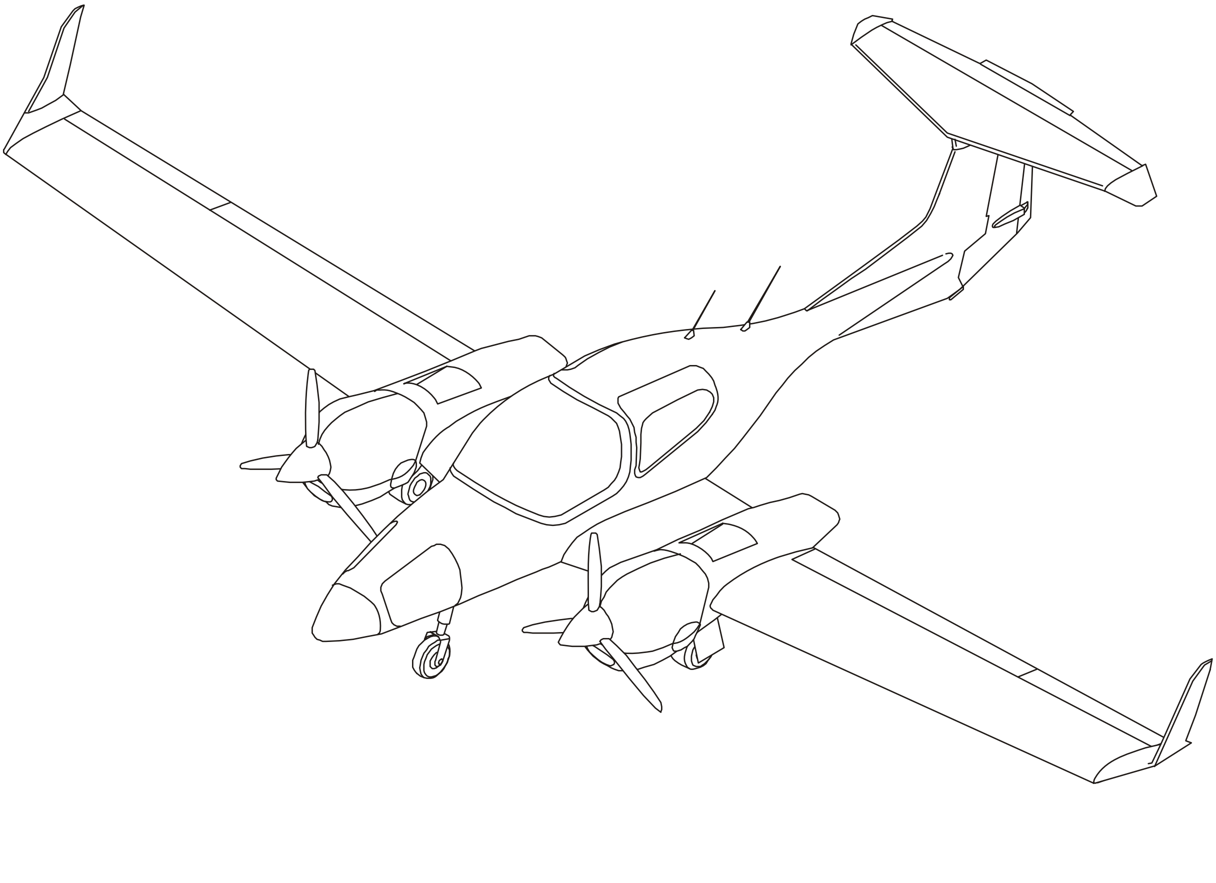
DA 42 NG

AIRPLANE MAINTENANCE MANUAL



Diamond Aircraft Industries GmbH

N. A. Otto-Str. 5

A-2700 Wiener Neustadt

Austria

Phone: +43-2622-26700

Fax: +43-2622-26780

E-mail: office@diamondaircraft.com

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Record of Revision

1. Record of Revision

Use this check list to record and control all of the revisions which you put in this Airplane Maintenance Manual (AMM). Put the affected pages of the revision into the AMM as soon as you get them. Remove and destroy the pages which are superseded. Complete the table below when you have put the revision in the AMM.

Revision Number	Date Issued	Inserted On	Inserted By	Revision Number	Date Issued	Inserted On	Inserted By
Original	18 Feb 2009						
1	15 Oct 2009						
2	31 Mar 2012						
3	16 Aug 2016						
4	15 Mar 2018						
5	22 Dec 2021						

2. Record of Incorporated Temporary Revisions

The following Temporary Revisions are incorporated into the DA 42 NG AMM by Revision 1:

Temporary Revision Number	Description of Temporary Revision
AMM-TR-OÄM-42-142	Sun Visors for Tall Canopy
AMM-TR-MÄM-42-353	Removal of Check Valves in Nacelle
AMM-TR-MÄM-42-357	Limitation Placard
AMM-TR-MÄM-42-364	Gear Up Landing Check
AMM-TR-MÄM-42-366	Change of the Resistor for the Feathering System
AMM-TR-MÄM-42-388	Isolationdiodes for ECU

The following Temporary Revisions are incorporated into the DA 42 NG AMM by Revision 2:

Temporary Revision Number	Description of Temporary Revision
AMM-TR-MÄM-42-319	Main Landing Gear Measurement
AMM-TR-MÄM-42-332	Inspection Intervals Rudder Trim Mechanism
AMM-TR-MÄM-42-334	Improved Maintenance Instructions for the Passenger Door
AMM-TR-MÄM-42-336	Optimized NLG Actuator
AMM-TR-MÄM-42-356/a	Rudder Trim Adjustment
AMM-TR-MÄM-42-384	Alternate Air Valve FOD Screen
AMM-TR-MÄM-42-391	Turbo System Aluminium Tube
AMM-TR-MÄM-42-395	Improved Heating
AMM-TR-MÄM-42-398/a & 450	Change of Breather Line Installation
AMM-TR-MÄM-42-406	Radiator and Intercooler Protection
AMM-TR-MÄM-42-440	Flap Preload Adjustment
AMM-TR-MÄM-42-447	Replacement Instructions MLG Joints
AMM-TR-MÄM-42-448	New Governor Speed Settings
AMM-TR-MÄM-42-451	Engine Shock Mount Torques
AMM-TR-MÄM-42-454	Inspection of MLG Door Hinges
AMM-TR-MÄM-42-462	Additional Drainage in the Static System
AMM-TR-MÄM-42-471	Fuel Pulsation Damper
AMM-TR-MÄM-42-478	Extended Time Limit Oxygen Cylinder

Temporary Revision Number	Description of Temporary Revision
AMM-TR-MÄM-42-480	Fuel Pumps Check Valves
AMM-TR-MÄM-42-495	Alternative Hydraulic Fluids and Greases
AMM-TR-MÄM-42-515	Safety Walk Adhesive Strips
AMM-TR-MÄM-42-522	Maintenance Interval GFC 700
AMM-TR-MÄM-42-524 & 380	Maintenance Program Phase 1
AMM-TR-MÄM-42-533	Caliper Back Plate Torque Value Correction
AMM-TR-MÄM-42-534	Propeller Shipping Plug Removal
AMM-TR-MÄM-42-535	Gearbox Oil Inspection
AMM-TR-MÄM-42-538	Fuel Drain Valve Mounting Torque
AMM-TR-MÄM-42-550	Routing in Center Wing
AMM-TR-MÄM-42-551	Alternator Regulator E4A-91-200-000
AMM-TR-MÄM-42-570	Large Washer at RH FWD Engine Mounting Arm Bolt
AMM-TR-MÄM-42-594	Alternative Engine Shock Mount
AMM-TR-MÄM-42-600	Performance Enhancement
AMM-TR-MÄM-42-601	Corrections
AMM-TR-MÄM-42-641	Propeller Pitch Information
AMM-TR-OÄM-42-176 & 171	Retrofit Installation of Austro Engine E4-B
AMM-TR-OÄM-42-187	Coated Safety Walk
AMM-TR-OÄM-42-191	Trim Weight
AMM-TR-OÄM-42-193	Recirculating Air-Cabin Cooling (RACC)
AMM-TR-OÄM-42-204/a	Additional Alternator
AMM-TR-OÄM-42-205	Emergency Axe
AMM-TR-OÄM-42-207	Short Baggage Extension
AMM-TR-OÄM-42-210	New GFC 700 Autopilot Hardware
AMM-TR-OÄM-42-231	Trim Weight

The following Temporary Revisions are incorporated into the DA 42 NG AMM by Revision 3:

Temporary Revision Number	Description of Temporary Revision
AMM-TR-MÄM-42-659	Maximum Landing Mass 1999 kg
AMM-TR-MÄM-42-660/a	Engine Gearbox Cooling
AMM-TR-MÄM-42-671	Engine Oil Quick Drain
AMM-TR-MÄM-42-684	Stall Warning System
AMM-TR-MÄM-42-707/a	Correction of Aircraft Leveling
AMM-TR-MÄM-42-728	Unfeathering Accu Procedure
AMM-TR-MÄM-42-730	Fuel Level Sensor Installation
AMM-TR-MÄM-42-737	Time Limit Fuel Bypass Valve
AMM-TR-MÄM-42-739	Heating / Defrost
AMM-TR-MÄM-42-742	Trouble Shooting Fuel System
AMM-TR-MÄM-42-743	Governor Nut Torque
AMM-TR-MÄM-42-745/a	Coolant Tank Pressure Relief Valve Test
AMM-TR-MÄM-42-746	Coolant System Pressure Test
AMM-TR-MÄM-42-756	Ground Handling
AMM-TR-MÄM-42-823	Protective Pads for Charged Air Hoses
AMM-TR-MÄM-42-852	Coolant Water Tank with Threaded Cap and Larger Filler Neck
AMM-TR-MÄM-42-875	Replacement of Passenger Door Hinges
AMM-TR-MÄM-42-878	Accessory Power Plug
AMM-TR-MÄM-42-880	Drag Brace Figure Correction
AMM-TR-MÄM-42-881	Additional Elevator Mass
AMM-TR-MÄM-42-885	New Rudder Installation and Rudder Trim
AMM-TR-MÄM-42-893	Inspection of Cardan Joint Bracket
AMM-TR-MÄM-42-895	Improved Lightning Protection of Coolant System
AMM-TR-MÄM-42-900/a	Silicate Pouch
AMM-TR-MÄM-42-920	New Type 6 Lubricants
AMM-TR-MÄM-42-933	Alternate Air
AMM-TR-MÄM-42-961	Flap Control System
AMM-TR-MÄM-42-963/a	Turbo Charger V-Clamp

Temporary Revision Number	Description of Temporary Revision
AMM-TR-OÄM-42-055	Continuous Flow Oxygen System
AMM-TR-OÄM-42-056/a	Auxiliary Fuel Tanks
AMM-TR-OÄM-42-119/b & -273	Garmin GWX 68 and GWX 70 Weather Radar
AMM-TR-OÄM-42-160	Flight Into Known Icing
AMM-TR-OÄM-42-193/b	Recirculating Air-Cabin Cooling (RACC)
AMM-TR-OÄM-42-203	TKS Tank in Rear Fuselage
AMM-TR-OÄM-42-204/d	Additional Alternator
AMM-TR-OÄM-42-213	Satellite Transceiver Gamin GSR 56
AMM-TR-OÄM-42-222	Whelen LED Position / Anti Collision Lights
AMM-TR-OÄM-42-224	Removal of Unfeathering Accumulator
AMM-TR-OÄM-42-226	ELT, KANNAD 406 AF-Compact
AMM-TR-OÄM-42-231/a	Trim Weight
AMM-TR-OÄM-42-251	Diesel Operation
AMM-TR-OÄM-42-259/a	Front Seats with Adjustable Backrest Hydrolok
AMM-TR-OÄM-42-270	Mid Continent, MD302 Standby Attitude Module
AMM-TR-OÄM-42-277	Provisions for MÄM 42-678 and MÄM 42-659
AMM-TR-OÄM-42-281/a & -283	RH Stick Removal & Pilot's Removable Stick

A. Airplanes with OÄM 42-277 installed:

Airplanes with OÄM 42-277 installed have all technical provisions for the operation with MÄM 42-678 and MÄM 42-659 installed, therefore consider MÄM 42-678 and MÄM 42-659 as carried out when using the AMM.

The following Temporary Revisions are incorporated into the DA 42 NG AMM by Revision 4:

Temporary Revision Number	Description of Temporary Revision
AMM-TR-MÄM-42-961/a & -1007	Flap Control System
AMM-TR-MÄM-42-978	Garmin Hard- and Software Upgrade I
AMM-TR-MÄM-42-989	Conservation of Parts
AMM-TR-MÄM-42-991	Turbo connector Shim
AMM-TR-MÄM-42-994	Door Handle Improvement
AMM-TR-MÄM-42-995	Engine Oils
AMM-TR-MÄM-42-1001/a	Colors other than White
AMM-TR-MÄM-42-1004	SG3-0 Hose between Turbo Charger and Intercooler
AMM-TR-MÄM-42-1008	Turbo Charger Hose Installation
AMM-TR-MÄM-42-1024	New Maplight
AMM-TR-MÄM-42-1041	Rudder Balance Mass Increase
AMM-TR-MÄM-42-1049	Horizontal Stabilizer Torque
AMM-TR-MÄM-42-1052	Rudder and Rudder Trim Adjustment
AMM-TR-OÄM-42-194	Canopy Jettison System
AMM-TR-OÄM-42-247	RH ECU Backup Battery in Lower Tail Fin
AMM-TR-OÄM-42-248	Provisions for Tablet Mount
AMM-TR-OÄM-42-304	Emergency Egress Hammer
AMM-TR-OÄM-42-324	AmSafe Seatbelt Airbag V23 System

The following Temporary Revisions are incorporated into the DA 42 NG AMM by Revision 5:

Temporary Revision Number	Description of Temporary Revision
AMM-TR-MÄM-42-1025	Alternative Emergency Battery Tray
AMM-TR-MÄM-42-1072/a	Garmin Hard- and Software Upgrade II
AMM-TR-MÄM-42-1073	MLG Tire Clearance
AMM-TR-MÄM-42-1079/a	Fuel Tank Sealant Material
AMM-TR-MÄM-42-1084	Wheel Track and Camber
AMM-TR-MÄM-42-1086	Rudder and Rudder Trim Adjustment
AMM-TR-MÄM-42-1090	Additional Colors
AMM-TR-MÄM-42-1093	Fire Detector Installation
AMM-TR-MÄM-42-1094	New Sealing Concept for Map Light Attachment
AMM-TR-MÄM-42-1099	Improved Filling Procedure for Cooling System
AMM-TR-MÄM-42-1105	Additional Color Light Blue
AMM-TR-MÄM-42-1112	Fuel Tank Connection Hoses
AMM-TR-MÄM-42-1124	Improved Rudder Yoke Bolt Design
AMM-TR-MÄM-42-1125	Inspection of Airfilter for Manufacturing Residues
AMM-TR-MÄM-42-1126	Definition of Special Torque at Hydraulic Pump Unit
AMM-TR-MÄM-42-1129	Door Warning Switch
AMM-TR-MÄM-42-1134	New Placard for Painting Scheme
AMM-TR-MÄM-42-1147	Garmin G1000 NXi Line Maintenance Manual
AMM-TR-MÄM-42-1157	Improvement of Stall Warning Gauge
AMM-TR-MÄM-42-1180	Actualisation of Wing Movable Mass
AMM-TR-MÄM-42-1189	Aileron Controls in the Fuselage
AMM-TR-MÄM-42-1194	Additional Colors
AMM-TR-MÄM-42-1220	Door Handle Installation
AMM-TR-OÄM-42-053	Flight Into Known Icing
AMM-TR-OÄM-42-056/c	Auxiliary Fuel Tanks
AMM-TR-OÄM-42-160/b	Flight Into Known Icing

AMM-TR-OÄM-42-204/e	Additional Alternator
AMM-TR-OÄM-42-324/b & 334/a	AmSafe Seatbelt Airbag V23 System
AMM-TR-OÄM-42-343	ELT, KANNAD AF-Integra
AMM-TR-OÄM-42-349	Avidyne Sky Trax 6xx (TAS 6xxA)Series
AMM-TR-OÄM-42-356	Alternative MLG Brace Bracket RH
AMM-TR-OÄM-42-365	Key Hanger

LIST OF EFFECTIVE PAGES

1. General

The list of effective pages uses this abbreviation:

- TOC = Table of Contents.
- ROR = Record of Revisions
- LOEP = List of Effective Pages

All Sections have a Title Page and a Table of Contents. The TOC can have one page or it can have many pages.

Each revision to the Airplane Maintenance Manual will have a new List of Effective Pages.

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57-00	Title 2	22 Dec 2021	57-50	5	22 Dec 2021	61-00	2	22 Dec 2021
57-00	TOC 1	22 Dec 2021	57-50	6	22 Dec 2021	61-10	1	22 Dec 2021
57-00	TOC 2	22 Dec 2021	57-50	201	22 Dec 2021	61-10	2	22 Dec 2021
57-00	1	22 Dec 2021	57-50	202	22 Dec 2021	61-10	3	22 Dec 2021
57-00	2	22 Dec 2021	57-50	203	22 Dec 2021	61-10	4	22 Dec 2021
57-10	1	22 Dec 2021	57-50	204	22 Dec 2021	61-10	5	22 Dec 2021
57-10	2	22 Dec 2021	57-50	205	22 Dec 2021	61-10	6	22 Dec 2021
57-10	3	22 Dec 2021	57-50	206	22 Dec 2021	61-10	101	22 Dec 2021
57-10	4	22 Dec 2021	57-50	207	22 Dec 2021	61-10	102	22 Dec 2021
57-10	201	22 Dec 2021	57-50	208	22 Dec 2021	61-10	201	22 Dec 2021
57-10	202	22 Dec 2021	57-50	209	22 Dec 2021	61-10	202	22 Dec 2021
57-10	203	22 Dec 2021	57-50	210	22 Dec 2021	61-10	203	22 Dec 2021
57-10	204	22 Dec 2021	57-50	211	22 Dec 2021	61-10	204	22 Dec 2021
57-10	205	22 Dec 2021	57-50	212	22 Dec 2021	61-10	205	22 Dec 2021
57-10	206	22 Dec 2021	57-60	1	22 Dec 2021	61-10	206	22 Dec 2021
57-10	207	22 Dec 2021	57-60	2	22 Dec 2021	61-10	207	22 Dec 2021
57-10	208	22 Dec 2021	57-60	3	22 Dec 2021	61-10	208	22 Dec 2021
57-10	209	22 Dec 2021	57-60	4	22 Dec 2021	61-10	209	22 Dec 2021
57-10	210	22 Dec 2021	57-60	201	22 Dec 2021	61-10	210	22 Dec 2021
57-10	211	22 Dec 2021	57-60	202	22 Dec 2021	61-10	211	22 Dec 2021
57-10	212	22 Dec 2021	57-60	203	22 Dec 2021	61-10	212	22 Dec 2021
57-10	213	22 Dec 2021	57-60	204	22 Dec 2021	61-10	213	22 Dec 2021
57-10	214	22 Dec 2021	57-60	205	22 Dec 2021	61-10	214	22 Dec 2021
57-10	215	22 Dec 2021	57-60	206	22 Dec 2021	61-10	215	22 Dec 2021
57-10	216	22 Dec 2021	61-00	Title 1	22 Dec 2021	61-10	216	22 Dec 2021
57-50	1	22 Dec 2021	61-00	Title 2	22 Dec 2021	61-10	217	22 Dec 2021
57-50	2	22 Dec 2021	61-00	TOC 1	22 Dec 2021	61-10	218	22 Dec 2021

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61-20	3	22 Dec 2021	71-00	102	22 Dec 2021	71-10	203	22 Dec 2021
61-20	4	22 Dec 2021	71-00	201	22 Dec 2021	71-10	204	22 Dec 2021
61-20	5	22 Dec 2021	71-00	202	22 Dec 2021	71-11	1	22 Dec 2021
61-20	6	22 Dec 2021	71-00	203	22 Dec 2021	71-11	2	22 Dec 2021
61-20	101	22 Dec 2021	71-00	204	22 Dec 2021	71-11	3	22 Dec 2021
61-20	102	22 Dec 2021	71-00	205	22 Dec 2021	71-11	4	22 Dec 2021
61-20	201	22 Dec 2021	71-00	206	22 Dec 2021	71-11	101	22 Dec 2021
61-20	202	22 Dec 2021	71-00	207	22 Dec 2021	71-11	102	22 Dec 2021
61-20	203	22 Dec 2021	71-00	208	22 Dec 2021	71-11	201	22 Dec 2021
61-20	204	22 Dec 2021	71-00	209	22 Dec 2021	71-11	202	22 Dec 2021
61-20	205	22 Dec 2021	71-00	210	22 Dec 2021	71-11	203	22 Dec 2021
61-20	206	22 Dec 2021	71-00	211	22 Dec 2021	71-11	204	22 Dec 2021
61-20	207	22 Dec 2021	71-00	212	22 Dec 2021	71-11	205	22 Dec 2021
61-20	208	22 Dec 2021	71-00	213	22 Dec 2021	71-11	206	22 Dec 2021
61-20	209	22 Dec 2021	71-00	214	22 Dec 2021	71-20	1	22 Dec 2021
61-20	210	22 Dec 2021	71-00	215	22 Dec 2021	71-20	2	22 Dec 2021
71-00	Title 1	22 Dec 2021	71-00	216	22 Dec 2021	71-20	3	22 Dec 2021
71-00	Title 2	22 Dec 2021	71-00	217	22 Dec 2021	71-20	4	22 Dec 2021
71-00	TOC 1	22 Dec 2021	71-00	218	22 Dec 2021	71-20	101	22 Dec 2021
71-00	TOC 2	22 Dec 2021	71-00	219	22 Dec 2021	71-20	102	22 Dec 2021
71-00	TOC 3	22 Dec 2021	71-00	220	22 Dec 2021	71-20	201	22 Dec 2021
71-00	TOC 4	22 Dec 2021	71-10	1	22 Dec 2021	71-20	202	22 Dec 2021
71-00	1	22 Dec 2021	71-10	2	22 Dec 2021	71-20	203	22 Dec 2021
71-00	2	22 Dec 2021	71-10	3	22 Dec 2021	71-20	204	22 Dec 2021
71-00	3	22 Dec 2021	71-10	4	22 Dec 2021	71-50	1	22 Dec 2021
71-00	4	22 Dec 2021	71-10	101	22 Dec 2021	71-50	2	22 Dec 2021
71-00	5	22 Dec 2021	71-10	102	22 Dec 2021	71-60	1	22 Dec 2021

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71-60	4	22 Dec 2021	71-61	101	22 Dec 2021	72-00	206	22 Dec 2021
71-60	5	22 Dec 2021	71-61	102	22 Dec 2021	73-00	Title 1	22 Dec 2021
71-60	6	22 Dec 2021	71-70	1	22 Dec 2021	73-00	Title 2	22 Dec 2021
71-60	101	22 Dec 2021	71-70	2	22 Dec 2021	73-00	TOC 1	22 Dec 2021
71-60	102	22 Dec 2021	71-70	201	22 Dec 2021	73-00	TOC 2	22 Dec 2021
71-60	201	22 Dec 2021	71-70	202	22 Dec 2021	73-00	1	22 Dec 2021
71-60	202	22 Dec 2021	71-70	203	22 Dec 2021	73-00	2	22 Dec 2021
71-60	203	22 Dec 2021	71-70	204	22 Dec 2021	73-00	3	22 Dec 2021
71-60	204	22 Dec 2021	71-71	1	22 Dec 2021	73-00	4	22 Dec 2021
71-60	205	22 Dec 2021	71-71	2	22 Dec 2021	73-00	101	22 Dec 2021
71-60	206	22 Dec 2021	71-71	201	22 Dec 2021	73-00	102	22 Dec 2021
71-60	207	22 Dec 2021	71-71	202	22 Dec 2021	73-00	201	22 Dec 2021
71-60	208	22 Dec 2021	71-71	203	22 Dec 2021	73-00	202	22 Dec 2021
71-60	209	22 Dec 2021	71-71	204	22 Dec 2021	73-00	203	22 Dec 2021
71-60	210	22 Dec 2021	72-00	Title 1	22 Dec 2021	73-00	204	22 Dec 2021
71-60	211	22 Dec 2021	72-00	Title 2	22 Dec 2021	75-00	Title 1	22 Dec 2021
71-60	212	22 Dec 2021	72-00	TOC 1	22 Dec 2021	75-00	Title 2	22 Dec 2021
71-60	213	22 Dec 2021	72-00	TOC 2	22 Dec 2021	75-00	TOC 1	22 Dec 2021
71-60	214	22 Dec 2021	72-00	1	22 Dec 2021	75-00	TOC 2	22 Dec 2021
71-60	215	22 Dec 2021	72-00	2	22 Dec 2021	75-00	1	22 Dec 2021
71-60	216	22 Dec 2021	72-00	3	22 Dec 2021	75-00	2	22 Dec 2021
71-60	217	22 Dec 2021	72-00	4	22 Dec 2021	75-00	3	22 Dec 2021
71-60	218	22 Dec 2021	72-00	101	22 Dec 2021	75-00	4	22 Dec 2021
71-60	219	22 Dec 2021	72-00	102	22 Dec 2021	75-00	5	22 Dec 2021
71-60	220	22 Dec 2021	72-00	201	22 Dec 2021	75-00	6	22 Dec 2021
71-61	1	22 Dec 2021	72-00	202	22 Dec 2021	75-00	7	22 Dec 2021
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75-00	102	22 Dec 2021	76-00	3	22 Dec 2021	77-40	2	22 Dec 2021
75-00	201	22 Dec 2021	76-00	4	22 Dec 2021	77-40	3	22 Dec 2021
75-00	202	22 Dec 2021	76-00	5	22 Dec 2021	77-40	4	22 Dec 2021
75-00	203	22 Dec 2021	76-00	6	22 Dec 2021	77-40	101	22 Dec 2021
75-00	204	22 Dec 2021	76-00	101	22 Dec 2021	77-40	102	22 Dec 2021
75-00	205	22 Dec 2021	76-00	102	22 Dec 2021	77-40	201	22 Dec 2021
75-00	206	22 Dec 2021	76-00	201	22 Dec 2021	77-40	202	22 Dec 2021
75-00	207	22 Dec 2021	76-00	202	22 Dec 2021	77-40	203	22 Dec 2021
75-00	208	22 Dec 2021	76-00	203	22 Dec 2021	77-40	204	22 Dec 2021
75-00	209	22 Dec 2021	76-00	204	22 Dec 2021	77-40	205	22 Dec 2021
75-00	210	22 Dec 2021	76-00	205	22 Dec 2021	77-40	206	22 Dec 2021
75-00	211	22 Dec 2021	76-00	206	22 Dec 2021	77-40	207	22 Dec 2021
75-00	212	22 Dec 2021	76-00	207	22 Dec 2021	77-40	208	22 Dec 2021
75-00	213	22 Dec 2021	76-00	208	22 Dec 2021	78-00	Title 1	22 Dec 2021
75-00	214	22 Dec 2021	76-00	209	22 Dec 2021	78-00	Title 2	22 Dec 2021
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75-00	218	22 Dec 2021	76-00	213	22 Dec 2021	78-00	2	22 Dec 2021
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75-00	220	22 Dec 2021	76-00	215	22 Dec 2021	78-00	4	22 Dec 2021
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75-00	222	22 Dec 2021	77-00	Title 1	22 Dec 2021	78-00	102	22 Dec 2021
76-00	Title 1	22 Dec 2021	77-00	Title 2	22 Dec 2021	78-00	201	22 Dec 2021
76-00	Title 2	22 Dec 2021	77-00	TOC 1	22 Dec 2021	78-00	202	22 Dec 2021
76-00	TOC 1	22 Dec 2021	77-00	TOC 2	22 Dec 2021	79-00	Title 1	22 Dec 2021
76-00	TOC 2	22 Dec 2021	77-00	1	22 Dec 2021	79-00	Title 2	22 Dec 2021
76-00	1	22 Dec 2021	77-00	2	22 Dec 2021	79-00	TOC 1	22 Dec 2021

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79-00	202	22 Dec 2021
79-00	203	22 Dec 2021
79-00	204	22 Dec 2021
79-00	205	22 Dec 2021
79-00	206	22 Dec 2021
80-00	Title 1	22 Dec 2021
80-00	Title 2	22 Dec 2021
80-00	TOC 1	22 Dec 2021
80-00	TOC 2	22 Dec 2021
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80-00	2	22 Dec 2021
80-00	101	22 Dec 2021
80-00	102	22 Dec 2021
80-00	201	22 Dec 2021
80-00	202	22 Dec 2021
80-00	203	22 Dec 2021
80-00	204	22 Dec 2021
80-00	205	22 Dec 2021
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80-00	207	22 Dec 2021
80-00	208	22 Dec 2021
80-00	209	22 Dec 2021
80-00	210	22 Dec 2021
81-00	Title 1	22 Dec 2021
81-00	Title 2	22 Dec 2021
81-00	TOC 1	22 Dec 2021
81-00	TOC 2	22 Dec 2021
81-00	1	22 Dec 2021
81-00	2	22 Dec 2021
81-00	3	22 Dec 2021
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81-00	6	22 Dec 2021
81-00	101	22 Dec 2021
81-00	102	22 Dec 2021
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81-00	207	22 Dec 2021
81-00	208	22 Dec 2021
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81-01	2	22 Dec 2021
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81-01	4	22 Dec 2021
81-01	5	22 Dec 2021
81-01	6	22 Dec 2021
81-01	101	22 Dec 2021
81-01	102	22 Dec 2021
81-01	201	22 Dec 2021
81-01	202	22 Dec 2021
81-01	203	22 Dec 2021
81-01	204	22 Dec 2021
81-01	205	22 Dec 2021
81-01	206	22 Dec 2021
81-01	207	22 Dec 2021
81-01	208	22 Dec 2021
92-00	Title 1	22 Dec 2021
92-00	Title 2	22 Dec 2021
92-00	TOC 1	22 Dec 2021
92-00	TOC 2	22 Dec 2021
92-00	1	22 Dec 2021
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wiring diagrams as listed in Chapter 92		

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CHAPTER 01

INTRODUCTION

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CHAPTER 01

INTRODUCTION

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CHAPTER 01
INTRODUCTION

1. General

This Airplane Maintenance Manual contains the data necessary to do the maintenance of the DA 42 NG airplane. It contains a full description of the systems, trouble shooting procedures, component removal and installation procedures and maintenance instructions. It does not contain maintenance data for components removed from the airplane (Maintenance Shop data).

The Airplane Maintenance Manual contains the wiring diagrams for the electrical system.

Use the DA 42 NG Airplane Flight Manual, latest revision with the Airplane Maintenance Manual, and the related Service Bulletins. Additional maintenance data is referenced in Chapter 05-00.

2. Revision Service

The manufacturer provides a revision service for the Airplane Maintenance Manual. The revision shows design changes to the airplane or changes in procedures. Each page of the manual shows the date of issue. If the page has changed, it shows the date of the revision.

3. Warning, Cautions and Notes

Obey all the usual safety precautions and maintenance instructions when doing maintenance.

This Airplane Maintenance Manual also contains warnings, cautions and notes before applicable instructions:

WARNING: A WARNING TELLS THE PERSON DOING THE MAINTENANCE THAT INJURY OR DEATH IS POSSIBLE IF THEY DO NOT STRICTLY FOLLOW THE INSTRUCTIONS.

CAUTION: A CAUTION TELLS THE PERSON DOING THE MAINTENANCE THAT DAMAGE TO EQUIPMENT IS POSSIBLE IF THEY DO NOT FOLLOW THE INSTRUCTIONS.

Note: A Note tells the person doing the maintenance how to make the task easier.

4. Manual Configuration

This manual is written using the regulations of the Air Transport Association of America Specification iSpec2200. Each system is given a chapter number from the ATA iSpec2200. Where applicable, a chapter contains sections for each sub-system.

The specification AECMA Simplified English has been used to write this Airplane Maintenance Manual. This is a mandatory requirement of the ATA iSpec2200.

There are only 3 sources of words available to use in Simplified English (SE).

– Approved words from the SE Guide. These words have defined meanings and selected parts of speech.

– Technical names as defined in the SE Guide. Used only as adjectives or nouns.

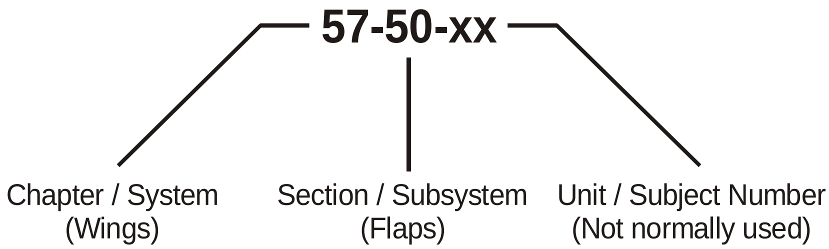
– Manufacturing processes as defined in the SE Guide. Always used as verbs.

To obtain a copy of the SE Guide contact ASD-STAN, Avenue de Tervuren, B-1150 Brussels, Belgium. Tel: +32-2775-81-26, Fax:+32-2763-35-65, Email: contact@asd-stan.org

This manual does not use the ATA iSpec2200 Airplane Maintenance Task Oriented Support System (ATMOSS) or the ATA iSpec2200 Production Management Data Base (PMDB).

A. The ATA iSpec2200 Numbering System

The ATA iSpec2200 numbering system uses 3 pairs of numbers, for example:



The first pair of numbers shows the system. System 57 is the wings. Chapter 57 contains the data for the wings.

The second pair of numbers shows the sub-system. Sub-system 50 is the Trailing Edge Flap. Chapter 57, Section 50 contains the data for the trailing edge flaps installation.

The third pair of numbers shows a unit. A unit could be the flap itself. Only complex systems use unit numbers.

For simple systems, the main chapter has all of the data and there are no section/sub-system break-downs.

B. Groups of Chapters

The chapters are put together in these groups:

Group A	Introduction	Chapters 01-02
Group B	Airplane General	Chapters 03-12
Group C	Airframe Systems	Chapters 20-35
Group D	Structure	Chapters 51-57
Group E	Propeller	Chapter 61
Group F	Engine	Chapters 71-81

A separation sheet divides each chapter. The separation sheet shows the number of the chapter and the title.

The main contents of each group of chapters is given below:

(1) Group A - Introduction

Chapter 01 tells you about the Airplane Maintenance Manual, and Chapter 2 tells you how to use the Airplane Maintenance Manual.

(2) Group B - Airplane General

Chapter 03 gives you a general description of the airplane and its systems.

Chapter 04 gives you data about the Airworthiness Limitations and certification of the airplane.

Chapter 05 contains the Scheduled Maintenance Checklist. Some tasks require a maintenance procedure. The scheduled maintenance checklist identifies the Section in the manual that gives the maintenance procedure for the task. It also tells you where to find general information.

Chapters 06 to 10 tell you about the dimensions of the airplane and general procedures such as towing, parking and weighing.

Chapter 11 tells you about the placards and markings which are important for the safe operation of the airplane.

Chapter 12 contains servicing tasks such as refueling and lubrication. It also contains data about cleaning the airplane.

(3) Group C - Airframe Systems

Chapter 20 contains the standard practices for airframe maintenance.

Chapters 21 to 35 tell you about the airframe systems. They include the avionics systems (such as communications (Chapter 23)) and the mechanical systems (such as flight controls (Chapter 27)).

Chapter 31 shows the location of the instruments. The chapter which is applicable to the system gives the details. For example, Chapter 27 gives the details for the flap position indicator.

(4) Group D - Structure

Chapter 51 contains data about the design of the airframe. It also gives instructions for assessing damage to the airframe and how to do minor repairs.

Chapters 52 to 57 tell you about each part of the structure.

(5) Group E - Propeller

Chapter 61 contains the maintenance procedures for the propeller. Refer to the propeller manufacturer's manual for other data.

(6) Group F - Engine

This group of chapters describes the engine and its systems. It contains the maintenance procedures for maintenance of the engine on the airplane. Refer to the engine manufacturer's manual for other data.

C. Chapter Configuration

The first page of each chapter shows the number of the chapter and the title. The second page shows the contents. Where applicable, each chapter and section contains the topics that follow:

– Description and Operation.

– Trouble-Shooting.

– Maintenance Practices. Where applicable the maintenance practices give data on these procedures:

- Servicing.
- Removal and Installation.
- Adjustment/Tests.
- Checking/Testing.
- Cleaning/Painting.
- Repairs.

5. Page Numbering System

This manual uses the ATA iSpec2200 page block-numbering system. The page number is at the bottom of the page at the outer edge. It is adjacent to the chapter/section number.

Each topic in a section has numbers from these page blocks:

– Description and Operation - Pages 1 to 99.

– Trouble Shooting - Pages 101 to 199.

– Maintenance Procedures - Pages 201 to 299.

6. Figures

Figures are given numbers in sequence. The first figure in a chapter or section is Figure 1.

7. Record of Revisions

The Airplane Maintenance Manual has a Record of Revisions. Use the Record of Revisions to show when changes were included in the Airplane Maintenance Manual.

8. List of Effective Pages

This Airplane Maintenance Manual has a List of Effective Pages. The List of Effective Pages shows you the number and effective date of each page contained in the Airplane Maintenance Manual.

CHAPTER 02

ORGANIZATION AND HANDLING OF THE MANUAL

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CHAPTER 02

ORGANIZATION AND HANDLING OF THE MANUAL

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CHAPTER 02

ORGANIZATION AND HANDLING OF THE MANUAL

1. General

For data about a system, look in the list of chapters and find the chapter number. The first page of each chapter after the title page shows the contents.

2. Applicability

Data applicable to a series of airplane is marked with an applicability note. For example:

Valid for S/N 42.N001 thru 42.N999.

This shows that you can use this data for airplane with serial numbers 42.N001 thru 42.N999 inclusive.

3. Revisions

The manufacturer makes changes to the Airplane Maintenance Manual to show design changes, maintenance procedure changes or other changes. Each group of changes is called a ‘Revision’.

A manual revision contains these items:

– The changed pages.

– The reason for the revision.

– Instructions for putting the revision into the Airplane Maintenance Manual.

– A new List of Effective Pages (LOEP).

A vertical bar in the left margin of the page shows the changes.

4. Temporary Revisions

Temporary revisions correct errors, or they give temporary instructions. The manufacturer sends them to the airplane owners quickly. The manufacturer uses yellow pages for temporary revisions. The manufacturer usually puts the contents of a temporary revision in the next approved revision.

5. Service Bulletins and Service Instructions

Service Bulletins (SB) regulate modifications carried out on registered, in field operated airplanes.

Service Instructions give the operator technical instruction about the product which are not included in the standard documentation. This could be for example recommendations for maintenance or information about SBs of other manufacturers (Austro Engine, mt-Propeller etc.).

Refer to Service Instruction No. SI42-001 for details on the organization of Service Bulletins and Service Instructions.

6. Concession-Reports and Non-Conformance-Reports

Concession- and Non-Conformance-Reports are tools to approve and document deviations from the standard manufacturing processes during construction and assembly of an individual airplane (for example, handling of a mis-drilled hole in the fuselage). In case the operator or the maintenance organization needs to be informed as a consequence of the deviations for that particular airplane (for example, the use of a special spare part is necessary or a different limit in a control surface balancing report applies), these Concession- and Non-Conformance-Reports are contained in the airplane log. Before you do maintenance, check the airplane log for such Concession- and Non-Conformance Reports.

7. Document Notifications

Manual Revisions, Temporary Revisions, Service Bulletins and Service Information are announced via e-mail. The new documents are available for download on the Internet web site of Diamond Aircraft: www.diamondaircraft.com

8. Abbreviations

Where possible, the abbreviations used correspond with the related regulations.

ACL	Anti-Collision Light (Strobe Lights)
ADF	Automatic Direction Finder
A&P	Airplane and Power Plant Mechanic
ASI	Airspeed Indicator
CFRP	Carbon Fiber Reinforced Plastic
DME	Distance Measuring Equipment
EECU	El. Engine Control Unit
ELT	Emergency Locator Transmitter
FRP	Fiber Reinforced Plastic
GFRP	Glass Fiber Reinforced Plastic
GPS	Global Positioning System
G/S	Glide Slope
IAU	Integrated Avionics Unit
ICS	Integrated Cockpit System
IFR	Instrument Flight Rules
HSI	Horizontal Situation Indicator
LOC	Localizer
MSI	Major Structural Inspection
OAT	Outside Air Temperature
PFD	Primary Flight Display
RCPI	Remote Control Panel Indicator
SAM	Standby Attitude Module
SB	Service Bulletin
SI	Service Instruction
S/N	Serial Number
TBO	Time Between Overhaul
TSMOH	Time Since Major Overhaul
TTSN	Total Time Since New

TTSO	Total Time Since Overhaul
UHF	Ultra High Frequency
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	VHF Omni-Directional Ranging
VSI	Vertical Speed Indicator

9. Conversion Factors and Abbreviations

Dimension Unit [Abbreviation]	Conversion Factor SI to US/Imperial	Conversion Factor US/Imperial to SI
Length		
Meter [m]	[m] / 0.3048 = [ft]	
Millimeter [mm]	[mm] / 25.4 = [in]	
Kilometer [km]	[km] / 1.852 = [nm]	
	[km] / 1.609 = [sm]	
Inch [in]		[in] x 25.4 = [mm]
Foot [ft]		[ft] x 0.3048 = [m]
Nautical mile [nm]		[nm] x 1.852 = [km]
Statute mile [sm]		[sm] x 1.609 = [km]
Velocity		
Kilometers per hour [km/h]	[km/h] / 1.852 = [kts]	
	[km/h] / 1.609 = [mph]	
Meters per second [m/s]	[m/s] x 196.85 = [fpm]	
Miles per hour [mph]		[mph] x 1.609 = [km/h]
Knots [kts]		[kts] x 1.852 = [km/h]
Feet per minute [fpm]		[fpm] / 196.85 = [m/s]
Rotational Speed		
Revolutions per minute [RPM]		[RPM] = [min^{-1}]
Pressure		
Bar [bar]	[bar] x 14.5038 = [PSI]	
Hectopascal [hPa] = Millibar [mbar]	[hPa] / 33.864 = [inHg]	
	[mbar] / 33.864 = [inHg]	
Pounds per square inch [PSI]		[PSI] / 14.5038 = [bar]
Inches of mercury column [inHg]		[inHg] x 33.864 = [hPa]
		[inHg] x 33.864 = [mbar]

Dimension Unit [Abbreviation]	Conversion Factor SI to US/Imperial	Conversion Factor US/Imperial to SI
Force or Weight		
Newton [N]	[N] / 4.448 = [lbf]	
Decanewton [daN]	[daN] / 0.4448 = [lbf]	
Pound-force [lbf]		[lbf] x 4.448 = [N]
		[lbf] x 0.4448 = [daN]
Mass ('Weight')		
Kilogram [kg]	[kg] / 0.45359 = [lb]	
Pound [lb]		[lb] x 0.45359 = [kg]
Volume		
Liter [l]	[l] / 3.7854 = [US gal]	
	[l] / 0.9464 = [US qts]	
	[l] / 4.5461 = [Imp gal]	
	[l] / 61.024 = [in^3]	
US gallon [US gal]		[US gal] x 3.7854 = [l]
US quart [US qt]		[US qt] x 0.9464 = [l]
Imperial gallon [Imp gal]		[Imp gal] x 4.5461 = [l]
Cubic inch [in^3]		[in^3] x 61.024 = [l]
Torque		
Newton meter [Nm]	[Nm] / 1.3558 = [lbf.ft.]	
	[Nm] x 8.851 = [lbf.in.]	
Pound-force foot [lbf.ft.]		[lbf.ft.] x 1.3558 = [Nm]
Pound-force inch [lbf.in.]		[lbf.in.] / 8.851 = [Nm]
Temperature		
Degree Celsius [°C]	[°C] x 1.8 + 32 = [°F]	
Degree Fahrenheit [°F]		([°F] - 32) / 1.8 = [°C]

Note: In this Airplane Maintenance Manual masses are referred to as weights. The authors accept, that this is technically incorrect but have used the expression for simplicity and convenience.

10.Torque Conversion Factor

Use figure 1 for conversion of torque values Nm - lbf.ft. Use figure 2 for conversion of Nm - lbf.in.

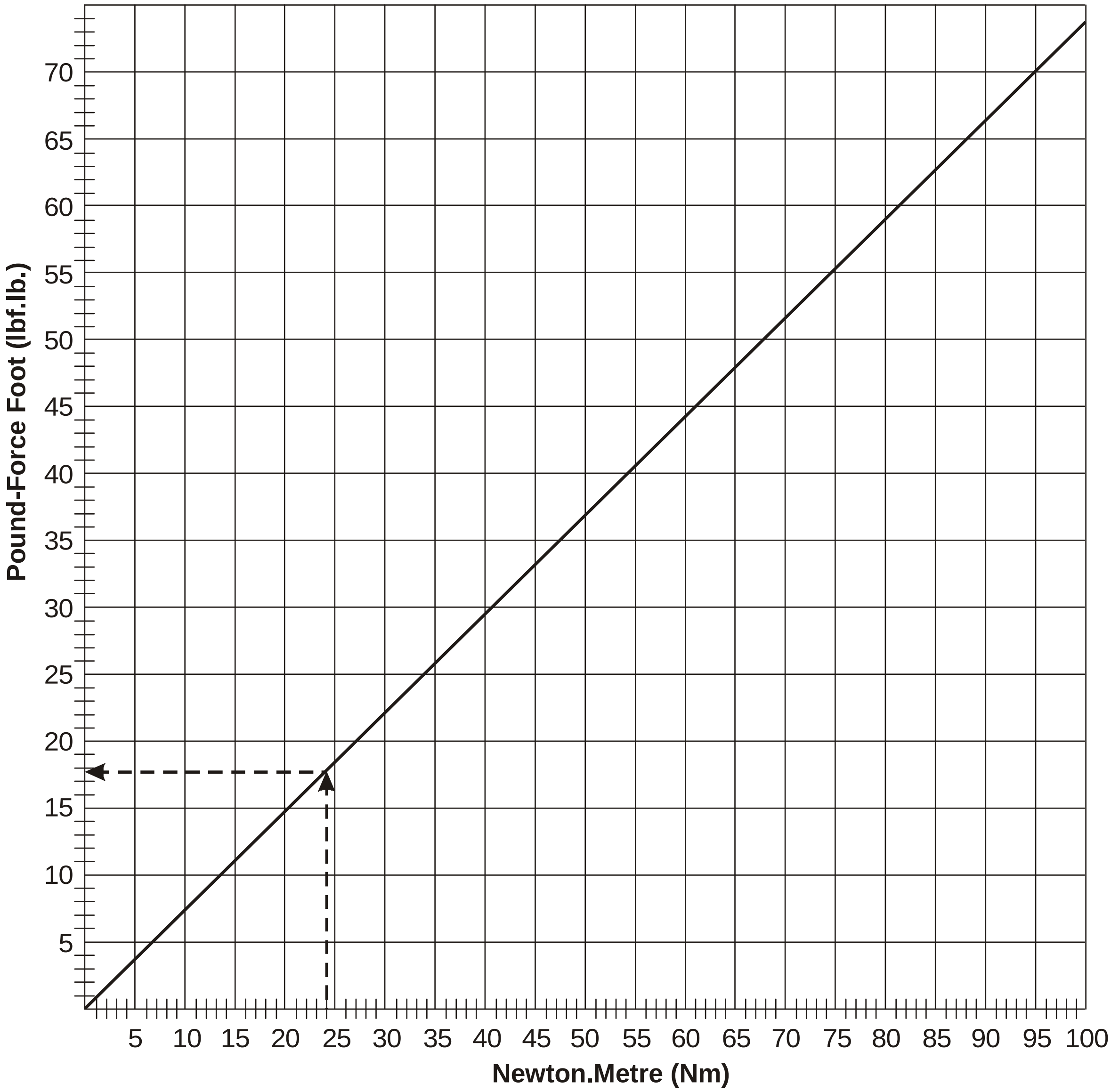

Figure 1: Nm - lbf.ft.

Find the Nm value on the horizontal axis. Move vertically to the solid black diagonal line. Then move horizontally to the vertical axis. Read the value in lbf.ft.

Example: To convert 24 Nm to lbf.ft., find 24 Nm on the horizontal axis (see the dashed line). Follow the dashed line vertically to the solid black diagonal line. Then follow the dashed line horizontally to the vertical axis. Read the value of 17.7 lbf.ft.

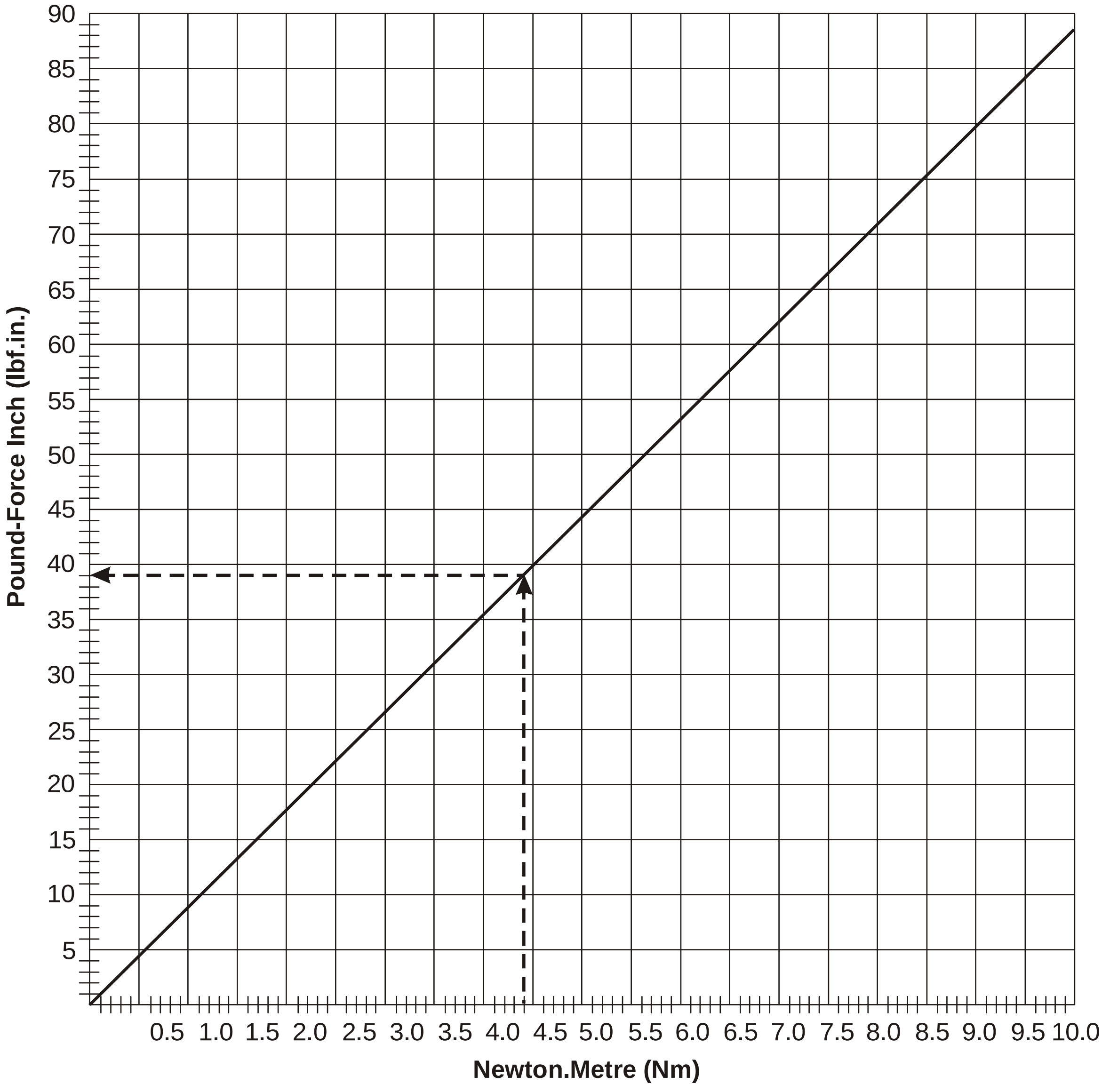

Figure 2: Nm - lbf.in.

Find the Nm value on the horizontal axis. Move vertically to the solid black diagonal line. Then move horizontally to the vertical axis. Read the value in lbf.in.

Example: To convert 4.4 Nm to lbf.in., find 4.4 Nm on the horizontal axis (see the dashed line). Follow the dashed line vertically to the solid black diagonal line. Then follow the dashed line horizontally to the vertical axis. Read the value of 39 lbf.in.

11. Supplemental Airplane Manuals

Supplemental Airplane Maintenance Manuals are used to provide maintenance procedures and installation instructions for additional equipment.

A. List of Supplemental AMMs

Doc. No.	Title	Rev.No.	Date	applicable	
				YES	NO
7.02.15-O03	O03 - Retrofit Installation of Austro Engine E4-B	0	01-Jun-2009	◻	◻

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CHAPTER 03

GENERAL DESCRIPTION OF THE AIRPLANE

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CHAPTER 03

GENERAL DESCRIPTION OF THE AIRPLANE

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CHAPTER 03
GENERAL DESCRIPTION OF THE AIRPLANE

1. Description

The DA 42 NG is a twin-engine, four seat, low wing mono-plane. It has a cantilever wing and a ‘T’ tail.

The airplane structure is fiber reinforced plastic composite. This gives a very strong but lightweight structure.

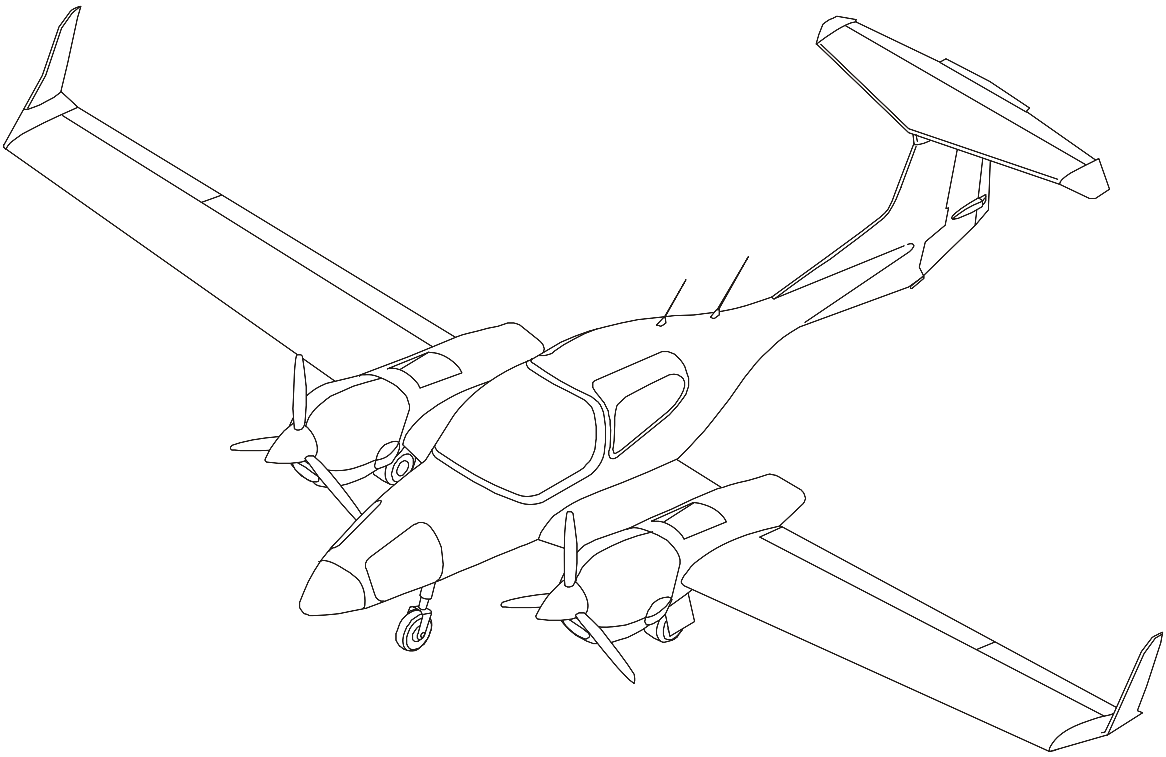

Figure 1: DA 42 NG Airplane

The semi-monocoque fuselage is a carbon-fiber reinforced-plastic (CFRP) shell with glass-fiber reinforced-plastic (GFRP) bulkheads and stiffeners. The fuselage is constructed in 2 halves that are bonded together after installation of the fuselage bulkheads and frames. Carbon fiber is used in many areas to give increased strength and rigidity. A roll-over protection bar forms part of the construction of the cockpit area. The vertical stabilizer is integral with the fuselage shells.

A wing center section is attached to the bottom of the fuselage center section. The wing center section has the 2 engine nacelles, the wing stubs and the fuselage center-section floor. The engine nacelles give the fixing points for the engines. The wing stubs have the attachment points for the outer wings. Two main spars ('spar bridges') transfer the loads from the wings to the fuselage. Four main bolts and 2 auxiliary bolts attach the wing spar stubs to the wing center section. The center section has the main landing gear bays and landing gear leg attachments.

The cantilever outer wing is a semi-monocoque structure. Each wing has two I-shaped spars with webs made from GFRP/rigid foam sandwich and caps made from carbon-fiber reinforced plastic (CFRP) tapes. Each wing has top and bottom shells made of carbon fiber reinforced plastic-sandwich construction which are bond to the spars. Carbon fiber reinforced plastic ribs and webs bond to the spars and shells to complete the structure. Electrically operated flaps and mechanical ailerons are attached to the trailing edge of the wings.

The horizontal stabilizer is a semi-monocoque structure. It has top and bottom shells made of GFRP and two main spars. The shells are bonded to the spars and ribs. The trailing edge has a conventional elevator with both mechanical and electrical trim systems.

The one-piece canopy has a large quantity of wrap-around glazing. This gives a good all-round view from the cockpit. A glazed rear passenger door on the left side of the airplane gives access to the rear seats. The passenger door lifts up to give good access and is supported in the open position by a gas strut.

A two-part acrylic lacquer finish protects the outside skin of the airplane from ultraviolet rays and humidity.

The tricycle landing gear is fully retractable and hydraulically operated. The main landing gear legs are attached to mounting points in the wing center-section. The main landing gear retracts into integral compartments in the wing center section. Landing gear doors seal the landing gear bays when the gear is retracted. The nose landing gear is steerable and is attached to the lower front of the fuselage. The nose landing gear bay is integral with the front fuselage and doors seal the bay when the gear is retracted.

The flight control system uses conventional ailerons, elevator and rudder. The DA 42 NG has 2 control sticks (1 on the LH side if OÄM 42-281 is installed. If OÄM 42-283 is installed, the RH control stick is removable by the pilot) and 2 rudder pedal assemblies to operate the primary flight controls. Push-pull rods operate the ailerons and the elevator. Cables operate the rudder. An electric motor operates the flaps via push-pull rods. The elevator has both an electric and a manual trim system. A handwheel and Bowden cable operate the elevator trim mechanically. The rudder has a mechanical trim system which uses a rotary drive and Bowden cable to operate a rudder trim tab.

Two Austro Engine E4-B liquid-cooled, in-line four-stroke four cylinder engines with double overhead camshaft (DOHC) with four valves per cylinder. The valves are actuated by the cam follower. The direct fuel injection is realized by means of a common rail technique and the engine is charged by a turbo charger in combination with an intercooler. The propeller is activated by an integrated gearbox with an integral torsional vibration damper. All engine components are controlled by an EECU system.

The airplane has aluminum fuel tank assemblies in each wing. Each fuel tank has 3 chambers which are mounted between the wing spars. The outer fuel chamber of each assembly has a fuel filler. Flexible hoses connect the fuel tanks to the fuel distribution system. Each tank can feed either engine via a fuel crossfeed system. Fuel level sensors are installed in the inner and outer fuel tank chambers. The fuel level sensors control the fuel indicating system in the cockpit. The total fuel capacity of the airplane is approximately 196 liter (51.8 US gal) in the main tanks. If the auxiliary tanks are installed the total fuel quantity is approximately 300.8 liter (79.4 US gal).

The airplane has two sources of electrical power. A 24 V battery supplies electrical power when the engines are not running. Engine generators provide electrical power when minimum one of the engines is running. Switches and circuit breakers control all electrical devices. A key switch controls the engine starting system.

The DA 42 NG has a full range of flight instruments contained in an integrated cockpit system (ICS). The ICS has 2 display screens. Both of them are able to show all the airplane flight instrumentation data, navigation data, engine data and other airplane system data. The ICS also displays all the airplane warnings, cautions and alerts. The ICS can also be configured to show ground and flight check lists.

2. Equipment Data

The table below gives you the names and address of the manufacturers who supply systems and/or equipment for the DA 42 NG. This will help you to get more data on a system and/or equipment.

"Yes" in the "Direct Shipping Approved" column means that the part can be ordered directly from the vendor. "No" means that the part must be obtained as a genuine Diamond Aircraft spare part. This is the case when a part needs to be configured for the DA 42 NG airplane.

In any case, the parts must have exactly the part numbers shown in the Equipment List in Chapter 6 of the Airplane Flight Manual, Doc. No. 7.01.15-E or Doc. No. 7.01.16-E, latest revision.

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
12	Anti-Corrosion Cleaning Agent: Ardrox AV 980 Anti-Corrosion Coating: Ardrox AV 30	Chemetall GmbH Trakehnerstrasse 3 D-60487 Frankfurt a. M. Germany Tel: +49 69 7165-0 Fax: +49 69 7165-3018 Website: www.chemetall.com	yes
	Anti-Corrosion Cleaning Agent: Diestone DLS Anti-Corrosion Coating: Socopac 65 H	Socomor Zl du Prat - RP 3707 F-56037 Vannes Cedex France Tel: +33 2 97 43 76 90 Fax: +33 2 97 43 76 86 Website: www.socomor.com	yes
22, 23, 31, 34	Integrated Cockpit System, Autopilot System:	Garmin International, Inc. 1200 East 151st Street Olathe, Kansas 66062 USA Tel: (913) 397-8200 Fax: (913) 397-8282 Website: www.garmin.com	yes

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
	Cooling Fans for Integrated Cockpit System:	SANDIA aerospace 3700 Osuna Road NE, Suite 711 Albuquerque, NM 87109 USA Tel: (505) 341-2930 Fax: (505) 341-2927 Website: www.sandiaaerospace.com	yes
24	Battery:	Concorde Battery Corp. 2009 San Bernardino Road West Covina, CA 91790 USA Tel: (626) 813-1234 Website: www.concordebattery.com	yes
25	Emergency Locator Transmitter (ELT):	Artex Aircraft Supplies 14405 Keil Road NE Aurora, Oregon 97002 USA Tel: (503) 678-7929 Fax: (503) 678-7930 Website: www.artex.net	yes
25	Safety Belts:	Schroth Safety Products GmbH P.O. Box 24 40 59714 Arnsberg Germany Tel: +49-2932-9742 Website: www.schroth.com	yes

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
25	AmSafe Seatbelt Airbag V23 System	AMSAFE, Inc. 1043 N. 47th Ave. Phoenix, AZ 85043 USA Tel: +1 602 850 2850 Fax: +1 602 850 2812 Website: www.amsafe.com	yes
26	Fire Extinguisher:	Total Feuerschutz GmbH Industriestr. 13 68526 Ladenburg Germany Tel: +49-6203-75-369 Fax: +49-6203-75-265 Website: www.total-feuerschutz.de	yes
Note: The airspeed indicator must have the markings specified in Chapter 2 of the Airplane Flight Manual, Doc. No. 7.01.15-E or Doc. No. 7.01.16-E, respective latest revision.			
31	Airspeed Indicator, Altimeter:	United Instruments Inc. 3625 Comotara Avenue Wichita, Kansas 67226 USA Tel: (316) 636-9203 Fax: (316) 636-9243 Website: www.unitedinstrumentsinc.com	yes
31	Attitude Gyro, Standby Attitude Module:	Mid-Continent Instrument and Avionics 9400 E. 34th Street North, Wichita, Kansas 67226 USA Tel: (316) 630-0101 Fax: (316) 630-0723 Website: www.mcico.com	yes

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
32	Main Wheels and Brakes:	Parker Hannifin Corporation Aircraft Wheel and Brake Division 1160 Center Road Avon, Cleveland, Ohio 44011 USA Tel: (440) 937 6211 Fax: (440) 937 6416 Website: www.parker.com	yes
33	Position / Anti-Collision Lights:	Whelen Aerospace Technologies. 51 Winthrop Road, Chester, CT 06412 USA Tel: (860) 526-9504 Fax: (860) 526-2009 Website: www.flyWAT.com	yes
33	Landing and Taxi Lights:	XeVision 4245 Airport Rd. Ogden, UT 84405 USA Tel: (801) 622-7000 Fax: (801) 622-7277 Website: www.xevision.com	yes
Note: The propeller must have the pitch settings specified in Chapter 61 of this manual.			
61	Propeller:	mt-Propeller Airport Straubing Wallmühle D-94348 Atting GERMANY Tel: +49-9429-9409-0 E-mail: sales@mt-propeller.com Website: www.mt-propeller.de	yes

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
72	Engine:	Austro Engine GmbH Rudolf Diesel-Straße 11 A-2700 Wiener Neustadt Austria Tel: +43-2622-23000 Fax: +43-2622-23000-2711 Website: www.austroengine.at	yes

3. Handling of Identification Data

No person shall remove, change, or place identification information on any airplane, engine, propeller, propeller blade, or propeller hub, without the approval of the competent national Airworthiness Authority.

If a deviation from the procedure above is necessary, any person performing maintenance work may in consultation with the competent national Airworthiness Authority:

– Remove, change, or place the identification plate on any airplane, engine, propeller, propeller blade, or propeller hub.

– Remove an identification plate, when necessary during maintenance operations.

– No person shall install an identification plate, removed in accordance with the procedures above, on any airplane, engine, propeller, propeller blade, or propeller hub other than the one from which it was removed.

CHAPTER 04

AIRWORTHINESS LIMITATIONS

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CHAPTER 04

AIRWORTHINESS LIMITATIONS

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CHAPTER 04
AIRWORTHINESS LIMITATIONS

THIS AIRWORTHINESS LIMITATIONS SECTION IS APPROVED BY EUROPEAN AVIATION SAFETY AGENCY (EASA) IN ACCORDANCE WITH THE APPLICABLE CERTIFICATION PROCEDURES AND THE TYPE CERTIFICATION BASIS. IT SPECIFIES THE AIRWORTHINESS LIMITATIONS REQUIRED BY JAR 23.

THIS AIRPLANE MAINTENANCE MANUAL CHAPTER 04 (AIRWORTHINESS LIMITATIONS) IS APPROVED WITH EASA APPROVAL NO. EASA.A.C.09012 AND 10042779.

THE AIRWORTHINESS LIMITATIONS SECTION IS FAA APPROVED AND SPECIFIES MAINTENANCE REQUIRED UNDER SECS. 43.16 AND 91.403 OF THE FEDERAL AVIATION REGULATIONS UNLESS AN ALTERNATIVE PROGRAM HAS BEEN FAA APPROVED.

SERVICE BULLETINS OR OTHER DOCUMENTS REVISING THIS SECTION WHICH CONTAIN A STATEMENT THAT THE DOCUMENT IS AUSTRO CONTROL GMBH (ACG) / EUROPEAN AVIATION SAFETY AGENCY (EASA) APPROVED ARE CONSIDERED FAA APPROVED.

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1. Airworthiness Limitations

This Chapter is approved and shows the mandatory limitations which were established as a result of the certification process.

The time limits given in Chapter 04 must be applied to ensure Continued Airworthiness of the DA 42 NG.

Note: Regular inspections of the airplane including replacement and overhaul of certain components are required to ensure Continued Airworthiness of the DA 42 NG.

For possible airworthiness limitations of engine, propeller, components and vendor equipment refer to the applicable Maintenance data as listed in Section 05-00.

A. Certification Maintenance Requirements

(1) Component and System Checks

The component and system checks under this Paragraph are also included in Section 05-10.

The following table lists airplane components and systems which require monitoring through scheduled maintenance.

Where an interval is given in both flight time and calendar years, the limit which is reached first must be applied.

ATA Ch.	Component	Maintenance Requirement	Interval	
			hrs.	yrs.
25	Electronics Module Assembly EMA (if OÄM 42-324 is installed)	Remove EMA and return to AmSafe for refurbishment.		7 years, calculated from the month of manufacture*
51	Bonding system and static discharging system.	Resistance measurements (refer to Section 51-80).	1000 ± 50	4 yrs. ± 60 days

*Storage or installation life.

(2) Life Time Limit / Structure Checks

There is no structural life limit.

Note: The DA 42 NG has been designed and tested under a 'damage tolerant structure' philosophy. Therefore the structural inspections given in Chapter 05 cover all required structure checks.

B. Replacement Requirements

The following table lists life limited airplane components which must be replaced at a specific time.

Where an interval is given in both flight time and calendar years, the limit which is reached first must be applied.

Note: The replacement requirements under this Paragraph are also included in Section 05-10.

ATA Ch.	Component	Replacement Time	
		hrs.	yrs.
24	Emergency battery package.		2 years ± 30 days, or upon reaching the date marked on the package, or after use, whichever comes first.
24	ECU backup batteries LH/RH.		1 yr. ± 30 days
25	Installation screws for forward inflators (if OÄM 42-324 is installed).	1000 hrs	
25	Electronics Module Assembly (if OÄM 42-324 is installed).		14 years, calculated from the month of manufacture*

ATA Ch.	Component	Replacement Time	
		hrs.	yrs.
25	Inflator Assembly (if OÄM 42-324 is installed).**		10 years, calculated from the month of manufacture* (as indicated in the expiration date stamp on the gas cylinder)

* Replacement times are shown as service life, defined as total sum of storage life and installation life.
** Return Inflator Assembly to AmSafe for disposal.

C. Paint

(1) For S/N below 42.N300/42.MN100:

It is mandatory to paint the DA 42 NG white with a solar absorptivity not exceeding 0.3. This will prevent the temperature of the structure from becoming too high. Examples of approved shades are:

– RAL 9016.

– Mercedes DB 147.

– BMW 218.

– Volvo XG28.

– Volvo BC76.

– Saab 5AC6.

– Alfa Romeo 230.

It is mandatory to paint the DA 42 M-NG white, if OÄM 42-232 is installed light grey (RAL 7035 mat) is also approved.

Before painting the airplane in a different shade than listed above, the manufacturer must be contacted. Special paint schemes can be defined in an approved supplement to this AMM.

Only certain areas which are defined in Chapter 51 of this manual (for example, registration markings, placards and warning markings, trim or striping) may have a different color.

(2) For S/N 42.N300/42.MN100 and above:

It is mandatory to paint the DA 42 NG and DA 42 M-NG in accordance with the color paint scheme provided in Section 51-20.

Before painting the airplane in a different shade than defined in Section 51-20 of this Manual, the manufacturer must be contacted.

D. Repairs

Repairs which are not described in Chapter 51 of this manual may only be carried out in accordance with a repair scheme which must be approved in accordance with the procedures established by the competent certifying authority.

E. Replacement of Composite Parts

Composite parts made from resin system L285 with part numbers designated only for serial numbers below 42.N300/42.MN100 must not be installed on serial numbers 42.N300/42.MN100 and above without further approval.

CHAPTER 05

TIME LIMITS AND MAINTENANCE CHECKS

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TIME LIMITS AND MAINTENANCE CHECKS

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CHAPTER 05
TIME LIMITS AND MAINTENANCE CHECKS

1. General

This Chapter will help you to do the maintenance of the DA 42 NG correctly. Refer to Chapter 04-00 and 05-00 to help you when you do maintenance and inspections.

The times given in this Chapter are times recommended by the airplane manufacturer. Do the scheduled maintenance at the given times, because they are the minimum required to keep the airplane in a good technical condition.

These checks do not over-ride the requirements of the Airworthiness Authority of the country where the airplane is registered. You must make sure that all Airworthiness Directives, Service Bulletins and any other requirements of the Airworthiness Authority of the country where the airplane is registered are completed as required.

The airplane manufacturer can change the time between checks. If this happens, the airplane manufacturer will publish the change as a revision to the Airplane Maintenance Manual.

Time limits and maintenance checks were established for operation in a moderate climate and on paved runways. For operation under rough conditions (extreme temperatures, saline air, wind-borne sand, operation on grass runways, etc.) it may be necessary to make changes to the maintenance requirements given in this Chapter. You can decrease the time between scheduled maintenance checks if the airplane's operation makes it necessary. You must not extend the time between scheduled maintenance checks without the approval of the Airworthiness Authority of the country where the airplane is registered.

2. Chapter Configuration

A. Section 05-10

Section 05-10 contains the recommended time limits for maintenance checks. It also contains the recommended time between overhaul for components. Use the data in Section 05-10 to find when to do the maintenance.

B. Section 05-20

Section 05-20 contains information about the maintenance checklist organization.

C. Section 05-21

Section 05-21 contains information about the Flight Line Checks.

D. Section 05-25

Section 05-25 contains the Drain Holes Inspection Checklist.

E. Section 05-28

Section 05-28 contains the Maintenance Checklist for the DA 42 NG airplane. The Section is subdivided into engine and airframe Sections and provides checklists for the engines, the propellers, the airframe and the corresponding reports.

(1) Section 05-28-00

DA 42 NG Maintenance Checklist for the engines: Maintenance checks schedule for 100, 200, 1000, and 2000 hour checks on the engine and propeller.

(2) Section 05-28-50

DA 42 NG Maintenance Checklist for the airframe: Maintenance checks schedule for 100, 200, 1000, and 2000 hour checks on the airframe.

(3) Section 05-28-90

DA 42 NG Maintenance Report.

(4) Section 05-28-91

DA 42 NG Engine Ground Test Reports.

(5) Section 05-28-92

DA 42 NG Check Flight Report.

(6) Section 05-28-93

Major Structural Inspection (MSI) Check Findings Report.

F. Section 05-50

Section 05-50 contains the unscheduled maintenance checks. Do these checks after hard landings, propeller damage, engine fire and lightning strike.

G. Referenced Maintenance Data

Use latest revision of referenced maintenance data.

Supplier	Document Name	Document No.
Aerox	Component Maintenance Manual with Illustrated Parts List, Part Numbers 4110-120 Series	35-00-01
AMSAFE	Supplemental Instructions for Continued Airworthiness AmSafe Seatbelt Airbag V23 System for Diamond Aircraft, Models DA 40, DA 40 NG, DA 40 F, DA 42, DA 42 NG, and DA 42 M-NG Inflatable Restraint System Assy. Series No. 7053 and 7057.	E509605
Artex	Installation and Maintenance Manual for the ME406 ELT	570-1600
Austro Engine	Austro Engine Operation Manual AE300	E4.01.01
Austro Engine	Austro Engine Maintenance Manual AE300	E4.08.04
Cleveland/Parker	Cleveland/Parker Maintenance Manual	AWBCMM0001-8
Cleveland/Parker	Cleveland/Parker Product Catalog	AWBPC0001-8
Cleveland/Parker	Cleveland/Parker Technician's Service Guide	AWBTSG0001-6
Concorde	RG® Series Main Aircraft Batteries Component Maintenance Manual	5-0171
Garmin	Garmin G1000 System Maintenance Manual	190-00907-00
Garmin	G1000 NXi Integrated Avionics System, Line Maintenance Manual	190-02631-00
Goodyear	Aircraft Tire Care & Maintenance	700-862-931-538 (012096) 10/04
Hartzell	Aircraft Alternator Owner's Manual	ES 1031
Honeywell	Honeywell Flightline Maintenance Manual Bendix/King KAP 140 Flight Control System	006-15574-0002
L-3	Stormscope WX-500 Installation Manual	009-11500-001
Kannad	Installation and Operation Manual for 406 AF-Compact	DOC08038
Kannad	Operation Manual for AF Integra	DOC09078
Kannad	Initial Installation Manual for AF-Integra	DOC09081E
Mid Continent	Installation Manual and Operating Instructions Model MD302 Series SAM	9017782
mt-Propeller	mt-Propeller Operation and Installation Manual	E-124, ATA 61-01-24

mt-Propeller	mt-Propeller Operation and Installation Manual for the Hydraulic Constant Speed Governor	E-1048, ATA 61-20-48

3. Definitions

In this Airplane Maintenance Manual, the words that follow have special meanings:

Adjust. To put to a specified position or condition. For example, adjust the clearance to 1 mm.

Check. A technical name for a group of maintenance tasks. For example, the 100 hour check.

Examine. To look carefully at an item. It includes steps such as these:

- Make sure that the item:

  Is complete.
  Is correctly attached.
  Has no loose parts.
  Shows no signs of leaks.
  Is not cracked or damaged.
  Is not worn.

- Make sure that:

  The surface protection is not damaged.
  All locking devices are installed correctly.

- Make sure that items such as pipes and cables:

  Look serviceable.
  Do not rub against other items.

- For log books and other technical records:

  To find outstanding faults.
  To make sure they are up-to-date and correctly maintained.

Inspection. The procedure which compares an object with its standard or specification.

Measure. To find out the dimensions, capacity or quantity of something.

Monitor. To look at something over a period of time. For example, monitor the engine speed indicator.

Record.	(1) Technical name for something that shows what was done. For example, write the result of the test in the engine record.
	(2) The act of making a record. For example, record the result of the test in the Airplane Maintenance Log.
Replace.	To remove an item and install a serviceable item in the same location.
Set.	To put equipment into a given adjustment, condition or mode. For example, set the altimeter scale to 1013 mbar (= 1013 hPa).
Task.	An assigned work or a procedure. For example, each step of the task has an identification letter.
Test.	That which you do when you operate or examine an item to make sure that it agrees with the applicable specifications. For example, disconnect the systems which are not necessary for the test. Or do an engine test.

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Section 05-10
Time Limits

1. General

All scheduled maintenance checks have time limits. You must do the scheduled maintenance within the time limits.

The flight time recorded in the airplane log book is the time that is relevant for the time limits.

Some components installed in the airplane have a fixed time between overhaul (TBO). Refer to Paragraph 4.

2. Regulatory Authorities

The recommended time limits given in this Chapter were created to meet the requirements of the certification process.

Note: National Regulatory Authorities can have different requirements. You must make sure that you meet the requirements of the Regulatory Authority of the country where the airplane is registered.

3. Scheduled Maintenance Time Limits

(Refer to Sections 05-20 through 05-28).

The following recommended hourly and calendar time limits apply to the scheduled maintenance checks which are necessary to maintain the airplane in a good technical condition. Do the scheduled maintenance at the intervals and within the tolerances shown below.

A. Recurring Maintenance Inspections

Note: Where an interval is given in both flight hours and calendar years, the limit which is reached first must be applied. The next interval starts with the Flying Hours **and** Calender Time of the latest performed Scheduled Maintenance Check.

Note: National requirements may require different maintenance schedules. For example, on airplanes registered in the USA a 100 hour inspection must be carried out annually.

Scheduled Maintenance Check	Interval	
	Flight Hours	**Calendar Time**
100 Hour Check.	100 ± 10	
200 Hour Check.	200 ± 10	12 months ± 30 days
1000 Hour Check.	1000 ± 50	
2000 Hour Check.	2000 ± 50	
First Major Structural Inspection (MSI).	6000 ± 50	12 years ± 6 months
Subsequent Major Structural Inspections.	4000 ± 50	12 years ± 6 months

The intervals between the inspections must be adhered to within the tolerances shown. These tolerances must not be added up. For example: if the 100 hour inspection was done at 110 hours, the next inspection must be done at 200 ±10 hours, not 210 ±10 hours.

If an inspection is carried out earlier than allowed by the specified tolerance, all subsequent inspection intervals are counted from that inspection. For example: If the 100 hour inspection was done at 83 hours, the next inspection must be done at 183 ±10 hours.

Some inspection items must be done at other intervals than the standard intervals listed in the table above. In these cases, the maintenance interval (for example, 800 hrs.) is shown as a number in the maintenance checklists. Refer to Section 05-20, Paragraph 2.

B. Complete Aircraft Inspection

The Complete Aircraft Inspection consists of a 200 Hour Check.

C. Scope of Maintenance Inspections

For maintenance of airplanes registered in the USA, do the items marked X and the items marked X* in the Maintenance Checklist.

For maintenance of airplanes registered in other countries, do only the items marked X in the Maintenance Checklist.

4. Component Time Limits

Note: Those component time limits which are Airworthiness Limitations are also listed in Chapter 04.

A. Maintenance Requirements

The following table lists airplane components and systems which require overhaul or specific checks.

Where an interval is given in both flight time and calendar time, the limit which is reached first must be applied.

For possible maintenance requirements of engine, propeller, components and vendor equipment refer to the applicable Maintenance data as listed in Section 05-00.

ATA Ch.	Component	Maintenance Requirement	Interval	
			hrs.	calendar time
Note: The mechanical check of the autopilot system is mandatory.				
22	Autopilot.	Mechanical check.	-	1 yr ± 30 days
22	Autopilot. (if OÄM 42-210 (GSM 86 servo mounts) is installed).	Clutch torque check.	-	5 yrs ± 60 days
24	Main battery Concorde.	Capacity test. Refer to Concorde RG® Series Main Aircraft Batteries Component Maintenance Manual, latest revision.	1000 ± 100	1 yr ± 30 days
25	ELT systen.	Self-test, operational test of the controls and crash sensor and signal transmission test according manufacturers recommondation		1 yr ± 30 days

ATA Ch.	Component	Maintenance Requirement	Interval	
			hrs.	calendar time
25	Safety harnesses equipped with AmSafe Seatbelt Airbag System (if OÄM 42-324 is installed). If OÄM 42-334 is installed, only the pilot's seats are equipped with the AmSafe Seatbelt Airbag System.	Functional test with V23 System diagnostic tool. Refer to Amsafe Maintenance Documentation.	1000 ± 50	1 yrs ± 30 days
26	Fire extinguisher.	Overhaul by fire extinguisher manufacturer (see Chapter 03).	-	10 yrs ± 90 days
29	Hydraulic reservoir air filter.	Check.	1000 ± 50	-
30	De-icing fluid strainer, if installed.	Clean.	-	1 yr ± 15 days
34	Pitot-static system.	Leakage test (refer to Section 34-10).	1000 ± 50	2 yrs ± 30 days
34	Airspeed indicators (G1000 and backup).	Ensure correct indication.	-	4 yrs ± 60 days
			-	2 yrs ± 30 days*
34	Vertical speed indicator (G1000).	Ensure correct indication.	-	4 yrs ± 60 days
			-	2 yrs ± 30 days*
* Only required for airplanes for which 14 CFR § 91.411 and 14 CFR § 91.411 Part 43 Appendix E are applicable.				
34	Altimeters (G1000 and backup).	Ensure correct indication.	-	2yrs ± 30 days
34	Magnetic compass.	Compensate.	-	1 yr ± 30 days
34	Transponder (G1000) and blind altitude encoder (altitude digitizer).	System check (refer to G1000 System Maintenance Manual 190-00907-00, latest revision).	1000 ± 50	2 yrs ± 30 days

ATA Ch.	Component	Maintenance Requirement	Interval	
			hrs.	calendar time
34	Transponder (G1000 NXi) and blind altitude encoder (altitude digitizer).	System check (refer to G1000 NXi Line Maintenance Manual 190-02631-00, latest revision).	1000 ± 50	2 yrs ± 30 days
35	Oxygen regulator valve (if installed).	Overhaul.	-	5 yrs ± 60 days
35	Oxygen cylinder (if installed). Manufacture / test dates before 01-Jul-2006: 01-Jul-2006, or later:	Hydro test per DOT.	-	3 yrs ± 30 days 5 yrs ± 60 days (if not otherwise governed by the local authority)
51	Bonding system and static discharging system.	Resistance measurements (refer to Section 51-80).	1000 ± 50	4 yrs ± 60 days

B. Airplane Life-Limited Components

The following table lists life limited airplane components which must be replaced at a specific time.

Where an interval is given in both flight time and calendar time, the limit which is reached first must be applied.

For possible life-limits of engine, propeller, components and vendor equipment refer to the applicable Maintenance data as listed in Section 05-00.

ATA Ch.	Component	Replacement Time	
		hrs.	calendar time
24	Emergency battery package.	2 years, or upon reaching the date marked on the package, or after use, whichever comes first.	
24	ECU backup batteries.	-	1 yr ± 30 days
24	V-belt of additional alternator (if installed).	2000 ± 50	
25	Safety harnesses, front and rear (if OÄM 42-324 is NOT installed). Safety harnesses rear (if OÄM 42-324 AND OÄM 42-334 is NOT installed). Note: If OÄM 42-324 is installed, refer to the AmSafe Maintenance Documentation for on condition inspection requirements.	-	12 yrs ± 90 days
25	First aid kit. Replace aseptic items.	Upon reaching the date marked on the kit.	
27	Rudder cables, non-stainless steel, 3.2 mm (1/8 in) diameter.	3000 ± 50	5 yrs ± 60 days
27	Rudder cables, stainless steel, 3.2 mm (1/8 in) diameter.	On condition.	
Note: If material of rudder cables is unknown, assume non-stainless steel.			
28	Electrical fuel pumps LH (2 pcs.) If MÄM 42-480 is carried out: including check valves (1 pc per pump).	2400 hours, or after a failure of one fuel pump.	
28	Electrical fuel pumps RH (2 pcs.) If MÄM 42-480 is carried out: including check valves (1 pc per pump).	2400 hours, or after a failure of one fuel pump.	
28	Fuel tank vent hoses.	-	8 yrs ± 60 days

ATA Ch.	Component	Replacement Time	
		hrs.	calendar time
28	Fuel hoses interconnecting the individual fuel tank chambers.	-	8 yrs ± 60 days
28	Fuel filter elements.	100 ± 10	1 yr ± 30 days
28	If MÄM 42-471 is carried out: Fuel pressure pulsation damper.	Co-incident with engine TBO.	-
28	If MÄM 42-480 is carried out: Check valves of the electrical fuel pumps (LH/RH, total 4 pcs.).	2400 ± 50	-
28	If MÄM 42-600 is installed: Fuel bypass valve.	Co-incident with engine TBO.	-
29	Metal/paper filter element of high pressure filter between the pressure pipe of the hydraulic pump and the hydraulic control unit.	1000 ± 50	
30	If the ice protection system is installed: Filter cartridges on the LH side.	2000 ± 50	-
32	Brake fluid.	-	3 yrs ± 60 days
32	Hydraulic fluid in landing gear dampers.	-	2 yrs ± 30 days
32	Hydraulic fluid in hydraulic system.	-	2 yrs ± 30 days
35	Oxygen cylinder (if installed).	-	15 yrs ± 90 days
35	Oxygen masks (if installed).	-	3 yrs ± 30 days
35	Oxysaver cannulas (if installed).	200 of cumulative use.	-
52	Canopy door handle compression gas spring (If MÄM 42-097 is installed, refer to Section 52-10).	3000 ± 50	6 yrs ± 60 days
71	Engine shock mounts (including bolts, washers and lock nuts).	Co-incident with engine TBO.	-
71	Air filter.	200 ± 10	-
71	Air intake hoses.	-	8 yrs ± 60 days
81	All charge air hoses from turbo charger to engine air intake manifold.	Co-incident with engine TBO.	-
75	Coolant hoses.	-	8 yrs ± 60 days

ATA Ch.	Component	Replacement Time	
		hrs.	calendar time
75	Coolant silicate pouch.	Co-incident with engine TBO.	6 yrs. ± 60 days

5. Component Time Tracking

To make sure that components overhaul/replacement is done at the correct time you must record the data that follows in the Airplane Maintenance Log for each component requiring overhaul/replacement:

- Serial Number.
- Flight hours and date at installation.
- Flight hours and date at removal.

Section 05-20
Scheduled Maintenance Checks

1. General

Do the scheduled maintenance checks in this Section at the intervals (flight hours and calendar time) stated in Section 05-10, Paragraph 3.

Note: Only persons or maintenance organizations authorized by national Regulatory Authorities of the country where the airplane is registered may do these checks. The inspection level for each item is a general visual inspection unless differently specified.

Note: Only AE authorized maintenance organizations may carry out maintenance and inspection work on the AE engine. Any engine malfunction must be reported to AE.

2. Maintenance Checklist Organization

Do the scheduled maintenance checks with reference to the Maintenance Checklist in this Section. Before starting a check, complete the requirements of Paragraphs 2 and 3 of the checklist. Do all the applicable tasks on the checklist.

Note: For maintenance of airplanes do the items marked X in the Maintenance Checklist.

Note: The interval columns "100", "200", "1000", and "2000" are used for maintenance items which must be done at intervals of 100, 200, 1000, or 2000 flight hours.

Note: The interval column "time" is used for
(a) Maintenance items which must be done at certain calendar time intervals. These items are marked with the explicit time interval.
(b) Maintenance items which must be done during a Major Structural Inspection (MSI). These items are marked with the term "MSI".

Note: Where an interval is given in both flight time and calendar years, the limit which is reached first must be applied.

Note: Some inspection items must be done at other intervals than the standard intervals (100, 200, 1000, or 2000 hrs.). In these cases, the maintenance interval is shown in the column for the next shorter interval instead of an X. For example, an item which must be done every 800 hours is identified by the words "800 hrs." in the 200 hrs. column.

All of the applicable items must be signed by authorized maintenance personnel. Record the completion of the check in the airplane log book. Complete a copy of the Maintenance Report (refer to Section 05-28-90).

The Maintenance Checklist is divided into the following Sections:

A. Section 05-28-00: Engine Compartments

All items forward of the firewalls. It includes the cowlings and the propellers.

B. Section 05-28-50 - Airframe

(1) Exterior of the Fuselage

All items on the outside of the fuselage from the nose to the leading edge of the vertical tail. It includes the nose baggage compartment, the nose landing gear, and the main landing gear.

(2) Cabin

All items inside the fuselage shell from the aft face of the instrument panel frame to the forward face of the baggage compartment frame. It also includes the internal parts of the flight control system, the internal pars of the brake system, and the canopy and rear door.

(3) Interior of the Rear Fuselage

All items inside the fuselage shell from the aft face of the baggage compartment frame to the vertical tail. It includes the control systems and the hydraulic systems in the rear fuselage.

(4) Center Wing

All items between the LH and RH wing root. It includes the engine nacelles aft of the firewalls.

(5) Tail

All items aft of the leading edge of the vertical tail. It includes the vertical stabilizer and the horizontal stabilizer.

(6) Wings

All items on the left and right wings. It includes the ailerons, flaps, Pitot-static probe, and fuel tanks.

(7) General

Those items which include more than one zone at the same time. It includes items such as control checks which need one person in the cockpit and another person at the control surface.

3. Major Structural Inspection

The Major Structural Inspection (MSI) is an important part of the infinite lifetime concept of the DA 42 NG. It is required to prove the structural integrity of the airframe. It must be carried out at the intervals shown in Section 05-10.

Since the MSI is intended to coincide with a 2000 hour inspection, the inspection items are included in the maintenance checklist, and are identified by the term “MSI” in the ‘time’ column.

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Section 05-21
Flight-Line Checks

1. General

These checks include the pre-flight and post-flight checks. Do these checks each day the airplane is used.

2. Flight-Line Checks

The Pre-Flight Check must be done before the first flight of the day. It shows the pilot the general condition of the airplane and the engine. It is important for flight safety. Look in the airplane log-book for problems before doing the pre-flight check.

WARNING: DO ALL THE STEPS OF THE PRE-FLIGHT CHECK CAREFULLY. ACCIDENTS CAN OCCUR IF THE PRE-FLIGHT CHECK IS NOT DONE CORRECTLY.

The schedule for the pilot's pre-flight check is furnished in the Airplane Flight Manual for the DA 42 NG.

3. Post-Flight Check

Do the post-flight check after the last flight of the day. The post-flight check includes all the steps of the pre-flight check.

You must also:

Refuel the airplane (Section 12-10).

Record in the log book each problem found in flight and during the post-flight check.

Park the airplane (Sections 10-00 and 10-10).

If necessary, moor the airplane (Section 10-20).

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Section 05-25
Drain Holes Inspection Checklist and Report

1. General

Do a check of the drain holes. The drain holes must not be blocked by dirt or other residues. Make sure to remove all foreign objects and clean the drain holes to their full diameter. Otherwise the drain capacity may not be sufficient under certain conditions like heavy rain etc.

All drain holes should be drilled with a diameter of 5 mm (+2 mm/-0 mm) or 0.2 in (+0.08 in/-0.00 in). The holes should be circular, deburred, not frayed and cleaned.

At drain holes marked with an asterisk (*) the adhesive bonding is recessed.

Refer to the corresponding indication on the figures to identify the locations of the drain holes listed below.

2. Drain Holes Inspection Checklist

Drain Holes Inspection Checklist			
Ref.	**Drain Hole Location**	**Hours**	**Initials**
1	**FUSELAGE**		
1.01	Lower shell, in front of radar frame (if neither OÄM 42-119 nor OÄM 42-273 is installed).	100	
1.02	Lower shell, behind the radar frame, on the left and right side of EPU.	100	
1.03	Lower shell, behind nose gear frame, on the left and right side of nose gear.	100	
1.04	Lower shell under the center console.	100	
1.05	In the floor panel rear side, LH and RH.	100	
1.06	Lower fuselage shell, aft of baggage compartment frame base.	100	
1.07	On lowest point of the fin.	100	
1.08	On the back side of the fin.	100	
1.09	Bolt in rudder mounting shell (on top of the rudder).	100	
1.10	On lowest point of the cowling (LH and RH).	100	
1.11	On lowest point of the engine nacelle two holes in the LH and RH nacelle.	100	
1.12	On lowest point of the engine nacelle aft of the front box spar (LH and RH).	100	
1.13	Lower center wing shell, next to landing light.	100	
1.14	Lower center wing shell, in front of front box - spar (LH and RH).	100	
1.15	Lower center wing shell, in front of front box - spar center.	100	
1.16	Lower center wing shell, aft of the front box - spar four holes in line.	100	
1.17	Lower center wing shell, in front of rear box - spar three holes in line.	100	

Drain Holes Inspection Checklist			
Ref.	**Drain Hole Location**	**Hours**	**Initials**
1.18	Flange top at main landing gear in front of rear box - spar (LH and RH).	100	
1.19	Lower center wing shell aft rear spar center position.	100	
1.20	Lower center wing shell, fuselage rib reinforcement section LH and RH and one in center position.	100	
1.21	Lower center wing shell, in front of baggage compartment frame base.	100	
1.22	Lower center wing shell, rear bonding flange.	100	
1.23	Engine nacelle rear; LH of fuel cooler cover.	100	
1.24	Engine nacelle rear; RH of fuel cooler cover.	100	
1.25	Through lower (if OÄM 42-119 or OÄM 42-273 is installed) and upper end of radar frame.	200	
1.26	In front of nose baggage compartment floor (LH and RH).	200	
1.27	In rear of nose baggage compartment (LH).	200	
1.28	Through baggage compartment frame, center position above lower fuselage shell.	200	
1.29	Through lower end of ring frame 1.	200	
1.30	Through lower end of ring frame 2.	200	
1.31	Through lower end of ring frame 3.	200	
1.32	In rib of vertical stabilizer, in front of vertical stabilizer front web.	200	
1.33	In rib of vertical stabilizer, in front of vertical stabilizer rear web.	200	
1.34	Lower fuselage shell, aft of vertical stabilizer rear web.	200	
1.35	Lower fuselage shell, aft of vertical stabilizer front web.	200	
1.36	In the front box spar, to the engine nacelle fuel compartment, (LH and RH).	200	
1.37	In the rear box spar, to the engine nacelle maintenance cap 2 (LH and RH).	200	

Drain Holes Inspection Checklist			
Ref.	**Drain Hole Location**	**Hours**	**Initials**
1.38	Through roll over bar duct and baggage compartment frame.	200	
1.39	In rear of nose baggage compartment RH.	2000	
2	**CANOPY AND DOOR**		
2.01	Lower canopy frame, in front of Bowden cable guide (LH and RH).	100	
2.02	Lower canopy frame, aft of the canopy locking mechanism (LH and RH).	100	
2.03	Inner door shell, below the front locking bolt.	100	
3	**HORIZONTAL STABILIZER**		
3.01	Lower shell, next to the mid inspection hole (LH and RH).	100	
3.02	Lower shell, next to the front inspection hole (LH and RH).	100	
3.03	On the lowest point of the horizontal stabilizer tips (LH and RH).	100	
3.04	Elevator end rib, next to the rear spar, next to lower shell (LH and RH).	200	
3.05	LH and RH rib, in front of the rear spar, above the lower shell.	200	
3.06	LH and RH rib, aft of the front spar, above the lower shell.	200	
3.07	LH and RH rib, in front of the front spar, above the lower shell.	200	
3.08	Mid LH and RH rib, behind the rear spar, above the lower shell.	2000	
3.09	Mid LH and RH rib, behind the front spar, above the lower shell.	2000	
4	**ELEVATOR**		
4.01	Lower shell, leading edge section (LH and RH).	100	
4.02	Lower shell, in front of trailing edge (LH and RH).	100	

Drain Holes Inspection Checklist			
Ref.	**Drain Hole Location**	**Hours**	**Initials**
5	**ELEVATOR TRIM TAB**		
5.01	Lower shell, leading edge section (LH and RH).	100	
5.02	Lower shell, in front of trailing edge bonding (LH and RH).	100	
6	**RUDDER**		
6.01	Lower edge of the rudder shell.	100	
6.02	Lower edge of the trim rudder shell.	100	
7	**WINGS**		
7.01	In outer wing end rib at aileron mass balance cut out.	100	
7.02	Wing tip in front of rear bonding (LH and RH wing).	100	
7.03	First fuel tank rib, next to front and rear spar bonding and lower shell (LH and RH wing)*.	200	
7.04	In flap rib rear spar next to lower shell (LH and RH wing).	200	
7.05	In rear root rib next to rear spar and lower shell (LH and RH wing)*.	200	
7.06	In aileron rib next to rear spar and lower shell (LH and RH wing)*.	200	
7.07	Second fuel tank rib, next to front and rear spar and lower shell (LH and RH wing)*.	200	
7.08	Third fuel tank rib, next to front and rear spar and lower shell (LH and RH wing)*.	200	
7.09	Fourth fuel tank rib, next to front and rear spar and lower shell (LH and RH wing)*.	200	
7.10	Fifth fuel tank rib, next to front and rear spar bonding and lower shell (LH and RH wing).	200	
7.11	In front root rib, next to front spar and lower shell (LH and RH wing).	2000	
7.12	Vent hole on face side of wing spar (LH and RH).	2000	

Drain Holes Inspection Checklist			
Ref.	**Drain Hole Location**	**Hours**	**Initials**
8	**FLAPS**		
8.01	Root rib, next to trailing edge bonding (LH and RH).	100	
8.02	Inner flap root rib, next to trailing edge bonding (LH and RH).	100	
8.03	Inner flap root rib, at the leading edge (LH and RH).	100	
9	**AILERONS**		
9.01	Inner root rib, next to the trailing edge bonding (LH and RH).	100	
9.02	Lower shell, aft of mass balance weight (LH and RH).	100	
9.03	Lower shell, in front of mass balance hinge line (LH and RH).	100	
9.04	Outer root rib, at the leading edge (LH and RH).	100	

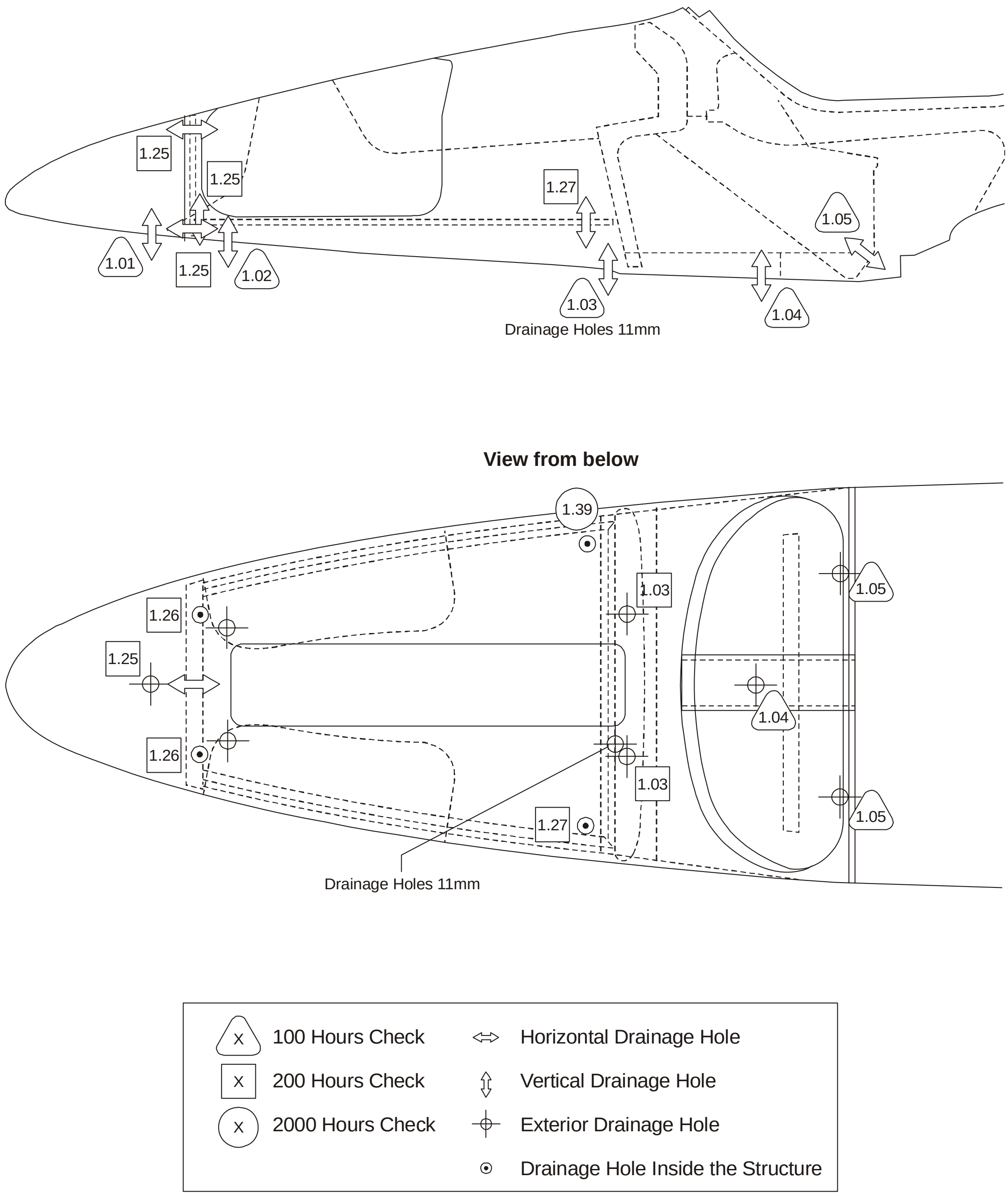


Figure 1: Drain Holes Fuselage (Part 1)

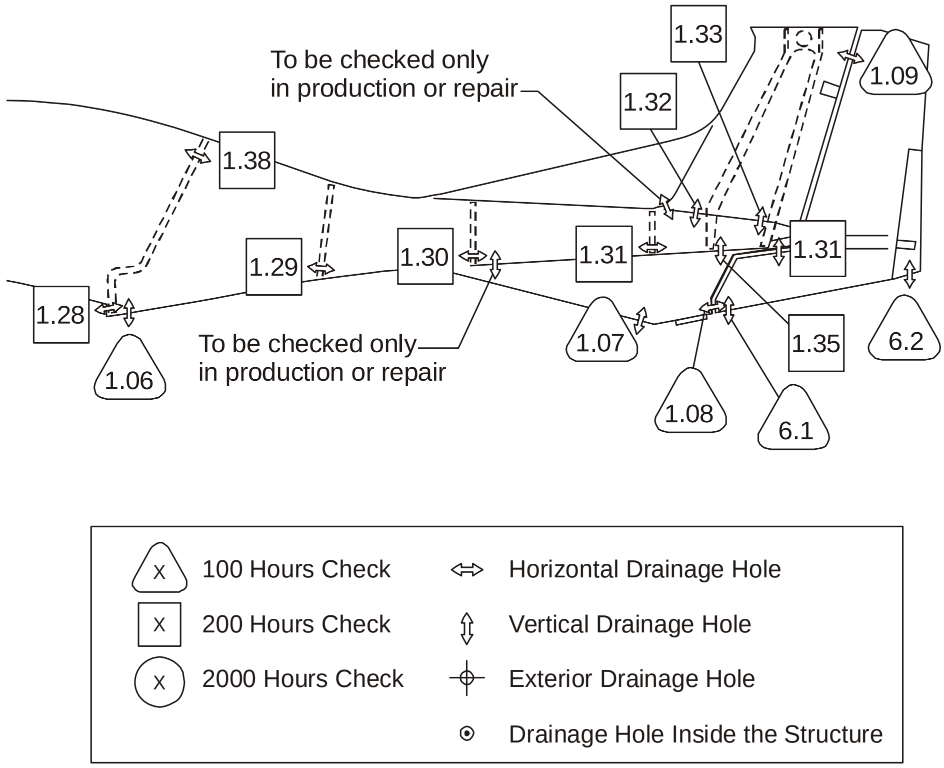


Figure 2: Drain Holes Fuselage (Part 2)

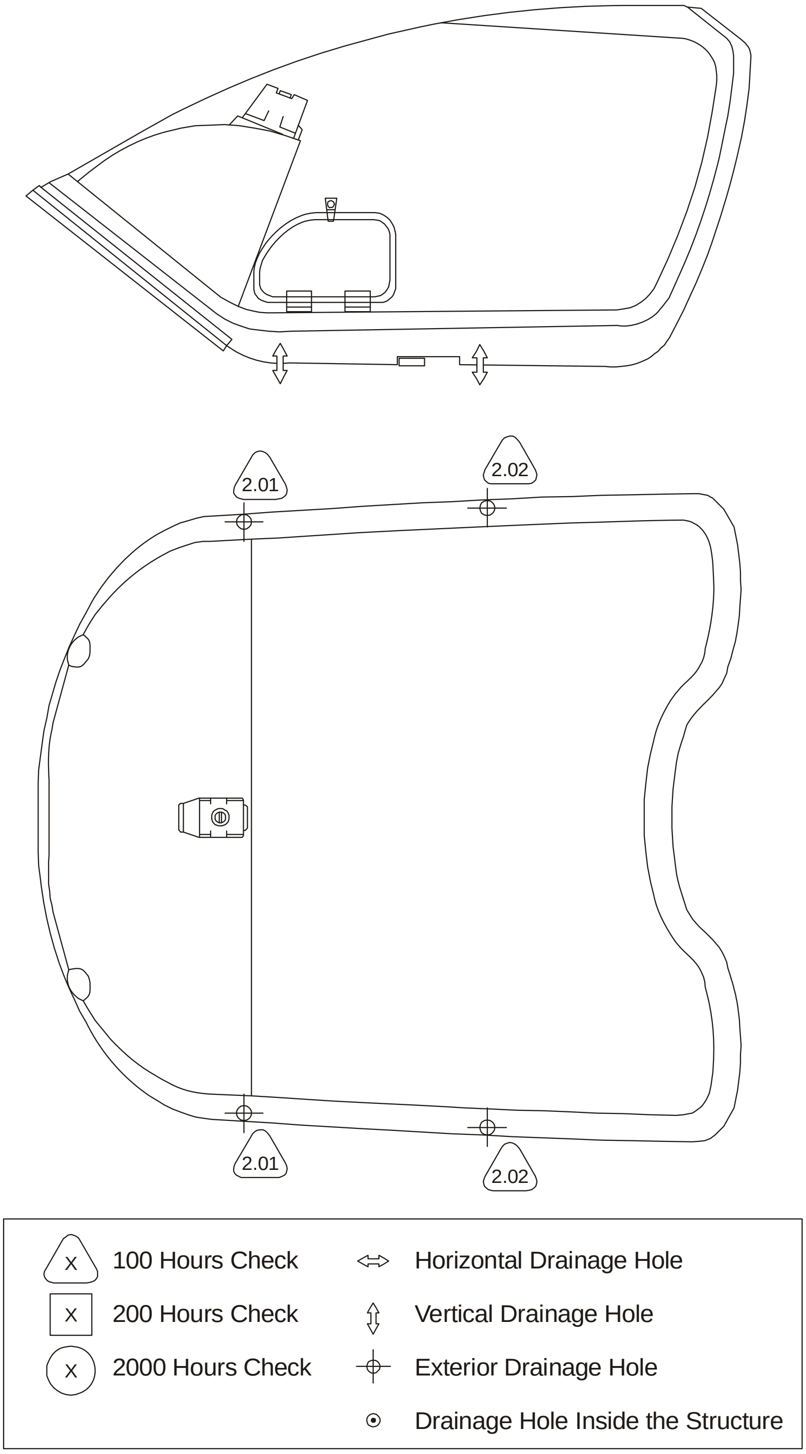


Figure 3: Drain Holes Canopy

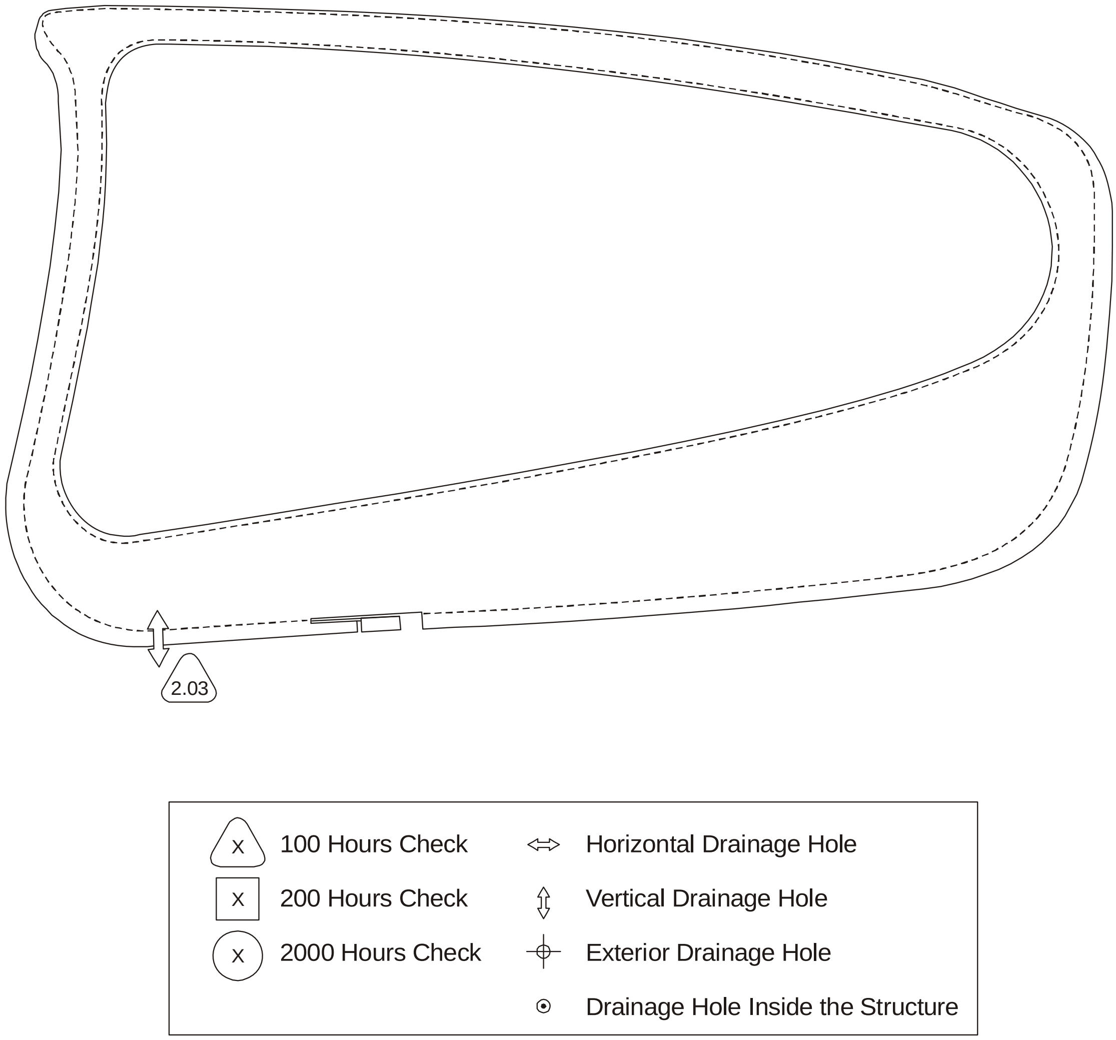


Figure 4: Drain Holes Door

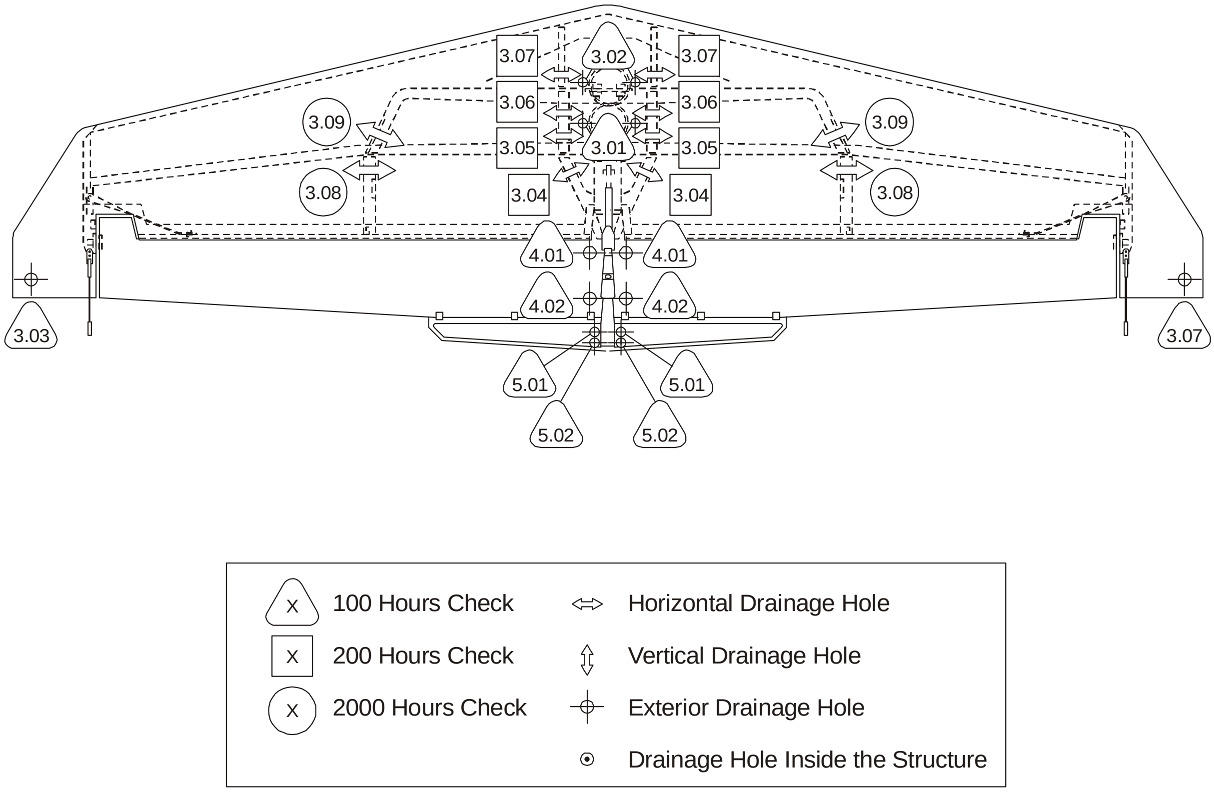


Figure 5: Drain Holes Horizontal Stabilizer, Elevator and Elevator Trim Tab

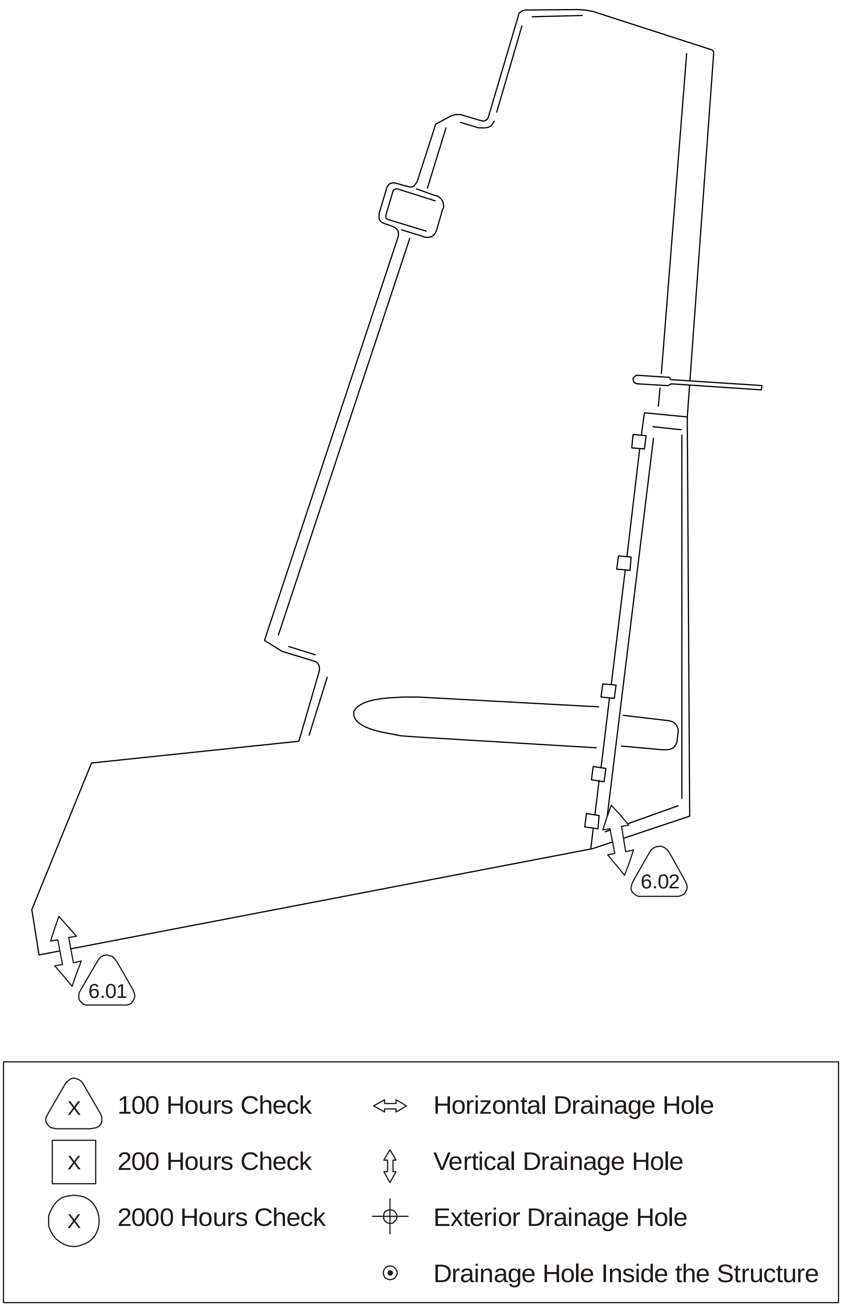
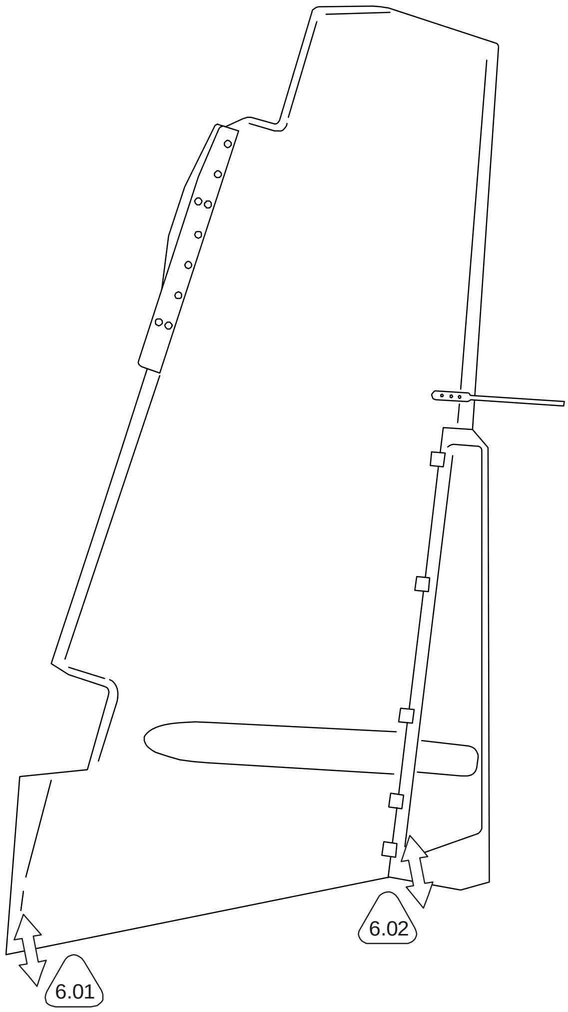


Figure 6: Drain Holes Rudder



X	100 Hours Check	⇔	Horizontal Drainage Hole
X	200 Hours Check	⇕	Vertical Drainage Hole
X	2000 Hours Check	⌖	Exterior Drainage Hole
		⊙	Drainage Hole Inside the Structure

Figure 7: Drain Holes Rudder (if MÄM 42-600 is installed)

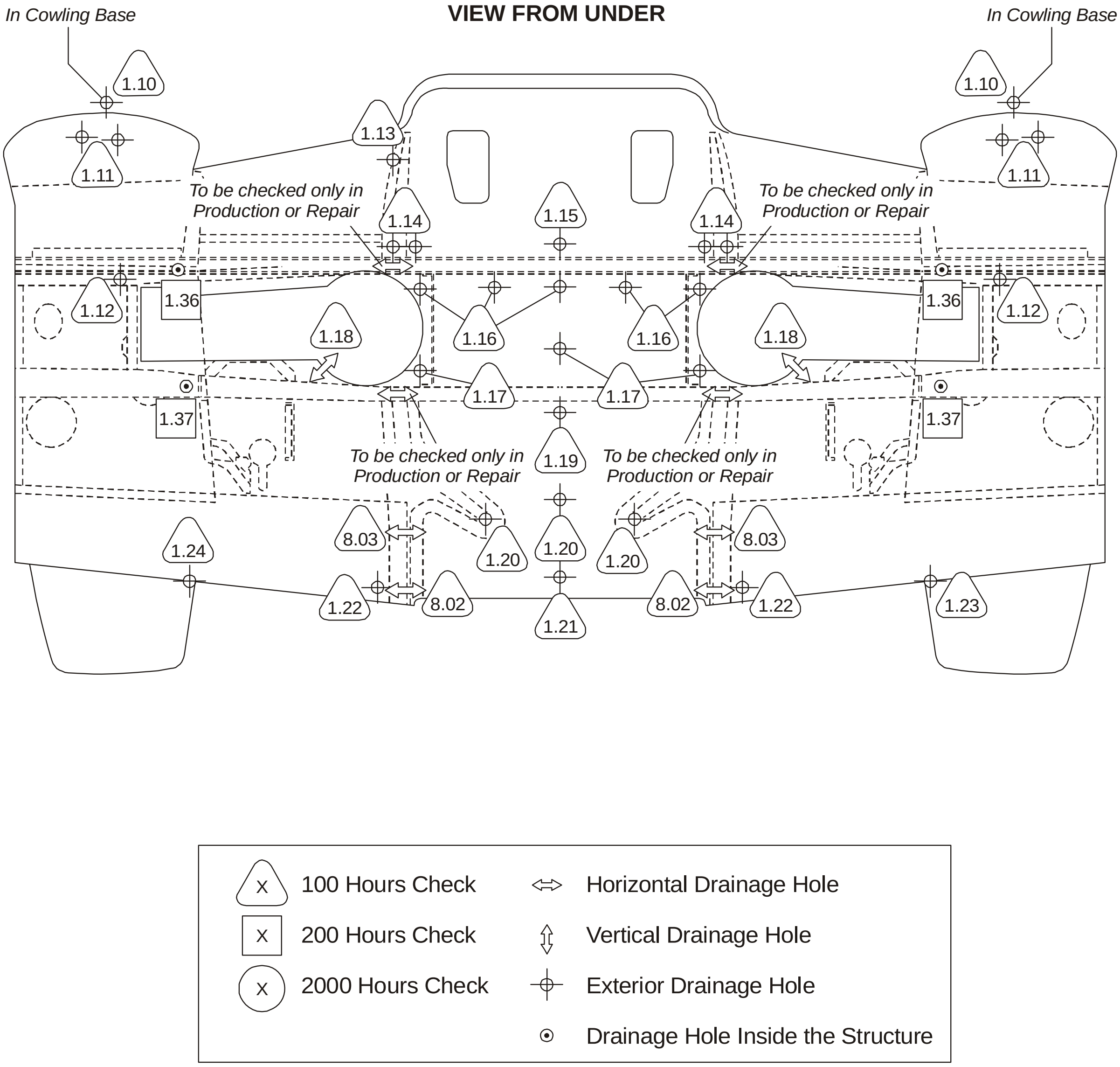


Figure 8: Drain Holes Center Wing

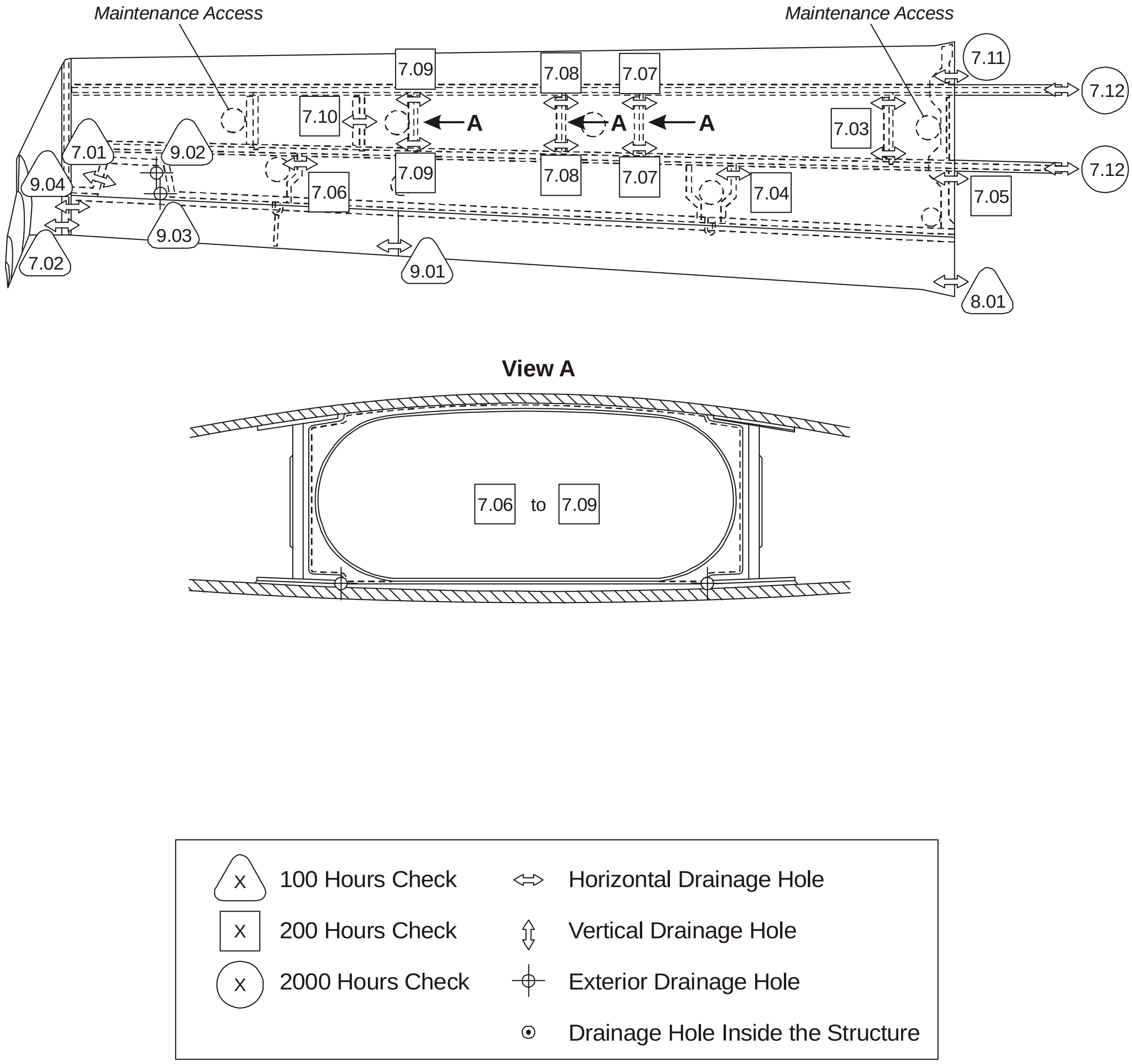


Figure 9: Drain Holes Wings, Flaps and Ailerons

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Section 05-28
Maintenance Checklist DA 42 NG
Section 05-28-00
Maintenance Checklist DA 42 NG Engines

1. General

Enter the applicable data in the blocks below:

Registration : ________		Date :	________		
Airplane S/N : ________		Engine S/N :		LH ____	RH ____
Airplane Operating Hours : ________		Engine hours, TTSN :		LH ____	RH ____
Inspection : ________		Propeller S/N :		LH ____	RH ____
(100, 200, 1000, 2000 hr, Annual Insp.)		Propeller hours, TTSN :		LH ____	RH ____

2. Preparation

Do the following items before you start the applicable check:

	Inspection Items	100	200	1000	2000	Initials
1.	Before you do the inspection: – Read the applicable Airworthiness Directives. – Read the applicable Service Bulletins.	X	X	X	X	
2.	Examine the Log Books. Look specially for: – Life limited parts. – Reported problems.	X	X	X	X	
3.	Clean the airplane fully. (Refer to Section 12-30).	X	X	X	X	

3. Engine Ground Test

Do an engine ground test as follows (complete a copy of the Engine Ground Test Record as part of the engine ground test. (Refer to Section 05-28-91)):

		Interval					
	Inspection Items	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
WARNING: DO NOT LET PERSONS GO INTO THE DANGER AREA OF THE PROPELLER. PROPELLERS CAN CAUSE INJURY OR DEATH. **WARNING: SET THE PARKING BRAKE TO ON. IF YOU DO NOT DO THIS, THE AIRPLANE CAN MOVE. THIS CAN CAUSE INJURY OR DEATH.**							
1.	Set the parking brake to ON.	X	X	X	X		
2.	Put the chocks against the airplane main wheels.	X	X	X	X		
3.	Do an engine ground run. (Refer to Section 71-00 and AE Maintenance Manual, latest revision).	X	X	X	X		
4.	Check engine instruments.	X	X	X	X		
5.	Do a test of the crossfeed system. (Refer to Section 28-20).	X	X	X	X		
6.	Do a test of the feathering and unfeathering system. (Refer to Section 61-20).	X	X	X	X		
7.	Shut engines down.	X	X	X	X		
8.	If auxiliary tanks are installed do a test of the auxiliary fuel transfer system. (Refer to Section 28-20).	X	X	X	X		
9.	Examine the engine for oil/fuel/coolant leaks.	X	X	X	X		

4. Maintenance Checklist Engines

A. LH Engine

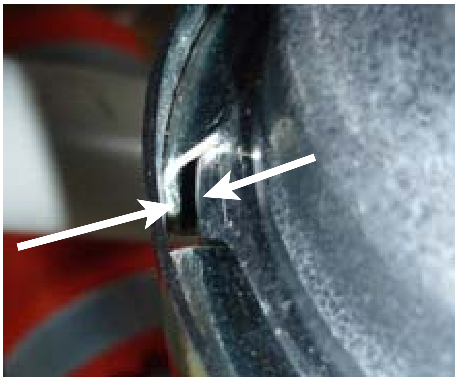
*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	WARNING: MAKE SURE THE EXHAUST SYSTEM IS COOL BEFORE YOU DO MAINTENANCE ON THE ENGINE. THE EXHAUST SYSTEM CAN BE HOT. THIS CAN CAUSE INJURY TO PERSONS. **WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.** **WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.**						
1.	Remove the top and bottom cowlings. (Refer to Section 71-10). Examine the cowlings. Make sure that the fasteners are serviceable. Look for cracks and areas that have got too hot. Check rubber seals.	X	X	X	X		
2.	Clean the engine and engine compartment. Refer to Section 12-30 and the AE Maintenance Manual, latest revision.	X	X	X	X		
3.	Do engine maintenance in accordance with AE Maintenance Manual, latest revision.	X	X	X	X		
4.	Cut open the used oil filter: – Look for contamination and metal abrasion. – If the filter contains particles of metal, refer to the engine manufacturer.	X	X	X	X	1 yr. ± 30 days	
5.	Verify proper mixture ratio of the coolant. Refer to the AE Maintenance Manual, latest revision.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
6.	Examine the fuel inline filter element in the rear nacelle (if auxiliary tanks are installed): – If filters are damaged replace them. – If filters are contaminated flush filter mesh with clean fuel.			X	X		
7.	Check fuel pre-filter elements (2 pcs.).			X	X		
8.	Test auxiliary fuel pumps (if auxiliary tanks are installed). (Refer to Section 28-20).			X	X		
9.	Test solenoid and check valves (if auxiliary tanks are installed). (Refer to Section 28-20).			X	X		
10.	Examine the exhaust end pipe incl. muffler (if installed). Look specially for cracks and heat damage or incorrect attachment.	X	X	X	X		
11.	Examine the mounting bracket, pulley assembly and electrical connections of the additional alternator (if OÄM 42-204 is carried out): – Visual inspection of mounting bracket and pulley assembly for corrosion and cracks. – Examine the electrical connections. Look especially for rub marks, damage and corrosion. Pull lightly to make sure they are not loose.	X	X	X	X		
12.	Examine the v-belt of the additional alternator (if OÄM 42-204 is carried out): – Visual inspection for damage and material deterioration. – Check the v-belt tension. Refer to Chapter 61.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
13.	Examine the air intake hoses: – Look specially for signs of damage. – Make sure the air hoses are correctly attached and that the torque seal on the hose clamps is intact.	X	X	X	X		
14.	Examine the cable ties and all electrical connectors in the engine area: – Look specially for rub marks and damage. – Pull lightly to make sure they are not loose.	X	X	X	X		
15.	Examine the bonding cables and their connectors in the engine area: – Look specially for rub marks and damage. – Pull lightly to make sure they are not loose.	X	X	X	X		
16.	Examine the oil breather line. Refer to the AE Maintenance Manual, latest revision.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
17.	Examine the propeller control system: Refer also to mt-Propeller Operation and Installation manual, latest revision. – Examine the hose and hose connection. Look specially for leakage and damage. – Examine the un-feathering pressure accumulator. Look specially for: – Leakage and damage. – Insecure attachment. – Nitrogen pressure accumulator. Refer to mt-Propeller Operation and Installation Manual, latest revision. – Check accumulator nitrogen pressure: – Set valve under current (open). – Remove the cap from the charging valve. – Connect a suitable nitrogen supply to the charging valve and charge the accumulator to the correct pressure 10.4 bar (150 PSI). Follow the manufacturer’s instructions for the nitrogen supply. – Disconnect the nitrogen supply. – Install the cap onto the charging valve.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
18.	Examine the air intake and turbo-charging system. Look specially at these items: – Air filter. – Hose from air filter to turbo-charger. – Turbo-charger. On the pressure side of the turbo-charger: – Hoses and hose clamps. – Aluminum pipes. – Look specially for signs of damage. – Make sure the air hoses and ducts are correctly attached and that the torque seal on the hose clamps is intact. – Intercooler. Do NOT re-tighten the worm drive clamps once they have been installed unless they are loose. Re-tightening of worm drive clamps will lead to damage of silicone hoses and possible loss of engine power.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	Inspect the v-clamp on the pressure side of the turbo charger: – Inspect for positive clearance between the flanges of the turbo charger/aluminum charged air tube and the base of the v-clamp on the complete circumference. If there is NO positive clearance: replace the v-clamp.  – Inspect for signs of cracks in the edges of the ends of the v-bands of the v-clamp with flashlight and mirror. 						

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
19.	Check cooling system for leaks. Look specially at these items: – Hoses and hose clamps. – Aluminum pipes.	X	X	X	X		
20.	Examine the coolant radiators: – Look specially for leakage, damage, and insecure attachment. – Make sure the cooling fins are not blocked.	X	X	X	X		
21.	Examine the coolant tank: – Look specially for leakage and damage. – Check the attachment for cracks.	X	X	X	X		
22.	Perform a coolant tank pressure relief valve test. (Refer to Section 75-00).	X	X	X	X		
23.	Examine the alternate air valve assembly: – Check correct movement when the alternate air lever in the cockpit is operated. – Examine the FOD screen for contamination. (Refer to Section 71-60).	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, LH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**

24.	Examine the engine mounts. Look specially for:
	– Cracks or corrosion. No cracks or corrosion allowed.
	– Damaged surface protection. Repair damaged surface protection.
	– Mounting bolts:
	  – Incorrect attachment.
	  – Damage. No damage allowed.
	  – Incorrect torque value. (Refer to Section 20-10).
	  – Loose or missing lock devices.
	– Damaged shock mounts. Replace damaged shock mounts.
		X	X	X	X		

25.	Check bolts mounting engine mount to firewall. Torque to the value given in Section 20-10 – At the first 100 hrs. check.	 (X)			X		
26.	Check the overheat detector for damage, loose connectors, and insecure attachment.	X	X	X	X		
27.	Do a function test of the overheat detector. (Refer to Section 26-00).	X	X	X	X		
28.	Do an engine ground test run. After the engine test run, read the EECU data out and send them via email to Austro Engine GmbH. Refer to AE Maintenance Manual, latest revision.	X	X	X	X		

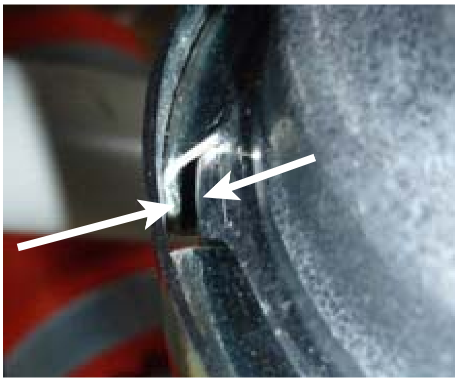
B. RH Engine

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	WARNING: MAKE SURE THE EXHAUST SYSTEM IS COOL BEFORE YOU DO MAINTENANCE ON THE ENGINE. THE EXHAUST SYSTEM CAN BE HOT. THIS CAN CAUSE INJURY TO PERSONS. **WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.** **WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.**						
1.	Remove the top and bottom cowlings. (Refer to Section 71-10). Examine the cowlings. Make sure that the fasteners are serviceable. Look for cracks and areas that have got too hot. Check rubber seals.	X	X	X	X		
2.	Clean the engine and engine compartment. Refer to Section 12-30 and the AE Maintenance Manual, latest revision.	X	X	X	X		
3.	Do engine maintenance in accordance with AE Maintenance Manual, latest revision.	X	X	X	X		
4.	Cut open the used oil filter: – Look for contamination and metal abrasion. – If the filter contains particles of metal, refer to the engine manufacturer.	X	X	X	X	1 yr. ± 30 days	
5.	Verify proper mixture ratio of the coolant. Refer to the AE Maintenance Manual, latest revision.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
6.	Examine the fuel inline filter element in the rear nacelle (if auxiliary tanks are installed): – If filters are damaged replace them. – If filters are contaminated flush filter mesh with clean fuel.			X	X		
7.	Check fuel pre-filter elements (2 pcs.).			X	X		
8.	Test auxiliary fuel pumps (if auxiliary tanks are installed). (Refer to Section 28-20).			X	X		
9.	Test solenoid and check valves (if auxiliary tanks are installed). (Refer to Section 28-20).			X	X		
10.	Examine the exhaust end pipe incl. muffler (if installed). Look specially for cracks and heat damage or incorrect attachment.	X	X	X	X		
11.	Examine the air intake hoses: – Look specially for signs of damage. – Make sure the air hoses are correctly attached and that the torque seal on the hose clamps is intact.	X	X	X	X		
12.	Examine the cable ties and all electrical connectors in the engine area: – Look specially for rub marks and damage. – Pull lightly to make sure they are not loose.	X	X	X	X		
13.	Examine the bonding cables and their connectors in the engine area: – Look specially for rub marks and damage. – Pull lightly to make sure they are not loose.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
14.	Examine the oil breather line. Refer to the AE Maintenance Manual, latest revision.	X	X	X	X		
15.	Examine the propeller control system: Refer also to mt-Propeller Operation and Installation manual, latest revision. – Examine the hose and hose connection. Look specially for leakage and damage. – Examine the un-feathering pressure accumulator. Look specially for: – Leakage and damage. – Insecure attachment. – Nitrogen pressure accumulator. Refer to mt-Propeller Operation and Installation Manual, latest revision. – Check accumulator nitrogen pressure: – Set valve under current (open). – Remove the cap from the charging valve. – Connect a suitable nitrogen supply to the charging valve and charge the accumulator to the correct pressure 10.4 bar (150 PSI). Follow the manufacturer’s instructions for the nitrogen supply. – Disconnect the nitrogen supply. – Install the cap onto the charging valve.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
16.	Examine the air intake and turbo-charging system. Look specially at these items: – Air filter. – Hose from air filter to turbo-charger. – Turbo-charger. On the pressure side of the turbo-charger: – Hoses and hose clamps. – Aluminum pipes. – Look specially for signs of damage. – Make sure the air hoses and ducts are correctly attached and the torque seal on the hose clamps is intact. – Intercooler. Do NOT re-tighten the worm drive clamps once they have been installed unless they are loose. Re-tightening of worm drive clamps will lead to damage of silicone hoses and possible loss of engine power.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	Inspect the v-clamp on the pressure side of the turbo charger: – Inspect for positive clearance between the flanges of the turbo charger/aluminum charged air tube and the base of the v-clamp on the complete circumference. If there is NO positive clearance: replace the v-clamp.  – Inspect for signs of cracks in the edges of the ends of the v-bands of the v-clamp with flashlight and mirror. 						

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
17.	Check cooling system for leaks. Look specially at these items: – Hoses and hose clamps. – Aluminum pipes.	X	X	X	X		
18.	Examine the coolant radiators: – Look specially for leakage, damage, and insecure attachment. – Make sure the cooling fins are not blocked.	X	X	X	X		
19.	Examine the coolant tank: – Look specially for leakage and damage. – Check the attachment for cracks.	X	X	X	X		
20.	Perform a coolant tank pressure relief valve test. (Refer to Section 75-00).	X	X	X	X		
21.	Examine the alternate air valve assembly: – Check correct movement when the alternate air lever in the cockpit is operated. – Examine the FOD screen for contamination. Refer to Section 71-60.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Engine	**100**	**200**	**1000**	**2000**	**Time**	**Initials**

22.	Examine the engine mounts. Look specially for:
	– Cracks or corrosion. No cracks or corrosion allowed.
	– Damaged surface protection. Repair damaged surface protection.
	– Mounting bolts:
	  – Incorrect attachment.
	  – Damage. No damage allowed.
	  – Incorrect torque value. (Refer to Section 20-10).
	  – Loose or missing lock devices.
	– Damaged shock mounts. Replace damaged shock mounts.
		X	X	X	X		

23.	Check bolts mounting engine mount to firewall. Torque to the value given in Section 20-10 – At the first 100 hrs. check.	(X)			X		
24.	Check the overheat detector for damage, loose connectors, and insecure attachment.	X	X	X	X		
25.	Do a function test of the overheat detector. (Refer to Section 26-00).	X	X	X	X		
26.	Do an engine ground test run. After the engine test run, read the EECU data out and send them via email to Austro Engine GmbH. Refer to AE Maintenance Manual, latest revision.	X	X	X	X		

5. Propellers

A. LH Propeller

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, LH Propeller	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	WARNING: DO NOT LET PERSONS GO INTO THE DANGER AREA OF THE PROPELLER. PROPELLERS CAN CAUSE INJURY OR DEATH. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER.**						
1.	Inspection in accordance with mt-Propeller Maintenance Manual, latest revision.	X*	X	X	X		

B. RH Propeller

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, RH Propeller	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	WARNING: DO NOT LET PERSONS GO INTO THE DANGER AREA OF THE PROPELLER. PROPELLERS CAN CAUSE INJURY OR DEATH. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER.**						
1.	Inspection in accordance with mt-Propeller Maintenance Manual, latest revision.	X*	X	X	X		

Section 05-28-50
Maintenance Checklist Airframe

1. Exterior of the Fuselage

A. General

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Exterior Fuselage, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the complete surface of the fuselage. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
2.	Check the static source holes for blockage.	X	X	X	X		
3.	Do a coin-tap test for delamination of the entire fuselage shell from the nose to the vertical tail. (Refer to Section 51-10).					MSI	
4.	Do a coin-tap test for defects in the entire fuselage tube bonding (top and bottom). (Refer to Section 51-10).					MSI	
5.	Examine all antennas. Look specially for damage, incorrect attachment, and cracks in the fuselage skin.	X	X	X	X		
6.	Examine the exterior placards. Make sure that: – They are not damaged. – None are missing. (Refer to Chapter 11).	X*	X	X	X		
7.	Lift the airplane on jacks. (Refer to Section 07-10).	X*	X	X	X		

B. Nose Landing Gear

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Nose Landing Gear	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the composite structure to which the nose landing gear assembly is attached. Look specially for cracks and delamination.	X	X	X	X		
2.	Examine the forward part of the steering linkage. Look specially for: – Damage and corrosion. – Damaged surface protection. – Incorrect attachment and loose or missing lock devices. – Defective bonding strap.	X	X	X	X		
3.	Examine the cardan joint bracket. Look specially for corrosion, cracks and damage.	X	X	X	X		
4.	Examine the nose wheel centering device. Look specially for damage, excessive wear, and looseness.	X	X	X	X		
5.	Examine the nose landing gear actuator. Look specially for leakage. (Refer to Section 32-20).	X	X	X	X		
6.	Examine the damper and the hydraulics. Look specially for leakage. (Refer to Section 32-20).	X	X	X	X		
7.	Examine the nose landing gear doors: – Check for damage to the doors. – Check for cracked hinges. – Examine the door operating rods.	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Nose Landing Gear	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
8.	Disassemble and examine the nose landing gear leg: – Remove the nose landing gear leg. – Remove the nose landing gear damper assembly. – Remove the nose landing gear mounting bracket. – Clean all parts. – Examine all parts. Look specially for deformation, cracks, wear, corrosion and damaged surface protection. – Install the nose landing gear mounting bracket. – Install the nose landing gear damper assembly. – Install the nose landing gear assembly. (Refer to Section 32-20).				X		
9.	Examine the nose landing gear for damage (nose landing gear leg assembly, folding stay assembly, mounting bracket assembly). Look specially for cracks, deformation, wear, corrosion and damaged surface protection.	X	X	X	X		
10.	Ensure correct gas pressure in the damper with the wheel off the ground: – 16 bar / 232 PSI. – 10 bar / 145 PSI (if MÄM 42-659 is carried out). For more information refer to Section 32-20.	X*	X	X	X		
11.	Apply grease to the actuator bearing. (Refer to Sections 12-20 and 32-20).	X	X	X	X		
12.	Apply a small amount of oil to the bearings of the torque links. (Refer to Sections 12-20 and 32-20).	X	X	X	X		
13.	Examine the up-lock and the down-lock micro-switches. (Refer to Section 32-20).	X	X	X	X		

C. Main Landing Gear

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Main Landing Gear	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the composite structure to which the main landing gear assembly is attached. Look specially for cracks and delamination.	X	X	X	X		
2.	Examine the bearings for the main landing gear assemblies in the center wing. Look specially for play.	X	X	X	X		
3.	Examine the landing gear legs and trailing arms. Look specially for cracks, deformation, corrosion, and damaged surface protection.	X	X	X	X		
4.	Examine the hydraulic lines of the brake system for damage, leakage, and loose or defective connectors.	X	X	X	X		
5.	Examine the main landing gear actuators and hydraulics. Look specially for leakage. (Refer to Chapter 32).	X	X	X	X		
6.	Examine the damper. Look specially for leakage.	X	X	X	X		
7.	Examine the main landing gear doors: – Check for damage to the doors. – Check for cracked hinges. – Examine the door operating rods.	X	X	X	X		
8.	Remove the dampers, trunnions, and trailing arms from the legs. (Refer to Section 32-10).				X		
9.	Examine these bearings: – Plain bearings in the trailing arm. – Upper and lower bearings for the dampers.				X		
10.	Examine the bolt that attaches the trailing arm to the leg. Look specially for deformation and cracks.				X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Main Landing Gear	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
11.	If MÄM 42-659 is NOT installed, examine the interior of the dampers: – Disassemble the dampers. (Refer to Section 32-10). – Clean all parts. – Examine all parts. Look specially for deformation and cracks. – Reassemble the dampers. (Refer to Section 32-10).				X		
12.	Reinstall the dampers, trunnions, and trailing arms to the legs. (Refer to Section 32-10).				X		
13.	Ensure correct gas pressure in the dampers (19 bar / 276 PSI with the wheel off the ground). (Refer to Chapter 32).	X*	X	X	X		
14.	Apply grease to the actuator bearing. (Refer to Sections 12-20 and 32-20).	X	X	X	X		
15.	Examine the up-lock and the down-lock micro switches. (Refer to Chapter 32).	X	X	X	X		
16.	Examine the Weight-on-Wheels switches. – Look specially for: – Damage. No damage allowed. – Incorrect attachment. – Verify proper operation.	X*	X	X	X		

D. Wheels

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Wheels	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the tires: – Look for cuts and wear. – Check slip marks. – Ensure correct inflation pressure in the nose wheel: – 6 bar / 87 PSI. – 6.1 bar / 88 PSI, if MÄM 42-659 is carried out. – Ensure correct inflation pressure in the main wheels: – 4.7 bar / 68 PSI.	X	X	X	X		
2.	Examine the main wheel brakes: – Check brake linings for excessive wear. – Check brake disks for distortion and excessive wear. – Check brake cylinders for leaks.	X	X	X	X		
3.	Remove all 3 wheels.	X*	X	X	X		
4.	Examine the wheel axles. Look specially for cracks and corrosion.	X*	X	X	X		
5.	Examine the wheel bearings. Look specially for play, corrosion and irregular running.	X*	X	X	X		
6.	Clean and lubricate all bearings at the wheels. (Refer to Section 12-20).	X*	X	X	X		
7.	Examine the rims of all 3 wheels. Look specially for cracks.	X	X	X	X		
8.	Install all 3 wheels.	X*	X	X	X		
9.	Do a test for wheel track and camber. (Refer to Section 32-10).			X	X		

E. Fuselage Nose

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Fuselage Nose	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the nose baggage doors: – Check for damage to the doors. – Check for defective hinges. – Make sure that the locks operate correctly. – Check operation of door warning switches.	X*	X	X	X		
2.	Close only one nose baggage door and test the lock of the other one by pushing from inside. Repeat the procedure for the other side.		X	X	X		
3.	Remove the covers from the rear wall of the nose baggage compartment.	X*	X	X	X		
4.	Examine the cable ties and all electrical connectors: – Look specially for rub marks and damage. – Pull lightly to make sure they are not loose.	X*	X	X	X		
5.	Do a check of the airplane battery. Refer to the Maintenance Manual of the Battery for additional instruction. Look specially for: – Corrosion, pitting, burn marks or damage on battery terminals. – Incorrect mounting. (Refer to Section 24-31).		X	X	X		
6.	Examine the battery area. Clean the area.		X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Fuselage Nose	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
7.	Visually inspect the interior structure of the front fuselage (forward of instrument panel frame). Use mirror and flashlight where necessary. Check for damage, cracks, delamination and disbonding from the fuselage skin. Inspect the following components: – Instrument panel frame. – Nose compartment floor. – Nose frame.				X		
8.	If installed, check the spraybar for the de-icing fluid for damage.	X*	X	X	X		
9.	If the oxygen system is installed (OÄM 42-055), visually inspect the ventilation of the nose baggage compartments (oxygen, battery, and TKS compartment). Especially check both ventilation caps, installed on the LH and RH side of the nose landing gear.	X	X	X	X		
10.	If the oxygen system is installed (OÄM 42-055), visually inspect all oxygen tubes installed in the oxygen and battery compartment. Check for improper fixture, chafing, leakage and improper ventilation of the high pressure tube.			X	X		
11.	If the oxygen system is installed (OÄM 42-055), visually inspect the cylinder regulator valve installed on the oxygen cylinder. Check for damage, dust and corrosion.			X	X		
12.	If the oxygen system is installed (OÄM 42-055), visually check the front baggage compartment for residues of oil, TKS fluid and grease. Clean up if necessary.	X	X	X	X		

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Fuselage Nose	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
13.	If the GWX 68 or GWX 70 weather radar system (OÄM 42-119 or OÄM 42-273) is installed: Examine the airplane nose cone: – Check for structural damage. – Check attachment screws (16 pieces). – Check lightning protection strips (4 pieces) for proper mounting.		X	X	X		
14.	If the GWX 68 or GWX 70 weather radar system (OÄM 42-119 or OÄM 42-273) is installed: Examine the GWX 68 or GWX 70 installation on the radar bulkhead: – Check radar antenna visually. – Check bracket attachment screws. – Check lightning protection bonding for proper mounting. – Examine the wire harness and electrical connectors for chafing, damage and proper attachment. Pull lightly to make sure they are not loose.			X	X	1 yr.	

2. Cabin

A. Cabin, General

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Cabin, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Remove the inspection hole covers. Remove front and rear seat shells. Refer to Section 25-10.	X*	X	X	X		
CAUTION: DO NOT LOOSEN THE LEVER FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.							
2.	If adjustable front seats (OÄM 42-067 or OÄM 42-259) are installed: – Do a test of the backrest adjustment mechanism on both front seats. (Refer to Section 25-10). – Do a test of the lumbar support mechanism on both front seats. (Refer to Section 25-10).	X*	X	X	X		
3.	Examine the emergency axe installation (if OÄM 42-205 is installed): – Check attachments for looseness. – Check release mechanism for interference or improper function.		X	X	X		
4.	Examine the emergency egress hammer installation (if OÄM 42-304 is installed): – Check attachments for looseness. – Check release mechanism for interference or improper function.		X	X	X		

B. Canopy, Doors, and Windows

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Canopy, Doors, and Windows	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the canopy: – Make sure the canopy lock mechanism operates correctly. (Refer to Section 52-10). – Examine the acrylic glass window for damage. Look specially for cracks. – Inspect the acrylic glass window for crazing and scratches. No crazing and scratches are acceptable which affect sight of the pilots. – Examine the bonding between the window and the canopy frame. (Refer to Section 56-10). – Examine the emergency windows and their hinges for damage. – Examine the 'pop out' windows and their hinges for damage. Check hinges for improper friction, correct if necessary.	X*	X	X	X		
2.	If OÄM 42-194 carried out: Perform release test of canopy jettison system (refer to Section 52-10)			x			
3.	If OÄM 42-194 carried out: Replace canopy jettison assemblies (refer to Section 52-10)				x	2 yrs.	
4.	If OÄM 42-194 carried out: Perform 100 h Maintenance Check of canopy jettison system (refer to Section 52-10)	x	x	x	x		
5.	Do a function test of the door unlocked warning light system. (Refer to Section 52-10).	X	X	X	X		
6.	Examine the safety hook mechanism. (Refer to Section 52-10).	X	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Canopy, Doors, and Windows	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
7.	Examine the carbon hinges for cracks. (Refer to Section 52-10).	X	X	X	X		
8.	Examine the rear passenger door: – Make sure the door lock mechanism and the safety hook mechanism operate correctly. (Refer to Section 52-10). – If MÄM 42-097 is installed: Do a test of the passenger door handle compression gas spring. (Refer to Section 52-10). – Examine the carbon hinges for cracks. (Refer to Section 52-10). – Examine the acrylic glass window for damage. Look specially for cracks. – Examine the bonding between the window and the door frame. (Refer to Section 56-10).	X*	X	X	X		
9.	Examine the rear window on the RH side: – Examine the acrylic glass window for damage. Look specially for cracks. – Examine the bonding between the window and the frame. (Refer to Section 56-10).	X*	X	X	X		

C. Cabin Structure

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Cabin Structure	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Visually inspect the inner skin of the front fuselage (forward of baggage compartment frame). Use mirror and flashlight where necessary. Check for damage, cracks, delamination and disbonding from the sandwich foam.					MSI	
2.	Check front and rear main spars for damage, cracks, delamination and disbonding from the center wing skin.		X	X	X		
3.	Visually inspect the interior structure of the front fuselage (from instrument panel frame to baggage compartment frame). Use mirror and flashlight where necessary. Check for damage, cracks, delamination and disbonding from the fuselage skin. Inspect the following components: – Front main spar. – Rear main spar. – Control bulkhead. – Floor element. – Top-hat profile for rudder lever.				X		
4.	Visually inspect the interior structure of the front fuselage. Use mirror and flashlight where necessary. Check for damage, cracks, delamination and disbonding from the fuselage skin. Inspect the following components: – Baggage compartment frame. – Roll bar. – Front and rear seat crash elements.			X	X		

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Cabin Structure	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
5.	Visually inspect the bolts that attach the center wing to the fuselage. Look specially for: – Damage or looseness. – Cracks in the fuselage structure around the holes for the bolts.			X	X		

D. Instrument Panel and Electrical System in Cabin

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Instrument Panel and Electrical System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the Pitot-static system water traps (below the pilot's seat and below the aft baggage compartment).	X*	X	X	X		
2.	Examine all cable ties and electrical connectors in the cabin. Pull lightly to make sure they are not loose.	X*	X	X	X		
3.	Examine the instrument panel. Make sure that: – The wiring is correctly attached. – The instruments are correctly attached. – The hoses are correctly attached. – The circuit breakers are correctly attached. – The cooling fans are operative and correctly attached. – The Pitot static lines are not sharply bent or chafed.	X*	X	X	X		

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Instrument Panel and Electrical System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
4.	Examine the attachments of the instrument panel. Make sure that: – The rubber damper elements are not damaged or porous. – The rubber damper elements are firmly attached to the instrument panel and angle supports (4 elements in the front, 1 element on each side).	X*	X	X	X		
5.	Examine the instrument panel for cracks.		X	X	X		
6.	Examine the emergency battery system: – Measure the voltage of the emergency battery pack on the EMERGENCY switch. Replace emergency battery pack if the voltage is below 30 V.	X*	X	X	X		
7.	Make sure that the seal on the EMERGENCY switch is intact.	X	X	X	X		
8.	Examine the backup instruments. Make sure that: – The markings are clear (if OÄM 42-270 is NOT installed). – The function is correct. – Connectors / fittings are correctly attached. – The instrument lights operate correctly (on the instrument panel cover).	X*	X	X	X		
9.	Examine the alternate static valve. Make sure that: – The valve is correctly attached. – The valve is not blocked. – The hoses are correctly attached.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Instrument Panel and Electrical System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
10.	Examine the compass. Make sure that: – The compass is correctly attached. – The fluid level is correct.		X	X	X		

E. Flight Control System in Cabin

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the control sticks. Make sure that the control stick attachments are not loose and do not catch.	X*	X	X	X		
2.	If OÄM 42-283 is installed: Make sure that the connection of the removable control stick has no play and wear. Make sure that the safety pin snaps on the rim of the sleeve nut.	X*	X	X	X		
3.	Examine the control stick stops.	X*	X	X	X		
4.	Examine the variable elevator stop: – Check actuator for damage and insecure mounting. – Check actuator wiring for rub-marks and loose connectors. – Check actuator lever for damage and excessive wear.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
5.	Examine the aileron and elevator control system. Look specially for: – Incorrect attachment. – Loose or missing lock devices. – Corrosion and damaged surface protection. (Refer to Sections 27-10 and 27-30).	X*	X	X	X		
6.	Examine the centering springs for the aileron control system. Look specially for damage and looseness.	X*	X	X	X		
7.	Examine the rudder pedals. Look specially for: – Incorrect attachment and function. – Corrosion and damaged surface protection. – Damaged adjustment mechanism. – Improper function of adjustment mechanism. (Refer to Section 27-20).	X*	X	X	X		
8.	Examine the rudder pedals S-tube. Look specially for: – Wear on cable inlets and outlets. – Wear in inner radius of tube (no deformation visible or tactile). (Refer to Section 27-20).	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
9.	Examine the rudder cables and pulleys. Look specially for: – Incorrect attachment and function. (Refer to Section 27-20). – Defective cable eyes. – Defective rubber sleeves. – Corrosion. – Rub marks. – Defective safety plates. – Worn out pulleys. – Broken strands.		X	X	X		
10.	Examine the elevator trim control in the center console. Make sure that: – There is full and free movement. – There is no unusual play.	X*	X	X	X		
11.	Examine the rudder trim control in the center console. Make sure that: – There is full and free movement. – There is no unusual play.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
12.	Examine the rear part of the steering linkage. Look specially for: – Damage and corrosion. – Damaged surface protection. – Defective linkage buffer. – Incorrect attachment and loose or missing lock devices. – Defective bonding strap.	X*	X	X	X		
13.	Examine the push rod guides for the elevator push-rod. Look specially for incorrect attachment and interference.	X*	X	X	X		
14.	Examine the flap control mechanism on the rear main spar. Look specially for: – Damage and corrosion. – Damaged surface protection. – Incorrect attachment and loose or missing lock devices.	X*	X	X	X		
15.	Examine the aileron control system on the rear main spar. Look specially for: – Damage and corrosion. – Damaged surface protection. – Incorrect attachment and loose or missing lock devices.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
16.	Check the following components of the autopilot system for wear and/or corrosion: – Servos. – Servo mounts (capstans). – Bridle cable assemblies.	X*	X	X	X		

F. Other Cockpit Controls

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Other Cockpit Controls	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the brake hoses and components. Look specially for leakage.	X	X	X	X		
2.	Examine the brake fluid reservoirs on the co-pilot's side. Make sure the fluid level is correct: – The fluid level must be 12 mm to 25 mm (1/2 in to 1 in) below the top face of the reservoir filler hole.	X*	X	X	X		
3.	Examine the power levers: – Check for damage. – Verify full travel (0-100%) with AE Software Tool ‘AE 300-Wizard’.		X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Other Cockpit Controls	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
4.	Examine the fuel selector valve controls (FUEL CONTROL): – Check levers for damage. – Check safety guards for the OFF position for damage. – Move the controls through their operating range. Check for restricted movement, interference, and unusual play.	X*	X	X	X		
5.	Examine the PARKING BRAKE lever in the center console: – Check for damage. – Move the lever through its operating range. Check for restricted movement, interference, unusual play, and incorrect bounce.	X*	X	X	X		
6.	Examine the ALTERNATE AIR lever: – Check for damage. – Move the lever through its operating range. Check for restricted movement, interference, unusual play, and incorrect bounce.	X*	X	X	X		
7.	Examine the CABIN and DEFROST levers: – Check for damage. – Move the levers through their operating range. Check for restricted movement, interference, unusual play, and incorrect bounce.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Other Cockpit Controls	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
8.	Examine the control cables in the center console: – Examine visually the cables in the center console. Look specially for wear and kinks in the cables and for foreign objects.	X*	X	X	X		

G. Miscellaneous Items in Cabin

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Cabin, Miscellaneous	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the interior placards. Make sure that: – They are not damaged. – None are missing. (Refer to Chapter 11).	X*	X	X	X		
2.	Examine the fire extinguisher. Make sure that: – The fire extinguisher will release from the mounting bracket. – The fire extinguisher contents are full. Do a check of the extinguisher expiry date. (Refer to Section 26-00).	X*	X	X	X		
3.	If the sun visors (OÄM 42-101 or OÄM 42-142) are installed: – Check for obvious damage. – Check press-studs for lack of retention force.		X	X	X		
4.	If the oxygen system is installed (OÄM 42-055), visually inspect each oxygen outlet port. Check for dust, damage and corrosion.		X	X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Cabin, Miscellaneous	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
5.	If the oxygen system is installed (OÄM 42-055), visually inspect the oxygen pressure gauge in the cabin. Check for flaws and compare the indicated pressure with the pressure of the filling unit, installed in the nose baggage compartment.		X	X	X		
6.	If the oxygen system is installed (OÄM 42-055), check the oxygen push-pull knob Bowden-cable assembly. Check for interference and corrosion.		X	X	X		
	CAUTION: OIL, GREASE OR OTHER LUBRICATIONS IN CONTACT WITH OXYGEN CREATE A SERIOUS HAZARD. SUCH CONTACT MUST BE AVOIDED WHEN HANDLING WITH ANY PART OF THE OXYGEN SYSTEM.						
7.	If the oxygen system is installed (OÄM 42-055), visually inspect all oxygen tubes installed in the oxygen- and battery compartment. Check for improper fixture, chafing, leakage and improper ventilation of the high pressure tube.			X	X		
9	If the oxygen system is installed: – Perform a functional check of the oxygen system.			X	X		

3. Interior of the Rear Fuselage

A. Interior Structure of the Rear Fuselage

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Interior Structure of the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the cabin baggage compartment. Look specially for damage and insecure attachment. Inspect the following components: – Baggage compartment structure. – Baggage restraint net. – D-rings for the attachment of the baggage restraint net. – Door to the baggage extension. – Lid for the tray on the floor.		X	X	X		
2.	If OÄM 42-203 is carried out: Remove the de-icing fluid tank. Refer to Chapter 30-00.				X		
3.	Visually inspect the inner skin of the rear fuselage (aft of baggage compartment frame) with mirror and flashlight. Check for damage, dents, cracks, delamination and disbonding from the sandwich foam.				X		
4.	Visually inspect the interior structure of the rear fuselage (aft of baggage compartment frame) through all access holes with mirror and flashlight. Check for damage, cracks, delamination and disbonding from the fuselage skin. Inspect the following components: – Ring frames 1, 2, and 3.				X		
5.	Check structure in the area of the RACC inlets and outlets for cracks, delamination and disbonding (if OÄM 42-193 is carried out).			X	X	MSI	

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Interior Structure of the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
6.	Examine the RACC air inlets and outlets (if OÄM 42-193/c or earlier is carried out): – One air inlet on the bottom. – Check the air inlet filter for contamination. – Two air outlets to the LH and RH side of the upper fuselage. Examine the RACC air inlets and outlets (if OÄM 42-193/d or later is carried out): – One air outlet on the bottom. – Check the RACC compartment ventilation filter on the LH side fuselage for contamination. – One air inlet on the LH side of fuselage. – Check evaporator drain on the bottom for blockage.	X*	X	X	X		
7.	Examine the RACC central unit (if OÄM 42-193 is carried out). Look specially for: – Insecure attachment of hoses, shrouds and cables. – Leakage of hoses. – Cleanness of drain tubes.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Interior Structure of the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
8.	Examine the RACC central unit (if OÄM 42-193 is carried out). Look specially for: – Defective bonding of the side brackets. – Incorrect attachment of the mounting panel. – Lack of mechanical stability of the mounting panel. – Insecure attachment of RACC components to the mounting panel. – Insecure attachment of hoses, shrouds and cables.		X	X			
9.	Perform a leakage test. (Refer to Chapter 21).					1 yr.	
10.	If OÄM 42-193/c or earlier is carried out: Check the compartment fan for incorrect operation.	X*	X	X	X		

B. Hydraulic System in the Rear Fuselage

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Hydraulic System in the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Check hydraulic module platform for improper or insecure attachment.		X	X	X		
2.	Check hydraulic components for damage and leakage.	X*	X	X	X		
3.	Ensure correct level of hydraulic fluid.	X*	X	X	X		
4.	Check condition of reservoir air filter.			X	X		
5.	Check accumulator for inner leakage and pre fill pressure.	X*	X	X	X		

C. Control System in the Rear Fuselage

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Control System in the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the push rod guides for the elevator push-rod. Look specially for: – Incorrect attachment. – Interference.	X*	X	X	X		
2.	Examine the elevator push-rod. Look specially for corrosion and damaged surface protection.	X*	X	X	X		
3.	Examine the rudder-control cables and turnbuckles. Look specially for: – Corrosion and wear. – Incorrect lock devices.	X*	X	X	X		
4.	Do a cable tension test of the rearward rudder control cables. (Refer to Section 27-20).	X*	X	X	X		

D. Miscellaneous Items in the Rear Fuselage

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Miscellaneous Items in the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Do an inspection of the ELT system. (Refer to Section 25-60).	X*	X	X	X	1 yr.	
2.	Examine the Garmin G1000 units behind the baggage compartment frame. Look specially for: – Insecure cable connections. – Insecure attachment.	X*	X	X	X		
3.	If OÄM 42-191 is installed: Examine the trim weight installation and retighten the attachment screws of the trim weight: – Remove trim weight assembly (Refer to Section 53-10). – Check the attachment structure in vertical tail for cracks, damage, and loose or missing anchor nuts. – Retighten attachment bolts of lead weight. – Reinstall trim weight assembly to vertical tail (Refer to Section 53-10).		X	X	X		
4.	If MÄM 42-231 is installed: Examine the trim weight installation. Look specially for cracks in vertical rib and bonding gap. Check attachment bolts for corrosion and ensure tight fit.		X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Miscellaneous Items in the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
5.	Examine the RACC central unit (if OÄM 42-193 is carried out). Look specially for: – Defective bonding of side brackets. – Incorrect attachment of mounting panel. – Lack of mechanical stability of mounting panel. – Insecure attachment of RACC components to mounting panel. – Insecure attachment of hoses, shrouds and cables.	X*	X	X	X		
6.	Check the condenser and evaporator for contamination and remove any accumulation of dust and dirt (if OÄM 42-193 is carried out).	X*	X	X	X		
7.	If OÄM 42-203 is carried out: Install the de-icing fluid tank. (Refer to Chapter 30-00).				X		

4. Center Wing

A. Center Wing, Exterior

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Center Wing, Exterior	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Remove all access panels in the center wing and the engine nacelles.	X*	X	X	X		
2.	Examine the complete surface of the center fuselage, center wing, and engine nacelles. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
3.	Do a coin-tap test for delamination of the entire center wing top and bottom shells. (Refer to Section 51-10).					MSI	
4.	Examine the air inlets for blockage: – In the engine nacelles. – In the RH center wing nose.	X	X	X	X		
5.	Visually inspect the wing main bolts. Look specially for play between the bolts and the bushes.	X*	X	X	X		
6.	De-fuel the airplane. (Refer to Section 12-10).			X	X		
7.	Do a function test of the fuel low-level switches: – Set the ELECT. MASTER switch to ON. – The L/R FUEL LOW caution messages must appear on the G1000 PFD. – Set the ELECT. MASTER switch to OFF.			X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Center Wing, Exterior	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
8.	Remove the wings from the center wing. (Refer to Section 57-10): – Examine the main bolts. Look specially for deformation, cracks, scratches, and corrosion. – Examine the main bolt bushes in the center wing spars. Look specially for deformation, cracks, and scratches and looseness. – Grease the main bolts. – Examine the A-bolts. Look specially for deformation, cracks, scratches, and corrosion. – Grease the A-bolts. – Examine the B-bolts. Look specially for deformation, cracks, scratches, and corrosion. – Grease the B-bolts. (Refer to Section 12-20).				X		

B. Center Wing, Interior

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Center Wing, Interior	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Visually inspect the inner skin of the center wing through all access holes with mirror and flashlight. Check for damage, cracks, delamination and disbonding from the sandwich foam.					MSI	
2.	Visually inspect the interior structure of the center wing through all access holes with mirror and flashlight. Check for damage, cracks, delamination and disbonding from the wing skin. Inspect the following components: – Front spar, inner and outer surfaces, specially in the area of the bushes for the main bolts. – Rear spar, inner and outer surfaces, specially in the area of the bushes for the main bolts. – Firewall (LH and RH). – Ribs in center wing nose, behind firewall (2 LH, 2 RH). – Root ribs (LH and RH; middle and rear). – Attachment ribs to fuselage (LH and RH; front, middle and rear). – Landing gear ribs (LH and RH). – Rib for landing gear lock struts (LH and RH). – Rib for wing flap bellcrank (LH and RH). – Rib connecting rear spar to trailing edge spar (LH; outboard of rib for flap bellcrank). – Guiding rib for flap push-rod (RH; inboard of rib for flap bellcrank). – Trailing edge spar (LH, RH).				X		

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Center Wing, Interior	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
3.	Examine the outer surfaces of the front and rear main spars, specially in the area of the bushes for the main bolts.		X	X	X		
4.	Examine the cable ties and electrical connectors. Look specially for rub marks. Pull lightly to make sure they are not loose.	X*	X	X	X		

C. Inner Flaps

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Inner Flaps	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the inner flaps. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
2.	Examine the inner flap hinges and horn. Look specially for too much play. (Refer to Section 27-00.) Play allowed: – Axial ± 1.00 mm (± 0.04 in). – Radial ± 0.25 mm (± 0.01 in).	X*	X	X	X		
3.	Examine the inner flap control system. Look specially for incorrect attachment and loose or missing lock devices. (Refer to Sections 27-10 and 27-50).	X*	X	X	X		
4.	Examine the inner flap push-rods: – Remove the inner flap push-rods from the center wing. – Check for corrosion and damaged surface protection. – Look specially for rub marks. – Install the inner flap push-rods. (Refer to Section 27-50).				X		

D. Miscellaneous Items in Center Wing & Nacelles

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Center Wing, Miscellaneous	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine all fuel system components firewall aft: – Look specially for signs of leakage and damage, chafings or material deterioration. – Make sure they are correctly attached.	X*	X	X	X		
2.	Examine the fuel cooler: – Look specially for leakage, damage, and insecure attachment. – Make sure the cooling fins are not blocked.	X*	X	X	X		

5. Tail

A. Tail, General

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Tail, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	If MÄM 42-600 is installed: Examine the rudder gap seal.		X	X	X		
2.	Remove the fairing for the horizontal stabilizer. (Refer to Section 55-10).	X*	X	X	X		
3.	Check rudder hinges for excessive play.	X*	X	X	X		
4.	Remove the rudder. (Refer to Section 55-40).	X*	X	X	X		
5.	Remove the elevator push-rod II. (Refer to Section 27-30).				X		
6.	Remove the horizontal stabilizer. (Refer to Section 55-10).					MSI	

B. Structure of the Vertical Tail

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Structure of the Vertical Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the complete surface of the vertical stabilizer. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
2.	Examine the tail fin (lower strake) on the bottom side of the fuselage tube. Look specially for: – Damage to the bottom of the fin. – Cracks at the junction to the fuselage.	X*	X	X	X		
3.	Visually inspect the inner skin of the vertical stabilizer through all access holes with mirror and flashlight. Check for damage, cracks, and delamination.					MSI	
4.	Visually inspect the interior structure of the vertical stabilizer through all access holes with mirror and flashlight. Check for damage, cracks, delamination and disbonding from the vertical tail skin. Inspect the following components: – Front web. – Rear web. – Lower rib (front and rear). – Rib for upper hinge. – Strake.				X		

C. Structure of the Horizontal Stabilizer

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Structure of the Horizontal Stabilizer	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the complete surface of the horizontal stabilizer. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
2.	Do a coin-tap test for delamination of the entire top and bottom shell of the horizontal stabilizer. (Refer to Section 51-10).					MSI	
3.	Examine the mounting brackets for the horizontal stabilizer. Look specially for cracks, deformation, and corrosion. Check the attachment bolts for corrosion. (Refer to Section 55-10).	X*	X	X	X		
4.	Examine the horizontal stabilizer tips. Look specially for cracks, dents, and loose or missing attachment screws. Examine the surface protection system.	X*	X	X	X		
5.	Remove the tips from the horizontal stabilizer. (Refer to Section 55-10).				X		
6.	Visually inspect the inner skin of the horizontal stabilizer through all access holes with mirror and flashlight. Look specially for damage, cracks, and delamination.					MSI	

*100 hr items marked * apply to US registered airplanes only*		Interval						
	Inspection Items, Structure of the Horizontal Stabilizer	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
7.	Visually inspect the interior structure of the horizontal stabilizer through all access holes with mirror and flashlight. Look specially for damage, cracks, delamination and disbonding from the horizontal tail skin. Inspect the following components: – Front spar. – Rear spar. – Trailing edge web. – Longitudinal ribs (LH and RH; front, middle, rear). – VT attachment box.				X		
8.	Install the tips to the horizontal stabilizer. (Refer to Section 55-10).				X		

D. Rudder

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Rudder	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the rudder skin. Look specially for: – Dents, cracks, holes, dis-bonding, and delamination. – Cracks and deformation on the bottom edge. – Damage to the surface protection system.	X*	X	X	X		
2.	Examine the lower bracket on the rudder. Look specially for: – Cracks and deformation. – Excessive wear on brass bushes. – Defective stop-screws. – Insecure attachment. – Loose or missing lock devices. – Defective powder coating.	X*	X	X	X		
3.	Check the upper hinge pin on the rudder for deformation, cracks, and corrosion.	X*	X	X	X		
4.	Examine the rudder trim tab. Look specially for: – Damage to the tab structure. – Damage to the surface protection system. – Incorrect attachment to the rudder. – Cracks in hinges. – Wear or excessive play of hinges. – Poor condition of the hinge wire. – Loose or missing lock devices.	X*	X	X	X		

E. Rudder Hinges and Control System in Vertical Tail

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Rudder Hinges and Control System in Vertical Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the rudder control cables. Look specially for: – Broken strands. – Defective or worn-out cable eyes. – Corrosion. – Poor general condition.	X*	X	X	X		
2.	Examine the support for the lower rudder hinge. Look specially for: – Cracks and deformation. – Insecure attachment. – Cracks, deformation or corrosion of stops. – Loose or missing lock devices. – Defective powder coating.	X*	X	X	X		
3.	Check the rudder hinges (top and bottom) for corrosion, insecure mounting, and poor general condition.	X*	X	X	X		
4.	Examine the rudder trim mechanism. Look specially for: – Deformation. – Incorrect attachment. – Loose or missing lock devices. – Wear. – Corrosion.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Rudder Hinges and Control System in Vertical Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
5.	Check the friction of the rudder trim mechanism. Verify smooth running on trim knob and proper function. – Correct friction force at the rudder trim friction rod: 3 daN - 5 daN (6.7 - 11.2 lbf.). – If the friction exceeds 5 daN (11.2 lbf.) polish the tube. – In case of new springs, cut up to 1.5 winds of the spring to reach friction value.	X*	X	X	X		

F. Elevator and Elevator Hinges

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Elevator and Elevator Hinges	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the elevator skin. Look specially for: – Dents, cracks, holes, dis-bonding, and delamination. – Damage to the surface protection system.	X*	X	X	X		
2.	Examine the fitting bushes for corrosion and looseness.				X		
3.	Check elevator horn for damage, deformation and cracks.	X*	X	X	X		
4.	Check elevator balancing masses for insecure attachment.	X*	X	X	X		
5.	Examine the elevator hinges. Look specially for: – Damage, cracks, and corrosion. – Loose or missing lock devices. – Excessive play. Play allowed: – Axial ± 1.00 mm (± 0.04 in). – Radial ± 0.25 mm (± 0.01 in).	X*	X	X	X		
6.	Examine the elevator trim tab. Look specially for: – Damage to the tab structure. – Damage to the surface protection elevator. – Incorrect attachment to the elevator. – Cracks in hinges. – Wear or excessive play of hinges. – Poor condition of the hinge wire. – Loose or missing lock devices.	X*	X	X	X		

G. Elevator Control System in Tail

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Elevator Control System in Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the elevator push-rods: – Check for damage, deformation, cracks, and corrosion. – Check for rub marks and defective powder coating. – Check rod end bearings for looseness and damage. – Check for insecure connection to the bellcrank or elevator horn. – Check for loose or missing lock devices.	X*	X	X	X		
2.	Examine the centering springs for the elevator control system. Look specially for damage and looseness.	X*	X	X	X		
3.	Examine the elevator push-rod which was removed from the rear fuselage. Look specially for rub marks. (Refer to Section 27-30).				X		
4.	Examine the elevator bellcrank in the vertical tail: – Check for damage, deformation, and cracks. – Check for insecure mounting. – Check for loose or missing lock devices.	X*	X	X	X		
5.	Examine the elevator trim mechanism. Look specially for: – Deformation. – Incorrect attachment. – Loose or missing lock devices. – Wear. – Corrosion.	X*	X	X	X		

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Elevator Control System in Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
6.	Adjust the friction of the elevator trim mechanism.	X*	X	X	X		

H. Miscellaneous Items in Tail

100 hr items marked * apply to US registered airplanes only		Interval					
	Inspection Items, Miscellaneous Items in Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	Note: The examination of the VHF antenna is not actually a part of the major structural inspection (MSI). It is however carried out at the same time because it can only be done with the horizontal stabilizer removed from the airplane.						
1.	Examine the VHF antenna.					MSI	
2.	Install the horizontal stabilizer. (Refer to Section 55-10).					MSI	
3.	Install the elevator push-rod which goes through the rear fuselage. (Refer to Section 27-30).				X		
4.	Install the rudder. Lubricate the rudder hinge bushes. Apply grease to the cable eyes. (Refer to Section 55-40).	X*	X	X	X		
5.	Install the fairing for the horizontal stabilizer. (Refer to Section 55-10).	X*	X	X	X		
6.	If installed, check porous panels of the ice protection system on the horizontal and vertical tail for damage.	X*	X	X	X		

6. Wings

A. Wings, General

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Wings, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Remove the winglets. (Refer to Section 57-10).				X		
2.	Remove the fuel tanks from the wings. (Refer to Chapter 28): – Remove the main fuel tanks from the wings. – If installed, remove the auxiliary fuel tanks from the engine nacelles (OÄM 42-056 carried out).				X		
3.	Remove the flap and aileron bell-crank access panels in the wing. (Refer to Section 52-40).	X*	X	X	X		

B. Wings, Structure

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Wings, Structure	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the complete surface of the wings. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
2.	Examine the winglets. Look specially for cracks, dents, and loose or missing attachment screws. Examine the surface protection system.	X*	X	X	X		
3.	Do a coin-tap test for delamination of the entire top and bottom wing shell. (Refer to Section 51-10).					MSI	
4.	Visually inspect the inner skin of the LH and RH wing through all access holes with mirror and flashlight or endoscope. Check for damage, cracks, delamination and disbonding from the sandwich foam.					MSI	
5.	Examine the wing spar stubs (inboard of the root rib). Look specially for damage, cracks, delamination and disbonding.				X		
6.	Examine the main bolt bushes in the wing spar stubs. Look specially for damage, deformation, cracks, and scratches and looseness.				X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Wings, Structure	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
7.	Visually inspect the interior structure of the LH and RH wing through all access holes with mirror and flashlight or endoscope. Check for damage, cracks, delamination and disbonding from the wing skin. Inspect the following components: – Front spar. – Rear spar. – Rear web. – Root rib (front, middle and rear). – End rib (on outboard edge). – 6 fuel tank attachment ribs. – Rib supporting aileron bellcrank. – Rib supporting flap bellcrank.				X		

C. Ailerons and Outer Flaps

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Ailerons and Outer Flaps	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the ailerons. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
2.	Examine the outer flaps. Look specially for damage (dents, cracks, holes and delamination). Examine the surface protection system.	X*	X	X	X		
3.	Examine the aileron mass balance. Look specially for cracks.	X*	X	X	X		
4.	Examine the aileron hinges and horn. Look specially for: – Damage, cracks, and corrosion. – Loose or missing lock devices. – Excessive play. Play allowed: – Axial ± 1.00 mm (± 0.04 in). – Radial ± 0.25 mm (± 0.01 in).	X*	X	X	X		
5.	Examine the outer flap hinges and horn. Look specially for: – Damage, cracks, and corrosion. – Loose or missing lock devices. – Excessive play. Play allowed: – Axial ± 1.00 mm (± 0.04 in). – Radial ± 0.25 mm (± 0.01 in).	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Ailerons and Outer Flaps	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
6.	Examine the aileron and flap control system. Look specially for incorrect attachment and loose or missing lock devices. (Refer to Sections 27-10 and 27-50).	X*	X	X	X		
7.	Examine the aileron push-rods: – Remove the aileron push-rods from the wings. – Check for corrosion and damaged surface protection. – Look specially for rub marks. – Install the aileron push-rods. (Refer to Section 27-10).				X		
8.	Examine the outer flap push-rods: – Remove the outer flap push-rods from the wings. – Check for corrosion and damaged surface protection. – Look specially for rub marks. – Install the flap push-rods. (Refer to Section 27-50).				X		

D. Fuel Tanks

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Fuel Tanks	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	Note: The inspection items shown in this table must also be applied to the auxiliary fuel tanks.						
1.	Visually check fuel tank bonding system through access panels for improper connections and damaged strips.	X*	X	X	X		
	WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.						
2.	Examine the fuel tank outlets: – Clean the finger filters. – Look for foreign matter. – Look for defective lock wire.				X		
3.	Remove the access covers.		X	X	X		
4.	Check condition of tank interconnecting hoses.		X	X	X		
5.	Check for leaks.	X	X	X	X		
6.	Collect a drain sample: – If sample is contaminated flush tank with removed drain valve.	X	X	X	X		
7.	Flush the tank: – Remove the drain valve. – Flush the fuel tank. – Check for debris and foreign objects. – Install the drain valve.			X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, Fuel Tanks	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
8.	Install the access covers.		X	X	X		
9.	Examine the fuel tank vents for blockage. – Open fuel filler cap and carefully blow through the LH-forward and RH-aft vent lines from outside into the tank with compressed air. – If MÄM 42-577 is installed: Open fuel filler cap and carefully blow through the vent all lines from outside into the tank with compressed air.	X	X	X	X		
10.	If the auxiliary fuel tanks are installed (OÄM 42-056): Examine the auxiliary fuel tank vents for blockage: – Open fuel filler cap and blow through the vent line from outside into the tank with compressed air. – Check vent hole in the fuel tank cap for blockage.	X	X	X	X		
11.	Examine the fuel tanks: – Look specially for corrosion, leaks and other damage. – Look for foreign objects in the tank. – Look for material deterioration, chafings or damage of the flexible fuel hoses connecting the fuel tank chambers. (Refer to Section 28-10)				X		

E. Wings, Miscellaneous

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, Wings, Miscellaneous	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the Pitot-static probe. Look specially for: – Incorrect attachment. – Damage. – Foreign objects.	X	X	X	X		
2.	Install the fuel tanks to the wings. (Refer to Chapter 28): – If incorporated (OÄM 42-056), install the auxiliary fuel tanks into the engine nacelles. – Install the main fuel tanks into the wings.				X		
3.	Install the wings. (Refer to Section 57-10).				X		
4.	Install the winglets. (Refer to Section 57-10).				X		
5.	Examine the stall warning sensor in the LH wing. Do a function test of the sensor.	X	X	X	X		
6.	Examine the placards on the wings. Make sure that: – They are not damaged. – None are missing. (Refer to Chapter 11).	X*	X	X	X		
7.	If installed, check porous panels of the ice protection system on the wings for damage.	X*	X	X	X		

7. General

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the Pitot-static system. – Clean the Pitot-static system. (Refer to Section 34-10).			X	X		
2.	If necessary, inspect optional equipment. Refer to: – Chapter 6 of the Airplane Flight Manual (Equipment List). – Chapter 9 of the Airplane Flight Manual (Supplements). – Chapter 05-00 of the Airplane Maintenance Manual (Referenced Maintenance Data).	X	X	X	X		
3.	Lubricate the airplane. (Refer to Section 12-20).	X	X	X	X		
4.	Measure the play in the aileron and elevator controls with the control surfaces locked. (Refer to Section 27-30). Look specially for too much play. Do the test at the top of the control stick. – Maximum play allowed ± 2.5 mm (± 0.1 in). (Refer to Section 27-10).	X*	X	X	X		
5.	Check flight controls and engine controls for improper operation and installation.	X*	X	X	X		
6.	Do a function test of the aileron control system. (Refer to Section 27-10).				X		
7.	Do a function test of the rudder control system. (Refer to Section 27-20).				X		
8.	Do a function test of the elevator control system. (Refer to Section 27-30).				X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
9.	Do an operational test of the variable elevator stop. (Refer to Section 27-30).				X		
10.	Do a function test of the rudder trim system. Look specially for incorrect operation and indication. (Refer to Section 27-21)				X		
11.	Do a function test of the elevator trim system. Look specially for incorrect operation and indication. (Refer to Section 27-38).				X		
12.	Do a function test of the flap system. (Refer to Section 27-50). Look specially at the pre-load. With the flaps set to UP: – Correct pre-load 3 - 5 daN (6.7 - 11.2 lbf).				X		
13.	Do a function test of the landing gear system. (Refer to Chapter 32): – Verify proper operation of the pressure accumulator (the hydraulic pump must stop operating after the pressure has built up). – Verify proper retraction and extension. – Verify correct landing gear indication. – Do a test of the landing gear warning with the flaps in LDG position, both power levers above 25 %. – Do a test of the landing gear warning with the flaps in UP position, LH power lever below 25 %, and RH power lever above 25 %. – Do a test of the landing gear warning with the flaps in UP position, RH power lever below 25 %, and LH power lever above 25 %. – Do a test of the emergency extension. (Refer to Section 32-30).	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
14.	Do a test of the steering linkage and nose wheel centering device: – Move the nose wheel to the left and right. – Verify proper operation of the steering linkage (to the rudder control system). – Verify the nose wheel returns to the neutral position.	X*	X	X	X		
15.	Examine the anti-corrosion coating of exterior parts. (Refer to Section 12-30). Replace coating on condition.		X	X	X		
16.	Lower the airplane off jacks. (Refer to Section 07-10).	X*	X	X	X		
17.	Do an operational test of the external lights.	X*	X	X	X		
18.	Do an operational test of the Pitot heat.	X*	X	X	X		
19.	LH/RH ECU backup battery fuses (32 A) and wiring check.	X*	X	X	X		
20.	If installed, do an operational test of the de-icing system. (Refer to Chapter 30).	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		Interval					
	Inspection Items, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
21.	Examine the airplane. Look specially for foreign objects, for example loose items and tools. Install these items, if previously removed: – All access panels. (Refer to Section 52-40). – The cabin baggage compartment (refer to Section 25-50). – The instrument panel cover (refer to Section 25-10). – The seat shells. (Refer to Section 25-10). – The control-stick boots. – The engine cowlings. (Refer to Section 71-10).	X	X	X	X		
WARNING: DO NOT LET PERSONS INTO THE DANGER AREA OF THE PROPELLER. PROPELLERS CAN CAUSE INJURY OR DEATH. **WARNING:** SET THE PARKING BRAKE TO ON. IF YOU DO NOT DO THIS THE AIRPLANE CAN MOVE. THIS CAN CAUSE INJURY OR DEATH.							
22.	Put chocks against the main airplane wheels.	X	X	X	X		
23.	Do the post maintenance engine test: – For the engine run procedures refer to the Airplane Flight Manual. – Record the data. (Refer to Section 05-28-91, Engine Ground Test Record).	X	X	X	X		
24.	Examine the engines for leakage.	X	X	X	X		
25.	Make sure the engine oil filters are tight (LH and RH engine). (Refer to Section 79-00).	X	X	X	X		
26.	Do a maintenance check flight. Put the engine ground test and the maintenance check flight reports in the Airplane Maintenance Log.	X*	X	X	X		

*100 hr items marked * apply to US registered airplanes only*		**Interval**					
	Inspection Items, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
27.	Complete the Maintenance Report and put it in the Airplane Maintenance Log.	X	X	X	X		
	Note: The manufacturer will use the completed Structural Findings Report for the continuous improvement of the Major Structural Inspection (MSI).						
28.	Complete the Structural Findings Report. Put one copy in the Airplane Maintenance Log. Send another copy to the manufacturer, i.e., Diamond Aircraft Industries GmbH Office of Airworthiness N. A. Otto-Str. 5 A-2700 Wiener Neustadt Austria by mail, fax (+43-2622-26780) or e-mail (airworthiness@diamond-air.at).					MSI	

Section 05-28-90
Maintenance Report

1. Maintenance Report

Complete a copy of the Maintenance Report after all of the applicable maintenance tasks in the Maintenance Checklist have been initialed.

DA 42 NG	
Airplane Serial Number:	Registration Number:
Check: ___________ (100 hr, 200 hr, 1000 hr, 2000 hr, Annual)	
REMARKS:	
The airplane is airworthy with respect to its maintenance condition. ___________________ ___________________ ___________________ Place Date Authorized	

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Section 05-28-91
Engine Ground Test Record

1. Engine Ground Test Record

Do the engine test in accordance with Section 71-00 and record results and comments.

WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER. MAKE SURE THAT:
- THE ELECT. MASTER SWITCH IS SET TO "OFF".
- THE ENGINE MASTER SWITCH IS SET TO "OFF".
- THE POWER LEVER IS SET TO "IDLE".

WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.

WARNING: WHEN YOU COMPLETE AN INSPECTION, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS/TOOLS FROM THAT AREA. LOOSE ITEMS/TOOLS CAN PREVENT FULL MOVEMENT OF THE AIRPLANE CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

CAUTION: YOU MUST ATTACH BLANKS/CAPS TO HOLES/PIPES WHEN YOU REMOVE COMPONENTS. IF YOU DO NOT DO THIS, UNWANTED DEBRIS CAN ENTER THE HOLES/PIPES. THIS CAN CAUSE BLOCKAGE TO THE AIRPLANE SYSTEMS.

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Section 05-28-92
Check Flight Report

1. Check Flight Report

Note: The maintenance check flight must be done in accordance with the applicable national regulations.

Diamond AIRCRAFT	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 42 NG Page 1 of 6
Registration:	Pilot:	Airdrome:
Date:	Take-Off:	Landing:

Functional Check, Flight Behavior	Findings		
	N/A	NO	YES
ON GROUND, ENGINES OFF			
Pre-flight inspection in accordance with AFM.			
Front baggage doors: mechanism, key lock, open door warning.			
Front canopy: locking mechanism, key lock, general condition / optics, open door warning.			
Rear door: mechanism, key lock, open door warning.			
Seat belts (4x): function, locking device, general condition.			
Front seats: fixed, general condition.			
Rear seats: locking mechanism, general condition.			
Baggage compartment: general condition.			
First aid kit.			
Flight controls: safety lacquer, centering springs.			
Trims: correct deflection.			
AFM: on board.			
Power levers, friction control.			
Instrument lighting and flood light.			
Map / reading lights.			
G1000 manual dim.			

Diamond AIRCRAFT	CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 42 NG Page 2 of 6		
		Findings		
Functional Check, Flight Behavior		**N/A**	**NO**	**YES**
Oxygen system (if installed).				
ON GROUND, ENGINES ON				
Engine start in accordance with AFM.				
Starting behavior.				
Warning / caution / advisory alerts.				
Engine parameters (indications): engine oil pressure / temperature, gearbox oil temperature, coolant temperature.				
Load / RPM (indications).				
Fuel quantity / temperature / fuel flow.				
Battery voltage / ammeters.				
Alternators.				
Altimeters (G1000 and backup).				
Airspeed indicators (G1000 and backup).				
Vertical speed indicator.				
Compass (G1000: slaved directional gyro; magnetic compass).				
Turn indicator.				
Attitude, bank (G1000 and backup).				
OAT (outside air temperature).				
G1000 emergency backup (red button).				
Flaps: full travel / intermediate position.				
Variable elevator stop.				
TKS annunciator test.				
Gear unsafe warning light.				
Fire test.				
Fuel cross feed.				
Electrical trim.				

Diamond AIRCRAFT	**CHECK FLIGHT** (See Maintenance Checklist for Applicability)	**DA 42 NG**		
		Page 3 of 6		
Functional Check, Flight Behavior		**Findings**		
		N/A	**NO**	**YES**
Autopilot (disconnect).				
Audio panel / intercom.				
COM 1 / COM 2.				
ELT.				
Moving map: satellite status, GPS position, terrain information.				
TAXIING (in accordance with AFM)				
Compass (G1000 and magnetic compass).				
Turn indicator.				
Attitude, bank.				
Brakes, pilot & co-pilot side.				
Taxiing behavior.				
BEFORE TAKE-OFF CHECK (in accordance with AFM)				
ECU test: normal behavior and warning sequence.				
ECU VOTER test.				
Available power check.				
Idle RPM.				
TAKE-OFF (in accordance with AFM)				
Gear retraction: hydraulic pump.				

Diamond AIRCRAFT	CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 42 NG		
		Page 4 of 6		
Functional Check, Flight Behavior		Findings		
		N/A	NO	YES
CLIMB (in accordance with AFM)				
Trim (pitch, direction).				
CRUISE (in accordance with AFM)				
Control behavior.				
Trim (pitch, direction).				
Engine parameters (indications): oil pressure / temperature, gearbox oil temperature, coolant temperature.				
Load / RPM (indications).				
Fuel quantity / temperature / fuel flow.				
Airspeed indicator (G1000 and backup).				
Altimeter (G1000 and backup).				
Alternate static valve.				
Vertical speed indicator.				
Compass (G1000: slaved directional gyro; magnetic compass).				
Turn indicator.				
Attitude, bank (G1000 and backup).				
If OÄM 42-224 is NOT installed: Propeller feathering (engine shut down).				
If OÄM 42-224 is NOT installed: Propeller unfeathering (engine restart): starting behavior.				
Emergency gear test.				
Stall warning test.				
Flight behavior at low airspeeds (according to AFM).				
Flight behavior at high airspeeds (according to AFM).				
Alternate air test.				
OAT (outside air temperature) / TAS / ground speed.				
NAV 1 / 2, DME, ILS (LOC, GS, MKR) (if required).				

Diamond AIRCRAFT	**CHECK FLIGHT** (See Maintenance Checklist for Applicability)	**DA 42 NG**		
		Page 5 of 6		
Functional Check, Flight Behavior		**Findings**		
		N/A	**NO**	**YES**
ADF (if required).				
Transponder.				
Moving map / GPS position.				
Autopilot: – Wings level mode. – HDG mode. – FD (flight director). – YD (yaw damper). – GA (go around mode). – NAV mode (if required) (on VLOC and GPS). – ALT / VS preselect and hold. – FLC mode. – CWS (control wheel steering) button. – Disconnect (red button).				
Cabin ventilation.				
Cabin heating.				
Cabin leaks / sounds.				
TKS system (if installed).				
TAS system (if installed).				
Stormscope (if installed).				
Aux. fuel transfer indication (if installed).				
Aux. fuel empty indication (if installed).				
Aux. fuel pump via main tank indication (if installed).				

Diamond AIRCRAFT	CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 42 NG Page 6 of 6		
Functional Check, Flight Behavior		**Findings**		
		N/A	**NO**	**YES**
DESCENT AND LANDING (in accordance with AFM)				
Function of flaps.				
Function of landing gear.				
Landing behavior.				
Braking action.				
AFTER LANDING CHECK AND SHUT-DOWN (in accordance with AFM)				
ELT.				
Engine shut-down behavior.				
Engine starting behavior, warm, LH and RH.				
OUTSIDE INSPECTION				
Damage.				
Engine oil / coolant / fuel / hydraulic leaks.				
Findings:				

Signature Pilot: ________________________

Section 05-28-93
Major Structural Inspection Check Findings Report

1. General

Complete the Structural Findings Report after each Major Structural Inspection (MSI). Record the following:

– Structural defects found during the MSI.

– All structural defects that were detected and repaired since new or since the last MSI.

STRUCTURAL FINDINGS REPORT DA 42 NG AT MAJOR STRUCTURAL INSPECTION (MSI)	
Registration : ____________________	Date : ________________
Airplane S/N : ___________________	Airplane Operating Hours : ________________
Maintenance Organization:	AMM Rev. used for check : ________________
	Signature : ________________

no.	structural defect/finding	repair method, remarks	at TSN

no.	structural defect/finding	repair method, remarks	at TSN

All defects have been repaired. The airplane is airworthy with respect to its maintenance condition.

Place: ______________________________

Date: ______________________________

Authorized: ______________________________

Section 05-50
Unscheduled Maintenance Checks

1. General

Unscheduled maintenance checks are necessary after any incident that could cause damage to the airplane.

2. Hard Landing Check

Figure 1 shows the hard landing check areas. You must do a hard landing check when the pilot makes a report of a hard landing. Or when ground handling applies unusual loads.

A. Equipment

Item	Quantity	Part No.
Slide sheets.	4	Commercial.

B. Procedure

	Detail Steps/Work Items	Key Items
(1)	Remove the access panels for the main and nose landing gear.	Refer to Section 52-40.
(2)	Examine the landing gear fittings. Look specially for cracks.	Use a mirror and a flashlight.
(3)	Examine the fuselage and center wing structure where the landing gear attaches. Look specially for: – Disbonds. – Delamination of the CFRP structure. – Damage to the mounting brackets.	Refer to Section 32-10.
(4)	Examine the landing gear struts. Look specially for: – Bending. – Cracks.	Refer to Section 32-10.
(5)	Do a test of wheel track and camber.	Refer to Section 32-10.

	Detail Steps/Work Items	Key Items
(6)	Examine the tires. Look specially for cuts in the side walls.	Refer to Section 32-40.
(7)	Examine the brake discs. Look specially for damage. Turn the wheel and make sure the disc is not bent.	
(8)	Remove the load from the nose-gear and examine it. Look specially for more than the usual play.	
CAUTION: IF YOU THINK THE AIRPLANE HAS DAMAGE TO AN AREA THAT TRANSMITS A LOAD, YOU MUST ASK THE AIRPLANE MANUFACTURER FOR ADVICE.		
(9)	Examine the structure in the bottom of the fuselage nose for delamination. Look specially in the area of the bearings for the nose-gear assembly.	
(10)	Examine the control surfaces. Look specially for: – Correct attachment of the hinges. – Correct attachment of the mass balance to the structure.	
(11)	Examine the leading edge of the wing for damage.	
(12)	Examine the area of the spar attachments to the wing shells. Look specially for cracks.	
(13)	Examine the leading edge of the horizontal and vertical stabilizers for damage.	
(14)	Examine the engine mounts.	
(15)	Examine the engine mount points on the firewall.	
(16)	Examine the propellers. Look specially to see if a propeller has touched the ground.	

	Detail Steps/Work Items	Key Items
If the adjustable front seats (OÄM 42-067 or OÄM-42-259) are installed: CAUTION: DO NOT LOOSEN THE LEVER FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.		
(17)	If the adjustable front seats (OÄM 42-067 or OÄM-42-259) are installed: Do a test of the backrest adjustment mechanism on both front seats. (Refer to Section 25-10).	

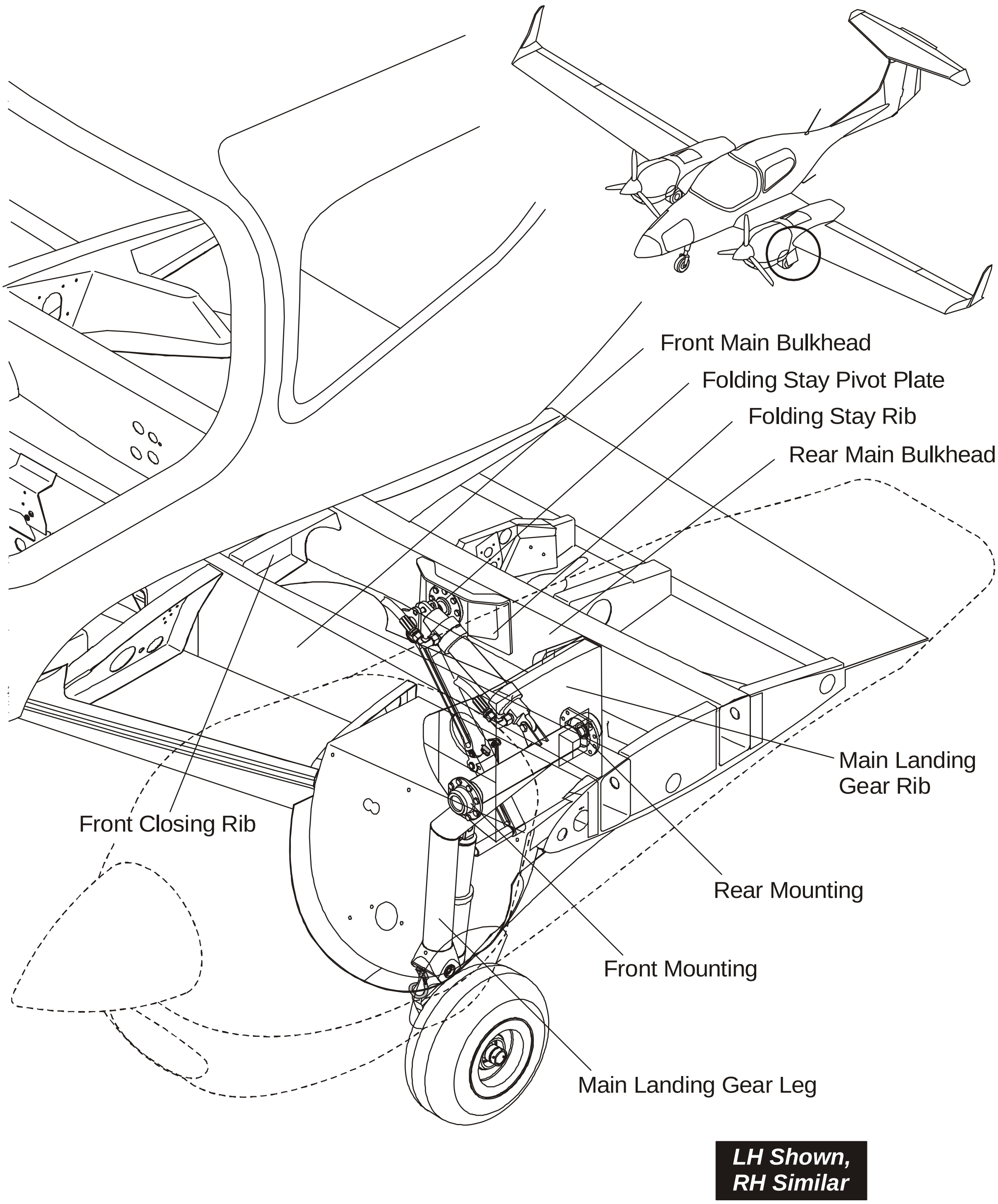

Figure 1: Hard Landing Check Areas - Main Landing Gear

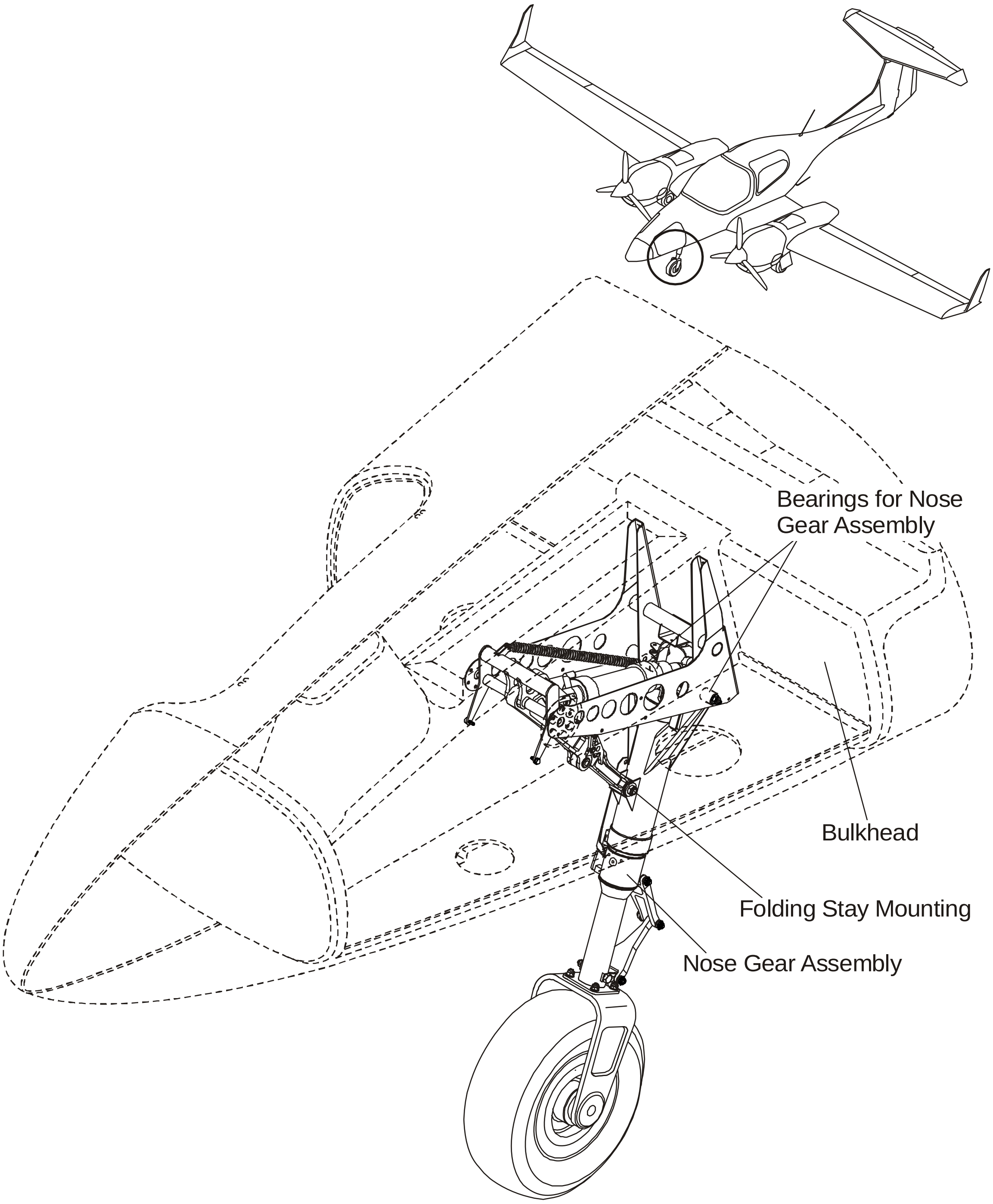

Figure 2: Hard Landing Check Areas - Nose Landing Gear

3. Gear Up Landing Check

	Detail Steps/Work Items	Key Items
(1)	Perform a hard landing check.	Refer to Paragraph 2, Hard Landing Check.
(2)	Examine the nose cone in the propeller area for external damages.	
(3)	Examine the fuselage to center wing attachment screw joint on lower surface.	
(4)	Examine the foot step attachment structure inboard and outboard: – Remove the aft baggage compartment.	 Refer to Section 52-50.
(5)	Examine the fuselage bonded joints: – Between LH and RH fuselage shell for cracks. – Between fuselage tube shell and ventral fin. – On leading edge of the ventral fin. – Between vertical stabilizer front, rear web, and fuselage shell. In case of doubt do a coin tap test.	Refer to Section 51-10.
(6)	Examine the antennas for damage.	
(7)	Examine the engine nacelle structure and bonding surfaces in- and outboard for cracks and delamination.	
(8)	Examine the engine mount for damages.	
(9)	Examine the engine cowlings and cowling attachment surface for cracks.	
(10)	If auxiliary fuel tanks (OÄM 42-056) are installed, examine auxiliary tank belt holding angle bracket for cracks.	

4. Propeller Strike

A propeller strike can be a moving propeller (engine running) which has hit a solid object. Or it can be a moving object that hits a propeller that is not moving.

A. Propeller Strike with the Engine Running

If the propeller has hit a solid object while the engine was running:

	Detail Steps/Work Items	Key Items
(1)	Remove the propeller.	Refer to Chapter 61.
(2)	Proceed according to Austro Engine Maintenance Manual, latest revision.	
(3)	Do an inspection of the engine mount.	Refer to Section 71-20.
(4)	Do an inspection of the propeller.	Refer to the Propeller Owner's Manual.

B. Propeller Hit by a Moving Object

If a propeller which is not moving is hit by a moving object:

	Detail Steps/Work Items	Key Items
(1)	Do an inspection of the propeller. If the propeller must be removed to do a repair other than minor dressing of the blades, you must do the inspection procedure specified for a moving propeller strike.	Refer to the Propeller Owner's Manual.
(2)	Inspect the airplane for damage.	

5. Engine Fire

WARNING: BEFORE YOU DO WORK ON THE AIRPLANE MAKE SURE THE FIRE HAS BEEN EXTINGUISHED. LET THE ENGINE COOL AND DISCONNECT THE BATTERY.

WARNING: FIRE CAN SERIOUSLY WEAKEN CFRP. IF YOU FIND ANY DAMAGE TO CFRP, DO NOT OPERATE THE AIRPLANE. ASK THE MANUFACTURER FOR ADVICE.

	Detail Steps/Work Items	Key Items
(1)	Remove the engine cowlings.	Refer to Section 71-10.
(2)	Disconnect the airplane batteries (main battery and ECU backup batteries).	Refer to Section 24-31.
(3)	Examine the engine cowlings. Look specially for signs of fire damage.	
(4)	Examine the electrical cables. Look specially for signs of fire damage.	Replace damaged cables.
(5)	Examine the fuel lines. Look specially for signs of fire damage to the fire-protection sleeves.	Replace damaged fuel lines.
(6)	Examine the engine oil lines. Look specially for signs of fire damage to the fire-protection sleeves.	Replace damaged oil lines.
(7)	Examine the engine. Look specially for: – Damage to the engine air filter. – Damage to gaskets and seals. – Damage to the engine shock mounts. – Damage to the engine mount. – Damage to pipes/hoses.	Make a record of the damage you find and ask the engine manufacturer for advice before you repair or operate the engine.

	Detail Steps/Work Items	Key Items
(8)	Examine the engine nacelles. Look specially for: – Blisters on the paint or burn marks. – Disbonding of the nacelle skin from the firewall. If you find any damage, ask the airplane manufacturer for advice.	
	WARNING: DO NOT GET FIRE EXTINGUISHER PARTICLES ON YOU. THE CHEMICALS USED TO EXTINGUISH A FIRE CAN BE CAUSTIC/POISONOUS. WHEN YOU CLEAN THE ENGINE REFER TO THE FIRE EXTINGUISHER MANUFACTURER'S SAFETY INSTRUCTIONS. USE SAFETY MASKS AND GLOVES AS RECOMMENDED.	
(9)	Clean the engine. Make sure you clean all the fire extinguisher particles from the engine.	Refer to the manufacturer of the fire extinguisher.
(10)	Connect the airplane batteries (main battery and ECU backup batteries).	Refer to Section 24-31.
(11)	Trouble-shoot the engine. Find the cause of the engine fire. Repair the defect if possible.	Ask the engine manufacturer for advice before you repair or operate the engine.
(12)	Install the engine cowlings.	Refer to Section 71-10.
(13)	Do an engine test.	Refer to the AE Maintenance Manual, latest revision.

6. Lightning Strike

A lightning strike usually enters the airplane at one point and leaves the airplane at another point. These points are called "attachment points". You usually find these points at the extremities of the airplane. You will often find the most damage to the airplane occurs at the attachment points. There can be more than two attachment points.

When a lightning strike is reported you must do the inspection procedure at Sub-paragraph D before the next flight.

A. Group 1 Damage

Group 1 damage is the direct damage caused by the lightning strike. To find this damage you must carefully examine all the external surface of the airplane. Look specially for burn marks, holes, discoloration or other physical damage. If you find this damage you must remove panels or equipment to look for damage on the inside of the airplane. Look specially around the area of the external damage.

You must also examine the airplane lightning protection system. Look specially for signs of heat damage or distortion to the conduction tubes and bonding strips. Also look for heat damage in the structures around the conduction tubes and bonding strips. Refer to Section 51-80 for data about the lightning protection system.

B. Group 2 Damage

Group 2 damage is the indirect damage caused by the lightning strike. It is mostly caused by the electromagnetic fields associated with lightning strikes. The electromagnetic fields can induce temporary voltages into the wiring system. These temporary voltages can cause damage to the electrical and electronic components of the airplane. Refer to the Wiring Diagrams for data about the electrical wiring.

Note: If you find any lightning damage you must make a record of the damage and ask Diamond Aircraft for advice before you repair or operate the airplane.

C. Equipment

Item	Quantity	Part No.
Bonding tester.	1	Commercial.

D. Lightning Strike Inspection

	Detail Steps/Work Items	Key Items
(1)	Examine the surface of the complete fuselage assembly. Look specially in these areas: – Propellers and spinners. – Exhaust pipes. – Engine breather. – Canopy handles. – Antennas. – Static discharge wicks. – Vertical fin tip. – Rudder. – Lower fin.	If you find any damage you must examine the airplane internally, specially in the area of the external damage. Make a record of the damage you find and ask Diamond Aircraft for advice before you repair or operate the airplane. If you find any sign of a lightning strike on the propellers, spinners, exhaust pipes or engine breather remove the engine from the airplane and send it back to Austro Engine GmbH. Refer to Section 71-00 for engine removal.

	Detail Steps/Work Items	Key Items
(2)	Examine the surface of the left wing for lightning damage. Look specially in these areas: – Pitot-static probe. – Stall warning switch. – Static discharge wicks. – Winglet. – Wing tip light assembly. – Wing trailing edge. – Aileron trailing edge. – Flap trailing edge. – Aileron horn. – Flap horn.	If you find any damage you must examine the airplane internally, specially in the area of the external damage. Make a record of the damage you find and ask Diamond Aircraft for advice before you repair or operate the airplane.
(3)	Examine the surface of the right wing for lightning damage. Look specially in these areas: – Winglet. – Static discharge wicks. – Wing tip light assembly. – Wing trailing edge. – Aileron trailing edge. – Flap trailing edge. – Aileron horn. – Flap horn.	If you find any damage you must examine the airplane internally, specially in the area of the external damage. Make a record of the damage you find and ask Diamond Aircraft for advice before you repair or operate the airplane.

	Detail Steps/Work Items	Key Items
(4)	Examine the surface of the horizontal stabilizer for lightning damage. Look specially in these areas: – Horizontal stabilizer tip. – Static discharge wicks. – Trailing edge. – Elevator trailing edge. – Trim tab.	If you find any damage you must examine the airplane internally, specially in the area of the external damage. Make a record of the damage you find and ask Diamond Aircraft for advice before you repair or operate the airplane.
(5)	Examine the main landing gear. Look specially in these areas: – Main gear leg attachment points.	Refer to Section 32-10.
(6)	Examine the nose landing gear. Look specially in these areas: – Nose gear attachment points.	Refer to Section 32-20.
(7)	Operate the flight controls through their complete range of movement. Look specially for: – Stiff or unusual feel during movement. – Restriction of movement. – Noisy operation.	Refer Section 27-00.
(8)	Examine the metal conduction tubes and bonding strips in the fuselage and in the wings. Look specially for: – Heat damage or discoloration. – Fusion of bonding joints. – Burn or scorch marks to the structure around the conduction tubes. Use the bonding tester when you are not able to see the whole length of a tube or bonding strip.	Make a record of any damage you find and ask Diamond Aircraft for advice before you repair or operate the airplane. Refer to Section 51-80. Follow the instructions of the tester manufacturer. The resistance must be in accordance with Section 51-80.

	Detail Steps/Work Items	Key Items
(9)	Do a test of these lighting systems: – External lights: – Position lights. – Strobe lights. – Landing light. – Taxi light. – Ice detection light (if installed). – Internal lights: – Instrument panel lights. – Instrument flood lights. – Map reading lights.	Refer to Section 33-40. Refer to Section 33-10.
(10)	Do a test of the Pitot heat system.	Refer to Section 34-10.
(11)	Do a test of all functions on the G1000 system.	
(12)	If OÄM 42-270 is installed: Do a test of all functions of the Standby Attitude Module MD302.	
(13)	Operate the engine power levers through their range of movement. Look specially for: – Stiff or unusual feel during movement. – Restriction of movement. – Noisy operation.	Refer to Section 76-10.
(14)	Do a visual check of engine bondings and wirings.	

	Detail Steps/Work Items	Key Items
(15)	Operate the cockpit heating controls through their range of movement. Look specially for: – Stiff or unusual feel during movement. – Restriction of movement. – Noisy operation.	Refer to Section 21-40.
(16)	Operate the parking brake control through its range of movement. Look specially for: – Stiff or unusual feel during movement. – Restriction of movement. – Noisy operation.	Refer to Section 32-40.
(17)	Do an engine run-up. Look specially for abnormal operation of the following systems: – Engine indicating systems. – DC generation.	Refer to Section 71-00. Refer to Section 31-00. Refer to Section 24-30
(18)	Do an ECU test.	Refer to Section 76-00.
(19)	Do an ECU VOTER test.	Refer to Section 76-00.
(20)	Visually check engine-sensors, harness and -systems for damages caused by indirect effects of lightning.	Ask the engine manufacturer for advice.
(21)	Do a compass check swing.	

7. Over Temperature

	Detail Steps/Work Items	Key Items
(1)	Check the fluid level and leakage.	
(2)	Check data and oil sample and send it to Austro Engine GmbH.	

8. High Oil Consumption

	Detail Steps/Work Items	Key Items
(1)	Check engine for oil leakage.	
(2)	Check the compression.	

9. Oil Pressure Loss

	Detail Steps/Work Items	Key Items
(1)	Check the oil quantity.	
(2)	Check the indication.	
(3)	Check the wiring.	
(4)	Check if negative g-load flights have been conducted. (Visual inspection of the breather outlet for oil contamination).	

10. Hang Start

	Detail Steps/Work Items	Key Items
(1)	Check voltage.	
(2)	Check battery condition.	
(3)	Read out data and send to Austro Engine GmbH.	

11. Overweight Landing Check

You must do an overweight landing check when the pilot makes a report of a landing with a mass in excess of the maximum landing mass (overweight landing). In case the pilot reports a hard and overweight landing, refer to Paragraph 2, Hard Landing Check.

A. Equipment

None.

B. Procedure

	Detail Steps/Work Items	Key Items
(1)	Examine the landing gear fittings. Look specially for cracks.	Use a mirror and a flashlight.
(2)	Examine the fuselage and center wing structure where the landing gear attaches. Look specially for: – Disbonds. – Delamination of the CFRP structure. – Damage to the mounting brackets.	Refer to Section 32-10.
(3)	Examine the landing gear struts. Look specially for: – Bending. – Cracks.	Refer to Section 32-10.
(4)	Examine the tires. Look specially for detoriation on the inner the side walls.	Refer to Section 32-40.
(5)	Examine the brake discs. Look specially for damage. Move the airplane to turn the wheel and make sure the disc is not bent.	
(6)	Examine the structure in the bottom of the fuselage nose for delamination. Look specially in the area of the bearings for the nose-gear assembly.	

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CHAPTER 06

DIMENSIONS AND AREAS

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CHAPTER 06

DIMENSIONS AND AREAS

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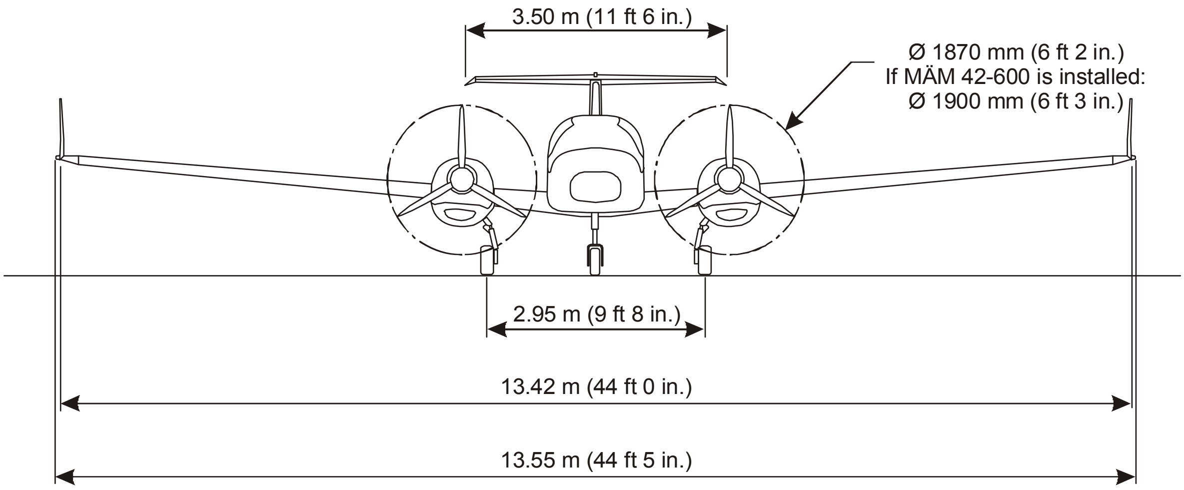
CHAPTER 06
DIMENSIONS AND AREAS

1. General

The DA 42 NG uses the System Internationale (SI) for dimensions and areas. Imperial dimensions are also given in brackets. For example: Wing span 13.42 m (44.03 ft).

Conversions between SI units and imperial units are given in Chapter 02.



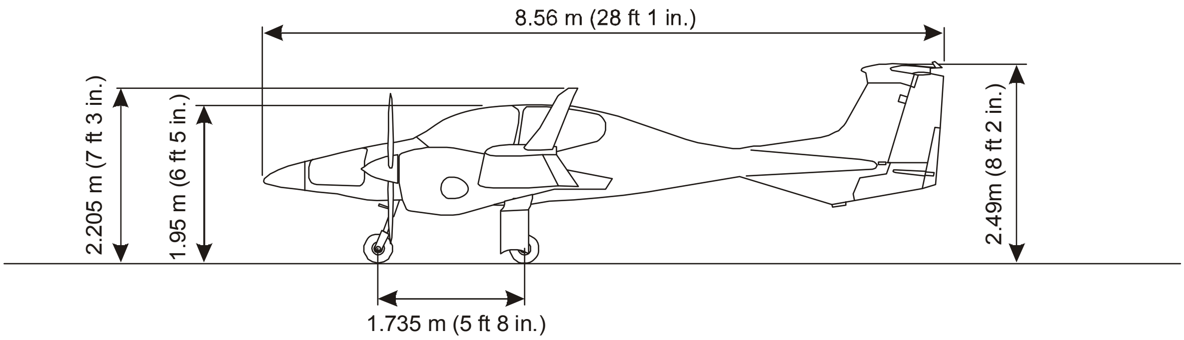


Figure 1: DA 42 NG Overall Dimensions (Approximate Values)

2. Dimensions

DA 42 NG Dimensions	
Overall Dimensions	
Wing span	13.42 m (44 ft) 13.55 m (44 ft 5 in) including ACL
Length	8.56 m (28 ft 1 in)
Height (nominal)	2.49 m (8 ft 2 in)
Wing Outer	
Airfoil	Wortmann FX63-137/20-W4
Wing area (each wing, without winglets, flaps and aileron)	3.91 m² (42.09 ft²)
Winglets (each)	0.40 m² (4.31 ft²)
Dihedral (nominal)	5.5°
Aspect ratio	11.06
Sweep back	1°
Wing Center Section	
Area (total without inner flaps)	6.16 m² (66.31 ft²)
Inner Flaps	
Span	2 x 1.42 m (2 x 4 ft 8 in)
Area	2 x 0.43 m² (2 x 4.63 ft²)
Horizontal Tail Surfaces	
Span	3.50 m (11 ft 6 in)
Area (with tips, without elevator)	1.79 m² (19.27 ft²)
Angle of incidence	-1°
Elevator	
Span	2.96 m (9 ft 9 in)
Area (without trim-tab)	0.58 m² (6.24 ft²)
Trim-tab	0.08 m² (0.86 ft²)

DA 42 NG Dimensions	
Aileron	
Span	2 x 1.67 m (2 x 5 ft 6 in)
Area	2 x 0.33 m² (2 x 3.55 ft²)
Outer Flaps	
Span	2 x 2.83 m (2 x 9 ft 3 in)
Area	2 x 0.65 m² (2 x 7.00 ft²)
Rudder	
Span	1.55 m (5 ft 1 in)
Area	0.79 m² (8.50 ft²)
Rudder Trim-Tab	
Span	0.71 m (2 ft 4 in)
Span (if MÄM 42-600 is installed)	0.77 m (2 ft 6 in)
Area	0.06 m² (0.65 ft²)
Area (if MÄM 42-600 is installed)	0.087 m² (0.94 ft²)
Landing Gear (typical static, normal load)	
Wheel track	2.95 m (9 ft 8 in)
Wheel base	1.735 m (5 ft 8 in)
Main Wheel	
Tire: Goodyear	15x6.0-6, 6 PR, TT, 160 mph, FS II Only if MÄM 42-659 is installed: 15x6.0-6, 6 PR, TT, 160 mph, FS II / FC III
Tire inflation pressure	4.7 bar (68 PSI)
Damper gas pressure (unloaded)	19 bar (276 PSI)
Nose Wheel	
Tire: Goodyear	5.00-5, 10 PR, TT, 120 mph, FS II
Tire inflation pressure	6 bar (87 PSI) If MÄM 42-659 is installed: 6.1 bar (88 PSI)
Damper gas pressure (unloaded)	16 bar (232 PSI) If MÄM 42-659 is installed: 10 bar (145 PSI)

3. Adjustment Reports

The measurements of the DA 42 NG are recorded on an Adjustment Report and the Main Landing Gear Wheel Track and Camber Report at the factory when the airplane is built. See Figures 2 thru 10. These reports become part of the airplane records.

When you measure the dimensions, use the Adjustment Report as reference to show any deviations.

4. Weight and Static Moments of Control Surfaces

WARNING: IF YOU REPAINT (OR DO REPAIRS TO) THE CONTROL SURFACES, YOU MUST MAKE SURE THAT THE WEIGHT AND STATIC MOMENTS OF THE CONTROL SURFACES ARE IN THE LIMITS GIVEN IN THE CONTROL SURFACE BALANCE REPORT. THIS WILL PREVENT CONTROL SURFACE FLUTTER.

To measure the static moments you must remove the control surface from the airplane. Refer to Section 51-60 for the measuring procedure.

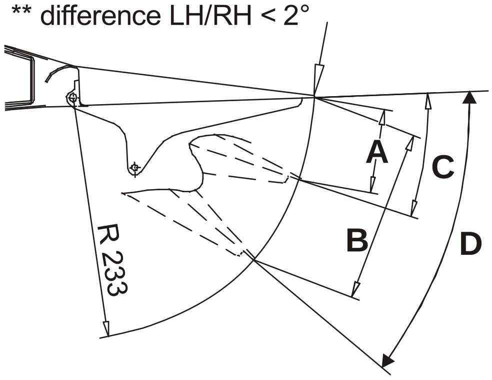
If the values are not within the limits in the Control Surface Balance Report, you must ask the manufacturer for advice before you adjust the balancing weight.

(1) Control Surface Adjustment Reports

	Flaps						Ailerons					
	Cruise		Take-Off		Landing		Up		Neutral		Down	
	left	right	left	right	left	right	left	right	left	right	left	right
Travel Limits [mm]	0 +8/-0		81 +16/-8 (see A)		167 +12/-4 (see B)		87 ±7 (see E)		0 ±3.5		52 +7/-0 (see F)	
Travel Limits [in.]	0 +0.32/-0		3.19 +0.64/-0.32 (see A)		6.57 +0.48/-0.16 (see B)		3.43 ±0.27 (see E)		0 ±0.14		2.06 +0.27/-0 (see F)	
Travel Actual												
Angle Limits [°]	0 +2/-0*		20 +4/-2 (see C)**		42 +3/-1 (see D)**		25 ±2 (see G)		0 ±1		+15 +2/-0 (see H)	
Angle Actual [°]												
	Split - Flap		Flap									
Initial Load Limit [kp]	3-10 (6.6-22.0 lbf)		3-5 (6.6-11.0 lbf)									
Initial Load Actual [kp]												

* difference LH/RH < 1°

** difference LH/RH < 2°



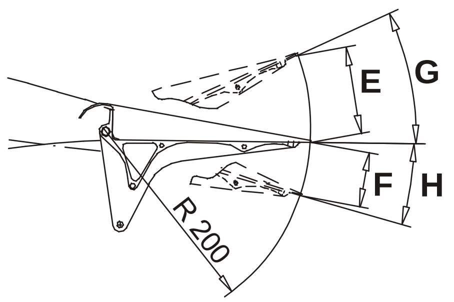
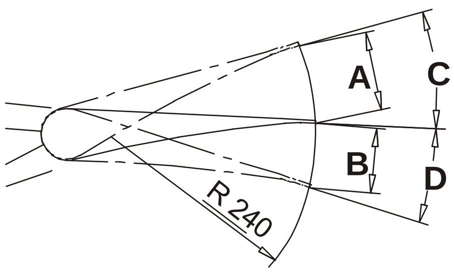


Figure 2: Control Surface Adjustment Report - Flaps and Ailerons

	Elevator		Rudder	
	up	down	left	right
Travel Limits [mm]	65 ±2 (see A)	54 ±4 (see B)	229 ±9 (see E)	245 ±9 (see F)
Travel Limits [in.]	2.55 ±0.08 (see A)	2.14 ±0.16 (see B)	9.01 ±0.34 (see E)	9.66 ±0.34 (see F)
Travel Actual				
Angle Limits [°]	15.5 ±0.5 (see C)	13 ±1 (see D)	27 ±1 (see G)	29 ±1 (see H)
Angle Actual [°]				

	up with variable elevator stop active
Travel Limits [mm]	54 ±2 (see A)
Travel Limits [in.]	2.14 ±0.08 (see A)
Travel Actual	
Angle Limits [°]	13 ±0.5 (see C)
Angle Actual [°]	



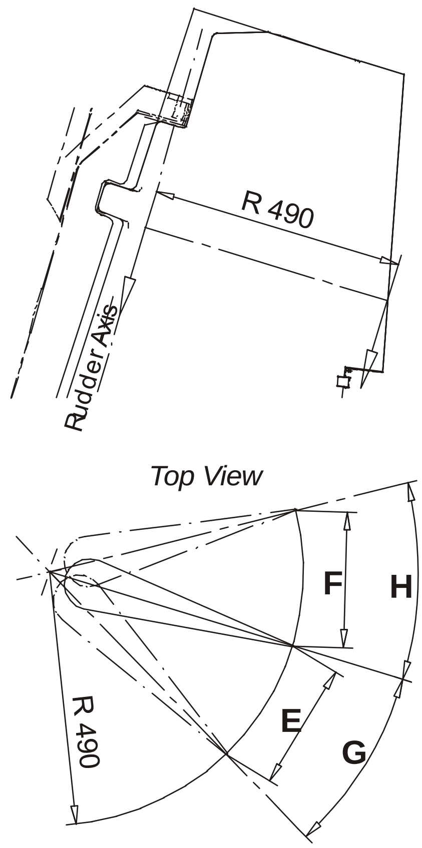


Figure 3: Control Surfaces Adjustment Report - Elevator and Rudder

	Elevator Trim								
	Elevator 10° Up			Elevator Neutral			Elevator 10° Down		
	Nose down	Neutral	Nose up	Nose down	Neutral	Nose up	Nose down	Neutral	Nose up
Travel Limits [mm]	55 ±7	23 ±5	28 ±8	40 ±7	8 ±5	45 ±7	28 ±9	5 ±5	67 ±4
Travel Limits [in.]	2.17 ±0.28	0.91 ±0.20	1.10 ±0.31	1.57 ±0.28	0.31 ±0.20	1.77 ±0.28	1.10 ±0.35	0.20 ±0.20	2.64 ±0.16
Travel Actual									
Angle Limits [°]	35 ±5	14 ±3	17 ±5	25 ±5	5 ±3	28 ±5	17 ±6	3 ±3	45 ±4
Angle Actual [°]									

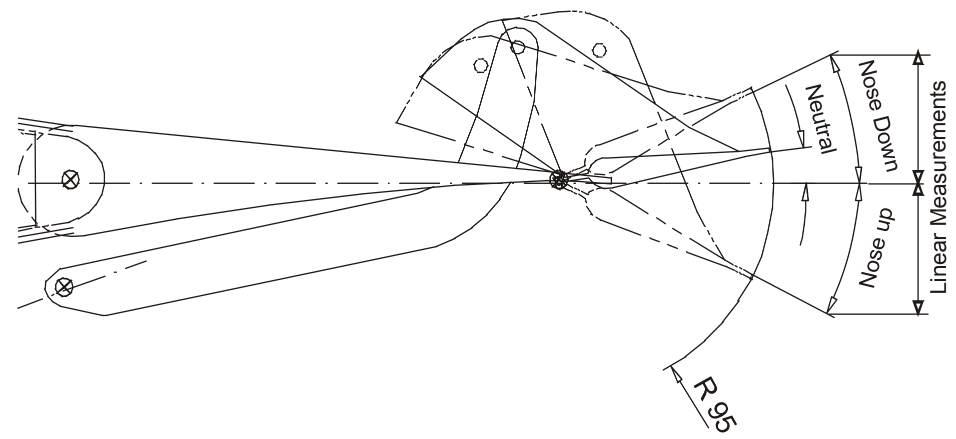


Figure 4: Control Surfaces Adjustment Report - Elevator Trim

	Rudder Trim								
	Rudder 20° LH			Rudder neutral			Rudder 20° RH		
	Trim RH	Trim Neutral	Trim LH	Trim RH	Trim Neutral	Trim LH	Trim RH	Trim Neutral	Trim LH
Travel Limits [mm]	61 ±6	15 ±4	25 ±6	51 ±4	7 ±2	47 ±4	47 ±6	3 ±4	58 ±6
Travel Limits [in.]	2.40 ±0.24	0.59 ±0.16	0.98 ±0.24	2.01 ±0.16	0.28 ±0.08	1.85 ±0.16	1.85 ±0.24	0.12 ±0.16	2.28 ±0.24
Travel Actual									
Angle Limits [°]	54 ±5	13 ±3	22 ±5	45 ±3	6 ±2	41 ±3	41 ±5	3 ±3	51 ±5
Angle Actual [°]									

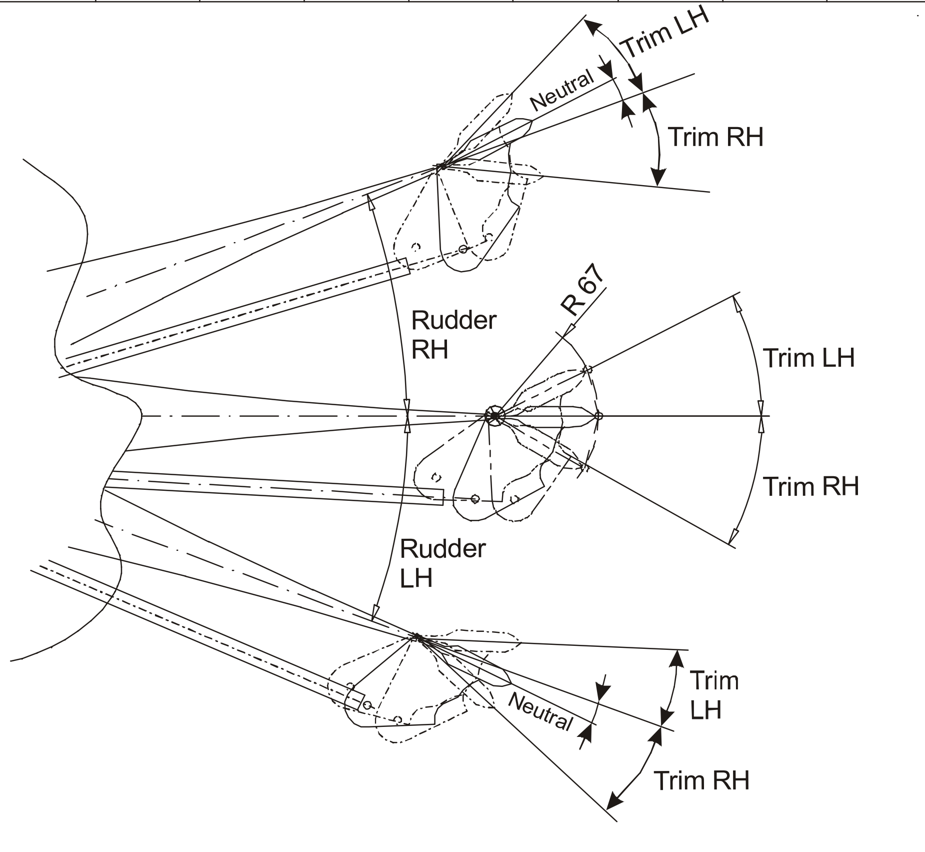
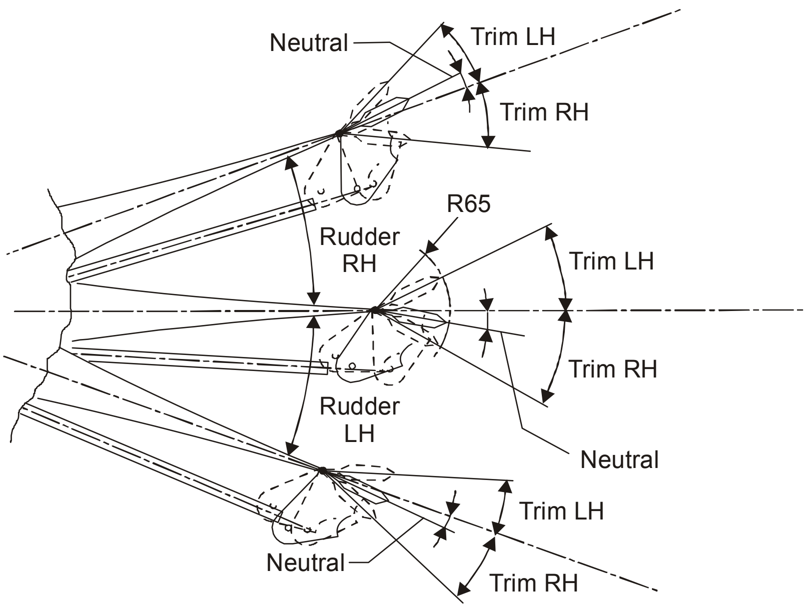


Figure 5: Control Surfaces Adjustment Report - Rudder Trim

Rudder Trim							
	Rudder 20° LH		Rudder Neutral			Rudder 20° RH	
	Neutral	Left Trimmed	Right Trimmed	Neutral	Left Trimmed	Right Trimmed	Neutral
Angle Limits (°)	15 ±3*	26 ±5*	48 ±3	6 ±3	36 ±5	40 ±5*	3 ±3*
Actual Angle (°)							



* Needs only be checked, if rudder trim system components are replaced.

Figure 6: Control Surfaces Adjustment Report - Rudder Trim (if MÄM 42-600 and MÄM 42-885 are installed)

	Rudder Trim								
	Rudder 20° LH			Rudder Neutral			Rudder 20° RH		
	Right Trimmed	Neutral	Left Trimmed	Right Trimmed	Neutral	Left Trimmed	Right Trimmed	Neutral	Left Trimmed
Travel Limits [mm]	40 ±6	1 ±4	42 ±6	50 ±4	4 ±2	45 ±4	54 ±6	8 ±4	31 ±5
Travel Limits [in.]	1.57 ±0.24	0.04 ±0.16	1.65 ±0.24	1.97 ±0.16	0.16 ±0.08	1.77 ±0.16	2.13 ±0.24	0.31 ±0.16	1.22 ±0.20
Travel Actual									
Angle Limits [°]	35 ±5	1 ±3	36 ±5	43 ±3	3 ±2	39 ±5	47 ±5	7 ±3	27 ±5
Angle Actual [°]									

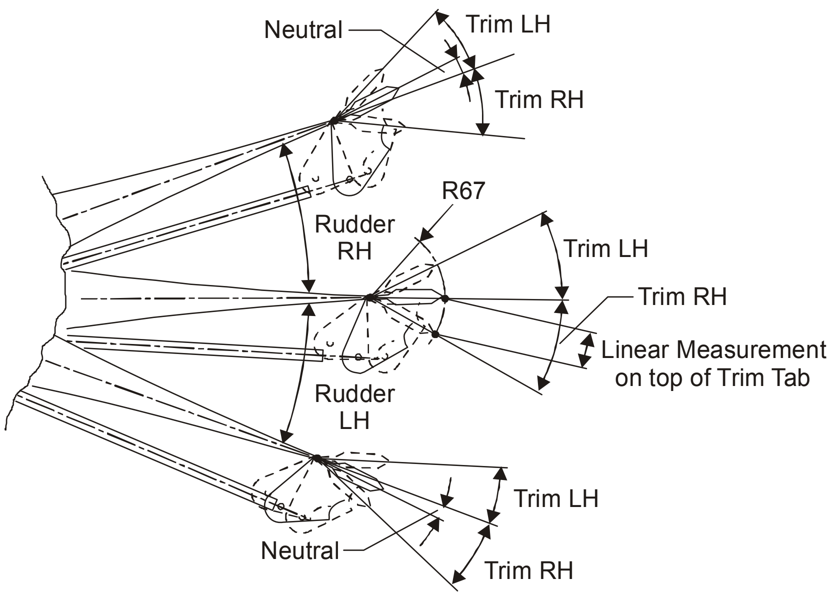
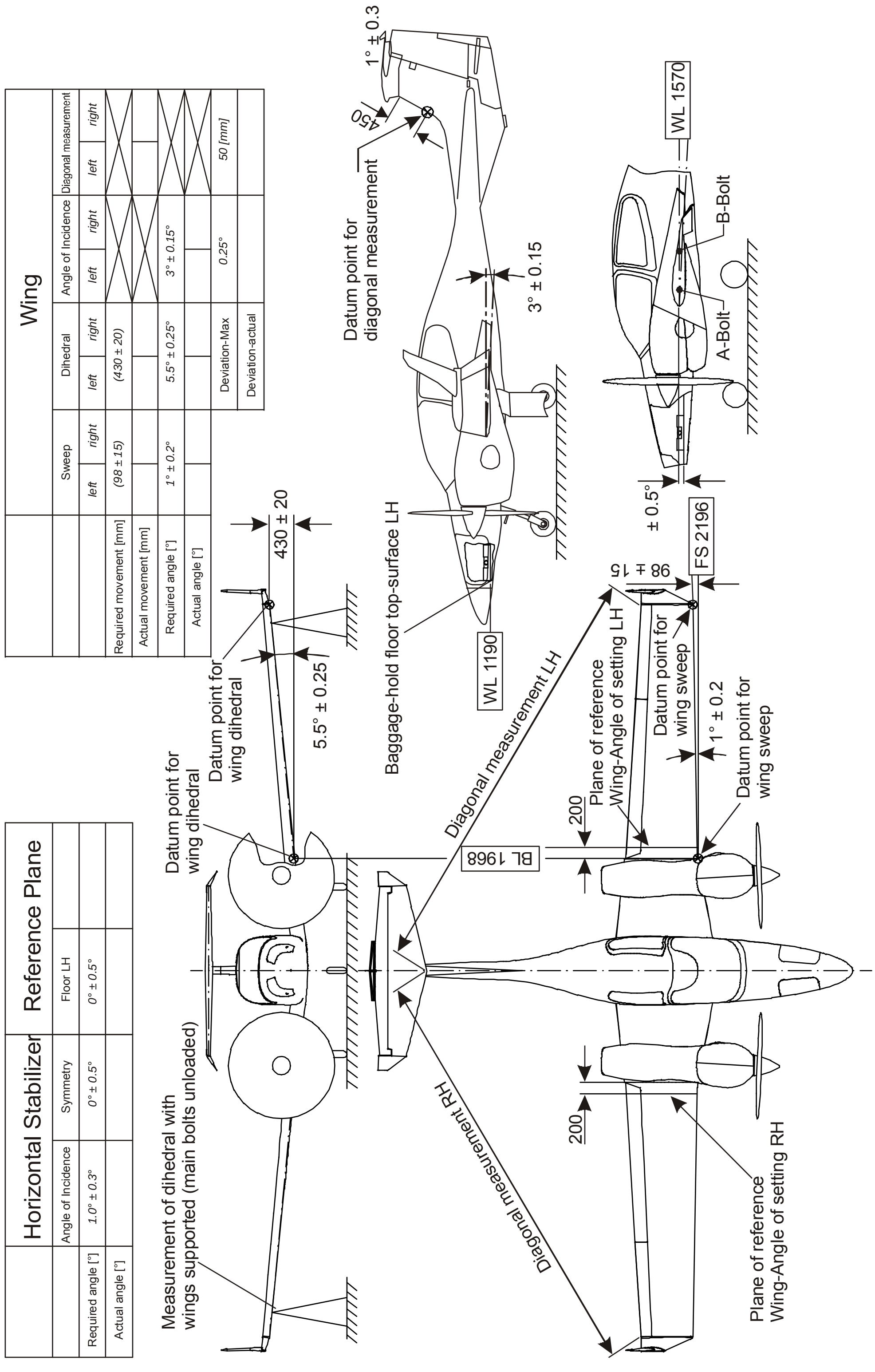


Figure 7: Control Surfaces Adjustment Report - Rudder Trim (if MÄM 42-600 is installed and MÄM 42-885 is NOT installed)



Wing	Sweep		Dihedral		Angle of Incidence		Diagonal measurement	
	left	right	left	right	left	right	left	right
Required movement [mm]	(98 ± 15)		(430 ± 20)					
Actual movement [mm]								
Required angle [°]	1° ± 0.2°		5.5° ± 0.25°		3° ± 0.15°			
Actual angle [°]								
			Deviation-Max		0.25°		50 [mm]	
			Deviation-actual					

	Horizontal Stabilizer		Reference Plane
	Angle of Incidence	Symmetry	Floor LH
Required angle [°]	1.0° ± 0.3°	0° ± 0.5°	0° ± 0.5°
Actual angle [°]			

Figure 8: Adjustment Report, General Items (Metric Data)

	Horizontal Stabilizer		Reference Plane
	Angle of Incidence	Symmetry	Floor LH
Required angle [°]	1.0° ± 0.3°	0° ± 0.5°	0° ± 0.5°
Actual angle [°]			

Wing	Sweep		Dihedral		Angle of Incidence		Diagonal measurement	
	left	right	left	right	left	right	left	right
Required movement [in]	(3.86 ± 0.59)		(16.93 ± 0.79)					
Actual movement [in]								
Required angle [°]	1° ± 0.2°		5.5° ± 0.25°		3° ± 0.15°			
Actual angle [°]								
			Deviation-Max		0.25°		1.97 [in]	
			Deviation-actual					

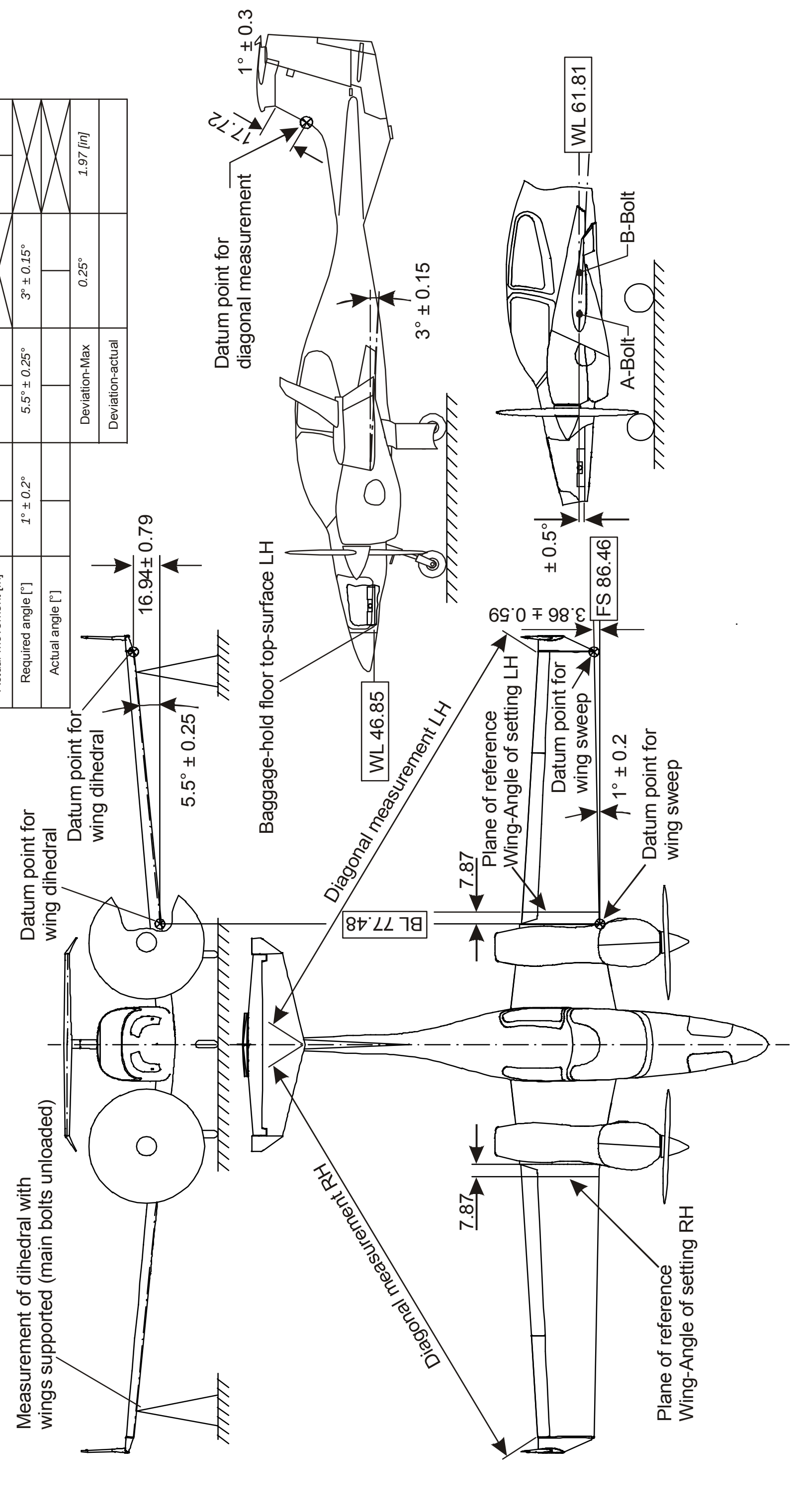


Figure 9: Adjustment Report, General Items (Imperial Dimensions)

Main Landing Gear Wheel Track and Camber Report (for test/adjustment procedure refer to Section 32-10 Paragraph 11)			A/C S/N: ____________ Date: ____________ Sign: ____________
	Check procedure		**Measured data**
(1)	Perform check at empty weight (fuel tank empty).		
(2)	Set airplane MLG wheels on relocatable plates (2 steel plates 250 x 300 x 2 mm; use Aeroshell grease between steel plates to reduce friction)		
(3)	Use either a track/camber fixture or perform the check manually		
	Measure wheel track	**Limits**	
(4)	Track LH wheel	0° ± 0.5°	δ_{VSL}= ------------------------------------ °
(5)	Track RH wheel	0° ± 0.5°	δ_{VSR}= ------------------------------------ °
(6)	Angle between LH and RH wheel (dvsl + dvsr)	0° ± 1.0°	δ_{VS}= ------------------------------------ °
	Measure wheel camber	**Limits**	
(7)	Camber LH wheel	max + 1.5° min - 1.5°	y_L= ------------------------------------ °
(8)	Camber RH wheel	max + 1.5° min - 1.5°	y_R= ------------------------------------ °
	Measure track width		
(9)	Overall track width		S= ------------------------------------ mm

Figure 10: Main Landing Gear Toe-In and Camber Report

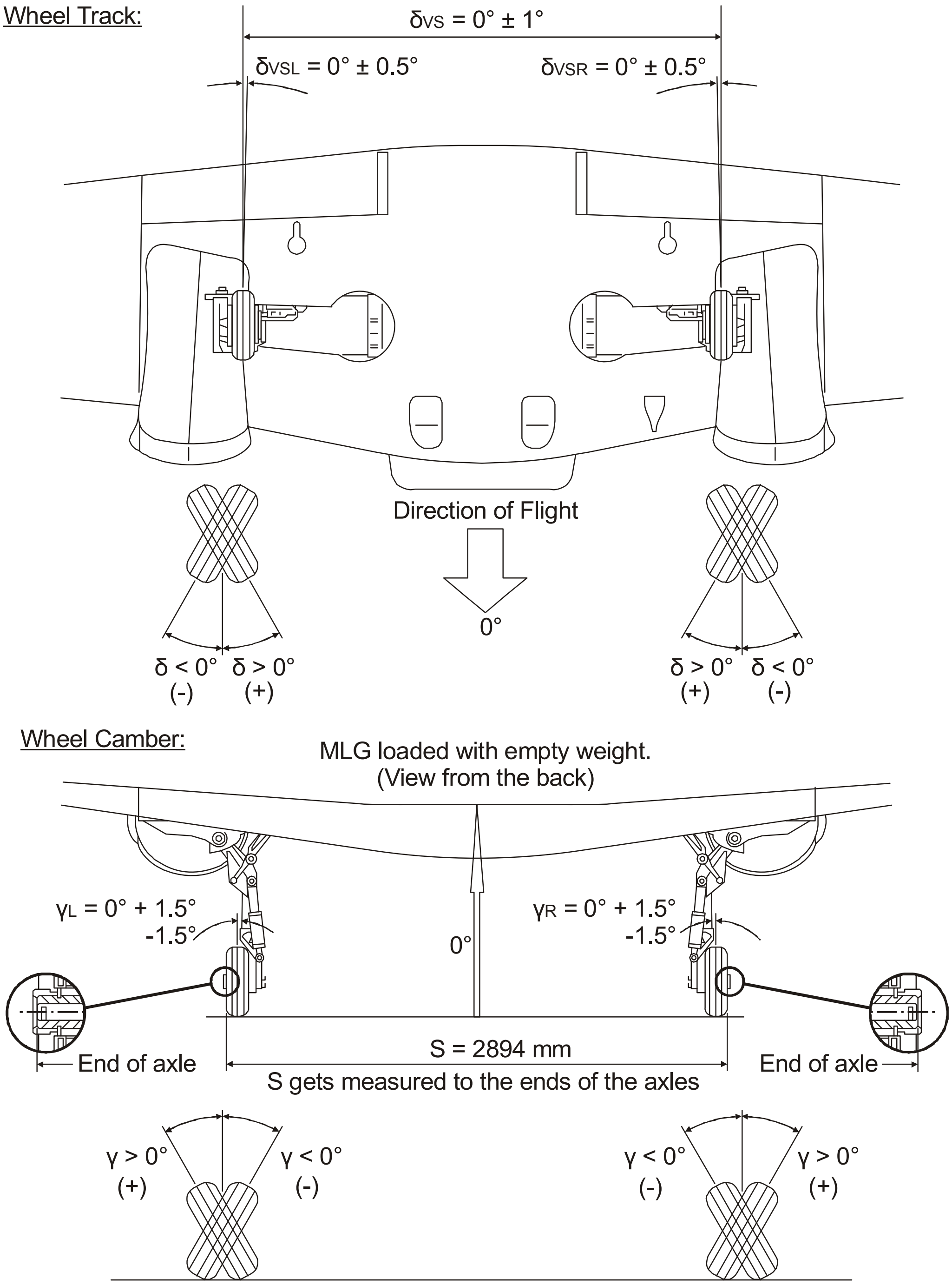


Figure 11: Main Landing Gear Track and Camber

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CHAPTER 07

LIFTING AND SHORING - GENERAL

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CHAPTER 07

LIFTING AND SHORING - GENERAL

1. General

The DA 42 NG has no lifting points. You must use straps to lift the airplane. Two persons can lift the outer wing, or the horizontal stabilizer, or any of the airplane control surfaces.

Section 07-10 tells you how to lift the airplane with jacks.

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Section 07-10
Jacking

1. General

The DA 42 NG has three jacking points. There are two main jacking points under each stub-wing and the tie-down hole in the lower fin makes the tail jacking point. For maintenance lift the fuselage with three hydraulic jacks. Use a trestle with a special former to hold the front of the fuselage. Use standard trestles under the wings at the position where the winglets connect to the wing.

Refer to Figure 1.

2. Lifting the Airplane on Jacks

A. Equipment

Item	Quantity	Part Number
Airplane jacks (1000 kg / 2200 lb minimum lifting capacity).	3	Commercial.
Nose trestle.	1	Commercial.
Wing trestles.	2	Commercial.
Ballast (min. 50 kg / 110 lb).	1	Local Manufacture.
Belt.	1	Commercial.

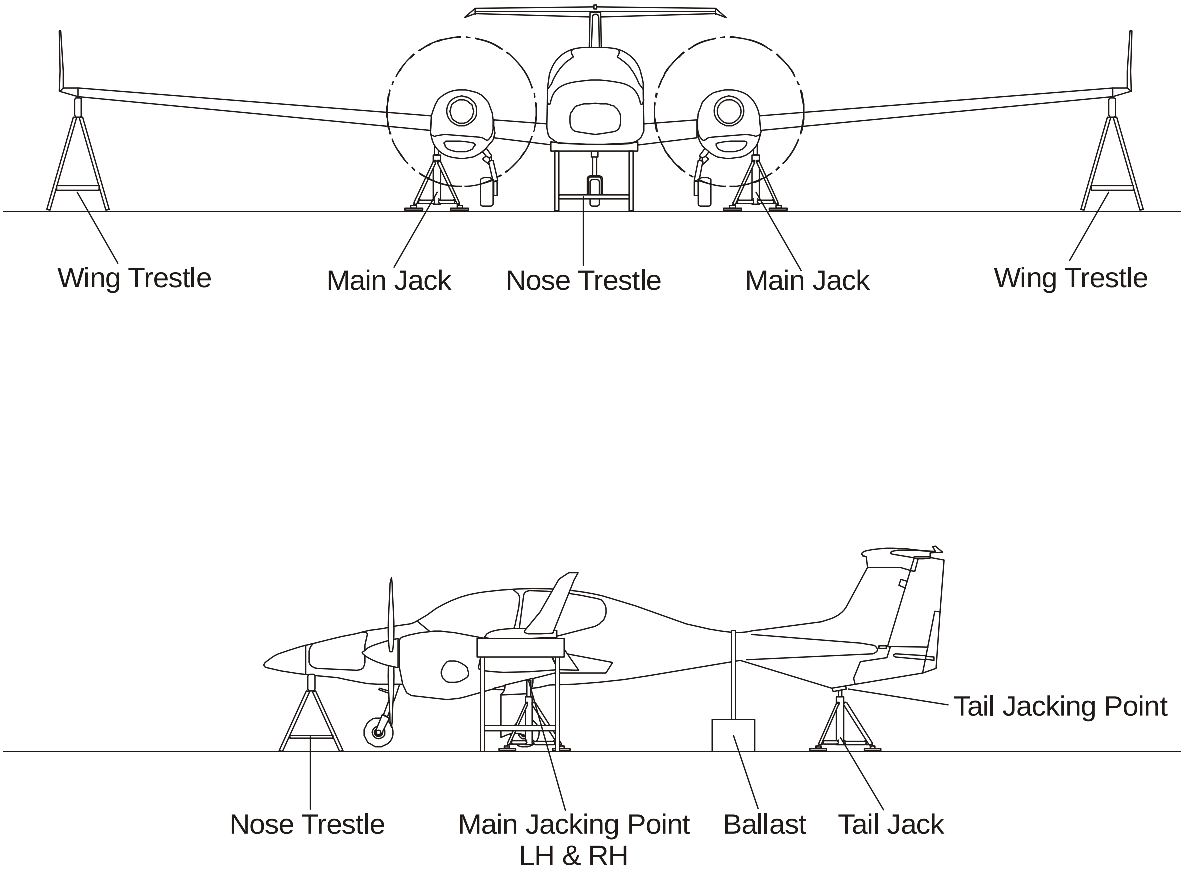

Figure 1: Lifting the Airplane on Jacks

B. Lifting the Airplane

Detail Steps/Work Items		Key Items/References
CAUTION: IF THE AIRPLANE IS IN THE OPEN THEN ALIGN IT INTO THE WIND. MAXIMUM WIND SPEED: 10 KM/H (6 KTS).		
(1)	Put chocks under the main wheels.	
(2)	Put the 2 jacks into position under the main jacking points. Extend the jacks to engage with the jacking plates.	Refer to Figure 1. The jacking plates are bonded to the bottom surface of the stub wing, under of the forward main spar.
(3)	Put the jack into position under the tail jacking point. Extend the jack until to engage with the lower fin skid plate. Tie down the tail section by use of a belt connected to the ballast.	
(4)	Extend all the jacks until the airplane wheels are clear of the ground.	You must operate all the jacks together to keep the airplane level.
(5)	If necessary, level the airplane.	Refer to Section 08-20.
CAUTION: DO NOT PUT TRESTLES UNDER THE MIDDLE OF THE WING. YOU MUST ONLY PUT TRESTLES AT THE TIPS OF THE WINGS.		
(6)	Put the wing trestles in position under each wing, at the tip.	Refer to Figure 1.
(7)	Put the nose trestle into position under the front fuselage.	At the front bulkhead.
CAUTION: YOU MUST USE THE NOSE TRESTLE. CG MOVEMENTS, E.G. RETRACTION/EXTENSION OF THE LANDING GEAR, MAY OVERBALANCE THE AIRPLANE. THE AIRPLANE CAN TILT FORWARD.		

C. Lowering the Airplane

Detail Steps/Work Items		Key Items/References
WARNING: MAKE SURE THAT THE AREA UNDER THE AIRPLANE IS CLEAR BEFORE YOU LOWER THE AIRPLANE WITH THE JACKS.		
(1)	Remove the nose trestle from under the front fuselage.	
(2)	Remove the wing trestles from under the wing tips.	
(3)	Retract the jacks until the airplane wheels are on the ground.	Retract the 3 jacks equally to keep the airplane level at all times.
(4)	Apply the parking brake. Put chocks under the wheels.	
(5)	Retract the 3 jacks fully and move the jacks clear of the airplane.	
(6)	Remove the belt and the ballast from the fuselage.	

Section 07-11
Hoisting

1. General

You do not need any lifting equipment to remove the wings and you do not need any lifting equipment to remove the horizontal stabilizer.

Use a sling assembly similar to the sling assembly shown in Figure 1. The sling assembly must have a lifting capacity of 2000 kg (4410 lb). If you remove any equipment (for example, an engine or landing gear leg), you move the center of gravity of the airplane. If you move the center of gravity of the airplane then you must change the lifting position of the lifting sling assembly. You can do this by repositioning the sling straps or by repositioning the shackle on the lifting beam.

WARNING: DO NOT GO UNDER THE AIRPLANE WHEN IT IS HELD BY THE HOIST. IF THE HOIST FAILS, YOU CAN BE INJURED.

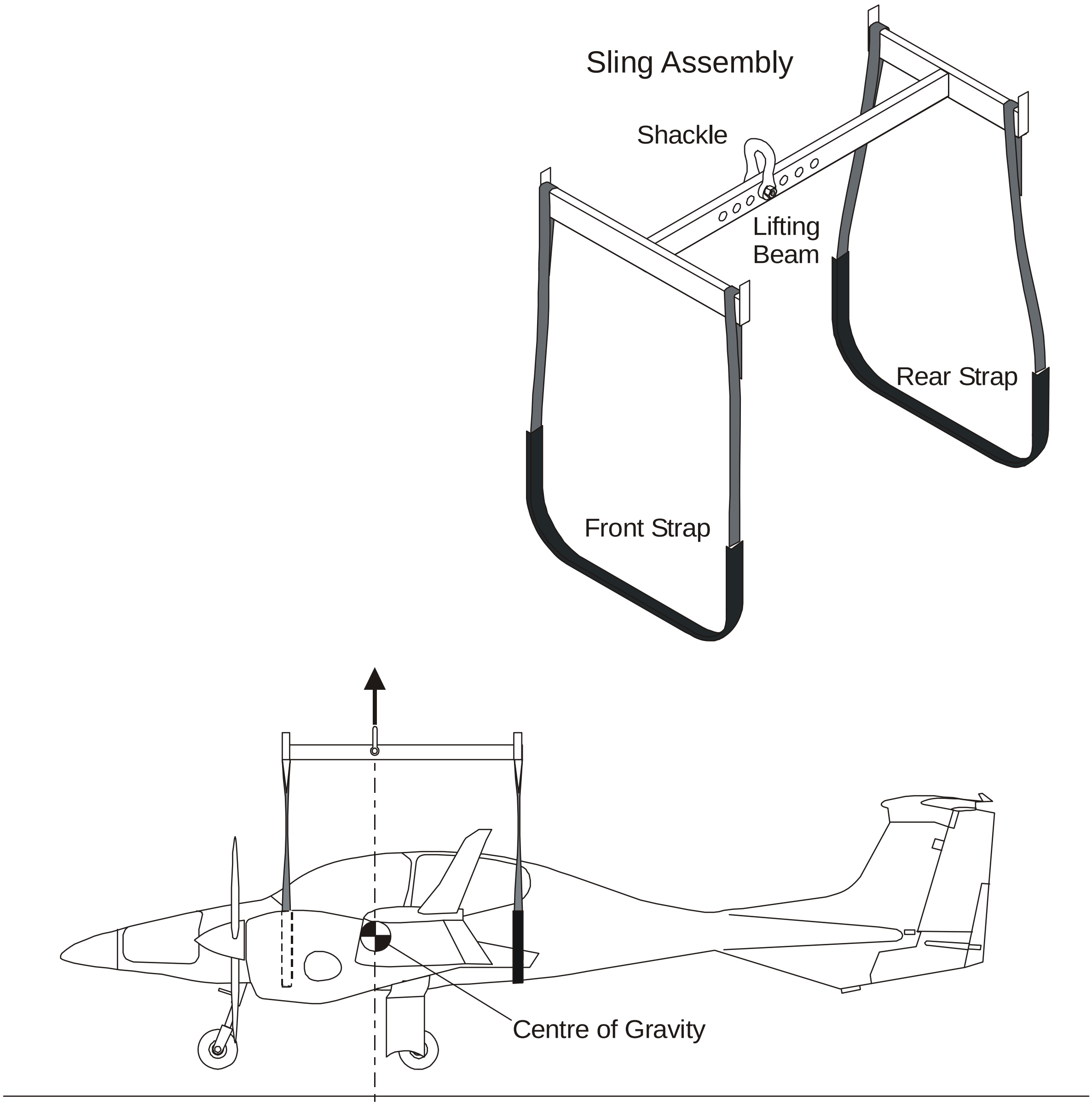

Figure 1: Hoisting the Airplane

CHAPTER 08

LEVELING AND WEIGHING

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CHAPTER 08
LEVELING AND WEIGHING

1. General

This Chapter tells you how to weigh the airplane. It also tells you how to level the airplane. Use the procedures given in Section 08-10 to weigh the airplane and to calculate the airplane moment. Use the procedures in Section 08-20 to level the airplane.

Note: In this Airplane Maintenance Manual masses are referred to as weights. The authors accept that this is technically incorrect but have used the expression for simplicity and convenience.

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Section 08-10

Weighing

1. General

Only operate the airplane within the permitted range of weight and center of gravity limits. This will give good flight performance and good handling qualities. It is also necessary for safe operation of the airplane.

If you make any changes to the airplane that may alter the weight (or the center of gravity), then you must calculate the new weight of the airplane. You must also calculate the center of gravity.

Only an approved person can weigh the airplane. The national Airworthiness Authority of the country where the airplane is registered gives approval for persons who can weigh the airplane. It also gives the time limits for when the airplane must be weighted.

Use the Weighing Report when you do the weight and balance calculations (refer to Figure 3).

You can use mechanical scales or electronic weighing units to weigh the airplane. Electronic weighing units give more accurate and consistent results. They are also easier to use. You must obey the manufacturer's instructions for using the scales or weighing units.

The reference plane for the DA 42 NG is a transverse, vertical plane in front of the airplane. It is at right angles to the horizontal reference line. The reference plane lies at 2196 mm (86.46 in) in front of the stub-wing leading edge at the wing root rib.

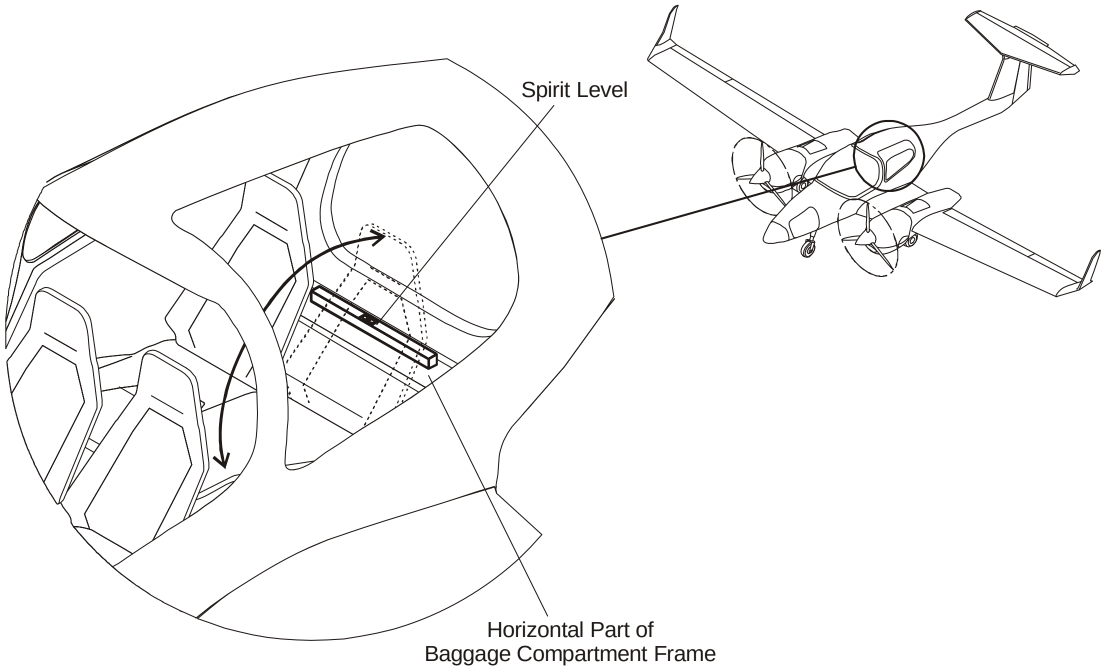
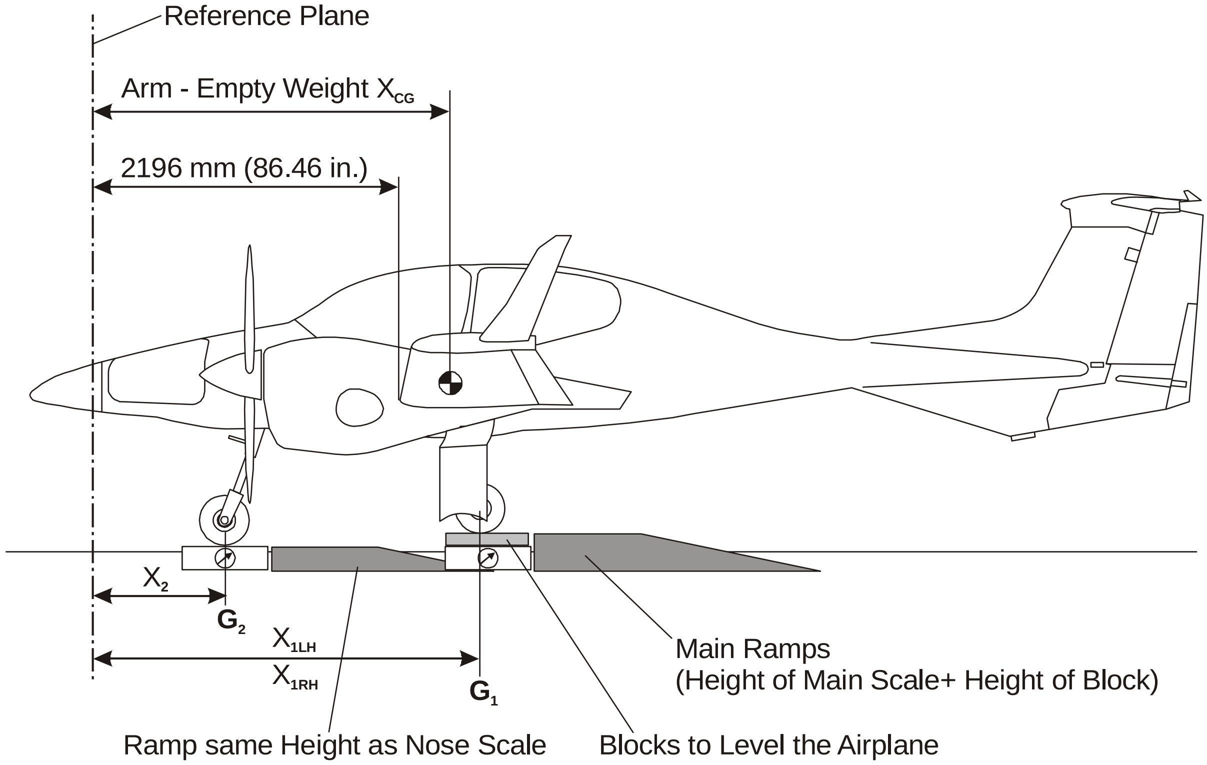


Figure 1: Level the Airplane Laterally for Weighing



X_1 = 2780 mm (109.45 in.)
X_2 = 925 mm (36.42 in.)

Legend:

- X_1 = Arm, Reference Plane to center line of main wheels.
- X_2 = Arm, Reference Plane to center line of nose wheel.
- G_1 = G_{1LH} + G_{1RH} = Net weight, main wheel scales LH and RH.
- G_2 = Net weight, Nose wheel scale.
- G = G_{1LH} + G_{1RH} + G_2 = Empty Weight.
- X_{CG} = Arm - Empty Weight center-of-gravity (calculated).

Figure 2: Weighing Dimensions for Mechanical Scales Under the Wheels

2. Weighing with Mechanical Scales Under the Wheels

If you use mechanical scales to weigh the airplane, you must also use wooden blocks under the wheels to level the airplane. You must obey the manufacturers instructions for using the scales.

A. Equipment

Item	Quantity	Part Number
Mechanical scales (the scales used for the main wheels must be the same).	3	Commercial.
Spirit level.	1	Commercial.
Plumb line.	1	Commercial.
Wooden blocks (various thicknesses).	A/R	Local Manufacture.
Ramps.	3	Local Manufacture.
Optional: airplane jacks (1000 kg / 2200 lb. minimum lifting capacity).	3	Commercial.

Note: This procedure uses jacks because the main wheel scales need a number of blocks to bring the airplane level.

Before you weigh the airplane do these items:

– Make sure that the airplane has all its equipment. The equipment must be in the location given in the Airplane Inventory.

– Defuel the airplane to the unusable fuel level 7.57 liter (2 US gal). Refer to Section 12-10.

– Replenish the engine oils, hydraulic fluid and cooling fluid up to the maximum levels. Refer to Section 12-10.

– Clean the airplane and dry it. Check that all the water drain holes are unobstructed. Refer to Section 12-20.

– Remove all objects which are not part of the Airplane Inventory (for example tools, baggage, etc.).

B. Weighing Procedure with Mechanical Scales Under the Wheels

	Detail Steps/Work Items	Key Items/References
Note: Weigh the airplane in a closed room. This will avoid any wind caused weighing errors.		
(1)	Make a copy of the Weighing Report form.	Figure 3.
(2)	Put the weighing scales in position on the floor in front of each wheel.	
(3)	Zero the scales.	Refer to the scale manufacturer’s instructions.
(4)	Close the canopy.	
(5)	Lift the airplane on jacks.	Refer to Section 07-10.
(6)	Put the flat part of the ramps under each wheel.	
(7)	Lower the airplane onto the ramps with the jacks. Remove the jacks.	Refer to Section 07-10.
(8)	Put a wooden block on the scale in front of each main wheel.	The blocks should be of the same thickness. Figure 2.
(9)	Push the airplane forward onto the scales.	Make sure that the wheels are above the center of the scales.
(10)	Make the airplane level laterally: – Put a spirit level on the horizontal surface of the baggage compartment frame. – If necessary, use additional thin blocks between the scale and the main wheel on the low side to bring the spirit level horizontal.	Refer to Figure 1. Behind the back seats. Push the airplane on and off the scales as necessary. Make sure that you do not touch the airplane when you read the spirit level.

	Detail Steps/Work Items	Key Items/References
(11)	Make the airplane level longitudinally: – Place a spirit level on the top surface of the front baggage compartment floor, left side. – Put thin blocks between the nose wheel and the scale to bring the spirit level horizontal. – Or, if necessary, reduce the air pressure in the nose wheel tire to bring the spirit level horizontal.	Refer to Figure 2.
(12)	Remove the levelling equipment from the airplane.	
(13)	Put the rear passenger seats in the upright position.	
(14)	Close the passenger door.	
(15)	Read the value from the left main wheel scale. Enter the value on the weighing form under MAIN G_{1LH} Gross.	
(16)	Read the value from the right main wheel scale. Enter the value on the weighing form under MAIN G_{1RH} Gross.	
(17)	Read the value from the nose wheel scale. Enter the value on the weighing form under NOSE G_2 Gross.	
(18)	Use the plumb line to mark the position of the reference plane on the floor: – Hold the plumb line against the leading edge of the wing where the wing joins the stub-wing. – Mark this position on the floor. – Draw a straight line between the 2 points you marked on the floor. – Draw a second line 2196 mm (86.46 in) forward of the first line.	Do this on each side.

	Detail Steps/Work Items	Key Items/References
(19)	Use the plumb line to mark the position of the nose wheel center line on the floor.	
(20)	Use the plumb line to mark the position of each main wheel center line on the floor.	
(21)	Lift the airplane off the scales with the jacks.	Refer to Section 07-10.
(22)	Read the weight of the wooden blocks on each of the scales. Record the values in the column headed TARE in the Weighing Report.	
(23)	Remove the scales and the ramps.	
(24)	Measure the distance X_{1LH}. Record the value in the Weighing Report.	
(25)	Measure the distance X_{1RH}. Record the value in the Weighing Report.	
(26)	Measure the distance X_2. Record the value in the Weighing Report.	
(27)	Refer to the calibration records for the weighing scales. If necessary, correct the Gross and Tare values of MAIN G_{1LH}, MAIN G_{1RH}, and NOSE G_2.	
(28)	Subtract each Tare value from the related Gross value. Record the result under Net in the Weighing Report.	
(29)	Lower the airplane with the jacks.	
(30)	Calculate the Empty Weight, G, from the Net values.	$G = \text{Net } G_{1LH} + \text{Net } G_{1RH} + \text{Net } G_2$
(31)	Calculate the Empty Weight Moment, M.	$M = (G_{1LH} * X_{1LH})+(G_{1RH} * X_{1RH}) + (G_2 * X_2)$
(32)	Calculate the position of the Empty Weight Center-of-Gravity, X_{CG}.	$X_{CG} = M/G$
(33)	Record the Empty Weight (G) and the Empty Weight Moment (M) in the Airplane Flight Manual.	

WEIGHING REPORT

Model: DA 42 NG Serial Number:___________ Registration:_____________

Data with reference to the Type Certificate Data Sheet and the Airplane Flight Manual.

Reference Plane: Vertical plane 2196 mm (86.46 in) in front of the leading edge of wing at the root rib.

Horizontal reference line: Front baggage compartment floor, left side.

Equipment Inventory - dated:_______ Cause for Weighing:______________________________

Weight and Balance Calculations (Weighing at the wheels)

Weight Condition: Include brake fluid, hydraulic fluid, coolant, engine oil, unusable fuel main tanks (7.57 liter/ 2 US gal) and unusable fuel auxiliary tanks (if installed; 5.0 liter/ 1.32 US gal).

Support	Gross	Tare	Net
MAIN G_{1LH}			
MAIN G_{1RH}			
NOSE G_2			
		Empty Weight	

Lever Arm
X_{1LH} = ... mm (..... in.)
X_{1RH} = ... mm (..... in.)
X_2 = ... mm (..... in.)

Calculate the Empty Weight, G = MAIN G_{1LH} + MAIN G_{1RH} + NOSE G_2.		G =
Calculate the Empty Weight Moment, M = (G_{1LH} * X_{1LH})+(G_{1RH} * X_{1RH}) + (G_2 * X_2).		M =
Calculate the Empty Weight Center-of-Gravity position, X_{CG} = M/G.		X_{CG} =
Maximum permitted all-up-weight: Max. AUW.	VÄM 42-004 (OSB 42-068)	1900 kg (4189 lb).
Maximum useful load = Max AUW - G.		

Record the Empty Weight (G) and the Empty-Weight Moment (M) in the Airplane Flight Manual.

Place/Date	Authorizing Stamp	Authorizing Signature

Figure 3: Weighing Report for Mechanical Scales Under the Wheels

Section 08-20
Leveling

1. General

These procedures tell you how to make the airplane level. See Section 07-10 for lifting the airplane with jacks.

Make the airplane level with jacks unless you are weighing the airplane.

If you have to do an asymmetry test, use the jacks to make the airplane level. If you weigh the airplane, change the airplane tire pressures or use blocks to make the airplane level (see Section 08-10).

2. Make the Airplane Level with Jacks

A. Equipment

Item	**Quantity**	**Part Number**
Airplane jacks (1000 kg / 2200 lb minimum lifting capacity).	3	Commercial.
Wing trestle.	2	Commercial.
Nose trestle.	1	Commercial.
Spirit level.	1	Commercial.

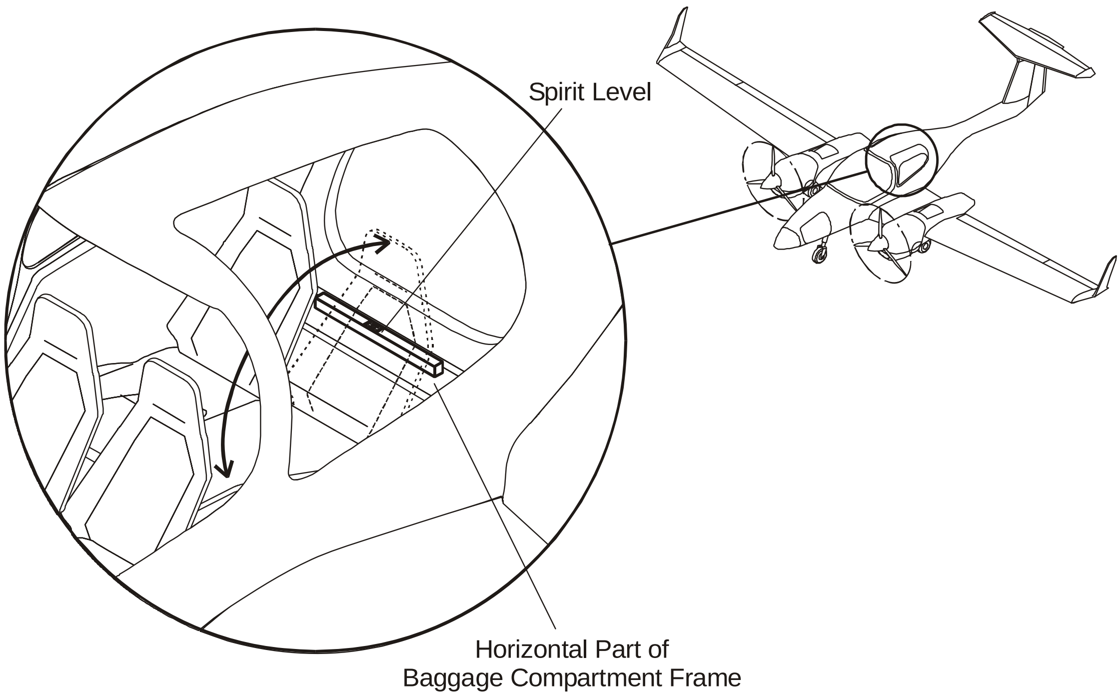


Figure 1: Level the Airplane Laterally

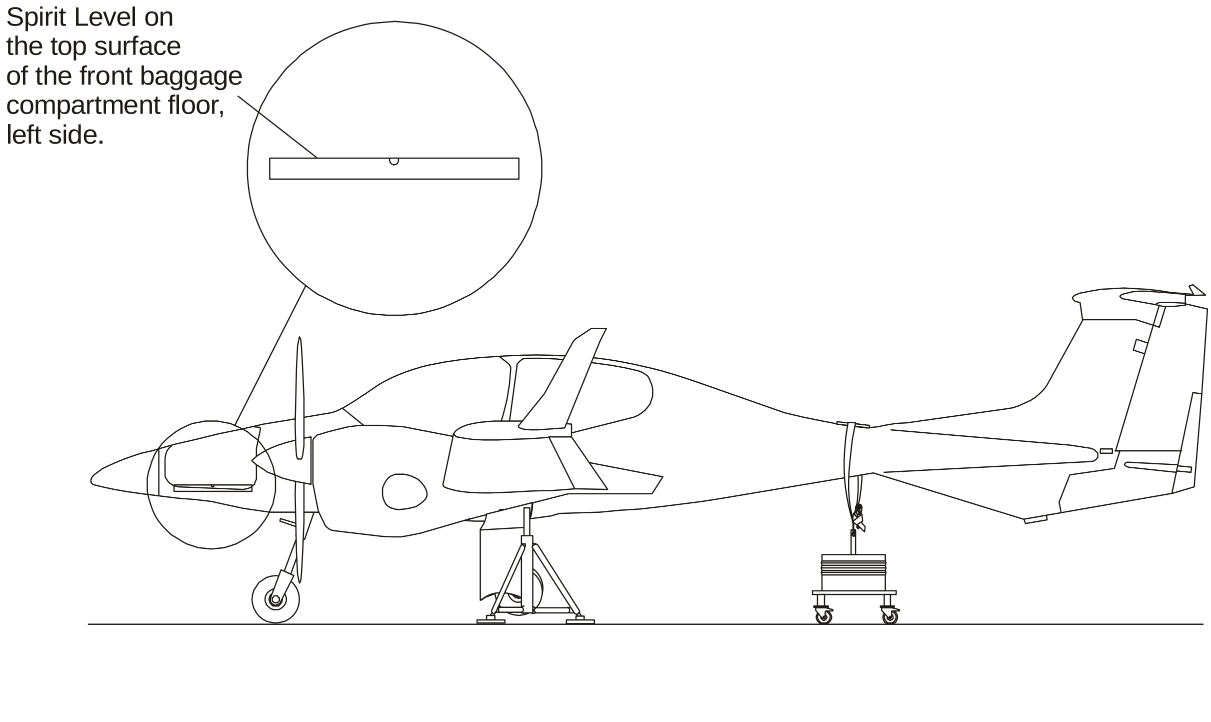


Figure 2: Level the Airplane Longitudinally

B. Level the Airplane with Jacks

	Detail Steps/Work Items	Key Items/References
	Note: Level the airplane in a closed room.	
(1)	Fasten the ballast with the belt at the airplane.	Refer to Figure 2.
(2)	Lift the airplane on jacks.	Refer to Section 07-10. Pay attention not to lift the ballast.
(3)	Make the airplane level laterally: – Put a spirit level on the horizontal surface of the baggage compartment frame. – Adjust the main jacks to bring the sprit level horizontal.	Refer to Figure 1. Behind the back seats.
(4)	Make the airplane level longitudinally: – Place a spirit level on the top surface of the front baggage compartment floor, left side. – Adjust the tail jack to bring the spirit level horizontal.	Refer to Figure 2.
(5)	Put trestles under each wing and the front fuselage.	Refer to Section 07-10, Figure 1.
(6)	Remove the spirit level from the airplane.	

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CHAPTER 09

TOWING AND TAXIING - GENERAL

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CHAPTER 09

TOWING AND TAXIING - GENERAL

1. General

You can move the airplane on the ground by hand or by taxiing. Use the procedures in Section 09-10 and Section 09-20 to move the airplane safely. Section 09-10 tells you how to tow the airplane. Section 09-20 tells you how to taxi the airplane.

WARNING: YOU MUST NOT TAXI THE AIRPLANE UNLESS YOU HAVE BEEN TRAINED TO TAXI AND HAVE BEEN AUTHORIZED BY YOUR AIRWORTHINESS AUTHORITY.

CAUTION: YOU MUST NOT EXCEED THE WHEEL STEERING ANGLE LIMITS WHEN TOWING THE AIRPLANE WITH A TOW VEHICLE. EXCEEDING THE WHEEL STEERING ANGLE LIMITS WILL DAMAGE TO THE NOSE GEAR LEG AND THE RUDDER CONTROL SYSTEM.

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Section 09-10
Towing

1. General

You can move the airplane by hand with or without using a steering or tow bar. You can push or pull the DA 42 NG at the inner section of the propeller blades near the spinners. You can push the DA 42 NG at the wing nose and at the rough upper surface of the center wing, inboard of the engine nacelle. Nevertheless the use of a tow bar facilitates towing and is preferable to pulling or pushing.

You can move the airplane using a tow vehicle that is suitable in size and power. You must not exceed the maximum wheel steering angle and starting and stopping of the movement must always be smooth and slowly to avoid damaging the nose landing gear. A qualified person must sit in the cockpit for immediate braking action in the event that the tow vehicle becomes uncoupled.

2. Towing Procedure

WARNING: DO NOT PUSH ON THE SPINNERS. IF YOU PUSH ON A SPINNER YOU CAN DAMAGE THE SPINNER WHICH CAN CAUSE VIBRATION.

WARNING: DO NOT DAMAGE THE VORTEX GENERATORS WHEN YOU PUSH ON THE CENTER WING.

CAUTION: NEVER USE FORCE ON THE PROPELLER TIPS OR ON THE CONTROL SURFACES. YOU CAN DAMAGE THE PROPELLERS AND THE CONTROL SURFACES.

CAUTION: NEVER APPLY WEIGHTS TO THE TAILPLANE TO LIFT THE NOSE WHEEL. YOU CAN DAMAGE THE TAILPLANE.

CAUTION: NEVER TOW THE AIRPLANE IF THE WHEELS ARE BLOCKED BY SNOW OR MUD. YOU CAN DAMAGE THE LANDING GEAR.

CAUTION: THE NOSE MAXIMUM WHEEL STEERING ANGLE IS 40º TO THE LEFT AND RIGHT. IF YOU TURN THE WHEEL MORE THAN 40º YOU WILL CAUSE DAMAGE TO THE NOSE GEAR.

A. Movement by Hand

To move the airplane on ground, it can be pushed or pulled by hand on the inner section of the propeller blades near the spinner or pushed at the wing nose and at the rough surface of the center wing, inboard of the nacelles. Do not push on the spinners, as you can damage the spinner which may cause vibration and damage to the engine. Do not use force on the propeller tips or on the airplane control surfaces and do not push on the de-icing nozzles (if installed) on the propeller blade root, as you may damage the propeller, the control surfaces or the de-icing nozzles.

It is recommended to use the steering bar or a tow bar which is available from the manufacturer to assist steering and towing. The tow bar is engaged in the appropriate hole in the nosewheel as shown in Figure 1.

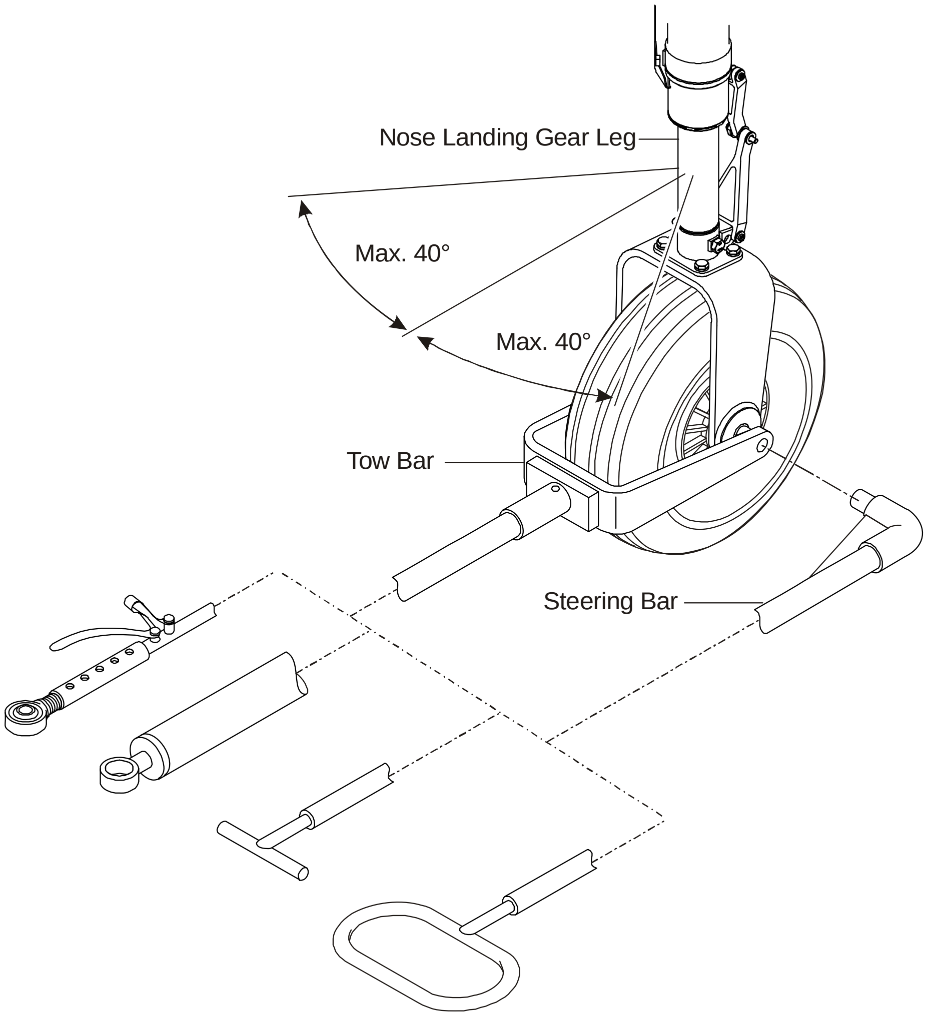

Figure 1: Steering Bar or Tow Bar Attachment

B. Movement with a Tow Vehicle

When towing the airplane with a tow vehicle, a qualified person must sit in the cockpit ready for immediate braking action, in the event that the tow vehicle becomes uncoupled. The movement of the tow vehicle should always be started and stopped slowly to avoid shock loads on the nose landing gear. The maximum steering angle of 40 degrees to either side must not be exceeded.

If the airplane must be pulled out of soft ground or deep snow, towing lines must be used. The towing lines should be attached to the main landing gear struts as high as possible without interfering with the brake lines. The ropes should be long enough to sufficiently clear the nose or tail. Make sure the wheels are not blocked by snow or mud. A qualified person must sit in the cockpit to maintain control of the airplane using the nose wheel steering and brakes.

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Section 09-20
Taxiing

1. General

The DA 42 NG can easily be taxied by using the nose wheel steering. To reduce the turn radius the wheel brakes furthered by asymmetric power can be used.

WARNING: DO NOT TAXI THE AIRPLANE UNLESS YOU HAVE BEEN TRAINED TO TAXI AND YOU HAVE BEEN AUTHORIZED.

CAUTION: THIS SECTION GIVES GENERAL DATA ON TAXIING ONLY. YOU MUST USE THE DA 42 NG AIRPLANE FLIGHT MANUAL WHEN YOU TAXI THE AIRPLANE.

<table>
<tr><th colspan="2">Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(1)</td><td>Make sure that the area around the airplane is clear of objects.</td><td>For example: Ground equipment and tools.</td></tr>
<tr><td>(2)</td><td>Operate the parking brake.</td><td></td></tr>
<tr><td>(3)</td><td>If necessary remove:
– The wheel chocks.
– The tow bar.
– The mooring ropes.
– Any other support equipment attached to the airplane.</td><td></td></tr>
<tr><td colspan="3">WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR OBJECTS NEAR THE AIRPLANE. THE AIRPLANE CAN INJURE PERSONS. OBJECTS CAN CAUSE DAMAGE TO THE AIRPLANE.</td></tr>
<tr><td>(4)</td><td>Start the engines.</td><td>Refer to the DA 42 NG Airplane Flight Manual.</td></tr>
<tr><td>(5)</td><td>Release the parking brake.</td><td></td></tr>
</table>

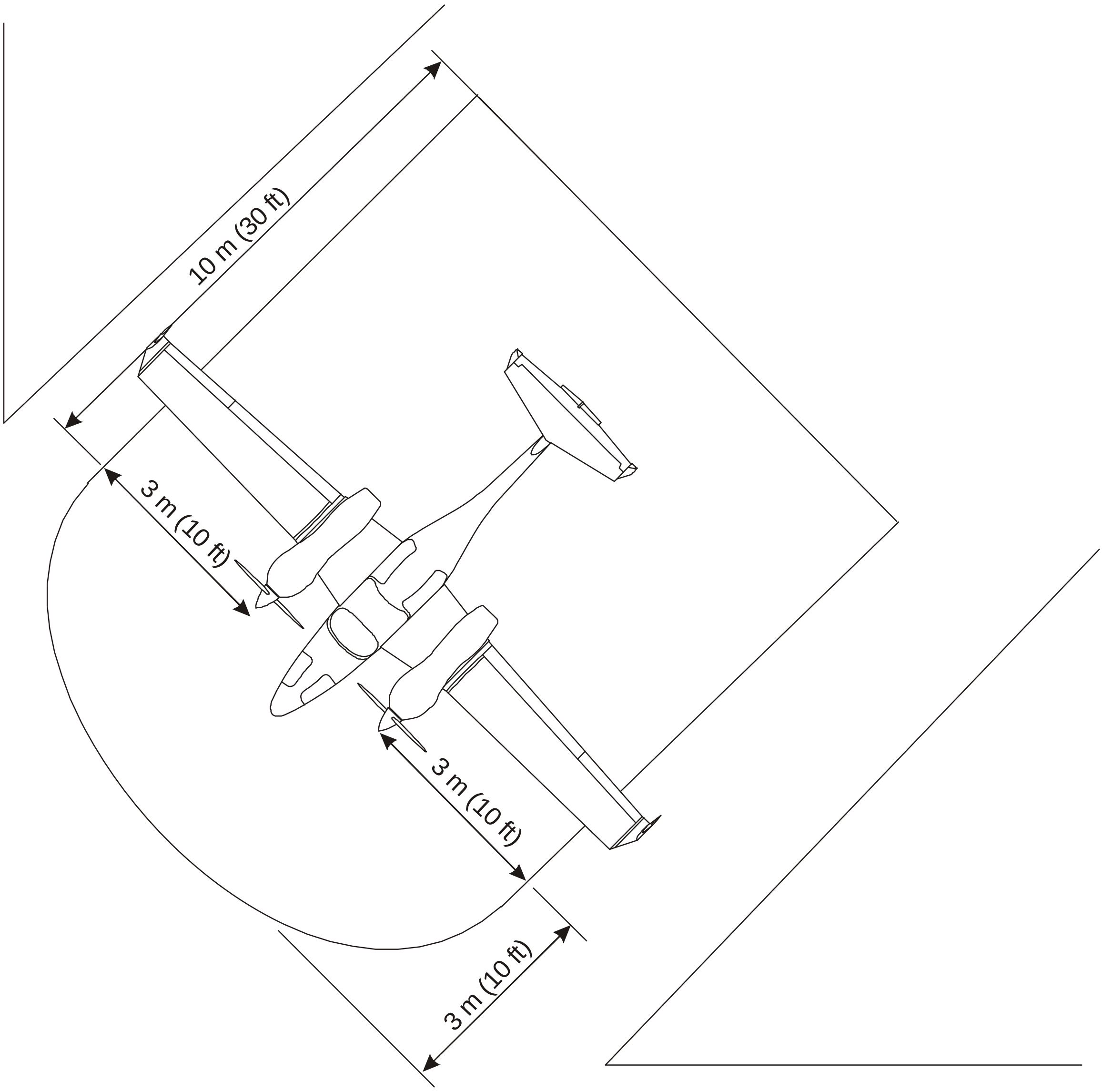

Figure 1: The Safety Area for Taxiing the DA 42 NG Airplane

<table>
<tr><th colspan="2">Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td colspan="3">

WARNING: MAKE SURE THAT THE BRAKES OPERATE CORRECTLY WHEN YOU TAXI THE AIRPLANE. IF THE BRAKES SHOULD FAIL, YOU MUST BE ABLE TO STOP THE AIRPLANE BEFORE YOU HIT PERSONS OR EQUIPMENT.

CAUTION: COMPLY WITH THE SAFETY AREA FOR TAXIING SHOWN IN FIGURE 1.

CAUTION: TAKE CARE IF YOU TAXI ON UNEVEN GROUND. THE PROPELLERS MUST NOT TOUCH THE GROUND. LOOSE STONES AND GRAVEL CAN DAMAGE THE PROPELLERS. USE THE LOWEST POSSIBLE RPM TO REDUCE THE RISK OF FOREIGN OBJECT DAMAGE TO THE PROPELLERS.

</td></tr>
<tr><td>(6)</td><td>Taxi the airplane to the new position.</td><td></td></tr>
<tr><td>(7)</td><td>Shut down the engines.</td><td>Refer to the DA 42 NG Airplane Flight Manual.</td></tr>
<tr><td>(8)</td><td>Park the airplane. If necessary, moor the airplane.</td><td>Refer to Chapter 10-00.</td></tr>
</table>

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CHAPTER 10

PARKING, MOORING, STORAGE AND RETURN TO SERVICE

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CHAPTER 10

PARKING, MOORING, STORAGE AND RETURN TO SERVICE

1. General

Always park or moor the DA 42 NG when it is not in use. Use the procedures given in Section 10-10 for parking the airplane. Use the procedures given in Section 10-20 to moor the airplane. If the airplane is parked overnight we recommend that you moor the airplane. If strong winds are forecast, you must always moor the airplane.

Refer to the AE Operation Manual, latest revision for detailed information about engine standstill and storage procedures.

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Section 10-10
Parking and Storage

1. General

Use these procedures to protect the airplane when it is parked. Use the short term parking procedure when the airplane will be parked for less than 5 days. Use the long term parking procedure when the airplane will be parked for 5 to 30 days. Use the storage procedure when the airplane will be parked for more than 30 days.

All pilots and all maintenance staff for the DA 42 NG must know the procedures in this Section.

CAUTION: MAKE SURE THAT THE AIRPLANE IS CORRECTLY MOORED AND PROTECTED IF STRONG WINDS ARE FORECAST. STRONG WINDS CAN CAUSE DAMAGE TO AN UNPROTECTED AIRPLANE.

A. Equipment

Item	**Quantity**	**Part Number**
Wheel chocks.	4	Commercial.
Gust locks.	1	Commercial.
Pitot cover.	1	-

B. Short-Term Parking

Detail Steps/Work Items		**Key Items/References**
(1)	If necessary, taxi or tow the airplane to the parking position.	Refer to Chapter 09.
(2)	Align the airplane into the wind (or forecast wind).	
CAUTION: MAKE SURE THAT THE NOSE WHEEL IS ALIGNED STRAIGHT AHEAD WHEN THE AIRPLANE STOPS. THIS WILL PREVENT SIDE LOADS WHICH CAN DAMAGE THE NOSE LANDING GEAR.		
(3)	If the wind is gusty (or the weather is stormy) moor the airplane.	Refer to Section 10-20.
(4)	If there is packed snow or ice on the parking area, spread sand under the wheels.	

Detail Steps/Work Items		Key Items/References
CAUTION: DO NOT APPLY THE PARKING BRAKE WHEN THE BRAKES ARE OVER-HEATED. THE BRAKES CAN SEIZE ON.		
(5)	Set the parking brake ON. Pull the lever fully aft, and push both the brake pedals at least two times.	
(6)	Put chocks in front of and behind the main wheels.	
(7)	RELEASE the parking brake.	Lever fully forward.
(8)	Set the airplane controls to neutral. Install the control lock.	
(9)	Set the flaps to UP position.	Fully up.
(10)	Make sure that the passenger door and canopy as well as the front baggage doors are closed and locked.	
CAUTION: DO NOT INSTALL THE PITOT COVER WHILE THE PITOT TUBE IS HOT.		
(11)	Install Pitot cover on Pitot tube.	Located on the lower surface of the LH wing.

C. Long-Term Parking

CAUTION: MAKE SURE THAT YOU DO THE LONG TERM PARKING PROCEDURE WHEN YOU PARK THE AIRPLANE FOR A LONG TIME. IF YOU DO NOT DO THE LONG TERM PARKING PROCEDURE CORRECTLY, THE ENGINE CYLINDERS AND WHEEL BEARINGS CAN CORRODE. ALSO THE TIRES CAN DEFORM.

Detail Steps/Work Items		Key Items/References
(1)	Do the procedure for short-term parking.	Refer to Paragraph B.
(2)	If the ice protection system is installed, then do the following procedure:	
	– Fill the de-icing fluid tank to at least one quarter of its capacity.	Refer to Section 12-10.
	– Close the canopy.	
	– Operate the windshield pumps of the ice protection system several times.	To deaerate the system.
	– Operate the system on HIGH until evidence of de-icing fluid on the porous panels is noticed.	
	– If the de-icing fluid tank is completely empty, refill the de-icing fluid tank with approx. 2 liter (0.5 US gal) of de-icing fluid.	Refer to Section 12-10.
(3)	If the airplane can be moved, remove the chocks, move the airplane to turn the wheels 3 or 4 revolutions. Put the chocks back.	You can push or tow the airplane. Make sure that a different part of the tire touches the ground when you stop.
	Note: Do step 3 every day in cold weather and every 7 days in warm weather.	
(4)	For engine standstill period refer to the AE Operation Manual, latest revision.	
	CAUTION: DO NOT INSTALL THE PITOT COVER WHILE THE PITOT TUBE IS HOT.	
(5)	Install Pitot cover on Pitot tube.	Located on the lower surface of the LH wing.

Detail Steps/Work Items		Key Items/References
(6)	Install the gust lock: – Move the rudder pedals fully rearward. – Engage the control surfaces gust lock with the pedals. – Engage the stick; wrap straps around stick once. – Attach the locks and tighten the straps.	
(7)	Do a test for water contamination of the fuel.	Refer to Section 12-10.
	Note: Do step 6 after each rainy day to prevent water contamination due to leaky fuel tank caps.	

2. Storage

If the airplane is parked (or not operated) for more than 30 days, you have to do this storage procedure.

A. Equipment and Material

Item	Quantity	Part Number
Wheel chocks.	4	Commercial.
Tire protector spray.	A/R	Commercial.

B. Preparation

Detail Steps/Work Items		Key Items/References
(1)	If possible, ventilate the airplane in a dry atmosphere.	
(2)	Do the procedure for the long-term parking.	Refer to Paragraph 1.
(3)	For engine standstill period and storage refer to AE Operation Manual, latest revision.	
(4)	Close all engine openings airproof.	
(5)	Disconnect the airplane main battery.	Refer to Section 24-31.
(6)	Completely fill the fuel tanks with fuel.	Refer to Section 12-10.
(7)	Wipe the tires with a dry cloth. Apply tire protector spray.	Obey the tire protector manufacturers instructions.
(8)	Lubricate the airplane.	Refer to Section 12-20.
(9)	Deactivate the ELT.	
(10)	Remove loose equipment from the airplane.	

C. Monthly Routine Check

Do these steps each month while the airplane is stored.

Detail Steps/Work Items		Key Items/References
(1)	Remove all plugs from the engine openings.	
(2)	Tighten the v-ribbed belt.	Refer to AE Maintenance Manual, latest revision.
(3)	Engine ground run: – Connect the main battery or connect the airplane to ground power. – Start up both engines for at least 20 minutes. – Disconnect the main battery or disconnect the airplane from ground power.	Refer to AFM Chapter 4A.
CAUTION: The engine must not be started after v-ribbed belt tension relieve.		
(4)	Relieve v-ribbed belt tension.	Refer to AE Maintenance Manual, latest revision.
(5)	Close all engine openings air proof.	

Section 10-20
Mooring

1. General

CAUTION: IF THE AIRPLANE MUST BE STORED OUTSIDE FOR A LONG TIME, IT HAS TO BE MOORED. STRONG WINDS OR GUSTS CAN CAUSE DAMAGE TO AN AIRPLANE WHICH IS NOT MOORED.
IT IS RECOMMENDED TO MOOR THE AIRPLANE FOR OVERNIGHT PARKING TOO. INSTALL THE GUST LOCK TO PREVENT DAMAGE TO THE CONTROL SURFACES.

2. Mooring

A. Equipment

Item	**Quantity**	**Part Number**
Wheel chocks.	4	Commercial.
Rope (nylon preferred or hemp).	A/R	Commercial.

B. Mooring Procedure

Detail Steps/Work Items		**Key Items/References**
(1)	Park the airplane.	Refer to Section 10-10.
(2)	Make sure that the flaps are set to UP.	Fully up.
CAUTION: MOOR THE AIRPLANE AT THE MOORING POINTS ONLY. CAUTION: WHEN USING HEMP ROPES, DO NOT MAKE THEM TIGHT. IF THE ROPES GET WET THEY WILL TIGHTEN AND MAY DAMAGE THE AIRPLANE. THIS IS MOST IMPORTANT WHEN YOU ARE USING SECURE GROUND ANCHOR POINTS.		
(3)	Attach a rope to each mooring point and to the ground anchor point. Do not make the ropes too tight.	
(4)	Remove all items from the area that may cause damage to the airplane.	
(5)	If snow is forecast you must put a trestle under the lower fin.	

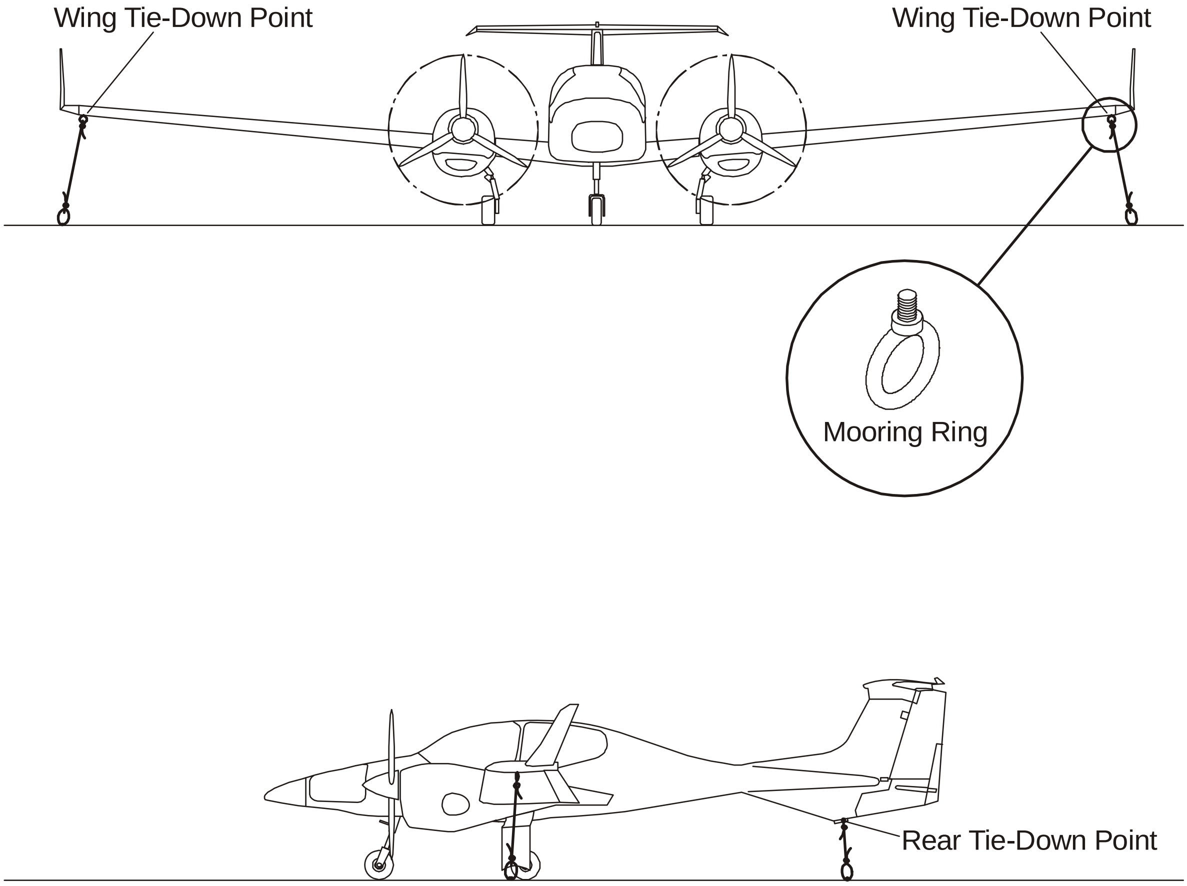

Figure 1: Location of Mooring Points on the Airplane

Section 10-30
Return to Service

1. General

Do this procedure when the airplane has been parked (or stored) for more than 5 days.

2. Return to Service Procedure

A. Storage Time Less Than One Year

Detail Steps/Work Items		Key Items/References
(1)	If necessary, install loose equipment which was removed for storage.	
(2)	If the battery has been removed: – Install the airplane main battery.	Refer to Section 24-31.
(3)	Do the test for water contamination of the fuel.	Refer to Section 12-10.
(4)	Do the test for correct air pressure in each tire. If necessary, inflate the tires.	Refer to Section 12-10.
(5)	Check the strut extension of each gear damper. If necessary, charge the damper assemblies of main and nose landing gear.	Sliding bare piston should be visible. Refer to Sections 32-10 and 32-20.
(6)	Check Pitot system and canopy for contamination/dirt.	
(7)	Open all engine openings.	
(8)	Install the v-ribbed belt according to the AE Maintenance Manual, latest revision.	
(9)	Change the engine oil to approved engine oil.	Refer to Airplane Flight Manual, latest revision.
(10)	Check oil and coolant level.	Refer to Section 12-10.
(11)	Perform an engine ground run according to the AE Operation Manual, latest revision.	
(12)	Reactivate the ELT.	

Detail Steps/Work Items		Key Items/References
(13)	Remove the gust lock: – Loosen the straps and detach the locks. – Disengage the stick from the straps. – Disengage the pedals from the gust lock. – Move the rudder pedals into position.	

B. Storage Time One Year and More

Detail Steps/Work Items		Key Items/References
(1)	Contact the engine manufacturer Austro Engine GmbH.	
(2)	If necessary, install loose equipment which was removed for storage.	
(3)	If the battery has been removed: – Install the airplane main battery.	Refer to Section 24-31.
(4)	Remove the gust lock: – Loosen the straps and detach the locks. – Disengage the stick from the straps. – Disengage the pedals from the gust lock. – Move the rudder pedals into position.	
(5)	Do a 200 hour maintenance check.	Refer to Section 05-10.

CHAPTER 11

PLACARDS AND MARKINGS

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CHAPTER 11
PLACARDS AND MARKINGS

1. General

Placards are used for identification and indication. They show the function, operation and operating limitations of systems and equipment.

Note: Placards must not be removed, exchanged or altered unless approved by the national Airworthiness Authority.

This Chapter shows you the location of these placards and markings:

– Exterior placards.

– Exterior markings.

– Interior placards.

Self-adhesive foil is used for all the placards except for the aircraft identification plate and the instrument panel labels. The aircraft identification plate is made from metal and the instrument panel with integrated lighting is made from composite plates.

2. Replace Plastic Foil Placards

A. Material

Item	Quantity	Part Number
Solvent.	A/R	Commercial.

B. Replace a Placard

Use this procedure for both internal and external foil placards.

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(1)</td><td>Remove the old placard:
– Warm the placard with a hot air blower.
– Lift one corner of the placard.
– Carefully pull the placard off.</td><td>Do not over-heat the composite structure.</td></tr>
<tr><td colspan="3">WARNING: DO NOT GET SOLVENT ON YOUR SKIN. DO NOT BREATHE SOLVENT VAPOR. SOLVENT CAN CAUSE DISEASE OR ILLNESS.</td></tr>
<tr><td>(2)</td><td>Clean the area where the new placard will go.</td><td>Use a commercial solvent. There must be no grease or dirt on the surface. Obey the solvent manufacturer’s instructions.</td></tr>
<tr><td>(3)</td><td>Remove the protective backing from the new placard.</td><td></td></tr>
<tr><td>(4)</td><td>Put the new placard into the correct position. Make the placard smooth with a clean cloth.</td><td>Refer to the related Figure in this Chapter.</td></tr>
</table>

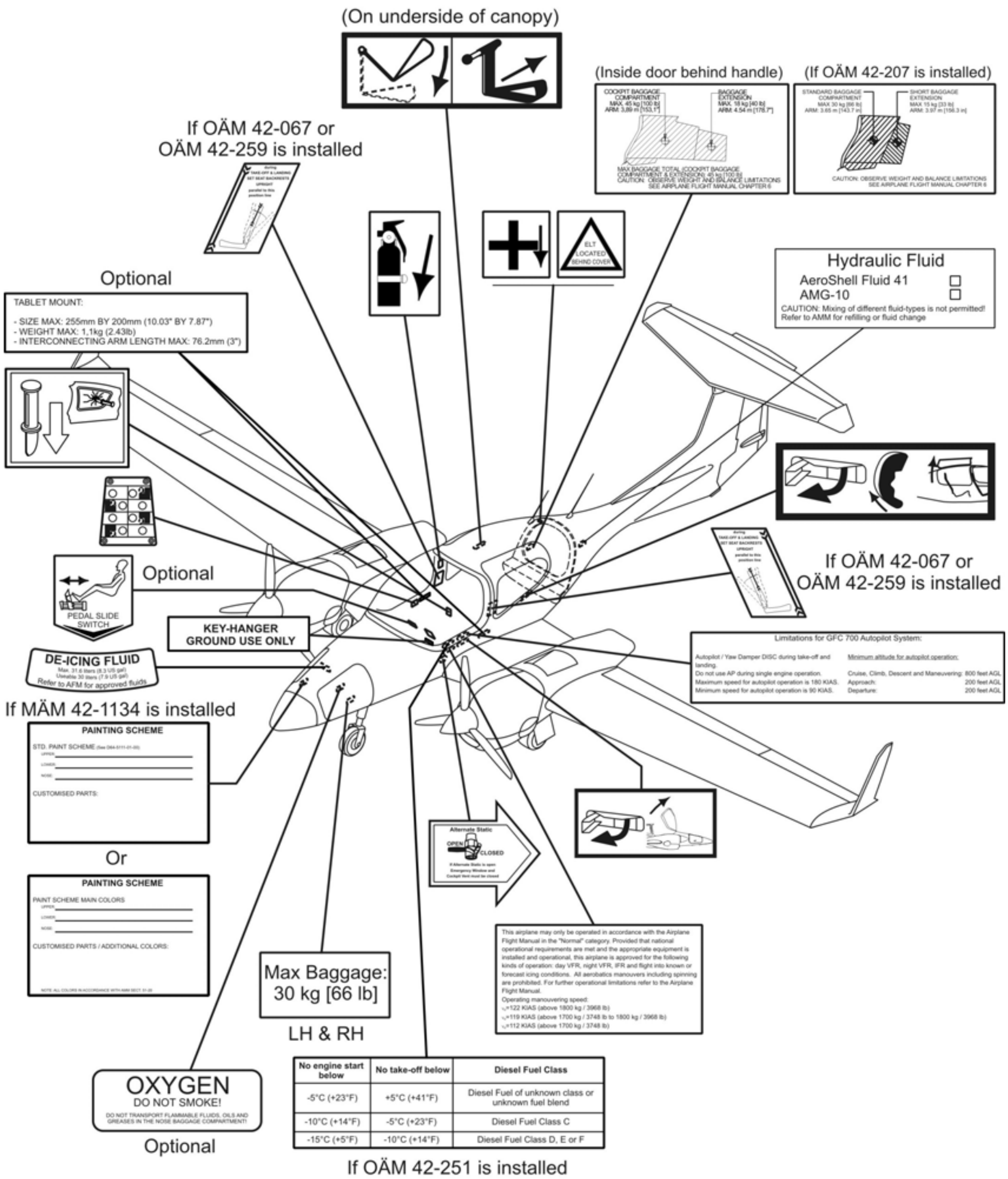
Section 11-20

Exterior Placards and Markings

1. General

Figure 1 shows the exterior placards for the DA 42 NG airplane.

If OÄM 42-187 is installed the safety walk is a coated safety walk instead of safety walk with adhesive strips. Refer to Section 51-20 for coated safety walk repair procedures.



No engine start below	No take-off below	Diesel Fuel Class
-5°C (+23°F)	+5°C (+41°F)	Diesel Fuel of unknown class or unknown fuel blend
-10°C (+14°F)	-5°C (+23°F)	Diesel Fuel Class C
-15°C (+5°F)	-10°C (+14°F)	Diesel Fuel Class D, E or F

Figure 1: Exterior Placards

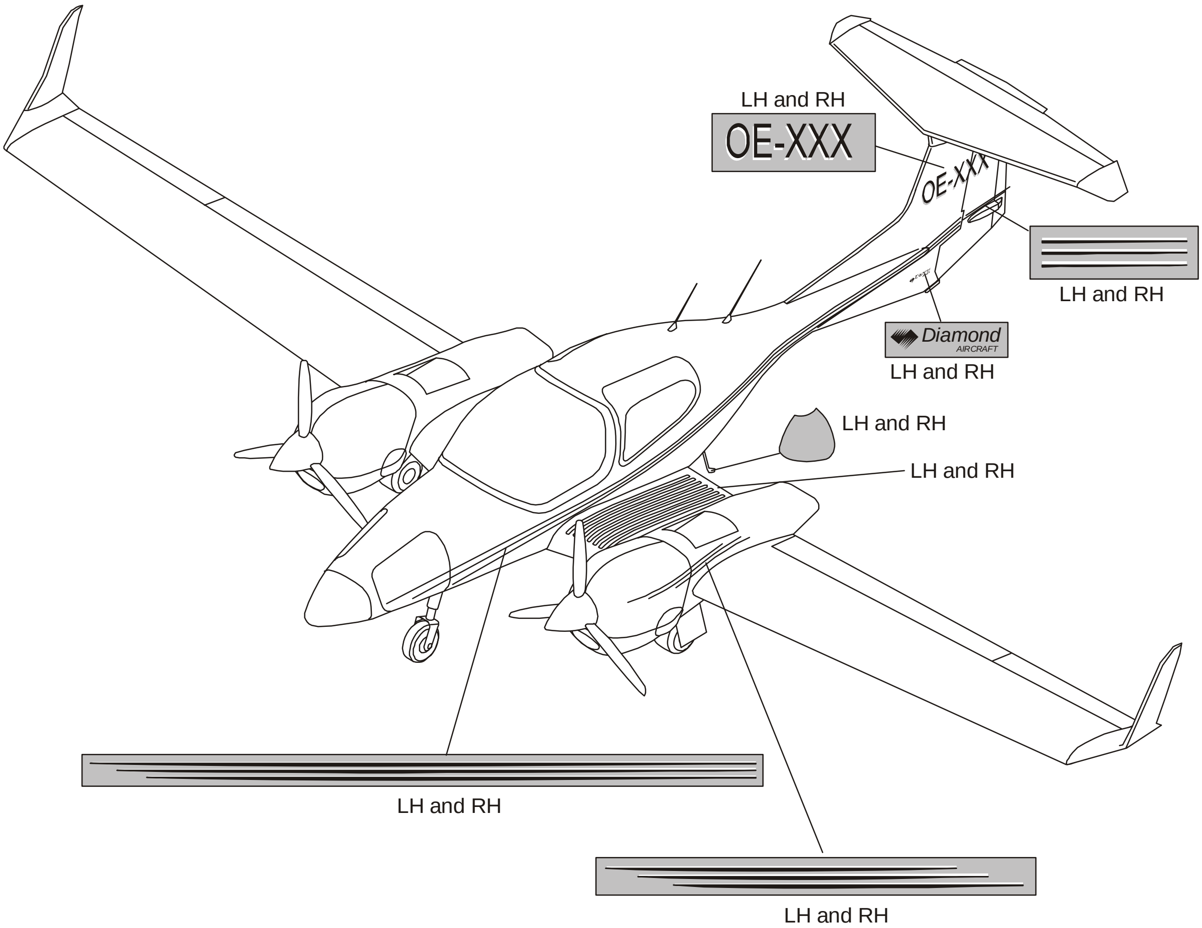


Figure 2: Design Example for Exterior Markings

Maintenance Practices

1. General

This Section tells you how to replace safety walk adhesive strips.

2. Replace the Safety Walk Adhesive Strips

A. Equipment

Item	Quantity	Part Number
Safety walk template.	1	D64-1127-10-52.
Roller.	1	Commercial.
Heat gun.	1	Commercial.

B. Material

Item	Quantity	Part Number
Socomore Dienstone DLS Satwipes.	as required.	29003-C86-C10.
Acetone.	as required.	N000 148.

C. Replacement Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove the safety walk adhesive strips: – Use a heat gun to warm up the safety walk adhesive strips. – Start removing the safety walk adhesive strips by lifting one corner. – Carefully pull the safety walk adhesive strips off.	 Do not exceed 60° C (140°F).

WARNING: WHEN HANDLING CHEMICALS ALWAYS OBSERVE HEALTH AND SAFETY REGULATIONS GIVEN BY THE MANUFACTURER OF THE CHEMICALS.

	Detail Steps/Work Items	Key Items/References
(2)	Remove the adhesives layer of the safety walk adhesive strips from surface: – Use fresh acetone or Socomore® cleaning cloth (P/N: 29003-C86-C10) to remove the adhesive layer. Do not use cleaning or polishing agents which contain silicon.	
(3)	Use water to remove dirt from the surface. If necessary, add a mild cleaning agent.	Refer to Section 12-30.
(4)	Use a commercial solvent to remove grease from the surface. The surface must be totally clean from grease or dirt.	
(5)	Place the safety walk template on the center wing.	Refer to Figure 3.
(6)	Make sure that the template orientation is parallel to flight direction.	
(7)	Remove the protective layer from the safety walk adhesive strips.	
(8)	Place the safety walk adhesive strips into the slots of the safety walk template.	
(9)	Use a roller to flatten and paste on the safety walk adhesive strips.	
(10)	Place the ‘No Step’ placard (front) and the ‘Foot Step’ placard (rear) according to the safety walk template.	Refer to Figure 3.
(11)	Use a clean cloth to flatten the ‘No Step’ placard and the ‘Foot Step’ placard.	
(12)	Remove the safety walk template.	

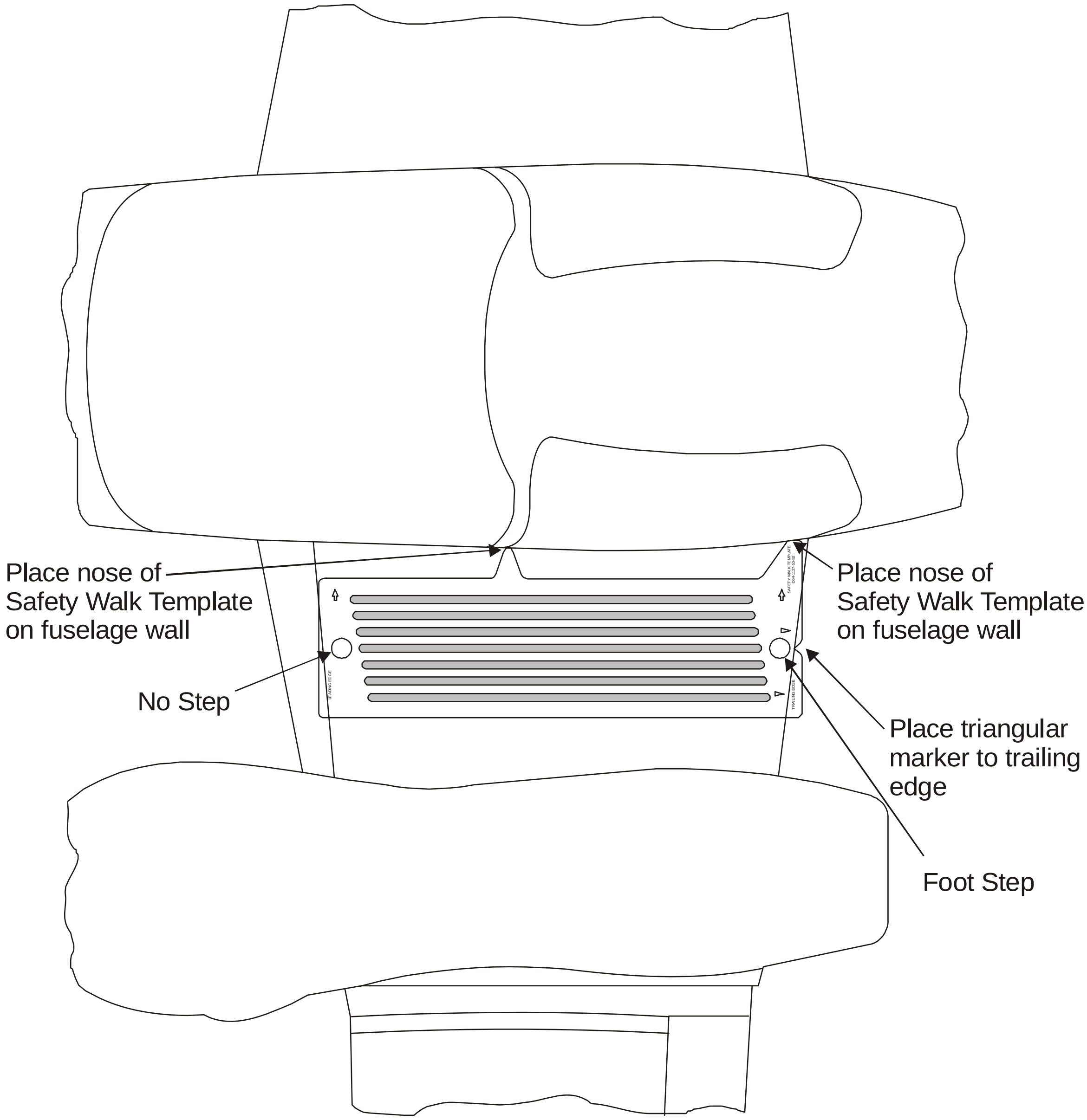


Figure 3: Safety Walk Template Positioning

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Section 11-30
Interior Placards and Markings

1. General

Figures 1 and 2 show the interior placards and markings in the cockpit. Figures 3 and 4 show the instrument panel placard panels.

2. Description

The DA 42 NG has self adhesive foil placards for the cockpit interior. The instrument panel has placard panels which are attached to the instrument panel with screws. The placard panels have integral lighting which is controlled by a combined ON/OFF dimmer switch. The dimmer switch is mounted on the top left of the instrument panel. Refer to Section 33-10 for more data about the dimmer switch and refer to Section 31-10 for more data about the inverter for the placard panels.

There are 8 placard panels and you can replace each of the placard panels.

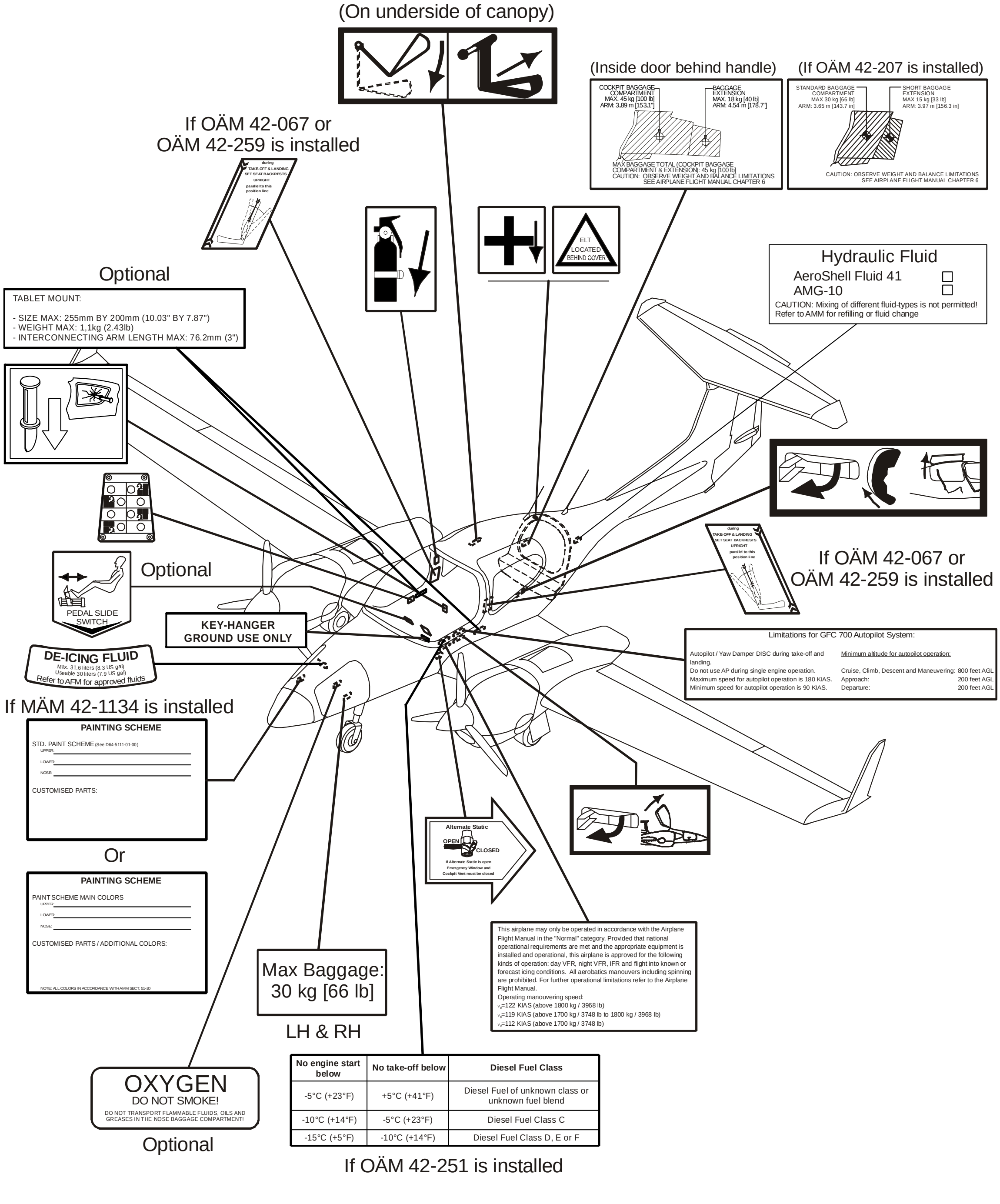

Figure 1: Interior Placards and Markings

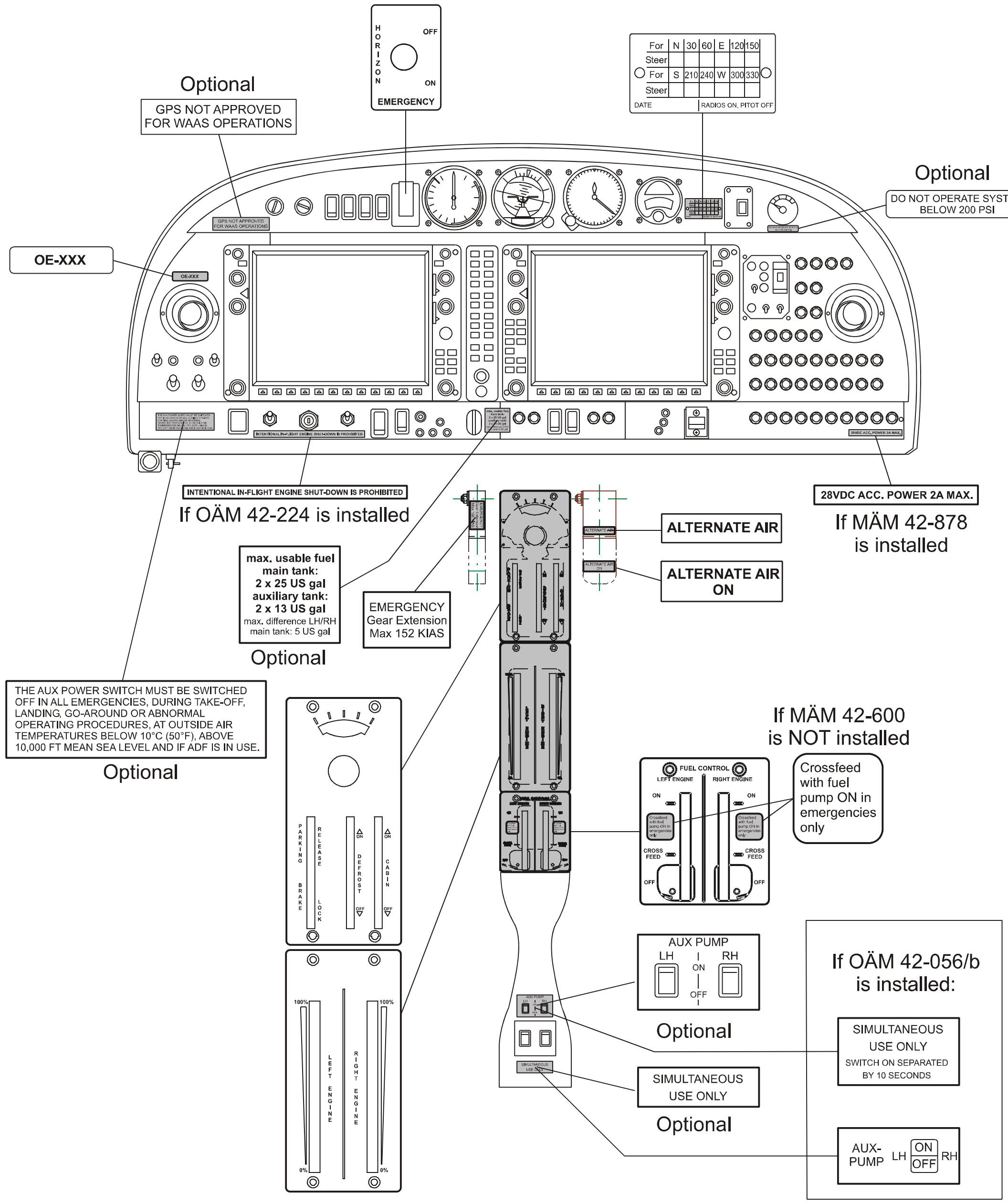

Figure 2: Interior Placards - Instrument and Control Panels

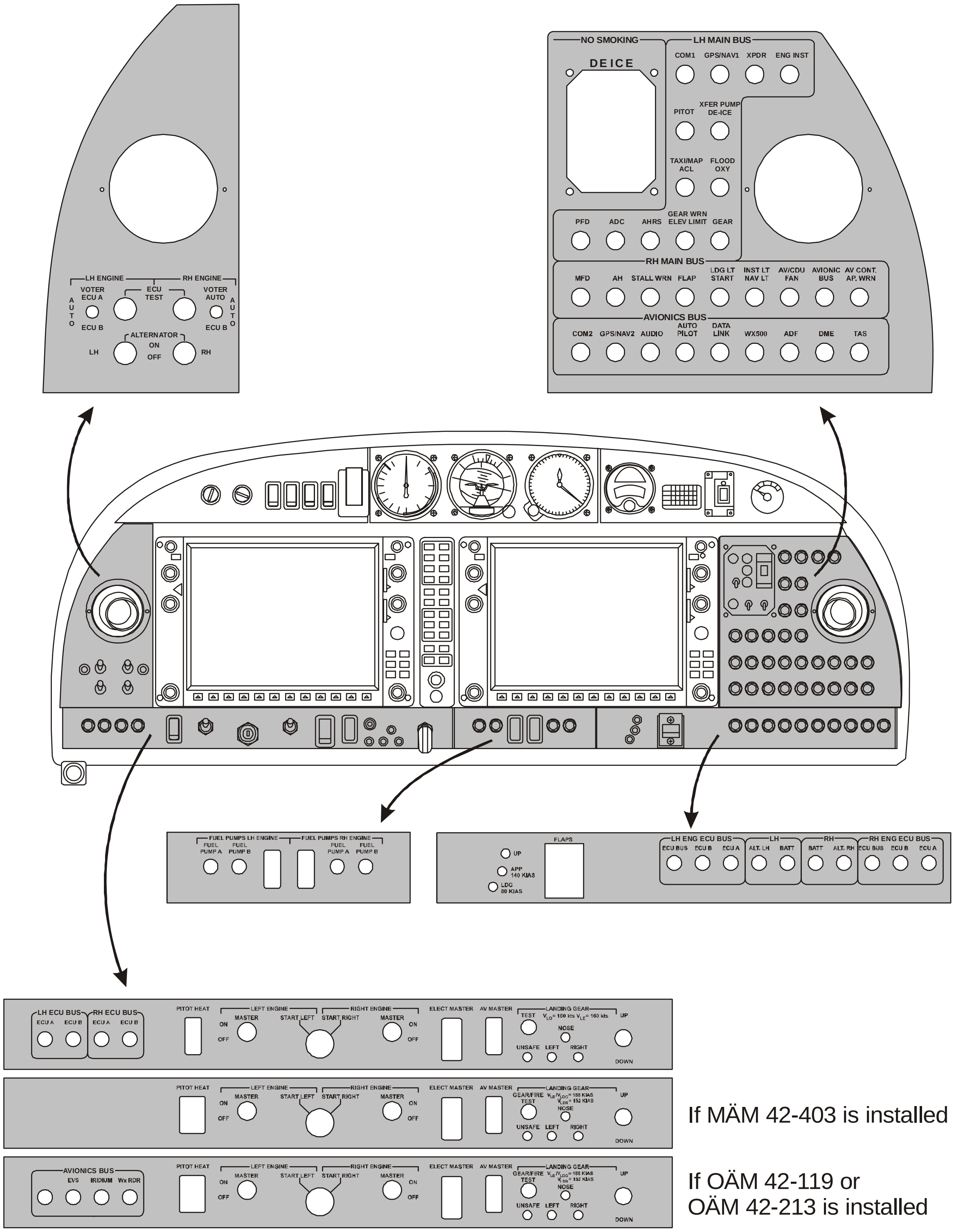

Figure 3: Placard Panels - Sheet 1

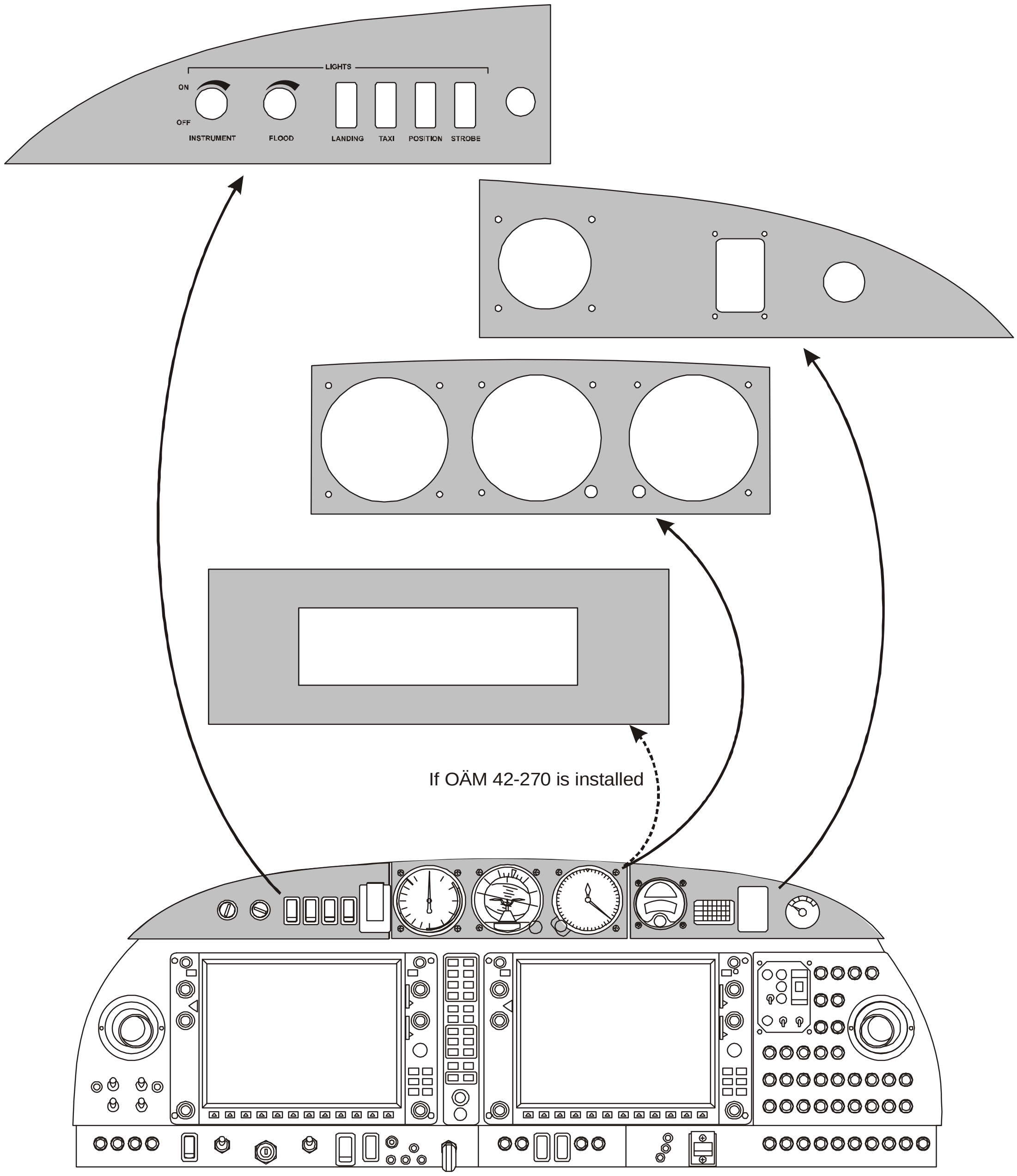

Figure 4: Placard Panels - Sheet 2

The placards shown in Figures 5 thru 8 are installed only if the optional oxygen system is installed (OÄM 42-055 is incorporated):

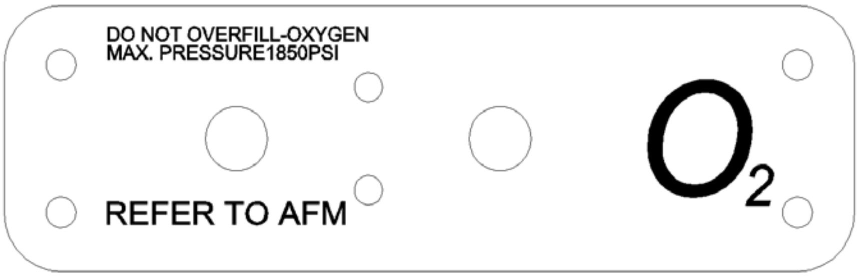

Figure 5: Placard on the Refill Unit, on the LH Side of the Nose Baggage Compartment

Figure 6: Placard on Each Outlet Manifold

Figure 7: Placard on the PUSH/PULL Knob

Figure 8: Placard on the LH/RH Oxygen Compartment Cover

If OÄM 42-193 is carried out the following placard is mounted next to the compressor:

NOTE

Contains fluorinated greenhouse gas
covered by the Kyoto Protocol.
1,1,1,2 - Tetrafluoroethane

Figure 9: RACC Compressor Placard

All maintenance and replenishment which requires to open and depressurize the refrigerant circuit must be carried out by authorized personnel according to national and international regulations for refrigerant systems.

If OÄM 42-193 is carried out the following placard is mounted next to the switch for the map reading light:

MAP LIGHT

Figure 10: Map Reading Light Placard

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Maintenance Practices

1. General

This Section tells you how to replace a placard panel. You cannot repair a placard panel.

2. Replace a Placard Panel

Use this procedure for all of the placard panels.

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery and ECU backup batteries.	Refer to Section 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Disconnect the electrical cables form the placard panel that you will replace.	If necessary, at the inline connector.
(4)	Replace the placard panel:	
	– Remove the screws that attach the placard panel to the instrument panel.	Make sure that you remove all of the screws!
	– Move the placard panel clear of the instrument panel.	
	– Move the new placard panel into position on the instrument panel.	Make sure that you route the electrical cables correctly.
	– Install the screws that attach the placard panel to the instrument panel.	
	– Connect the electrical cables for the placard panel.	At the inline connector.
(5)	Install the instrument panel cover.	Refer to Section 25-10.
(6)	Connect the airplane main battery and the ECU backup batteries.	Refer to Section 24-31.

	Detail Steps/Work Items	Key Items/References
(7)	Do a test for the correct operation of the placard panel lights: – Set the ELECT. MASTER to ON. – Rotate the INSTRUMENT dimmer switch fully clockwise. – Rotate the INSTRUMENT dimmer switch a small amount counter-clockwise. – Rotate the INSTRUMENT dimmer switch fully counter-clockwise. – Set the ELECT. MASTER to OFF.	 The placard lights must come on. The placard lights must dim. The placard lights must go out.

CHAPTER 12

SERVICING - GENERAL

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CHAPTER 12
SERVICING

1. General

This Chapter gives the servicing tasks which apply to the whole airplane:

– Section 12-10. Replenishment procedures for various systems.

– Section 12-20. Lubrication data.

– Section 12-30. Cleaning and snow and ice removal.

The procedures for preventive and corrective maintenance of systems are given in the related Chapter of this manual. Refer to Chapter 05 for the time limits and servicing schedules.

Note: The designation of "left" and "right" as well as of "forward" and "afterwards" is based on the airplane's direction of flight.

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Section 12-10
Replenishment

1. General

Use the procedures in this Section to replenish the fluid systems of the airplane.

Figure 1 shows the location of the servicing points.

2. Fuel System

A. Main Fuel Tanks

There are three interconnected fuel tanks in each wing holding the fuel for the DA 42 NG. The fuel capacity is 26 US gal (98.4 liter) per wing. The tanks are located in the wing outboard of the engine nacelles, between the main spars.

Each wing has a filler cap located on the top surface of the wing. The filler cap connects to the outboard end of the outer fuel tanks. A fuel tank drain is located on the lower surface of each wing. The drain connects to the inboard end of the inner fuel tank.

B. Auxiliary Fuel Tanks (Optional Equipment)

The auxiliary fuel tanks consist of a single fuel chamber in each engine nacelle. The auxiliary fuel tanks are installed in the rear section of the engine nacelles, above the wing main spars. The additional fuel capacity is 13.7 US gal (52 liter) per side. The total fuel capacity (main fuel tanks and auxiliary fuel tanks) is 39.7 US gal (150 liter) per side.

Each auxiliary tank has a filler cap located on the top surface of the nacelle. The filler cap connects to the forward end of the auxiliary tanks. A fuel tank drain is located at the rear of each auxiliary tank.

WARNING: DO NOT ALLOW FIRE, SPARKS OR HEAT NEAR FUEL. FUEL BURNS VIOLENTLY AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE AIRPLANE.

WARNING: DO NOT GET FUEL ON YOUR SKIN. FUEL CAN CAUSE SKIN DISEASE.

WARNING: CONNECT THE AIRPLANE AND THE FUEL SUPPLY VEHICLE TO ELECTRICAL GROUND BEFORE REFUELING. IF YOU DO NOT GROUND THE AIRPLANE, STATIC ELECTRICITY CAN CAUSE FIRE DURING REFUELING.

WARNING: MAKE SURE THAT A SUITABLE FIRE EXTINGUISHER IS AVAILABLE AT ALL TIMES DURING REFUELING/DEFUELING.

WARNING: TURN OFF ALL GROUND EQUIPMENT IN THE REFUELING AREA.

WARNING: DO NOT OPERATE ELECTRICAL SWITCHES IN THE AIRPLANE DURING REFUELING.

WARNING: REFUELING WITH PERSONS ON BOARD IS PROHIBITED.

CAUTION: USE ONLY THE FUEL TYPES GIVEN IN CHAPTER 2 OF THE AIRPLANE FLIGHT MANUAL.

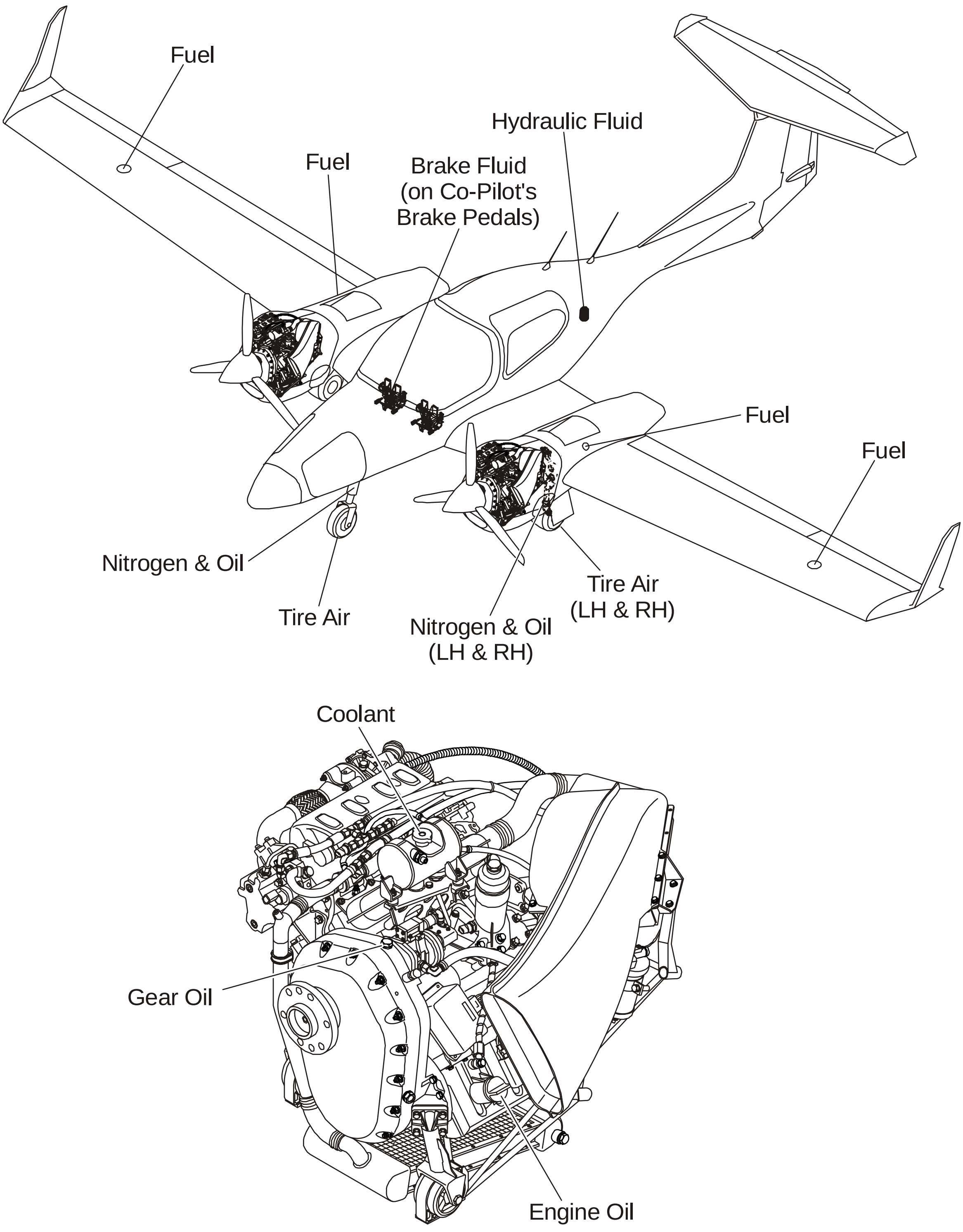

Figure 1: Replenishment Points

3. Refueling/Defueling

A. Refueling

	Detail Steps/Work Items	Key Items/References
(1)	Shut down the engines.	
(2)	ENGINE MASTER OFF.	
(3)	All occupants leave the airplane.	
(4)	Ground the airplane electrically.	At the refueling connection.
(5)	Ground the refueling vehicle electrically.	
(6)	Remove the fuel filler cap.	
(7)	Refuel the airplane.	
(8)	Install the fuel filler cap.	Make sure that the filler cap is locked.
(9)	Do steps 4 thru 6 for the other wing.	
(10)	Do steps 6 thru 8 for the auxiliary tanks, if installed (OÄM 42-056).	Filler caps are located on the outboard side of the engine nacelles.
(11)	Remove the ground cable from the airplane.	
(12)	Remove the ground cable from the refueling vehicle.	

B. Defueling

	Detail Items/Work Steps	Key Items/References
(1)	Ground the airplane electrically.	At the refueling connection.
(2)	Put a suitable container below the drain valve for the wing that you will defuel.	Make sure that you have enough containers to hold all the fuel. Each wing can hold approximately 26 US gal (100 liter) fuel.
(3)	Open the drain valve.	
(4)	When the fuel stops draining, close the drain valve.	Make sure that the drain valve is seated correctly.
(5)	Do steps 2 thru 4 for the auxiliary fuel tank, if installed (OÄM 42-056).	Each auxiliary tank can hold approximately 13.7 US gal (52 liter) fuel.
(6)	If necessary, do steps 2 thru 4 for the other wing.	
(7)	Remove the ground cable from the airplane.	At the refueling ground connection.

4. Fuel Contamination Test

A. Equipment

Item	Quantity	Part Number
Glass container.	1	Commercial.

B. Fuel Contamination Test Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Put the glass container under the fuel tank drain valve that you will take the fuel from.	
(2)	Open the drain valve.	
(3)	When the fuel container is half full, close the drain valve.	Make sure that the drain valve is seated correctly.
(4)	Let the fuel in the glass container stand for 1 minute.	
(5)	Examine the fuel: – It must be clear (JET A1). – Look specifically for small drops of water in the bottom of the glass container. – Look for small particles of solid material.	If you find any contamination you must do the test again. If you still find contamination after 3 tests, you must drain the related fuel tank. Flush the tank (use fuel) and fill it with clean fuel.
(6)	Perform steps 1 thru 5 for the other wing.	
(7)	Drain the nacelle tanks.	

5. Engine Oil System

WARNING: ENGINE OPERATION WITH NO OIL (OR VERY LOW OIL LEVEL) WILL CAUSE ENGINE MALFUNCTION OR DAMAGE.

The engines installed in the DA 42 NG have a wet sump oil system. The engine oil sump can hold 7 liter (7.4 US qt). You must only use engine oil specified by the engine manufacturer.

The oil filler is located on the left side of the engine (Figure 2). There is an access hole implemented in the top LH engine cowling. The oil filler has a dip-stick attached.

A marginal oil consumption is normal. Measure the oil quantity before each flight (or engine ground run-up). If necessary, replenish the oil system.

A. Replenish the Oil System

<table>
<tr><th colspan="2">Detail Steps / Work Items</th><th>Key Items / References</th></tr>
<tr><td>(1)</td><td>Open the access panel located at the upper left cowling.</td><td></td></tr>
<tr><td colspan="3">CAUTION: USE ONLY THE CORRECT ENGINE OILS. REFER TO THE AE MAINTENANCE MANUAL, LATEST REVISION FOR THE CORRECT OIL SPECIFICATIONS AND CHAPTER 2 OF THE AFM. IF YOU DO NOT USE THE CORRECT ENGINE OIL, THE ENGINE CAN BE DAMAGED.</td></tr>
<tr><td colspan="3">For oil system replenishment procedures refer to AE Maintenance Manual, latest revision.</td></tr>
<tr><td>(2)</td><td>Close the access panel located at the upper left cowling.</td><td></td></tr>
</table>

B. Change the Engine Oil

Refer to Section 72-00.

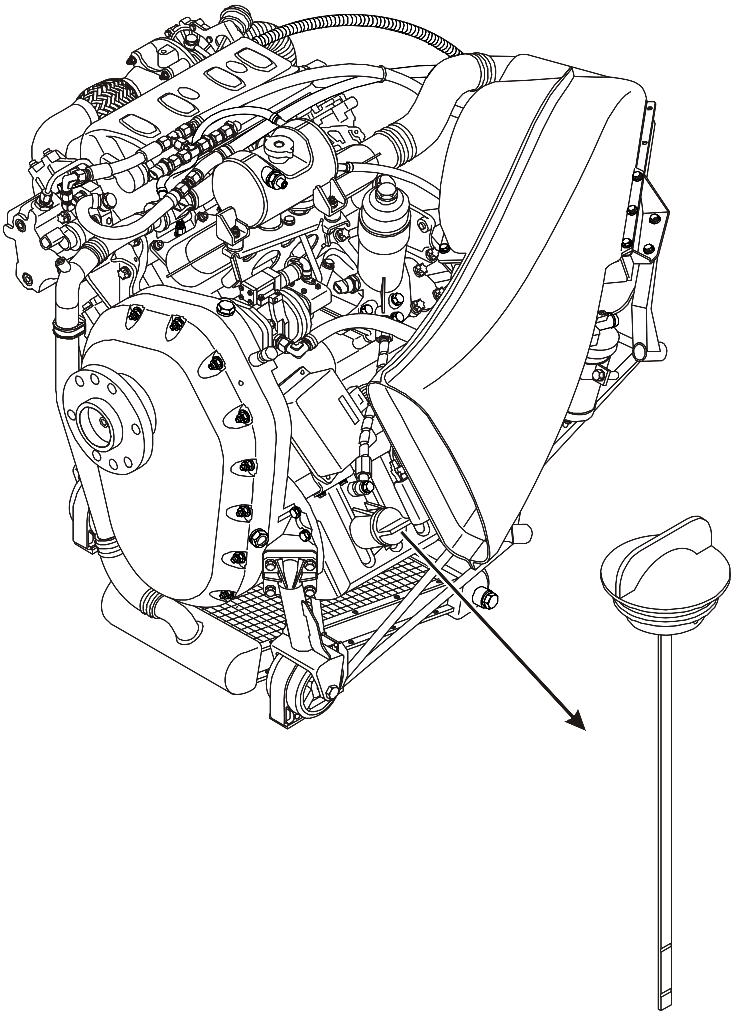

Figure 2 : Engine Oil Filler/Dip-Stick

6. Gearbox Oil

WARNING: ENGINE OPERATION WITH NO GEARBOX OIL (OR VERY LOW OIL LEVEL) WILL CAUSE ENGINE MALFUNCTION OR FAILURE.

Refer to the AE Maintenance Manual, latest revision for proper gearbox oil level.

A. Replenish the Gearbox Oil System

CAUTION: IF THE GEARBOX OIL LEVEL IS LOW THE REASON MUST BE DETERMINED AND THE PROBLEM MUST BE CORRECTED BY AUTHORIZED PERSONNEL.

Detail Steps / Work Items		Key Items / References
(1)	Remove the engine top cowling.	
For gearbox oil system replenishment procedures refer to AE Maintenance Manual, latest revision.		
(2)	Install the top engine cowlings.	

B. Change the Gearbox Oil

Refer to Section 72-00.

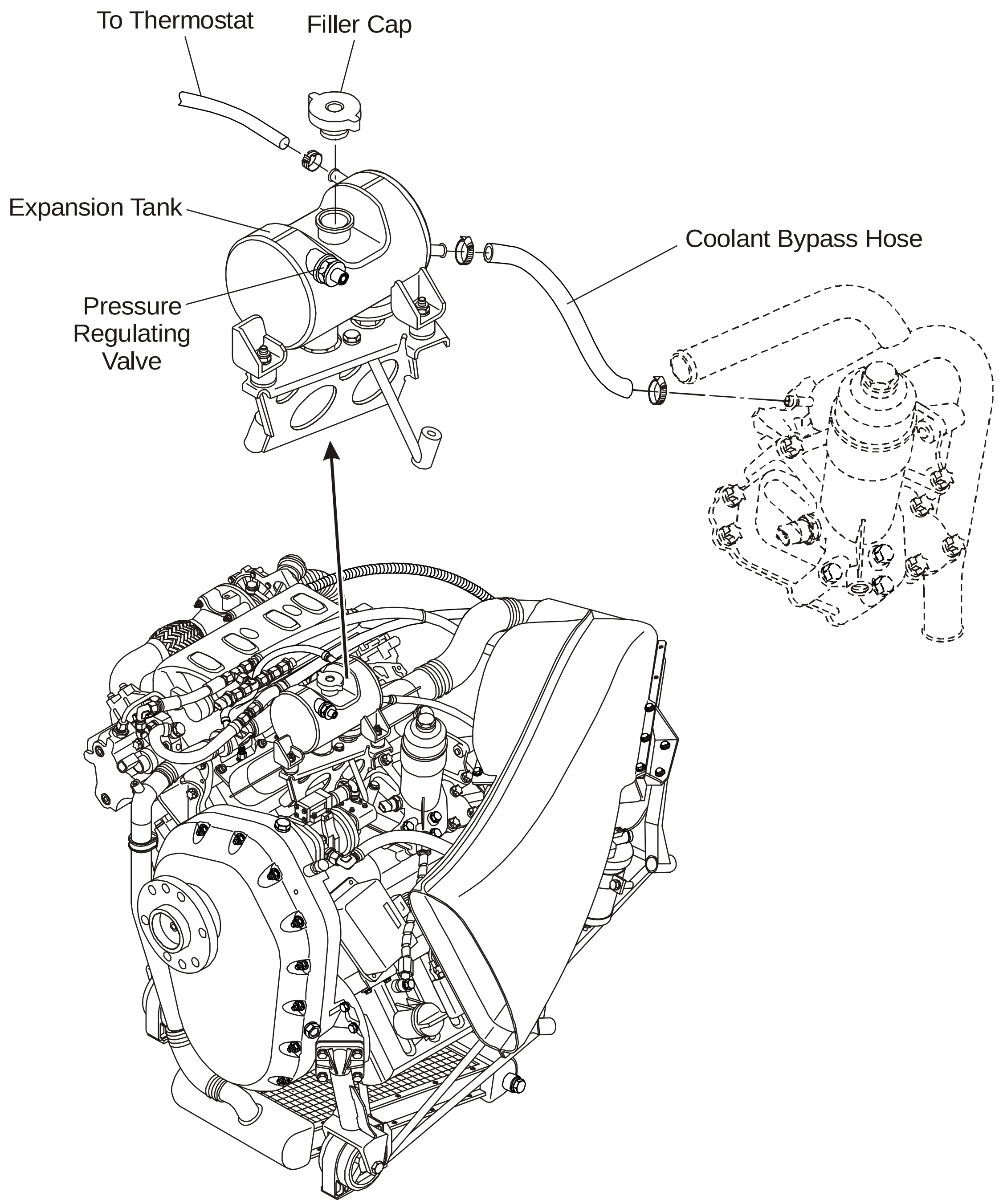

Figure 3: Engine Coolant Expansion Tank / Filler Cap

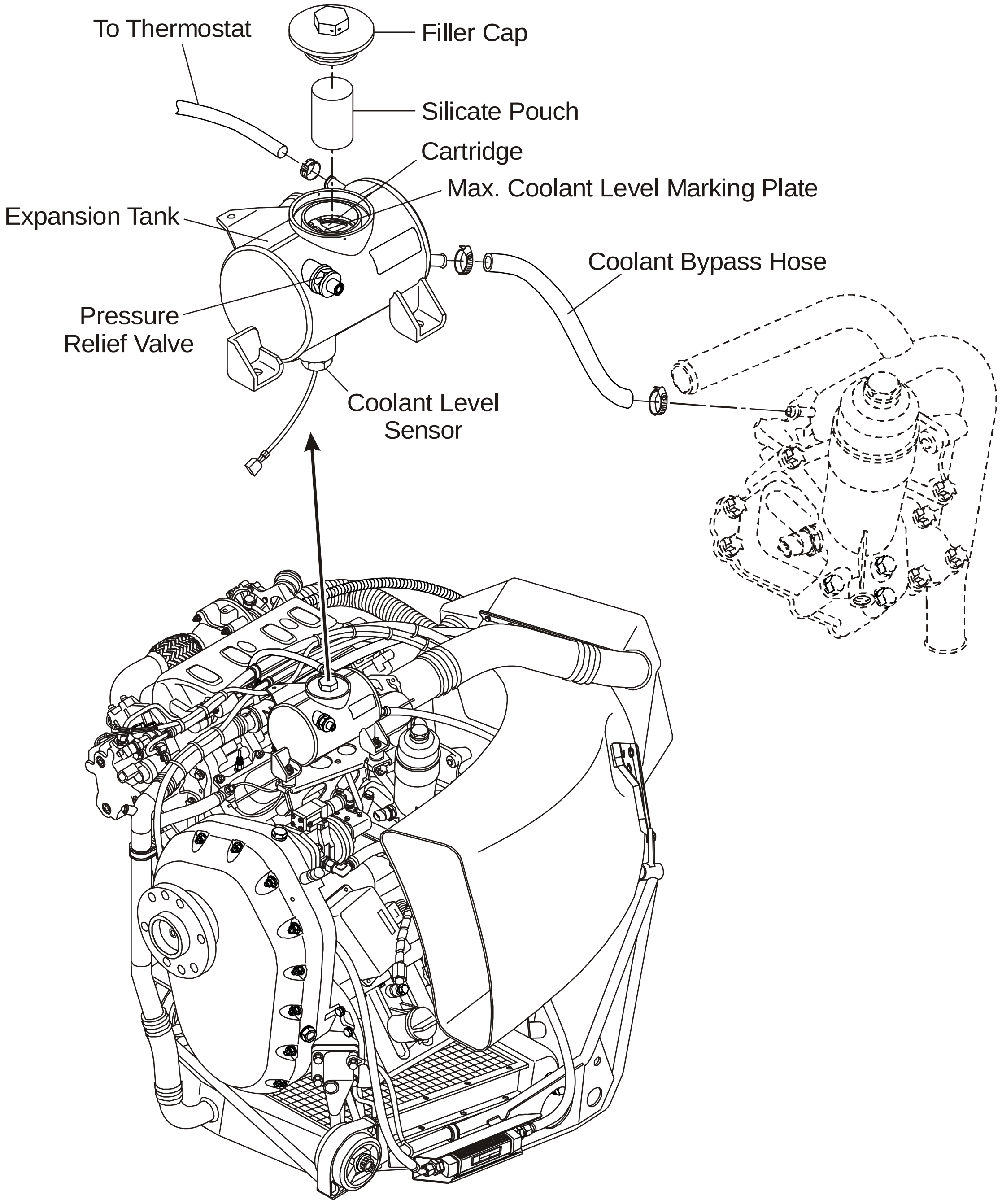

Figure 4: Engine Coolant Expansion Tank / Filler Cap (if MÄM 42-852 is installed)

7. Engine Coolant

WARNING: DO NOT REMOVE THE EXPANSION TANK FILLER CAP WHEN THE ENGINE IS HOT. THE TANK IS PRESSURIZED WITH HOT COOLANT. HOT COOLANT CAN CAUSE INJURY TO PERSONS.

WARNING: DURING NORMAL OPERATION THE AE E4 ENGINE SHOULD NOT CONSUME COOLANT. ANY COOLANT LOSS MUST BE INVESTIGATED BEFORE FURTHER OPERATION OF THE ENGINE. OPERATING THE ENGINE WITH A FAULTY COOLING SYSTEM CAN DAMAGE THE ENGINE

The DA 42 NG engines use liquid coolant to cool the engine and supply heating to the flight cabin. The coolant is circulated around the engine in an integral water jacket. When the coolant is at normal engine operating temperature a thermostatic valve directs the coolant to flow through a heat exchanger. The thermostatic valve controls the flow of coolant through the heat exchanger in order to control the temperature of the coolant.

A coolant expansion tank is located on the left side of the engine (Figure 3 and 4). The expansion tank has a filler cap, a pressure relief valve, a silicate pouch and a coolant level sensor. Use the procedures in this Paragraph to replenish the coolant system when the system has been drained for maintenance or system repair.

A. Replenish the Engine Coolant

<table>
<tr><th colspan="2">Detail Steps / Work Items</th><th>Key Items / References</th></tr>
<tr><td>(1)</td><td>Remove the top engine cowling.</td><td></td></tr>
<tr><td colspan="3">WARNING: DO NOT REMOVE THE EXPANSION TANK FILLER CAP WHEN THE ENGINE IS HOT. THE TANK IS PRESSURIZED WITH HOT COOLANT. HOT COOLANT CAN CAUSE INJURY TO PERSONS.</td></tr>
<tr><td>(2)</td><td>Carefully remove the filler cap from the coolant expansion tank.</td><td></td></tr>
<tr><td colspan="3">CAUTION: USE ONLY THE CORRECT COOLANT. REFER TO CHAPTER 2 OF THE AIRPLANE FLIGHT MANUAL FOR THE CORRECT COOLANT SPECIFICATIONS. IF YOU DO NOT USE THE CORRECT COOLANT, THE ENGINE CAN BE DAMAGED.</td></tr>
<tr><td>(3)</td><td>If MÄM 42-852 is NOT installed:
Add coolant until the fluid level is at the bottom of the tank filler tab.
If MÄM 42-852 is installed:
Add coolant until the fluid level is at the “max. coolant level marking” in the filler neck.</td><td></td></tr>
<tr><td>(4)</td><td>Install the filler cap.
If MÄM 42-852 is installed:
– Install the filler cap.
– Install safety lock wire to secure filler cap.</td><td>Torque refer to Section 20-70.
Check O-ring for deformation, apply EZ TURN.
Wire diameter 0.8 mm (0.032 in).</td></tr>
<tr><td>(5)</td><td>Install the engine cowlings.</td><td></td></tr>
<tr><td colspan="3">Note: When the coolant system has been drained for maintenance/repair air may get trapped in the system. The following steps are to remove any air trapped in the system and give a correct fluid level in the expansion tank.</td></tr>
</table>

Detail Steps / Work Items		Key Items / References
(6)	Do an engine ground run until the engine reaches normal operating temperature. Then shut-down the engine.	Refer to Section 71-00.
(7)	Repeat steps 1 thru 6 until the coolant level remains constant at the correct level.	

B. Fill and Bleed an Engine Cooling System

Refer to Section 75-00.

8. Brake System

The brake fluid reservoirs are located on the brake master cylinders on the co-pilot's side. You get access in the cockpit below the instrument panel.

WARNING: DO NOT GET BRAKE FLUID ON YOUR SKIN OR IN YOUR MOUTH. BRAKE FLUID IS TOXIC AND CAN CAUSE INTERNAL INJURY.

CAUTION: REMOVED SPILLED BRAKE FLUID IMMEDIATELY. BRAKE FLUID CAN CAUSE DAMAGE TO PAINT AND OTHER MATERIALS.

A. Fill the Brake System Reservoirs

Detail Steps / Work Items		Key Items / References
(1)	Clean the top of the brake fluid reservoir and filler cap.	
(2)	Remove the filler cap.	
(3)	Fill the reservoir to the correct level.	Use only MIL-PRF-5606H hydraulic fluid. 12 to 25 mm (0.5 to 1 in) below the top of the filler hole.
(4)	Install the filler cap.	

9. Ice Protection System

The ice protection system is optional equipment (OÄM 42-053 carried out). The deicing fluid tank is installed in the nose compartment of the airplane, on the RH side. It has a capacity of 30 liter (7.9 US gal).

The filler is located in the fuselage nose on the right side and is accessible via the nose baggage compartment.

A. Fill the Deicing Fluid Tank

Detail Steps / Work Items		Key Items / References
(1)	Open the right nose baggage compartment.	
(2)	Clean the filler cap.	
(3)	Remove the filler cap.	
(4)	Fill the de-icing fluid tank.	Refer to the AFM for approved deicing fluids.
(5)	Install the filler cap.	
(6)	Close the right nose baggage compartment.	

10. Tires

The DA 42 NG uses these tires:

Main tires: 15x6.0-6; 6 PR, TT, 160 mph, Flight Special II, Goodyear

Only if MÄM 42-659 is installed:

15x6.0-6; 6 PR, TT, 160 mph, Flight Special II / Flight Custom III, Goodyear

Nose tire: 5.00-5; 10 PR, TT, 120 mph, Flight Special II, Goodyear

A. Examine the Tires and Measure the Pressure

Detail Steps / Work Items		Key Items / References
(1)	Examine the tires. Look specially for: – Cuts and friction damage. – Correct alignment of the slippage markers.	Move the airplane as necessary so that each part of each tire can be seen. If the slippage markers do not align, remove the wheel for shop maintenance.
(2)	Measure the tire pressure. If necessary, inflate the tires to the correct pressure.	Main tire: 4.7 bar (68 PSI). Nose tire: 6.0 bar (87 PSI). If MÄM 42-659 is installed: 6.1 bar (88 PSI).

11. Oxygen System

The continuous flow oxygen system is optional equipment (OÄM 42-055 incorporated). The oxygen cylinder is installed in its own vented compartment in the nose baggage compartment. Its capacity is 10.7 liter (650 cu.in.) at 128 bar (1850 PSI). The filling unit is also installed in the oxygen compartment accessible via a cover on the LH side of the nose baggage compartment.

WARNING: OXYGEN STRONGLY SUPPORTS - RISK FOR FIRE AND EXPLOSION. SMOKING STRICTLY PROHIBITED. AVOID FLAMES, SPARKS AND OTHER SOURCES OF IGNITION. AVOID CONTACT WITH FLAMMABLE MATERIALS (E.G., OIL OR GREASE). SERIOUS PERSONAL INJURY AND/OR DAMAGE TO EQUIPMENT MAY RESULT.

CAUTION: OIL, GREASE OR OTHER LUBRICATIONS IN CONTACT WITH OXYGEN CREATE A SERIOUS HAZARD. SUCH CONTACT MUST BE AVOIDED WHEN HANDLING WITH ANY PART OF THE OXYGEN SYSTEM.

A. Filling the Oxygen Cylinder

Detail Steps/Work Items		Key Items/References
(1)	Open both nose baggage compartment doors.	
(2)	Remove all loose items from the baggage compartment.	
(3)	Check baggage compartment for oil or oil residue.	
(4)	Check deicing fluid tank: must be closed and clean.	
(5)	Open the cover of the oxygen filling unit on the LH side of the oxygen compartment.	
(6)	Check pressure gauges by comparing the pressure indication of the filling block with the pressure indication of the gauge installed on the RH side of the instrument panel.	
(7)	Remove the filling port protection nut and check the filling valve for dust.	
(8)	Connect the oxygen filling station outlet port to the filling valve.	Do not use oxygen with a lower purity grade than prescribed by MIL-PRF-27210.

Detail Steps/Work Items		Key Items/References
(9)	Slightly open the valve of the oxygen filling station and check oxygen flow.	The oxygen cylinder is limited to a pressure of 128 bar (1850 PSI). Refilling of a fully depleted cylinder will take approximately 3.5 minutes.
(10)	Close the valve of the oxygen filling station when a pressure of 128 bar (1850 PSI) is reached.	
(11)	Disconnect the filling station outlet port from the filling valve.	
(12)	Reinstall the filling valve protection nut.	
(13)	Check pressure gauges by comparing pressure indication of the filling block with pressure indication of the gauge installed on the RH side of the instrument panel.	
(14)	Close the cover of the oxygen filling unit.	

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Section 12-20
Scheduled Servicing

1. General

This Section gives lubrication data. It tells you where components are located. It gives a list of approved lubricants. It also gives components which MUST NOT be lubricated.

Most systems and components have maintenance-free bearings. These can be sealed ball/roller bearings or Teflon bushes. These bearings MUST NOT be lubricated. Table 1 shows the bearings which MUST NOT be lubricated.

Table 1 - Items Which MUST NOT Be Lubricated	
Rudder pedal sled.	DO NOT LUBRICATE
Flap rod-end bearings.	DO NOT LUBRICATE
Aileron rod-end bearings.	DO NOT LUBRICATE
Elevator rod-end bearings.	DO NOT LUBRICATE

2. Lubrication Schedule

Table 2 shows the lubrication schedule. Clean each lubrication point before lubrication.

See Figures 1 and 2 for the location of the lubrication points listed on the left side of the table. The center column shows the type of lubricant. The right column shows the lubrication interval.

Table 2 - Lubrication Schedule

Location		Type of Lubricant							Interval
No.	See Figure 1 and 2	1	2	3	4	5	6	7	(Hours) see Notes (1), (2)
(1)	Brake pedal pivot shaft interior					●			1000
(2)	Rudder cable S-tubes			●					200
(3)	Flap actuator extension rod			●					200
(4)	Passenger door safety hook button (red)				●				100
(5)	Upper rudder pivot bearing	●							200
(6)	Nose wheel bearing (see notes 3, 5, and 6)	●						●	200
(7)	Wing main bolts	●							2000
(8)	Stick support pivot pins	●							1000
(9)	Battery terminals				●				1000
(10)	B-bolts	●							2000
(11)	B-bolt spherical bearings	●							2000
(12)	A-bolts	●							2000
(13)	A-bolt spherical bearings	●							2000
(14)	Brake pedal pivot		●						200
(15)	Flap actuator universal pivot block	●							1000
(16)	Brake caliper locating pins						●		1000
(17)	Torque link bearings			●					100
(18)	Main wheel bearings (see notes 3, 5, and 6)	●						●	200
(19)	Cable eyes on rudder	●							200
(20)	Landing gear actuator bearings	●							100

Notes:

(1) Lubricate at the time shown or at every disassembly / assembly.

(2) Lubricate more frequently in severe climates or operating conditions.

(3) Lubricate more frequently when the ice protection system (optional equipment) is frequently operated.

(4) Lubricate at the time shown and at Annual Inspection.

(5) Do not grease on the threads. It will reduce the friction of the lock-nut.

CAUTION: DO NOT MIX AVIATION WHEEL BEARING GREASES WITH EACH OTHER. IF USING OTHER APPROVED GREASES, COMPLETE REMOVAL OF CONTAINED GREASE AND BEARING CLEANING IS REQUIRED. REPLACEMENT OF PREVIOUSLY LUBRICATED FELT GREASE SEALS IS ALSO REQUIRED.

(6) The wheel manufacturer lubricates the main wheel bearings with Mobil Aviation Grease SHC 100 Type 1 grease is completely compatible with the wheel bearings.

(7) On airplanes registered in the USA, lubricate the wheel bearings at every annual / 100 hour inspection (see FAR 43, Appendix D).

Table 3 - Lubricant Specifications		
Specification	**Product**	**Manufacturer**
TYPE 1		
MIL-G-3545 (obsolete)	AeroShell Grease 5	Shell Oil Company
	Grease CIATIM 201, GOST 6267-74	RUSMA LLC Company
	Grease CIATIM 221, GOST 9433-80	RUSMA LLC Company
	Mobil Aviation Grease SHC 100	Exxon Mobil Oil Corp.
TYPE 2		
MIL-L-7870	Royco 363	Royal Lubricants Co. Inc.
	Brayco 363	Bray Oil Co.
Warm climates only	LPS 2	LPS
TYPE 3		
Greaseless Lubricant	LPS 1	LPS
TYPE 4		
VV-P-236 (petrolatum)	Royco 1	Royal Lubricants Co. Inc.
	DC 4	Dow Corning
TYPE 5		
MIL-C-16173 (Grade 2)	LPS 3	LPS
TYPE 6		
MIL-A-907	Loctite Antiseize 767	Loctite
-	Multi-Purpose Lubricant	DRI SLIDE
-	LPS Force 842	LPS
-	Lubriplate X-357	Lubriplate
-	Loctite 8191	Loctite
-	Anti-Friction Spray MoS2	WEICON GmbH
TYPE 7		
MIL-PRF-81322, Grade 2 or	Aeroshell Grease 22	Shell Oil Company
DOD-G-24508 A	Mobil Aviation Grease SHC 100	Exxon Mobil Oil Corp.

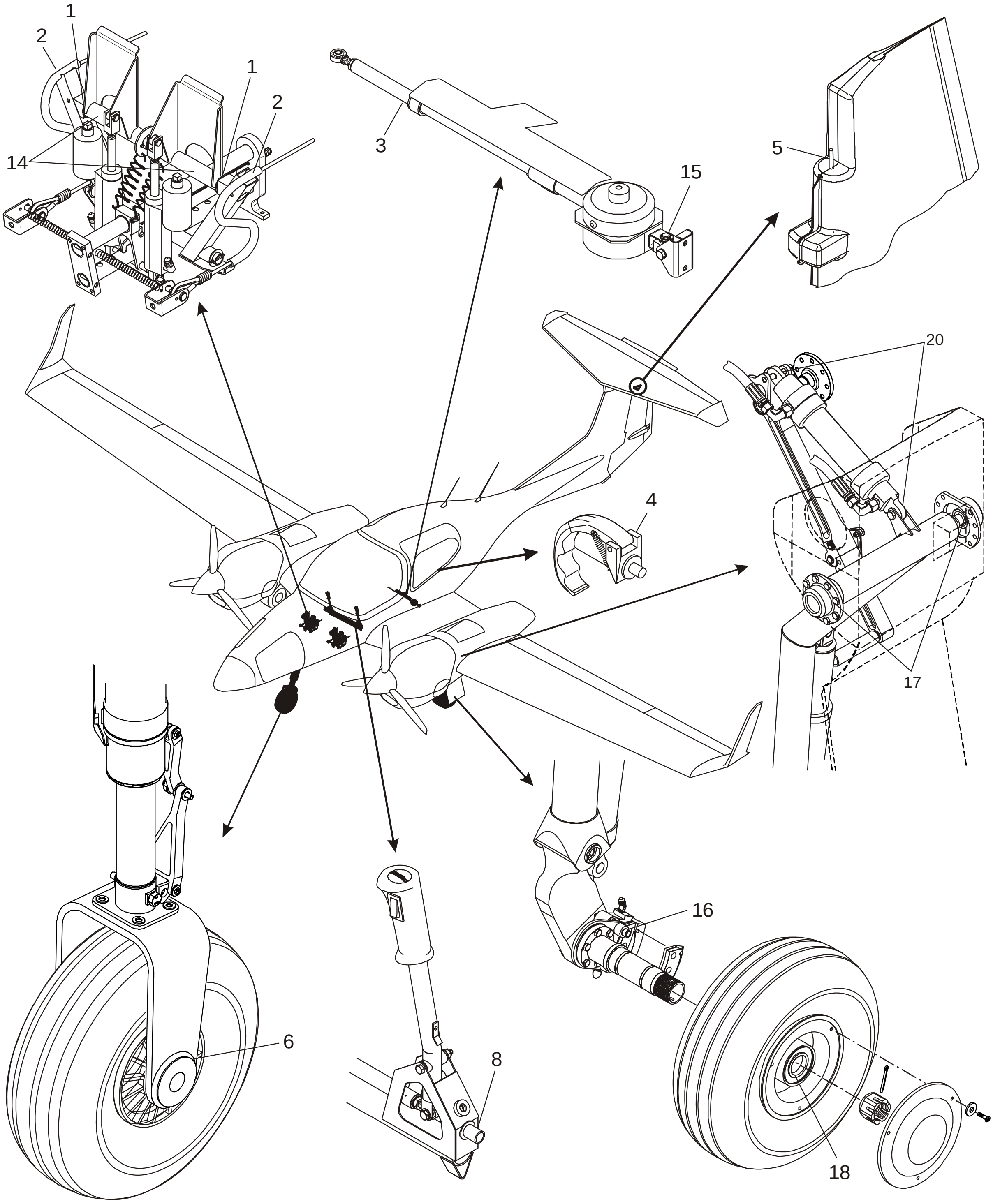

Figure 1: Lubrication Points Sheet 1

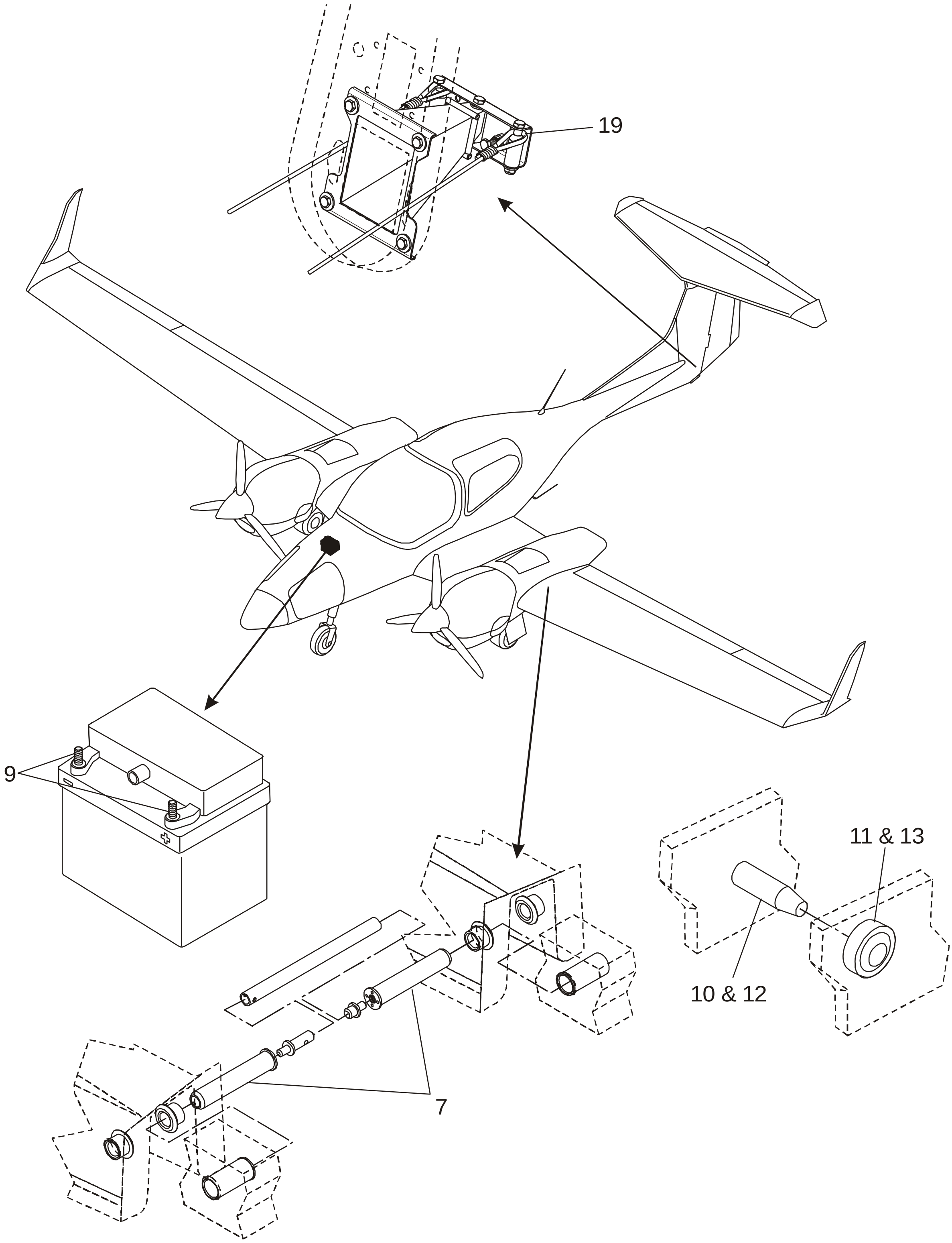

Figure 2: Lubrication Points Sheet 2

Section 12-30
Unscheduled Servicing

1. General

This Section tells you how to clean the airplane. It also tells you how to remove snow and ice from the airplane.

2. Exterior Cleaning

The outer surfaces of the DA 42 NG must be kept clean to maintain the good performance characteristics of the airplane. The leading edge of the wings are specially important.

Protect all control surface bearings and other lubricated components before cleaning the airplane.

Use large quantities of water to clean the airplane. If necessary, add a mild cleaning agent to the water. Remove excess dirt or dead insects immediately after flight. Dried on dirt and dead insects are very difficult to remove.

CAUTION: DO NOT USE CLEANING OR POLISHING AGENTS WHICH CONTAIN SILICON. IF THE AIRPLANE NEEDS REPAIR AT SOME TIME, SILICON CAN PREVENT REPAIR MATERIALS FROM BONDING CORRECTLY.

Approximately once a year, apply a silicone-free automotive polish to the outer surface of the airplane.

3. Canopy and Transparency Cleaning

CAUTION: DO NOT RUB THE CANOPY OR TRANSPARENCIES WHILE THEY ARE DRY. DO NOT USE DIRTY CLOTHS OR SPONGES. THE ACRYLIC TRANSPARENCIES SCRATCH VERY EASILY WITH THE SMALLEST PARTICLES OF DUST OR DIRT.

Clean the canopy and transparencies with large quantities of clean water. Use clean sponges and good chamois leather that you should not use for any other purpose.

Polish dull or scratched areas using a special acrylic cleaner. Remove scratches with special transparency polishing systems (e.g. Micro-Mesh).

4. Interior Cleaning

Clean the interior of the airplane cabin with a flame-proof vacuum cleaner.

5. Engine Cleaning

Use a cold cleaning agent (e.g. Berner Cold Cleaner No.13618.0 or refer to the AE Maintenance Manual).

CAUTION: DO NOT CLEAN THE ENGINE WHILE THE ENGINE IS HOT.

CAUTION: DO NOT USE HIGHLY FLAMMABLE OR CORROSIVE CLEANING AGENTS TO CLEAN THE ENGINE.

CAUTION: DO NOT LET THE CLEANING AGENT GET INTO ELECTRICAL COMPONENTS AND ENGINE INTAKES.

CAUTION: DO NOT START THE ENGINE UNTIL ALL OF THE CLEANING AGENT HAS EVAPORATED.

Protect all electrical components and cables. Use polythene bags to seal intakes and other areas that you want to keep dry. After washing you can dry the engine using compressed air (< 8 bar (118 PSI).)

6. Snow and Ice Removal

Remove snow and ice as soon as possible to prevent water from the melting snow or ice re-freezing and causing damage.

CAUTION: DO NOT USE SHARP OBJECTS TO REMOVE SNOW OR ICE. YOU CAN DAMAGE THE AIRPLANE STRUCTURE.

Use soft brushes to remove snow from the surfaces.

Put the airplane in a heated hangar to remove ice or spray de-icing fluid onto ice-covered surfaces using a suitable spray bottle. For approved de-icing fluids refer to AFM, Section 8.7.

Use a soft piece of cloth to wipe the airplane dry.

7. Conservation of Exterior Parts

This Section tells you which exterior parts are protected with an anti-corrosion coating, when and how a new anti-corrosion coating must be applied.

A. Anti-Corrosion Coating Check

Check the protected exterior parts (refer to the Anti-Corrosion Checklist and Figures 1 through 15) for a film of the anti-corrosion coating. If the film is scratched or the part shows signs of corrosion, you must replace the anti-corrosion coating (refer to Paragraphs B and C of this Section).

B. Remove the Anti-Corrosion Coating

CAUTION: YOU MUST USE THE APPROVED ANTI-CORROSION COATING CLEANING AGENTS IN ORDER TO PREVENT DAMAGE TO OTHER PARTS OF THE AIRPLANE.

Approved anti-corrosion coating cleaning agents are:

– Ardrox® AV 980

– Diestone DLS

Remove the anti-corrosion coating:

– Read the product datasheet carefully.

– Cover the airplane parts and surfaces in your working area, which are not subject to the cleaning.

– Apply the anti-corrosion cleaning agent to the parts.

– Use a cloth to remove the remains.

– Repeat until the surface is clean and dry.

C. Apply the Anti-Corrosion Coating

CAUTION: YOU MUST USE THE APPROVED ANTI-CORROSION COATINGS IN ORDER TO PREVENT DAMAGE TO OTHER PARTS OF THE AIRPLANE.

Approved anti-corrosion coatings are:

– Ardrox® AV 30 (color: red; recommended for not visible parts)

– Socopac 65H (color: red; recommended for not visible parts)

– Cor - Ban 35 (color: transparent; recommended for visible parts)

Apply the anti-corrosion coating:

– Read the product datasheet carefully.

– Cover the airplane parts and surfaces in your working area, which are not subject to the anti-corrosion coating.

– Apply the anti-corrosion agent to the parts. Make sure the surface is covered with a thin film of the anti-corrosion coating.

– The anti-corrosion coating needs 3 hours to dry.

– Remove the covers from the airplane.

D. Anti-Corrosion Coating Checklist

Refer to the figure numbers in the following table to identify the parts, where anti-corrosion coatings must be applied.

Anti-Corrosion Coating Checklist		
Figure	**Part / Location**	**Initials**
	FLAPS LH/RH	
1	Control rod eye end fitting	
1	Ball joint bolt and nut	
	AILERONS LH/RH	
2	Control rod eye end fitting	
2	Ball joint bolt and nut	
	MAIN LANDING GEAR LH/RH	
3, 5	Tension spring	
3, 5	Forward pivot bearing, bolt head and nut	
3, 5	Aft pivot bearing, bolt head and nut	
3, 5	Tension spring	
3, 5	Latch operating arm, bolt heads and nuts (2)	
3, 5	Driver plate and folding stay bracket	
4	Main landing gear axle, bolt heads and nuts (4)	
4	Main landing gear leg assy / trailing arm oversize bolt head and nut	
4	Damper upper bolt head and nut	
4	Damper lower bolt head and nut	
6	Main landing gear bay, door hinges (2), bolt heads (6) and nuts (6)	
6	Main landing gear bay nuts (5)	
	ELEVATOR, ELEVATOR CONTROLS AND ELEVATOR TRIM SYSTEM	
7, 8	Elevator push rod, upper eye end fitting	
7, 8	Elevator upper eye end fitting, bolt head and nut	
7, 8	Elevator trim bolt heads (8) and nuts (8)	
7, 8	Elevator trim actuating lever attaching bolt head and nut	
9	Elevator push eye end fitting, bolt head and nut	
9	Elevator bellcrank, bolt heads (3) and nuts (3)	
9	Elevator centering springs (2) and mountings (3)	

Anti-Corrosion Coating Checklist		
Figure	**Part / Location**	**Initials**
	RUDDER	
10	Rudder pedestal, nuts (4)	
10	Rudder friction damper coupling and bolt heads (2)	
10	Rudder plate, bolt heads (3) and nuts (3)	
11	Rudder upper bearing	
	NOSE LANDING GEAR	
12	Centering unit guidance plate and bolt heads (3)	
12	Nose wheel fork bolt heads (4)	
12	Torque links bolt heads (5) and nuts (5)	
13	Tension spring	
13	Tension spring mounting bolt heads (2) and nuts (2)	
13	Folding stay latching mechanism	
13	Folding stay latch operating arm: lower ball joint, bolt head and nut	
14	Actuator eye end fitting	
14	Mounting bracket bolt heads (5)	
15	Nose landing gear bracket and bolt heads LH (4), RH (4)	
15	Door rod upper eye end fitting LH, RH	
15	Door hinges LH (4) , RH (4)	
	FUSELAGE	
16	Foot step screws LH (4), RH (4)	

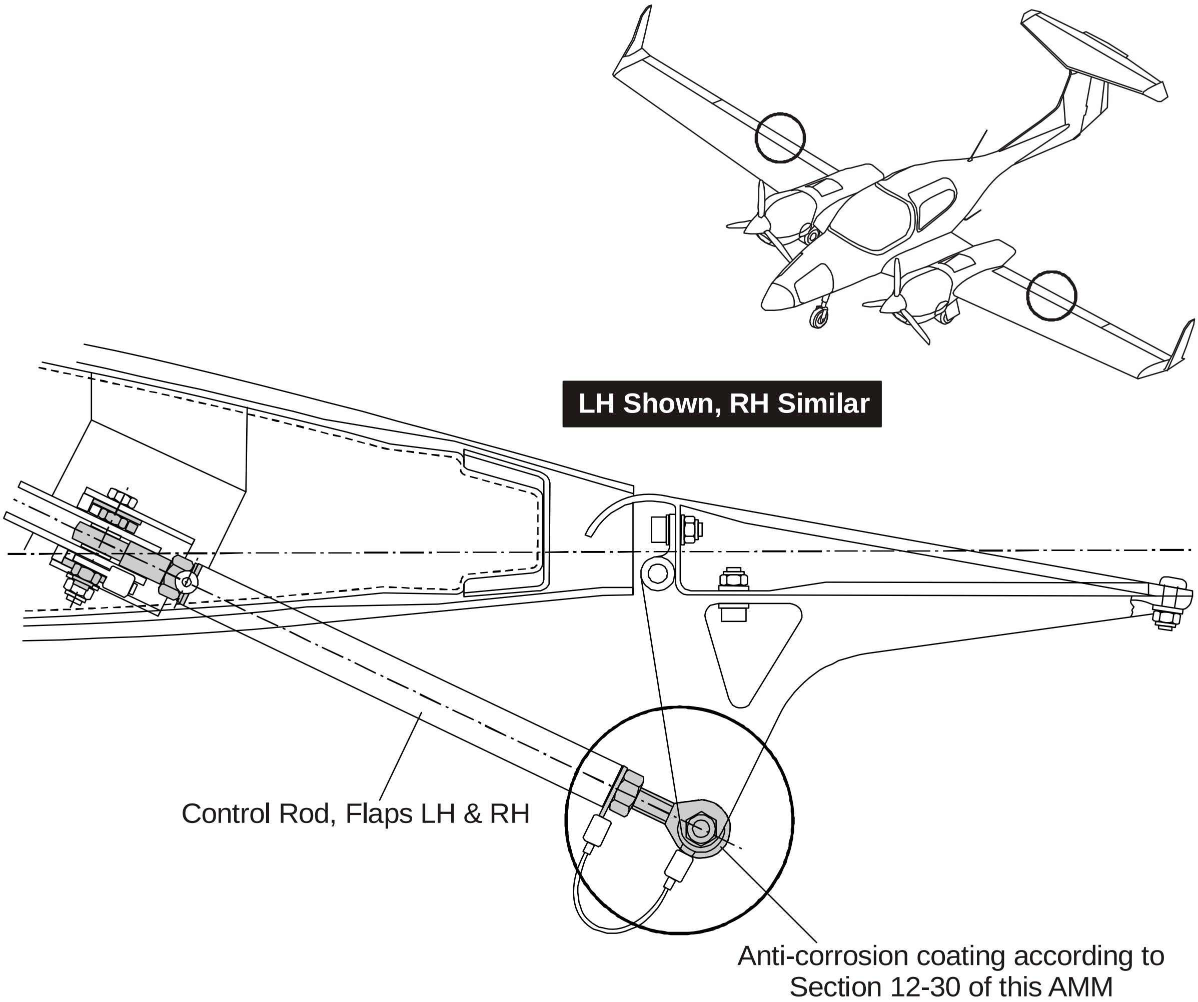

Figure 1: Anti-Corrosion Coating - Control Rod Flaps LH/RH

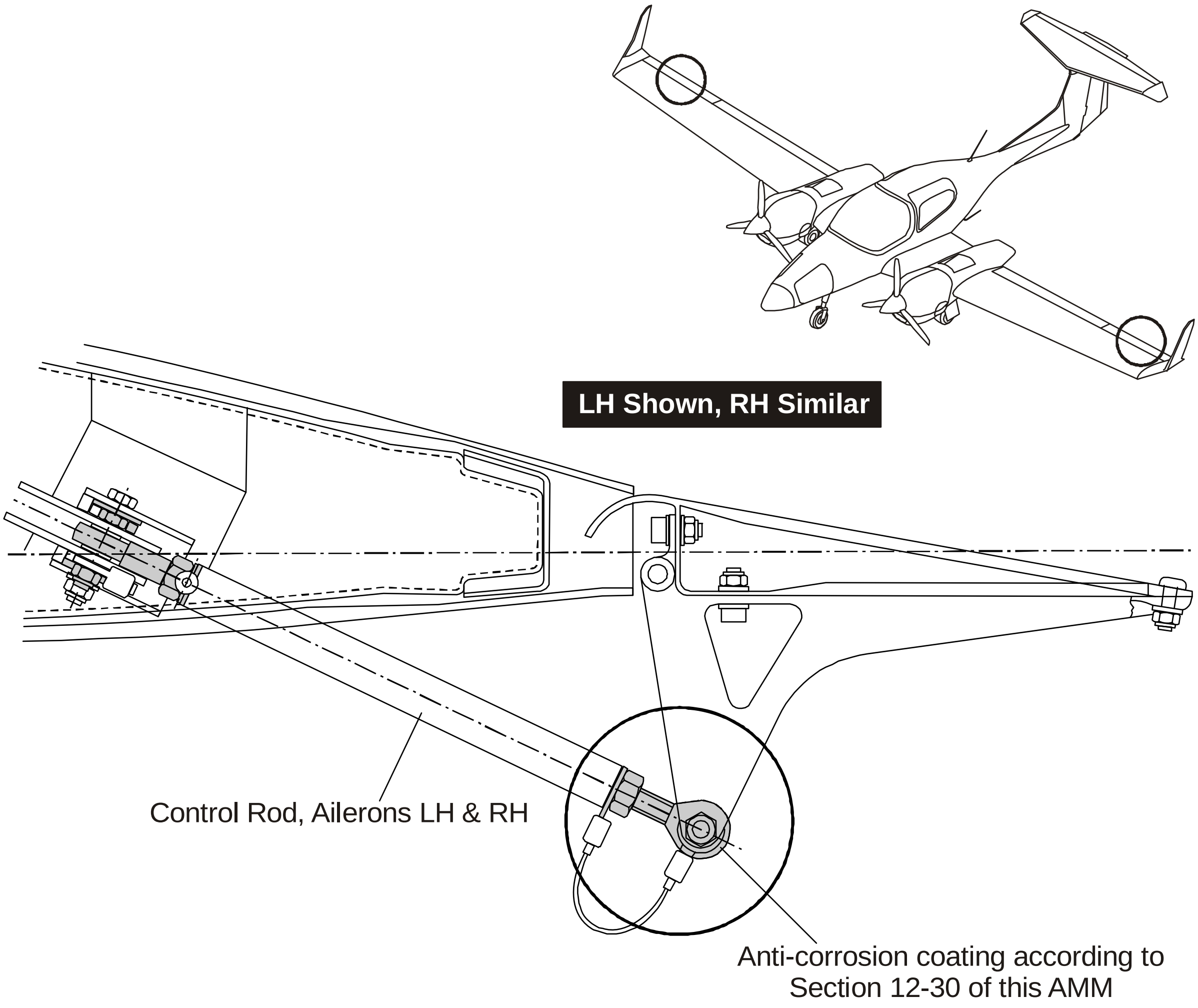

Figure 2: Anti-Corrosion Coating - Control Rod Ailerons LH/RH

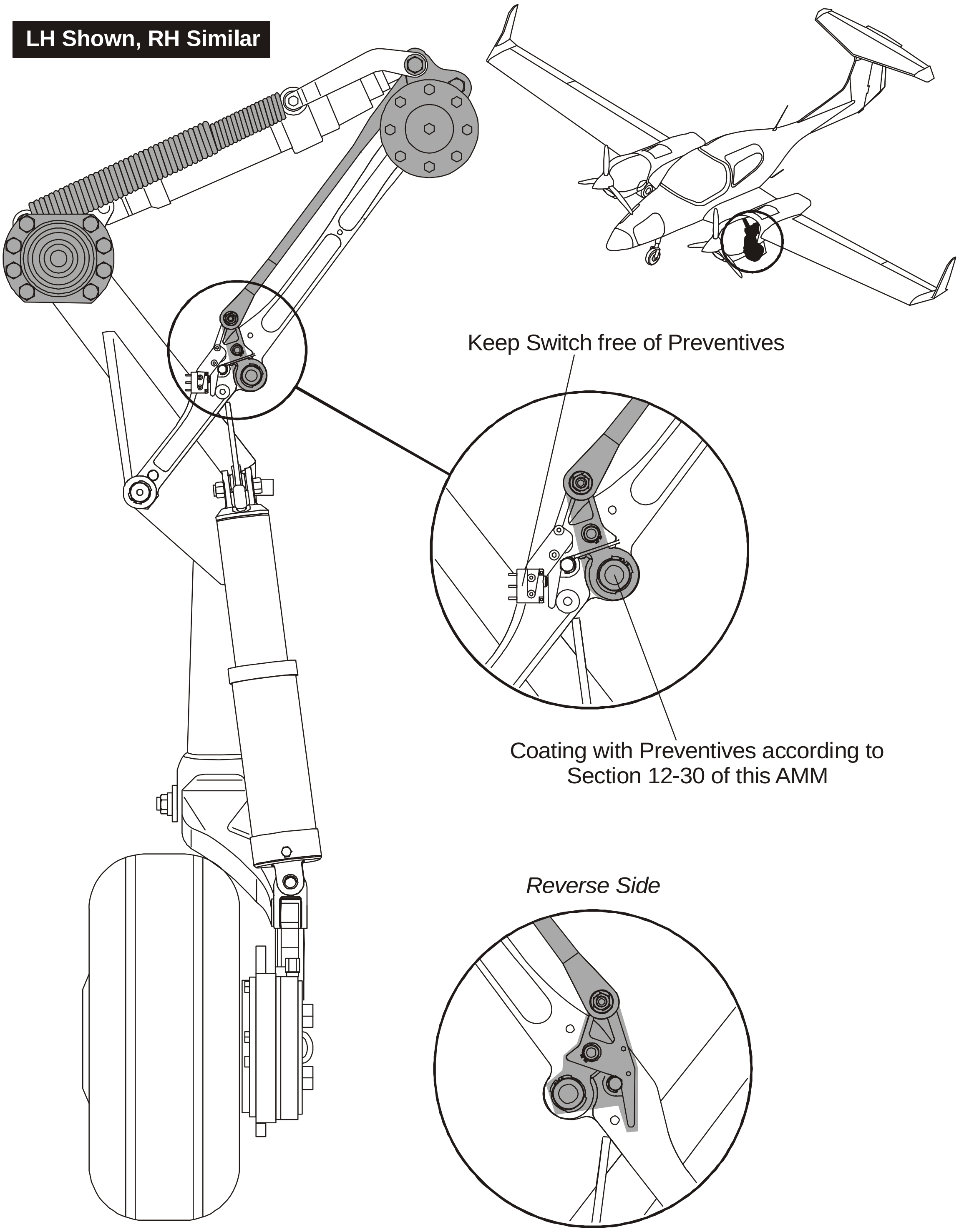

Figure 3: Anti-Corrosion Coating - Main Landing Gear LH/RH (1)

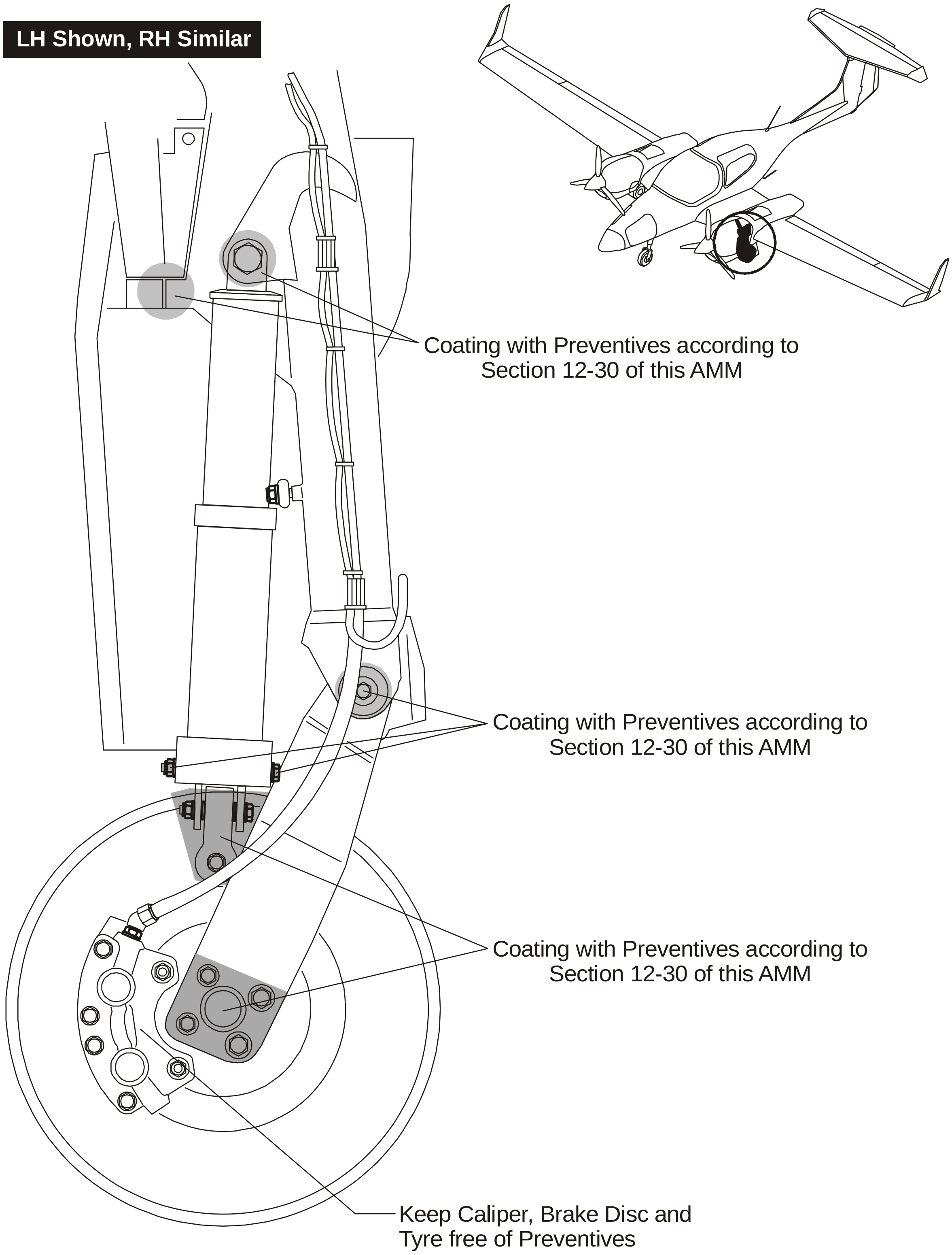

Figure 4: Anti-Corrosion Coating - Main Landing Gear LH/RH (2)

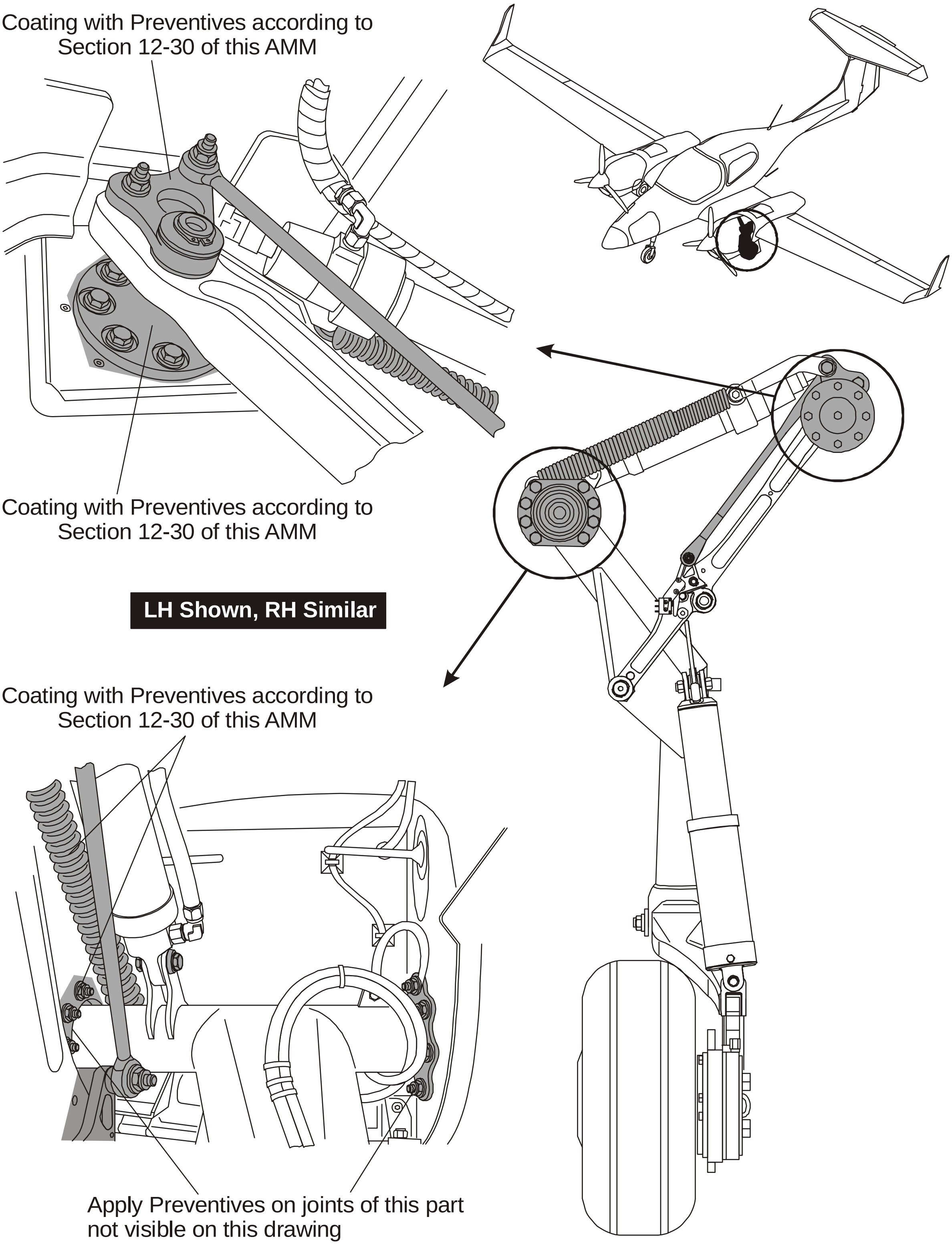

Figure 5: Anti-Corrosion Coating - Main Landing Gear LH/RH (3)

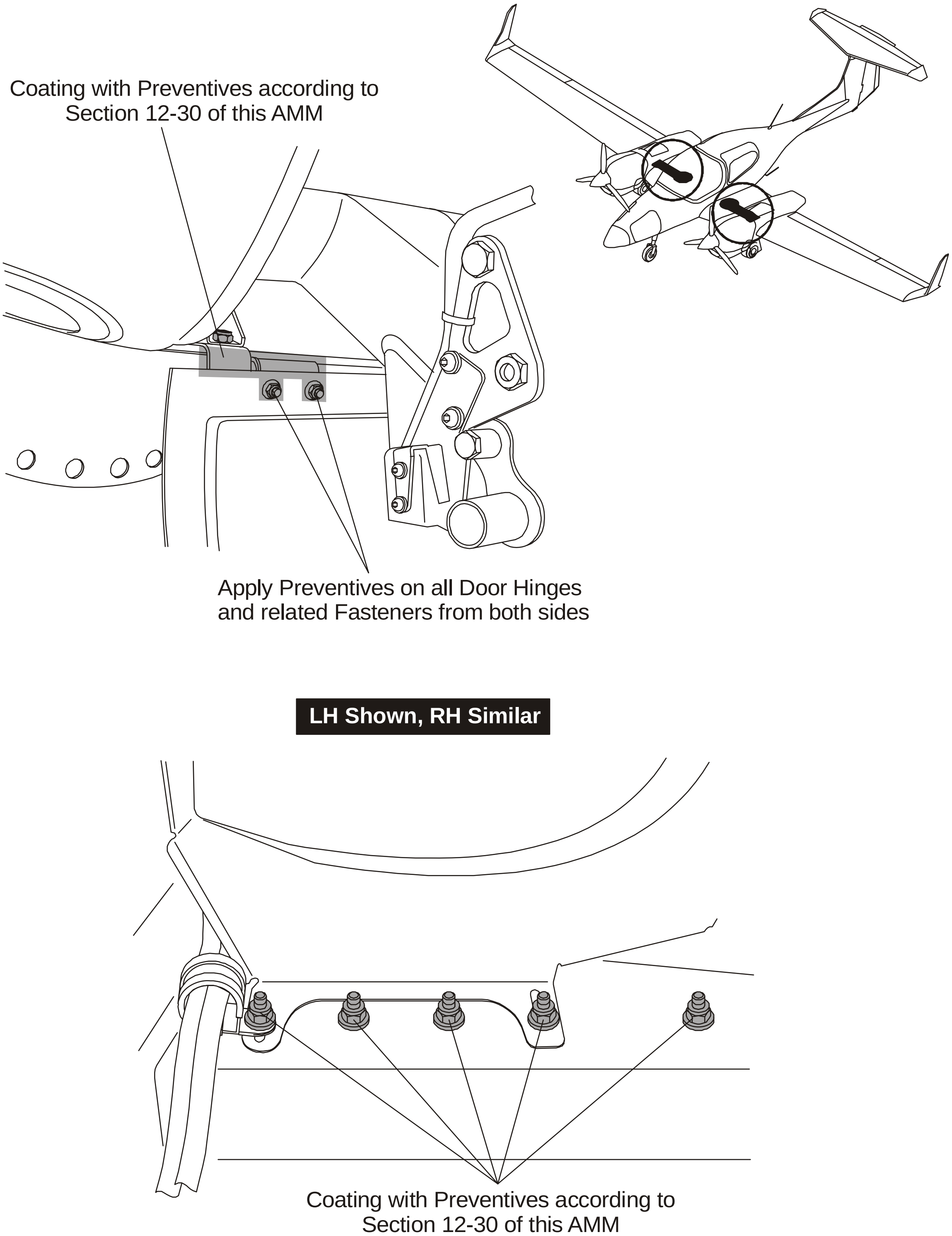

Figure 6: Anti-Corrosion Coating - Main Landing Gear Bay LH/RH

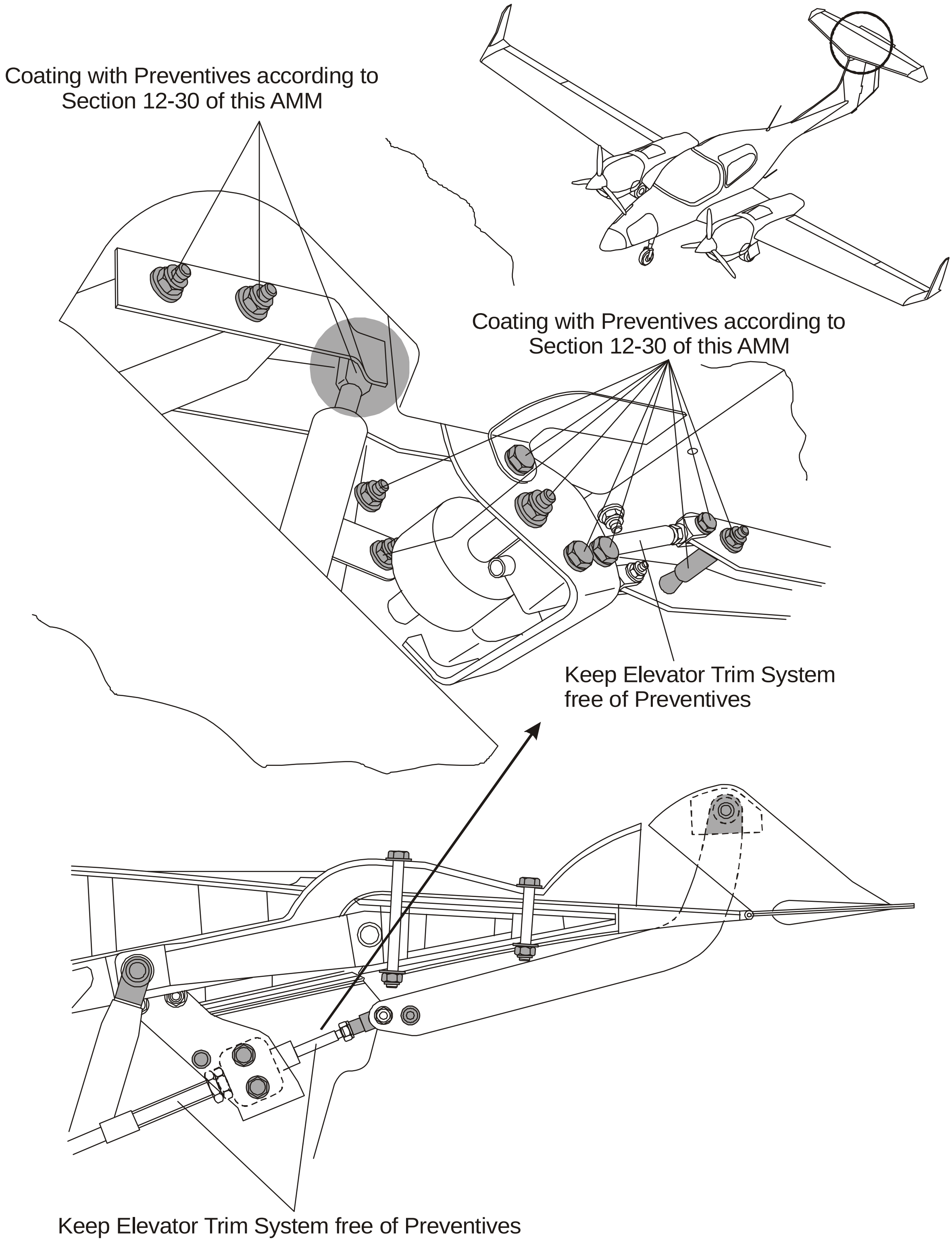

Figure 7: Anti-Corrosion Coating - Elevator and Elevator Trim System (1)

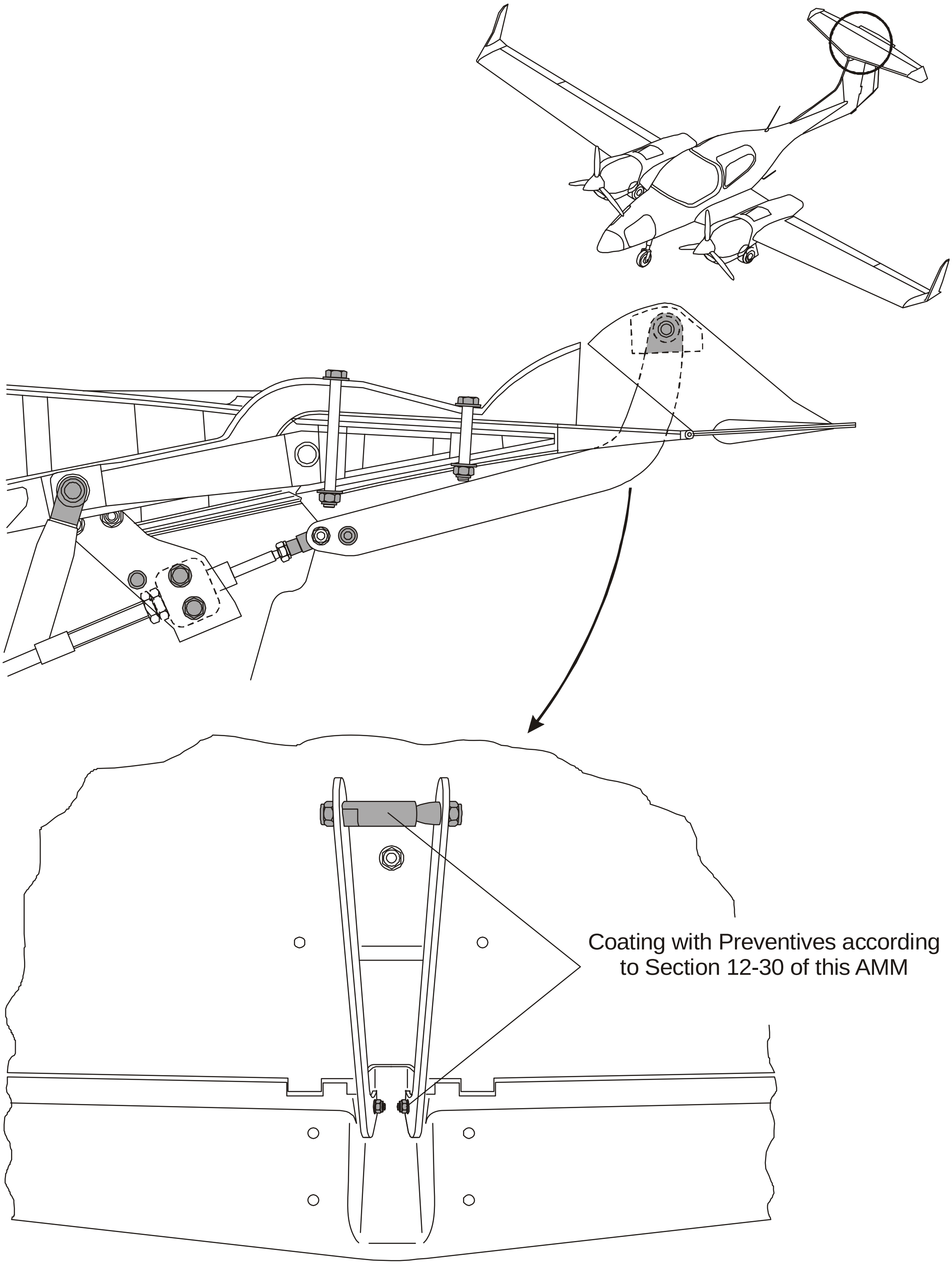

Figure 8: Anti-Corrosion Coating - Elevator and Elevator Trim System (2)

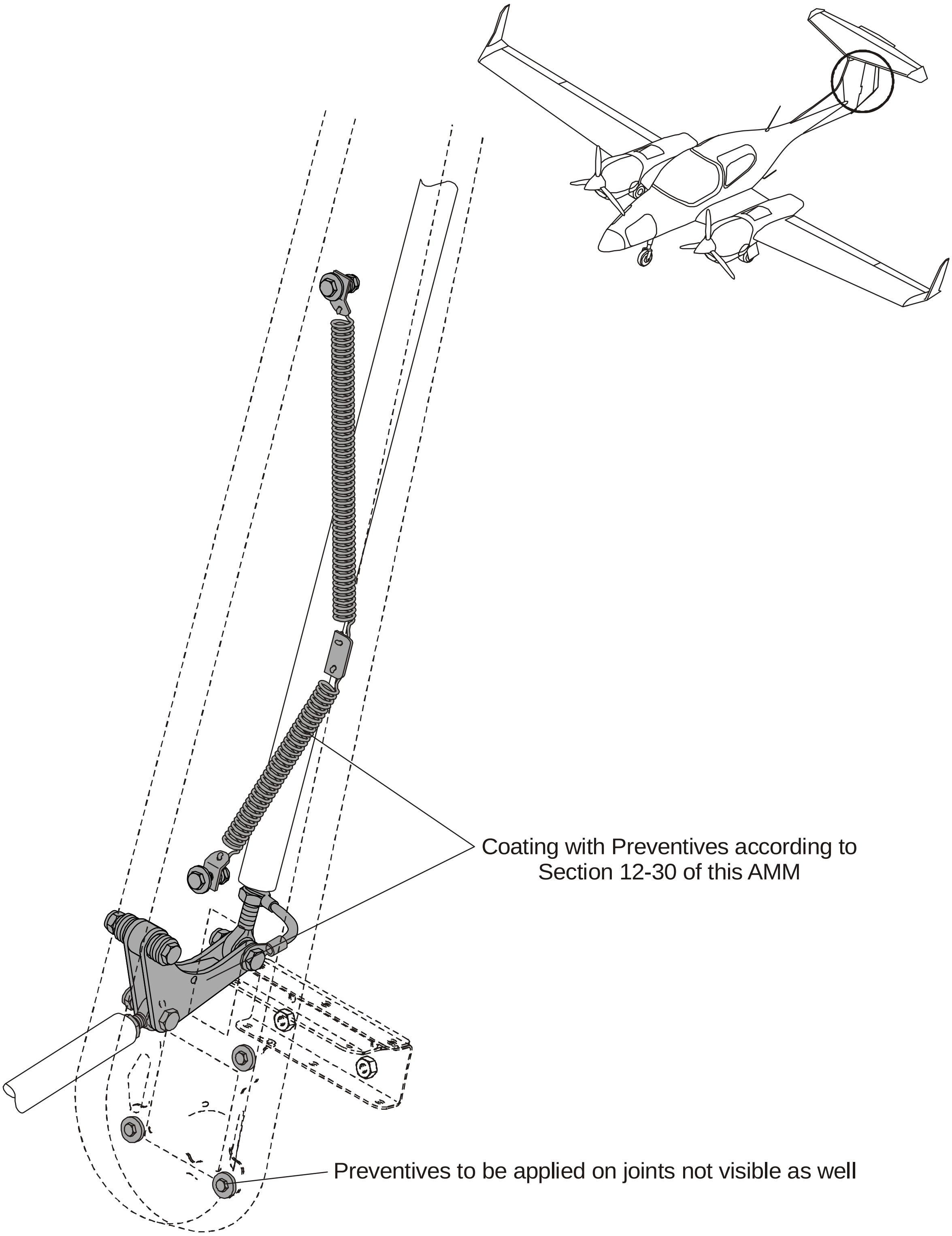

Figure 9: Anti-Corrosion Coating - Elevator Controls

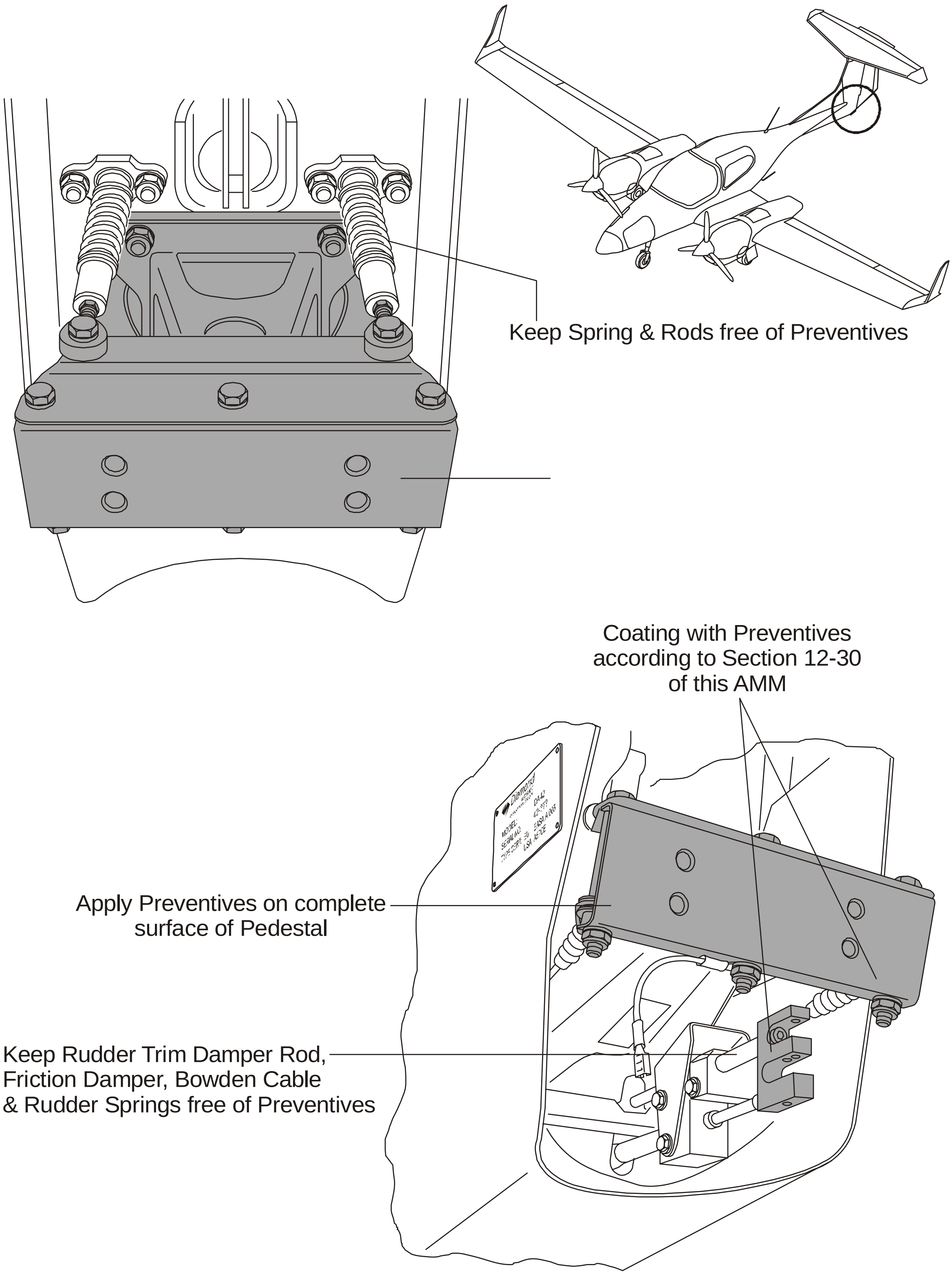

Figure 10: Anti-Corrosion Coating - Rudder Pedestal

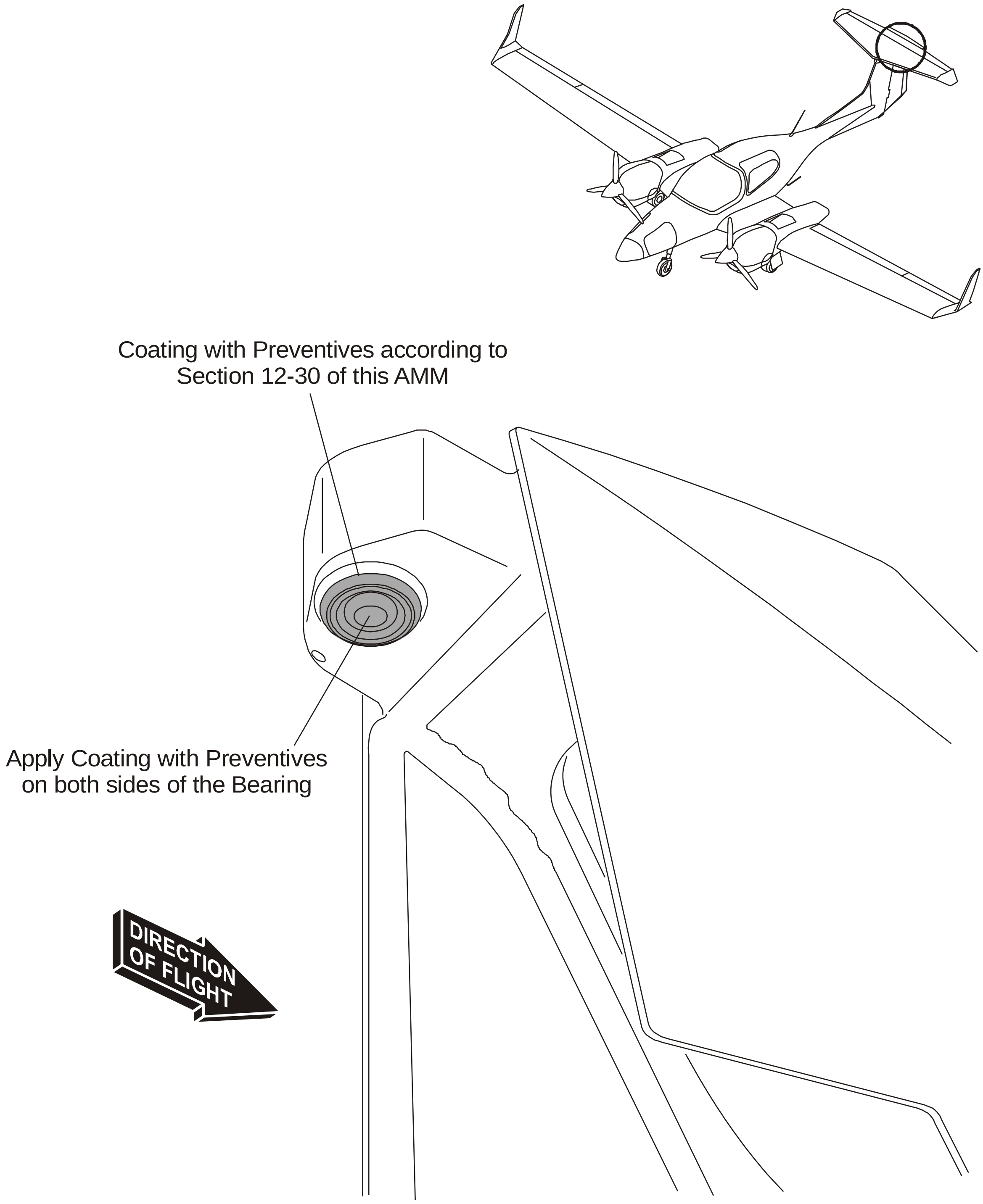

Figure 11: Anti-Corrosion Coating - Rudder

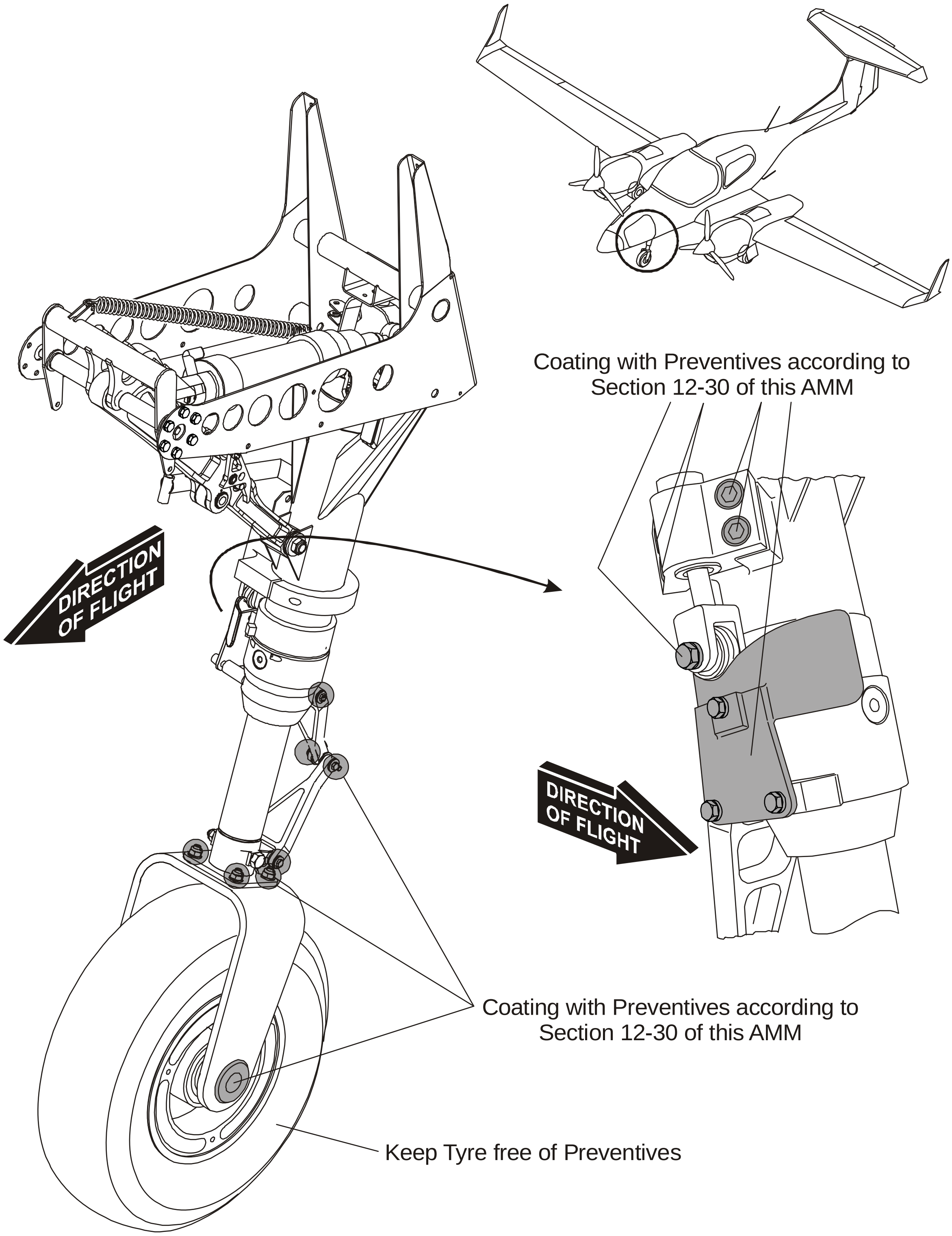

Figure 12: Anti-Corrosion Coating - Nose Landing Gear (1)

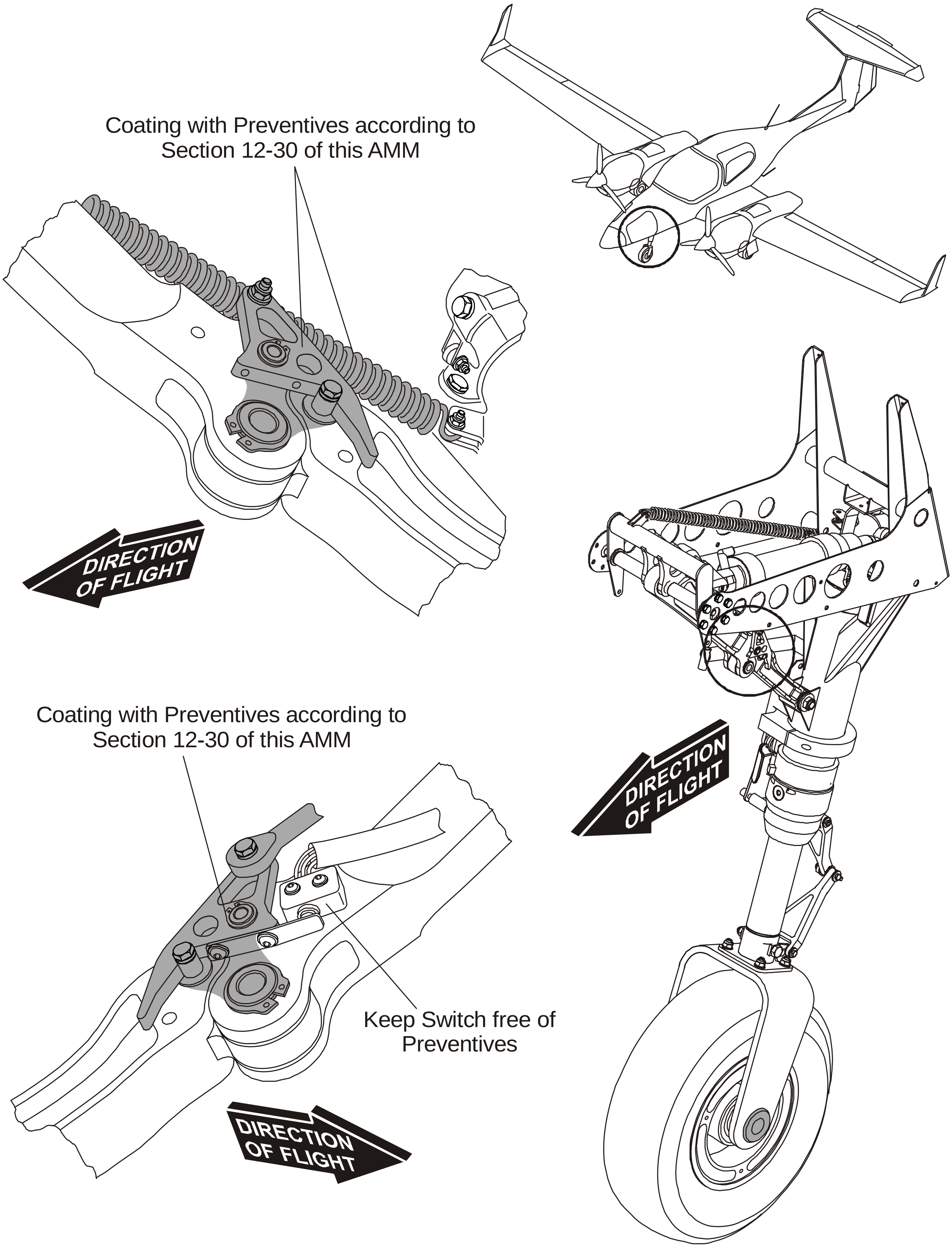

Figure 13: Anti-Corrosion Coating - Nose Landing Gear (2)

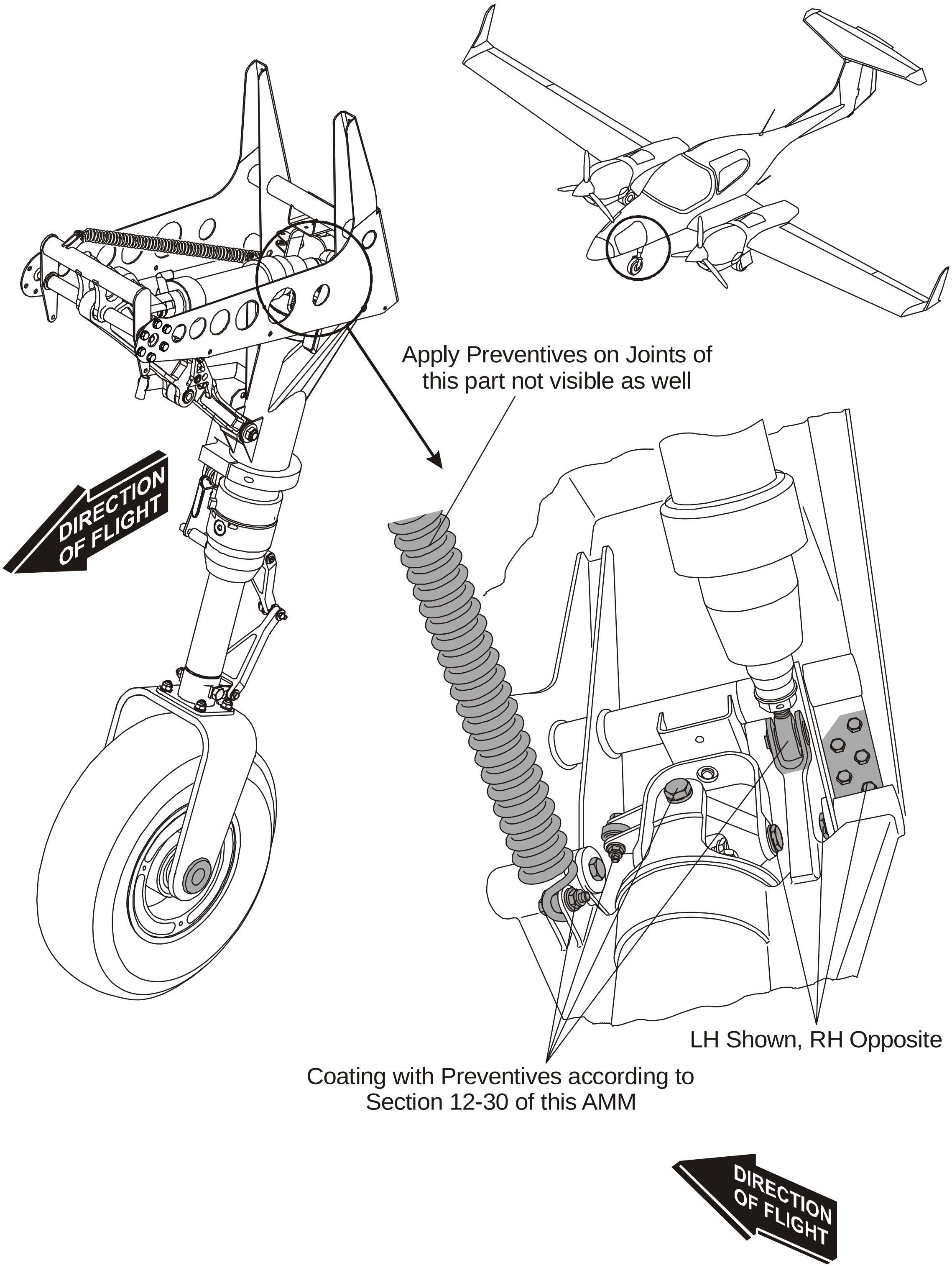

Figure 14: Anti-Corrosion Coating - Nose Landing Gear (3)

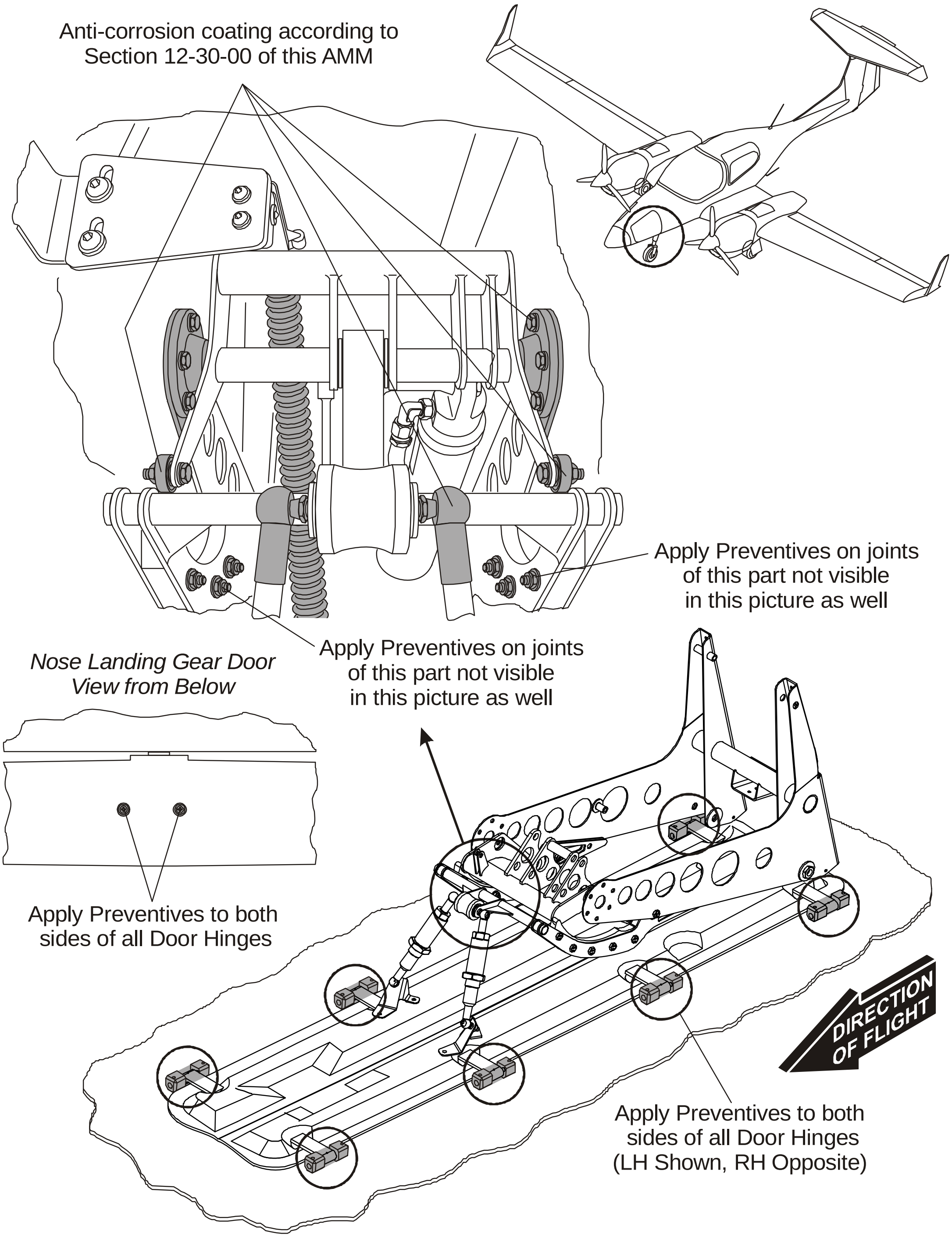

Figure 15: Anti-Corrosion Coating - Nose Landing Gear (4)

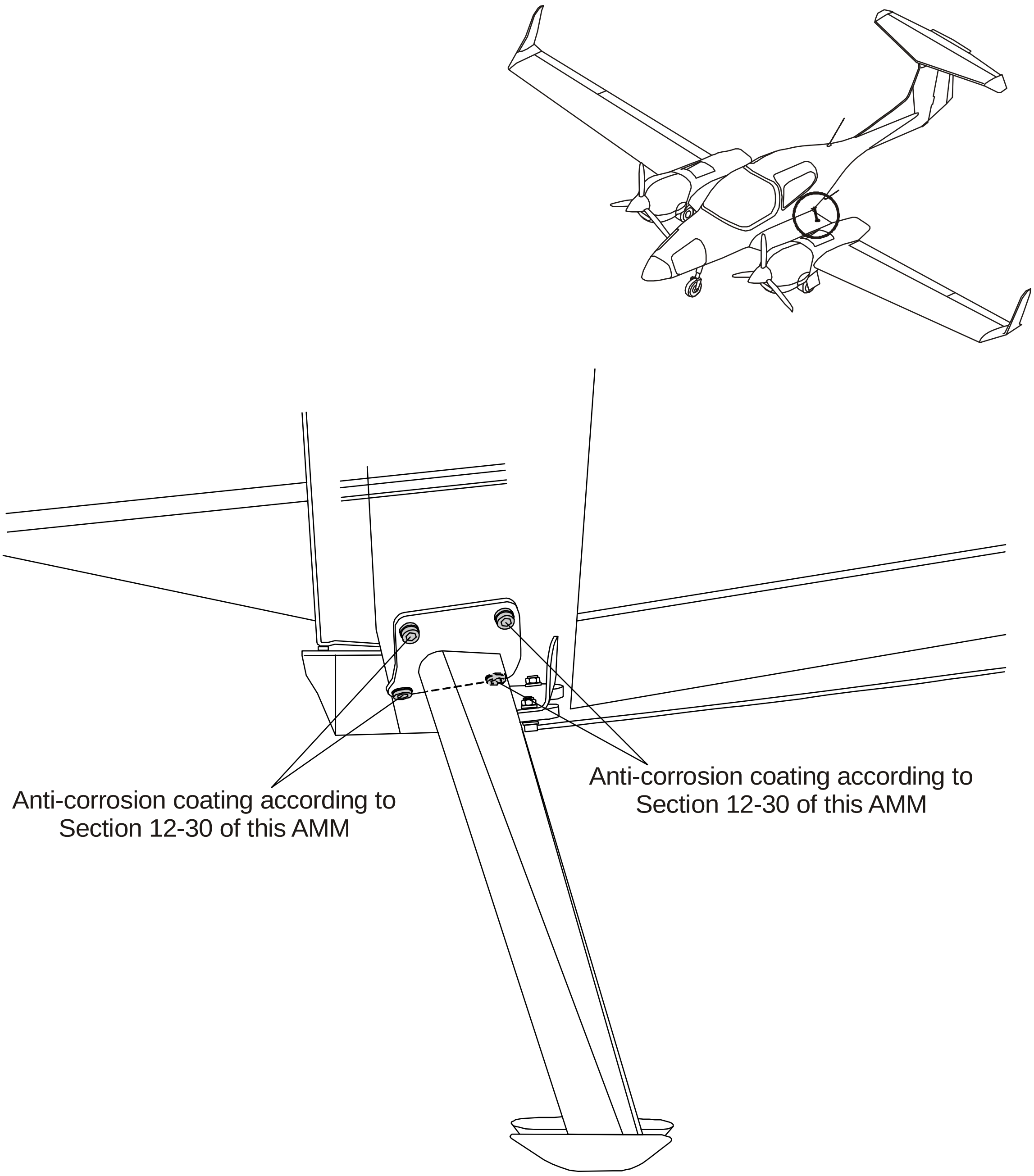

Figure 16: Anti-Corrosion Coating - Foot Step Screws

CHAPTER 20

STANDARD PRACTICES

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CHAPTER 20
STANDARD PRACTICES

1. General

This Chapter gives you the standard practices for the DA 42 NG airplane. Use industry standard practice where no specific practice is given.

This Chapter has the following Sections:

- Section 20-10. Standard Practices - Airframe.
- Section 20-30. Standard Practices - Electrical.
- Section 20-70. Standard Practices - Engines.
- Section 20-90. Standard Practices - Center Wing.

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Section 20-10
Standard Practices - Airframe

1. General

This Section gives you data about the fasteners (bolts/screws/nuts) used in the DA 42 NG airplane and their related torque values. This Section tells you the procedures used to tighten the fasteners.

Note: Use the standard torque values listed on the subsequent pages of this section where no specific values are given.

Note: Composite structures can have a different thickness for the same component or assembly. You must always make sure that you use the correct length of fastener. The length of fastener given in the Illustrated Parts Catalogue may NOT be correct for all components or assemblies.

2. Bolt and Nut Types Used in the Airplane

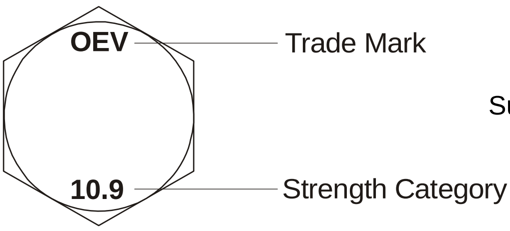
The DA 42 NG airplane uses these bolts:

- DIN bolts.
- LN bolts.
- AN bolts.

The minimum strength for the bolts is DIN specification 8.8. Letters and numbers on the head of the bolt identify the bolt type. The surface treatment also identifies the bolt.

A. DIN Bolt

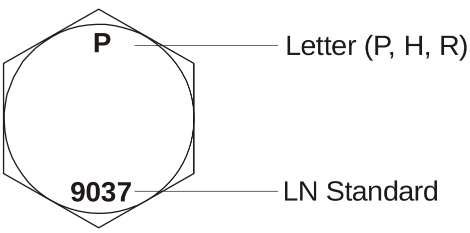
Bolt Head Identification



Surface Treatment - Galvanized

B. LN Bolts

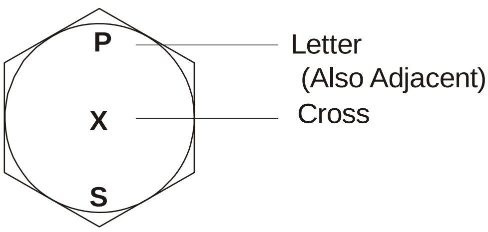
Bolt Head Identification



Surface Treatment - Galvanized and chromated yellow

C. AN Bolts

Bolt Head Identification



Surface Treatment - Galvanized or chromated yellow

The DA 42 NG uses these types of standard nuts: DIN934, DIN 985, AN 364, AN 365, LN 9338, LN 9348, MS21042, MS21044.

3. Standard Torque Values

A. AN Fine Threads

Bolt Size	Torque (Nm)	Torque (lbf.ft.)
10 - 32	1.6	1.2
1/4 - 28	6.2	4.6
5/16 - 24	13.6	10
3/8 - 24	20.7	15.3
7/16 - 20	37.7	27.8
1/2 - 20	54.2	40
9/16 - 18	90.4	66.7
5/8 - 18	124.3	91.7

B. AN Coarse Thread Series

Bolt Size	Torque (Nm)	Torque (lbf.ft.)
10 - 24	1.6	1.2
1/4 -20	5.7	4.2
5/16 - 18	10.2	7.5
3/8 - 16	20.9	15.4
7/16 - 14	28.9	21.3
1/2 - 13	54.2	40
9/16 - 12	79	58.3
5/8 - 11	101.6	75

C. DIN and LN Specifications

Metric Thread	Torque (Nm)	Torque (lbf.ft.)
M4	1.8	1.3
M5	3.6	2.7
M6	6.4	4.7
M8	16	11.8
M10	32	23.6
M12	60	44.3

4. Special Torque Values

Part	Torque (Nm)	Torque (lbf.ft.)
Bolts attaching the engine mount to the firewall.	40	29.5
Bolts attaching the engine mounting arms to the engine (if MÄM 42-600 is installed).	20 ± 2*	14.75 ± 1.48
Front LH / RH shock mounts to engine mounting arms.	85*	62.7
Rear LH / RH shock mounts to engine mounts.	28 ± 2.8	20.64 ± 2.06
Propeller to engine nuts.	85 - 90	62.7 - 66.4
Propeller governor nut.	28	20.7
Intercooler clamp.	5	3.7
V-clamp turbo charger.	5.0 ± 0.5	3.7 ± 0.4
V-clamp turbo charger (if MÄM 42-963/a is installed).	5.5 ± 0.5	4.0 ± 0.4
Cabin air heat exchanger clamp.	5	3.7
Fuel filter drain connection.	22	16.2
Fuel drain valve.	1 - 3	0.74 - 2.21
Hydraulic pump motor electric connection bolt.	9 - 11	6.6 - 8.1
Bolts attaching the main landing gear brake back plates to the caliper.	Refer to Cleveland/Parker Maintenance Manual, latest revision or placard on brake cylinder assy.	
Main landing gear axles (all bolts M 8).	16*	11.8*
Main landing gear axles (all bolts M 12).	60*	44.3*
Trailing arm main landing gear attachment bolts M 12.	30*	22.1*
Upper main landing gear damper attachment bolt M 12.	48*	35.4*
Horizontal stabilizer attachment bolts.	45*	33.2*

*) Values including friction.

5. Torque Measurement

For self-locking nuts, add the torque value of the locking device (friction or brake torque) to the value in the table. Read the friction value from the torque wrench before the nut seats.

Where a bolt is tightened from the bolt-head, add the value of the shaft friction (the friction of the bolt in the attached part) to the value in the table. Read the fiction value from the torque wrench before the bolt seats.

Section 20-30
Standard Practices - Electrical

1. General

This Section gives you the standard practices for the electrical system. Modern airplanes reliability depends on proper function of the electric and electronic systems to a greater extent than previous certified airplanes. Maintenance carried out must be of good workmanship strictly considering the guidelines of AC 43-13.1B. Any time you work on the engine harness refer to AE Maintenance Manual, Doc. No. E4.08.04, latest revision.

The satisfactory performance of a modern airplane, like the DA 42 NG, depends to a great extent, on reliability of its electrical systems. Improperly or carelessly maintained wiring can be a source of potential danger, and many malfunctions and failures of an electrical system can be traced to this cause. The continued proper performance of the electrical systems depends on the knowledge of the personal who do the inspection and repair.

It is therefore important that maintenance is carried out in accordance with the best available techniques and properly trained maintenance personal, in order to eliminate possible failures.

2. Thread Locking

Many electrical terminals are locked with electrical varnish or lacquer. If you release a terminal that has been thread locked with lacquer or varnish then use Loctite 222 or equivalent to lock the thread when you re-assemble the terminal.

3. Repair and Maintenance

Repair and maintenance of the electrical system wiring, not covered in a separate document (e.g. Service Bulletin, Work Instruction) is limited to the extent of:

– Replacement of wires and cables.

– Replacement of ring terminals.

A. Crimp Tools

Following crimp tools are commonly used for crimp contacts in the DA 42 NG. Refer to the equipment manufacturer for more details of the tools and their use.

– Tyco, P/N 69478-1

– Tyco CERTI-LOK, P/N 169400

– Tyco SUPER CHAMP FT, P/N 720781-3

– Tyco CERTI-CRIMP, P/N 91523-1

– Tyco CERTI-CRIMP, P/N 91512-1

– Commercial, M22520/1-01

– Commercial, M22520/2-01

– Commercial, M22520/37-01

B. Wires and Cables

(1) Wires

For the purpose of electric and electronic installation, an insulated wire consists of a metal conductor covered with a dielectric or insulating material. Wires used in the airplane contain stranded conductors for flexibility. The insulation may consist of several materials and layers to provide:

– Dielectric insulation

– Thermal protection

– Abrasion resistance

– Moisture resistance

– Fluid resistance

Approved wires for the DA 42 NG:

– M22759/16

– M22759/34

(2) Cables

The term “cable”, may refer to any of the following:

– Two conductors twisted together (twisted pair).

– A single center conductor with a metallic braided outer conductor (coaxial cable).

– Two or more insulated conductors contained in a common covering (multi conductor cable).

– One or more insulated conductors with an overall shield (shielded cable).

Approved cables for the DA 42 NG are:

– M27500

– M17/60-RG142

– M17/128-RG400

(3) Wire Marking

Locating a specific wire within a large wiring loom would be extremely difficult without individual identification of each wire, or cable. To simplify maintenance, each interconnecting wire and cable installed in the airplane is marked with a combination of numbers and letters. If a wire or cable must be replaced, the wire must be marked according to the wiring diagrams in Chapter 92.

C. Testing

After a wire, cable or ring terminal has been replaced, testing must be done as listed below:

– Visual inspection of the crimp connection (all leads within the crimp, insulation not crimped etc.).

– Check for continuity between the two ends of the conductor.

– Check for NO continuity between the conductor and aircraft electrical ground.

– The crimp contact is not damaged of bend.

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Section 20-70
Standard Practices - Engines

1. General

This Section gives you data about the fasteners used on the AE E4-B engines installed in the DA 42 NG airplane. It also gives you the procedures for tightening the fasteners.

Refer to the AE Maintenance Manual, latest revision for more data.

2. Torque Values

Use the torque values given in tables 1 thru 4 for standard fasteners on the engine and use the torque values given in table 5 for the components listed.

3. Special Torque Procedures

When you use self-locking nuts, add the safety torque (friction torque or braking torque) to the table values. Set this value on the dial of the torque meter before you tighten the nut.

If a bolt has an additional torque due to shaft friction, add this torque value to the table value. Set this calculated value on the dial of the torque meter before you tighten the bolt.

Lubricate threads unless shown differently.

CAUTION: YOU MUST ADD THE SAFETY TORQUE (OR THE FRICTION TORQUE) TO THE FOLLOWING VALUES FOR SELF-LOCKING NUTS (OR BOLTS WITH SHAFT FRICTION).

Table 1 - Standard Torque Values for Engine Bolts and Nuts

INCH THREAD	TORQUE (Nm)	TORQUE (lbf.ft.)
1/4	11	8
5/16	23	17
3/8	41	30
7/16	68	50
1/2	102	75
9/16	149	110
5/8	203	150
3/4	366	270

Table 2 - Standard Torque Values for Engine Pipe Plugs

TAPER THREAD	TORQUE (Nm)	TORQUE (lbf.ft.)
1/16 - 27 NPT	4.5	3.3
1/8 - 27 NPT	4.5	3.3
1/4 - 18 NPT	9.5	7
3/8 - 18 NPT	12.3	9
1/2 - 14 NPT	18	13.3
3/4 - 14 NPT	26	19

Table 3 - Standard Torque Values for Engine Crush-Type Asbestos Gaskets

THREAD PITCH	ANGLE OF TURN	
THREADS PER INCH	ALUMINUM ASBESTOS	COPPER ASBESTOS
8	135°	67°
10	135°	67°
12	180°	90°
14	180°	90°
16	270°	135°
18	270°	135°
20	270°	135°
24	360°	180°
28	360°	180°

Note: Install all crush type gaskets (except the self-centering type) with the continuous surface against the flange of the plug or against the part which you will tighten against the gasket. Turn the part until the surfaces which you must seal, touch the gasket. Then tighten to the angle of turn shown for the thread size as given in Table 3.

Table 4 - Standard Torque Values for Engine Flexible Hose (or Tube) Connections

TUBE SIZE	THREAD	TORQUE (Nm)	TORQUE (lbf.ft.)
(-4) 1/4	7/16 - 20	11 - 16	7 -11
(-6) 3/8	9/16 - 18	17 - 22	11 - 16
(-10) 5/8	7/8 - 14	41 - 48	30 - 36

Table 5 - Special Torque Values for the Engine

ITEM	THREAD	TORQUE (Nm)	TORQUE (lbf.ft.)
Engine oil filter	-	25	18.5
Gearbox distance bolts (if MÄM 42-600 is installed)		28 ± 3	20.6 ± 2.2
Coolant silicate pouch cartridge	-	32.5 ± 2.5	24.0 ± 1.8
Coolant tank filler cap (if MÄM 42-852 is installed)	-	12-15	8.85 - 11.06
Pressure relief valve	-	12-15	8.85 - 11.06
Coolant level sensor	Loctite 243 O-Ring	25-30	18.44 - 22.13

4. Installation and Tightening Torques of Worm Drive Clamps

The Figures and tables show the proper installation and the tightening torques of worm drive clamps.

A. Single Worm Drive Clamp

CAUTION: DO NOT PLACE A WORM DRIVE CLAMP ON A TUBE BEAD. THIS CAN DAMAGE THE HOSE AND MAY (IN CASE OF ENGINE CHARGE AIR INSTALLATION) CAUSE LOSS OF ENGINE POWER.

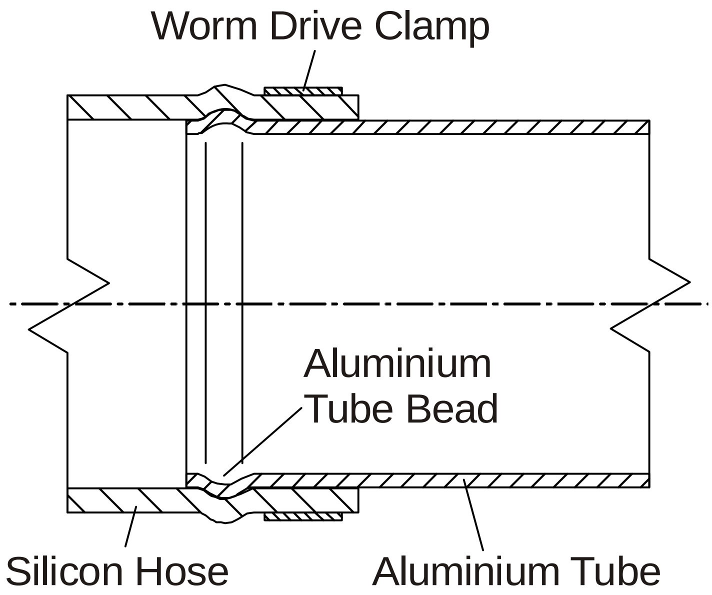

Figure 1: Installation with Single Worm Drive Clamp

B. Two Worm Drive Clamps

(1) Axial Placement

CAUTION: DO NOT PLACE A WORM DRIVE CLAMP ON A TUBE BEAD. THIS CAN DAMAGE THE HOSE AND MAY (IN CASE OF ENGINE CHARGE AIR INSTALLATION) CAUSE LOSS OF ENGINE POWER.

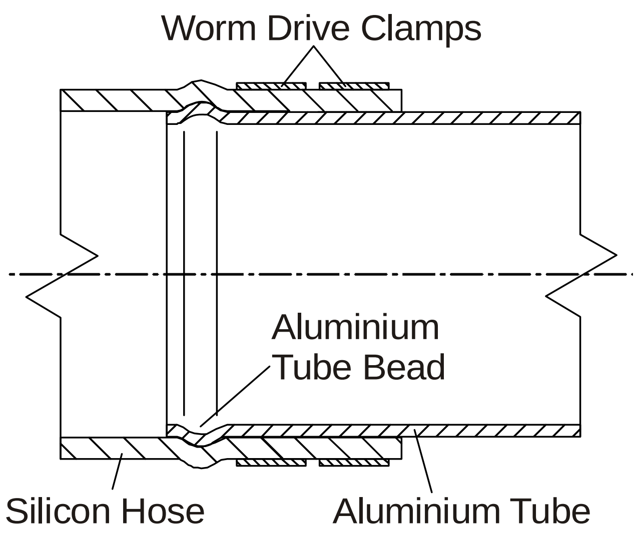

Figure 2: Installation with Two Worm Drive Clamps and Single Bead (Axial Placement)

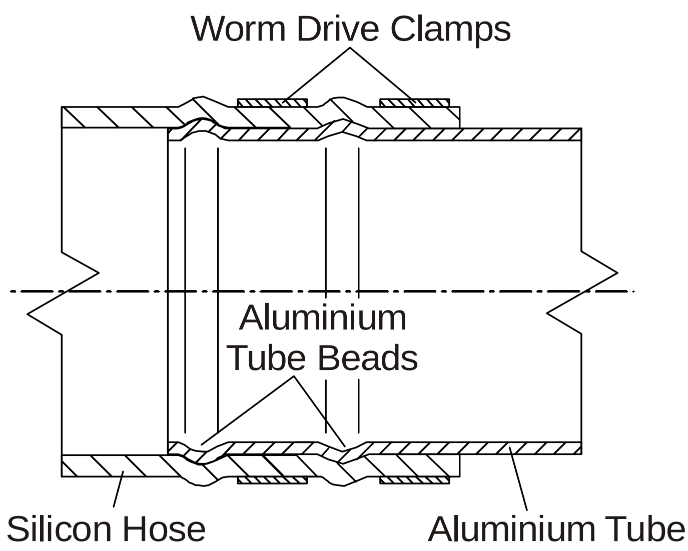

Figure 3: Installation with Two Worm Drive Clamps Two Beads (Axial Placement)

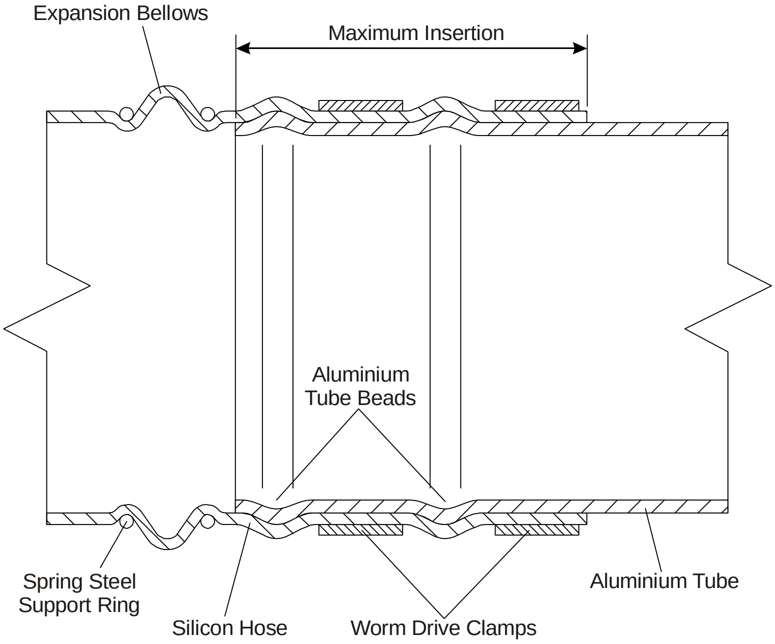

Figure 4: Installation with two Worm Drive Clamps, Two Beads (Axial Placement) and a Hose with flexible Bellows (if MÄM 42-1004 is installed)

(2) Radial Placement

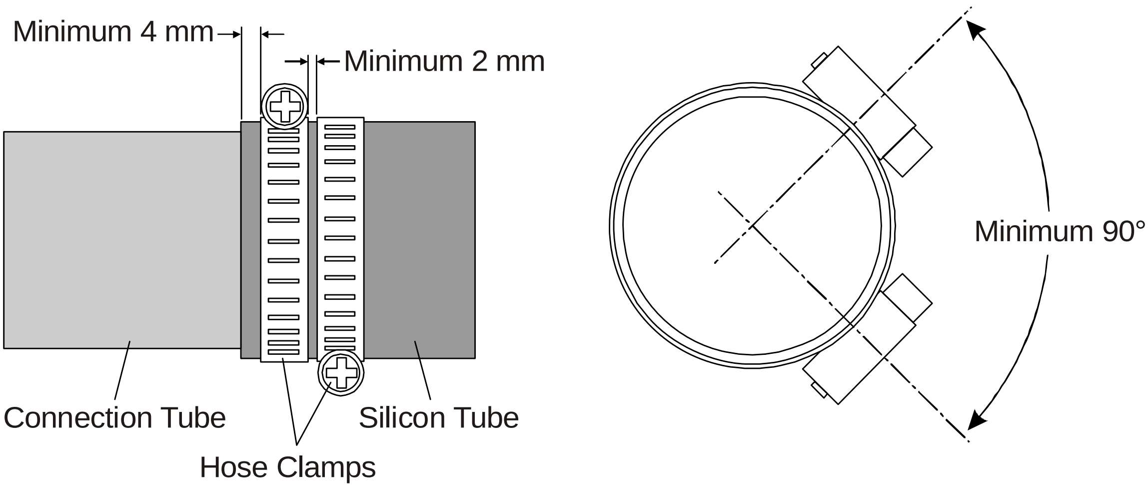

Figure 5: Installation with Two Worm Drive Clamps (Radial Placement)

C. Tightening Torques for Worm Drive Clamps

CAUTION: WORM DRIVE CLAMPS MUST BE TIGHTENED ACCORDING TO THE TABLE BELOW. OVER-TIGHTENING A WORM DRIVE CLAMP CAN DAMAGE THE HOSE AND MAY (IN CASE OF ENGINE INSTALLATIONS) CAUSE LOSS OF ENGINE POWER.

CAUTION: FOR WORM DRIVE CLAMP INSTALLATION THE ENGINE MUST BE COLD. INSTALLATION ON A HOT ENGINE CAN CAUSE DAMAGE TO THE HOSE AND MAY (IN CASE OF ENGINE INSTALLATIONS) CAUSE LOSS OF ENGINE POWER.

CAUTION: DO NOT RE-TIGHTEN A WORM DRIVE CLAMP ON A SILICONE HOSE PERFORMING AN AIRPLANE INSPECTION UNLESS IT IS LOOSE. REFER TO THE TABLE BELOW FOR THE CORRECT TIGHTENING TORQUES OF WORM DRIVE CLAMPS.

(1) Tightening Torques for Clamp Widths Below 12 mm (0.47 in)

Clamp Diameter	Torque (Nm)	Torque (lbf.ft.)
8-12	2.5 ± 0.5	1.8 ± 0.4
10-160	3.0 ± 0.5	2.2 ± 0.4

(2) Tightening Torques for Clamp Widths of 12 mm (0.47 in) and Higher

Clamp Diameter	Torque (Nm)	Torque (lbf.ft.)
8-160	5.0 ± 0.5	3.7 ± 0.4

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Section 20-90

Standard Practices - Center Wing

1. General

This Section shows the typical installation in the center wing section. The installation details of electrical cables, hoses and Bowden cables may change with optional equipment installed and serial number development. The following figures show typical installation positions for the components.

2. Description

The Figures show the key points of the routing. The cables and hoses may be removed for maintenance and repair work. Make sure to install components according to the previous setting.

Note: A minimum clearance of 5 mm (0.2 in) is required between electrical cables or hoses and moving parts, if jamming may occur.

Note: A minimum clearance of 2 mm (0.08 in) is required between electrical cables or hoses and moving parts, if chafing may occur.

Note: It might be helpful to document the actual installation in the center wing section with some photographs.

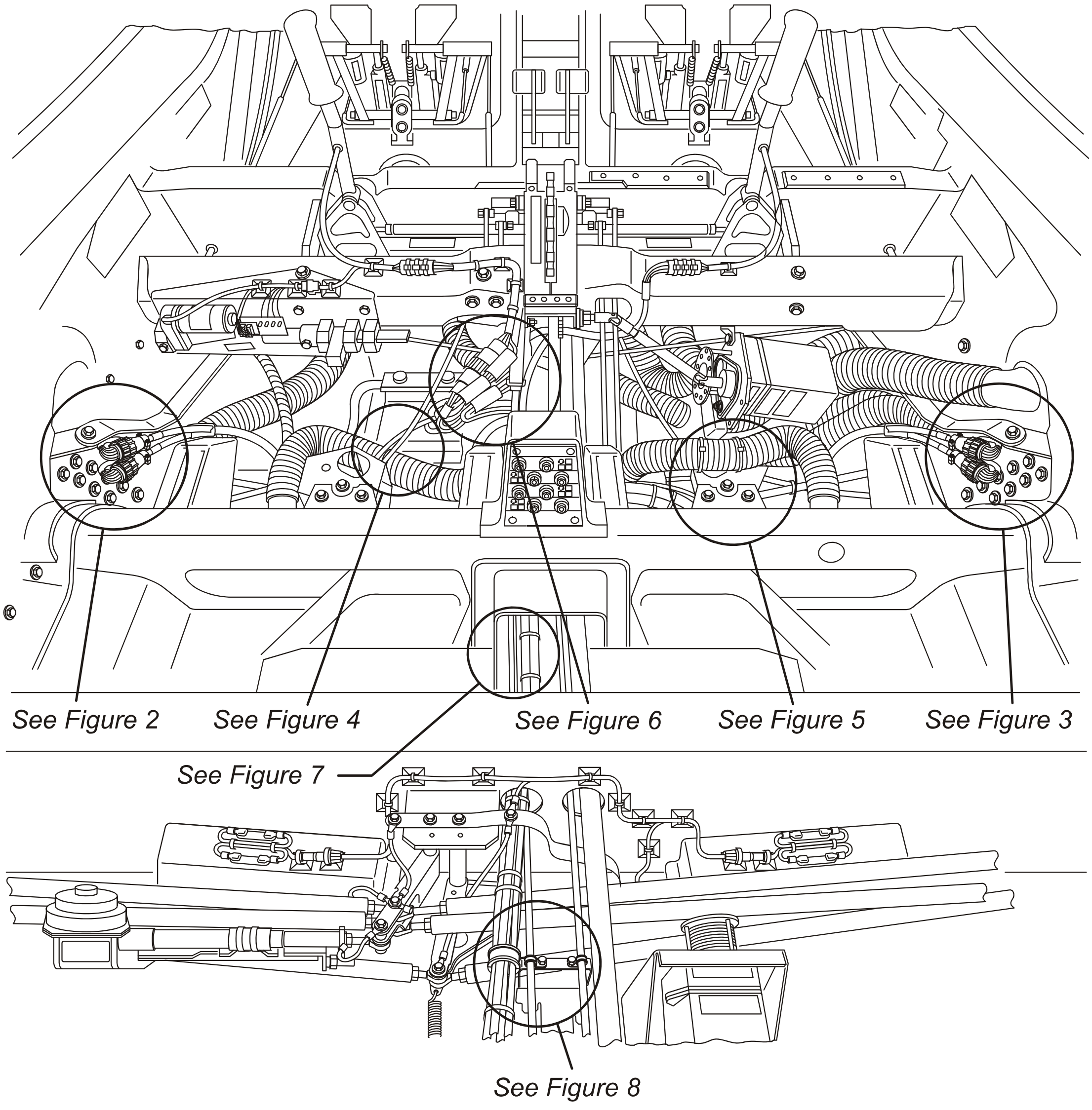

Figure 1: Routing in Center Wing - Overview

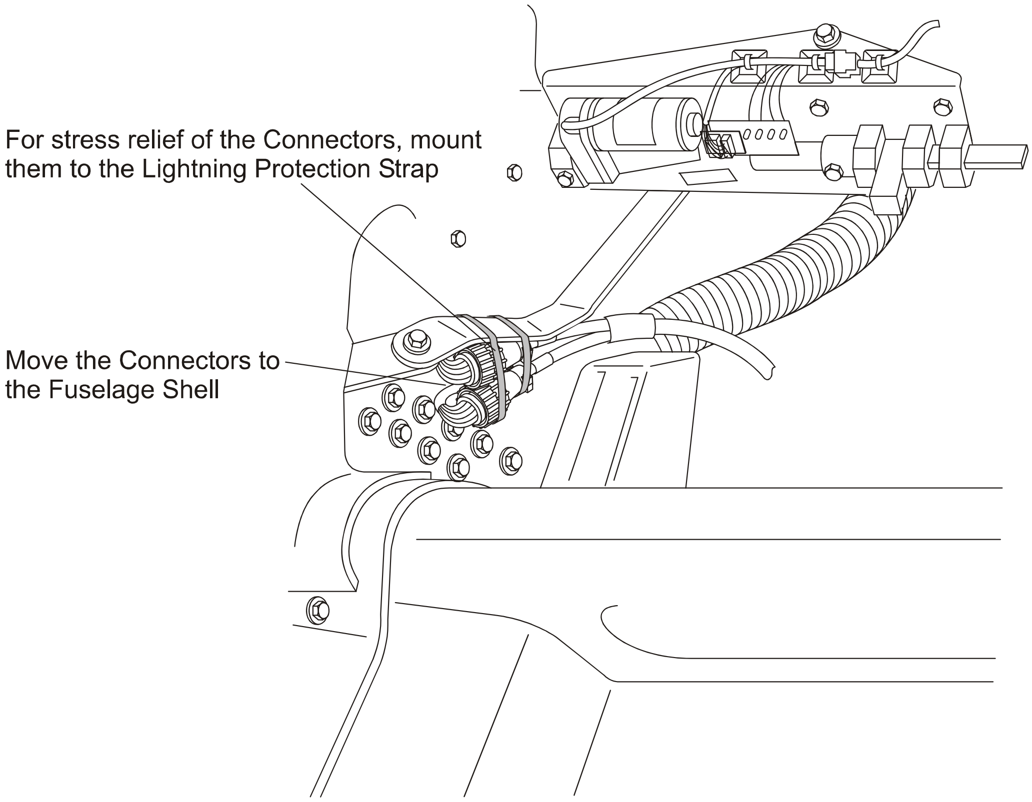

Figure 2: Routing in Center Wing - Detail 1

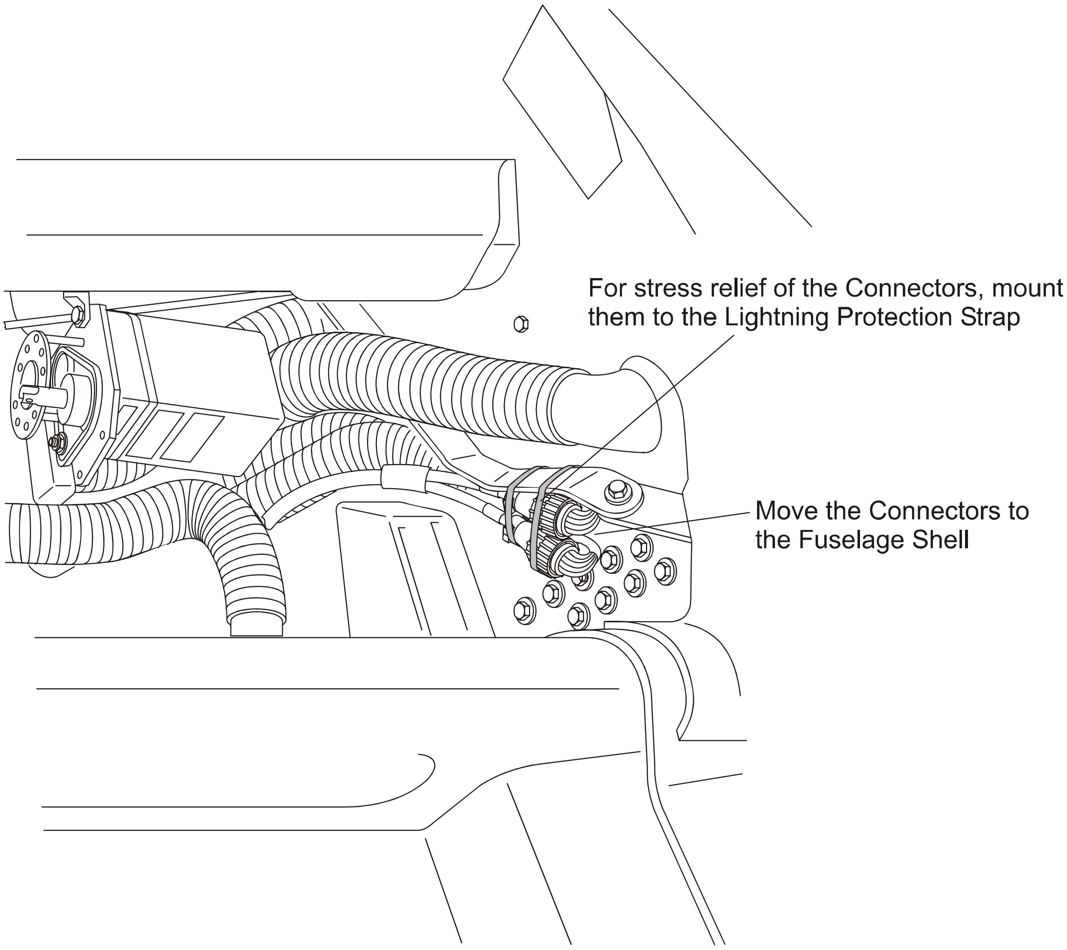

Figure 3: Routing in Center Wing - Detail 2

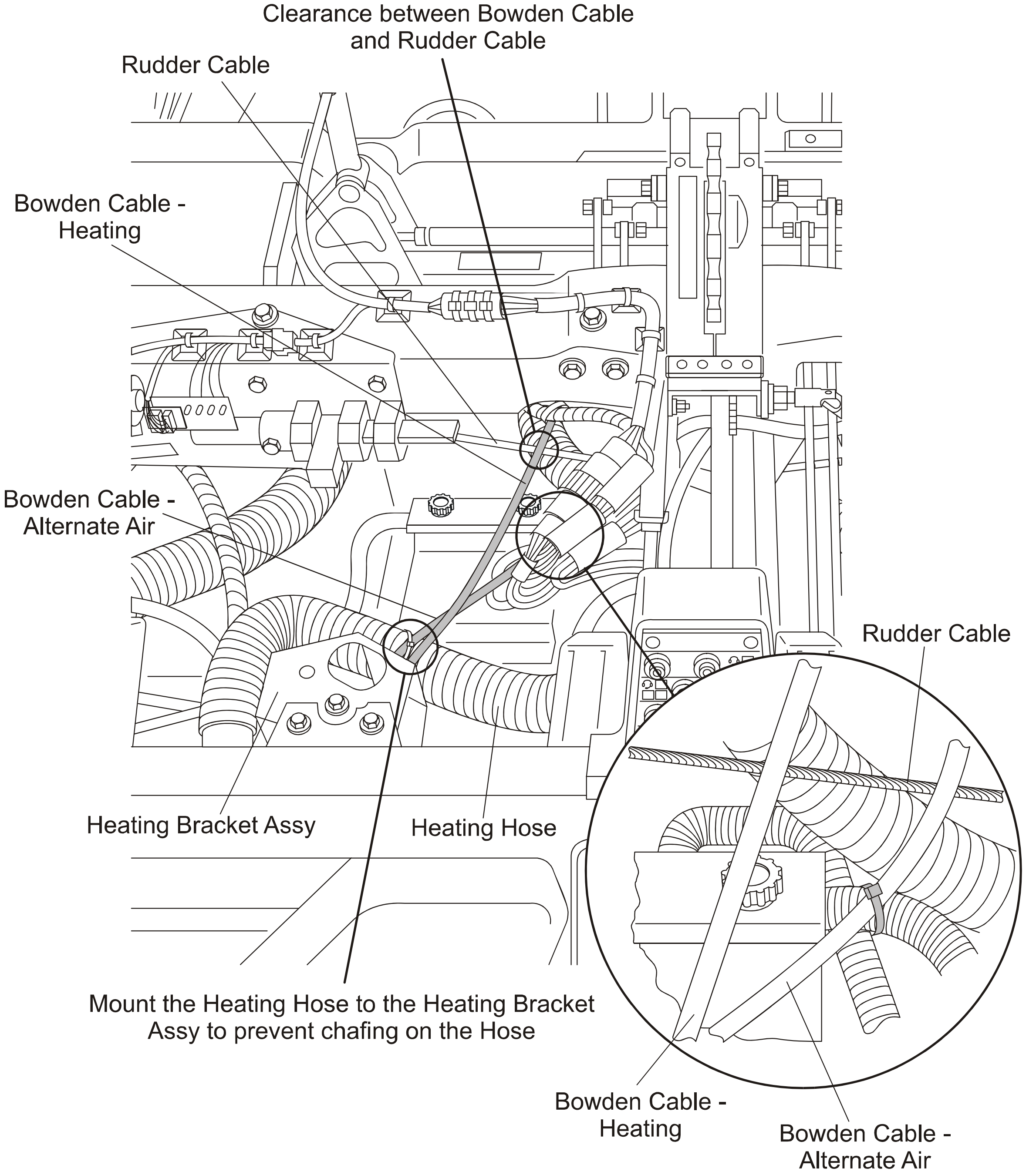

Figure 4: Routing in Center Wing - Detail 3

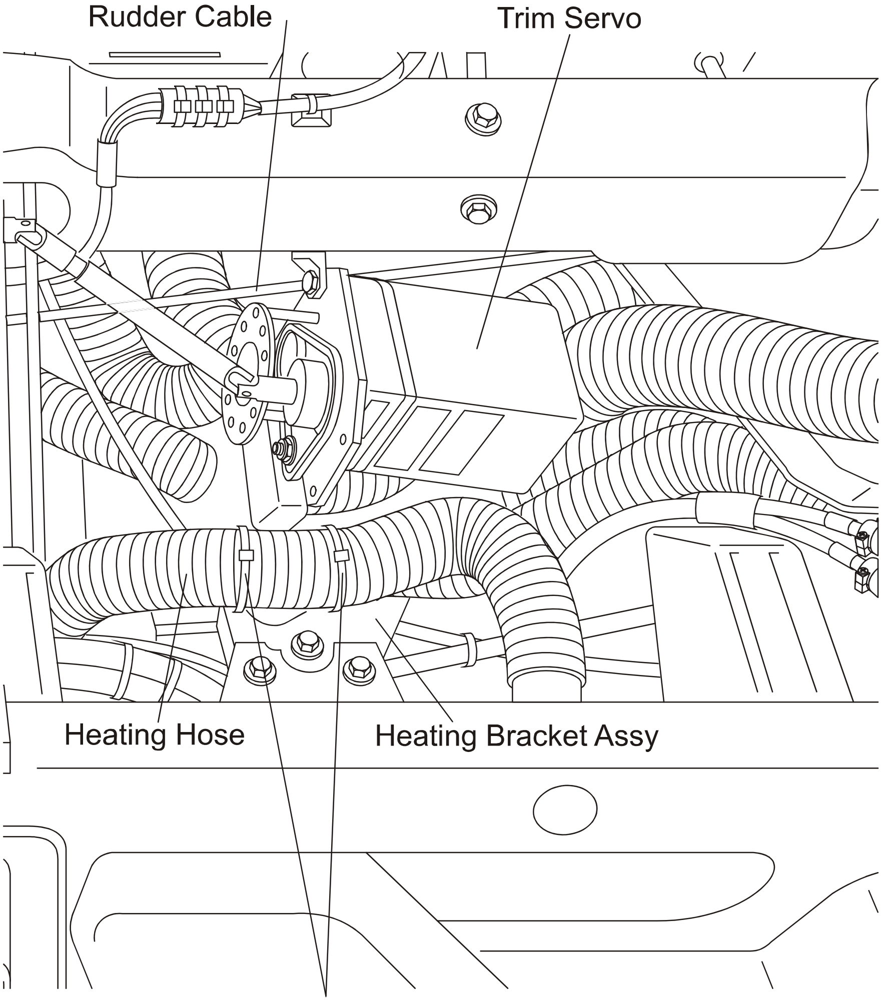

Figure 5: Routing in Center Wing - Detail 4

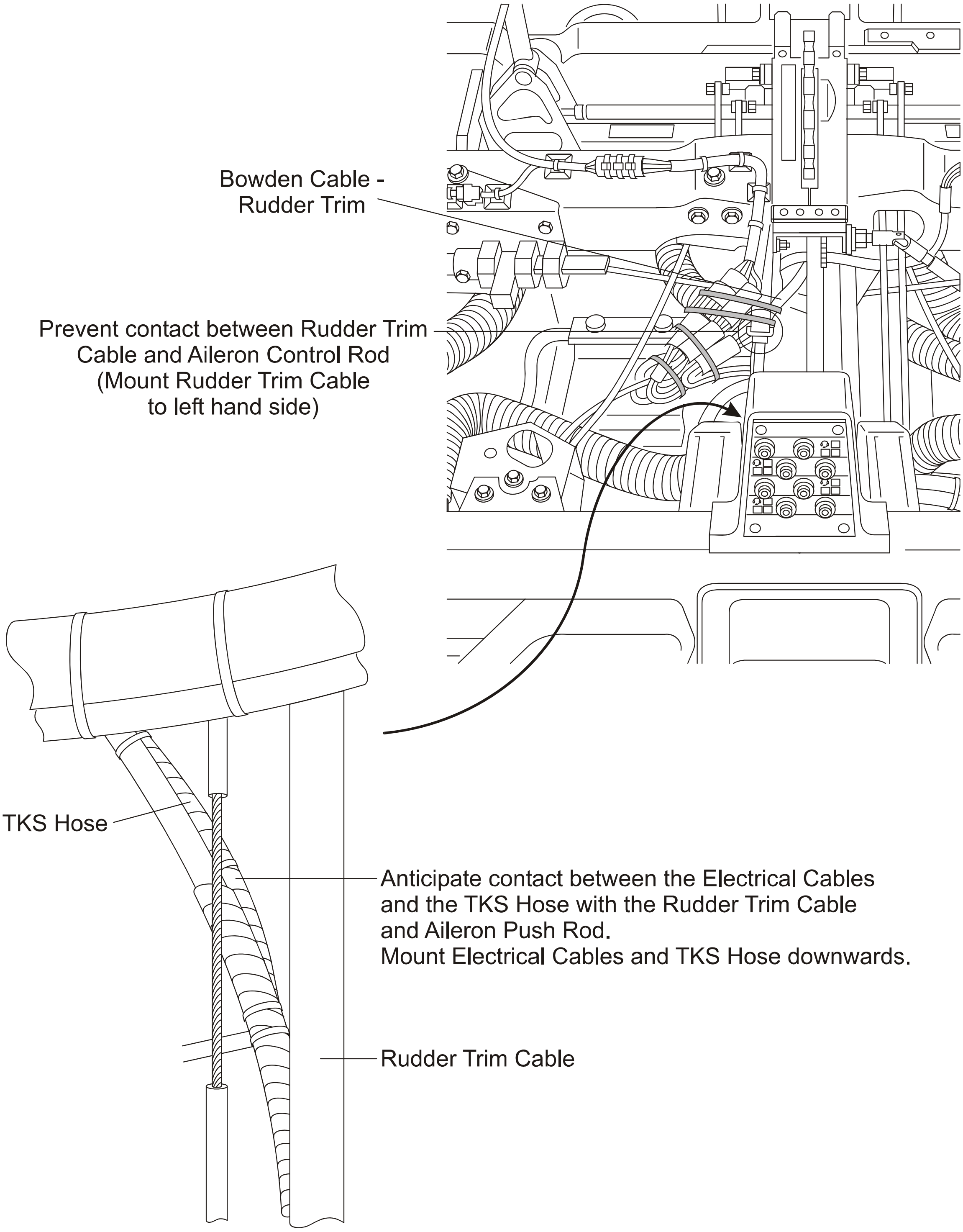

Figure 6: Routing in Center Wing - Detail 5

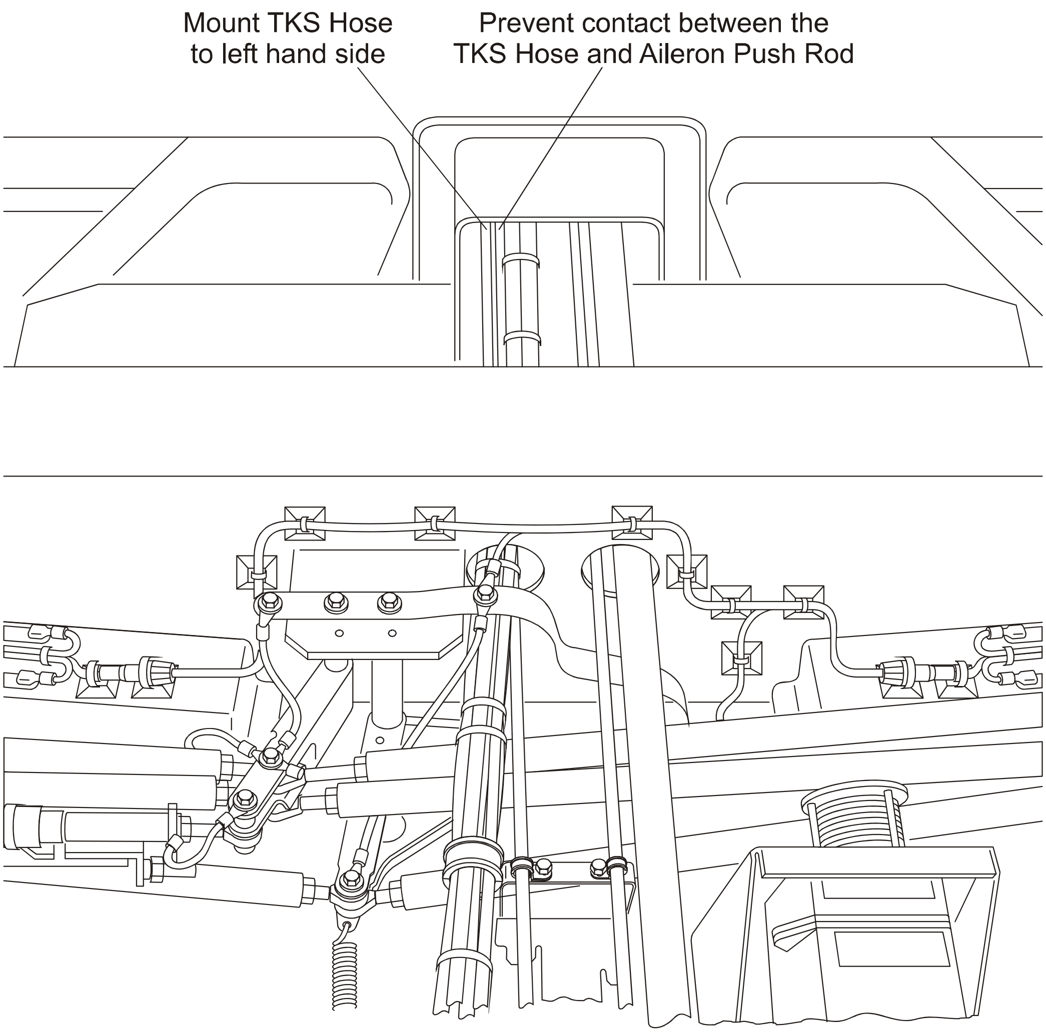

Figure 7: Routing in Center Wing - Detail 6

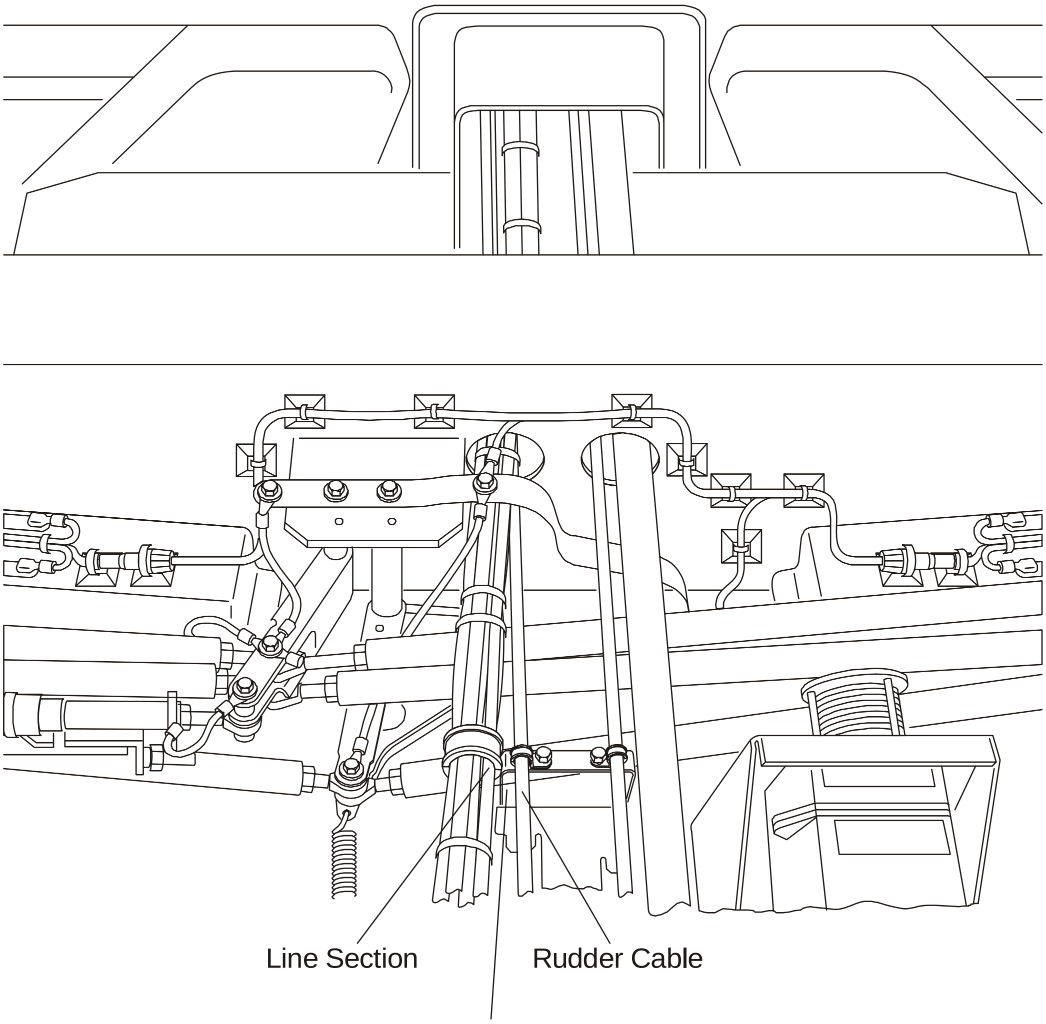

Figure 8: Routing in Center Wing - Detail 7

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Trouble-Shooting

1. General

The table below lists defects you could have in the aileron control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Clearance less than 5 mm (0.2 in) if jamming may occur.	Electrical cables, hoses and Bowden cables position.	Position and fix the electrical cables, hoses and Bowden cables properly.
Clearance less than 2 mm (0.08 in) if chafing may occur.	Electrical cables, hoses and Bowden cables position.	Position and fix the electrical cables, hoses and Bowden cables properly.
Hoses pinched.	Cable tie tightened with undue force.	Replace the cable tie.

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Maintenance Practices

1. General

For maintenance of the components refer to the related Chapters of this AMM.

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CHAPTER 21

HEATING AND VENTILATION

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CHAPTER 21
HEATING AND VENTILATION

1. General

This Chapter tells you about the air conditioning system for the DA 42 NG. It gives you a description of the system and operation. It also provides information on trouble-shooting and tells you how to remove and install the main components of the air conditioning system.

If OÄM 42-193 is carried out, a recirculating air - cabin cooling (RACC) system is installed. Refer to Section 21-50 (if OÄM 42-193/c or earlier is installed) or Section 21-51 (if OÄM 42-193/d or later is installed) for more details about the RACC system.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

2. Description and Operation

The DA 42 NG has two separate systems for heating and one ventilating/cooling system for the cabin area. Figure 1 shows the schematic for the heating and ventilating/cooling systems.

Refer to Section 21-20 for more data about the air conditioning distribution system. Refer to Section 21-40 for more data about the heating system and refer to Section 21-60 for more data about the temperature control system.

A. Cabin Heating and Canopy Defrosting

A heat exchanger in each engine nacelle provides the warm air for cabin heating. Hot cooling liquid from the engine cooling system flows through the matrix of the heat exchanger. Ambient air flows from an air inlet in the engine nacelle through the heat exchanger. The air flows from the heat exchanger through a control valve to the airplane cabin. The heated air is then used for cabin heating and windscreen defrosting. Levers in the central control console of the cockpit connect to the control valves with Bowden cables and control the flow of heated air.

The warm air from the left engine installation supplies the canopy defrosting system and the warm air from the right engine installation supplies the cabin heating.

B. Cabin Ventilation/Cooling

Ambient air flows through a NACA duct at the lower surface of the right-side wing center-section. In flight, ambient air flows through this NACA duct into the cabin ventilation/cooling system via flexible hoses. The flow of air into the forward cockpit is controlled by outlets located in each side of the instrument panel. The flow of air to the rear passenger area is controlled by air outlets located in the cockpit instrument panel and the rear-cabin overhead-panel. The volume and direction of the air flowing from the outlets can be controlled at the outlets.

Refer to Section 21-50 for more details about the RACC system (if OÄM 42-193/c or earlier is installed).

Refer to Section 21-51 for more details about the RACC system (if OÄM 42-193/d or later is installed).

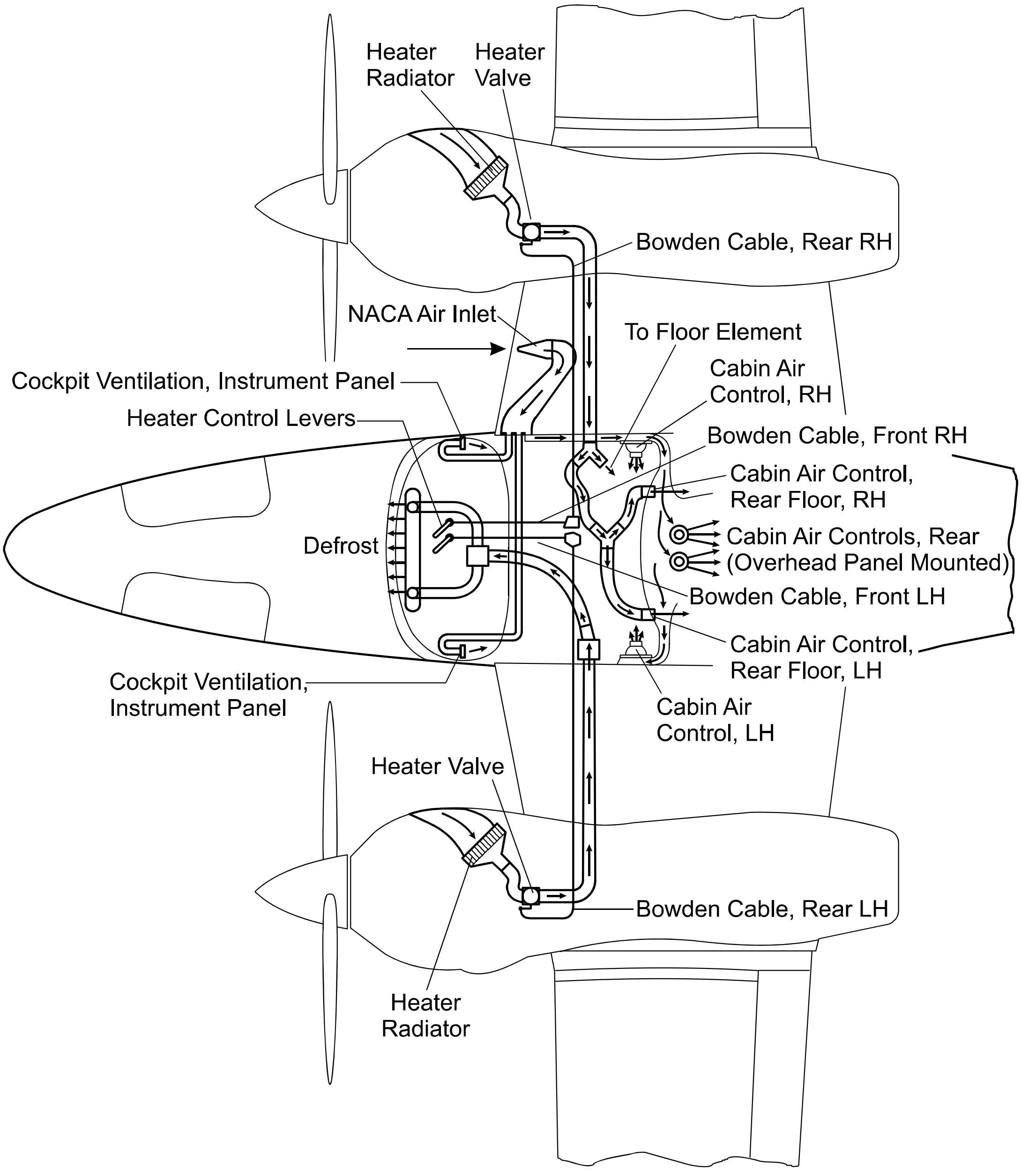

Figure 1: Air Conditioning Schematic Diagram

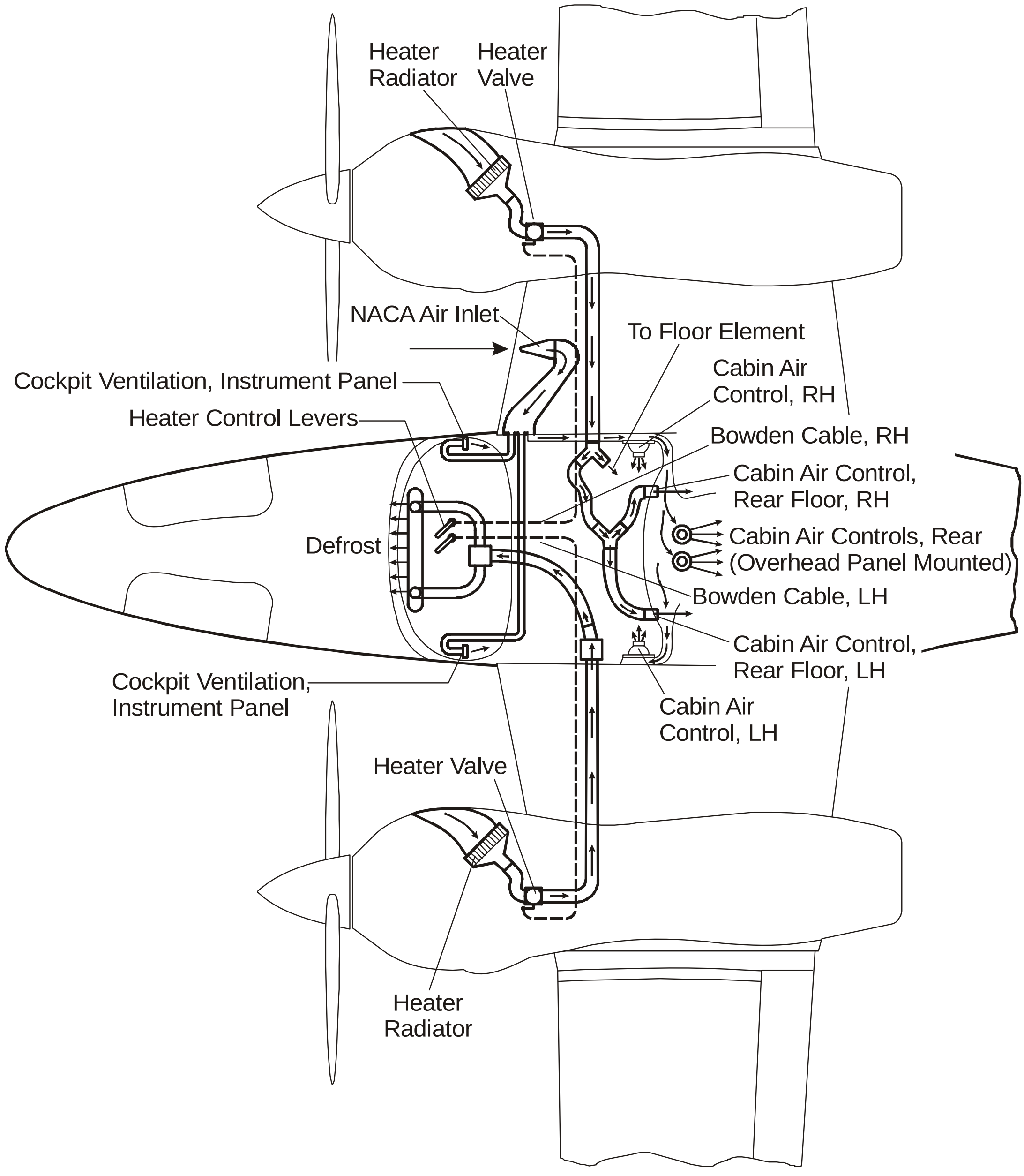

Figure 2: Air Conditioning Schematic Diagram (if MÄM 42-739 is installed)

Section 21-20
Air Distribution

1. General

The DA 42 NG has a heating and a ventilation system. The ventilation system uses ambient air to ventilate the cabin. Warm air for windscreen defrosting and cabin heating is provided by heat-exchangers located in the engine nacelles. This Section tells you about the air distribution system of the DA 42 NG. Refer to Section 21-40 for data about the air heating system and refer to Section 21-60 for data about the temperature control system.

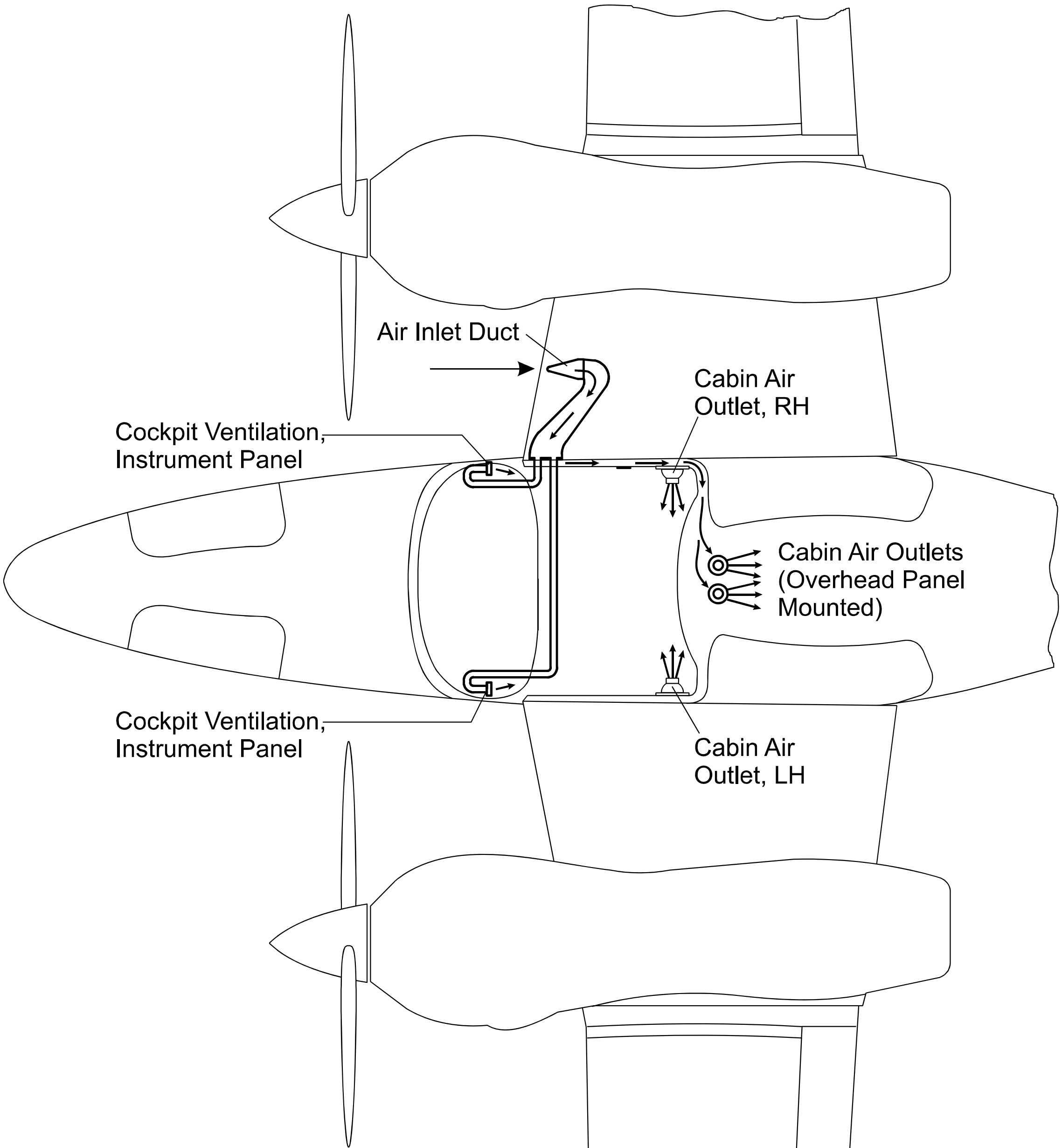

Figure 1: Ventilation Air Distribution System Schematic Description and Operation

A. Ventilation

Figure 1 shows the ventilation air distribution system. In normal flight ambient air flows through a NACA duct on the lower surface of the right-side center wing section. The air flows through sealed compartments in the center wing section to the fuselage. At the fuselage the airflow is divided. Some of the air is directed into an integral GRP duct that directs the air to the two air outlets on the J-panel and to the two air outlets in the rear passenger compartment overhead panel. The remaining air flows through flexible hoses to air outlets located at each side of the instrument panel.

The airflow is controlled by rotating the nozzles of the air outlets.

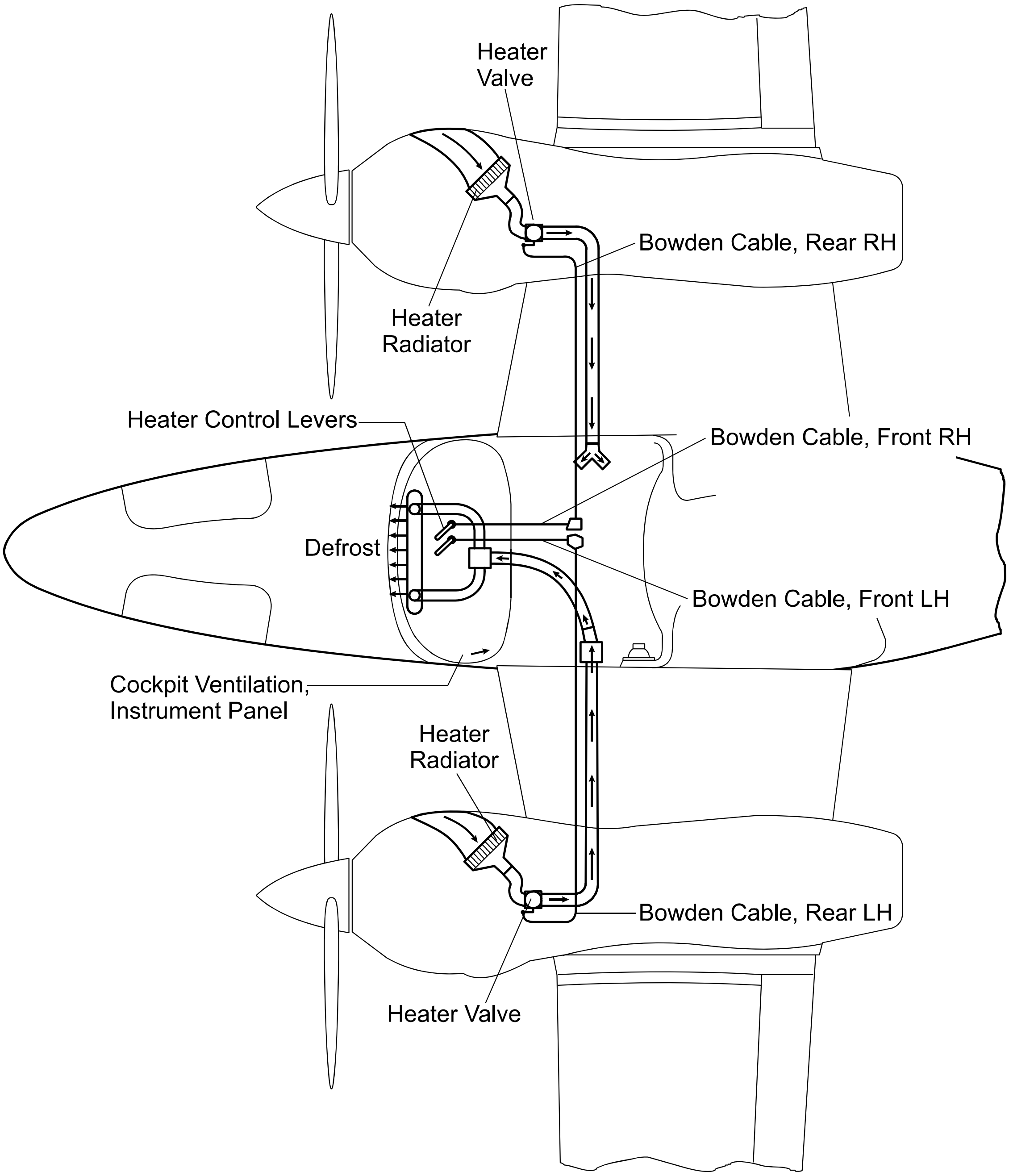

Figure 2: Cabin Heating and Defrost Air Distribution System Schematic

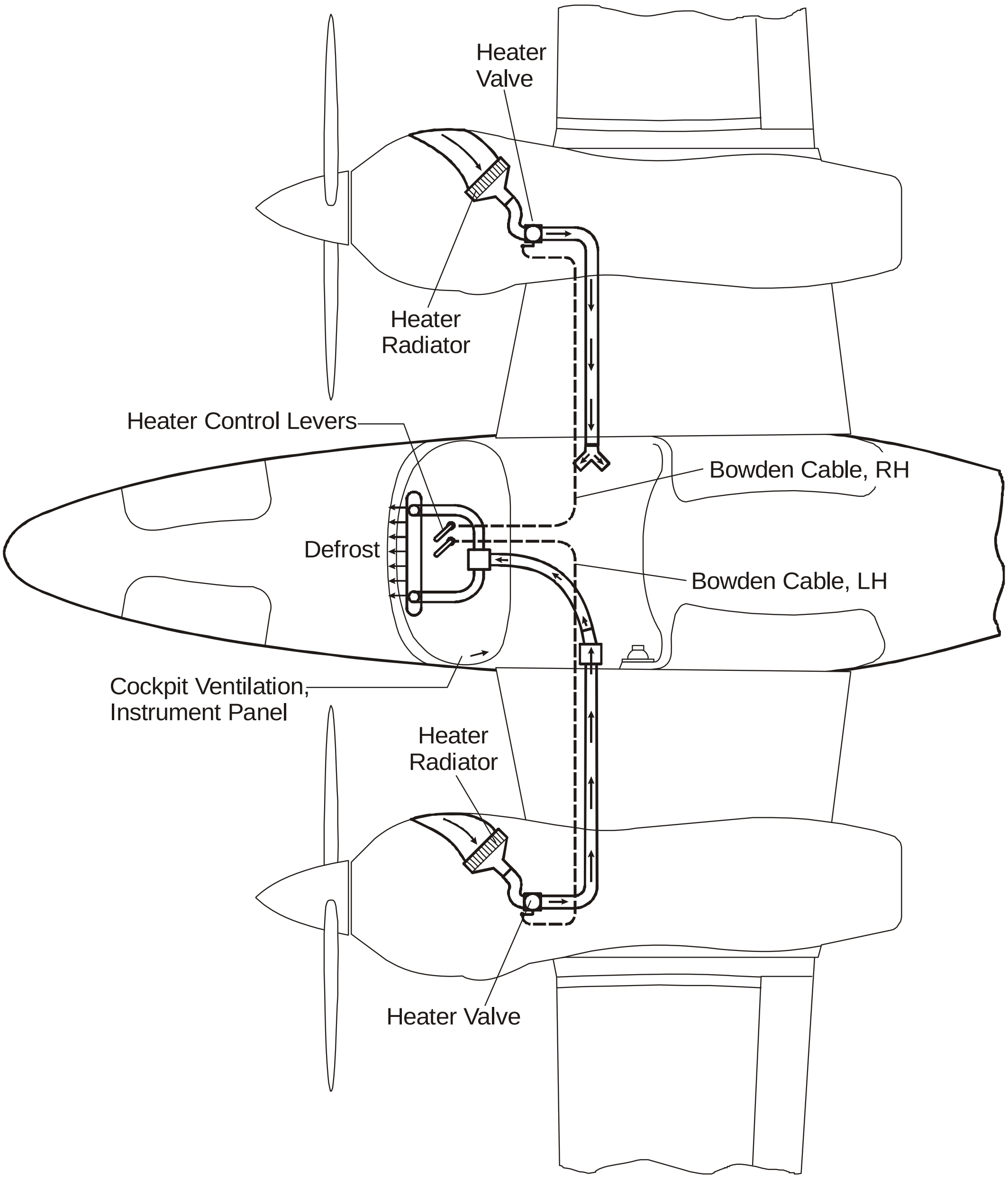

Figure 3: Cabin Heating and Defrost Air Distribution System Schematic
(if MÄM 42-739 is installed)

B. Heating and Defrosting

Figure 2 and 3 shows the schematic drawing for the cabin heating and defrost air distribution system. Air enters the heating and defrosting systems through inlet ducts located at the right lower side of each engine nacelle. The left engine supplies warm air to the canopy defrosting system and the right engine supplies warm air to the cabin heating system. The warm air supply system is similar for both engines.

Ambient air flows through the inlet duct in the engine nacelle into a carbon fiber composite (CFC) shroud and is directed through the heat exchanger. When the engine is running, hot coolant flows from the engine through the core of the heat exchanger and back to the engine. The temperature of the air increases as it passes through the matrix of the heat exchanger. The heated air then flows through flexible hoses from the heat exchanger shroud to a heater valve mounted on the engine firewall.

Each heater valve has an internal flap that can be moved from an open position to a bypass position. If a valve is set to the open position the heated air flows into the related heating or defrosting system. If the valve is set to the bypass position the heated air flows out of the valve into the engine compartment.

Two control levers located in the cockpit center console control the position of the flaps in the heater valves via Bowden cables. The left lever (DEFROST) controls the left engine heater valve. The right lever (CABIN) controls the right engine heater valve. If MÄM 42-739 is NOT installed, a forward Bowden cable from each control lever attaches to the left and right relay levers located under the pilots' seats. Two aft Bowden cables connect the relay levers to the left and right heater valves. If MÄM 42-739 is installed, a forward Bowden cable from each control lever attaches to the left and right heater valves.

Moving the DEFROST to the open position allows heated air to flow through the heater valve into a flexible hose. A flexible hose connects the heater valve to the cockpit defrosting system. The flexible hose passes through the leading edge of the left-side central wing section into the fuselage. At the fuselage the hose connects to a splitter which causes the air flow to be divided. Two smaller-diameter flexible hoses connect the outlets of the splitter to the left and right side canopy defrosting ducts. The volume of heated air flowing through the defrosting system is controlled by the position of the DEFROST control lever in the center console.

Moving the CABIN lever from the closed position allows heated air to flow through the heater valve into a flexible hose. The flexible hose connects the heater valve to the cockpit heating system in the fuselage. The warm air flows from the flexible hoses into the area of the passengers' and the pilots' foot-wells. The volume of heated air flowing through the cabin heating system is controlled by the position of the CABIN control lever in the center console.

Trouble-Shooting

1. General

This table tells you how to trouble-shoot the air conditioning distribution system. Refer to Section 21-40 for trouble-shooting data for the air heating system and see Section 21-60 for trouble-shooting data for the temperature control system.

If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
No air flows from the cabin fresh air outlets.	Fresh air outlets closed.	Open the fresh air outlets. Section 21-20 Paragraph 2A.
	NACA air inlet duct blocked.	Make sure the inlet duct is not blocked.
	Flexible hose(s) between the air inlet ducts and the fresh air inlet blocked or damaged.	Examine the flexible hoses, repair or replace the hoses as required.
No warm air flows through the cockpit defrosting system outlets.	The DEFROST control lever in the cockpit center console set to OFF.	Make sure that the DEFROST control lever (left lever) is set to ON.
	Left engine heater valve control cable(s) out of adjustment.	Adjust the left engine heater valve control cable(s).
	Left engine heater valve control cable(s) broken.	Replace the left engine heater valve control cable(s).
	Flexible hose(s) between the left engine heater control valve and the de-frosting ducts damaged or broken.	Examine the flexible hoses, repair or replace the hoses as required.

Trouble	Possible Cause	Repair
No warm air flows through the cockpit heating system outlets.	The CABIN lever in the cockpit center console set to OFF.	Make sure that the CABIN control lever (right lever) is set to ON.
	The right engine heater valve control cable(s) out of adjustment.	Adjust the right engine heater valve control cable(s). Refer to Section 21-20.
	Right engine heater valve forward/aft control cable(s) broken.	Replace the right engine heater valve forward/aft control cable(s). Refer to Section 21-20.
	Flexible hose(s) between the right engine heater control valve and the fuselage damaged or broken.	Examine the flexible hoses, repair or replace the hoses as required.

Maintenance Practices

1. General

This Section tells you how to replace a heater valve control cable. It also tells you how to adjust a heater valve. Refer to Section 21-60 for more data about engine heater valves.

2. Replace a Heater Control Valve Forward Inner Control Cable

Use these procedures for both the left and right heater valves.

A. Replace a Heater Control Valve Forward Inner Control Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.	
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings from the related engine.	Refer to Section 71-10.
(3)	Remove the pilot's/co-pilot's seat as necessary.	Pilot's seat for DEFROST cables, co-pilot's seat for CABIN cables.
(4)	Disconnect the forward cable at the relay lever: – Loosen the screw that attaches the swivel fitting to the control lever and cable. – Pull the cable clear of the swivel fitting. – Move the swivel fitting clear of the relay lever.	Refer to Figures 4 and 5. Retain the swivel fitting.

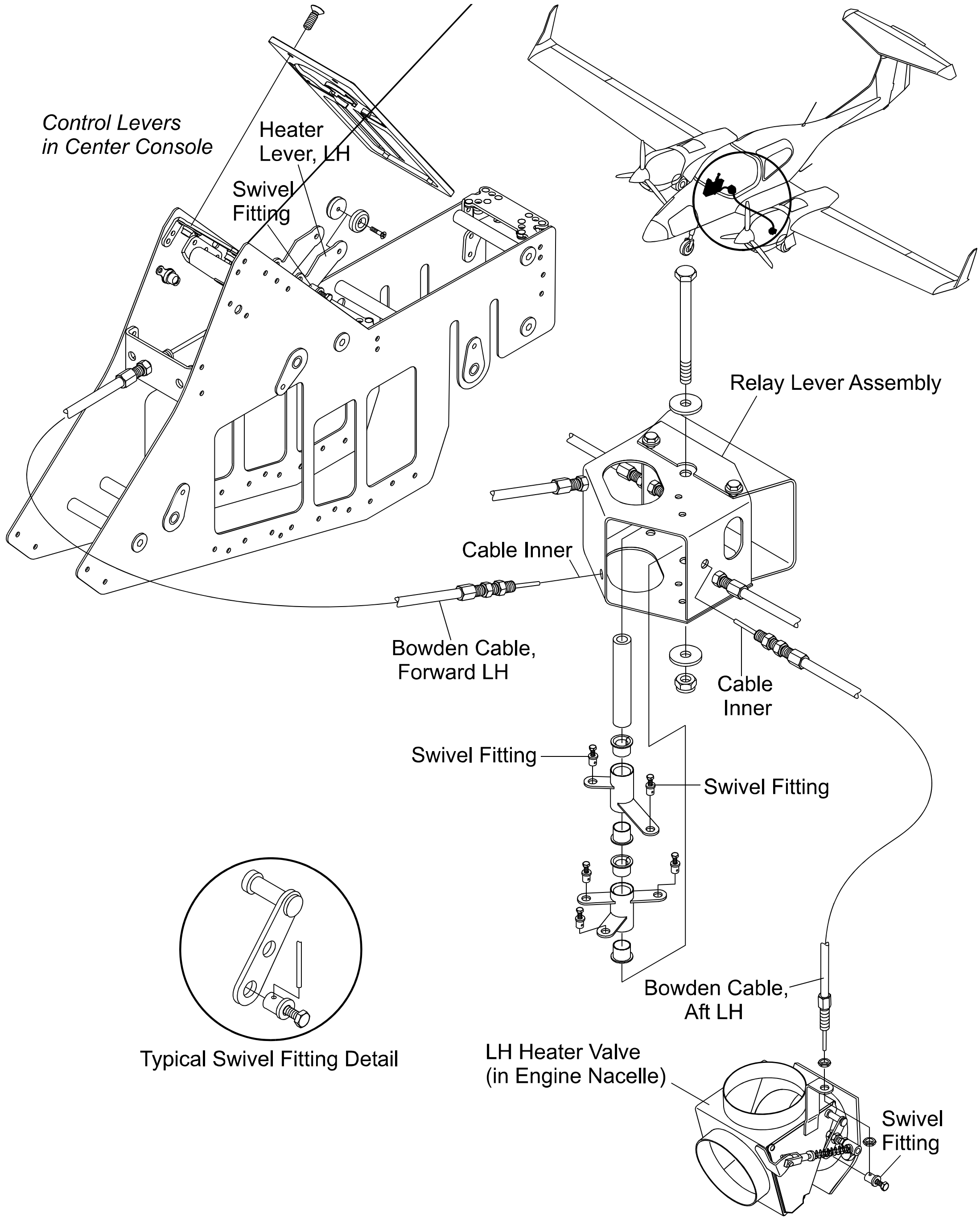

Figure 4: LH Heater Valve Control Cables

Detail Steps/Work Items		Key Items/References
(5)	Remove the cover plate from the CABIN and DEFROST control levers in the center console: – Remove the 4 screws that attach the cover plate to the center console. – Slide the cover plate clear of the control levers.	
(6)	Disconnect the control cable from the related control lever: – Move the related control lever to the OFF position. – Loosen the screw that attaches the swivel fitting to the control lever.	For access.
(7)	Move the broken control cable clear of the cable outer sheath.	Remove and retain the swivel fitting from the broken cable.

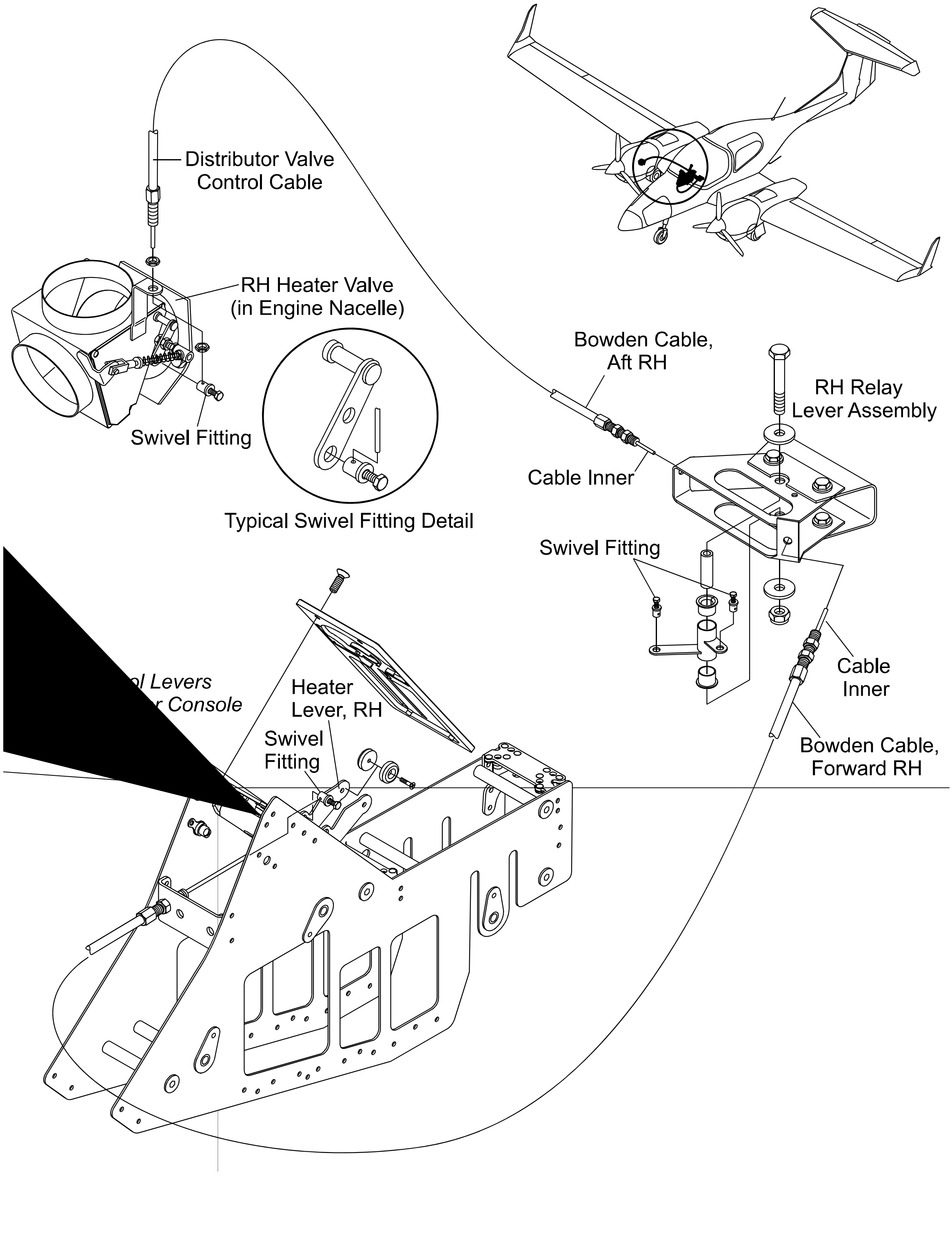

Figure 5: RH Heater Valve Control Cables

Detail Steps/Work Items		Key Items/References

(8)	Install the new inner control cable:
	– Move the new cable into position in the outer sheath.
	– Connect the control cable to the related heater valve flap lever:
	  – Make sure that the heater valve is in the fully closed/bypass position.
	  – Move the swivel fitting into position in the flap lever.
	  – Pass the cable through the swivel fitting.
	  – Tighten the swivel fitting screw.
	– Connect the control cable to the relay lever under the pilot's/co-pilot's seat:
	  – Move the control lever to a position 3 mm (0.1 in) clear of the OFF position.
	  – Move the swivel fitting into position in the relay lever.
	  – Pass the control cable through the swivel fitting.
	  – Tighten the swivel fitting screw.
		
		From the cockpit control lever.

(9)	Do a test for the correct operation of the related heater valve. If necessary, adjust the heater valve cable.	Refer to Paragraph 4.

Detail Steps/Work Items		Key Items/References
(10)	Install the DEFROST/CABIN control-lever cover at the center console: – Move the cover into position at the center console. – Install the 4 screws that attach the cover to the center console. – Tighten the 4 screws. – Make sure that both control levers move freely through the full range of movement.	
(11)	Install the engine cowlings that you removed in step 2.	Refer to Section 71-10. Make sure that there is no servicing equipment left in the engine nacelle.
(12)	Install the pilot's/co-pilot's seat that you removed.	Refer to Section 25-10.

B. Replace a Heater Control Valve Aft Cable

Detail Steps/Work Items		Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings from the related engine.	Refer to Section 71-10.
(3)	Remove the pilot's/co-pilot's seat as necessary.	Pilot's seat for DEFROST cables, co-pilot's seat for CABIN cables. Refer to Section 25-10.
(4)	Disconnect the aft cable at the relay lever: – Loosen the screw that attaches the swivel fitting to the control lever and cable. – Pull the cable clear of the swivel fitting. – Move the swivel fitting clear of the relay lever.	Figures 4 and 5. Retain the swivel fitting.
(5)	Disconnect the cable at the heater valve operating lever: – Loosen the screw that attaches the swivel fitting to the operating lever and cable. – Pull the cable clear of the swivel fitting. – Move the swivel fitting clear of the relay lever.	Figures 4 and 5. Retain the swivel fitting.

Detail Steps/Work Items		Key Items/References

(6)	Install the new inner control cable:
	– Move the new cable into position in the outer sheath.
	– Connect the control cable to the related heater valve flap lever:
	  – Make sure that the heater valve is in the fully closed/bypass position.
	  – Move the swivel fitting into position in the flap lever.
	  – Pass the cable through the swivel fitting.
	  – Tighten the swivel fitting screw.
	– Connect the control cable to the relay lever under the pilot's/co-pilot's seat:
	  – Move the control lever at the center console to a position 3 mm (0.1 in) clear of the OFF position.
	  – Move the swivel fitting into position in the relay lever.
	  – Pass the control cable through the swivel fitting.
	  – Tighten the swivel fitting screw.
		
		From the relay lever.

(7)	Do a test for the correct operation of the related heater valve. If necessary, adjust the heater valve cable.	Refer to Paragraph 4.
(8)	Install the engine cowlings that you removed.	Refer to Section 71-10.
(9)	Install the pilot's/co-pilot's seat as necessary.	Refer to Section 25-10.

3. Replace a Heater Control Valve Control Cable (if MÄM 42-739 is installed)

A. Replace a Heater Control Valve Control Cable

Detail Steps/Work Items		Key Items/References
WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**		
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings from the related engine.	Refer to Section 71-10.
(3)	Remove the pilot's/co-pilot's seat as necessary.	Pilot's seat for DEFROST cables, co-pilot's seat for CABIN cables.
(4)	Disconnect the cable at the heater valve operating lever: – Loosen the screw that attaches the swivel fitting to the operating lever and cable. – Pull the cable clear of the swivel fitting. – Move the swivel fitting clear of the operating lever.	Refer to Figures 6 and 7. Retain the swivel fitting.

Detail Steps/Work Items		Key Items/References
(5)	Remove the cover plate from the CABIN and DEFROST control levers in the center console: – Remove the 4 screws that attach the cover plate to the center console. – Slide the cover plate clear of the control levers.	
(6)	Disconnect the control cable from the related control lever: – Move the related control lever to the OFF position. – Loosen the screw that attaches the swivel fitting to the control lever.	For access.
(7)	Move the broken control cable clear of the cable outer sheath.	Remove and retain the swivel fitting from the broken cable.

Detail Steps/Work Items		Key Items/References

(8)	Install the new inner control cable:
	– Move the new cable into position in the outer sheath.
	– Connect the control cable to the related heater valve flap lever:
	  – Make sure that the heater valve is in the fully closed/bypass position.
	  – Move the swivel fitting into position in the flap lever.
	  – Pass the cable through the swivel fitting.
	  – Tighten the swivel fitting screw.
	– Connect the control cable to the relay lever under the pilot’s/co-pilot’s seat:
	  – Move the control lever to a position 3 mm (0.1 in) clear of the OFF position.
	  – Move the swivel fitting into position in the relay lever.
	  – Pass the control cable through the swivel fitting.
	  – Tighten the swivel fitting screw.
		
		From the cockpit control lever.

(9)	Do a test for the correct operation of the related heater valve. If necessary, adjust the heater valve cable.	Refer to Paragraph 4.

Detail Steps/Work Items		Key Items/References
(10)	Install the DEFROST/CABIN control-lever cover at the center console: – Move the cover into position at the center console. – Install the 4 screws that attach the cover to the center console. – Tighten the 4 screws. – Make sure that both control levers move freely through the full range of movement.	
(11)	Install the engine cowlings that you removed in step 2.	Refer to Section 71-10. Make sure that there is no servicing equipment left in the engine nacelle.
(12)	Install the pilot's/co-pilot's seat that you removed.	Refer to Section 25-10.

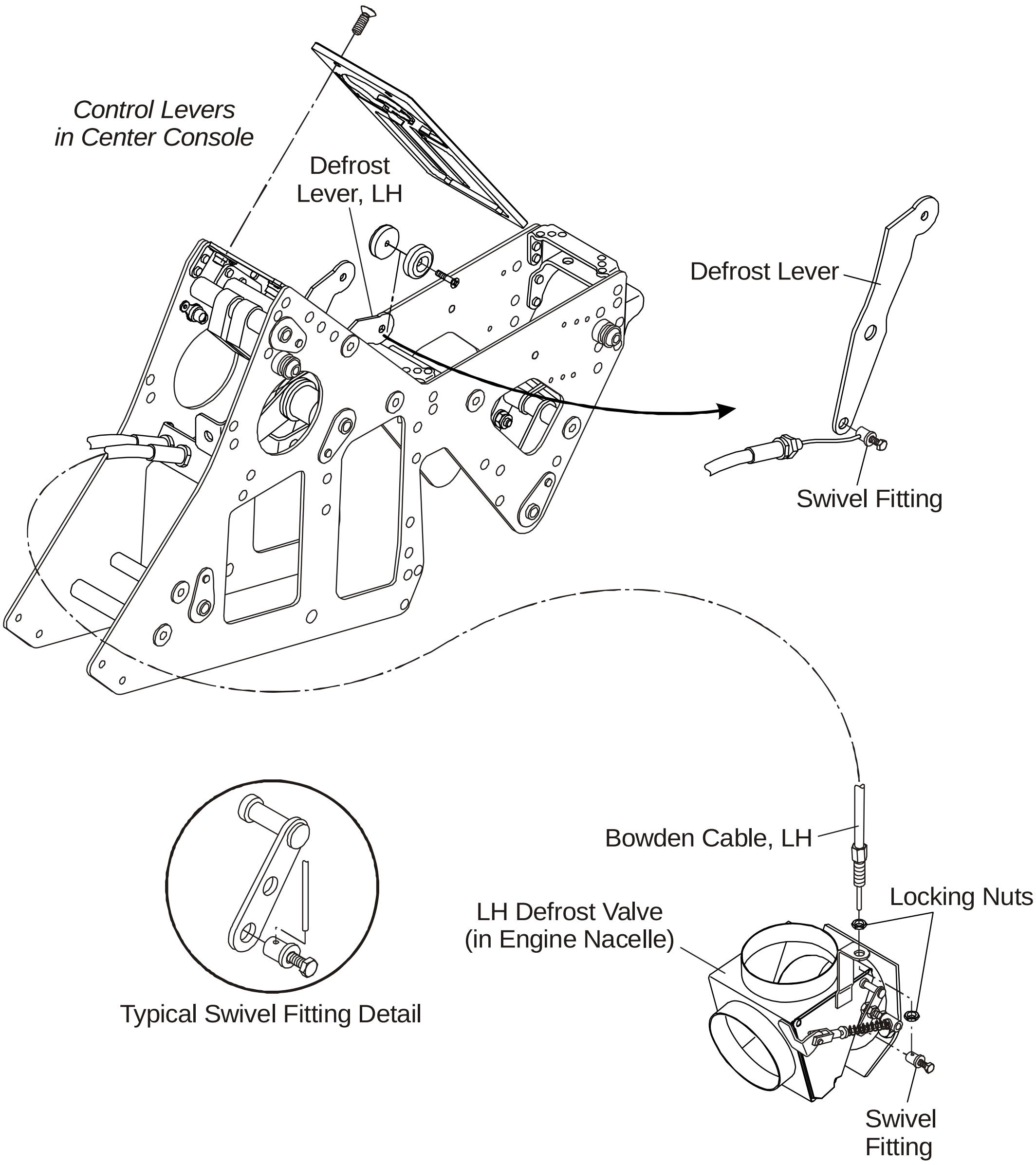

Figure 6: LH Heater Valve Control Cables (if MÄM 42-739 is installed)

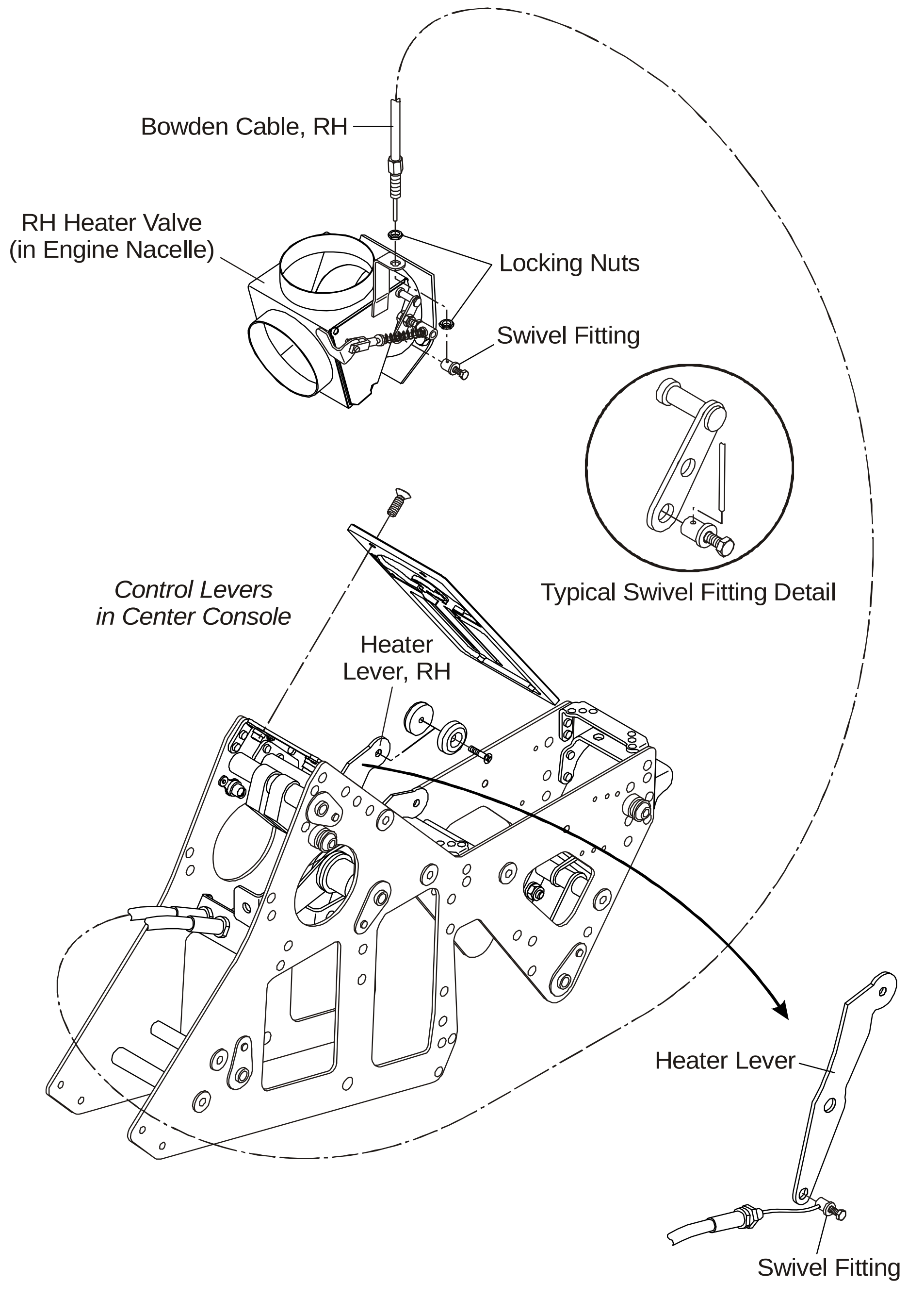

Figure 7: RH Heater Valve Control Cables (if MÄM 42-739 is installed)

4. Test/Adjust a Heater Valve Control Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings for the heater valve control cable that you will test/adjust.	Refer to Section 71-10.
(3)	Test the operation of the heater valve: – Set the related control lever in the cockpit to the OFF position. – Make sure that the flap of the heater valve fully closes off the outlet from the heater valve to the engine firewall.	There must be ‘bounce’ of about 3 mm (0.1 in) between the bottom of the lever and the cockpit stop.

Detail Steps/Work Items		Key Items/References
(4)	If necessary, adjust the control cable in the swivel fitting to give the correct bounce: – Set the related heater valve control lever to ON. – Loosen the screw in the swivel fitting and move the flap a small distance towards the closed/bypass position. – Tighten the screw in the swivel fitting.	
(5)	Repeat steps 3 and 4 as necessary to get the correct adjustment.	It may also be necessary to adjust the cables at the relay lever under the pilot's/co-pilot's seats.
(6)	Install the engine cowlings that you removed in step 2.	Refer to Section 71-10. Make sure that there is no servicing equipment left in the engine nacelle.

Section 21-40

Heating

1. General

The DA 42 NG has separate heating supplies for the windscreen defrosting and the cabin heating systems. The left engine supplies warm air for the defrost system. The right engine supplies warm air for the cabin heating system. This Section tells you about the engine heat exchangers. Refer to Section 21-20 for data about the air distribution systems and Section 21-60 for data about the temperature control systems.

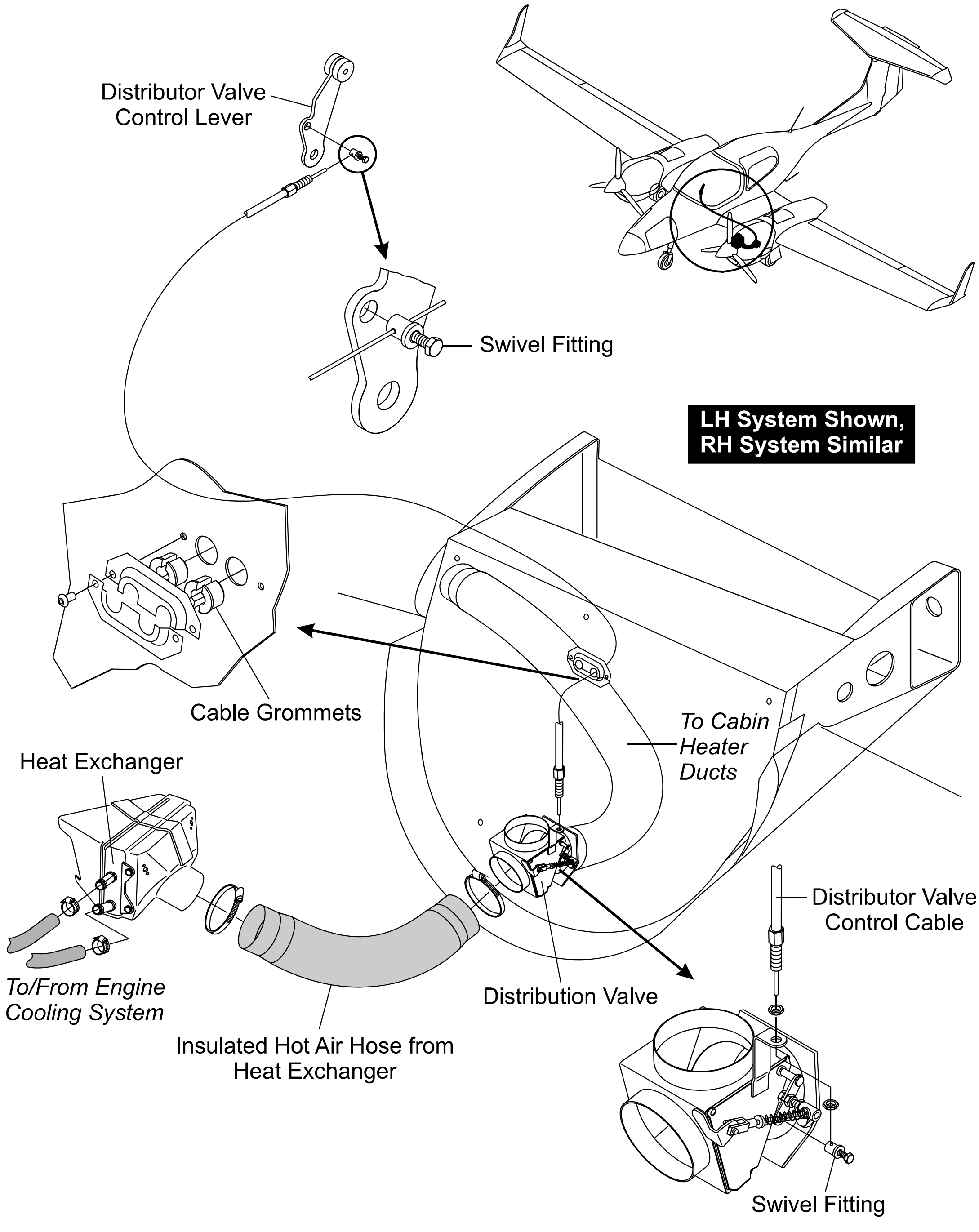

Figure 1: Heating System

2. Description and Operation

The heated air from the left engine is used for windscreen defrosting and the heated air from the right engine is used for cabin heating. Both the left and right engine air heating systems are similar. The left engine system is used in this description.

With the engine running, or when the airplane is in flight, ambient air is forced into a duct on the lower right side of the engine cowling. The duct connects to a carbon fiber composite (CFC) shroud which houses a heat exchanger. Hot coolant from the engine liquid cooling system flows through the core of the heat exchanger. The coolant is taken from upstream of the engine cooling system thermostatic valve. The temperature of the ambient air is raised as it flows through the matrix of the heat exchanger. A flexible hose connects the outlet of the CFC shroud to the heater valve.

The heater valve is mounted on the engine firewall and has one air inlet and two air outlets. An internal flap divides the air flow from the inlet between the two outlets. In the OFF or bypass position, the flap covers the outlet to the airplane heating system and provides the firewall seal. In the this position all the air from the heat exchanger is vented into the engine nacelle and then overboard with the normal flow of air through the engine nacelle. As the flap moves from the OFF or bypass position some air can flow through the heater valve into the airplane heating system. When the flap is in the fully ON or open position the flap seals the outlet into the engine nacelle and all the air flows into the airplane heating system.

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Trouble-Shooting

1. General

This table tells you how to trouble-shoot the air conditioning heating system. Refer to Section 21-20 for trouble-shooting data for the air distribution system and see Section 21-60 for trouble-shooting data for the temperature control system.

If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
The air flowing through the windscreen defrosting vents is cold or not warm enough.	The left engine is not at normal running temperature.	Allow the engine to warm-up to normal operating temperature.
	Air trapped in the left engine heat exchanger or heat exchanger coolant supply.	Bleed the heat exchanger and heat exchanger supply system.
	Left engine heat exchanger matrix blocked or damaged.	Replace the heat exchanger.
The air flowing through the cabin heating vents is cold or not warm enough.	The right engine is not at normal running temperature.	Allow the engine to warm-up to normal operating temperature.
	Air trapped in the right engine heat exchanger or heat exchanger coolant supply.	Bleed the heat exchanger and heat exchanger supply system.
	Right engine heat exchanger matrix blocked or damaged.	Replace the heat exchanger.

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Maintenance Practices

1. General

The Maintenance Practices in this Section tell you how to replace a heat exchanger and how to bleed the heat exchanger coolant system. Refer to Section 75-00 for more data about the engine liquid cooling system.

2. Remove/Install a Heat Exchanger Assembly

Use this procedure for both the left engine and right engine heat exchanger assembly.

A. Remove a Heat Exchanger Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings from the engine that you will remove the heat exchanger.	Refer to Section 71-10.
	WARNING: IF THE COOLANT SYSTEM IS HOT IT MAY BE PRESSURIZED. IF YOU BREAK INTO A PRESSURIZED SYSTEM YOU MAY SPILL HOT COOLANT. HOT COOLANT CAN CAUSE INJURY TO PERSONS.	

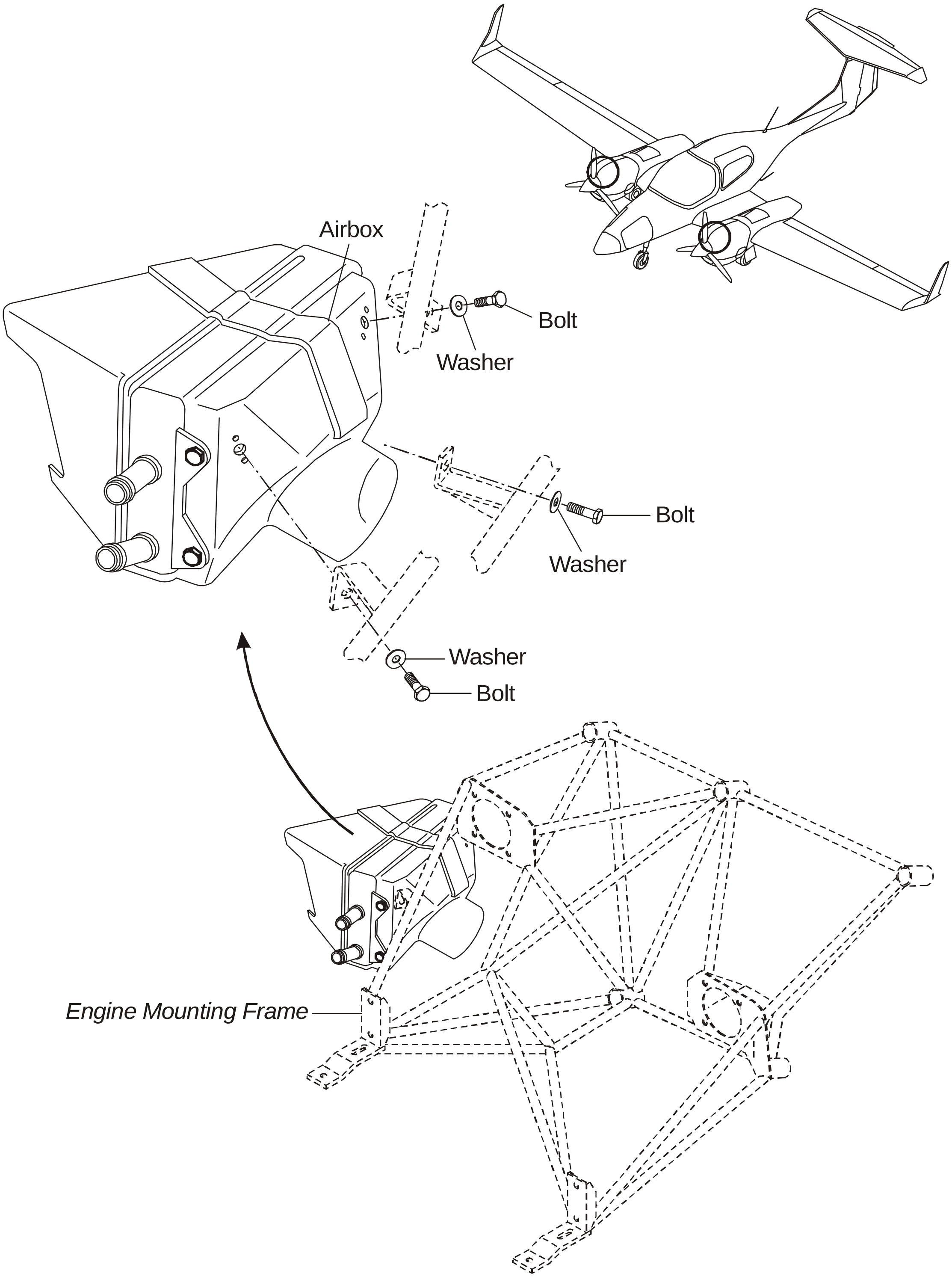

Figure 2: Heat Exchanger Installation 1

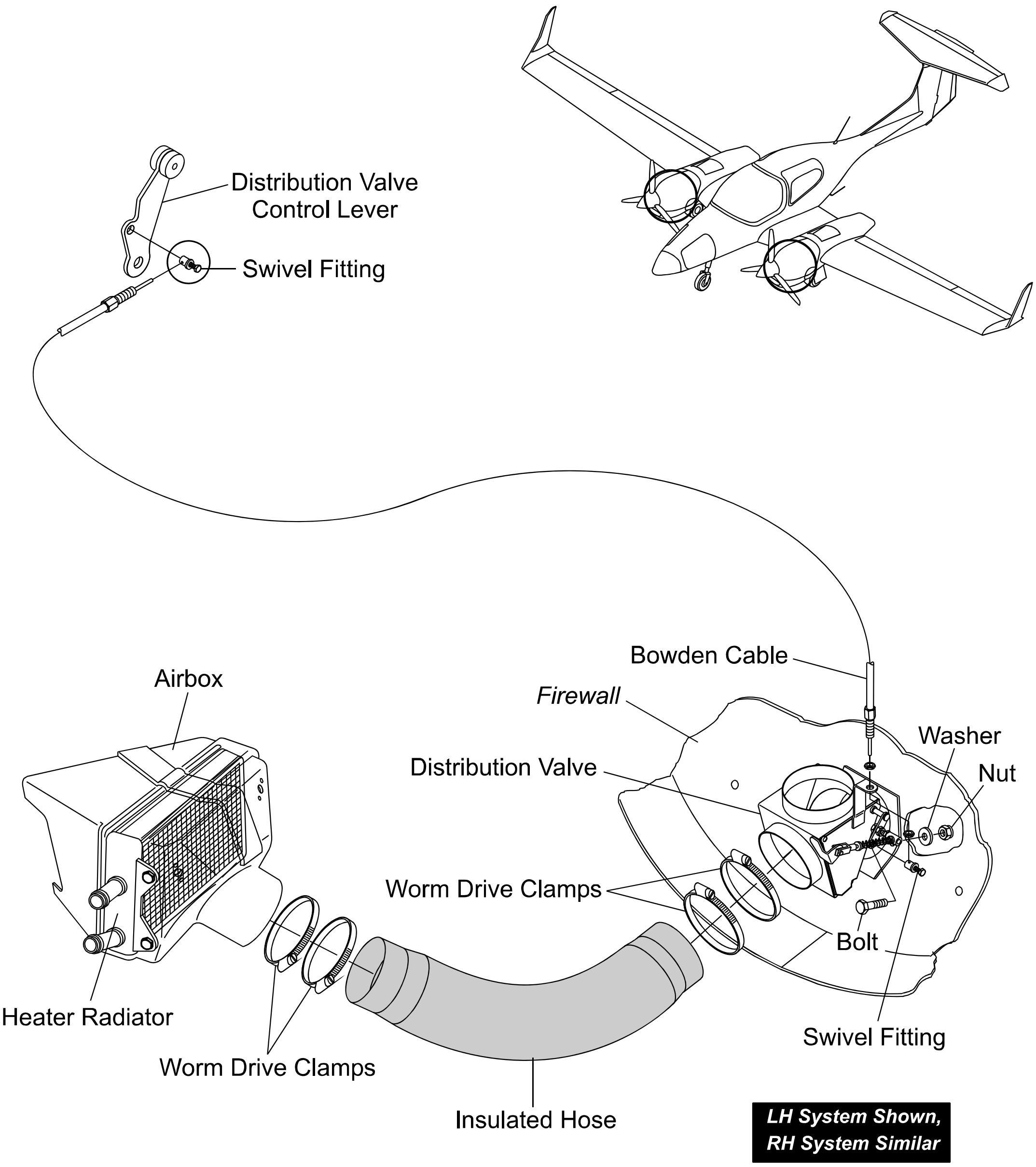

Figure 3: Heat Exchanger Installation 2

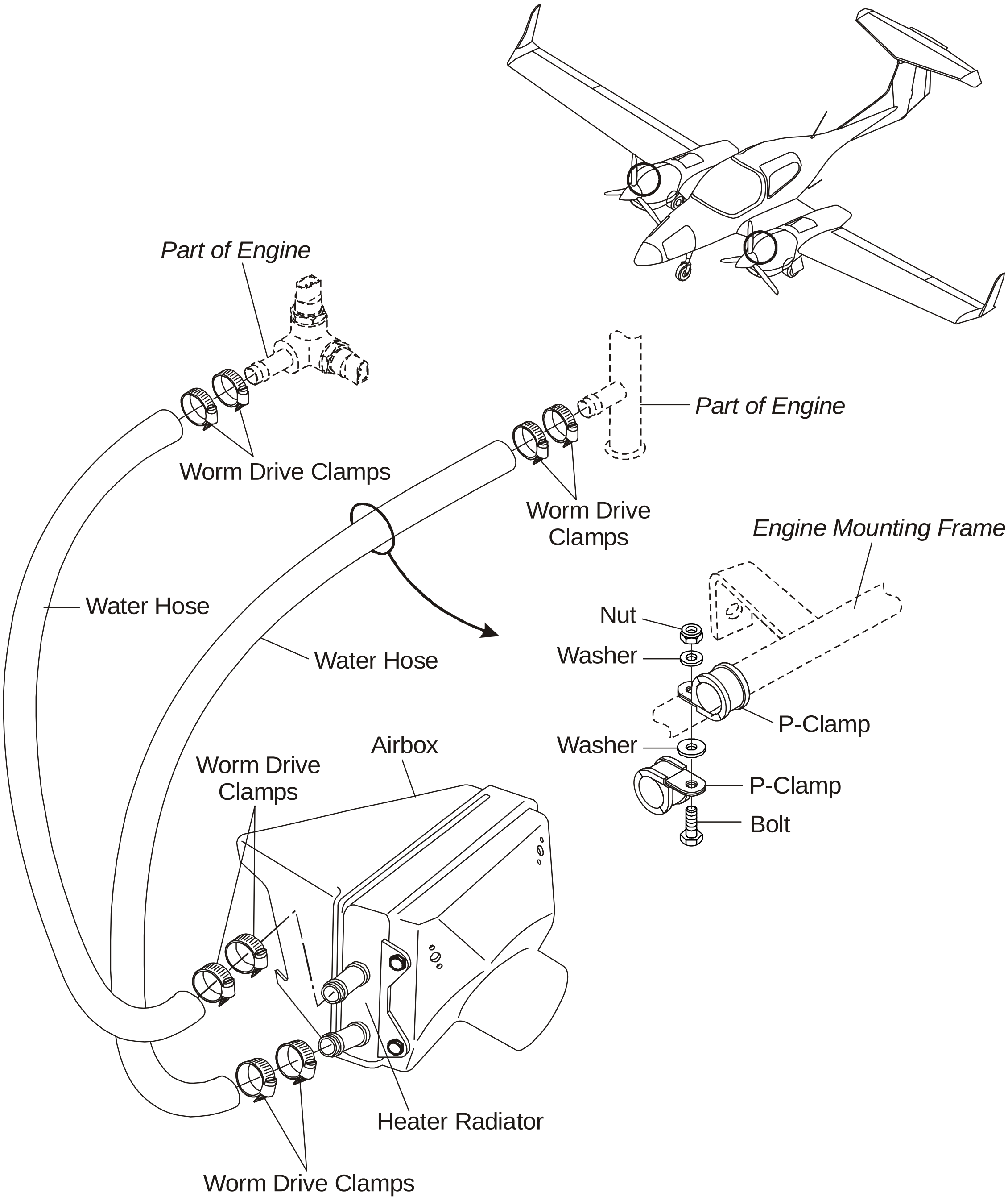

Figure 4: Heat Exchanger Installation 3

	Detail Steps/Work Items	Key Items/References
(4)	Relieve any over pressure from the coolant system: – Turn the cap of the coolant tank a small distance to release the pressure. – When the pressure has fully released, close the cap again tightly.	Refer to Section 75-00.
(5)	Remove the flexible hose that connects the heat exchanger outlet to the heater valve: – Remove the worm drive clamp. – Remove the flexible hose.	Refer to Figure 3.
(6)	Remove the flexible hoses that connect the heat exchanger to the engine cooling system: – Remove the worm drive clamp from the heat exchanger coolant supply connection. – Remove the worm drive clamp from the heat exchanger coolant return connection. – Remove both the flexible hoses from the heat exchanger.	Make sure that the system is not pressurized. At the heat exchanger. At the heat exchange. Use a suitable container to catch spilt coolant.
(7)	Remove the heat exchanger and shroud assembly from the airplane: – Remove the nuts, washers and bolts that attach the heat exchanger assembly to the mounting bracket. – Move the heat exchanger assembly clear of the airplane and drain the contents of the heat exchanger into a suitable container.	

B. Install a Heat Exchanger Assembly

	Detail Steps/Work Items	Key Items/References
(1)	If necessary, remove the shroud from the heat exchanger that you removed and install it on to the heat exchanger that you will install: – Remove the nuts, washers and bolts that attach the shroud to the heat exchanger. – Move the shroud clear of the heat exchanger. – Move the heat exchanger shroud into position onto the heat exchanger that you will install. – Install the bolts, washers and nuts that attach the heat exchanger shroud to the heat exchanger.	
(2)	Install the heat exchanger assembly: – Move the heat exchanger assembly into position in the engine mount. – Install the bolts, washers and nuts that attach the heat exchanger assembly to the mounting bracket. – Tighten the bolts.	
(3)	Install the flexible hoses that connect the coolant supply and return to the heat exchanger: – Move the supply hose into position on the heat exchanger supply pipe. – Move the return hose into position on the heat exchanger return pipe. – Install the worm drive clamps onto the hoses and tighten the clamps.	Make sure that the hose is located correctly. Make sure that the hose is located correctly.

	Detail Steps/Work Items	Key Items/References
(4)	Install the flexible hose that connects the heat exchanger outlet to the heater valve: – Move the flexible hose into position at the connector on the heat exchanger shroud. – Install the worm drive clamp and tighten the worm drive clamp.	Make sure that the hose is correctly located on the outlet.
(5)	Replenish the coolant supply and then bleed the engine liquid cooling system.	Refer to Chapter 75-00.
(6)	Install the engine cowlings that you removed in Paragraph 1A, step 2.	Refer to Section 71-10.
(7)	Do an engine ground test of the related engine and make sure that: – The cooling system operates correctly. – That there are no leaks.	Refer to the DA 42 NG Airplane Flight Manual.
(8)	If necessary, replenish the liquid cooling system.	Refer to Section 12-10.

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Section 21-50
Cooling (OÄM 42-193/c or earlier installed)

1. General

If OÄM 42-193/c or earlier is installed, a recirculating air - cabin cooling (RACC) system is installed. The RACC system is an independent subsystem of the airplane and is electrically powered. It consists of the central unit (installed aft of baggage compartment) and a control panel (in the cabin, LH sidewall).

2. Description

A. Central Unit

The central unit operates with a refrigerant R134a vapor cycle cooling circuit. The system requires electrical power (28 V DC, max. 65 A) for operation, which is provided by an additional alternator.

The central unit is subdivided into the following components:

- Compressor assembly (part of refrigerant circuit).
- Condenser assembly (part of refrigerant circuit).
- Evaporator assembly (part of refrigerant circuit).
- Condenser fan.
- Evaporator radial fan.
- Cabin radial fan.
- Electrical control system.

Refer to Figure 1 for a system schematic of the RACC system.

Note: The refrigerant vapor cooling system is a hermetically sealed and pressurized circuit and contains the refrigerant R134a.

WARNING: ALL MAINTENANCE AND REPLENISHMENT WHICH REQUIRES TO OPEN AND DEPRESSURIZE THE REFRIGERANT CIRCUIT MUST BE CARRIED OUT BY AUTHORIZED PERSONNEL ACCORDING TO NATIONAL AND INTERNATIONAL REGULATIONS FOR REFRIGERANT SYSTEMS.

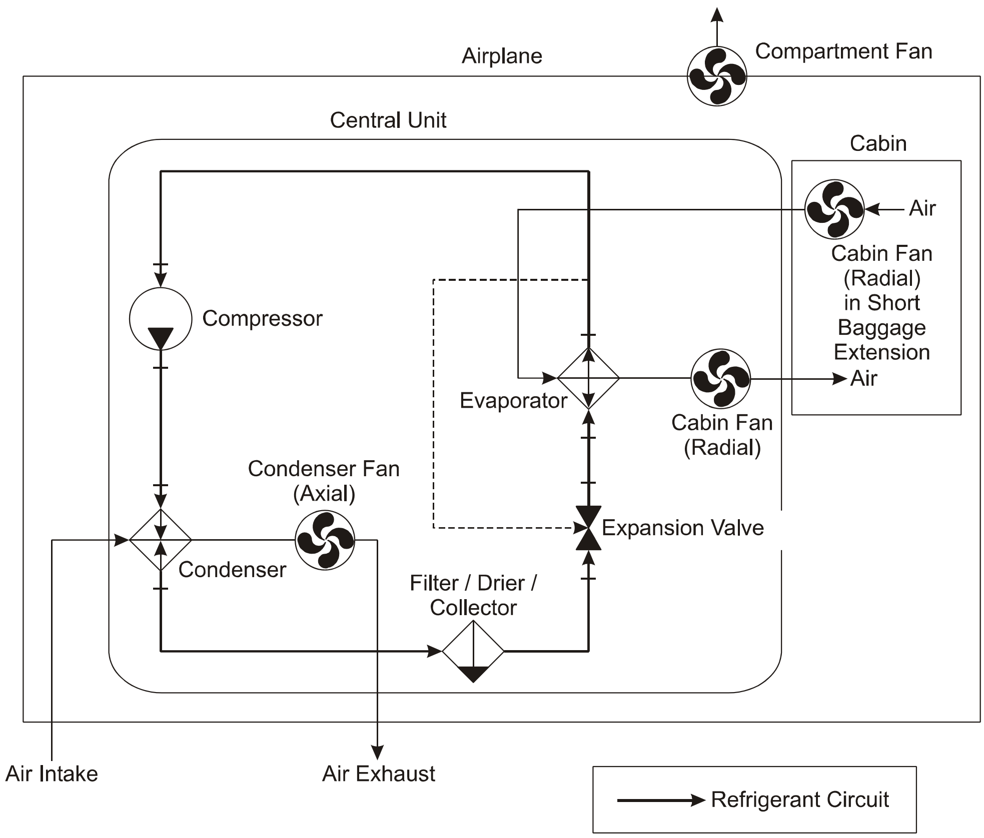

Figure 1: RACC System Schematic

B. Control Panel

The control panel is situated on the LH sidewall in the cabin. It is electrically connected to the RACC controller and provides all necessary elements to control the center unit. An integrated display shows the preset air temperature.

Refer to Figure 2 for details about the RACC control panel.

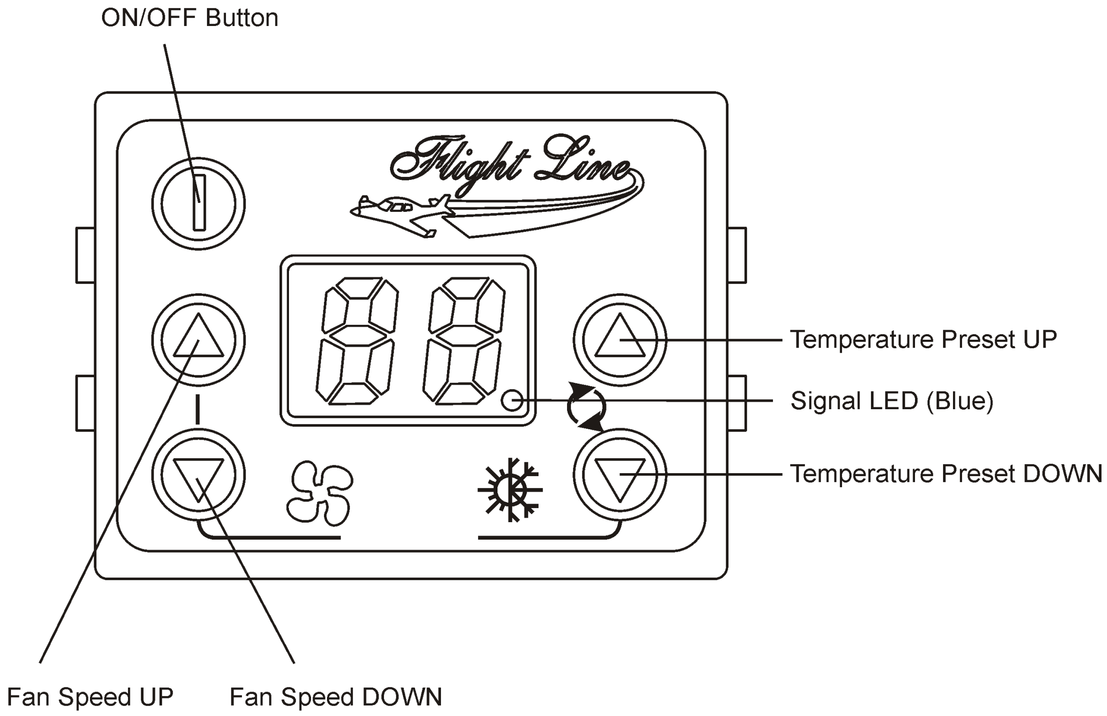

Figure 2: RACC Control Panel

3. Operation

If electrical power is provided to the RACC system, the blue LED on the control panel flashes.

The control panel of the RACC system on the LH sidewall allows the crew to control the fan speed and the cabin temperature. A two digit display shows the preset cabin air temperature in °F. A push-button is used to set the RACC system to ON (if the RACC system is already running, the display is illuminated if the push-button is pressed) and set to OFF (if pressed and held for approximately one second).

During power-up the software version of the control panel is displayed.

The central unit is located aft of the baggage compartment. The RACC controller is located on top of the central unit and controls the refrigerant circuit valves and the compressor with respect to the control panel settings. With the control panel set to ON and a temperature preset lower than the current cabin air temperature, the refrigerant cooling circuit is activated. An electrically powered compressor takes the low-pressure low-temperature refrigerant gas and compresses it to a high-temperature gas. A pressure switch on the compressor assembly regulates the compressor discharge pressure. The hot refrigerant gas is cooled down in the condenser and condenses to a high pressure liquid. An axial condenser fan forces outside air through the condenser coils and vents the thus heated air overboard. The filter / drier / collector bottle removes moisture from the refrigerant and stores the refrigerant. The expansion valve controls the amount of refrigerant liquid flowing to the evaporator. The refrigerant boils in the evaporator and turns back into a low-pressure low-temperature gas while cooling the coils of the evaporator. Two radial cabin fans force cabin air through the cooling coils and thus remove heat from the cabin air. The cool cabin air cannot hold the moisture and water condensates on the evaporator cooling coils. The condensate is collected under the evaporator and is drained overboard. The refrigerant gas returns to the compressor.

A cooling fan vents air through the RH air outlet on top of the fuselage and ensures ventilation of the rear fuselage.

Trouble Shooting

1. General

The table below lists the defects you could have with the control panel in the center console. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Note: The refrigerant vapor cooling system is a hermetically sealed and pressurized circuit and contains the refrigerant R134a.

WARNING: ALL MAINTENANCE AND REPLENISHMENT WHICH REQUIRES TO OPEN AND DEPRESSURIZE THE REFRIGERANT CIRCUIT MUST BE CARRIED OUT BY AUTHORIZED PERSONNEL ACCORDING TO NATIONAL AND INTERNATIONAL REGULATIONS FOR REFRIGERANT SYSTEMS.

Trouble	Possible Cause	Repair
Blue LED on control panel does not illuminate.	RACC circuit breaker open. Additional alternator defective.	Set. Check RACC power supply of the airplane.
Central unit does not power up.	Control panel defective. Electrical control unit defective.	Replace. Replace.

Trouble	Possible Cause	Repair
Insufficient cooling.	Air inlet filter contaminated.	Clean or replace filter.
	Electrical power source insufficient.	Check ground power source respective RACC power supply of airplane.
	Hot air outlet on LH fuselage blocked.	Remove blockage.
	Leak in refrigerant circuit.	Perform a leak test. Repair leak. Charge the system.
	Condenser faulty.	Check condenser coils for dirt accumulation and remove dirt.
	Expansion valve faulty.	Replace expansion valve.
	Compressor faulty.	Replace compressor.

Maintenance Practices

1. Remove/ Install the Central Unit

If OÄM 42-324 is installed:

WARNING: WHEN REMOVING A SEAT FROM THE AIRCRAFT, VERIFY THAT THE AMSAFE SEATBELT AIRBAG SYSTEM RESTRAINT IS NOT BUCKLED AND DISCONNECT CABLE INTERFACE ASSY. FROM THE END-RELEASE BUCKLE ASSEMBLY CONNECTOR BEFORE REMOVAL OF THE SEAT. AN ELECTRICALLY CONNECTED AMSAFE SEATBELT AIRBAG RESTRAINT SYSTEM AND BUCKLED SEAT BELT MAY RESULT IN DAMAGE TO THE EQUIPMENT OR DEPLOYMENT OF THE SYSTEM. REFER TO AMSAFE MAINTENANCE DOCUMENTATION.

A. Remove the Central Unit

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger seats.	Refer to Section 25-10.
(2)	If OÄM 42-324 is NOT installed OR OÄM 42-334 is installed: Remove the seatbelt pulleys of the passenger seats. If OÄM 42-324 is installed AND OÄM 42-334 is NOT installed: Refer to AmSafe Maintenance Documentation.	Refer to 25-10.
(3)	Unplug the electrical connection of the cabin fan: – Open the baggage tray. – Unplug the electrical connector on the rear wall of the short baggage extension.	
(4)	Remove the short baggage extension.	Refer to Section 25-10.
(5)	Remove the air ducts from the RACC central unit.	
(6)	Remove the metal air duct tube from the LH air outlet.	

	Detail Steps/Work Items	Key Items/References
(7)	Unplug the electrical connections from the RACC central unit to: – 3 connectors at the RACC central unit. – 3 heavy cables (under the passenger seats and at the lightning protection system).	
(8)	Remove the four bolts which connect the mounting panel of the RACC central unit to the mounting panel supports.	
(9)	Slide the RACC central unit forward.	
(10)	Lift the RACC central unit clear of the airplane.	

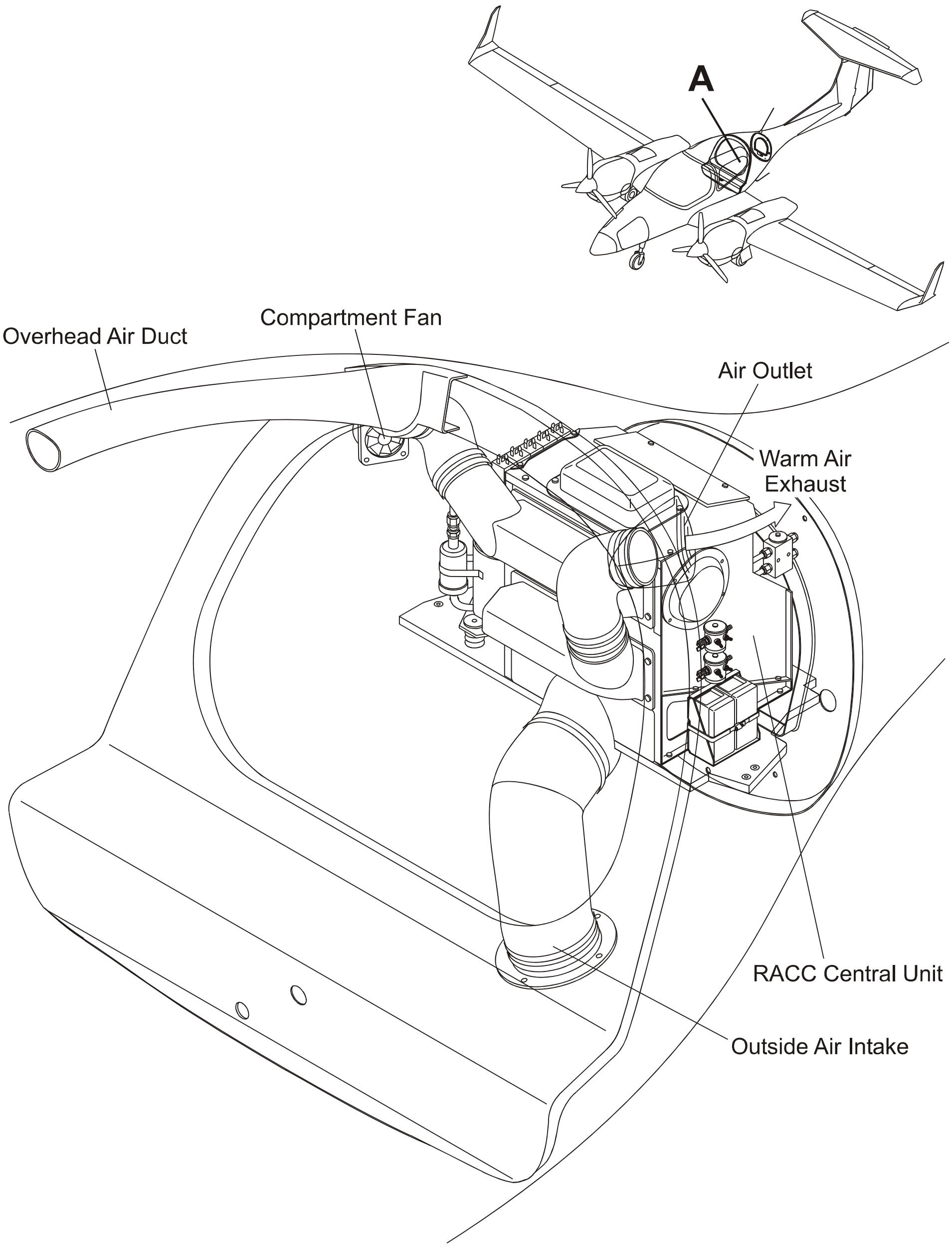

Figure 3: RACC Central Unit Installation

B. Install the Central Unit

	Detail Steps/Work Items	Key Items/References
(1)	Lift the RACC central unit into the airplane.	
(2)	Slide the RACC central unit backward. Make sure to position the mounting panel on the mounting panel supports in the fuselage.	
(3)	Install the 4 screws which connect the mounting panel of the RACC central unit to the mounting panel supports.	
(4)	Connect the RACC central unit electrically to: – 3 electrical connectors of the RACC unit. – 3 heavy cables (under the passenger seats and at the lightning protection system).	Verify correct connection. Refer to Section 92-00.
(5)	Install the metal air duct tube to the RH air outlet.	
(6)	Install the air ducts on the RACC central unit.	
(7)	Install the short baggage extension.	Refer to Section 25-10.
(8)	Connect the cabin fan electrically: – Open the baggage tray. – Plug in the electrical connector on the rear wall of the short baggage extension.	
(9)	If OÄM 42-324 is NOT installed OR OÄM 42-334 is installed: Install the seatbelt pulleys of the passenger seats. If OÄM 42-324 is installed AND OÄM 42-334 is NOT installed: Refer to AmSafe Maintenance Documentation.	Refer to Section 25-10.
(10)	Install the passenger seats.	Refer to Section 25-10.
(11)	Perform a cooling test of the RACC system.	

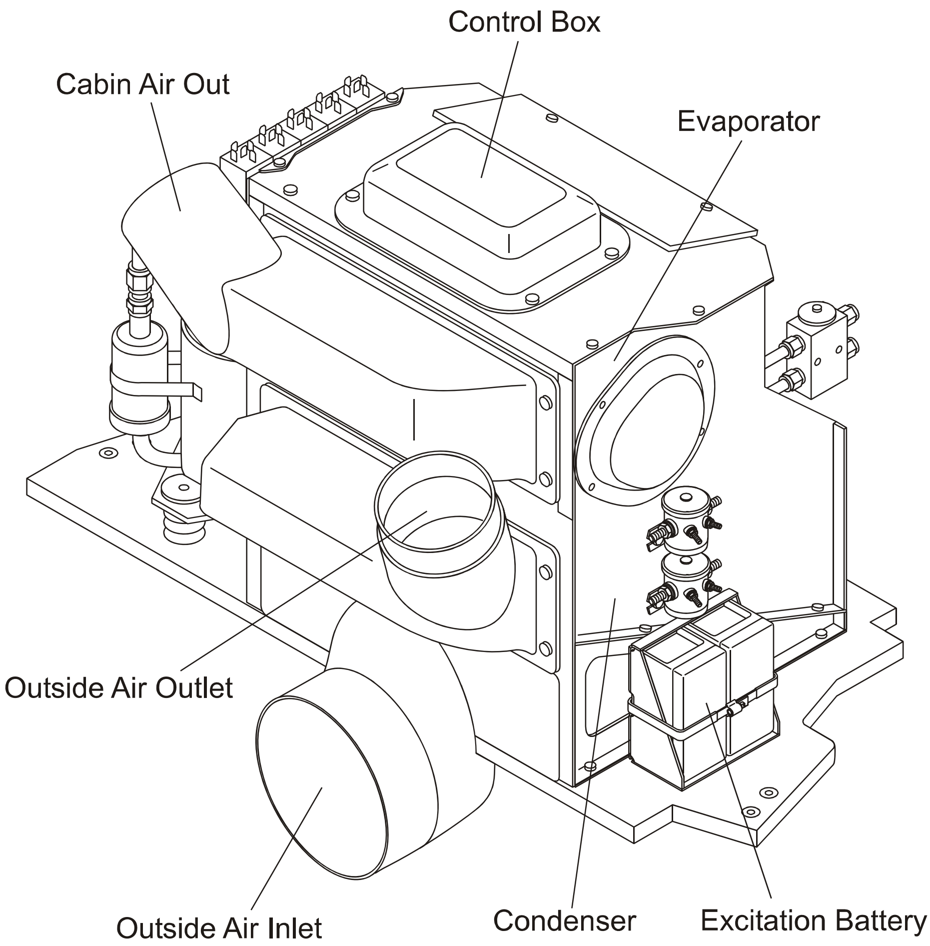

Figure 4: Central Unit - Front and LH Side

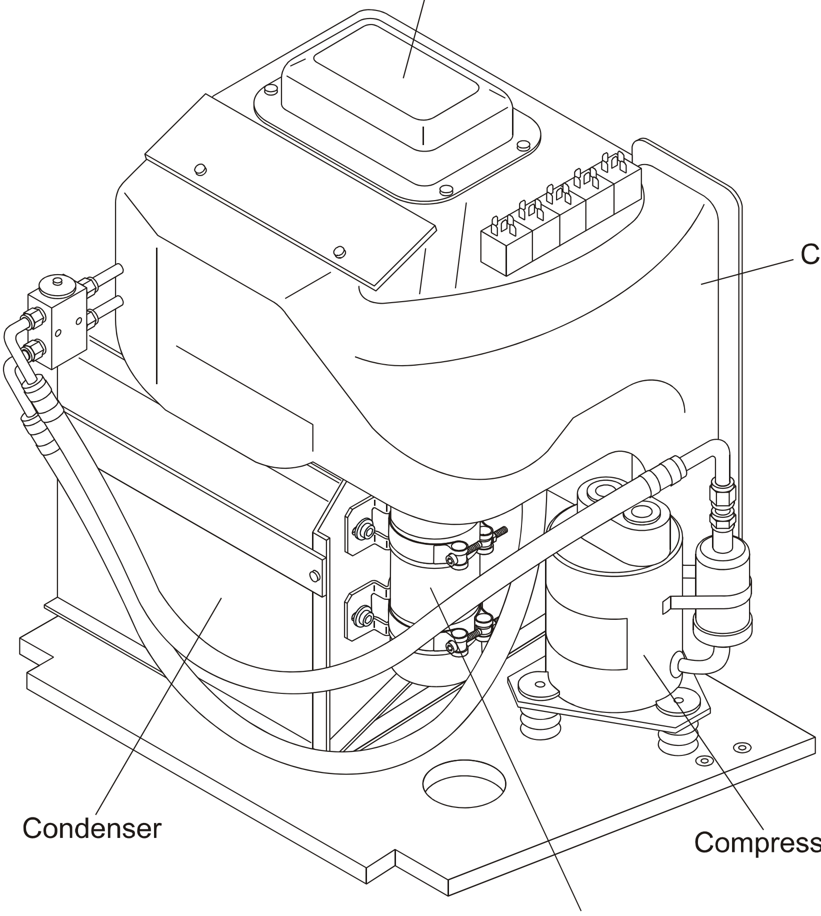

Figure 5: Central Unit - Back and RH Side

2. Remove/Install the Control Panel

A. Remove the Control Panel

	Detail Steps/Work Items	Key Items/References
(1)	Remove the console from the LH sidewall.	Refer to Section 25-10.
(2)	Unplug the electrical connectors of the control panel.	
(3)	Unclip the RACC control panel from the LH sidewall.	

B. Install the Control Panel

	Detail Steps/Work Items	Key Items/References
(1)	Move the RACC control panel in position on the console on the LH sidewall.	
(2)	Push the control panel into the console until the clips hold the panel in place on the console.	
(3)	Connect the electrical connectors to the control panel.	
(4)	Install the console.	Refer to Section 25-10.
(5)	Perform a RACC - System Test.	Refer to Paragraph 3.

3. RACC - System Test Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Perform an engine ground test.	Refer to Section 71-00.
(2)	Set the LH engine to idle power (700 - 800 RPM).	
(3)	Set the AUX POWER switch to ON.	The blue LED on the RACC control panel must flash.
(4)	Push the ON/OFF button on the RACC control panel once to switch the RACC system ON.	The preset temperature display on the RACC control panel must illuminate.
(5)	Push the Preset Temperature DOWN button until the preset temperature shows ‘LO’.	
(6)	Verify that the cabin outlet air temperature is significantly lower than the cabin air temperature.	
(7)	Set the cabin air preset temperature to a convenient temperature level.	Use the preset temperature UP and DOWN buttons on the control panel.
(8)	Push the ON/OFF button on the RACC control panel for approximately 1 second to switch the RACC system to OFF.	
(9)	Set the AUX POWER switch to OFF.	

4. Remove/Install Parts of the Refrigerant Circuit

Note: The refrigerant vapor cooling system is a hermetically sealed and pressurized circuit and contains the refrigerant R134a.

WARNING: ALL MAINTENANCE AND REPLENISHMENT WHICH REQUIRES TO OPEN AND DEPRESSURIZE THE REFRIGERANT CIRCUIT MUST BE CARRIED OUT BY AUTHORIZED PERSONNEL ACCORDING TO NATIONAL AND INTERNATIONAL REGULATIONS FOR REFRIGERANT SYSTEMS.

Before you do any maintenance on parts of the refrigerant circuit you must remove the central unit from the airplane. Refer to Paragraph 1.

Make sure to obey the regulations for handling the refrigerant.

A. Discharge/Charge the Refrigerant Circuit

(1) Equipment

One of the following automated discharge and charging stations or equivalent must be used:

Item	Quantity	Part Number
Silco CS 199.	1	Commercial.
Silco CS 195.	1	Commercial.
Silco CS 150.	1	Commercial.

(2) Discharge the Refrigerant Circuit

	Detail Steps/Work Items	Key Items/References
(1)	Remove the central unit from the airplane.	Refer to Paragraph 1.
(2)	Connect the RACC system to the discharge / charging station.	Follow the instructions of the discharge/charging station.
(3)	Discharge the refrigerant.	Follow the instructions of the discharge/charging station.
(4)	Print the protocol of the discharge/charging station and add it to the RACC system documentation.	Follow the instructions of the discharge/charging station.

(3) Charge the Refrigerant Circuit

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that all connectors of the refrigerant circuit are tight.	
(2)	Charge the refrigerant circuit: – Use R 134a: 0.45 kg (0.99 lb). – Use Reniso Triton Oil: SE 55, 0.019 liter (0.02 quart).	Follow the instructions of the discharge/charging station.
(3)	Print the protocol of the discharge/charging station and add it to the RACC system documentation.	Follow the instructions of the discharge/charging station.
(4)	Disconnect the RACC system from the discharge/charging station.	Follow the instructions of the discharge/charging station.
(5)	Install the RACC central unit in the airplane.	Refer to Paragraph 1.
(6)	Perform a RACC system test.	Refer to Paragraph 3.

B. Remove/Install the Compressor

(1) Remove the Compressor

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4A (2).
(2)	Unplug the electrical connectors from the compressor.	
(3)	Loosen the hose connections of the refrigerant circuit on the compressor.	Use caps to plug the hose connectors.
(4)	Remove the three screws which attach the compressor to the RACC mounting panel.	
(5)	Move the compressor clear of the central unit.	

(2) Install the Compressor

	Detail Steps/Work Items	Key Items/References
(1)	Position the compressor on the RACC mounting panel.	
(2)	Use the three screws to attach the compressor to the RACC mounting panel.	
(3)	Connect the refrigerant circuit hoses to the compressor.	Remove the caps from the hose connectors. Use new O-rings.
(4)	Connect the electrical connectors to the compressor.	
(5)	Charge the refrigerant circuit.	Refer to Paragraph 4A (3).

C. Remove/Install the Filter/Drier Assembly

(1) Remove the Filter/Drier Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4A (2).
(2)	Remove the electrical connectors from the pressure sensor.	
(3)	Loosen the hose connections of the refrigerant circuit on the filter/drier assembly.	Use caps to plug the hose connectors.
(4)	Remove the two screws which attach the filter/drier assembly to the central unit.	
(5)	Move the filter/drier assembly clear of the central unit.	

(2) Install the Filter/Drier Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Position the filter/drier assembly on the RACC mounting panel.	
(2)	Use the two screws to attach the filter/drier assembly to the central unit.	
(3)	Connect the refrigerant circuit hoses to the filter/drier assembly.	Remove the caps from the hose connectors. Use new O-rings.
(4)	Connect the electrical connectors to the pressure sensor.	
(5)	Charge the refrigerant circuit.	Refer to Paragraph 4A (3).

D. Remove/Install the Expansion Valve

(1) Remove the Expansion Valve

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4A (2).
(2)	Loosen the hose connections of the refrigerant circuit to the expansion valve.	Use caps to plug the hose connectors.
(3)	Open the pressure line fittings which connect the expansion valve to the evaporator.	
(4)	Move the expansion valve clear of the central unit.	

(2) Install the Expansion Valve

	Detail Steps/Work Items	Key Items/References
(1)	Position the expansion valve on the central unit.	
(2)	Attach the expansion valve to the evaporator with the pressure line fittings.	Use new O-rings.
(3)	Connect the refrigerant circuit hoses to the expansion valve.	Remove the caps from the hose connectors.
(4)	Charge the refrigerant circuit.	Refer to Paragraph 4A (3).

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Section 21-51
Cooling (OÄM 42-193/d or later installed)

1. General

If OÄM 42-193/d or later is installed, an improved recirculating air - cabin cooling (RACC) system is installed. The RACC system is an independent subsystem of the airplane and is electrically powered. It consists of the central unit (installed aft of baggage compartment) and a control panel (in the cabin, center console).

2. Description

A. Central Unit

The central unit operates with a refrigerant R134a vapor cycle cooling circuit. The system requires electrical power (28 V DC, max. 65 A) for operation, which is provided by an additional alternator.

The central unit is subdivided into the following components:

- Compressor assembly (part of refrigerant circuit).
- Condenser assembly (part of refrigerant circuit).
- Evaporator assembly (part of refrigerant circuit).
- Condenser radial fan.
- Evaporator radial fan.
- Electrical control system.

Refer to Figure 1 for a system schematic of the RACC system.

Note: The refrigerant vapor cooling system is a hermetically sealed and pressurized circuit and contains the refrigerant R134a.

WARNING: ALL MAINTENANCE AND REPLENISHMENT WHICH REQUIRES TO OPEN AND DEPRESSURIZE THE REFRIGERANT CIRCUIT MUST BE CARRIED OUT BY AUTHORIZED PERSONNEL ACCORDING TO NATIONAL AND INTERNATIONAL REGULATIONS FOR REFRIGERANT SYSTEMS.

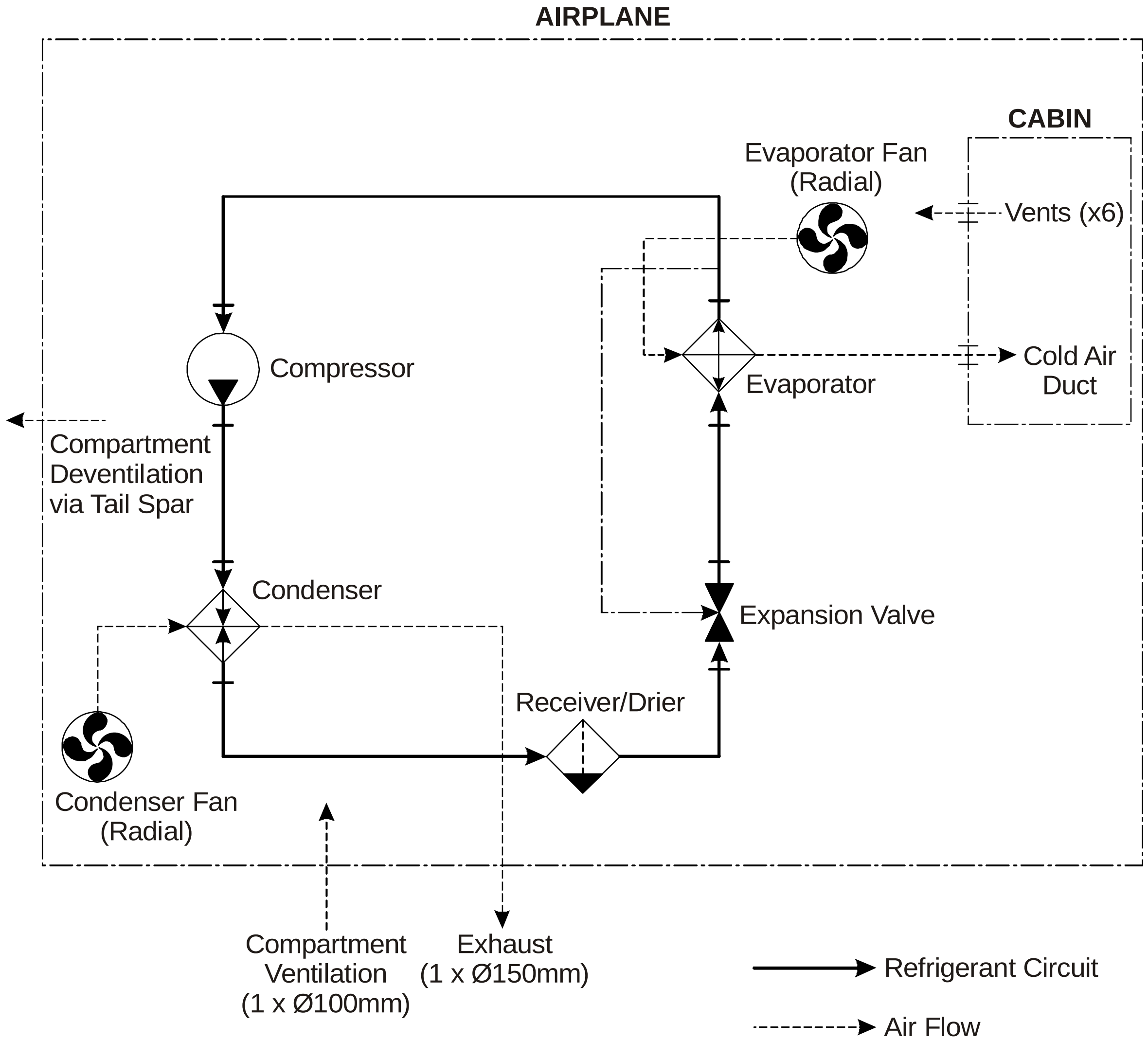

Figure 1: RACC System Schematic (OÄM 42-193/d or later is installed)

B. Control Panel

The control panel is situated on the center console in the cabin. It is electrically connected to the RACC controller and provides all necessary elements to control the center unit. An integrated display shows the preset air temperature.

Refer to Figure 2 for details about the RACC control panel.

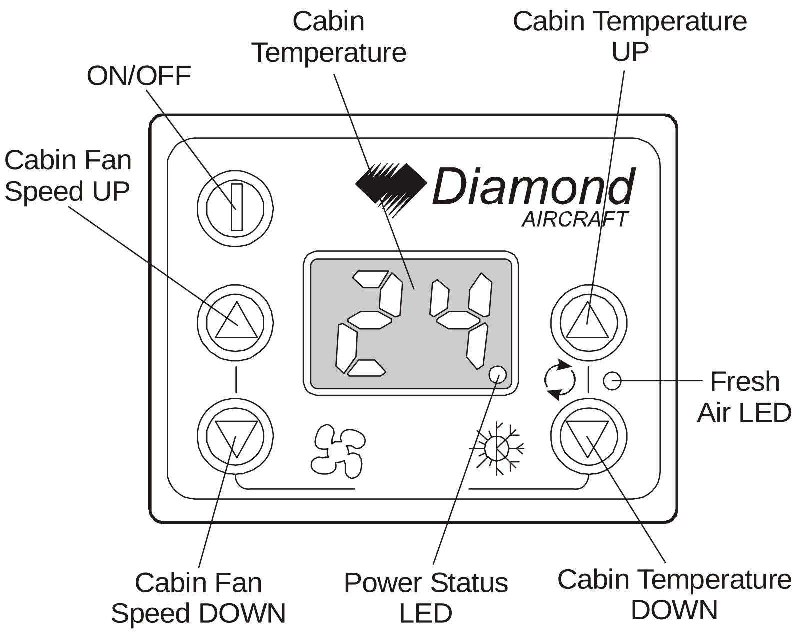

Figure 2: RACC Control Panel (if OÄM 42-193/d or later is installed)

3. Operation

If electrical power is provided to the RACC system, the power status LED on the control panel flashes.

The control panel of the RACC system in the center console allows the crew to control the fan speed and the cabin temperature. A two digit display shows the preset cabin air temperature in °C. A push-button is used to set the RACC system to ON (if short depressed; display is illuminated) and OFF (if pressed and held for approximately one second).

During power-up the software version of the control panel is displayed.

The central unit is located aft of the baggage compartment. The RACC controller is located below the condenser unit and controls the refrigerant circuit valves and the compressor with respect to the control panel settings. With the control panel set to ON and a temperature preset lower than the current cabin air temperature, the refrigerant cooling circuit is activated. An electrically powered compressor takes the low-pressure low-temperature refrigerant gas and compresses it to a high-temperature gas. A pressure switch on the compressor assembly regulates the compressor discharge pressure. The hot refrigerant gas is cooled down in the condenser and condenses to a high pressure liquid. A radial condenser fan forces outside air through the condenser coils and vents the thus heated air overboard. The drier / receiver bottle separates moisture from liquid and filters contaminations from refrigerant. The expansion valve controls the amount of refrigerant liquid flowing to the evaporator. The refrigerant boils in the evaporator and turns back into a low-pressure low-temperature gas while cooling the coils of the evaporator. A radial evaporator fan forces cabin air through the cooling coils and thus remove heat from the cabin air. The cool cabin air cannot hold the moisture and water condensates on the evaporator cooling coils. The condensate is collected under the evaporator and is drained overboard. The refrigerant gas returns to the compressor.

An inlet including a drip tray and an air filter enables ambient air to enter the RACC compartment ensuring sufficient compartment ventilation.

Trouble Shooting

1. General

The table below lists the defects you could have with the control panel in the center console. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
The Power Status LED on control panel does not illuminate.	RACC circuit breaker open. Additional alternator defective.	Set. Check RACC power supply of the airplane.
Central unit does not power up.	Control panel defective. Electrical control unit defective.	Replace. Replace.
Insufficient cooling.	Hot air outlet on fuselage bottom blocked. Leak in refrigerant circuit. Condenser faulty. Expansion valve faulty. Compressor faulty. Electrical power source insufficient. Filter/dryer assembly inoperative.	Remove blockage. Perform a leak test. Repair leak. Charge the system. Check condenser coils for dirt accumulation and remove dirt. Replace expansion valve. Replace compressor. Check ground power source respective RACC power supply of airplane. Replace filter/dryer assembly

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Maintenance Practices

1. Remove/ Install the Central Unit

If OÄM 42-324 is installed:

WARNING: WHEN REMOVING A SEAT FROM THE AIRCRAFT, VERIFY THAT THE AMSAFE SEATBELT AIRBAG SYSTEM RESTRAINT IS NOT BUCKLED AND DISCONNECT CABLE INTERFACE ASSY. FROM THE END-RELEASE BUCKLE ASSEMBLY CONNECTOR BEFORE REMOVAL OF THE SEAT. AN ELECTRICALLY CONNECTED AMSAFE SEATBELT AIRBAG RESTRAINT SYSTEM AND BUCKLED SEAT BELT MAY RESULT IN DAMAGE TO THE EQUIPMENT OR DEPLOYMENT OF THE SYSTEM. REFER TO AMSAFE MAINTENANCE DOCUMENTATION.

A. Remove the Central Unit

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger seats.	Refer to Section 25-10.
(2)	If OÄM 42-324 is NOT installed OR OÄM 42-334 is installed: Remove the seatbelt pulleys of the passenger seats. If OÄM 42-324 is installed AND OÄM 42-334 is NOT installed: Refer to AmSafe Maintenance Documentation.	Refer to Section 25-10.
(3)	Remove the short baggage extension.	Refer to Section 25-10.
(4)	Remove the flexible air hoses from the RACC central unit: – Flexible cold air hose. – Flexible hot air hose.	
(5)	Remove the hot exhaust air duct from the RACC central unit.	

	Detail Steps/Work Items	Key Items/References
(6)	Unplug the electrical connections from the RACC central unit to: – 2 heavy connectors at the RACC central unit terminal board (LH). – 1 plug coming from the RACC control panel.	
(7)	Remove the drain hoses from the RACC central unit: – Drip tray drain hose. – Evaporator drain hose.	
(8)	Remove the drip tray.	
(9)	Remove the four bolts which connect the base plate of the RACC central unit to the RACC brackets on the LH and RH side of airplane.	
(10)	Slide the RACC central unit forward.	
(11)	Lift the RACC central unit clear of the airplane.	

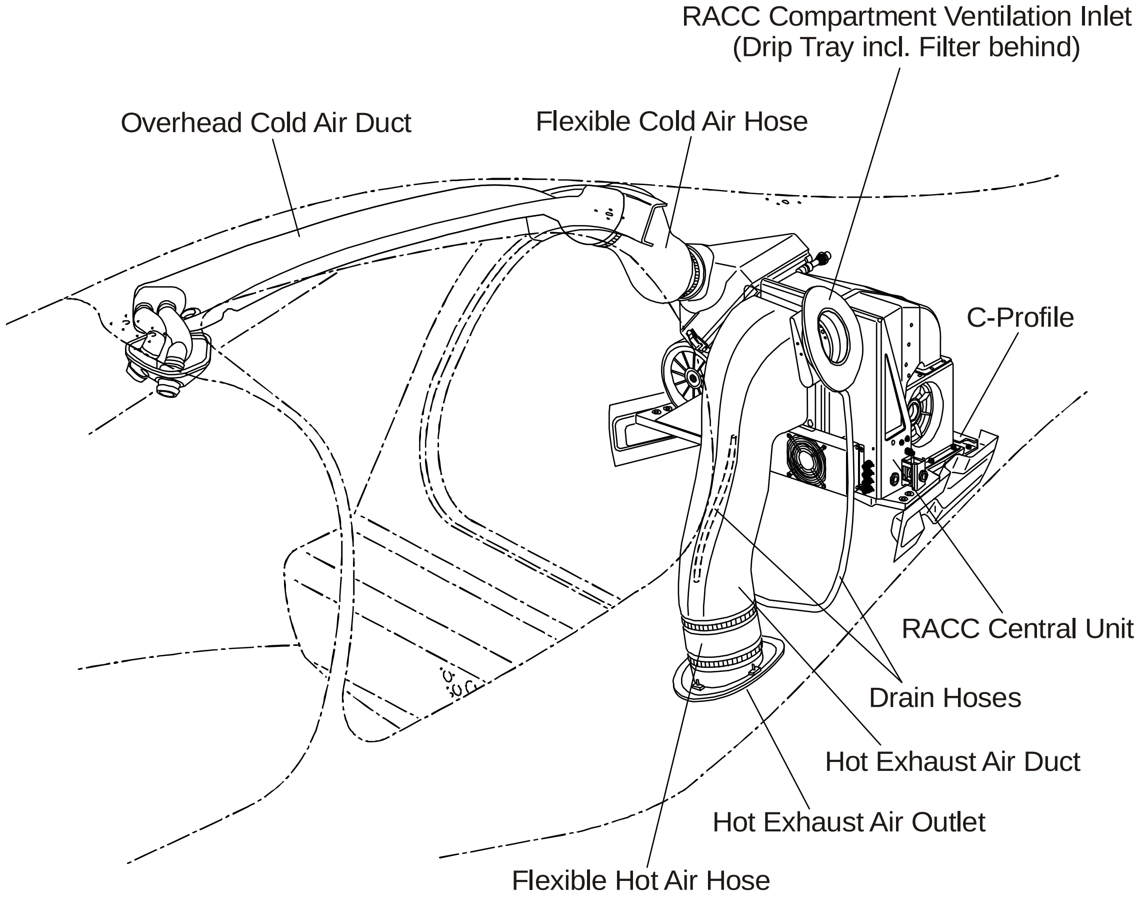

Figure 3: RACC Central Unit Installation (if OÄM 42-193/d or later is installed)

B. Install the Central Unit

	Detail Steps/Work Items	Key Items/References
(1)	Lift the RACC central unit into the airplane.	
(2)	Slide the RACC central unit backward. Make sure to position the baseplate of the RACC central unit above the RACC brackets and trailing edge of the baseplate inside the C-profile.	
(3)	Install four bolts which connect the baseplate of the RACC central unit to the RACC brackets on LH and RH side of airplane.	
(4)	Install the drip tray.	
(5)	Install the drain hoses to the RACC central unit: – Drip tray drain hose. – Evaporator drain hose.	
(6)	Connect the electric cables to the RACC central unit to: – 2 heavy connectors of the RACC central unit terminal board (LH). – 1 plug coming from control panel.	
(7)	Install the hot exhaust air duct to the RACC central unit.	
(8)	Install the flexible air hoses to the RACC central unit: – Flexible cold air hose. – Flexible hot air hose.	
(9)	Install the short baggage extension.	Refer to Section 25-10.

	Detail Steps/Work Items	Key Items/References
(10)	If OÄM 42-324 is NOT installed OR OÄM 42-334 is installed: Install the seatbelt pulleys of the passenger seats. If OÄM 42-324 is installed AND OÄM 42-334 is NOT installed: Refer to AmSafe Maintenance Documentation	Refer to Section 25-10.
(11)	Install the passenger seats.	Refer to Section 25-10.
(12)	Perform a cooling test of the RACC system.	

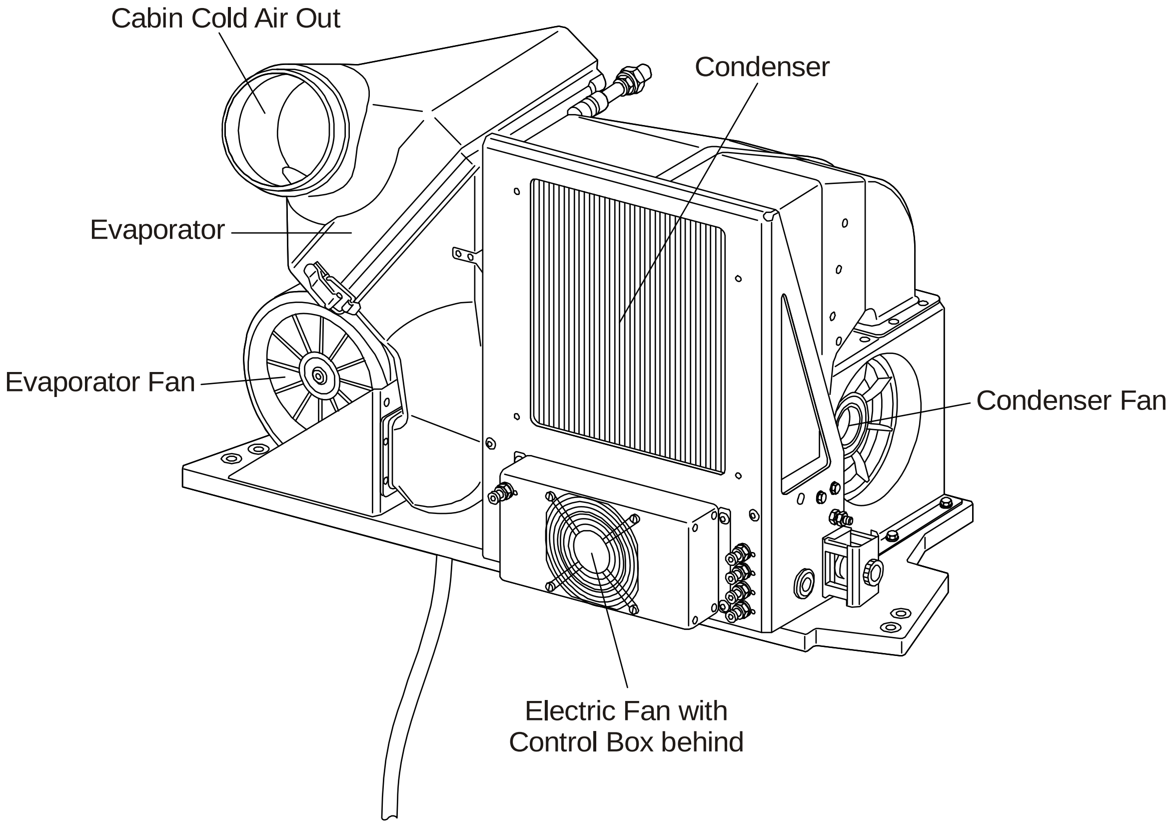

Figure 4: Central Unit - Front and LH Side (if OÄM 42-193/d or later is installed)

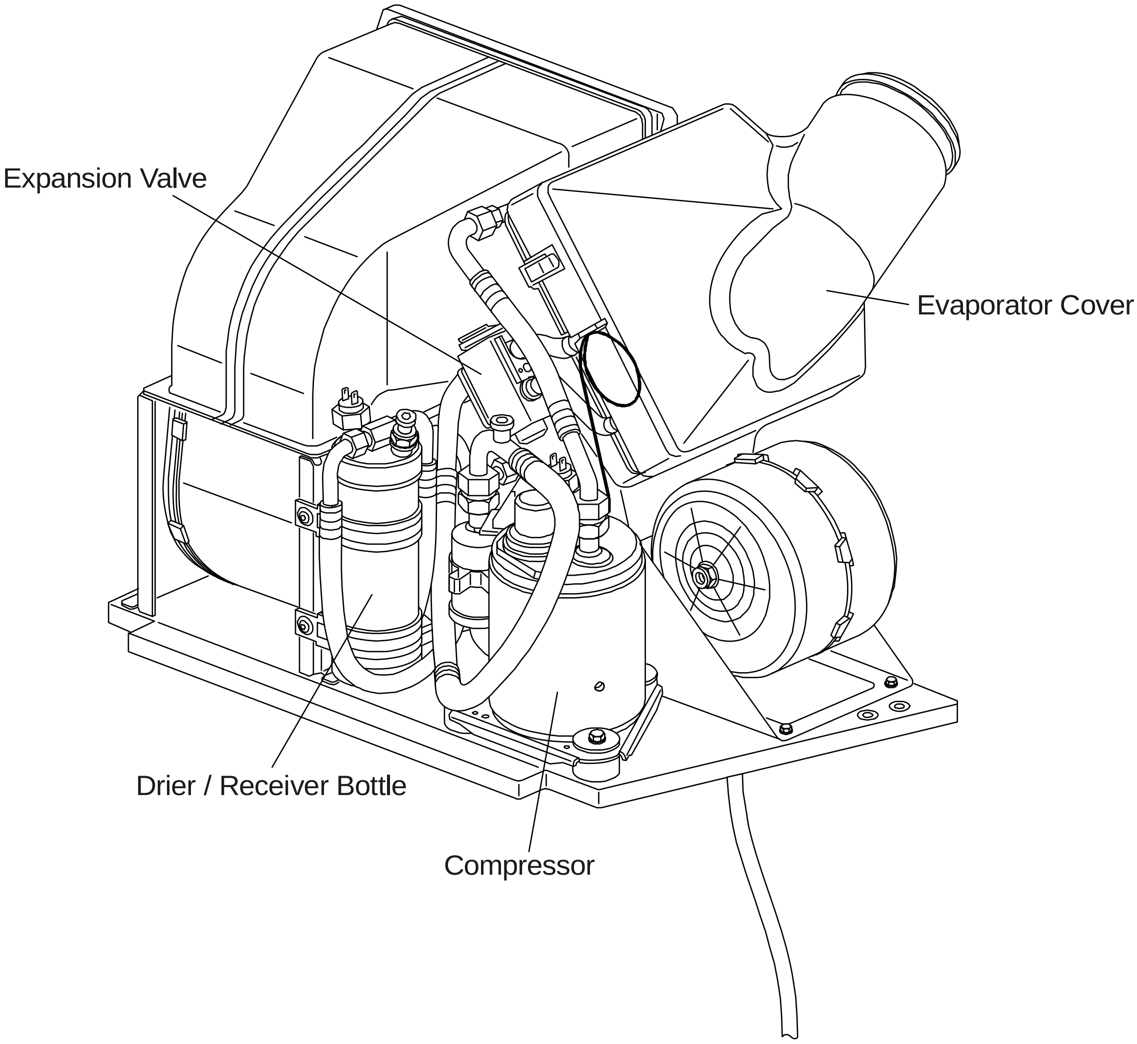

Figure 5: Central Unit Back and RH Side (if OÄM 42-193/d or later is installed)

2. Remove/Install the Control Panel

A. Remove the Control Panel

	Detail Steps/Work Items	Key Items/References
(1)	Remove the center console.	Refer to Section 25-10.
(2)	Unplug the electrical connectors of the control panel.	
(3)	Unclip the RACC control panel from the center console.	

B. Install the Control Panel

	Detail Steps/Work Items	Key Items/References
(1)	Move the RACC control panel in position on the center console.	
(2)	Push the center console into the center console until the clips hold the panel in place on the center console.	
(3)	Connect the electrical connectors to the control panel.	
(4)	Install the center console.	Refer to Section 25-10.
(5)	Perform a RACC-system test.	Refer to Paragraph 3.

3. RACC - System Test Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Perform an engine ground test.	Refer to Section 71-00.
(2)	Set the engine to 1000 to 1200 RPM.	The test procedure may be alternatively performed with power supplied by engine or GPU.
(3)	Set the AUX POWER switch to ON.	The Power Status LED on the RACC control panel must flash.
(4)	Push the ON/OFF button on the RACC control panel once to switch the RACC system ON.	The preset temperature display on the RACC control panel must illuminate.
(5)	Push the Preset Temperature DOWN button until the preset temperature shows ‘LO’ and switch the cabin fan speed to the highest stage (“3") .	
(6)	Verify that the cabin air temperature at outlet is significantly lower than the outside air temperature. Perform test at ambient temperature of 20 - 30°C and relative humidity of 20 - 90 %. The cabin air temperature at outlet must be 8 - 15°C less than the ambient temperature.	
(7)	Set the cabin air preset temperature to a convenient temperature level.	Use the preset temperature UP and DOWN buttons on the control panel.
(8)	Push the ON/OFF button on the RACC control panel for approximately 1 second to switch the RACC system to OFF.	
(9)	Set the AUX POWER switch to OFF.	

4. Remove/Install Parts of the Refrigerant Circuit

Note: The refrigerant vapor cooling system is a hermetically sealed and pressurized circuit and contains the refrigerant R134a.

WARNING: ALL MAINTENANCE AND REPLENISHMENT WHICH REQUIRES TO OPEN AND DEPRESSURIZE THE REFRIGERANT CIRCUIT MUST BE CARRIED OUT BY AUTHORIZED PERSONNEL ACCORDING TO NATIONAL AND INTERNATIONAL REGULATIONS FOR REFRIGERANT SYSTEMS.

Before you do any maintenance on parts of the refrigerant circuit you must remove the central unit from the airplane. Refer to Paragraph 1.

Make sure to obey the regulations for handling the refrigerant.

If the refrigerant circuit is open for more than 30 min and the filter /dryer assy is not sealed, Diamond Aircraft recommends to replace the filter/dryer assy by a new one.

A. Discharge/Charge the Refrigerant Circuit

(1) Equipment

One of the following automated discharge and charging stations or equivalent may be used:

Item	Quantity	Part Number
Silco CS 199.	1	Commercial.
Silco CS 195.	1	Commercial.
Silco CS 150.	1	Commercial.

(2) Discharge the Refrigerant Circuit

	Detail Steps/Work Items	Key Items/References
(1)	Remove the central unit from the airplane.	Refer to Paragraph 1.
(2)	Connect the RACC system to the discharge/charging station.	Follow the instructions of the discharge/charging station.
(3)	Discharge the refrigerant.	Follow the instructions of the discharge/charging station.
(4)	Print the protocol of the discharge/charging station and add it to the RACC system documentation.	Follow the instructions of the discharge/charging station.

(3) Charge the Refrigerant Circuit

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that all connectors of the refrigerant circuit are tight.	
(2)	Charge the refrigerant circuit with R134a (500 g ± 25 g if OÄM 42-193/d and subsequent or 450 g ± 25 g if OÄM42-193/c and earlier is installed) and add 15 ccm ± 5 ccm of oil (type PVE 68 cSt acc. to ISO 68). If refrigerant circuit and compressor was completely discharged add a total of 290 ccm of oil instead of the amount described above.	Follow the instructions of the discharge/charging station.
(3)	Perform a Leakage Test if not automatically performed by the discharge/charging station.	Refer to Paragraph 4.
(4)	Print the protocol of the discharge/charging station and add it to the RACC system documentation.	Follow the instructions of the discharge/charging station.
(5)	Disconnect the RACC system from the discharge/charging station.	Follow the instructions of the discharge/charging station.
(6)	Install the RACC central unit in the airplane.	Refer to Paragraph 1.
(7)	Perform a RACC System test.	Refer to Paragraph 3.

(4) Leakage Test of the Refrigerant Circuit

After every discharge/charge of the refrigerant system it must be checked for leakages.

Most of the charging stations run automatically a leakage check before charging the air condition system. If the applied service station was equipped with this function, but does not automatically perform a test, engage manually the check before charging the air condition system.

If leakage in the air condition system was detected or the air condition unit lost more than 150 g per year of refrigerant, then one of the below described checks must be performed:

	Detail Steps/Work Items	Key Items/References
(1)	Use a detection spray or soapy water at the suspicious areas and watch for bubbles and foam. If a leak is detected, repair the leakage. To order spare parts contact DAI.	
(2)	Use an electronic leak detector suitable to detect the R134a refrigerant with a minimum leakage detection sensitivity of 5 g per year. If a leak is detected, repair the leakage. To order spare parts contact DAI.	

B. Remove/Install the Compressor

(1) Remove the Compressor

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4A(2).
(2)	Unplug the electrical connectors from the compressor.	
(3)	Loosen the hose connections of the refrigerant circuit on the compressor.	Use caps to plug the hose connectors.
(4)	Remove the three screws which attach the compressor to the RACC mounting panel.	
(5)	Move the compressor clear of the central unit.	

(2) Install the Compressor

	Detail Steps/Work Items	Key Items/References
(1)	Position the compressor on the RACC mounting panel.	
(2)	Use the three screws to attach the compressor to the RACC mounting panel.	
(3)	Connect the refrigerant circuit hoses to the compressor.	Remove the caps from the hose connectors and replace O-rings of circuit-hoses.
(4)	Connect the electrical connectors to the compressor.	
(5)	Charge the refrigerant circuit.	Refer to Paragraph 4A(3).
(6)	Perform a leakage check.	Refer to Paragraph 4A(4).

C. Remove/Install the Filter/Dryer Assembly

(1) Remove the Filter/Dryer Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4A(2).
(2)	Remove the electrical connectors from the pressure sensor.	
(3)	Loosen the hose connections of the refrigerant circuit on the filler/drier assembly.	Use caps to plug the hose connectors.
(4)	Remove the two screws which attach the filler/drier assembly to the central unit.	
(5)	Move the filter/drier assembly clear of the central unit.	

(2) Install the Filter/Dryer Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Position the filter/drier assembly on the RACC mounting panel.	
(2)	Use the two screws to attach the filter/drier assembly to the central unit.	
(3)	Connect the refrigerant circuit hoses to the filter/drier assembly.	Remove the caps from the hose connectors and replace O-rings of circuit-hoses.
(4)	Connect the electrical connectors to the pressure sensor.	
(5)	Charge the refrigerant circuit.	Refer to Paragraph 4A(3).
(6)	Perform a leakage check.	Refer to Paragraph 4A(4).

D. Remove/Install Parts of the Refrigerant Circuit

(1) Remove the Expansion Valve

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4A(2).
(2)	Open latches of evaporator cover and remove cover.	
(3)	Remove evaporator from fixing cover.	
(4)	Loosen the hose connections of the refrigerant circuit to the expansion valve and remove associated evaporator fixing plate.	Note and mark the correct position of refrigerant hoses evaporator fixing plate on the expansion valve.
(5)	Remove two bolts from the expansion valve and the second evaporator fixing plate first and then remove the expansion valve from the evaporator.	Note and mark correct position of the expansion valve.
(6)	Move the expansion valve clear of the central unit.	

(2) Install the Expansion Valve

	Detail Steps/Work Items	Key Items/References
(1)	Position the expansion valve on the evaporator.	Use new O-rings on evaporator-hoses.
(2)	Install the associated expansion valve fixing plate with two bolts.	Check for correct position.
(3)	Connect the refrigerant circuit hoses and the second evaporator fixing plate to the expansion valve.	Use new O-rings on refrigerant-hoses and check for correct position.
(4)	Install the evaporator inside fixing cover.	
(5)	Install the evaporator cover and close the cover latches.	
(6)	Charge the refrigerant circuit.	Refer to Paragraph 4A(3).
(7)	Perform a leakage check.	Refer to Paragraph 4A(4).

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Section 21-60

Temperature Control

1. General

The DA 42 NG has separate heating supplies for the windscreen defrosting and the cabin heating systems. The left engine supplies warm air for the defrost system. The right engine supplies warm air for the cabin heating system. This Section tells you about the engine heater valves. Refer to Section 21-20 for data about the air distribution systems and Section 21-40 for data about the heating systems.

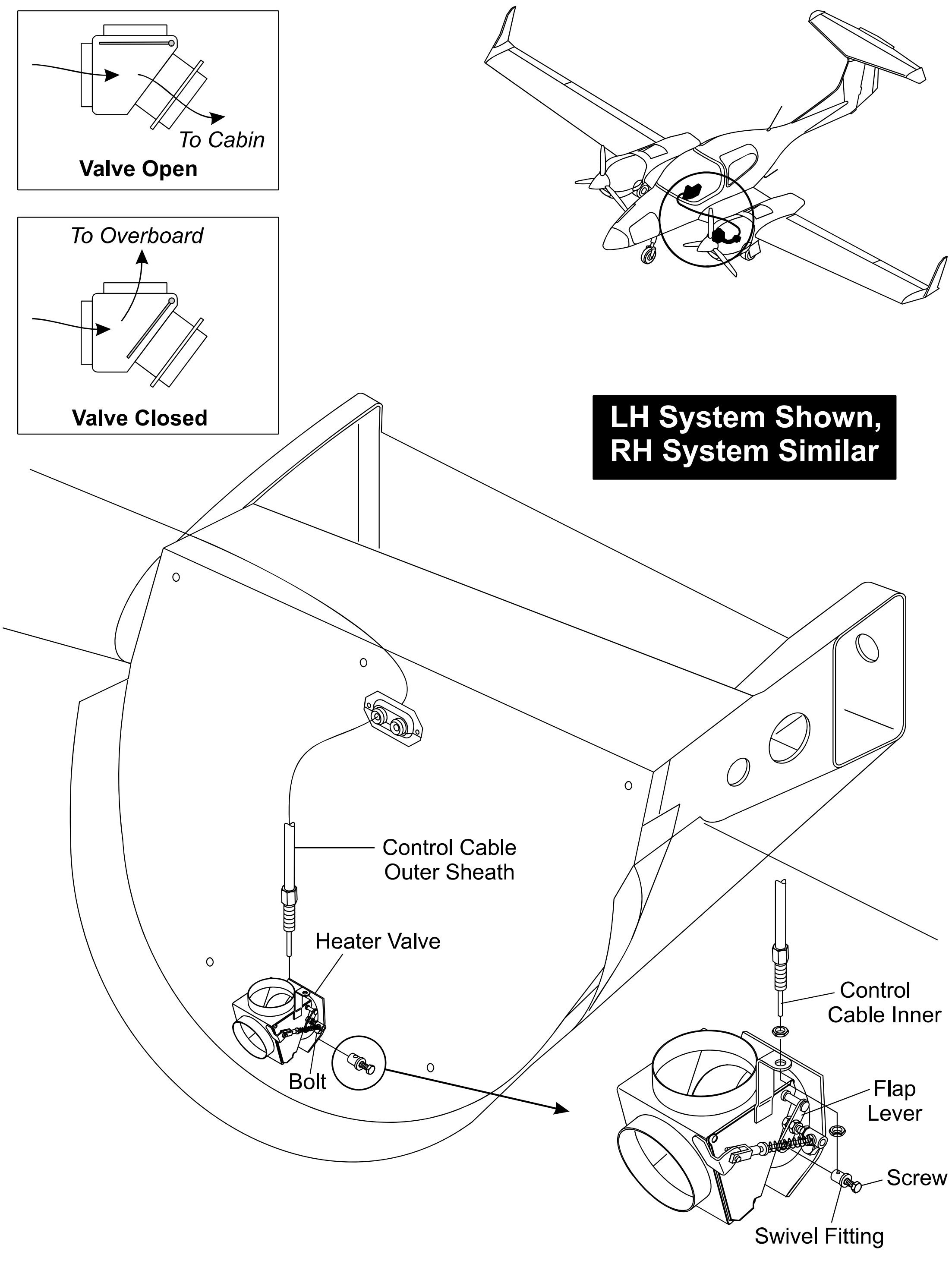

Figure 1: Heater Valve Assembly

2. Description and Operation

The heater valves are similar for the left and the right engine. Figure 1 shows the left engine heater valve installation. An insulated flexible hose connects the outlet of the heat exchanger to the inlet of the heater valve.

The heater valve has two outlets. One outlet supplies air to the airplane heating/defrost system. The other outlet directs the heated air into the engine compartment. An internal flap in the heater valve can be set to close the outlet to the airplane heating system and allow all the warm air to flow into the engine nacelle. Or it can be set to close the outlet to the engine nacelle and allow all the heated air to flow to the airplane heating/defrost system. Or it can be set to any position between these positions to regulate the flow of air to the airplane heating/defrost systems. The amount of warm air flowing into the related system controls the operating temperature of the system.

The position of the flap in the heater valve is controlled by a control lever in the cockpit center console. The DEFROST control lever controls the left engine heater valve and the CABIN control lever controls the right engine heater valve.

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Trouble-Shooting

1. General

This table tells you how to trouble-shoot the air conditioning temperature control. Refer to Section 21-20 for troubleshooting data for the air distribution system and see Section 21-40 for trouble-shooting data for the heating system. If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
There is no control of the temperature of the DEFROST or CABIN heating systems.	The related heater valve is inoperative.	Replace the heater valve.

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Maintenance Practices

1. General

The Maintenance Practices in this Section tell you how to replace an engine heater valve.

2. Remove/Install a Heater Valve

Use this procedure for both the left and right heater valve.

A. Remove a Heater Valve

Detail Steps/Work Items		Key Items/References
WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings from the engine that you will remove the heater valve.	Refer to Section 71-10.
(3)	Remove the flexible hose that attaches the heater valve to the heat exchanger: – Remove the worm-drive-clamp that holds the hose to the valve inlet. – Remove the hose from the valve inlet.	

Detail Steps/Work Items		Key Items/References
(4)	Disconnect the heater valve control cable from the heater valve flap lever: – Loosen the swivel fitting screw. – Remove the cable from the swivel fitting. – Remove and retain the swivel fitting from the flap lever.	
(5)	Remove the flexible hose that attaches the heater valve to the airplane system: – Remove the access panel from the under the rear of the engine nacelle. – Remove the worm drive clamp that holds the hose to the valve outlet. – Remove the hose from the valve outlet.	Refer to Section 52-40.
(6)	Remove the heater valve assembly: – Remove the 2 nuts, washers and bolts that attach the heater valve to the engine firewall. – Move the heater valve clear of the engine nacelle.	

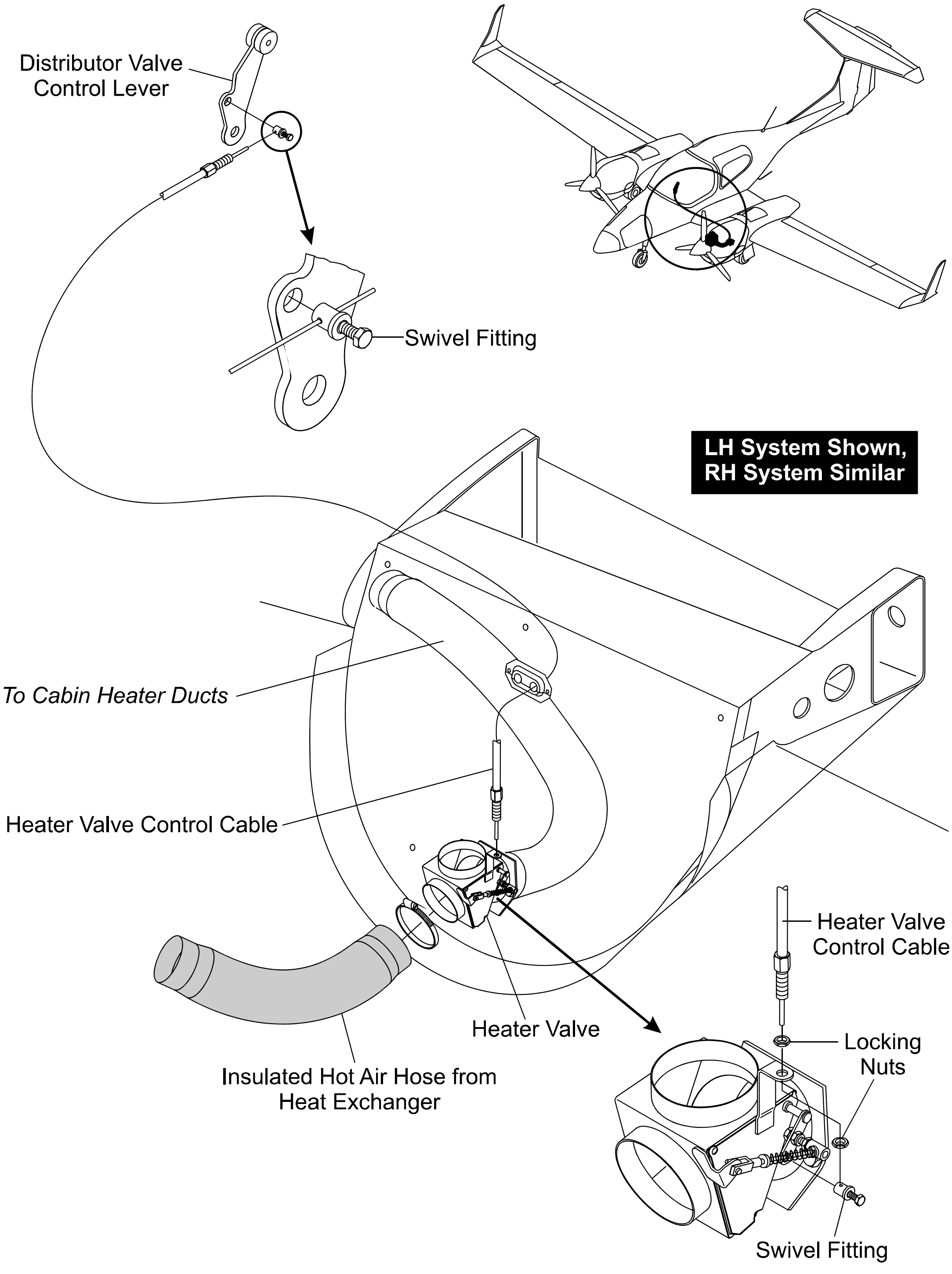

Figure 2: Heater Valve Installation

B. Install a Heater Valve Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Move the heater valve assembly into position at the related engine nacelle.	
(2)	Install the heater valve assembly: – Hold the heater valve assembly in position. – Install the 2 bolts, washers and nuts that attach the heater valve assembly to the firewall. – Tighten the bolts.	
(3)	Connect the flexible hose that attaches the heater valve assembly to the airplane system: – Move the worm drive clamp into position on the flexible hose. – Move the flexible hose into position on the heater valve assembly. – Tighten the worm drive clamp.	
(4)	Connect the heater valve control cable to the heater valve flap lever: – Move the swivel fitting into position on the flap lever. – Move the cable into position through the swivel fitting. – Move the related heater valve control lever to the OFF position and then move it 0.3 mm (0.1 in) towards the ON position. – Make sure that the heater valve flap is in the closed/bypass position. – Tighten the screw of the swivel fitting.	The flap must completely seal the heater valve outlet to the airplane system.
(5)	Test and if necessary adjust the heater valve control cable.	Refer to Section 21-20 Paragraph 3.

	Detail Steps/Work Items	Key Items/References
(6)	Install the flexible hose that connects the heater valve assembly to the heat exchanger: – Move the worm drive clamp into position on the flexible hose. – Connect the flexible hose to the heater valve assembly inlet. – Tighten the worm drive clamp.	
(7)	Install the engine cowlings that you removed at Paragraph 2A, step 2.	Refer to Section 71-10.
(8)	Do an engine ground test and do a functional test of the related cabin heating/defrost system.	Refer to the DA 42 NG Airplane Flight Manual.

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CHAPTER 22

AUTO FLIGHT

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Autopilot

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CHAPTER 22
AUTO FLIGHT

1. General

This Chapter tells you about the auto flight (autopilot) system that is installed in the DA 42 NG airplane. This Chapter tells you about the components of the GFC 700 system installed in the airplane. This Chapter does not tell you about the workshop maintenance of the equipment. For more data about the equipment you must refer to the equipment manufacturer's manuals.

Refer to Section 22-10 for more data about the autopilot system installed the DA 42 NG airplane.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

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Section 22-10
Autopilot

1. General

This Section tells you about the GFC 700 autopilot system that is installed in the DA 42 NG.

2. Description

The GFC 700 autopilot system is a digital flight control system that provides roll, pitch, pitch trim, and yaw steering with altitude control. The system has the following components (refer to Figure 1):

- Flight director (integral part of the Garmin G1000 system).
- GSA 81 roll servo.
- GSA 81 pitch servo.
- GSA 81 pitch trim servo.
- GSA 80 yaw servo.

The GFC 700 autopilot system is controlled via the MFD of the Garmin G1000 integrated cockpit system (ICS).

The GFC 700 roll axis features includes wing leveler, heading select, and VOR/LOC intercept and tracking. The GFC 700 is also coupled to the ICS for navigation information. Attitude information is derived from the AHRS.

Pitch axis features include vertical speed, flight level change, glideslope and altitude hold along with the optional altitude preselect. Pitch information is derived from AHRS and GDC. Internal monitors keep constant track of the GFC 700's status and provide for automatic shutdown of the autopilot or trim system in the event of a malfunction.

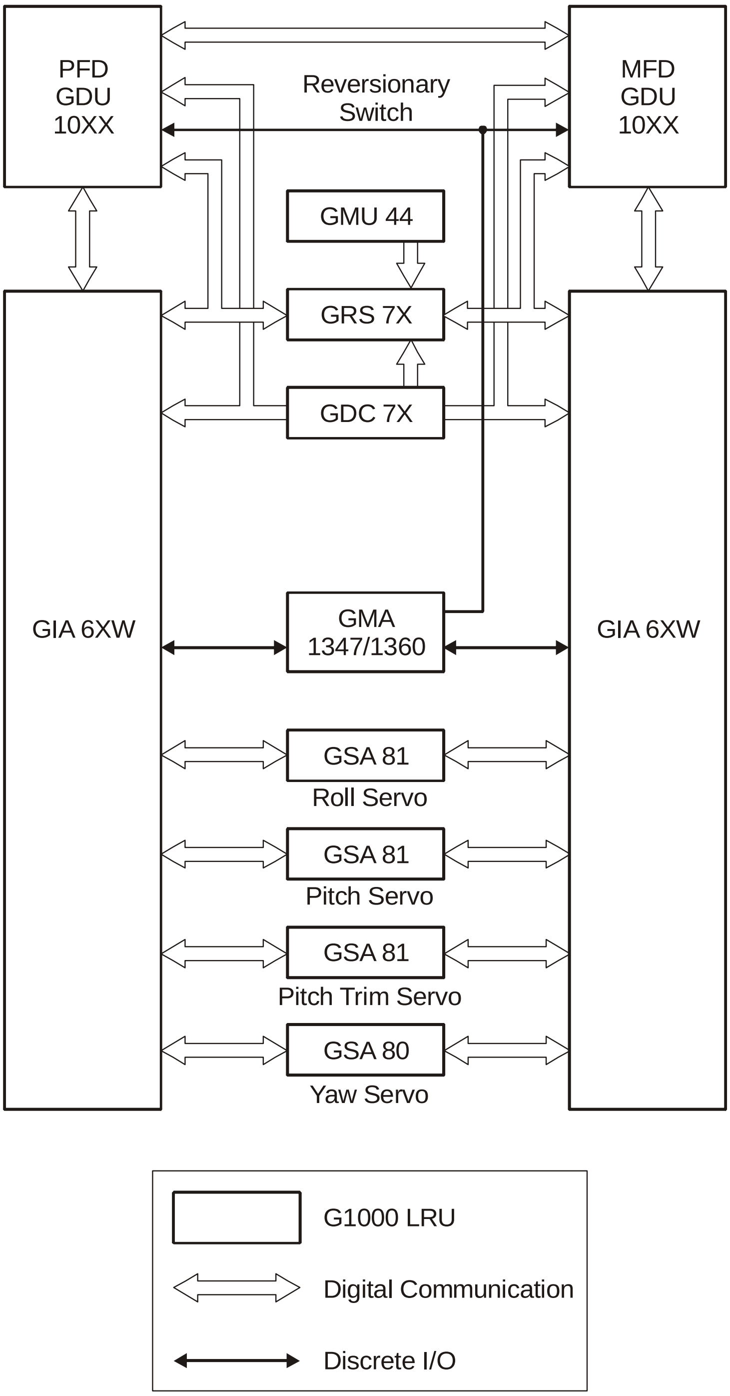

Figure 1: GFC 700 Autopilot Schematic Diagram

A. GFC 700 Flight Control

For details about operation and the indications concerning GFC 700 functions refer to Garmin DA 42 NG Pilot's Guide, latest revision.

B. GSA 81 Roll Servo

The roll servo is located behind the rear main bulkhead on the right side. It is mounted on a mounting plate which is made from sheet aluminum. Two aluminum clamps connect a bridle cable to the aileron push-rod.

C. GSA 81 Pitch Servo

The pitch servo is located aft of the baggage compartment frame. It is mounted on a mounting plate which is made from sheet aluminum. Two aluminum clamps connect a bridle cable to the elevator push-rod.

D. GSA 81 Pitch Trim Servo

The pitch trim servo is located under the co-pilot's seat. It is mounted on a mounting plate which is made from sheet aluminum and mounting bracket which is made from GFRP. Servo movement is transmitted to the trim wheel through a chain gear on the servo, a cardan shaft, and a chain gear next to the trim wheel on the right side.

E. GSA 80 Yaw Servo

The yaw servo is located under the passenger seats. It is mounted on a mounting rack made from stainless steel and a mounting bracket made from CFRP. A braided cable is connected to the two turnbuckles of the rudder control cables.

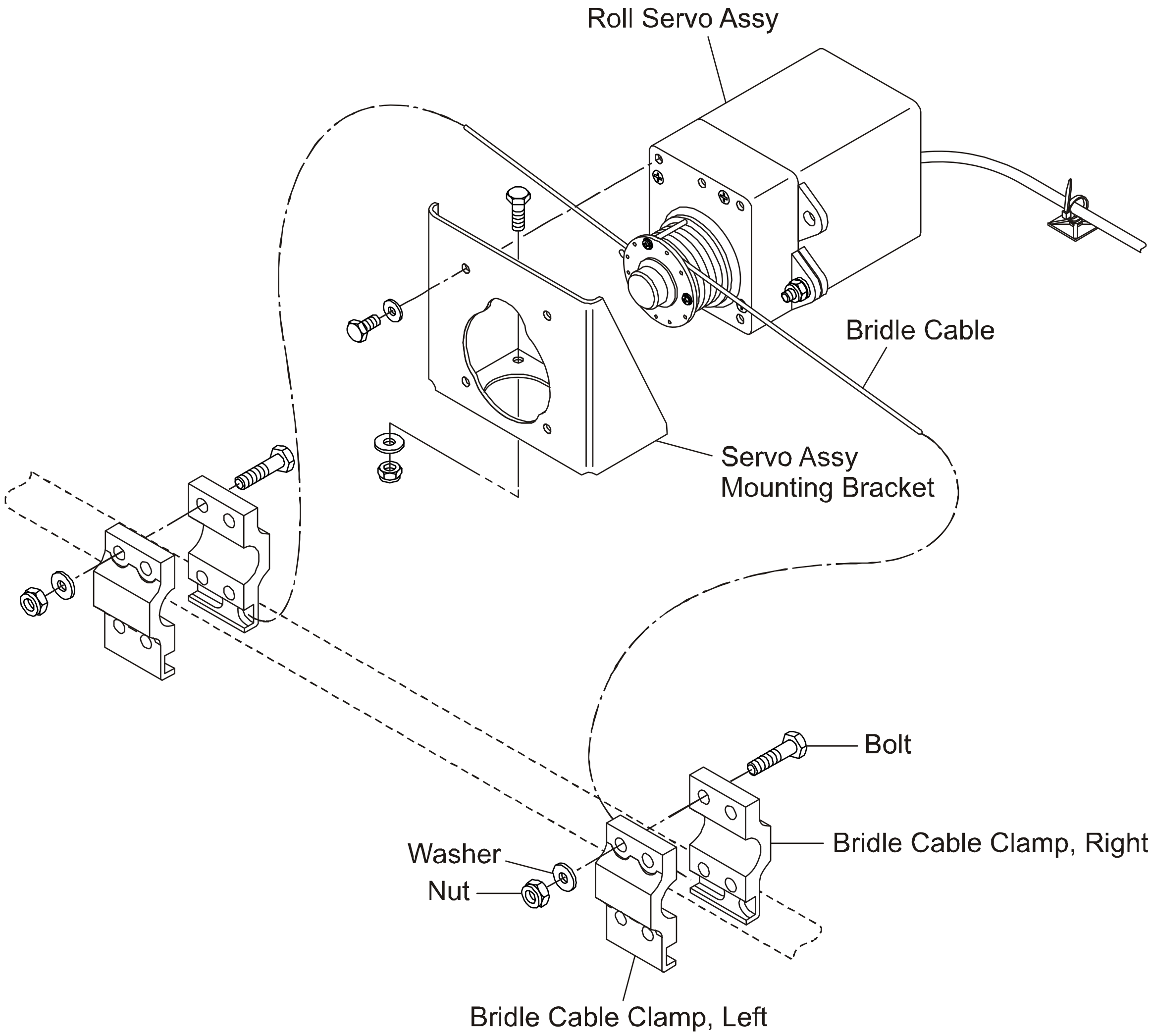

Figure 2: Roll Servo Installation

Maintenance Practices

1. General

These Maintenance Practices tell you how to install the components of the autopilot system. They also tell you how to test and adjust the autopilot system.

2. Remove/Install the Roll Servo

A. Remove the Roll Servo

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger seats.	Refer to Section 25-10.
(2)	Disconnect the connector from the servo.	
(3)	Remove the mounting screws (2 or 4) which attach the servo to the clutch.	Hold the servo.
(4)	Remove the servo clear of the airplane.	

B. Install the Roll Servo

	Detail Steps/Work Items	Key Items/References
(1)	Put the servo in place on the clutch.	
(2)	Install the mounting screws (2 or 4) which attach the servo to the mounting plate and clutch.	Refer to Figure 2.
(3)	Connect the connector to the servo.	
(4)	Do a test of the autopilot system: – Set ELECT. MASTER switch to ON. – Set AV. MASTER switch to ON. – Observe self-test of the flight control computer. – Set AV. MASTER switch to OFF. – Set ELECT. MASTER switch to OFF.	If no error message appears, then the system is operative.
(5)	Install the passenger seats.	Refer to Section 25-10.

3. Remove/Install the Roll Servo Clutch

A. Equipment

Item	Quantity	Part Number
Cable tension gauge.	1	Commercial.

B. Remove the Roll Servo Clutch

	Detail Steps/Work Items	Key Items/References
(1)	Remove the roll servo.	Refer to Paragraph 2.
(2)	Release the clamps which connect the bridle cable to the aileron push-rod.	
(3)	Remove the cable guard.	
(4)	Remove the 4 screws which attach the clutch to the mounting plate.	Hold the clutch.
(5)	Remove the clutch clear of the airplane.	

C. Install the Roll Servo Clutch

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilot's seat or the co-pilot's seat.	Refer to Section 25-10. To give access for the rigging pin.
(2)	Put the clutch in place on the mounting plate.	
(3)	Install the 4 screws which attach the clutch to the mounting plate.	
(4)	Center the aileron control system with a rigging pin at one control stick.	Refer to Section 27-10.
(5)	Center the capstan.	The recess for the ball in the middle of the bridle cable must be in the uppermost position.
(6)	Install bridle cable to capstan.	The ball in the middle of the bridle cable must engage in the recess on the capstan. Wrap bridle cable around capstan 1.5 turns to each side.

	Detail Steps/Work Items	Key Items/References
(7)	Connect the ends of the bridle cable to the aileron push-rod with the clamps.	Tighten clamps lightly to allow adjustment (see next step).
(8)	Using a small plastic hammer, move the clamps along the push-rod to adjust the bridle cable tension.	Adjust tension to 156 ± 9 N (35 ± 2 lbf). Measure cable tension with cable tension gauge.
(9)	Tighten the clamps.	
(10)	Install the cable guard.	
(11)	Remove the rigging pin from the control stick.	
(12)	Install the front seat which was removed.	Refer to Section 25-10.
(13)	Install the roll servo.	Refer to Paragraph 2.

4. Remove/Install the Pitch Servo

A. Remove the Pitch Servo

	Detail Steps/Work Items	Key Items/References
(1)	Remove the trim/cover from the front face of the baggage compartment and remove the lower access panel from the baggage compartment insert.	
(2)	Disconnect the connector from the servo.	
(3)	Remove the mounting screws (2 or 4) which attach the servo to the clutch.	Hold the servo.
(4)	Remove the servo clear of the airplane.	

B. Install the Pitch Servo

	Detail Steps/Work Items	Key Items/References
(1)	Put the servo in place on the clutch.	
(2)	Install the mounting screws (2 or 4) which attach the servo to the clutch.	
(3)	Connect the connector to the servo.	
(4)	Do a test of the autopilot system: – Set ELECT. MASTER switch to ON. – Set AV. MASTER switch to ON. – Observe self-test of the flight control computer. – Set AV. MASTER switch to OFF. – Set ELECT. MASTER to OFF.	If no error message appears, then the system is operative.
(5)	Install the baggage compartment lower access panel and install the trim/cover to the front face of the baggage compartment.	

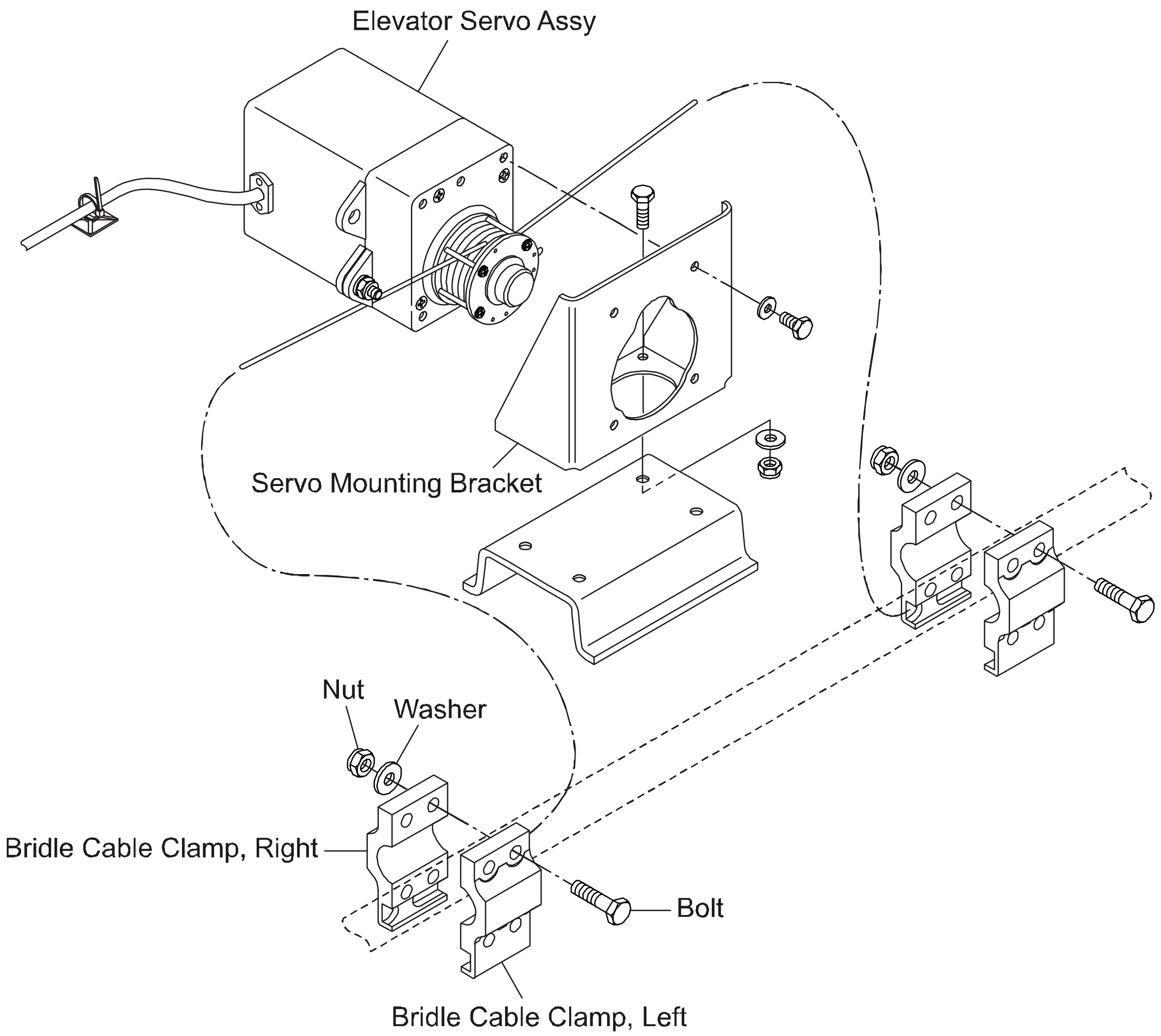

Figure 3: Pitch Servo Installation

5. Remove/Install the Pitch Servo Clutch

A. Equipment

Item	Quantity	Part Number
Cable tension gauge.	1	Commercial.

B. Remove the Pitch Servo Clutch

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pitch servo.	Refer to Paragraph 4.
(2)	Release the clamps which connect the bridle cable to the elevator push-rod.	
(3)	Remove the cable guard.	
(4)	Remove the 4 screws which attach the clutch to the mounting plate.	Hold the clutch.
(5)	Remove the clutch clear of the airplane.	

C. Install the Pitch Servo Clutch

	Detail Steps/Work Items	Key Items/References
(1)	Put the clutch in place on the mounting plate.	
(2)	Install the 4 screws which attach the clutch to the mounting plate.	
(3)	Center the elevator control system with a rigging pin at one control stick.	Refer to Section 27-30.
(4)	Center the capstan.	The recess for the ball in the middle of the bridle cable must be in the under most position.
(5)	Install bridle cable to capstan.	The ball in the middle of the bridle cable must engage in the recess on the capstan. Wrap bridle cable around capstan 1.5 turns to each side.
(6)	Connect the ends of the bridle cable to the elevator push-rod with the clamps.	Tighten clamps lightly to allow adjustment (see next step).

	Detail Steps/Work Items	Key Items/References
(7)	Using a small plastic hammer, move the clamps along the push-rod to adjust the bridle cable tension.	Adjust tension to 156 ± 9 N (35 ± 2 lbf). Measure cable tension with cable tension gauge.
(8)	Tighten the clamps.	
(9)	Install the cable guard.	
(10)	Remove the rigging pin from the control stick.	
(11)	Install the front seat which was removed.	Refer to Section 25-10.
(12)	Install the pitch servo.	Refer to Paragraph 4.

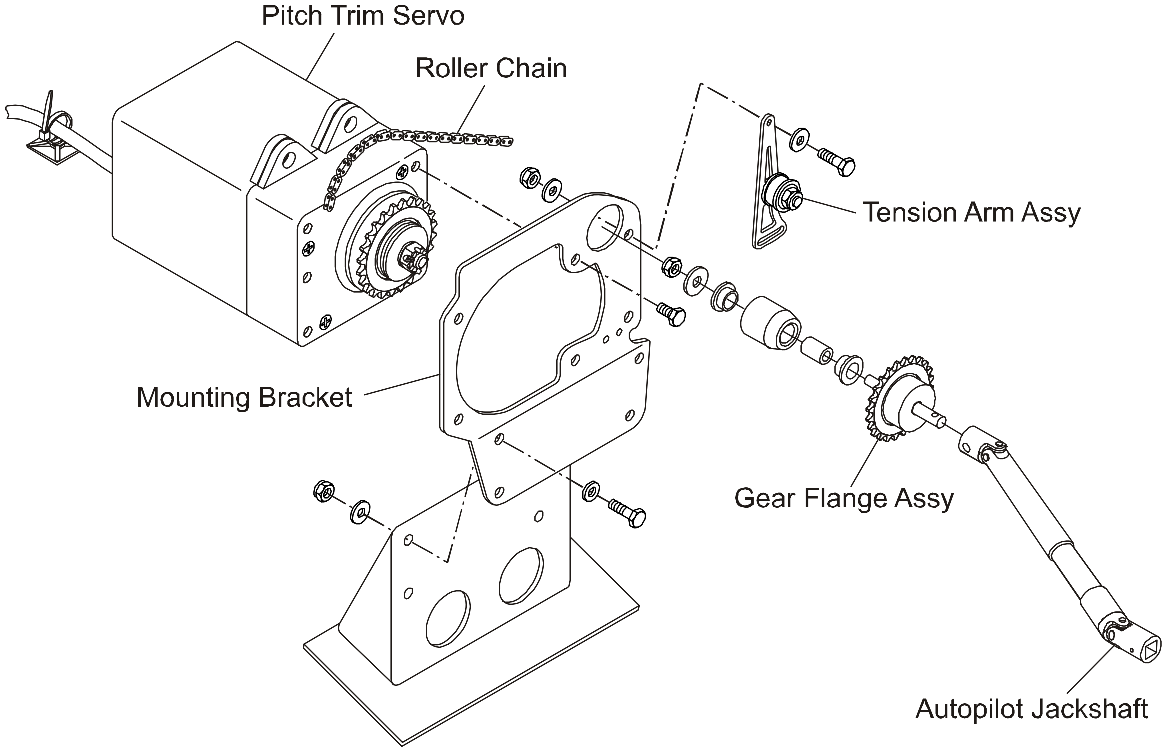

Figure 4: Pitch Trim Servo Installation

6. Remove/Install the Pitch Trim Servo

A. Remove the Pitch Trim Servo

	Detail Steps/Work Items	Key Items/References
(1)	Remove the co-pilot's seat.	Refer to Section 25-10.
(2)	Disconnect the connector from the servo.	
(3)	Remove the mounting screws (2 or 4) which attach the servo to the clutch.	Hold the servo.
(4)	Remove the servo clear of the airplane.	

B. Install the Pitch Trim Servo

	Detail Steps/Work Items	Key Items/References
(1)	Put the servo in place on the clutch.	
(2)	Install the mounting screws (2 or 4) which attach the servo to the clutch.	
(3)	Connect the connector to the servo.	
(4)	Do a test of the autopilot system: – Set ELECT. MASTER switch to ON. – Set AV. MASTER switch to ON. – Observe self-test of the flight control computer. – Set AV. MASTER switch to OFF. – Set ELECT. MASTER switch to OFF.	If no error message appears, then the system is operative.
(5)	Install the co-pilot's seat.	Refer to Section 25-10.

7. Remove/Install the Pitch Trim Servo Clutch

A. Remove the Pitch Trim Servo Clutch

	Detail Steps/Work Items	Key Items/References
CAUTION:	DO NOT APPLY STRONG FORCES TO THE CARDAN SHAFT. THE UPPER CARDAN JOINT CONNECTS TO A PART WHICH IS WEAK BY DESIGN TO GIVE OCCUPANT PROTECTION IN AN EMERGENCY LANDING.	
(1)	Remove the pitch trim servo.	Refer to Paragraph 6.
(2)	Remove the screws which hold the cap to the capstan.	
(3)	Remove the cap from the capstan.	
(4)	Release chain tension with chain adjuster.	On the chain gear next to the servo.
(5)	Remove the chain from the chain gear.	
(6)	Remove the 4 screws which attach the clutch and the chain adjuster to the mounting plate.	Hold the clutch and the chain adjuster.

B. Install the Pitch Trim Servo Clutch

	Detail Steps/Work Items	Key Items/References
(1)	Put the clutch and the chain adjuster in place on the mounting plate.	
(2)	Install the 4 screws which attach the clutch and the chain adjuster to the mounting plate.	
(3)	Install the chain to the chain gear.	
(4)	Put the cap in place on the capstan.	
(5)	Install the screws which hold the cap to the capstan.	
(6)	Install the pitch trim servo.	Refer to Paragraph 6.

8. Remove/Install the Yaw Servo and the Yaw Servo Clutch

A. Equipment

Item	Quantity	Part Number
Cable tension gauge.	1	Commercial.

B. Remove the Yaw Servo and the Yaw Servo Clutch

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger seats.	Refer to Section 25-10.
(2)	Disconnect the connector from the servo.	
(3)	Remove 4 screws which attach the rudder cable support.	
(4)	Remove 7 screws which attach the yaw servo mounting cradle to the airplane.	Hold the assembly.
(5)	Remove the bridle cable.	
(6)	Remove the yaw servo, the yaw servo clutch and the mounting cradle from the airplane.	
(7)	Remove the 4 screws witch attach the servo to the clutch and the mounting cradle.	Hold the clutch, servo and cradle.

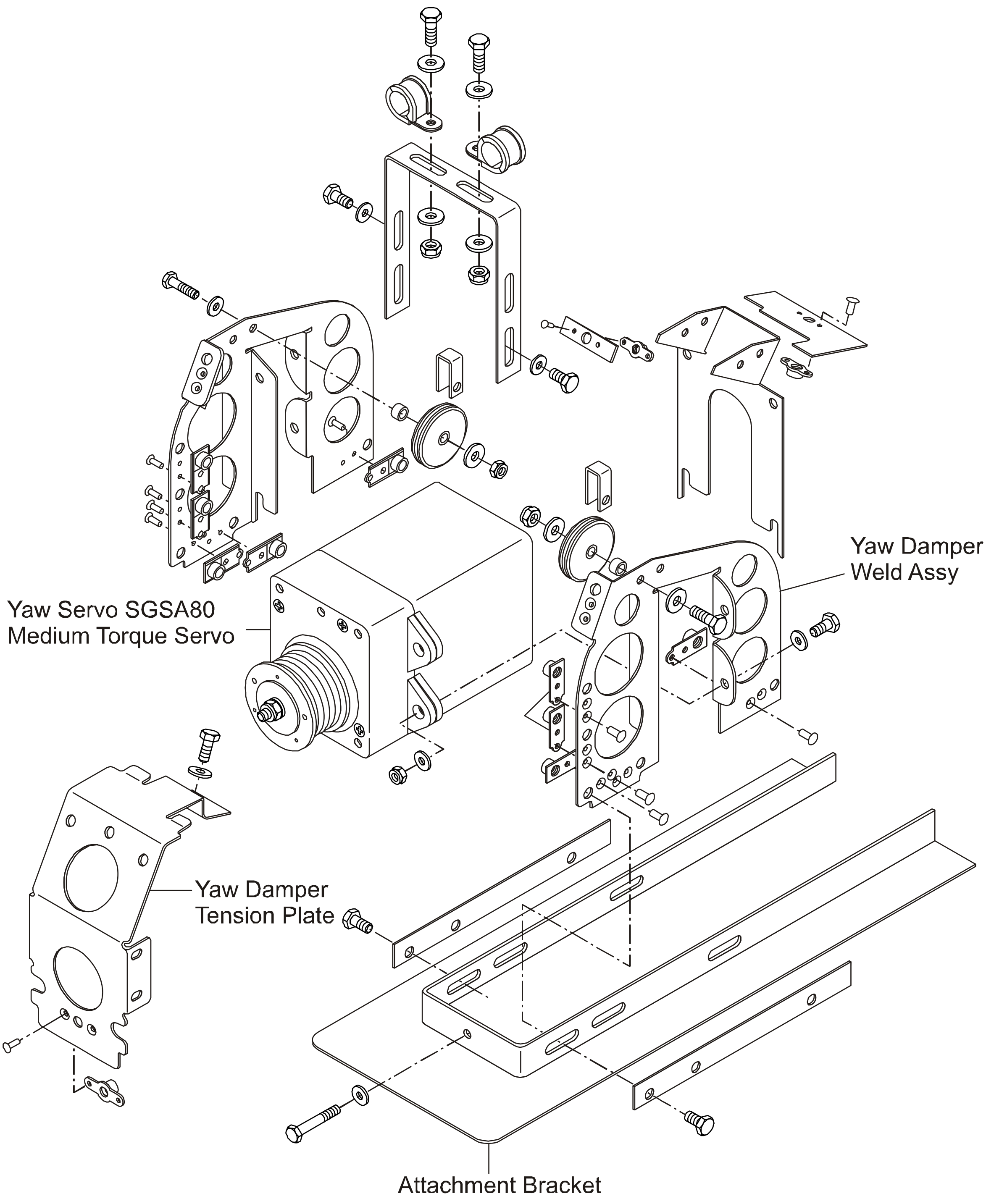

Figure 5: Yaw Servo Installation

C. Install the Yaw Servo, the Yaw Servo Clutch and Bridle Cable

	Detail Steps/Work Items	Key Items/References
(1)	Adjust/check the servo clutch torques.	Refer to Paragraph 11.
(2)	Install the GM 85/86 servo mount and GSA 80 servo into the yaw damper frame assy with 8 screws.	
(3)	Install the yaw damper cable onto the capstan.	Refer to Figure 6.
(4)	Temporarily fix the cable on the servo frame with tape.	
(5)	Install the cable guard kit (GSM 85 only) or the capstan standoff kit (GSM 85 and GSM 86) onto the servo mount and secure with Loctite 243 or equivalent.	
(6)	Install the yaw damper tension plate on the yaw damper frame.	
(7)	Put the rudder cable support in place (if installed).	
(8)	Pre fit the yaw damper frame assy into the airplane. Install but do not tighten the mounting screws to allow axial movement. Install the tension screw located on the front of the yaw damper. Check before crimping: – Rudder in neutral position. – Capstan ball cut-out in center up position. Crimp thimble eye on the cables according to AC 43.13-1B if necessary.	
(9)	Adjust the bridle cable tension.	Refer to Paragraph 10.
(10)	Connect the electrical connection of the yaw servo. Fix the harness with cable ties.	
(11)	Install all clamps and fix the hydraulic lines to the yaw damper frame. Fix the TKS lines with cable ties (if installed).	

	Detail Steps/Work Items	Key Items/References
(12)	Check all flight controls in working area for minium 3 mm (0.12 in) clearance.	
(13)	Check if rudder is in neutral position and the capstan ball cut-out is in center up position.	
(14)	Do an inspection of the adjusted controls. If necessary for the Airworthiness Authority do a second inspection of the controls.	
(15)	Install the passenger seats.	Refer to Section 25-10.

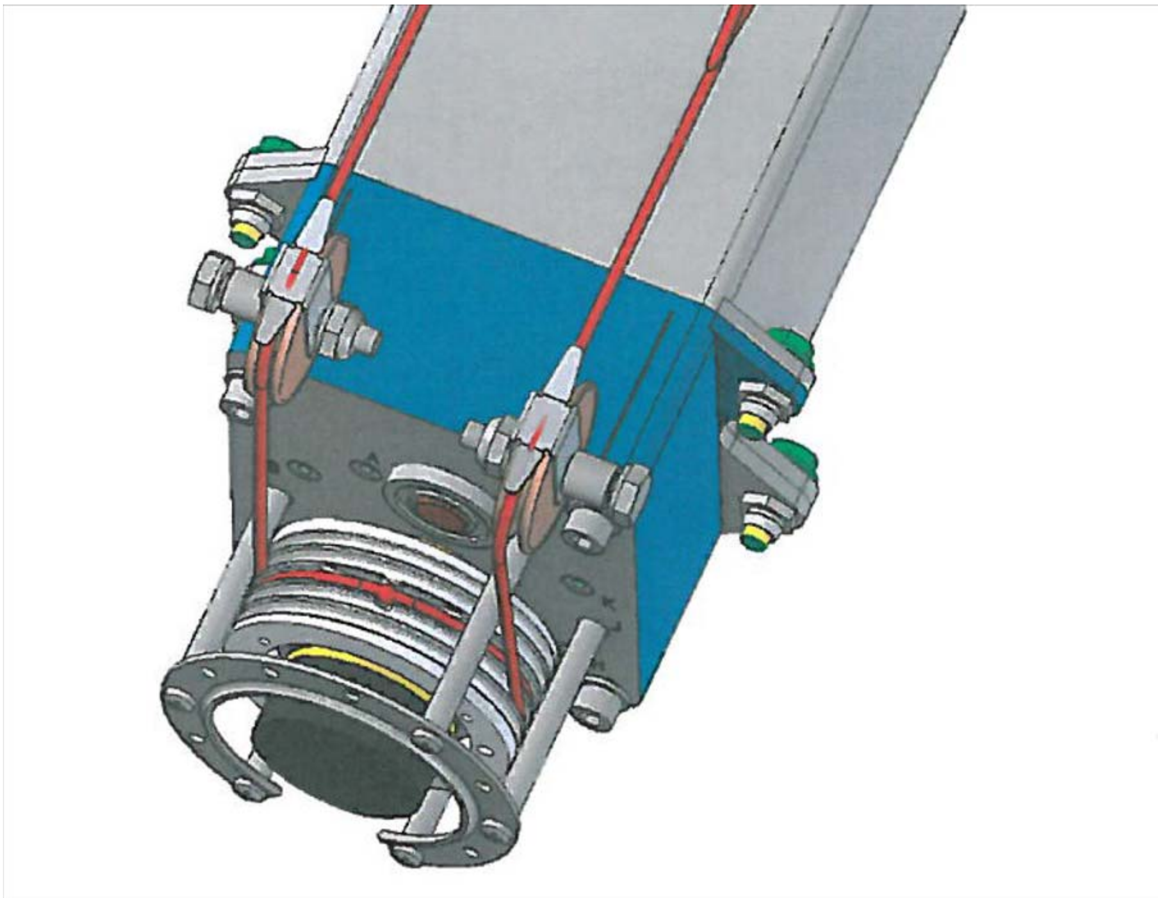

Figure 6: Yaw Damper Cable Installation

9. Adjust the Bridle Cable Tension of the Roll and Pitch Servos

A. Equipment

Item	Quantity	Part Number
Cable tension gauge.	1	Commercial.

B. Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Loosen the bolts in the clamps which connect the bridle cable to the push-rod.	Do not remove the bolts. Loosen just enough so that the next step can be done.
(2)	Using a small plastic hammer, move the clamps along the push-rod to adjust the bridle cable tension.	Adjust tension to 156 ± 9 N (35 ± 2 lbf.) for the pitch and roll servos. Measure cable tension with cable tension gauge.
(3)	Tighten the bolts in the clamps which connect the bridle cable to the push-rod.	

10. Adjust the Bridle Cable Tension of the Yaw Servo

A. Equipment

Item	Quantity	Part Number
Cable tension gauge.	1	Commercial.

B. Adjustment Procedure

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(1)</td><td>Check tension of rudder cables.</td><td>Refer to Section 27-20.</td></tr>
<tr><td>(2)</td><td>Connect the yaw damper thimble eye to the rudder cable turnbuckle with the carabiner.

Secure screwed connection on carabiner using Loctite 243 or equivalent.

Remove the cable fixing tape.</td><td></td></tr>
<tr><td colspan="3">CAUTION: DO NOT USE THE YAW SERVO ADJUSTMENT SCREW TO ADJUST CABLE TENSION. MOVE THE SERVO UNIT WITH GENTLE STROKES AND SECURE POSITION VIA THE ADJUSTMENT SCREW INSTEAD.

CAUTION: DO NOT BEND THE FRAME ASSY DURING ADJUSTMENT.</td></tr>
<tr><td>(3)</td><td>Check and adjust the yaw damper cable tension:

– Pull the yaw damper cable centrally between the pulley and the cable eye with the spring scale with a force of 3 kg (6.6 lbf) and adjust cable tension to obtain a deflection of 5 mm to 10 mm (0.2 in to 0.39 in)</td><td></td></tr>
<tr><td>(4)</td><td>Tighten the 6 screws mounting the yaw damper frame to the airplane.</td><td></td></tr>
</table>

	Detail Steps/Work Items	Key Items/References
(5)	Fix carabiners and bridle cable eye-ends to thimble eyes with cable ties.	
(6)	Do a test of the autopilot system: – Set ELECT. MASTER switch to ON. – Set AV. MASTER switch to ON. – Observe self-test of the flight control computer. – Set AV. MASTER switch to OFF. – Set ELECT. MASTER switch to OFF.	If no error message appears, then the system is operative.

11. Adjust/Check the Servo Clutch Torques

A. Equipment

Item	Quantity	Part Number
Garmin slip clutch adjustment fixture.	1	T10-00110-01.

B. Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove the clutch from the airplane.	Refer to this Section.
(2)	Clean the servo output gears.	
(3)	Install the clutch assembly on the slip clutch test stand.	Refer to the equipment manufacturers' documentation.

	Detail Steps/Work Items	Key Items/References
(4)	If OÄM 42-210 (GSM 86 servo mounts) is not installed: Measure clockwise (CW) and counter-clockwise (CCW) clutch torque, adjust if necessary. If OÄM 42-210 (GSM 86 servo mounts) is installed: Measure clockwise (CW) and counter-clockwise (CCW) clutch torque, replace if necessary.	Refer to the equipment manufacturers' documentation. The correct clutch torques are: Roll servo 5.08 ± 0.68 Nm (45 ± 6 lbf.in.) Pitch servo 6.21 ± 0.79 Nm (55 ± 7 lbf.in.) Pitch trim servo 5.08 ± 0.68 Nm (45 ± 6 lbf.in.) Yaw servo 9.04 ± 1.13 Nm (80 ± 10 lbf.in.) Refer to the equipment manufacturers' documentation. The correct clutch torques are: Roll servo 5.08 ± 0.68 Nm (45 ± 6 lbf.in.) Pitch servo 6.89 ± 1.01 Nm (61 ± 9 lbf.in.) Pitch trim servo 5.08 ± 0.68 Nm (45 ± 6 lbf.in.) Yaw servo 10.17 ± 1.47 Nm (90 ± 13 lbf.in.)
(5)	Remove the clutch assembly from the slip clutch test stand.	
(6)	Apply grease to the servo output gears.	
(7)	Install the clutch to the airplane.	Refer to this Section.

12. Mechanical Check of the Autopilot System (if OÄM 42-210 (GSM 86 Servo Mounts) is not installed)

Do this check at the intervals given in Section 05-10.

	Detail Steps/Work Items	Key Items/References
(1)	Check bridle cable tension for the roll servo, adjust if necessary.	Refer to this Section.
(2)	Check bridle cable tension for the pitch servo, adjust if necessary.	Refer to this Section.
(3)	Check the clutch torque settings for the roll servo, adjust if necessary.	Refer to this Section.
(4)	Check the clutch torque settings for the pitch servo, adjust if necessary.	Refer to this Section.
(5)	Check the clutch torque settings for the pitch trim servo, adjust if necessary.	Refer to this Section.
(6)	Check the clutch torque settings for the yaw servo, adjust if necessary.	Refer to this Section.
(7)	Check the bridle cable tension for the yaw servo, adjust if necessary.	Refer to this Section.

13. Mechanical Check of the Autopilot System (if OÄM 42-210 (GSM 86 Servo Mounts) is installed)

Do this check at the intervals given in Section 05-10.

	Detail Steps/Work Items	Key Items/References
(1)	Check bridle cable tension for the roll servo, adjust if necessary.	Refer to this Section.
(2)	Check bridle cable tension for the pitch servo, adjust if necessary.	Refer to this Section.
(3)	Check the bridle cable tension for the yaw servo, adjust if necessary.	Refer to this Section.
(4)	Perform a slip clutch override procedure.	Refer to this Section.

14. Slip Clutch Override Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Lift the airplane on jacks.	Refer to Section 07-10.
(2)	With the autopilot disengaged, check freedom of control movement in all control axes, including pitch trim.	
(3)	Power up the Garmin G1000 in Configuration Mode.	Refer to G1000 System Maintenance Manual, latest revision.
(4)	Navigate to the second of the GFC pages.	
(5)	Engage the pitch servo: – Select the ENG CLCH soft-key. – Set the DRIVE SERVO speed to zero. – Select the DRV SRVO soft-key.	
(6)	Manually override the servo actuator slip clutch by moving the control stick forward and back through its range of motion.	The control should move with some resistance through its range of motion.
(7)	Verify the servo motor does not turn by viewing the SPEED in the SERVO DATA area of the screen.	The motor of the servo actuator should remain stationary.
(8)	Disengage the pitch servo: – Select the STP SRVO soft-key. – Select the DIS CLCH soft-key.	Verify freedom of movement of the pitch axis.
(9)	Repeat steps 5 to 8 for each axis including pitch trim.	

CHAPTER 23

COMMUNICATIONS

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CHAPTER 23
COMMUNICATIONS

1. General

This Chapter tells you about the communications system in the DA 42 NG airplane. It tells you about the intercom system which lets the pilots and passengers talk to each other. It also tells you about the radio system which lets the pilots talk to the ground and other airplane.

This Chapter does not tell you about the communications equipment. Refer to the equipment manufacturers’ manual for data about the equipment. Refer to Chapter 92 for the wiring diagrams.

2. Description

The DA 42 NG communication system has these components:

– GMA 1347/1360 audio panel.

– NAV/COM transceivers (integral with the Garmin GIA 6X W integrated avionics units).

– COM VHF antennas.

– NAV antenna (integral with the horizontal stabilizer), or if OÄM 42-112 is carried out externally on the vertical stabilizer.

– Push-to-talk (PTT) switches. A PTT switch is located in each of the pilot's control sticks.

– Headset sockets. Headset sockets are located on the back of the center console for both the pilots and the passengers.

– Cabin speaker. A cabin speaker is mounted in the roof of the cockpit.

– GSR 56 satellite transceiver (if OÄM 42-213 is carried out).

– Iridium antenna (if OÄM 42-213 is carried out).

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Section 23-10

Speech Communication

1. General

This Section tells you about the speech communication system in the DA 42 NG. It does not tell you about the speech communication equipment. Refer to the equipment manufacturers' manuals for more data about the equipment.

Figure 1 shows the main components of speech communication system.

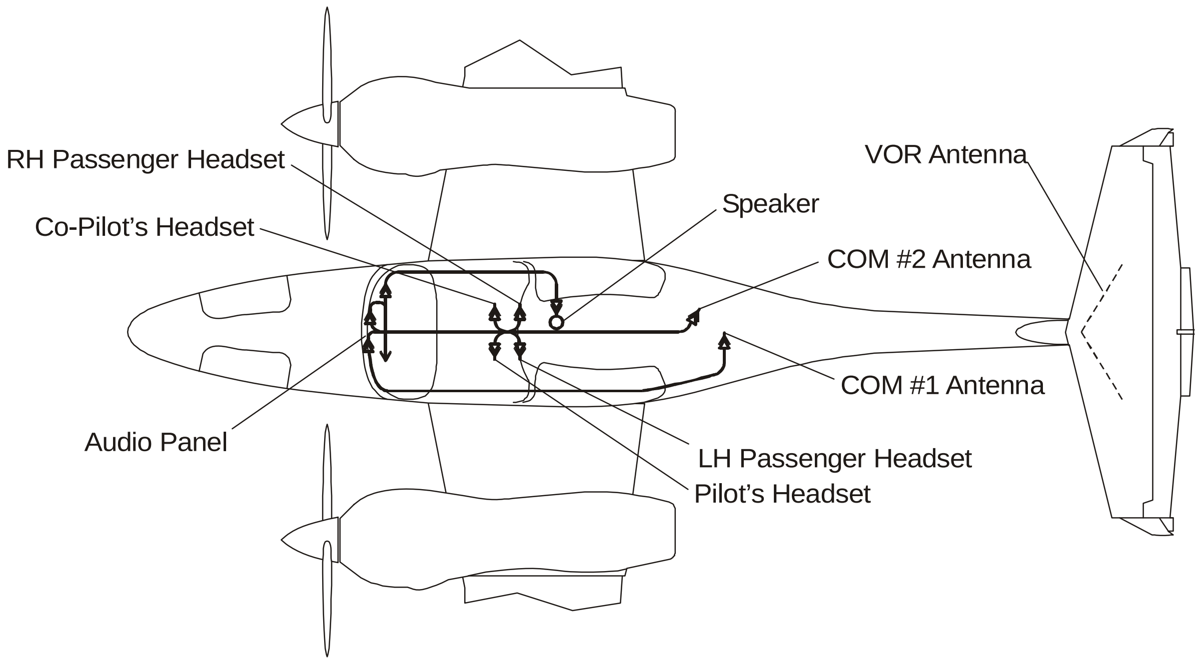

Figure 1: Speech Communication System Main Components

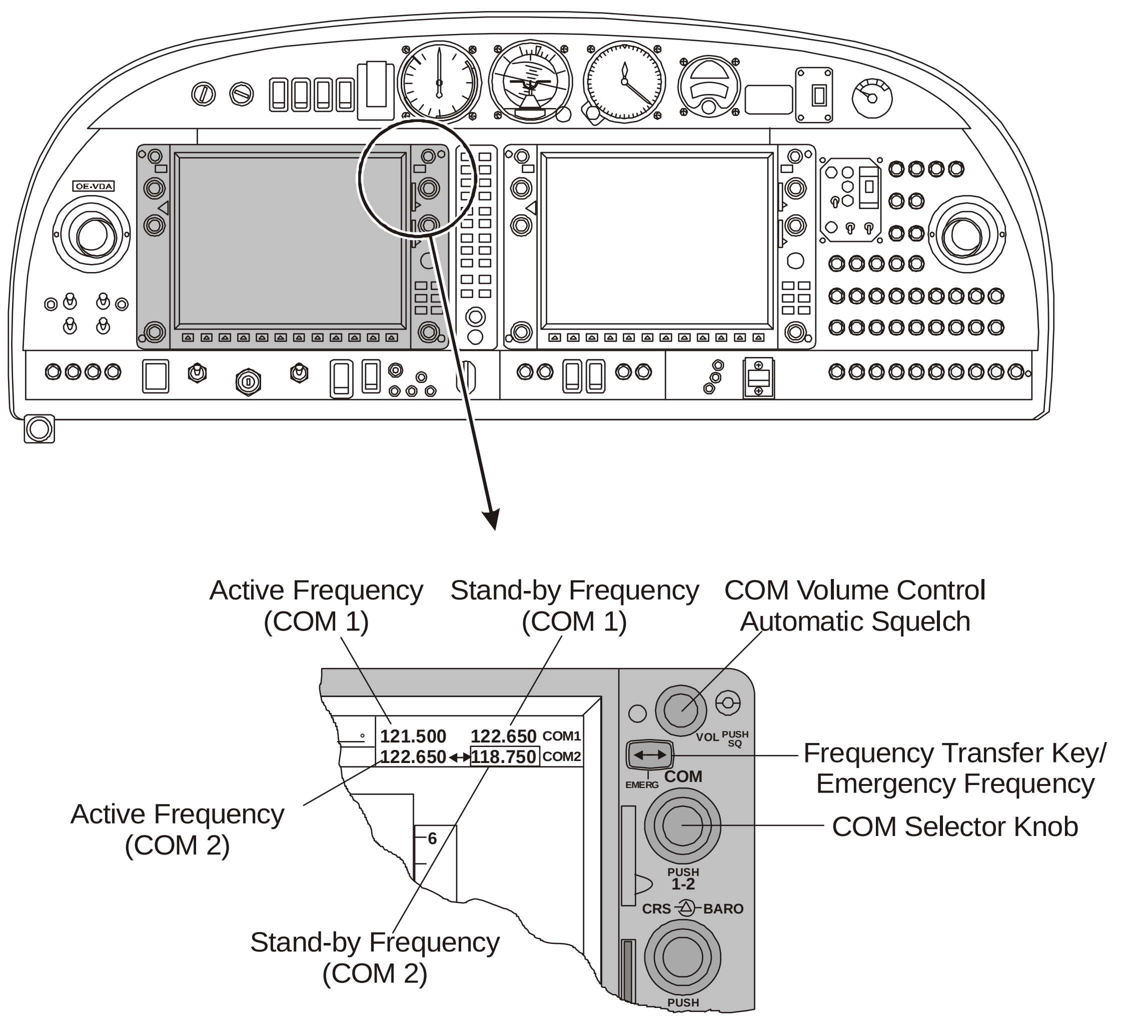

Figure 2: Garmin 1000 Primary Flight Display Panel

2. Description

The DA 42 NG has dual VHF radio communications transceivers (COM 1 and COM 2) which are integral with the GIA 6X W integrated avionics units. The No.1 GIA 6X W and No. 2 GIA 6X W units are remotely located in the aft fuselage avionics rack. The COM 1 antenna is located on the upper surface of the fuselage, aft of the cockpit. The COM 2 antenna is located on the lower surface of the fuselage, aft of the cockpit. Refer to Section 31-40 for more data about the Garmin 1000 ICS.

Figure 2 shows the Garmin 1000 primary flight display (PFD). The speech communication system is integral with the Garmin 1000 integrated cockpit system (ICS). Power is supplied to the dual VHF communications transceivers when the ICS is switched on. The COM selector knob is located at the top-right corner of each ICS display panel. A digital display in the top right corner of the primary flight display (PFD) screen shows which COM system and frequency is in use.

Both the active and standby frequencies are shown for both COM 1 and COM 2 systems. Pushing the inner knob of the COM selector will toggle the active COM system between COM 1 and COM 2. Push the COM FREQUENCY TRANSFER key to toggle between the active and standby frequency of the selected communication system. A box is displayed around the stand by frequency.

Pressing and holding the COM FREQUENCY TRANSFER key for approximately 2 seconds will override all previous selections and select the EMERGENCY COM frequency of 121.5 MHz.

You can only change the frequency that is currently selected as the stand by frequency. You must rotate the large outer COM selector knob to select the MHz value of the frequency and rotate the small inner knob of the COM selector to select the kHz value of the frequency.

Above the COM knob is the VOL knob. You control the volume level of the active radio receiver with the VOL knob. Press the knob to toggle the ON/OFF selection of the automatic squelch control.

The pilots use the audio control panel to control all the audio systems of the DA 42 NG. Both speech and navigational audio can be sent to the pilots' or passengers' headphones. Or can be played on the cockpit loudspeaker. Refer to Section 23-50 for more data about the audio control unit.

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Trouble-Shooting

1. General

This table tells you how to troubleshoot the speech communication system. See Section 23-50 for troubleshooting the audio integrating system.

If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
Radio check reports readability good, strength poor due to low modulation on COM 1/COM 2.	Mic. output low. Faulty related GIA 6X W IAU.	Replace the defective mic. Replace the related GIA 6X W IAU.
Radio check reports readability poor, strength good.	Faulty related GIA 6X W IAU. Faulty mic.	Replace the related GIA 6X W IAU. Replace the mic.
Radio check reports readability poor, strength poor on COM 1/COM 2. Received audio is poor.	Coaxial cable connector faulty.	Examine the coaxial cable and connections for condition and security.
	Faulty related GIA 6X W IAU. Faulty antenna.	Replace the related GIA 6X W IAU Replace the antenna.
Short range in transmit mode, but reception is OK, COM 1/COM 2.	Faulty related GIA 6X W IAU.	Replace the related GIA 6X W IAU.
No voice modulation when transmitting from one pilot's side. The other pilot's side OK.	Audio integrating fault. Related headset defective.	Refer to Section 23-50. Replace related headset.
Cannot transmit. Transmit annunciator not shown in COM display.	Faulty PTT switch.	Replace PTT switch.
PTT wiring circuit defective.	Do a test of the PTT wiring circuit. Refer to Chapter 92 for wiring diagrams. Faulty related GIA 6X W IAU.	Replace the related GIA 6X W IAU.

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Maintenance Practices

1. General

This Section tells you how to replace the main components of the speech communication system. Refer to the equipment manufacturers' manuals for more data about the equipment. The communications transceivers are integral with the GIA 6X W integrated avionics units (IAU). Refer to Section 31-40 for data about replacing the GIA 6X W IAUs.

2. Remove/Install a COM VHF Antenna

Use this procedure for both COM 1 and COM 2 antennas. Access to both the antennas is through the rear baggage compartment.

A. Remove a COM VHF Antenna

Detail Steps/Work Items		Key Items/References
(1)	Remove the aft baggage compartment.	Refer to Section 25-10.
(2)	Identify the antenna that you will replace.	Lower antenna COM 2, top antenna COM 1.
(3)	Disconnect the coaxial cable from the antenna.	At the bayonet connector.
(4)	Remove the antenna: – Remove the 3 screws, nuts and washers that attach the antenna to the airplane structure. – Move the antenna clear of the airplane.	 If necessary, cut the sealant around the base of the antenna. You must not damage the fuselage skin.

B. Install a COM VHF Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Carefully remove any sealant from the area where the antenna attaches to the fuselage.	Take care not to damage the fuselage. If necessary, use a commercial solvent.
(2)	Install the antenna: – Move the antenna into position on the fuselage. – Make sure that the bonding strip for the antenna is correctly located. – Install the 3 screws, washers and nuts that attach the antenna to the fuselage.	
(3)	Connect the coaxial cable to the antenna.	At the bayonet connector.
(4)	Do a test for the correct operation of the related speech communications system.	Refer to the Airplane Flight Manual.
(5)	Install the aft baggage compartment.	Refer to Section 25-10.
(6)	Seal the outer edge of the antenna to the fuselage skin with sealant.	Use Terosat MS 9380, or equivalent. Follow the sealant manufacturer’s instructions.

3. Remove/Install a PTT Switch

Use this procedure for both pilot's and co-pilot's switches.

A. Remove a PTT Switch

Detail Steps/Work Items		Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	Instrument panel, left side.
(2)	Open the AUDIO circuit breaker.	Instrument panel, right side.
(3)	Remove the PTT switch: – Leverage the switch with a small screwdriver out of the stick's bar end. – Disconnect the electrical cable from the switch and move the switch clear of the pilot's compartment.	 Handle with care. You must not damage the bar end.
(4)	Remove the electrical cable, if necessary: – Remove the appropriate pilot's seat. – Unplug the cable. – Pull the cable downward out.	 Refer to Section 25-10. At the connector behind the main bulkhead. Through the hole in the stick.

B. Install a PTT Switch

Detail Steps/Work Items		Key Items/References
(1)	Install the electrical cable, if removed before: – Push the cable through the inside of the stick. – Connect the lower end of cable.	 Through the hole in the stick. At the connector behind the main bulkhead.
(2)	Install the PTT switch: – Connect the electrical cable to the switch and move the switch into position at the bar end of the stick. – Push the switch in to the cut out of the bar end.	 Put the single cables to the switch. Push carefully. You must not damage the switch.
(3)	Install the pilot's seat.	If removed. Refer to Section 25-10.
(4)	Reset the AUDIO circuit breaker.	Instrument panel, right side.

Section 23-15

Satellite Transceiver System (if OÄM 42-213 is carried out)

1. General

This Section tells you about the satellite transceiver system that can be installed in the DA 42 NG. Refer to the manufacturer's manual for more data about the equipment.

2. Description and Operation

The Garmin GSR 56 provides airborne Iridium satellite telephone and SMS messaging service. Iridium telephone and text messaging are available to the flight crew through the MFD, audio panel and headset. The GSR 56 is also used to obtain worldwide weather information from Garmin Flight Data Services (GFDS). The G1000 displays graphical weather information and associated text on the MFD and the PFD inset map.

The GSR 56 satellite transceiver is tray mounted and is located under the passenger's seats. The antenna of the satellite transceiver system is mounted on the fuselage nose, just aft of the right-hand baggage compartment door.

The AVIONICS BUS supplies power to the satellite transceiver system. The ELECT. MASTER switch and the AV. MASTER switch must be set to ON to supply power through a circuit breaker to the satellite transceiver system.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the satellite transceiver system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
GSR 56 does not operate.	Circuit breaker open. Faulty cables/connectors.	Set circuit breaker. Do a test for continuity on each cable. Do a test for short circuit to ground and between cables. Replace defective cables.
No or low-quality signal.	Poor antenna performance.	Ensure the iridium antenna has an unobstructed view of satellite constellation. Check the antenna cable and connectors.
No audio output.	Faulty cables/connectors. No subscription with Garmin Iridium Services.	Check wiring from GSR 56 to the audio panel. Verify subscription with Garmin Iridium Services.
Unable to make a phone call.	Faulty cables/connectors. No subscription with Garmin Iridium Services.	Check wiring from GSR 56 to the #2 GIA 63W. Verify subscription with Garmin Iridium Services.

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Maintenance Practices

1. General

This Section tells you how to remove/install the components of the satellite transceiver system.

2. Remove/Install the GSR 56 Satellite Transceiver

A. Remove the GSR 56 Satellite Transceiver

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch and the AV. MASTER switch to OFF.	
(2)	Open the IRIDIUM circuit breaker.	
(3)	Remove the passengers seat.	Refer to Section 25-10.
(4)	Loosen the lock nut that attaches the transceiver to its mounting tray.	
(5)	Remove the satellite transceiver from the mounting tray.	

B. Install the GSR 56 Satellite Transceiver

	Detail Steps/Work Items	Key Items/References
(1)	Put the satellite transceiver in position in the mounting tray.	
(2)	Tighten the lock nut that attaches the transceiver to its mounting tray.	
(3)	Install the passengers seat.	Refer to Section 25-10.
(4)	Close the IRIDIUM circuit breaker.	
(5)	Do a test of the satellite transceiver.	Refer to Paragraph 4.

3. Remove/Install the Iridium Antenna

A. Remove the Iridium Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Open the forward, right baggage compartment door.	
(2)	Open the IRIDIUM circuit breaker.	
(3)	Disconnect the connector of the Iridium antenna.	At the antenna.
(4)	Remove the antenna: – Remove the 4 screws, washers and nuts that attach the antenna to the structure. – If necessary, use a knife to carefully remove the sealant that seals the antenna to the airplane outer surface. – Move the antenna clear of the airplane.	Take care not to damage the airplane surface!
(5)	Remove the Iridium antenna from the fuselage nose.	

B. Install the Iridium Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Move the antenna into position.	
(2)	Install the 4 screws, washers and nuts that attach the antenna to the airplane.	
(3)	Seal the outer edge of the antenna where it contacts the airplane surface with sealant.	Refer to 34-50, Paragraph 4 for approved sealants.
(4)	Remove the excess sealant that has been forced out of the joint between the antenna and the airplanes surface.	
(5)	Connect the coaxial cable to the antenna.	At the antenna.
(6)	Reset the IRIDIUM circuit breaker.	
(7)	Do a test of the satellite transceiver system.	Refer to Paragraph 4.

4. Test of the GSR 56 Satellite Transceiver

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch and the AV. MASTER switch to ON.	
(2)	Select the AUX page group on the MFD.	Using the large FMS knob.
(3)	Select the AUX-TELEPHONE page.	Using the small FMS knob.
(4)	Ensure the system displays reasonable Iridium signal strength.	To improve signal strength move airplane out of the hangar.
(5)	Press the TEL button on the GMA 1347/1360 audio panel.	
(6)	Press the DIAL softkey on the MFD.	
(7)	Enter the test phone number in the ENTER PHONE NUMBER field.	Using the FMS knobs or the sofkeys on the MFD.
(8)	Press ENT on the MFD.	To accept the phone number.
(9)	Press ENT on the MFD again.	To initiate the dialing sequence.
(10)	When the call is completed, press the HANGUP softkey on the MFD to end the call.	
(11)	Set the ELECT. MASTER switch and the AV. MASTER switch to OFF.	

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Section 23-50
Audio Integration

1. General

The DA 42 NG has a voice-operated (VOX) intercom. This gives full hands free intercom when headsets are used. The pilot controls the intercom system with the audio control panel. The audio control panel is located in the instrument panel between the integrated cockpit system (ICS) display screens. Figure 1 shows the audio control panel.

Push to talk (PTT) switches are installed in the handles of both control sticks (one in the LH side control stick if OÄM 42-281 is installed. If OÄM 42-283 is installed, the RH control stick, including the PTT switch is removable by the pilot). The jack sockets for all the headsets are located at the back of the center console.

An amplifier in the radio receiver system operates a loudspeaker located in the roof of the passenger cabin.

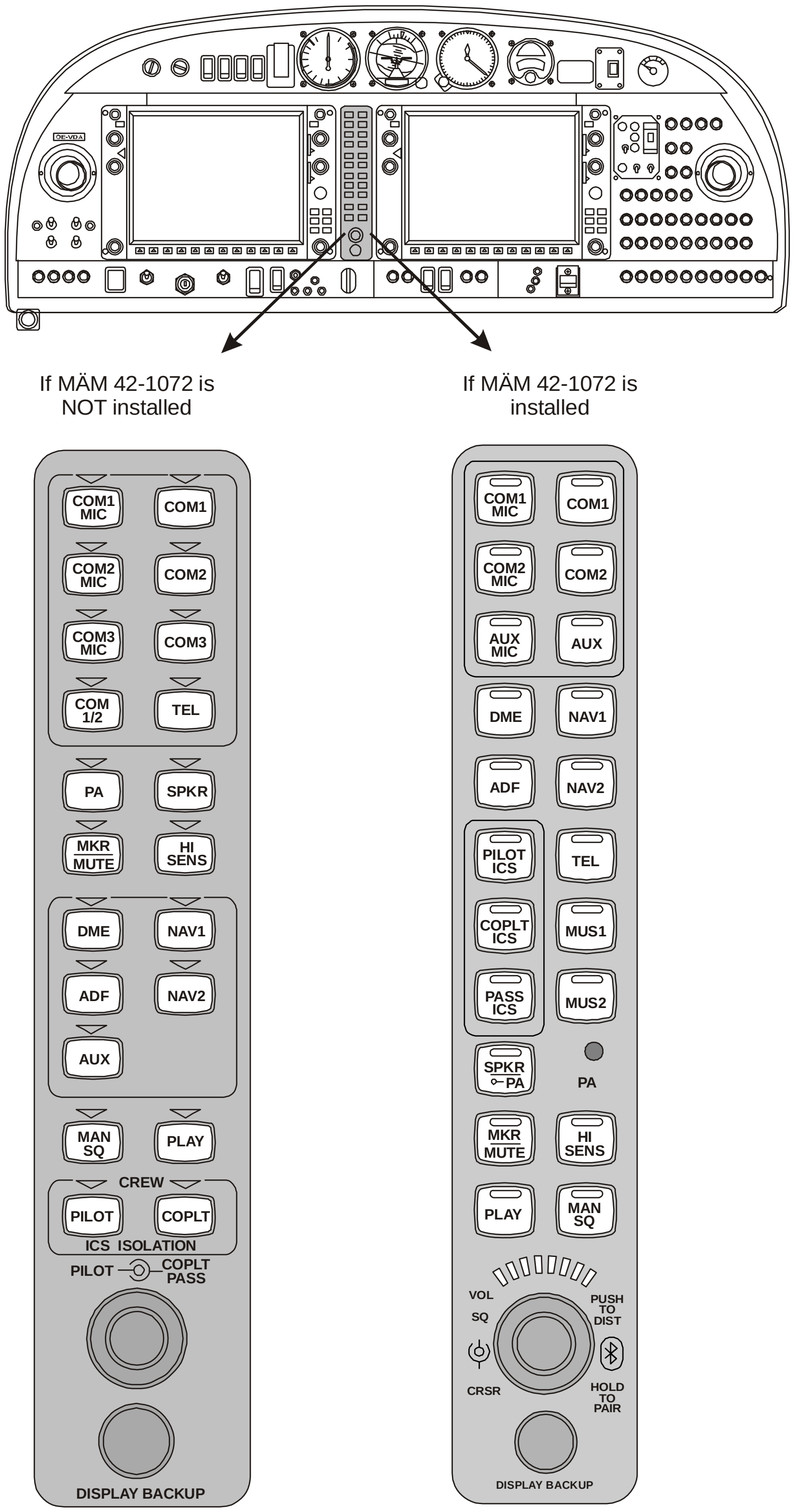

Figure 1: Audio Control Panel

2. Description and Operation

Figure 1 shows the GMA 1347/1360 audio control panel of the DA 42 NG airplane. The audio control panel is powered with the Garmin 1000 ICS and is an integral component of the integrated cockpit system. The audio control panel makes an interface between the audio systems of the integrated cockpit system (ICS) and the pilots'/crew headsets.

The audio control panel is located in the instrument panel between the ICS displays. The control panel keys have LED annunciator labels and has backlighting which is controlled by the ICS. When a key is active the annunciator is lit by the LED. The control panel performs a self-test when power is applied to the panel which then resets the panel to the operating condition that was set when the panel was last powered off. If the control panel fails the self-test the panel switches to a fail safe mode and all fail safe audio output is directed to the pilot’s headset.

If the audio panel GMA 1347 (MÄM 42-1072 is NOT installed) is installed, the control panel has these keys and selectors:

– COM 1 MIC key. Press this key to select COM 1 as the active microphone source and to automatically deselect any COM MIC key that may have been previously selected. The COM 1 MIC key annunciator illuminates and the COM 1 caption on the ICS display screen is highlighted.

– COM 2 MIC key. Press this key to select COM 2 as the active microphone source and to automatically deselect any COM MIC key that may have been previously selected. The COM 2 MIC key annunciator illuminates and the COM 2 caption on the ICS display screen is highlighted.

– COM 1/2 key. Press this key to toggle the selection of the split com function. When COM 1/2 is selected COM 1 becomes the dedicated COM system for the pilot’s mic/audio and COM 2 becomes the dedicated COM system for the co-pilot’s mic/audio. When the split com function is selected both the pilot and co-pilot can transmit simultaneously using separate COM systems. The pilot can also monitor all the NAV audio as selected. The co-pilot can only monitor the COM 2 audio.

– COM 1 key. Press this key to select COM 1 as the active audio source. Selecting COM 1 audio using this key maintains COM 1 as an audio source independent of any other selection. The annunciator illuminates when the COM 1 key is activated.

– COM 2 key. Press this key to select COM 2 as the active audio source. Selecting COM 2 audio using this key maintains COM 2 as an audio source independent of any other selection. The annunciator illuminates when the COM 2 key is activated.

– TEL key. This key is not active in the DA 42 NG installation.

- AUX key. This key is not active in the DA 42 NG installation.

- SPKR/PA key. Press this key to select the cabin speaker. When selected, the cabin speaker will broadcast all the selected audio channels and all unswitched/unmuted audio warnings. The speaker will be muted when a COM microphone is keyed. The annunciator illuminates when the SPKR key is activated.

- MKR/MUTE key. Press this key to select MKR audio. When selected the key annunciator is illuminated. When a marker beacon audio tone is generated it can be heard over the headsets and the related caption will show on the ICS primary flight display. Pressing the MKR/MUTE key while a marker beacon tone is being generated will cause the audio to be muted but the caption on the ICS display will remain. When the next marker beacon signal is generated the it will be heard over the headsets. Pressing the MKR/MUTE key while the marker beacon audio system is in the mute mode will cause the audio signal to be deactivated and the key annunciator will go out.

- HI SENS key. Press this key to increase the sensitivity of the marker beacon receiver. The annunciator illuminates when the HI SENS key is activated.

- DME, ADF, NAV 1, NAV 2 keys. Press one of these keys to select the related audio source. The related annunciator illuminates when the key is activated.

- MAN SQ key. Press this key to make the pilot/co-pilot/pass ICS volume control knob a push toggle switch for setting ICS squelch levels manually. The annunciator illuminates when the MAN SQ key is activated.

- PLAY key. Press this key to replay the digital recording made by the ICS. The digital recording of recent audio activity will be heard over the headsets. The annunciator illuminates when the PLAY key is activated.

- PILOT, COPLT keys. These keys control the intercom system (ICS) isolation system. The ICS isolation system has 4 modes of operation which can all be selected using a combination of the PILOT and COPLT keys. The system has these modes of operation:

  - Pilot mode. Pilot mode is selected when only the PILOT key is annunciated. In pilot mode the pilot can hear the selected radios. The co-pilot and passengers can only communicate with each other.

  - Co-pilot mode. Co-pilot mode is selected when only the COPLT key is annunciated. In co-pilot mode the co-pilot's headset is isolated. The pilot and passengers can hear the selected radios, and communicate with each other.

- Crew mode. Crew mode is selected when both the PILOT and COPLT keys are annunciated. In crew mode both the pilot and co-pilot can hear the selected radios and communicate with each other.

- All mode. All mode is selected when neither the PILOT or COPLT keys are annunciated. In all mode both the pilots and the passengers can hear the selected radios and are able to communicate with each other.

– VOLUME/SQ knob. This knob has 2 functions depending on the selection of the MAN SQ key.

- MAN SQ key deselected. When the MAN SQ key is deselected the ICS squelch levels are set automatically. The VOLUME/SQ knob acts as a volume control and the VOL caption to the lower left of the knob illuminates. Rotate the inner knob clockwise to increase the volume level of the pilot’s ICS and rotate the inner knob counterclockwise to reduce the volume of the pilot's ICS. Rotate the outer knob clockwise to increase the volume level of the co-pilot’s and passengers' ICS. Rotate the outer knob counterclockwise to reduce the volume level of the co-pilot’s and passengers’ ICS.

- MAN SQ key selected. When the MAN SQ is selected the ICS squelch levels can set manually and pressing the VOLUME/SQ knob toggles the manual squelch ON/OFF. Manual squelch is toggled ON when the SQ caption to the lower right of the knob illuminates. Rotate the inner knob clockwise to increase the squelch threshold of the pilot‘s ICS and rotate the inner knob counter-clockwise to reduce the squelch threshold of the pilots ICS. Rotate the outer knob clockwise to increase the squelch threshold of the co-pilot's and passengers’ ICS. Rotate the outer knob counterclockwise to reduce the squelch threshold of the co-pilot’s and passengers’ ICS.

– DISPLAY BACKUP button. Pressing the red DISPLAY BACKUP button at the bottom of the audio control panel selects the backup mode for all the displays.

If the audio panel GMA 1360 (MÄM 42-1072) is installed, the control panel has these keys and selectors:

- COM 1 MIC key. Press this key to select COM 1 as the active microphone source and to automatically deselect any COM MIC key that may have been previously selected. The COM 1 MIC key annunciator illuminates and the COM 1 caption on the ICS display screen is highlighted.

- COM 2 MIC key. Press this key to select COM 2 as the active microphone source and to automatically deselect any COM MIC key that may have been previously selected. The COM 2 MIC key annunciator illuminates and the COM 2 caption on the ICS display screen is highlighted. Pressing the COM 1 MIC and COM 2 MIC buttons simultaneously will activate split COM mode between those two COMs. The key annunciators of the COM MICs are illuminated while in split COM mode, the pilot transmits on COM 1 and the copilot transmits on COM 2.

- COM 1 key. Press this key to select COM 1 as the active audio source. Selecting COM 1 audio using this key maintains COM 1 as an audio source independent of any other selection. The annunciator illuminates when the COM 1 key is activated.

- COM 2 key. Press this key to select COM 2 as the active audio source. Selecting COM 2 audio using this key maintains COM 2 as an audio source independent of any other selection. The annunciator illuminates when the COM 2 key is activated.

- AUX MIC, AUX keys. These keys are not active in the DA 42 NG installation.

- DME, ADF, NAV 1, NAV 2 keys. Press one of these keys to select the related audio source. The related annunciator illuminates when the key is activated.

- PILOT ICS, COPLT ICS, PASS ICS keys. These keys control the intercom system (ICS) isolation system. The ICS isolation system has 8 modes of operation which can be selected using a combination of the PILOT ICS, COPLT ICS and PASS ICS keys. The system has these modes of operation:

  - When neither the PILOT ICS, the COPLT ICS or the PASS ICS keys are annunciated the pilots hear selected radios and aural alerts and the passengers are able to communicate with each other.

  - When the PILOT ICS key is annunciated and COPLT ICS and PASS ICS keys are not annunciated the pilots hear selected radios and aural alerts and the passengers are able to communicate with each other.

  - When the COPLT ICS key is annunciated and PILOT ICS and PASS ICS keys are not annunciated the pilots hear selected radios and aural alerts and the passengers are able to communicate with each other.

 – When the PASS ICS key is annunciated and the PILOT ICS and COPLT ICS keys are not annunciated the pilots hear selected radios and aural alerts. The passengers are able to communicate with each other and hear selected radios and aural alerts.

 – When the PILOT ICS and COPLT ICS keys are annunciated and PASS ICS is not annunciated the pilots hear selected radios, aural alerts and are able to communicate with each other. The passengers are able to communicate with each other.

 – When COPLT ICS and PASS ICS keys are annunciated and the PILOT ICS is not annunciated the pilots and passengers hear selected radios and aural alerts. The copilot and the passengers are able to communicate with each other.

 – When PILOT ICS and PASS ICS keys are annunciated and the COPLT ICS key is not annunciated the pilot and the passengers hear selected radios, aural alerts and are able to communicate with each other. The copilot hears selected radios and aural alerts.

 – When PILOT ICS, COPLT ICS and PASS ICS keys are annunciated the pilots and passengers hear selected radios, aural alerts and are able to communicate with each other.

– TEL, MUS1, MUS2 keys. These keys are not active in the DA 42 NG installation.

– SPKR/PA key. Press this key to select the cabin speaker. When selected, the cabin speaker will broadcast all the selected audio channels and all unswitched/unmuted audio warnings. The speaker will be muted when a COM microphone is keyed. The annunciator illuminates when the SPKR key is activated.

– MKR/MUTE key. Press this key to select MKR audio. When selected the key annunciator is illuminated. When a marker beacon audio tone is generated it can be heard over the headsets and the related caption will show on the ICS primary flight display. Pressing the MKR/MUTE key while a marker beacon tone is being generated will cause the audio to be muted but the caption on the ICS display will remain. When the next marker beacon signal is generated the it will be heard over the headsets. Pressing the MKR/MUTE key while the marker beacon audio system is in the mute mode will cause the audio signal to be deactivated and the key annunciator will go out.

– HI SENS key. Press this key to increase the sensitivity of the marker beacon receiver. The annunciator illuminates when the HI SENS key is activated.

– PLAY key. Press this key to replay the digital recording made by the ICS. The digital recording of recent audio activity will be heard over the headsets. The annunciator illuminates when the PLAY key is activated.

– MAN SQ key. Press this key to make the pilot/co-pilot/pass ICS volume control knob a push toggle switch for setting ICS squelch levels manually. The annunciator illuminates when the MAN SQ key is activated.

– VOLUME/SQ knob. This knob has 2 functions depending on the selection of the MAN SQ key.

MAN SQ key deselected. When the MAN SQ key is deselected the ICS squelch levels are set automatically. Rotate the outer knob to select one of the active audio sources for volume adjustment. Only active audio sources are available for volume adjustment. Once the outer knob has been turned, the key annunciator of the selected audio source starts flashing, the VOL/ SQ annunciator flashes in time with the selected audio source, and a volume bar appears over the knob. The first source to be selected upon entering volume adjustment will be PILOT ICS, then COPLT, PASS, COM1, COM2, etc, assuming the outer knob is rotated clockwise. Counterclockwise from PILOT ICS selects MAN SQ, SPKR, etc. The inner knob can then be used to adjust the volume level of the selected source. Rotate the inner knob clockwise to increase the volume level and rotate the inner knob counterclockwise to decrease the volume level. Audio source volume adjustment ends after 20 seconds of not adjusting audio or changing the selected source. The end of volume adjustment is signaled by the annunciator of the previously selected audio source and the VOL annunciator becoming solid. When no audio source is selected, rotating the inner knob also initiates volume adjustment on the PILOT ICS.

– MAN SQ selected. If MAN SQ is active, it is available for selection. The text annunciator to the left of the knob changes from VOL to SQ to indicate squelch thresholds are being adjusted instead of volume levels. Upon activating an audio source or manual squelch, volume/ squelch adjustment for that source is automatically selected and remains selected until 20 seconds pass with no adjustment. The volume bar for that source is displayed during this time, but the key annunciator of the selected source will not flash unless the volume is adjusted. If the volume is adjusted, the key annunciator and the corresponding VOL/ SQ annunciator are flashing in time, indicating the volume/ squelch adjustment mode.

– DISPLAY BACKUP button. Pressing the red DISPLAY BACKUP button at the bottom of the audio control panel selects the backup mode for all the displays.

Trouble-Shooting

1. General

This table tells you how to trouble-shoot the audio integrating system. See Section 23-10 for trouble-shooting the speech communication system.

If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
No voice modulation when transmitting from co-pilot’s side on headset. Pilot’s side OK.	Faulty headset. Open mic audio line. Faulty GMA 1347/1360.	Replace headset. Do a test of the mic audio wiring. Refer to Chapter 92 for the wiring diagrams. Replace GMA 1347/1360.
No voice modulation when transmitting from pilot’s side on headset. Co-pilot’s side OK.	Faulty headset. Open mic audio line. Faulty GMA 1347/1360.	Replace headset. Do a test of the mic audio wiring. Refer to Chapter 92 for the wiring diagrams. Replace GMA 1347/1360.
No intercom audio on pilot’s headset. Receives radio transmissions correctly.	ICS mode set incorrectly. Faulty GMA 1347/1360.	Set mode to required position, refer to Section 23-50 Paragraph 2. Replace the GMA 1347/1360.
No audio on pilot’s headset with the ICS set to OFF.	Faulty headset. Open audio line.	Replace headset. Do a test of the headset audio wiring. Refer to Chapter 92 for the wiring diagrams.
No audio on co-pilot’s or passenger headsets.	Open audio line. Faulty GMA 1347/1360.	Do a test of the headset audio wiring. Refer to Chapter 92 for the wiring diagrams. Replace the GMA 1347/1360.

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Maintenance Practices

1. General

This Section tells you how to remove/install the GMA 1347/1360 audio control panel. It also tells you how to adjust/test the ICS. Refer to the equipment manufacturers manuals for more data about the audio integrating system.

2. Remove/Install the GMA 1347/1360 Audio Control Panel

A. Remove the GMA 1347/1360 Audio Control Panel

Detail Steps/Work Items		Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, lower center.
(2)	Remove the audio control unit: – Insert a 3/32" hexagonal drive wrench into the access hole in the front of the panel. – Rotate the locking mechanism counter-clockwise to release the lock. – Pull the audio control panel towards you and clear of the instrument panel.	 Refer to Figure 1.

B. Install the GMA 1347/1360 Audio Control Panel

Detail Steps/Work Items		Key Items/References
(1)	Examine the connecters at the rear of the audio control panel. Look specially for bent or damaged pins.	
(2)	Insert a 3/32" hexagonal drive wrench into the access hole in the front of the panel and rotate the locking mechanism 90° counter-clockwise to make sure that the locking mechanism is in the unlocked position.	
(3)	Install the audio control panel:	
	– Move the audio control panel into position at the instrument panel.	
	– Carefully slide the panel into position in the instrument panel.	Make sure that the audio control panel fully engages with the connectors at the rear of the panel.
	– Insert a 3/32" hexagonal drive wrench into the access hole in the front of the panel and rotate the locking mechanism clockwise to lock the panel into position.	Make sure that you cannot pull the audio control panel towards you!
(4)	Do a test for the correct operation of the audio control panel. If you have installed a replacement audio control panel you may have to update the Garmin G1000 integrated cockpit system software.	Refer to the G1000 Line Maintenance Manual for data about installing software and testing the audio control panel.

Section 23-60
Static Discharging

1. General

The static discharging system has 2 main parts, the airplane bonding system and the surface static-discharging system. The bonding system gives the airplane good lightning protection.

A special bonding system is necessary for the composite structure of the DA 42 NG. The composite structure does not conduct electricity. A series of metal tubes and strips make the airplane bonding system. All the metal components or the airplane and the antenna ground planes connect to the bonding system. Refer to Section 51-80 for more data about the airplane bonding system.

2. Description

The static discharging system removes the electrostatic charge which collects on the airplane surfaces. The composite structure of the DA 42 NG does not let electricity flow through it. The airplane surfaces are covered with a special conductive filler through which the electrostatic charges can flow to the discharge wicks. The discharge wicks discharge the electrostatic charges back into the air.

Figure 1 shows the location of the static discharge wicks for the DA 42 NG airplane.

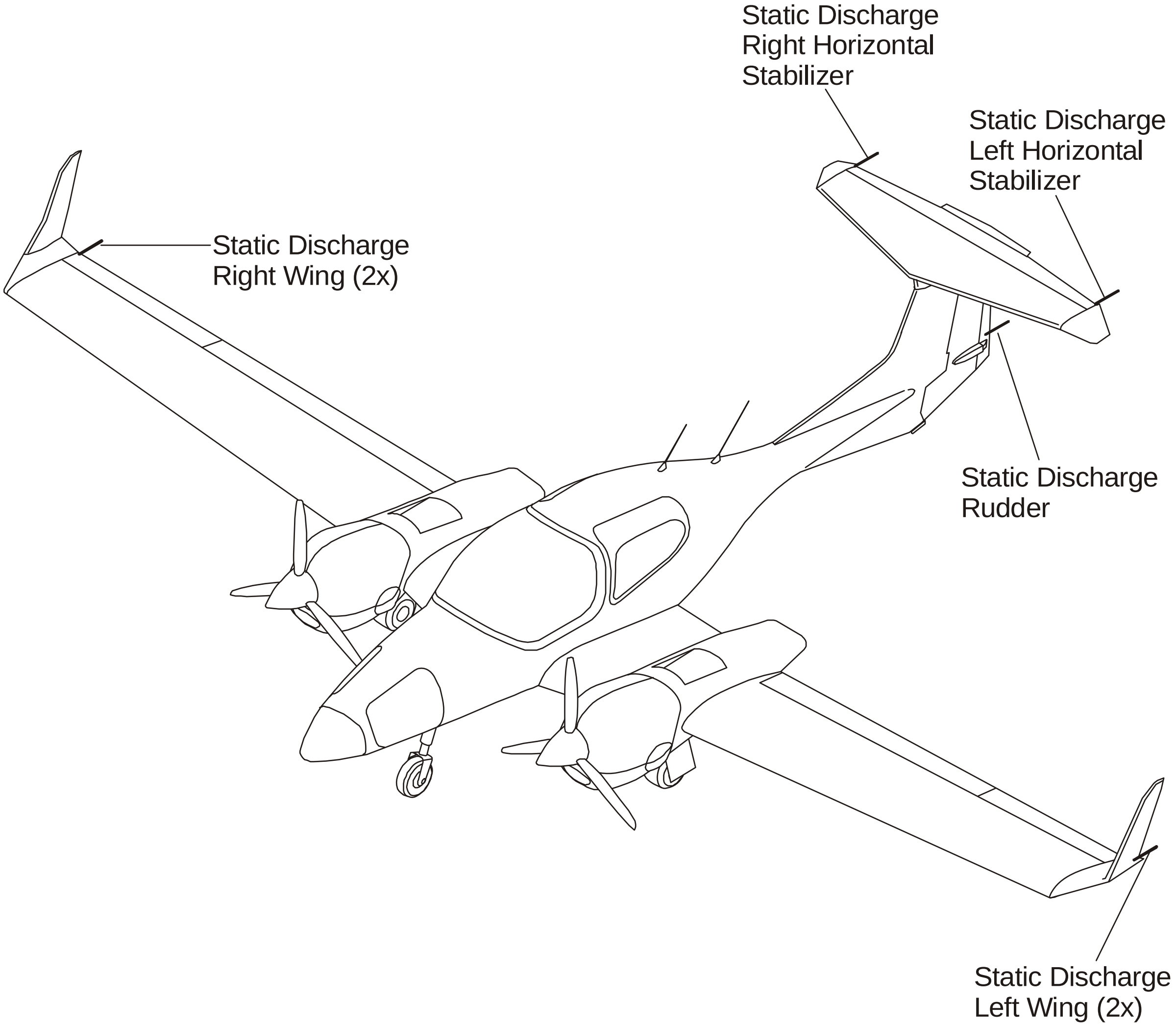

Figure 1: Static Discharge Wick Locations DA 42 NG

Maintenance Practices

1. General

This Section tells you how to remove/install a static discharge wick and how to test a static discharge wick.

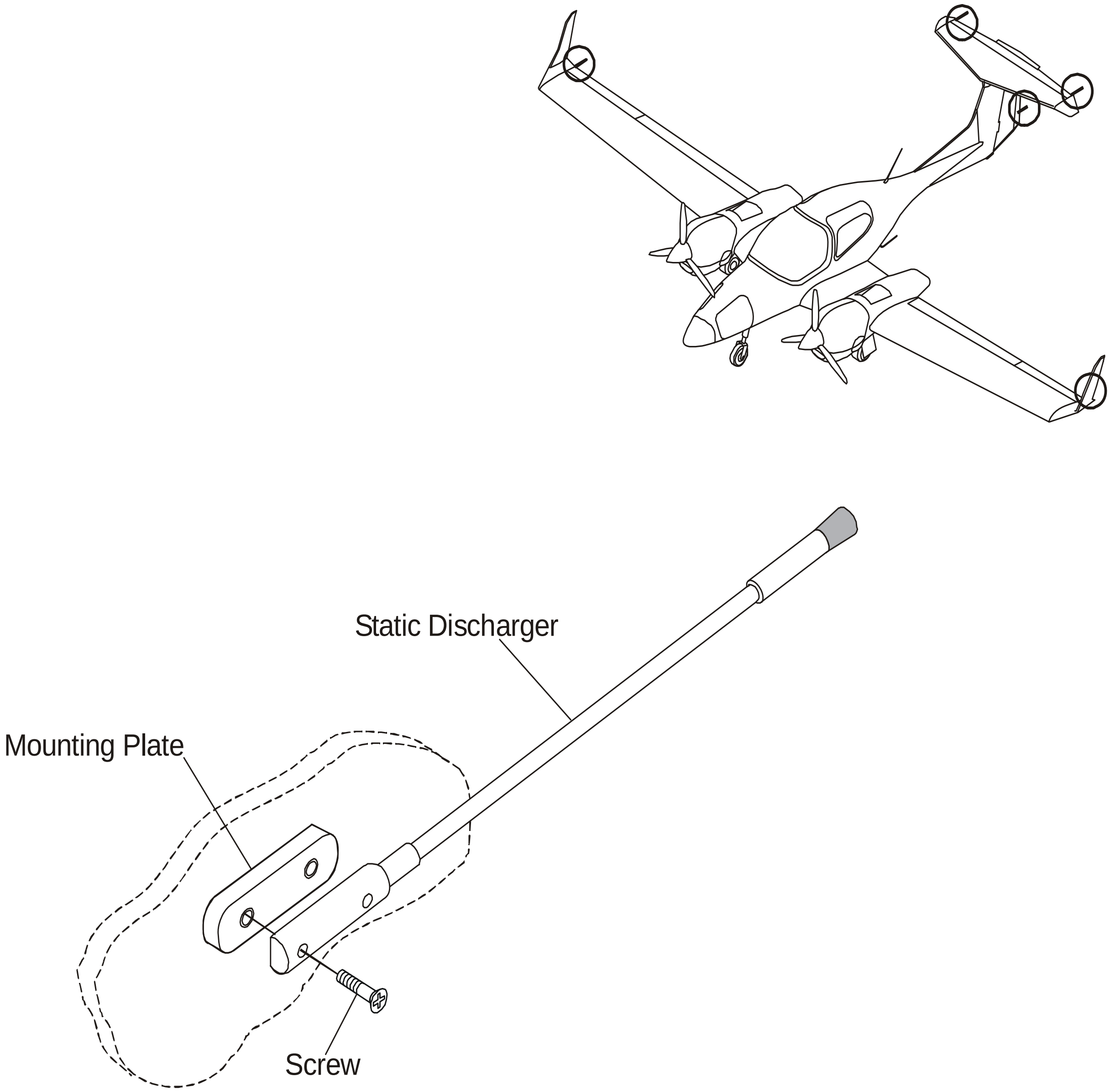

Figure 2: Static Discharge Wick Installation

2. Replace a Static Discharge Wick

Use this procedure for all the static discharge wicks.

A. Replace a Static Discharge Wick

Detail Steps/Work Items		Key Items/References
(1)	Remove the 2 screws that attach the discharge wick to the wick mounting.	Refer to Figure 2.
(2)	Make sure that the mounting is clean and correctly bonded to the airplane structure.	
(3)	Move the new static discharge wick into position at the mounting.	
(4)	Install the 2 screws that attach the wick to the mounting.	
(5)	Do a test for the correct bonding of the static discharge wick to the airplane bonding system.	Refer to Section 51-80.

CHAPTER 24

ELECTRICAL POWER

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CHAPTER 24
ELECTRICAL POWER

1. General

The DA 42 NG has a 24 V DC electrical system. This Section describes the complete system from the power supplies to the circuit breakers or other interface with the consumer components.

This Chapter has only simplified schematic diagrams and location diagrams. Refer to Chapter 92 for the wiring diagrams. Refer to the related Chapter for data about systems. For example, refer to Chapter 80 for data about the starter system.

For Trouble-Shooting and Maintenance Practices for this electrical system, refer to these Sections:

- Section 24-30. Electrical power generation.
- Section 24-31. Battery installation.
- Section 24-33. Additional alternator (if OÄM 42-204 is installed).
- Section 24-40. External power.
- Section 24-60. Power distribution.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called “Additional Equipment”. The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

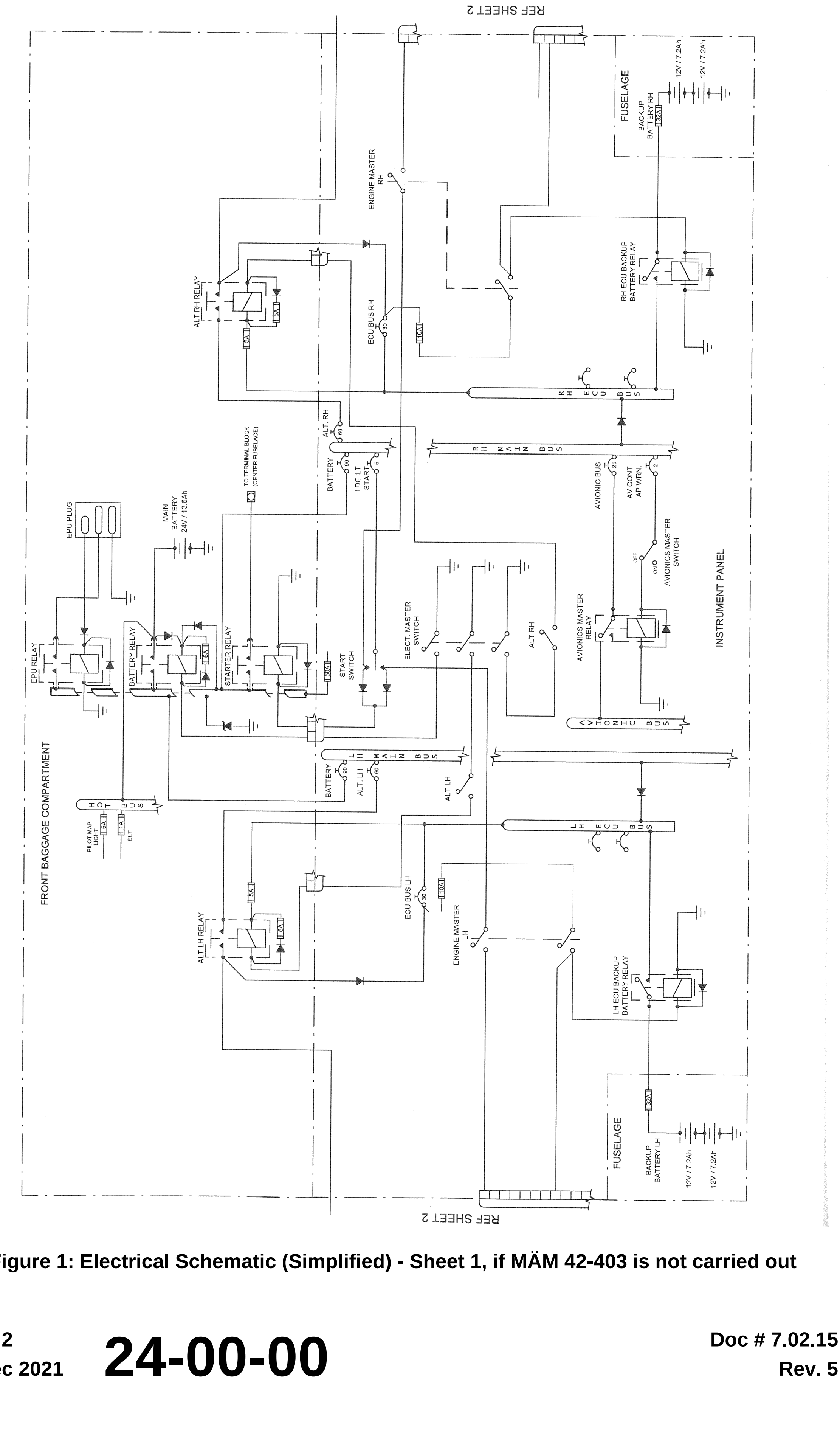

Figure 1: Electrical Schematic (Simplified) - Sheet 1, if MÄM 42-403 is not carried out

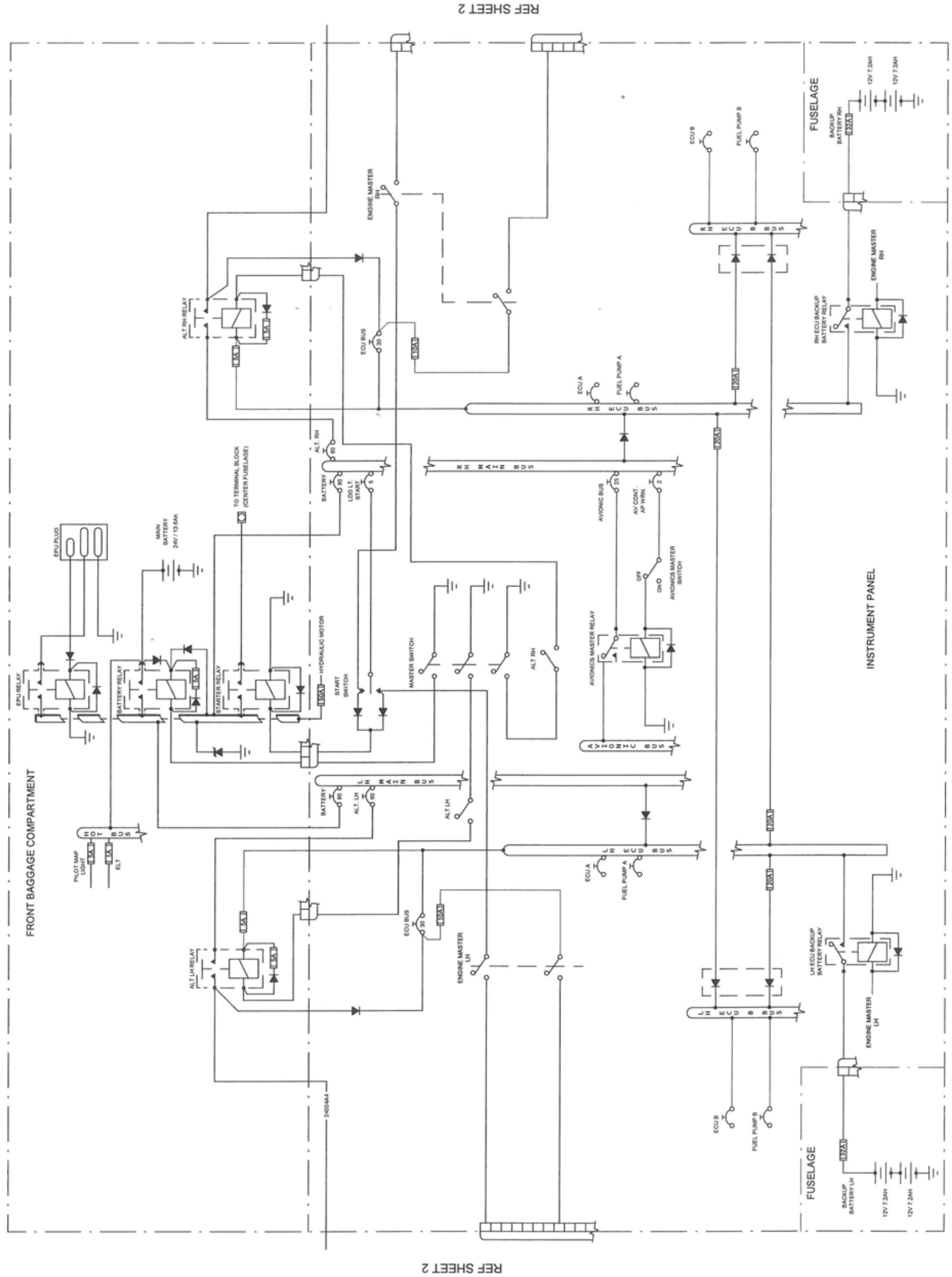

Figure 2: Electrical Schematic (Simplified) - Sheet 1, if MÄM 42-403 is carried out

2. Electrical System Description and Operation

Figures 1 and 2 show the electrical system simplified schematic diagrams.

A. Power Supplies

(1) Main Battery

The main battery is located in the front baggage compartment and is mounted on the forward RH side of the cockpit front bulkhead. It is a 24 V, 13.6 Ah sealed battery. The battery is connected to the main airplane ground, the battery relay and the battery HOT BUS.

(2) Alternators

Each engine has an alternator located at the left rear of the engine. A flat multi-vee belt with automatic tensioner turns the alternator. The alternator has an external regulator which is located in the engine nacelle. The output from the alternators connects to the LH and RH MAIN BUS, through terminal blocks, relays and fuses. In the event of a main battery failure the alternators can be excited directly from the related ECU backup batteries which are located below the passengers seat.

Optionally, the RH ECU backup batteries may be installed in the lower tail fin (if OÄM 42-247 is installed).

(3) External Power Connector

The external power connector is located below the forward baggage compartment. The external power connector connects to the external power relay in the relay junction box in the forward baggage compartment.

– The control pin connects to the relay coil through a diode to prevent reverse connection.

– The + pin connects to the relay main input connection.

– The – pin connects to ground.

CAUTION: WHEN OPERATING THE AIRPLANE ELECTRICAL SYSTEM WITH ENGINE MASTER ON (LH OR RH) AND THE ENGINE IS NOT RUNNING (e.g. EVENT LOG READOUT) ALWAYS CONNECT AN EXTERNAL POWER SUPPLY WITH A PRESET VOLTAGE OF 29 V TO THE AIRPLANE. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

ADDITIONALLY, IF MÄM 42-551 IS INSTALLED, SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES.

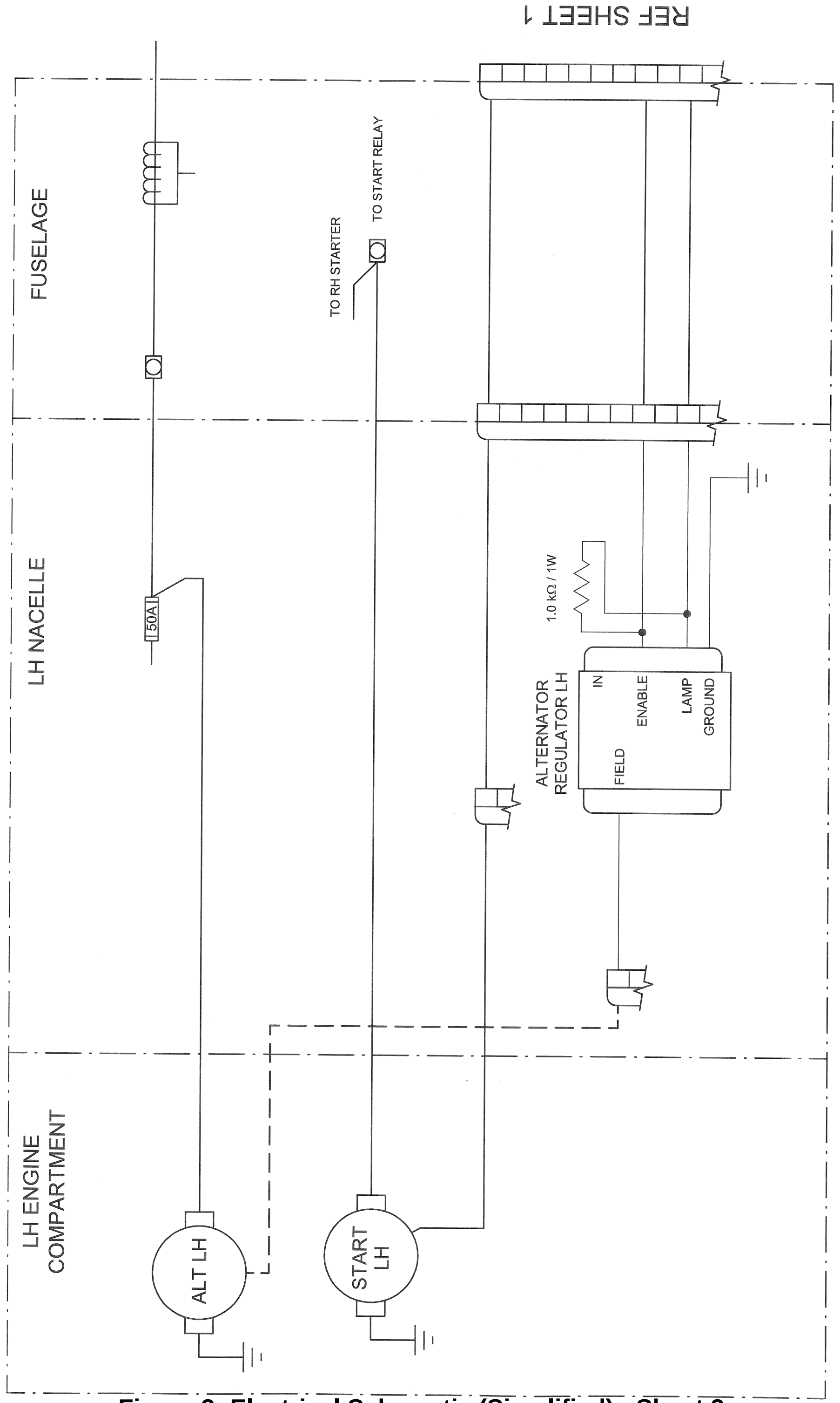

Figure 3: Electrical Schematic (Simplified) - Sheet 2

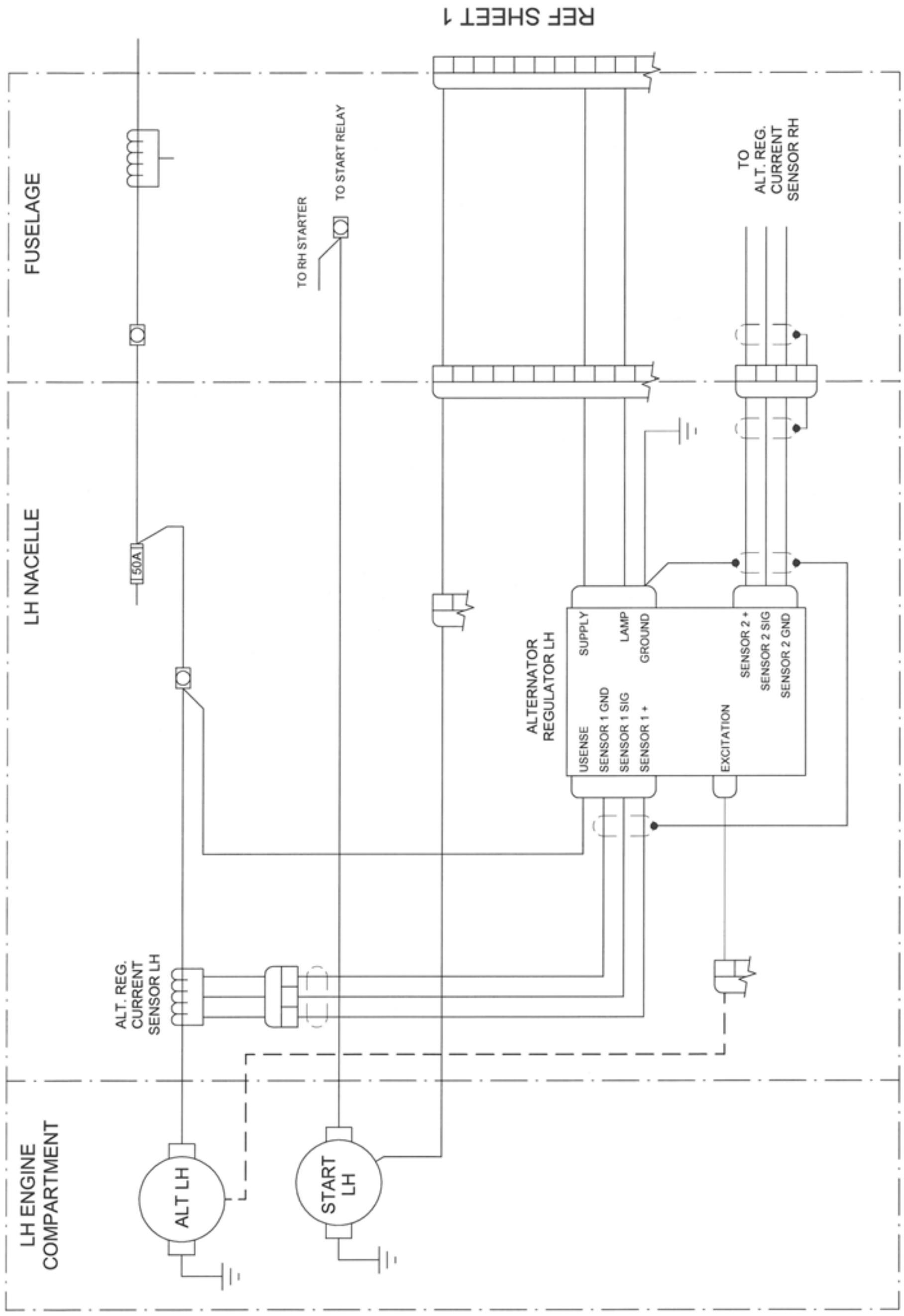

Figure 4: Electrical Schematic (Simplified) - Sheet 2, if MÄM 42-551 is carried out

3. Power Supply Control

(1) Battery Relay

The battery relay is located on the relay panel in the front baggage compartment. The output from the battery connects directly RELAY BOX BUS bar. The coil + of the battery relay is tied to the battery + connection to the relay and the BATTERY BUS via diodes. The ELECT. MASTER switch provides the coil ground when set to the ON position.

(2) External Power Relay

The external power relay is located on the relay panel in the front baggage compartment. The relay output connects directly to the RELAY BOX BUS bar.

If a 28 V external power is connected, the +28 V DC on the control pin energizes the relay. The relay operates and connects the external power to the RELAY BOX BUS bar.

(3) Starter Relay

The starter relay contacts connect to the RELAY BOX BUS bar. Power is applied to the coil of the starter relay when the ELECT. MASTER switch is set to ON and the START switch is set to START LEFT or START RIGHT. The energized coil operates the starter relay which connects the power to the solenoid of related engine starter motor.

(4) Bus Structure

All buses (except the RELAY BOX BUS) are flat metal strips connecting rows of circuit breakers. The circuit breakers are located on the instrument panel.

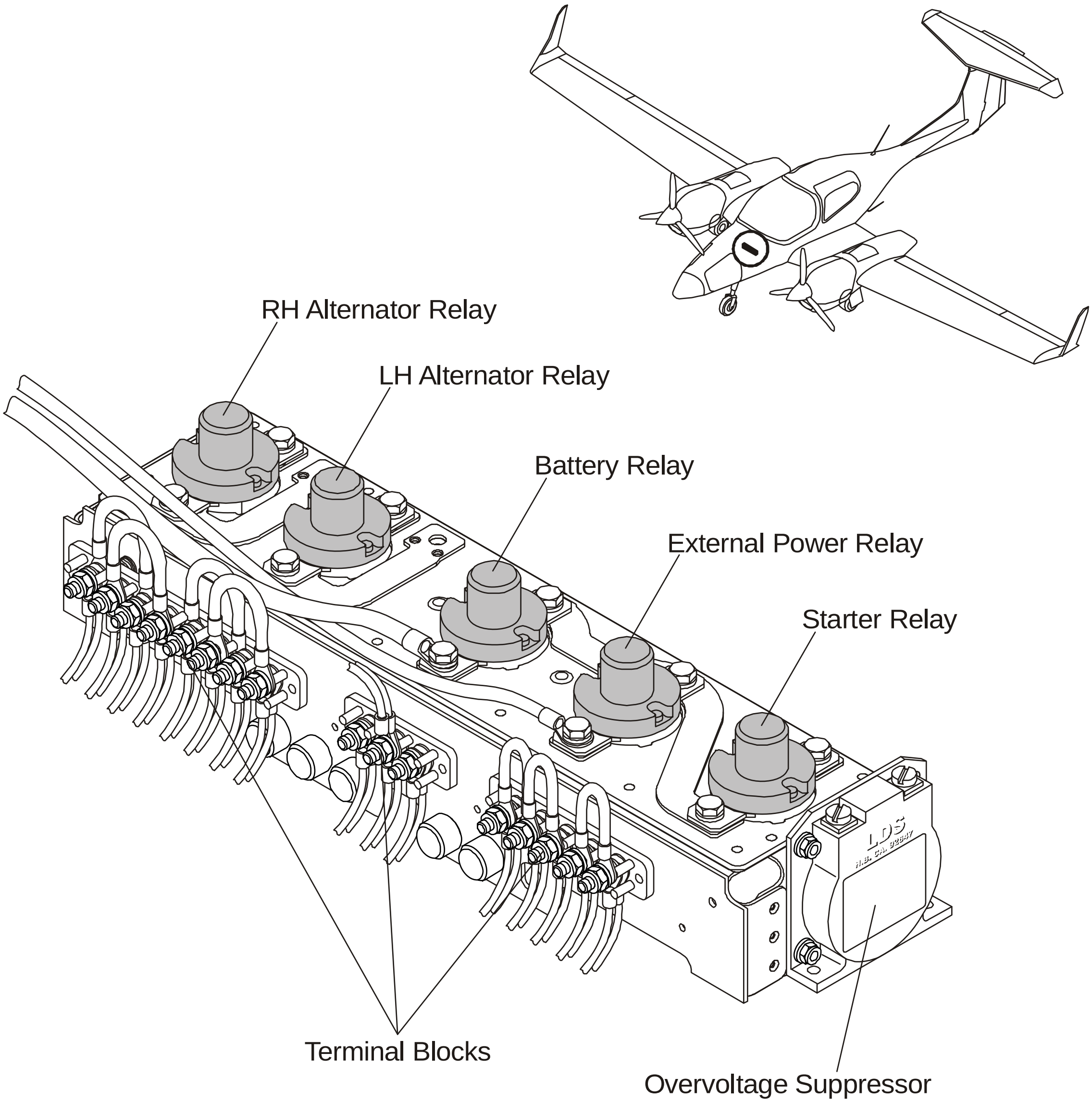

Figure 5: Relay Locations in the Relay Box

(5) Relay Box Bus

Figure 5 shows the relays in the relay box. The RELAY BOX BUS is located in the front luggage compartment, next to the main battery. The bus is a metal strip which connects these relays:

– The battery relay.

– The starter relay.

– The external power relay.

The relay box also has these relays:

– LH alternator.

– RH alternator.

The RELAY BOX BUS has these outputs:

– RH MAIN BUS.

– LH MAIN BUS.

– Hydraulic pump motor.

(6) Hot Bus

The HOT BUS is connected to the main battery relay input connection. The HOT BUS supplies power for the PILOT MAP LIGHT and the Emergency Locator Transmitter (ELT).

(7) LH Main Bus

The LH MAIN BUS is connected to the RELAY BOX BUS through a 90 Ampere circuit breaker. The LH MAIN BUS supplies power for the consumers and the LEFT ECU BUS. Each consumer or bus is protected by circuit breakers or fuses. The LH MAIN BUS is connected to the LH alternator output through a 60 Ampere circuit breaker and a relay.

(8) RH Main Bus

The RH MAIN BUS is connected to the RELAY BOX BUS through a 90 Ampere circuit breaker. The RH MAIN BUS supplies power for the consumers, the RIGHT ECU BUS and the AVIONICS BUS. Each consumer or bus is protected by circuit breakers or fuses. The RH MAIN BUS is connected to the RH alternator output through a 60 Ampere circuit breaker and a relay.

(9) LH ECU Bus

If MÄM 42-403 is not carried out the LH ECU BUS is located on the right side, center (for fuel pumps), and left side of the instrument panel at the bottom. If MÄM 42-403 is carried out the LH ECU BUS is located on the right side and center (for fuel pumps) of the instrument panel at the bottom. The LH ECU BUS has power when power is applied to the LH MAIN BUS or if the left engine alternator is online.

The LH ECU BUS provides power for the both ECU A and ECU B functions of the LH engine control unit and to the ECU A and ECU B fuel pumps. If MÄM 42-403 is not carried out both ECU A and ECU B supplies are protected by 20 Ampere and 7.5 Ampere circuit breakers. If MÄM 42-403 is carried out both ECU A and ECU B supplies are protected by a 20 Ampere circuit breaker and a 5 Ampere fuse. If MÄM 42-403 is carried out the LH ECU BUS also provides electrical power for the RH ECU B and its fuel pump.

(10) RH ECU Bus

If MÄM 42-403 is not carried out the RH ECU BUS is located on the right, center and left side of the instrument panel at the bottom. If MÄM 42-403 is carried out the RH ECU BUS is located on the right side and center (for fuel pumps) of the instrument panel at the bottom. The RH ECU BUS has power when power is applied to the RH MAIN BUS or if the right engine alternator is online.

The RH ECU BUS provides power for the both ECU A and ECU B functions of the RH engine control unit and to the ECU A and ECU B fuel pumps. If MÄM 42-403 is not carried out both ECU A and ECU B supplies are protected by 20 Ampere and 7.5 Ampere circuit breakers. If MÄM 42-403 is carried out both ECU A and ECU B supplies are protected by a 20 Ampere circuit breaker and a 5 Ampere fuse. If MÄM 42-403 is carried out the RH ECU BUS also provides electrical power for the LH ECU B and its fuel pump.

(11) Avionics Bus

The AVIONICS BUS supplies power to avionic consumers through circuit breakers and fuses. The power to the AVIONICS BUS is supplied by the RH MAIN BUS and is controlled by the avionics master relay and AV. MASTER switch.

(12) Avionics Master Control System

The AV. MASTER switch and the avionics master relay make the main components of the avionics master control system.

In normal operation the AV. MASTER switch is set to the ON position. In the OFF position the power is supplied to the coil of the avionics master relay and the avionics master relay operates and removes power from the AVIONICS BUS.

(13) Avionics Master Relay

The avionics master relay connects the AVIONICS BUS to the RH MAIN BUS. The AV. MASTER switch controls the avionics master relay.

(14) Elect. Master Switch

The ELECT. MASTER switch is located on the bottom of the instrument panel, left side. It is a rocker switch that has 3 sets of contacts. When the switch is set to ON the contacts operate as follows:

– The coil of the battery relay is connected to ground and the battery relay operates.

– The ground side of the LH alternator switch is connected to ground.

– The ground side of the RH alternator switch is connected to ground.

(15) Start Switch

The START switch is operated with a key. The switch can be turned to LH or RH and must be held against a spring to maintain the selected position. Setting the START switch to LH or RH, with the ELECT. MASTER switch set to ON and the related ENGINE MASTER switch set to ON will cause the related engine starter motor to operate.

(16) Engine Master LH / RH

The LH and RH ENGINE MASTER switches are located either side of the START switch. Each switch is similar and has 4 sets of contacts which operate as follows:

– The related engine starter control system is energized.

– The alternator regulator is enabled and the ECU backup battery relays are energized.

– The LH / RH ECU BUS is connected to the related engine ECU A and ECU B EECU system.

(17) Alternator LH and Alternator RH Switches

Each engine alternator relay has a control switch. The control switches are labeled ALT LH and ALT RH. When the ELECT. MASTER switch is set to ON setting the ALT LH or ALT RH switch to ON gives a ground to the related engine alternator relay. The alternator relay operates and the related alternator output is connected to the related MAIN BUS.

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Section 24-30

DC Generation

1. General

The DC generation system for the DA 42 NG has these components:

- Alternators LH and RH.
- Alternator relays LH and RH.
- ENGINE MASTER switches LH and RH.
- ELECT. MASTER switch.
- Alternator current sensors LH and RH.
- Alternator regulators (including current sensors LH and RH, if MÄM 42-551 is installed).
- ECU backup batteries (LH and RH).

This Section gives you only the simplified description, Trouble-Shooting and Maintenance Practices for the DC generating systems for the DA 42 NG. Refer to Section 24-00 for a general description of complete electrical system.

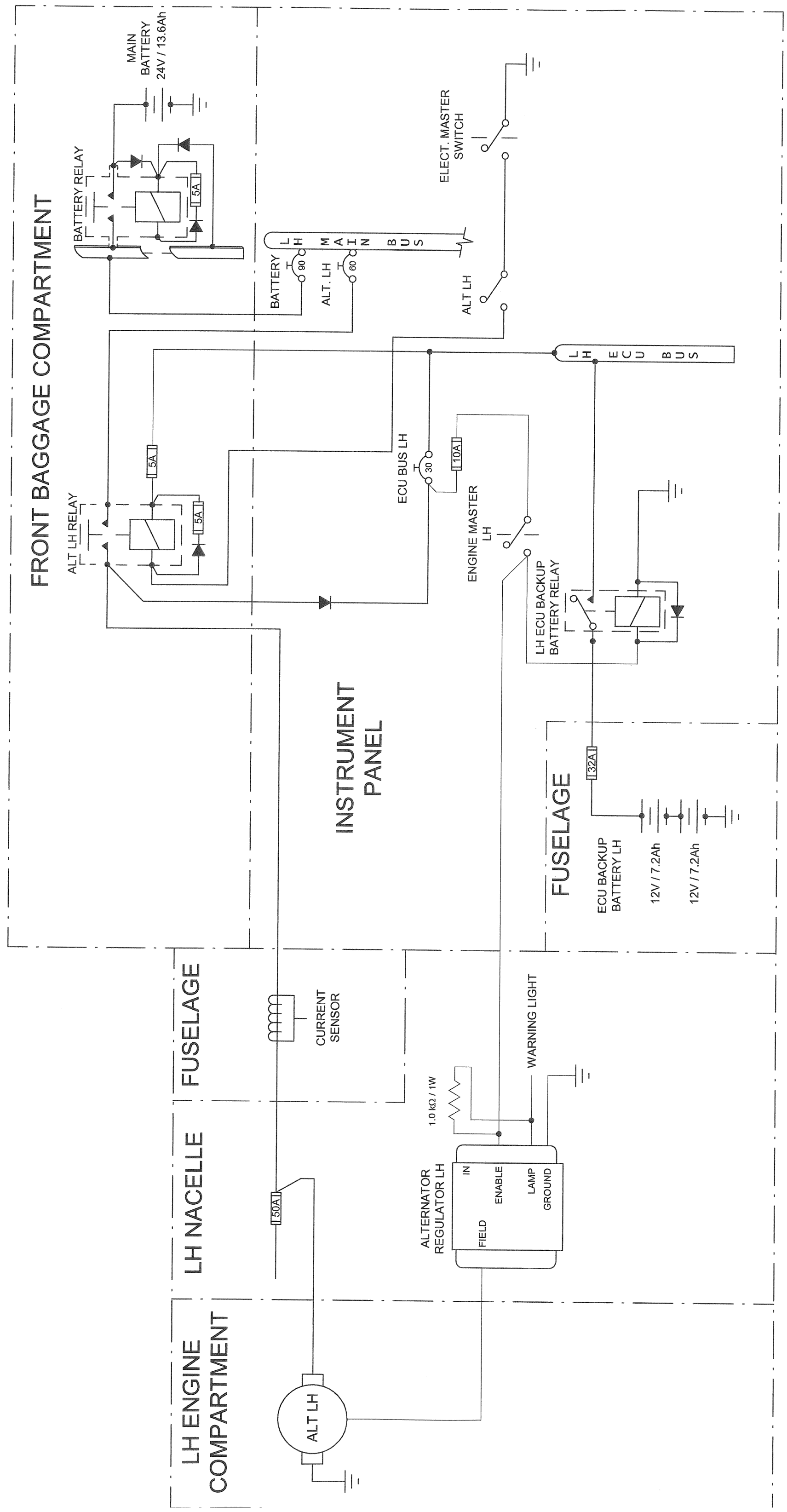

Figure 1: DC Generation Schematic Diagram, if MÄM 42-403 is not carried out

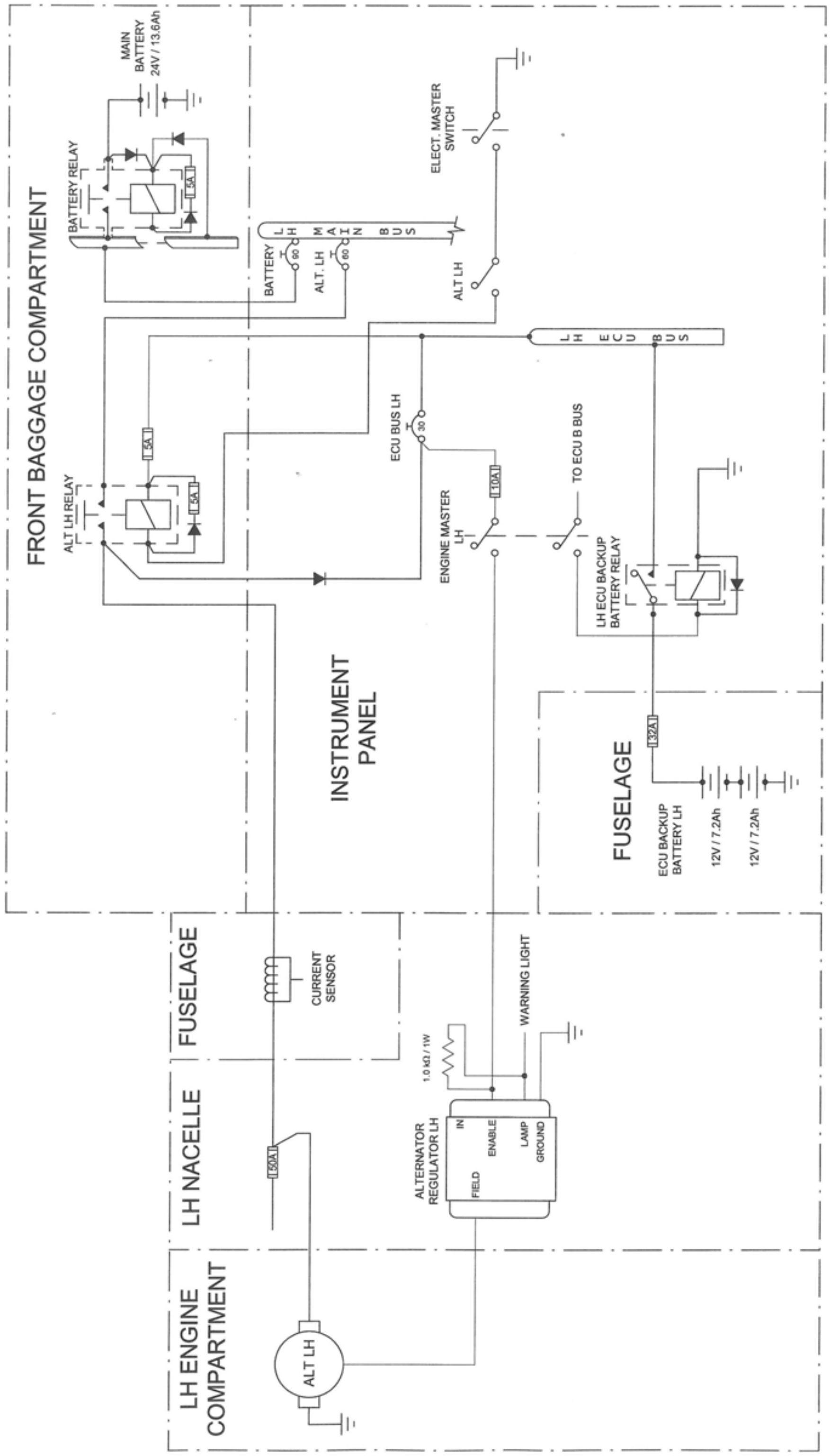

Figure 2: DC Generation Schematic Diagram, if MÄM 42-403 is carried out

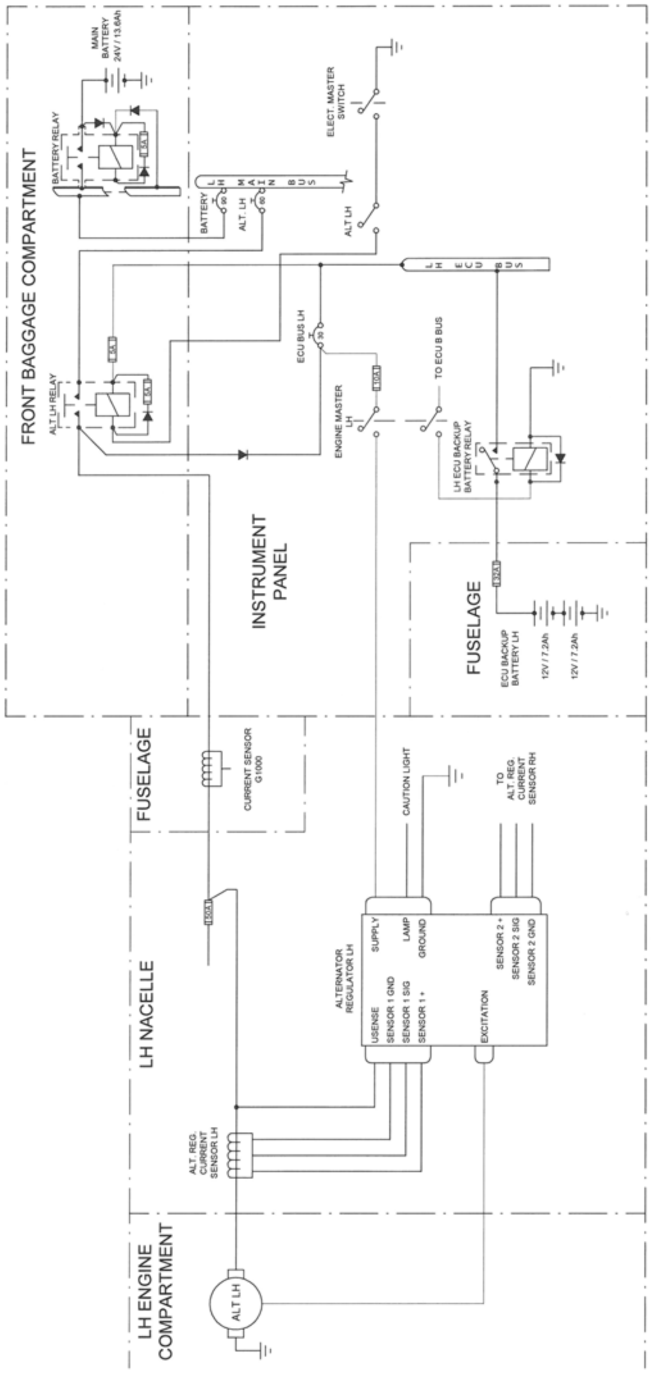

Figure 3: DC Generation Schematic Diagram, if MÄM 42-551 is carried out

2. Description and Operation

Figure 1, 2 and 3 shows the generation system simplified schematic diagram.

A. Alternators

Each engine has an alternator supplied with the engine. Each alternator is 28 VDC machine with a maximum output of 70 Ampere. The alternator is located at the rear left of the engine. A multi-V flat belt drives the alternator. An automatic system keeps the belt at the correct tension.

The alternator has an external regulator which is located in the engine nacelle.

There is no approved maintenance that you can do to the alternator.

B. Alternator Relays

The alternator relays connect the output from each alternator to the related MAIN BUS. Each alternator relay is controlled by a switch located on the instrument panel. The relays are located in the relay box. The relay box is located in the front baggage compartment.

C. Alternator Current Sensors

A current sensor monitors the current flowing in the alternator outputs and indicates them on the Garmin G 1000 system. This current sensor is located below the pilot's seat and monitors the current flow between the alternator and the related alternator relay.

D. Alternator Regulators

Each alternator has an external regulator. The regulator controls the output of the alternator. If MÄM 42-551 is carried out, additional current sensors are installed. These sensors are independent from the sensors for the Garmin G1000 system. They are installed in the LH and RH engine nacelles and connected to the LH alternator regulator only. The LH alternator regulator controls its output depending on the output current of both alternators.

E. ECU Backup Batteries

To support the alternator electrical power supply to the ECUs in case of a malfunction of the main battery, additional sealed-lead-acid batteries (ECU backup batteries) are connected to the RH and LH ECU BUS.

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Trouble-Shooting

1. General

This table tells you how to trouble-shoot the DC generation system. If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
LH or RH alternator warning light illuminated.	Related alternator defective.	Refer to the engine manufacturer.
LH/RH alternator output paralleling insufficient.	Alternator regulators need adjustment (if MÄM 42-551 is not installed).	Refer to the engine manufacturer.

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Maintenance Practices

1. General

This Section tells you how to replace components of the 28 V DC electrical generation system on the airplane. Refer to the components manufacturers' manuals for more data and for shop data.

2. Electrical Safety

The DA 42 NG has a low voltage DC electrical system. When correctly maintained it is safe to do work on. The battery can supply heavy current through low resistance circuits (for example, if you ground the battery positive with a wrench by accident).

Always follow the usual safety practices for working on electrical equipment. Allow only qualified persons to maintain the electrical system.

CAUTION: DISCONNECT THE BATTERIES (MAIN AND ECU BACKUP) BEFORE YOU DO ANY WORK ON THE ELECTRICAL SYSTEM. MAKE SURE THAT YOU DISCONNECT THE NEGATIVE LEAD FIRST.

CAUTION: AFTER DOING ELECTRICAL MAINTENANCE ALWAYS DO A CONFIDENCE TEST OF THE SYSTEM WITH A 24 VOLT POWER SUPPLY THAT HAS OVER-CURRENT PROTECTION. DO THIS BEFORE CONNECTING THE BATTERY.

CAUTION: WHEN OPERATING THE AIRPLANE ELECTRICAL SYSTEM WITH ENGINE MASTER ON (LH OR RH) AND THE ENGINE IS NOT RUNNING (e.g. EVENT LOG READOUT) ALWAYS CONNECT AN EXTERNAL POWER SUPPLY WITH A PRESET VOLTAGE OF 29 V TO THE AIRPLANE. OTHERWISE THE ALTERNATORS MAY BE DAMAGED. ADDITIONALLY, IF MÄM 42-551 IS INSTALLED, SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES.

CAUTION: USE ONLY DA 42 NG SPARE PARTS APPROVED BY THE MANUFACTURER.

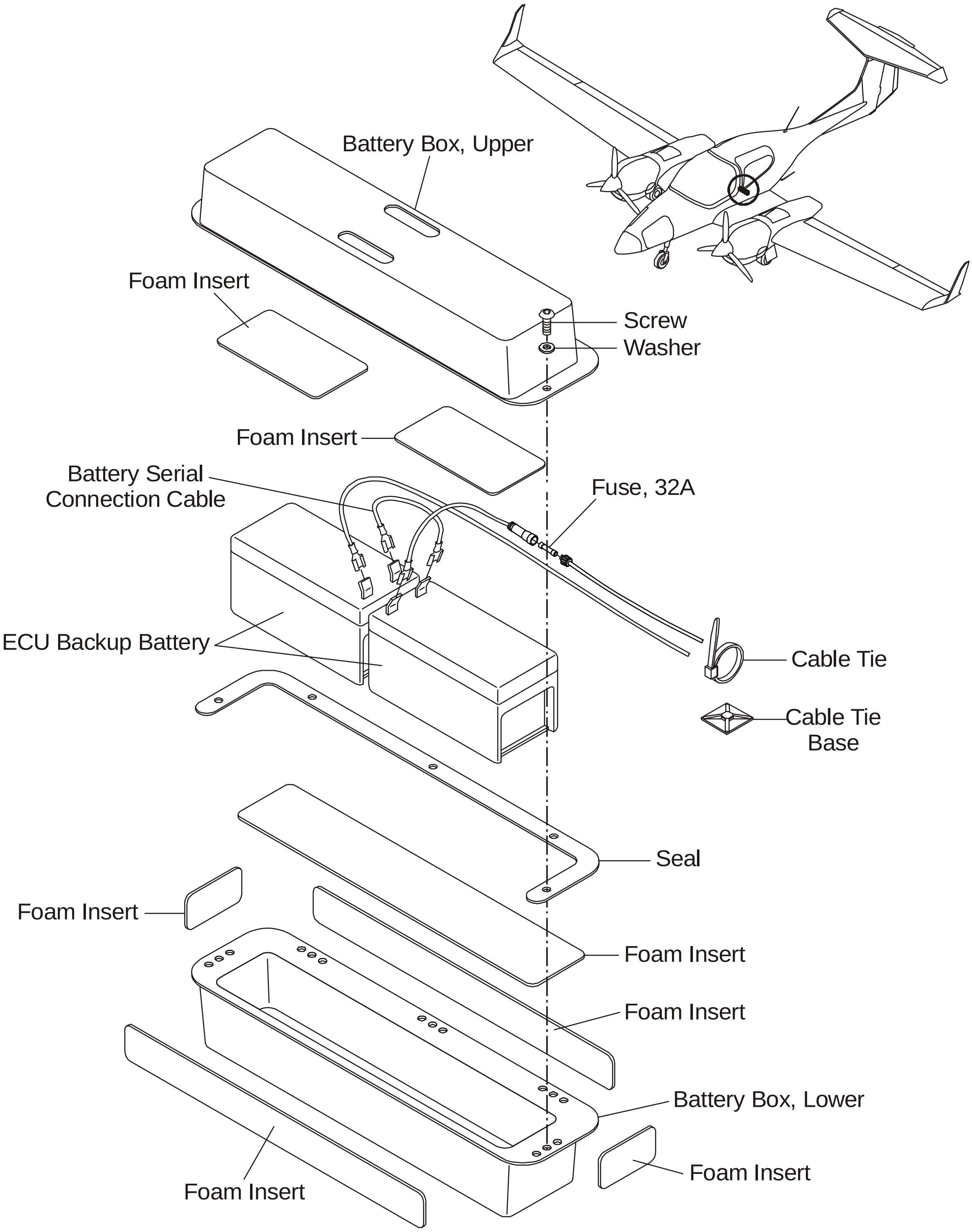

Figure 4: ECU Backup Batteries Installation (RH)

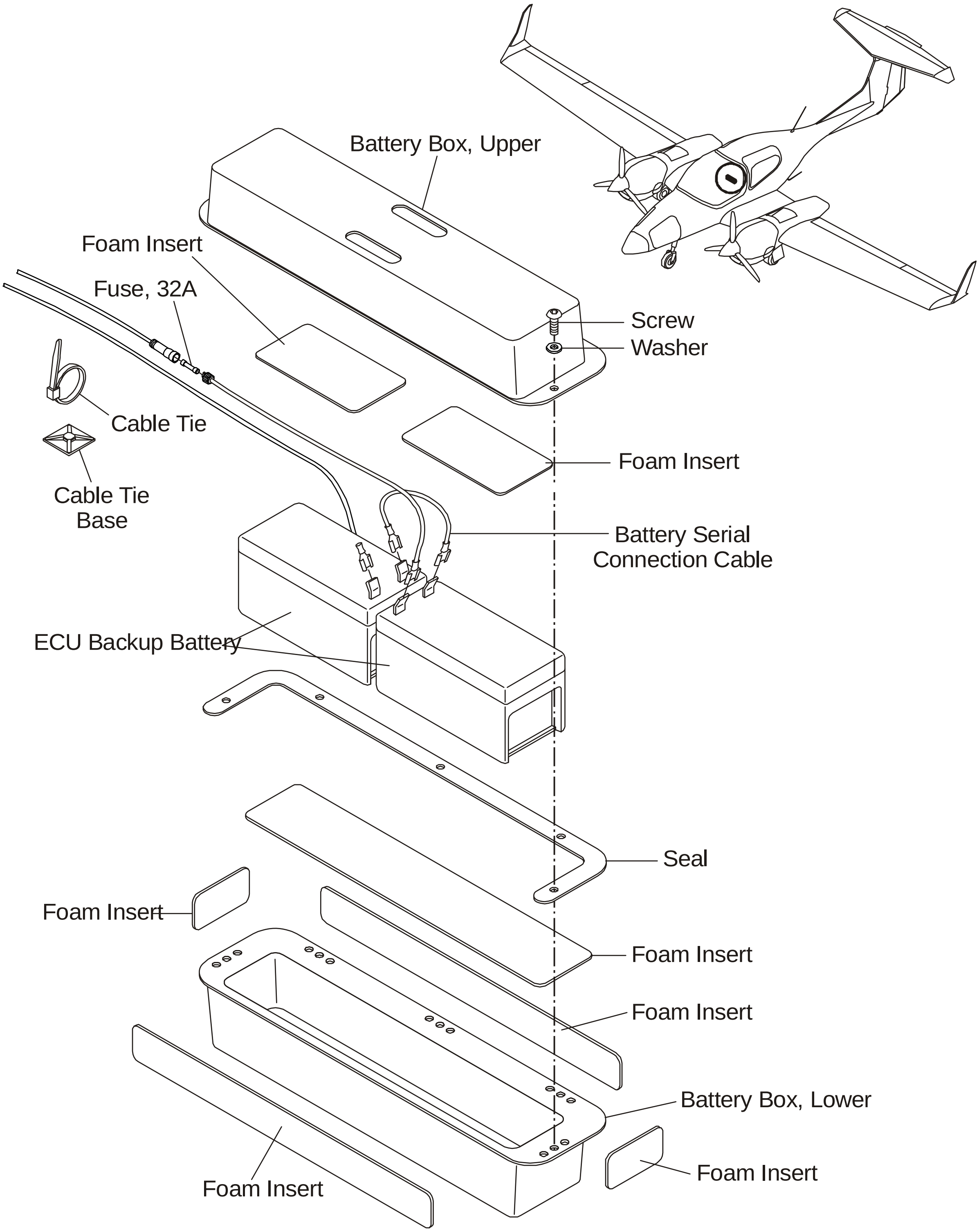

Figure 5: ECU Backup Batteries Installation (LH)

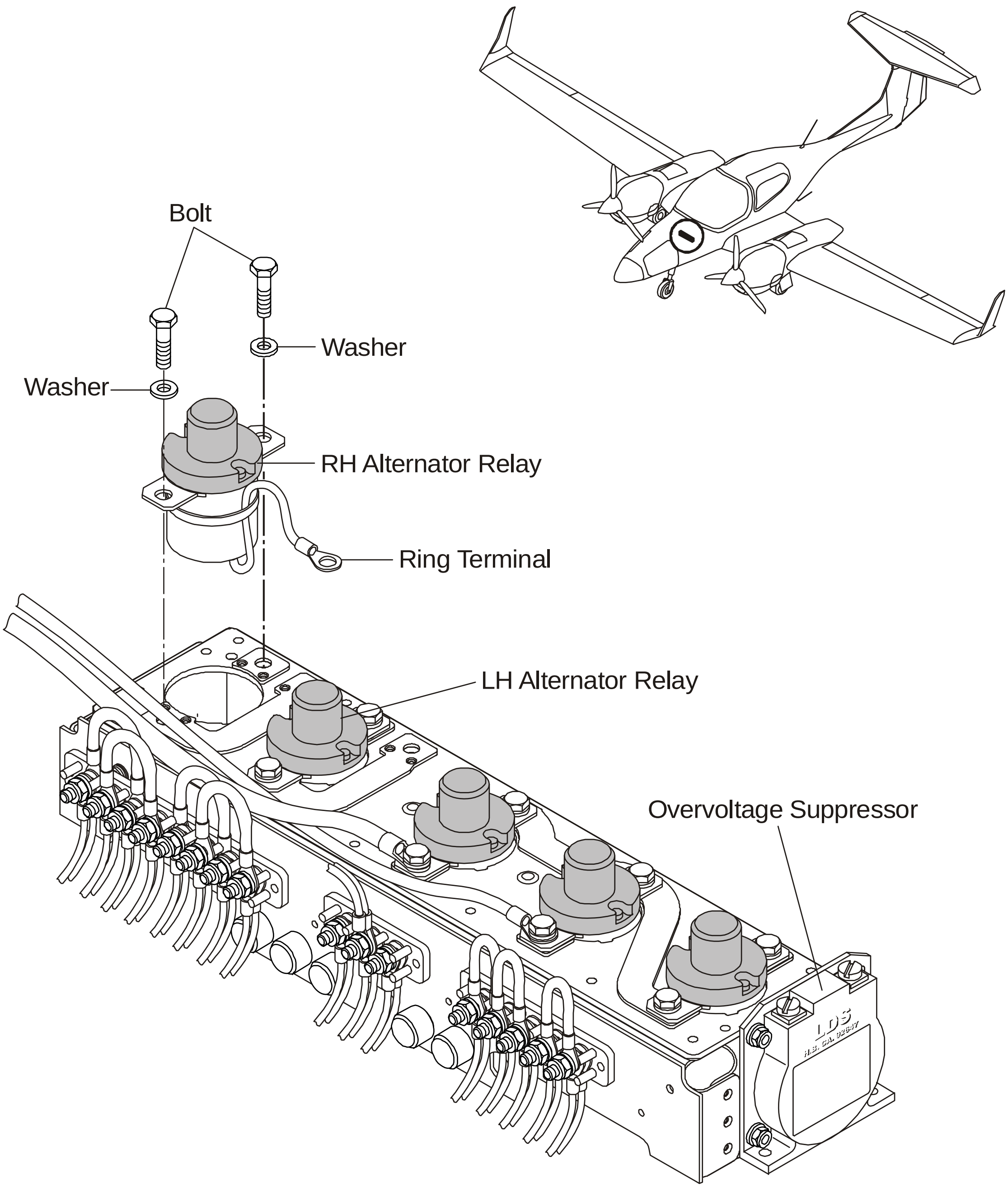

Figure 6: LH/RH Alternator Relay Installation

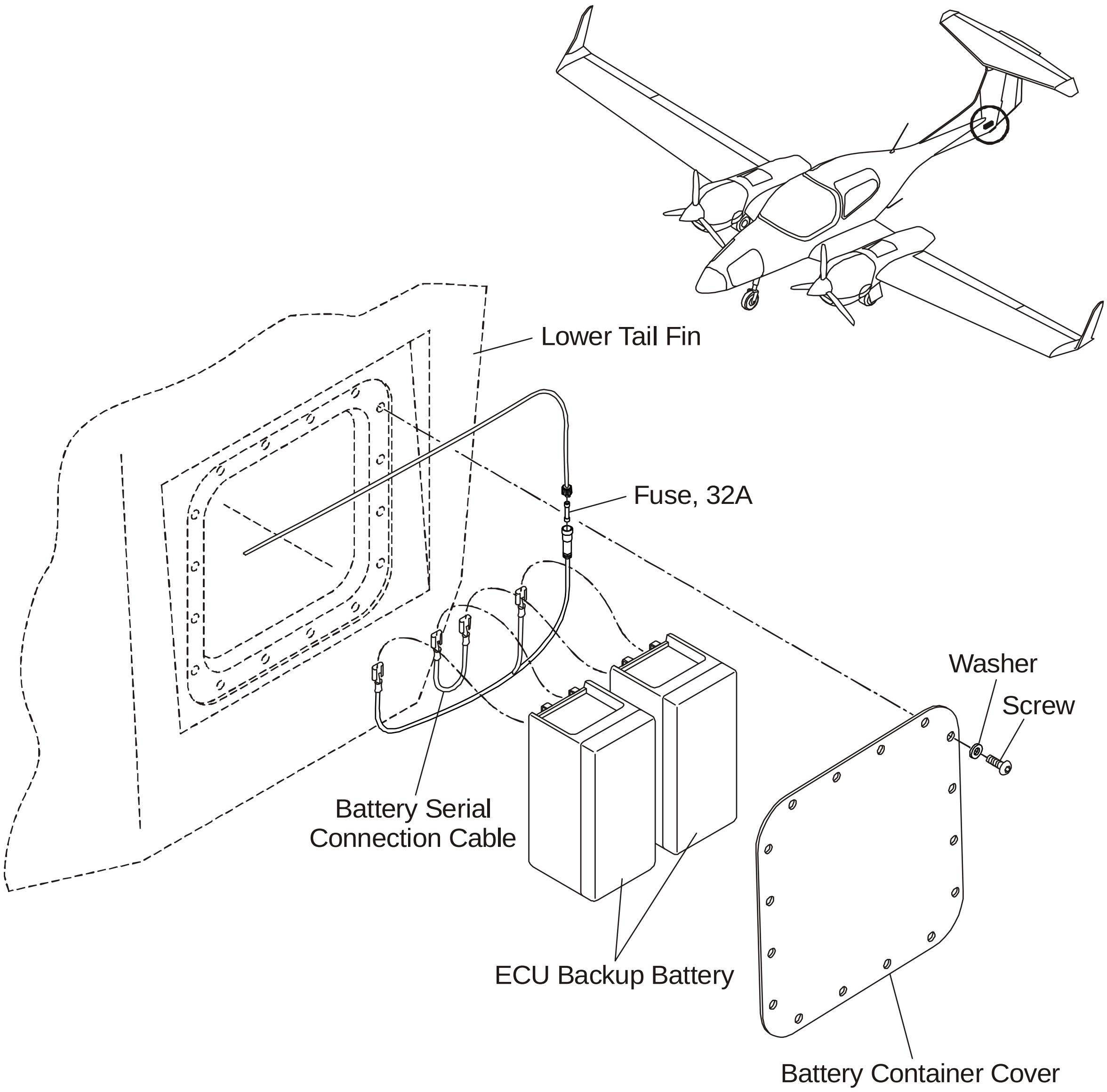

Figure 7: ECU Backup Battery Installation (RH, if OÄM 42-247 is installed)

3. Remove/Install an Alternator Relay

A. Remove an Alternator Relay

Use this procedure for both the LH and the RH alternator relay.

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Remove the baggage compartment rear cover.	
(3)	Disconnect the battery and ECU backup batteries for maintenance.	Refer to Section 24-31.
(4)	Disconnect the LH/RH alternator relay from the RELAY BOX BUS bar: – Remove the bolts and washers that attach the relay to the RELAY BOX BUS bar.	
(5)	Disconnect the electrical cables from the external relay terminals.	
(6)	Remove the LH/RH alternator relay: – Lift the LH/RH alternator relay clear of the relay box.	

B. Install an Alternator Relay

	Detail Steps/Work Items	Key Items/References
(1)	Move the LH/RH alternator relay into position at the relay mounting and connect the control cables to the terminal block.	Check for correct polarity.
(2)	Lower the relay into position at the relay mounting.	
(3)	Connect the LH/RH alternator relay to the RELAY BOX BUS bar: – Install the washers and bolts that attach the relay to the RELAY BOX BUS bar.	
(4)	Connect the main battery and ECU backup batteries.	Refer to Section 24-31.
(5)	Install the baggage compartment rear cover.	
(6)	Close and secure the front baggage compartment door.	Refer to Section 52-40.
(7)	Do a test for the correct operation of the LH/RH alternator relay: – Do a ground run up of the related engine. – Make sure that the alternator comes online. – Shut down the related engine.	 Refer to Section 71-00. Refer to Section 71-00.

4. Remove/Install an ECU Backup Battery

A. Remove the ECU Backup Batteries

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Remove the baggage compartment rear cover.	
(3)	Disconnect the airplane main battery.	Refer to Section 24-31.
(4)	Remove the ECU backup batteries: – Remove the passenger seats. – Disconnect the negative cable from the batteries that you will remove. – Disconnect the positive cable from the batteries that you will remove. – Disconnect the serial connection cable from the batteries that you will remove. – Release the battery pack hold cover. – Move the related batteries clear of the airplane.	Refer to Figure 4 and 5. Refer to Section 25-10.
(5)	Remove the RH ECU backup batteries (if OÄM 42-247 is installed): – Remove the 14 screws and washers of the battery container cover in the lower tail fin. – Remove the battery container cover. – Move the ECU batteries slightly out of the lower tail fin to gain access to the terminals of the batteries. – Disconnect the negative cable from the batteries. – Disconnect the serial connection cable. – Remove the batteries from the airplane.	Refer to Figure 7.

B. Install the ECU Backup Batteries

	Detail Steps/Work Items	Key Items/References
(1)	Move the batteries into position in its mounts.	
(2)	Install the battery pack hold cover.	
(3)	Connect the related batteries: – Connect the serial connection cable to the batteries that you will install. – Connect the positive cable to the batteries that you installed. – Connect the negative cable to the batteries that you installed. – Install the passenger seats.	 Refer to Section 25-10.
(4)	Install the RH ECU backup batteries (if OÄM 42-247 is installed): – Move the ECU backup batteries slightly into the lower tail fin. – Connect the serial connection cable to the batteries. – Connect the positive cable to the positive terminal of the batteries. – Connect the negative cable to the negative terminal of the batteries. – Move the batteries in place in the lower tail fin. – Install the battery container cover with the 14 screws and washers.	Refer to Figure 7.
(5)	Connect the airplane main battery.	Refer to Section 24-31.
(6)	Install the baggage compartment rear cover.	
(7)	Close and secure the front baggage compartment door.	Refer to Section 52-40.

	Detail Steps/Work Items	Key Items/References
(8)	Do an engine ground run-up.	Make sure that the electrical system operates correctly.

Section 24-31
Battery Systems

1. General

This Section tells you about the battery systems for the DA 42 NG airplane. See Section 24-00 and 24-30 for the description and operation of the batteries in the electrical generation system.

The DA 42 NG has these battery systems:

– A main battery located in the front baggage compartment. This battery provides the usual airplane electrical services.

– ECU backup batteries.

2. Main Battery Description and Operation

The main battery is a 24 V, 13.6 Ah sealed battery. A battery tray located on the forward face of the cockpit bulkhead holds the battery. You can access the battery through the front baggage compartment, right side after removing the baggage compartment rear cover. A clamp and two bolts hold the battery in position. The positive and negative cables attach to terminals on the top of the battery, at the front. The usual rubber caps protect the electrical connections.

When either, or both of the engine alternators are online and the system voltage is greater than the battery voltage, the system charges the battery.

When either or both alternators are on-line the integrated cockpit system (ICS) display shows each alternator voltage. When both alternators are offline, the ICS display shows the battery voltage.

The battery supplies current to the RELAY BOX BUS through the battery relay. There is no circuit protection. The RELAY BOX BUS also supplies power to the LH MAIN BUS, RH MAIN BUS and the hydraulic pump. Each of the main bus systems are protected by 90 Ampere circuit breakers. The landing gear extension and retraction system is protected by a 50 Ampere fuse.

The battery also supplies the HOT BUS.

Regular maintenance of the battery system is necessary. Do not wait until a problem occurs.

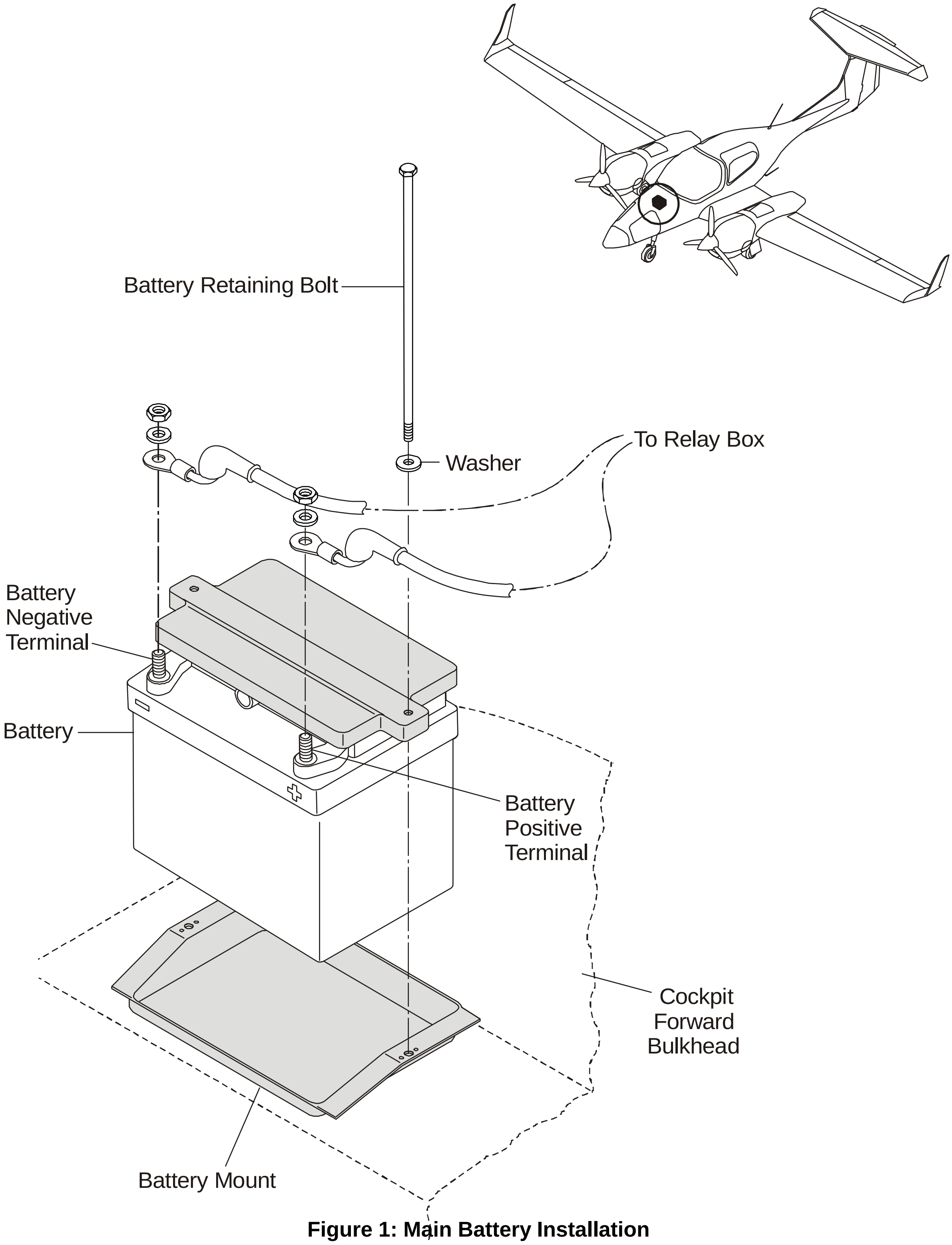

Figure 1: Main Battery Installation

Trouble-Shooting

1. General

This table tells you how to trouble-shoot the battery system. If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
Main battery voltage low.	Battery capacity low.	Do a capacity test. If necessary, replace the battery.
	Alternator(s) low output.	Trouble-shoot the alternator(s). Refer to Section 24-30.
Main battery will not connect to the RELAY BUS.	Battery relay defective.	Replace the battery relay.
	ELECT. MASTER switch defective.	Replace the ELECT. MASTER switch.
	Battery system wiring defective.	Do test of the battery system wiring. Refer to Chapter 92 for the wiring diagrams.
Ammeter on ICS display shows zero at all times for LH or RH alternator.	Defective transducer.	Replace the related transducer.
	Alternator regulator needs adjustment (if MÄM 42-551 is not installed).	Refer to the engine manufacturer.
Voltmeter on ICS display shows zero with the ELECT. MASTER switch set to ON.	Defective voltmeter.	Trouble-shoot the ICS.
	Defective wiring in the voltmeter system.	Do a test of the wiring. Refer to Chapter 92 for the wiring diagrams.

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Maintenance Practices

1. General

Keep the battery clean. Remove the grease and other contaminants from the battery case. Remove dirt from the area of the terminals. Protect the terminals and cable lugs with Dow Corning compound 4 (DC4).

If you do not use the airplane regularly you must remove the battery for charging.

CAUTION: INSTALL ONLY A BATTERY WHICH IS APPROVED BY THE AIRPLANE MANUFACTURER.

2. Safety Precautions

Obey the instructions of the battery manufacturer.

Always disconnect the battery before you do work on the airplane electrical system. You must disconnect the negative cable first. Connect the negative cable last.

3. Remove/Install the Main Battery

A. Remove the Main Battery from the Airplane

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Remove the baggage compartment rear cover.	
(3)	Disconnect the negative cable from the battery: – Pull back the rubber boot from the cable end. – Remove the bolt and washer that attaches the negative cable to the battery terminal. – Move the negative cable clear of the battery terminal.	Refer to Figure 1.
(4)	Disconnect the positive cable from the battery: – Pull back the rubber boot from the cable end. – Remove the bolt and washer that attaches the positive cable to the battery terminal. – Move the positive cable clear of the battery terminal.	
(5)	Remove the battery retaining clamp: – Remove the 2 bolts and washers that hold the battery clamp. – Remove the battery clamp.	
(6)	Remove the battery from the airplane.	

B. Install the Main Battery in the Airplane

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the battery is clean and dry.	
(2)	Move the battery into position in the battery tray.	Refer to Figure 1.
	CAUTION: MAKE SURE THAT YOU CONNECT THE CABLES TO THE CORRECT TERMINALS. INCORRECT CONNECTION CAN DAMAGE THE ELECTRICAL AND AVIONICS SYSTEMS.	
(3)	Connect the positive cable to the positive terminal of the battery: – Move the cable end fitting into place over the positive battery terminal. – Install the washer and bolt that attaches the cable to the battery terminal. – Move the rubber boot into position over the cable end.	
(4)	Connect the negative cable to the negative terminal of the battery: – Move the cable end fitting into place over the negative battery terminal. – Install the washer and bolt that attaches the cable to the battery terminal. – Move the rubber boot into position over the cable end.	
(5)	Install the battery clamp: – Move the battery clamp into position over the battery cover. – Install the washers on the battery clamp bolts. – Install and tighten the battery clamp bolts.	Tighten the bolts equally.
(6)	Install the baggage compartment rear cover.	
(7)	Close and secure the front baggage compartment door.	Refer to Section 52-40.

4. Disconnect/Connect the Main Battery for Maintenance

A. Disconnect the Main Battery for Maintenance

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Remove the baggage compartment rear cover.	
(3)	Disconnect the negative cable from the battery: – Pull back the rubber boot from the cable-end. – Remove the bolt and washer that attaches the negative cable to the battery terminal. – Move the negative cable clear of the battery terminal.	Refer to Figure 1.
(4)	Disconnect the positive cable from the battery: – Pull back the rubber boot from the cable-end. – Remove the bolt and washer that attaches the positive cable to the battery terminal. – Move the positive cable clear of the battery terminal.	

B. Connect the Main Battery after Maintenance

	Detail Steps/Work Items	Key Items/References
CAUTION:	MAKE SURE THAT YOU CONNECT THE CABLES TO THE CORRECT TERMINALS. INCORRECT CONNECTION CAN DAMAGE THE ELECTRICAL AND AVIONICS SYSTEMS.	
(1)	Connect the positive cable to the positive terminal of the battery: – Move the cable end fitting into place over the positive battery terminal. – Install the washer and bolt that attaches the cable to the battery terminal. – Move the rubber boot into position over the cable end.	Refer to Figure 1.
(2)	Connect the negative cable to the negative terminal of the battery: – Move the cable end fitting into place over the negative battery terminal. – Install the washer and bolt that attaches the cable to the battery terminal. – Move the rubber boot into position over the cable end.	
(3)	Remove the baggage compartment rear cover.	
(4)	Close and secure the front baggage compartment door.	Refer to Section 52-40.

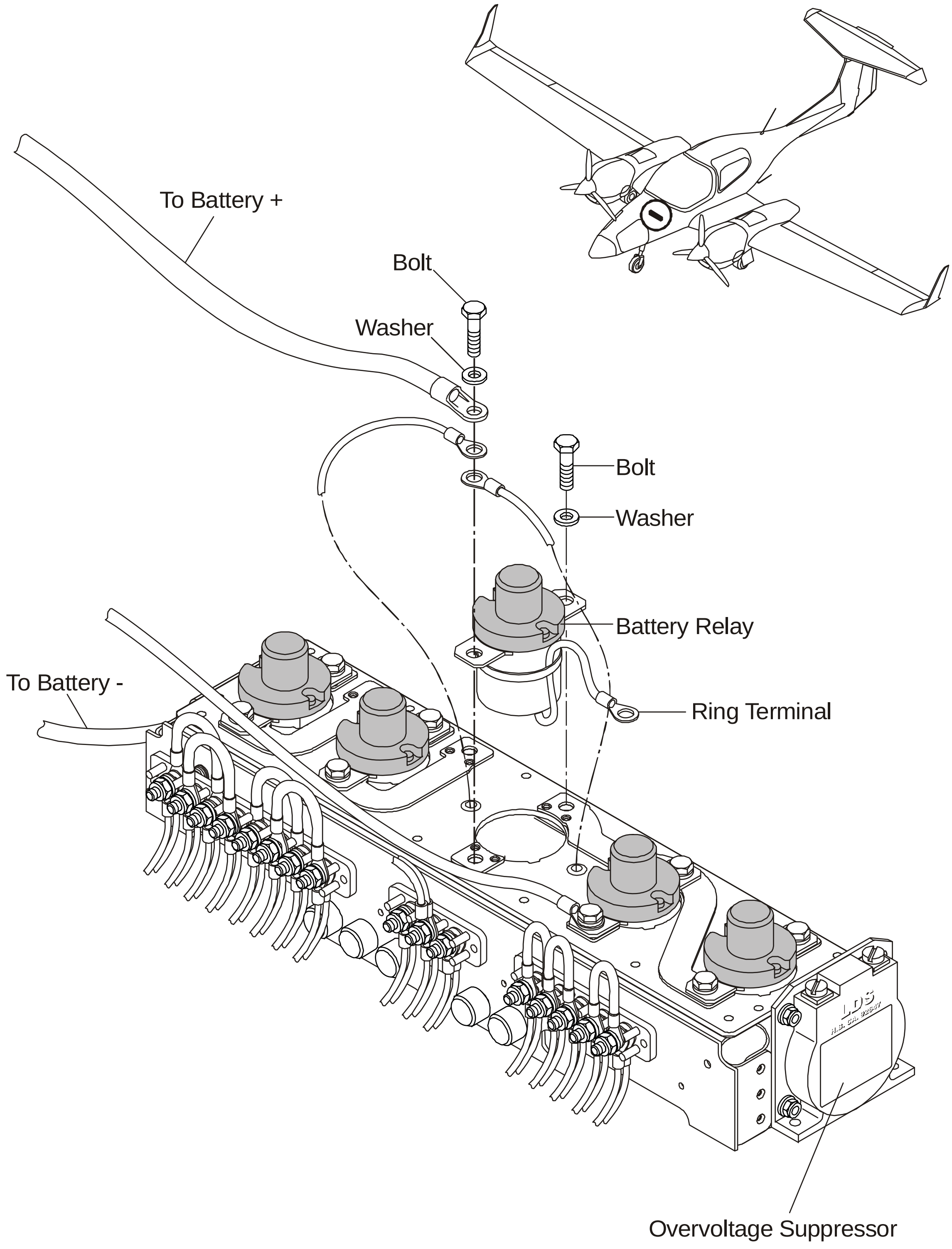

Figure 2: Main Battery Relay Installation

5. Remove/Install the Battery Relay

A. Remove the Battery Relay

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Remove the baggage compartment rear cover.	
(3)	Disconnect the battery for maintenance.	Refer to Paragraph 4 (A).
(4)	Disconnect the positive cable from the battery relay: – Remove the bolt and washer from the terminal of the battery relay. – Move the positive cable clear of the relay. – Move the 2 smaller cables clear of the relay terminal.	
(5)	Disconnect the battery relay from the RELAY BOX BUS bar: – Remove the bolt and washer that attaches relay to the RELAY BOX BUS bar.	Refer to Figure 2.
(6)	Disconnect the electrical cables from the terminal block.	
(7)	Remove the battery relay: – Lift the battery relay clear of the relay box.	

B. Install the Battery Relay

	Detail Steps/Work Items	Key Items/References
(1)	Move the relay into position at the relay mounting and connect the control cables to the terminal block.	Check for correct polarity.
(2)	Lower the battery relay into position at the relay mounting.	
(3)	Connect the battery relay to the RELAY BOX BUS bar: – Install the washer and bolt that attaches the relay to the RELAY BOX BUS bar.	
(4)	Connect the battery positive cable and the 2 smaller cables to the battery relay coil terminal: – Move the 2 smaller cables into position at the battery relay. – Move the battery positive cables into position at the battery relay. – Install the bolt and washer that attaches the cables to the relay through all 3 cables and into the relay mounting.	Refer to the wiring diagrams in Chapter 92.
(5)	Connect the main battery.	Refer to Paragraph 4 (B).
(6)	Install the baggage compartment rear cover.	
(7)	Close and secure the front baggage compartment door.	Refer to Section 52-40.

6. Starter Relay Functional Test

Do this test in an area where the engine can be run.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to ON.	
(2)	Set the LH or RH ENGINE MASTER to ON.	
	WARNING: MAKE SURE THAT THE AREA OF THE PROPELLERS IS CLEAR BEFORE YOU OPERATE THE STARTER MOTOR. PROPELLERS CAN CAUSE INJURY OR DEATH.	
(3)	Turn the key of the START switch to the engine for the ENGINE MASTER switch that you set to ON in step 2.	The engine starter motor must operate. You do not have to start the engine.
(4)	Turn the key of the START switch to OFF.	
(5)	Set the ENGINE MASTER switch that you set on in step 2 to OFF.	
(6)	Set the ELECT. MASTER switch to OFF.	

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Section 24-32
Emergency Power

1. General

This Section tells you about the emergency battery system for the DA 42 NG airplane. Regular maintenance of the emergency battery system is necessary. Figure 1 shows the main components of the emergency power system.

Refer to Chapter 92 for the wiring diagrams.

2. Description

The emergency battery system consists of:

– An emergency battery pack.

– A sealed HORIZON EMERGENCY switch.

The emergency battery pack consists of 10 lithium manganese batteries, 3 V, 1,300 mAh. Refer to the Equipment List in Section 6.5 of the Airplane Flight Manual for the approved battery pack type.

If MÄM 42-1025 is installed, the batteries are located in a plastic battery box. All used cells must be replaced by a set of new cells with identical expiry dates.

The emergency battery pack is mounted behind the instrument panel, on the pilot's side.

When all other sources of electrical power fail during flight, the EMERGENCY HORIZON switch on the top of the instrument panel is set to ON to use the emergency battery. It supplies the backup attitude gyro (horizon), or standby attitude module (if OÄM 42-270 is installed) and the flood light with power for at least 1 hour and 30 minutes.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the emergency battery system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Batteries leaking.	Batteries expired.	Replace battery pack. If MÄM 42-1025 is installed: replace all battery cells. All used cells must be replaced by a set of new cells with identical expiry date, update placard on cover. Clean all items that are contaminated.
Voltage on the back side of the emergency switch less than 30.0 V.	Batteries expired.	Replace battery pack. If MÄM 42-1025 is installed: replace all battery cells. All used cells must be replaced by a set of new cells with identical expiry date, update placard on cover.
	Batteries have been used.	Replace battery pack. If MÄM 42-1025 is installed: replace all battery cells. All used cells must be replaced by a set of new cells with identical expiry date, update placard on cover.
	Emergency battery system wiring defective.	Repair the emergency battery system wiring.
	If MÄM 42-1025 is installed: Batteries installed incorrectly in battery box.	Install battery cells, correctly.

Note: Expiration date must be the same on all cells and at least five years in the future at time of installation in airplane.

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Maintenance Practices

1. General

This Section tells you how to replace the emergency battery pack. It also tells you how to test the emergency battery system.

Refer to Chapter 92 for the wiring diagrams.

2. Remove/Install the Emergency Battery Pack

A. Remove the Emergency Battery Pack

	Detail Steps/Work Items	Key Items/References
(1)	Remove the instrument panel cover.	Refer to Section 25-10.
(2)	Disconnect the electrical plug of the battery pack.	Refer to Figure 1.
(3)	Remove the GEA 71/B of its mounting rack.	
(4)	Remove the two screws and nuts of the battery pack.	Hold the battery pack.
(5)	Remove the battery pack clear of the airplane.	
(6)	If MÄM 42-1025 is installed: Remove all battery cells from the plastic battery box.	Refer to Figure 1.

CAUTION: THE BATTERY PACKS CANNOT BE RE CHARGED. DO NOT TRY TO RECHARGE THE BATTERY PACKS. IF YOU TRY TO RECHARGE THE BATTERY PACKS, THEY CAN EXPLODE OR LEAK.

CAUTION: DISPOSE OF THE BATTERY PACKS PROPERLY (ASK YOUR BATTERY DEALER FOR ADVISE). BATTERIES CONTAIN POISONS WHICH HARM THE ENVIRONMENT. DO NOT THROW THE USED BATTERY PACKS INTO THE GARBAGE. DO NOT EXPOSE BATTERIES TO FIRE. DO NOT DISMANTLE BATTERY PACKS.

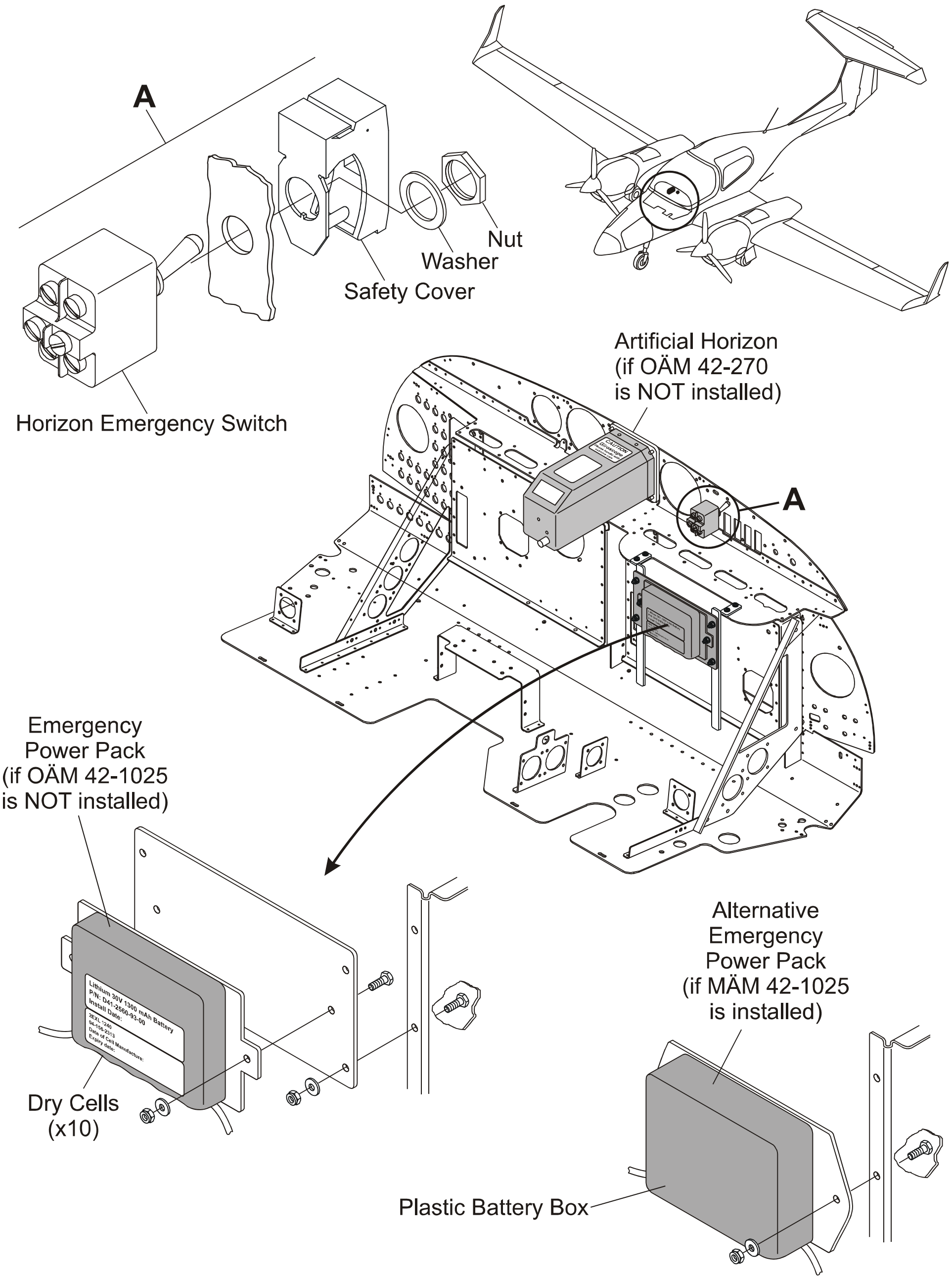

Figure 1: Emergency Battery Pack

B. Install the Battery Pack

CAUTION: USE ONLY NEW BATTERY PACKS. REFER TO THE EQUIPMENT LIST IN THE AIRPLANE FLIGHT MANUAL, SECTION 6.5, FOR THE CORRECT BATTERY TYPE.

CAUTION: DO NOT SHORT CIRCUIT THE BATTERY PACK.

	Detail Steps/Work Items	Key Items/References
(1)	If MÄM 42-1025 is installed, install the battery cells in the plastic battery pack. Apply Electrolube SGB Contact Treatment Grease 2x on all cell contacts. Always use new, unused battery cells. All battery cells must have the same expiry date. All battery cells must have an output voltage of at least 3.0 V each.	Make sure that the cells are installed correctly.
(2)	Measure the voltage of the battery pack.	On the connector for the electrical plug. If the voltage is less than 30 V, then the batteries are used. Use a new battery pack.
(3)	Put the battery pack in place in the instrument panel on the pilot's side.	
(4)	Install the two screws and nuts of the battery pack.	
(5)	Connect the electrical plug of the battery pack.	Ensure correct polarity.
(6)	Install the GEA 71/B.	
(7)	Measure the voltage on the back side of the EMERGENCY HORIZON switch.	If the voltage is below 30 V, it is probable that the wiring is defective. Repair wiring.
(8)	Install the instrument panel cover.	Refer to Section 25-10.

Note: Update date on placard on battery box cover, when cells are replaced.

Note: Expiration date must be the same on all cells and at least five years in the future at time of installation in airplane.

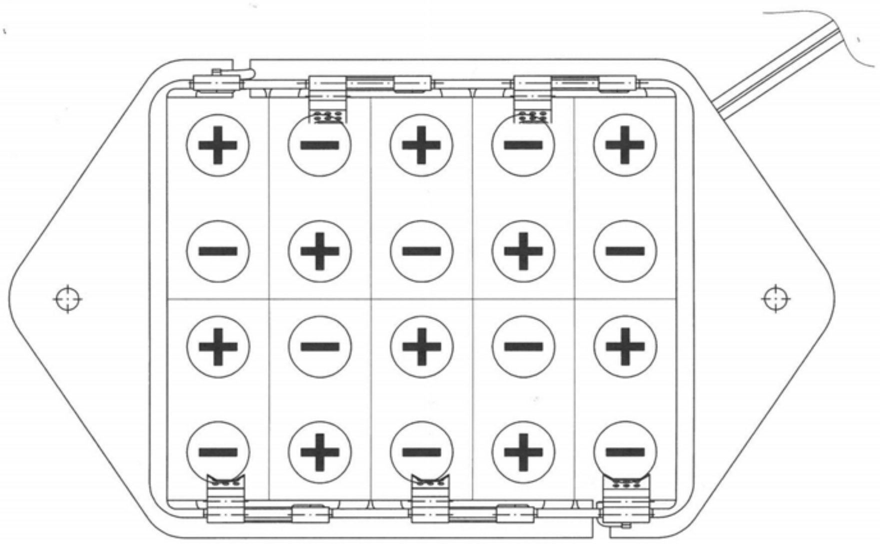

Figure 2: Battery Cell Orientation (Top View)

Section 24-33
Additional Alternator

1. General

If OÄM 42-204 is carried out, an additional alternator is installed on the LH engine. The additional alternator generates electrical DC - power for optional airplane equipment. The additional alternator and its consumers form an additional electrical system which is not connected to the airplanes standard electrical system.

The additional alternator system has the following components:

- Alternator.
- Alternator fuse.
- Voltage regulator.
- Excitation battery.
- AUX POWER switch.

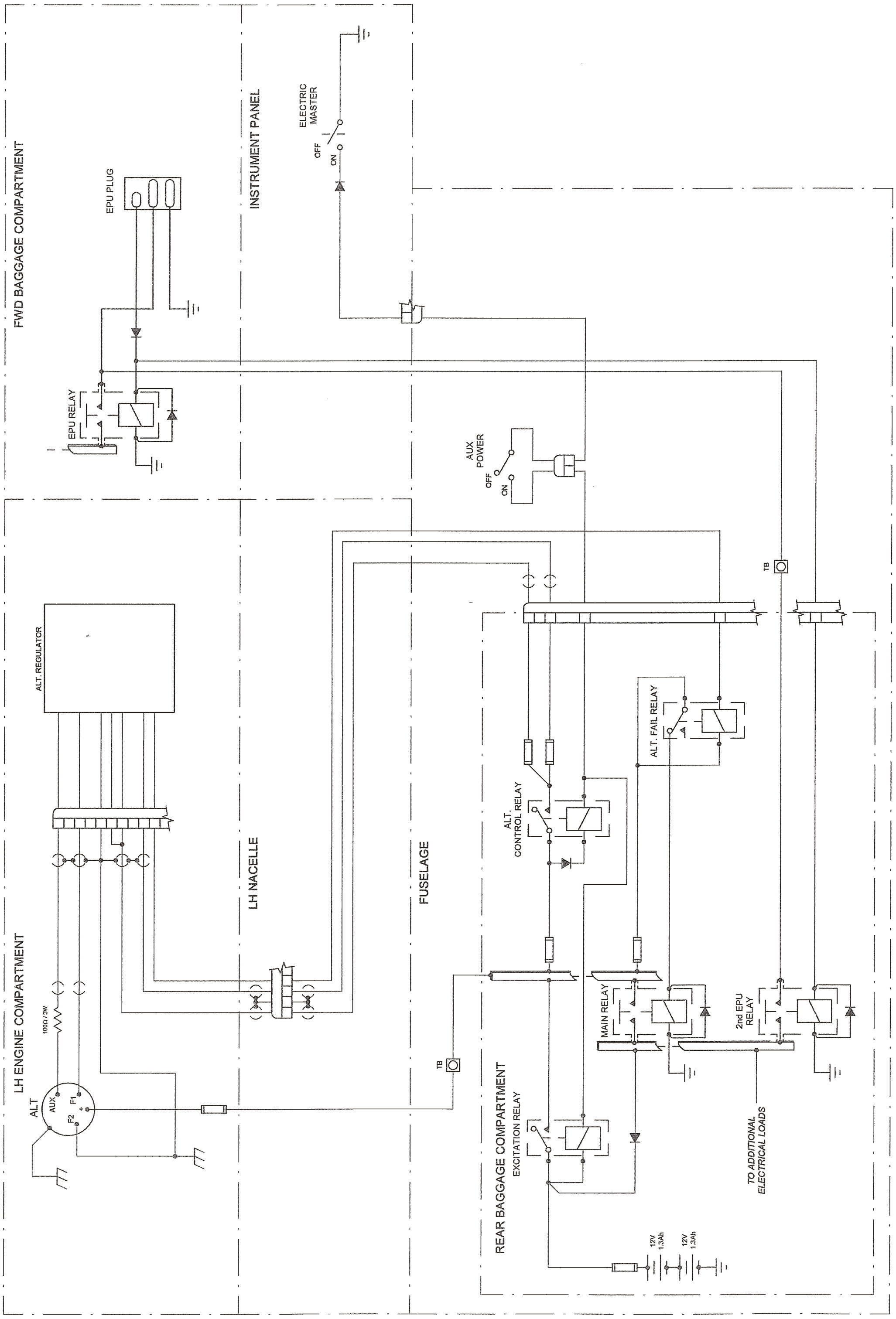

Figure 1: Additional Alternator Electrical System Schematic Diagram

2. Description and Operation

Figure 1 shows the additional alternator electrical system schematic diagram.

A. Additional Alternator

The additional alternator is mounted to the LH engine gearbox and to the RH forward engine mounting arm. The alternator is driven via a v-belt and generates up to 100 A at 28 V. The alternator has an external voltage regulator.

There is no scheduled maintenance for the additional alternator. If the additional alternator fails, it must be replaced.

B. Additional Alternator Excitation Battery

A separately installed small battery is used for the excitation of the additional alternator.

C. Alternator Fuse

A 100 A fuse is located in the engine compartment.

D. Additional Alternator Regulator

The alternator regulator is located in the engine compartment. It measures the alternator output voltage and controls the current through the alternator field coils via a pulse-width modulated signal. To keep the output voltage stable at all load and speed conditions, the alternator field signal is modulated accordingly.

The AUX POWER switch controls the circuit to the alternator regulator.

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Trouble Shooting

1. General

The table below lists the defects you could have in the additional alternator electrical system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Alternator provides no electrical power.	Alternator defective.	Replace alternator.
	Voltage regulator defective.	Replace voltage regulator.
	Alternator fuse open.	Replace fuse.
	Alternator control fuse open.	Replace fuse.
	Alternator v-belt loose/broken.	Adjust/replace the v-belt. Refer to Section 61-10.

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Maintenance Practices

1. General

This Section provides instructions how to remove/install and adjust the components of the additional 28 VDC electrical generating system. Refer to the component manufacturers' manuals for more detailed information and instructions.

2. Electrical Safety

The additional electrical system is a low voltage DC system. When correctly maintained it is safe to work on.

Always follow the usual safety practices for working on electrical equipment. Allow only qualified persons to maintain the electrical system.

Maintenance carried out must be of good workmanship strictly considering the guidelines of AC 43-13.1B. It is important that maintenance is carried out in accordance with the best available techniques and properly trained maintenance personnel, in order to eliminate possible failures.

CAUTION: AFTER DOING ELECTRICAL MAINTENANCE ALWAYS DO A CONFIDENCE TEST OF THE SYSTEM WITH A 24 VOLT POWER SUPPLY THAT HAS OVER-CURRENT PROTECTION. DO THIS BEFORE CONNECTING THE BATTERY.

CAUTION: USE ONLY DA 42 NG SPARE PARTS APPROVED BY THE MANUFACTURER.

3. Remove/Install the AUX POWER Switch

A. Remove the AUX POWER Switch

	Detail Steps/Work Items	Key Items/References
(1)	Remove the console from the LH sidewall.	Refer to Section 25-10.
(2)	Unplug the electrical connector of the AUX POWER switch.	
(3)	Remove the nut and washer of the AUX POWER switch.	Note the orientation of the switch.
(4)	Move the AUX POWER switch clear of the console.	

B. Install the AUX POWER Switch

	Detail Steps/Work Items	Key Items/References
(1)	Position the AUX POWER switch in place in the console.	Verify correct orientation of the switch.
(2)	Insert the washer and the nut of the AUX POWER switch. Tighten the nut.	
(3)	Install the electrical connectors on the AUX POWER switch.	
(4)	Install the console on the LH sidewall.	Refer to Section 25-10.

4. Remove/Install the Additional Alternator Regulator

A. Remove the Voltage Regulator

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINES ARE SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR REGULATOR. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Remove the LH engine upper cowling.	Refer to Section 71-10.
(3)	Disconnect the voltage regulator wiring harness.	Refer to Figure 4.
(4)	Remove the two attachment bolts with the two bushings of the regulator.	
(5)	Move the voltage regulator clear of the airplane.	

B. Install the Voltage Regulator

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINES ARE SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR REGULATOR. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Position the alternator regulator on the regulator mounting bracket.	Refer to Figure 4.
(3)	Install the two bolts with the two bushings which attach the alternator regulator on the regulator mounting bracket.	
(4)	Connect the electrical wiring harness to the alternator regulator.	Refer to Section 24-33.
(5)	Install the LH engine upper cowling.	Refer to Section 71-10.
(6)	Do an engine run-up. Do a test for correct operation of the regulator.	Refer to Section 71-00.

Section 24-40
External Power

1. General

The DA 42 NG has an external power socket located on the lower surface of the fuselage nose section. It is a standard 28 V DC power socket. When you connect external power to the external power socket, the external power control relay is energized and the external power comes online.

2. Description

Figure 1 shows a simple schematic diagram of the external power system. The external power system has these components:

A. 28 Volt Socket

The 28 V DC power socket is located on the lower surface of the fuselage nose section. The socket has 3 pins:

– A large negative pin.

– A large positive pin.

– A small positive pin.

A diode connected between the small positive pin and the external power relay solenoid protects the system from reverse polarity.

B. External Power Relay

The external power relay is located in the relay box mounted on the forward face of the cockpit front bulkhead. You can access the relay box through the front baggage compartment. A heavy duty cable connects the large positive pin to the input terminal of the relay. Another heavy duty cable connects the large negative pin to a ground point.

The small positive pin connects to the solenoid of the external power relay via the diode.

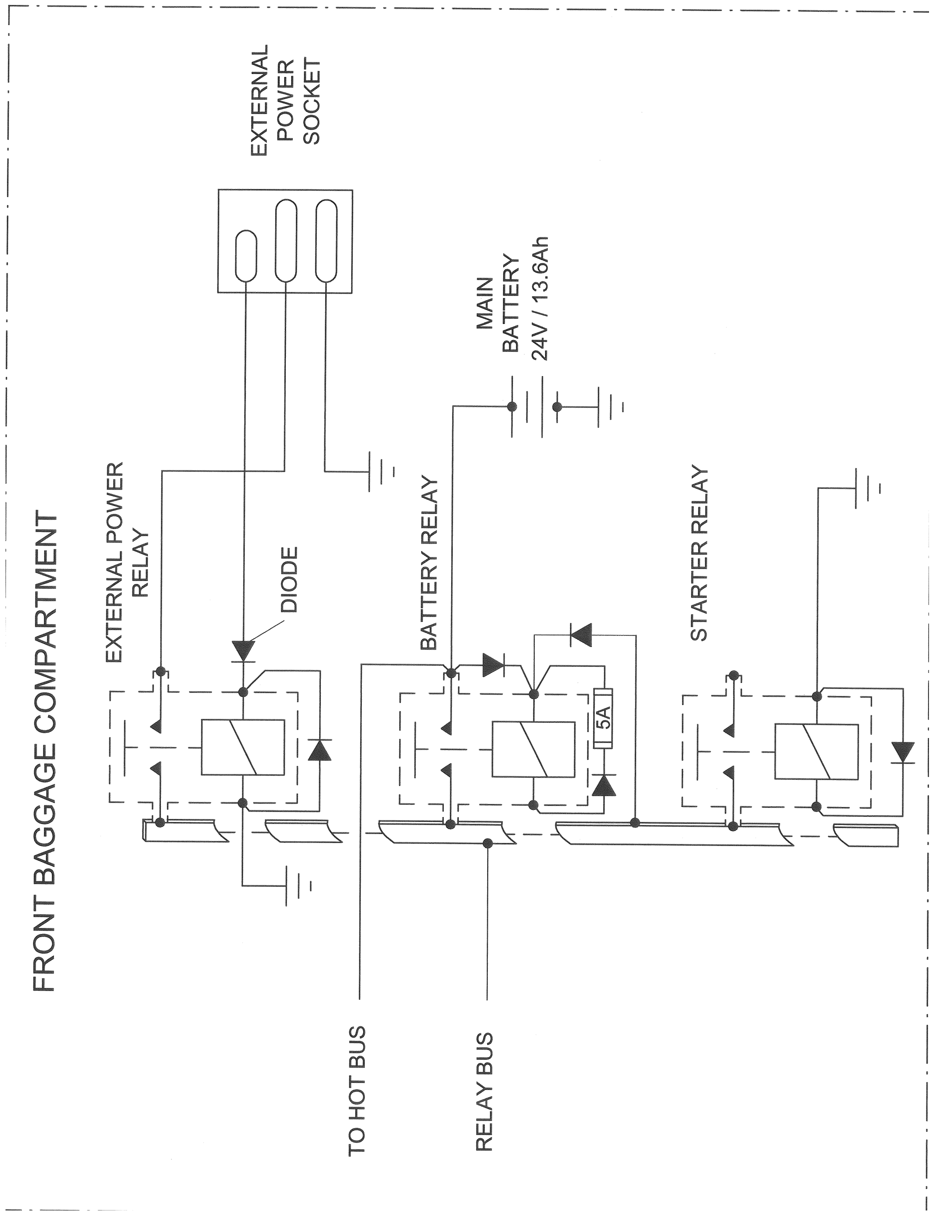

Figure 1: External Power Supply System Schematic

3. Operation

When you connect a 28 V DC power supply to the external power socket these things happen:

– Current can flow from the small positive pin to the solenoid of the external power relay, the solenoid operates and closes the relay.

– Current can flow from the large positive pin through the external power relay to the relay bus.

– The large negative pin is connected to ground.

If the polarity of the power supply is incorrect, then the diode will prevent current from flowing through the solenoid. The solenoid will not operate and current cannot flow through the external power relay to the RELAY BOX BUS.

CAUTION: WHEN OPERATING THE AIRPLANE ELECTRICAL SYSTEM WITH ENGINE MASTER ON (LH OR RH) AND THE ENGINE IS NOT RUNNING (e.g. EVENT LOG READOUT) ALWAYS CONNECT AN EXTERNAL POWER SUPPLY WITH A PRESET VOLTAGE OF 29 V TO THE AIRPLANE. OTHERWISE THE ALTERNATORS MAY BE DAMAGED. ADDITIONALLY, IF MÄM 42-551 IS INSTALLED, SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the external power system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
External power will not come on line.	No external power.	Make sure that the external power plug is securely in the socket.
	External power relay is defective.	Make sure that the external power is operating correctly. Do a test of the external power relay, if necessary, replace the external power relay.

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Maintenance Practices

1. General

This Section tells you how to remove/install the external power relay. Refer to the component manufacturers manuals for more data and shop data.

2. Electrical Safety

The DA 42 NG has a low voltage DC electrical system. When correctly maintained it is safe to work on. The battery can supply heavy current through low resistance circuits (for example, if you ground the positive output with a wrench by accident).

Always follow the usual safety practices for working on electrical equipment. Allow only qualified persons to maintain the electrical system.

CAUTION: DISCONNECT THE BATTERIES (MAIN AND ECU BACKUP) BEFORE DOING MAINTENANCE ON THE ELECTRICAL SYSTEM. MAKE SURE THAT YOU DISCONNECT THE NEGATIVE CABLE FIRST.

CAUTION: AFTER DOING ELECTRICAL MAINTENANCE ALWAYS DO A CONFIDENCE TEST OF THE SYSTEM WITH A 24 VOLT POWER SUPPLY THAT HAS OVER-CURRENT PROTECTION. DO THIS BEFORE CONNECTING THE BATTERY.

CAUTION: WHEN OPERATING THE AIRPLANE ELECTRICAL SYSTEM WITH ENGINE MASTER ON (LH OR RH) AND THE ENGINE IS NOT RUNNING (e.g. EVENT LOG READOUT) ALWAYS CONNECT AN EXTERNAL POWER SUPPLY WITH A PRESET VOLTAGE OF 29 V TO THE AIRPLANE. OTHERWISE THE ALTERNATORS MAY BE DAMAGED. ADDITIONALLY, IF MÄM 42-551 IS INSTALLED, SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES.

CAUTION: USE ONLY DA 42 NG PARTS THAT ARE APPROVED BY THE MANUFACTURER.

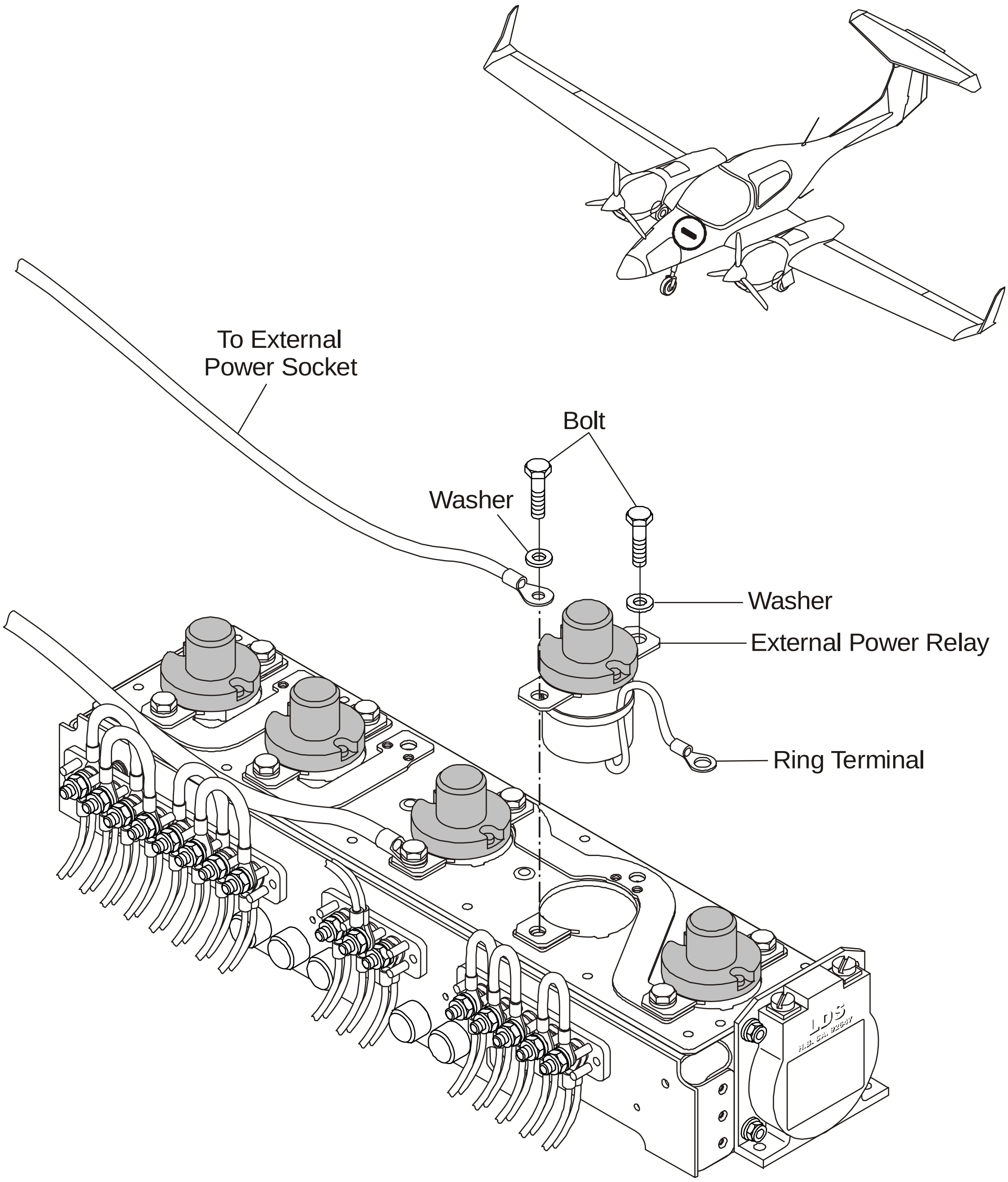


Figure 2: External Power Relay

3. Remove/Install the External Power Relay

A. Remove the External Power Relay

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Remove the front baggage compartment rear cover.	
(3)	Disconnect the battery for maintenance.	Refer to Section 24-31.
(4)	Disconnect the cable from the external power relay: – Remove the bolt and washer from the terminal of the external power relay. – Move the cable clear of the relay.	
(5)	Disconnect the external power relay from the RELAY BOX BUS bar: – Remove the bolt and washer that attaches relay to the RELAY BOX BUS bar.	
(6)	Disconnect the electrical cables from the external relay terminals.	
(7)	Remove the external power relay: – Lift the external power relay clear of the relay box.	

B. Install the External Power Relay

	Detail Steps/Work Items	Key Items/References
(1)	Move the relay into position at the relay mounting and connect the control cables to the terminal block.	Check for correct polarity.
(2)	Lower the external power relay into position at the relay mounting.	
(3)	Connect the external power relay to the RELAY BOX BUS bar: – Install the washer and bolt that attaches the relay to the RELAY BOX BUS bar.	
(4)	Connect the cable to the external power relay terminal: – Move the cables into position at the external power relay. – Install the bolt and washer that attaches the cable to the relay through he cable and into the relay mounting.	Refer to the wiring diagrams in Chapter 92.
(5)	Connect the main battery.	Refer to Section 24-31.
(6)	Remove the front baggage compartment rear cover.	
(7)	Close and secure the front baggage compartment door.	Refer to Section 52-40.
(8)	Do a test for the correct operation of the external power relay.	

Section 24-60

DC Electrical Load Distribution

1. General

This Section tells you about the system which supplies DC electrical power to other systems. The DC electrical load distribution system has these components:

– RELAY BUS.

– HOT BUS.

– LH MAIN BUS.

– RH MAIN BUS.

– LH ECU BUS.

– RH ECU BUS.

– AVIONICS BUS.

– Battery relay.

– Starter relay.

– Avionics master relay.

– Switches.

– Circuit breakers.

– Fuses.

Figure 1 and 2 shows the electrical bus structure for the DA 42 NG. Figure 3 shows the layout of the switches and circuit breakers in the instrument panel.

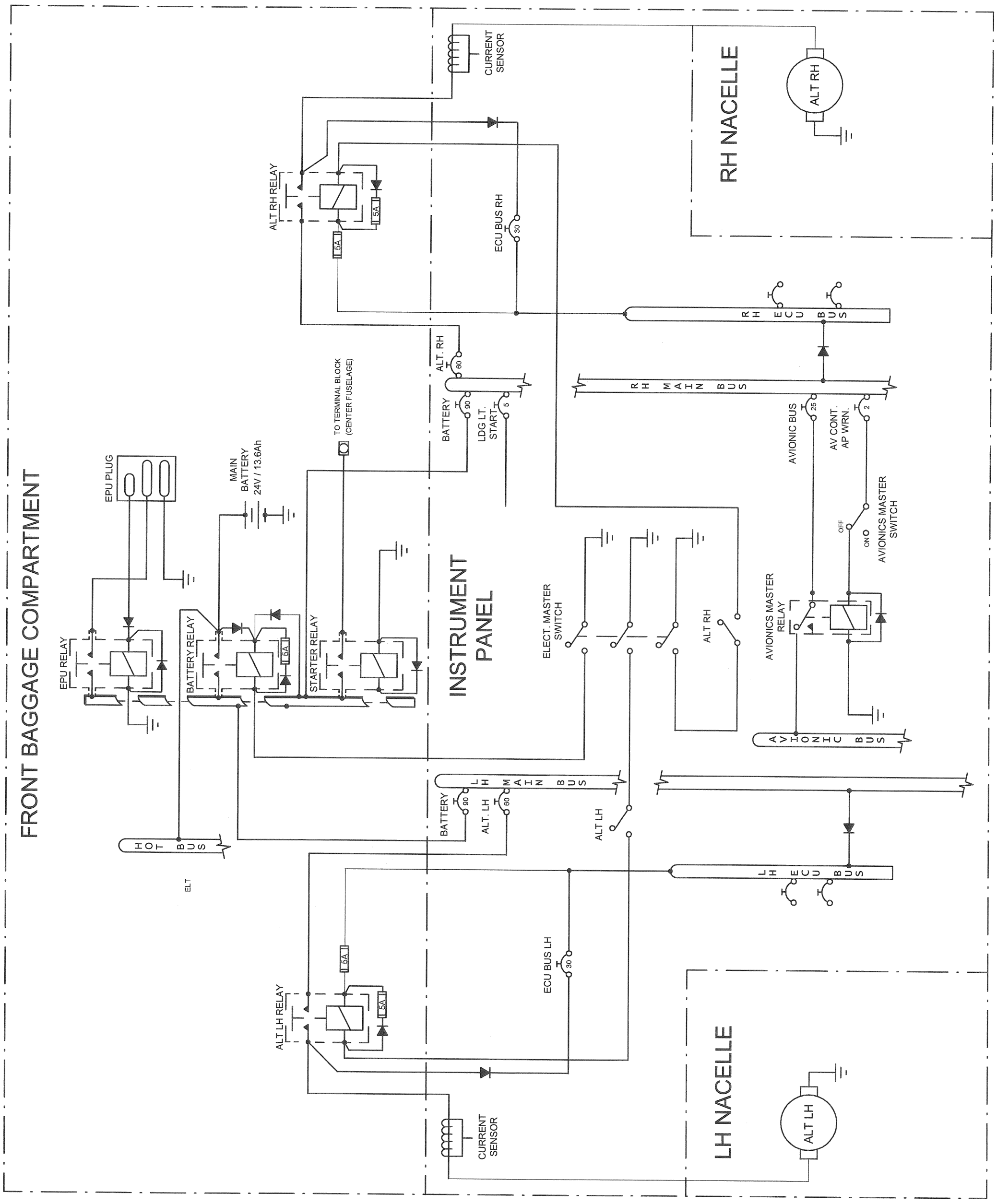


Figure 1: Electrical System Bus Structure Simplified Diagram, if MÄM 42-403 is not carried out

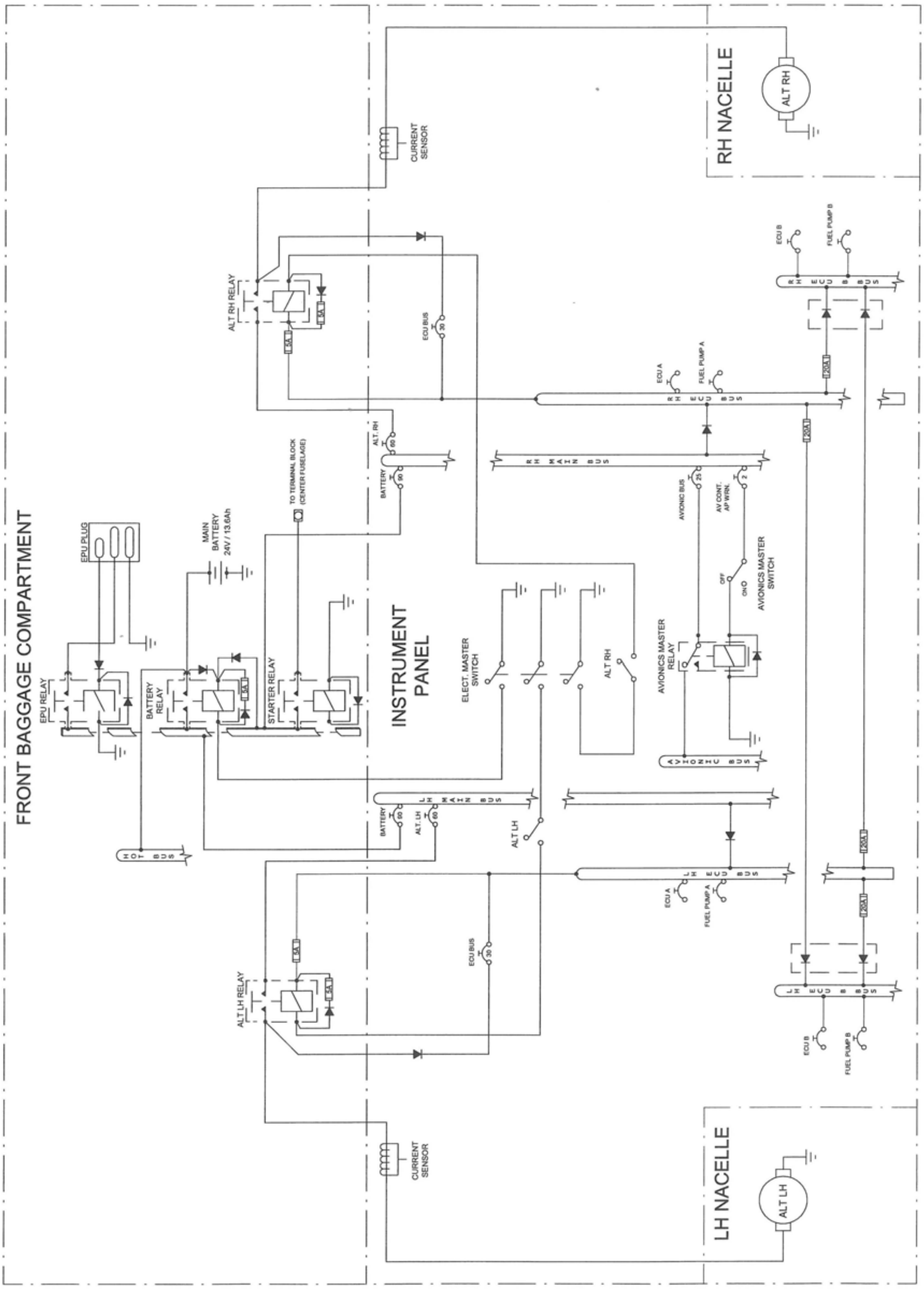
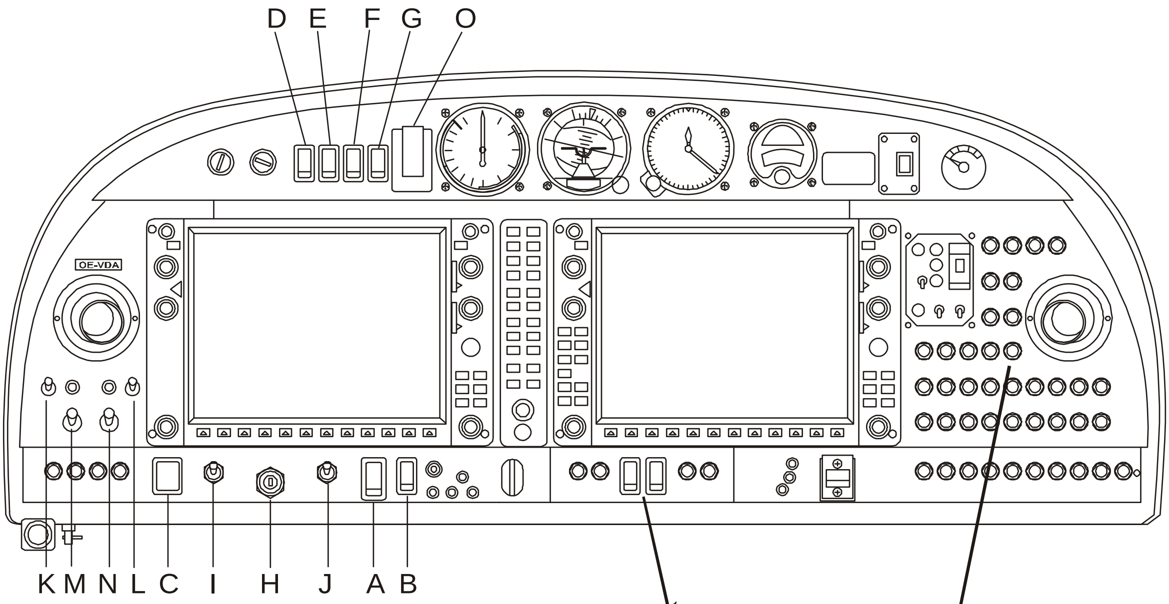


Figure 2: Electrical System Bus Structure Simplified Diagram, if MÄM 42-403 is carried out



SWITCHES

A - ELECT MASTER
B - AV. MASTER
C - PITOT
D - LANDING
E - TAXI
F - POSITION
G - STROBE
H - START SWITCH
I - ENGINE MASTER LH
J - ENGINE MASTER RH
K - VOTER LH
L - VOTER RH
M - ALT LH
N - ALT RH
O - HORIZON EMERGENCY

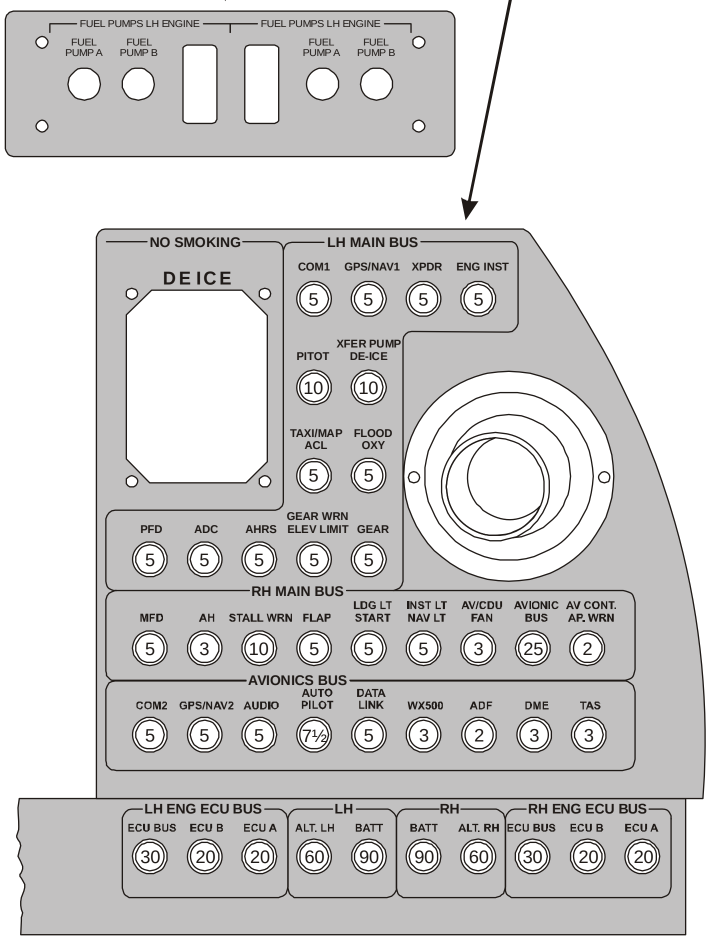


Figure 3: Location of Electrical Switches and Circuit Breakers

Trouble-Shooting

1. General

This table tells you how to trouble-shoot the DC electrical distribution system. It does not tell you about the equipment. For faults on an item of equipment, or a system, refer to the applicable chapter. For example, for no oil pressure indication, see Chapter 77 - ENGINE INDICATING. Make sure that there is 28 V DC on both the LH MAIN BUS and the RH MAIN BUS and that the alternators are supplying power.

If you find the trouble in column 1 do the repair given in column 3.

Trouble	Possible Cause	Repair
There is 28 V DC on the RH MAIN BUS but not on the AVIONICS BUS.	AV. MASTER switch set to OFF.	Set the AV. MASTER switch to ON.
	MASTER CONTROL circuit breaker not set.	Set the MASTER CONTROL circuit breaker.
	AVIONICS BUS circuit breaker not set.	Set the AVIONICS BUS circuit breaker.
	Avionics master relay defective.	Replace the avionics master relay.
	A failure of the cables which connect the AVIONICS BUS to the RH MAIN BUS.	Do a continuity test of the cables. Refer to Chapter 92 for the wiring diagrams. Repair/replace defective wiring.

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Maintenance Practices

1. General

This Section tells you how to remove/install components of the DC load distribution system. Refer to the component manufacturers' manuals for more data and shop data.

2. Electrical Safety

The DA 42 NG has a low voltage DC electrical system. When correctly maintained it is safe to do work on. The battery can supply heavy current through low resistance circuits (for example, if you ground the battery positive with a wrench by accident).

Always follow the usual safety practices for working on electrical equipment. Allow only qualified persons to maintain the electrical system.

CAUTION: DISCONNECT THE BATTERIES (MAIN AND ECU BACKUP) BEFORE YOU DO ANY WORK ON THE ELECTRICAL SYSTEM. MAKE SURE THAT YOU DISCONNECT THE NEGATIVE LEAD FIRST.

CAUTION: AFTER DOING ELECTRICAL MAINTENANCE ALWAYS DO A CONFIDENCE TEST OF THE SYSTEM WITH A 24 VOLT POWER SUPPLY THAT HAS OVER-CURRENT PROTECTION. DO THIS BEFORE CONNECTING THE BATTERY.

CAUTION: WHEN OPERATING THE AIRPLANE ELECTRICAL SYSTEM WITH ENGINE MASTER ON (LH OR RH) AND THE ENGINE IS NOT RUNNING (e.g. EVENT LOG READOUT) ALWAYS CONNECT AN EXTERNAL POWER SUPPLY WITH A PRESET VOLTAGE OF 29 V TO THE AIRPLANE. OTHERWISE THE ALTERNATORS MAY BE DAMAGED. ADDITIONALLY, IF MÄM 42-551 IS INSTALLED, SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES.

CAUTION: USE ONLY DA 42 NG SPARE PARTS APPROVED BY THE MANUFACTURER.

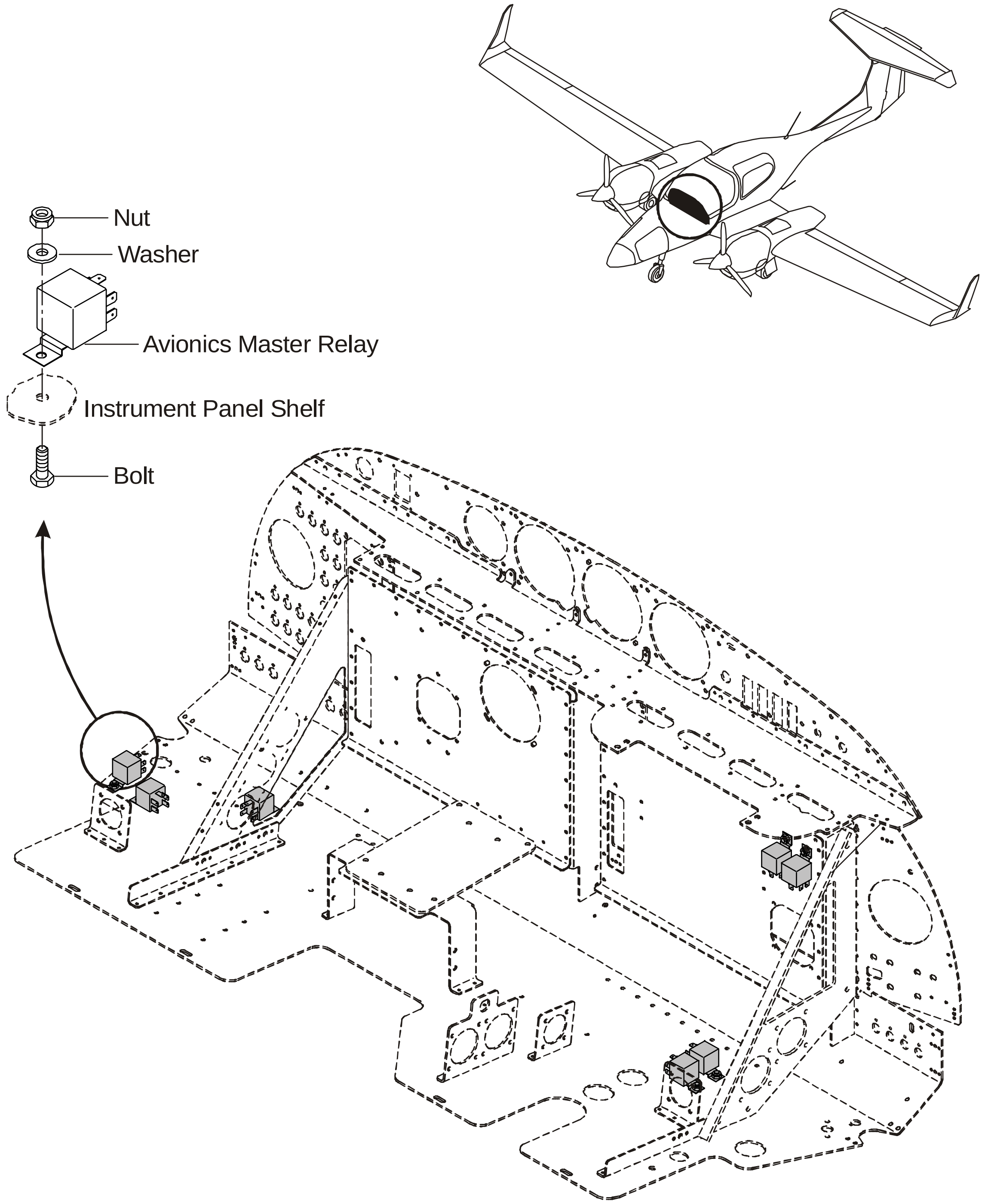

Figure 3: Avionics Master Relay Installation

3. Remove/Install the Avionics Master Relay

A. Remove the Avionics Master Relay

	Detail Steps/Work Items	Key Items/References
(1)	Open the forward baggage compartment door.	Refer to Section 52-40.
(2)	Remove the battery cover.	
(3)	Disconnect the battery for maintenance.	Refer to Section 24-31.
(4)	Remove the instrument panel cover.	Refer to Section 25-10.
(5)	Locate the avionics master relay.	Refer to Figure 3.
(6)	Disconnect the electrical cables from the relay.	Make a note of the connections.
(7)	Remove the nut, washer and bolt that attaches the relay to the instrument panel floor.	
(8)	Move the relay clear of the airplane.	

B. Install the Avionics Master Relay

	Detail Steps/Work Items	Key Items/References
(1)	Move the new relay into position on the instrument panel shelf.	
(2)	Connect the electrical cables to the relay.	Refer to the wiring diagrams and Paragraph 3.A(6) above.
(3)	Install the bolt, washer and nut that attaches the relay to the instrument panel floor.	
(4)	Install the instrument panel cover.	
(5)	Reconnect the main battery.	Refer to Section 24-31.
(6)	Install the battery cover.	
(7)	Close the forward baggage compartment doors.	Refer to Section 52-40.
(8)	Do a test of the relay: – Set the ELECT. MASTER switch to ON. – Set the AV. MASTER switch to ON. – Set the AV. MASTER switch to OFF. – Set the ELECT. MASTER switch to OFF.	All avionics must operate.

4. Remove/Install a Circuit Breaker

To remove some circuit breakers and switches it may be necessary to remove a placard panel from the instrument panel. Refer to Section 11-30.

A. Remove a Circuit Breaker

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Disconnect the main battery and the ECU backup batteries for maintenance.	Refer to Section 24-31.
(3)	Remove the instrument panel cover.	Refer to Section 25-10.
(4)	Remove the nuts and washers that attach the circuit breakers to the instrument panel.	Do this for all the circuit breakers that are attached to the same bus bar.
(5)	Remove the screw that connects the circuit breaker that you will replace to the bus bar.	
(6)	Disconnect the electrical cables(s) from the circuit breaker that you will replace.	
(7)	Move the bus bar and all the circuit breakers attached to it away from the instrument panel.	
(8)	Remove the circuit breaker clear of the instrument panel.	

B. Install a Circuit Breaker

	Detail Steps/Work Items	Key Items/References
(1)	Move the circuit breaker into position in the instrument panel.	
(2)	Move the bus bar back into position with the remaining circuit breakers.	
(3)	Reconnect the electric cables to the circuit breaker.	Refer to Chapter 92 for the wiring diagrams.
(4)	Install the screw that attaches the circuit breaker to the bus bar.	
(5)	Install the washers and nuts that attach the circuit breakers to the instrument panel.	
(6)	Install the instrument panel cover.	Refer to Section 25-10.
(7)	Reconnect the main battery and the ECU backup batteries.	Refer to Section 24-31. Connect the positive cable first.
(8)	Close and secure the baggage compartment door.	Refer to Section 52-40.
(9)	Do a test for the correct function of the circuit breaker: – Set the ELECT. MASTER to ON. – Operate the electrical system related to the circuit breaker that you will test. – Pull the circuit breaker. – Set the circuit breaker. – Set the ELECT. MASTER switch to OFF.	Apply the full electrical load to the system. The system must stop operating. Make sure that there is no power to the system.

5. Remove/Install an Instrument Panel Switch

To remove some circuit breakers and switches it may be necessary to remove a placard panel from the instrument panel. Refer to Section 11-30.

Use the procedures at Sub-paragraphs A and B for these clip secured switches:

– ELECT. MASTER.

– AV. MASTER.

– FUEL PUMPS.

– PITOT.

– LANDING LIGHT.

– TAXI LIGHT.

– POSITION LIGHTS.

– STROBE.

Use the procedures given in Sub-paragraphs C and D for the other switches.

A. Remove a Clip-Secured-Type Instrument Panel Switch

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Disconnect the main battery and the ECU backup batteries for maintenance.	Refer to Section 24-31.
(3)	Remove the instrument panel cover.	Refer to Section 25-10.
(4)	Disconnect the electrical cables for the switch that you will remove.	
(5)	Remove the switch from the instrument panel: – Press the locking clips at the sides of the switch to release the switch from the instrument panel. – Move the switch clear of the instrument panel, from the pilot's side of the instrument panel.	With your fingers, from the back of the instrument panel.

B. Install a Clip-Secured-Type Instrument Panel Switch

	Detail Steps/Work Items	Key Items/References
(1)	Hold the clips on the switch compressed and move the switch into position in the instrument panel.	From the pilot's side of the instrument panel. Make sure that the clips have expanded and that the switch is correctly located.
(2)	Connect the electrical cables to the switch.	Refer to Chapter 92 for the wiring diagrams.
(3)	Install the instrument panel cover.	Refer to Section 25-10.
(4)	Reconnect the main battery and the ECU backup batteries.	Refer to Section 24-31. Connect the positive cable first.
(5)	Close and secure the baggage compartment door.	Refer to Section 52-40.
(6)	Do a test for the correct function of the switch: – Set the ELECT. MASTER to ON. – Set the switch that you installed to ON. – Set the switch that you installed to OFF. – Set the ELECT. MASTER to OFF.	 The system must operate correctly. The system must switch off.

Use the procedures in Sub-paragraphs C and D for these nut secured switches:

– START SWITCH.

– ENGINE MASTER LH.

– ENGINE MASTER RH.

– ALT LH.

– ALT RH.

– VOTER LH.

– VOTER RH.

– ECU TEST LH/RH.

– HORIZON EMERGENCY.

C. Remove a Nut-Secured-Type Instrument Panel Switch

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door.	Refer to Section 52-40.
(2)	Disconnect the main battery and ECU backup batteries for maintenance.	Refer to Section 24-31.
(3)	Remove the instrument panel cover.	Refer to Section 25-10.
(4)	Remove the nut and washer that attaches the switch to the instrument panel.	
(5)	Move the switch forward and clear of the instrument panel to give access to disconnect the electrical cables from the switch.	
(6)	Disconnect the electrical cables from the switch and move the switch clear of the airplane.	

D. Install a Nut-Secured-Type Instrument Panel Switch

	Detail Steps/Work Items	Key Items/References
(1)	Move the switch into position near to the switch electrical cables.	
(2)	Connect the electrical cables to the switch.	Refer to Chapter 92 for the wiring diagrams.
(3)	Move the switch into position in the instrument panel.	Hold the switch in position.
(4)	Install the washer and nut that attach the switch to the instrument panel.	
(5)	Install the instrument panel cover.	Refer to Section 25-10.
(6)	Reconnect the main battery and ECU backup batteries.	Refer to Section 24-31. Connect the positive cable first.
(7)	Close and secure the baggage compartment door.	Refer to Section 52-40.
(8)	Do a test for the correct function of the switch: – Set the ELECT. MASTER to ON. – Set the switch that you installed to ON. – Set the switch that you installed to OFF. – Set the ELECT. MASTER to OFF.	 The related system must operate. The related system must switch off.

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CHAPTER 25

EQUIPMENT/FURNISHINGS

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CHAPTER 25

EQUIPMENT FURNISHINGS

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CHAPTER 25
EQUIPMENT FURNISHINGS

1. General

This Chapter tells you about the equipment and the furnishings in the flight compartment of the DA 42 NG airplane. Figure 1 shows the location of the cabin equipment. Section 25-10 includes the flight compartment trim panels, the cabin seats and the safety harnesses. Section 25-60 tells you about the emergency location transmitter (ELT) and the first aid kit. Refer to Chapter 26 for data about the hand fire extinguisher.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Note: Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called “Additional Equipment”. The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

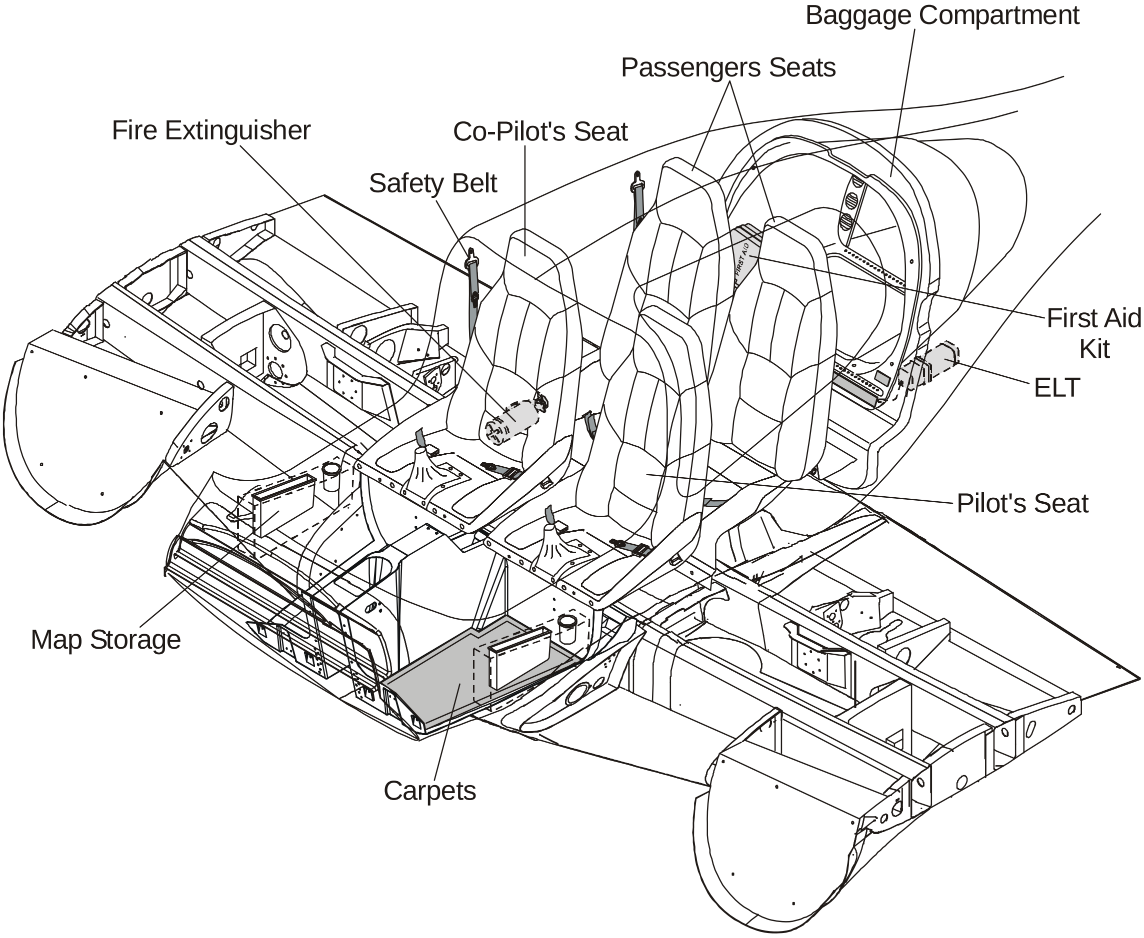

Figure 1: Cabin Equipment

Section 25-10

Flight Compartment

1. General

The flight compartment of the DA 42 NG has fixed seats for the two pilots and two passengers.

If OÄM 42-067 or OÄM 42-259 is carried out, the pilots' seats are equipped with adjustable backrests.

Each seat has a safety harness. The fuselage shell is trimmed with fabric wall panels. Carpets cover the floor areas and the aft baggage compartment floor. Map pockets are located on the cockpit side by each pilot.

GFRP moldings make the instrument panel cover and the center console. Refer to Section 25-60 for data about the ELT and the first aid kit.

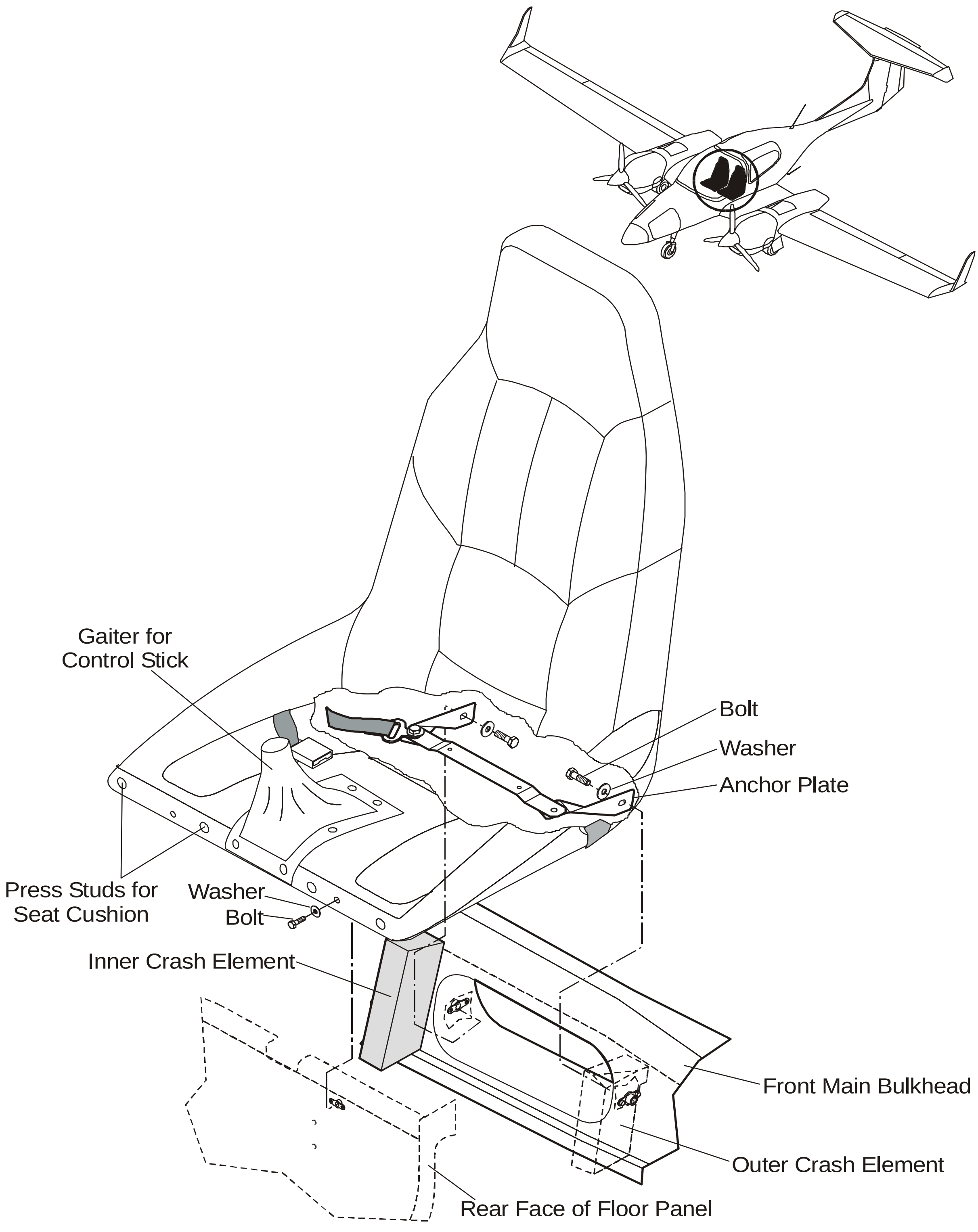

Figure 1: Pilot’s Seat Installation

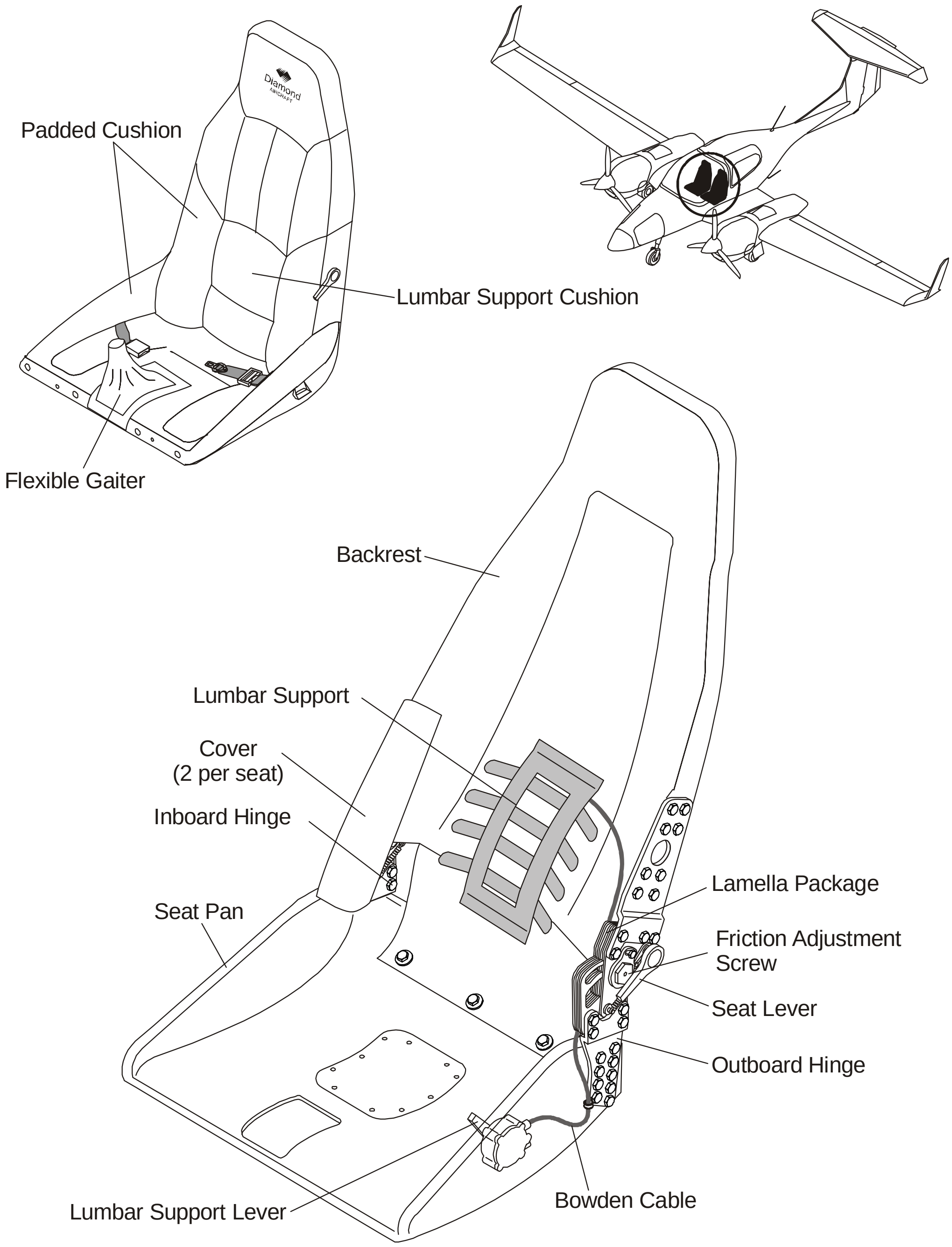

Figure 2: Pilot’s Seat Installation (if OÄM 42-067 is carried out)

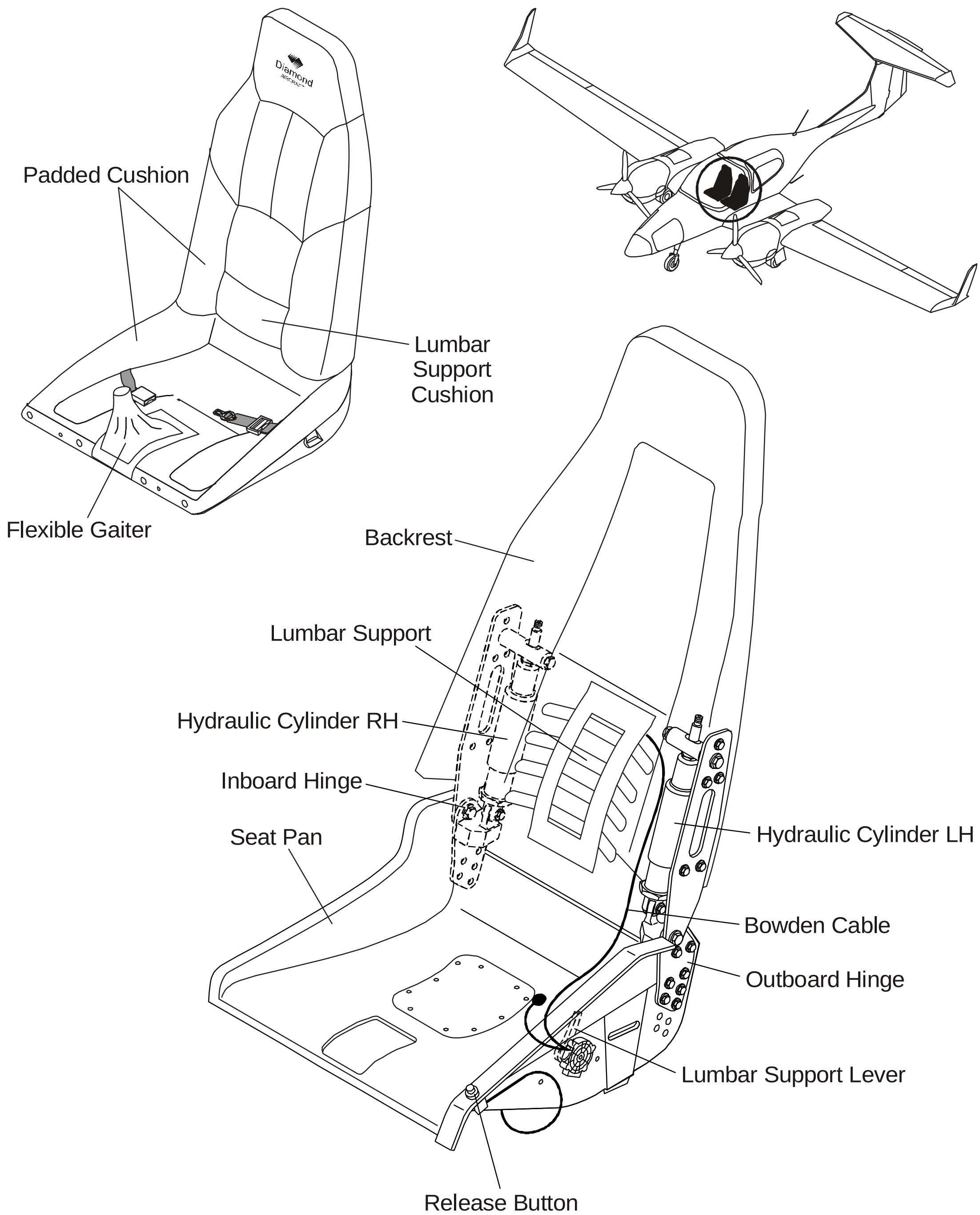

Figure 3: Pilot's Seat Installation (if OÄM 42-259 is carried out)

2. Description and Operation

A. Pilots' Seats

(1) Fixed Pilots' Seats

Figure 1 shows the pilot's seat installation. Each pilot's seat is GFRP/Carbon/Kevlar molding. Rivets attach a metal plate to the bottom of the seat pan at the back. Two bolts go through the seat pan and the metal plate to hold the lap straps of the safety harness. These bolts also hold metal anchor plates which attach to anchor nuts in the large cut out in the front main bulkhead.

The front of the seat pan curves down to locate over the rear vertical wall of the front floor panel. Two bolts with washer plates attach the front seat to the floor panel.

A padded seat cushion covers the molding. Velcro tapes attach the forward part of the seat cushion to the seat pan. A flexible gaiter attaches to the front seat pan with velcro tapes. The control stick passes through the gaiter. A velcro tape seals the top of the gaiter to the control stick.

(2) Pilots' Seats with Adjustable Backrest (if OÄM 42-067 or OÄM 42-259 is carried out)

CAUTION: DO NOT LOOSEN THE LEVER FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.

Figure 2 and Figure 3 show the variants of pilots' seats with adjustable backrest installations. Each pilots' seat consists of a seat pan and a backrest made of GFRP/Carbon/Kevlar. Rivets attach a metal plate to the bottom of the seat pan at the back. Two bolts go through the seat pan and the metal plate to hold the lap straps of the safety harness. These bolts also hold metal anchor plates which attach to anchor nuts in the large cut-out in the front main bulkhead. The front of the seat pan curves down to locate over the rear vertical wall of the front floor panel.

The backrest is attached to the seat pan via an inboard and an outboard hinge. If OÄM 42-067 is installed each hinge is formed by two lamella packages - one is bolted to the seat pan, the other to the backrest with hexagon head bolts. The lamella packages act as a friction brake controlled by a friction adjustment screw and the seat lever on the outboard side of each backrest. To preload the friction brake to the correct setting refer to the Maintenance Practices in this Section. Additionally the backrest is forced forward by a GFRP/Carbon spring element mounted to the bottom of the seat pan.

If the OÄM 42-259 is installed, the seat pan and backrest are bolted similarly to the inboard and outboard hinges. The hinges are linked twice, once thru brackets with the Hydrolok cylinder and once with a bolt allowing rotation. A button operates via bowden cable a valve allowing the Hydrolok cylinder retract/extend forcing the hinges rotating around their connecting bolt. Additionally the backrest is forced forward by a spring integrated in the Hydrolok cylinder.

The upright position of the backrest is determined by a placard on the roll-over bar.

A lumbar support cushion is integrated to the lower part of the backrest. The cushion is operated via a Bowden cable by use of a lever mounted to the outboard side of the seat pan.

A padded cushion covers the seat pan molding and the backrest. Press studs attach the forward part of the seat cushion to the seat pan. A flexible gaiter attaches to the front seat pan with press-studs. The control-stick passes through the gaiter. A velcro band seals the top of the gaiter to the control stick.

B. Passenger Seat

Figure 4 shows the passenger seat installation. The passenger seat has three main parts. It has a double seat pan which is the full width of the cockpit. The rear seat pan also makes the baggage compartment floor. The passenger seat also has two seat backs which attach to the seat pan with hinges. A latch at the left side of each seat back locks the seat in the upright position. You can lift the latch pin to fold the seat-back forward for access to the aft baggage compartment.

A padded seat cushion covers the seat molding. Velcro tapes attach the forward part of the seat cushion to the seat pan. Padded cushions also cover the seat backs.

Rivets attach a metal plate under each half of the seat pan at the back. Two bolts go through each half of the seat pan and the metal plate to hold the lap straps of the safety harness. Three bolts with washer plates on each side of the seat pan go through the seat pan and metal plate to anchor nuts in metal anchor plates. The anchor plates are bolted to the fuselage structure. Two bolts with washer plates attach the front of the seat pan to ribs on top of the rear main bulkhead. Five bolts with washer plates attach the rear of the seat pan to the top face of the aft baggage compartment frame.

C. Crash Elements

Each seat rests on crash elements. Each crash element has layers of fiber composite and a special rigid foam bonded together. The crash elements compress under the high loads which occur in accidents. They reduce the injuries to pilots and passengers in an accident.

The rear of each pilot’s seat rests on two crash elements. They are located just outboard of the safety harness attachments. The passenger seat pan rests on two crash elements. They are located under the anchor plates on each side.

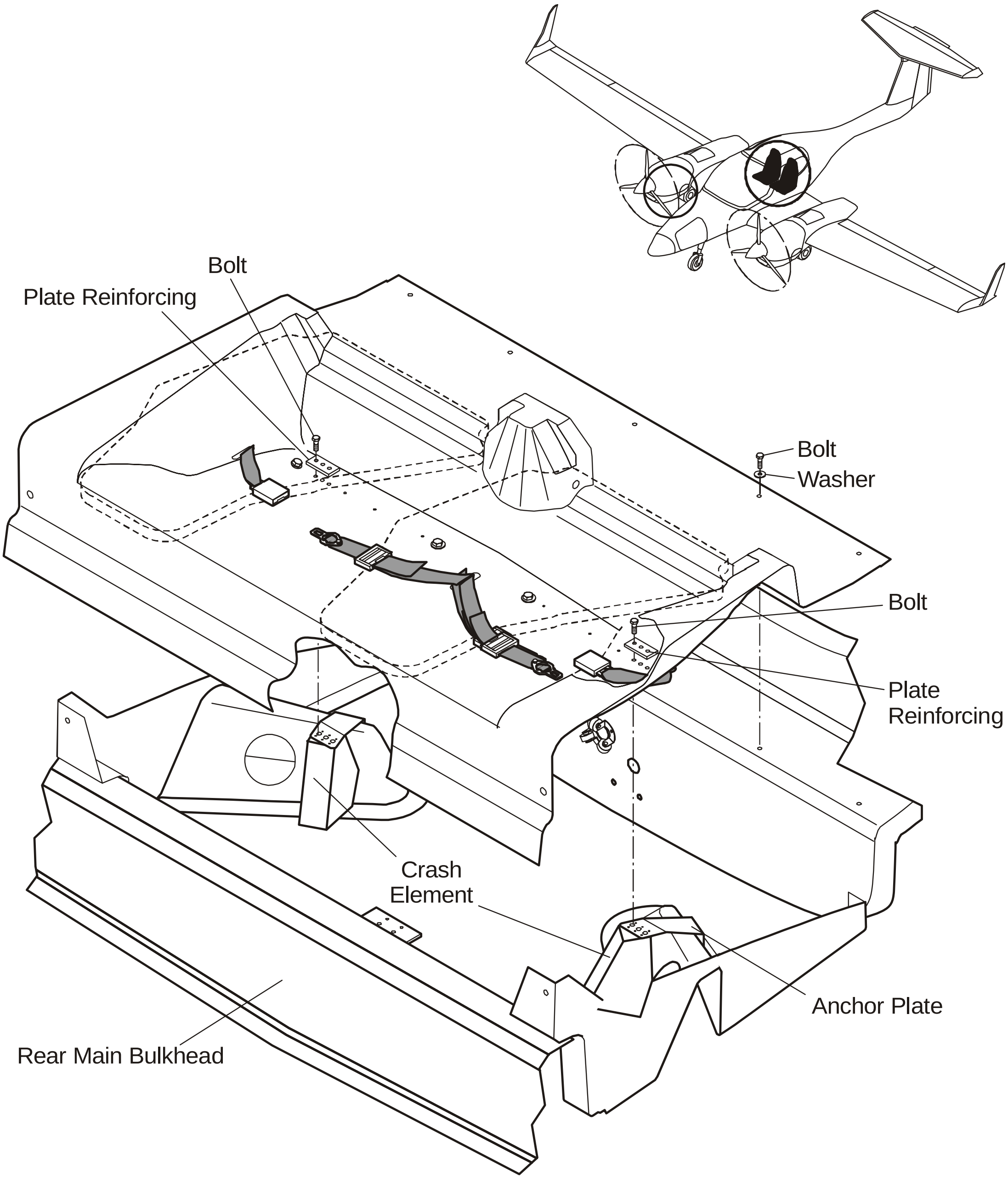

Figure 4: Passenger Seat Installation

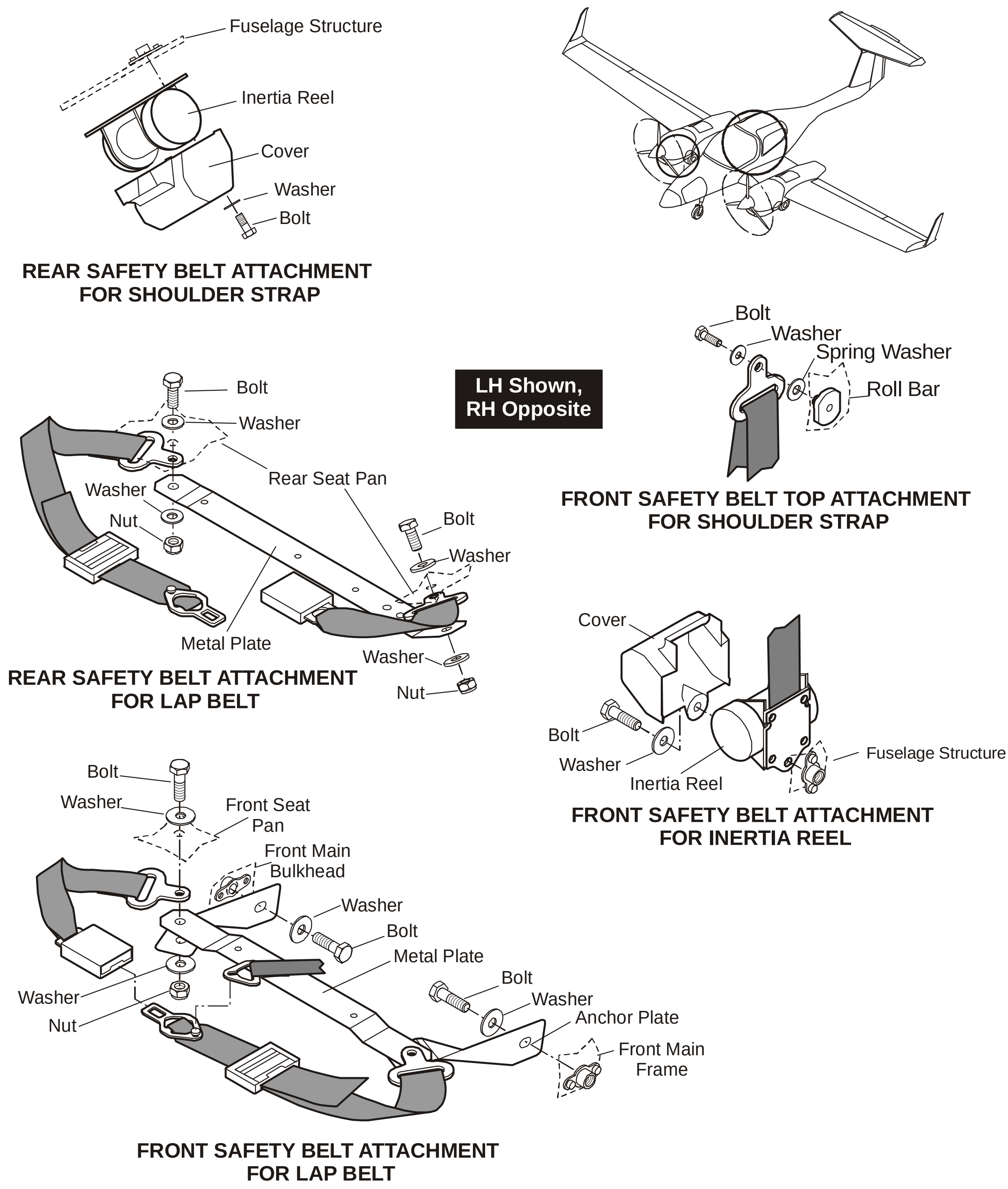

Figure 5: Safety Harness Installation

D. Safety Harness

Figure 5 shows the safety harness installation. Each seat has a fixed lap strap and an inertia sensitive shoulder strap. The lap belt has two straps. The outboard strap has an adjuster to tighten the strap in use. It also has tongue to engage the buckle on the inboard strap. The inboard strap is a fixed length. The buckle has a red button at the outboard end to release the tongue of the outboard lap strap. Push the tongue into the end of the buckle to lock them together.

Bolts with washer plates and anchor nuts attach each lap strap to the seat pan. You must remove the seat to remove the lap strap.

The shoulder strap attaches to an inertia reel. The inertia reel has a latch which senses acceleration. With the airplane flying straight and level, the inertia reel lets the shoulder strap pull out against a light spring tension. If the airplane is accelerated (for example, in turbulence), the latch stops the shoulder strap from pulling out.

The inertia reel for the pilot’s safety harness is located on the fuselage wall behind the pilot’s seat. The strap passes up through a guide attached to the roll-bar just above the pilot’s shoulder and down to the tongue on the outboard lap strap. The end fitting on the shoulder strap hooks onto a stud on the tongue.

The inertia reels for the rear passenger’s safety harnesses are located above and to the rear of the passengers. They are mounted on the fuselage top inner surface.

If OÄM 42-324 is installed: Refer to AmSafe Maintenance Documentation for further information.

E. Fabric Wall Panels

Fabric wall panels bond to the inside of the fuselage shell. Each front outboard side-panel has a map pocket.

F. Instrument Panel Cover

A GFRP cover goes over the instrument panel. Screws attach the cover to the instrument panel. The instrument panel cover has a defrost manifold to direct defrost air from the heating system onto the inside of the canopy to prevent canopy misting. Flexible hoses connect the manifold to the airplane heating system.

G. Center Console Panel

A GFRP panel goes between the rear wall of the floor panel and the front face of the main front bulkhead. The center console panel covers the trim mechanism. It also seals the gap between the pilot's seats.

H. Baggage Compartment

If OÄM 42-207 is carried out, a short baggage extension is installed.

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install the seats, the safety harnesses and other furnishings. See Section 25-60 for data about the ELT and other safety equipment.

2. Remove/Install a Pilot's Seat

If OÄM 42-324 is installed:

WARNING: WHEN REMOVING A SEAT FROM THE AIRCRAFT, VERIFY THAT THE AMSAFE SEATBELT AIRBAG SYSTEM RESTRAINT IS NOT BUCKLED AND DISCONNECT CABLE INTERFACE ASSY. FROM THE END-RELEASE BUCKLE ASSEMBLY CONNECTOR BEFORE REMOVAL OF THE SEAT. AN ELECTRICALLY CONNECTED AMSAFE SEATBELT AIRBAG RESTRAINT SYSTEM AND BUCKLED SEAT BELT MAY RESULT IN DAMAGE TO THE EQUIPMENT OR DEPLOYMENT OF THE SYSTEM. REFER TO AMSAFE MAINTENANCE DOCUMENTATION.

Note: Some maintenance procedures described in this AMM require the removal of a front seat. However, if the maintenance hole in the seat gives sufficient access to the system beneath it, it is acceptable to leave the seat in place and remove only the maintenance access panel. Refer to Paragraph 3.

A. Remove a Pilot's Seat

	Detail Steps/Work Items	Key Items/References
	If the adjustable front seats (OÄM 42-067 or OÄM 42-259) are installed: CAUTION: DO NOT ENGAGE THE LEVER OR THE BUTTON FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.	

	Detail Steps/Work Items	Key Items/References
(1)	If the adjustable front seats (OÄM 42-067 or OÄM 42-259) are installed: Set backrest to the upright position: – Sit down in the front seat. – Lift the seat lever. – Adjust the backrest to the upright position. – Release and press down the seat lever.	
(2)	Release the top of the gaiter from the control stick.	Refer to Figure 1 (fixed backrest) or Figure 2 and 3 (adjustable backrest).
(3)	Release the press-studs at the front of the seat cushion.	Move the cushion to give access to the attaching bolts for the seat.
(4)	Remove the 2 bolts with washer plates which attach the anchor plates to the front main bulkhead.	From the passenger compartment behind the pilot’s seat.
(5)	Remove the 4 bolts with washer plates which attach the front of the seat to the rear wall of the floor panel.	
(6)	Remove the lap strap from the seat.	
(7)	Lift the seat forward and out of the cockpit.	Take care that the stick gaiter does not catch on the top of the control stick.

B. Install a Pilot's Seat

	Detail Steps/Work Items	Key Items/References
If the adjustable front seats (OÄM 42-067 or OÄM 42-259) are installed: CAUTION: DO NOT ENGAGE THE LEVER OR THE BUTTON FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.		
(1)	Examine the crash elements. Look specially for delaminating and buckling.	Refer to Figure 1.
(2)	Make sure that the area below the seat is clean and has no unwanted objects.	For example, tools.
(3)	Move the seat into position so that the anchor plates go through the large holes in the front main bulkhead.	Make sure that the stick gaiter locates correctly over the control stick.
(4)	Install the bolts and washer plates which attach the seat to the floor panel.	Torque 6.4 Nm (4.7 lbf.ft.).
(5)	Install the bolts and washer plates which attach the anchor plates to the front main bulkhead.	From the passenger compartment behind the pilot's seat. Torque 16 Nm (11.8 lbf.ft.).
(6)	Fasten the press-studs which attach the seat cushion.	
(7)	Tighten the top of the gaiter around the control stick.	Make sure that the control stick is free to move throughout its range of operation.
(8)	If the adjustable front seats (OÄM 42-067 or OÄM 42-259) are installed: – Do a test of the backrest adjustment mechanism. – Do a test of the lumbar support mechanism.	 Refer to Paragraph 3. Refer to Paragraph 3.

3. Additional Maintenance Practices for Seats with Adjustable Backrest

Perform test procedures the following test of the adjustable backrest mechanism.
If the test fails refer to Paragraph (2), (3).

(1) Test Procedures

(a) Test the Backrest Adjustment Mechanism of a Front Seat (optional, OÄM 42-067 or OÄM 42-259)

	Detail Steps/Work Items	Key Items/References
CAUTION: DO NOT ENGAGE THE LEVER OR THE BUTTON FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.		
Note: If the adjustable backrest mechanism does not pass the following test, perform a visual inspection. Refer to Paragraph 3.		
(1)	Sit down in the front seat.	
(2)	Lean against the backrest.	To counteract the spring loaded backrest mechanism.
(3)	Carefully lift the seat lever or press button.	
(4)	Move the backrest fully rearward: – Check for limited range of movement and interference. – Release the seat lever or button in different backrest angles and check for improper fixation.	Release the seat lever or button to ensure proper locking. Apply a test load of 90 daN (200 lbf) to the top of the backrest at room temperature.

	Detail Steps/Work Items	Key Items/References
(5)	Allow the backrest to move forward to the upright position: – Check for interference. – Check for lack of spring force.	The spring must be strong enough to move the backrest from the full rearward position to the upright position designated by a placard on the roll-over bar.
(6)	Pull forward on the backrest to move it forward beyond the designated upright position. – Check for limited range of movement and interference. – Let the seat lever move to the locking position or release the button at different backrest angles and check for improper fixation.	Press down the seat lever to ensure proper locking. Apply a test load of 90 daN (200 lbf) to the top of the backrest at room temperature.
(7)	Move the seat back to the upright position.	
(8)	Let the seat lever move to the locking position.	Press down the seat lever to ensure proper locking.

(b) Test the Lumbar Support Mechanism of a Front Seat (optional, OÄM 42-067 or OÄM 42-259)

	Detail Steps/Work Items	Key Items/References
(1)	Sit down in the front seat.	
(2)	Turn the lumbar support lever.	You must feel the mechanism increasing and decreasing the effect of the lumbar support cushion in the backrest.

(2) Adjust the Friction of the Backrest (optional, OÄM 42-067)

	Detail Steps/Work Items	Key Items/References
CAUTION: DO NOT ENGAGE THE LEVER OR THE BUTTON FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.		
(1)	Remove the seat.	
(2)	Pull away the lining from the inboard hinge to gain access to the inboard friction adjustment screw.	Through the access hole in the cover.
(3)	Adjust the friction: – Set the locking lever to the „unlocked“ position. – Loosen the friction adjustment screws (LH and RH). – Tighten friction adjustment screws (LH and RH) with finger force. – Tighten friction adjustment screws (LH and RH) with 10 mm hexagon nut in increments of approx. 15 degrees (1/24 turns) until friction in the hinge mechanism increases notably. – Turn back the adjustment screws (LH and RH) one-quarter turn.	

	Detail Steps/Work Items	Key Items/References
(4)	Re-attach the lining to seat.	
(5)	Install the seat.	
(6)	Do a test of the backrest adjustment mechanism.	Refer to Paragraph (1)(a).

(3) Visual Inspection of the Adjustment Mechanism (optional, OÄM 42-067)

	Detail Steps/Work Items	Key Items/References
(1)	Remove the seat from the airplane.	Refer to Paragraph 2.
(2)	Remove the seat lever from the seat: – Remove the plug from the lever. – Remove the lever mounting screw. – Remove the lever from the seat.	
(3)	Carefully separate the leather lining from the backrest: – Remove the cushion from the seat pan (attached with velcro). – Drill out one blind rivet each attaching the two plastic brackets for the rubber bands to the seat pan. – Pull off the rubber bands from the plastic brackets. – Untie the knots of the 3 strings which tie the lower edge of the backrest cushion to the seat pan. – Carefully remove the leather lining from the cover by opening all velcro fasteners.	Turn lining inside out together with the bag while pulling off.
(4)	Move the cover forward to remove it from the hinge.	The cover remains attached to the cushion.
(5)	Check the lamella package for deformation, corrosion and lack of lubrication.	

	Detail Steps/Work Items	Key Items/References
(6)	Install cover by moving it over the hinge.	
(7)	Reinstall the leather lining to the seat: – Attach the leather lining to the cover using the velcro fasteners. – Tie the backrest cushion to the seat pan with the 3 strings. – Put the rubber bands into the plastic brackets. – Use blind rivets to fasten the plastic brackets to the seat pan. – Attach the cushion to the seat pan using the velcro.	
(8)	Install the seat lever: – Put the lever onto the adjustment mechanism in correct position. – Install the lever mounting screw. – Install plug to lever.	

(4) Visual Inspection of the Adjustment Mechanism (optional, OÄM 42-259)

	Detail Steps/Work Items	Key Items/References
(1)	Remove seat from airplane.	
(2)	Carefully separate the leather lining from the backrest	Turn lining inside out together with the bag while pulling off.
(3)	Check the Hydrolok cylinder for leakage, contamination, check actuator cable for damage. Replace items if necessary, for disassembly of the mechanism refer to Maintenance Practices, Paragraph 5.	Use mirror and flashlight to be able to inspect the mechanism installed in the backrest tunnel.
(4)	Re-install the leather lining to the seat.	

4. Remove/Install a Pilot’ s Seat Access Panel

A. Remove a Pilot’s Seat Access Panel

	Detail Steps/Work Items	Key Items/References
(1)	Remove the cloth coating from the seat.	
(2)	Remove the 10 bolts which attach the access panel to the seat.	
(3)	Lift the access panel clear of the airplane.	

B. Install a Pilot’s Seat Access Panel

	Detail Steps/Work Items	Key Items/References
(1)	Move the access panel in place in the seat.	
(2)	Install the 10 bolts which attach the access panel to the seat.	
(3)	Fasten the cloth coating on the seat.	

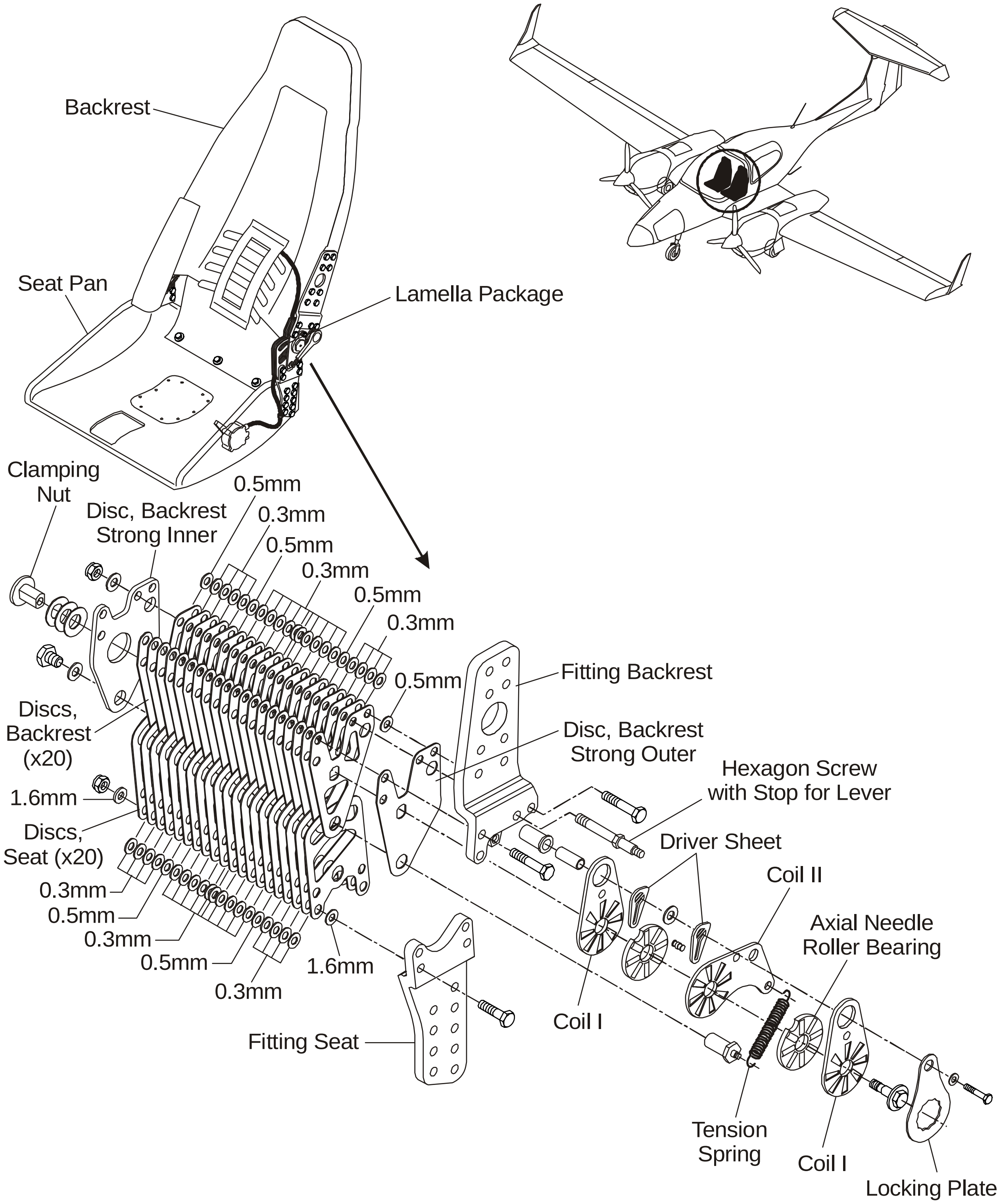

Figure 6: Adjustable Backrest Assembly (if OÄM 42-067 is installed)

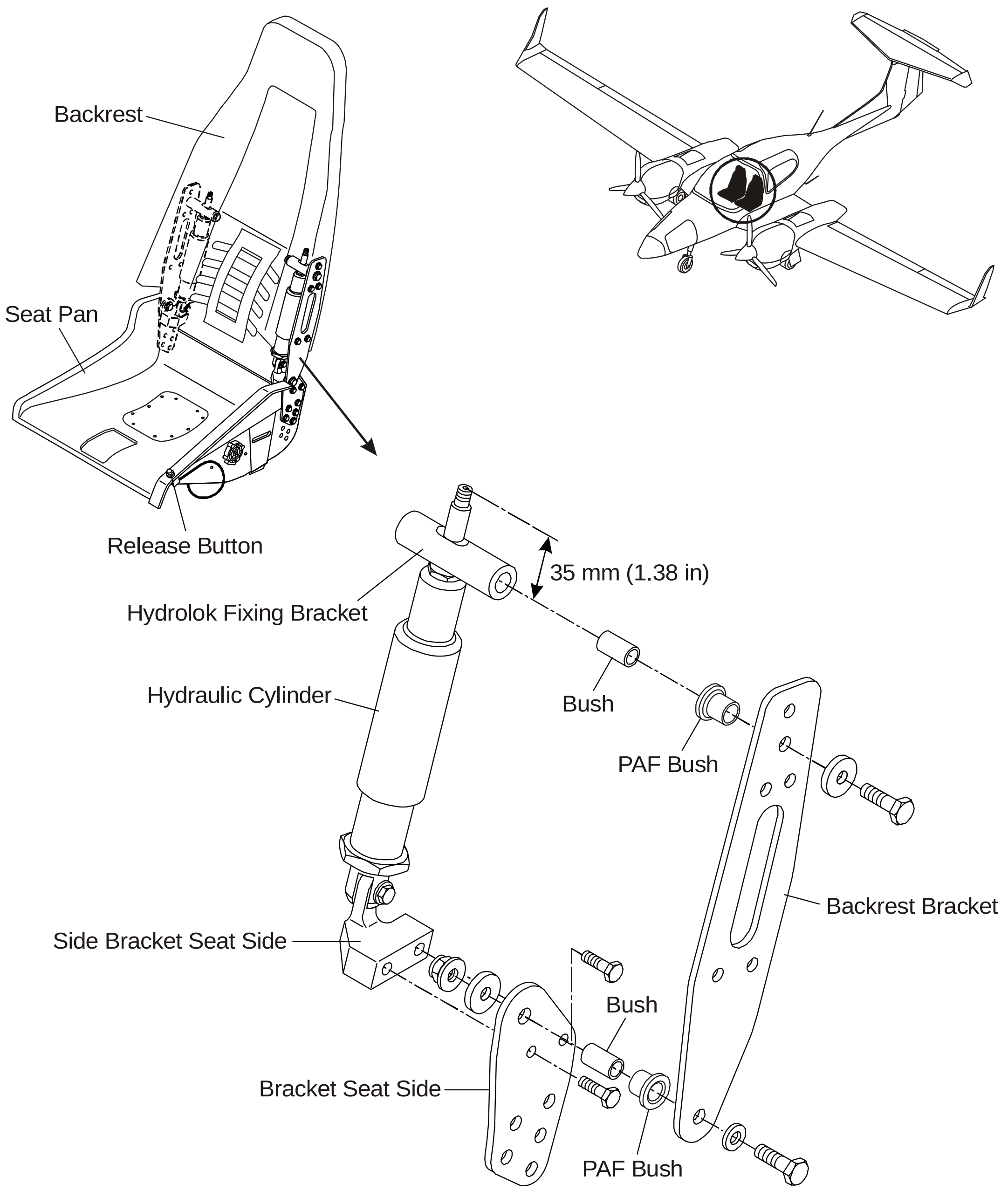

Figure 7: Seat Adjustment Mechanism (if OÄM 42-259 is installed)

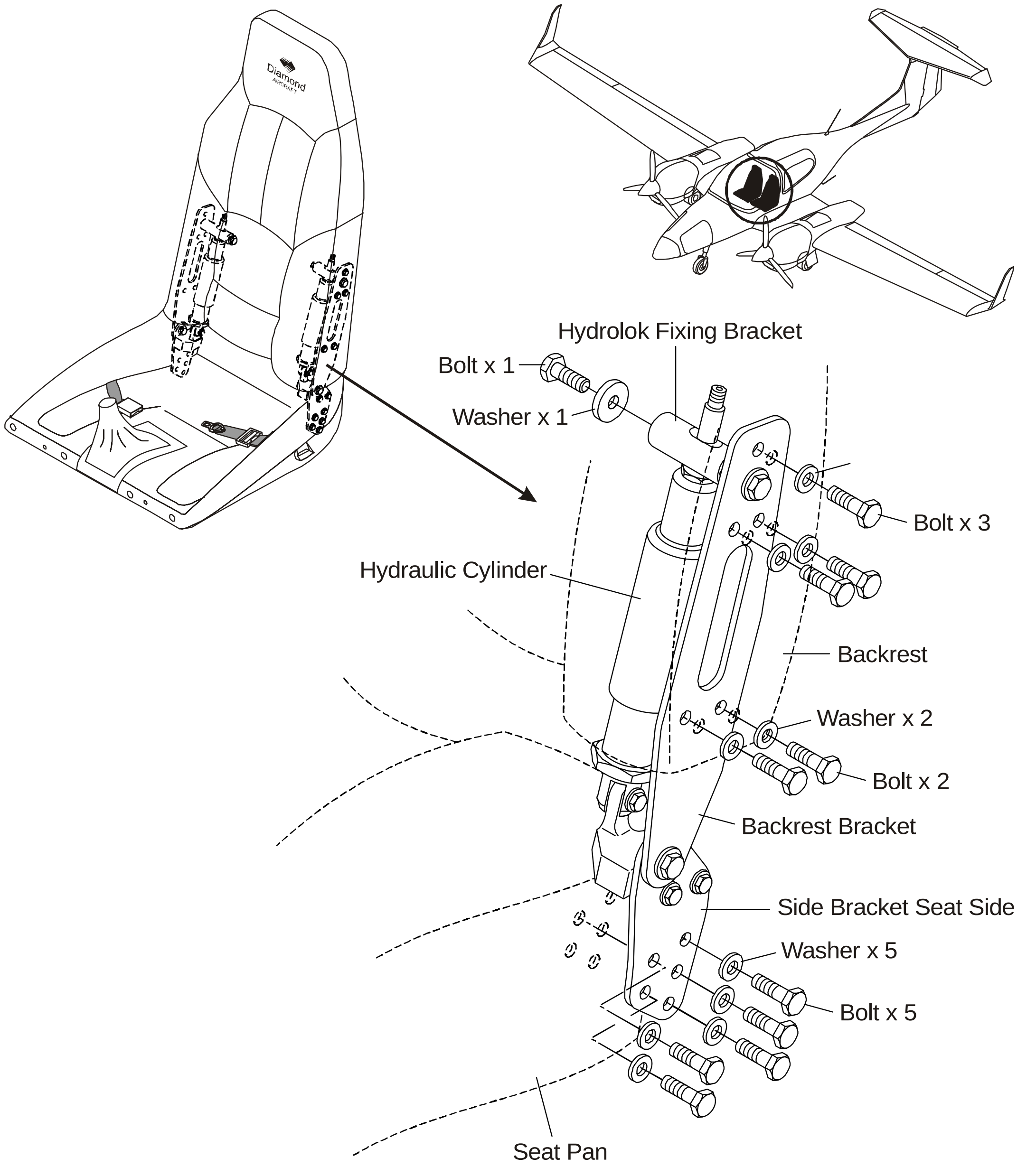

Figure 8: Adjustable Backrest Assembly (if OÄM 42-259 is installed)

5. Disassemble/Assemble the Adjustable Backrest Mechanism

A. Remove the Backrest Assembly from the Seat (optional, OÄM 42-067)

Each seat contains a left and right side mechanism. Before you can disassemble the backrest mechanism you must carry out the following steps:

	Detail Steps/Work Items	Key Items/References
(1)	Remove the seat from the airplane.	Refer to Paragraph 2.
(2)	Remove the seat lever from the seat: – Remove the plug from the lever. – Remove the lever mounting screw. – Remove the lever from the seat.	
(3)	Carefully separate the leather lining from the backrest: – Remove the cushion from the seat pan (attached with velcro). – Drill out one blind rivet each attaching the two plastic brackets for the rubber bands to the seat pan. – Pull off the rubber bands from the plastic brackets. – Untie the knots of the 3 strings which tie the lower edge of the backrest cushion to the seat pan. – Carefully remove the leather lining from the cover by opening all velcro fasteners.	Turn the lining inside out together with the bag while pulling off.
(4)	Move the cover forward to remove it from the hinge.	The cover remains attached to the cushion.
(5)	Peel away the leather lining from the bottom of the seat pan on the side which points towards the middle of the fuselage. The nine hexagon screws of the seat fitting become accessible.	

	Detail Steps/Work Items	Key Items/References
(6)	Remove the screw with the distancing bushing and the washer from the torsion bar.	
(7)	Remove the nine hexagon screws on both sides of each seat fitting.	
(8)	Remove the LH and the RH mechanism.	
(9)	Remove the torsion bar from the backrest.	

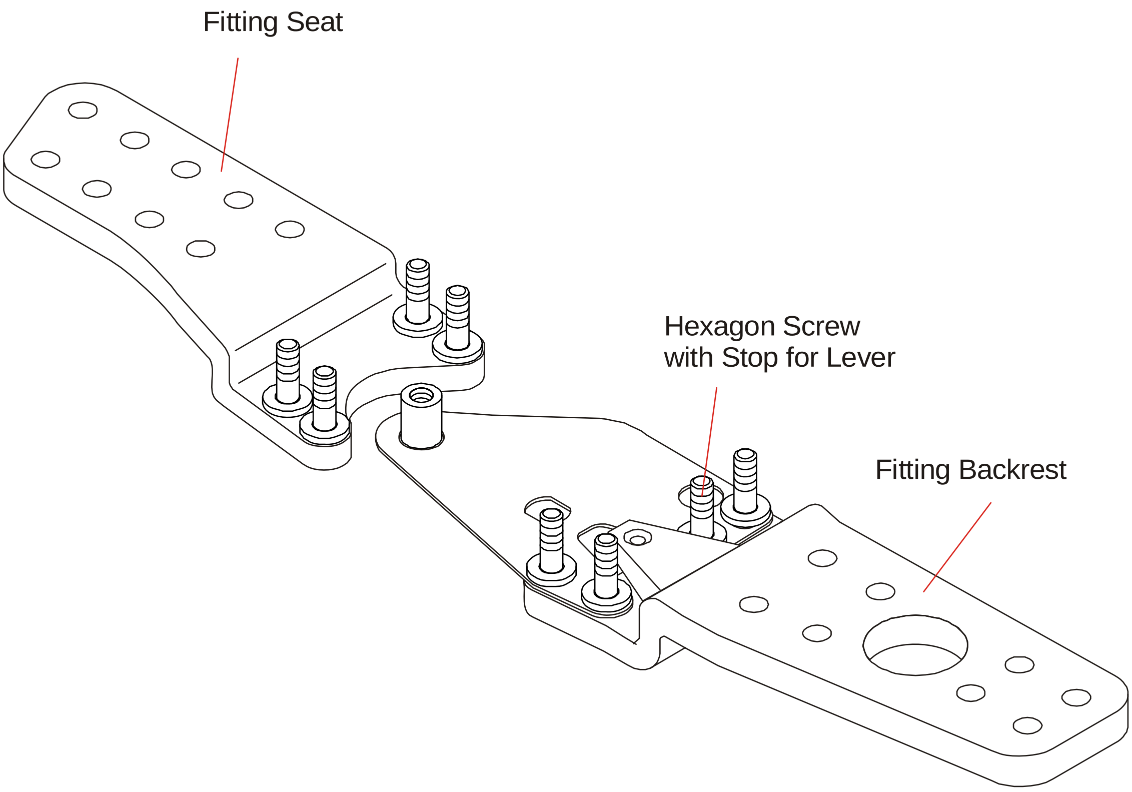

Figure 9: Arrangement of the Fitting Seat, Fitting Backrest and Screws (LH side shown, if OÄM 42-067 is installed)

B. Remove Backrest Assembly from Seat (optional, OÄM 42-259)

Each seat contains a left and right side mechanism. Before you can disassemble the backrest mechanism you must carry out the following steps:

	Detail Steps/Work Items	Key Items/References
(1)	Remove seat from airplane.	
(2)	Carefully separate the leather lining from the backrest.	Turn lining inside out together with the bag while pulling off.
(3)	Disconnect the lumbar actuator bowden cable.	
(4)	Remove the 5 outboard and 1 inboard hexagon screws from the backrest brackets as they become accessible on both sides.	Refer to Figure 8.
(5)	Pull off the backrest shell.	

C. Disassemble the Adjustable Backrest Mechanism (optional, OÄM 42-067 or OÄM 42-259)

Disassemble the adjustable backrest mechanism carefully. Refer to the table in Paragraph D or E and carry out the steps in the opposite order.

D. Assemble the Adjustable Backrest Mechanism (optional, OÄM 42-067)

The following table describes the assembling of a single backrest mechanism. The assembly procedure is used for both sides.

Step No.	Seat Fitting	Thickness	Backrest Fitting	Thickness	Remark
(1)	Arrange the seat fitting and the backrest fitting and place the 7 hexagon screws (M6 x 32) and a hexagon screw with stop for lever as shown in Figure 6. Use some adequate bars to put under the fittings.				
(2)	4 Washers	1.6 mm	Disc, Backrest Strong Outer	1.6 mm	
(3)	Stick the bolt (10 mm) through the outer backrest disc.				
(4)	Lamella	0.3 mm	4 Washers	0.5 mm	
(5)	4 Washers	0.3 mm	Lamella	0.3 mm	Repeat steps (5) and (6) four times.
(6)	Lamella	0.3 mm	4 Washers	0.3 mm	
(7)	4 Washers	0.5 mm	Lamella	0.3 mm	
(8)	Lamella	0.3 mm	4 Washers	0.5 mm	
(9)	4 Washers	0.3 mm	Lamella	0.3 mm	Repeat steps (9) and (10) four times.
(10)	Lamella	0.3 mm	4 Washers	0.3 mm	
(11)	4 Washers	2 x 0.3 mm	Lamella	0.3 mm	
(12)	Lamella	0,3 mm	4 Washers	2 x 0.3 mm	
(13)	4 Washers	0.3 mm	Lamella	0.3 mm	Repeat steps (13) and (14) four times.
(14)	Lamella	0.3 mm	4 Washers	0.3 mm	
(15)	4 Washers	0.5 mm	Lamella	0.3 mm	
(16)	Lamella	0.3 mm	4 Washers	0.5 mm	
(17)	4 Washers	0.3 mm	Lamella	0.3 mm	Repeat steps (17) and (18) four times.
(18)	Lamella	0.3 mm	4 Washers	0.3 mm	
(19)	4 Washers	1.6 mm	Lamella	0.3 mm	
(20)	4 Self Locking Hexagon Nuts	M5	4 Washers	0.5 mm	

Step No.	Seat Fitting	Thickness	Backrest Fitting	Thickness	Remark
(21)	---	---	Disc, Backrest Strong Inner	4 mm	
(22)	Screw the hexagon screw (M5x6) with the washer (17 mm) into the thread of the bolt and apply Loctite 262 screw locking or equivalent.				
(23)	In order to check the correct arrangement of the lamella, view the assembly from side and observe the regular pattern of the lamella formed the varying thickness of the washers.				
(24)	Screw the thinner hexagon nuts on the 4 hexagon screws of the strong backrest disc and apply Loctite 262 screw locking or equivalent.				
(25)	Insert the brass bushing next to the seat fitting side.				
(26)	Insert the clamping nut from the backside with the 3 disc springs, ensuring the outer diameter of the disc springs points towards the backrest disc and the inner diameter points towards the clamping nut.				
(27)	LH side: place coil 1 so that 1 stamped point can be seen, place one bearing on the coil 1, place coil 2 onto the bearing so that 2 stamped points can be seen, place a bearing on coil 2, place another coil 1 on the bearing so that 1 stamped point can be seen.				
(28)	RH side: place coil 1 so that 2 stamped point can be seen, place one bearing on the coil 1, place coil 2 onto the bearing so that 1 stamped point can be seen, place a bearing on coil 2, place another coil 1 on the bearing so that 2 stamped point can be seen.				
(29)	Screw the clamping screw into the internal thread of the clamping nut, and just tighten it by hand.				
(30)	Insert the distancing bushing through the holes of the two coils.				
(31)	Put the M4 x 20 screw with the washer and the locking plate through the distancing bushing, screw it into the backrest fitting, but do not tighten it yet.				
(32)	Tighten the clamping screw as far as possible by hand and apply a quarter additional turn with the screw wrench.				
(33)	Place the locking plate over the hexagon screw and tighten the distancing bushing with the hexagon screw (M4 x 20) and the washer and secure it with Loctite 262 screw locking.				
(34)	Put the driver into the hole of coil 2, mount the lower driver sheet, mount the upper driver sheet and insert the washer between the driver sheets.				
(35)	Fix the driver sheets and the washer to the brass bushing with a cable clip.				

E. Assemble the Adjustable Backrest Mechanism (optional, OÄM 42-259)

The following table describes the assembling of a single backrest mechanism. The assembly procedure is used for both sides.

	Detail Steps/Work Items	Key Items/References
(1)	Screw the Hydrolok hydraulic cylinder into the actuating shaft, so that the cylinder rod end and the center of the actuating shaft are 35 mm apart.	Refer to Figure 7.
(2)	Attach the lower end of the hydraulic cylinder to the side bracket seat shell.	
(3)	Attach the side bracket seat shell to the seat bracket seat side using 2 hexagon screws.	
(4)	Attach the backrest bracket to the actuating shaft using a bush and a hexagon screw.	
(5)	Attach the backrest and the seat bracket with a hexagon screw and nut thru the rotation hole.	

F. Assemble a Pilots' Seat (optional, OÄM 42-067)

After assembling the adjustable backrest mechanism carry out these steps:

	Detail Steps/Work Items	Key Items/References
(1)	Fix the inboard mechanism with the 17 hexagonal screws.	
(2)	Insert the torsion bar into the backrest, insert the torsion bar through the driver blades of the mechanism.	
(3)	Insert the outboard mechanism through the clearance (hole) of the seat pan.	
(4)	Place the mechanism on the backrest and insert the torsion bar through the driver blades of the mechanism.	
(5)	Fix the outboard mechanism with the 17 hexagon screws.	
(6)	Screw the torsion bar screw with the washer and the distance bushing into the inside thread.	
(7)	Install cover by moving it over the hinge.	
(8)	Reinstall the leather lining to the seat: – Attach the leather lining to the cover using the velcro fasteners. – Tie the backrest cushion to the seat pan with the 3 strings. – Put the rubber bands into the plastic brackets. – Use blind rivets to fasten the plastic brackets to the seat pan. – Attach the cushion to the seat pan using the velcro.	
(9)	Install the seat lever: – Put the lever onto the adjustment mechanism in correct position. – Install the lever mounting screw. – Install plug to lever.	

G. Assemble a Pilots' Seat (optional, OÄM 42-259)

After assembling the adjusting mechanisms on both sides install the backrest using the steps in the opposite sequence as described in Maintenance Practices, Paragraph 5(B).

6. Remove/Install the Passenger Seat

If OÄM 42-324 is installed and OÄM 42-334 is NOT installed:

WARNING: WHEN REMOVING A SEAT FROM THE AIRCRAFT, VERIFY THAT THE AMSAFE SEATBELT AIRBAG SYSTEM RESTRAINT IS NOT BUCKLED AND DISCONNECT CABLE INTERFACE ASSY. FROM THE END-RELEASE BUCKLE ASSEMBLY CONNECTOR BEFORE REMOVAL OF THE SEAT. AN ELECTRICALLY CONNECTED AMSAFE SEATBELT AIRBAG RESTRAINT SYSTEM AND BUCKLED SEAT BELT MAY RESULT IN DAMAGE TO THE EQUIPMENT OR DEPLOYMENT OF THE SYSTEM. REFER TO AMSAFE MAINTENANCE DOCUMENTATION.

A. Remove the Passenger Seat

	Detail Steps/Work Items	Key Items/References
(1)	Release the velcro tapes at the front of the seat cushion.	Refer to Figure 4. Move the cushion to give access to the attaching bolts for the seat.
(2)	Remove the 6 bolts and washer plates which attach the seat pan to the anchor plates.	
(3)	Remove the 2 bolts and washer plates which attach the front of the seat pan to the rib on top of the rear main bulkhead.	
(4)	Fold the seat-backs forward.	Lift the latch pins at the left side of each seat back.
(5)	Remove the 5 bolts and washers which attach the rear of the seat pan to the aft baggage compartment frame.	
(6)	Remove the 2 inertia reels attachment points from the through roll over bar duct.	
(7)	Lift the seat forward and up out of the cockpit.	

B. Install a Passenger Seat

	Detail Steps/Work Items	Key Items/References
(1)	Examine the crash elements. Look specially for delaminating and buckling.	Refer to Figure 4.
(2)	Make sure that the area below the seat is clean and has no unwanted objects.	For example, tools.
(3)	Move the seat into position in the fuselage with the seat-backs folded forward.	Lift the latch pins at the left side of each seat-back.
(4)	Attach the inertia reels to the through roll over bar.	
(5)	Install the 5 bolts and washer plates which attach the rear of the seat pan to the aft baggage compartment frame.	Torque 6.4 Nm (4.7 lbf.ft.).
(6)	Install the 6 bolts and washer plates which attach the seat pan to the anchor plates.	Torque 6.4 Nm (4.7 lbf.ft.).
(7)	Install the 2 bolts and washer plates which attach the front of the seat pan to the rib on top of the rear main bulkhead.	Torque 6.4 Nm (4.7 lbf.ft.).
(8)	Fasten the velcro tapes which hold the seat cushion.	

7. Remove/Install a Safety Harness (if OÄM 42-324 is NOT installed)

If OÄM 42-324 is NOT installed:

Use this procedure for both the pilots' seats and the passenger seat harnesses.

If OÄM 42-324 is installed and OÄM 42-334 is NOT installed, refer to AmSafe Documentation.

If OÄM 42-334 is installed, use this procedure for the passenger seats and refer to the AmSafe Documentation for the pilots' seats.

WARNING: WHEN REMOVING A SEAT FROM THE AIRCRAFT, VERIFY THAT THE AMSAFE SEATBELT AIRBAG SYSTEM RESTRAINT IS NOT BUCKLED AND DISCONNECT CABLE INTERFACE ASSY. FROM THE END-RELEASE BUCKLE ASSEMBLY CONNECTOR BEFORE REMOVAL OF THE SEAT. AN ELECTRICALLY CONNECTED AMSAFE SEATBELT AIRBAG RESTRAINT SYSTEM AND BUCKLED SEAT BELT MAY RESULT IN DAMAGE TO THE EQUIPMENT OR DEPLOYMENT OF THE SYSTEM. REFER TO AMSAFE MAINTENANCE DOCUMENTATION.

A. Remove a Safety Harness

	Detail Steps/Work Items	Key Items/References
(1)	Remove the seat.	Refer to Paragraph 2 or 3.
(2)	Remove the anchor nuts, washers and plates which attach the straps to the seat.	Refer to Figure 5. For the pilots' seats only: – Make a note of the position of the anchor plates which these bolts also hold.
(3)	Move the straps through the holes in the seat pan and remove them.	
(4)	Release the bolt and washer which attach the inertia reel and its cover to the fuselage structure.	
(5)	Release the bolt and washer which attach the guide to the roll-bar.	For the pilots' seats only: – Make a note of the position of the washers.
(6)	Remove the shoulder strap.	

B. Install a Safety Harness

	Detail Steps/Work Items	Key Items/References
(1)	Put the lap straps through the holes in the seat pan.	The buckle goes to the inboard side of the pilots' seats (front) and the outboard side of the passenger seat (rear).
(2)	Put the lap straps between the seat pan and the metal plate. Install the bolts and washer plates from the top of the seat pan.	
(3)	Move the anchor plates into position on the bolts.	For the pilots' seats only.
(4)	Install the seat.	Refer to Paragraph 2 or 3.
(5)	Install the bolt and washer which attach the guide to the roll-bar.	For the pilots' seats only.
(6)	Install the bolt and washer which attach the inertia reel and its cover to the structure.	Refer to Figure 5 (1).
(7)	Install washer plates and self-locking nuts onto the bolts.	Torque 16 Nm (11.8 lbf.ft.).

8. Remove/Install the Instrument Panel Cover

A. Remove the Instrument Panel Cover

	Detail Steps/Work Items	Key Items/References
(1)	Remove the screws which attach the instrument panel cover to the instrument panel and the fuselage.	
(2)	Lift the cover for access to the defrost system flexible hoses.	
(3)	Loosen the tie wraps that hold the flexible hoses to the defrost manifold.	
(4)	Lift the cover clear of the instrument panel and the airplane.	

B. Install the Instrument Panel Cover

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the area below the instrument panel cover is free of unwanted objects.	For example; tools.
(2)	Move the instrument panel cover into position near the instrument panel.	
(3)	Connect the flexible hoses to the defrost manifold: – Move the tie wraps into position on the flexible hoses. – Push the flexible hoses onto the defrost manifold of the cover. – Tighten the worm-drive-clamps.	
(4)	Lower the cover into position on the instrument panel.	
(5)	Install the screws which attach the instrument panel cover to the instrument panel and the fuselage.	

9. Cleaning

A. Seats

The seat cushions are made from a fire resistant material. Clean the cushions with a vacuum cleaner. Use a mild soap solution to remove stains. Make sure that the area is well ventilated after cleaning to remove all moisture.

B. Safety Harnesses

If OÄM 42-324 is NOT installed:

Use a mild soap solution to clean the straps of the harnesses.

If OÄM 42-324 is installed and OÄM 42-334 is NOT installed:

Refer to AmSafe Maintenance Documentation.

If OÄM 42-334 is installed:

Refer to AmSafe Maintenance Documentation for both pilots' seats and use a mild soap solution to clean the straps of the harnesses of the passenger seats.

10. Remove/Install the Short Baggage Extension (OÄM 42-207 installed)

A. Remove the Short Baggage Extension

	Detail Steps/Work Items	Key Items/References
(1)	Remove access panel.	Refer to Paragraph 4.
(2)	Release 4 screws with washers which attach the front of the baggage tray to the rear seats.	
(3)	Release the 2 screws with washers which attach the rear of the tray to the baggage bulkhead.	
(4)	Remove the upholstery pieces which cover the sides of the baggage bulkhead.	Attached with velcro.
(5)	Open the baggage tray and unplug the electrical connectors of the cabin fan (if installed).	
(6)	Release the seven 1/4-turn fasteners which attach the short baggage extension to the baggage bulkhead.	
(7)	Remove the short baggage extension from the airplane.	Do not damage the upholstery.

B. Install the Short Baggage Extension

	Detail Steps/Work Items	Key Items/References
(1)	Do a check for unwanted items in the area below the short baggage extension.	For example: tools.
(2)	Put the short baggage extension in place in the baggage bulkhead.	Do not damage the upholstery.
(3)	Fasten the seven 1/4-turn fasteners which attach the short baggage extension to the baggage bulkhead.	
(4)	Install the upholstery pieces which cover the sides of the baggage bulkhead.	Attached with velcro.
(5)	Put the baggage tray in place on the baggage floor.	
(6)	Fasten the 4 screws with washers that attach the front of the baggage tray to the rear seat base.	Torque: 3.6 Nm (2.7 lbf.ft.).
(7)	Fasten the 2 screws with washers that attach the rear of the baggage tray to the baggage bulkhead.	Torque: 3.6 Nm (2.7 lbf.ft.).
(8)	Plug the electrical connectors of the cabin fan (if installed) to the plug on rear panel of the short baggage extension.	
(9)	Install the access panel.	Refer to Paragraph 4.

Section 25-50
Aft Baggage Compartment

1. General

This Section tells you about the aft baggage compartment, the baggage tie-downs and baggage net.

For data about the forward baggage compartment doors refer to Section 52-00.

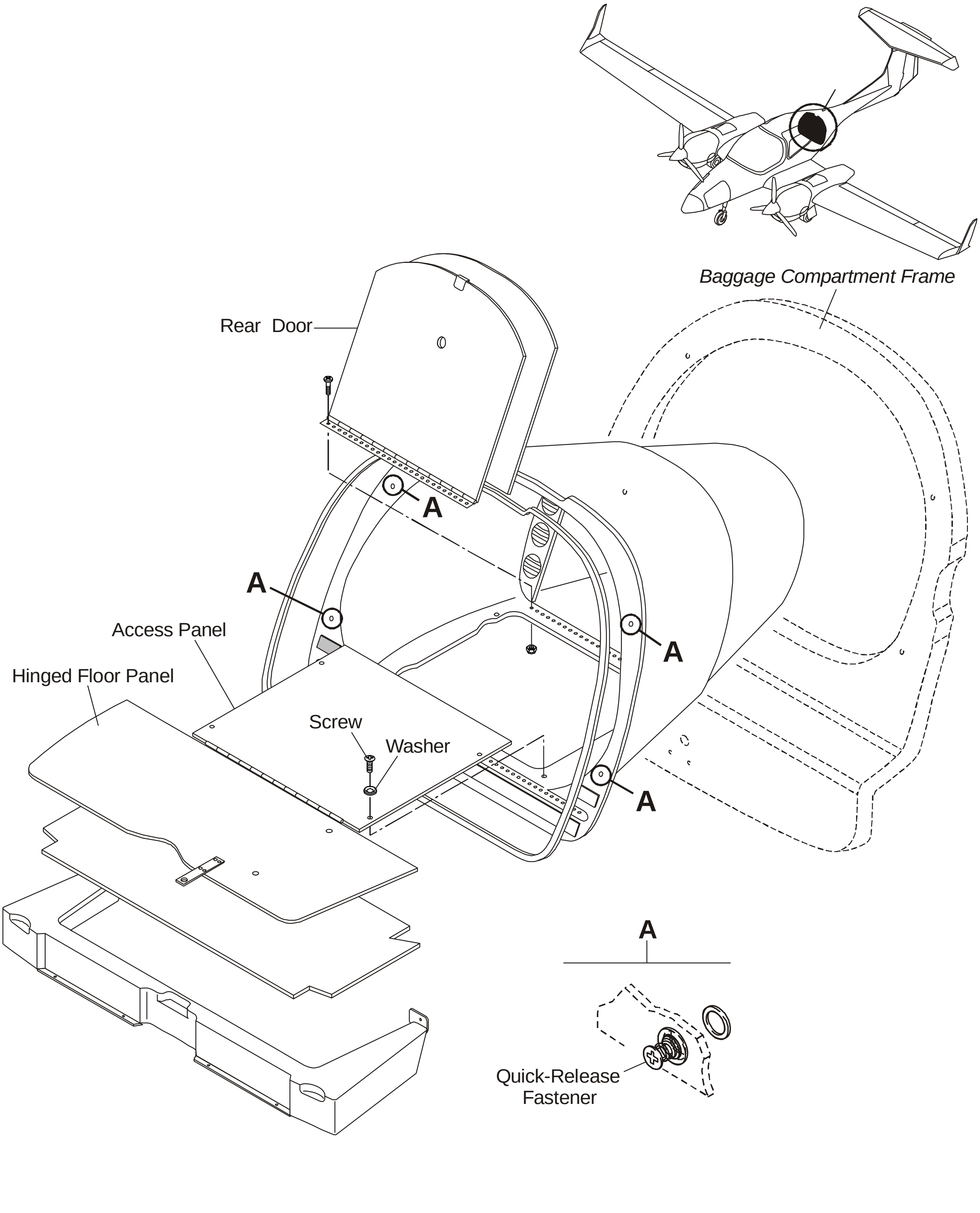

Figure 1: Aft Baggage Compartment

2. Description

Figure 1 shows the aft baggage compartment.

GFRP makes the aft baggage compartment. Quick-release fasteners attach the front of the baggage compartment to the fuselage baggage compartment frame. The rear of the baggage compartment locates in the fuselage ring frame 1. You can remove the aft baggage compartment.

The aft baggage compartment has a rear section that is accessed through a door. The door is hinged along the lower edge. The forward section of the baggage compartment has an access panel in the floor section of the compartment. Quick-release fasteners attach the access panel to the baggage compartment floor. You can remove this access panel to gain access to the aft fuselage. Carpet covers the floor of the baggage compartment.

A cargo net covers the front of the aft baggage compartment and secures the contents of the aft baggage compartment. The cargo net attaches to special net tie-down brackets that are bolted to the front of the baggage compartment frame.

From backside of the baggage extension to the G1000 box is a flexible air hose fixed with two worm drive clamps.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove the access panel in the aft baggage compartment floor. They also tell you how to remove the aft baggage compartment from the airplane.

2. Remove/Install the Access Panel in the Baggage Compartment Floor

A. Remove the Access Panel

	Detail Steps/Work Items	Key Items/References
(1)	Fold the passenger seat-backs forward into the down position.	Refer to Section 25-10.
(2)	If necessary remove the cargo net and move any equipment stowed in the baggage compartment clear of the airplane.	
(3)	Fold the carpet on the floor of the baggage compartment forward to gain access to the panel.	
(4)	Remove the access panel: – Remove the 4 quick-release fasteners that attach the access panel to the baggage compartment. – Lift the access panel up from the baggage compartment floor and move it clear of the airplane.	Refer to Figure 1.

B. Install the Access Panel

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the rear fuselage is clear of loose objects.	For example, tools, cleaning cloths or other hardware.
(2)	Install the access panel: – Move the access panel into position at the baggage compartment floor. – Install the 4 quick-release fasteners and washers that attach the access panel to the baggage compartment.	
(3)	Move the floor carpet back into position on the baggage compartment floor.	
(4)	If necessary, install any equipment that you removed from the baggage compartment and install the cargo net.	
(5)	Move the passenger seat backs into the upright position.	Make sure that the seat backs are correctly locked into position.

3. Remove/Install the Aft Baggage Compartment

A. Remove the Aft Baggage Compartment

	Detail Steps/Work Items	Key Items/References
(1)	Fold the passenger seat backs forward into the down position.	Refer to Section 25-10.
(2)	If necessary remove the cargo net and move any equipment stowed in the baggage compartment clear of the airplane.	
(3)	Fold the carpet on the floor of the baggage compartment forward and clear of the baggage compartment.	
(4)	Open the 4 quick-release fasteners of the access panel to remove the access panel with the hinged floor panel.	Refer to Figure 1.
(5)	Remove the aft baggage compartment: – Remove the 4 quick-release fasteners that attach the baggage compartment to the fuselage baggage frame. – Move the baggage compartment forward out of the rear fuselage then upwards and clear of the airplane.	

B. Install the Aft Baggage Compartment

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the rear fuselage is clear of loose objects.	For example, tools, cleaning cloths or other hardware.
(2)	Install the aft baggage compartment: – Move the baggage compartment into position at the rear fuselage. – Install the flexible air hose on the G1000 box and attach the worm drive clamp. – Move the baggage compartment aft and into the rear fuselage: –Make sure that baggage compartment is fully into position and install the 4 quick-release fasteners that attach the baggage compartment to the fuselage baggage frame.	Make sure that the aft end of the baggage compartment locates correctly in fuselage ring frame 1.
(3)	Install the hinged floor-panel: – Move the hinged floor panel into position at the front of the baggage compartment. – Align the 4 quick-release fasteners from the floor panel in to the baggage compartment floor and attach.	
(4)	Move the floor carpet back into position on the baggage compartment floor.	
(5)	If necessary, install any equipment that you removed from the baggage compartment and install the cargo net.	
(6)	Move the passenger seat backs into the upright position.	Make sure that the seat backs are correctly locked into position.

Section 25-60
Emergency Equipment

1. General

This Section tells you about the emergency equipment installed in the DA 42 NG airplane. It tells you about the emergency location transmitter (ELT) and the first aid kit. Refer to the equipment manufacturers manuals for more data.

Refer to Chapter 26 for data about the hand fire extinguisher which is installed in the cabin of the DA 42 NG.

2. Description

Figure 1 shows the location of the main components of the ELT system.

The ELT is located in the rear fuselage, below the aft baggage compartment. A protective case attached to a mounting bracket holds the ELT in position. The ELT antenna is mounted on the upper surface of the fuselage, above the ELT. A remote control panel/indicator (RCPI) is mounted on the instrument panel, right side.

The ELT transmits signals automatically after a crash on the emergency frequencies of 121.5 and 243.0 Megahertz (MHz). Every 50 seconds the transmitter also transmits a signal on the 406.025 MHz frequency to a satellite. The signal to the satellite contains the serial number of the ELT transmitter or the airplane ID, a country code and a unique identity code. The satellite will also give the emergency services a more accurate location for the airplane.

The ELT has its own battery pack to supply electrical power. When the ELT is ON and transmitting the batteries will keep the ELT transmitting for up to 72 hours on the 121.5 and 243.0 MHz frequencies and for up to 24 hours on the 406.025 MHz frequency.

It is important to monitor the battery expiry dates for the battery pack. The expiry date for the battery pack is shown on the identity plate for the transmitter. The battery pack must be replaced when:

– After use in an emergency.

– After the transmitter has been accidentally switched ON for an unknown period of time.

– After 1 hour of accumulated use (testing).

– On or before the battery pack expiry date.

You must do regular functional tests. Refer to the Maintenance Practices in this Section.

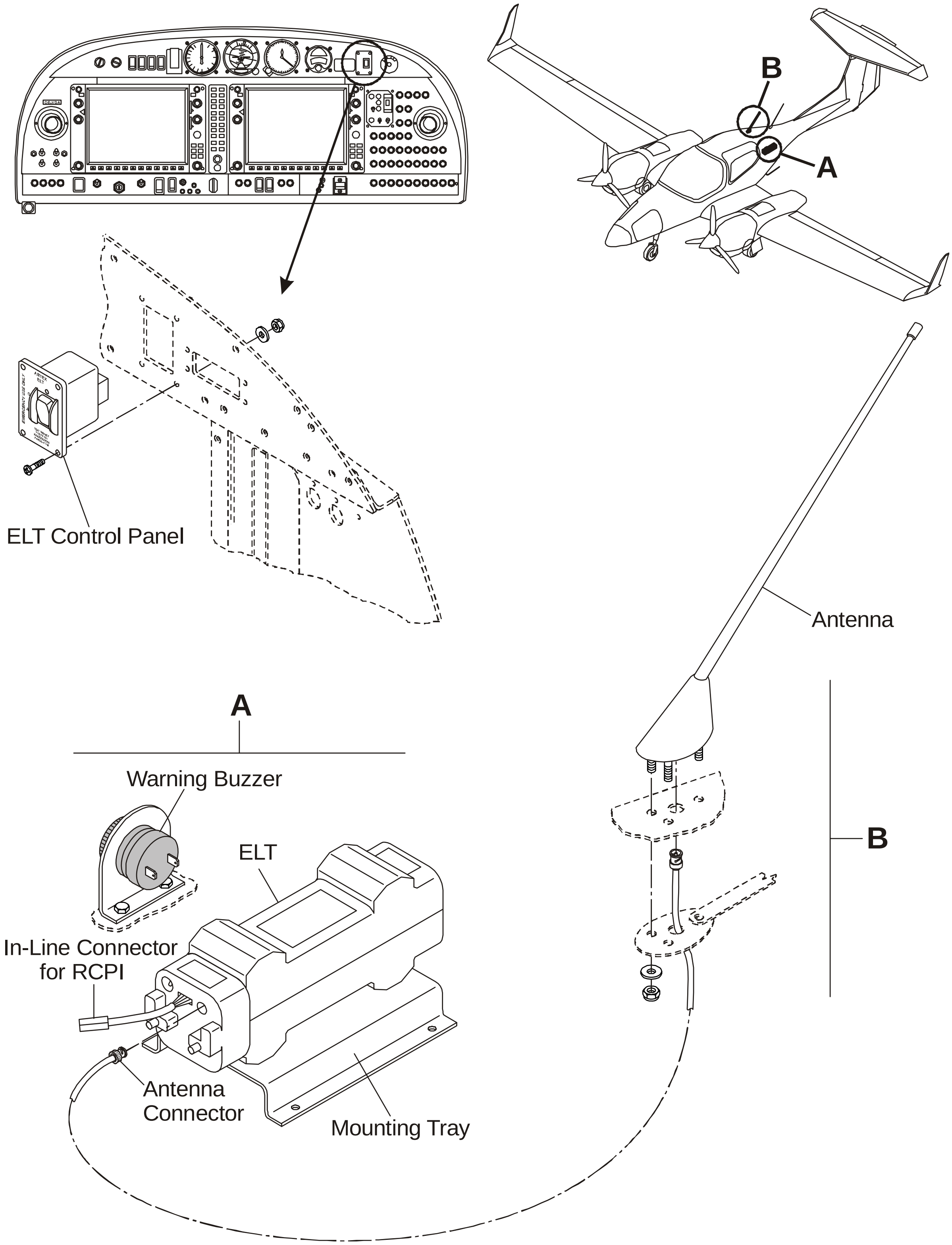

Figure 1: ELT Main Components

3. Description of the Artex ME406 ELT

The ELT is located in the rear fuselage, below the aft baggage compartment. A velcro strap attached to a mounting bracket holds the ELT in position. The ELT antenna is mounted on the upper surface of the fuselage, above the ELT. A remote control panel/indicator (RPCI) is mounted on the instrument panel, right side.

The ELT transmits signals automatically after a crash on the emergency frequencies of 121.5 and 406.028 Megahertz (MHz). Every 50 seconds the transmitter transmits a signal on the 406.028 MHz frequency to a satellite. The signal to the satellite contains the serial number of the ELT transmitter or the airplane ID, a country code and a unique identity code. The satellite will also give the emergency services a more accurate location for the airplane.

The ELT has its own battery pack to supply electrical power. When the ELT is ON and transmitting the batteries will keep the ELT transmitting until battery power is gone on the 121.5 MHz frequency and for up to 24 hours on the 406.028 MHz frequency.

It is important to monitor the battery expiry dates for the battery pack. The expiry date for the battery pack is shown on the identity plate for the transmitter. The battery pack must be replaced when:

– After use in an emergency.

– After the transmitter has been accidentally switched ON for an unknown period of time.

– After 1 hour of accumulated use (testing).

– On or before the battery pack expiry date.

You must do regular functional tests. Refer to the Maintenance Practices in this Section.

4. Description of the Kannad 406 AF-Compact ELT/ AF Integra ELT

The ELT is located in the rear fuselage, below the aft baggage compartment. A velcro strap attached to a mounting bracket holds the ELT AF Compact in position. A draw latch strap attached to a mouting bracket holds the ELT AF-Integra in position. The ELT antenna is mounted on the upper surface of the fuselage, above the ELT. A Remote Control Panel/Indicator (RPCI) is mounted on the instrument panel, right side.

The ELT transmits signals automatically after a crash on the emergency frequencies of 121.5 and 406.028 Megahertz (MHz). Every 50 seconds the transmitter transmits a signal on the 406.028 MHz frequency to a satellite. The signal to the satellite contains the serial number of the ELT transmitter or the airplane ID, a country code and a unique identity code. The satellite will also give the emergency services a more accurate location for the airplane.

The ELT has its own battery pack to supply electrical power. When the ELT AF Compact is ON and transmitting the batteries will keep the ELT transmitting until battery power is gone for over 48 hours on the 121.5 MHz and on 406.028 MHz. When the ELT AF-Integra is ON and transmitting the batteries will keep the ELT transmitting until battery power is gone for over 48 hours on 121.5 MHz and for over 24 hours on 406.028 MHz.

It is important to monitor the battery expiry dates for the battery pack. The expiry date for the battery pack is shown on the identity plate for the transmitter. The battery pack must be replaced when:

– After use in an emergency.

– After the transmitter has been accidentally switched ON for an unknown period of time.

– After 1 hour of accumulated use (testing).

– On or before the battery pack expiry date.

You must do regular functional tests. Refer to the Maintenance Practices in this Section.

Trouble-Shooting

1. General

The table below lists the defects you could have with the ELT. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
ELT does not operate on test.	ELT batteries discharged.	Replace the ELT batteries.
	ELT defective.	If the ELT batteries are serviceable then replace the ELT.
	RCPI/cables defective.	Do a continuity test of the cables between the RCPI and the ELT. Replace defective cables. If the cables are not defective then replace the RCPI.

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Maintenance Practices

1. General

This Section tells you how to remove and install the ELT and the RCPI. It tells you how to test the ELT in the airplane and how to replace the ELT batteries. It also tells you how to replace the ELT antenna.

See the ELT manufacturer's Operator's Manual for more data about the ELT.

2. Remove/Install the ELT

A. Remove the ELT

	Detail Steps/Work Items	Key Items/References
(1)	Remove the access panel in the floor of the aft baggage compartment.	Refer to Section 25-50.
(2)	Remove the ELT protective cover: – Loosen the 2 thumbscrews on the ELT end-cap. – Move the end cap forward and clear of the ELT. – Lift the top protective cover at the aft end and pull the cover aft and up from the ELT. – Move the top protective cover clear of the ELT.	
(3)	Disconnect these cables at the front of the ELT: – The coaxial cable. – The electrical cables.	 At the bayonet connector. At the inline connector.
(4)	Remove the ELT from the ELT mounting tray: – Lift the ELT from the mounting tray at the forward end. – Move the ELT forwards and upwards, clear of the mounting tray. – Move the ELT clear of the airplane.	Use a flat bladed screwdriver to carefully lift the front end of the ELT.

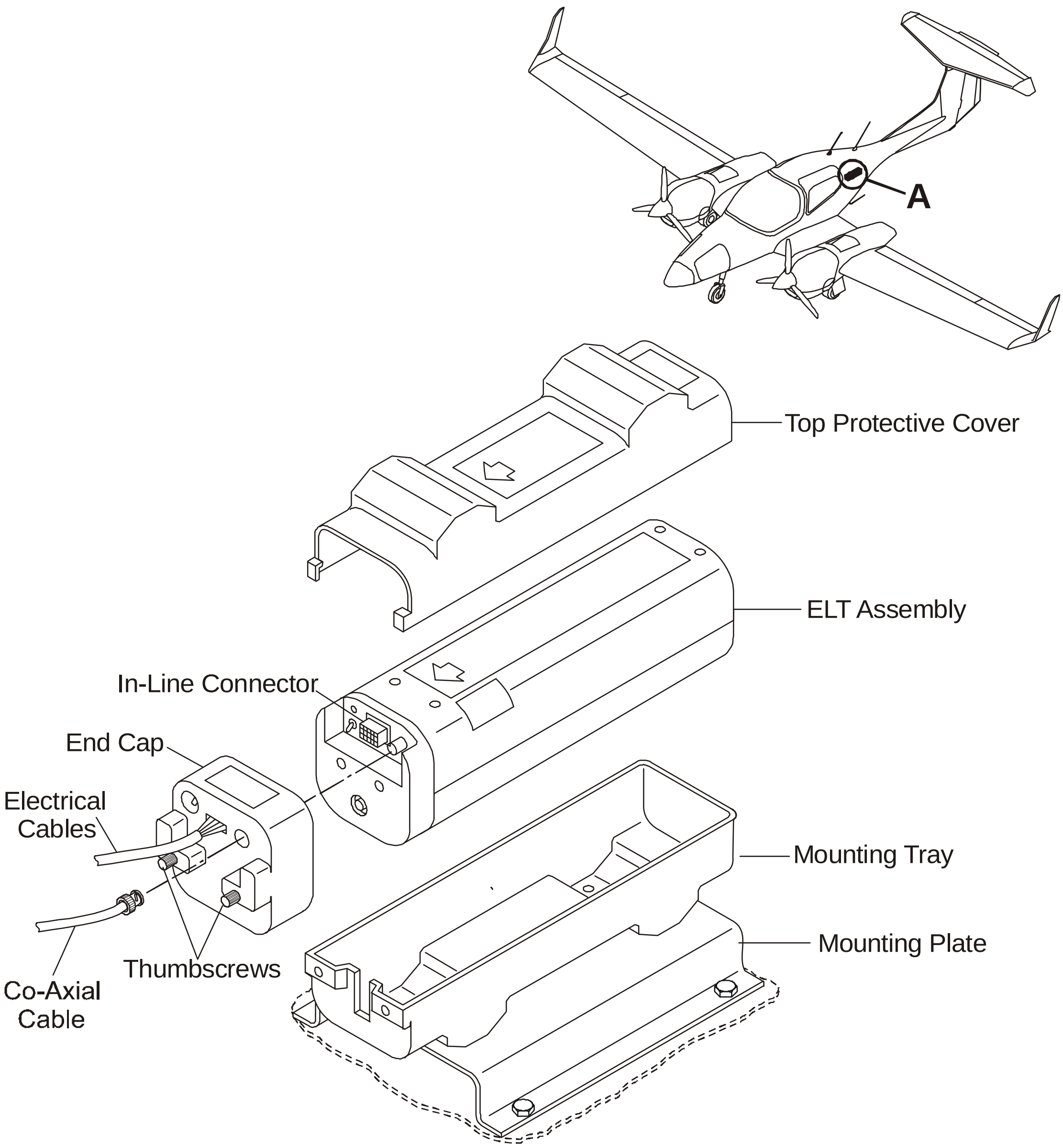

Figure 2: ELT Installation (Standard Equipment)

B. Install the ELT

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the battery pack is serviceable and the battery expiration date is valid.	
(2)	Install the ELT into the mounting tray: – Move the ELT into position at the mounting tray. – Make sure that the ON/OFF switch at the front of the ELT is set to OFF. – Lower the aft end of the ELT into the mounting tray so that the locking ‘ears’ at the aft end of the ELT engage with the slots in the mounting tray. – Lower the ELT fully into the mounting tray. – Install the top protective cover onto the mounting tray. Make sure that the slots on the top cover engage over the ears on the ELT.	
(3)	Connect the electrical cables.	At the in-line connector. Make sure that the cables pass through the end cap before you connect them!
(4)	Connect the coaxial cable.	At the bayonet connector. Make sure that the cable passes through the end cap before you connect it!
(5)	Install the end-cap: – Move the end-cap into position over the top protective cover and the mounting tray. – Align and tighten the thumbscrews.	Finger tight only!
(6)	Make sure that both the electrical cable connector and the coaxial bayonet connector are correctly located.	
(7)	Do a test for the correct operation of the ELT.	Refer to Paragraph 7.

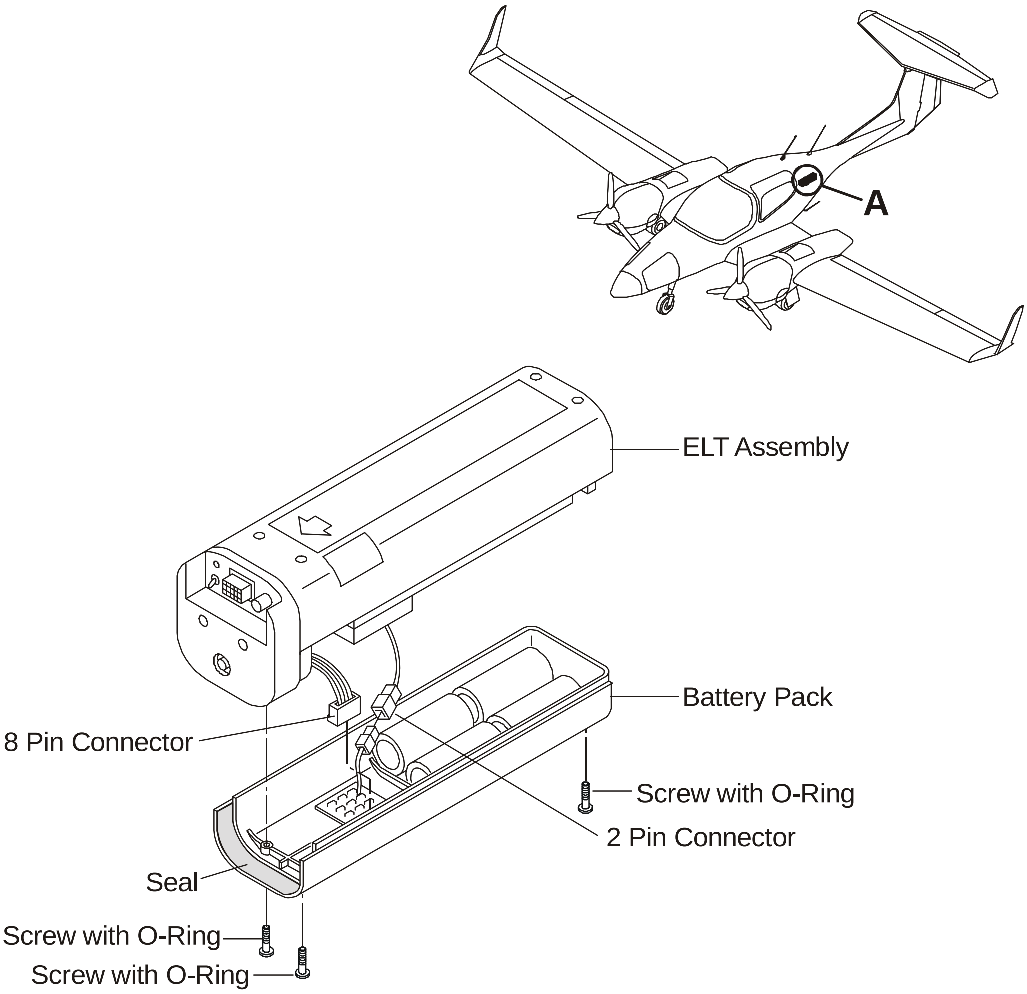

Figure 3: ELT Battery Pack Installation

3. Replace the ELT Battery Pack

You must only use a battery pack that is supplied by the equipment manufacturer.

Note: The battery pack contains components that are sensitive to static electricity. You must take electro-static discharge precautions before doing work on the battery pack.

Note: The battery pack is connected to the ELT by a short electrical cable assembly. You must take care not to strain this cable when you separate the battery pack from the ELT.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the ELT from the airplane ELT mounting.	Refer to Paragraph 2A.
(2)	Remove the battery pack:	Refer to Figure 3.
	– Remove the 4 screws that attach the battery pack to the ELT.	Hold the battery pack to the ELT with your hand to prevent the battery pack separating from the ELT.
	– Lay the ELT with battery pack on it's side on a suitable work surface.	
	– Carefully move the battery pack a short distance clear of the ELT.	
	– Disconnect the wiring harness.	At the 8 pin in-line connector. Take care not to 'short' any of the pins.
	– Disconnect the 2 smaller cables.	At the 2 pin connector.
	– Move the battery pack clear of the ELT.	
(3)	Do a visual inspection of the underside of the ELT (the battery pack side). Look specially for corrosion or other damage to the ELT casing.	

	Detail Steps/Work Items	Key Items/References
(4)	Prepare the new battery pack for installation: – Remove the paper backing from the rubber seal at the connector end of the battery pack. – Lubricate the seal.	Use G GE-635 non-petroleum based silicone grease or similar.
(5)	Install the new battery pack: – Connect the 8 pin connector from the ELT wiring loom to the connector on the battery pack. – Connect the 2 pin connector from the battery pack cables to the recessed connector on the ELT. – Move the battery pack into position on the ELT. – Install the 4 screws that attach the battery pack to the ELT.	Connecting the 2 pin connector will activate the ELT. Reset the ELT by setting the ELT ON/OFF switch to ON then to OFF. Make sure that none of the electrical cables are trapped between the mating surfaces of the ELT and the battery pack.
(6)	Install the ELT in the airplane mounting and attach the 'Battery Pack Replacement Date' label to the top surface of the ELT protective cover where it can be easily seen.	Refer to Paragraph 2.
(7)	Record the details of the ELT battery pack replacement date in the airplane log-book.	
(8)	Do a functional test of the ELT.	Refer to Paragraph 7.

4. Remove/Install the Artex ME 406 or Kannad 406 AF-Compact ELT or Kannad AF-Integra ELT

A. Remove the Artex ME 406 or Kannad 406 AF-Compact ELT or Kannad AF-Integra ELT

	Detail Steps/Work Items	Key Items/References
(1)	Remove the access panel in the floor of the aft baggage compartment.	Refer to Section 25-50.
(2)	Disconnect these cables at the front of the ELT: – The coaxial cable. – The electrical cables.	 At the bayonet connector. At the in-line connector.
(3)	Open the velcro strap.	
(4)	Remove the ELT from the ELT mounting tray: – Lift the ELT from the mounting tray at the forward end. – Move the ELT forward and upward, clear of the mounting tray. – Move the ELT clear of the airplane.	

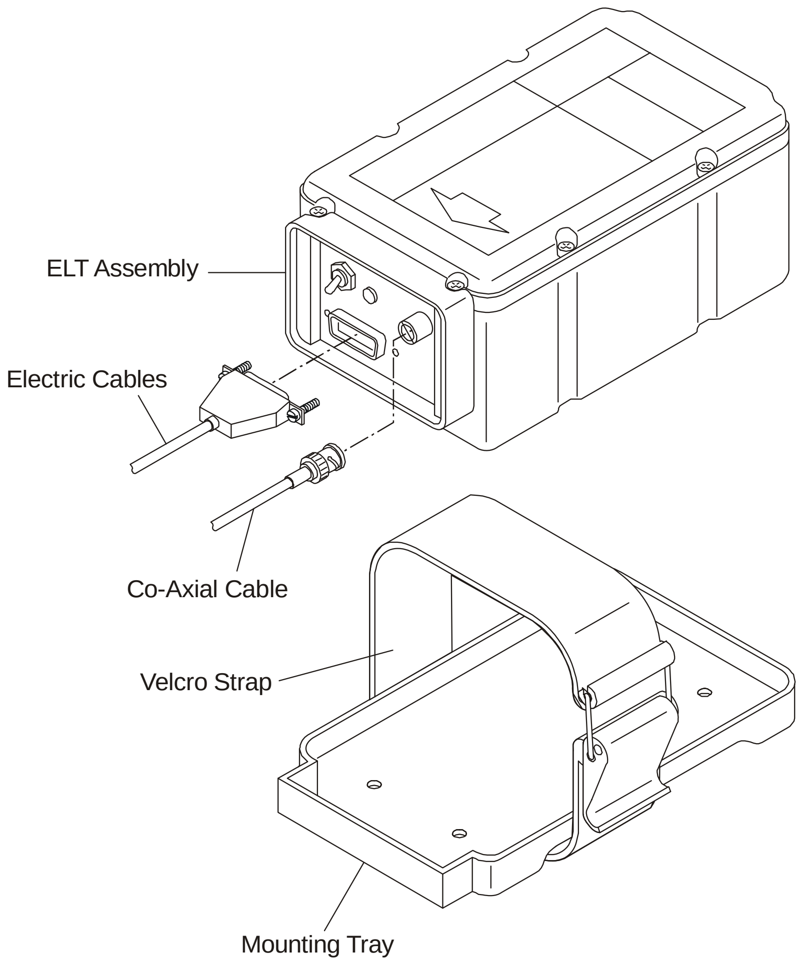

Figure 4: Artex ME406 ELT Installation

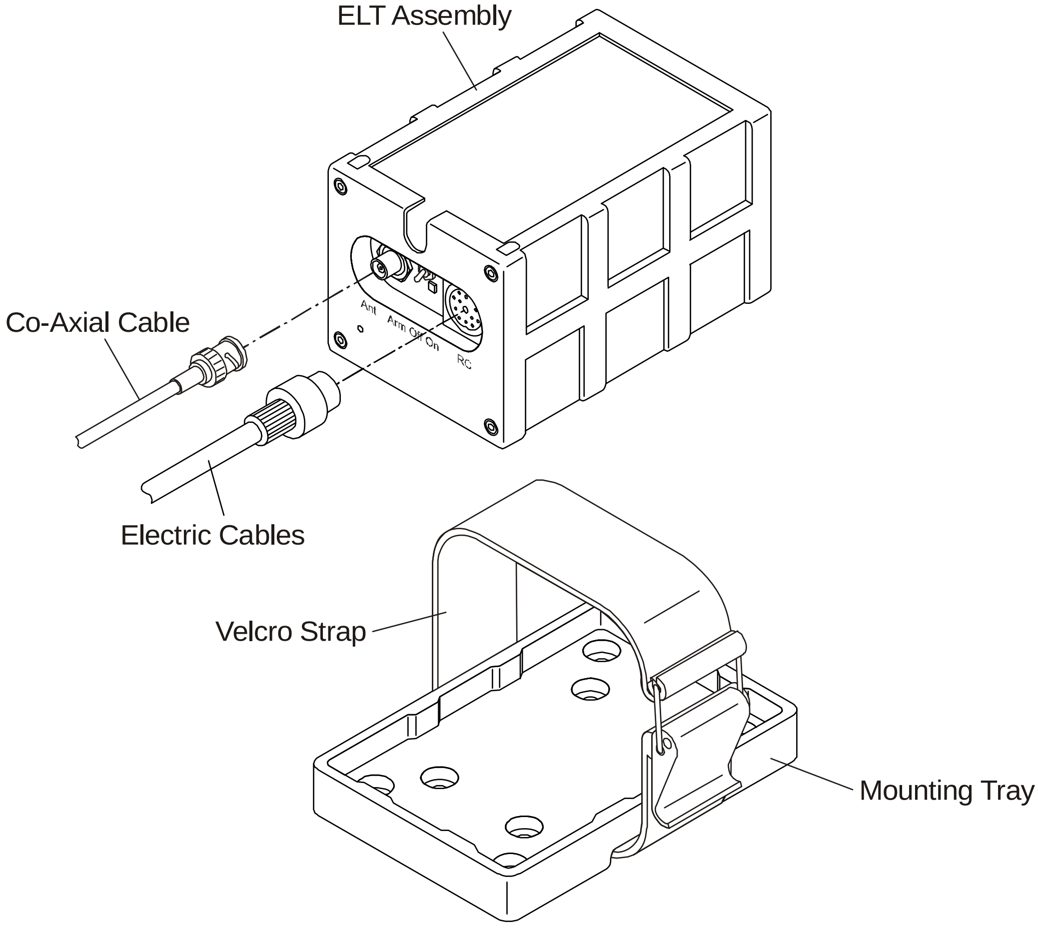

Figure 5: Kannad 406 AF-Compact ELT Installation

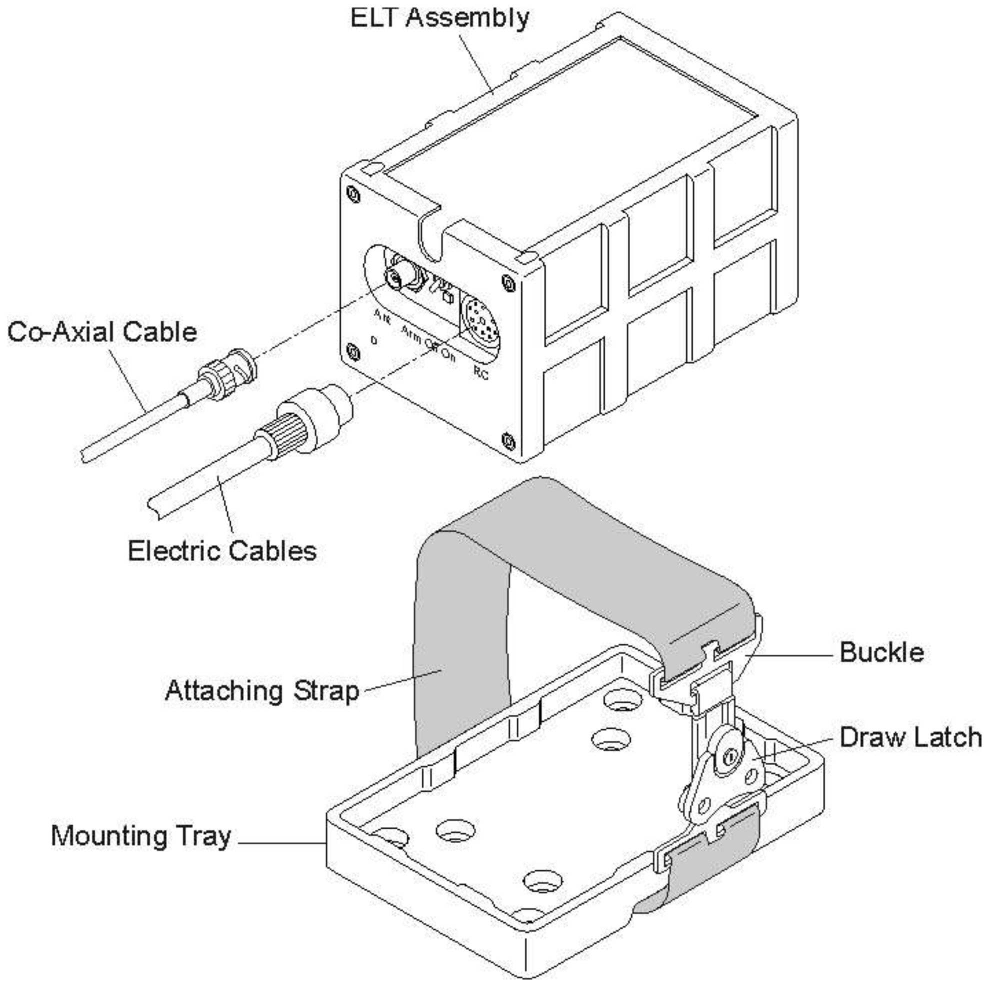

Figure 6: Kannad AF-Integra ELT Installation

B. Install the Artex ME406 or Kannad 406 AF-Compact ELT or Kannad AF-Integra ELT

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the battery pack is serviceable and the battery expiration date is valid.	
(2)	If the Kannad AF-Integra is installed: Refer to the Initial Installation Manual. For the Artex ME 406 or the Kannad 406 AF Compact: Install the ELT into the mounting tray: – Move the ELT into position at the mounting tray. – Make sure that the ON/OFF switch at the front of the ELT is set to OFF. – Lower the aft end of the ELT into the mounting tray so that the locking ‘ears’ at the aft end of the ELT engage with the slots in the mounting tray. – Lower the ELT fully into the mounting tray.	Refer to Section 05-00.
(3)	Fasten the velcro strap around the ELT so that it is firmly held in place.	
(4)	Connect the electrical cables.	At the in-line connector.
(5)	Connect the coaxial cable.	At the bayonet connector.
(6)	Make sure that both the electrical cable connector and the coaxial bayonet connector are correctly located.	
(7)	Do a test for the correct operation of the ELT.	Refer to Paragraph 7.

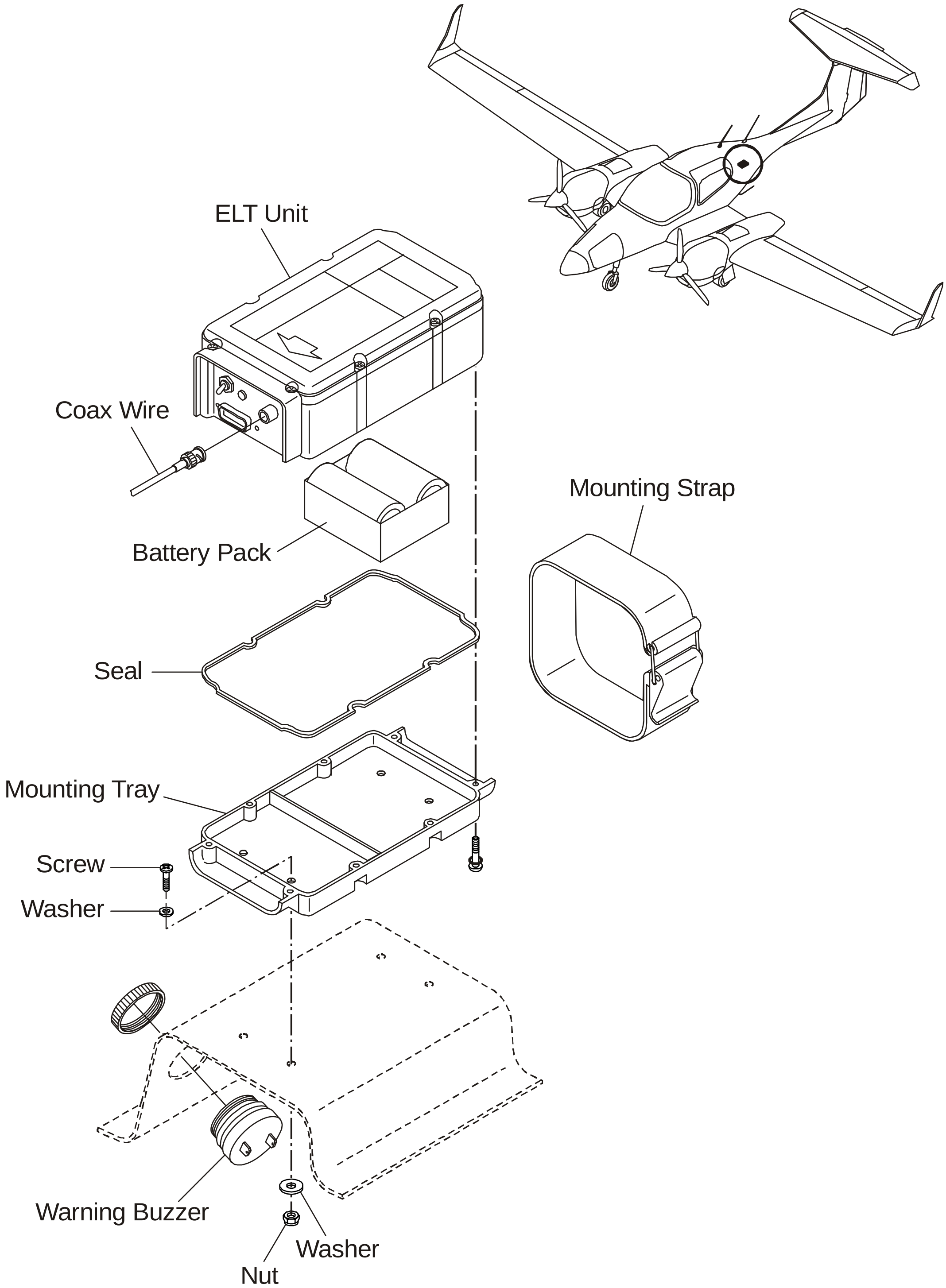

Figure 7: Battery Pack Installation - Artex ME406

5. Replace the ELT Battery Pack of the Artex ME406

You must only use a battery pack that is supplied by the equipment manufacturer.

Note: The battery pack contains components that are sensitive to static electricity. You must take electrostatic discharge precautions before doing work on the battery pack.

Note: The battery pack is connected to the ELT by a short electrical cable assembly. You must take care not to strain this cable when you separate the battery pack from the ELT.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the ELT from the airplane ELT mounting.	Refer to Paragraph 2A.
(2)	Remove the battery pack: – Remove the 8 screws from the battery-side cover. – Carefully move the battery pack a short distance clear of the ELT. – Disconnect the wiring harness. – Move the battery pack clear of the ELT.	Refer to Figure 7. Hold the battery pack to the ELT with your hand to prevent the battery pack separating from the ELT.
(3)	Do a visual inspection of the underside of the ELT (the battery pack side). Look specially for corrosion or other damage to the ELT casing.	
(4)	Prepare the new battery pack for installation.	
(5)	Lay the battery pack on the work surface with the batteries facing up.	
(6)	Install the replacement seal.	In the slot along the perimeter housing.
(7)	Position the ELT over the battery pack and plug the connector into the battery assembly.	Make sure that the cable is not twisted and that the connector is correctly attached.
(8)	Mate the ELT to the battery.	Make sure that the seal is positioned correctly.
(9)	Install the 8 screws that attach the battery pack to the ELT.	

	Detail Steps/Work Items	Key Items/References
(10)	Install the ELT in the airplane mounting and attach the battery pack replacement date label to the top surface of the ELT protective cover where it can be easily seen.	Refer to Paragraph 2.
(11)	Record the details of the ELT battery pack replacement date in the airplane log-book.	
(12)	Do a functional test of the ELT.	Refer to Section 25-60, Paragraph 7.

6. Remove/Install the ELT RCPI

A. Remove the ELT Remote Control Panel/Indicator RCPI

	Detail Steps/Work Items	Key Items/References
(1)	Remove the instrument panel cover.	Refer to Section 25-10.
(2)	Disconnect the electrical cables from the rear of the RCPI.	Refer to Figure 8. At the in-line connector.
(3)	Remove the RCPI: – Remove the 4 nuts, washers and screws that attach the RCPI to the instrument panel. – Move the RCPI towards the rear of the airplane and clear of the instrument panel. – Move the RCPI clear of the airplane.	Hold the RCPI.

B. Install the ELT Remote Control Panel/Indicator RCPI

	Detail Steps/Work Items	Key Items/References
(1)	Move the RCPI into position at the instrument panel.	
(2)	Install the RCPI: – Move the RCPI into position in the instrument pane. – Install the 4 screws, washers and nuts that attach the RCPI to the instrument panel.	From the cockpit side.
(3)	Connect the electrical cables to the rear of the RCPI.	At the inline connector.
(4)	Install the instrument panel cover.	Refer to Section 25-10.
(5)	Do a functional test of the ELT system.	Refer to Paragraph 7.

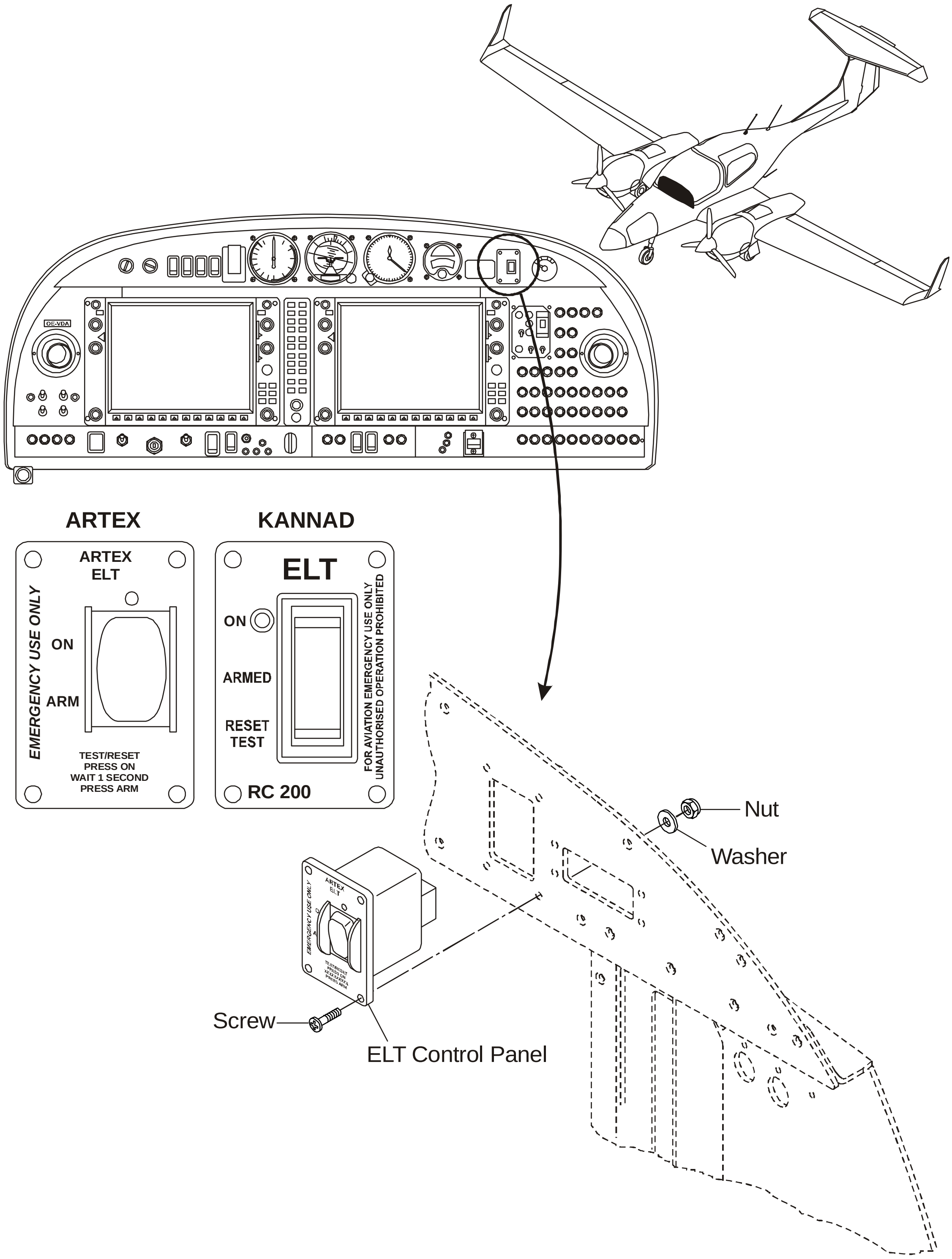

Figure 8: RCPI Installation

7. ELT Functional Test

Note: Do this test only in the first 5 minutes of each hour. If you are at a location with a control tower or other monitoring facility, tell them before you do the test.

Note: For maintenance done to FAR 91 (airplanes registered in the USA) an additional functional test of the ELT is required. Refer to FAA Action Notice 8150.3 for more data.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to ON.	
(2)	Set the AV MASTER switch to ON.	
(3)	Set the communications radio to receive 121.50 MHz.	
	WARNING: DO NOT OPERATE THE ELT FOR MORE THAN 5 SECONDS. IF YOU OPERATE THE ELT FOR MORE THAN 5 SECONDS THE ELT WILL TRANSMIT AN EMERGENCY SIGNAL TO THE SATELLITE MONITORING SYSTEM. THE SATELLITE MONITORING SYSTEM WILL REACT TO THE ELT SIGNAL AS IT WOULD TO A VALID EMERGENCY SITUATION.	
(4)	Set the ELT RCPI to ON for about 3 sweeps of the receiver (approximately 1 second). The test MUST NOT last longer than 3 audio sweeps!	The LED in the RCPI must illuminate.
(5)	Monitor the communications receiver for the ELT sweep tone.	
(6)	Set the ELT RCPI switch to ARM.	The LED should switch off within 1 sec. If the LED switches off and then flashes it indicates that there is a fault with the ELT system. Refer to the ELT manufacturer's manual for more data about ELT fault diagnosis.
(7)	Set the AV MASTER switch to OFF.	
(8)	Set the ELECT. MASTER switch to OFF.	

8. Kannad 406 AF-Compact ELT and Kannad AF-Integra ELT Functional Test

Note: Do this test only in the first 5 minutes of each hour. If you are at a location with a control tower or other monitoring facility, tell them before you do the test.

Note: For maintenance done to FAR 91 (airplanes registered in the USA) an additional functional test of the ELT is required. Refer to FAA Action Notice 8150.3 for more data.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to ON.	
(2)	Set the AV MASTER switch to ON.	
(3)	Set the communications radio to receive 121.50 MHz.	
WARNING:	**DO NOT OPERATE THE ELT FOR MORE THAN 5 SECONDS. IF YOU OPERATE THE ELT FOR MORE THAN 5 SECONDS THE ELT WILL TRANSMIT AN EMERGENCY SIGNAL TO THE SATELLITE MONITORING SYSTEM. THE SATELLITE MONITORING SYSTEM WILL REACT TO THE ELT SIGNAL AS IT WOULD TO A VALID EMERGENCY SITUATION.**	
(4)	Switch the RCPI to “ON” (max. 5 sec.).	RCPI visual indicator flashing. ELT buzzer modulated activation.
(5)	Monitor the communications receiver for the ELT sweep tone.	
(6)	Switch the RCPI to “TEST/RESET” at least 1 sec., then back to “ARMED”.	ELT transmission stops if: – RCPI visual indicator is OFF. – ELT buzzer stops.
(7)	Set the AV MASTER switch to OFF.	
(8)	Set the ELECT. MASTER switch to OFF.	

CHAPTER 26

FIRE PROTECTION

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CHAPTER 26

FIRE PROTECTION

Trouble-Shooting

Maintenance Practices

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CHAPTER 26
FIRE PROTECTION

1. General

This Chapter tells you about the fire extinguisher installed in the airplane. It also tells you about the installation of the overheat detector installed in each engine nacelle. See the fire extinguisher manufacturer's manual for more data about the extinguisher and see the overheat detector manufacturer’s manual for more data about the overheat detector.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Note: Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called "Additional Equipment". The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

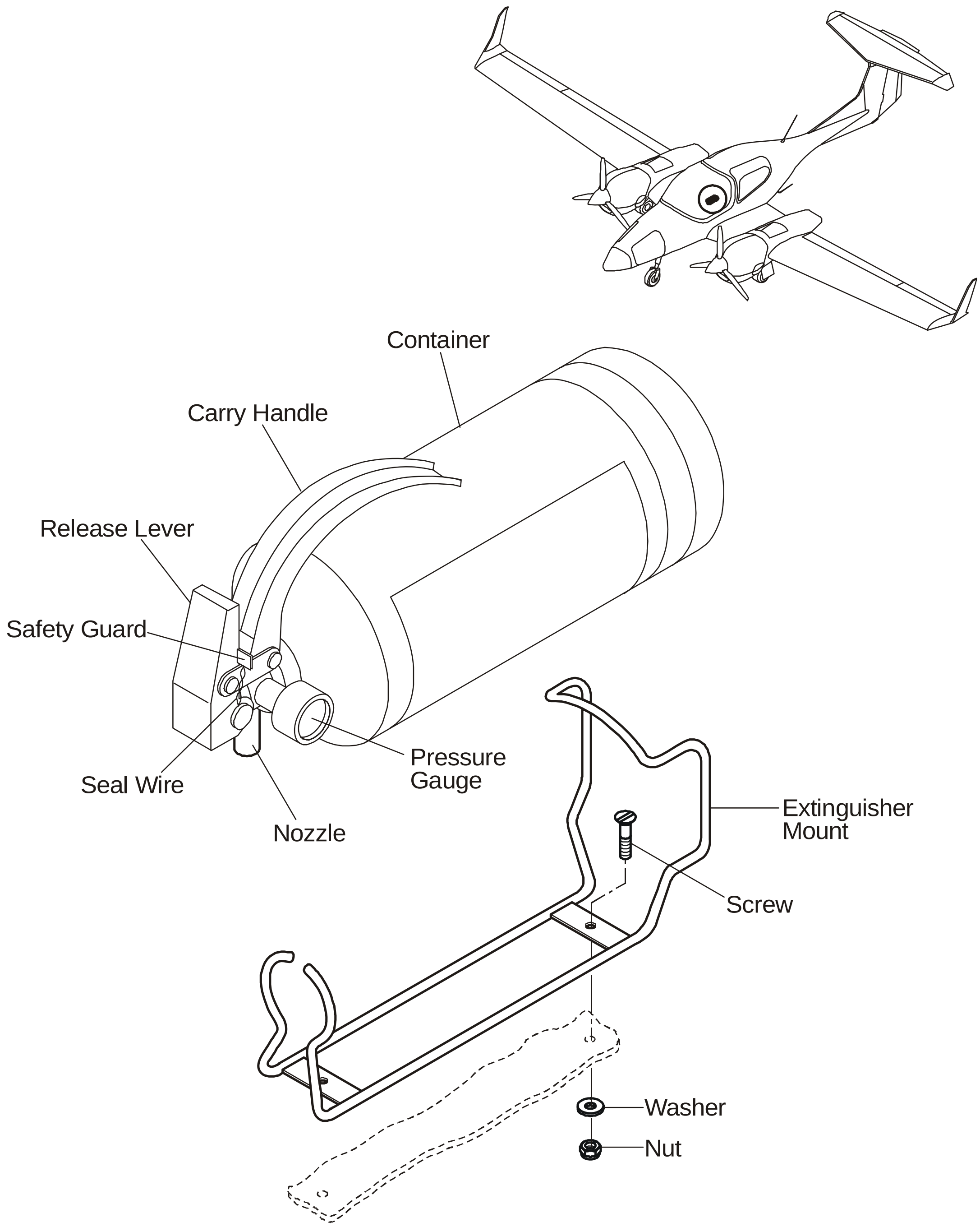

Figure 1: Fire Extinguisher Installation

2. Description

A. Fire Extinguisher

Figure 1 shows the installation of the fire extinguisher in the airplane. The fire extinguisher is located behind the co-pilot's seat. Screws attach the extinguisher mounting bracket to the closing rib between the front and the rear main bulkhead. The extinguisher uses a liquid gas which is non-toxic and does not have a residue.

The only on-airplane maintenance is:

– Monitor the pressure indicator. It must show in the green sector.

– Make sure that the seal wire is not broken.

– Make sure that the extinguisher is correctly held in the mounting.

If the seal wire is broken, remove the extinguisher for weighing. Weight data is given on the label attached to the extinguisher body.

You must replace the extinguisher (or return it to the manufacturer for repair):

– When the weight is incorrect.

– When the pressure is too low.

– When the extinguisher has been used.

– If the extinguisher is damaged.

– At the ‘Next Overhaul Date’ that is given on the label attached to the extinguisher body.

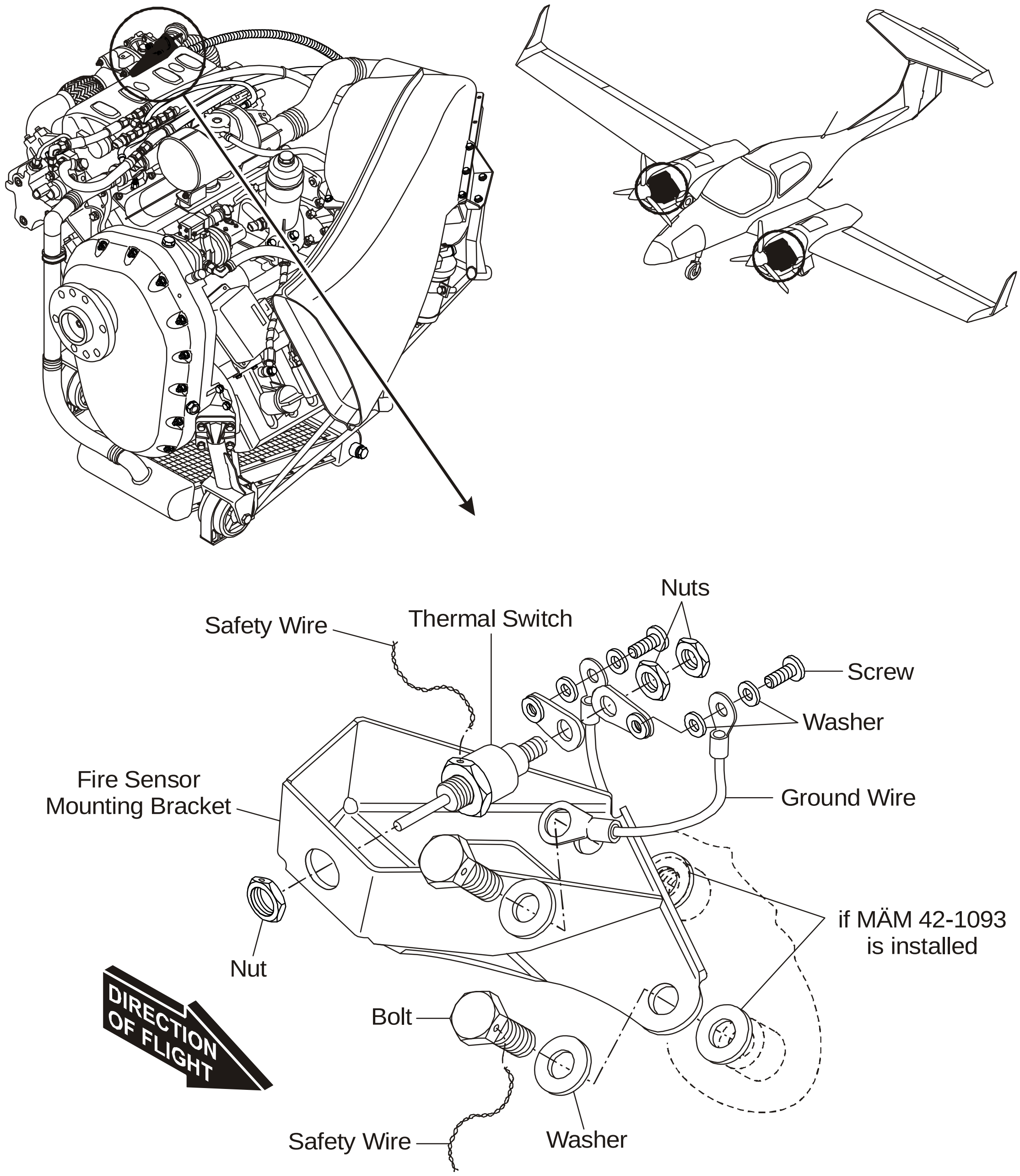

Figure 2: Engine Overheat Detector Installation

B. Overheat Detector

Figure 2 shows the overheat detector installation in an engine nacelle. Each engine has an overheat detector installed on the right side of the engine. The detector is mounted on a bracket and connects with ring terminals to the wiring harness.

A bi-metal switch makes the fire detector. If the fire detector reaches a temperature of 260 °C (500 °F) the switch closes and a LH/RH ENG FIRE warning is displayed on the integrated cockpit system (ICS) display screen. You cannot cancel the LH/RH ENG FIRE warning.

Operating the TEST button for the landing gear will by-pass the bi-metal switch and will cause the LH/RH ENG FIRE warning of ICS to operate. This test system will test the serviceability of the electrical cables for the overheat detectors and the operation of the LH/RH ENG FIRE warning of the ICS. Refer to Section 31-40 for more data about the ICS.

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Trouble-Shooting

1. General

This Section lists some defects you could have with the fire protection system. If you have the trouble shown in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
The LH/RH ENG FIRE warning fails to display when the landing gear TEST button is operated.	Wiring defective.	Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.
	ICS display defective.	Refer to Section 31-40 for more data about the ICS.
An LH/RH ENG FIRE warning shows when power is applied to the ICS.	Defective overheat detector.	Replace the related engine overheat detector.
	Wiring defective.	Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.

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Maintenance Practices

1. General

These Maintenance Practices only tell you how to replace an engine overheat detector. Refer to the overheat detectors manufacturer's manuals for more data about the overheat detector.

2. Remove/Install an Engine Overheat Detector

A. Remove an Engine Overheat Detector

Detail Steps/Work Items		Key Items/References
WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**		
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings from the related engine.	Refer to Section 71-10.
(3)	Remove cable ties of the cable near the fire sensor.	
(4)	Remove the overheat detector: – Remove the safety wire form overheat detector and mounting bracket. – Carefully screw off the overheat detector from the mounting bracket.	
(5)	Disconnect the electrical cables for the overheat detector.	Refer to Figure 2. At the ring terminals.

B. Install an Engine Overheat Detector

Detail Steps/Work Items		Key Items/References
(1)	Connect the electrical cables for the overheat detector.	Refer to Figure 2. At the ring terminals.
(2)	Install the overheat detector: – Move the overheat detector into position at the mounting bracket. – Lower the overheat detector into the mounting bracket from the top. – Tighten the overheat detector on the mounting bracket. – Secure the overheat detector on the mounting bracket.	Use a new safety wire.
(3)	Fix the cable with cable ties in the same way as they were before removal.	
(4)	Do a test of the related overheat detector.	Refer to Paragraph 3.
(5)	Install the engine cowlings to the related engine.	Refer to Section 71-10.

3. Overheat Detector Test

Detail Steps/Work Items		Key Items/References
(1)	Set the ELECT. MASTER switch to ON.	In the cockpit.
(2)	Press and hold the TEST button of the landing gear.	The LH/RH ENG FIRE warning must appear on the PFD.
(3)	Release the TEST button of the landing gear.	The LH/RH ENG FIRE warning must disappear from the PFD.
(4)	Set the ELECT. MASTER switch to OFF.	

CHAPTER 27

FLIGHT CONTROLS

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CHAPTER 27
FLIGHT CONTROLS

1. General

This Chapter tells you about the flight controls of the DA 42 NG. It tells about the operation of the controls and it tells you about the assembly and adjustment of the controls. Refer to the related Section for the data about a specific system.

This Section tells you how standard parts are used to make the flight controls for each system.

Note: Equipment which is certified for use in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Any equipment not listed in Section 6.5 of the Airplane Flight Manual is called ”Additional Equipment”. The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

2. Description

Figure 1 shows the basic control surfaces of the DA 42 NG. The DA 42 NG has the usual flight controls. An elevator attached to the horizontal stabilizer gives longitudinal control. Ailerons attaches to the trailing edge of each wing gives lateral control. Rudder attached to the vertical stabilizer gives yaw control. Flaps attach to the trailing edge of each wing to give extra lift for take-off and landing. The rudder and the elevator both have trim systems.

Each pilot has a control stick. If OÄM 42-281 or OÄM 42-283 is installed, the RH control stick is removed or removable. The pilot can set the elevator trim by using a hand wheel located in the center console or electrically by using a switch mounted on the pilot's control stick. The DA 42 NG is equipped with an electrically operated variable elevator stop that limits the upward elevator deflection as soon as the power setting of both engines exceeds approx. 20 %. The variable elevator stop is controlled by two switches on the throttle quadrant (one for each power lever).

Each pilot has a set of rudder pedals. The rudder pedal assembly attaches to the cockpit floor. Each pilot can adjust the position of the rudder pedals with an adjuster handle on the rudder pedal assembly. A rudder trim adjuster is mounted in the front of the center console. A flexible drive cable connects the rudder trim adjuster to the rudder trim tab.

The pilot uses the control stick to move the ailerons and elevator. Both the ailerons and elevator are moved by a series of bellcranks and pushrods. Flexible cables connect the rudder pedal assembly to the rudder. An electric actuator operates the flaps.

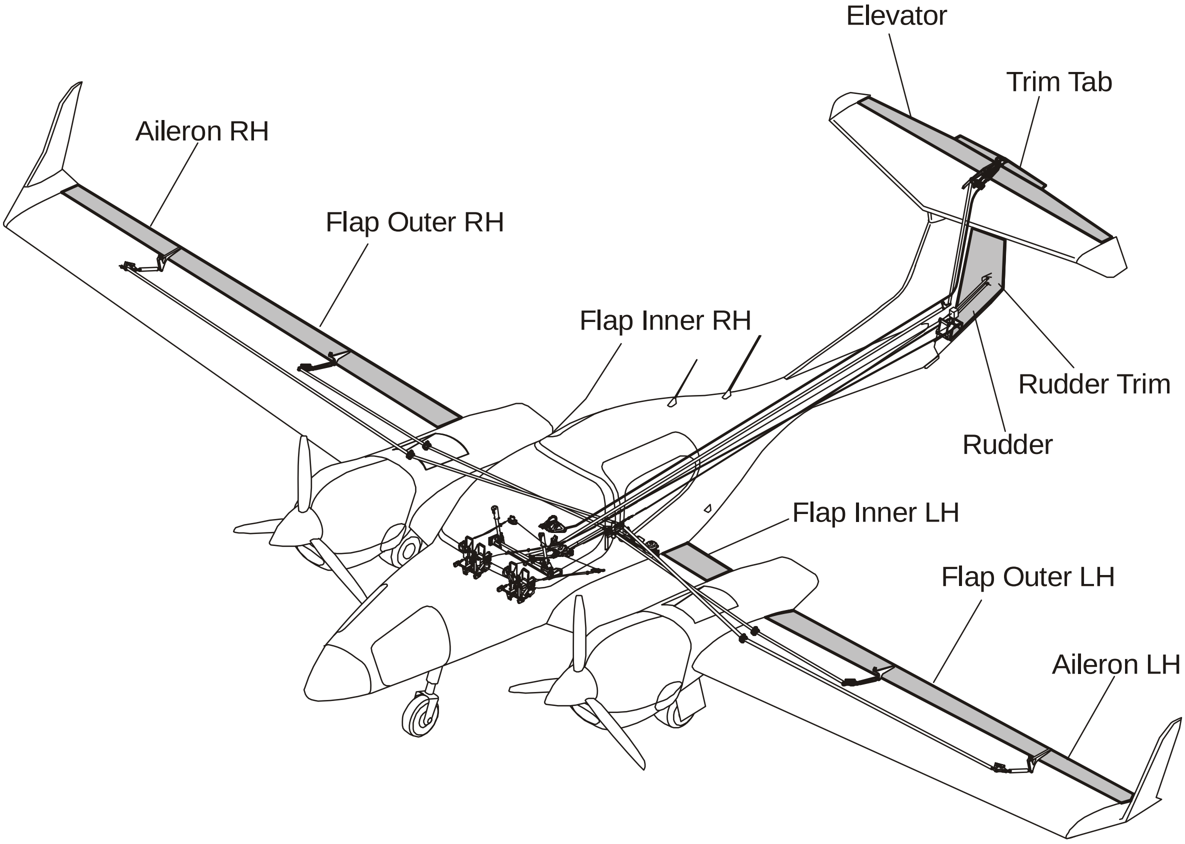

Figure 1: DA 42 NG Control Surfaces

3. Pushrods

The pushrods used in the DA 42 NG have standard end fittings. Most control rods also use a standard diameter tube. Only the length of the rods are special. Some rods have one fixed fork end fitting and an adjustable eye end fitting. Other rods have two adjustable eye end fittings.

Figure 2 shows an example of a standard pushrod. The rod has adjustable end fittings. The adjustable fittings have eye ends with a threaded shaft. The eye end has a spherical self-aligning bearing. A jam nut on the threaded shaft locks the eye end in position. A toothed washer locks the nut. You can turn the eye ends to adjust the length of the pushrod.

A steel tube makes the rod which connects the end fittings. Threaded inserts are welded into the ends of the tube to make the connections for the eye ends. Safety holes are drilled into the tube at the end fittings. The safety holes shows you if the installation of the eye end into the control rod is correct. If you can push safety wire through the hole when the eye end is installed then the eye end fitting is NOT installed correctly. You cannot push safety wire through the hole if the eye end fitting is installed correctly.

Refer to the maintenance practices in this Section for the procedures for adjusting the length of adjustable pushrods.

4. Control Rigging

The flight controls of the DA 42 NG have been designed to make correct rigging of the controls as easy as possible. Most levers and bellcranks have holes for rigging pins. The rigging pins lock the levers in the neutral position.

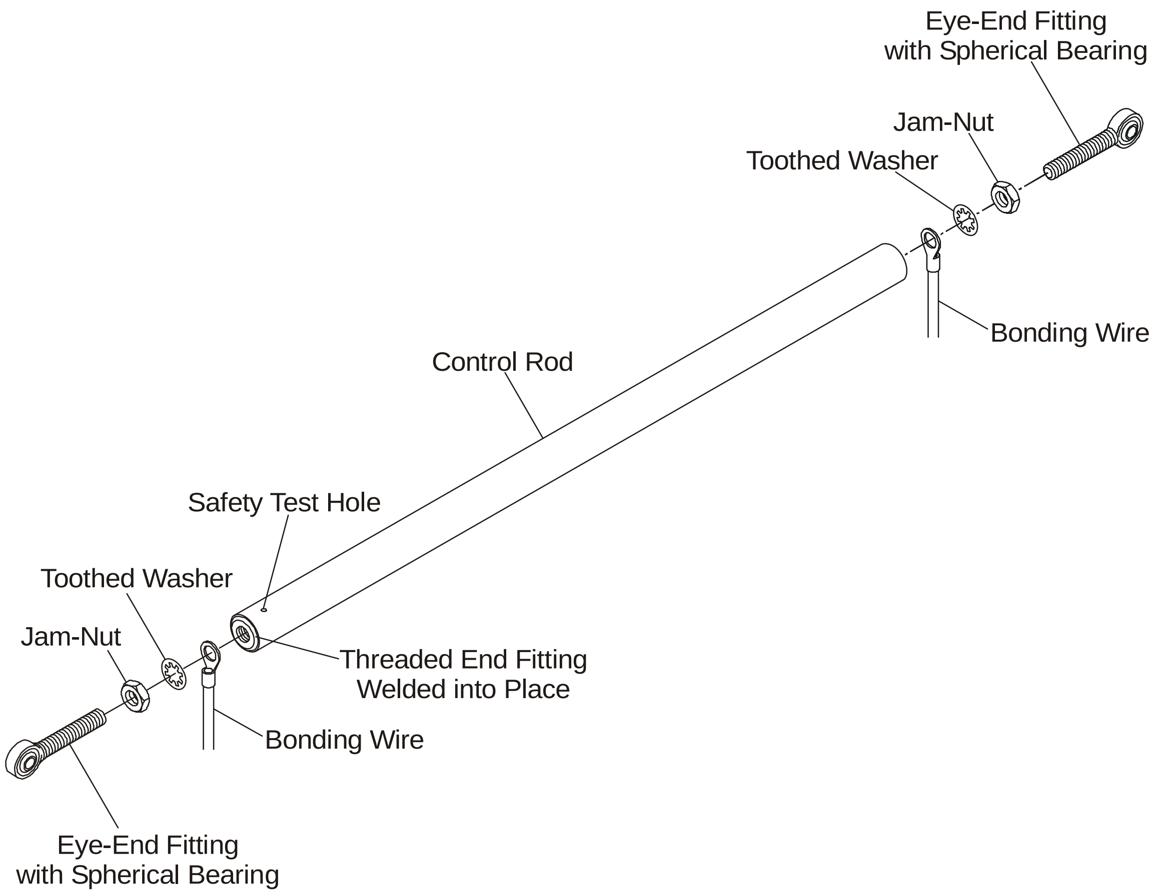

Figure 2: DA 42 NG Standard Control Pushrod

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Maintenance Practices

1. General

These Maintenance Practices tell you how to do procedures which apply to all of the control systems (such as push-rod adjustment).

2. Push-Rod Adjustment

WARNING: IF YOU DO AN ADJUSTMENT OF A PUSHROD, YOU MUST MAKE SURE THAT THE PUSHROD IS STILL IN SAFETY. IF YOU DO NOT DO THIS, THE PUSH ROD CAN DISCONNECT. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

	Detail Steps/Work Items	Key Items/References
(1)	Release the bolt which attaches the pushrod adjustable fitting to its related lever or bellcrank.	
(2)	Loosen the jam nut that locks the adjustable fitting.	Refer to Figure 1.
(3)	Turn the eye end to adjust the length of the rod.	Turn the eye end clockwise to make the rod shorter, turn the eye end counter-clockwise to make the rod longer.
(4)	When you have adjusted the eye end do a test for safety of the eye end: – Try to push lock wire through the safety hole.	The lock wire MUST NOT go through the safety hole and out of the other side.
(5)	Tighten the jam-nut.	Torque 16 Nm (11.8 lbf.ft.).
(6)	Move the eye end fitting into position in its related lever or bellcrank.	
(7)	Install the bolt, washer and self locking nut that attaches the control rod to its related lever or bellcrank.	Torque 6.4 Nm (4.7 lbf.ft.). You must always use a new self locking nut.

	Detail Steps/Work Items	Key Items/References
(8)	Do an inspection of the control that you have adjusted: – If necessary for your Airworthiness Authority, do a duplicate inspection of the control system that you adjusted. – Do a friction check of the appropriate control system.	Make sure that there is no undue friction within the control system.

3. Remove/Install Levers or Bellcranks

The DA 42 NG has standard attachments for bellcranks and levers in the flight control systems. Refer to the tables at the end of each Section for access data. Refer to the Figures in the related Section for the correct orientation.

A. Remove a Lever or Bellcrank

	Detail Steps/Work Items	Key Items/References
(1)	Release the bolts attaching the pushrods to the lever or bellcrank.	
(2)	Remove the pivot bolt assembly from the lever or bellcrank.	
(3)	If necessary, remove the lever or bellcrank mounting bracket: – Remove the bolts and washers that attach the mounting bracket to the structure.	Where you have access to both side of the attachment, bolts with washers and nuts are used. In all other cases, anchor nuts are used.

B. Install a Lever or Bellcrank

	Detail Steps/Work Items	Key Items/References
(1)	If necessary, put the mounting bracket into position.	
	Note: You must always use new self locking nuts when installing control levers or bellcranks. Do NOT use a self locking nut more than once.	
(2)	Install the bolts, washers and nuts that attach the mounting bracket to the structure.	Torque 6.4 Nm (4.7 lbf.ft.).
(3)	Put the lever or bellcrank into position at the mounting bracket.	Make sure that bushes and spacers are correctly located.
(4)	Install the pivot bolt, washer and nut.	Torque 6.4 Nm (4.7 lbf.ft.).
(5)	Install the bolts, washers and self locking nuts which attach the push rods.	Torque 6.4 Nm (4.7 lbf.ft.).
(6)	Do a test of the control system.	Refer to the related Section.
(7)	Do an inspection of the control that you have adjusted: – If necessary for your Airworthiness Authority, do a duplicate inspection of the control system that you adjusted. – Do a friction check of the appropriate control system.	Make sure that there is no undue friction within the control system.

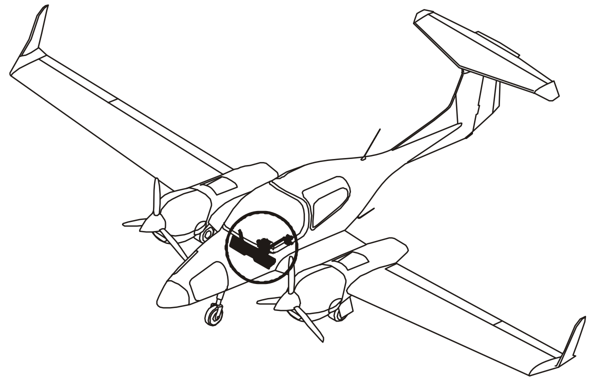
4. Remove/Install a Control Stick

If OÄM 42-281 is installed, the RH stick lever replaces the RH control stick.

If OÄM 42-283 is installed, the RH stick can be removed by the pilot and consists of two parts, the control stick base and the removable control stick. For removal / installation of the removable control stick refer to Supplement O08 to the AFM.

A. Remove a Control Stick

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilot’s seat.	Refer to Section 25-10.
(2)	Loosen the control stick electrical harness from the airplane structure.	
(3)	Disconnect the control stick electrical harness connectors. If OÄM 42-283 is installed: Disconnect the AP/DISC relay from the control stick base harness.	
(4)	Remove the nut, washer and the bolt attaching the control stick / stick lever to the torque tube assy and remove the control stick from the torque tube assy.	
(5)	Disconnect the push rod from the control stick / stick lever: – Remove the bonding wire, the nut and the bolt.	



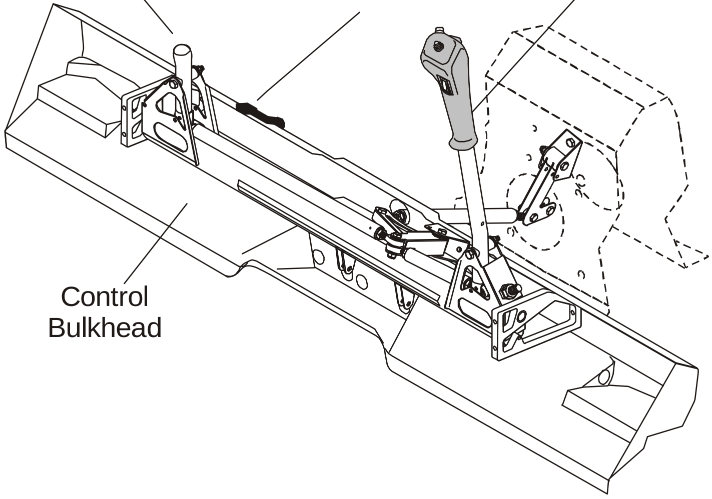


Figure 3: LH Control Stick and RH Stick Lever (if OÄM 42-281 is installed)

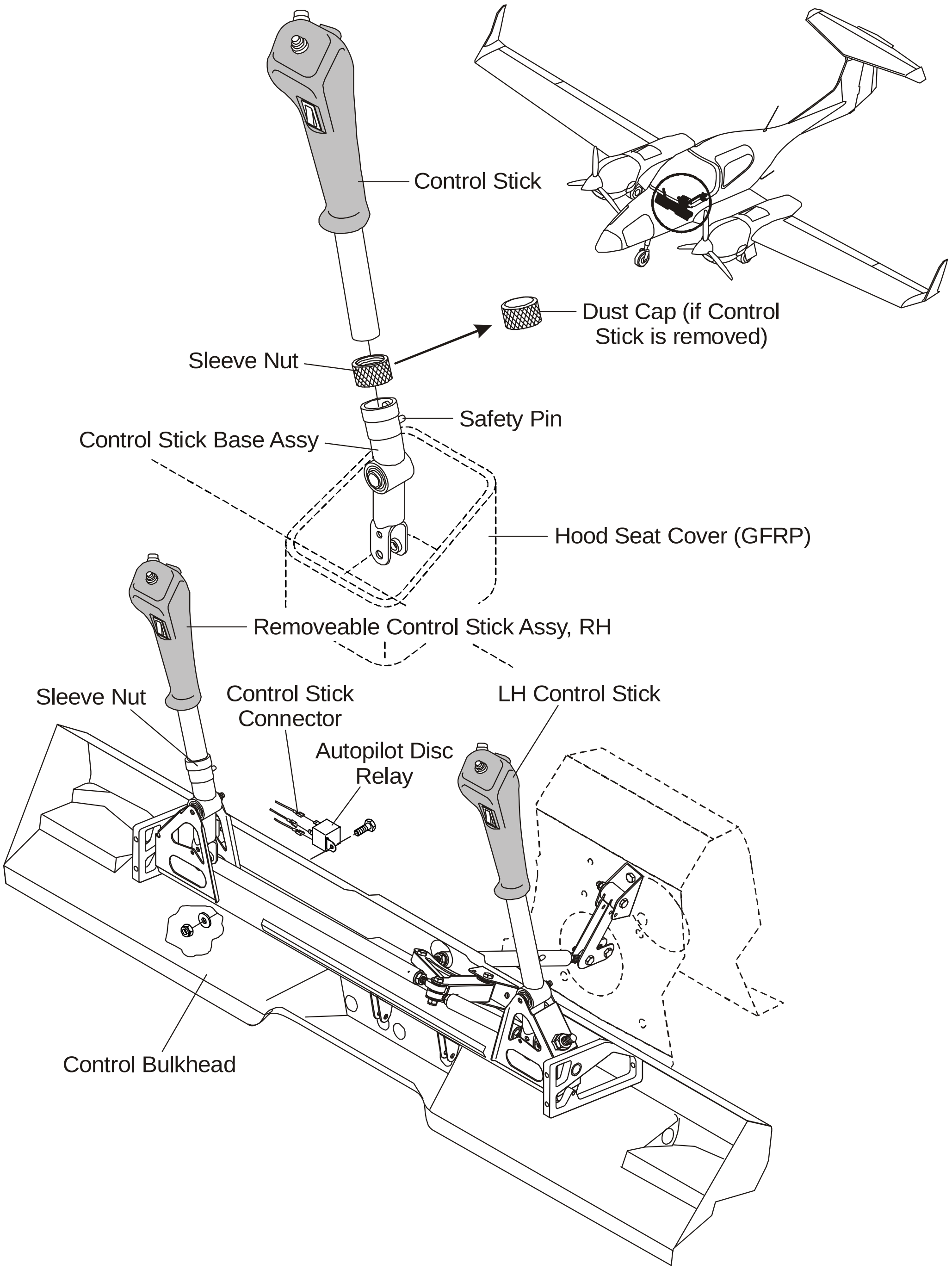


Figure 4: Control Sticks (if OÄM 42-283 is installed)

B. Install a Control Stick

	Detail Steps/Work Items	Key Items/References
(1)	Move the push rod and the control stick / stick lever into place and install the bolt, bonding wire and nut.	Insert the bolt from the front to the rear.
(2)	Move the control stick / stick lever into place and install the bolt, washer and nut attaching the stick lever to the torque tube assy.	Insert the bolt from the front to the rear.
(3)	Connect the the autopilot and the PTT connectors. If OÄM 42-281 is installed: Install the autopilot bridge connector. If OÄM 42-283 is installed: Connect the AP / DSC relay to the control stick base harness.	Refer to Chapter 92 for the wiring diagrams.
(4)	Secure the control stick harness to the airplane structure.	Use cable ties.
(5)	Do an inspection of the control stick / stick lever: – If necessary for your Airworthiness Authority, do a duplicate inspection of the control system that you adjusted. – Do a friction check of the control system.	Make sure that there is no undue friction within the control system.
(6)	Install the pilot's seat.	Refer to Section 25-10.
(7)	If OÄM 42-281 or OÄM 42-283 is installed: – Fold the control stick gaiter and use the Velcro strap to fix the gaiter to the pilot's seat.	
(8)	Perform an Elevator and an Aileron Control System Test Procedure.	Refer to Section 27-10.

5. Measure the Play in a Hinge

A. Equipment

Item	Quantity	Part Number
Caliper.	1	Commercial.

B. Measure the Axial Play of a Control Surface Hinge

Move the control surface by hand along the direction of the hinge line in both directions (up and down for the rudder, inboard and outboard for the other control surfaces). Measure the maximum travel from one limit position to the other.

C. Measure the Radial Play of a Control Surface Hinge

Move the control surface by hand perpendicular to the direction of the hinge line in both directions (left and right for the rudder, up and down for the other control surfaces). Measure the maximum travel from one limit position to the other.

Section 27-10

Flight Controls - Aileron and Tabs

1. General

The DA 42 NG has two control sticks that operate the ailerons. If OÄM 42-281 or OÄM 42-283 is installed, the RH control stick is removed or removable. The aileron control system uses pushrods and bellcranks.

Figures 1 and 2 show the aileron controls in the fuselage. Figure 3 shows the aileron controls in the wing.

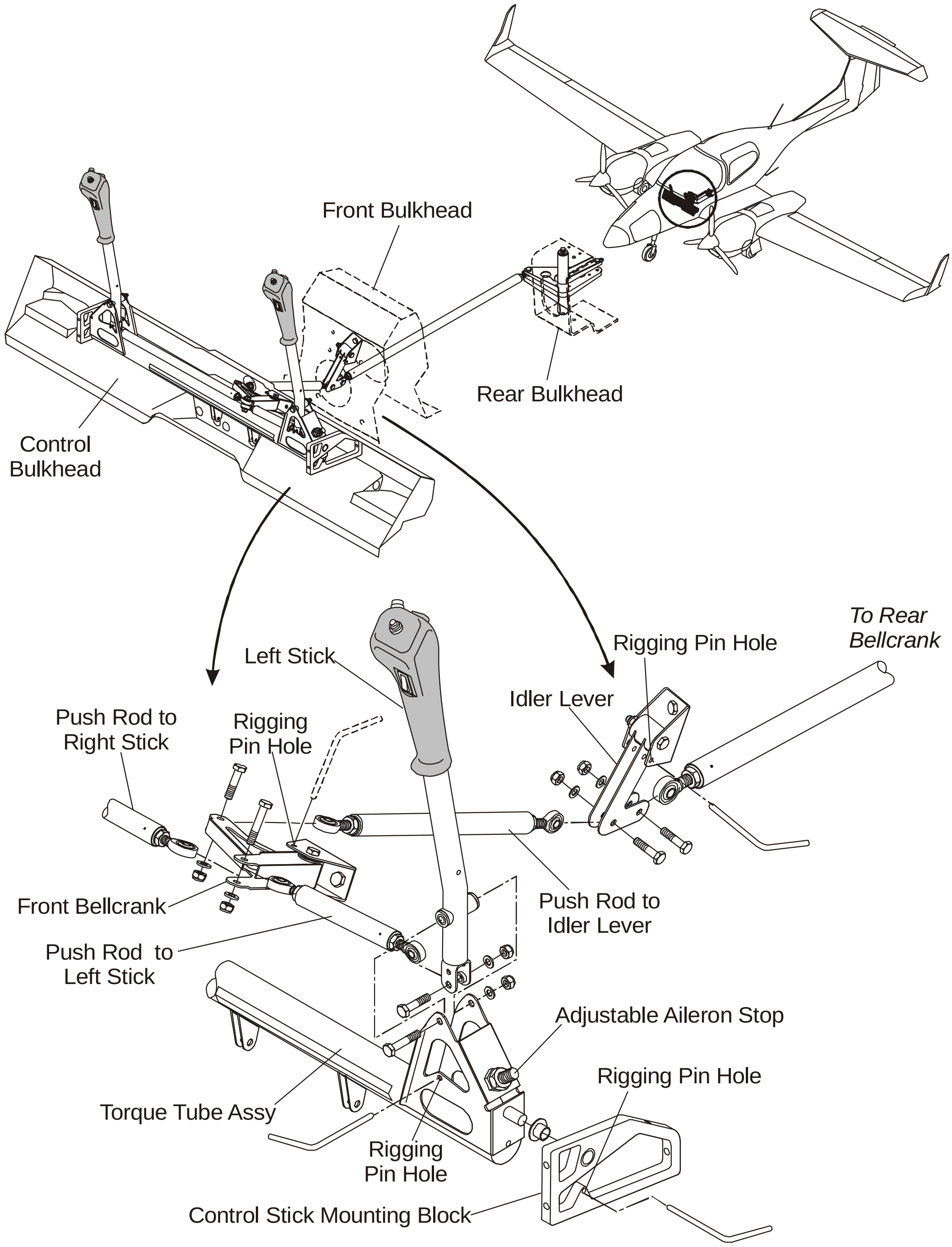


Figure 1: Aileron Controls in the Fuselage (Sheet 1)

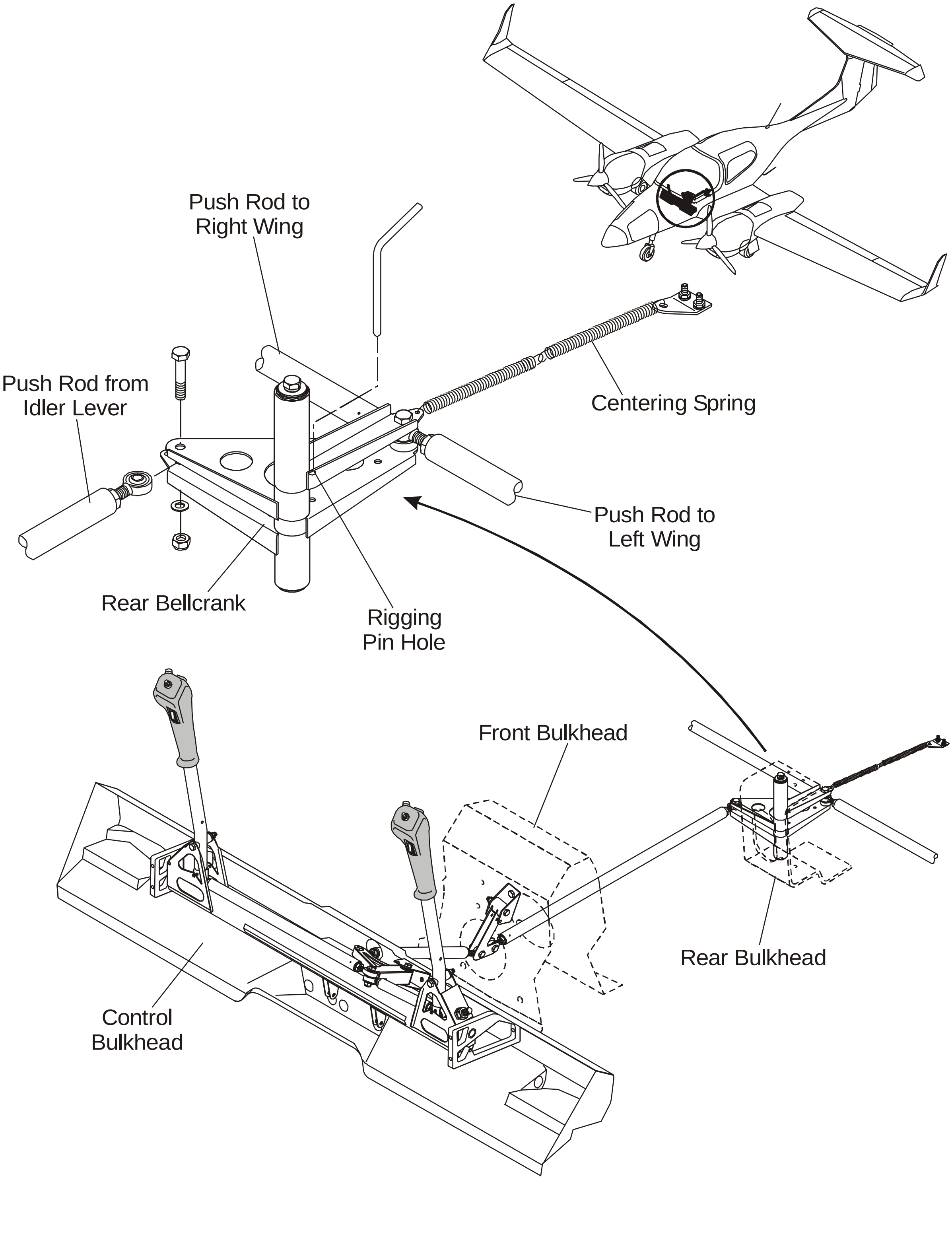


Figure 2: Aileron Controls in the Fuselage (Sheet 2)

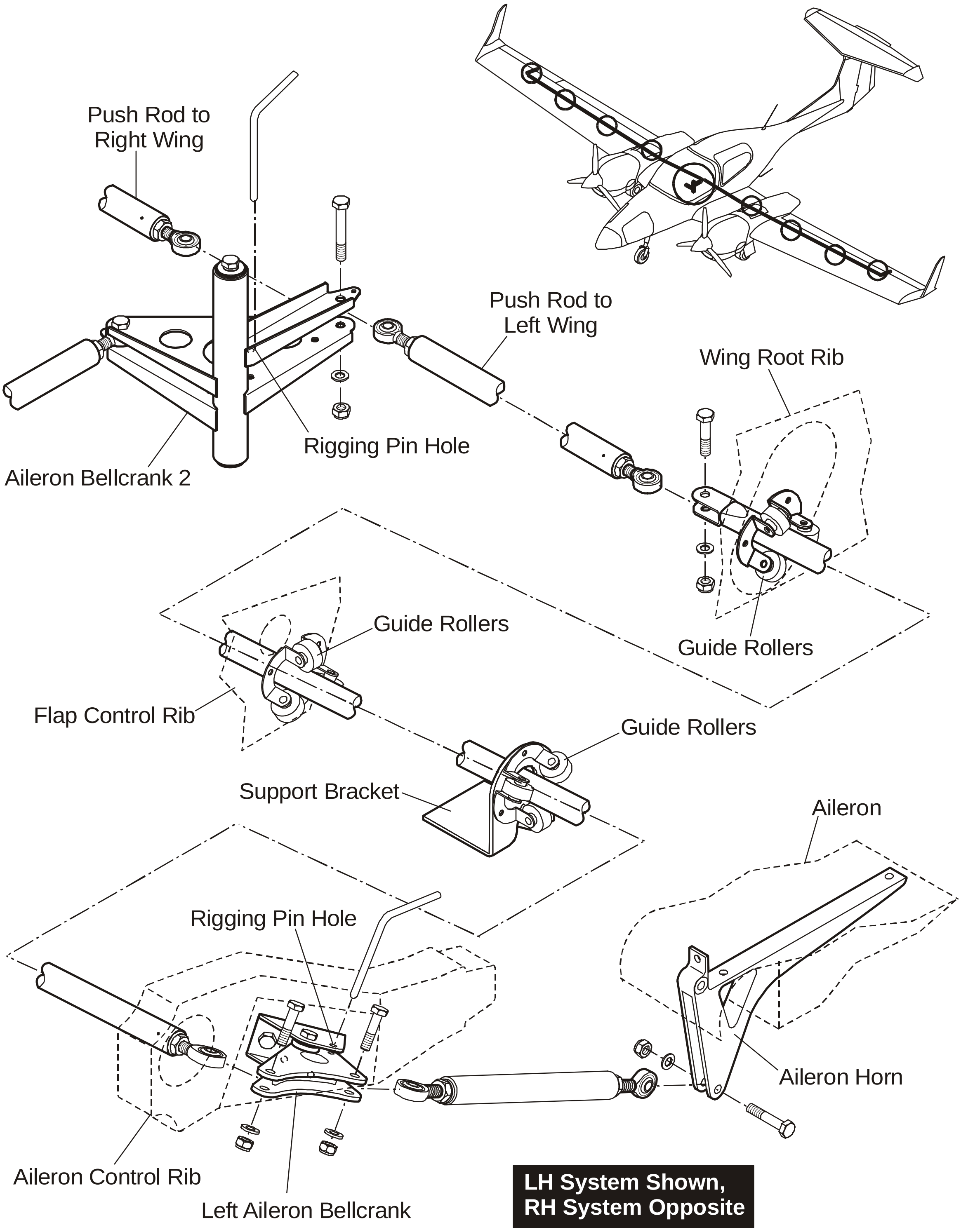


Figure 3: Aileron Controls in the Wing

2. Description

The DA 42 NG has a control stick for each pilot. If OÄM 42-281 or OÄM 42-283 is installed, the RH control stick is removed or removable. The control sticks operate the ailerons and elevator via control rods. Aileron pushrods connect to the bottom of the control sticks. The pushrods connect to the aileron front bellcrank at the control bulkhead. The front bellcrank at the control bulkhead connects to a short pushrod under the center console.

The short pushrod connects to an idler lever attached to the front main bulkhead. Another push-rod connects the idler lever to the aileron rear bellcrank. The aileron rear bellcrank attaches to the rear face of the rear main bulkhead.

The rear bellcrank connects to the two pushrods in the center section. Each of these rods connect to long pushrod assemblies located in each of the wings.

Each long pushrod assembly has three pushrod guides. The first pushrod guide attaches to a rib located in the wing center section. The second attaches to the outer flap control rib. A small rib holds the third pushrod guide. The two long pushrod assemblies attach to the aileron bellcranks which are mounted in each wing, at the aileron control rib.

Short pushrods connect the aileron bellcrank to the aileron horn. You can adjust the short pushrods to move the aileron range-of-movement up or down.

The aileron stop which limits the movement of the control sticks to the right (right aileron up, left aileron down) is located to the left of the pilot’s control stick (Figure 1). The aileron stop which limits the movement o the control stick to the left (left aileron up, right aileron down) is located to the right of the co-pilot’s control stick. Each aileron stop consists of a nut which is welded to the torque tube assembly, a bolt which is installed in the nut and a jamnut which locks the assembly. The head of the bolt makes the stop.

Additional, non adjustable stops are located in front of the leading edge of the LH and RH aileron. Each stop consists of a GFRP block with a rubber coating, bonded to the inside of the upper wing skin. When the aileron is deflected fully downward, the aileron paddle is deflected fully upward and contacts the stop.

3. Operation

If you move the control stick to the left:

– The pushrods connected to the stick move to the right.

– The front bellcrank moves the pushrod below the center console towards the rear.

– The push-rod below the center console moves the idler lever and second short pushrod to the rear.

– The second short pushrod moves the rear bellcrank so that the long pushrods in the wing move to the left.

– The left aileron bellcrank in the left wing moves the short pushrod attached to the left aileron horn to the rear.

– The left aileron moves up.

If you move the control sticks to the right:

– The left aileron moves down.

– The right aileron moves up.

Trouble-Shooting

1. General

The table below lists defects you could have in the aileron control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Airplane moves about the longitudinal axis in flight with no input from the pilot.	Aileron pushrods out of adjustment.	Adjust the aileron pushrods.
Aileron controls stiff/catch.	Defective bearings in a control rod eye end.	Replace the defective eyeend.
	Control rod guide(s) defective.	Replace the guides.
	Pushrod bent.	Replace the pushrod.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to do tests on the aileron control system. They also tell you how to adjust the aileron control system. This Section also gives you the access data on the pushrods and bellcranks. Refer to Section 57-60 for data about removing/installing the ailerons.

WARNING: **WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO THE CONTROL SURFACES CAN OCCUR.**

WARNING: **WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS OR TOOLS FROM THAT AREA. LOOSE ITEMS OR TOOLS CAN PREVENT FULL AND FREE MOVEMENT OF THE AIRPLANE CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.**

2. Aileron Control System Test for Correct Range of Movement

A. Equipment

Item	Quantity	Part Number
Control stick rigging pins.	2	VR-D41-2757-3000.
Ruler/measuring stick.	1	Commercial.

B. Aileron Control System Test Procedure

Note: Use a ruler/measuring stick to make all measurements at the control surfaces. Make the measurement between the top surface of the aileron and the top surface of the wing.

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Chapter 06-00. Use it to record the measurements.
(2)	Remove the left pilot's seat.	Refer to Section 25-10.
(3)	Install the control stick rigging pins: – At the bottom of the left stick. – Through the left mounting bracket.	Refer to Figure 1. To lock aileron movement. To lock elevator movement.
(4)	Measure the distance between the trailing edge of each aileron and the trailing edge of the wing tip.	Record these measurements. The left aileron must align with the right aileron.
(5)	Remove the rigging pins from the following: – The bottom of the control stick. – The left stick mounting bracket.	
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONNEL/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.	
(6)	Move the control stick fully to the left and hold it against the stop.	
(7)	Measure the distance between the trailing edge of the left aileron and the trailing edge of the wing tip.	Record the measurement. The distance must be as shown in the Control Surface Adjustment Report.
(8)	Measure the distance between the trailing edge of the right aileron and the trailing edge of the wing tip.	Record the measurement. The distance must be as shown in the Control Surface Adjustment Report.

	Detail Steps/Work Items	Key Items/References
(9)	Move the control stick fully to the right and hold it against the stop.	
(10)	Measure the distance between the trailing edge of the right aileron and the trailing edge of the wing tip.	Record the measurement. The distance must be as shown in the Control Surface Adjustment Report.
(11)	Measure the distance between the trailing edge of the left aileron and the trailing edge of the wing tip.	Record the measurement. The distance must be as shown in the Control Surface Adjustment Report.
(12)	Install the left pilot’s seat.	Refer to Section 25-10.

3. Aileron Control System Adjustments

If you cannot get the correct range of movement of the aileron control system, use this procedure to adjust the system. Gust travel refers to the amount of travel remaining at the control surface with the control stick held against the cockpit stop.

WARNING: IF YOU DO AN ADJUSTMENT OF A PUSHROD, YOU MUST MAKE SURE THAT THE PUSHROD IS STILL IN SAFETY. IF YOU DO NOT DO THIS, THE PUSHROD CAN DISCONNECT. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

A. Equipment

Item	Quantity	Part Number
Rigging pins.	7	VR-D41-2757-3000.
Ruler/measuring stick.	1	Commercial.

B. Aileron Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – Pilots' seats. – Passenger seat. – Pushrod access panels under the center section. – Aileron bellcrank access panels under each wing.	Refer to: Section 25-10. Section 52-40.

	Detail Steps/Work Items	Key Items/References
(2)	Install rigging pins in the following:	Refer to Figures 1 and 2.
	– The bottom of each control stick.	To lock the stick to the torque tube.
	– The left stick mounting bracket.	To lock the elevator movement.
	– The front bellcrank.	On the control bulkhead.
	– The idler lever.	On the front main bulkhead.
	– The rear bellcrank.	On the rear main bulkhead.
	– The left aileron bellcrank.	In the left wing.
	– The right aileron bellcrank.	In the right wing.
	Note: Keep the aileron rigging pins into position until you have finished making the adjustments. Lock each lever or bellcrank in sequence.	
(3)	If you cannot put a rigging pin into a lever or bellcrank, adjust the pushrod(s) as necessary.	Refer to Section 27-00 for the pushrod adjustment procedure.
(4)	Measure the distance between the trailing edge of each aileron and the trailing edge of the wing tip.	Record these measurements. The left aileron must align with the right aileron.
	WARNING: ALL RIGGING PINS MUST BE REMOVED TO AVOID DAMAGE OF THE CONTROL SYSTEM.	
(5)	Remove the rigging pins from the following:	
	– The bottom of each control stick.	
	– The left stick mounting bracket.	
	– The front bellcrank.	On the control bulkhead.
	– The idler lever.	On the front main bulkhead.
	– The rear bellcrank.	On the rear main bulkhead.
	– The left aileron bellcrank.	In the left wing.
	– The right aileron bellcrank.	In the right wing.
(6)	Do the Aileron Control System Test Procedure.	Refer to Paragraph 1.

	Detail Steps/Work Items	Key Items/References
(7)	If necessary, adjust the pushrods between the aileron bellcranks in the wings and the ailerons.	Refer to Section 27-00. Adjust the rods to give the measurements in the original Control Surfaces Adjustment Report supplied with the airplane.
(8)	If necessary, adjust the aileron stop bolts in the torque tube assembly: – Release the jam nut on the stop bolt. – Adjust the stop bolt to give the correct range of movement. – Tighten the jam nut on the stop bolt.	Refer to Figure 1. The aileron positions must be the distances shown in the original Control Surfaces Adjustment Report (measured from the neutral position).
(9)	Do an inspection of the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	
(10)	Install these items: – Pilots' seats. – Passenger seat. – Pushrod access panels under the center section. – Aileron bellcrank access panels under each wing.	Refer to: Section 25-10. Section 25-10. Section 27-50. Section 27-10.

4. Aileron Pushrod Access

Aileron Pushrod	Remove/Install Access	References
Between the control stick and the bellcrank at the control bulkhead.	Pilot's seat.	Section 25-10.
Between the bellcrank at the control bulkhead and the idler lever at the front main bulkhead.	Pilot's seat.	Section 25-10.
Between the idler lever at the front main bulkhead and the bellcrank at the rear main bulkhead.	Pilot's seat. Passenger seat.	Section 25-10.
Between the bellcrank at the rear main bulkhead and the center section closing rib.	Passenger seat. Center section access panels.	Section 25-10. Section 52-40.
Between the center section closing rib and the bellcrank in the left/right wing.	Center section access panels. Aileron bellcrank access panels under each wing.	Section 52-40.
Between the bellcrank in the left/right wing and the ailerons.	Aileron bellcrank access panels under each wing.	Section 52-40.

5. Aileron Bellcrank and Lever Access

Aileron Bellcrank/Lever	Remove/Install Access	References
Bellcrank at the control bulkhead.	Pilot's seat.	Section 25-10.
Idler lever at the front main bulkhead.	Pilot's seat.	Section 25-10.
Bellcrank at the rear main bulkhead.	Passenger seat.	Section 25-10.
Bellcrank in the wing.	Aileron bellcrank access panels under each wing.	Section 52-40.

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Section 27-20

Flight Controls - Rudder

1. General

The DA 42 NG has the usual rudder control system. Each pilot has a rudder pedal assembly. The pilot can adjust the pedal position. Control cables connect the pedal assembly to the rudder. The rudder has an adjustable trim tab. Refer to Section 27-21 for data about the rudder trim system.

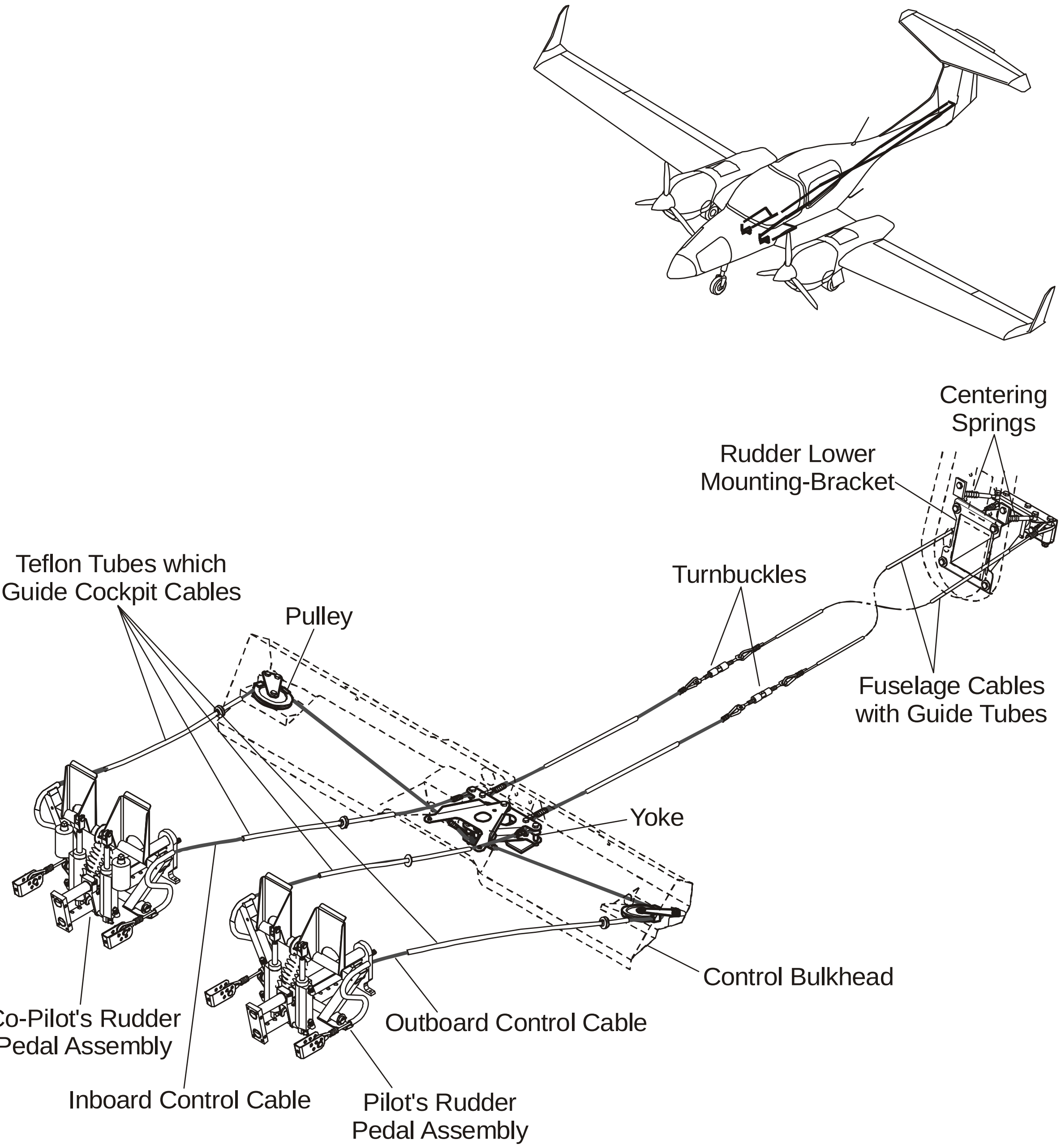

Figure 1: Rudder Control System

2. Description

The DA 42 NG has a set of rudder control pedals for each pilot. The pedal assembly can be adjusted.

Figure 1 shows the rudder control system. Figure 2 shows the rudder pedal assembly with manual pedal adjustment. Figure 3 shows the rudder pedal assembly with electrical pedal adjustment (optional equipment, OÄM 42-070). Figure 4 shows the rudder control in the cockpit and Figure 5 shows the rudder controls in the fuselage The system has these components:

– A rudder pedal assembly for each pilot at the front of the cockpit. The forward part of each pedal connects to a brake master cylinder (refer to Section 32-40 for more data about the brake system).

– An adjuster handle for each pilot, attached to the aft face of each rudder pedal assembly or as optional equipment, an adjuster switch for each pilot, located at the rear wall of the leg room.

– A yoke (a “T” shaped lever) assembly in the fuselage below the center console. The yoke attaches to the bottom of the control bulkhead and to the fuselage shell.

– A rudder pedestal at the rear of the fuselage. The rudder lower mounting-bracket is attached to the rudder leading edge. It connects the rudder to the rudder pedestal.

– Cable assemblies. Flexible control cables connect the cockpit front bulkhead to the yoke. Two long flexible control cables connect the yoke to the rudder. Each of the long flexible cables has a turnbuckle assembly for adjusting the length of the cable.

Six bolts attach each rudder pedal assembly to the cockpit floor.

Each rudder pedal assembly has two pedals. Each pedal has a lever and a foot pad. Each pedal has an “S” shaped tube. The lower part of the tube aligns with the pivot of the pedal. The upper part of the tube aligns with the foot pad of the pedal.

Four control cables (cockpit cables) go from the cockpit front bulkhead to enter the bottom of each “S” shaped tube. A multihole fitting at the bulkhead gives adjustment for each fitting. Each cable goes through an “S” shaped tube and comes ut at the top of the tube. Each cable then goes from the tube to the yoke.

Each outboard control cable goes through a Teflon tube in the aft face of the floor panel. Each outboard control goes inboard through a guide pulley on the control bulkhead. The cables connect each outer pedal to the front arm of the yoke.

Each inboard control cable goes through a Teflon tube in the aft face of the floor panel. The cables connect each inner pedal to the side arms of the yoke.

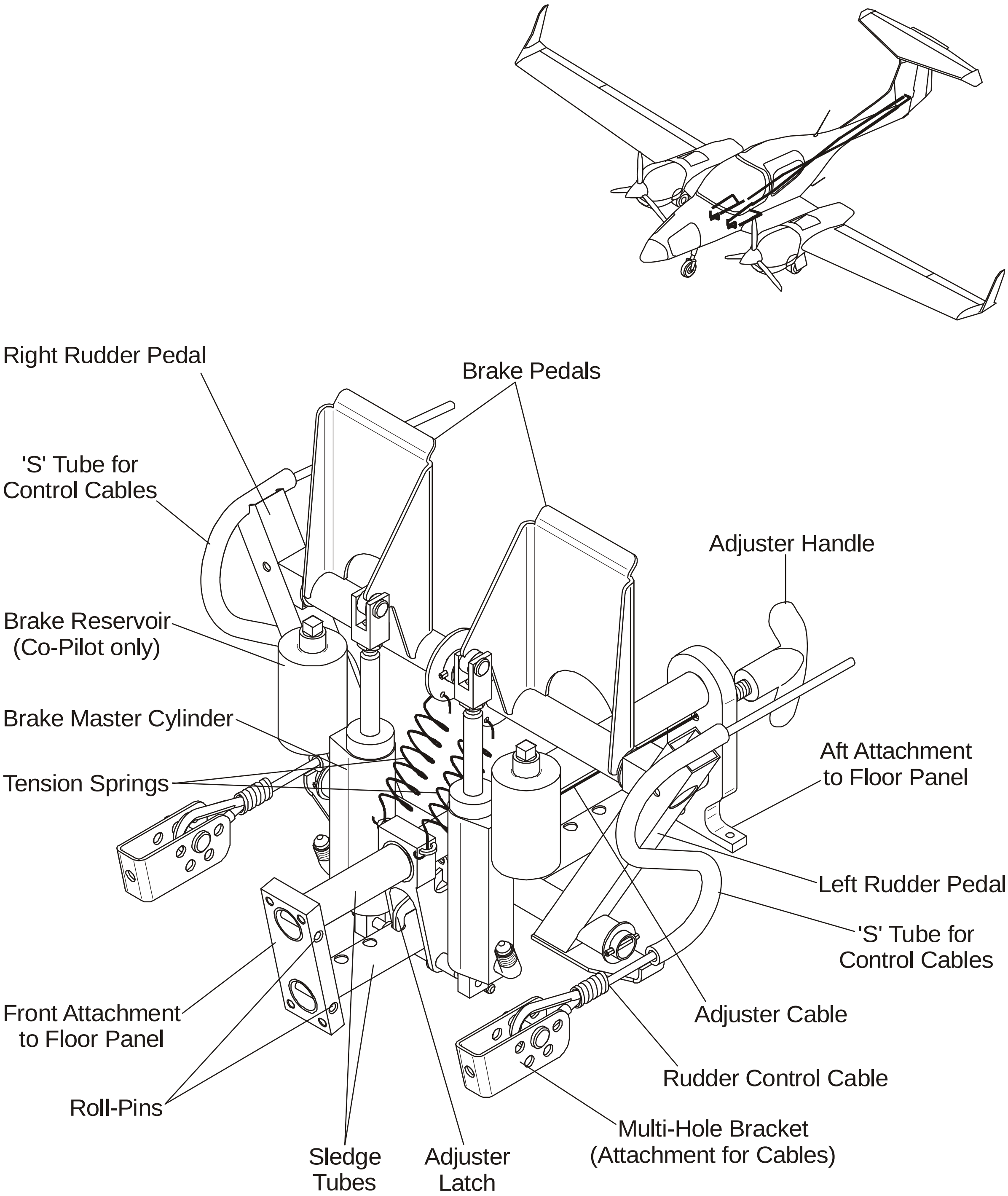

Figure 2: Rudder Pedal Assembly

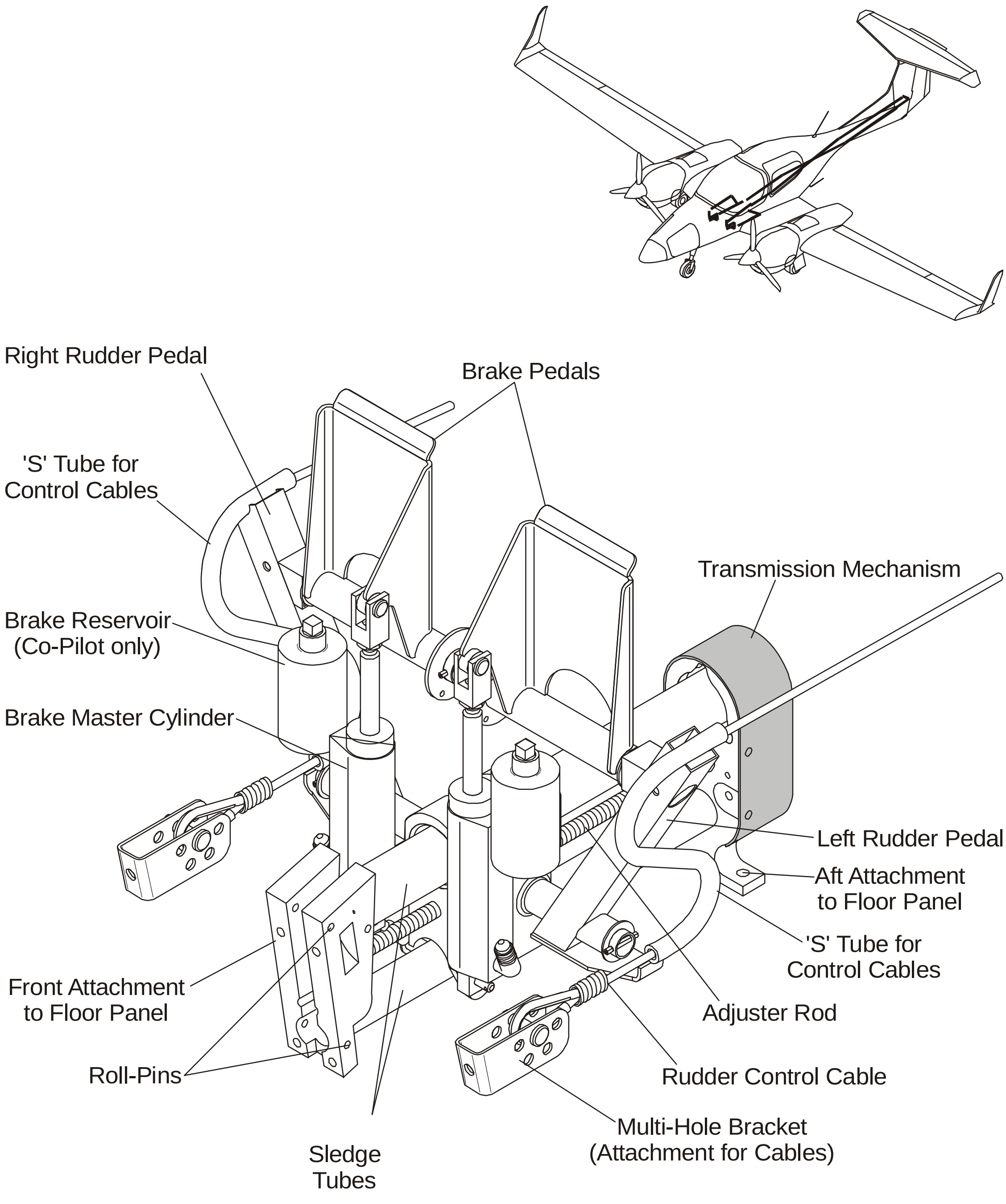

Figure 3: Rudder Pedal Assembly with Electric Adjustment (OÄM 42-070 carried out)

Two cable assemblies (fuselage cables) attach to the rear of the yoke. Each cable has a short front cable and a longer rear cable. All cables go through Teflon tubes. Turnbuckles connect the front cable to the rear cable. The turnbuckles can adjust the tension in the fuselage cables and the neutral position of the rudder.

The two fuselage cables go through Teflon tubes in the rear fuselage. The cables attach to the rudder lower mounting bracket. The cables cross over each other in the rear fuselage.

The rudder stop which limits the rudder deflection to the left side is located left of the lower rudder hinge (Figure 4). The rudder stop which limits the ruder deflection to the right side is located right of the rudder lower hinge. Each rudder stop consists of a nut which is welded to the rudder lower mounting-bracket and a bolt which is held tight in the nut by a jam nut.

3. Operation

If you move the left rudder pedal forward:

- The top of the “S” shaped tube moves forward.
- The “S” shaped tube pulls the left cockpit cable.
- The left cockpit cable moves the yoke counterclockwise (seen from above).
- The yoke pulls the fuselage cable attached to its right arm forward. This cable connects to the left of the rudder.
- The fuselage cable deflects the rudder to the left.
- The rudder movement pulls the other fuselage cable aft. This cable connects to the left of the yoke.
- The fuselage cable moves aft with the left side of the yoke.
- The left side of the yoke pulls both of the right cockpit cables aft. And the cables pull the “S” shaped tube on the right rudder pedals aft.

If you move the right rudder pedal forward each part moves in the opposite sense. The rudder moves to the right and pulls the left cables aft.

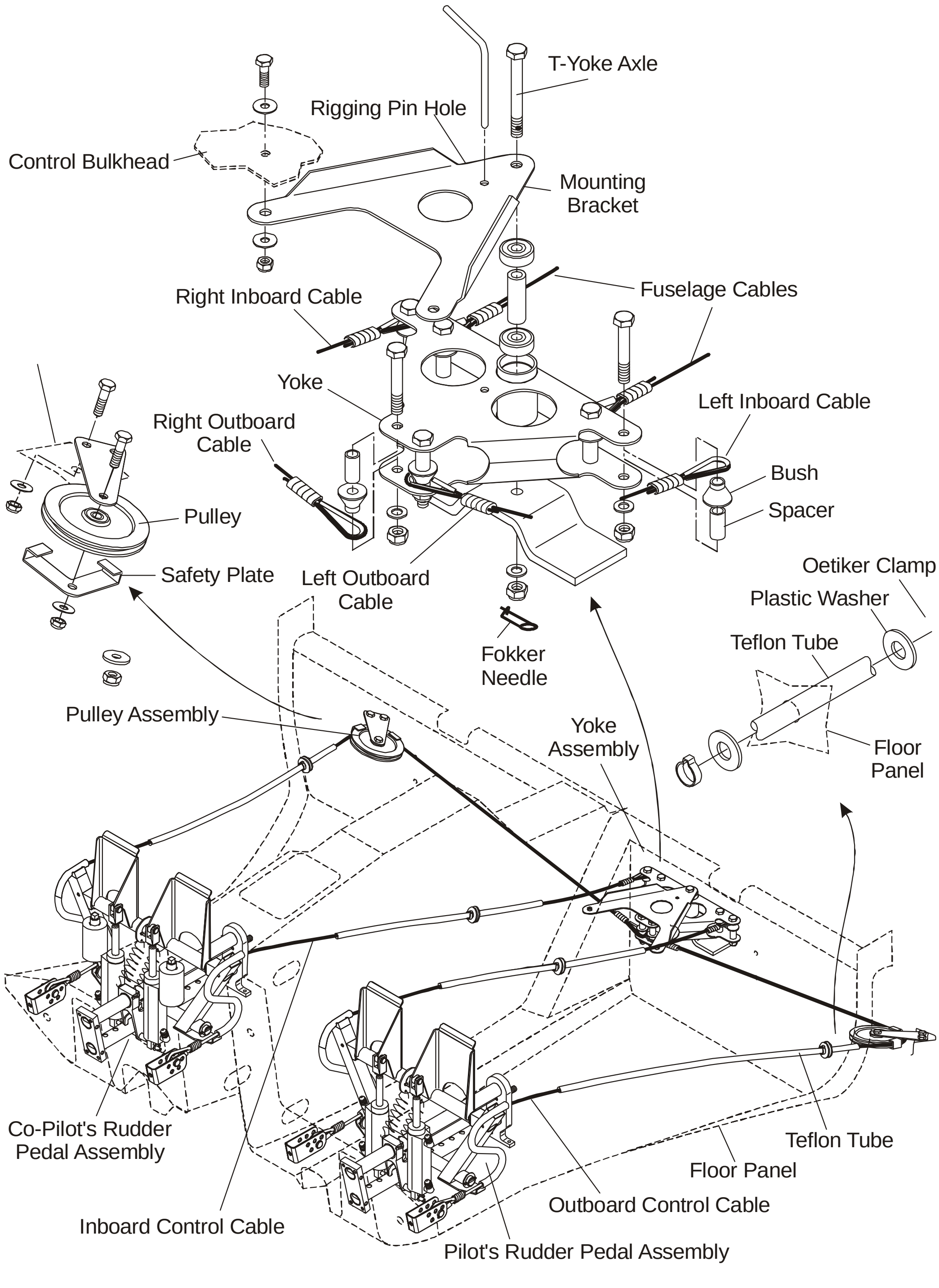

Figure 4: Rudder Controls in Cockpit

A. Manual Adjustment

When you pull on the adjuster handle, the latch disengages from the bottom sledge tube. If you pull further, the pedal assembly moves along the sledge tube towards you. Release the handle, then push with your feet on both pedals. The latch will lock.

If you push with both feet while you pull the handle, the pedal assembly moves along the sledge tube away from you. Release the handle, then push with your feet on both of the pedals. The latch will lock.

When you adjust the position of the pedals, the control cables move through the “S” shaped tubes.

B. Electrical Adjustment (Optional Equipment, OÄM 42-070)

Positioning switches are located on the LH and RH side, at the rear wall of the leg room. The positioning switch causes the rudder pedals on the corresponding side to move along the guide rail.

To move the pedals towards you, press the upper side of the switch. Press the lower end of the switch and the pedals will move away from you.

Releasing the switch will cause the motor to be switched off and the pedals will remain in the current position.

When you adjust the position of the pedals, the control cables move through the "S" shaped tubes.

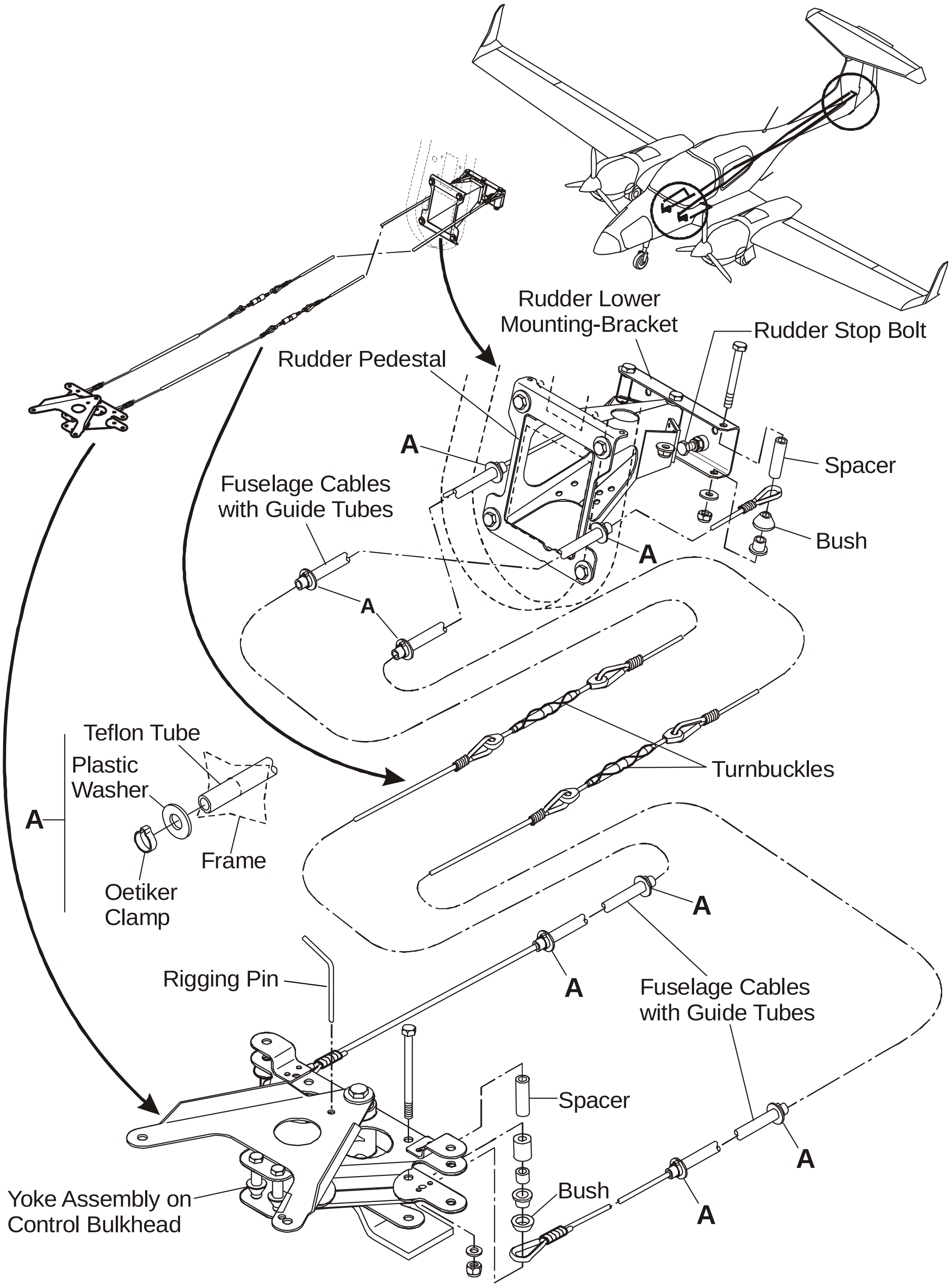

Figure 5: Rudder Controls in the Fuselage

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Trouble-Shooting

1. General

The table below lists the defects you could have in the rudder control system. Refer to Section 27-21 for more data about the rudder trim system. If you have the trouble detailed in the Trouble column, read across to the Possible Cause column and then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Airplane moves about its yaw axis with no input from the pilot.	Rudder control cable needs adjusting. Rudder trim system defective.	Adjust the rudder control cables. Refer to Section 27-21.
Rudder controls stiff/catch.	Bearings defective. Cables chafing in the guide tubes.	Replace the defective bearing. Replace the cables and guide tubes.
Cable tension too low.	Cable worn out. Pulley worn out.	Replace rudder control cable. Adjust rudder control system. Replace pulley.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to do test procedures on the rudder control system. They also tell you how to adjust the rudder control system. Refer to Section 52-40 for data about removing/installing the rudder. Refer to Section 27-21 for data about the rudder trim system.

WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO THE CONTROL SURFACES CAN OCCUR.

WARNING: WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS OR TOOLS FROM THAT AREA. LOOSE ITEMS OR TOOLS CAN PREVENT FULL AND FREE MOVEMENT OF THE AIRPLANE CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Rudder Control System Test for Correct Range of Movement

A. Equipment

Item	Quantity	Part Number
Rigging pins.	4	VR-D41-2723-5000.
Rudder deflection gauge for S/N 42.N100 and subsequent and 42.MN050 and subsequent.	1	D64-5540-00-00-PL.
Rudder deflection gauge for all other S/N.	1	D60-5540-00-00-PL.

B. Rudder Control Test Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record the measurements.
(2)	Install the deflection gauge on the vertical stabilizer.	
(3)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	

	Detail Steps/Work Items	Key Items/References
(4)	Set both rudder pedals fully forward.	
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONNEL/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.	
(5)	Set the rudder pedals central.	The left pedal must align with the right pedal. Make sure that the rudder is in the neutral position shown in the Control Surfaces Adjustment Report for the airplane.
(6)	Set the rudder pedals to fully left.	Make sure the rudder deflects to the left at least 24°. The maximum left rudder deflection according to the Control Surfaces Adjustment report must be achieved when the rudder is moved directly by hand when hitting the rudder stop.
(7)	Set the rudder pedals to fully right.	Make sure the rudder deflects to the right at least 24°. The maximum right rudder deflection according to the Control Surfaces Adjustment report must be achieved when the rudder is moved directly by hand when hitting the rudder stop.
(8)	Make sure that the left and right rudder pedals are free to move when they are set in all of the adjustable positions.	

3. Rudder Control System Adjustments

If you cannot get the correct range of movement of the rudder control system, use this procedure to adjust the system.

A. Equipment

Item	Quantity	Part Number
Cable tension gauge (tensiometer).	1	Commercial.
Rudder deflection gauge for S/N 42.N100 and subsequent and 42.MN050 and subsequent.	1	D64-5540-00-00-PL.
Rudder deflection gauge for all other S/N.	1	D60-5540-00-00-PL.
Spring scale (up to 10 kg (22 lbf)).	1	Commercial.

B. Rudder Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – The pilot's seat. – The passengers seat.	Refer to Section 25-10.
(2)	Set both rudder pedals fully forward.	
(3)	Set the rudder pedals central.	Make sure that the rudder is in the neutral position. The left rudder pedal must align with the right rudder pedal.

	Detail Steps/Work Items	Key Items/References
(4)	If necessary, adjust the length of the cables between the yoke and the rudder lower mounting bracket:	Refer to Figure 4.
	– Remove the lock wire from the turnbuckles.	
	– Adjust the turnbuckles to set the rudder to neutral.	Below the passenger seat.
	– Do a test for the correct cable tension.	Use the tensiometer. Required value: 15 daN (33.72 lbf.) - 17 daN (38.22 lbf.).
	– If GFC700 autopilot (OÄM 42-102) is installed: – Pull on turnbuckle using a spring scale applying a force of 10 kg (22 lbf). – Deflection of turnbuckle should be 20 ± 5 mm (0.79 ± 0.2 in). – If necessary adjust rudder tension accordingly via the turnbuckle.	
	– Tighten the turnbuckles and install the lockwire.	
(5)	Set the rudder pedals to fully left.	Make sure the rudder deflects to the left at least 24°. The maximum left rudder deflection according to the Control Surfaces Adjustment report must be achieved when the rudder is moved directly by hand when hitting the rudder stop.
(6)	If necessary, adjust the rudder stop bolt on the left side of the rudder lower mounting bracket:	
	– Release the jam nut on the left stop bolt.	
	– Adjust the stop bolt to give the correct range of movement.	The rudder position must be the distance to the left shown in the Control Surfaces Adjustment Report for the airplane (measured from the neutral position).
	– Tighten the jam nut on the stop bolt.	

	Detail Steps/Work Items	Key Items/References
(7)	Set the rudder pedals to fully right.	Make sure the rudder deflects to the right at least 24°. The maximum right rudder deflection according to the Control Surfaces Adjustment report must be achieved when the rudder is moved directly by hand when hitting the rudder stop.
(8)	If necessary, adjust the rudder stop bolt on the right side of the rudder lower mounting bracket: – Release the jam nut on the right stop bolt. – Adjust the stop bolt to give the correct range of movement. – Tighten the jam nut on the stop bolt.	The rudder position must be the distance to the right shown in the Control Surfaces Adjustment Report for the airplane (measured from the neutral position).
(9)	Do a test for the correct range of rudder movement.	Refer to Paragraph 2.
(10)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	
(11)	Install these items: – The passenger seat. – The pilots' seats.	Refer to Section 25-10.

4. Remove/Install the Rudder Control Cables

A. Equipment

Item	Quantity	Part Number
Cable tension gauge (tensiometer).	1	Commercial.
Swaging tool.	1	Commercial.
Nicopress oval and stop sleeve gauge (‘go/no-go gauge’) for 1/8 in sleeves.	1	

B. Remove the Cockpit Rudder Control Cables (Front Cables)

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – The pilots’ seats.	Refer to Section 25-10.
(2)	Remove the cable between the cockpit front bulkhead and the yoke: – Remove the nut, washer, bolt and spacer that attach the cable to the multihole bracket at the bulkhead. – Remove the nut, washer, bolt, bush and spacer that attach the cable to the yoke. – Cut the eye end from the cable that you will remove, at the bulkhead end. – Remove the old cable.	Refer to Figures 2 and 3.

C. Install the Rudder Control Cables (Front Cables)

	Detail Steps/Work Items	Key Items/References
	WARNING: ONLY TRAINED AND AUTHORIZED PERSONS SHOULD INSTALL CABLE EYE-ENDS. IF THE EYE-ENDS ARE NOT INSTALLED CORRECTLY, THE RUDDER CONTROLS CAN FAIL. THIS CAN CAUSE DEATH OR INJURY TO PERSONNEL.	
	Note: Install eye ends in accordance with FAA AC 43.13-1B, Chapter 7, Section 8. Note: To make the work easier, install an eye end on one end of the cable before you install it in the airplane.	
(1)	Install one new eye end to the cable before you install it in the airplane: – Use cables to specification LN9374 or ISO 2020 or MIL-DTL-83420, streched to 60 % MBS. – Make the eye-end using Locoloc thimbles and Nico-Press clamps appropriate to the installed 3.2 mm (1/8") diameter steel cables. – Inspect the cable eye end for correct assembly. – If necessary for your Airworthiness Authority, send a sample eye end for proof test.	Inspect cable swages with go/no go gauge for 1/8 in Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
(2)	Push the control cable through the Teflon tubes from the rear.	Refer to Figure 3.
(3)	Make sure the cable is in the correct position on the pulley (for the outer cables only).	
(4)	Push the cable through the “S” shaped tube on the rudder pedal assembly.	

	Detail Steps/Work Items	Key Items/References
(5)	Install a new eye end to the cable at the cockpit front bulkhead end: – Make the eye-end using Locoloc thimbles and Nico-Press clamps appropriate to the installed 3.2 mm (1/8") diameter steel cables. – Inspect the cable eye end for correct assembly. – If necessary for your Airworthiness Authority, send a sample eye end for proof test.	Inspect cable swages with go/no go gauge for 1/8 in Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
(6)	Install the cable to the yoke: – Install the bolt, bush and spacer that attach the cable to the yoke. – Install a washer and new self-locking nut onto the bolt.	Torque to 6.4 Nm (4.7 lbf.ft.). Always use new self locking nuts.
(7)	Install the cable to the bracket at the cockpit front bulkhead: – Install the bolt and spacer that attach the cable to the bracket. – Install a washer and new self locking nut to the bolt.	Adjust the position of the bolt in the multihole bracket to give the correct rudder pedal position. The rudder pedal lever must be vertical when the rudder is set to neutral. Torque to 6.4 Nm (4.7 lbf.ft.). Always use new self-locking nuts.
(8)	Do a test for the correct range of rudder movement. If necessary adjust the rudder controls.	Refer to Paragraph 2. Refer to Paragraph 3.
(9)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	

	Detail Steps/Work Items	Key Items/References
(10)	Install these items: – The passenger seat. – The pilots’ seats.	Refer to Section 25-10.
(11)	Record type of cables installed (stainless or non-stainless steel cables) in the airplane logs.	

D. Remove the Fuselage Rudder Control Cables (Rear Cables)

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – The pilot’s seat. – The passenger seat.	Refer to Section 25-10.
(2)	Remove the cable between the yoke and the turnbuckle: – Remove the nut, washer, bolt, bush and spacer that attach the cable to the yoke. – Cut the eye end from the cable that you will remove, at the yoke. – Remove the old cable aft. – Cut the eye end from the cable that you will, remove, at the turnbuckle.	Refer to Figure 4.
(3)	Remove the cable between the turnbuckle and the rudder: – Remove the nut, washer, bolt, bush and spacer that attach the cable to the rudder lower mounting bracket. – Cut the eye end from the cable that you will remove, at the rudder end. – Remove the old cable forward. – Cut the eye end from the cable that you will remove at the turnbuckle.	

E. Install the Fuselage Rudder Control Cables (Rear Cables)

	Detail Steps/Work Items	Key Items/References
	WARNING: ONLY TRAINED AND AUTHORIZED PERSONS SHOULD INSTALL CABLE EYE ENDS. IF THE EYE ENDS ARE NOT INSTALLED CORRECTLY, THE RUDDER CONTROLS CAN FAIL. THIS CAN CAUSE DEATH OR INJURY TO PERSONNEL.	
	Note: Install eye ends in accordance with FAA AC 43.13-1B, Chapter 7, Section 8. Note: To make the work easier, install an eye end on one end of the cable before you install it in the airplane.	
(1)	Install a new eye end to the front of the cable at the yoke end before you install the cable in the airplane and: – Use cables to specification LN9374 or ISO 2020 or MIL-DTL-83420, streched to 60 % MBS. – Make the eye-end using Locoloc thimbles and Nico-Press clamps appropriate to the installed 3.2 mm (1/8") diameter steel cables. – Inspect the cable eye end for correct assembly. – If necessary for your Airworthiness Authority, send a sample eye end for proof test.	Inspect cable swages with go/no go gauge for 1/8 in Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
(2)	Push the control cable through the Teflon tube from the front.	Refer to Figure 4. Through the front and rear main bulkheads.

	Detail Steps/Work Items	Key Items/References
(3)	Install a new eye end to the cable at the turnbuckle end: – Make the eye-end using Locoloc thimbles and Nico-Press clamps appropriate to the installed 3.2 mm (1/8") diameter steel cables. – Inspect the cable eye end for correct assembly. – If necessary for your Airworthiness Authority, send a sample eye end for proof test.	Inspect cable swages with go/no go gauge for 1/8 in Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
(4)	Install a new eye end to the rear cable before you install the cable into the airplane: – Use cables to specification LN9374 or ISO 2020 or MIL-DTL-83420, streched to 60 % MBS. – Make the eye-end using Locoloc thimbles and Nico-Press clamps appropriate to the installed 3.2 mm (1/8") diameter steel cables. – Inspect the cable eye end for correct assembly. – If necessary for your Airworthiness Authority, send a sample eye end for proof test.	Inspect cable swages with go/no go gauge for 1/8 in Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
(5)	Push the cable through the Teflon tubes from the front.	Towards the rudder.

	Detail Steps/Work Items	Key Items/References
(6)	Install a new eye end to the cable at the rudder mounting bracket end: – Make the eye-end using Locoloc thimbles and Nico-Press clamps appropriate to the installed 3.2 mm (1/8") diameter steel cables. – Inspect the cable eye end for correct assembly. – If necessary for your Airworthiness Authority, send a sample eye end for proof test.	Inspect cable swages with go/no go gauge for 1/8 in Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
(7)	Install the able to the rudder lower mounting-bracket: – Install the bolt, bush and spacer that attach the cable to the rudder. – Install a washer and new self-locking nut.	Refer to Figure 4. Torque 6.4 Nm (4.7 lbf.ft.). Use a new self-locking nut.
(8)	Install the cable to the yoke: – Install the bolt, bush and spacer that attach he cable to the yoke. – Install a washer and a new self-locking nut.	Refer to Figure 4. Torque 6.4 Nm (4.7 lbf.ft.). Use a new self-locking nut.
(9)	Adjust both left and right rudder cable turnbuckles to give the correct tension to the control cables.	Refer to Paragraph 3.
(10)	Do a test for the correct range of rudder movement.	Refer to Paragraph 2.
(11)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	

	Detail Steps/Work Items	Key Items/References
(12)	Install these items: – The pilots’ seats. – The passenger seat.	Refer to Section 25-10.
(13)	Record type of cables installed (stainless or non-stainless steel cables) in the airplane logs.	

5. Remove/Install the Pulleys

A. Remove the Pulleys

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – The pilot’s seat.	Refer to Section 25-10.
(2)	Remove the pulley: – Remove the nut, washers and bolt that attach the pulley to the mounting link at the control bulkhead. – Separate pulley and safety plate from the outer front cable.	Refer to Figure 3. Handle with care. Do not spoil the control cable.

B. Install the Pulleys

	Detail Steps/Work Items	Key Items/References
(1)	Install the pulley: – Put the outer cable into the groove around the pulley. – Bring the safety plate into position. – Install the bolt, washers and nuts that attach the pulley to the mounting link at the control bulkhead.	Refer to Figure 3. Check for correct guidance of the control cable.
(2)	Make sure the cable is in the correct position on the pulley.	Check friction.
(3)	Do a test for the correct range of rudder movement. If necessary adjust the rudder controls.	Refer to Paragraph 2. Refer to Paragraph 3.
(4)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	
(5)	Install these items: – The pilot's seat.	Refer to Section 25-10.

6. Rudder Control Cable and Yoke Access

Rudder Cable/Yoke	Remove/Install Access	References
Cockpit cables between the cockpit front bulkhead and the yoke.	Pilot’s seat.	Section 25-10.
Rear fuselage cables between the yoke and the rudder.	Pilot’s seat. Passenger seat. Rudder.	Section 25-10. Section 55-40.
Yoke.	Pilots' seats.	Section 25-10.

Section 27-21
Flight Controls - Rudder Trim

1. General

The DA 42 NG has a rudder with a trim tab. The pilot uses a trim knob located at the front of the center console to move the rudder trim tab. The rudder trim control system is a mechanical control system.

Figure 1 shows the main components of the rudder trim control system.

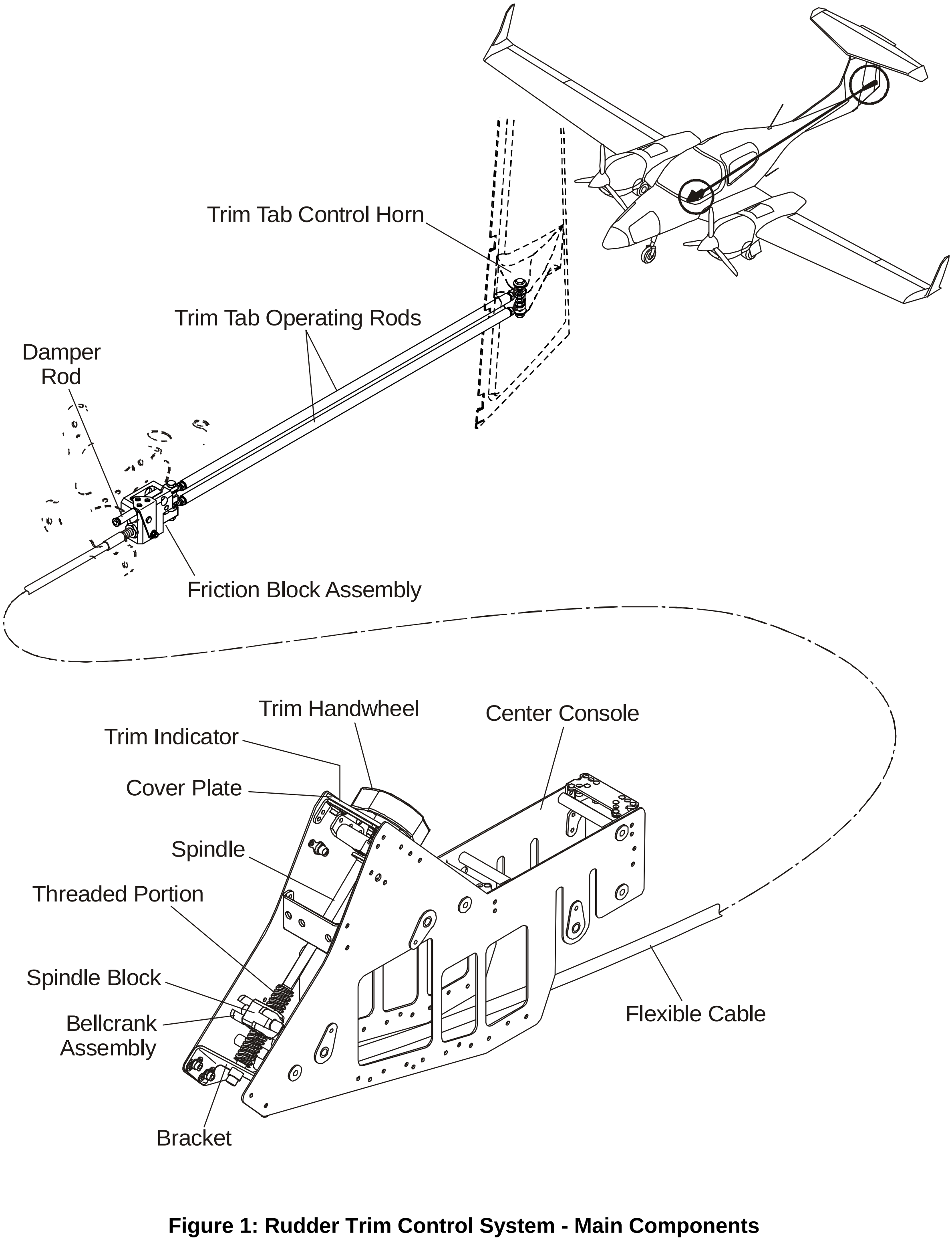

Figure 1: Rudder Trim Control System - Main Components

2. Description

The mechanical rudder trim system has three main parts:

– A handwheel assembly with trim indicator.

– A long flexible cable which connects the handwheel to the trim tab operating mechanism.

– The trim tab actuator assembly.

A. Rudder Trim Handwheel Assembly

A handwheel assembly at the top of the center console controls the rudder system. The handwheel attaches to a rectangular drive on the top of a long spindle. The rectangular drive at the top of the spindle also drives the trim indicator. The trim indicator system is a mechanical device and attaches to the lower surface of the center console cover plate.

The long spindle is supported at the top by the center console cover plate and at the bottom by a bearing located on a bracket bolted to the structure of the center console.

The lower section of the spindle has an external thread. A spindle block with an internal thread is positioned on the threaded portion of the spindle. The spindle block has spigots which engage with slots on a bellcrank assembly. The bellcrank has two input arms with slots that engage with the spindle block spigots and an operating lever that connects to a long flexible cable.

The two input arms of the bellcrank have a hole drilled through both arms that will align with a hole drilled through the structure of the center console. When the holes are aligned the handwheel assembly is in the neutral position. You can insert a rigging pin through the holes when you will adjust the rudder trim control system.

B. Flexible Cable

A long flexible cable connects the trim handwheel assembly to the trim tab actuator assembly. The cable goes through holes in all the fuselage bulkheads and through the bottom of vertical stabilizer. From the rear of the vertical stabilizer the cable goes into the rudder lower mounting bracket where it connects to the rudder trim tab actuator assembly.

The cable has an inner core with threaded end fittings. Fork end fittings attach to the threaded end-fittings of the inner core. The fork end fittings attach to the operating lever of the handwheel assembly at one end and to the trim tab operating rods at the other end.

The outer sleeve of the flexible cable has threaded sections at each end. These threaded sections screw into fixings at the handwheel assembly and the trim actuator assembly. Locknuts are used on the threaded ends to secure the flexible cable in position.

C. Trim Tab Actuator Assembly

The trim tab is a GFRP molding. The trim tab has a control horn with two integral levers. Two trim tab operating rods connect the integral levers to the flexible cable fork end fitting. The operating rods have spherical end fittings screwed into each end of the rods. The spherical end fittings are bolted to the integral levers and the fork end fitting.

The end of the flexible cable outer sleeve screws into a friction block assembly. The friction block assembly has a hole with an internal thread. The flexible cable outer sleeve screws into this threaded hole.

The top section of the friction block has a hole drilled in it for the friction rod. The friction rod passes through the upper section of the friction block and attaches to the fork end fitting. A friction shoe in the top section of the friction block is held in contact with the friction rod by springs. This clamping action on the friction rod dampens the movement of the trim tab actuator should the trim tab control system fail.

3. Operation

If the pilots rotates the trim control knob clockwise during flight then these events occur:

– The trim control spindle rotates clockwise. The trim indicator moves to the right to show the position of the spindle.

– The spindle-block moves up the threaded portion of the trim control spindle.

– The moving spindle block rotates the bellcrank and the bellcrank lever arm moves forward.

– The bellcrank lever arm pulls the inner core of the flexible cable forward.

– The flexible cable fork end fitting moves forward and the trim tab control rods move forward.

– The trim tab moves to the left and the dynamic forces acting on the rudder trim tab move the rudder to the right.

If the pilot rotates the trim control knob counterclockwise during flight the system operates in the reverse direction.

Trouble-Shooting

1. General

The table below lists the defects you could have in the rudder control system. If you have the trouble detailed in the Trouble column, read across to the Possible Cause column and then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Airplane moves about its yaw axis with no input from the pilot.	Rudder control cables need adjusting.	Refer to Section 27-20.
	Rudder trim system defective.	Adjust the rudder trim tab control system.

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Maintenance Practices

1. General

This Section tells you how to test and adjust the rudder trim tab control system.

2. Rudder Trim-Tab Control System Test for Correct Range of Movement

If you cannot get the correct range of movement of the rudder trim tab control system, use this procedure to adjust the system.

A. Equipment

Item	Quantity	Part Number
Rudder deflection gauge for S/N 42.N100 and subsequent and 42.MN050 and subsequent.	1	D64-5540-00-00-PL.
Rudder deflection gauge for all other S/N.	1	D60-5540-00-00-PL.
Rudder trim deflection gauge for S/N 42.N100 and subsequent and 42.MN050 and subsequent.	1	D64-5545-00-00-PL.
Rudder trim deflection gauge for all other S/N.	1	D60-5545-00-00-PL.
Rigging pin (Ø 4 mm [0.16 in]).	1	VR-D41-2757-3000.

B. Adjust the Rudder Trim-Tab Control System

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record the measurements.
(2)	Install the rudder deflection gauge.	
(3)	Install the rudder trim deflection gauge.	Make sure the rudder trim gauge axle marker corresponds with the rudder trim tab axle. Make sure the rudder trim gauge 0° position is aligned with the rudder trailing edge center line. Use shims to achieve the correct gauge position.
(4)	Make sure that the rudder is in the neutral position according to Control Surface Adjustment Report.	Refer to Section 27-20. Hold the rudder in position.

	Detail Steps/Work Items	Key Items/References
(5)	Operate the rudder trim control knob fully clockwise, then counterclockwise, then set the control knob to the neutral position.	The system must operate smoothly throughout the full range of movement. The rudder trim tab must be in the neutral position.
(6)	Remove the access panel from the side of the center console: – Remove the 3 screws that attach the access panel to the structure. – Move the access panel clear of the center console.	
(7)	Install a rigging pin through the holes in the center console structure and the bellcrank.	The rudder trim tab indicator should indicate neutral.
(8)	The deflection angle of the trim tab must be in accordance with the Control Surfaces Adjustment Report.	If necessary, adjust the lengths of both trim tab control rods. Refer to Paragraph 3. Make sure that the trim rudder linkage play is equal to the left and to the right side of neutral position.
(9)	Remove the rigging pin from the center console.	
(10)	Turn the rudder trim control wheel fully clockwise and measure the position of the rudder trim tab.	Record the measurement. The measurement must be the same as shown in the Control Surfaces Adjustment Report.
(11)	Turn the rudder trim control wheel fully counterclockwise and measure the position of the rudder trim tab.	Record the measurement. The measurement must be the same as shown in the Control Surfaces Adjustment Report.

	Detail Steps/Work Items	Key Items/References
(12)	Install the access panel in the side of the center console that you removed: – Make sure that there are no loose articles in the center console. – Move the access panel into position at the center console. – Install the 3 screws that attach the access panel to the center console.	 For example: rags or tools.
(13)	Release the rudder and make sure that both the rudder and the rudder trim tab can move fully and freely throughout their range of movements.	
(14)	Remove the rudder and the rudder trim deflection gauges.	

3. Adjust the Rudder Trim Tab Control System

If you cannot get the correct range of movement of the rudder trim tab, use this procedure to adjust the trim system.

A. Equipment

Item	Quantity	Part Number
Rudder deflection gauge for S/N 42.N100 and subsequent and 42.MN050 and subsequent.	1	D64-5540-00-00-PL.
Rudder deflection gauge for all other S/N.	1	D60-5540-00-00-PL.
Rudder trim deflection gauge for S/N 42.N100 and subsequent and 42.MN050 and subsequent.	1	D64-5545-00-00-PL.
Rudder trim deflection gauge for all other S/N.	1	D60-5545-00-00-PL.
Rigging pin (Ø 4 mm [0.16 in]).	1	VR-D41-2757-3000.

B. Rudder Trim Control System Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the rudder is in the neutral position.	Refer to Section 27-20. Hold the rudder in this position.
(2)	Install the rudder and the rudder trim deflection gauges.	Make sure the rudder trim gauge axle marker corresponds with the rudder trim tab axle. Make sure the rudder trim gauge 0° position is aligned with the rudder trailing edge center line. Use shims to achieve the correct gauge position.
(3)	Operate the rudder trim control knob fully clockwise, then counterclockwise, then set the control knob to the neutral position.	The system must operate smoothly throughout the full range of movement.
(4)	Remove the access panel from the side of the center console: – Remove the 3 screws that attach the access panel to the structure. – Move the access panel clear of the center console.	Refer to Figure 2.

	Detail Steps/Work Items	Key Items/References
(5)	Install a rigging pin through the holes in the center console structure and the bellcrank.	The rudder trim tab indicator should indicate neutral.
(6)	Adjust the rudder trim tab operating rods to set the rudder trim tab to the neutral position: There is some play in the trim tab linkage, so make sure the play is equal left and right when the trim tab in neutral position. – Remove the bolts that attach the spherical end fittings of the operating rods to the trim tab. – Loosen the locknut on the lower operating rod end fitting. – Screw the end fitting in/out of the operating rod half a turn (as required). Note: Do not expose more than 14 mm (0.55 in) of thread. – Move the lower operating rod back into position at the trim tab lever and install the attaching bolt. – Adjust the end fitting of the top operating rod until the end fitting aligns with the trim tab lever. – Tighten the lock-nuts on the end fittings of both operating both operating rods. – Install the bolts that attach the spherical end fittings of the operating rods to the trim tab levers.	In accordance with Control Surfaces Adjustment Report. Screw the end fitting into the rod to move the trim tab to the left, screw the end fitting out of the rod to move the trim tab to the right. The center of the trailing edge of the trim tab must align with the trailing edge of the rudder. If it does not then you must adjust the lower operating rod until the trim tab aligns correctly with the rudder.
(7)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	

	Detail Steps/Work Items	Key Items/References
(8)	Remove the rigging pin from the center control console.	
(9)	Install the access panel in the side of the center console that you removed: – Make sure that there are no loose articles in the center console. – Move the access panel into position at the center console. – Install the 3 screws that attach the access panel to the center console.	 For example: rags or tools.
(10)	Release the rudder and make sure that both the rudder and the rudder trim tab can move fully and freely throughout their range of movements.	
(11)	Remove the rudder and the rudder trim deflection gauge.	

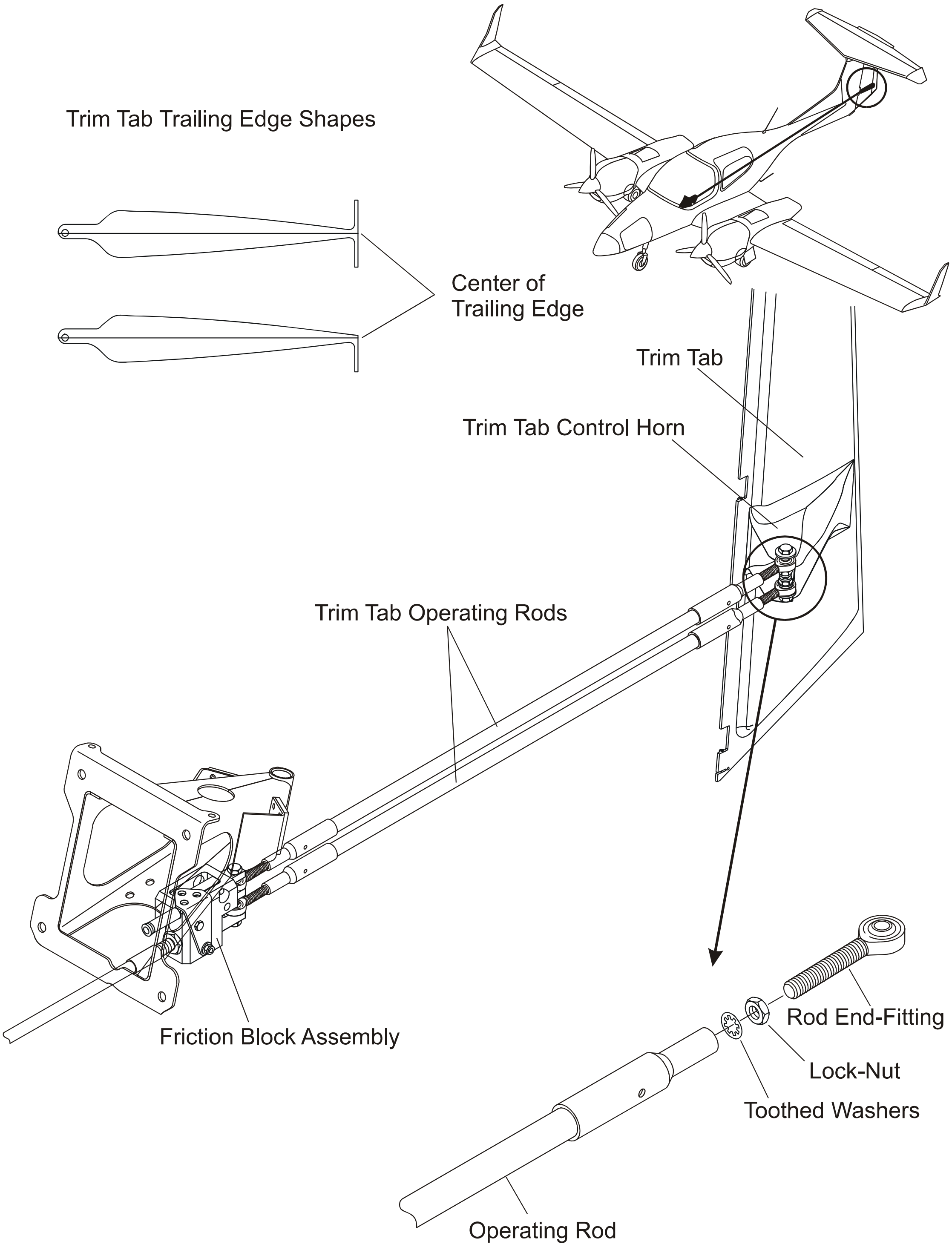

Figure 2: Adjust the Rudder Trim Tab Control System

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Section 27-30
Flight Controls - Elevator

1. General

The DA 42 NG has the usual elevator control system. An elevator attaches to the horizontal stabilizer gives longitudinal control of the airplane. Two control sticks operate the elevator. The DA 42 NG has an electrically operated elevator trim system and a mechanically operated trim system. Refer to Section 27-38 for data about the mechanical trim system and refer to Section 27-39 for data about the electric trim system.

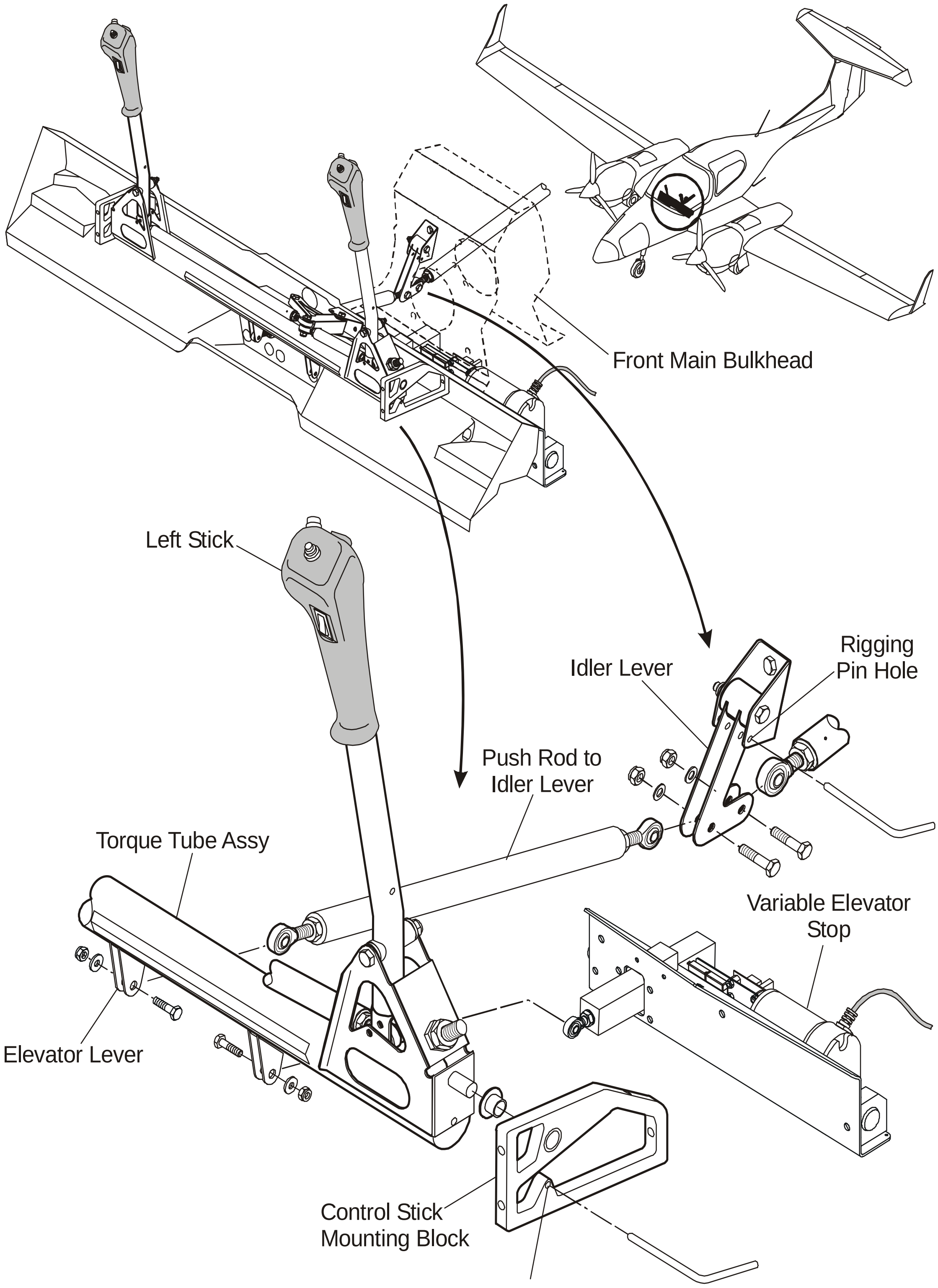

Figure 1: Elevator Control Installation in the Cockpit

2. Description

Figure 1 shows the elevator controls in the cockpit. Figure 2 shows the elevator controls in the rear fuselage.

Each pilot has a control stick that attaches to the torque tube assembly. The torque tube assembly has a lever which attaches to a short pushrod. The short pushrod connects to an idler lever on the front main bulkhead. The idler lever connects to a long pushrod.

The long pushrod has three guide bearings. The aft baggage frame, ring frame 1 and ring frame 2 have pushrod guides. Each guide has three rollers.

The long pushrod attaches to a bellcrank at the bottom of the vertical stabilizer. The bellcrank attaches to a vertical pushrod in the vertical stabilizer. The vertical pushrod connects to the elevator horn. The vertical pushrod has two balance springs attached to a bracket welded to the pushrod. These springs assist the elevator to return to the neural position.

The elevator stop for the downward movement consists of a GFRP block which is bonded to the inside of the upper skin of the horizontal stabilizer. When the elevator is deflected fully downwards, the forward extension of the elevator horn is deflected fully upwards and contacts the stop.

The elevator stop for the upward movement consists of a bolt/bush assembly which is installed in the trim actuator mounting bracket in a transverse direction (refer to Section 27-38). When the elevator is deflected fully upwards, the forward extension of the elevator horn is deflected fully downward and contacts the stop.

Figure 3 shows the variable elevator stop. The DA 42 NG is equipped with an electrically operated actuator that limits the elevator up travel to 13° as soon as the power setting of both engines exceeds approximately 20 %. The linear actuator acts as a movable stop and is controlled by two switches on the throttle quadrant, one for each power lever. When power is reduced below approximately 20 %, full elevator deflection is regained. The operation of the variable elevator stop is only controlled by the position of the engine power levers and cannot be selected or deselected by the pilot.

An amber STICK LIMIT caution is provided on the PFD to inform the pilot in case a malfunction is present. The STICK LIMIT caution appears when the variable elevator stop should be in place and is actually not activated (power ON condition) or should be retracted and actually limits the elevator travel (power OFF condition). The annunciation circuitry is not operative when one power lever is positioned beyond the approach power setting, while the other is below or in idle position (engine failure or training).

You cannot adjust the elevator stops.

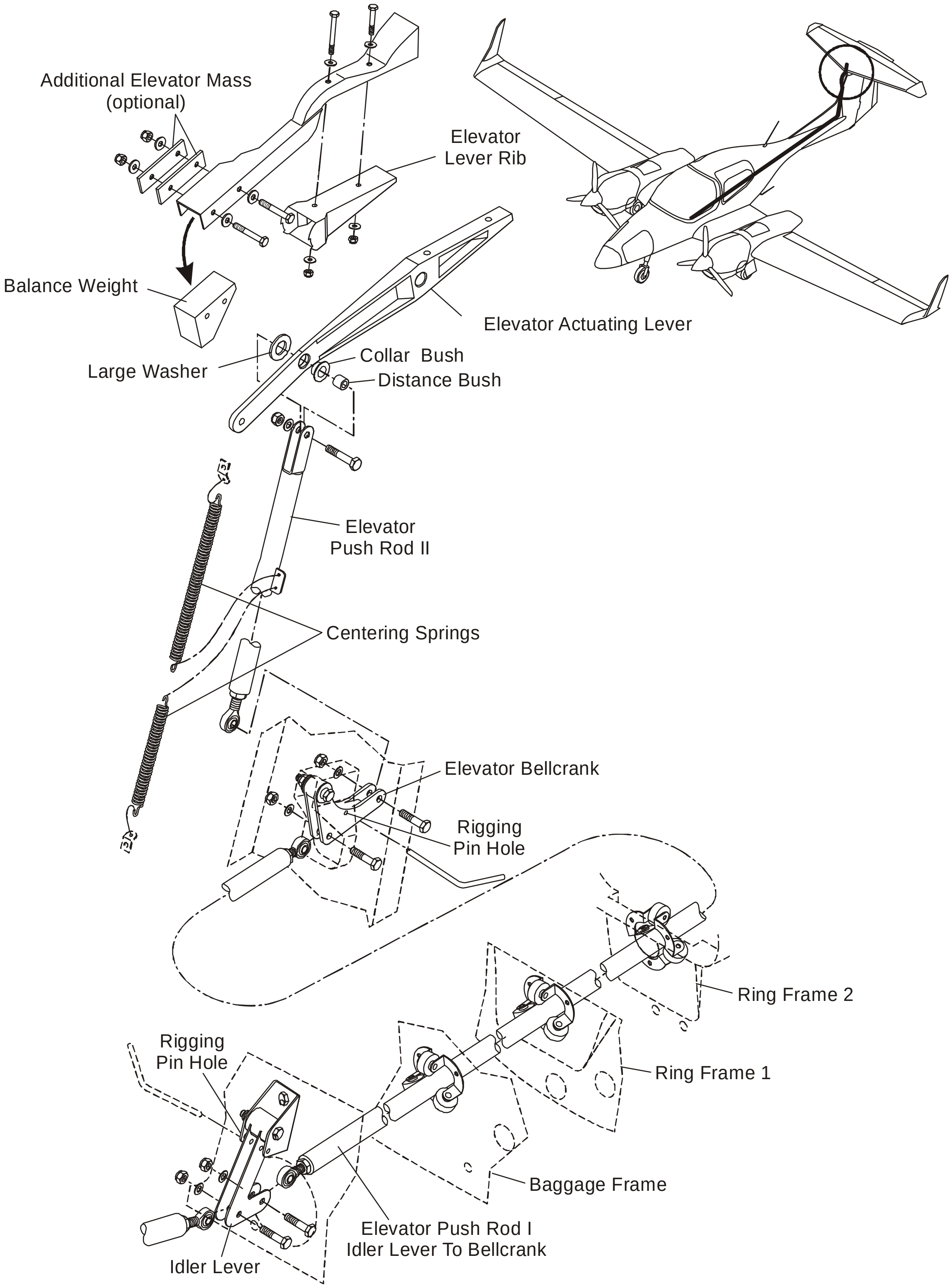

Figure 2: Elevator Controls in the Rear Fuselage

3. Operation

If you move the control stick forward:

– The torque tube assembly turns.

– The lever below the torque tube assembly pushes the short pushrod aft.

– the short pushrod pushes the long pushrod aft.

– the long pushrod pushes the aft bellcrank rearward.

– The bellcrank pushes the vertical pushrod up.

– The vertical pushrod moves the front of the elevator horn upwards.

– The elevator moves down.

If you move the control stick aft:

– The torque tube assembly turns.

– The short and long pushrods move forward.

– The bellcrank pulls the vertical pushrod downwards.

– The elevator moves up.

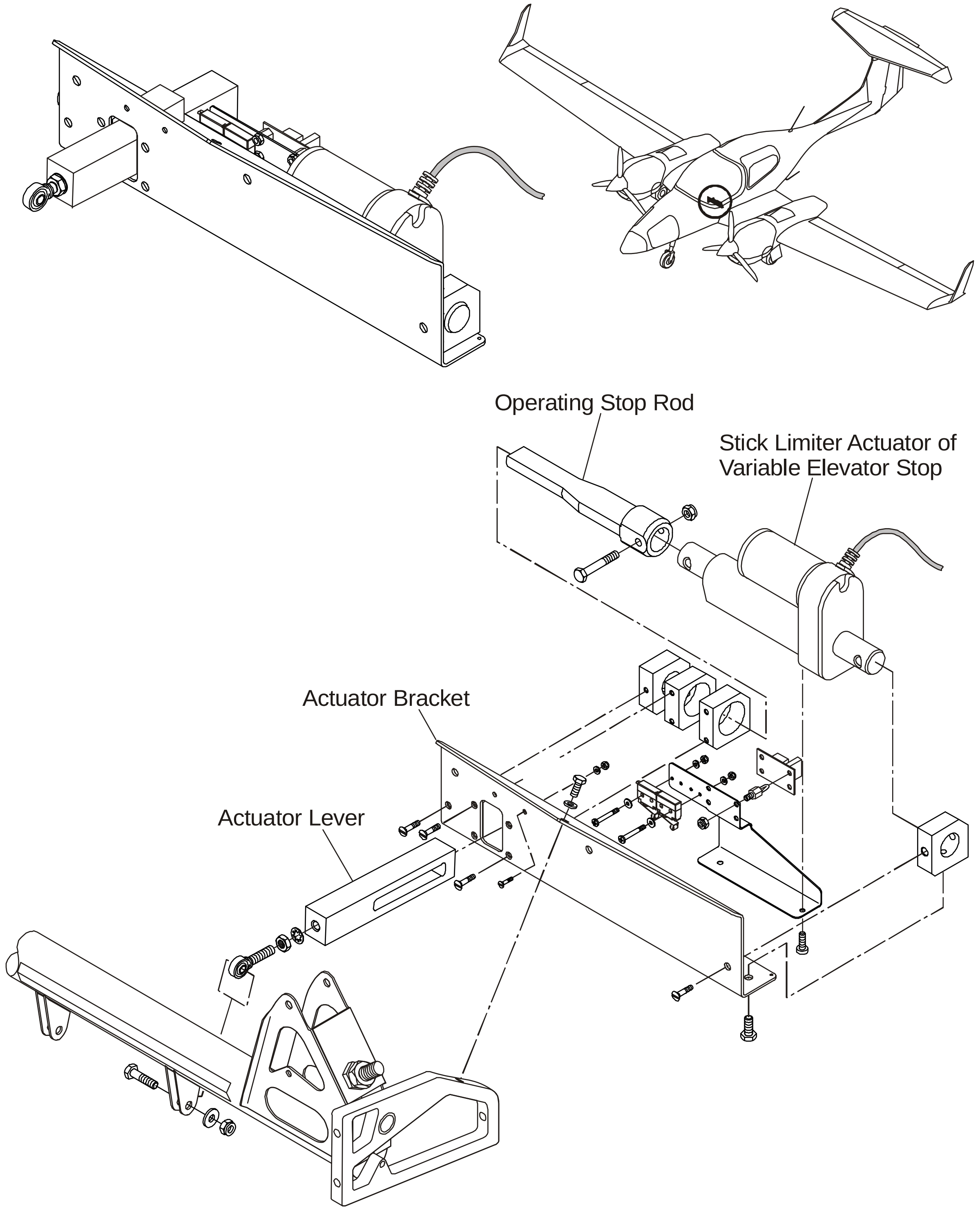

Figure 3: Variable Elevator Stop

Trouble-Shooting

1. General

The table below list the defects you could have in the elevator control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Control vibration during flight.	Too much backlash in the flight controls.	Examine the flight control system to isolate the problem. Replace the defective part.
Elevator controls stiff/catch.	Bearings defective. Pushrod deformed.	Replace the defective eye end. Replace the deformed pushrod.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to do test procedures on the elevator control system. They also tell you how to adjust the elevator control system. Refer to Section 55-20 for data on how to remove/install the elevator. Refer to Sections 27-38 and Section 27- 39 for data about the elevator trim systems.

WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO THE CONTROL SURFACES CAN OCCUR.

WARNING: WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS OR TOOLS FROM THAT AREA. LOOSE ITEMS OR TOOLS CAN PREVENT FULL AND FREE MOVEMENT OF THE AIRPLANE CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Elevator Control System Test for Correct Range of Movement

A. Equipment

Item	Quantity	Part Number
Rigging pin.	1	VR-D41-2757-3000.
Ruler or deflection gauge.	1	Commercial.
Fuselage trestle.	1	Commercial.
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.

B. Elevator Control Test Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record measurements.
(2)	Remove the left pilot's seat.	Refer to Section 25-10.
(3)	Install the rigging pin through the stick mounting block and the torque tube.	Refer to Figure 1.
	Note: Place the elevator deflection indicator between the stabilizer tips and the stabilizer so that the markings face backwards to the elevator.	
(4)	Make sure that the elevator deflection indicator is placed correctly.	At the stabilizer tips.
(5)	Read the angle of deflection of the elevator on the elevator deflection indicator.	Record the measurement.
(6)	Remove the rigging pin from the stick mounting block.	
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONS/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.	
(7)	Move the control stick fully forward and hold it against the stop.	
(8)	Read the angle of deflection of the elevator on the elevator deflection indicator.	Record the measurement. The distance must be as shown in the Control Surfaces Adjustment Report.
(9)	Move the control stick fully aft and hold it against the stop.	
(10)	Read the angle of deflection of the elevator on the elevator deflection indicator.	Record the measurement. The distance must be as shown in the Control Surfaces Adjustment Report.
(11)	Install the pilot's seat.	Refer to Section 25-10.

C. Elevator Control Test Procedure Using the Protractor (Electronic Deflection Gauge)

Note: If you use a protractor, make sure that the airplane does not move in pitch during the test procedure. It will cause errors in the test.

	Detail Steps/Work Items	Key Items/References
(1)	Raise the airplane on jacks.	Refer to Section 07-10.
(2)	Put a trestle under the rear fuselage.	To prevent a movement in pitch.
(3)	Level the airplane.	Refer to Section 08-00.
(4)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record measurements.
(5)	Remove the left pilot’s seat.	Refer to Section 25-10.
(6)	Install the rigging pin through the stick mounting block and the torque tube.	Refer to Figure 1.
(7)	Remove the horizontal stabilizer tips: – Remove the 8 screws that attach the tip to the stabilizer.	Hold the tips.
(8)	Protractor reference: – Place the protractor on the edge of the stabilizer onto the rib where the tips were removed before. – Reset the protractor.	This is the 0° reference plane. Make sure that the protractor is placed correctly. Refer to Figure 4.
(9)	Protractor measurement: – Place the protractor on the elevator surface and read the angle of deflection of the elevator surface. – Read the angle of deflection of the elevator on the protractor. The correct angle must be 6.5° because then the elevator is centered.	Make sure to use the same orientation of the protractor like before, taking measurement. Refer to Figure 4. Record the measurement.
(10)	Remove the rigging pin from the stick mounting block.	

	Detail Steps/Work Items	Key Items/References
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONS/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.	
(11)	Move the control stick fully forward and hold it against the stop.	
(12)	Repeat step 9 and keep the bevelled angle (6.5°) in mind.	Record the measurement. The angle must be as shown in the Control Surfaces Adjustment Report.
(13)	Move the control stick fully aft and hold it against the stop.	
(14)	Repeat step 9 and keep the bevelled angle (6.5°) in mind.	Record the measurement. The angle must be as shown in the Control Surfaces Adjustment Report.
(15)	Install the horizontal stabilizer tips: – Install the 8 screws that attach the tip to the stabilizer.	
(16)	Install the pilot’s seat.	Refer to Section 25-10.
(17)	Remove the trestle from under the rear fuselage.	
(18)	Lower the airplane.	Refer to Section 07-00.

3. Elevator Control System Adjustments

If you cannot get the correct range of movements of the elevator control system, use this procedure to adjust the system. Gust travel refers to the amount of travel remaining at the control surface with the control stick held against the cockpit stop.

WARNING: IF YOU DO AN ADJUSTMENT OF A PUSH-ROD, YOU MUST MAKE SURE THAT THE PUSH-ROD IS STILL IN SAFETY. IF YO DO NOT DO THIS, THE PUSH-ROD CAN DISCONNECT. THIS CAN CAUSE DEATH OR INJURY TO PERSONNEL.

A. Equipment

Item	Quantity	Part Number
Protractor (electronic deflection gauge) or elevator deflection indicator.	1	Commercial.
Rigging pins.	3	-

B. Elevator Control Adjustment Procedure

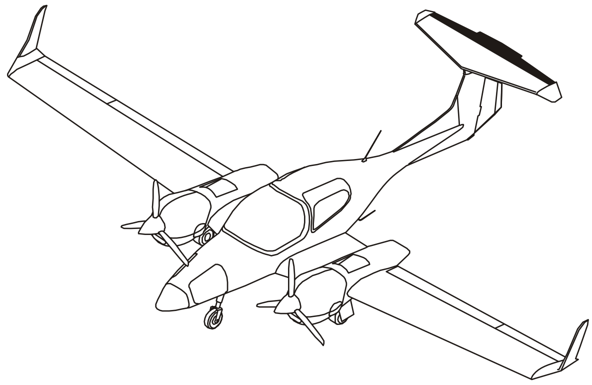
Refer to Figure 1.

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – The pilots' seat. – The rudder.	Refer to: Section 25-10. Section 55-40.
(2)	Install rigging pins in the following: – Through the stick mounting block and the torque tube. – The idler lever. – The rear bellcrank.	Refer to Figure 1 and 2. On the control bulkhead. On the front main bulkhead. On the vertical stabilizer rear web.
(3)	If you cannot put a rigging pin into a lever or bellcrank, adjust the pushrods as necessary.	Refer to Section 27-00 for the push-rod adjustment procedure.
(4)	Make sure that the elevator is in horizontal position.	Refer to Figure 4.

	Detail Steps/Work Items	Key Items/References
(5)	If the elevator does not align with the horizontal stabilizer, adjust the vertical push-rod at the rear bellcrank.	Refer to Section 27-00 for the push-rod adjustment procedure.
(6)	Remove the rigging pins from the following: – The stick mounting block and the torque tube. – The idler lever. – The rear bellcrank.	 On the control bulkhead. On the front main bulkhead. On the vertical stabilizer rear web.
(7)	Do a test for the correct range of elevator movement.	Refer to Paragraph 2.
(8)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	
(9)	Install these items: – The pilots' seats. – The rudder.	Refer to: Section 25-10. Section 55-40.

C. Elevator Angle Limits Table

Elevator Position	Elevator Deflection Indicator Angle Limits
Upper Limit.	15.5° ± 0.5°
Horizontal Position.	0°
Lower Limit.	13.0° ± 0.5°
Upper Limit (Vertical Elevator Stop Active).	13.0° ± 0.5°



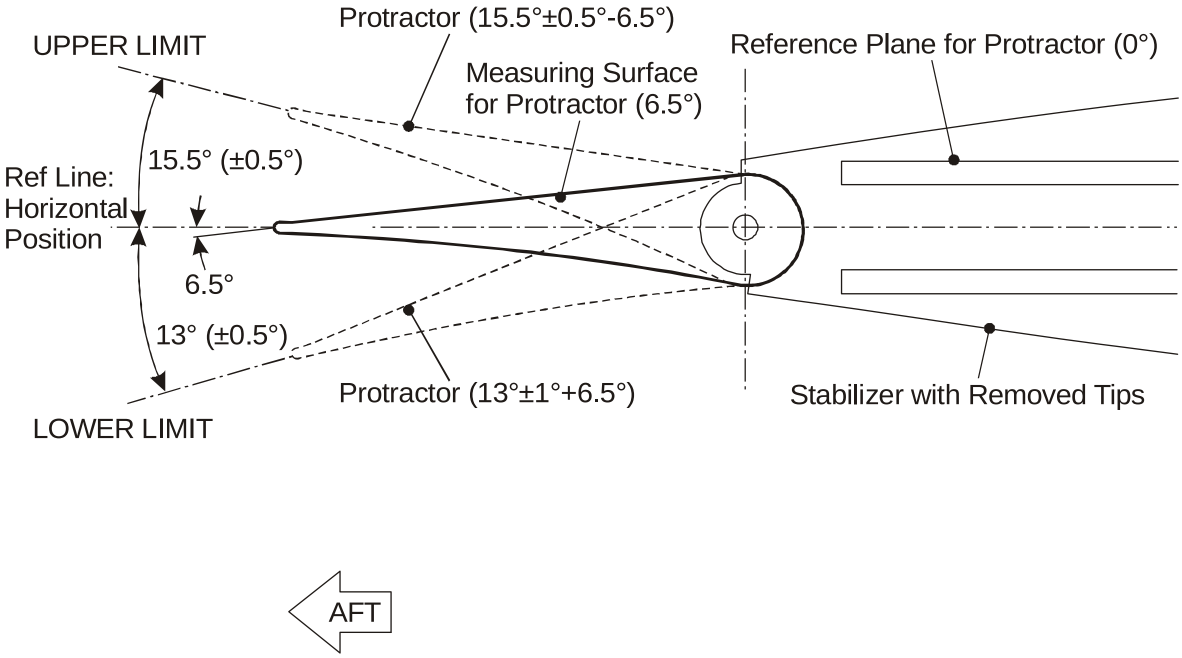


Figure 4: Elevator Angle Measurement

4. Remove/Install the Variable Elevator Stop Assembly

A. Remove the Variable Elevator Stop Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Remove the LH pilot's seat.	Refer to Section 25-10.
(2)	Open the GEAR WRN/ELEV. LIMIT circuit breaker.	On the right side of the instrument panel.
(3)	Remove the variable elevator stop assembly: – Disconnect the two in-line connectors. – Release the bolt which attaches the actuator lever adjustable fitting to the torque tube assy. – Remove the four bolts, washers and nuts that attach the assembly bracket to the control bulkhead. – Move the variable elevator stop assembly clear of the pilot's compartment.	 At the variable elevator stop assembly. Refer to Figure 1 and Figure 3.

B. Install the Variable Elevator Stop Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Install the variable elevator stop assembly: – Put the variable elevator stop assembly into position on the control bulkhead. – Install the four bolts, washers and nuts that attach the assembly bracket to the control bulkhead. – Install the bolt which attaches the actuator lever adjustable fitting to the torque tube assy. – Connect the two in-line connectors.	Refer to Figure 1 and Figure 3. At the variable elevator stop assembly.
(2)	Reset the GEAR WRN/ELEV. LIMIT circuit breaker.	On the right side of the instrument panel.
(3)	Do an operational test.	Refer to Paragraph 5.
(4)	If necessary adjust the actuator lever.	Refer to Section 27-00.
(5)	Install the LH pilot's seat.	Refer to Section 25-10.

5. Test/Adjust the Variable Elevator Stop

A. Equipment

Item	Quantity	Part Number
Ruler or deflection gauge.	1	Commercial.

B. Variable Elevator Stop Test/Adjustment Procedure

Note: If you use a deflection gauge, make sure that the airplane does not move in pitch during the test procedure. It will cause errors in the test.

	Detail Steps/Work Items	Key Items/References
(1)	If you will use a deflection gauge, put a trestle under the rear fuselage.	To prevent movement in pitch.
(2)	Switch on the ELECT. MASTER.	Refer to Section 24-00.
(3)	Position both power levers approx. beyond the 20 % power level.	
(4)	Continue according to the elevator control test procedure.	Refer to Paragraph 2. Required upward deflection: 13° ± 0.5° (51 mm ± 2 mm).
(5)	If necessary adjust the actuator lever.	Refer to Section 27-00, Paragraph 2.
(6)	Do an operational test of the STICK LIMIT caution message.	Refer to Paragraph 7.
(7)	Switch off the ELECT. MASTER.	Refer to Section 24-00.

6. Operational Test of the Variable Elevator Stop

	Detail Steps/Work Items	Key Items/References
(1)	Switch on the ELECT. MASTER.	Refer to Section 24-00.
(2)	Position both power levers above approx. 20 % power level.	To activate the stick limiter.
(3)	Test the system: – Pull the control stick rearward to the stop. Hold the stick fully rearward. – Set both power levers to IDLE. – Set both power levers above approx. 20 %.	 The stick must move rearward. The stick must move forward.
(4)	Switch off the ELECT. MASTER.	Refer to Section 24-00.

7. Operational Test of the STICK LIMIT Caution Message

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilot's seat.	Refer to Section 25-10.
(2)	Set the ELECT. MASTER to ON.	Refer to Section 24-00.
(3)	Set both power levers to IDLE.	To test the system in the de-activated configuration.
(4)	Connect pin "A" on the printed circuit (PC) board installed on the flap actuator assembly to electrical ground.	Refer to Chapter 92 for the wiring diagram of the variable elevator stop (stick limiter).
(5)	The STICK LIMIT caution message must appear on the G1000 PFD after 6 seconds.	
(6)	Remove ground connection from pin "A".	
(7)	Set both power levers above approx. 20 %.	To test the system in the activated configuration.
(8)	Connect pin "D" on the printed circuit (PC) board installed on the flap actuator assembly to electrical ground.	Refer to Chapter 92 for the wiring diagram of the variable elevator stop ("stick limiter").
(9)	The STICK LIMIT caution message must appear on the G1000 PFD after 6 seconds.	
(10)	Remove ground connection from pin "D".	
(11)	Set the ELECT. MASTER to OFF.	Refer to Section 24-00.
(12)	Install the pilot's seat.	Refer to Section 25-10.

8. Elevator Pushrod Access

Elevator Pushrod	Remove/Install Access	References
Between the control torque tube and the idler lever at the front main bulkhead.	Pilot's seat.	Section 25-10.
Between the idler lever at the front main bulkhead and the bellcrank at the vertical stabilizer rear web.	Pilot's seat. Rudder.	Section 25-10. Section 55-40.
Between the bellcrank at the vertical stabilizer rear web and the elevator.	Rudder.	Section 55-40.

9. Elevator Bellcrank and Lever Access

Elevator Pushrod	Remove/Install Access	References
Idler lever at the front main bulkhead.	Pilots’ seats.	Section 25-10.
Bellcrank at the vertical stabilizer rear web.	Rudder.	Section 55-40.

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Section 27-37
Stall Warning System

1. General

The DA 42 NG has a simple electrical stall warning system.

The stall system consists of the following items:

– Stall warning switch.

– Stall warning horn.

2. Description and Operation

A stall warning switch is mounted on the left wing's leading edge. The stall warning switch has heater elements to prevent icing. A switch on the instrument panel controls the stall warning heat. To avoid overheating the heaters are supplied via a resistor if the airplane is on ground. A circuit-breaker protects the system. As the angle of attack increases and the airplane approaches an aerodynamic stall, the stall warning switch closes and activates a stall warning horn, installed in the instrument panel.

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Trouble-Shooting

1. General

CAUTION: DO NOT JACK THE AIRPLANE AND SWITCH ON THE STALL HEATER (PITOT HEAT SWITCH)! THE HEATERS CAN BURN OUT IN A FEW SECONDS.

The table below lists the defects you could have with the stall warning system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Stall warning horn does not operate.	Circuit-breaker not set.	Set the circuit-breaker.
	Stall warning horn defective.	Replace the stall warning horn.
	Stall warning switch (lift detector) defective.	Replace the stall warning switch.
	Faulty cables/connectors.	Do a test for continuity on each cable. Do a test for short circuit to ground and between cables. Replace defective cables.

Trouble	Possible Cause	Repair
‘STAL HT FAIL’ caution is indicated on the PFD in flight.	Vane, plate or case heater defective.	Replace the stall warning switch.
	RH Weight on Wheel switch defective.	Replace the switch, refer to Section 32-60.
	“PITOT”-switch defective.	Replace the switch, refer to Section 24-60.
	Stall heat control relay defective.	Replace relay.
	Faulty cables/connectors.	Do a test for continuity on each cable. Do a test for short circuit to ground and between cables. Replace defective cables.

Maintenance Practices

1. General

This Section tells you how to remove/install the components of the stall warning system.

2. Equipment

Item	Quantity	Part Number
Stall warning installation gauge DA 42.	1	D60-2737-11-PL.

3. Remove/Install the Stall Warning Switch (Lift Detector)

A. Remove the Stall Warning Switch

	Detail Steps/Work Items	Key Items/References
(1)	Open the STALL WRN circuit breaker.	
(2)	If the stall warning switch is mounted firmly and the vane is not bent or damaged: – Mark location and angle of the vane on the stall warning switch installation gauge.	
(3)	Loosen the screws that attach the stall warning switch to the wing.	
(4)	Disconnect the electrical wires.	At the in-line connector.
(5)	Remove the stall warning switch from the wing.	

B. Install the Stall Warning Switch

	Detail Steps/Work Items	Key Items/References
(1)	Connect the electrical wires.	At the in-line connector.
(2)	Put the switch in position in the wing.	Use the stall warning installation gauge Listed equipment) to align the vane with the marking from step A(2). Use the standard marking on the gauge, if step A(2) was not performed.
(3)	Install the screws that attach the switch to the wing.	

	Detail Steps/Work Items	Key Items/References
(4)	Close the STALL WRN circuit breaker.	
(5)	If step A(2) was not performed and the stall warning switch vane was installed according to the standard marking on the gauge: Perform a flight check of the stall warning system: – Reduce airspeed at 1kts per second. – Record stall warning speed and stall speed. – If a minimum of 10 kts margin in between stall warning speed and stall speed does not exist, or nuisance warnings are experienced during take-off or approach, adjust the stall warning switch following the scheme: – Down: if nuisance warnings and a margin of more than 10 kts exists. – Up: if the stall warning is less than 10 kts. – Repeat the flight check until the test is passed.	Conditions: CG-range: 2.40 m ± 0.01 m. Min. test altitude: 3000 ft AGL. Max. test altitude: FL 65 Trim speed: 100 KIAS. Flaps: UP. Gear: UP. Power: IDLE. Attitude: Wings level.

4. Remove/Install the Stall Warning Horn

A. Remove the Stall Warning Horn

	Detail Steps/Work Items	Key Items/References
(1)	Remove the instrument panel cover.	Refer to Section 25-10.
(2)	Open the STALL WRN circuit breaker.	
(3)	Disconnect the electrical wires of the stall warning horn.	Note the connections.
(4)	Remove the nut which attaches the stall warning horn to the instrument panel.	
(5)	Remove the stall warning horn from the instrument panel.	

B. Install the Stall Warning Horn

	Detail Steps/Work Items	Key Items/References
(1)	Put the stall warning horn in position in the instrument panel.	
(2)	Install the nut that attaches the stall warning horn to the instrument panel.	
(3)	Connect the electrical wires to the stall warning horn.	Refer to Section 92-00.
(4)	Close the STALL WRN circuit breaker.	
(5)	Install the instrument panel cover.	Refer to Section 25-10.
(6)	Do a test of the stall warning system.	

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Section 27-38

Flight Controls - Elevator Trim-Mechanical

1. General

The DA 42 NG has an elevator with a trim tab. The trim tab is mechanically operated. The elevator also has an electric trim system which operates on the elevator via flexible cable. Refer to Section 27-39 for more data about the electrically operated trim system.

A handwheel on the center console controls the elevator trim tab. An indicator tells the pilot the trim tab setting. A flexible cable moves the trim tab.

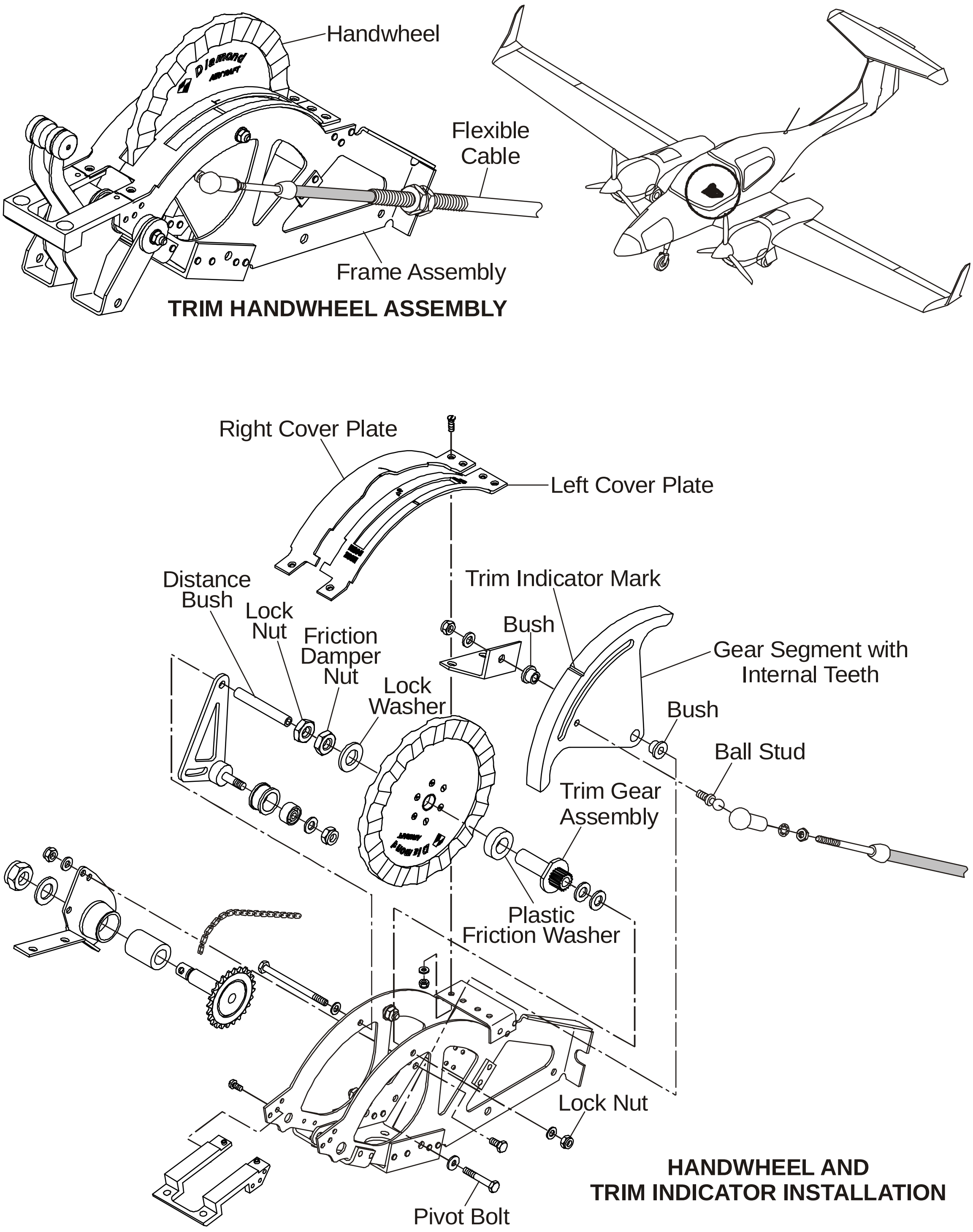

Figure 1: Elevator Mechanical Trim Mechanism in the Cockpit

2. Description

The mechanical trim installation has three main parts:

– A handwheel assembly with trim indicator.

– A flexible cable which connects the handwheel to the trim tab.

– The trim tab actuator assembly.

Figure 1 shows the elevator trim mechanism in the cockpit. Figure 2 shows the trim tab actuator assembly.

A. Trim Handwheel Assembly

A handwheel assembly on the center console controls the mechanical elevator trim system. The assembly has a metal mounting frame. The frame attaches to the rear of the engine control assembly and the top of the control bulkhead.

A long bolt through the mounting frame carries the handwheel. The bolt also holds friction discs, plain washers and spring washers against the handwheel. Two jam nuts let you adjust the friction.

A small gear wheel attaches to the handwheel. The small gear wheel engages with a large gear segment with internal teeth. The gear segment has a pivot bolt at the bottom of the mounting frame. A ballstud attaches the eye end of a long flexible cable to the gear segment. An extension to the mounting frame at the rear makes the anchor point for the outer sheath of the flexible cable.

The gear segment is also the trim indicator. The top face of the segment has a white line across it midway between the front and back. The top face can be seen by the pilot through a slot in the cover plate. The side of the cover plate have markings to show the trim position.

B. Flexible Cable

A long flexible cable connects the trim handwheel assembly to the trim tab. The cable goes through holes in the front and rear main bulkheads, the aft baggage frame, and each of the fuselage ring frames. It goes up the front face of the front web of the vertical stabilizer and through a slot near the top. It goes through a large hole at the top of the rear web of the vertical stabilizer to the trim tab actuator assembly.

The cable has an inner core with threaded end fittings. Spherical end fittings at each end connect to the gear segment in the cockpit and the trim actuator assembly at the horizontal stabilizer.

Clamp blocks hold the outer core of the cable to the mounting frame at the front and a bracket from the horizontal stabilizer at the back.

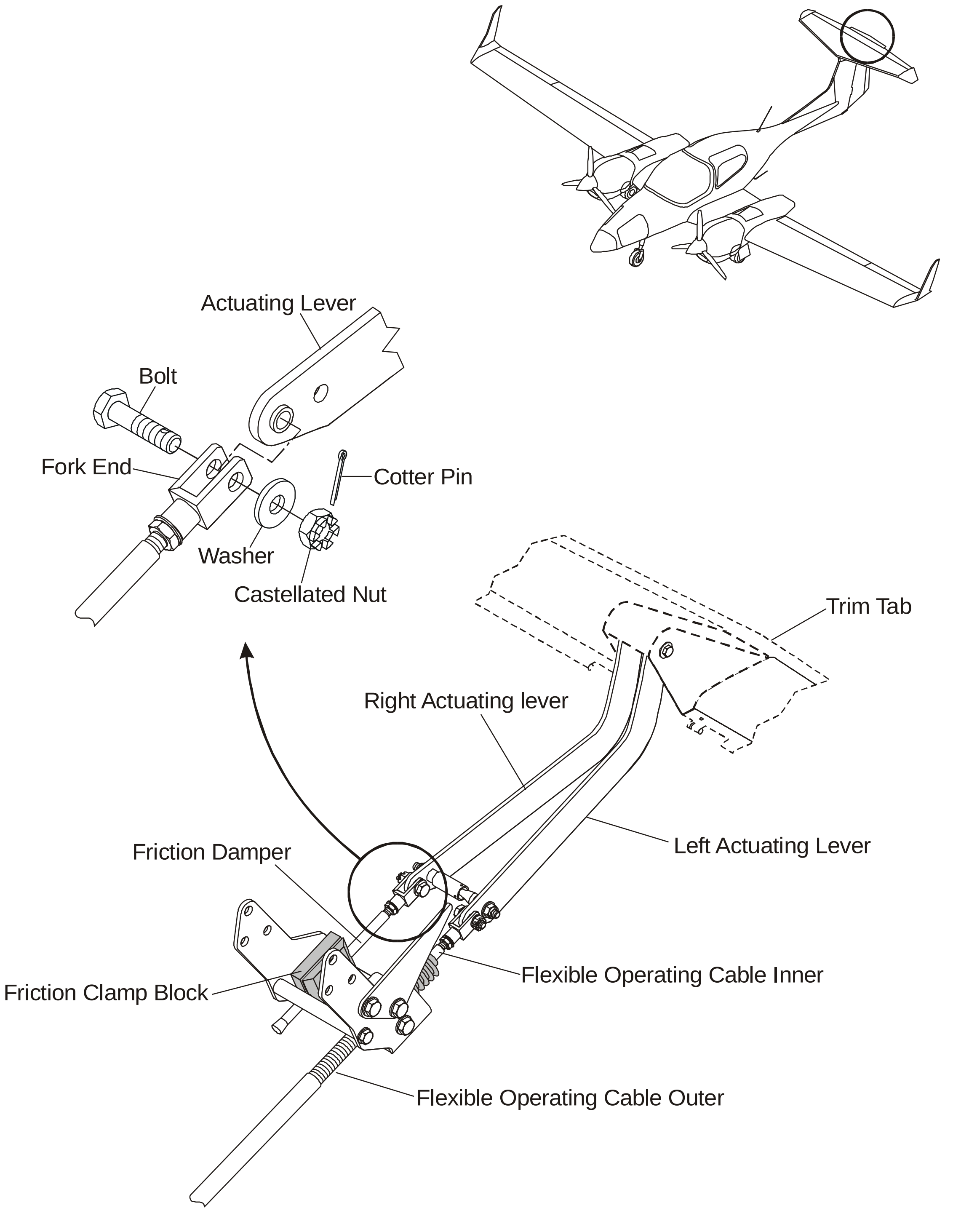

Figure 2: Trim Tab Actuator Assembly

C. Trim Tab Actuator Assembly

The trim tab is a one-piece GFRP molding. The tab has two integral levers. Two cranked actuating levers attach to the integral levers. The left cranked actuating lever connects to the long flexible cable. The right actuating lever connects to a friction damper.

The friction damper has a clamp-block with a hole for a rod. The rod connects to the right actuating lever on the trim tab. You can adjust the friction of the rod in the clamp block.

3. Operation

When you move the top of the trim handwheel forward these things happen:

- The small gear wheel moves the top of the gear segment forward.
- The gear segment pulls the inner core of the flexible cable forward.
- The inner core of the flexible cable pulls the left cranked actuating lever forward.
- The left cranked actuating lever pulls the trim tab lever forward to move the trim tab upwards.
- The up movement of the trim tab uses aerodynamic forces to push the elevator down in flight giving nose-down trim.

When you move the top of the trim handwheel aft, the gear segment moves aft, the cable moves aft and the trim tab moves down. This pushes the elevator up during flight to give nose up trim.

In each case the pilot can see the trim position from the white mark on the gear segment.

4. Emergency Operation

In the event of a failure of the mechanical trim control system between the handwheel and the trim actuator lever, the friction damper will prevent the trim tab from fluttering.

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Trouble-Shooting

1. General

The table below list the defects you could have in the elevator mechanical trim control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Too much play in the mechanical trim system.	Worn bearings or joints.	Replace the defective items.
Trim handwheel stiff to move.	Flexible cable damaged. Trim damper incorrectly adjusted.	Replace the flexible cable. Adjust the trim damper.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to test the elevator mechanical trim control system. They also tell you how to adjust the system. Refer to Section 55-20 for data on how to remove and install the elevator and trim tab. Refer to Section 27-39 for data about the electric trim system for the DA 42 NG.

2. Elevator Mechanical Trim Control System Test for Correct Range of Movement

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Rigging pin.	1	VR-D41-2757-3000.
Protractor (electronic deflection gauge).	1	Commercial.
Elevator trim deflection indicator.	1	D60-5525-00-PL.

B. Elevator Mechanical Trim Control Test Procedure

	Detail Steps/Work Items	Key Items/References
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONS/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Levelling the airplane.	Refer to Section 08-00.
(3)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record the measurements.
(4)	Check elevator for correct range of movement.	Refer to Section 27-30.

	Detail Steps/Work Items	Key Items/References
(5)	Set the elevator to horizontal position: – Install the rigging pin through the stick mounting block and the torque tube.	Refer to Figure 1 in Section 27-30. Elevator should have 0° deflection referred later as the horizontal position.
(6)	Place the elevator trim deflection indicator onto the elevator.	Refer to Figure 1.
(7)	Set the elevator trim hand wheel to NEUTRAL.	
(8)	Check the elevator trim angle limits: – Read the angle deflection from the elevator trim deflection indicator – Record your measurement.	Check your measurements with the elevator trim angle limits table in this section.
(9)	Set the elevator trim hand wheel to NOSE UP. Repeat step 8.	
(10)	Set the elevator trim hand wheel to NOSE DOWN. Repeat step 8.	
(11)	Set the elevator to 10° inclined position. Use a protractor or an elevator deflection indicator to measure the inclined position.	Refer to Figure 1.
(12)	Set the elevator trim hand wheel to NEUTRAL. Repeat step 8.	
(13)	Set the elevator trim hand wheel to NOSE UP. Repeat step 8.	
(14)	Set the elevator trim hand wheel to NOSE DOWN.	
(15)	Set the elevator to 10° declined position. Use a protractor or an elevator deflection indicator to measure the declined position.	Refer to Figure 1.
(16)	Set the elevator trim hand wheel to NEUTRAL. Repeat step 8.	

	Detail Steps/Work Items	Key Items/References
(17)	Set the elevator trim hand wheel to NOSE UP. Repeat step 8.	
(18)	Set the elevator trim hand wheel to NOSE DOWN. Repeat step 8.	
(19)	If your measurements do not comply with the limits in the trim angle limit table, then re-adjust the trim elevator.	Refer to Section 27-38.
(20)	Move the wing and rear fuselage trestles clear of the airplane.	
(21)	Lower the airplane.	Refer to Section 07-10.

3. Elevator Mechanical Trim Control System Adjustment

If you cannot get the correct range of movement of the elevator mechanical trim control system, use this procedure to adjust the system.

A. Equipment

Item	Quantity	Part Number
Control clamp.	1	Commercial.
Inclinometer.	1	Commercial.
Fuselage trestle.	1	Commercial.
Spring balance.	1	Commercial.

B. Elevator Mechanical Trim Control Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: – The pilot's seat. – The center console cover.	Refer to Section 25-10.
(2)	Put a trestle under the rear fuselage.	To prevent movement in pitch.
(3)	Hold the trailing edge of the elevator in line with the horizontal stabilizer.	Use a clamp at the tips.
(4)	Set the trim handwheel to neutral.	See the trim indicator.
(5)	Adjust the flexible cable: – Loosen the nuts that hold the outer sheath of the flexible cable to the mounting frame for the trim handwheel. – Turn the nuts to move the outer sheath forward or aft as necessary. – Tighten the nuts.	Refer to Figure 1. Move the outer sheath forward to move the trim tab down. Move the outer sheath aft to move the trim tab up.

	Detail Steps/Work Items	Key Items/References
(6)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	
(7)	Install these items: – The center console cover. – The pilot's seat.	Refer to Section 25-10.
(8)	Remove the clamps from the elevator/horizontal stabilizer tips.	
(9)	Remove the trestle from under the rear fuselage.	

C. Elevator Mechanical Trim Friction Damper Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove the horizontal stabilizer fairing.	Refer to Section 55-10.
(2)	Disconnect the right actuator lever from the friction rod: – Release the cotter pin locking the nut, washer and bolt assembly which attaches the fork end fitting to the actuator. – Remove the nut, washer and bolt from the fork end fitting. – Move the fork end fitting clear of the actuator.	Refer to Figure 2.
(3)	Measure the force needed to move the damper rod through the clamp.	Use a spring balance. The friction force must be 15-30 N (3.4 - 6.7 lbf.).
(4)	If necessary, adjust the friction force: – Tighten or loosen the clamping screw a small amount.	
(5)	Do steps 3 and 4 again, as necessary.	
(6)	Connect the right actuating lever to the friction rod: – Move the fork end into position at the actuating lever. – Install the bolt, washer and nut that connects the fork end to the actuating lever. – Tighten the nut until it contacts the face of the fork end and then turn it clockwise to align the nut with a cotter pin hole in the bolt. – Install a new cotter pin.	

	Detail Steps/Work Items	Key Items/References
(7)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	
(8)	Install the horizontal stabilizer fairing.	Refer to Section 55-10.

D. Elevator Mechanical Trim Handwheel Friction Damper Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: The pilot's seat. – The center console cover. – The right cover plate of the trim handwheel assembly	Refer to Section 25-10.
(2)	Loosen the self-locking nut on the handwheel pivot bolt.	On the right side of the mounting frame.
(3)	Loosen the lock nut for the handwheel friction damper.	Against the right inner face of the mounting frame.
(4)	Adjust the friction damper nut.	Against the pack of washers and spring washers on the pivot bolt.
(5)	Measure the friction force (clamp a spring balance onto the handwheel and measure force).	The friction force must be 3.2 - 4.4 Nm This corresponds to a force of 60 ± 10 N on the corded area of the trim handwheel.
(6)	Do step 4 as necessary to set the correct friction force.	
(7)	Tighten the locknut for the handwheel friction damper.	
(8)	Tighten the self-locking nut on the handwheel pivot bolt.	
(9)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	
(10)	Install these items: – The right cover plate of the trim handwheel assembly – The center console cover. – The pilot's seat.	Refer to Section 25 -10.

Section 27-39

Flight Controls - Elevator Trim-Electrical

1. General

This Section tells you about the elevator electrically controlled trim system. Refer to Section 27-38 for data about the elevator mechanical trim control system.

A thumb switch on the pilot’s control stick operates the DA 42 NG electrically controlled elevator trim system.

2. Description

The DA 42 NG elevator has a trim tab that can be operated mechanically via the usual trim wheel in the center console or electrically via a trim switch on the pilot’s control stick. The elevator electrical trim system is integrated with the autopilot control system. For more data about the autopilot control system and the interaction with the elevator electrical trim system refer to Chapter 22.

The elevator electric trim system has two main components:

A. Pilot’s Control Stick Switch

A thumb switch on the pilot’s control stick operates the elevator electrical trim servo. The switch is spring loaded at the neutral position. The switch can pushed against the spring in a forward or aft direction. When pushed forwards the trim servo will trim the airplane more nose down and when pushed aft the trim servo will trim the airplane more tail heavy.

B. Elevator Trim Servo

The DA 42 NG has a pitch trim servo located below the co-pilot’s seat. The servo is mounted on an aluminum plate and is attached to the plate with a GFRP bracket. A chain gear on the servo, a cardan shaft and a chain gear on the right side of the cockpit trim wheel transmits the movement of the servo to the elevator trim wheel.

When the pilot operates the electric trim switch on the control stick the servo will operate and drive the mechanical trim wheel to the required position.

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Trouble-Shooting

1. General

The table below list the defects you could have in the elevator electrical trim control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
The elevator electrical trim system does not operate correctly from the switch on the pilot’s control stick but the autopilot elevator trim control system operates correctly.	Defective trim switch on the pilot’s control stick.	Replace the defective trim switch.
The elevator electrical trim system does not operate correctly from the switch on the pilot’s control stick or with the autopilot control system.	Autopilot circuit breaker open. Elevator trim servo defective.	Reset autopilot circuit breaker. Replace elevator trim servo.

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Maintenance Practices

1. General

For data about the removal/installation of the elevator trim electrical servo and the removal/installation of the elevator trim servo clutch refer to Chapter 22.

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Section 27-50
Flight Controls - Flaps

1. General

The DA 42 NG has flaps for approach and landing. There are two flaps attached to the trailing edges of each wing. The inboard and outboard flap assemblies of each wing are directly coupled. The outboard end of the inner flap has a tongue which engages with a slot in the inboard end of the outer flap.

An electric flap actuator moves the flaps. See Section 57-50 for data about the flap structure.

A three position toggle switch controls the flaps. The switch is in the right side of the instrument panel.

Lights located to the left of the flap toggle switch come on when these flap positions are set:

– Green lit, both white off - flaps UP.

– White lit, green and bottom white off - flaps at APPROACH.

– White lit, green and middle white off - flaps at LANDING.

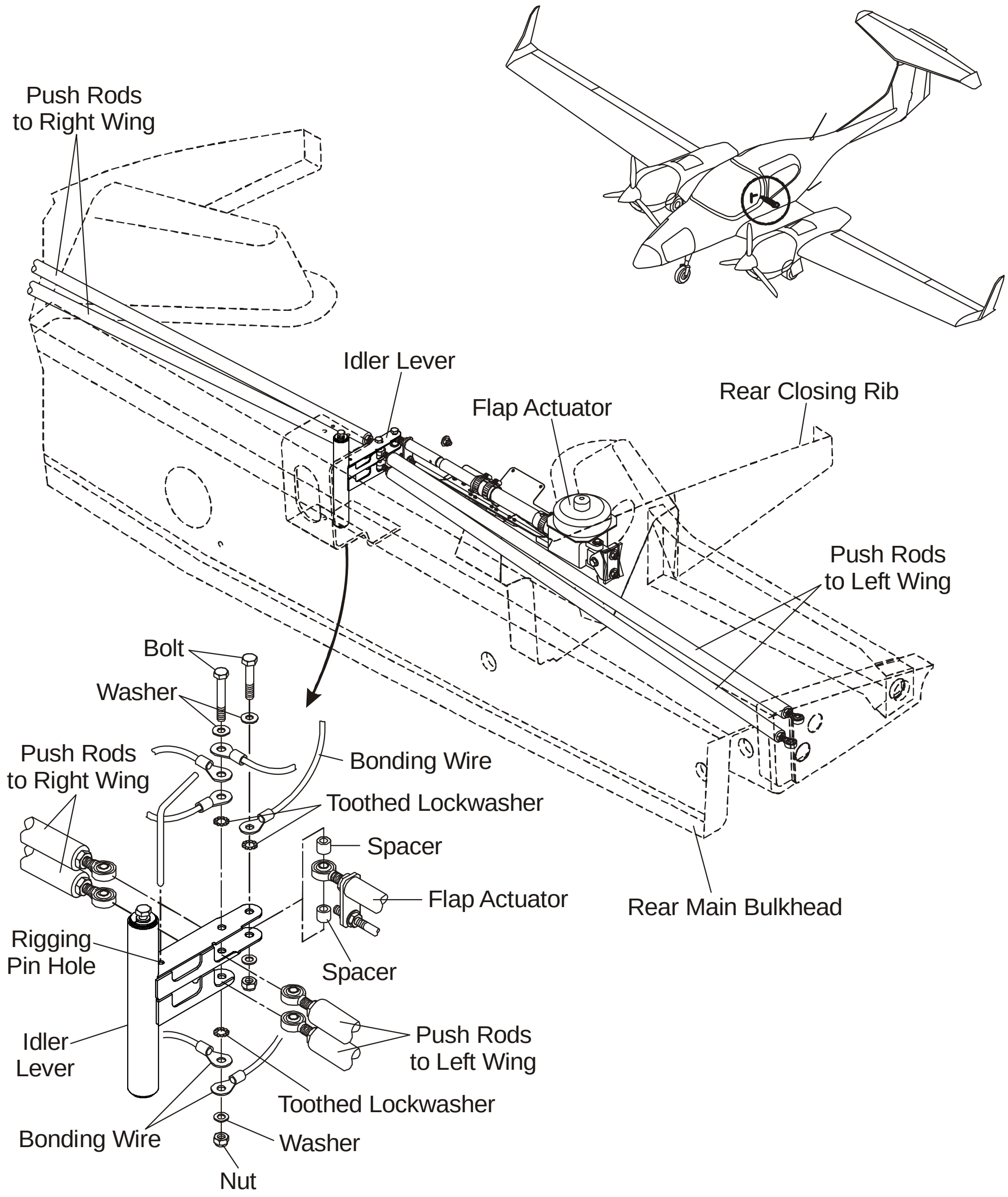


Figure 1: Flap Control System in the Fuselage

2. Description

Figure 1 shows the flap control system in the fuselage. Figure 2 shows the flap pushrods and bellcranks in the wing. Figure 3 shows the flap actuator installation.

A. Flap Actuator

An electric actuator operates the flaps. The electric actuator is under the left passenger seat. A mounting bracket on the left rear closing rib attaches the actuator to the structure.

The actuator has an electric motor. The motor has a reduction gear which turns a spindle. The spindle operates a pushrod. The pushrod connects to an idler lever attaches to the rear main bulkhead.

A cam attached to the pushrod operates five micro switches. The micro switches are part of the flaps electronic control circuit.

B. Push-Rods and Bellcranks

The idler lever on the rear man bulkhead connects to four pushrods. Two of the pushrods connect to the inboard ends of longer pushrods in the wing and the other two pushrods connect to the inner flap bellcranks. Two short pushrods connect the inner flap bellcranks to the inner flap horns.

The long pushrods connect to flap bellcranks in the outer wing. A guide bearing holds each long push-rod at the root rib. Two short pushrods connect the outer flap bellcranks to the flap horns.

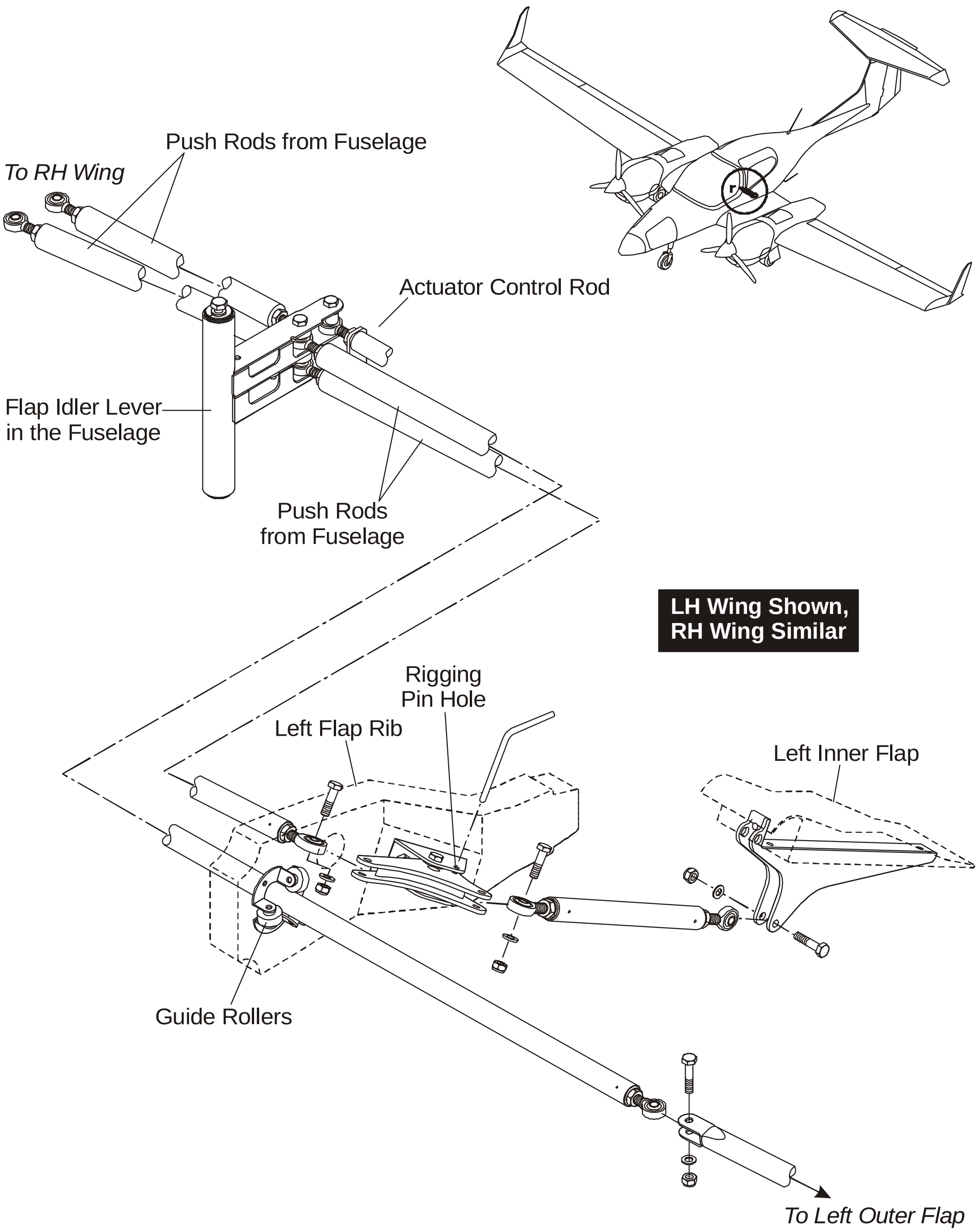


Figure 2: Flap Push-Rods and Bellcranks in the Wings

C. Flap Electrical Control

Figure 4 shows the flap electrical control system. The main bus supplies the power for the flaps. A circuit breaker protects the system. See Chapter 92 for the Wiring Diagrams.

The flap electrical control system uses solid state electronics. It has an electronic control unit and a switchboard. The electronic control unit is mounted on the instrument panel. Then switchboard attaches to the flap actuator.

The electronic control unit has a 3-position selector switch and a flap position indicator. The selector switch can be set to:

– UP (fully up) 0° ± 1°

– APP (approach) 20° ± 2°

– LDG (landing) 42° ± 1°

The flap position indicator has three light emitting diodes. The top diode lights when the flaps are in the UP position. The middle diode lights when the flaps rare in the APP position. The bottom diode lights when the flaps are in the LDG position.

The switch board attaches to the body of the flap actuator. The switch board has five micro switches. It also has solid state logic board.

The logic circuits monitor the outputs from the selector switch and the micro switches on the switch board. They control four power transistors. Two of the power transistors can connect the power supply to the flap motor. The other two can connect the motor to ground.

Two screws attach each micro switch to the switchboard. You can adjust the position of the switch board with three worm drive clamps. The micro switches have these functions:

– Micro switch 1 - UP position.

– Micro switch 2 - UP indication and APP position moving down.

– Micro switch 3 - APP indication.

– Micro switch 4 - LDG position.

– Micro switch 5 - LDG indication APP position moving up.

Cable harnesses with multi pin connectors connect the components.

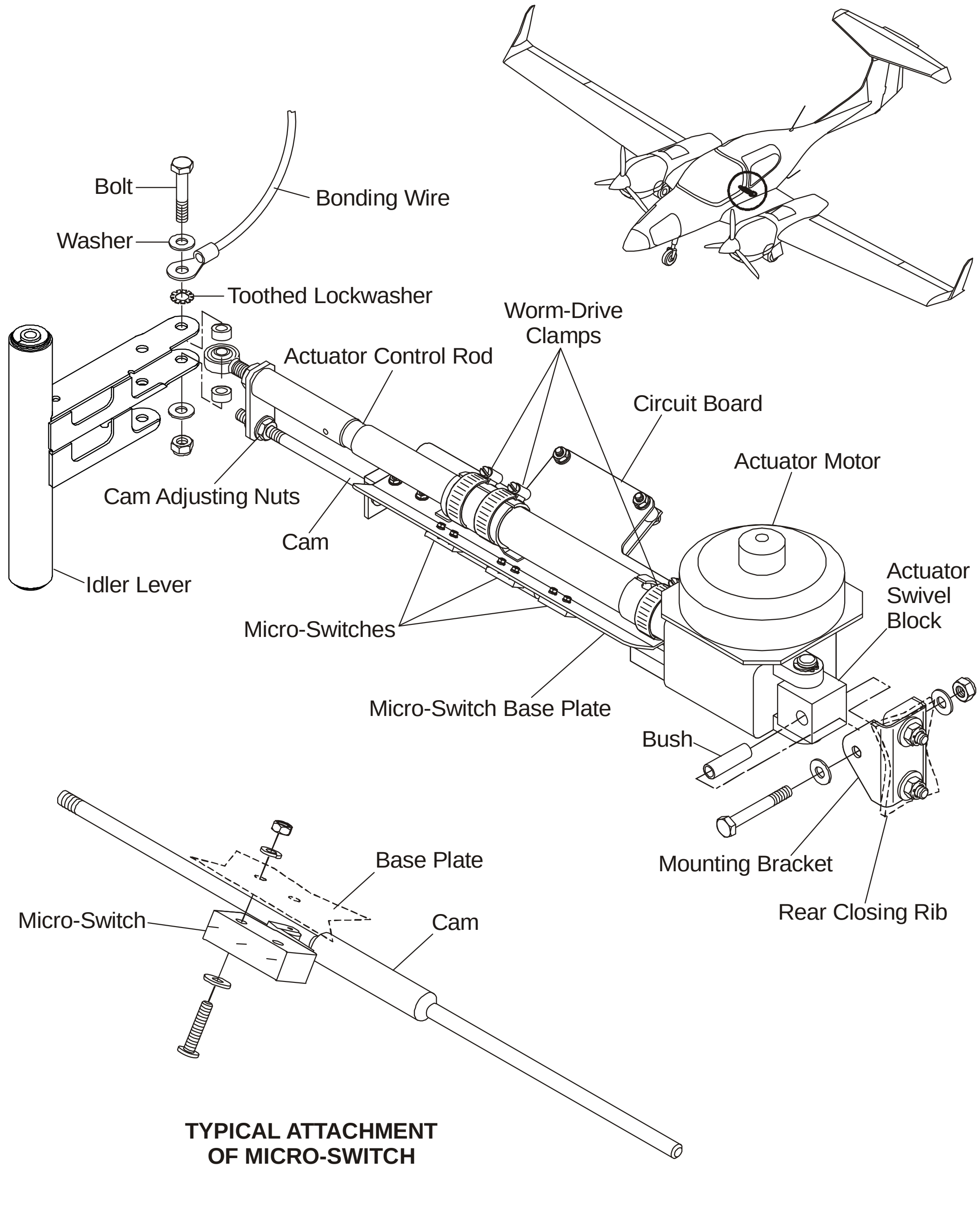


Figure 3: Flap Actuator Installation

3. Operation

If you operate the flap selector switch these things happen:

– The switch energizes the related logic circuit.

– The logic circuit switches on the related transistors to supply power/ground to the flap motor.

– The flap motor turns the reduction gear and spindle. This moves the actuator pushrod towards the new set position.

– The push rod turns the idler lever around its axis.

– The idler lever moves the flap operating pushrods in the fuselage and the wings.

– The push-rods move the flap bellcranks in the left and right wings.

– The short pushrods move the flaps.

When the flap position reaches the position set by the flap selector:

– The cam on the flap actuator operates the related flap position and indication micro switches.

– The logic circuit switches off the related transistors to de-energize the flap motor.

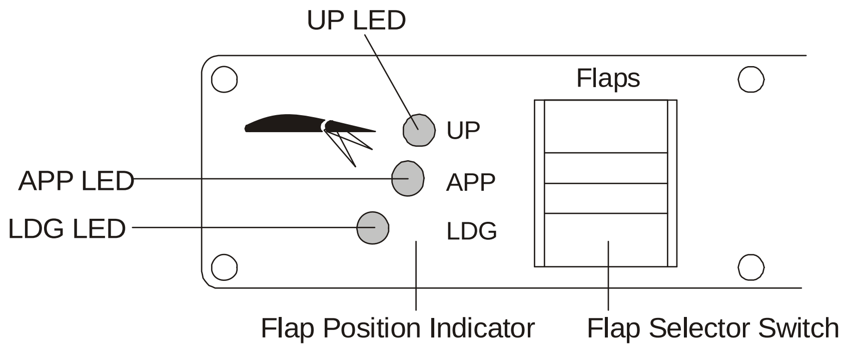
– The flap position indicator shows the new flap position.

4. Fail-Safe Operation

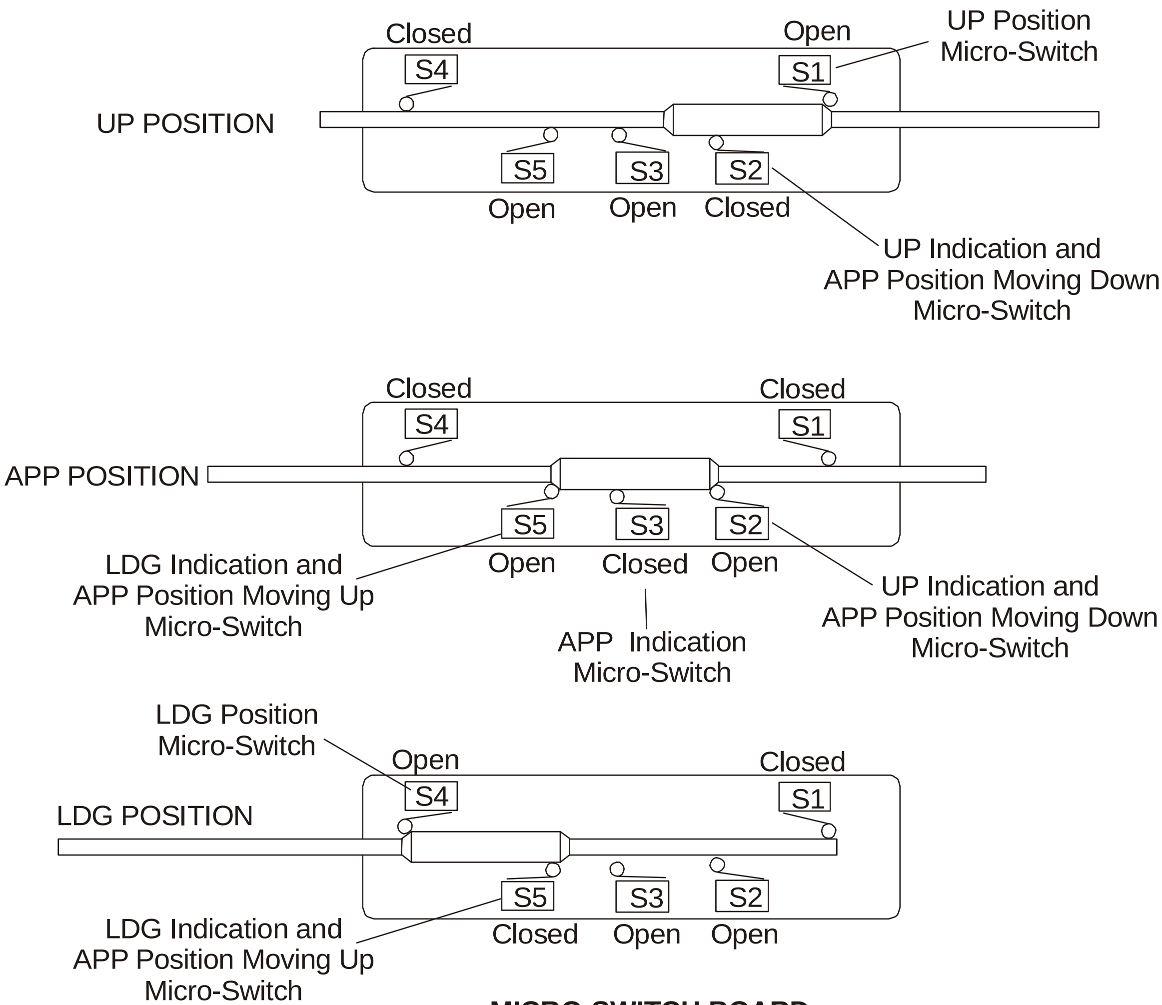
The flap control system has these fail-safe properties:

– If the LDG position micro switch fails closed the flap actuator pushrod will continue to travel for about 5 mm (0.2 in) until it reaches an internal stop. This prevents damage to the flaps. The FLAP circuit breaker opens and breaks the flap operating circuit.

– If the UP position micro switch fails closed, the actuator pushrod contacts the end of the actuator body after about 5 mm (0.2 in) of movement. This prevents damage to the flaps. The FLAP circuit breaker opens and breaks the flap operating circuit.



FLAP CONTROL UNIT IN THE INSTRUMENT PANEL
(View Looking Forward)



MICRO-SWITCH BOARD
(View Looking Down)

Figure 4: Flap Electrical Control System

Trouble-Shooting

1. General

The table below lists the defects you could have in the flap control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Flaps do not operate.	Circuit breaker not set. Airplane electrical system voltage low. Flap selector switch defective.	Set the flap circuit breaker. Do a test of the airplane electrical system voltage. Replace the flap electronic control unit.
Flap circuit breaker will not stay closed.	Short to ground in the wires to the electrical control unit or the micro switches. Short to ground in the electrical control unit. Short to ground in a micro switch. Short to ground in a wire between a closed micro switch and the control unit.	Do an insulation test between each wire and ground. Repair or replace defective wires. Replace the electrical control unit. Replace the micro switch. Do an insulation test between each wire and ground. Repair or replace defective wires.
Flap circuit breaker opens when flap selector switch moved to any down position.	Short to ground in a motor supply wire.	Do an insulation test between each wire and ground. Repair or replace defective wires.
Flap circuit breaker opens when flap selector switch moved to any up position.	Short to ground in a motor supply wire.	Do an insulation test between each wire and ground. Repair or replace defective wires.
Flap circuit breaker opens when the flaps stop at the chosen position.	Short to ground in the wires to the electrical control unit from the related indication micro switch.	Do an insulation test between each wire and ground. Repair or replace defective wires.

Trouble	Possible Cause	Repair
Flap circuit breaker opens when the flaps have moved only a short distance from the UP setting.	Short to ground in the wires to the electrical control unit from micro switch 1.	Do an insulation test between each wire and ground. Repair or replace defective wires.
Flap circuit breaker opens when the flaps have moved only a short distance from the LDG setting.	Short to ground in the wires to the electrical control unit from micro switch 4.	Do an insulation test between each wire and ground. Repair or replace defective wires.
Flaps move slowly.	Airplane electrical system voltage low. Flap motor defective. Flap actuator defective.	Do a test of the airplane electrical system voltage. Do a test for 24 V at the motor with flaps selected. If there is 24 V at the motor, replace the actuator. Examine the actuator. If you find damage, then replace the flap actuator.
Flaps do no not align with the wing trailing edge.	Flaps extended at too high airspeed.	Examine the flap system. Replace damaged parts. Adjust the system.
Flaps will not move to LDG position. Flaps move to APP and UP correctly.	Micro switch 4 defective. Open circuit in the micro switch 4 wiring.	Replace the micro switch. Do a continuity test of the wiring. Repair or replace the defective wire.
Flaps will not move to UP position. Flaps move to APP and LDG correctly.	Micro switch 1 defective. Open circuit in the micro switch 1 wiring.	Replace the micro switch. Do a continuity test of the wiring. Repair or replace the defective wire.

Trouble	Possible Cause	Repair
No LDG indication when the flaps are in the LDG position. Flaps will not move from LDG to APP. Flaps move from LDG to UP correctly.	Micro switch 5 defective. Open circuit in the micro switch 5 wiring.	Replace the micro switch. Do a continuity test of the wiring. Repair or replace the defective wire.
No UP indication when the flaps are in the UP position. Flaps will not move from UP to APP. Flaps move from UP to LDG correctly.	Micro switch 2 defective. Open circuit in the micro switch 2 wiring.	Replace the micro switch. Do a continuity test of the wiring. Repair or replace the defective wire.
No APP indication when the flaps are in the APP position. Flaps move to all positions correctly.	Micro switch 3 defective. Open circuit in the micro switch 3 wiring.	Replace the micro switch. Do a continuity test of the wiring. Repair or replace the defective wire.
Flap circuit breaker opens at the end of down movement.	Micro switch 4 defective.	Replace the micro switch.
Flap circuit breaker opens at the end of up movement.	Micro switch 1 defective.	Replace the micro switch.
LDG LED stays on when the flaps are not in the LDG position. The other indications operate correctly.	Micro switch 5 defective.	Replace the micro switch.
UP LED stays on when the flaps are not in the UP position. The other indications operate correctly.	Micro switch 2 defective.	Replace the micro switch.

Trouble	**Possible Cause**	Repair
APP LED stays on when the flaps are not in the APP position. The other indications operate correctly.	Micro switch 3 defective.	Replace the micro switch.
Flaps move to LDG when APP set from UP.	Micro switch 2 defective.	Replace the micro switch.
Flaps move to UP when APP set from LDG.	Micro switch 5 defective.	Replace the micro switch.

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install components of the flap control system. They also tell you hot to test and adjust the system. See Section 57-50 for data about removing and installing the flaps.

WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THAT THE AREA AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO THE CONTROL SURFACES CAN OCCUR.

WARNING: WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS OR TOOLS FROM THAT AREA. LOOSE ITEMS OR TOOLS CAN PREVENT FULL AND FREE MOVEMENT OF THE AIRPLANE CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Remove/Install the Flap Actuator

Refer to Figures 1 and 3.

A. Remove the Flap Actuator

	Detail Steps/Work Items	Key Items/References
(1)	If possible set the flaps to the APP position.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the passenger seat.	Refer to Section 25-10.
(4)	Disconnect the electrical supply connector to the flap motor.	At the flap motor.
(5)	Disconnect the control harness plug from the switch board.	
(6)	Remove the bolt which attaches the actuator pushrod to the idler lever.	At the rear main bulkhead. Support the flaps.
(7)	Lower the flaps by hand until they stop.	
(8)	Remove the bolt which attaches the actuator body to the mounting bracket.	At the left rear closing rib.
(9)	Remove the actuator from the airplane.	

B. Install the Flap Actuator

	Detail Steps/Work Items	Key Items/References
(1)	Put the flap actuator into position in the fuselage.	
(2)	Install the bolt which attaches the actuator body to the mounting bracket.	At the left rear closing rib. Make suer that the bush is in the correct position in the actuator swivel block. Torque 6.4 Nm (4.7 lbf.ft.).
(3)	Install the bolt which attaches the actuator push-rod to the idler lever.	At the rear main bulkhead. Hold the flaps. Torque 6.4 Nm (4.7 lbf.ft.).
(4)	Connect the control harness plug for the switch-board.	
(5)	Connect the electrical supply connector to the flap motor.	
(6)	Connect the airplane main battery.	Refer to Section 24-31.
(7)	Do the flap adjustment procedure.	See Paragraph 4.
(8)	Do an inspection of all the controls that you connected. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.	
(9)	Install the passenger seat.	Refer to Section 25-10.

3. Test the Flap Control System

A. Equipment

Item	Quantity	Part Number
Inclinometer.	1	Commercial.
Spring balance.	1	Commercial.

B. Test the Flap Control System

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record the measurements.
(2)	Make sure that the flaps are fully UP: – Set the ELECT. MASTER switch to ON. – Set the flaps to APP. – When the flaps stop moving, set the flaps to UP. – When the flaps stop moving, set the ELECT. MASTER switch to OFF.	
(3)	Do a test for the correct pre-load in the flap UP position:	
	– Build a loop with strong (durable) tape and bond both ends side by side on top of the left inner flap.	The UP position limit stop at the outboard end of the inner flap is the reference point for measurements.
	– Use the loops of tape for the spring balance until the flap just moves from the lower surface of the wing.	Pull vertical downwards.
	– Record the value in the Control Surfaces Adjustment report.	The values must be as shown in the Control Surfaces Adjustment Report.

	Detail Steps/Work Items	Key Items/References
(4)	If the preload is not correct, adjust the control rod between the bellcrank in the wing and the flap horn for the flap you tested. Repeat steps 3 and 4 as necessary until you measure the correct pre-load value.	Refer to Section 27-00.
(5)	Repeat steps 3 and 4 for the right inner flap.	
(6)	Zero the inclinometer to the left outer flap: – Put the inclinometer on the left outer flap close to the flap horn. – Zero the inclinometer. – Remove the inclinometer.	
(7)	Set the flaps to APP: – Set the ELECT. MASTER switch to ON. – Set the flap selector switch to APP. – When the flaps stop moving, set the ELECT. MASTER switch to OFF.	
(8)	Measure the angle of the left outer flap. Record the value in the Control Surfaces Adjustment Report.	Use the inclinometer. The value must be as shown in the Control Surfaces Adjustment Report.
(9)	Set the flaps to LDG: – Set the ELECT. MASTER switch to ON. – Set the flap selector switch to LDG. – When the flaps stop moving, set the ELECT. MASTER switch to OFF.	
(10)	Measure the angle of the left outer flap. Record the value in the Control Surfaces Adjustment Report.	Use the inclinometer. The value must be as shown in the Control Surfaces Adjustment Report.
(11)	Repeat steps 6 to 10 for the right outer flap.	

	Detail Steps/Work Items	Key Items/References
(12)	Set the flaps to UP: – Set the ELECT. MASTER switch to ON. – Set the flap selector switch to UP. – When the flaps stop moving, set the ELECT. MASTER switch to OFF.	

4. Adjust the Flap Control System

If you cannot get the correct range of movement of the flap control system, use this procedure to adjust the system.

A. Equipment

Item	Quantity	Part Number
Rigging pins.	3	VR-D41-2757-3000.
Deflection gauge.	2	D60 5753 00 PL.

B. Adjust the Flap Control System

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Record the measurements.
(2)	Remove these items for access: – The passenger seat. – The flap bellcrank access panels in both wings.	 Refer to Section 25-10. Refer to Section 53-40.
(3)	Disconnect the airplane main battery.	Refer to Section 24-31.
(4)	Remove the bolt, spacer, washer and nut which attach the actuator push-rod to the idler lever.	At the rear main bulkhead. Hold the flaps.
(5)	Put a rigging pin in the idler lever.	Refer to Figure 3. At the rear main bulkhead.
(6)	Put a rigging pin in the left inner bellcrank in the left wing. If necessary adjust the push-rod between the idler lever and the bellcrank.	Refer to Section 27-00.
(7)	Repeat step 6 for the left outer flap and both the right wing inner and outer flaps.	
(8)	Remove the rigging pins from the flap idler lever and the bellcranks in the wings.	
CAUTION: MAKE SURE THAT ALL THE RIGGING PINS ARE REMOVED!		
(9)	Connect the airplane main battery.	Refer to Section 24-31.

	Detail Steps/Work Items	Key Items/References
WARNING:	**DO NOT TOUCH THE ACTUATOR WHEN YOU OPERATE IT. THE MOVING PARTS CAN CAUSE INJURY.**	
(10)	Check actuator extension: – Hold the actuator rod end clear of the structure. – Set the ELECT. MASTER switch to ON. – Set the flap selector switch to APP. – When the actuator stops moving, set the flap switch to UP. – When the actuator stops moving, set the ELECT. MASTER switch to OFF.	Use a piece of a string through the eye end.
(11)	Measure the extension of the actuator push-rod.	The distance between the center of the eye-end of the actuator rod and the center of the actuator swivel block mounting must be 379.7 mm (14.87 in).
(12)	If the actuator pushrod extension is not correct, adjust the cam rod: – Loosen the nuts which attach the cam rod to the plate at the eye end. – Turn the nuts to move the cam rod. – Tighten the nuts.	Refer to Figure 3. One turn clockwise decreases the extension by 1 mm (0.04 in). Torque 6.4 Nm (4.7 lbf.ft.).
(13)	Repeat steps 11 and 12 as necessary to get the correct extension.	
(14)	Disconnect the rod end on flap attachment on all 4 flap connections.	At the flap.
(15)	Set the flap actuator to flap UP.	

	Detail Steps/Work Items	Key Items/References
(16)	Connect the flap actuator: – Install the bolt, spacer, washer and nut which attaches the eye end to the idler lever.	Torque 6.4 Nm (4.7 lbf.ft.).
(17)	Install the deflection gauge on the wing.	
(18)	Connect the outer flap rod end LH and RH on flap lever and adjust it to 0°.	
(19)	Connect the inner flap LH and RH on flap lever and adjust it to the flap stop.	
(20)	Measure flap deflection: Set the flap selector switch to LDG. – Set the flap selector switch to APP. – Set the flap selector switch to UP.	Record the value in the Control Surfaces Adjustment Report.
(21)	Make sure that all the flaps hit the stops at the same time. If necessary, adjust the rod between the bellcrank in the wing and the related flap.	Refer to Section 27-00.
(22)	Do a test and adjust flap pre-load.	Refer to Paragraph C.
(23)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	
(24)	Install these items: – The passenger seat. – The flap bellcrank panels in both wings.	Refer to Section 25-10. Refer to Section 53-40.

C. Adjust the Flap Preload

	Detail Steps/Work Items	Key Items/References
(1)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00.
(2)	Connect external power source.	
(3)	Set the ELECT. MASTER switch to ON.	
(4)	Check flap deflection for UP, APP, LDG position with deflection gauge according to the Control Surfaces Adjustment Report.	If deflection out of limit refer to Paragraph B.
(5)	Disconnect LH and RH outer flap push rods.	
(6)	Install reinforced tape loop on outer end of inner flap, bond both ends side by side on top of the inner flaps. Do not place loop ends over the flap stop.	Refer to Figure 5.
(7)	Put paper slip between inner flap outer end and flap stop.	
(8)	Set flaps to 0°.	
(9)	Connect scale to the reinforced tape loop.	
(10)	Pull on scale and paper slip until the paper slip is released.	Pull vertical downwards.
(11)	If the paper slip release-force is out of limits, disconnect inner flap push rod and twist rod end half a revolution. Connect push rod and try again until limits are reached.	
(12)	Repeat steps 6 to 11 on other side.	
(13)	Disconnect LH and RH inner flap push rods.	
(14)	Connect LH and RH outer flap push rods.	
(15)	Put paper slip in outer flap stop fairing between flap stop and flap stop lever.	
(16)	Set flaps to 0°.	
(17)	Position scale on screw head on outer end of flap.	
(18)	Pull on scale and paper slip until paper slip is released.	

	Detail Steps/Work Items	Key Items/References
(19)	If the paper slip release-force is too small bond inserts into the outer flap stop fairing until force is above minimum. If release force is too high, remove layers from the outer flap stop fairing until force is below maximum.	
(20)	Connect the inner flap push rods.	
(21)	Do an inspection of all controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection if the controls.	

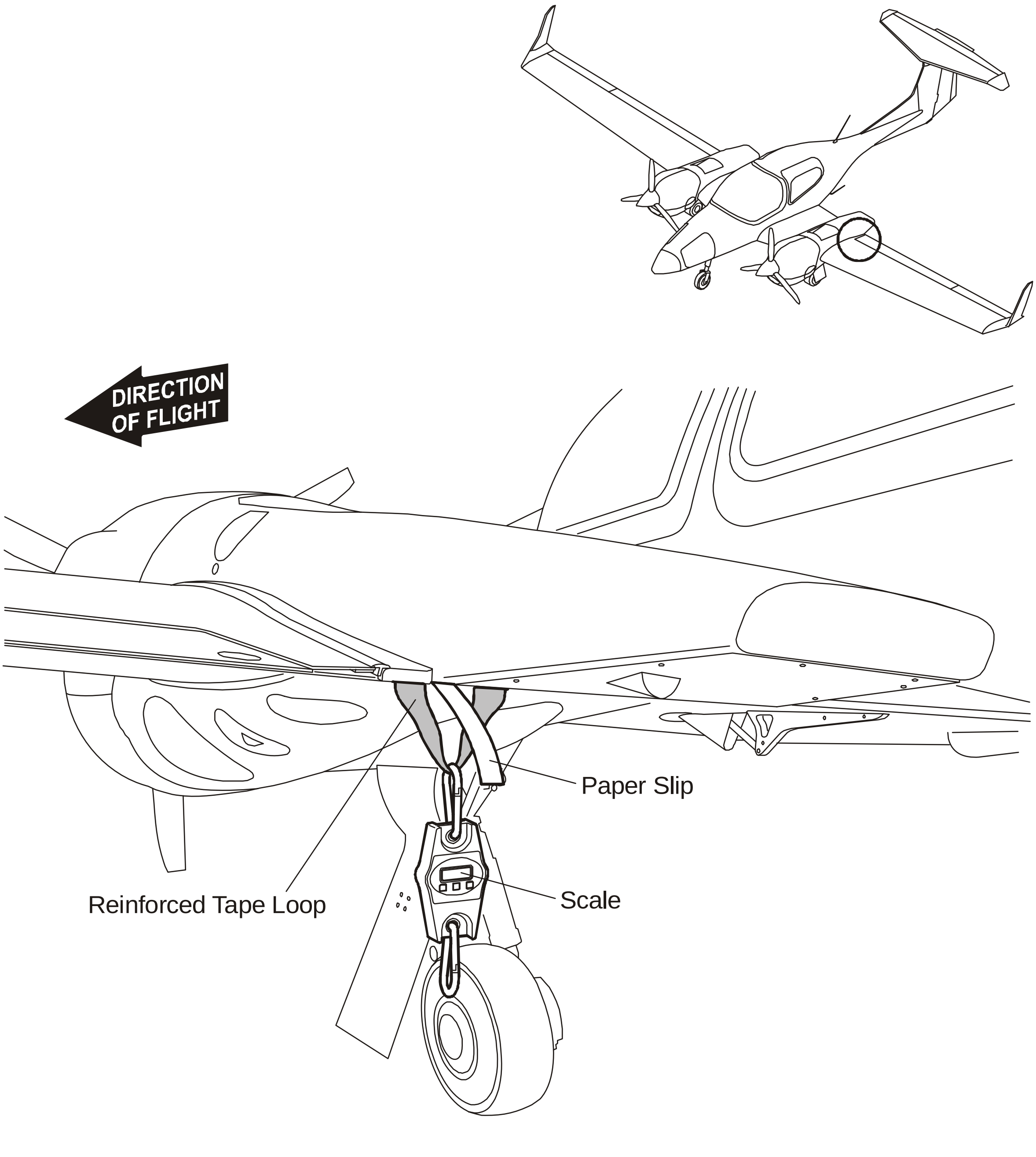


Figure 5: Flap Preload Adjustment

5. Flap Push-Rod Access

Flap Pushrod	Remove/Install Access	References
Between the idler lever at the rear bulkhead and the center section closing ribs.	Passenger seat. Center section access panels.	Section 25-10. Section 52-40.
Between the center section closing ribs and the inner flap bellcranks.	Passenger seat. Inner flap bellcrank access panels under each wing.	Section 25-10. Section 52-40.
Between the center section closing ribs and the outer flap bellcranks.	Passenger seat. Outer flap bellcrank access panels under each wing.	Section 25-10. Section 52-40.
Between the inner flap bellcranks and the inner flap horns.	Inner flap bellcrank access panels under each wing.	Section 52-40.
Between the outer flap bellcranks and the outer flap horns.	Outer flap bellcrank access panels under each wing.	Section 52-40.

6. Flap Bellcrank and Lever Access

Flap Pushrod	Remove/Install Access	References
Idler lever at the rear main bulkhead.	Passenger seat.	Section 25-10.
Bellcranks in wings.	Inner and outer bellcrank access panels under each wing.	Section 52-40.

CHAPTER 28

FUEL

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CHAPTER 28

FUEL

1. General

This Chapter describes the DA 42 NG fuel system. It tells you about the fuel system from the fuel tanks to the engine fuel filter. For more data on the engine fuel system refer to Chapter 73 and the AE Operation Manual, latest revision and the AE Maintenance Manual, latest revision.

The DA 42 NG has a fuel tank assembly in each wing. Each fuel tank assembly has an approximate capacity of 26 US gal (100 liter). Each engine has two parallel installed independent electrically powered low pressure pumps and a high pressure fuel pump which supply the engine with fuel. Each engine is protected against contaminated fuel by two pre-filters located in front of the low pressure pumps and a fine fuel filter after the low pressure fuel pumps. The pre-filters, fine filter, and low pressure fuel pumps are located in the engine nacelles. A fuel selector/shut-off valve in each engine nacelle can be operated by the pilot to shut-off the fuel supply to each engine.

Auxiliary fuel tanks are optional equipment (OÄM 42-056). The auxiliary fuel tanks consist of a single fuel chamber in each engine nacelle. The additional fuel capacity is 13.7 US gal (52 liter) per side. The total fuel capacity (main fuel tank and auxiliary fuel tank) is 39.6 US gal (150 liter) per side. Each auxiliary tank has its own fuel tank filler and an auxiliary electric fuel pump which transfers fuel into the main fuel tank.

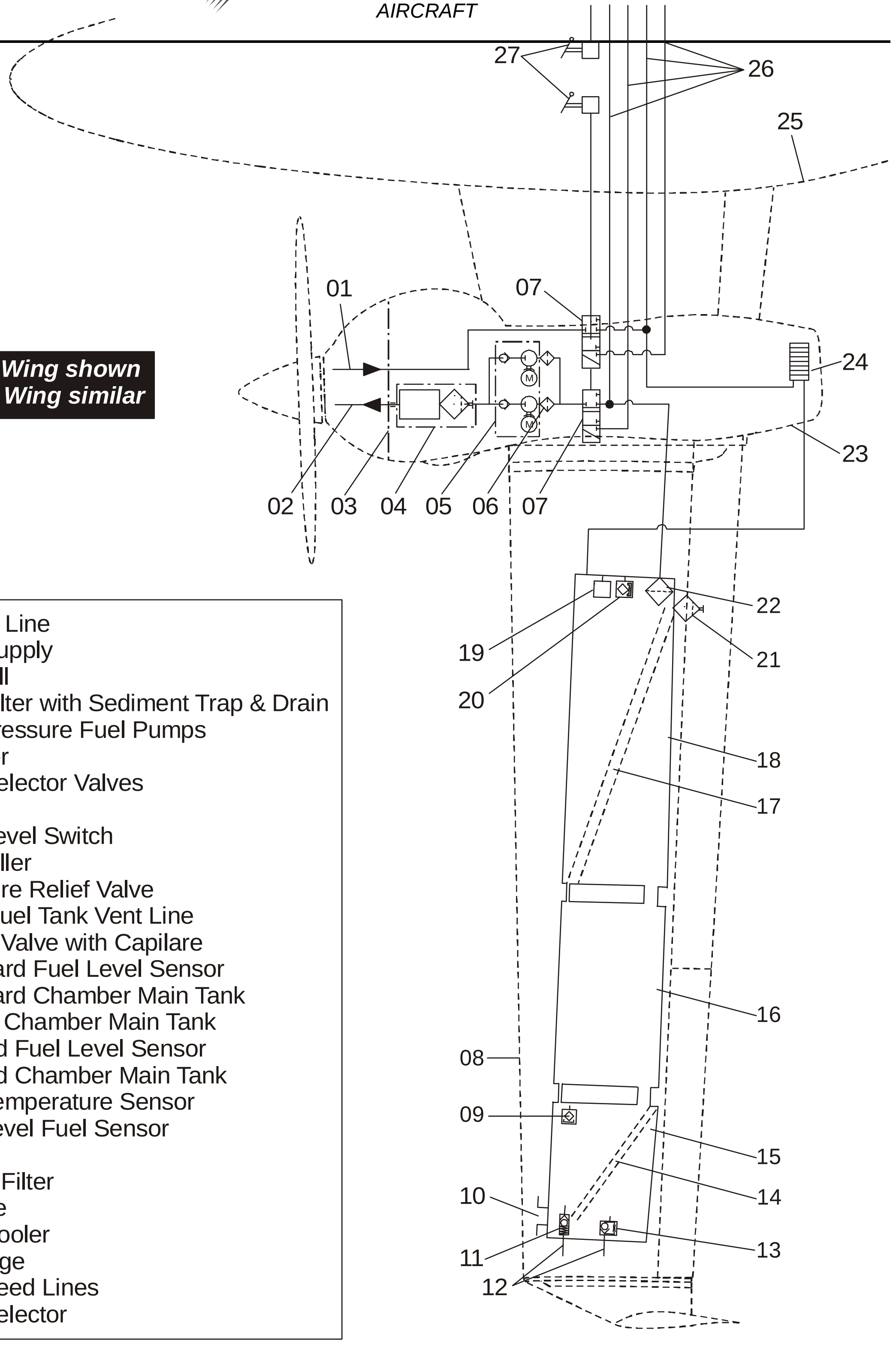
Fuel level sensors in the inboard and outboard chambers of each fuel tank assembly provide fuel quantity data which are displayed on the multi-function display (MFD) screen of the integrated cockpit system (ICS). Refer to these Sections for more data on these systems:

- Section 28-10. Fuel storage.
- Section 28-20. Fuel distribution.
- Section 28-21. Fuel distribution (if MÄM 42-600 is installed).
- Section 28-40. Fuel indication.
- Section 73-00. Engine fuel system.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

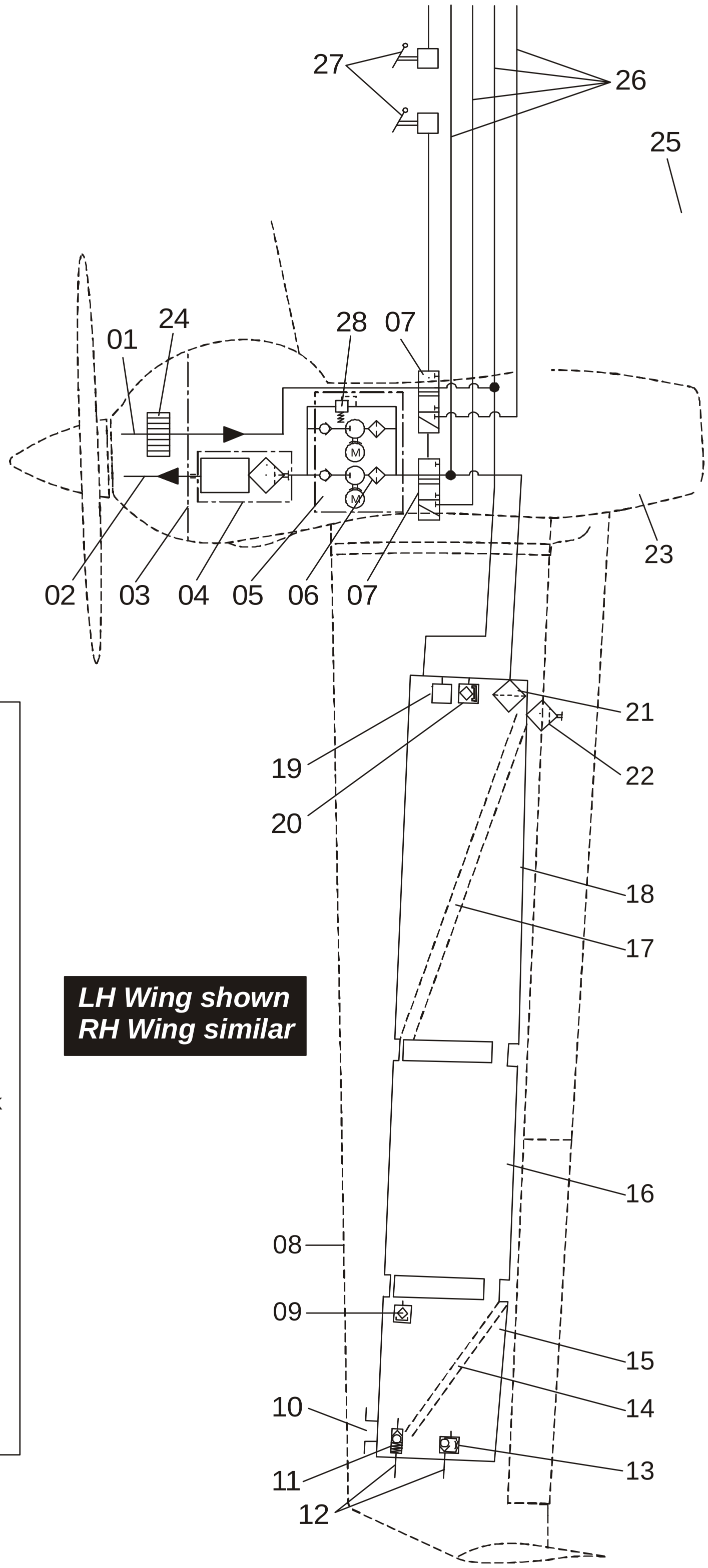
Note: Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called “Additional Equipment”. The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.



1	Return Line
2	Fuel Supply
3	Firewall
4	Fuel Filter with Sediment Trap & Drain
5	Low Pressure Fuel Pumps
6	Prefilter
7	Fuel Selector Valves
8	Wing
9	Fuel Level Switch
10	Fuel Filler
11	Pressure Relief Valve
12	Main Fuel Tank Vent Line
13	Check Valve with Capilare
14	Outboard Fuel Level Sensor
15	Outboard Chamber Main Tank
16	Middle Chamber Main Tank
17	Inboard Fuel Level Sensor
18	Inboard Chamber Main Tank
19	Fuel Temperature Sensor
20	Low Level Fuel Sensor
21	Drain
22	Finger Filter
23	Nacelle
24	Fuel Cooler
25	Fuselage
26	Crossfeed Lines
27	Fuel Selector

Figure 1: Fuel System Schematic Diagram without Auxiliary Tanks



01	Return Line
02	Fuel Supply
03	Firewall
04	Fuel Filter with Sediment Trap & Drain
05	Low Pressure Fuel Pumps
06	Prefilter
07	Fuel Selector Valves
08	Wing
09	Fuel Level Switch
10	Fuel Filler
11	Pressure Relief Valve
12	Main Fuel Tank Vent Line
13	Check Valve with Capilare
14	Outboard Fuel Level Sensor
15	Outboard Chamber Main Tank
16	Middle Chamber Main Tank
17	Inboard Fuel Level Sensor
18	Inboard Chamber Main Tank
19	Fuel Temperature Sensor
20	Low Level Fuel Sensor
21	Drain
22	Finger Filter
23	Nacelle
24	Fuel Cooler
25	Fuselage
26	Crossfeed Lines
27	Fuel Selector
28	Fuel Bypass Valve

Figure 2: Fuel System Schematic Diagram without Auxiliary Tanks (if MÄM 42-600 is installed)

2. Description

Figure 1 shows the fuel system schematic diagram of the DA 42 NG airplane. Figure 2 shows the fuel system schematic diagram of the DA 42 NG airplane, if MÄM 42-600 is installed. The DA 42 NG has a fuel tank assembly in each wing.

Figure 3 shows the auxiliary fuel tank system schematic diagram of the DA 42 NG airplane. Figure 4 shows the auxiliary fuel tank system schematic diagram of the DA 42 NG airplane, if MÄM 42-600 is installed. The auxiliary fuel tank system is optional equipment (OÄM 42-056). It has an additional fuel chamber in each engine nacelle.

A. Main Fuel Tanks

Each wing tank assembly has three separate chambers. The chambers are connected by large diameter flexible hoses. Smaller hoses interconnect the chambers at the top to provide a vent system for the fuel tank assembly.

The inboard chamber has a fuel level sensor, fuel temperature sensor, low fuel level switch, fuel supply and return connections. The fuel supply connection attaches to a finger filter mounted on the fuel chamber. A fuel drain valve is located at the lowest point of the inner fuel chamber.

The middle fuel chamber is a plain chamber and has no installed components.

The outer fuel chamber has a fuel level sensor, high fuel level switch, and the fuel filler assembly. In addition a fuel tank vent system, consisting of a check valve, and pressure relief valve, is installed on the outboard fuel chamber. The high fuel level switch is only used when the optional auxiliary fuel tanks (OÄM 42-056) are installed.

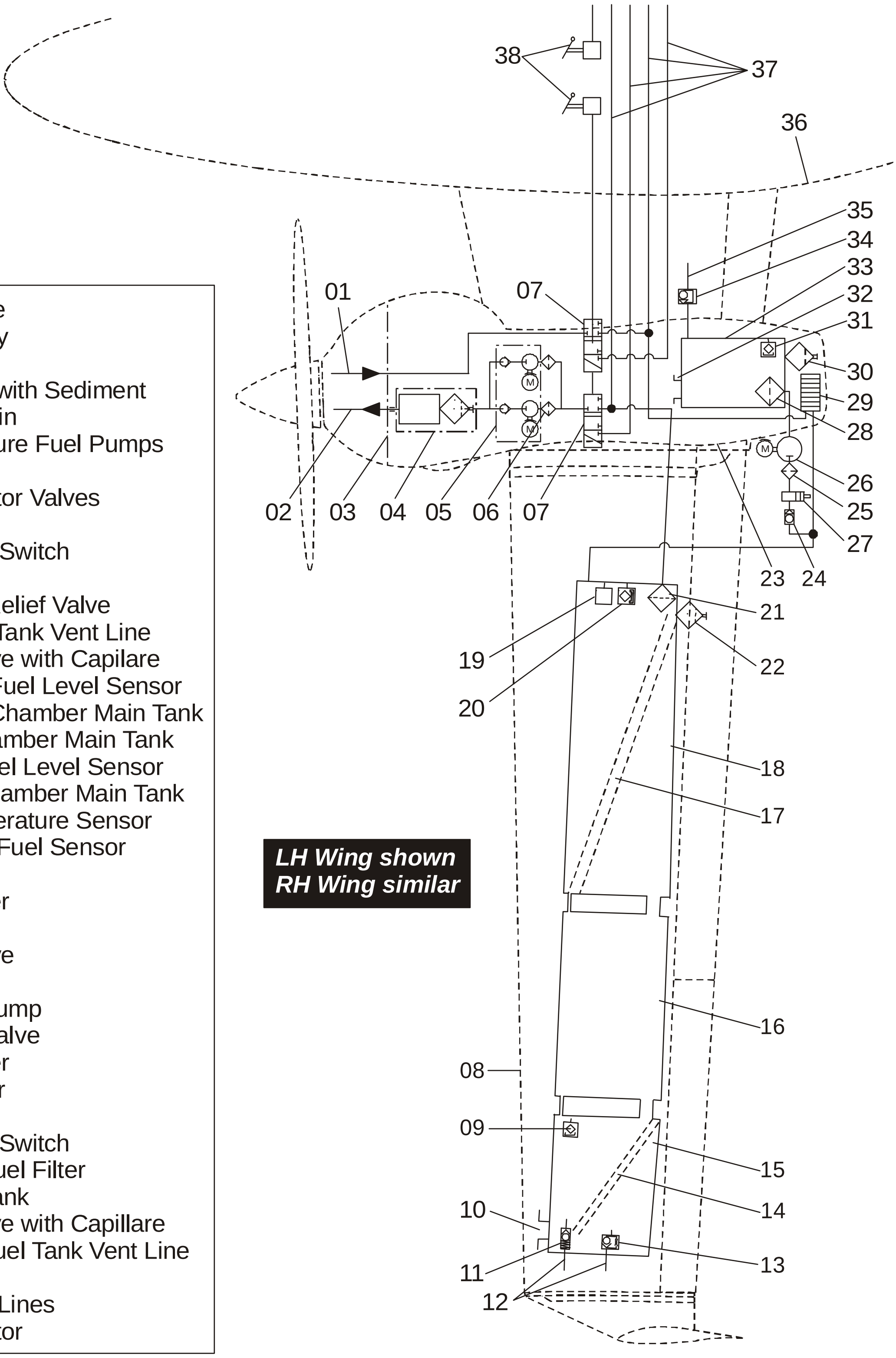
The fuel level sensors go from the bottom inboard corner to the top outboard corner of the fuel chambers. The sensors detect the level of fuel in the fuel tank assemblies and display the information on the MFD (multi-functional display) of the integrated cockpit system.

B. Auxiliary Fuel Tanks

The auxiliary fuel tank system is optional equipment (OÄM 42-056). The auxiliary fuel tanks consist of a single fuel chamber in each engine nacelle. Each auxiliary fuel tank has an auxiliary electrically powered pump which transfers fuel into the collocated main fuel tank. Between the fuel pump and return line a solenoid valve and a check valve are installed. The solenoid valve is operated via the fuel transfer pump switch in parallel with the fuel transfer pump.

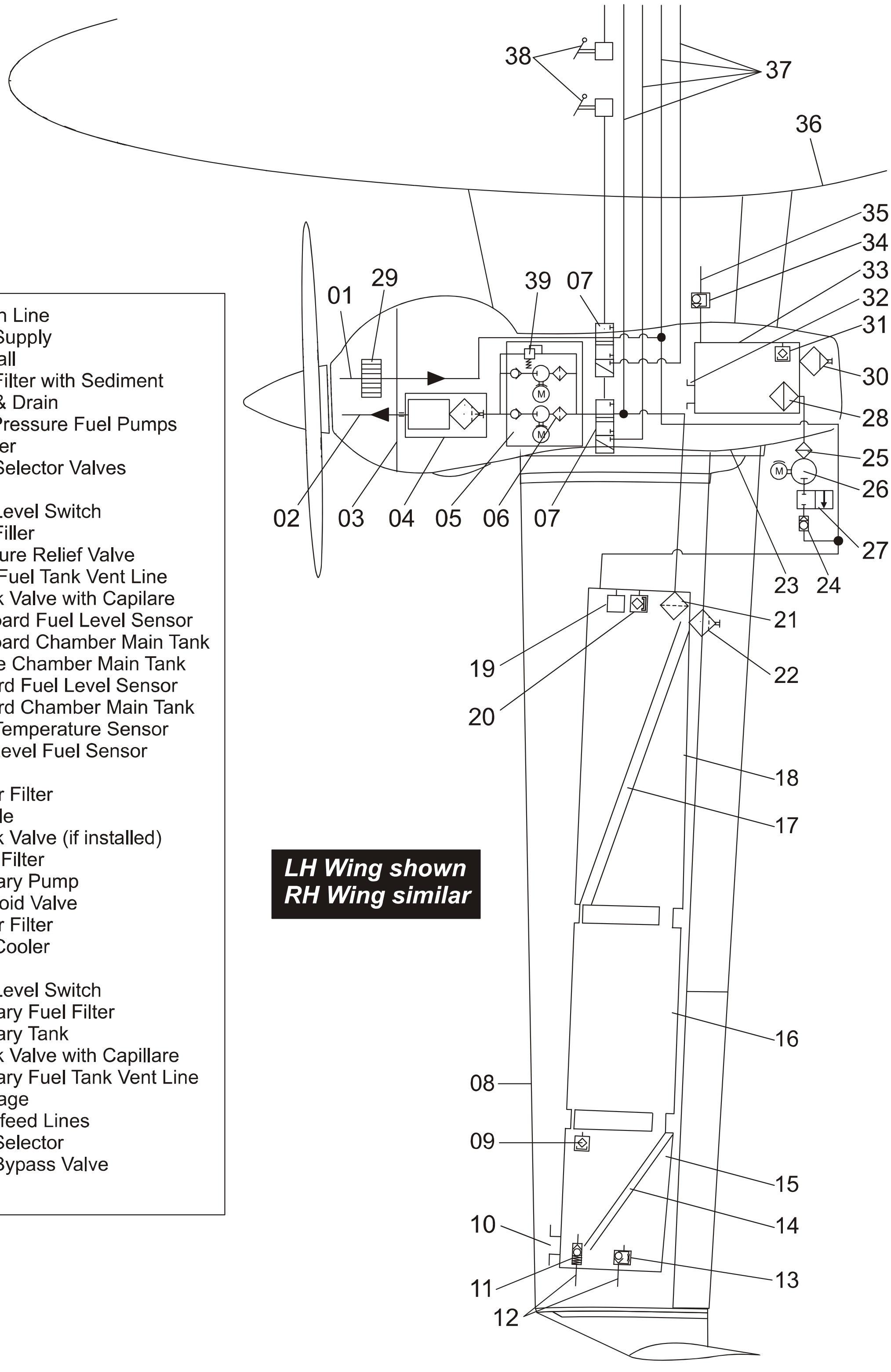
Each auxiliary fuel tank has a shut-off switch which turns the auxiliary electric pump off in case the fuel level in the auxiliary fuel tank is low. The fuel supply connection attaches to a finger filter mounted at the rear of the auxiliary fuel tank. A fuel drain valve is located at the lowest point of the auxiliary fuel tank. A vent line with check valve and capillary is connected at the forward wall of the auxiliary fuel tank. A drain line is connected to the filler drip tray.

Prior to the auxiliary fuel pump an inline filter protects the connected fuel pump and electrically operated solenoid valve from contamination. The function of the solenoid valve is to isolate main and auxiliary fuel tanks during normal operation. In the event of fuel transfer from the auxiliary to the main tank, the solenoid valve opens. To prevent fuel from flowing back into the auxiliary tank, a check valve is mounted to the exit of the solenoid valve. If MÄM 42-600 is installed, the solenoid valve and a check valve (if installed) are installed aft of the electrically driven auxiliary fuel pump.



01	Return Line
02	Fuel Supply
03	Firewall
04	Fuel Filter with Sediment Trap & Drain
05	Low Pressure Fuel Pumps
06	Prefilter
07	Fuel Selector Valves
08	Wing
09	Fuel Level Switch
10	Fuel Filler
11	Pressure Relief Valve
12	Main Fuel Tank Vent Line
13	Check Valve with Capilare
14	Outboard Fuel Level Sensor
15	Outboard Chamber Main Tank
16	Middle Chamber Main Tank
17	Inboard Fuel Level Sensor
18	Inboard Chamber Main Tank
19	Fuel Temperature Sensor
20	Low Level Fuel Sensor
21	Drain
22	Finger Filter
23	Nacelle
24	Check Valve
25	Inline Filter
26	Auxiliary Pump
27	Solenoid Valve
28	Finger Filter
29	Fuel Cooler
30	Drain
31	Fuel Level Switch
32	Auxiliary Fuel Filter
33	Auxiliary Tank
34	Check Valve with Capillare
35	Auxiliary Fuel Tank Vent Line
36	Fuselage
37	Crossfeed Lines
38	Fuel Selector

Figure 3: Auxiliary Fuel System Schematic Diagram (OÄM 42-056 implemented)



- 01 Return Line
- 02 Fuel Supply
- 03 Firewall
- 04 Fuel Filter with Sediment Trap & Drain
- 05 Low Pressure Fuel Pumps
- 06 Prefilter
- 07 Fuel Selector Valves
- 08 Wing
- 09 Fuel Level Switch
- 10 Fuel Filler
- 11 Pressure Relief Valve
- 12 Main Fuel Tank Vent Line
- 13 Check Valve with Capilare
- 14 Outboard Fuel Level Sensor
- 15 Outboard Chamber Main Tank
- 16 Middle Chamber Main Tank
- 17 Inboard Fuel Level Sensor
- 18 Inboard Chamber Main Tank
- 19 Fuel Temperature Sensor
- 20 Low Level Fuel Sensor
- 21 Drain
- 22 Finger Filter
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- 24 Check Valve (if installed)
- 25 Inline Filter
- 26 Auxiliary Pump
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- 29 Fuel Cooler
- 30 Drain
- 31 Fuel Level Switch
- 32 Auxiliary Fuel Filter
- 33 Auxiliary Tank
- 34 Check Valve with Capillare
- 35 Auxiliary Fuel Tank Vent Line
- 36 Fuselage
- 37 Crossfeed Lines
- 38 Fuel Selector
- 39 Fuel Bypass Valve

Figure 4: Auxiliary Fuel System Schematic Diagram (OÄM 42-056 and MÄM 42-600 is installed)

3. Operation

A. Normal Operation

With an engine running and the fuel selector/shut-off valve set to OPEN, fuel to the engine is supplied from the related fuel tank. Fuel flows through a finger filter of the main tank to the fuel selector/shut-off valve. From the valve the fuel flows through the two parallel installed pre-filters and then through the two parallel installed independent electrically powered low pressure fuel pumps. The low pressure fuel pumps feed the fuel through the fuel filter assembly to the engine. The fuel filter assembly has a sediment trap and a fuel drain valve.

The low pressure fuel pumps always supply more fuel than the engine fuel injection system can use. The unused fuel flows back from the engine fuel system through the fuel selector/shut-off valve. From the fuel selector/shut-off valve the fuel flows through a flexible hose to the fuel cooler. The fuel cooler is located at the rear of the engine nacelle. Fuel from the fuel cooler flows through another flexible hose back into the related main fuel tank.

If MÄM 42-600 is installed, the unused fuel flows back to the main fuel tank through the fuel cooler (located in the engine nacelle) and the fuel selector/shut-off valve. From the fuel selector/shut-off valve the fuel flows through another flexible hose back into the related main fuel tank.

As the engine uses fuel the fuel level decreases in the related main fuel tank. Air flows through the vent system in the main fuel tank which prevents the fuel tank pressure from decreasing below atmospheric pressure. This allows the low pressure fuel pumps to continue taking fuel from the main fuel tank.

Auxiliary fuel tanks are optional equipment (OÄM 42-056). For each auxiliary tank there is an AUX PUMP switch in the cockpit, in the center console behind the elevator trim wheel. When this switch is set to ON, the solenoid valve is opened and fuel is transferred from the auxiliary fuel tank into the related main fuel tank. The pump is automatically turned off when the main fuel tank is full, or when the auxiliary fuel tank is empty. If the pump is switched off, the solenoid valve is closed automatically.

(1) Fuel Pumps

Each engine is feed by two parallel installed independent low pressure fuel pumps. During normal operation one of the two fuel pumps is working. In case of a low fuel pressure detection ECU switches automatically to the second fuel pump. During landing and take-off, or in case of a low fuel pressure both low pressure fuel pumps can be activated by the FUEL PUMP LH/RH ENGINE switch. If both fuel pumps are activated the fuel pressure increases.

If MÄM 42-600 is NOT installed:

WARNING: SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED MAY CAUSE DAMAGE TO THE HIGH-PRESSURE PUMP DUE TO THE HIGH FUEL PRESSURE. AFTER SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED IN CASE OF AN EMERGENCY SPECIAL MAINTENANCE OF THE HIGH PRESSURE PUMP IS REQUIRED.

Each fuel pump is electrically connected to the LH/RH ECU BUS and protected by a 7.5 A circuit breaker.

Note: By switching between ECU A and B the two independent electrical fuel pumps are switched over as well. In case of an emergency both pumps can be activated simultaneously by using the FUEL PUMP LH/RH ENGINE switch.

B. Fuel Transfer

With an engine running and the fuel selector/shut-off valve set to CROSSFEED the fuel supply and return lines to the related fuel tank are shut-off. If MÄM 42-600 is NOT installed: Before crossfeed operation verify FUEL PUMP LH/RH ENGINE switch is OFF. Now the low pressure fuel pumps take the fuel from the opposite engine main fuel tank through the related fuel crossfeed line. The fuel returning from the engine leads back to the crossfeed tank where it was taken from.

For example, if the left engine fuel selector/shut-off valve is set to CROSSFEED the left low pressure fuel pumps will take fuel from the right main fuel tank via the related fuel crossfeed lines through the fuel selector shut off valve and the independent pre-filters. The electrically powered low pressure fuel pumps feed then the engine fuel system through the fuel filter assembly. The fuel that is returned from the left engine will be returned to the right fuel tank. If the right fuel selector/shut-off valve is set to CROSSFEED the right low pressure fuel pumps will take fuel from the left main fuel tank via the related fuel crossfeed lines through the fuel selector shut off valve and the independent pre-filters. The electrically powered low pressure fuel pumps feed then the engine fuel system through the fuel filter assembly. The fuel returning from the engine leads back to the crossfeed tank where it was taken from.

C. Emergency Operation

In an emergency (for example, an engine failure) you can set the related engine fuel selector/shut-off valve to SHUT-OFF. The fuel selector/shut-off valve has a safety gate to prevent accidental selection of the SHUT-OFF position. You must turn and hold the gate in the open position to set a fuel selector/shut-off to SHUT-OFF. When the engine fuel selector/shut-off valve is set to SHUT-OFF no fuel can flow to the related engine. The engine can not run.

The pilot can set the working engine fuel selector/shut-off valve to CROSSFEED and use the fuel from the opposite main fuel tank to supply the engine. Thus it is possible for the pilot to keep fuel balance between main fuel tanks.

D. Refueling

Add fuel to the tanks through the fuel fillers in the top of each wing. Fuel flows through the filler caps into the main fuel tank assembly. Air in the tank can escape back past the fuel. As the fuel tank becomes full the air can also escape through the vent system.

E. Fuel Drains

You can use the fuel drains in each fuel tank, each auxiliary fuel tank (if installed) and each sediment trap to defuel the airplane. As part of the pre-flight inspection use these drains to drain a small quantity of fuel into a transparent container to test for water or other contamination. Push the bottom part of the valve up to release fuel. A spring inside the drain valve closes the valve automatically when you release the bottom part. Always make sure that the drain valves close correctly and does not leak.

Section 28-10
Fuel Storage System

1. General

This Section describes the fuel storage system of the DA 42 NG airplane. It talks the following components:

– Main fuel tanks.

– Fuel filler assembly.

– Fuel tank vents.

– Auxiliary fuel tanks (optional equipment).

Refer to Section 28-00 for a general description and schematic of the fuel system. Refer to Section 28-20 for data about the fuel distribution system and Section 28-40 for data about the fuel indicating system.

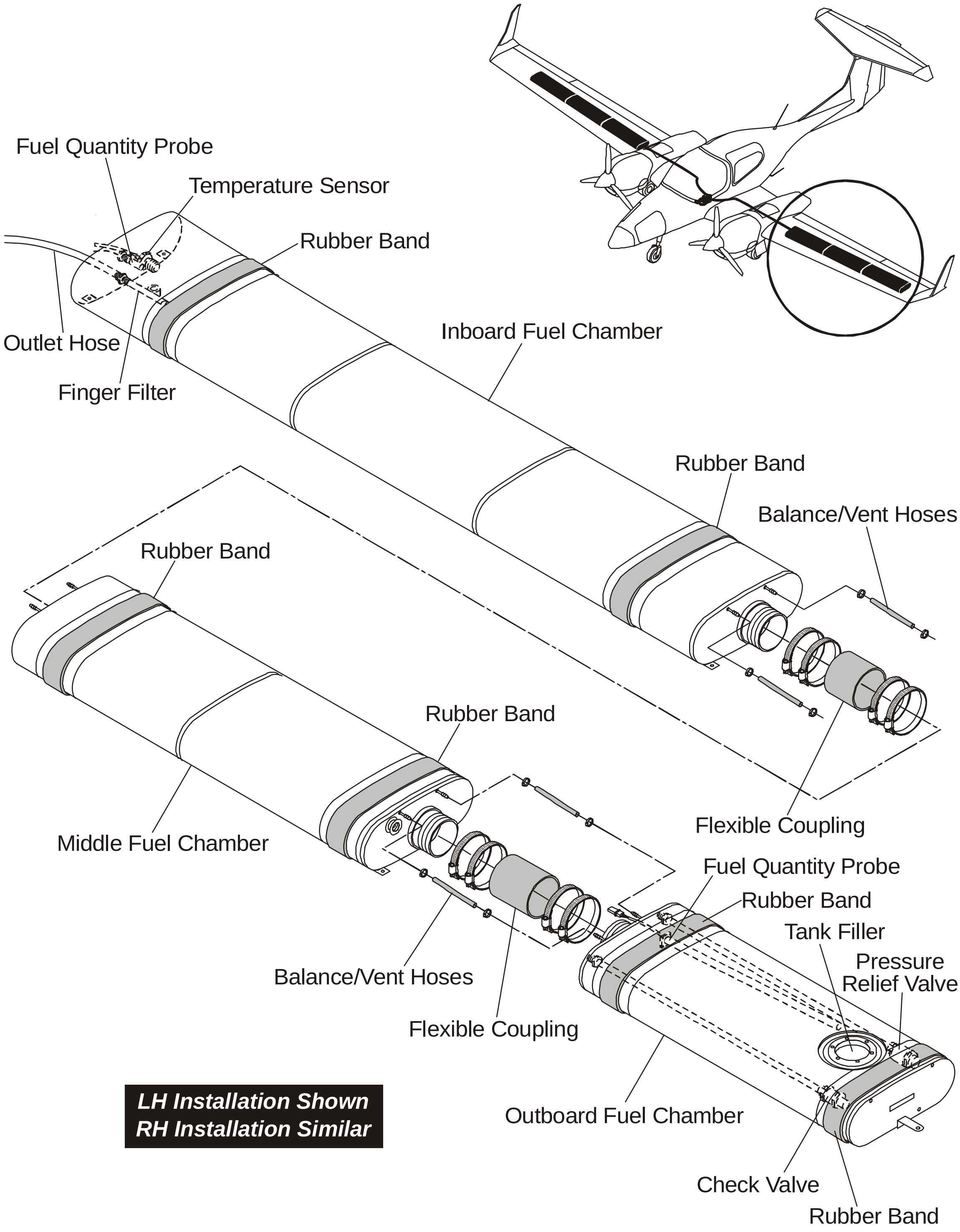

Figure 1: Main Fuel Tank Installation

2. Main Fuel Tank Description

A. Main Fuel Tank

Figure 1 shows the fuel tank installation. The airplane has two fuel tank assemblies. One in the left wing and one in the right wing. Three chambers connected by flexible couplings make the fuel tank assembly. The three chambers are outboard of the engine nacelles and are located between the main spars of each wing.

Each chamber is a welded aluminum structure. Each chamber has an oval cross section and flat end plates. Baffles in the chambers prevent the fuel from moving quickly from one end of the tank to the other. The chambers have bosses welded into the end plates to make connections for the flexible hoses and other components that attach to the end plates of the chambers.

A tank outlet is located at the inboard end plate of the inner chamber. A finger filter at the tank outlet prevents debris from entering the engine fuel systems. A drain valve is located at the lower surface of the inner chamber. You can use this drain valve to check for fuel contamination and for draining the fuel tanks.

A fuel temperature sensor and a low fuel sensor are also mounted on the inboard end plate of the inner fuel tank chamber. The fuel return/transfer line also connects to the inboard end plate. The outer end plate of the inner chamber has mountings for the flexible connecting hose and a fuel high level switch.

The end plates of the middle chamber have fittings attached for the flexible connecting hoses that join the middle chamber to the inner and outer chambers.

The inboard end plate of the outer fuel chamber has fittings attached for the flexible connecting hose and a fuel high level switch. The inboard end plate also has fittings attached for the fuel tank vents. The top surface of the outboard fuel tank has an attachment for the fuel filler assembly.

Fuel level sensors are installed in both the inner and outer chambers. The sensors go from the lower inboard corner to the upper outboard corner of each chamber. The signals from the sensors are displayed on the MFD of the integrated cockpit system. Refer to Section 28-40 for more data about the fuel indicating system.

Ribs and the two main spars of the wings hold the fuel tank chambers in position. Rubber strips go between the tank chambers and the ribs. The filler cap assembly is attached to the upper surface of the wing with screws which holds the tank assembly in position.

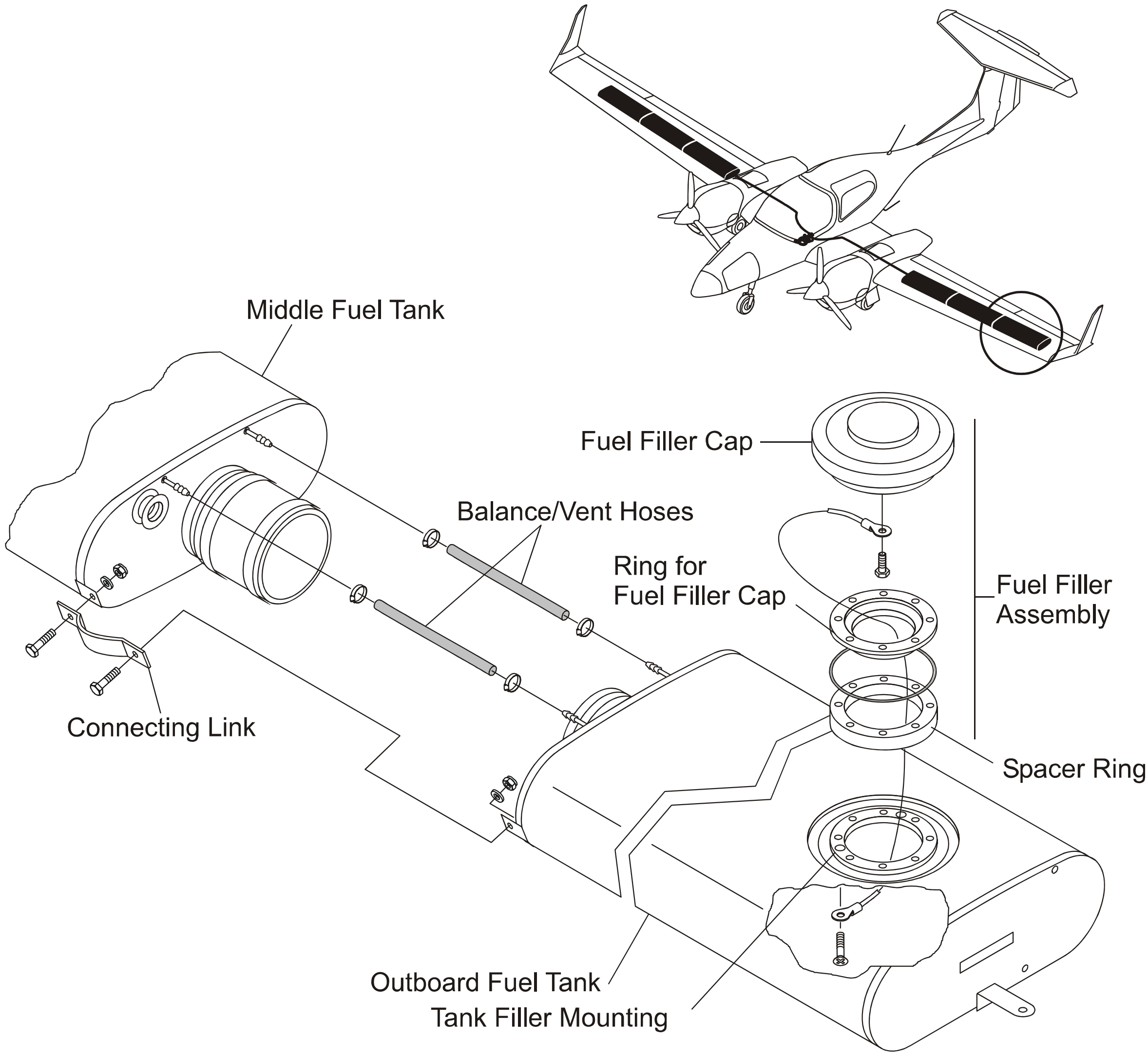

Figure 2: Fuel Filler Assembly LH

B. Fuel Filler Assemblies

The fuel filler assembly is a welded aluminum tubular structure, approximately 75 mm (3 in) diameter. The filler has a flange that attaches to the top skin of the wing. It also has slots to engage the fuel filler cap.

The filler cap has a locking lever. You pull the locking lever up and turn the filler cap counter-clockwise to release it. You turn the cap clockwise to install it and push down the locking lever to secure it. The area just below the flange has adapters where the flexible hoses of the vent system connect (see Figure 2).

Bonding strips connect the tank to the fuel filler assembly and the airplane bonding system.

3. Auxiliary Fuel Tank Description

Figure 3 shows the auxiliary fuel tank installation. The airplane has two auxiliary fuel tank assemblies (optional equipment, OÄM 42-056). A single chamber makes the auxiliary fuel tank assembly. The chamber is located in the rear section of each engine nacelle.

The chamber is a welded aluminum structure. Baffles in the chamber prevent the fuel from moving quickly from one end of the tank to the other. The chamber has bosses welded into the forward and rearward end plates to make connections for the flexible hoses and other components that attach to the end plates of the chamber.

A tank outlet is located at the inboard rear corner of the chamber. A finger filter at the tank outlet prevents debris from entering the main fuel tank. A drain valve is located at the lower surface at the rear end of the chamber. You can use this drain valve during pre-flight inspection to check fuel contamination and for draining the auxiliary fuel tank assembly. A fuel low level sensor is also mounted on the rearward end plate of the chamber.

The forward end plate of the fuel chamber has a fitting to attach the auxiliary fuel tank vent line. The top surface has the fitting to attach the fuel filler assembly.

The auxiliary fuel tank has no fuel quantity indicating system.

Two ribs in the nacelle hold the fuel chamber in position. The rearward rib is open on the bottom side. A stainless steel strap closes the rear rib.

Rubber strips go between the tank chamber and the nacelle ribs. The filler cap assembly is attached to the upper surface of the nacelle.

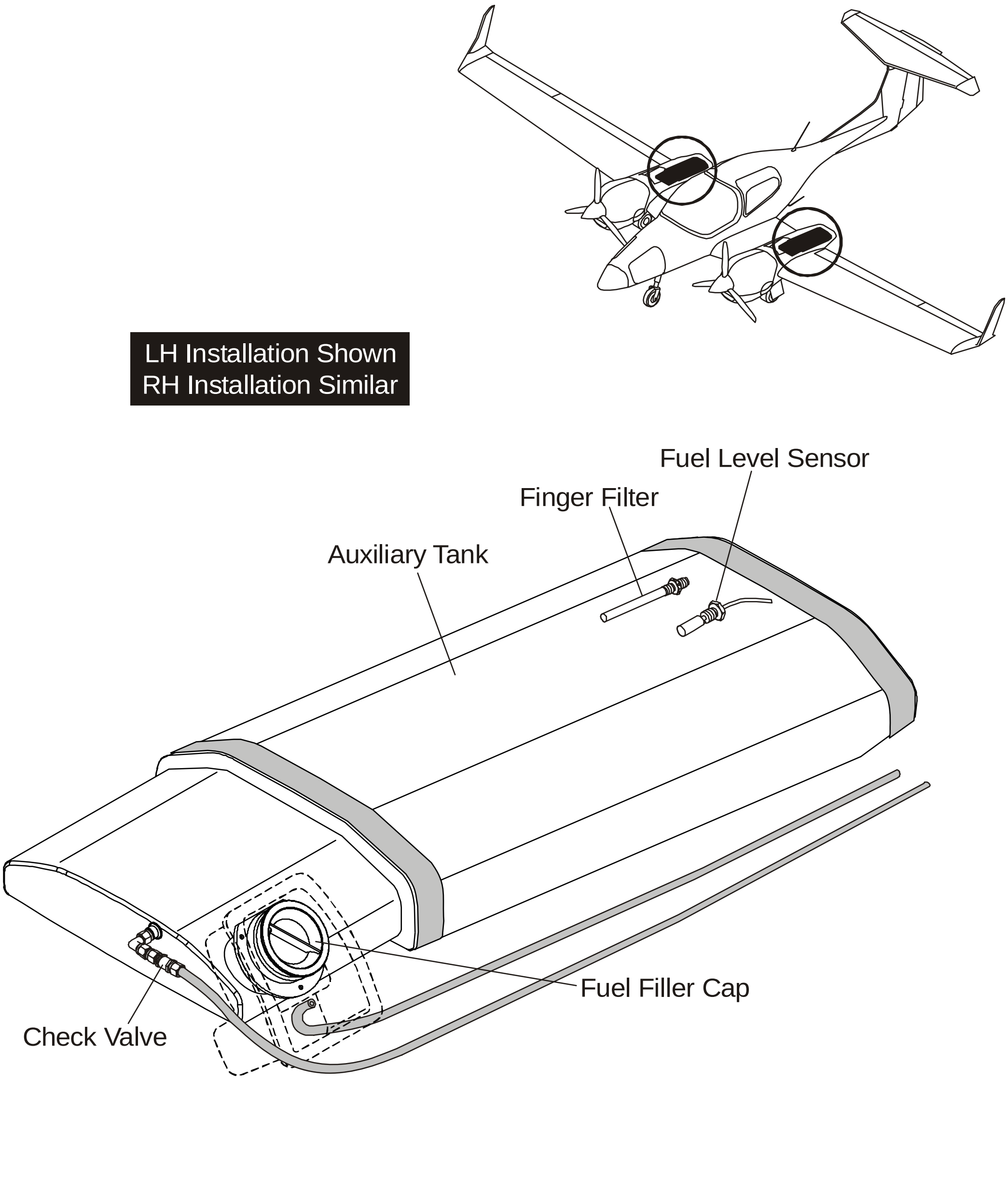

Figure 3: Auxiliary Fuel Tank Installation

4. Auxiliary Fuel Tank Filler

Refer to Figure 4 for the auxiliary tank fuel filler installation.

The auxiliary fuel tank filler has a flange that attaches to a drip tray in the top skin of the nacelle. It also has slots that engage the fuel filler cap. Turn the filler cap counterclockwise to release it. Turn the cap clockwise to install it.

A drain line is connected to the drip tray.

Bonding strips connect the tank to the airplane bonding system.

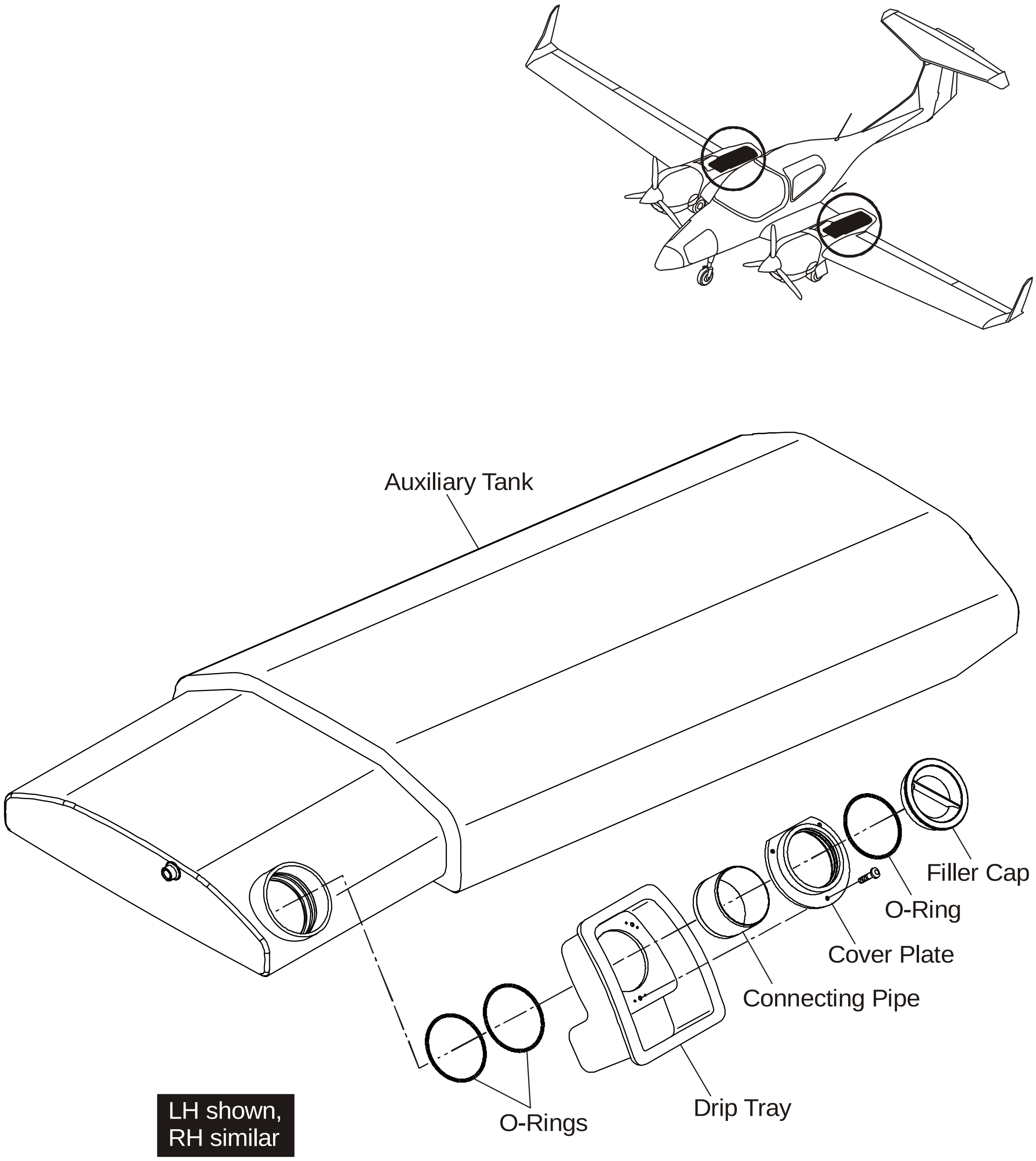

Figure 4: Auxiliary Fuel Tank Filler Installation

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Trouble-Shooting

1. General

The table below list the defects you could have with the fuel storage system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Filler cap leaking.	Filler cap damaged.	Replace filler cap gasket.
	Filler cap does not have a tight fit.	Tighten nut on lower side of cap.
Fuel drain valve leaking.	Drain valve damaged.	Replace fuel drain valve.
	Contamination in drain valve.	Open and close drain valve to flush contaminant. Do this until the drain seals. If the drain will not seal then replace the drain valve.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install the fuel tanks. Obey the safety precautions for fuel at all times.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE.

WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: DO NOT BREATHE FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. Remove/Disassemble a Main Fuel Tank Assembly

A. Remove a Main Fuel Tank Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the fuel tank that you will remove is empty.	Defuel and drain the fuel tank.
(2)	Remove the outer wing that has the fuel tank that you will remove and support the wing on trestles.	Refer to Section 57-10.
(3)	Remove the fuel tank assembly access panels from the lower surface of the wing.	Refer to Section 52-40.
(4)	Remove the fuel drain valve: – Cut the lockwire. – Remove the drain valve from its mounting.	
(5)	Remove the fuel tank access panel from the wing root rib: – Remove the 11 nuts and washers that attach the access panel to the wing root. – Move the access panel clear of the wing root.	
(6)	Disconnect the electrical connector for the fuel quantity probe at the inboard end of the outer fuel chamber.	

	Detail Steps/Work Items	Key Items/References
(7)	Release the bonding strip from the inboard end of the tank assembly: – Remove the nut and washer from the bolt. – Remove the bonding strip from the bolt and move it clear of the tank. – Remove the bolt.	
(8)	Disconnect the 2 vent hoses from the adapters on the fuel tank access panel: – Remove the access panel from the outer lower surface of the wing. – Remove the clamps that hold the vent hoses to the adapters on the access panels. – Disconnect the vent hoses from the adapters on the access panels.	Near the outboard end of the lower wing. Refer to Section 52-40.
(9)	Disconnect the bonding wire cable from the fuel tank access panel: – Remove the nut and washer from the bolt. – Remove the bonding strip from the bolt and move it clear of the tank. – Remove the bolt.	
(10)	Remove the fuel filler assembly: – Remove the fuel filler cap. – Remove the 8 screws that attach the filler flange to the to the fixing ring in the outer fuel chamber. – Remove the filler flange, the O-ring seal, the spacer ring and the fixing ring.	Note the location of the retaining cable. Discard the O-ring seal.

	Detail Steps/Work Items	Key Items/References
(11)	Remove the fuel tank assembly: – Remove the nut, washer and bolt that attaches the outer fuel chamber to the retaining bracket in the wing. – Gently pull the fuel tank assembly out of the wing through the wing root rib. Move the tank clear of the wing and support the tank on a clean workbench.	

B. Disassemble a Main Fuel Tank Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Remove the fuel tank assembly that you will disassemble and support on a clean workbench.	Refer to Paragraph 2A.
(2)	Remove the connecting link that attach the inboard fuel chamber to the middle fuel chamber: – Remove the nuts, washers and bolts that attach each end of the link to the fuel chambers. – Move the link clear of the fuel chambers.	
(3)	Remove the connecting link that attach the middle fuel chamber to the outboard fuel chamber: – Remove the nuts, washers and bolts that attach each end of the link to the fuel chambers. – Move the link clear of the fuel chambers.	

	Detail Steps/Work Items	Key Items/References
(4)	Remove the vent connector hoses that connect the inboard fuel chamber to the middle fuel chamber: – Remove the hose clips from the 2 hoses. – Pull the hoses off the fuel chamber connectors and clear of the fuel chambers.	
(5)	Remove the vent connector hoses that connect the middle fuel chamber to the outboard fuel chamber: – Remove the hose clips from the 2 hoses. – Pull the hoses off the fuel chamber connectors and clear of the fuel chambers.	
(6)	Remove the flexible coupling that connects the inboard fuel chamber to the middle fuel chamber: – Remove the worm drive clamps from the flexible coupling. – Pull the flexible coupling off the fuel chamber connectors and clear of the fuel chambers.	
(7)	Remove the flexible coupling that connects the middle fuel chamber to the outboard fuel chamber: – Remove the worm drive clamps from the flexible coupling. – Pull the flexible coupling off the fuel chamber connectors and clear of the fuel chambers.	

3. Assemble/Install a Main Fuel Tank Assembly

A. Preparation

	Detail Steps/Work Items	Key Items/References
(1)	Examine the fuel chambers. Look specially for: – Damage to the skins and welded seams of the chambers. – Corrosion. – Damage/wear to the rubber mounting bands which go around the outside of the fuel chambers.	Use a x 10 magnifying glass.
(2)	Examine all the flexible hoses and couplings which connect the fuel chambers together. Look specially for: – Cuts or damage, specially at the ends where the clips and worm drive clamps locate. – Distortion or cracking.	
(3)	Examine the fuel filler flange on the outer fuel chamber. Look specially for: – Corrosion on the mating surfaces. – Cracking around the flange.	Use a strong light and x 10 magnifying glass.
(4)	Make sure that the insides of all the fuel chambers are clean.	

B. Assemble a Main Fuel Tank Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Lay the fuel chambers on a clean workbench in the order in which you will assemble them.	
(2)	Install the flexible coupling that connects the outboard fuel chamber to the middle fuel chamber: – Push a flexible coupling over the large connector on the outboard fuel cell. – Move the middle fuel chamber towards the outer fuel chamber until the large connector engages with the open end of the flexible coupling. – Push the fuel chambers together until the flexible coupling is fully located of the fuel chamber connectors. – Install the worm drive clamps onto the flexible couplings.	
(3)	Install the flexible coupling that connects the inboard fuel chamber to the middle fuel chamber: – Push a flexible coupling over the large connector on the middle fuel chamber. – Move the inboard fuel chamber towards the middle fuel chamber until the large connector engages with the open end of the flexible coupling. – Push the fuel chambers together until the flexible coupling is fully located of the fuel chamber connectors. – Install the worm drive clamps onto the flexible couplings.	

	Detail Steps/Work Items	Key Items/References
(4)	Install the flexible vent hoses that connect the middle fuel chamber to the outboard fuel chamber: – Install 2 flexible hoses over the vent connectors on the outboard fuel chamber. – Install the other end of the 2 flexible hoses on the vent connectors of the middle fuel chamber. – Install the worm-drive-clamps onto the flexible hoses.	
(5)	Install the flexible vent hoses that connect the inboard fuel chamber to the middle fuel chamber: – Install 2 flexible hoses over the vent connectors on the middle fuel chamber. – Install the other end of the 2 flexible hoses on the vent connectors of the inboard fuel chamber. – Install the worm drive clamps onto the flexible hoses.	

	Detail Steps/Work Items	Key Items/References
(6)	Install the connecting links that connect the fuel chambers together: – Move the link into position between the outboard fuel chamber and the middle fuel chamber. – Install the bolts, washers and nuts that attach the connecting link to the fuel chambers. – Move the link into position between the middle fuel chamber and the inboard fuel chamber. – Install the bolts, washers and nuts that attach the connecting link to the fuel chambers.	

C. Install a Main Fuel Tank Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Move the fuel tank assembly into position in the wing.	Make sure that the tank assembly is correctly located in the wing.
(2)	Install the fuel filler assembly: – Make sure that the mounting in the outboard fuel chamber is correctly aligned with the hole in the top surface of the wing. – Apply a thin layer of sealant to the contact area between spacer ring and tank filler mounting. – Install the spacer ring onto the tank filler mounting. – Install a new O-ring seal in position on the top surface of the wing. – Apply a thin layer of sealant to the contact area between the ring for filler cap and the spacer ring. – Put the ring for filler cap in position over the filler flange. – Install the retaining wire cable. – Install the 8 screws which attach the fuel filler to the outboard fuel chamber. – When all 8 screws are installed, then tighten the screws. – Remove any excess sealant squeeze-out from the fuel filler assembly.	If necessary, move the tank assembly to give the correct alignment. Use Hylomar Aerograde PL32M or Hylomar Aerograde Ultra PL32A. Use Hylomar Aerograde PL32M or Hylomar Aerograde Ultra PL32A. At the position noted in Paragraph 2 A, step 10. Finger tight only. Tighten opposite screws. CAUTION: FAILURE TO DO SO COULD LEAD TO FUEL CONTAMINATION
(3)	Install the bolt, washer and nut that attaches the bracket at the outboard end of the outboard fuel chamber to the bracket in the wing.	

	Detail Steps/Work Items	Key Items/References
(4)	Install the bonding strip at the inboard end of the tank assembly: – Install the bolt through the bracket on the fuel chamber and the bonding strip. – Install the washer and nut onto the bolt.	
(5)	Connect the 2 vent hoses to the adapters on the fuel tank access panel: – Push the vent hoses onto the adapters on the access panels. – Install the hose clips that hold the hoses.	
(6)	Connect the bonding cable to the fuel tank access panel: – Install the bolt through the bonding cable and the bonding bracket. – Install the washer and nut onto the bolt.	
(7)	Connect the electrical connector for the fuel quantity probe at the inboard end of the outer fuel chamber.	At the inline connector.
(8)	Install the fuel tank access panel at wing root rib: – Move the access panel into position over the studs. – Install the 11 washers and nuts that attach the panel to the wing root rib.	

	Detail Steps/Work Items	Key Items/References
(9)	Install the fuel drain valve on the lower surface of the inboard fuel chamber: – Install a new seal onto the fuel drain. – Install the drain valve into the lower surface of the fuel chamber. – Secure the drain valve with lock-wire.	Torque: 1 - 3 Nm (0.73 - 2.21 lbf.ft).
(10)	Install the wing assembly onto the airplane.	Refer to Section 57-10.
(11)	Refuel or transfer fuel into the wing tank assembly that you removed and do a test for fuel leaks. Look specially at the hose connections and around the fuel filler assembly.	Refer to Section 12-10.
(12)	Install all the fuel tank access panels in the lower surface of the wing.	Refer to Section 52-40.
(13)	Do an engine ground run up. Make sure that: – Both engines can be supplied with fuel from the fuel tank assembly that you installed. – Make sure that the fuel quantity and temperature indications operate correctly. – Make sure that the L/R FUEL LOW caution on the integrated cockpit system display panel operates at the correct fuel level.	Refer to Chapter 71-00.

4. Remove/Install an Auxiliary Fuel Tank

A. Remove an Auxiliary Fuel Tank

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the auxiliary fuel tank that you will remove is empty.	Defuel and drain the auxiliary fuel tank.

	Detail Steps/Work Items	Key Items/References
(2)	Remove the auxiliary fuel tank access panel from the engine nacelle: – Remove the 8 screws that attach the access panel to the nacelle. – Disconnect the vent line and the drain line (coming from the drip tray) from the connectors on the access panel. – Move the access panel clear of the nacelle.	
(3)	Disconnect the electrical connector for the fuel level switch at the rearward end of the fuel chamber.	
(4)	Disconnect the fuel line from the tank outlet.	
(5)	Disconnect the bonding strip from the cooler bracket.	
(6)	Remove the fuel filler assembly: – Open the access door to the fuel filler cap. – Remove the fuel filler cap. – Remove the 3 screws that attach the cover plate to the drip tray. – Remove the cover plate with the connection pipe.	
(7)	Remove the bolt, washer and nut which closes the metal strap on the rear attachment rib.	Hold the tank.
(8)	Disconnect the front bonding cable at the connection point, in the chamber below the tank compartment.	Accessible through the inspection cover below the tank filler.

	Detail Steps/Work Items	Key Items/References
(9)	Disconnect the 2 vent hoses at the front wall of the auxiliary fuel tank: – Gently move the tank rearward a small distance. – Pull the vent lines off the connectors on the tank.	 Through the hole for the drip tray.
(10)	Remove the fuel tank assembly: – Gently pull the auxiliary fuel tank assembly out of the nacelle in a rearward and downward direction. – Move the tank clear of the nacelle and support it on a clean workbench.	

B. Install an Auxiliary Fuel Tank

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel tank assembly: – Gently move the auxiliary fuel tank assembly into the nacelle in an upward and forward direction.	Do not move the tank fully forward (see next item).
(2)	Connect the 2 vent hoses at the front wall of the auxiliary fuel tank: – Connect the vent lines to the connectors on the tank. – Gently move the tank fully forward.	Through the hole for the drip tray.
(3)	Connect the front bonding cable at the connection point, in the chamber below the tank compartment.	Accessible through the inspection cover below the tank filler.
(4)	Install the bolt, washer and nut which closes the metal strap on the rear attachment rib.	
(5)	Install the fuel filler assembly: – Lubricate thread of connection pipe. – Assemble the cover plate with the connection pipe. – Lubricate outer surface of connection pipe. – Seal the flange of the cover plate to the drip tray. – Install cover plate connection pipe assembly. – Install the 3 screws that attach the cover plate to the drip tray. – Install the fuel filler cap. – Close the access door to the fuel filler cap.	Use EZ-Turn (Fuel Lube). Use EZ-Turn (Fuel Lube). Use Dow Corning 732.
(6)	Connect the bonding strip to the cooler bracket.	
(7)	Connect the fuel line to the tank outlet.	

	Detail Steps/Work Items	Key Items/References
(8)	Connect the electrical connector for the fuel level switch at the rearward end of the fuel chamber.	
(9)	Install the auxiliary fuel tank access panel to the engine nacelle: – Move the access panel in place on the nacelle. – Connect the vent line and the drain line (coming from the drip tray) to the connectors on the access panel. – Install the 8 screws that attach the access panel to the nacelle.	
(10)	Refuel the auxiliary fuel tank.	
(11)	Check auxiliary fuel tank assembly for leakage.	

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Section 28-20
Fuel Distribution

1. General

This Section describes the fuel distribution system for the DA 42 NG airplane. The fuel distribution system supplies fuel from the fuel tanks to the engines. The components of the fuel distribution system are:

– Flexible fuel hoses.

– Fuel transfer/shut-off valves.

– Fuel filters.

– Low pressure fuel pump assembly.

– Fuel coolers.

– Fuel pressure pulsation damper.

Refer to Section 28-00 for a general description of the fuel system and for the schematic diagram of the fuel system.

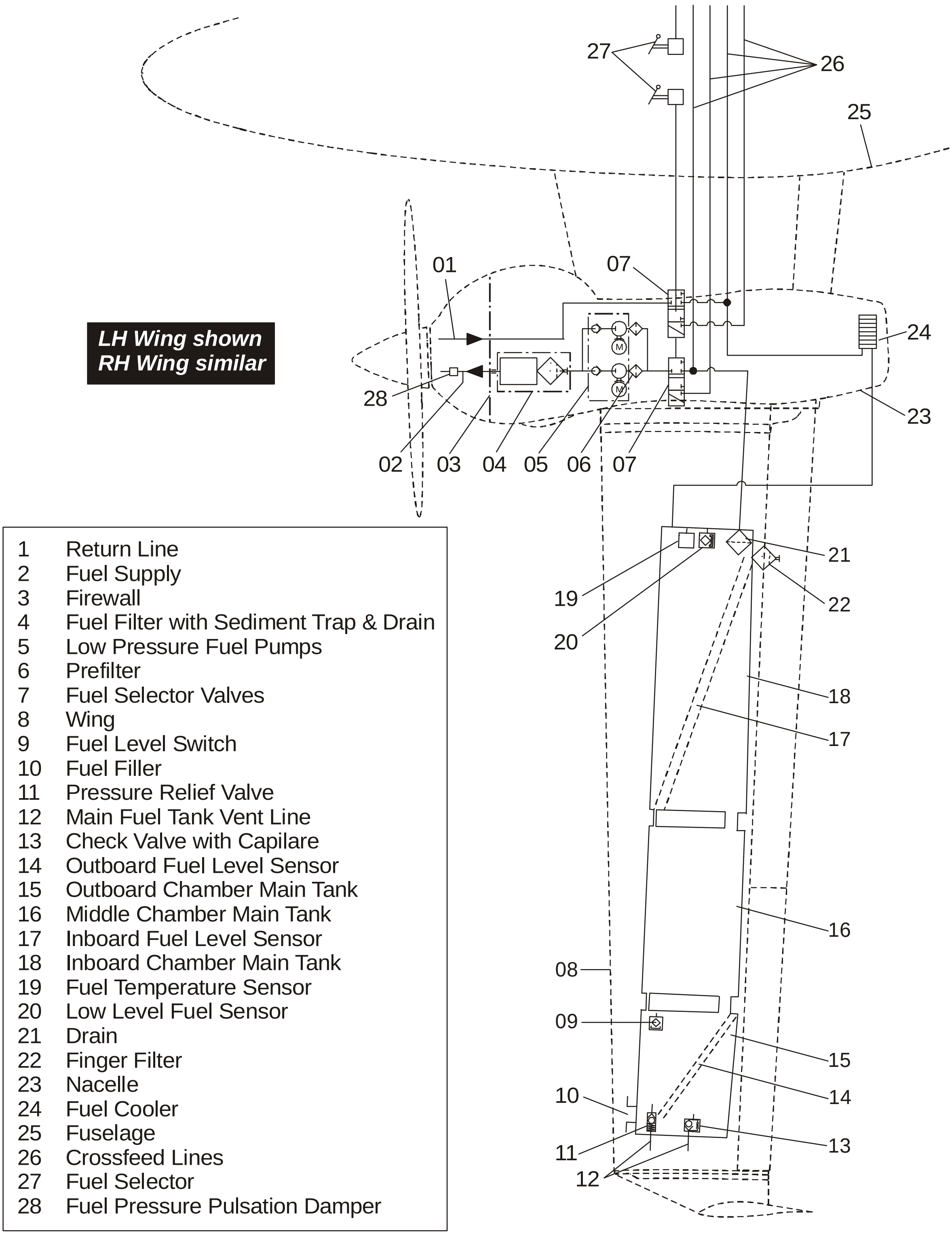

Figure 1: Fuel Distribution System Schematic Without Auxiliary Tanks

2. Description

A. Normal Operation

Figure 1 shows the schematic diagram of the fuel distribution system for the DA 42 NG airplane, auxiliary tanks not installed. Figure 2 shows the schematic diagram with the auxiliary fuel tanks installed. Figure 3 shows the items connecting the auxiliary fuel tank to the main fuel tank.

A flexible hose connects the main fuel tank outlet to the fuel transfer/shut-off valve. The fuel transfer/shut-off valve is located in the related engine nacelle, aft of the engine firewall. A lever in the cockpit center console controls the fuel transfer/shut-off valve via a mechanical drive system. The fuel transfer/shut-off valve connects to the parallel installed independent pre-filters and the low pressure fuel pumps. The electrically powered fuel pumps connect then to the fuel filter assembly. A drain valve is located at the bottom of the fuel filter assembly. The bottom of the fuel filter assembly forms the sediment trap.

The fuel filter assembly connects via flexible hose to a fuel bulkhead fitting on the engine firewall. From there a flexible hose connects the bulkhead fitting to a fuel pressure pulsation damper and then to the engine driven high pressure fuel pump.

A flexible hose connects the engine fuel system return line to the return bulkhead fitting located on the engine firewall. A flexible fuel hose connects on the nacelle side to the return line of the fuel transfer/shut-off valve. Another flexible hose connects the return of the fuel transfer/shut-off valve to the related main fuel tank return system.

During normal operation the fuel returning from the left engine will flow through the left fuel cooler back into the left fuel tank. Flexible hoses connect the fuel cooler into the fuel return system. The fuel cooler is located in the rear of the engine nacelle. A NACA duct in the lower surface of the rear engine nacelle supplies air for the fuel cooler. A shroud around the fuel cooler guides the air from the NACA duct through the matrix of the fuel cooler. The air from the cooler exits from the nacelle through air outlets at the rear of the nacelle.

If the optional auxiliary fuel tank is installed (OÄM 42-056), a flexible hose runs from the outlet of the auxiliary fuel tank to the auxiliary fuel pump. Another flexible hose runs from the outlet of the auxiliary fuel pump via an inline filter, a solenoid valve and a check valve to a T-fitting which feeds the auxiliary fuel into the return fuel circuit.

The check valve and the solenoid valve prevent a backflow of the cooled return fuel from the engine into the auxiliary fuel tank. To protect the solenoid valve from contamination an inline filter is installed in the fuel transfer line directly at the outlet of the auxiliary fuel pump.

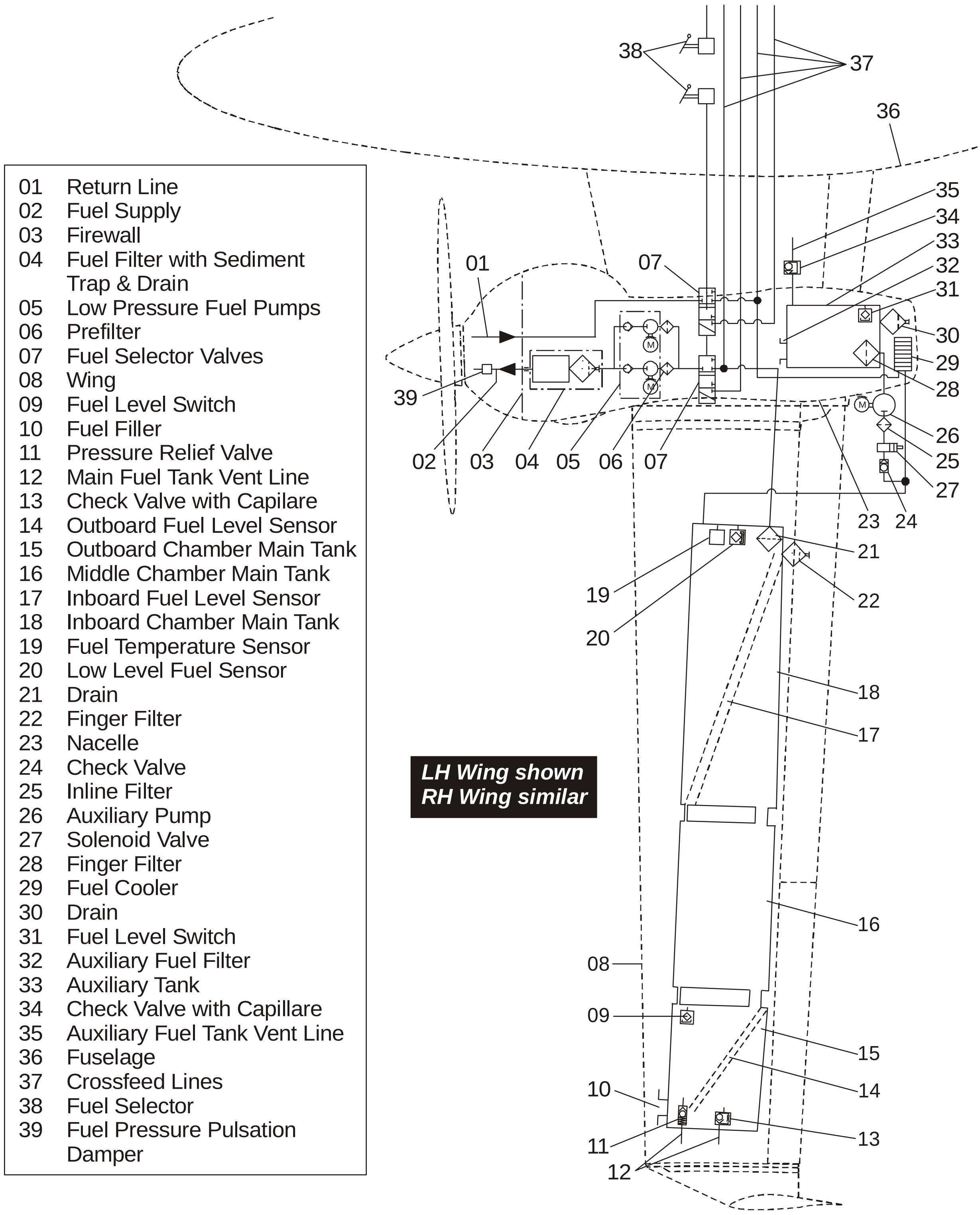

Figure 2: Fuel Distribution System Schematic With Auxiliary Tanks (OÄM 42-056)

B. Fuel Transfer Operation

When the left engine fuel transfer/shut-off valve is set to CROSSFEED the fuel for the left engine is taken from the right fuel tank. A flexible hose from the left fuel transfer/shut-off valve connects to the supply system of the right fuel tank. Another flexible hose connects the return port of the left fuel transfer/shut-off valve to the right return system of the right fuel tank. The right engine fuel transfer system is designed similar.

WARNING: SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED MAY CAUSE DAMAGE TO THE HIGH-PRESSURE PUMP DUE TO THE HIGH FUEL PRESSURE. AFTER SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED IN CASE OF AN EMERGENCY SPECIAL MAINTENANCE OF THE HIGH PRESSURE PUMP IS REQUIRED.

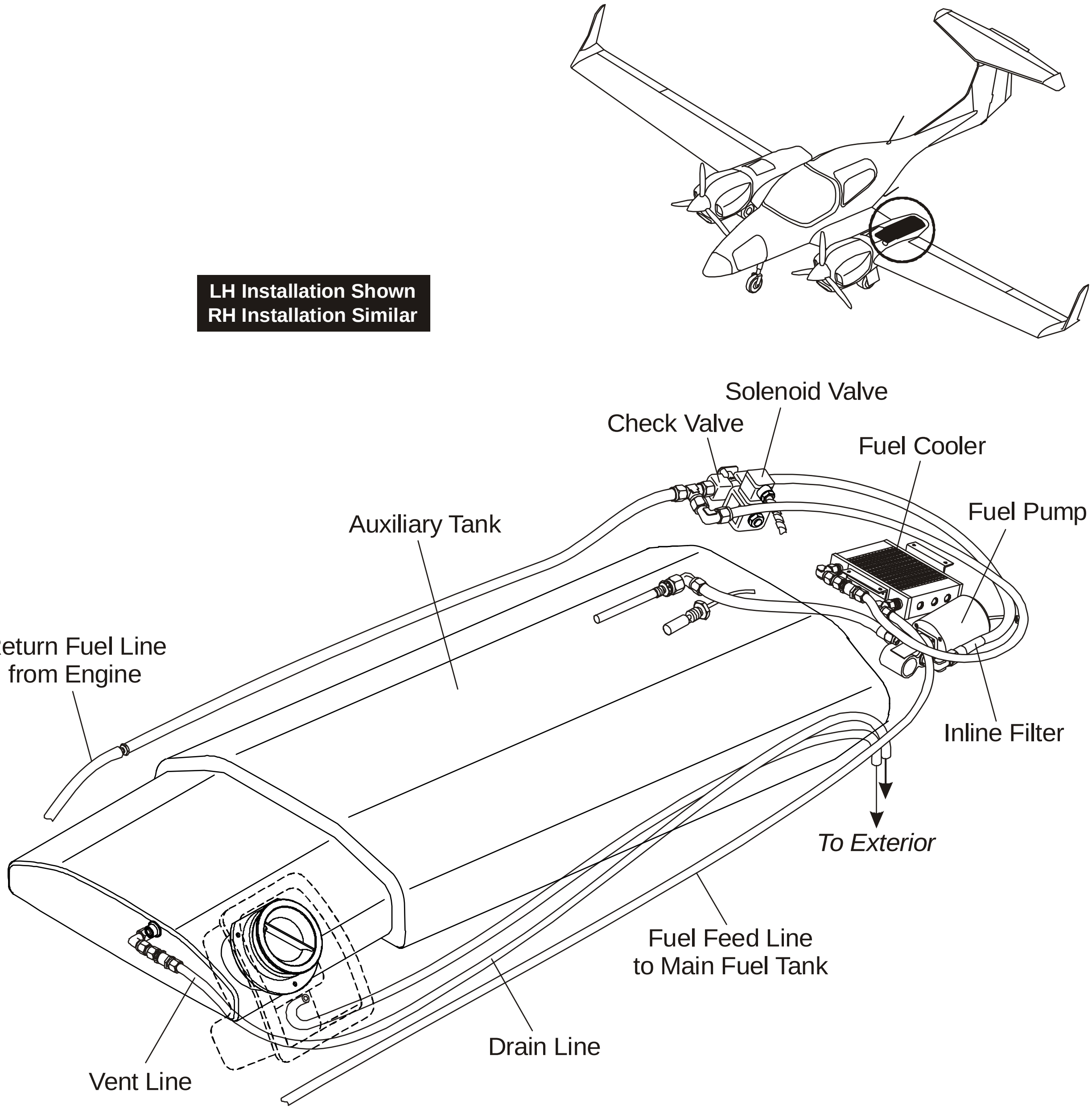

Figure 3: Auxiliary Fuel Supply to the Main Fuel Tank

3. Fuel Distribution System Components

A. Flexible Hoses

The fuel system uses synthetic flexible hoses. The flexible hoses in the engine bay have integral fire-protection sleeves.

You must only use approved flexible hoses in the fuel system which have been pressure tested.

B. Fuel Transfer/Shut-Off Valves

Figure 4 shows a fuel transfer/shut-off valve installation. A fuel transfer/shut-off valve is located in each engine nacelle, aft of the engine firewall. A long shaft connects the valve to a drive unit located under the cockpit floor. A lever connects the drive unit to a fuel selector lever. The selector levers for both fuel transfer/shut-off valves are mounted in the cockpit center console. Each lever has the positions:

(1) ON

If you set the engine fuel selector levers to the ON position both engines will be take fuel from their related fuel tanks. For example, the left engine will take fuel from the left main fuel tank and the right engine will take fuel from the right main fuel tank.

(2) CROSSFEED

If you set an engine fuel selector lever to the CROSSFEED position the engine will take fuel from the opposite main fuel tank. For example, if you set the left fuel selector lever to CROSSFEED and the right fuel control lever to ON then both engines will take fuel from the right main fuel tank. If you set the right fuel selector lever to CROSSFEED and the left selector lever to ON then both engines will take fuel from the left main fuel tank.

(3) SHUT-OFF

If you set an engine fuel selector to the SHUT-OFF position then the fuel supply to that engine will be shut-off and the engine will not run. Each lever has a safety guard located on the lever console to prevent accidental selection of the SHUT-OFF position. You must turn the safety guard before you can move the related fuel selector lever to the SHUT-OFF position. The other engine fuel selector lever is independent and will operate based on the selected position.

For example, if you set the left fuel selector lever to SHUT-OFF and the right fuel selector lever to ON the left engine takes no fuel and the right engine takes fuel from the right main fuel tank. If the right selector lever is moved to CROSSFEED then the right engine will take fuel from the left main fuel tank.

WARNING: **SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED MAY CAUSE DAMAGE TO THE HIGH-PRESSURE PUMP DUE TO THE HIGH FUEL PRESSURE. AFTER SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED IN CASE OF AN EMERGENCY SPECIAL MAINTENANCE OF THE HIGH PRESSURE PUMP IS REQUIRED.**

C. Fuel Filter Assembly

Figure 5 shows a fuel filter assembly. The fuel filter assembly is installed in the engine nacelle and is accessible through the inspection panel on the lower inboard side.

The fuel filter assembly consists of a cap which distributes the fuel into the fuel filter body. The body is an integral part which acts as fine filter and sediment trap. A drain is installed at the bottom of the sediment trap. Use this drain to drain fuel from the fuel distribution system or for drain fuel when you do a test for fuel contamination.

You can remove the filter element for replacement.

D. Low Pressure Fuel Pump Assembly

Figure 6 shows a low pressure fuel pump assembly. The low pressure fuel pump assembly is installed in the engine nacelle and is accessible through the nacelle inspection panel on the lower outboard side.

Flexible hoses connect a fuel distribution bridge which leads into two independent pre-filters. The pre-filters prevent the low pressure fuel pumps from contamination. Figure 8 shows the pre-filter assembly. The pre-filters are screwed into independent electrically powered low pressure fuel pumps. By turning the FUEL PUMP LH/RH ENGINE switch on the instrument panel the fuel pumps can be powered without switching the ENGINE MASTER. Check that the fuel transfer/shut-off valves are turned to position ON before switching the fuel pumps to ON. At the pressure side the fuel pumps are connected through a bridge banjo into a flexible hose.

E. Fuel Cooler

Figure 9 shows the fuel cooler. The fuel cooler for each fuel return system is located in the rear of each engine nacelle. Flexible hoses connect the fuel cooler to the fuel return line and the related fuel tank. Air to the cooler inlet is channeled through a NACA duct in the lower surface of the nacelle. The outlet for the cooling air is on the rear face of the engine nacelle.

F. Fuel Pressure Pulsation Damper

A fuel pressure pulsation damper is installed in the fuel supply line firewall forward between the bulkhead fitting and the engine driven high pressure fuel pump (LH and RH engine). See Figure 8.

Trouble-Shooting

1. General

The table below lists the trouble you could have with the fuel distribution system. If you have the trouble detailed in the Trouble column then read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	**Possible Cause**	Repair
The airplane smells of fuel.	Hose/pipe leaking.	Examine all hoses and pipes. Replace damaged or defective components.
	Loose connection.	Examine all connections. Tighten loose connections.
	Component leaking.	Examine all components. Replace defective components.

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Maintenance Practices

1. General

This Section gives you the Maintenance Practices for the fuel distribution system. The procedures are limited to the removal/installation of the main components of the system.

Obey the safety precautions for fuel at all times.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE.

WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: DO NOT BREATHE FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. Remove/Install a Fuel Transfer/Shut-Off Valve

A. Remove a Fuel Transfer/Shut-Off Valve

Obey the safety precautions for fuel at all times.

	Detail Steps/Work Items	Key Items/References
(1)	Defuel the airplane.	Refer to Section 12-10.
(2)	Remove the access panels from the related engine nacelle, aft of the bulkhead that give access to the fuel transfer/shut-off valve.	Refer to Section 52-40.
(3)	Remove the engine cowlings for the related engine.	Refer to Section 71-10.
(4)	Drain the fuel from the fuel distribution system: – Set the related FUEL SELECTOR lever in the cockpit to the related engine until fuel stops draining from the fuel sediment bowl drain. – Set the related FUEL SELECTOR lever in the cockpit to the CROSSFEED position until fuel stops draining from the fuel sediment bowl drain. – Set the related FUEL SELECTOR lever in the cockpit to the SHUT-OFF position.	Use a suitable container. Use the drain valve on the fuel sediment bowl.

	Detail Steps/Work Items	Key Items/References
(5)	Disconnect these fuel connections at the fuel transfer/shut-off valve: – The fuel supply to the engine. – The fuel return from the engine. – The fuel supply from the related fuel tank. – The fuel supply from the opposite fuel tank. – The fuel return to the related fuel tank. – The fuel return to the opposite fuel tank.	Refer to Figure 4. Put caps on all the open fuel connections.
(6)	Remove the fuel transfer/shut-off valve from the bulkhead: – Remove the cotter pin from the universal joint. – Remove the 4 bolts and washers that attach the valve to the mounting bracket. – Remove the bonding wire. – Move the valve clear of the mounting bracket and pull the valve off the valve drive-tube assembly. – Move the fuel transfer/shut-off valve clear of the engine nacelle.	

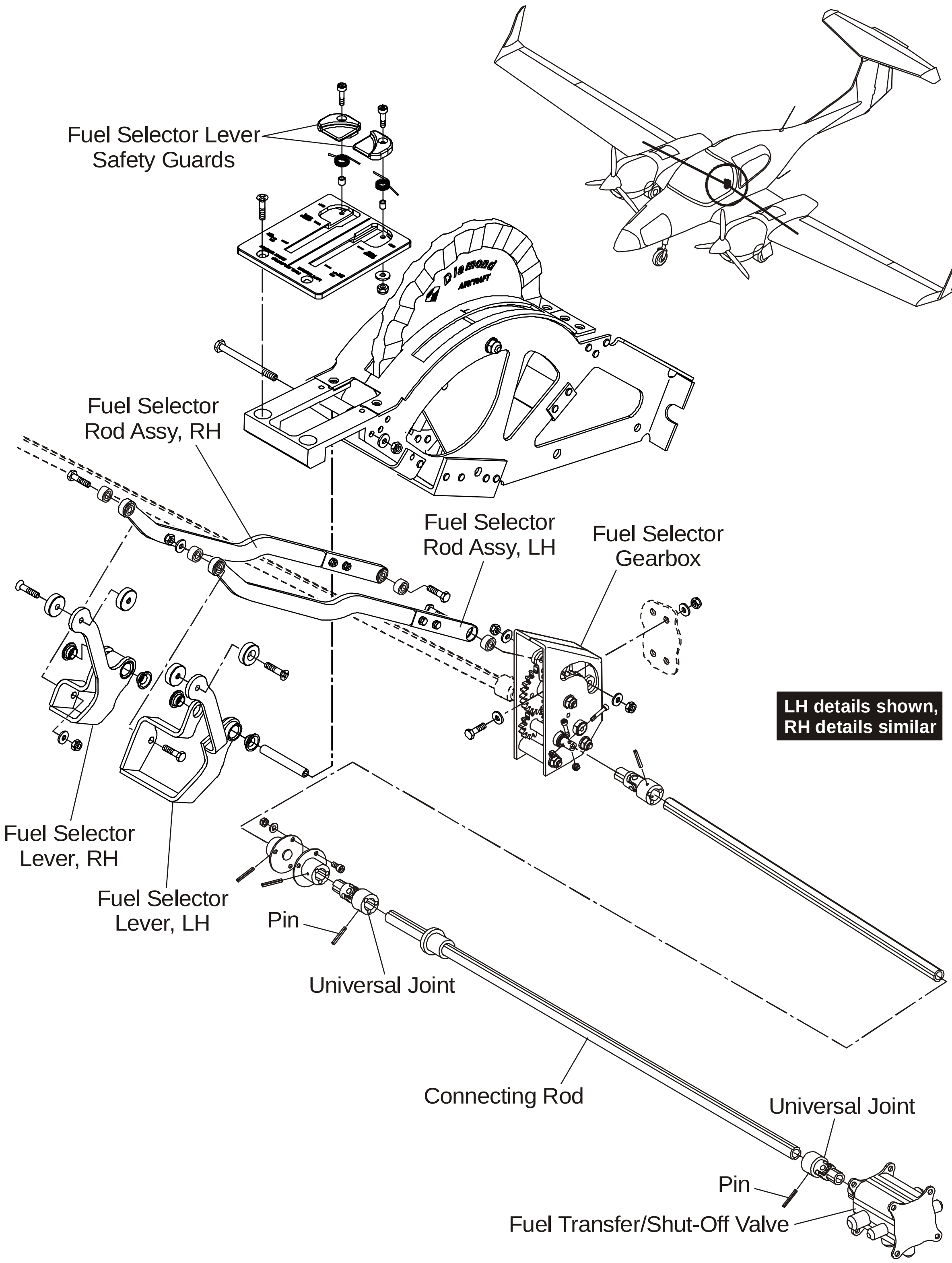


Figure 4: Fuel Transfer/Shut-Off Valve Installation

B. Install a Fuel Transfer/Shut-Off Valve

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever in the cockpit is set to SHUT-OFF.	In the cockpit.
(2)	Set the fuel transfer/shut-off valve to the shut-off position.	
(3)	Install the fuel transfer/shut-off valve: – Hold the valve in the shut-off position and move the valve into position over the valve drive-tube assembly. – Install cotter pin (of universal joint). – Locate the fuel transfer/shut-off valve on the mounting bracket. – Install the 4 bolts and washers that attach the fuel transfer/shut-off valve to the bracket. – Install the bonding wire.	Seal the connection with bonding lacquer.
(4)	Connect these fuel connections at the fuel transfer/shut-off valve: – The fuel supply to the engine. – The fuel return from the engine. – The fuel supply from the related fuel tank. – The fuel supply from the opposite fuel tank. – The fuel return to the related fuel tank. – The fuel return to the opposite fuel tank.	Make sure that all the caps are removed from the connections. Make sure that all the fuel hoses are connected to the correct transfer/shut-off valve connectors.
(5)	Refuel the airplane.	Refer to Section 12-10.
(6)	Bleed both engine fuel distribution systems.	Refer to Paragraph 7.
(7)	Do a test for fuel leaks at these connections: – The inlet from the related fuel tank. – The inlet from the opposite fuel tank.	

	Detail Steps/Work Items	Key Items/References
(8)	Do a test for correct operation of the fuel transfer/shut-off valve.	Refer to Paragraph 9.
(9)	Install the access panels that you removed.	Refer to Section 52-40.
(10)	Install the engine cowlings that you removed.	Refer to Section 71-10.
(11)	Do an engine ground run up. Make sure that the fuel system operates correctly.	

3. Remove/ Install the Fuel Selector Gearbox

A. Remove the Fuel Selector Gearbox

Refer to Figure 2.

	Detail Steps/Work Items	Key Items/References
(1)	Remove pilot’s and co-pilot’s seat.	Refer to Section 25-10.
(2)	Remove center console between pilot’s and co-pilot’s seat.	
(3)	Remove knobs from the fuel selector levers.	
(4)	Remove fuel selector cover plate.	
(5)	Push LH fuel selector lever into ON position.	Make sure that the fuel selector valve is engaged in the ON position.
(6)	Mark the ON position on the outer connecting rod (splined tube, which connects the fuel selector gearbox with the fuel selector valve) directly at the bushing in the fuselage wall.	
(7)	Pull fuel selector lever into CROSSFEED position.	Make sure that the fuel selector valve is engaged in the CROSSFEED position.
(8)	Mark the CROSSFEED position on the outer connecting rod directly at the bushing in the fuselage wall.	
(9)	Pull the fuel selector lever into the OFF position.	Make sure that the fuel selector valve is engaged in the OFF position.

	Detail Steps/Work Items	Key Items/References
(10)	Mark the OFF position on the outer connecting rod directly at the bushing in the fuselage wall.	
(11)	Repeat steps 5 to 10 for the RH fuel selector lever.	
(12)	Push both fuel selector levers into the ON position.	Make sure that the fuel selector valves are engaged in the ON position. This is the necessary position for adjustment when the new fuel selector valve will be installed.
(13)	Remove crash element above the fuel selector gearbox.	
(14)	Disconnect the fuel selector push rods (rods between fuel selector levers and fuel selector gearbox) directly at the fuel selector gear box.	
(15)	Disconnect the LH inner connecting rod from the outer connecting rod.	Open the three bolts at the connection element below the outer crash element.
(16)	Disconnect the RH inner connecting rod from the outer connecting rod.	Open the three bolts at the connection element below the outer crash element.
(17)	Disconnect both inner connecting rods from the fuel selector gearbox.	Open the bolts at the universal joint.
(18)	Remove the fuel selector gearbox.	Open both bolts of the attachment brackets and the two countersunk bolt which attach the fuel selector gearbox to the main spar.

B. Install the Fuel Selector Gearbox

Refer to Figure 4.

	Detail Steps/Work Items	Key Items/References
(1)	Bring fuel selector gearbox in position between the attachment brackets.	
(2)	Attach the fuel selector gearbox to both brackets with the bolts on the bottom of the gearbox.	
(3)	Attach the gearbox to the main spar.	
(4)	Connect the fuel selector push rods to the fuel selector gearbox.	
(5)	Install fuel selector cover.	
(6)	Push both fuel selector levers fully forward into the ON position.	Make sure that the length of the push rods is proper to reach the most forward position at the fuel selector gearbox. If necessary adjust the length of the push rods at the designated point. Old push rods are not adjustable. If necessary, exchange these push rods with new ones. Make sure that the fuel selector valve is engaged in the ON position. For reference use marking on the outer push rod directly at the bushing in the fuselage wall.
(7)	Exchange the drilled part of the connection element between the connecting rods with a new undrilled part.	For adjustment of the fuel selector valve positions in accordance with the fuel selector lever positions new holes must be drilled.
(8)	Connect the inner connecting rods to the fuel selector gearbox.	
(9)	Bring both parts of the LH connection element between the connecting rods into position.	
(10)	Mark the position of both parts of the connection element in relation to each other.	

	Detail Steps/Work Items	Key Items/References
(11)	Remove both parts of the connection element.	
(12)	Drill holes in the undrilled part of the connection element.	Use drilled part of the connection element in the marked position as template.
(13)	Install both parts of the connection element.	
(14)	Connect both parts of the connection element with the three bolts.	
(15)	Repeat steps 9 to 14 for the RH connection element.	
(16)	Do a functional test of the fuel selector valve.	Pull fuel selector levers into all positions. Make sure that the fuel selector valve is engaged in the respective positions using the marking at the bushing in the fuselage wall as reference.
(17)	Bond new crash element onto the fuel selector gearbox using bonding paste.	Refer to Section 51-20.
(18)	Install center console between pilot’s and co-pilot’s seat.	
(19)	Install pilot’s and co-pilot’s seat.	Refer to Section 25-10.

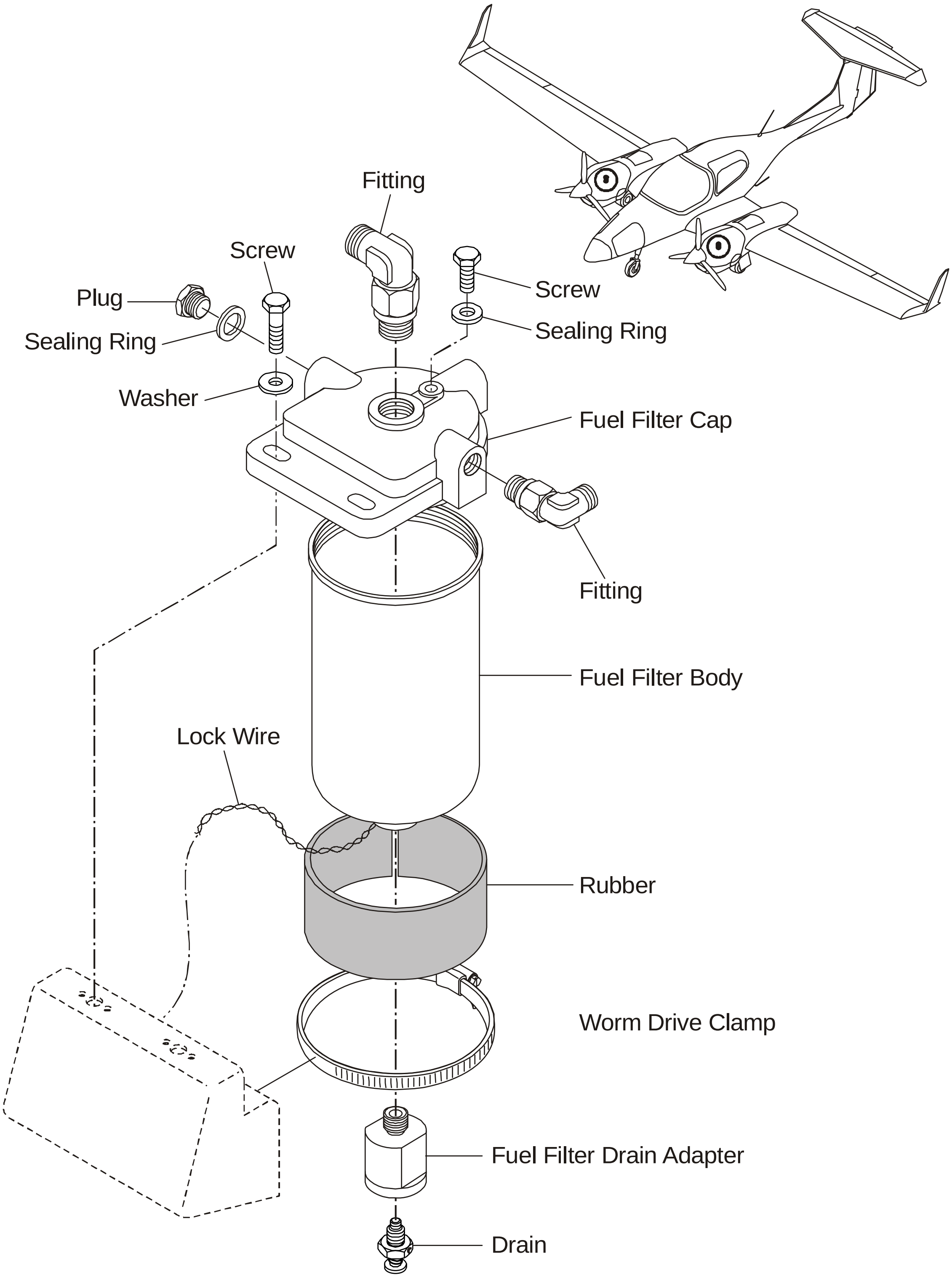


Figure 5: Fuel Filter Assembly

4. Remove/Install the Fuel Filter Body

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Filter Body

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Remove the fuel filter element: – Drain the fuel from the fuel distribution system. – Remove the safety wire from the filter bowl. – Unscrew the filter body together with the drain valve assembly from the filter assembly. – Unscrew the drain valve and the drain valve adapter from the fuel filter body.	Refer to Figure 5. From the fuel sediment bowl drain. Use a suitable container to catch spilt fluid.

B. Install the Fuel Filter Body

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel filter drain adapter and the drain valve into the new filter body.	Refer to Figure 5. Use Loctite 243 on adapter to fuel filter body connection.
(2)	Install the filter body assembly into the fuel filter cap.	Make sure that the integral sealings at the new fuel filter body are not damaged.
(3)	Secure the filter body assembly via the drain valve to the filter assembly with lockwire.	
(4)	Do a test for leaks of the filter assembly: – Make sure that there is fuel in the related fuel tank. – Set the FUEL SELECTOR lever to the related tank. – Examine the filter assembly for leaks.	

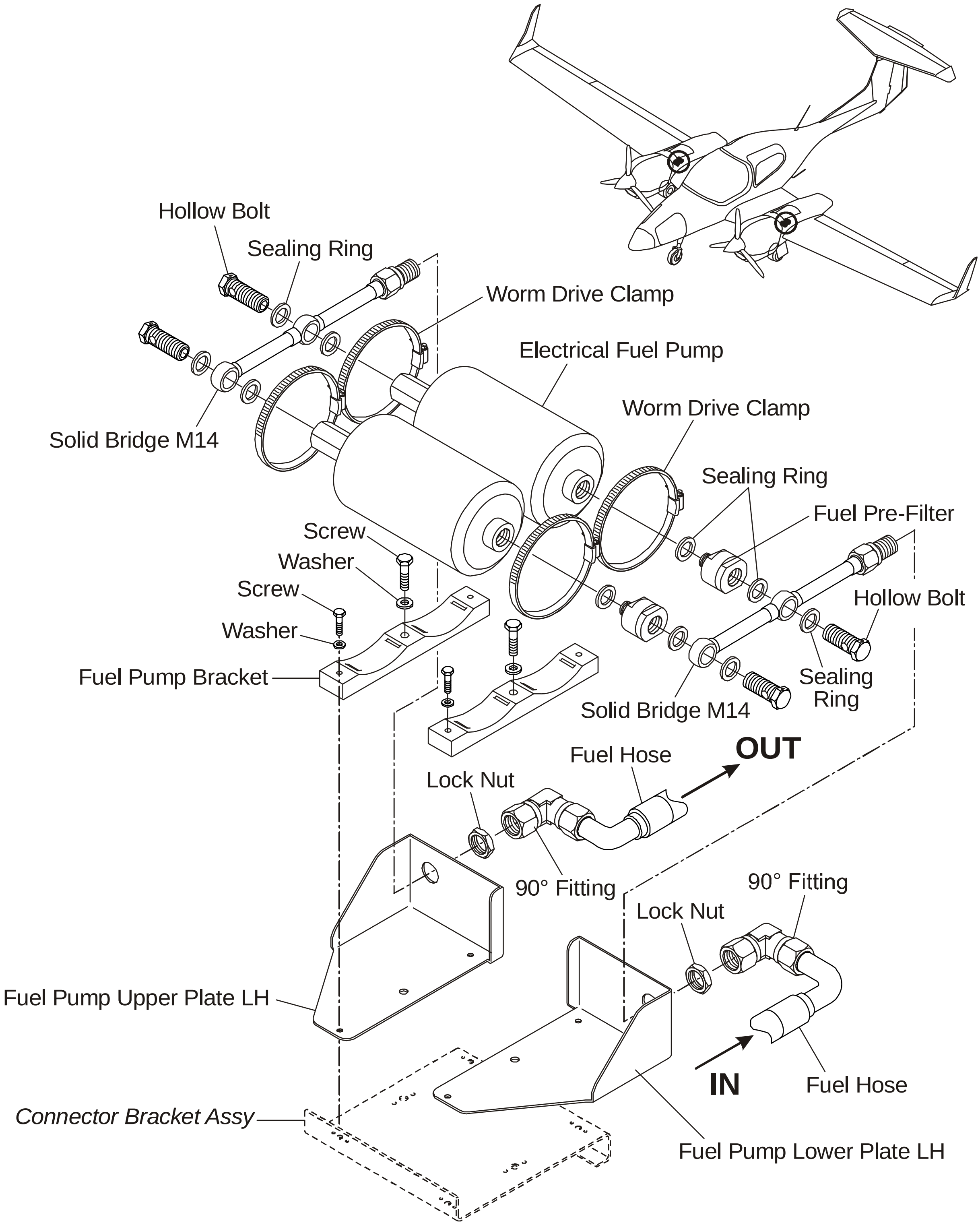


Figure 6: Fuel Pumps Assembly

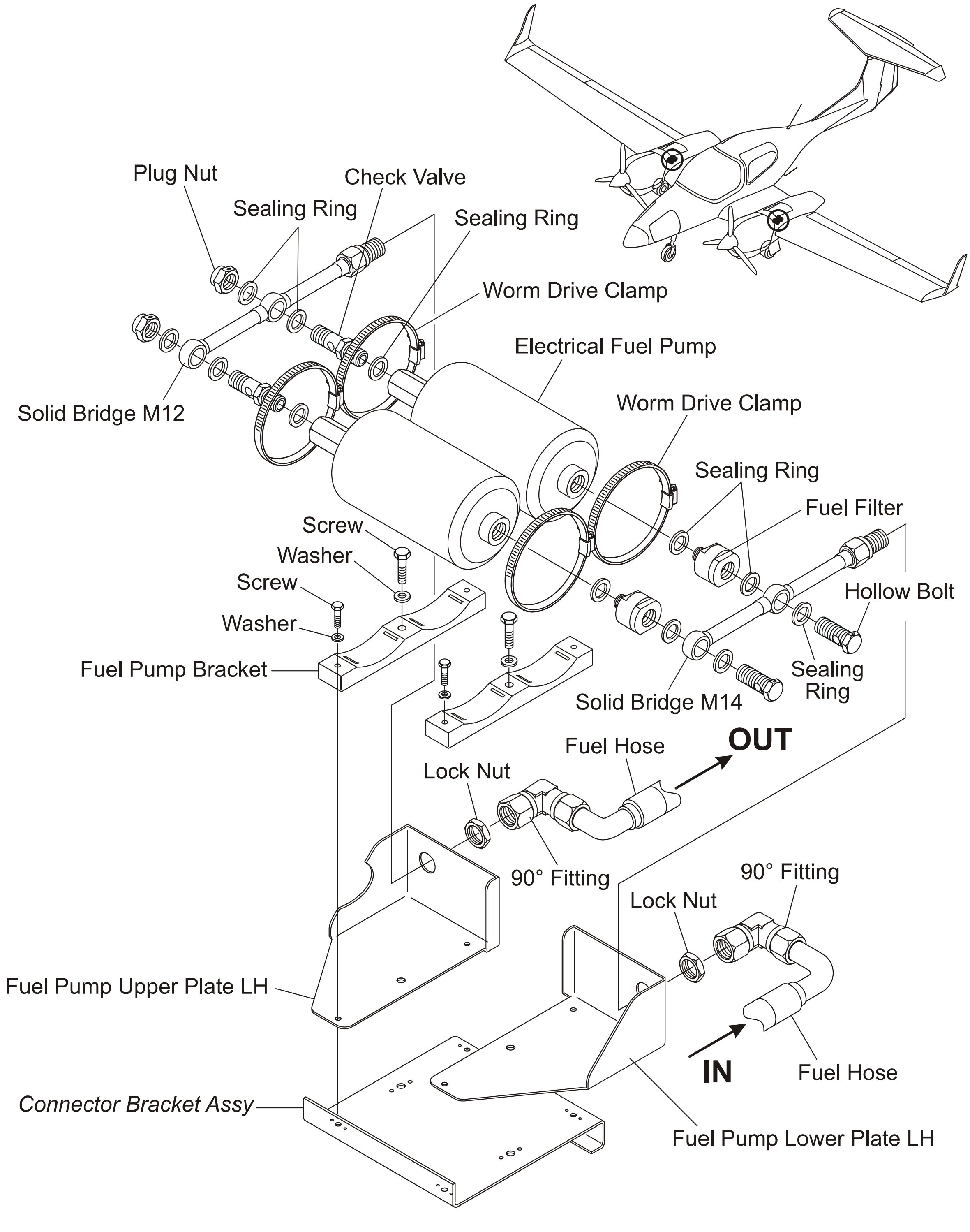


Figure 7: Fuel Pumps Assembly (if MÄM 42-480 is installed)

5. Remove/Install the Fuel Pre-Filters

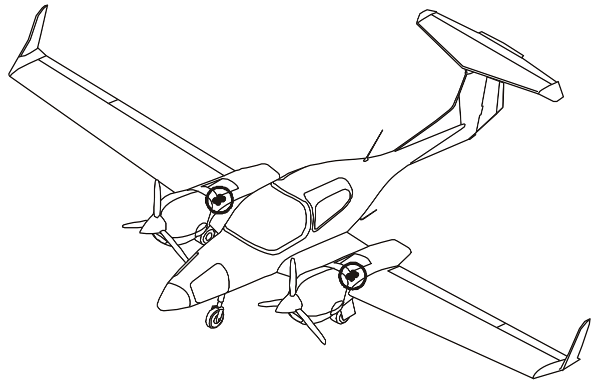
Obey the safety precautions for fuel at all times.

A. Remove the Fuel Pre-Filters

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Pull the appropriate circuit breaker of electrically driven fuel pumps.	
(3)	Remove the fuel pre-filters: – Drain the fuel from the fuel distribution system. – Disconnect the fuel hose on the pre-filter side. – Remove the safety wire from the hollow bolts next to the pre-filters. – Remove the hollow bolts and the solid bridge next to the pre-filters. – Remove the pre-filter assemblies.	Refer to Figure 6. From the fuel filter drain. Use a suitable container to catch spilt fluid. The assemblies will contain fuel!

B. Clean the Pre-Filters

	Detail Steps/Work Items	Key Items/References
(1)	Disassemble the pre-filters.	Refer to Figure 8.
(2)	Flush the filter mesh with clean fuel.	
(3)	Replace the O-ring.	
(4)	Assemble the pre-filters.	Torque: 15 ± 2 Nm (11.1 ± 1.5 lbf.ft.).



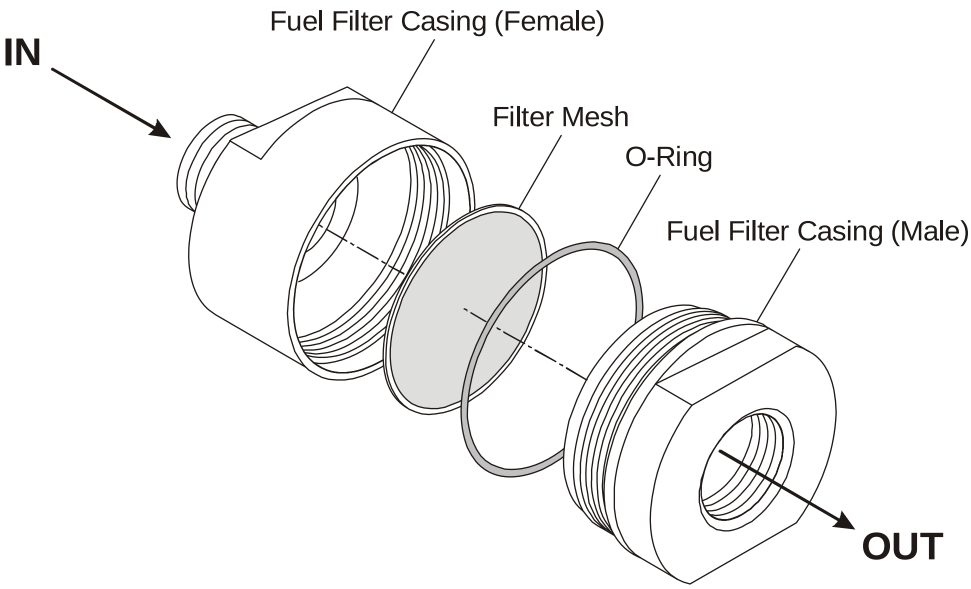


Figure 8: Fuel Pre-Filter Assembly

C. Install the Fuel Pre-Filters

	Detail Steps/Work Items	Key Items/References
(1)	Install the pre-filters: – Replace all aluminium washers of the fuel pump assembly on the pre-filter side. – Install the pre-filter assembly. – Install the solid bridge and the hollow bolts. – Connect the fuel hose on the pre-filter side. – Secure the hollow bolts with safety wire.	Refer to Figure 6. Torque: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.).
(2)	Do a test for leaks of the filter assembly: – Make sure that there is fuel in the related fuel tank. – Reset the circuit breaker of the fuel pumps. – Set the FUEL SELECTOR lever to the related tank. – Examine the filter assembly for leaks while both low pressure fuel pumps are running.	

6. Remove/Replace/Install the Fuel Pressure Pulsation Damper

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Pressure Pulsation Damper (LH or RH Engine)

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the upper cowlings.	
(3)	Remove the P-clamp which positions the fuel pressure pulsation damper installation.	
(4)	Remove the lock wires at the lines on the fuel pressure pulsation damper housing.	
(5)	Disconnect the two fuel lines which are connected to the fuel pressure pulsation damper housing.	
(6)	Remove the fuel pulsation damper.	

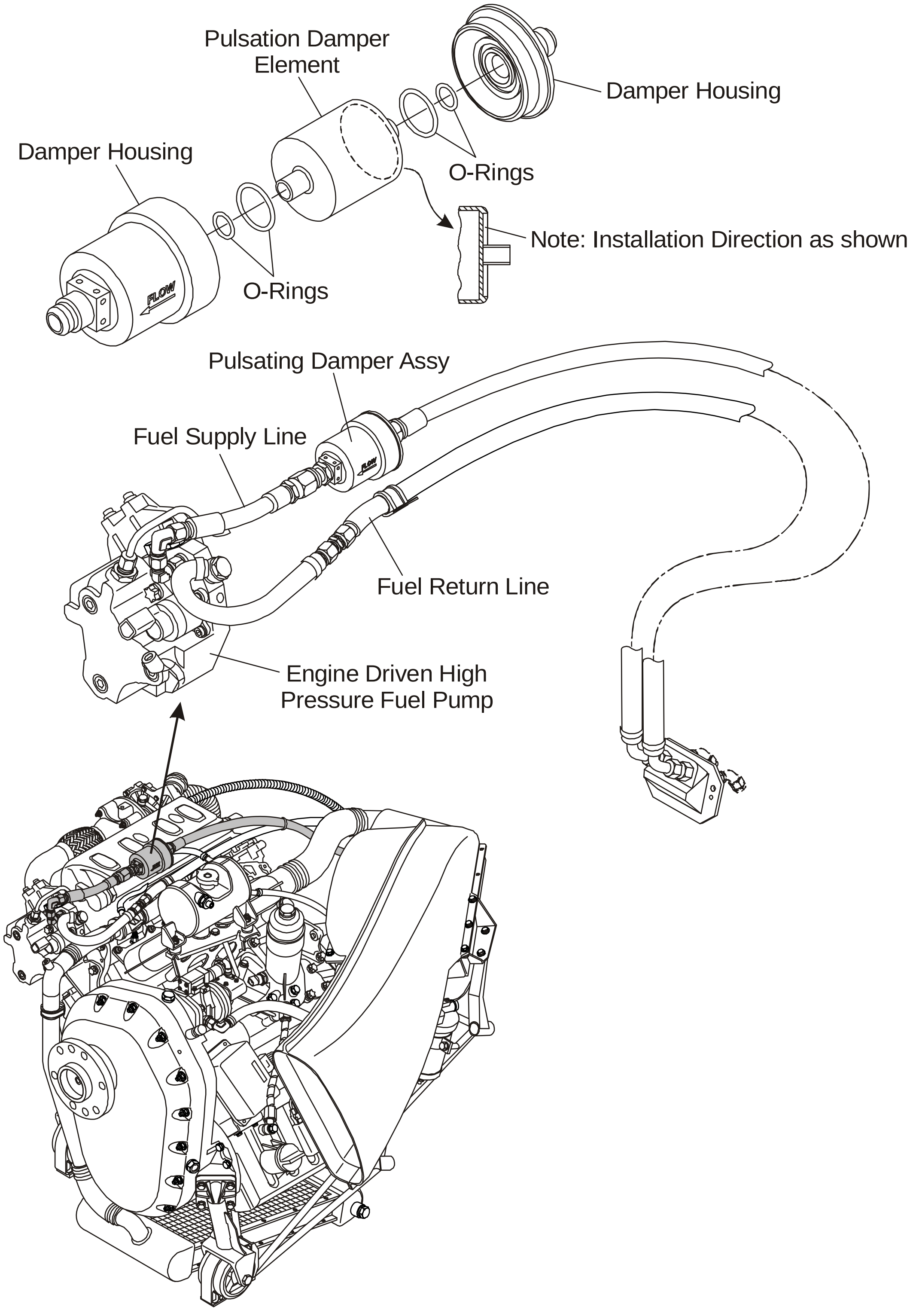


Figure 9: Fuel System Components Firewall Forward LH and RH Engine

B. Replace the Fuel Pressure Pulsation Damper

	Detail Steps/Work Items	Key Items/References
(1)	Remove the wire locking of the fuel pressure pulsation damper housing.	
(2)	Open the fuel pressure pulsation damper housing by turning the cover counterclockwise.	
(3)	Remove and discard the fuel pressure pulsation damper and the four O-rings.	
(4)	Clean the inside of the fuel pressure pulsation damper housing. No contamination allowed.	Flush with fuel approved for the airplane.
(5)	Install the four new O-rings.	
(6)	Apply 09-25300 ‘Fuelube EZTurn 1LB’ to the outside thread and sealing surface of the fuel pressure pulsation damper housing.	
(7)	Install the new fuel pressure pulsation damper in the housing. Watch out for the installation direction of the fuel pressure pulsation damper in the housing.	Refer to Figure 9.
(8)	Tighten the fuel pressure pulsation damper housing.	Torque 80 ± 4 Nm (59.0 ± 2.9 lbf.ft).
(9)	Secure the fuel pressure pulsation damper housing with locking wire.	

C. Install the Fuel Pressure Pulsation Damper Housing Assy

	Detail Steps/Work Items	Key Items/References
(1)	Flush the fuel pressure pulsation damper assy with fuel approved for the airplane. No contamination allowed.	
(2)	Connect the fuel pressure pulsation damper housing to the fuel supply lines and secure with locking wire. Watch out for the flow direction (arrow).	
(3)	Install the P-clamp and mount the fuel pressure pulsation damper assy to the engine.	
(4)	Install the upper cowlings.	
(5)	Conduct an engine ground run.	
(6)	Inspect the airplane for fuel leakage.	

7. Remove/Install the Low Pressure Fuel Pumps

Obey the safety precautions for fuel at all times.

A. Remove/Replace the Low Pressure Fuel Pumps

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Pull the appropriate circuit breaker of electrically driven fuel pumps.	
(3)	Remove the low pressure fuel pumps: – Remove the fuel hoses from the fuel filter assembly. – Disconnect the electric wires from the electric fuel pumps. – Remove the fuel pump assembly from the bracket. – Remove the hollow bolts, solid bridge, and pre-filters.	Refer to Figure 6.

	Detail Steps/Work Items	Key Items/References
(4)	If MÄM 42-480 is carried out: Remove the low pressure fuel pumps: – Remove the fuel hoses from the fuel filter assembly. – Disconnect the electric wires from the electric fuel pumps. – Remove the fuel pump assembly from the bracket. – Remove the two hollow bolts, the solid bridge, and the two pre-filters from the bottom of the fuel pump assembly. – Remove safety wire from plug nuts. – Remove the two plug nuts, the solid bridge and two check valves from the top of the fuel pump assembly.	Refer to Figure 7.
(5)	Replace fuel pumps and pre-filters.	Refer to Chapter 05.
(6)	Replace aluminium washers.	
(7)	Check hollow bolts and bridges for damage.	Replace damaged items!

B. Install Low Pressure Fuel Pumps

	Detail Steps/Work Items	Key Items/References
(1)	Install the low pressure fuel pump assembly: – Install the aluminum washers, the two pre-filters, the solid bridges, and the hollow bolts. – Install the fuel pumps assembly to the bracket. – Connect the electric wires to the fuel pumps. – Connect the fuel hoses to the solid bridges. – Secure hollow bolts with safety wire.	Refer to Figure 6. Hollow bolts torque: D-08: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.) D-06: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.)
(2)	If MÄM 42-480 is carried out: Install the low pressure fuel pump assembly: – Install the aluminum washers, the two pre-filters, the solid bridge, and the two hollow bolts. – Install the washers, the two check valves, the solid bridge, and the two plug nuts. – Secure plug nuts with safety wire. – Install the fuel pumps assembly to the bracket. – Connect the electric wires to the fuel pumps. – Connect the fuel hoses to the solid bridges. – Secure hollow bolts with safety wire.	Refer to Figure 7. Hollow bolts torque: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.) Plug nuts torque: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.)

	Detail Steps/Work Items	Key Items/References
(3)	Do a test for leaks of the filter assembly: – Make sure that there is fuel in the related fuel tank. – Reset the circuit breaker of the fuel pumps. – Set the FUEL SELECTOR lever to the related tank. – Examine the filter assembly for leaks while both low pressure fuel pumps are running.	

8. Test the Solenoid Valve/Check Valve in the Fuel Transfer Line (If Auxiliary Tanks Installed)

Obey the safety precautions for fuel at all times.

CAUTION: YOU MUST REPLACE THE CHECK VALVE IF THE TEST FAILS.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that there is no fuel in the related main fuel tank.	
(2)	Top off the auxiliary fuel tank.	
(3)	Disconnect the fuel transfer line from the Tee-fitting of the fuel return line.	Put a cap on the T-fitting.
(4)	Check for any leakage from the solenoid valve/check valve.	If leakage is observed: replace solenoid valve/check valve.
(5)	Disconnect cap from the T-fitting and reconnect the fuel transfer line to the T-fitting.	
(6)	Check for leakage while operating the auxiliary fuel pump.	If leakage is observed replace relevant fittings and hoses.

9. Remove/Install a Fuel Cooler

A. Remove a Fuel Cooler

Obey the safety precautions for fuel at all times.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Remove the access panel for the fuel cooler: – Remove the screws that attach the panel to the lower surface of the engine nacelle. – Move the access panel clear of the nacelle.	At the rear of the engine nacelle. On the lower surface of the nacelle. Support the panel.
(3)	Disconnect the flexible hoses that connect to the fuel cooler.	Refer to Figure 10. Use a suitable container to catch spilt fuel. Put caps on all open connections.
(4)	Remove the fuel cooler: – Remove the 4 bolts and washers that attach the fuel cooler to the mounting brackets. – Lower the cooler from the mounting brackets and clear of the engine nacelle. – Empty the fuel from the cooler into a suitable container.	Support the cooler. Take care! The cooler will contain fuel!

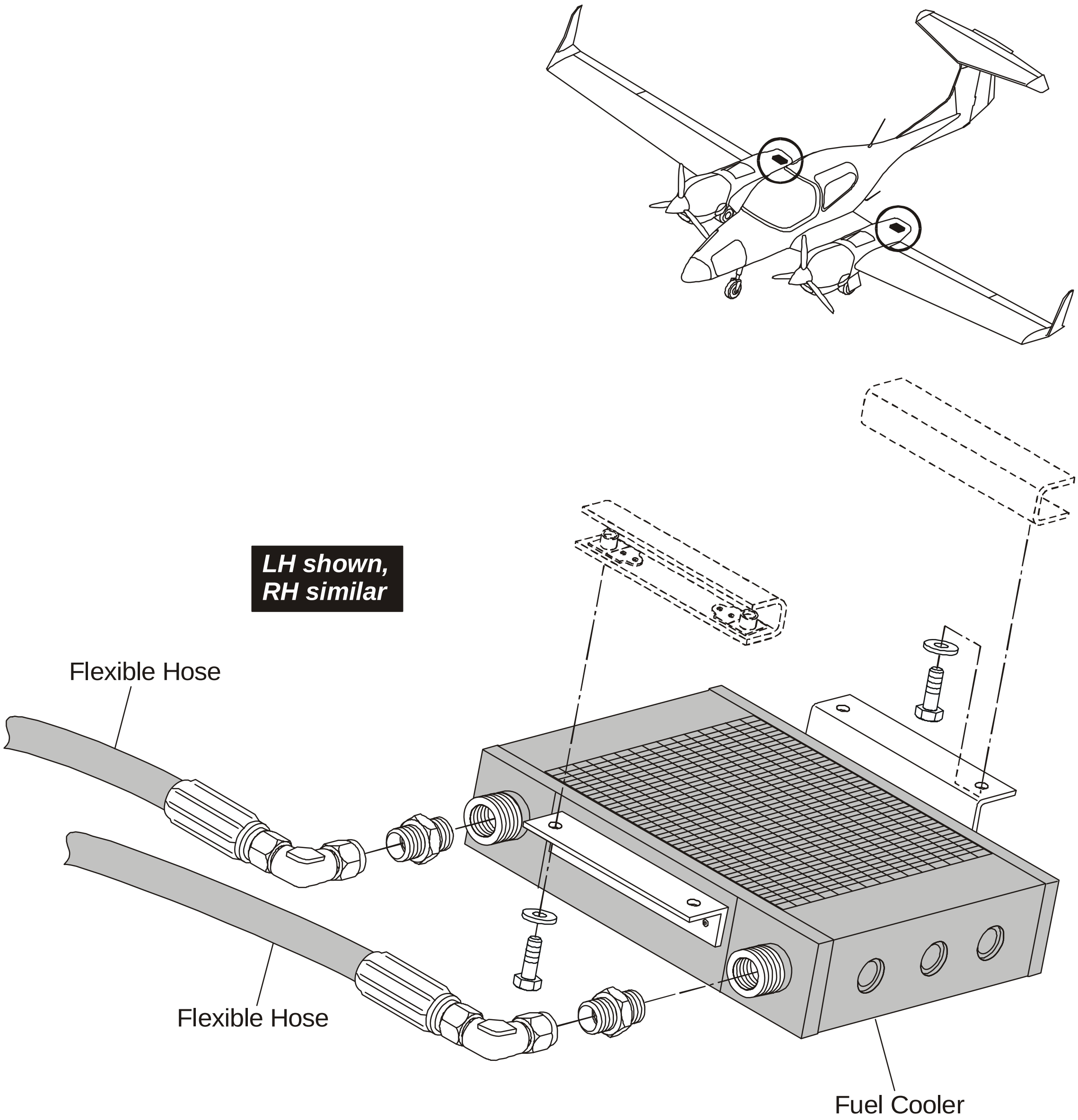


Figure 10: Fuel Cooler Installation

B. Install a Fuel Cooler

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel cooler: – Move the fuel cooler into position in the engine nacelle. – Align the cooler with the mounting brackets and install the 4 bolts and washers that attach the fuel cooler to the brackets.	
(2)	Connect the flexible hoses to the fuel cooler.	Make sure that you remove all the blanking caps.
(3)	Bleed the related fuel distribution system.	Refer to Paragraph 9.
(4)	Do a test for leaks. Specially at the flexible hose connections to the fuel cooler.	
	Install the fuel cooler access panel: – Move the access panel into position at the rear of the engine nacelle, lower surface. – Install the screws that attach the access panel to the engine nacelle.	

10. Test the Crossfeed Position of a Fuel Selector Valve

WARNING: SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED MAY CAUSE DAMAGE TO THE HIGH-PRESSURE PUMP DUE TO THE HIGH FUEL PRESSURE. AFTER SWITCHING ON THE FUEL PUMP IN COMBINATION WITH CROSSFEED IN CASE OF AN EMERGENCY SPECIAL MAINTENANCE OF THE HIGH PRESSURE PUMP IS REQUIRED.

	Detail Steps/Work Items	Key Items/References
(1)	Do the preparation for an engine test.	Refer to Section 71-00.
(2)	Start the related engine.	On the side of the fuel selector valve that you want to test. Refer to Section 71-00. Make sure that the fuel selector valve is in the ON position.
(3)	Set the fuel selector valve that you want to test in the CROSSFEED position.	
(4)	Let the engine idle for 1 minute.	Refer to Section 71-00.
(5)	Set the related power lever to 100% after engine warm up and keep this position for 1 minute.	Keep the engine temperature in view. Do not continue the test if the engine temperature rises too high.
(6)	Make sure that the engine does not stop.	If the engine stops, then the CROSSFEED system is defective. Correct the fault and do the test again.
(7)	Shut down the engine.	Refer to Section 71-00.

11. Remove/Install an Inline Filter

Obey the safety precautions for fuel at all times.

A. Remove an Inline Filter

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the auxiliary fuel tank is empty.	Defuel and drain the auxiliary fuel tank.
(2)	Remove the auxiliary fuel tank access panel from the engine nacelle: – Remove the 8 screws that attach the access panel to the nacelle. – Disconnect the vent line and the drain line (coming from the drip tray) from the connectors on the access panel. – Move the access panel clear of the nacelle.	
(3)	Disconnect the fuel transfer line from the auxiliary fuel pump outlet.	
(4)	Remove the inline filter.	Filter is inserted in the fuel transfer line.

B. Install an Inline Filter

	Detail Steps/Work Items	Key Items/References
(1)	Insert the inline filter into the fuel transfer line.	Directly at the auxiliary fuel pump outlet connection fitting.
(2)	Connect the fuel transfer line to the auxiliary fuel pump outlet.	
(3)	Refuel the auxiliary fuel tank.	Fill more than 2 US gal (7.6 l) of fuel into the auxiliary tank.
(4)	Perform a test of the auxiliary fuel transfer system.	Refer to Paragraph 11.
(5)	Check auxiliary fuel tank assembly for leakage.	
(6)	Install the auxiliary fuel tank access panel to the engine nacelle: – Move the access panel in place on the nacelle. – Connect the vent line and the drain line (coming from the drip tray) to the connectors on the access panel. – Install the 8 screws that attach the access panel to the nacelle.	

12. Test the Auxiliary Fuel Transfer System

A. Equipment

Item	Quantity	Part Number
Ground power supply.	1	-
Stopwatch.	1	Commercial.

B. Procedure

Obey the safety precautions for fuel at all times.

CAUTION: YOU MUST REPLACE THE INLINE FILTER IF THE TEST FAILS.

	Detail Steps/Work Items	Key Items/References
(1)	Connect the airplane to ground power.	
(2)	Defuel the auxiliary tank using the auxiliary fuel transfer pump.	On the side of the auxiliary fuel system that you want to test. Make sure that the corresponding main tank is empty enough to hold the auxiliary fuel. The auxiliary fuel pump must stop due to the auxiliary tank empty switch.
(3)	Fill 2 US gal (7.6 l) of fuel into the auxiliary fuel tank.	
(4)	Measure transfer time for transferring the 2 US gal (7.6 l) of fuel from the auxiliary tank into the main tank.	The auxiliary fuel pump must stop due to the auxiliary tank empty switch. Measure time from switching on the fuel pump until the fuel transfer stops due to the auxiliary tank empty switch. The transfer time must not be more than 4 min. Check if the corresponding main tank fuel quantity indication increases.
(5)	Repeat steps 2 thru 4 for the other auxiliary fuel transfer system.	

Section 28-21

Fuel Distribution (if MÄM 42-600 is installed)

1. General

This Section describes the fuel distribution system for the DA 42 NG airplane with MÄM 42-600 installed. The fuel distribution system supplies fuel from the main fuel tanks to the engines. The components of the fuel distribution system are:

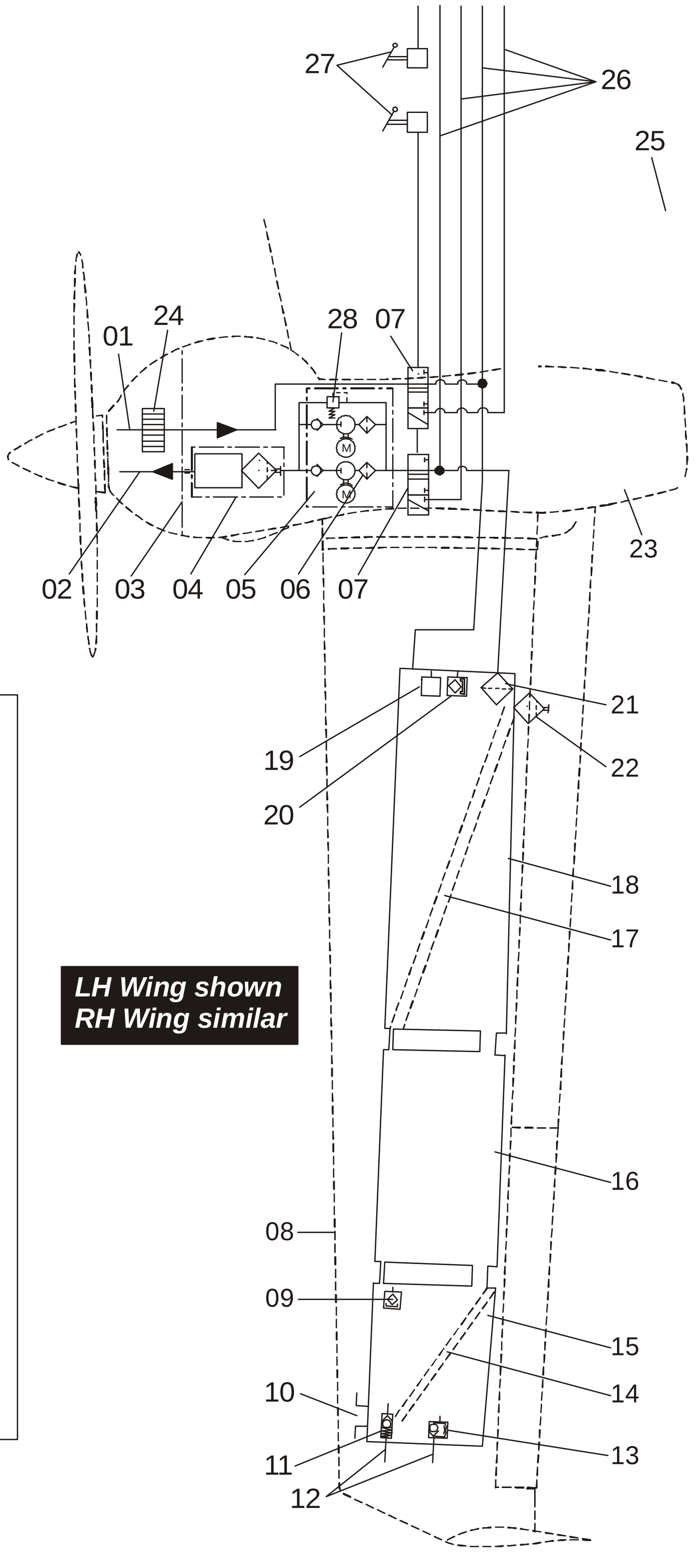
– Flexible fuel hoses.

– Fuel transfer/shut-off valves.

– Fuel filters.

Low pressure fuel pump assembly. Refer to Section 28-00 for a general description of the fuel system and for the schematic diagram of the fuel system.

Refer to Chapter 73-00 for information about the fuel cooler installation.



01	Return Line
02	Fuel Supply
03	Firewall
04	Fuel Filter with Sediment Trap & Drain
05	Low Pressure Fuel Pumps
06	Prefilter
07	Fuel Selector Valves
08	Wing
09	Fuel Level Switch
10	Fuel Filler
11	Pressure Relief Valve
12	Main Fuel Tank Vent Line
13	Check Valve with Capilare
14	Outboard Fuel Level Sensor
15	Outboard Chamber Main Tank
16	Middle Chamber Main Tank
17	Inboard Fuel Level Sensor
18	Inboard Chamber Main Tank
19	Fuel Temperature Sensor
20	Low Level Fuel Sensor
21	Drain
22	Finger Filter
23	Nacelle
24	Fuel Cooler
25	Fuselage
26	Crossfeed Lines
27	Fuel Selector
28	Fuel Bypass Valve

Figure 1: Fuel Distribution System Schematic Without Auxiliary Tanks (if MÄM 42-600 installed)

2. Description

A. Normal Operation

Figure 1 shows the schematic diagram of the fuel distribution system for the DA 42 NG airplane, auxiliary tanks not installed. Figure 2 shows the schematic diagram with the auxiliary fuel tanks installed. Figure 3 shows the items connecting the auxiliary fuel tank to the main fuel tank.

A flexible hose connects the main fuel tank outlet to the fuel transfer/shut-off valve. The fuel transfer/shut-off valve is located in the related engine nacelle, aft of the engine firewall. A lever in the cockpit center console controls the fuel transfer/shut-off valve via a mechanical drive system. The fuel transfer/shut-off valve connects to the parallel installed independent pre-filters and the low pressure fuel pumps. The electrically powered fuel pumps connect then to the fuel filter assembly. A drain valve is located at the bottom of the fuel filter assembly. The bottom of the fuel filter assembly forms the sediment trap.

The fuel filter assembly connects via flexible hose to a fuel bulkhead fitting on the engine firewall. From there a flexible hose connects the bulkhead fitting to a fuel pressure pulsation damper and then to the engine driven high pressure fuel pump.

A flexible hose connects the engine fuel system return line to the return bulkhead fitting located on the engine firewall via the fuel cooler. A flexible fuel hose connects on the nacelle side to the return line of the fuel transfer/shut-off valve. Another flexible hose connects the fuel transfer/shut-off valve to the related main fuel tank return system.

During normal operation the fuel returning from the left engine will flow through the left fuel cooler back into the left main fuel tank via the fuel transfer / shut -off valve. The fuel cooler is located in the engine compartment. An opening in the left sidewall of the air inlet diffusor of the radiator supplies cooling air to the fuel cooler via a duct system. The cooling air from the fuel cooler exits through cowling air outlets.

If the optional auxiliary fuel tank is installed (OÄM 42-056), a flexible hose runs from the outlet of the auxiliary fuel tank to the electrically driven auxiliary fuel pump via an inline fuel filter. Another flexible hose runs from the outlet of the auxiliary fuel pump via a solenoid valve and a check valve to a Y-adapter which feeds the auxiliary fuel into the return fuel circuit.

The check valve and the solenoid valve prevent fuel backflow into the auxiliary fuel tank. To protect the fuel pump and the solenoid valve from contamination an inline filter is installed in the fuel transfer line prior to the auxiliary fuel pump.

01 Return Line
02 Fuel Supply
03 Firewall
04 Fuel Filter with Sediment Trap & Drain
05 Low Pressure Fuel Pumps
06 Prefilter
07 Fuel Selector Valves
08 Wing
09 Fuel Level Switch
10 Fuel Filler
11 Pressure Relief Valve
12 Main Fuel Tank Vent Line
13 Check Valve with Capilare
14 Outboard Fuel Level Sensor
15 Outboard Chamber Main Tank
16 Middle Chamber Main Tank
17 Inboard Fuel Level Sensor
18 Inboard Chamber Main Tank
19 Fuel Temperature Sensor
20 Low Level Fuel Sensor
21 Drain
22 Finger Filter
23 Nacelle
24 Check Valve
25 Inline Filter
26 Auxiliary Pump
27 Solenoid Valve
28 Finger Filter
29 Fuel Cooler
30 Drain
31 Fuel Level Switch
32 Auxiliary Fuel Filter
33 Auxiliary Tank
34 Check Valve with Capillare
35 Auxiliary Fuel Tank Vent Line
36 Fuselage
37 Crossfeed Lines
38 Fuel Selector
39 Fuel Bypass Valve

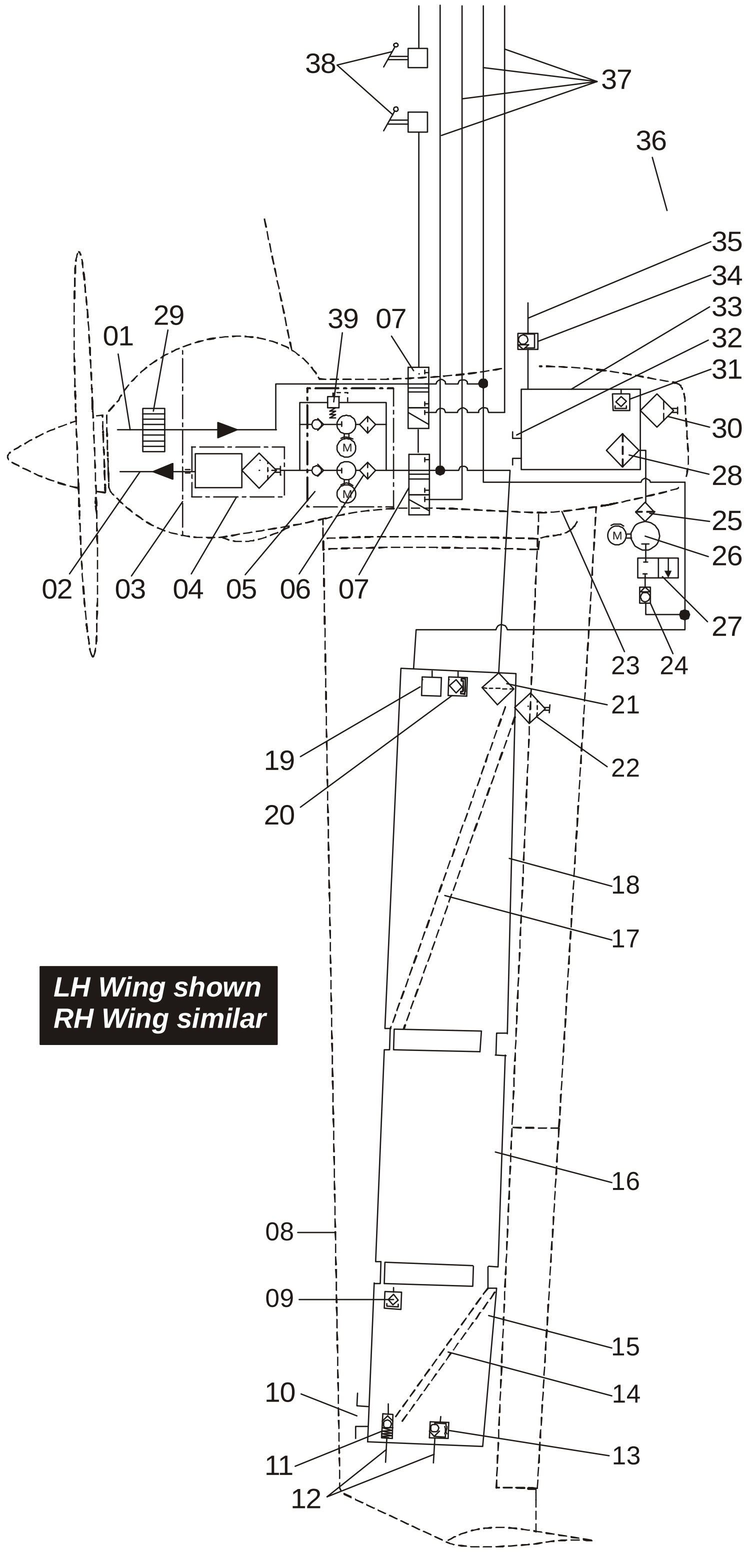


Figure 2: Fuel Distribution System Schematic With Auxiliary Tanks (OÄM 42-056 and MÄM 42-600 installed)

B. Fuel Transfer Operation

When the left engine fuel transfer/shut-off valve is set to CROSSFEED the fuel for the left engine is taken from the right main fuel tank. A flexible hose from the left fuel transfer/shut-off valve connects to the supply system of the right main fuel tank. Another flexible hose connects the return port of the left fuel transfer/shut-off valve to the right return system of the right main fuel tank. The right engine fuel transfer system is designed similar.

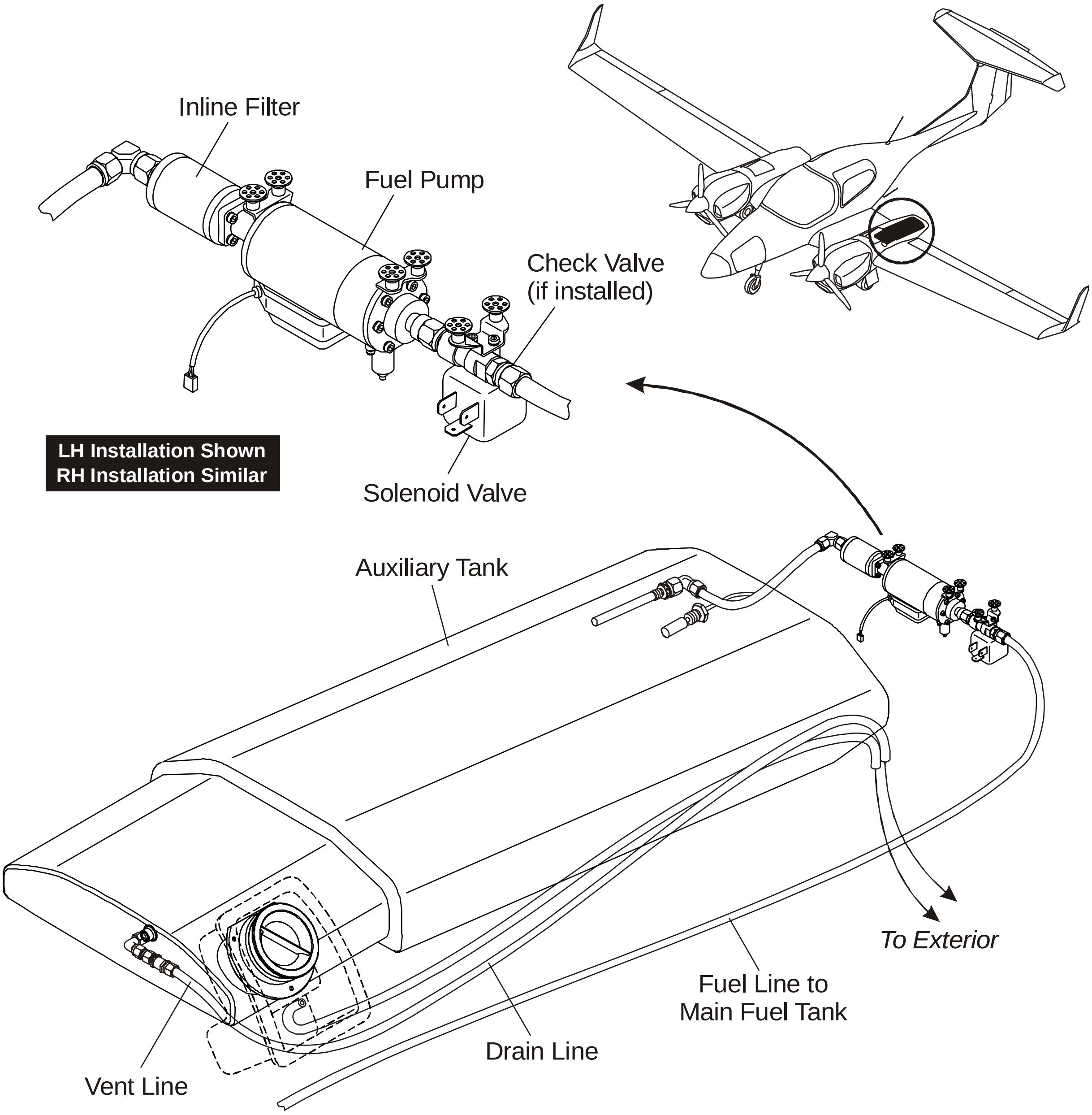


Figure 3: Auxiliary Fuel Supply to the Main Fuel Tank (if MÄM 42-600 is installed)

3. Fuel Distribution System Components

A. Flexible Hoses

The fuel system uses synthetic flexible hoses. The flexible hoses in the engine compartment have integral fire-protection sleeves.

Only use approved flexible hoses in the fuel system.

B. Fuel Transfer/Shut-Off Valves

Figure 4 shows a fuel transfer/shut-off valve installation. A fuel transfer/shut-off valve is located in each engine nacelle, aft of the engine firewall. A long shaft connects the valve to a drive unit located under the cockpit floor. A lever connects the drive unit to a fuel selector lever. The selector levers for both fuel transfer/shut-off valves are mounted in the cockpit center console. Each lever has the positions:

(1) ON

If you set the engine fuel selector levers to the ON position both engines will take fuel from their related main fuel tanks. For example, the left engine will take fuel from the left main fuel tank and the right engine will take fuel from the right main fuel tank.

(2) CROSSFEED

If you set an engine fuel selector lever to the CROSSFEED position the engine will take fuel from the opposite main fuel tank. For example, if you set the left fuel selector lever to CROSSFEED and the right fuel control lever to ON then both engines will take fuel from the right main fuel tank. If you set the right fuel selector lever to CROSSFEED and the left selector lever to ON then both engines will take fuel from the left main fuel tank.

(3) SHUT-OFF

If you set an engine fuel selector to the SHUT-OFF position then the fuel supply to that engine will be shut-off and the engine will not run. Each lever has a safety guard located on the lever console to prevent accidental selection of the SHUT-OFF position. You must turn the safety guard before you can move the related fuel selector lever to the SHUT-OFF position. The other engine fuel selector lever is independent and will operate based on the selected position.

For example, if you set the left fuel selector lever to SHUT-OFF and the right fuel selector lever to ON no fuel is provided to the left engine and the right engine takes fuel from the right main fuel tank.

C. Fuel Filter Assembly

Figure 5 shows a fuel filter assembly. The fuel filter assembly is installed in the engine nacelle and is accessible through the inspection panel on the lower inboard side.

The fuel filter assembly consists of a cap which distributes the fuel into the fuel filter body. The body is an integral part which acts as fine filter and sediment trap. A drain is installed at the bottom of the sediment trap. Use this drain to drain fuel from the fuel distribution system or for drain fuel when you do a test for fuel contamination.

The filter element can be removed for replacement.

D. Low Pressure Fuel Pump Assembly

Figure 8 shows a low pressure fuel pump assembly. The low pressure fuel pump assembly is installed in the engine nacelle and is accessible through the nacelle inspection panel on the lower outboard side.

Flexible hoses connect a fuel distribution bridge which leads into two independent pre-filters. The pre-filters prevent the low pressure fuel pumps from contamination. Figure 6 shows the pre-filter assembly. The pre-filters are screwed into independent electrically powered low pressure fuel pumps. By turning the FUEL PUMP LH/RH ENGINE switch on the instrument panel to ON the fuel pumps can be powered without switching the ENGINE MASTER to ON. Check that the fuel transfer/shut-off valves are turned to position ON before switching the fuel pumps to ON. At the pressure side the fuel pumps are connected through a bridge banjo into a flexible hose.

E. Fuel Cooler

Refer to Chapter 73-00 for information about the fuel cooler installation.

F. Fuel Pressure Pulsation Damper

A fuel pressure pulsation damper is installed in the fuel supply line firewall forward between the bulkhead fitting and the engine driven high pressure fuel pump (LH and RH engine). See Figure 7.

Trouble-Shooting

1. General

The table below lists the trouble you could have with the fuel distribution system. If you have the trouble detailed in the Trouble column then read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
The airplane smells of fuel.	Hose / pipe leaking.	Examine all hoses and pipes. Replace damaged or defective components.
	Loose connection.	Examine all connections. Tighten loose connections.
	Component leaking.	Examine all components. Replace defective components.

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Maintenance Practices

1. General

This Section gives you the Maintenance Practices for the fuel distribution system. The procedures are limited to the removal/installation of the main components of the system.

Obey the safety precautions for fuel at all times.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE.

WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: DO NOT BREATHE THE FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. Remove/Install a Fuel Transfer/Shut-Off Valve

A. Remove a Fuel Transfer/Shut-Off Valve

Obey the safety precautions for fuel at all times.

	Detail Steps/Work Items	Key Items/References
(1)	Defuel the airplane.	Refer to Section 12-10.
(2)	Remove the access panels from the related engine nacelle, aft of the bulkhead that give access to the fuel transfer/shut-off valve.	Refer to Section 52-40.
(3)	Remove the engine cowlings for the related engine.	Refer to Section 71-10.
(4)	Drain the fuel from the fuel distribution system: – Set the related FUEL SELECTOR lever in the cockpit to the related engine until fuel stops draining from the fuel sediment bowl drain. – Set the related FUEL SELECTOR lever in the cockpit to the CROSSFEED position until fuel stops draining from the fuel sediment bowl drain. – Set the related FUEL SELECTOR lever in the cockpit to the SHUT-OFF position.	Use a suitable container. Use the drain valve on the fuel sediment bowl.

	Detail Steps/Work Items	Key Items/References
(5)	Disconnect these fuel connections at the fuel transfer/shut-off valve: – The fuel supply to the engine. – The fuel return from the engine. – The fuel supply from the related fuel tank. – The fuel supply from the opposite fuel tank. – The fuel return to the related fuel tank. – The fuel return to the opposite fuel tank.	Refer to Figure 4. Put caps on all the open fuel connections.
(6)	Remove the fuel transfer/shut-off valve from the bulkhead: – Remove the cotter pin from the universal joint. – Remove the 4 bolts and washers that attach the valve to the mounting bracket. – Remove the bonding wire. – Move the valve clear of the mounting bracket and pull the valve off the valve drive-tube assembly. – Move the fuel transfer/shut-off valve clear of the engine nacelle.	

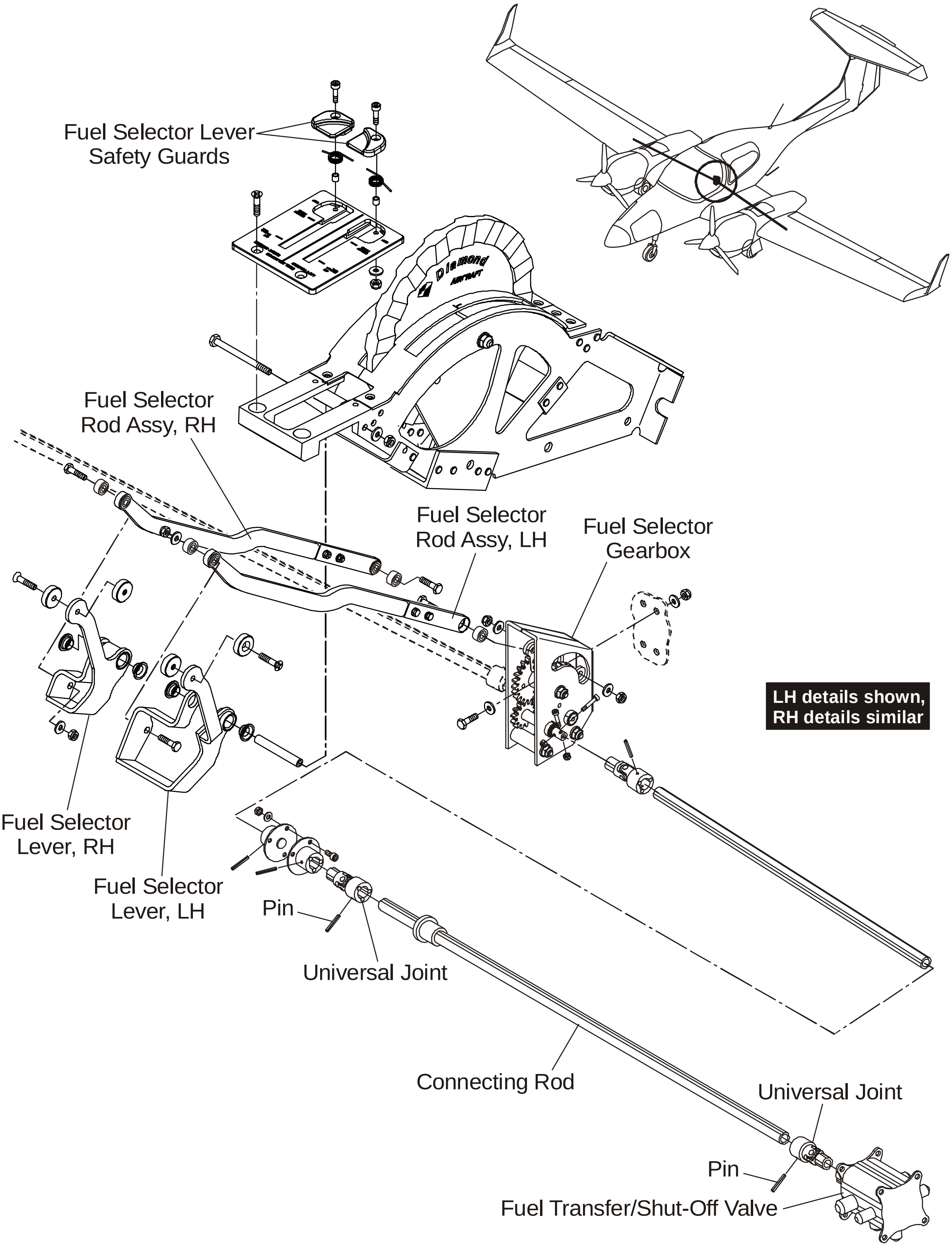

Figure 4: Fuel Transfer/Shut-Off Valve Installation (if MÄM 42-600 is installed)

B. Install a Fuel Transfer/Shut-Off Valve

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever in the cockpit is set to SHUT-OFF.	In the cockpit.
(2)	Set the fuel transfer/shut-off valve to the shut-off position.	
(3)	Install the fuel transfer/shut-off valve: – Hold the valve in the shut-off position and move the valve into position over the valve drive-tube assembly. – Install cotter pin (of universal joint). – Locate the fuel transfer/shut-off valve on the mounting bracket. – Install the 4 bolts and washers that attach the fuel transfer/shut-off valve to the bracket. – Install the bonding wire.	Seal the connection with bonding lacquer.
(4)	Connect these fuel connections at the fuel transfer/shut-off valve: – The fuel supply to the engine. – The fuel return from the engine. – The fuel supply from the related fuel tank. – The fuel supply from the opposite fuel tank. – The fuel return to the related fuel tank. – The fuel return to the opposite fuel tank.	Make sure that all the caps are removed from the connections. Make sure that all the fuel hoses are connected to the correct transfer/shut-off valve connectors.
(5)	Refuel the airplane.	Refer to Section 12-10.
(6)	Bleed both engine fuel distribution systems.	Refer to Paragraph 7.
(7)	Do a test for fuel leaks at these connections: – The inlet from the related fuel tank. – The inlet from the opposite fuel tank.	

	Detail Steps/Work Items	Key Items/References
(8)	Do a test for correct operation of the fuel transfer/shut-off valve.	Refer to Paragraph 9.
(9)	Install the access panels that you removed.	Refer to Section 52-40.
(10)	Install the engine cowlings that you removed.	Refer to Section 71-10.
(11)	Do an engine ground run up. Make sure that the fuel system operates correctly.	

3. Remove/Install the Fuel Selector Gearbox

A. Remove the Fuel Selector Gearbox

Refer to Figure 2.

	Detail Steps/Work Items	Key Items/References
(1)	Remove pilot’s and co-pilot’s seat.	Refer to Section 25-10.
(2)	Remove center console between pilot’s and co-pilot’s seat.	
(3)	Remove knobs from the fuel selector levers.	
(4)	Remove fuel selector cover plate.	
(5)	Push LH fuel selector lever into ON position.	Make sure that the fuel selector valve is engaged in the ON position.
(6)	Mark the ON position on the outer connecting rod (splined tube, which connects the fuel selector gearbox with the fuel selector valve) directly at the bushing in the fuselage wall.	
(7)	Pull fuel selector lever into CROSSFEED position.	Make sure that the fuel selector valve is engaged in the CROSSFEED position.
(8)	Mark the CROSSFEED position on the outer connecting rod directly at the bushing in the fuselage wall.	
(9)	Pull the fuel selector lever into the OFF position.	Make sure that the fuel selector valve is engaged in the OFF position.

	Detail Steps/Work Items	Key Items/References
(10)	Mark the OFF position on the outer connecting rod directly at the bushing in the fuselage wall.	
(11)	Repeat steps 5 to 10 for the RH fuel selector lever.	
(12)	Push both fuel selector levers into the ON position.	Make sure that the fuel selector valves are engaged in the ON position. This is the necessary position for adjustment when the new fuel selector valve will be installed.
(13)	Remove crash element above the fuel selector gearbox.	
(14)	Disconnect the fuel selector push rods (rods between fuel selector levers and fuel selector gearbox) directly at the fuel selector gear box.	
(15)	Disconnect the LH inner connecting rod from the outer connecting rod.	Open the three bolts at the connection element below the outer crash element.
(16)	Disconnect the RH inner connecting rod from the outer connecting rod.	Open the three bolts at the connection element below the outer crash element.
(17)	Disconnect both inner connecting rods from the fuel selector gearbox.	Open the bolts at the universal joint.
(18)	Remove the fuel selector gearbox.	Open both bolts of the attachment brackets and the two countersunk bolt which attach the fuel selector gearbox to the main spar.

B. Install the Fuel Selector Gearbox

Refer to Figure 4.

	Detail Steps/Work Items	Key Items/References
(1)	Bring fuel selector gearbox in position between the attachment brackets.	
(2)	Attach the fuel selector gearbox to both brackets with the bolts on the bottom of the gearbox.	
(3)	Attach the gearbox to the main spar.	
(4)	Connect the fuel selector push rods to the fuel selector gearbox.	
(5)	Install fuel selector cover.	
(6)	Push both fuel selector levers fully forward into the ON position.	Make sure that the length of the push rods is proper to reach the most forward position at the fuel selector gearbox. If necessary adjust the length of the push rods at the designated point. Old push rods are not adjustable. If necessary, exchange these push rods with new ones. Make sure that the fuel selector valve is engaged in the ON position. For reference use marking on the outer push rod directly at the bushing in the fuselage wall.
(7)	Exchange the drilled part of the connection element between the connecting rods with a new undrilled part.	For adjustment of the fuel selector valve positions in accordance with the fuel selector lever positions new holes must be drilled.
(8)	Connect the inner connecting rods to the fuel selector gearbox.	
(9)	Bring both parts of the LH connection element between the connecting rods into position.	
(10)	Mark the position of both parts of the connection element in relation to each other.	

	Detail Steps/Work Items	Key Items/References
(11)	Remove both parts of the connection element.	
(12)	Drill holes in the undrilled part of the connection element.	Use drilled part of the connection element in the marked position as template.
(13)	Install both parts of the connection element.	
(14)	Connect both parts of the connection element with the three bolts.	
(15)	Repeat steps 9 to 14 for the RH connection element.	
(16)	Do a functional test of the fuel selector valve.	Pull fuel selector levers into all positions. Make sure that the fuel selector valve is engaged in the respective positions using the marking at the bushing in the fuselage wall as reference.
(17)	Bond new crash element onto the fuel selector gearbox using bonding paste.	Refer to Section 51-20.
(18)	Install center console between pilot’s and co-pilot’s seat.	
(19)	Install pilot’s and co-pilot’s seat.	Refer to Section 25-10.

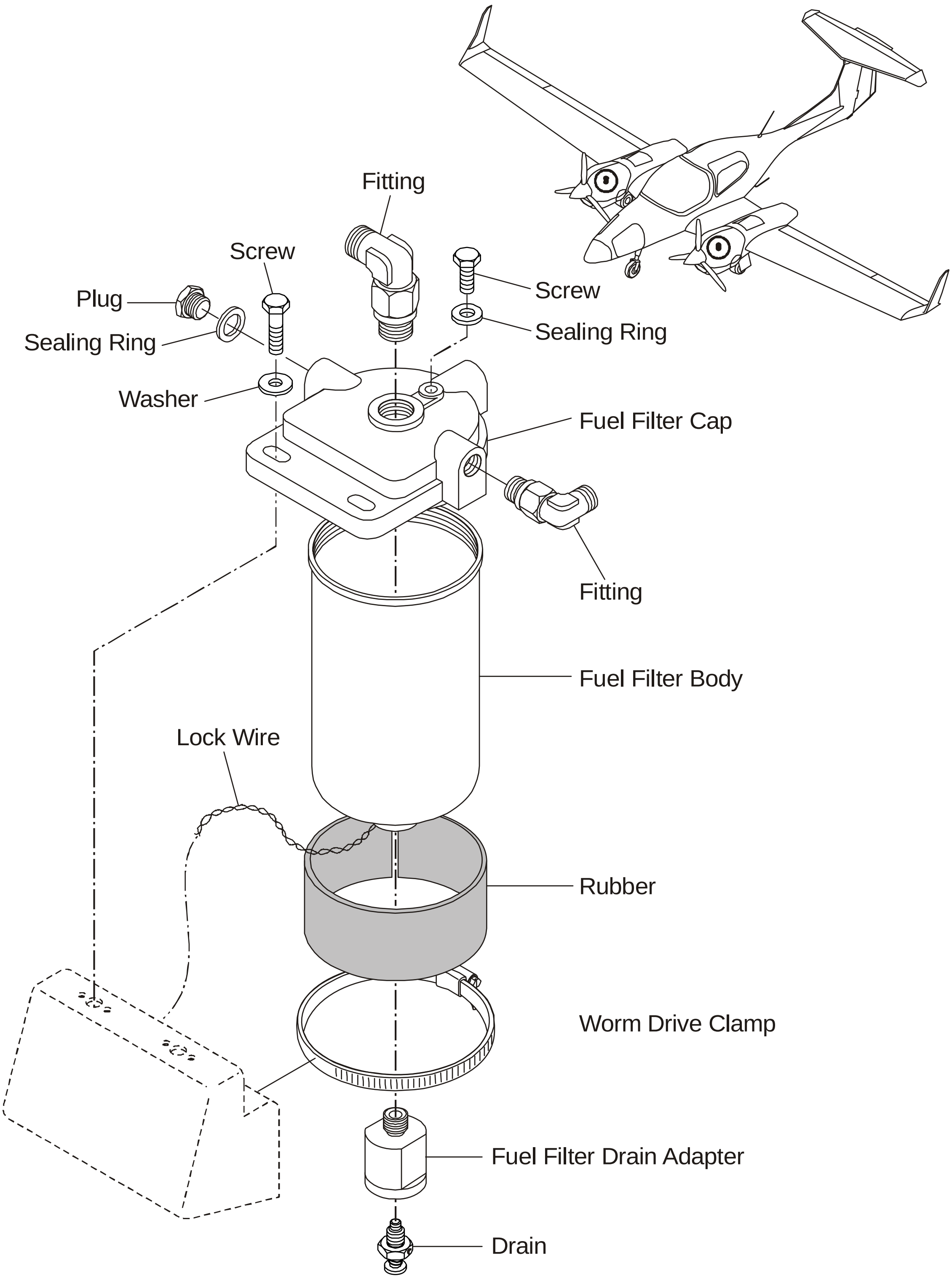

Figure 5: Fuel Filter Assembly (if MÄM 42-600 is installed)

4. Remove/Install the Fuel Filter Body

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Filter Body

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Remove the fuel filter element: – Drain the fuel from the fuel distribution system. – Remove the safety wire from the filter bowl. – Unscrew the filter body together with the drain valve assembly from the filter assembly. – Unscrew the drain valve and the drain valve adapter from the fuel filter body.	Refer to Figure 5. From the fuel sediment bowl drain. Use a suitable container to catch spilt fluid.

B. Install the Fuel Filter Body

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel filter drain adapter and the drain valve into the new filter body.	Refer to Figure 5. Use Loctite 243 on adapter to fuel filter body connection.
(2)	Install the filter body assembly into the fuel filter cap.	Make sure that the integral sealings at the new fuel filter body are not damaged.
(3)	Secure the filter body assembly via the drain valve to the filter assembly with lockwire.	

	Detail Steps/Work Items	Key Items/References
(4)	Do a test for leaks of the filter assembly: – Make sure that there is fuel in the related fuel tank. – Set the FUEL SELECTOR lever to the related tank. – Examine the filter assembly for leaks.	

5. Remove/Install the Fuel Pre-Filters

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Pre-Filters

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Pull the appropriate circuit breaker of electrically driven fuel pumps.	
(3)	Remove the fuel pre-filters: – Drain the fuel from the fuel distribution system. – Disconnect the fuel hose on the pre-filter side. – Remove the safety wire from the hollow bolts next to the pre-filters. – Remove the hollow bolts and the solid bridge next to the pre-filters. – Remove the pre-filter assemblies.	Refer to Figure 8. From the fuel filter drain. Use a suitable container to catch spilt fluid. The assemblies will contain fuel!

B. Clean the Pre-Filters

	Detail Steps/Work Items	Key Items/References
(1)	Disassemble the pre-filters.	Refer to Figure 6.
(2)	Flush the filter mesh with clean fuel.	
(3)	Replace the O-ring.	
(4)	Assemble the pre-filters.	Torque: 15 ± 2 Nm (11.1 ± 1.5 lbf.ft.).

C. Install the Fuel Pre-Filters

	Detail Steps/Work Items	Key Items/References
(1)	Install the pre-filters: – Replace all aluminium washers of the fuel pump assembly on the pre-filter side. – Install the pre-filter assembly. – Install the solid bridge and the hollow bolts. – Install the T-fitting, bypass valve and bypass fuel line. – Connect the fuel hose on the pre-filter side. – Secure the hollow bolts with safety wire.	Refer to Figure 8. Torque: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.).
(2)	Do a test for leaks of the filter assembly: – Make sure that there is fuel in the related fuel tank. – Reset the circuit breaker of the fuel pumps. – Set the FUEL SELECTOR lever to the related tank. – Examine the filter assembly for leaks while both low pressure fuel pumps are running.	

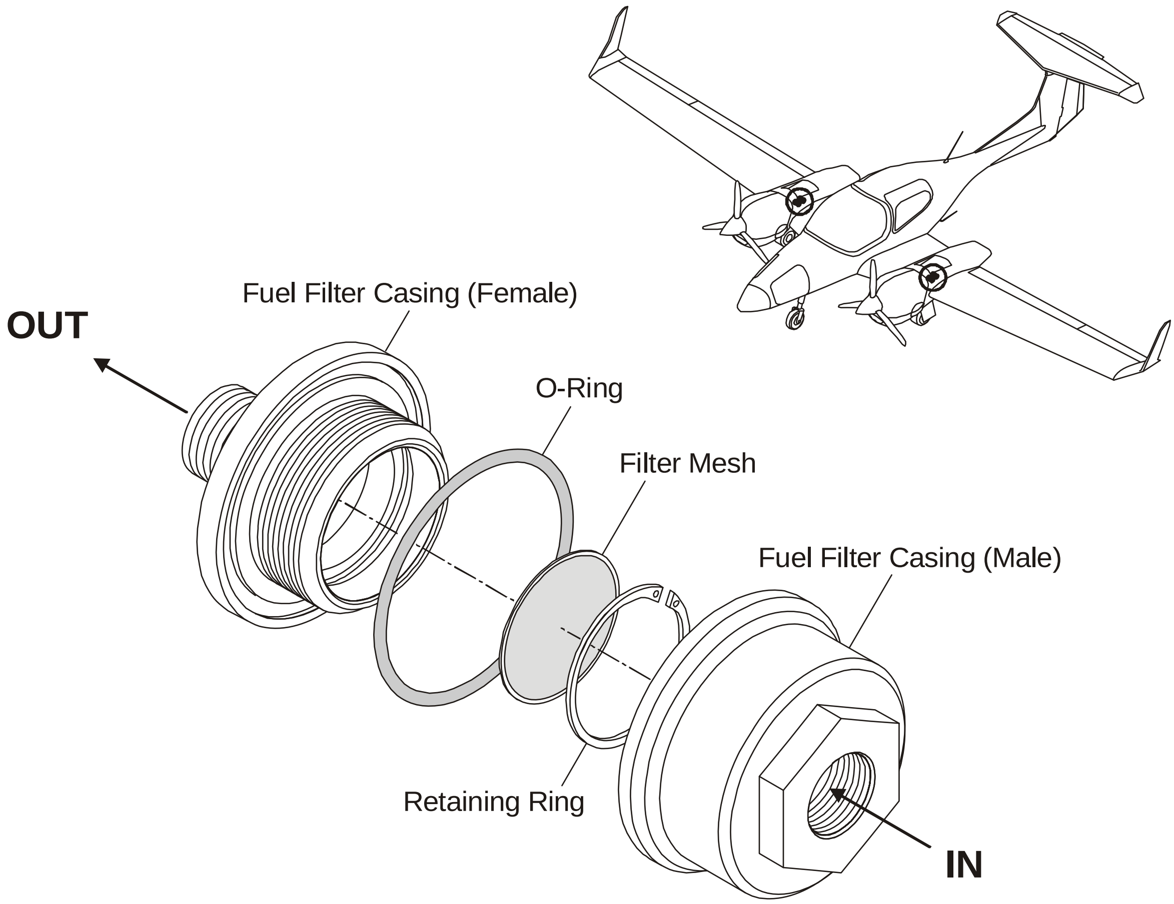

Figure 6: Fuel Pre-Filter Assembly (if MÄM 42-600 is installed)

6. Remove/Replace/Install the Fuel Pressure Pulsation Damper

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Pressure Pulsation Damper (LH or RH Engine)

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the engine is safe: – Set the ENGINE MASTER switch to OFF. – Set the ELECT. MASTER switch to OFF. – Set the power lever to 0%.	
2.	Remove the upper cowlings.	
3.	Remove the P-clamp which positions the fuel pressure pulsation damper installation.	
4.	Remove the lock wires at the lines on the fuel pressure pulsation damper housing.	
5.	Disconnect the two fuel lines which are connected to the fuel pressure pulsation damper housing.	
6.	Remove the fuel pulsation damper.	

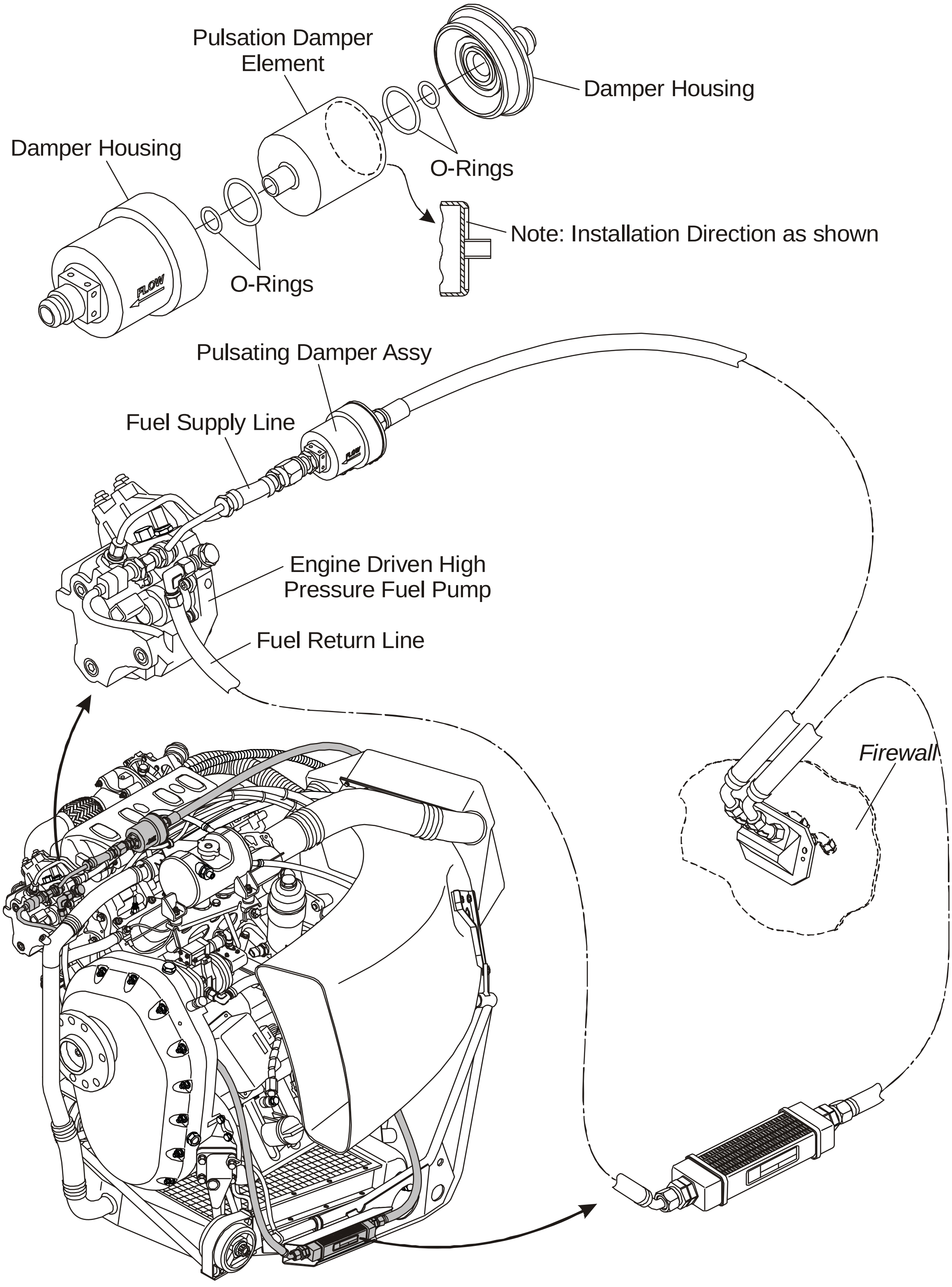

Figure 7: Fuel System Components Firewall Forward LH and RH Engine (if MÄM 42-600 is installed)

B. Replace the Fuel Pressure Pulsation Damper

	Detail Steps/Work Items	Key Items/References
1.	Remove the wire locking of the fuel pressure pulsation damper housing.	
2.	Open the fuel pressure pulsation damper housing by turning the cover counterclockwise.	
3.	Remove and discard the fuel pressure pulsation damper and the four O-rings.	
4.	Clean the inside of the fuel pressure pulsation damper housing. No contamination allowed.	Flush with fuel approved for the airplane.
5.	Install the four new O-rings.	
6.	Apply 09-25300 ‘Fuelube EZTurn 1LB’ to the outside thread and sealing surface of the fuel pressure pulsation damper housing.	
7.	Install the new fuel pressure pulsation damper in the housing. Watch out for the installation direction of the fuel pressure pulsation damper in the housing.	Refer to Figure 7.
8.	Tighten the fuel pressure pulsation damper housing.	Torque 80 ± 4 Nm (59.0 ± 2.9 lbf.ft).
9.	Secure the fuel pressure pulsation damper housing with locking wire.	

C. Install the Fuel Pressure Pulsation Damper Housing Assy

	Detail Steps/Work Items	Key Items/References
1.	Flush the fuel pressure pulsation damper assy with fuel approved for the airplane. No contamination allowed.	
2.	Connect the fuel pressure pulsation damper housing to the fuel supply lines and secure with locking wire. Watch out for the flow direction (arrow).	
3.	Install the P-clamp and mount the fuel pressure pulsation damper assy to the engine.	
4.	Install the upper cowlings.	
5.	Conduct an engine ground run.	
6.	Inspect the airplane for fuel leakage.	

7. Remove/Install the Low Pressure Fuel Pumps

Obey the safety precautions for fuel at all times.

A. Remove/Replace the Low Pressure Fuel Pumps

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(2)	Pull the appropriate circuit breaker of electrically driven fuel pumps.	
(3)	Remove the low pressure fuel pumps: – Remove the fuel hoses from the fuel filter assembly. – Remove the bypass valve, the bypass fuel line and the T-fitting. – Disconnect the electric wires from the electric fuel pumps. – Remove the fuel pump assembly from the bracket. – Remove the hollow bolts, the solid bridge, and the two pre-filters from the bottom of the fuel pump assembly. – Remove the safety wires from plug nuts. – Remove the two plug nuts, the solid bridge and two check valves from the top of the fuel pump assembly.	Refer to Figure 8.
(4)	Replace fuel pumps and inspect / clean pre-filters.	Refer to Chapter 05.
(5)	Replace aluminium washers.	
(6)	Check hollow bolts and bridges for damage.	Replace damaged items!

B. Install Low Pressure Fuel Pumps

	Detail Steps/Work Items	Key Items/References
(1)	Install the low pressure fuel pump assembly: – Install the aluminum washers (new), the two pre-filters, the solid bridge, and the two hollow bolts. – Install the washers, the two check valves, the solid bridge, and the two plug nuts. – Secure plug nuts and hollow bolts with safety wire. – Install the T-fitting, the bypass valve and the bypass fuel line. – Install the fuel pumps assembly to the bracket. – Connect the electric wires to the fuel pumps. – Connect the fuel hoses to the bypass valve and the T-fitting.	Refer to Figure 8. Hollow bolts torque: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.) Plug nuts torque: 18 ± 2 Nm (13.3 ± 1.5 lbf.ft.)
(2)	Do a test for leaks of the filter assembly: – Make sure that there is fuel in the related fuel tank. – Reset the circuit breaker of the fuel pumps. – Set the FUEL SELECTOR lever to the related tank. – Examine the filter assembly for leaks while both low pressure fuel pumps are running.	

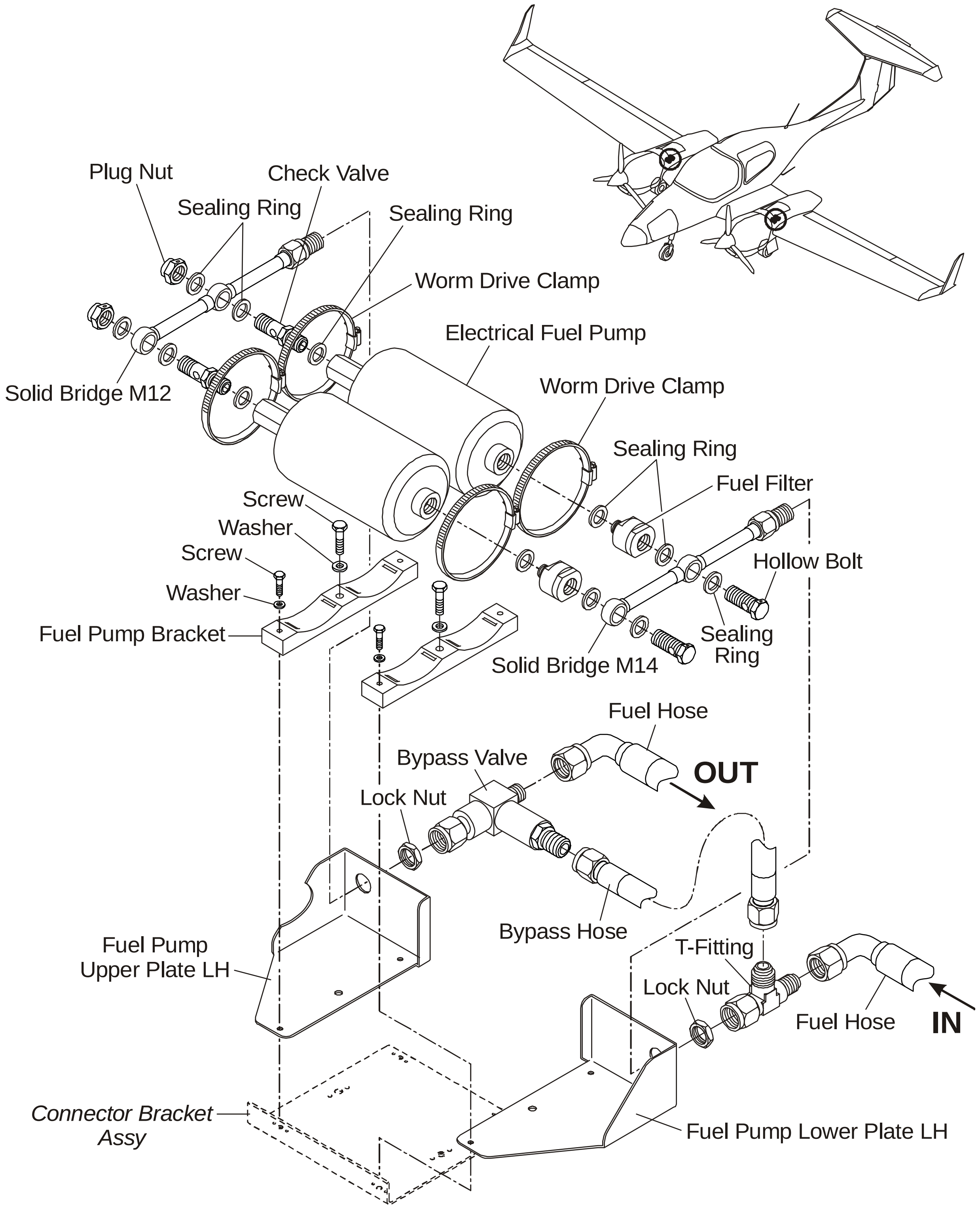

Figure 8: Fuel Pumps Assembly (if MÄM 42-600 is installed)

8. Test the Solenoid Valve/Check Valve in the Fuel Transfer Line (If Auxiliary Tanks Installed)

Obey the safety precautions for fuel at all times.

CAUTION: YOU MUST REPLACE THE CHECK VALVE IF THE TEST FAILS.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that there is no fuel in the related main fuel tank.	
(2)	Top off the auxiliary fuel tank.	
(3)	Disconnect the fuel transfer line from the check valve.	Put a cap on the fuel line.
(4)	Check for any leakage from the check valve.	If leakage is observed: replace solenoid valve and check valve.
(5)	Disconnect cap from the check valve and reconnect the fuel transfer line to the check valve.	
(6)	Check for leakage while operating the auxiliary fuel pump.	If leakage is observed replace relevant fittings and hoses.

9. Test the Crossfeed Position of a Fuel Selector Valve

	Detail Steps/Work Items	Key Items/References
(1)	Do the preparation for an engine test.	Refer to Section 71-00.
(2)	Start the related engine.	On the side of the fuel selector valve that you want to test. Refer to Section 71-00. Make sure that the fuel selector valve is in the ON position.
(3)	Set the fuel selector valve that you want to test in the CROSSFEED position.	
(4)	Let the engine idle for 1 minute.	Refer to Section 71-00.
(5)	Set the related power lever to 100% after engine warm up and keep this position for 1 minute.	Keep the engine temperature in view. Do not continue the test if the engine temperature rises too high.
(6)	Make sure that the engine does not stop.	If the engine stops, then the CROSSFEED system is defective. Correct the fault and do the test again.
(7)	Shut down the engine.	Refer to Section 71-00.

10. Remove/Install an Inline Filter

Obey the safety precautions for fuel at all times.

A. Remove an Inline Filter

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the auxiliary fuel tank is empty.	Defuel and drain the auxiliary fuel tank.
(2)	Remove the auxiliary fuel tank access panel from the engine nacelle: – Remove the 8 screws that attach the access panel to the nacelle. – Disconnect the vent line and the drain line (coming from the drip tray) from the connectors on the access panel. – Move the access panel clear of the nacelle.	
(3)	Disconnect the fuel transfer line from the inline fuel filter.	
(4)	Remove the inline filter from the auxiliary fuel pump.	

B. Install an Inline Filter

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel filter to the auxiliary fuel pump inlet.	
(2)	Connect the fuel transfer line to the auxiliary fuel filter.	
(3)	Refuel the auxiliary fuel tank.	Fill more than 2 US gal (7.6 l) of fuel into the auxiliary tank.
(4)	Perform a test of the auxiliary fuel transfer system.	Refer to Paragraph 11.
(5)	Check auxiliary fuel tank assembly for leakage.	
(6)	Install the auxiliary fuel tank access panel to the engine nacelle: – Move the access panel in place on the nacelle. – Connect the vent line and the drain line (coming from the drip tray) to the connectors on the access panel. – Install the 8 screws that attach the access panel to the nacelle.	

11. Test the Auxiliary Fuel Transfer System

A. Equipment

Item	Quantity	Part Number
Ground power supply.	1	-
Stopwatch.	1	Commercial.

B. Procedure

Obey the safety precautions for fuel at all times.

CAUTION: YOU MUST REPLACE THE INLINE FILTER IF THE TEST FAILS.

	Detail Steps/Work Items	Key Items/References
(1)	Connect the airplane to ground power.	
(2)	Defuel the auxiliary tank using the auxiliary fuel transfer pump.	On the side of the auxiliary fuel system that you want to test. Make sure that the corresponding main tank is empty enough to hold the auxiliary fuel. The auxiliary fuel pump must stop due to the auxiliary tank empty switch.
(3)	Fill 2 US gal (7.6 l) of fuel into the auxiliary fuel tank.	
(4)	Measure transfer time for transferring the 2 US gal (7.6 l) of fuel from the auxiliary tank into the main tank.	The auxiliary fuel pump must stop due to the auxiliary tank empty switch. Measure time from switching on the fuel pump until the fuel transfer stops due to the auxiliary tank empty switch. The transfer time must not be more than 4 min. Check if the corresponding main tank fuel quantity indication increases.
(5)	Repeat steps 2 thru 4 for the other auxiliary fuel transfer system.	

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Section 28-40
Fuel Indicating

1. General

This Section tells you about the fuel indicating systems of the DA 42 NG. Refer to Section 28-00 for the general data on the fuel system.

2. Description

Figure 1 shows the main components of the fuel indicating systems. The DA 42 NG has these fuel system indications which are displayed on the integrated cockpit system (ICS) display.

– Fuel quantity. Fuel level probes are installed in the inboard and outboard fuel chambers of both the left and right main fuel tank assemblies.

– Fuel temperature. Fuel temperature probes are installed on the inboard end of each inboard fuel chamber.

– Fuel low-level. Fuel low-level sensors are installed on the inboard end of each inboard fuel chamber.

The fuel quantity in the auxiliary fuel tanks (optional equipment, OÄM 42-056) is not indicated.

3. Operation

A. Fuel Quantity

As the fuel level in the fuel tanks decreases, the area of the fuel probes which are ‘wetted’ with fuel also decreases. The amount of ‘wetted’ area of each tank probe is converted into electrical signals which set the fuel quantity indication which is displayed on the ICS. The fuel quantity indication shows the amount of fuel in the left fuel tank and the right fuel tank. The display shows the fuel quantities in US gallons.

Electrical cables connect the fuel probes to the ICS. Refer to Section 31-40 for more data about the ICS.

B. Fuel Temperature

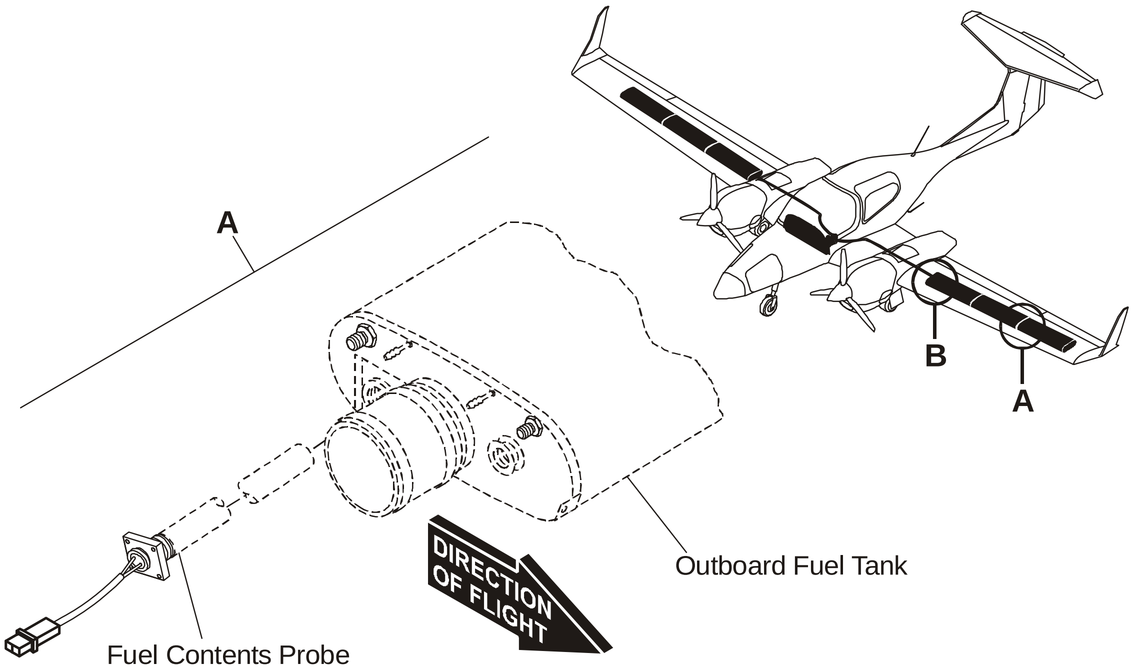
The electrical resistance of the fuel temperature probes change with temperature. This change of electrical resistance is used to set the fuel temperature indications shown on the ICS. Electrical cables connect the fuel temperature probes to the ICS.

The display shows the temperature of the fuel in the left main fuel tank and in the right main fuel tank. The temperature is given in °C.

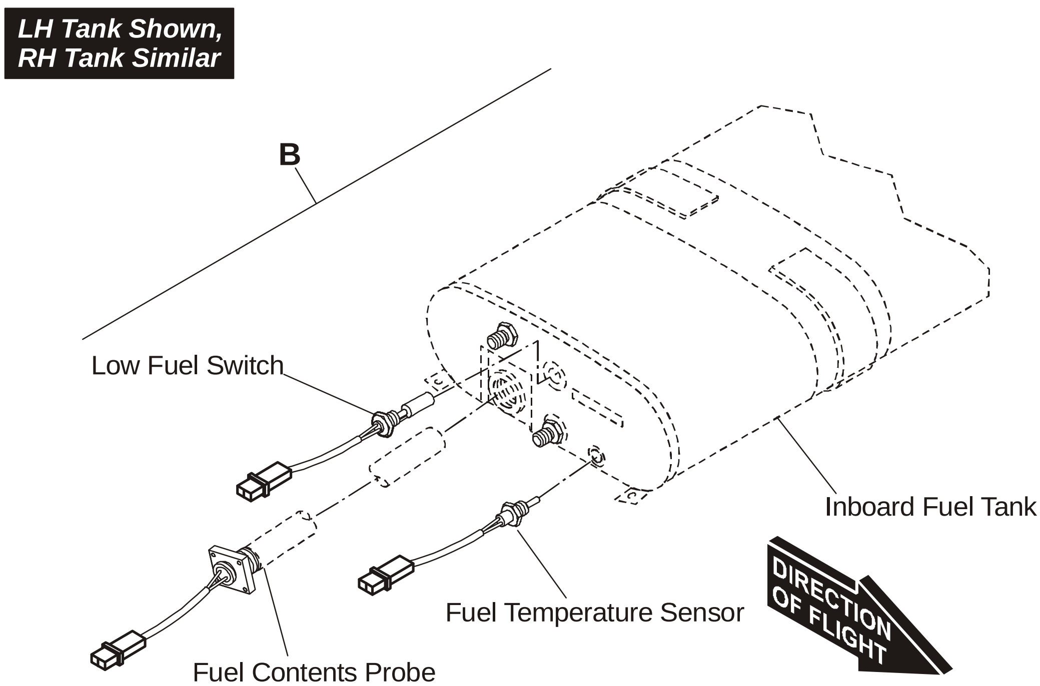
C. Fuel Low-Level

The fuel low-level sensors are float-type switches. When the fuel in the fuel tank falls to 11 to 15 liter (3 to 4 US gal) the float operates a micro-switch. The micro-switch operates an electrical circuit which gives a L/R FUEL LOW caution on the ICS.

Electrical cables connect the fuel low-level switches to the ICS. Refer to Section 31-40 for more data about the ICS.



VIEW ON INBOARD END OF LEFT OUTBOARD FUEL TANK



VIEW ON INBOARD END OF LEFT INBOARD FUEL TANK

Figure 1: Fuel Indicating System Components

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Trouble-Shooting

1. General

The table below lists the defects you could have with the fuel indicating systems of the DA 42 NG. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Fuel quantity for one tank incorrect, other tank reads correctly.	Fuel probe unit in fuel tank defective/contaminated.	Defuel/refuel the related fuel tank to flush the fuel probe. Rock the wings during defueling several times. This will flush the water out of the fuel quantity probe. Repeat defueling / refueling until the fuel quantity probe indicates correct values. If the indication is still incorrect after the third attempt, replace the fuel probe(s).
	Fuel quantity indicating system wiring defective.	Do a test of the fuel quantity indicating system wiring. Refer to Chapter 92-00 for the wiring diagrams.
Fuel quantity indication on both tanks incorrect.	Fuel quantity display on ICS defective.	Refer to the ICS manufacturer’s manual.
Fuel temperature indication in one tank incorrect.	Temperature probe defective.	Replace the temperature probe in the related fuel tank.
	Fuel temperature wiring defective.	Do a test of the fuel temperature indicating system wiring. Refer to Chapter 92-00 for the wiring diagrams.
Fuel temperature indication in both fuel tanks incorrect.	Fuel temperature display on ICS defective.	Refer to the ICS manufacturer’s manual.

Trouble	Possible Cause	Repair
Fuel low level warning fails to operate in one fuel tank.	Fuel low level switch defective.	Replace the related fuel low-level switch.
	Fuel low level warning wiring defective.	Do a test of the fuel low-level warning system wiring. Refer to Chapter 92-00 for the wiring diagrams
Fuel low-level warning fails to operate in both fuel tanks.	Fuel low level caution on ICS defective.	Refer to the ICS manufacturer's manual.

Maintenance Practices

1. General

The Maintenance Practices in this Section tell you how to replace a fuel tank probe, a fuel tank temperature sensor and a fuel tank low-level warning switch.

Refer to Section 31-40 for more data about the related indicator.

Obey the safety precautions for fuel at all times.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE.

WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: DO NOT BREATHE THE FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. Remove/Install a Fuel Quantity Probe

The inboard and outboard chambers of each main fuel tank assembly has a fuel quantity probe.

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Quantity Probe

	Detail Steps/Work Items	Key Items/References
(1)	Remove the outer wing section that has the fuel quantity probe(s) that you will remove, and support the wing on trestles.	Refer to Section 57-10.
(2)	Remove the access panel from the wing root rib.	
(3)	Remove the fuel tank assembly from the outer wing section.	Refer to Section 28-10.
(4)	Remove the fuel quantity probe from it mounting: – Remove the lockwire from the probe. – Unscrew the probe from the fuel tank.	

B. Install a Fuel Quantity Probe

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel quantity probe into the fuel chamber: – Apply sealant to the thread of the fuel quantity probe. – Install a new O-ring seal. – Carefully move the probe into position into the guide tube in the fuel chamber and engage the screw thread. – Turn the probe clockwise, by hand, until the fuel quantity probe is fully engaged in its mount. – Tighten the fuel quantity probe until the O-ring seals.	Use Loctite 243 similar. Make sure that the fuel quantity probe is correctly located.
(2)	Install the fuel tank assembly into the outer wing section.	Refer to Section 28-10.
(3)	Install the outer wing section onto the airplane.	Refer to Section 57-10.
(4)	Refuel the airplane and examine the fuel quantity probe installation for leaks.	

3. Remove/Install a Fuel Temperature Sensor

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Temperature Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Remove the outer wing section that has the fuel temperature sensor that you will remove, and support the wing on trestles.	Refer to Section 57-10.
(2)	Remove the access panel from the wing root rib: – Remove the 11 nuts and washers that attach the access panel to the root rib. – Move the access panel clear of the root rib.	
(3)	Unscrew the temperature sensor from the mounting boss and pull the sensor clear of the tank.	Install a blank on the open tank connector.
(4)	Remove and discard the seal from the sensor.	

B. Install a Fuel Temperature Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Install a new seal onto the temperature sensor.	
(2)	Screw the temperature sensor into the mounting boss on the fuel tank.	Remove the blanking cap. Make sure that the seal is seated correctly.
(3)	Install the access panel in the wing root rib: – Move the access panel into position over the studs in the wing root rib. – Install the 11 washers and nuts that attach the access panel to the wing root rib.	
(4)	Install the wing onto the airplane.	Refer to Section 57-10.
(5)	Refuel/transfer fuel into the fuel tank assembly for which you installed the temperature sensor.	
(6)	Bleed the fuel system.	Refer to Section 28-20.
(7)	Do a test for fuel leaks at the temperature sensor that you replaced.	
(8)	Do a test for the correct operation of the related fuel temperature sensor: – Set the ELECT. MASTER switch to ON. – Set the ELECT. MASTER switch to OFF.	Monitor the multi function display screen of the ICS. The fuel temperature indications must both indicate the ambient temperature.

4. Remove/Install a Fuel Low-Level Sensor

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Low-Level Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Defuel the main fuel tank related to the fuel low level switch that will be removed.	Refer to Section 12-10.
(2)	Remove the wing.	Refer to Section 57-10.
(3)	Remove the access panel from the wing root rib: – Remove the 11 nuts and washers that attach the access panel to the root rib. – Move the access panel clear of the root rib.	
(4)	Unscrew the fuel low-level sensor from the inner tank chamber.	

B. Install a Fuel Low-Level Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Screw the low-level sensor into the inner tank chamber. Use Loctite 243.	Make sure the arrow on the wrench face of the low-level sensor is pointing DOWN.
(2)	Install the access panel in the wing root rib: – Move the access panel into position over the studs in the wing root rib. – Install the 11 washers and nuts that attach the access panel to the wing root rib.	
(3)	Install the wing.	Refer to Section 57-10.
(4)	Refuel/transfer fuel into the fuel tank assembly for which you installed the low-level sensor. Monitor the ICS alert panel and: – Note the fuel level indication at which the related L/R FUEL LOW caution goes out. – Stop the refuel/transfer. – Transfer fuel out from the related fuel tank. – Note the fuel level indication at which the related L/R FUEL LOW caution comes ON.	If the L/R FUEL LOW caution is on. The level at which the caution comes on must be at the level given in the Airplane Flight Manual.
(5)	Make sure there are no fuel leaks, especially around the replaced fuel low-level sensor.	

5. Remove/Install a Fuel High-Level Shut-Off Sensor

Obey the safety precautions for fuel at all times

A. Remove a Fuel High-Level Shut-Off Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Defuel the main fuel tank related to the fuel high-level shut-off sensor that will be removed.	Refer to Section 12-10.
(2)	Remove the wing.	Refer to Section 57-10.
(3)	Remove the main fuel tank assembly.	Refer to Section 28-10.
(4)	Unscrew the fuel high-level shut-off sensor from the outer tank chamber.	

B. Install a Fuel High-Level Shut-Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Install a new seal onto the fuel high-level shut-off sensor.	
(2)	Screw the high-level shut-off sensor into the mounting boss on the fuel tank.	Remove the blanking cap. Make sure that the seal is seated correctly and that the arrow on the wrench face of the high-level shut-off sensor is pointing DOWN.
(3)	Secure the high-level shut-off sensor with lock-wire.	
(4)	Install the main fuel tank assembly.	Refer to Section 28-10.
(5)	Install the wing onto the airplane.	Refer to Section 57-10.
(6)	Bleed the fuel system. If necessary refuel or transfer a small amount of fuel into both fuel tanks.	Refer to Section 28-20.
(7)	Refuel/transfer fuel into the fuel tank assembly for which you installed the low-level sensor. Monitor the ICS alert panel and:	
	– Note the fuel level indication at which the related L/R FUEL LOW caution goes out.	If the L/R FUEL LOW caution is on.
	– Stop the refuel/transfer.	
	– Transfer fuel out from the related fuel tank.	
	– Note the fuel level indication at which the related L/R FUEL LOW caution comes ON.	The level at which the caution comes on must be at the level given in the Airplane Flight Manual.
(8)	Do a test for fuel leaks. Specially around the fuel high-level shut-off sensor that you replaced.	

CHAPTER 29

HYDRAULIC POWER

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CHAPTER 29

HYDRAULIC POWER

Section 29-10

Main Hydraulic Power

Trouble-Shooting

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CHAPTER 29
HYDRAULIC POWER

1. General

This Chapter tells you about the hydraulic system of the DA 42 NG. It gives you the system description. It also gives you the trouble-shooting data and tells you how to remove and install the main components of the hydraulic system.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

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Section 29-10
Main Hydraulic Power

1. General

Use these procedures to maintain the hydraulic system of the DA 42 NG. The Trouble-Shooting section provides information about possible causes and repair procedures.

2. Description

The hydraulic main unit contains all components which are necessary to produce the hydraulic power for the DA 42 NG. It consists of the hydraulic pump, the hydraulic fluid tank, the hydraulic main control block and the hydraulic accumulator.

The hydraulic main unit is shown in Figure 1.

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Trouble-Shooting

1. General

Trouble	Possible Cause	Repaired Items/References
Landing gear is not retracting.	Dump valve is not closed (hydraulic short circuit).	Close the dump valve. Tighten the hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.). See Figure 1.
CAUTION: DO NOT OPERATE THE HYDRAULIC MAIN PUMP WITH LOW FLUID LEVEL IN THE HYDRAULIC PUMP.		
	Fill quantity of hydraulic reservoir is too low. Pump draws air and runs with high speed.	Check the fill quantity of the hydraulic reservoir. Replenish the hydraulic reservoir with fluid. Refer to Section 29-10 (check reason of fluid leakage).
	Bottom solenoid valve is not switching. – No voltage supply on the solenoid valve. – Solenoid valve does not switch, power is switched on and off.	 Check fuses, power supply and cables. Replace solenoid valve. Refer to Section 29-10.
	Solenoid valves are not fully closing. Leakage caused by dirt or low supply voltage.	High rate of re-pump cycles or permanent operation of the pump. Check power supply and solenoid valves. Replace solenoid valve. Refer to Section 29-10.

Trouble	Possible Cause	Repaired Items/References
	Hydraulic pump is not working (landing gear is moving until the accumulator is empty).	
	– Relay is damaged. Check if relay is switching correctly.	Replace the relay.
	– Landing gear switch damaged. Check fuses, electric power supply and cables.	Replace landing gear switch.
	– Hydraulic pump defect.	Check hydraulic pump and replace if damaged.
Landing gear is retracting too slow.	Dump valve is not fully closed (high re-pump cycles).	Close dump valve. Tighten hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.). See Figure 1.
	Poor motor/pump performance.	
	– Power supply low.	Check power supply.
	Top solenoid valve is switched ON (i.e. differential pressure mode is OFF).	
	– Electrical fault.	Check cables, connectors and power supply of the solenoid valve.
	– Mechanical fault.	Replace solenoid valve or main control block. Refer to Section 29-10.

Trouble	Possible Cause	Repaired Items/References
	Solenoid valves are not fully closing. Leakage caused by dirt or low supply voltage.	High rate of re-pump cycles or permanent operation of the pump. Check power supply and solenoid valves. Replace solenoid valve. Refer to Section 29-10.
Landing gear is not fully retracting.	Dump valve is not fully closed (high re-pump cycles).	Close dump valve. Tighten hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.). See Figure 1.
	Pressure limitation valve is not working properly. Wrong system pressure.	Check pressure limitation valve. Refer to Section 29-10. Replace pressure limitation valve. Refer to Section 29-10.
	Level of hydraulic fluid in the hydraulic reservoir is too low. Pump draws air and runs with high speed.	Check the level of the hydraulic reservoir. Replenish hydraulic reservoir, if necessary. Refer to Section 29-10 (check reason of fluid leakage).
Landing gear is not extending.	Bottom solenoid valve is not switching. – Landing gear switch defect. – Mechanical fault.	 Check power supply and cables. Replace solenoid valves. Refer to Section 29-10.

Trouble	Possible Cause	Repaired Items/References
Landing gear is extending slow and erratic.	Dump valve is not fully closed (high re-pump cycles).	Open up the dump valve fully, then close the dump valve. Tighten hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.). See Figure 1.
	Motor/Pump is not pumping enough hydraulic fluid. – Power supply low.	 Check power supply.
Hydraulic pump does not switch off after extending/retracting the landing gear.	Dump valve is not fully closed (high re-pump cycles).	Close dump valve. Tighten hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.). See Figure 1.
	Solenoid valves are not fully closing. Leakage caused by dirt or low supply voltage.	High rate of re-pump cycles or permanent operation of the pump. Check power supply and solenoid valves. Replace solenoid valve. Refer to Section 29-10.
	Pump pressure switch is damaged.	Check switching points (refer to pump pressure switch operation test). Replace pump pressure switch. Refer to Section 29-10.
	Pressure limitation valve is not working properly. Wrong system pressure.	Check pressure limitation valve. Refer to Section 29-10. Replace pressure limitation valve. Refer to Section 29-10.

Trouble	Possible Cause	Repaired Items/References
Charging time of the completely empty accumulator is too long (more than 25 sec).	Dump valve is not fully closed (high re-pump cycles).	Close dump valve. Tighten hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.). See Figure 1.
	Pre-fill pressure in hydraulic accumulator too low.	Check accumulator pressure. Refer to Section 29-10. Charge accumulator to appropriate pressure.
	Pressure limitation valve is not working properly. Wrong system pressure.	Check pressure limitation valve. Refer to Section 29-10. Replace pressure limitation valve.
	Leakage of the emergency extension block. Occurs only when retracting the landing gear.	Check Bowden cables. Replace the emergency extension block. Refer to Section 29-10.
Re-pump time of the pump is too short (less than 2 sec).	Pre-fill pressure in hydraulic accumulator too low.	Check accumulator pressure. Refer to Section 29-10. Charge accumulator to appropriate pressure.
	Pump pressure switch is damaged.	Check switching points (refer to pump pressure switch operation test). Replace pump pressure switch. Refer to Section 29 -10.

<table>
<tr><th>Trouble</th><th>Possible Cause</th><th>Repaired Items/References</th></tr>
<tr><td>Re-pump cycles are too high (more than 1 cycle per 45 min).</td><td>Dump valve is not fully closed (high re-pump cycles).</td><td>Close dump valve. Tighten hexagon socket with 6 - 10 Nm (4.4 - 7.4 lbf.ft.). Tighten counter nut with 8 Nm (5.9 lbf.ft.).

See Figure 1.</td></tr>
<tr><td rowspan="2"></td><td>Pre-fill pressure in hydraulic accumulator is too low.</td><td>Check accumulator pressure. Refer to Section 29-10.

Charge accumulator to appropriate pressure.</td></tr>
<tr><td>Solenoid valves are not fully closing.

Leakage caused by dirt or low supply voltage.</td><td>High rate of re-pump cycles or permanent operation of the pump.

Check power supply and solenoid valves.

Replace solenoid valve. Refer to Section 29-10.</td></tr>
<tr><td>Emergency extension slow or not completed.</td><td>High stream resistance in the hydraulic system.</td><td>Check hydraulic hoses for damage.</td></tr>
<tr><td colspan="3">Note: Emergency extension does not fully extend on the ground because of missing aerodynamic forces. Pull the gear backwards to extend it fully!</td></tr>
<tr><td rowspan="2"></td><td>Pressure in the hydraulic reservoir.</td><td>Open FILL plug on the hydraulic reservoir to check if pressurized.

Send reservoir to vendor.</td></tr>
<tr><td>High friction on landing gear legs and/or actuators.

Remove hydraulic actuators and move the landing gear manually.</td><td>Send hydraulic actuators to vendor (Rev. B of main gear and Rev. A of nose gear have friction optimized piston sealings). Refer to Section 32-20.</td></tr>
</table>

Maintenance Practices

1. Check the Hydraulic Fluid Level of the Hydraulic System

	Detail Steps/Work Items	Key Items/References
(1)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(2)	Charge the hydraulic accumulator: – Set the ELECT. MASTER switch to ON. – The hydraulic pump must operate until the system pressure stabilizes. – The hydraulic pump must stop operating. – Set the ELECT. MASTER switch to OFF.	Approx. 16 (+4/-3) sec with a completely empty accumulator.
(3)	Check the fluid level on the hydraulic reservoir: – The accumulator must be fully charged and the landing gear has to be fully extended. – The airplane must be even on the ground and the fluid level should be in the middle of the inspection glass.	

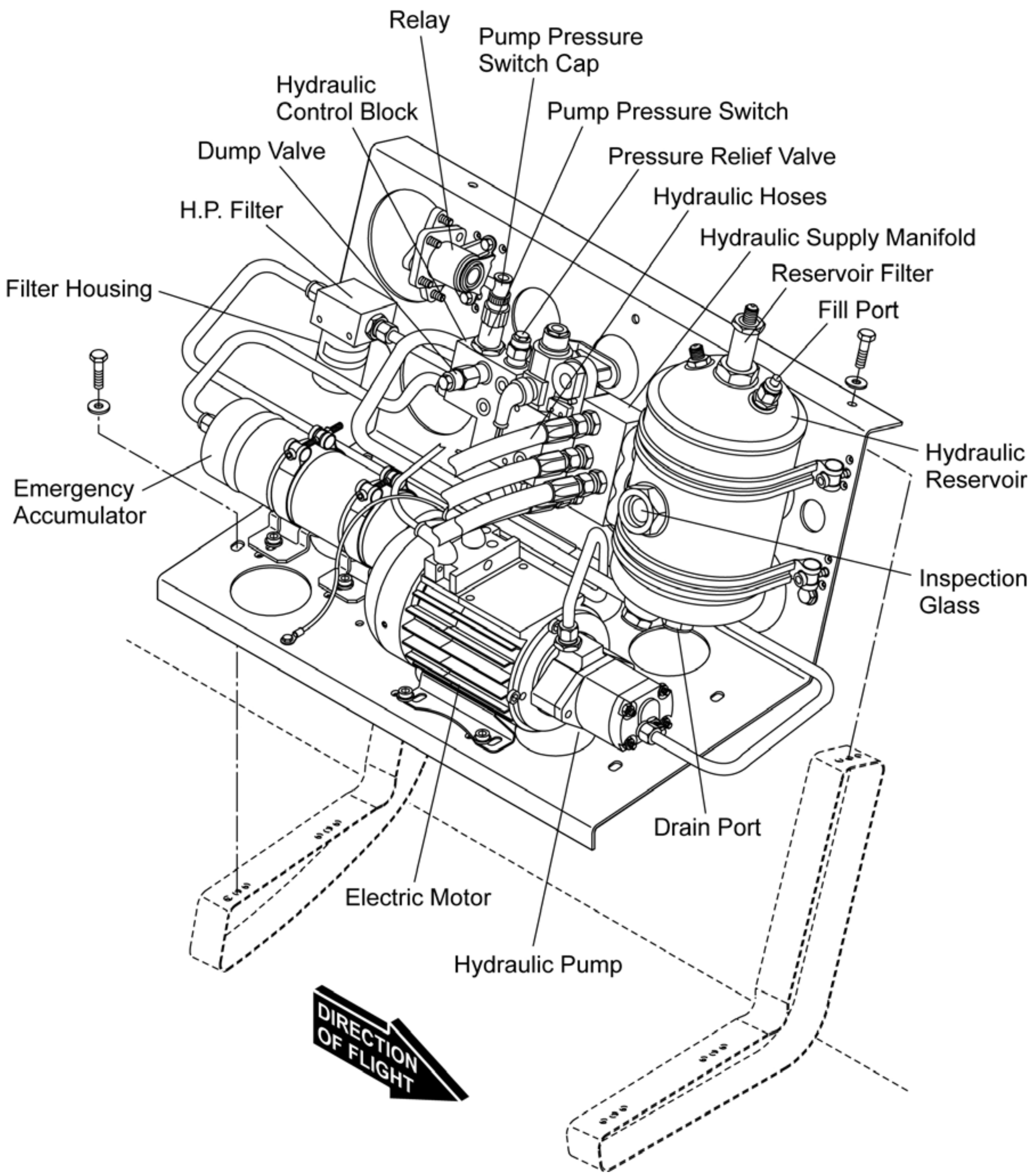

Figure 1: Hydraulic Supply and Control Assembly

2. Fluid Change of the Hydraulic System

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Pump (for emptying the reservoir).	1	Commercial.

B. Fluid Change of the Hydraulic System

WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

CAUTION: DO NOT OPERATE THE HYDRAULIC PUMP WITH LOW FLUID LEVEL. THE PUMP WILL HEAT UP AND GETS DAMAGED.

	Details Steps/Work Items	Key Items/References
(1)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Retract the landing gear.	Refer to Section 32-30.
(4)	Pull the GEAR circuit breaker.	Right side of instrument panel.

	Details Steps/Work Items	Key Items/References
(5)	Extend the landing gear with the emergency extension switch.	
(6)	Set the landing gear handle down.	
(7)	Set the emergency gear lever up.	
(8)	Get access to the hydraulic system: – Fold the rear passenger seat backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(9)	Remove the fluid from the hydraulic reservoir using a pump to suck it out.	
(10)	Replace the high pressure filter.	Refer to Section 29-10.
(11)	Maintain the hydraulic reservoir filter.	Refer to Section 29-10.
(12)	First fill / replenish the hydraulic system.	Refer to Section 29-10.
(13)	Bleed the accumulator.	Refer to Section 29-10.
(14)	Bleed the hydraulic system.	Refer to Section 29-10.
(15)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(16)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(17)	Replenish the hydraulic system, if necessary.	Refer to Section 29-10.
(18)	Check level of the hydraulic reservoir.	Refer to Section 29-10.
(19)	Repeat the last two steps until the level of the hydraulic reservoir is correct.	
(20)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear. Refer to Section 07-10.

C. Fluid Change of the Hydraulic System from Aero Shell Fluid 41 to AMG-10

	Detail Steps/Work Items	Key Items/References
(1)	Repeat the Fluid Change of the Hydraulic System procedure 3 times.	Refer to Paragraph B.
(2)	Apply the hydraulic fluid placard and mark the used fluid.	Refer to Figure 2. Mark hydraulic fluid type by punching.

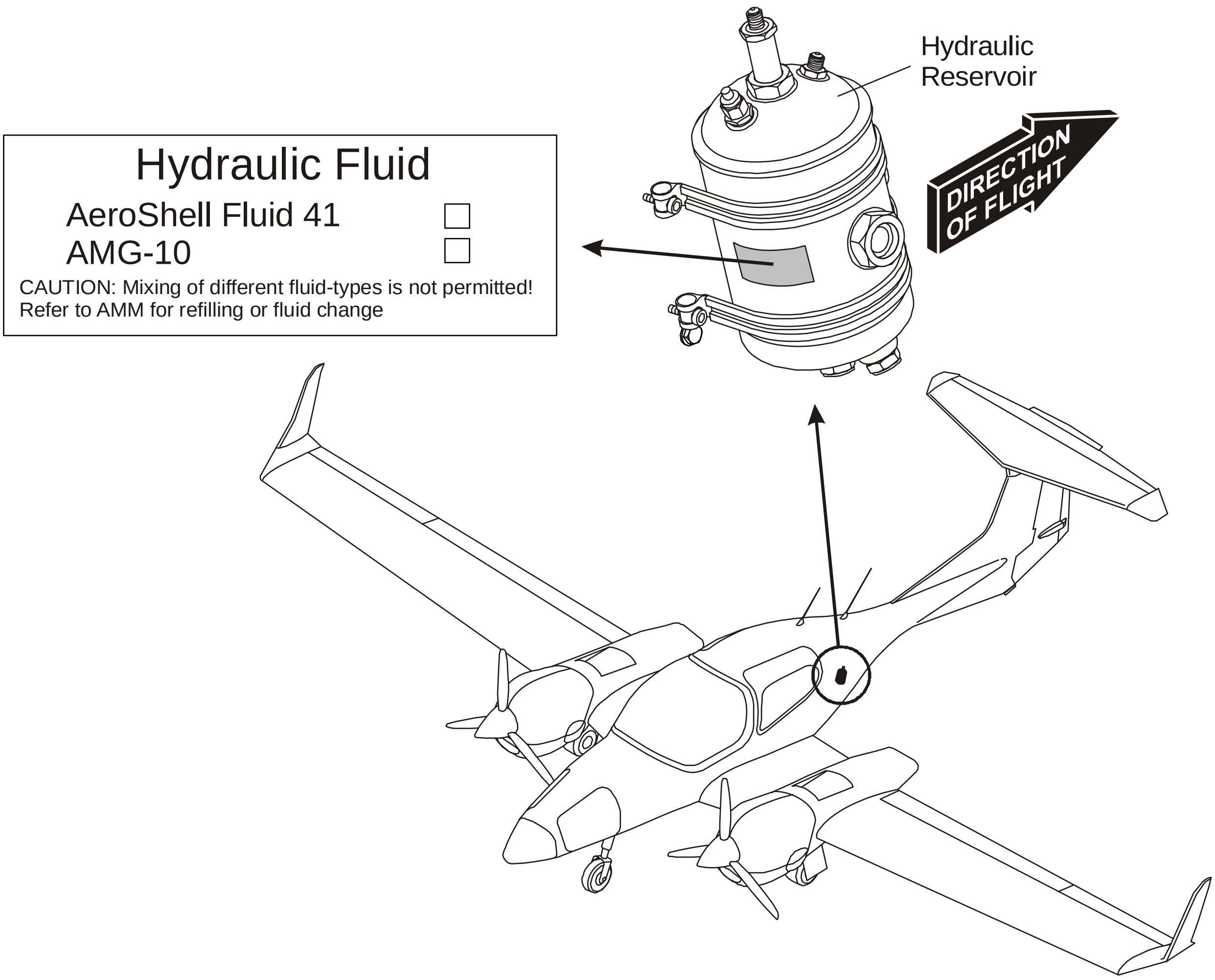

Figure 2: Position of the Hydraulic Fluid Placard

3. Depressurize the Hydraulic System

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Remove the protection cap from the MiniMess 1215 plug.	If the hydraulic system is an old revision without MiniMess 1215 contact the vendor to get it installed.
(3)	Install a test manometer on the MiniMess 1215 plug. The normal pressure should be between 95 and 120 bar (1378 to 1740 PSI).	Located on the hydraulic control block. Refer to Figure 4.
(4)	Operate the dump valve: – Remove the lock wire from the dump valve. – Loosen the counter nut. – Loosen the hexagon socket to open the dump valve. – After emptying wait 10 to 15 min until the accumulator is thermally balanced.	 Wrench size 19 mm. Wrench size 1/4 in.
(5)	Operate the pressure button on the upper solenoid valve. Located on the top of the hydraulic control block.	See Figure 4. Use a little metal pin or ball pen to operate the button.
(6)	Check the drop in pressure on the manometer.	There should be no pressure left.
(7)	Close the dump valve: – Tighten the hexagon socket to close the dump valve. – Tighten the counter nut. – Install the lock wire onto the dump valve.	 6 - 10 Nm (4.4 - 7.4 lbf.ft.), wrench size 1/4 in. 8 Nm (5.9 lbf.ft.), wrench size 19 mm.
(8)	Disconnect the test manometer from the MiniMess 1215 plug.	
(9)	Install the protection cap onto the MiniMess 1215 plug.	

4. Bleed the Hydraulic System

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Bleed the Hydraulic System

	Detail Steps/Work Items	Key Items/Reference
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
	CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.

	Detail Steps/Work Items	Key Items/Reference
(4)	Extend and retract the landing gear to bleed the system:	Refer to Paragraph 7 in Chapter 32-30. (Landing Gear Extension and Retraction Test).
	– Retract and extend the landing gear 2 to 4 times with short breaks in between.	Check the times of extending and retracting the landing gear.
	– Between the extension/retraction the dump valve should be operated 3 to 4 times to release possible air pockets.	Refer to Section 29-10.
(5)	Operate the emergency extension of the landing gear (repeat this step 1 to 2 times).	Refer to Section 29-10.
(6)	Move the wing and rear fuselage trestles clear of the airplane.	
(7)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

5. Drain Fluid from the Hydraulic System

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION:: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

CAUTION: DO NOT OPERATE THE HYDRAULIC PUMP WITH LOW FLUID LEVEL. THE PUMP WILL HEAT UP AND GETS DAMAGED.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Prepare the drain hose: – Put a container under the drain hose to collect spilt hydraulic fluid.	Use a drain hose which can be connected to the MiniMess 1215 plug Refer to Figure 4.
(4)	Install the drain hose: – Remove the protection cap from the MiniMess 1215 plug. – Install the drain hose onto the plug.	The MiniMess 1215 plug is situated on the hydraulic control block. Refer to Figure 4. If your hydraulic system is an old revision without the MiniMess 1215 plug contact the vendor to get it installed.
(5)	Reset the GEAR circuit breaker.	Right side of instrument panel.

	Detail Steps/Work Items	Key Items/References
(6)	Drain hydraulic fluid from the hydraulic system: – Turn the ELECT. MASTER switch to ON. – The hydraulic pump starts pumping and drains hydraulic fluid into the container. – Turn the ELECT. MASTER switch to OFF.	For most Maintenance Practices it's the best to drain approx. ½ liter of hydraulic fluid from the fully filled hydraulic system.
(7)	Remove the drain hose: – Remove the drain hose from the MiniMess 1215 plug. – Install the protection cap back onto the plug.	

6. Remove/Install the Relay

Note: To change the relay on an old hydraulic system contact the customer service of Diamond Aircraft.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Disconnect all electric connectors from the relay.	Remember how the cables where connected to the relay.
(4)	Remove the 2 bolts which hold the relay onto the mounting plate.	
(5)	Install the new relay with two bolts onto the hydraulic panel.	
(6)	Reconnect all electric connectors with the relay.	
(7)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(8)	Reset the GEAR circuit breaker.	Right side of instrument panel.

7. Remove/Install the Hydraulic Reservoir

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

A. Remove Hydraulic Reservoir

	Detail Steps/Work Items	Key Items/References
(1)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(2)	Depressurize the hydraulic system.	Refer to Section 29-10
(3)	Remove the hydraulic supply and control assembly.	Refer to Section 32-30.
(4)	Draining the hydraulic tank: – Remove the fill port to put a drain hose into the hydraulic tank and use a commercial pump to suck the fluid. – Remove the fluid from the hydraulic reservoir until the tank is completely empty.	

	Detail Steps/Work Items	Key Items/References
(5)	Remove the hydraulic reservoir: – Remove the intake line and the return line from the reservoir. – Put caps onto the open ends of the lines and the end fittings of the reservoir. – Remove the 4 bolts from the clamp which secure the hydraulic tank. – Then move the tank clear from the hydraulic system.	Refer to Figure 3.

B. Install the Hydraulic Reservoir

	Detail Steps/Work Items	Key Items/References
(1)	Install the hydraulic reservoir: – Move the reservoir into position. – Install the 4 bolts onto the clamp to secure the hydraulic tank. – Install the intake line and the return line onto the reservoir.	
(2)	Install the hydraulic supply and control assembly.	Refer to Section 32-30.
(3)	Replenish the hydraulic reservoir with hydraulic fluid.	Refer to Section 29-10.
(4)	Bleed the accumulator.	Refer to Section 29-10.
(5)	Bleed the hydraulic system.	Refer to Section 29-10.
(6)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(7)	Reset the GEAR circuit breaker.	Right side of instrument panel.

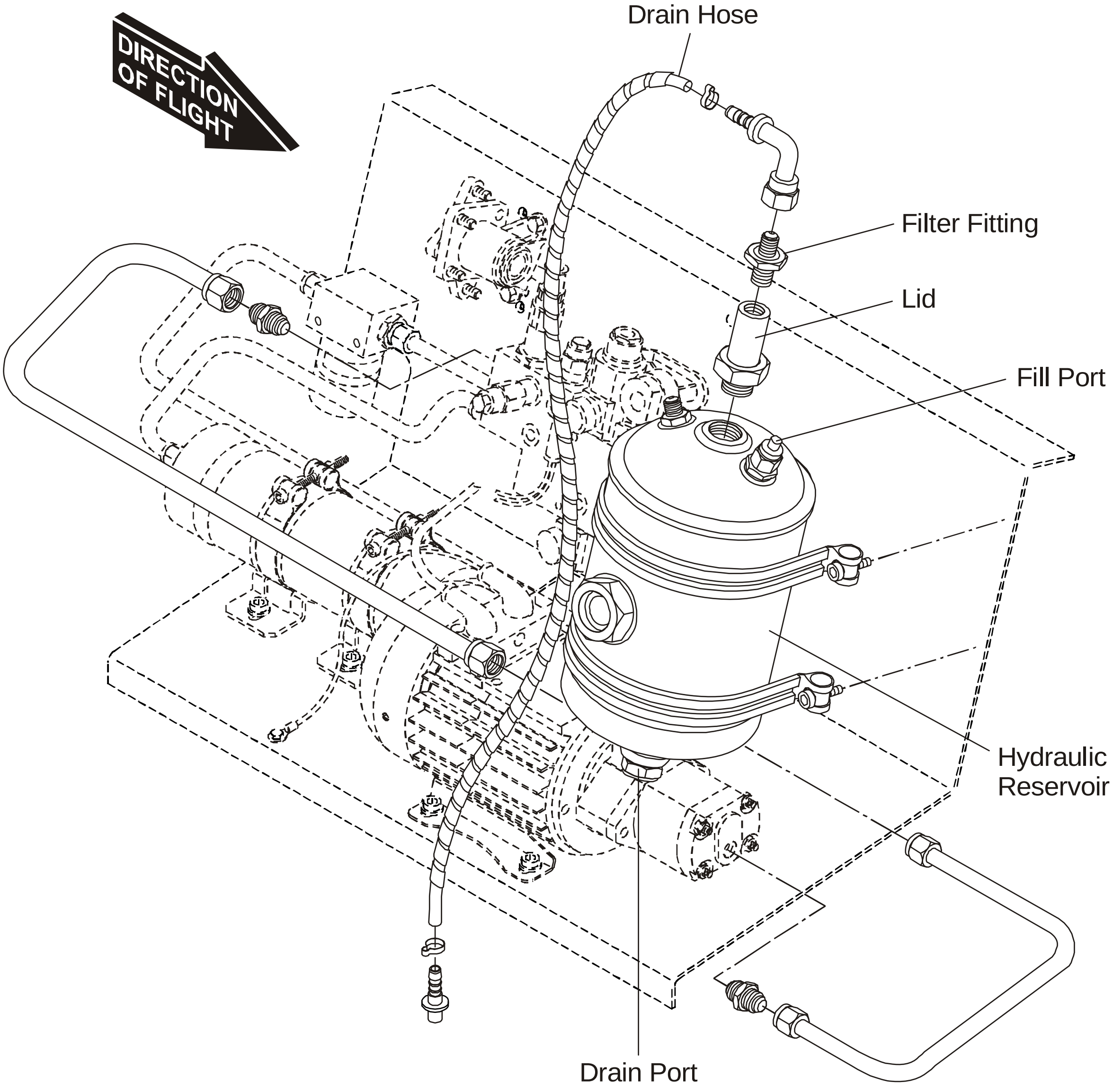

Figure 3: DA 42 NG Hydraulic Reservoir Assembly

8. Remove/Install the Hydraulic Supply and Control Assembly

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOUR SKIN OR YOUR CLOTHES. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO AIRPLANE COMPONENTS.

B. Remove the Hydraulic Supply and Control Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 7-10.
(3)	Release the hydraulic pressure from the hydraulic system:	
	– Fold the rear passenger seat-backs forward.	Refer to Section 25-10.
	– Remove the rear baggage compartment lower access panel.	Refer to Section 25-60.
	– Operate the accumulator dump-valve.	Hydraulic supply and control assembly.

	Detail Steps/Work Items	Key Items/References
(4)	Disconnect these hydraulic hoses from the hydraulic manifold:	Use a suitable container to catch spilt fluid.
	– Disconnect the 3 return hoses from the hydraulic manifold.	Fit blanking caps to all connectors.
	– Disconnect the pressure hose from the hydraulic manifold.	Fit blanking caps to all connectors.
(5)	Disconnect these electrical cables from the hydraulic supply and control assembly:	
	– Disconnect the electrical cables from the 2 solenoid valves.	At the in-line connectors.
	– Disconnect the electrical cables from the hydraulic pump pressure switch.	At the in-line connectors.
	– Disconnect the electrical cables from the hydraulic pump motor.	At the hydraulic pump electric motor. Loosen the connection by holding the lower nut and applying torque to the upper nut.
(6)	Disconnect the flexible cable from the emergency extension valve:	
	– Loosen the bolt on the cable swivel fitting.	
	– Move the cable clear of the swivel fitting.	
	– Release the cable clamp and move the cable clear of the supply and control assembly.	
(7)	Remove the hydraulic supply and control assembly:	
	– Remove the 4 bolts and washers that attach the mounting tray to the surrounding structure.	Note the location of the bonding strip connection and the earth wire.
	– Lift the complete assembly clear of the airplane. Hold the assembly level to minimize hydraulic fluid spillage.	Use a suitable container/material to catch spilt hydraulic fluid.

C. Install the Hydraulic Supply and Control Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Install the hydraulic supply and control assembly: – Move the hydraulic supply and control assembly into position in the fuselage. – Install the 4 bolts and washers that attach the hydraulic supply and control assembly mounting to the fuselage structure.	Attach the bonding strip and earth cable in the location noted in Paragraph 8 B step 7.
(2)	Connect these flexible hydraulic hoses to the hydraulic supply and control assembly: – The 3 return hoses to the hydraulic manifold. – The supply hose to the hydraulic manifold.	Make sure that all the blanking caps are removed.
(3)	Connect these electrical cables to the hydraulic supply and control assembly: – Connect the electrical cables to the hydraulic pump motor. – Connect the electrical cables to the 2 solenoid valves. – Connect the electrical cables to the hydraulic pump pressure witch.	At the hydraulic pump electric motor. Tighten the connection by holding the lower nut and applying torque to the upper nut. Torque: 9 - 11 Nm (6.6 - 8.1 lbf.ft.). At the in-line connectors. At the in-line connector.

	Detail Steps/Work Items	Key Items/References
(4)	Connect the flexible cable to the emergency extension valve: – Make sure that the emergency extension valve is in the fully closed (normal) position. – Make sure that the emergency extension control lever in the cockpit is fully forward. – Attach the flexible cable outer sheath to the mounting bracket. – Pass the flexible cable inner through the swivel fitting in the emergency extension valve operating lever and tighten the screw.	
(5)	Do a visual test for the correct adjustment of the emergency extension valve operating cable: – Set and hold the lever in the cockpit to the EMERGENCY position. – Set the lever in the cockpit to the NORMAL position.	The emergency valve at the supply and control panel must be in the emergency position. The hydraulic pump cut-out micro switch must be open. The emergency valve at the supply and control panel must be in the normal position. The hydraulic pump cut-out micro switch must be closed.
(6)	If necessary, fill the hydraulic reservoir with fluid.	Refer to Section 29-10.
(7)	If necessary, charge the hydraulic accumulator with nitrogen.	
(8)	Install the rear baggage compartment lower access panel.	Refer to Section 25-60.
(9)	Bleed the hydraulic system.	Refer to Section 29-10.
(10)	Do a test for the correct operation of the landing gear extension and retraction system.	Refer to Section 32-30.
(11)	Do a test for the correct operation of the emergency extension system.	Refer to Section 32-30.

	Detail Steps/Work Items	Key Items/References
(12)	Move the wing and fuselage trestles clear of the airplane.	
(13)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

9. Remove/Install Hydraulic Pump

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Depressurize the hydraulic system.	Refer to Section 29-10.
(4)	Drain fluid from the hydraulic system.	Refer to Section 29-10. The fluid level should be lower than the hydraulic lines of the motor-pump.
(5)	Disconnect the motor-pump: – Disconnect the two hydraulic connectors from the pump. – Put caps onto the hydraulic lines and on the pump so that no hydraulic fluid can leak. – Disconnect the electric connectors from the motor.	Refer to Figure 1. Remember which one is the plus and minus pole. Loosen the connection by holding the lower nut and applying torque to the upper nut.
(6)	Remove the motor-pump: – Remove the bolts which hold the motor-pump on the hydraulic panel. – Move the motor-pump clear from the hydraulic system.	

	Detail Steps/Work Items	Key Items/References
(7)	Install the new motor-pump: – Move the motor-pump into position. – Install the bolts which hold the motor-pump onto the hydraulic panel.	
(8)	Connect the motor-pump: – Connect the electric connectors to the motor. – Remove the caps from the hydraulic lines and the pump. – Connect the two hydraulic connectors onto the pump.	M8 nut. Tighten the connection by holding the lower nut and applying torque to the upper nut. Torque: 9 - 11 Nm (6.6 - 8.1 lbf.ft.).
(9)	If hydraulic fluid was drained, replenish the hydraulic reservoir with hydraulic fluid.	Refer to Section 29-10.
(10)	Bleed the accumulator.	Refer to Section 29-10.
(11)	Bleed the hydraulic system.	Refer to Section 29-10.
(12)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(13)	Reset the GEAR circuit breaker.	Right side of instrument panel.

10. First Fill/Replenishment of the Hydraulic System

A. Material

Item	Quantity	Part Number
CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.		
Note: If MÄM 42-495 is carried out, a placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes with MÄM 42-495 NOT installed have been manufactured with Aeroshell Fluid 41 (MIL-PRF-5606 H). The identification placard must be installed if a hydraulic fluid change to another fluid type is carried out.		
Hydraulic fluid.	As required.	Aeroshell Fluid 41 (MIL-PRF-5606 H) or AMG-10 (GOST 6794-75 Amdt 1-5), see CAUTION above.

B. Fluid Capacity

Item	Capacity
Hydraulic reservoir.	0.9 l (0.24 US gal) (mid-leve on the inspection glass)
Extended landing gear (when hydraulic actuators are retracted).	Both actuators: Approx. 0.5 l (0.13 US gal)
Accumulator.	Approx. 0.09 l (0.02 US gal)
Hoses and misc. components.	Approx. 0.25 l (0.07 US gal)
Total hydraulic system.	Approx. 1.74 l (0.46 US gal)

Note: If the level of the hydraulic reservoir differs 1 cm (0.4 inch) it equals approx. 0.12 liter (0.03 US gal) of hydraulic fluid.

C. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Hand pump.	1	P/N X11-P004.

D. First Fill/Replenishment of the Hydraulic System

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
	CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.

	Detail Steps/Work Items	Key Items/References
	CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.	
	Note: If MÄM 42-495 is carried out, a placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes with MÄM 42-495 NOT installed have been manufactured with Aeroshell Fluid 41 (MIL-PRF-5606 H). The identification placard must be installed if a hydraulic fluid change to another fluid type is carried out.	
(5)	ONLY FOR FIRST FILL: Fill the hydraulic reservoir with 1.25 liter (0.33 US gal) using a hand pump which connects to the FILL port of the hydraulic reservoir.	See Figure 3.
(6)	Reset the GEAR circuit-breaker.	Right side of instrument panel.
(7)	Charge the hydraulic accumulator: – Set the ELECT. MASTER switch to ON. – The hydraulic pump must operate until the system pressure stabilizes. – The hydraulic pump must stop operating. – Set the ELECT. MASTER switch to OFF.	Approx. 16 (+4/-3) sec with a completely empty accumulator.
(8)	Check the fluid level of the hydraulic reservoir.	Refer to Section 29-10.
	CAUTION: DO NOT FILL THE HYDRAULIC TANK FULL BECAUSE IT MAY OVERFLOW. FILL IT IN SMALL STEPS.	
(9)	Use the hand pump to replenish the hydraulic reservoir to adjust the fluid level.	
(10)	Repeat steps 8 and 9 until the fluid level of the hydraulic reservoir is correct.	
(11)	Bleed the accumulator.	Refer to Section 29-10.
(12)	Bleed the hydraulic system.	Refer to Section 29-10.

	Detail Steps/Work Items	Key Items/References
(13)	Do the normal operational test of the hydraulic system.	Refer to Section 29-10.
(14)	Move the wing and rear fuselage trestles clear of the airplane.	
(15)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

11. Tests of the Hydraulic System

A. Normal Operation Test of the Hydraulic System

(1) Charging Time of the Empty Accumulator

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	Refer to Section 25-10. Refer to Section 25-60.
(3)	Depressurize the hydraulic system.	Refer to Section 29-10.
(4)	Reset the GEAR circuit-breaker.	Right side of instrument panel.
(5)	Measure the charging time of the accumulator: – Set the ELECT. MASTER switch to ON. – Charging time of a completely empty accumulator until the electronic pump pressure switch turns it off. – Set the ELECT. MASTER switch to OFF.	16 (+4/-3) sec. (18 - 20 sec for control blocks before revision D).

	Detail Steps/Work Items	Key Items/References
	Note: The normal refill cycle is shorter (from the lower switching point to the upper switching point of the pump pressure switch). If the measured time differs significantly from the actual value, then check the prefill pressure of the accumulator.	

(2) Extending and Retracting Time of the Landing Gear

These values assume that the hydraulic system is fully bled.

Cycle	Set-point
Retracting.	7 (+2/-1) sec.
Follow-up time of the pump.	12 (+3/-2) sec, respectively 15 sec for control blocks rev. D.
Extending.	7 (+2/-1) sec.
Follow-up time of the pump.	12 (+3/-2) sec, respectively 15 sec for control blocks rev. D.
Note: Make sure to raise the airplane according to Section 07-10 and connect an external power supply according to Section 24-40 before doing this test. If the measured values accord to the set-points, the function of the “differential pressure mode for retracting” is given automatically.	

(3) Differential Pressure Mode for Retracting of the Landing Gear

	Detail Steps/Work Items	Key Items/References
(1)	Retract the landing gear.	Refer to Section 32-30.
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel. – Use a screwdriver or any magnetizable material and hold it close to the solenoid valve. – If the tool gets pulled to the valve it means it is energized and the differential mode is OFF.	 Refer to Section 25-10. Refer to Section 25-60. A magnetic testing device (P/NX11-P005) can also be used to test the solenoid valve.
(3)	In case the solenoid valve is not energized, check the micro switches in the nose landing gear bay.	Refer to Section 32-60.

(4) Internal Leak Tightness

High re-pump cycles as a result of internal leakage at the fully bled system are usually a maximum of one cycle in 2 hours.

Re-pump cycles at completely bled and thermally balanced system cycle	Set-point
Retracted landing gear.	Max. 1 cycle per hour.
Extended landing gear.	Max. 1 cycle per hour.
Note: When the system is cooling down it starts to re-pump earlier. High re-pump cycles can be caused by internal leakage in the valves or also by the piston sealing of the actuator.	

B. Emergency Operation Function Test of the Hydraulic System

(1) Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

(2) Emergency Extension Test

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
	CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Pull the GEAR circuit-breaker.	Right side of the instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Release the hydraulic pressure from the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.

	Detail Steps/Work Items	Key Items/References
(5)	Open the dump valve: – Remove the lock wire from the dump valve. – Loosen the counter nut. – Loosen the hexagon socket to open the dump valve. – After emptying wait 10-15 min until the accumulator is thermally balanced.	 Wrench size 19 mm. Wrench size 1/4 in.
(6)	Close the dump valve: – Tighten the hexagon socket to close the dump valve. – Tighten the counter nut. – Install the lock wire onto the dump valve.	 6 - 10 Nm (4.4 - 7.4 lbf.ft.), wrench size 1/4 in. 8 Nm (5.9 lbf.ft.), wrench size 19 mm.
(7)	Reset the GEAR circuit-breaker.	Right side of instrument panel.
(8)	Emergency extension: – Operate the emergency extension micro switch. (Located on the hydraulic main control block)	 This causes the solenoid valves to switch off and the landing gear extends. See Figure 4.
(9)	Retract the landing gear.	Refer to Section 32-30.
(10)	Extend the landing gear regularity.	
(11)	Move the wing and rear fuselage trestles clear of the airplane.	
(12)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

C. Leak Tightness Test of the Hydraulic System

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
	CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Pull the GEAR circuit-breaker.	Right side of the instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Retract the landing gear.	Refer to Section 32-30 (Landing Gear Extension and Retraction Test).
(5)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.

	Detail Steps/Work Items	Key Items/References
(6)	Switch to permanent differential pressure mode: – Remove the electrical plug from the upper solenoid valve.	This causes the hydraulic system to stay in differential pressure mode. Refer to Figure 4 to see the solenoid valve.
(7)	Drain fluid from the hydraulic system.	Refer to Section 29-10. This is important because when testing the hydraulic system, fluid gets pumped into the system and can cause an overflow.
(8)	Install the hand pump: – Remove the protection cap from the MiniMess 1215 plug. – Install the hand pump onto the plug.	The MiniMess 1215 plug is situated on the hydraulic control block. Refer to Figure 4. If your hydraulic system is an old revision without the MiniMess 1215 plug contact the vendor to get it installed.
	Note: Make sure to use clean hydraulic fluid with the hand pump for testing the hydraulic system. Don't overfill the hydraulic reservoir by pumping too much hydraulic fluid with the hand pump into the system.	
(9)	Adjust the pressure limitation valve of the hand pump to 190 bar (2775 PSI).	
(10)	Check for external/internal leakage: – Increase the pressure with the hand pump in the hydraulic system to 170 bar (2466 PSI). – Keep this pressure for 5 minutes and check for any pressure decrease. – Use checklist for leakage test.	The pressure should stay at 170 (+0, -5) bar (2466 [+0, -72] PSI). If the pressure drops below 165 bar (2393 PSI) and there is no external leakage visible it can be assumed that there is an internal leakage. Please contact after sales support at Diamond Aircraft. Refer to Paragraph D (Checklist for external leakage).

	Detail Steps/Work Items	Key Items/References
(11)	Check operation of the protection valve on the main control block: – Increase the pressure of the hydraulic system to >180 bar (2610 PSI). – The protection valve should open and after the valve closes and the pressure in the hydraulic system is stabilized the pressure is steady at 150 bar (2175 PSI).	Refer to Figure 4.
(12)	Move the wings and rear fuselage trestles clear of the airplane.	
(13)	Lower the airplane with the jacks. Make sure that area around the airplane is clear.	
(14)	Reset the GEAR circuit breaker.	Right side of instrument panel.

D. Checklist for External Leakage

Note: Check the hydraulic hoses on the hydraulic kit which is installed in the back of the fuselage. Also check the connections of the hoses on the hydraulic control block and on the hydraulic actuators visually for leak-tightness.

Checkpoint	Set-point
Leakage on the fittings of the hydraulic kit.	No leakage.
Leakage on the hose connections of the manifold and control block.	No leakage.
Leakage on the hose connections of the hydraulic actuators.	No leakage.
Leakage on the piston seal of the hydraulic actuator.	No drop formation allowed. Maximum a little amount of dried fluid on the cylinder head respectively on the piston rod end.

Note: After fixing a leakage on the fittings or hose connections a leak tightness test has to be done.

(1) External Leakage

In general you should check if there is any damage of the piston of the hydraulic actuator when the landing gear is retracted. (Refer to Section 32-30 Landing Gear Extension and Retraction Test). Look for scratches, bumps, grooves or any other physical damage. If there are any damages in the range of the piston seal the hydraulic actuator piston has to be replaced. (Refer to Section 29-10)

If a hydraulic actuator has a major leakage (drop formation visible) send the hydraulic actuator to the vendor for a repair.

If a hydraulic actuator has a minor leakage (a little amount of dried fluid, no drop formation) perform a detailed check.

(2) Detailed Check

Static (landing gear extended, ELECT. MASTER switch ON / set GEAR circuit breaker):

– Max. leakage 1 drop of fluid in 10 hours.

Dynamic (after 25 extend/retract cycles):

– Max. leakage 1 drop of fluid.

Note: If one of the measurements don't comply with these set-points send the actuator to the vendor for a repair. Otherwise you can continue the operation but observe the situation.

E. Pump Pressure Switch and Pressure Limitation Valve Operation Test

(1) Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Manometer to test hydraulic pressure.	1	X11-P001.

(2) Testing Procedure

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
	CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(5)	Remove the protection cap from the test plug (MiniMess 1215) located on the main control block and connect the manometer.	See Figure 4. If your hydraulic system is an old revision without the MiniMess 1215 plug contact the vendor to get it installed.
(6)	Reset the GEAR circuit-breaker.	Right side of instrument panel.
(7)	Check of the pressure limitation valve: – Landing gear fully extended. – Pump is still running to charge the accumulator.	 Set-point: 120 (+5, -0) bar (1740 [+72, -0] PSI).

	Detail Steps/Work Items	Key Items/References
	Note: The following 2 steps to test the pump pressure switch are not required if the system is working properly.	
(8)	Check closing point of the pump pressure switch:	
	– Retract the landing gear fully.	Refer to Section 32-30, Paragraph 7.
	– Operate the emergency extension lever just a little bit, so that the micro switch on the emergency extension doesn't switch but that the valve is opened a little bit.	See Figure 4.
	– The pressure on the manometer should decrease.	
	– When the pump switches on, read the manometer value.	93 ±1 bar (1349 ± 14.5 PSI).

	Detail Steps/Work Items	Key Items/References
(9)	Check opening point of the pump pressure switch:	
	– Extend the landing gear fully.	Refer to Section 32-30.
	– Open dump valve until the pump switches ON:	
	– Remove the lock wire from the dump valve.	
	– Loosen the counter nut.	
	– Loosen the hexagon socket to open the dump valve.	
	– Slowly close the dump valve so that the pressure on the manometer increases slowly.	Adjust the dump valve so that the circulation pressure is at 110 bar (1595 PSI).
	– Now wait approx. 20 sec so that the accumulator can charge fully.	
	– **Slowly** close the dump valve completely and check the pressure with the manometer:	Set-point: 114 ±1 bar (1653 ± 14.5 PSI).
	– Tighten the hexagon socket to close the dump valve.	6 - 10 Nm (4.4 - 7.4 lbf.ft.), wrench size 1/4 in.
	– Tighten the counter nut.	8 Nm (5.9 lbf.ft.), wrench size 19 mm.
	– Install the lock wire onto the dump valve.	
(10)	Move the wing and rear fuselage trestles clear of the airplane.	
(11)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

12. Filters

A. Maintain Hydraulic Reservoir Filter

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

Note: A contaminated filter causes a bad intake performance of the pump, because it needs a minimum intake pressure of 350 mbar.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Remove the vent hose by disconnecting the 90° fitting on the top of the hydraulic reservoir.	In case you have an old revision without drain hose skip this step. Refer to Figure 3.
(4)	Maintain the filter assembly (fitting and filter): – Remove the lock wire from the filter fitting. – Hold the reservoir lid screw with a wrench that the lid doesn't turn while removing the filter. – Remove the filter fitting while holding the lid. – Clean the filter by using benzine or other washing solvent. Blow the filter with compressed-air to remove dirt.	Use wrench size 27 mm. Use wrench size 22 mm. Make sure to blow the filter in the correct direction.
(5)	If removed, install vent hose by connecting the 90° fitting on the top of the hydraulic reservoir.	

	Detail Steps/Work Items	Key Items/References
(6)	Install the rear baggage compartment lower access panel.	Refer to Section 25-60.
(7)	Fold the rear passenger seat-backs backwards.	Refer to Section 25-10.
(8)	Reset the GEAR circuit-breaker.	Right side of instrument panel.

B. Replace/Maintain the High Pressure Filter

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

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	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Replace high pressure filter: – Remove filter housing. – Pull the old filter element clear of the filter body. – Push and slightly turn the filter element into the filter body until it's secure. – Install filter housing.	Refer to Figure 1. Put paper towel underneath to avoid spilling of hydraulic fluid. Metal/paper filter element. Tighten the filter housing with your hand (approx. 5 Nm, 3.7 lbf.ft.)
(4)	Install the rear baggage compartment lower access panel.	Refer to Section 25-60.
(5)	Fold the rear passenger seat-backs backwards.	Refer to Section 25-10.
(6)	Reset the GEAR circuit-breaker.	Right side of instrument panel.

CAUTION: BECAUSE OF ITS DESIGN THIS FILTER ELEMENT CAN NOT BE CLEANED. IT HAS TO BE REPLACED IF IT'S CONTAMINATED.

Note: The high pressure filter is located between the pressure pipe of the hydraulic pump and the hydraulic control unit. It consists of a metal/paper filter element.

13. Valves

A. Replace the Dump Valve

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CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

	Detail Steps/Work Items	**Key Items/References**
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Depressurize the hydraulic system.	Refer to Section 29-10.
(4)	Drain fluid from the hydraulic system.	Refer to Section 29-10. The fluid level of the reservoir should be lower than the top surface of the main control block.
(5)	Replace the dump valve: – Remove both lock wires from the valve. – Remove the dump valve. – Install the new dump valve. – Install lock wires on the dump valve.	 Use wrench size 22 mm. Put Rivolta F.L.A onto the thread and tighten the valve with 25 Nm (18.4 lbf.ft.).

	Detail Steps/Work Items	Key Items/References
(6)	If hydraulic fluid was drained in step 3, replenish the hydraulic reservoir with hydraulic fluid.	Refer to Section 29-10.
(7)	Bleed the accumulator.	Refer to Section 29-10.
(8)	Bleed the hydraulic system.	Refer to Section 29-10.
(9)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(10)	Reset the GEAR circuit breaker.	Right side of instrument panel.

B. Replace the Pressure Relief Valve / Pump Pressure Switch

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit-breaker.	Right side of instrument panel.
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Depressurize the hydraulic system.	Refer to Section 29-10.
(4)	Drain fluid from the hydraulic system.	Refer to Section 29-10. The fluid level of the reservoir should be lower than the top surface of the main control block.
(5)	Remove the pump pressure switch: – Remove the electric connector from the switch. – Remove the pump pressure switch.	To get a better access to the pressure relief valve remove the pump pressure switch first. Use wrench size 27 mm.
Note: The following 2 steps are not required if only the pump pressure switch should be replaced.		
(6)	Install a cap onto the main control block where the pump pressure switch was installed.	This is to protect the control block from dirt/dust. Use a DIN908-G 1/4 size plug.

	Detail Steps/Work Items	Key Items/References
(7)	Replace the pressure relief valve: – Remove the valve carefully. – Install the pressure relief valve.	Use wrench size 24 mm. Make sure not to damage the backup ring on the valve. Apply Rivolta F.L.A onto the thread and tighten with 25 Nm (18.4 lbf.ft.).
(8)	Install the pump pressure switch: – Install the switch. – Install the electric connector back onto the switch.	 Use wrench size 27 mm. Apply Rivolta F.L.A. onto the thread and tighten with 18 Nm (13.3 lbf.ft.).
(9)	If hydraulic fluid was drained in step 3, replenish the hydraulic reservoir with hydraulic fluid.	Refer to Section 29-10.
(10)	Bleed the accumulator.	Refer to Section 29-10.
(11)	Bleed the hydraulic system.	Refer to Section 29-10.
(12)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(13)	Reset the GEAR circuit breaker.	Right side of the instrument panel.

C. Replace/Check a Solenoid Valve

Note: In order to replace the bottom solenoid valve, remove the bolts from the metal plate where the hydraulic system is mounted on. Now lift the plate to get access to the solenoid valve.

(1) Replace a Solenoid Valve

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Remove the electric connector from the solenoid valve.	
(3)	Remove the knurled nut on the top of the valve.	Use special tool to remove the nut.
(4)	Remove the solenoid valve from the shaft.	Make sure all the O-rings are removed from the shaft.
(5)	Install the new solenoid valve onto the shaft. Tighten the valve by hand (approx. 5 Nm (3.7 lbf.ft.)).	Make sure the valve is installed properly otherwise you can damage it.
(6)	Plug the electric connector back onto the solenoid valve.	
(7)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(8)	Reset the GEAR circuit breaker.	Right side of instrument panel.

(2) Electric States of the Solenoid Valves

Checkpoint	Set-Point
Retracting.	Top solenoid valve: energized. Bottom solenoid valve: not energized.
Fully retracted.	Top solenoid valve: energized. Bottom solenoid valve: energized.
Extending / Fully extended.	Top solenoid valve: not energized. Bottom solenoid valve: not energized.

D. Replace the Accumulator Charging Valve

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel
(2)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10 Refer to Section 25-60.
	Note: Make sure when loosening the counter nut that you don't accidentally loosen the whole accumulator charging valve.	
(3)	Releasing the nitrogen from the accumulator: – Remove the yellow protection cap from the accumulator charging valve. – Loosen the counter nut on the accumulator charging valve until you feel a resistance. Now slowly continue to loosen the nut. This will cause the valve to open.	Make sure to release the nitrogen slowly. The accumulator cools down while releasing the nitrogen. Use wrench size ¾ in.

	Detail Steps/Work Items	Key Items/References
(4)	Replace the accumulator charging valve: – Remove the accumulator charging valve by loosening the hexagon head of valve body (not the counter nut). – Install the new accumulator charging valve.	MS-28889-2 standard valve is used. Use wrench size ¾ in. Apply Rivolta F.L.A onto the thread and tighten the valve with 25 Nm (18.4 lbf.ft.).
(5)	Charge the accumulator with nitrogen.	Refer to Section 29-10.
(6)	Test the accumulator charging valve for leak-tightness.	Apply some leak-finder spray onto the valve and look for air bubbles.
(7)	Reset the GEAR circuit breaker.	Right side of instrument panel.

E. Replace the Flow Regulation Valve

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(2)	Depressurize the hydraulic system.	Refer to Section 29-10.
(3)	Drain fluid from the hydraulic system.	Refer to Section 29-10. The fluid level should be lower than the hydraulic control manifold.
(4)	Remove the flow regulation valves. – Remove the valves and two seal rings on each valve. – Make sure to catch spilt hydraulic fluid.	 Wrench size 22 mm.
(5)	Install flow regulation valves: – Install the M1.7 valve in the middle hole of the hydraulic supply manifold and tighten it with 25 Nm (18.4 lbf.ft.). – Install the two M1.5 valves in the top and bottom hole of the hydraulic supply manifold and tighten them with 25 Nm (18.4 lbf.ft.).	 Put Rivolta F.L.A on both, the thread and the O-rings.
(6)	Replenish the hydraulic reservoir with hydraulic fluid.	Refer to Section 29-10.
(7)	Bleed the accumulator.	Refer to Section 29-10.
(8)	Bleed the hydraulic system.	Refer to Section 29-10.

	Detail Steps/Work Items	Key Items/References
(9)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(10)	Reset the GEAR circuit breaker.	Right side of instrument panel.

14. Remove/Install/Disassemble/Assemble Hydraulic Control Block

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A. Remove the Hydraulic Control Block

	Detail Steps/Work Items	Key Items/References
(1)	Getting access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(2)	Depressurize the hydraulic system.	Refer to Section 29–10.
(3)	Remove all seven hydraulic hoses from the hydraulic control block.	Use a suitable container to catch spilt hydraulic fluid. Fit caps on all open connections.
(4)	Remove all electrical connections from the hydraulic control block.	(Pump pressure switch connector, solenoid valve connections).
(5)	Remove the emergency extension micro switch.	Refer to Figure 4.
(6)	Disconnect the Bowden cable from the emergency extension block.	Refer to Figure 4.

	Detail Steps/Work Items	Key Items/References
(7)	Remove the control block: – Remove the three bolts which secure the hydraulic control block. – Move the control block clear from the rest of the hydraulic system.	Use hexagon socket size 4.

B. Install the Hydraulic Control Block

	Detail Steps/Work Items	Key Items/References
(1)	Install the control block: – Move the control block into position onto the hydraulic system. – Install the three bolts which secure the hydraulic control block but don’t tighten them yet.	Use hexagon socket size 4.
(2)	Connect the Bowden cable onto the emergency extension module.	Refer to Figure 4.
(3)	Install the emergency extension micro switch.	Refer to Figure 4.
(4)	Install all electrical connections onto the hydraulic control block (Pump pressure switch connector, solenoid valve connections).	Check polarity of solenoid valve connections.
(5)	Install all seven hydraulic hoses onto the hydraulic control block.	Remove the caps from the connections.
(6)	Tighten the three bolts which secure the hydraulic control block.	
(7)	If hydraulic fluid was drained, replenish the hydraulic reservoir with hydraulic fluid.	Refer to Section 29-10.
(8)	Bleed the accumulator.	Refer to Section 29-10.
(9)	Bleed the hydraulic system.	Refer to Section 29-10.

	Detail Steps/Work Items	Key Items/References
(10)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.
(11)	Reset the GEAR circuit breaker.	Right side of instrument panel.

C. Disassemble Hydraulic Control Block

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	Detail Steps/Work Items	Key Items/References
(1)	Remove hydraulic control block.	Refer to Section 29-10.
(2)	Remove the four bolts from the control block (size 4 hexagon socket head).	
(3)	Separate the three main blocks.	Refer to Figure 4.
(4)	Remove the control block: – Clean the holes and bolts from residues of the adhesive. – Remove the seal rings from contact surface of the blocks.	Standard MS28778-4 seal rings are used.

D. Assemble Hydraulic Control Block

	Detail Steps/Work Items	Key Items/References
(1)	Prepare the three main blocks: – Make sure there is no residues of the adhesive on the holes and bolts. – Position the three main blocks vertical so that seal rings can be installed easier. – Install the seal rings onto the blocks.	Refer to Figure 4. So that the plane surface where the seals get installed is horizontal. Make sure there is no dirt on the plane surfaces otherwise the control block may be leaking.
(2)	Install the four bolts to secure the three main parts: – Apply some Loctite 243 onto each bolt thread to secure it. – Install the bolts and tighten them with 4 Nm (3 lbf.ft.).	
(3)	Install the hydraulic control block.	Refer to Section 29-10.

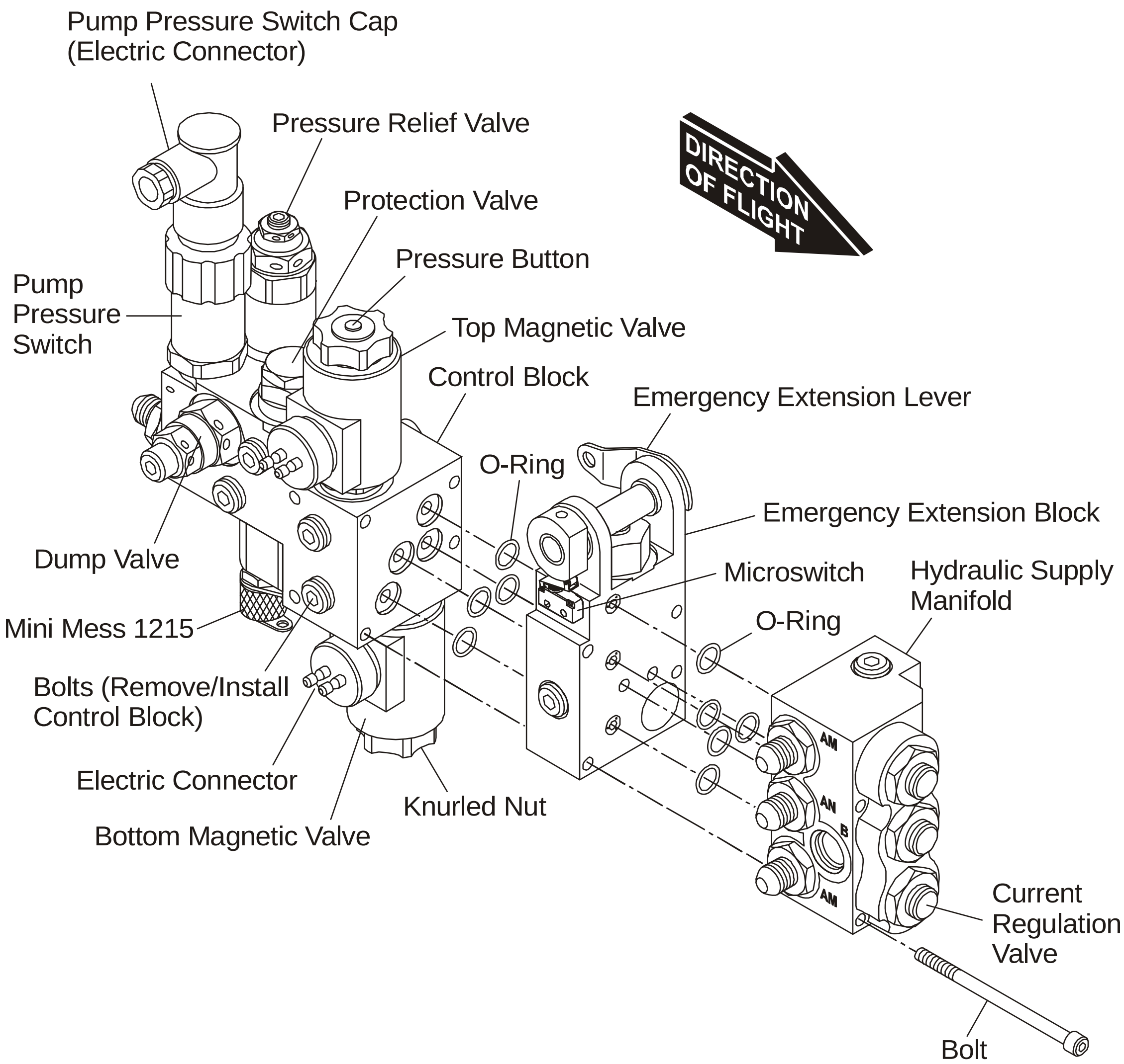

Figure 4: Hydraulic Control Block

15. Bleed/Remove/Install the Accumulator

A. Bleed the Accumulator

	Detail Steps/Work Items	Key Items/References
(1)	Check level of hydraulic reservoir.	Refer to Section 29-10.
(2)	Replenish hydraulic reservoir if necessary.	Refer to Section 29-10.
(3)	Set GEAR circuit breaker.	Right side of instrument panel.
(4)	Set ELECT. MASTER switch to ON.	
(5)	The hydraulic pump must operate until the system pressure stabilizes.	The hydraulic pump must stop operating.
(6)	Set the ELECT. MASTER switch to OFF.	
(7)	Open the dump valve: – Remove the lock wire from the dump valve. – Loosen the counter nut. – Loosen the hexagon socket to open the dump valve. – After emptying wait 10-15 min until the accumulator is thermally balanced.	 Wrench size 19 mm. Wrench size 1/4 in.
(8)	Close the dump valve: – Tighten the hexagon socket to close the dump valve. – Tighten the counter nut. – Install the lock wire onto the dump valve.	 6-10 Nm (4.4 - 7.4 lbf.ft.), wrench size 1/4 in. 8 Nm (5.9 lbf.ft.), wrench size 19 mm.
(9)	Pull GEAR circuit breaker.	Right side of instrument panel.

B. Remove the Accumulator

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	Detail Steps/Work Items	**Key Items/References**
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Open the dump valve: – Remove the lock wire from the dump valve. – Loosen the counter nut. – Loosen the hexagon socket to open dump valve. – After emptying wait 10-15 min. until the accumulator is thermally balanced.	Wrench size 19 mm. Wrench size 1/4 in.
(3)	Operate the pressure button on the upper solenoid valve on the top of the hydraulic control block.	See Figure 4. Use a little metal pin or ball pen to operate the button.
(4)	Remove the accumulator: – Remove the hydraulic hose from the accumulator. – Open the bolts which hold the accumulator in place and open the clamp – Move the accumulator clear from the hydraulic system.	

C. Install the Accumulator

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Install the accumulator: – Move the accumulator in position. – Close the clamps and install the bolts which hold the accumulator in place. – Install the hydraulic hose from the accumulator.	Apply Rivolta F.L.A for corrosion protection. Tighten with 5 - 6 Nm (3.7 - 4.4 lbf.ft.).
(3)	Check the hydraulic fluid level of the hydraulic reservoir.	Refer to Section 29-10.
(4)	Bleed the hydraulic system.	Refer to Section 29-10.
(5)	Bleed the accumulator.	Refer to Section 29-10.
(6)	Do the normal operation test for the hydraulic system.	Refer to Section 29-10.

16. Check the Accumulator

The accumulator should be tested every 200 hours of operation respectively once a year if there is any inner leakage and the correct pre-fill pressure.

A. Equipment

Item	Quantity	Part Number
Adapter MS28889-2 / MiniMess 1615.	1	Commercial.
Manometer to test pressure on the accumulator.	1	X11-P002.

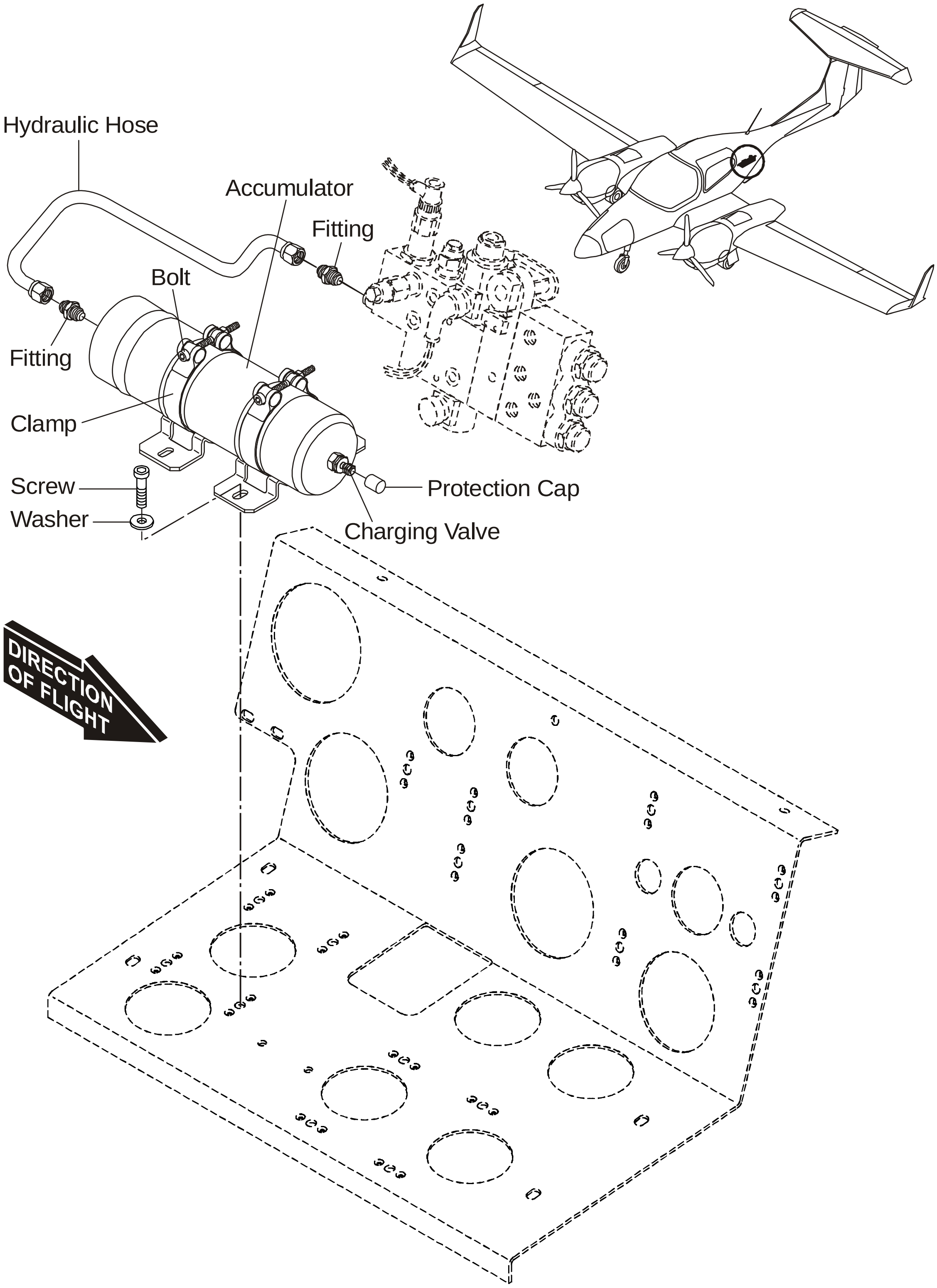

Figure 5: Hydraulic Accumulator Installation

B. Testing Procedure

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(1)</td><td>Get access to the hydraulic system:
– Fold the rear passenger seat-backs forward.
– Remove the rear baggage compartment lower access panel.</td><td>
Refer to Section 25-10.
Refer to Section 25-60.</td></tr>
<tr><td>(2)</td><td>Depressurize the hydraulic system.</td><td>Refer to Section 29-10.</td></tr>
<tr><td colspan="3">Note: Make sure when loosening the counter nut on the accumulator that you don’t accidentally loosen the whole high pressure valve.</td></tr>
<tr><td colspan="3">WARNING: IF THE HOSE OF THE MANOMETER IS NOT CONNECTED PROPERLY TO THE HIGH PRESSURE VALVE, NITROGEN CAN LEAK FROM THE ACCUMULATOR. IF THAT IS THE CASE, CLOSE THE COUNTER NUT IMMEDIATELY AND CHECK ALL CONNECTIONS AGAIN. THE ACCUMULATOR HAS TO BE REFILLED ACCORDING TO SECTION 29-10 PARAGRAPH 17.</td></tr>
<tr><td>(3)</td><td>Connecting the test manometer:
– Remove the yellow protection cap from the high pressure valve on the accumulator.
– Screw the Adapter (MS28889-2 / MiniMess 1615) onto the valve as far as it will go (sealing face).
– Screw the swivel nut from the manometer onto the adapter.
– Loosen the counter nut on the valve until it reaches the end face. Now slowly continue to loosen the nut -> this will cause the valve to open.</td><td></td></tr>
</table>

	Detail Steps/Work Items	Key Items/References
(4)	Check the pressure on the manometer: The required pressure is 80 bar (1160 PSI) at 15°C, (82.8 bar [1200 PSI] at 25°C).	If the measured pressure differs a lot compared to the set-point, see the Troubleshooting section.
(5)	Disconnecting the test manometer: – Tighten the counter nut on the valve with 10 Nm (7.4 lbf.ft.). – Remove the manometer from the adapter. – Remove the Adapter (MS28889-2 / MiniMess 1615) from the valve. – Put the yellow protection cap back onto the high pressure valve.	
(6)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(7)	Check for correct charging time of the hydraulic accumulator: – Set the ELECT. MASTER switch to ON. – The hydraulic pump must operate until the system pressure stabilizes. – The hydraulic pump must stop operating. – Set the ELECT. MASTER switch to OFF.	Approx. 16 (+4/-3) seconds with a completely empty accumulator.

17. Charge the Hydraulic Accumulator with Nitrogen

A. Equipment

Item	Quantity	Part Number
Adapter MS28889-2 / MiniMess 1615.	1	Commercial.
Nitrogen bottle with pressure reducer.	1	X11-P003.

B. Charge Accumulator with Nitrogen

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Get access to the hydraulic system: – Fold the rear passenger seat-backs forward. – Remove the rear baggage compartment lower access panel.	 Refer to Section 25-10. Refer to Section 25-60.
(3)	Depressurize the hydraulic system.	Refer to Section 29-10.
Note: Make sure when loosening the counter nut on the accumulator that you don’t accidentally loosen the whole high pressure valve.		
WARNING: IF THE HOSE OF THE MANOMETER IS NOT CONNECTED PROPERLY TO THE HIGH PRESSURE VALVE, NITROGEN CAN LEAK FROM THE ACCUMULATOR. IF THAT IS THE CASE, CLOSE THE COUNTER NUT IMMEDIATELY AND CHECK ALL CONNECTIONS AGAIN.		

	Detail Steps/Work Items	Key Items/References
(4)	Connecting the nitrogen bottle: – First, check that the pressure reducer on the nitrogen bottle is set to 90 bar (1305 PSI). – Remove the yellow protection cap from the accumulator charging valve. – Screw the Adapter (MS28889-2 / MiniMess 1615) onto the valve as far as it will go (sealing face). – Screw the swivel nut of the charging hose onto the adapter. – Loosen the counter nut on the high pressure valve until it reaches the end face. Now slowly continue to loosen the nut -> this will cause the valve to open.	
(5)	Charge the accumulator: – Read the pressure on the manometer of the pressure reducer. – Charge the accumulator to a pressure of 85 - 90 bar (1233 - 1305 PSI). – Close the valve on the nitrogen bottle and wait 10 min until the accumulator is thermally balanced. – Check the pressure of the accumulator again and fine tune the pressure with the pressure reducer on the nitrogen bottle until the set-point is reached.	Set-point: 80 bar, 1160 PSI (15°C) 82.8 bar, 1200 PSI (25°C)

	Detail Steps/Work Items	Key Items/References
(6)	Disconnect the nitrogen bottle: – Tighten the counter nut on the valve with 10 Nm (7.4 lbf.ft.). – Close the valve on the nitrogen bottle and release the remaining pressure with the pressure reducer. – Remove the nitrogen bottle from the adapter. – Remove the Adapter (MS28889-2 / MiniMess 1615) from the valve. – Put the yellow protection cap back onto the high pressure valve.	
(7)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(8)	Check operation of the hydraulic accumulator.	Refer to Section 29-10.

CHAPTER 30

ICE PROTECTION SYSTEM

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CHAPTER 30
ICE PROTECTION SYSTEM

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CHAPTER 30
ICE PROTECTION SYSTEM

1. General

WARNING: DO NOT GET DE-ICING FLUID ON YOUR SKIN OR ON YOUR CLOTHES. DE-ICING FLUID IS HARMFUL AND CAN CAUSE INJURIES TO PERSONS AND CAN DAMAGE YOUR CLOTHING.

CAUTION: HANDLE DE-ICING FLUID WITH CARE. DE-ICING FLUID IS FLAMMABLE AND CAN CAUSE DAMAGE TO EQUIPMENT.

This Section explains the fluid based ice protection system of the DA 42 NG airplane. It gives you general data and the trouble-shooting data on the system. Refer to CAV Aerospace Ltd. for data on the ice protection system.

The ice protection system prevents accumulation of ice by distributing a thin film of a special de-icing fluid on the wings, horizontal stabilizer, vertical stabilizer, propellers and canopy. The area on the panels at which de-icing fluid weeps out through many fine holes is called the 'active area.'

The airframe and propellers are grouped and operate together. Windshield de-icing is a separate system and operates independently. All systems draw fluid from a common tank.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

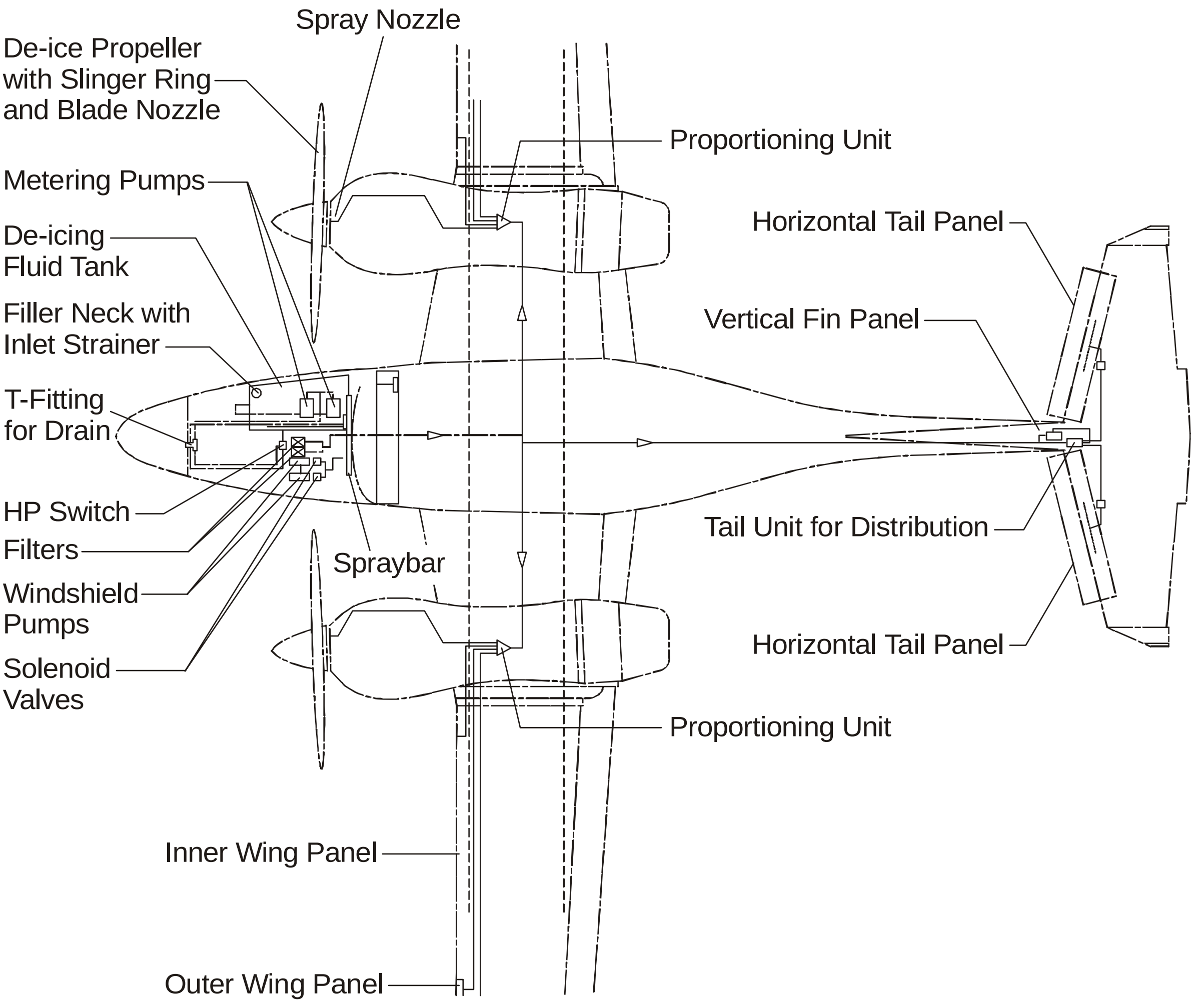

Figure 1: Ice Protection System - Mechanical Schematic

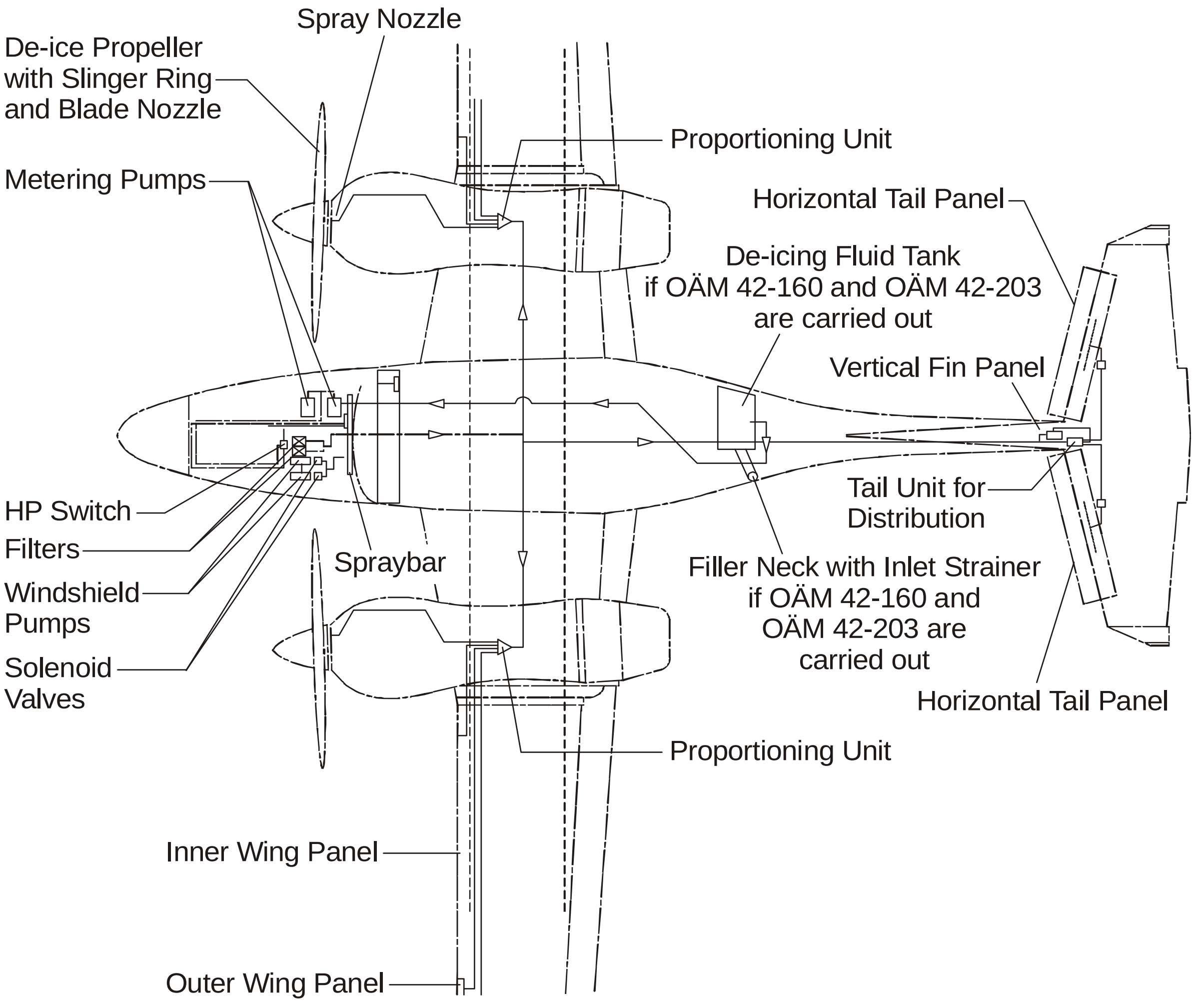

Figure 2: Ice Protection System - Mechanical Schematic (if OÄM 42-203 is installed)

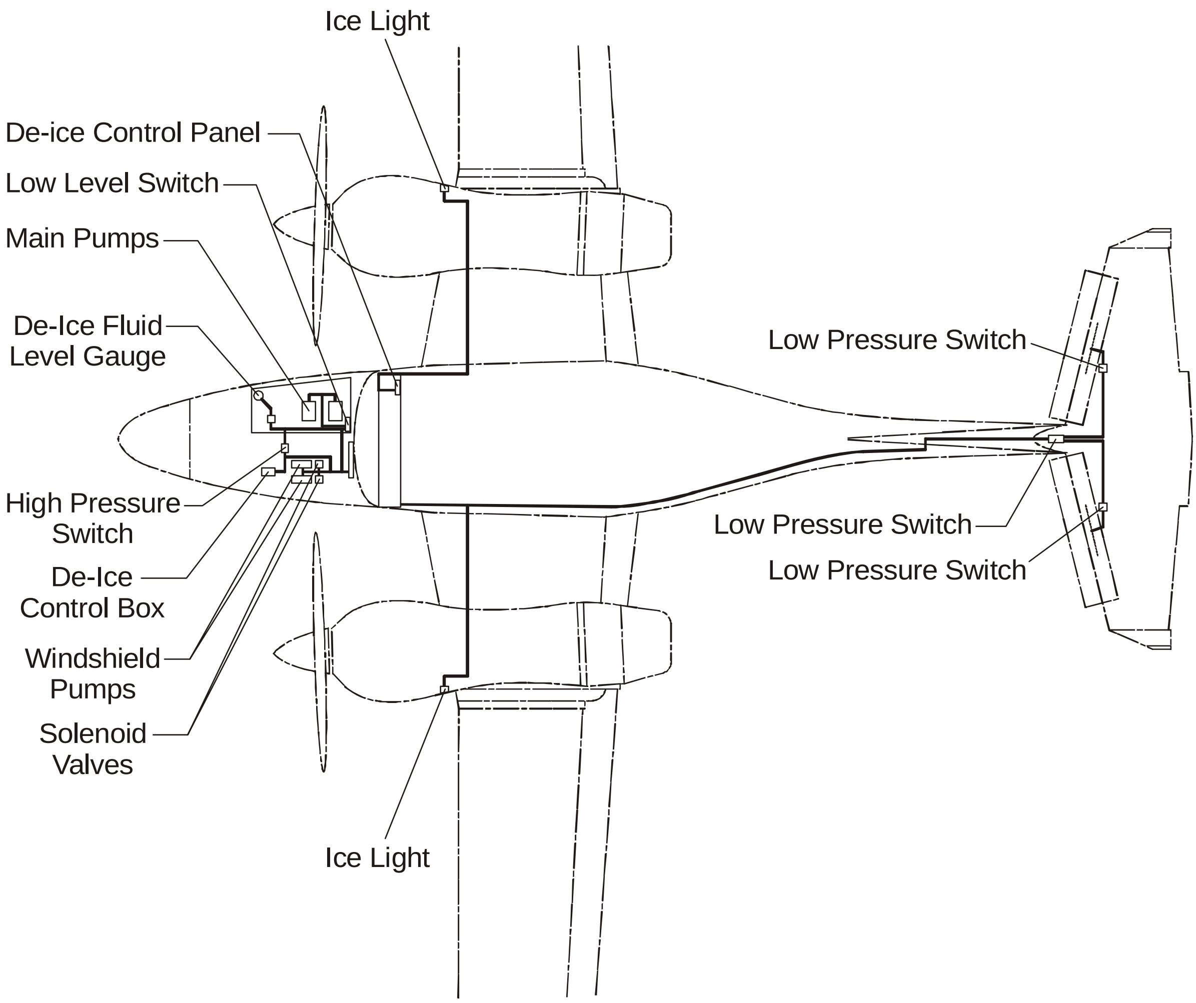

Figure 3: Ice Protection System - Electrical Schematic

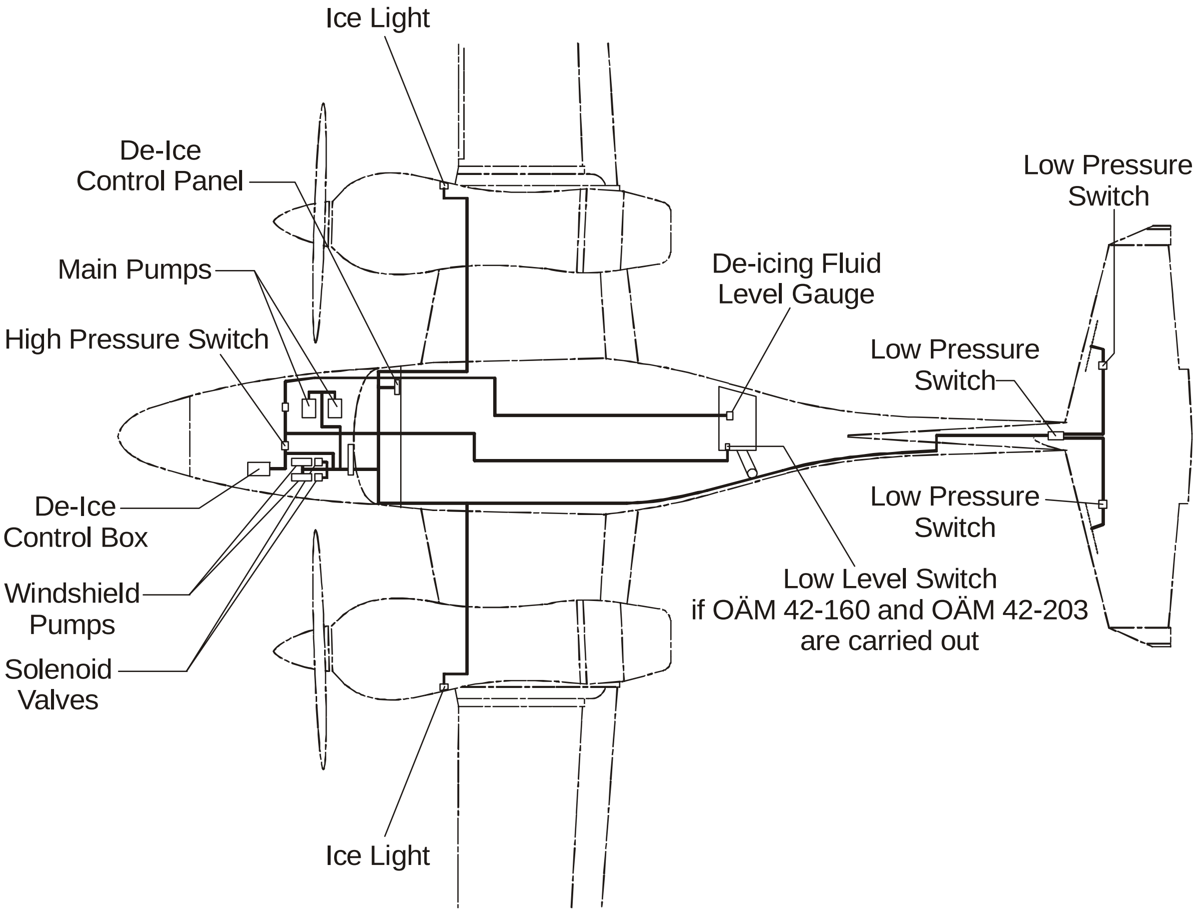

Figure 4: Ice Protection System - Electrical Schematic (if OÄM 42-203 is installed)

2. Description

Figures 1 and 2 show the schematic diagram for the mechanical parts of the fluid based ice protection system on the DA 42 NG. The mechanical part of the ice protection system consists of:

– Porous panels on the leading edge of the horizontal tail.

– Porous panel on the leading edge of the vertical tail.

– Porous panels on the leading edge of the outer wings.

– De-icing fluid tank with integrated level sensor, level switch and inlet strainer.

– De-icing fluid main pumps.

– De-icing fluid filters.

– Drain hose connector in nose landing gear bay.

– Proportioning units in each engine nacelle.

– Nozzles and slinger rings on the LH and RH propeller.

– Proportioning unit in the vertical tail.

– Low pressure sensors in the vertical tail.

– High pressure sensor.

– Windshield pumps with solenoid valves.

– Spraybar in front of the canopy.

These system components are connected with nylon tubing. For the ice protection of the propeller Teflon lines through the engine nacelles to the slinger rings of the propeller are used.

Figures 3 and 4 show the schematic diagram for the electrical parts of the fluid based ice protection system on the DA 42 NG. The electrical part of the ice protection system consists of:

– De-ice control box.

– De-ice control panel.

– Low level sensor.

– De-ice fluid level gauge.

– Low pressure sensor.

– High pressure sensor.

– Main pumps.

– Windshield pumps.

– Solenoid valves.

– Ice lights.

The ice protection system is electrically operated. It is supplied with power via the XFR PUMP/DE-ICE circuit breaker. Refer to Chapter 92 for wiring diagrams.

A. De-Icing Fluid Tank

The de-icing fluid tank is installed in the nose baggage compartment of the airplane on the RH side. It consists of a single polyamide chamber with a usable capacity of 30 liter (7.9 US gal). If OÄM 42-203 is installed, the de-icing fluid tank is installed behind the baggage compartment and the optional short baggage extension. The tank filler is located in the fuselage nose on the RH side, aft of the nose baggage door. If OÄM 42-203 is installed, the tank filler is located on the LH side of the fuselage, aft of the passenger door.

A fluid level sensor provides the signal for the fluid level indication on the G1000. A level switch in the tank provides indication of the minimum quantity for dispatch (45 minutes) via a caution message on the G1000.

The tank has an inlet with an integrated strainer. From the outlet, nylon tubing feeds the fluid to the inlet of the main pump assembly.

B. Main Pump Assembly

The main pump assembly consists of two electrical pumps which are connected in series. These pumps are mounted to the bottom side of a lid in the floor of the nose baggage compartment on the RH side.

The main pump assembly has two outlets. One outlet supplies the airframe ice protection system (see Paragraph C). The other outlet supplies the windshield de-icing system (see Paragraph D).

C. Airframe Ice Protection System

(1) High Pressure Sensor

A high pressure sensor is situated between the main pump assembly and the filter. It is attached to the LH inspection hole cover in the nose baggage compartment.

When the resistance of the filters becomes too high, the sensor activates a caution message ("DEIC PRES HI") on the Garmin G1000 PFD. The system remains operative, but the filter cartridges must be replaced at the next scheduled inspection.

(2) De-Icing Fluid Filters

Two filters protect the capillaries in the proportioning units from fouling . The filters are connected in parallel for redundancy purposes. The outlets of the filters are merged with a T-fitting and then the fluid runs underneath the cockpit floor to a manifold block in the center of the airplane. Each filter has a bleeding socket connected to a bleeding hose, which is located in the LH nose baggage compartment.

(3) Manifold Block

The manifold block is located under the small center console between the center wing main spars. It divides the flow of de-icing fluid into three branches. One branch goes to each wing to feed the wing and propeller ice protection system (see Paragraph 4). One branch goes back to feed the empennage ice protection system (see Paragraph 5).

(4) Wing and Propeller Ice Protection System

(a) Proportioning Unit

A proportioning unit is located in each engine nacelle between the center wing spars. It is accessible after removal of the small inspection panel on the outboard side of the nacelle.

The proportioning unit divides the fluid flow into three sub-branches. For each sub-branch there is a capillary which ensures that the correct amount of de-icing fluid flows to the related sub-branch.

One sub-branch goes forward to feed the propeller ice protection system (see Paragraph b). Two branches go to the outer wing to feed the wing ice protection system (see Paragraph c).

(b) Propeller Ice Protection System

A Teflon tube goes from the proportioning unit forward to a nozzle near the propeller, where the de-icing fluid drops onto a slinger ring. In the engine compartment of the nacelle the tube is protected by a fire sleeve. The slinger ring has three notches that allow the de-icing fluid to be distributed over the propeller blades by centrifugal action.

(c) Wing Ice Protection System

Two porous panels are attached to the leading edge of each outer wing. They discharge the fluid onto the wing through many fine holes.

The panels are bonded to the wing leading edge. They cannot be removed without damage.

(d) Purging Connections

Near the rearward inspection hole cover on the outboard side of each nacelle an equal tee for purging of the system is installed.

(e) Filter Bleeding Hose

In the LH nose baggage compartment behind the floor carpet.

(5) Empennage Ice Protection System

(a) Proportioning Unit

A proportioning unit is attached forward of the front spar of the vertical stabilizer.

The proportioning unit divides the fluid flow into three sub branches. For each sub-branch there is a capillary which ensures that the correct amount of de-icing fluid flows to the related horizontal or vertical tail porous panel.

(b) Horizontal Tail Ice Protection System

One porous panel is attached to the leading edge of the horizontal tail on the LH side. Another panel is attached on the RH side. The panels discharge the fluid onto the horizontal tail through many fine holes.

The panels are bonded to the horizontal tail leading edge. They cannot be removed without damage.

(c) Vertical Tail Ice Protection System

One porous panel is attached to the leading edge of the vertical tail. The panel discharges the fluid onto the vertical stabilizer through many fine holes.

The panel is bonded to the vertical tail leading edge. It cannot be removed without damage.

(d) Low Pressure Sensors

Three low pressure sensors are situated between the proportioning unit and the porous panels on the empennage. If one of these panels is not supplied with sufficient pressure, then the sensor activates a caution message on the G1000 PFD ("DEIC PRES LO").

D. Windshield De-Icing System

(1) Windshield De-Icing Pumps

One outlet of the main pump assembly is connected to the inlets of the two windshield de-icing pumps via an equal tee. The windshield de-icing pumps are connected in parallel. The pumps are mounted to the bottom side of a lid in the floor of the nose baggage compartment on the LH side. Only one pump is operative at a time, while the other pump is a backup. The active pump is selected with a switch in the cockpit.

(2) Solenoid Valves

A solenoid valve is located in front of each windshield de-icing pump. When the pilot operates the switch for the windshield de-icing system, then the valves allow the de-icing fluid to flow to the spraybar for 5 seconds. The solenoid valves avoid that air is drawn into the system via the spraybar.

(3) Spraybar

A spraybar is located in front of the canopy. It is aligned parallel with the center axis of the airplane. When activated, it sprays de-icing fluid onto the canopy.

A deflector-wedge is mounted to the airplane in front of the spraybar for protection and airflow guide purposes.

E. Ice Protection Control System

(1) De-Ice Control Box

The de-ice control box consists basically of relays and is connected to the de-ice control panel. It is supplied with electrical power via the XFER PUMP / DE-ICE circuit breaker. It is installed to control all 4 pumps of the ice protection system. The de-ice control box is mounted on the bottom side of the LH baggage compartment floor.

(2) De-Ice Control Panel

The ice protection system (including ice-lights) installed in the DA 42 NG is operated via the de-ice control panel. The de-ice control panel is connected to the de-ice control box and to the instrument panel lighting bus. It is supplied with electrical power via the XFER PUMP / DE-ICE circuit breaker.

3. Operation

The system is operated through 4 toggle type switches and two push buttons located on the de-ice control panel in the RH section of the instrument panel.

A. OFF/NORM/HIGH Switch

The left OFF/NORM/HIGH switch operates the main pumps and thus activates the system. It has 3 positions:

– Down position: OFF.

– Center position: NORM (normal). The main pumps produce a cycled fluid flow: for 30 seconds both main pumps provide fluid to the system, followed by a 90 seconds off. This mode is selected when icing conditions are encountered and prior to ice formation. Maximum system operating time is approximately 2.5 hours.

– Up position: HIGH. The active main pump produces a continuous fluid flow. This mode is selected when icing conditions are more demanding or if ice has already accumulated. Maximum system operating time is approximately 1.0 hour.

B. MAX Push Button

The upper push button activates the MAX mode of the ice protection system when the system is presently in the HIGH mode. This mode is only active for 2 minutes. In this mode both pumps are active simultaneously and provide fluid to the system. This mode is selected when icing conditions are severe or if significant ice has accumulated on the airplane. Maximum system operating time in the MAX mode is approximately 30 minutes.

C. PUMP1/PUMP2 Switch

The RH bottom switch selects one of the two main pumps and one of the two windshield pumps. It has 2 positions.

Down position: PUMP 1. Main pump 1 is selected as the active pump in HIGH mode. Pump 2 is standby. Also windshield pump 1 is selected in case the windshield switch is activated. Windshield pump 2 is inoperative.

Up position: PUMP 2. Main pump 2 is selected as the active pump in HIGH mode. Pump 1 is standby. Also windshield pump 2 is selected in case the windshield switch is activated. Windshield pump 1 is inoperative.

D. WINDSHIELD Push Button

The WINDSHIELD push button activates the selected windshield de-icing pump for a duration of 5 seconds. During this time it feeds de-icing fluid to the spraybar in front of the canopy.

The windshield de-icing works even when the OFF/NORM/HIGH switch of the ice protection system is set to OFF. Air removal from the ice protection system is also provided by these pumps by continuously pressing the WINDSHIELD push button.

E. ALTERNATE Switch

The ALTERNATE switch connects main pump 2 directly to the RH main bus. Thus, in case of a total loss of the LH main bus in icing conditions, operation of the ice protection system similar to the HIGH- mode is possible.

F. ICE LIGHT / ANNUN-TEST Switch

This switch activates either both ice lights or the annunciation test procedure.

(1) Ice Lights Operation

The ice lights are switched ON by setting the toggle switch to the upper position.

(2) Test of Annunciations

Proper function of the fluid level switch and the low pressure sensor can be tested with the annunciation test mode.

(a) Test of the DEIC PRES LO Annunciation

After the switch is set to ANNUN-TEST, the DEIC PRES LO annunciation in the alert window of the PFD appears with a delay of 2 minutes.

(b) Test of the DEICE LVL LO Annunciation

This test can only be carried out if the fluid level in the de-ice tank is less than 10 liter (2.6 US gal). After the switch is set to ANNUN-TEST, the DEICE LVL LO annunciation in the alert window of the PFD appears.

4. Handling of Porous Panels

Only the following solvents are permitted for use on the porous panels:

– Water with soap or detergent.

– Approved de-icing fluids.

– Propylene glycol.

– Avgas.

– Jet fuel.

– Isopropylalcohol.

– Ethyl alcohol.

– Industrial methylated spirit.

CAUTION: DON'T USE OTHER MATERIALS AS THE ABOVE STATED ONES. THE MICROSCOPIC LASER DRILLED HOLES MAY BE CLOGGED BY USE OF ANY OTHER MATERIALS LIKE ADHESIVES, SEALANTS, PAINT, OR ANY FINE PARTICLES. THIS MAY AFFECT PANEL PERFORMANCE AND IS CAUSE FOR PANEL REJECTION.

Mask panel active area with low tack tape and plug inlet ports when working with adhesives near panels or in a dusty environment.

The inlets should be protected with appropriate caps.

Note: The porous panels are not approved for temperatures above 82° C (180°F).

The following tapes are approved for use on the porous panels:

– Low tack masking tape: Scotch Flatback tape 2517, width 48 mm.

– Surface protection film: 3M Protective tape type 7007 AB, width 150 mm.

Trouble-Shooting

1. General

The table below lists the defects you could have with the ice protection system.

If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Cycle time of the WINDSHIELD, NORM or/and MAX- mode is/are out of tolerance.	Internal failure of the de-ice control box.	Replace control box.
No de-icing fluid comes out of the spraybar and porous panels.	De-icing fluid tank empty. De-icing fluid pump defective. De-icing fluid filter(s) clogged. De-icing fluid tubing leaky. De-icing fluid tubing clogged.	Replenish. Replace pump. Replace filter(s). Replace the affected part of the tubing. Replace the affected part of the tubing.
No fluid dissipates from part of the active area of a porous panel.	Trapped air in porous panel.	Purge system.
DEIC PRES HI caution altert active.	De-icing fluid filter(s) clogged.	Replace filter(s).

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Maintenance Practices

1. General

These Maintenance Practices tell you how to perform an operational test of the ice protection system. They also tell you how to remove and install the main components of the ice protection system.

WARNING: DO NOT GET DE-ICING FLUID ON YOUR SKIN OR ON YOUR CLOTHES. DE-ICING FLUID IS HARMFUL AND CAN CAUSE INJURIES TO PERSONS AND CAN DAMAGE YOUR CLOTHING.

CAUTION: HANDLE DE-ICING FLUID WITH CARE. DE-ICING FLUID IS FLAMMABLE AND CAN CAUSE DAMAGE TO EQUIPMENT.

CAUTION: DO NOT APPLY POLISH OR WAX TO THE PANELS. CERTAIN SOLVENTS, PARTICULARLY METHYL ETHYL KETONE (MEK), ACETONE, LACQUER THINNER AND OTHER TYPES OF THINNERS AND SOLVENTS DAMAGE THE INNER MEMBRANE OF THE PANELS. MASK ACTIVE AREA OF PANELS WITH A LOW TACK TAPE WHEN USING SOLVENTS OR PAINTING THE AIRPLANE IN THE PROXIMITY OF THE PANELS OR WHEN THE AIRPLANE IS STORED IN A DUSTY ENVIRONMENT. REFER TO PARAGRAPH 4 “HANDLING OF POROUS PANELS” IN THE GENERAL SECTION OF THIS CHAPTER.

Note: It is of particular importance that components and tubes upstream of the pumps and between the filters and the proportioning units are protected from ingress of foreign matter, as particles in the orifices of the proportioning units may cause a malfunction of the system. Cap ends of loose tubes during maintenance with plastic caps. The use of self adhesive tape is not recommended as protective material for nylon tubes.

2. Operational Test

A. Equipment

Item	Quantity	Part Number
TKS set.	1	A00305.
TKS system test cart.	1	D60-3000-04-00-ST.

B. Operational Test

	Detail Steps/Work Items	Key Items/References
(1)	Drain the de-ice fluid tank and verify that it is empty.	Use the T-fitting of feed line installed in the front wheel well for drainage.
(2)	Verify the following de-ice control panel settings: – OFF/NORM/HIGH switch: OFF. – ICE LIGHT / ANNUN-TEST switch: OFF. – PUMP SELECTOR: PUMP 1.	
(3)	Set the ELECT MASTER switch to ON.	
(4)	Check the following indications: – MFD: De-ice fluid level indication must show empty. – PFD: No ice protection system related message in the alert window is active.	Press SYSTEM - ENGINE softkey to indicate de-ice fluid level.
	Annunciation Check	
(5)	Switch to ANNUN-TEST mode on the de-ice control panel and check that the DEICE LVL LO message appears in the alert window of the PFD.	The DEICE LVL LO message appears only if less then approx. 6.0 liter (1.59 US gal) are in the de-icing fluid tank.
(6)	Wait 2 minutes and verify that the DEIC PRES LO message appears in the alert window of the PFD.	
(7)	Turn the ICE LIGHT / ANNUN-TEST switch back into the OFF position and verify that both messages disappear immediately.	
	Fluid Emission Test Preparation	
(8)	Verify that all gutters, catchment tanks and shieldings are fixed on the airplane and protection tapes on the porous panels are removed.	Recommended when system is turned on inside of hangar. See also TKS system test cart.

	Detail Steps/Work Items	Key Items/References
(9)	Sprinkle all 7 ice protection panels with approved de-icing fluid by using a clean, lint free cloth.	
(10)	Fill the de-icing fluid tank.	Refer to Section 12-10.
(11)	Verify that the de-ice level indication on the MFD shows full.	
(12)	Switch to the ANNUN-TEST mode on the de-ice control panel and verify that there is no DEICE LVL LO message in the alert window of the PFD.	
(13)	Set ICE LIGHT / ANNUN-TEST - switch to OFF.	
	Windshield Spraybar Check	
(14)	Verify that the canopy is closed.	
(15)	Check that each hole on the canopy spraybar emits de-icing fluid with pump 1 and pump 2:	
	– Press the WINDSHIELD push-button on the de-ice control panel for 1 second.	Repeat procedure until de-icing fluid emits from all holes in the spraybar.
	– Select PUMP2 on the de-ice control panel.	
	– Press the WINDSHIELD push-button on the de-ice control panel for 1 second.	Repeat procedure until de-icing fluid emits from all holes in the spraybar.
(16)	If the check described in the previous step was not successful, then shortly apply high air pressure to blocked holes of the spray bar and repeat the check procedure.	
	Main De-Ice Panel Test	
(17)	Verify that the Pump-Selector switch on the de-ice control panel is in PUMP 1 position.	
(18)	Open canopy and set the OFF/NORM/HIGH switch to the HIGH position and check operation of the annunciation light on the de-ice control panel.	The DEIC PRES LO annunciation may appear on the PDF in HIGH-mode. The ice protection system pressure depends on the system temperature.
(19)	Check all ice protection panels for evidence of de-icing fluid.	

	Detail Steps/Work Items	Key Items/References
(20)	After each part of the ice protection panels become wet select PUMP 2 on the de-ice control panel.	The DEIC PRES LO annunciation may appear on the PFD in HIGH-mode. The ice protection system pressure depends on the system temperature.
(21)	Check that each panel emits de-icing fluid with pump 1 or pump 2.	
(22)	Turn the OFF/NORM/HIGH switch in NORM position and check the lower, white annunciation light is on.	
(23)	Verify that both main pumps are running.	
(24)	Verify that no DEIC PRES LO warning is now indicated in the alert window on the PFD.	Above 20°C (68°F) ambient temperature, warning cancellation may not be possible.
	Cycle Time Test	
(25)	In the NORM - Mode the operation of both main pumps is cycled. Therefore check runtime of the cycles: – Pumps ON: 30 s (Tolerance +1 s / -3 s). – Pumps OFF: 90 s (Tolerance +9 s / -1 s).	
(26)	Turn the OFF/NORM/HIGH switch in the HIGH position, press the MAX push-button and check operation of both amber annunciation lights.	
(27)	Check the runtime of the MAX-mode. Pumps ON: 120 s (± 10 s).	
(28)	Check the runtime of the WINDSHIELD-pumps. Pump ON: 5 s (± 1s).	Verify that the canopy is closed.
(29)	Turn the OFF/NORM/HIGH switch in OFF position.	

	Detail Steps/Work Items	Key Items/References
	ICE LIGHT / ANNUN-TEST - Test	
(30)	Turn the ICE LIGHT / OFF/ ANNUN TEST switch in ICE LIGHT position and check operation of the LH and the RH Ice Light.	
(31)	Turn the ICE LIGHT / OFF/ ANNUN TEST back in the OFF position.	
(32)	Set the ELECT MASTER switch to OFF.	

3. Drain the Ice Protection System

	Detail Steps/Work Items	Key Items/References
(1)	Open blanking plug on the T-fitting in the nose wheel bay.	Refer to Figure 1.
(2)	Allow the de-icing fluid to flow into suitable containers.	
(3)	Close blanking plug on the T-fitting in the nose wheel bay.	

4. Remove/Install the De-Icing Fluid Tank

A. Remove the De-Icing Fluid Tank

	Detail Steps/Work Items	Key Items/References
(1)	Drain the ice protection system.	Refer to Paragraph 3.
(2)	Open the RH door to the nose baggage compartment.	
(3)	Disconnect all hose and electrical connections from the de-icing fluid tank.	Use caps to protect the loose line connections from contamination.
(4)	Remove the 4 bolts and washers which attach the tank to the nose baggage compartment.	
(5)	Remove the battery cover.	
(6)	Move the tank clear of the airplane.	Twist the tank 90° clockwise inboard for easier removal.

B. Remove the De-Icing Fluid Tank (if OÄM 42-203 is installed)

	Detail Steps/Work Items	Key Items/References
(1)	Drain the ice protection system.	Refer to Paragraph 3.
(2)	Open the passenger door and remove short baggage extension.	
(3)	Disconnect all hose and electrical connections from the de-icing fluid tank.	
(4)	Remove the 2 bolts from the tank belts and loosen both hose clamps from the TKS fluid hose (diameter approx. 60 mm).	
(5)	Move the TKS fluid hose downwards and parallel to the de-icing fluid tank neck.	
(6)	Move the tank clear of the airplane.	Tilt the tank forward for easier removal.

C. Install the De-Icing Fluid Tank

	Detail Steps/Work Items	Key Items/References
(1)	Move the tank in position in the RH nose baggage compartment.	Twist the tank 90° counter-clockwise inboard for easier installation.
(2)	Connect all hose and electrical connections to the de-icing fluid tank.	Remove caps. Use new O-rings. Keep the aluminum olives free from dust.
(3)	Install the 4 bolts and washers which attach the tank to the nose baggage compartment.	
(4)	Install the battery cover.	
(5)	Close the RH door to the nose baggage compartment.	
(6)	Replenish the ice protection system.	Refer to Section 12-10.
(7)	Carry out operational test.	Refer to Paragraph 2.

D. Install the De-Icing Fluid Tank (if OÄM 42-203 is installed)

	Detail Steps/Work Items	Key Items/References
(1)	Move the tank in position aft of the short baggage extension.	
(2)	Install the TKS fluid hose and tighten 2 hose clamps.	
(3)	Move the tank belts in position and install the 2 bolts on the belts.	
(4)	Connect the hoses and the electrical connectors to the de-icing fluid tank.	
(5)	Install the short baggage extension.	
(6)	Replenish the ice protection system.	Refer to Section 12-10.
(7)	Carry out an operational test.	Refer to Paragraph 2.

5. Remove/Install the De-Icing Fluid Inlet Strainer

A. Equipment

Item	Quantity	Part Number
Drive slot tool.	1	12160-01.

B. Remove the De-Icing Fluid Inlet Strainer

	Detail Steps/Work Items	Key Items/References
(1)	Open the filler cap of the de-icing fluid tank.	
(2)	Removal of inlet strainer – Put drive pins of tool into drive slots of lock ring. – Unscrew the strainer lock ring counter-clockwise. – Remove strainer lock and O-ring. – Take out inlet strainer of filler neck.	 Use drive slot tool.
(3)	Protect filler neck with glycol cap.	

C. Remove the De-Icing Fluid Inlet Strainer (if OÄM 42-203 is installed)

	Detail Steps/Work Items	Key Items/References
(1)	Remove the de-icing fluid tank.	Refer to Paragraph 4.B.
(2)	Unscrew the de-icing fluid strainer from the de-icing tank filler neck.	
(3)	Protect the de-icing tank filler neck with a cap.	

D. Install the De-Icing Fluid Inlet Strainer

	Detail Steps/Work Items	Key Items/References
(1)	Remove glycol cap from filler neck.	Verify that interior of tank is clean before installing the strainer
	CAUTION: MAKE SURE THAT THE STRAINER DOESN'T TURN. A TURNING STRAINER CAN DAMAGE THE TANK VENTILATION.	
(2)	Implementation of inlet strainer: – Move strainer in place in the filler neck. – Apply O-ring and strainer lock. – Put drive pins of tool into drive slots of lock ring. – Fix strainer lock ring by twisting clockwise.	Use drive slot tool.
(3)	Close the filler cap of the de-icing fluid tank.	

E. Install the De-Icing Fluid Inlet Strainer (if OÄM 42-203 is installed)

	Detail Steps/Work Items	Key Items/References
(1)	Remove the cap from the de-icing fluid tank filler neck.	
(2)	Mount the de-icing fluid strainer to the de-icing tank filler neck.	
(3)	Install the de-icing tank.	Refer to Paragraph 4.D.

6. Remove/Install a De-Icing Metering Pump

A. Remove a De-Icing Metering Pump

	Detail Steps/Work Items	Key Items/References
(1)	Remove the de-icing fluid tank.	Only for removal of the main pumps (RH side). Refer to Paragraph 4.
(2)	Remove the bolts and washers which attach the lid to the floor in the nose baggage compartment.	
(3)	Lift the lid upward.	
(4)	Disconnect all electrical connectors from the pumps.	
(5)	Remove the locking wire from all hose connections.	
(6)	Disconnect all hose connections from the pumps.	Use caps to protect the loose line connections from contamination.
(7)	Remove the bolts and washers which hold the pump to the lid including the l-sections.	
(8)	Remove the pump from the lid.	

B. Install a De-Icing Metering Pump

	Detail Steps/Work Items	Key Items/References
(1)	Move the pump in place on the nose floor lid.	
(2)	Install the bolts and washers which hold the pump to the lid including the l-sections.	
(3)	Move the lid in place in the nose baggage compartment.	Leave a gap to connect the hoses and electrical connectors.
(4)	Connect all hose connections to the pumps.	Remove caps. Use new seals.
(5)	Secure all hose connections with locking wire	
(6)	Connect all electrical connectors to the pumps.	
(7)	Move the lid in place in the floor.	

	Detail Steps/Work Items	Key Items/References
(8)	Attach the bolts and washers which attach the lid to the floor in the nose baggage compartment.	
(9)	Install the de-icing fluid tank.	Only for installation of the main pumps (RH side). Refer to Paragraph 4.
(10)	Carry out operational test.	Refer to Paragraph 2.

7. Replace the Filter Cartridge or Windshield Pump or Solenoid Valve

	Detail Steps/Work Items	Key Items/References
(1)	Open front baggage door LH.	
(2)	Remove the bolts and washers which attach the lid (small inspection hole) to the floor in the LH nose baggage compartment.	
(3)	Remove locking wire of hose connections downstream of the high pressure switch (½ in).	
(4)	Remove locking wire of both hose connections downstream of equal tee (5/16 in).	
(5)	Disconnect hose line connections.	Use caps to protect the loose line connections from contamination.
(6)	Lift up access lid in the nose baggage compartment on the LH side.	
(7)	Disconnect all electrical connectors from the windshield pump/solenoid valve.	
(8)	Remove locking wire of hose connection to spray bar (3/16 in), filter bleeding hose (3/16 in) and to the manifold block (½ in) downstream of equal tee.	
(9)	Disconnect hose line connections.	Use caps to protect the loose line connections from contamination.
(10)	Remove the access lid in the nose baggage compartment on the LH side.	Twist up outer edge of lid and push slightly rearward.
(11)	Remove the locking wire from the hose connections to the component(s) to be replaced.	

	Detail Steps/Work Items	Key Items/References
(12)	Remove the bolts and washers which hold the component(s) to the lid.	
(13)	Disconnect all hose line connections from the component(s).	Use caps to protect the loose line connections from contamination.
(14)	Replace component(s).	
(15)	Attach the bolts and washers which attach the new component(s) to the lid.	
(16)	Connect all hose connections to the new component(s).	Remove caps. Use new seals.
(17)	Secure all hose connections with locking wire.	
(18)	Move the lid in place in the floor.	
(19)	Connect all hose connections (spray bar, filter bleeding hose and manifold block)	Remove caps. Use new seals.
(20)	Secure all hose connections with locking wire.	
(21)	Connect all hose connections below small inspection hole (High pressure switch and equal tee).	Remove caps. Use new seals.
(22)	Connect all electrical connectors of the windshield pump/solenoid valve.	
(23)	Secure all hose connections with locking wire.	
(24)	Attach the bolts and washers which attach the lids to the floor of the LH nose baggage compartment.	
(25)	Close the door of the LH nose baggage compartment.	
(26)	Bleed the de-icing system.	Refer to Paragraph 8.

8. Bleed the De-Icing System

	Detail Steps/Work Items	Key Items/References
(1)	Bleed the metering pumps:	
	– Fill the de-icing fluid tank to at least one quarter of its capacity.	Refer to Section 12-10.
	– Close canopy.	
	– Operate the windshield pumps of the ice protection system several times.	To remove all air.
	– Operate the system on HIGH until evidence of de-icing fluid on the porous panels is noticed.	
	– If de-icing fluid tank is completely empty, re-fill the de-icing fluid tank with approx. 2 liter (0.5 US gal) of de-icing fluid.	Refer to Section 12-10.
(2)	Bleed the filter elements.	
	– Move end of bleeding hose to the exterior of the airplane.	Accessible via the LH baggage compartment door behind carpet.
	– Remove the blanking plug from the filter bleeding hose.	To prevent the baggage compartment floor from becoming contaminated.
	– Set ELECT MASTER switch to ON.	
	– Set OFF/NORM/HIGH switch of the de-icing control unit to HIGH.	
	– Operate system until air free fluid is discharged from the bleeding hose of the filter elements.	
	– Set OFF/NORM/HIGH switch of the de-icing control unit to OFF.	
	– Set ELECT MASTER switch to OFF.	
	– Install the blanking plug to the filter bleeding hose.	Use new seal if necessary.
	– Put bleeding hose back in place.	Make sure that no leakage occurs.

9. Purge the De-Icing System

Purging is required when part of the active area of one or more porous panels fails to dissipate fluid.

	Detail Steps/Work Items	Key Items/References
	Open the small inspection panels on the outboard side of the proportioning unit.	To give access to the proportioning units.
(1)	Open blanking plugs on the proportioning unit.	LH and RH nacelles.
(2)	Use external pump (max. 6 bar or 87 PSI) with filtration fitted (0.8 micrometers or 1/25,000 inch) to force de-icing fluid through the porous panels.	LH and RH. Refer to the AFM for approved de-icing fluids.
(3)	Close blanking plugs on the proportioning unit.	LH and RH nacelles.
(4)	Close the small inspection panels on the outboard side of the engine nacelles.	

10. Remove/Install a Proportioning Unit

A. Remove a Proportioning Unit from the Nacelle

	Detail Steps/Work Items	Key Items/References
(1)	Drain the ice protection system.	Refer to Paragraph 3.
	CAUTION: YOU MUST MARK THE HOSES AND PORTS SO THAT YOU CAN RE-CONNECT THE HOSES TO THE CORRECT PORTS ON THE PROPORTIONING UNIT. IF YOU DO NOT RE-CONNECT THE HOSES CORRECTLY, THE SYSTEM WILL NOT WORK PROPERLY.	
(2)	Remove the bolts, washers and the spacer holding the proportioning unit.	Hold the proportioning unit.
(3)	Remove the locking wire from the hose connections to the filter element.	
(4)	Disconnect all hose connections from the proportioning unit.	Use caps to protect the loose line connections from contamination.
(5)	Move the proportioning unit clear of the airplane.	

B. Install a Proportioning Unit to the Nacelle

	Detail Steps/Work Items	Key Items/References
(1)	Move the proportioning unit in position in the nacelle.	
	CAUTION: YOU MUST CONNECT THE HOSES TO THE CORRECT PORTS. IF YOU DO NOT CONNECT THE HOSES CORRECTLY, THE SYSTEM WILL NOT WORK PROPERLY.	
(2)	Connect all hose connections to the proportioning unit.	Remove caps.
(3)	Secure all hose connections with wire lock.	
(4)	Install the bolts and washers which hold the proportioning unit.	
(5)	Close the small inspection panels on the outboard side of the engine nacelles.	
(6)	Carry out operational test.	Refer to Paragraph 2.

11. Replace an Ice Protection Porous Panel

The porous panels for the ice protection system are bonded to the wing, vertical and horizontal stabilizer leading edges. They cannot be removed without damage to the panels. Refer to the airplane manufacturer when you must replace a porous panel.

12. Replace De-Icing Fluid Nylon Tubing

Used diameters are: 3/16 in, 5/16 in and 1/2 in. Only replace tubes by tubes with the same diameter.

Refer to the CAV Aerospace Nylon Tubing and Coupling General Practices Manual for the replacement procedure. For the feeder lines in the engine nacelle to the propeller only use PTFE tubing.
Minimum bending radius cold formed are:

Tool No.	Tube outside diameter	Min. recommended bend radius inch (mm) measured to inside wall of tube, cold formed
T300 - 112 A.	3/16 in	1 (25)
T300 - 120 A.	5/16 in	3 (75)
T300 - 144 A.	1/2 in	4 (100)

13. Replace Ice Protection Control Box

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the XFER PUMP/ DE-ICE circuit breaker is pulled.	
(2)	Open the access lid in the nose baggage compartment on the LH side.	To give access the ice protection control box.
(3)	Unscrew the 2 mounting screws from the upper side of the baggage compartment floor.	
(4)	Extract the de-ice control box via the access hole.	
(5)	Disconnect plug no.: P3011 from control box.	
(6)	Connect plug no.: P3011 to new control box.	
(7)	Move the de-ice control box to the prior position and fix it by using the 2 mounting screws and the upper-floor reinforcement doubler.	
(8)	Close the access lid in the nose baggage compartment on the LH side.	

14. Remove/Install the High Pressure Switch

A. Remove High Pressure Switch

	Detail Steps/Work Items	Key Items/References
(1)	Drain the ice protection system.	Refer to Paragraph 3.
(2)	Open front baggage door LH.	
(3)	Remove the bolts and washers which attach the small inspection lid to the floor of LH nose baggage compartment.	
(4)	Lift the lid upward.	
(5)	Disconnect electrical connectors from high pressure switch.	
(6)	Remove locking wire from all hose connections on the high pressure switch.	
(7)	Disconnect all hose connections from the high pressure switch.	Use caps to protect the loose line connections from contamination.
(8)	Remove cable ties which fix high pressure switch to the nose cone.	
(9)	Remove high pressure switch from baggage compartment.	

B. Install High Pressure Switch

(1) High Pressure Switch Values

HP Switch Value	
Activate.	5.86 (± 0.35) bar / 85 (± 5) PSI
Reset.	4.83 (± 0.35) bar / 70 (± 5) PSI

(2) Install High Pressure Switch

	Detail Steps/Work Items	Key Items/References
(1)	Move high pressure switch in place below the small inspection lid on the LH side in the nose baggage compartment.	
(2)	Connect hose line connection upstream of the high pressure switch.	Remove caps. Use new seals.
(3)	Fit tubing containing valve and dampened manometer downstream of the high pressure switch.	For appropriate range of manometer see table above. Prepare collecting container for dissipating fluid.
(4)	Operate ice protection system in HIGH mode.	
(5)	Adjust pressure in tubing with the vessel above the activation limit of the high pressure switch.	See table above for limits.
(6)	Check high pressure caution on PFD of G1000 after 2 minutes (tolerance + 5 sec.) delay since pressure adjusted above limit.	
(7)	Check low-pressure warning on PDF of G1000 after 2 minutes (tolerance + 5 sec.) delay since pressure adjusted above limit.	
(8)	Check if high pressure indication extinguishes after pressure in tubing has been adjusted below reset value according the table above.	
(9)	Switch off ice protection system.	
(10)	Remove nylon tubing containing vessel and manometer downstream of high pressure switch.	

	Detail Steps/Work Items	Key Items/References
(11)	Connect hose line connection downstream of the high pressure switch.	Remove caps. Use new seals.
(12)	Secure hose line connections of high pressure switch with lock wire.	
(13)	Fix high pressure switch with cable ties to the nose cone.	Replace cable tie base if necessary.
(14)	Move small inspection lid in place.	
(15)	Install bolts and washers which attach the lid to the floor of the nose baggage compartment.	
(16)	Close LH door of nose baggage compartment.	
(17)	Do an operational test.	Refer to Paragraph 2.

15. Remove/Install the Low Pressure Switch Proportioning Unit

A. Remove the Low Pressure Switch Proportioning Unit

	Detail Steps/Work Items	Key Items/References
(1)	Remove fairing cover from empennage.	
(2)	Remove cable ties.	
(3)	Disconnect VOR antenna (coaxial cable).	
CAUTION: YOU MUST MARK THE HOSES AND PORTS SO THAT YOU CAN RE-CONNECT THE HOSES TO THE CORRECT PORTS ON THE PROPORTIONING UNIT. IF YOU DO NOT RE-CONNECT THE HOSES CORRECTLY, THE SYSTEM WILL NOT WORK PROPERLY.		
(4)	Disconnect all electrical connectors from the low pressure switches.	
(5)	Remove locking wire from the hose connections pointing in flight direction.	
(6)	Disconnect the hose connections to the low pressure switches.	Use caps to protect the loose line connections from contamination.
(7)	Remove bolts and washers, which hold the low pressure switch proportioning unit to the vertical stabilizer.	
(8)	Pull low pressure switch proportioning unit upward.	To give access to the feeder line of the fuselage section.
(9)	Remove locking wire from the feeder line connection.	
(10)	Disconnect feeder line to the low pressure switch proportioning unit.	Use caps to protect the loose line connections from contamination.
(11)	Remove locking wire from the two hose connections labeled as 2 and 3 on the proportioning unit (LH & RH horizontal tail panel).	
(12)	Disconnect the two hose connections labeled as 2 and 3 on the proportioning unit (LH & RH panel).	Use caps to protect the loose line connections from contamination.
(13)	Remove low pressure switch proportioning unit.	

B. Install the Low Pressure Switch Proportioning Unit

	Detail Steps/Work Items	Key Items/References
(1)	Connect feeder line to the low pressure switch proportioning unit.	
(2)	Secure feeder line connection with locking wire.	
(3)	Move low pressure switch proportioning unit in position in the vertical stabilizer.	To give access to the feeder line of the fuselage section.
(4)	Install bolts and washers which hold the low pressure switch proportioning unit to the vertical stabilizer.	
(5)	Connect the two hose connections to the proportioning unit labeled as 2 and 3 on the proportioning unit.	
(6)	Secure the two hose connections with locking wire.	
	CAUTION: YOU MUST CONNECT THE HOSES TO THE CORRECT PORTS. IF YOU DO NOT CONNECT THE HOSES CORRECTLY, THE SYSTEM WILL NOT WORK PROPERLY.	
(7)	Connect the hose connections to the low pressure switches.	Remove caps. Use new seals.
(8)	Secure the hose connections with locking wire.	
(9)	Connect all electrical connectors from the low pressure switches.	
(10)	Connect VOR antenna (coaxial cable).	
(11)	Install cable ties.	
(12)	Install fairing cover to empennage.	
(13)	Carry out operational test.	Refer to Paragraph 2.

16. Remove/Install a Low Pressure Switch in the Horizontal Tail

A. Remove a Low Pressure Switch in the Horizontal Tail

	Detail Steps/Work Items	Key Items/References
(1)	Remove the maintenance cap horizontal tail outboard.	Cut sealant.
(2)	Disconnect the electrical connectors from the low pressure switch.	
(3)	Remove the locking wire from the hose connections and the screw connections.	
(4)	Disconnect the hose connections to the low pressure switch	
(5)	Remove bolts and washers, which hold the low pressure switch to the low pressure switch bracket.	
(6)	Remove low pressure switch from bracket.	Use caps to protect the loose line connections from contamination.

B. Install a Low Pressure Switch in the Horizontal Tail

	Detail Steps/Work Items	Key Items/References
(1)	Connect the hose connection of the feeding line (from the proportioning unit) to the low pressure switch.	
(2)	Secure the hose connection with locking wire.	
(3)	Move the low pressure switch in position to the low pressure switch bracket bonded to the upper shell of the horizontal tail.	In flight direction.
(4)	Install bolts and washers which hold the low pressure switch to the bracket.	
(5)	Secure the bolts with locking wire.	
(6)	Connect the hose connections of the feeding line (to panel inlet) to the low pressure switch.	Max. length 200 mm.
(7)	Secure the hose connection with locking wire.	
(8)	Connect the electrical connector from the low pressure switch.	
(9)	Carry out operational test.	
(10)	Install maintenance cap.	Use sealant.

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CHAPTER 31

INDICATING SYSTEMS

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INDICATING SYSTEMS

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CHAPTER 31
INDICATING SYSTEMS

1. General

This Chapter tells you about the indicating systems installed in the airplane. Refer to these Sections for the related data:

- Section 31-10. The instrument and control panels installed in the DA 42 NG.
- Section 31-20. Independent instruments.
- Section 31-40. The integrated cockpit system.

The DA 42 NG has these indicating systems:

- An instrument panel. The instrument panel is made in several pieces with a shelf. The shelf goes between the panel and the cockpit forward bulkhead.
- A control panel in the center console. This panel has the engine controls, fuel controls, cabin heat control levers, parking brake and trim. It has a forward part and an aft part.
- Integrated cockpit system (ICS). The airplane has an integrated cockpit system with 2 displays which give the airplane flight and navigation displays, engine instrument displays and airplane systems indications. The ICS has “softkeys” on the display screens for the option of selecting which indications will be displayed on the screen.

This Section does not tell you about the indicators that belong to systems. See the related system for data. For example, see Section 27-31 for data about the trim indicator.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called "Additional Equipment". The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

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Section 31-10

Instrument and Control Panels

1. General

The DA 42 NG has these instrument and control panels:

– An instrument panel. The instrument panel is made in several pieces with a shelf. The shelf goes between the panel and the instrument panel frame.

– A control panel in the center console. This panel has a forward cover and an aft cover. The forward cover has the cabin heat control levers, parking brake lever and rudder trim control. The aft cover has the engine controls and fuel transfer/shut-off valve.

See the related Chapter or Section for data about the controls. For example, see Section 76-00 for data on the engine controls.

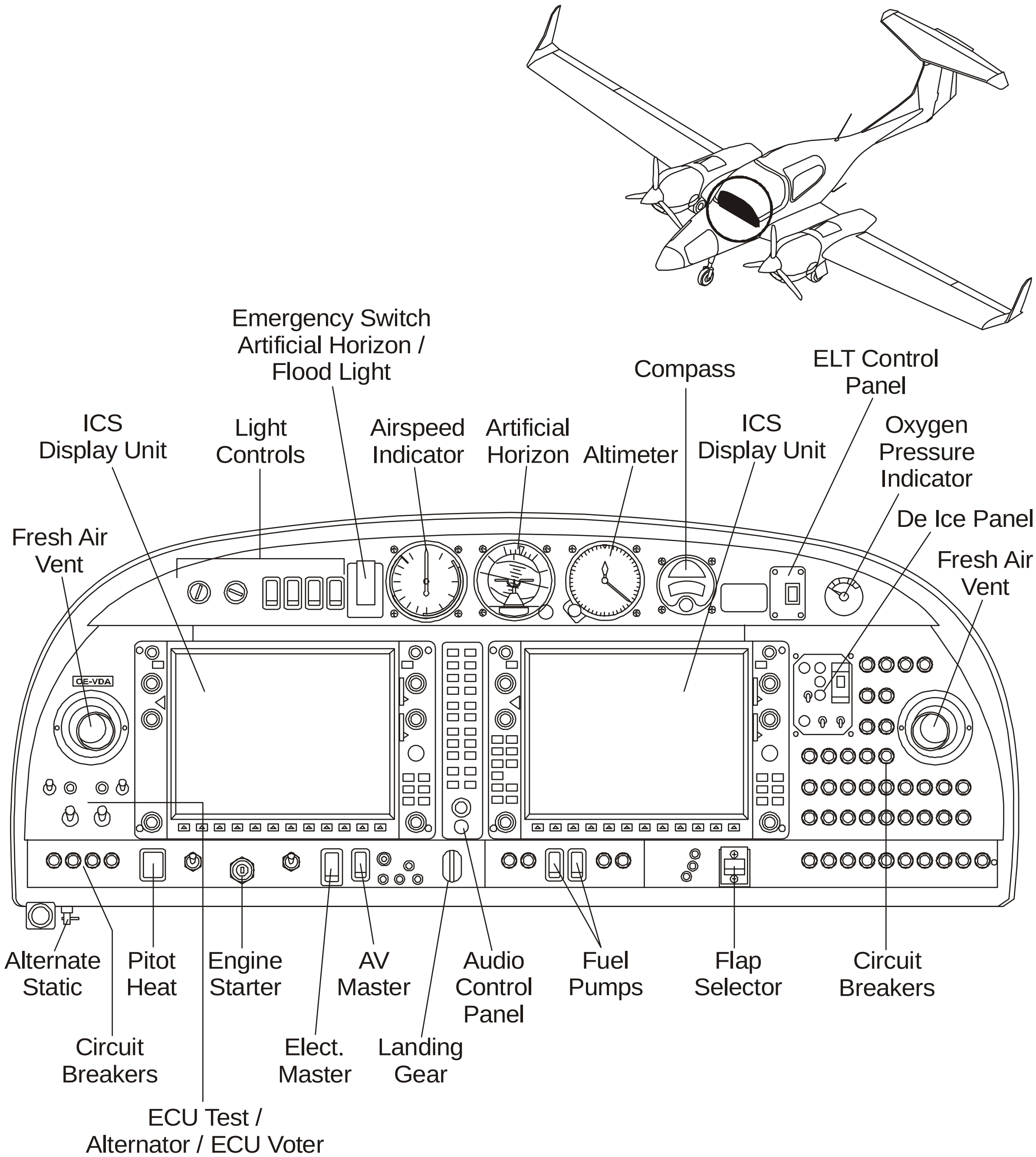

Figure 1: Instrument Panel

Optional, if OÄM 42-270 is installed

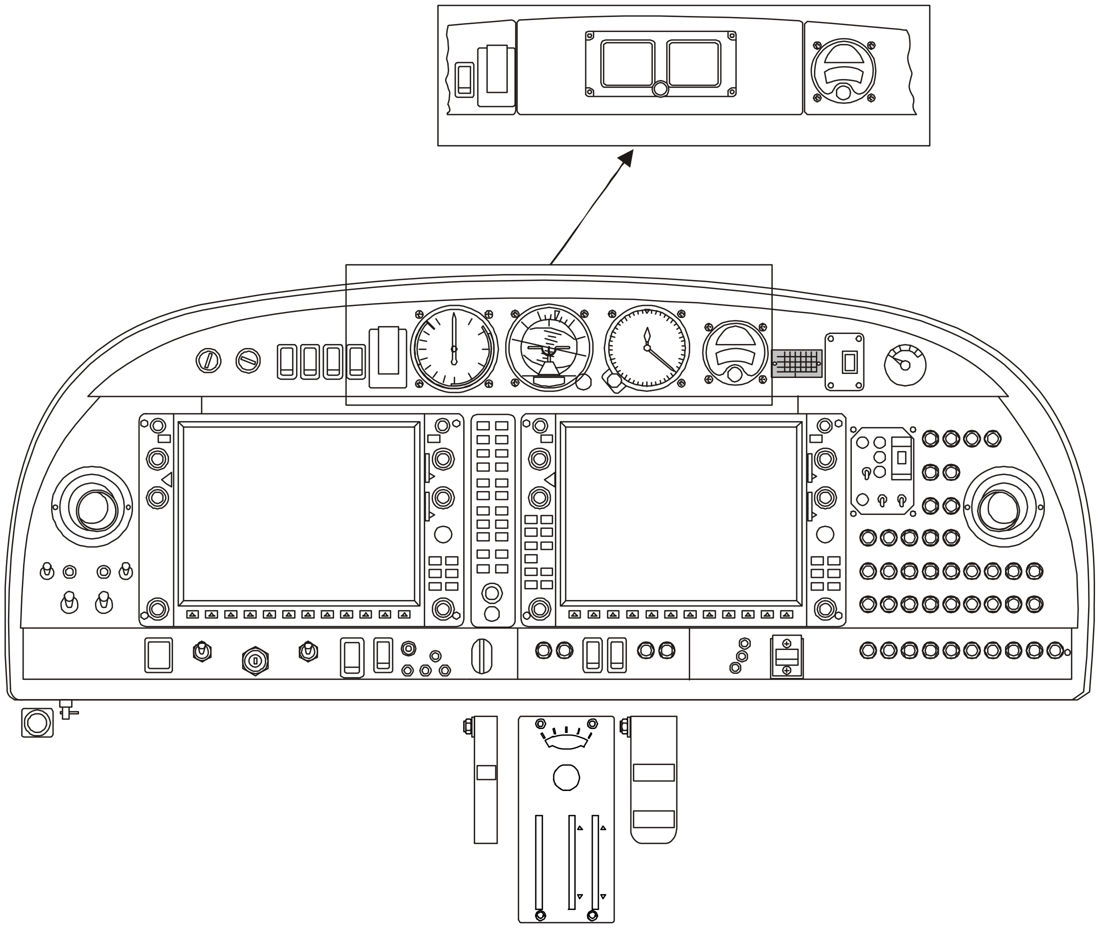

Figure 2: Instrument Panel (with OÄM 42-270)

2. Instrument Panel Description

Several pieces of aluminum alloy make the instrument panel. The panel has a vertical face with instruments and a horizontal 'shelf' with electrical components. The shelf goes between the forward bulkhead of the cockpit and the vertical face of the panel.

The DA 42 NG has an integrated cockpit system (ICS). The ICS has two large LCD display screens which are located in the instrument panel. These two display screens can digitally display all of the flight, navigation and airplane system data. An audio control panel is located between the display screens. The audio control panel integrates with the ICS and is used to control all of the airplane radio and navigation audio systems. Refer to Section 31-40 for more data about the ICS.

An airspeed indicator, artificial horizon, altimeter and magnetic compass are located along the top of the instrument panel. Optional, if OÄM 42-270 is installed, the airspeed indicator, artifical horizon and altimeter are combined in one unit named Standby Altitude Module. These instruments provides the basic data required to fly the airplane in the event of a power failure and the loss of the ICS. The artificial horizon or the standby attitude module can be powered from an emergency power pack. An emergency switch is located near the artificial horizon or standby attitude module and has a guard installed to prevent accidental selection.

Most circuit breakers for the electrical systems are located on the right side of the instrument panel. The electrical system bus-bars are directly connected to the rear of the circuit-breakers.

Along the bottom of the instrument panel are the electrical, avionic and engine master switches. The landing gear and flap control switches and fuel pump switches are also located along the bottom of the instrument panel. The instrument panel and airplane light switches are located at the top-left of the instrument panel.

The shelf part of the instrument panel holds relays, junction blocks, connectors and ground studs.

The instrument panel has a cover attached by screws.

Refer to Chapter 24 for more data about the electrical system and Chapter 22 for more data about the autopilot system.

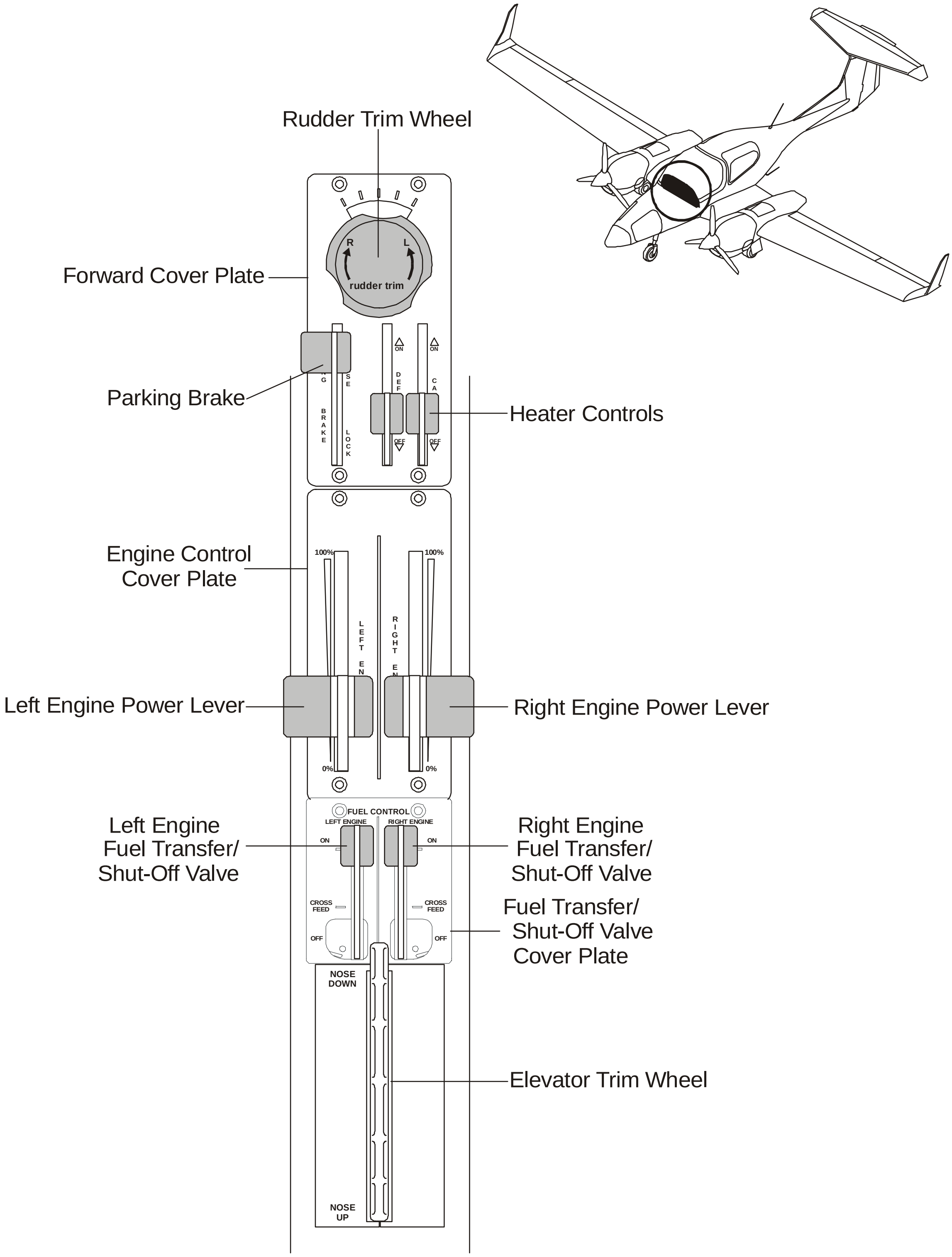

Figure 3: Center Console

3. Center Console Description

Figure 3 shows the center console structure. Refer to the related chapters for the data on the controls.

The center console holds the engine control assembly. The engine control assembly holds the rudder trim, parking brake, heating controls and engine power levers. Aft of the engine control assembly are the controls for the fuel transfer/shut off valves and the elevator trim wheel.

The engine control assembly has two aluminum alloy side plates. Four brackets attach to the side plates with rivets. The front bracket has holes to anchor the outer sheaths of the brake and heat control cables. The top bracket has two anchor nuts. Bolts engage the anchor nuts to attach the engine control assembly to the top of the floor panel.

The center bracket has two anchor nuts for the control cover plates. The rear bracket attaches to the elevator trim control assembly.

There are no user maintainable parts in the engine control assembly structure or the center console structure.

4. De-Ice Control Panel Description

Figure 4 shows the de-ice control panel which is installed on the RH side of the instrument panel. All functions of the de-ice system are operated by the de-ice control panel in conjunction with the de-ice control box. Refer to Chapter 30 for a detailed description of the de-icing system.

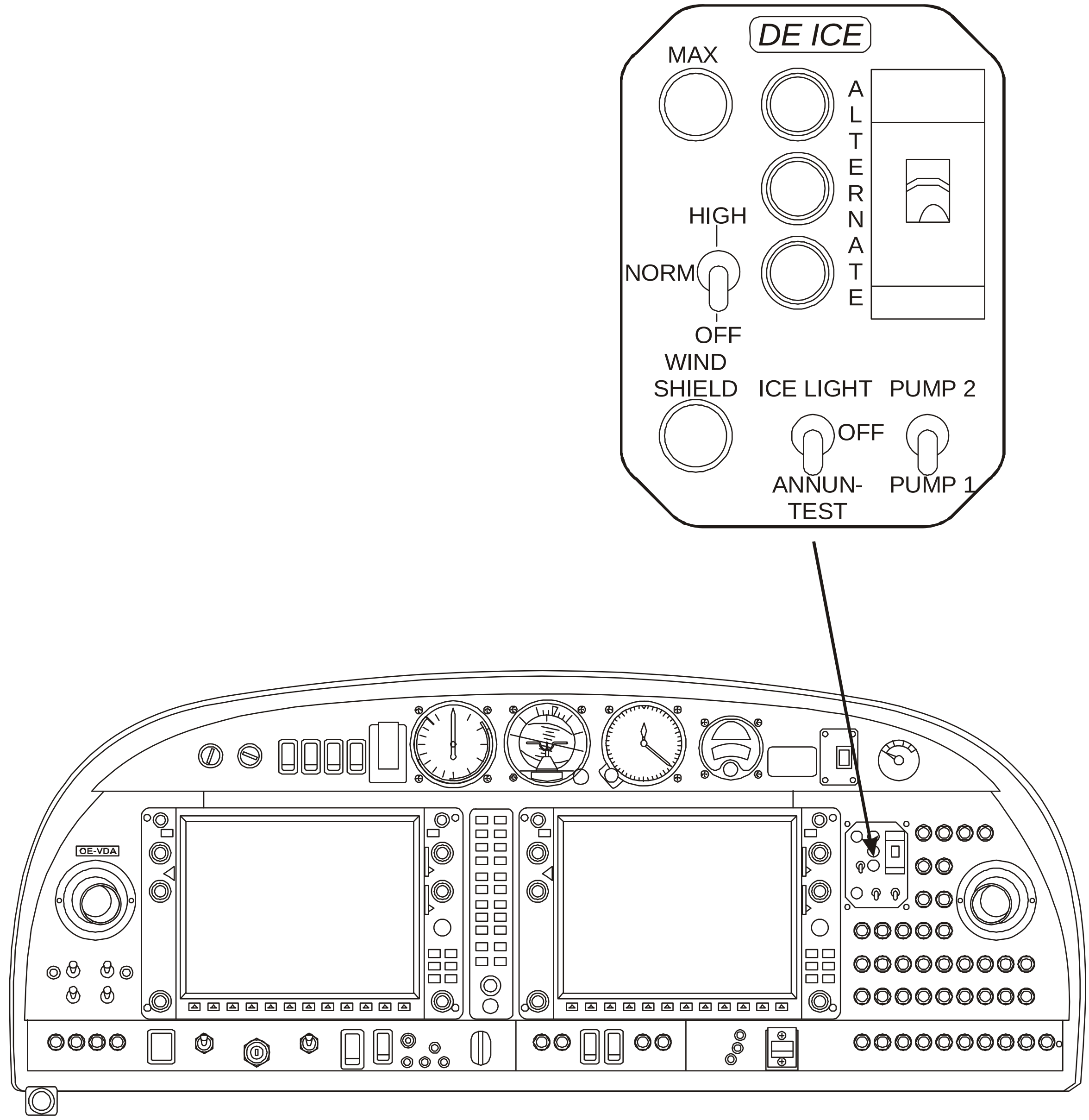

Figure 4: DE-ICE Control Panel

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Trouble-Shooting

1. General

The table below lists the defects you could have with the control panel in the center console. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Parking brake or cabin heat control levers do not stay in the set position.	Friction tension too low. Too much wear in the friction washers.	Adjust the friction. Replace the friction washers.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install the engine control assembly.

2. Remove/Install the Engine Control Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Remove the knob from the rudder trim control: – Remove the grub screw from the recess in the knob. – Pull the knob clear of the spindle.	
(2)	Remove the knob from the parking brake control lever: – Remove the screw that attaches the plain knob to the threaded knob. – Remove the knobs and spacer from the lever.	
(3)	Remove the knobs from the heater control levers. Do this procedure for each lever: – Remove the screw that attaches the plain knob to the threaded knob. – Remove the knobs and spacer from the lever.	
(4)	Remove the forward cover plate: – Remove the 4 screws that attach the cover plate to the engine control assembly. – Lift the cover plate clear of the engine control assembly.	

	Detail Steps/Work Items	Key Items/References
(5)	Remove the engine control cover plate: – Remove the 4 screws that attach the cover plate to the engine control assembly. – Lift the cover plate clear of the engine control assembly.	
(6)	Remove the knobs from the fuel transfer/shut off control levers. Do this procedure for each lever: – Remove the screw that attaches the plain knob to the threaded knob. – Remove the knobs and spacer from the lever.	
(7)	Remove the fuel transfer/shut off control assembly cover plate: – Remove the 4 screws that attach the cover plate to control assembly. – Move the cover plate clear of the center console.	

	Detail Steps/Work Items	Key Items/References
(8)	Remove the engine control assembly:	
	– Remove the 2 bolts that attach the aft end of the engine control assembly to the structure.	
	– Lift the engine control assembly up from the center console and release these components as they become accessible:	
	– The parking brake control cable.	Refer to Section 32-40.
	– The heater control cables.	Refer to Sections 21-20 and 21-40.
	– The electrical cables for the engine power levers.	Refer to Section 76-00.
	– The rudder trim cable.	Refer to Section 27-21.
	– The electrical cables for the engine control assembly micro switches.	At the in-line connectors.
	– When all the components are released lift the engine control assembly clear of the center console.	

A. Install the Engine Control Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Install the engine control assembly:	
	– Move the control into position in the cockpit and hold above the center console and:	
	– Connect the rudder trim cable.	Refer to Section 27-21.
	– Connect the electrical cables for the micro switches in the engine control assembly.	At the in-line connectors.
	– The electrical cables for the engine power levers.	Refer to Section 76-00.
	– The heater control cables.	Refer to Sections 21-20 and 21-40.
	– The parking brake control cable.	Refer to Section 32-40.
	– When all the components are connected lower the engine control assembly into position in the center console.	
	– Install the 2 bolts at the rear of the engine control assembly that attach the engine control assembly to the center console.	
(2)	Install the fuel transfer/shut off control assembly cover plate:	
	– Move the cover plate into position at the center console.	
	– Install the 4 screws that attach the cover plate to control assembly.	
(3)	Install the knobs onto the fuel transfer/shut off control levers. Do this procedure for each lever:	
	– Install the plain knob, spacers and threaded knob onto the lever.	
	– Install the screw that attaches the plain knob to the threaded knob.	

	Detail Steps/Work Items	Key Items/References
(4)	Install the engine control cover plate: – Move the cover plate into position over the power levers. – Install the 4 screws that attach the cover plate to the engine control assembly.	
(5)	Install the forward cover plate: – Move the cover plate into position over the engine control assembly. – Install the 4 screws that attach the cover plate to the engine control assembly.	
(6)	Install the knobs onto the heater control levers. Do this procedure for each lever: – Install the plain knob, spacer and threaded knob onto the lever. – Install the screw that attaches the plain knob to the threaded knob.	
(7)	Install the knobs onto the parking brake lever: – Install the plain knob, spacer and threaded knob onto the lever. – Install the screw that attaches the plain knob to the threaded knob.	
(8)	Install the knob onto the rudder trim control: – Move the knob into position over the spindle. – Install the grub-screw into the recess in the knob.	

	Detail Steps/Work Items	Key Items/References
(9)	Do a test for the correct operation of the rudder trim system. If necessary for your Airworthiness Authority do a duplicate inspection of the rudder trim system.	Refer to Section 27-21.
(10)	Do a test for the correct operation of the parking brake system.	Refer to Section 32-40.
(11)	Do a test for the correct operation of the airplane heating and ventilation system.	Refer to Sections 21-20 and 21-40.
(12)	Do a test for the correct operation of the engine control system.	Refer to Section 76-00.

Section 31-20
Independent Instruments

1. General

The DA 42 NG airplane has no independent instruments that are not part of the integrated cockpit system (ICS). For more data about the ICS refer to Section 31-40.

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Section 31-40
Central Computers

1. General

The DA 42 NG has a Garmin G1000 integrated cockpit system (ICS). The ICS integrates all the usual flight, avionic and airframe system indications into one system. The system displays the data on two display screens located in the instrument panel. An audio control panel is located between the two display screens. The audio control panel integrates and controls the airplane radio, navigation and intercom systems.

Refer to Section 23-50 for more data about the audio control panel.

Electrical power is supplied to the ICS control and display screens when the ELECT. MASTER switch is set to ON. Power is supplied to the audio control panel when the AV. MASTER switch is set to ON.

During normal operation the left display screen is referred to as the primary flight display (PFD) and the right display screen as the multi function display (MFD). Either display can be used as PFD or MFD. If one display fails the remaining screen can be toggled automatically to reversionary mode.

For more detailed data about the ICS refer to the G1000 Cockpit Reference Guide for the DA 42 NG Airplane.

Figure 1 shows the ICS system schematic.

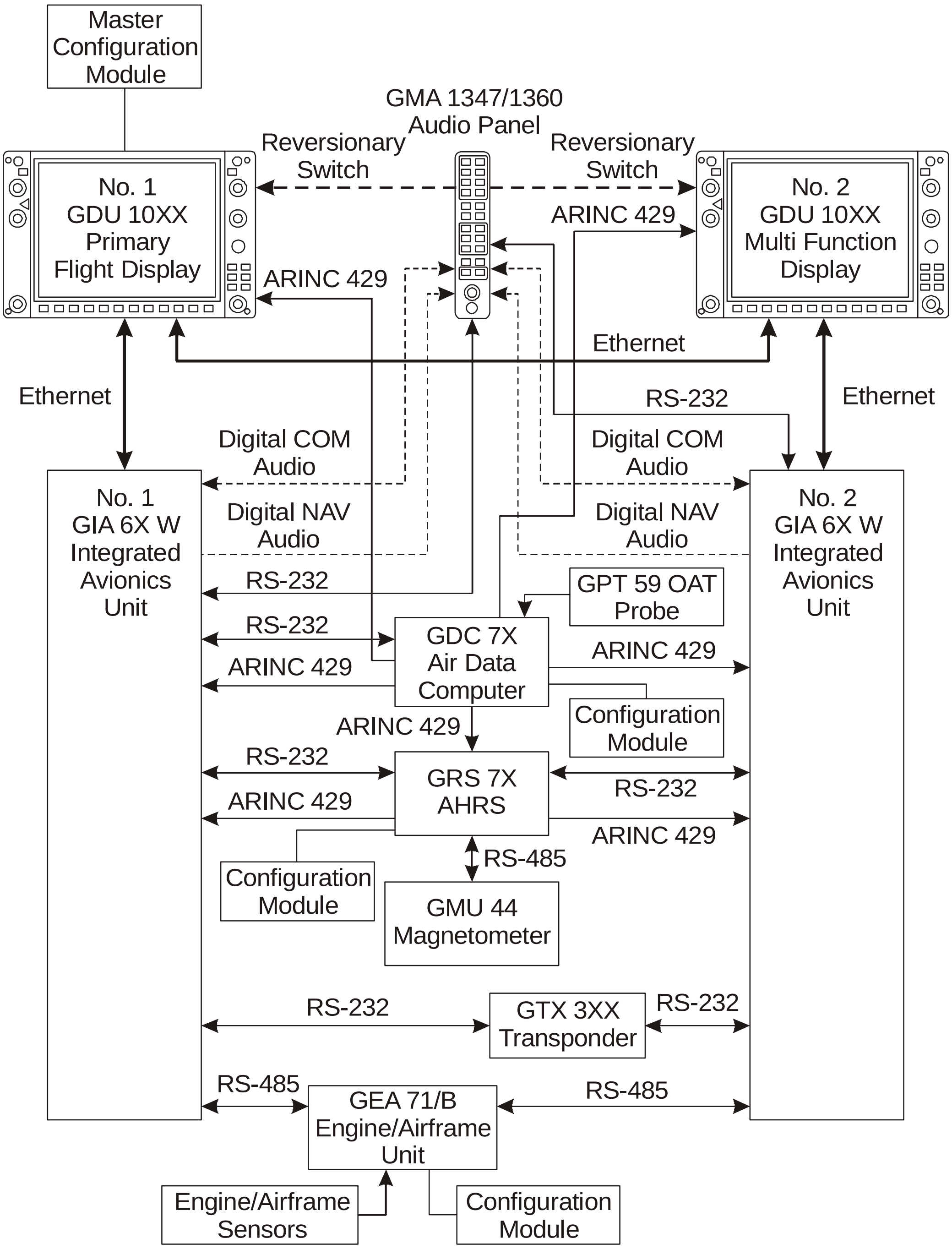

Figure 1: Integrated Cockpit System Schematic Diagram

2. Description

Figure 2 shows the schematic diagram for the ICS. The ICS has these main components:

A. Primary Flight Display (PFD)

The PFD is a 10.4 in liquid crystal display. Bezels on the left and right side of the PFD have the controls for the ICS. The lower edge of the PFD has 'softkeys'. The function of the softkeys relates to the on-screen display and the display will show the function of the key.

The PFD shows the basic primary flight display plus a number of additional options that can selected manually. Some other indications will be generated automatically for example, alert captions.

The left side bezel has these controls:

– NAV VOL/SQ knob. This controls the NAV audio level. Press the knob to toggle the ident filter OFF/ON.

– NAV frequency transfer key. Press this key to make the standby NAV frequency the active frequency.

– NAV knob. This control has a large outer knob and a smaller inner knob. Rotate these knobs to select the NAV frequency. Rotate the large outer knob to select the MHz and the inner knob to select the kHz. Pressing the smaller inner knob will toggle the tuning cursor between the NAV1 and NAV2 frequency display.

– HDG knob. You can manually select the heading with this control. Pressing this knob will cause a heading window to momentarily appear to the left of the heading indicator. This window will show the airplane heading in a digital display and the heading bug will align with the compass lubber line.

– ALT SEL knob. Sets the selected altitude in the window over the altimeter tape display. The large outer knob sets the thousands indication and the inner knob sets the hundreds indication.

The right side bezel has these controls:

– COM VOL/SQ knob. Controls the COM audio level. Press the knob to toggle the COM automatic squelch ON/OFF.

– COM frequency transfer key. Press this key momentarily to make the standby COM frequency active. Press and hold this key to automatically make the emergency frequency (121.5 MHz) the standby frequency.

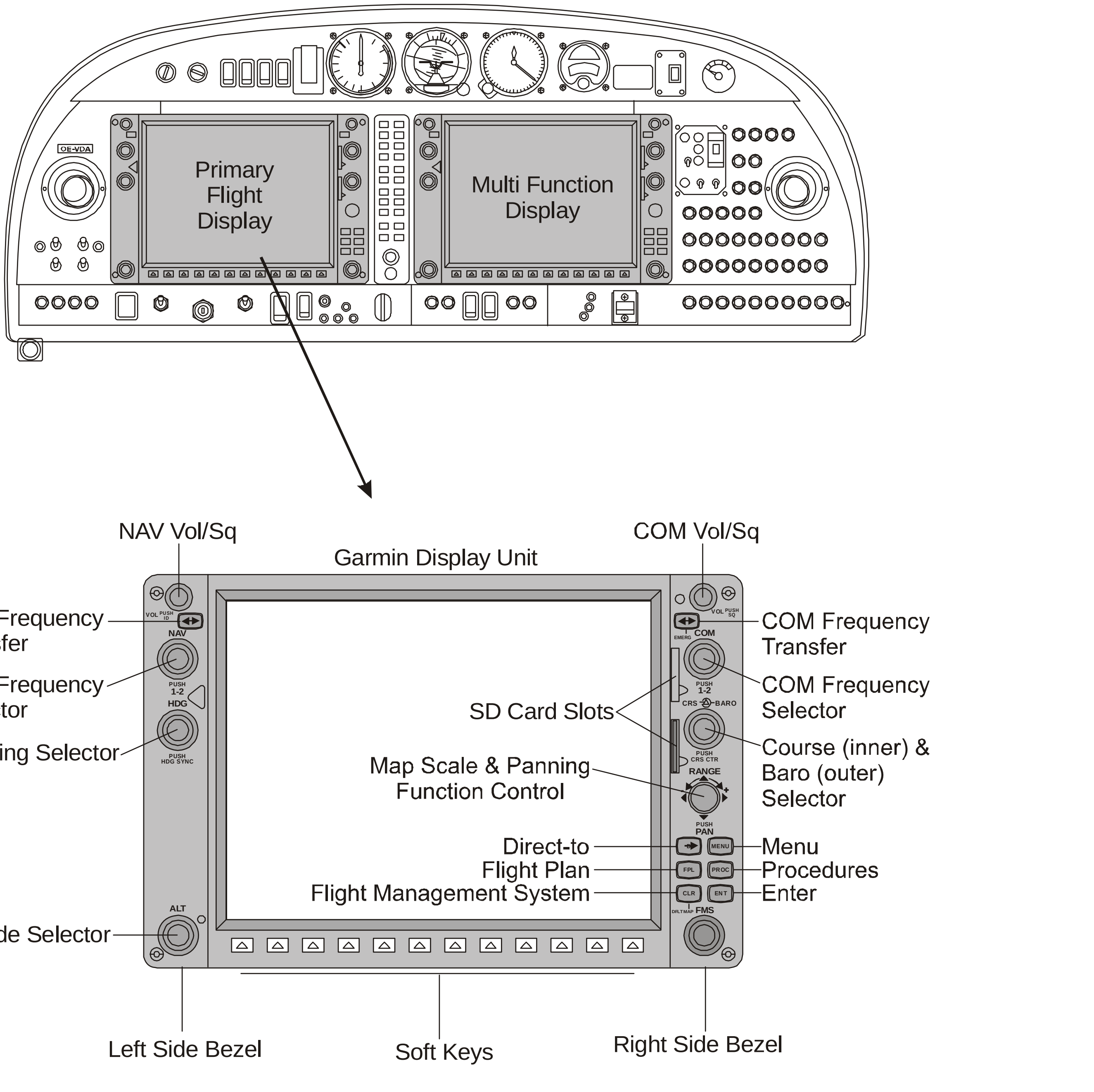

Figure 2: Garmin G1000 Display Screens and Audio Integrating Unit

- COM knob. This control has a large outer knob and a smaller inner knob. Rotate these knobs to select the COM frequency. Rotate the large outer knob to select the MHz and the inner knob to select the kHz. Pressing the smaller inner knob will toggle the tuning cursor between the COM1 and COM2 frequency display.
- CRS/BARO knob. This control has a large outer knob and a small inner knob. The outer knob sets the barometric pressure. The inner knob sets the airplane course.
- RANGE/PAN JOYSTICK knob. Rotate the knob to increase/decrease the map scale. Use the knob as a joystick to pan the map display.
- DIRECT TO key. Press this key to activate the direct-to function. This will give the direct course to a waypoint selected from the active route or to a position indicated by the map cursor.
- MENU key. Press the key to display the menu. The menu displays the options associated with the currently displayed page.
- FPL key. Press this key to display the active flight plan page. You can create or edit an existing flight plan using the bezel controls and soft keys when this page is displayed.
- PROC key. Press this key to display the procedures page. If this page is used with a selected flight plan then the procedures page will display the data associated with the flight plan. If the page is not used with a flight plan then an airfield and its relate procedures can be selected from a database.
- CLR key. Press this key to cancel an entry or delete information. Press and hold this key to immediately display the 'Default Navigation Map Page'.
- ENT key. Press to accept a menu selection or data entry. Use this key to approve an operation or to complete a data entry.
- FMS knobs. Use these concentric knobs select the page to be displayed. The outer large knob selects a page group and the inner knob selects a specific page from within the selected page group. Press the inner knob to activates an on-screen cursor. When the cursor is activated the outer knob can be used to move the cursor on the page and the small inner knob can used to scroll the cursor through an item or menu selected by the outer knob.
- Secure Digital (SD) cards. Secure Digital cards can be inserted into the slots in the right side bezel. These cards can contain data such as updated GPS navigation charts or special-to-type airplane checklists.

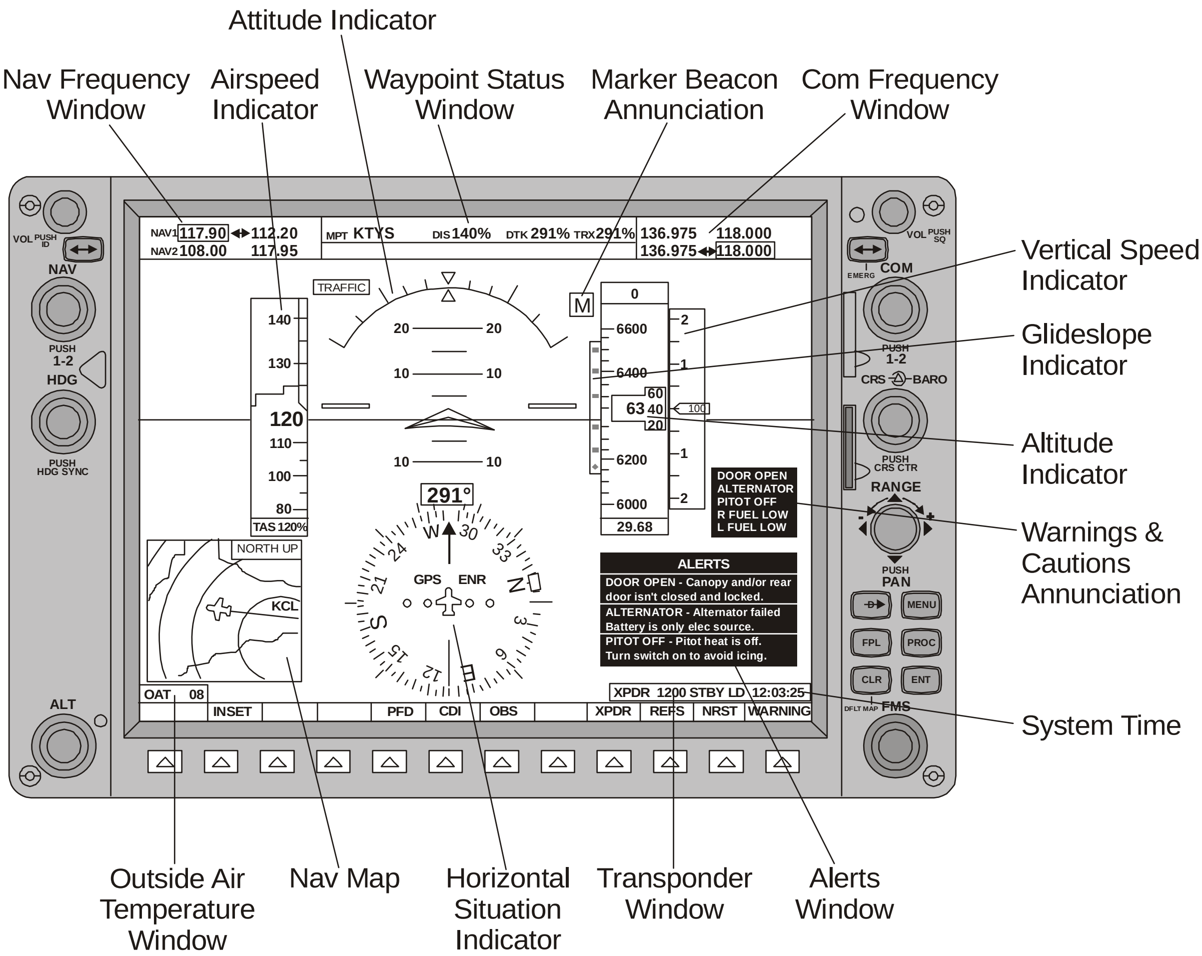

Figure 3: Primary Flight Display

The PFD window displays the usual primary flight instruments in a standard ‘T’ configuration. The basic flight instruments are:

– Airspeed indicator (ASI). The airspeed indicator is on the left side of the display and indicates the airspeed on a rolling number gauge using a moving tape. The airspeed indicator also displays speed ranges for different airplane configurations, airspeed trends and ‘V’ speeds. If the airspeed indicator fails the display marks the airspeed display area with a red ’X’ and yellow text spelling out ‘AIRSPEED FAIL’ (if MÄM 42-978 is NOT installed).

– TAS. True airspeed is digitally displayed in a small window below the airspeed indicator.

– Attitude indicator (Artificial Horizon). The attitude indicator is located in the center of the PFD, at the top. The attitude indicator shows the pitch, roll and yaw situation of the airplane. If the attitude indicator fails the display marks the pitch attitude display area with a red ’X’ and yellow text spelling out ‘ATTITUDE FAIL’ (if MÄM 42-978 is NOT installed).

– Altimeter. The altimeter is located at the top right of the PFD. The altimeter displays the airplane altitude in feet on a rolling number gauge using a moving tape. The altimeter also shows a altitude ‘bug’ at the selected altitude or the edge of the tape, whichever is closest to the current altitude. If the altitude indicator fails the display marks the tape display area with a red ’X’ and yellow text spelling out ‘ALTITUDE FAIL’ (if MÄM 42-978 is NOT installed).

– Barometric pressure indicator. The barometric pressure indicator is located immediately below the altitude indicator. The indicator shows the barometric pressure that has been set in either inches of mercury (Hg) or hectopascal number (hPa)

– Vertical speed indicator (VSI). The vertical speed indicator is located to the right of the altitude indicator. The indicator displays the airplane vertical speed in feet/min. A numeric pointer moves vertically up/down a fixed tape. The vertical speed indication is also shown digitally on the pointer. A negative sign is shown on the pointer to indicate negative vertical speeds (airplane descending). If the VSI fails the display marks the tape display area with a red or yellow ’X’ and yellow text spelling out ‘VERT SPEED FAIL’ (if MÄM 42-978 is NOT installed).

– Horizontal situation indicator (HSI). The HSI s located in the center of the PFD at the bottom. The HSI displays a rotating circular compass with heading markings. The HSI shows the following information:

– Heading information. The heading is shown digitally in a window at the top of the rotating compass.

– Turn rate indicator. A turn rate indicator is located between the digital heading window and the rotating compass.

– Course deviation indicator (CDI). The CDI is a line with an arrowhead that points to the airplane heading on the rotating compass. The line can slide left or right of the center marking to show the deviation of the actual course being flown to the required course. Course data can be supplied from the airplane VOR, LOC or GPS system. If the heading data is invalid the digital heading display window is marked with a red cross and yellow text spelling ‘HDG’.

– Vertical deviation (glidescope) indicator. The glidescope indicator is located to the left of the altimeter.

– Alerts window. The alerts window is located on the lower right side of the PFD. This window opens when an alert is activated or when the WARNINGS softkey is operated.

– Warnings and cautions window. The warnings and cautions window is located above the alerts window. This window opens when a warning or caution is activated or if the WARNING softkey is operated.

– NAV MAP. The NAV MAP window is located in the lower left of the PFD. The window is activated by pressing the INSET softkey and when activated shows a pictorial view of the airplane on a moving map.

Small windows in the top left corner of the PFD show active and standby NAV frequencies. Small windows in the top right of the PFD show active and standby COM frequencies. A larger window in the top of the PFD flight planning data when activated and autopilot mode annunciations.

A small window in the bottom left of the PFD shows the outside air temperature (OAT). A small windows on the bottom right of the PFD shows the transponder settings and operational state. Another small window in the right bottom corner of the PFD shows a digital clock.

A set of labels along the very bottom of the PFD identify the function of the softkeys for the current page being displayed on the PFD.

The PFD has a self-monitoring system. If the PFD self-monitoring system detects a fault the PFD enters reversionary mode. In the reversionary mode the PFD is configured to display the flight instrument symbology and the basic engine parameter monitoring indications. The PFD reversionary mode can also be entered by pressing the DISPLAY BACKUP selector. The DISPLAY BACKUP selector is located on the bottom of the audio control panel.

B. Multi-Function Display (MFD)

The MFD is a 10.4 in liquid crystal display. Bezels on the left and right side of the MFD have the controls for the ICS. The lower edge of the MFD has ‘softkeys’. The function of the soft keys relates to the on-screen display and if a key has a function related to the current display the display will show the function of the key.

The MFD displays engine and airplane pages on the left slide of the screen. The remainder of the screen is used to display navigational pages. The bezels on the left and right side of the MFD have the same controls and function as the bezels on the PFD. The left side bezel on the MFD has also the controls for the autopilot system. Refer to Chapter 22 for more information about the autopilot.

The Engine instrumentation system window (EIS) is on the left side of the MFD and displays a full-time dedicated display of engine parameters. The information is presented in three displays:

- Engine Display. This is the default display and shows following critical engine and fuel indicators:

  - Engine load. The engine loads are displayed as a percentage. Pointers on each side of a vertical scale move to show the engine load. If the system fails the display shows a red or yellow cross to the left or right of the load indicator to show which engine system has failed.

  - Engine RPM. Pointers on each side of a vertical scale move to show the engine rpm. If the system fails the display shows a red or yellow cross to the left or right of the RPM indicator to show which engine system has failed.

  - Fuel flow. Small windows to the left and right of a GPH marking show the engine fuel flow digitally. If the system fails a red or yellow cross is displayed in place of the digital indication for the failed system(s).

  - Oil temperature. Pointers above and below a range bar indicate the oil temperature. The range bar is color coded, green to show the normal operating range, yellow in the cautionary range and red in the warning range. The pointers move from left to right to indicate the oil temperature. The pointer above the range bar indicates the oil temperature of the left engine and the pointer below the range bar indicates the oil temperature of the right engine. If the system fails a red or yellow cross is displayed above or below the range bar to show which engine system has failed.

  - Oil pressure. Pointers above and below a range bar indicate the oil pressure. The range bar is color coded, green to show the normal operating range, yellow in the cautionary range and red in the warning range. The pointers move from left to right to indicate the oil pressure. The pointer above the range bar indicates the oil pressure of the left engine and the pointer below the range bar indicates the oil pressure of the right engine. If the system fails a red or yellow cross is displayed above or below the range bar to show which engine system has failed.

- Coolant temperature. Pointers above and below a range bar indicate the coolant temperature. The range bar is color coded, green to show the normal operating range, yellow in the cautionary range and red in the warning range. The pointers move from left to right to indicate the coolant temperature. The pointer above the range bar indicates the coolant temperature of the left engine and the pointer below the range bar indicates the coolant temperature of the right engine. If the system fails a red or yellow cross is displayed above or below the range bar to show which engine system has failed.

- Fuel temperature. Pointers above and below a range bar indicate the fuel temperature. The range bar is color coded, green to show the normal operating range, yellow in the cautionary range and red in the high warning range. The pointers move from left to right to indicate the fuel temperature. The pointer above the range bar indicates the temperature of the fuel in the left fuel tank and the pointer below the range bar indicates the temperature of the fuel in the right fuel tank. If the system fails a red or yellow cross is displayed in place of the digital indication for the failed system(s).

- Fuel quantity. Pointers above and below a range bar indicate the fuel quantities. The pointers move from left (low) to right (full) to indicate the fuel quantity. The pointer above the range bar indicates the quantity of fuel in the left fuel tank and the pointer below the range bar indicates the quantity of fuel in the right fuel tank. If the system fails a red or yellow cross is displayed in place of the digital indication for the failed system(s).

- System Display (if MÄM 42-978 is NOT installed). This display shows graphic and numeric readouts of following critical engine, electrical indicators and optional deice fluid quantity:

  - Engine load. This indication is in the same format as in the ENGINE page.

  - Engine RPM. This indication is in the same format as in the ENGINE page.

  - Volts. The primary bus voltage is displayed. Pointers above and below a horizontal range bar show the bus voltages. The top pointer indicates the left main bus voltage and the bottom pointer indicated the right main bus voltage. The horizontal range bar is color coded. The green central section of the bar indicates that the voltage is within limits. The red section at the left end of the range bar indicates too low a voltage. The red section at the right end of the range bar indicates too high a voltage. Above the range bar are left and right windows displaying the main bus voltages digitally.

  - Amps. The Generator load is displayed. Pointers above horizontal range bar show the generator loads. The range bar is color coded, green in the normal load range and then red at the high end of the range. The range bar is also marked numerically at the 0 and 80 Amp indications. The pointers move from left to right to show the load on each generator. The top pointer shows the left generator load. The bottom pointer shows the right generator load. Small windows above the range bar show the related generator loads digitally.

  – Engine gearbox temperature. Pointers above and below a horizontal range bar show the gearbox temperatures. The range bar is color coded, green in the normal temperature range, yellow in the caution range and then red at the high end of the range. The pointers move from left to right to show the temperature of each gear. The top pointer shows the left gearbox temperature and the bottom pointer shows the right gearbox temperature. Small windows above the range bar show the related gearbox temperatures digitally. If the system fails the display shows red crosses in place of the indications for the failed system(s).

  – Coolant temperature. Displays digital readouts of the coolant temperature.

  – Oil temperature. Displays digital readouts of the oil temperature.

  – Oil pressure. Displays digital readouts of the oil pressure.

  – Deice fluid quantity (optional).

– Pressing the FUEL softkey at the bottom of the MFD will change the display to the FUEL page in the EIS panel (if MÄM 42-978 is NOT installed). The display will now give the following indications:

  – Engine load and RPM. These indications are in the same format as in the ENGINE page.

  – Fuel Quantity. Displays digital readouts of the fuel tank quantity.

  – Fuel flow. Displays digital readouts of the fuel flow.

  – Fuel temperature. Displays digital readouts of the fuel temperature.

  From this page you can use softkeys to enter data for the fuel system. Refer to the Garmin G1000 Cockpit Reference Guide for more data about entering data into the ICS.

– If MÄM 42-978 is installed, pressing the ENGINE softkey at the bottom of the MFD will change the display of the MFD to a full engine indication system page, as shown in Figure 5.

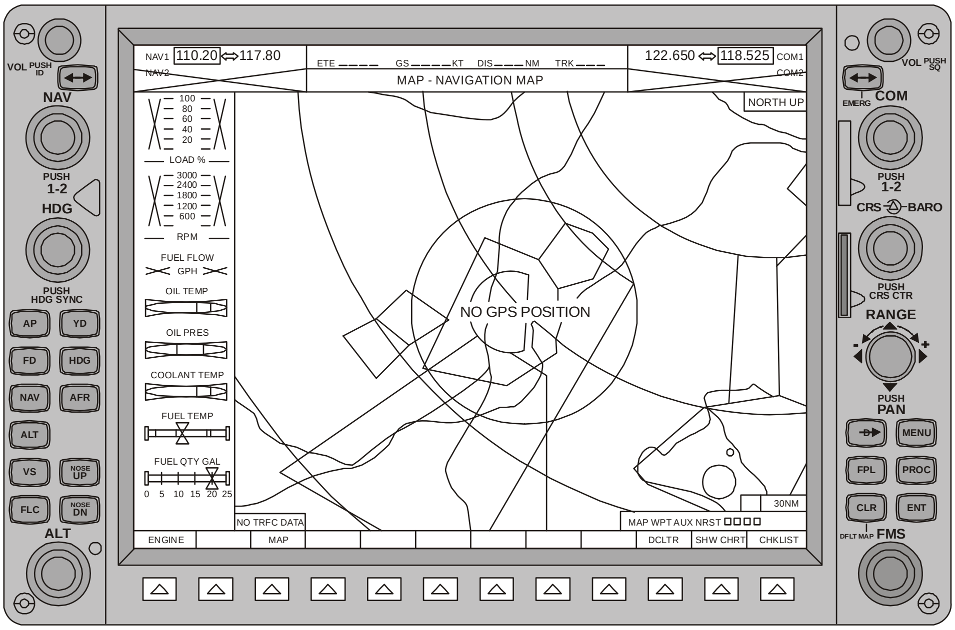

Figure 4: Multi Function Display

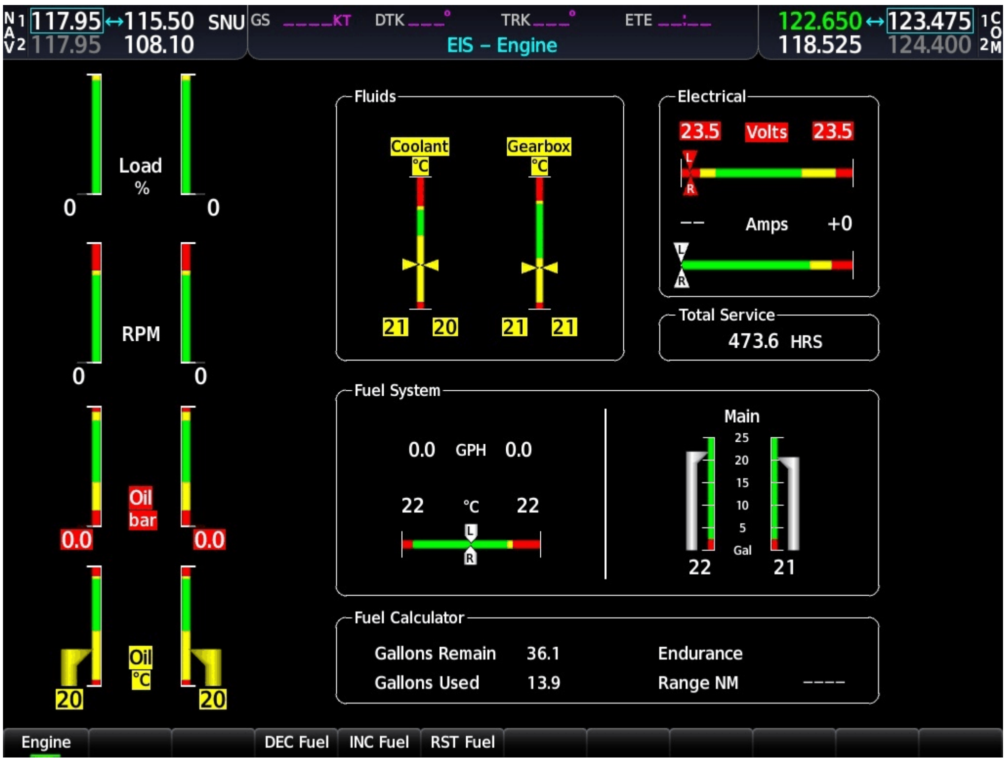

Figure 5: MFD Full EIS Page

C. GMA 1347/1360 Audio Control Panel

The GMA 1347/1360 audio control panel is located in the airplane instrument panel between the two display screens. The audio control panel integrates the NAV/COM digital audio, intercom system and marker beacon controls. Manual display reversion is also controlled from the GMA 1347/1360. The GMA 1347/1360 communicates with both IAUs using RS-232 digital interface. For more data about the audio control panel refer to Section 23-50.

D. GIA 6X W Integrated Avionics Unit (IAU)

The ICS has two GIA 6X W IAUs. The two IAUs are identical and independent. They are both installed in the avionics rack in the rear fuselage, just aft of the rear baggage frame. The IAU processes all the data that is displayed on the cockpit display. Either IAU can supply data to either cockpit display. You cannot service the IAU.

E. GTX 33/335 R Transponder

The GTX 33/335 R transponder is a solid state Mode-S transponder. The transponder provides modes A, C and S functions. The unit is operated directly through the PFD in the cockpit. The transponder is linked to both IAUs via RS-232 digital interface. The transponder is installed in the avionics rack in the rear fuselage, just aft of the rear baggage frame.

F. GRS 77/79 Attitude, Heading and Reference Unit (AHRS)

The GRS 77/79 provides airplane attitude and related flight data to the cockpit displays. The GRS 77/79 receives data from the air data computer, the GMU 44 magnetometer and GPS signals from the GIA 6X W. The GRS communicates with both the GIA 6X Ws and the cockpit dispays via ARINC 429 digital interface. The GRS 77/79 is located next to the avionics rack in the rear fuselage, just aft of the rear baggage frame.

G. GDC 74A/72 Air Data Computer (ADC)

The ADC receives data from the pitot/static system, OAT sensor. The ADC uses this data to provide pressure altitude, airspeed, vertical speed and outside air temperature data to the G1000 system. The ADC communicates with the GIA 6X Ws, GDU 10XX display screens and the GRS 77/79 using ARINC 429 digital interface. Software and configuration data is received through RS-232 digital interface with the GIA 6X Ws. The ADC is located on the instrument panel shelf.

H. GEA 71/B

The GEA 71/B is a microprocessor based unit that receives and processes signals from airframe and engine sensors. The GEA 71/B communicates directly with both IAUs using RS 485 digital interface. The GEA 71/B is located on the instrument panel shelf.

I. GMU 44 Magnetometer

The magnetometer senses magnetic field information. Data is sent to the GRS 77/79 ARHS for processing. The magnetometer receives power form the GRS 77/79 and communicates with the GRS 77/79 using RS-485 digital interface. The magnetometer is located in the right outer wing and can accessed through a panel in the lower surface of the wing.

Trouble-Shooting

1. General

The Garmin ICS has a built-in test and trouble-shooting facility. For more data about troubleshooting the ICS refer to the G1000 Cockpit Reference Guide for the DA 42 NG Airplane.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to replace the main components of the ICS. They do not tell you how to maintain the components. For data about removing/installing the GMA 1347 audio control unit refer to Section 23-50. For more data about maintaining the equipment refer to the G1000 Line Maintenance Manual. The G1000 Line Maintenance Manual gives you particular information on:

– Unit related alerts and problems.

– Equipment removal and installation.

– Uploading software, configuring and testing.

– Final system checkout.

– Periodic maintenance.

– G1000 system software and configuration.

– GDU lighting setup.

Refer to the DAI MSB 42NG-003 for data about the approved software configurations.

The specific DA 42 NG values as to the equipment basic setting are given in the table below:

Item	Basic Setting	
Main Lighting – Display (PFD1, MFD1), if MÄM 42-978 and/or MÄM 42-1072 are NOT installed	Source:	28 V
	Response Time:	3
	Minimum:	3.50
	Edit Curve Vertex:	none
	Photo Transition:	20 %
	Edit Photo Vertex:	none
	GMA Annunciator Gain:	1.00
	GMA Annunciator Offset:	0

Item	Basic Setting
Main Lighting – Key (PFD1, MFD1), if MÄM 42-978 and/or MÄM 42-1072 are NOT installed	Source: 28 V Response Time: 1 Minimum: 1.75 Edit Curve Vertex: none GMA Key Gain: 2.00 GMA Key Offset: 2
Transponder Configuration	VFR Code: specific to Country (e.g. USA: 1200) Aircraft Weight: < 15,500 lbs Max Airspeed: <= 300 kts Address Type - Europe: hex id - USA: us tail Flight ID Type - Europe: PFD Entry - USA: same as tail
GMA Configuration – Headset Volume, if MÄM 42-1072 is NOT installed	Music #1: -20 Music #2 -20 Unswitched in #1: -20 Unswitched in #2: -20 Unswitched in #3: -20 Altitude Warning: -20
GMA Configuration – Speaker Volume, if MÄM 42-1072 is NOT installed	Crew Audio: 5
GMA Configuration – Master Squelch, if MÄM 42-1072 is NOT installed	Threshold Value: -16
GMA Configuration – Marker Beacon	HI SENSE THRESHOLD: specific to airplane LO SENSE THRESHOLD: specific to airplane

Item	Basic Setting	
GMA Configuration – KEYPAD Annunciators, if MÄM 42-1072 is NOT installed	Disable COM3:	set
	Disable TEL:	set
	Disable DME:	specific to airplane
	Disable ADF:	specific to airplane
	Disable AUX:	set
	Disable SPEAKER:	blank
	Disable PA:	set
	Disable PLAY:	blank
	Disable MUSIC:	set
	Disable REC:	set
	Disable CABIN:	set

Note: Unlisted items are preset. You must not change their values.

Note: Some items are specific to the airplane. Note down the settings prior to performing a software upload.

2. Remove/Install a GDU 10XX Display

A. Remove a GDU 10XX Display

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Set the PFD and MFD circuit breakers open.	Right side of instrument panel.
(3)	Remove the display unit: – Rotate the 4 locking studs that attach the display to the instrument panel 90° counter-clockwise. – Move the display aft and disconnect the electrical cables. – Move the display unit clear of the instrument panel.	Refer to Figure 6. At the in-line connector.

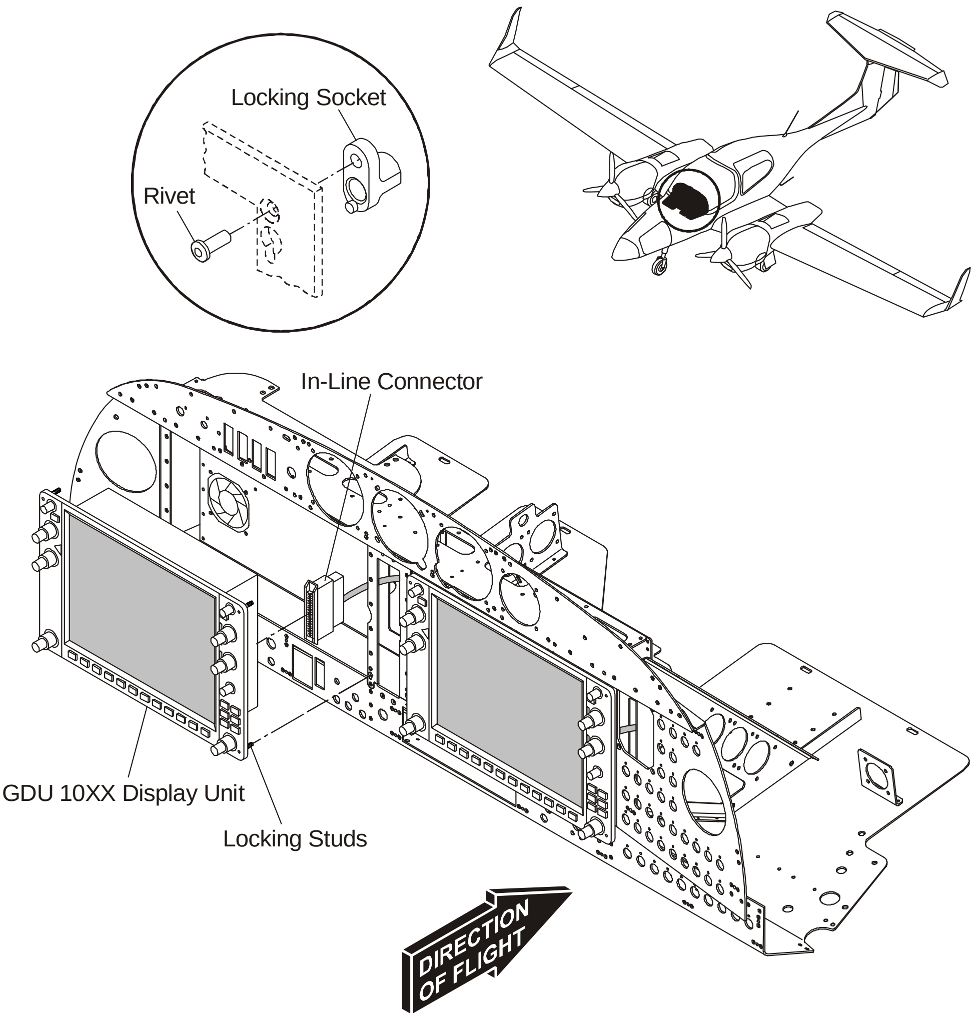

Figure 6: GDU 10XX Display Unit Installation

B. Install a GDU 10XX Display

	Detail Steps/Work Items	Key Items/References
(1)	If necessary, set the PFD and MFD circuit breakers open.	Right side of instrument panel.
(2)	Install the display unit: – Move the display unit into position at the instrument panel. – Connect the electrical cables to the display unit. – Move the display unit fully forward into position on the instrument panel. – Rotate the 4 locking studs that attach the display unit to the instrument panel 90° clockwise.	At the in-line connector. Make sure that you do not trap the electrical cables. The locking studs should be oriented with the alignment marks in the vertical position for installation. When locked, the alignment marks are in the horizontal position.
(3)	Reset the PFD and MFD circuit breakers.	Right side of instrument panel.
(4)	Do a test for the correct operation of the integrated cockpit system (ICS): – Set the ELECT. MASTER switch to ON. – Set the ELECT. MASTER switch to OFF.	The ICS must power-up and successfully complete its self-test procedure.

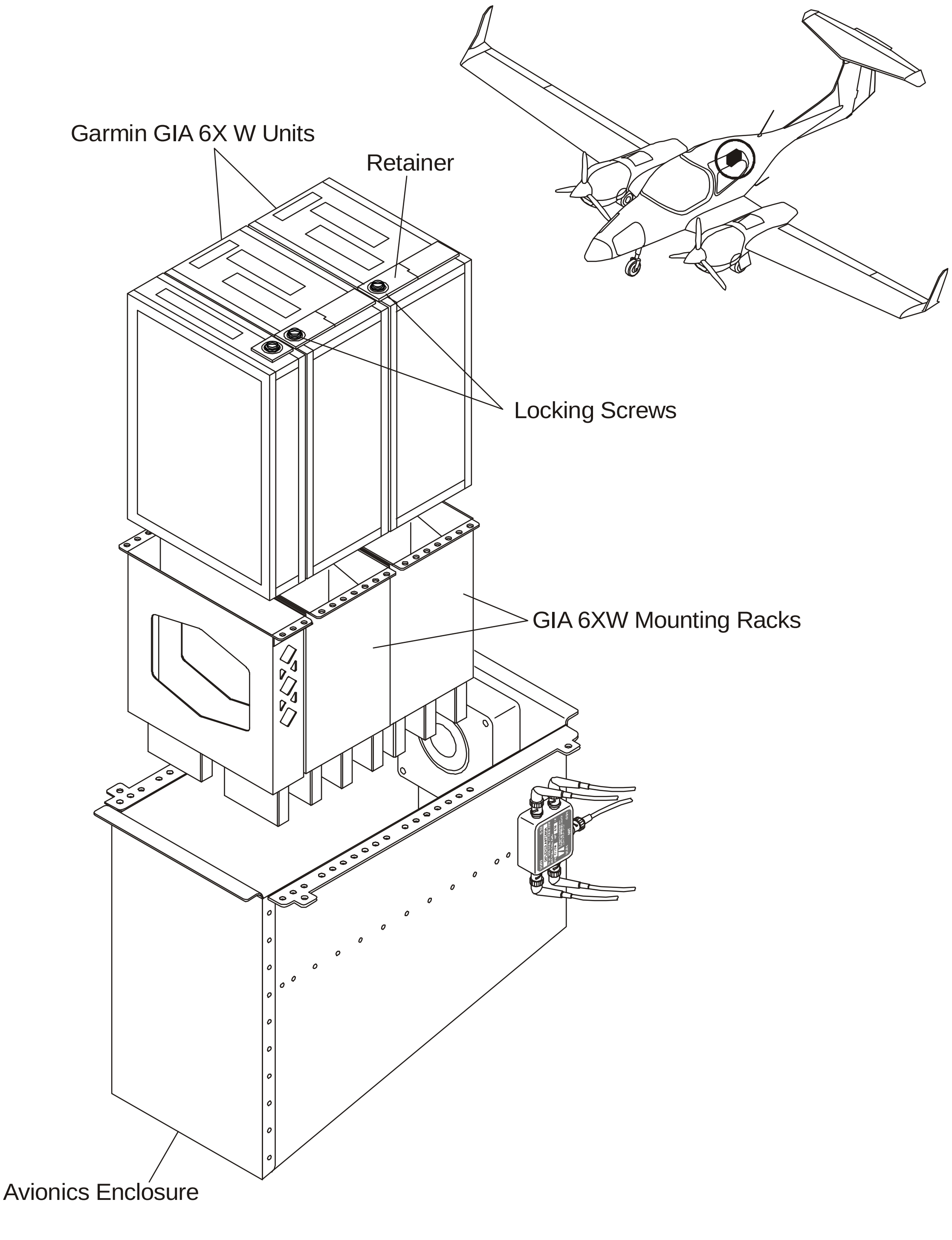

Figure 7: GIA 6X W Integrated Avionics Unit

3. Remove/Install a GIA 6X W Integrated Avionics Unit (IAU)

A. Remove a GIA 6X W Integrated Avionics Unit (IAU)

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the lower access panel from the rear baggage compartment.	Refer to Section 25-50.
(3)	Remove the GIA IAU: – Identify the unit that you will remove. – Release the locking screw from the retainer. – Lift the retainer clear of the unit. – Lift the IAU clear of the mounting rack and the airplane.	Refer to Figure 7.

B. Install a GIA 6X W Integrated Avionics Unit (IAU)

	Detail Steps/Work Items	Key Items/References
(1)	Install the IAU: – Move the GIA IAU into position at the mounting and lower the unit into position in the rack. – Move the retainer into position and secure with the locking screw.	Make sure that the unit is seated correctly. Do not force the unit into position!
(2)	Install the lower access panel in the rear baggage compartment.	Refer to Section 25-50.
(3)	Do a test for the correct operation of the integrated cockpit system (ICS): – Set the ELECT. MASTER switch to ON. – Set the ELECT. MASTER switch to OFF.	The ICS must power up and successfully complete its selftest procedure.

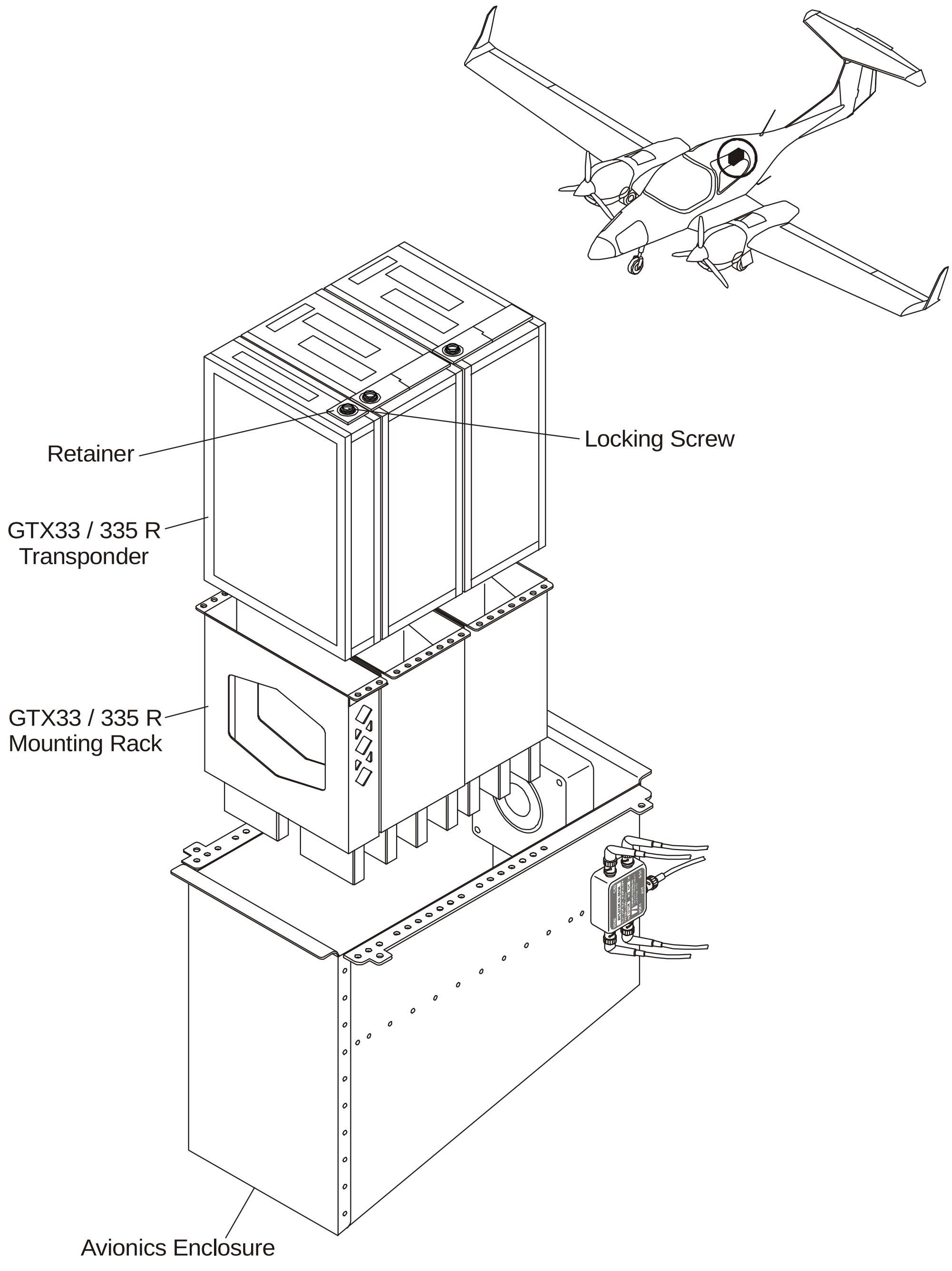

Figure 8: GTX33/335 R Transponder Installation

4. Remove/Install the GTX33/335 R Transponder

A. Remove the GTX33/335 R Transponder

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the lower access panel from the rear baggage compartment.	Refer to Section 25-50.
(3)	Remove the GTX33/335 R: – Identify the unit that you will remove. – Release the locking screw from the retainer. – Lift the retainer clear of the unit. – Lift the GTX33/335 R clear of the mounting rack and the airplane.	Refer to Figure 8.

B. Install the GTX33/335 R Transponder

	Detail Steps/Work Items	Key Items/References
(1)	Install the GTX33/335 R: – Move the GTX33/335 R into position at the mounting and lower the unit into position in the rack. – Move the retainer into position and secure with the locking screw.	Make sure that the unit is seated correctly. Do not force the unit into position!
(2)	Install the lower access panel in the rear baggage compartment.	Refer to Section 25-50.
(3)	Do a test for the correct operation of the integrated cockpit system (ICS): – Set the ELECT. MASTER switch to ON. – Set the ELECT. MASTER switch to OFF.	The ICS must power-up and successfully complete its self-test procedure.

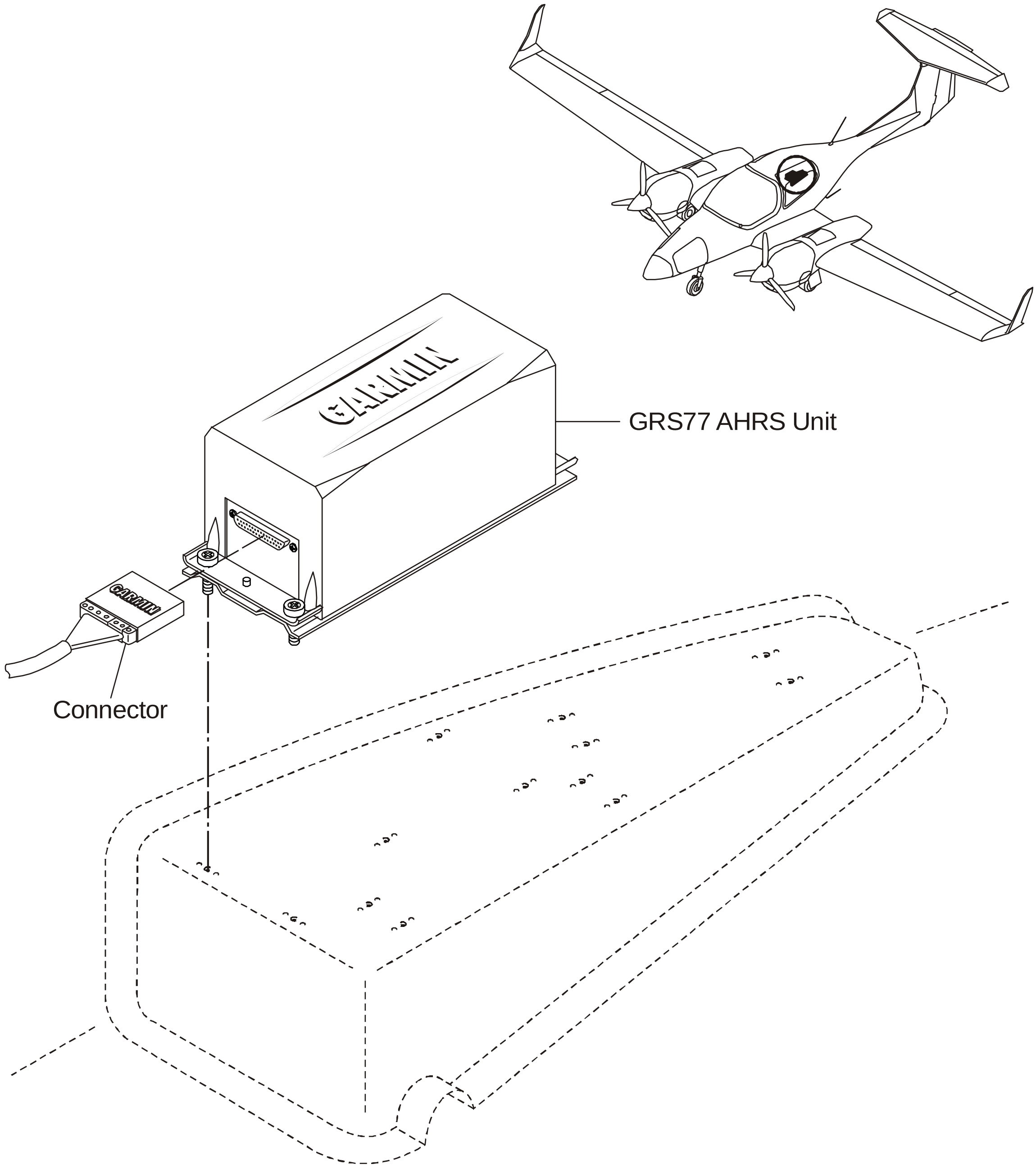

Figure 9: GRS 77 Attitude, Heading and Reference Unit (AHRS) Installation

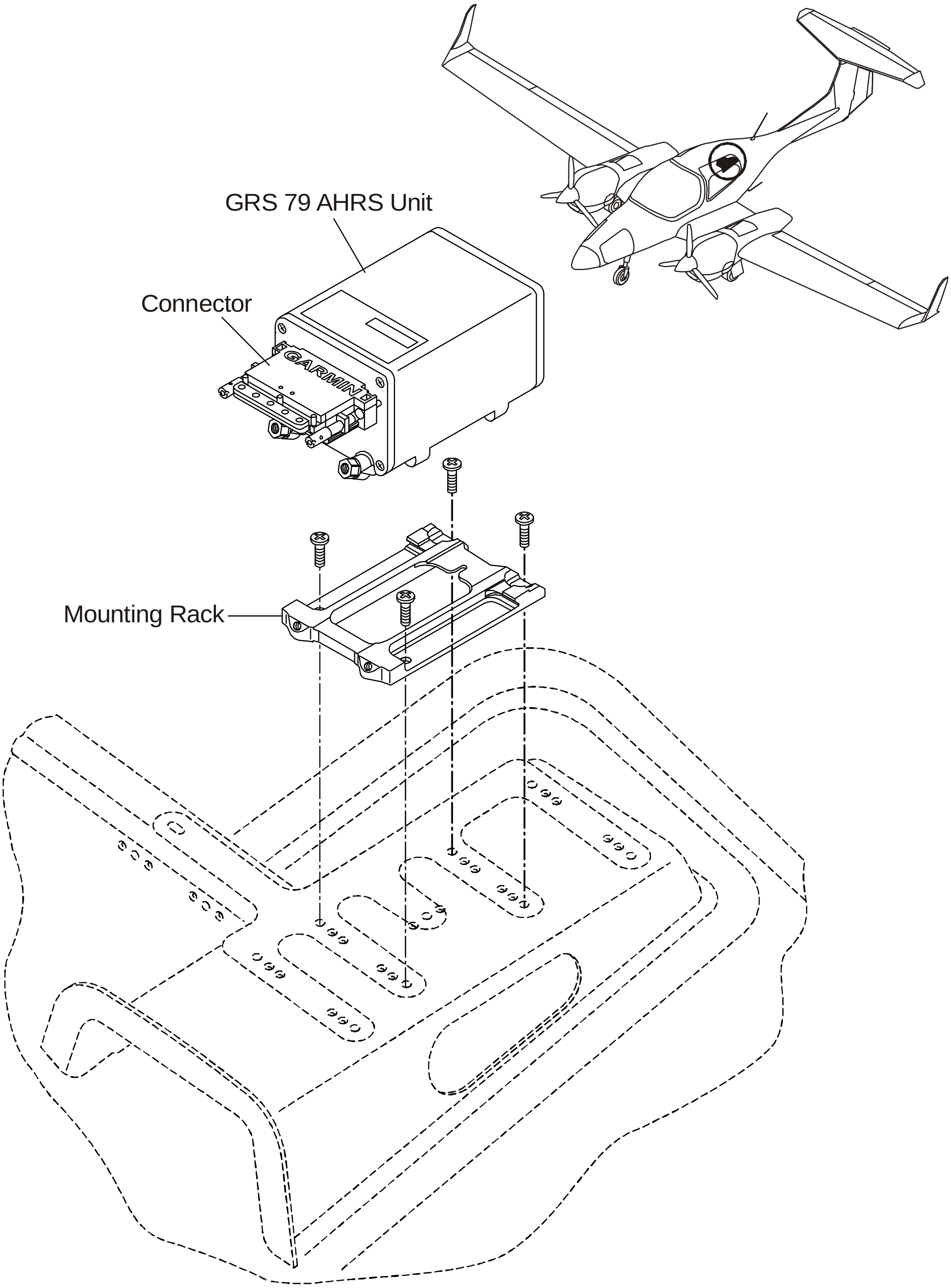

Figure 10: GRS 79 Attitude, Heading and Reference Unit (AHRS)

5. Remove/Install the GRS 7X Attitude, Heading and Reference Unit (AHRS)

A. Remove the GRS 7X Attitude, Heading and Reference Unit (AHRS)

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the lower access panel from the rear baggage compartment.	Refer to Section 25-50.
(3)	Remove the GRS 7X: – Disconnect the electrical cables. – Loosen the 4 or 2 (if MÄM 42-978 is installed) screws that attach the GRS 7X to the mounting. – Move the GRS 7X clear of the airplane.	Refer to Figure 9 or 10.

B. Install the GRS 7X Attitude, Heading and Reference Unit (AHRS)

	Detail Steps/Work Items	Key Items/References
(1)	Install the GRS 7X unit: – Move the unit into position next to the avionics rack. – Tighten the 4 or 2 (if MÄM 42-978 is installed) screws that attach the unit to the mount. – Connect the electrical cables.	At the in-line connector.
(2)	Install the lower access panel in the rear baggage compartment.	Refer to Section 25-50.

	Detail Steps/Work Items	Key Items/References
(3)	Do a test for the correct operation of the integrated cockpit system (ICS):	
	– Set the ELECT. MASTER switch to ON.	The ICS must power up and successfully complete its selftest procedure.
	– Set the ELECT. MASTER switch to OFF.	

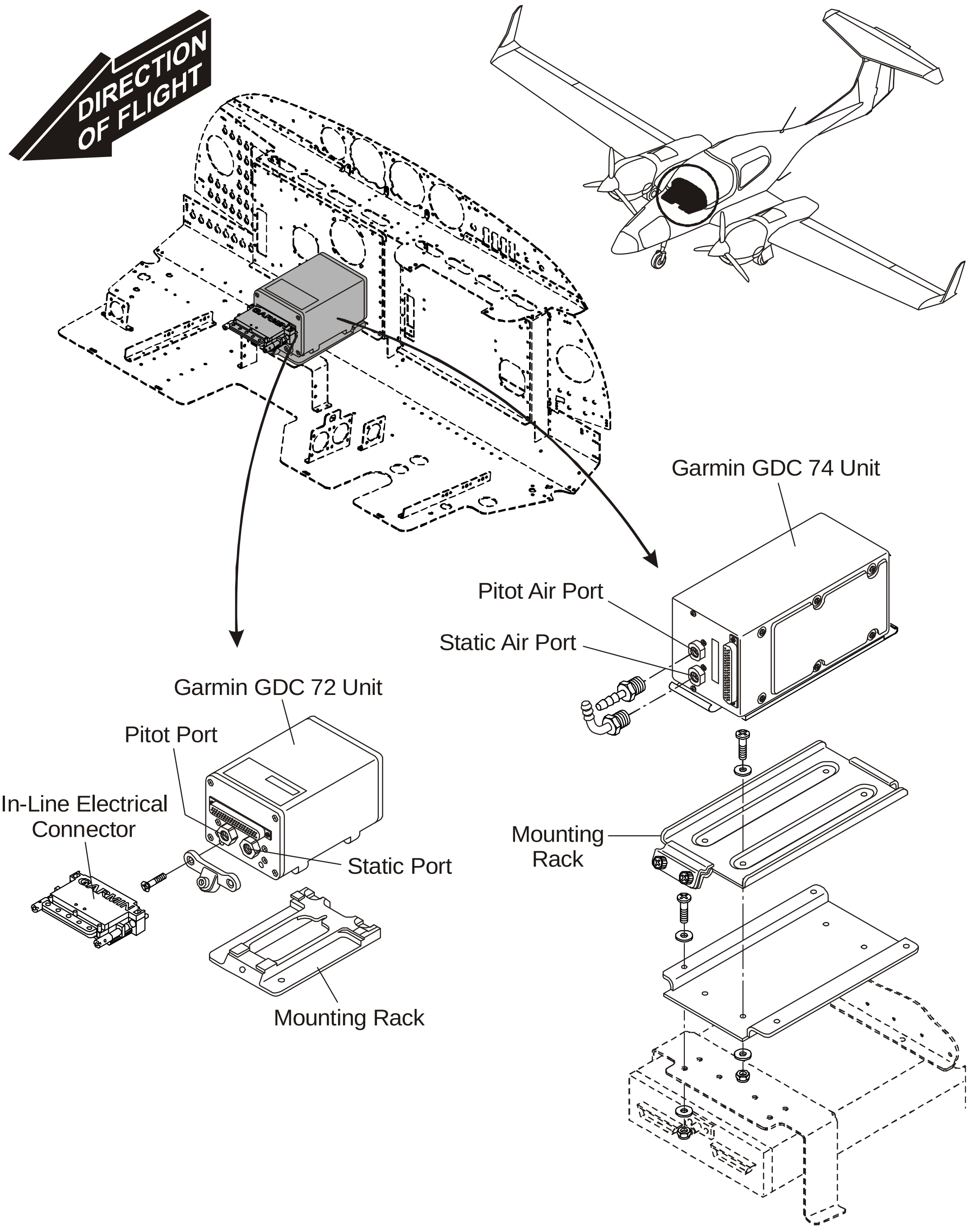

Figure 11: GDC 7X Air Data Computer (ADC) Installation

6. Remove/Install the GDC 7X Air Data Computer (ADC)

A. Remove the GDC 7X Air Data Computer (ADC)

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the GDC 7X: – Locate the GDC 7X on the instrument panel shelf. – Disconnect the electrical cables. – Disconnect the Pitot/static tubes from the unit. – Remove the 2 screws of the adapter plate that attaches the GDC 7X to its mounting rack. – Move the GDC 7X clear of the airplane.	Refer to Figure 11. Note the connections!

B. Install the GDC 7X Air Data Computer (ADC)

	Detail Steps/Work Items	Key Items/References
(1)	Install the GDC 7X: – Move the GDC 7X assembly into position on the mounting rack. – Install the adapter plate and tighten the 2 screws that attach the GDC 7X to the mounting rack. – Install the Pitot/Static tubes to the unit. – Connect the electrical cables.	As noted in 6A. At the in-line connector.
(2)	Install the instrument panel cover.	Refer to Section 25-10.
(3)	Connect the airplane main battery.	Refer to Section 24-31.
(4)	Do a test for the correct operation of the integrated cockpit system (ICS): – Set the ELECT. MASTER switch to ON. – Set the ELECT. MASTER switch to OFF.	The ICS must power-up and successfully complete its self-test procedure.
(5)	Do a Pitot/static leak test.	Refer to Section 34-10.

7. Remove/Install the GEA 71/B Processor

A. Remove the GEA 71/B Processor

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the GEA 71/B: – Locate the GEA 71/B instrument panel shelf. – Release the screw that secures the retainer. – Move the retainer clear and lift the GEA 71/B clear of the mounting.	Refer to Figure 12.

B. Install the GEA 71/B Processor

	Detail Steps/Work Items	Key Items/References
(1)	Install the GEA 71/B: – Move the GEA 71/B into position at its mounting. – Lower the GEA 71/B into its mounting. – Install the retainer and secure the retainer with the retaining screw.	
(2)	Install the instrument panel cover.	Refer to Section 25-50.
(3)	Connect the airplane main battery.	Refer to Section 24-31.
(4)	Do a test for the correct operation of the integrated cockpit system (ICS): – Set the ELECT. MASTER switch to ON. – Set the ELECT. MASTER switch to OFF.	The ICS must power-up and successfully complete its selftest procedure.

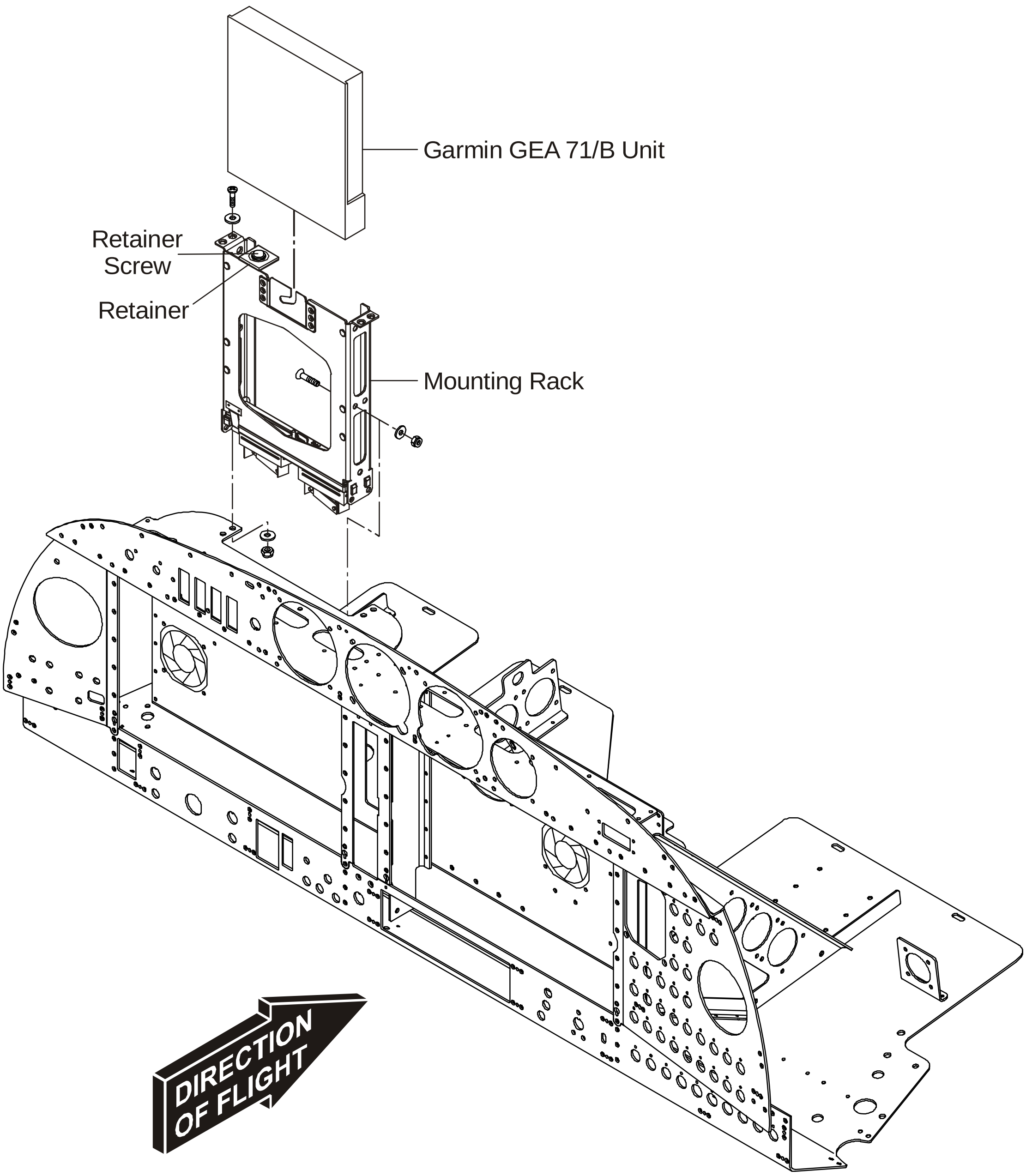

Figure 12: GEA 71/B Processor Installation

8. GMU 44 Magnetometer

A. Remove the GMU 44 Magnetometer

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the magnetometer assembly: – Remove the 3 screws that attach the magnetometer assembly to the lower surface of the right wing. – Lower the magnetometer assembly clear of the structure and disconnect the electrical cables. – Move the magnetometer assembly clear of the airplane.	Support the assembly.
(3)	If necessary, remove the magnetometer from the panel.	

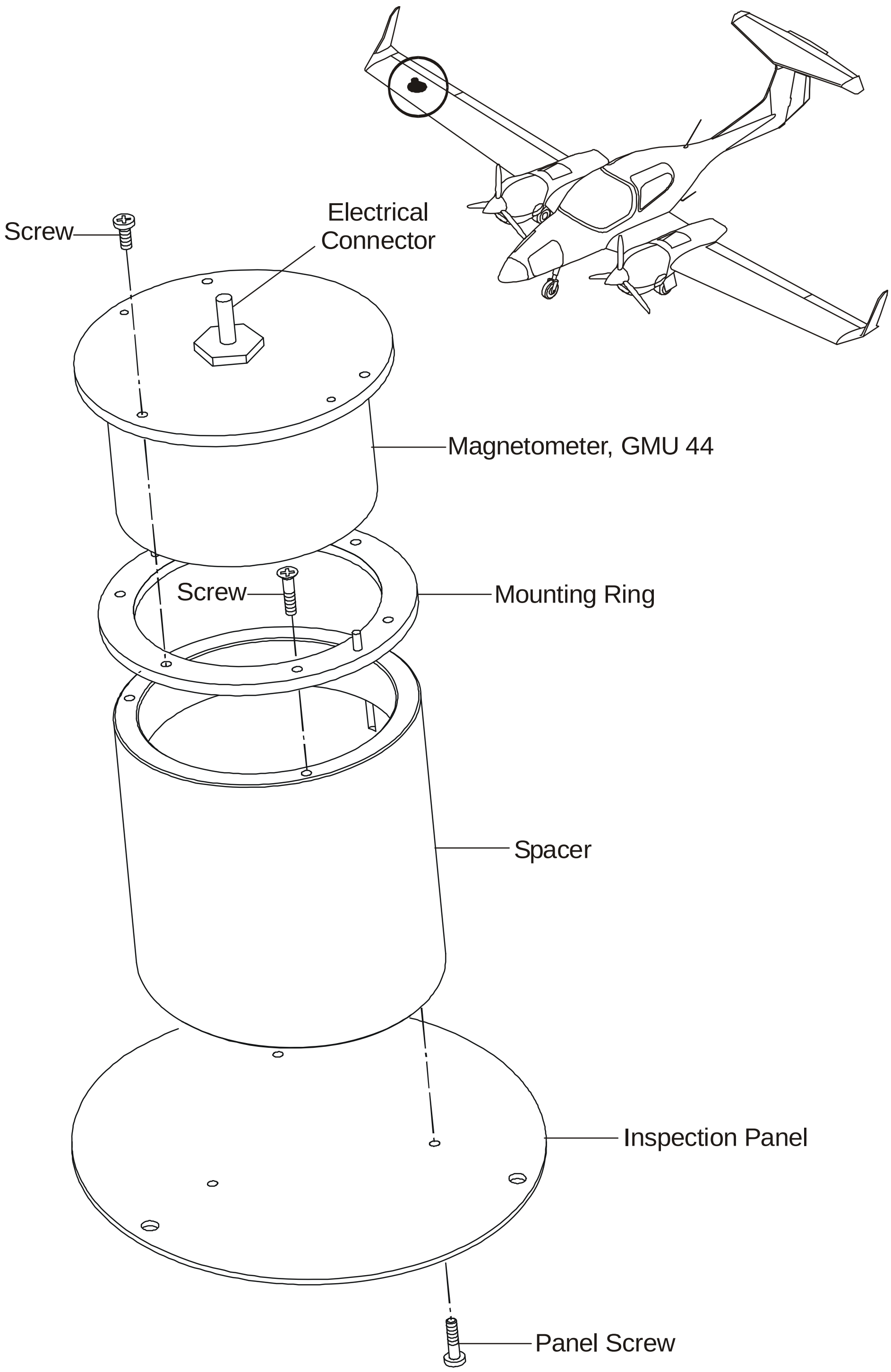

Figure 13: Magnetometer Assembly Installation

B. Install the GMU 44 Magnetometer

	Detail Steps/Work Items	Key Items/References
(1)	Install the magnetometer assembly: – Move the magnetometer assembly into position at the right wing. – Connect the electrical cables to the magnetometer assembly. – Move the magnetometer assembly fully into position in the lower surface of the right wing. – Install the 3 screws that attach the magnetometer assembly to the wing.	Pay attention on the dedicated mounting direction marked by an arrow! At the in-line connector.
(2)	Do a test for the correct operation of the integrated cockpit system (ICS): – Set the ELECT. MASTER switch to ON.	The ICS must power up and successfully complete its selftest procedure.
(3)	Do a magnetometer calibration.	Refer to Paragraph 9.

9. G1000 Magnetometer Calibration

Note: This calibration procedure must be carried out on a compass rose in order to guarantee measurements free of environmental magnetic disturbances. Attempting to carry out this maneuver on a typical ramp area will not yield a successful calibration. The accuracy of the AHRS cannot be guaranteed if this calibration is not performed on a magnetically clean compass rose.

	Detail Steps/Work Items	Key Items/References
(1)	Taxi the airplane to a compass rose. Ensure that there are no nearby magnetic materials. If unavoidable, maneuver the airplane to keep the magnetometer from passing within 6 meter (19.7 feet) of such objects. At the compass rose, align the airplane to a heading of magnetic north (± 5°).	
(2)	With the airplane stationary, initiate the GRS 7X AHRS magnetometer calibration procedure as follows: – Enter the GDU configuration mode by holding the ENTER button while applying power. Release the ENTER button when the words INITIALIZING SYSTEM are displayed on the GDU. – Press the FMS inner knob to select which calibration procedure to run. Select MAGNETOMETER and press the ENTER button. – Follow the checklist items displayed on the GDU and press the ENTER button as each one is completed or confirmed. When the CALIBRATE field is blinking, press the ENTER button to begin the procedure. – The GDU display advises the operator when to turn the airplane, when to stop, and when to turn again.	

	Detail Steps/Work Items	Key Items/References
(3)	Upon advice to turn, taxi the airplane in a right turn. After approximately 25° to 30° of turn from the last heading the GDU display advises the operator to stop the airplane.	
(4)	The GDU display guides the operator to dwell at multiple headings around a complete circle.	
	Note: The operator may use outside references to turn the airplane by about 30° each time the GDU displays that it is time to turn, rather than attempting to use the GDUs real-time indication of how much additional turn is needed. Simply turning the airplane by roughly 30° (± 5°) increments and dwelling for the time recommended by the GDU is all that is needed for successful calibration.	
(5)	Repeat the turn-and stop process until the GDU display advises that a successful calibration is complete. The GRS 7X AHRS then enters its normal operational mode. Press the ENTER button on the GDU to conclude this procedure.	

Refer to the GRS 7X/GMU 44 Installation Manual for more information on the post installation configuration and checkout procedure.

10. Remove/Install the De-Ice Control Panel

A. Remove De-Ice Control Panel from Instrument Panel

	Detail Steps/Work Items	Key Items/References
(1)	Set the DE-ICE/XFER circuit breaker open.	Right side of instrument panel.
(2)	Remove instrument panel cover.	
(3)	Disconnect plug No. P3015 from socket J3015.	
(4)	Remove all cable ties which used for the de-ice panel installation.	
(5)	Remove the 4 bolts, washers and locknuts which attach the de-ice control panel to the instrument panel.	Take care that no washer or nut falls into the instrument panel.
(6)	Move the control panel clear from instrument panel.	

B. Install the De-Ice Control Panel in the Instrument Panel

	Detail Steps/Work Items	Key Items/References
(1)	Set the DE-ICE/XFER circuit breaker open.	Right side of instrument panel.
(2)	Attach the de-ice control panel in the designated cutout on the RH side of the instrument panel.	Right side of instrument panel.
(3)	Screw in all 4 bolts, washers and locknuts in the designated holes around the control panel.	Take care that no washer or nut falls into the instrument panel.
(4)	Connect plug No. P3015 to socket J3015.	
(5)	Use cable ties to fix loose cables of the de-ice control panel.	
(6)	Install instrument panel cover.	
(7)	Set the DE-ICE/XFER circuit breaker closed.	

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CHAPTER 32

LANDING GEAR

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CHAPTER 32
LANDING GEAR

1. General

This Chapter tells you about the landing gear for the DA 42 NG airplane. Refer to Chapter 57-00 for data about the wing structure where the main landing gear attaches. Refer to Chapter 53-00 for data about the fuselage structure where the nose landing gear attaches.

Refer to Chapter 92-00 for the wiring diagrams for the position control and position indicating systems of the landing gear.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

2. Description

Figure 1 shows the main components of the landing gear. The landing gear absorbs landing loads and let you move the airplane on the ground. The landing gear also provides steering control and braking when the airplane is on the ground.

The DA 42 NG has a tricycle landing gear. The landing gear can retract. The left main gear leg attaches to the wing center section on the left side of the fuselage. The right main landing gear attaches the wing center section on the right side of the fuselage. The nose gear leg attaches to the fuselage front bulkhead. All three legs have CFRP doors that seal the landing gear bays when the landing gear is retracted in flight.

Each main leg is a tubular steel strut. A trailing arm attaches to the bottom of the strut and an axle for the wheel assembly attaches to the trailing arm. A damper behind the tubular strut also attaches to the trailing arm and absorbs the landing loads. The landing gear hydraulic system holds the main gear legs in the retracted position. When the main gear legs are extended the legs geometrically lock and a latch holds the legs in the locked position during rebound loads.

Each main gear leg has a single main-wheel and a hydraulic disk-brake. Toe pedals on the rudder pedals operate the disk-brakes.

The nose gear leg attaches to the fuselage front bulkhead. A steel strut with an integral telescopic damper absorbs the landing loads. The nose gear leg carries a single nose-wheel. The pilot uses the rudder control pedals to steer the nose-wheel. Two steering stops attached to the gear leg limit the rotary motion of the nose landing gear.

The landing gear hydraulic system holds the nose leg in the retracted position. When the nose leg is extended the leg geometrically locks and a latch holds the leg in the locked position during rebound loads.

The landing gear has a electrically powered hydraulic supply and control system. The hydraulic supply and control system is mounted on a bracket located in the rear fuselage, near the rear baggage compartment. Refer to Chapter 29 and Section 32-30 for more data about the hydraulic system.

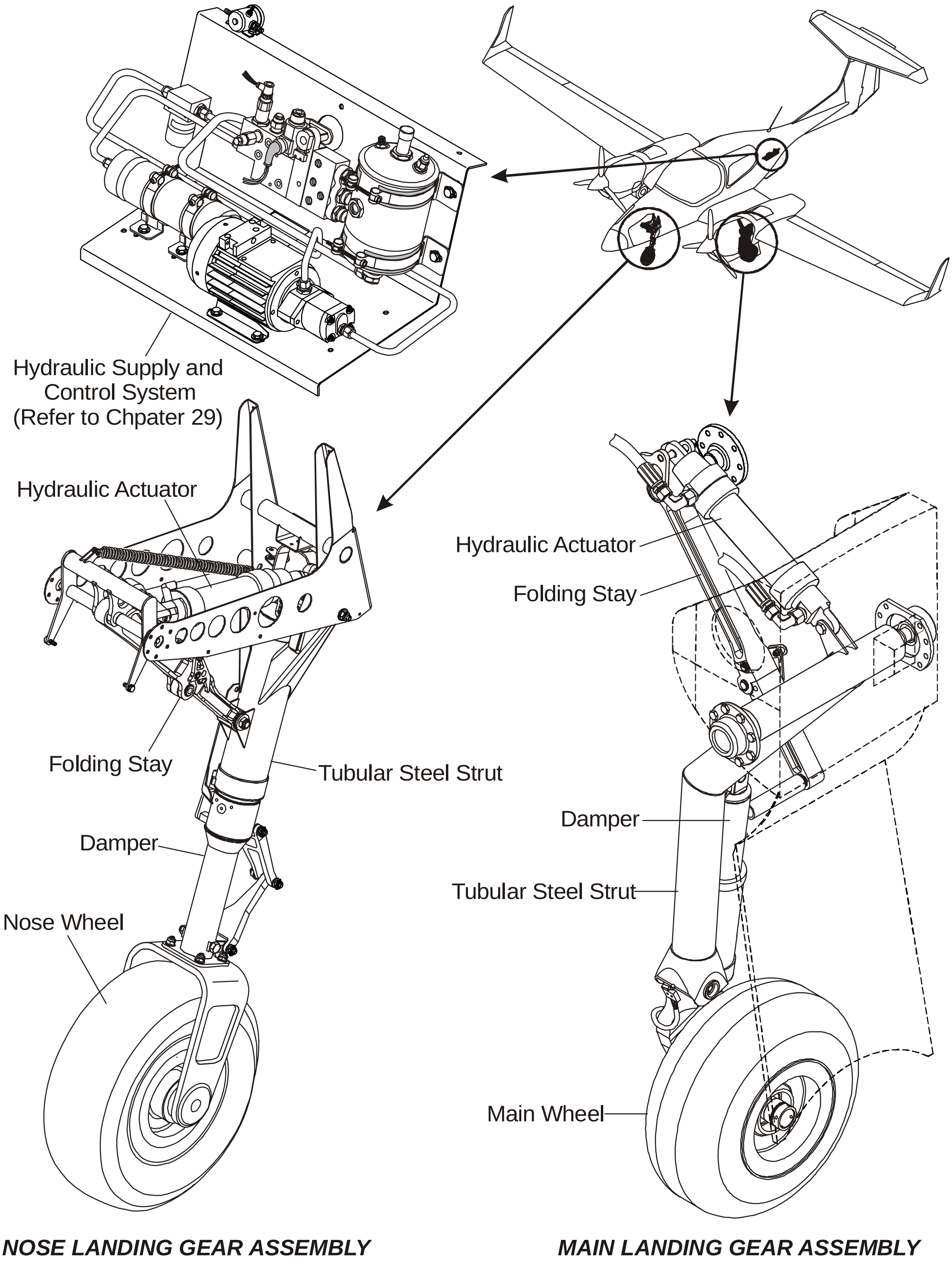

Figure 1: Landing Gear - Main Components

3. Operation on the Ground

The pilot can steer the airplane with the rudder pedals. When he pushes the left rudder pedal forward the nose gear leg turns to the left and the airplane turns to the left. When he pushes the right rudder pedal forward the nose gear turns to the right and the airplane turns to the right.

Refer to Section 32-50 for more data about the nose-wheel steering.

If the pilot pushes the toe brake pedals, hydraulic fluid from the brake master cylinders flows to the disk brake cylinders and applies the brakes. If the pilot sets the parking brake lever while he pushes the toe brake pedals, the parking brake valve keeps the brakes in the ON position.

Refer to Section 32-40 for more data about the wheels and brakes.

Each landing leg has an oil/gas damper. When the airplane is moving on the wheels over uneven ground the dampers can compress and absorb the loads. The dampers can absorb loads that are greater than the normal landing loads.

Refer to Section 32-10 for more data about the main landing gear components and refer to Section 32-20 for more data about the nose landing gear components.

4. Operation in the Air

When the airplane is airborne, the pilot can retract the landing gear into the landing gear bays. The landing gear bays have doors which close when the landing gear is retracted. Refer to Section 32-30 for more data about the extension and retraction system for the landing gear.

5. Emergency Operation

If the hydraulic system fails the pilot can extend the landing gear by setting the landing gear lever to the DOWN position. The weight of the landing gear assisted by a spring, will cause the gear to extend. When the gear is fully extended spring loaded latches operate and hold the landing gear legs geometrically locked in the down position. The pilot can make a normal landing. The pilot can NOT retract the landing gear if the hydraulic system has failed.

Note: A failure of the on-board electrical system causes the landing gear automatically to extend. The hydraulic pump is not driven anymore and both solenoid valves open. The hydraulic locking mechanism of the landing gear system is inoperable. When the gear is fully extended it will geometrically lock in the down position.

Section 32-10
Main Landing Gear

1. General

This Section tells you about the main landing gear. See the related Sections for data about these systems that connect to the main gear:

– Section 32-30. Extension and retraction.

– Section 32-40. Wheels and brakes.

– Section 32-60. Position and warning.

– Section 57-00. Wing structure.

Refer to Chapter 92 for data about the electrical wiring of the landing gear systems.

2. Description

Figure 1 shows the main landing gear.

Each main landing gear is a tubular steel strut. The strut has a longitudinal pivot at the top. Large bearings at each end of the longitudinal pivot hold the leg to the wing structure. A trailing arm attaches to the bottom of the tubular steel strut. A gas/oil filled damper attaches to the rear of the tubular steel strut and it attaches to the trailing arm.

The trailing arm carries an axle for the main-wheel assembly. Four bolts attach the axle to the trailing arm. The axle has a steel plate that holds the brake unit. Clips and cable binders hold the hydraulic hose for the brake unit and the electrical cables for the micro-switches to the leg.

Each main gear leg has a large hydraulic actuator to retract and extend the leg. One end of the hydraulic actuator connects to the top of the tubular steel strut, near the longitudinal pivot. The other end of the actuator connects to the wing structure via a folding stay.

3. Operation

Each main leg transmits vertical loads (for example, landing loads) to the airplane structure. When the leg has a vertical load, the wheel pushes up the trailing arm. The trailing arm moves and compresses the damper. The damper pushes up on the top of the tubular strut.

The damper can compress quickly but can only extend slowly. This prevents the leg from pushing the airplane up after the landing and it also prevents vibration.

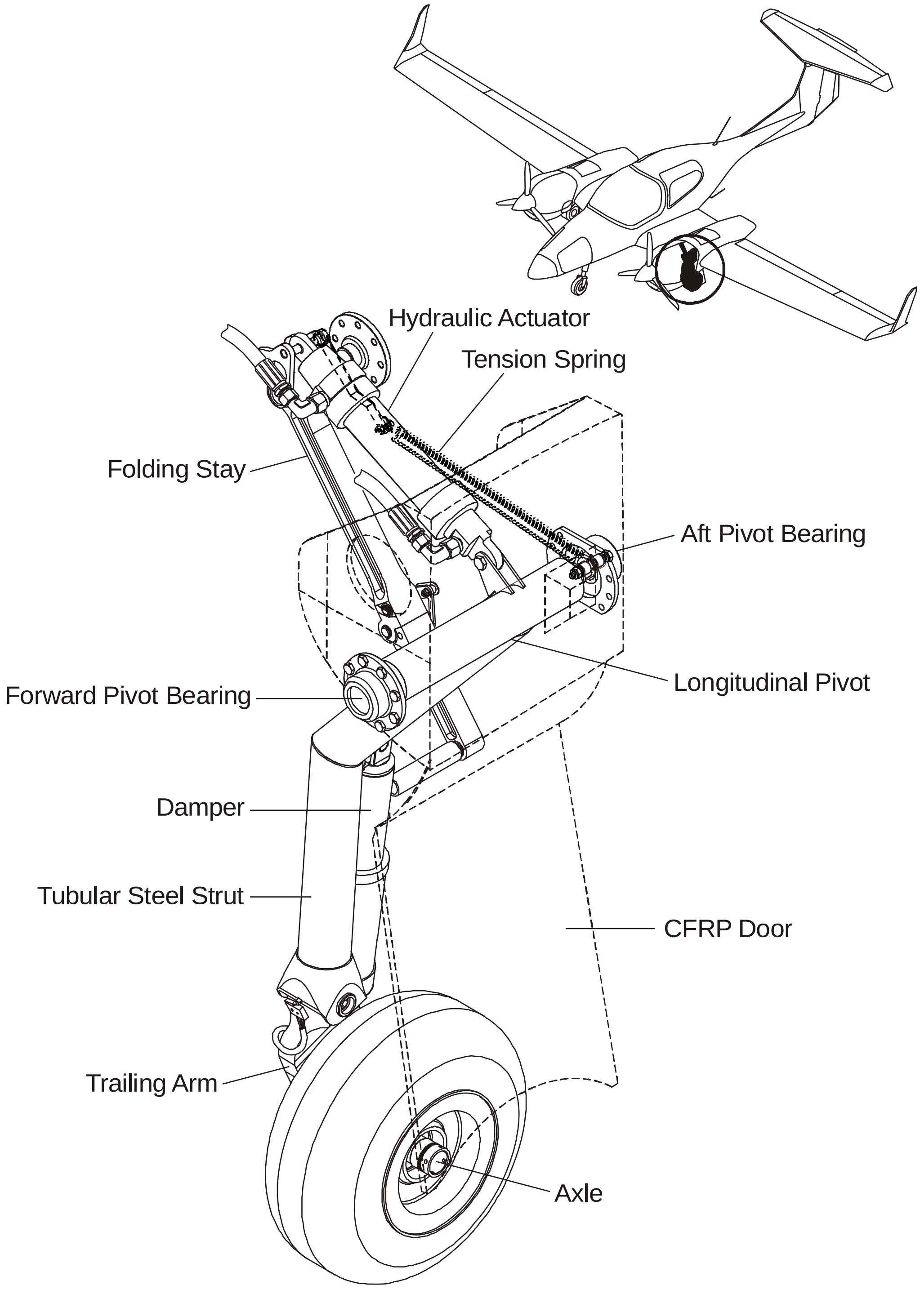

Figure 1: Main Landing Gear

Trouble-Shooting

1. General

This table gives you the trouble-shooting procedures for the main landing gear. Refer to Section 32-30 for trouble-shooting the main gear extension/retraction system. Refer to Section 32-40 for trouble-shooting the main gear wheels and brakes. Refer to Section 32-60 for trouble-shooting the main landing gear position and warning system. Refer to Chapter 29 for trouble-shooting on the hydraulic power generation.

If you find the trouble given in Trouble column read across to the possible cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Airplane stands on ground with one wing low.	Uneven ground.	Move airplane to level ground.
	Heavy landing.	Do a test for heavy landing. Refer to Section 05-50. Replace damaged parts.
	Damper pressure low.	Inflate the damper to the correct pressure. Refer to MAINTENANCE PRACTICES, Paragraphs 3 & 4 of this Section.
	Damper defective.	Replace damper.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install the main gear leg components. The Maintenance Practices are applicable to both the left and right main gear legs. You can remove the main gear leg with the wheel or you can remove the wheel first.

Refer to Section 32-30 for data on the main gear retraction system. Refer to Section 32-40 for data on the main gear wheels/brakes. Refer to Section 32-60 for data about the landing gear position and warning system.

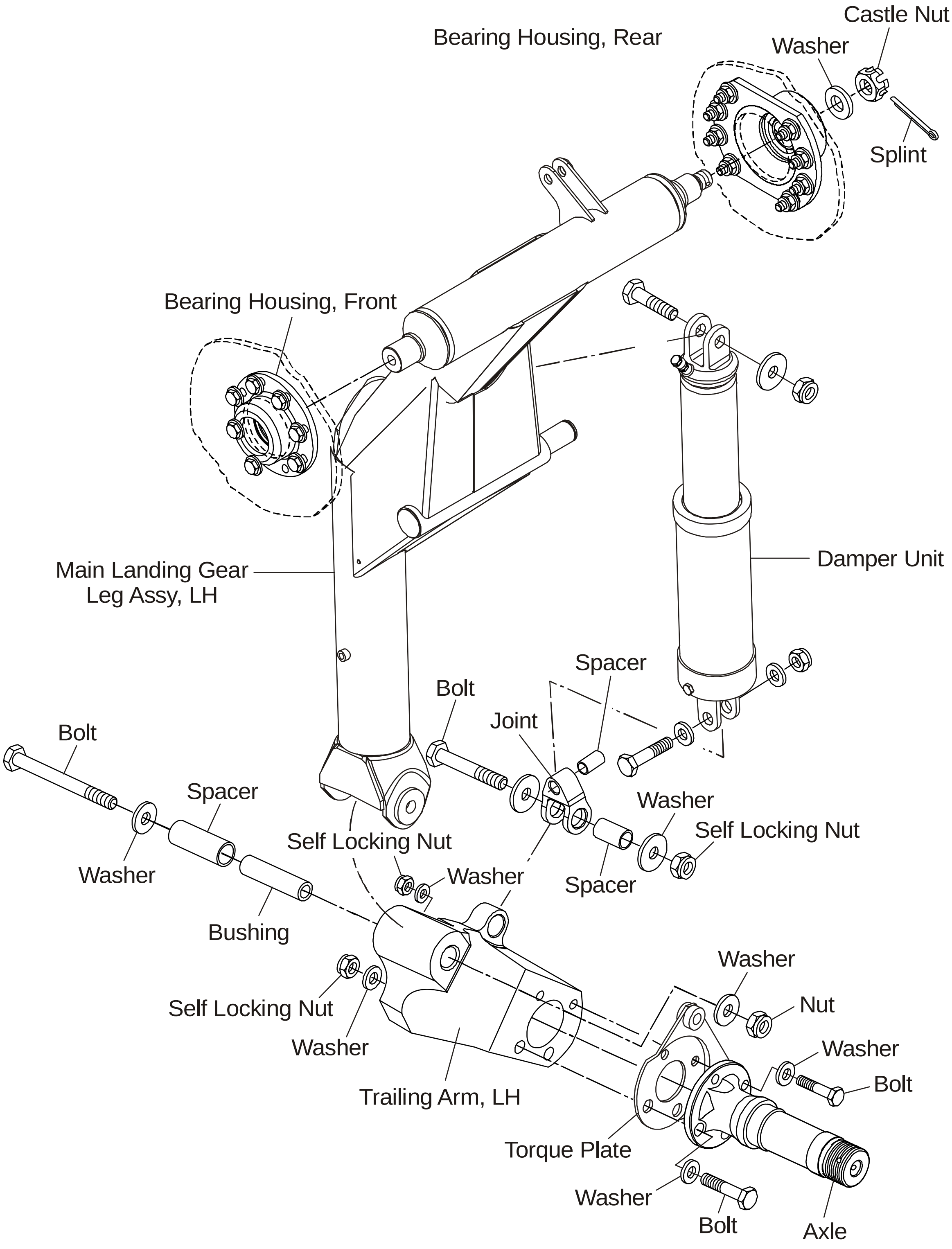


Figure 2: Main Landing Gear Leg Assy

2. Remove/Install the Main Gear Leg (Completely with Axle and Brake Unit)

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Aft bearing centering tool.	1	VR-D60-3217-12-31.
Front bearing centering tool.	1	VR-D60-3217-12-30.
Bearing housing puller.	1	VR-D60-3217-11-00.

B. Remove the Main Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.

	Detail Steps/Work Items	Key Items/References
(2)	Bleed the system: – Retract the landing gear to bleed the system. – Operate the emergency extension of the landing gear (repeat this step one or two times).	Refer to Section 32-30.
(3)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(4)	Disconnect the main gear door from the main gear leg: – Remove the nut, washer and spacer that attach the door connecting arm to the main gear leg. – Pull the connecting arm clear of the main gear leg attachment and secure to the door. – Move and hold the main gear door clear of the main gear leg.	Refer to Figure 2.
(5)	Remove the brake calliper.	Refer to Section 32-40.
(6)	Remove the main-wheel.	Refer to Section 32-40.
(7)	Remove all cable binders which secure the flexible brake hose and the electric cables to the micro switch.	
(8)	Remove the weight-on-wheels switch.	Refer to Section 32-60.
(9)	Remove the MLG folding stay switch.	Refer to Section 32-60.
(10)	Disconnect the folding stay assembly of the MLG.	Refer to Paragraph 10.

	Detail Steps/Work Items	Key Items/References
(11)	Remove the rear bearing housing: – Remove the cotter-pin from the castle nut. – Remove the castle nut. – Remove the 7 bolts, nuts and washers and washer sheet(s), which hold the bearing housing onto the fuselage. – Remove the bolt, 3 washers, 2 spacers, the spacer sleeve and the nut from the bearing housing. – Use the bearing housing puller to get the bearing housing off the longitudinal pivot.	Refer to Figures 2 and 3. Support the main gear leg and make sure not to scratch the surface.
(12)	Remove the fuel filter element.	Refer to Section 28-20.
(13)	Optional: Remove the flexible heat pipe from the clamp to gain more space to reach the front bearing housing.	
(14)	Optional: Remove the front bearing housing: – Remove the 8 bolts, nuts, washers and washer sheet(s) which hold the bearing housing onto the fuselage. – Use the bearing housing puller to get the bearing housing off the longitudinal pivot.	Refer to Figures 2 and 3.

	Detail Steps/Work Items	Key Items/References
(15)	Remove the main gear leg: – Move the leg aft to slide the forward longitudinal pivot clear of its bearing housing. – Lower the forward longitudinal pivot clear of the landing gear bay. – Move the leg forward until aft longitudinal pivot is clear of the main gear web. – Move the leg clear of the airplane.	

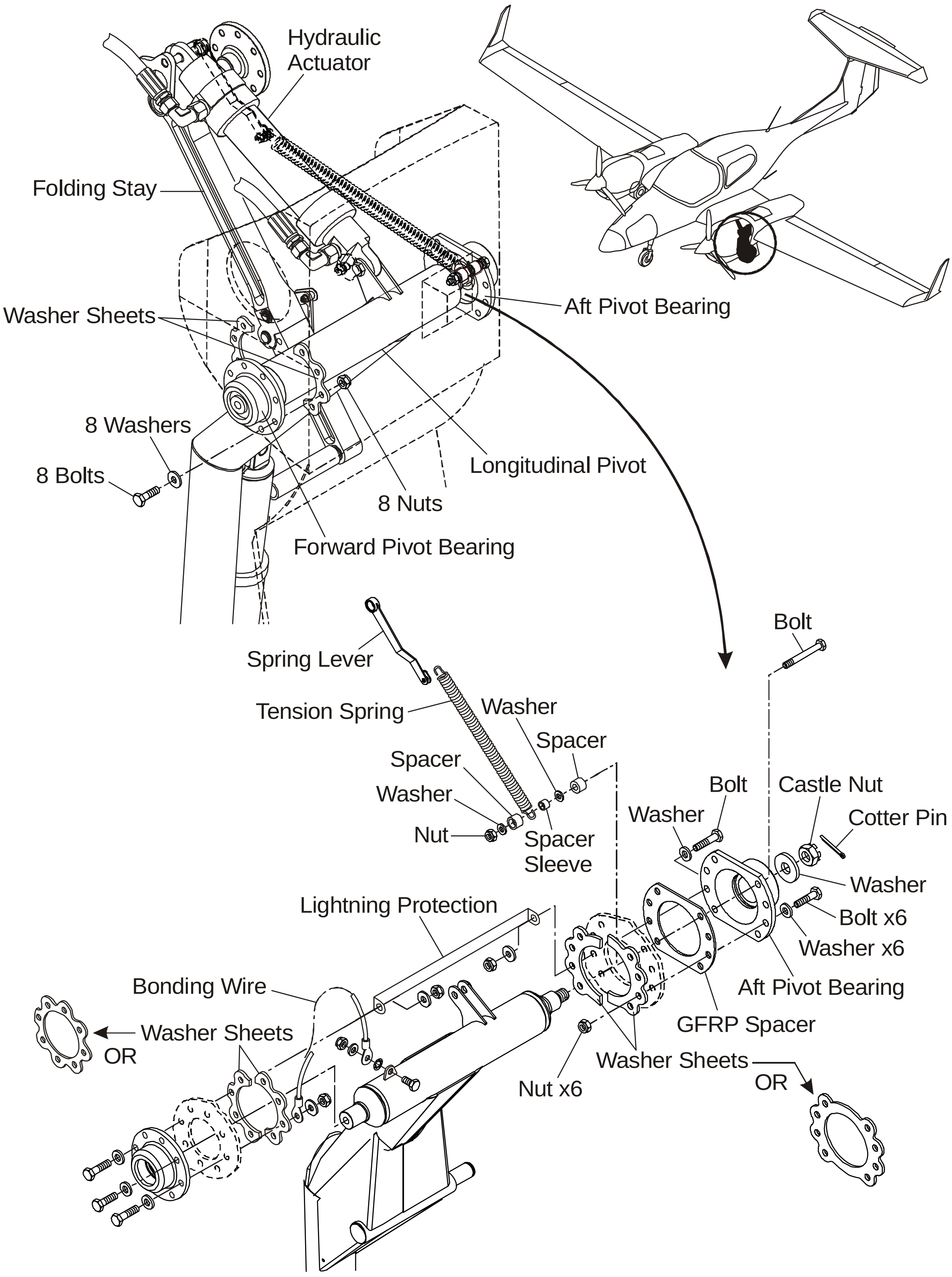


Figure 3: Main Landing Gear Installation

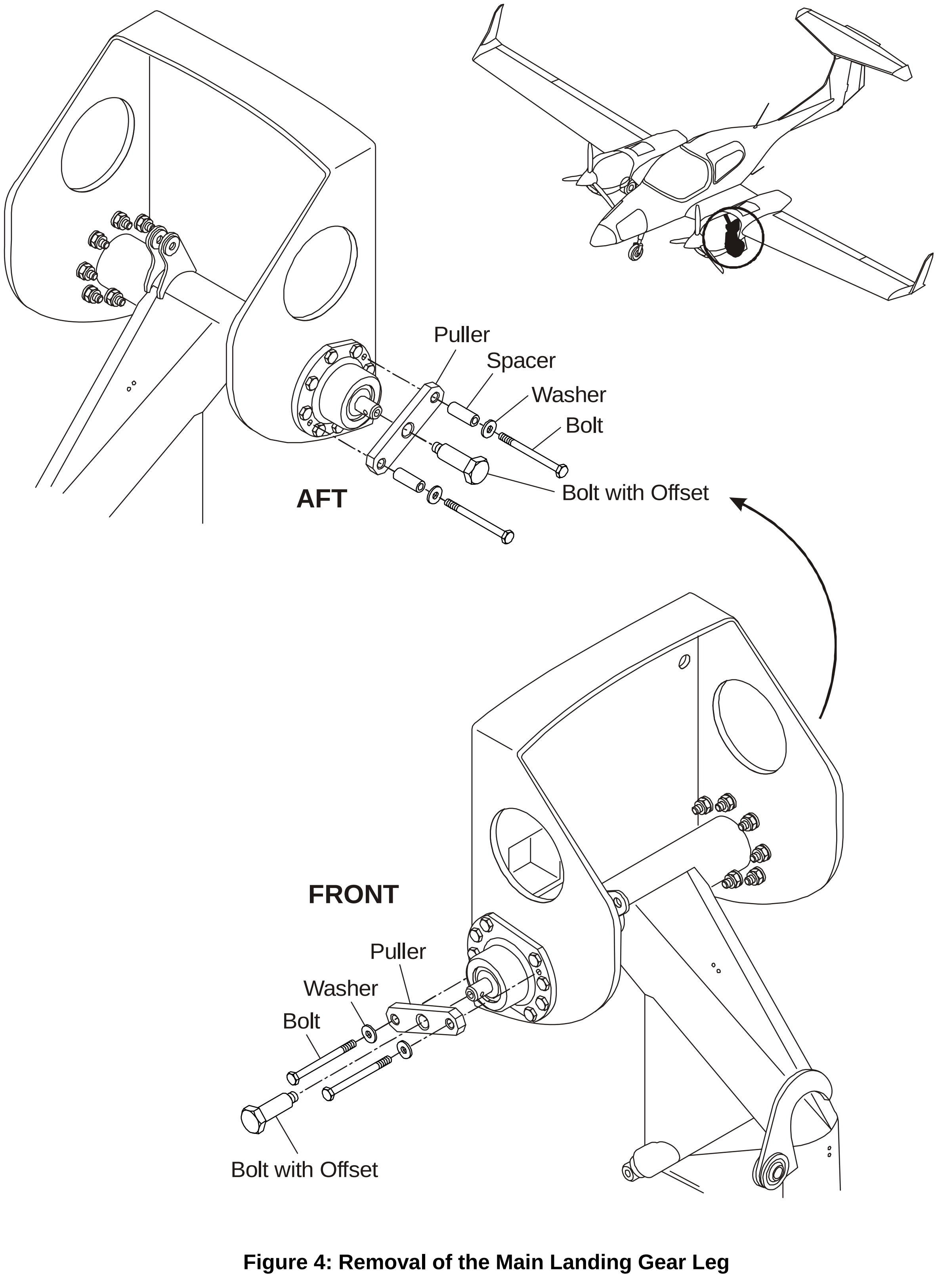


Figure 4: Removal of the Main Landing Gear Leg

C. Install the Main Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
(1)	Install the main gear leg: – If the single washer sheet is used: Position the washer sheet on the MLG pivot. – Slide the main gear leg into the aft main gear web. – Move the forward longitudinal pivot up and engage it with the front bearing. – Move the leg forward until the forward longitudinal pivot is fully engaged in the front main gear bearing.	Support the main gear leg and make sure not to scratch the surface.
(2)	Install the front bearing housing: – Use the front bearing centering tool to pull the longitudinal pivot into the bearing housing. If removed previously: – Install the 8 bolts, nuts and washers / washer sheet(s) which secure the bearing housing onto the fuselage.	Refer to Figure 3. Use new self-locking nuts.

	Detail Steps/Work Items	Key Items/References
(3)	Install the rear bearing housing: – Use the aft bearing centering tool to push the bearing housing onto the longitudinal pivot. – Install the 7 bolts, nuts, washers and washer sheet(s) which secure the bearing housing onto the fuselage. – Install the bolt, 4 washers, 2 spacers, the spacer sleeve and the nut onto the bearing housing. – Check the axial clearance of the gear leg. – Install the castle nut and adjust axial clearance by tightening the castle nut. – Check the axial clearance again. – Install the cotter-pin onto the castle nut.	Refer to Figure 3. Use new self-locking nuts. Use new self-locking nuts. Required axial clearance: max. 0.2 mm. Tighten by hand.
(4)	Optional: Install the flexible heat pipe back onto the worm-drive clamp if it was removed.	
(5)	Install the fuel filter element.	Refer to Section 28-20.
(6)	Connect the folding stay assembly of the MLG.	Refer to Paragraph 10.
(7)	Install the main gear wheel.	Refer to Section 32-40.
(8)	Install the brake calliper.	Refer to Section 32-40.
(9)	Bleed the brake system.	Refer to Section 32-40.
(10)	Install the weight on wheels switch.	Refer to Section 32-60.
(11)	Install the MLG folding stay switch.	Refer to Section 32-60.
(12)	Adjust the weight on wheels switch and the MLG folding stay switch.	Refer to Section 32-60.
(13)	Install all cable binders to secure the electrical cables and the flexible brake hose.	
(14)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(15)	Adjust the wheel in retracted position and check MLG door pre-load.	Refer to Paragraph 12.

	Detail Steps/Work Items	Key Items/References
(16)	Move the wing and rear fuselage trestles clear of the airplane.	
(17)	Lower the airplane.	Refer to Section 07-10.

3. Disassemble/Assemble a Main Landing Gear Leg

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Disassemble Main Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Remove main landing gear leg.	Refer to Section 32-10.
(2)	Optional: If not removed before, remove the main gear wheel.	Refer to Section 32-40.
(3)	Remove the main gear damper.	Refer to Section 32-10.
(4)	Remove the trailing arm from the main gear leg: – Remove the bolt, self locking nut, washers, bushing and the spacer.	
(5)	Remove the joint from the trailing arm.	Refer to Paragraph 3.D.
(6)	Remove the axle installation from the trailing arm: – Remove the four bolts, washers and self locking nuts which hold the axle. – Remove the torque plate.	

C. Assemble Main Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Install the axle installation onto the trailing arm: – Move the torque plate and the axle in position. – Install the four bolts, washers and self locking nuts which secure the axle and the torque plate.	Use a new self locking nut.
(2)	Install the top of the damper to the main landing gear leg.	Refer to Paragraph 6.B.
(3)	Install the trailing arm onto the main gear leg: – Slide the outer spacer into the trailing arm. – Move the trailing arm into position. – Slide the inner spacer through the main landing gear leg and trailing arm. – Install the trailing arm onto the main gear leg by installing the bolt, washers and self locking nut.	Use a new self locking nut.
(4)	Install the joint on main landing gear leg.	Refer to Paragraph 3.D.

D. Remove/Install a Joint on Main Landing Gear Leg

(1) Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

(2) Remove a Joint on Main Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(3)	Support the tire and remove the nut, washer, lower bolt and bushing from the joint.	Refer to Figure 2.
(4)	Move the damper and the joint clear of the trailing arm.	
(5)	Remove the nut, washer, spacer and the upper bolt from the joint.	Refer to Figure 2.
(6)	Move the joint clear of the MLG damper.	
(7)	Measure the joint.	Refer to Figure 5.

	Detail Steps/Work Items	Key Items/References
(8)	Make a note of ordering numbers of the LH and RH joint sizes: – D64-3217-23-00 Joint: x = 62 mm, z = 32 mm – D64-3217-23-01 Joint oversize 1: x = 64 mm, z = 34 mm – D64-3217-23-02 Joint oversize 2: x = 66 mm, z = 36 mm – D64-3217-23-03 Joint oversize 3: x = 68 mm, z = 38 mm	
	Note: Different part numbers may be used on LH and RH MLG of the airplane.	

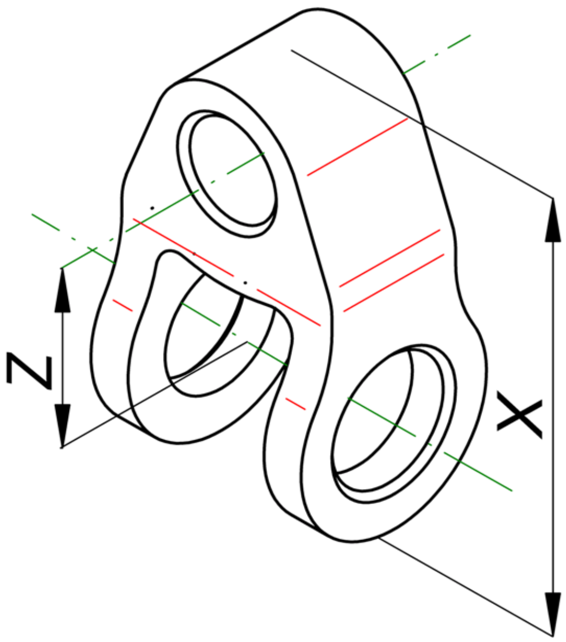


Figure 5: Main Landing Gear Joint Measurement

(3) Install a Joint on Main Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
(1)	Use a joint according to your measurement.	As noted in Subparagraph (2).
	Note: You must use the correct joint / joint oversize.	
(2)	Install joint on damper: – Move joint on damper – Verify smooth and easy movement – Install the bolt, washer, spacer and self locking nut.	Use new self-locking nut.
(3)	Connect joint to main landing gear trailing arm: – Move trailing arm into position – Install bushing, bolt, washer and self locking nut.	Use new self locking nut.
(4)	Adjust the wheel in retracted position and check MLG door pre-load.	Refer to Paragraph 12.

4. Fill/Charge the Damper Assemblies on the Main Gear Legs

The following procedure tells you how to fill the main gear damper assemblies with hydraulic fluid and then charge with nitrogen.

A. Equipment

Item	Quantity	Part Number
Bottle.	1	Commercial.
Bleed tube.	1	Commercial.
Valve core removal tool.	1	Commercial.
Nitrogen charging equipment.	1	Commercial.
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Nose trestle.	1	Commercial.

B. Material

Item	Quantity	Part Number
CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.		
Note: If MÄM 42-495 is carried out, a placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes with MÄM 42-495 NOT installed have been manufactured with Aeroshell Fluid 41 (MIL-PRF-5606 H). The identification placard must be installed if a hydraulic fluid change to another fluid type is carried out.		
Hydraulic fluid.	As required.	Aeroshell Fluid 41 (MIL-PRF-5606 H) or AMG-10 (GOST 6794-75 Amdt 1-5), see CAUTION above.
Grease for sliding interfaces.	As required.	DOD-L-25681 or NATO S-1735 (for example, Mocil 50/50).
Gaseous nitrogen.	As required.	Commercial.

C. Procedure

WARNING: DO NOT GET HYDRAULIC FLUID ON YOUR SKIN OR YOUR CLOTHES. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.

WARNING: DO NOT LET NITROGEN AT HIGH PRESSURE BLOW ONTO YOUR SKIN. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY.

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO AIRPLANE COMPONENTS.

CAUTION: YOU MUST FILL/CHARGE THE MAIN-WHEEL DAMPER ASSEMBLIES CORRECTLY. IF YOU DO NOT FILL/CHARGE THE MAIN-WHEEL DAMPER CORRECTLY THE MAIN LANDING GEAR WILL NOT OPERATE CORRECTLY. THIS CAN CAUSE DAMAGE TO THE MAIN LANDING GEAR AND THE AIRPLANE STRUCTURE.

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY. **WARNING: THE TRAILING ARM AND THE WHEEL ARE CONNECTED TO THE GAS LOADED DAMPER. DUE TO THE HIGH FORCES INVOLVED THE ELEMENTS OF THE DAMPING SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.

	Detail Steps/Work Items	Key Items/References
(3)	Release the nitrogen pressure from the damper: – Remove the dust cap from the charging valve. – Press and hold down the pin inside the valve until all the pressure is released.	
	WARNING: **YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE DAMPER BEFORE YOU REMOVE THE CHARGING VALVE. NITROGEN AT HIGH PRESSURE CAN PENETRATE YOUR SKIN. THIS CAN CAUSE INJURY.**	
(4)	Remove the core of the charging valve from the damper assembly.	
(5)	Compress the damper assembly.	
	WARNING: **DO NOT GET HYDRAULIC FLUID ON YOUR SKIN. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.**	
(6)	Connect the tube of the hydraulic fluid filler bottle to the charging valve.	
	CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.	
	Note: If MÄM 42-495 is carried out, a placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes with MÄM 42-495 NOT installed have been manufactured with Aeroshell Fluid 41 (MIL-PRF-5606 H). The identification placard must be installed if a hydraulic fluid change to another fluid type is carried out.	

	Detail Steps/Work Items	Key Items/References
(7)	Turn the bottle to the open position and allow the hydraulic fluid to flow from the bottle into the damper.	Use Aeroshell Fluid 41 (MIL-PRF-5606 H) or AMG-10 (GOST 6794-75 Amdt 1-5) hydraulic fluid (see CAUTION above) with 0.3 % grease compliant with DOD-L-25681 or NATO S-1735 (for example, Mocil 50/50) added.
(8)	Extend the damper assembly by hand to allow the hydraulic fluid to fill the damper assembly.	
(9)	Compress and extend the damper not less than 6 times to release the air from the damper and allow the hydraulic fluid to flow into the damper.	
(10)	Compress the damper and hold the damper compressed while you close the bottle and remove the tube from the charging valve.	Keep the damper compressed.
(11)	Install the core of the charging valve.	
(12)	Connect the gaseous nitrogen charging equipment to the damper charging valve.	Allow the damper to extend as it is charged.
(13)	Charge the damper with nitrogen to the correct pressure.	Refer to Paragraph 4. The damper must be fully extended.
(14)	Disconnect and remove the gaseous nitrogen charging equipment from the damper charging valve.	
(15)	Install the dust cap onto the charging valve.	
(16)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(17)	Remove the rear fuselage and wing trestles clear of the airplane.	
(18)	Lower the airplane with the jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

D. Fluid Change from Aero Shell Fluid 41 to AMG-10

	Detail Steps/Work Items	Key Items/References
	Note: If the damper is disassembled, clean the inner surface of the damper and fill with AMG-10. Refer to Paragraph C of this Chapter and to item (2) of this table.	
(1)	Repeat the Fill/Charge the Damper Assemblies on the Main Gear Legs procedure 3 times.	Refer to Paragraph C.
(2)	Apply the hydraulic fluid placard and mark the used fluid.	Refer to Figure 6. Mark hydraulic fluid type by punching.

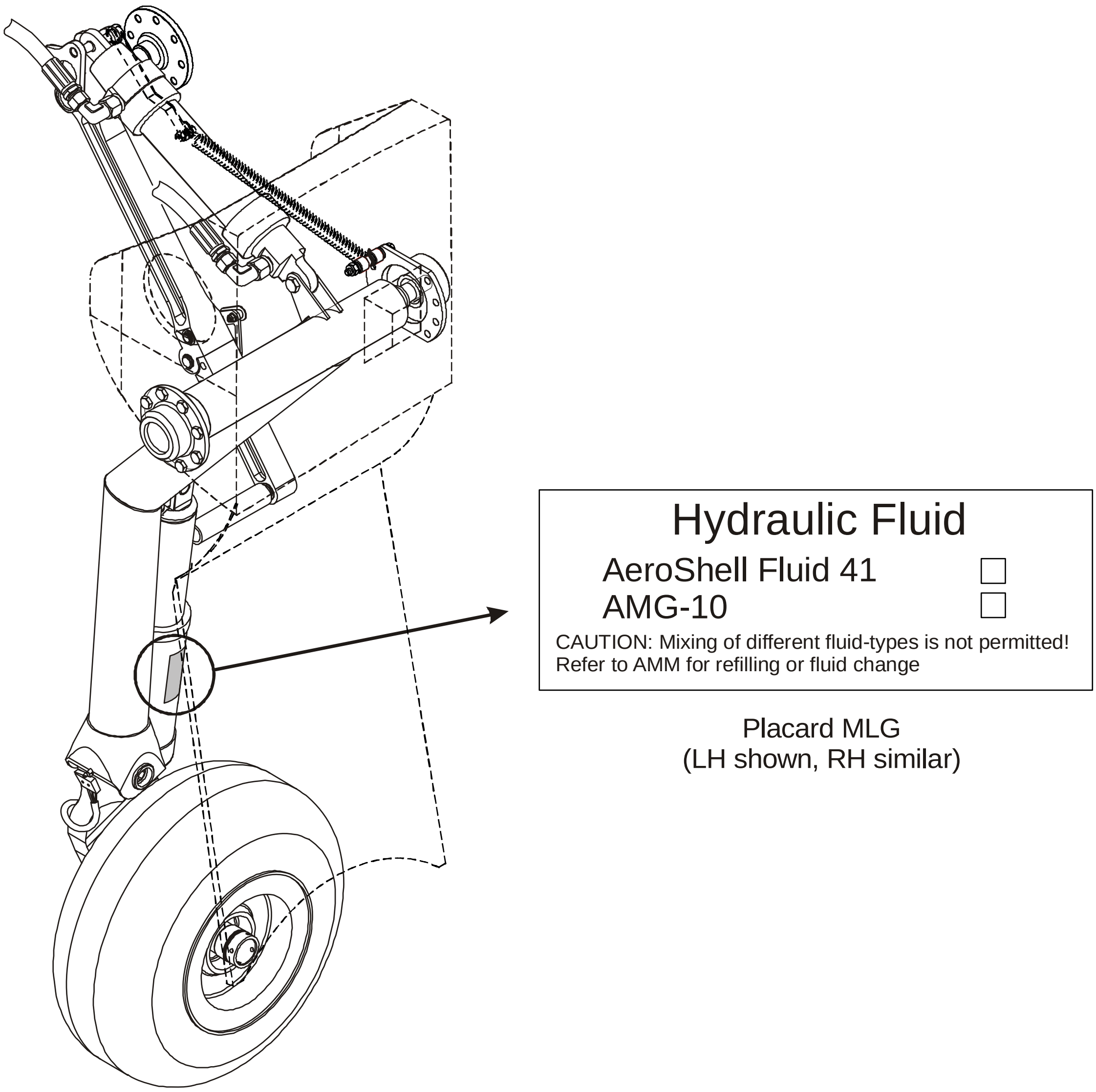


Figure 6: Position of the Hydraulic Fluid Placard - Main Landing Gear Dampers

5. Required Strut Extension of the Main Gear Damper Assemblies

The subsequent table tells you about the correct strut extension and pressure of the unloaded, fully extended main landing gear dampers.

MLG Damper	**Strut Extension (unloaded)** (visible length of bare piston)	**Gas Pressure**
LH	15 cm (6 inches)	19 bar (276 PSI).
RH	15 cm (6 inches)	19 bar (276 PSI).

6. Remove/Install a Main Landing Gear Damper

A. Remove a Main Landing Gear Damper

It is possible but not necessary to remove the main landing gear from the airplane.

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY. **WARNING: THE TRAILING ARM AND THE WHEEL ARE CONNECTED TO THE GAS LOADED DAMPER. DUE TO THE HIGH FORCES INVOLVED THE ELEMENTS OF THE DAMPING SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Release the nitrogen pressure from the damper: – Remove the dust cap from the charging valve. – Press and hold down the pin inside the valve until all the pressure is released.	
(4)	Remove the nut, washer and bolt that attach the top of the damper to the main gear leg.	
(5)	Remove the spacer, nut, washer and bolt that attach the bottom of the damper to the trailing arm.	
(6)	Move the damper clear of the main gear leg.	

B. Install a Main Landing Gear Damper

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY. **WARNING: THE TRAILING ARM AND THE WHEEL ARE CONNECTED TO THE GAS LOADED DAMPER. DUE TO THE HIGH FORCES INVOLVED THE ELEMENTS OF THE DAMPING SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Move the damper in position at the main gear leg.	
(2)	Install the spacer, nut, washer and bolt that attach the bottom of the damper to the trailing arm.	Use a new lock nut.
(3)	Install the nut, washer and bolt that attach the top of the damper to the main gear leg.	Use a new lock nut.
(4)	Fill the damper if necessary.	Refer to Paragraph 4.
(5)	Charge the damper.	Refer to Paragraph 4.
(6)	Remove the trestles and lower the airplane with the jacks.	Refer to Section 07-10.
(7)	Reset the GEAR circuit breaker.	Right side of instrument panel.

7. Disassemble/Assemble Main Landing Gear Damper

A. Disassemble Main Landing Gear Damper

Note: If the damper unit D60-3277-10-00_1 is installed, refer to RSB 42NG-017.

If RSB 42NG-017 is carried out, refer to RSB 42NG-017.

If the damper unit D60-3277-10-00_1 is not installed and RSB 42NG-017 is not carried out it is recommended to carry out RSB 42NG-017.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the MLG damper.	Refer to Section 32-10.
(2)	Release nitrogen and oil from the damper: – Install a drain hose onto the charging valve of the damper. – Wait until the nitrogen is fully released. – Compress the damper to drain the oil.	Use a suitable container to catch the damper oil (approx. 0.5 l [0.13 US gal]).
(3)	Remove the charging valve from the damper.	Refer to Figure 7.
(4)	Remove the bottom cap: – Remove M6 lower cross bolt, washer and lock nut. – Pull the bottom cap from the damper assembly. – Remove the O-ring from the cap.	Refer to Figure 7.
(5)	Disassemble damper tube: – Slide the inner cylinder out of the damper tube. – Remove the quad ring and the two backup rings from the tube.	Refer to Figure 7. Use a screwdriver or a thin metal plate. Make sure not to damage the parts.

	Detail Steps/Work Items	Key Items/References
(6)	Disassemble the inner cylinder: – Remove the M8 nut and pull the orifice plate from the damper pipe. – Pull the upper cap together with the center bolt from the damper pipe. – Remove the O-ring from the lid.	Refer to Figure 7. Make sure not to damage the orifice plate.

B. Assemble Main Landing Gear Damper

	Detail Steps/Work Items	Key Items/References
(1)	Assemble the inner cylinder: – Install the O-ring onto the upper cap. – Install the upper cap together with the center bolt onto the damper pipe. – Install the orifice plate onto the damper pipe. – Install the lock nut.	Refer to Figure 7. Use a new O-ring. Apply Teflon oil S408 onto the O-ring. If MÄM 42-659 is NOT installed: Make sure to install the cap onto the correct side (grooves are different on cod side). Make sure not to damage the orifice plate. Use new self-locking nut. Apply Loctite 262 on thread and tighten with 15 Nm (11.1 lbf.ft.).
(2)	Assemble damper tube: – Install the quad ring and the two backup rings onto the tube. – Put inner cylinder onto a tube (special tool) to raise it. – Slide the damper tube onto the inner cylinder.	Refer to Figure 7. Use new O-rings.
(3)	Install the bottom cap: – Install the O-ring onto the cap. – Push the bottom cap onto the damper tube. – Install the M6 lower cross bolt, washer and lock nut to secure the cap.	Refer to Figure 7. Use a new O-ring. Apply Teflon oil S408 onto the O-ring. Use new self-locking nut. Apply Loctite 262 onto the thread.
(4)	Install the charging valve onto the damper.	Apply Teflon oil S408 onto the O-ring.
(5)	Charge the damper with nitrogen and oil.	Refer to Section 32-10.
(6)	Install the MLG damper.	Refer to Section 32-10.

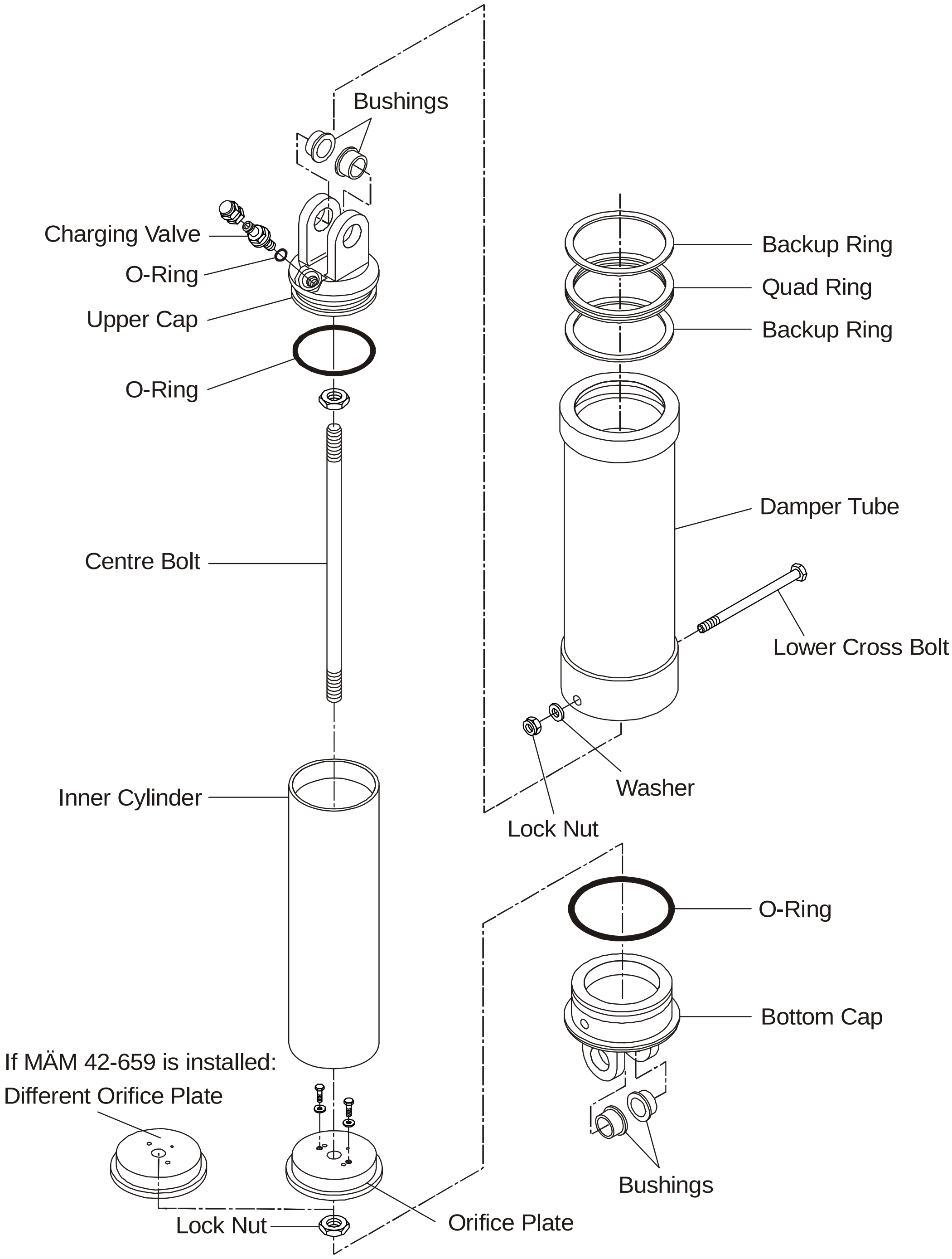


Figure 7: Main Landing Gear Damper Assembly

8. Remove/Install a Main Landing Gear Door

A. Remove a Main Gear Door

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Pull the GEAR circuit breaker.	On the right side of instrument panel.
(2)	Disconnect the door operating rod from the door that will be removed:	Refer to Figure 8.
	– Remove the nut, washers, spacers and the bolt from the rod end.	At the door end of the rod.
	– Pull the operating rod clear of the angle bracket.	
(3)	Remove the door:	
	– Remove the two bolts, washers and self locking nuts from one of the hinges.	At the hinge mounted on the door.
	– Remove the hinge.	
	– Unhinge and move the door clear of the main gear bay.	Support the door.
	– Mount the hinge back on the door with the two bolts and washers.	For not loosing the hinge and hardware.

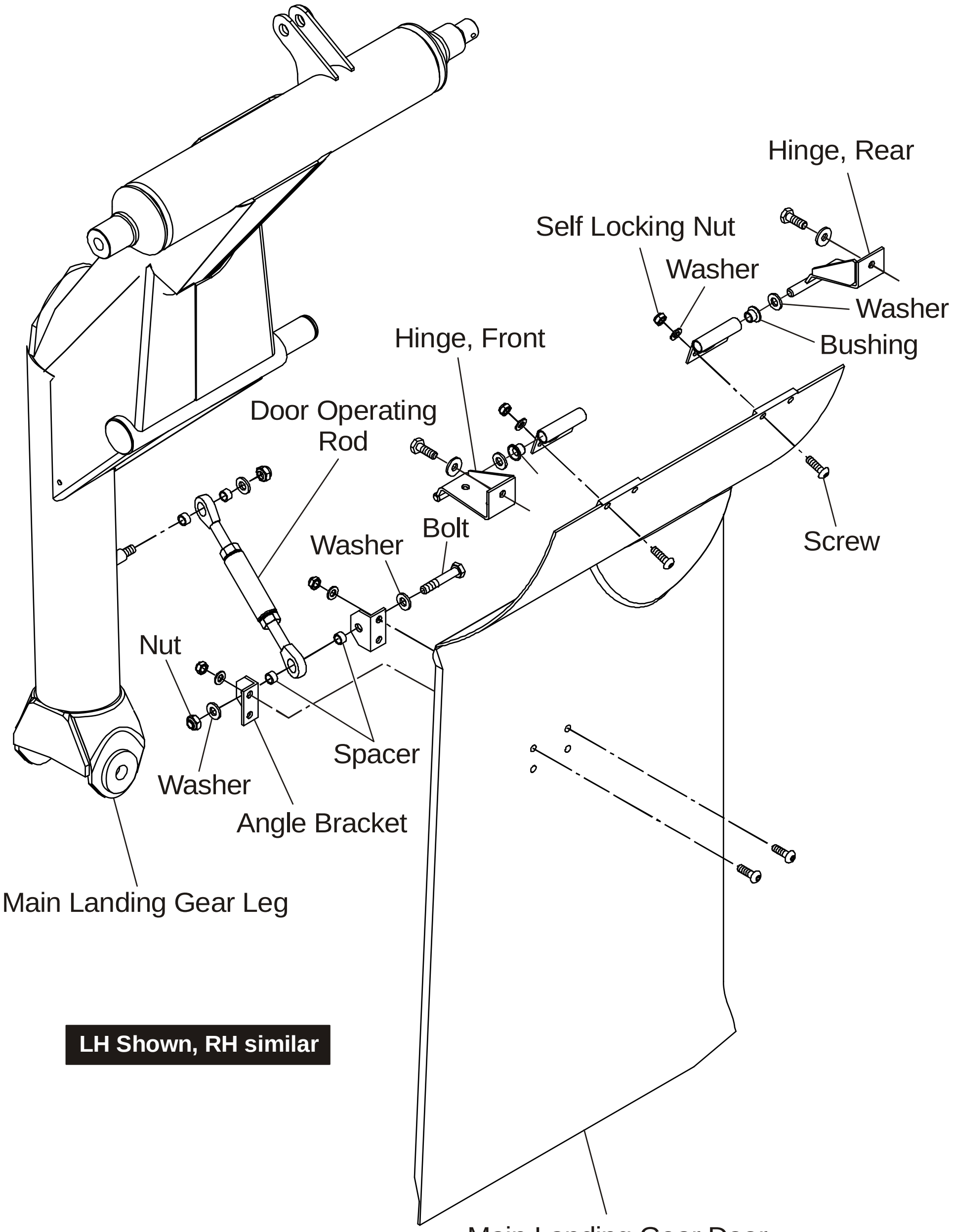


Figure 8: Main Landing Gear Door

B. Install a Main Gear Door

	Detail Steps/Work Items	Key Items/References
(1)	Install the main gear door: – Remove the two bolts, washers and self locking nuts from one of the hinges on the main gear door. – Move the main gear into position at the main gear bay. – Push the removed hinge onto the hinge in the main gear bay and align the gear door with the hinge. – Install the two bolts, washers and self locking nuts.	Refer to Figure 8. Use new self locking nuts.
(2)	Connect the door operating rod to the door that you installed: – Push the door operating rod onto the angle bracket. – Install the nut, washers, spacers and the bolt onto the rod end on the door side.	Refer to Figure 8. Use a new self locking nut.
(3)	Reset the GEAR circuit breaker.	On the right side of the instrument panel.
(4)	Carry out a test of the MLG door preload.	Refer to Paragraph 12.
(5)	Do a test of the extension/retraction system.	Refer to Section 32-30.

9. Remove/Install the MLG Folding Stay / Hydraulic Actuator

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Folding Stay / Hydraulic Actuator

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Retract the landing gear.	Use the landing gear switch.
(3)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(4)	Set the ELECT. MASTER switch to OFF.	
(5)	Depressurize the hydraulic system: – Operate the emergency extension lever of the landing gear.	Refer to Section 29-10.

	Detail Steps/Work Items	Key Items/References
(6)	Disconnect the main landing gear door from the main landing gear leg.	Refer to Figure 8.
(7)	Remove the folding stay switch.	Refer to Section 32-60.
(8)	Disconnect the MLG folding stay assembly.	Refer to Section 32-10.
(9)	Disconnect the hydraulic lines from the actuator. (Only if removing the actuator).	Use a suitable container to catch spilt hydraulic fluid. Fit caps on all open connections.
(10)	Measure and record the distance from the actuator safety lock washer to the center of spherical rod-end bearing.	Refer to Figure 9. Note the distance marked ‘x’.
(11)	Disassemble the folding stay/actuator: – Remove the nut, 4 spacers, washer and bolt from the driver plate. – Move the spring lever with spring, the latch operating arm, the drag lever assembly and the actuator clear from the airplane.	Refer to Figure 10.

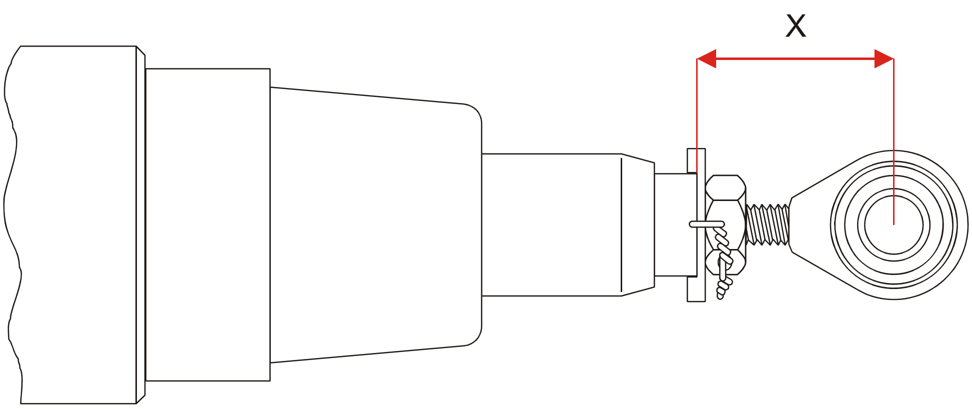


Figure 9: MLG Actuator Measurement

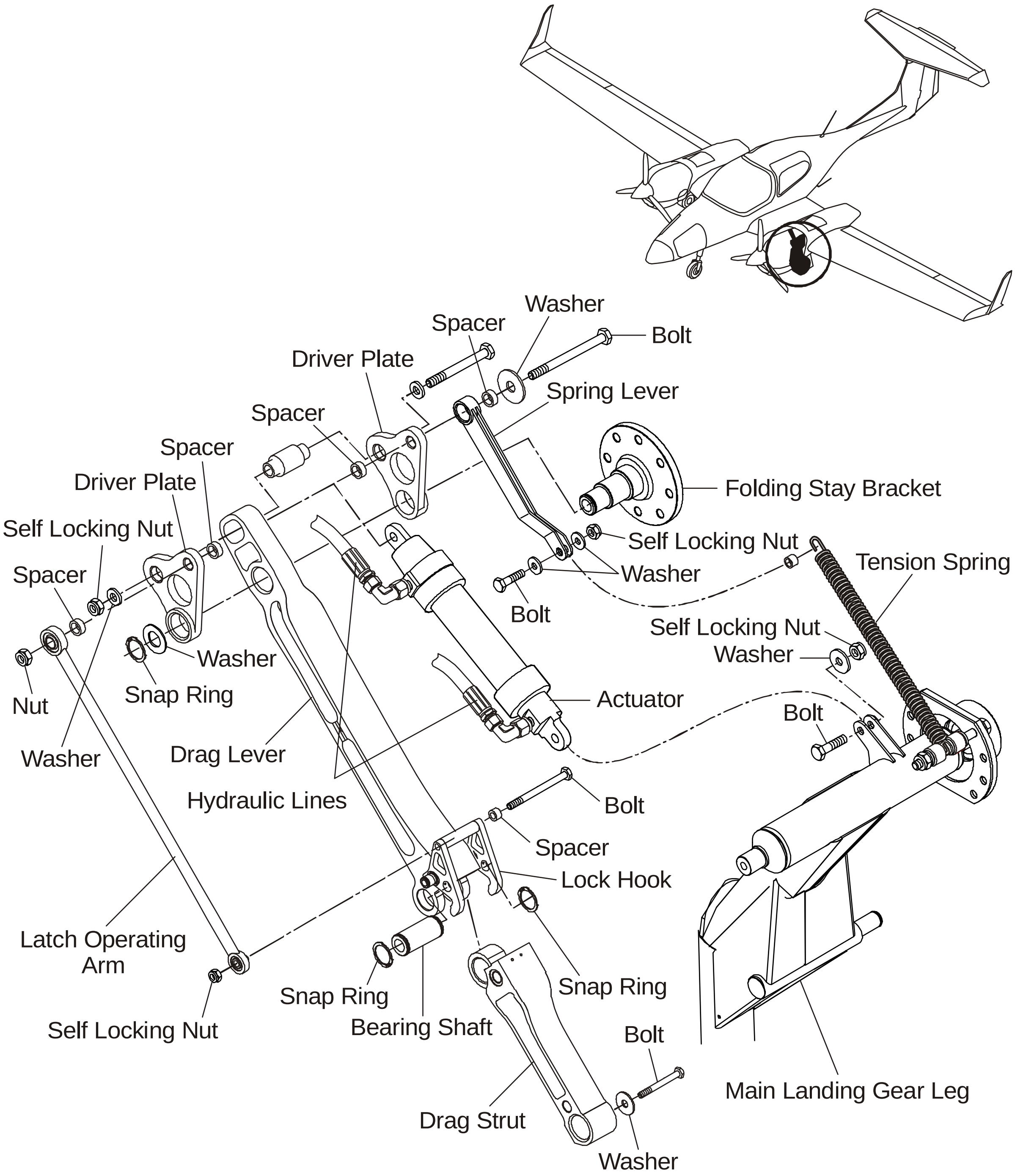


Figure 10: Main Landing Gear Folding Stay

C. Install the Folding Stay / Hydraulic Actuator

	Detail Steps/Work Items	Key Items/References
(1)	Verify the distance from the actuator safety lock washer to the center of the spherical rod-end bearing with your record or adjust base setting of 34 mm (1.34 in).	Refer to Figure 9. Base setting equals min. screw-in depth. Maximum distance x (min. screw-in depth): 34 mm (1.34 in).
(2)	Connect actuator with folding stay: – Following parts will be connected in the next step: Spring lever, latch operating arm, the drag lever assembly and the actuator. – Install the nut, 4 spacers, washer and bolt onto the driver plate.	Refer to Figure 10.
(3)	Connect the hydraulic lines with the actuator.	Remove caps from all open connections.
(4)	Replenish the hydraulic reservoir if necessary.	Refer to Section 29-10.
(5)	Connect the folding stay assembly of the MLG.	Refer to Section 32-10.
(6)	Install and adjust the folding stay assembly of the MLG.	Refer to Section 32-60.
(7)	Reset the GEAR circuit-breaker.	Right side of instrument panel.
(8)	Bleed the hydraulic system.	Refer to Section 29-10.
(9)	Carry out a test for the correct operation of the landing gear retraction and extension system.	Refer to Section 32-30.
(10)	Carry out a test for the correct pre-load of the main landing gear door.	Refer to Paragraph 12.
(11)	Move the wing and rear fuselage trestles clear of the airplane.	
(12)	Lower the airplane.	Refer to Section 07-10.

10. Remove/Install a Folding Stay Bracket

A. Remove a Folding Stay Bracket

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Remove the Folding Stay/ Hydraulic Actuator.	Refer to Paragraph 9, Section B.
(2)	Remove the folding stay bracket: – Mark or record the orientation of the folding stay bracket flange (if OÄM 42-356 is carried out). – Remove 8 bolts and 8 washers. – Move the folding stay bracket clear from the airplane.	

B. Install a Folding Stay Bracket

	Detail Steps/Work Items	Key Items/References
(1)	Move the folding stay bracket in place. If OÄM 42-356 is carried out: Make sure that the flange is orientated like your record or marking.	Refer to Figure 11.
(2)	Install the folding stay bracket: – Install 8 bolts and 8 washers.	Use the three longer bolts at thicker flange section of the folding stay bracket. For wet installation of components use CA 1000.
(3)	Install the MLG folding stay.	Refer to Paragraph 9, Section C.

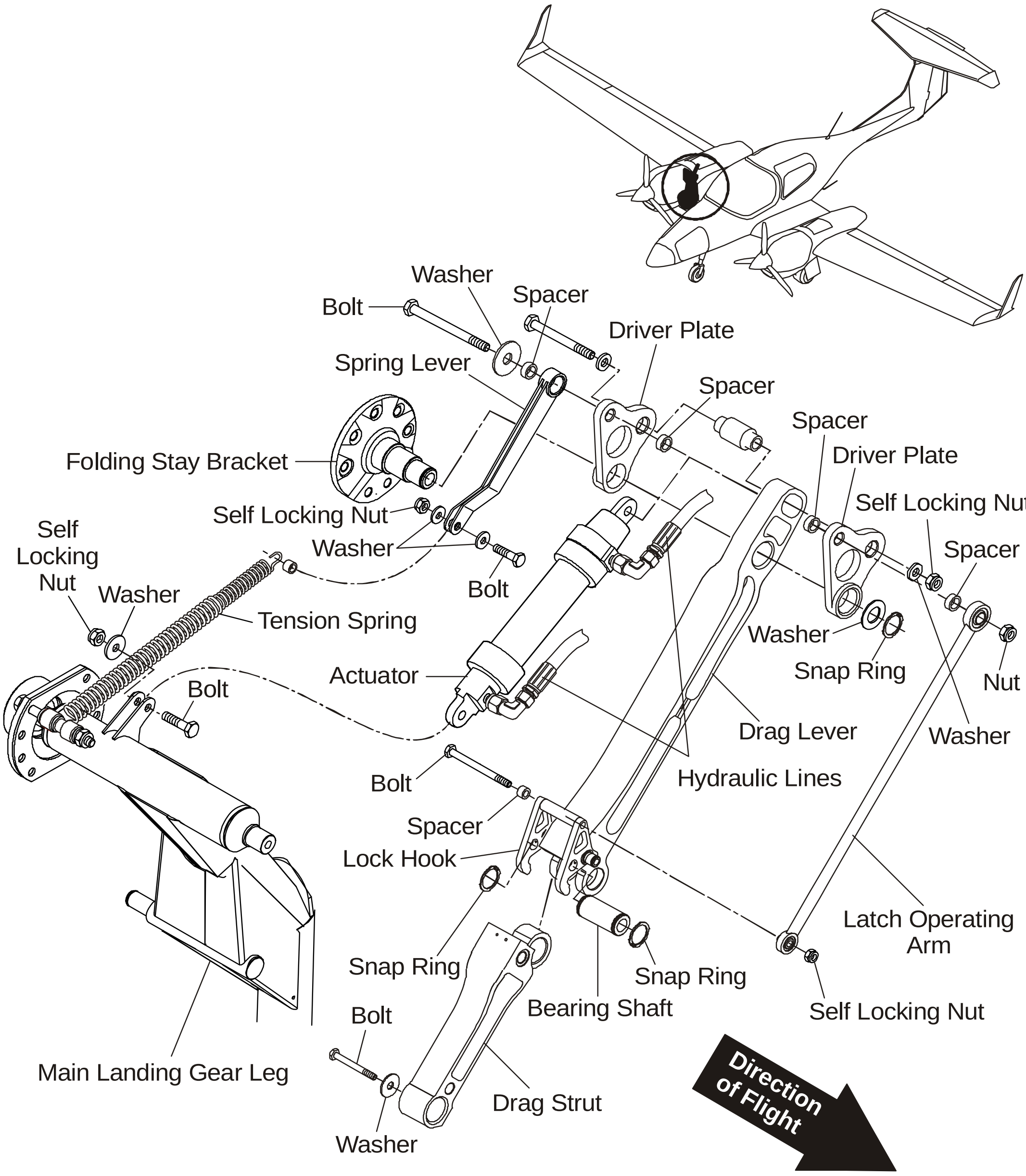


Figure 11: Main Landing Gear Folding Stay (RH side, if OÄM 42-356 is installed)

11. Disconnect/Connect the MLG Folding Stay Assembly

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Disconnect the Folding Stay Assembly of the MLG

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(4)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(5)	Bleed the system: – Retract the landing gear to bleed the system. – Operate the emergency extension of the landing gear (repeat this step one or two times).	Refer to Section 32-30.
(6)	Pull the GEAR circuit breaker.	Right side of instrument panel.
	CAUTION: THE MAIN LANDING GEAR LEG MAY GET DAMAGED IF THE FUSELAGE SKIN IS NOT PROTECTED WHEN DISCONNECTING THE FOLDING STAY.	
(7)	Put foam plastic between MLG leg and the airplane fuselage to protect it.	

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(8)</td><td>Remove the nut, spacer and bolt which connect the latch operating arm with the folding stay and disconnect the arm.</td><td>Disconnect at the lock hook.
Refer to Figure 10.</td></tr>
<tr><td colspan="3">WARNING: THE FOLDING STAY AND THE ACTUATOR ARE TENSED BY THE SPRING. IT CAN CAUSE SERIOUS DAMAGE IF HANDLED IMPROPERLY. MAKE SURE TO SUPPORT THESE PARTS WHEN REMOVING THEM.</td></tr>
<tr><td>(9)</td><td>Disconnect the drag strut:
– Remove the DIN 471-20 snap ring between the drag strut and the drag lever from the folding stay.
– Push the drag lever outward to release the stress from the folding stay and slowly remove the bearing shaft from the folding stay.
– Open the lock hook and slowly release the drag lever.
– Move the drag strut free from the drag lever.
– Remove the bolt and the washer which connects the drag strut with the MLG leg.
– Remove the drag strut.</td><td>Refer to Figure 10.</td></tr>
<tr><td colspan="3">CAUTION: WHEN DISCONNECTING THE ACTUATOR THE MAIN LANDING GEAR LEG WILL MOVE OUTWARDS. DON’T FORGET THE FOAM PLASTIC TO PROTECT THE FUSELAGE SKIN.</td></tr>
<tr><td>(10)</td><td>Disconnect the actuator:
– Remove the nut and washer which connects the actuator with the MLG leg.</td><td>
Make sure to support the actuator after removing the bolt.</td></tr>
</table>

	Detail Steps/Work Items	Key Items/References
(11)	Disconnect the tension spring: – Pull the tension spring out of its mounting where it is connected to the MLG leg. – Move the tension spring clear of the MLG leg.	Refer to Figure 10.
(12)	Disconnect the folding stay assembly: – Remove the snap ring and the washer from the drag lever were it connects to the folding stay bracket. – Pull the drag lever and the actuator off the folding stay bracket. – The whole assembly will come off but is still connected to the fuselage through the actuator hydraulic lines and the MLG folding stay switch. – Make sure to affix the whole assembly so that the hydraulic lines and the electrical connections are not stressed.	

C. Connect the Folding Stay Assembly to the MLG

	Detail Steps/Work Items	Key Items/References
(1)	Connect folding stay assembly: – Install the drag lever and the actuator together with the whole assembly onto the folding stay bracket. – Move the actuator to the main gear leg until it is on top of it. – Bring the main gear leg and the actuator into position. – Install the bolt, washer and nut to secure the actuator. – Install the washer and the snap ring onto the drag lever to secure the whole folding stay / actuator assembly onto the folding stay bracket.	Refer to Figure 10. Use new self locking nuts. Use a new snap ring.
(2)	Make sure the lock wire for the hydraulic actuator is installed.	
(3)	Connect the tension spring: – Move the tension spring into position. – Push the tension spring into its mounting where it is connected to the MLG leg. – Make sure the spring fits solidly to the spacer.	Refer to Figure 10. The openings of the tension spring bearings must face towards the spring.
CAUTION:	MAKE SURE TO SUPPORT THE DRAG LEVER UNTIL THE BEARING SHAFT IS INSTALLED. OTHERWISE THE FOLDING STAY SWINGS BACK AND CAN CAUSE SERIOUS DAMAGE AND INJURIES.	

	Detail Steps/Work Items	Key Items/References
(4)	Connect the drag strut: – Move the drag strut into position. – Install the bolt and the washer which connects the drag strut with the MLG leg. – Push the drag lever outward to align the drag lever with the drag strut. – Close the lock hook. – Install the bearing shaft. – Install the DIN471-20 snap ring which connects the drag strut and the drag lever.	Refer to Figure 10. Use a new snap ring.
(5)	Install the nut, spacer and bolt which connect the latch operating arm with the folding stay.	Refer to Figure 10.
(6)	Remove the foam plastic between MLG leg and the GFRP of the airplane fuselage.	
(7)	Reset the GEAR circuit-breaker.	Right side of instrument panel.
(8)	Bleed the hydraulic system.	Refer to Section 29-10.
(9)	Do a test for the correct operation of the landing gear retraction and extension system.	Refer to Section 32-30.
(10)	Do a test for the correct pre-load of the main landing gear door.	Refer to Paragraph 12B.
(11)	Move the wing and rear fuselage trestles clear of the airplane.	
(12)	Lower the airplane.	Refer to Section 07-10.

12. Test Main Landing Gear

A. Equipment

Item	Quantity	Part Number
Slide sheets - 2 per side.	4	Commercial.
E-protractor.	1	Commercial.

B. Test Main Landing Gear (Wheel Track and Camber)

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the airplane is at the empty weight.	Refer to Wheel Track and Camber Report. Section 06-00.
(2)	Remove the main landing gear doors.	Refer to Paragraph 8.
(3)	Move the airplane to put the main wheels on the slide sheets. Make sure there is no horizontal friction load on the landing gear.	Make sure the floor is level in the work area. Refer to Figure 13.
(4)	Measure the wheel track: – Measure from the front wing root edge LH and RH (between wing and fuselage) perpendicular to the ground. – Mark these points on the ground and draw a line or use a straight beam which aligns with both points. – Use a metal angle or similar and hold it onto the measured line from the previous step to the rim of the main gear wheel. – Measure the wheel track in the front and the rear. – Substract the two measurements and write this wheel track measurement down. – Use the wheel track table to convert your measurement into degrees.	Refer to Figures 12 and 13.
(5)	Measure the camber using an e-protractor.	
(6)	Measure overall track with.	Refer to Section 06-00.

	Detail Steps/Work Items	Key Items/References
(7)	Fill out the Wheel Track and Camber Report.	Refer to Section 06-00, Figure 10.
(8)	If the Wheel Track and Camber Report does not meet the requirement: contact DAI.	
(9)	Move the airplane off the slide sheets.	
(10)	Install the main gear door.	Refer to Paragraph 8.

DA 42 NG Wheel Track Table					
(valid for DA 42 NG with 6" - Parker rim P/N: 40-75Z)					
mm	°	mm	°	mm	°
0,1	0,03	3,4	1,04	6,7	2,05
0,2	0,06	3,5	1,07	6,8	2,08
0,3	0,09	3,6	1,10	6,9	2,11
0,4	0,12	3,7	1,13	7	2,15
0,5	0,15	3,8	1,16	7,1	2,18
0,6	0,18	3,9	1,20	7,2	2,21
0,7	0,21	4	1,23	7,3	2,24
0,8	0,25	4,1	1,26	7,4	2,27
0,9	0,28	4,2	1,29	7,5	2,30
1	0,31	4,3	1,32	7,6	2,33
1,1	0,34	4,4	1,35	7,7	2,36
1,2	0,37	4,5	1,38	7,8	2,39
1,3	0,40	4,6	1,41	7,9	2,42
1,4	0,43	4,7	1,44	8	2,45
1,5	0,46	4,8	1,47	8,1	2,48
1,6	0,49	4,9	1,50	8,2	2,51
1,7	0,52	5	1,53	8,3	2,54
1,8	0,55	5,1	1,56	8,4	2,57
1,9	0,58	5,2	1,59	8,5	2,61
2	0,61	5,3	1,62	8,6	2,64
2,1	0,64	5,4	1,65	8,7	2,67
2,2	0,67	5,5	1,69	8,8	2,70
2,3	0,70	5,6	1,72	8,9	2,73
2,4	0,74	5,7	1,75	9	2,76
2,5	0,77	5,8	1,78	9,1	2,79
2,6	0,80	5,9	1,81	9,2	2,82
2,7	0,83	6	1,84	9,3	2,85
2,8	0,86	6,1	1,87	9,4	2,88
2,9	0,89	6,2	1,90	9,5	2,91
3	0,92	6,3	1,93	9,6	2,94
3,1	0,95	6,4	1,96	9,7	2,97
3,2	0,98	6,5	1,99	9,8	3,00
3,3	1,01	6,6	2,02	9,9	3,03

Figure 12: DA 42 NG Wheel Track Table

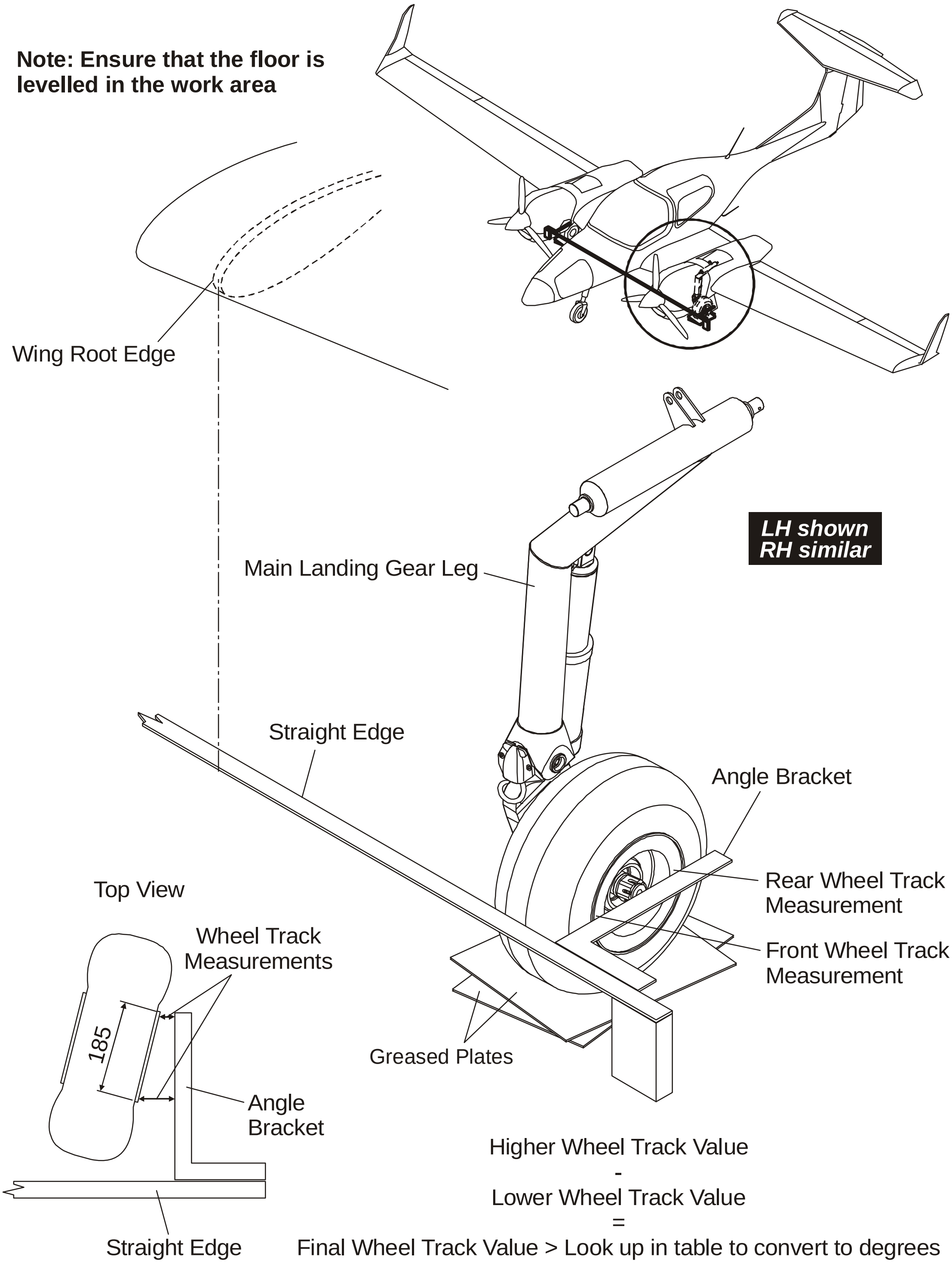


Figure 13: Main Gear Wheel Track

13. Adjustment of the MLG Wheel in Retracted Position and Check of MLG Door Pre-Load

A. Adjustment of the Main Landing Gear Wheel in Retracted Position

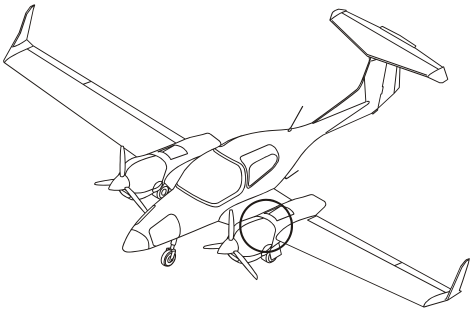
	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Remove the dust cup from the wheel.	
(3)	Verify the tire pressure.	Refer to the AFM for correct pressure.
(4)	Disconnect the MLG door from the MLG leg.	Refer to Paragraph 8.
(5)	Set the ELECT. MASTER switch to ON.	
(6)	Retract the landing gear.	
(7)	Check the clearance between the MLG tire and the lower wing-shell, wheel bay cutout:	
	– Put a trestle under the MLG wheel.	
	– Set the emergency gear lever to the EXTEND position.	
	– Set the ELECT. MASTER switch to OFF.	
	– Support the MLG wheel in the position shown in Figure 14.	Refer to Figure 14.
	– Measure the clearance between the MLG tire and the wheel bay cutout.	Minimum clearance: 4 mm (0.16 in) circumferential and along full depth of the wheel bay cutout.
	– Remove the trestle and extend landing gear.	

	Detail Steps/Work Items	Key Items/References
(8)	If the clearance is asymmetric between front and rear side: – Adjust the clearance by use of an oversize joint and replace joint. – Too small gap on front side: use a shorter joint. – Too big gap on front side: use a longer joint.	For replacement refer to Paragraph 3.D.

B. Check of Main Landing Gear Door Pre-Load

	Detail Steps/Work Items	Key Items/References
(1)	Connect the MLG door.	Refer to Paragraph 8.
(2)	Push the emergency landing gear extension lever.	
(3)	Set the ELECT. MASTER switch to ON.	
(4)	Retract the landing gear.	
(5)	Measure the distance between the end plane of the wheel axle and the lower wing shell.	Refer to Figure 15.
(6)	If the measurement does not meet the requirements: – Adjust the rod end bearing of the MLG actuator until obtaining the above mentioned value. Therefore change screw-in depth of rod and bearing.	Refer to Section 32-30 for disassembly and assembly of the MLG actuator.
Note: Check assembly for min. screw-in depth.		

	Detail Steps/Work Items	Key Items/References
(7)	Measure the MLG door pre-load: – Attach the spring-scale / load cell to the MLG door. – Calibrate the spring scale / load cell to display zero. – Read the force value, when the MLG door starts to lift off from the lower wing shell. The correct pre-load is 5 to 10 kg (11 to 22 lbf).	Refer to Figure 16.
(8)	If the measurement does not meet the requirements: – Adjust the MLG door pre-load with the MLG door operating rod.	
(9)	Carry out a test of the correct operation of the landing gear retraction and extension system.	Refer to Section 32-30.
(10)	Extend the landing gear.	
(11)	Set the ELECT. MASTER switch to OFF.	
(12)	Install the dust cap on the wheel.	
(13)	Move the wing and rear fuselage trestles clear of the airplane.	
(14)	Lower the airplane.	Refer to Section 07-10.



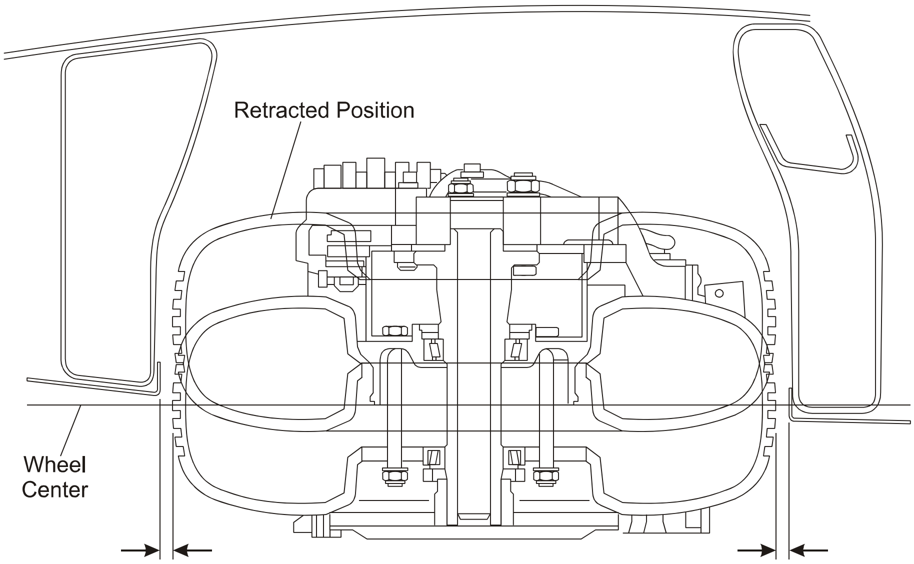


Figure 14: Main Landing Gear Tire Clearance Measurement

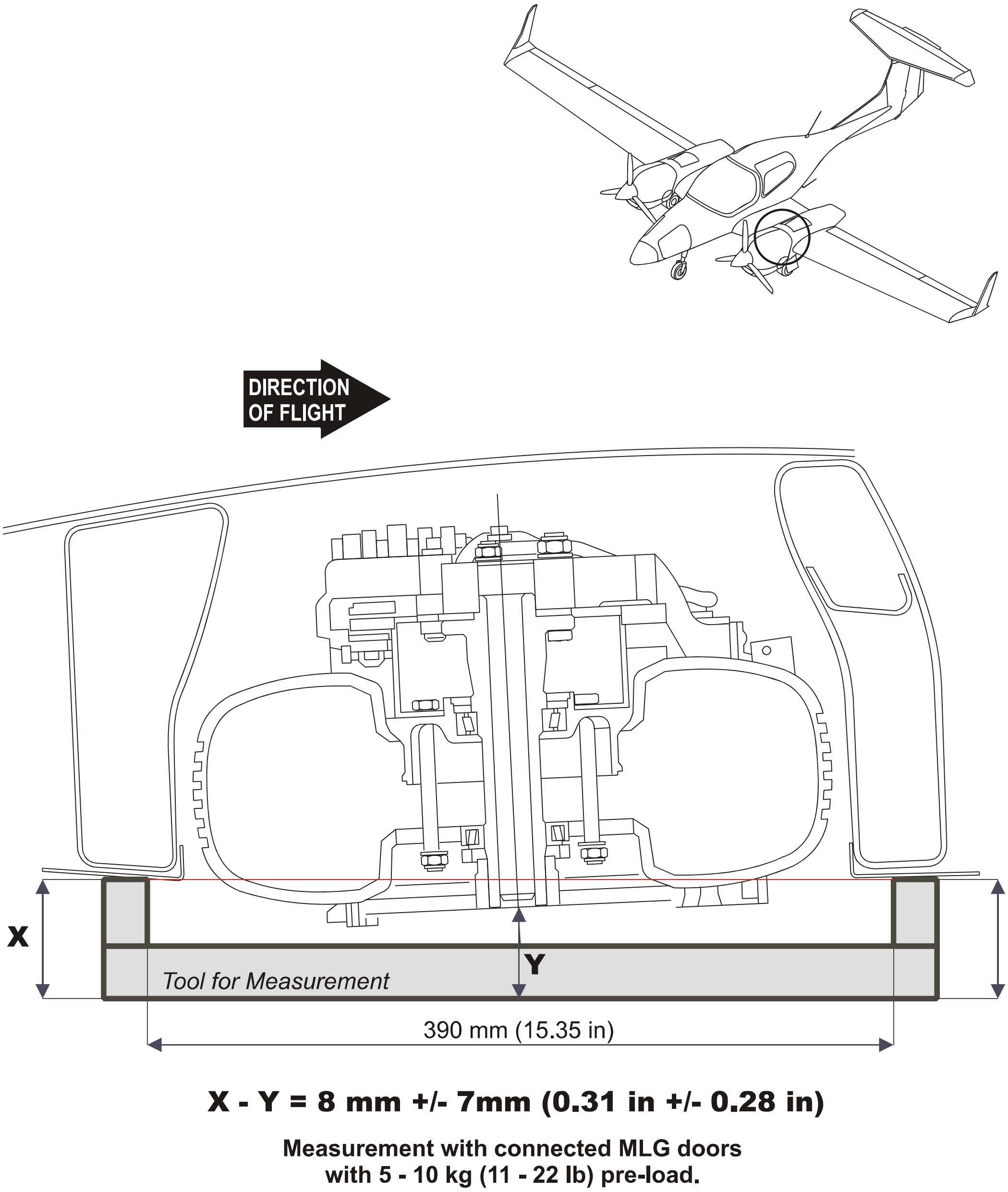


Figure 15: Main Landing Gear Door Measurement

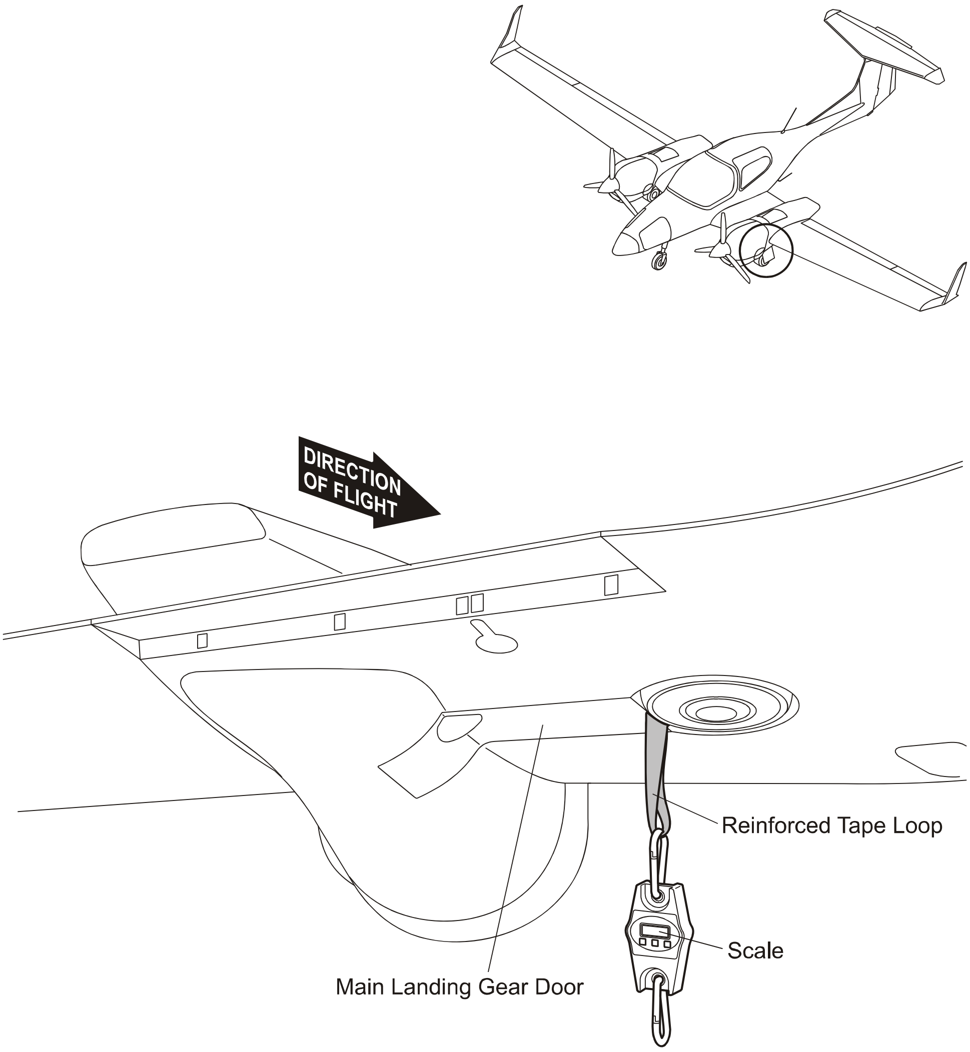


Figure 16: Main Landing Gear Door Pre-Load Measurement

Section 32-20

Nose Landing Gear

1. General

The nose landing gear is housed in the nose gear bay and is attached to the surrounding structure by the nose landing gear mounting-bracket. The nose gear leg has an oleo-pneumatic strut and a single wheel. The nose gear bay has two composite doors and the rudder control system operates the nose wheel steering.

2. Description

Figures 1 and 2 show the nose landing gear. The nose gear bay is located in the nose of the airplane and is an integral part of the nose structure. The nose landing gear attaches to a mounting bracket. Bolts attach the mounting bracket to the cockpit front frame and the nose gear bay.

The nose gear leg has a tubular steel housing. The tubular steel housing makes the top of the leg and has the leg swivel mountings. Bronze bushes in the tubular steel housing hold a tubular strut. The strut can turn in the housing. Stops on the tubular steel housing and the tubular steel strut limit the amount that the tubular steel strut can turn.

The tubular strut carries a universal joint coupling at the top. The coupling has three parts. A top pivot gimbal, a bottom pivot gimbal and a central pivot block. The top pivot gimbal has a steering actuator lever. Refer to Section 32-50 for more data about the nose wheel steering.

A sliding tube is located in the bottom of the tubular steel strut. A seal holds the sliding tube in the tubular steel strut. The bottom part of the sliding tube contains hydraulic fluid. The top part of the tubular steel strut contains nitrogen at high pressure. These components make the nose gear leg damper. Two torque-links hold the sliding tube aligned with the tubular steel strut.

Four bolts attach the nose wheel fork to the bottom of the sliding tube. The fork holds the nose wheel. Refer to Section 32-40 for more data about the nose wheel.

The nose gear bay is sealed by two doors when the landing gear is retracted. Each nose gear door has four hinges. Two short operating rods connect the nose gear bay doors to the nose gear leg operating mechanism.

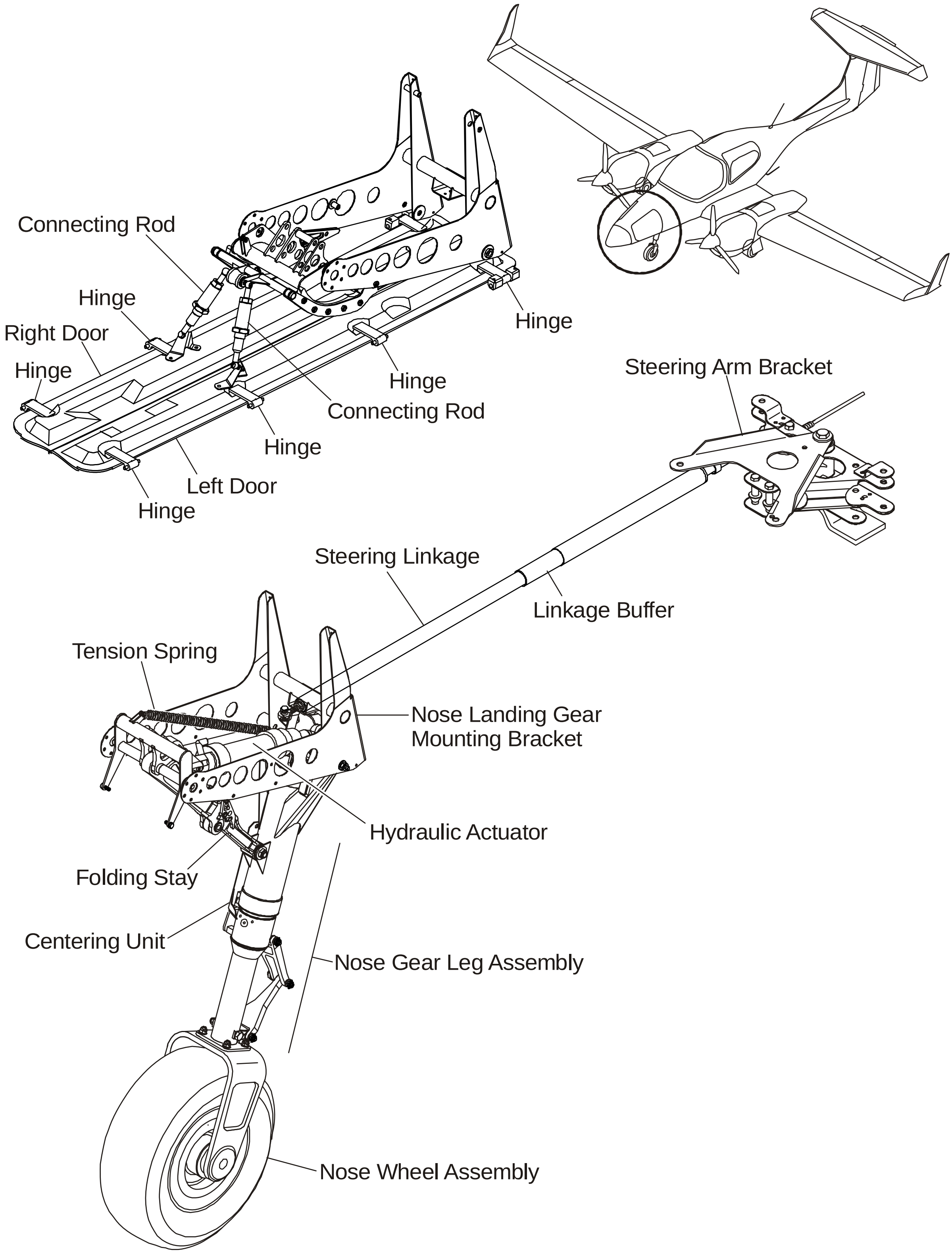


Figure 1: Nose Gear Assembly

3. Operation

The nose gear leg has two functions. It absorbs vertical loads and it provides steering on the ground.

If the nose gear has vertical load (for example during landing), the sliding tube moves up into the tubular strut. This movement compresses the nitrogen in the damper. When the load decreases the sliding tube moves out of the tubular strut. The sliding tube can move quickly into the tubular strut. In the reverse direction the speed of the sliding tube is limited by a damper. This prevents the airplane from being pushed up after the landing and it also prevents vibration.

Refer to Section 32-50 for data about the nose wheel steering. Refer to Section 32-30 for data about the extension and retraction system.

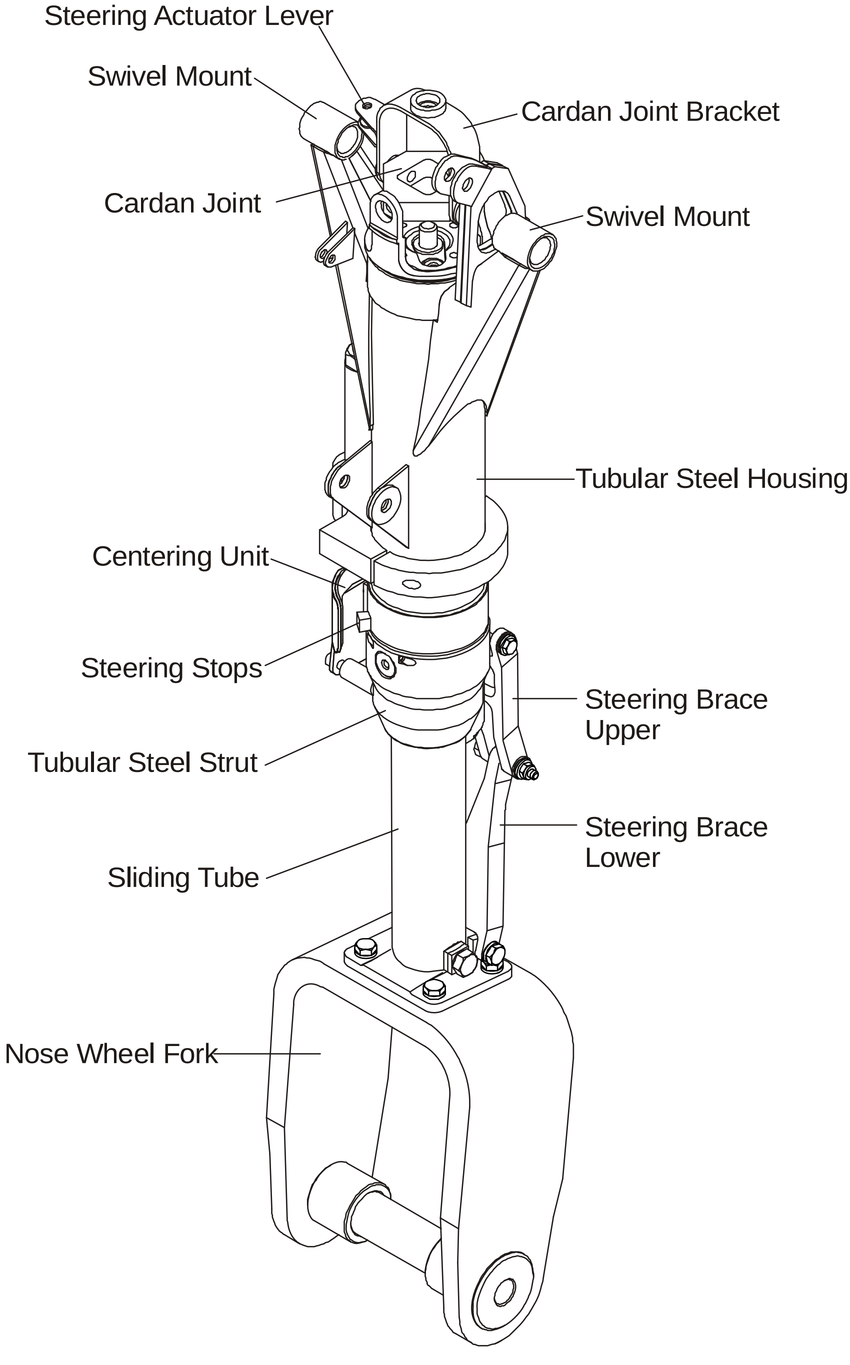


Figure 2: Nose Gear Leg Assembly

Trouble-Shooting

1. General

This table gives you the trouble-shooting procedures for the nose landing gear. Refer to Section 32-30 for trouble-shooting the nose gear extension/retraction system. Refer to Section 32-40 for trouble-shooting the nose wheel assembly. Refer to Section 32-50 for trouble-shooting the nose wheel steering. Refer to Section 32-60 for trouble-shooting the nose landing gear position and warning system.

If you find the trouble given in Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Nose gear leg cracked or bent.	Hard landing.	Do the hard landing inspection given in Section 05-50.
WARNING: THE FOLDING STAY AND THE DAMPER ARE SPRING LOADED. DUE TO THE HIGH FORCES INVOLVED THE ELEMENTS OF THE DAMPING SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS.		
Nose gear leg extension too small. Airplane sits nose-down when parked on level ground.	Nitrogen pressure in the damper to low.	Charge the leg with nitrogen to the correct pressure. Refer to MAINTENANCE PRACTICES, Paragraphs 5 and 6.
	Damper leaking.	Remove the nose gear leg. Disassemble the nose gear leg in a workshop and repair/replace the damper seals. Assemble and install the nose gear leg.

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Maintenance Practices

1. General

The Maintenance Practices in this Section tell you how to remove/install the nose gear leg and other main nose landing gear components. They also tell you how to charge the damper with hydraulic fluid/nitrogen. You can remove the nose gear leg complete with the nose wheel or you can remove the wheel first

Refer to Section 32-30 for data about the nose gear retraction/extension system. Refer to Section 32-40 for data about the nose-wheel. Refer to Section 32-60 for data about the landing gear position and warning system.

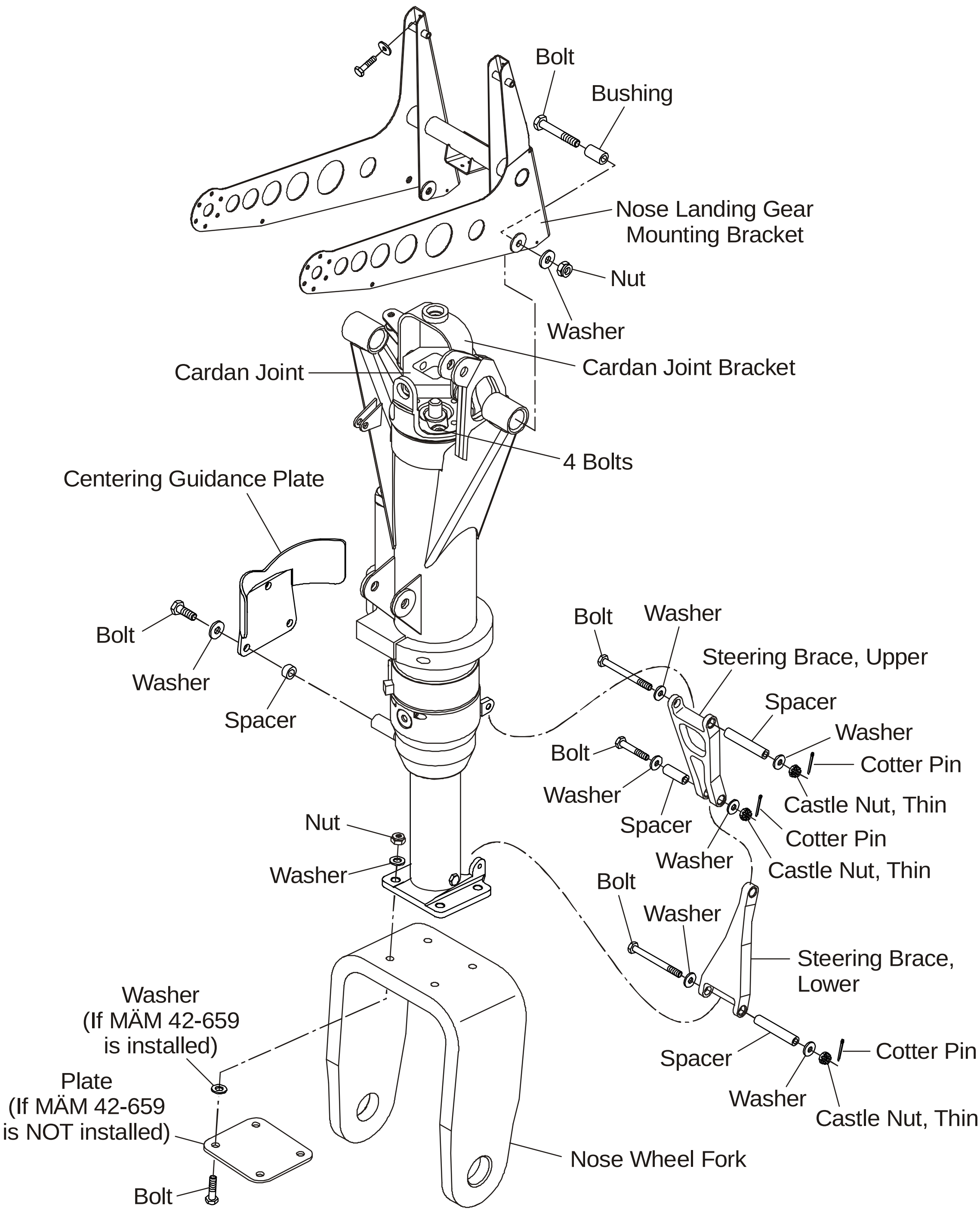


Figure 3: Nose Landing Gear Leg

2. Remove/Install the Nose Landing Gear Leg

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Nose Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY. **WARNING: THE FOLDING STAY AND THE DAMPER ARE SPRING LOADED. DUE TO THE HIGH FORCES INVOLVED THE ELEMENTS OF THE DAMPING SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Depressurize the hydraulic system.	Refer to Section 29-00.
(3)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(4)	Remove the two nose gear folding stay switches and move them together with the electrical connections clear of the landing gear.	Refer to Section 32-60.
(5)	Disconnect the NLG folding stay assembly.	Refer to Section 32-20.
(6)	Disconnect the NLG actuator from the NLG leg.	

	Detail Steps/Work Items	Key Items/References
(7)	Disconnect the nose-wheel steering rod from the steering lever at the top of the nose gear leg: – Remove the bolt, nut and washer. – Move the nose-wheel steering rod clear of the nose gear leg.	
(8)	Remove the cardan joint assy: – Remove the bolt, washer and nut from the front cardan joint mount. – Remove the bolt, washer and nut from the rear cardan joint mount. – Remove the cardan joint bracket from the pin and the cardan joint.	Refer to Figure 3. Steer the nose gear by hand so you get better access to the rear joint mount.
(9)	Remove the carpet in the front baggage compartment.	
(10)	Airplanes with de-icing system: – Remove the de-icing fluid tank. – Remove the de-icing metering pump. – Remove the filter cartridge.	Refer to Section 30-00. This step is necessary to get access to the nose gear leg mount.
(11)	Airplanes without de-icing system: – Remove the LH and RH aft access panels in the baggage compartment.	
(12)	Remove the nose landing gear leg: – Remove the bolt, bushing, washer and nut on the LH and RH side of the nose gear. – Move the nose gear leg clear of the airplane.	Refer to Figure 3. Support the nose gear.

C. Install Nose Landing Gear Leg

	Detail Steps/Work Items	Key Items/References
(1)	Install the nose gear leg: – Move the nose gear leg into position. – Install the bolt, bushing, washer and nut on the LH and RH side of the nose gear.	Refer to Figure 3. Support the nose gear. Use new self-locking nut.
(2)	Airplanes with de-icing system: – Install the filter cartridge. – Install the de-icing metering pump. – Install the de-icing fluid tank.	Refer to Section 30-00. This step is necessary to get access to the nose gear leg mount.
(3)	Airplanes without de-icing system: – Install the LH and RH aft access panels in the front baggage compartment.	
(4)	Install the carpet in the front baggage compartment.	
(5)	Install the cardan joint assy: – Install the cardan joint bracket onto the pin and move the cardan joint into position. – Install the bolt, washer and nut onto the rear cardan joint mount. – Install the bolt, washer and nut onto the front cardan joint mount.	Refer to Figure 3. Use new self locking nuts.
(6)	Connect the nose-wheel steering rod onto the steering lever at the top of the nose gear leg: – Install the bolt, nut and washer.	Use new self locking nut.
(7)	Connect the NLG folding stay assembly.	Refer to Section 32-20.
(8)	Connect the NLG actuator to the NLG leg.	Make sure the lock wire for the hydraulic actuator is installed correctly.

	Detail Steps/Work Items	Key Items/References
(9)	Install the two nose gear folding stay switches and secure the electrical connections with cable binder.	Refer to Section 32-60.
(10)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(11)	Do a test for the correct operation of the landing gear retraction and extension system.	
(12)	Move the wing and rear fuselage trestles clear of the airplane.	
(13)	Lower the airplane.	Refer to Section 07-10.

3. Remove/Install a Nose Gear Door

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove a Nose Gear Door

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY. **WARNING: THE FOLDING STAY AND THE DAMPER ARE SPRING LOADED. DUE TO THE HIGH FORCES INVOLVED THE ELEMENTS OF THE DAMPING SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Disconnect the door operating rod from the door that you will remove: – Remove the safety clip from the end of the operating rod. – Pull the operating rod clear of the ball-fitting.	 At the door-end of the rod.

	Detail Steps/Work Items	Key Items/References
(4)	Remove the door: – Remove the roll-pins from the door hinges. – Remove the 4 hinge pins from the door. – Move the door clear of the nose gear bay.	 All 4 hinges. Support the door.

C. Install a Nose Gear Door

	Detail Steps/Work Items	Key Items/References
(1)	Install the nose gear door: – Move the nose gear door into position at the nose gear bay. – Align the hinges of the door with the hinges at the nose gear bay and install the 4 hinge pins. – Install the roll-pins into the door hinges.	Use new roll-pins.
(2)	Connect the door operating rod to the door that you installed: – Push the rod onto the ball-end fitting. – Install the safety clip onto the end of the operating rod.	
(3)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(4)	Do a test of the retraction/extension system.	Refer to Section 32-30.
(5)	Remove the rear fuselage and wing trestles clear of the airplane.	
(6)	Lower the airplane with the jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

4. Remove/Inspect/Install Nose Landing Gear Damper Assembly

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Narrow wrench.	1	Commercial.

B. Remove the Nose Landing Gear Damper Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Pull the GEAR circuit breaker.	On the right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Remove the nose gear wheel.	Refer to Section 32-40.
(4)	Remove the nose wheel fork: – Remove the four bolts, washers, nuts and the plate from the nose wheel fork. – Move the fork clear from the nose gear.	Refer to Figure 3.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the damper assembly: – Remove the four bolts which hold the whole damper assembly. – Remove the shim and slide plate. The cardan joint assembly stays mounted. – Slide the damper assembly out of the nose gear.	Support the nose gear. Refer to Figure 2. Use the special tool (narrow wrench).
(6)	Remove the torque links: – Remove the bolts, washers, spacers and lock nuts from the nose gear. – Move the torque links clear from the nose gear.	Refer to Figure 3.
(7)	Remove the centering guidance plate: – Remove the locking wire. – Remove the spacers, washers and bolts. – Move the centering unit clear from the damper assembly.	Refer to Figure 3. Alternatively the bolts may be secured with Loctite.

C. Inspect the Nose Landing Gear Damper Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Inspect the nose wheel:	
	– Examine the wheel bearings.	Refer to Section 32-40.
	– Check the wheel rim.	Look specially for scratches and deformation.
	– Examine the tire and check the pressure.	Refer to Section 12-10.
(2)	Inspect the nose wheel fork:	
	– Examine the structure.	Look for cracks.
(3)	Inspect the torque links.	Look for cracks, deformation, and play.
(4)	Inspect the nose gear damper:	
	– Examine the sliding tube.	Look specially for surface damages and deformation.
	– Check the strut extension.	Refer to Paragraph 6.
	– Check for oil leakage.	In case of oil leakage: Contact DAI.

D. Install the Nose Landing Gear Damper Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Install the centering guidance plate: – Move the centering guidance plate into position. – Install the spacers, washers and bolts. – Secure the bolts with locking wire.	Refer to Figure 3. Use a new self locking nut. Apply Loctite 262 on the thread. Alternatively secure the bolts with locking wire if bolts with drilled heads are used.
(2)	Install the torque links: – Move the torque links into position. – Install the four bolts, washers and lock nuts onto the nose gear.	Refer to Figure 3. Use a new self locking nut. Apply Loctite onto the thread. There must be a play sideways of 0.1 - 0.3 mm (0.004 - 0.012 in).
(3)	Install the nose gear damper assembly: – Slide the damper assembly into the nose gear. – Move the shim, slide plate and the cardan joint assembly into position. – Install the four bolts which hold the whole damper assembly.	Refer to Figure 3. Use a new self locking nut. Apply Loctite onto the thread.
(4)	Install the nose gear fork: – Move the fork into position. – Install the four bolts, washers, plate (if it was installed) and nuts into the nose wheel fork.	Refer to Figure 3. Use new self locking nuts.
(5)	Install the nose gear wheel.	Refer to Section 32-40.
(6)	Reset the GEAR circuit breaker.	On the right side of instrument panel.

5. Required Strut Extension of the Nose Landing Gear Damper Assembly

The subsequent table tells you about the correct strut extension and pressure of the unloaded, fully extended nose landing gear damper.

Strut Extension (unloaded) (visible length of bare piston)	**Gas Pressure**
20 cm (8 inches)	16 bar (232 PSI) at 20°C (68°F) If MÄM 42-659 is installed: 10 bar (145 PSI) at 20°C (68°F)

6. Fill/Charge the Damper Assembly on the Nose Gear Leg

The following procedure tells you how to fill the nose gear damper assembly with hydraulic fluid and then charge with nitrogen.

A. Equipment

Item	Quantity	Part Number
Bottle.	1	Commercial.
Bleed tube.	1	Commercial.
Valve core removal tool.	1	Commercial.
Nitrogen charging equipment.	1	Commercial.
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Material

Item	Quantity	Part Number
CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.		
Note: If MÄM 42-495 is carried out, a placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes with MÄM 42-495 NOT installed have been manufactured with Aeroshell Fluid 41 (MIL-PRF-5606 H). The identification placard must be installed if a hydraulic fluid change to another fluid type is carried out.		
Hydraulic fluid.	As required.	Aeroshell Fluid 41 (MIL-PRF-5606 H) or AMG-10 (GOST 6794-75 Amdt 1-5), see CAUTION above.
Grease for sliding interfaces.	As required.	DOD-L-25681 or NATO S-1735 (for example, Mocil 50/50).
Gaseous nitrogen.	As required.	Commercial.

C. Procedure

WARNING: **DO NOT GET HYDRAULIC FLUID ON YOUR SKIN OR YOUR CLOTHES. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.**

WARNING: **DO NOT LET NITROGEN AT HIGH PRESSURE BLOW ONTO YOUR SKIN. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY.**

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO AIRPLANE COMPONENTS.

CAUTION: YOU MUST FILL/CHARGE THE NOSE-WHEEL DAMPER ASSEMBLY CORRECTLY. IF YOU DO NOT FILL/CHARGE THE NOSE-WHEEL DAMPER CORRECTLY THE NOSE LANDING GEAR WILL NOT OPERATE CORRECTLY. THIS CAN CAUSE DAMAGE TO THE NOSE LANDING GEAR AND THE AIRPLANE STRUCTURE.

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Release the nitrogen pressure from the damper: – Remove the dust cap from the charging valve. – Press and hold down the pin inside the valve until all the pressure is released.	

	Detail Steps/Work Items	Key Items/References
	WARNING: YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE DAMPER BEFORE YOU REMOVE THE CHARGING VALVE. NITROGEN AT HIGH PRESSURE CAN PENETRATE YOUR SKIN. THIS CAN CAUSE INJURY.	
(4)	Remove the core of the charging valve from the damper assembly.	
(5)	Compress the damper assembly.	
	WARNING: DO NOT GET HYDRAULIC FLUID ON YOUR SKIN. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.	
(6)	Connect the tube of the hydraulic fluid filler bottle to the charging valve.	
	CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.	
	Note: If MÄM 42-495 is carried out, a placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes with MÄM 42-495 NOT installed have been manufactured with Aeroshell Fluid 41 (MIL-PRF-5606 H). The identification placard must be installed if a hydraulic fluid change to another fluid type is carried out.	
(7)	Turn the bottle to the open position and allow the hydraulic fluid to flow from the bottle into the damper.	Use Aeroshell Fluid 41 (MIL-PRF-5606 H) or AMG-10 (GOST 6794-75 Amdt 1-5) hydraulic fluid (see CAUTION above) with 0.3 % grease compliant with DOD-L-25681 or NATO S-1735 (for example, Mocil 50/50) added.
(8)	Extend the damper assembly by hand to allow the hydraulic fluid to fill the damper assembly.	
(9)	Compress and extend the damper not less than 6 times to release the air from the damper and allow the hydraulic fluid to flow into the damper.	

	Detail Steps/Work Items	Key Items/References
(10)	Compress the damper and hold the damper compressed while you close the bottle and remove the tube from the charging valve.	Keep the damper compressed.
(11)	Install the core of the charging valve.	
(12)	Connect the gaseous nitrogen charging equipment to the damper charging valve.	Allow the damper to extend as it is charged.
(13)	Charge the damper with nitrogen to the correct pressure.	Refer to Paragraph 5. The damper must be fully extended.
(14)	Disconnect and remove the gaseous nitrogen charging equipment from the damper charging valve.	
(15)	Install the dust cap onto the charging valve.	
(16)	Reset the GEAR circuit breaker.	Right side of instrument panel.
(17)	Remove the rear fuselage and wing trestles. clear of the airplane.	
(18)	Lower the airplane with the jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

D. Fluid Change from Aero Shell Fluid 41 to AMG-10

	Detail Steps/Work Items	Key Items/References
	Note: If the damper is disassembled, clean the inner surface of the damper and fill with AMG-10. Refer to Paragraph C of this Chapter and to item (2) of this table.	
(1)	Repeat the Fill/ Charge the Damper Assembly on the Nose Gear Leg procedure 3 times.	Refer to Paragraph C.
(2)	Apply the hydraulic fluid placard and mark the used fluid.	Refer to Figure 4. Mark hydraulic fluid type by punching.

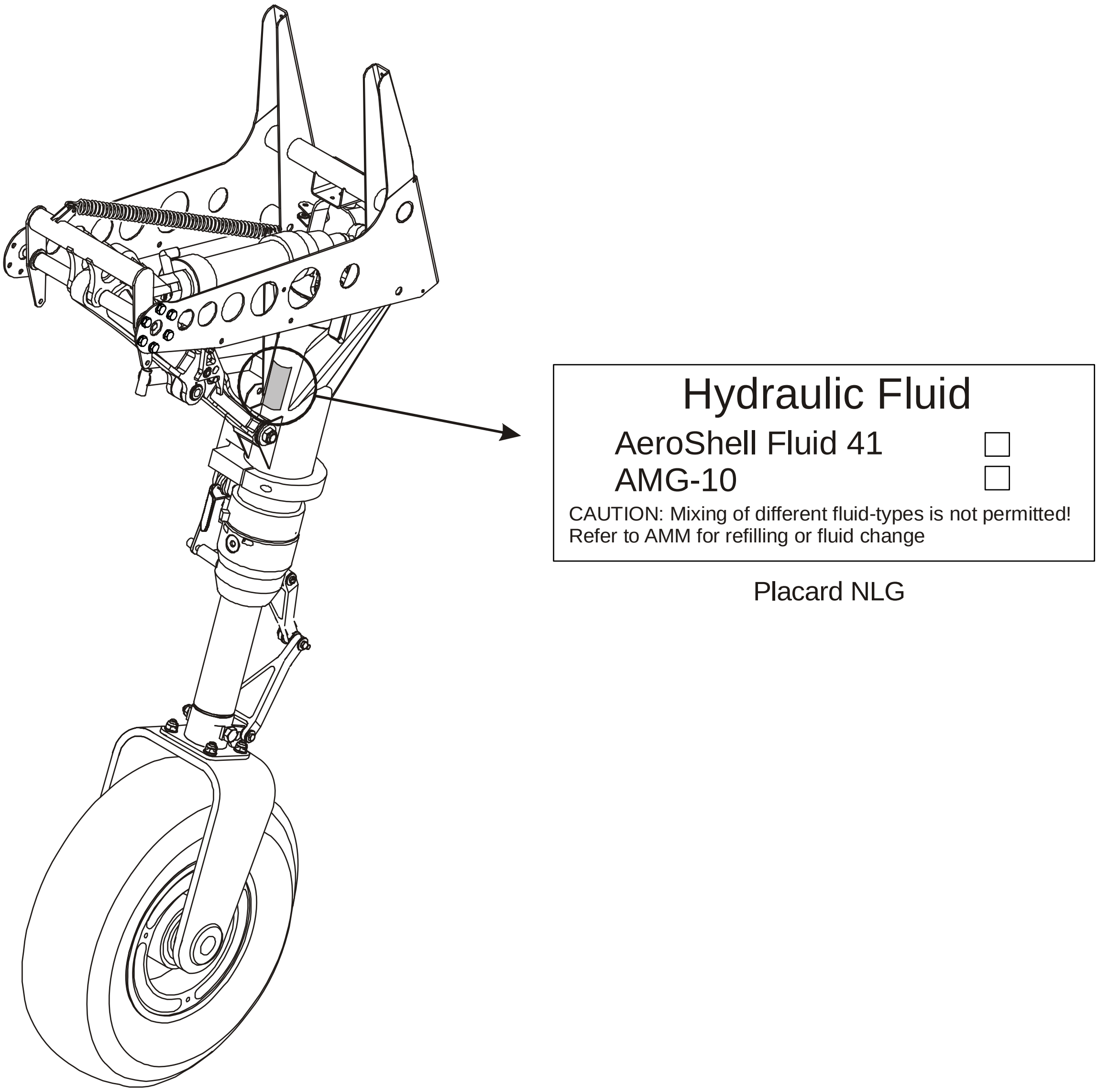


Figure 4: Position of the Hydraulic Fluid Placard - Nose Landing Gear Damper

7. Disconnect/Connect the NLG Folding Stay Assembly

The NLG folding stay assembly consists of the following main parts:

– Folding stay.

– Curve part.

– Nose landing gear brace assembly.

– Tension spring.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Disconnect the Nose Landing Gear Folding Stay Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Disconnect the main battery.	Refer to Section 24-31.

	Detail Steps/Work Items	Key Items/References
(3)	Pull the GEAR circuit breaker and secure against inadvertent operation.	Right hand side of instrument panel.
(4)	Set the ELECT. MASTER switch to OFF.	
(5)	Depressurize the hydraulic system: – Operate the emergency extension of the landing gear.	Refer to Section 29-10.
(6)	Disconnect the nose landing gear doors: – Remove the pins attaching the door connecting arms to the nose landing gear door. – Move the connecting arms clear of the nose landing gear door.	 Make sure to collect all pins.
CAUTION:	WHEN DISCONNECTING THE FOLDING STAY THE NOSE LANDING GEAR LEG SWINGS BACK AND CAN DAMAGE THE DIFFERENTIAL SWITCH. HOLD THE NOSE LANDING GEAR LEG FIRMLY.	
(7)	Put foam plastic in between the nose landing gear leg and the airplane fuselage for damage protection.	
(8)	Disconnect the differential switch located in the nose gear bay: – Remove the two bolts, four washers and two nuts which mount the switch assembly to the nose landing gear mounting bracket. – Remove the cable ties which hold the electrical cables of the switch. – Move the differential switch clear of the airplane.	Refer to Section 32-60.
(9)	Remove the two nose landing gear extension switches.	Refer to Section 32-60.

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td colspan="3">CAUTION: THE NOSE LANDING GEAR FOLDING STAY IS SPRING LOADED. DUE TO THE HIGH FORCES INVOLVED THE ELEMENT OF THE FOLDING STAY CAN CAUSE SERIOUS INJURY TO PERSONS.</td></tr>
<tr><td colspan="3">WARNING: FOR THE FOLLOWING STEP SIT IN FRONT OF THE NOSE LANDING GEAR LEG FACING THE AFT. MAKE SURE TO POSITION YOURSELF SO THAT THE NOSE LANDING GEAR FOLDING STAY CANNOT HIT YOU WHEN IT IS RELEASED.</td></tr>
<tr><td colspan="3">WARNING: DO NOT REMOVE THE PIN WHICH CONNECTS THE NOSE LANDING GEAR FOLDING STAY DRAG LEVER AND THE DRAG STRUT WHEN STILL MOUNTED IN THE AIRPLANE. THE FOLDING STAY SWINGS BACK AND CAN CAUSE SERIOUS INJURY TO PERSONS.</td></tr>
<tr><td>(10)</td><td>Release the nose landing gear folding stay tension:
– Remove the nut and washer from the nose landing gear leg which holds the folding stay.
– Carefully remove the bolt with spacer while securing the folding stay firmly.
– Release the nose landing gear folding stay slowly until the tension is fully released.</td><td>Refer to Figure 5.
Support the folding stay with your hands and at the same time hold the nose landing gear leg with your feet.
The nose landing gear leg falls backwards, when the bolt is removed.</td></tr>
<tr><td>(11)</td><td>Remove the tension spring:
– Remove the bolt, nut, washer, spacer and bushing which connects the tension spring to the nose landing gear leg.
– Move the tension spring clear of the nose landing gear leg.</td><td>Refer to Figure 5.
Note the directions of the bushing and the spring. The slot of the bushing must point to the direction of the spring. The spring hook tip must be on top.</td></tr>
<tr><td>(12)</td><td>Remove the carpets from the front baggage compartment.</td><td></td></tr>
</table>

	Detail Steps/Work Items	Key Items/References
(13)	If a de-icing system is installed: – Remove the de-icing fluid tank.	Refer to Section 30-00. In some cases the de-icing fluid tank can be moved sideways by loosening the mounting belt and thus access to the nose landing gear brace mounting bolt heads is gained.
(14)	Disconnect the nose landing gear actuator from the nose landing gear brace: – Remove the bolt which connects the nose landing gear actuator to the nose landing gear brace. – Move the nose landing gear actuator clear of the nose gear brace assembly.	Refer to Figure 5.
(15)	Disconnect the curve part from the fuselage: – Remove the bolt, bushing, washer and nut from both sides of the curve part.	Refer to Figure 5.
(16)	If MÄM 42-659 is NOT installed: Remove the nose landing gear leg.	Refer to Paragraph 2.B.
(17)	If MÄM 42-659 is NOT installed: Disconnect the nose landing gear brace assembly. – Remove the 6 mounting bolts, washers and nuts from both sides of the brace.	Refer to Figure 5.
(18)	If MÄM 42-659 is NOT installed: Disconnect the nose landing gear mounting bracket: – Remove the 22 bolts, washers and nuts which hold the mounting bracket on the nose landing gear frame.	

	Detail Steps/Work Items	Key Items/References
(19)	If MÄM 42-659 is installed: Remove the nose landing gear brace axle: – Remove the nut and the special washer on RH side. – Pull axle from LH side.	Refer to Figure 6. Hold the folding stay assembly in place when pulling the axle.
(20)	Move the nose landing gear folding stay assembly, if MÄM 42-659 is NOT installed with the nose landing gear mounting bracket, clear of the nose gear bay: – The nose landing gear actuator is still connected via the hydraulic lines. – Secure all parts so that the hydraulic lines are not stressed.	

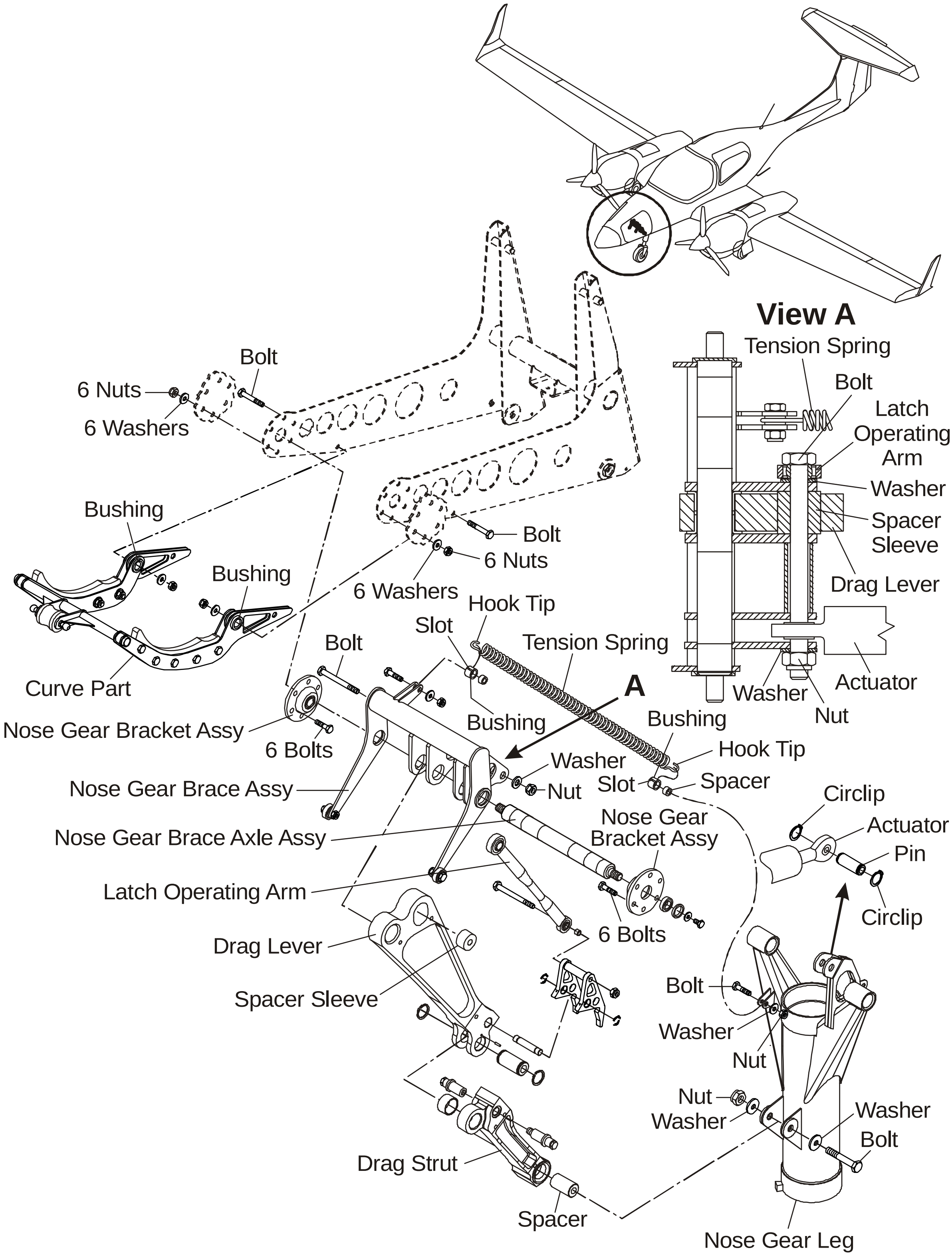


Figure 5: Nose Landing Gear Extension and Retraction

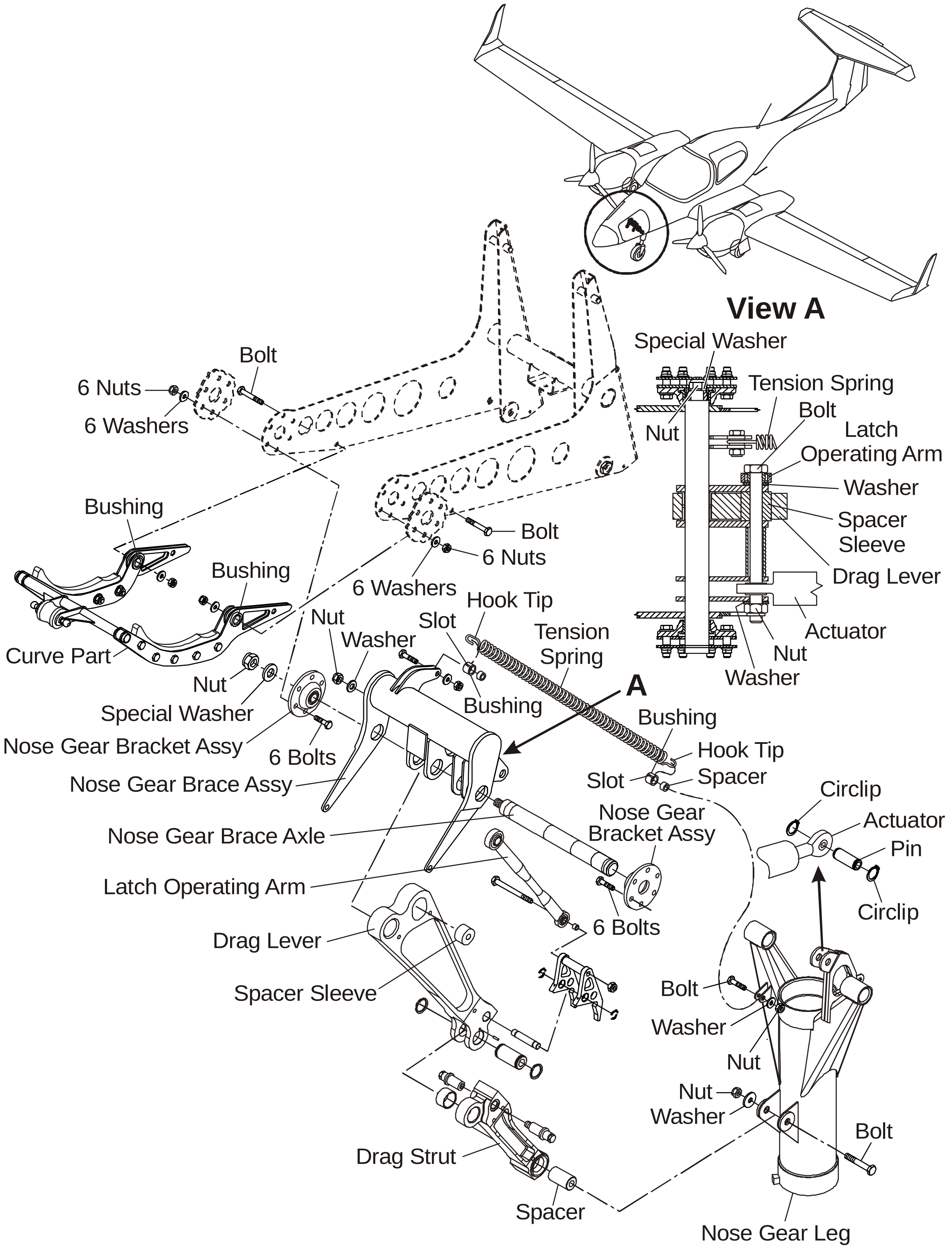


Figure 6: Nose Landing Gear Extension and Retraction (if MÄM 42-659 is installed)

C. Connect the Nose Landing Gear Folding Stay Assembly

	Detail Steps/Work Items	Key Items/References
WARNING:	**TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.**	
(1)	Move the nose landing gear folding stay assembly into position on the mounting bracket.	
(2)	If MÄM 42-659 is NOT installed: Move the nose landing gear mounting bracket with the folding stay assembly in position on the nose landing gear frame: – Connect the mounting bracket with the 22 bolts, washers and nuts to the nose landing gear frame.	Seal the bonding connections.
(3)	If MÄM 42-659 is NOT installed: Connect the nose landing gear brace assembly to the nose landing gear bay: – Install the 6 bolts, washers and nuts on both sides of the nose landing gear brace.	Refer to Figure 5. Use new self locking nuts.
(4)	If MÄM 42-659 is installed: Install the nose landing gear brace axle: – Shift in axle axle from LH side. – Install special washer and nut on RH side.	Refer to Figure 6. Use new self locking nut.
(5)	Connect the curve part in the nose landing gear bay: – Install the bolt, bushing, washer and nut on both sides of the curve part.	Refer to Figure 5. Use new self locking nuts.

	Detail Steps/Work Items	Key Items/References
(6)	If MÄM 42-659 is NOT installed: Install the nose landing gear leg.	Refer to Paragraph 2B.
(7)	Connect the nose landing gear actuator to the nose landing gear brace assembly: – Move the nose landing gear actuator into position in the nose landing gear brace assembly. – Install the bolt, washer and nut connecting the actuator to the nose landing gear brace assembly.	Refer to Figure 5. Use new self locking nut.
(8)	If a de-icing system is installed: – Install the de-icing fluid tank.	Refer to Section 30-00.
(9)	Install the carpets in the front baggage compartment.	
(10)	Install the tension spring: – Move the tension spring into position. – Install the bolt, nut, washer, spacer and bushing which connects the tension spring to the nose landing gear leg.	Refer to Figure 5. Make sure to mount the tension spring and the bushing as noted during disassembling.
(11)	Connect the nose landing gear folding stay to the nose landing gear leg: – Push the folding stay towards the nose landing gear leg slowly. – Install the bolt and the spacer while supporting the folding stay. – Install the nut and washer onto the folding stay bolt.	Hold the nose landing gear leg with your feet and move it close to the folding stay.
(12)	Remove the protective foam plastic.	

	Detail Steps/Work Items	Key Items/References
(13)	Install the nose landing gear differential switch: – Install the two bolts, four washers and two nuts which mount the nose landing gear differential switch to the nose landing gear bay. – Install the cable ties which hold the electrical cables of the differential switch.	Refer to Section 32-60.
(14)	Adjust the differential switch.	Refer to Section 32-60.
(15)	Install the two nose landing gear extension switches.	Refer to Section 32-60.
(16)	Adjust the nose landing gear extension switches.	Refer to Section 32-60.
(17)	Connect the nose landing gear door arms to the nose landing gear doors.	
(18)	Connect the main battery.	Refer to Section 24-31.
(19)	Set the GEAR circuit breaker.	
(20)	Set the ELECT. MASTER switch to ON.	
(21)	Perform a test of the correct operation of the landing gear retraction and extension system.	Refer to Section 32-30.
(22)	Move the wing and rear fuselage trestles clear of the airplane.	
(23)	Lower the airplane to the ground.	Refer to Section 07-10.

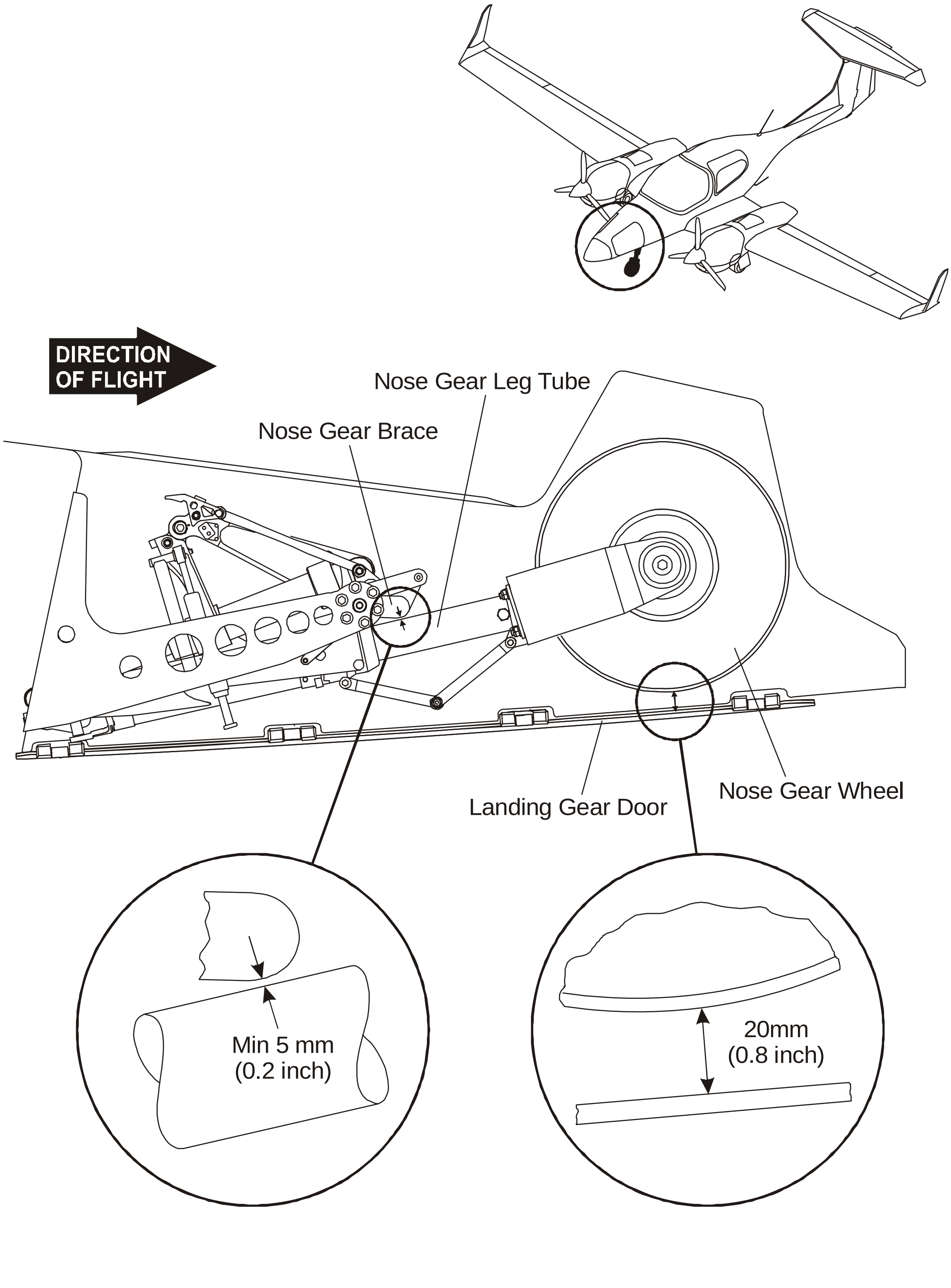


Figure 7: Nose Landing Gear Actuator

8. Remove/Install the NLG Actuator

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Nose Landing Gear Actuator

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Retract the landing gear.	Use the landing gear switch.
(3)	Disconnect the main battery.	Refer to Section 24-31.
(4)	Pull the GEAR circuit breaker and secure against inadvertent operation.	Right hand side of instrument panel.
(5)	Set the ELECT. MASTER switch to OFF.	
(6)	Depressurize the hydraulic system: – Operate the emergency extension of the landing gear.	Refer to Section 29-10.

	Detail Steps/Work Items	Key Items/References
(7)	Disconnect the nose landing gear doors: – Remove the pins attaching the door connecting arms to the nose landing gear door. – Move the connecting arms clear of the nose landing gear door.	Make sure to collect all pins.
	CAUTION: WHEN DISCONNECTING THE FOLDING STAY THE NOSE LANDING GEAR LEG SWINGS BACK AND CAN DAMAGE THE DIFFERENTIAL SWITCH. HOLD THE NOSE LANDING GEAR LEG FIRMLY.	
(8)	Put foam plastic in between the nose landing gear leg and the airplane fuselage for damage protection.	
	CAUTION: THE NOSE LANDING GEAR FOLDING STAY IS SPRING LOADED. DUE TO THE HIGH FORCES INVOLVED THE ELEMENT OF THE FOLDING STAY CAN CAUSE SERIOUS INJURY TO PERSONS.	
	WARNING: FOR THE FOLLOWING STEP SIT IN FRONT OF THE NOSE LANDING GEAR LEG FACING THE AFT. MAKE SURE TO POSITION YOURSELF SO THAT THE NOSE LANDING GEAR FOLDING STAY CANNOT HIT YOU WHEN IT IS RELEASED.	
	WARNING: DO NOT REMOVE THE PIN WHICH CONNECTS THE NOSE LANDING GEAR FOLDING STAY DRAG LEVER AND THE DRAG STRUT WHEN STILL MOUNTED IN THE AIRPLANE. THE FOLDING STAY SWINGS BACK AND CAN CAUSE SERIOUS INJURY TO PERSONS.	

	Detail Steps/Work Items	Key Items/References
(9)	Release the nose landing gear folding stay tension:	Refer to Figure 5.
	– Remove the nut and washer from the nose landing gear leg which holds the folding stay.	Support the folding stay with your hands and at the same time hold the nose landing gear leg with your feet.
	– Carefully remove the bolt with spacer while securing the folding stay firmly.	The nose landing gear leg falls backwards, when the bolt is removed.
	– Release the nose landing gear folding stay slowly until the spring tension is fully released.	
(10)	Disconnect the hydraulic lines from the actuator.	Use a suitable container to catch spilt hydraulic fluid. Fit caps on all open connections.
(11)	Disconnect the actuator from the nose landing gear:	
	– Remove the circlip which secures the ball joint of the actuator.	
	– Remove the pin with the second circlip.	
	– Remove the bolt from the nose landing gear brace assembly.	
	– Move the actuator clear of the airplane.	
(12)	Measure and record the distance from the actuator safety lock washer to the center of the ball joint.	Refer to Figure 8. Note the distance marked ‘Y’.

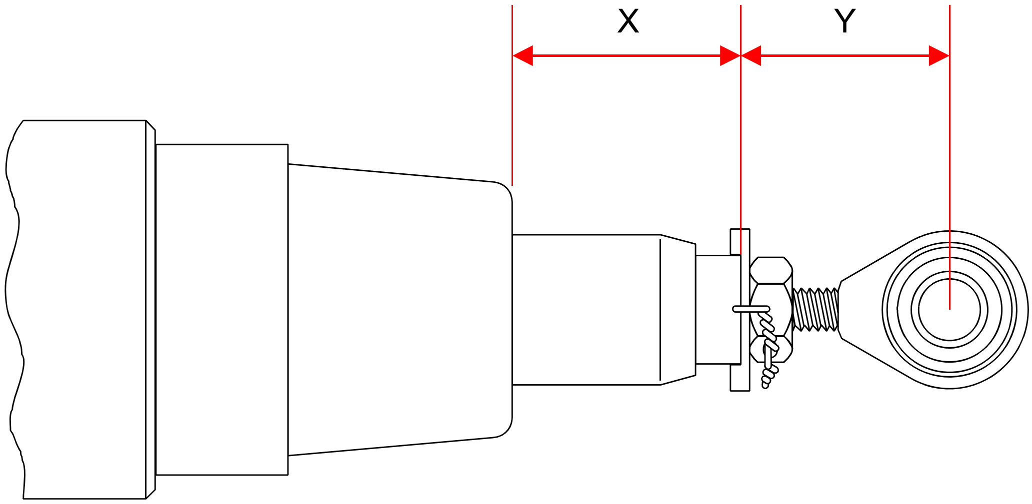


Figure 8: Nose Landing Gear Actuator Measurements

C. Install the Nose Landing Gear Actuator

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Install the hydraulic fittings to the actuator.	Make sure to achieve appropriate orientation. Remove all caps.
(2)	Install the ball joint rod to the piston rod of the actuator. Adjust the ball joint center according to the measurement ‘Y’.	Refer to Figure 8.
(3)	Connect the hydraulic lines to the actuator.	Remove all caps.
(4)	Connect the nose landing gear actuator to the nose landing gear: – Move the nose landing gear actuator into position in the nose landing gear brace assembly. – Install the bolt, washer and nut connecting the actuator to the nose landing gear brace assembly. – Install the pin with the two circlips to connect the actuator to the nose landing gear leg.	Use new self locking nuts. Use new circlips.
(5)	Connect the nose landing gear folding stay to the nose landing gear leg: – Push the folding stay towards the nose landing gear leg slowly. – Install the bolt and the spacer while supporting the folding stay. – Install the nut and washer onto the folding stay bolt.	Hold the nose landing gear leg with your feet and move it close to the folding stay.

	Detail Steps/Work Items	Key Items/References
(6)	Remove the protective foam plastic.	
(7)	Bleed the hydraulic system.	Refer to Section 29-10.
(8)	Replenish the hydraulic reservoir as necessary.	Refer to Section 29-10.
(9)	Connect the main battery.	Refer to Section 24-31.
	WARNING: DUE TO THE HIGH FORCES INVOLVED, THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS. MAKE SURE THAT NO PERSON CAN BE HIT OR CRUSHED WHEN OPERATING THE LANDING GEAR RETRACTION SYSTEM.	
(10)	Set the GEAR circuit breaker.	
(11)	Set the ELECT. MASTER switch to ON.	
(12)	Retract the landing gear: – Set the Landing Gear switch to the UP position and secure against inadvertent operation.	
(13)	Pull the emergency landing gear lever to the emergency extension position.	
(14)	Measure and record the distance in between the nose landing gear actuator safety lock washer to the cylinder head.	Refer to Figure 8. Note the distance ‘X’.
(15)	Extend the landing gear: – Set the gear selector to DOWN. – Push the landing gear emergency lever to the normal position.	
(16)	Pull the GEAR circuit breaker and secure against inadvertent operation.	
(17)	Set the ELECT. MASTER switch to OFF.	
(18)	Measure the distance in between the nose landing gear actuator safety lock washer to the cylinder head.	Refer to Figure 8. Note the distance ‘X’.

	Detail Steps/Work Items	Key Items/References
(17)	The difference of the measurements in step 12 and step 16 must lie in between 0.1 mm (0.004 inch) and 0.9 mm (0.035 inch). If the measurements do not meet the requirement: – Adjust the pushrod of the nose landing gear actuator. – Repeat steps 8 to 17.	Refer to Figure 8. Maximum distance ‘Y’ (Min. screw-in depth of rod end bearing): 34 mm (1.34 in).
(19)	Tighten the nose landing gear actuator counter nut and install the safety lock wire.	
	WARNING: DUE TO THE HIGH FORCES INVOLVED, THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS. MAKE SURE THAT NO PERSON CAN BE HIT OR CRUSHED WHEN OPERATING THE LANDING GEAR RETRACTION SYSTEM.	
(20)	Set the GEAR circuit breaker.	
(21)	Set the ELECT. MASTER switch to ON.	
(22)	Retract the landing gear: – Set the Landing Gear Switch to the UP position and secure against inadvertent operation.	
(23)	Check the clearance between the nose landing gear tire and the nose landing gear doors: – Close one NLG door by hand. – The clearance must be at least 20 mm (0.8 in). If the clearance does not meet the requirement: Contact DAI.	Refer to Figure 7.

	Detail Steps/Work Items	Key Items/References
(24)	Check the clearance between the nose landing gear leg strut and the nose landing gear brace. The clearance must be at least 5 mm (0.2 in). If the clearance does not meet the requirement: Contact DAI.	Refer to Figure 7.
(25)	Set the Landing Gear switch to DOWN.	
(26)	Connect the nose landing gear door arms to the nose landing gear doors.	
(27)	Perform a test of the correct operation of the landing gear extension and retraction system.	Refer to Section 32-30.
(28)	Move the wing and rear fuselage trestles clear of the airplane.	
(29)	Lower the airplane to the ground.	Refer to Section 07-10.

9. Remove/Install the Nose Landing Gear Mounting Bracket (if MÄM 42-659 is installed)

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Nose Landing Gear Mounting Bracket

	Detail Steps/Work Items	Key Items/References
(1)	Remove the nose landing gear leg.	Refer to Paragraph 2.
(2)	Remove the LH and the RH nose gear bracket assy: – Remove the 6 mounting bolts, washers and nuts from both sides of the baggage compartments and nose gear bay.	Refer to Figures 5, 6.
(3)	Disconnect the nose landing gear mounting bracket: – Remove the 22 bolts, washers and nuts which hold the bracket in the nose landing gear bay.	
(4)	Move the nose landing gear mounting bracket clear of the nose gear bay.	

C. Install the Nose Landing Gear Mounting Bracket

	Detail Steps/Work Items	Key Items/References
(1)	Install the nose landing gear mounting bracket: – Install the 22 bolts, washers and nuts which hold the bracket in the nose landing gear bay.	Use new self-locking nuts.
(2)	Install the LH and RH nose gear bracket assy: – Install the 6 mounting bolts, washers and nuts on both sides of the baggage compartment and nose gear bay.	Use new self-locking nuts. If MÄM 42-659 is installed: Install bracket assy with plain bearing on the LH side. Orientation of LH side bracket according to Figure 9.

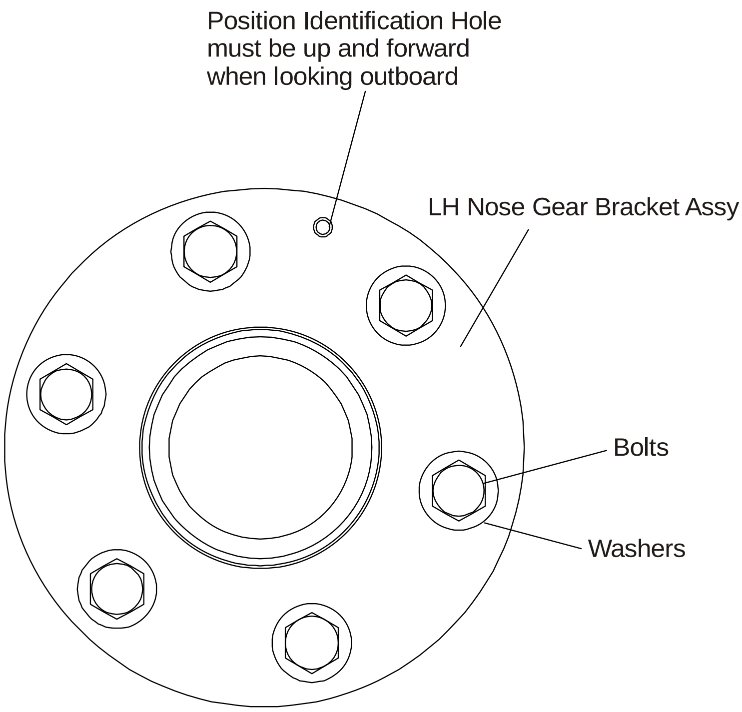


Figure 9: LH Nose Gear Mounting Bracket Position (if MÄM 42-659 is installed)

Section 32-30
Extension and Retraction

1. General

This Section tells you about the components that extend and retract the landing gear. It tells you how the system operates in normal operation and it tells you how the systems operates in an emergency.

Refer to Section 32-10 for data about the main gear legs. Refer to Section 32-20 for data about the nose gear leg. Refer to Section 32-60 for data about the landing gear position and warning system. Refer to the wiring manual for data about the related electrical systems.

2. Description

Figure 1 shows the main components of the of the extension and retraction system. Figure 2 shows the main landing gear extension and retraction system and Figure 3 shows the nose landing gear extension and retraction system. The landing gear has a dedicated hydraulic system to extend and retract the legs. Folding stays that attach to the legs and the surrounding structure unfold to lock the legs in the extended position. A spring operated latching mechanism holds the folding stays in a geometrically locked position. The initial movement of the gear actuator when moving to retract the landing gear operates the mechanism to unlock the folding stay. As the gear retracts, the folding stay folds and retracts into the landing gear bay with its related leg. The landing gear extension and retraction system has these main components:

A. Hydraulic Actuators

The hydraulic actuators are located in the related main gear bay. The actuators use hydraulic fluid pressure to extend and retract the airplane landing gear during normal operation of the system.

B. Folding Stays

Each landing gear leg has a folding stay. The folding stay holds the extended leg locked in the down position. When the leg extends to the fully down position the folding stay unfolds and a latching mechanism locks the stay in the unfolded position. When the pilot retracts the landing gear the hydraulic actuator operates a mechanism to unlatch the folding stay. The folding stay then folds into the landing gear bay with the landing gear.

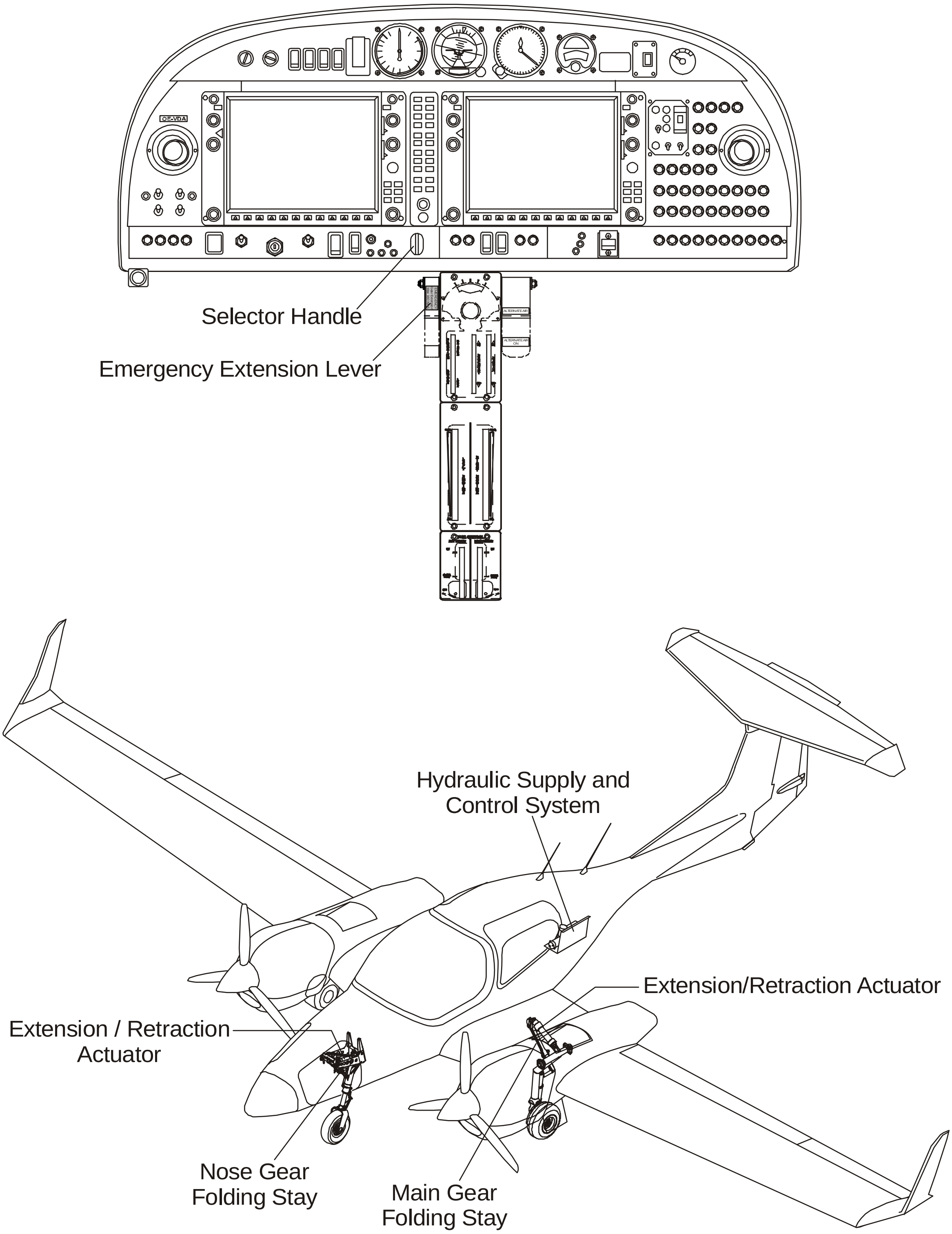


Figure 1: Extension and Retraction System Main Components

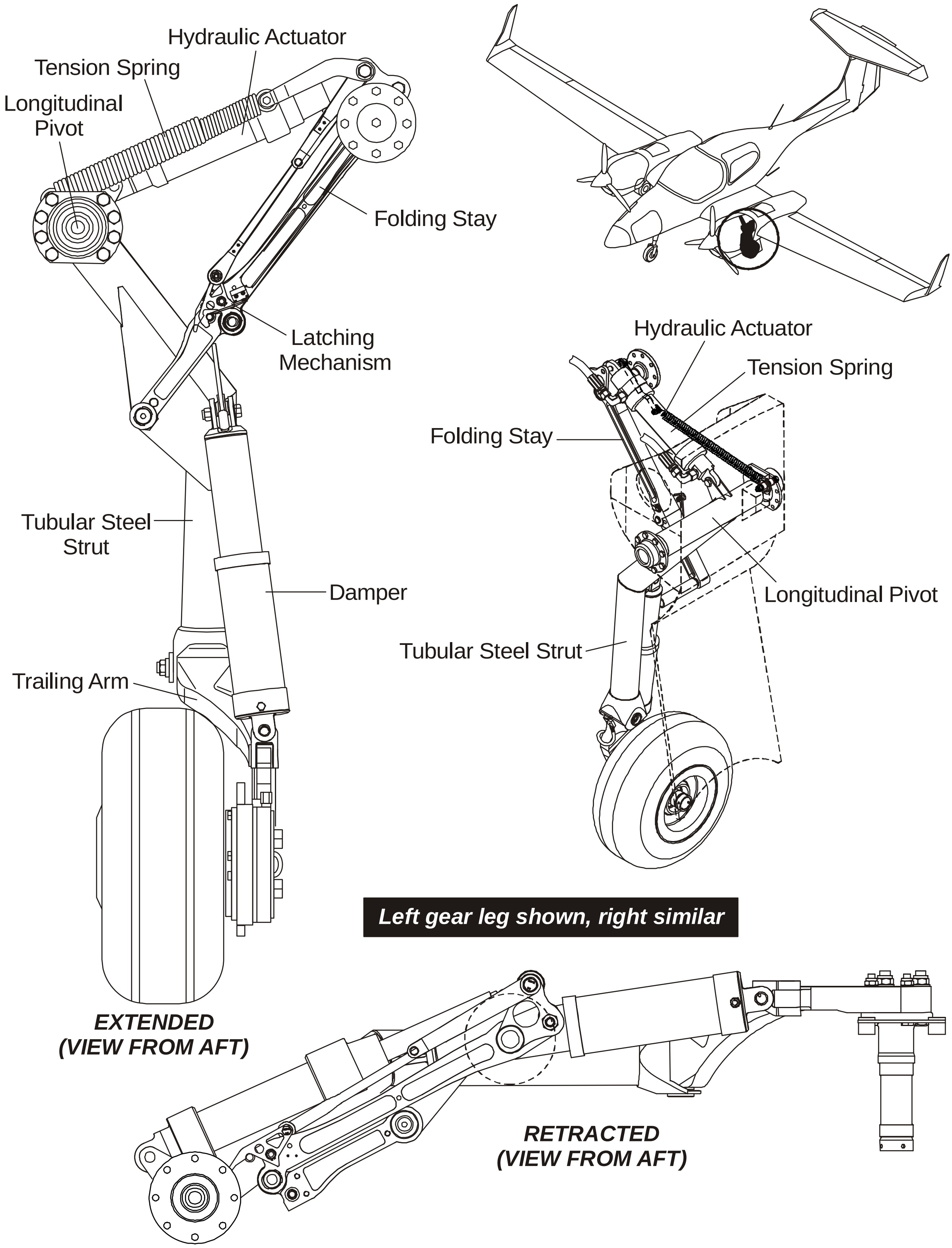


Figure 2: Main Landing Gear - Extension and Retraction

C. Selector Handle

The selector handle is located in the cockpit, in the instrument panel. The selector lever is used for normal extension and retraction of the landing gear. Three LEDs located on the instrument panel next to the selector handle show the status of the main landing gear.

D. Emergency Extension System

The emergency extension system allows the pilot to extend the landing gear in the event of a system failure. The forces of gravity are used to extend the legs and a spring-loaded mechanism on each leg folding-stay locks the leg in the extended position. The main component of the emergency extension system is the:

– Emergency extension valve. The emergency extension valve is located on the hydraulic control and is operated by the emergency extension lever. When the emergency extension valve is operated (emergency extension position) the return flow from the actuators by-passes the actuator regulating valves. The emergency extension lever is located on the left side of the cockpit, below the instrument panel. A micro switch located at the emergency extension valve isolates the hydraulic pump when the valve has been set to the EMERGENCY position.

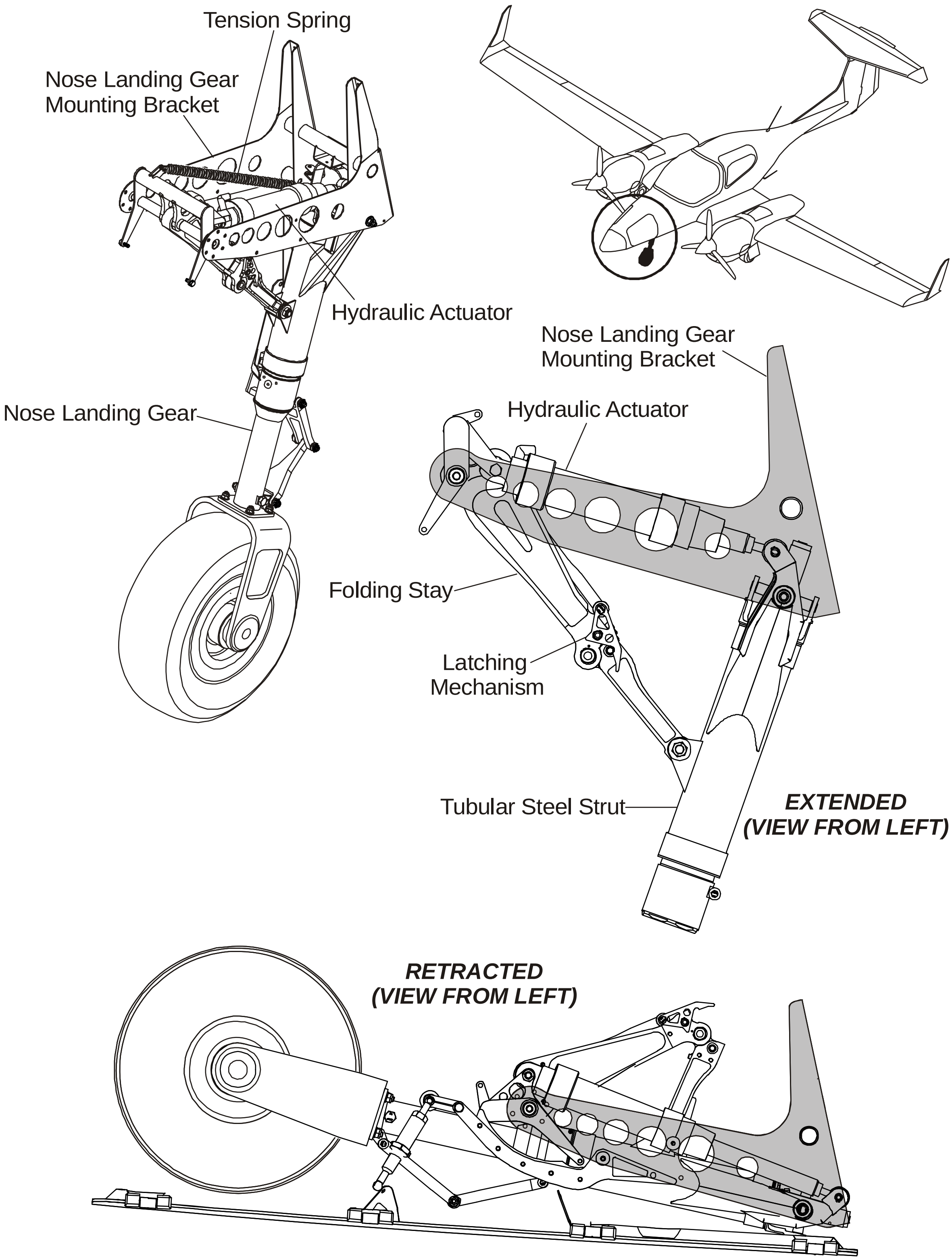


Figure 3: Nose Landing Gear - Extension and Retraction

3. Operation

Figures 4 thru 7 show the hydraulic schematic diagrams for the operation of the landing gear.

A. Retraction

When the pilot sets the landing gear selector handle to UP during flight the following occurs:

– The electrical circuit to the hydraulic pump is made and the pump will operate if the system pressure is less than 96.5 bar (1400 PSI). The retract solenoid valve is energized through the LH main gear ‘weight-on-wheels’ micro switch and allows fluid to flow from the pump to the retract side of the actuator. The extend solenoid valve is de-energized and allows fluid to flow from the pump to the extend side of the actuator (Figure 4).

– The pump pressure switch operates the pump as necessary to maintain the system pressure at 96.5 - 113.8 bar (1400 - 1650 PSI). Fluid at pump pressure acts on both sides of the actuator piston. The effective surface area of the retract side of the piston is larger than the effective surface area on the extend side of the actuator piston. Because the same fluid pressure is acting on different effective areas of the actuator pistons the resulting ‘differential pressure’ acting on the piston causes the actuator to move the landing gear leg towards the retract position.

– The initial movement of the hydraulic actuators towards the retract position releases the folding stay latching mechanism. The folding stay can then fold into the landing gear bay with the landing gear.

– When the landing gear is fully retracted the nose landing gear UP micro switch operates and the extend solenoid valve is energized and moves to the ‘full pressure’ position (Figure 5). Fluid returning from the extend side of the actuators flows through the extend solenoid valve and back into the reservoir. The full pump pressure acting on the retract side of the actuator pistons holds the landing gear in the fully retracted position.

– The pump pressure switch operates the pump as necessary, to maintain the system pressure at 96.5 - 113.8 bar (1400 - 1650 PSI). If there are no internal leaks in the system the hydraulic accumulator will maintain the pressure in the system without the hydraulic pump operating.

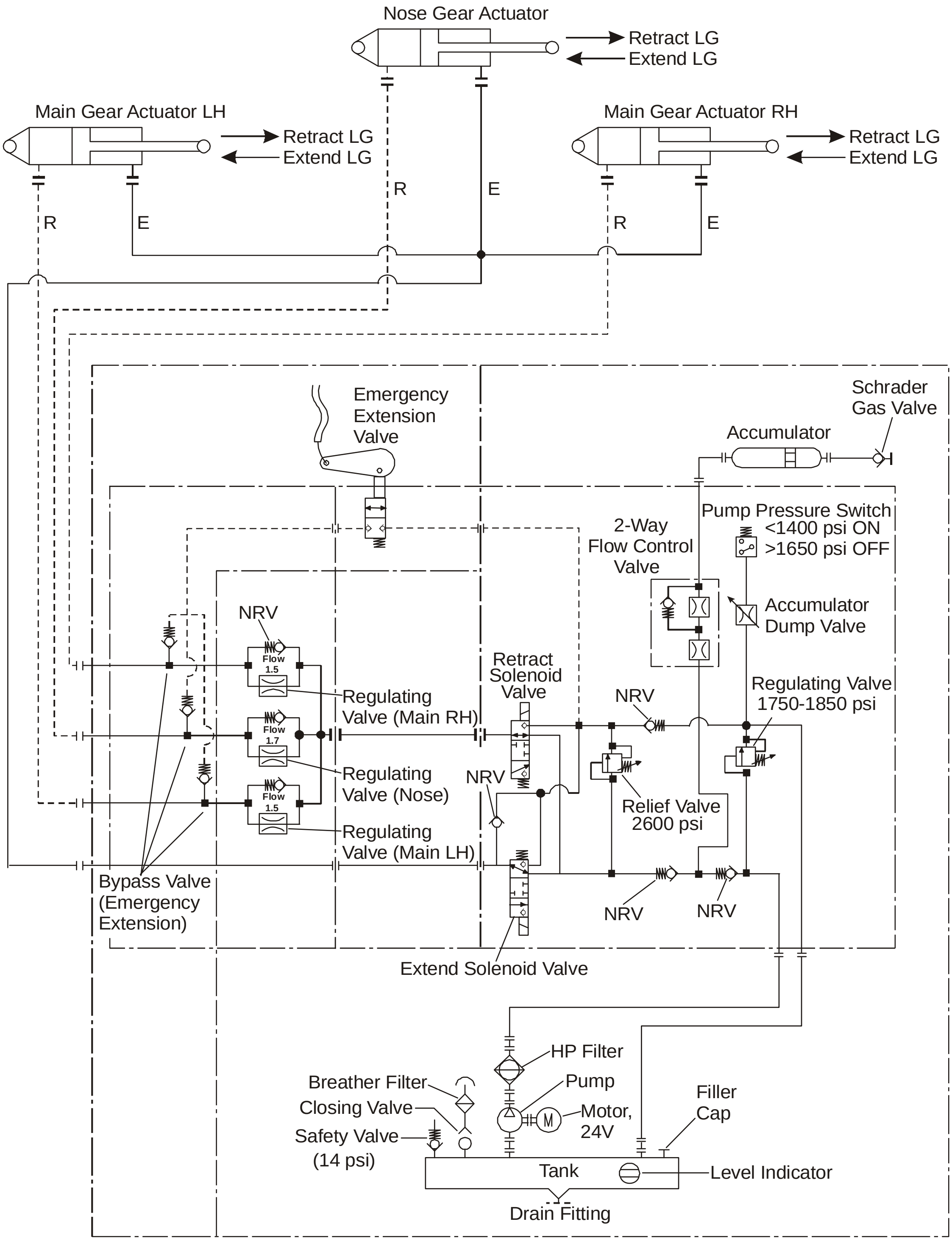


Figure 4: Hydraulic Schematic Diagram - 'Differential Pressure' Retraction Operation

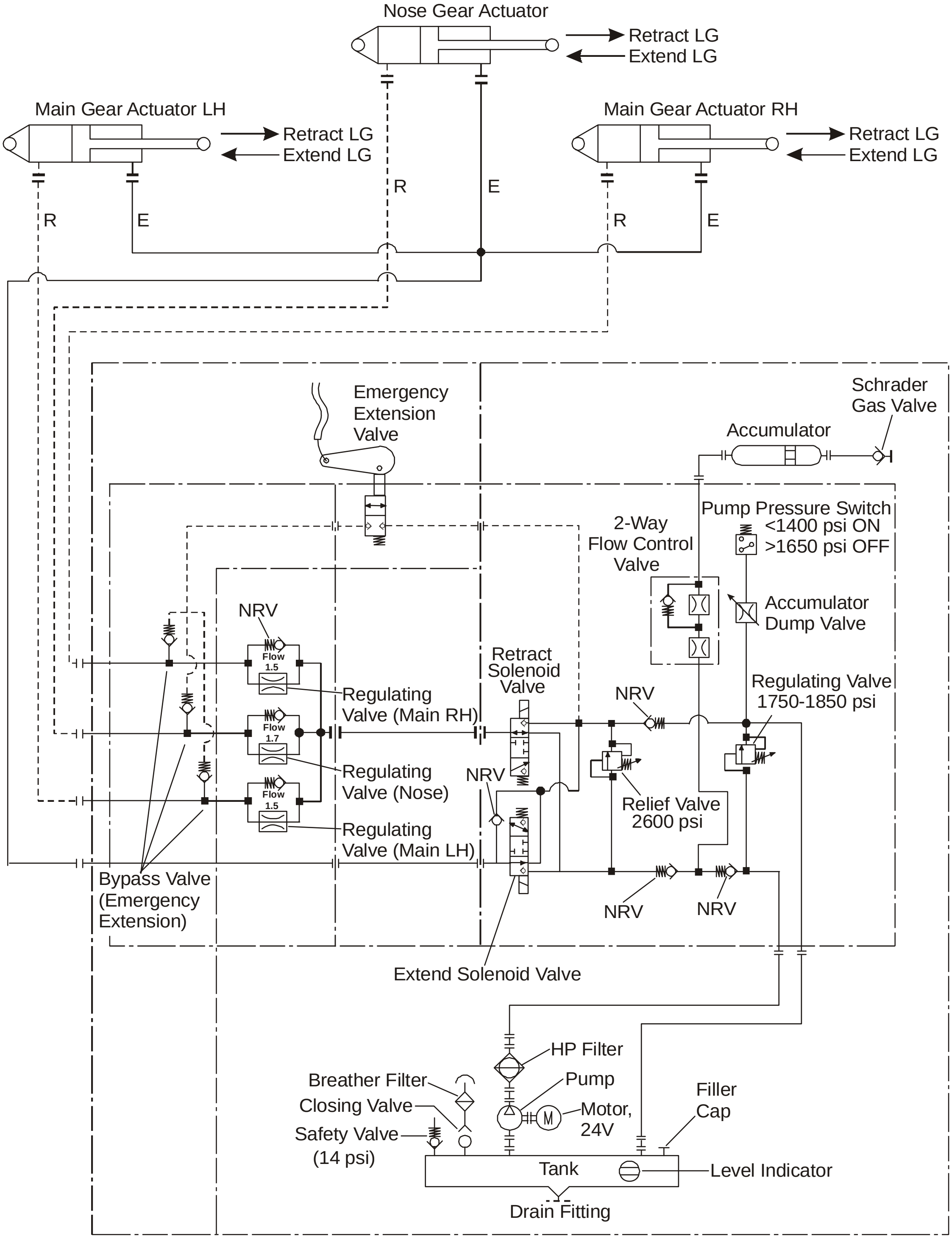


Figure 5: Hydraulic Schematic Diagram - ‘Full Pressure’ Retraction Operation

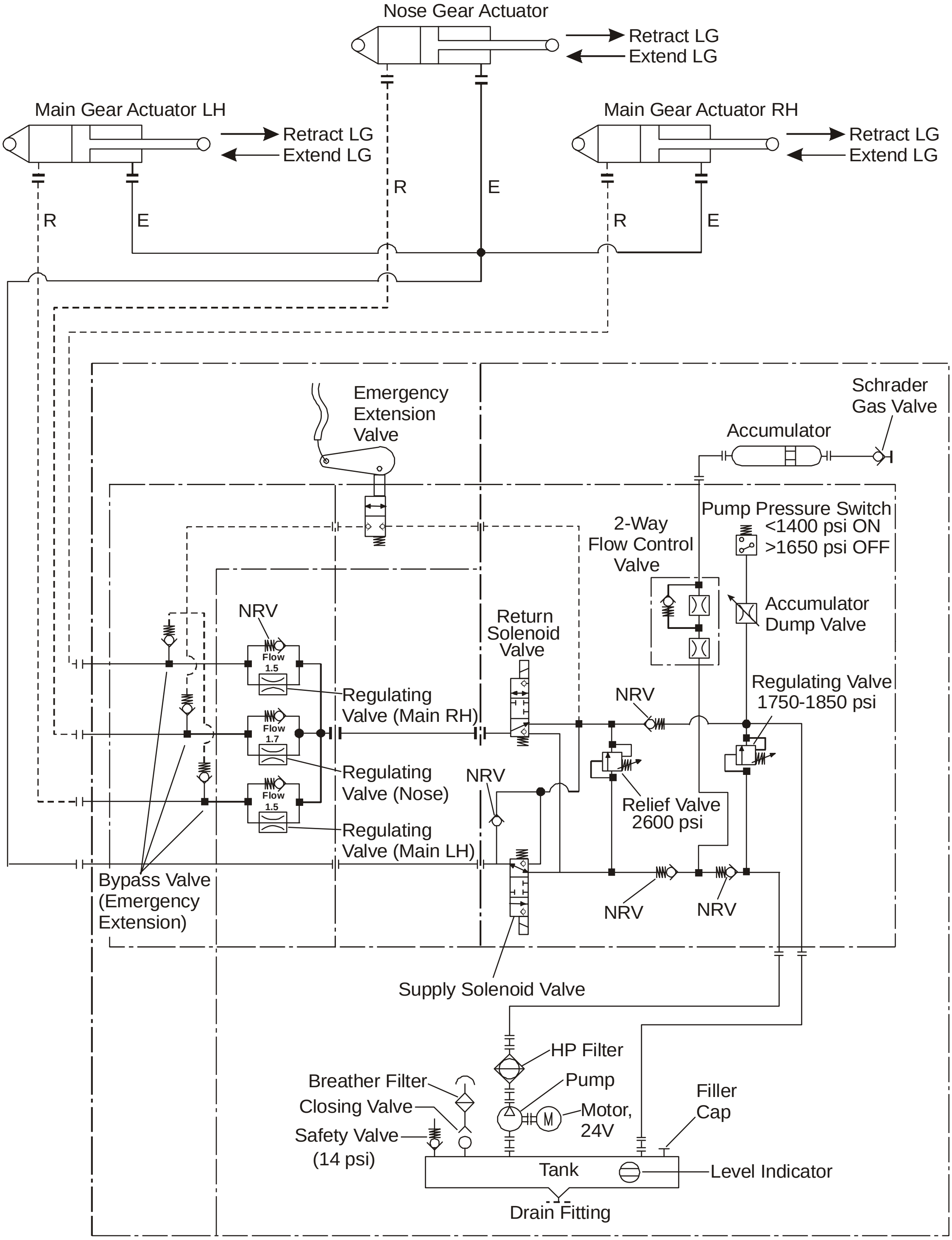


Figure 6: Hydraulic Schematic Diagram - Normal Extension Operation

B. Extension

When the pilot sets the landing gear selector handle to DOWN during normal operation the following occurs:

- The electrical circuit to the hydraulic pump is closed and the pump will operate if the system pressure is less than 96.5 bar (1400 PSI). The extend solenoid valve de-energizes (Figure 6) and fluid from the hydraulic pump flows through the extend solenoid valve into the extend side of the actuator. The retract solenoid valve de-energizes and allows the hydraulic fluid to flow from the retract side of the actuators, through the regulating valves and back into the reservoir.

- The pump pressure switch operates the pump as necessary to maintain the system pressure at 96.5 -113.8 bar (1400 - 1650 PSI). The pressure acting on the extend side of the actuator piston moves the piston to extend the landing gear legs.

- As the legs reach the fully extended position the latches on the folding stays operate against spring pressure to lock the stay in the unfolded position.

- When all the hydraulic actuators are fully retracted (legs fully extended) the pressure in the system increases until the system pressure reaches 113.8 bar (1650 PSI). The pump pressure switch opens at 113.8 bar (1650 PSI) and isolates the hydraulic pump. If there are no internal leaks in the system the hydraulic accumulator will maintain the pressure in the system without the hydraulic pump operating.

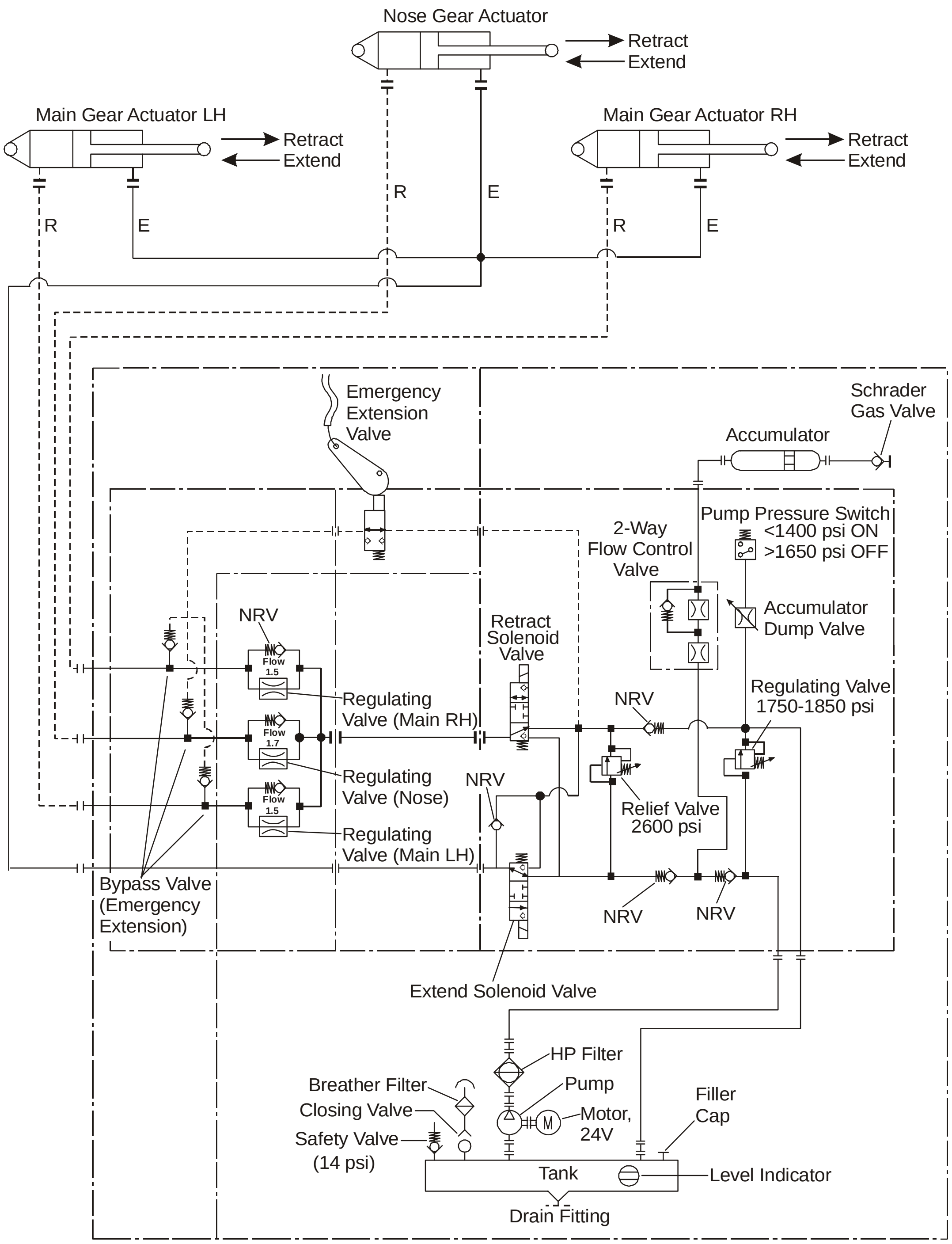


Figure 7: Hydraulic Schematic Diagram - Emergency Extension Operation

C. Emergency Extension

Figure 7 shows the schematic diagram for the main landing gear emergency hydraulic extension system. The pilot can use this system to extend the landing gear when there is a problem with the normal extension system. You cannot retract the landing gear with the emergency system. The emergency extension lever is located on the left side of the cockpit, below the instrument panel. A flexible cable connects the emergency extension lever to the emergency extension valve. When the pilot operates the emergency extension lever these events occur:

– The emergency control lever opens the emergency extension valve. The actuating lever for the emergency extension valve also operates a micro switch which isolates the electrical power from the hydraulic pump. The pump cannot run.

– Gravity causes the weight of each landing gear leg to move the piston in each actuator inwards. The open emergency extension valve allows the fluid on the retract side of the piston in each actuator to flow through the by-pass valves. The by-pass valves allow the hydraulic fluid flowing from the actuators to by-pass the regulating valves and return to the reservoir. The position of the solenoid valves does not affect the operation of the emergency extension system.

– As each landing gear leg extends the related folding stay unfolds. Tension springs located in each landing gear bay ensure that each folding stay fully unfolds. When the stay fully unfolds the spring operated latching mechanism positively locks the folding stay open. The locked stay holds the related landing gear leg fully extended.

– When the folding-stays are locked, the related folding-stay switches (LDG GEAR DOWN) are closed and electrical ground is supplied to the related green indicator lights. The electrical circuit for the selected indicator light is closed and the green light illuminates.

Trouble-Shooting

1. General

This table gives you the trouble-shooting procedures for the landing gear extension and retraction system. Refer to Section 32-10 for trouble-shooting the main landing gear assembly. Refer to Section 32-20 for trouble-shooting the nose landing gear assembly. Refer to Section 32-40 for trouble-shooting the nose wheel assembly. Refer to Section 32-50 for trouble-shooting the nose wheel steering. Refer to Section 32-60 for trouble-shooting the nose landing gear position and warning system.

If you find the trouble given in Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Landing gear does not retract when the selector lever is set to UP.	Hydraulic pump (GEAR) circuit breaker pulled.	Reset GEAR circuit breaker.
	Emergency extension lever operated.	Reset emergency extension lever.
	Hydraulic pump defective.	Replace hydraulic pump.
	Hydraulic supply and control assembly defective.	Replace hydraulic supply and control assembly.
	Wiring from landing gear selector to hydraulic supply and control panel defective.	Do a test for continuity of the related wiring. Replace or repair defective wiring as necessary. Refer to Chapter 92 for the Wiring Diagrams.
Landing gear does not extend when the selector lever is set to DOWN.	Hydraulic supply and control assembly defective.	Replace hydraulic supply and control assembly.
	Wiring from landing gear selector to hydraulic supply and control panel defective.	Do a test for continuity of the related wiring. Replace or repair defective wiring as necessary. Refer to Chapter 92 for the Wiring Diagrams.

Trouble	Possible Cause	Repair
One landing gear leg does not retract correctly.	Defective hydraulic actuator.	Replace defective hydraulic actuator.
Hydraulic pump runs continuously / keeps cycling.	Accumulator pressure low/defective.	Recharge/replace accumulator.
	Pump pressure switch defective.	Replace pump pressure switch. Refer to MAINTENANCE PRACTICES, Paragraph 5.
	Internal leak in the hydraulic supply and control assembly.	Replace hydraulic supply and control assembly.
Hydraulic system fluid level low.	Hydraulic fluid leak.	Do a test for leaks in the hydraulic system. Tighten leaking connections. Repair/replace leaking components.

Maintenance Practices

1. General

The Maintenance Practices in this Section tell you how to remove/install the main components of the landing gear extension and retraction system. They also tell you how to do a test for the correct operation of the landing gear extension and retraction system.

Refer to Section 32-10 for data about the main landing gear. Refer to Section 32-20 for data about the nose landing gear. Refer to Section 32-40 for data about the wheels and brakes. Refer to Section 32-50 for data about the nose wheel steering system. Refer to Section 32-60 for data abut the landing gear position and warning system.

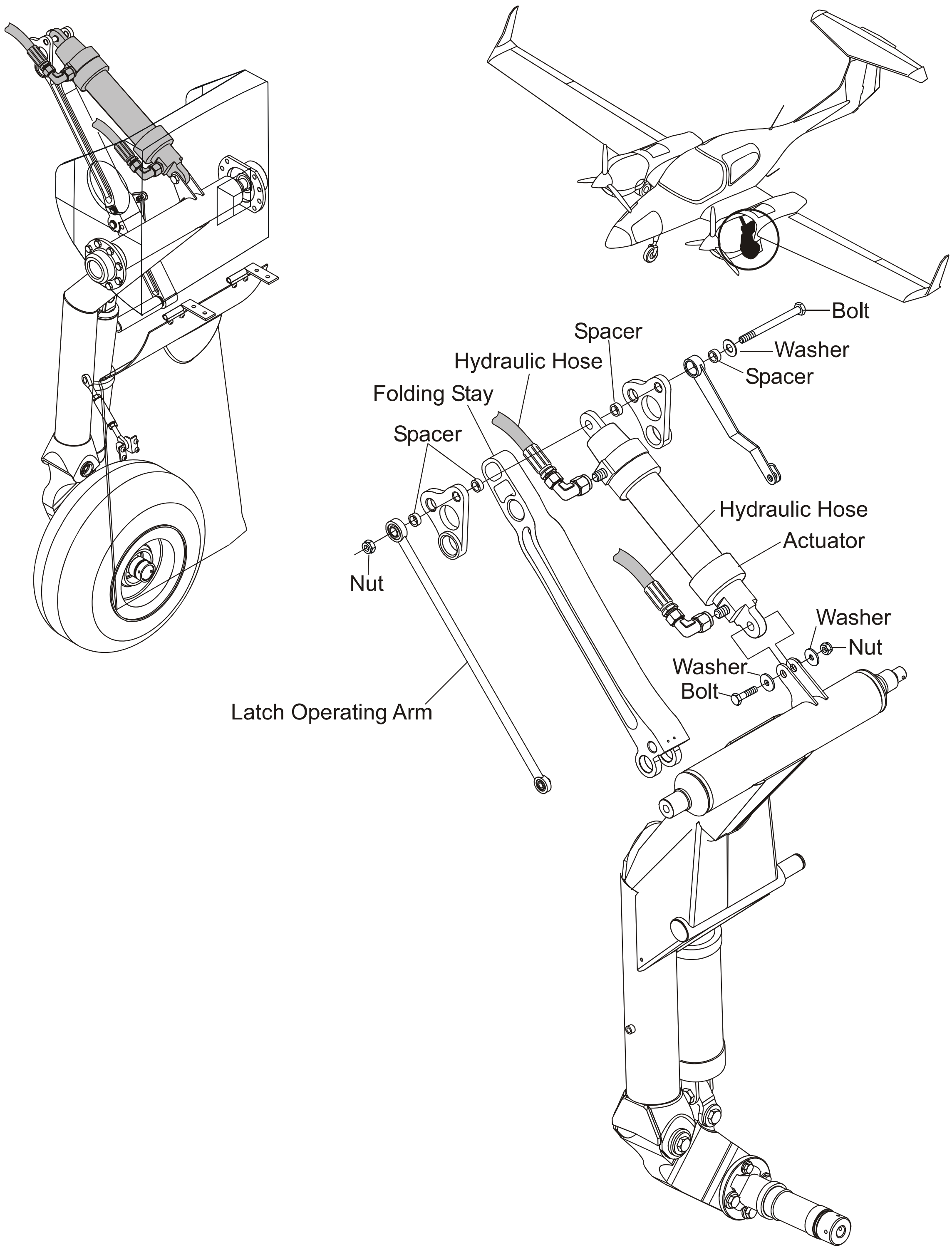


Figure 8: Main Landing Gear Hydraulic Actuator Installation

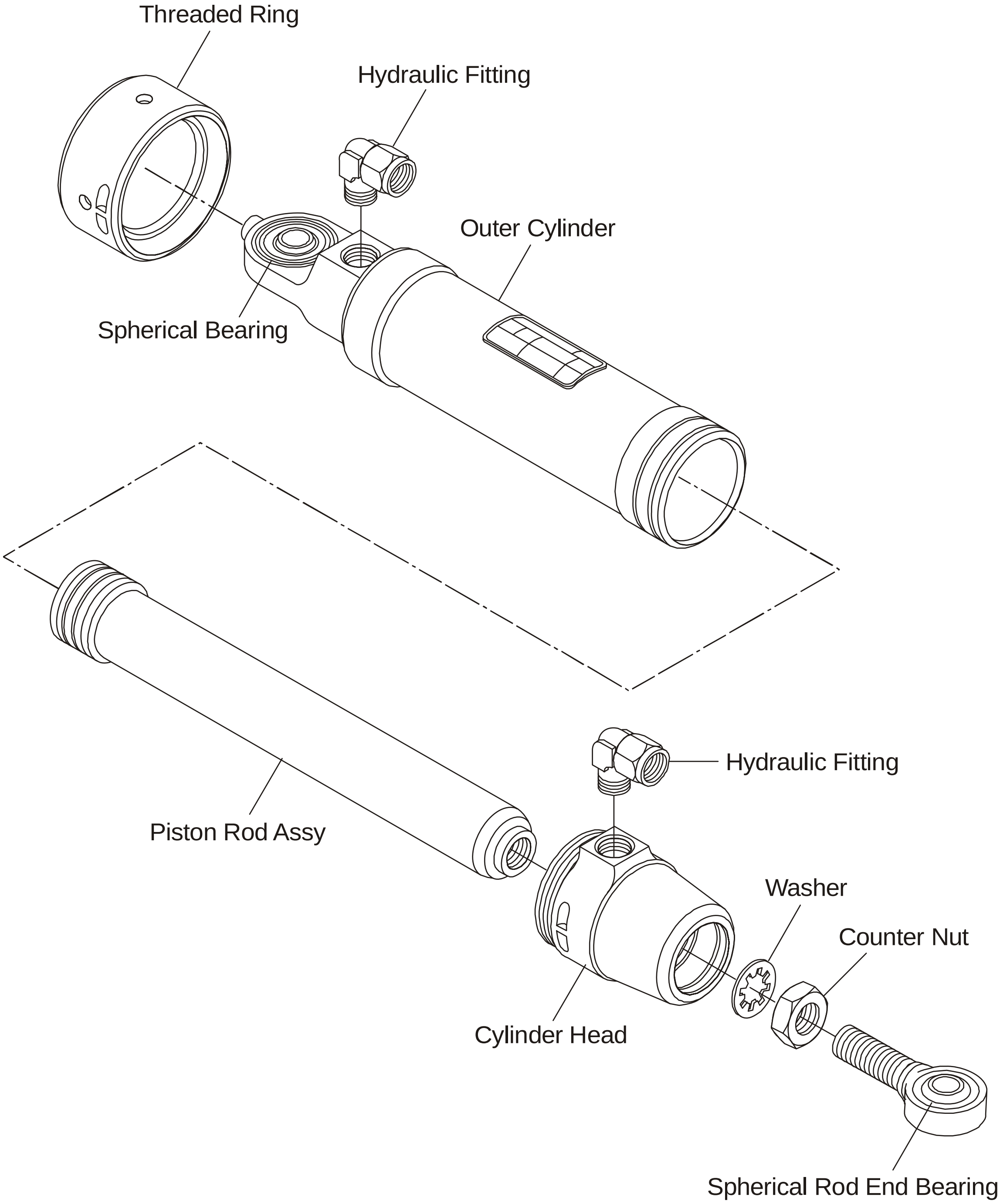
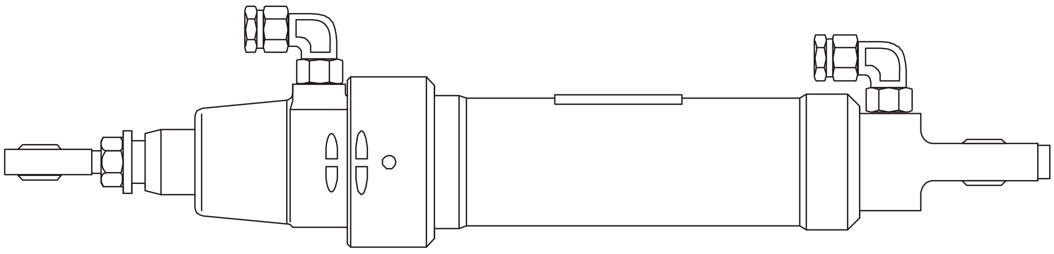


Figure 9: Landing Gear Hydraulic Actuator Assembly
(for Correct Alignment of Hydraulic Fittings Refer to Figure 10)

Main Landing Gear Actuator



Nose Landing Gear Actuator

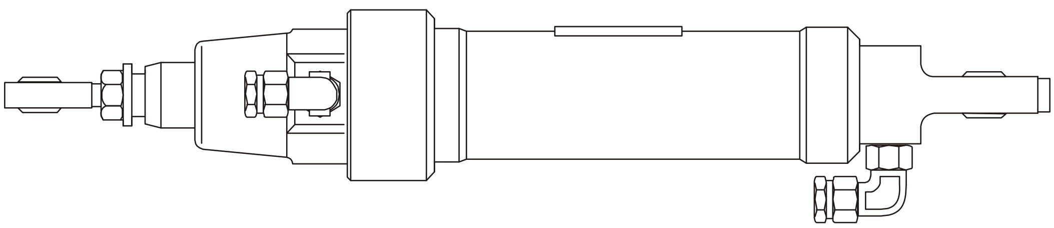


Figure 10: Hydraulic Actuator Alignments

2. Disassemble/Assemble the Actuator

A. Equipment

Item	Quantity	Part Number
Spanner wrench.	1	Commercial.
Seal ring protection.	1	Commercial.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

B. Disassemble the Actuator

	Detail Steps/Work Items	Key Items/References
(1)	Measure and make a note of the distance from the actuator safety lock washer to the center of the rod-end bearing.	Refer to Figure 11.
(2)	Remove spherical rod end bearing: – Remove the lock wire from the counter nut. – Loosen the counter nut. – Remove the spherical rod end bearing, counter nut and the washer from the actuator.	Refer to Figure 9.
(3)	Clamp the actuator: – Put two washers onto the spherical bearing on the actuator assembly. – Use a vice to clamp the actuator assembly at the spherical bearings side. This helps when disassembling the actuator.	This helps protecting the spherical bearing. Make sure not to damage or scratch the actuator.

	Detail Steps/Work Items	Key Items/References
(4)	Remove the cylinder head: – Remove the lock wire from the cylinder head. – Place the spanner wrench (special tool) onto the cylinder head. – Place the hook wrench onto the threaded ring. – Loosen the cylinder head by turning the hook wrench and holding the spanner wrench (special tool) against it. – Remove the cylinder head.	Refer to Figure 9.
(5)	Remove the hydraulic fitting, the threaded ring and the piston rod from the actuator.	Refer to Figure 9.

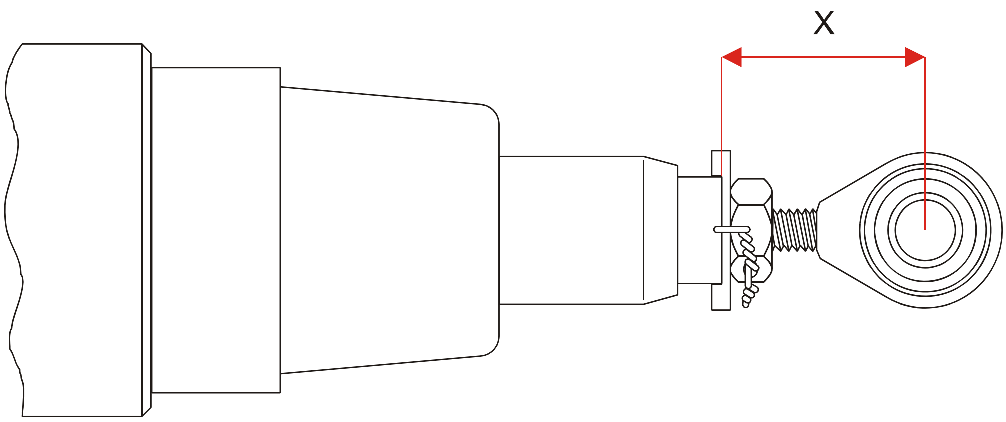


Figure 11: MLG Actuator Measurement

C. Assemble the Actuator

	Detail Steps/Work Items	Key Items/References
(1)	Install the piston rod.	Slide into the outer cylinder.
(2)	Slide the threaded ring from the backside onto the actuator assembly which has an already installed “snap ring”.	Refer to Figure 9.
	CAUTION: THERE IS A DIFFERENT ALIGNMENT FOR THE MAIN GEAR ACTUATOR THAN FOR THE NOSE GEAR ACTUATOR. REFER TO FIGURE 10 TO SEE THE DIFFERENCE.	
(3)	Install the hydraulic fitting onto the actuator.	Refer to Figure 9.
(4)	Install the cylinder head: – Install the seal ring protection (special tool) onto the piston rod. – Slide the cylinder head onto the piston rod. – Remove the seal ring protection (special tool) from the piston rod. – Apply Rivolta F.L.A on the cylinder head thread, the O-ring and the snap ring. – Install the spanner wrench (special tool) onto the cylinder head. – Place the hook wrench onto the threaded ring. – Tighten the cylinder head by turning the hook wrench and hold the spanner wrench (special tool) against it. – Secure the cylinder head with 120 Nm (88.5 lbf.ft.) by using a torque hook wrench. – Install the lock wire onto the cylinder head.	Make sure the alignment of the cylinder head is correct. Refer to Figure 10.

	Detail Steps/Work Items	Key Items/References
(5)	Install spherical rod end bearing:	Install the lock wire not until installing the actuator into the airplane because of correct alignment.
	– Apply Rivolta F.L.A on the spherical rod end bearing thread.	
	– Install the rod end together with the counter nut and washer.	Refer to Figure 9.
	– Adjust the main landing gear rod-end bearing according to the measurement or the base setting of 34 mm (1.34 in) from the safety lock washer to the center of the rod-end bearing.	Refer to Figure 11. Base settings equals min. screw-in depth. Maximum distance x (min. screw-in depth): 34 mm (1.34 in).
	– Tighten the counter nut.	
(6)	Remove the actuator from the vice and remove the protection washers.	

3. Landing Gear Extension and Retraction Test (Normal Extension)

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Landing Gear Extension and Retraction Test

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT LET PERSONS NEAR THE LANDING GEAR WHEN YOU DO THE EXTENSION AND RETRACTION TEST. THE LANDING GEAR CAN CAUSE INJURY TO PERSONS. CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(3)	Set the ELECT. MASTER switch to ON.	
(4)	Set both engine power levers to 100%.	Fully forward.

	Detail Steps/Work Items	Key Items/References
(5)	Retract the landing gear: – Set the landing gear selector lever to UP and these events must occur: – The hydraulic pump operates. – The green (SAFE) leds switch off. – The red led (UNSAFE) illuminates. – The landing gear retracts. – When the gear is fully retracted: – The red led (UNSAFE) switches off. – The hydraulic pump stops operating (allow 15 sec. after gear is fully retracted).	Refer to Section 32-60 for more data about the landing gear indicating system.
(6)	Do a test for the correct operation of the landing gear warning horn:	
	– Move the left engine power lever to IDLE.	The landing gear warning horn must operate.
	– Move the right engine power lever to IDLE.	The landing gear warning horn must operate.
	– Move the left engine power lever to 100%.	The landing gear warning horn must operate.

	Detail Steps/Work Items	Key Items/References
(7)	Do a test for the correct operation of the landing gear extension system: – Set the landing gear selector lever to DOWN and these events must occur: – The hydraulic pump operates. – The red led (UNSAFE) illuminates. – The landing gear extends. – When all the landing gear legs are fully extended and locked: – The red led (UNSAFE) switches off. – The green (SAFE) leds illuminate. – The hydraulic pump stops operating (allow 15 sec. after gear is fully extended). – Set both engine power levers to IDLE.	
(8)	Set the ELECT. MASTER switch to OFF.	
(9)	Disconnect the external power supply from the airplane.	Refer to Section 24-40.
(10)	Move the wing and fuselage trestles clear of the airplane.	
(11)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

4. Landing Gear Emergency Extension System Test

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Landing Gear Emergency Extension Test

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT LET PERSONS NEAR THE LANDING GEAR WHEN YOU DO THE EMERGENCY EXTENSION TEST. THE LANDING GEAR CAN CAUSE INJURY TO PERSONS. CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(3)	Set the ELECT. MASTER switch to ON.	

	Detail Steps/Work Items	Key Items/References
(4)	Retract the landing gear: – Set the landing gear selector lever to UP and these events must occur: – The hydraulic pump operates. – The green (SAFE) leds switch off. – The red led (UNSAFE) illuminates. – The landing gear retracts. – When the gear is fully retracted: – The red led (UNSAFE) switches off. – The hydraulic pump stops operating (allow 15 sec. after gear is fully retracted).	Refer to Section 32-60 for more data about the landing gear indicating system.
(5)	Set the EMERGENCY EXTENSION lever to the EXTEND position, these events must occur: – The hydraulic pump must not operate. – The red (UNSAFE) led illuminates. – The landing gear extends. When the landing gear is fully extended and locked: – The red (UNSAFE) led remains on. – The 3 green (SAFE) leds illuminate.	Pull fully aft.
(6)	Reset the landing gear emergency extension lever: – Set the normal landing gear selector to DOWN. – Set the emergency extension lever to close and these events must occur: – The hydraulic pump operates until the system pressure stabilizes at 96.5 - 113.5 bar (1400 - 1650 PSI).	Fully forward.

	Detail Steps/Work Items	Key Items/References
(7)	Do a test of the correct operation of the landing gear normal retraction and extension system.	Refer to Paragraph 3.
(8)	Move the wing and fuselage trestles clear of the airplane.	
(9)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

Section 32-40
Wheels and Brakes

1. General

The DA 42 NG has two main wheels and a nose wheel. All wheels have split hubs and tires with inner tubes. The main wheels are standard Cleveland components.

The main wheels have brake disks and a Cleveland brake caliper. Toe-brake pedals operate hydraulic cylinders. Hydraulic pipes and hoses connect the cylinders to the brake calipers. A parking valve locks the brakes ON.

Each main wheel has an independent brake system. The left pedal of each rudder pedal assembly operates the left wheel brake and the right rudder pedal operates the right wheel brake.

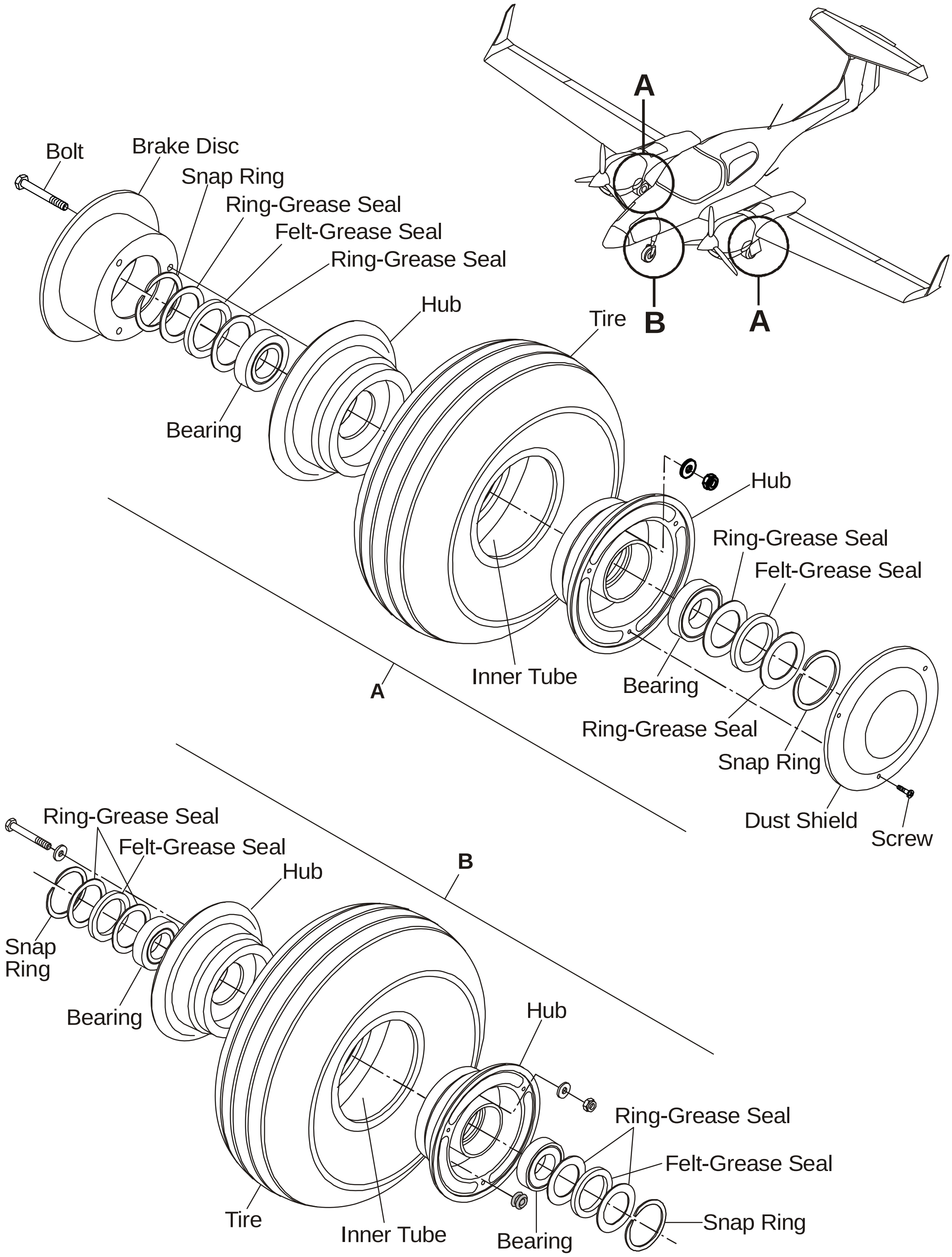


Figure 1: Main and Nose Wheel Assemblies

2. Description - Main Wheels

Figure 1 shows the main and nose wheel assemblies. The main wheel hub has two halves. Each half of the hub is made from light alloy. Three bolts with nuts and washers hold the two halves of the hub together. The bolts also hold a brake disk to the wheel.

Each half of the hub has a roller bearing assembly. Each bearing has two grease seals and a felt seal. Snap rings hold each bearing assembly in position.

Each main wheel has a Goodyear 15x6.00-6, 6 PR, TT, 160 mph, FS II tire with a Goodyear 6.00-6 / 15x6.00-6 (G15/6.00-6) inner tube, valve type TR 20. If MÄM 42-659 is installed, each main wheel may have a Goodyear 15x6.00-6, 6 PR, TT, 160 mph, FC III or FS II tire with a Goodyear 6.00-6 / 15x6.00-6 (G15/6.00-6) inner tube, valve type TR 20.

Two red slip marks - one on the tire and the other on the wheel - are aligned.

3. Description - Nose Wheel

Figure 1 shows the main and nose wheel assemblies. The nose wheel has a split hub. Each half of the hub is made from light alloy. Three AN-bolts hold the two halves of the hub together. Each hub half has a sealed bearing.

The nose wheel has a Goodyear 5.00-5, 10 PR, TT, 120 mph, FS II tire with a Goodyear 5.00-5 / 15x6.00-5 / 380x150-5 inner tube, valve type TR 67.

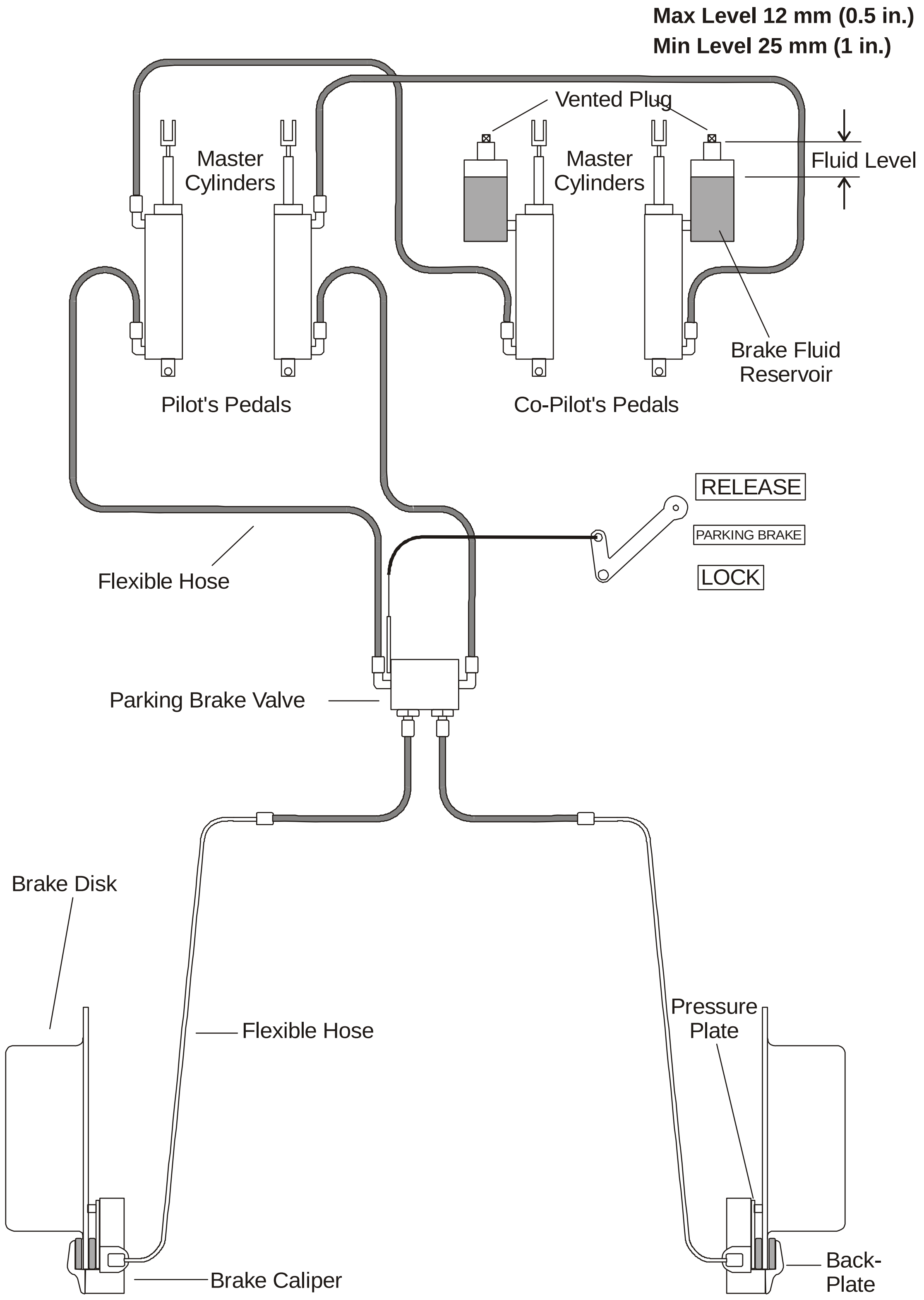


Figure 2: Wheel Brake System Schematic Diagram

4. Description - Brake System

Figure 2 shows the brake system schematic diagram.

The left and right wheel brakes are independent systems. Each system has a reservoir on the co-pilot’s brake pedals. The reservoirs are directly connected to the brake master cylinders. Two flexible hoses connect the master cylinders on the co-pilot’s brake pedals to the master cylinders on the pilot’s brake pedals.

Two more flexible hoses connect the pilot’s left and right master cylinders to the parking brake valve. Flexible hoses connect the parking brake valve to each main-wheel brake caliper. The parking brake valve is mounted on the floor of the fuselage, below the seats. A flexible cable connects the parking brake valve to an operating lever mounted in the cockpit center console.

The brake calipers are standard Cleveland components. Two pistons in each caliper push a friction lining against the brake disk and a back-plate attached to the caliper pulls the other friction lining against the outer face of the brake disk. The caliper can move laterally on two anchor pins.

Each main wheel has a brake disc. Bolts attach the brake disk to the wheel. The brake disk turns between the friction linings in the brake caliper. The caliper is located on an torque plate which is attached to the landing gear axle.

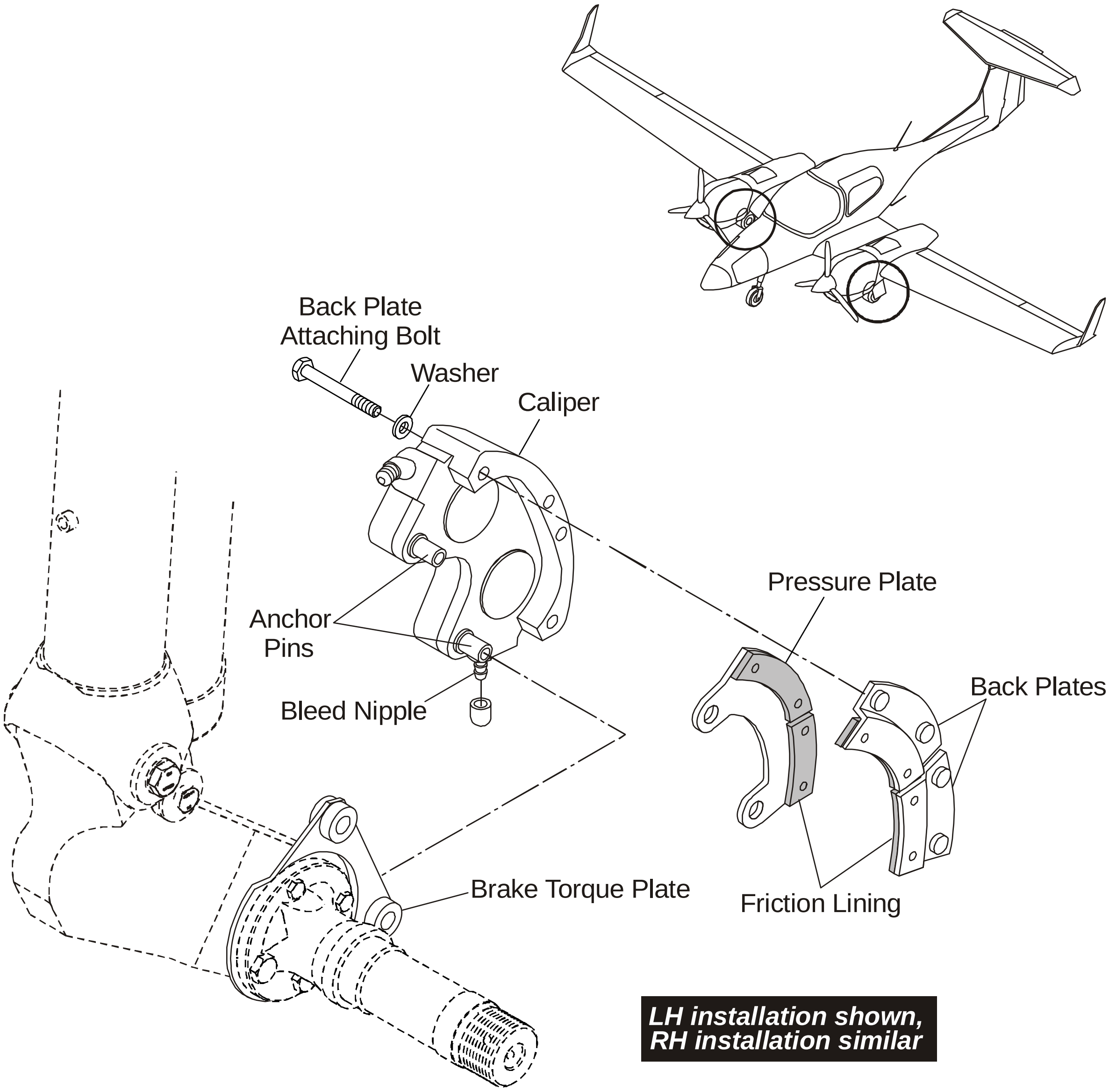


Figure 3: Main Wheel Brake Assembly

5. Operation - Brake System

If you press on the toe brake of a rudder pedal the fluid in the master cylinder is pushed along the outlet hose. The fluid at the brake caliper pushes the two pistons. The pistons push the pressure plate onto the wheel brake disk. The reaction of the pressure plate pushing on the wheel brake disk forces the brake caliper away from the wheel disk. The caliper moving away from the brake disk pulls the friction lining of the caliper back-plate against the other side of the disk. The wheel brake disk is held between the friction linings.

If you release the pressure on the brake pedal the fluid can go back into the master cylinder and the brake caliper releases the brake disk. The wheel is free to turn.

The right brake pedal of each set of rudder pedals operates the right wheel brake. The left brake pedal of each set of rudder pedals operate the left wheel brake.

If you push on the left brake pedal and the right brake pedal together, then both wheel brakes operate. If you set the parking brake to LOCK while you push on both brake pedals the parking brake valve traps the fluid in the brake units and the wheel brakes stay on. Move the parking brake lever to RELEASE to release the brakes.

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Trouble-Shooting

1. General

This table gives you the trouble-shooting data for the wheels and brakes.

If you find the trouble given in Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Too much wheel run-out.	Wheel bearing(s) defective.	Replace the defective wheel bearing(s).
Brake disk damaged.	Hard landing.	Replace damaged brake disk. Do a hard landing inspection. Refer to Section 05-50.
	Excessive braking.	Replace brake disk(s).

Trouble	Possible Cause	Repair
Brake(s) do not operate.	No brake fluid.	Examine the brake system. Look specially for leaks. Repair/replace defective components. Fill the brake reservoir(s) with brake fluid.
	Air trapped in brake system.	Bleed the brake system.
	Master cylinder defective.	Examine the brake system. Look specially for leaks. Do a test for the correct operation of each master cylinder. Replace defective master cylinder(s).
	Brake caliper defective.	Examine the brake caliper. Look specially for leaks and for a piston that is seized. Repair/replace the caliper.
	Brake friction linings worn excessively.	Replace the brake friction linings.
	Brake hose connector leaking.	Tighten/replace leaking connectors.
Parking brake does not operate correctly.	Parking brake valve operating cable out of adjustment.	Adjust the parking brake valve operating cable.
	Parking brake valve defective.	Replace parking brake valve.

Maintenance Practices

1. General

This Section tells you how to remove/install the wheels and the main brake system components. It also tells you how to disassemble/assemble the wheels.

Refer to the component manufacturers manuals for repair of all other components in the workshop.

2. Remove/Install a Main Wheel

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove a Main Wheel

WARNING: DO NOT LIFT THE AIRPLANE ON JACKS IN THE OPEN IF THE WIND SPEED IS MORE THAN 10 KM/H (6 KNOTS).

	Detail Steps/Work Items	Key Items/References
(1)	Lift the airplane on jacks.	Refer to Section 07-10.
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(2)	Pull the GEAR circuit breaker.	Right side of instrument panel.
	CAUTION: MAKE SURE THAT THE PARKING BRAKE IS SET TO RELEASE BEFORE YOU RELEASE THE BRAKE CALIPER. CAUTION: DO NOT STRAIN THE BRAKE HOSE. YOU CAN CAUSE DAMAGE TO THE BRAKE HOSE AND CAUSE BRAKE FAILURE.	

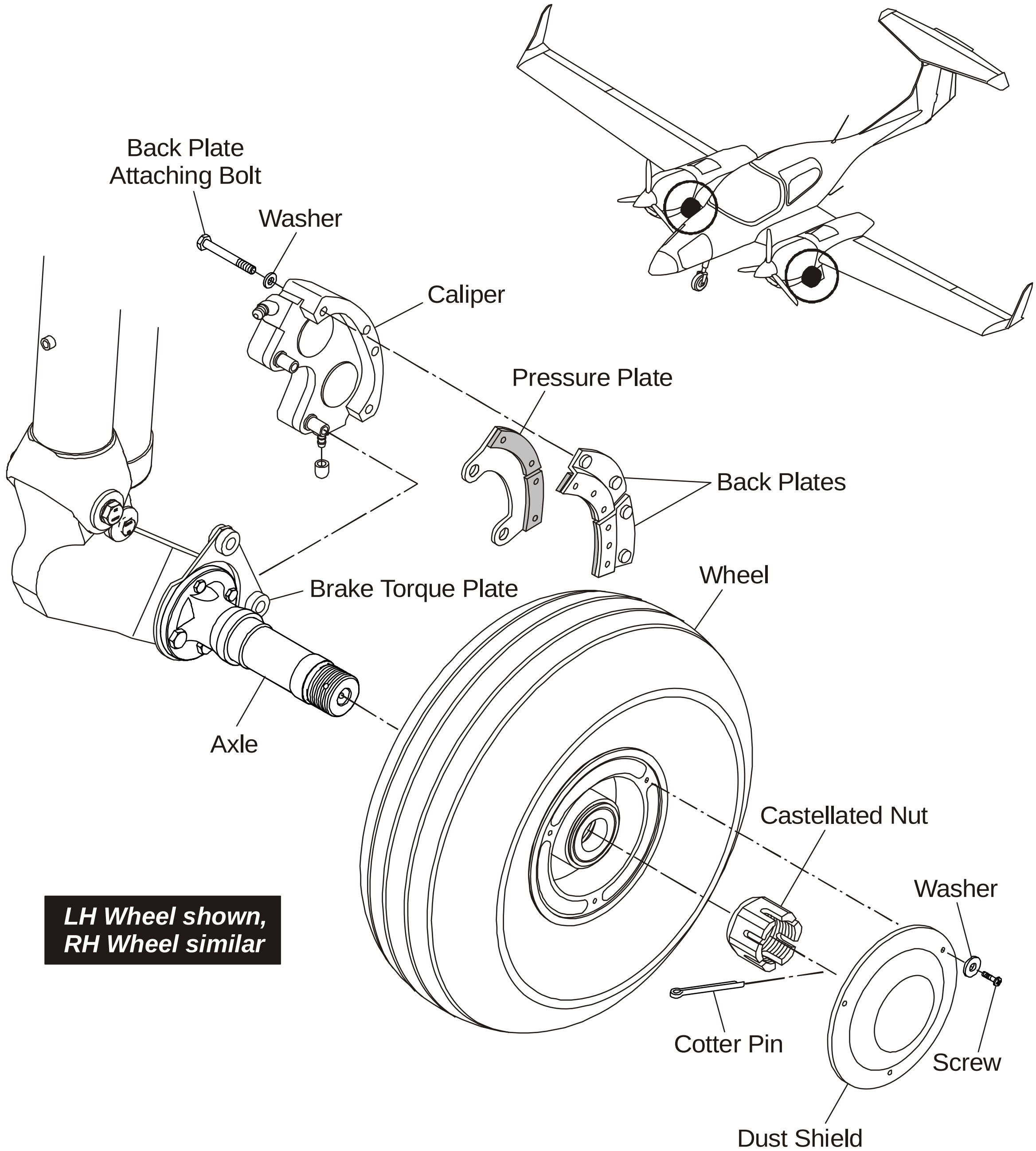

Figure 4: Remove/Install a Main Wheel

	Detail Steps/Work Items	Key Items/References
(3)	Release the brake caliper: – Remove the 4 bolts that attach the back-plates to the caliper. – Move the back-plates clear of the wheel disk.	Refer to Figure 4. Do NOT remove the brake caliper from the torque plate.
(4)	Examine the wheel. Make sure that the wheel turns smoothly.	
(5)	Remove the wheel from the axle: – Remove the dust shield. – Remove the cotter pin from the castle nut. – Remove the castle nut that holds the wheel to the axle. – Pull the wheel off the axle and clear of the airplane.	
(6)	Examine the wheel bearings: – Examine the wheel bearings for contamination. – Look for damage to the bearings. – Turn the bearing slowly and listen for noise that may indicate wear to the bearings. Make sure that the bearing turns freely and quietly.	Look specially for sand, dust or similar contaminants. Signs of overheating or scoring. Replace damaged bearings. Replace damaged bearings.

C. Install a Main Wheel

	Detail Steps/Work Items	Key Items/References
(1)	Install the wheel: – Make sure that the axle is clean. – Move the wheel into position on the axle. – Install the castle nut. Tighten the castle nut with 17 - 23 Nm (12 - 17 lbf.ft.) during turning the wheel. Thereafter untighten it completely. Repeat fastening with 5 Nm (3.7 lbf.ft.). Then tighten the wheel nut until split pin fits into next drillhole. – Install the cotter pin.	
(2)	Make sure that the wheel turns freely and with no noise.	No perceptible play in the bearings allowed.
(3)	Move the caliper into position at the wheel. Make sure that the mounting spigots engage with the locating bushes of the torque plate.	Make sure that the pressure plate is correctly located within the caliper.
(4)	Install the back-plates: – Move the back-plates into position at the caliper. – Install the 4 bolts and Washers that attach the back-plates to the caliper, finger tight. – Make sure that the wheel brake disk can rotate freely between the caliper pressure plate and the back-plates. – Tighten the bolts that attach the back-plates to the caliper.	Torque according to Cleveland/Parker Maintenance Manual, latest revision or placard on caliper.
(4)	Install dust shield.	

	Detail Steps/Work Items	Key Items/References
	CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED. CAUTION: MAKE SURE THAT THE LANDING GEAR IS LOCKED DOWN BEFORE YOU LOWER THE AIRPLANE WITH THE JACKS.	
(5)	Reset the GEAR circuit breaker and make sure that the landing gear selector is set to DOWN.	
(6)	If a tire/wheel change is performed check minimum clearance between MLG tire and the lower wing shell / wheel bay cut-out.	Refer to Section 32-10 - Adjustment of the MLG wheel in retracted position.
(7)	Carry out a test of the correct operation of the landing gear retraction and extension system.	Refer to Section 32-30.
(8)	Move the wing and fuselage trestles clear of the airplane.	
(9)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.

3. Remove/Install the Nose Wheel

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	1	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Nose Wheel

	Detail Steps/Work Items	Key Items/References
(1)	Raise the nose of the airplane on an airplane jack. Move the wing and rear fuselage trestle into position to steady the airplane.	
(2)	Examine the wheel. Make sure that the wheel can turn easily and quietly.	
(3)	Remove the nose wheel form the airplane: – Remove the nut and washer that holds the axle bolt in the wheel fork. – Remove the axle bolt and flanged bushes. – Move the nose wheel clear of the airplane. – Remove and retain the spacers and tubular axle from the wheel.	Refer to Figure 5. Support the nose wheel.
(4)	Examine the wheel bearings: – Examine the wheel bearings for contamination. – Look for damage to the bearings. – Turn the bearing slowly and listen for noise that may indicate wear of the bearings. Make sure that the bearing turns freely and quietly.	 Look specially for sand, dust or similar contaminants. Signs of overheating or scoring. Replace damaged bearings. Replace damaged bearings.

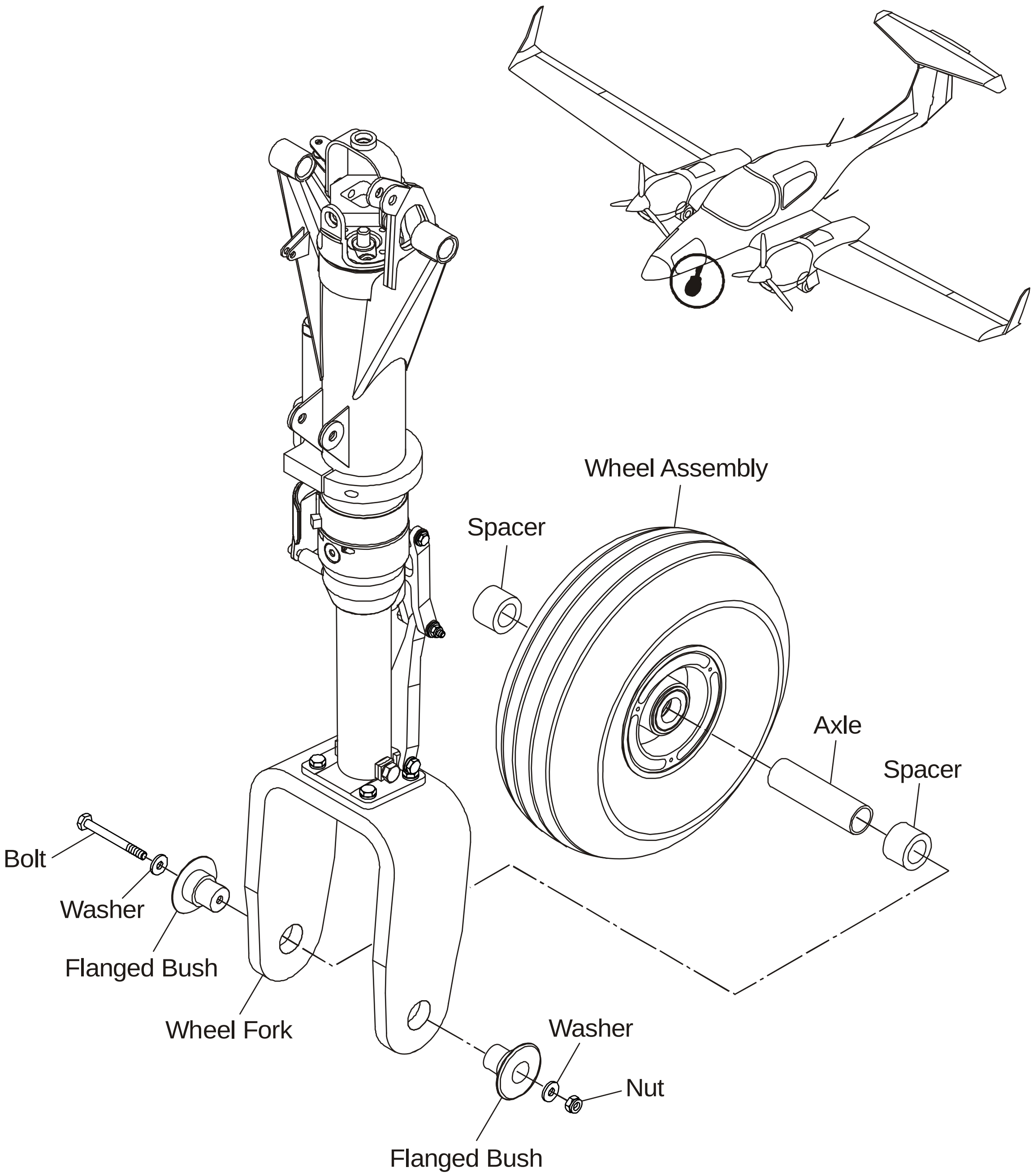

Figure 5: Remove/Install the Nose Wheel

C. Install the Nose Wheel

	Detail Steps/Work Items	Key Items/References
(1)	Install the wheel: – Make sure that the tubular axle is clean and install the axle into the wheel. – Install the spacer bushes on the tubular axle. – Move the wheel into position in the fork. – Install the flanged bushes. – Install the axle bolt with washer through the fork and wheel. – Install the washer and nut that holds the axle bolt into the fork.	Torque 16 Nm (11.8 lbf.ft.).
(2)	Make sure that the wheel turns freely and with no noise.	No perceptible play in the bearings allowed.
(3)	Make sure that the nose gear leg is locked down.	
(4)	Move the wing trestles and rear fuselage trestles clear of the airplane.	
(5)	Lower the nose of the airplane with the jack.	

4. Disassemble/Assemble Main/Nose Wheel

A. Disassemble the Main/Nose Wheel

WARNING: DEFLATE THE TIRE COMPLETELY BEFORE YOU DISASSEMBLE THE WHEEL. IF YOU DO NOT DEFLATE THE TIRE COMPLETELY BEFORE YOU DISASSEMBLE THE WHEEL YOU MAY GET INJURED.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the wheel from the airplane.	Paragraph 2/3.
(2)	Deflate the tire.	
(3)	Remove the bolts that hold the 2 halves of the hub together.	Refer to Figure 1.
(4)	Remove the brake disk from the wheel.	Main wheels only.
(5)	Remove the hubs from the tire.	
(6)	Remove the inner tube from the tire.	
(7)	Remove the bearings from each hub of the wheel: – Remove the snap ring. – Remove the grease seals from the hub. – Remove the bearing cones.	 Note the order of the seals. Refer to Cleveland/Parker Maintenance Manual, latest revision.
(8)	Examine the wheel hubs, brake disc and the bearings for wear/damage.	Main wheel only. Refer to Cleveland/Parker Maintenance Manual, latest revision.
(9)	Examine the wheel hubs and bearings for wear/damage.	Refer to Cleveland/Parker Maintenance Manual, latest revision.

B. Assemble Main/Nose Wheel

	Detail Steps/Work Items	Key Items/References
(1)	Install the bearings into each half of the wheel hub: – Make sure that the hub is clean. – Grease and install the bearing cones. – Install the grease seals. – Install the snap ring.	Refer to Cleveland/Parker Maintenance Manual, latest revision. In the order note in Paragraph 4 A (7).
(2)	Move the inner tube into position in the tire.	Prior to mounting make sure tire bead is clean. Apply talcum powder to the outside of the inner tube.
(3)	Assemble the main wheel: – Move the main wheel hubs into position in the tire. – Move the brake disk into position at the inner hub. – Install the bolts that attach the brake disk and the 2 hub halves. – Install the washers and nuts onto the bolts.	Torque according to Cleveland/Parker Maintenance Manual, latest revision or placard on rim.
(4)	Assemble the nose wheel: – Move the nose wheel hubs into position in the nose tire. – Install the bolts, washers and nuts that hold the hub halves.	Torque according to Cleveland/Parker Maintenance Manual, latest revision or placard on rim.
(5)	Inflate the tire.	Refer to Section 12-10.
(6)	Paint a red slip mark on the tire and on the hub.	
(7)	Install the wheel on to the airplane.	Refer to Paragraphs 2 and 3.

5. Remove/Install Brake System Components - General

This Section tells you how to remove and install the major components of the brake system. Refer to the equipment manufacturer’s manuals for data about repairing the equipment in the workshop.

WARNING: RELEASE PRESSURE FROM THE WHEEL BRAKE SYSTEM BEFORE YOU DO WORK ON THE SYSTEM. HYDRAULIC FLUID AT HIGH PRESSURE CAN PENETRATE YOUR SKIN AND CAUSE DISEASE.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE AND IT CAN DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE STRUCTURE AND IT CAN REMOVE PAINT FROM COMPONENTS.

Note: Put caps on all open hydraulic connections to prevent contamination.

Note: Put a container below a connection before you release the connection to catch spilt hydraulic fluid.

Note: If you open a brake system connection you must bleed the brake system after you have remade the connection.

6. Remove/Install a Brake Master Cylinder

A. Equipment

Item	Quantity	Part Number
Hydraulic bleeding equipment.	1	Commercial.
Syringe for hydraulic fluid.	1	Commercial.

B. Material

Item	Quantity	Part Number
Hydraulic fluid.	A/R	MIL-PRF-5606H (for example, Aeroshell Fluid 41).

C. Remove a Brake Master Cylinder

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE AND IT CAN DAMAGE CLOTHING. CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE STRUCTURE AND IT CAN REMOVE PAINT FROM COMPONENTS.	
(1)	If necessary, remove the brake fluid reservoir: – Remove the hose from lower hydraulic connection. – Remove the reservoir from the top hydraulic connection.	Co-pilot's pedals only. Use a container to catch spilt fluid. Put caps on all open connections.
(2)	Disconnect the hoses from the upper and lower hydraulic connection.	Pilot's pedals only. Use a container to catch spilt fluid. Put caps on all open connections.

	Detail Steps/Work Items	Key Items/References
(3)	Remove the upper clevis pin: – Remove the cotter pin from the clevis pin. – Remove the washer. – Remove the clevis pin.	
(4)	Release the master cylinder from the lower mounting spindle: – Remove the cotter pin from the mounting spindle. – Remove the washer. – Move the master cylinder clear of the pedal assembly. – Remove and retrain the spacer from the lower mounting spindle.	

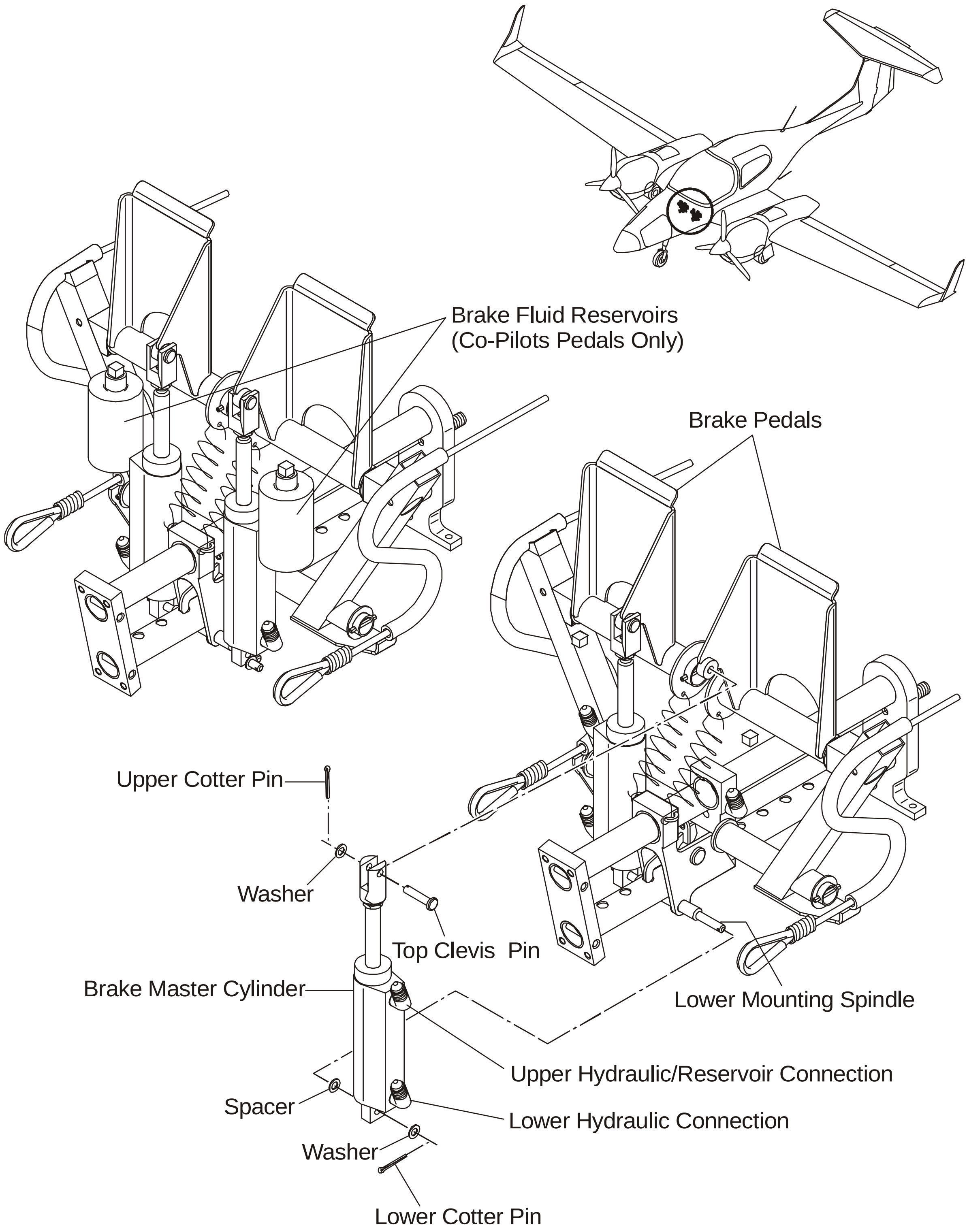

Figure 6: Brake Master Cylinder Installation

D. Install a Brake Master Cylinder

	Detail Steps/Work Items	Key Items/References
(1)	Move the master cylinder into position at the brake pedal assembly.	
(2)	Install the master cylinder onto the lower mounting spindle: – Install the spacer onto the lower mounting spindle. – Move the master cylinder into position on the mounting spindle. – Install the washer. – Install the cotter pin.	
(3)	Install the upper clevis pin: – Align the top of the master cylinder with the mounting on the brake pedal. – Install the upper clevis pin. – Install the washer onto the clevis pin. – Install the cotter pin.	
(4)	Install the hose onto the lower hydraulic connection on the master cylinder.	Make sure that all blanking caps are removed.
(5)	Install the hose onto the upper hydraulic connection on the master cylinder.	Pilot's pedals only. Make sure that all blanking caps are removed.
(6)	Install the hydraulic reservoir onto the upper hydraulic connection of the master cylinder.	Co-pilot's pedals only. Make sure that all blanking caps are removed.
(7)	Bleed the brake system.	Refer to Paragraph 9.
(8)	Do a test for the correct operation of the brake system.	

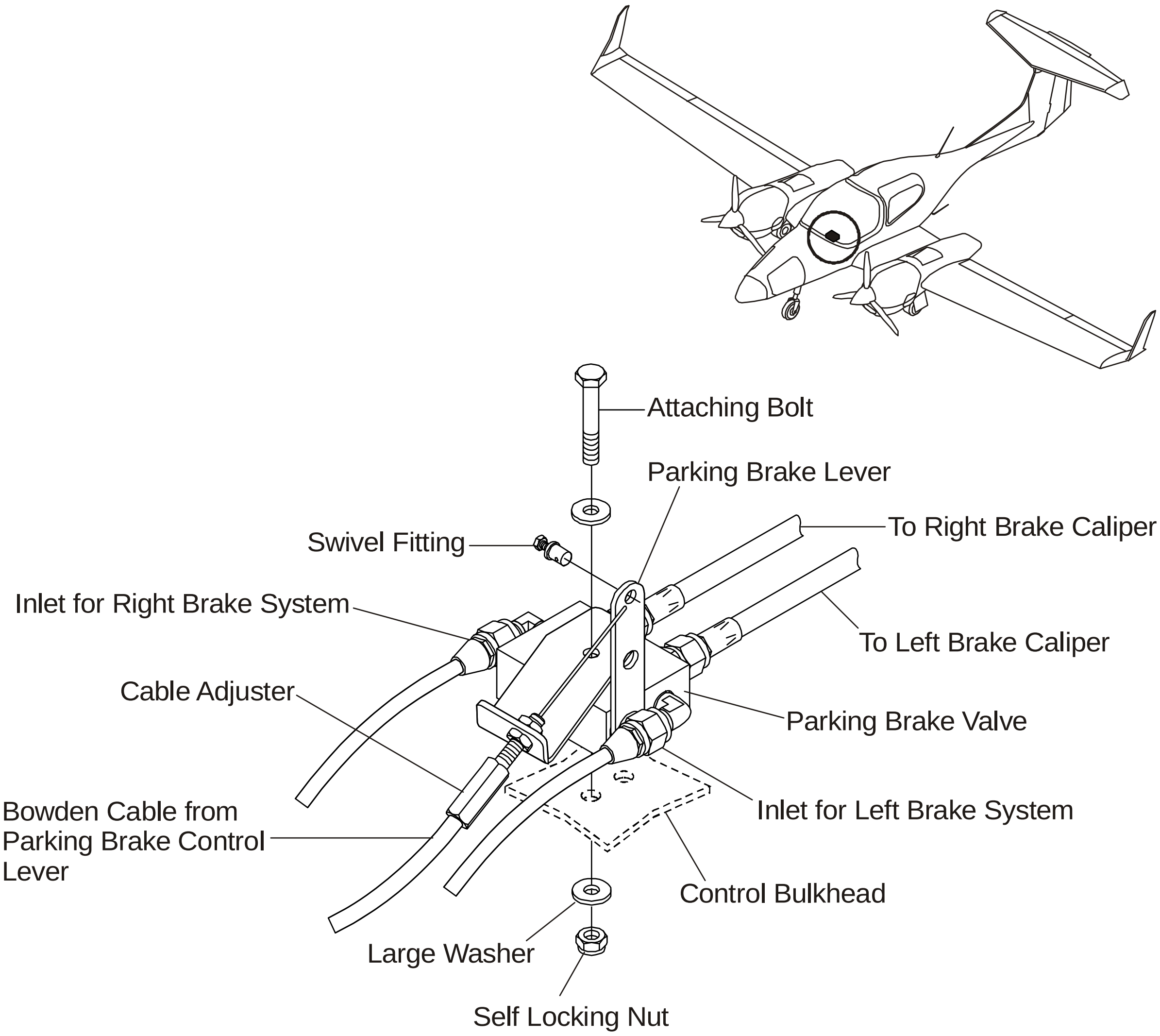

Figure 7: Parking Brake Valve Installation

7. Remove/Install the Parking Brake Valve

A. Remove the Parking Brake Valve

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilots' seats.	Refer to Section 25-10.
	WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE AND IT CAN DAMAGE CLOTHING. CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE STRUCTURE AND IT CAN REMOVE PAINT FROM COMPONENTS.	
(2)	Disconnect the Bowden cable: – Loosen the screw in the swivel fitting. – Pull the inner wire of the Bowden cable out of the swivel fitting.	Refer to Figure 7.
(3)	Disconnect the 4 brake hoses from the parking brake valve.	Use a suitable container to catch spilt fluid. Install blanking caps on all open connections.
(4)	Remove the 2 nuts, bolts and washers that attach the parking brake valve to its mounting.	
(5)	Move the valve clear of the airplane.	

B. Install the Parking Brake Valve

	Detail Steps/Work Items	Key Items/References
(1)	Move the parking brake valve into position by its mounting.	
(2)	Install the 2 bolts, washers and nuts that attach the parking brake valve to its mounting.	Use new self locking nuts.
(3)	Connect the 4 brake hoses to the parking brake valve.	Remove all blanking caps.
(4)	Connect the Bowden control cable to the parking brake valve: – Move the inner cable of the Bowden cable through the swivel fitting. – Make sure that the parking brake control lever in the cockpit is set to RELEASE. – Make sure that the operating lever on the parking brake valve is set to the fully open position. – Tighten the screw of the swivel fitting.	
(5)	Bleed the brake system.	Refer to Paragraph 9.
(6)	Do a test for the correct operation of the parking brake system: – Push and hold both brake pedals on the pilot's rudder pedal assembly. – Set the PARKING BRAKE to PARK. – Both wheel brakes must stay on. – Set the PARKING BRAKE to RELEASE. – Both wheel brakes must release.	
(7)	Install the pilots’ seats.	Refer to Section 25-10.

8. Remove/Install a Brake Caliper

A. Remove a Brake Caliper

	Detail Steps/Work Items	Key Items/References
	WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE AND IT CAN DAMAGE CLOTHING.** **WARNING:** **MAKE SURE THAT THE PARKING BRAKE IS SET TO RELEASE BEFORE YOU DISCONNECT THE HYDRAULIC HOSE TO THE BRAKE CALIPER. HYDRAULIC FLUID AT HIGH PRESSURE CAN PENETRATE YOUR SKIN AND CAUSE DISEASE.** CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE STRUCTURE AND IT CAN REMOVE PAINT FROM COMPONENTS.	
(1)	Disconnect the brake hose from the brake caliper.	Refer to Figure 8. Use a suitable container to catch spilt fluid. Put blanking caps on all open connectors.
	CAUTION: DO NOT OPERATE THE BRAKES WHILE THE CALIPER BACK PLATES ARE REMOVED OR THE CALIPER IS REMOVED FROM THE AIRPLANE. IF YOU DO OPERATE THE BRAKES, THE PISTONS BE PUSHED OUT FROM THE CYLINDERS.	
(2)	Remove the backing plates from the brake caliper: – Remove the lock-wire from the 4 bolts that attach the back plates to the brake caliper. – Remove the 4 bolts and washers that attach the backing plate to the brake caliper. – Remove the backing plates.	If bolts with drilled heads are used.
(3)	Move the caliper inboard until the mounting spigots are clear of the torque plate, then move the caliper clear of the airplane.	Retain the pressure plate with the caliper.

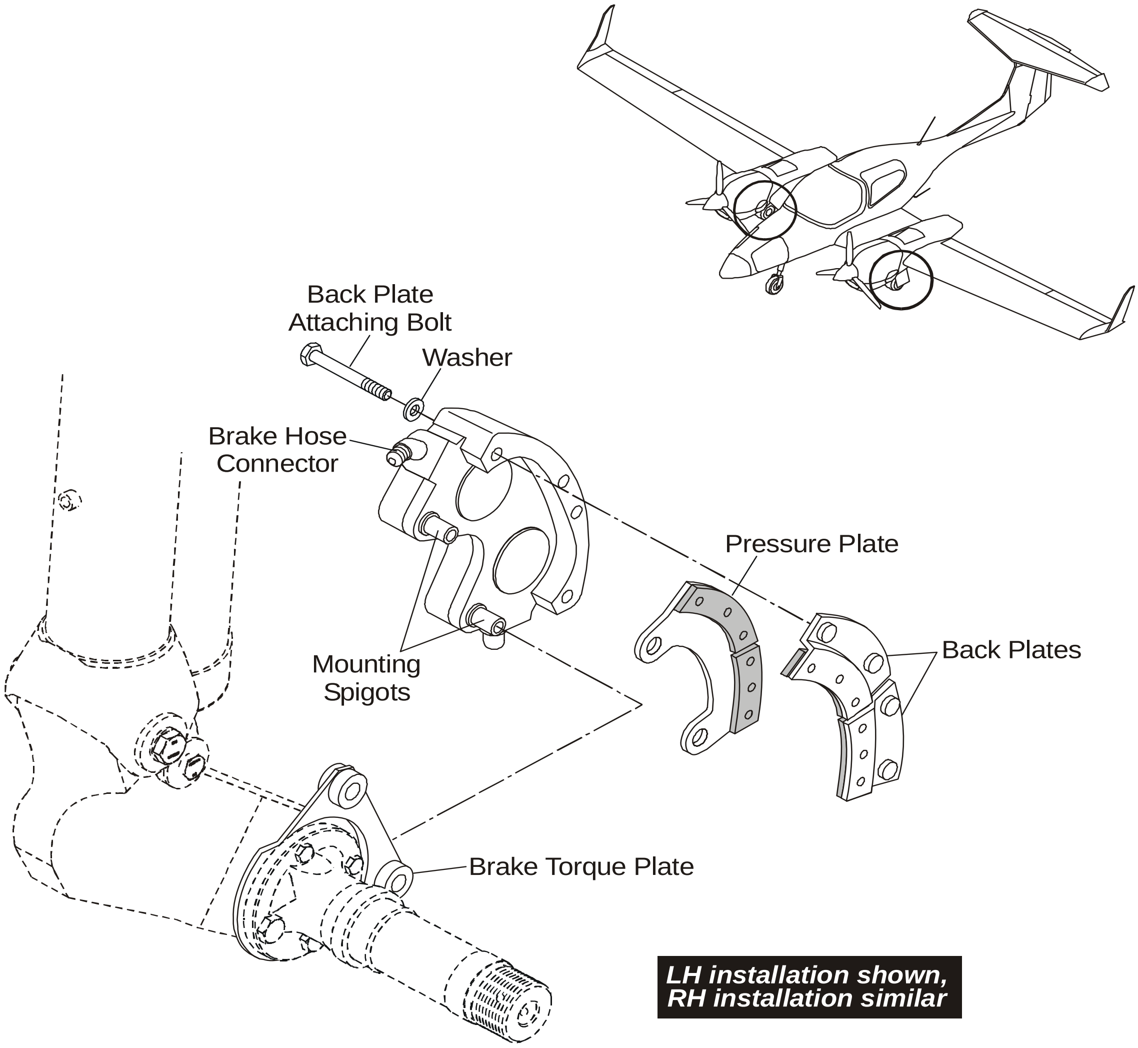

Figure 8: Brake Caliper Installation

B. Install the Brake Caliper

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the friction linings on both the pressure plate and the back-plate are in good condition.	Refer to Cleveland/Parker Maintenance Manual, latest revision.
(2)	Make sure that the mounting spigots on the caliper are clean.	
(3)	Make sure that the spigot locating bushes on the brake torque plate are clean.	
(4)	Move the caliper into position at the wheel. Make sure that the mounting spigots engage with the locating bushes of the torque plate.	Make sure that the pressure plate is correctly located within the caliper.
(5)	Install the back-plates: – Move the back-plates into position at the caliper. – Install the 4 bolts and washers that attach the back-plates to the caliper, finger tight. – Make sure that the wheel brake disk can rotate freely between the caliper pressure plate and the back-plates. – Tighten the bolts that attach the back-plates to the caliper.	Torque according to Cleveland/Parker Maintenance Manual, latest revision or placard on caliper.
(6)	Connect the hydraulic brake hose to the connection on the caliper.	
(7)	Bleed the brake system.	Refer to Paragraph 9.
(8)	Do a test for the correct operation of the brake system.	

9. Bleed the Wheel Brake System

A. Equipment

Item	Quantity	Part Number
Pressure-hydraulic bleeding equipment.	1	Commercial.
Syringe.	1	Commercial.

B. Material

Item	Quantity	Part Number
Hydraulic fluid.	A/R	MIL-PRF-5606H (for example, Aeroshell Fluid 41).

C. Bleed the Wheel Brake System

Use a pressure-hydraulic bleeding tool to bleed the wheel brake system.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO REMOVE THE PAINT FROM SOME COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the cap from the brake fluid reservoir. If necessary remove fluid until the fluid level is at MINIMUM.	On the co-pilot's brake pedals. Use a syringe.
(2)	Set the parking brake to RELEASE.	At the center console.
(3)	Connect the brake bleeding tool to the caliper: – Remove the blanking cap from the left brake caliper bleed nipple. – Connect the outlet hose of the hydraulic bleeding tool to the bleed nipple of the left brake caliper.	

	Detail Steps/Work Items	Key Items/References
(4)	Bleed the left brake system: – Open the bleed nipple on the brake caliper a small amount until fluid flows from the bleeding tool into the airplane brake system. – Let hydraulic fluid continue to flow into the airplane brake system until no more air bubbles can be seen in the airplane reservoir. – Close the bleed nipple on the brake caliper. – Disconnect the outlet hose of the bleeding tool from the nipple of the brake caliper. – Install the blanking cap onto the nipple.	Monitor the level of fluid in the left brake fluid reservoir. If necessary use a syringe to remove brake fluid.
(5)	Do steps 3 and 4 for the right wheel brake system.	
(6)	Make sure that both brake fluid reservoirs are filled to the correct level.	The MAXIMUM line on the reservoir.
(7)	Install both the left and right reservoir caps onto the reservoirs.	Use "vented caps".
(8)	Do a test for the correct operation of the wheel brake systems.	

10. Replace the Brake Friction Linings

A. Equipment

Item	Quantity	Part Number
Drill bit 1/8".	1	Commercial.
Pin punch.	1	Commercial.
Cleveland brake riveting set.	1	Cleveland 199-1.

B. Material

Item	Quantity	Part Number
Cleveland brake friction linings for Brake Caliper 30-52Z.	4 per brake.	Cleveland 066-10500.
Rivets.	8 per brake.	Cleveland 105-00200.

C. Replace the Brake Friction Linings.

Note: For detailed instructions refer to Cleveland/Parker Maintenance Manual, latest revision.

WARNING: DO NOT BREATHE THE DUST FROM BRAKE LININGS. THE DUST CAN CAUSE DISEASE.

CAUTION: MAKE SURE THAT THE PARKING BRAKE IS SET TO RELEASE BEFORE YOU RELEASE THE BRAKE CALIPER BACK-PLATE.

Note: For brake component limits refer to Cleveland/Parker Maintenance Manual, latest revision.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the brake caliper from the wheel assembly.	Refer to Paragraph 8.
(2)	Remove the pressure plate from the caliper.	Refer to Figure 8.

	Detail Steps/Work Items	Key Items/References
(3)	Remove the brake friction lining from the pressure plate: – Drill out the rivets that attach the friction lining to the pressure plate. – Use pin-punch to remove the rivet stems.	
(4)	Remove the brake friction linings from the back plates: – Drill out the rivets that attach the friction lining to the pressure plate. – Use pin-punch to remove the rivet stems.	
(5)	Install the new friction linings onto the pressure plate and the back-plates.	Use only approved parts. Use the Cleveland rivet set to install the new brake friction linings. Follow the Cleveland rivet set Instruction Manual.
(6)	Install the pressure plate into the caliper.	
(7)	Install the brake caliper.	Refer to Paragraph 8.
(8)	Do a test for the correct operation of the airplane braking system.	

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Section 32-50
Steering

1. General

The DA 42 NG has nose-wheel steering. The rudder pedals can turn the nose gear leg. The rudder pedals connect to the nose gear leg with a steering rod. You can turn the nose wheel up to 9° using the rudder pedals and up to 42° using a wheel brake.

This Section tells you about the nose-wheel steering system form the interface with the rudder controls to the nose wheel leg. See Section 27-20 for more data about the rudder control system and see Section 32-20 for more data about the nose gear leg.

Figure 1 shows the nose wheel steering system.

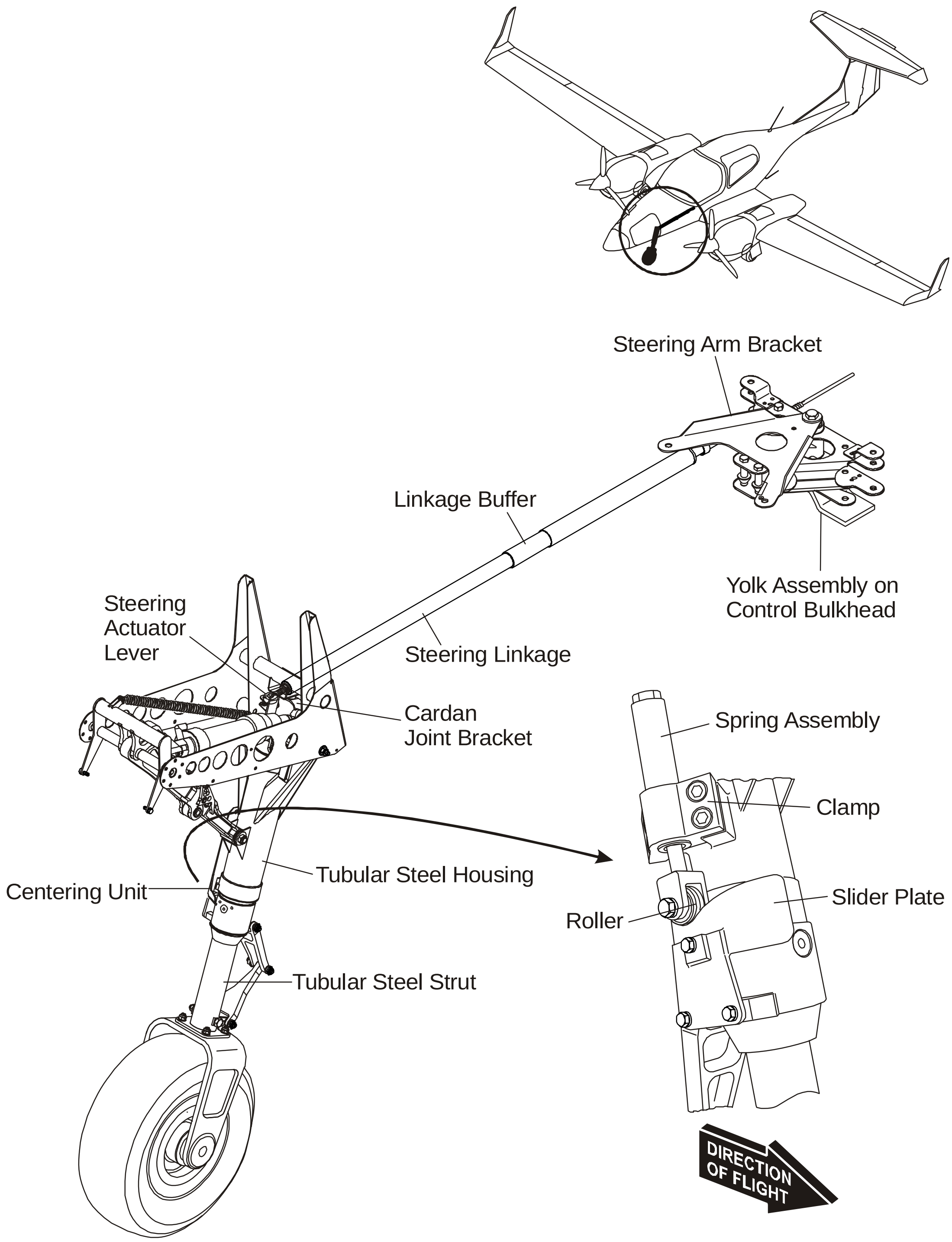

Figure 1: Nose Wheel Steering

2. Description

The nose wheel steering system has these major components:

A. Steering Linkage

One end of the steering linkage connects to the steering arm bracket on the rudder yoke assembly. The rudder yoke assembly is located on the forward control bulkhead. The other end of the steering linkage attaches to the steering actuator lever which is bolted to the top of the tubular strut of the nose gear leg.

B. Linkage Buffer

A telescopic arm containing a compression spring makes the linkage buffer. When a force is applied to one end of the telescopic arm the arm compresses the spring which then exerts a force onto the other end of the telescopic arm. This allows the pilot to operate the rudder control system when the nose wheel steering system has reached it’s limit of operation.

C. Centering Unit

A spring assembly which presses a roll against a slider plate makes the centering unit. The spring assembly with the roller are attached to the tubular steel strut which does not rotate. The slider plate is attached to the sliding tube guide which rotates about the leg axis when the nose wheel is deflected.

When the nose wheel is deflected, the slider plate pushes the spring loaded roller up. The spring creates a counter force which moves the nose wheel back into neutral position.

3. Operation

When the pilot pushes the left rudder pedal when taxiing the airplane these events occur:

- The rudder cables from the rudder pedal turns the steering arm bracket of the yoke assembly on the control bulkhead counter-clockwise.
- The steering linkage moves forward and turns the tubular steel strut of the nose gear leg to counter-clockwise.
- The airplane will turn to the left.

When the pilot pushes the right rudder pedal when taxiing the airplane these events occur:

- The rudder cables from the rudder pedal turns the steering arm bracket of the yoke assembly on the control bulkhead clockwise.
- The steering linkage moves aft and turns the tubular steel strut of the nose gear leg to clockwise.
- The airplane will turn to the right.

Trouble-Shooting

1. General

This Section gives you the trouble-shooting data for the nose wheel steering components only. Refer to Section 32-20 for trouble-shooting data on the nose gear leg and refer to Section 27-20 for trouble-shooting data on the rudder control system.

If you find the trouble given in Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Nose wheel steering ineffective, the pilot must give inputs to the rudder pedals to steer the airplane.	Linkage buffer defective.	Replace the steering linkage.

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Maintenance Procedures

1. General

These Maintenance Procedures tell you how to remove/install the steering linkage and the centering unit. It also tells you how to check the friction of the nose wheel steering. Refer to these Sections for the related data:

– Section 32-10. Main landing gear.

– Section 32-20. Nose landing gear.

– Section 32-30. Extension and retraction.

2. Remove/Install the Steering Linkage

A. Remove the Steering Linkage

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilot's seat.	Refer to Section 25-10.
(2)	Disconnect the steering linkage from the steering arm bracket at the yoke assembly: – Remove the nut, washer and bolt that attaches the steering linkage to the steering arm bracket. – Move the end of the steering linkage clear of the steering arm bracket.	Refer to Figure 1.
(3)	Disconnect the steering linkage from the steering actuator lever: – Remove the nut, washer and bolt that attaches the steering linkage to the steering actuator. – Move the steering linkage clear of the steering actuator. – Pull the steering linkage forward through into the nose gear bay and clear of the airplane.	At the top of the nose gear leg. Note the orientation of the steering linkage.

B. Install the Steering Linkage

	Detail Steps/Work Items	Key Items/References
(1)	Move the steering linkage into position through the nose gear bay and into the fuselage.	Make sure that you install the steering linkage in the correct orientation as noted in Paragraph 2A.
(2)	Connect the steering linkage to the steering arm bracket at the yoke assembly: – Move the end of the steering linkage into position so that it aligns with the steering arm bracket. – Install the bolt, washer and nut that attaches the steering linkage to the steering arm bracket.	 Always use a new self-locking nut.
(3)	Connect the steering linkage to the steering actuator at the top of the nose gear leg: – Move the end of the steering linkage into position to align with the steering actuator lever. – Install the bolt, washer and nut that attaches the steering linkage to the steering actuator lever.	 Always use a new self-locking nut.
(4)	Do a test for the correct operation of the rudder control system.	Refer to Section 27-20.
(5)	If necessary for your Airworthiness Authority do a duplicate inspection of the rudder control system.	
(6)	Install the pilot’s seat.	Refer to Section 25-10.

3. Remove/Install the Centering Unit

Refer to Figure 1.

A. Remove the Centering Unit

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Remove the spring assembly: – Remove the 4 bolts and washers which hold the clamp to the leg. – Move the clamp and spring assembly clear of the leg.	
(3)	Remove the slider plate: – Remove the 3 bolts and washers which attach the slider plate to the leg. – Move the slider plate clear of the leg.	Remove lock wire first, if bolts with drilled heads are used.

B. Install the Centering Unit

	Detail Steps/Work Items	Key Items/References
(1)	Install the slider plate:	
	– Release the nose landing gear.	Jack the airplane. Refer to Section 07-10.
	– Move the slider plate in position on the leg.	
	– Install the 3 bolts and washers which attach the slider plate to the leg.	Use Loctite 243 or lock wire if bolts with drilled heads are used.
(2)	Align the nose wheel to the center position.	
(3)	Install the spring assembly:	
	– Move the clamp and spring assembly in position at the leg.	
	– Install the 4 bolts and washers which hold the clamp to the leg. Do not tighten the bolts.	Use Loctite 243.
	– Align the spring so that the roller just contacts the lowest point on the slider plate.	Hold the spring assembly in this position.
	– Turn the nose gear leg in one of its maximum deflected positions.	
	– Move the spring assembly towards the slider plate so that 2.5 mm (0.1 inch) of bare piston remain visible.	The centering unit must be slightly pre-stressed while in center position.
	– Tighten the 4 bolts which hold the clamp to the leg.	
	– Align the nose wheel to the center position.	
(4)	Remove the jacks from the airplane.	Refer to Section 07-10.
(5)	Reset the GEAR circuit breaker.	Right side of instrument panel.

4. Nose Wheel Steering Friction Test

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Release the nose landing gear.	Jack the airplane. Refer to Section 07-10.
(2)	Check the strut extension of the nose landing gear damper.	Refer to Section 32-20. If necessary charge the damper assembly.
(3)	Turn the nose wheel to its fully deflected position left hand.	The counter force of the centering unit must move the nose wheel back into neutral position.
(4)	Turn the nose wheel to its fully deflected position right hand.	The counter force of the centering unit must move the nose wheel back into neutral position.
(5)	Lower the airplane.	Remove the jacks from the airplane. Refer to Section 07-10.

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Section 32-60
Position and Warning

1. General

This Section tells you about the parts of the landing gear system that give the pilot position and warning data. Refer to these Sections for the related data:

– Section 32-10. Main landing gear.

– Section 32-20. Nose landing gear.

– Section 32-30. Extension and retraction.

– Section 32-50. Nose wheel steering.

2. Description

The landing gear position and warning system has these functions:

– Landing gear control.

– Landing gear position.

– Landing gear warning.

– To give position data for the extension and retraction system.

The system has these components:

– A cockpit selector handle and indicators. The cockpit selector handle controls the position of the landing gear. The indicators show the position/condition of the landing gear legs.

– Switches that sense 'weight-on-wheels'.

– Switches that sense 'folding-stay locked'.

– Switches that sense 'landing gear retracted'.

– Switches that sense the position of the engine power levers.

– Control relays and circuit breakers.

Figure 1 shows the landing gear electrical system schematic diagram.

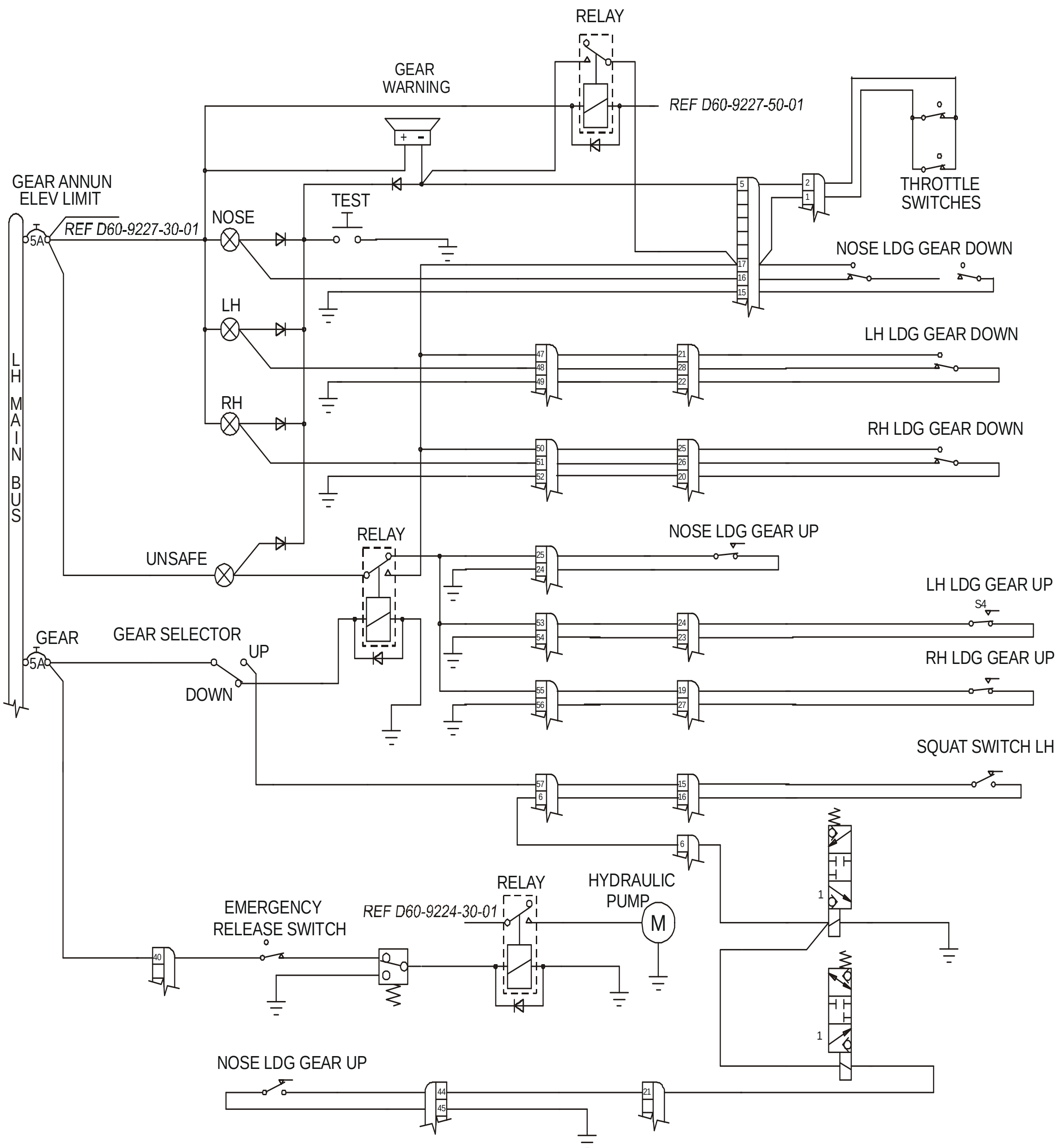

Figure 1: Landing Gear Electrical Schematic Diagram

A. Landing Gear Selector

The landing gear selector is in the middle of the instrument panel. The gear selector has a handle and can be set to UP or DOWN. Next to the gear selector are three green indicators and a red indicator. There is also a push-to-test type TEST switch. Each landing gear has a related green indicator. The green indicators will light if all the landing gear legs are down and locked when the gear selector is set to DOWN. The green indicators will not light if all the landing gear legs are fully up when the gear selector is set to UP. During the movement of the legs during extension or retraction the red UNSAFE indicator will light and the green indicators will be off.

The red indicator will stay lit if one, or more, of the landing gear legs has not fully retracted when the selector has been set to UP. The red indicator will stay lit if one, or more, of the landing gear legs has not fully locked down when the selector has been set to DOWN. The related leg green indicator will also not be lit.

Push the TEST switch to make sure that the red and green indicators are serviceable and to test the landing gear audible warning horn.

B. Weight-on-Wheels Switches

The LH main landing gear leg has a weight-on-wheel switch (squat switch). When the airplane is on the ground the weight of the airplane causes the trailing arm to move up and compress the damper. This movement of the trailing arm causes the weight-on-wheels switch to open. With these switches open the electrical power to the solenoid valves of the hydraulic supply and control system is isolated. This over-rides the position of the landing gear selector handle and selects the landing gear to the DOWN position when the airplane is on the ground.

C. Folding-Stay Switches

Each landing gear leg has a folding-stay. When the landing gear leg is fully down the folding-stay will lock in the unfolded position to hold the leg locked down. When the folding-stay is locked the related folding-stay switch (LDG GEAR DOWN) is closed and an electrical ground is supplied for the related green indicator. The green indicator for the related gear leg will be illuminated.

D. Landing Gear Retracted Switches

Each landing gear leg has landing gear retracted switch (LDG GEAR UP) located in the top of the landing gear bay. When the landing gear has fully retracted the switch will open and isolate the electrical ground for the red UNSAFE indicator. If all three switches are open the red UNSAFE indicator will not be illuminated.

E. Engine Power Lever Switches

Switches sense the position of the left and the right engine power levers. When both engine power levers are moved towards the IDLE position the engine power lever switches close. If both switches are closed and the GEAR selector is set to UP the landing gear audible warning horn will operate. If one or more engine power lever is moved towards TAKE-OFF or the GEAR selector is set to DOWN the audible warning horn will not operate.

F. Control Relay and Circuit Breakers

The position and warning system has these relays and circuit breakers:

– UNSAFE control relay. The UNSAFE control relay is energized when the GEAR selector is set to DOWN. When energized the relay gives an electrical ground for the red UNSAFE indicator through the folding stay switch in the OPEN position (folding-stay not locked). When the GEAR selector is set to UP the relay is de-energized. The de-energized relay gives an electrical ground for the red UNSAFE indicator through the landing gear retracted switches in the CLOSED position (landing gear not retracted).

– The GEAR and GEAR ANNUN. circuit breakers give circuit protection to the UNSAFE control relay and the position indicating and warning systems.

Trouble-Shooting

1. General

This table gives you the trouble-shooting data for the position and warnings system. Refer to Section 32-10 for trouble-shooting the main landing gear. Refer to Section 32-20 for trouble-shooting the nose landing gear. Refer to Section 32-30 for trouble-shooting the extension and retraction system.

If you find the trouble given in Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
The red UNSAFE indicator stays lit when the landing gear is retracted.	One of the landing gear retracted switches is defective.	Replace the related landing gear retracted switch.
The red UNSAFE indicator stays lit when the landing gear is down. All green indicators are lit.	Control relay defective.	Replace the control relay.
The red UNSAFE indicator stays lit when the landing gear is down. One of the 3 green indicators not lit.	The folding-stay switch is not adjusted properly.	Adjust the folding-stay switch properly.
	The folding-stay switch defective for the landing gear leg for which the green indicator is not lit.	Replace the related folding-stay switch.
	The green indicator led is unserviceable and the control relay is defective.	Check the light bulb and replace as necessary. Replace the control relay.

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Maintenance Practices

1. General

This Section tells you how to remove/install the major components of the position and warning system. It also tells you how to adjust some of the switches. Refer to these Sections for data about other landing gear systems:

– Section 32-10. Main landing gear.

– Section 32-20. Nose landing gear.

– Section 33-30. Extension and retraction system.

Refer to Chapter 92-00 for the wiring diagrams of the electrical circuits.

Figures 2 thru 4 show the locations of the position and warning switches.

2. Remove/Install an Engine Power Lever Switch

A. Remove an Engine Power Lever Switch

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR and GEAR ANNUN/ELEV LIMIT circuit breakers.	Instrument panel. Right side.
(2)	Release the engine control quadrant and lift it clear of the center console.	Refer to Chapter 76-00.
(3)	Remove an engine power lever switch:	
	– Move both the engine power levers to TAKE-OFF.	To move the switch operating rod clear of the switches.
	– Disconnect the electrical cables to the switch that you will remove.	At the in-line connector.
	– Remove the 2 nuts, washers and bolts that attach the switch that you will remove to the structure.	Take care to retain the nuts, washers and bolts. Hold the switch.
	– Move the switch clear of the engine control quadrant.	

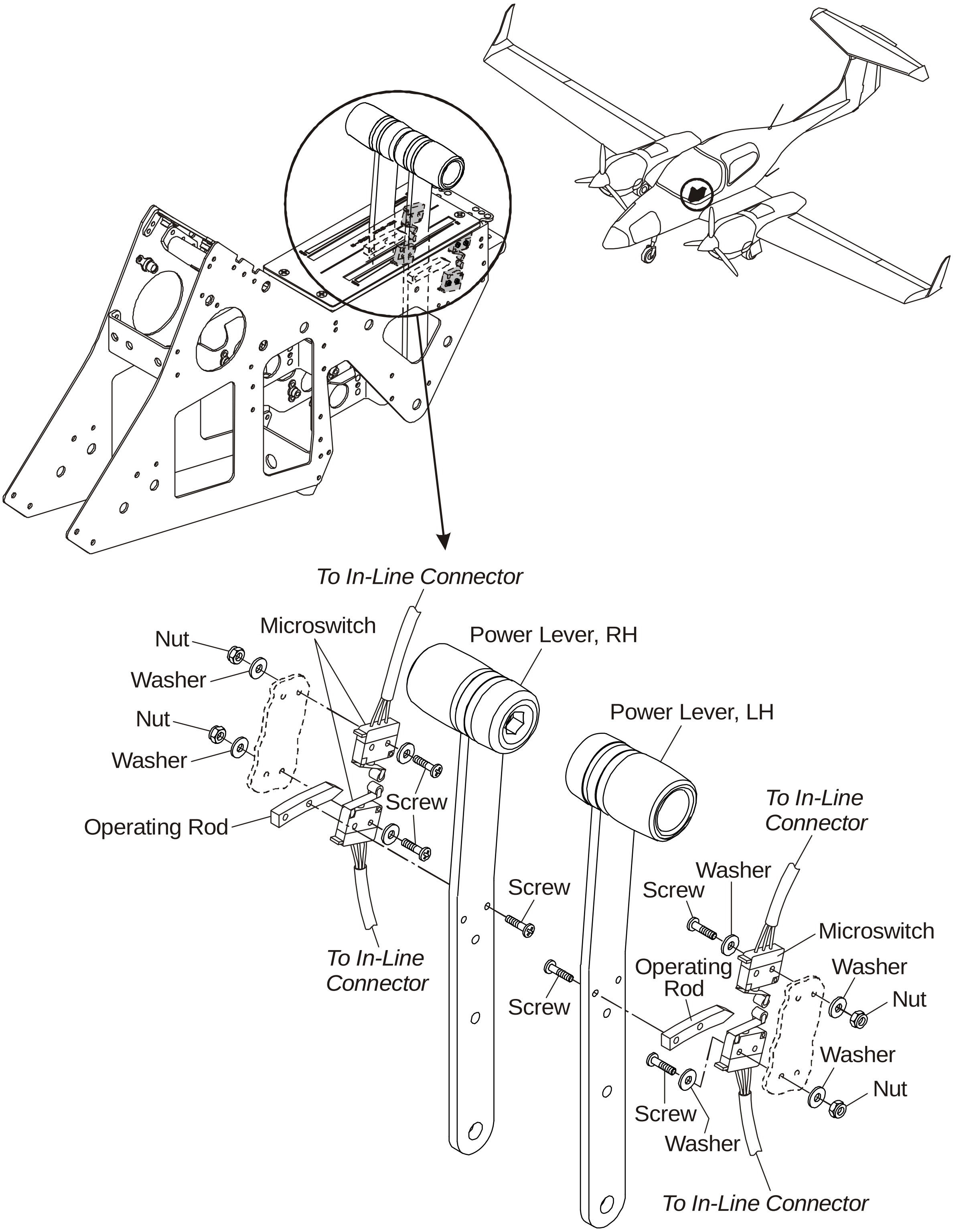

Figure 2: Engine Power Lever Switch Installation

B. Install an Engine Power Lever Switch

	Detail Steps/Work Items	Key Items/References
(1)	Install the switch: – Move the switch into position in the engine control quadrant. – Install the 2 screws, washers and nuts that attach the switch to the structure. – Connect the electrical cables for the switch.	
(2)	Install the engine control quadrant.	Refer to Chapter 76-00.
(3)	Reset the GEAR and GEAR ANNUN/ELEV LIMIT circuit breakers.	Instrument panel. Right side.
(4)	Do a test of the landing gear position and warning system.	Refer to Paragraph 5.

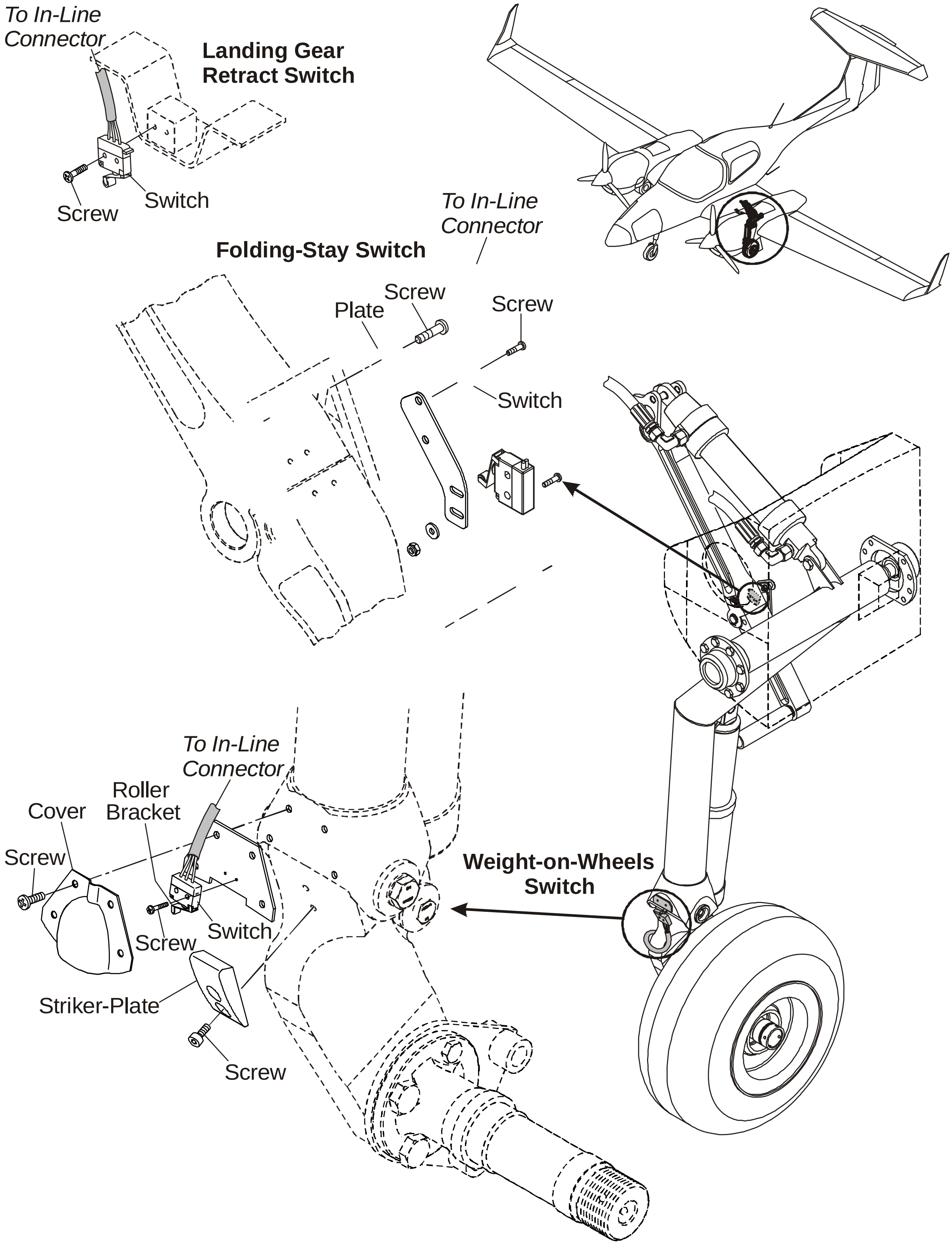

Figure 3: Position and Warning Switches - Main Landing Gear

3. Replace a Landing Gear Switch (Excluding the Nose Gear Folding Stay Switch)

Use this procedure for the following landing gear switches:

– Main gear folding stay switch.

– Main gear retract switch.

– Main gear weight on wheels switch.

– Nose gear differential switch.

– Nose gear retract switch.

The table will tell you where procedures are different for some switches.

A. Replace a Landing Gear Switch

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR and GEAR ANNUN/ELEV LIMIT circuit breakers.	Instrument panel. Right side.
(2)	Locate the switch that you will replace.	Refer to Figure 3.

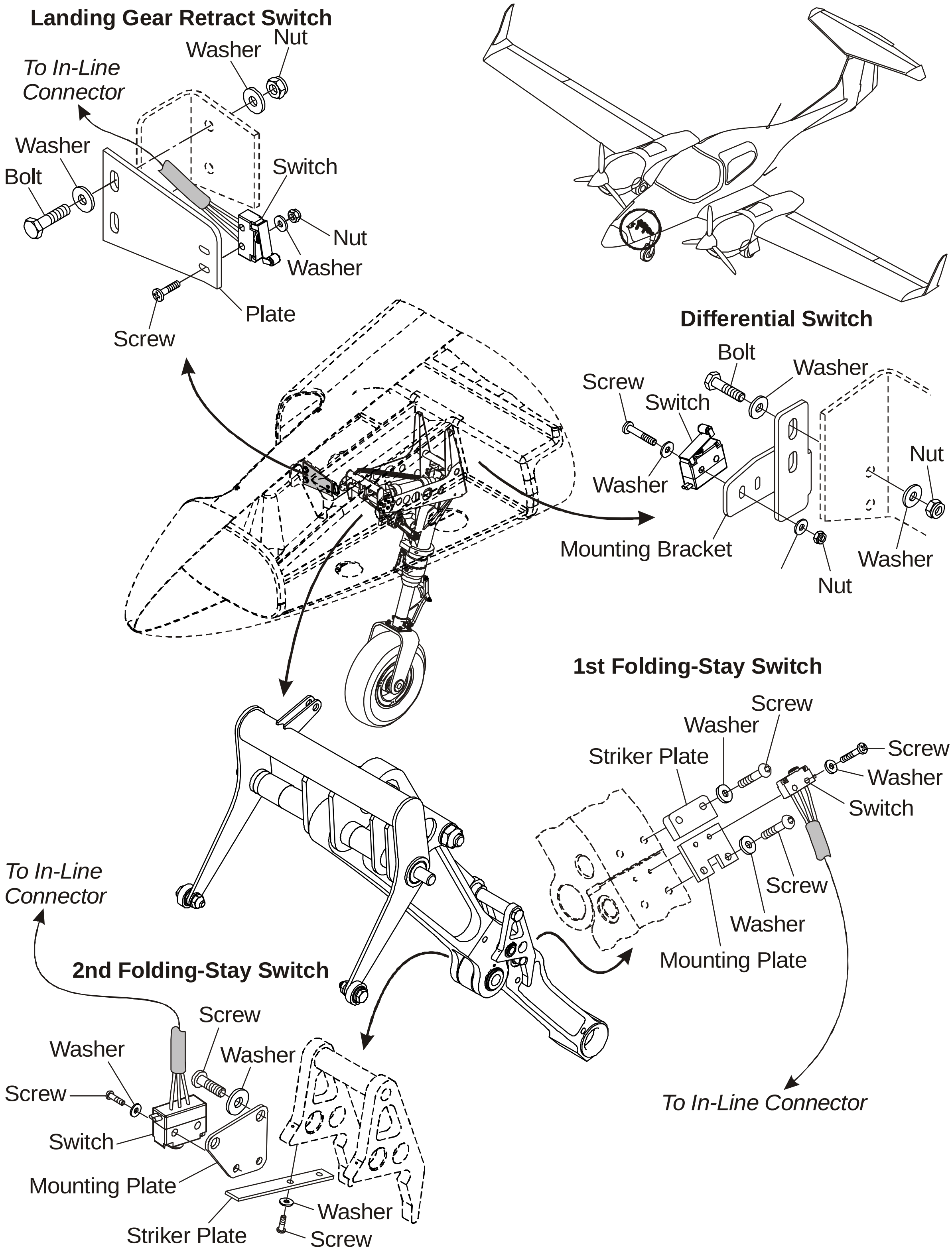

Figure 4: Position and Warning Switches - Nose Landing Gear

	Detail Steps/Work Items	Key Items/References
(3)	Replace the switch: – Remove any cable-ties that may secure the electrical cables for the switch to the structure. – Remove the protective cover for the switch. – Disconnect the electrical cables for the switch. – Remove the 2 screws and washers that attach the switch. – Remove the roller bracket. – Move the old switch clear of the mounting. – Move the new switch into position in the mounting. – Install the roller bracket. – Install the 2 screws and washers that attach the switch. – Adjust landing gear switch. – Reconnect the electrical cables for the switch. – Install the cable-ties that attach the electrical cables for the switch to the structure. – Install the protective cover for the switch.	Note the position of the cable-ties.
(4)	Reset the GEAR and GEAR ANNUN/ELEV LIMIT circuit breakers.	Instrument panel. Right side.
(5)	Do a test of the landing gear position and warning system.	Refer to Paragraph 5.

4. Replace a Nose Gear Folding Stay Switch

Use the following procedure for the nose gear folding stay switch.

A. Replace a Nose Gear Folding Stay Switch

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR and GEAR ANNUN/ELEV LIMIT circuit breakers.	Instrument panel. Right side.
(2)	Locate the switch that you will replace.	Refer to Figure 6.
(3)	Replace the switch:	
	– Remove any cable-ties that may secure the electrical cables for the switch to the structure.	Note the position of the cable-ties.
	– Disconnect the electrical cables for the switch.	At the in-line connector.
	– Remove the 2 screws and washers that attach the switch.	
	– Move the old switch clear of the mounting.	
	– Move the new switch into position.	
	– Install the 2 screws and washers that attach the switch.	
	– Reconnect the electrical cables for the switch.	At the in-line connector.
	– Install the cable-ties that attach the electrical cables for the switch to the structure.	At the positions noted.
(4)	Reset the GEAR and GEAR ANNUN/ELEV LIMIT circuit breakers.	Instrument panel. Right side.
(5)	Do a test of the landing gear position and warning system.	Refer to Paragraph 5.

5. Adjust Landing Gear Indication Micro Switches (Excluding Nose Gear Folding Stay Switch)

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

The following landing gear switches can be adjusted with this procedure:

– Main gear folding stay switch (LH and RH).

– Main gear retract switch (LH and RH).

– Main gear weight on wheels switch (LH and RH).

– Nose gear differential switch.

– Nose gear retract switch.

B. Adjust Main/Nose Gear Retract Switches and Differential Switch

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BY SECURING THE AREA AROUND THE AIRPLANE BEFORE YOU PERFORM MAINTENANCE ON THE LANDING GEAR. THE LANDING GEAR RETRACTION SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS IF OPERATED ACCIDENTALLY.	
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Remove the main/nose gear doors to get access to the landing gear.	Refer to Section 32-10 or 32-20.

	Detail Steps/Work Items	Key Items/References
(5)	Reset the GEAR circuit breaker.	
(6)	Set the ELECT. MASTER switch to ON.	
(7)	Retract the landing gear.	Refer to Section 32-30.
(8)	Adjusting the micro switches: – Open the two screws which hold the micro switch in position. – Adjust the micro switch so that the gap between the micro switch lever and the micro switch body is approx. 1 - 2 mm (0.04 - 0.08 in). – Tighten the two screws on the micro switch.	Refer to Figure 3 and 4 to see where the micro switches are located. The gap of 1 - 2 mm (0.04 - 0.08 in) ensures that the lever is far enough away from the switch point and that it is not overstretched which can cause the lever to break.
(9)	Extend the landing gear.	Refer to Section 32-30.
(10)	Set the ELECT. MASTER switch to OFF.	
(11)	Pull the GEAR circuit breaker.	
(12)	Install the main/nose gear doors.	Refer to Section 32-10 or 32-20.
(13)	Move the wing and rear fuselage trestles clear of the airplane.	
(14)	Lower the airplane with the jacks.	Make sure that the area around the airplane is clear.
(15)	Reset the GEAR circuit breaker.	Right side of instrument panel.

C. Adjust Landing Gear Folding Stay and Weight on Wheel Switch

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Right side of instrument panel.
(2)	This step is only necessary for adjusting the weight on wheels switch: – Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(3)	Adjusting of the micro switches: – Open the two screws which hold the micro switch in position. – Adjust the micro switch so that the gap between the micro switch lever and the micro switch body is approx. 1 - 2 mm (0.04 - 0.08 in). – Tighten the two screws on the micro switch.	Refer to Figure 3 and 4 to see where the micro switches are located. For the weight on wheels switch remove the protection cover. The gap of 1 - 2 mm (0.04 - 0.08 in) ensures that the lever is far enough away from the switch point and that it is not overstretched which can cause the lever to break.
(4)	Move the wing and rear fuselage trestles clear of the airplane and lower the airplane with the jacks.	Make sure that the area around the airplane is clear.
(5)	Reset the GEAR circuit breaker.	Right side of instrument panel.

D. Cleaning and Maintaining the Micro Switches

Note: In case the landing gear indicators in the cockpit are not working properly it can be that the micro switches are either not adjusted right or that the micro switches have to be cleaned. Check the micro switches and their electrical connection for damage.

6. Test the Landing Gear Position and Warning System

A. Equipment

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Test the Landing Gear Position and Warning System

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT LET PERSONS NEAR THE LANDING GEAR WHEN YOU DO THE POSITION AND WARNING TEST. THE LANDING GEAR CAN CAUSE INJURY TO PERSONS. CAUTION: MAKE SURE THAT THE AREA AROUND THE AIRPLANE IS CLEAR. IF THE LANDING GEAR HITS AN OBJECT THE LANDING GEAR CAN BE DAMAGED.	
(1)	Raise the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Connect an external power supply to the airplane.	Refer to Section 24-40
(3)	Set the ELECT. MASTER switch to ON.	
(4)	Set both engine power levers to 100%.	Fully forward.

(5)	Retract the landing gear:
	– Set the landing gear selector lever to UP and you must have these indications:
	  – All 3 green (SAFE) leds switch off.
	  – The red led (UNSAFE) illuminates.
	  – The landing gear retracts.
	– When the gear is fully retracted:
	  – The red led (UNSAFE) switches off.	

	Detail Steps/Work Items	Key Items/References
(6)	Do a test for the correct operation of the landing gear warning horn:	
	– Move the left engine power lever to IDLE.	The landing gear warning horn must operate.
	– Move the right engine power lever to IDLE.	The landing gear warning horn must operate.
	– Move the left engine power lever to 100%.	The landing gear warning horn must operate.
(7)	Extend the landing gear:	
	– Set the landing gear selector lever to DOWN and you must have these indications:	
	– The red led (UNSAFE) illuminates.	
	– The landing gear extends.	
	– When all the landing gear legs are fully extended and locked:	
	– The red led (UNSAFE) switches off.	
	– All 3 green (SAFE) leds illuminate.	

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CHAPTER 33

LIGHTS

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CHAPTER 33
LIGHTS

1. General

This Chapter tells you about the cockpit and exterior lighting of the DA 42 NG. Section 33-10 tells you about the flight compartment lighting and Section 33-40 tells you about the exterior lighting.

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

2. Description

Figure 1 shows the location of the lights.

The DA 42 NG has these flight compartment lights:

– Map/reading lights.

– Placard lights.

Some avionic equipment has internal lighting. Refer to the related Section and the equipment manufacturers handbook for the equipment in your airplane. A combined ON/OFF and dimmer switch for the placard lighting is located in the instrument panel, top left.

The DA 42 NG has these exterior lights in one light unit at each wing tip:

– Left and right position lights. The front part of the light has a red (left) or green (right) lens. The light can only be seen from the front and the side. If OÄM 42-222 is installed, the lenses are clear and the LEDs provide the coloration.

– Rear position lights. The aft part of each wing tip light unit has a clear lens. The lights can be seen only from the rear of the airplane.

– Strobe light. The middle part of each wing-tip light unit has a clear lens. The filament gives a high-intensity flash. The strobe light can be seen from all directions. If OÄM 42-222 is NOT installed, a separate power unit for each strobe light is mounted in the wing-tip.

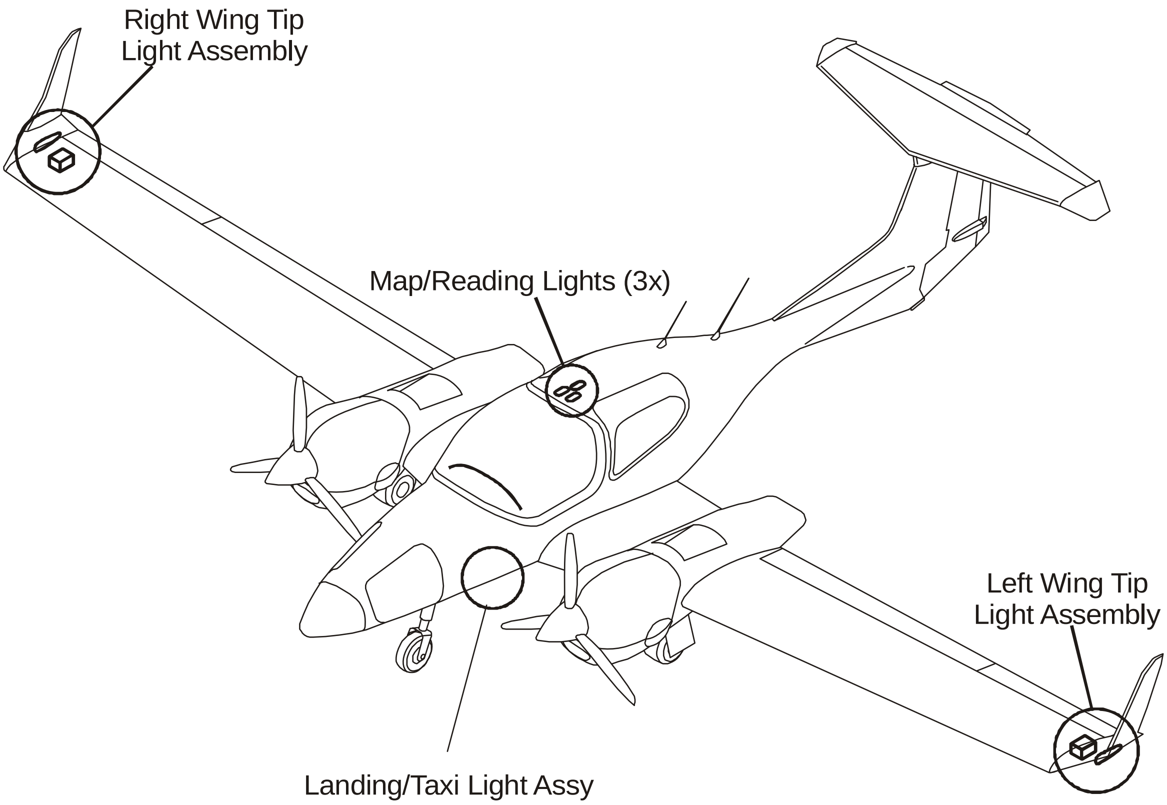

Figure 1: Flight Compartment

The DA 42 NG has these exterior lights mounted in a unit under the center fuselage:

- Landing light. The landing light has a clear lens and a 35 Watt HID Xenon bulb. It is located in a recess located under the center fuselage, next to the taxi light.

- Taxi light. The taxi light has a clear lens and a 35 Watt HID Xenon bulb. It is located in a recess located under the center fuselage, next to the landing light.

The switches for the landing and taxi lights are in the top left of the instrument panel. The landing and taxi lights each have electronic controllers for the Xenon filaments. The electronic controllers are located on the center section floor, below the pilots' seats.

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Section 33-10
Lights - Flight Compartment

1. General

This Section tells you about the flight compartment lights of the DA 42 NG airplane. Refer to Chapter 92 for the wiring diagrams.

2. Description

The DA 42 NG has these flight compartment lights:

– Map/reading lights.

– Instrument panel flood lighting.

– Instrument lights (placard lights).

Some avionic equipment has internal lighting. Refer to the related Section and the equipment manufacturers handbooks for the equipment installed in your airplane. Combined ON/OFF and dimmer switches for the placard lights and the flood light are located in the instrument panel, top-left side.

A. Map/Reading Lights.

Map/reading lights are located in the roof of the cockpit. The two lights at the front are directed towards the pilots' seats and the light at the rear is directed towards the passenger seats. Each light assembly has an integral switch and a directional beam. The system is protected by a circuit breaker located in the right side of the instrument panel.

Note: Map/Reading lights become very hot in service.

B. Instrument Panel Flood Lighting

A 115 V AC foil type light strip makes the instrument panel flood light. The intensity of the light is controlled by a combined ON/OFF dimmer switch located on the top left of the instrument panel. Turn the dimmer switch fully counterclockwise to turn the flood light off. Turn the dimmer switch clockwise to turn the flood on and to set the level of lighting that you require. The strip light is held in place under the instrument panel cover with double-sided pressure sensitive tape. A solid state inverter supplies the 115 V AC current and the system is protected by a circuit breaker located on the right side of the instrument panel.

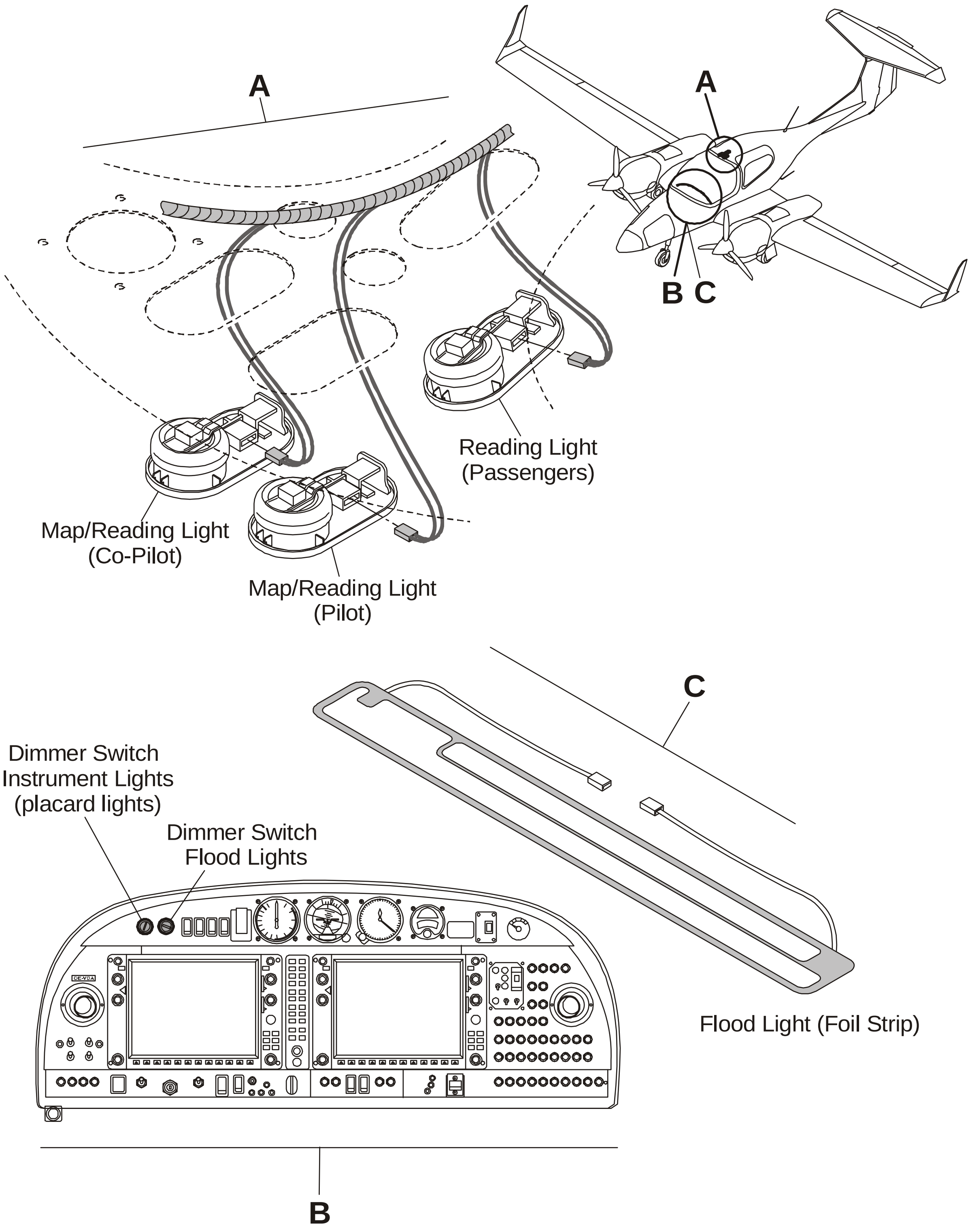

Figure 1: Flight Compartment Lights

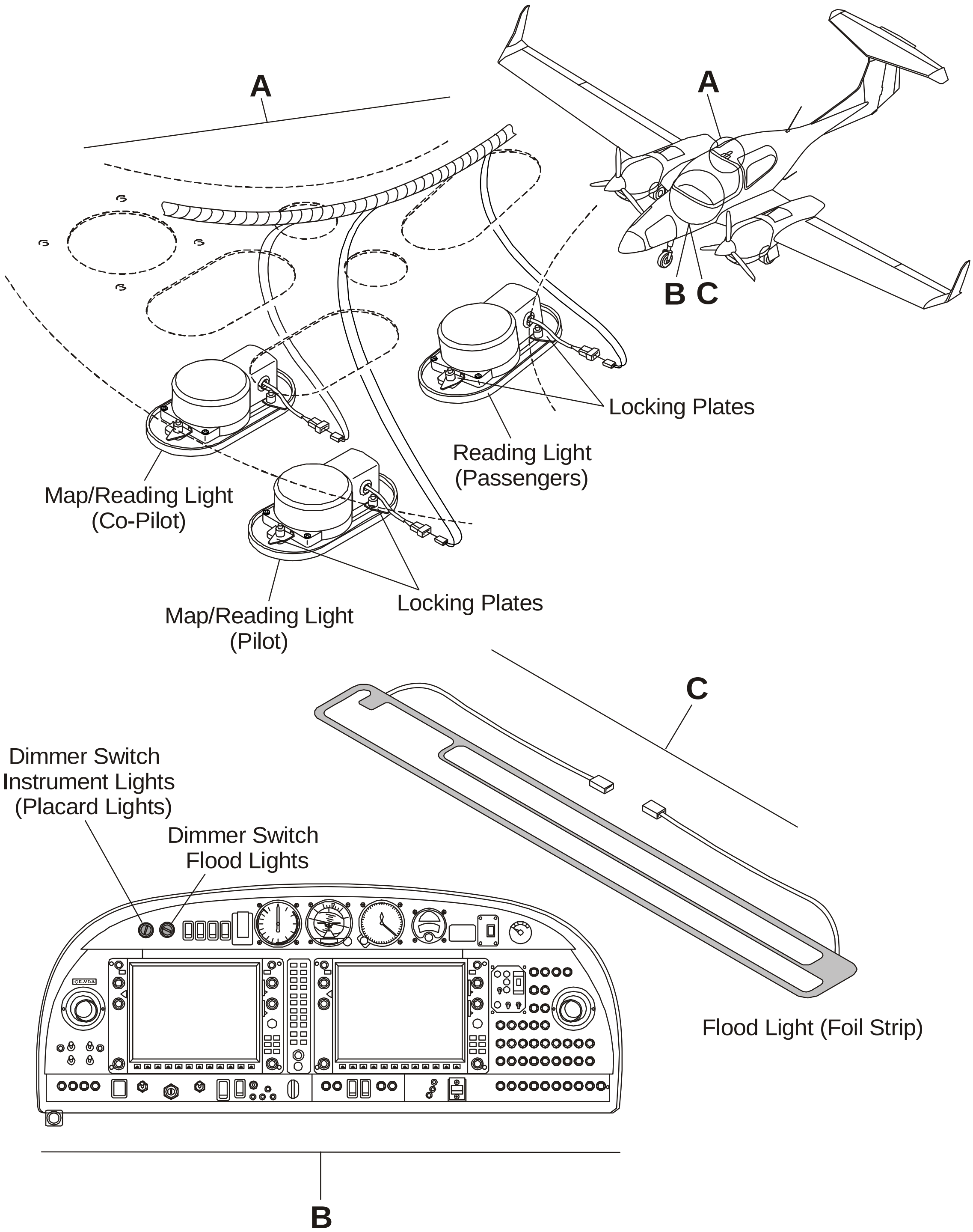

Figure 2: Flight Compartment Lights (if MÄM 42-1024 is installed)

C. Instrument Lights (Placard Lights)

The DA 42 NG has placards that are etched onto panels. There are 8 placard panels on the DA 42 NG instrument panel. Each placard panel has a dedicated light source. When the light source is switched on the placards are illuminated. The intensity of the light sources are controlled by a single ON/OFF dimmer switch located on the top left of the instrument panel. Turn the dimmer switch fully counter clockwise to turn the placard lights off. Turn the dimmer switch clockwise to turn the placard lights on and to set the level of lighting that you require.

All placard panels are attached to the instrument panel with screws. You can replace a placard panel.

Refer to Section 11-30 for more data about the placard panels.

Trouble-Shooting

1. General

This Section lists some defects you could have with the flight compartment lighting system. If you have the trouble shown in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
One of the map/reading lights does not operate.	Defective filament. Defective light unit.	Replace the filament. Replace the light unit.
The instrument panel flood light does not operate correctly.	Circuit breaker not set. Dimmer switch defective. Solid state inverter defective. Light strip defective. Wiring defective.	Reset the circuit breaker. Replace the dimmer switch. Replace the solid state inverter. Replace the light strip. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.
The instrument lights (placard lights) do not operate correctly. One or more light panels not operating correctly.	Circuit breaker not set. One or more light panels defective. Dimmer switch defective. Wiring defective.	Reset the circuit breaker. Replace defective light panel(s). Replace the dimmer switch. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install the main components of the flight compartment lighting system. Refer to Chapter 92 for the wiring diagrams.

2. Remove/Install a Map/Reading Light Assembly (if MÄM 42-1024 is not installed)

A. Remove a Map/Reading Light Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Pull the TAXI/MAP/ACL circuit breaker.	Instrument panel, right side.
(2)	Remove the light assembly: – Release the spring clip that holds the light assembly in position. – Lower the light assembly from the cabin roof and disconnect the electrical cables. – Move the light assembly clear of the airplane.	 At the switch end of the assembly. At the in-line connector.

B. Install a Map/Reading Light Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Move the light assembly into position in the airplane cabin.	Hold the light assembly.
(2)	Connect the electrical cables to the light assembly.	At the in-line connector.
(3)	Move the light assembly into position, lamp end first, then push the switch end up into position until the spring clip engages.	Make sure that the light assembly is correctly installed and that the spring clip is fully engaged.
(4)	Reset the TAXI/MAP/ACL circuit breaker.	
(5)	Do a test for the correct function of the light assembly.	

3. Replace a Filament in a Map/Reading Light Assembly (if MÄM 42-1024 is not installed)

	Detail Steps/Work Items	Key Items/References
(1)	Pull the TAXI/MAP/ACL circuit breaker.	Instrument panel, right side.
(2)	Remove the light assembly.	Refer to Paragraph 2A.
(3)	Remove the filament holder from the back of the light assembly.	
(4)	Replace the filament.	
(5)	Install the filament holder to the rear of the light assembly.	
(6)	Install the light assembly.	Refer to Paragraph 2B.
(7)	Reset the TAXI/MAP/ACL circuit breaker.	
(8)	Do a test for the correct function of the light assembly.	

4. Remove/Install a Map/Reading Light Assembly (if MÄM 42-1024 is installed)

A. Remove a Map/Reading Light Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Pull the TAXI/MAP/ACL circuit breaker.	Instrument panel, right side.
(2)	Remove the light assembly: – Loosen the three screws which hold the light assembly in position. – Lower the light assembly from the cabin roof and disconnect the electrical cables. – Move the light assembly clear of the airplane.	 Slightly open the screws to prevent the locking plate from falling into the area behind the map lights. At the in-line connector.

B. Install a Map/Reading Light Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Open the screws, so that the threads of the locking plates are just screwed in.	Make sure that no locking plate falls down.
(2)	Install the map light seal (self adhesive) on the map light frame.	
(3)	Move the light assembly into position in the airplane cabin.	Hold the light assembly.
(4)	Connect the electrical cables to the light assembly.	At the in-line connector.
(5)	Install the map light seal for emergency lever on the emergency exit lever that the recess in the frame is covered.	
(6)	Move the light assembly into position.	Make sure that the light assembly is correctly positioned.
CAUTION: THE LOCKING PLATES MUST BE IN CORRECT POSITION		
(7)	Tighten the screws to fully engaged.	
(8)	Reset the TAXI/MAP/ACL circuit breaker.	
(9)	Do a test for the correct function of the light assembly.	

5. Replace a Filament in a Map/Reading Light Assembly (if MÄM 42-1024 is installed)

	Detail Steps/Work Items	Key Items/References
(1)	Pull the TAXI/MAP/ACL circuit breaker.	Instrument panel, right side.
(2)	Remove the light assembly.	Refer to Paragraph 4A.
(3)	Open the black plastic cover.	Loosen three screws (M3x10).
(4)	Pull the cable with the socket out of the lamp.	
(5)	Open the nut and take out the LED lamp.	
(6)	Install a new LED lamp, tighten the nut and connect the plug.	
(7)	Close the light cover.	
(8)	Install the light assembly.	Refer to Paragraph 4B.

(9)	Reset the TAXI/MAP/ACL circuit breaker.	
(10)	Do a test for the correct function of the light assembly.	

6. Remove/Install a Dimmer Switch

Use this procedure for both the FLOOD light dimmer switch and the INSTRUMENT lights dimmer switch.

A. Remove a Dimmer Switch

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the knob from the dimmer switch that you will remove: – Loosen the grub screw that attaches the knob to the switch spindle. – Pull the knob off the switch spindle.	
(4)	Disconnect the electrical cables from the rear of the dimmer switch.	Make a note of the connections.
(5)	Remove the placard panel.	Refer to Section 11-30.
(6)	Remove the nut and washer from the front of the dimmer switch.	Hold the dimmer switch.
(7)	Move the dimmer switch forward and clear of the instrument panel.	

B. Install a Dimmer Switch

	Detail Steps/Work Items	Key Items/References
(1)	Move the dimmer switch into position in the instrument panel.	From the forward side of the panel. Make sure that the locating peg on the switch engages with the hole in the instrument panel.
(2)	Install the washer and nut that attaches the dimmer switch to the instrument panel.	Make sure that the dimmer switch is installed with the correct orientation.
(3)	Connect the electrical cables to the rear of the dimmer switch.	Refer to Chapter 92 for the wiring diagrams. Use the note that you made at Paragraph 4A, step 4.
(4)	Install the placard panel.	Refer to Section 11-30.
(5)	Install the knob to the front of the dimmer switch: – Align the flat on the switch spindle with the flat in the bore of the knob. – Push the knob onto the switch spindle. – Tighten the grub screw that holds the knob onto the switch spindle.	
(6)	Install the instrument panel cover.	Refer to Section 25-10.
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do a test for the correct operation of the dimmer switch: – Set the ELECT. MASTER switch to ON. – Rotate the dimmer switch clockwise. – Rotate the dimmer switch fully clockwise. – Rotate the dimmer switch fully counter-clockwise to the OFF position. – Set the ELECT. MASTER switch to OFF.	The system light(s) must come on. The intensity of the light(s) must increase. The light(s) must go off.

7. Replace the Flood Light/Instrument Light Strip

You cannot remove the flood light/instrument light strip without causing damage to the strip. Only remove the flood light/instrument light strip if it is defective.

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the instrument panel cover and place on a clean work bench.	Refer to Section 25-10.
(3)	Remove the light strip from the inside of the instrument panel cover: – Peel the light strip away from the panel cover.	
(4)	Install the new flood light/instrument light strip to the inside of the instrument panel cover: – Make sure that the area where the light strip attaches to the instrument cover is clean. – Apply double-sided tape to the back of the light strip. – Position the flood light/instrument light strip and firmly press into place.	Use a commercial solvent. Obey the solvent manufacturer's directions. Use the tape specified in the DA 42 NG Illustrated Parts Catalog or that is supplied with the flood light strip.
(5)	Install the instrument panel cover.	Refer to Section 25-10.
(6)	Connect the airplane main battery.	Refer to Section 24-31.

	Detail Steps/Work Items	Key Items/References
(7)	Do a test for the correct operation of the flood light/instrument light panel:	
	– Set the ELECT. MASTER switch to ON.	
	– Rotate the FLOOD light/INSTRUMENT light dimmer switch fully clockwise.	The light strip must come on bright.
	– Rotate the FLOOD light/INSTRUMENT light dimmer switch a small amount counter-clockwise.	The light strip must go dimmer.
	– Rotate the FLOOD light/INSTRUMENT light dimmer switch fully counter-clockwise.	The light strip must go off.
	– Set the ELECT. MASTER switch to OFF.	

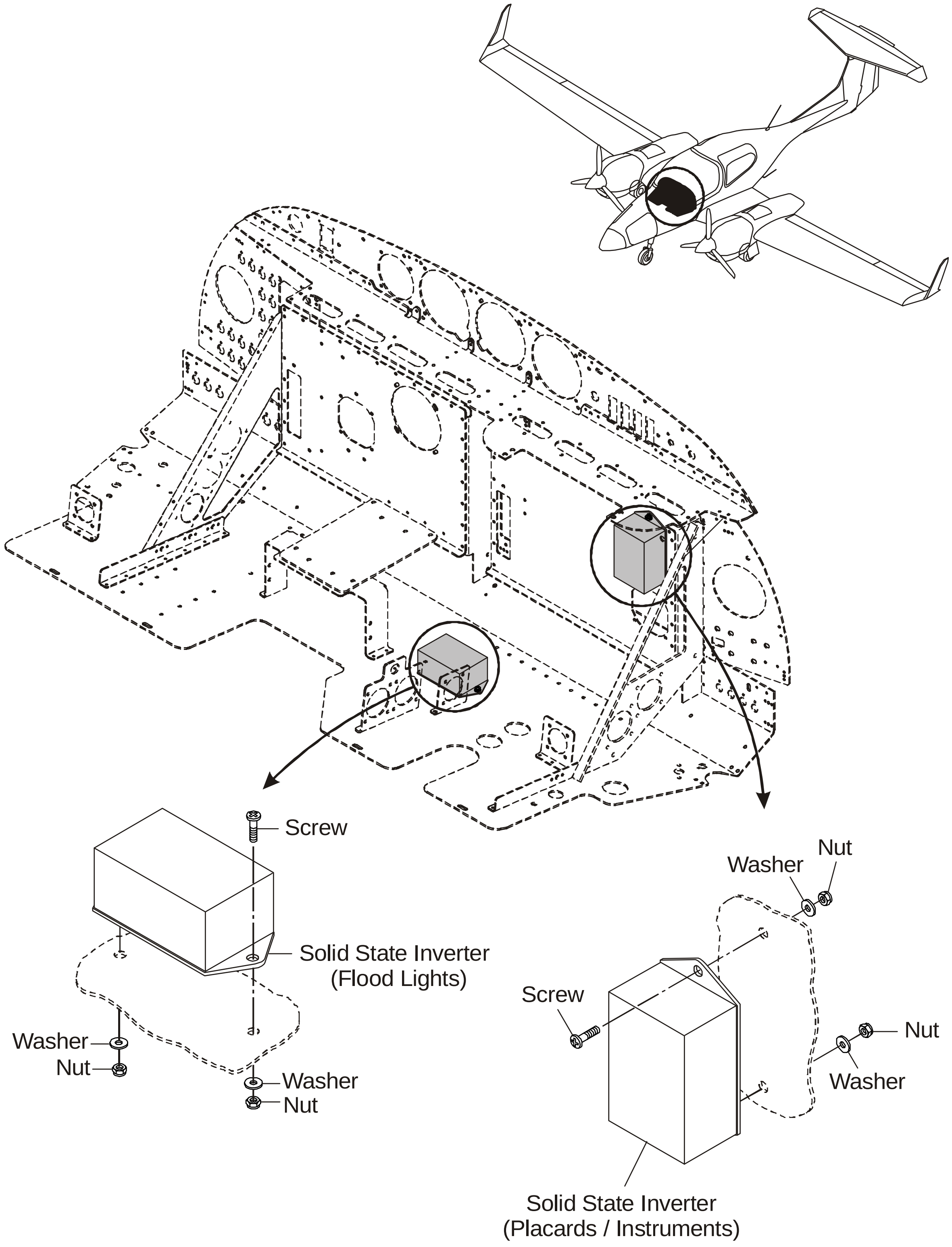

Figure 2: Solid State Inverters for the Instrument and Flood Lights

8. Remove/Install a Solid State Inverter for the Flood Light/Instrument Lights

Use this procedure for both the flood light inverter and the instrument lights inverter.

A. Remove a Solid State Inverter

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Disconnect the electrical cables from the inverter.	At the in-line connector.
(4)	For removal of the instrument light inverter, remove the PFD.	Refer to Section 31-40.
(5)	Remove the inverter: – Remove the 2 screws, washers and nuts that attach the inverter to the instrument panel floor. – Move the inverter clear of the instrument panel.	

B. Install a Solid State Inverter

	Detail Steps/Work Items	Key Items/References
(1)	Install the inverter: – Move the inverter into position on the instrument panel floor. – Install the 2 washers, screws and nuts that attach the inverter to the instrument panel floor.	
(2)	For the instrument light inverter, install the PFD.	Refer to Section 31-40.
(3)	Connect the electrical cables to the inverter.	At the in-line connector.
(4)	Install the instrument panel cover.	Refer to Section 25-10.
(5)	Connect the airplane main battery.	Refer to Section 24-31.
(6)	Do a test for the correct operation of the inverter: – Set the ELECT. MASTER switch to ON. – Rotate the related dimmer switch clockwise. – Rotate the related dimmer switch fully clockwise. – Rotate the dimmer switch fully counter-clockwise to the OFF position. – Set the ELECT. MASTER switch to OFF.	The system light(s) must come on. The intensity of the light(s) must increase. The light(s) must go off.

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Section 33-40
Exterior Lights

1. General

This Section tells you about the exterior lights of the DA 42 NG. The DA 42 NG has these exterior lights:

– Position lights.

– Strobe lights.

– Landing light.

– Taxi light.

2. Description

The DA 42 NG has the position lights and the strobe lights in a single light unit in each wing tip. The taxi and landing lights are located below the fuselage. Figure 1 and 2 show the wing tip light unit and Figure 3 shows the landing and taxi lights.

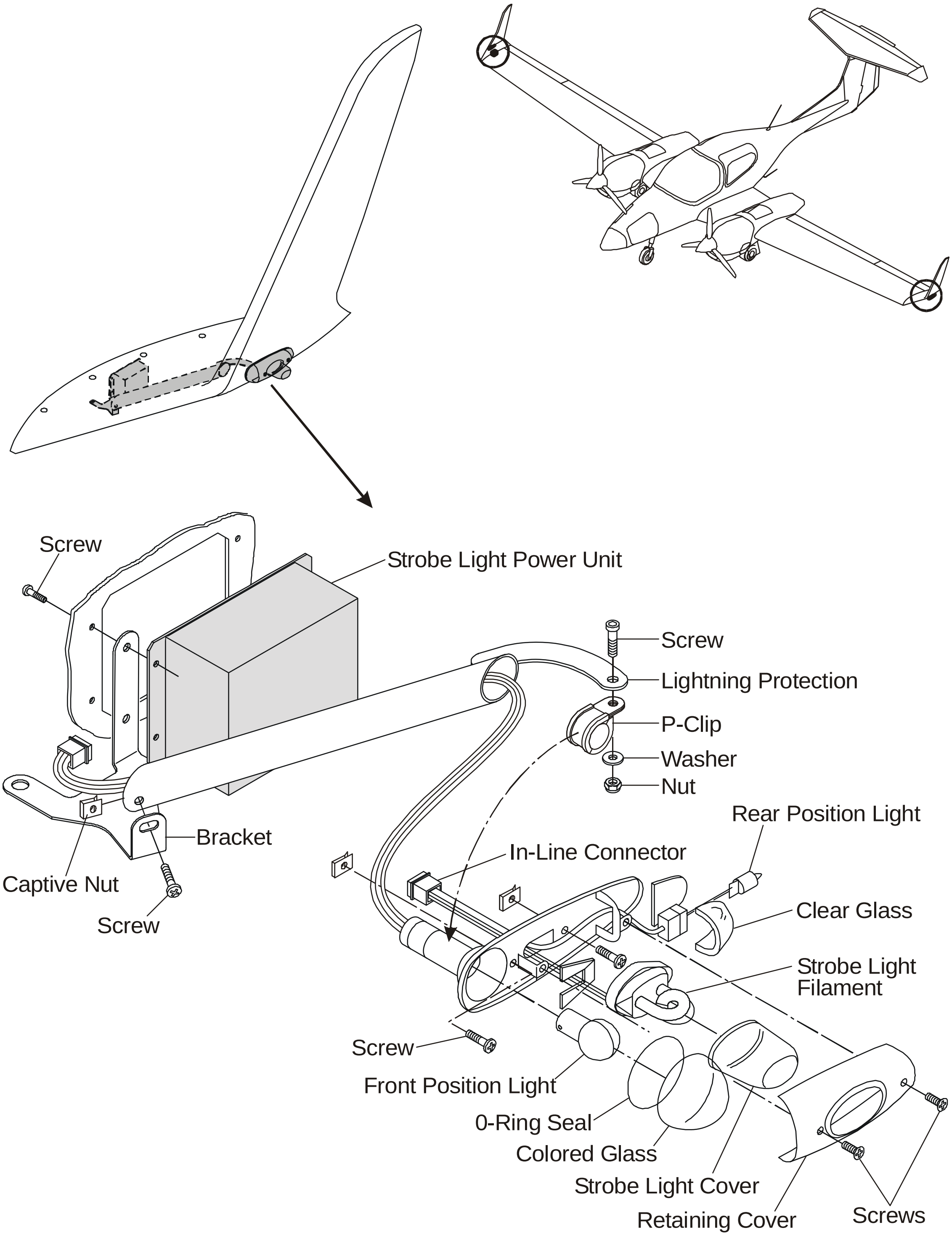

Figure 1: Wing Tip Light Unit and Strobe Power Unit

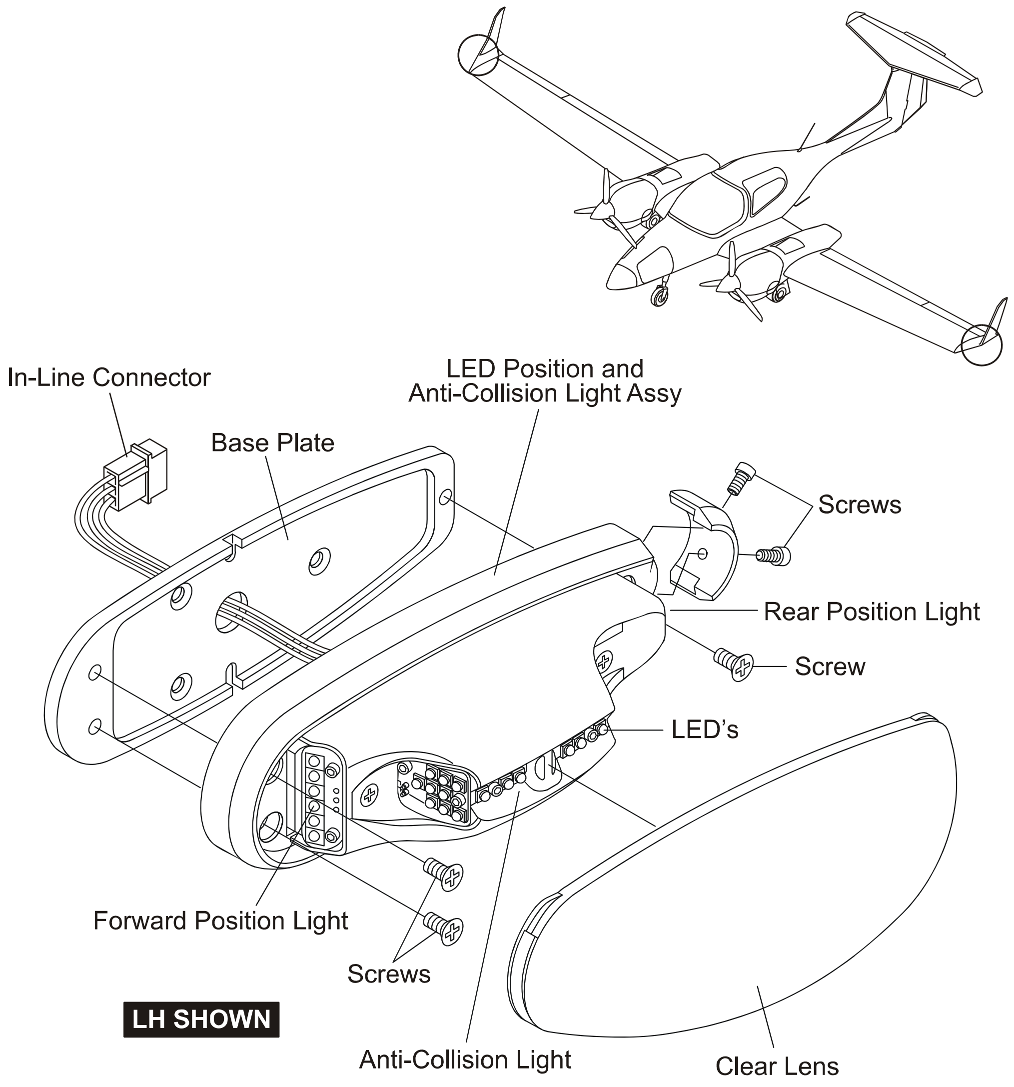

Figure 2: Wing Tip-Light Unit (if OÄM 42-222 is installed)

A. Position Lights (if OÄM 42-222 is NOT installed)

The DA 42 NG has left and right position lights. The front part of each light unit has a red (left) lens or green (right) lens. The light can only be seen from the front or the side of the airplane.

Each light unit also has an aft light. Each aft light has a clear lens. The light can only be seen from the rear of the airplane.

A switch on the top left of the instrument panel controls the position lights and a circuit breaker protects the system.

B. Strobe Light (Anti-Collision Light - ACL), if OÄM 42-222 is NOT installed

The middle part of each wing tip light unit has a clear optic lens for a strobe light. The filament gives a high intensity flash. This is followed immediately by a less bright flash. The double-flashes occur about 50 times per minute. The strobe lights can be seen from all round the airplane.

A separate power unit for each strobe light is mounted in the wing tip. A switch on the top left of the instrument panel controls both the strobe lights and the system is protected by a circuit breaker.

The power unit generates an electrical impulse of approximately 600 Volts. The pulse ionizes the gas in the strobe light which causes a bright flash. A second less powerful pulse occurs immediately after the main pulse to give the lower intensity second flash.

C. LED Position and Anti-Collision Light (if OÄM 42-222 is installed)

The DA 42 NG has left and right LED position and anti-collision light assemblies. The position and anti-collision lights are installed on a base plate covered by a clear lens. The LEDs provide the coloration. The forward position light is covered with red (left) or green (right) LEDs. The rear position light is designed with two white LEDs. The anti-collision light is designed with 24 white LEDs. If one of the LEDs fails, the unit must be replaced.

The position lights and the anti-collision lights are controlled by separate switches and are protected by individual circuit breakers.

D. Landing Light

The landing light is located in a housing below the center fuselage, on the right. The landing light has a clear lens and Xenon filament. The landing light has an electronic controller located on the wing center section floor, below the pilots' seats. A switch on the top left of the instrument panel controls the landing light and a circuit breaker protects the system.

E. Taxi Light

The taxi light is located in a housing below the center fuselage, on the left. The taxi light has a clear lens and Xenon filament. The taxi light has an electronic controller located on the wing center section floor, below the pilots' seats. A switch on the top left of the instrument panel controls the taxi light and a circuit breaker protects the system.

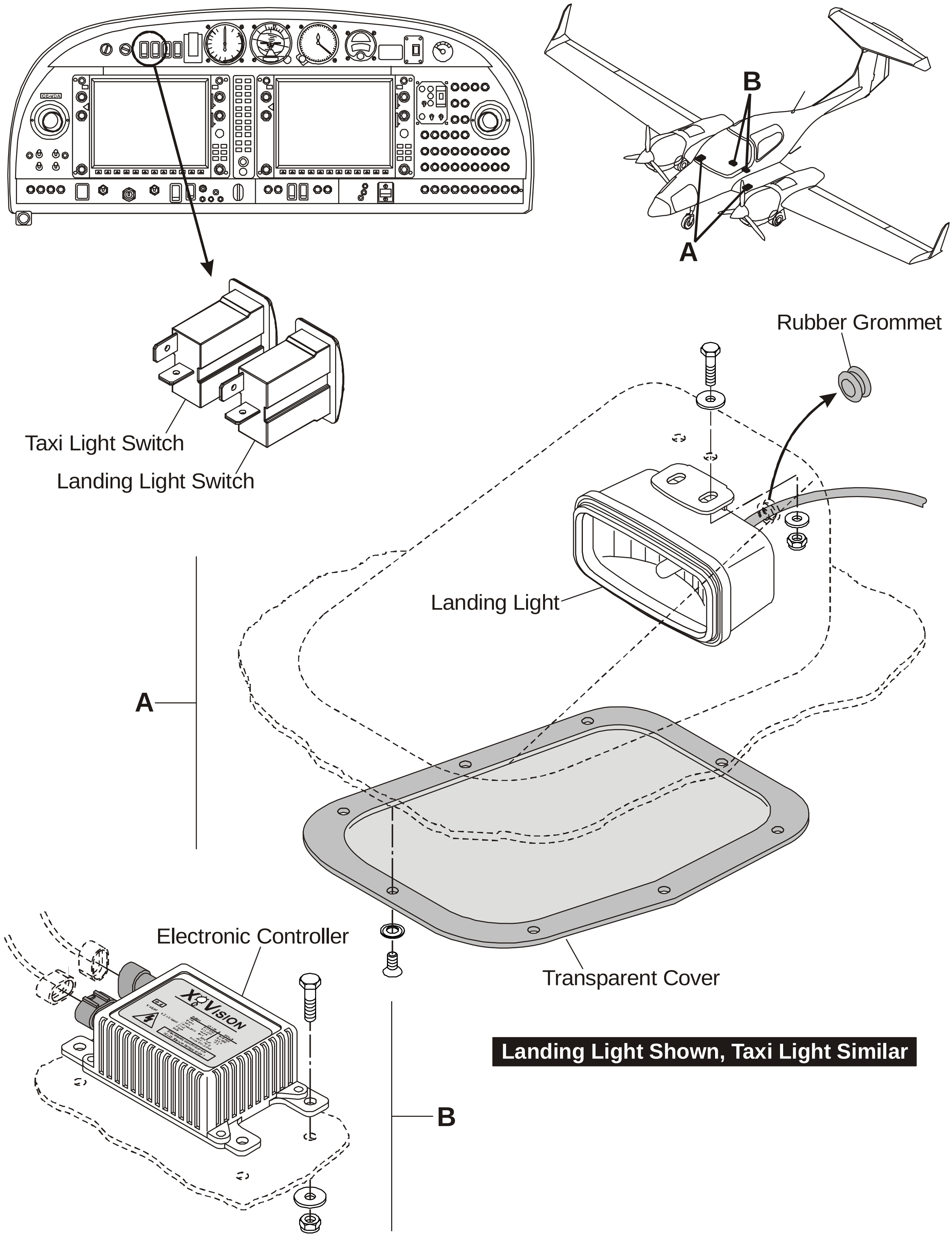

Figure 3: Landing and Taxi Light Installation

Trouble-Shooting

1. General

This Section lists some defects you could have with the exterior lighting system. If you have the trouble shown in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Both position lights do not operate.	Circuit breaker not set or defective. Defective position light switch. Defective wiring.	Reset/replace circuit breaker. Replace the switch. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.
One position light does not operate.	Defective filament. Defective wiring.	Replace the filament. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.
Both strobe lights do not operate.	Circuit breaker not set or defective. Defective strobe light switch. Defective wiring.	Reset/replace circuit breaker. Replace the switch. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.

Trouble	Possible Cause	Repair
One strobe light does not operate.	Defective power supply unit (if OÄM 42-222 is NOT installed). Defective strobe unit or LED. Defective wiring.	Replace the power supply unit. Replace the strobe unit or the light assembly. Repair/Replace the wiring. Refer to Chapter 92 for the wiring diagrams.
Strobe and position light does not operate on one side.	Connector at outer wing to center section disconnected.	Connect the connector.
Landing light or taxi light does not operate.	Defective light unit. Defective electronic controller. Circuit breaker not set or defective. Defective landing light or taxi light switch. Loose connector at the light unit. Defective wiring.	Replace the defective light unit. Replace the defective electronic controller. Reset/replace circuit breaker. Replace the defective switch. Connect the connector correctly. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install defective filaments and light units. They also tell you how to remove/install the major components of the exterior lighting system. Refer to Chapter 92 for the wiring diagrams.

WARNING: DO NOT OPERATE THE STROBE LIGHTS WHEN PERSONS ARE CLOSE TO THE AIRPLANE. DO NOT LOOK AT THE LIGHT WHEN IT OPERATES. STROBE LIGHTS CAN CAUSE EYE DAMAGE.

WARNING: AFTER YOU SET THE AIRPLANE POWER OFF YOU MUST WAIT A MINIMUM OF 5 MINUTES BEFORE YOU DO WORK ON THE STROBE LIGHTS. THE POWER SUPPLIES TO THE STROBE LIGHTS GENERATE HIGH VOLTAGES. HIGH VOLTAGES CAN CAUSE INJURY OR DEATH TO PERSONS.

2. Remove/Install the Taxi Light

A. Remove the Taxi Light

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	Instrument panel.
(2)	Set the TAXI light switch to OFF.	Top left of instrument panel.
(3)	Set the TAXI/MAP/ACL circuit breaker open.	Pull.
(4)	Remove the pilot's seat.	Refer to Section 25-10.
(5)	Remove the taxi light cover from below the center fuselage: – Remove the 8 screws and washers that attach the light cover to the housing. – Move the light cover clear of the housing.	Refer to Figure 3.
(6)	Remove the 2 nuts, washers and bolts that attach the taxi light unit to the structure.	
(7)	Hold the taxi light and move out a small way from the housing and disconnect the electrical cables. Move the taxi light clear of the housing.	At the in-line connector.

B. Install the Taxi Light

	Detail Steps/Work Items	Key Items/References
(1)	Install the taxi light unit: – Move the light unit into position by the housing. – Connect the electrical connections to the light unit. – Move the light unit fully into position in the housing. – Install the 2 bolts, washer and nuts that attach the light unit to the structure.	Refer to Figure 3. At the in-line connector.
(2)	Install the light cover: – Move the light cover into position below the fuselage. – Install the 8 screws and washers that attach the light cover to the light housing.	
(3)	Reset the TAXI/MAP/ACL circuit breaker.	Instrument panel, right side.
(4)	Set the ELECT. MASTER switch to ON.	Instrument panel.
(5)	Do a test for the correct operation of the taxi light: – Set the TAXI light switch to ON. – The taxi light must come on. – Set the TAXI light switch to OFF. – The taxi light must go off.	
(6)	Set the ELECT. MASTER switch to OFF.	Instrument panel.
(7)	Install the pilot's seat.	Refer to Section 25-10.

3. Remove/Install the Landing Light

A. Remove the Landing Light

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	Instrument panel.
(2)	Set LANDING light switch to OFF.	Top left of instrument panel.
(3)	Set the LDG LT/START circuit breaker open.	Pull.
(4)	Remove the co-pilot's seat.	Refer to Section 25-10.
(5)	Remove the landing light cover from below the center fuselage: – Remove the 8 screws and washers that attach the cover to the light housing. – Move the light cover clear of the housing.	Refer to Figure 3.
(6)	Remove the 2 nuts, washers and bolts that attach the landing light unit to the structure.	
(7)	Hold the landing light and move out a small way from the housing and disconnect the electrical cables. Move the landing light clear of the housing.	At the in-line connector.

B. Install the Landing Light

	Detail Steps/Work Items	Key Items/References
(1)	Install the landing light unit: – Move the light unit into position by the housing. – Connect the electrical connections to the light unit. – Move the light unit fully into position in the housing. – Install the 2 bolts, washers and nuts that attach the light unit to the structure.	Refer to Figure 3. At the in-line connector.
(2)	Install the light cover onto the housing: – Move the light cover into position at the housing. – Install the 8 screws and washers that attach the light cover to the light housing.	
(3)	Reset the LDG LT/START circuit breaker.	Instrument panel, right side.
(4)	Set the ELECT. MASTER switch to ON.	Instrument panel.
(5)	Do a test for the correct operation of the landing light: – Set the LANDING light switch to ON. – The landing light must come on. – Set the LANDING light switch to OFF. – The landing light must go off.	
(6)	Set the ELECT. MASTER switch to OFF.	Instrument panel.
(7)	Install the co-pilot's seat.	Refer to Section 25-10.

4. Remove/Install an Electronic Controller

Use this procedure for both the landing light and taxi light electronic controllers. Refer to Figure 3.

A. Remove an Electronic Controller

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	Instrument panel.
(2)	Set LANDING/TAXI light switch to OFF.	Top left of instrument panel.
(3)	Set the LDG LT/START or TAXI/MAP/ACL circuit breaker open as necessary.	Pull. Right side of instrument panel.
(4)	Remove the pilot's/co-pilot's seat as required.	Refer to Section 25-10.
(5)	Remove the electronic controller: – Disconnect the electrical cables form the controller. – Remove the nuts, washers, bolts and bonding wire lead that attach the controller to the structure. – Move the controller clear of the airplane.	Refer to Figure 3. Note the position of the wire bonding lead.

B. Install an Electronic Controller

	Detail Steps/Work Items	Key Items/References
(1)	Install the electronic controller: – Move the controller into position under the pilot's/co-pilot's seat. – Install the 2 bolts, washers, wire bonding lead and nut that attaches the controller to the airplane structure.	
(2)	Connect the electrical cables to the controller.	At the in-line connectors.
(3)	Do a test for the correct operation of the LANDING/TAXI light: – Set the LDG LT/START or TAXI/MAP/ACL circuit breaker as necessary. – Set the ELECT. MASTER switch to ON. – Set the LANDING/TAXI light switch to ON. – Set the LANDING/TAXI light switch to OFF. – Set the ELECT. MASTER switch to OFF.	 Push the circuit breaker in. Right side of instrument panel. Instrument panel, lower. The related light must come on. The related light must go off.
(4)	Install the pilot's/co-pilot's seat as required.	Refer to Section 25-10.

5. Replace a Filament in the Wing Tip Light Unit (OÄM 42-222 is NOT installed)

A. Replace a Position Light Filament in the Wing Tip

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	
	WARNING: AFTER YOU SET THE POWER TO OFF YOU MUST WAIT A MINIMUM OF 5 MINUTES BEFORE YOU DO WORK ON THE STROBE LIGHTS. THE POWER SUPPLIES TO THE STROBE LIGHTS GENERATE HIGH VOLTAGE. HIGH VOLTAGE CAN CAUSE DEATH OR INJURY TO PERSONS.	
(2)	Set these circuit breakers open: – INST LT/NAV LT. – TAXI/MAP/ACL.	
(3)	Remove the light unit cover and the lamp glasses from the wing tip unit: – Remove the 2 screws that attach the cover to the unit. – Remove the cover. – Remove the glasses and seals.	Refer to Figure 1. Hold the cover and glasses.
(4)	Replace the defective filament.	
(5)	Install the lamp glasses and light unit cover: – Move the glasses into position with the seals. – Move the light unit cover into position. – Install the 2 screws that attach the cover to the light unit.	 Make sure that the seals are correctly located.

	Detail Steps/Work Items	Key Items/References
(6)	Set these circuit breakers: – INST LT/NAV LT. – TAXI/MAP/ACL.	
(7)	Do a test for the correct operation of the position light: – Set the ELECT. MASTER switch to ON. – Set the POSITION light switch to ON. – Set the POSITION light switch to OFF. – Set the ELECT. MASTER switch to OFF.	The position lights must all come on. The position lights must all go off.

B. Replace a Strobe Light Filament in the Wing Tip

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	
	WARNING: AFTER YOU SET THE POWER TO OFF YOU MUST WAIT A MINIMUM OF 5 MINUTES BEFORE YOU DO WORK ON THE STROBE LIGHTS. THE POWER SUPPLIES TO THE STROBE LIGHTS GENERATE HIGH VOLTAGE. HIGH VOLTAGE CAN CAUSE DEATH OR INJURY TO PERSONS.	
(2)	Set these circuit breakers open: – INST LT/NAV LT. – TAXI/MAP/ACL.	
(3)	Remove the light unit cover and the lamp glasses from the wing tip unit: – Remove the 2 screws that attach the cover to the unit. – Remove the cover. – Remove the glasses and seals.	Refer to Figure 1. Hold the cover and glasses.
(4)	Replace the strobe light filament.	Disconnect/connect the electrical cables at the in-line connector.
(5)	Install the lamp glasses and light unit cover: – Move the glasses into position with the seals. – Move the light unit cover into position. – Install the 2 screws that attach the cover to the light unit.	 Make sure that the seals are correctly located.

	Detail Steps/Work Items	Key Items/References
(6)	Set these circuit breakers: – INST LT/NAV LT. – TAXI/MAP/ACL.	
(7)	Do a test for the correct operation of the strobe light: – Set the ELECT. MASTER switch to ON. – Set the STROBE light switch to ON. – Set the STROBE light switch to OFF. – Set the ELECT. MASTER switch to OFF.	 The strobe lights must both operate. The strobe lights must all go off.

6. Remove/Install a Wing Tip Light Unit

A. Remove a Wing Tip Light Unit

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	
	WARNING: AFTER YOU SET THE POWER TO OFF YOU MUST WAIT A MINIMUM OF 5 MINUTES BEFORE YOU DO WORK ON THE STROBE LIGHTS. THE POWER SUPPLIES TO THE STROBE LIGHTS GENERATE HIGH VOLTAGE. HIGH VOLTAGE CAN CAUSE DEATH OR INJURY TO PERSONS.	
(2)	Set these circuit breakers open: – INST LT/NAV LT. – TAXI/MAP/ACL.	
(3)	Remove the light unit cover and the lamp glasses from the wing tip unit: – Remove the 2 screws that attach the cover to the unit. – Remove the cover. – Remove the glasses and seals.	Refer to Figures 1 and 2. Hold the cover and glasses.
(4)	Remove the 3 light filaments (if OÄM 42-222 is NOT installed).	Make sure that you disconnect the strobe light filament at the connector.
(5)	Remove the wing tip from the wing: – Remove the screws that attach the wing tip to the wing. – Move the wing tip just clear of the wing and disconnect the electrical connectors. – Move the wing tip clear of the airplane.	

	Detail Steps/Work Items	Key Items/References
(6)	Remove the light unit from the wing tip: – Remove the nut, washer, bolt and P-clamp that attach the bonding strip to the light unit. – Remove the screws that attach the light unit to the wing tip. – Carefully move the light unit out from the wing tip. – Disconnect the 2 electrical in-line connectors from the rear of the light unit. – Move the light unit clear of the airplane.	

B. Install a Wing Tip Light Unit

	Detail Steps/Work Items	Key Items/References
(1)	Install the light unit: – Move the light unit into position at the wing tip. – Connect the 2 electrical connectors at the rear of the light unit. – Move the light unit into the wing tip. – Install the screws that attach the light unit to the wing tip. – Install the P-clamp, bolt, washer and nut that attach the bonding strip to the light unit.	Refer to Figure 1.
(2)	Install the filaments to the light unit (if OÄM 42-222 is NOT installed).	
(3)	Install the lamp glasses and light unit cover: – Move the glasses into position with the seals. – Move the light unit cover into position. – Install the 2 screws that attach the cover to the light unit.	Make sure that the seals are correctly located.
(4)	Install the wing tip onto the wing: – Move the wing tip into position near the wing. – Connect the electrical connections to the wing tip. – Move the wing tip fully into position and install the screws that attach the wing tip to the wing.	At the connector.

	Detail Steps/Work Items	Key Items/References
(5)	Set these circuit breakers: – INST LT/NAV LT. – TAXI/MAP/ACL.	
	WARNING: DO NOT OPERATE THE STROBE LIGHTS WHEN PERSONS ARE CLOSE TO THE AIRPLANE AND DO NOT LOOK AT THE LIGHT WHEN THE LIGHT OPERATES. HIGH INTENSITY STROBE LIGHTS CAN CAUSE EYE DAMAGE.	
(6)	Do a test for the correct operation of the strobe light: – Set the ELECT. MASTER switch to ON. – Set the STROBE light switch to ON. – Set the STROBE light switch to OFF.	 The strobe lights must both operate. The strobe lights must all go off.
(7)	Do a test for the correct operation of the position light: – Set the POSITION light switch to ON. – Set the POSITION light switch to OFF. – Set the ELECT. MASTER switch to OFF.	 The position lights must all come on. The position lights must all go off.

7. Remove/Install a Strobe Power Unit in the Wing Tip (if OÄM 42-222 is NOT installed)

A. Remove a Strobe Power Unit from the Wing Tip

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	
	WARNING: AFTER YOU SET THE POWER TO OFF YOU MUST WAIT A MINIMUM OF 5 MINUTES BEFORE YOU DO WORK ON THE STROBE LIGHTS. THE POWER SUPPLIES TO THE STROBE LIGHTS GENERATE HIGH VOLTAGE. HIGH VOLTAGE CAN CAUSE DEATH OR INJURY TO PERSONS.	
(2)	Set these circuit breakers open: – INST LT/NAV LT. – TAXI/MAP/ACL.	
(3)	Remove the wing tip from the wing: – Remove the screws that attach the wing tip to the wing. – Move the wing tip just clear of the wing and disconnect the electrical connectors. – Move the wing tip clear of the airplane.	
(4)	Disconnect the electrical cables from the power unit.	At the in-line connector at the power unit.
(5)	Remove the power unit from the wing tip: – Remove the 4 screws that attach the power unit to the structure. – Move the power unit clear of the wing tip.	

B. Install a Strobe Power Unit into a Wing Tip

	Detail Steps/Work Items	Key Items/References
(1)	Install the power unit into the wing tip: – Move the power unit into position in the wing tip. – Install the 4 screws that attach the power unit to the structure.	
(2)	Connect the power cables to the power unit.	At the in-line connector at the power unit.
(3)	Install the wing tip onto the wing: – Move the wing tip into position near the wing. – Connect the electrical connections to the wing tip. – Move the wing tip fully into position and install the screws that attach the wing tip to the wing.	 At the connector.
WARNING:	**DO NOT OPERATE THE STROBE LIGHTS WHEN PERSONS ARE CLOSE TO THE AIRPLANE AND DO NOT LOOK AT THE LIGHT WHEN THE LIGHT OPERATES. HIGH INTENSITY STROBE LIGHTS CAN CAUSE EYE DAMAGE.**	
(4)	Set these circuit breakers: – INST LT/NAV LT. – TAXI/MAP/ACL.	

	Detail Steps/Work Items	Key Items/References
(5)	Do a test for the correct operation of the strobe light:	
	– Set the ELECT. MASTER switch to ON.	
	– Set the STROBE light switch to ON.	The strobe lights must both operate.
	– Set the STROBE light switch to OFF.	The strobe lights must all go off.
(6)	Do a test for the correct operation of the position light:	
	– Set the POSITION light switch to ON.	The position lights must all come on.
	– Set the POSITION light switch to OFF.	The position lights must all go off.
	– Set the ELECT. MASTER switch to OFF.	

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CHAPTER 34

NAVIGATION

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CHAPTER 34
NAVIGATION

1. General

This Chapter tells you about the navigation systems in the airplane. It only tells you about the installation in the airplane. Refer to the equipment manufacturers' manuals for more data about the equipment and refer to the Wiring Diagrams in Chapter 92 for more data about the electrical wiring for the navigation systems.

Refer to Section 23-10 for more data about the NAV system which is part of the speech communication system.

The DA 42 NG has these navigation systems. Refer to these Sections for data about the systems:

– Section 34-10. Flight environment data (Pitot/static/OAT/flight instruments).

– Section 34-20. Attitude and direction (compass/artificial horizon).

– Section 34-30. Landing and taxiing aids (localizer).

– Section 34-40. Independent position determining.

– Section 34-50. Dependent position determining (VOR/transponder/altitude encoder/GPS).

Note: Refer to Section 20-90 before starting maintenance work in the center wing area.

2. Description

A. Flight Environment Data

The DA 42 NG has the usual flight environment data systems. It has a Pitot system. The Pitot system has a Pitot probe located under the left wing. The Pitot probe has an electric heater. The heater is controlled by a switch on the left side of the instrument panel, at the bottom. Flexible plastic hoses connect the Pitot probe to the airplane instruments. The static probe of the Pitot system is not used in this installation.

The airplane has a static system. The normal static vents are located on the rear fuselage. An alternate static vent is located in the cockpit, under the instrument panel, on the left side. The pilot opens the alternate static vent by turning a valve on the vent.

The Pitot system and the static system connect to these flight instruments and systems:

– Altimeter (if OÄM 42-270 is NOT installed).

– Airspeed indicator (if OÄM 42-270 is NOT installed).

– Standby attitude module (if OÄM 42-270 is installed).

– Integrated cockpit system (ICS).

The DA 42 NG also has an electronic outside air temperature (OAT) indicator. The indicator is integral with the ICS. Refer to Section 31-40 for more data about the ICS. The probe for the OAT is located below the nose baggage compartment.

B. Attitude and Direction

The DA 42 NG has a magnetic compass mounted in the instrument panel, on the right side, at the top. The airplane is also equipped with an attitude gyro (artificial horizon) or standby attitude module (if OÄM 42-270 is installed) mounted at the top of the instrument panel, centrally arranged.

C. Landing and Taxiing Aids

The DA 42 NG has a localizer system which is part of the ICS. Refer to Section 31-40 for more data about the landing and taxiing aids which are part of the ICS.

D. Independent Position Determining

The DA 42 NG may be equipped with the following independent position determining systems:

– Stormscope system, consisting of stormscope processor and stormscope antenna.

– Traffic advisory system, consisting of a processor, two antennas and a transponder coupler

E. Dependent Position Determining

The DA 42 NG has these dependent position determining systems that are integral with the ICS:

- VOR/LOC.
- Global positioning system (GPS).
- Transponder.
- DME.
- ADF.
- Marker beacon receiver.

Refer to Section 31-40 for more data about the integrated cockpit system.

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Section 34-10
Flight Environment Data

1. General

This Section tells you about the Pitot system and the OAT sensor. It does not tell you about the OAT indication. The OAT indication is integral with the ICS. Refer to Section 31-40 for more data about the ICS.

Refer to Section 22-10 for information on the static pressure supplied to the autopilot system.

2. Description

– Figure 1 shows the Pitot and the static system schematic diagram.

– Figure 2 shows the component locations.

A. Pitot System

The Pitot system supplies Pitot pressure to the air data instruments and the ICS. A Pitot probe mounted below the left wing senses the Pitot pressure. The static ports on the rear fuselage sense the static pressure. An alternate static vent is located under the instrument panel, left side. The alternate static vent is normally closed. The pilot can open the alternate static vent by operating a valve-lever.

The Pitot probe has a heater element to prevent icing. A switch on the instrument panel controls the Pitot heater and a circuit breaker protects the system. The Pitot heater status is shown on the ICS.

Flexible hoses connect the Pitot probe and the alternate static vent to the air data instruments and the ICS. Pitot hoses are green and the static hoses are blue/purple or red. Push fit plastic connectors make the connections in the flexible hoses. Plastic T-pieces make junctions in the hoses.

Both Pitot and static hoses have water traps at the lowest parts of the hose run (under the pilot’s seat). T-pieces divide the hoses into 2 runs. The top runs go directly to the instruments. The bottom runs form sumps before joining the top-runs at T-pieces.

If MÄM 42-462 is installed, the static pressure system has an additional water trap below the aft baggage compartment. T-pieces at the static ports divide the hoses into 2 runs. The top runs go directly to the instruments via the water trap below the pilot’s seat and the bottom runs from a sump at the fuselage floor.

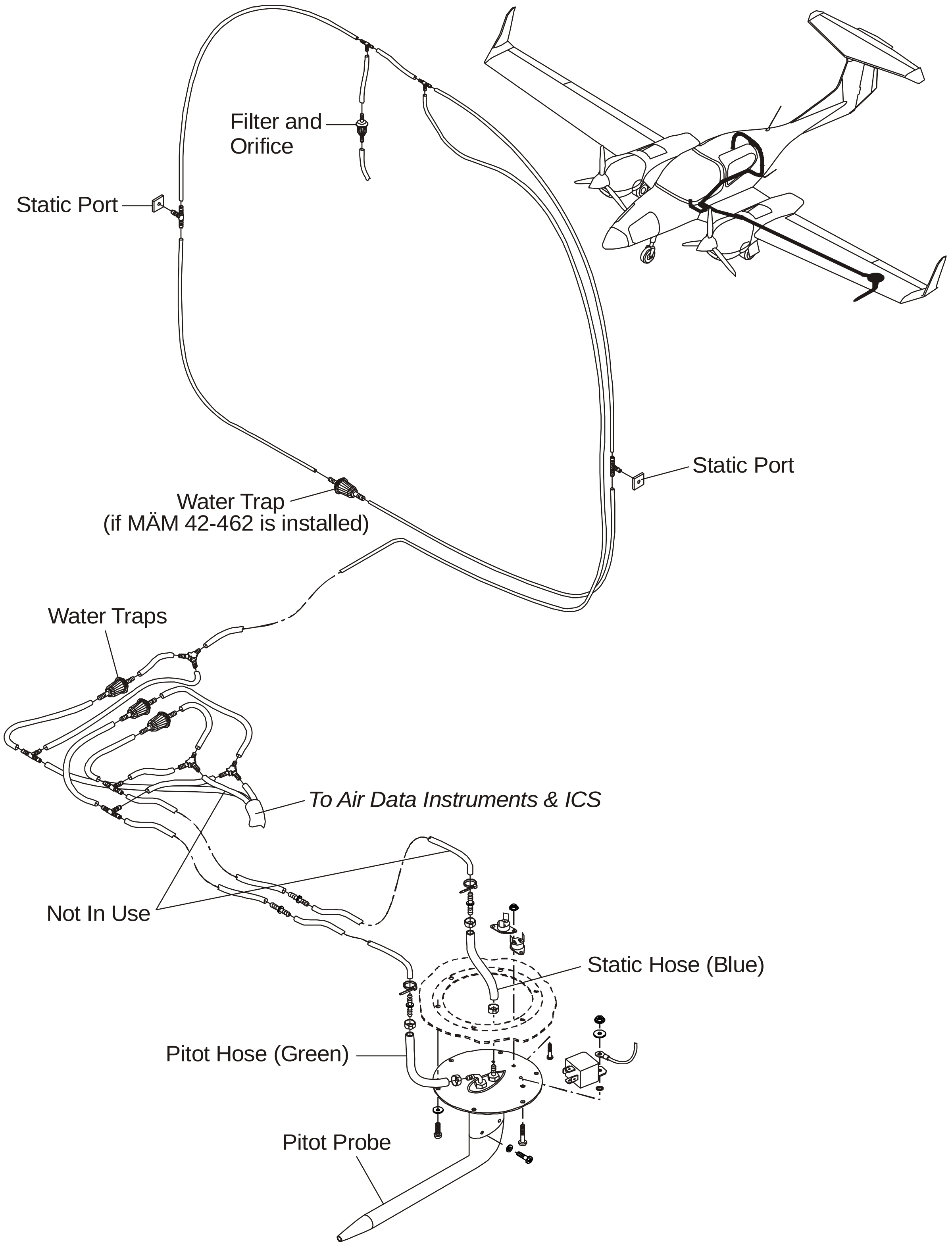

Figure 1: Pitot Probe and Static System Hoses

B. Outside Air Temperature (OAT) Probe

The OAT indicator is integral with the ICS. The OAT sensor is located below the nose baggage compartment. The ICS supplies the power for the OAT probe. Refer to Section 31-40 for more data about the ICS.

C. Air Speed Indicator (ASI)

The DA 42 NG has the usual mechanical ASI with an analogue display an airspeed indicator integral of the standby attitude module (if OÄM 42-270 is installed), as well as the speed indication displayed on the G1000's PFD.

The mechanical ASI shows the speed of the airplane relative to the ambient airmass. It does not show ground speed. Dynamic air pressure from the Pitot system acts on the inside of a bellows assembly and ambient air pressure from the static system acts on the outside of the bellows assembly. One end of the bellows assembly is fixed and the other end is connected to a gear drive assembly. The movement of the bellows assembly is translated into rotary movement of indicator arm(s) on the analogue display of the ASI. The indicator arms shows the airspeed of the airplane in knots.

The airspeed indicator integral with the ICS or standby attitude module displays airspeed on a rolling number gauge using a moving tape. Speed ranges, speed references and an airspeed trend vector are also displayed on the PFD or SAM. Refer to the G1000 system or MD302 SAM installation manual and the airplane flight manual for particular information on the ICS or SAM implemented airspeed indicator.

D. Altimeter

The DA 42 NG has the usual mechanical altimeter with an analogue display an altimeter integral of the standby attitude module (if OÄM 42-270 is installed) as well as the altimeter displayed on the G1000's PFD.

The mechanical altimeter shows the relative altitude of the airplane above a defined pressure altitude. The altimeter is a mechanical instrument. Pressure from the airplane static system acts on a sealed bellows assembly. If the altitude of the airplane increases the static pressure decreases and the bellows assembly expands. If the altitude of the airplane decreases the static pressure increases and the bellows assembly contracts.

One end of the bellows assembly is fixed and the other end is connected to a gear drive assembly. The movement of the bellows assembly is translated into rotary movement of indicator arm(s) on the analog display of the altimeter. The indicator arms shows the relative altitude of the airplane in feet. The initial setting of the altimeter can be adjusted by turning a small thumb-wheel located on the front of the instrument. This allows the instrument to be compensated for regional barometric variations and to be adjusted to indicate altitude above ground level or sea level.

The altimeter integral with the ICS or standby attitude module displays barometric altitude values on a rolling number gauge using a moving tape. Refer to the G1000 system or MD302 SAM installation manual and the airplane flight manual for particular information on the ICS or SAM implemented altimeter.

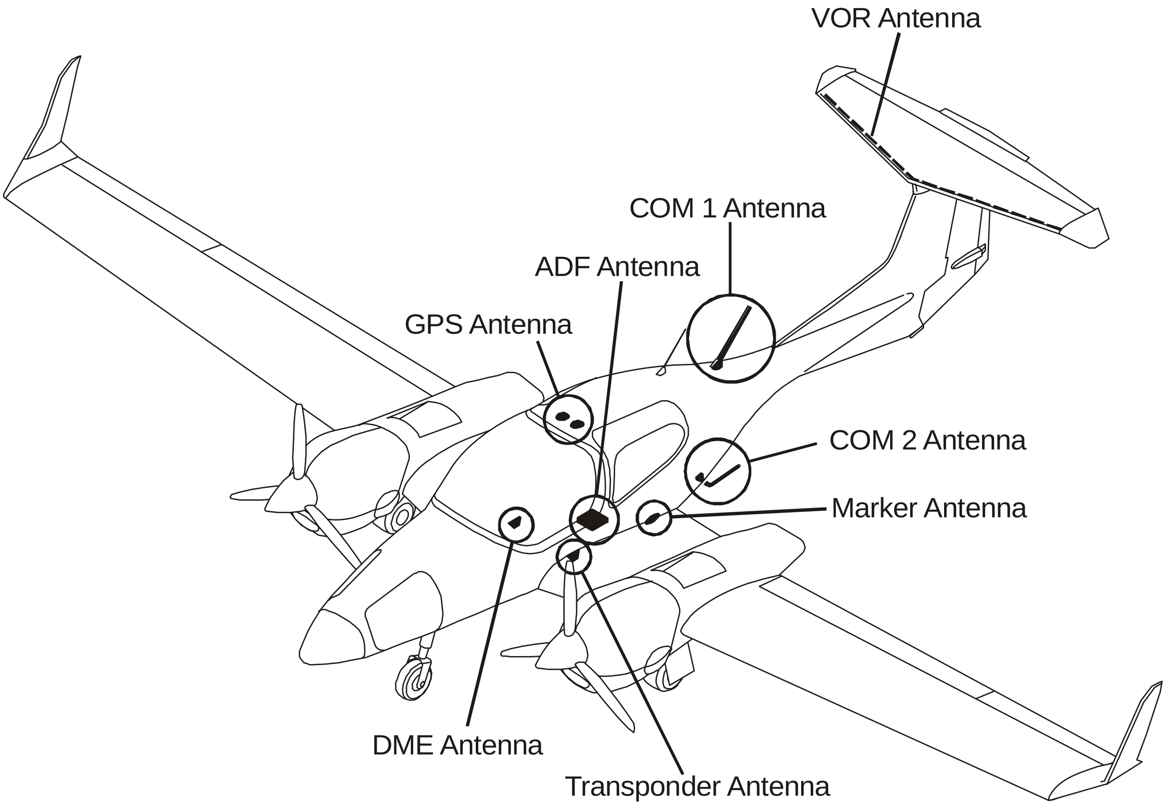

Figure 2: Flight Environment Data - Component Locations

Trouble-Shooting

1. General

The table below lists the trouble you could have with the flight environment data system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column. For more data about trouble-shooting the Standby Attitude Module (if OÄM 42-270 is installed) refer to the Installation Manual of the MD302.

Trouble	Possible Cause	Repair
Altimeter lags or reads incorrectly. VSI (on ICS) reads incorrectly.	Faulty altimeter. Blocked or kinked static hose. Water in static system.	Replace altimeter. Clear/straighten the hose. Drain the static system.
Airspeed indication incorrect (low).	Faulty indicator. Blocked or kinked Pitot hose. Water in the system. Leak in Pitot hose.	Replace ASI. Clear/straighten the hose. Drain the Pitot system. Do a Pitot-static leak check.
Pitot heater does not operate.	Pitot circuit breaker open. Pitot circuit breaker defective. Pitot heat wiring open-circuit. Pitot probe defective.	Close the circuit breaker. If the circuit breaker opens again, do a test for a short-circuit in the Pitot heat wiring system. Replace the circuit breaker. Do a continuity test of the Pitot heat wiring system. Repair or replace defective wiring. Refer to Chapter 92 for the Wiring Diagrams. Replace the Pitot probe.
OAT indication (on ICS) incorrect.	OAT probe defective.	Replace the OAT probe.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to replace the main components of the environmental data system. It also tells you how to test the Pitot-static system. Refer to the equipment manufacturers' manuals for more data about the equipment.

2. Remove/Install an ASI or Altimeter or Standby Attitude Module (if OÄM 42-270 is installed)

A. Remove an ASI or Altimeter or SAM

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the instrument panel cover.	Refer to Section 25 -10.
(3)	Disconnect the Pitot-static hose(s) from the rear of the indicator.	
(4)	Disconnect the electrical connector from the rear of the standby attitude module (if OÄM 42-270 is installed).	
(5)	Remove the screws that attach the indicator to the instrument panel.	Hold the indicator!
(6)	Remove the indicator from the instrument panel and clear of the airplane.	Fit dust caps to all open connections.

B. Install an ASI or Altimeter or SAM

	Detail Steps/Work Items	Key Items/References
(1)	Remove the dust-cover(s) from all open connections.	If necessary, install the dust covers from the new indicator onto the indicator that you removed.
(2)	If necessary, install Pitot-static hose connections onto the new indicator.	Use the connections from the indicator that you removed.
(3)	Move the indicator into position at the instrument panel.	Hold the indicator!
(4)	Install the screws that attach the indicator to the instrument panel.	
(5)	Connect the Pitot-static hose(s) to the rear of the indicator.	
(6)	Connect the electrical connector to the rear of the standby attitude module (if OÄM 42-270 is installed).	
(7)	Do a low-range static leak check.	Refer to Paragraph 5.
(8)	For the ASI only: – Do a Pitot-static leak check.	Refer to Paragraph 5.
(9)	Install the instrument panel cover.	Refer to Section 25-10.

3. Remove/Install the Pitot Probe

A. Remove the Pitot Probe

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Open the PITOT circuit breaker.	Instrument panel, right side.
(3)	Remove the Pitot probe access panel (with the Pitot probe) from the lower surface of the left wing.	Refer to Section 52-40.
(4)	Disconnect the electrical cables from the Pitot probe.	At the in-line connector.
(5)	Disconnect the Pitot and static hose connections.	Identify the connections and install dust caps on the hoses.
(6)	Disconnect the bonding-wire-assembly.	Note the position of the bonding-wire-assembly connection.
(7)	Remove the Pitot probe: – Remove the nuts and washers that attach the probe to the access panel. – Move the probe clear of the airplane.	 Hold the probe!

B. Install the Pitot Probe

	Detail Steps/Work Items	Key Items/References
(1)	Move the Pitot probe into position at the wing.	
(2)	Install the probe onto the access panel: – Move the probe into position at the access panel. – Connect the bonding-wire-assembly. – Install the bolts, washers and nuts that attach the probe to the access panel.	 Install the bonding-wire-assembly at the position noted in Paragraph 3 A, step 6.
(3)	Connect the Pitot and static hoses to the probe.	At the positions marked at Paragraph 3 A, step 5.
(4)	Connect the electrical cables to the probe.	At the in-line connector.
(5)	Install the Pitot probe access panel: – Move the panel up into position on the lower surface of the wing. – Install the 3 screws and washers that attach the access panel to the wing.	Refer to Section 52-40.
(6)	Do a test of the Pitot probe heat system: – Set the ELECT. MASTER switch to ON. – Reset the PITOT circuit breaker. – Set the PITOT switch to ON: – The Pitot probe must get warm. – Set the PITOT switch to OFF: – The Pitot probe must cool down. – Set the ELECT. MASTER switch to OFF.	 Instrument panel, left side. Instrument panel, right side. Instrument panel, left side.
(7)	Do a Pitot leak test.	Refer to Paragraph 5.
(8)	Install a cover with a red pennant onto the Pitot probe.	

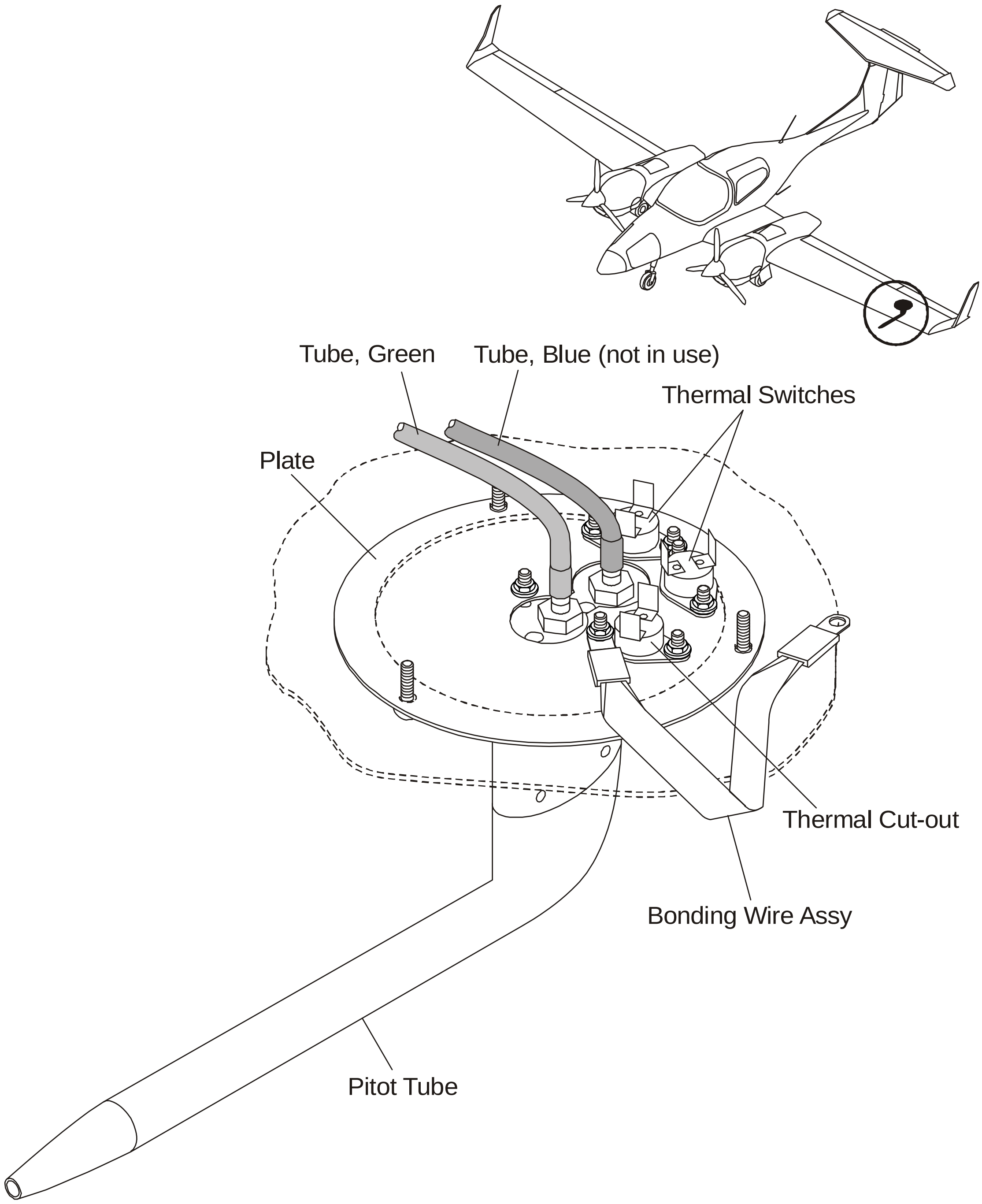


Figure 3: Pitot Probe Installation

4. Remove/Install an Altimeter Orifice

A. Remove an Altimeter Orifice

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the static hose (blue) from the rear of the altimeter.	
(4)	Disconnect this part of static hose (blue) from the next T-fitting.	Hold the T-fitting.
(5)	Carefully warm up the section around the orifice.	Use a heat gun.
(6)	Use an edgeless object to press out the orifice.	Use a screwdriver.

B. Install an Altimeter Orifice

	Detail Steps/Work Items	Key Items/References
(1)	Carefully warm up 50 mm (2 in) from one end of the hose.	Use a heat-gun.
(2)	Press the orifice in the static hose.	Use a screwdriver to press in the orifice.
(3)	Connect the hose to the static T-fitting.	Hold the T-fitting.
(4)	Connect the other end of the hose to the altimeter.	

5. Pitot and Static System Leak Tests

Always do a Pitot leak-test after you do maintenance on the Pitot system and always do a low-range static leak-test after you do maintenance on the static system.

CAUTION: OBEY THE FOLLOWING PRECAUTIONS WHEN YOU DO A PITOT OR STATIC LEAK-TEST. IF YOU DO NOT OBEY THE PRECAUTIONS YOU CAN DAMAGE THE AIR DATA INSTRUMENTS.

A. Precautions

– The pressure in the Pitot system must always be equal to (or greater than) the pressure in the static equipment.

– Reversal of the Pitot and static hoses can cause damage to the air data instruments.

– The applied pressure (and the rate of change of pressure) must not be greater than the design limits of the equipment that you will test.

– After doing the test, you must always return the system to usual operating conditions.

B. Equipment

Item	Quantity	Part Number
Pitot-static probe adaptor.	1	PS 49742M-3-4, or equivalent.
Pitot-static leak tester.	1	Commercial.
Static port adaptor.	2	SKA 100-4.

C. Low-Range Static Leak Test

Follow the Pitot-static leak tester manufacturer's instructions for the use of the test-set. Obey the safety precautions for Pitot-static leak-testing at all times.

	Detail Steps/Work Items	Key Items/References
CAUTION:	THE G1000 CONFIGURATION MODE CONTAINS CERTAIN PAGES AND SETTINGS THAT ARE CRITICAL TO AIRPLANE OPERATION AND SAFETY. THESE PAGES ARE PROTECTED AND CAN NOT BE MODIFIED, UNLESS THE TECHNICIAN IS PROPERLY AUTHORIZED AND EQUIPPED. HOWEVER, MOST PROTECTED PAGES ARE VIEWABLE TO ALLOW SYSTEM AWARENESS FOR TROUBLESHOOTING.	
(1)	Remove the blanking cap from the Pitot static probe and connect the Pitot-static leak tester to the probe.	Use the test set adaptor.
(2)	Make sure that the alternate static port is fully closed.	Under the instrument panel, left side.
(3)	Remove the aft baggage compartment.	Refer to Section 25-50.
(4)	Block the static line.	At the filter on top of the fuselage.

	Detail Steps/Work Items	Key Items/References
(5)	Prepare the G1000 system for the test: – Allow the unit to warm up for 15 minutes before performing the following tests. – Start the G1000 system in normal mode. – Remove power to the PFD. – Turn the PFD on in configuration mode by pressing and holding the ENT key on the PFD while applying power. – Release the ENT key after ‘INITIALIZING SYSTEM’ appears on the upper left corner of the PFD. – Using the outer FMS knob on the PFD turn to the GRS page group, use the B ALT field for all CFR Part 43 Appendix E tests for G1000 altitude. – Place the MFD in reversionary mode by pressing the red ‘DISPLAY BACKUP’ button on the GMA 1347/1360 audio panel. Baro settings can then be read from the MFD for the CFR Part 43 Appendix E tests.	Only required for airplanes for which 14 CFR §91.411 and 14 CFR §91.411 part 43 Appendix E is applicable.
(6)	Apply a partial vacuum to the static port until you get a pressure altitude of 1000 ft above the ambient pressure altitude.	Note the altitude.
(7)	Let the pressure stabilize.	
(8)	Monitor the system pressure.	The system pressure change must not be more than 100 ft/min.
(9)	Compare the test equipment altimeter and the airplane altimeter.	The indication error must be less than shown in Table 1.
(10)	Slowly adjust the system pressure to the ambient pressure.	
(11)	Return both the MFD and PFD to normal mode.	Only required for airplanes for which 14 CFR §91.411 and 14 CFR §91.411 part 43 Appendix E is applicable.

	Detail Steps/Work Items	Key Items/References
(12)	Disconnect the Pitot-static probe adaptor and install a blanking cap, with pennant, onto the airplane Pitot static probe.	
(13)	Remove the blockage of the static line.	At the filter on top of the fuselage.
(14)	Install the aft baggage compartment.	Refer to Section 25-50.

Table 1: Altimeter Indication Error

Altitude	Permissible Error
-1000 ft.*	±20 ft.*
Sea level.	±20 ft.
4,000 ft.	±35 ft.
8,000 ft.	±60 ft.
12,000 ft.	±90 ft.
16,000 ft.	±110 ft.
20,000 ft.	±130 ft.

* Only required for airplanes for which 14 CFR § 91.411 and 14 CFR § 91.411 part 43 Appendix E is applicable.

D. Pitot Leak Test

Follow the Pitot static leak tester manufacturer's instructions for the use of the test set. Obey the safety precautions for Pitot static leak testing at all times.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the blanking cap from the Pitot-static probe and connect the Pitot-static leak tester to the probe.	Use the test-set adaptor.
(2)	Slowly apply a pressure to the Pitot port that gives an indication of 150 kts on the ASI.	
(3)	Let the pressure stabilize.	
(4)	Monitor the system pressure.	The leak rate must not be more than 10 kts/min.
(5)	Compare the test equipment ASI and the airplane ASI.	The indication error must be less than shown in Table 2.
(6)	Slowly release the system pressure.	
(7)	Disconnect the Pitot static probe adaptor and install a blanking cap, with pennant, onto the airplane Pitot-static probe.	

Table 2: ASI Indication Error

Airspeed	Permissible Error
160 kts	±4 kts
100 kts	±4 kts
40 kts	±1.7 kts

6. Clean the Pitot System and the Static System

CAUTION: OBEY THE FOLLOWING PRECAUTIONS WHEN YOU CLEAN THE PITOT STATIC SYSTEM. IF YOU DO NOT OBEY THE PRECAUTIONS YOU CAN DAMAGE THE AIR DATA INSTRUMENTS.

A. Precautions

– Never apply pressurized air to the air data instruments. Always apply compressed air to the hoses from the inboard end to the outboard end.

– Do not apply excessive pressure (above 1 bar/14.5 PSI) to the Pitot and static hoses.

– Do not use compressed air without oil separator.

– Reversal of the Pitot and static hoses can cause damage to the air data instruments.

– After cleaning the system, you must always return the system to usual operating conditions.

B. Equipment

Item	Quantity	Part Number
Compressed air equipment with oil separator and pressure regulator.	1	Commercial.

C. Cleaning Procedure

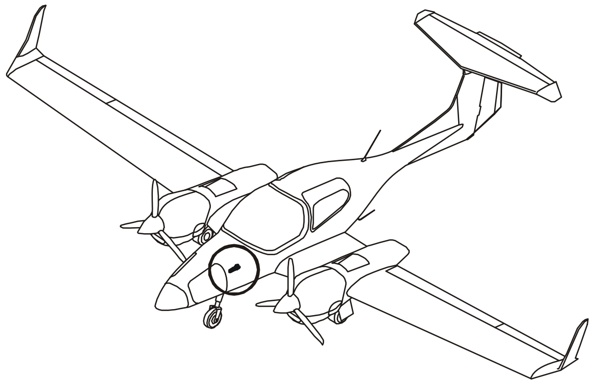
	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the pilot’s seat.	Refer to Section 25-10.
(4)	Remove the aft baggage compartment.	
(5)	Disconnect the Pitot static hoses from the rear of the backup instruments.	
(6)	Disconnect the Pitot static hoses from the air data computer (ADC).	

	Detail Steps/Work Items	Key Items/References
(7)	Disconnect the Pitot static hoses from the water traps.	Two under the pilot’s seat, one below the aft baggage compartment.
(8)	Blow compressed air through each of the Pitot static hoses from the inboard end to the outboard end.	Maximum pressure: 1 bar (14.5 PSI).
(9)	Check the water traps for dirt. Replace if necessary.	
(10)	Reconnect the Pitot static hoses to the water traps.	Two under the pilot’s seat, one below the aft baggage compartment.
(11)	Reconnect the Pitot static hoses to the Pitot probe.	
(12)	Reconnect the Pitot static hoses to the air data computer (ADC).	
(13)	Reconnect the Pitot static hoses to the rear of the backup instruments.	
(14)	Do a low-range static leak test.	Refer to Paragraph 5.
(15)	Do a Pitot static leak test.	Refer to Paragraph 5.
(16)	Install the pilot’s seat and the aft baggage compartment.	Refer to Section 25-10.
(17)	Install the instrument panel cover.	Refer to Section 25-10.

7. Remove/Install the OAT Probe

A. Remove the OAT Probe

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Open the right nose baggage compartment door.	
(3)	If the de-icing system is installed: Remove the de-icing fluid tank.	
(4)	Remove the baggage compartment carpeting and the rear access panel on the compartment floor.	
(5)	Disconnect the electrical cables from the OAT probe.	At the in-line connector located on the instrument panel frame in the LH corner below the nose baggage compartment.
(6)	Remove the nut and the sealing washer that attach the OAT probe to the airplane surface.	Located on the lower surface of the fuselage nose, on the RH side of the nose landing gear bay.
(7)	Move the OAT probe clear of the nose baggage compartment.	Note the position of the bonding wire.



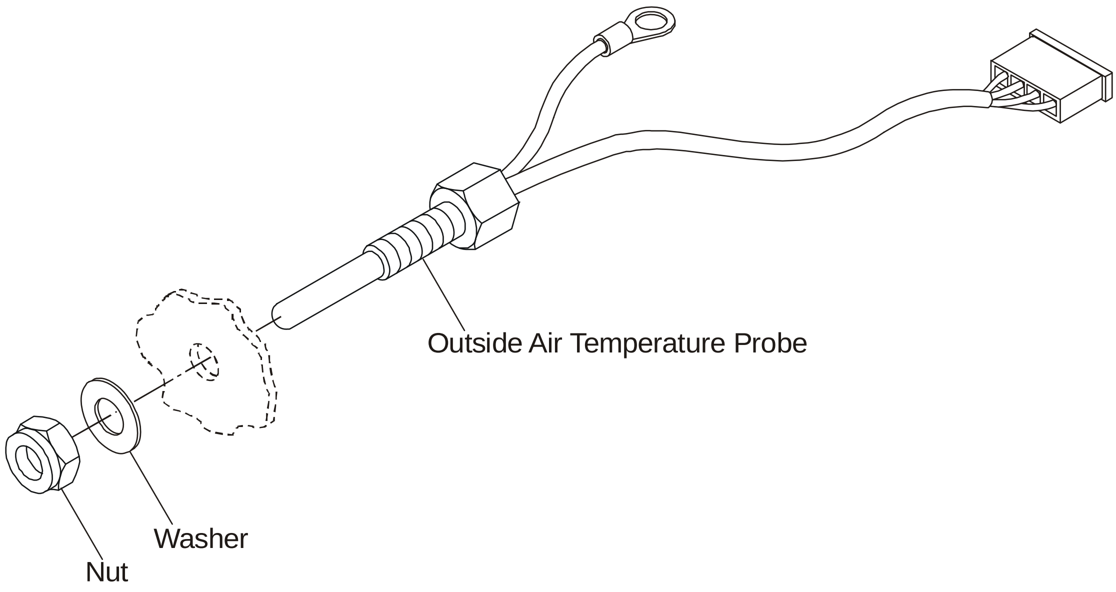


Figure 4: OAT Probe

B. Install the OAT Probe

	Detail Steps/Work Items	Key Items/References
(1)	Connect the bonding wire to the OAT Probe.	Install the bonding wire as noted in Paragraph 6 A, step 7.
(2)	Move the OAT probe into position below the nose baggage compartment.	Slide the probe from the inside outwards though the hole beside the nose landing gear bay.
(3)	Install the sealing washer and the nut that attach the probe to the airplane surface.	On the lower surface of the fuselage nose, on the RH side of the nose landing gear bay.
(4)	Connect the electrical cables from the OAT probe.	At the in-line connector located on the instrument panel frame in the LH corner below the nose baggage compartment.
(5)	If the de-icing system is installed: Install the de-icing fluid tank.	
(6)	Close the rear access hole on the nose baggage compartment floor and install the compartment carpeting.	
(7)	Set the ELECT. MASTER switch to ON.	Instrument panel, left side.
(8)	Do a nominal/actual value comparison with a reliable digital or mercury thermometer to test the serviceability of the OAT probe.	Read the OAT indication on the ICS.

Section 34-20
Attitude and Direction

1. General

This Section tells you about the attitude and direction systems installed in the DA 42 NG airplane. The main attitude and direction systems are integral with the integrated cockpit system (ICS) that is installed in the DA 42 NG airplane. Refer to Section 31-40 for more data about the ICS.

The DA 42 NG has the usual magnetic compass. The magnetic compass is installed in the instrument panel at the top, on the right hand side. There is also an artificial horizon or standby attitude module (OÄM 42-270) installed in the instrument panel at the top, arranged centrally.

2. Description and Operation

A. Magnetic Compass

The magnetic compass shows the heading of the airplane related to magnetic north. Fluid in the compass bowl gives damping. Each graduation of the compass is 5°.

A compass deviation card is located next to the compass on the instrument panel. You must do a test for the correct operation of the compass (compass swing):

– After replacing a major component.

– After replacing the compass.

– After a major modification to the airplane.

– After a lightning strike has been reported.

– If the airplane has been parked for more than 90 days.

B. Attitude Gyro (Artificial Horizon), if OÄM 42-270 is NOT installed

The artificial horizon is an electrically powered gyroscopic instrument. It operates when the RH MAIN BUS is powered and the AH circuit breaker is closed. It can also receive power from the emergency battery, see Section 24-32. A warning flag drops into view to indicate that the gyro motor is not receiving sufficient power to operate.

The artificial horizon incorporates a moving display that simulates the earth's horizon and provides the pilot with a real time visual indication of the airplane pitch and roll attitude relative to the indicator symbolic airplane. The instrument can function as a primary or standby indicator.

The attitude gyro incorporates pitch and roll displays that are mechanically linked to a spinning mass gyroscope. The horizon bar moves behind the symbolic airplane. Precession error is corrected by the internal erection system or by pulling the PULL TO CAGE knob.

The artificial horizon employs an efficient electrically driven internal vertical gyroscope assembly incorporating a special air erection mechanism. This mechanism simultaneously erects the pitch and roll axes of the gyroscope. Movement of the airplane generates a reaction of the display that simulates the visual reference seen by the pilot when looking outside at the earth's true horizon line.

C. Standby Attitude Module, if OÄM 42-270 is installed

The left display of the standby attitude module MD302 represents the attitude indicator.

The background of the display consists of the representative white horizon line separating the ‘sky’ (blue) and ‘ground’ (brown).

The roll scale depicted as an arc of graduations representing bank angles of 0 (triangle), 10, 20, 30, 45 (small triangle) and 60. The roll scale can be configured during installation to be fixed to the sky/horizon or fixed to the top of the display.

The roll pointer is the triangle just below the roll scale and represents the airplane in relation to its bank angle. It is configured, by definition, to operate conversely to the roll scale behavior. That is, a rotating scale produces a fixed roll pointer and a fixed roll scale produces a rotating roll pointer.

The pitch scale is depicted as a series of graduations representing pitch angles of every 5°, with every 10° graduation extended and numbered.

The symbolic airplane will always remain in the center of the display, with the background elements moving behind it to represent the aircraft’s relative position.

Refer to the manufacturer’s documentation for more information of the standby attitude module.

Trouble-Shooting

1. Magnetic Compass

The table below lists the defects you could have with the magnetic compass. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Magnetic compass damping fluid leaking.	Defective compass housing.	Replace the compass.
Compass deviation more than 10°.	Residual magnetism of a metal component in the airplane.	Do a test for residual magnetism using a hand-held compass. If necessary, degauss the component.
	Defective compass.	Replace the compass.
	Compass out of calibration.	Do a compass swing.

2. Attitude Gyro (Artificial Horizon), if OÄM 42-270 is NOT installed

The table below lists the defects you could have with the artificial horizon. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Warning flag in view.	AH circuit breaker open or defective.	Close or replace the circuit breaker.
Indication of instrument not reliable.	Power supply wiring defective.	Do a test for the correct voltage at the instrument. Repair the power supply wiring/connector.
	Ground connection defective.	Do a test for correct ground connection. Repair the ground wiring/connector.
	Instrument defective.	Replace the instrument.
Instrument is sluggish.	Mechanism worn or dirty.	Replace the instrument.

3. Standby Attitude Module, if OÄM 42-270 is installed

For data about troubleshooting the standby attitude module refer to the Installation Manual of the MD302.

Maintenance Practices

1. General

This Section tells you how to remove/install the magnetic compass as well as the attitude gyro (artificial horizon). It also tells you how to test and adjust the magnetic compass (compass swing).

2. Remove/Install the Magnetic Compass

A. Remove the Magnetic Compass

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Disconnect electrical cables.	At the in-line connector.
(4)	Remove the 4 screws that attach the compass to the instrument panel.	Hold the compass!
(5)	Move the compass forward and clear of the instrument panel.	Remove and discard the compass deviation table.

B. Install the Magnetic Compass

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Move the magnetic compass into position at the instrument panel.	Hold the compass in position.
(3)	Install the 4 screws that attach the compass to the instrument panel.	
(4)	Connect electrical cables.	At the in-line connector.
(5)	Install the instrument panel cover.	Refer to Section 25-10.
(6)	Do a compass swing.	Refer to Paragraph 3.

3. Test/Adjust the Magnetic Compass (Compass Swing)

You must do a test for correct operation of the compass (compass swing):

– After replacing a major component.

– After replacing the compass.

– After a major modification to the airplane.

– After a lightning strike has been reported.

– If the airplane has been parked for more than 90 days.

CAUTION: USE ONLY NON-MAGNETIC TOOLS TO ADJUST THE COMPASS.

CAUTION: DO NOT WEAR OR CARRY METALLIC OBJECTS (WATCHES, BRACELETS ETC) WHEN YOU ADJUST THE COMPASS COMPENSATING MAGNETS OR OPERATE THE LAND COMPASS. METALLIC OBJECTS NEAR THE COMPASS CAN CAUSE ERRORS.

Note: If possible, use a compass swing area that has been tested for magnetic interference. In any case, you must use a level area that is away from metal structures, underground pipes, reinforced concrete, other airplane and ground servicing equipment.

A. Equipment

Item	Quantity	Part Number
Calibrated land compass.	1	Commercial.

B. Compass Swing

	Detail Steps/Work Items	Key Items/References
(1)	Adjust the compensating magnets in the compass to a neutral position.	Refer to the compass manufacturer's instructions.
(2)	Start the engine and set all electrical loads to ON.	Refer to the Airplane Flight Manual.
(3)	Use the land compass to align the airplane to magnetic north.	Adjust the N-S compensator magnet so that the airplane compass indicates a heading of 0°.

	Detail Steps/Work Items	Key Items/References
(4)	Use the land compass to align the airplane to magnetic east.	Adjust the E-W compensator magnet so that the airplane compass indicates a heading of 90°.
(5)	Use the land compass to align the airplane to magnetic south.	Adjust the N-S compensator magnet to remove half of the error between the indicated heading and 180°.
(6)	Use the land compass to align the airplane to magnetic west.	Adjust the E-W compensator magnet to remove half of the error between the indicated heading and 270°.
(7)	Turn the airplane through 360°, record the deviation at each 30° radial. Prepare a deviation table that shows the corrections that must be applied to each of the 30° radials.	If large deviations occur when you operate electrical equipment/systems, the deviation table must also show the corrections to apply to each 30° radial when that particular equipment/system is operating.
(8)	Install the new deviation table in the compass card holder next to the compass.	

4. Remove/Install the Attitude Gyro (Artificial Horizon), if OÄM 42-270 is NOT installed

CAUTION: GYROS ARE DELICATE AND CAN NOT WITHSTAND THE SHOCK OF BEING DROPPED, JARRED OR STRUCK BY PIECES OF EQUIPMENT. DO NOT PLACE GYROS ON ANY HARD SURFACE. PAD WITH GENEROUS FOAM.

A. Precautions

To prevent damage to a gyro, the instrument should be transported to and from the airplane in its original shipping container. If this is impractical, the gyro should be hand carried carefully in an upright position.

A gyro should never be removed while it is spinning or running down. The instrument normally operates at high RPM and may take 10 minutes or longer to run down. If it is removed while running and tilted more than 20 degrees, the gyro can develop a gimbal lock. The gimbal will tumble and start to spin. If gimbal lock occurs while the rotor is turning, the gimbal may spin fast enough to damage the gimbal bearings, requiring overhaul.

A malfunctioning gyro should be handled with the same care given a new instrument. Most malfunctioning instruments can be repaired and returned to service. Using proper handling procedures during removal prevents additional damage and helps ensure possible reuse.

B. Remove the Attitude Gyro

	Detail Steps/Work Items	Key Items/References
(1)	Pull the AH circuit breaker.	Instrument panel, right side.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Disconnect the connector at the rear of the instrument.	
(4)	Remove the screws which attach the instrument to the instrument panel.	Hold the instrument!
(5)	Remove the instrument from the instrument panel.	Handle with care.

C. Install the Attitude Gyro

	Detail Steps/Work Items	Key Items/References
(1)	Insert the indicator into the instrument panel cutout.	Upper instrument panel, arranged centrally.
(2)	Install the screws which attach the instrument to the instrument panel.	
(3)	Connect the connector at the rear of the instrument.	
(4)	Install the instrument panel cover.	Refer to Section 25-10.
(5)	Set the AH circuit breaker.	Instrument panel, right hand side.

5. Remove/Install the Standby Attitude Module, if OÄM 42-270 is installed

Refer to Section 34-10, Maintenance Practices.

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Section 34-30
Landing and Taxiing Aids

1. General

This Section tells you about the landing and taxiing aids that can be installed in the DA 42 NG.

Refer to the equipment manufacturers' manuals for more data about other options of landing and taxiing aids.

2. Description

The DA 42 NG has the following landing and taxiing aids:

– Localizer system, which is part of the G1000 integrated avionics system. Refer to Section 31-40 for more data about the G1000 integrated avionics system.

– Glideslope system, which is part of the G1000 integrated avionics system. Refer to Section 31-40 for more data about the G1000 integrated avionics system.

– Marker beacon receiver, which is part of the G1000 integrated avionics system. Refer to Section 31-40 for more data about the G1000 integrated avionics system.

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Section 34-40

Independent Position Determining

1. General

This Section tells you about the independent position determining systems that can be installed in the DA 42 NG. Refer to these Sections for data about the systems:

Section 34-41. Stormscope system (OÄM 42-057).

Section 34-42. Traffic advisory system (TAS) (OÄM 42-094).

Section 34-43. Enhanced vision system (EVS) (OÄM 42-214).

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Section 34-41

Stormscope System

1. General

This Section tells you about the stormscope system that can be installed in the DA 42 NG. Refer to the manufacturer'´s manual for more data about the equipment.

The stormscope system consists of the following items:

– Stormscope processor.

– Stormscope antenna.

2. Description and Operation

The WX-500 is a passive sensor that listens for electromagnetic signals with a receiving antenna. The antenna detects intra-cloud, inter-cloud, or cloud-to-ground electrical discharges within a 200 nm radius of the airplane and sends the resulting 'discharge signals' to the processor. The processor digitizes, analyzes, and converts the discharge signals into range and bearing data. This information is stored in the storm buffer.

A. Stormscope Processor

The stormscope processor is tray mounted and is located under the passengers' seat.

The AVIONICS BUS power to the stormscope system. The ELECT. MASTER switch and the AV. MASTER switch must be set to ON to supply power through the WX-500 circuit breaker to the stormscope system.

The processor houses the lightning data acquisition circuitry as well as the circuitry necessary to process heading information and communicate with the G1000 system. All WX-500 functions are controlled through the MFD of the G1000 system.

B. Stormscope Antenna

The NY-163 stormscope antenna is located on the horizontal stabilizer. The antenna is a combined cross-loop and sense antenna. The antenna is sealed against environmental extremes and is non-repairable.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the stormscope system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Stormscope does not operate.	Circuit breaker not set.	Set the circuit breaker.
	Faulty cables/connectors.	Do a test for continuity on each cable. Do a test for short circuit to ground and between cables. Replace defective cables.

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Maintenance Practices

1. General

This Section tells you how to remove/install the components of the stormscope system. It also tells you how to test the stormscope system.

2. Remove/Install the Stormscope Processor

A. Remove the Stormscope Processor

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passengers seat.	Refer to Section 25-10.
(2)	Open the WX-500 circuit breaker.	
(3)	Loosen the screw that attaches the processor to its mounting tray.	
(4)	Remove the stormscope processor from the mounting tray.	

B. Install the Stormscope Processor

	Detail Steps/Work Items	Key Items/References
(1)	Put the stormscope processor in position in the mounting tray.	
(2)	Tighten the screw that attaches the processor to its mounting tray.	
(3)	Install the passengers seat.	Refer to Section 25-10.
(4)	Close the WX-500 circuit breaker.	
(5)	Do a test of the stormscope system.	Refer to Paragraph 4.

3. Remove/Install the Stormscope Antenna

A. Remove the Stormscope Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Remove the horizontal stabilizer fairing.	Refer to Section 55-10.
(2)	Open the WX-500 circuit breaker.	
(3)	Remove the screws which attach the stormscope antenna to the mounting bracket.	Hold the antenna!
(4)	Disconnect the connector of the stormscope antenna.	
(5)	Remove the stormscope antenna from the horizontal stabilizer.	

B. Install the Stormscope Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Put the stormscope antenna in position on the horizontal stabilizer.	The arrow must point into flight direction.
(2)	Connect the connector of the stormscope antenna.	
(3)	Install the screws which attach the stormscope antenna to the mounting bracket.	
(4)	Close the WX-500 circuit breaker.	
(5)	Install the horizontal stabilizer fairing.	Refer to Section 55-10.
(6)	Do a test of the stormscope system.	Refer to Paragraph 4.

4. Test of the Stormscope System

Perform the installation checkout as outlined in Goodrich Stormscope WX-500 Installation Manual P/N 009-11500-001 Chapter 3 'Installation Checkout'.

Section 34-42
Traffic Advisory System

1. General

This Section tells you about the traffic advisory system that can be installed in the DA 42 NG. Refer to the manufacturer's manual for more data about the equipment.

The TAS consists of the following items:

– Processor.

– Transponder coupler.

– Top antenna.

– Bottom antenna.

2. Description and Operation

The Ryan/Avidyne traffic advisory systems (collectively know as TASs) are actively interrogating on-board air traffic detection systems used to identify potential collision threats. The TAS computes relative altitude and range of threats from nearby transponder-equipped airplanes. Airplanes with non-Mode C transponders can provide range information. The TAS does not detect airplanes without an operating transponder.

A. Processor

The TAS processor is tray mounted and is located behind the first ring frame.

The AVIONICS BUS supplies power to the traffic advisory system. The ELECT. MASTER switch and the AV. MASTER switch must be set to ON to supply power through the TAS circuit breaker to the traffic advisory system.

The TAS processor communicates to the Garmin G1000 system which indicates nearby traffic on the MFD. All functions of the TAS are controlled through the MFD.

B. Transponder Coupler

The transponder coupler is mounted on the remote avionic box of the Garmin G1000 system. The transponder coupler supplies the processor with a signal indicating the on-board transponder is transmitting a reply.

C. Antennas

The TAS has two directional antennas. The top antenna is located on top of the fuselage behind the cabin between the COM and the ELT antennas, and the bottom antenna is located on the fuselage bottom between the taxi - and landing lights.

Trouble-Shooting

1. General

The table below lists the defects you could have with the traffic advisory system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
TAS does not operate.	Circuit breaker not set.	Set the circuit breaker.
	Faulty cables/connectors.	Do a test for continuity on each cable. Do a test for short circuit to ground and between cables. Replace defective cables.
The TAS bearing shows opposite to the traffic forward and aft, and it shows correctly left and right.	The antenna co-axes for the top antenna are backwards.	Check antenna connections.
The TAS bearing shows opposite to the traffic left and right, and it shows correctly forward and aft.	The antenna co-axes for the bottom antenna are backwards.	Check antenna connections.

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Maintenance Practice

1. General

This Section tells you how to remove/install the components of the traffic advisory system.

2. Remove/Install the TAS Processor

A. Remove the TAS Processor

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Remove the aft baggage compartment.	Refer to Section 25-50.
(3)	Open the TAS circuit breaker.	Instrument panel, right side.
(4)	Disconnect the connectors and antenna cables from the TAS processor.	
(5)	Loosen the diagonal retaining screws that attaches the processor to its mounting tray.	
(6)	Slide the TAS processor out of its mounting tray and clear of the airplane.	Along the rails.

B. Install the TAS Processor

	Detail Steps/Work Items	Key Items/References
(1)	Slide the TAS processor into its mounting tray.	Along the rails.
(2)	Tighten the diagonal retaining screws that attached the processor to its mounting tray.	
	CAUTION: WRONG CONNECTION OF THE ANTENNA CABLES WILL LEAD TO A WRONG INDICATION.	
(3)	Connect the connectors and antenna cables to the TAS processor.	
(4)	Close the TAS circuit breaker.	
(5)	Install the aft baggage compartment.	
(6)	Do a test of the traffic advisory system.	Refer to the TAS Installation Manual, latest revision.

3. Remove/Install the Transponder Coupler

A. Remove the Transponder Coupler

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Remove the aft baggage compartment.	Refer to Section 25-50.
(3)	Open the TAS circuit breaker.	Instrument panel, right side.
(4)	Disconnect the antenna cables from the transponder coupler.	
(5)	Remove the screws that attach the transponder coupler to the remote avionics box.	Hold the transponder coupler!
(6)	Remove the transponder coupler from the remote avionics box and clear of the airplane.	Fit dust caps to all connections.

B. Install the Transponder Coupler

	Detail Steps/Work Items	Key Items/References
(1)	Remove the dust-cover(s) from all connections.	If necessary, install the dust covers from the new transponder coupler onto the transponder coupler that you removed.
(2)	Move the transponder coupler into position on the remote avionics box.	Hold the transponder coupler!
(3)	Install the screws that attach the transponder coupler to the remote avionics box.	
(4)	Connect the antenna cables to the transponder coupler.	
(5)	Close the TAS circuit breaker.	
(6)	Install the aft baggage compartment.	Refer to Section 25-50.
(7)	Do a test of the traffic advisory system.	Refer to the TAS Installation Manual, latest revision.

4. Remove/Install a TAS Antenna

A. Remove a TAS Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Open the TAS circuit breaker.	Instrument panel, right side.
(3)	Remove the aft baggage compartment if you will replace the top mounted antenna. Remove both pilots’ seats if you will replace the bottom mounted antenna.	Refer to Section 25-50. Refer to Section 25-10.
(4)	Disconnect the coaxial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: – Remove the 4 screws that attach the antenna to the structure. – If necessary, use a knife to carefully remove the sealant that seals the antenna to the airplane outer surface. – Move the antenna clear of the airplane.	 Hold the antenna. Take care not to damage the airplane surface!

B. Install a TAS Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the contact surfaces of the antenna and the ground plane where the antenna will be installed are clean and free of grease.	
(2)	Move the antenna into position.	
(3)	Install the 4 screws that attach the antenna to the airplane.	
(4)	Seal the outer edge of the antenna where it contacts the airplane surface with sealant.	Refer to 34-50, Paragraph 4 for an approved sealant.
(5)	Remove the excess sealant that has been forced out of the joint between the antenna and the airplanes surface.	
CAUTION: WRONG CONNECTION OF THE ANTENNA CABLES WILL LEAD TO A WRONG INDICATION.		
(6)	Connect the coaxial cable to the antenna.	At the antenna.
(7)	Install the aft baggage compartment or seat if necessary.	Refer to Section 25-10 or 25-50.
(8)	Reset the TAS circuit breaker.	Instrument panel, right side.
(9)	Do a test of the traffic advisory system.	Refer to the TAS Installation Manual, latest revision.

Section 34-43

Garmin GWX 68 or GWX 70 Weather Radar System

1. General

This Section tells you about the weather radar system that can be installed in the DA 42 NG. Refer to the manufacturer's manual for more data about the equipment.

2. Description and Operation

(1) Radar Nose Cone

The radar nose cone is made of GFRP and protects the GWX 68 or GWX 70 weather radar system mechanically and is transparent for the transmitted microwaves. For lightning protection 4 strips are mounted to the surface and connected to the airplanes lightning protection system with a lightning plate.

(2) Garmin GWX 68 or GWX 70 Weather Radar System

The Garmin GWX 68 or GWX 70 weather radar system provides information about precipitation conditions ahead of the airplane. The system consists of a combined microwave transmitter and receiver system in the nose cone, mounted to the radar bulkhead via the GWX 68 or GWX 70 bracket. The system is connected to the electrical system of the airplane via a circuit breaker on the instrument panel. The processed data of the GWX 68 or GWX 70 system is displayed on the Garmin G1000 MFD. Refer to the Garmin G1000 Pilot's Guide for more information about operation of the system.

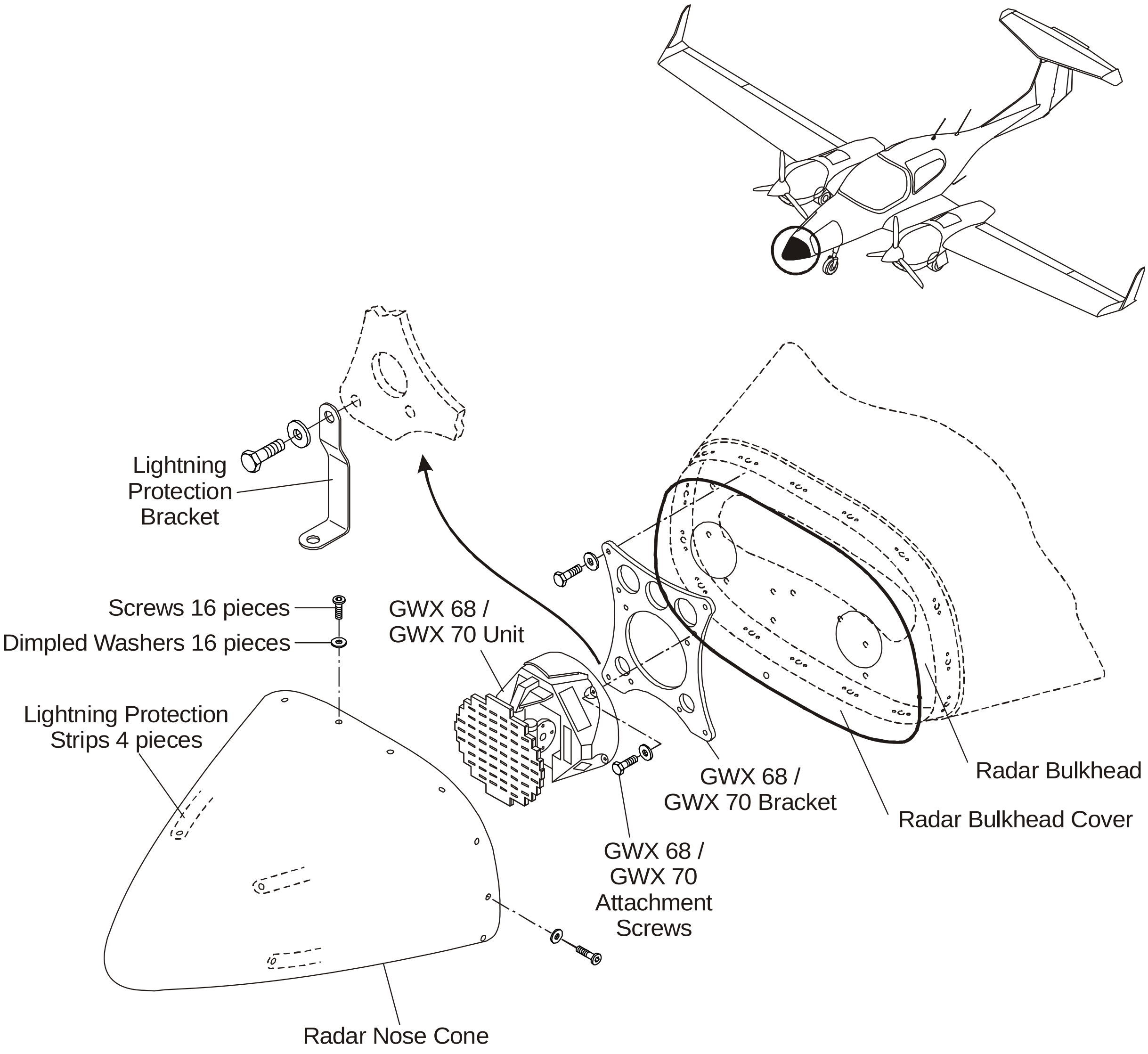

Figure 1: Installation of the Garmin GWX 68 or GWX 70 Weather Radar System

Trouble Shooting

1. General

The table below lists the trouble you could have with the Garmin GWX 68 or GWX 70 weather radar system. If you have the trouble detailed in the trouble column read across to the possible cause column. Then do the repair given in the repair column.

Trouble	Possible Cause	Repair
Weather radar does not operate.	Circuit breaker not set.	Set the circuit breaker.
	Faulty cables / connectors.	Do a test for continuity test of the weather radar system. Repair or replace defective wiring. Refer to Chapter 92 for the wiring diagrams.
Weather radar shows poor image quality.	Radome damaged / scratched.	Replace radome.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to replace the Garmin GWX 68 or GWX 70 weather radar system. Refer to the equipment manufacturers’ manuals for more data about the equipment.

2. Remove/Install the Garmin GWX 68 or GWX 70 Weather Radar System

A. Remove the Garmin GWX 68 or GWX 70 Weather Radar System

Note: Special care must betaken to avoid any contact between tools that could become magnetized and the magnetron. Use of non-magnetic tools (e.g. beryllium copper or titanium) is recommended when installing or servicing the GWX 68 system.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
	Note: The inner and outer surface of the radar nose cone (radome) effects the function and image quality of the weather radar system significantly. Make sure to avoid any scratches and contamination of the inner and outer surfaces of the radome and do not touch the antenna face of the GWX 68 or GWX 70 unit.	
(2)	Remove the radar nose cone:	
	– Protect the surface of the fuselage and the radar nose cone with a protective cover.	
	– Cut the sealant between the fuselage and the radar nose cone.	Use a plastic spattle.
	– Clean the sealed gap between fuselage and the radar nose cone.	
	– Remove the 16 screws which attach the radar nose cone to the fuselage.	Hold and support the radar nose cone.
	– Move the radar nose cone straight forward.	
(3)	Disconnect the electrical connector.	

	Detail Steps/Work Items	Key Items/References
(4)	Remove the GWX 68 or GWX 70 unit: – Remove the 4 screws which attach the GWX 68 or GWX 70 unit to the GWX 68 or GWX 70 bracket on the radar bulkhead. – Move the GWX 68 or GWX 70 unit free of the airplane.	Hold and support the GWX 68 or GWX 70 unit on the mounting plate. Do not touch the delicate radar antenna.

B. Install the Garmin GWX 68 Weather Radar System

	Detail Steps/Work Items	Key Items/References
	Note: The inner and outer surface of the radar nose cone (radome) effects the function and image quality of the weather radar system significantly. Make sure to avoid any scratches and contamination of the inner and outer surfaces of the radome and do not touch the antenna face of the GWX 68 unit.	
(1)	Install the GWX 68 or GWX 70 unit: – Move the GWX 68 or GWX 70 unit in place in front of the GWX 68 bracket. – Install the 4 screws which attach the GWX 68 or GWX 70 unit to the GWX 68 or GWX 70 bracket on the radar bulkhead.	Hold and support the GWX 68 or GWX 70 unit on the mounting plate. Do not touch the delicate radar antenna.
(2)	Connect the electrical connector.	
(3)	Install the radar nose cone: – Move the radar nose cone towards the fuselage. – Install the 16 screws which attach the radar nose cone to the fuselage.	Do not touch the delicate radar antenna.

	Detail Steps/Work Items	Key Items/References
(4)	Seal the joint between fuselage and the radar nose cone:	
	– Apply thin red adhesive tape and the masking tape on both sides of the joint.	Refer to Figure 2.
	– Fill the joint with sealant.	
	– Use plastic or rubber spattle to remove excess sealant.	Use Terostat MS 9380 white sealant. Maximum time for sealing process: 10 min.
	– Spray the joint with water / cleaning solvent solution and create smooth surface by hand.	Use gloves to protect the skin.
	– Remove all adhesive and masking tapes.	
	– Allow the sealant to cure for at least 12 hrs.	
	Note: Before energizing the equipment make sure microwave radiation safety precautions including both fuel and personnel safety considerations are observed. These include clearing all personnel to an area beyond the maximum permissible exposure level (MPEL) boundary. The MPEL for the GWX 68 or GWX 70 is 3 m (10 ft).	
(5)	Switch the ELECT. MASTER switch and the AV. MASTER switch to ON and test the weather radar system. Refer to the manufacturer’s manual for more information.	

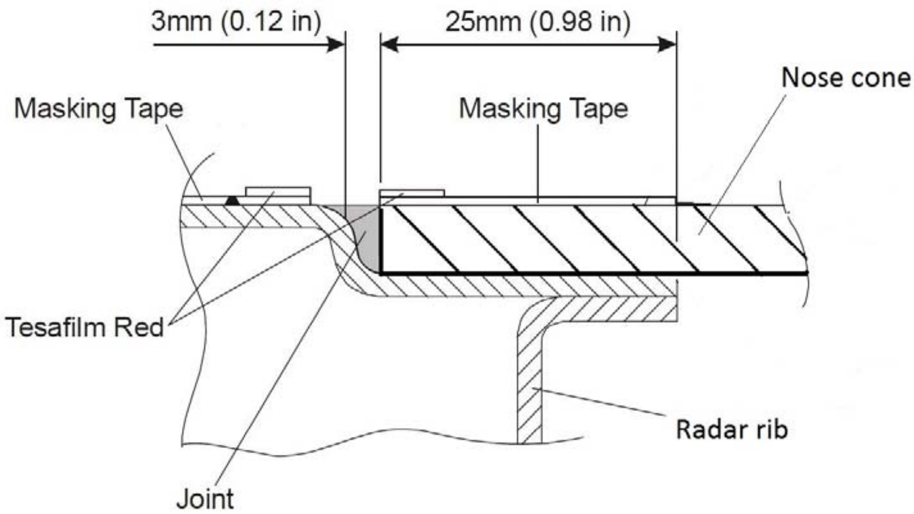

Figure 2: Radar Nose Cone Sealed Joint

Section 34-50
Dependent Position Determining

1. General

The DA 42 NG has an integrated cockpit system (ICS). The ICS has all the usual dependent position determining systems. Refer to Section 31-40 for more data about the dependent position determining systems that are integral with the ICS.

This Section tells you how to replace the antennas for the dependent position determining systems.

2. Description

The DA 42 NG has these dependent position determining systems and antennas:

- Transponder.
- DME.
- GPS (2x).
- ADF.
- Marker.
- VOR/G/S.

Flexible coaxial cables connect the antennas to their related equipment. You can replace the coaxial cables. The antennas are all attached to the surface of the airplane and can be replaced.

Refer to Section 31-40 for more data about the dependent position determining systems and their related displays.

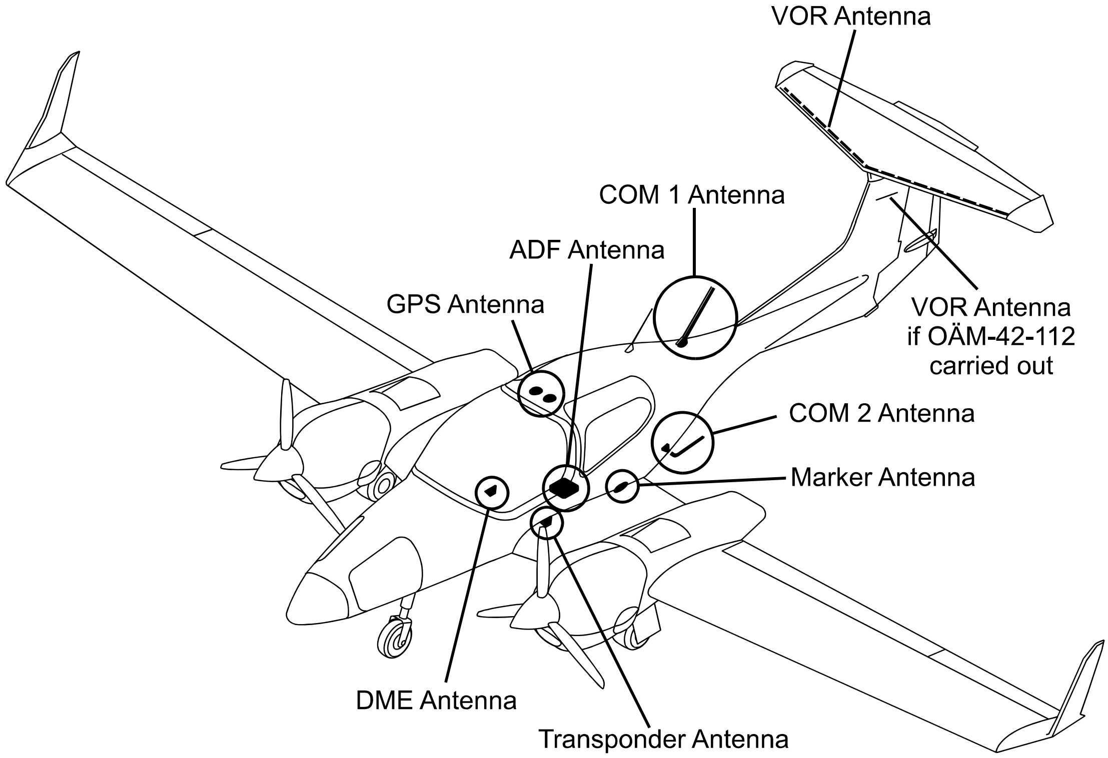

Figure 1: Antenna Locations

Trouble Shooting

1. General

The table below lists the defects you could have with the dependent position determining system antennas. Refer to Section 31-40 for trouble-shooting data for the dependent position determining systems.

If you have the trouble listed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
ATC reports no transponder reply. Transponder reply symbol operates.	Low output power.	Examine and repair/replace defective antenna connections. Replace antenna.
ATC reports no transponder reply. Transponder reply symbol not operating.	Poor received signal.	Examine and repair/replace defective antenna connections. Replace antenna.
DME/GPS/ADF/MARKER/ VOR/G/S systems give poor performance.	Poor received signal.	Examine and repair/replace related defective antenna connections. Replace related antenna.

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Maintenance Practices

1. General

The Maintenance Practices in this Section tell you how to replace the antennas of the dependent position determining systems. Refer to Section 31-40 for more data about the dependent position determining systems. Refer to Paragraph 3 for more information on the used types of coaxial cables. Further particulars on the antenna sealant are given in Paragraph 4.

2. Replace a Dependent Position Determining System Antenna

A. Replace the Transponder or DME Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Open the XPDR/DME circuit breaker.	Instrument panel, right side.
(3)	Remove the pilot's seat if you will replace the transponder antenna. Remove only the co-pilot's seat if you will replace the DME antenna.	Refer to Section 25-10.
(4)	Disconnect the coaxial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: – Remove the 2 nuts and washers that attach the antenna to the structure. – If necessary, use a knife to carefully remove the sealant that seals the antenna to the airplane outer surface. – Move the antenna clear of the airplane.	 Hold the antenna. Take care not to damage the airplane surface!

	Detail Steps/Work Items	Key Items/References
(6)	Install the antenna: – Make sure that the contact surfaces of the antenna and the airplane surface where the antenna will be installed are clean and free of grease. – Move the antenna into position under the fuselage. – Seal the outer edge of the antenna where it contacts the airplane surface with sealant. – Install the 2 washers and nuts that attach the antenna to the airplane structure. – Remove the excess sealant that has been forced out of the joint between the antenna and the airplane surface.	Use sealant. Refer to Paragraph 4.
(7)	Connect the coaxial cable to the antenna.	At the antenna.
(8)	Install the seat(s) that you removed at step 3.	Refer to Section 25-10.
(9)	Reset the XPDR/DME circuit breaker.	Instrument panel, right side.
(10)	Do a test of the transponder.	Only if you replaced the transponder antenna.
(11)	Do an operational test of the DME on the next flight.	Only if you replaced the DME antenna.

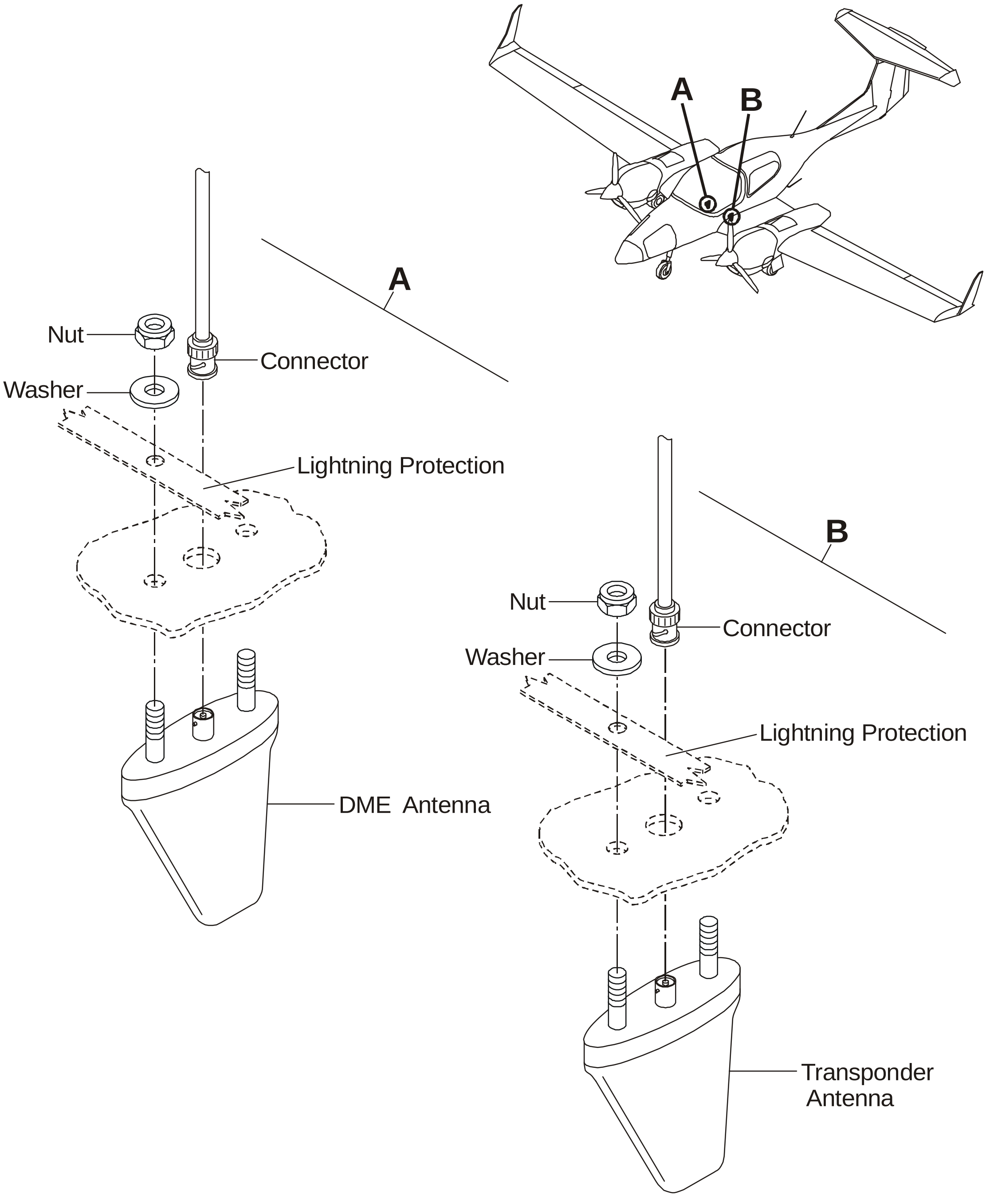

Figure 2: Transponder and DME Antenna Installation

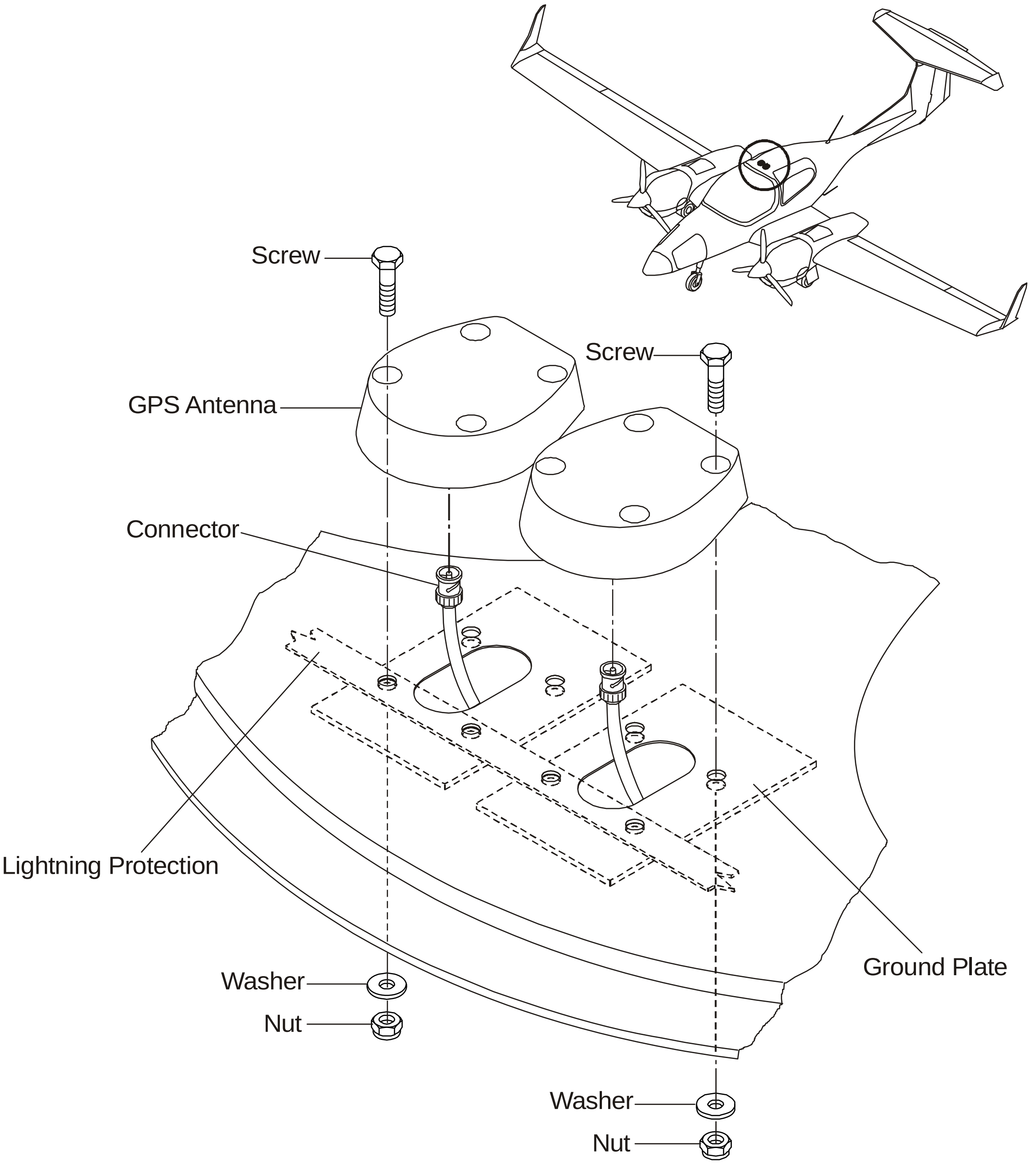

Figure 3: Replace a GPS Antenna

B. Replace a GPS Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Open the GPS/NAV1 and/or GPS/NAV2 circuit breaker.	Instrument panel, right side.
(3)	Remove the reading/map light(s) as necessary to gain access to the antenna that you will replace.	Refer to Section 33-10.
(4)	Disconnect the coaxial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna:	
	– Remove the 4 screws, nuts and washers that attach the antenna to the airplane.	Hold the antenna.
	– Remove the ground-plate.	
	– If necessary, use a knife to carefully remove the sealant that seals the antenna to the airplane outer surface.	Take care not to damage the airplane surface!
	– Move the antenna clear of the airplane.	From the outside.
(6)	Install the antenna:	
	– Make sure that the contact surfaces of the antenna and the airplane surface where the antenna will be installed are clean and free of grease.	
	– Move the antenna into position on the top of the fuselage.	
	– Seal the outer edge of the antenna where it contacts the airplane surface with sealant.	Use sealant. Refer to Paragraph 4.
	– Install the ground plate.	
	– Install the 4 screws, washers and nuts that attach the antenna to the airplane.	Torque 2.5 ± 0.3 Nm (1.8 ± 0.22 lbf.ft.).
(7)	Connect the coaxial cable to the antenna.	At the antenna.

	Detail Steps/Work Items	Key Items/References
(8)	Install the reading/map light(s) that you removed at step 3.	
(9)	Set the GPS/NAV1 and/or GPS/NAV2 circuit breaker.	Instrument panel, right side.
(10)	Do a test of the GPS system(s).	Refer to Section 31-40.

C. Replace a Marker or ADF Antenna

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Remove the passengers seats.	Refer to Section 25-10.
(3)	Disconnect the coaxial cable from the antenna that you will replace.	At the antenna.
(4)	Remove the antenna: – Remove the 3 screws, nuts and washers that attach the antenna to the airplane. – Remove the ground plate. – If necessary, use a knife to carefully remove the sealant that seals the antenna to the airplane outer surface. – Move the antenna clear of the airplane.	 Hold the antenna. Take care not to damage the airplane surface! From the outside.

	Detail Steps/Work Items	Key Items/References
(5)	Install the antenna: – Make sure that the contact surfaces of the antenna and the airplane surface where the antenna will be installed are clean and free of grease. – Move the antenna into position on the bottom of the fuselage. – Seal the outer edge of the antenna where it contacts the airplane surface with sealant. – Install the ground plate. – Install the 3 screws, washers and nuts that attach the antenna to the airplane.	Use sealant. Refer to Paragraph 4.
(6)	Connect the coaxial cable to the antenna.	At the antenna.
(7)	Install the passenger seats.	Refer to Section 25-10.
(8)	Do a post installation operational test of the ADF system.	Only if you replaced the ADF antenna. Refer to Paragraph 5.
(9)	Do an operational test of the marker system on the next flight.	Only if you replaced the marker antenna.

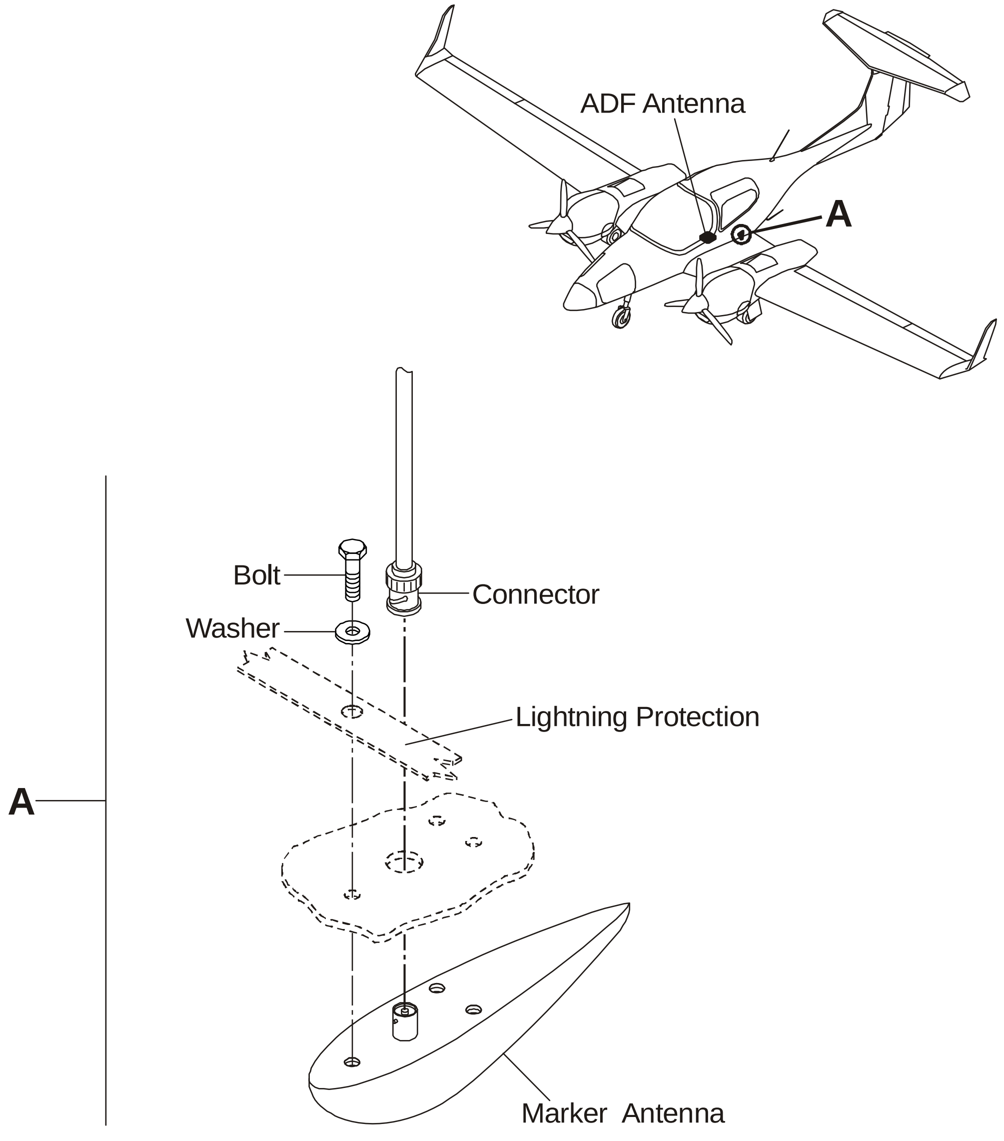

Figure 4: Replace a Marker Antenna

D. Replace a NAV/G/S Antenna (if OÄM 42-112 carried out)

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	Instrument panel, left side.
(2)	Open the GPS/NAV1 and/or GPS/NAV2 circuit breaker.	Instrument panel, right side.
(3)	Remove the rudder to gain access to the NAV G/S antenna via the hole in the stabilizer spar.	Refer to Section 27-20.
(4)	Disconnect the coaxial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: – Remove the 4 nuts and washers that attach the antenna to the airplane. – If necessary, use a knife to carefully remove the sealant that seals the antenna to the airplane outer surface.	
(6)	Install the rudder.	Refer to Section 27-20

3. Used Types of Flexible Coaxial Cables

Antenna/Receiver	Coaxial Cable
Transponder	RG 142
DME	RG 142
GPS	RG 400
ADF	RG 400
Marker	RG 400

4. Sealant Specification

Use an adhesive bonding compound on the basis of modified polymers or polyurethane to seal the antennas to the airplane outer surface. Make sure the sealant is free of silicone and it is temperature resistant from -40 °C (-40 °F) to +60 °C (+140 °F).

5. Post-Installation Check of the ADF System

A. General

After installing the equipment, check the indicator reading is correct and determine whether or not quadrantal error correction is necessary. If so, correction should be first carried out on the ground, then in the air. It is also necessary to establish whether any equipment in the airplane electrical system is generating interference.

B. Operational Check

	Detail Steps/Work Items	Key Items/References
(1)	Locate the airplane on the correction platform and using the bearing compass point the nose of the airplane to a radio beacon in boundary range.	
(2)	Switch on the ADF, adjust to the correct frequency and observe the indication in the ADF operating mode.	The indicator should read 0 relative bearing.
(3)	Turn the airplane about its vertical axis to a larger heading.	The indicator should move to the left.
(4)	Turn the airplane about its vertical axis to a smaller heading.	The indicator should move to the right.

Note: If the reading is incorrect or should the indicator move in the wrong direction, check the wiring of the equipment for agreement with the wiring diagram and correct if necessary.

Note: If the airplane is accurately aligned with the NBD beacon, but a relative bearing reading of 0° is not indicated, this is an indication that the antenna has been wrongly installed. Recheck the antenna for agreement with the centerline of the airplane and correct if necessary.

Refer to the manufacturer’s manual for detailed information on the quadrantal error correction.

Note: It is obliging to proceed in accordance with FAA AC 43-13-1A and FAA AC 43.13-2A requirements.

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Section 34-56

Transponder (XPDR)

1. General

The DA 42 NG has a transponder system which is an integral part of the Garmin G1000 system.

Refer to the G1000 Maintenance Manual, Doc.No.190-00907-00, latest revision or to the G1000 NXi Line Maintenance Manual, Doc.No. 190-02631-00, latest revision for more details about the transponder (XPDR) system of the DA 42 NG airplane.

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CHAPTER 35

OXYGEN SYSTEM

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CHAPTER 35
OXYGEN SYSTEM

1. General

This Chapter tells you about the optional continuous flow oxygen system installed in the DA 42 NG airplane. This Chapter contains general, trouble-shooting and maintenance information on the system.

2. Description

This oxygen system supplies supplemental oxygen which is required in an altitude above 12,500 ft. Each pilot or passenger can connect a mask or cannula to the oxygen system via four outlet ports. The operation of the oxygen system is controlled via a single ON/OFF switch installed below the instrument panel on the pilot's side. Information concerning the endurance of the system, which is in direct relation to the cylinder pressure, is indicated on a pressure gauge installed on the upper right side of the instrument panel.

A pressure gauge is installed on the RH side of the instrument panel. This gauge shows the amount of remaining oxygen by means of the current oxygen pressure in the cylinder. Two marks (REFILL=red color and FULL=green color) show the limits within which the system can be operated.

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Section 35-10
Pressure Gauge and Oxygen System

1. General

This oxygen system supplies supplemental oxygen which is required at altitudes above 12,500 ft. Each pilot or passenger can connect a mask or cannula to the oxygen system via four outlet ports. The operation of the oxygen is controlled via a single ON/OFF switch installed below the instrument panel on the pilot's side. Information concerning the endurance of the system, which is in direct relation to the cylinder pressure, is indicated on a pressure gauge installed on the upper right side of the instrument panel.

An oxygen system overview is given in Figure 1.

The system consists of five main sections:

– Pressure gauge on the instrument panel.

– Oxygen cylinder.

– Regulator valve assembly.

– Filling block.

– Outlet ports.

To enable proper ventilation the nose baggage compartment is divided into three vented compartments:

– Battery/relay-box compartment.

– Oxygen compartment.

– De-icing compartment (including de-icing fluid tank; optional equipment).

Not shown in Figure 1:

– Instrument panel pressure gauge lighting.

– Interfaces: masks, cannulas.

The high pressure system components are connected with copper tubing (filling block to regulator valve assembly; regulator valve assembly to instrument panel pressure gauge). The low pressure system components are connected via PFA tubing.

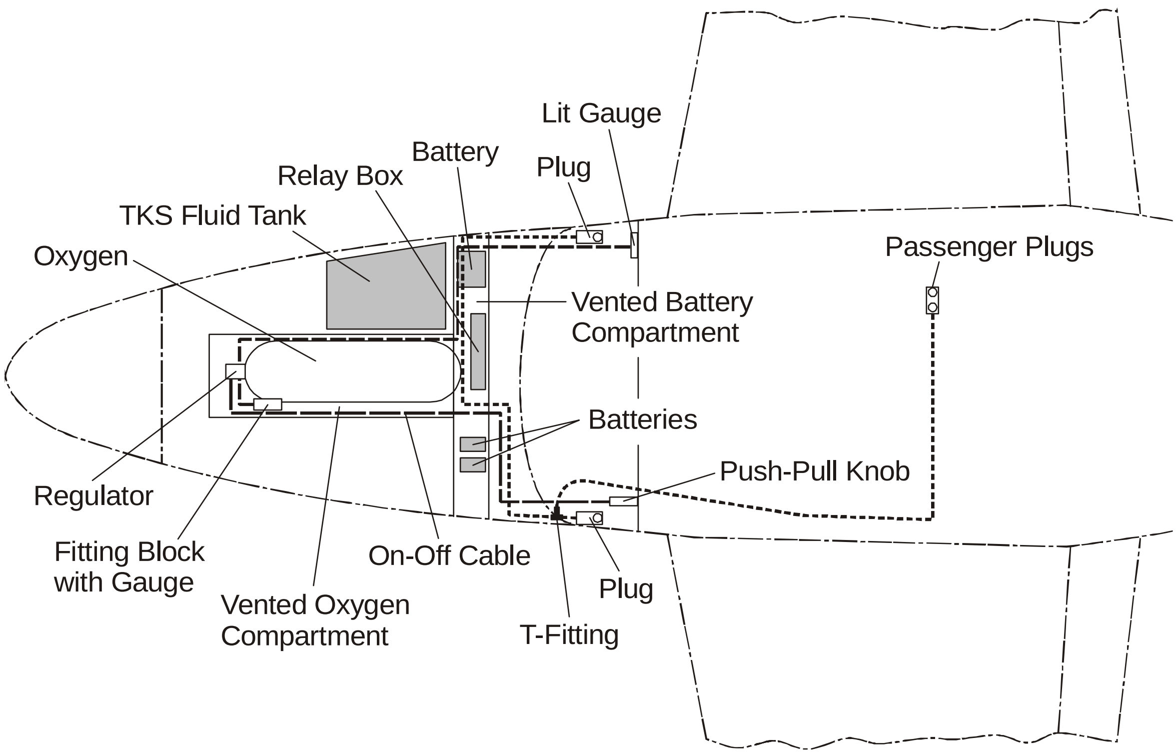

Figure 1: AEROX Oxygen System

2. Description

A. Pressure Gauge

The oxygen pressure gauge is installed on the RH side of the instrument panel. The gauge shows the current pressure in the oxygen cylinder. The oxygen pressure is directly related to the remaining amount of oxygen.

The lighting of the instrument panel pressure gauge is the only electrical item of the oxygen system. There are no indications and warning lamps of the oxygen system connected to the Garmin G1000 system.

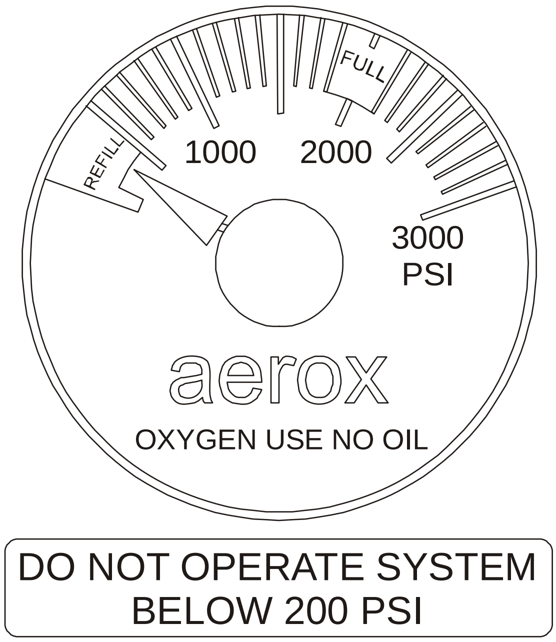

Figure 2: Oxygen Pressure Gauge

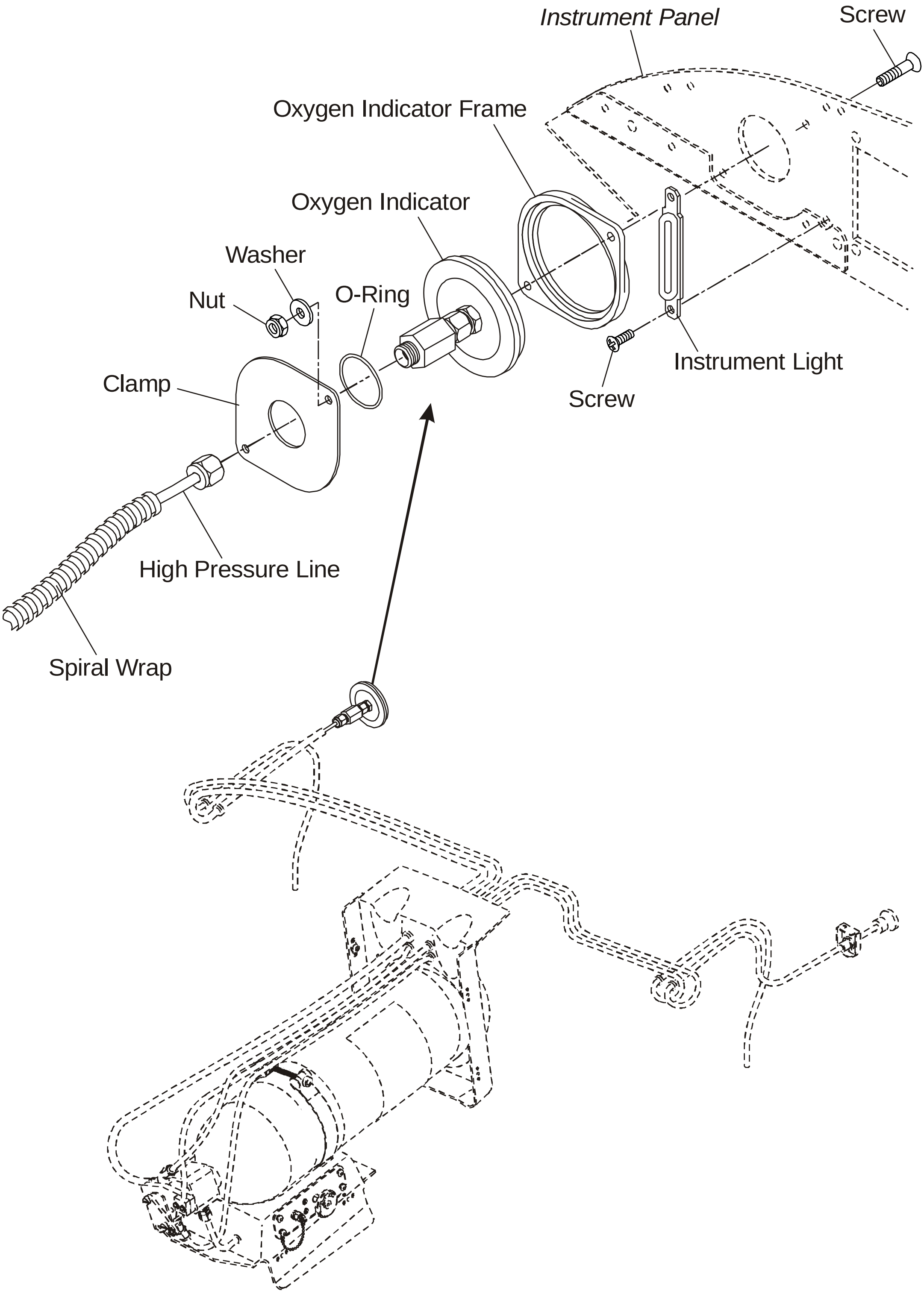

Figure 3: Pressure Gauge Installation on the Instrument Panel

B. Oxygen Cylinder

The Kevlar oxygen cylinder is installed in the front baggage compartment in its own vented compartment. The cylinder capacity is 10.7 liter (650 cu.in.), or 1419 liter (50.1 cu.ft.) of compressed oxygen at 128 bar (1850 PSI).

C. Regulator Valve Assembly

The oxygen flow is controlled by a regulator valve assembly which is switched by a push/pull knob Bowden cable assembly. The main task of the regulator valve is to reduce the oxygen pressure to 3.4 bar (50 PSI). Each mask or cannula is equipped with its own adjustable pressure regulator, therefore each user can adjust the amount of supplemental oxygen.

D. Filling Block

Refilling of the oxygen cylinder, which is firmly installed in the airplane, is done via the filling block assembly which is installed on the LH side of the oxygen compartment. It is accessible via a small cover on the LH side of the oxygen compartment. It consists of a damper valve and a pressure gauge. The cylinder is limited to a pressure of 128 bar (1850 PSI). The refilling of a fully depleted oxygen cylinder takes approximately 3.5 min.

E. Outlet Ports

Each pilot and each passenger has his own outlet port to which the mask or cannulas including their regulators can be connected. The outlet ports are interconnected via PFA-tubing to the low pressure side of the regulator.

3. Operation

CAUTION: OIL, GREASE OR OTHER LUBRICANTS IN CONTACT WITH OXYGEN CREATES A SERIOUS HAZARD. SUCH CONTACT MUST BE AVOIDED WHEN HANDLING OXYGEN EQUIPMENT.

A four-place oxygen system provides the supplementary oxygen necessary for continuous flight at high altitude. An oxygen cylinder is located in the center section of the forward baggage compartment, in its own enclosed, vented compartment. A combined pressure regulator/shut-off valve attached to the cylinder automatically reduces pressure to the delivery pressure required for the operating altitude. The oxygen cylinder filler valve is located on the LH side of the oxygen compartment next to the cylinder in the forward baggage compartment.

The 50 cubic feet (1.41 cubic meter) capacity oxygen cylinder may be filled to 1850 PSI while installed in the airplane. The system has a pressure gauge located next to the filler valve to indicate the amount of oxygen in the cylinder. An identical gauge is located on the upper RH side of the instrument panel (above the circuit breaker panel).The oxygen supply shut-off control is located on the LH side below the instrument panel. It is cable connected to the oxygen regulator valve, controlling the oxygen system by pulling the green control knob out for ON and pushing the same knob in for system supply OFF. The system should be left OFF when not in use.

The oxygen ports are located (one each) in the map pocket recess for the pilot and co-pilot. The passengers' oxygen ports are located overhead in the "roll-over bar" next to the cabin speaker. The individual cannula or mask supply tubes are plug-in connected to each port and contain the individual flow adjustments (flow meter-needle valve) for each occupant. Note that these ports are serviced directly from the oxygen regulator valve.

The oxygen cylinder, when fully charged, contains 50 cubic feet (1.41 cubic meter) of aviator's breathing oxygen under a pressure of 1850 PSI at 21°C (70 °F). Filling pressures will vary due to the ambient temperatures in the filling area and the rise of temperature resulting from the compression of the oxygen. Due to these factors merely filling the cylinder to 1850 PSI will not result in a properly filled cylinder. Fill oxygen cylinders to the pressures indicated in the table shown below, based on the filling area's ambient temperature.

The oxygen system pressure is limited and rated to 1850 PSI.

Ambient Temperature °C (°F)	Filling Pressure PSI	Ambient Temperature °C (°F)	Filling Pressure PSI
-18 (0)	1650	10 (50)	1875
-12 (10)	1700	16 (60)	1925
-7 (20)	1725	21 (70)	1975
-1 (30)	1775	27 (80)	2000
4 (40)	1825	32 (90)	2050

Trouble-Shooting

1. General

The table below lists the defects you could have with the oxygen system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
No oxygen comes out of the connected masks and cannulas.	False adjustment of flow meter-needle valve.	Adjust.
	Flow meter needle valve defective.	Replace valve.
	Outlet port defective.	Replace outlet port.
	Regulator valve assembly defective.	Replace regulator valve assembly.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to perform an operational test of the oxygen system. They also tell you how to remove and install the main components of the ice protection system.

2. Operational Test

	Detail Steps/Work Items	Key Items/References
(1)	Fill up the oxygen cylinder to a max. pressure of 128 bar (1850 PSI).	Do not use oxygen with a lower purity grade than prescribed by MIL-PRF-27210.
(2)	Check each plug-in outlet port.	Use the flow meter-needle valve assembly; open every needle valve completely and make sure the ball floats to the top of the flow meter. Make sure that every plug in is fully opened.
(3)	Check pressure gauges by comparing the one attached on the filling block with the pressure gauge installed in the instrument panel.	If the difference between both pressure indications is more than 100 PSI exchange inaccurate pressure gauge. Use a calibrated gauge, connected on the filling valve to determine the inaccurate gauge.

3. Empty the Oxygen System

	Detail Steps/Work Items	Key Items/References
(1)	Place airplane outside of hangar.	
(2)	Open the canopy.	
(3)	Check that the ON/OFF knob is in the OFF position.	
(4)	Plug in one connection tube in the pilot’s outlet port. Plug in only the connection tube including the flow meter needle valve assembly.	
(5)	Pull ON/OFF knob in ON position and adjust the needle valve to maximum flow.	
(6)	Confirm that the outlet of the flow meter needle valve assembly does not point not towards oil or grease (engine).	
(7)	The cylinder is depleted when the flow meter ball shows no flow.	

4. Remove/Install the Instrument Panel Pressure Gauge

A. Remove the Instrument Panel Pressure Gauge

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the oxygen cylinder is empty.	
(2)	Remove instrument panel cover.	
(3)	Disconnect the high pressure tube from the pressure gauge.	
(4)	Remove the screws of the panel-overlay and remove the placard.	
(5)	Remove the 2 nuts and washers from the rear clamp sheet metal.	
(6)	Remove the clamp sheet metal and pull the indicator backwards out of its frame.	
(7)	Remove the ring from the indicator.	

B. Install the Instrument Panel Pressure Gauge

	Detail Steps/Work Items	Key Items/References
(1)	Place the oxygen indicator in the frame.	
(2)	Attach the ring and the clamp sheet metal to the rear of the indicator.	
(3)	Install this assembly in the designated cutout on the RH side of the instrument panel.	Take care that no washer or nut falls into the instrument panel.
(4)	Install the RH panel overlay.	
(5)	Connect the high pressure copper tube to the gauge.	
(6)	Fix the tube which surrounds the copper tube by using cable ties.	Take care that the cable ties do not clamp this plastic tube.
(7)	Install the instrument panel cover.	

5. Remove/Install the Oxygen Cylinder

A. Remove the Oxygen Cylinder

	Detail Steps/Work Items	Key Items/References
(1)	Empty the oxygen cylinder.	Refer to Paragraph 3.
(2)	Check both oxygen pressure gauges and check the ON/OFF knob is in OFF position.	
(3)	Open both doors to the nose baggage compartment.	
(4)	Remove the LH and RH oxygen compartment cover.	
(5)	Remove one PFA tubing.	
(6)	Pull ON/OFF knob in ON position and confirm that the cylinder is empty.	
(7)	Disconnect all other lines and the Bowden cable from the regulator.	
(8)	Open the clamp which fixes the oxygen cylinder.	
(9)	Remove the LH battery cover.	For easier removal of the oxygen cylinder.
(10)	Remove the cylinder.	

B. Install the Oxygen Cylinder

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that no oil, greases or any accumulations of oil based substances are in or near the oxygen compartment.	
(2)	Install the regulator on the cylinder. Seal the thread with Teflon tape and a rubber ring.	
(3)	Install the cylinder in its designated position.	Regulator points forward.
(4)	Fix the cylinder by using the silicon protection ring and a clamp.	
(5)	Connect all pressure lines and the Bowden cable to the regulator.	
(6)	Install the LH battery cover and both oxygen compartment covers.	
(7)	Perform an operational test.	

6. Remove/Install the Oxygen Regulator

A. Remove the Oxygen Regulator

	Detail Steps/Work Items	Key Items/References
(1)	Empty the oxygen cylinder.	Refer to Paragraph 3.
(2)	Check both oxygen pressure gauges; verify that the ON/OFF knob is in the OFF position.	
(3)	Open both doors to the nose baggage compartment.	
(4)	Remove the LH and RH oxygen compartment cover.	
(5)	Remove one PFA tubing.	
(6)	Pull ON/OFF knob in ON position and confirm that the cylinder is empty.	
(7)	Disconnect all other lines and the Bowden cable from the regulator.	
(8)	Open the clamp which fixes the oxygen cylinder.	
(9)	Remove the LH battery cover.	For easier removal of the oxygen cylinder.
(10)	Remove the cylinder.	
(11)	Remove the regulator from the cylinder.	

B. Install the Oxygen Regulator

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that no oil, greases or any accumulations of oil based substances are in or near the oxygen compartment.	
(2)	Install the regulator on the cylinder. Seal the thread with Teflon tape and a rubber ring.	
(3)	Install the cylinder in its designated position.	Regulator points forward.
(4)	Fix cylinder with the silicon protection ring and a clamp.	
(5)	Connect all pressure lines and the Bowden cable to the regulator.	
(6)	Install the LH battery cover and both oxygen compartment covers.	
(7)	Perform an operational test.	

7. Remove/Install the Filling Block Assembly

A. Remove the Filling Block Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Empty the oxygen cylinder.	Refer to Paragraph 2.
(2)	Check both oxygen pressure gauges and check the ON/OFF knob is in OFF position.	
(3)	Open both doors to the nose baggage compartment.	
(4)	Remove the LH and RH oxygen compartment cover.	
(5)	Remove one PFA tubing.	
(6)	Pull ON/OFF knob in ON position and confirm that the cylinder is empty.	
(7)	Carefully disconnect the high pressure filling copper line from the regulator.	
(8)	Remove filling block assembly screws and pull out the filling block.	

B. Install the Filling Block Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Thread in the high pressure copper filling line in the grommet installed in front of the forward oxygen base. Mount the filling block assembly in the forward base by using 4 screws.	Use a new compression ring in the fitting of the regulator.
(2)	Install the LH battery compartment cover.	
(3)	Perform an operational test.	

8. Remove/Install the Pilot/Co-Pilot Outlet Manifold

A. Remove the Pilot/Co-Pilot Outlet Manifold

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the oxygen system is switched OFF.	
(2)	Remove the side pocket and disconnect the PFA tubing from the outlet manifold.	
(3)	Open the threaded ring of the outlet manifold and remove the outlet manifold.	

B. Install the Pilot/Co-Pilot Outlet Manifold

	Detail Steps/Work Items	Key Items/References
(1)	Remove the side pocket and install the outlet manifold by using the threaded ring after attaching the placard. Confirm that 2 PA rings (one between the side pocket and the outlet manifold and the other between the side pocket and the placard) are on the manifold.	
(2)	Connect the outlet manifold to the PFA tubing.	
(3)	Install the side pocket and check operation of the manifold.	

9. Remove/Install the Passengers' Dual Outlet Manifold

A. Remove the Passengers' Dual Outlet Manifold

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the oxygen system is switched OFF.	
(2)	Remove both forward lights and the speaker from the roll-over bar.	
(3)	Remove both threaded rings of the dual outlet manifold and push it in the roll-over bar.	
(4)	Remove the cable ties from the oxygen line and pull on the oxygen line to extract the dual manifold.	Take care that the PA rings on the outlet manifold do not fall into the roll bar.
(5)	Disconnect the PFA tubing from the dual outlet manifold.	
(6)	Protect open end of the PFA tubing against debris with tape.	

B. Install the Passengers' Dual Outlet Manifold

	Detail Steps/Work Items	Key Items/References
(1)	Put the 2 PA rings (one at each outlet) on the dual outlet manifold.	Use a small amount of adhesive to fix it.
(2)	Place the dual outlet manifold in the roll bar under the GPS antennas.	
(3)	Connect the PFA tubing with the outlet manifold.	
(4)	Place the outlet manifold in position and fix it with 2 threaded rings. Clamp the oxygen placard between the roll bar and the ring.	
(5)	Use cable ties to fix the oxygen line on the bonding strip.	
(6)	Perform an operational check and reinstall the forward cabin lights and the speaker.	

CHAPTER 51

STANDARD PRACTICES/STRUCTURES

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CHAPTER 51
STANDARD PRACTICES/STRUCTURES

1. General

The DA 42 NG is a twin engine, low wing monoplane of composite construction. The airplane has a standard T-tail and vertical stabilizer with a tail skid. It has retractable tricycle landing gear with a nose wheel that can be steered.

Two types of structural resin systems are in use, further designated as L285 and RIM 935 (refer to Section 51-30 for detailed data). The resin system is clearly defined by a distinguished part number. In addition the resin system for parts produced for S/N 42.N300/42.MN100 or above is stated on the identification label of the part (refer to Figure 1). Composite parts with no resin system stated on the identification label or on the part are made of L285.

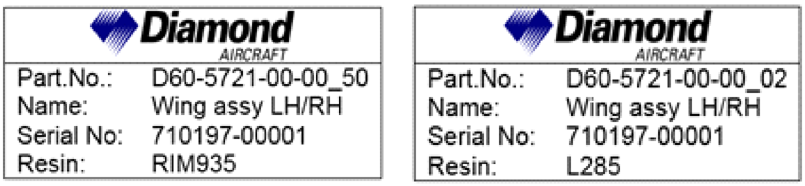

Figure 1: Composite Part Identification Labels

The DA 42 NG fuselage has a semi-monocoque structure. Two carbon fiber reinforced plastic (CFRP) half-shells make the fuselage skin. The fuselage shells have many layers of carbon cloth. Rigid foam inserts give stiffness to the fuselage shells where necessary. All of the main structural components are CFRP or GFRP rigid moldings. Many layers of carbon or glass cloth bond together to make each molding. Carbon fiber cloth gives more strength and stiffness.

The vertical stabilizer is part of the fuselage. The aft part of the left and right fuselage shells make the left and right shells of the vertical stabilizer.

The DA 42 NG has a wing center section and the left and right wings attach to the wing center section. The wing center-section also supports the two engine nacelles. The wing center section is divided into three areas, these are the engine nacelles, wing stubs and center section.

The flight loads from the wings are transferred to two spar bridges running laterally through the wing center-section. The wings are connected to the center section with spar stubs that extend into the wing center-section. Each wing is attached to the center section with four main bolts and two auxiliary bolts.

Each wing has top and bottom shells. It has front and rear spars and a wing root rib made in three parts. Each shell has a carbon fiber reinforced plastic (CFRP) outer skin, a rigid foam core and a GFRP inner skin.

Each wing has two I-section spars. The front spar on one side is the same as the rear spar on the other side. Many layers of uni-directional carbon fiber make the spar caps. The number of layers in the spar caps decreases from root to tip. Each spar has a shear web. The shear web has GFRP skins and a rigid foam core. Glass cloth fillets attach the spar caps to the shear web.

A rear web closes the trailing edge of the wing. An end rib closes the outboard end of the wing. A removable winglet attaches to the wing shells and outer rib with screws.

The flaps and ailerons have top and bottom shells. Each shell has a mixture of CFRP and GFRP cloth. The shells have rigid foam cores and bond together.

The horizontal stabilizer has top and bottom shells. Each shell has GFRP skins. The horizontal stabilizer has a front spar and a rear spar. Three pairs of ribs give strength to the central area. The elevator has top and bottom shells. Each shell has GFRP skins with a rigid foam core.

The rudder has left and right shells. Each shell has GFRP skins with a rigid foam core. The shells bond together at a flange.

The canopy is a CFRP molding with inner and outer frames that bond together. The canopy has a large one-piece acrylic transparency. The passenger door is a CFRP molding with inner and outer frames. The frames bond together. The door has an acrylic transparency.

A polyurethane paint finish protects the outer skins of the airplane from ultraviolet rays and humidity.

2. Types of Structure

The DA 42 NG is constructed from two main types of composite structure.

A. Glass Fiber Reinforced Plastic (GFRP)

GFRP is very thin glass fibers bonded together by resin. The glass fibers give most of the strength and the resin maintains the shape. The resin also bonds to other structural components such as metal attachment brackets or metal bushings.

The glass fibers are woven to make glass cloth. The orientation and the weave of the glass in the cloth affects the structural strength of the cloth. A component can have many layers of cloth bonded together with resin. This is called lamination.

GFRP has very good properties. It is strong and flexible. It is very resistant to chemical attack and very little maintenance of GFRP laminates is necessary.

B. Carbon Fiber Reinforced Plastic (CFRP)

CFRP is very thin carbon fibers bonded together by resin. The carbon gives most of the strength and the resin maintains the shape. The resin also bonds to other structural components such as metal attachment brackets or metal bushings.

CFRP is very similar to GFRP. The main advantage of CFRP is that it is stronger and more rigid than GFRP.

3. Laminated Components

A laminated component has two or more layers of glass/carbon cloth. The direction of the fibers in the cloth give the properties of each layer. Extra layers are bonded to some areas to give more strength.

4. Sandwich Construction

Many of the components in the DA 42 NG have a sandwich of two skins and a core. GFRP or CFRP make the skins and rigid foam makes the core.

The skins must bond to the core of a sandwich structure completely. If the skins do not bond to the core the component can fail.

5. Bonded Components

A number of components can bond together to make a larger component. Special thick resin bonds these components together and fills the gap in a joint.

6. Repair Limitations

Repairs which are categorized as 'Class 1' in accordance with Section 51-10, Paragraph 2, may only be carried out in accordance with a repair scheme which has been approved by Diamond Aircraft Industries. Such repairs are not described in the Airplane Maintenance Manual (AMM).

Repair work on these components is not permitted:

– Radome (nose cone, if OÄM 42-119 or OÄM 42-273 is installed).

Section 51-10
Investigation

1. General

This Section tells you how to assess the class of damage. It also tells you how to inspect glass fiber reinforced plastic (GFRP), carbon fiber reinforced plastic (CFRP) composite structures and debris protection composite and adhesive foil structures. Damage assessment and repairs must be carried out by approved persons.

Refer to Section 51-00 for the types of structures used in the DA 42 NG and for repair limitations. Refer to Section 51-20 for general repair procedures. Refer to Chapter 53 for more information about the debris protection system.

2. Damage Classification

Damage is divided into the classes described below. If you are not sure about the classification of any damage you must refer to the airplane manufacturer.

A. Class 1 Damage

Any damage, that is not class 2 through 4 damage is counted among Class 1.

B. Class 2 Damage

Damage to primary structural components (fuselage, wings, empennage) and control surfaces (dimensions for L285 <150 mm [5.9 in] or for RIM 935 <25 mm [1 in] in any direction) as well as holes and cracks passing through both skins of a sandwich construction component. The core damage must be able to be covered by a 75 mm (3 in) diameter circle for L285 or by a 13 mm (0.5 in) diameter circle for RIM 935.

C. Class 3 Damage

Small holes or cracks in the outer skin of primary structural components (fuselage, wings, empennage) and control surfaces where there is no internal damage to the component, the sandwich material or the inner skin.

D. Class 4 Damage

Minor scratches, abrasions or similar damage which is not a puncture or crack in the airplane skin as well as any sort of damage to non-load-bearing structures (e.g. fairings, cowlings, carpetings, canopies).

3. Types of Damage

There are two basic types of damage that can occur in composite structures and which can not be readily found with visual examination:

– Disbonding.

– Delamination.

Disbonding is the failure of the bonding between two or more components. For example between the wing skin and a wing rib. Or between a metal component and a composite component. Or between a composite skin and a sandwich core material.

Delamination is the failure of a bond between one or more layers of glass/carbon cloth in a laminated component.

There are also two main types of cracks that can occur in composite structures:

– Micro cracks.

– Major cracks.

Micro cracks occur in the surface of the resin and do not affect the integrity of the cloth.

Major cracks have broken fibers in the cloth. Major cracks do not occur with normal flight loads or normal landing loads. You must carefully examine the areas around major cracks for indications of further damage which can transmitted into other components.

You must repair all major cracks. If you are not sure how to proceed with further inspections of major cracks you should contact the airplane manufacturer for advice.

4. Inspection Techniques

A. Visual Examination

Use this method to find all types of damage to composites. Use a bright light to examine visually the inside of a component. GFRP must be green or brown in color. If it has white areas, then it may be damaged. Look specially where components bond to the GFRP.

CFRP must be black in color. Apply a small load to the area where you expect a damage, e.g. by pushing slightly on it. Check for abnormal flexibility or noises. Broken lamination often crackles under load. Look specially in areas where components bond to the CFRP.

Look carefully at the outer surface of a component. If the paint has cracks or bubbles, then the composite below may be damaged. Refer to Paragraph 5 in this Section.

Also look for dents and deformation. Look specially in the areas where stones can hit the fuselage and wings below the airplane. Look specially in the areas of the wing walkways.

B. Light Test

Use the light test to find delamination. Use this test on components which do not have rigid foam cores.

CAUTION: DO NOT LET THE COMPOSITE GET HOT. HEAT CAN CAUSE DAMAGE TO COMPOSITES.

Point a very bright light at the surface and look at the surface from the opposite side to the light source. Damage usually shows as dark areas in the component. You can point the light from the inside of the component or the outside of a component.

Note: You can use the light test on thick sections of GFRP but it is difficult to use on CFRP.

C. Coin Tap Test

Use the coin tap test to find delamination and disbonding. Tap a coin on the laminate surface across the area you will test. The sound of the coin tapping on the surface of the laminate will change as you move the coin over damaged laminate.

Look specially in the area around the damage for secondary damage, which can remain undetected.

5. Further Inspection

If you find damage to the paint when you examine a composite structure then do this further inspection.

Find a way to see the inside of the structure or component. If necessary, remove panels (or other components), or you can use remote viewing equipment. For example, remove a winglet to see inside the wing. If you can see damage inside the component or structure you must do a repair.

Remove the paint coat in the area that you think is damaged. Remove the paint coat carefully, you must not damage the surface under the paint coat.

Look carefully at the surface under the paint coat. Push the middle of the area to be tested with your thumb. If you can feel the skin hitting against the core of the sandwich (or other layer/component) then the skin is disbonded and you must repair the structure.

In some cases you may need to cut inspection holes in the structure to do the test correctly. If you must make inspection holes then you must contact Diamond Aircraft Industries for advice.

6. Debris Protection Inspection (OÄM 42-088a, OÄM 42-089a, OÄM 42-090a)

A. Single and Triple Layer Adhesive Foil Debris Protection (OÄM 42-088a, OÄM 42-089a)

Even small holes or buckling deeper than 1.5 mm (0.06 in) in this layer have an adverse effect on its tensile strength. A proper protection of the fuselage cannot be ensured and therefore the debris protection must be replaced. Visually inspect the fuselage skin underneath during replacement. Refer to Section 51-10 for classification and repair of a probable fuselage damage. Scratches and little damages in the border area are acceptable. If damage occurs outside of the debris protection check position or contact the airplane manufacturer.

A replacement by a composite debris protection is possible.

B. Composite Debris Protection (OÄM 42-090a)

The composite debris protection should be replaced if damage occurs. If damage exceeds 50 mm (2 in) in diameter, the debris protection must be replaced and the fuselage skin underneath must be inspected. Refer to Section 51-10 for classification and repair of a probable fuselage damage.

A replacement by adhesive foil debris protection is possible.

Section 51-20
Repair Processes

1. General

Note: On certain serial numbers the engine cowlings are manufactured with a resin that is different from the usual resin. Refer to Section 51-30.

This Section tells you how to repair composite structures. Repairs must be carried out by approved persons. Refer to Section 51-00 for data about the types of structure. Refer to Section 51-10 for data about the classification of damage and inspection techniques. Refer to Section 51-30 for data about approved repair materials.

2. Center of Gravity Limits

When you repair an airplane you change the weight of the airplane. If you change the weight of an airplane then you change the center of gravity. The further the distance of a repair from the center of gravity, the greater the effect of the repair will have on the center of gravity. You must always weigh the airplane after a large repair and calculate the center of gravity. Refer to Section 08-10 for data about weighing the airplane and calculating the center of gravity.

3. Control Surface Balancing

When you repair a control surface it becomes heavier. Make an estimate of the new weight of the control surface if you were to carry out the repair. (Weigh the materials that you will use to do the repair and add the weight to the actual weight of the control surface). If the post repair weight is greater than the permitted weight then do not do the repair. You must install a new control surface. Refer to Chapter 06-00 for data about the weight and balance of control surfaces.

When you repair a control surface and/or apply a new paint coat you must weigh the control surface and check the balance of the control surface. Section 51-60 tells you how to check the balance of a control surface. Refer to Chapter 06-00 for data about the weight and balance of control surfaces.

4. Drain/Vent Holes

You must keep all drain and vent holes in the structure of the DA 42 NG open. If you close a drain or vent hole during a repair you must make a new hole in the same position after the repair is complete.

5. Holding a Component During a Repair

You must hold a component in the correct position when you do a repair. If you do not hold a component correctly it may move during the repair and cause further damage. It can also change the airplane alignment.

Hold the component in a special device (jig/fixture) before you cut out the damaged area. If necessary, lift the airplane on jacks and level the airplane. Refer to Section 07-10 for more data about lifting the airplane on jacks and refer to Section 08-20 for data about leveling the airplane.

6. Safety Precautions

Moist resins can cause skin disease. When you use resins/hardeners use a protective barrier cream on all exposed skin, specially your hands. You must always wear protective gloves.

WARNING: DO NOT GET RESIN ON YOUR SKIN. RESIN CAN CAUSE SKIN DISEASE.

The resins, hardeners and solvents used for composite repairs are poisonous. You must not take food or drinks into the work area. Use a mask to protect your face and use eye protection.

WARNING: DO NOT GET RESINS, HARDENERS OR SOLVENTS IN YOUR MOUTH OR IN YOUR EYES. THESE CHEMICALS CAN CAUSE DISEASE.

When you grind composites you make small particles of composite dust. These particles can irritate the skin and eyes. If you breathe these particle they can cause lung disease.

When you grind composite you must always use a protective cream on all exposed skin, specially your hands. Wear overalls that seal; at the neck, sleeves and ankles. You must always wear protective gloves and if necessary, change them often. Use a suitable mask to protect your face and lungs. Always wear safety goggles to protect your eyes.

If your skin comes into contact with composite dust, then wash it off with clean flowing water. Do not rub your skin while there is dust on it.

WARNING: DO NOT GET COMPOSITE DUST PARTICLES IN YOUR EYES, OR IN YOUR MOUTH, OR ON YOUR SKIN. THESE PARTICLES CAN CAUSE DISEASE.

7. Workshop Conditions

Keep the workshop clean and free from dust. Remove grinding dust as it occurs. The working area must not be affected by draughts.

The workshop temperature must be maintained:

– for L285 between 18 °C (65 °F) and 27 °C (80 °F).

– for RIM 935 between 18 °C (65 °F) and 23 °C (73 °F).

The temperature must not fall below 15 °C (59 °F).

The relative humidity during mixing, applying or curing resins must not be allowed to rise above 80% for L285 or 65% for RIM 935.

Maintain the workshop temperature as near to 25 °C (77 °F) as possible during curing.

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Maintenance Practices

1. General

These Maintenance Practices tell you about composite repair processes and how to repair Class 2, 3 and 4 damage to the composite structure. Refer to Section 51-10 for data about damage classification. Class 1 damage may only be repaired in accordance with a repair scheme which must be approved in accordance with the procedures established by the competent certifying authority. All repairs must only be carried out by approved persons.

You must only use the materials approved by the manufacturer when repairing the airplane. Refer to Section 51-30 for data about approved materials.

Inspect the damaged area(s). Look specially at the adjacent structure. Damage can go a long way under the surface of a composite. Use the techniques given in Section 51-10.

You must take care to do the repair correctly. The outer shell of a composite structure is stressed. Improper repairs can cause structural failure.

2. Resin

You must use the correct quantity of mixed resin for the repair. Weigh all the cloth patches that you will use for the repair. The ratio for glass cloth to resin mix is 100 : 70. For example, 100 grams of dry cloth require 70 grams of mixed resin. The ratio for carbon cloth to mixed resin is 100 : 85. For example, 100 grams of dry carbon cloth requires 85 grams of mixed resin.

Measure the quantities of resin and hardener accurately (± 0.5% by weight). Mix the resin and hardener thoroughly before laminating, or adding fillers or other additives.

Always use clean containers for mixing resin and only mix as much resin as you can use within its ‘working life’.

When using large quantities of resin put it shallow containers. This will increase the ratio surface area to volume which will reduce the risk of an exothermic reaction.

Two types of structural resin systems are in use, further designated as L285 and RIM 935 (refer to Section 51-30 for detailed data). The part must be repaired with the same resin system as used during manufacturing of the part. The resin system is clearly defined by a distinguished part number and is stated on the identification label of the part. The resin system can also be specially defined for specific parts (e.g. cowlings). In case of doubt, contact the manufacturer.

3. Glass and Carbon Cloth

You must always use the correct cloth for the repair. Refer to the lay-up drawing of the repair area for data about the type of cloth you must use for the repair. The lay-up drawing will tell you:

– The correct type of cloth.

– The fiber direction.

– The dimensions of the layer.

Make sure that the fibers in each layer of cloth point in the direction given by the lay-up drawing. This gives the correct strength to the laminate.

Only use sharp shears or scissors to cut the cloth to size. Make sure that the fibers in the cut cloth point in the correct relative direction. Make sure that the fiber strands are not broken or damaged. The cloth must be free of any damage or contamination.

4. Core Material

You must always use the correct sandwich core for the repair. Refer to the lay-up drawing of the repair area for data about the core material that you must use.

Make sure that the core material is not damaged or contaminated.

Use a sharp knife to cut the core to the exact size for the repair. The edges of the cut must be clean so that the core will bond correctly. You can profile the core by cutting or sanding.

Small damages of the core (diameter ≤ ½ inch) may be repaired by resin thickened with micro balloons or Q-Cell.

5. Laminating

A prescribed stack of resin impregnated cloth makes a laminate. A laminate which is used to repair an airplane becomes an integral part of the airplane structure once the laminate has hardened and fully cured.

You can make a laminate in place on the airplane or you can make a laminate on a work bench and then apply the wet laminate to the airplane repair. When you make the laminate on a work bench:

– It is easier to do.

– It is easier to control and correct the laminating process.

– You can make sure that the cloth layers in the stack are correct before you apply the resin.

– You can make the repair neater.

– You do not have to work upside down to make the laminate.

A. Laminating Directly on the Airplane

	Detail Steps/Work Items	Key Items/References
(1)	Prepare the damaged area for laminating: – Make sure that the repair is clean and free of contamination. – Do not touch the area to be repaired. Especially particles of skin protecting cream on your hands may act as a separating agent within the lamination.	Refer to the relevant repair procedure in this Section.
(2)	Identify type of resin used for the parts to be repaired.	Find the parts label and note the resin system used for this part. For S/N below 42.N300/42.MN100: if the parts label does not state a type of resin, and this manual does not give instructions on the resin system to be used for the specific part, use L285 for repair. In case of doubt, contact Diamond Aircraft for assistance.

	Detail Steps/Work Items	Key Items/References
(3)	Prepare the layers of cloth that you will use for the repair.	Refer to the lay-up drawing.
(4)	Protect the area of the structure around the repair from contamination by the repair materials.	Use plastic/polythene sheeting held in place by self-adhesive tape.
	WARNING: DO NOT GET RESIN ON YOUR SKIN. RESIN CAN CAUSE SKIN DISEASE. **WARNING: DO NOT GET RESINS, HARDENERS OR SOLVENTS IN YOUR MOUTH OR IN YOUR EYES. THESE CHEMICALS CAN CAUSE DISEASE.**	
(5)	Apply a thin coat of resin to the repair.	
(6)	Apply the first layer (the biggest one) of cloth to the repair and trim to the correct size.	Make sure that the fibers in the cloth point in the correct direction.
(7)	Use a roller, squeegee and a stipple brush to remove all trapped air. Make sure that the cloth is completely impregnated with resin. If necessary, add more resin.	
(8)	When the excess resin has been brought to the surface with the rolling and stippling process. Apply the next layer of cloth. Trim the cloth to the correct size.	Make sure that the fibers in the cloth point in the correct direction.
(9)	Do steps 6 and 7 as necessary until all the layers of cloth are in place.	
(10)	Use the roller and squeegee to remove the excess resin.	
(11)	Put a layer of peel ply over the laminate.	
(12)	If necessary, apply a vacuum bag to the laminate.	Refer to the lay-up drawing and/or repair drawing.
	WARNING: DO NOT PUT HOLLOW COMPONENTS COMPLETELY INTO A VACUUM BAG. YOU MAY DESTROY THEM.	

B. Laminating on a Work-Bench

	Detail Steps/Work Items	Key Items/References
(1)	Prepare the damaged area for laminating: – Make sure that the repair is clean and free of contamination.	Refer to the relevant repair procedure in this Section.
(2)	Identify type of resin used for the parts to be repaired.	Find the parts label and note the resin system used for this part. For S/N below 42.N300/42.MN100: if the parts label does not state a type of resin, and this manual does not give instructions on the resin system to be used for the specific part, use L285 for repair. In case of doubt, contact Diamond Aircraft for assistance.
(3)	Prepare the layers of cloth that you will use for the repair.	Refer to the lay-up drawing.
(4)	Put a layer of clean transparent plastic/polythene sheeting over the repair area and hold in place with self-adhesive tape.	
(5)	Use an indelible ink marker to: – Trace onto the plastic sheet the extreme outline of the repair. – Trace onto the plastic sheet the contour lines of each layer of cloth in the structure.	The outer layer of the structure must be tapered to avoid stress risers and to give a good finish.
(6)	Remove the transparent sheet from the repair area and place it upside down on a work-bench.	
	Note: The cloth layers are laid in reverse order when you laminate on a table. You must take care to put the cut cloth layers in the correct order and that the fibers in each cloth layer point in the correct direction.	
(7)	Cut the layers of cloth to fit the contour lines that you traced onto the transparent sheet.	

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GET RESIN ON YOUR SKIN. RESIN CAN CAUSE SKIN DISEASE. **WARNING: DO NOT GET RESINS, HARDENERS OR SOLVENTS IN YOUR MOUTH OR IN YOUR EYES. THESE CHEMICALS CAN CAUSE DISEASE.**	
(8)	Apply a thin coat of resin to the transparent sheet.	
(9)	Apply the first inner layer of cloth to the transparent sheet and trim to the correct size.	Make sure that the fibers in the cloth point in the correct direction.
(10)	Use a roller squeegee and a stipple brush to remove all trapped air. Make suer that the cloth is completely impregnated with resin. If necessary, add more resin.	
(11)	When the excess resin has been brought to the surface with the rolling and stippling process. Apply the next layer of cloth. Trim the cloth to the correct size.	Make sure that the fibers in the cloth point in the correct direction.
(12)	Do steps 9 and 10 as necessary until all the layers of cloth are in place.	
(13)	Apply a thin coat of resin to the area of the repair on the airplane structure where you will attach the laminate patch.	
(14)	Put the laminate patch carefully into position on the airplane structure using the transparent sheet.	Make sure that the fibers in the cloths point in the correct direction.
(15)	Carefully remove the transparent sheet from the patch.	
(16)	Use the roller and squeegee to remove the excess resin.	
(17)	Put a layer of peel ply over the laminate.	
(18)	If necessary, apply a vacuum bag to the laminate.	Refer to the lay-up drawing and/or repair drawing.

6. Bonding Paste (Thickened Resin)

CAUTION: FOR BONDING OF PARTS WHICH ARE MADE WITH SELF EXTINGUISHING RESIN, THE BONDING PASTE MUST ALSO BE MIXED FROM SELF EXTINGUISHING RESIN. REFER TO SECTION 51-30.

Use bonding paste to bond GFRP/CFRP components together and in the repair of sandwich cores. Resin and thickening fillers make the bonding paste. Table 1 gives you the proportion by weight of resin to thickening fillers.

Table 1 - Bonding Paste Mixing Proportions

Material	Weight in Grams								
Mixed Resin	50	100	150	200	250	300	350	400	450
Cotton Flakes	6.1	12.2	18.3	24.4	30.5	36.6	42.7	48.8	54.9
Sil Cell 300 or Eurocell 300	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1

7. Curing

You must cure a composite structure to make it strong. If you do not cure a composite structure correctly it may fail. Curing is a two part process, pre curing and post curing. The following procedure gives a typical curing process. You must follow the resin manufacturers instructions for the resin that you are using.

Curing and post curing depends on the resin system used for repair.

A. Curing with L285

	Detail Steps/Work Items	Key Items/References
(1)	Maintain the temperature of the repair at 20 to 25 °C (68 to 77 °F) for at least 24 hours to pre-cure the repair.	If you do not have an oven or a warming room you can make a temporary enclosure around the repair to trap the heat from a flame proof air heater.
	CAUTION: DO NOT ALLOW THE TEMPERATURE TO GET TOO HIGH DURING THE CURE. A TEMPERATURE THAT IS TOO HIGH CAN DAMAGE THE COMPOSITE STRUCTURE.	
(2)	After 24 hours raise the temperature of the repair to at least 65 °C (149 °F) for a minimum of 6 hours to complete the first stage of the post-cure.	Monitor the temperature every 15 minutes for the first hour then hourly.
(3)	After a minimum of 6 hours raise the temperature of the repair to at least 80 °C (176 °F). Maintain this temperature for a minimum of 14 hours to complete the final post-cure.	The final stage post cure time can be divided into sections but you must make sure that the repair has a minimum total of 14 hours at post cure temperature.
	CAUTION: DO NOT HEAT UP ABOVE 85 °C (185 °F). THE FOAM CORE MIGHT BE DESTROYED.	

B. Curing with RIM 935

	Detail Steps/Work Items	Key Items/References
(1)	Establish and maintain a temperature of the repair area of 40 to 55 °C (104 to 131 °F) for at least 10 hours to pre-cure the repair.	If you do not have an oven or a warming room you can make a temporary enclosure around the repair to trap the heat from a flame proof air heater.
	CAUTION: DO NOT ALLOW THE TEMPERATURE TO GET TOO HIGH DURING THE CURE. A TEMPERATURE THAT IS TOO HIGH CAN DAMAGE THE COMPOSITE STRUCTURE.	
(2)	Gradually raise the temperature of the repair area to 125 to 135 °C (257 to 275 °F) over a minimum of 4 hours.	
(3)	Maintain this temperature for a minimum of 14 hours to complete the final post-cure.	Monitor the temperature every 15 minutes for the first hour then hourly. The post cure time can be divided into sections but you must make sure that the repair has a minimum total of 14 hours at post cure temperature.
(4)	After min. 14 hours lower the temperature to room temperature over a minimum of 4 hours.	
	CAUTION: DO NOT HEAT UP ABOVE 135 °C (275 °F). OTHERWISE THE FOAM CORE MIGHT BE DESTROYED.	

8. Exterior Paint Finish

A. Paint Color Schemes

CAUTION: YOU MUST PAINT THE AIRPLANE TO THE PAINT COLOR SCHEME. IF YOU DO NOT PAINT THE AIRPLANE TO THE PAINT COLOR SCHEME YOU MAY CAUSE DAMAGE TO THE AIRPLANE STRUCTURE.

If MÄM 42-1134 is installed, the painting scheme of the airplane at first delivery is stated on a placar on the floor in the RH nose baggage compartment according to Section 11-30-00.

Since full strength of the fiber composite structure has only been shown up to the most critical climatic conditions expected in service with certain paint colors, the outer surface of the airplane must be painted in accordance with a paint color scheme of a certain solar absorptivity. Refer to Chapter 04 of this manual.

Refer to Figure 1 or Figures 2, 3 and the table for the details of the respective paint color scheme.

(1) For S/N below 42.N300/42.MN100:

Exceptions from the paint color scheme are registration markings, warning markings, trim or striping, which are subject to the following restrictions (refer to Figure 1):

– Zone 1. No registration markings, warning markings, trim or striping may be applied here, except for the placards in accordance with Section 11-20.

– Zone 1a. This zone has the same restrictions as Zone 1, except that registration markings may be applied here which comply with the restrictions of Zone 2.

– Zone 2. Registration markings, warning markings, trim or striping may be applied here. They may be any shape and color, provided that the average absorption coefficient of each area measuring 200 mm by 200 mm (8 in by 8 in) does not exceed 0.5. Examples which meet this criterion are:

- Registration markings, warning markings, trim or striping of any shape, provided that colors with a solar absorptivity not exceeding 0.5 (e.g. light yellow or light green) are used.
- Registration markings, warning markings, trim or striping of any color, provided that no area measuring 200 mm by 200 mm (8 in by 8 in) is covered by more than 50%. One consequence is that the width of decoration stripes must not exceed 100 mm (4 in).

– Zone 3. Registration markings, warning markings, trim or striping of any shape and color may be applied here without restrictions. In addition color paint finish of any color may be applied in this zone.

– Zone 4. It is mandatory to paint this zone (top of vertical stabilizer leading edge) in a color with a solar absorptivity not exceeding 0.65.

If the Garmin GWX 68 or GWX 70 weather radar system (OÄM 42-119 or OÄM 42-273) is installed, a special GFRP radar nose cone is installed. The radar nose cone is coated with a special paint. You must replace the radar nose cone if the surface condition affects the weather radar system's image quality.

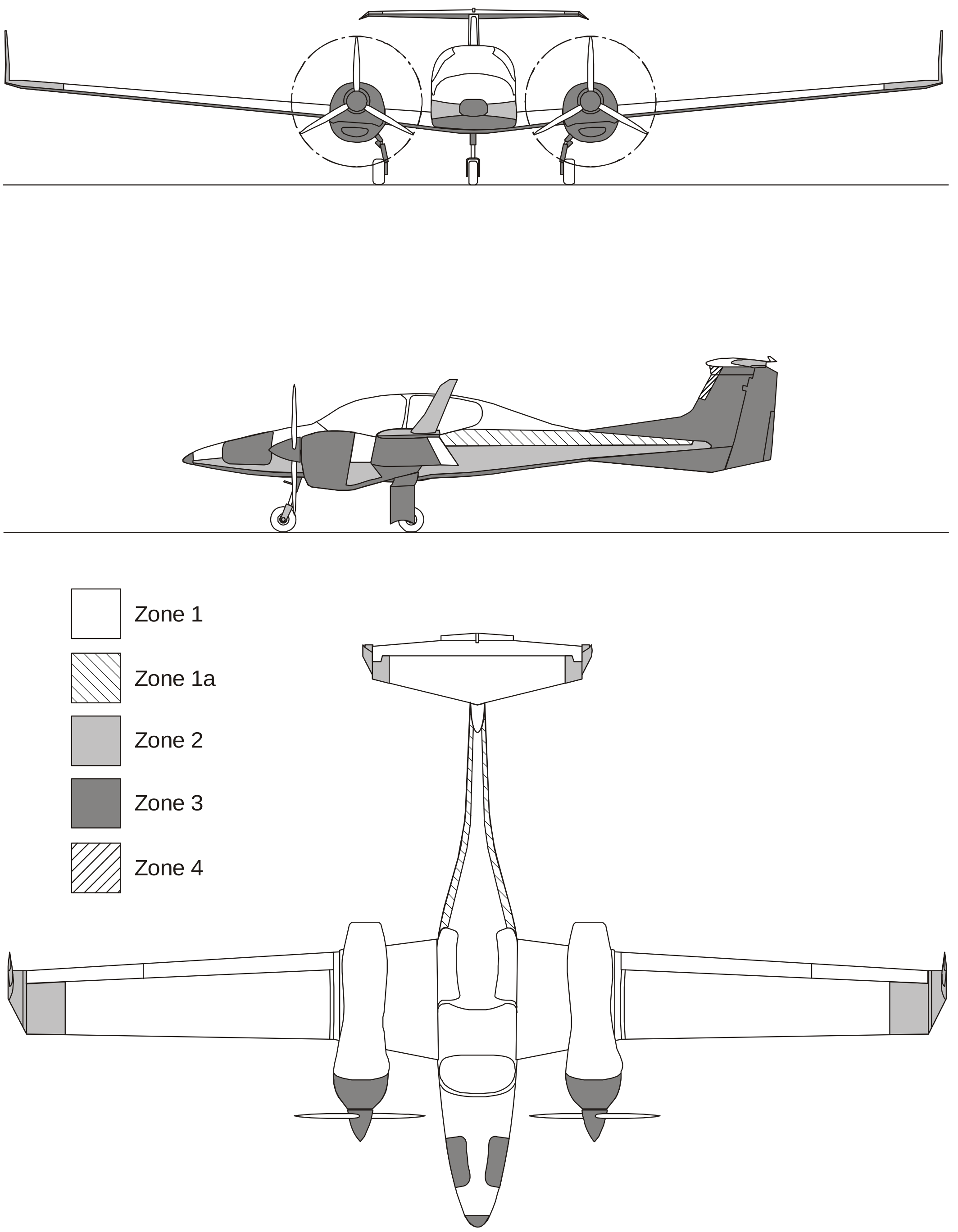

Figure 1: Paint Color Scheme S/N below 42.N300/42.MN100

(2) For S/N 42.N300/42.MN100 and above:

Refer to Figures 2, 3 and Table 2 for further information on the paint color scheme.

– Zone 1. Colors coded A*** according to Table 2 have to be used on:

- the upper shell of the outer wings, from the engine nacelle to 1000 mm (40 in) outboard,
- 50 mm (2 in) radial distance from hinges on the upper shells of the aileron, the elevator, the elevator trim tab and the outer flaps.

– Zone 2. This zone can either be painted with:

- colors coded A*** according to Table 2 or
- a combination of colors in patterns (e.g. stripes, squares, lines) with a maximum solar absorptivity of 0.54 averaged over any 125 mm x 125 mm (5 in x 5 in) square. Examples which meet this criterion are:
  - Registration markings, warning markings, trim or striping of any shape, provided that colors with a solar absorptivity not exceeding 0.54 are used.
  - A stripe of any color on a white background (solar absorptivity 0.3) results in a maximum width of the stripe of 50 mm (2 in) within the 125 mm x 125 mm (5 in x 5 in) square.

– Zone 3. Color paint finish of any color may be applied in this zone.

– Zone 4. If the weather radar is installed, the radome has to be painted with colors coded N*** according to Table 2. Otherwise color paint finish of any color may be applied in this zone.

For DA 42 M-NG external stores other than under fuselage the limitations of Zone 2 apply.
For DA 42 M-NG external stores under fuselage the limitations of Zone 3 apply.

Any color refers to any PU-based color. For suppliers other than MIPA, compatibility with the basis paint layers must be verified.

The definition of the separation line between Zone 2 and 3 is shown in Figure 3 .

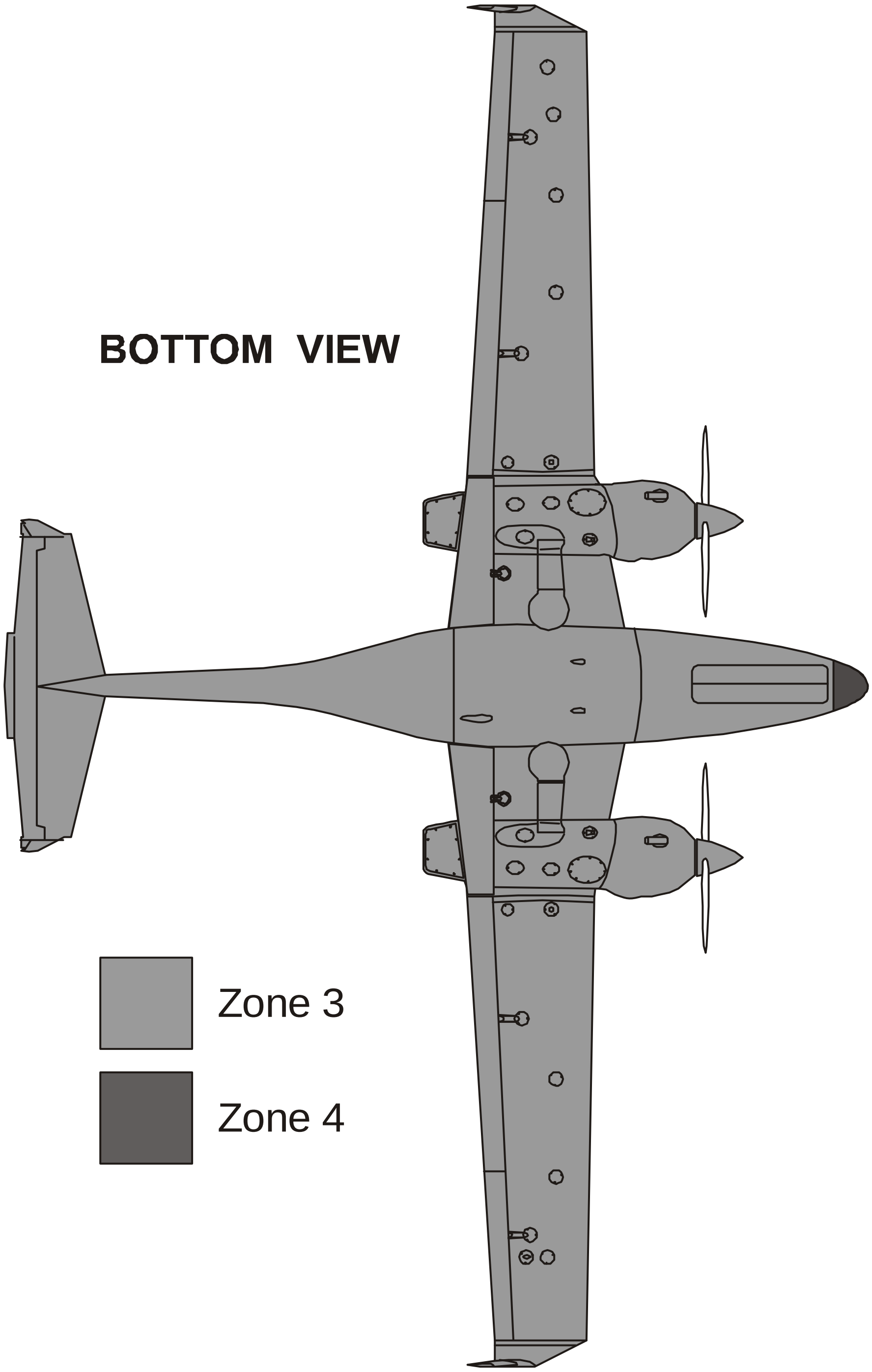

Figure 2: Paint Color Scheme S/N 42.N300/42.MN100 and above, Part I

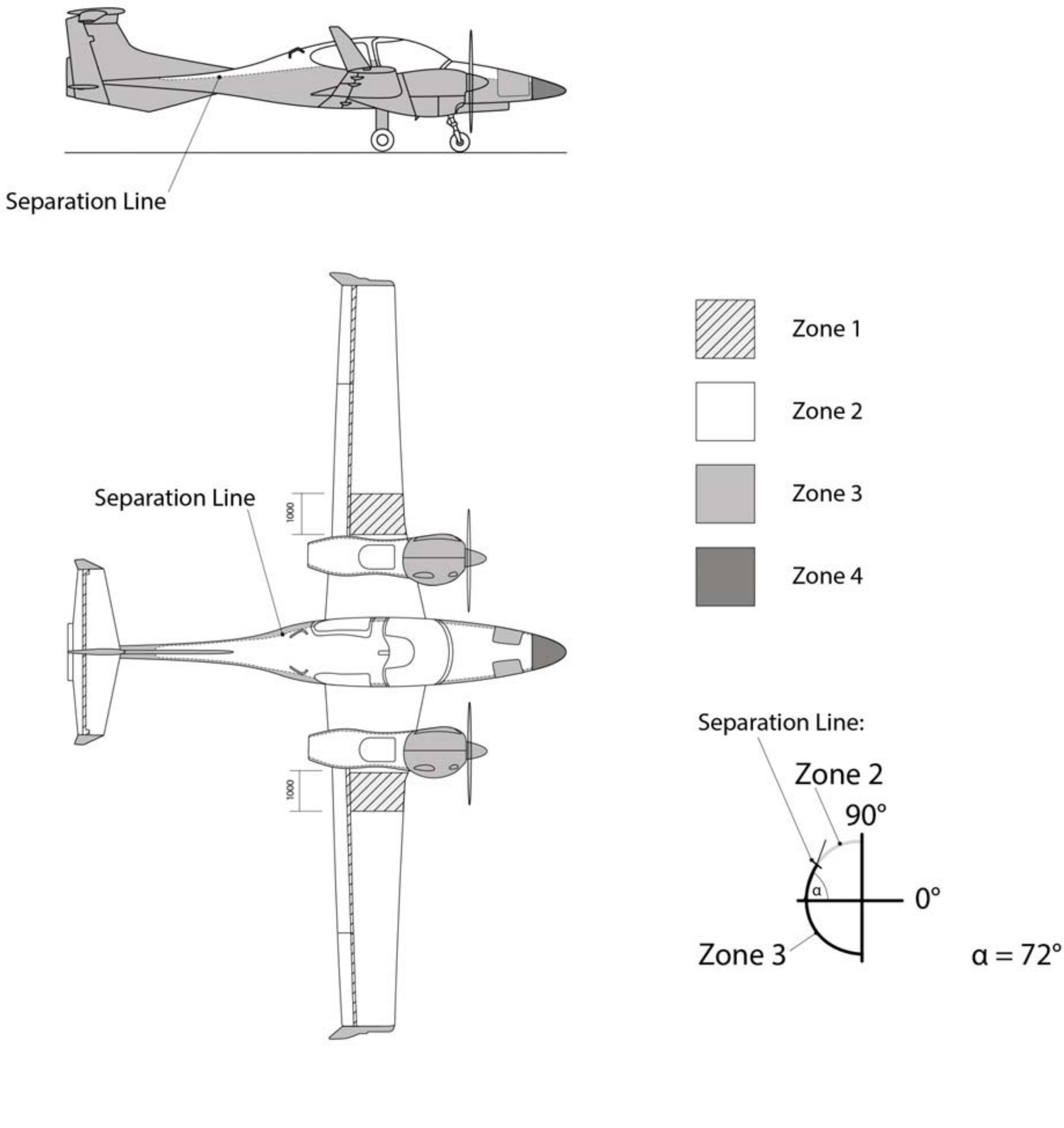

Figure 3: Paint Color Scheme S/N 42.N300/42.MN100 and above, Part II

Table 2: APPROVED BASE COAT COLORS					
CODE	**Base Coat Color Number (Airplane)**	**Supplier**	**CODE**	**Base Coat Color Number (Nose, Metal Free Colors)**	**Supplier**
A000	White PU-based color with a solar absorptivity not exceeding 0.3. Examples: RAL 9016, Mercedes D B 147, BMW 218, Volvo XG28, Volvo BC76, Saab 5AC6, Alfa Romeo 230.	MIPA*	N000	Use only approved white coating paints according to Section 51-30-00, H(4)(a).	See Section 51-30
A001	BC A-71061 RUMPF SILBER MET TOY-199	MIPA	N001	BC A-71072 RADARNASE SILBER PEARL TOY-199	MIPA
A002	BC A-71062 RUMPF ANTHRAZIT TOY-1E5	MIPA	N002	BC A-71071 RADARNASE ANTHRAZIT PEARL TOY-1E5	MIPA
A003	BC A-3819 RADARNASE ROT PEARL TOY-3L6	MIPA	N003	BC A-3819 RADARNASE ROT PEARL TOY-3L6	MIPA
A004	BC A-50466 RUMPF BLAU MET FEU-MLTC	MIPA	N004	BC A-50467 RADARNASE BLAU MET FEU-MLTC	MIPA
A005	BC A-10416 RUMPF GOLD MET BMW-301	MIPA	N005	BC A-10417 RADARNASE GOLD MET BMW-301	MIPA
A006	BC A-50478 RUMPF BLAUGRÜN MET BMW-288	MIPA	N006	NOT AVAILABLE	MIPA
A007	BC A-50474 PANTONE 281c	MIPA	N007	BC A-50474 PANTONE 281c	MIPA

A008	TSR-2655 LIGHT SUNSET ORANGE	MIPA	N008	TSR-2655 LIGHT SUNSET ORANGE	MIPA
A009	TSR-2656 DARK SUNSET ORANGE	MIPA	N009	TSR-2656 DARK SUNSET ORANGE	MIPA
A010	TSR-3993 FLAMENCO RED	MIPA	N010	TSR-3993 FLAMENCO RED	MIPA
A011	TSR-50652 SAN MARINO BLUE	MIPA	N011	TSR-50652 SAN MARINO BLUE	MIPA
A012	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL MT	MIPA	N012	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL MT	MIPA
A013	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL SM	MIPA	N013	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL SM	MIPA
A014	TSR-50687 LIGHT BLUE	MIPA	N014	TSR-50687 LIGHT BLUE	MIPA
A015	TSR-10617 AURORA GOLD	MIPA	N015	TSR-10617 AURORA GOLD	MIPA
A016	BC A-71062 RUMPF ANTHRAZIT TOY-1E5 GLOSS LEVEL MIT	MIPA	N016	BC A-71071 RADARNASE ANTHRAZIT TOY-1E5 GLOSS LEVEL MT	MIPA
A017	A-90641 CREME WHITE PEARL**	MIPA	N017	A-90641 CREME WHITE PEARL**	MIPA

* For Suppliers other than MIPA, compatibility with the basis paint layers must be verified.

** This base coat includes a base coat and subsequent effect coat. For application obey manufacture's instructions.

Following clear coats have to be used:

– for gloss level MT: MIPA 2K-HS-Klarlack matt

– for gloss level SM: MIPA 8010-12-349-6040 (stumpfmatt)

– for all other base coats: MIPA 2K-MS-Klarlack C 75

B. Painting a Large Repair Area

This procedure must be followed when the diameter of the area which must be painted is larger than 200 mm (8 in).

	Detail Steps/Work Items	Key Items/References
(1)	Carefully scarf the edges of the existing paint finish.	Refer to Figure 4. Do not sand through the existing antistatic filler. Minimum scarf length: 25 mm (1 in). To ensure the at the antistatic filler of the existing paint is electrically connected to the antistatic filler of the new paint.
	WARNING: DO NOT GET ACETONE, FILLER, OR PAINT ON YOUR SKIN. ACETONE, FILLER, AND PAINT CAN CAUSE SKIN DISEASE. **WARNING: DO NOT BREATHE ACETONE, FILLER, OR PAINT FUMES. ACETONE, FILLER, AND PAINT FUMES CAN CAUSE DISEASE.** CAUTION: THERE MUST BE NO GREASE OR DUST ON THE REPAIR AREA. GREASE AND DUST PREVENT A GOOD BOND.	
(2)	Make sure that the area to be repaired is clean and free from any contaminants.	If necessary, use acetone and re-sand the area.
(3)	Apply HS filler to the repair area.	Obey the filler manufacturer's instructions.
(4)	Allow the HS filler to cure.	2 hours at 45 °C (113 °F).
(5)	Lightly sand the HS filler with 320 grit sanding paper.	
(6)	Make sure that the area to be repaired is clean and free from any contaminants.	If necessary, use acetone and re-sand the area.

	Detail Steps/Work Items	Key Items/References
(7)	Apply two layers of anti-static spray filler to the repair area.	Obey the filler manufacturer's instructions.
(8)	Allow the anti-static filler to dry.	At 60 °C (140 °F).
(9)	Carefully sand the HS filler with 320 grit sanding paper.	Remove as little antistatic filler as possible. Do not sand through the edges.
(10)	Make sure that the area to be repaired is clean and free from any contaminants.	If necessary, use acetone and re-sand the area.
(11)	Apply the paint coat.	Obey the paint manufacturer's instructions.
(12)	Allow the paint coat to dry.	90 minutes at 45 °C (113 °F), then 2 days at 20 °C (68 °F).

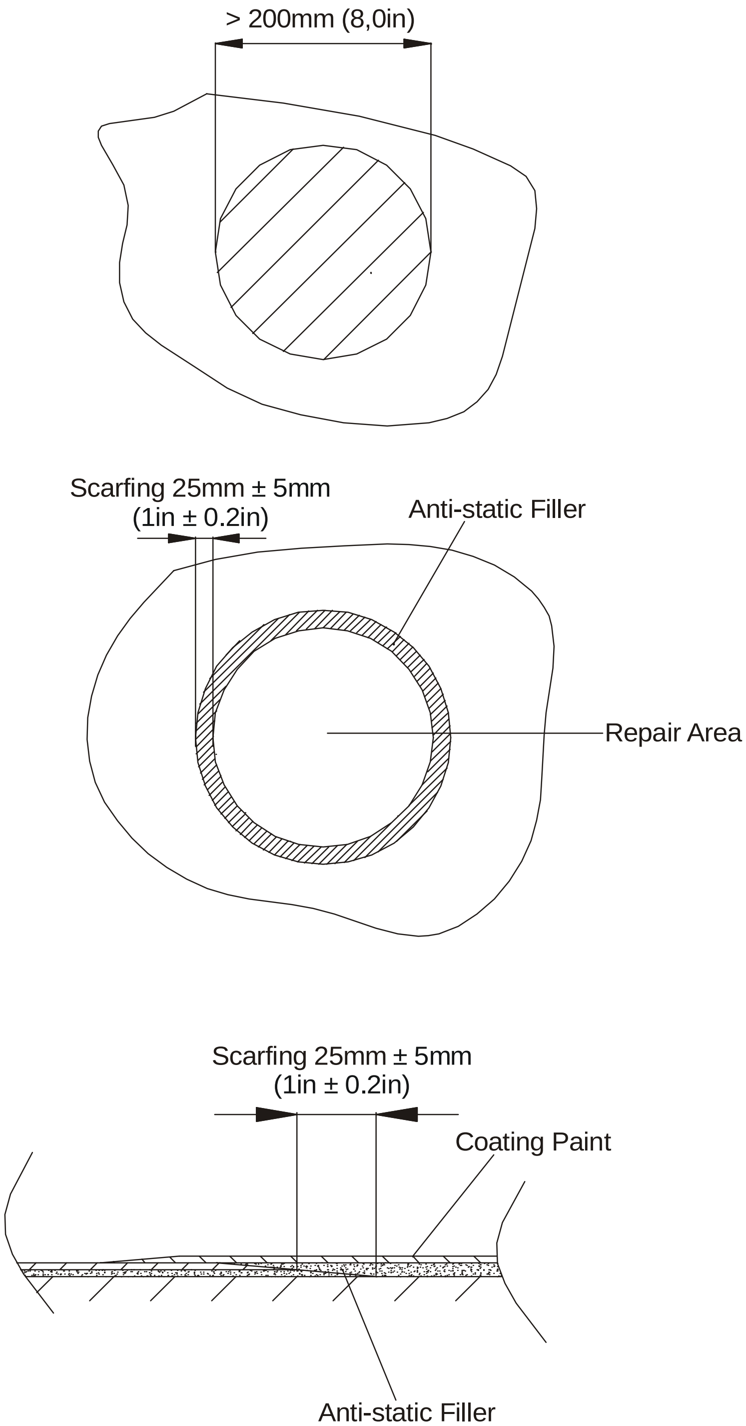

Figure 4: Scarfing the Paint Coat

C. Painting a Small Repair Area

This procedure must be followed when the diameter of the area which you will paint is 200 mm (8 in) or less.

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GET ACETONE, FILLER, OR PAINT ON YOUR SKIN. ACETONE, FILLER, AND PAINT CAN CAUSE SKIN DISEASE. **WARNING: DO NOT BREATHE ACETONE, FILLER, OR PAINT FUMES. ACETONE, FILLER, AND PAINT FUMES CAN CAUSE DISEASE.** CAUTION: THERE MUST BE NO GREASE OR DUST ON THE REPAIR AREA. GREASE AND DUST PREVENT A GOOD BOND.	
(1)	Make sure that the area to be repaired is clean and free from any contaminants.	If necessary, use acetone and re-sand the area.
(2)	Apply 2 layers of HS filler to the repair area.	Obey the filler manufacturer's instructions.
(3)	Allow the HS filler to cure.	2 hours at 45 °C (113 °F).
(4)	Lightly sand the HS filler with 320 grit sanding paper.	
(5)	Make sure that the area to be repaired is clean and free from any contaminants.	If necessary, use acetone and re-sand the area.
(6)	Apply the paint coat.	Obey the paint manufacturer's instructions.
(7)	Allow the paint coat to dry.	90 minutes at 45 °C (113 °F), then 2 days at 20 °C (68 °F).

D. Coated Safety Walk Repair (OÄM 42-187 carried out)

(1) Equipment

Item	Quantity	Part Number
Safety walk substrate sprinkler.	1	DAI-9011-20-03_LV.
Plastic spattle.	1	Commercial.

(2) Material

Item	Quantity	Part Number
Safety walk cover LH.	1	D60-1120-20-01_LV.
Safety walk cover RH.	1	D60-1120-20-02_LV.
Fill-in 2 K 400 ml RAL 7038.	3	22101980.
Safety walk substrate.	0.5 kg	DAI-9011-20-03.

(3) Repair Procedure

	Detail Steps/Work Items	Key Items/References
WARNING:	**WHEN HANDLING CHEMICALS ALWAYS OBSERVE HEALTH AND SAFETY REGULATIONS GIVEN BY THE MANUFACTURER OF THE CHEMICALS.**	
(1)	Clean the entire area between fuselage and nacelle. Use water to remove dirt from the surface. If necessary, add a mild cleaning agent.	Refer to Section 12-30.
(2)	Use a commercial solvent to remove grease from the surface. The surface must be totally clean from grease or dirt.	
(3)	Place the safety walk cover on the center wing and mark the position with a pencil on the middle wing surface.	Refer to Figure 5.
(4)	Make sure that the safety walk cover orientation is parallel to flight direction.	
(5)	Remove the protective layer from the safety walk cover.	
(6)	Place the safety walk cover corresponding to the marks on center wing (don’t use soap water) and remove the transfer foil smoothly.	
(7)	Remove air bubbles from the edges of the cutouts with a plastic spattle.	

	Detail Steps/Work Items	Key Items/References
(8)	Prepare the surface at the cutouts of the safety walk cover: – Carefully roughen the paint with sandpaper (grit 320), for the ends of strips use red Scotch-Brite.	
(9)	Clean the surface at the safety walk cutouts with a vacuum cleaner and silicon remover.	
(10)	Cover the airplane's surface around the safety walk cover.	
(11)	Prepare lacquer P/N 22101980 in acc. with the technical information sheet. Shake 2 minutes before and after operating the red button. Press red button with the ball of your hand until stop is reached.	
(12)	Spray a thick film at the cutouts of the safety walk cover.	
(13)	Use safety walk substrate sprinkler to apply safety walk substrate evenly over cutouts.	
(14)	Apply a second layer of lacquer: – Make sure the whole substrate is evenly covered with a sufficient amount of paint.	
(15)	Carefully pull off the safety walk cover starting from one edge. Remove the cover in direction of the strips within 15 minutes.	
(16)	Let the system dry for 12h in a dry and weather protected area at temperatures from 20 to 30°C (68 to 86 °F).	
(17)	Remove the cover from the airplane surface.	

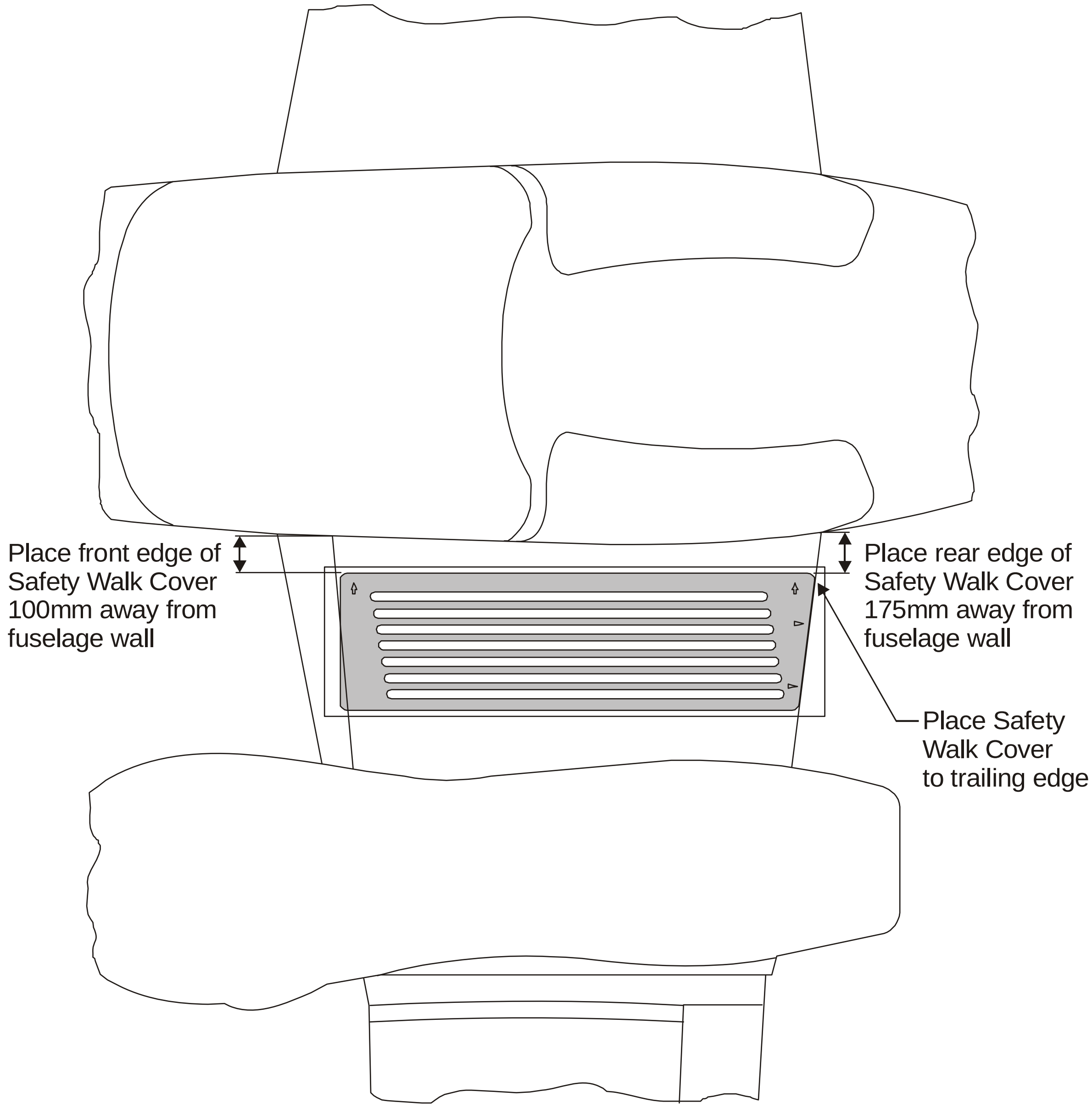

Figure 5: Safety Walk Cover Positioning

9. Repairs

A. Class 4 Repairs

The repair of minor scratches, abrasions or similar damage which is not a crack or a puncture in the skin.

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GET ACETONE, FILLER OR PAINT ON YOUR SKIN. ACETONE, FILLER AND PAINT CAN CAUSE SKIN DISEASE. **WARNING: DO NOT BREATHE ACETONE, FILLER OR PAINT FUMES. ACETONE, FILLER AND PAINT FUMES CAN CAUSE DISEASE.**	
(1)	Sand the repair area with 150 grit sanding paper.	
(2)	Make sure that the area to be repaired is clean and free from any contaminants.	If necessary, use acetone.
(3)	Apply putty to the repair area to fill any damage.	Obey the putty manufacturer's instructions. Fill to the original contour of the structure.
(4)	Allow the putty to cure.	5 to 20 minutes.
(5)	Lightly sand the putty with 150 grit sanding paper.	
(6)	Apply filler(s) and paint coat.	Refer to Paragraph 8.

B. Class 3 Repairs

Small holes or cracks in the outer skin where there is no internal damage to the component, the sandwich material, or the inner skin.

Refer to Figure 6 for an example of a typical Class 3 repair scheme.

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(1)</td><td>Make sure that the area around the damage is clean.</td><td></td></tr>
<tr><td>(2)</td><td>Carefully examine the area around the damage. Look specially for disbonding between the inner laminate layers and any core material.</td><td>Do a coin tap test to find the extent of any disbonding or delamination.</td></tr>
<tr><td>(3)</td><td>Remove damaged/loose laminate until the edges of the laminates are bonded together and to any core material.</td><td>Refer to Figure 6.
Use a sharp knife or grinding disk.</td></tr>
<tr><td>(4)</td><td>Scarf the edges of the repair area with a grinding disk or block.</td><td>Scarf glass cloth at 50:1 (50x cloth thickness) minimum and carbon cloth at 100:1 (100x cloth thickness) minimum.</td></tr>
<tr><td>(5)</td><td>Count the layers of fabric that you will need to replace.</td><td>Refer to the lay-up drawing for the related structure for data about the cloth type and orientation.</td></tr>
<tr><td colspan="3">WARNING: DO NOT GET ACETONE, FILLER OR PAINT ON YOUR SKIN. ACETONE, FILLER AND PAINT CAN CAUSE SKIN DISEASE.

WARNING: DO NOT BREATHE ACETONE, FILLER OR PAINT FUMES. ACETONE, FILLER AND PAINT FUMES CAN CAUSE DISEASE.

CAUTION: THERE MUST BE NO GREASE OR DUST ON THE REPAIR AREA. GREASE AND DUST PREVENT A GOOD BOND.</td></tr>
<tr><td>(6)</td><td>Clean the area of the repair.</td><td>If you use acetone to remove any grease or dirt then you must lightly re-sand the repair area.</td></tr>
</table>

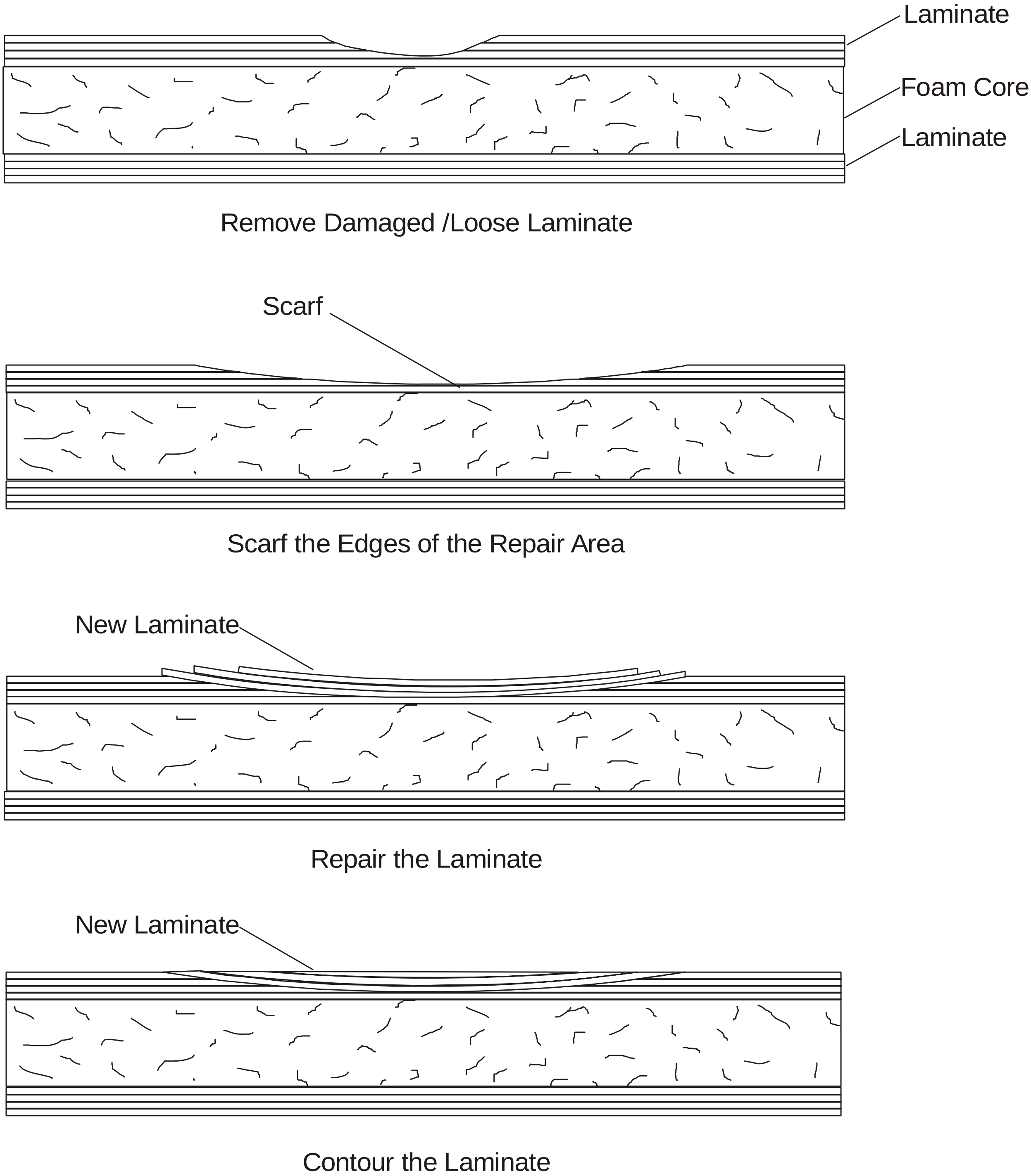

Figure 6: Typical Class 3 Repair

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GET RESIN ON YOUR SKIN. RESIN CAN CAUSE SKIN DISEASE. **WARNING: DO NOT GET RESINS, HARDENERS OR SOLVENTS IN YOUR MOUTH OR IN YOUR EYES. THESE CHEMICALS CAN CAUSE DISEASE.**	
(7)	Repair the laminate.	Use one of the 2 methods given in Paragraph 5, step 7.
(8)	Pre-cure the repair.	Refer to Paragraph 7.
(9)	Post-cure the repair.	Refer to Paragraph 7.
(10)	When the repair is fully post cured, remove the peel ply and sand smooth the surface of the repair.	
(11)	Contour the repair so that the final surface level of the repair is slightly lower than the original surrounding area.	Use 150 grit sanding paper. To allow for the paint coat.
(12)	Apply filler(s) and paint coat.	Refer to Paragraph 8.

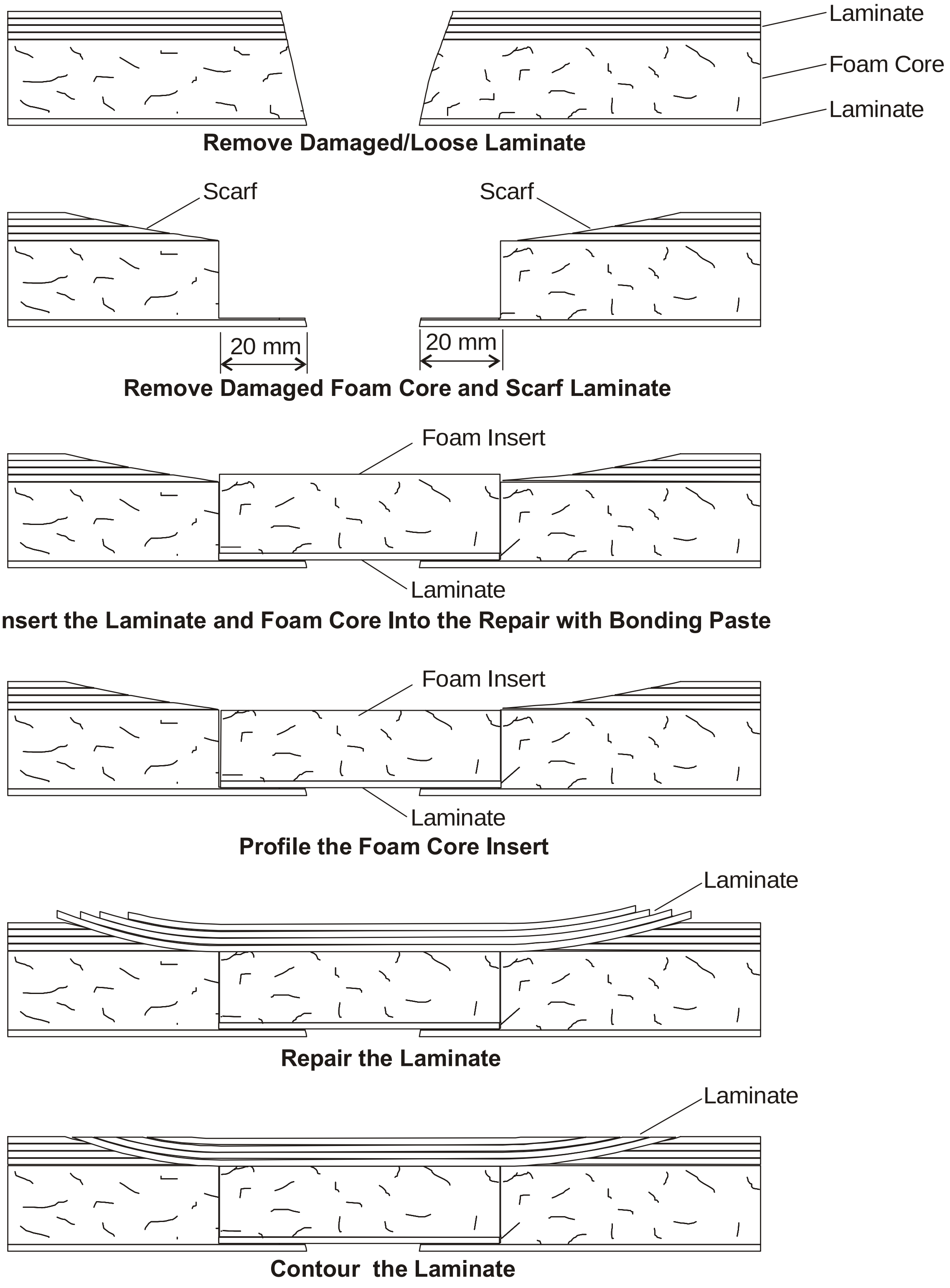

Figure 7: Typical Class 2 Repair

C. Class 2 Repairs

Holes and cracks passing through both skins of a sandwich construction component. The core damage must be able to be covered by a 75 mm (3 in) diameter circle.

Refer to Figure 7 for an example of a typical Class 2 repair scheme.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the area around the damage is clean.	
(2)	Carefully examine the area around the damage. Look specially for disbonding between the inner laminate layers and any core material.	Do a coin tap test to find the extent of any disbonding or delamination.
(3)	Remove damaged/loose laminate until the edges of the laminates are bonded together and to any core material.	Refer to Figure 7. Use a sharp knife or grinding disk.
(4)	Remove the damaged foam core.	Remove sufficient foam core to give a minimum of 20 mm (0.8 in) edge around the outside of the damaged area. Refer to Figure 7.
(5)	Scarf the edges of the external laminate repair area with a grinding disk or block.	Scarf glass cloth at 40:1 (40x cloth thickness) minimum and carbon cloth at 60:1 (60x cloth thickness) minimum.
WARNING:	**DO NOT GET ACETONE, FILLER OR PAINT ON YOUR SKIN. ACETONE, FILLER AND PAINT CAN CAUSE SKIN DISEASE.**	
WARNING:	**DO NOT BREATHE ACETONE, FILLER OR PAINT FUMES. ACETONE, FILLER AND PAINT FUMES CAN CAUSE DISEASE.**	
CAUTION:	THERE MUST BE NO GREASE OR DUST ON THE REPAIR AREA. GREASE AND DUST PREVENT A GOOD BOND.	
(6)	Clean the area of the repair.	Use acetone only if any grease or dirt comes to the surface of the repair.
(7)	Cut and shape a piece of foam core to replace the damaged foam core that you removed in step 4.	Use a sharp knife to cut the foam.

	Detail Steps/Work Items	Key Items/References
(8)	Prepare the layers of cloth that you will need to laminate on the inner surface of the foam core.	Refer to the lay-up drawing for the related structure for data about the cloth type and orientation.
	WARNING: DO NOT GET RESIN ON YOUR SKIN. RESIN CAN CAUSE SKIN DISEASE. **WARNING: DO NOT GET RESINS, HARDENERS OR SOLVENTS IN YOUR MOUTH OR IN YOUR EYES. THESE CHEMICALS CAN CAUSE DISEASE.**	
(9)	Prepare the foam core for inserting in the repair: – Apply a thin coat of resin to the foam core. – Apply a coat of thickened resin to the foam core. – Laminate the inner layers of cloth onto the inner surface of the foam core. Make sure that the fibers of the cloth point in the correct direction.	Refer to Paragraph 6. Use one of the 2 methods given in Paragraph 5.
(10)	Apply a thin coat of resin to the area to be repaired.	
(11)	Put the foam core and inner laminate into position in the repair.	
(12)	Pre-cure the repair.	Refer to Paragraph 7.
(13)	Use a sanding disk or block to contour the foam core of the repair.	Refer to Figure 7.
(14)	Clean the repair.	
(15)	Apply a coat of thickened resin to the foam core of the repair.	
(16)	Apply a thin coat of resin to the scarfed edges of the outer laminate of the repair.	
(17)	Repair the outer laminate.	Use one of the 2 methods given in Paragraph 5.
(18)	Pre cure the repair.	Refer to Paragraph 7.

	Detail Steps/Work Items	Key Items/References
(19)	Post cure the repair.	Refer to Paragraph 7.
(20)	When the repair is fully post cured, remove any peel ply and sand smooth the surface of the repair.	
(21)	Contour the repair so that the final surface level of the repair is lower than the original surrounding area.	Use 150 grit sanding paper. To allow for the paint coat.

Section 51-30
Materials

1. General

You must only use approved materials from approved sources to repair the DA 42 NG airplane.

2. Approved Materials

A. Resin Systems

(1) L285

Resin : L285
Hardener : H286
Mixture : 100 parts resin and 40 ± 2 parts of hardener (by weight)

Supplier : Hexion Specialty Chemicals Stuttgart GmbH
Am Ostkai 21/22
D-70327 Stuttgart, Germany
Phone: +49-711-389800-0
Fax: +49-711-389800-11

(2) RIM 935

Resin : RIM 935
Hardener : RIMH937
Mixture : 100 parts resin and 38 ± 2 parts of hardener (by weight)

Supplier : Hexion Specialty Chemicals Stuttgart GmbH
Am Ostkai 21/22
D-70327 Stuttgart, Germany
Phone: +49-711-389800-0
Fax: +49-711-389800-11

B. Self- Extinguishing Resin System

CAUTION: THE SELF-EXTINGUISHING RESIN SYSTEM MAY ONLY BE USED FOR THE REPAIR OF ENGINE COWLINGS WHICH WERE MADE WITH THAT RESIN SYSTEM (OÄM 42-061).

Resin : L940

Hardener : H286

Mixture : 100 parts resin and 21 ± 2 parts of hardener (by weight)

Supplier : Hexion (see above)

C. Glass Fiber Cloth

(1) L285

WLB No. (German Aviation Standard)	Weave	Weight per unit area [g/m²]	Interglas Type	Porcher Type
8.4548.60	2/2 twill	163	92110	917
8.4551.60	2/2 twill	280	92125	3063
8.4554.60	2/2 twill	390	92140	1989
8.4520.60	UD	220	92145	
8.4525.60	UD	425	92146	

All cloth types consist of alkali free E-glass with I 550 or PT 55 finish and comply with LN9169 (German Aviation Standard).

(2) **RIM 935**

WLB No. (German Aviation Standard)	Weave	Weight per unit area [g/m²]	Interglas Type	Porcher Type
8.4548.60	2/2 twill	163		917
8.4551.60	2/2 twill	280		3063
8.4554.60	2/2 twill	390		1989
8.4520.60	UD	220	92145	
8.4525.60	UD	425	92146	
	Plain	49		2037

All cloth types consist of alkali free E-glass with K 506 or FK 144 finish and comply with LN9169 (German Aviation Standard).

Supplier for Interglas cloth : Interglas
P-D Interglas Technologies GmbH
Benzstraße 14
D-89155 Erbach, Germany
Phone: +49(0)-7305955-0
Fax: +49(0)-7305955-513

Supplier for Porcher cloth : Porcher Industrietextilien GmbH
Holzgraben 13/15
D-52062 Aachen, Germany
Phone: +49-241-48225
Fax: +49-241-48229

D. Carbon Fiber Cloth

(1) L285

WLB No. (German Aviation Standard)	Weave	Mass per unit area [g/m²]	Interglas Type	ECC Type	SGL Type
8.3520.80	2/2 twill	200	98141	CCC 452	
	2/2 twill with aluminum fibers	220		CCC 459 Al	
	UD tape	380			Sigratex KDU 1034

(2) RIM 935

WLB No. (German Aviation Standard)	Weave	Mass per unit area [g/m²]	ECC Type	SGL Type	J.H. vom Baur Type
	2/2 twill	200	CCC 452		
	2/2 twill with aluminum fibers	220	CCC 459 Al		
	UD tape	380		Sigratex KDU 1034	16563
	UD cloth	280	CCC 796		
	plain	80	CCC 461		

The cloth complies with LN9169 (German Aviation Standard).

Supplier for Interglas cloth	: Rudolf Usner GmbH (Refer to Paragraph 2(C))
Supplier for Cramer cloth	: ECC GmbH + CoKG Weberstrasse 21 D-48619 Heek-Nienborg, Germany Phone: +49-2568-3883-34 Fax: +49-2568-3883-97
Supplier for Vom Baur	: J.H. vom Baur Sohn GmbH & CoKG Marktstraße 34 D-42369 Wuppertal, Germany Phone: +49(0)-20224661-0 Fax: +49(0)-2024660033
Supplier for SGL tape	: SGL Technik GmbH Werner von Siemens-Str. 8 D-86405 Meitingen, Germany Phone: +49-8271-832152 Fax: +49-8271-831427

E. Peel Ply

Type	: PA20-63, compliant with LN98690
Supplier	: Strübel Vertriebs GbR Herrlingerstr. 36/1 D-89081 Ulm, Germany Phone: +49-731-388577-1, -2 Fax: +49-731-39387353

F. Sandwich Core Material

Type	: Airex C71.55
Manufacturer	: AIREX AG
Supplier	: Polychem HandelsgesmbH Markt Allhau Nr. 463 A-7411 Markt Allhau, Austria Phone: +43-3356-20444 Fax: +43-3356-20445 E-Mail: chemie@polychem.at

G. Fillers for Resin

Type	: Cotton flakes FB1/035
Supplier	: Rudolf Usner GmbH (see above)
Type	: Silcell 300
Supplier	: Joh. Klinglhuber & Söhne Handelsgesellschaft mbH Wallgasse 21 A-1060 Vienna, Austria Phone: +43-1-5974712-0 Fax: +43-1-5974712-16
Type	: Aerosil 380
Supplier	: Polychem HandelsgesmbH Markt Allhau Nr. 463 A-7411 Markt Allhau, Austria Phone: +43-3356-20444 Fax: +43-3356-20445 E-Mail: chemie@polychem.at

H. Exterior Painting Materials

(1) Putty

Type	: Sikkens Polysoft
Manufacturer	: Akzo Nobel
Supplier	: Akzo Nobel Coatings GesmbH Baudißg.10 A-1110 Vienna, Austria Phone: +43-1-7674488 Fax: +43-1-7674488-33
Type	: ICI P551-1052
Manufacturer	: ICI Paints, Berkshire, Great Britain
Supplier	: ICI Autocolor der PPG Austria Handels GmbH Siezenheimerstrasse 31 A-5020 Salzburg, Austria Phone: +43-1-662-420425-0 Fax: +43-1-662-435640

(2) EP Filler

Type	: ICI P580-2100
Manufacturer	: ICI Paints, Berkshire, Great Britain
Supplier	: ICI Autocolor (see above)
Type	: MIPA EP 103-20, gelb lasierend
Manufacturer	: MIPA Professional Coating System AG
Supplier	: MIPA Professional Coating System AG Am Oberen Moos 1 D-84051 Essenbach, Germany

(3) **Anti-Static Filler**

Type	: Streicolor 2K PU ESD-Leitlack, matt
Manufacturer	: Streicolor AG
Supplier	: Streicolor AG Niederwil CH-8502 Frauenfeld, Switzerland Phone: +41–52-7232150 Fax: +41-52-7232169
Type	: MIPA PU 191-20-1001 ESD Füller
Manufacturer	: MIPA Professional Coating System AG
Supplier	: MIPA Professional Coating System AG (see above)

(4) **Coating Paint**

(a) **White**

Type	: PPG Turbo Plus 493; Color 6-KVW (white)
Manufacturer	: PPG Deutschland
Supplier	: Nexa Autocolor der PPG Austria Handels GmbH Siezenheimerstrasse31 A-5020 Salzburg, Austria Phone: +43-662-420425-0 Fax: +43-662-435640
Type	: MIPA PUR HS
Manufacturer	: MIPA Professional Coating System AG
Supplier	: MIPA Professional Coating System AG (see above)
Type	: Dupont Imron AF400
Manufacturer	: E.I. DUPONT DE NEMOURS & CO
Supplier	: E.I. DUPONT DE NEMOURS & CO WILMINGTON, DE 19898 USA

Type	: Dupont Imron 5000
Manufacturer	: E.I. DUPONT DE NEMOURS & CO
Supplier	: E.I. DUPONT DE NEMOURS & CO (see above)

Type	: BASF UNO
Manufacturer	: BASF
Supplier	: BASF CANADA INC. 10 Craig Street Brantfort, Ontario Canada

(b) Other Colors

Type	: Refer to Section 51-20
Manufacturer	: MIPA Professional Coating System AG
Supplier	: MIPA Professional Coating System AG (see above)

I. Interior Painting Materials

(1) Putty

Type	: Sikkens Polysoft
Manufacturer	: Akzo Nobel
Supplier	: Akzo Nobel Coatings GesmbH (see above)
Type	: ICI P551-1052.
Manufacturer	: ICI Paints, Berkshire, Great Britain
Supplier	: ICI Autocolor der PPG Austria Handels GmbH (see above)

(2) Coating Paint

Glare shield	: Nuvovern DS 10/1 + Nuvovern ACR
Inst. Panel cover	: Nuvovern DS 10/1 + Nuvovern ACR
General	: Nuvovern DS 10/1
Manufacturer	: Mäder Lacke AG, Killwangen, Switzerland
Supplier	: Walter Mäder GmbH Wiener Str.99 A-2514 Traiskirchen, Austria Phone: +43-2252-53038 Fax: +43-2252-52297

J. Fire Retardant Paint

(1) PPG Aerospace

Fire retardant paint	: Wiedoflugat N 56582/T508 (white)
Finishing varnish	: PU 2K- Klarlack 423511-2-035
Hardener	: PU-Härter FN39-1327
Supplier	: PRC-DeSoto Deutschland GmbH PPG Aerospace Hein-Saß- Weg 29 D-21129 Hamburg, Germany Phone: +49-40-742193-10 Fax: +49-40-742139-69

(2) Hensel

Fire retardant paint	: Hensotherm 2 KS (white)
Coating paint	: Hensotop 84f
Supplier	: Rudolf Hensel GmbH Lack- und Farbenfabrik Lauenburger Landstrasse 11 D-21039 Börnsen, Germany Phone: +49-40-72106210 Fax: +49-40-72106252

K. Acrylic Glass Cement

Acrylic glass cement	: Polymerization Cement Acrifix 92
Manufacturer	: Röhm D-64275 Darmstadt, Germany Phone: +49-6151-1801 Fax: +49-6151-1802
Supplier	: Röhm Austria GmbH & Co. KG Lamezanstrasse 17 1239 Wien, Austria Phone: +43-1616-7510-0 Fax: +43-1616-7510-33

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Section 51-40

Fasteners

1. General

This Section tells you about the fasteners used to attach panels and cowlings on the DA 42 NG airplane.

2. Description

The DA 42 NG uses two main types of fasteners. It has quick release camloc fasteners for panels which you remove often, for example, engine cowlings, and it has screws for all other access panels.

Figure 1 shows the quick release camloc fastener. The fastener has three parts, a receptacle with a cam track, a grommet and a stud. Rivets attach the receptacle to the structure or base panel. A spring ring attaches the stud assembly to the access panel and a compression spring holds the stud in the stud assembly.

The T shaped end of the stud locates in the slot of the receptacle. When you turn the stud clockwise through 90° it engages the cam-track in the receptacle and pulls the access panel into position. When the stud is turned fully 90° clockwise the T-shaped end of the stud engages in a small indent in the cam-track. The compression spring in the stud assembly holds the stud in position in the detent.

There are different length studs. Short studs for thin panels and longer studs for thicker panels. Not all airplane serial numbers have the same length studs in the same positions. This is because composite structures and components can vary in thickness. If you must replace a fastener, make sure that the new fastener that you install has the correct length stud. You can replace a stud in a stud assembly.

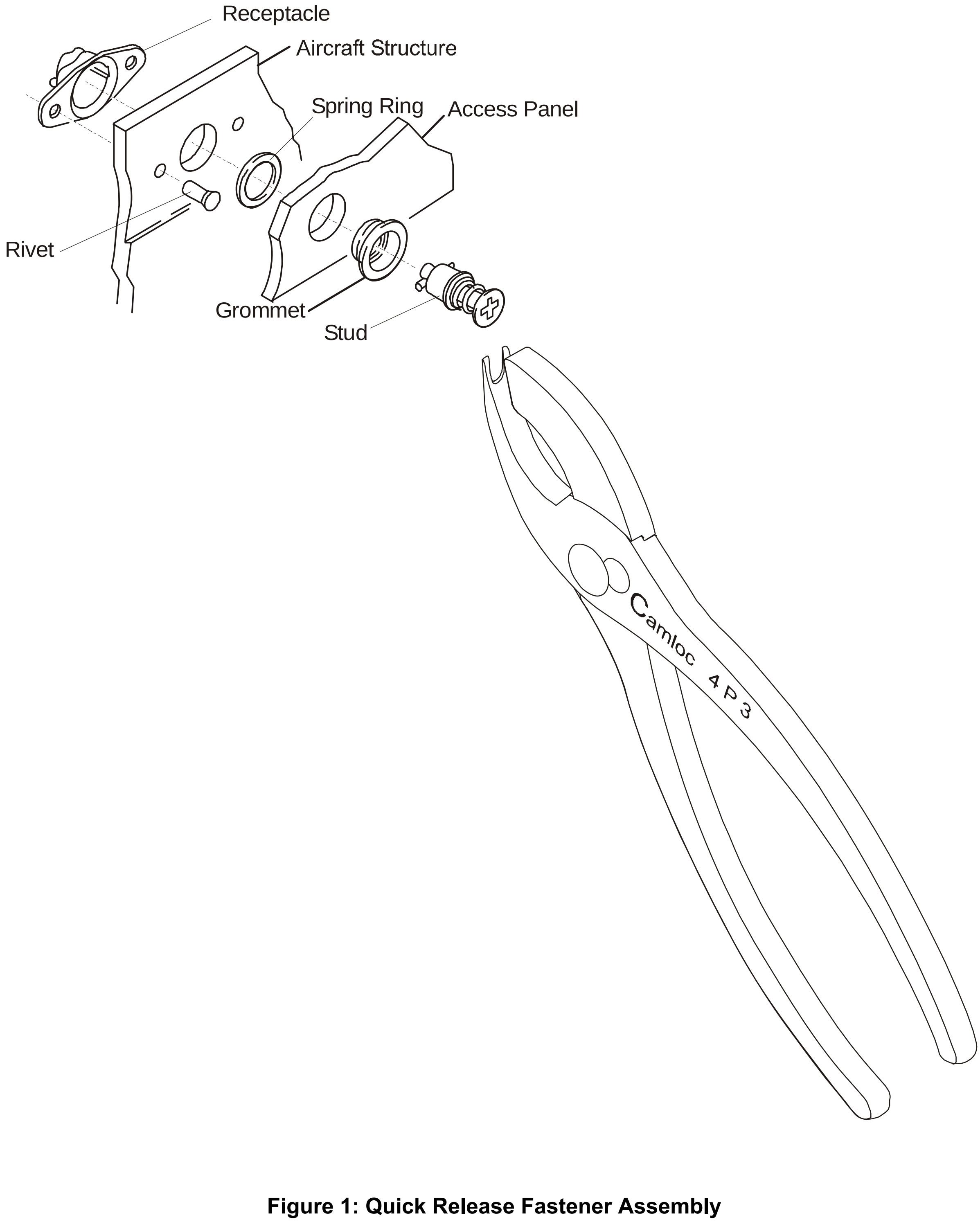

Figure 1: Quick Release Fastener Assembly

Maintenance Practices

1. General

This Section tells you how to replace a quick release fastener stud in an access panel.

2. Replace a Quick Release Fastener Stud

A. Equipment

Item	Quantity	Part Number
Stud pliers.	1	Camloc 4 P 3.

B. Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Remove the damaged stud assembly: – Turn the stud 90° counter clockwise to release it from the receptacle. – Move the U-jaw of the stud pliers into position under the rim of the stud assembly. – Compress the stud assembly with the stud pliers and remove the stud assembly from the grommet.	If installed. Refer to Figure 1. Turn the stud assembly approximately 30° off-axis.
(2)	Install the new stud assembly: – Select the correct length stud assembly. – Put the stud assembly into the U jaw of the stud pliers. – Compress the stud assembly and move the stud assembly into position in the grommet and then release the stud assembly. – Engage the stud in the receptacle and turn the stud 90° clockwise to lock the stud.	Turn the stud assembly approximately 30° off-axis. Make sure that the panel is pulled fully into position and that the stud is in the detent of the receptacle.

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Section 51-60
Control Surface Balancing

1. General

This Section tells you how to weigh and measure the residual moment of the control surfaces. Figure 1 thru 8 show typical Weights and Residual Moments Reports for the DA 42 NG airplane.

WARNING: YOU MUST WEIGH AND CHECK THE BALANCE OF A CONTROL SURFACE AFTER ANY WORK WHICH COULD AFFECT ITS WEIGHT OR ITS BALANCE. AN OUT OF BALANCE CONTROL SURFACE CAN FLUTTER AND CAUSE STRUCTURAL FAILURE.

Correct control surface balance is critical to flight safety. You must remove a control surface to weigh it and check its balance after:

– Any repair to the control surface.

– Painting the control surface.

– Any report of control vibration or flutter in flight.

You can use any convenient method to weigh a control surface. If you use anything to connect the control surface to the weighing device then you must weigh the device, (for example, a sling) separately and deduct its weight from the total value. For example, you use a rope sling to weigh an aileron with a spring balance:

– Weight of aileron and the rope sling = 3.8 kg (8.378 lb).

– Weight of rope sling = 0.7 kg (1.543 lb).

– Weight of aileron = (3.8 kg - 0.7 kg) = 3.1 kg (6.835 lb).

When you do a test for the correct balance of a control surface, the pivot angle of the control must be as shown in the Weights and Residual Moments Report.

We recommend that for balancing the flaps, aileron, elevator and elevator trim tab, you put a suitable size rod through the hinge bearings. Support the rod at two points to keep it horizontal.

To balance the rudder it must be supported at the top pivot pin and the bottom mounting bracket. The center line of the rudder must be horizontal.

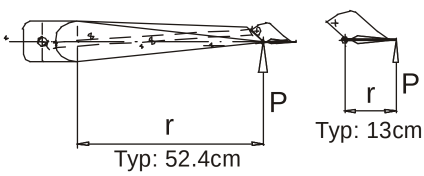
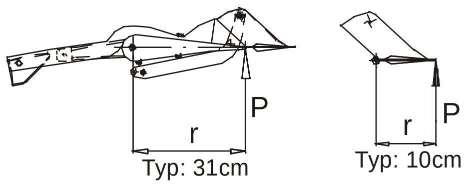
DA 42 NG SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [kp]	6.6 to 8.25	0.28 to 0.39	5.3 to 6.35	0.28 to 0.39
	Actual [kp]				
Mass Balance [kg]		Upper Rudder Horn Lower Rudder Horn		Centre: Push Rod: L: R:	
P [kp]					
r [cm]					
Static Moment	Limits [kp cm]	23.0 to 33.1	1.3 to 2.15	1.0 to 7.6	1.0 to 1.5
	Actual [kp cm]				
M = P*r P in [kp] r in [cm]		Center-line horizontal  Rudder trim tab and push rod		Center-line horizontal  Elevator trim tab and push rod	

Figure 1: Typical Weights and Residual Moments Report DA 42 NG Airplane (if MÄM 42-600 is NOT installed) - Sheet 1 (Metric Dimensions)

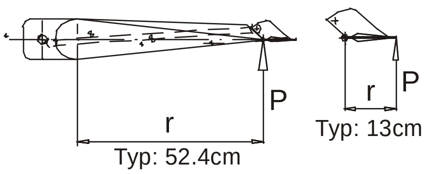
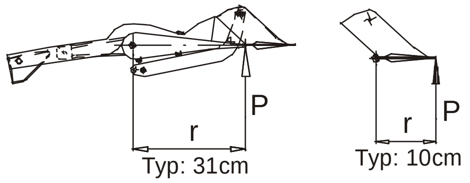
DA 42 NG SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [kp]	5.62 to 6.54	0.31 to 0.42	5.3 to 6.35	0.28 to 0.39
	Actual [kp]				
Mass Balance [kg]		Upper Rudder Horn Lower Rudder Horn		Centre: Push Rod: L: R:	
P [kp]					
r [cm]					
Static Moment	Limits [kp cm]	53.9 to 69.2	1.5 to 2.4	1.0 to 7.6	1.0 to 1.5
	Actual [kp cm]				
M = P*r P in [kp] r in [cm]		Center-line horizontal  Rudder trim tab and push rod		Center-line horizontal  Elevator trim tab and push rod	

Figure 2: Typical Weights and Residual Moments Report DA 42 NG Airplane (if MÄM 42-600 is installed) - Sheet 1 (Metric Dimensions)

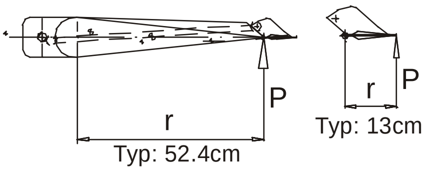
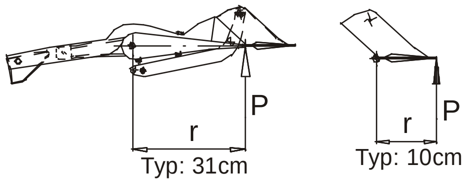
DA 42 NG SN:	Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance — Limits [kp]	6.17 to 7.09	0.41 to 0.56	5.3 to 6.35	0.28 to 0.39
Weight incl. mass balance — if MÄM 42-1041 is installed: Limits [kp]	6.17 to 7.50	0.41 to 0.51	5.3 to 6.35	0.28 to 0.39
Weight incl. mass balance — Actual [kp]				
Mass Balance [kg]	Upper Rudder Horn Lower Rudder Horn		Centre: Push Rod: L: R:	
P [kp]				
r [cm]				
Static Moment — Limits [kp cm]	53.9 to 69.2	1.5 to 2.4	1.0 to 7.6	1.0 to 1.5
Static Moment — if MÄM 42-1041 is installed: Limits [kp cm]	53.9 to 75.0	1.3 to 2.0	1.0 to 7.6	1.0 to 1.5
Static Moment — Actual [kp cm]				
M = P*r P in [kp] r in [cm]	Center-line horizontal  Rudder trim tab and push rod		Center-line horizontal  Elevator trim tab and push rod	

Figure 3: Typical Weights and Residual Moments Report DA 42 NG Airplane (if MÄM 42-600 and MÄM 42-885 are installed) - Sheet 1 (Metric Dimensions)

<table>
<tr><td colspan="2">DA 42 NG
SN:</td><td>Rudder</td><td>Rudder Trim</td><td>Elevator</td><td>Elevator Trim Tab</td></tr>
<tr><td rowspan="2">Weight incl. mass balance</td><td>Limits [lbf]</td><td>14.6 to 18.2</td><td>0.62 to 0.86</td><td>11.7 to 14.0</td><td>0.62 to 0.86</td></tr>
<tr><td>Actual [lbf]</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Mass Balance [lb]</td><td>Upper Rudder Horn

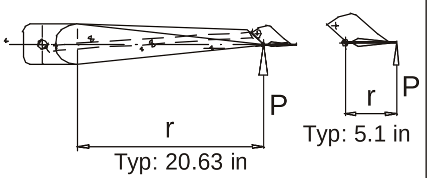
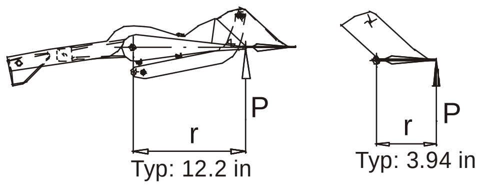
Lower Rudder Horn</td><td></td><td>Centre:
Push Rod:
L: R:</td><td></td></tr>
<tr><td colspan="2">P [lbf]</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">r [in]</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Static Moment</td><td>Limits [lbf in]</td><td>20.0 to 28.7</td><td>1.13 to 1.87</td><td>0.87 to 6.60</td><td>0.87 to 1.30</td></tr>
<tr><td>Actual [lbf in]</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">M = P*r
P [lbf]
r [in]</td><td colspan="2">Center-line horizontal

Rudder trim tab and push rod</td><td colspan="2">Center-line horizontal

Elevator trim tab and push rod</td></tr>
</table>

Figure 4: Typical Weights and Residual Moments Report DA 42 NG Airplane (if MÄM 42-600 is NOT installed) - Sheet 1 (Imperial Dimensions)

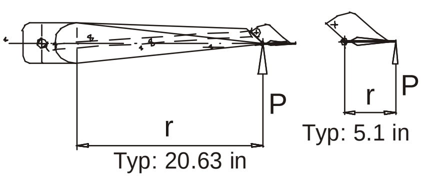
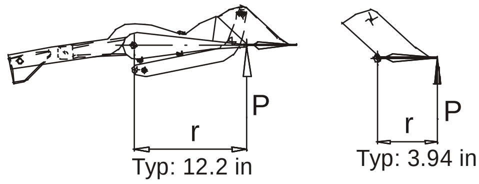
DA 42 NG SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [lbf]	12.4 to 14.4	0.68 to 0.93	11.7 to 14.0	0.62 to 0.86
	Actual [lbf]				
Mass Balance [lb]		Upper Rudder Horn Lower Rudder Horn		Centre: Push Rod: L: R:	
P [lbf]					
r [in]					
Static Moment	Limits [lbf in]	46.8 to 60.1	1.30 to 2.08	0.87 to 6.60	0.87 to 1.30
	Actual [lbf in]				
M = P*r P [lbf] r [in]		Center-line horizontal  Elevator trim tab and push rod		Center-line horizontal  Elevator trim tab and push rod	

Figure 5: Typical Weights and Residual Moments Report DA 42 NG Airplane (if MÄM 42-600 is installed) - Sheet 1 (Imperial Dimensions)

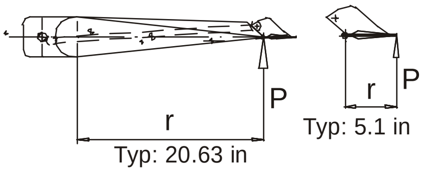
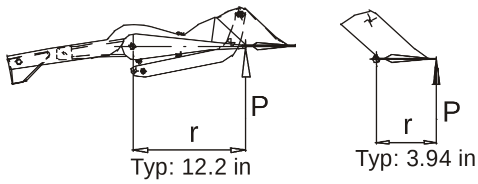
DA 42 NG SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [lbf]	13.6 to 15.6	0.90 to 1.24	11.7 to 14.0	0.62 to 0.86
	if MÄM 42-1041 is installed: Limits [lbf]	13.6 to 16.5	0.90 to 1.12	11.7 to 14.0	0.62 to 0.86
	Actual [lbf]				
Mass Balance [lb]		Upper Rudder Horn Lower Rudder Horn		Centre: Push Rod: L: R:	
P [lbf]					
r [in]					
Static Moment	Limits [lbf in]	46.8 to 60.1	1.30 to 2.08	0.87 to 6.60	0.87 to 1.30
	if MÄM 42-1041 is installed: Limits [lbf in]	46.8 to 65.1	1.13 to 1.73	0.87 to 6.60	0.87 to 1.30
	Actual [lbf in]				
M = P*r P [lbf] r [in]		Center-line horizontal  Elevator trim tab and push rod		Center-line horizontal  Elevator trim tab and push rod	

Figure 6: Typical Weights and Residual Moments Report DA 42 NG Airplane (if MÄM 42-600 and MÄM 42-885 are installed) - Sheet 1 (Imperial Dimensions)

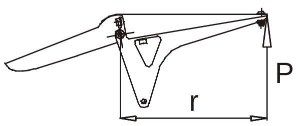
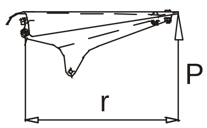
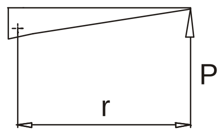
DA 42 NG SN:	Aileron		Outer Flap		Inner Flap	
	Left	Right	Left	Right	Left	Right
Weight incl. mass balance – Limits [kp]	2.28 to 2.77		3.4 to 3.96		2.3 to 2.84	
Weight incl. mass balance – Actual [kp]						
Mass Balance [kg]						
P [kp]						
r [cm]						
Static Moment – Limits [kp cm]	0 to 2.5		24.5 to 33.1		25.5 to 32.6	
Static Moment – Actual [kp cm]						
M = P*r P in [kp] r in [cm]	Upper surface horizontal  Typ: LH 17cm Typ: RH 19cm		Upper surface horizontal  Typ: 23cm		Upper surface horizontal  Typ: 30cm	

Figure 7: Typical Weights and Residual Moments Report
DA 42 NG Airplane - Sheet 2 (Metric Dimensions)

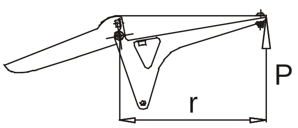
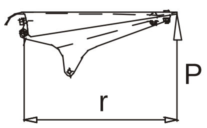
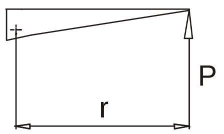
DA 42 NG SN:		Aileron		Outer Flap		Inner Flap	
		Left	Right	Left	Right	Left	Right
Weight incl. mass balance	Limits [lbf]	5.03 to 6.10		7.50 to 8.73		5.07 to 6.26	
	Actual [lbf]						
Mass Balance [lb]				/	/	/	/
P [lbf]							
r [in]							
Static Moment	Limits [lbf in]	0 to 2.17		21.3 to 28.7		22.1 to 28.3	
	Actual [lbf in]						
M = P*r P [lbf] r [in]		Upper surface horizontal  Typ: LH 6.7 in Typ: RH 7.5 in		Upper surface horizontal  Typ: 9.1 in		Upper surface horizontal  Typ: 11.8 in	

Figure 8: Typical Weights and Residual Moments Report
DA 42 NG Airplane - Sheet 2 (Imperial Dimensions)

2. Rudder Static Balance

Refer to Figure 1 to 6 for the weight and residual moment.

Use any suitable method to support the rudder horizontally at the pivot axis. The rudder must be able to rotate freely around the pivot axis.

Remove the stop bolts from the lower mounting bracket before weighing and balancing.

The residual moment is tail heavy.

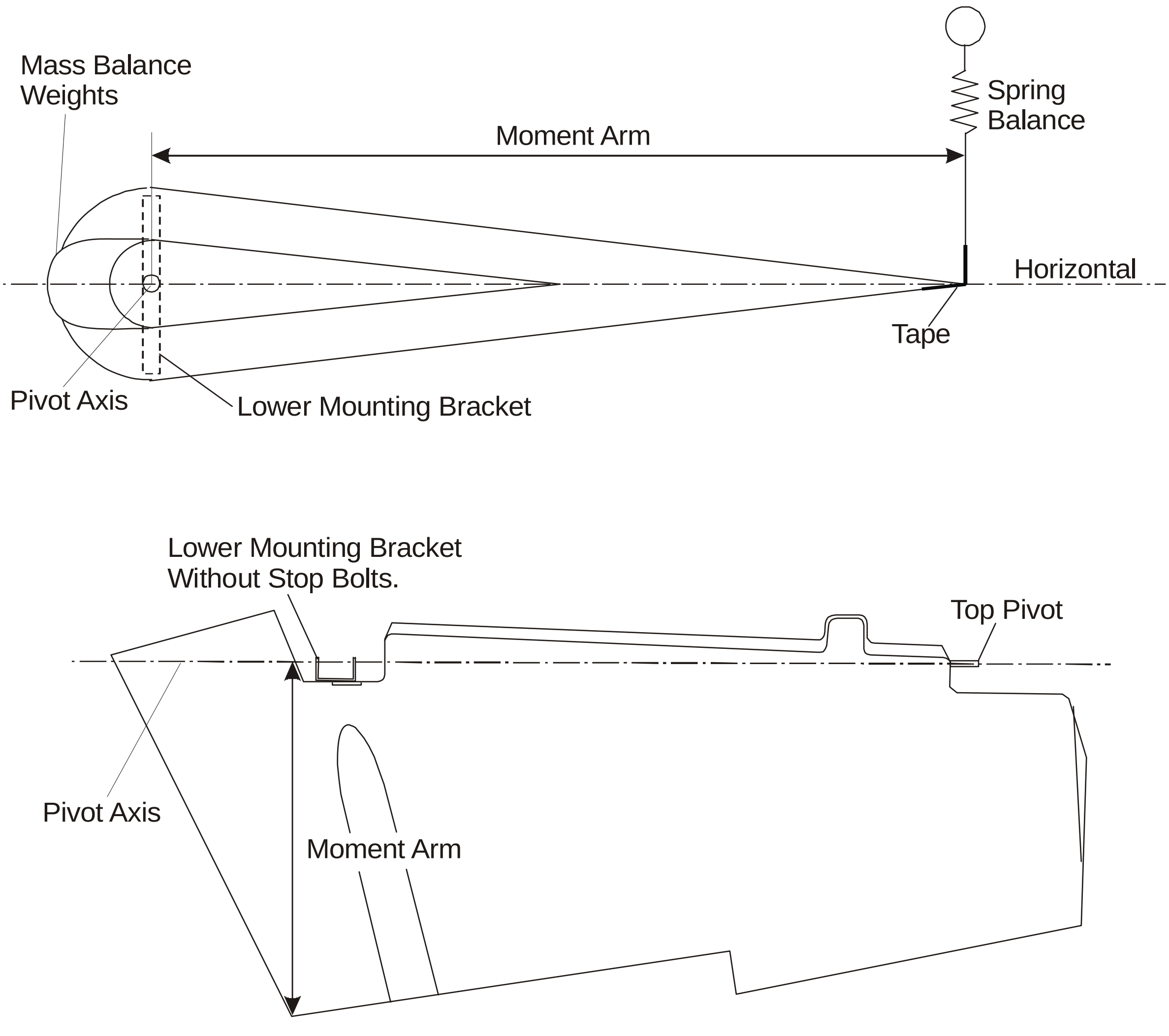


Figure 9: Rudder Static Balance

3. Rudder Trim Tab Static Balance

Refer to Figure 1 to 6 for the weight and residual moment.

Use any suitable method to support the trim horizontally at the pivot axis. The trim tab must be able to rotate freely around the pivot axis.

The residual moment is tail heavy.

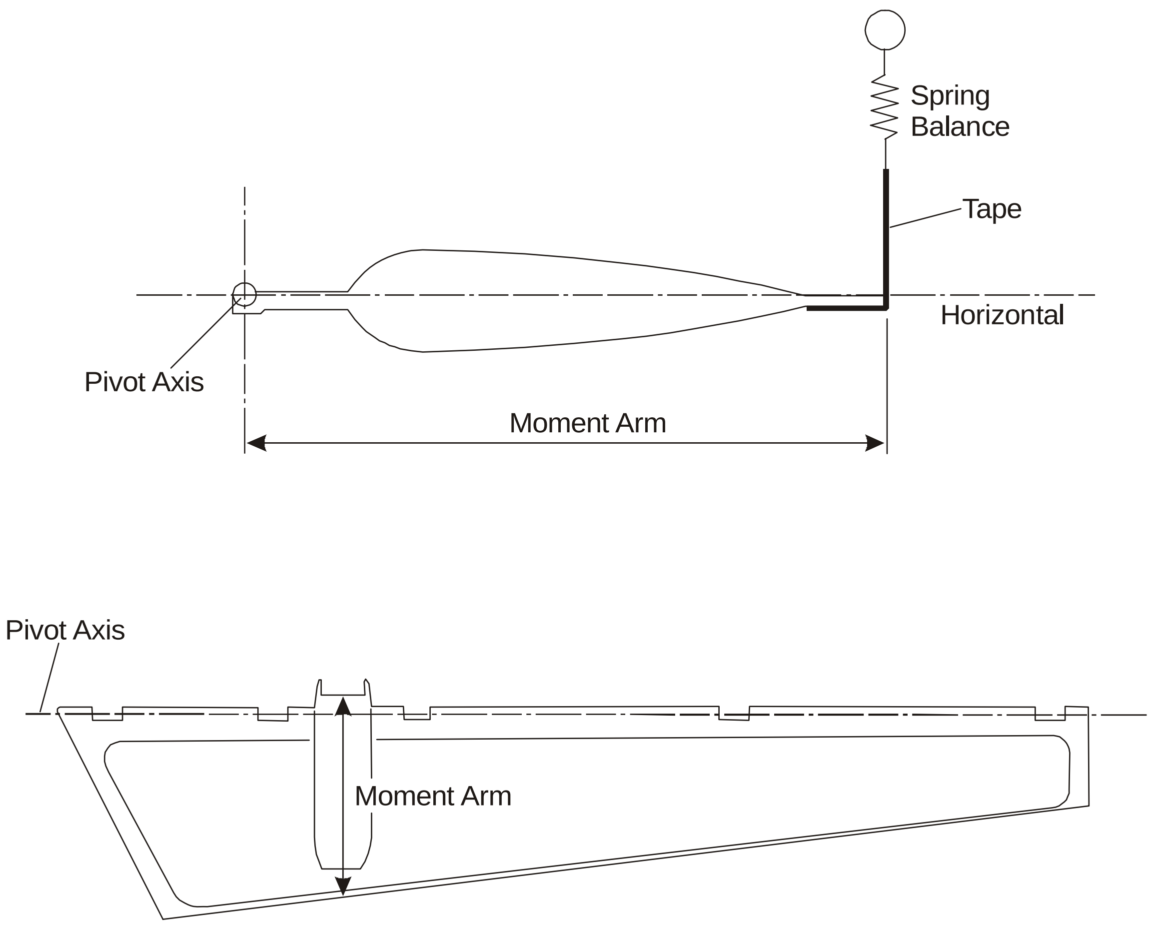


Figure 10: Rudder Trim Tab Static Balance

4. Elevator Static Balance

Refer to Figure 1 to 6 for the weight and residual moment.

Use any suitable method to support the elevator horizontally at the pivot axis. The elevator must be able to rotate freely around the pivot axis.

The balance includes the trim tab, trim tab control rods and horn.

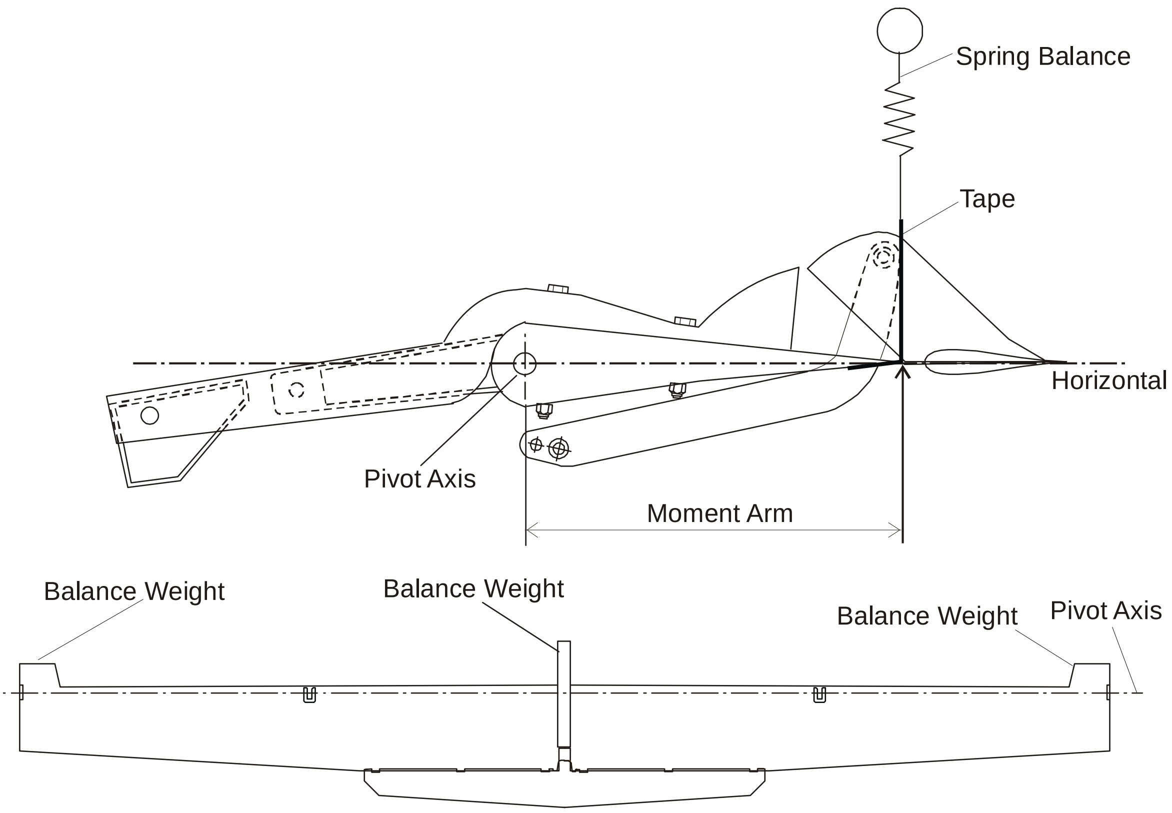


Figure 11: Elevator Static Balance

5. Elevator Trim Tab Static Balance

Refer to Figure 1 to 6 for the weight and residual moment.

Use any suitable method to support the elevator trim tab horizontally at the pivot axis. The elevator trim tab must be able to rotate freely around the pivot axis.

The residual moment is tail heavy.

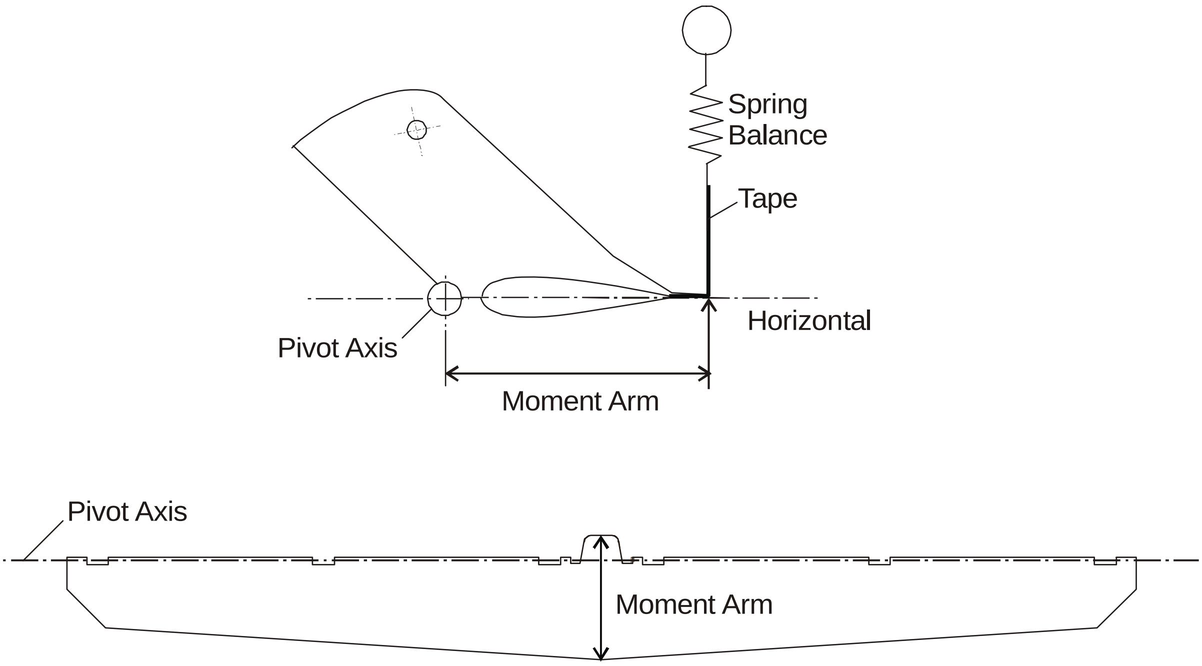


Figure 12: Elevator Trim Tab Static Balance

6. Aileron Static Balance

Refer to Figure 7 or 8 for the weight and residual moment.

Use any suitable method to support the aileron horizontally at the pivot axis. The aileron must be able to rotate freely around the pivot axis.

The balance includes the horn, trim plate and hinges.

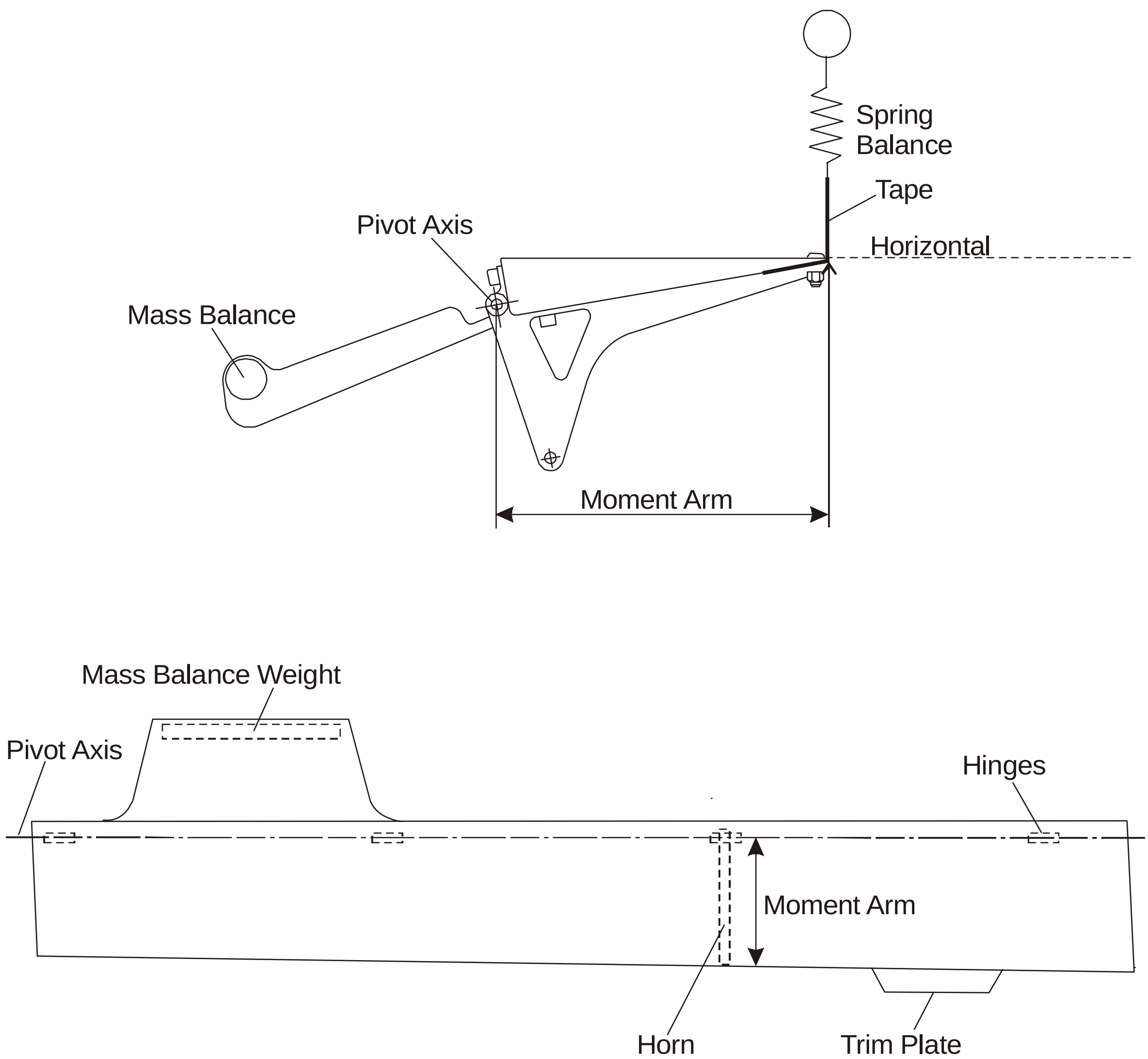


Figure 13: Aileron Static Balance

7. Wing Outer Flap Static Balance

Refer to Figure 7 or 8 for the weight and residual moment.

Use any suitable method to support the outer flap horizontally at the pivot axis. The outer flap must be able to rotate freely around the pivot axis.

The balance includes the horn and hinges.

The residual moment is tail heavy.

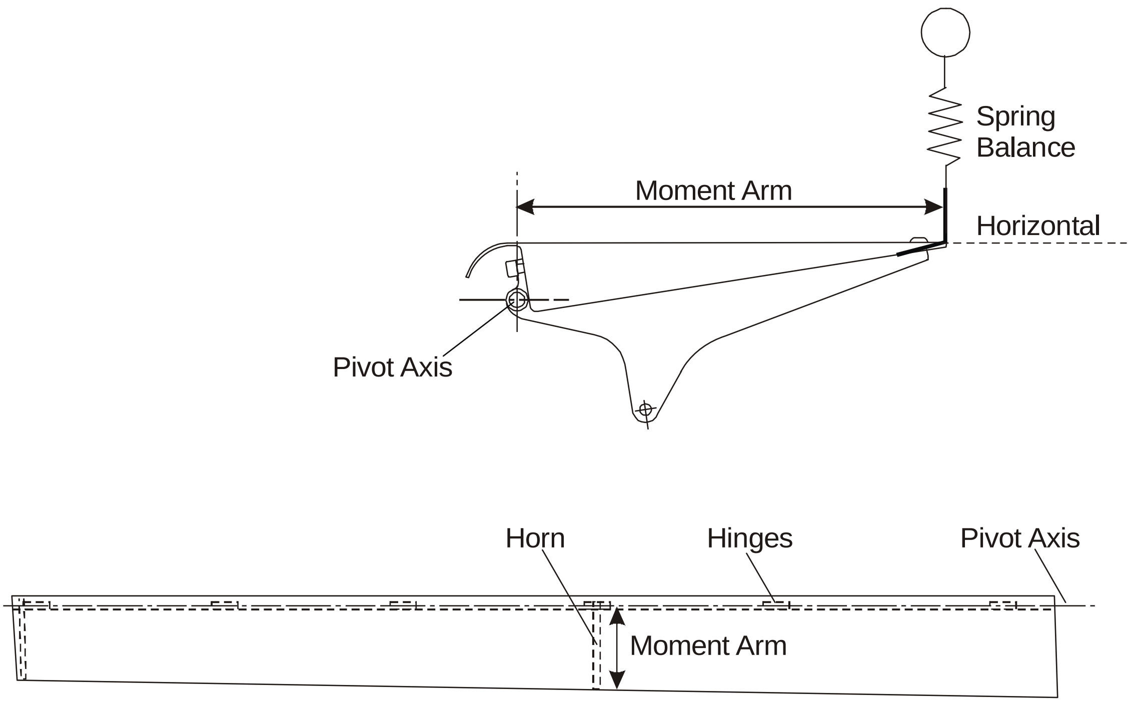


Figure 14: Wing Outer Flap Static Balance

8. Wing Inner Flap Static Balance

Refer to Figure 7 or 8 for the weight and residual moment.

Use any suitable method to support the inner flap horizontally at the pivot axis. The inner flap must be able to rotate freely around the pivot axis.

The balance includes the horn and hinges.

The residual moment is tail heavy.

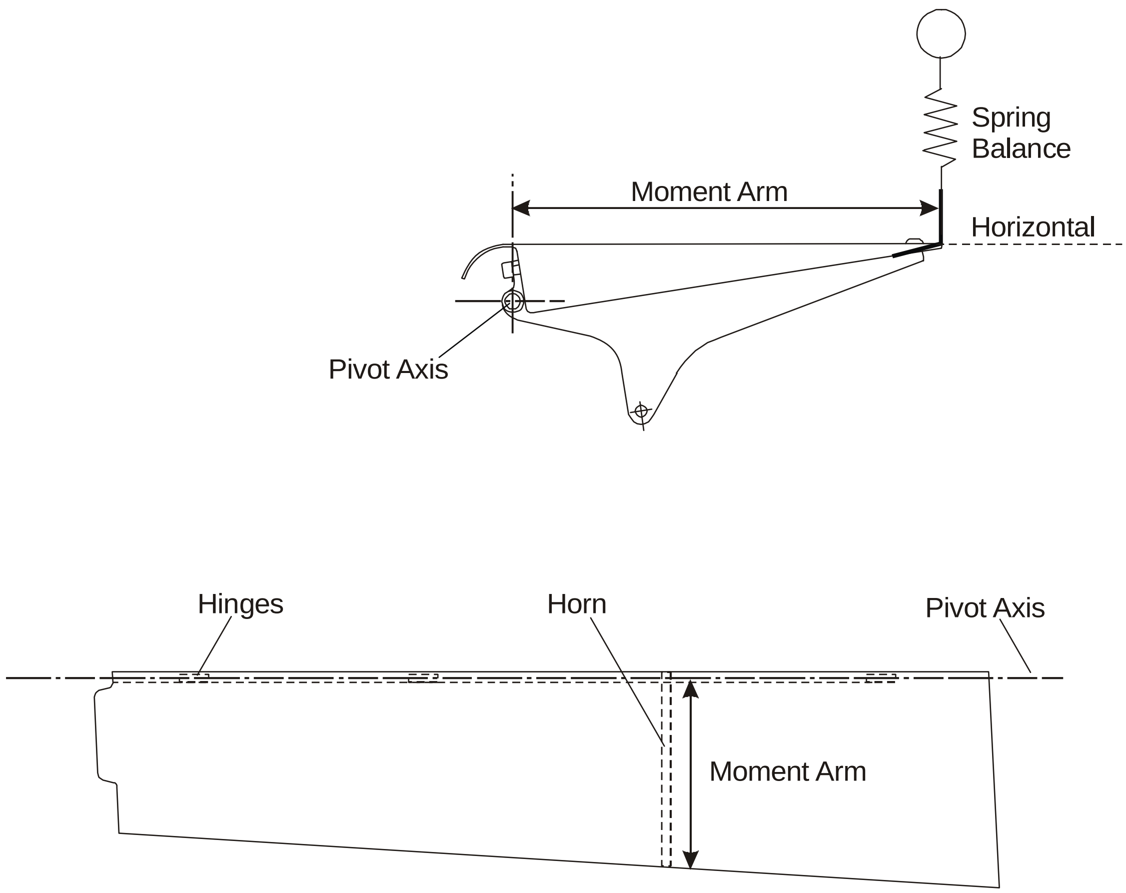


Figure 15: Wing Inner Flap Static Balance

Section 51-80
Lightning Protection

1. General

Lightning protection for the DA 42 NG is provided by the airplane bonding system. A special bonding system is necessary for the composite structure of the DA 42 NG. Without this special system, the composite structure would not sufficiently conduct electricity.

Refer to Section 23-60 for data about the static discharge wicks.

2. Description

Figure 1 shows the simplified bonding system schematic diagram.

The lightning conductor system is the main part of the bonding system. High capacity aluminum alloy tubes and strips make the basis of the lightning conductor system.

The lightning conductor system has a longitudinal system and a lateral system. The longitudinal system runs from the front rib of the fuselage, through both sides and center of the wing center section, through the left side of the rear fuselage and up into the vertical stabilizer. From the vertical stabilizer aluminum strips and braids connect to the horizontal stabilizer, the elevator and trim tab.

The lateral system runs from the wing tips, through the front of the wing, across the engine nacelles and through the center wing section where it connects to the longitudinal system. Aluminum strips and braids connect the propellers, engines, fuel tanks and other metal components installed along the wings to the main lateral system.

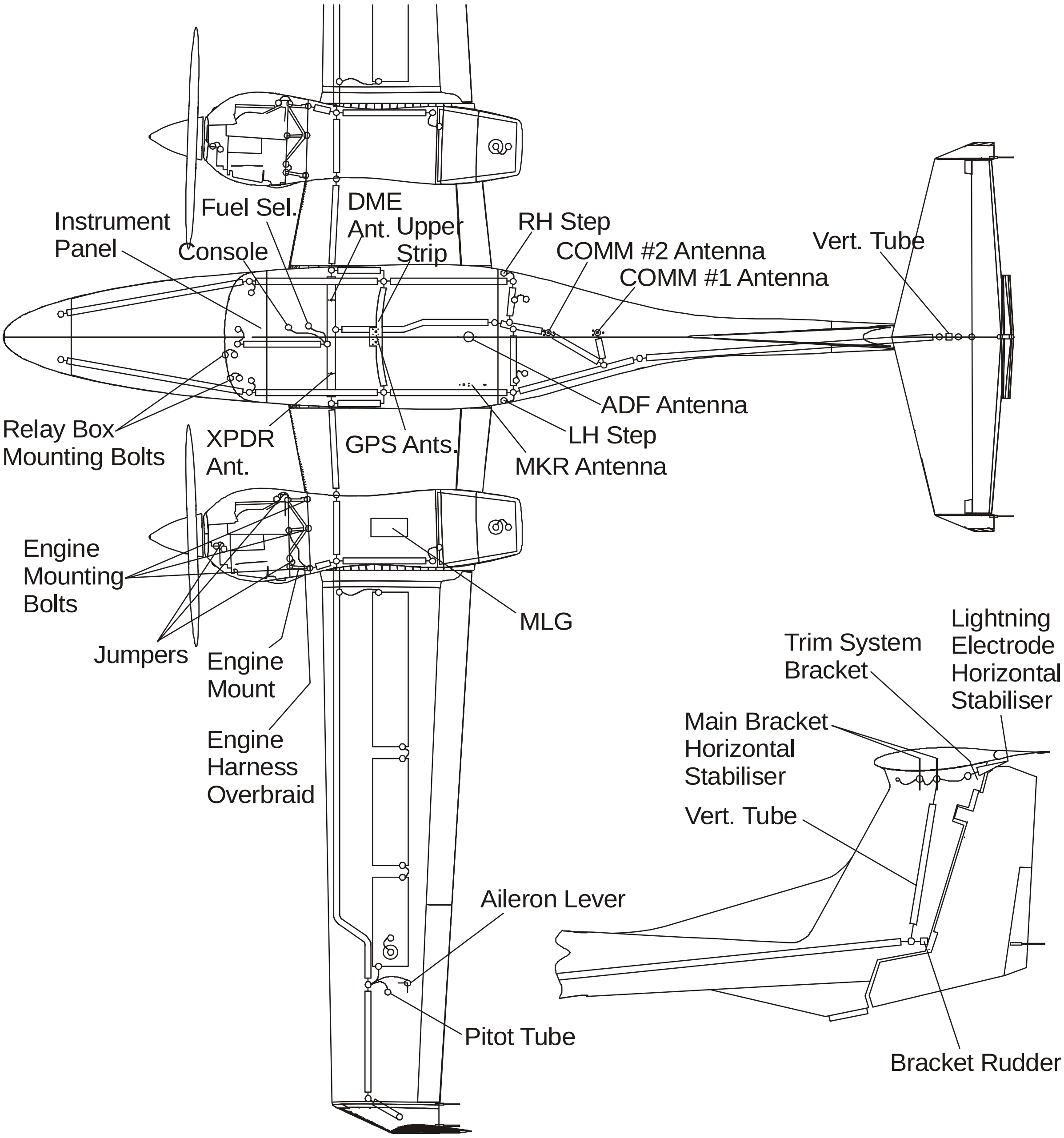


Figure 1: Lightning Protection System Schematic Diagram

The following design features also add to the lightning protection system:

– The aluminum tubes of the lightning protection system also provide the conduit system for electrical cables.

– Carbon fiber material is used for parts of the wing and fuselage skins. Carbon fiber material is conductive and is used to form part of the lightning protection system.

– Carbon fiber material with interwoven aluminum fibers is used on the upper wing skin, the fuselage and the engine cowlings. Carbon fiber material with interwoven aluminum fibers is conductive.

– A lightning conductor strip is integrated into the horizontal stabilizer.

– The propeller blades are non-conductive (except for the blade sheaths), therefore currents cannot flow in structural parts of the propeller. The propeller spinner is made from aluminum and is connected to electrical ground.

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Maintenance Practices

1. General

This Section tells you how to do a test of the electrical bonding system.

2. Test the Electrical Bonding System

The resistance measurements on the DA 42 NG are divided into 3 categories:

– Very low ohms measurements for conduits in the direct lightning path and electrical power grounds.

– Low ohms resistance measurements for bonding of controls and canopy.

– High resistance measurements for antistatic precipitation i.e. static wicks.

Do the low resistance bonding measurements with a milliohmmeter and Kelvin probes. The test current must be approximately 2 amps.

Do the high resistance measurements with a high voltage megaohmmeter. Measure the static discharge wicks and the precautions against static charge of the airplane.

All measurements are referenced to the negative terminal of the airplane main battery. The airplane must be serviceable during the tests and the engine cowlings must be removed.

A. Very Low Resistance Measurements

Item	Attachment Point	Max Allowable (mΩ)	Measured L/R (mΩ)	Passed
ENGINE COMPARTMENTS				
Firewall.		6.0	/	
Engine mount.		6.0	/	
Engine.	Propeller bearing, front	6.0	/	
Heat exchanger.	Case	6.0	/	
Oil cooler.	Case	6.0	/	
Water cooler.	Case	6.0	/	
Intercooler.	Case	6.0	/	
Engine breather.	Tube	10.0	/	
Engine to firewall.	Engine block - firewall	3.0	/	
2nd Alternator LH (optional)	Case	10.0		

Item	Attachment Point	Max Allowable (mΩ)	Measured L/R (mΩ)	Passed
NACELLE COMPONENTS				
Electrical junction box fwd.	Sheet metal	5.0	/	
Electrical junction box aft.	Sheet metal	10.0	/	
Fuel cooler.	Mounting screw	10.0	/	
Fuel pumps.	Mounting bracket	10.0	/	
Aux fuel tank (optional).	Drain	10.0	/	
Aux fuel tank refill (optional).	Tube	10.0	/	
Nacelle fuel filter.	Mounting bracket	10.0	/	
FUSELAGE COMPONENTS				
External power connector.	Outer large pin	5.0		
Instrument panel.	Above co-pilot's left knee	3.0		
Taxi light.	Mounting screw	4.0		
Landing light.	Mounting screw	4.0		
Remote avionic box.	Case	4.0		
Hydraulic module.	Sheet metal	4.0		
Nose LDG gear door hinge.	LH/RH front hinge	10.0	/	
Nose baggage door lock.	LH/RH front lock	10.0	/	
TKS spray bar (optional).	Center	5.0		
Radar nose cone lightning strips (4 pieces, optional).	Mounting screws	8.0		

Item	Attachment Point	Max Allowable (mΩ)	Measured L/R (mΩ)	Passed
EXTERNAL CONDUCTIVE PARTS				
LH step.	Grounding point	5.0		
RH step.	Grounding point	5.0		
OAT sensor.		10.0		
Front LDG gear.	Yoke exposure mounting screw	10.0		
Main LDG gear LH.	Axle mounting screw	10.0		
Main LDG gear RH.	Axle mounting screw	10.0		
RACC outlet scoop (optional)	Tube	10.0	/	
RACC inlet cap (optional)	Tube	15.0		
ANTENNAS				
COM 1 antenna (top).	Mounting screws	6.0		
COM 2 antenna (bottom).	Mounting screws	6.0		
ELT antenna.	Mounting screws	6.0		
Top TAS antenna (optional).	Mounting screws	6.0		
Bottom TAS antenna (optional).	Mounting screws	5.0		
Iridium antenna (optional)	Mounting screws	5.0		
STABILIZER				
Vertical lightning protection tube.	Upper end	7.0		
LH horizontal stabilizer lightning strap.	Tip	15.0		
RH horizontal stabilizer lightning strap.	Tip	15.0		
Rudder hinge.	Rudder side	10.0		

Item	Attachment Point	Max Allowable (mΩ)	Measured L/R (mΩ)	Passed
Vertical stabilizer fairing.	Front left-side attachment screw	12.0		
Vertical stabilizer fairing.	Front right-side attachment screw	12.0		
Horizontal stabilizer.	Front bracket	10.0		
Horizontal stabilizer.	Rear bracket	10.0		
Horizontal stabilizer TKS panel (optional).	LH inner panel section	15.0		
Horizontal stabilizer TKS panel (optional).	LH outer panel section	15.0		
Horizontal stabilizer TKS panel (optional).	RH inner panel section	15.0		
Horizontal stabilizer TKS panel (optional).	RH outer panel section	15.0		
Vertical stabilizer TKS panel (optional).	Upper panel section	25.0		
Vertical stabilizer TKS panel (optional).	Bottom panel section	25.0		
TKS low pressure switches (optional).	Mounting plate	20.0		
LH WING				
Fuel tank drain.	Drain	5.0		
Tank refill.	Ring	5.0		
Tank vent.	Plate	10.0		
Pitot tube base.	Tube base	6.0		
Tip light assembly.	Base plate	8.0		
Aileron push-rod attachment.	Bonding strap connection	50.0		
Outer flaps push-rod attachment.	Bonding strap connection	50.0		

Item	Attachment Point	Max Allowable (mΩ)	Measured L/R (mΩ)	Passed
Inner flap push-rod attachment.	Bonding strap connection	50.0		
Stall warning switch.	Mounting screw	10.0		
Inner TKS panel (optional).	Inner panel section	15.0		
Outer TKS panel (optional).	Inner panel section	15.0		
Outer TKS panel (optional).	Outer panel section	10.0		
RH WING				
Fuel tank drain.	Drain	5.0		
Tank refill.	Ring	5.0		
Tank vent.	Plate	10.0		
Pitot tube base.	Tube base	6.0		
Tip light assembly.	Base plate	8.0		
Aileron push-rod attachment.	Bonding strap connection	50.0		
Outer flaps push-rod attachment.	Bonding strap connection	50.0		
Inner flap push-rod attachment.	Bonding strap connection	50.0		
Inner TKS panel (optional).	Inner panel section	15.0		
Outer TKS panel (optional).	Inner panel section	15.0		
Outer TKS panel (optional).	Outer panel section	10.0		

B. Low Resistance Measurements in Control System

Item	Attachment Point	Max Allowable (mΩ)	Measured (mΩ)	Passed
Pilot stick.	Tube	50.0		
Co-pilot stick.	Tube	50.0		
Trim wheel assembly.	Frame	10.0		
Levers.	Frame	50.0		
Pilot pedal assembly.		150.0		
Co-pilot pedal assembly.		150.0		
Canopy hinge LH.	Tube tip	100.0		
Canopy hinge RH.	Tube tip	100.0		
RACC system (optional)	Bracket	100.0		

C. High Resistance Measurements

Use a wet sponge to get a constant electrical connection to the static dischargers.

Item	Attachment Point	Max Allowable (MΩ)	Measured (MΩ (500V) IN/OUT)	Passed
STATIC DISCHARGE WICKS				
LH wing tip.		200.0	/	
RH wing tip.		200.0	/	
Rudder.		200.0		
Horizontal stabilizer, LH.		200.0		
Horizontal stabilizer, RH.		200.0		
TIRES				
Nose wheel.		100.0		
LH main wheel.		100.0		
RH main wheel.		100.0		

CHAPTER 52

DOORS

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CHAPTER 52
DOORS

1. General

The DA 42 NG has three types of doors. Section 52-10 tells you about the canopy and the passenger access door. Section 52-30 tells you about the front baggage compartment doors and Section 52-40 tells you about the maintenance access panels.

2. Description

The canopy is a CFRP molding with inner and outer frames. The frames bond together. The canopy has a large one-piece acrylic glass window. The window has direct vision panels on both sides. You can open the direct vision panels in flight. Refer to Chapter 56 for data about the window.

The canopy attaches to a tubular steel frame at the front. The frame attaches to two hinges on the rear face of the instrument panel frame. The canopy moves up and forward to open.

A handle on the left of the canopy operates two locking bolts. The handle is red on the inside of the canopy and red on the outside. The locking bolts are at the bottom rear corners of the canopy.

The passenger door is a CFRP molding with inner and outer frames. The frames bond together. The door has a acrylic glass window.

Two hinges attach the door to the top of the fuselage near the center-line. A gas strut attaches to the rear of the door and the fuselage. The gas strut holds the door open.

A handle on the left of the door operates two locking bolts. The handle is black on the inside of the door and red on the outside. The locking bolts are at the bottom front and rear corners of the door.

The DA 42 NG has a large baggage compartment in the nose of the airplane. An access door on each side of the airplane gives access to the baggage compartment. The baggage compartment doors have hinges at the top and locking handles at the bottom. Gas struts hold the doors up when they are in the open position.

The DA 42 NG has a small number of access panels. Panels which must be used often (for example, engine cowlings) have quick release fasteners. Other panels have the usual screws.

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Section 52-10
Canopy and Passenger Door

1. General

This Section tells you about the structure, operation and maintenance of the canopy and the passenger door. Refer to Chapter 56-00 for data about the windows in the canopy and the passenger door.

An optional Canopy Jettison System can be installed with OÄM 42-194.

2. Canopy Description and Operation

Figure 1 shows the canopy installation.

The canopy is a CFRP molding with inner and outer frames. The frames bond together with thickened resin. Each part of the frame has layers of carbon cloth and one layer of glass cloth. Areas of high stress have extra layers of carbon cloth. Mounting bushes for the handle and locking bolts bond to the inside of the frame with thickened resin.

The canopy has a large one-piece acrylic glass window. A special flexible adhesive bonds the window to the canopy frame. A flexible filler seals the small gap between the edge of the window and the frame.

The window has a direct vision panels on each side. You can open the direct vision panels in flight. Refer to Chapter 56-00 for data about the window.

The canopy attaches to a tubular steel frame at the front (the hinge frame). The frame attaches to two hinges on the rear face of the instrument panel frame. A gas spring strut attaches to the hinge frame and the bottom of the instrument panel frame. The canopy moves up and forward to open. The gas spring strut holds the canopy open.

The canopy has two tubular brackets on the front edge of the canopy frame. Two bolts attach each bracket to the canopy frame. You can remove the canopy by removing these bolts.

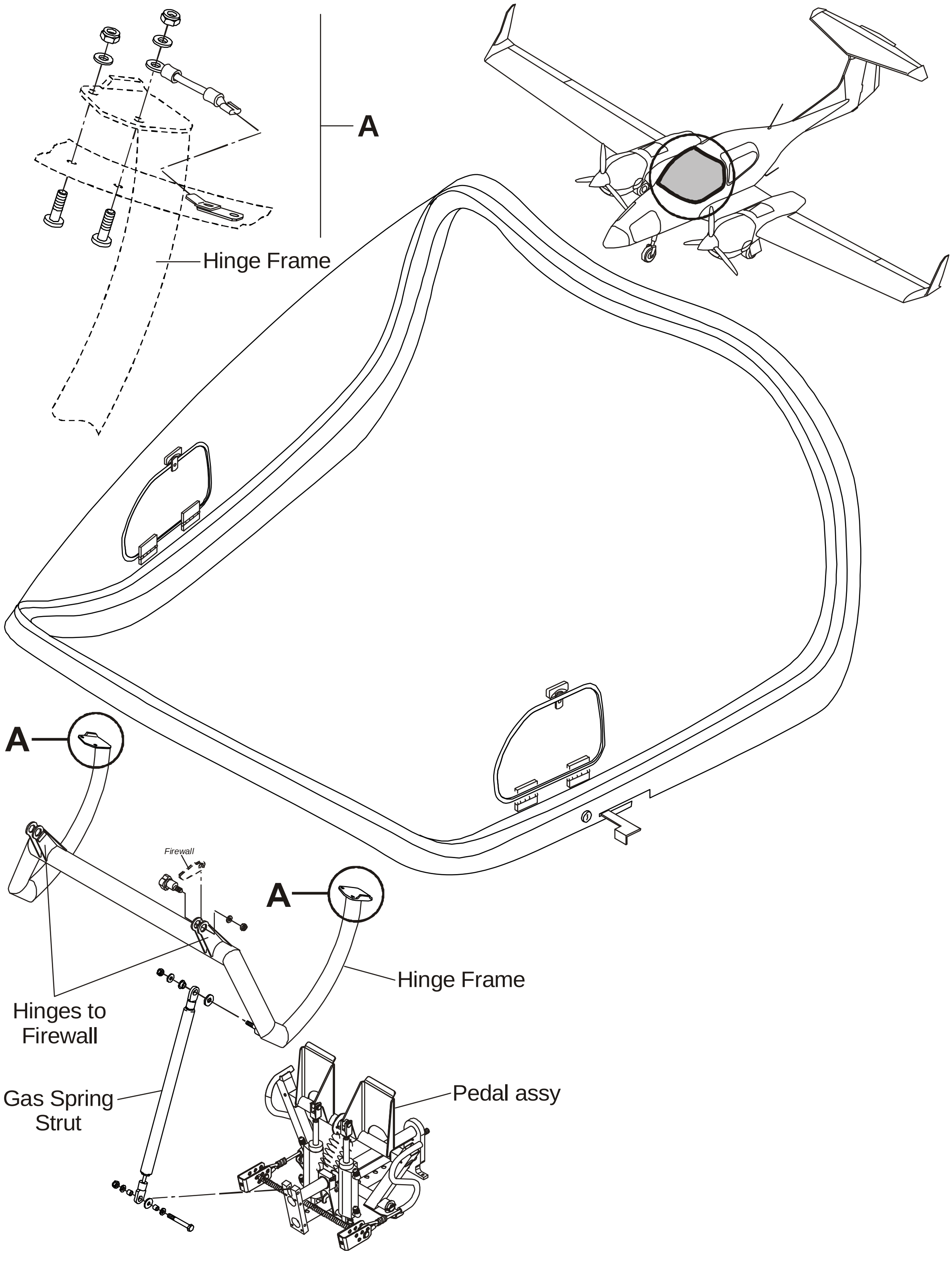

Figure 1: Canopy Installation

A. MÄM 42-097 not installed

Figure 2 shows the canopy locking mechanism.

A handle on the left of the canopy operates two locking bolts. The handle has a spring assisted over-center lock which holds the handle in the closed position. The locking bolts are at the bottom rear corners of the canopy.

The handle has two parts. The inner handle is red and has a black double lever. The outer handle is red and attaches to the inner handle with two roll pins. A connecting rod attaches to the rear of the double lever. The other end of the connecting rod attaches to the inside of the left canopy locking bolt.

A teleflex cable attaches to the front of the double lever. The teleflex cable goes inside the front of the canopy frame to the right canopy locking bolt. If you pull the canopy handle away from the canopy frame, these things happen:

– The double lever turns to pull the connecting rod and the teleflex cable.

– The connecting rod pulls the left canopy locking bolt forward. The forward movement of the locking bolt operates the door unlocked warning micro-switch in the left side fuselage shell.

– The teleflex cable pulls the right canopy locking bolt forward.

The canopy can be pushed up and forward to open.

With the canopy fully closed, push the canopy handle towards the canopy frame. This engages the locking bolts in the fuselage holes. The spring assisted over-center lock holds the handle in the closed position. The left canopy locking bolt operates the micro-switch for the DOOR warning caption. When the handle is flush with the canopy frame, the canopy is locked. Push up on the rear of the canopy frame to make sure that it is locked. A key operated lock can be used to secure the canopy in the closed position, when the airplane is parked.

B. MÄM 42-097 installed

Figure 2 shows the canopy locking mechanism with MÄM 42-097 installed.

A handle on the left of the canopy operates two locking bolts. The handle has a spring assisted over-center lock which holds the handle in the closed position. The locking bolts are at the bottom rear corners of the canopy.

The handle has two parts. The inner handle is red and has a black double lever. The outer handle is red and attaches to the inner handle with a roll pin. A connecting rod attaches to the rear of the double lever. The other end of the connecting rod attaches to the inside of the left canopy locking bolt.

A teleflex cable attaches to the front of the double lever. The teleflex cable goes inside the front of the canopy frame to the right canopy locking bolt. It can be removed. If you pull the canopy handle away from the canopy frame, these things happen:

- The double lever turns to pull the connecting rod and the teleflex cable.
- The connecting rod pulls the left canopy locking bolt forward. The forward movement of the locking bolt operates the door unlocked warning microswitch in the left side fuselage shell.
- The teleflex cable pulls the right locking bolt forward.

The teleflex cable pulls the right locking bolt forward.

With the canopy fully closed, push the canopy handle towards the canopy frame. This engages the locking bolts in the fuselage holes. The spring assisted over-center lock holds the handle in the closed position. The left canopy locking bolt operates the microswitch for the door unlocked warning light (DOOR or DOORS). When the handle is flush with the canopy frame, the canopy is locked. Push up on the rear of the canopy frame to make sure that it is locked. A key operated lock can be used to secure the canopy in the closed position when the airplane is parked.

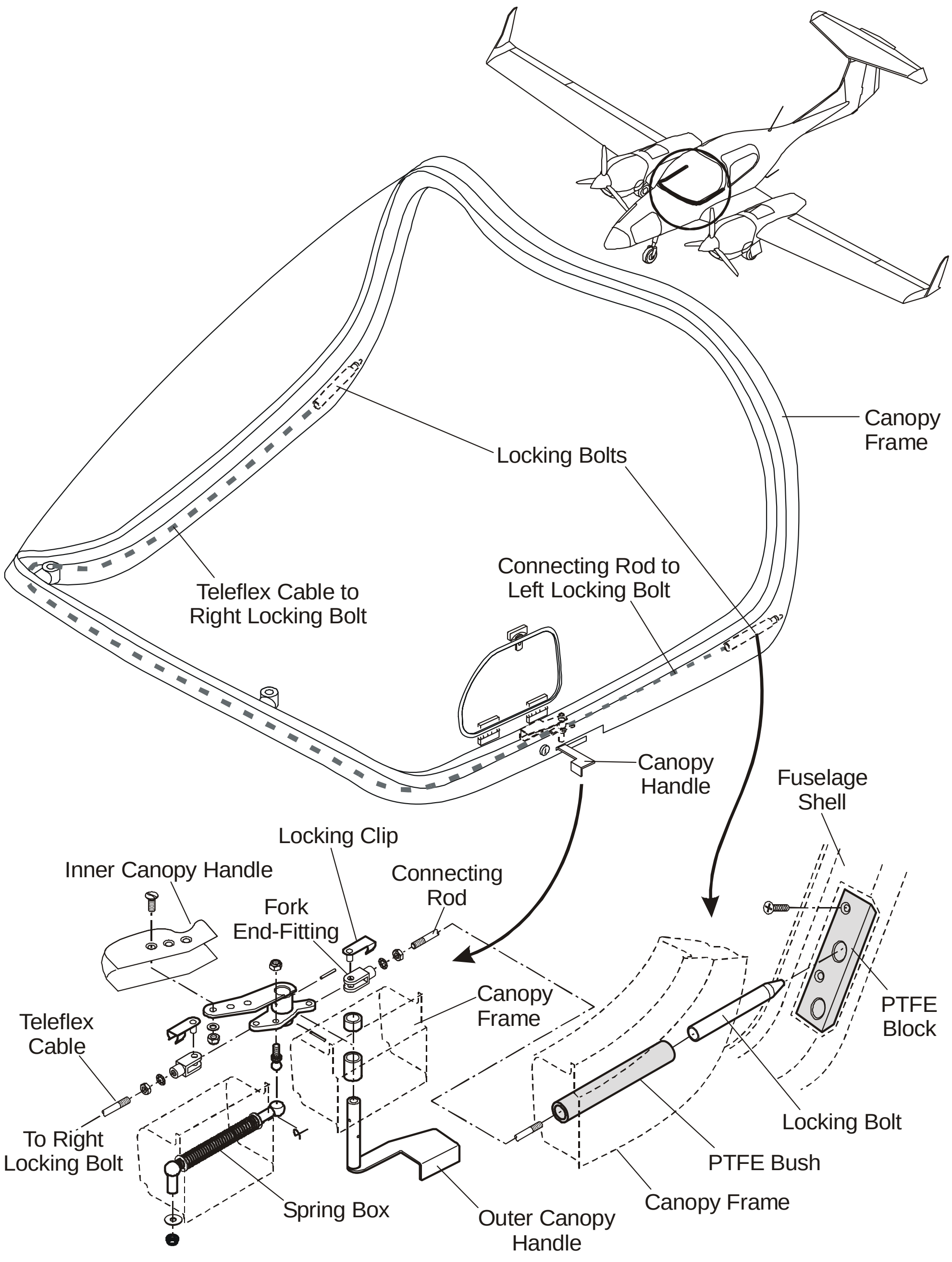

Figure 2: Canopy Locking Mechanism (MÄM 42-097 not installed)

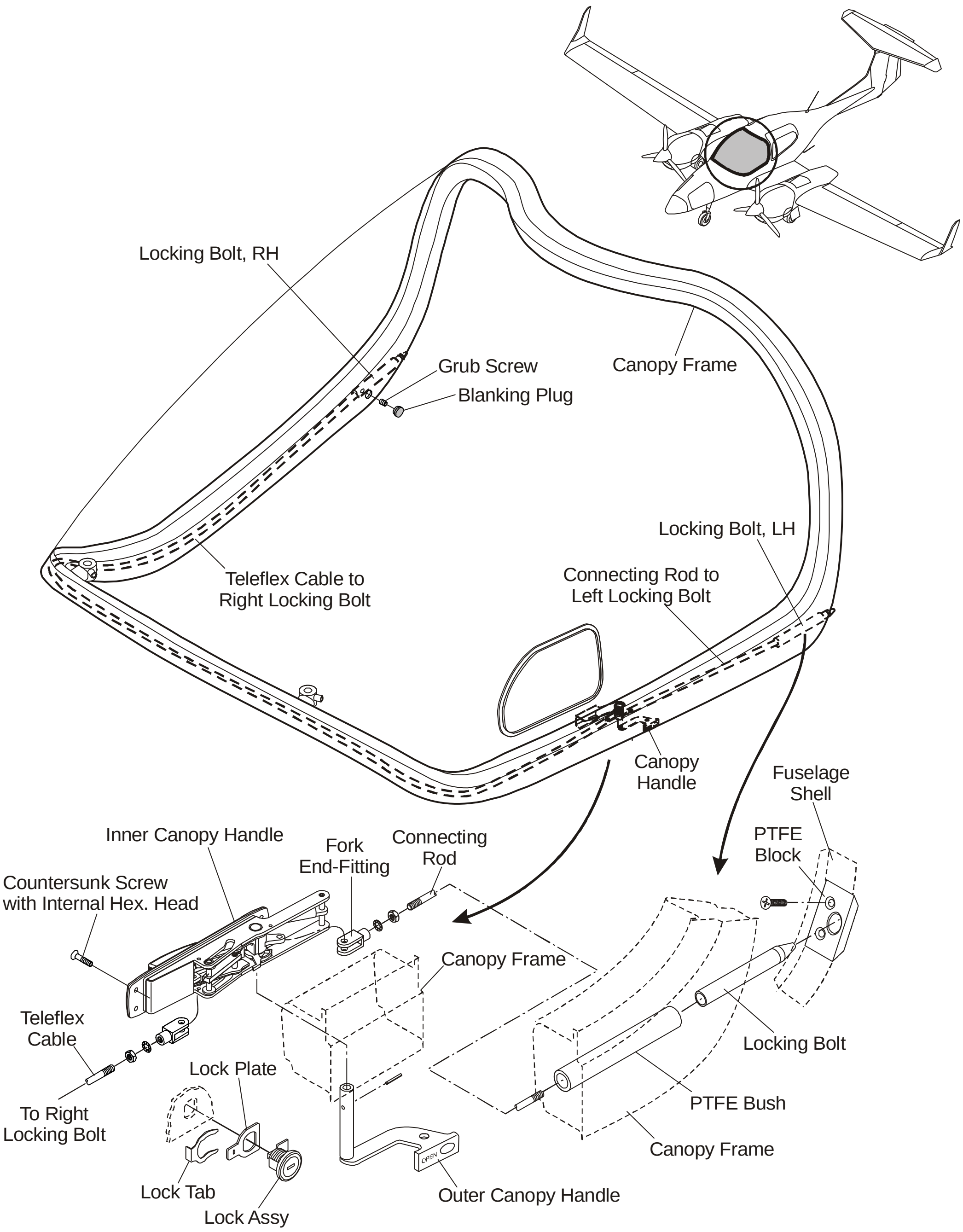

Figure 3: Canopy Locking Mechanism (MÄM 42-097 installed)

3. Passenger Door Description and Operation

A. MÄM 42-097 not installed

Figure 4 shows the passenger door installation and locking mechanism.

The passenger door is a CFRP molding with inner and outer frames. The frames bond together with thickened resin. Each part of the frame has layers of carbon cloth and one layer of glass cloth. Areas of high stress have extra layers of carbon cloth. Mounting bushes for the handle and locking bolts bond to the inside of the frame with thickened resin.

The door has a acrylic glass window. A special flexible adhesive bonds the window to the door frame. A flexible filler seals the small gap between the edge of the window and the frame.

Two hinges attach the door to the top of the fuselage near the center-line. The hinges bolt to the door frame. The front hinge can be removed from inside of the cabin in an emergency. With the front hinge removed, the passenger door can be forced open from the top. A gas strut attaches to a bracket at the rear of the door and to the fuselage. The gas strut holds the door open. A door unlocked warning caption on the ICS display operates when the door is unlocked.

A handle on the left of the door operates two locking bolts. The locking bolts are at the bottom front and rear corners of the door.

The handle has two parts. The inner handle is black and has a double lever. The outer handle is red and attaches to the inner handle with two roll pins. A long connecting rod attaches to the rear of the double lever. The other end of the long connecting rod attaches to the inside of the rear locking bolt. A safety lock is fitted to prevent accidental movement of the handle.

You must lift the safety handle before you can operate the black handle from inside the passenger compartment. To operate the red handle from the outside you must push the button next to the red handle to lift the inner safety lock.

A short connecting rod attaches to the front of the double lever. The short connecting rod goes to the front locking bolt. If you pull the canopy handle away from the canopy frame, these things happen:

– The double lever turns to pull the both of the connecting rods.

– The long connecting rod pulls the rear locking bolt forward.

– The short connecting bolt pulls the front locking bolt aft. The aft movement of the locking bolt operates a micro switch for the warning caption located on the ICS.

The door can be pushed up and out to open.

With the door fully closed, push the door handle towards the door frame. This engages the locking bolts in the fuselage holes. The forward locking bolt operates the door unlocked micro switch. When the handle is flush with the door frame, the door is locked. Push outwards on the bottom of the door frame to make sure that it is locked. A key operated lock can be used to secure the door in the closed position when the airplane is parked.

B. MÄM 42-097 is installed

Figure 5 shows the passenger door installation and locking mechanism. The passenger door is a CFRP molding with inner and outer frames. The frames bond together with thickened resin. Each part of the frame has layers of carbon cloth and one layer of glass cloth. Areas of high stress have extra layers of carbon cloth. Mounting bushes for the locking bolts bond to the inside of the frame with thickened resin.

The door has an acrylic glass window. A special flexible adhesive bonds the window to the door frame. A flexible filler seals the small gap between the edge of the window and the frame.

Two hinges attach the door to the top of the fuselage near the center-line. The hinges bolt to the door frame. The front hinge can be removed from inside of the cabin in an emergency. With the front hinge removed, the passenger door can be forced open from the top. A gas strut attaches to a bracket at the rear of the door and to the fuselage. The gas strut holds the door open. A door unlocked warning caption on the ICS display operates when the door is unlocked.

A handle on the left of the door operates two locking bolts. The locking bolts are at the bottom front and rear corners of the door.

The handle has two parts. The inner handle is red and has a double lever. The outer handle is red and attaches to the inner handle with two roll pins. A long connecting rod attaches to the rear of the double lever. The other end of the long connecting rod attaches to the inside of the rear locking bolt. A safety lock is fitted to prevent accidental movement of the handle.

You must lift the safety handle before you can operate the red handle from inside the passenger compartment. To operate the red handle from the outside you must push the button next to the red handle to lift the inner safety lock.

A short connecting rod attaches to the front of the double lever. The short connecting rod goes to the front locking bolt. If you pull the canopy handle away from the canopy frame, these things happen:

- The double lever turns to pull the both of the connecting rods.
- The long connecting rod pulls the rear locking bolt forward.
- The short connecting bolt pulls the front locking bolt aft. The aft movement of the locking bolt operates a micro switch for the warning caption located on the ICS.

The door can be pushed up and out to open. With the door fully closed, push the door handle towards the door frame. This engages the locking bolts in the fuselage holes. The forward locking bolt operates the door unlocked micro switch. When the handle is flush with the door frame, the door is locked. Push outwards on the bottom of the door frame to make sure that it is locked. A key operated lock can be used to secure the door in the closed position when the airplane is parked.

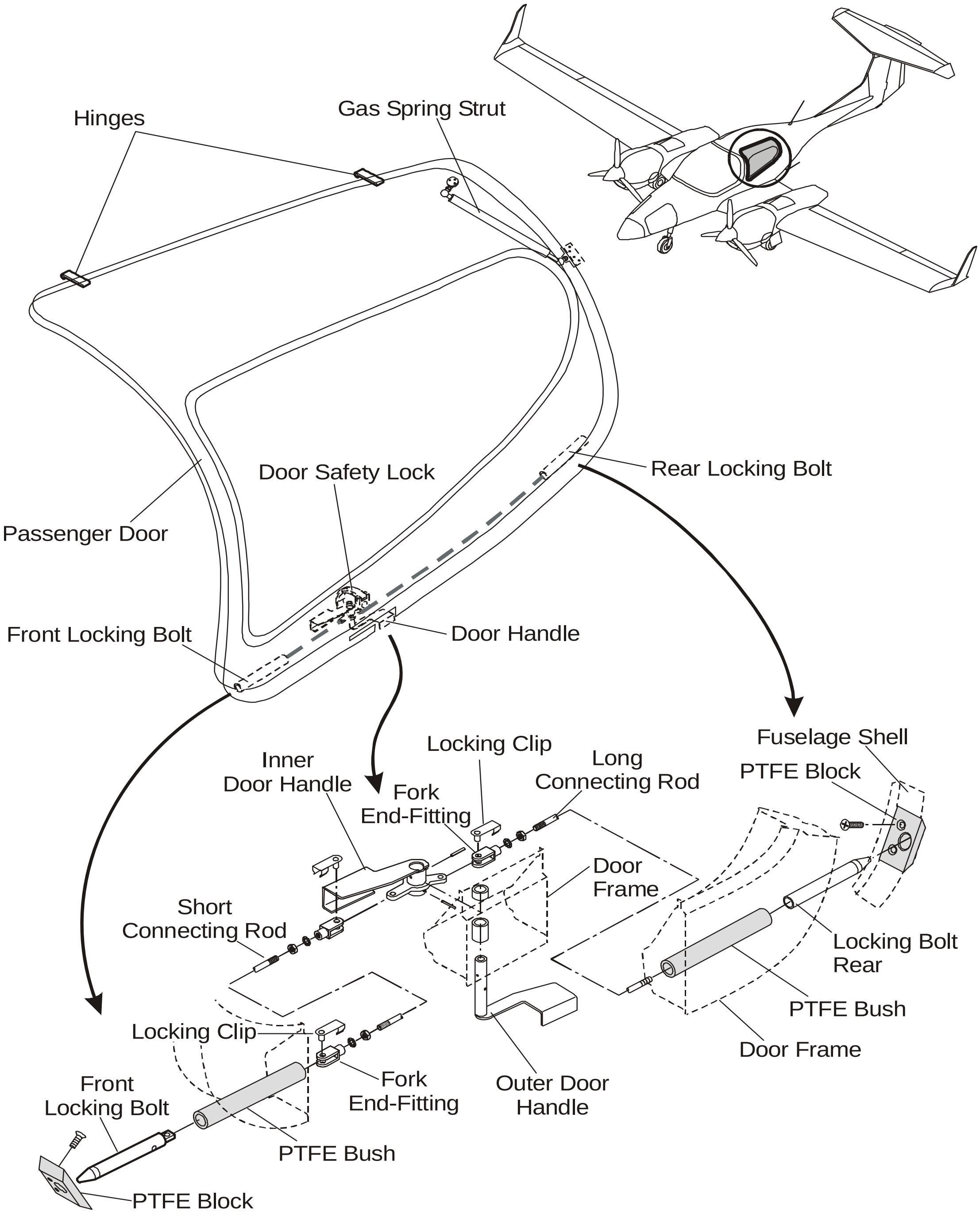

Figure 4: Passengers Door (MÄM 42-097 not installed)

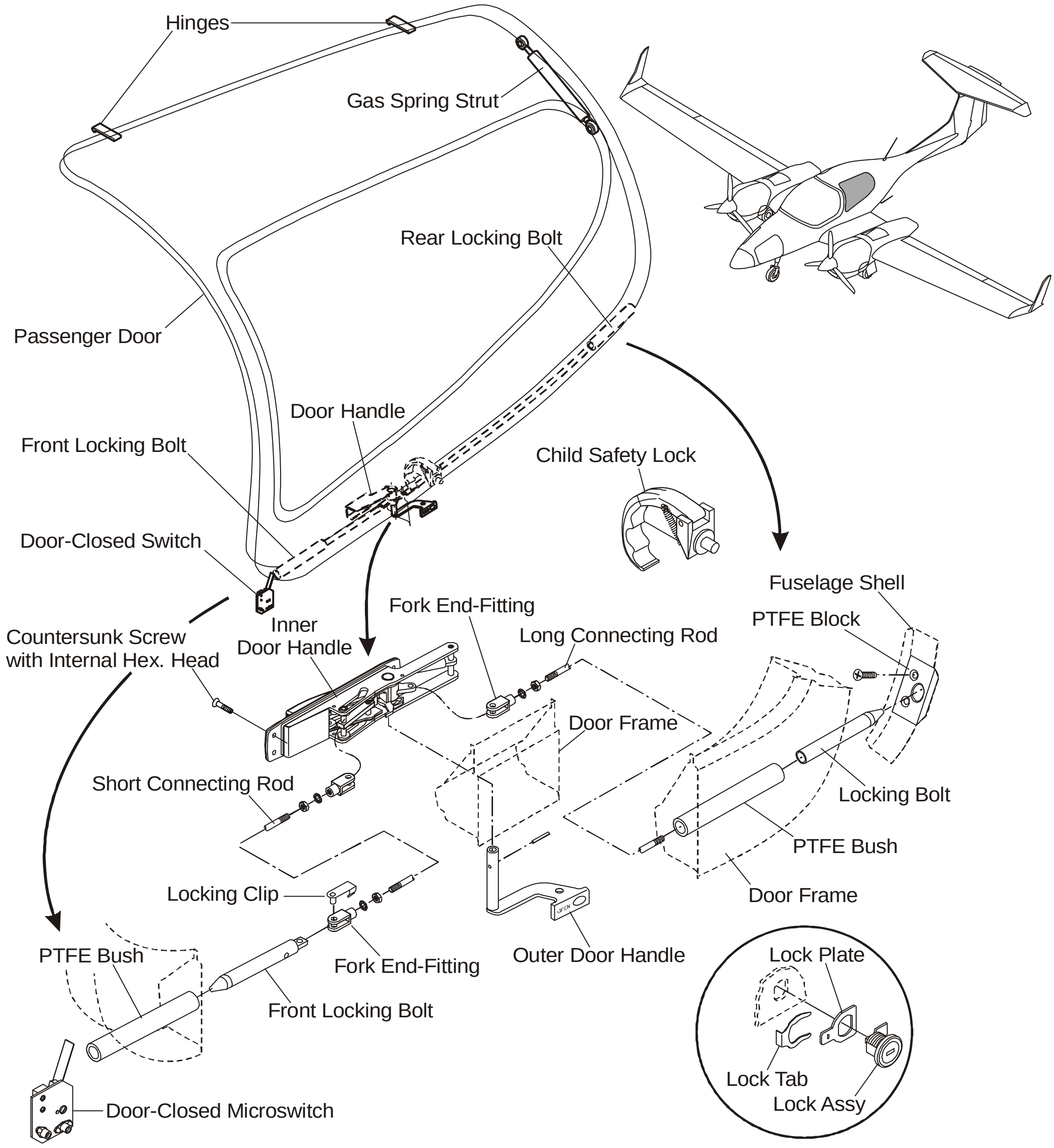

Figure 5: Passengers Door (MÄM 42-097 is installed)

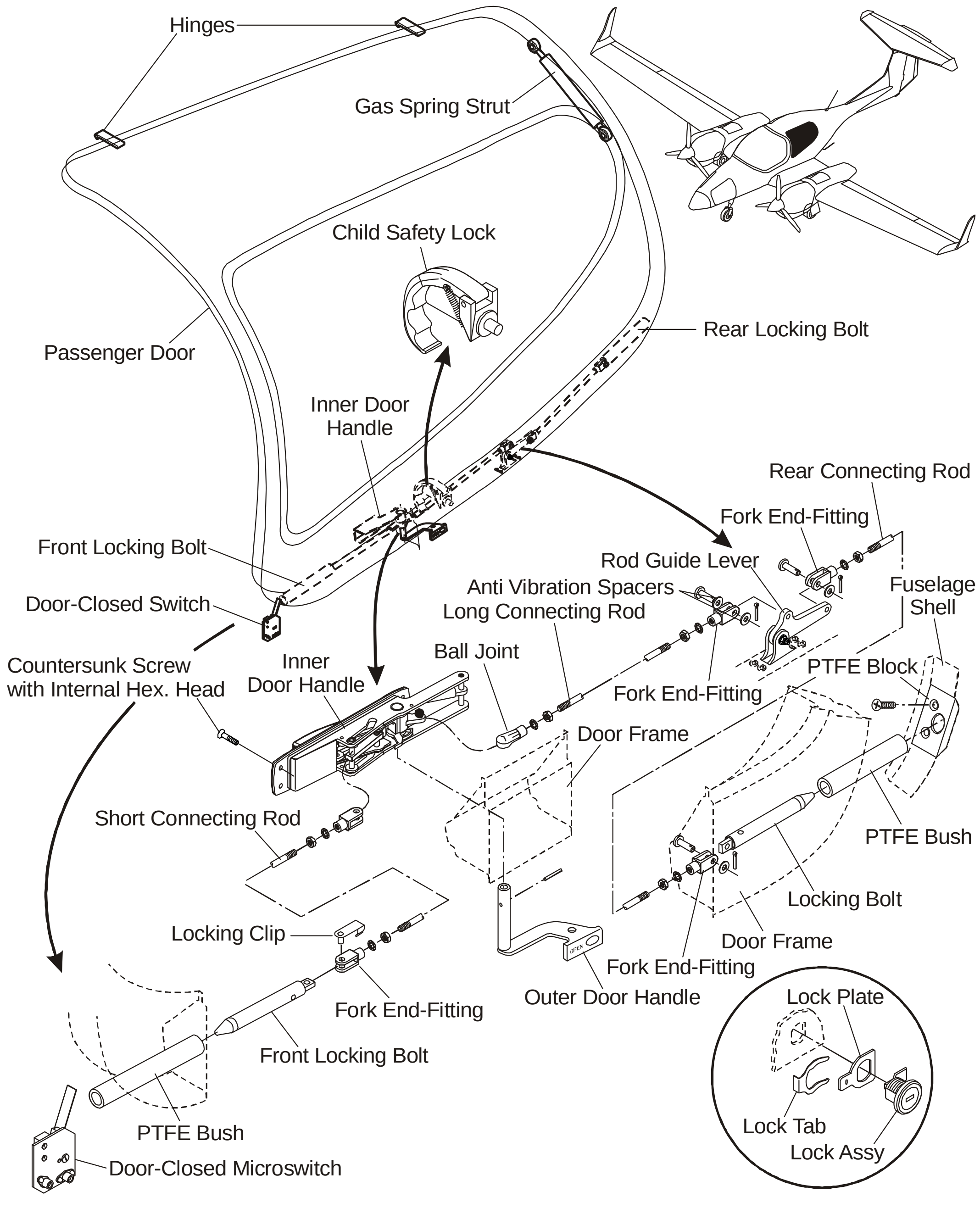

Figure 6: Passengers Door (if MÄM 42-687 is installed)

Trouble-Shooting

1. General

The table below lists the defects you could have with the canopy and passenger door. If you have the trouble detailed in the Trouble column, read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Canopy/door is difficult to move.	Canopy/door frame damaged.	Replace the canopy/door.
	Canopy/door hinges damaged.	Replace the damaged parts.
	Gas spring strut defective.	Replace the gas spring strut.
Canopy/door handle is difficult to move.	Locking bolts damaged.	Replace the damaged bolt.
	Handle bushes damaged.	Replace the canopy/door.
Canopy handle is difficult to move.	Teleflex cable defective.	Replace the teleflex cable.
Incorrect operation of door warning caption on the ICS display.	Canopy/door micro switch incorrectly adjusted.	Adjust canopy/door micro switch.
	Canopy/door micro switch defective.	Replace defective micro switch. Do a continuity test of the wiring. Refer to Chapter 92 for the wiring diagrams.
	Defective wiring.	
Red button operating the safety hook mechanism is stuck in pushed position.	Poor lubrication.	Lubricate. Refer to Section 12-20.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the canopy and the passenger door. They also tell you how to adjust and test the locking mechanism.

2. Remove/Install the Canopy

A. Remove the Canopy

	Detail Steps/Work Items	Key Items/References
(1)	Open the canopy: – Pull the canopy handle away from the canopy frame. – Lift the canopy open.	Refer to Figure 2 or 3.
(2)	Remove the 2 nuts, 4 washers and 2 bolts on either side that attach the canopy tubular brackets to the hinge frame.	Refer to Figure 1. Note the position of the bonding wire cable. Hold the canopy!
(3)	Lift the canopy clear of the airplane.	2 persons needed.

B. Install the Canopy

	Detail Steps/Work Items	Key Items/References
(1)	Move the canopy into position on the airplane.	2 persons needed.
(2)	Align the canopy mountings with the canopy frame and: – Install the 2 nuts, 4 washers and 2 bolts on either side that attach the canopy tubular brackets to the canopy frame. – Install the bonding wire cable onto the canopy.	 Refer to Figure 1. At the location noted in Paragraph 2.
(3)	Close the canopy.	
(4)	Operate the canopy lock: – Hold the canopy closed. – Push the canopy handle towards the canopy frame. – Push up on the rear of the canopy frame.	 When the canopy is locked, the canopy handle must be flush with the canopy frame. To make sure that the canopy is locked.

3. Remove/Install the Canopy Door Handle (if MÄM 42-097 is installed)

A. Remove the Canopy Door Handle

	Detail Steps/Work Items	Key Items/References
(1)	Remove the canopy.	Refer to Paragraph 2.
(2)	Put the canopy on a stable surface and secure it against movement.	Protect the canopy surface.
(3)	Remove the outside door handle: – Open the inside door handle for access to the spring pin. – Push the spring pin through the inside door handle. – Pull the outside door handle out.	 Use punch 4 mm (0.16 in).
(4)	Remove the 4 screws from the inside door handle.	
(5)	Pull out the handle and disconnect the front fork head from the slide axle. Remove the circlip and move the axle out.	
(6)	Disconnect the rear fork head from the inside lever.	
(7)	Remove the inside door handle from the canopy shell.	
(8)	Remove the spring pin from the canopy door handle.	

B. Install the Canopy Door Handle

	Detail Steps/Work Items	Key Items/References
(1)	Install the inside door handle to the canopy door shell: – Pre fit the door handle. – Connect the rear fork head to the inside lever.	
(2)	Connect the front fork head. Install the slide axle and secure the axle with circlip.	
(3)	Install the inside handle. Install the 4 screws.	
(4)	Install the outside door handle: – Push the outside door handle into the door shell to the inside door handle.	
(5)	Install the spring pin through the inside door handle.	Use punch 4 mm (0.16 in).
(6)	Install the canopy.	Refer to Paragraph 2.

4. Remove/Install the Gas Spring Strut for the Canopy

A. Remove the Gas Spring Strut for the Canopy

	Detail Steps/Work Items	Key Items/References
(1)	Remove the canopy.	Refer to Paragraph 2.
(2)	Remove the nut and washer that attach the strut to the hinge frame.	Refer to Figure 1.
WARNING:	**MAKE SURE THAT THE STRUT IS FULLY EXTENDED BEFORE YOU DISCONNECT IT FROM THE HINGE FRAME.**	
(3)	Pull the top of the strut away from the hinge frame.	Remove and retain the bush and second washer.
(4)	Remove these items that attach the bottom of the strut: – Nut washer and bolt. – Bush. – Two spacers.	
(5)	Remove the strut from the airplane.	

B. Install the Gas Spring Strut for the Canopy

	Detail Steps/Work Items	Key Items/References
(1)	Move the strut into position in the airplane.	The cylinder goes to the top.
(2)	Install the bolt, washer and self-locking nut at the bottom attachment to the instrument panel frame.	Torque 6.4 Nm (4.7 lbf.ft.). Use a new self-locking nut.
(3)	Put the washer and bush into position on the hinge frame.	
(4)	Move the top eye end of the of the strut over the bush on the hinge frame.	
(5)	Install the washer and self-locking nut onto the hinge frame.	Torque 6.4 Nm (4.7 lbf.ft.). Use a new self-locking nut.
(6)	Install the canopy.	Refer to Paragraph 2.

5. Remove/Install the Passenger Door

A. Remove the Passenger Door

	Detail Steps/Work Items	Key Items/References
(1)	Open the passenger door: – Push and hold the safety button next to the door handle. – Pull the door handle away from the door frame. – Lift the door open.	Refer to Figure 3, 4 or 5.
(2)	Remove the gas strut: – Remove the locking clips from the gas strut top and bottom ball end fittings. – Pull the gas strut off the ball end fittings on the fuselage and clear of the airplane.	Hold the door!
(3)	Remove the passenger reading light assembly from the top of the cockpit.	For access to the front door hinge. Refer to Section 33-10.
(4)	Remove the bolts and washers which attach the front and rear door hinges to the fuselage.	Hold the door!
(5)	Lift the door clear of the airplane.	

B. Install the Passenger Door

	Detail Steps/Work Items	Key Items/References
(1)	Put the door in position in the fuselage.	
(2)	Install the bolts and washers which attach the front and rear door hinges to the fuselage.	
(3)	Install the passenger reading light assembly.	Refer to Section 33-10.
(4)	Install the gas strut: – Push the gas strut ball end fittings onto the fuselage gas strut mounts. – Install the locking clips which lock the ball end fittings in place.	
(5)	Close the door.	
(6)	Operate the door lock: – Hold the door closed. – Press the safety button next to the door handle and push the door handle towards the door frame. – Push outwards on the bottom of the door frame.	When the door is locked, the door handle must be flush with the door frame.
(7)	Do a test for correct operation of the DOOR warning caption. In the ICS display.	Refer to Paragraph 8.

6. Remove/Install the Passenger Door Locking Mechanism (if MÄM 42-687 is installed)

A. Remove the Passenger Door Locking Mechanism

	Detail Steps/Work Items	Key Items/References
(1)	Remove the door handle.	
(2)	Remove the 4 bolts from the rod guide base.	
(3)	Remove the lever bolt from the guide base.	
(4)	Remove the guide base.	
(5)	Pull the long connecting rod and the guide lever with the locking bolt to the door handle cut out.	

B. Install the Passenger Door Locking Mechanism

	Detail Steps/Work Items	Key Items/References
(1)	Install the long connecting rod and the guide lever into the door handle cutout.	
(2)	Install the rear locking bolt into the PTFE bush.	
(3)	Connect the guide lever to the guide base.	
(4)	Connect the ball cup fitting from the thread rod 2 to the door handle.	
(5)	Connect the front fork head to the slide axle.	
(6)	Pre-fit the inner door handle.	
(7)	Install the guide base.	

	Detail Steps/Work Items	Key Items/References
(8)	Adjust the rear locking bolt: – Check that the short lever arm from the guide lever position is more than 90° in the closed position. If necessary adjust long connecting rod. – Check the rear locking bolt over length in closed position min. 43 mm max. 45 mm. If necessary adjust the locking bolt thread rod. For adjustment remove the guide base and lever. – Check the locking mechanism for release. Push with 15 kg on the rear locking bolt in the closed position. The closing mechanism has to stay locked up to a force of 15 kg. – Check the front locking bolt over length in closed position 40 mm ± 1mm. – Install the 4 guide base bolts. – Install the inner door handle.	

7. Remove/Install the Gas Spring Strut for the Passenger Door

A. Remove the Gas Spring Strut for the Passenger Door

	Detail Steps/Work Items	Key Items/References
(1)	Open the passenger door: – Push and hold the button next to the door handle. – Pull the door handle away from the door frame. – Lift the door open.	Refer to Figure 3, 4 or 5.
(2)	Remove the gas strut: – Remove the locking clips from the gas strut top and bottom ball-end fittings. – Pull the gas strut off the ball end fittings on the fuselage and clear of the airplane.	Hold the door!

B. Install the Gas Spring Strut for the Passenger Door

	Detail Steps/Work Items	Key Items/References
(1)	Open the passenger door: – Pull the door handle away from the door frame. – Lift the door open.	Refer to Figure 3, 4 or 5. Hold the door!
(2)	Install the gas strut: – Push the gas strut ball end fittings onto the fuselage gas strut mounts. – Install the locking clips which lock the ball end fittings in place.	
(3)	Close the door.	

8. Test the Canopy and Access Door Warning Lights

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that both the front canopy and the passenger door are fully closed.	Operating handles flush against the canopy/door frame.
(2)	Test the operation of the DOOR warning caption on the ICS display:	Monitor the integrated cockpit display.
	– Set the ELECT. MASTER switch to ON.	The DOOR warning caption must be off.
	– Move the passenger door operating handle towards the open position.	The DOOR warning caption must come on when the operating handle has moved away from the door frame.
	– Move the door operating handle to the fully closed position.	The DOOR warning caption must go off.
	– Move the canopy operating handle towards the open position.	The DOOR warning caption must come on when the operating handle has moved away from the door frame.
	– Move the canopy operating handle to the fully closed position.	The DOOR warning caption must go off.
	– Set the ELECT. MASTER switch to OFF.	

9. Examine the Carbon Hinges on the Passenger Door

	Detail Steps/Work Items	Key Items/References
(1)	Open the passenger door to carry out the carbon hinge inspection.	
(2)	Examine the carbon hinges for cracks and delamination on the side faces:	Refer to Figure 7.
	– Hold the passenger door frame with one hand to the left and one hand to the right of the hinge.	
	– Apply torsional test force to the hinge by alternately pulling with one hand and pushing with the other hand.	Apply test force of approx. 8 kg (18 lb) with each hand.
	– If cracks become visible on the side faces of the hinges when test force is applied, the hinge is structurally damaged due to delamination. Replace the carbon hinges.	Refer to Paragraph 11.

	Detail Steps/Work Items	Key Items/References
(3)	Cracks at the outer face of the hinges where they meet the door frame may be visible. If cracks in this area are visible, perform the following checks: – Hold the passenger door frame with one hand to the left and one hand to the right of the hinge. – Apply torsional test force to the hinge by alternately pulling with one hand and pushing with the other hand, check the cracks on the outer face of the hinge. – If cracks expand extensively when applying test force, the hinges are structurally damaged. Replace the carbon hinge. If cracks expand extensively when applying test force, the hinges are structurally damaged. Contact Diamond Aircraft for repair instructions. If the cracks do not expand extensively when applying test force, they are limited to the painting and do not affect the serviceability of the door.	Refer to Figure 8. Apply test force of approx. 8 kg (18 lb) with each hand. Refer to Paragraph 11.

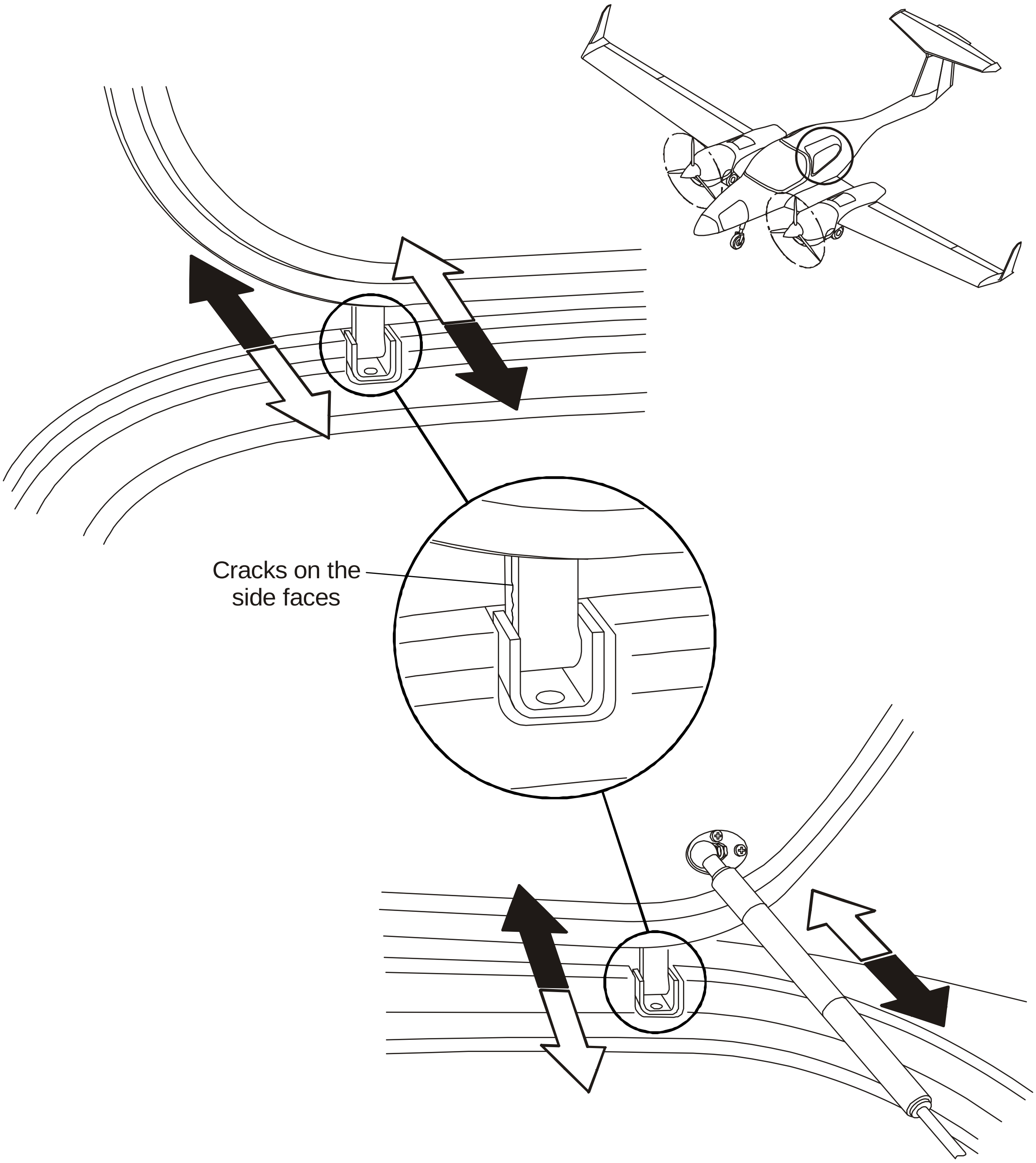

Figure 7: Passenger Door Torsional Hinge Test

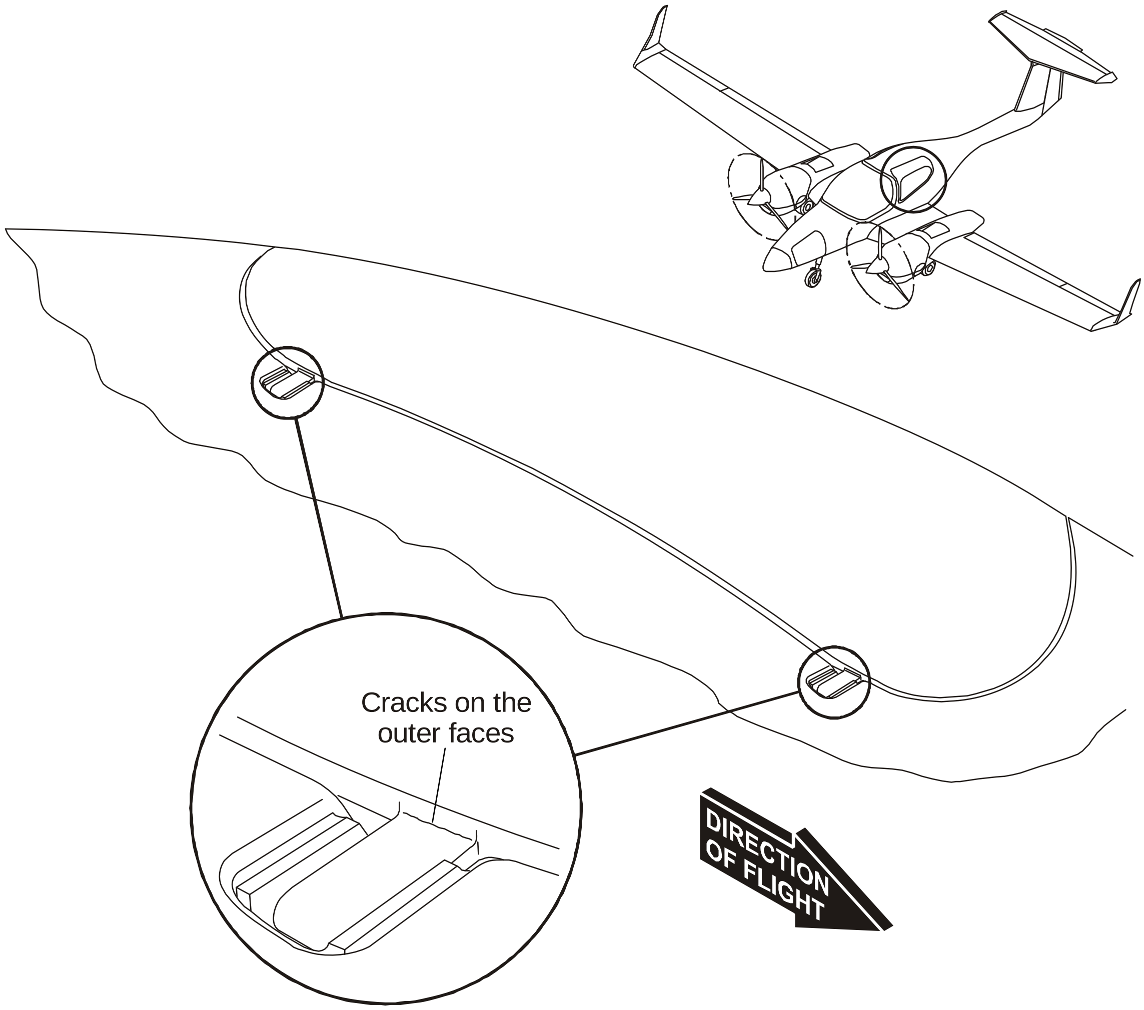

Figure 8: Passenger Door Outer Face Hinge Test

10. Inspection of the Door Locking and Safety Hook Mechanisms

	Detail Steps/Work Items	Key Items/References
(1)	Make sure the door lock mechanism works correctly: – The pins must engage in the guarding plates of the door frame correctly.	
(2)	Make sure the safety hook mechanism works correctly: – Lubricate the red button of the safety hook mechanism from outside, where it enters the door frame. – Operate the button several times. Repeat lubrication procedure until button moves smoothly. – Make sure the safety hook engages correctly into the retaining block on the fuselage when the door is closed but unlatched.	Refer to Section 12-20.

11. Replace a Passenger Door Carbon Hinge

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger door.	Refer to Paragraph 5.
(2)	Clean the surface around the hinge on fuselage and passenger door.	
(3)	Cover the surface around the hinge with masking tape.	Use enough masking tape to prevent bonding paste touching the paint.
(4)	Remove the peel ply from the carbon hinge.	
(5)	Install and center the new carbon hinge on the fuselage side.	Use shims to keep the bearing centered.

	Detail Steps/Work Items	Key Items/References
(6)	Remove the carbon hinge from the passenger door.	Make sure not to damage to door structure.
(7)	Cover the surface around the hole for the carbon hinge with masking tape.	Use enough masking tape to prevent bonding paste touching the paint.
(8)	Put the passenger door into position for trial fit. Close door lock.	Use shims to make sure there are equal gaps and contour fit. Mark shims and positions for later use.
(9)	Remove the passenger door.	
(10)	Prepare bonding surfaces.	Refer to Section 51-20.
(11)	Coat bonding surface with mixed resin.	Refer to Section 51-20.
(12)	Fill the hole for the carbon hinge with bonding paste completely.	Refer to Section 51-20.
(13)	Put the passenger door into position. Close door lock.	Make sure there are equal gaps and contour fit.
(14)	Remove excessive bonding paste.	
(15)	Pre-cure hinges.	Refer to Section 51-20.
(16)	Remove the passenger door.	
(17)	Remove masking tape from fuselage and passenger door.	
(18)	Post-cure the carbon hinge.	Refer to Section 51-20.
(19)	Grind surface smooth.	
(20)	Paint surface.	Refer to Section 51-20.
(21)	Install passenger door.	Refer to Paragraph 5.

12. Remove/Install the Passenger Door Handle (if MÄM 42-097 is installed)

A. Remove the Passenger Door Handle

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger door.	Refer to Paragraph 4.
(2)	Fix the passenger door on a flat surface.	Protect the door surface finish.
(3)	Remove the outer door handle: – Open the inner door handle in order to gain access to the spring pin. – Push the spring pin through the inner door handle. – Remove the outer door handle.	 Use a 4 mm punch.
(4)	If MÄM 42-687 is installed: Remove the rod guide base from the door shell: – Remove the 4 screws. – Move the guide base free of the door shell.	
(5)	If MÄM 42-687 is installed: Disconnect the thread rod from the rod guide lever: – Remove the cotter pin and the bolt.	
(6)	Remove the inner door handle from the passenger door shell: – Remove the 4 screws from the inner door handle.	
(7)	Lift the inner door handle and disconnect the front fork head from the slide axle.	
(8)	Remove the circlip and move the axle free of the door shell.	
(9)	Disconnect the rear fork head from the lever.	

	Detail Steps/Work Items	Key Items/References
(10)	Move the door handle free of the door shell.	
(11)	Remove the spring pin from the door handle.	

B. Install the Passenger Door Handle

	Detail Steps/Work Items	Key Items/References
(1)	Install the inner door handle of the passenger door: – Move the door handle into place. – Connect the rear fork head to the inner door handle lever.	
(2)	Connect the front fork head and install the slide axle and secure the axle with a circlip.	
(3)	If MÄM 42-687 is installed: – Connect the rear thread rod to the rod guide lever.	
(4)	If MÄM 42-687 is installed: Install the rod guide base to the door shell: – Install the 4 screws.	
(5)	Install the inner handle: – Install the 4 screws.	
(6)	Install the outer door handle of the passenger door: – Align the outer door handle with the hole of the inner door handle. – Push the door handle into the inner door handle.	

	Detail Steps/Work Items	Key Items/References
(7)	Install the spring pin through the inner door handle.	Use a 4 mm punch.

13. Remove/Install the Door Handle Compression Gas Spring (if MÄM 42-097 is installed)

A. Remove the Door Handle Compression Gas Spring

	Detail Steps/Work Items	Key Items/References
(1)	Remove the canopy or passenger door handle.	Refer to Paragraph 12.
(2)	If installed, remove the circlip from the gas spring tie bolt.	Protect the door surface finish.
(3)	Pull the rear end of the door handle frame approximately 4 mm apart and pull out the gas spring tie bolt. If MÄM 42-981 is installed, pull the tie bolt out axially. Caution: spring loaded!	Door handle must be in open position.
(4)	Unscrew the piston of gas spring from the door handle.	

B. Install the Door Handle Compression Gas Spring

	Detail Steps/Work Items	Key Items/References
(1)	Screw the piston of the gas spring into the door handle.	Use Loctite 243.
(2)	Adjust the length of the compression gas spring. Make sure that the polyamide bushing defines the mechanical stop of the red aluminum door handle.	The mechanical stop of the red aluminum door handle must not be defined by the internal stop of the compression gas spring.
(3)	Compress the gas spring and insert the tie bolt. Pull the rear end of the door handle frame approximately 4 mm apart and push the gas spring tie bolt in. If MÄM 42-981 is installed, push the tie bolt in axially.	
(4)	If MÄM 42-981 is installed, install the circlip on the gas spring tie bolt.	
(5)	Install the canopy or passenger door handle.	Refer to Paragraph 12.

14. Test the Passenger Door Handle Compression Gas Spring (if MÄM 42-097 is installed)

	Detail Steps/Work Items	Key Items/References
(1)	Open the passenger door.	
(2)	Move the door handle into open position. Slowly move the door handle to closed position and check, if the door handle snaps into closed position by itself at least 10 mm (measured at the outermost point of the lever) before reaching the end position.	
(3)	If the distance is less then 10 mm, replace the compression gas spring.	Refer to Paragraph 13.

15. Canopy Jettison System (if OÄM 42-194 is installed)

The canopy jettison system consists of:

– Special canopy hinge with attached canopy jettison mechanism.

– Canopy jettison mechanism with the LH and RH Bowden cables.

– Canopy jettison lever assembly.

– Canopy- and Roeger type hooks.

The standard remove / install procedure is valid for the standard canopy and the canopy with the jettison system installed (if OÄM 42-194 is installed).

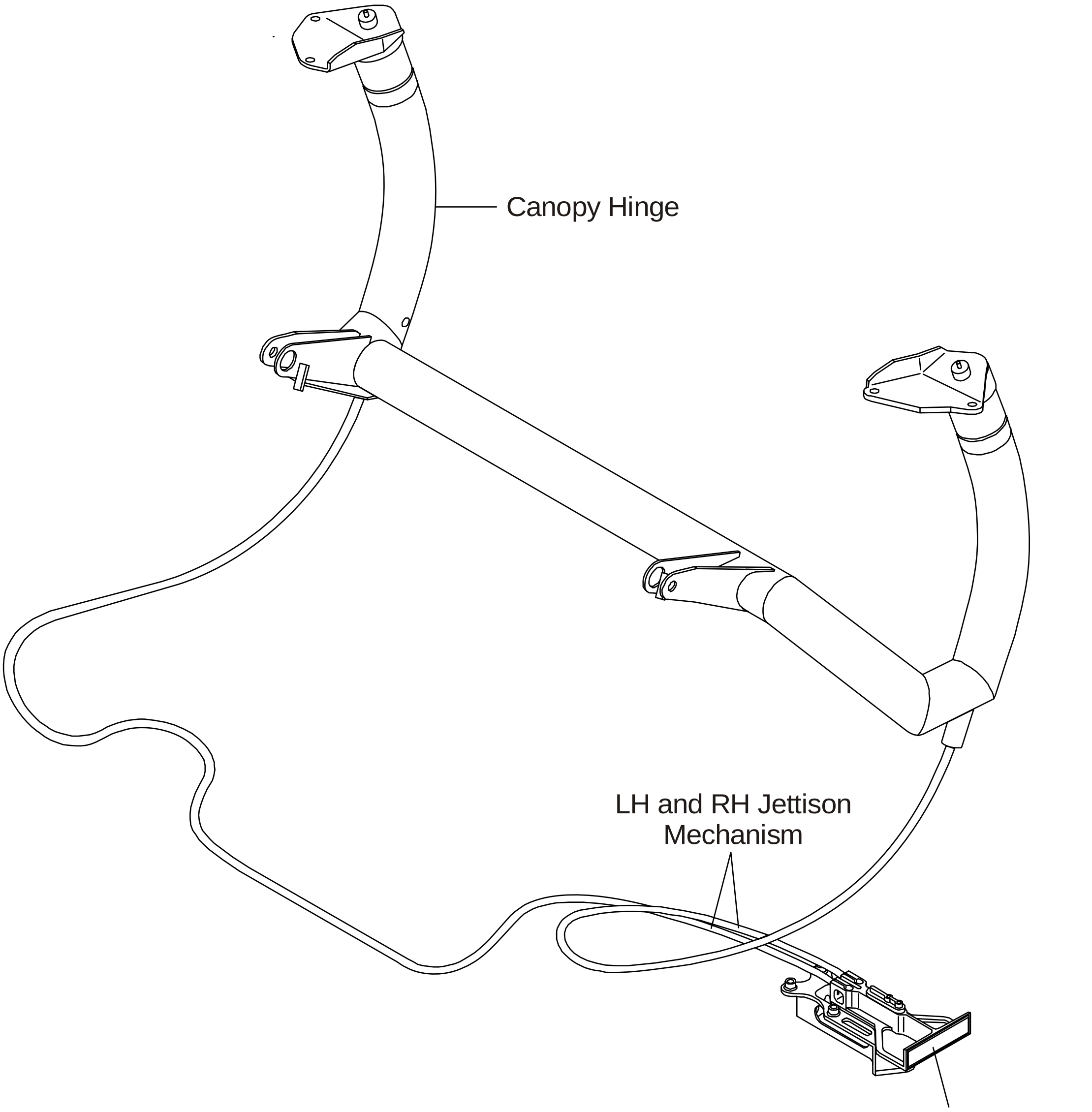

Figure 9: The Canopy Jettison System consists of the Canopy Hinge, the LH and RH Canopy Jettison Mechanism and the Canopy Jettison Lever

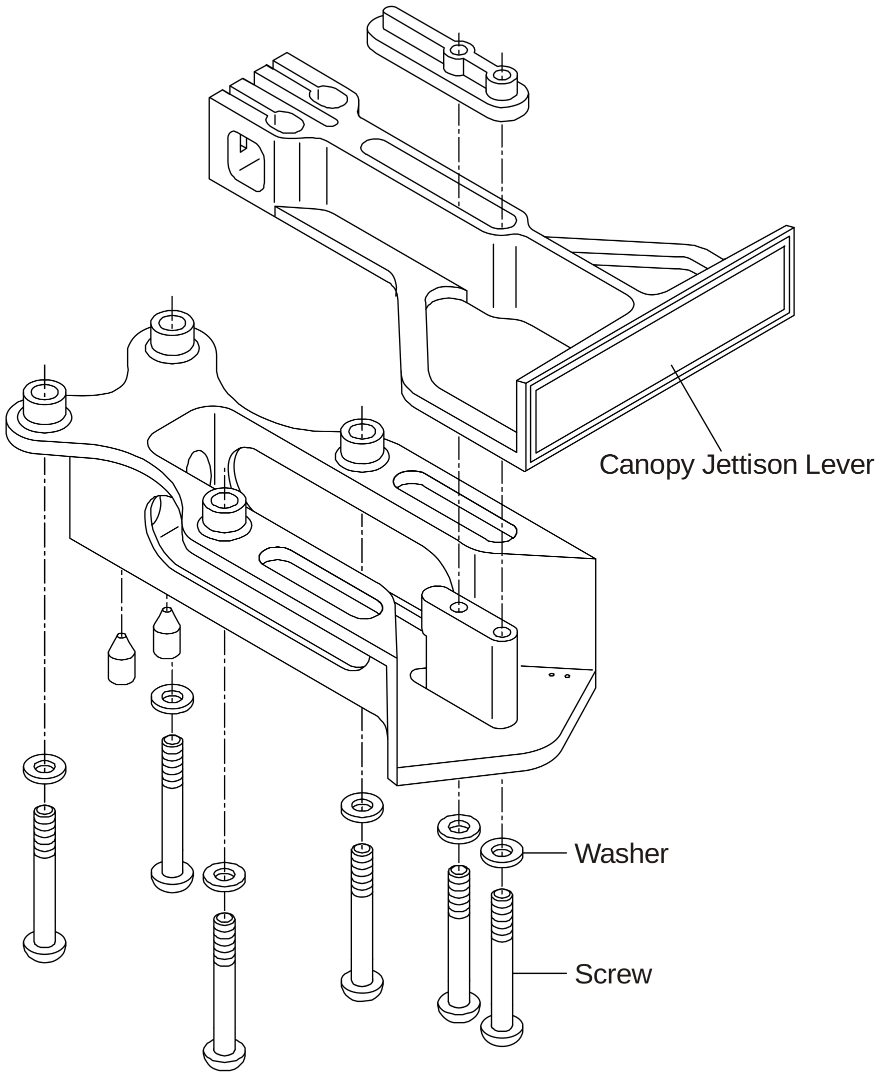

Figure 10: Canopy Jettison Lever Assembly

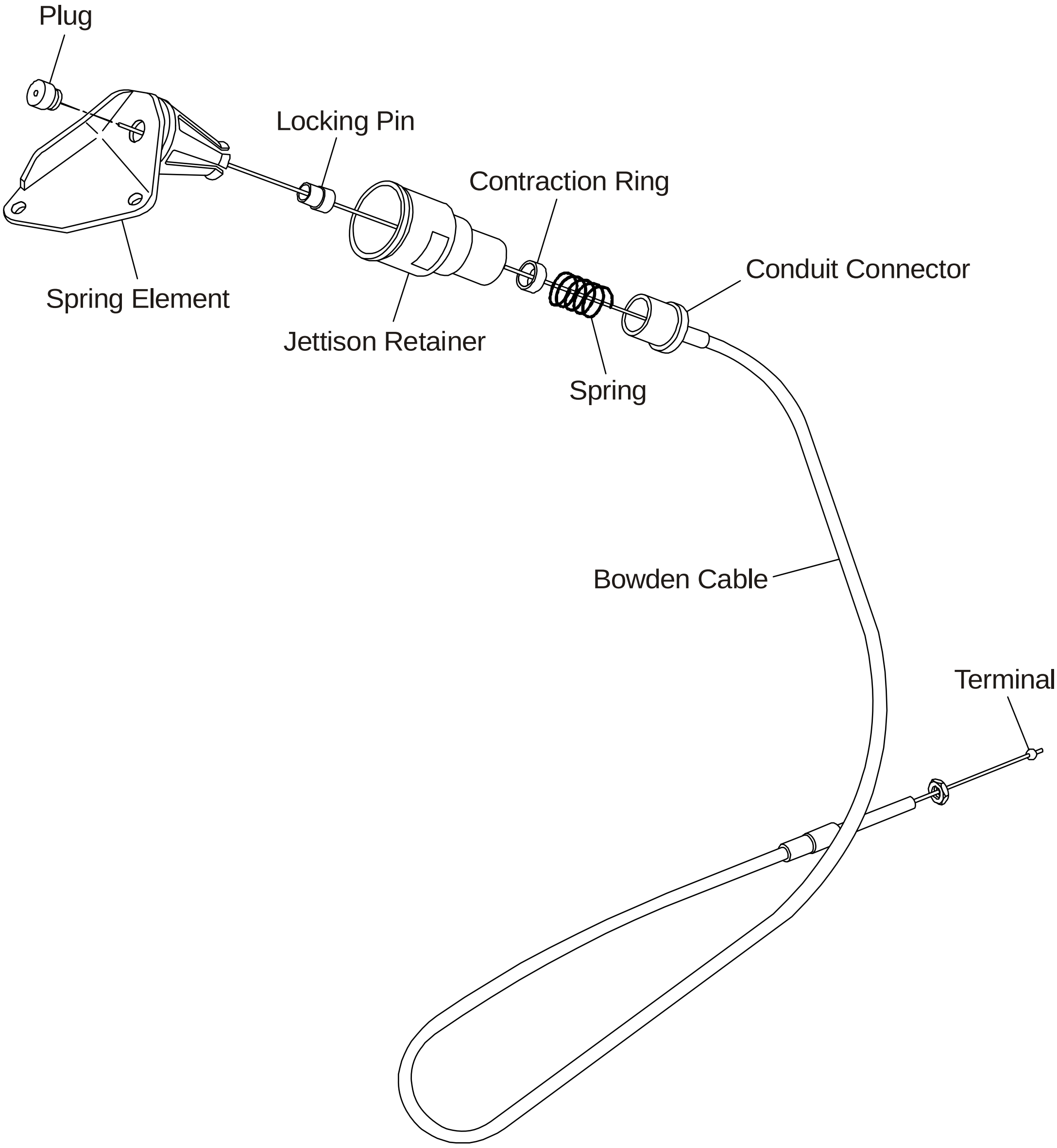

Figure 11: Canopy Jettison Mechanism I

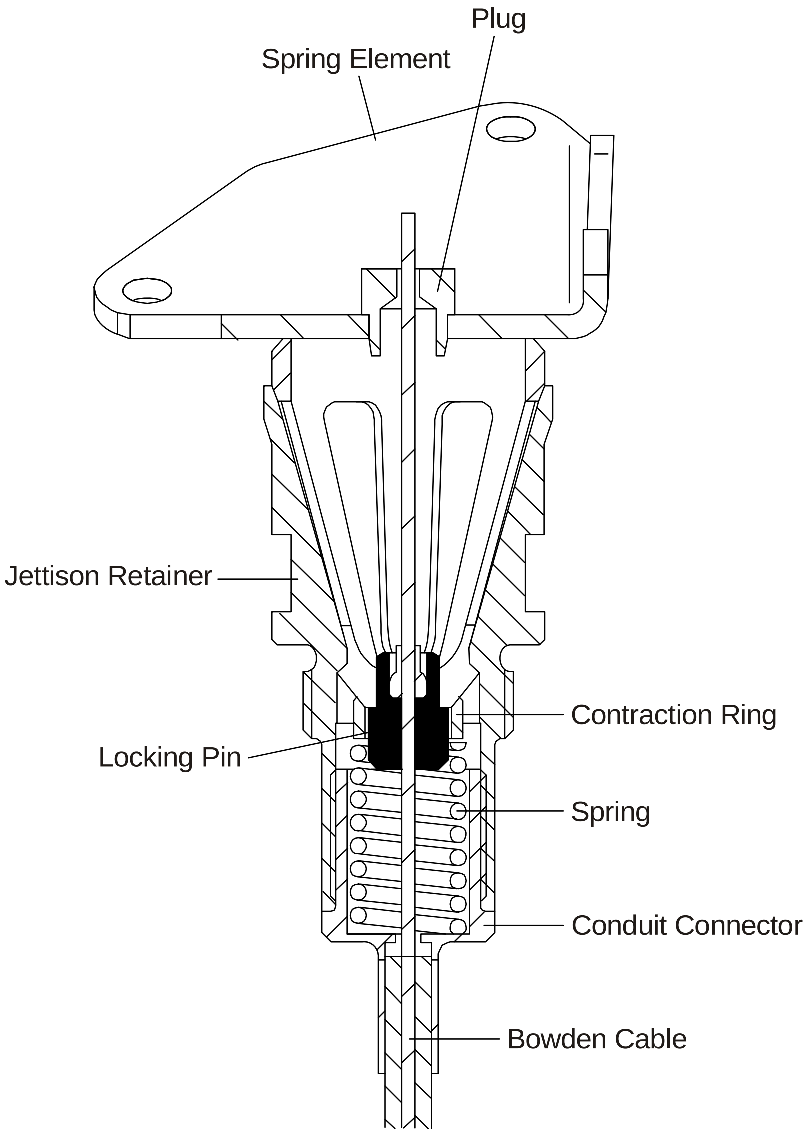

Figure 12: Canopy Jettison Mechanism II

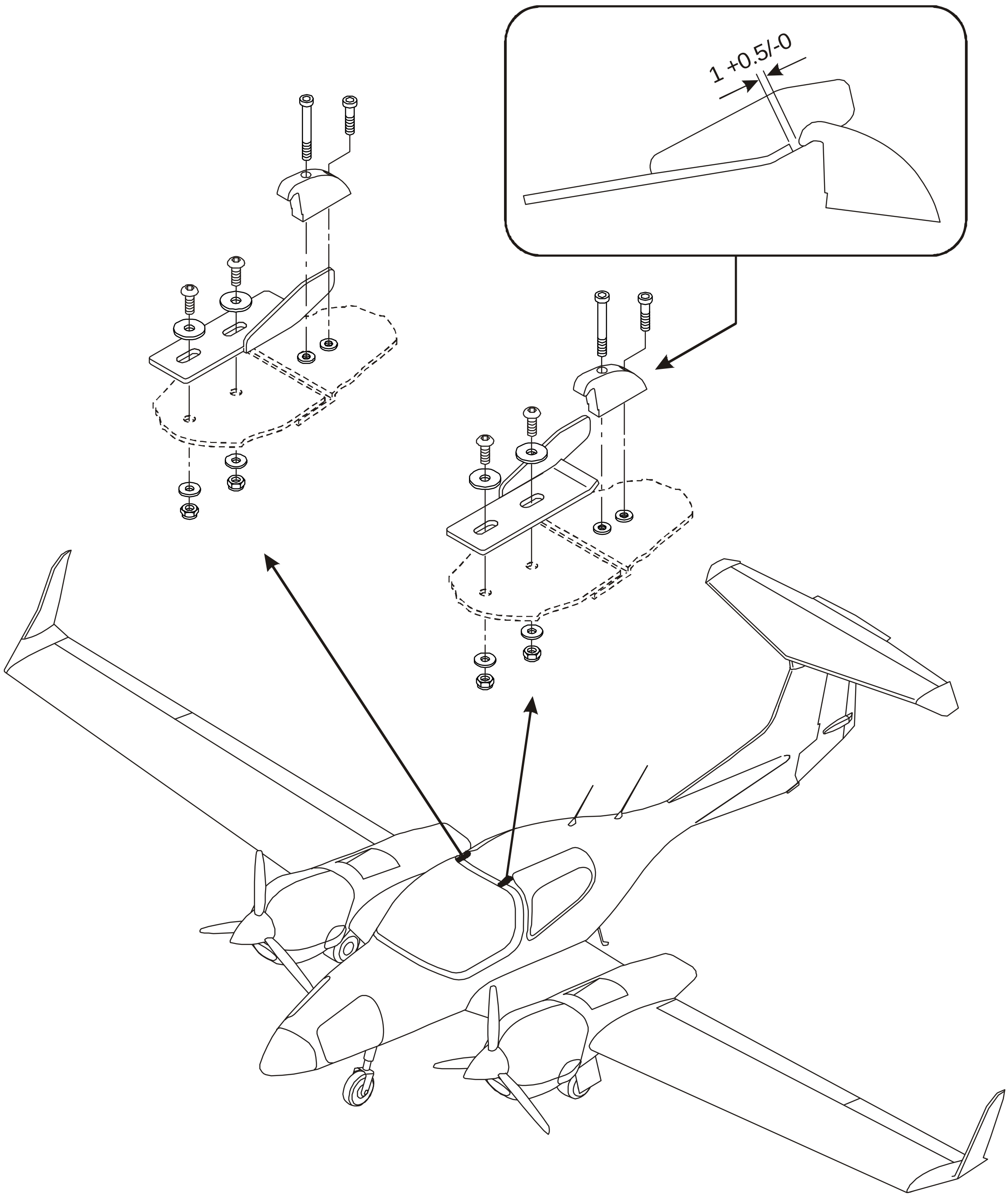

Figure 13: Configuration of the Canopy and Roeger Type Hooks

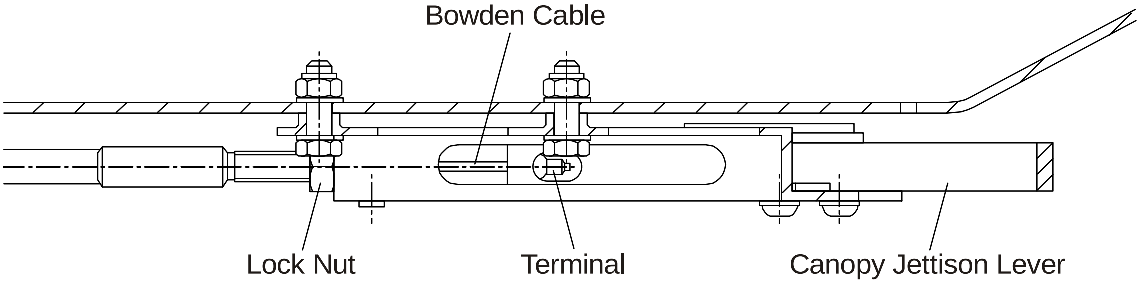

Figure 14: Adjustment of the Bowden Cable Play

A. 100 Hours Maintenance Check

	Detail Steps/Work Items	Key Items/References
(1)	Check if the lead plumbing on the canopy jettison lever is not broken.	Refer to Figure 10.
(2)	Make sure, that the bowden cables protrude 7 mm (± 2 mm) from the plug on each side.	Refer to Figures 9 and 12.
(3)	Make sure, that torque seal on the bowden cable at the plug is not broken.	
(4)	Check clearance between canopy hooks and Roeger type hooks: 1.0 +0.5/-0 mm (0.04 +0.02/-0 in.).	Refer to Figure 13.

B. Release Test

	Detail Steps/Work Items	Key Items/References
WARNING:	**THE JETTISON MECHANISM IS SPRING LOADED. PARTS CAN SNAP AND CAUSE SERIOUS INJURIES.**	
(1)	Position one person on each side of the canopy. They should hold the canopy in an almost closed position.	
(2)	A third person sitting inside the airplane releases the canopy jettison system. – The release force on the lever must not exceed 160 N. – If the force exceeds 160 N, contact Diamond Aircraft Industries.	Use spring scale.
(3)	Remove the canopy.	
(4)	Report test result to the manufacturer, Diamond Aircraft Industries GmbH Office of Airworthiness N.A. Otto-Str. 5 A-2700 Wiener Neustadt Austria by mail, fax (+43-2622-26780) or e-mail (airworthiness@diamond-air.at).	

C. Remove the Canopy Jettison System

	Detail Steps/Work Items	Key Items/References
	WARNING: THE JETTISON MECHANISM IS SPRING LOADED. PARTS CAN SNAP AND CAUSE SERIOUS INJURIES.	
(1)	Perform a release test.	
(2)	Remove the canopy.	Refer to Section 52-10.
(3)	Remove the spring element from the canopy.	
(4)	Remove the instrument panel cover.	Refer to Section 25-10.
(5)	Remove the canopy jettison lever assy from the instrument panel.	Refer to Figure 10.
(6)	Remove the bowden cable from the canopy-jettison lever assy.	
(7)	Remove the canopy jettison mechanism LH and RH from the canopy hinge.	

D. Install the Canopy Jettison System

	Detail Steps/Work Items	Key Items/References
WARNING: THE JETTISON MECHANISM IS SPRING LOADED. PARTS CAN SNAP AND CAUSE SERIOUS INJURIES.		
(1)	Remove the conduit connector from the jettison retainer.	
(2)	Connect the jettison retainer to the spring element (LH/RH).	Apply molykote on spring element.
(3)	Assemble the jettison mechanism (LH/RH): – Slide the conduit-connector, the spring and the contraction ring onto the bowden cable.	Refer to Figure 11.
(4)	Insert the locking pin into the spring element (LH/RH): – Pull at the end of the bowden cable. – Make sure, that the bowden cable protrudes 7 mm ± 2 mm (0.28 in ± 0.08 in) from the plug.	Apply molykote on locking pin. Refer to Figure 12.
(5)	Screw the jettison retainer on the bowden cable conduit-connector (LH/RH).	Secure bowden cable conduit-connector with Loctite 243.
(6)	Install the plug on the jettison retainer (LH/RH).	
(7)	Install the bowden cables (LH/RH) in the canopy hinge.	
(8)	Install the jettison mechanism (LH/RH) in the canopy hinge.	Secure with Loctite 243.

	Detail Steps/Work Items	Key Items/References
(9)	Install the bowden cables on the canopy jettison assy: – Set the hexagon nuts of the bowden cable to the most inward position. – Install the bowden cables in the lower part of the canopy jettison assy. – Insert the terminal into the canopy jettison lever. – Install the canopy jettison lever in the lower part of the canopy jettison assy.	Refer to Figure 10.
(10)	Adjust the bowden cable length and tension with the hexagon nut until following conditions apply: – There is no pretension on the bowden cables. – The cables do not touch the bracket. – The bowden cables can be pushed down approximately 2 diameters of the cable with a small screwdriver.	
(11)	Make sure, that the bowden cables protrude 7 mm ± 2 mm (0.28 in ± 0.08 in) from the plug.	
(12)	Fix the positions of the bowden cables with the worm screws.	Secure with Loctite 243.
(13)	Tighten the hexagon screws on the bowden cables.	Secure with Loctite 243.
(14)	Install the lead plumbing on the canopy jettison lever.	Do not use fuse wire!
(15)	Install the canopy jettison lever assy below the instrument panel.	
(16)	Adjust the spring element of the canopy jettison mechanism, so that the mounting holes match those of the canopy.	

	Detail Steps/Work Items	Key Items/References
(17)	Make sure, that the bowden cables protrude 7 mm ± 2 mm (0.28 in ± 0.08 in) from the plug.	
(18)	Apply torque seal on the bowden cable at the plugs.	Use Loctite 243.
(19)	Install the canopy.	Refer to Section 52-10.

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Section 52-30
Front Baggage Compartment Doors

1. General

This Section tells you about the front baggage compartment doors. The DA 42 NG has access doors to the front baggage compartment on each side of the fuselage.

2. Description

Figure 1 shows the front baggage compartment doors. Figure 2 shows the front baggage compartment doors, if MÄM 42-600 is installed. Figures 3 shows the option with the adjustable micro switch (if MÄM 42-1129 is installed).

The doors are CFRP moldings with a foam core. Each door has a finishing layer of glass cloth. Mounting brackets for the door locking latches are bonded to the doors with resin.

Both doors are hinged at the upper edge and lift up. Door locking latches are installed at the bottom corners of the doors. Three small gas springs are integrated in each of the four hinge assemblies (if MÄM 42-600 is NOT installed). If MÄM 42-600 is installed, each door is mounted with two gooseneck hinges supported by a gas spring mounted to the forward gooseneck hinge and the NLG bulkhead.

A door warning caption is displayed on the integrated cockpit system display when a door is not locked.

3. Operation

A door locking latch on each lower corner of the door operates two locking bolts. A spring loading mechanism holds the door latch in the locked position. You pull the outer side of the door latch away from the door recess to unlock the latching mechanism and move the door up into the open position. The gas springs will hold the door open.

You close the door by pushing the door down against the gas spring strut until it is flush with the door surround. Hold the door in this position and push the door locking latch lever towards the door. The door locking latch lever must be flush with the door when the door is locked.

A micro switch for each door operates a door unlocked warning alert in the integrated cockpit system primary display panel.

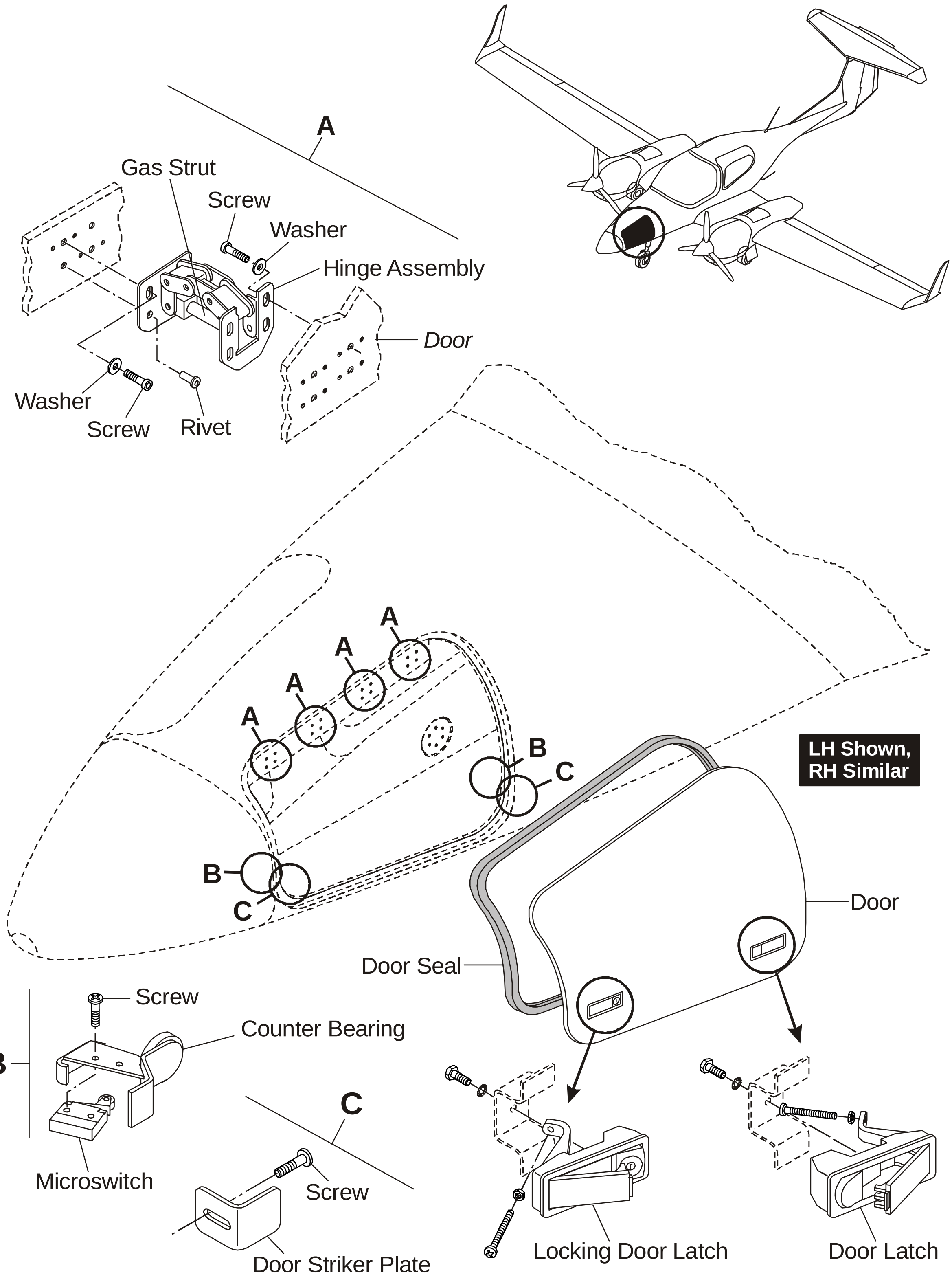

Figure 1: Front Baggage Compartment Access Doors

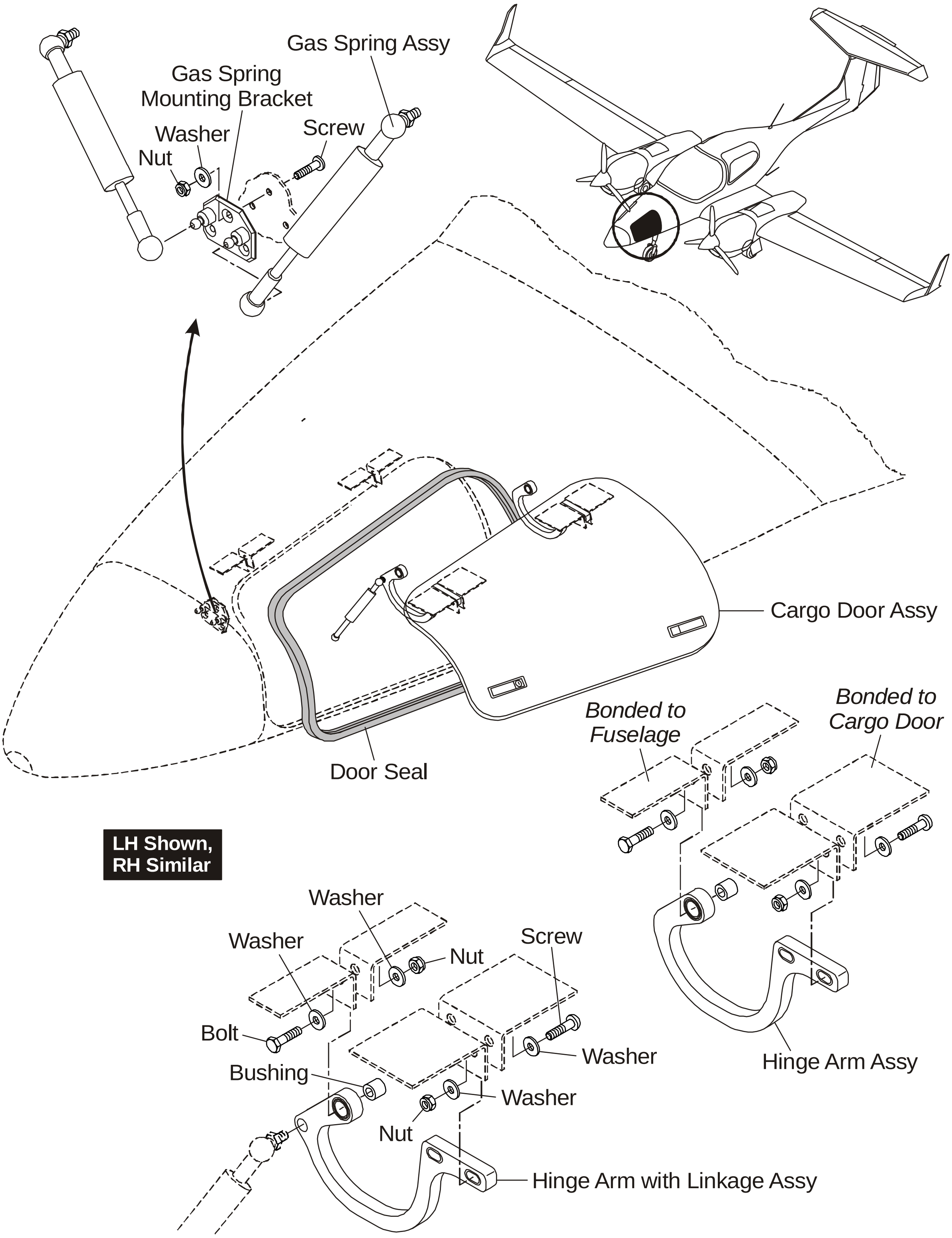

Figure 2: Front Baggage Compartment Access Doors (if MÄM 42-600 is installed)

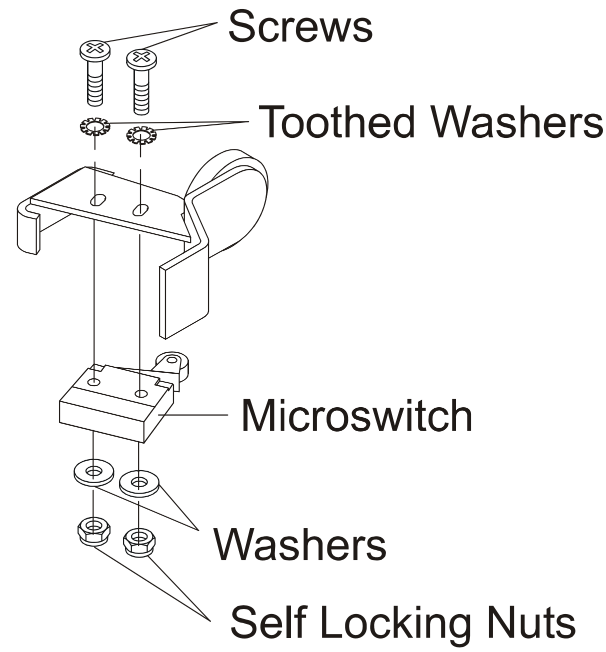

Figure 3: Front Baggage Compartment Doors Micro Switch Installation (if MÄM 42-1129 is installed)

Trouble-Shooting

1. General

The table below lists the defects you could have with the front baggage compartment door. If you have the trouble detailed in the Trouble column, read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Access door is difficult to move.	Door damaged.	Replace the door.
	Door hinges damaged.	Replace the damaged parts.
	Gas springs defective.	Replace the hinge assembly.
Door handle is difficult to move.	Locking bolts damaged.	Replace the damaged bolt.
	Door locking mechanism defective.	Replace the door locking mechanism.
Door warning light does not extinguish with closed baggage compartment doors.	Micro Switch is broken.	Replace Micro Switch.
	Micro Switch adjustment incorrect.	Adjust Micro Switch.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the front baggage compartment doors, and how to remove, install and adjust a door warning Micro Switch. They also tell you how to test the baggage compartment door warning light system.

2. Remove/Install a Front Baggage Compartment Door

A. Remove a Front Baggage Compartment Door

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage compartment door that you will remove.	
(2)	Remove the door from the hinges (if MÄM 42-600 is NOT installed): – Remove the 4 nuts and washers that attach each door hinge to the door. – Move the door clear of the airplane.	Support the door.
(3)	Remove the gas spring (if MÄM 42-600 is installed).	
(4)	Remove the door from the hinges (if MÄM 42-600 is installed): – Remove the nuts, bolts and washers that attach each gooseneck hinge to the fuselage. – Move the door clear of the airplane.	Support the door.

B. Install a Front Baggage Compartment Door

	Detail Steps/Work Items	Key Items/References
(1)	Connect the door to the door hinges (if MÄM 42-600 is NOT installed): – Move the door into position at the door hinges. – Align the door with the hinge and install the 4 washers and nuts that attach each hinge to the door.	
(2)	Connect the door to the door hinges (if MÄM 42-600 is installed): – Move the door with the installed gooseneck hinges in position and align the gooseneck with the attachment brackets on the fuselage nose. – Install the bolt, nut and washer.	
(3)	Install the gas spring (if MÄM 42-600 is installed).	
(4)	Close the door and lock the door.	
(5)	Do a test for the correct operation of the door warning caption: – Make sure that the canopy, passenger door and both forward baggage compartment doors are closed.	
	– Set the ELECT. MASTER switch to ON.	The DOOR warning caption must be off.
	– Move the operating handle of the baggage compartment door that you replaced towards the open position.	The DOOR warning caption must come on when the operating handle has moved away from the door frame.
	– Move the door operating handle to the fully closed position.	The DOOR warning caption must go off.
	– Set the ELECT. MASTER switch to OFF.	

3. Remove, Install and Ajust a Front Baggage Compartment Micro Switch (if MÄM 42-1129 is installed)

A. Remove a Front Baggage Compartment Micro Switch

	Detail Steps/ Work Item	Key Items/References
(1)	Remove the carpet on the baggage compartment floor until the plug of the switch can be disconnected.	
(2)	Cut the cable tie on the cable plug.	Mark the position of the cable.
(3)	Disconnect the plug.	
(4)	Remove the 2 self locking nuts, 2 screws, the toothed washers and washers that attach the switch to the counter bearing back.	

B. Install a Front Baggage Compartment Micro Switch

	Detail Steps/Work Items	Key Items/References
(1)	Connect the plug to the cable.	
(2)	Install the cable tie.	
(3)	Lead the cable to the correct position.	
(4)	Attach the switch to the counterbearing back, push it away from the front baggage compartment door along the hole and install the self locking nuts, screws, washers and toothed washers.	
(5)	Do a test for the correct function of the door warning light.	
(6)	Make sure that the canopy, passenger door and baggage compartment doors are closed.	
(7)	Set the ELECT. MASTER switch to ON.	The door warning caption must be off.
(8)	Open the front baggage compartment door.	The door warning caption must come on when the operating handle has moved away from the door frame.

	Detail Steps/Work Items	Key Items/References
(9)	Close the front baggage compartment door.	The door warning caption must be off.
(10)	Set ELECT. MASTER switch to OFF.	
(11)	If the door warning light does not indicate correctly: Refer to Paragraph C and adjust the micro switch.	

C. Adjust a Front Baggage Compartment Micro Switch

	Detail Steps/ Work Item	Key Items/References
(1)	Open the 2 screws which hold the micro switch in position.	
(2)	Adjust the micro switch towards the cone in a small step.	
(3)	Tighten the 2 screws on the micro switch.	
(4)	Perform a test of the correct function of the door warning light.	If the test fails: refer to Paragraph B, steps 5 to 11.

Section 52-40
Access Panels

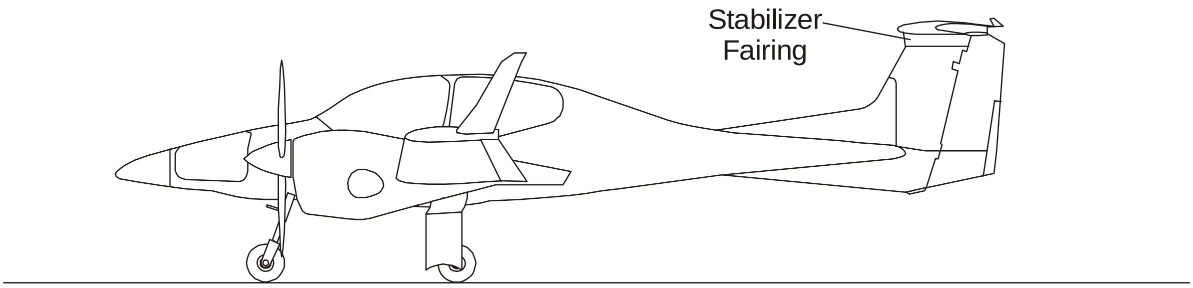
1. General

The DA 42 NG has access panels where needed for routine maintenance of the airplane and its systems. Panels which must be removed more often (for example, the engine cowlings) have quick-release fasteners. Other access panels have the usual screws. The two access panels for the TKS system in the horizontal stabilizer (if installed) are installed with a sealant. Refer to Section 71-20 for data about the engine cowlings.

2. Description

Figure 1 shows the location of the access panels on the airplane.

Most panels are CFRP/GFRP moldings. Screws hold the panels in position. There are no special procedures for removing the access panels. When install access panels you must make sure that the area inside the access panel has no loose objects (for example, tools or rags).



VIEW FROM BELOW

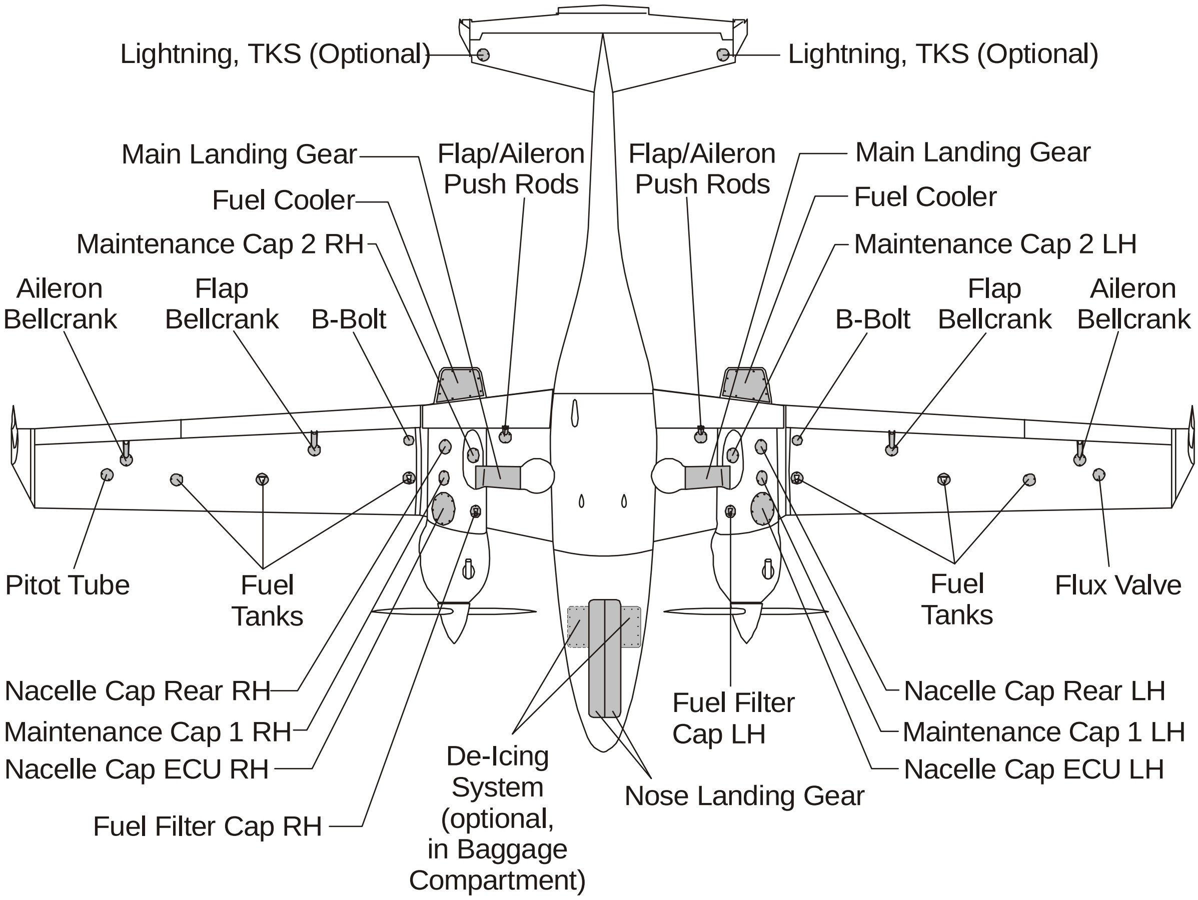


Figure 1: Access Panel Locations

CHAPTER 53

FUSELAGE

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CHAPTER 53

FUSELAGE

Section 53-10

Fuselage Structure

Maintenance Practices

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CHAPTER 53
FUSELAGE

1. General

The DA 42 NG fuselage has a semi-monocoque structure. Two CFRP half-shells make the fuselage skin. GFRP frames and webs give the fuselage strength and stiffness. The vertical stabilizer is an integral part of the fuselage.

The fuselage shells have many layers of carbon cloth with some layers of glass cloth. Some areas have more layers of cloth than other areas. This gives more strength and stiffness where it is needed. Rigid foam inserts give stiffness where necessary.

The frames and webs also have many layers of glass cloth. Some areas have layers of carbon fiber cloth or tape to give extra strength. Some components also have rigid inserts of GFRP for attaching brackets or other components.

In order to protect the fuselage from damages caused by ice accumulation which drops off from the rotating propellers, debris protection is installed on the fuselage. The debris protection is made from composite material (OÄM 42-090) or adhesive foil (OÄM 42-088 and OÄM 42-089).

Section 53-10 gives the data for the fuselage structure and the debris protection.

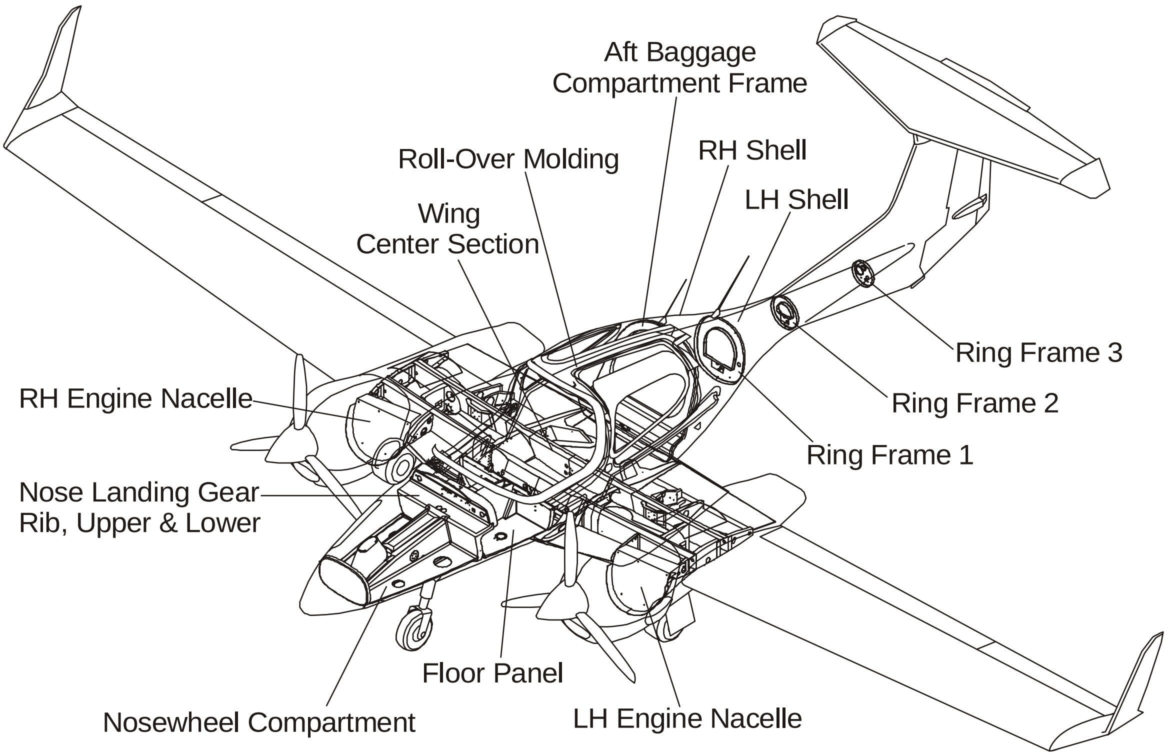

Figure 1: Fuselage Structure - Main Components

Section 53-10
Fuselage Structure

1. General

This Section gives you the data about the fuselage structure. It also includes the vertical stabilizer. See Chapter 51-00 for data about repair to the structure.

All of the main structural components are CFRP rigid moldings. Many layers of carbon cloth bond together to make each molding. Some components have more layers of carbon fiber cloth. This gives more strength and stiffness.

Most components have rigid GFRP inserts. The inserts give strength and stiffness for attaching other components such as brackets for controls.

Bonding paste (thickened resin) bonds components to other components. Most of the components in the fuselage are also bond to the fuselage shell.

To trim the airplane's CG, it is possible to install a trim weight in the lower vertical tail. It can be varied in 3.0 kg (6.6 lb) steps up to 15 kg (33 lb) by installing the required number of lead plates.

If MÄM 42-600 is installed, Serial number 42.N100 and subsequent:

To trim the airplane's CG, it is possible to install a trim weight in the lower vertical tail. It can be varied in 1.0 kg (2.2 lb) steps from 2.0 kg (4.4 lb) up to 12 kg (26.4 lb) by installing the required number of steel plates (min. 2 to max. 12 plates).

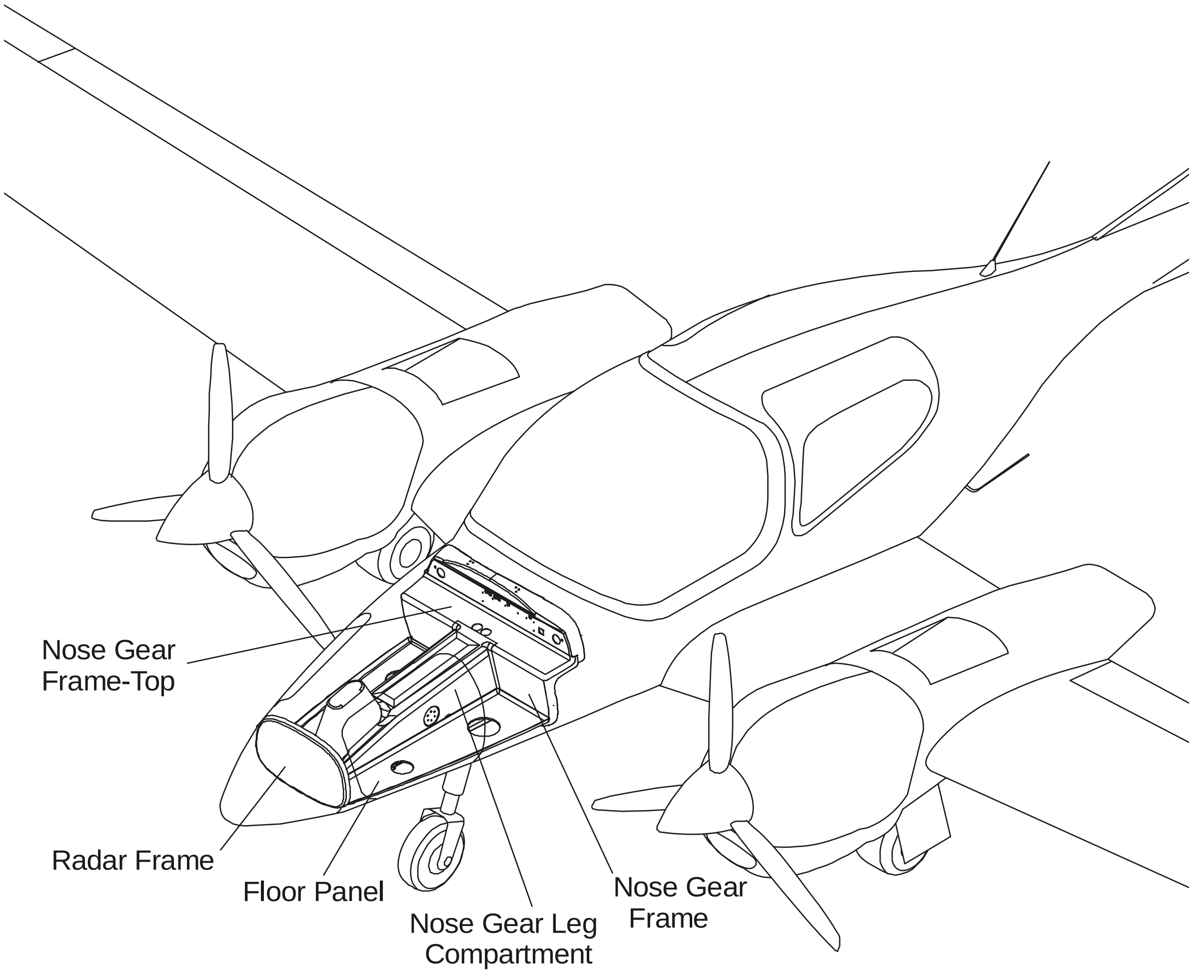

Figure 2: Fuselage Structure - Nose Section

2. Description

Figures 1 thru 5 show the structure of the fuselage.

A. Fuselage Shells

Two CFRP shells make the outer skin of the fuselage. The shells transmit structural loads. The shells bond to each other at the top and bottom of the fuselage. Each shell has many layers of carbon cloth. Some areas have of the shell have more layers to give more strength and stiffness. Some areas have rigid foam inserts to give more stiffness. The vertical stabilizer is integral with the fuselage shells.

Thickened resin bonds all other structural components to the fuselage shells. Many small components bond to the fuselage shells, these include:

– Air inlet and outlet ducts.

– Conduits for electrical wires, antenna cables and fuel pipes.

– Mountings for airplane system components.

B. Nose Section

The nose section bonds to the front of the fuselage. The nose section has a left shell and it has a right shell. The shells are made from CFRP with rigid foam inserts. Each shell has a hinged door to give access to the nose baggage compartment. Refer to Section 52-30 for more data about the front baggage compartment doors.

The nose gear frame top and the nose gear frame close the front of the cockpit and make the rear of the nose section. The nose gear leg compartment attaches to the nose gear frame at the rear and the radar frame at the front. Left and right floor panels strengthen the nose section and make the floor for the front baggage compartment. Access holes in the floor panels give access to the nose landing gear leg mountings. The nose cone is bonded to the nose section shell.

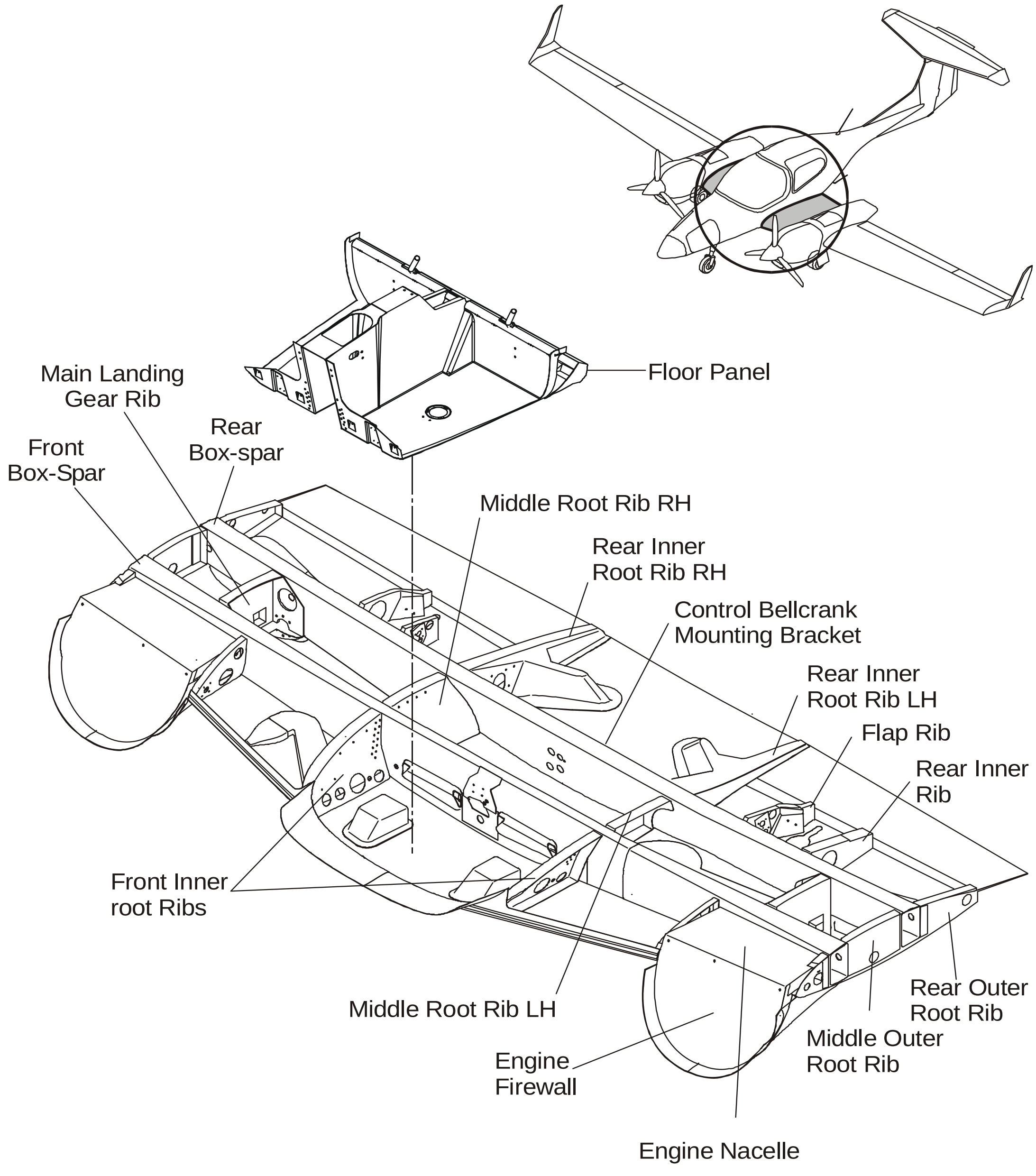

Figure 3: Fuselage Structure - Wing Center Section

C. Wing Center Section

The wing center section attaches to the fuselage shells and is an integral part of the fuselage.

The wing center section has the mountings for the wings, the engine nacelles and the main landing gear. It has a front box spar and it has a rear box spar. The box spars have the mountings for the outer wings. The spar extensions of the outer wings slide into the box spars and are secured with special bolts. The box spars are CFRP rigid moldings. The control bellcrank mounting-bracket is bonded to the rear face of the rear main bulkhead, in the center.

The engine nacelles are located at the outer ends of the wing center section. The engine nacelles bond to the box spars and provide mountings for the engine mounting frame. The forward face of the engine nacelle makes the engine firewall.

Front, middle and rear inner-root-ribs bond to the inner ends of the front and rear box spars. The ribs are rigid CFRP moldings which make the inner face of the wing center section.

Middle and rear closing ribs bond to the box spars at the outer end of the center section, to the rear of the outer end of the engine nacelles. These ribs close the end of the wing center section.

The rear inner ribs and flap ribs bond to the aft face of the rear box spar. The flap rib has the mountings for the inner flap relay lever and the rear inner gives rigidity to the rear of the wing center section.

A rigid CFRP bottom shell bonds to the lower surface of the center section and makes the bottom surface of the wing center section and fuselage. Rigid CFRP top shells bond to the top outer surface of the center section and makes the top surface of the wing center section.

D. Floor Panel

Note: Do not use surface protection except the certified!

The floor panel is a rigid GFRP molding. It bonds to the inner bottom skin of the fuselage shell and the instrument panel frame. The center part of the floor panel makes the center console.

The rear part of the floor makes the front support for the pilots' seats. It also holds the front of the control stick support brackets. The rudder pedal assembly for each pilot attaches to the floor panel.

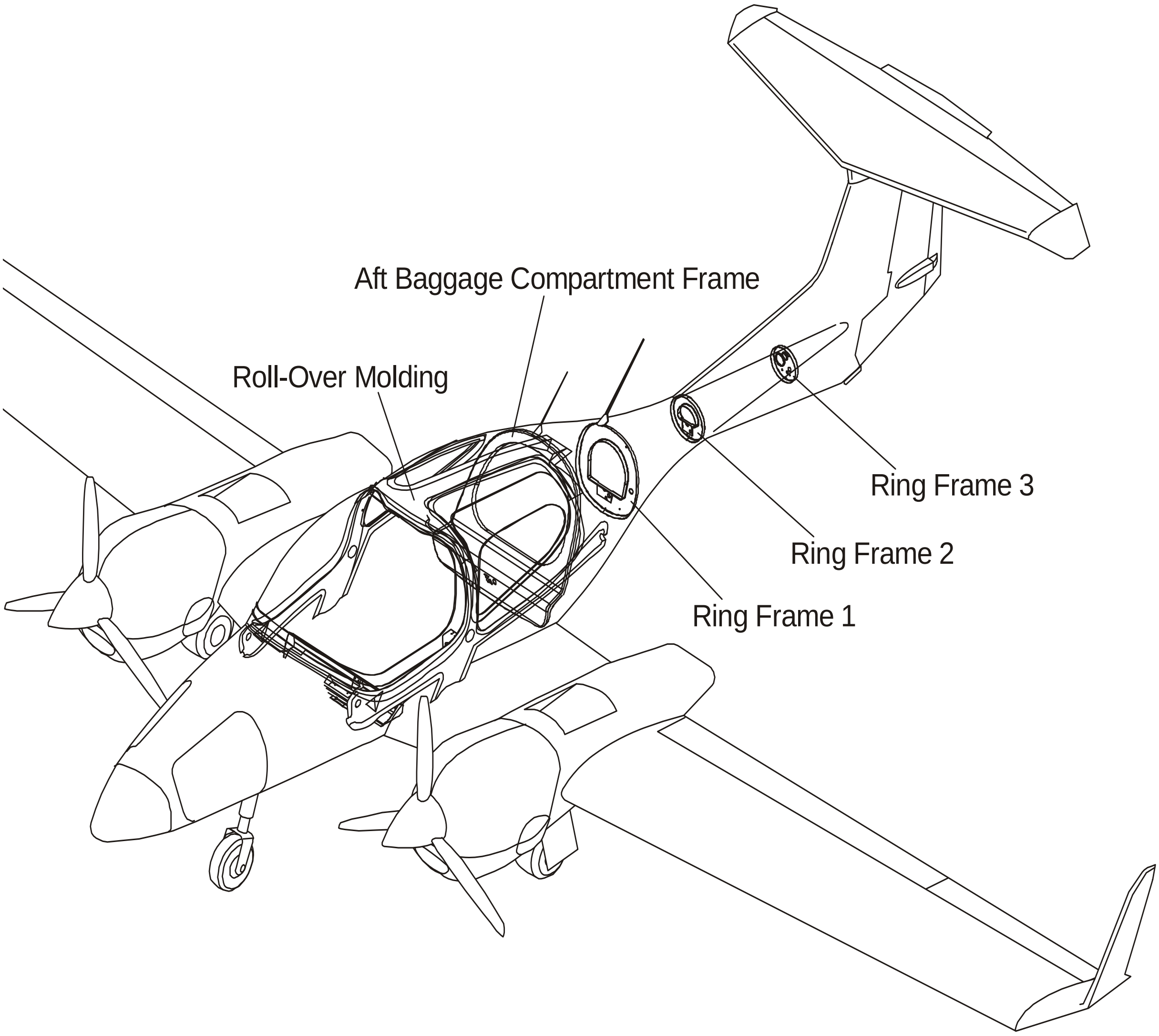

Figure 4: Rear Fuselage Structure

E. Roll Over Molding

The roll-over molding is a rigid GFRP molding. Carbon tape gives strength and stiffness to the molding. The roll over molding bonds to the inner face of the fuselage shell and around the canopy, window and passenger door cut-outs.

F. Aft Baggage Compartment Frame

The aft baggage compartment frame is a rigid GFRP molding. It closes the rear of the cockpit and makes a support for the passenger seat (rear seat pan). The frame bonds to the inner fuselage shells and the center section lower shell.

The lower part of the frame has holes for the rudder cables and trim control. It also has a control rod guide for the elevator control rod.

G. Ring Frame 1

The ring frame 1 is a rigid GFRP molding. It bonds to the fuselage shells just aft of the baggage compartment frame. It has holes for the rudder control cables and trim control. It also has a control rod guide for the elevator control rod.

H. Ring Frame 2

The ring frame 2 is a rigid GFRP molding. It bonds to the fuselage shells aft of ring frame 1. It has holes for the rudder control cables and trim control. It also has a control rod guide for the elevator control.

I. Ring Frame 3

The ring frame 3 is a rigid GFRP molding. It bonds to the fuselage shells just forward of the vertical stabilizer. It has holes for the rudder control cables and trim control.

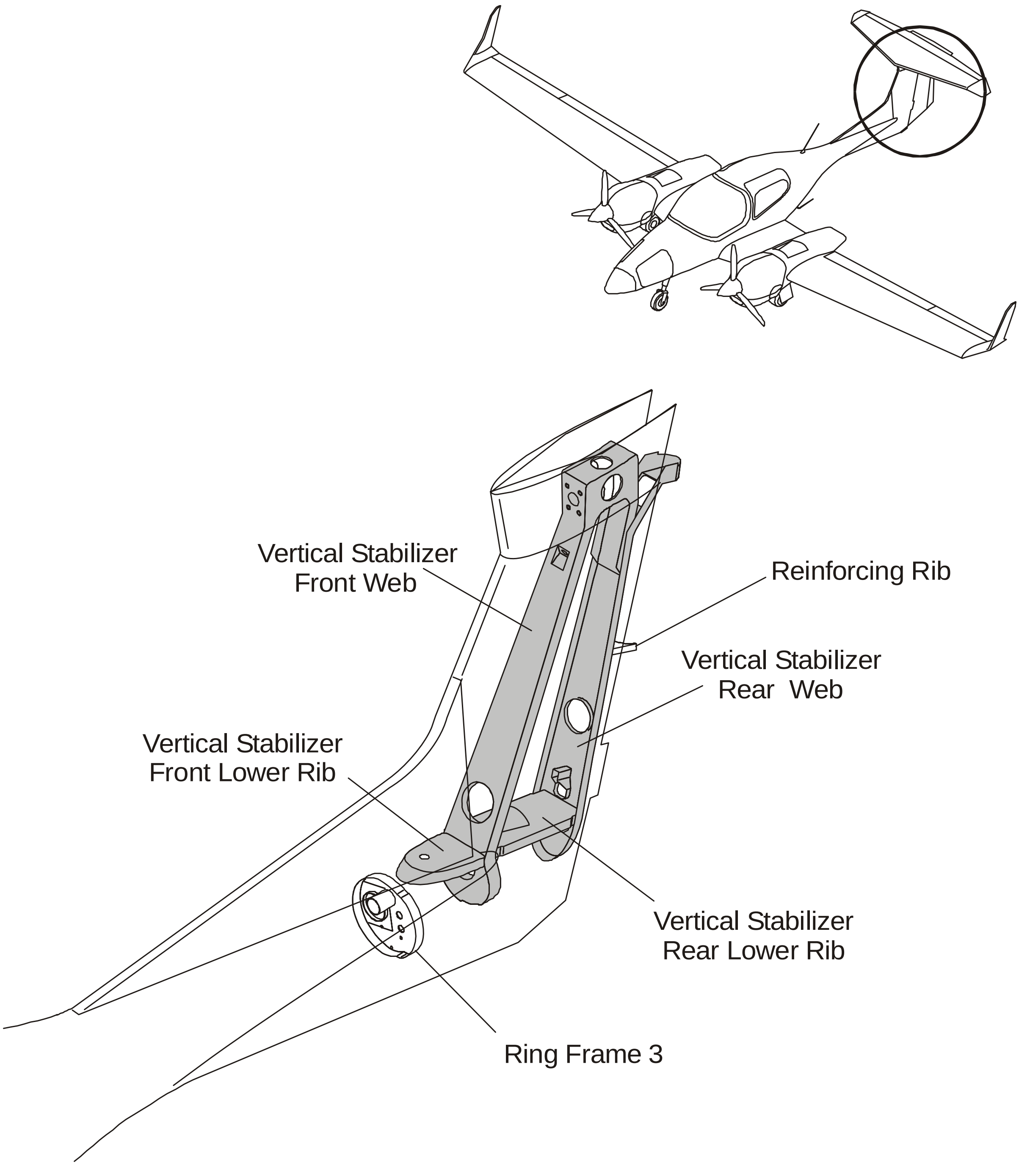

Figure 5: Fuselage Structure - Vertical Stabilizer

J. Vertical Stabilizer Front Lower Rib

The vertical stabilizer front lower rib is a rigid GFRP molding. It bonds to the fuselage shell at the bottom of the vertical stabilizer. It also bonds to the vertical stabilizer front web. It has a hole for the flexible control cable for the elevator trim tab.

K. Vertical Stabilizer Rear Lower Rib

The vertical stabilizer rear lower rib is a rigid GFRP molding. It bonds to the fuselage shell at the bottom of the vertical stabilizer. It also bonds to the vertical stabilizer front and rear webs. It has a large slot for the elevator control pushrod.

L. Vertical Stabilizer Front Web

The vertical stabilizer front web is a rigid GFRP molding. It bonds to the fuselage shell. It also bonds to the vertical stabilizer lower ribs and to the top of the rear web.

The top of the front web is a rigid channel section. GFRP inserts give strength to the area where the horizontal stabilizer mounts attach.

M. Vertical Stabilizer Rear Web

The vertical stabilizer rear web is a rigid GFRP molding. It bonds to the fuselage shell and it bonds to the vertical stabilizer front web. The top of the rear web has the top mounting for the rudder. It also has a reinforcing rib bonded to the rear face.

The vertical stabilizer rear web closes the rear of the vertical stabilizer.

N. Trim Weight

The trim weight can be varied in 3.0 kg (6.6 lb) steps up to 15 kg (33 lb) by installing the required number of lead plates. For each number of lead plates, the attachment bolts with adequate length must be used. The lead plates are fixed by seven bolts to the attachment plate. The trim weight assembly replaces the access hole cover in the lower vertical tail and is fixed by eleven screws.

O. Trim Weight (if MÄM 42-600 is installed, Serial numbers 42.N100 and subsequent)

The trim weight can be varied in 1.0 kg (2.2 lb) steps from 2 kg (4.4 lb) up to 12 kg (26.4 lb) by installing the required number of steel plates (minimum 2 to max. 12 plates). For each number of steel plates, attachment bolts with adequate length must be used.

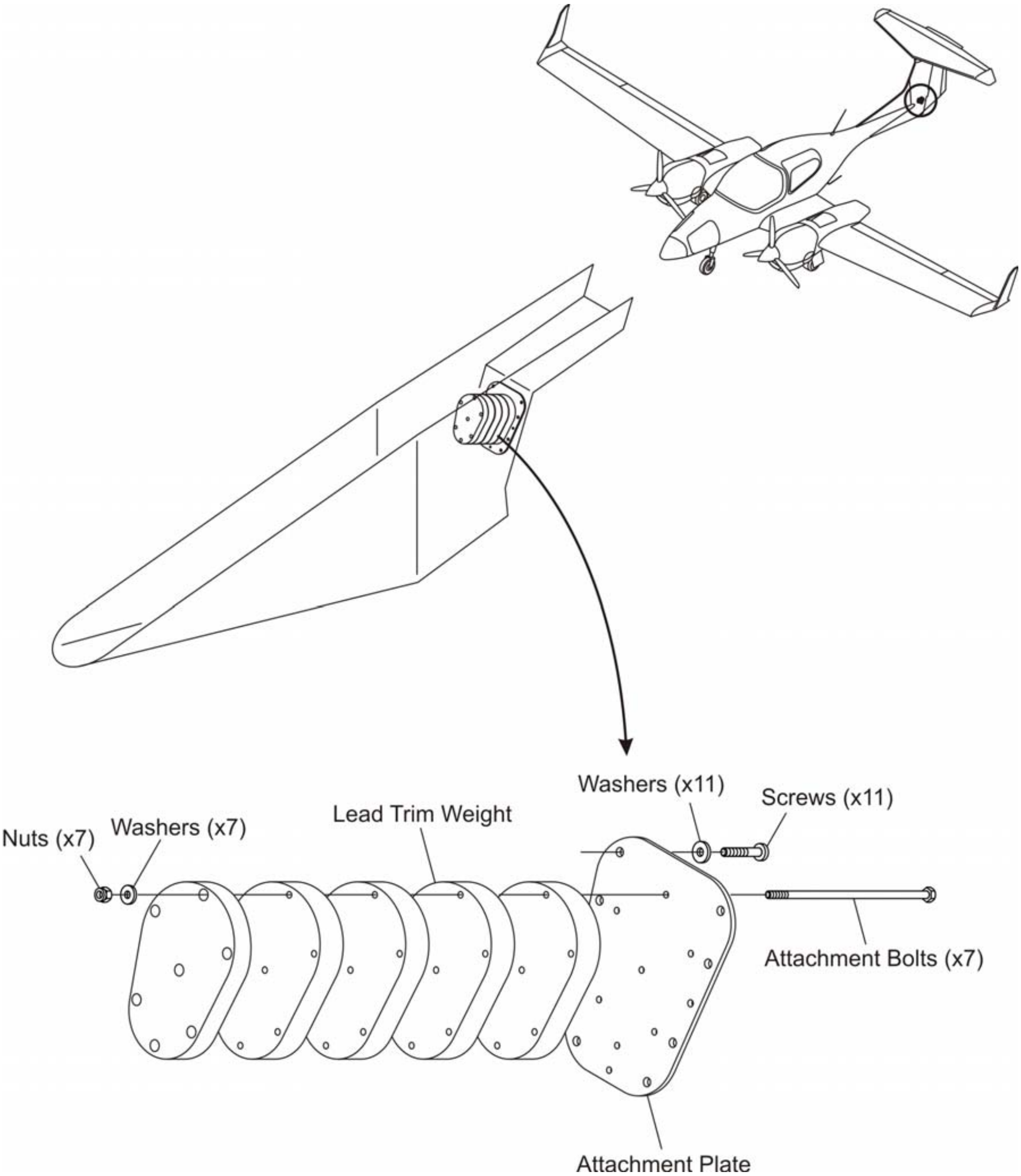

Figure 6: Trim Weight

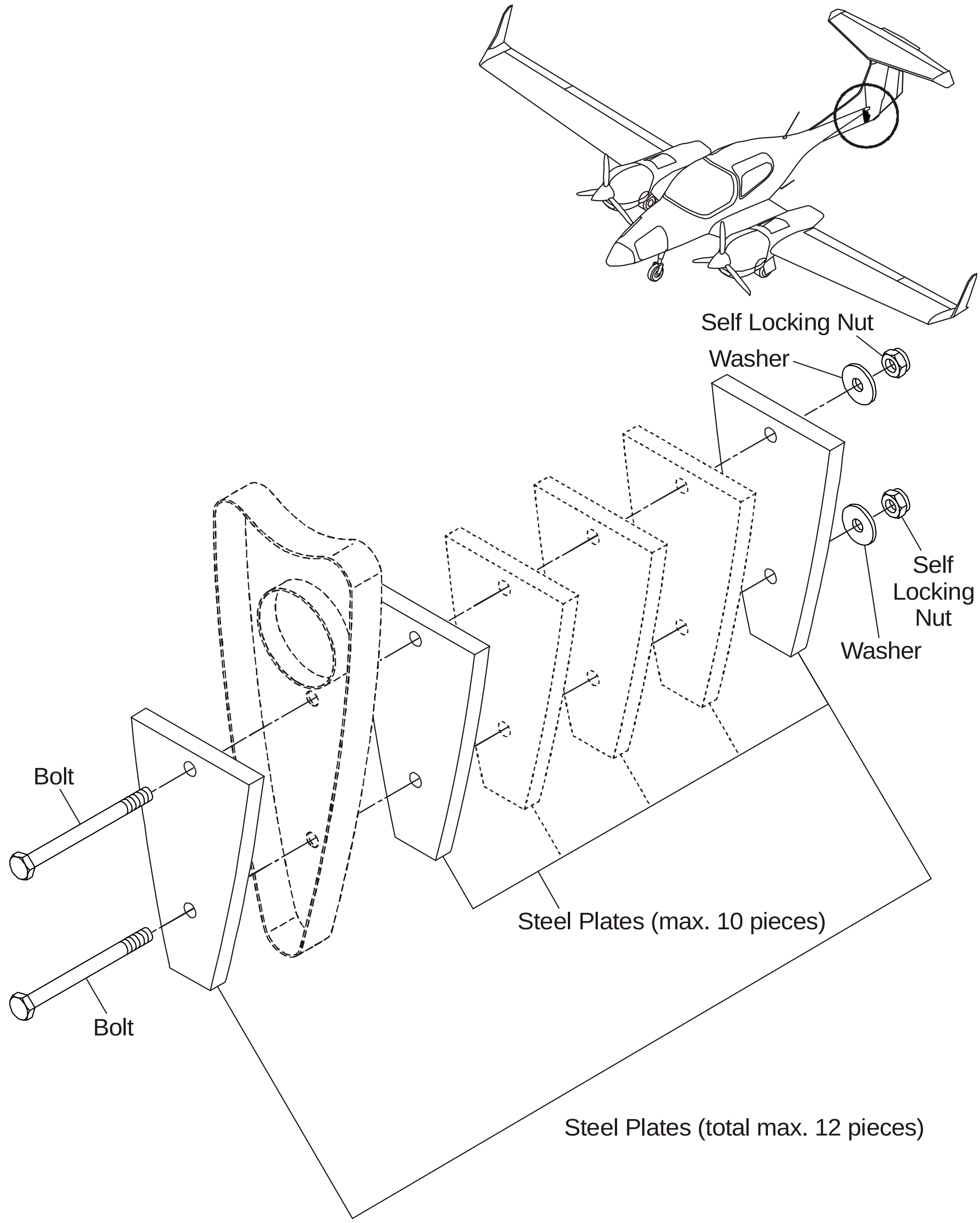

Figure 7: Trim Weight (if MÄM 42-600 is installed, Serial numbers 42.N100 and subsequent)

3. Composite Debris Protection (OÄM 42-090)

This Section contains all necessary information concerning the composite debris protection (certified with OÄM 42-090). Refer to Paragraph 4 for information concerning the foil based debris protection (certified with OÄM 42-088 and 42-089).

The composite debris protections are installed on both sides of the forward fuselage with a silicone based adhesive. Refer to Figure 8.

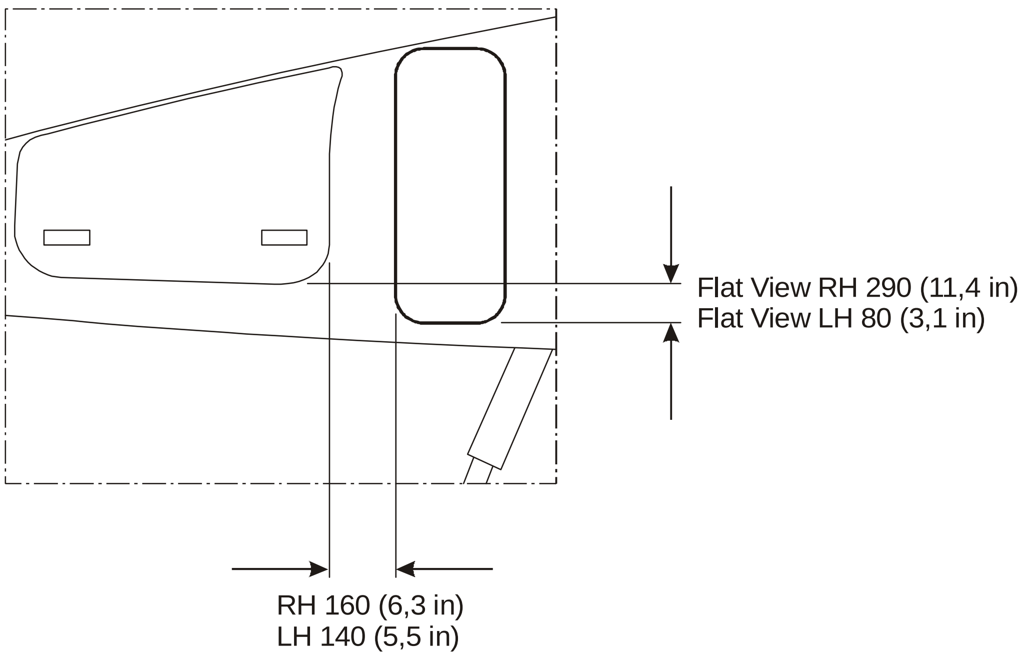

Figure 8: Composite Debris Protection (OÄM 42-090)

4. Adhesive Foil Debris Protection (OÄM 42-088 & 42-089)

A. Single Layer Debris Protection (OÄM 42-089)

Figure 9 shows the single layer debris protection (material: 3M) certified with OÄM 42-089 for installation on the DA 42 NG.

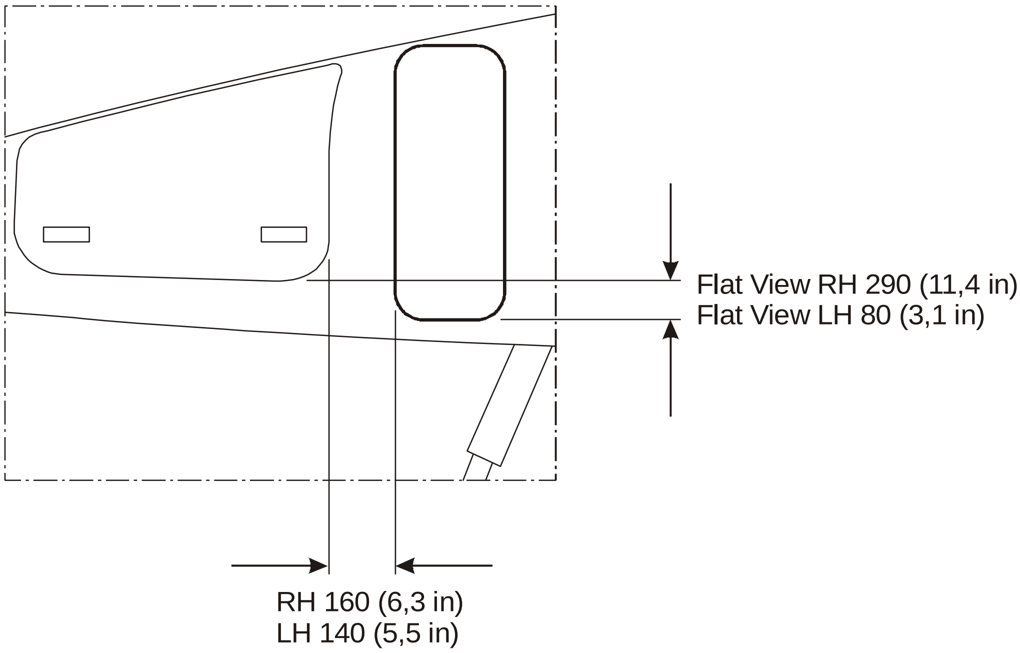

Figure 9: Single Layer Debris Protection (OÄM 42-089)

B. Triple Layer Debris Protection (OÄM 42-088)

Figure 10 shows the triple layer debris protection (material: PM) certified with OÄM 42-088 for installation on the DA 42 NG.

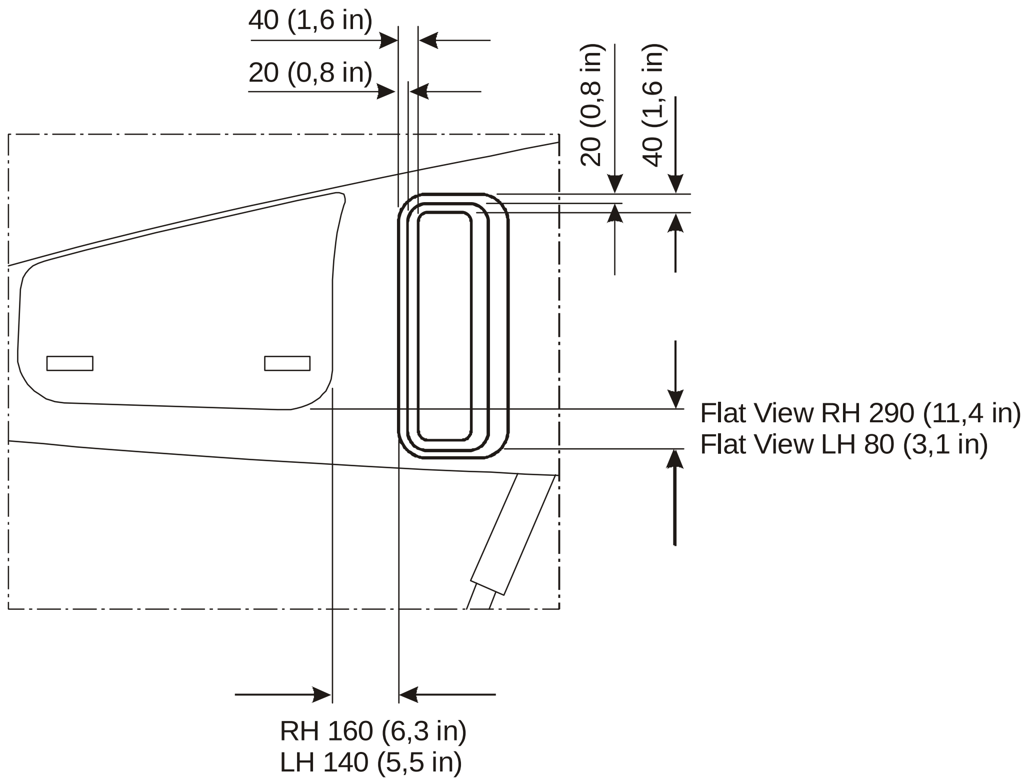

Figure 10: Triple Layer Debris Protection (OÄM 42-088)

Maintenance Practices

1. General

There are no special Maintenance Practices for the DA 42 NG fuselage. You must keep the airplane clean and you should visually examine the airplane fuselage for damage when you clean it. Refer to Section 12-30 for data about airplane cleaning.

If you find any damage you must refer to Chapter 51-10 for data about damage classification. Only authorized persons can classify and repair damage to the DA 42 NG airplane.

If the composite debris protection (OÄM 42-090) is installed, refer to Paragraph 2 for more information.

If the adhesive foil debris protection (OÄM 42-088 & OÄM 42-089) is installed, refer to Paragraph 3 for more information.

2. Remove/Install the Composite Debris Protection (OÄM 42-090)

A. Remove the Composite Debris Protection (OÄM 42-090)

	Detail Steps/Work Items	Key Items/References
(1)	Carefully cut around the debris protection by use of a sharp knife.	
(2)	Remove the separated silicone seal.	
(3)	Cut between the fuselage and the composite debris protection using a long sharp knife.	
(4)	Remove the debris protection.	
(5)	Visually inspect the fuselage skin.	
(6)	Remove the silicone left on the fuselage by use of a palette-knife together with silicone removal agent.	Make sure that the agent does not harm the paint finish.

B. Install the Composite Debris Protection (OÄM 42-090)

	Detail Steps/Work Items	Key Items/References
(1)	Clean fuselage surface and the rear side of the composite debris protection.	
(2)	Mark exact position of both composite debris protections on fuselage.	Refer to Figure 8.
(3)	Install the composite debris protection using Terostat MS 9380 white adhesive.	
(4)	Seal cleave around the composite debris protection with Terostat MS 9380 white.	

3. Remove/Install the Trim Weight

A. Remove the Trim Weight

	Detail Steps/Work Items	Key Items/References
(1)	Remove the rudder.	Refer to Section 55-40.
(2)	Remove the trim weight assembly: – Loosen the outer eleven screws which attach the trim weight assembly to the lower vertical tail.	Use an Allen wrench size 3. Begin with the lower screws and hold the trim weight assembly in place.
(3)	Pull the trim weight assembly carefully out of the lower vertical tail.	

B. Install the Trim Weight

	Detail Steps/Work Items	Key Items/References
(1)	Check the trim weight attachment structure (lower vertical tail) for: – Cracks. – Other damages. – Loose or missing anchor nuts.	
(2)	Put the seven bolts with adequate length from the attachment plate side in the vertical lead weight(s), put the washers on the bolts and tighten the trim weight assembly.	Use 8 mm box wrenches. Use new self locking nuts.
(3)	Carefully place the trim weight assembly in the lower vertical tail.	
(4)	Tighten all eleven outer screws.	Use an Allen wrench size 3.
(5)	Install the rudder.	Refer Section 55-40.
(6)	Verify completeness of the tools.	
(7)	Verify correctness of Weighing Report.	Refer to Section 08-10.

4. Remove/Install the Trim Weight (if MÄM 42-600 is installed, Serial numbers 42.N100 and subsequent)

A. Remove the Trim Weight

	Detail Steps/Work Items	Key Items/References
(1)	Remove the rudder.	Refer to Section 55-40.
(2)	Remove the trim weight assembly: – Loosen the two screws which attach the trim weights to the lower vertical tail.	Hold the trim weights in place.
(3)	Pull the trim weights carefully out of the lower vertical tail.	

B. Install the Trim Weight

	Detail Steps/Work Items	Key Items/References
(1)	Check the trim weights structure (lower vertical tail) for: – Cracks. – Other damages.	
(2)	Carefully place the trim weights in the lower vertical tail.	
(3)	Put the two bolts with adequate length in the steel weight(s), put the washers on the bolts and tighten the trim weight assembly.	Use new self locking nuts.
(4)	Install the rudder.	Refer Section 55-40.
(5)	Verify completeness of the tools.	

CHAPTER 55

STABILIZERS

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CHAPTER 55
STABILIZERS

1. General

The DA 42 NG has the usual stabilizers. The vertical stabilizer is part of the fuselage. The aft part of the left and right fuselage shells make the left and right shells of the vertical stabilizer. See Section 53-10 for data on the fuselage structure.

The horizontal stabilizer has top and bottom shells. Each shell has GFRP skins. The horizontal stabilizer has a front spar and a rear spar. Both spars have mounting brackets. Three pairs of ribs give strength to the center area. Two trailing edge webs hold the hinges for the elevator.

The elevator has top and bottom shells. Each shell has GFRP skins with a rigid foam core. The bottom shell also makes the leading edge spar. The hinges attach to the bottom shell. A large horn with the mass balance weight attaches to the bottom shell at the center. The trailing edge carries a trim tab.

The lower fin is a GFRP molding. Bolts attach the lower fin to the bottom of the fuselage.

The rudder has left and right shells. Each shell has GFRP skins with a rigid foam core. The shells bond together at a flange. The hinges attach to the top face of the rudder and a flat face near the bottom of the leading edge. The horn near the top makes the rudder mass balance.

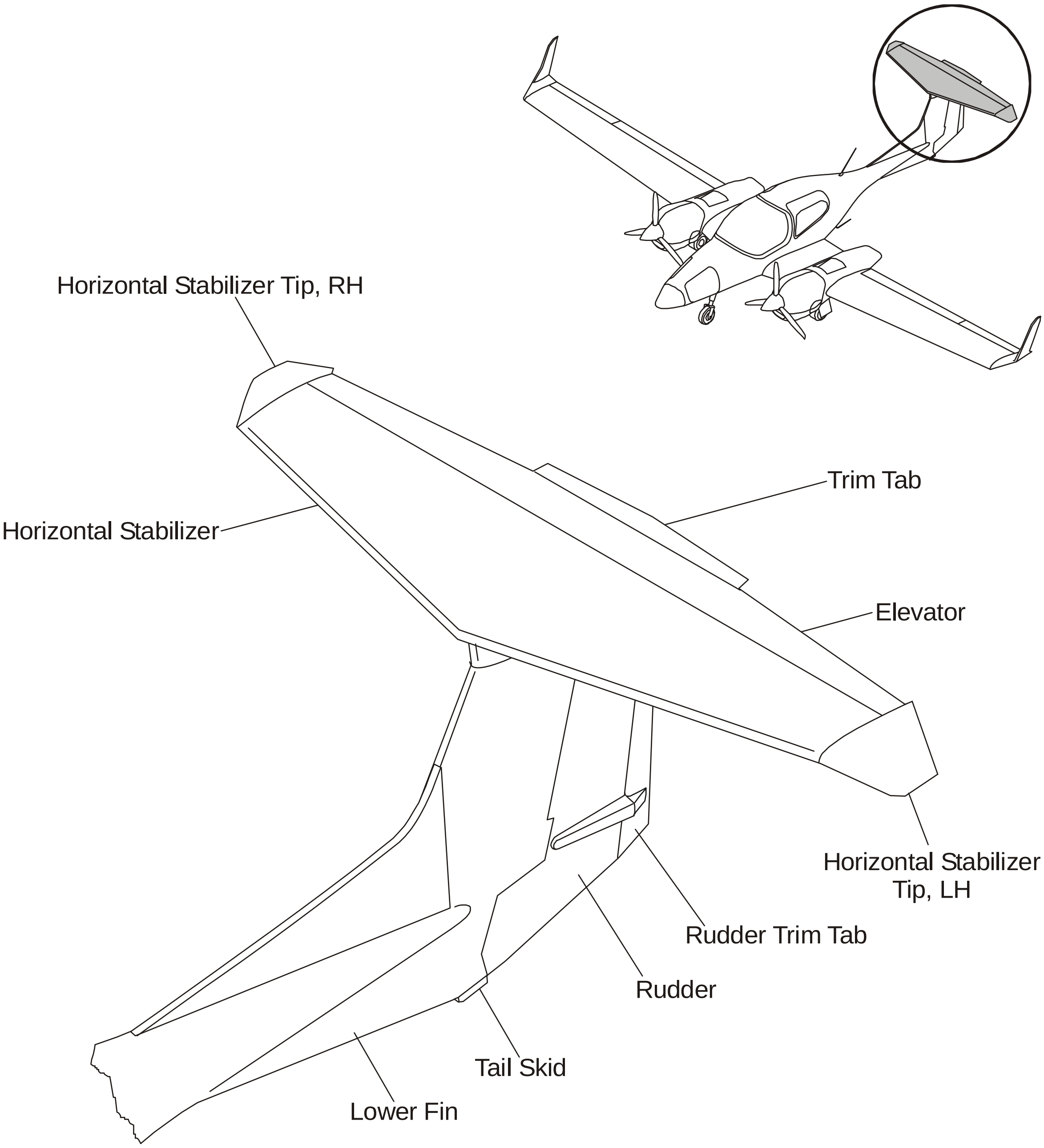

Figure 1: Stabilizers

Section 55-10
Horizontal Stabilizer

1. General

The DA 42 NG has the usual horizontal stabilizer. The horizontal stabilizer attaches to the top of the vertical stabilizer. The elevator attaches to the trailing edge of the horizontal stabilizer. See Section 55-20 for data about the elevator structure.

2. Description

Figure 1 shows the horizontal stabilizer structure.

The horizontal stabilizer has top and bottom shells. Each shell has GFRP skins. The top shell has no cut-outs. The bottom shell has a large cut-out at the rear for the elevator horn and mass balance. It also has two smaller holes forward and aft of the front spar.

The horizontal stabilizer has two spars. The spars have GFRP skins with rigid GFRP inserts at the main mounting points. They also have top and bottom caps. The ends of the front spar turn back to join the aft spar at mid span. The rear spar goes almost to the tip of the horizontal stabilizer. The spars bond to the top and bottom shells with resin.

Each spar has four holes for a mounting bracket. You can get access to the attachment bolts from below. The mounting brackets go down through the cut-outs in the bottom shell. Four more holes in the bottom part of each mounting bracket attach to the vertical stabilizer front web.

Three pairs of ribs give strength to the center area on each side of the access holes. All are rigid GFRP moldings. They bond to the other components with resin. The rear 'box' ribs make a box round the large cut-out in the bottom skin. A short rear rib at mid-span gives strength to the area between the rear spar and the trailing edge web.

The rear box rib has sides with bends and a top face which joins the sides. It closes the sides of the large cut-out in the bottom shell. The aft part has three holes on each side for the anchor bracket for the trim-tab mechanism.

Two trailing edge webs close the trailing edges of the top and bottom shells. The outboard end of each web is a 'J' shape which goes round the outboard balance weight of the elevator. It extends aft at the outer side to close the elevator cut-out. The webs also holds the hinges for the elevator. The webs bond to the top and bottom shells and the rear and rear 'box' ribs with resin.

A rigid GFRP fairing goes around the joint between the horizontal stabilizer and the vertical stabilizer. Four screws attach the fairing to the vertical stabilizer.

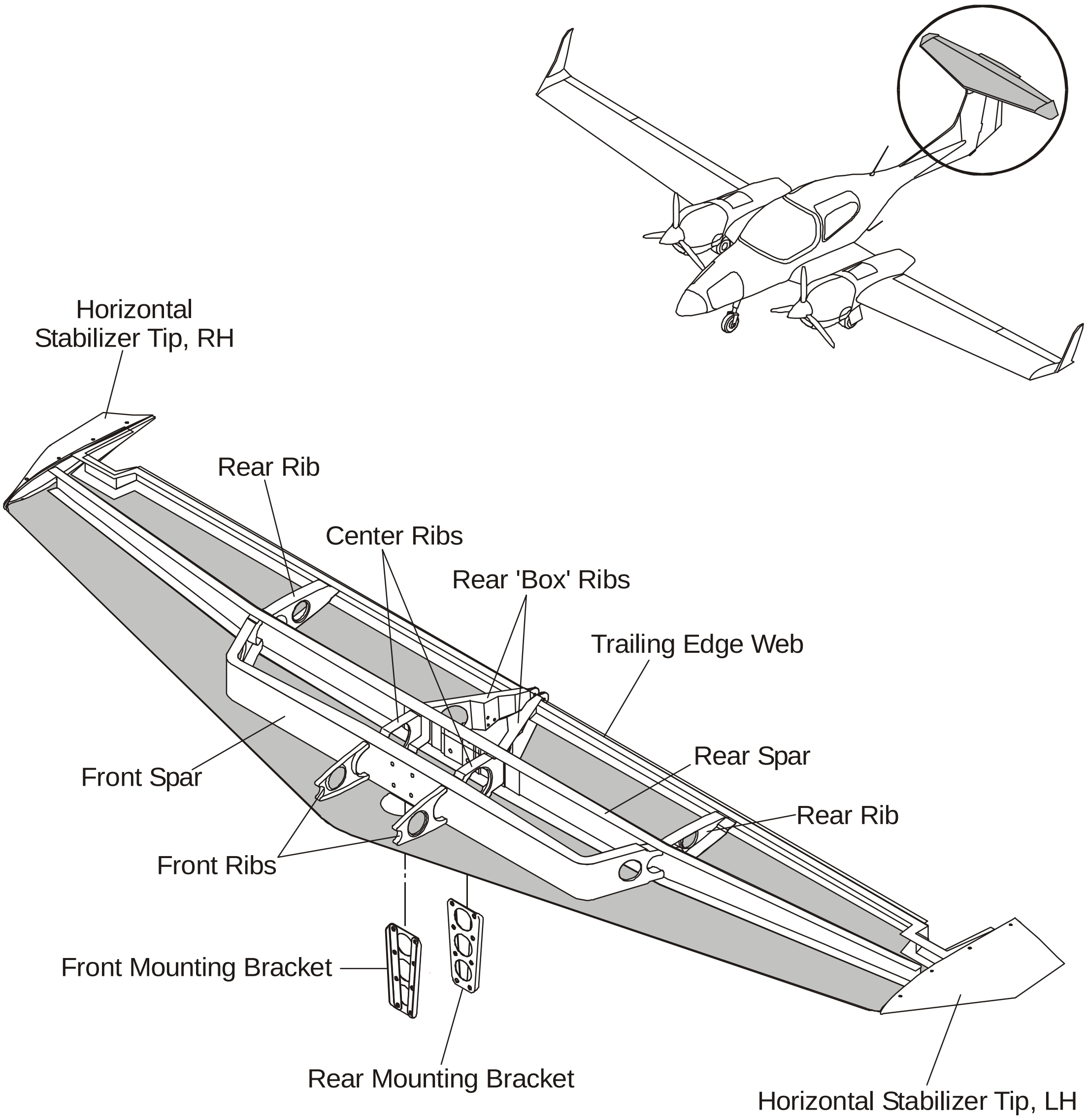

Figure 1: Horizontal Stabilizer Structure

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the horizontal stabilizer.

2. Remove/Install the Horizontal Stabilizer

A. Remove the Horizontal Stabilizer

Note: Two persons are needed to remove/install the horizontal stabilizer.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the horizontal stabilizer fairing. – Remove the 4 screws that attach the faring to the structure.	Hold the fairing.
(2)	Release the 2 fork-end fittings from the trim-tab cranked actuating levers: Remove the cotter pins from the nuts. – Remove the nuts, washers and bolts that attach the fork-ends to the cranked actuating levers.	Under the elevator.
(3)	Release the trim-tab mechanism from its mounting bracket.	Refer to Section 27-38.
(4)	Release the lightning protection strip and wire bonding cable from the trim mounting bracket: – Remove the nut, washer, spacer and bolt that attaches the lightning protection strip and wire bonding cable to the trim mounting bracket.	
(5)	Move the trim-tab mechanism forward through the hole in the vertical stabilizer web, clear of the mounting bracket.	

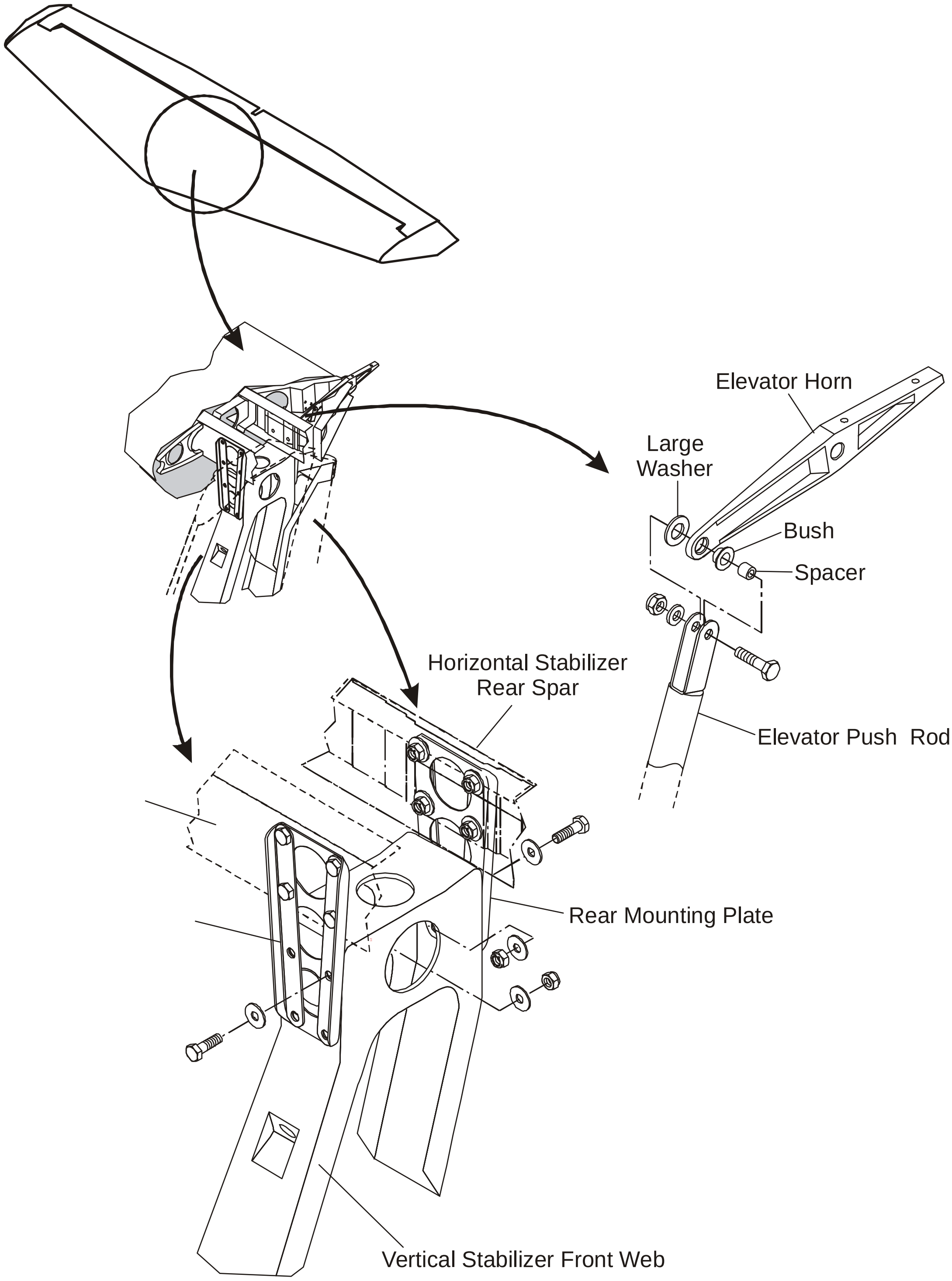

Figure 2: Horizontal Stabilizer Installation

	Detail Steps/Work Items	Key Items/References
(6)	Disconnect the elevator push-rod from the elevator horn:	
	– Loosen the 2 bolts holding the elevator mass-balance lever.	Refer to Section 55-20, Figure 2.
	– Remove the nut, bolt and washer which connects the elevator vertical push rod to the elevator horn.	Refer to Figure 2.
	– Remove and retain the large washer, bush and spacer from the push rod to elevator horn assembly.	Note the location of the large washer, bush and spacer.
(7)	Remove the 8 lower bolts which attach the horizontal stabilizer and lightning protection strip to the front and rear mounting brackets.	Hold the horizontal stabilizer.
(8)	Disconnect the VOR antenna.	
(9)	Lift the horizontal stabilizer clear of the airplane.	

B. Install the Horizontal Stabilizer

	Detail Steps/Work Items	Key Items/References
(1)	Examine the horizontal stabilizer attachments. Look specially for: – Corrosion or wear of the bolts. – Distortion of the mounting brackets. – Cracks in the mounting brackets. – Damage to the mounting holes.	
(2)	Put the horizontal stabilizer in position on the vertical stabilizer.	Hold the horizontal stabilizer.
(3)	Connect the VOR antenna.	
(4)	Install the 8 lower bolts, washers and nuts which attach the horizontal stabilizer and lightning protection strip to the front and rear mounting brackets.	Use new self-locking nuts. Torque: 45 Nm (33.2 lbf.ft.)
(5)	Connect the elevator control push rod to the elevator horn: – Install the large washer, bush and spacer into the push rod to elevator horn assembly. – Install the bolt, washer and nut that attaches the elevator control push-rod to the elevator horn. – Tighten the 2 bolts holding the elevator mass-balance lever.	As noted in Paragraph 2A, item (6). Torque: 1.7 Nm (1.2 lbf.ft.). Use a new self-locking nut. That you loosened in Paragraph 2A, item (6).
(6)	Move the trim-tab mechanism aft through the hole in the vertical stabilizer web, through the mounting bracket for the trim mechanism.	
(7)	Attach the trim-tab mechanism to its mounting bracket: – Install 2 bolts, washers and nuts.	Use new self-locking nuts.

	Detail Steps/Work Items	Key Items/References
(8)	Install the lightning protection strip and wire bonding cable to the trim mounting bracket: – Move the lightning protection strip into position at the elevator trim mount. – Move the wire bonding cable into position at the elevator trim mount. – Install the bolt, spacer, washer and nut that attaches the lightning protection strip and wire bonding cable to the trim mounting bracket.	
(9)	Connect the 2 fork-end fittings to the trim-tab cranked actuating levers: – Install the 2 bolts, washers and nuts that attach the fork-end fittings to the trim-tab actuating levers. – Secure the nuts to the bolts with cotter pins.	Under the elevator.
(10)	Do a test for correct, full and free movement of the elevator control. If necessary, adjust the elevator control.	Refer to Section 27-30.
(11)	Do a test for correct, full and free movement of the trim control. If necessary, adjust the trim control.	Refer to Section 27-38.
(12)	If necessary for your Airworthiness Authority do a duplicate inspection of the elevator control system.	
(13)	If necessary for your Airworthiness Authority do a duplicate inspection of the elevator trim control system.	
(14)	Install the horizontal stabilizer fairing: – Install the 4 screws that attach the fairing to the structure.	

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Section 55-20

Elevator

1. General

The DA 42 NG has the usual elevator. The elevator attaches to the rear web of the horizontal stabilizer. See Section 27-30 for data about the elevator controls.

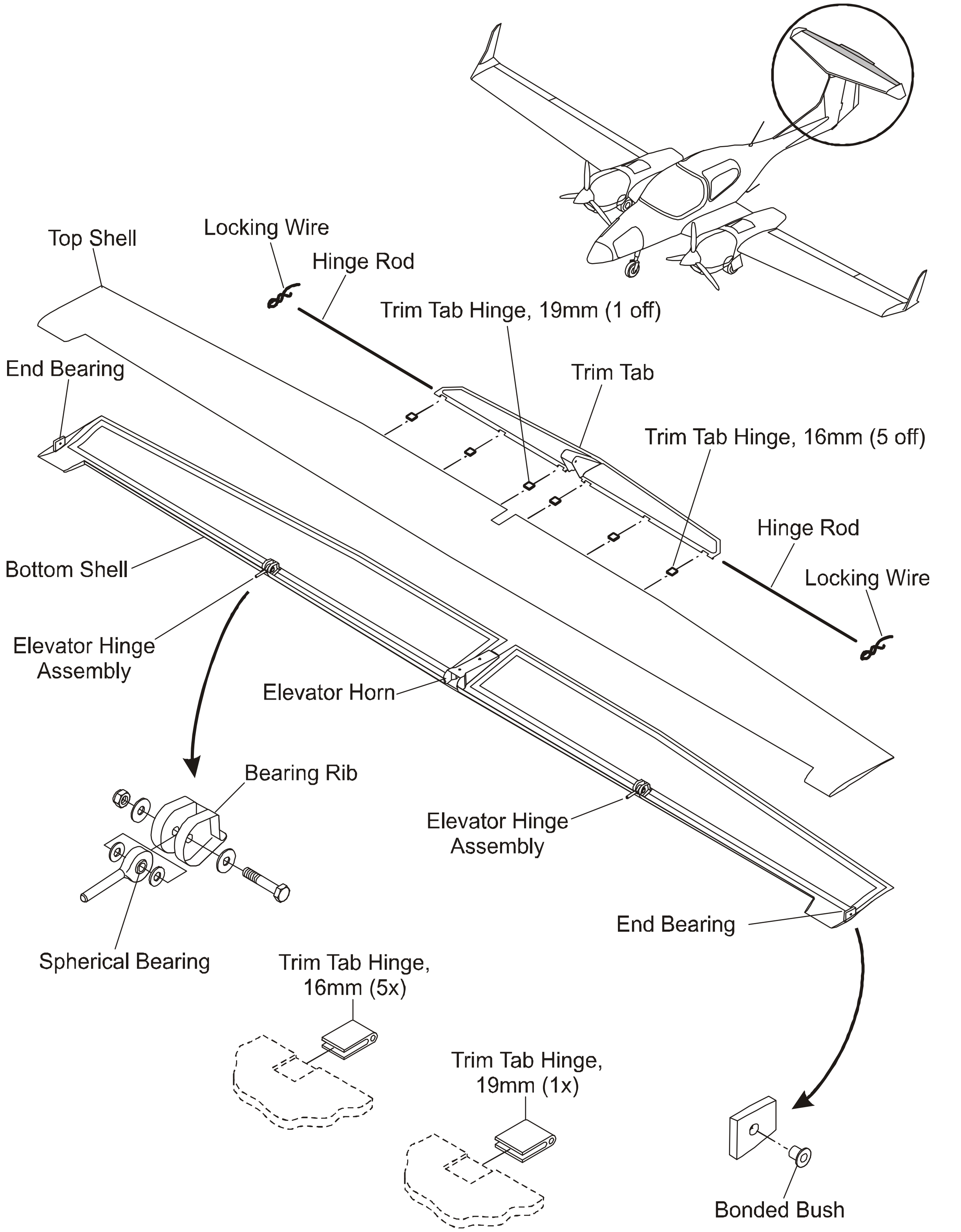

Figure 1: Elevator Structure

2. Description

Figure 1 shows the elevator structure. Figure 2 shows the installation of the elevator on the horizontal stabilizer. Figure 3 shows the trim tab installation.

The elevator has top and bottom shells. Each shell has GFRP skins with a rigid foam core. The leading edge of each shell has a curve. The shells bond together where the curves overlap. The shells also bond together at the ends and at the trailing edge.

The elevator has a horn rib in the middle. It is a strong box with an open front. The elevator horn goes into the horn rib. Two bolts attach the horn to the elevator.

The horn has a hole with a bush for the elevator push rod. The front of the horn has elevator mass balance weight. More mass balance weight is attached at the front of the elevator tips.

Five bearings hold the elevator. The elevator horn has a plain bearing. A bolt and spacer attach the elevator horn to the trailing edge webs of the horizontal stabilizer.

A small bearing rib at mid-span on each side holds an elevator hinge assembly. The hinge assembly has an eye-end with a plain shank. The eye-end has a spherical bearing. The shank engages in a bush in the trailing edge web.

The outer end of the elevator on each side has an end bearing. A reinforcing block holds a bonded bush. The bush aligns with a bonded bush in the horizontal stabilizer trailing edge web. A pivot pin goes through both bushes to make the outer bearing. A roll pin locks the pivot pin in the bonded bush.

A GFRP trim tab attaches to the trailing edge of the elevator. The trim tab has six GFRP hinges. The front half of each hinge bonds to the trailing edge of the elevator. The rear half of each hinge bonds to the leading edge of the trim tab. Two hinge rods go through the hinges. Lock wires hold the hinge rods in place.

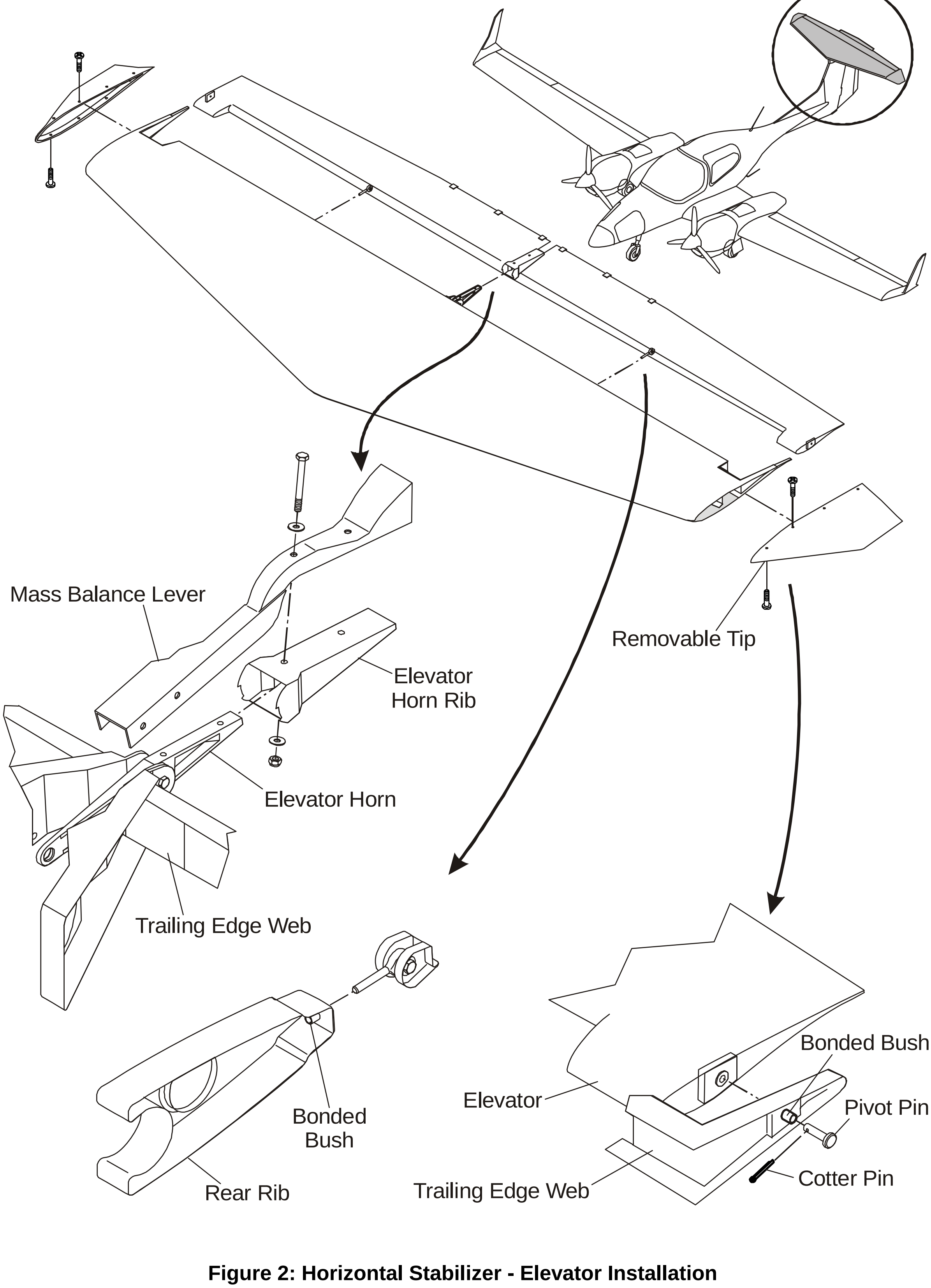

Figure 2: Horizontal Stabilizer - Elevator Installation

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the elevator and trim tab. Refer to Sections 27-30 and 27-31 for data on the elevator and trim tab control setting.

2. Remove/Install the Elevator

A. Remove the Elevator

	Detail Steps/Work Items	Key Items/References
(1)	Remove the horizontal stabilizer fairing. – Remove the 4 screws that attach the fairing to the structure.	Refer to Figure 2.
(2)	Remove the horizontal stabilizer tips: – Remove the 8 screws that attach the tip to the stabilizer.	Hold the tips.
(3)	Release the 2 fork-end fittings from the trim-tab cranked actuating levers.	Under the elevator.
(4)	Remove 2 bolts, nuts and washers which attach the elevator horn rib to the elevator.	Refer to Figure 2.
(5)	Remove the pivot pins from the end bearings: – Remove the roll pin. – Pull the pivot pin out of the end bearing.	Hold the elevator.
(6)	Pull the elevator aft to release the elevator horn and hinge assemblies.	
(7)	Put the elevator in a stand or on a padded surface.	

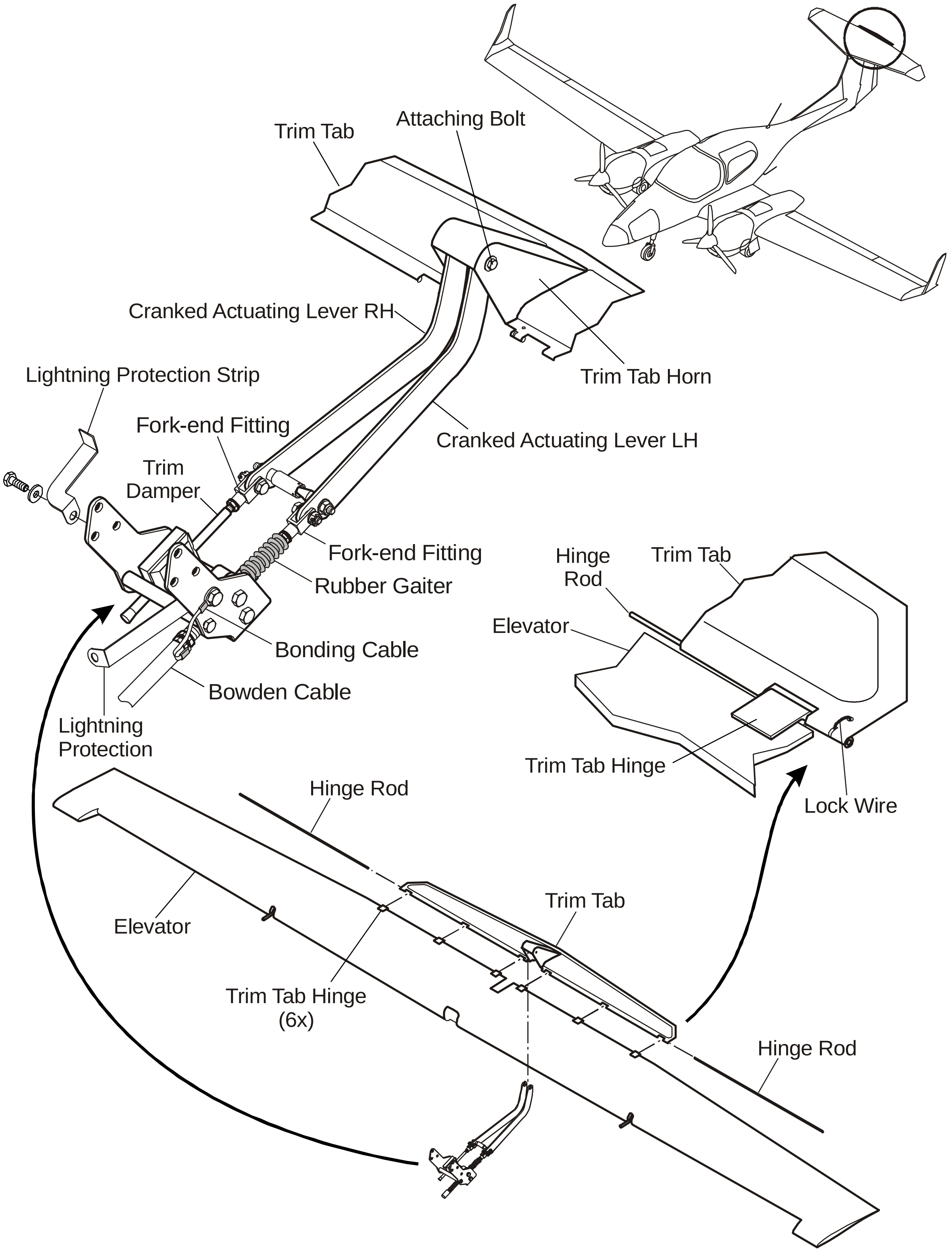

Figure 3: Trim-Tab Installation

B. Install the Elevator

	Detail Steps/Work Items	Key Items/References
(1)	Put the elevator in position aft of the horizontal stabilizer: – Align the elevator with the horn. – Move the elevator forward over the horn. – Align the shanks of the hinge assemblies at mid-span with the bushes in the trailing edge web of the horizontal stabilizer. – Push the elevator forward to engage the shanks in the bushes. – Align the end bearings with the bushes in the trailing edge spar of the horizontal stabilizer.	Refer to Figure 2.
(2)	Install the pivot pins in the end bearings and lock the pivot pins in position with a roll pin.	
(3)	Install the bolts, washers and nuts which attach the elevator to the elevator horn.	Torque: 6.4 Nm (4.7 lbf.ft.). Use new self-locking nuts.
(4)	Install the 2 fork-end fittings for the trim-tab cranked actuating levers.	Under the elevator.
(5)	Install the horizontal stabilizer tips: – Install the 8 screws that attach the tip to the horizontal stabilizer.	
(6)	Install the horizontal stabilizer fairing: – Install 4 screws that attach the fairing to the structure.	
(7)	Do a test for correct range of movement of the elevator control.	Refer to Section 27-30.
(8)	Do a test for correct range of movement of the elevator trim control.	Refer to Section 27-38.

	Detail Steps/Work Items	Key Items/References
(9)	If necessary for your Airworthiness Authority do a duplicate inspection of the elevator trim control.	

3. Remove/Install the Elevator Trim-Tab

A. Remove the Elevator Trim-Tab

	Detail Steps/Work Items	Key Items/References
(1)	Remove the nut, washer and bolt which attaches the cranked actuating levers to the trim tab.	Refer to Figure 3.
	CAUTION: DO NOT USE FORCE TO REMOVE THE LOCK WIRE FROM THE TRIM TAB HINGE. YOU CAN DAMAGE THE GFRP HINGE.	
(2)	Remove the lock wire at the outer hinge on each side of the trim tab.	
(3)	Move the hinge rods out of the hinges.	Hold the trim tab.
(4)	Remove the trim tab from the elevator.	

B. Install the Elevator Trim-Tab

	Detail Steps/Work Items	Key Items/References
(1)	Put the trim tab in position on the elevator.	Refer to Figure 3.
(2)	Align the hinges.	
(3)	Install the hinge rods in each side.	
	CAUTION: DO NOT USE FORCE TO INSTALL THE LOCK WIRE IN THE TRIM TAB HINGE. YOU CAN DAMAGE THE GFRP HINGE.	
(4)	Lock the hinge rods in position with wire.	Use new lock wire.
(5)	Align the cranked actuating levers with the trim tab.	
(6)	Install the bolt, washer and nut which attaches the cranked actuating levers to the trim tab.	
(7)	Do a test for correct range of movement of the elevator trim control.	Refer to Section 27-38.
(8)	If necessary for your Airworthiness Authority do a duplicate inspection of the elevator trim control system.	

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Section 55-30
Lower Fin

1. General

The DA 42 NG has a lower fin. The lower fin is a GFRP molding that is bonded to the bottom of the rear fuselage. A tail-skid is attached to the bottom of the lower fin. Refer to Section 32-70 for more data about the tail-skid.

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Section 55-40

Rudder and Trim Tab

1. General

The DA 42 NG has the usual rudder. The rudder attaches to the rear web of the vertical stabilizer. Refer to Section 27-20 for data about the rudder controls.

The rudder has a mechanical trim-tab. A rotary knob at the top of the cockpit center console controls the rudder trim-tab. Refer to Section 27-21 for data about the rudder trim-tab controls.

2. Description

A. Rudder

Figure 1 shows the rudder structure.

The rudder has left and right shells. Each shell has GFRP skins with a rigid foam core. The leading edge of each shell has a curve and a flange. The shells bond together at the flanges. The shells also bond together at the top, bottom and at the trailing edge. The left shell has a molded fairing for the ruder trim control rods.

The rudder has a flat face at the bottom of the leading edge. The flat face has two bonded bolts. The bolts attach the rudder to the rudder lower mounting bracket. Refer to Section 27-20 for data about the rudder lower mounting bracket.

The rudder has a mass balance weight bonded into the leading edge near the top and in its rudder horn. You cannot adjust the mass balance.

Two bearings hold the rudder. A pivot pin bonds into the leading edge near the top. It engages with a bearing attached to the rear web of the vertical stabilizer. The rudder lower mounting bracket has the bottom bearing.

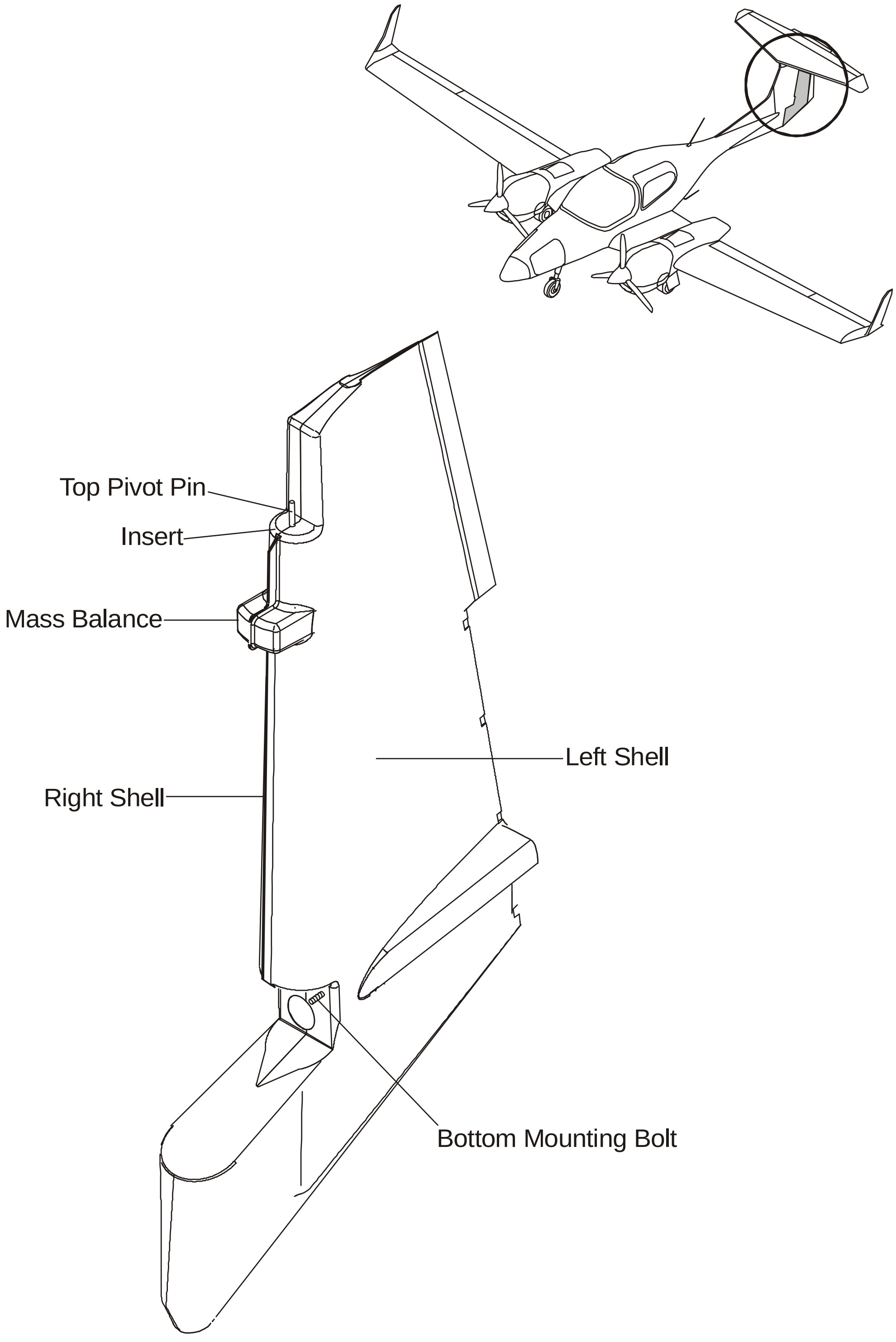

Figure 1: Rudder Assembly

B. Rudder Trim-Tab

Figure 2 shows the rudder trim-tab.

The trim-tab has left and right shells. Each shell has GFRP skins. A rigid foam insert strengthens the trim-tab at the leading edge. The leading edge of each shell has a curve and a flange. The leading edge flange has a vertical tube for the trim-tab hinge-wire. The shells bond together at the flanges. The shells also bond together at the top, bottom and at the trailing edge.

A GFRP control horn is bonded to the left side of the trim-tab. Two GFRP shells bonded together make the control horn.

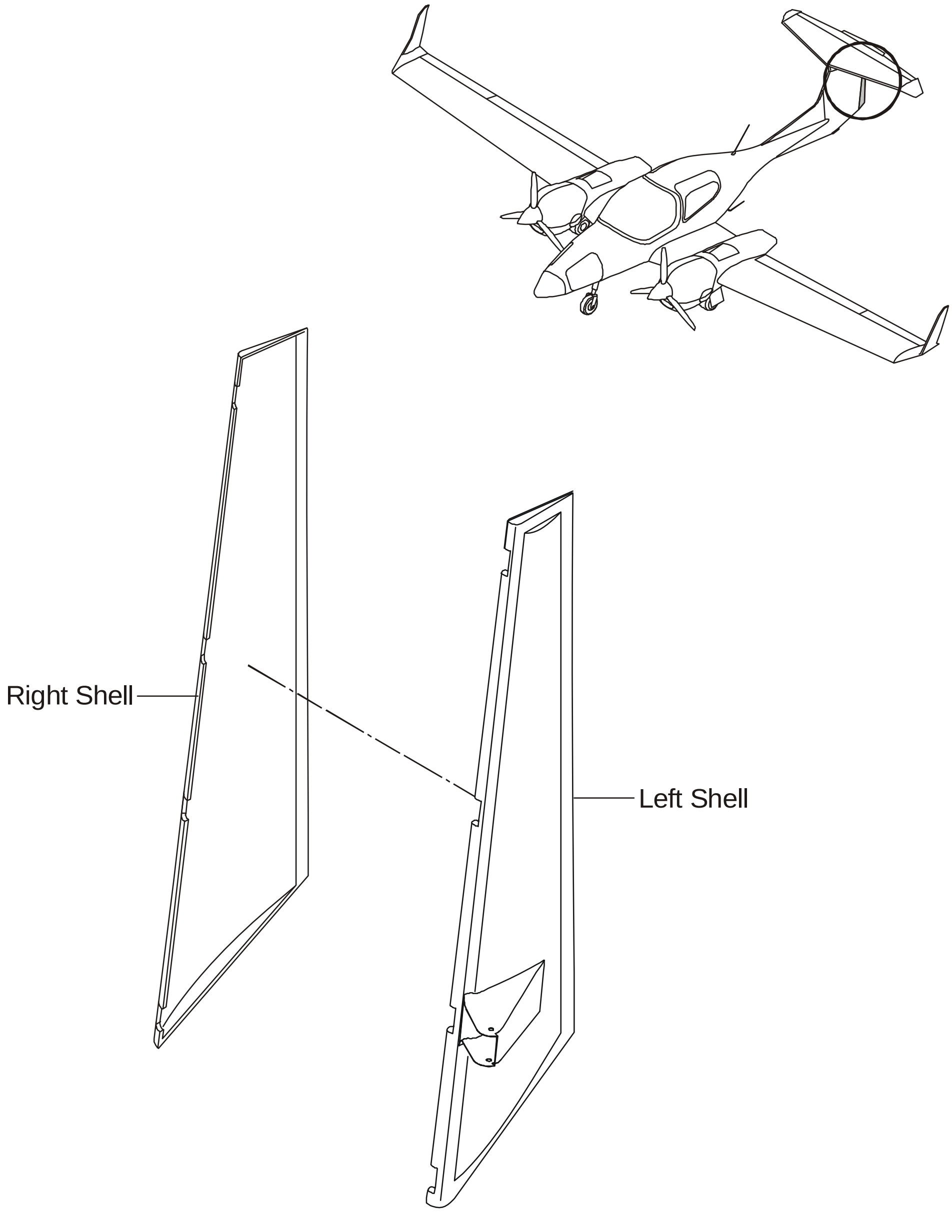

Figure 2: Rudder Trim-Tab

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the rudder and the rudder trim-tab. Refer to Section 27-20 for data on the rudder control setting. And refer to Section 27-21 for the rudder trim-tab setting.

2. Remove/Install the Rudder Assembly

A. Remove the Rudder Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the 2 control rods for the rudder trim-tab: – Remove the 2 nuts, washers and bolts that attach the control rods to the trim operating lever. – Move the rods clear of the operating lever.	Refer to Figure 3. Refer to Figure 4, if MÄM 42-600 is installed. At the rudder bottom bracket.
(2)	Remove 2 nuts and washers which attach the rudder to the rudder lower mounting bracket.	Hold the rudder.
(3)	Pull the bottom of the rudder aft to disengage the bottom bolts.	
(4)	Lower the rudder to disengage the top pivot and move the rudder and trim-tab assembly clear of the airplane.	
(5)	Put the rudder in a stand or on a padded surface.	

B. Install the Rudder Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Move the rudder assembly into position at the vertical stabilizer.	

	Detail Steps/Work Items	Key Items/References
(2)	Install the rudder assembly: – Move the rudder to engage the top pivot pin in the upper pivot bearing. – Install the 2 washers and nuts that attach the rudder to the rudder mounting bracket.	Torque: 6.4 Nm (4.7 lbf.ft.). Use new self-locking nuts.
(3)	Connect the trim-tab control rods: – Align the control rod eye-ends with the trim control levers. – Install the 2 bolts, washers and nuts that attach the eye-ends to the control levers.	
(4)	If MÄM 42-600 is installed and the rudder sealing tape and the sliding tape are worn: – Remove the rudder sealing tape and the sliding tape from the fin and the rudder surface. – Use solvent to clean the surfaces. – Install the self adhesive sliding tape to the rudder surface. – Install the self adhesive sealing tape to the rudder fin surface. The not adhesive half of the sealing tape must protrude from the fin towards the rudder and cover the gap.	
(5)	Do a test for the correct range of movement of the rudder control.	Refer to Section 27-20.
(6)	Do a test for the correct range of movement of the rudder trim control.	Refer to Section 27-21.
(7)	If necessary for your Airworthiness Authority do a duplicate inspection of the rudder control system.	

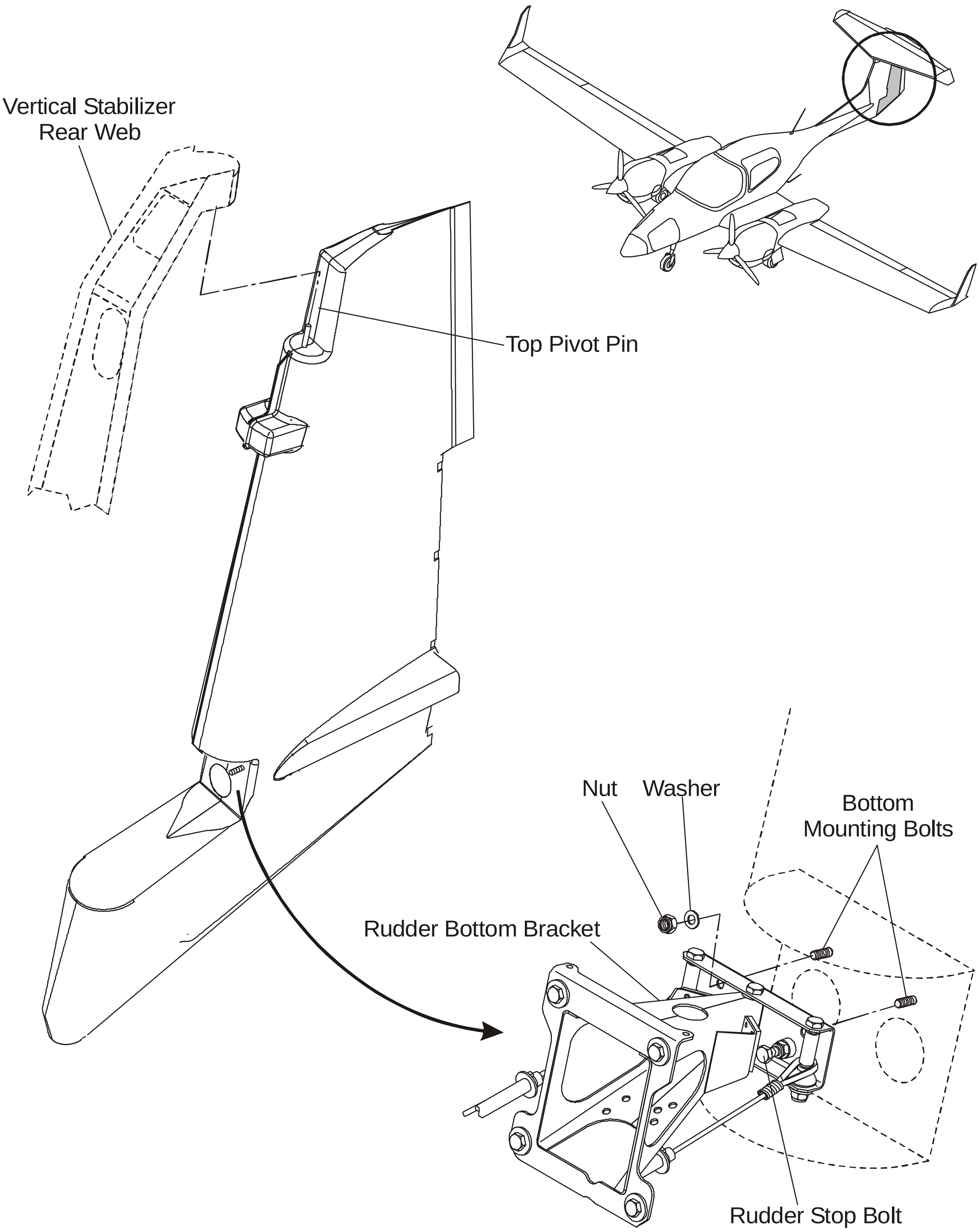

Figure 3: Rudder Assembly Installation

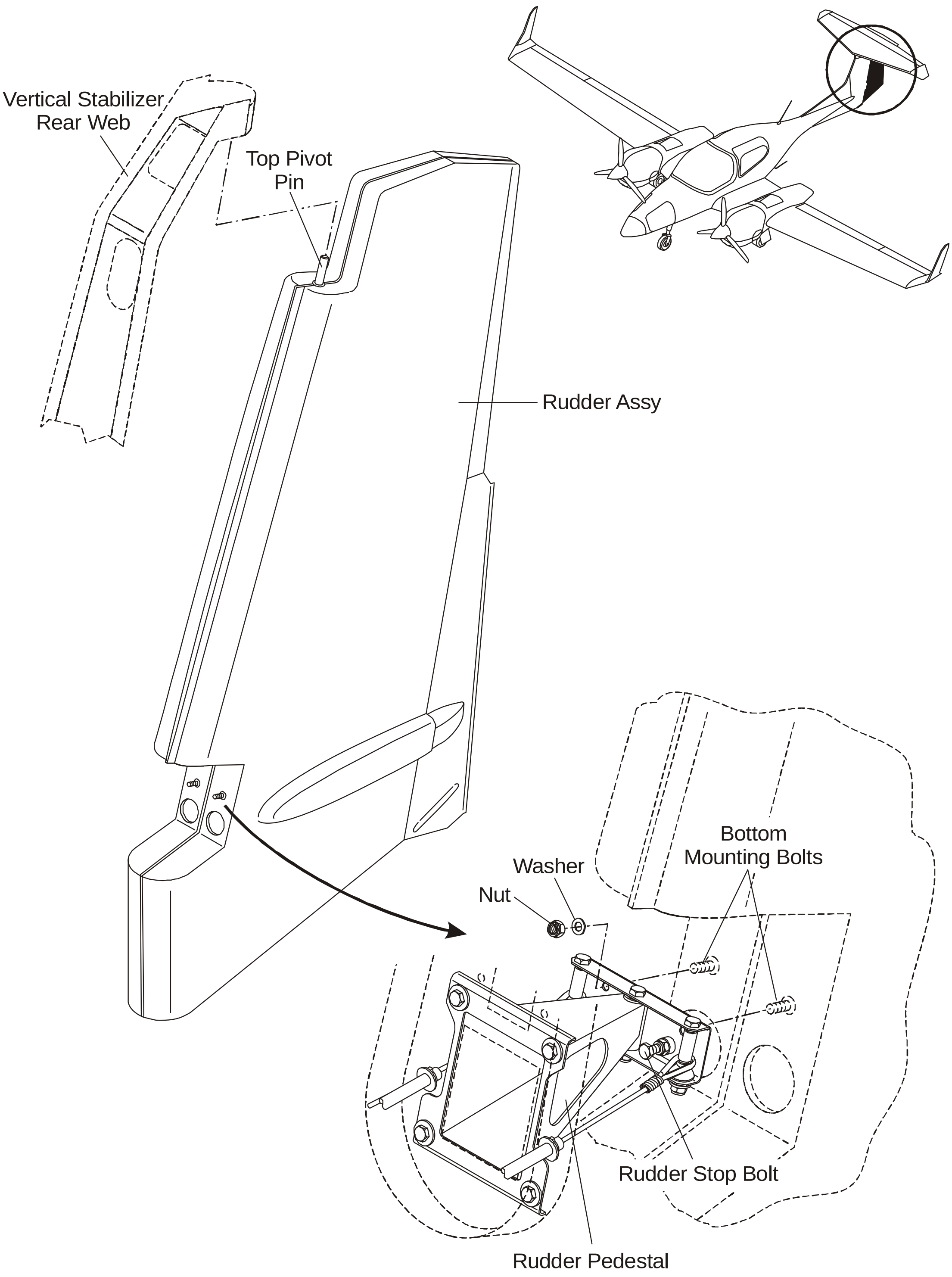

Figure 4: Rudder Assembly Installation (if MÄM 42-600 is installed)

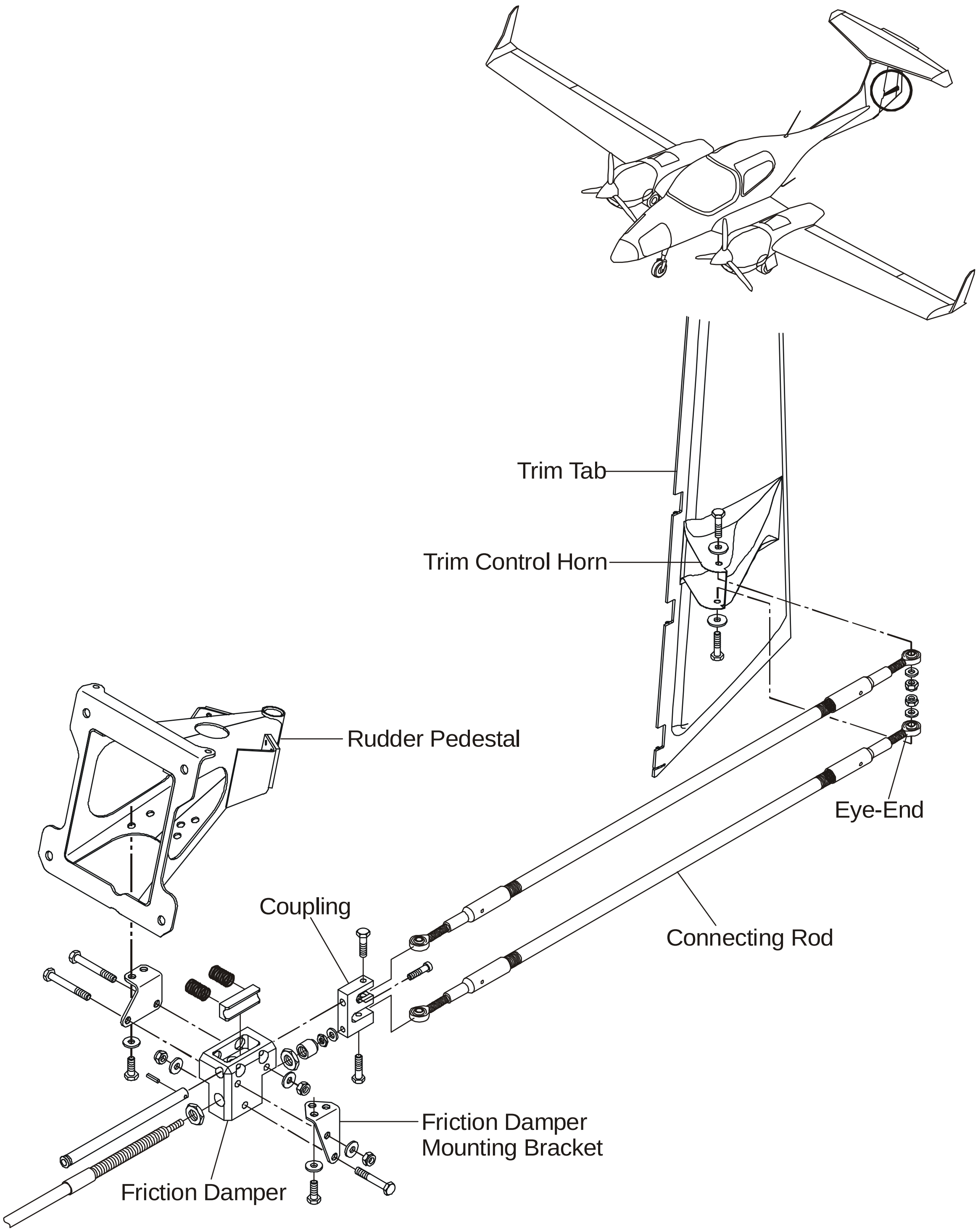

Figure 5: Rudder Trim-Tab Installation

3. Remove/Install the Rudder Trim-Tab

A. Remove the Rudder Trim-Tab

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the 2 control rods for the rudder trim-tab: – Remove the 2 nuts, washers and bolts that attach the trim control rods to the trim control horn. – Move the rods clear of the operating lever.	Refer to Figure 5. At the trim-tab control horn.
(2)	Remove the trim-tab: – Remove the locking wire that secures the hinge pin. – Remove the hinge pin from the trim-tab. – Move the trim-tab clear of the airplane.	 Hold the trim-tab!

B. Install the Trim-Tab

	Detail Steps/Work Items	Key Items/References
(1)	Install the trim-tab: – Move the trim-tab into position at the rudder. – Align the hinges in the trim tab with the hinges in the rudder. – Install the hinge pin. – Secure the hinge pin with lock-wire.	Use new lock-wire.
(2)	Connect the control rods for the trim-tab: – Align the eye-ends of the control rods with the trim tab control horn. – Install the bolt, spacer, washers and nut that attaches the control rods to the control horn.	
(3)	Do a test for the correct range of movement of the rudder trim-tab control system.	
(4)	If necessary for your Airworthiness Authority do a duplicate inspection of the rudder trim control system.	

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CHAPTER 56

WINDOWS

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WINDOWS

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CHAPTER 56
WINDOWS

1. General

The DA 42 NG has three windows. All of the windows are molded acrylic glass (plexiglass). The one-piece canopy window covers the pilots' cockpit. It is also the windscreen. The passenger door has a window. The right side of the fuselage has a window for the passenger compartment.

A high-performance elastic adhesive bonds each window to the structure.

Section 56-10 gives the data for all of the windows. Refer to Section 52-10 for data about the canopy and door structure.

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Section 56-10
Flight Compartment Windows

1. General

This Section tells you about the windows in the canopy, passenger door and fuselage. Refer to Section 52-10 for data about the canopy and door structure.

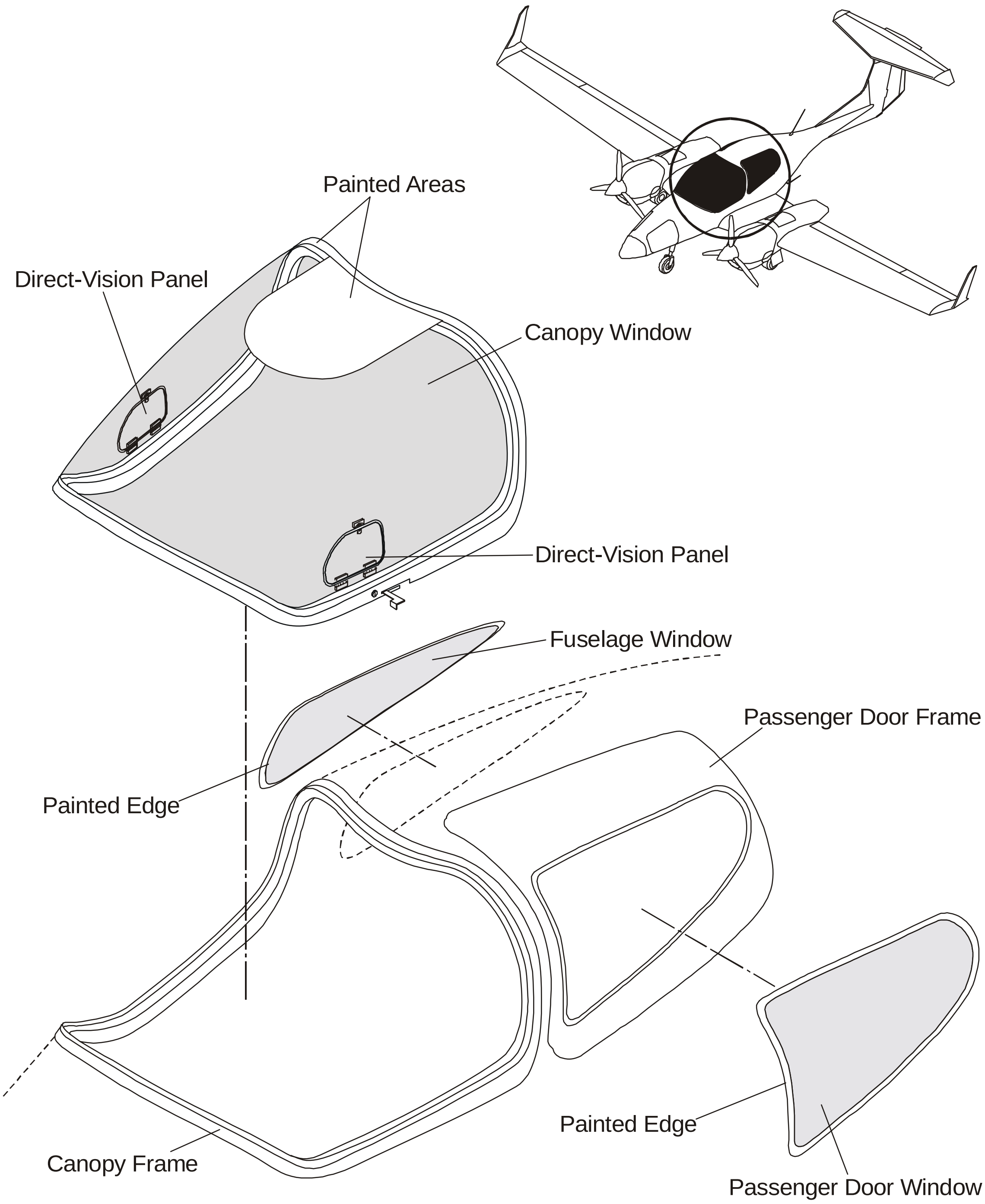

Figure 1: Windows

2. Description and Operation

Figure 1 shows the windows.

The DA 42 NG has three windows. Each window is polycast molded acrylic glass (plexiglass). This material gives good optical characteristics. It is also strong. It can be accurately formed into 3-dimensional shapes. A high-performance elastic adhesive bonds each window to the structure. A flexible white sealant fills the small gap between the edge of the window and the structure.

The one-piece canopy window covers the pilots' cockpit. It is also the windscreen. It has a small direct-vision panel in each side. The direct vision-panels have hinges. You can open the direct-vision panels in flight.

The passenger door has a window for the left side of the passenger compartment. The right side of the fuselage also has a window for the passenger compartment.

Each window has a band of white paint over the area where it bonds to the structure. The canopy window also has a screened area above the pilots' heads. This is a sun-shade. New windows are painted by the manufacturer.

As an option you can install tinted windows in the DA 42 NG. Refer to the Illustrated Parts Catalog for data about tinted windows.

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Maintenance Practices

1. General

This Section tells you how to replace or repair damaged windows. See Section 12-30 for data on cleaning windows.

2. Replace a Window

You must remove the window by cutting out the damaged window.

A. Equipment

Item	Quantity	Part Number
Rocker saw with non-rotating saw blade.	1	Commercial.
Adhesive.	A/R	Terostat MS 9380.
White sealant.	A/R	Terostat MS 9380.

B. Replace a Window

	Detail Steps/Work Items	Key Items/References
	Note: Do not use cleaning agents containing alcohol on windows and canopy bubbles.	
(1)	Remove the canopy or door. Put the canopy or door on a firm working surface.	If the canopy or door window must be replaced. Refer to Section 52-10.
(2)	Put protective covers on the inside of the cockpit.	If the right fuselage window must be replaced.
(3)	Cut the damaged window from the frame.	Use the rocker saw with non-rotating saw blade.
(4)	Grind the frame in order to remove the remaining window material and sealant.	
(5)	Put the new window in frame position. Align the 2 holes in the window (center front and back) with the holes in the frame.	
(6)	Carefully remove the protective coating from the new window/canopy bubble on the future bonding surface.	

	Detail Steps/Work Items	Key Items/References
(7)	Prepare the surfaces: – Window/canopy bubble. – Canopy frame/ fuselage. – Remove dust from the bonding surfaces and make sure to get no grease or silicone on the bonding surfaces.	Use sand paper (grid size 320) until the surface is rough and not shiny. Use sand paper (grid size 80).
(8)	Apply thin red adhesive tape on the frame and the window/canopy bubble.	Refer to Figure 2.
(9)	Apply the dam tape to the canopy frame/fuselage.	Refer to Figure 2. Make sure to achieve a wide bonding surface.
	Note: The following bonding of the window/canopy bubble and the alignment must be finished within 10 minutes.	
(10)	Apply the sealant and follow the suggested shape and positioning around the entire canopy frame/fuselage.	Refer to Figure 2. Make sure to apply a constant amount of sealant.
	Note: It is very important that the Plexiglas is positioned within ten minutes after the sealant has been applied.	
(11)	Position the window/canopy bubble in place on the canopy frame/fuselage by use of the 2 pins.	
(12)	Push the window/canopy bubble into position. After first positioning, do not move the window again, to prevent sealant smearing.	Refer to Figure 3. Align the window/canopy bubble with the frame surface.
(13)	Use adhesive tape to hold the window/canopy bubble in place.	
(14)	Allow the sealant to cure.	Minimum 24 hrs.
(15)	Remove the 2 pins.	
(16)	Remove the adhesive tape which held the window/canopy bubble in place on the frame.	
(17)	Remove the excess sealant along the joint (1 - 2 mm [0.04 - 0.08 in] deep).	Use plastic spattle.

	Detail Steps/Work Items	Key Items/References
(18)	Apply masking tape on both sides of the joint.	Refer to Figure 3.
(19)	Use sealant to fill the joint and the pinholes and smoothen the surface.	Use plastic spattle.
(20)	Spray the joint with a water/cleaning solvent solution and smooth the surface by hand.	
(21)	Remove all adhesive and masking tapes.	
(22)	Allow the sealant to cure.	Minimum 24 hrs.
(23)	Install the canopy or door.	Only if you have replaced the canopy or door window. Refer to Section 52-10.

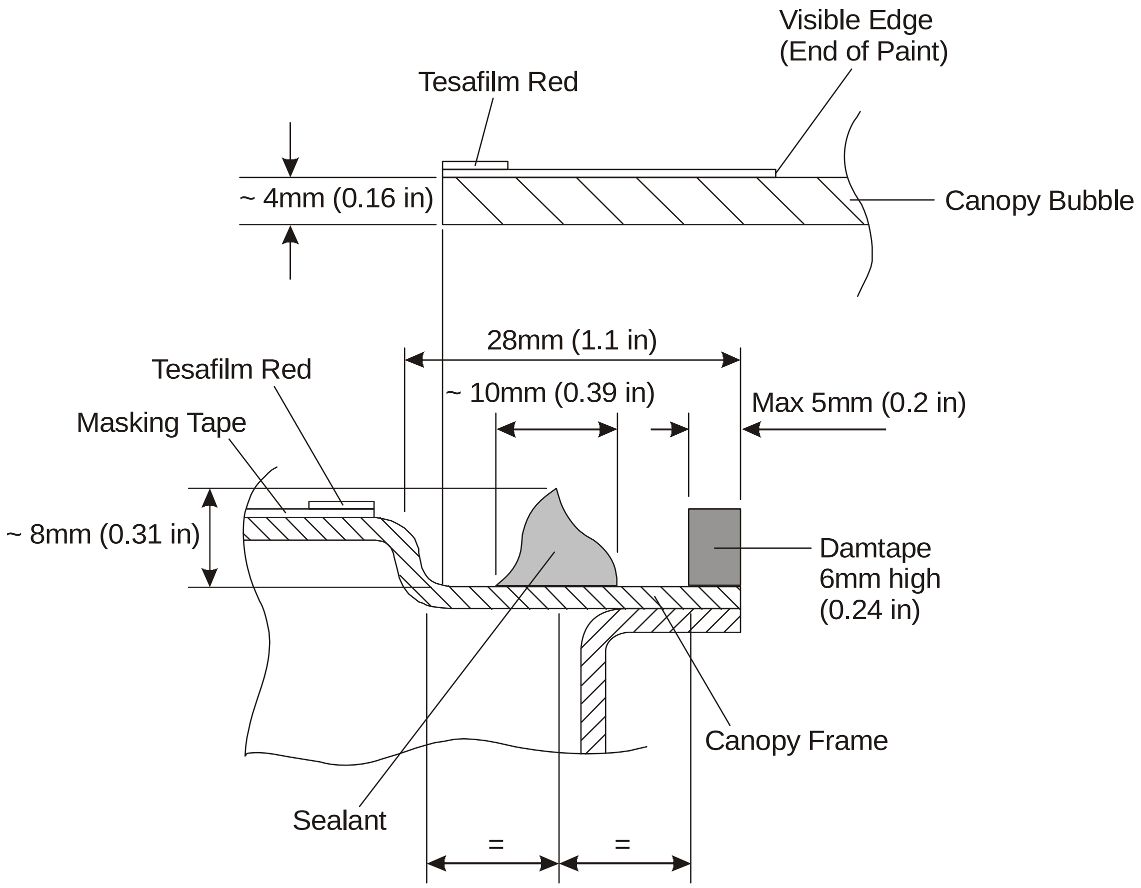

Figure 2: Position and Form of the Applied Adhesive

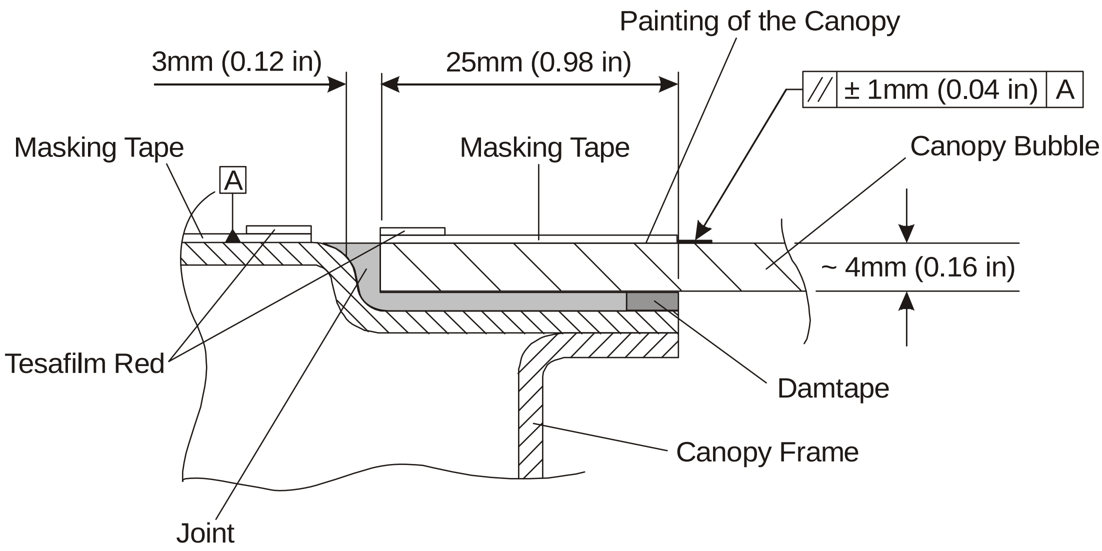

Figure 3: Filling After Placing the Glazing

3. Window Repairs

A. Damage Limits

Maximum crack length: 150 mm (6 in).

Do not repair cracks which are more than 150 mm (6 in) from the edge of the window.

B. Equipment

Item	Quantity	Part Number
Small high-speed rotary grinder.	1	Commercial.
Filler: Acryfix 92 or Tensol cement No. 70.	A/R	Commercial.
Masking tape.	A/R	Commercial.
Plastic adhesive tape.	A/R	Commercial.
Cold ultra-violet light source (only for Acryfix 92).	A/R	Commercial.

Note: Fillers become smaller when they cure. Apply enough filler to be above the level of the window surface. Cut the filler back when it has cured.

If you repair a vertical crack, keep the filler in place with plastic adhesive tape. Apply a second coat of filler after the first coat has cured.

C. Temporary Repairs to Windows

Stop-drill the ends of short cracks. Use a 2.5 mm (3/32 in) drill. Refer to Figure 4.

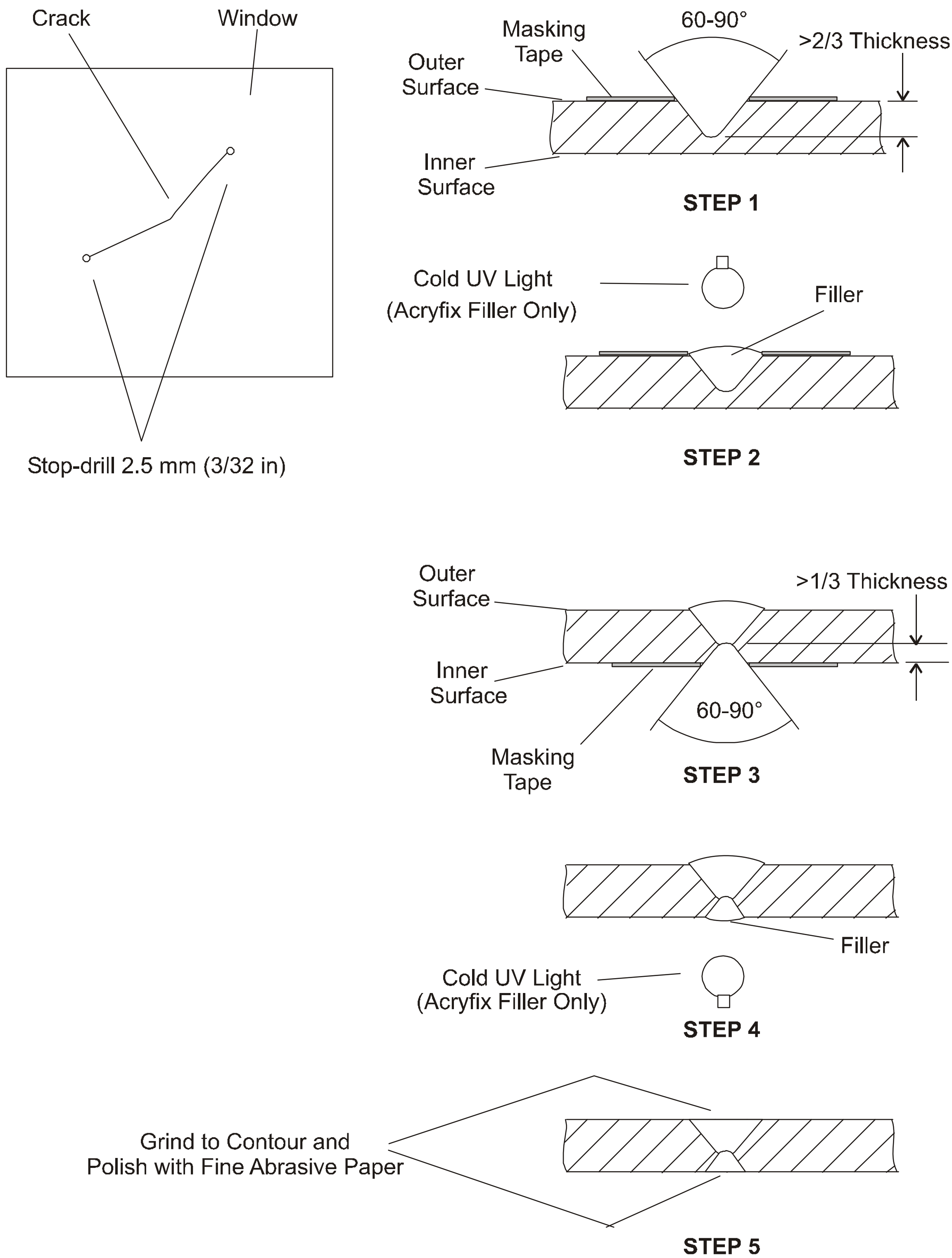

Figure 4: Window Repairs

D. Permanent Repairs to Windows

	Detail Steps/Work Items	Key Items/References
(1)	Remove the canopy or door. Put the canopy or door on a firm working surface with the crack horizontal.	Only if you will repair the canopy or door window. Refer to Section 52-10.
(2)	Put protective covers over the inside of the cockpit.	Only if you will repair the right fuselage window.
(3)	Mask the area around the crack on both inner and outer surfaces.	
(4)	Cut a groove along the crack in the outer surface of the window.	Refer to Figure 4, step 1.
(5)	Countersink temporary stop-drill holes.	
(6)	Seal the stop-drill holes on the inner surface.	Use plastic adhesive tape.
(7)	Apply filler to the groove and the stop-drill holes.	Refer to Figure 4, step 2. Use Acryfix 92 or Tensol cement no. 70.
(8)	Let the filler cure.	Refer to the manufacturer's data.
(9)	If possible, turn the window so that the inner surface is up. Remove any plastic adhesive tape.	
(10)	Cut a groove along the crack in the inner surface of the window.	Refer to Figure 4, step 3.
	Note: This groove is less deep than the outer surface groove. It must cut into the outer layer of filler. This prevents holes in the filler.	
(11)	Countersink the filler in the stop-drill holes on the inner surface to 1 mm (0.04 in).	
(12)	Apply filler to the groove and the stop-drill holes.	Refer to Figure 4, step 4.
(13)	Let the filler cure.	Refer to the manufacturer's data.
(14)	Remove the masking materials.	
(15)	Grind the filler to the profile of the surface.	Grind both sides. Refer to Figure 4, step 5.
(16)	Polish the repair area with fine abrasive paper.	
(17)	Verify sufficient remaining thickness of the window in the repair area.	Measure thickness, for example with an ultrasonic thickness gauge. Minimum thickness: 4.25 mm (0.167 in).

CHAPTER 57

WINGS

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CHAPTER 57
WINGS

1. General

The DA 42 NG is a low wing monoplane with cantilever wings. A wing center section with stub wings and the engine nacelles attaches to the fuselage. Refer to Section 53-10 for more data about the fuselage center section.

The outer wings attach to the wing center section stub wings. Each wing has a flap attached to the inboard trailing edge of the outer wing and to the trailing edge of the stub wing. An aileron attaches to the outboard trailing edge of each outer wing.

The wings have a semi-monocoque structure. Each wing has top and bottom shells. The shells have CFRP outer skins, a rigid foam core and GFRP inner skins. Each wing has two I-section spars. Uni-directional carbon fiber cloth makes the spar caps. Each wing also has GFRP ribs and webs.

The flaps and ailerons have a mixture of CFRP and GFRP cloth in the shells. The shells have rigid foam cores.

Refer to Chapter 51 for general composite repair data. Refer to Chapter 27 for data about the control systems which operate the flaps and ailerons.

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Section 57-10
Wing Structure

1. General

This Section tells you about the structure of the outer wing. Refer to Section 53-10 for data about the structure of the wing center section. Refer to Section 57-50 for data about the structure of the flaps. Refer to Section 57-60 for data about the structure of the ailerons.

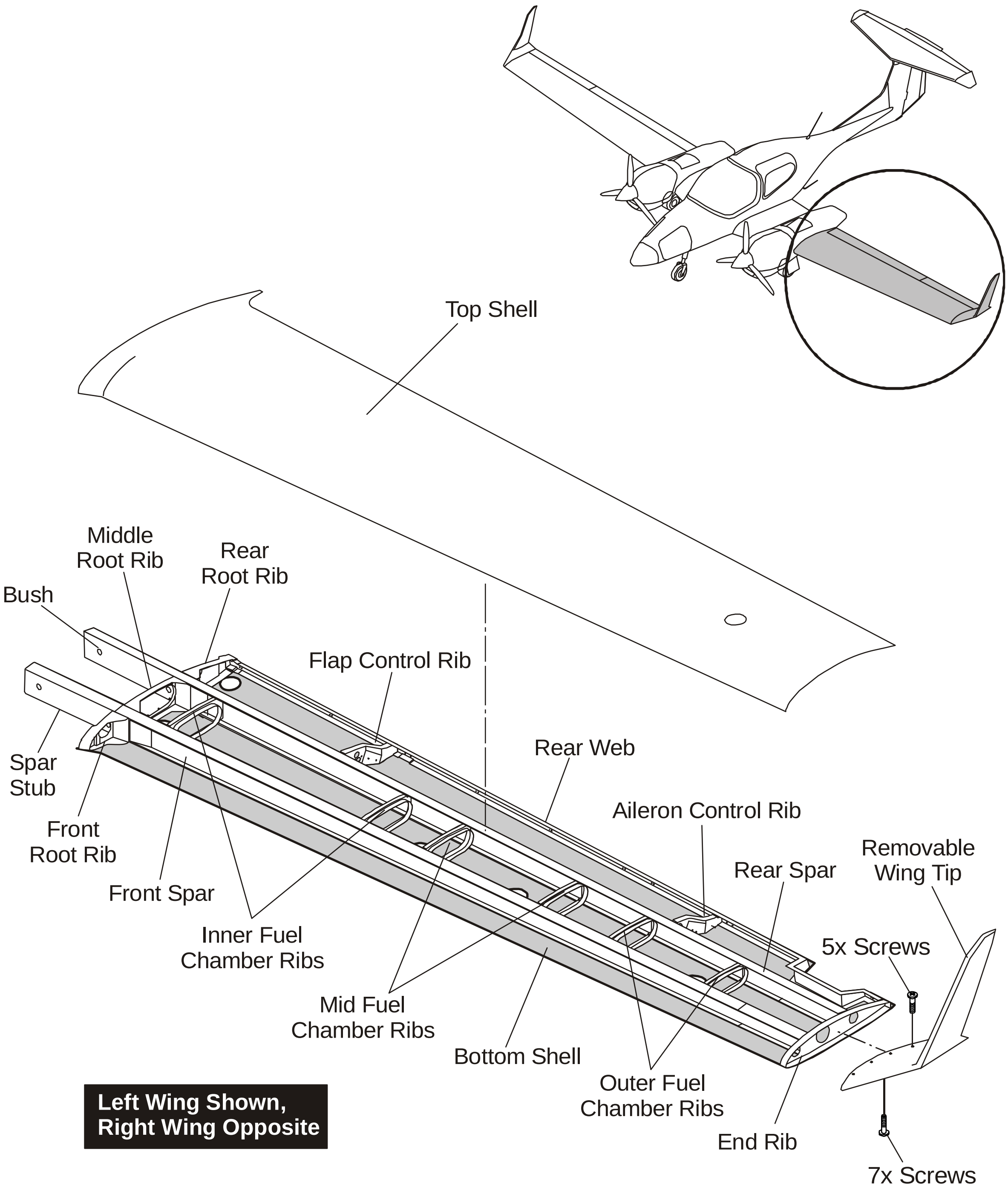

Figure 1: Wing Structure

2. Description

Figure 1 shows the wing structure. The wing has top and bottom shells. It has front and rear spars and a root rib made in three parts. Five ribs hold the fuel tanks between the spars. Flap and aileron control ribs hold the bellcranks for the control systems.

A rear web closes the trailing edge of the wing. An end rib closes the outboard end of the wing. A removable GFRP tip attaches to the wing shells and outer rib with screws.

Bonding paste (thickened resin) bonds the wing components to each other. The following section gives more data about the main parts:

A. Wing Shells

Each wing has top and bottom shells. Each shell has a CFRP skin with a rigid foam core. The fibers in the layers of cloth which cover the whole wing run at ± 45° to the lateral axis of the wing. The outer layer of the wing is carbon fiber. The inner layer of the wing is glass fiber.

Some areas have more layers of cloth to give more strength. For example, the area around each access hole has extra layers of carbon fiber cloth.

The bottom shell of each wing has 8 access holes. These give access to the flap and aileron bellcranks and fuel tanks. The top shell has a hole for the fuel cap of the outer fuel chamber.

B. Spars

Each wing has two I-section spars. The front spar on one side is the same as the rear spar on the opposite side.

Many layers of uni-directional carbon fiber make the spar caps. The number of layers in the spar caps decreases from root to tip.

Each spar has a shear web. The shear web has GFRP skins and a rigid foam core. Glass cloth fillets attach the spar caps to the shear web.

The inboard end of each spar (the 'stub') goes past the root rib. The spar stub is a box-section with many layers of glass cloth wrapped round the spar caps. Two large bushes bond into the spar stub. The wing main bolts engage these bushes and attach the wing to the fuselage center section. The bushes and bolts transmit the wing bending loads into the center section. Figure 2 shows the main bolt installation.

C. Root Rib

Each outer wing has a three-piece root rib. Each piece is a GFRP molding with many layers of glass fiber cloth. The front root rib bonds to the top and bottom shells and the front face of the front spar. It has a housing for the A-bolt. The A-bolt transmits lift loads into the center section.

The middle part of the root rib bonds to the top and bottom shells, the aft face of the front spar and the front face of the rear spar. It has a large oval access panel for removing the fuel tanks.

The rear root rib bonds to the top and bottom shells, the aft face of the rear spar and the rear web. It has a housing for the B-bolt. The B-bolt transmits lift loads into the center section. It also has guide rollers for the flap and aileron push rods.

D. Fuel Tank Ribs

Six ribs hold the fuel tanks in each wing. Each rib is a GFRP molding with a large oval hole. The hole has a flat inner flange to hold the tank. The ribs bond to the top and bottom shells, the aft face of the front spar and the front face of the rear spar.

E. Flap and Aileron Control Ribs

Each wing has two flap and one aileron control ribs. The ribs are GFRP moldings. Each rib has a bend with a solid insert. The insert gives extra strength where the control bellcrank attaches. The ribs bond to the top and bottom shells, the aft face of the rear spar and the rear web.

F. Rear Web

Each wing has a rear web. The web closes the trailing edge of the wing. The web bonds to the top and bottom shells. It also bonds to the rear faces of the rear root rib, the flap control ribs and the aileron control rib. The rear web has extra layers where the flap and aileron hinges attach. Rivets hold anchor-nut plates to the forward face of the rear web where the hinges attach.

G. Wing End Rib

Each wing has an end rib. The end rib is a GFRP molding. The end rib has eight anchor nuts which attach the wing tip. It also has a threaded strong-point for a tie-down ring.

H. Wing Tip

The wing tip is a GFRP molding with top and bottom shells. The wing tip holds the external lights.

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the outer wings. They also tell you how to remove and install the wing tips and other small components.

2. Remove/Install the Wings

A. Equipment

Item	Quantity	Part Number
Padded wing trestles.	4	Commercial.
Main bolt removal tool.	1	-
Wing stand (not essential).	1 per wing	Commercial.

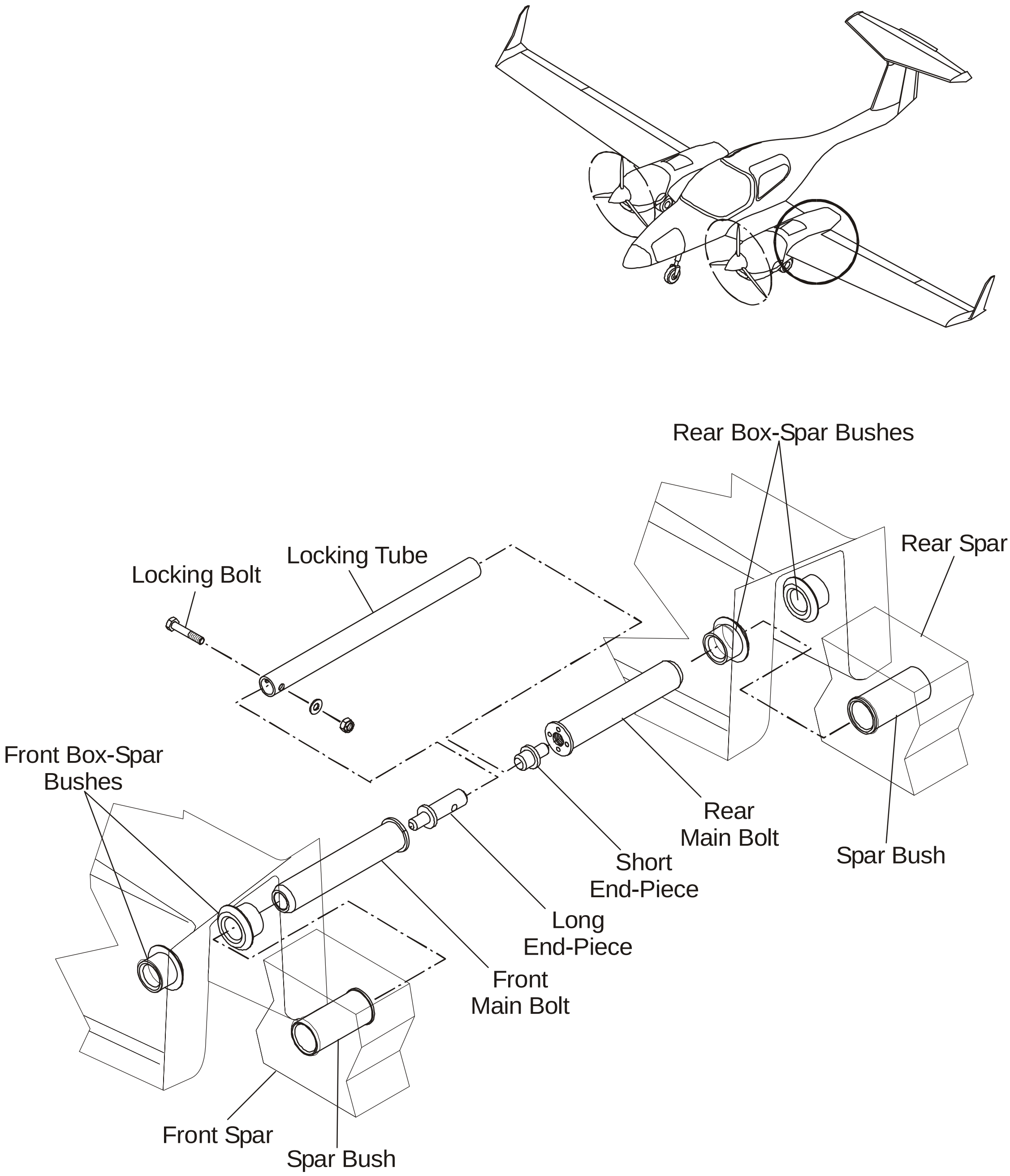

Figure 2: Wing Main Bolt Installation

B. Remove the Wings

Use this procedure to remove the left wing or the right wing. Where a part of the procedure applies to only one wing it will tell you so.

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE AREA AROUND THE FLAPS IS CLEAR OF PERSONS AND EQUIPMENT BEFORE YOU LOWER THE FLAPS. IF NOT, THE FLAPS CAN INJURE PERSONS OR BE DAMAGED BY EQUIPMENT.	
(1)	Lower the flaps.	
(2)	Disconnect the main battery.	Refer to Section 24-31.
(3)	Defuel the airplane.	Refer to Section 12-10.
(4)	Put trestles under both wing tips.	Under the end rib.
(5)	Disconnect the flap push-rod: – Remove the nut, washer and bolt.	At the wing root. Through the engine nacelle access panels.
(6)	Disconnect the aileron pushrod: – Remove the nut, washer and bolt.	At the wing root. Through the engine nacelle access panels.
(7)	Disconnect the cable for the fuel probes and the fuel sensor.	At the fuel tank.
(8)	Disconnect these items at the wing root: – The Pitot hose. – The static hose.	Left wing only. The hose is 8 mm (5/16 in) diameter (green color). The hose is 8 mm (5/16 in) diameter (purple color).
(9)	Disconnect the wing electrical connector.	Engine nacelle panels.
(10)	Disconnect the wing bonding connections.	Engine nacelle panels.
(11)	Disconnect the fuel lines.	

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE DISEASE. **WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.**	
(12)	Disconnect the fuel hose from the fuel tank.	Put a container to catch a small quantity of fuel. Remove spilt fuel.
(13)	Remove the locking tube from the inboard and outboard main bolts: – Remove the nut, washer and bolt. – Move the tube over the long end piece. – Remove the short end piece. – Remove the tube and the long end piece.	
	WARNING: USE 3 PERSONS TO LIFT THE WING. IF YOU DO NOT, YOU CAN CAUSE INJURY. CAUTION: DO NOT LIFT ON THE FLAP. YOU CAN DAMAGE THE FLAP. Note: For the rest of this procedure, one person must lift the wing tip. One person must lift the leading edge at the root rib. One person must lift the trailing edge at the root rib.	

(14)	Remove the main bolts:
	– Take the weight off the wing.
	– For each bolt:
	  – Install the main bolt removal tool.
	  – Extract the bolt.
		If necessary, move the wing tip a small amount up and down to help release the main bolts.
		
		Make a note of the location of each bolt.

(15)	Lift the wing away from the center section.	Make sure that the electrical cables do not catch on the center section conduit.
(16)	Put the wing on trestles or a wing stand.	

	Detail Steps/Work Items	Key Items/References
	Note: If you use trestles, put one trestle under the spar stubs. Put the second trestle under the wing end rib.	

C. Pre-Installation Procedure

Do this check before you install the wings.

	Detail Steps/Work Items	Key Items/References
(1)	Examine the inner faces of the front and rear boxspars. Look specially for: – Damage to the main bolt bushes. – Damage to the structure round the bushes. – Looseness between the bushes and the structure. – Damage to the top and bottom shells of the center section (where the spar stubs can touch the shells during wing removal). – Delamination between the boxspars and the shells.	Refer to the manufacturer if you find damage in any of these areas. Clean the bushes.
(2)	Examine the front, middle and rear end ribs in the wing center section. Look specially for: – Damage to the A and B-bolt bushes. – Looseness between the A and B-bolt bushes and the end ribs. – Delamination between the end ribs, the boxspars and the shells.	Refer to the manufacturer if you find damage in any of these areas. Clean the bushes.
(3)	Examine the wing spar stubs. Look specially for: – Damage to the main bolt bushes. – Damage to the spar stub around the bushes. – Looseness between the bushes and the spar stub. – Delamination between the spars and the shells.	Refer to the manufacturer if you find damage in any of these areas. Clean the bushes.

	Detail Steps/Work Items	Key Items/References
(4)	Examine the wing root ribs. Look specially for: – Damage to the A and B-bolts and bushes. – Damage to the front and rear root ribs around the bushes. – Looseness between the bushes and the root ribs. – Delamination between the root ribs, the spars and the shells.	Refer to the manufacturer if you find damage in any of these areas. Clean the bolts and bushes.
(5)	Examine the main bolt assemblies. Look specially for: – Corrosion of the end-pieces or tube. – Corrosion of the main bolts. – Scratches on the bearing surfaces. – Deformation. – Damage to the threads for the removal tool.	Clean the main bolt assembly. Remove corrosion. Repair the surface finish. Refer to Section 51-20. No corrosion permitted. Maximum depth 0.1 mm (0.004 in). No deformation permitted. Replace the bolt if you cannot attach the removal tool correctly.
(6)	Measure the radial play of each main bolt in the related main bulkhead bushes.	Maximum radial play 0.2 mm (0.008 in).
(7)	Measure the radial play of each main bolt in the related spar stub bush.	Maximum radial play 0.2 mm (0.008 in).
(8)	Lubricate these items: – Main bolts. – Front and rear main bulkhead bushes. – Spar bushes. – A and B-bolt bushes in the end ribs. – A and B-bolts in the wing root ribs.	Refer to Section 12-20.
(9)	Examine the flap. Look specially for damage to the inner end rib.	

D. Install the Wings

Use this procedure to install the left wing or the right wing. Where a part of the procedure applies to only one wing it will tell you so.

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td>(1)</td><td>Do the pre-installation check.</td><td>Refer to Paragraph C.</td></tr>
<tr><td colspan="3">WARNING: USE 3 PERSONS TO LIFT THE WING. IF YOU DO NOT, YOU CAN CAUSE INJURY.

CAUTION: DO NOT LIFT ON THE FLAP. YOU CAN DAMAGE THE FLAP.

CAUTION: DO NOT LET THE SPAR STUBS TOUCH THE CENTER SECTION SHELLS. YOU CAN DAMAGE THE SHELLS.</td></tr>
<tr><td colspan="3">Note: Until you install the main bolts, one person must lift the wing tip. One person must lift the leading edge at the root rib. One person must lift the trailing edge at the root rib.</td></tr>
<tr><td>(2)</td><td>Lift the wing into position:
– Install inboard fuel tank access panel.
– Move the spar stubs part way into the front and rear box spars.
– Put the electrical cable, Pitot static and fuel lines through the conduit in the leading edge of the center section.
– Align the flap inner rib with the inner flap.
– Move the wing fully into the center section to engage the A and B-bolts and the outer flap to inner flap transfer lug.</td><td>

Hold the wing in position.
Hold the wing in position. Pitot static tube left wing only.
Hold the wing in position.</td></tr>
<tr><td>(3)</td><td>Install the main bolts:
– Hold the weight of the wing.
– Install each bolt.</td><td>If necessary, move the wing tip a small amount up and down to help install the main bolts.</td></tr>
</table>

	Detail Steps/Work Items	Key Items/References
(4)	Install the locking tubes on the inboard and outboard main bolts: – Install the long end piece in one main bolt. – Move the tube over the long end piece. – Install the short end piece in the other main bolt. – Move the tube over the short end piece. – Install the bolt, washer and self-locking nut through the tube and the long end piece.	Refer to Figure 2.
(5)	Connect these items: – The Pitot hose. – The static hose.	Left wing only. The hose is 8 mm (5/16 in) diameter (green color). The hose is 8 mm (5/16 in) diameter (purple color).
(6)	Connect the electrical connector.	Engine nacelle access panels.
(7)	Connect the bonding connections.	Engine nacelle access panels.
(8)	Connect the fuel hose.	At the fuel tank.
(9)	Connect the fuel probe and fuel sensor cables.	At the fuel tank.
(10)	Connect the flap pushrod: – Install the bolt, washer and self-locking nut.	Engine nacelle access panels. Torque: 6.4 Nm (4.7 lbf.ft.).
(11)	Connect the aileron pushrod: – Install the bolt, washer and self-locking nut.	Engine nacelle access panels. Torque: 6.4 Nm (4.7 lbf.ft.).
(12)	If you must also install the other wing, do steps 1 to 11 again for the other wing.	
(13)	Connect the battery.	Refer to Section 24-31.
(14)	Do a test for correct operation and range of movement of the flap system. If necessary, adjust the flap system.	Refer to Section 27-50.

	Detail Steps/Work Items	Key Items/References
(15)	Do an inspection of the flap controls which you have connected or adjusted. – If necessary for your Airworthiness Authority, do a second inspection of the controls.	
(16)	Do a test for correct operation and range of movement of the aileron system. If necessary, adjust the aileron system.	Refer to Section 27-10.
(17)	Do an inspection of the aileron controls which you have connected or adjusted. – If necessary for your Airworthiness Authority, do a second inspection of the controls.	
(18)	Do a functional check of these lights: – Position lights. – Strobe lights (ACLs).	Refer to Section 33-40.
(19)	Do a Pitot and static system leak test.	Left wing only. Refer to Section 34-10.
(20)	Refuel the airplane to the unusable fuel level.	Refer to Section 12-10.
(21)	Do a fuel quantity indication calibration check.	Refer to Section 28-40.
(22)	Do a check flight.	Refer to the DA 42 NG Airplane Flight Manual.

3. Remove/Install the A or B-Bolts

A. Remove the A or B-Bolts

	Detail Steps/Work Items	Key Items/References
(1)	Remove the wing.	Refer to Paragraph 2.
(2)	Remove the A or B-bolt: – Hold the flats on the flange of the bolt with a wrench. – Remove the self-locking nut from the A or B-bolt. – Remove the A or B-bolt.	Refer to Figure 3. Access for the A-bolt through the hole in the front root rib. Access for the B-bolt through the access panel in the bottom shell.

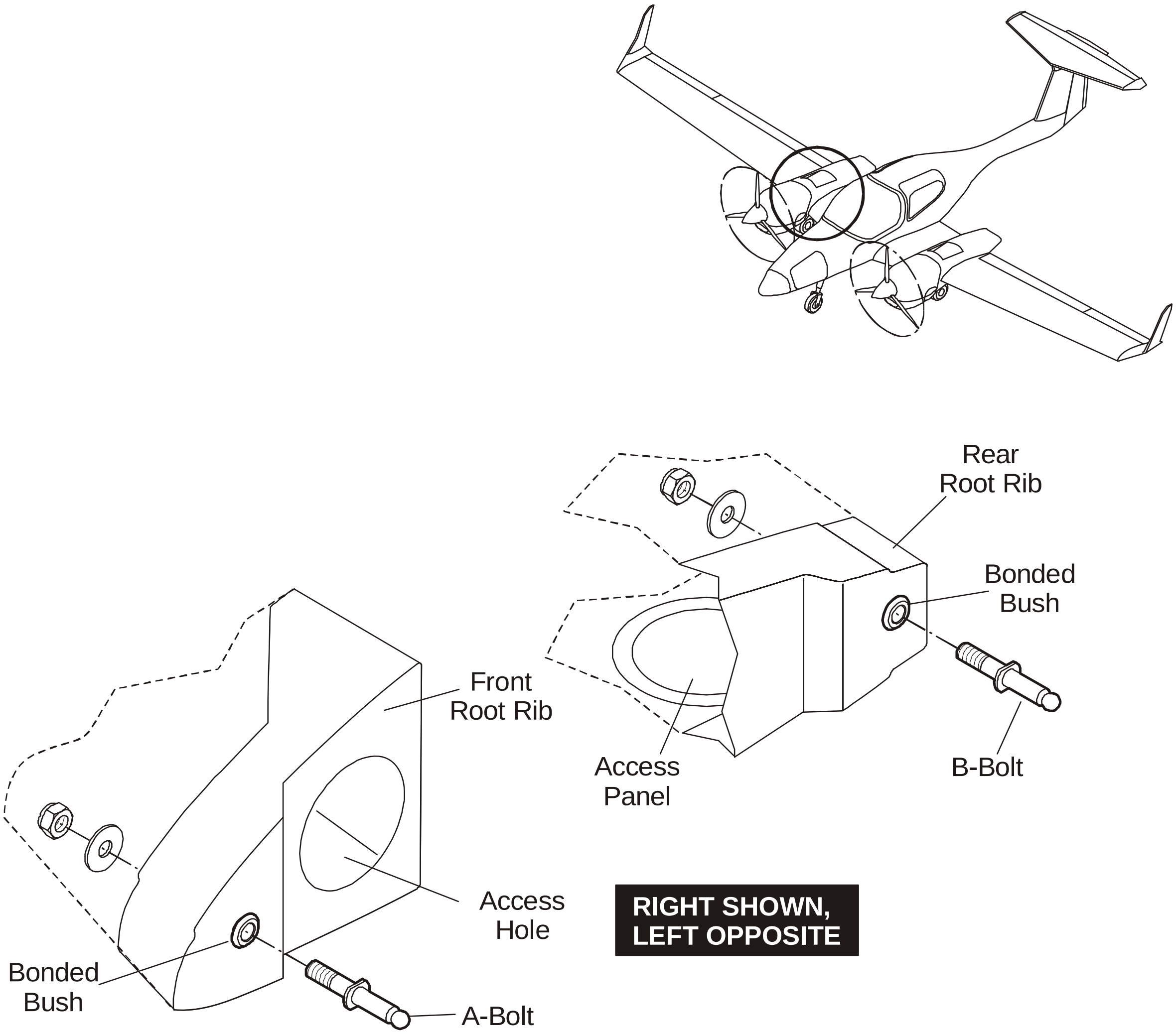

Figure 3: A and B-Bolt Installation

B. Install the A or B-Bolt

	Detail Steps/Work Items	Key Items/References
(1)	Examine the A or B-bolt. Look specially for:	
	– Corrosion.	No corrosion permitted.
	– Scratches on the bearing surfaces.	Maximum depth 0.1 mm (0.004 in).
	– Deformation.	No deformation permitted.
	– Damage to the threads.	No damage permitted.
(2)	Examine the A or B-bolt bush. Look specially for: – Looseness between the A or B-bolt bush and the root rib. – Damage to the root rib where the bush attaches. – Damage to the bush.	
(3)	Install the A or B-bolt:	Refer to Figure 3.
	– Install the bolt in the bush.	Access for the A-bolt through the hole in the front root rib.
	– Hold the flats on the flange of the bolt with a wrench.	Access for the B-bolt through the access panel in the bottom shell.
	– Install the washer and self-locking nut.	Torque: 32 Nm (23.6 lbf.ft.).
(4)	Install the wing.	Refer to Paragraph 2.

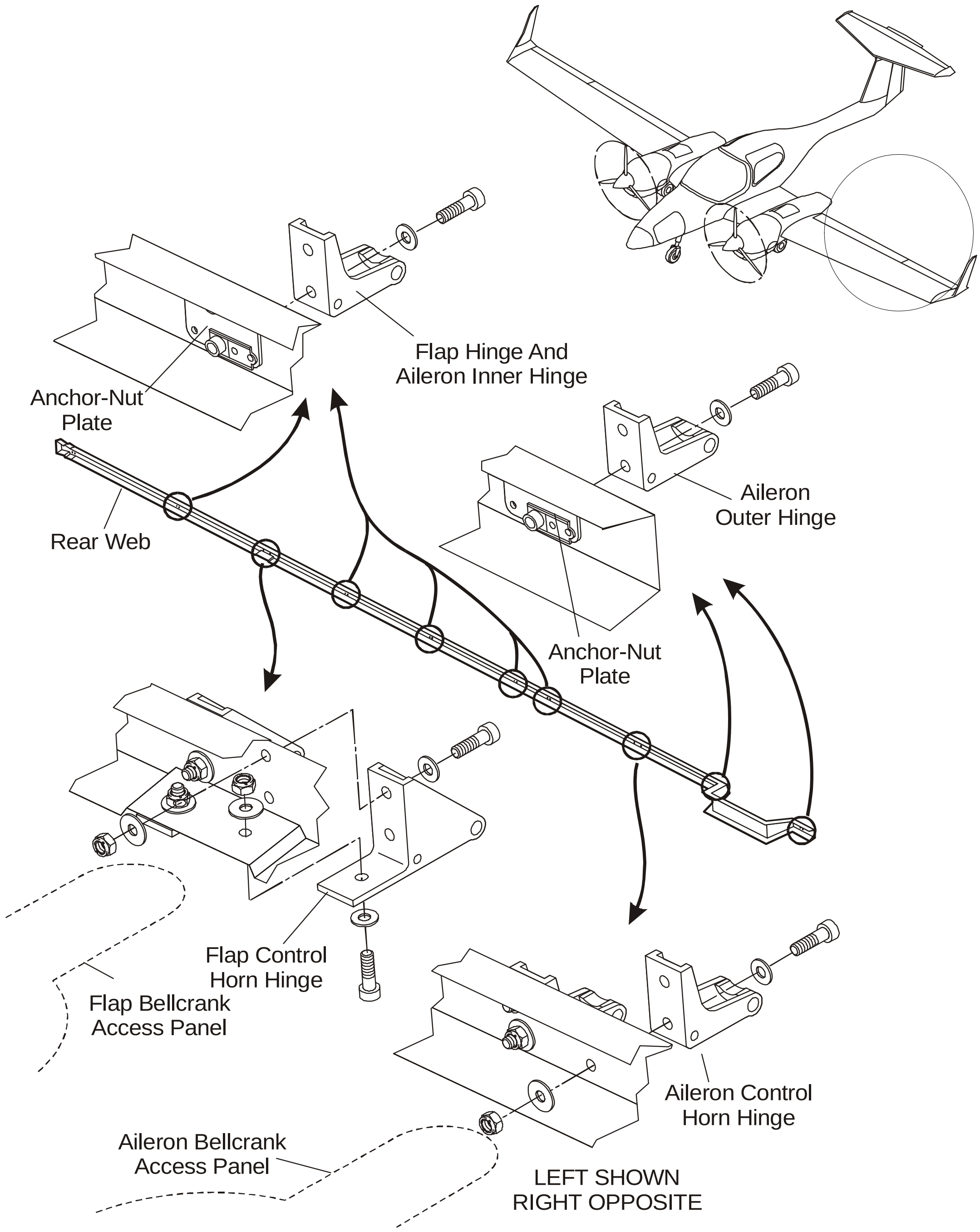

Figure 4: Control Surface Hinge Bracket Installation

4. Remove/Install Control Surface Hinge Brackets

A. Remove a Control Surface Hinge Bracket

	Detail Steps/Work Items	Key Items/References
(1)	Remove the control surface.	Refer to Sections 57-50 and 57-60.
(2)	For brackets at the control horn hinge: – Remove the control bell crank access panel under the wing. – Remove the attaching nuts and large washers. – Remove the bolts and small washers. – Remove the bracket.	The flap brackets have 3 bolts. The aileron brackets have 2 bolts. From inside of the wing.
(3)	For brackets not at the control horn hinge: – Remove the bolts and small washers. – Remove the bracket.	All brackets have 2 bolts.

B. Install a Control Surface Hinge Bracket

	Detail Steps/Work Items	Key Items/References
(1)	For brackets at the control horn hinge:	The flap brackets have 3 bolts.
	– Put the bracket in position on the rear web.	The aileron brackets have 2 bolts.
	– Install the bolts with small washers.	
	– Install the large washers and self-locking nuts.	From inside of the wing. Torque: 3.6 Nm (2.7 lbf.ft.).
	– Install the control bellcrank access panel under the wing.	
(2)	For brackets not at the control horn hinge:	All brackets have 2 bolts.
	– Put the bracket in position on the rear web.	
	– Install the bolts and small washers.	Torque: 3.6 Nm (2.7 lbf.ft.).
(3)	Install the control surface.	Refer to Sections 57-50 and 57-60.

Section 57-50

Flaps

1. General

This Section tells you about the flap of the DA 42 NG. The DA 42 NG has an inner and an outer flap on each wing. The outer flap attaches to the outer wing and the inner flap attaches to the airplane wing center section. The flap selector in the cockpit controls both inner and outer flaps.

Refer to Section 27-50 for data about the flap control system.

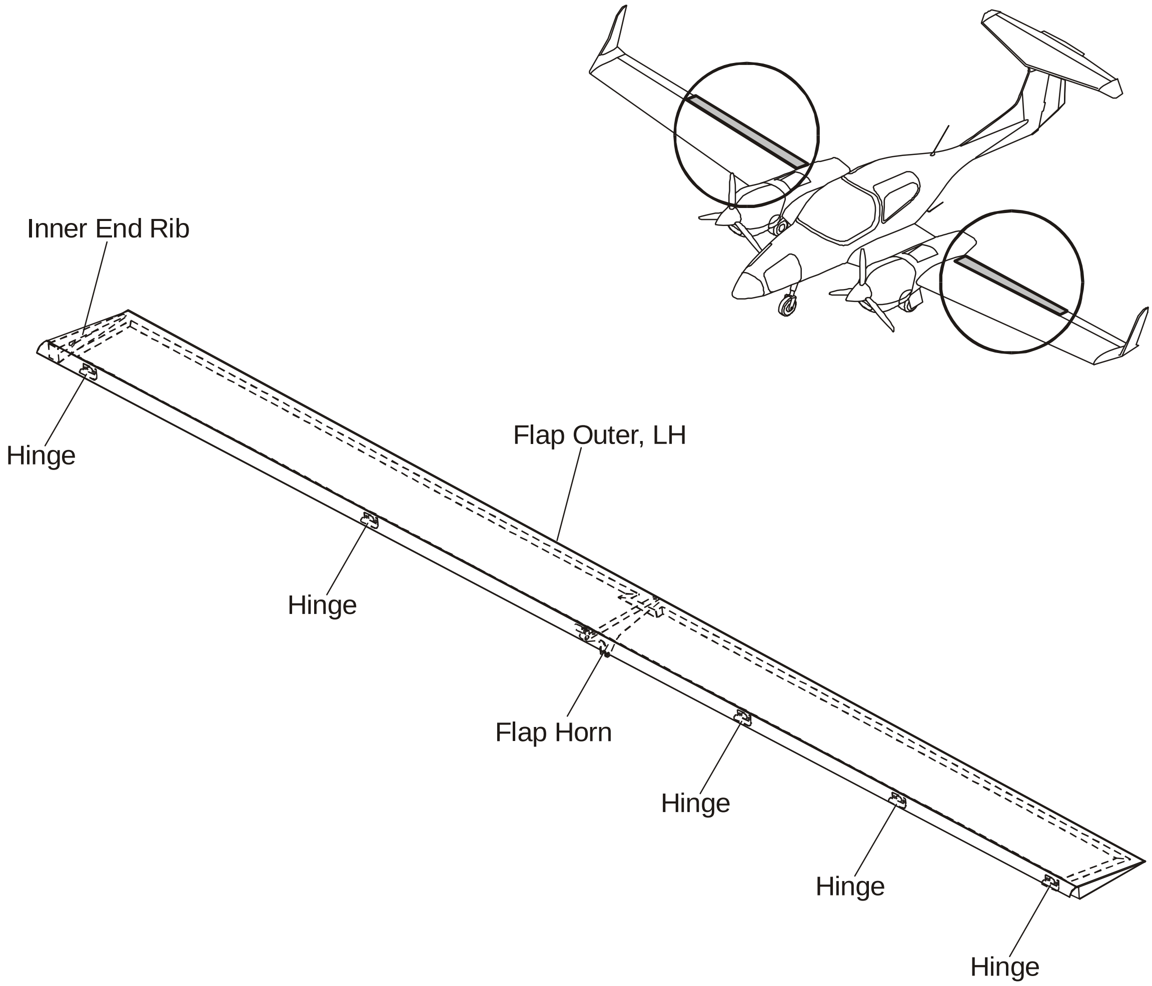

Figure 1: Outer Flap Assembly

2. Description

Figures 1 and 2 show the outer and inner flaps. Both flaps have a similar construction.

A. Outer Flap

The outer flap has a top shell and a bottom shell.

The bottom shell has inner and outer skins which bond to a foam core. The outer layer of the skins are GFRP. The inner layers are CFRP. The leading edge of the shell bends up to form a web. It then curves forward to form a shroud which seals the gap between flap and wing when the flap is down.

The outboard end of the bottom shell also bends up to close the end of the flap. The leading edge, the ends, and the area where the horn attaches have more carbon fiber cloth to give more strength and stiffness.

The top shell has inner and outer GFRP skins which bond to a foam core. The outer layer of the skins are GFRP. The inner layers are CFRP. The top shell bonds to the bottom shell and the inner end rib.

The flap has an inner end rib. The inner end rib is a CFRP molding. The rib has an recess which engages with an extension on the inner flap. The end rib bonds to the top and bottom shells.

A flap horn drives the outer flap. The flap horn is an aluminum alloy component. Three bolts attach the horn to the bottom surface of the flap. A small hole in the leading edge of the flap gives access to the front attaching nuts and washers. The horn also makes one of the flap hinges. Two flanged bushes in the front of the horn make the hinge.

Hinges attach the outer flap to the trailing edge of the outer wing. Each flap has five hinges (as well as the flap horn). Two bolts attach each hinge to the leading edge of the flap. A small hole in the middle of the hinge gives access to the attaching nuts and washers. Each hinge has a flanged bush at the inboard end. A plastic plug seals the outboard end.

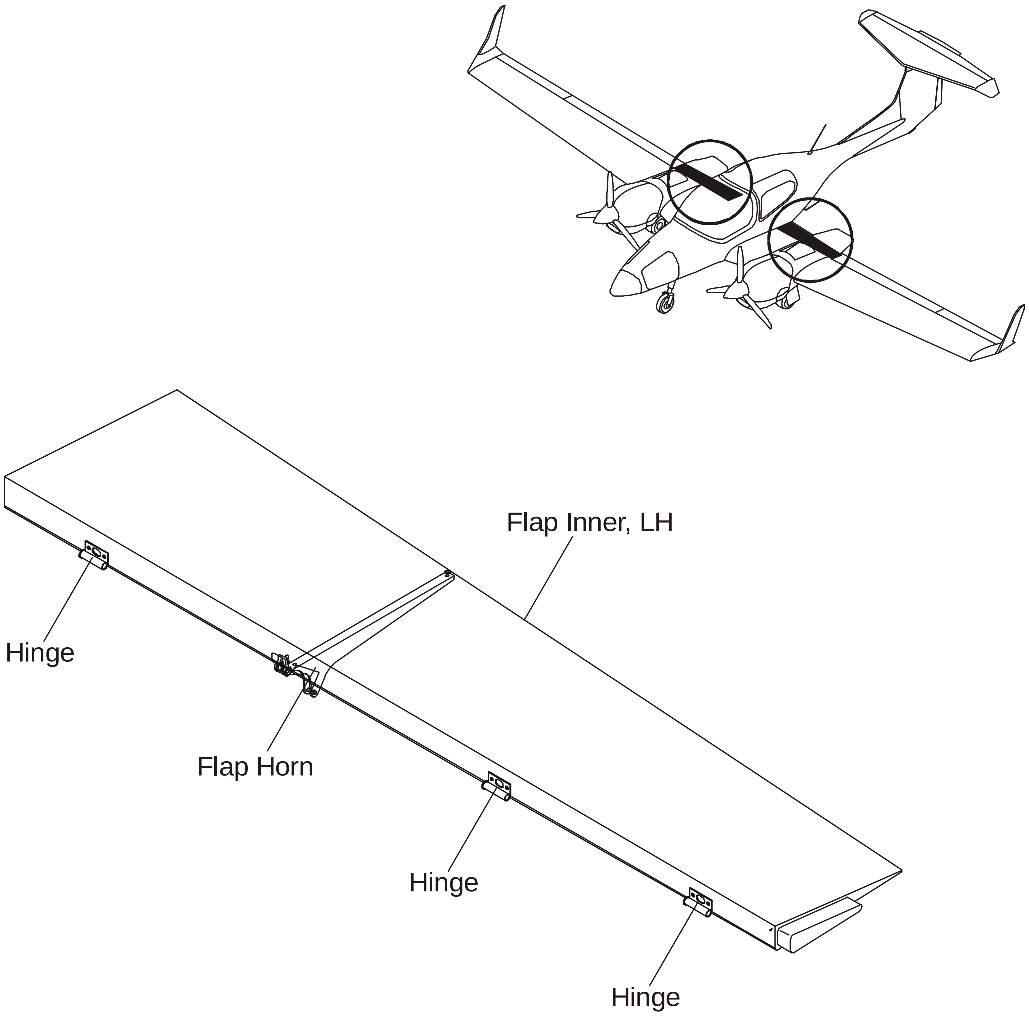

Figure 2: Inner Flap Assembly

B. Inner Flap

The inner flap has a top shell and a bottom shell.

The bottom shell has inner and outer skins which bond to a foam core. The outer layer of the skins are GFRP. The inner layers are CFRP. The leading edge of the shell bends up to form a web.

The inboard end of the bottom shell also bends up to close the end of the flap. The leading edge, the ends, and the area where the horn attaches have more carbon fiber cloth to give more strength and stiffness.

The top shell has inner and outer GFRP skins which bond to a foam core. The outer layer of the skins are GFRP. The inner layers are CFRP. The top shell bonds to the bottom shell and the inner end rib.

The flap has an outer end rib. The outer end rib is a CFRP molding. The rib has an extension which engages with a recess on the outer flap. The end rib bonds to the top and bottom shells.

A flap horn drives the inner flap. The flap horn is an aluminum alloy component. Three bolts attach the horn to the bottom surface of the flap. A small hole in the leading edge of the flap gives access to the front attaching nuts and washers. The horn also makes one of the flap hinges. Two flanged bushes in the front of the horn make the hinge.

Hinges attach the inner flap to the trailing edge of the airplane center section. Each inner flap has four hinges (as well as the flap horn). Two bolts attach each hinge to the leading edge of the flap. A small hole in the middle of the hinge gives access to the attaching nuts and washers. Each hinge has a flanged bush at the inboard end. A plastic plug seals the outboard end.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the flaps. Refer to Section 27-50 for the flap setting procedure.

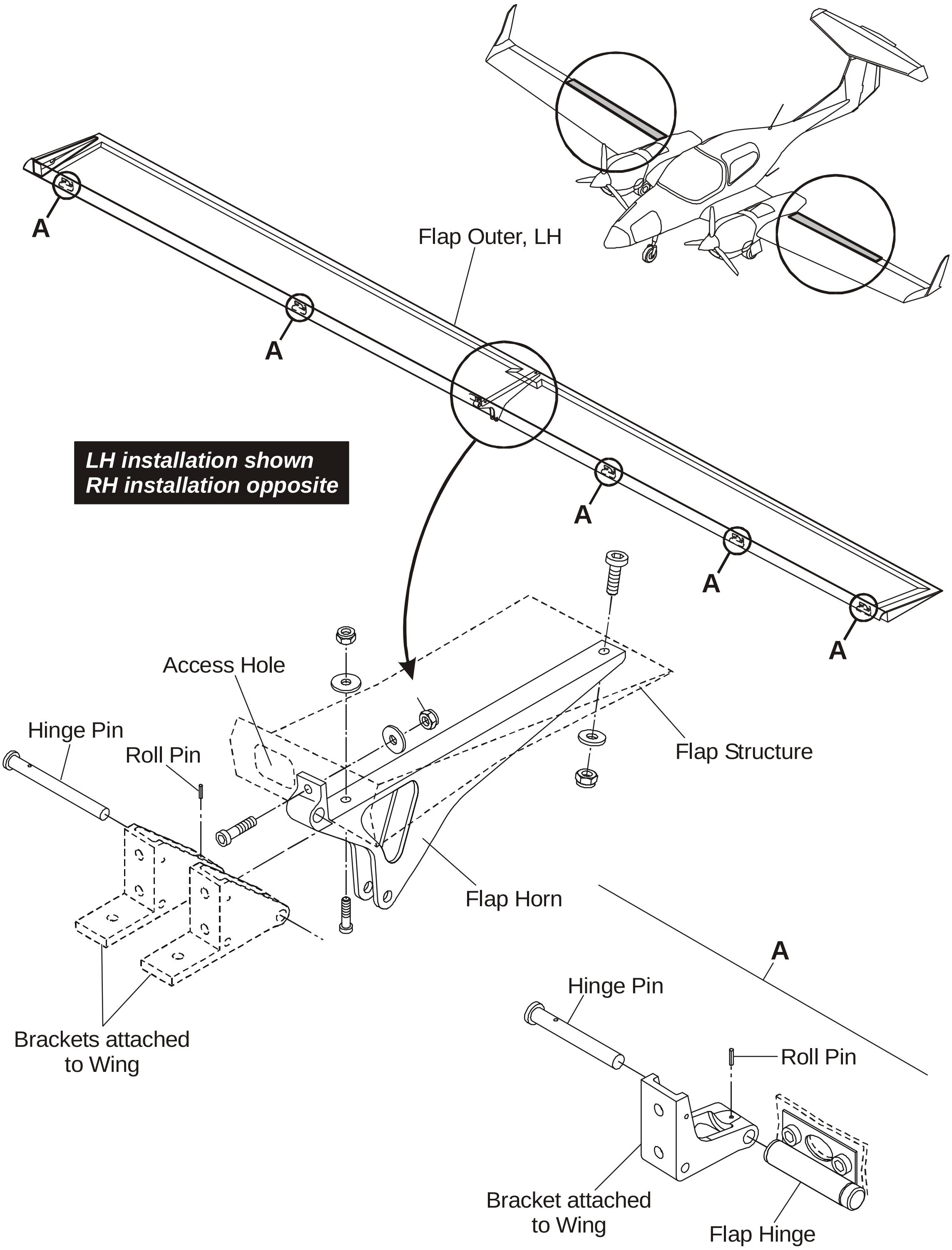

Figure 3: Outer Flap Installation

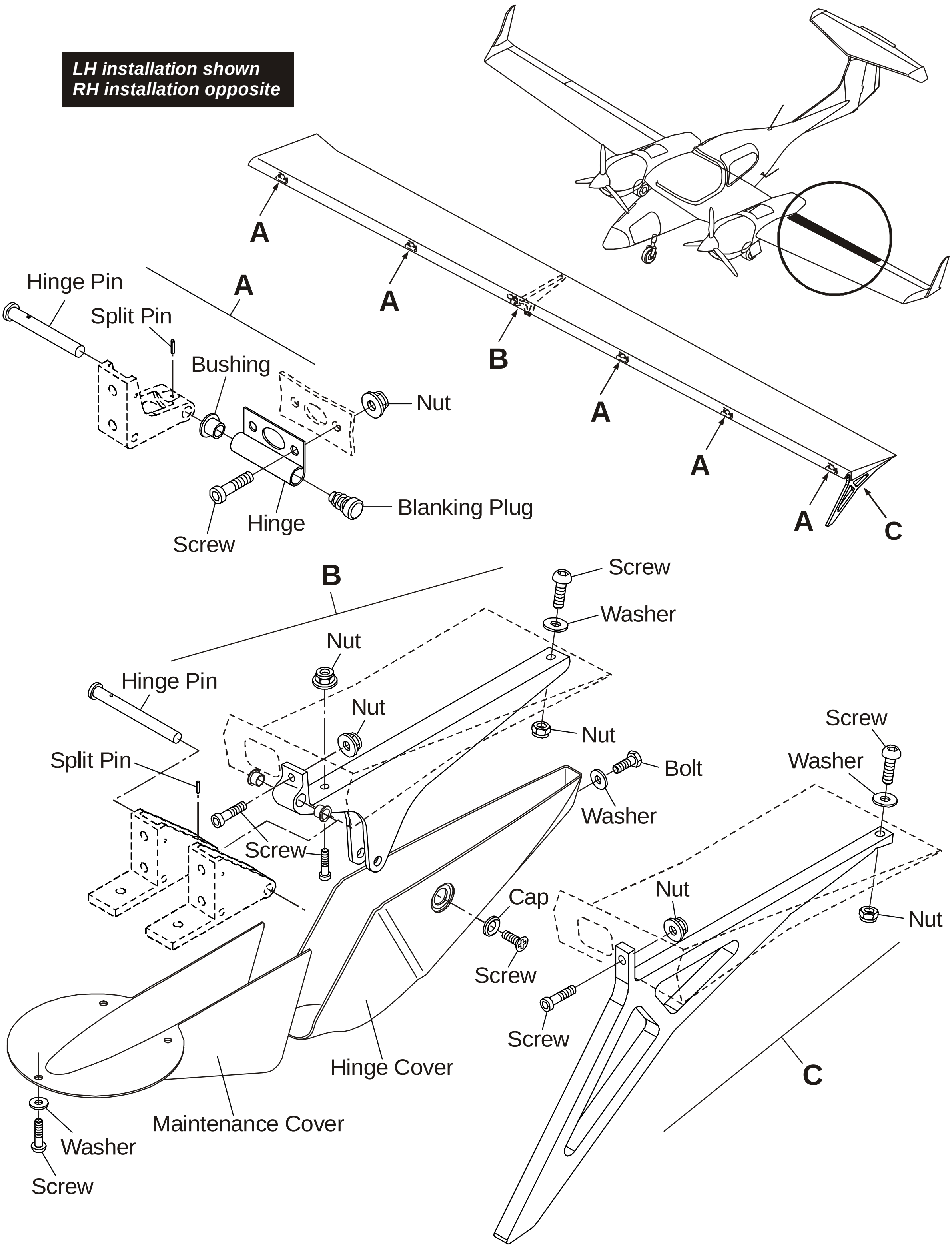

Figure 4: Outer Flap Installation (if MÄM 42-600 is installed)

2. Remove/Install a Flap

A. Remove an Outer Flap

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE AREA AROUND THE FLAPS IS CLEAR OF PERSONS AND EQUIPMENT BEFORE YOU LOWER THE FLAPS. IF NOT, THE FLAPS CAN INJURE PERSONS OR BE DAMAGED BY EQUIPMENT.	
(1)	Lower the flaps: – Set the ELECT. MASTER switch to ON. – Set the flap selector to LDG. – When the flaps stop moving. – Set the ELECT. MASTER switch to OFF.	
(2)	Open the circuit breaker for the flap control.	Instrument panel. Right side.
(3)	Remove the flap hinge cover (if MÄM 42-600 is installed): – Remove the bolts and washers which attach the flap hinge cover to the flap horn. – Remove the flap hinge cover including the bushings.	
(4)	Disconnect the flap push rod from the flap horn: – Remove the nut and washer from the bolt which attaches the push rod to the horn. – Remove the attachment bolt and washer from the horn.	Refer to Figure 3. Hold the flap.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the 6 hinge pins from the flap hinges and the flap horn: – Remove the roll pins which locate the flap hinge pins. – Move the hinge pins inboard, and clear of the hinges.	Support the flap assembly!
(6)	Carefully move the flap aft, and clear of the airplane.	

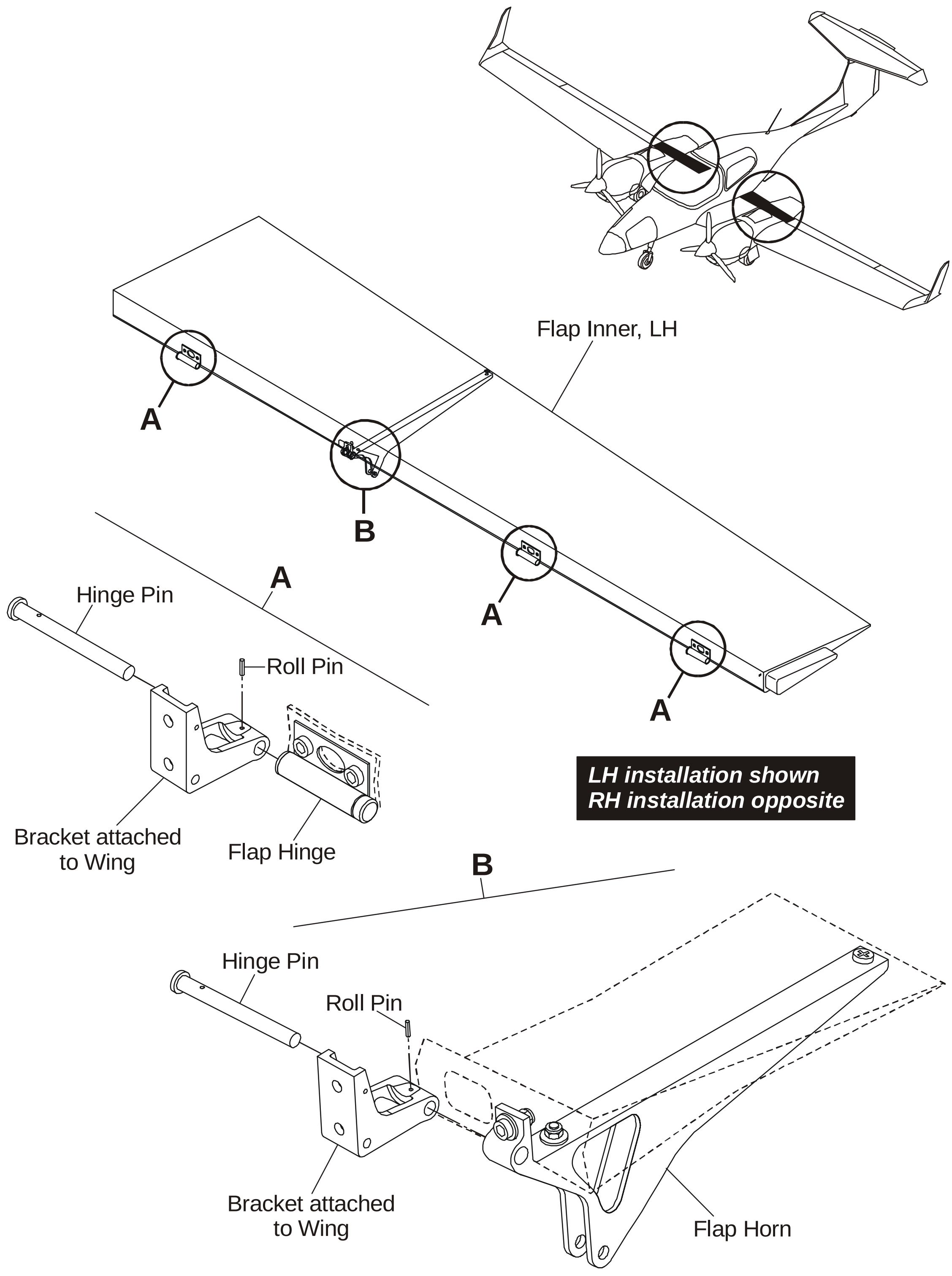

Figure 5: Inner Flap Installation

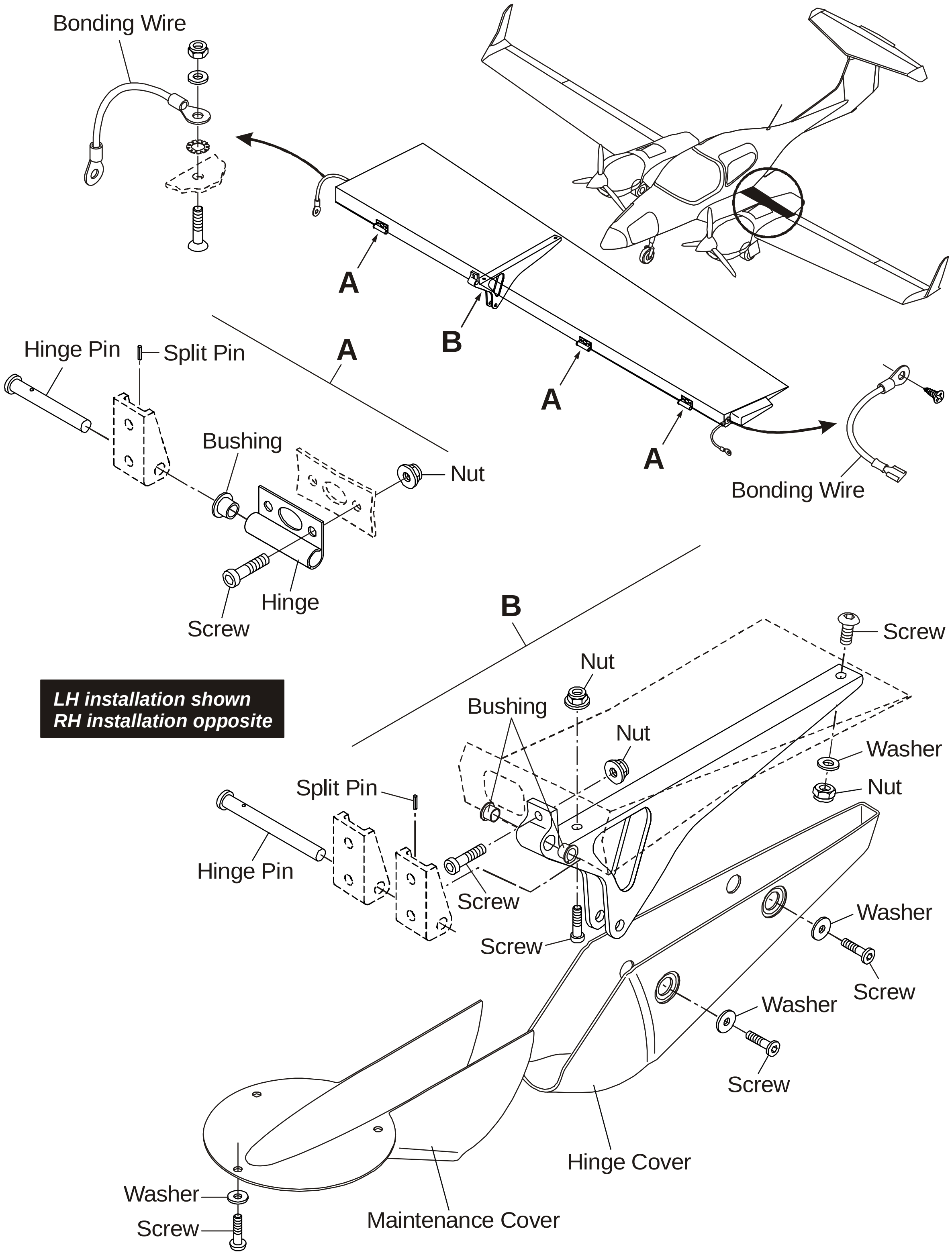

Figure 6: Inner Flap Installation (if MÄM 42-600 is installed)

B. Remove an Inner Flap

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE AREA AROUND THE FLAPS IS CLEAR OF PERSONS AND EQUIPMENT BEFORE YOU LOWER THE FLAPS. IF NOT, THE FLAPS CAN INJURE PERSONS OR BE DAMAGED BY EQUIPMENT.	
(1)	Lower the flaps: – Set the ELECT. MASTER switch to ON. – Set the flap selector to LDG. – When the flaps stop moving. – Set the ELECT. MASTER switch to OFF.	
(2)	Open the circuit breaker for the flap control.	Instrument panel. Right side.
(3)	Remove the flap hinge cover (if MÄM 42-600 is installed): – Remove the bolts and washers which attach the flap hinge cover to the flap horn. – Remove the flap hinge cover including the bushings.	Refer to Figure 6.
(4)	Disconnect the flap push rod from the flap horn: – Remove the nut and washer from the bolt which attaches the push rod to the horn. – Remove the attachment bolt and washer from the horn.	Refer to Figure 5. Hold the flap.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the 4 hinge pins from the flap hinges and the flap horn: – Remove the roll pins which locate the flap hinge pins. – Move the hinge pins inboard, and clear of the hinges.	Support the flap assembly!
(6)	Carefully move the flap aft, and clear of the airplane.	

C. Install an Outer Flap

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the hinge pins are clean and not damaged.	
(2)	Put the flap into position on the airplane.	
(3)	Install the 6 hinge pins in the hinges and flap horn: – Push the hinge pins into position from the inboard side. – Align the holes in the hinges with the holes in the hinge pins and install the roll pins.	Make sure that there is a gap of 0.5 - 2.5 mm (0.002 - 0.010 in) between the faces of the hinge at the horn and a gap of 1 - 3 mm (0.004 - 0.012 in) between the faces at the other hinges.
(4)	Install the bolt which attaches the flap push rod to the flap horn: – Install a washer on the bolt. – Push the bolt through the horn and the push rod. – Install the washer and the nut on the bolt.	
(5)	Do a test for correct adjustment of the flaps.	Refer to Section 27-50.
(6)	Install the flap hinge cover (if MÄM 42-600 is installed): – Position the flap hinge cover to the flap horn. – Install the bushings. – Install the washer and bolts.	Apply Loctite Screw Locking 243 (blue) or equivalent.
(7)	If necessary for your Airworthiness Authority, do a second inspection of the flap controls.	

D. Install an Inner Flap

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the hinge pins are clean and not damaged.	
(2)	Put the flap into position on the airplane.	
(3)	Install the 4 hinge pins in the hinges and flap horn: – Push the hinge pins into position from the inboard side. – Align the holes in the hinges with the holes in the hinge pins and install the roll pins.	Make sure that there is a gap of 0.5 - 2.5 mm (0.002 - 0.010 in) between the faces of the hinge at the horn and a gap of 1 - 3 mm (0.004 - 0.012 in) between the faces at the other hinges.
(4)	Install the bolt which attaches the flap push rod to the flap horn: – Install a washer on the bolt. – Push the bolt through the horn and the push rod. – Install the washer and the nut on the bolt.	
(5)	Do a test for correct adjustment of the flaps.	Refer to Section 27-50.
(6)	Install the flap hinge cover (if MÄM 42-600 is installed): – Position the flap hinge cover to the flap horn. – Install the bushings. – Install the washer and bolts.	Apply Loctite Screw Locking 243 (blue) or equivalent.
(7)	If necessary for your Airworthiness Authority, do a second inspection of the flap controls.	

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Section 57-60

Ailerons

1. General

This Section tells you about the aileron. Refer to Section 27-10 for data about the aileron control system.

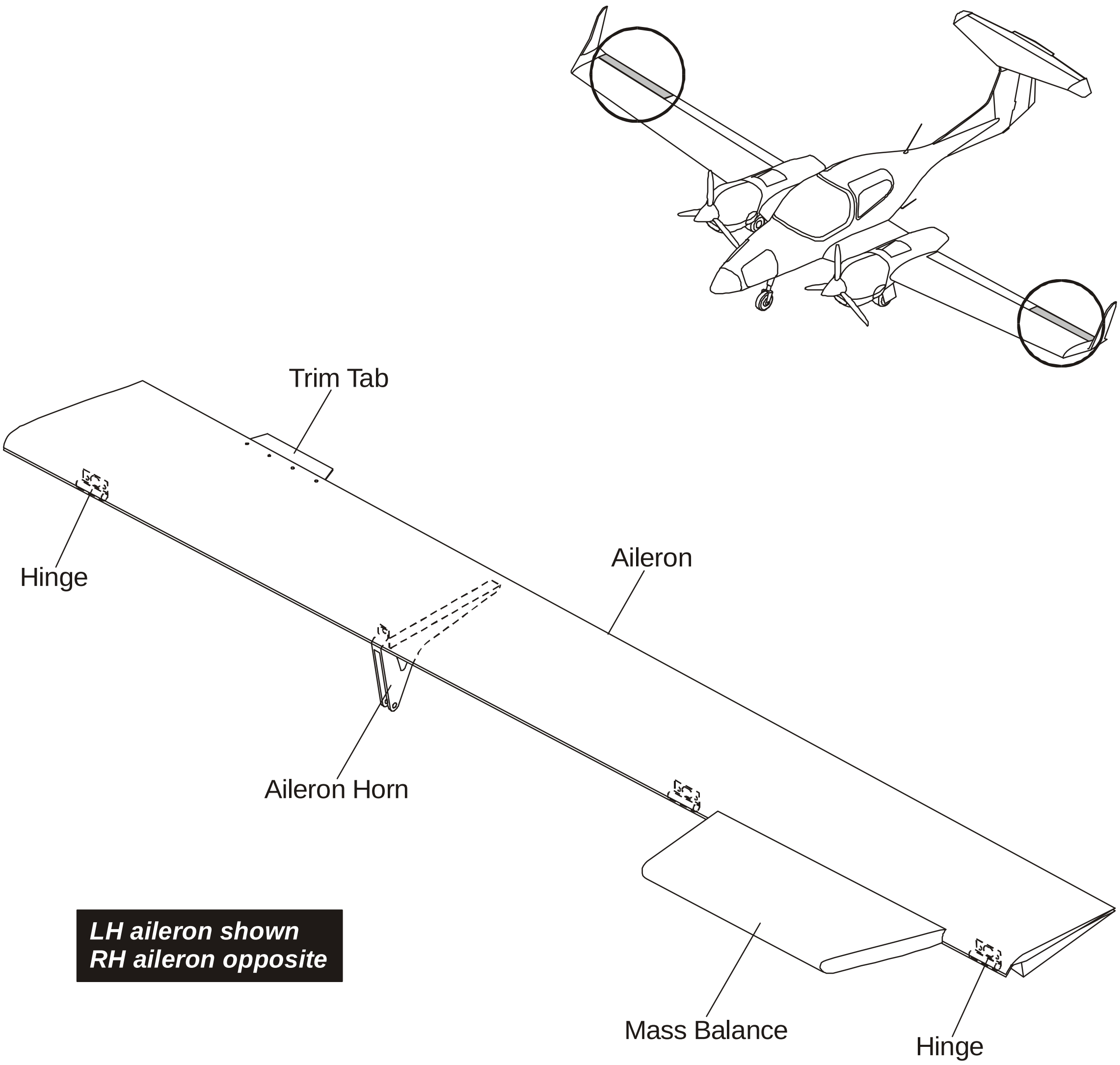

Figure 1: Aileron Assembly

2. Description

Figure 1 shows the aileron assembly.

The aileron has a bottom shell and a top shell. The bottom shell has inner and outer CFRP skins. The outer and inner layers of the skins are GFRP. The skins bond to a rigid plastic foam core. The leading edge of the shell bends up to form a web. It then curves forward to form a shroud which seals the gap between aileron and wing when the aileron moves down.

The ends of the bottom shell also bend up to close the ends of the aileron. The leading edge, the ends and the area where the horn attaches have more carbon fiber cloth to give more strength and stiffness.

The top shell has inner and outer CFRP skins. The outer and inner layers of the skins are GFRP. The skins bond to a rigid plastic foam core.

The aileron horn is an aluminum alloy component. Three bolts attach the horn to the bottom surface of the aileron. A small hole in the leading edge of the aileron gives access to the front attaching nuts and washers. The horn also makes one of the aileron hinges.

Each aileron has three hinges (as well as the aileron horn). Two bolts attach each hinge to the leading edge of the aileron. A small hole in the middle of the hinge gives access to the attaching nuts and washers. Each hinge has a flanged bush at the inboard end. A plastic plug seals the outboard end.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the ailerons. Refer to Section 27-10 for the aileron control setting procedure.

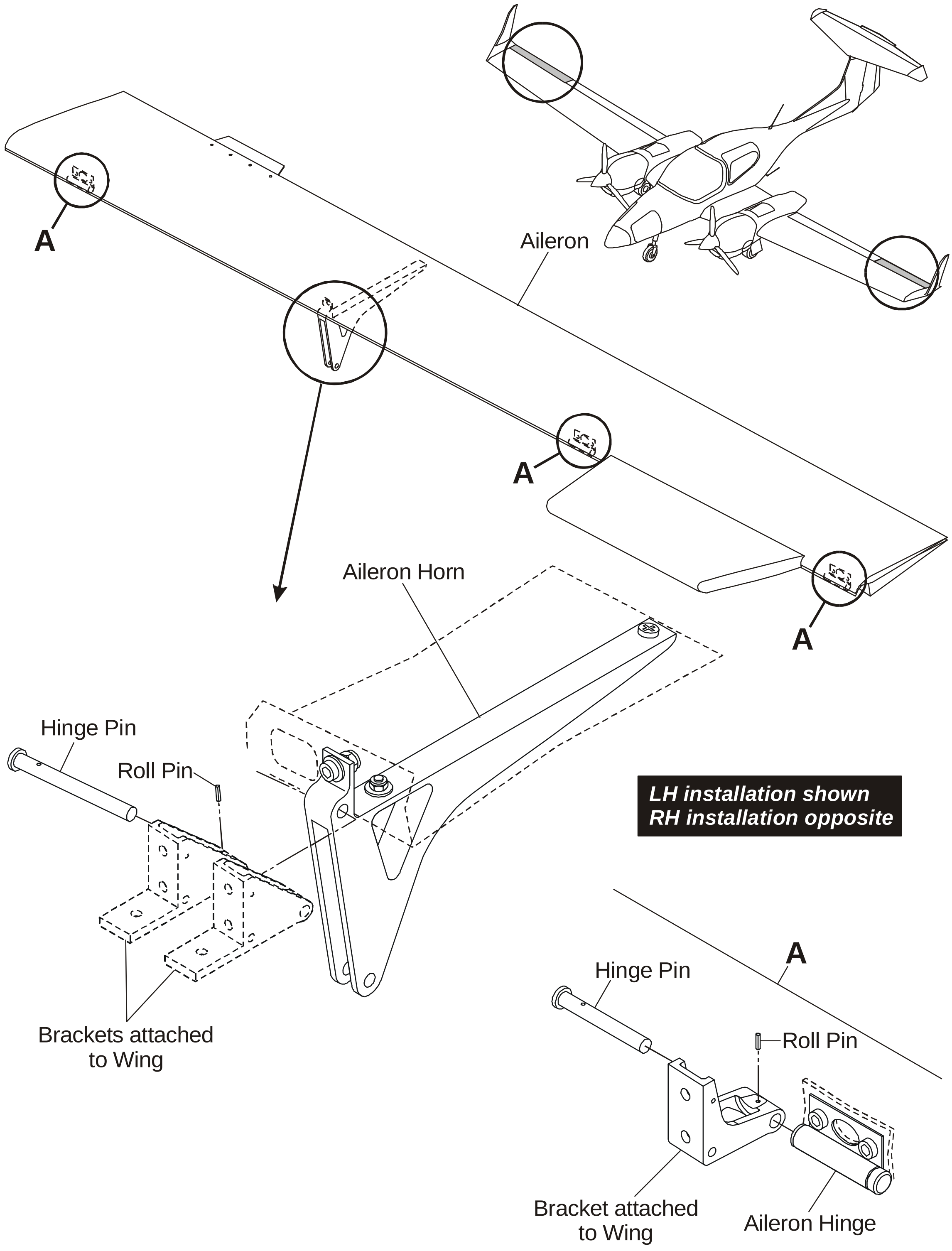

Figure 2: Aileron Installation

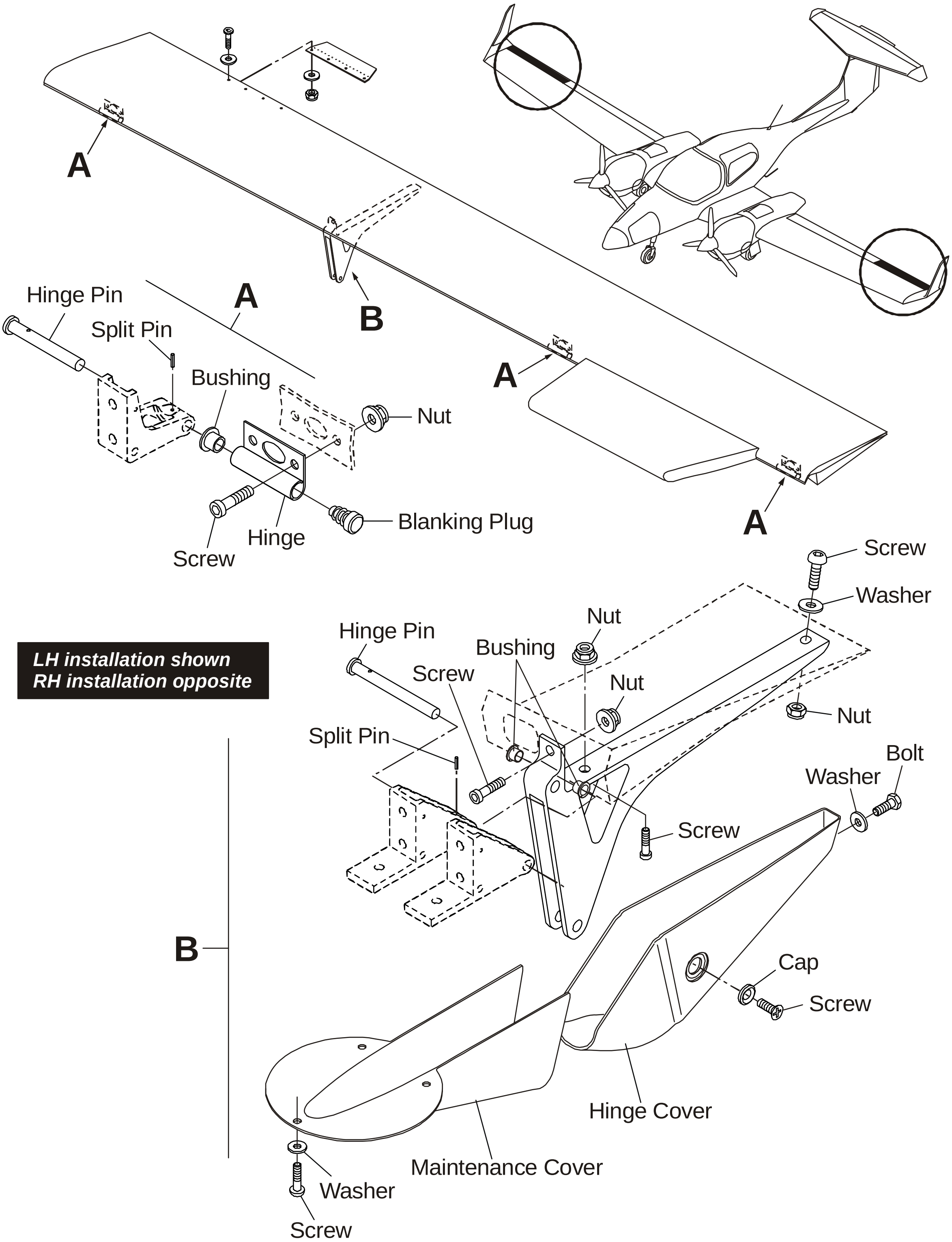

Figure 3: Aileron Installation (if MÄM 42-600 is installed)

2. Remove/Install an Aileron

A. Remove an Aileron

	Detail Steps/Work Items	Key Items/References
(1)	Remove the aileron hinge cover (if MÄM 42-600 is installed): – Remove the bolts and washers which attach the aileron hinge cover to the aileron horn. – Remove the aileron hinge cover including the bushes.	
(2)	Disconnect the aileron push rod from the aileron horn: – Remove the nut and washer from the bolt which attaches the push rod to the horn. – Remove the attachment bolt and washer from the horn.	Hold the aileron.
(3)	Remove the 4 hinge pins from the aileron hinges and the aileron horn: – Remove the roll pins which locate the aileron hinge pins. – Move the hinge pins inboard, and clear of the hinges.	Support the aileron assembly!
(4)	Carefully move the aileron aft, and clear of the airplane.	

B. Install an Aileron

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the hinge pins are clean and not damaged.	
(2)	Put the aileron into position on the airplane.	
(3)	Install the 4 hinge pins in the hinges and aileron horn: – Push the hinge pins into position from the inboard side. – Align the holes in the hinges with the holes in the hinge pins and install the roll pins.	Make sure that there is a gap of 0.5 - 2.5 mm (0.002 - 0.010 in) between the faces of the hinge at the horn and a gap of 1 - 3 mm (0.004 - 0.012 in) between the faces at the other hinges.
(4)	Install the bolt which attaches the aileron push rod to the aileron horn: – Install a washer on the bolt. – Push the bolt through the horn and the push rod. – Install the washer and the nut on the bolt.	
(5)	Do a test for correct adjustment of the aileron.	Refer to Section 27-60.
(6)	Install the aileron hinge cover (if MÄM 42-600 is installed): – Position the aileron hinge cover to the aileron horn. – Install the bushings. – Install the washer and bolts.	Apply Loctite Screw Locking 243 (blue) or equivalent.
(7)	If necessary for your Airworthiness Authority, do a second inspection of the aileron controls.	

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CHAPTER 61

PROPELLER

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CHAPTER 61
PROPELLER

1. General

This Chapter tells you about the propeller installed on the DA 42 NG. Refer to Section 61-10 for data about the propeller and refer to Section 61-20 for data about the propeller control.

For more data on the propeller refer to the propeller manufacturer's manuals.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called "Additional Equipment". The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

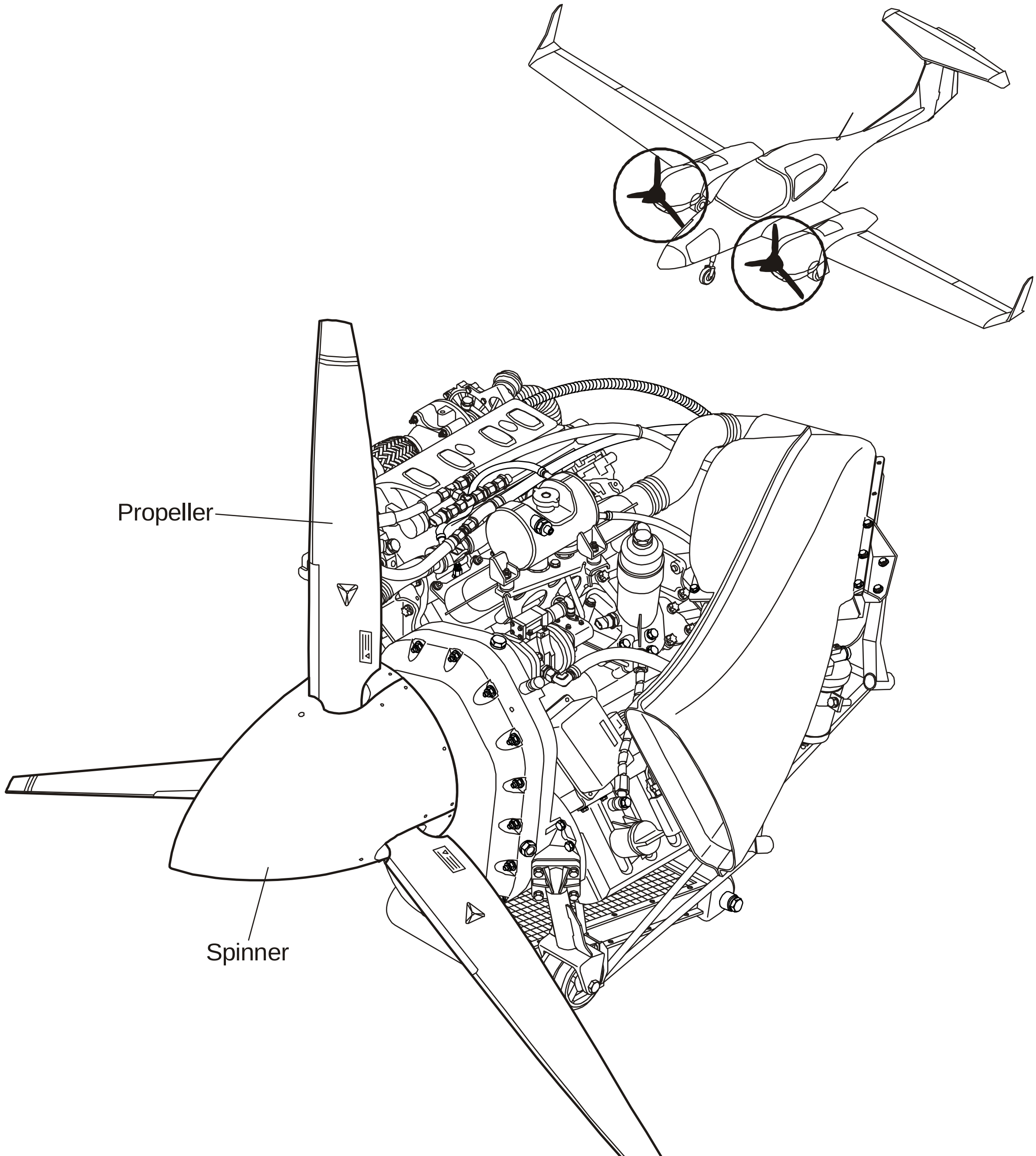

Figure 1: Propeller Assembly

Section 61-10
Propeller Assembly

1. General

The DA 42 NG has MTV-6-R-C-F/CF187-129 variable pitch and feathering propellers. Each propeller has three blades. The blades are made from wood and are covered with GFRP. The blades have an acrylic lacquer painted finish. The outboard leading-edges of the blades are protected from erosion by a stainless-steel sheath. The stainless-steel sheath is bonded into position. The inboard section of the leading-edge is protected by a self-adhesive rubber strip (PU tape).

This Section tells you how to remove and install the propellers and how to do a test for blade tracking. Section 61-20 tells you about the propeller governor.

Refer to the propeller manufacturer’s manuals for more data on the propeller.

If OÄM 42-204 is carried out, a gearbox fan with an additional alternator pulley is installed on the gearbox flange of the LH engine.

2. Description

Figure 1 shows the propeller. The propeller hub has six studs on the rear face. The propeller attaches to the engine gearbox flange with six nuts and washers.

If OÄM 42-204 is carried out, an additional alternator gearbox fan with an additional alternator pulley is installed on the gearbox flange of the LH engine using a prop flange pulley support. The six propeller attachment nuts mount the gearbox fan assy and the propeller to the gearbox flange (Figure 2).

A spinner bulkhead (spinner backplate) attaches to the rear of the hub with six bolts. The bolts are locked with wire. A front support plate attaches to the front of the hub with six screws. The screws are locked with wire. A spinner which is made from composite material attaches to the aft bulkhead with screws.

When the engine is running centrifugal twisting moments make the propeller blades move towards fine pitch. The propeller of the DA 42 NG has counterweights attached to the propeller blades. The counterweights overcome the centrifugal twisting moment of the blades and cause the blades to move to coarse pitch.

The engine has a electronic engine control system EECS including an electronic engine control unit (EECU). The EECU controls the propeller pitch hydraulically. Gearbox oil flows via the constant speed governor to control the oil pressure in the propeller pitch change mechanism. The oil pressure is increased for lower pitch angles and reduced for higher pitch angles. The oil flows from the governor to the propeller hub through the hollow propeller shaft.

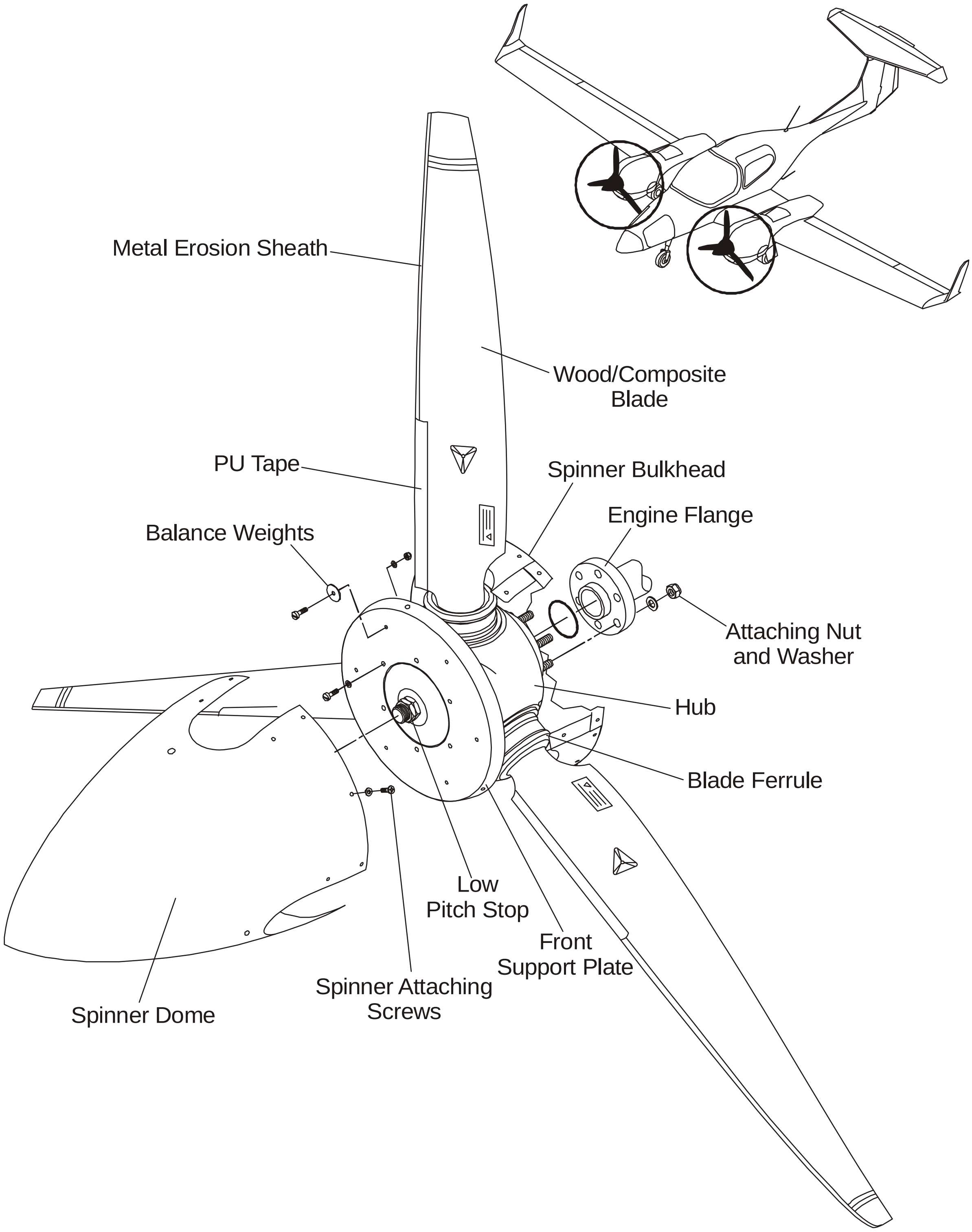

Figure 1: Propeller Assembly

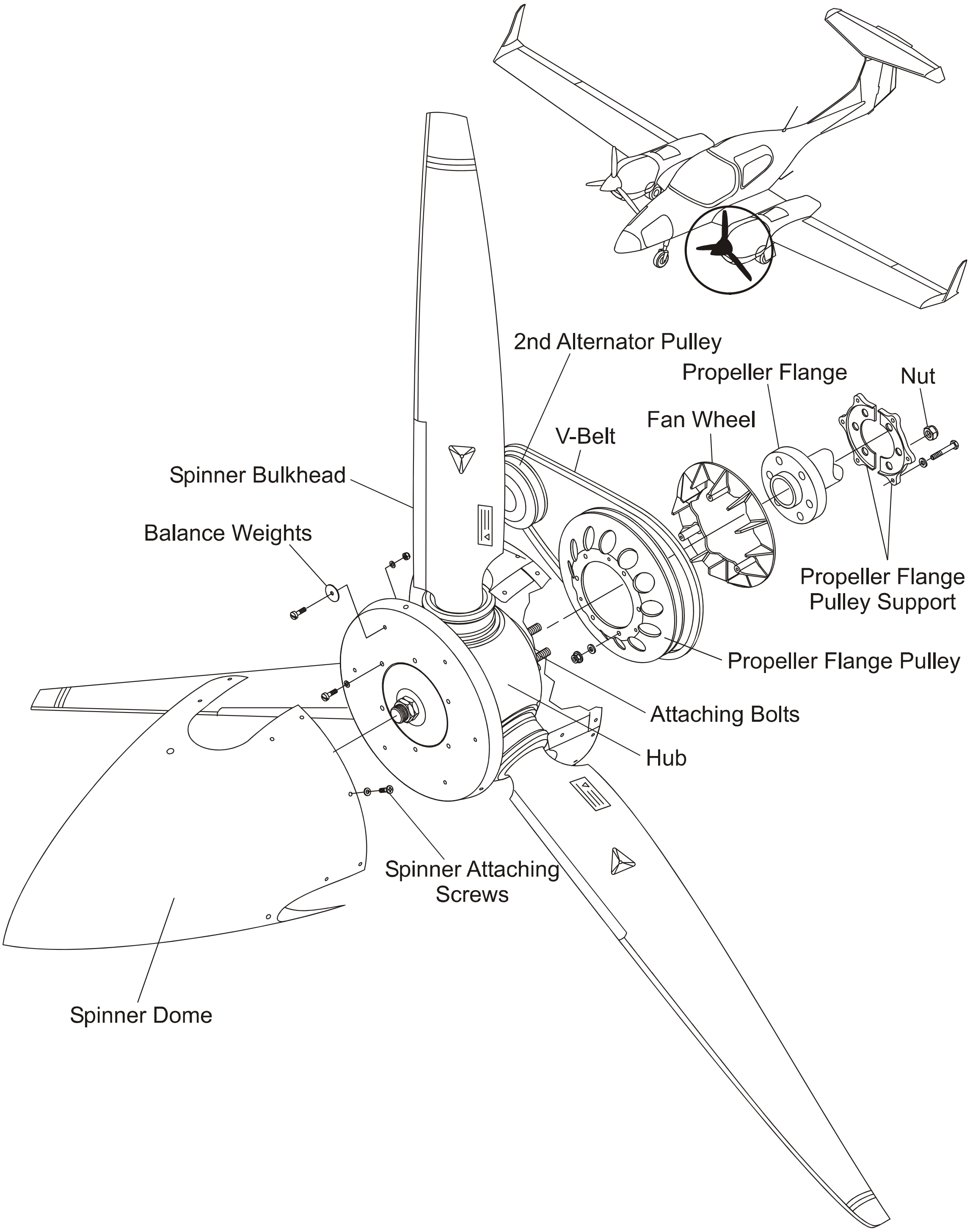

Figure 2: Propeller Assembly (if OÄM 42-204 is carried out)

3. Operation

When the propeller is turning, aerodynamic twisting moments normally cause the blades to turn towards fine pitch. The propeller installed on the DA 42 NG has counterweights attached to each propeller blade to overcome the aerodynamic twisting moments. The counterweights act in the opposite sense to the aerodynamic twisting moments and move the blades towards coarse pitch. In addition to that a spring within the propeller hub also supports the counterweight and forces the propeller blades to feathered position.

High pressure oil is used to control the propeller pitch. Oil from the engine gearbox is pumped to the governor. The governor directs the oil to the propeller as necessary to control the propeller pitch. Hydraulic pressure in the cylinder acts on a piston and the piston moves the propeller blades towards low pitch.

The propeller pitch control system is integrated into the engine EECS system. The pitch is controlled automatically by the EECU. Depending on the power setting the propeller pitch is adjusted so that the required RPM will be obtained as shown in Figure 3.

An pitch stop (start lock) limits the blade movement towards coarse pitch (propeller RPM below 1300 RPM). When the propeller RPM is higher than 1300 RPM the centrifugal latches (pitch stop) are disengaged and allow the propeller blades to move past the start lock position.

If the oil pressure fails during normal flight (propeller RPM greater than 1300 RPM), the centrifugal latches are disengaged and the counterweights and a spring in the propeller hub will force the propeller to the feathered position.

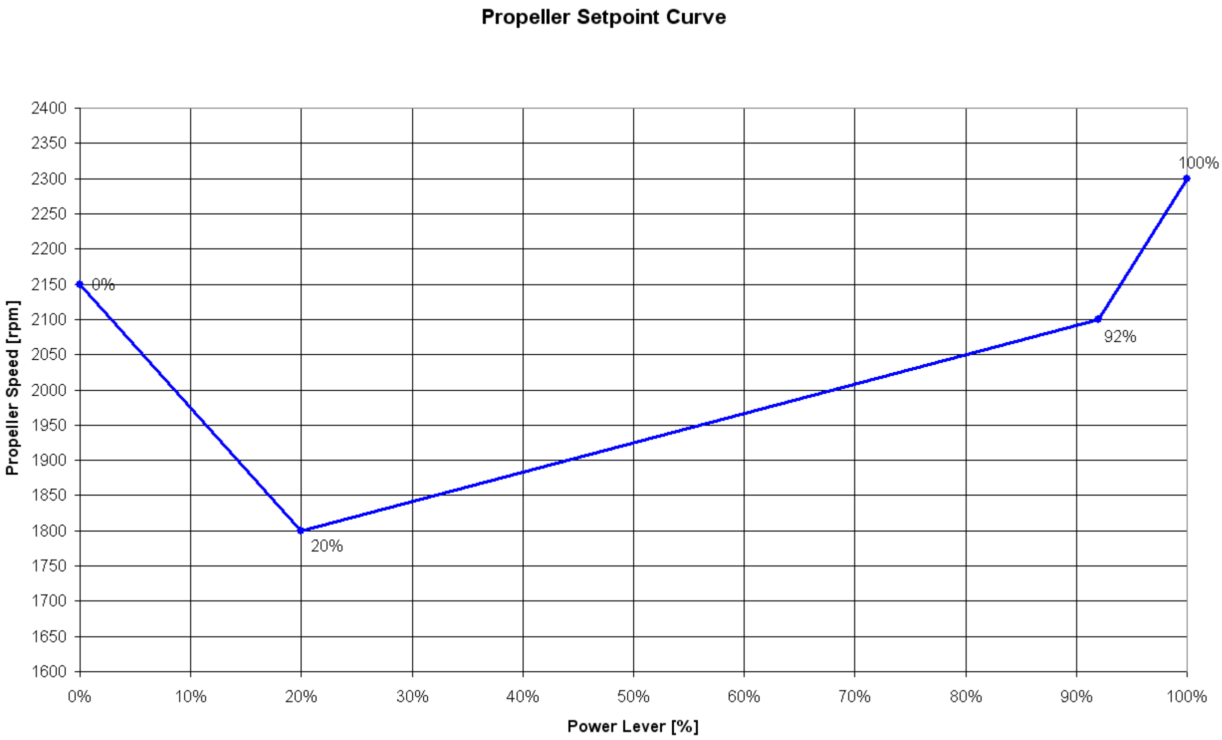

Figure 3: Propeller RPM Adjusted by the Engine ECU System

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Trouble-Shooting

1. General

The table below lists the defects you could have for the propeller. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Engine vibration.	Propeller out of balance.	Examine the propeller. If you find damage refer to the manufacturer's Owners Manual.
	Spinner out of balance.	Replace the spinner.
	Propeller mounting loose.	Tighten the mounting nuts to the correct torque. Refer to the manufacturer's Owners Manual. Use new nuts.
	Spinner attaching screws loose.	Tighten the attaching screws. Refer to the manufacturer's Owners Manual.
	Blade tracking not correct.	Refer to the manufacturer's Owners Manual.
Cracks in the blades.	Over-speed.	Refer to the manufacturer's Owners Manual.
Holes/nicks/dents in the blade.	Stone damage.	Repair/replace the propeller. Refer to the manufacturer's Owners Manual.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the propeller. They also tell you how to do a propeller blade tracking test and how to remove and install the additional alternator pulley assy (if OÄM 42-204 is installed).

2. Remove/Install the MTV-6-R-C-F Propeller

A. Remove the Propeller

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the related ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	Note: Mark the propeller, spinner, front support plate and spinner bulkhead, with an index mark. This will help you install these items in the correct position.	
(4)	Remove the spinner: – Mark the spinner and spinner bulkhead with index marks to aid installation. – Release the screws holding the spinner to the spinner bulkhead and move the spinner clear of the airplane.	Refer to Figure 4.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the nuts and washers which attach the propeller to the propeller shaft flange.	Hold the propeller!
(6)	Pull the propeller forward and clear of the propeller shaft flange.	
(7)	Use caps to cover open lines.	

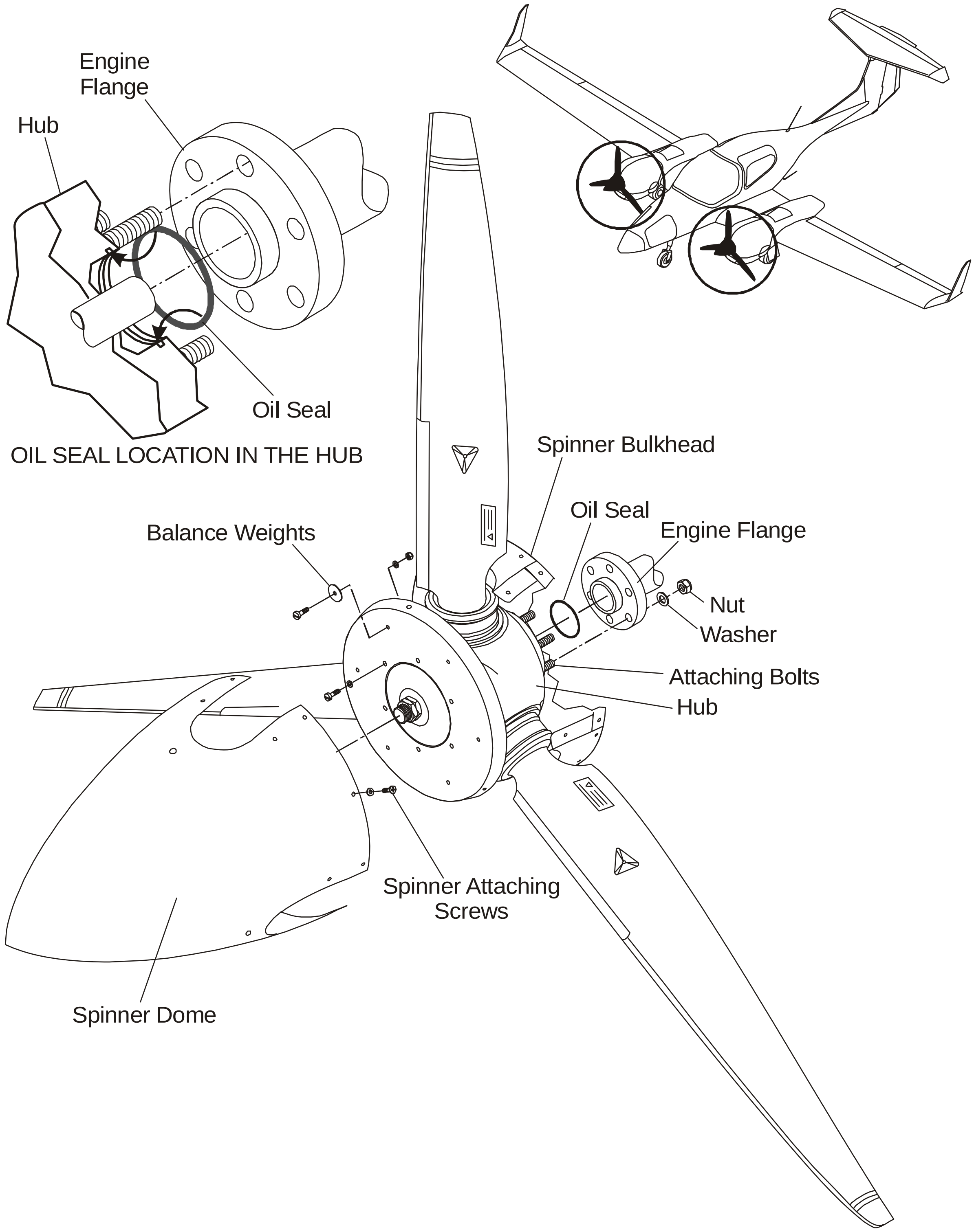


Figure 4: Propeller Installation

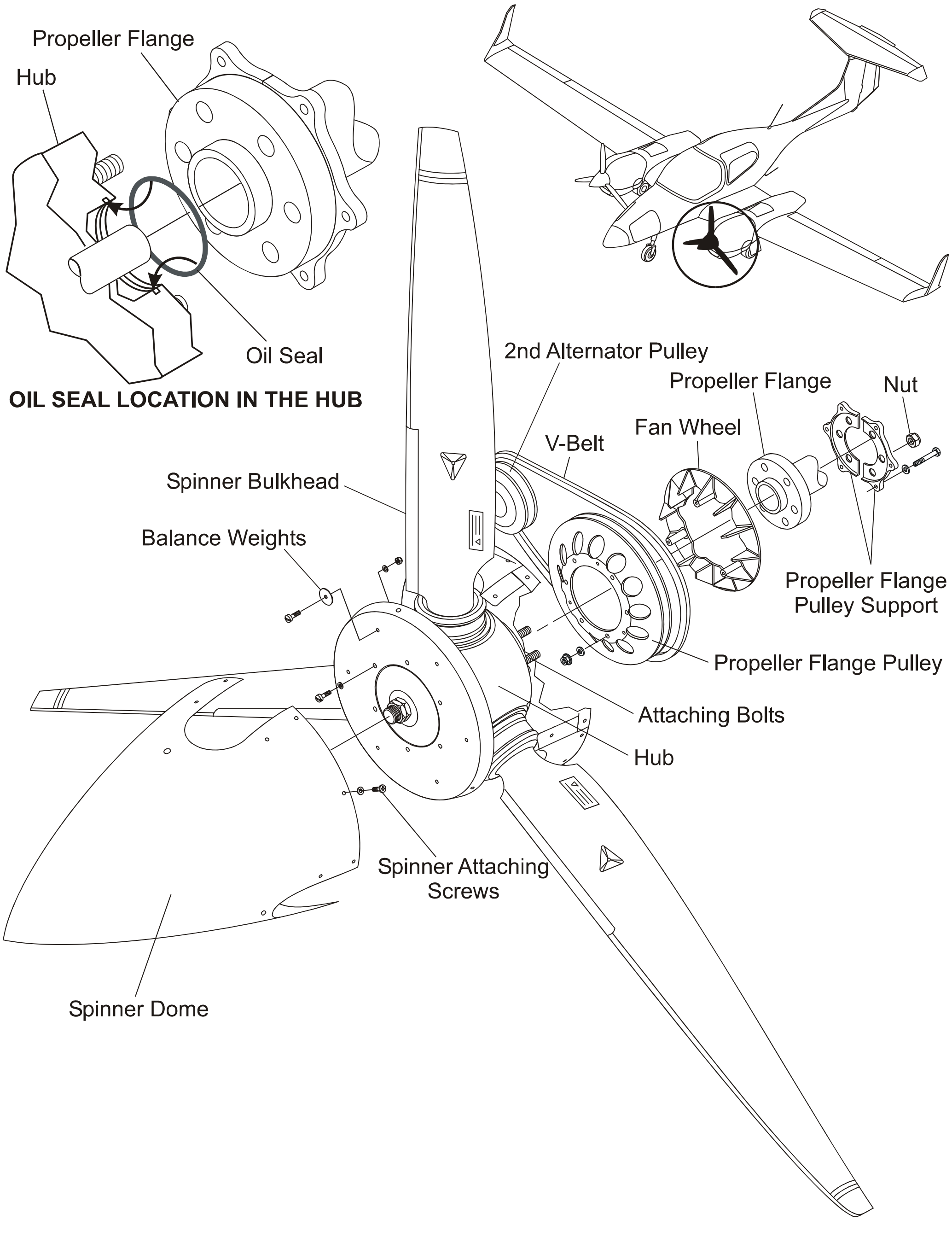


Figure 5: Propeller Installation (if OÄM 42-204 is installed)

B. Install the Propeller

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the related ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Make sure that the propeller shaft flange and the propeller flange are clean and dry.	
(3)	Make sure that the shipping plug is removed and check the inside of the propeller hub area for contamination.	
(4)	Make sure that a new O-ring oil seal is in place in the propeller hub. Lightly oil the seal.	Refer to Figure 4. Use clean gearbox oil.
(5)	Move the propeller into position on the propeller shaft flange.	Take care not to damage the propeller O-ring seal.
	Note: Make sure that the propeller is pushed into the correct position by hand. Do not use the nuts to pull the propeller into position.	
(6)	Install the 6 washers and nuts.	
(7)	When the propeller is in the correct position, fully tighten the nuts in opposing pairs.	Torque 85 - 90 Nm (63 - 66 lbf.ft.).
(8)	Check gearbox oil level and refill if necessary.	Refer to Section 12-10.
(9)	Do a test for correct blade track.	Refer to Paragraph 3.

	Detail Steps/Work Items	Key Items/References
(10)	Install the spinner: – Loosely install the screws and plastic washers which attach the spinner to the spinner bulkhead. – Tighten all the attaching screws.	Align the index mark. Torque 4 - 5 Nm (35 - 44 lbf.in.).
(11)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(12)	Do an engine run-up. Do a test for correct operation of the propeller.	Refer to Section 71-00.
(13)	Check gearbox oil level and refill if necessary.	Refer to Section 12-10.

3. Propeller Blade Tracking Test

A. Equipment

Item	Quantity	Part Number
Tracking stand.	1	Commercial.

B. Procedure

Refer to mt-Propeller Operation and Installation manual, latest revision.

4. Check/Adjust the V-Belt Tension of the Additional Alternator (if OÄM 42-204 is installed)

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINES ARE SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR ASSEMBLY. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the LH engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Check the v-belt tension by conducting one of the following test methods: – Pull the v-belt half way between the pulleys down with 25 N (5.6 lbf) and measure the deflection. – Measure the natural frequency of the v-belt half way between the pulleys according the instructions of the tension gauge manufacturer. Repeat this measurement 4 times turning the propeller blade each time 90°.	Recommended tension gauge: CONTI® VSM-1.

	Detail Steps/Work Items	Key Items/References
(5)	If the deflection is 4 mm to 5 mm (0.16 in to 0.20 in) respectively the natural frequency is 123 Hz +12/-0: – Refer to item 6 of this checklist. If the deflection is not in between 4 mm and 5 mm (0.16 in and 0.20 in) respectively the natural frequency is not 123 Hz +12/-0: – Remove the safety wires on the alternator bracket bolts. – Release the two alternator bracket bolts. – Install Diamond tool. – Adjust the v-belt tension. – Tighten the accessible bracket bolt. – Check the v-belt tension. – If the deflection is 4 mm to 5 mm (0.16 in to 0.20 in) respectively the natural frequency is 123 Hz +12/-0: – Remove Diamond tool. – Tighten the remaining bracket bolt. – Install the safety wires.	Use Diamond tool No. 044-6116-00-00-SW Refer to item 4 of this checklist.
(6)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do an engine run-up. Do a test for correct operation of the propeller.	Refer to Section 71-00.

5. Remove/Install the Additional Alternator V-Belt (if OÄM 42-204 is installed)

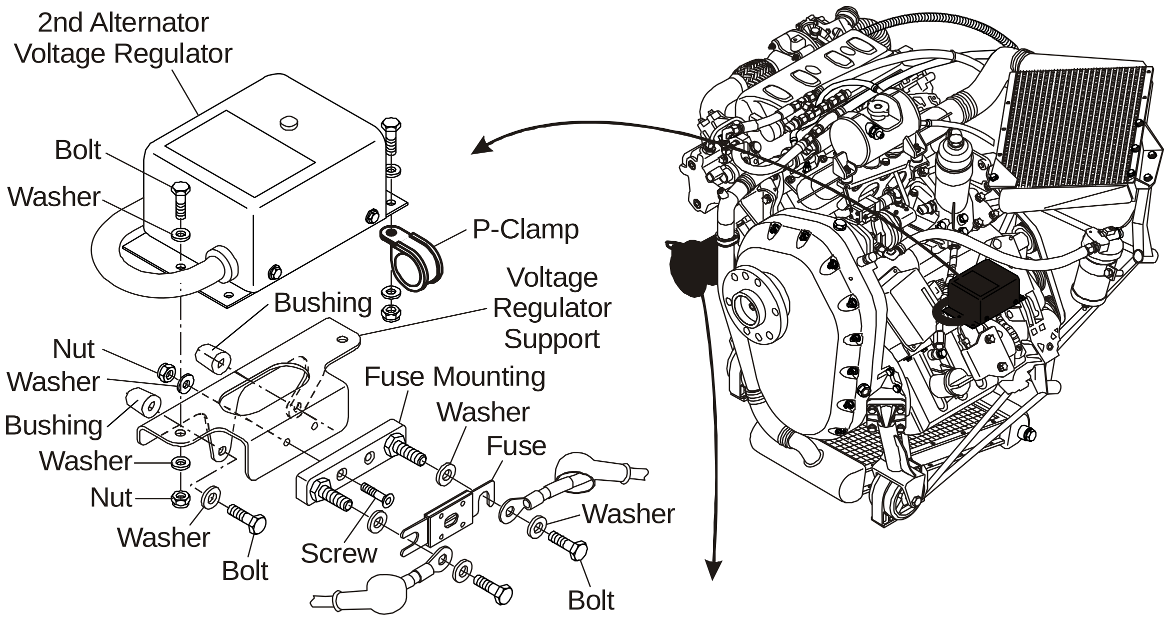
A. Remove the Additional Alternator V-Belt

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINES ARE SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR ASSEMBLY. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the LH engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Remove the safety wires on the alternator bracket bolts.	
(5)	Release the three alternator bracket bolts.	
(6)	Lift the v-belt from the additional alternator pulley.	
(7)	Remove the six bolts which attach the LH propeller pulley assembly to the propeller flange pulley support and move the assembly towards the propeller.	Refer to Figure 5.
(8)	Release the six propeller attachment nuts.	Support the propeller.
(9)	Remove the propeller, v-belt and the propeller pulley assembly.	

B. Install the Additional Alternator V-Belt

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINES ARE SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR ASSEMBLY. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Verify that the airplane main battery is disconnected.	Refer to Section 24-31.
(3)	Make sure that the LH propeller shaft, the propeller flange and the propeller flange pulley support are clean and dry.	Refer to Section 71-10 or 71-11.
(4)	Assemble the LH propeller flange pulley and the fan wheel with six bolts, washers and self locking nuts.	Use new self locking nuts.
(5)	Remove the caps which cover the propeller and the gearbox hub.	
(6)	Make sure that a new O-ring oil seal is in place in the propeller hub. Lightly oil the seal.	Refer to Figure 5. Use clean gearbox oil.
(7)	Move the v-belt, the propeller pulley assembly and the propeller into position on the propeller flange.	Take care not to damage the propeller O-ring seal.
	Note: Make sure that the propeller is pushed into the correct position by hand. Do not use the nuts to pull the propeller into position.	
(8)	Put the propeller flange pulley support into position and install the six nuts.	
(9)	If the propeller is in the correct position fully tighten the nuts in opposing pairs.	Refer to mt-Propeller Operation and Installation Manual, latest revision.

	Detail Steps/Work Items	Key Items/References
(10)	Install the six bolts which attach the propeller pulley assembly to the propeller flange pulley support.	
(11)	Lift the v-belt into position on the additional alternator and the propeller flange pulley assembly.	
(12)	Adjust the additional alternator v-belt tension.	Refer to Paragraph 4.
(13)	Check the gearbox oil level and refill if necessary.	Refer to Section 12-10.
(14)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(15)	Connect the airplane main battery.	Refer to Section 24-31.
(16)	Do an engine run-up. Do a test for correct operation of the propeller.	Refer to Section 71-00.
(17)	Check for oil leaks.	
(18)	Check gearbox oil level and refill if necessary.	Refer to Section 12-10.



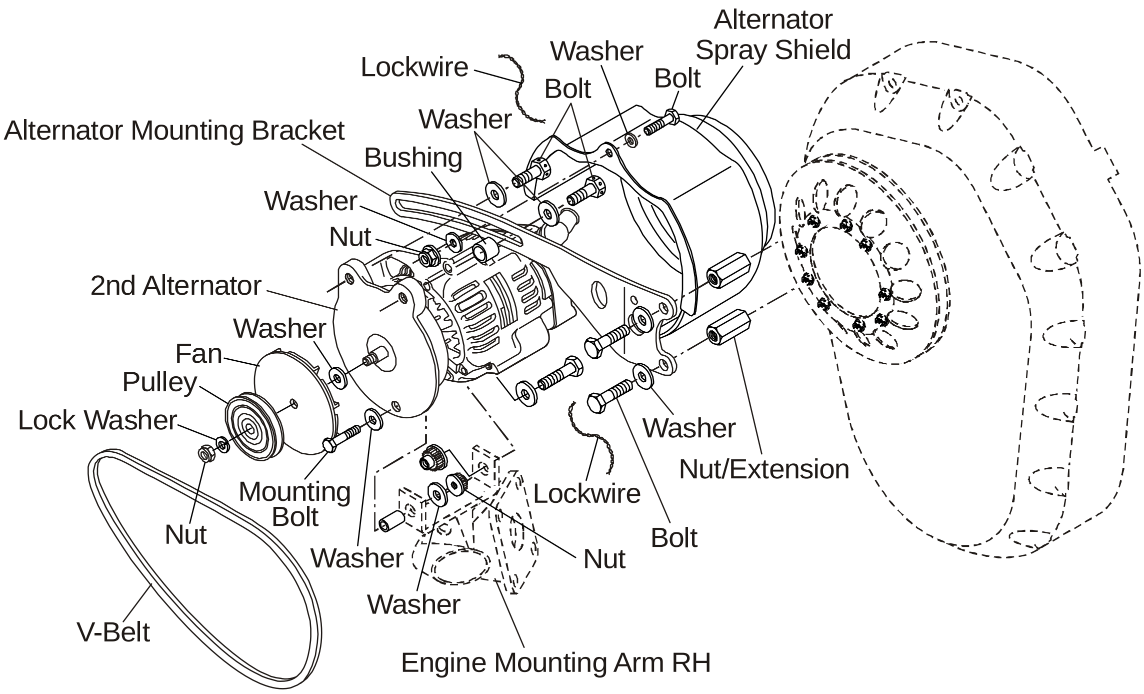


Figure 6: Additional Alternator and Regulator Installation
(if OÄM 42-204/e or earlier is installed)

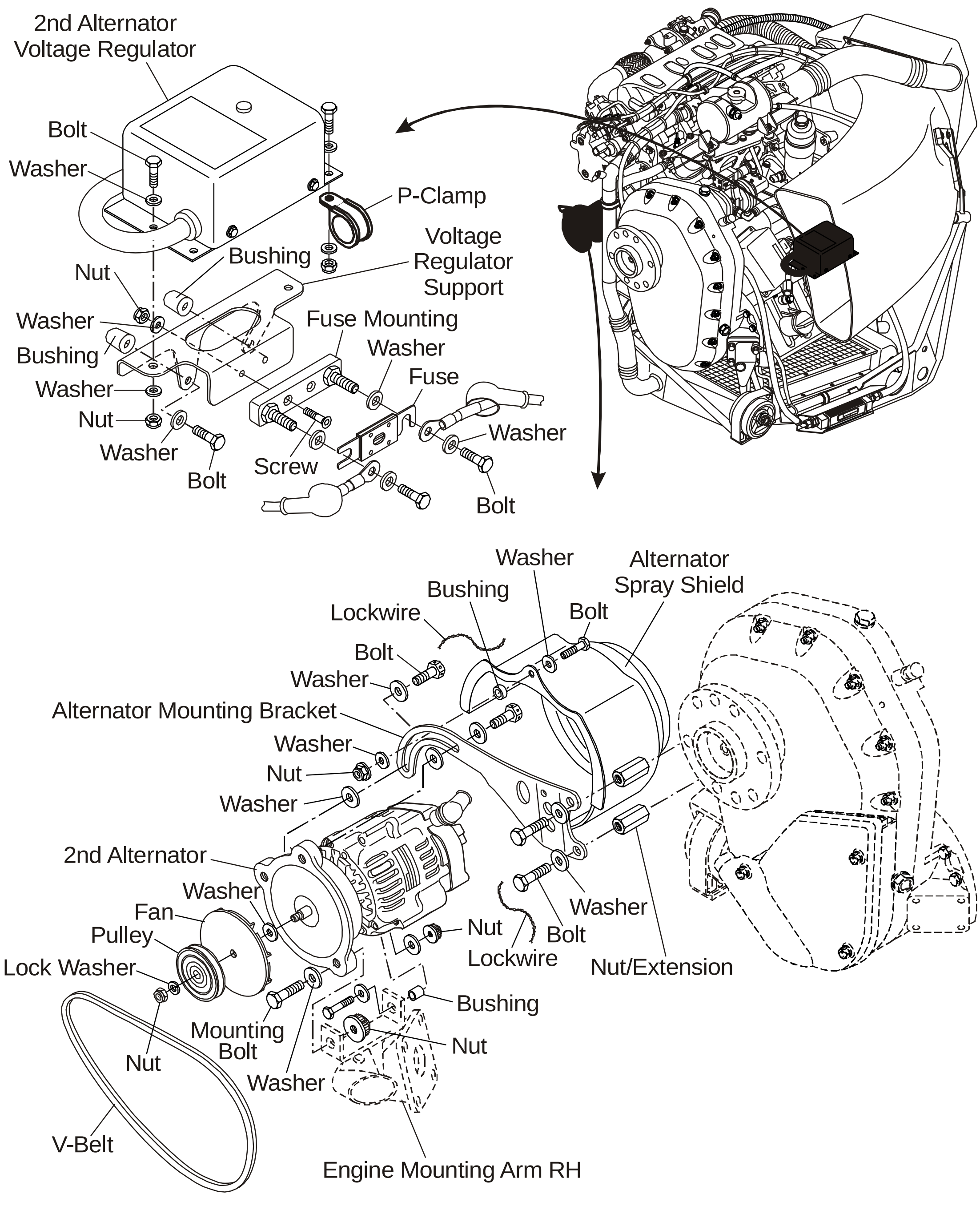


Figure 7: Additional Alternator and Regulator Installation (if OÄM 42-204/g or later and MÄM 42-600 are installed)

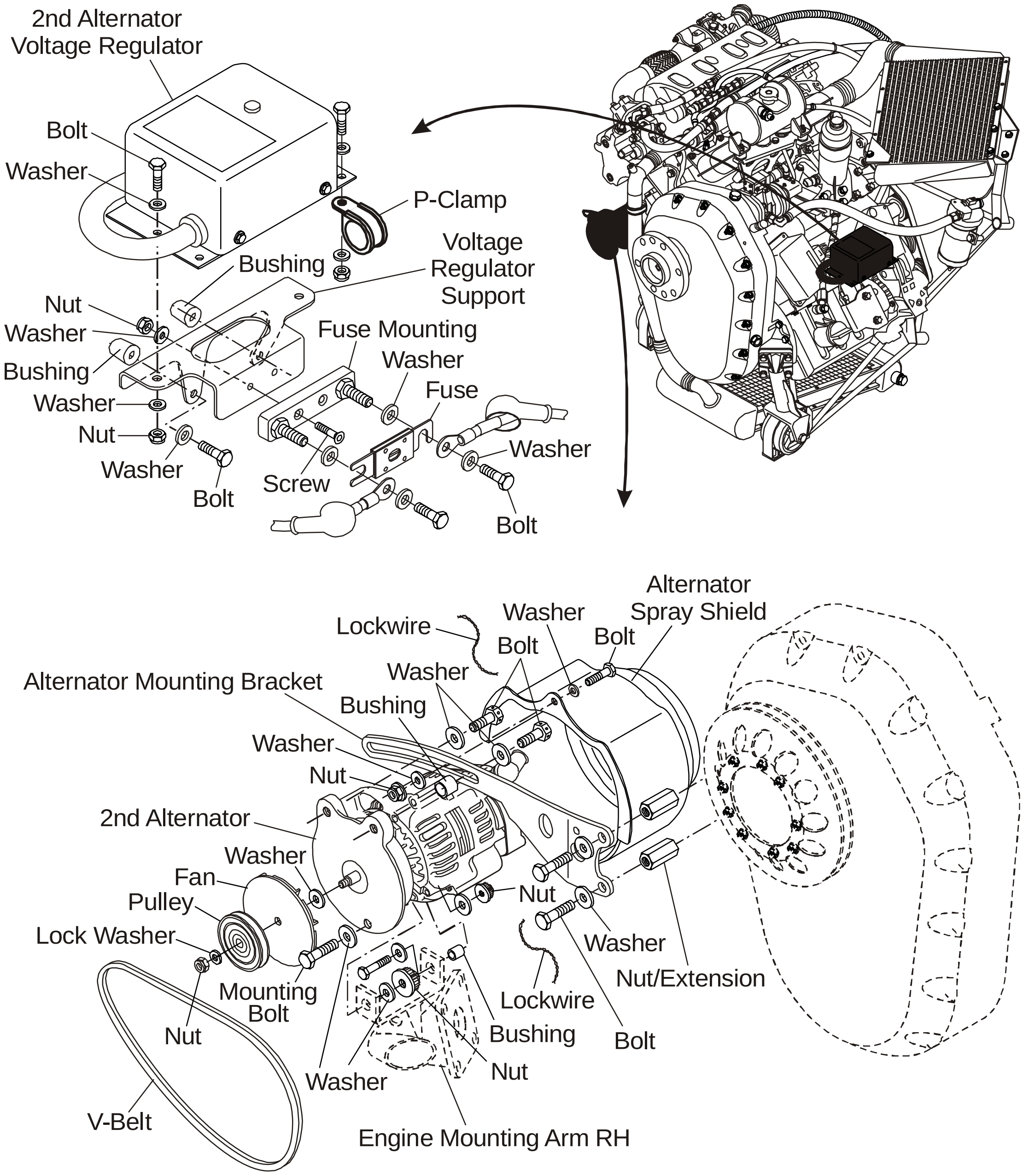


Figure 8: Additional Alternator and Regulator Installation
(if OÄM 42-204/o or later is installed and MÄM 42-600 is NOT installed)

6. Remove/Install the Additional Alternator Pulley (if OÄM 42-204 is installed)

A. Remove the Additional Alternator Pulley

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINES ARE SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR ASSEMBLY. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the LH engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Remove the safety wires on the additional alternator bracket bolts.	
(5)	Release the three alternator bracket bolts.	Refer to Figure 6 - 8.
(6)	Lift the v-belt from the additional alternator pulley.	
(7)	Release the steel nut on the additional alternator pulley.	Use hook wrench on provided pulley holes.
(8)	Remove the additional alternator pulley and the locking washer.	Refer to Figure 6 - 8. Discard the locking washer.

B. Install the Additional Alternator Pulley

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE ADDITIONAL ALTERNATOR ASSEMBLY. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engine are safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switches to OFF. – Set the power levers to 0%.	
(2)	Verify that the airplane main battery is disconnected.	Refer to Section 24-31.
(3)	Install the additional alternator pulley.	Use new locking washer.
(4)	Position the v-belt on the propeller pulley assembly and the additional alternator pulley.	
(5)	Adjust the v-belt tension.	Refer to Paragraph 4.
(6)	Check the two safety wires on the additional alternator bracket bolts.	
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(9)	Do an engine run-up. Do a test for correct operation of the propeller.	Refer to Section 71-00.

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Section 61-20
Propeller Control

1. General

The DA 42 NG has two MTV-6-R-C-F/CF187-129 or two MTV-6-R-C-F/CF190-69 (if MÄM 42-600 is installed) variable pitch and feathering propellers. The engines have mounted constant speed governors P-877-16. The constant speed governor is controlled by the engine EECS system. The constant speed governor controls the engine speed by changing the propeller blade angle (pitch).

For further information about the constant governor unit refer to mt-Propeller Operation and Installation Manual, latest revision.

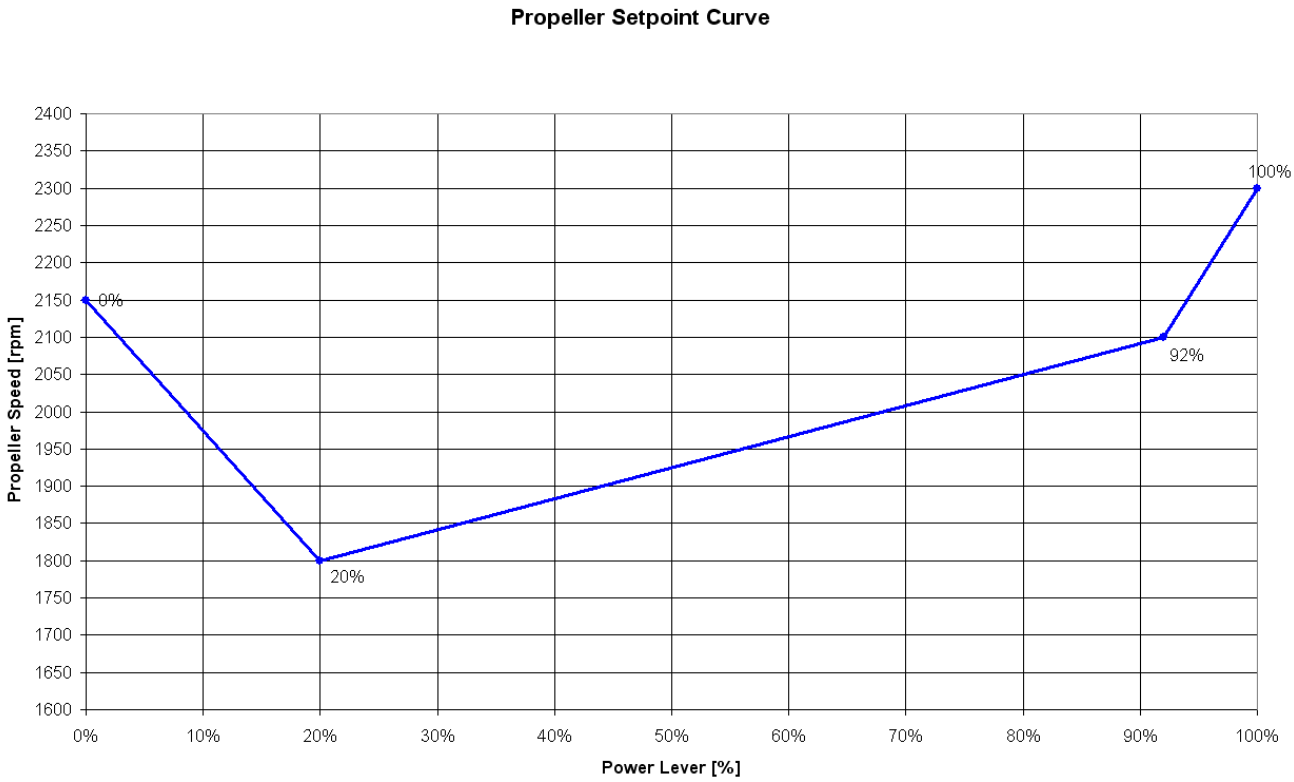

Figure 1: Propeller RPM Adjusted by the EECU System

2. Description and Operation

The DA 42 NG has two MTV-6-R-C-F/CF187-129 or two MTV-6-R-C-F/CF190-69 (if MÄM 42-600 is installed) variable pitch and feathering propellers. A counterweight is fitted to each propeller blade. When the propeller is rotating the counterweight overcomes the centrifugal twisting moment and causes the blades to move towards coarse pitch. The propeller uses oil pressure to decrease the blade angle (pitch).

The constant speed governor is an mounted part of the engine control system. The engine control system measures many engine parameters. The propeller blade angle is adjusted automatically. The pilot has only one lever for each engine to control the engine performance. Figure 1 shows the propeller RPM as set by the engine EECU system for a given load.

As with other constant speed propeller control systems, the EECU senses engine performance and sets the governor to regulate oil pressure to the propeller to change blade angle as necessary. Depending on the power setting the propeller pitch is adjusted so that the required RPM will be obtained as shown in Figure 1.

Figure 2 shows the propeller control system schematic diagram.

The oil pressure at the governor is 22 bar (320 PSI). If the engine speed is too high, the constant speed governor operates the governor so that the oil flows out from the propeller. The counterweights on each blade moves the blades to a coarse pitch and increases the blade angle. This reduces the RPM.

If the engine speed is too low, the governor increases oil flow into the propeller. The piston moves to reduce the blade angle. This increases engine RPM.

For further information of the governor's working principles refer to the mt-Propeller Operation and Installation Manual, latest revision.

During normal operation a preset coarse-pitch-stop prevents the propeller blades from moving past a preset blade angle. A centrifugal latching mechanism disengages the coarse-pitch-stop when the propeller is rotating at speeds greater than 1300 RPM. If the engine fails in flight, or if the propeller oil supply fails in flight, the blade counterweights will increase the blade pitch angle. If the engine is rotating faster than 1300 RPM the centrifugal latching mechanism will be disengaged and the propeller blades can move to the feather position. The propeller pitch angle in feather position is 81° ± 1° (80° ± 1° if MÄM 42-600 is incorporated).

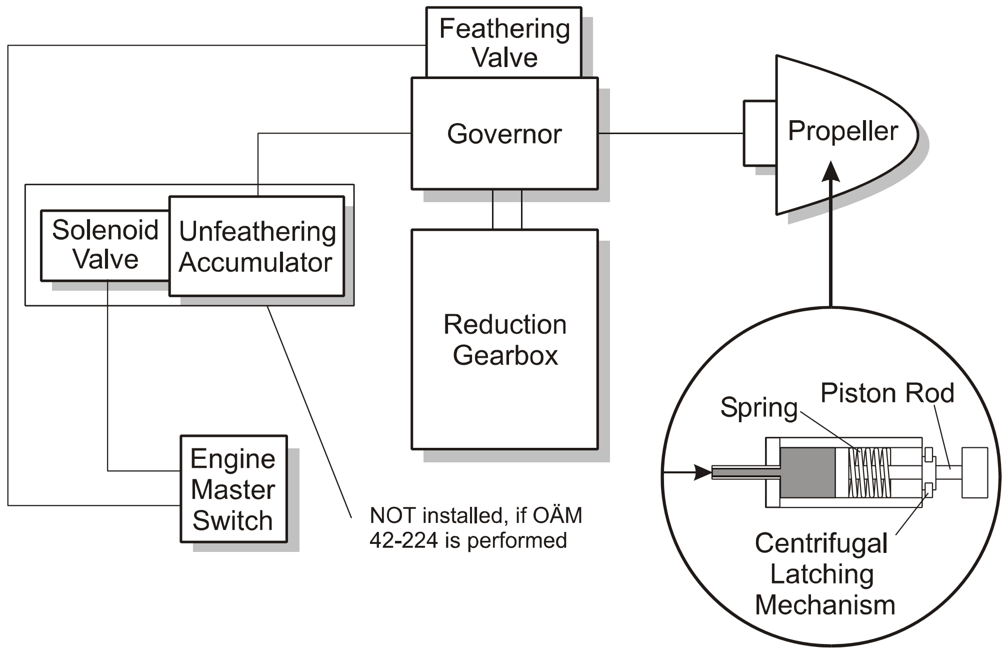

Figure 2: Propeller Control System Schematic Diagram

A nitrogen-oil type accumulator is installed in the propeller control system. If OÄM 42-224 is performed, the unfeathering accumulator is NOT installed. Oil at system pressure can flow into the accumulator through an electrically operated shut-off valve. When the ENGINE MASTER switch is set to OFF the accumulator shut-off valve is closed. Oil is stored in the accumulator at normal system pressure.

To un-feather the propeller you must set the ENGINE MASTER switch to ON. This will open the electric valve at the accumulator and allow oil to flow under pressure from the accumulator to the propeller. The oil flowing to the propeller will cause the blades to move into low pitch position. The propeller pitch angle in low pitch position is 12° ± 0.2° (13° ± 0.2° if MÄM 42-600 is incorporated). As soon as the propeller starts turning and the gearbox oil operates, the accumulator will be refilled.

The specified propeller settings are given as follows:

– Low pitch: 12° ± 0.2° (13° ± 0.2° for MTV-6-R-C-F/CF 190-69)

– Start lock position: 15° ± 1.5°

– Feathered position: 81° ± 1° (80° ± 1° for MTV-6-R-C-F/CF 190-69)

Technical data governor:

– Specific installation: DA 42

– Specific engine: Austro Engine E4

– Max. revolution: 2680 RPM ± 10 RPM

– Min. revolution: 2030 RPM ± 10 RPM

– Rotation: LH

– Control head position: 355°

If MÄM 42-600 is installed:

– Specific installation: DA 42 NG (with MÄM 42-600 is installed)

– Specific engine: Austro Engine E4-C

– Max. revolution: 2680 RPM ± 10 RPM

– Min. revolution: 2030 RPM ± 20 RPM

– Rotation: LH

– Control head position: 355°

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Trouble-Shooting

1. General

The table below lists the defects you could have for the propeller control. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Propeller RPM fluctuating.	Engine gearbox oil level low.	Replenish gearbox oil level. Refer to Chapter 72.
	Engine gearbox oil contaminated.	Replace engine gearbox oil. Refer to Chapter 72.
	Electrical connection between related engine EECU system and governor.	Do a continuity check of the wiring between the EECU system and the governor. Replace/repair faulty wiring. Refer to Chapter 92 for the wiring diagrams.
	Governor defective.	Replace the governor.

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Maintenance Practices

1. General

This Section tells you how to remove/install the governor and how to test/adjust the governor. It also tells you how to replace/adjust the propeller control cable.

2. Remove/Install the Propeller Governor

A. Remove the Propeller Governor

	Detail Steps/Work Items	Key Items/References
WARNING:	**MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the related ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Disconnect the cable connector GOV from the governor.	Refer to the AE Maintenance Manual, latest revision, Chapter 71-50-05.
(5)	Remove the oil hose from the governor. If OÄM 42-224 is performed, the oil hose is not installed.	
(6)	Put a blanking cover on the oil hose.	
(7)	Release the four nuts which attach the governor to the drive-pad and remove the governor from the gearbox.	Use a container to catch the small amount of oil from the governor.
(8)	Remove and discard the gasket.	
(9)	Put a blanking cover on the governor drive-pad and put a cover over the governor mounting face.	

B. Install the Propeller Governor

Note: It is prohibited to adjust propeller RPMs.

	Detail Steps/Work Items	Key Items/References
(1)	Compare governor Equipment Log-Sheet with the settings given in Section 61-20, page 5.	
(2)	Put the governor and gasket in position on the gearbox drive pad.	Use a new gasket. Verify installation direction.
(3)	Install the four washers and nuts which attach the governor to the drive pad.	Torque: 28 Nm (20.7 lbf.ft). Use new self locking nuts.
(4)	Connect the propeller control cable connector GOV to the governor.	Refer to the AE Maintenance Manual, latest revision, Chapter 71-50-05.
(5)	Install the oil hose from the unfeathering accumulator to the governor. If OÄM 42-224 is performed, install the safety cap to the governor.	
(6)	Install the engine cowling.	Refer to Section 71-10 or 71-11.
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do an engine ground run.	
(9)	Check the gearbox oil level.	Refer to Section 12-10.

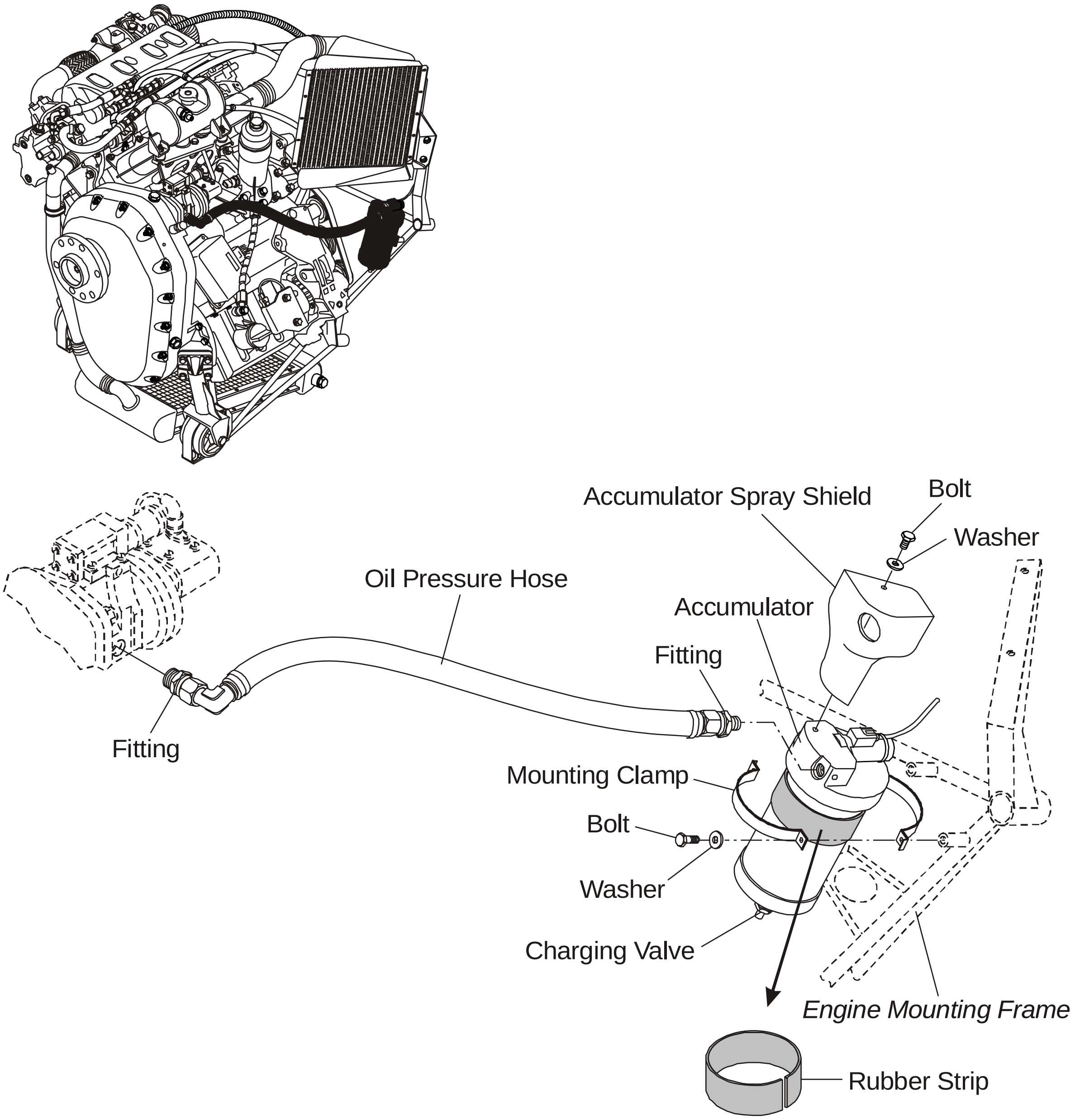

Figure 4: Propeller Un-Feathering Accumulator Installation

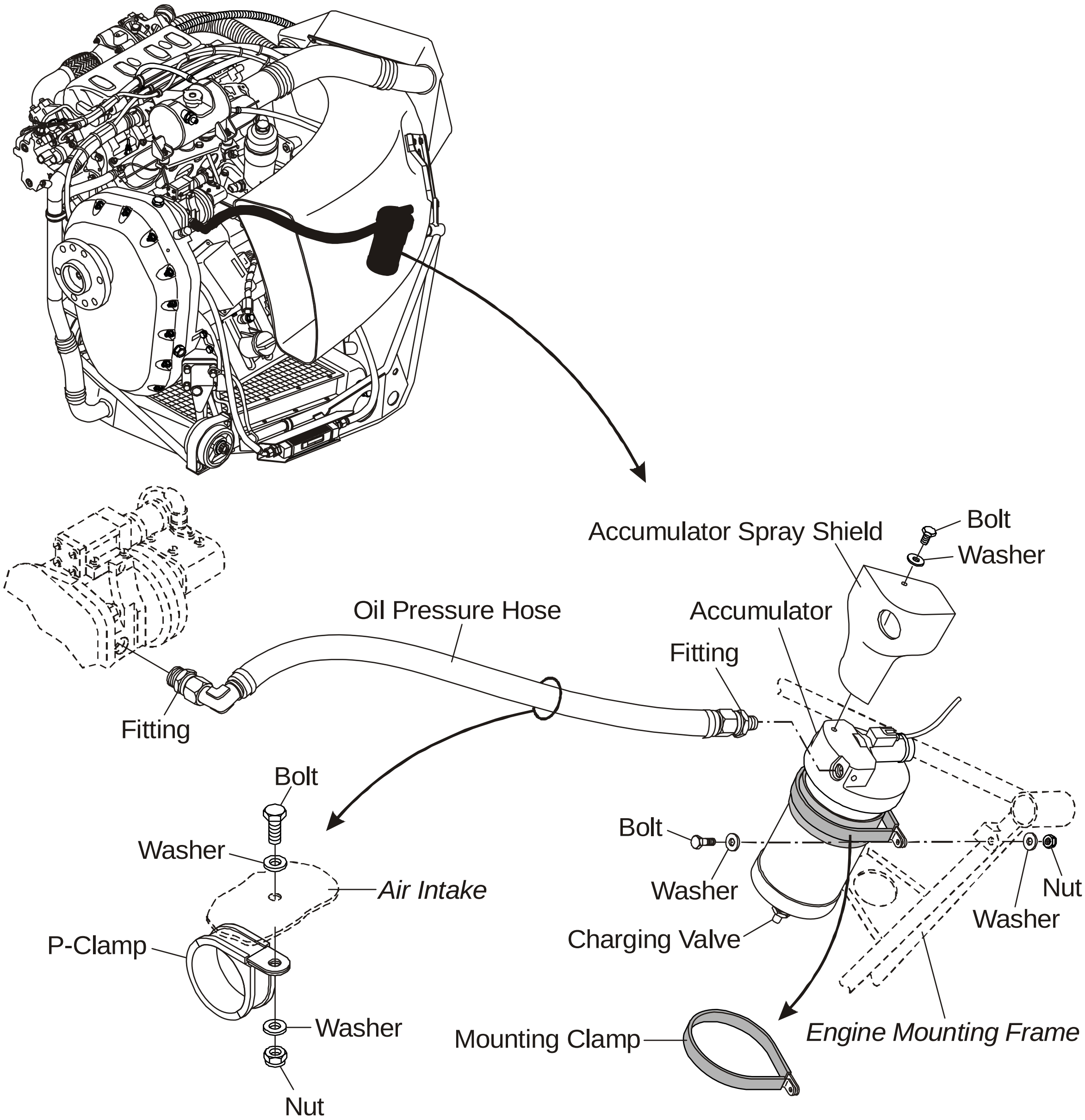

Figure 5: Propeller Un-Feathering Accumulator Installation (if MÄM 42-600 is installed)

3. Remove/Install the Propeller Un-Feathering Accumulator

A. Remove the Propeller Un-Feathering Accumulator

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the related ENGINE MASTER switch to OFF. – Set the power lever to IDLE.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE ACCUMULATOR BEFORE YOU REMOVE IT. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN. THIS CAN CAUSE DISEASE.	
(4)	Drain the propeller un-feathering accumulator: – Set the ELECT. MASTER ON. – Set the ENGINE MASTER ON. – Set ENGINE and ELECT. MASTER OFF.	
(5)	Release the nitrogen pressure from the accumulator: – Release the pressure from the charging valve at the end of the accumulator.	

	Detail Steps/Work Items	Key Items/References
(6)	Disconnect the electrical cables from the shut-off valve.	At the in-line connector at the shut-off valve. Cut the tie wraps.
(7)	Remove the accumulator: – Remove the 2 bolts on engine mount that hold the accumulator. – Remove both mounting clamps. – Lift the accumulator clear of the mounting bracket.	Support the accumulator!
(8)	Remove the accu spray shield. Remove the bolt and washer.	
(9)	Disconnect the oil hose from the accumulator.	Use a suitable container to collect spilt oil. Cap open oil lines.

B. Install the Un-Feathering Accumulator

	Detail Steps/Work Items	Key Items/References
(1)	Install the oil hose to the governor.	
(2)	Install the accumulator: – Install the spray shield. – Move the accumulator into position in the mounting bracket. – Install both mounting clamps. – Install the 2 bolts that attach the accumulator to the mounting bracket. – Tighten the bolts.	Make sure that the accumulator is orientated correctly.
(3)	Connect the electrical cables to the governor.	Fix it with tie wraps.
(4)	Charge the accumulator with nitrogen: – Set valve under current (open). – Remove the cap from the charging valve. – Connect a suitable nitrogen supply to the charging valve and charge the accumulator to the correct pressure. – Disconnect the nitrogen supply. – Install the cap onto the charging valve.	Follow the manufacturer’s instructions for the nitrogen supply. 10.4 bar (150 PSI).
(5)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(6)	Connect the airplane main battery.	Refer to Section 24-31.
(7)	Do a test for oil leaks: – Start the engine and allow to reach normal operating temperature. – Stop the engine. – Remove the engine cowlings. – Look for oil leaks. Specially in the area of the propeller un-feathering accumulator.	Refer to the Airplane Flight Manual. Refer to the Airplane Flight Manual. Refer to Section 71-10 or 71-11.

	Detail Steps/Work Items	Key Items/References
(8)	Check gearbox oil level and refill if necessary.	Refer to Section 12-10.
(9)	Do a test for the correct operation of the un-feathering accumulator.	Refer to the Airplane Flight Manual.
(10)	Install the engine cowling.	Refer to Section 71-10 or 71-11.

4. Propeller Un-Feathering Test

	Detail Steps/Work Items	Key Items/References
WARNING:	**DO NOT LET PERSONS INTO THE SAFETY RANGE OF THE AIRPLANE. PROPELLERS CAN CAUSE INJURY OR DEATH.**	
(1)	Position the airplane on level ground. Make sure that: – There are no loose stones on the ground near the propeller. – The safety zone around the airplane is clear. – The airplane heads into the wind.	
(2)	Put chocks in front of each main wheel.	
(3)	Set the parking brake to ON.	
(4)	Make sure that the ENGINE FUEL SELECTOR is set to ON for both engines.	
(5)	Make sure that the passenger door is closed and locked. Close and lock the canopy.	
(6)	Set both engine power levers to 0%.	Make sure that the power levers are free to move.
(7)	Set the ELECT. MASTER key switch to ON.	
(8)	Set the alternate air control to OFF.	
(9)	Make sure the area of the propellers is clear.	
(10)	Set the related ENGINE MASTER switch to ON.	

	Detail Steps/Work Items	Key Items/References
(11)	Make sure that the engine instruments read correctly.	The RPM, LOAD and FUEL FLOW indications must be zero (0). Dashes (-) indicate a malfunction.
(12)	Turn the START key switch to the LH or RH position as required.	Do not start the engine as long as the white GLOW status light is illuminated.
(13)	When the selected engine starts: – Release the START key switch.	
(14)	Leave the power lever at 0%.	Make sure that there are no warning lights on.
(15)	Monitor the oil pressure.	The oil pressure must rise to 1 bar minimum, within 3 seconds of starting the engine. If it does not, then you must shut-down the engine.
(16)	Let the engine idle at 900 RPM for 4 minutes.	Monitor the engine instruments for unusual indications.
(17)	Set the power lever to give a speed frequency of 1500 RPM.	
(18)	Shut off the engine by setting the related ENGINE MASTER switch to OFF.	The engine must stop. The propeller must feather (→ feathered position: 81°).
(19)	Reset the ENGINE MASTER switch to ON.	Do not start the engine.

	Detail Steps/Work Items	Key Items/References
(20)	Observe the change in propeller pitch angle. If the unfeathering accumulator is not installed (if OÄM 42-224 is performend): Restart the engine: – STARTER of affected engine: engage, 5 seconds maximum. – Note: Unfeathering of the propeller is done in the start sequence by building up system oil pressure when cranking the starter. – Circuit breakers: check/reset if necessary. If the engine does not start: wait 30 seconds and proceed with first item of starting sequence.	The propeller must un-feather within 12 to 15 sec (→ low pitch: 12°). Check the functional efficiency of the accumulator if the propeller does not un-feather.
(21)	Set the ENGINE MASTER switch to OFF.	The propeller must remain in the un-feathered position. There is just a small change in pitch angle of 3° (→ start lock position: 15°). Check the functional efficiency of the accumulator if the propeller does not remain in the un-feathered position.
(22)	Set both engine power levers to 0%.	
(23)	Redo steps 9 thru 22 for the other engine.	
(24)	Set the ELECT. MASTER switch to OFF.	

CHAPTER 71

POWER PLANT

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CHAPTER 71
POWER PLANT

1. General

This Chapter contains information about the AE E4-B and the AE E4-C (if MÄM 42-600 is installed) engines installation in the DA 42 NG. It describes the removal/installation of the power plant.

For data on the engine test after installation refer to the Operation Manual for the AE E4-B or AE E4-C (if MÄM 42-600 is installed) engine. Refer to the DA 42 NG Airplane Flight Manual for engine start/stop procedures. For particular information on the applicable firmware refer to DAI Service Bulletin MSB-42NG-002.

Refer to these Chapters for data about other engine systems:

– Chapter 72. Refer to the AE Operation Manual, latest revision for data on the engine.

– Chapter 73. Engine fuel and control. Refer to the AE Operation Manual, latest revision for data on the fuel injection system.

– Chapter 76. Engine controls.

– Chapter 77. Engine indicating.

– Chapter 78. Exhaust system.

– Chapter 79. Oil system components installed in the nacelle. Refer to the AE Operation Manual, latest revision for data on the engine oil system.

– Chapter 80. Starter system control and installation. Refer to the AE Operation Manual, latest revision for data on the starter.

– Chapter 81. Turbo charger.

Note: Equipment which is certified for installation in the DA 42 NG is listed in Section 6.5 of the Airplane Flight Manual. Such equipment may be installed in accordance with the Airplane Maintenance Manual.

Any equipment which is not listed in Section 6.5 of the Airplane Flight Manual is called "Additional Equipment". The installation of Additional Equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin.

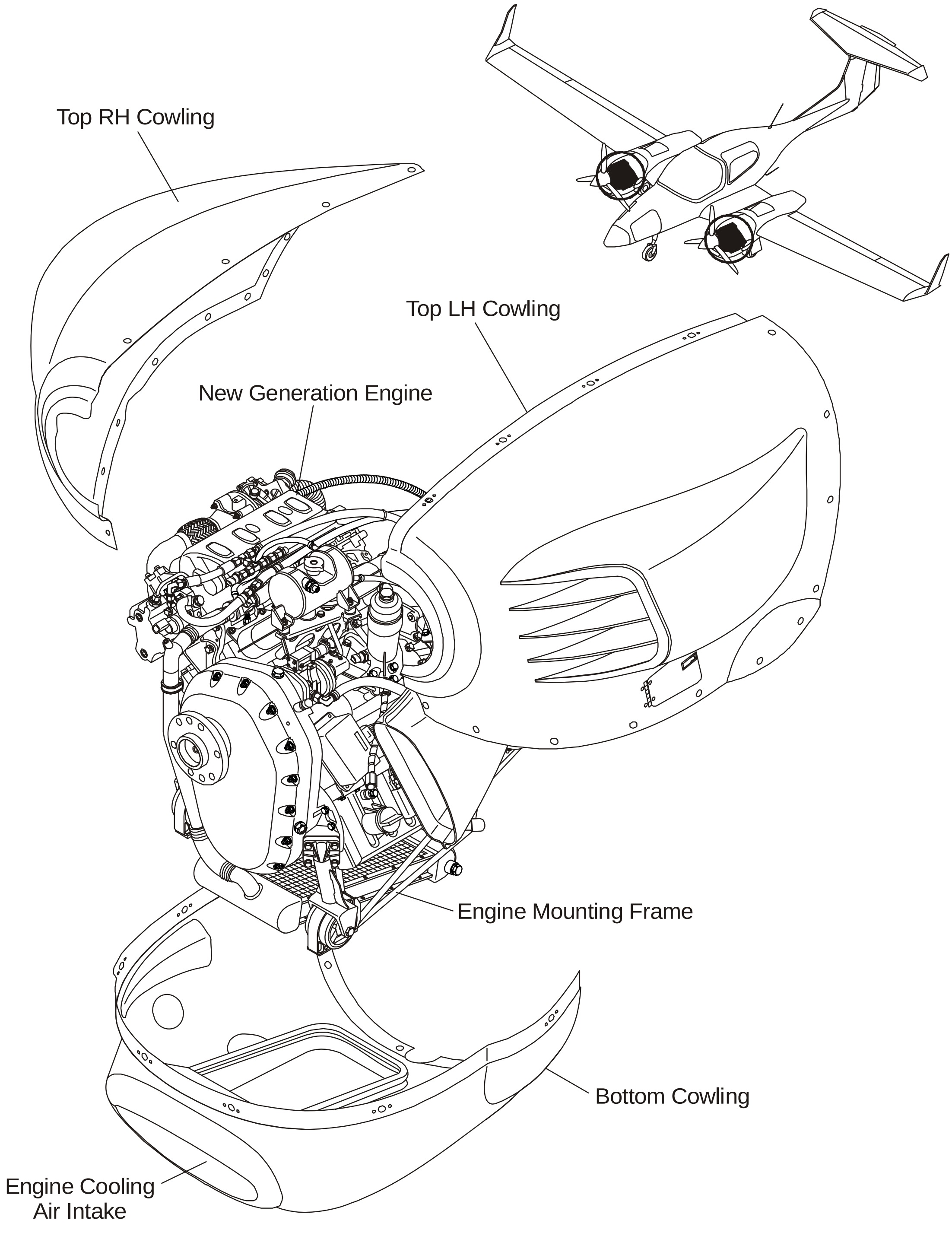

Figure 1: Power Plant

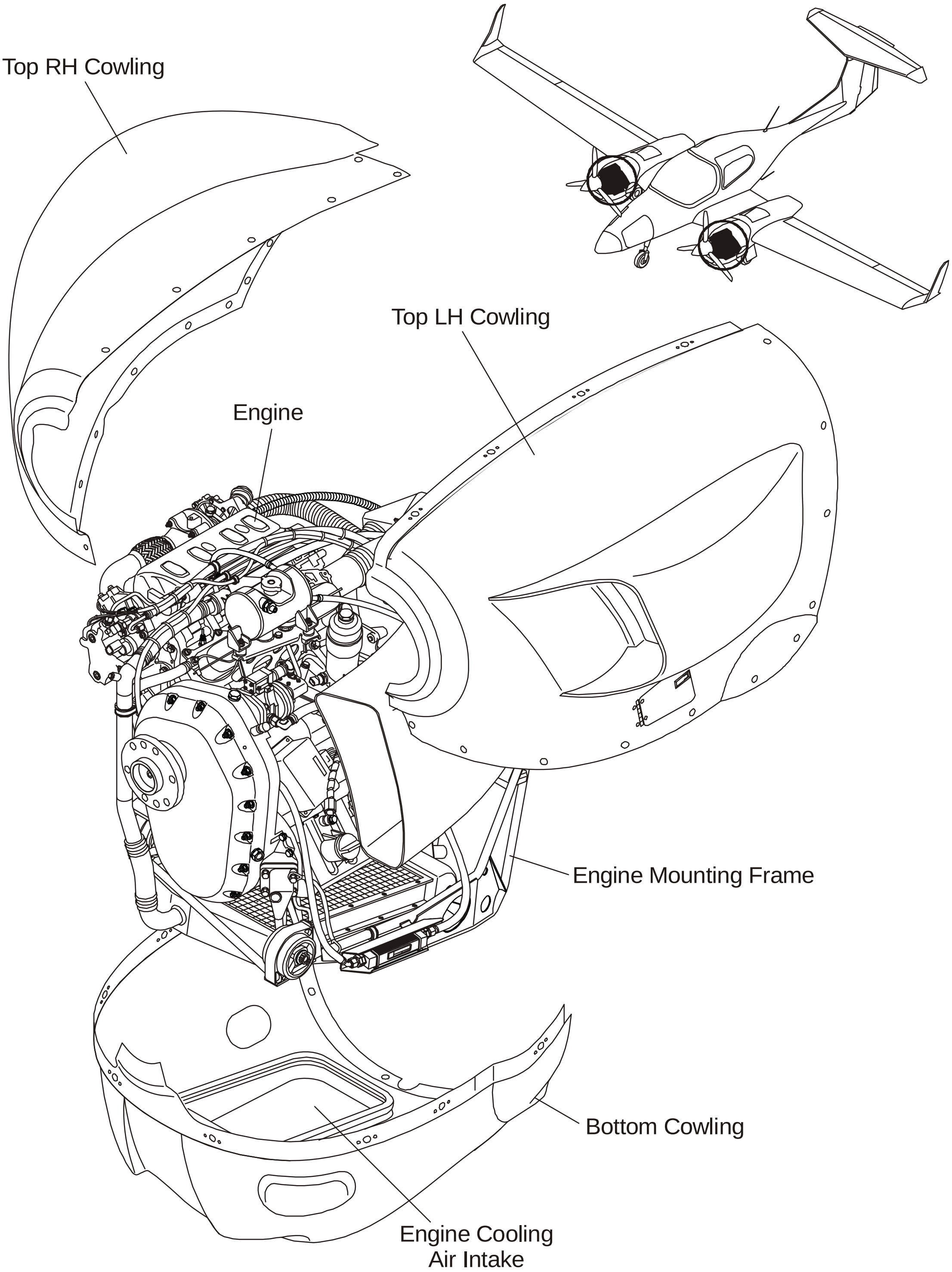

Figure 2: Power Plant (if MÄM 42-600 is installed)

2. Description an Operation

The DA 42 NG has a AE E4-B liquid-cooled, in-line four-stroke four cylinder engine with a double overhead camshaft (DOHC) with four valves per cylinder. The valves are actuated by the cam follower The direct fuel injection is realized by means of a common rail technique and the engine is charged by a turbo charger in combination with an inter-cooler.

The propeller is activated by a directly integrated gearbox with an integral torsional vibration damper. All engine components are controlled by an EECU system.

The power plant has these components installed:

A. Cowlings

The power plant has a left side cowling, a right side cowling and bottom engine cowling. All the cowlings attach to each other and the engine nacelle with Camloc quick release fasteners.

The bottom cowling has air intakes for the engine cooling, the cabin heat exchanger and the engine air intake.

B. Engine Mounts

The engine mount attaches to the firewall at five locations. Tubular steel makes the mounting frame. The engine attaches to the engine mount with four shock-mounts. Gel-filled rubber elements make the engine shock-mounts.

C. Electrical Harness

Electrical cables go through the firewall to connect to the engine. They give electrical supply to the engine sensors. Electrical cables from the main battery and from the generator supply electrical power to the airplane electrical system.

3. Engine Specification

Note: The engine drives the propeller through a speed-reducing gear. All RPMs are shown as propeller RPMs.

AE E4-B and E4-C (if MÄM 42-600 is installed) Engine Specification	
Engine manufacturer.	Austro Engine GmbH.
Engine model.	E4-B, E4-C (if MÄM 42-600 is installed).
Engine operating limits: – Maximum take-off power. – Maximum continuous power. – Maximum overspeed (max. 20 sec).	 123.5 kW (165.6 DIN-hp) at 2300 RPM. 114.0 kW (152.9 DIN-hp) at 2100 RPM. 2500 RPM.
Oil pressure (indicated values are corrected for pressure altitude):	Refer to Airplane Flight Manual.
Oil temperature:	Refer to Airplane Flight Manual.
Oil consumption: – Maximum.	0.1 liter/hr. (0.11 US qt/hr.).
Oil quantity:	Refer to Airplane Flight Manual.
Coolant temperature:	Refer to Airplane Flight Manual.
Fuel consumption:	Refer to Airplane Flight Manual.
Gearbox oil capacity:	2.1 liter (2.22 US qts).
Engine weight, bare:	185 kg (407.9 lb).
Fuel grade:	Refer to Airplane Flight Manual.
Oil specification:	Refer to Airplane Flight Manual.
Coolant:	Refer to Airplane Flight Manual.
Gearbox oil:	Refer to Airplane Flight Manual.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the power plant. It does not give trouble shooting data for the engine or the engine systems. Refer to the AE Operation Manual, latest revision for engine and engine system trouble-shooting.

WARNING: YOU MUST BE CAREFUL WHEN YOU DO POWER PLANT TROUBLE SHOOTING. OPERATION OF A DAMAGED ENGINE CAN CAUSE MORE DAMAGE TO THE ENGINE. THIS CAN CAUSE INJURY TO PERSONNEL.

If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Engine vibration.	Damaged shock mounts.	Replace the shock mounts.
	Propeller unbalance.	Balance the propeller.
	Engine operates with only 3 fuel injectors.	Refer to the engine manufacturer.
Engine does not produce full power.	Engine air inlet blocked.	Examine the air inlet.
	Air filter blocked.	Examine/Replace the air filter
	Sensor signal out of limits.	Read AE engine data with laptop computer via CAN interface. Refer to the AE Maintenance Manual, latest revision, Chapter 72-00.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install the engine.

WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER. DISCONNECT THE BATTERY.

WARNING: DO NOT GO BELOW THE ENGINE WHEN YOU LIFT THE ENGINE WITH THE HOIST. THE HOIST CAN FAIL. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: DO NOT GET ENGINE OIL, GEAR OIL OR COOLANT ON YOU. THESE LIQUIDS CAN CAUSE SKIN DISEASE.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE OR SPARKS NEAR FUEL. FUEL BURNS AND BURNING FUEL CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.

CAUTION: YOU MUST ATTACH CAPS TO HOLES/PIPES WHEN YOU REMOVE THE ENGINE. IF YOU DO NOT DO THIS, CONTAMINATION CAN ENTER THE HOLES/PIPES. THIS CAN CAUSE BLOCKAGE TO THE AIRPLANE SYSTEMS.

CAUTION: AFTER WORK ON THE FUEL DISTRIBUTION SYSTEM, BEFORE STARTING THE ENGINE BLEED THE FUEL SYSTEM AT THE INLET OF THE HIGH PRESSURE PUMP.

2. Remove/Install the Engine

A. Equipment

Item	Quantity	Part Number
Hoist.	1	Commercial.
Engine sling.	1	Commercial.
Engine stand.	1	Commercial.
Tail trestle.	1	Commercial.
Hoisting points.	4	Delivered with engine.

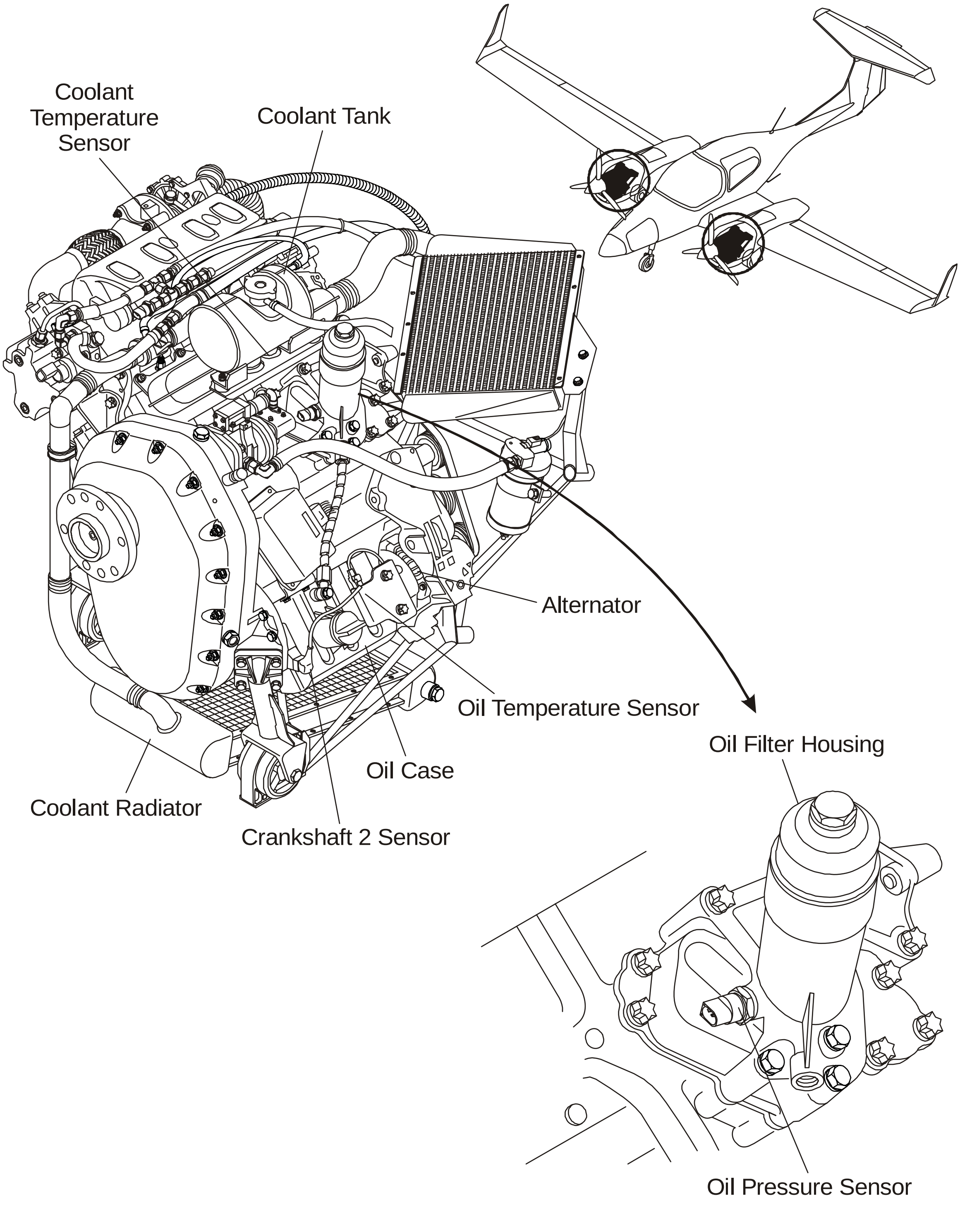

Figure 3: Left Side of Engine

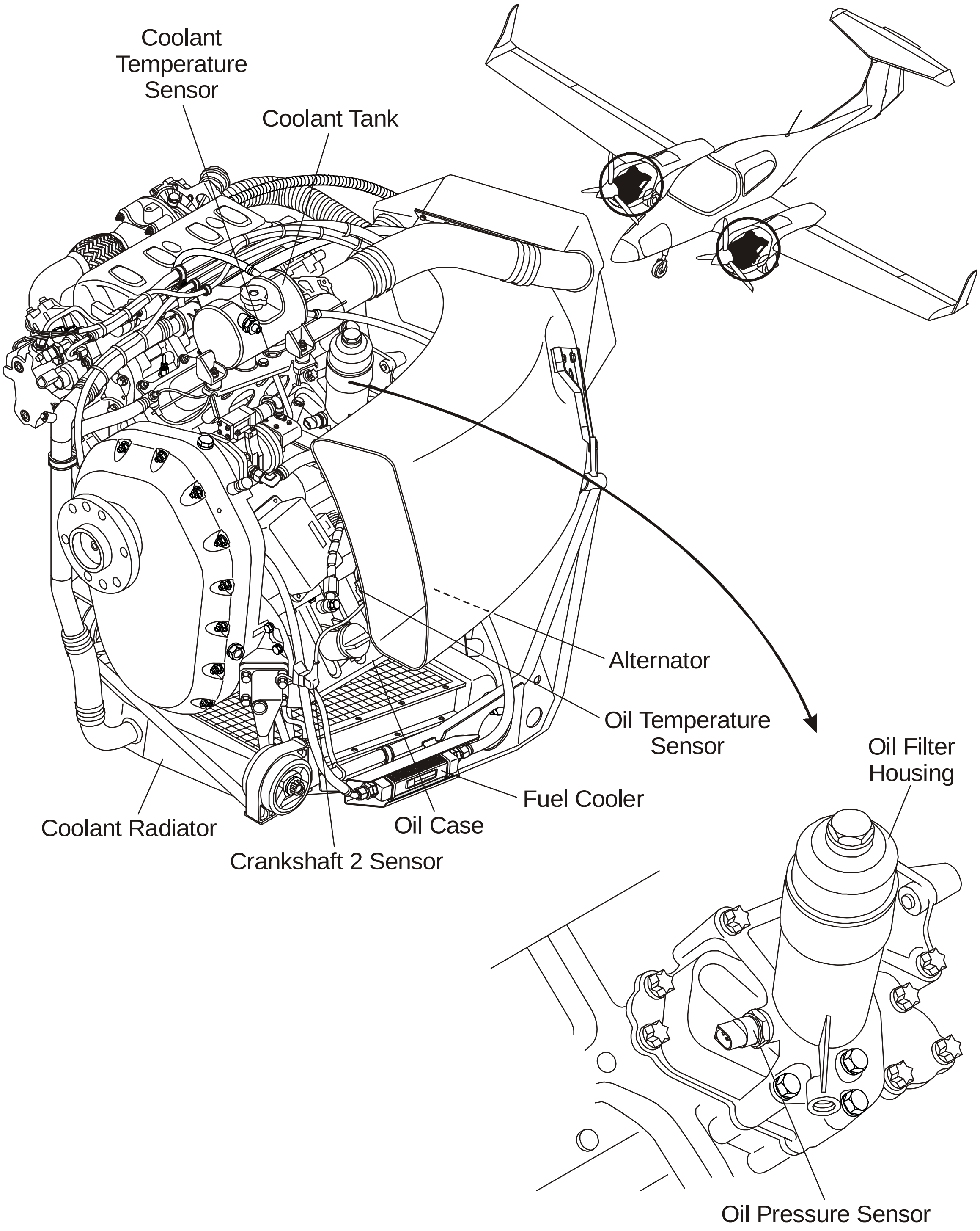

Figure 4: Left Side of Engine (if MÄM 42-600 is installed)

B. Remove the Engine without Cable Harness

	Detail Steps/Work Items	Key Items/References
(1)	Read the engine EECU data out and send them via email to Austro Engine GmbH. Refer to the AE Maintenance Manual, latest revision.	Refer to Section 72-00.
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(2)	Set the related engine FUEL SELECTOR to OFF.	
(3)	Make sure that the engine is safe: – Set ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(4)	Disconnect the airplane main battery.	Refer to Section 24-31.
(5)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
(6)	Remove the propeller.	Refer to Section 61-10.
(7)	Drain the coolant system.	Refer to Section 75-00.
(8)	Remove the hose from the alternate air valve to the turbo charger.	
(9)	Remove the air intake duct from the intercooler.	
(10)	Remove the coolant tank.	Refer to Section 75-00.
(11)	Disconnect the coolant hoses from the coolant radiator: – Remove the 8 worm-drive-clamps. – Remove the hoses. – Remove the cooling pipe.	Refer to Section 75-00. 4 on each hose.
(12)	Disconnect the coolant hoses from the heating radiator.	Refer to Section 75-00.

	Detail Steps/Work Items	Key Items/References
(13)	Disconnect the oil hose from the accumulator.	Use a suitable container to catch the oil in the tubes.
(14)	Remove the propeller accumulator.	
(15)	Disconnect the breather line.	
(16)	Disconnect the TKS line from the engine (if installed).	
(17)	Disconnect the electrical cables on the alternator. – Release all clips and ties holding the cables to the engine.	
(18)	Disconnect the electrical cables from the starter motor. – Disconnect the two control cables at the solenoid. – Disconnect the main supply cable at the solenoid. – Release all clips and ties holding the cables to the engine.	Do not remove clips and ties on the engine mount.
(19)	Disconnect all electrical connections (glow plugs, injectors, etc.).	Refer to the AE Maintenance Manual, latest revision.
(20)	Remove the hose that connects the turbo charger outlet to the inter-cooler: – Remove the 4 worm-drive-clamps. – Remove the hose.	Refer to Section 73-00.
(21)	Remove the exhaust.	Refer to Section 78-00.
(22)	Release clips, ties and clamps holding the engine wire harness to the engine mount. Move the harness clear of the engine.	
(23)	Disconnect the fuel supply hose and remove the fuel line mounting bracket.	At the high-pressure fuel pump.
(24)	Disconnect the fuel return hose.	Behind the rail pressure regulator.
(25)	Remove the bonding cable at the engine near each engine shock-mount and safety cables.	

	Detail Steps/Work Items	Key Items/References
(26)	Support the airplane at the tail.	Use the tail trestle. Refer to Section 07-10.
(27)	Remove the TKS bracket: – Remove the three bolts located at the upper right side of the gearbox and engine housing.	
(28)	Install hoisting points.	
(29)	Attach the sling to the engine. Attach the sling to the hoist.	There are lifting points at: – Front right cylinder head. – Rear left of the cylinder head near coolant pump. – Rear right at the alternator bracket. Refer to AE Installation Manual, latest revision.
(30)	Take the weight of the engine with the hoist.	
(31)	Remove the nuts, bolts and washers that attach the engine support brackets to the engine mount.	
(32)	Remove the safety rope from the engine.	
(33)	Lift the engine a small distance, turn it slightly to the right side and move it at the same time forward and clear of the engine mount.	Make sure that the engine does not hit the engine mount.
(34)	Remove the support bracket from the engine.	
(35)	Attach the shipping stand to the engine.	Refer to AE Installation Manual, latest revision.
(36)	Put caps on the open end pipes and connections.	
(37)	Prepare engine for shipping.	Note TTSO hours and reason for removal.
(38)	Clean firewall and engine mount.	
(39)	Examine the engine mount for cracks and corrosion.	
(40)	Check lifetime of the elastomer hoses and replace as necessary.	

	Detail Steps/Work Items	Key Items/References
(41)	If the engine was removed because of oil system contamination: – Remove and discard oil radiator and oil hoses.	Refer to Section 79-00.

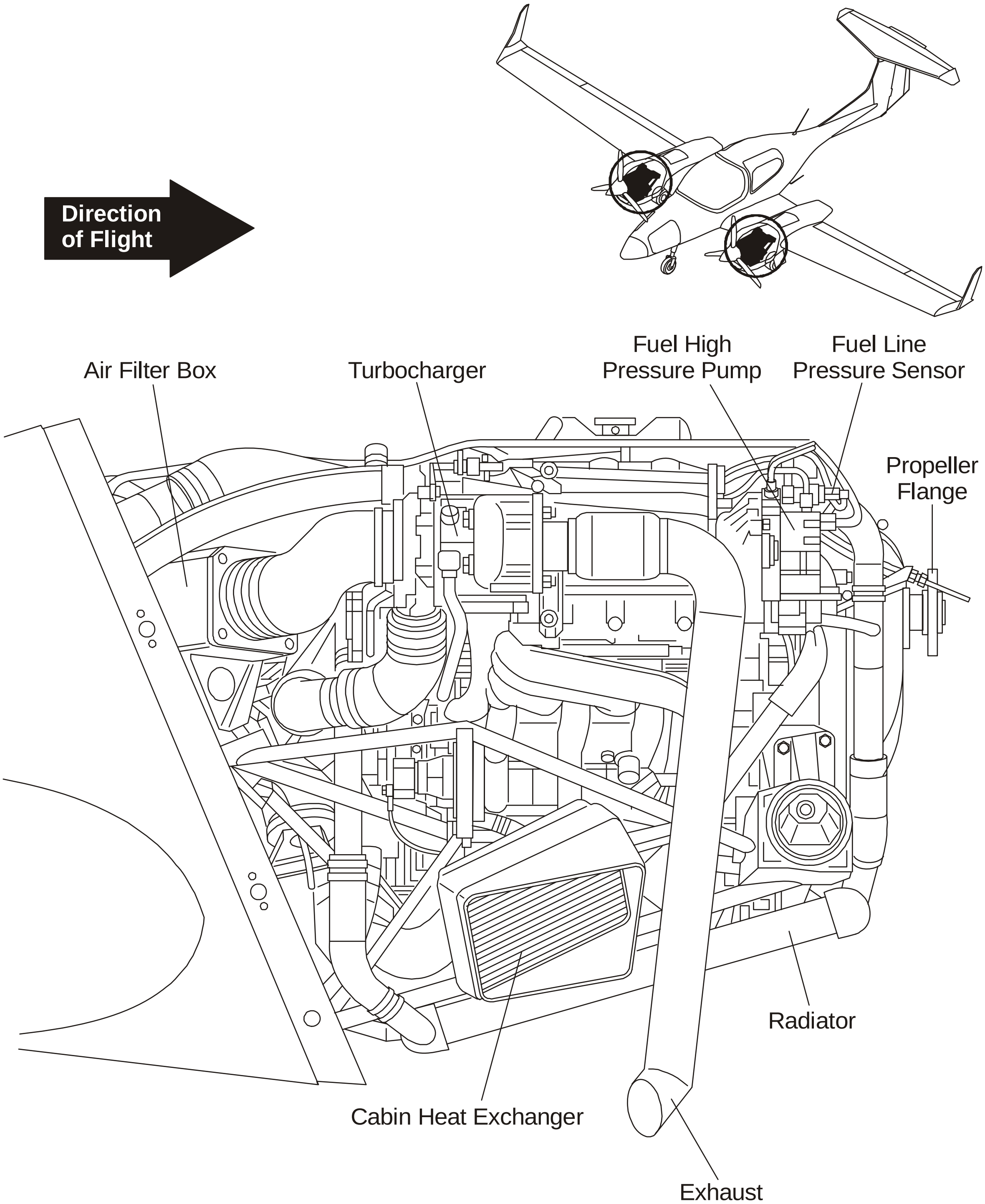

Figure 5: Right Side of Engine

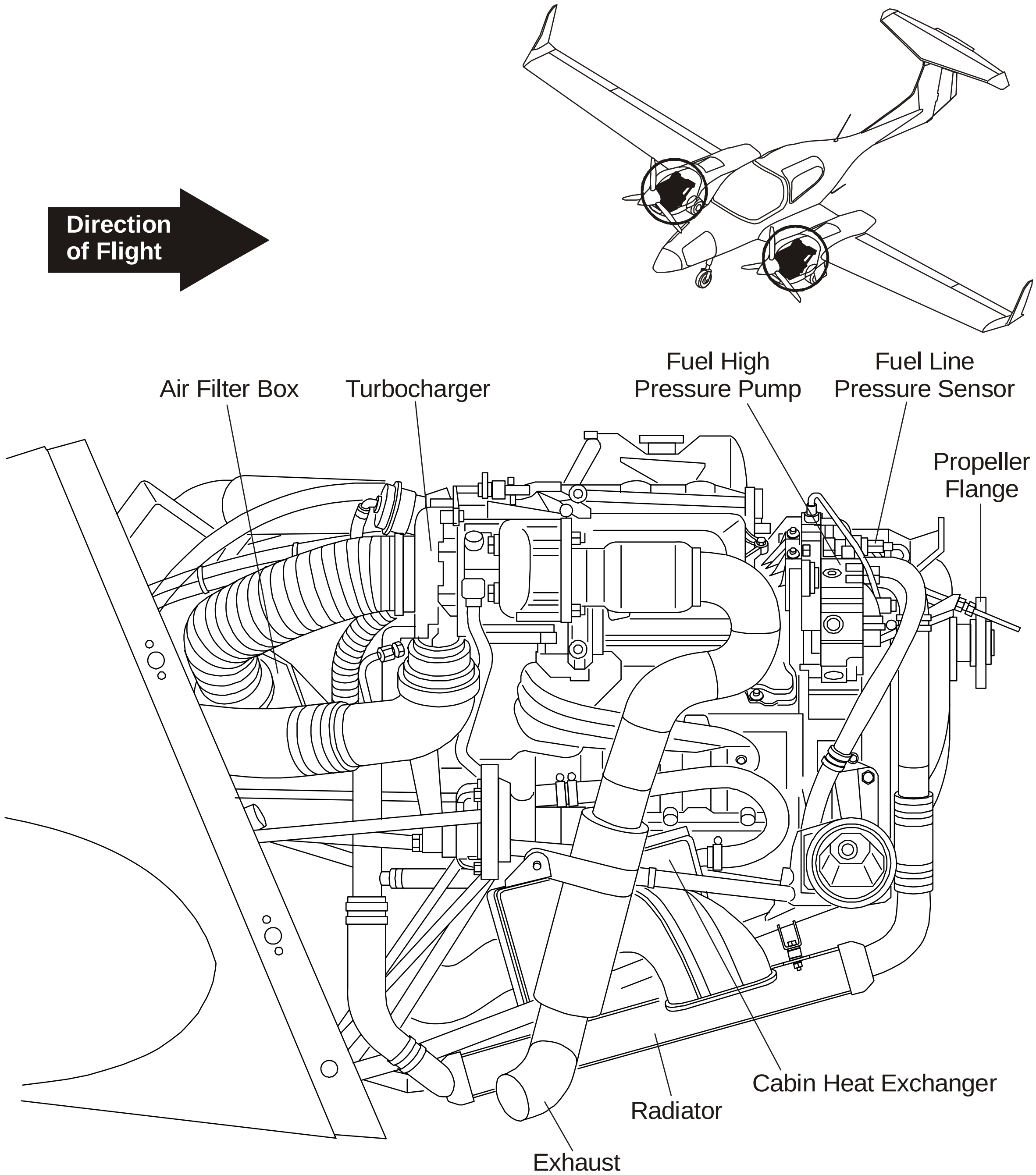

Figure 6: Right Side of Engine (if MÄM 42-600 is installed)

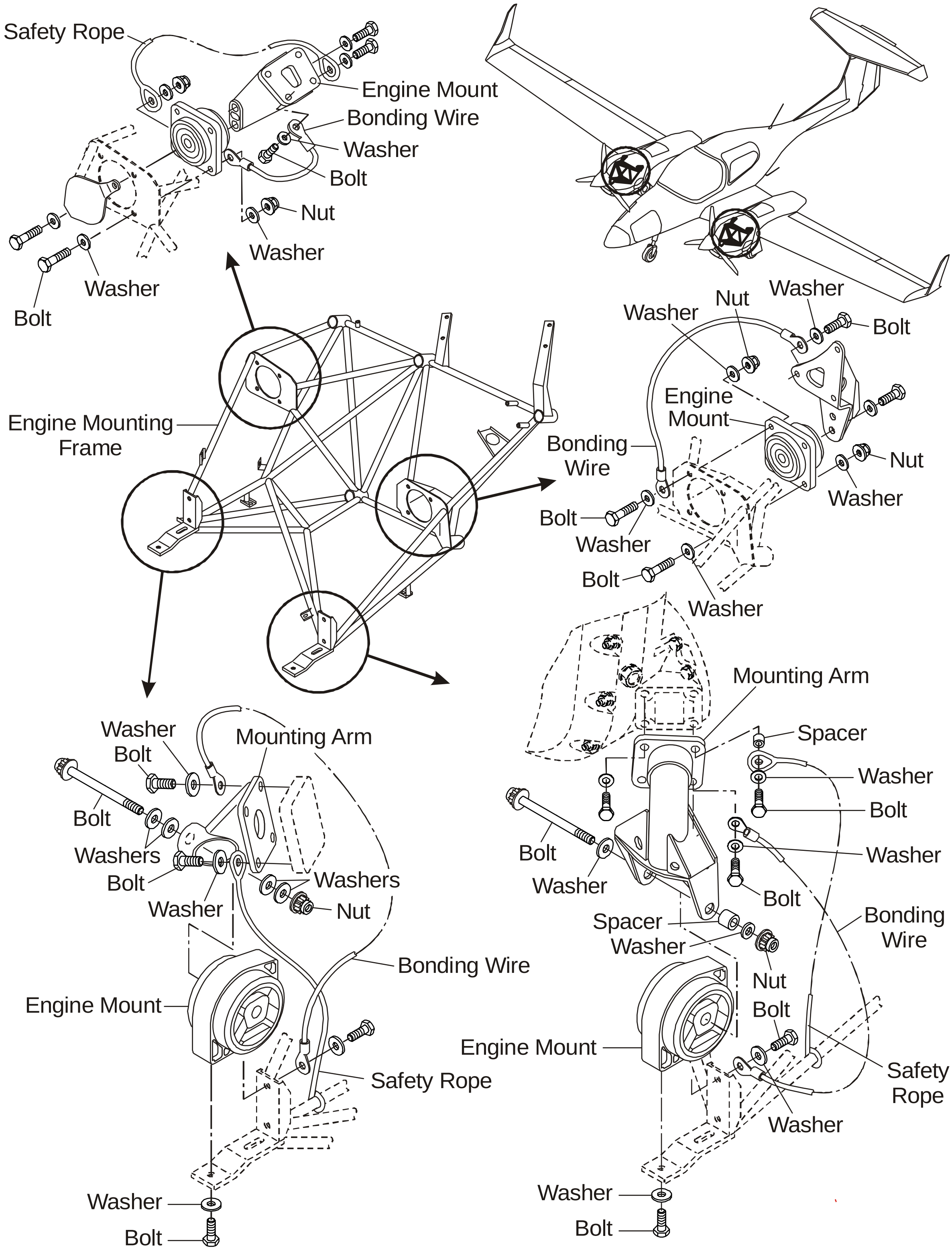

Figure 7: Engine Shock-Mounts

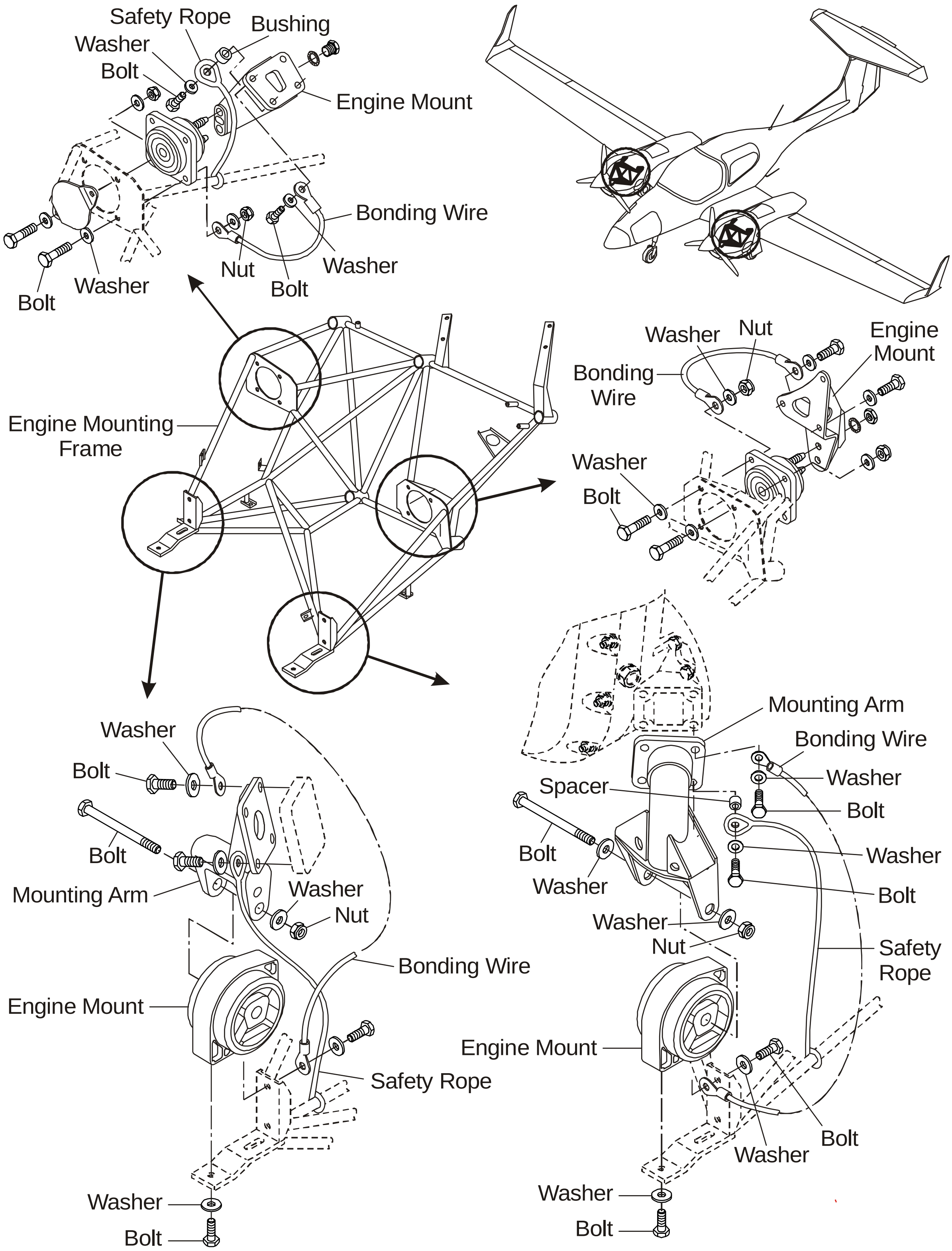

Figure 8: Engine Shock-Mounts (if MÄM 42-594 is installed)

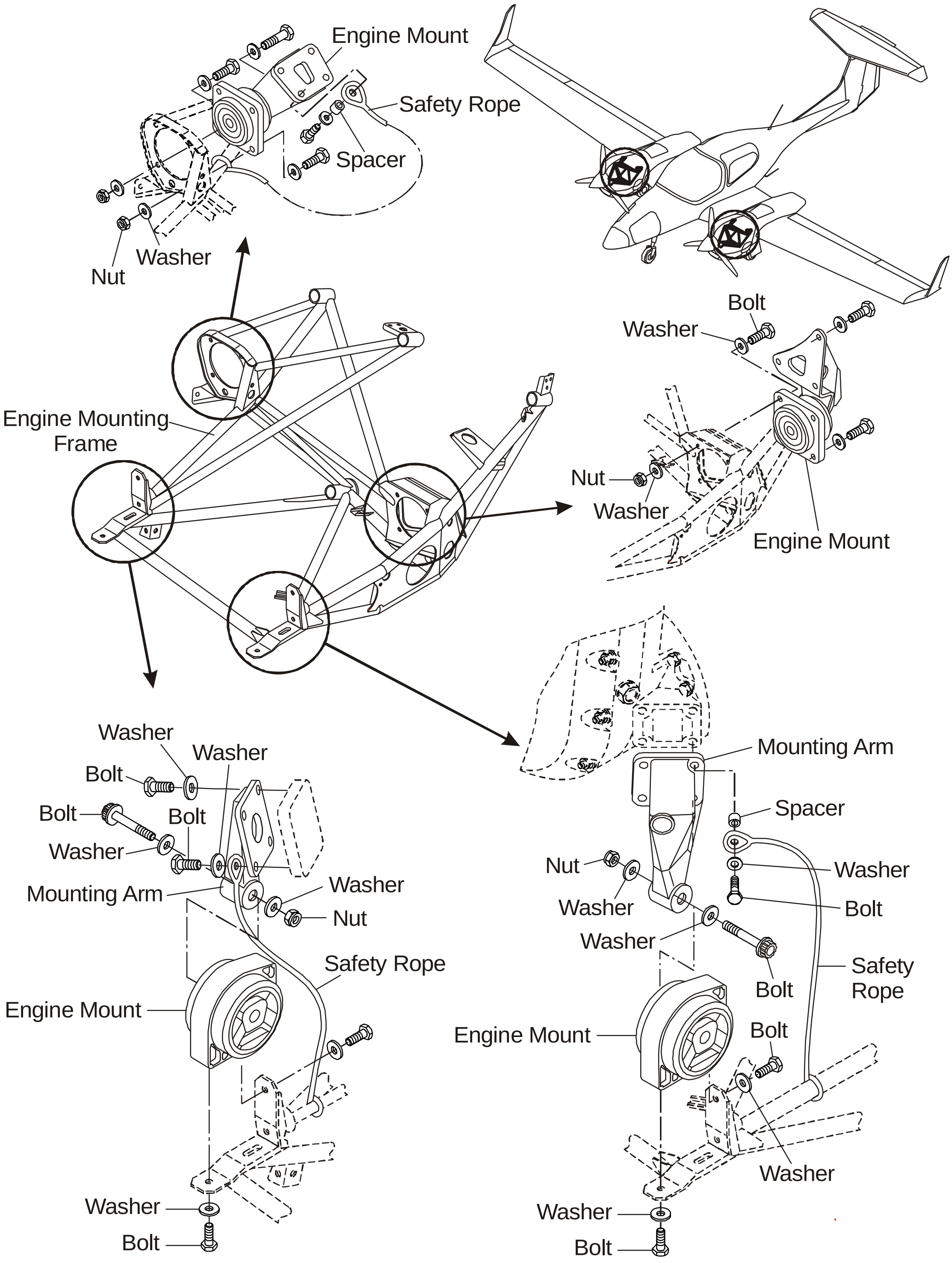

Figure 9: Engine Shock-Mounts (if MÄM 42-600 is installed)

C. Install the Engine

	Detail Steps/Work Items	Key Items/References
(1)	Attach the sling to the engine. Attach the sling to the hoist.	There are lifting points at: – Front right cylinder head. – Front left of the reduction gear housing. – Rear left of the cylinder head near coolant pump. – Rear right at the alternator bracket.
(2)	Remove the shipping stand from the engine.	
(3)	Install the engine shock-mounts at the engine mount.	Front: Torque: 16 Nm (11.8 lbf.ft.), if MÄM 42-600 is installed: 20 Nm (14.75 lbf.ft.). Use Loctite 243. Rear: Torque: 28 Nm (20.64 lbf.ft.).
(4)	Install engine support bracket at the engine with safety rope.	Use Loctite 243.
(5)	Carefully move the engine back into position in the engine mount.	
(6)	Install the bolts, nuts, and washers that attach the engine shock-mounts to the engine mounting arms.	Refer to Chapter 20 for torque values. Front bolt: Lubricate with CA 1000-PRC De Soto, Torque: 85 Nm (62.7 lbf.ft.). Rear bolt: Use Loctite 243, Torque: 32 Nm (23.6 lbf.ft.), if MÄM 42-594 or MÄM 42-600 is installed: RH: 54 Nm (39.83 lbf.ft.), LH: 44 Nm (32.45 lbf.ft.).
(7)	Install the bonding cable at the engine near each shock-mount.	

	Detail Steps/Work Items	Key Items/References
(8)	Install the safety cables at the engine near each shock-mount, except the rear LH shock-mount.	Refer to Figure 7, 8 or 9.
(9)	Install the water tube with clamp at the engine mount.	
(10)	Connect the electrical cables to the starter motor: – Connect the two control cables at the solenoid. – Connect the main supply cable at the solenoid. – Attach all clips and ties holding the cables to the engine.	
(11)	Move the engine wire harness into position on the engine. Connect the engine wire harness and bonding cables to these electrical sensors: – Fuel rail pressure regulator. – Propeller governor. – Waste gate valve solenoid. – Fuel injectors. – Glow plugs.	 At the rear end of the fuel rail. At the right side of the reduction gear. At the lower crankshaft cover. At each fuel injector. At the lower crankshaft cover.
(12)	Install clips and ties clamps holding the engine wire harness to the engine.	
(13)	Connect the fuel supply hose.	At the high pressure pump.
(14)	Connect the fuel return hose.	At the high pressure pump.
(15)	Install the coolant tank.	Refer to Section 75-00.
(16)	Install the coolant hoses to the coolant radiator: – Install the 2 hoses, at the radiator. – Install the 8 worm-drive-clamps that hold the hoses.	Refer to Section 75-00. 4 on each hose.
(17)	Install the hose which connects the alternate air to the turbo charger.	

	Detail Steps/Work Items	Key Items/References
(18)	Install the hose which connects the intercooler to the turbo charger.	
(19)	Connect the breather tube.	At the oil pre-separator.
(20)	Install exhaust pipe flange.	Torque: 25 - 34 Nm (18.44 - 25.08 lbf.ft.).
(21)	Install the propeller accumulator. Connect the hose to the governor.	
(22)	Install the air intake duct at the intercooler.	
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(23)	Install the TKS bracket: – Install the three bolts located at the upper right side of the gearbox and engine housing.	
(24)	Install the propeller.	Refer to Section 61-00.
(25)	Fill and bleed the cooling system.	Refer to Section 75-00.
(26)	Fill the engine with oil.	Refer to Section 12-10.
(27)	Fill the reduction gear with oil.	Refer to Section 12-10.
(28)	Connect the airplane main battery.	Refer to Section 24-31.
(29)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(30)	Remove the tail trestle.	Refer to Section 07-10.
	CAUTION: AFTER WORK ON THE FUEL DISTRIBUTION SYSTEM, BEFORE STARTING THE ENGINE BLEED THE FUEL SYSTEM AT THE INLET OF THE HIGH PRESSURE PUMP.	
(31)	Do an engine test.	Refer to Paragraph 3.

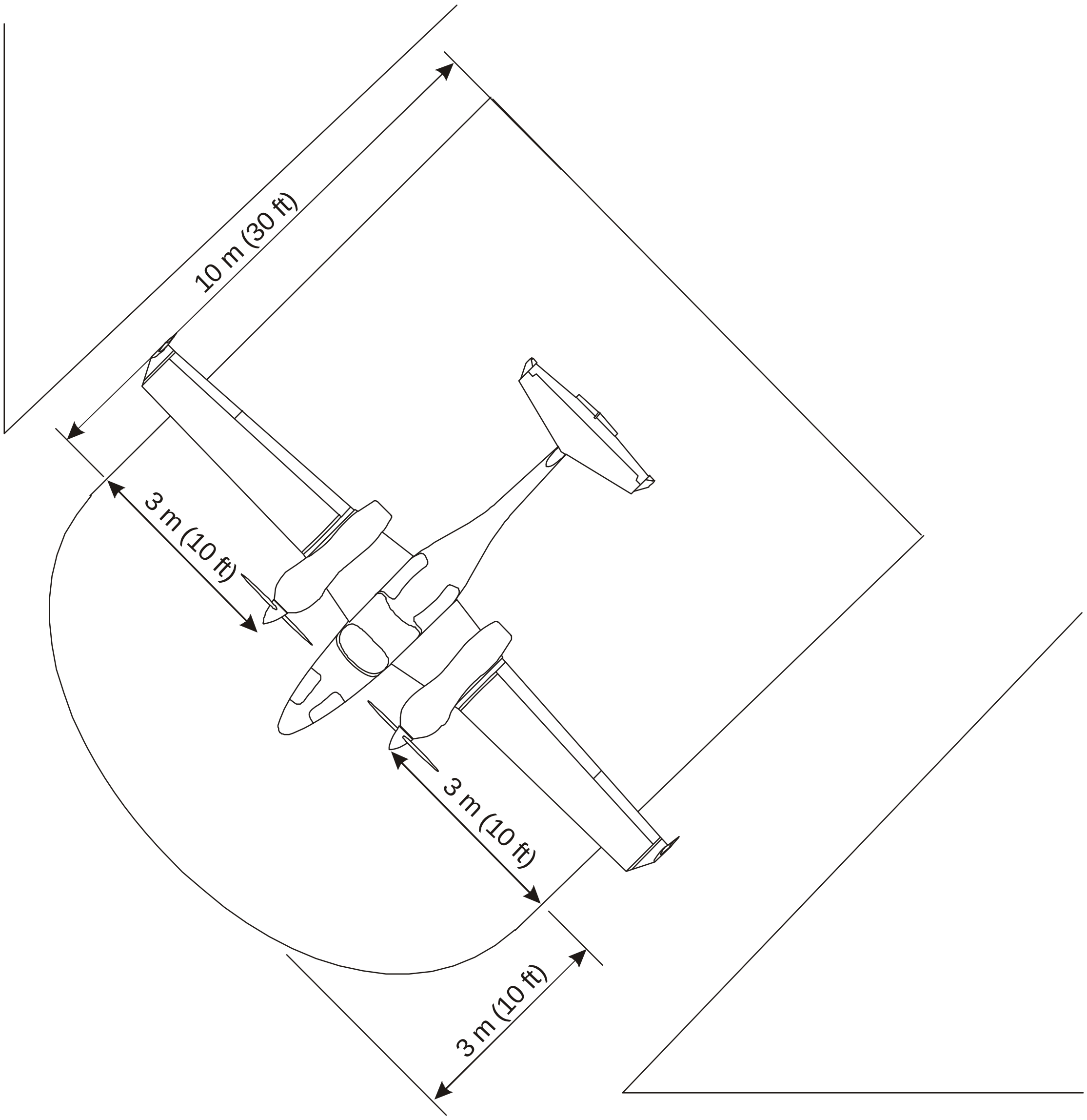

Figure 10: Engine Testing Safety Zone

3. Engine Test - General

For engine starting and warm-up, ECU test, propeller control test, ECU swap test and performance check refer to AE Operation Manual, latest revision and Airplane Flight Manual.

Note: The engine drives the propeller through a speed-reducing gear. All RPMs are shown as propeller RPMs.

CAUTION: ONLY AUTHORIZED PERSONNEL MAY READ ENGINE DATA WITH THE 'ECU OPERATOR' SOFTWARE.

A. Equipment

Item	Quantity	Part Number
Airplane chocks.	2	Commercial.
Fuel sample kit.	1	Commercial.
Laptop computer.	1	Commercial.
"Wizard 300" software, latest approved revision.	n/a	n/a.
CAN interface.	1	n/a.

B. Preparation

	Detail Steps/Work Items	Key Items/References
WARNING:	**DO NOT LET PERSONS INTO THE SAFETY RANGE OF THE AIRPLANE. PROPELLERS CAN CAUSE INJURY OR DEATH.**	
(1)	Look in the engine records for reports of problems.	
(2)	Make sure that all switches are OFF.	
(3)	Position the airplane on level ground. Make sure that: – There are no loose stones on the ground near the propeller. – The safety zone around the airplane is clear. – The airplane heads into the wind.	Refer to Figure 10.
(4)	Check engine oil level, gearbox oil level, and coolant level. For the engine that you will test.	
(5)	Do a test of a sample of fuel for contamination.	Refer to Section 12-10.
(6)	Put chocks in front of each main wheel.	
(7)	Make sure that there is enough fuel for the engine test: – Set the ELECT. MASTER switch to ON. – Read the fuel quantity indicator. – Set the ELECT. MASTER switch to OFF. – Refuel the airplane if necessary.	

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Section 71-10
Engine Cowlings

1. General

The DA 42 NG has three carbon fiber reinforced plastic (CFRP) panels which make the engine cowlings. A top-left cowling, a top-tight cowling and a bottom cowling. CFRP is very strong and is easy to maintain. The cowlings give a good aerodynamic shape to the engine nacelles. They are very easy to remove and give good access to the engine.

Refer to Section 51-20 for repair data for the cowlings. Refer to Section 51-60 for data on the quick-release fasteners.

2. Description

Figure 1 shows the cowlings.

Camloc quick-release fasteners attach the cowlings to each other and to the engine nacelle. All the cowlings are very light and one person can hold them easily.

The bottom cowling has an air intake on the right side of the cowling and a large air intake on the bottom of the cowling at the front. The side-intake supplies air for the cabin heat exchanger. The intake at the front of the bottom cowling supplies air for the coolant radiator.

The top cowling consists of a right and a left half. The left cowling half has one air intake for the intercooler and the engine. The right cowling half has one outlet next to the turbo-charger.

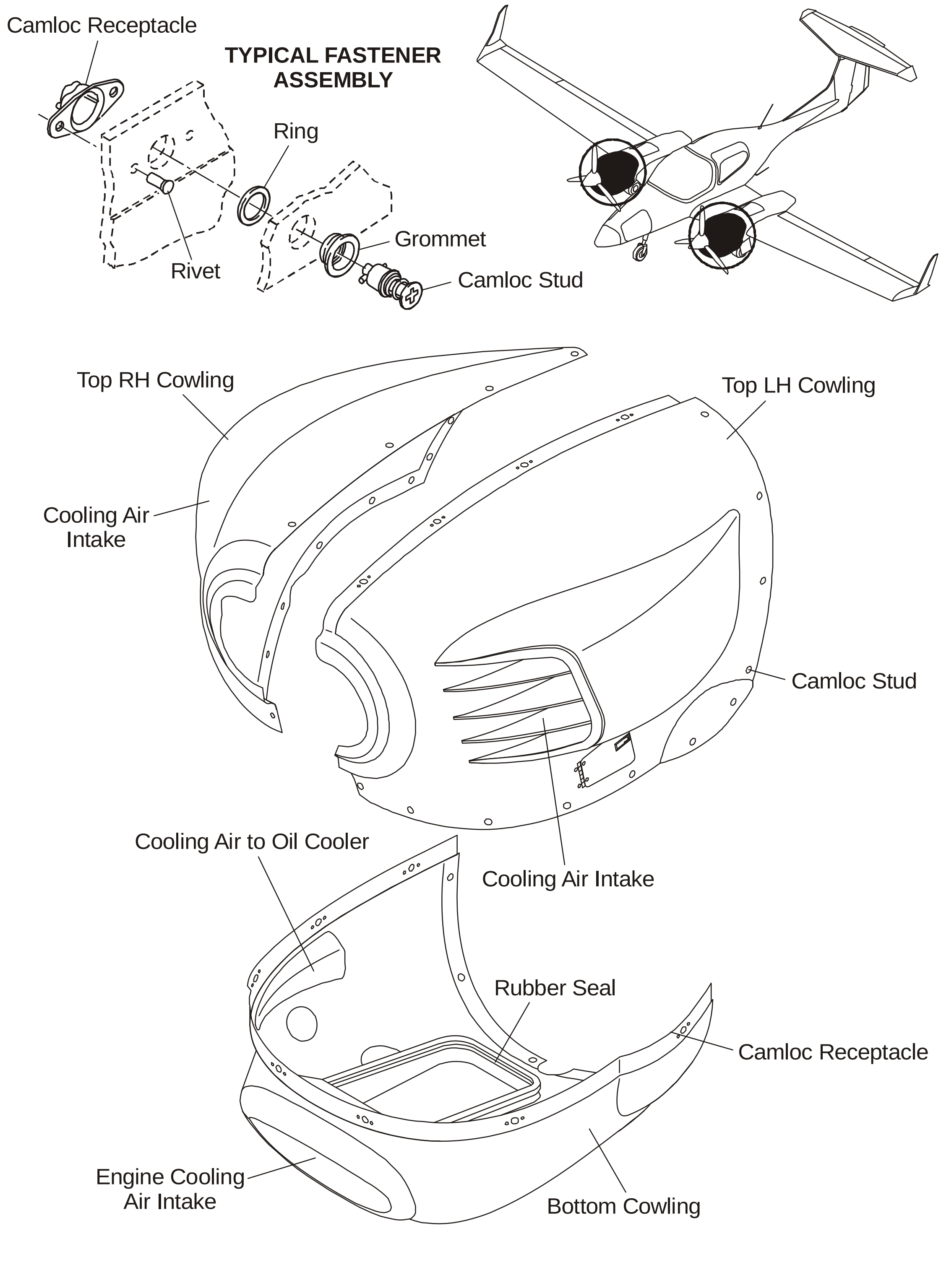

Figure 1: Engine Cowlings 1

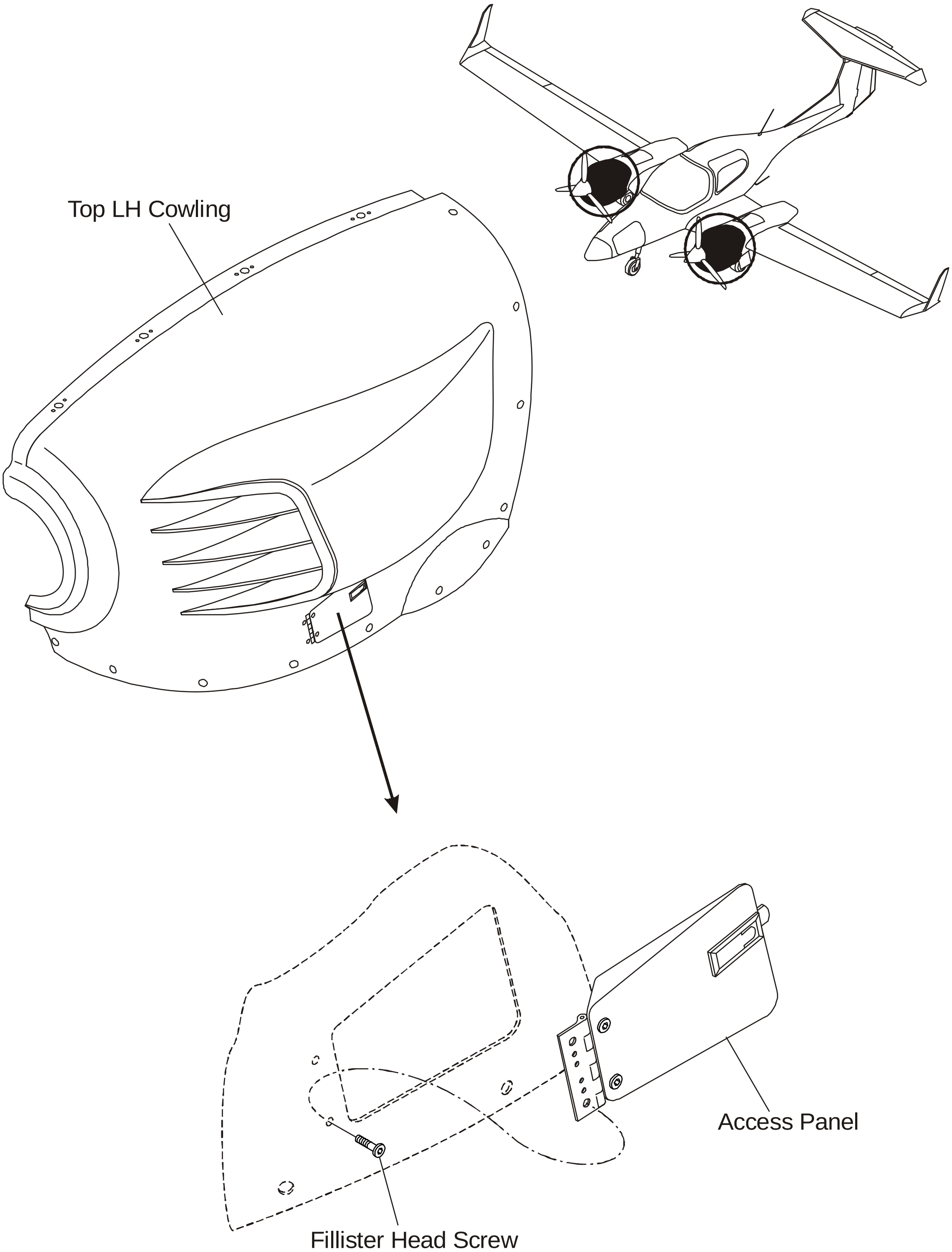

Figure 2: Engine Cowlings 2

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Trouble-Shooting

1. General

The table below lists the defects you could have with the engine cowlings. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Outer surface of the cowling discolored. Paint blistered. Black soot on the inner surface.	Engine overheating. Hot gas leak. Engine fire.	Examine the engine for hot gas leaks. Examine the exhaust for cracks and leaking gaskets. Replaced damage items. Repaint the cowlings.
Oil/fuel/coolant on the inner surface of the cowling.	Oil, fuel or coolant leak.	Examine the engine. Look specially for oil, fuel and coolant leaks. Correct problems which you have found. Clean the cowling.

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Maintenance Practices

1. General

This Section contains the Maintenance Practices for the cowlings. It tells you how to remove/install the cowlings. It also tells you how to clean and paint the cowlings.

2. Remove/Install the Engine Cowlings

Use these procedures for the left engine or the right engine.

A. Remove the Engine Left and Right Top Cowlings

WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU WORK NEAR TO THE PROPELLER.
- SET THE ELECT. MASTER SWITCH TO "OFF".
- SET THE ENGINE MASTER SWITCH TO "OFF".
- SET THE POWER LEVER TO "0%".
- DISCONNECT THE AIRPLANE MAIN BATTERY.

	Detail Steps/Work Items	Key Items/References
WARNING:	**MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE COWLINGS. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the related ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Release the fasteners that attach the top-left and top-right cowlings to each other, the bottom cowling and the engine nacelle.	Refer to Figure 1.
(4)	Pull the top of the top-right cowling up and away from the top-left cowling, the bottom cowling and clear of the engine nacelle.	Take care not to scratch the cowling on the propeller!

	Detail Steps/Work Items	Key Items/References
(5)	Pull the bottom edge of top-left cowling away from the bottom cowling and clear of the engine nacelle.	Take care not to scratch the cowling on the propeller!

B. Remove the Bottom Cowling

	Detail Steps/Work Items	Key Items/References
(1)	Release the quick-release fasteners which hold the bottom cowling.	Hold the bottom cowling!
(2)	Remove the bottom cowling:	
	– Lower the rear of the cowling.	Take care not to scratch the cowling on the propeller and spinner cone.
	– Move the cowling down and forward.	
	– Move the cowling clear of the airplane.	

C. Install the Bottom Cowling

	Detail Steps/Work Items	Key Items/References
(1)	Examine the bottom cowling. Make sure that:	
	– The cowling is clean.	
	– The cowling is not damaged.	Repair any damage.
	– The quick-release fasteners are not missing/damaged.	Replace missing/damaged fasteners.
	– Drain holes must be clear.	
(2)	Lift the cowling into position:	
	– Move the cowling upwards.	
	– Lift the cowling fully into position.	Take care of the air inlets. Engage the respective shrouds.
	– Tighten the quick-release fasteners that attach the cowling to the engine nacelle.	

D. Install the Engine Left and Right Top Cowlings

	Detail Steps/Work Items	Key Items/References
(1)	Examine the top-left and top-right cowlings. Make sure that: – The cowlings are clean. – The cowlings are not damaged. – The quick-release fasteners are not missing/damaged.	 Repair any damage. Replace missing/damaged fasteners.
(2)	Install the top-left cowling: – Move the top-left cowling into position on the engine nacelle. – Move the top-right cowling into position on the engine nacelle.	 Make sure that the fasteners engage correctly in the engine nacelle and bottom cowling. Make sure that the fasteners engage correctly in the top-left cowling, the engine nacelle and bottom cowling.
(3)	Tighten all the quick-release fasteners that attach the top-left and top-right cowlings to the bottom engine cowling and the engine nacelle.	

3. Cleaning and Painting

A. Clean the Cowlings

	Detail Steps/Work Items	Key Items/References
(1)	Wash the outer surface with a mixture of water and a mild detergent.	Obey the detergent manufacturer's instructions.
(2)	Wash the inner surface with a mixture of water and a mild detergent.	Obey the detergent manufacturer's instructions.
	CAUTION: DO NOT USE POLISH CONTAINING SILICONE. SILICONE MAKES CFRP REPAIR DIFFICULT.	
(3)	Polish the outer surface with wax polish.	Obey the polish manufacturer's instructions. Do not use silicone polish.

B. Paint the Insides of the Cowlings

This Paragraph gives the data for painting the inside of the engine cowlings with fire protection paint. Refer to Section 51-20 for repairs and painting the outside of the cowlings.

Note: If OÄM 40-205 has been carried out (cowling made from self extinguishing resin), do not apply fire protection paint on the inside of the cowling. Use only self extinguishing resin for repair (refer to Section 51-30).

	Detail Steps/Work Items	Key Items/References
(1)	Clean the inside of the cowling.	
(2)	Make the area rough for painting.	Use 150-320 grade wet and dry paper.
	WARNING: DO NOT GET ACETONE ON YOUR SKIN. ACETONE CAN CAUSE SKIN DISEASE. **WARNING: DO NOT BREATHE ACETONE FUMES. ACETONE FUMES CAN CAUSE ILLNESS.** CAUTION: REMOVE ACETONE AS SOON AS POSSIBLE FROM GFRP. ACETONE CAN CAUSE THE RESIN TO SOFTEN AND FAIL.	
(3)	Clean the area for painting.	Use acetone.
(4)	Paint the inside of the cowling with fire protection paint.	Obey the paint manufacturer's instructions.

Section 71-11

Engine Cowlings (if MÄM 42-600 is installed)

1. General

The DA 42 NG with MÄM 42-600 installed has three carbon fiber reinforced plastic (CFRP) panels which make the engine cowlings. A top-left cowling, a top-tight cowling and a bottom cowling. CFRP is very strong and is easy to maintain. The cowlings give a good aerodynamic shape to the engine nacelles. They are very easy to remove and give good access to the engine.

Refer to Section 51-20 for repair data for the cowlings. Refer to Section 51-60 for data on the quick-release fasteners.

2. Description

Figure 1 shows the cowlings.

Camloc quick-release fasteners attach the cowlings to each other and to the engine nacelle. All the cowlings are very light and one person can hold them easily.

The bottom cowling has three air intakes at the front of the cowling. The intake at the front bottom of the lower cooling supplies air to the coolant radiator, the fuel cooler, the cabin heat exchanger and the gearbox oil cooling. A gearbox cooling hose directs air from the air intake to the gearbox oil cooling fins.

The top cowling consists of a right and a left half. The left cowling half has one air intake for the intercooler and engine air intake. The right cowling half has one outlet aft of the turbo-charger.

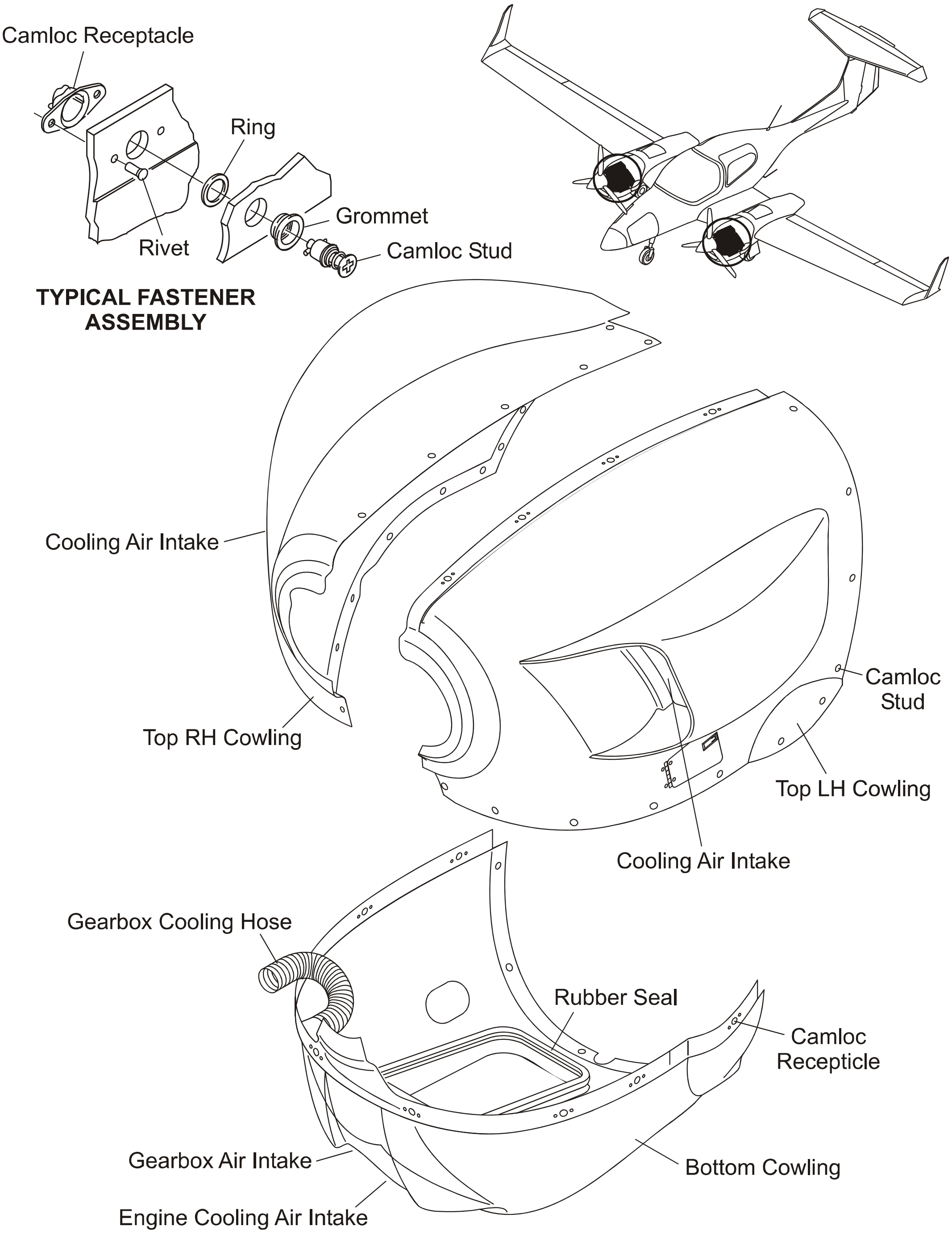

Figure 1: Engine Cowlings 1 (if MÄM 42-600 installed)

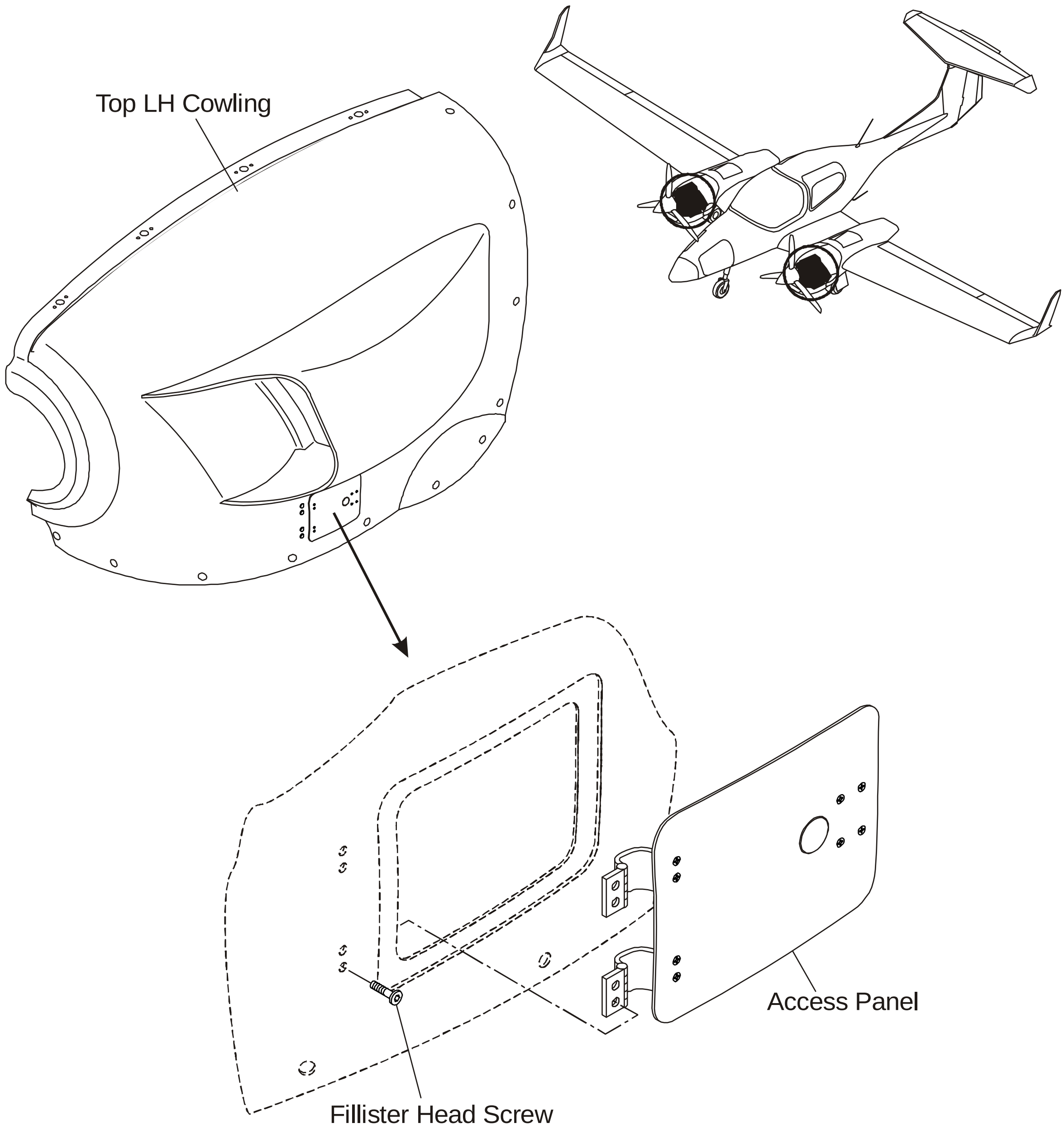

Figure 2: Engine Cowlings 2 (if MÄM 42-600 installed)

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Trouble-Shooting

1. General

The table below lists the defects you could have with the engine cowlings. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Outer surface of the cowling discolored. Paint blistered. Black soot on the inner surface.	Engine overheating. Hot gas leak. Engine fire.	Examine the engine for hot gas leaks. Examine the exhaust for cracks and leaking gaskets. Replaced damage items. Repaint the cowlings.
Oil/fuel/coolant on the inner surface of the cowling.	Oil, fuel or coolant leak.	Examine the engine. Look specially for oil, fuel and coolant leaks. Correct problems which you have found. Clean the cowling.

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Maintenance Practices

1. General

This Section contains the Maintenance Practices for the cowlings. It tells you how to remove/install the cowlings. It also tells you how to clean and paint the cowlings.

2. Remove/Install the Engine Cowlings

Use these procedures for the left engine or the right engine.

A. Remove the Engine Left and Right Top Cowlings

WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU WORK NEAR TO THE PROPELLER.
- SET THE ENGINE MASTER SWITCH TO "OFF".- SET THE ELECT. MASTER SWITCH TO "OFF".
- SET THE POWER LEVER TO "0%".
- DISCONNECT THE AIRPLANE MAIN BATTERY.

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE COWLINGS. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
(1)	Make sure that the engine is safe: – Set the related ENGINE MASTER switch to OFF. – Set the ELECT. MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Release the fasteners that attach the top-left and top-right cowlings to each other, the bottom cowling and the engine nacelle.	Refer to Figure 1.
(4)	Pull the top of the top-right cowling up and away from the top-left and bottom cowling and clear of the engine.	Take care not to scratch the cowling on the propeller!

	Detail Steps/Work Items	Key Items/References
(5)	Pull the bottom edge of top-left cowling away from the bottom cowling and clear of the engine.	Take care not to scratch the cowling on the propeller!

B. Remove the Bottom Cowling

	Detail Steps/Work Items	Key Items/References
(1)	Release the worm drive clamp on the gearbox cooling duct.	
(2)	Release the air hose from the gearbox cooling duct.	
(3)	Release the quick-release fasteners which hold the bottom cowling to them engine nacelle.	Hold the bottom cowling!
(4)	Remove the bottom cowling: – Lower first the left side of the cowling. – Move the cowling down. – Move the cowling clear of the engine.	Take care not to scratch the cowling on the propeller and spinner cone.

C. Install the Bottom Cowling

	Detail Steps/Work Items	Key Items/References
(1)	Examine the bottom cowling. Make sure that: – The cowling is clean. – The cowling is not damaged. – The quick-release fasteners are not missing/damaged. – Drain holes must be clear.	 Repair any damage. Replace missing/damaged fasteners.
(2)	Lift the cowling into position: – Move first the cowling upwards. – Lift the right side of the cowling fully into position. – Tighten the quick-release fasteners that attach the cowling to the engine nacelle.	 Take care of the air inlets. Engage the respective shrouds.
Note:	Make sure that the hose clamp lock at the cooling duct connection is positioned at the top to avoid chafing on the bottom cowling.	
(3)	Lift the cowling into position: – Install the air hose and the worm drive clamp on the gearbox cooling duct.	

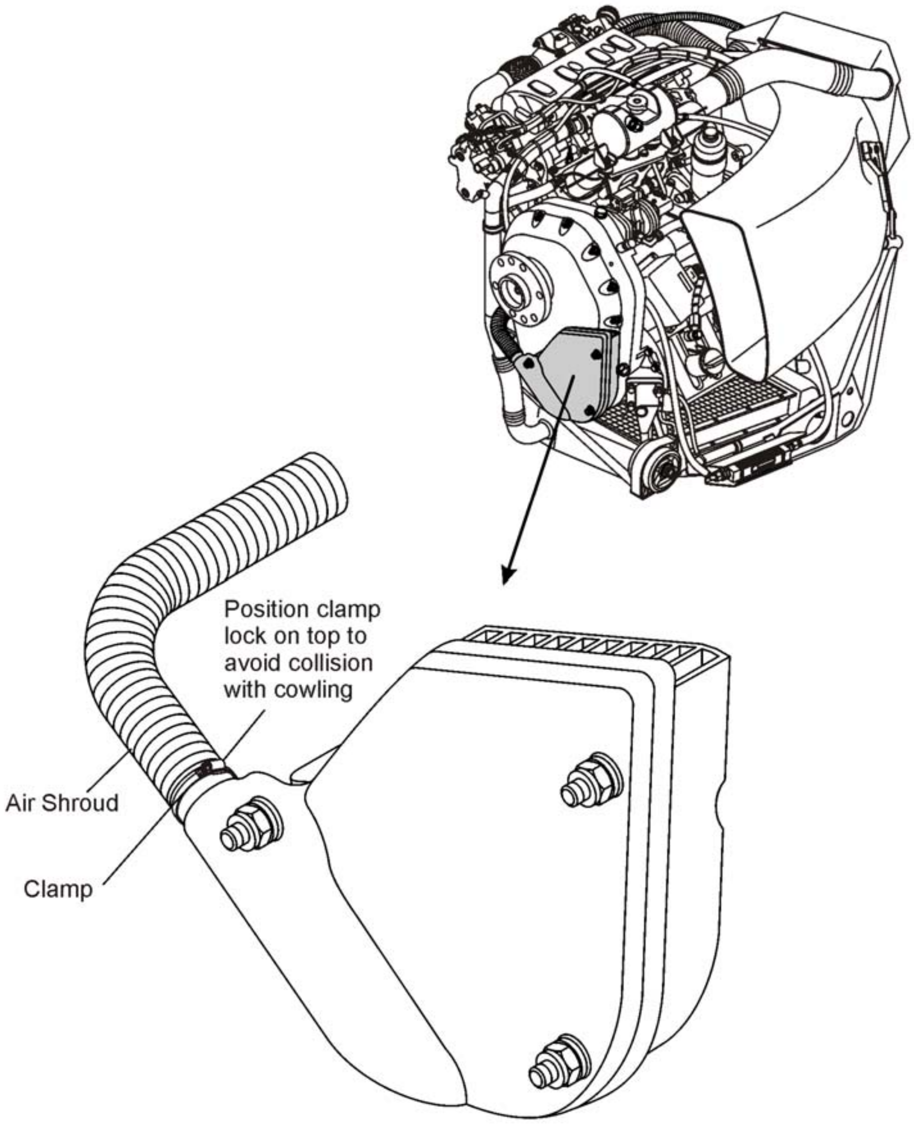

Figure 3: Air Shroud and Clamp Installation (if MÄM 42-600 and MÄM 42-660 are installed)

D. Install the Engine Left and Right Top Cowlings

	Detail Steps/Work Items	Key Items/References
(1)	Examine the top-left and top-right cowlings. Make sure that: – The cowlings are clean. – The cowlings are not damaged. – The quick-release fasteners are not missing/damaged.	 Repair any damage. Replace missing/damaged fasteners.
(2)	Install the top-left cowling: – Move the top-left cowling into position on the engine nacelle. – Move the top-right cowling into position on the engine nacelle.	 Make sure that the fasteners engage correctly in the engine nacelle and bottom cowling. Make sure that the fasteners engage correctly in the top-left cowling, the engine nacelle and bottom cowling.
(3)	Tighten all the quick-release fasteners that attach the top-left and top-right cowlings to the bottom engine cowling and the engine nacelle.	

3. Cleaning and Painting

A. Clean the Cowlings

	Detail Steps/Work Items	Key Items/References
(1)	Wash the outer surface with a mixture of water and a mild detergent.	Obey the detergent manufacturer’s instructions.
(2)	Wash the inner surface with a mixture of water and a mild detergent.	Obey the detergent manufacturer’s instructions.
	CAUTION: DO NOT USE POLISH CONTAINING SILICONE. SILICONE MAKES CFRP REPAIR DIFFICULT.	
(3)	Polish the outer surface with wax polish.	Obey the polish manufacturer’s instructions. Do not use silicone polish.

B. Paint the Insides of the Cowlings

This Paragraph gives the data for painting the inside of the engine cowlings with fire protection paint. Refer to Section 51-20 for repairs and painting the outside of the cowlings.

	Detail Steps/Work Items	Key Items/References
(1)	Clean the inside of the cowling.	
(2)	Make the area rough for painting.	Use 150-320 grade wet and dry paper.
	WARNING: DO NOT GET ACETONE ON YOUR SKIN. ACETONE CAN CAUSE SKIN DISEASE. **WARNING: DO NOT BREATHE ACETONE FUMES. ACETONE FUMES CAN CAUSE ILLNESS.** CAUTION: REMOVE ACETONE AS SOON AS POSSIBLE FROM GFRP. ACETONE CAN CAUSE THE RESIN TO SOFTEN AND FAIL.	
(3)	Clean the area for painting.	Use acetone.
(4)	Paint the inside of the cowling with fire protection paint.	Obey the paint manufacturer’s instructions.
(5)	Paint the inside of the cowling with clear top coat.	Obey the paint manufacturer’s instructions.

Section 71-20
Engine Mounting

1. General

Tubular steel makes the engine mount. The engine mount has welded joints. Powder coating protects the frame from corrosion. Welded brackets hold components such as the coolant radiator and the inter-cooler. Rubber lined P-clamps and cable ties hold electrical cables and other items of equipment to the engine mount.

The engine mounting-frame has five small mounting pads at the rear of the frame. Bolts through the pads attach the engine mount to the engine nacelle.

The engine attaches to the engine mount at four mounting pads. Large gel-filled rubber shock-mounts go between the engine and the engine mount pads. These shock-mounts isolate the airframe from engine vibrations.

Additionally there are safety ropes (steel wire ropes) at each engine mounting pad.

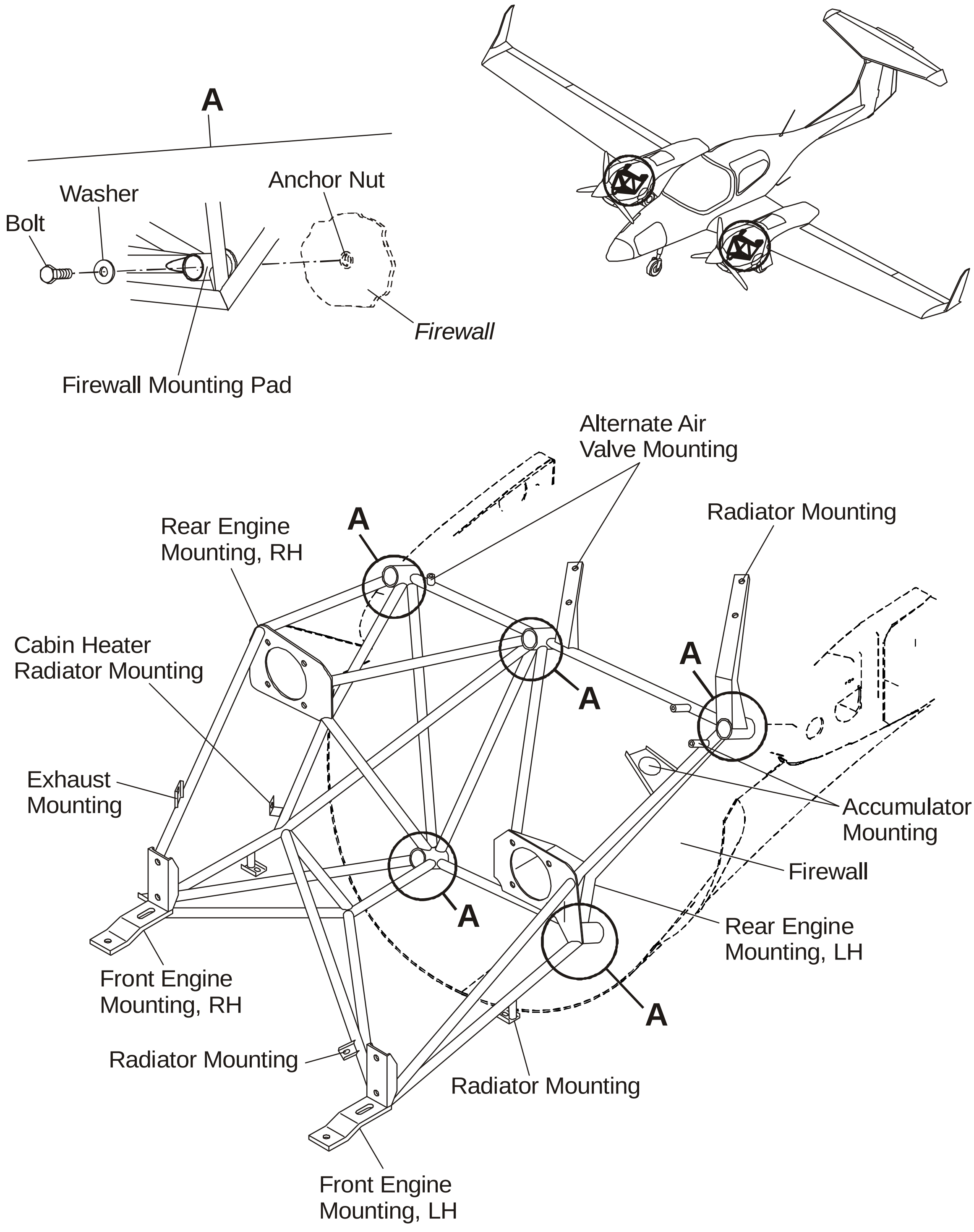

Figure 1: Engine Mount Assembly

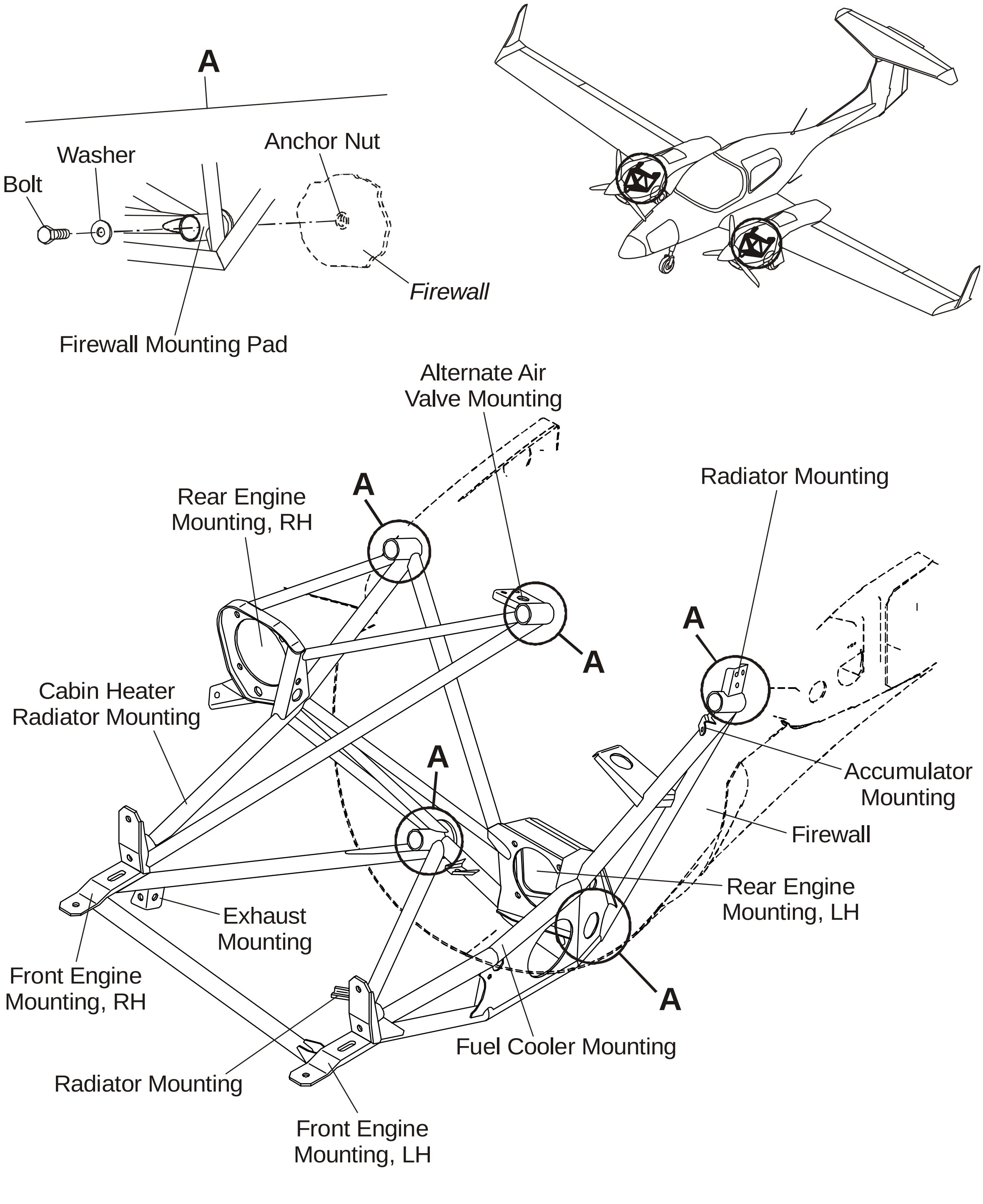

Figure 2: Engine Mount Assembly (if MÄM 42-600 is installed)

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Trouble-Shooting

1. General

The table below lists the defects you could have with the engine mounting. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

Trouble	Possible Cause	Repair
Engine vibration.	Cracked engine mount.	Examine the engine mount. Look specially for cracks at the welded joints.
Defective shock mounts.	Refer to the engine manufacturer.	

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Maintenance Practices

1. General

The Maintenance Practices for the engine mount are limited to removal/installation. If the engine mount is damaged it must be repaired by an authorized repair facility.

2. Remove/Install an Engine Mount

A. Equipment

Item	Quantity	Part Number
Hoist.	1	Commercial.
Engine sling.	3	Commercial.
Engine stand.	1	Commercial.
Tail trestle.	1	Commercial.
Hoisting points.	4	Delivered with engine.

B. Remove an Engine Mount

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine.	Refer to Section 71-00.
(2)	Release all clamps, clips and ties holding the electrical harness and hoses to the engine mount.	
(3)	Remove the un-feathering accumulator.	Refer to Section 61-20.
(4)	Remove the cabin heating heat-exchanger and shroud.	Refer to Section 21-40.
(5)	Remove the engine coolant radiator.	Refer to Section 75-00.
(6)	Remove the inter-cooler.	Refer to Section 81-00.
(7)	Remove the turbo charger inter-cooler.	Refer to Section 81-00.
(8)	Remove the inter-cooler mounting bracket.	Refer to Section 81-00.
(9)	Remove the air filter housing and alternate air valve.	Refer to Section 71-60.
(10)	Remove the 5 bolts and washers which attach the engine mount to the firewall at the engine nacelle.	
(11)	Move the engine mount clear of the engine nacelle.	

C. Install an Engine Mount

	Detail Steps/Work Items	Key Items/References
(1)	Move the engine mount into position on the firewall.	
(2)	Install the 5 bolts which attach the engine mount to the engine nacelle firewall: – Fasten the bolts through the firewall.	Use new bolts. Torque: 40 Nm (29.5 lbf.ft.).
(3)	Install the engine coolant radiator.	
(4)	Install the inter-cooler mounting bracket.	Refer to Section 81-00.
(5)	Install the turbo charger inter-cooler.	
(6)	Install the inter-cooler.	
(7)	Install the engine air filter housing and alternate air valve.	
(8)	Install the cabin heating heat-exchanger and shroud.	
(9)	Install the propeller un-feathering accumulator.	
(10)	Install all the clamps, clips and ties that hold the electrical harness and hose to the engine mount.	The clamps, clips and ties that you removed in Paragraph 2 B, step 2.

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Section 71-50

Electrical Cables in the Engine Compartment

1. General

Each engine compartment has a main electrical wiring harness. The harness is supplied as part of the engine installation. The harness has all of the low-power cables for the engine control system. It is integral with the engine control system. Refer to Section 76-00 for data about the main electrical wiring harness.

There are a small number of separate cables for the alternator and starter. See Chapter 24 for data about the battery and alternator wiring. See Chapter 80 for more data about the starter cables. See Chapter 92 wiring diagrams for data about the cables in each system.

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Section 71-60
Air Intakes

1. General

An air filter housing, air filter and alternate air valve assembly make the engine air intake system for the DA 42 NG airplane. The air filter box is connected to the intercooler air intake by a flexible hose. The same sort of hose feeds the air from the alternate air valve to the turbo-charger. A lever below the instrument panel, right-side, operates both alternate air valves.

Figure 1 shows the engine air filter and alternate air valve.

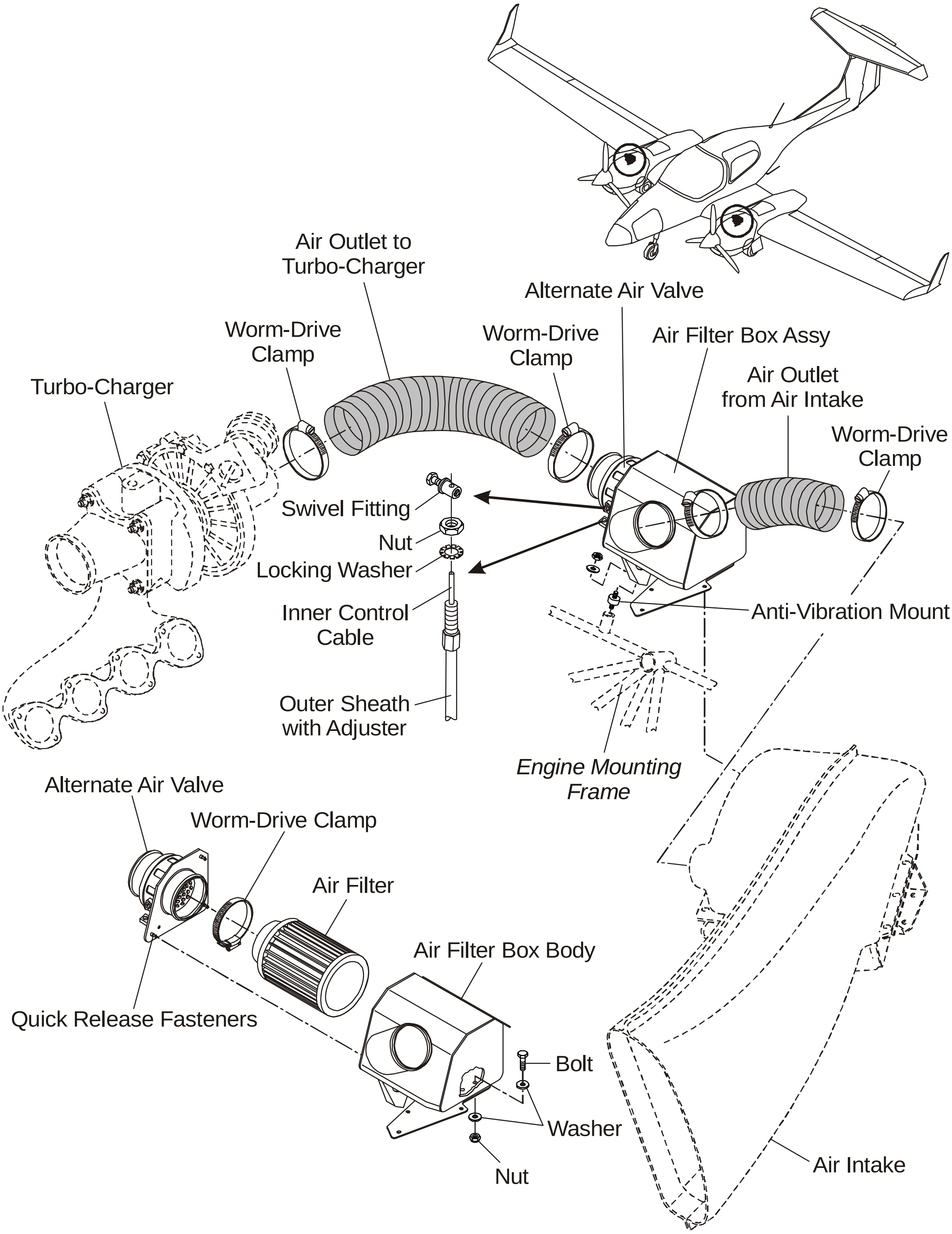

Figure 1: Air Filter and Alternate Air Assembly

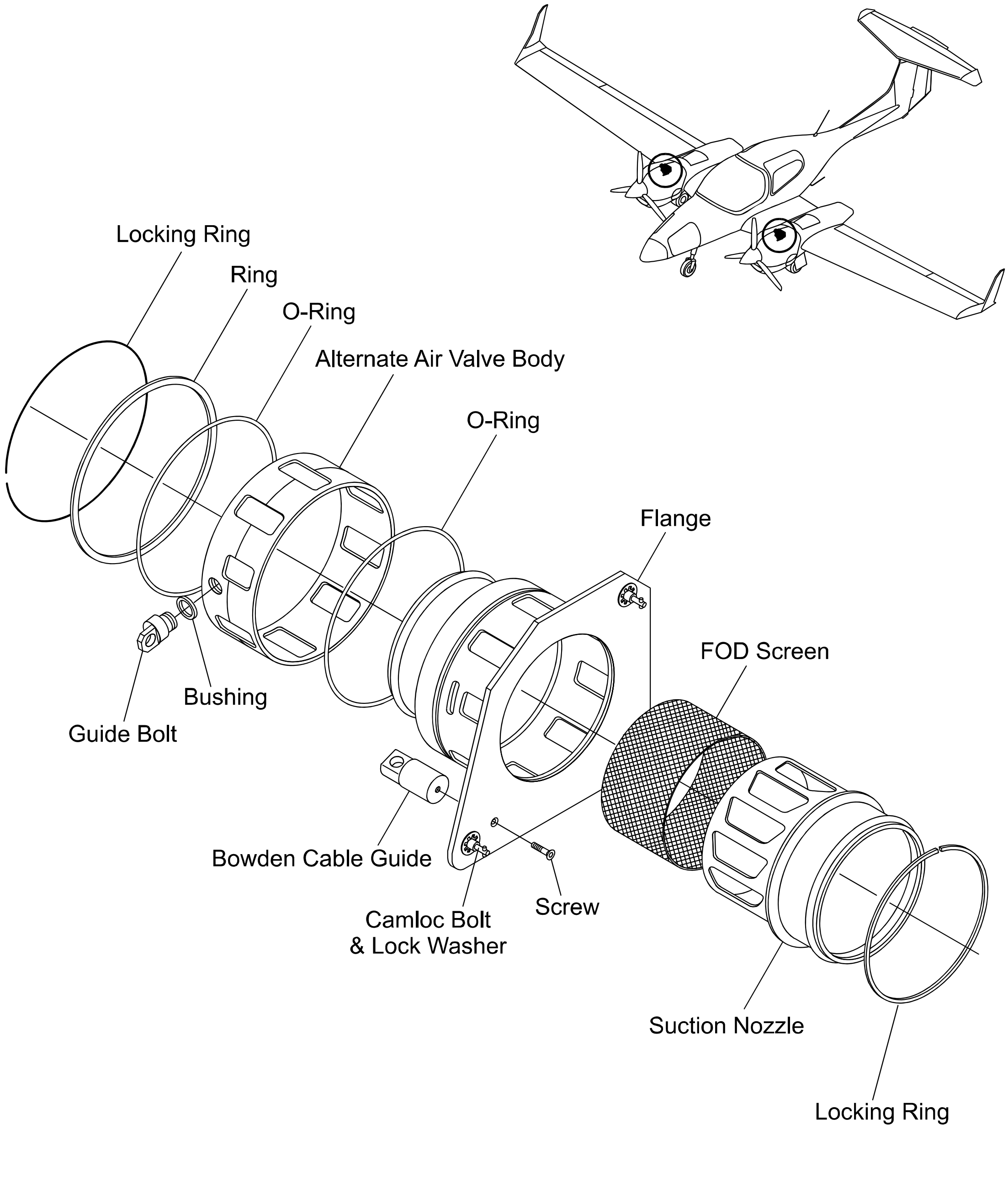

Figure 2: Air Valve Assembly

2. Description

The air intake has 4 main parts:

– Alternate air valve assembly.

– Air filter housing.

– Air filter.

– Alternate air valve operating cables.

A. Alternate Air Assembly

Refer to Figure 1. The alternate air valve is attached to the right hand face of the air filter box. The air filter attaches to the front of the alternate air valve. The alternate air valve also has an inlet direct from the engine compartment. Rotary motion of the outer ring opens different holes to the engine compartment. Thus the valve can select either fresh filtered air or warm unfiltered air which passes through a fine foreign object damage (FOD) screen. Refer to Figure 2.

B. Air Filter Housing

The air filter housing is made of sheet aluminum. It has a flexible hose which connects the housing to the air intake duct. Bolts attach the air filter housing to brackets on the engine mount.

C. Air Filter

Refer to Figure 1. The air filter is a K&N RU-1620 high-flow air filter. The air filter located on the air filter housing, on the right of the engine compartment, just forward of the firewall. It is held to the forward face of the alternate air valve by a worm-drive clamp.

D. Alternate Air Valve Operating Cables

A control lever on the right side of the center console, below the instrument panel operates the alternate air valves.

If MÄM 42-933 is NOT installed:

Bowden cable connects the control lever to a relay lever. The relay lever is mounted in the relay bracket which is located on the cockpit control bulkhead, below the pilot’s seat. Two more Bowden cables connect the relay lever to the left and right engine alternate air valve operating levers.

3. Operation

When the pilot pulls the alternate air valve control lever towards the rear of the airplane these events occur:

If MÄM 42-933 is NOT installed:

– The lever pulls the inner cable of the forward Bowden cable.

– The inner cable of the forward Bowden cable turns the relay lever clockwise.

– The relay lever pulls the inner cables of the left and right alternate valves.

– Both engine alternate air valves move to the alternate (unfiltered) position.

If MÄM 42-933 is installed:

– Both engine alternate air valves move to the alternate (unfiltered) position.

When the pilot moves the alternate air valve control lever forward both alternate air valves move back to the normal (OFF) position.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the air intake system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
An engine does not develop full power.	Air filter blocked/defective on related engine.	Replace air filter. For the related engine.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the air filter and the alternate air valve assembly. They also tell you how to adjust, remove and install the alternate air control cables.

2. Remove/Install an Air Filter

A. Remove an Air Filter

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the related ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine top cowlings.	Refer to Section 71-10.
(4)	Disconnect the alternate air valve Bowden cables.	
(5)	Open the 3 camloc bolts of the alternate air valve.	
(6)	Pull out the alternate air valve with the attached filter element.	
(7)	Open the worm-drive clamp which holds the filter element. Pull off the filter from the air valve.	

B. Install an Air Filter

	Detail Steps/Work Items	Key Items/References
(1)	Inspect the air filter for loose rubber residues from manufacturing. If loose rubber residues are found, remove them carefully prior to installation of the filter.	
(2)	Place the filter on the air valve. Close the worm drive clamp which holds the filter element. Do not use the worm drive clamp provided with K&N filter package. Use 9 mm (3/8 in) wide worm drive clamp instead.	
(3)	Place the alternate air valve with the attached filter element.	
(4)	Close the 3 camloc bolts of the alternate air valve.	
(5)	Connect the alternate air valve Bowden cables.	
(6)	Check if position of the alternate air valve is in accordance to the selector handle position.	
(7)	Install the engine top cowlings.	Refer to Section 71-10.

3. Remove/Install an Alternate Air Valve

A. Remove an Alternate Air Valve

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine top cowlings.	Refer to Section 71-10.
(4)	Disconnect the airplane main battery.	Refer to Section 24-31.
(5)	Remove the bolts, nuts and washers that hold the alternate air valve to the air filter housing.	
(6)	Disconnect the alternate air control cable.	
(7)	Disconnect the hose that connects the alternate air valve to the turbo-charger inlet: – Open the worm-drive-clamp. – Pull the hose off the valve.	At the alternate air valve.
(8)	Move the alternate air valve clear of the airplane.	
(9)	If the FOD screen of the alternate air valve is contaminated: – Clean FOD screen.	

B. Install an Alternate Air Valve

	Detail Steps/Work Items	Key Items/References
(1)	Install the air filter.	Refer to Paragraph 2.
(2)	Install the alternate air valve on the air filter housing.	Apply fire resistant sealant (Dow Corning 736 or equivalent) between air filter housing and alternate air valve.
(3)	Move the alternate air valve close to the engine and connect the alternate air control cable to the valve.	
(4)	Adjust the alternate air control cable.	Refer to Paragraph 6.
(5)	Connect the hose that connects the alternate air valve to the turbo-charger inlet: – Connect the hose to the valve. – Tighten the worm-drive clamp.	 At the alternate air valve.

4. Remove/Install an Alternate Air Control Inner-Cable (if MÄM 42-933 is NOT installed)

A. Remove an Alternate Air Control Forward Inner-Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine top cowlings.	Refer to Section 71-10.
(4)	Remove the pilot's seat.	Refer to Section 25-10.
(5)	Disconnect the control cable from the relay lever at the relay bracket: – Loosen the screw on the cable swivel fitting at the relay lever. – Pull the inner control cable clear of the swivel fitting.	Refer to Figure 1. Retain the swivel fitting.
(6)	Disconnect the control cable from the alternate air control operating lever in the cockpit: – Loosen the screw on the cable swivel fitting at the operating lever. – Remove the swivel fitting from the cable.	Refer to Figure 2. Retain the swivel fitting.

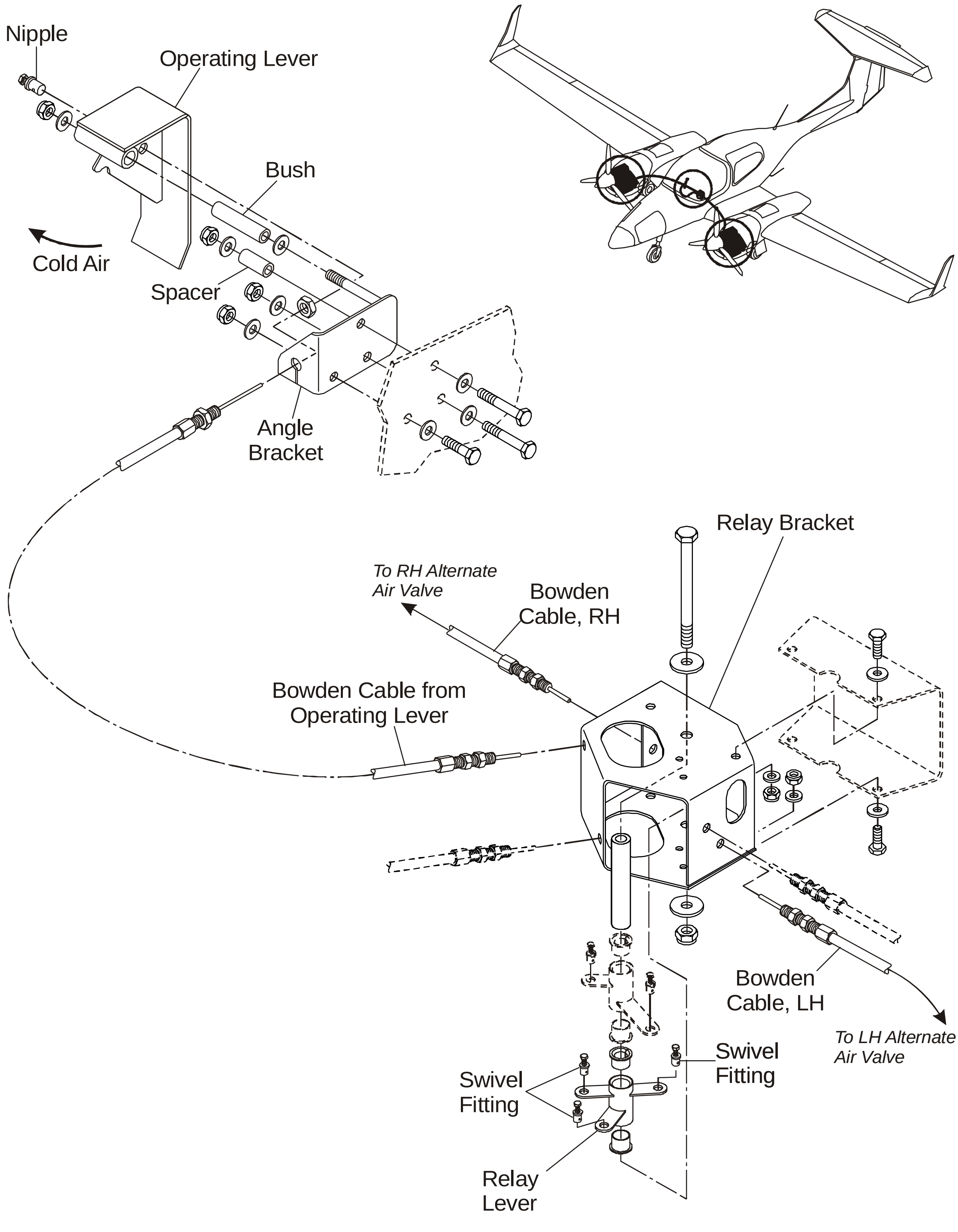

Figure 3: Alternate Air Valve Operating Cables

	Detail Steps/Work Items	Key Items/References
(7)	Remove the inner control cable form the sheath:	
	– Attach a length of suitable cord to the end of the inner cable.	The cord must be longer than the inner cable!
	– Pull the inner cable from the outer sheath and pull the length of cord into the outer sheath and clear of the airplane.	
	– Disconnect the inner cable from the length of cord.	Leave the length of cord in the outer sheath!

B. Install an Alternate Air Control Forward Inner-Cable

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the alternate air control cable outer sheath is in good condition and is not kinked.	
(2)	Make sure that the new alternate air valve forward control cable inner is clean and dry.	
(3)	Install the new alternate air valve forward control cable inner:	
	– Attach the end of the length of cord that is in the control cable outer sheath to the new control cable inner.	At the cockpit end.
	– Pull the new cable into the outer sheath with the length of cord.	From the relay lever end.
	– When the new inner cable is fully through the outer sheath:	
	– Disconnect the length of cord from the inner cable.	
(4)	Connect the alternate air forward inner cable to the operating lever in the cockpit:	Refer to Figure 2.
	– Install the swivel fitting into the operating lever.	
	– Pass the inner cable through the swivel fitting and tighten the swivel fitting.	
(5)	Connect the alternate air inner cable to the relay lever:	Refer to Figure 2.
	– Install the swivel fitting into the relay lever.	
	– Pass the inner cable through the swivel fitting and tighten the swivel fitting screw.	
(6)	Adjust the alternate air cable that you installed.	Refer to Paragraph 6.
(7)	Install the engine cowlings that you removed.	Refer to Section 71-10.

C. Remove an Alternate Air Control Forward Left/Right-Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine top cowlings.	Refer to Section 71-10.
(4)	Remove the pilot's seat.	Refer to Section 25-10.
(5)	Disconnect the control cable from the relay lever at the relay bracket: – Loosen the screw on the cable swivel fitting at the relay lever. – Pull the inner control cable clear of the swivel fitting.	Refer to Figure 1. Retain the swivel fitting.
(6)	Disconnect the control cable from the related alternate air valve: – Loosen the screw on the cable swivel fitting at the alternate air valve. – Pull the inner control cable clear of the swivel fitting	Refer to Figure 1. Retain the swivel fitting.

	Detail Steps/Work Items	Key Items/References
(7)	Remove the inner control cable form the sheath:	
	– Attach a length of suitable cord to the end of the inner cable.	The cord must be longer than the inner cable!
	– Pull the inner cable from the outer sheath and pull the length of cord into the outer sheath and clear of the airplane.	
	– Disconnect the inner cable from the length of cord.	Leave the length of cord in the outer sheath!

D. Install an Alternate Air Control Forward Left/Right-Cable

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the alternate air control cable outer sheath is in good condition and is not kinked.	
(2)	Make sure that the new alternate air valve control cable inner is clean and dry.	
(3)	Install the new alternate air valve left/right control cable inner:	
	– Attach the end of the length of cord that is in the control cable outer sheath to the new control cable inner.	At the related engine end.
	– Pull the new cable into the outer sheath with the length of cord.	From the relay lever end.
	– When the new inner cable is fully through the outer sheath:	
	– Disconnect the length of cord from the inner cable.	
(4)	Connect the alternate air inner cable to the related engine alternate air valve operating lever:	
	– Install the swivel fitting into the alternate air valve operating lever.	
	– Pass the inner cable through the swivel fitting and tighten the swivel fitting screw.	
(5)	Connect the alternate air inner cable to the relay lever:	Refer to Figure 2.
	– Install the swivel fitting into the relay lever.	
	– Pass the inner cable through the swivel fitting and tighten the swivel fitting screw.	
(6)	Adjust the alternate air cable that you installed.	Refer to Paragraph 6.
(7)	Install the engine cowlings that you removed.	Refer to Section 71-10.

5. Remove/Install an Alternate Air Control Cockpit Lever Cable (if MÄM 42-933 is installed)

A. Remove an Alternate Air Control Cockpit Lever Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine top cowlings.	Refer to Section 71-10.
(4)	If necessary: remove the pilot's seat.	Refer to Section 25-10.
(5)	Disconnect the control cable from the related alternate air valve: – Loosen the screw on the cable swivel fitting at the alternate air valve. – Pull the inner control cable clear of the swivel fitting.	Refer to Figure 4. Retain the swivel fitting.
(6)	Disconnect the control cable from the alternate air control operating lever in the cockpit, by removing the worm screw.	Refer to Figure 4.

	Detail Steps/Work Items	Key Items/References
(7)	Remove the inner control cable from the sheath:	
	– Attach a length of suitable cord to the end of the inner cable.	The cord must be longer than the inner cable!
	– Pull the inner cable from the outer sheath and pull the length of cord into the outer sheath and clear of the airplane.	
	– Disconnect the inner cable from the length of cord.	Leave the length of cord in the outer sheath!

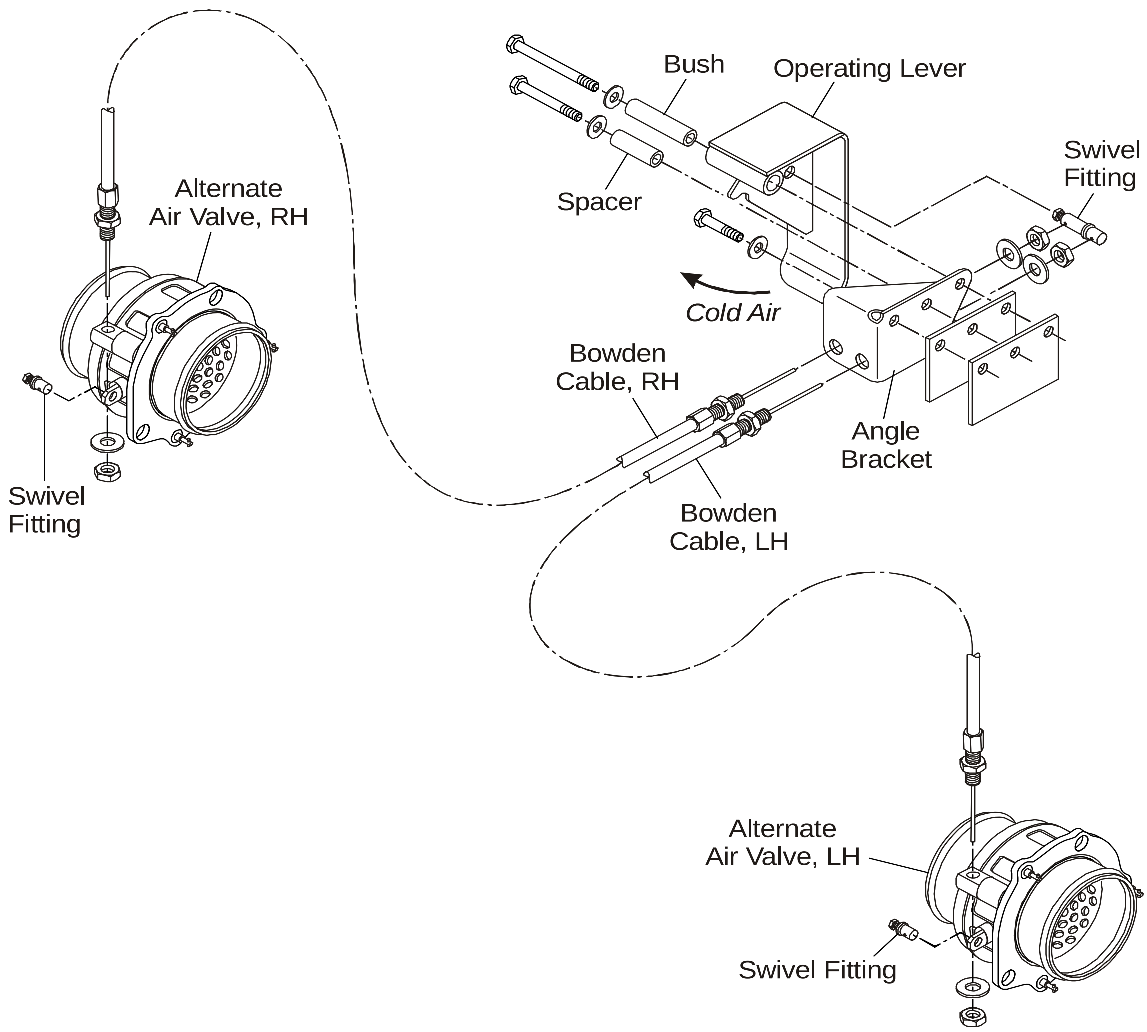

Figure 4: Alternate Air Valve Operating Cables (if MÄM 42-933 is installed)

B. Install an Alternate Air Control Cockpit Lever Cable

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the alternate air control cable outer sheath is in good condition and is not kinked.	
(2)	Make sure that the new alternate air control cable inner is clean and dry.	
(3)	Install the new alternate air control cable inner: – Attach the end of the length of cord that is in the control cable outer sheath to the new control cable inner. – Pull the new cable into the outer sheath with the length of cord. – When the new cable is fully through the outer sheath: – Disconnect the length of cord from the cable.	
(4)	Connect the alternate air cable to the operating lever in the cockpit.	Refer to Figure 4.
(5)	Connect the alternate air inner cable to the alternate air valve: – Install the swivel fitting into the alternate air valve. – Pass the cable through the swivel fitting and tighten the swivel fitting screw.	Refer to Figure 4.
(6)	Adjust the alternate air cable that you installed.	Refer to Paragraph 6.
(7)	Install the engine cowlings that you removed.	Refer to Section 71-10.

6. Adjust an Alternate Air Valve Control Cable

A. Adjust the Alternate Air Valve Forward Control Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	If necessary, disconnect the airplane main battery.	Refer to Section 24-31.
(3)	If necessary, remove the engine top cowlings.	Refer to Section 71-10.
(4)	Move the alternate air lever in the cockpit from OFF to ON: – Make sure the lever moves freely with no restrictions.	Fully aft.
(5)	Set the alternate air lever in the cockpit to OFF and hold it in position: – Make sure that both left and right engine alternate air valves are fully closed.	Fully forward. With the alternate air valve fully closed there must be at least 3 mm (0.125 in) clearance (bounce) between the alternate air lever and the stop.

	Detail Steps/Work Items	Key Items/References
(6)	Set the alternate air lever in the cockpit to ON and hold it in position: – Make sure that both left and right engine alternate air control valves are in the fully open position.	
(7)	If necessary, adjust the alternate air control cable to get the correct settings at step 5.	At the alternate air lever.
(8)	Do steps 5 to 7 again as necessary.	
(9)	Connect the airplane battery.	Refer to Section 24-31.
(10)	Install the engine top cowlings.	Refer to Section 71-10.

B. Adjust a Left/Right Engine Alternate Air Valve Control Cable

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	If necessary, disconnect the airplane main battery.	Refer to Section 24-31.
(3)	If necessary, remove the engine top cowlings.	Refer to Section 71-10.
(4)	Remove the pilot’s seat.	Refer to Section 25-10.
(5)	Move the alternate air lever in the cockpit from OFF to ON: – Make sure the lever moves freely with no restrictions.	Fully aft.
(6)	Set the alternate air lever in the cockpit to OFF and hold it in position: – Make sure that the related engine alternate air valve is fully closed.	Fully forward. With the alternate air valve fully closed there must be at least 3 mm (0.125 in) clearance (bounce) between the alternate air lever and the stop.

	Detail Steps/Work Items	Key Items/References
(7)	Set the alternate air lever in the cockpit to ON and hold it in position: – Make sure that the related engine alternate air control valve is in the fully open position.	
(8)	If necessary, adjust the related engine alternate air control cable to get the correct settings at step 6.	At the relay lever.
(9)	Do steps 5 to 8 again as necessary.	
(10)	Install the engine cowlings.	Refer to Section 71-10.
(11)	Install the pilot's seat.	Refer to Section 25-10.
(12)	If necessary, connect the airplane main battery.	Refer to Section 24-31.

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Section 71-61
Air Intakes (if MÄM 42-600 is installed)

1. General

An air filter housing, air filter and alternate air valve assembly make the engine air intake system of the DA 42 NG (if MÄM 42-600 is installed) airplane. The air filter box is connected to the intercooler air intake duct via bolts. A flexible hose feeds the air from the alternate air valve to the turbo-charger. A lever below the instrument panel (right-side) operates both (LH and RH) alternate air valves simultaneously.

Figure 1 shows the engine air filter and alternate air valve.

2. Description

The air intake has 4 main parts:

– Alternate air valve assembly.

– Air filter housing.

– Air filter.

– Alternate air valve operating cables.

A. Alternate Air Assembly

Refer to Figure 1. The alternate air valve is attached to the aft face of the air filter housing. The air filter attaches to the front of the alternate air valve. The alternate air valve also has an inlet direct from the engine compartment. Rotary motion of the outer ring opens different holes to the engine compartment. So the valve can select either fresh filtered air or unfiltered air from inside the cowling.

B. Air Filter Housing

The air filter housing is made of CFRP. It is installed directly to the intercooler / engine air intake duct via bolts.

C. Air Filter

Refer to Figure 1. The air filter is a high-flow air filter. The air filter is located in the middle of the engine compartment, just forward of the firewall in the air filter box.

D. Alternate Air Valve Operating Cables

If MÄM 42- 933 is NOT installed:

A control lever on the right side of the center console, below the instrument panel operates the alternate air valves. A Bowden cable connects the control lever to a relay lever. The relay lever is mounted in the relay bracket which is located on the cockpit control bulkhead, below the pilot’s seat. Two more Bowden cables connect the relay lever to the left and right engine alternate air valve operating levers.

If MÄM 42- 933 is installed:

A control lever on the right side of the center console, below the instrument panel operates the alternate air valves. Two Bowden cables connect the control lever connect the relay lever to the left and right engine alternate air valve operating levers.

3. Operation

When the pilot pulls the alternate air valve control lever aft:

If MÄM 42- 933 is NOT installed:

– The cable turns the relay lever clockwise.

– The relay lever pulls the cables of the left and right alternate valves.

– Both engine alternate air valves move to the alternate air position (unfiltered air).

If MÄM 42- 933 is installed:

– Both engine alternate air valves move to the alternate air position (unfiltered air).

When the pilot moves the alternate air valve control lever forward both alternate air valves move back to the normal (OFF) position.

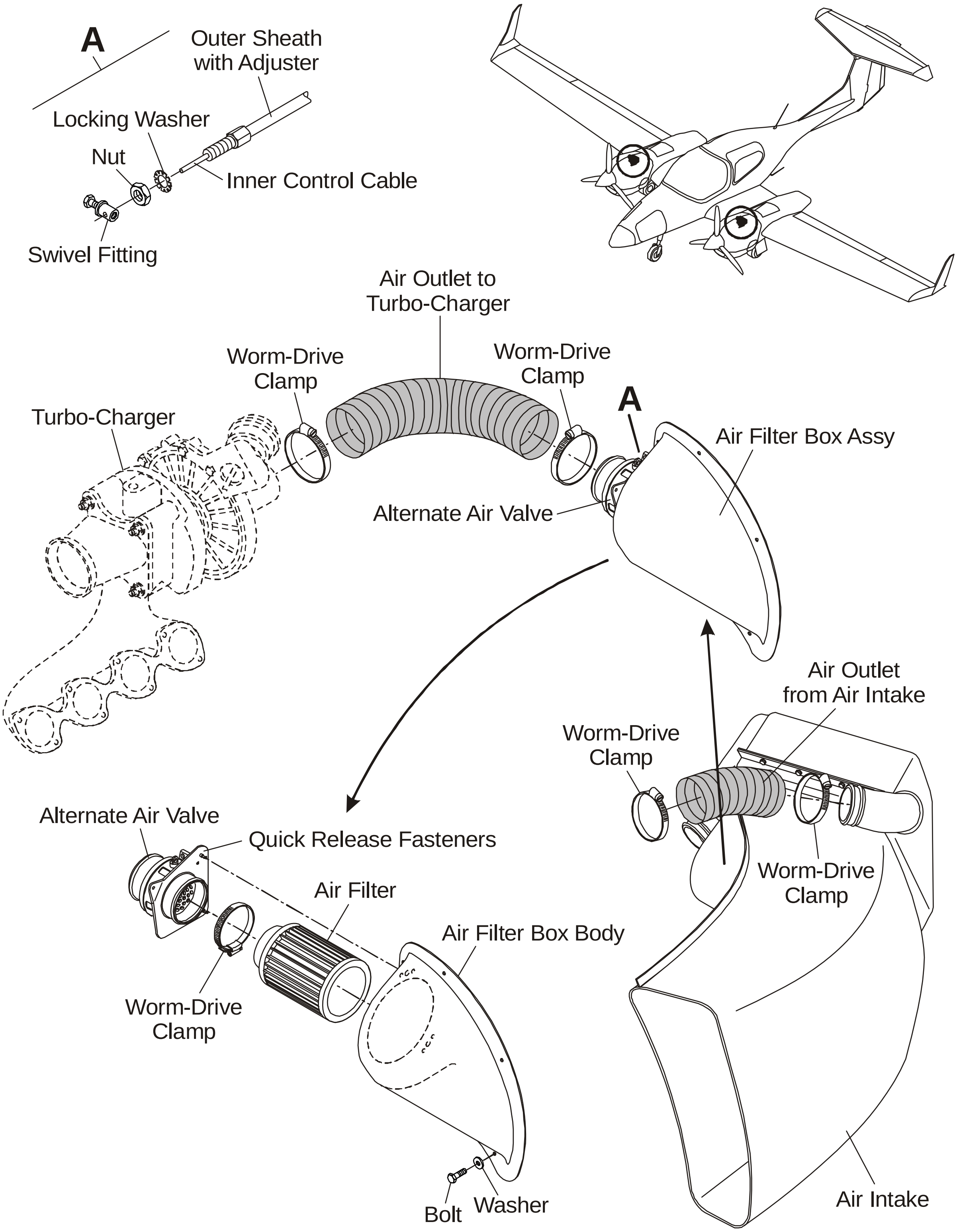

Figure 1: Air Filter and Alternate Air Assembly (if MÄM 42-600 installed)

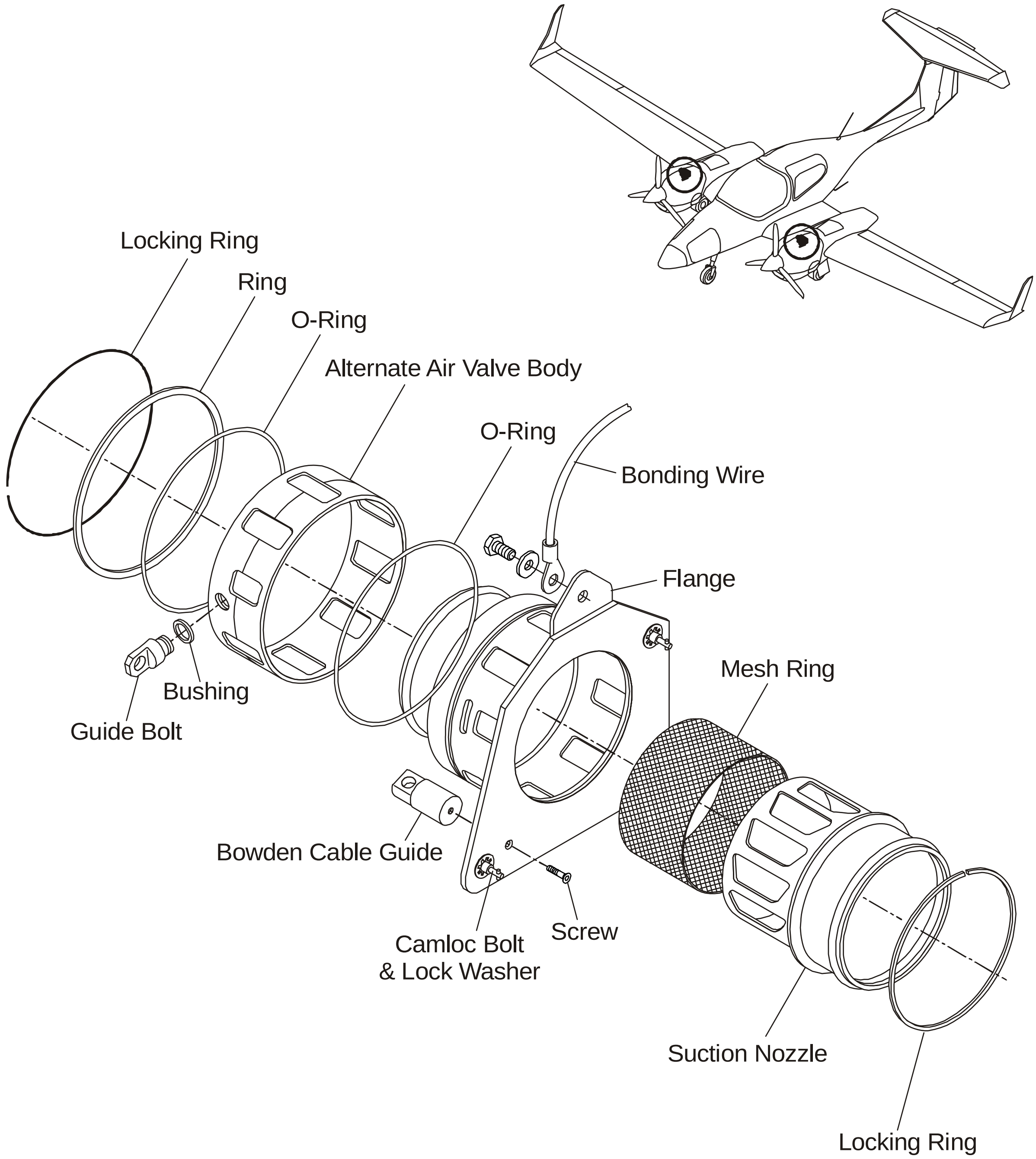

Figure 2: Air Valve Assembly (if MÄM 42-600 installed)

Trouble-Shooting

1. General

The table below lists the defects you could have with the air intake system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
An engine does not develop full power.	Air filter blocked/defective on related engine.	Replace air filter. For the related engine.

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Section 71-70

Engine Drains

1. General

The DA 42 NG has a breather for the oil separator for each engine nacelle.

Refer to Chapter 72 for more data about the engine oil system and refer to Chapter 75 for more data about the engine liquid cooling system.

2. Description

Figure 1 shows the engine drain installation of the AE E4-B engine.

The engine drain installation consists of two hoses and the breather outlet adapter. The first breather hose connects to the injector cover outlet and to the breather outlet adapter on the other side. The breather outlet adaptor is installed to the air filter housing with a P-clamp. The second breather hose connects the breather outlet adapter to the guide tube which vents the breather gases clear of the cowling.

To allow for drainage of oil / water which accumulates underneath the injector cover, a cylinder head drain hose connects to the engine drain outlet located at the front side of the engine below the injector cover. The other end of the cylinder end drain hose is attached to the guide tube.

Both, the breather hose assembly and the cylinder head drain hose are secured to the engine mounting frame via cable ties and P-clamps.

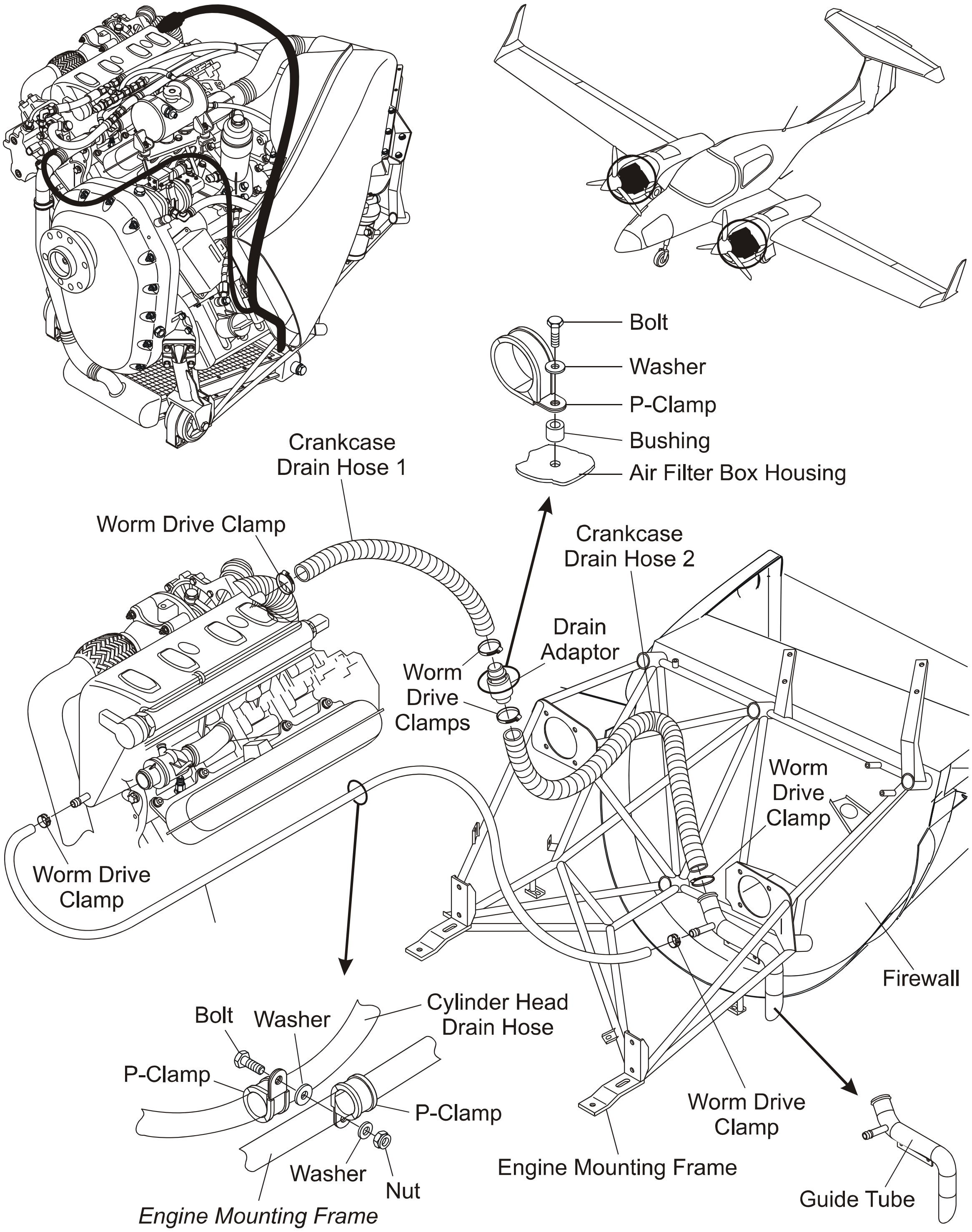

Figure 1: Engine Cylinder Head Drain and Breather Hose Assembly

Maintenance Practices

1. General

These Maintenance Practices tell you how to remove/install an oil separator breather hose.

2. Remove/Install a Breather Hose Assembly

A. Remove a Breather Hose Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10.
(4)	Remove the cable ties and P-clamp that secure the breather hose assembly to the engine mounting frame.	Refer to Figure 1. Mark attachment points of oil breather hose assembly before removing it.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the breather hose assembly: – Remove the worm drive clamp that secures the breather hose assembly to the outlet at the top aft side of the rail cover. – Remove worm drive clamp that secures the breather hose assembly to the guide tube. – Move the breather hose assembly clear of the engine.	
(6)	Disassemble the breather hose assembly: – Remove the worm drive clamps which secure the breather outlet adaptor to the breather hoses.	

B. Install a Breather Hose Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Assemble breather hose assembly: – Install the short breather line to the breather outlet adaptor and secure with worm drive clamp. – Install the long breather line to the breather outlet adaptor and secure with worm drive clamp.	Refer to Figure 1. Make sure to install the breather outlet adapter with correct orientation.
(2)	Install the breather hose assembly according to the previously marked attachment points.	
(3)	Connect the breather hose assembly to the outlet at the top aft side of the injector cover and guide tube. Secure both connections with worm drive clamps.	
(4)	Secure the breather hose assembly with cable ties and P-clamps according to the previously marked attachment points.	
(5)	Install the engine cowlings.	Refer to Section 71-10.
(6)	Connect the airplane main battery.	Refer to Section 24-31.

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Section 71-71
Engine Drains (if MÄM 42-600 is installed)

1. General

The DA 42 NG has a breather for the oil separator for each engine.

Refer to Chapter 72 for more data about the engine oil system and refer to Chapter 75 for more data about the engine liquid cooling system.

2. Description

Figure 1 shows the engine drains for the AE E4-C engine.

The engine drain installation consists of hoses and the breather outlet adapter. The first breather hose connects to the injector cover breather outlet and to the breather drain adapter on the other side. The breather drain adaptor is installed to the engine mount with P-clamps. The second breather hose connects the breather drain adapter to the guide tube which vents the breather gases clear of the cowling.

To allow for drainage of oil / water which accumulates underneath the injector cover, a cylinder head drain hose connects to the engine drain outlet located at the front side of the engine below the injector cover. The other end of the cylinder head drain hose is attached to the guide tube.

Both, the breather hose assembly and the cylinder head drain hose are secured to the engine mounting frame via cable ties and P-clamps.

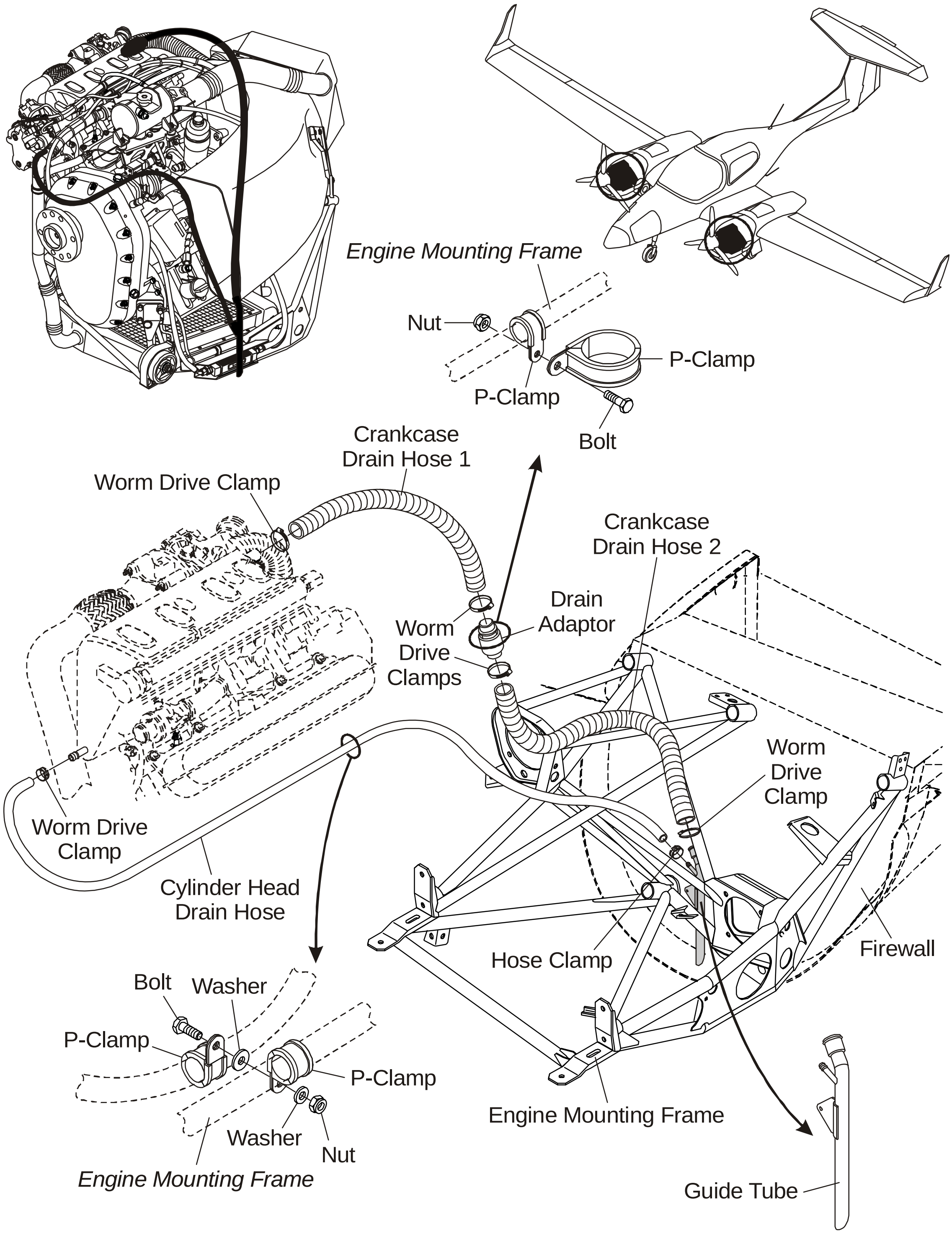

Figure 1: Engine Cylinder Head Drain and Breather Hose Assembly (if MÄM 42-600 installed)

Maintenance Practices

1. General

These Maintenance Practices describe how to remove/install the oil separator breather hose.

2. Remove/Install a Breather Hose Assembly

A. Remove a Breather Hose Assembly

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ENGINE MASTER switch to OFF. – Set the ELECT. MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-11.
(4)	Remove the cable ties and P-clamp that secure the breather hose assembly to the engine mounting frame.	Refer to Figure 1. Mark attachment points of oil breather hose assembly before removing it.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the breather hose assembly: – Remove the worm drive clamp that secures the breather hose assembly to the outlet at the top aft side of the rail cover. – Remove worm drive clamp that secures the breather hose assembly to the guide tube. – Move the breather hose assembly clear of the engine.	
(6)	Disassemble the breather hose assembly: – Remove the worm drive clamps which secure the breather outlet adaptor to the breather hoses.	

B. Install a Breather Hose Assembly

	Detail Steps/Work Items	Key Items/References
(1)	Assemble breather hose assembly: – Install the short breather line to the breather outlet adaptor and secure with worm drive clamp. – Install the long breather line to the breather outlet adaptor and secure with worm drive clamp.	Refer to Figure 1. Make sure to install the breather outlet adapter with correct orientation.
(2)	Install the breather hose assembly according to the previously marked attachment points.	
(3)	Connect the breather hose assembly to the outlet at the top aft side of the injector cover and guide tube. Secure both connections with worm drive clamps.	
(4)	Secure the breather hose assembly with cable ties and P-clamps according to the previously marked attachment points.	
(5)	Install the engine cowlings.	Refer to Section 71-11.
(6)	Connect the airplane main battery.	Refer to Section 24-31.

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CHAPTER 72

ENGINE

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ENGINE

1. General

This Section gives you background data about the AE E4-B or AE E4-C (if MÄM 42-600 is installed) engines installed in the DA 42 NG airplane. This Section also tells you about the maintenance of the oil system of the AE E4-B or AE E4-C (if MÄM 42-600 is installed) engine.

Refer to these Chapters for more data about the engine systems:

– Chapter 73. Engine fuel and control.

– Chapter 75. Liquid cooling system.

– Chapter 76. Engine controls.

– Chapter 77. Engine indicating.

– Chapter 78. Engine exhaust.

– Chapter 79. Oil cooling.

– Chapter 80. Engine starting.

– Chapter 81. Turbo charger.

Note: Only AE authorized maintenance organizations may carry out maintenance and inspection work on the AE E4-B or AE E4-C (if MÄM 42-600 is installed) engine. Any engine malfunction must be reported to AE.

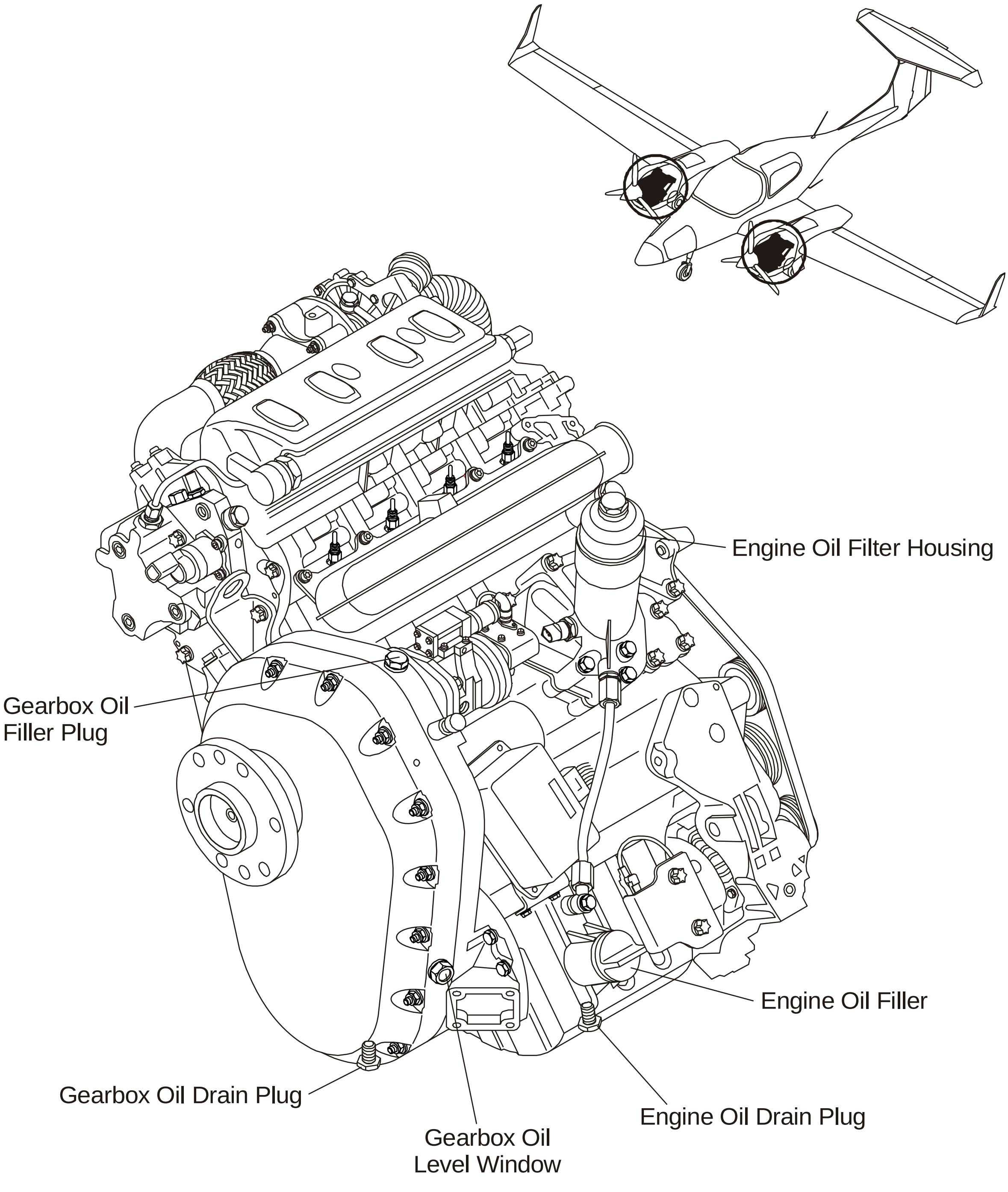

Figure 1: Oil System Maintenance Locations

2. Description

The AE E4-B or AE E4-C (if MÄM 42-600 is installed) engine is a liquid-cooled, in-line four-stroke four cylinder engine with a double overhead camshaft (DOHC). The valves are actuated by the cam follower. The direct fuel injection is realized with a common rail technique and the engine is charged by a turbo charger. All engine components are controlled by an EECU system. The engine is equipped with an electrical starter, an alternator, a water pump, an oil pump, a coolant system and an oil cooler. The propeller is powered by a directly integrated gearbox with an integral torsional vibration damper.

3. Engine Oil System

The engine has the usual wet sump oil system. The sump has a maximum capacity of 7 liter (7.4 US qt). Refer to the Airplane Flight Manual Chapter 2 for data about the oil types to use in the engine.

The internal oil pump supplies oil to all bearings and other components that require oil. Oil galleries inside the engine crankcase and cylinder head supply oil to the internal components.

Figure 1 shows the location of the items that you can maintain on the engine oil system of the AE E4-B engine. The engine has these maintenance locations:

– A full-flow oil filter located at the top left adjacent to the cylinder head. You must replace the filter at the times given in Chapter 05.

– An engine oil drain plug at the rear left of the engine sump.

– An oil filler located at the left of the crankcase.

– A gearbox oil filler plug located at the top of the gearbox.

– A gearbox oil level window located at the LH side of the gearbox. When the oil covers half of the inspection window, the gearbox contains the correct quantity of oil.

– A gearbox oil drain plug located at the bottom of the gearbox.

– A oil separator is located under the injector cover.

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Trouble-Shooting

1. General

The trouble-shooting given in this Section is limited to those items that you are allowed to do on the engine. For all other engine troubles, you must refer to an approved AE E4-B or AE E4-C (if MÄM 42-600 is installed) repair facility or the engine manufacturer.

Trouble	Possible Cause	Repair
Engine oil pressure low.	Not enough oil in the engine oil sump.	Fill the engine with oil.
Oil pressure regulator valve does not operate correctly.	Refer to the engine manufacturer.	
Defective oil pump.	Refer to the engine manufacturer.	
Gearbox oil temperature high.	Not enough oil in the gearbox.	Find the reason for the loss of gearbox oil and correct the problem. Fill the gearbox with oil. Refer to the AFM for approved oils.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to service the oil system on the engine. Further maintenance practices are described in the AE service documents. You must refer to an approved AE E4-B or AE E4-C (if MÄM 42-600 is installed) maintenance facility or the engine manufacturer for all other engine maintenance.

WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.

CAUTION: ALWAYS PUT A CAP ON OPEN CONNECTIONS. IF YOU DO NOT PUT A CAP ON OPEN CONNECTIONS, THEN CONTAMINATION CAN GET INTO THE SYSTEM AND CAUSE DAMAGE.

CAUTION: DO NOT MIX OIL TYPES. IF YOU MIX OIL TYPES THE OIL CAN LOSE ITS PROPERTIES AND THE ENGINE WILL WEAR MORE QUICKLY.

Note: A sample of the oil and the used oil filter must be stored in a clean container, labeled, and made available to Austro Engine GmbH on request for the complete engine life time. The label must show the airplane serial number, registration number, engine serial number, operation time and date. Quantity of the oil sample must be 100 ml.

2. Change the Engine Oil and Replace the Oil Filter

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-34.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	For the engine oil change and the oil filter replacement procedures refer to AE Maintenance Manual, latest revision. If an engine oil quick drain equipment is available, refer to Chapter 79 for more details.	
(4)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(5)	Do a ground test of the related engine, allow the engine to reach normal operating temperatures.	Refer to Section 71-00 and AE Maintenance Manual, latest revision.
(6)	Do a test for oil leaks: – Remove the engine cowlings. – Look for oil leaks, specially in the areas where you have done work. – Install the engine cowlings.	 Refer to Section 71-10 or 71-11. Refer to Section 71-10 or 71-11.

3. Replace the Gearbox Oil

	Detail Steps/Work Items	Key Items/References
	Note: For environment protection, changing the gearbox oil is only allowed on sealed surfaces. Used gearbox oil has to be disposed according to the applicable regulations. The environment and ground water must not be contaminated.	
(1)	The gearbox oil must have operation temperature.	
	WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.	
(2)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Remove the gearbox oil filler plug.	Refer to the AE Maintenance Manual, latest revision.
(5)	Remove the gearbox oil drain plug.	Refer to the AE Maintenance Manual, latest revision.
(6)	Drain the gearbox oil.	Refer to the AE Maintenance Manual, latest revision.
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.	

	Detail Steps/Work Items	Key Items/References
(7)	Drain the propeller un-feathering accumulator: – Set the ELECT. MASTER ON. – Set the ENGINE MASTER ON - OFF 3 times. – Set the ENGINE and ELECT. MASTER OFF.	
(8)	Install the gearbox oil drain plug.	Refer to the AE Maintenance Manual, latest revision.
CAUTION: YOU MUST USE A GEARBOX OIL THAT AGREES WITH THE SPECIFICATION IN THE AIRPLANE FLIGHT MANUAL, CHAPTER 2.		
(9)	Fill the gearbox with appropriate oil.	Refer to the AE Maintenance Manual, latest revision.
(10)	Install the gearbox oil filler plug.	Refer to the AE Maintenance Manual, latest revision.
(11)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(12)	Do a ground test of the related engine	Refer to Section 71-00 and AE Maintenance Manual, latest revision.
(13)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
(14)	If necessary, correct gearbox oil level: – Remove the gearbox oil filler plug. – Fill the gearbox oil system to the correct level. – Tighten the oil filler plug. – Secure the oil filler plug with lock wire.	Refer to the AE Maintenance Manual, latest revision.
(15)	Check for leakage, especially at the gearbox oil drain plug and gearbox oil filler plug.	
(16)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.

4. Read an Engine Event Log

CAUTION: ONLY AE-AUTHORIZED PERSONNEL MAY DOWNLOAD DATA FROM THE ENGINE.

CAUTION: WHEN OPERATING THE AIRPLANE ELECTRICAL SYSTEM WITH ENGINE MASTER ON (LH OR RH) AND THE ENGINE IS NOT RUNNING ALWAYS CONNECT AN EXTERNAL POWER SUPPLY WITH A PRESET VOLTAGE OF 29V TO THE AIRPLANE. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

A. Equipment

Item	Quantity	Part Number
Laptop computer.	1	Commercial.
"Wizard 300" software, latest approved revision.	n/a	n/a.
CAN interface.	1	Commercial.

B. Read an Engine Event Log

Refer to AE Maintenance Manual, latest revision.

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CHAPTER 73

ENGINE FUEL AND CONTROL

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CHAPTER 73

ENGINE FUEL AND CONTROL

1. General

This Section describes the fuel system of the AE E4-B engines and AE E4-C engines (if MÄM 42-600 is installed). It provides general data and trouble shooting information of the system.

Refer to the engine manufacturer's Repair Manual for the AE E4 engines. You can replace components in the air intake system and the fuel system. Refer to the engine manufacturer for data on the engine fuel system.

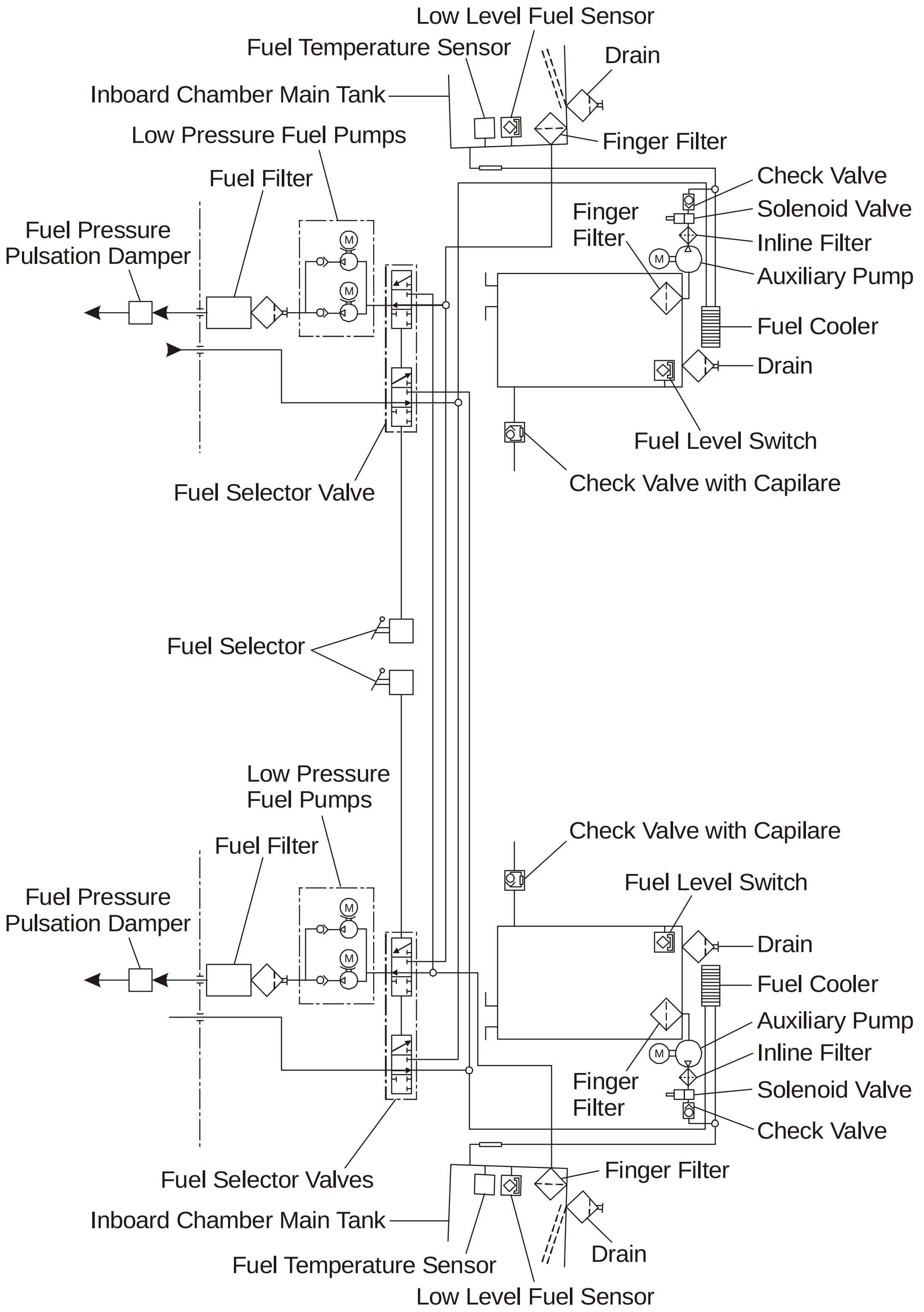
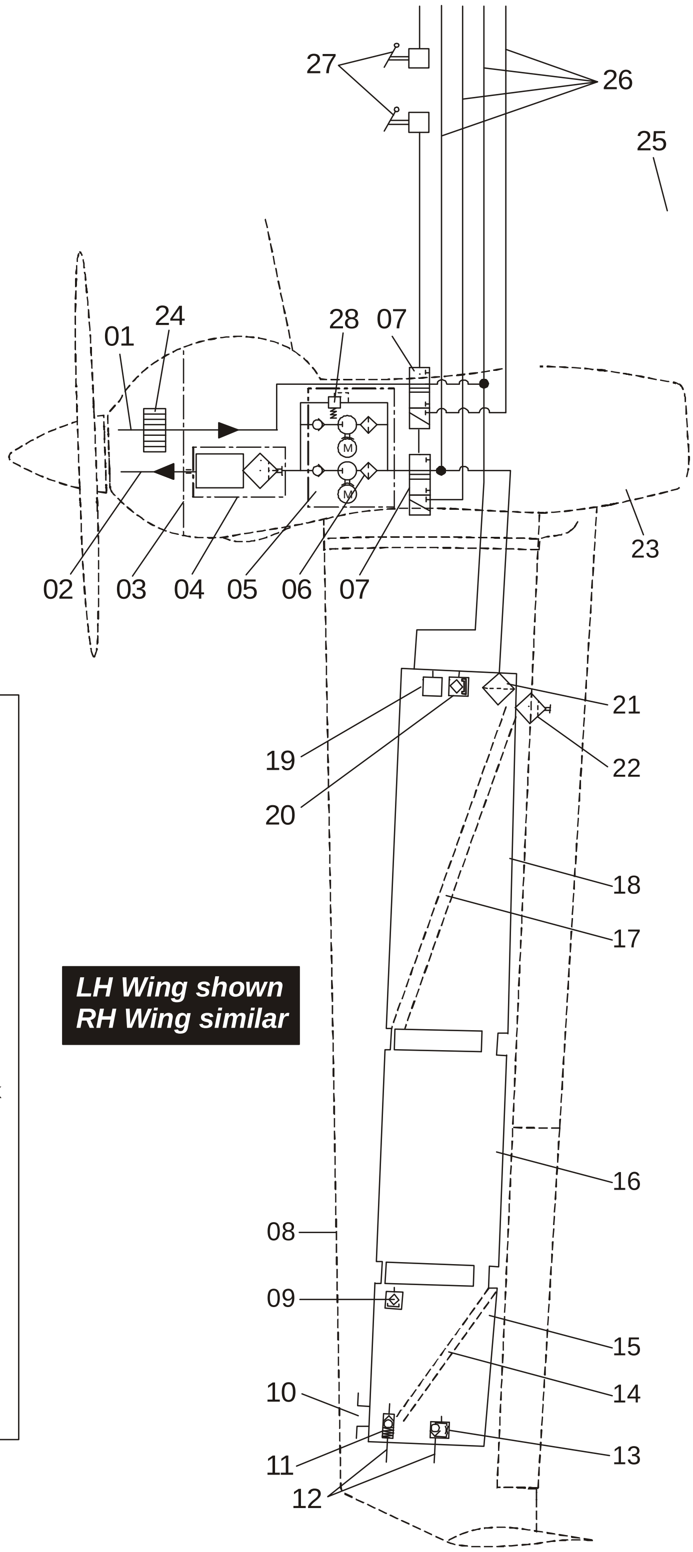


Figure 1: Engine Fuel System Schematic



01	Return Line
02	Fuel Supply
03	Firewall
04	Fuel Filter with Sediment Trap & Drain
05	Low Pressure Fuel Pumps
06	Prefilter
07	Fuel Selector Valves
08	Wing
09	Fuel Level Switch
10	Fuel Filler
11	Pressure Relief Valve
12	Main Fuel Tank Vent Line
13	Check Valve with Capilare
14	Outboard Fuel Level Sensor
15	Outboard Chamber Main Tank
16	Middle Chamber Main Tank
17	Inboard Fuel Level Sensor
18	Inboard Chamber Main Tank
19	Fuel Temperature Sensor
20	Low Level Fuel Sensor
21	Drain
22	Finger Filter
23	Nacelle
24	Fuel Cooler
25	Fuselage
26	Crossfeed Lines
27	Fuel Selector
28	Fuel Bypass Valve

Figure 2: Engine Fuel System Schematic (if MÄM 42-600 is installed)

2. Description and Operation

Figure 1 shows the schematic diagram for DA 42 NG with the AE E4-B engine. Figure 2 shows the schematic diagram for DA 42 NG with the AE E4-C engine (if MÄM 42-600 is installed).

The power generation system has two main parts:

- An air intake system. This system supplies air from the inlet to the air filter to the engine inlet manifold.
- An engine fuel system. The engine fuel system takes fuel from the airplane fuel system and injects it into the cylinders.

A. Air Intake System

The air intake system has an air filter located on the right of each engine nacelle, just forward of the firewall. If MÄM 42-600 is installed, the air intake system has an air filter located in the aft middle of the engine compartment. The filter attaches to the forward face of the alternate air valve. The alternate air valve also has an inlet direct from the engine compartment. The valve can select either filtered air or warm, unfiltered air. Refer to Section 71-60 for more data on the air filter and alternate air valve. If MÄM 42-600 is installed, refer to Section 71-61 for more data on the air filter and alternate air valve.

The outlet from the alternate air valve connects to the turbo charger. The outlet from the turbocharger connects to an intercooler. The outlet from the intercooler connects to the engine intake manifold. Refer to Section 81-00 for more data on the turbo charger and intercooler. If MÄM 42-600 is installed refer to Section 81-01 for more data on the turbo charger and intercooler.

B. Engine Fuel System

The fuel from the main tank flows through the pre-filter to the electrically driven low pressure fuel pumps. These fuel pumps supply the high pressure pump with the required fuel pressure and fuel flow. A fine fuel filter is installed upstream of the high pressure pump to assure clean fuel supply to the engine.

The high-pressure pump supplies fuel via the common rail to the injectors. A combined pressure relief and regulator valve at the end of the common rail controls the fuel pressure within the rail. Surplus fuel returns to the airplane main fuel tanks. The fuel returning from the engine is hot. The hot fuel passes through a fuel cooler located at the rear of each engine nacelle (in the engine compartment, if MÄM 42-600 is installed). From the fuel cooler the fuel returns to the main fuel tanks.

Trouble-Shooting

1. General

The table below lists the defects you could have with the engine fuel and control system. It only gives you the data for the air intake, air filter and fuel filter. For more data on troubleshooting the engine fuel and control system refer to the engine manufacturer.

If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
Loss of engine power.	Blocked air intake.	Examine the air intake. Remove any obstructions. Refer to Section 71-60 or 71-61.
	Dirty/damaged air filter.	Replace the air filter. Refer to Section 71-60 or 71-61.
	Dirty/damaged fuel filter.	Replace the fuel filter. Look for contaminated fuel in the airplane fuel system. Refer to Section 28-00 and Section 28-20 or 28-21.

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Maintenance Practices

1. General

Only an approved AE repair shop can repair the engine fuel system. For more data on the engine fuel and control system refer to the engine manufacturer.

Refer to Section 28-20 or to Section 28-21 (if MÄM 42-600 is installed) for more data on the fuel distribution system. Refer to Section 71-60 or to Section 71-61 (if MÄM 42-600 is installed) for maintenance data on the air filter and alternate air valve. Refer to Section 81-00 or to Section 81-01 (if MÄM 42-600 is installed) for maintenance data on the turbo charging system.

2. Remove/Install a Fuel Cooler (if MÄM 42-600 is installed)

A. Remove a Fuel Cooler

Obey the safety precautions for fuel at all times.

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
2.	Disconnect the flexible hoses that connect to the fuel cooler. – Remove the wire locking from the fuel hose connectors.	Refer to Figure 3. Use a suitable container to catch spilt fuel. Put caps on all open connections.
3.	Remove the fuel cooler: – Remove the 2 bolts and washers that attach the fuel cooler to the engine mount. – Lower the cooler including spray shield from the engine mount and clear of the engine nacelle. – Empty the fuel from the cooler into a suitable container.	 Support the cooler. Take care! The cooler will contain fuel!

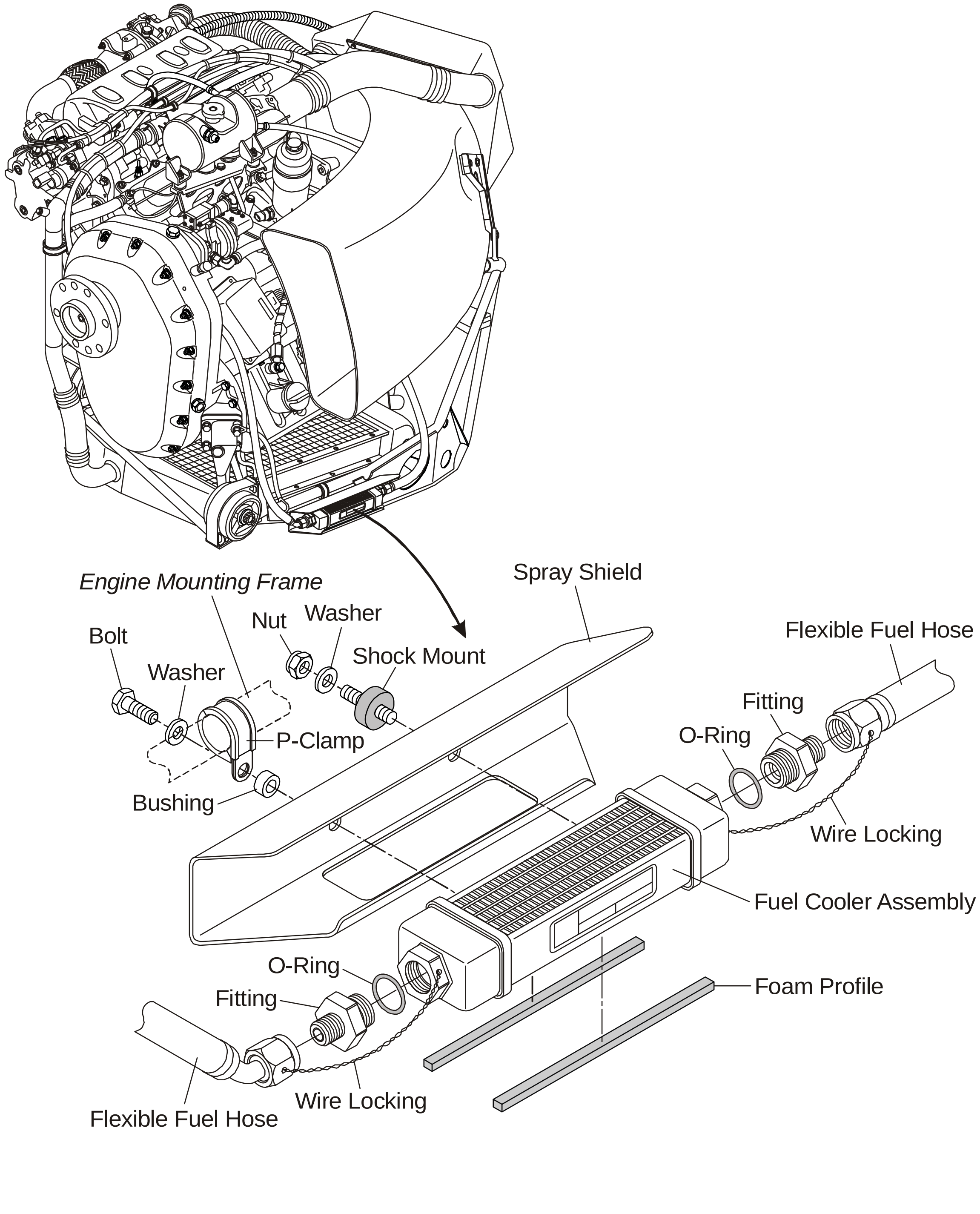

Figure 3: Fuel Cooler Installation (if MÄM 42-600 installed)

B. Install a Fuel Cooler

	Detail Steps/Work Items	Key Items/References
1.	Install the fuel cooler: – Move the fuel cooler and spray shield into position on the engine mount. – Align the cooler with the mounting hole on the engine mount and install the 2 bolts and washers that attach the fuel cooler to the engine mount.	
2.	Connect the flexible hoses to the fuel cooler. Secure fuel line connections with wire locking.	Make sure that you remove all the blanking caps.
3.	Do a test for leaks. Specially at the flexible hose connections to the fuel cooler.	

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CHAPTER 75

LIQUID COOLING SYSTEM

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CHAPTER 75

LIQUID COOLING SYSTEM

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CHAPTER 75
LIQUID COOLING SYSTEM

1. General

This Section gives you the data for the liquid cooling system for the DA 42 NG airplane. It gives you the Maintenance Practices to remove/install the system components.

Figure 1 shows the liquid cooling system schematic diagram. Figure 2 shows the installation in the airplane.

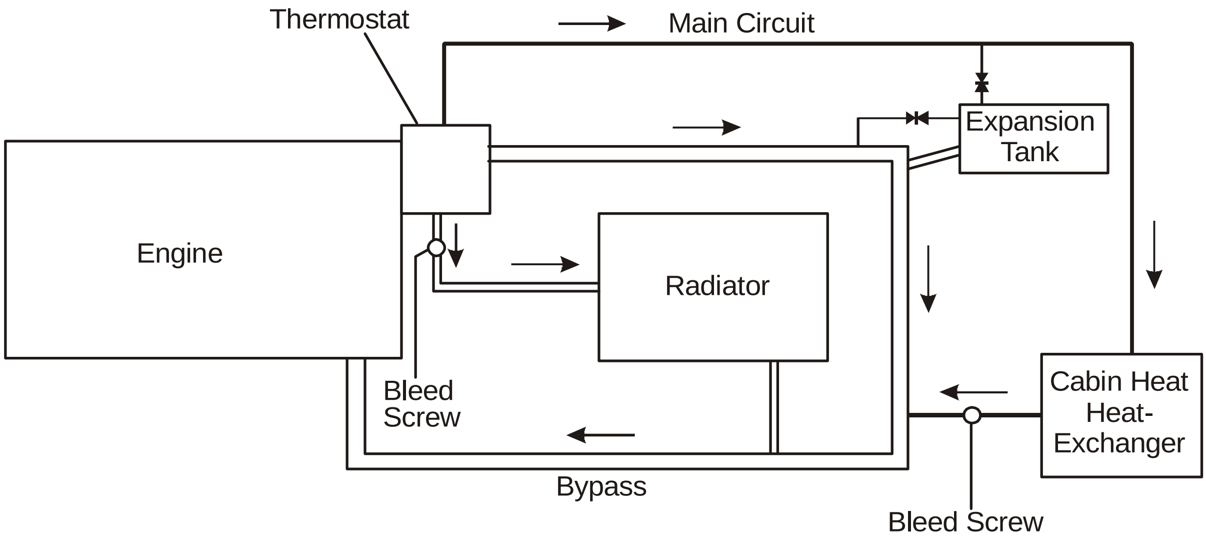

Figure 1: Liquid Cooling System Schematic Diagram

2. Description

Each engine has a water-based liquid cooling system. The liquid coolant is a mixture of water and antifreeze. Refer to the Airplane Flight Manual for approved coolants.

The engine has an integral coolant pump. The coolant pump is located at the rear of the engine, below the oil filter housing. The v-ribbed belt at the rear of the engine operates the coolant pump. An automatic tensioner keeps the belt tension at the correct value. The coolant flows through passages inside the crankcase and cylinder head and becomes hot. The coolant leaves the engine through a thermostat valve at the top, front left of the crankcase.

A temperature sensor at the rear of the thermostat valve connects to the engine control system. The integrated cockpit system (ICS) display shows the coolant temperature (COOLING TEMPERATURE).

The cooling system has 2 circuits. There is a main circuit and a bypass circuit.

For the main circuit, large diameter hoses and pipes connect the thermostat valve to the inlet of a coolant radiator. The coolant radiator is located below the engine. Large hoses and pipes connect the outlet from the coolant radiator to an inlet on the engine crankcase at the rear, top. This is the inlet to the engine coolant pump.

For the bypass circuit, large diameter hoses and pipes connect the bypass outlet from the thermostat valve to the inlet for the coolant pump.

A coolant expansion tank is located on top of the engine above the thermostat valve. This is the highest point in the system. A small diameter hose connects the highest point of the system to the top of the coolant tank. The tank has an over pressure valve which opens at too high coolant system pressure.

A small diameter hose connects the bottom of the coolant tank to the inlet to the coolant pump.

A coolant level sensor is installed in the coolant tank. It operates the WATER LEVEL caution light in the ICS.

Hoses connect the inner coolant circuit to the inlet of the cabin heating heat-exchanger. The return flow from the heat exchanger connects to a tapping on the main circuit pipe on the rear side of the engine.

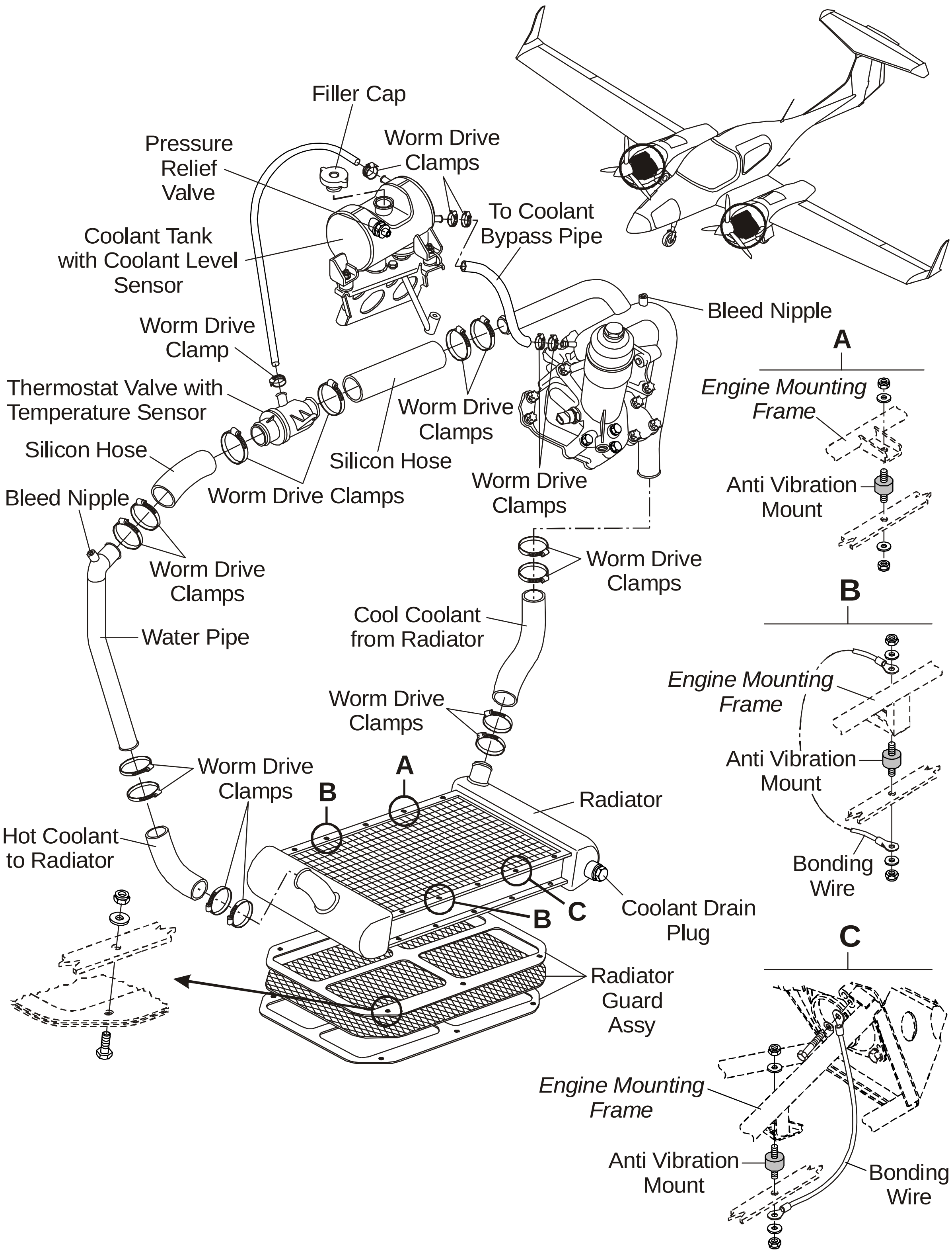

Figure 2: Liquid Cooling System Installation

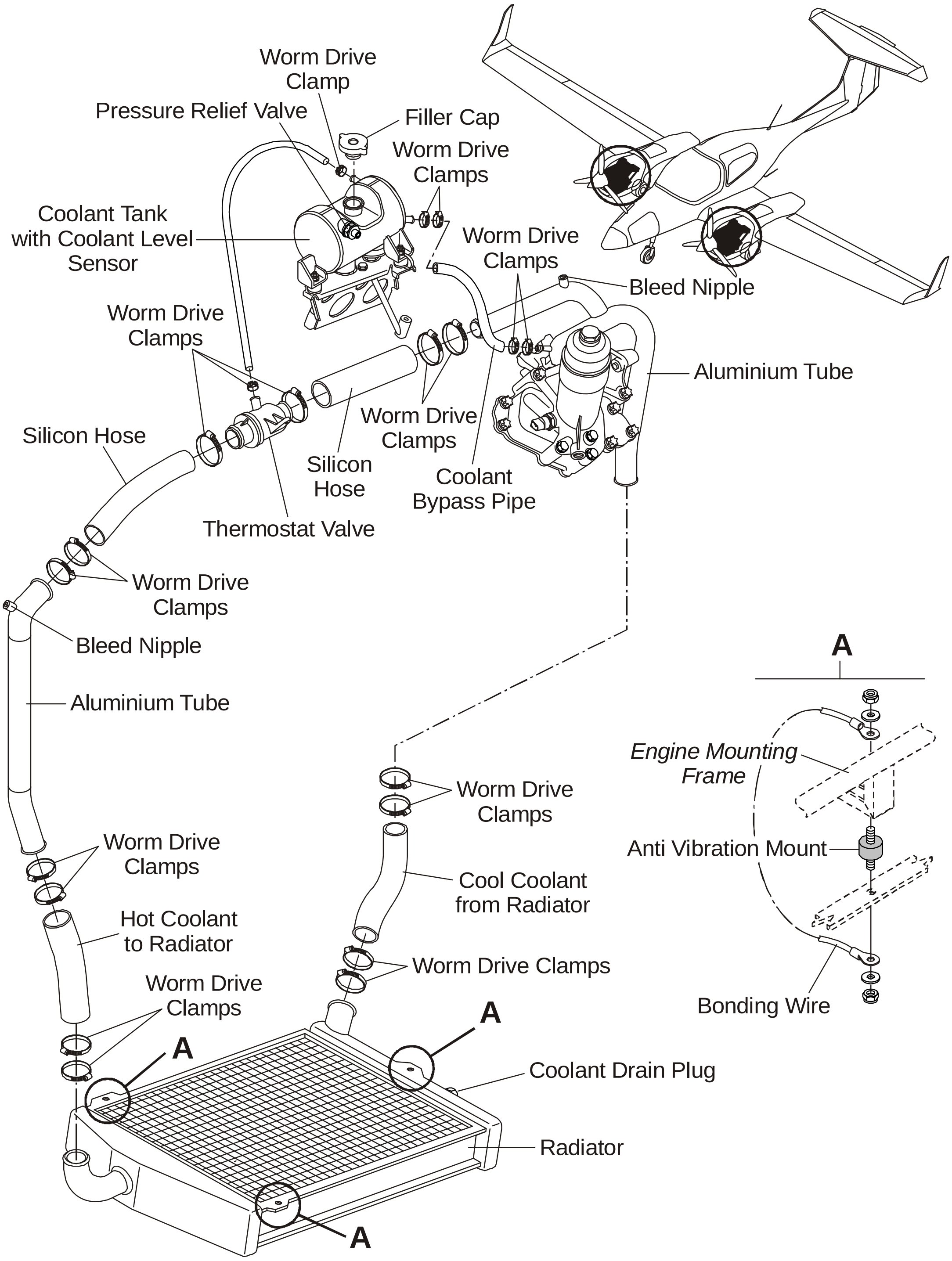

Figure 3: Liquid Cooling System Installation (if MÄM 42-600 is installed)

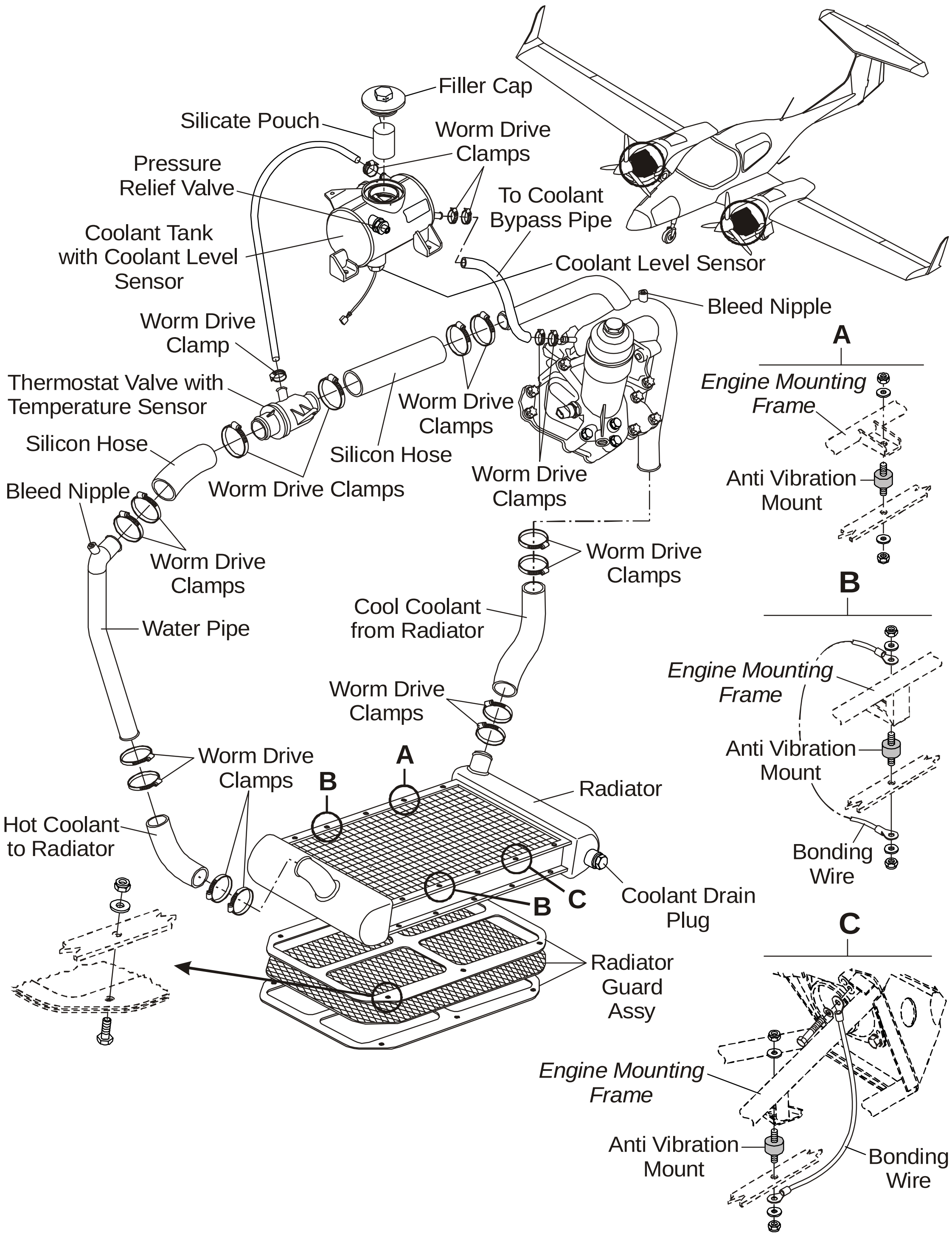

Figure 4: Liquid Cooling System Installation (if MÄM 42-852 is installed)

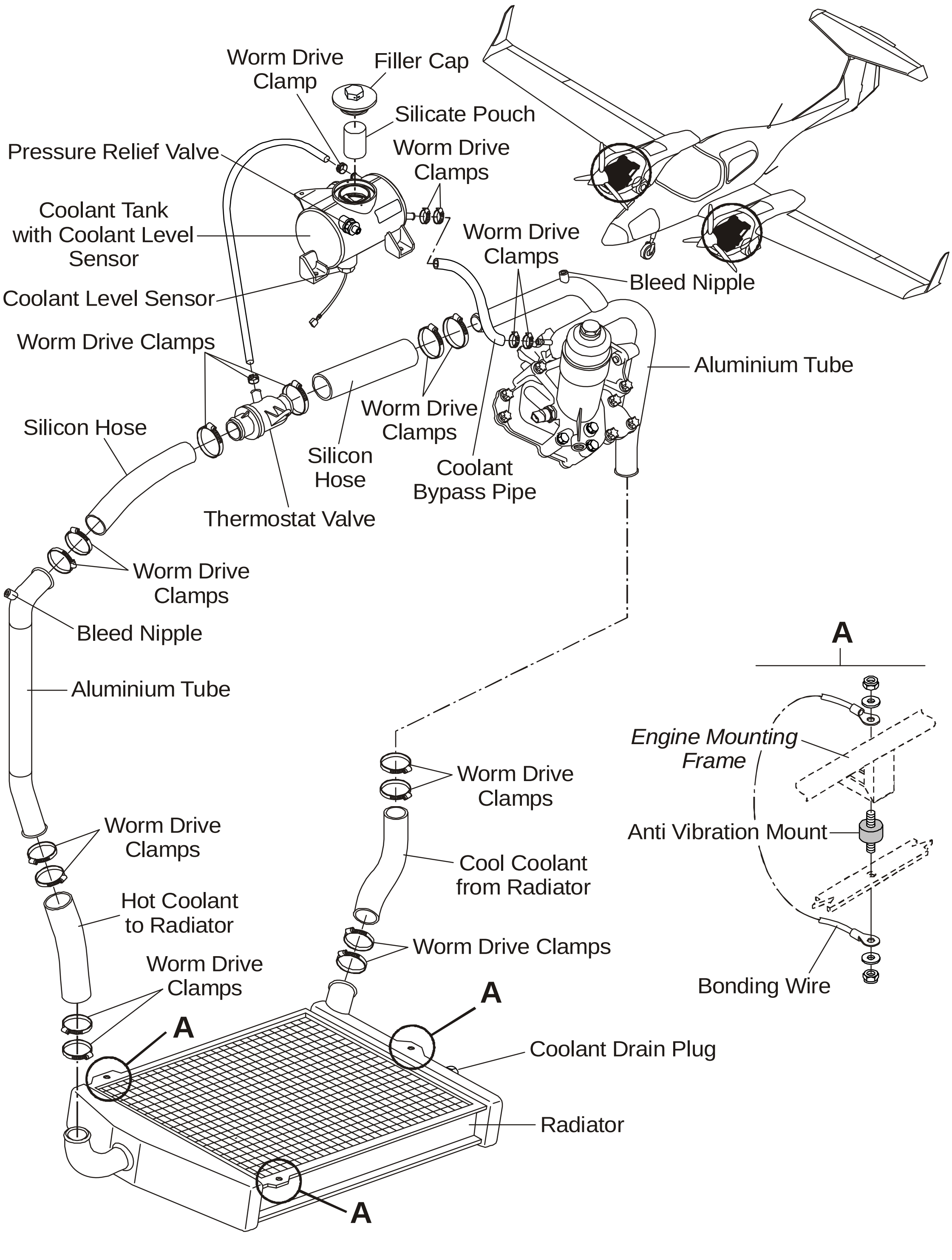

Figure 5: Liquid Cooling System Installation (if MÄM 42-600 and MÄM 42-852 are installed)

When the engine is cold, the thermostat valve closes the main circuit. The coolant pump moves the coolant through the engine. The coolant becomes warm. The coolant flows out of the thermostat valve through the bypass circulation pipes directly to the inlet of the coolant pump.

As the engine becomes hot, the temperature of the coolant increases. The thermostat valve senses the increased temperature and starts to open. Some coolant goes through the bypass circuit directly to the coolant pump inlet. Some coolant goes through the main circuit through the coolant radiator. Air flowing through the coolant radiator cools the liquid coolant. The cool liquid returns to the inlet of the coolant pump and mixes with the hot coolant from the bypass circulation.

The thermostat valve adjusts the flow of coolant through the main and bypass circuit to keep the correct temperature. It starts opening at 80 °C (176 °F) and fully opens at 95 °C (203 °F), allowing the coolant to flow through the coolant radiator.

The connection for the cabin heat system supplies coolant at the outlet temperature from the engine at all times, independent of the coolant temperature.

On top of the coolant expansion tank a pressure relief valve is installed. The pressure relief valve limits the over and under pressure in the cooling circuit.

If MÄM 42-852 is NOT installed:

A silicate cartridge contains a replaceable silicate pouch and is situated on the bottom side of the coolant expansion tank.

If MÄM 42-852 is installed:

A cartridge contains a replaceable silicate pouch and is situated in the filler neck of the coolant expansion tank.

Trouble-Shooting

1. General

This table tells you how to troubleshoot the liquid cooling system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

This Trouble-Shooting table gives only troubles to the airplane parts of the cooling system.

Trouble	Possible Cause	Repair
Engine overheats.	Flat-belt worn or broken.	Refer to the engine manufacturer.
	Coolant level low.	Fill the cooling system. Refer to Section 12-10.
	Coolant leak.	Look for leaks at all system joints. Repair or replace defective components.
	Air in cooling system.	Bleed the cooling system.
	Radiator matrix blocked by foreign objects.	Remove foreign objects and clean radiator matrix.
	Thermostat valve defective.	Refer to the engine manufacturer.
	Coolant pump defective.	Refer to the engine manufacturer.
	Defective cylinder head gasket.	Refer to the engine manufacturer.

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Maintenance Practices

1. General

This Section tells you about the Maintenance Practices for the components in the liquid cooling system.

2. Remove/Install a Coolant Expansion Tank

A. Remove a Coolant Expansion Tank

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.** Note: Use only new worm-drive clamps for hose installation of liquid cooling system.	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-34.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE PRESSURE CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	

	Detail Steps/Work Items	Key Items/References
(4)	Remove the filler cap from the coolant tank: – Turn the cap counterclockwise a small distance to release the pressure. – When the pressure has fully released, remove the cap. – Drain coolant.	Refer to Paragraph 8.
(5)	Disconnect the hose that connects the expansion tank to the supply system: – Remove the worm-drive-clamp that secures the hose. – Pull the hose from the connector at the expansion tank.	Use a suitable container to collect spilt coolant.
(6)	Disconnect the electrical cables for the coolant level sensor.	At the inline connector, at the sensor.
(7)	Remove the hose from the coolant tank which connects to the thermostat vent. – Remove the wire locking from the worm-drive-clamps. – Remove the worm-drive-clamps and the hose.	
(8)	Remove the nut which also holds cable clamps of the fuel and electrical system on top of the thermostat vent.	
(9)	Remove the two other nuts which hold the tank on the small shock mounts.	
(10)	Move the expansion tank clear of the engine nacelle.	

B. Install a Coolant Expansion Tank

	Detail Steps/Work Items	Key Items/References
(1)	Place the expansion tank in the engine nacelle.	
(2)	Install the two nuts which hold the tank on the small shock mounts.	
(3)	Install the nut which also holds cable clamps of the fuel and electrical system on top of the thermostat vent.	
(4)	Connect the electrical cables for the coolant level sensor.	
(5)	Connect the balance hoses that connect the cabin heat pipe and the bypass vent to the expansion tank:	
	– Push the hoses onto the connector at the expansion tank.	
	– Install the worm-drive-clamps that secure the hose connections and apply torque seal (no red of white torque seal color allowed).	Use only new worm-drive clamps.
(6)	Connect the hose that connects the expansion tank to the supply system:	
	– Push the hose onto the connector at the expansion tank.	
	– Install and tighten the worm-drive-clamp that secures the hose connection and apply torque seal (no red of white torque seal color allowed).	Use only new worm-drive clamps.
(7)	Fill and bleed the liquid coolant system.	Refer to Paragraph 7.
(8)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(9)	Perform coolant pressure test.	Refer to Paragraph 9.

3. Remove/Install the Pressure Relief Valve

A. Remove the Pressure Relief Valve

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE PRESSURE CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	
(3)	Remove the locking wire from the pressure relief valve.	
(4)	Remove the pressure relief valve.	

B. Install the Pressure Relief Valve

	Detail Steps/Work Items	Key Items/References
(1)	Install the pressure relief valve.	Torque 12-15 Nm (8.85-11.06 lbf.ft.). Check O-ring for deformation and delocation. Apply EZ TURN.
(2)	Install locking wire.	Wire diameter 0.8 mm (0.032 in).
(3)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.

4. Remove/Install Silicate Pouch (If MÄM 42-852 is installed)

Note: If MÄM 42-852 is NOT installed, refer to Paragraph 11.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine cowlings.	Refer to Section 71-10 and 71-11.
	WARNING: DO NOT REMOVE THE FILLER CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	
(2)	Remove the safety lock wire from the filler cap on the coolant expansion tank.	
(3)	Remove the filler cap from the coolant tank to relief any pressure which may be resident in the system: – Turn the cap counterclockwise a small distance to release the pressure. – When the pressure has fully released, turn the cap fully counterclockwise.	
(4)	Remove retaining ring inside the filler neck.	
(5)	Remove max coolant level plate.	
(6)	Remove the used silicate pouch and replace it with the new silicate pouch. Remove cartridge and clean it with water. Reinstall cartridge.	
(7)	Install the max coolant level plate.	Be sure that the engraved max coolant marking is on the top.
(8)	Install the retaining ring.	
(9)	Check coolant level, refill if required.	Refer to Paragraph 7.
(10)	Install cap on the coolant expansion tank. Check O-ring for deformation.	Refer to Section 20-70. Torque 12-15 Nm (8.85-11.06 lbf.ft.). Renew O-Ring if necessary. Apply EZ TURN.
(11)	Install safety lock wire to secure filler cap.	Wire diameter 0.8 mm (0.032 in).

5. Remove/Install Coolant Level Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine cowlings.	Refer to Section 71-10 and 71-11.
WARNING:	**DO NOT REMOVE THE FILLER CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.**	
(2)	If MÄM 42-852 is installed: Remove the safety lock wire from the filler cap on the coolant expansion tank.	
(3)	Remove the filler cap from the coolant tank to relief any pressure which may be resident in the system: – Turn the cap counterclockwise a small distance to release the pressure. – When the pressure has fully released, turn the cap fully counterclockwise.	
(4)	Drain engine cooling system.	Refer to Paragraph 8.
(5)	Disconnect the electrical cables for the coolant level sensor.	At the inline connector, at the sensor.
(6)	Remove the coolant level sensor.	
(7)	Install new coolant level sensor, use new copper gasket.	Use Loctite 243. Torque: 25-30 Nm (18.44-21.13 lbf.ft.).
(8)	Fill and bleed the engine coolant system.	Refer to Paragraph 7.

6. Remove/Install a Coolant Radiator

A. Remove a Coolant Radiator

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-34.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE PRESSURE CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	
(4)	Remove the filler cap from the coolant tank to relief any pressure which may be resident in the system: – Turn the cap counterclockwise a small distance to release the pressure. – When the pressure has fully released, turn the cap fully counterclockwise.	
(5)	Drain the coolant system.	

	Detail Steps/Work Items	Key Items/References
(6)	Remove the hoses from the radiator: – Remove the worm-drive-clamps that secure the hoses. – Pull the hoses from the connectors on the radiator.	Note the position and orientation of the hoses on the radiator!
(7)	Remove the radiator: – Remove the nuts, washers and bolts that attach the radiator guard assy to the radiator. – Remove the nuts, washers and bolts that attach the radiator to the engine mounting frame. – Move the radiator clear of the engine nacelle.	

B. Install a Coolant Radiator

	Detail Steps/Work Items	Key Items/References
(1)	Install the radiator: – Install the radiator guard assy. – Move the radiator into position at the bottom of the engine nacelle. – Install the bolts, washers and nuts that attach the radiator to the engine mounting frame.	 Refer to Figure 2.
(2)	Install the hoses onto the radiator that you removed in Paragraph 6A, step 5: – Install the radiator hoses onto the radiator connections. – Secure the hoses with worm-drive-clamps and apply torque seal (no red of white torque seal color allowed).	In the position and orientation noted in Paragraph 6A, step 5. Use new worm-drive clamps.
(3)	Fill and bleed the liquid coolant system.	Refer to Paragraph 7.
(4)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(5)	Perform coolant pressure test.	Refer to Paragraph 9.

7. Fill and Bleed an Engine Cooling System

A. Equipment

Item	Quantity	Part Number
Vacuum filler device for cooling system.	1	DAI-7500-10-ST
Pressure tool cap.	1	D44-7521-00-00-ST
Pressure relief valve blocking tool.	1	DAI-7500-01-00-ST

B. Fill and Bleed an Engine Cooling System

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE PRESSURE CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	

	Detail Steps/Work Items	Key Items/References
(4)	Fill the cooling system: If MÄM 42-852 is NOT installed: – Remove the filler cap. – Install the rubber cone of the filler device. If MÄM 42-852 is installed: – Remove lock wire. – Remove filler cap. – Install pressure tool cap.	D44-7521-00-00-ST
(5)	Make sure that the drain plug on the coolant radiator is installed.	
(6)	Connect the filler line of the cooling system filler device with the pressure tool cap or the rubber cone.	DAI-7500-10-00-ST Make sure that all valves are closed on the filler device.
(7)	Close the pressure relief valve by installing the pressure relief valve blocking tool.	DAI-7500-01-00-ST
(8)	Place the suction line from the filler device into a container with at least 8 liters of coolant fluid. Place container on a pedestal on engine level.	Refer to chapter 2 of the AFM for approved coolant. Make sure, that the suction line is completely filled with coolant.
	WARNING: USE ONLY APPROVED COOLANT. A WRONG COOLANT CAN DAMAGE THE ENGINE.	
(9)	Attach a supply hose for compressed air to the compressed air connector.	
(10)	Open the air valve at the compressed air connector for approx. 2 minutes.	Make sure the filler device gauge shows -0.6 to -0.8 bar.

	Detail Steps/Work Items	Key Items/References
(11)	Close the air valve and check if the pressure on the gauge stays constant. If the pressure changes, search for leaks and repair if necessary. Repeat steps 9 and 10 until there is no detectable pressure change.	For a minimum of 30 seconds.
(12)	Open the suction line valve completely.	The filling process is finished, when there is no coolant flow in the suction line and the pressure has fully equalized. (Filler device gauge shows 0.0 bar)
(13)	Close the suction line valve and disconnect the filler device from the coolant tank.	
(14)	Perform a coolant system pressure test.	Refer to Paragraph 9.
(15)	Remove the pressure relief valve blocking tool.	
(16)	If MÄM 42-852 is installed: – Perform pressure relief valve test.	Refer to Paragraph 10.
(17)	If MÄM 42-852 is NOT installed: – Fill coolant to max. Coolant level marking in the filler neck. – Install the filler cap. If MÄM 42-852 is installed: – Fill coolant to max. Coolant level marking in the filler neck. – Check O-ring for deformation. – Install the filler cap to the coolant expansion tank.	Replace if necessary. Apply EZ TURN. Refer to Section 20-70. Torque 12-15 Nm (8.85 - 11.06 lbf.ft.).

	Detail Steps/Work Items	Key Items/References
(18)	Do an engine ground run: – Let the coolant temperature rise up to the point where the coolant flows from the thermostat valve through the main circuit. – After shut down, check for leaks.	Refer to the Airplane Flight Manual. 85 °C (185 °F)
(19)	Let the engine cool down.	
	WARNING: DO NOT REMOVE THE PRESSURE CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	
(20)	Remove the filler cap from the coolant tank: – Turn the cap counterclockwise a small distance to release the pressure. – When the pressure has fully released, remove the cap.	
(21)	Check coolant level. Repeat steps 17 to 20 until the fluid level in coolant tank remains constant.	
(22)	If MÄM 42-852 is installed: – Install safety lock wire to secure filler cap.	Wire diameter 0.8 mm (0.032 in).
(23)	Install engine cowlings.	Refer to Section 71-10 or 71-11.

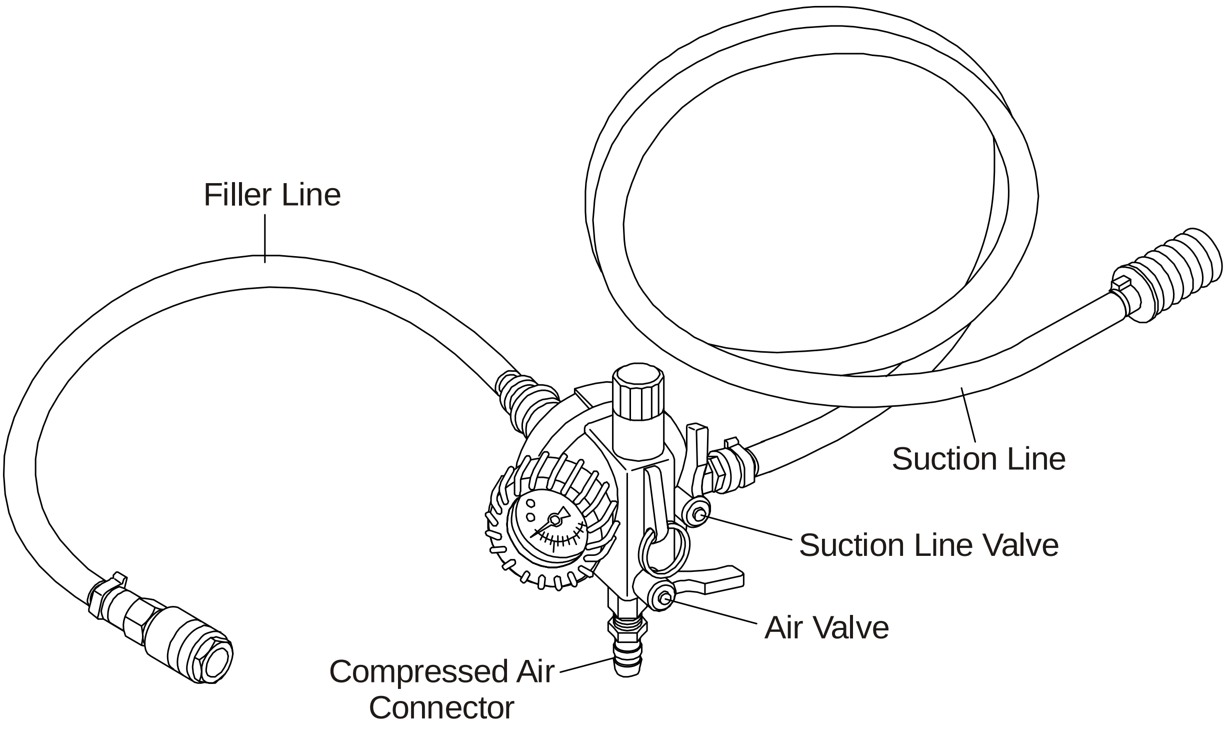

Figure 6: Vacuum Filler Device

8. Drain the Engine Coolant System

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE FILLER CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	
(4)	Remove the filler cap from the coolant tank to relief any pressure which may be resident in the system: – Turn the cap counterclockwise a small distance to release the pressure. – When the pressure has fully released, remove the cap.	

	Detail Steps/Work Items	Key Items/References
(5)	Drain the coolant system: – Remove the safety lock wire from the drain plug at the coolant radiator. – Remove the drain plug from the bottom left side of the coolant radiator.	

9. Coolant System Pressure Test

A. Equipment

Item	Quantity	Part Number
Pressure test equipment.	1	DAI-7500-02-00-ST
Pressure relief valve blocking tool.	1	DAI-7500-01-00-ST

B. Coolant System Pressure Test

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE PRESSURE CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	
(4)	Remove the filler cap from the coolant tank and install the pressure test equipment instead.	
(5)	Install the pressure relief valve blocking tool.	

	Detail Steps/Work Items	Key Items/References
(6)	Pressurize the coolant system.	Apply 2.0 bar (29 PSI) relative pressure. Max. allowable pressure drop in 15 minutes: 0.1 bar (1.45 PSI).
(7)	Check the coolant system for leaks.	
(8)	Remove the pressure test equipment from the coolant tank. – Open the pressure relief valve. – Remove the test equipment carefully to relieve the remaining pressure.	 If existent.
(9)	Remove the pressure relief valve blocking tool.	
(10)	Install the cap to the coolant tank.	
(11)	Install engine cowlings.	Refer to Section 71-10 or 71-11.
(12)	Connect the airplane main battery.	Refer to Section 24-31.

10. Pressure Relief Valve Test

A. Equipment

Item	Quantity	Part Number
Pressure test equipment.	1	DAI-7500-02-00-ST
Pressure tool cap.	1	D44-7521-00-00-ST (if MÄM 42-852 is installed).

B. Pressure Relief Valve Test

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	WARNING: DO NOT REMOVE THE FILLER CAP FROM THE COOLANT EXPANSION TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND BURN YOU.	

	Detail Steps/Work Items	Key Items/References
(4)	Remove the filler cap from the coolant tank and install the pressure test equipment instead.	Remove safety lock wire and use pressure tool D44-7521-00-00-ST. Torque refer to Section 20-70. (if MÄM 42-852 is installed).
(5)	Pressurize the coolant system.	Apply 2.3 bar (33.4 PSI).
(6)	Verify: – Pressure relief valve (PRV) opens between 1.8 and 2.3 bar (26.1 and 33.4 PSI). – If the PRV does not open, depressurize the coolant system by opening the pressure relief valve of the test equipment. Mechanically open the PRV by pulling on the outer ring until it moves approx. 2 mm (0.08 in) outward. Remove the PRV. – Clean the PRV with water. – Install the PRV. – Repeat the PRV test. If the PRV does not open between 1.8 and 2.3 bar (26.1 and 33.4 PSI): Replace the PRV with a new PRV.	
(7)	Remove the pressure test equipment.	If existent.
(8)	Install the cap to the coolant tank.	Torque refer to Section 20-70. Check O-ring, apply EZ TURN. Install safety lock wire (diameter 0.8 mm (0.032 in)). (if MÄM 42-852 is installed).
(9)	Install engine cowlings.	Refer to Section 71-10 or 71-11.
(10)	Connect the airplane main battery.	Refer to Section 24-31.

11. Silicate Pouch Replacement

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Drain the engine cooling system.	Refer to Paragraph 6.
(2)	Remove the coolant expansion tank.	Refer to Paragraph 2.
(3)	Remove the lock wire from the cartridge cap.	
(4)	Remove the cartridge cap.	
(5)	Remove the used silicate pouch and replace it with the new silicate pouch.	
(6)	Replace the used O-ring with a new O-ring.	Grease O-ring with EZ TURN lubricant.
(7)	Install the cartridge cap.	Torque: 32.5 ± 2.5 Nm (24.0 ± 1.8 lbf.ft.)
(8)	Secure the cartridge cap with lock wire.	
(9)	Install the coolant expansion tank.	Refer to Paragraph 2.
(10)	Fill and bleed the engine coolant system.	Refer to Paragraph 5.
(11)	Perform a coolant system pressure test.	Refer to Paragraph 7.

CHAPTER 76

ENGINE CONTROLS

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CHAPTER 76
ENGINE CONTROLS

1. General

This Section tells you about the DA 42 NG with the AE engines installed. Each engine has only one control lever. Electrical cables connect the power levers to the engine control systems.

2. Description and Operation

Figure 1 shows the schematic diagram of an engine control system. The system contains an electronic engine control unit (EECU).

Each electronic engine control unit has two independent computers (ECU A and ECU B), either of which can provide all control functions for the engine and propeller.

Each engine control system consists of the following componants:

– One EECU located in the engine nacelle.

– An electrical harness that connects the ECUs to the engine, the power lever, the annunciator panel, control buttons and some instruments.

– Sensors that measure engine parameters.

– An electrical power lever located in the center console.

– Control buttons for setting the second ECU in an emergency and testing the control system.

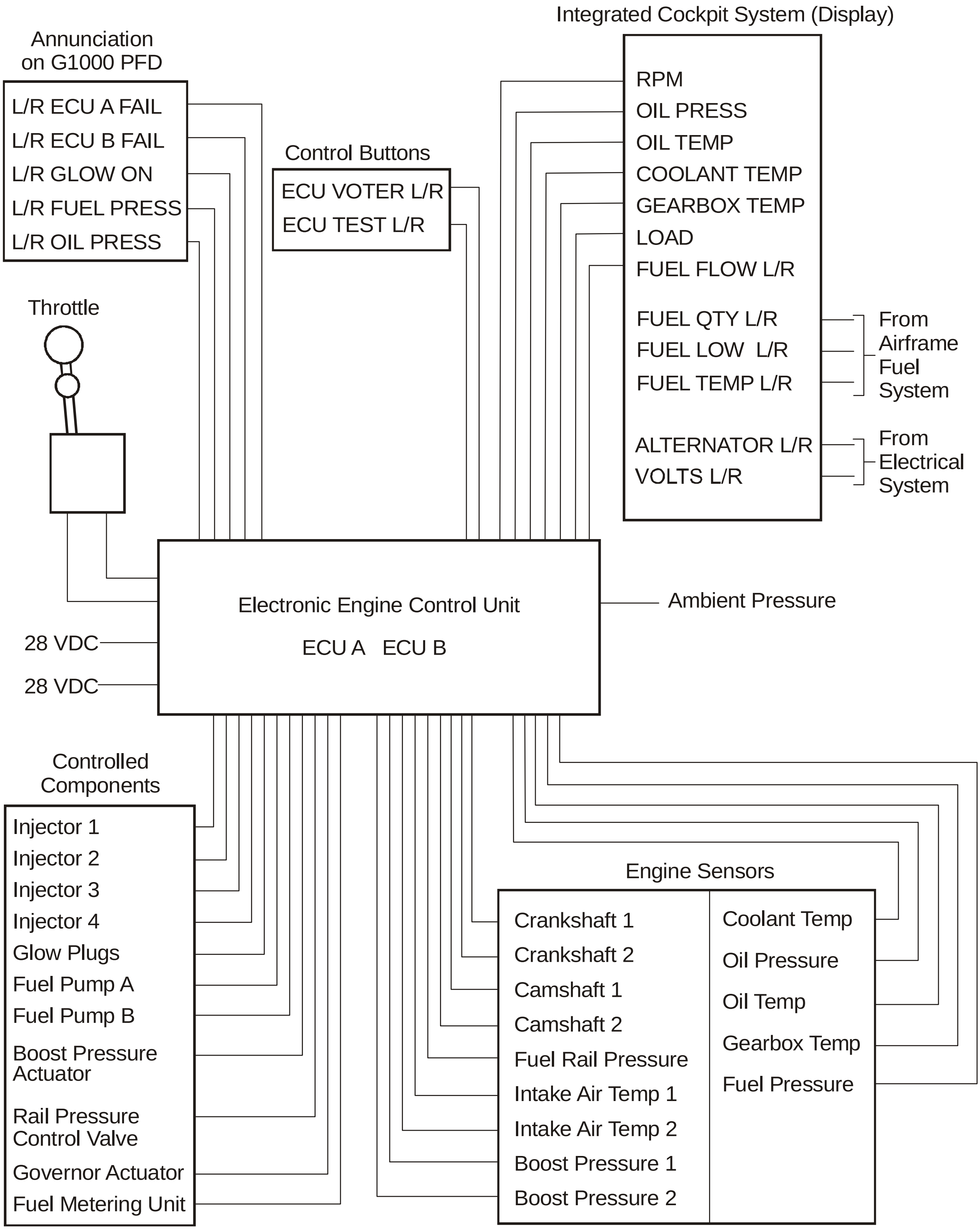

Figure 1: Engine Control System Schematic Diagram

A. Engine Control Units

The ECU A and ECU B are contained in one box located in each engine nacelle, aft of the firewall. A harness connects the box to the engine, the power lever and the integrated cockpit system (ICS).

In the usual operation, the alternator supplies power for the system. If the alternator fails, the ECU B automatically takes over and the ECU backup battery provides power. Refer to Section 24-00 for more data about the electrical supply for the engine control systems.

The annunciator panel of the ICS has two amber caution lights for the engine control system (marked ECU A and ECU B).

The ECU VOTER switch on the left of the instrument panel let you toggle between ECU A and ECU B. For all normal operation, the VOTER switch is set to AUTO and one ECU controls the engine.

The ECU TEST buttons on the left of the instrument panel let you test the systems. Refer to Section 71-00 for the ECU test procedure.

B. Electrical Harness

Each engine has a dedicated engine electrical harness. The electrical harness is an engine component. The harness connects the power lever and sensors to the ECU A and ECU B. It also provides connections for the ECU buttons and the ICS.

The electrical harness comes through the engine firewall. P-clamps and tie-wraps attach the electrical harness to the engine. The harness goes forward and divides to go down both sides of the engine.

The cables on the right side pass mainly along the cylinder head. They connect to the fuel pressure regulator, fuel pressure sensor, fuel injectors and camshaft position sensors. A cable goes to the inter-cooler outlet. Cables also go forward and down to the glow plugs, waste gate, right and left crankshaft position sensors, gearbox temperature sensor, coolant temperature sensor, and propeller governor.

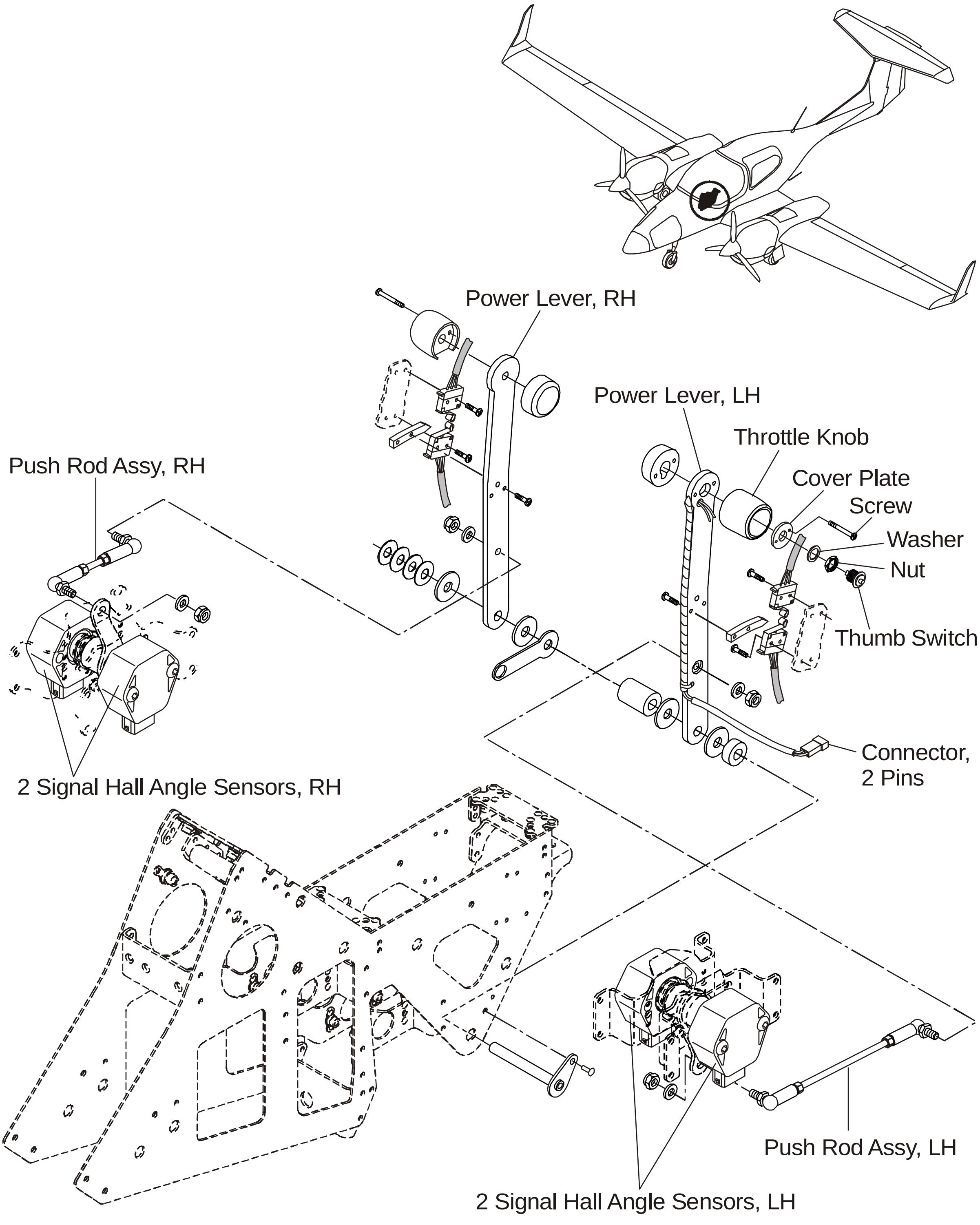

Figure 2: Engine Power Levers

The left side of the engine has cables to the sensors for oil pressure and oil temperature and cables for the starter and alternator.

The repair of the electrical harness is limited to damage that occurs near the ends of the cables, outside of the isolated section. If a cable fails within the isolated section, then you must replace the complete harness.

C. Manifold Pressure

Manifold pressure is measured by two sensors for each ECU located at the air intake manifold.

D. Power Levers

Each engine has a dedicated power level. Figure 2 shows the installation of the engine power levers. Each power lever is located in the center console. The power levers assemble as a unit to the engine control assembly in the center console.

Each power lever has two separate and independent electrical systems. One system provides signals to the ECU A. The other system provides signals to the ECU B. Either system can control the engine.

The levers operate electrical sensors (HALL effect) that give signals in proportion to the power lever position. The signals are used by the engine control system to set the power output. The control system also sets the propeller governor to give best RPM for the power setting. Refer to Section 61-20 for more data on the propeller control function.

Push rods connect the throttle levers to the Hall-sensors. You can adjust the relative position of each power lever relative to its sensor by adjusting the length of the related push rod. You can make this adjustment so that the power levers align with each other when the engines are giving the same power output.

E. Sensors

Both ECUs of each engine get data about engine performance from the following sensors mounted on each engine:

Sensor	Location
Crankshaft 1.	Front, right of the crankcase.
Crankshaft 2.	Front, left of the crankcase.
Camshaft 1.	Front between camshafts.
Camshaft 2.	Aft between camshafts.
Coolant temperature.	Beneath the air intake manifold.
Oil temperature.	On the top side of the oil sump.
Oil pressure.	Behind the oil filter.
Manifold air temperature 1 and 2.	On the air intake manifold.
Manifold air pressure 1 and 2.	On the air intake manifold.
Fuel rail pressure.	At the front of the fuel rail.
Gearbox temperature.	At the back side of the gearbox next to the starter.
Fuel inlet pressure.	At the inlet of the high pressure pump.

Trouble-Shooting

1. General

The table below lists the defects you could have with the engine control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

For all other engine control trouble, refer to the engine manufacturer.

Trouble	Possible Cause	Repair
An ECU caution light comes ON.	The related ECU defective.	Read engine event log (refer to Section 72-00). Refer to the engine manufacturer.
An engine does not respond correctly to power lever movement.		Run diagnostic routine in ECU Operator software (refer to Section 72-00). Refer to the engine manufacturer.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the main components in an engine control system. All other work on the engine control systems can only be done by a AE approved maintenance shop or the manufacturer.

2. Remove/Install a Hall Angle Sensor

A. Remove a Hall Angle Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the engines are safe: – Set the ELECT. MASTER switch to OFF. – Set both ENGINE MASTER switches to OFF. – Set the power lever to 0%.	
(2)	Lift the power lever control quadrant from the center console: – Remove the 4 screws that attach the top covers to the power lever quadrant. – Remove the 2 top cover plates from the power lever quadrant. – Remove the 2 screws that attach the aft end of the power lever quadrant to the fuel selector mounting.	

	Detail Steps/Work Items	Key Items/References
(3)	Remove a hall angle sensor: – Lift the complete power lever quadrant assembly out of the center console and support the quadrant. – Disconnect the electrical cables for the hall angle sensor that you will remove. – Remove the 2 bolts and washers that attach the hall angle sensor that you will remove to the power lever quadrant. – Pull the hall angle sensor of its drive-shaft and clear of the quadrant.	The flexible cables attached to the other control levers in the quadrant and the electrical cables for the sensor are long enough for you to just lift the quadrant clear of the center console.

B. Install a Hall Angle Sensor

	Detail Steps/Work Items	Key Items/References
(1)	Install the hall angle sensor: – Move the new sensor into position at the power lever quadrant. – Make sure that the drive of the sensor aligns with the quadrant drive-shaft. – Push the sensor onto the quadrant drive-shaft. – Install the 2 washers and bolts that attach the sensor to the quadrant.	
(2)	Connect the electrical cables for the hall angle sensor.	At the inline connector.
(3)	Install the power lever quadrant into the center console: – Lower the quadrant into position in the center console. – Install the 2 screws that attach the aft end of the quadrant to the fuel selector mounting.	Make sure that all the flexible cables and the electrical cables are in the correct position and orientation.

	Detail Steps/Work Items	Key Items/References
(4)	Start the engines and allow to reach normal operating temperatures:	Refer to Section 71-00.
	– Make sure that the power control levers align:	
	– Set both engines to give 1800 RPM.	
	– Both power levers must align ± 2 mm (0.08 in).	
	– If they do not align, make a note of the mis-alignment.	Use the power lever for which you did NOT replace the hall angle sensor as the datum.
	– Set both engine to 0%.	
	– Stop the engines.	Refer to Section 71-00.
(5)	If necessary, adjust the power lever alignment:	
	– Lift the power lever control quadrant from the center console.	Refer to Paragraph 2 A, step 2 in this Section.
	– Loosen the 2 jam nuts on the sensor link rod for the hall angle sensor that you replaced.	
	– Turn the drive rod to adjust the length of the link rod to align the power levers.	Hold the input lever to the sensor stationary and turn the control rod to move the power lever the distance noted in step 4 of this procedure.
	– Tighten the jam-nuts on the sensor link rod.	
	– Install the power lever control quadrant into the center section.	Refer to step 3 in this procedure.
(6)	Repeat steps 4 and 5 of this procedure as necessary, until the power levers align correctly.	

	Detail Steps/Work Items	Key Items/References
(7)	Install the top covers on the power lever quadrant: – Move the top covers into position on the power lever control quadrant. – Install the 4 screws that attach the top covers to the power lever control quadrant.	
(8)	Do a full test of the engine for which you replaced the hall angle sensor.	Refer to Section 71-00.

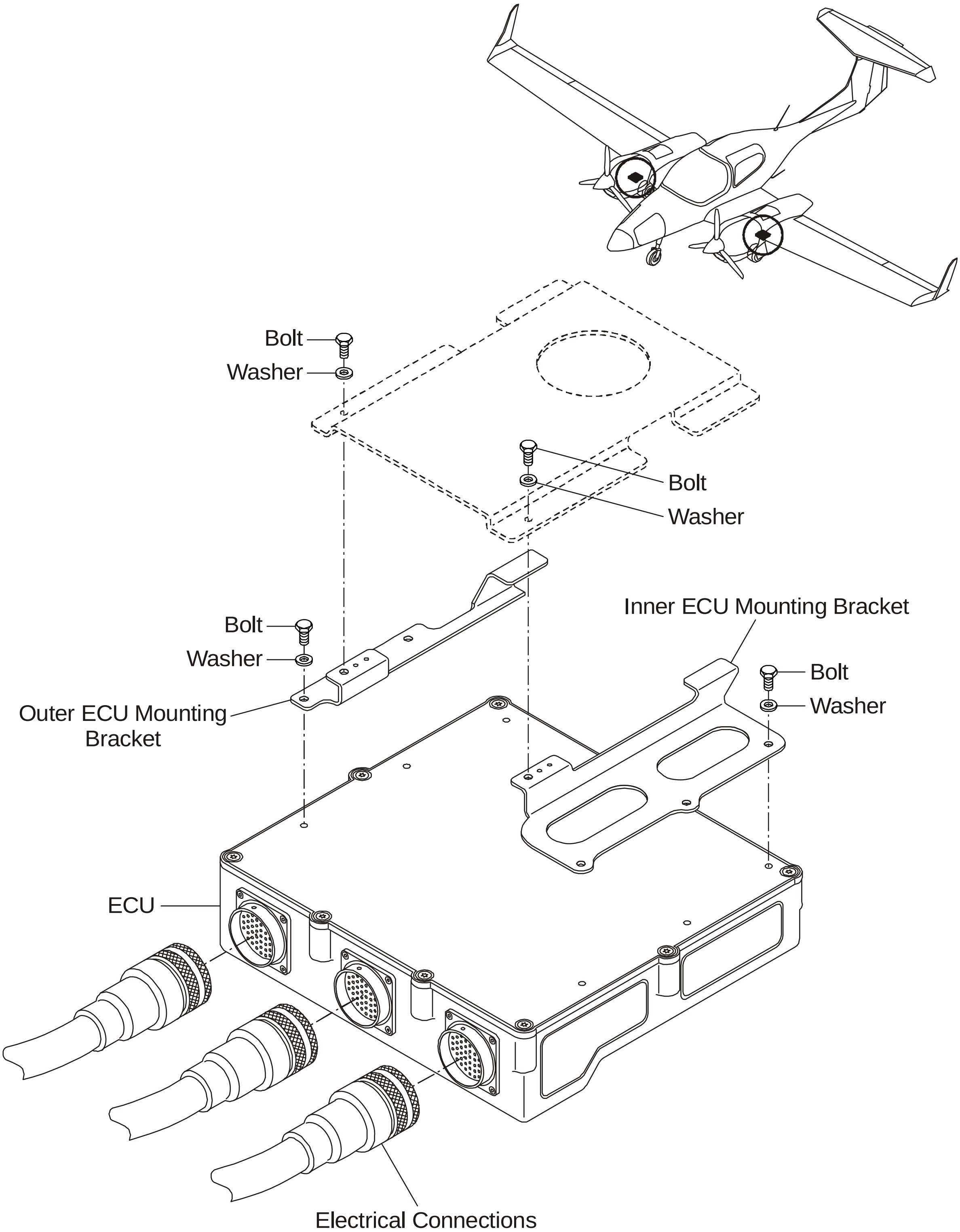

Figure 3: ECU Installation

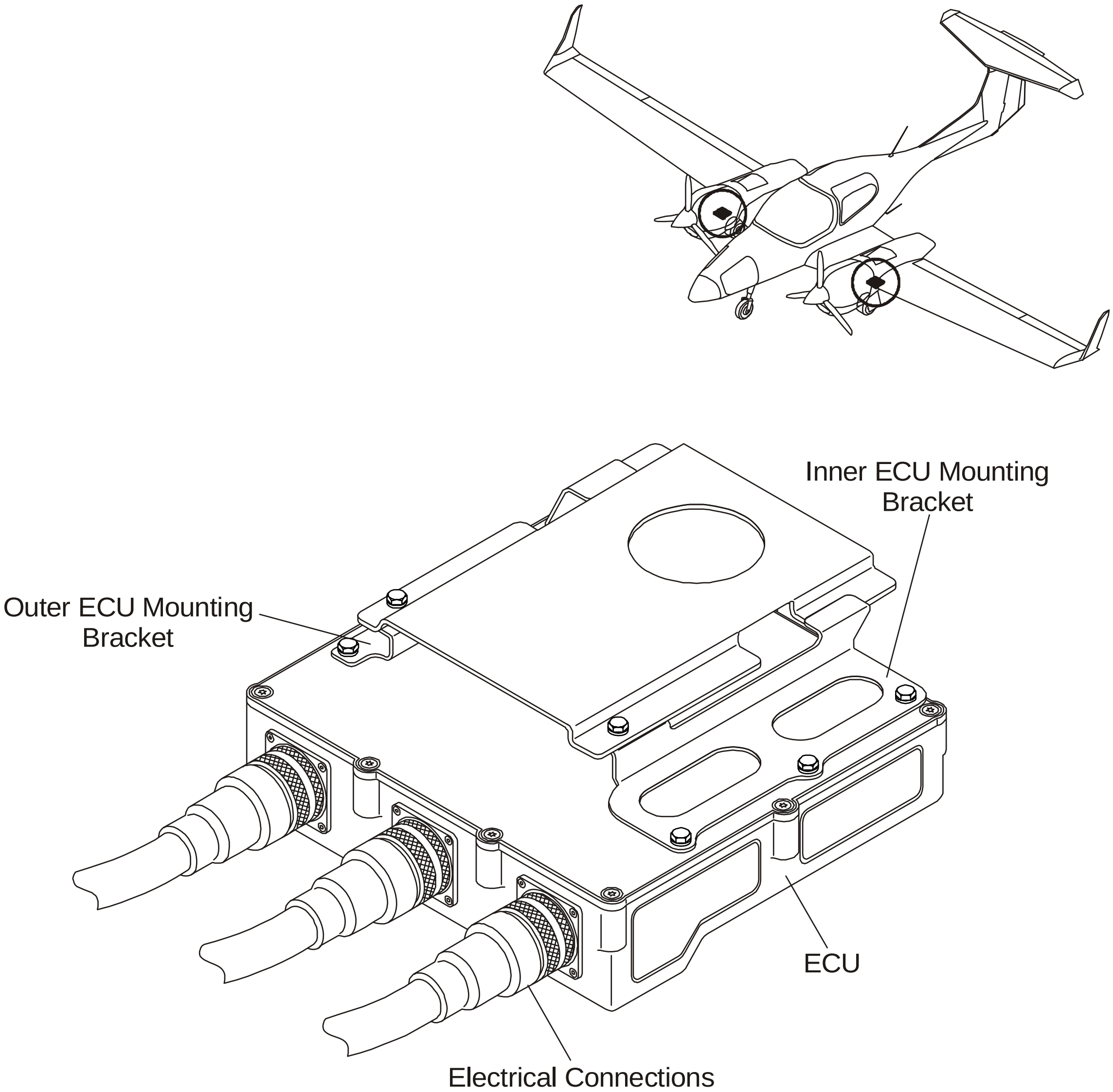

Figure 4: ECU Installation

3. Remove/Install an Engine Control Unit (ECU)

A. Remove an Engine ECU

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Read out and write down the ECU IQA-Codes and engine serial number.	Refer to the AE Maintenance Manual, latest revision.
(2)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(3)	Disconnect the airplane main battery.	Refer to Section 24-31.
(4)	Remove the access panel for the ECU on the related engine nacelle.	Refer to Section 52-40.
(5)	Release the 3 electrical connectors from the ECU.	Refer to Figure 4.
(6)	Remove the ECU from the mounting bracket: – Release the 2 bolts and washers that hold the ECU to the mounting bracket. – Slide the ECU forward until it comes free of the bracket.	Refer to Figure 4.
(7)	Remove the inner and outer mounting bracket from the ECU.	Refer to Figure 3.

B. Install an Engine ECU

CAUTION: YOU MUST CONTACT THE ENGINE MANUFACTURER BEFORE YOU INSTALL A NEW ECU.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Install the inner and outer mounting bracket to the ECU.	Refer to Figure 3.
(3)	Install the ECU: – Move the ECU into position in the related engine nacelle by sliding the ECU into the bracket. – Install the 2 washers and bolts that attach the ECU to the mounting bracket and use Loctite 243 to secure the bolts.	Refer to Figure 4.
(4)	Connect the 3 electrical connectors to the ECU.	Refer to Figure 4.
(5)	Install the access panel.	Refer to Section 52-40.
(6)	Connect the airplane main battery.	
(7)	Check that IQA-Codes and engine serial number at the new ECU match the ones of the related engine.	Refer to the AE Maintenance Manual, latest revision.

4. Remove/Install an Engine Control System Electrical Harness

A. Remove an Engine Control System Electrical Harness

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the access panel for the ECU on the related engine nacelle.	Refer to Section 52-40.
(4)	Release the 3 electrical connectors from the ECU.	Refer to Figure 3.
(5)	Remove the related engine access panels.	Refer to Section 71-10 or 71-11.
(6)	Release the cable connections at the related ECU relay panel.	In the engine nacelle, aft of the firewall.

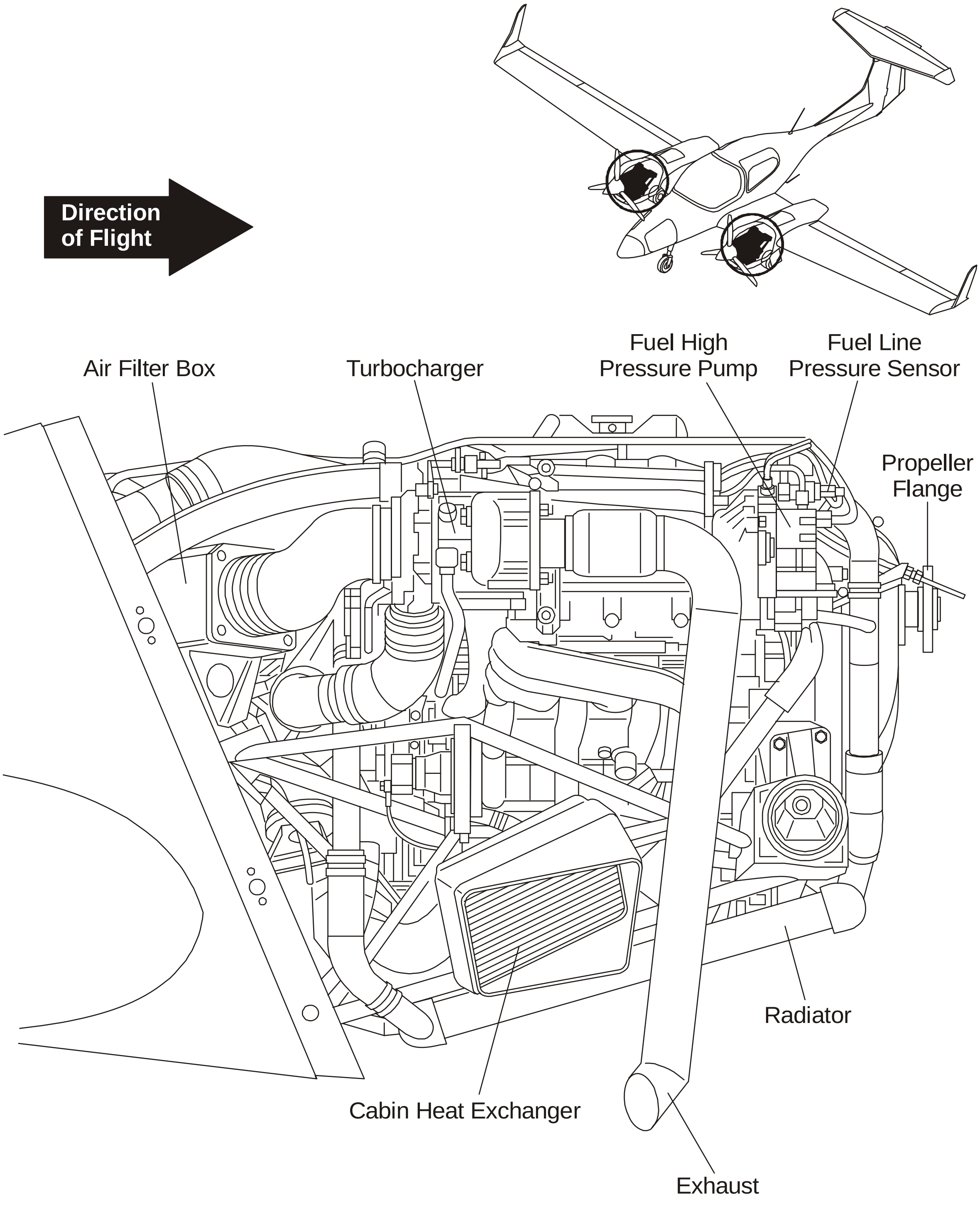

Figure 5: Engine Sensors - RH Side of Engine

	Detail Steps/Work Items	Key Items/References
(7)	Disconnect the engine wire harness and bonding cables from these electrical sensors:	
	– Crankshaft 1.	At the front right crank case.
	– Crankshaft 2.	At the front left crank case.
	– Camshaft 1.	On inlet valve cover between cyl. 3 and 4.
	– Camshaft 2.	On inlet valve cover between cyl. 1 and 2.
	– Coolant temperature.	
	– Oil temperature.	At the bottom of the oil case.
	– Oil pressure.	At the rear side of the oil filter housing.
	– Manifold air temperature 1 and 2.	
	– Manifold air pressure 1 and 2.	
	– Fuel rail pressure regulator.	At the rear end of the fuel rail.
	– Fuel rail pressure sensor.	At the front side of the fuel rail.
	– Fuel inlet pressure.	At the inlet of the high pressure pump.
	– Propeller governor.	
	– Gear temperature.	At the backside of the gearbox next to the starter.
	– Waste gate valve solenoid.	
	– Fuel injectors.	At each fuel injector.
	– Glow plugs.	At the lower camshaft.
	– Waste gate control valve.	At the rear camshaft cover.
(8)	Remove the cable ties and clamps that attach the cable harness to the engine and structure.	Make a note of the type and location of each attachment.
(9)	Remove the shields for the feed-through at the firewall.	
(10)	Carefully move the harness aft through the firewall.	Take care not to damage the connectors.
(11)	Remove the harness from the nacelle.	

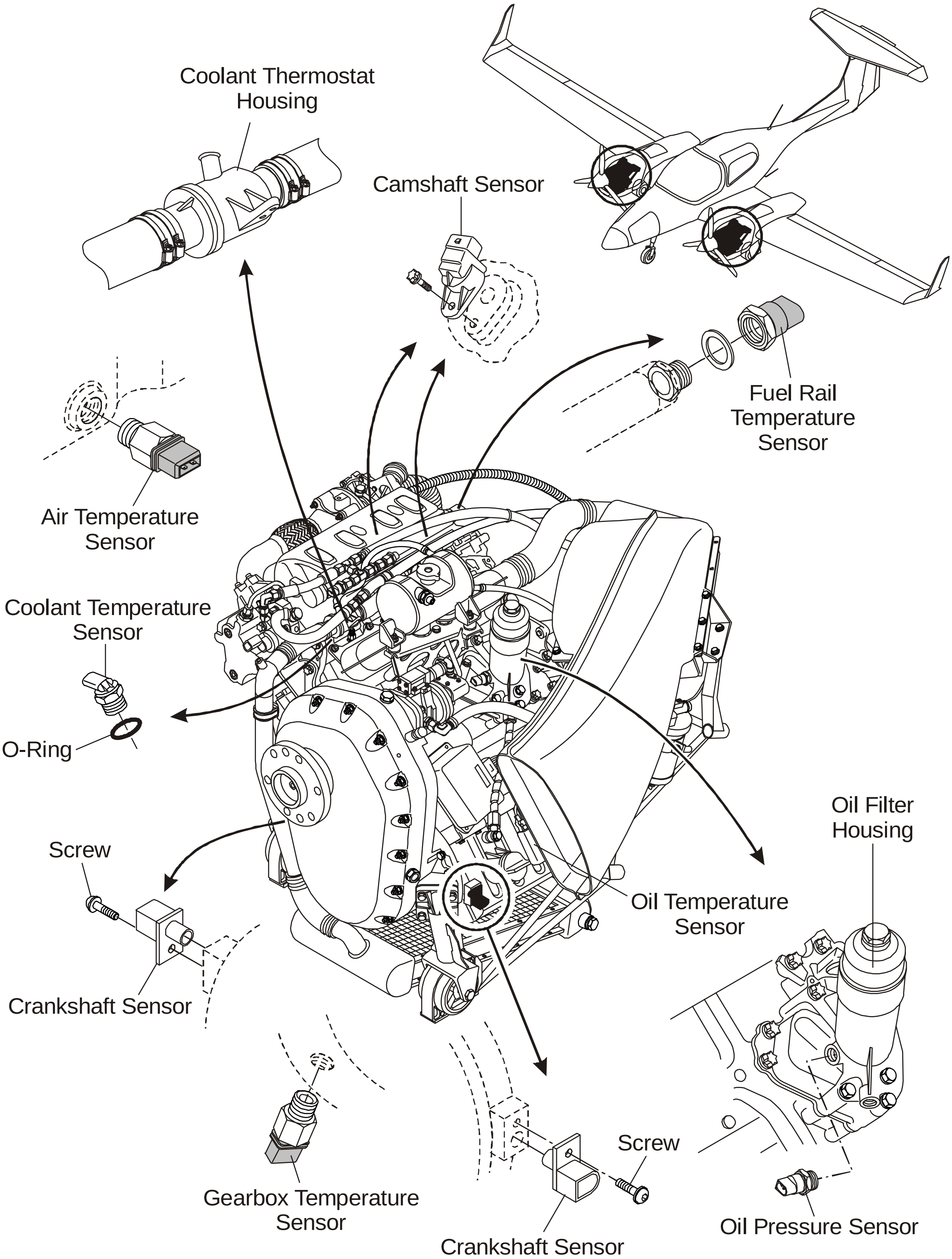

Figure 6: Engine Sensors - LH Side of Engine

B. Install the Engine Control System Electrical Harness

	Detail Steps/Work Items	Key Items/References
(1)	Carefully move the engine end of the harness forward through the firewall.	Take care not to damage the connectors. Adjust the harness position so that all connections can be made without stress.
(2)	Connect the engine wire harness and bonding cables to these electrical sensors:	
	– Crankshaft 1.	At the front right crank case.
	– Crankshaft 2.	At the front left crank case.
	– Camshaft 1.	On inlet valve cover between cyl. 3 and 4.
	– Camshaft 2.	On inlet valve cover between cyl. 1 and 2.
	– Coolant temperature.	Beneath the air intake manifold.
	– Oil temperature.	At the bottom of the oil case.
	– Oil pressure.	At the rear side of the oil filter housing.
	– Manifold air temperature 1 and 2.	On the intercooler outlet pipe.
	– Manifold air pressure 1 and 2.	
	– Fuel rail pressure regulator.	At the rear end of the fuel rail.
	– Fuel rail pressure sensor.	At the front side of the fuel rail.
	– Fuel inlet pressure.	At the inlet of the high pressure pump.
	– Propeller governor.	At the right side of the reduction gear.
	– Gear temperature.	At top left of front bearing reduction gear.
	– Waste gate valve solenoid.	At the lower crankshaft cover.
	– Fuel injectors.	At each fuel injector.
	– Glow plugs.	At the lower crankshaft cover.
	– Waste gate control valve.	At the lower crankshaft cover.
(3)	Connect the cables at the related ECU relay panel.	In the engine nacelle, aft of the firewall.
(4)	Connect the 2 electrical connectors to the ECU.	Refer to Figure 3. Make sure that the bayonet locks are correctly engaged.

	Detail Steps/Work Items	Key Items/References
(5)	Install the cable-ties and clamps that attach the cable harness to the engine and structure.	Refer to the notes that you made during removal for the type and location of each attachment.
(6)	Install the shields for the feed-through at the firewall.	Seal with PR 812 or equivalent.
(7)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(8)	Install the access panels in the engine nacelle.	Refer to Section 52-40.
(9)	Connect the main airplane battery.	Refer to Section 24-31.
(10)	Do an engine run up of the engine for which you replaced the control system electrical harness.	Refer to Section 71-00.

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CHAPTER 77

ENGINE INDICATING

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CHAPTER 77
ENGINE INDICATING

1. General

This Section tells you about the engine indicating system for the DA 42 NG airplane. An integrated cockpit system (ICS) with two large display screens located in the instrument panel show all engine related indications.

Engine control units (EECUs) provide most of the indications for the engine. Figure 1 shows a schematic diagram of the engine control and indication system. Refer to Section 76-00 for data about the engine control system. The ICS also shows airframe fuel system data. Refer to Section 28-40 for data about the airframe parts of the system.

2. Description and Operation

The ICS gives all engine indications. The ICS displays are located in the left and right sides of the instrument panel. Each display has a combination of digital and analogue displays.

Either display can show all the engine indications. Refer to Section 77-40 for more data about the system sensors. Refer to Section 31-40 for more data about the ICS.

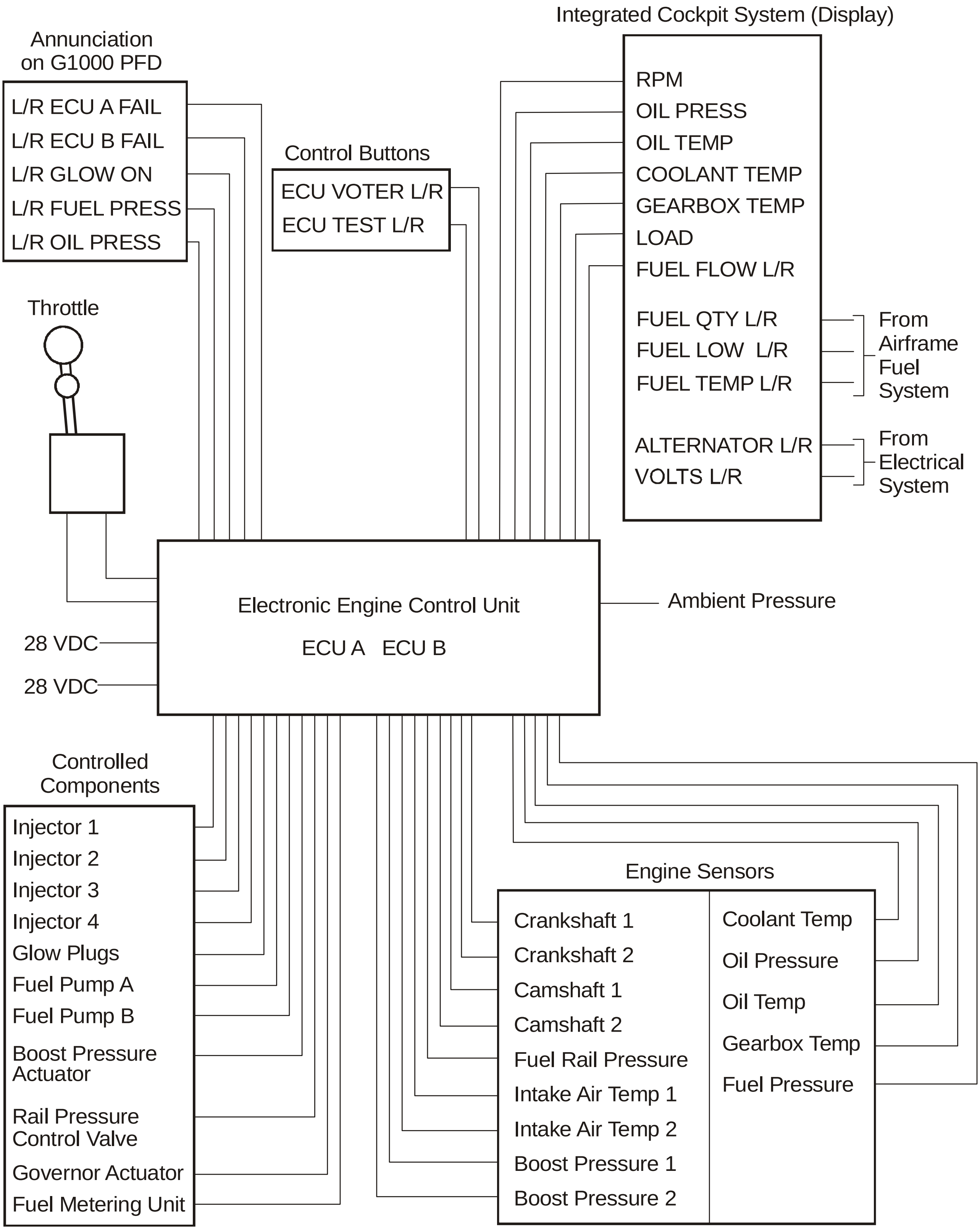

Figure 1: Engine Control and Indication Schematic Diagram

Section 77-40
Engine Indicating System

1. General

This Section tells you about the engine indicating system for the DA 42 NG airplane. The integrated cockpit system (ICS) display screens which are located in the instrument panel give all engine and related airplane system indications. For normal operations the left display is the primary flight display (PFD) and the right is the multi-function display (MFD). Both displays are similar, except the autopilot control buttons.

Refer to Section 31-40 for more data about the ICS.

The engine control units (EECUs) provide most of the indications for the engines. Refer to Section 76-00 for data about the engine control system. The ICS also shows fuel and systems data. Refer to Section 28-40 for data about the airframe parts of the system.

2. Description and Operation

The ICS displays the engine indications for both engines on the MFD screen. The MFD gives the following engine indications:

– LH and RH engine load. Indicates the engine loads from 0 to 100%.

– LH and RH engine RPM. Indicates the engine RPM from 0 to 2500 RPM.

– LH and RH engine gearbox temperature in °C.

– LH and RH engine coolant temperature in °C.

– LH and RH engine oil temperature in °C.

– LH and RH engine oil pressure in bar.

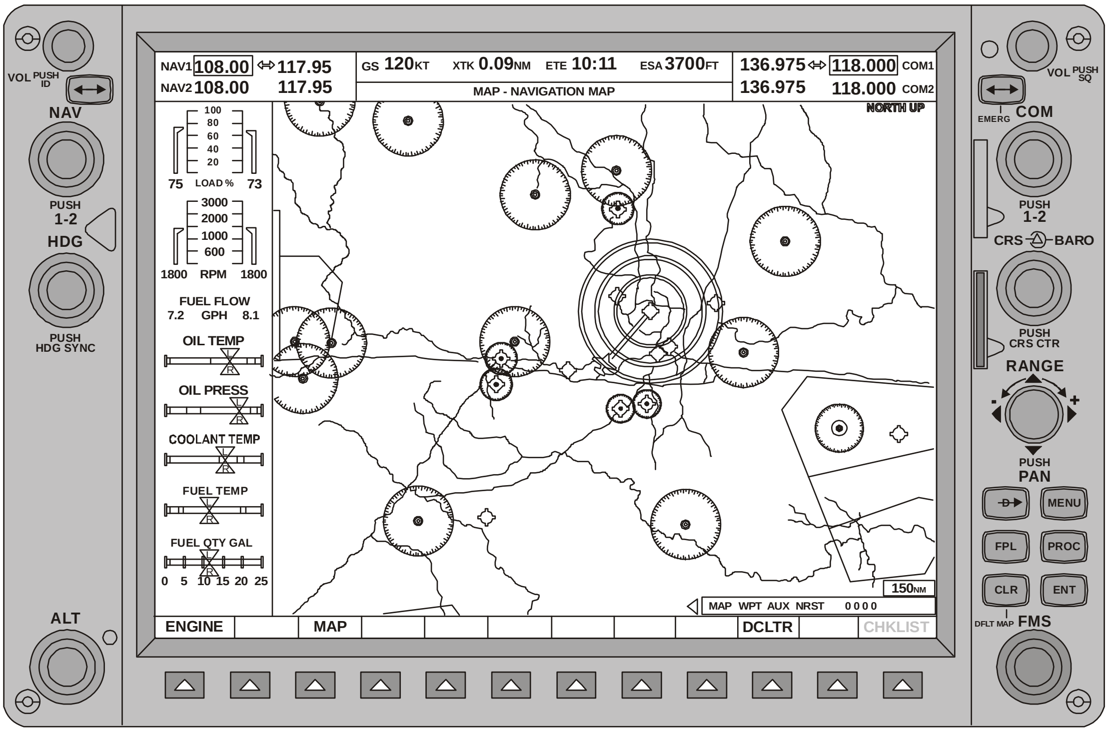

Figure 1: Display Screen - Integrated Cockpit System

The MFD also gives these auxiliary displays with the engine displays:

– LH and RH engine voltages.

– LH and RH engine generator output, in AMPS.

The MFD can also display the following fuel system information:

– LH and RH main fuel tank quantity (Refer to Section 28-40).

– LH and RH main fuel tank temperature in °C (Refer to Section 28-40).

– LH and RH engine fuel flow in gals/hour (Refer to Section 28-40).

Engine alerts are given on the PFD screen. A flashing warning annunciator appears in the PFD when an alert is activated. Pressing the WARNING softkey at the bottom of the PFD opens an alert window in the PFD. The alerts window gives more details of the alert. The ICS alert system gives alerts and warning captions for both engine and airplane systems. Refer to Section 31-40 for more data about the ICS.

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Trouble–Shooting

1. General

The table below lists the defects you could have with the engine indication system. For more data on the system refer to the equipment manufacturer's manual.

If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
One of the indicators in an integrated instrument does not indicate correctly.	Sensor/transducer defective.	Do a test for continuity of the cables for the relevant sensor. If the cables are serviceable, then refer to the engine manufacturer. Refer to Section 28-40 for the fuel quantity indicating system. Refer to Section 76-00 for the location of engine sensors.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to replace the following sensors:

– Crankshaft (RPM).

– Gearbox oil temperature.

– Liquid coolant temperature.

– Engine oil temperature.

– Engine oil pressure.

Refer to the related Chapter for maintenance data on the sensors.

Where the engine control system provides data for the engine indicating system, only the engine manufacturer or a AE-approved maintenance shop can replace sensors.

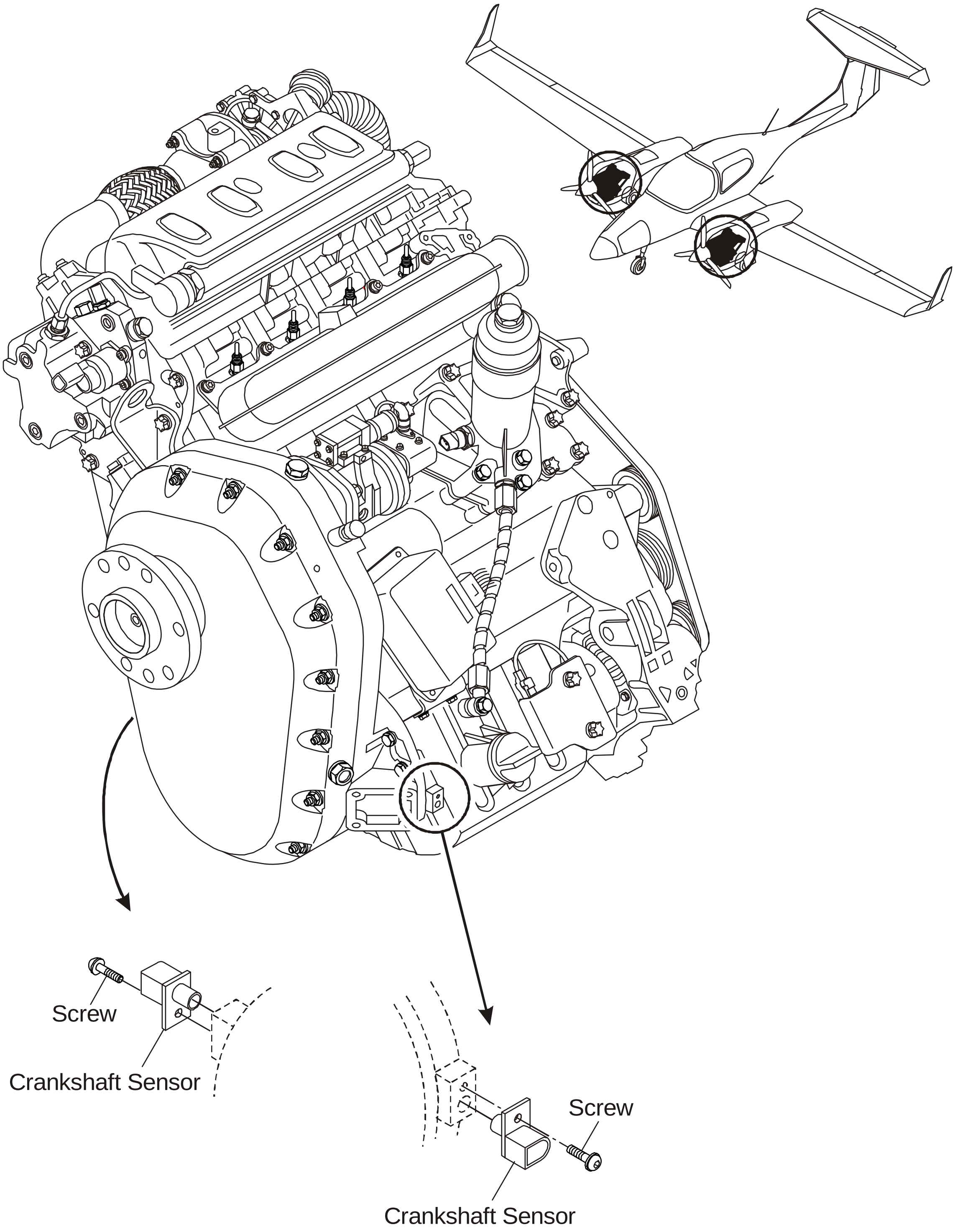

Figure 2: Crankshaft (RPM) Sensor Installation

2. Replace/Install a Sensor

Figures 2 through 6 show the sensors for the engine indications.

Use the following general procedure for replacing all of the sensors on both engines. If any of the sensors has a different procedure then the procedure will be described.

A. Replace a Sensor

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
	Refer to AE Maintenance Manual, latest revision for replace a sensor procedures.	
(4)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(5)	Connect the airplane main battery.	Refer to Section 24-31.
(6)	Do a ground test of the related engine and monitor the related engine indication.	Refer to Section 71-00.

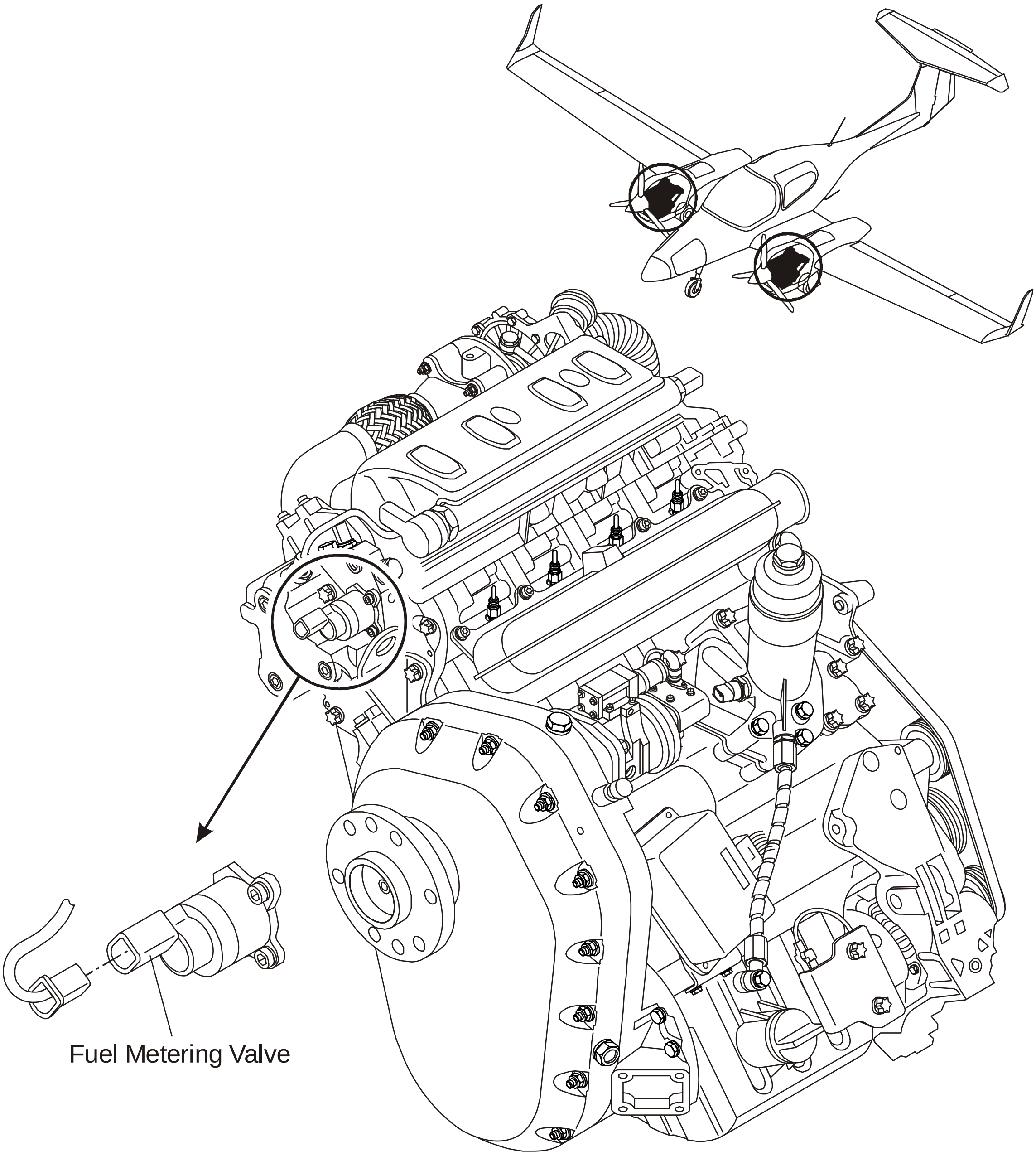

Figure 3: Fuel Metering Valve Installation

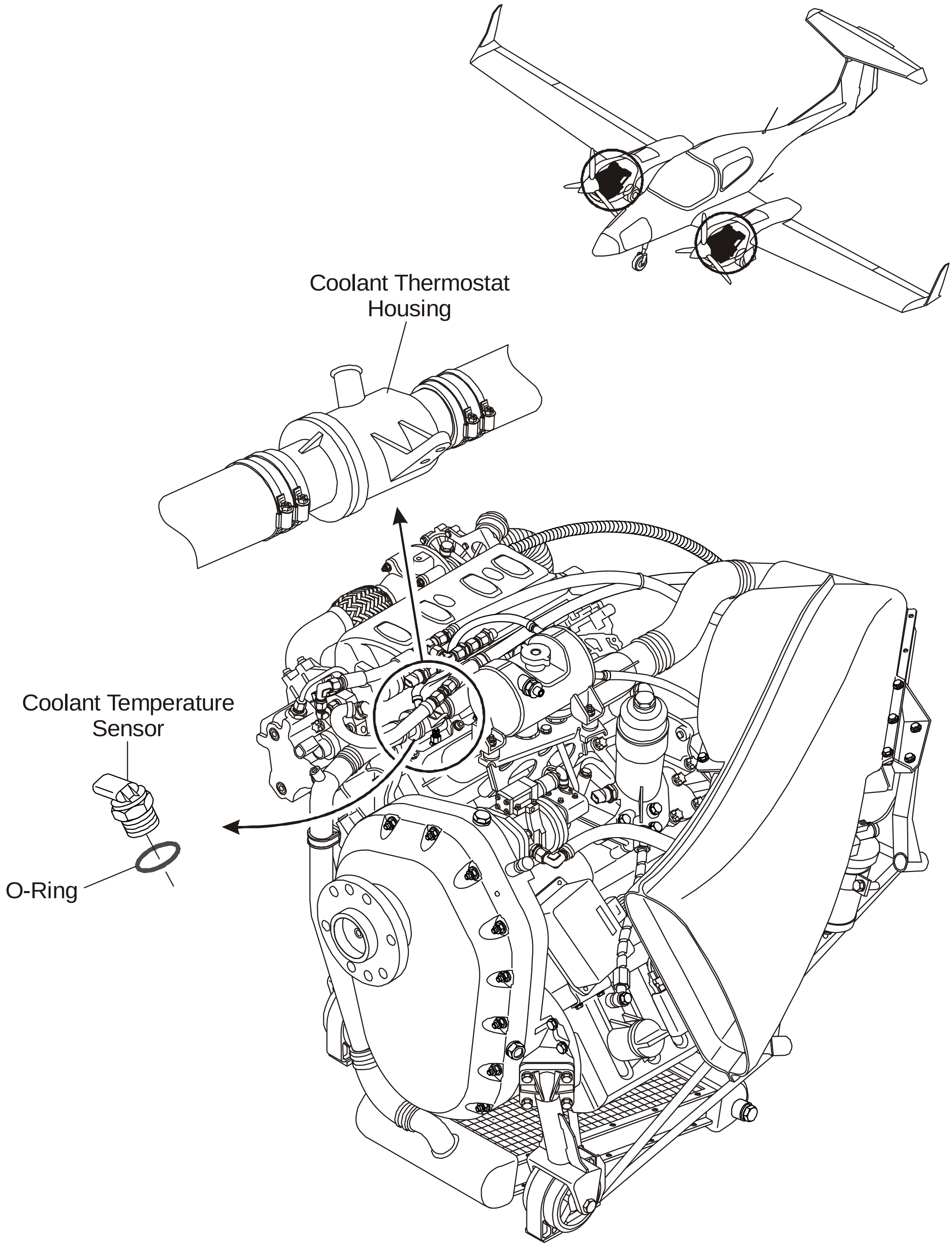

Figure 4: Engine Coolant Temperature Sensor Installation

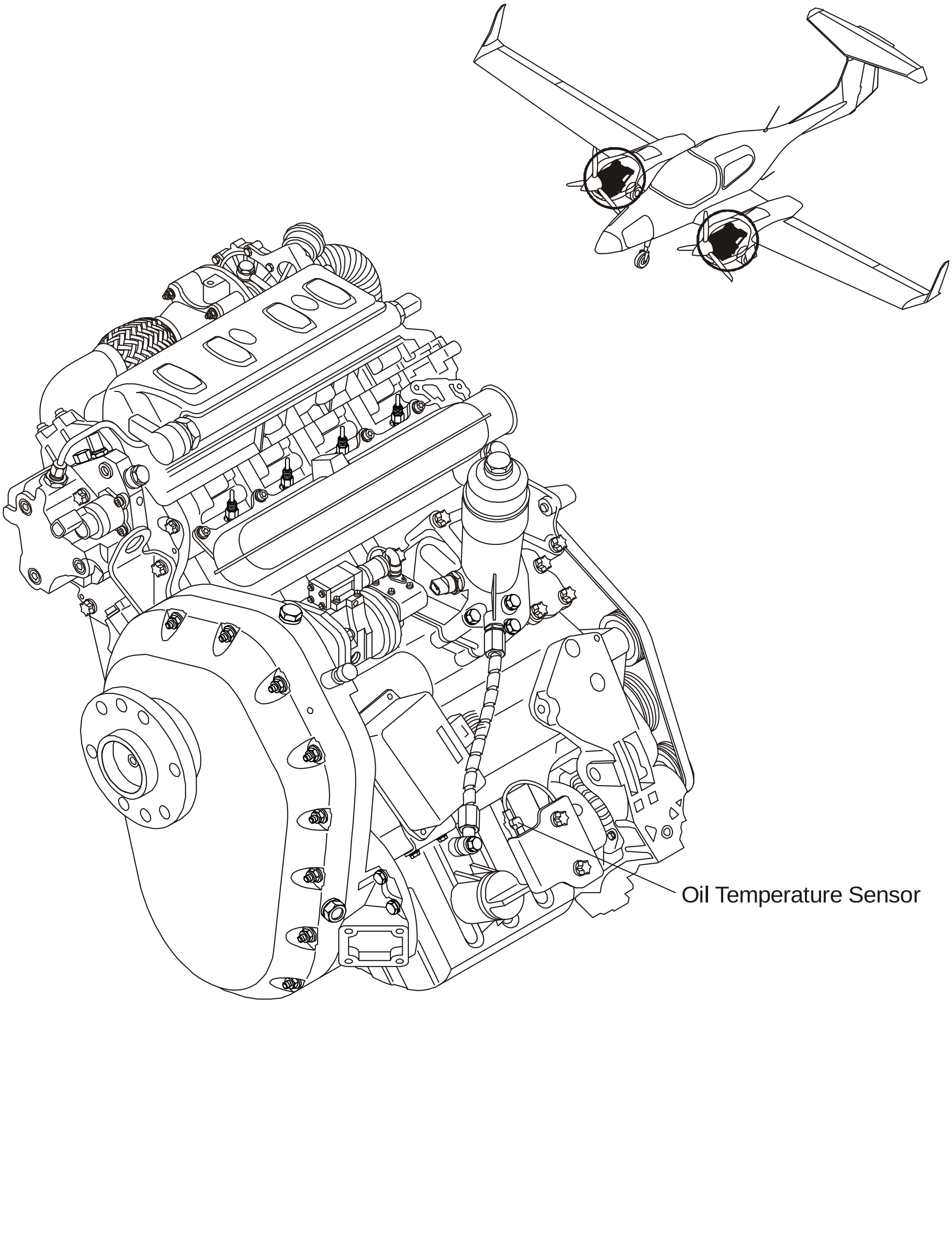

Figure 5: Engine Oil Temperature Sensor Installation

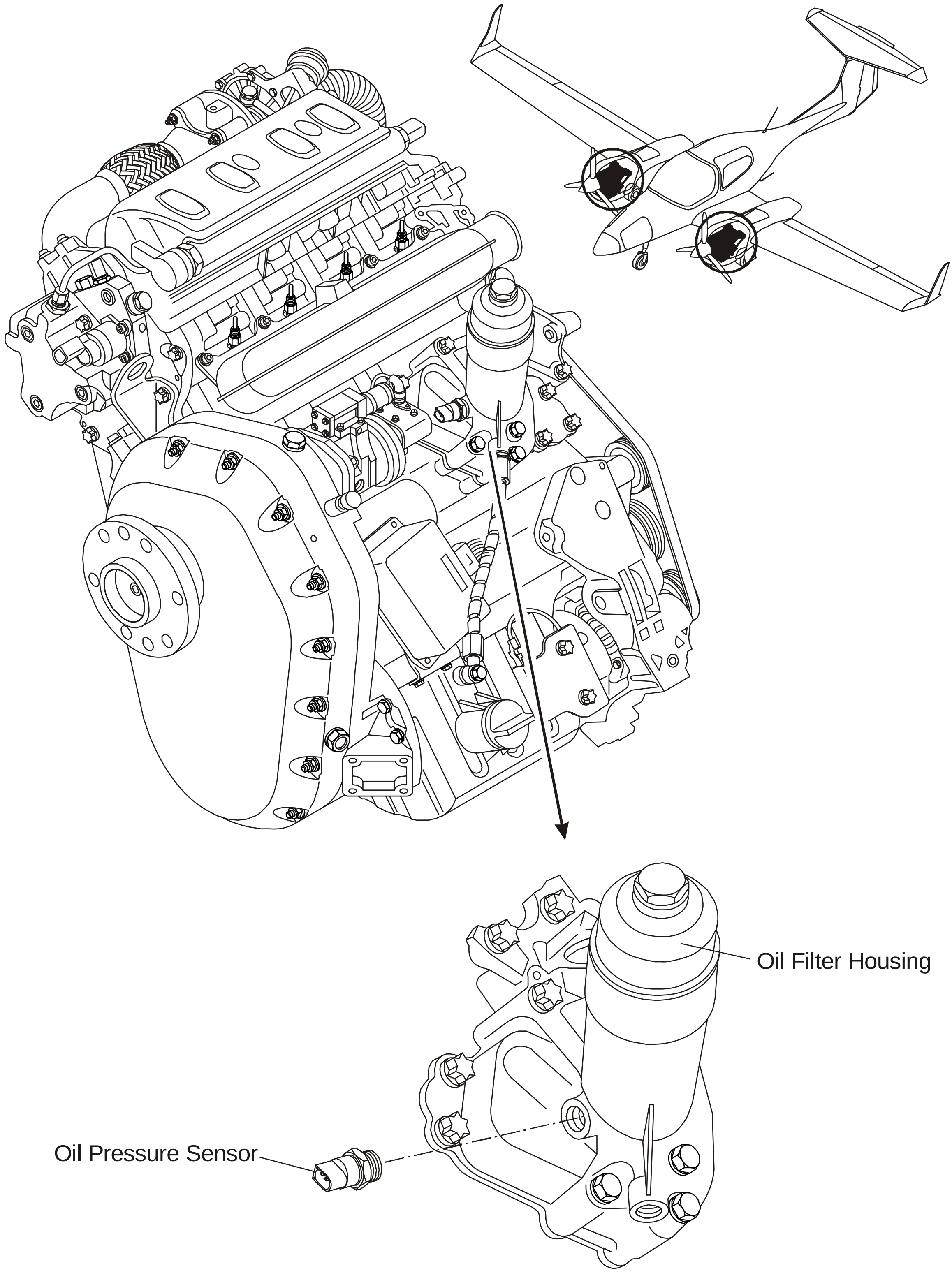

Figure 6: Engine Oil Pressure Sensor Installation

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EXHAUST

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CHAPTER 78
EXHAUST

1. General

The DA 42 NG has a simple exhaust systems for the engines. Each engine has a single short exhaust pipe that bolts to the turbo charger outlet and passes through the engine cowling at the bottom.

2. Description

Figure 1 shows the engine exhaust system. You cannot do any maintenance on the exhaust pipe.

The exhaust pipe does not have a muffler.

If MÄM 42-600 is installed, Figure 2 shows the engine exhaust system. The exhaust system has a fixed integral muffler.

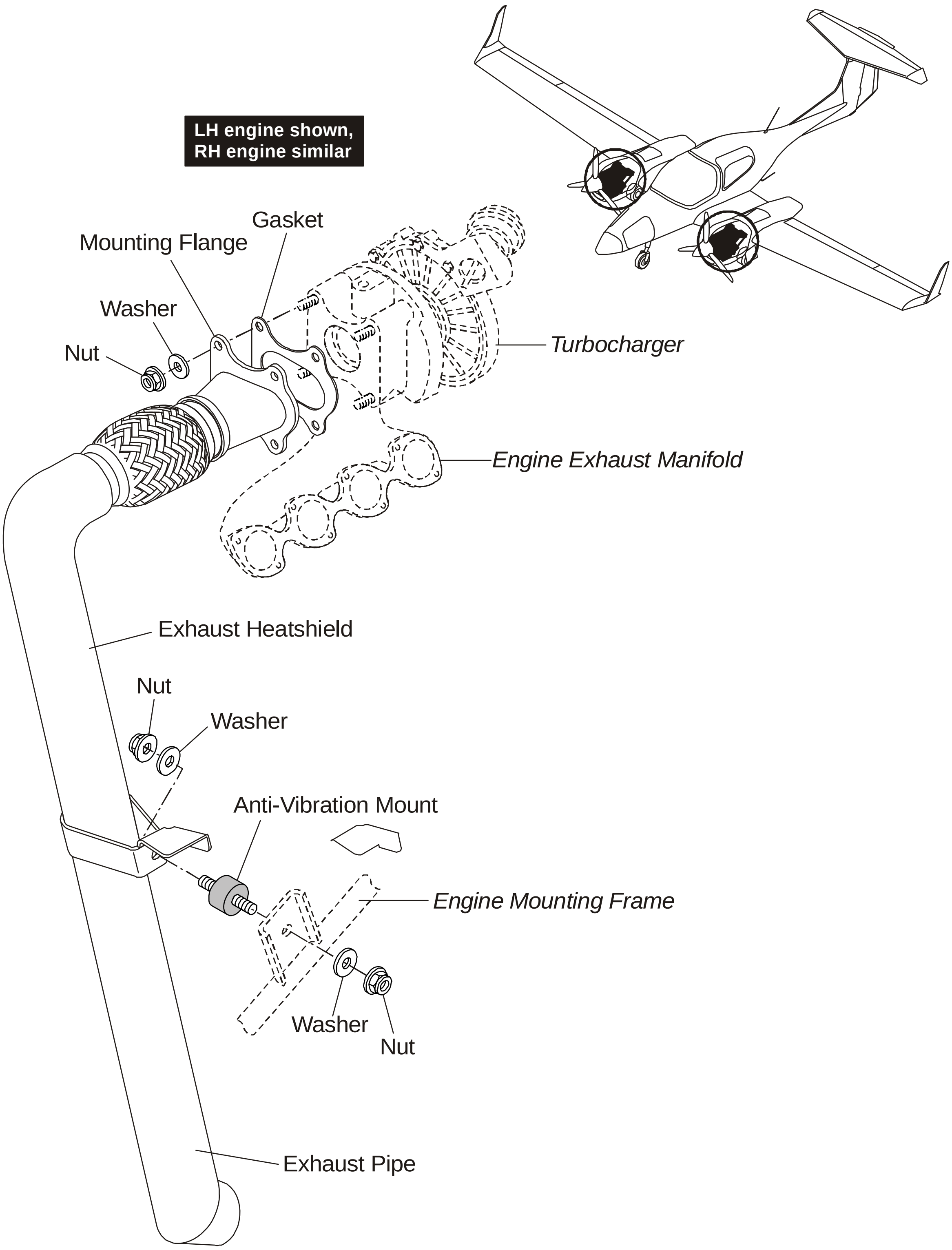

Figure 1: Exhaust System Installation

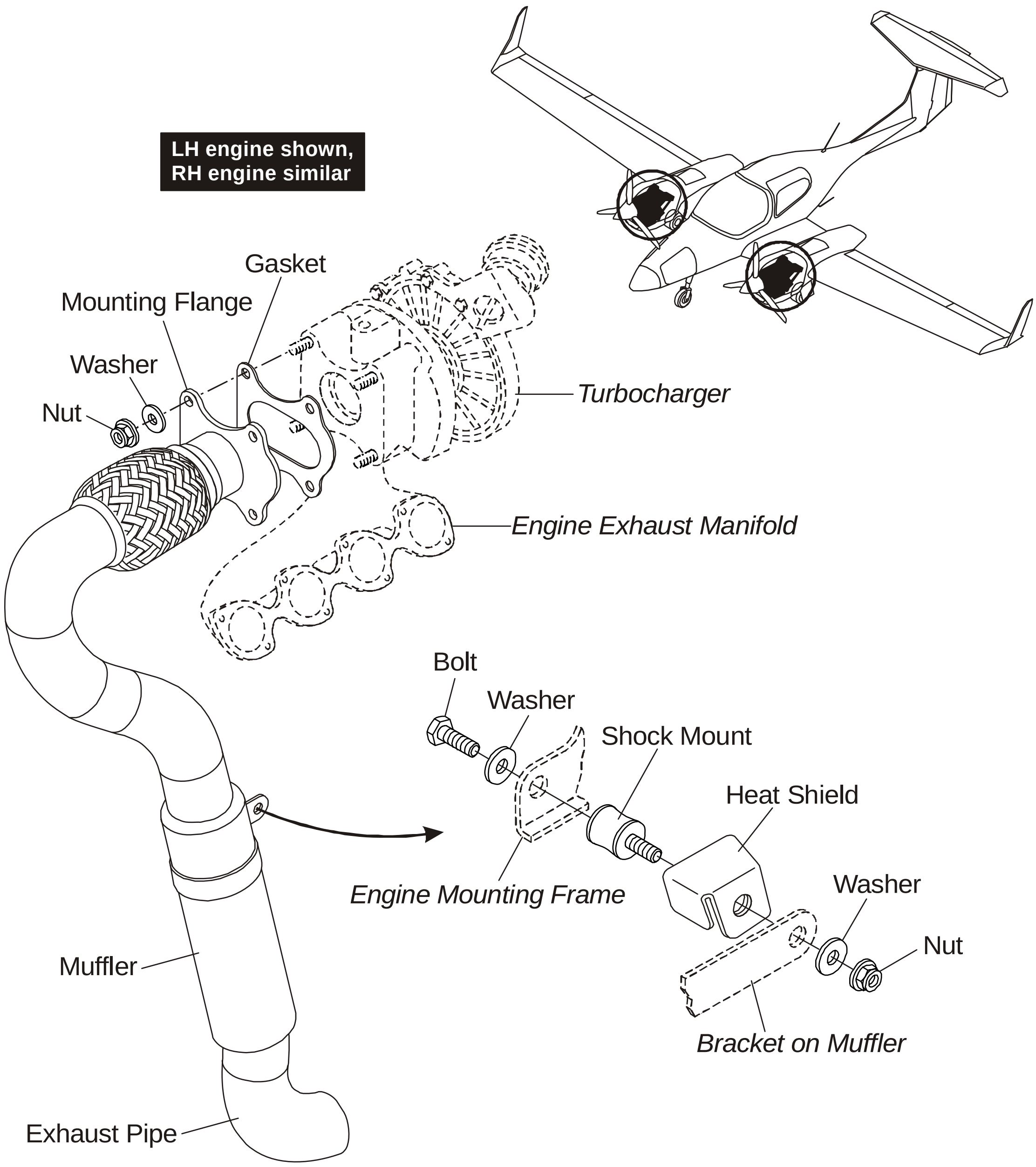

Figure 2: Exhaust System Installation (if MÄM 42-600 is installed)

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Trouble-Shooting

1. General

The table below lists the defects you could have with the exhaust system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
More noise than usual.	Exhaust pipe cracked.	Look for signs of exhaust gas leaks. Replace cracked pipes.
Signs of exhaust gas leaks in the engine compartment.	Exhaust pipe cracked.	Look for signs of exhaust gas leaks. Replace cracked pipes.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install an engine exhaust pipe. Refer to Section 81-00 or 81-01 (if MÄM 42-600 is installed) for data about the turbo-chargers.

2. Remove/Install an Engine Exhaust Pipe

WARNING: MAKE SURE THAT THE EXHAUST SYSTEM IS COOL BEFORE YOU TOUCH IT. THE EXHAUST SYSTEM CAN BE VERY HOT, THIS CAN CAUSE INJURY TO PERSONS.

A. Remove an Engine Exhaust Pipe

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ENGINE MASTER switch to OFF. – Set the ELECT. MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-34.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Remove the exhaust pipe: – Remove the 4 special nuts that attach the exhaust pipe to the turbo charger. – Remove the anti-vibration mount of the exhaust (if MÄM 42-600 is installed).	

B. Install an Engine Exhaust Pipe

	Detail Steps/Work Items	Key Items/References
(1)	Install the exhaust pipe: – Move the exhaust pipe into position in the engine nacelle. – Move the exhaust pipe flange over the studs on the turbo charger outlet. – Install the 4 special nuts that attach the exhaust pipe to the turbo charger outlet. – Install the anti-vibration mount to the exhaust.	Use new nuts.
(2)	Install the engine cowlings.	Refer to Section 71-10 or 71-11.
(3)	Connect the airplane main battery.	
(4)	Do an engine ground run-up and then check the exhaust pipe for leaks.	Specially around the gasket at the turbo charger outlet.

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CHAPTER 79
OIL COOLING

1. General

Each engine has the usual wet-sump lubrication system. The bottom part of the engine crankcase makes the sump. An oil filler tube with a screw cap connects to the crankcase on the left of the engine.

The oil cooler is an integrated oil water heat exchanger which is located under the oil filter case and is part of the engine.

The oil breather system has an oil separator located under the injector cap. A flexible hose at the rear of the oil separator vents blow-by gases and any remaining oil mist overboard. A small hose connects the bottom of the oil separator to the oil sump.

To protect the breather system from blockage due to icing of the moistured blow by gases an engine integrated over pressure valve is provided below the injector cover.

An oil pump in the engine takes oil from the sump. The oil flows through a filter to the oil water heat exchanger. Air passing through the oil cooler cools the oil. The cool oil returns to the engine. Oil galleries in the engine take the oil to all bearings.

The gearbox oil is cooled via airflow over the gearbox housing.

If MÄM 42-600 is installed, additional aluminum fins are installed to the gearbox housing to enhance cooling. On top of the aluminum fins a composite duct with an air inlet and an air outlet is installed. Refer to Figure 1.

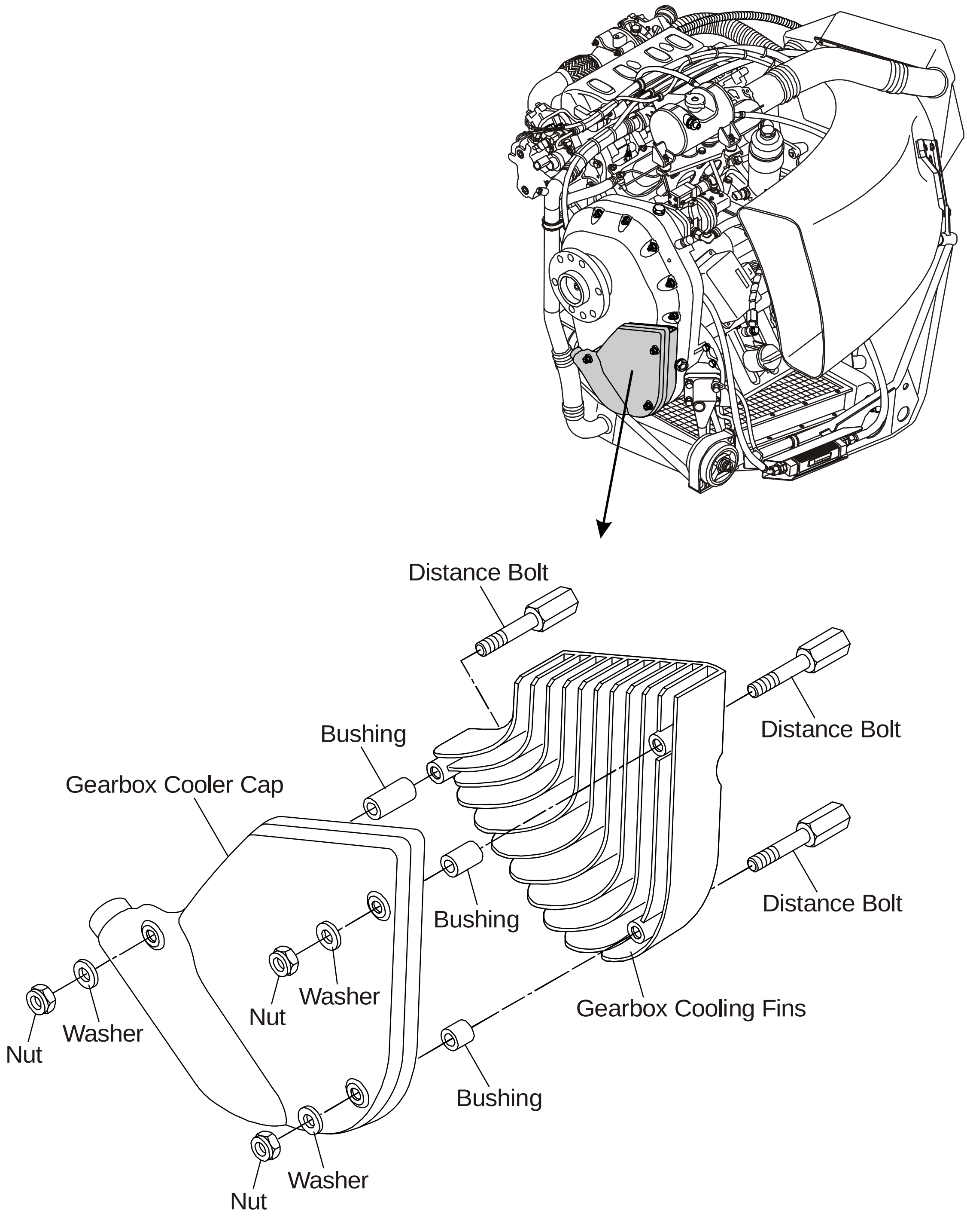

Figure 1: Gearbox Oil Cooling Fins (if MÄM 42-600 is installed)

Trouble-Shooting

1. General

The table below lists the defects you could have with the oil system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
An engine oil temperature is too high.	Oil cooler blocked internally.	Contact engine manufacturer.
	Low oil level.	Refill oil. Refer to Section 12-10.
An engine oil pressure too high.	Defective oil pressure sensor.	Refer to AE Maintenance Manual.
An engine oil pressure too low at normal operating temperatures.	Low oil level.	Replenish oil system. Refer to Section 12-10.
	Defective oil pressure sensor.	Refer to AE Maintenance Manual.

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Maintenance Practices

1. General

This Section describes the Maintenance Practices of the gearbox cooling system (if MÄM 42-600 is installed).

2. Remove/Install the Gearbox Cooling System (if MÄM 42-600 is Installed)

A. Remove the Engine Gearbox Cooling System

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-34.
(3)	Remove the engine cowlings.	Refer to Section 71-10.
(4)	Remove the 3 nuts and washers on the cooler duct.	Refer to Figure 1.
(5)	Remove the GFRP gearbox cooler duct.	Refer to Figure 1.
(6)	Remove the 3 bushings.	Refer to Figure 1.
(7)	Remove the aluminum cooling fins from the gearbox.	Refer to Figure 1.
(8)	Clean the backside of the cooling fins and the gearbox.	
(9)	Remove the 3 distance bolts from the gearbox.	Refer to Figure 1.

B. Install the Engine Gearbox Cooling System

	Detail Steps/Work Items	Key Items/References
(1)	Install the 3 distance bolts and secure with Loctite 262: – Short bolt on the lower LH side. – Medium bolt on the upper LH side. – Long bolt on the RH side.	Torque: 28 ± 3 Nm (20.6 ± 2.2 lbf.ft).
(2)	Install the aluminum cooling fins to the gearbox: – Position the cooling fin assy on the gearbox; Verify that the cutout matches the gearbox oil inspection window. If not rework the cutout on the cooling fin to match the gearbox oil inspection window. – Apply heat transfer compound Keratherm KP 98 to the backside of the cooling fins assy. – Install the 3 bushings, length according to the bolts. – Install 3 nuts on the 3 bolts. – Remove the excess heat compound. – Remove the 3 nuts from the 3 bolts.	Use a notched spattle.
(3)	Install the GFRP duct: – Position the GFRP cooling duct on the cooling fin assy; use the bolts to guide into position. – Install the 3 washers and 3 self locking heat resistant nuts to the 3 bolts. – Apply sealing compound ‘easy gasket’ or equivalent heat conducting paste to the cooling fins assy / gearbox.	

	Detail Steps/Work Items	Key Items/References
(4)	Install the engine cowlings.	Refer to Section 71-10.
(5)	Do a ground test of the related engine.	Refer to Section 71-00 and AE Maintenance Manual, latest revision.

3. Drain the Engine Oil (with the Engine Oil Quick Drain)

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-34.
(3)	Remove the engine cowlings.	Refer to Section 71-10 or 71-11.
(4)	Put a drain hose on the oil quick drain.	
(5)	Put a container (min. capacity 8.5 l) below the drain hose.	
(6)	Open th oil dip stick.	
(7)	Open the oil quick drain.	
(8)	Let the oil drain off.	

4. Refill the Engine Oil (with the Engine Oil Quick Drain)

	Detail Steps/Work Items	Key Items/References
(1)	Close the oil quick drain.	
(2)	Remove the drain hose.	
	CAUTION: USE ONLY APPROVED ENGINE OIL. REFER TO CHAPTER 2 OF THE AIRPLANE FLIGHT MANUAL FOR APPROVED ENGINE OIL SPECIFICATION. IF YOU DO NOT USE APPROVED ENGINE OIL, THE ENGINE CAN BE DAMAGED.	
(3)	Refill engine oil.	
(4)	Install oil dipstick and check oil level.	
(5)	Install the engine cowlings.	Refer to Section 71-10 or 71-11
(6)	Do a ground test of the related engine, allow the engine to reach normal operating temperatures.	Refer to Section 71-00 and AE Maintenance Manual, latest revision.
(7)	Do a test for oil leaks: – Remove the engine cowlings. – Look for oil leaks, specially in the areas where you have done work. – Install the engine cowlings.	 Refer to Section 71-10 or 71-11. Refer to Section 71-10 or 71-11.

5. Remove/Install the Quick Oil Drain Valve

A. Remove the Quick Oil Drain Valve

	Detail Steps/Work Items	Key Items/References
(1)	Drain the engine oil.	Refer to Paragraph 3.
(2)	Remove the safety wire.	
(3)	Remove the quick oil drain valve.	

B. Install the Quick Oil Drain Valve

	Detail Steps/Work Items	Key Items/References
(1)	Turn in the oil quick drain with new O-ring and torque it with 14 Nm (10.3 lbf.ft).	
(2)	Secure the oil quick drain with safety wire diameter 0.8 mm (0.032 in).	
(3)	Refill engine oil.	
(4)	Do a test for oil leaks: – Remove the engine cowlings. – Look for oil leaks, specially in the areas where you have done work. – Install the engine cowlings.	 Refer to Section 71-10 or 71-11. Refer to Section 71-10 or 71-11.

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STARTING

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CHAPTER 80
STARTING

1. General

This Section tells you about the system that cranks the AE E4-B engine for starting.

Refer to Section 24-60 for more data on the electrical supplies to the system Refer to Section 76-00 for data about the engine control system.

2. Description and Operation

Figure 1 shows the simplified schematic diagram of the starter system. The system operates off a 24 Volts DC supply.

The AE E4-B engine has a small, high-powered electric starter. The starter motor is located on the left side of the engine near the front. It has an integral solenoid to connect the starter motor to the relay junction box bus. Either the airplane battery or the external power system can supply the bus for the starter.

The ELECT. MASTER rocker switch is located on the bottom left of the instrument panel. Push the rocker to supply power to the main left and right bus bars.

LEFT ENGINE and RIGHT ENGINE switches located on the bottom left of the instrument panel controls the ground connection for the related engine starter relays. This switch must be set to ON for the starter system to operate. A key operated START switch located between the LEFT ENGINE and RIGHT ENGINE master switches operates the related engine starter. Turn the key to LEFT START or RIGHT START to operate the related engine starter. A spring returns the key to the neutral position when the key is released.

A START warning light on the ALERT panel of the integrated cockpit display comes ON when there is power to the starter. If this light stays on after the engine has started, set the LEFT ENGINE/RIGHT ENGINE MASTER switch to OFF.

If necessary during starting, the engine control unit operates the glow plugs to heat intake air for the engine.

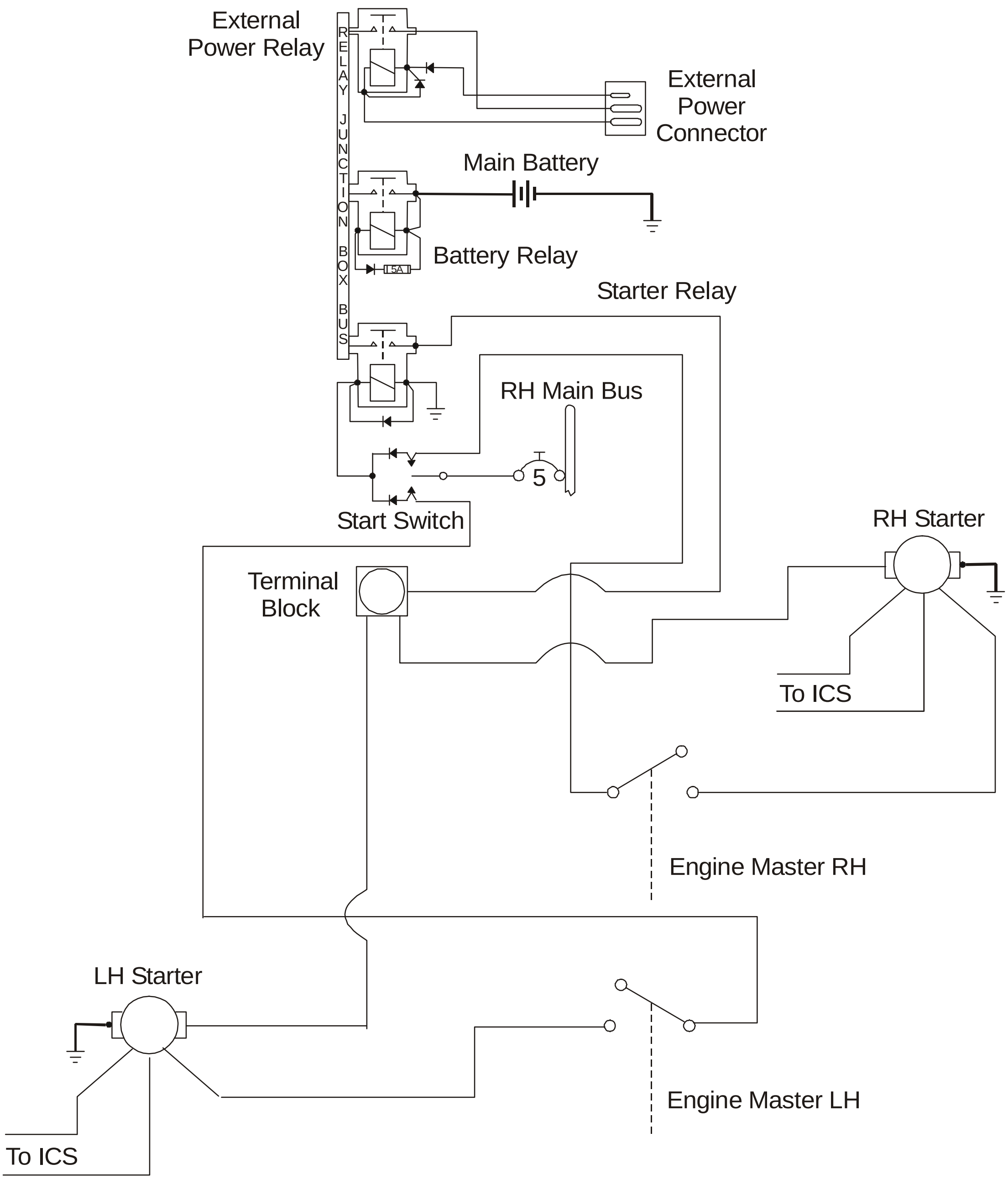

Figure 1: Engine Starter System Schematic Diagram

Trouble-Shooting

1. General

The table below lists the defects you could have with the starting system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

WARNING: DO NOT ALLOW PERSONS TO ENTER THE DANGER AREA OF A PROPELLER. THE PROPELLER MAY TURN AND CAUSE INJURY TO PERSONS.

WARNING: DISCONNECT AND ISOLATE THE STARTER POWER CABLES BEFORE DOING TESTS IN THIS SECTION. THE ENGINE MAY TURN AND CAUSE INJURY TO PERSONS.

Trouble	Possible Cause	Repair
The starter does not operate when the ELECT. MASTER switch is set to ON, the related ENGINE MASTER and the related engine START key switch is set to START LEFT or START RIGHT.	The airplane main battery is discharged.	Charge airplane main battery.
	The related ENGINE MASTER switch is defective.	Replace the related ENGINE MASTER switch.
	The ENGINE START key switch is defective.	Replace the ENGINE START key switch.
	The starter relay is defective.	Replace the starter relay.
	The related engine starter motor assembly is defective.	Replace the related engine starter motor assembly.
	A cable in the related engine start system is defective.	Do a test of the electrical cables. Refer to Chapter 92 for the wiring diagrams. Repair/Replace the defective cable. Refer to Section 71-50 for repair limits of the engine harness.

Trouble	Possible Cause	Repair
A starter power-on light stays on after the key is released from the START LEFT/START RIGHT position.	The related starter relay is defective.	Replace the related starter relay.
	The related starter solenoid is defective.	Refer to the engine manufacturer.
Difficult cold starting.	Glow plugs worn.	Replace the glow plugs. Refer to the engine manufacturer.
	Glow fuse defective.	Replace the fuse.

Maintenance Practices

1. General

This Section gives you only Maintenance Practices for the airplane part of the starter system. No repairs are permitted on the AE E4-B engine. Only an AE authorized repair shop or the manufacturer can repair the engine part of the system.

2. Remove/Install an Engine Master Switch

A. Remove an Engine Master Switch

Use this procedure for both left and right engine switches.

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Disconnect the airplane main battery and the ECU backup batteries too!	Refer to Section 24-30 and 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the lower placard panel from the instrument panel.	Refer to Section 11-30.
(4)	Remove the related ENGINE MASTER switch: – Remove the nut and washer from the front of the instrument panel. – Move the switch forward and clear of the instrument panel. – Hold the switch and disconnect the electrical cables. – Move the switch clear of the instrument panel.	Refer to Figure 2. Note the position of the cables.

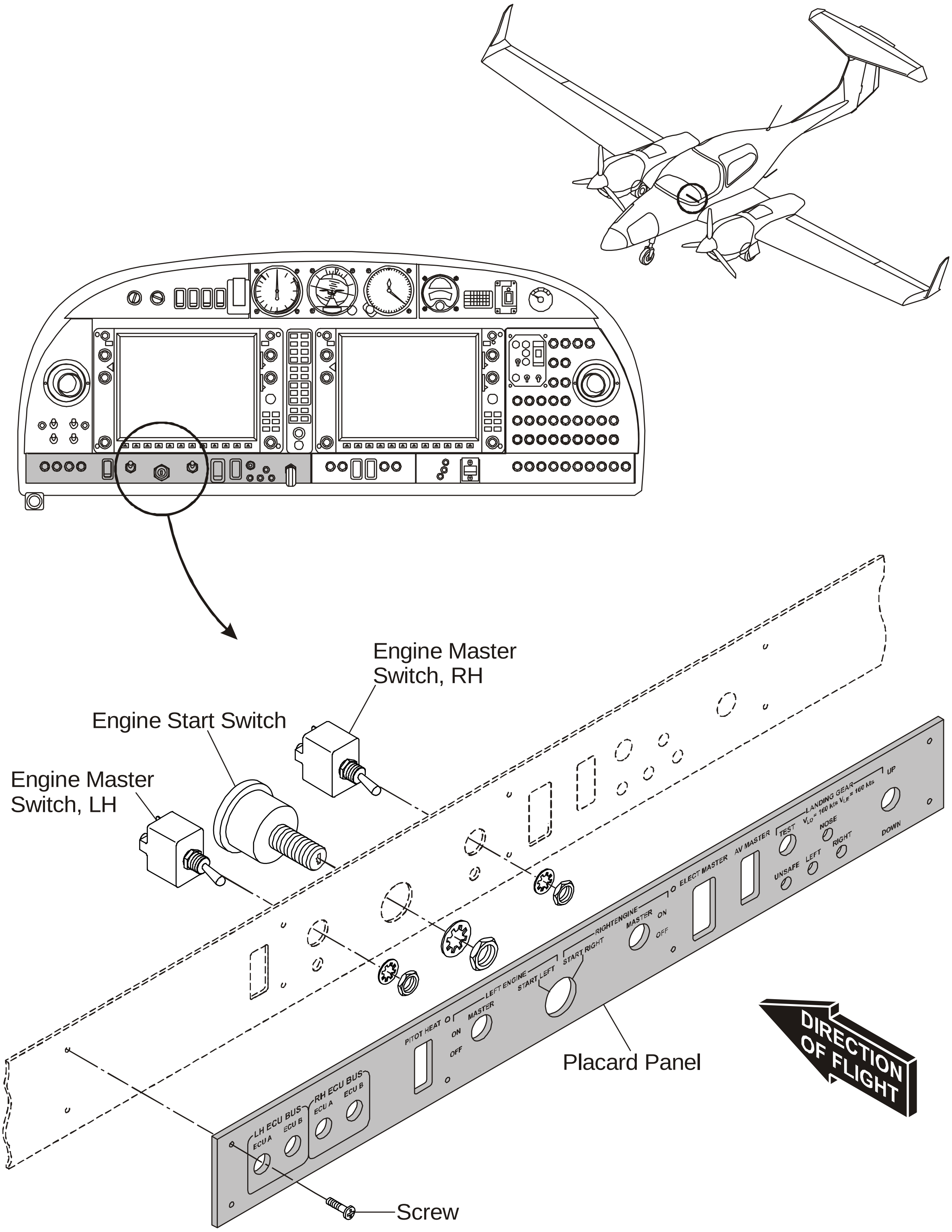

Figure 2: Engine Master Switch and Start Switch Installation

B. Install an Engine Master Switch

	Detail Steps/Work Items	Key Items/References
(1)	Install the switch: – Move the switch into position by the instrument panel and hold the switch. – Connect the electrical cables to the terminals on the switch. – Move the switch fully into position in the instrument panel. – Install the washer and nut onto the front of the switch.	 Refer to Chapter 92 for the wiring diagrams. Make sure that the switch is correctly orientated.
(2)	Install the lower placard panel onto the instrument panel.	Refer to Section 11-30.
(3)	Install the instrument panel cover and connect the ECU backup batteries too!	Refer to Section 24-30 and 25-10.
(4)	Connect the airplane main battery.	Refer to Section 24-31.
(5)	Do an engine ground run-up and do a test for the correct operation of the related engine MASTER switch and the lower placard panel.	Refer to Section 71-00.

3. Remove/Install the Engine Start Switch

A. Remove the Engine Start Switch

	Detail Steps/Work Items	Key Items/References
WARNING:	**MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.**	
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Remove the lower placard panel from the instrument panel.	Refer to Section 11-30.
(4)	Remove the START switch: – Remove the nut and washer from the front of the instrument panel. – Move the switch forward and clear of the instrument panel. – Hold the switch and disconnect the electrical cables. – Move the switch clear of the instrument panel.	Refer to Figure 2. Note the position of the cables.

B. Install the Engine Start Switch

	Detail Steps/Work Items	Key Items/References
(1)	Install the switch: – Move the switch into position by the instrument panel and hold the switch. – Connect the electrical cables to the terminals on the switch. – Move the switch fully into position in the instrument panel. – Install the washer and nut onto the front of the switch.	 Refer to Chapter 92 for the wiring diagrams. Make sure that the switch is correctly orientated.
(2)	Install the lower placard panel onto the instrument panel.	Refer to Section 11-30.
(3)	Install the instrument panel cover.	Refer to Section 25-10.
(4)	Connect the airplane main battery.	Refer to Section 24-31.
(5)	Do an engine ground run-up and do a test for the correct operation of the related engine START switch and the lower placard panel.	Refer to Section 71-00.

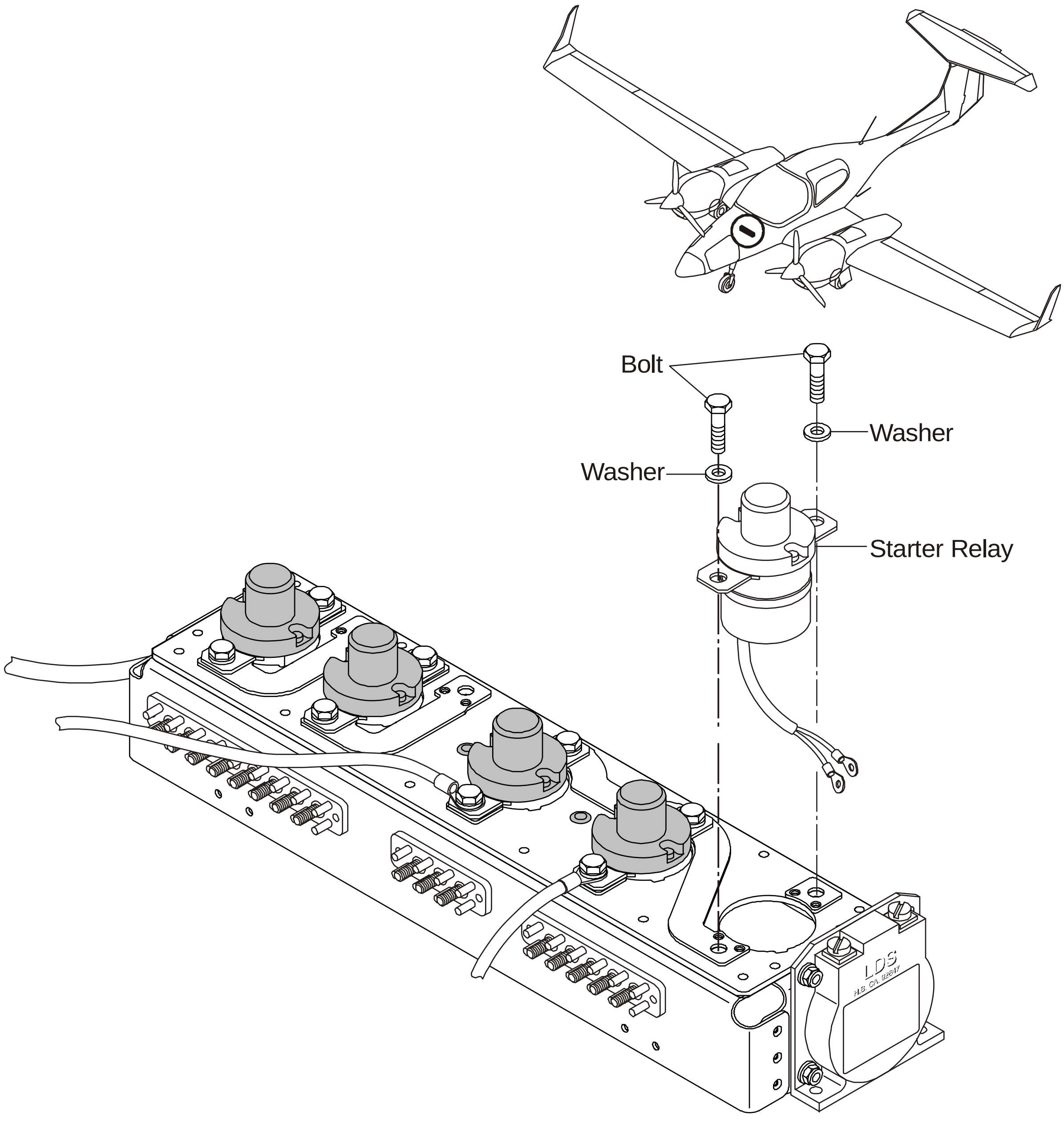

Figure 3: Engine Starter Relay Installation

4. Remove/Install an Engine Start Relay

A. Remove an Engine Start Relay

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Open the front baggage compartment door, left side for access to the relay panel.	Refer to Figure 3.
(3)	Disconnect the control cables from the starter relay.	At the terminal block.
(4)	Remove the starter relay: – Remove the 2 bolts and washers that attach the relay to the relay panel. – Move the relay up and clear of the relay panel and the airplane.	

B. Install an Engine Start Relay

	Detail Steps/Work Items	Key Items/References
(1)	Install the starter relay: – Move the new relay into position in the relay panel. – Install the 2 washers and bolts that attach the relay to the relay panel.	
(2)	Connect the control cables to the relay.	At the terminal block.
(3)	Connect the airplane main battery.	Refer to Section 24-31.
(4)	Close and secure the front baggage compartment door.	
(5)	Start the related engine and do a test for the correct operation of the engine starting system.	Refer to Section 71-00.

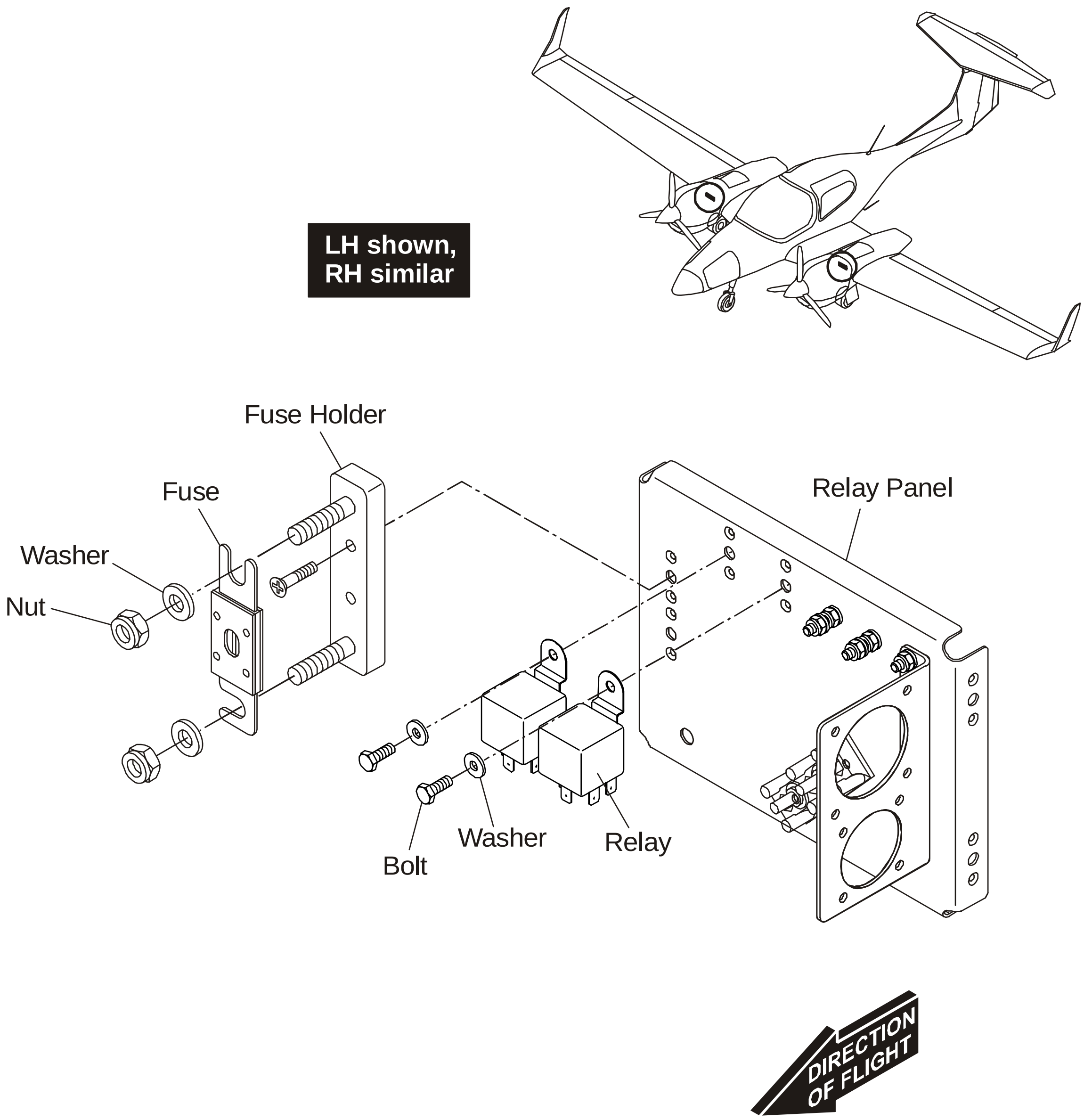

Figure 4: Engine Glow Fuse Installation

5. Replace the Glow Fuse

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.	
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the relay panel access panel from the related engine nacelle.	Refer to Section 52-40.
(3)	Remove the fuse: – Loosen the nut that attaches the electrical cable and fuse to the fuse holder. – Loosen the nut that attaches the bus bar link and fuse to the fuse holder. – Pull the fuse clear of the fuse holder.	Refer to Figure 4. Top side. Do not remove the nut. Bottom side. Do not remove the nut.
(4)	Install a new fuse: – Move the new fuse into position at the fuse holder. – Tighten the 2 nuts.	
(5)	Install the relay panel access panel onto the related engine nacelle.	Refer to Section 52-40.
(6)	Connect the airplane main battery.	Refer to Section 24-31.
(7)	Do an engine ground run-up and make sure that the glow plugs operate correctly.	Refer to Section 71-00.

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CHAPTER 81
TURBO CHARGER

1. General

This Section describes the turbo-charging system of the AE E4-B engine.

If MÄM 42-600 is installed, refer to Section 81-01 for data about the turbo-charging system with the AE E4-C engine installed.

2. Description

Each engine air intake system has an air filter located on the right side of each engine nacelle. The filter attaches to the front face of the alternate air valve. The alternate air valve also has an inlet which takes air from the engine nacelle. A rotating cage in the alternate air valve can be set to take air into the air inlet system through the filter or it can be set to take unfiltered air directly from the engine nacelle. Refer to Section 71-60 for more data about the air filter and the alternate air valve.

The outlet from the alternate air valve connects to the turbo charger inlet. The turbo charger compresses the air. This makes the air hot. The outlet from the turbo charger connects to the intercooler.

The intercooler is located at the top rear of the engine and is attached to the engine mounting frame. The outlet from the intercooler connects to the engine intake manifold. A manifold pressure sensor and manifold air temperature sensor are attached to the engine intake manifold.

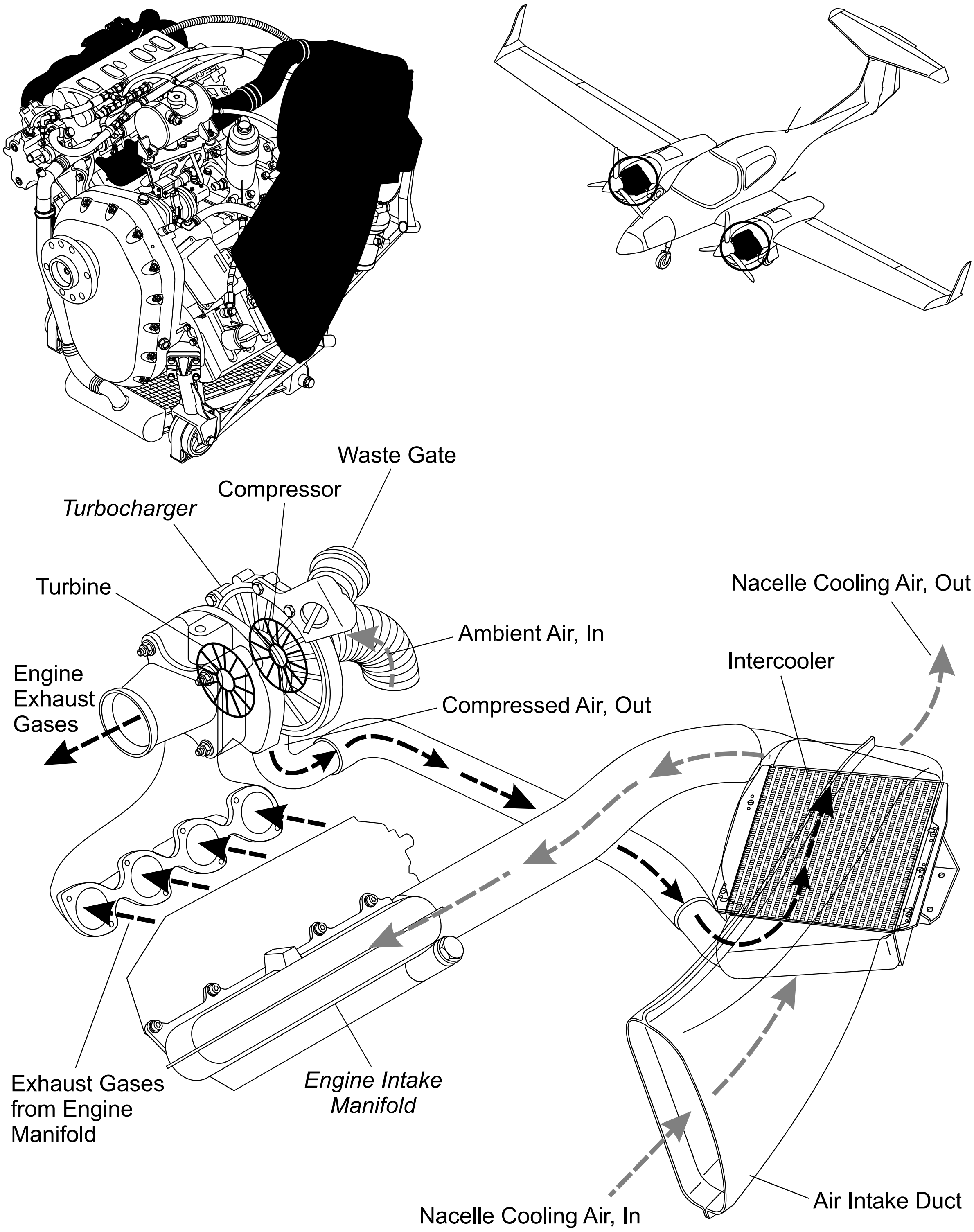


Figure 1: Engine Turbo Charger Schematic Diagram

3. Operation

Figure 1 shows the turbo charger system schematic diagram.

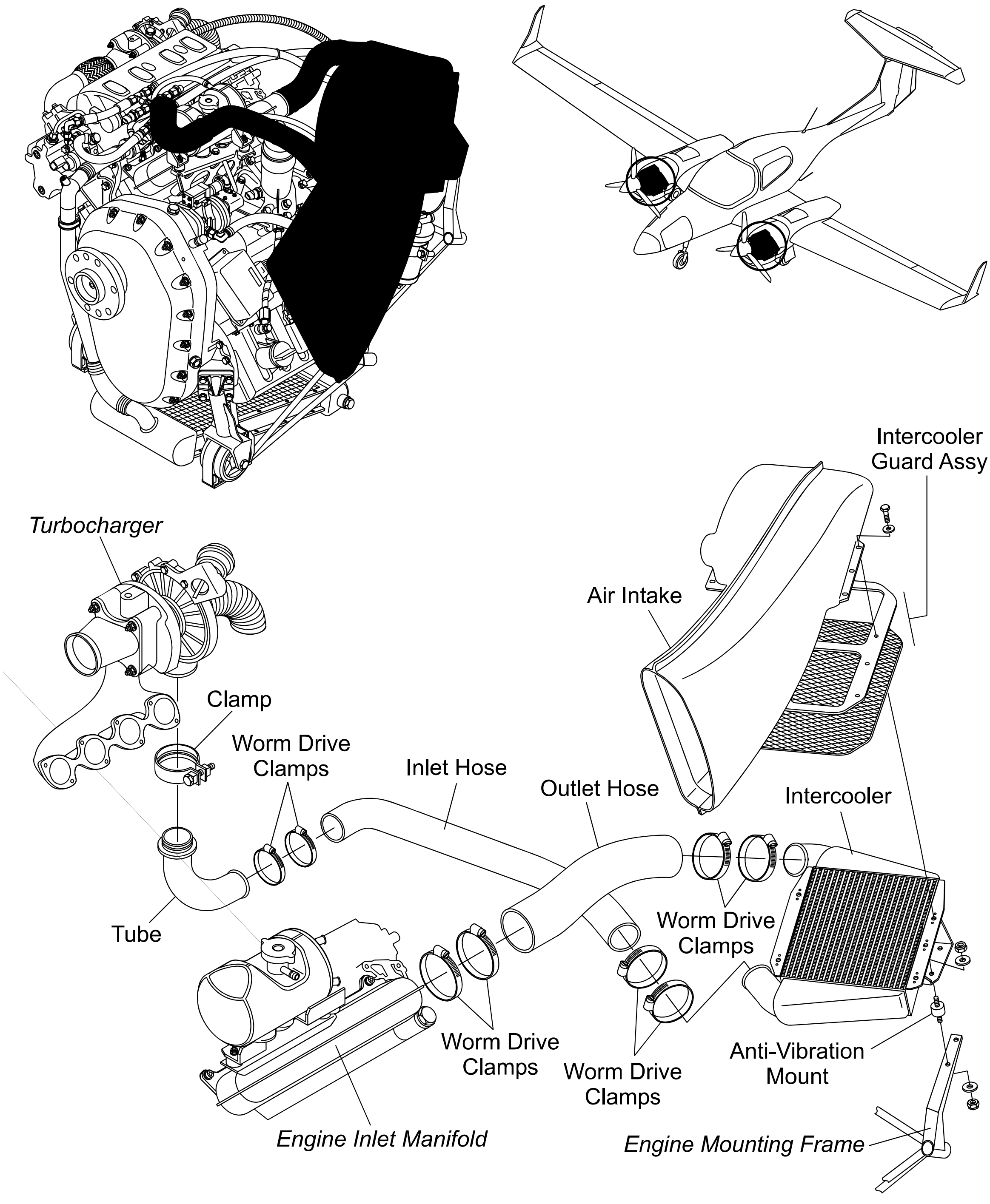
When the engine is running the exhaust gases from the engine flow through a manifold to the turbo charger turbine. A waste gate in the turbo charger turbine inlet can open to allow some of the exhaust gases from the engine to bypass the turbine and flow directly in to the engine exhaust pipe. The waste gate opening is controlled by the engine EECU.

Ambient air flows through the air filter (normal operation) or from the engine nacelle (alternate air operation) into the turbo charger compressor. The air gains heat while being compressed in the turbo charger. The hot compressed air flows through an aluminum tube and a flexible hose to the intercooler.

In the intercooler the hot compressed air is cooled down.

To provide cooling of the hot compressed air the intercooler is supplied with cold outside air via a composite air intake duct.

The cool compressed air from the intercooler flows through a flexible hose to the engine intake manifold.



Note: Apply torque seal on all worm drive clamps.

Figure 2: Intercooler Installation

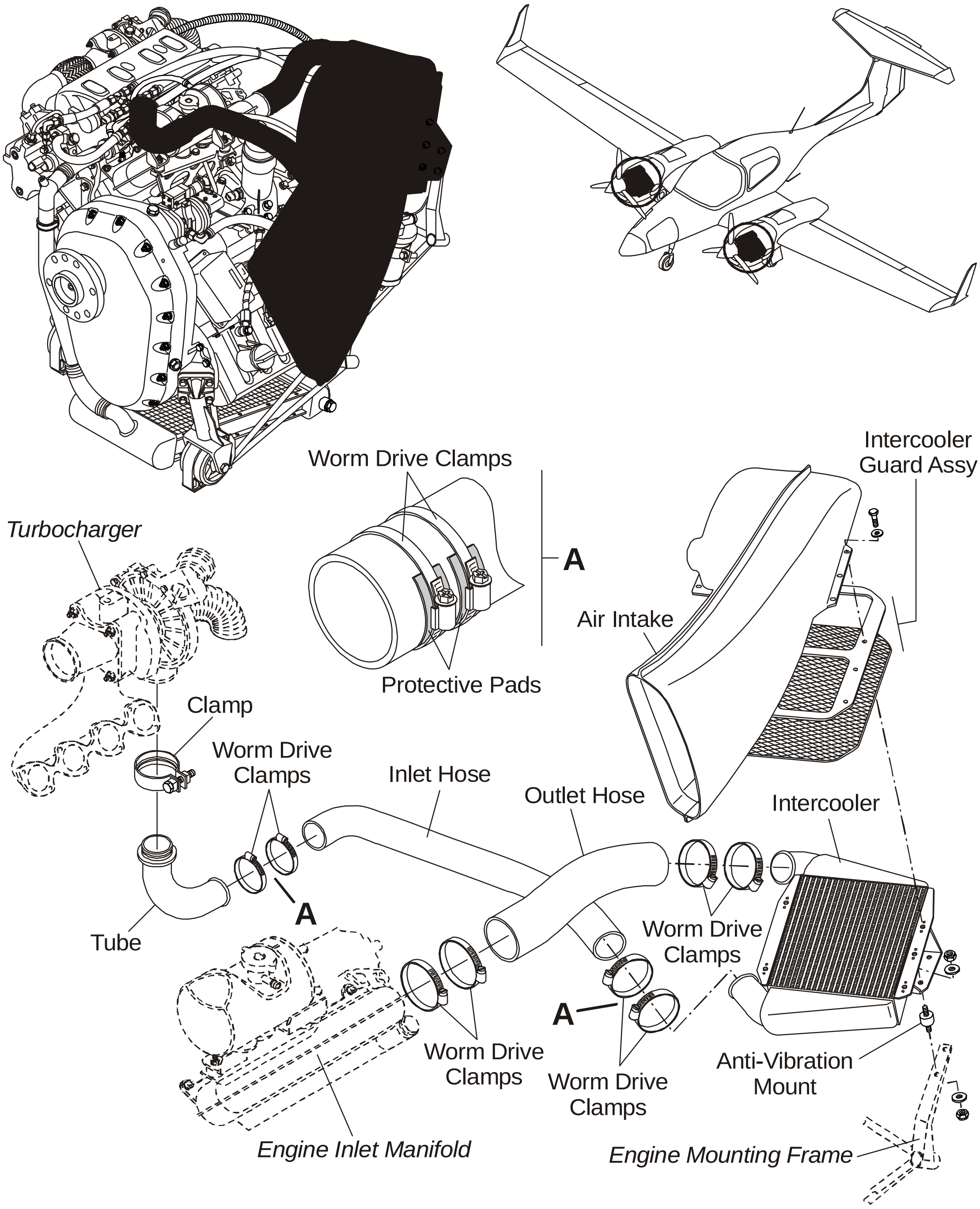


Figure 3: Intercooler Installation (if MÄM 42-792 is installed)

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Trouble-Shooting

1. General

The table below lists the defects you could have with the turbo charging system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
An engine inlet manifold pressure is too low/ too high.	Waste gate valve defective.	Refer to the engine manufacturer.
Inlet air temperature too high.	Intercooler matrix blocked/damaged.	Clear intercooler matrix of obstructions. Replace intercooler if necessary.

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Maintenance Practices

1. General

This Section tells you how to remove/install the intercooler.

CAUTION: YOU CANNOT DO MAINTENANCE ON THE INTERCOOLER.

CAUTION: DO NOT TRY TO ADJUST THE WASTE GATE CONTROL PUSH ROD. ANY ADJUSTMENT WILL AFFECT THE CHARACTERISTICS OF THE ELECTRONIC CONTROL SYSTEM.

Refer to Section 71-60 for maintenance data on the air filter and the alternate air valve.

2. Remove/Install an Engine Intercooler

Note: All hose clamp connections (except such secured with self locking nuts) in the charge air system must be secured with lock wire.

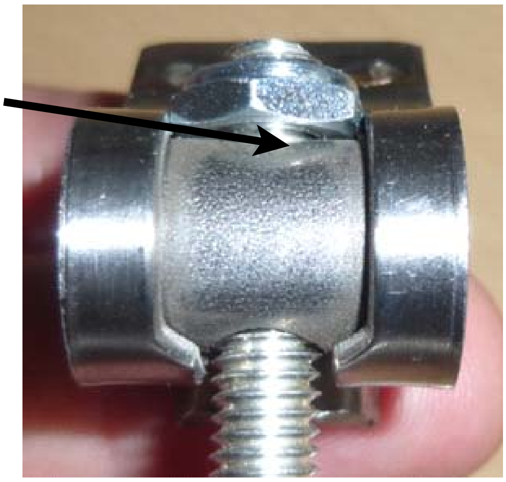
A. Remove an Engine Intercooler

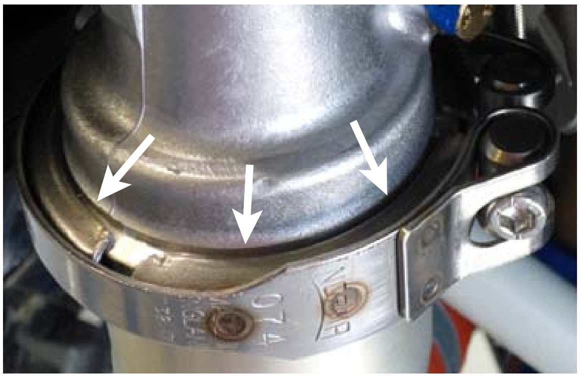
	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ELECT. MASTER switch to OFF. – Set the ENGINE MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-10.

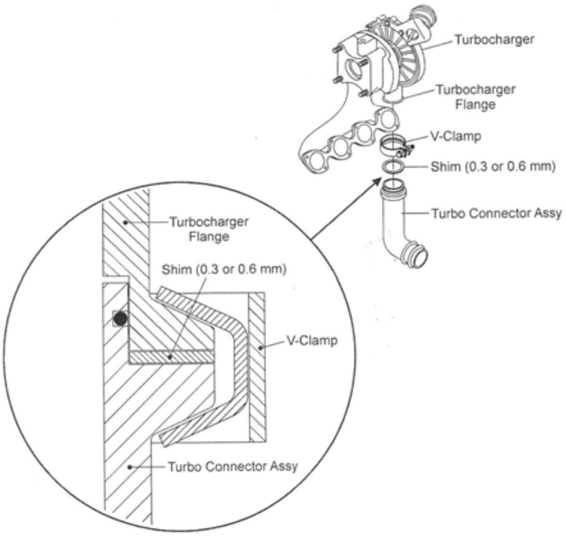
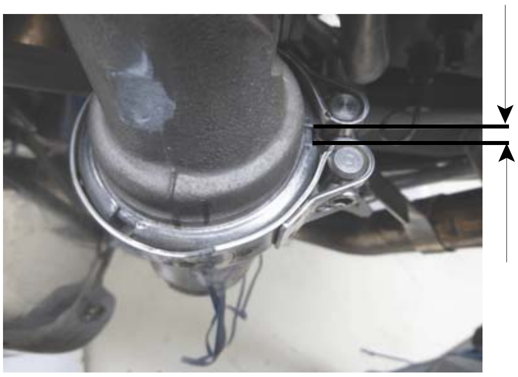
	Detail Steps/Work Items	Key Items/References
(4)	Remove the composite air intake duct: – Remove the bolts and washers that attach the composite air intake duct to the intercooler. – Move the composite air intake duct clear of the engine.	
(5)	Remove the intercooler guard assy.	Refer to Figure 2.
(6)	Disconnect the flexible hose that connects the intercooler to the turbo charger and the turbo charger to the engine air intake manifold: – Remove the worm-drive-clamps. – Pull the hoses off the intercooler connectors and the turbo charger inlet.	Refer to Figure 2. At the intercooler.
(7)	Remove the intercooler: – Remove the nuts, washers and bolts that attach the intercooler to the engine mount. – Move the intercooler clear of the engine nacelle.	Take care not to damage the intercooler matrix!

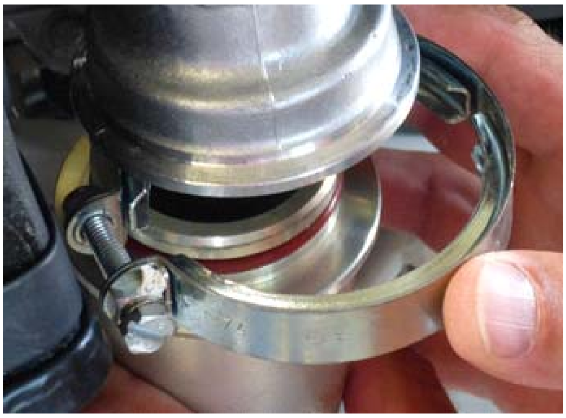
B. Install an Engine Intercooler

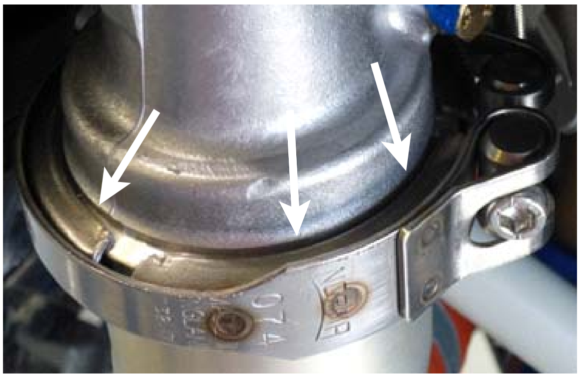
	Detail Steps/Work Items	Key Items/References
	CAUTION: MAKE SURE THAT TURBO CHARGER HOSES ARE ROUTED CORRECTLY WITHOUT KINKS. FALSE INSTALLED HOSES MAY RESULT IN DAMAGE TO THE TURBO CHARGER.	
(1)	Install the intercooler: – Position the intercooler on the appropriate engine mount brackets. – Install the nuts and washers that attach the intercooler to the engine mount via anti-vibration mounts.	Refer to Figure 2.
(2)	Connect the flexible hoses that connect the intercooler to the turbo charger and engine air intake manifold: – Move the worm-drive-clamps into position on the flexible hoses. – Push the flexible hoses onto the intercooler connectors. – Move the worm-drive-clamps into the correct position and tighten the worm-drive-clamps and apply torque seal (no red of white torque seal color allowed). – If MÄM 42-792 is installed, bond the protective pad underneath the houses of the worm-drive-clamps.	Do not tighten the worm-drive-clamps! Use only new worm-drive-clamps. Torque: 5.0 ± 0.5 Nm (3.7 ± 0.4 lbf.ft.). Use Dow Corning 736 to the red turbo charger hoses. Refer to Figure 3.

	Detail Steps/Work Items	Key Items/References
(3)	If MÄM 42-963/a is installed: – Install the nut BN175-M6-PZ on the end of the screw of the new v-clamp so that there is no gap.  – Put the v-clamp in position on the flanges. Note: Do not pull the v-clamp over the turbo charger tube since the v-clamp will be permanently deformed.	

	Detail Steps/Work Items	Key Items/References
		
	– Before tightening the v-clamp make sure that there is no gap between the aluminum charged air tube and the turbo charger flange. When correctly installed the aluminum charged air tube must fit into the turbo charger flange without tension.	
	– Tighten v-clamp on turbo-charger. Make sure the circumferential gap to the turbo charger is equal (if not, use rubber mallet to tap v-clamp into position). If tapping with a rubber mallet was required, retighten the v-clamp.	Torque: 5.5 ± 0.5 Nm (4.0 ± 0.4 lbf.ft).
		

	Detail Steps/Work Items	Key Items/References
	– Make sure that the distance between V-flanges on the lock is between 6 and 10 mm (0.24 - 0.39 in). If necessary insert turbo connector shims to obtain the required distance.  6 - 10 mm (0.24 - 0.39 in) 	

	Detail Steps/Work Items	Key Items/References
	If MÄM 42-963/a is NOT installed:	
	– Put the v-clamp in position on the flanges.	
	Note: Do not pull the v-clamp over the turbo charger tube since the v-clamp will be permanently deformed.	
		
	– Tighten v-clamp on turbo-charger.	Torque: 5.0 ± 0.5 Nm (3.7 ± 0.4 lbf.ft).
		
	– Secure bolt of v-clamp with lock wire.	
	– Make sure the circumferential gap to the turbo charger is equal (if not, use rubber mallet to tap v-clamp into position). If tapping with a rubber mallet was required, retighten the v-clamp.	

	Detail Steps/Work Items	Key Items/References
		
(4)	Install the composite air intake duct: – Position the composite air intake duct on the intercooler. – Install the bolts and washers that attach the composite air intake duct to the intercooler.	
(5)	Install the intercooler guard assy.	Refer to Figure 2.
(6)	Install the engine cowlings.	Refer to Section 71-10.
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do an engine ground run-up and do a test for the correct operation of the engine intercooler.	Refer to Section 71-00.

Section 81-01
Turbo Charger (if MÄM 42-600 is installed)

1. General

This Chapter describes the turbo-charging system of the AE E4-C engine.

2. Description

Each engine air intake system has an air filter located in the middle of the engine compartment. The filter attaches to the front face of the alternate air valve. The alternate air valve also has an inlet which takes air from the engine compartment. A rotating cage in the alternate air valve can be set to take air into the air inlet system through the filter or it can be set to take unfiltered air directly from the engine compartment. Refer to Section 71-61 for more data about the air filter and the alternate air valve.

The outlet from the alternate air valve connects to the turbo charger inlet. The turbo charger compresses the air. This makes the air hot. The outlet from the turbo charger connects to the intercooler.

The intercooler is located in the upper rear part of the engine compartment. The intercooler is attached to the engine mount via the intercooler duct and mounting brackets. The outlet from the intercooler connects to the engine intake manifold. A manifold pressure sensor and manifold air temperature sensor are attached to the engine intake manifold.

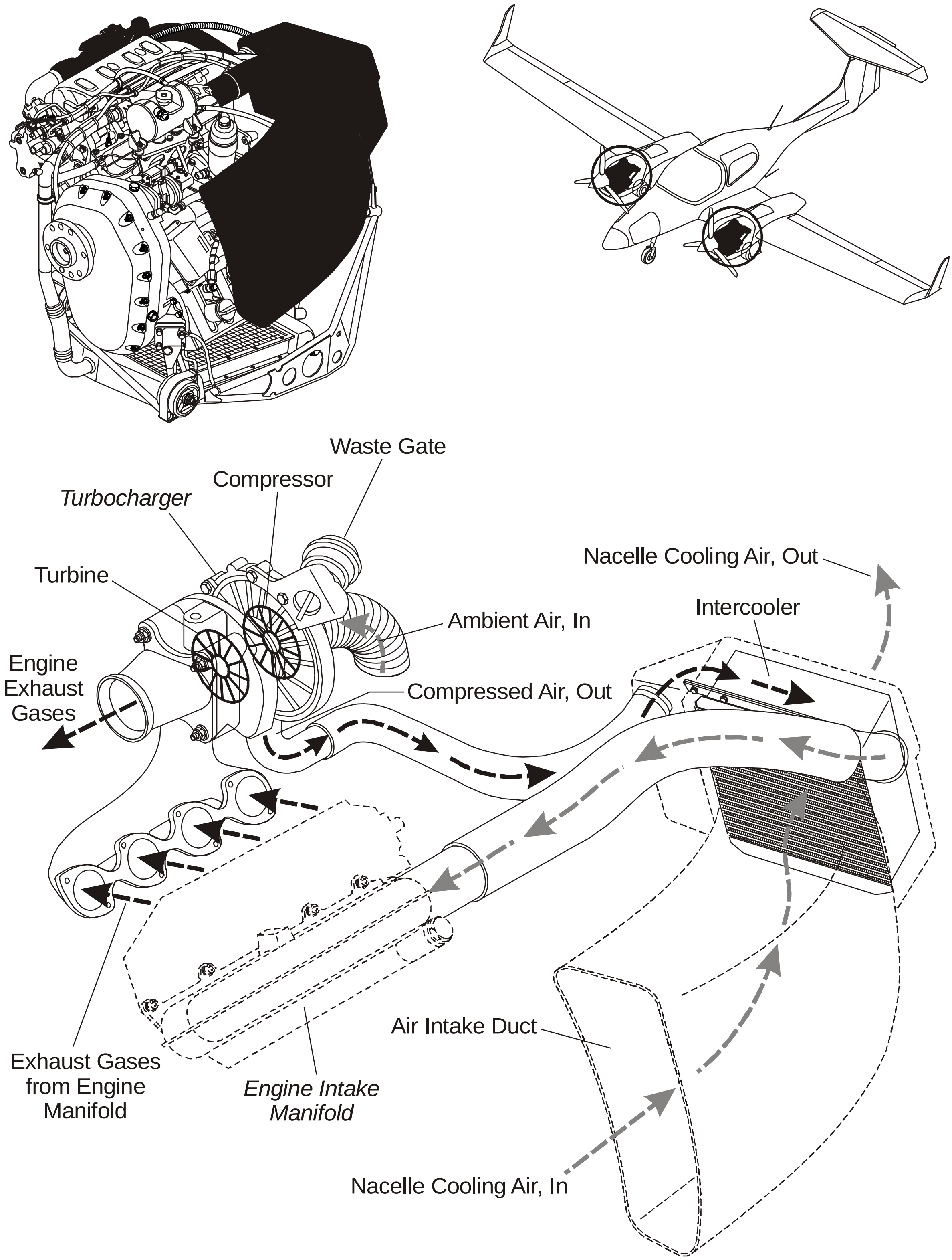


Figure 1: Engine Turbo Charger Schematic Diagram (if MÄM 42-600 installed)

3. Operation

Figure 1 shows the turbo charger system schematic diagram.

When the engine is running the exhaust gases from the engine flow through a manifold to the turbo charger turbine. A waste gate in the turbo charger turbine inlet can open to allow some of the exhaust gases from the engine to bypass the turbine and flow directly in to the engine exhaust pipe. The waste gate opening is controlled by the engine EECU.

Ambient air flows through the air filter (normal operation) or from the engine compartment (alternate air operation) into the turbo charger compressor. The air gains heat while being compressed in the turbo charger. The hot compressed air flows through a flexible hose to the intercooler.

The hot compressed air flows through the matrix of the intercooler. Cooling air is guided from the left side of the nacelle to the intercooler and flows around the intercooler matrix. The hot compressed air is cooled. The cooled compressed air from the intercooler matrix flows through a flexible hose to the engine air intake manifold.

The cooling air from around the intercooler matrix flows to the cooling air outlet at the rear of the engine nacelle.

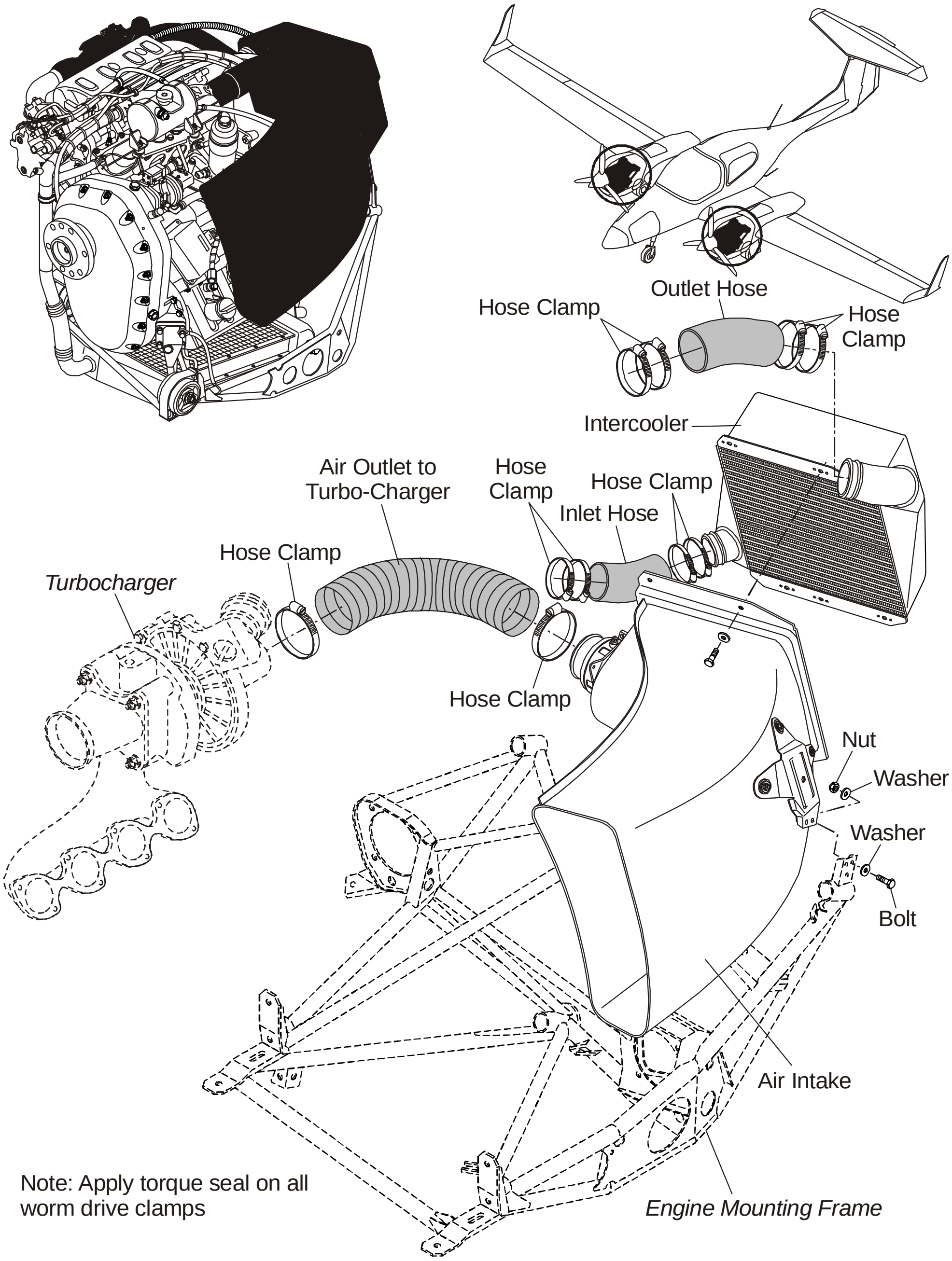


Figure 2: Intercooler Installation (if MÄM 42-600 installed)

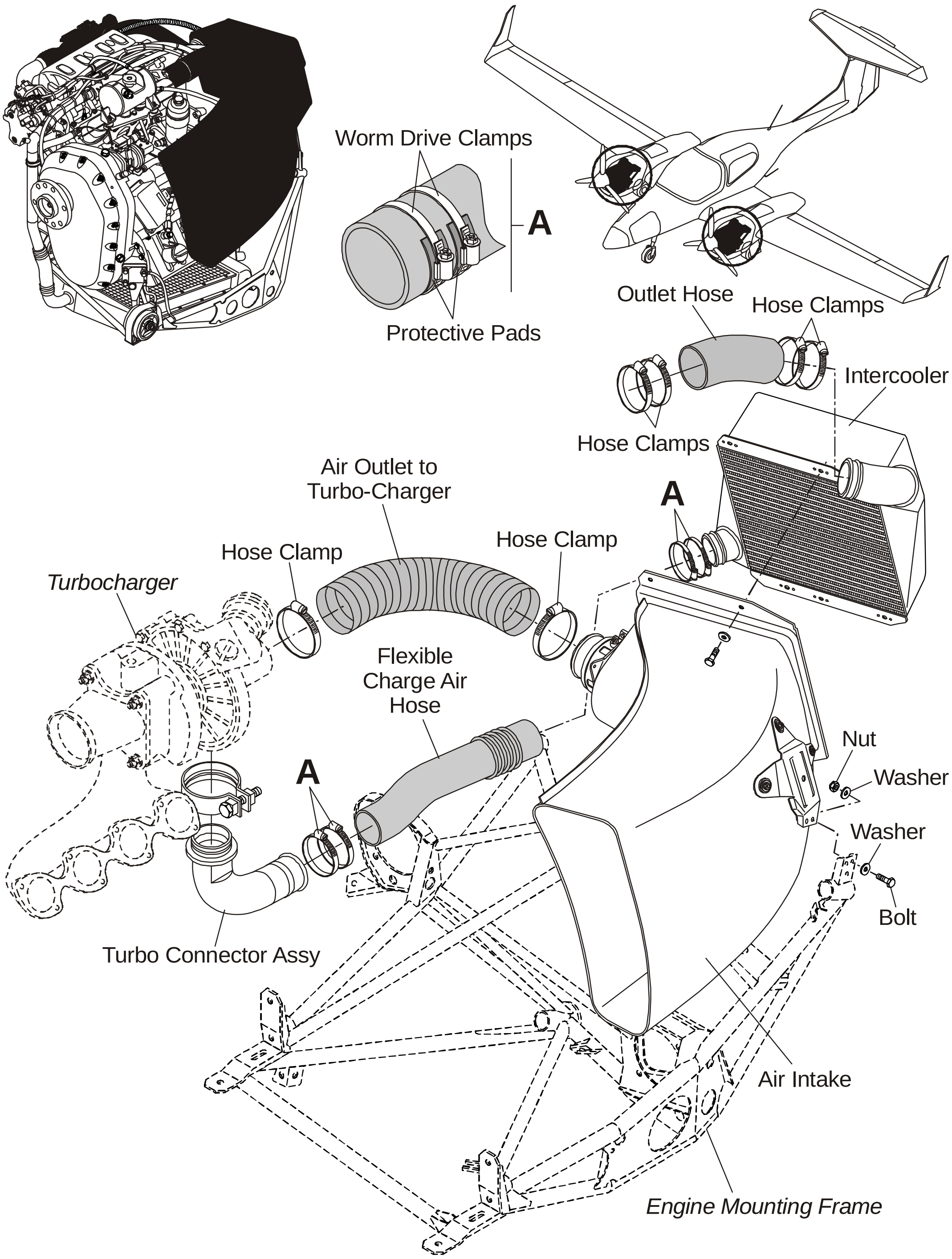


Figure 3: Intercooler Installation (if MÄM 42-600 and MÄM 42-1004 are installed)

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Trouble-Shooting

1. General

The table below lists the defects you could have with the turbo charging system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

Trouble	Possible Cause	Repair
An engine intake manifold pressure is too low/ too high.	Waste gate valve defective.	Refer to the engine manufacturer.
Intake air temperature too high.	Intercooler matrix blocked/damaged.	Clear intercooler matrix of obstructions. Replace intercooler if necessary.

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Maintenance Practices

1. General

This Section tells you how to remove/install the intercooler.

CAUTION: YOU CANNOT DO MAINTENANCE ON THE INTERCOOLER.

CAUTION: DO NOT TRY TO ADJUST THE WASTE GATE CONTROL PUSH ROD. ANY ADJUSTMENT WILL AFFECT THE CHARACTERISTICS OF THE ELECTRONIC CONTROL SYSTEM.

Refer to Section 71-61 for maintenance data on the air filter and the alternate air valve.

2. Remove/Install an Engine Intercooler

Note: All hose clamp connections (except such secured with self locking nuts) in the charge air system must be secured with lock wire.

A. Remove an Engine Intercooler

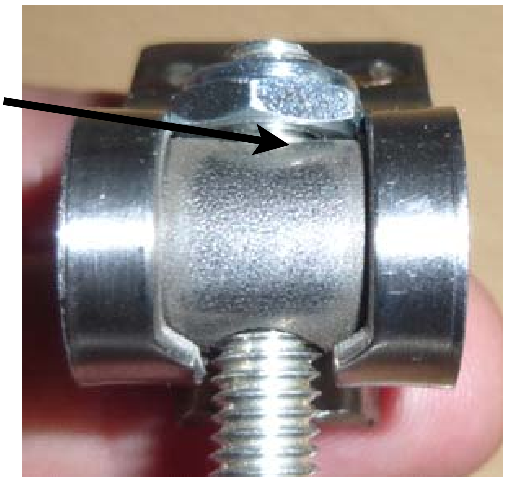
	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.**	
(1)	Make sure that the related engine is safe: – Set the ENGINE MASTER switch to OFF. – Set the ELECT. MASTER switch to OFF. – Set the power lever to 0%.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the engine cowlings.	Refer to Section 71-11.

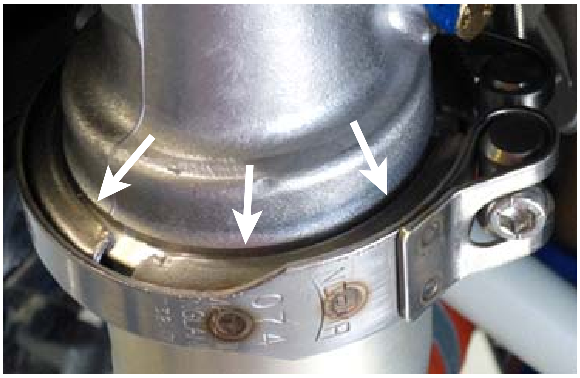
	Detail Steps/Work Items	Key Items/References
(4)	Remove the intercooler air duct, the air filter box and intercooler: – Remove the air filter box with alternate air valve. – Remove the charge air hoses which are connected to the intercooler. – Remove the bolts which fix the intercooler air duct to the engine mount. – Remove the bolts and washers that attach the composite air intake duct to the intercooler. – Move the composite air intake duct clear of the engine.	

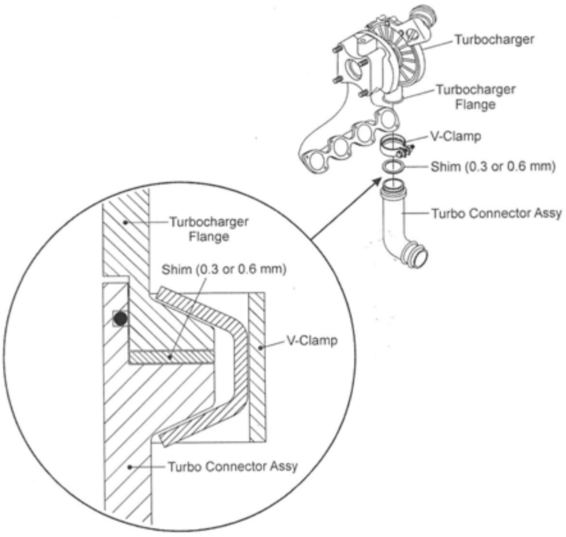
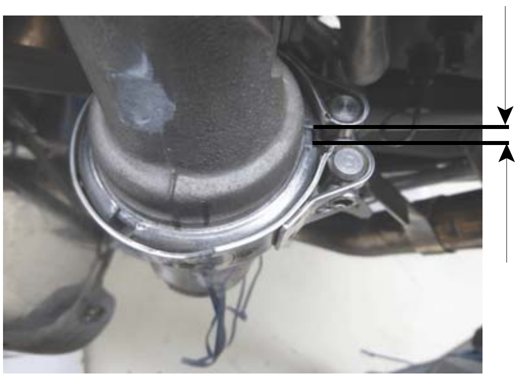
B. Install the Engine Intercooler

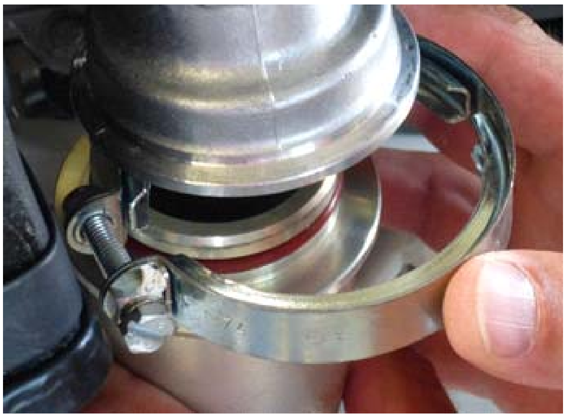
	Detail Steps/Work Items	Key Items/References
	CAUTION: MAKE SURE THAT TURBO CHARGER HOSES ARE ROUTED CORRECTLY WITHOUT KINKS. FALSE INSTALLED HOSES MAY RESULT IN DAMAGE TO THE TURBO CHARGER.	
(1)	Install the intercooler to the intercooler air duct.: – Position the intercooler on the intercooler air duct. – Install the nuts and washers that attach the intercooler to the intercooler air duct..	Refer to Figure 2.

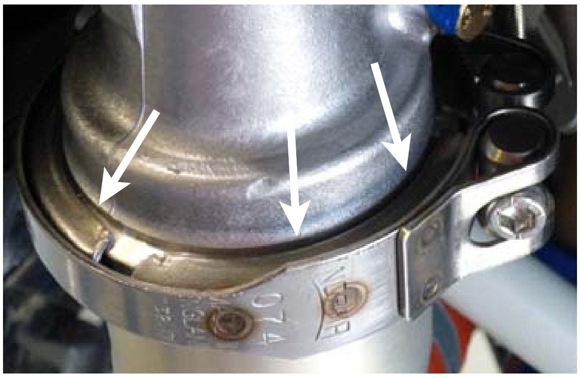
	Detail Steps/Work Items	Key Items/References
(2)	Connect the flexible hoses that connect the intercooler to the turbo charger and engine air intake manifold:	
	– Move the intercooler air duct with intercooler into position.	
	– Move the worm-drive-clamps into position on the flexible hoses.	Use only new worm-drive-clamps.
	– Apply water to the inside of the hoses to ease hose installation.	
	– Push the flexible hoses onto the intercooler connectors.	
	– If MÄM 42-1004 is installed:	Refer to Figure 3.
	– Make sure that the position of the support rings of the bellows are in front of the aluminum connector and not on it. Check that the bellows of the hose are not compressed or stretched. If necessary realign charge air hose.	
	– Move the worm-drive-clamps into the correct position.	Do not tighten the worm-drive-clamps!
	– If MÄM 42-1004 is installed, bond the protective pad using Dow Corning 736 to the red turbocharger hoses underneath the housings of the worm-drive-clamps.	
	– Install the airfilter box to the intercooler air duct.	

	Detail Steps/Work Items	Key Items/References
(3)	If MÄM 42-963/a is installed: – Install the nut BN175-M6-PZ on the end of the screw of the new v-clamp so that there is no gap.  – Put the v-clamp in position on the flanges. Note: Do not pull the v-clamp over the turbo charger tube since the v-clamp will be permanently deformed.	

	Detail Steps/Work Items	Key Items/References
		
	– Before tightening the v-clamp make sure that there is no gap between the aluminum charged air tube and the turbo charger flange. When correctly installed the aluminum charged air tube must fit into the turbo charger flange without tension.	
	– Tighten v-clamp on turbo-charger. Make sure the circumferential gap to the turbo charger is equal (if not, use rubber mallet to tap v-clamp into position). If tapping with a rubber mallet was required, retighten the v-clamp.	Torque: 5.5 ± 0.5 Nm (4.0 ± 0.4 lbf.ft).
		

	Detail Steps/Work Items	Key Items/References
	– Make sure that the distance between V-flanges on the lock is between 6 and 10 mm (0.24 - 0.39 in). If necessary insert turbo connector shims to obtain the required distance.  6 - 10 mm (0.24 - 0.39 in) 	

	Detail Steps/Work Items	Key Items/References
	If MÄM 42-963/a is NOT installed: – Put the v-clamp in position on the flanges. Note: Do not pull the v-clamp over the turbo charger tube since the v-clamp will be permanently deformed. 	
	– Tighten v-clamp on turbo-charger. 	Torque: 5.0 ± 0.5 Nm (3.7 ± 0.4 lbf.ft).
	– Secure bolt of v-clamp with lock wire. – Make sure the circumferential gap to the turbo charger is equal (if not, use rubber mallet to tap v-clamp into position). If tapping with a rubber mallet was required, retighten the v-clamp.	

	Detail Steps/Work Items	Key Items/References
		
(4)	Install the intercooler air duct: – Position the intercooler air duct on the intercooler such that it aligns with the engine mounting brackets. – Install the bolts and washers that attach the intercooler air duct to the engine mount.	
(5)	Install the alternate air valve: – Tighten the worm drive clamps on the flexible hoses of the intercooler and apply torque seal (no red of white torque seal color allowed).	Torque: 5.0 ± 0.5 Nm (3.7 ± 0.4 lbf.ft.). Use only new worm-drive clamps.
(6)	Install the engine cowlings.	Refer to Section 71-11.
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do an engine ground run-up and do a test for the correct operation of the engine intercooler.	Refer to Section 71-00.

CHAPTER 92

WIRING DIAGRAMS

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CHAPTER 92

WIRING DIAGRAMS

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CHAPTER 92
WIRING DIAGRAMS

1. General

This Chapter contains the wiring diagrams for each system. The wiring diagrams use the ATA Chapter/Section numbering system.

Title	Drawing No.	Rev. No.	No. of Sheets
Schematic, Twin NG Equipment Cooling	D64-9221-20-01	-	1
Schematic, RACC Wiring	D64-9221-50-01	-	1
Schematic, RACC Wiring (if OÄM 42-193/d or later is installed)	D64-9221-50-01	A	1
Schematic, GFC 700 Wiring	D64-9222-10-02	-	1
Schematic, GSR 56 Wiring	D64-9223-15-00	-	1
Schematic, Electrical System	D64-9224-30-01	A	2
Schematic, Electrical System, ECU Split Bus	D64-9224-30-01_01	-	2
Schematic, Electrical System	D64-9224-30-01_02	-	2
Schematic, RH ECU Backup Battery, Tail Fin Installation	D64-9224-30-01x01	-	1
Schematic, Second Alternator	D64-9224-30-02	-	1
Schematic, Accessory Power Plug	D64-9224-60-01	-	1
Schematic, Emergency Power	D64-9225-60-01	-	1
Schematic, ELT ME 406	D64-9225-60-02	-	1
Schematic, ELT Kannad 406 Wiring	D64-9225-60-03	-	1
Schematic, ELT Kannad AF-Integra Wiring	D64-9225-60-04	-	1
Schematic, Removable Co-Pilot Stick Wiring	D64-9227-03-00	-	1
Schematic, Rudder Pedal Adjust	D64-9227-20-01	-	1
Schematic, Stick Limiter	D64-9227-30-01	A	1
Schematic, Flaps	D64-9227-50-01	A	1
Schematic, LH Aux Fuel Wiring	D64-9228-10-01	B	1
Schematic, RH Aux Fuel Wiring	D64-9228-11-01	A	1
Schematic, Pitot and Stall Heat Warning	D64-9230-30-01	A	1

Title	Drawing No.	Rev. No.	No. of Sheets
Schematic, De-Ice Control System	D64-9230-40-01	A	1
Schematic, Door Warning Switches	D64-9231-00-01	A	1
Schematic, De-Ice Warning System	D64-9231-00-02	A	1
Schematic, G1000	D64-9231-60-01	A	6
Schematic, G1000	D64-9231-60-01_01	-	6
Schematic, G1000 NXi	D64-9231-60-04	D	6
Schematic, TAS 6xxA Wiring	D64-9231-60-04x02	A	1
Schematic, Landing Gear	D64-9232-00-01	-	1
Schematic, Flood Light	D64-9233-10-01	-	1
Schematic, Dimming Regulator & Placards	D64-9233-10-07	A	1
Schematic, Map/Reading Lights	D64-9233-20-01	A	1
Schematic, Map/Reading Lights, LED	D64-9233-20-01_02	-	1
Schematic, Map/Reading Light, Wiring RACC	D64-9233-20-01x01	-	1
Schematic, Map/Reading Lights Wiring (LED), RACC	D64-9233-20-01x02	-	1
Schematic, Exterior Lighting	D64-9233-40-01	C	1
Schematic, LED Position / Anti-Collision Lights	D64-9233-40-01x01	-	1
Schematic, Attitude Gyro	D64-9234-10-01	-	1
Schematic, MD302 Wiring	D64-9234-10-02	-	1
Schematic, Drum Altimeter	D64-9234-20-01	-	1
Schematic, GWX 68 Weather Radar Wiring	D64-9234-40-01	-	1
Schematic, GWX 70 Weather Radar Wiring	D64-9234-40-02	-	1
Schematic, ADF	D64-9234-50-01	A	1
Schematic, Feathering System	D64-9261-20-01_01	-	1
Schematic, LH ECU	D64-9277-40-02_01	-	2
Schematic, RH ECU	D64-9277-40-03_01	-	2
Schematic, LH ECU	D64-9277-40-02_02	-	2
Schematic, RH ECU	D64-9277-40-03_02	-	2

Title	Drawing No.	Rev. No.	No. of Sheets

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REVISIONS		
Rev.	Zone	Description
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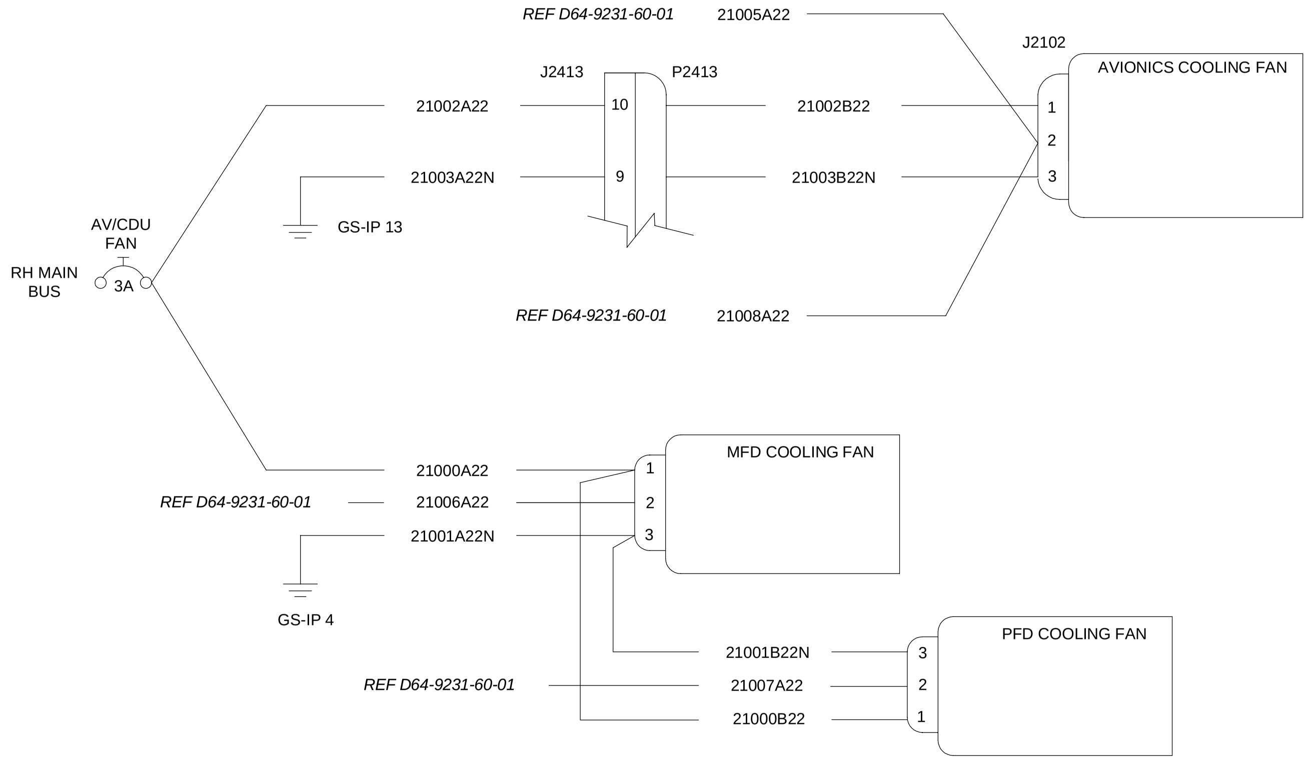

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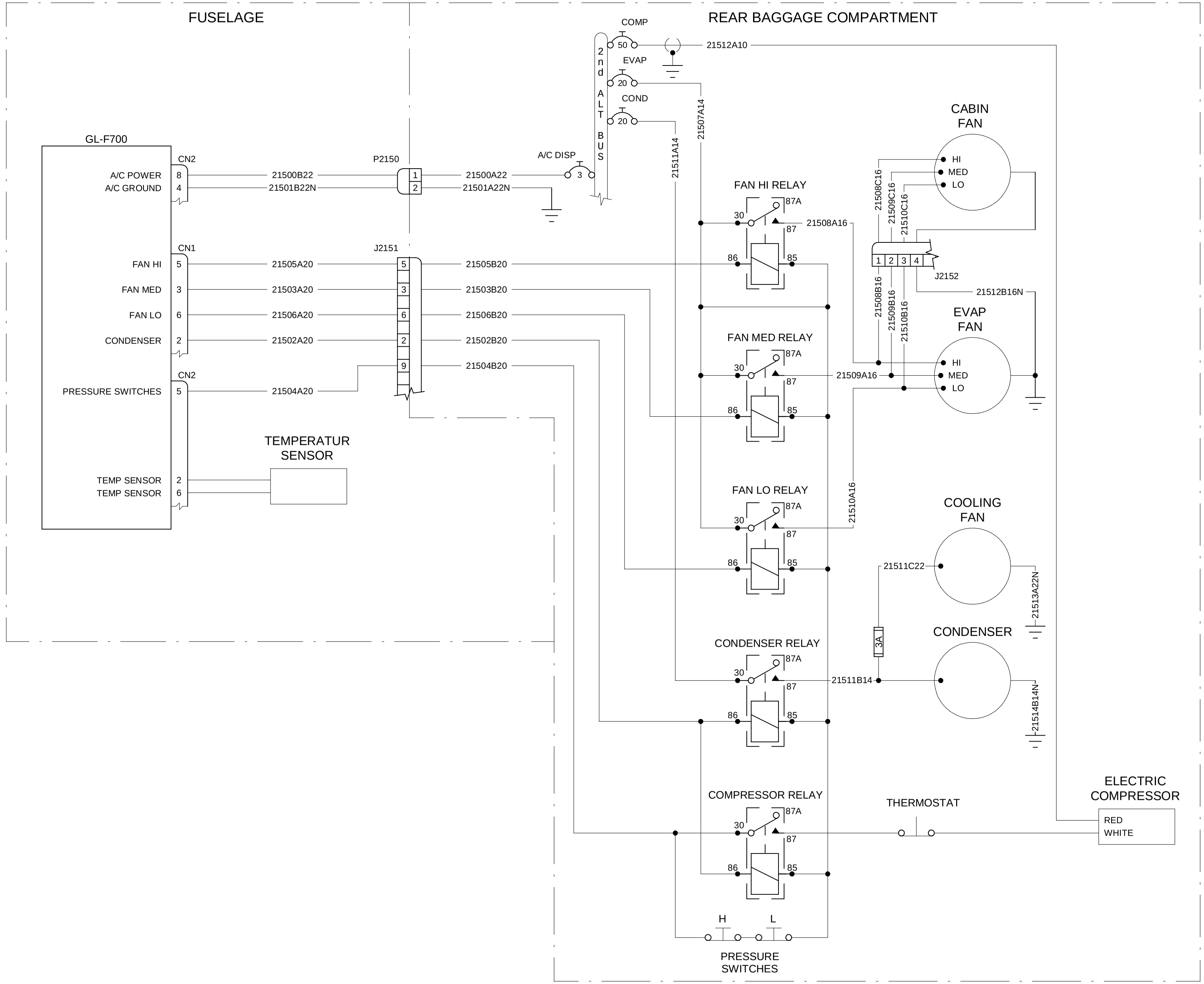
"-" VÄM 42-004, 14.07.08, M. Spanton (Rev. / Change / Date / Name)	Next Higher Assembly : D64-9200-00-00	Title : Schematic, Twin NG Equipment Cooling	
	Diamond Aircraft Industries GmbH		
	DA42 NG Twin Star	Drawing Number: D64-9221-20-01	Sheet 1 from 1
	Saved under : D64-9221-20-01.dft		



REVISION

REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-193 FIRST RELEASE	13.01.11	SEE TB

DIMENSIONS METRIC	IDENTIFICATION MARKINGS DP-S-17-00001	Diamond Aircraft Industries GmbH	Diamond Aircraft Industries — N. A. Otto-Straße 5, A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION	FORMAT A2	CLASSIFICATION: NONE	PROJECT DA 42 NG
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART NO	DEPARTMENT / SIGN / DATE	TITLE Schematic, RACC Wiring
DIMENSION TOLERANCES: 2 DECIMAL ±0,25; 1DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5	THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18	DRAWN 13.01.11	DWG.ORIG. DAIA
3.2 FINISH IN MICRO-METER	FILENAME D64-9221-50-01.dft	CHECKED: QA: N/A STRESS: N/A MANUF.: N/A SYSTEM: N/A APPROVED: TL	DWG.NO. D64-9221-50-01 REV "-"
			CODE 710197 SCALE NTS SH 01 OF 01

Confidential

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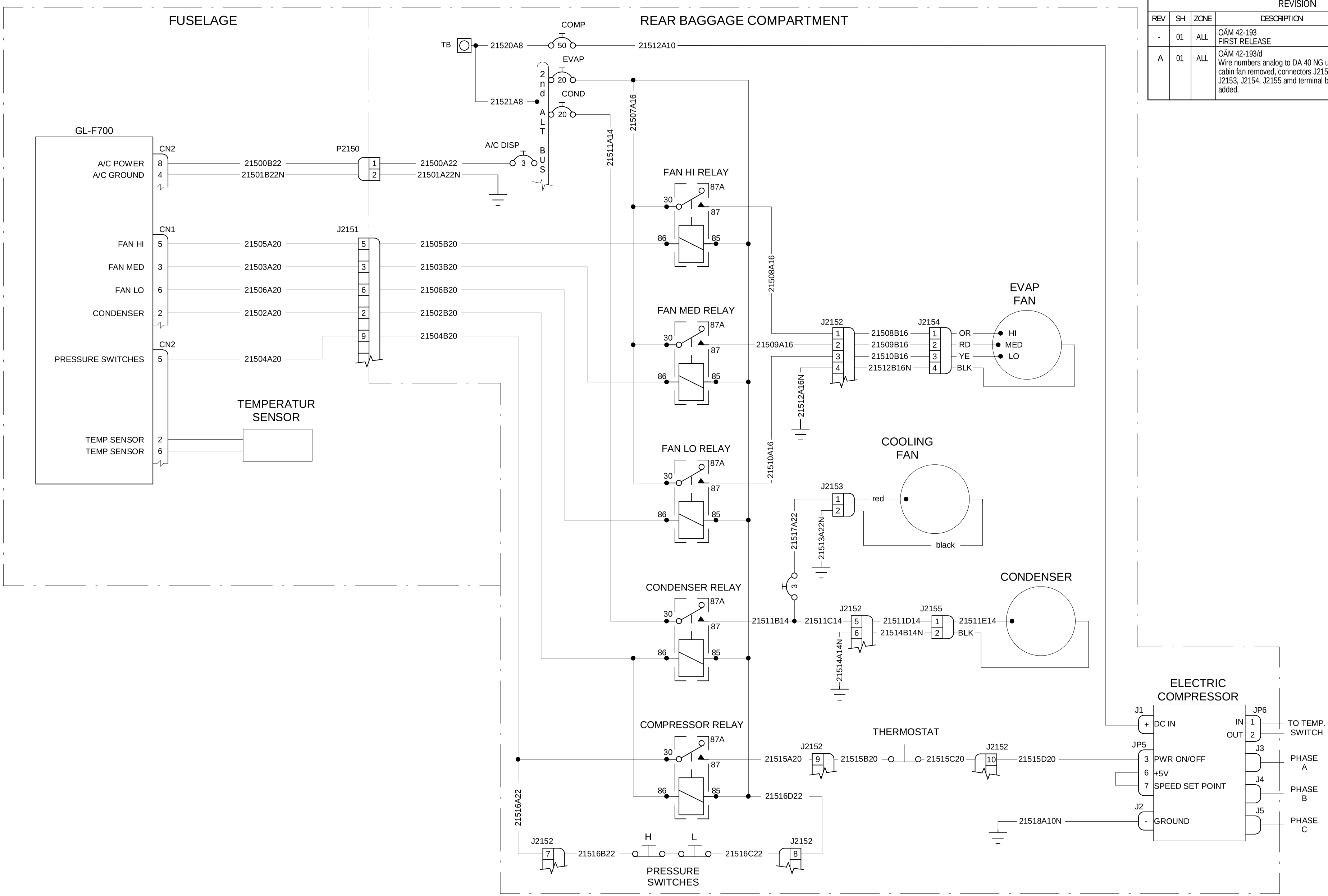
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-193 FIRST RELEASE	19.08.10	SEE TB
A	01	ALL	OÄM 42-193/d Wire numbers analog to DA 40 NG updated, cabin fan removed, connectors J2152, J2153, J2154, J2155 and terminal block added.	20.06.12	SEE TB



DIMENSIONS **METRIC**		IDENTIFICATION MARKINGS **DP-S-17-00001**	Diamond Aircraft Industries GmbH		Diamond Aircraft Industries		N. A. Otto-Straße 5 A-2700 Wiener Neustadt	
FIRST ANGLE PROJECTION	FORMAT **A2**	CLASSIFICATION: **NONE**	DEPARTMENT	SIGN	DATE	PROJECT **DA 42 NG**		
			DRAWN		20.06.12	TITLE **Schematic, RACC Wiring**		
			CHECKED:					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART **NO**	QA: **N/A**					
DIMENSION TOLERANCES	3.2	THIS DRAWING WAS PRODUCED USING	STRESS: **N/A**					
2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	SOFTWARE: **SOLID EDGE V18**	MANUF.: **N/A**			DWG.ORIG. **DAIA**	DWG.NO. **D64-9221-50-01**	REV **"A"**
		FILENAME **D64-9221-50-01a.dft**	SYSTEM: **N/A**			CODE **710197**	SCALE **NTS**	SH **01** OF **01**
			APPROVED: **TL**					

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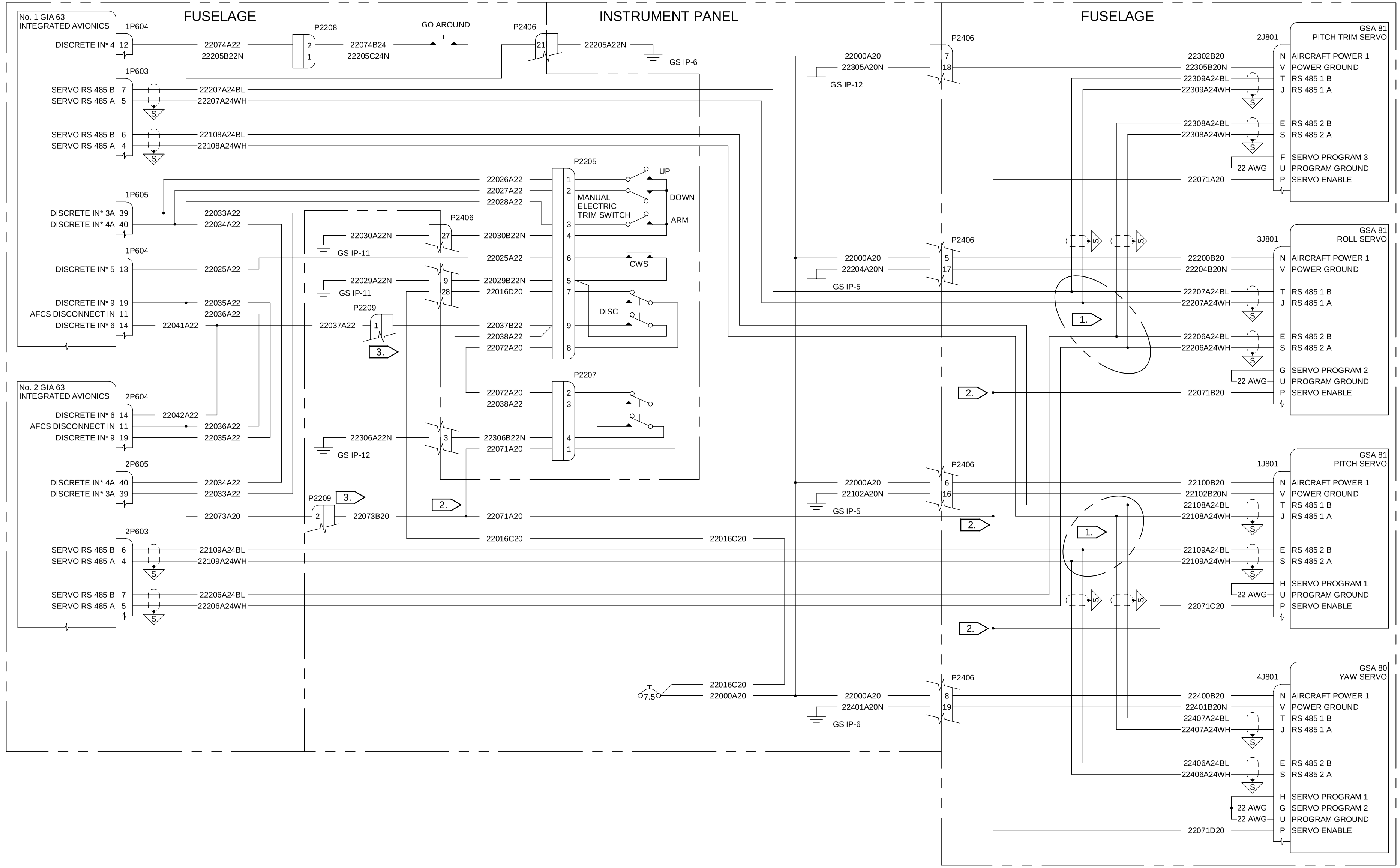


Approved : Date / Name	Checked : Date / Name	General Tolerance : ISO 2768		Scale: NTS
Next Higher Assembly : D64-9200-00-00	Title : Schematic, GFC700 Wiring			
Diamond AIRCRAFT Industries GmbH				
DA42 NG Twin Star	Drawing Number: D64-9222-10-02			Sheet 1 from 1
Saved under : D64-9222-10-02.dft				

Rev.	Change	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton

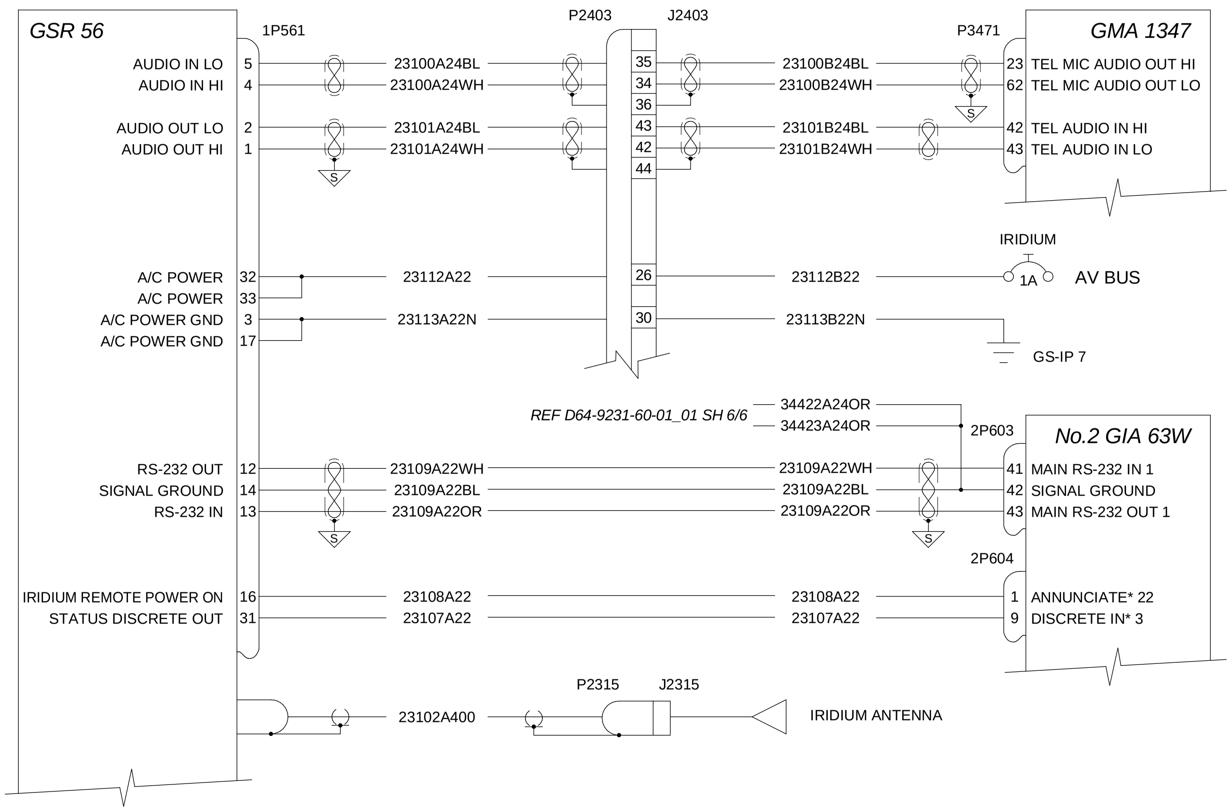
REVISIONS

Rev.	Zone	Description
"-"	all	new drawing

Weight:	N/A
Calculated Weight:	N/A

Confidential

REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-213 FIRST RELEASE	20.09.12	SEE TB



DIMENSIONS **METRIC**		IDENTIFICATION MARKINGS **DP-S-17-00001**	- / -
FIRST ANGLE PROJECTION	FORMAT **A3**	CLASSIFICATION: **NONE**	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART	**NO**
DIMENSION TOLERANCES	3.2	THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE V18**	
2 DECIMAL ±0,25 1DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	FILENAME **D64-9223-15-00.dft**	

Diamond Aircraft Industries GmbH — Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN			20.09.12
CHECKED:			
QA:	N/A		
STRESS:	N/A		
MANUF.:	N/A		
SYSTEM:	N/A		
APPROVED:	TL		

PROJECT **DA 42 NG /M-NG**

TITLE

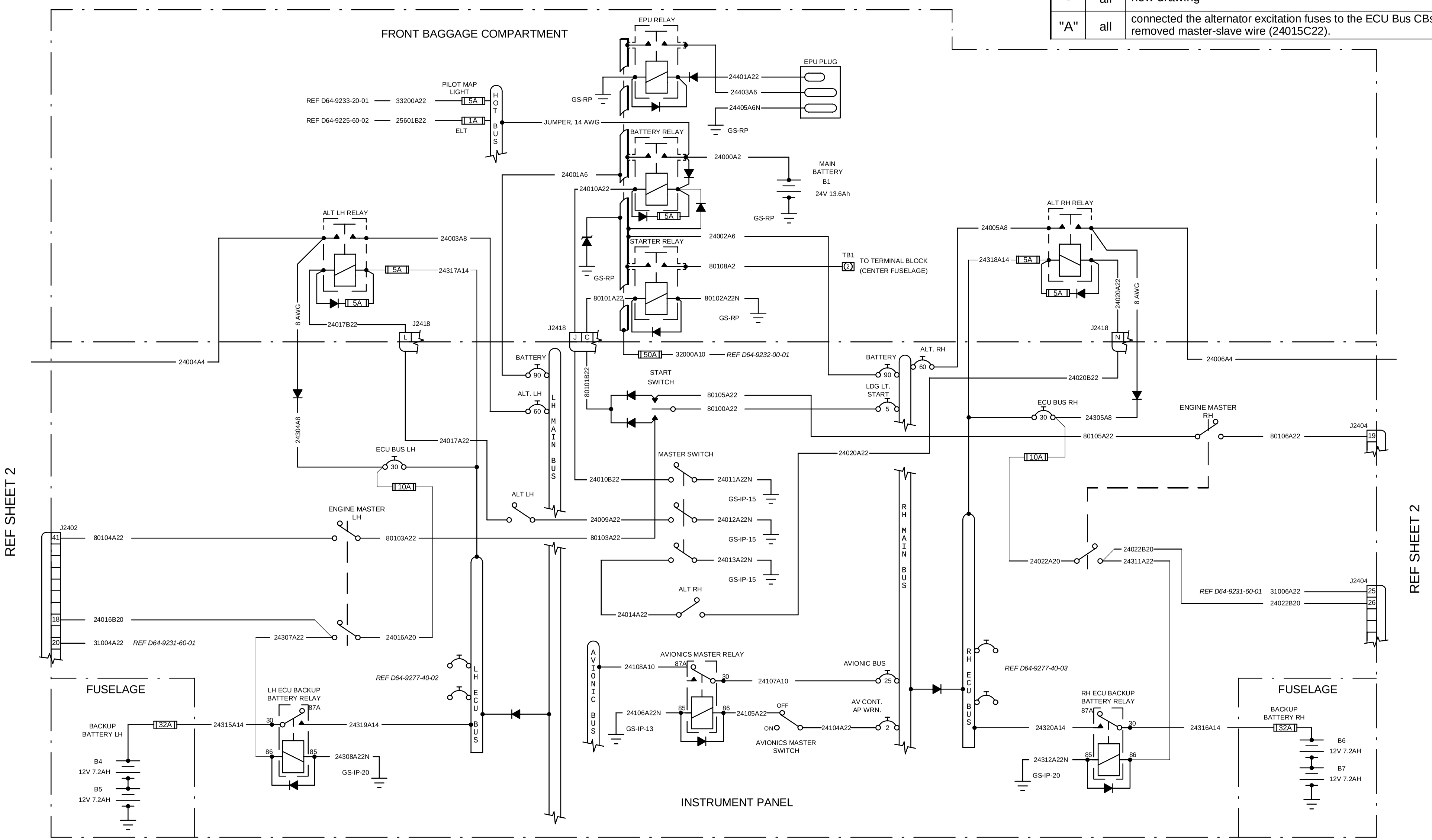
Schematic, GSR 56 Wiring

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9223-15-00**	"-"

CODE **710197** SCALE NTS SH **01** OF **01**

Confidential

Rev.	Zone	Description
"-"	all	new drawing
"A"	all	connected the alternator excitation fuses to the ECU Bus CBs, removed master-slave wire (24015C22).



Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"A"	VÄM 42-004	10.11.08	Kowarsch
"-"		04.08.08	Kowarsch

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

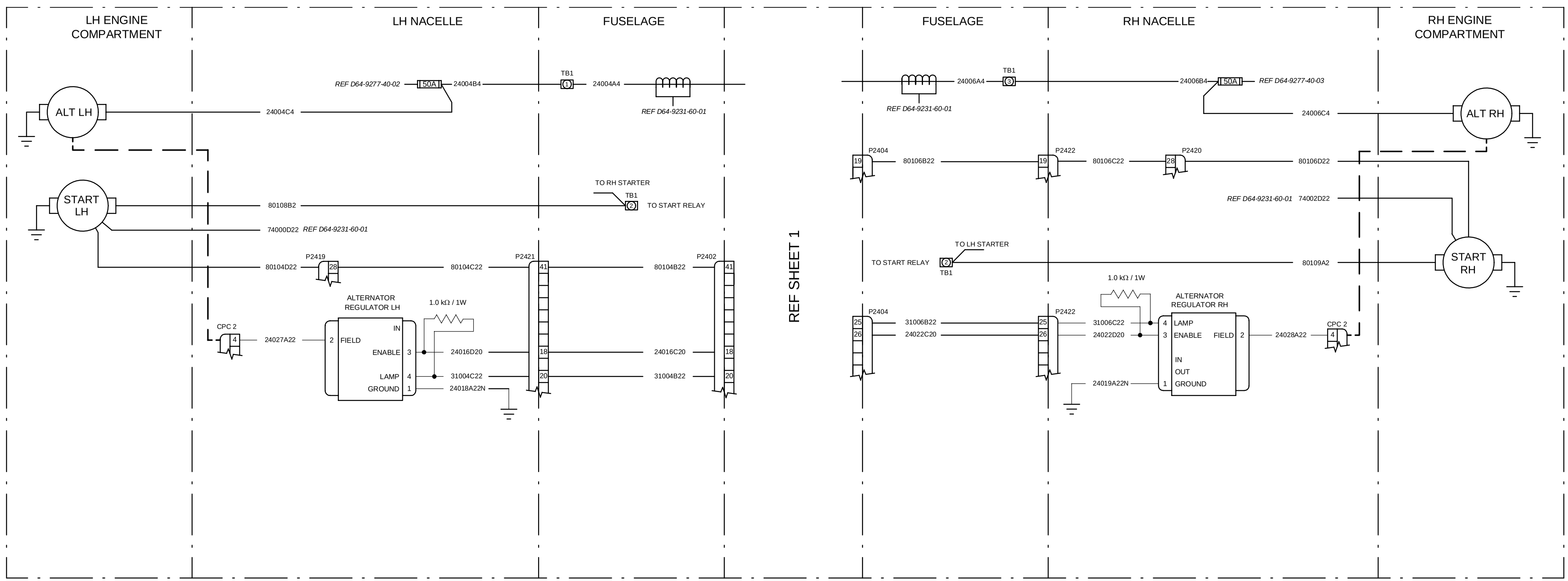
Title : Schematic, Electrical System

Drawing Number: D64-9224-30-01

Sheet 1 from 2

Saved under : D64-9224-30-01a.dft

REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing
"A"	all	added pinout of alternator regulators, removed master-slave wire (24015X22), added pull-up resistor.



Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"A"	VÄM 42-004	10.11.08	Kowarsch
"-"		04.08.08	Kowarsch

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

Title : Schematic, Electrical System

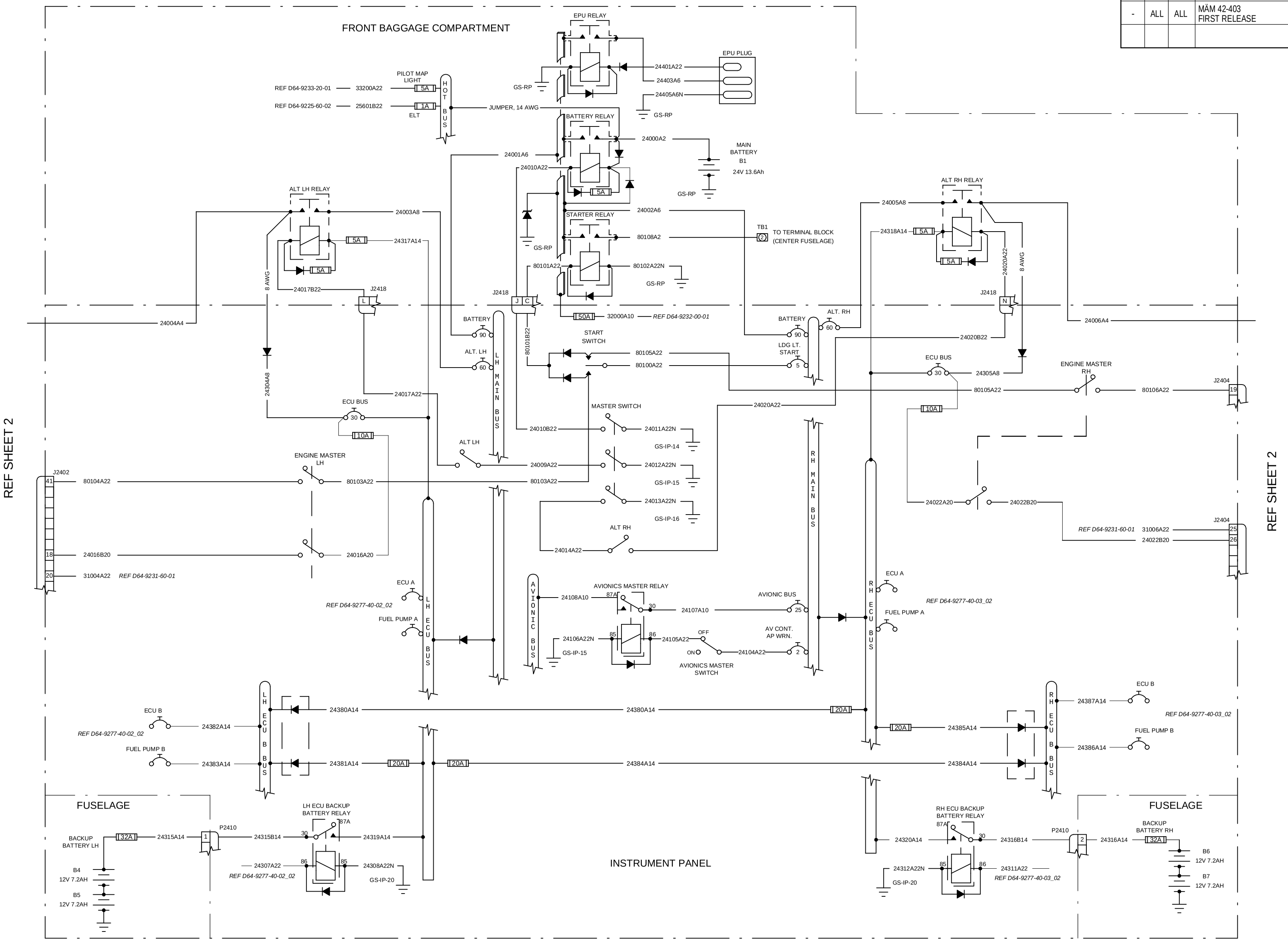
Drawing Number: D64-9224-30-01

Sheet 2 from 2

Saved under : D64-9224-30-01a.dft

Confidential

REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	ALL	ALL	MÄM 42-403 FIRST RELEASE	24.11.09	SEE TB



DIMENSIONS METRIC	FORMAT A2	IDENTIFICATION MARKINGS DE-S-10-00003	Diamond Aircraft Industries GmbH — Diamond Aircraft Industries, N. A. Otto-Straße 5, A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION		CLASSIFICATION: NONE	PROJECT DA 42 NG
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART NO	TITLE Schematic, Electrical System, ECU Split Bus
DIMENSION TOLERANCES: 2 DECIMAL ±0,25; 1 DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5	3.2 FINISH IN MICROMETER	THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18	DWG.ORIG. DAIA; DWG.NO. D64-9224-30-01_01; REV "-"
		FILENAME D64-9224-30-01_01.dft	CODE 710197; SCALE NTS; SH 01 OF 02

DEPARTMENT		SIGN	DATE
DRAWN	Kowarsch		24.11.09
CHECKED	Kowarsch		
QA	N/A		
STRESS	N/A		
MANUF.	N/A		
SYSTEM	N/A		
APPROVED	TL		

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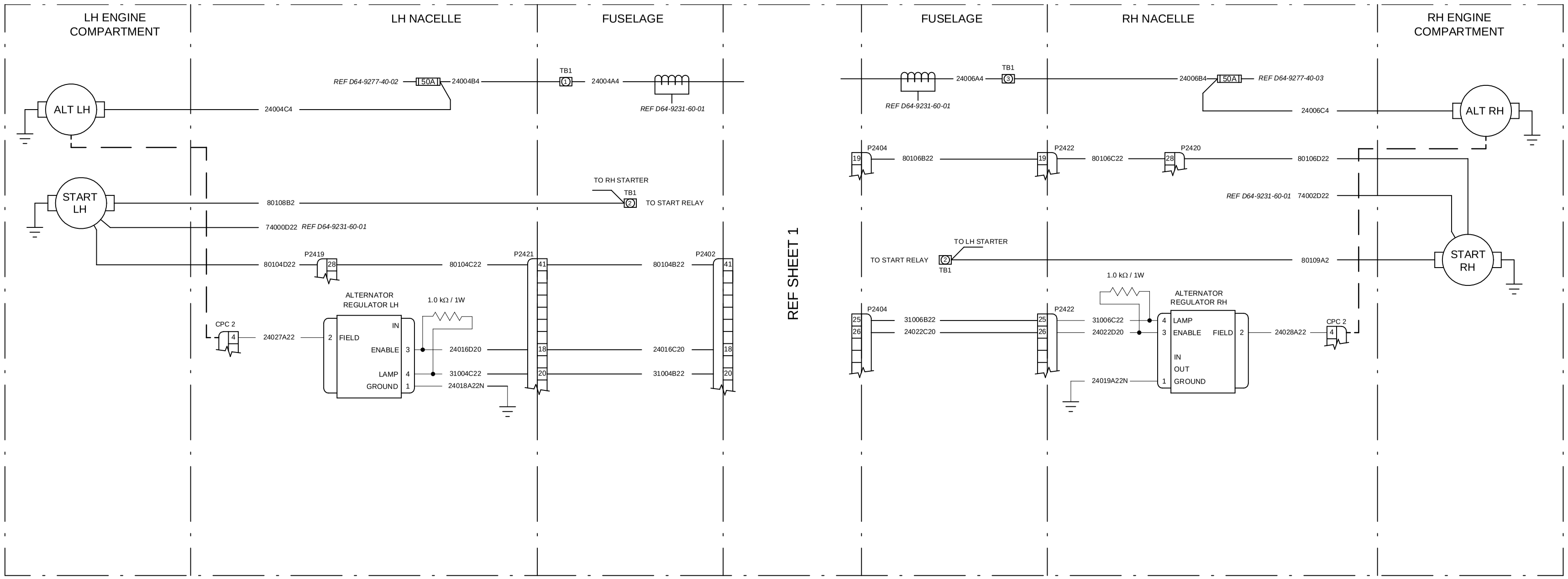

Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE Schematic, Electrical System, ECU Split Bus	DWG.ORIG. DAIA	DWG.NO. D64-9224-30-01_01	REV "-"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt		CODE 710197	SCALE NTS	SH 02 OF 02

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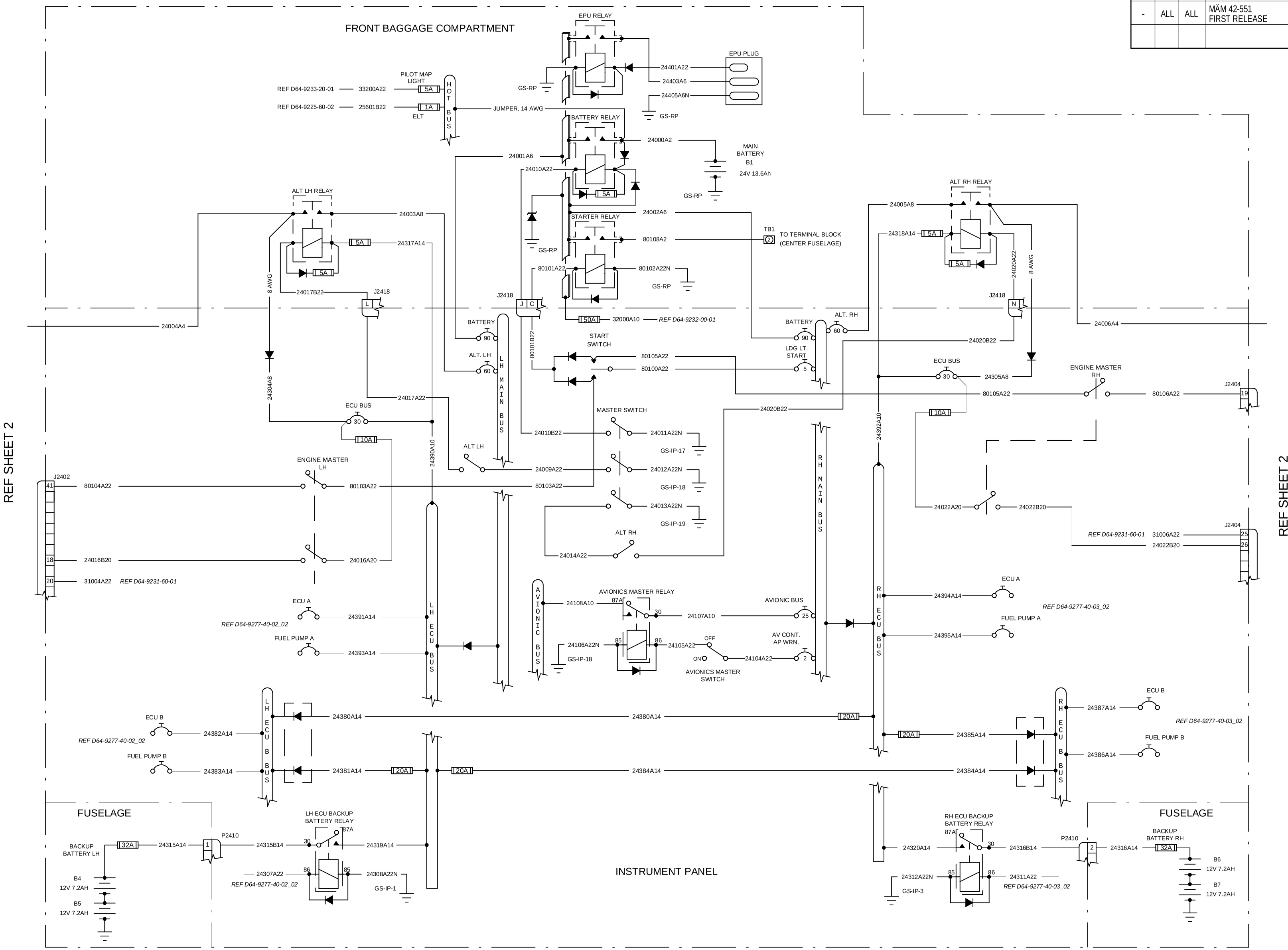
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	ALL	ALL	MÄM 42-551 FIRST RELEASE	26.08.11	SEE TB



DIMENSIONS METRIC		IDENTIFICATION MARKINGS	
FIRST ANGLE PROJECTION	FORMAT A2	DP-S-17-00001	
		CLASSIFICATION: NONE	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART	NO
DIMENSION TOLERANCES	3.2	THIS DRAWING WAS PRODUCED USING	
2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	SOFTWARE: SOLID EDGE V18	
		FILENAME: D64-9224-30-01_02.dft	

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		26.08.11
CHECKED:		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED: TL		

PROJECT: DA 42 NG

TITLE: **Schematic, Electrical System**

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9224-30-01_02	"-"
CODE 710197	SCALE NTS	SH 01 OF 02

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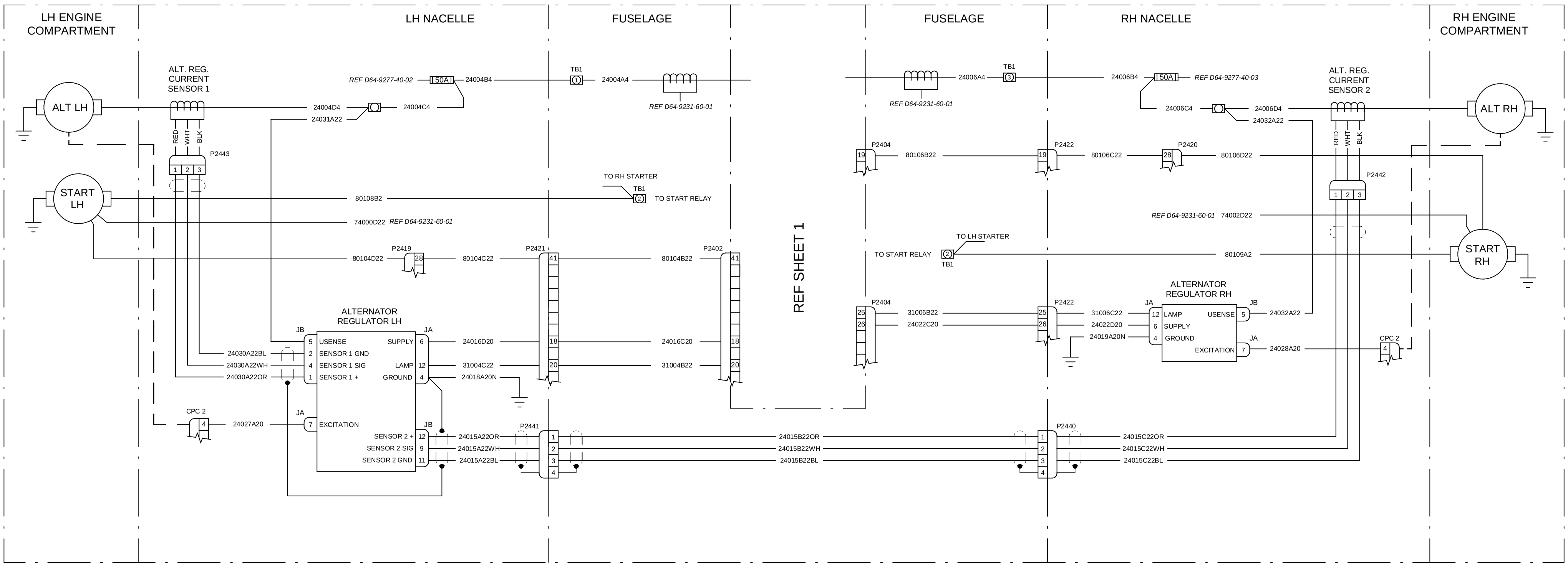

Diamond Aircraft Industries GmbH / Diamond Aircraft Industries	PROJECT DA 42 NG	TITLE Schematic, Electrical System	DWG.ORIG. DAIA / DWG.NO. D64-9224-30-01_02 / REV "-"
N. A. Otto-Straße 5, A-2700 Wiener Neustadt			CODE 710197 / SCALE NTS / SH 02 OF 02

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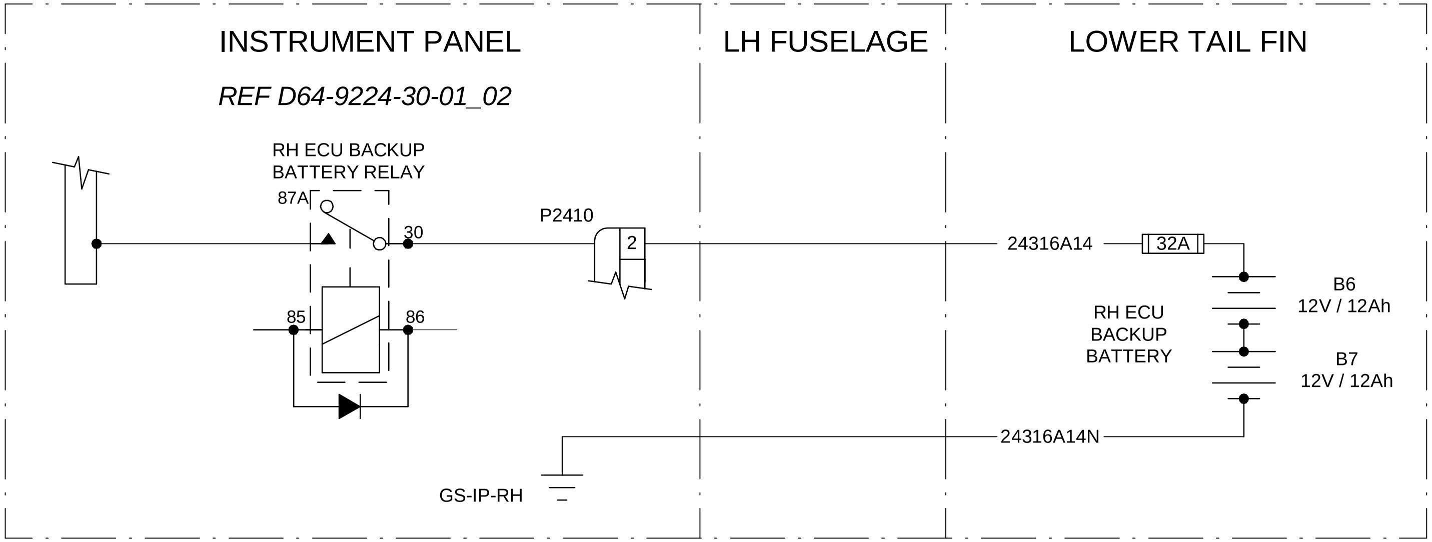
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-247 FIRST RELEASE	06.03.14	SEE TB



DIMENSIONS **METRIC**

FIRST ANGLE PROJECTION | FORMAT **A3**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM

DIMENSION TOLERANCES

2 DECIMAL	±0,25
1 DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

3.2 FINISH IN MICRO-METER

IDENTIFICATION MARKINGS **DP-S-17-00001**

CLASSIFICATION: **NONE**

INTERCHANGEABLE PART **NO**

THIS DRAWING WAS PRODUCED USING SOFTWARE **SOLID EDGE V18**

FILENAME **D64-9224-30-01x01.dft**

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		06.03.14
CHECKED:		
QA: **N/A**		
STRESS: **N/A**		
MANUF.: **N/A**		
SYSTEM: **N/A**		
APPROVED: **TL**		

PROJECT **DA 42 NG /M-NG**

TITLE

Schematic, RH ECU Backup Battery, Tail Fin Installation

DWG.ORIG. **DAIA** | DWG.NO. **D64-9224-30-01x01** | REV "-"

CODE **710197** | SCALE NTS | SH **01** OF **01**

Confidential

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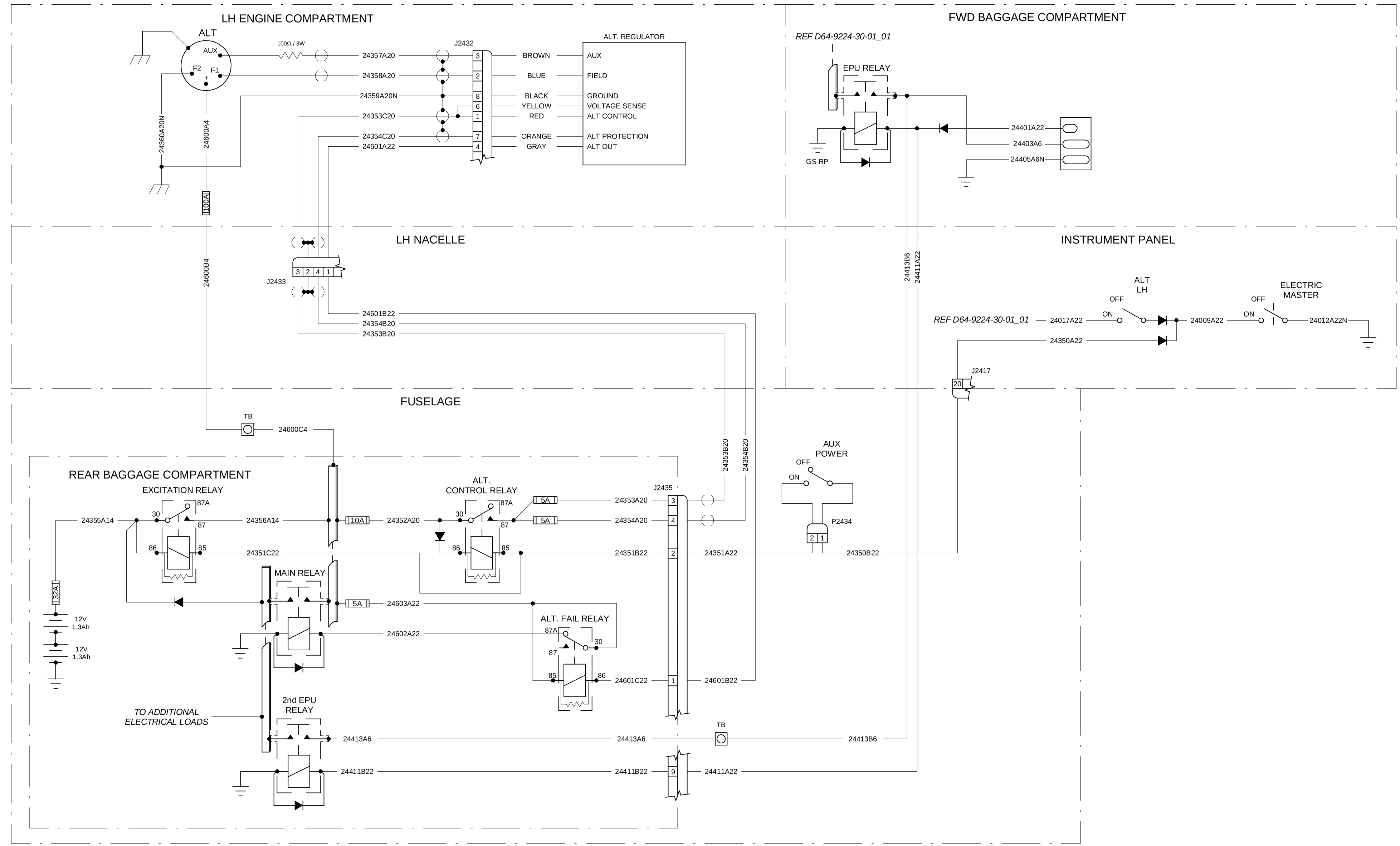


REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-204 FIRST RELEASE	13.04.11	SEE TB

DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT A2
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	
DIMENSION TOLERANCES	3.2
2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER
IDENTIFICATION MARKINGS	DE-S-10-00003
CLASSIFICATION	NONE
INTERCHANGEABLE PART	NO
THIS DRAWING WAS PRODUCED USING SOFTWARE	SOLID EDGE V18
FILENAME	D64-9224-30-02.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries
N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		13.04.11
CHECKED		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED: TL		

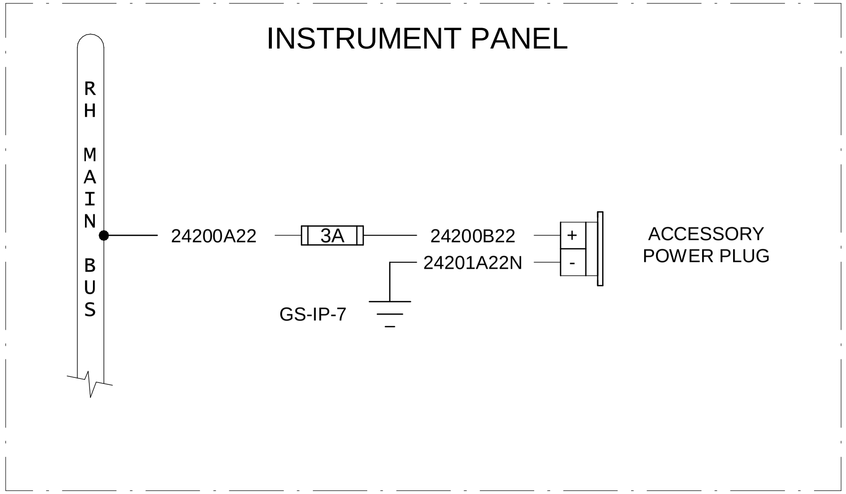
PROJECT: DA 42 NG

TITLE: **Schematic, Second Alternator**

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9224-30-02	"-"
CODE 710197	SCALE NTS	SH 01 OF 01

Confidential

REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	MÄM 42-878 NEW DRAWING, DOES NOT SUPERSEDE ANOTHER DRAWING.	07.11.14	SEE TB



DIMENSIONS **METRIC**	IDENTIFICATION MARKINGS **DP-S-17-00001**	Diamond Aircraft Industries GmbH	Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION	FORMAT **A3**	CLASSIFICATION: **NONE**		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART **NO**			
DIMENSION TOLERANCES 2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	3.2 FINISH IN MICRO-METER	THIS DRAWING WAS PRODUCED USING SOFTWARE **SOLID EDGE ST6**		
		FILENAME **D64-9224-60-01.dft**		

DEPARTMENT		SIGN	DATE
DRAWN			**07.11.14**
CHECKED:			
QA:	**N/A**		
STRESS:	**N/A**		
MANUF.:	**N/A**		
SYSTEM:	**N/A**		
APPROVED:			

PROJECT **DA 42 NG**

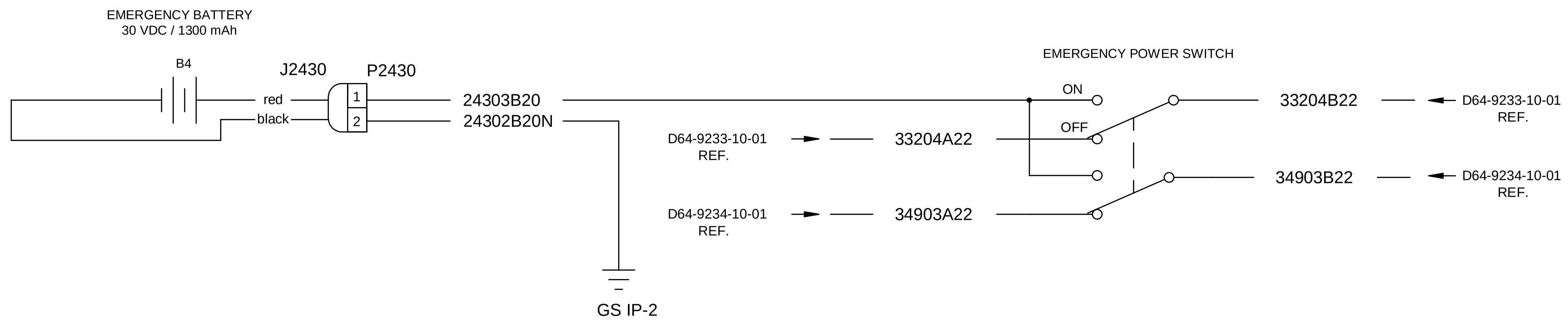
TITLE

Schematic, Accessory Power Plug

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9224-60-01**	"-"

CODE **710197** SCALE NTS SH **01** OF **01**

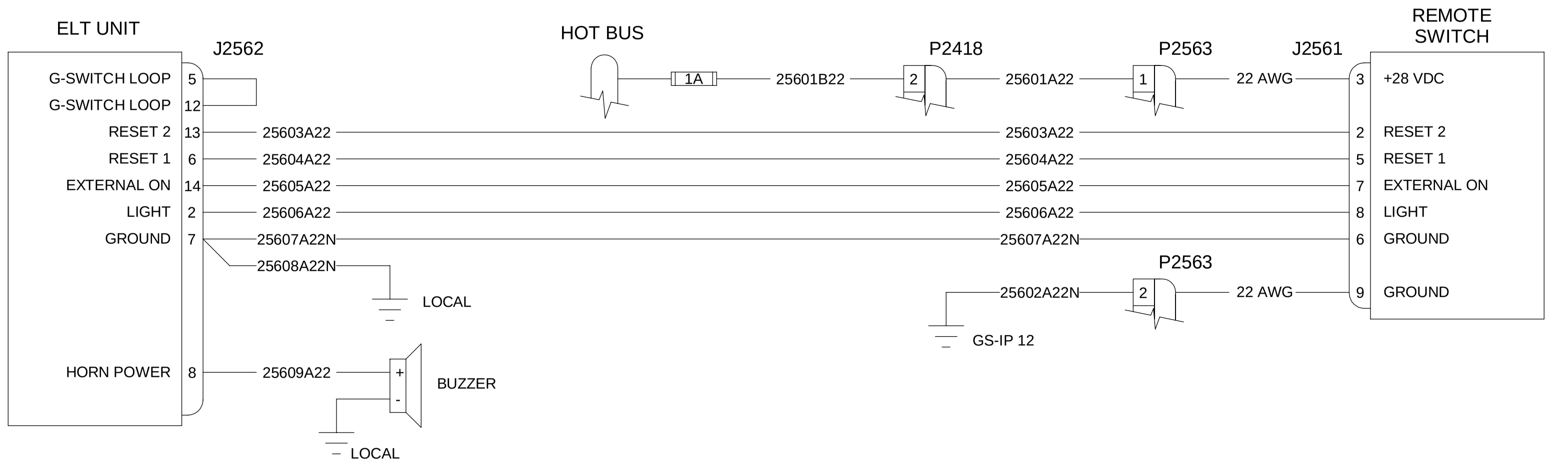
Rev.	Zone	Description
"-"	all	new drawing



Weight:	N/A
Calculated Weight:	N/A

Approved : Date / Name	Checked : Date / Name	General Tolerance : ISO 2768 medium	Scale: NTS
"-" | VÄM 42-004 | 05.08.08 | Kowarsch	Next Higher Assembly : D64-9200-00-00	Title : Schematic, Emergency Power	
Rev. | Change | Date | Name	Diamond AIRCRAFT Industries GmbH — DA 42 NG	Drawing Number: D64-9225-60-01	Sheet 1 from 1
	Saved under : D64-9225-60-01.dft		

REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing



Weight:	N/A
Calculated Weight:	N/A

Approved :		Checked :	
Date	Name	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton
Rev.	Change	Date	Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA42 NG Twin Star

Title : Schematic, ELT ME 406

Drawing Number: D64-9225-60-02

Sheet 1 from 1

Saved under : D64-9225-60-02

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REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-226 FIRST RELEASE	27.02.12	SEE TB

DIMENSIONS METRIC	IDENTIFICATION MARKINGS DP-S-17-00001 (- / -)	Diamond Aircraft Industries GmbH — Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION	FORMAT A3	CLASSIFICATION: NONE	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART NO		
DIMENSION TOLERANCES 3.2	THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18		
2 DECIMAL ±0,25 1DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	FILENAME D64-9225-60-03.dft	

DEPARTMENT	SIGN	DATE
DRAWN		27.02.12
CHECKED:		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED: TL		

PROJECT DA 42 NG / M-NG

TITLE

Schematic, Kannad 406 AF-Compact ELT

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9225-60-03	"-"
CODE 710197	SCALE NTS	SH 01 OF 01

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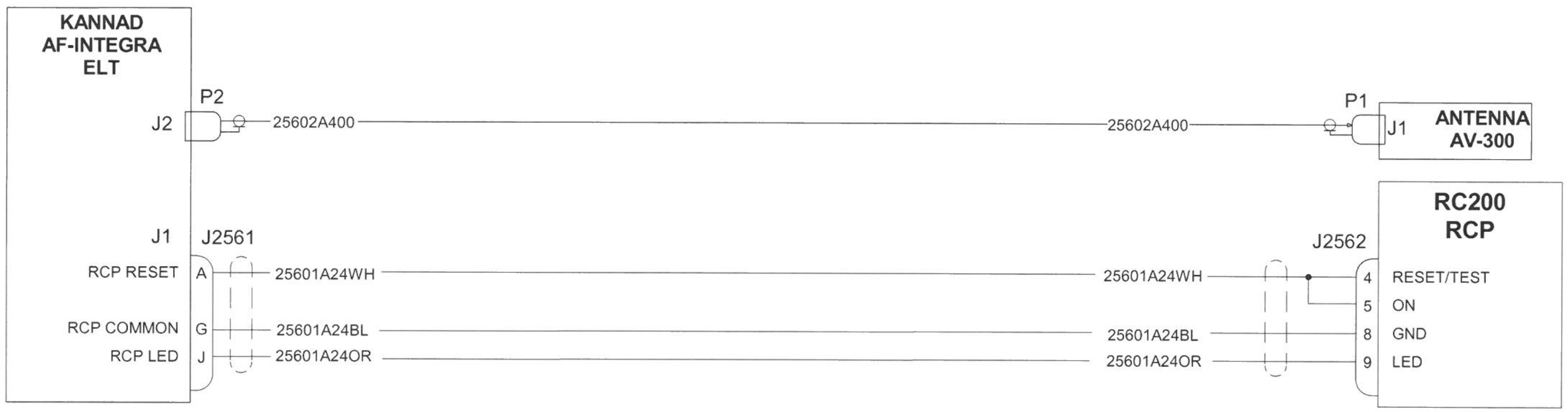
REVISION

REV	SH	ZONE	DESCRIPTION	DATE
-	01	ALL	OÄM 42-343 NEW DRAWING, DOES NOT SUPERSEDE ANOTHER DRAWING.	27.03.2019



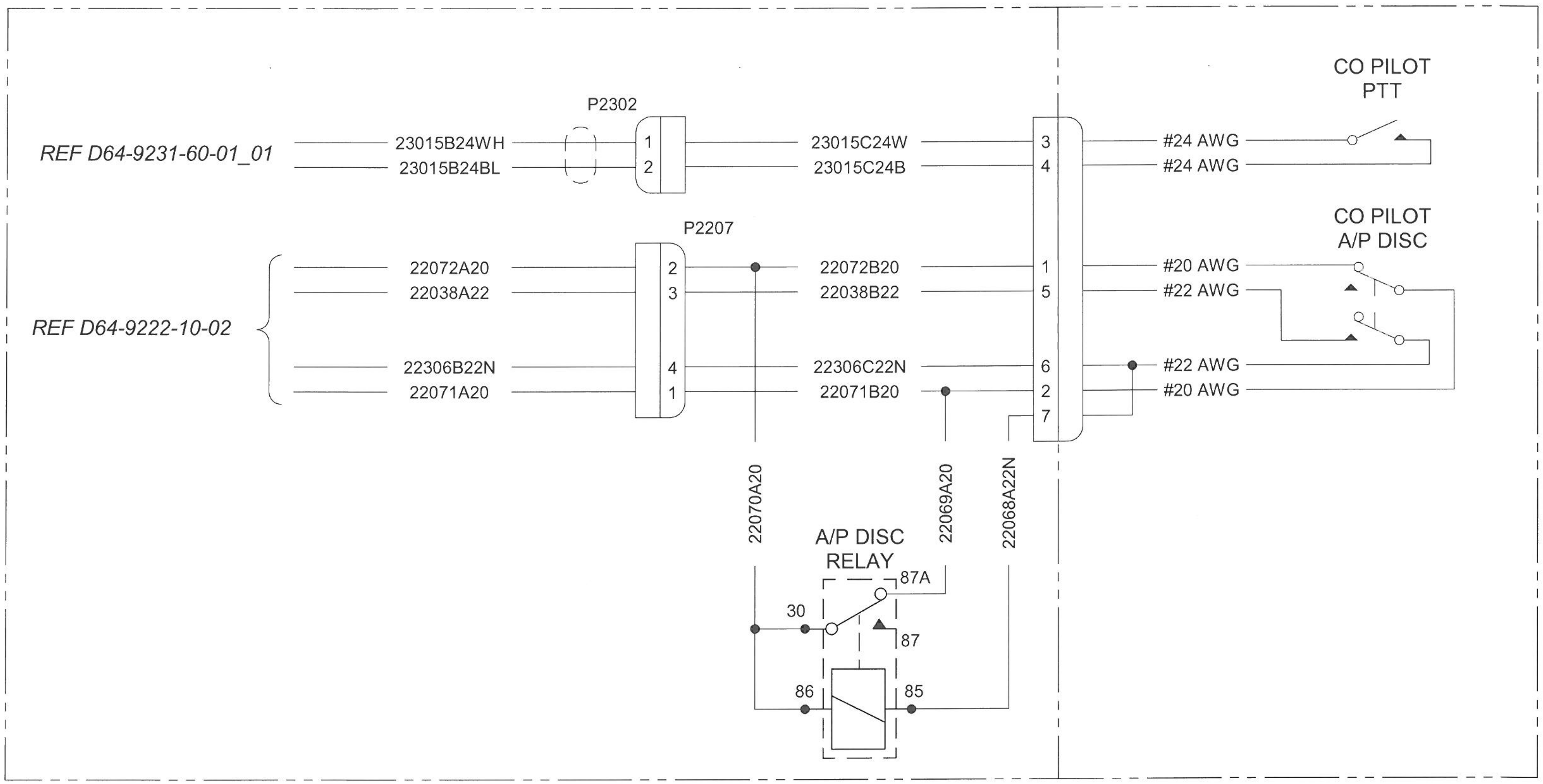
IDENTIFICATION MARKINGS **DP-S-17-00001**	FIRST ANGLE PROJECTION	DIMENSIONS **METRIC / mm**	PROJECT **DA 42 NG /M-NG**
CLASSIFICATION: **NONE**	NAME / SIGN / DATE	WEIGHT: -	INTERCHANGEABLE PART **NO**
IF NOT OTHERWISE SPECIFIED GEOMETRIC DIMENSIONING AND TOLERANCING ACC. TO **ISO 2768- mk** 3.2	DRAWN: C. Dworak 27 MAR 19	TITLE **SCHEMATIC, ELT KANNAD AF-INTEGRA WIRING**	
SCALE N.T.S.	CHECKED: M. Kowarsch 02 JUL 19	DWG.NO. **D64-9225-60-04**	REV "-"
FORMAT **A3** SOLID EDGE PDM N	RELEASED: S. Posch 02 JUL 19	NEXT HIGHER ASSY -	
		FILENAME **D64-9225-60-04.dft**	SH **01** OF **01**

Diamond Aircraft Industries GmbH

Confidential

DAIA DWG.ORIG. CODE: 710197

REVISION				
REV	SH	ZONE	DESCRIPTION	DATE
-	01	ALL	OÄM 42-283 NEW DRAWING, DOES NOT SUPERSEDE ANOTHER DRAWING.	09.06.2015



DIMENSIONS **METRIC**		IDENTIFICATION MARKINGS **DP-S-17-00001**	- / -
FIRST ANGLE PROJECTION	FORMAT **A3**	CLASSIFICATION: **NONE**	
IF NOT OTHERWISE SPECIFIED GEOMETRIC DIMENSIONING AND TOLERANCING ACC. TO **ISO 2768-mK**		INTERCHANGEABLE PART **NO**	
		THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE ST6**	
DIMENSIONS IN **mm**	FINISH IN MICRO-METER	FILENAME **D64-9227-03-00.dft**	

Diamond Aircraft Industries GmbH — Diamond Aircraft Industries, N. A. Otto-Straße 5, A-2700 Wiener Neustadt

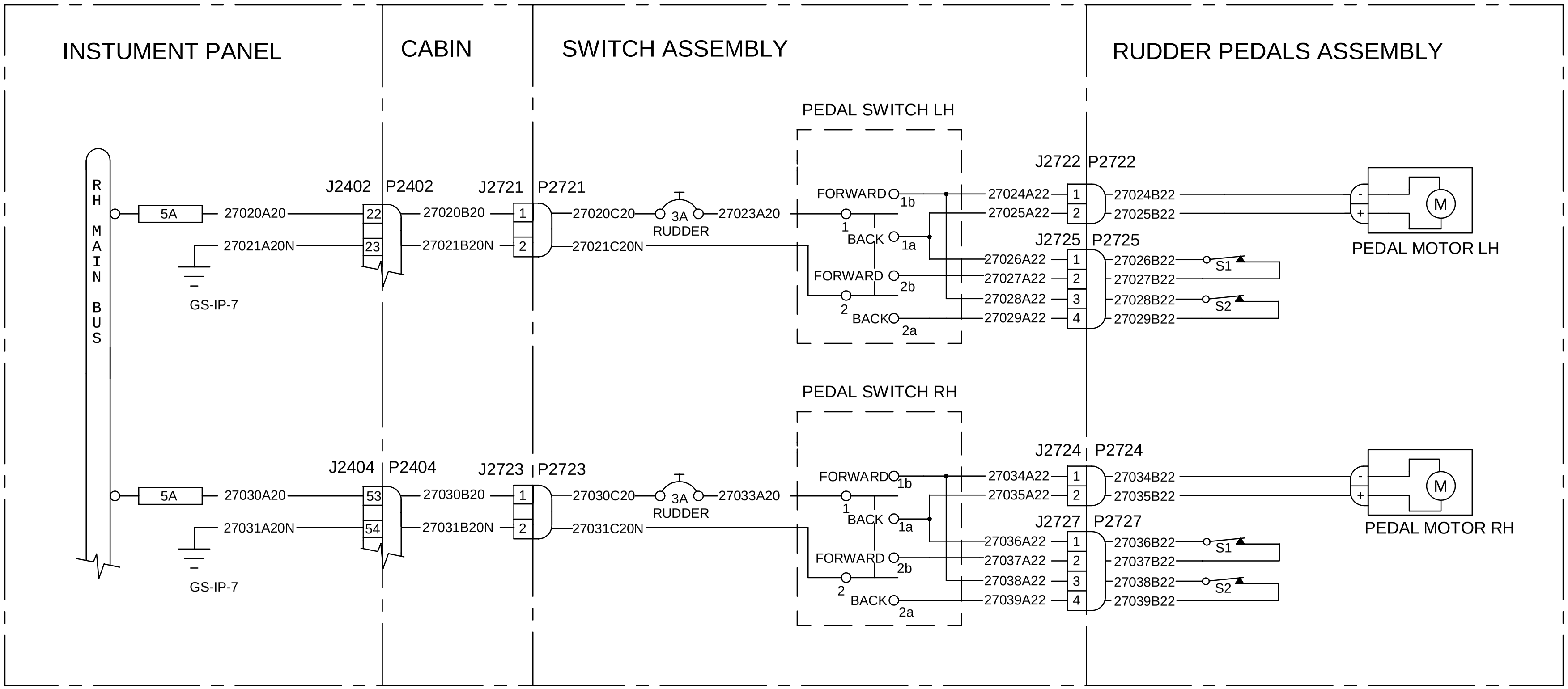
	NAME / SIGN / DATE
DRAWN:	R. Schuster 29 JUN 15
CHECKED:	M. Kowarsch 29 JUN 15
RELEASED:	M. Scheikl 30 JUN 15

PROJECT **DA 42 NG**

TITLE

SCHEMATIC, REMOVABLE CO-PILOT STICK WIRING

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9227-03-00**	-
CODE **710197**	SCALE NTS	SH **01** OF **01**



REVISIONS

Rev.	Zone	Description
"-"	all	new drawing

Weight:	N/A
Calculated Weight:	N/A

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Rev.	Change	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA42 NG Twin Star

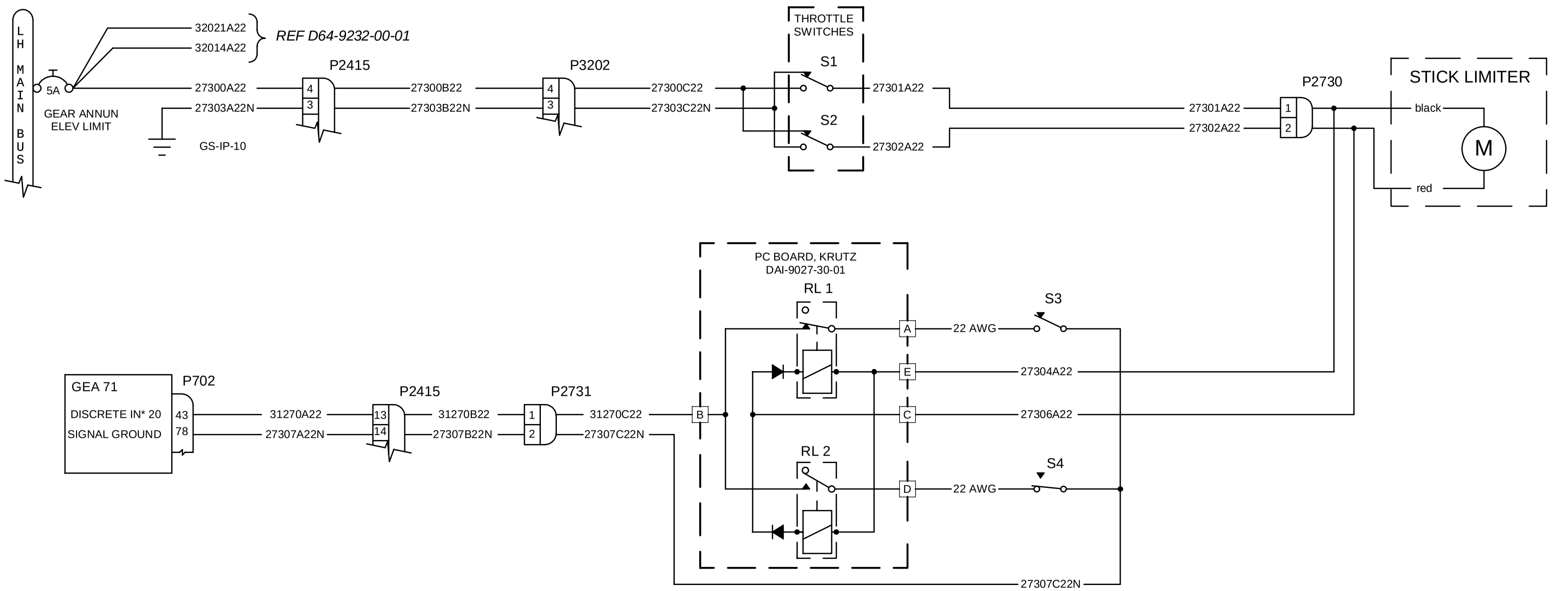
Title : Schematic, Rudder Pedal Adjust

Drawing Number: D64-9227-20-01

Sheet 1 from 1

Saved under : D64-9227-20-01.dft

Rev.	Zone	Description
"-"	all	new drawing
"A"	all	removed flaps position logic.



NOTES:

1. WIRING SHOWN WITH STICK LIMITER DEACTIVATED (THROTTLE IN IDLE POSITION) AND POWERED.

Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"A"	VÄM 42-004	28.11.08	Kowarsch
"-"		14.07.08	M. Spanton

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

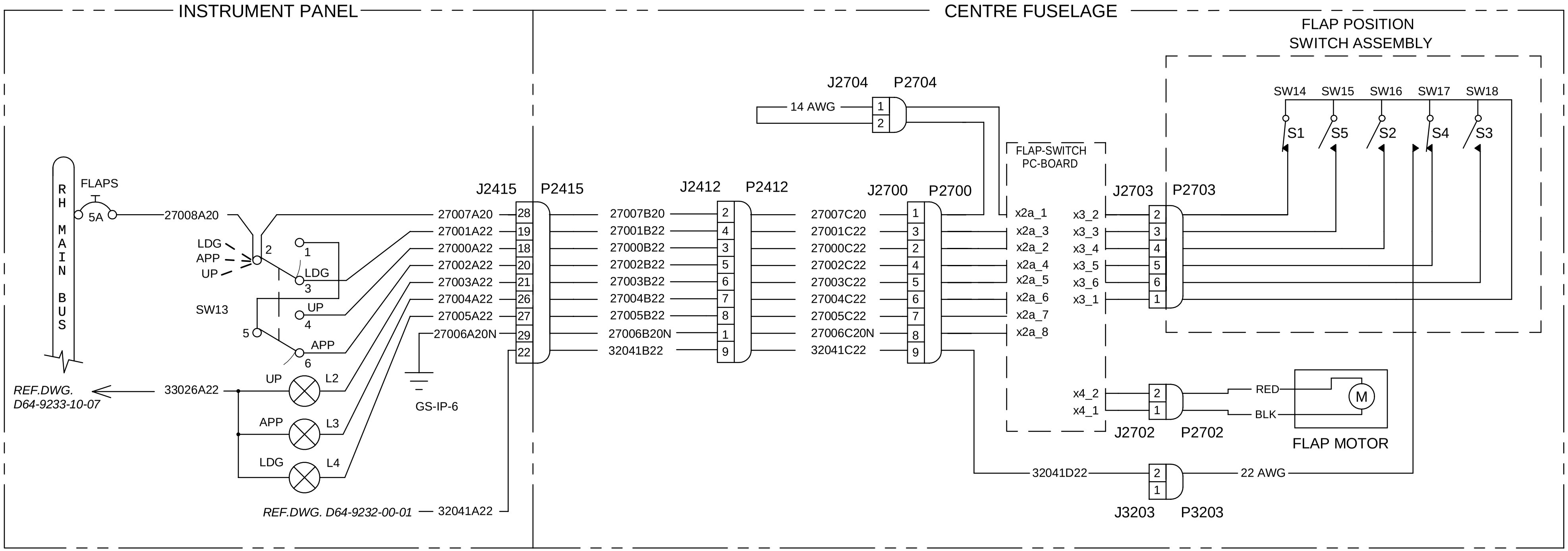
Title : Schematic, Stick Limiter

Drawing Number: D64-9227-30-01

Sheet 1 from 1

Saved under : D64-9227-30-01a.dft

REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing
"A"	all	removed wire 27310A22 for stick limiter.



Approved : Date Name	Checked : Date Name	General Tolerance : ISO 2768	Scale: NTS

Rev.	Change	Date	Name
"A"	VÄM 42-004	28.11.08	Kowarsch
"-"		14.07.08	M. Spanton

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

Title : Schematic, Flaps

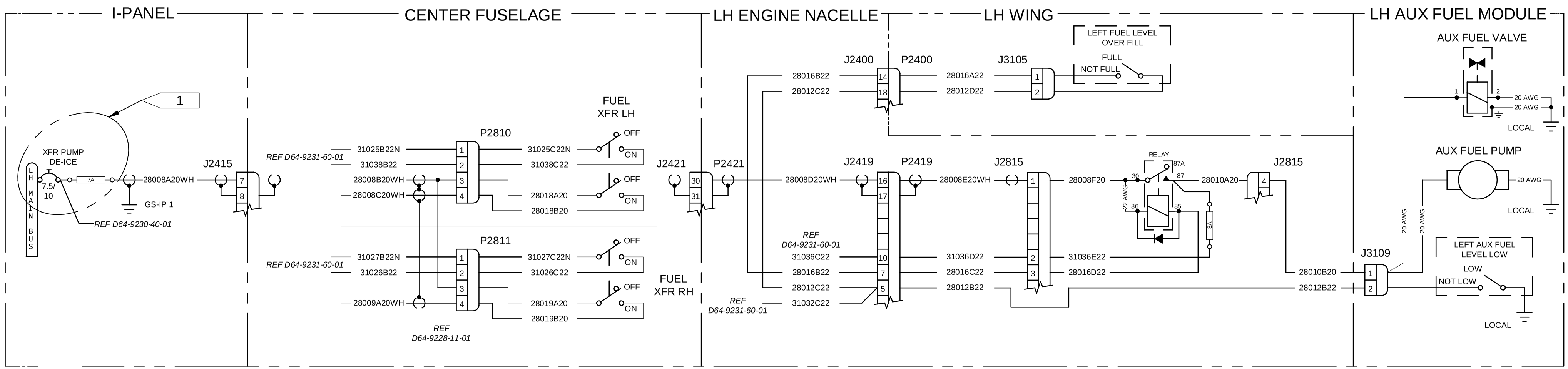
Drawing Number: D64-9227-50-01

Sheet 1 from 1

Saved under : D64-9227-50-01a.dft

Weight: N/A
Calculated Weight: N/A

REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
B	01	ALL	ÖÄM 42-056/p, CB value changed and Flag Note clarified, new standard	18.11.10	SEE TB



FLAG NOTES

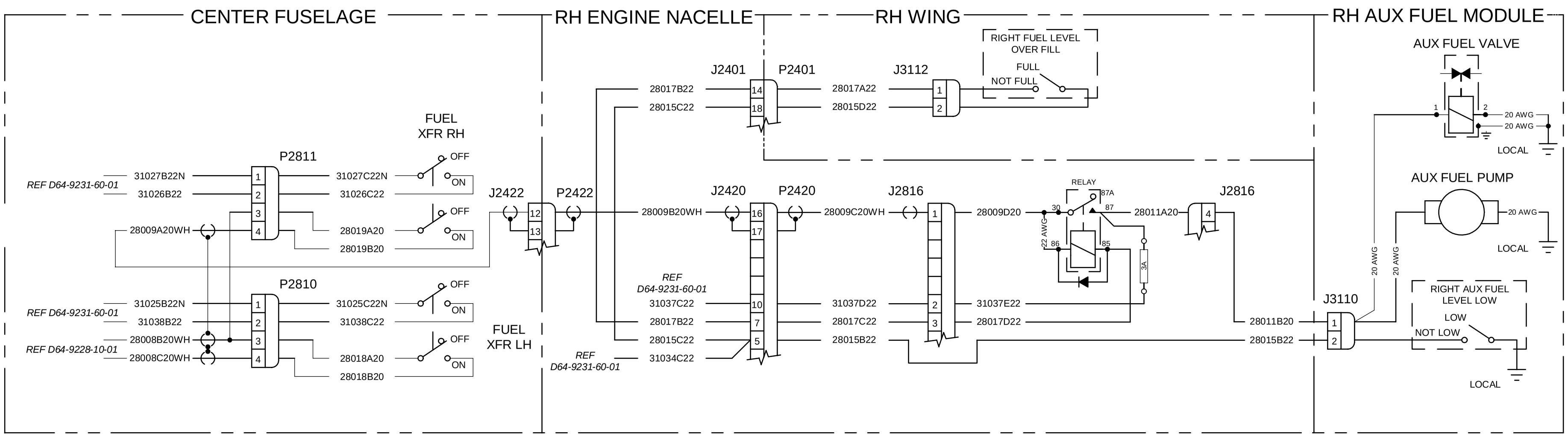
1 DEPENDING ON THE INSTALLED OPTIONS, THE INSTALLATION OF THE CIRCUIT PROTECTIVE DEVICES IS DIFFERENT.

AUX FUEL SYSTEM ONLY: 7.5A CIRCUIT BREAKER, NO FUSE

AUX FUEL SYSTEM AND DE-ICE SYSTEM: 10A CIRCUIT BREAKER AND 7A SLOW BLOW FUSE FOR THE AUX FUEL SYSTEM.

DIMENSIONS METRIC	IDENTIFICATION MARKINGS DP-S-17-00001	Diamond Aircraft Industries GmbH — Diamond Aircraft Industries	N. A. Otto-Straße 5, A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION; FORMAT A3	CLASSIFICATION: NONE	DEPARTMENT / SIGN / DATE; DRAWN 18.11.10; CHECKED:	PROJECT DA 42 NG / M-NG
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART NO	QA: N/A	TITLE Schematic, LH Aux Fuel Wiring
DIMENSION TOLERANCES 3.2	THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18	STRESS: N/A; MANUF.: N/A	DWG.ORIG. DAIA; DWG.NO. D64-9228-10-01; REV "B"
2 DECIMAL ±0,25; 1DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5; FINISH IN MICRO-METER	FILENAME D64-9228-10-01b.dft	SYSTEM: N/A; APPROVED: TL	CODE 710197; SCALE NTS; SH 01 OF 01

Rev.	Zone	Description
"-"	all	new drawing
"A"	all	added connector at relay.



Approved :		Checked :		General Tolerance : ISO 2768	Scale: NTS
Date	Name	Date	Name		

Rev.	Change	Date	Name
"A"	VÄM 42-004	22.11.08	Kowarsch
"-"		14.07.08	M. Spanton

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

Title : **Schematic, RH Aux Fuel Wiring**

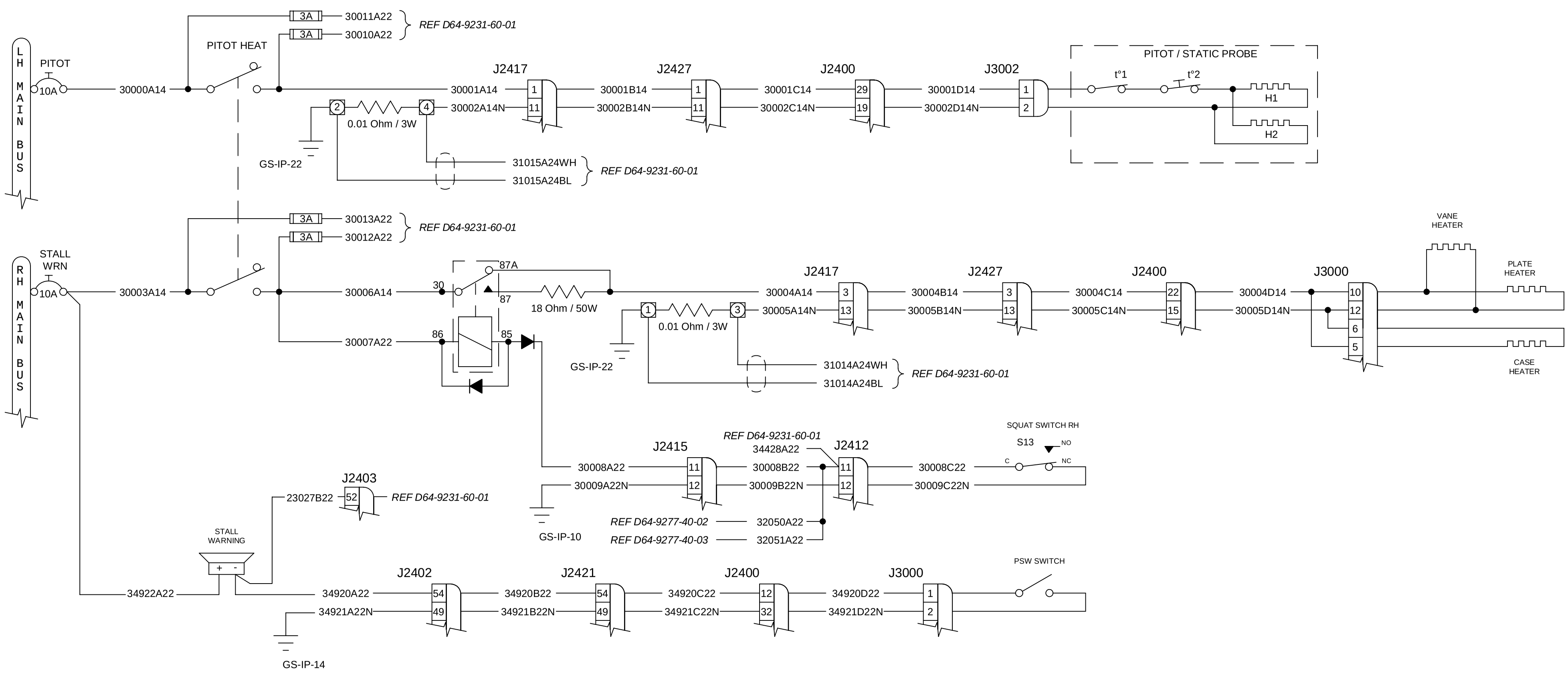
Drawing Number: **D64-9228-11-01**

Sheet 1 from 1

Saved under : D64-9228-11-01a.dft

Weight:	N/A
Calculated Weight:	N/A

REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing
"A"	C4-5	added WOW wiring for EECU´s



1. WIRING SHOWN WITH AIRPLANE ON GROUND AND NOT POWERED.

2. S13 OPENED WHEN THE AIRPLANE IS AIRBORNE, PSW SWITCH WILL CLOSE WHEN AIRPLANE STALLS.

Weight:	N/A
Calculated Weight:	N/A

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Rev.	Change	Date	Name
"A"	VÄM 42-004	20.11.08	Kowarsch
"-"		14.07.08	M. Spanton

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

Title : Schematic, Pitot and Stall Heat Warning

Drawing Number: D64-9230-30-01

Sheet 1 from 1

Saved under : D64-9230-30-01a.dft

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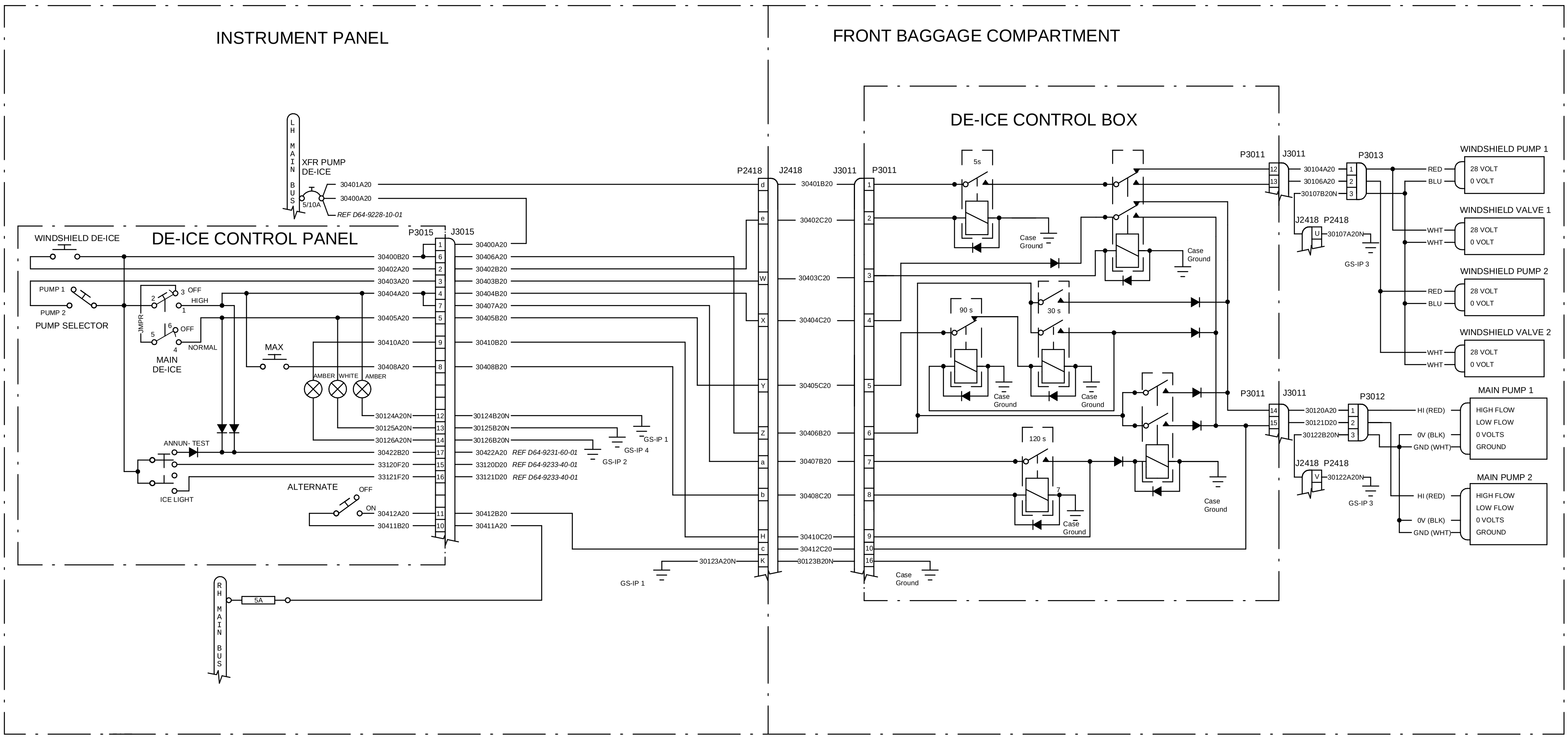
REVISION

REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	VÄM 42-004 FIRST RELEASE	14.07.08	SEE TB
A	01	C-6	OÄM 42-053/j corrected 33120E20 and 33121E20 to 33120D20 and 33121D20	04.05.09	SEE TB



DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT A3

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM

DIMENSION TOLERANCES

2 DECIMAL	±0,25
1DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

3.2 FINISH IN MICRO-METER

IDENTIFICATION MARKINGS: DE-S-10-00003

CLASSIFICATION: NONE

INTERCHANGEABLE PART: NO

THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18

FILENAME: D64-9230-40-01a.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		04.05.09
CHECKED:		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED: TL		

PROJECT: DA 42 NG

TITLE

Schematic, De-Ice Control System

DWG.ORIG.: DAIA

DWG.NO.: D64-9230-40-01

REV: A

CODE: 710197 | SCALE: NTS | SH 01 OF 01

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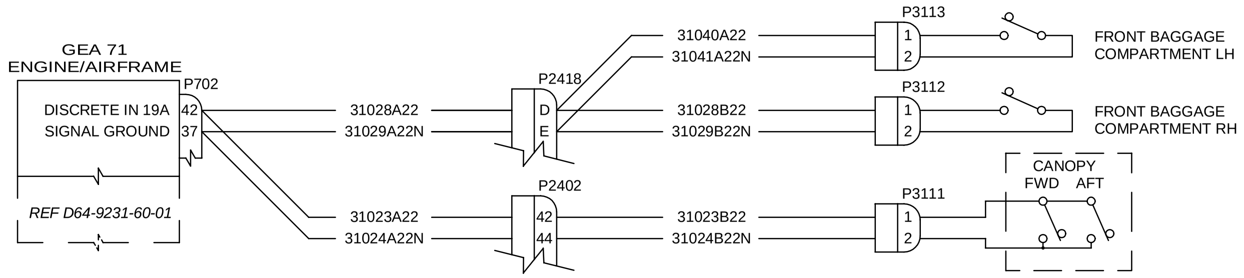
REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing
"A"	D5	corrected pinout of P2402 and P2418



Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"A"	VÄM 42-004	12.08.08	Kowarsch
"-"		14.07.08	M. Spanton

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

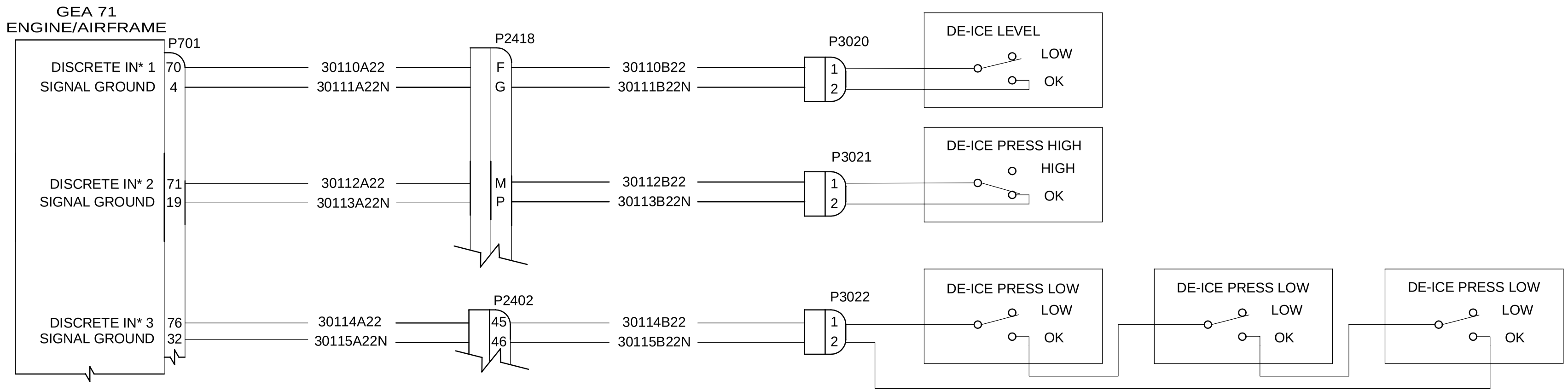
Title : Schematic, Door Warning Switches

Drawing Number: D64-9231-00-01

Sheet 1 from 1

Saved under : D64-9231-00-01a.dft

Rev.	Zone	Description
"-"	all	new drawing
"A"	E6	corrected pinout of P2418



NOTES:

1. SWITCHES SHOWN IN UNPOWERED STATE AND NO FLUID IN DE-ICE TANK

Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"A"	VÄM 42-004	12.08.08	Kowarsch
"-"		14.07.08	M. Spanton

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA 42 NG

Title : Schematic, De-Ice Warning System

Drawing Number: D64-9231-00-02

Sheet 1 from 1

Saved under : D64-9231-00-02a.dft

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REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	VÄM 42-004 FIRST RELEASE	06.08.08	SEE REV
A	05	ALL	OÄM 42-214 EVS3 WIRING ADDED	21.07.11	SEE TB

NOTES:

1. SYMBOL DESIGNATIONS
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED PAIR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED PAIR SHIELD FLOATS
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD FLOATS
   - AIRCRAFT GROUND
   - GARMIN (SHIELD BLOCK) GROUND REFER TO DOC. 190-00313-09
   - WIRE SPLICE CONNECTION
   - COAXIAL CABLE

   N/C = NO CONNECTION

2. USE DOUBLE-SHIELDED WIRING: BOTH SHIELDS SHOULD BE GROUNDED ON THE RECEIVING SIDE; ON THE TRANSMITTING SIDE, ONLY THE OUTER SHIELD SHOULD BE GROUNDED, WHILE THE INNER SHIELD SHOULD FLOAT.

DIMENSIONS METRIC	IDENTIFICATION MARKINGS DP-S-17-00001	Diamond Aircraft Industries GmbH — Diamond Aircraft Industries — N. A. Otto-Straße 5, A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION; FORMAT A3	CLASSIFICATION: NONE	DEPARTMENT / SIGN / DATE; DRAWN 21.07.11; CHECKED:
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART NO	QA: N/A
DIMENSION TOLERANCES: 2 DECIMAL ±0,25; 1DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5	THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18	STRESS: N/A; MANUF.: N/A
3.2 FINISH IN MICRO-METER	FILENAME D64-9231-60-01a.dft	SYSTEM: N/A; APPROVED: TL

PROJECT	DA 42 NG
TITLE	Schematic, G1000
DWG.ORIG.	DAIA
DWG.NO.	D64-9231-60-01
REV	"A"
CODE	710197
SCALE	NTS
SH	01 OF 06

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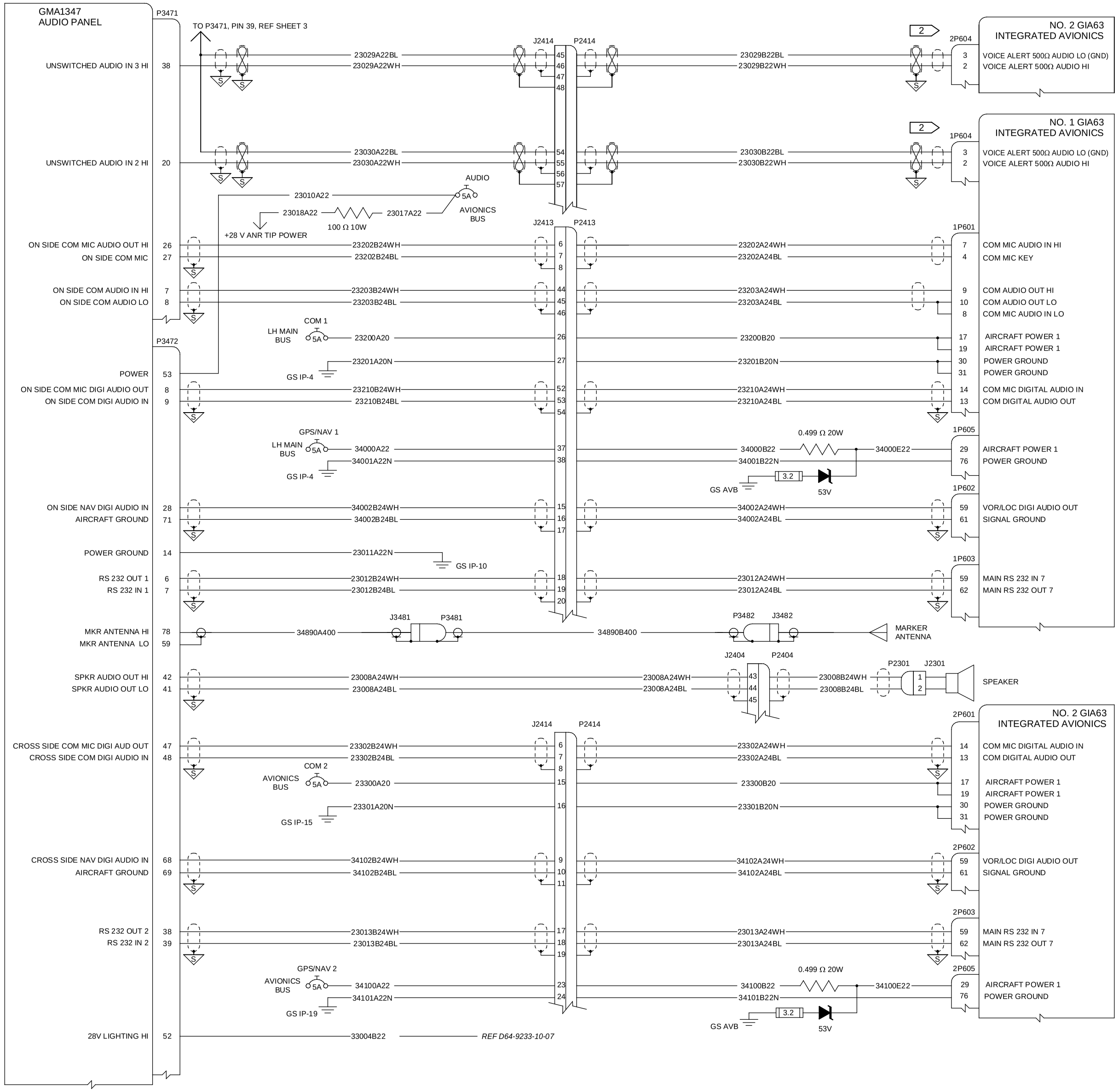
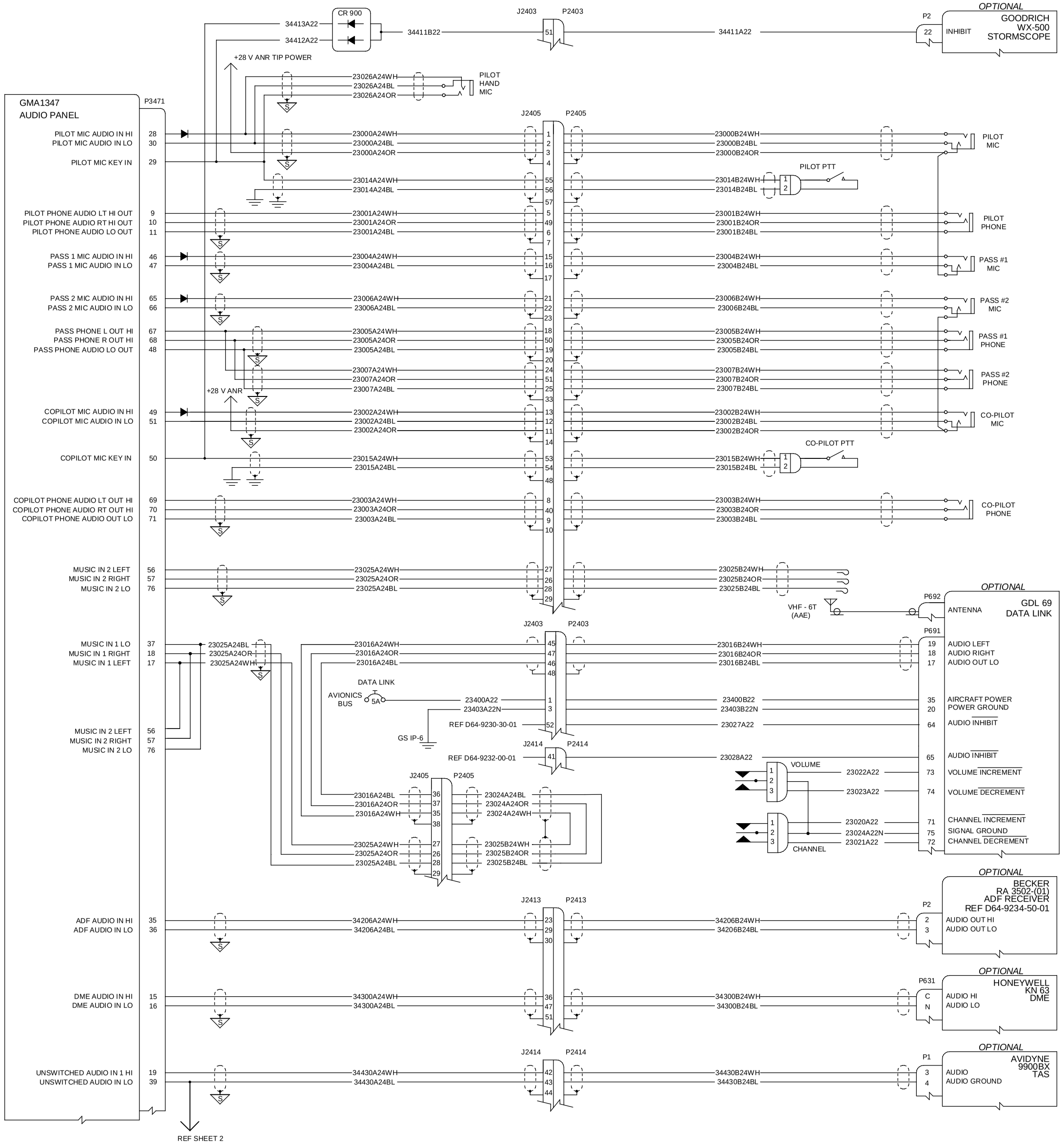


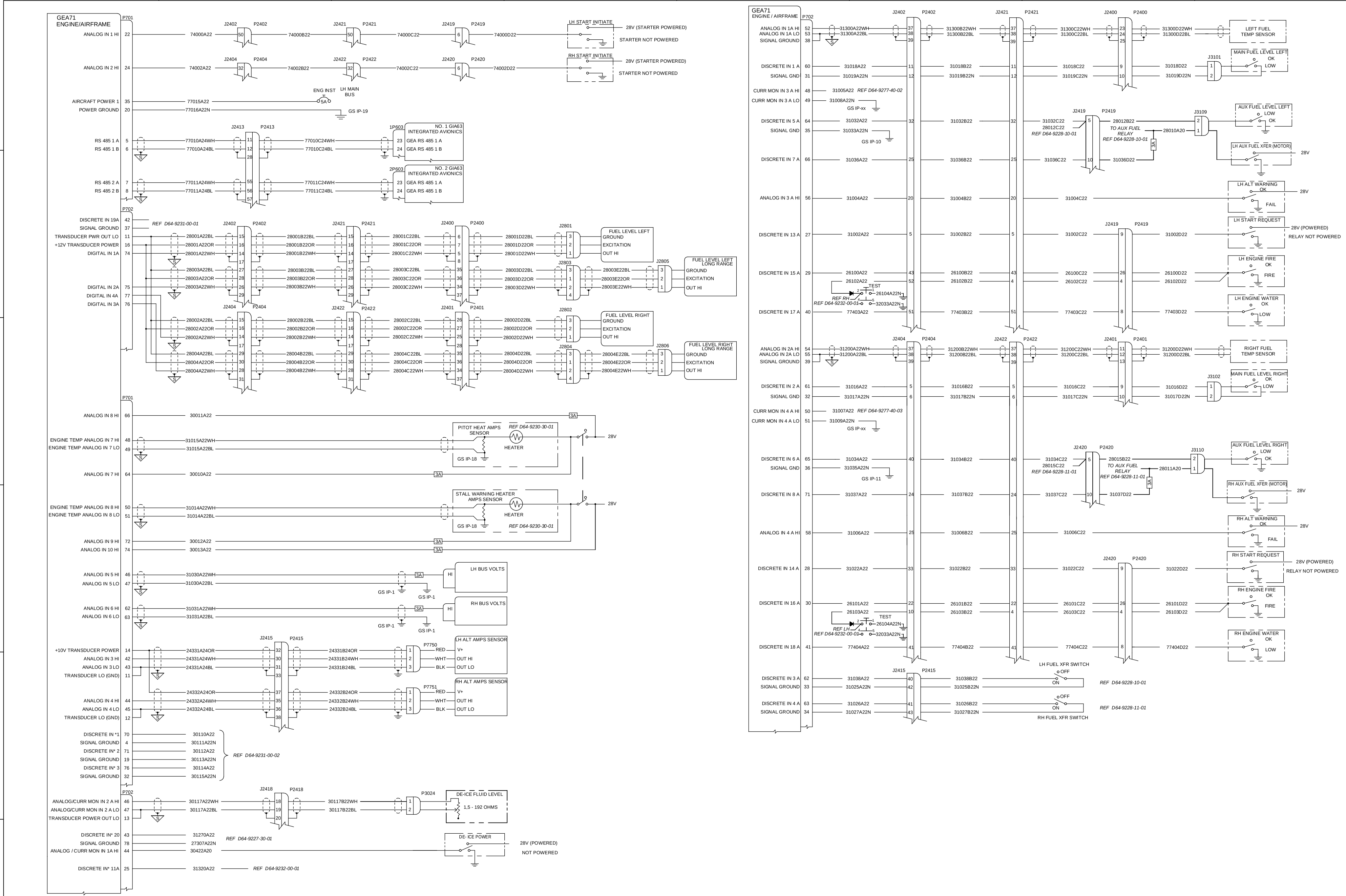
Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-01	REV "A"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	CODE 710197	SCALE	SH 02 OF 06

Confidential



Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-01	REV "A"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	CODE 710197	SCALE	SH 03 OF 06

Confidential



Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-01 / REV "A"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	CODE 710197	SCALE / SH 04 OF 06

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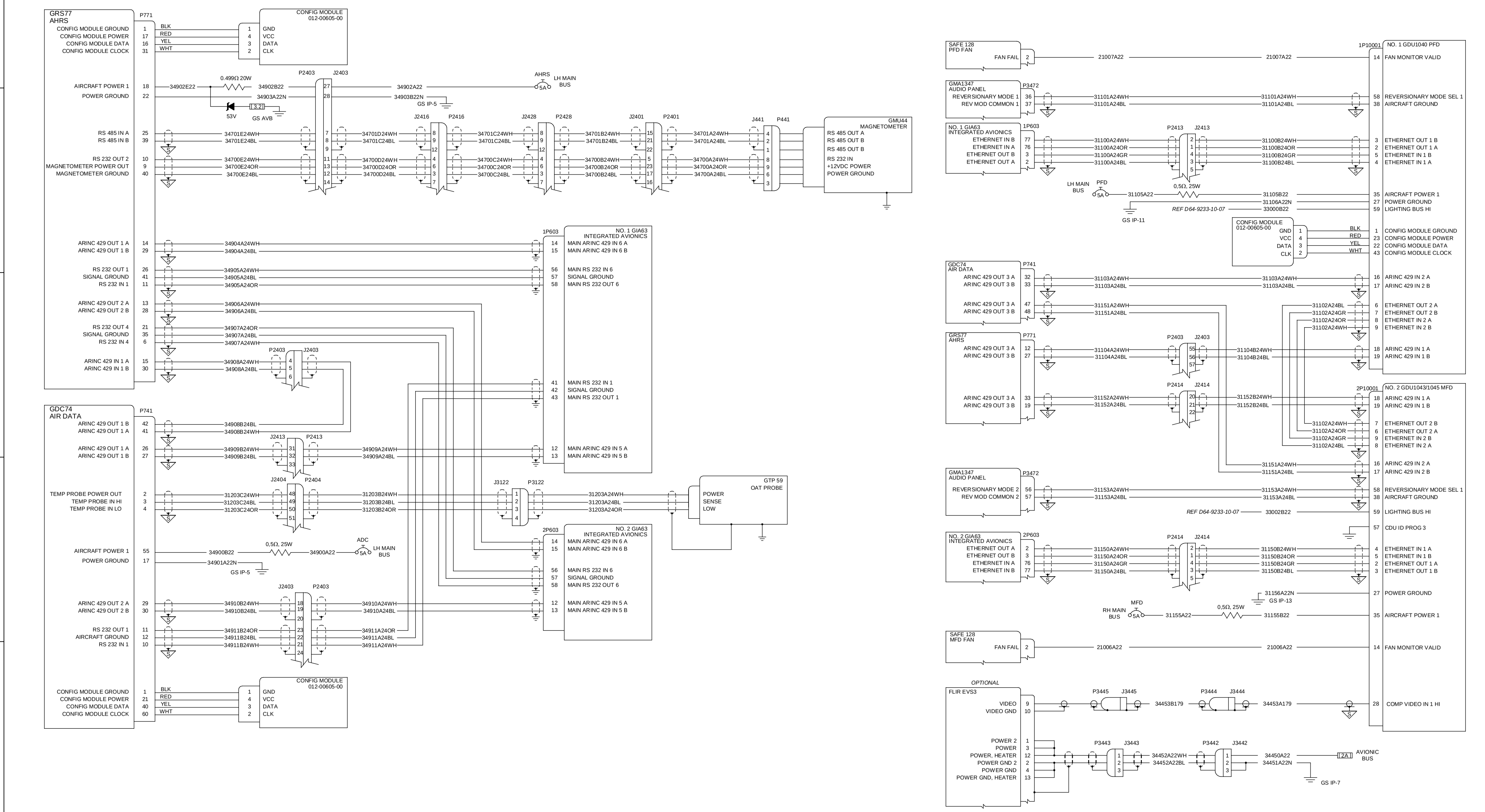
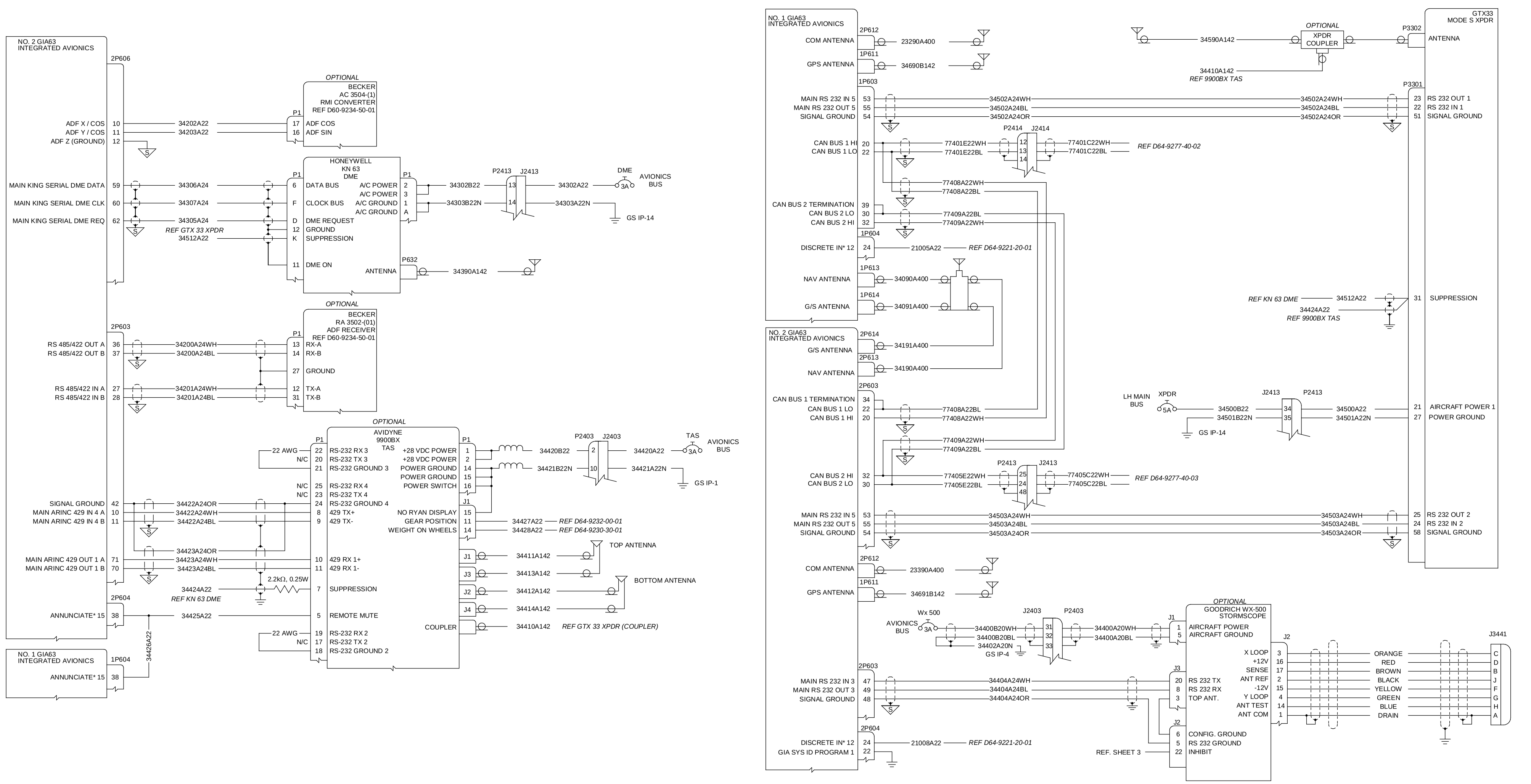


Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-01 / REV "A"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	CODE 710197	SCALE / SH 05 OF 06

Confidential



Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	DWG.NO. D64-9231-60-01 — REV "A"
			CODE 710197 — SCALE — SH 06 OF 06

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REVISION

REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	ALL	ALL	MÄM 42-587 FIRST RELEASE	15.11.11	SEE TB

NOTES:

1. SYMBOL DESIGNATIONS
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED PAIR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED PAIR SHIELD FLOATS
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD FLOATS
   - AIRCRAFT GROUND
   - GARMIN (SHIELD BLOCK) GROUND REFER TO DOC. 190-00313-09
   - WIRE SPLICE CONNECTION
   - COAXIAL CABLE

   N/C = NO CONNECTION

2. USE DOUBLE-SHIELDED WIRING: BOTH SHIELDS SHOULD BE GROUNDED ON THE RECEIVING SIDE; ON THE TRANSMITTING SIDE, ONLY THE OUTER SHIELD SHOULD BE GROUNDED, WHILE THE INNER SHIELD SHOULD FLOAT.

FLAG NOTES

1 OPTIONAL INSTALLATION IN REAR FUSELAGE, IF OÄM 42-203 IS INSTALLED

DIMENSIONS **METRIC**	IDENTIFICATION MARKINGS **DP-S-17-00001** - / -	**Diamond Aircraft** Industries GmbH — Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION; FORMAT **A3**	CLASSIFICATION: **NONE**	DEPARTMENT / SIGN / DATE; DRAWN 15.11.11; CHECKED:	PROJECT **DA 42 NG**
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART **NO**	QA: **N/A**	TITLE **Schematic, G1000**
DIMENSION TOLERANCES **3.2**	THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE V18**	STRESS: **N/A**; MANUF.: **N/A**	DWG.ORIG. **DAIA**; DWG.NO. **D64-9231-60-01_01**; REV "-"
2 DECIMAL ±0,25; 1DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5; FINISH IN MICRO-METER	FILENAME **D64-9231-60-01_01.dft**	SYSTEM: **N/A**; APPROVED: **TL**	CODE **710197**; SCALE NTS; SH **01** OF **06**

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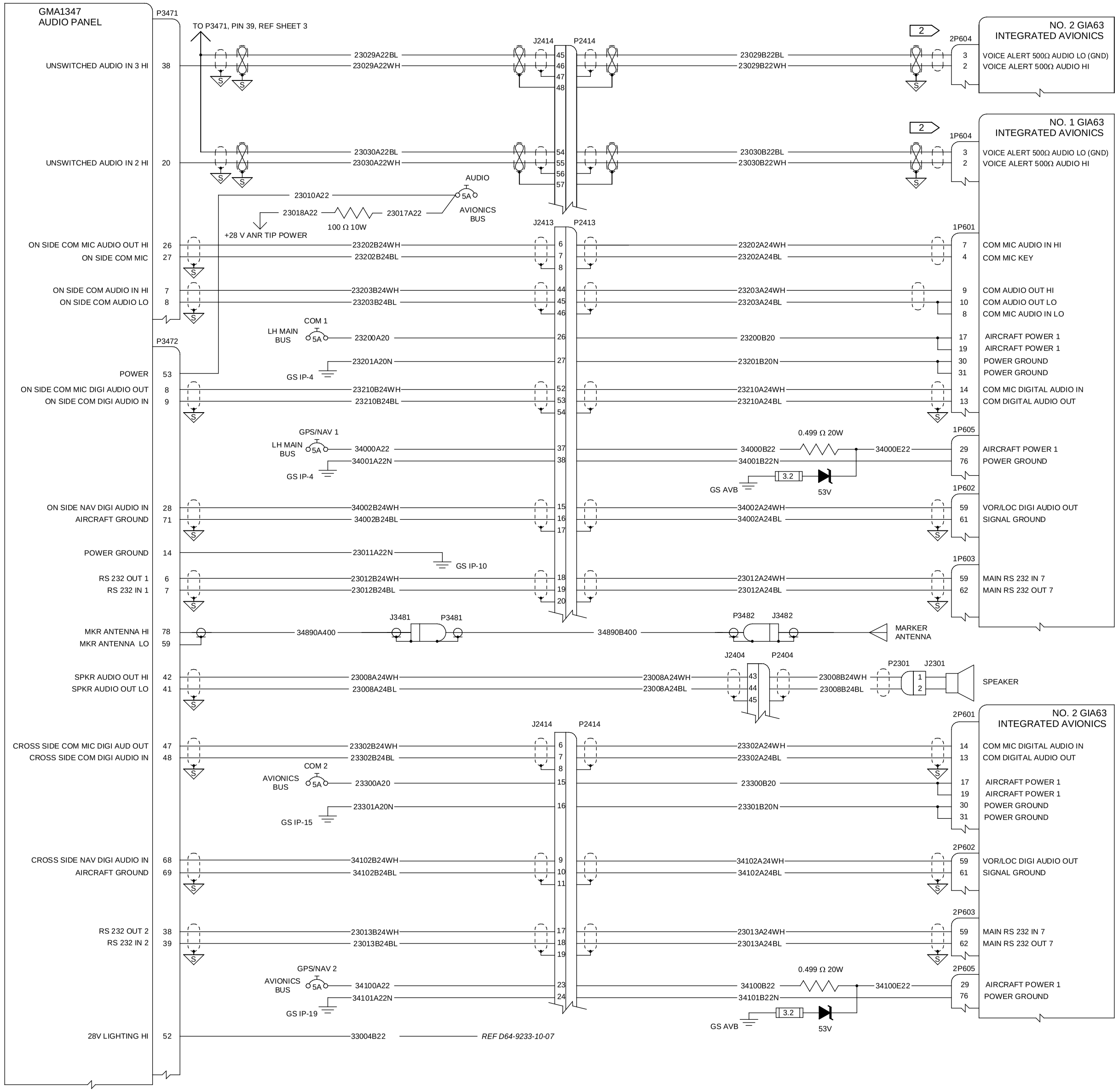

Diamond Aircraft Industries GmbH	PROJECT **DA 42 NG**	TITLE	DWG.ORIG. **DAIA**	DWG.NO. **D64-9231-60-01_01**	REV "-"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	**Schematic, G1000**	CODE **710197**	SCALE NTS	SH **02** OF **06**

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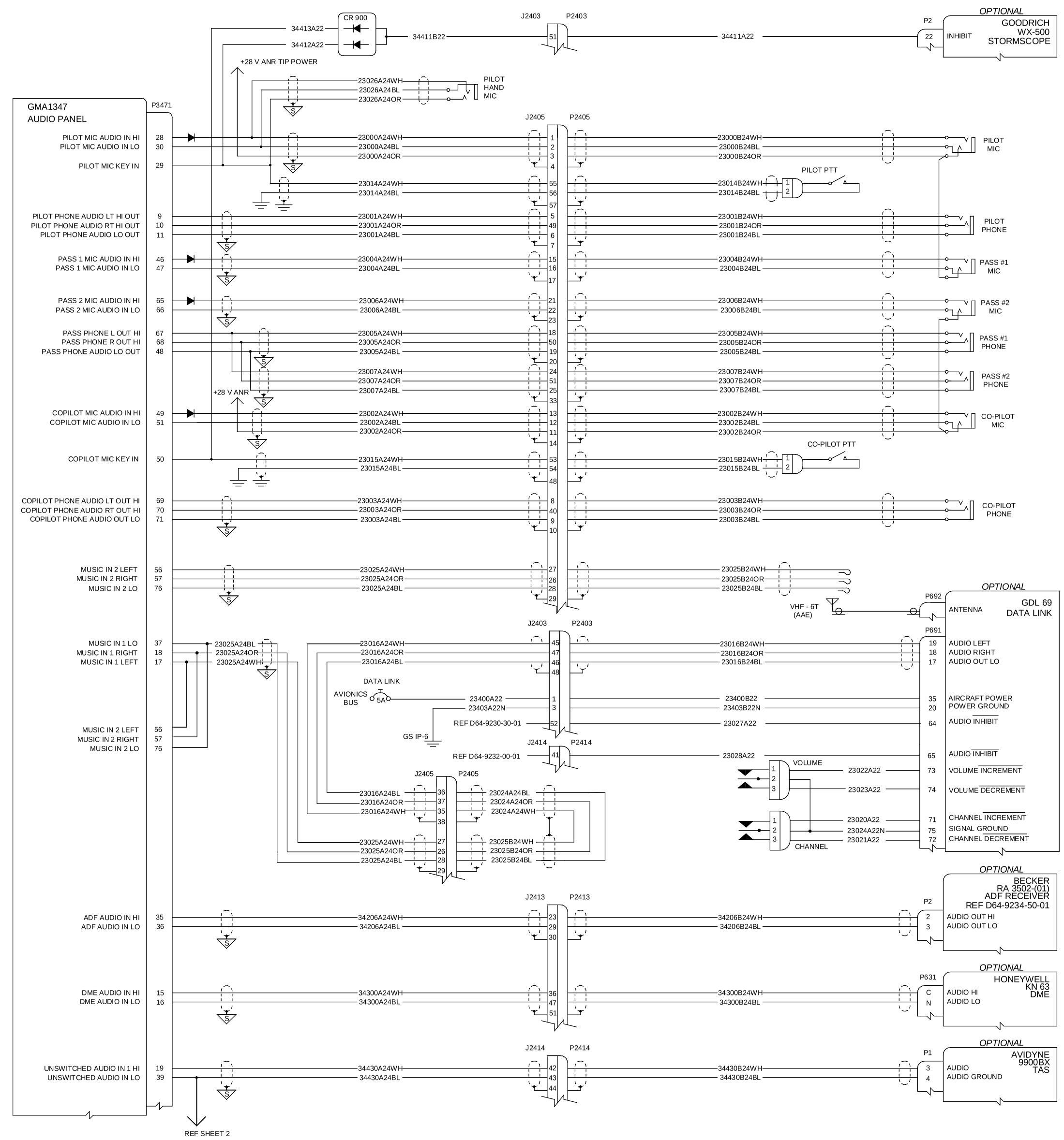

Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE Schematic, G1000	DWG.ORIG. DAIA / DWG.NO. D64-9231-60-01_01 / REV "-"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt		CODE 710197 / SCALE NTS / SH 03 OF 06

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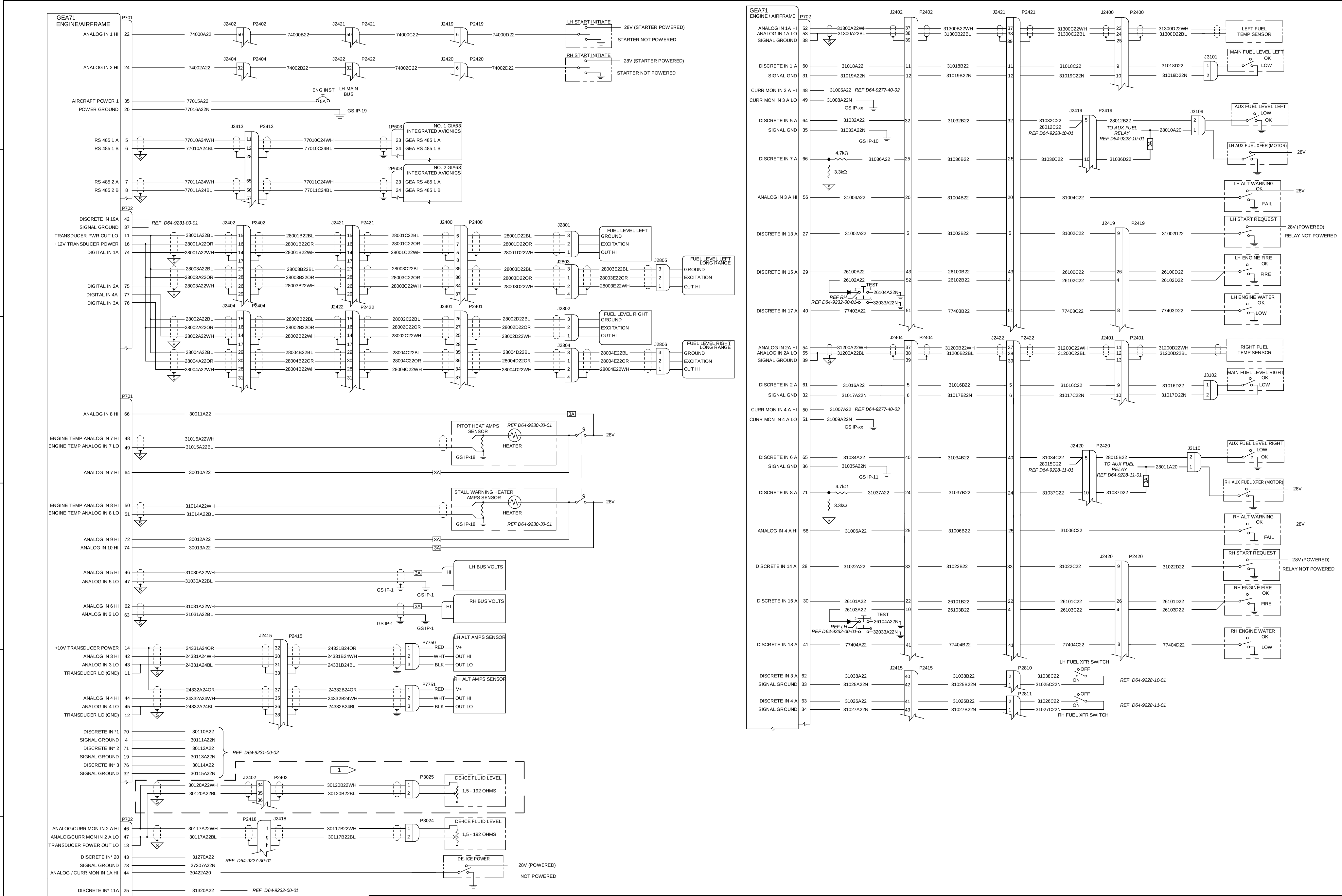

Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-01_01
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	CODE 710197	SCALE NTS
			REV "-"	SH 04 OF 06

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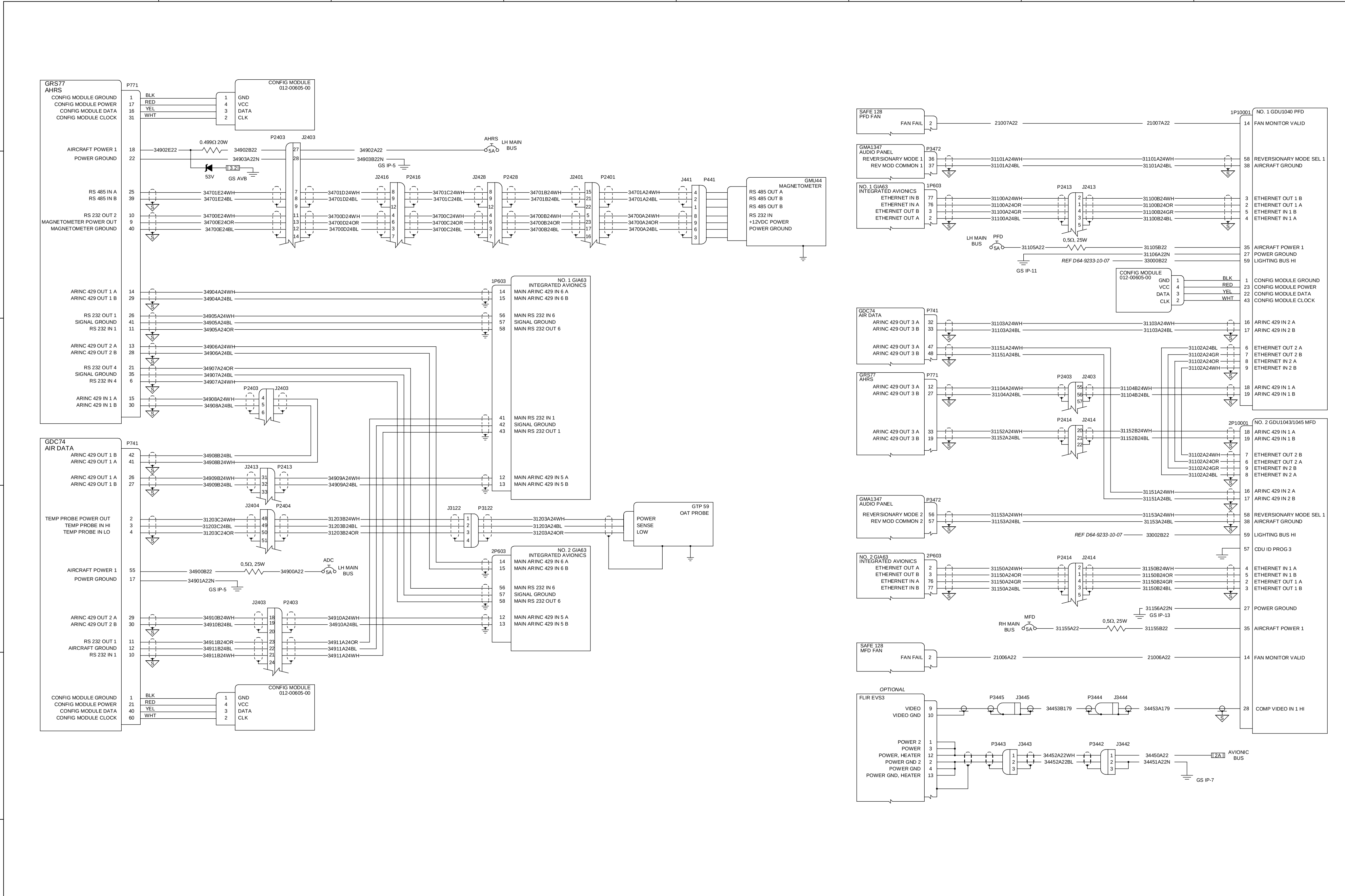
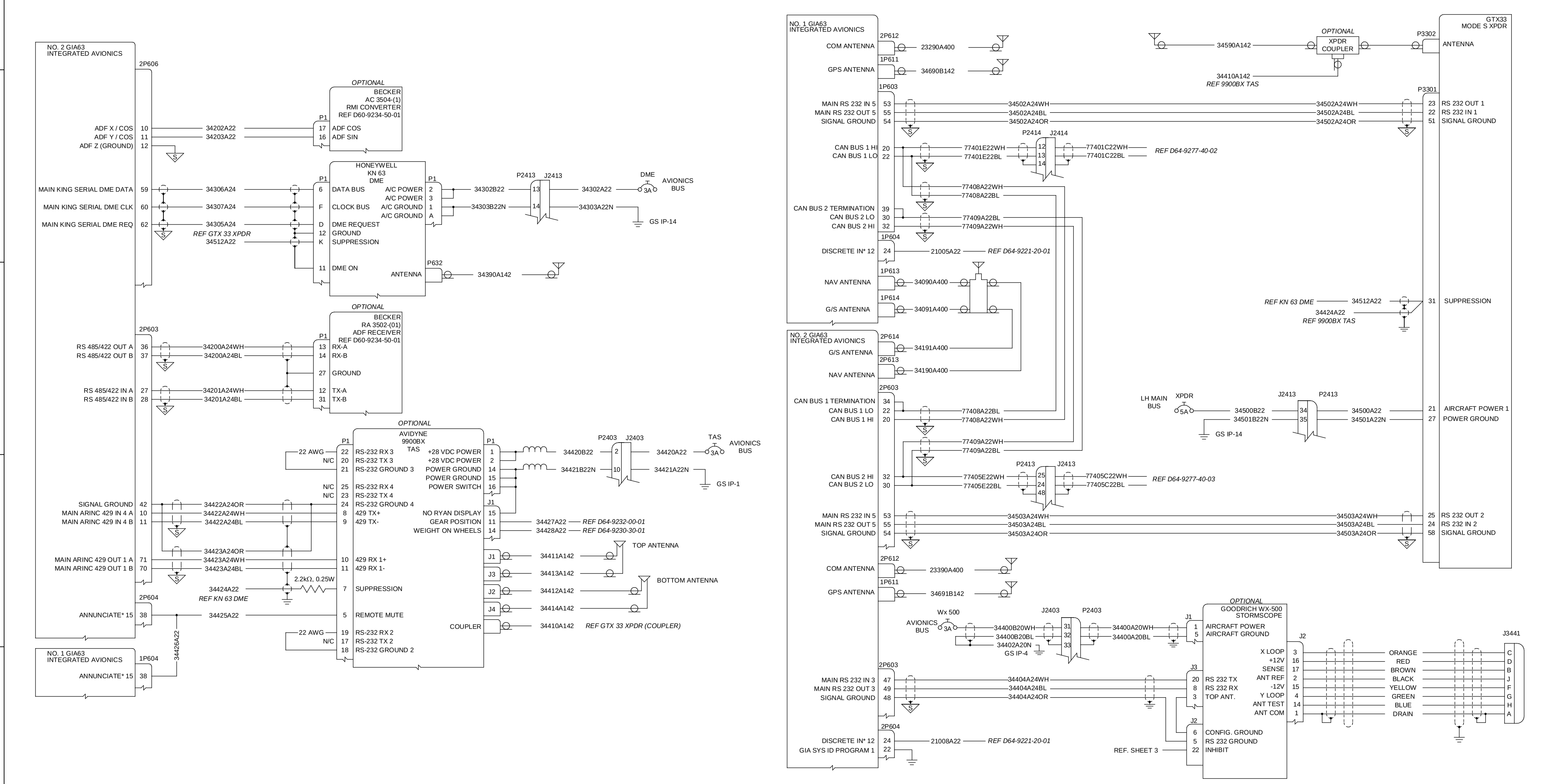


Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA / DWG.NO. D64-9231-60-01_01 / REV "-"
Diamond Aircraft Industries — N. A. Otto-Straße 5, A-2700 Wiener Neustadt		Schematic, G1000	CODE 710197 / SCALE NTS / SH 05 OF 06



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Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, G1000	DWG.NO. D64-9231-60-01_01
			REV "-"
			CODE 710197 SCALE NTS SH 06 OF 06

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REVISION				
REV	SH	ZONE	DESCRIPTION	DATE
"B"	01 03 06	ALL	MÄM 42-1068 Flag Note 3 and 4 added. Optional connection to GTX345R added, J/P3446 added. J/P3446 at TAS added, Optional GTX345R wiring added, Pins 41 and 42 at transponder added.	21.02.2018
"C"	ALL	ALL	MÄM 42-1072 LRU designations updated.	23.03.2018
"D"	05 05	F1-3 B1-3	MÄM 42-1108 HSDB connection between PFD and GMA added. HSDB connection to GWX and GDL clarified.	04.12.2018

NOTES:

1. SYMBOL DESIGNATIONS
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED PAIR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED PAIR SHIELD FLOATS
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD FLOATS
   - AIRCRAFT GROUND
   - GARMIN (SHIELD BLOCK) GROUND REFER TO DOC. 190-00313-09
   - WIRE SPLICE CONNECTION
   - COAXIAL CABLE

   N/C = NO CONNECTION

FLAG NOTES

1. OPTIONAL INSTALLATION IN REAR FUSELAGE, IF OÄM 42-203 IS INSTALLED
2. USE DOUBLE-SHIELDED WIRING: BOTH SHIELDS SHOULD BE GROUNDED ON THE RECEIVING SIDE; ON THE TRANSMITTING SIDE, ONLY THE OUTER SHIELD SHOULD BE GROUNDED, WHILE THE INNER SHIELD SHOULD FLOAT.
3. WIRE / CABLE NOT INSTALLED WITH GTX 345R.
4. EITHER CABLE 34430B24 (TAS6XX) OR 34523A24 (GTX345R) ARE INSTALLED IN CONNECTOR P2414.

DIMENSIONS **METRIC**	IDENTIFICATION MARKINGS **DP-S-17-00001**	**Diamond Aircraft Industries GmbH** Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION	FORMAT **A3**	NAME / SIGN / DATE	PROJECT **DA 42 NG**
IF NOT OTHERWISE SPECIFIED GEOMETRIC DIMENSIONING AND TOLERANCING ACC. TO **ISO 2768-mK**	CLASSIFICATION: **NONE**	DRAWN: C. Dworak 04 DEC 18	TITLE **Schematic, G1000 NXi**
DIMENSIONS IN **mm**	INTERCHANGEABLE PART **NO**	CHECKED: M. Kowarsch 05 DEC 18	DWG.ORIG. **DAIA**
FINISH IN MICRO-METER **3.2**	THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE ST6**	RELEASED: M. Schell 05 DEC 18	DWG.NO. **D64-9231-60-04** REV **"D"**
	FILENAME **D64-9231-60-04d.dft**		CODE **710197** SCALE SH **01** OF **06**

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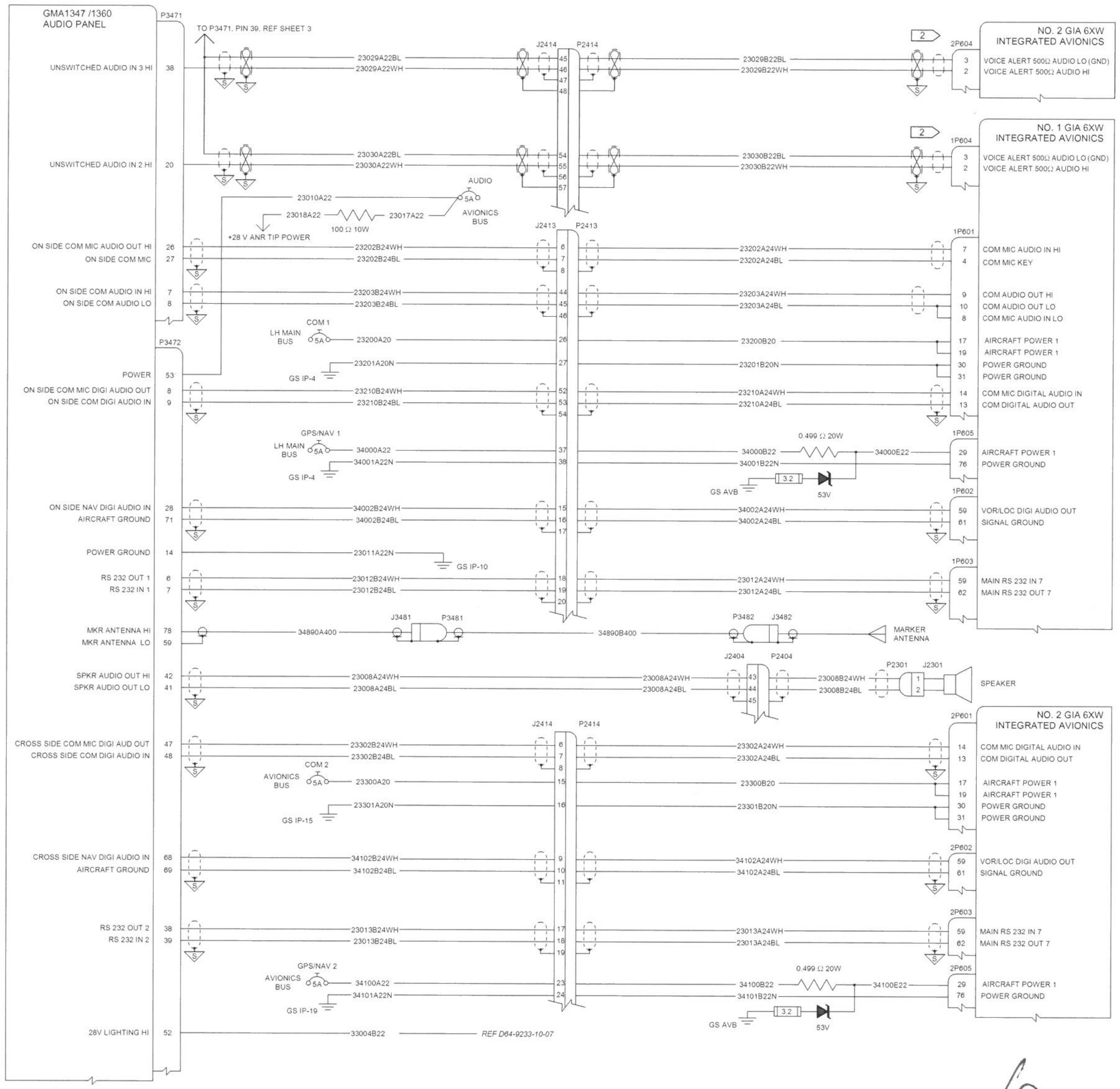

M. Kowarsch
05 DEC 18

M. Scheit
05 DEC 18

Diamond Aircraft Industries GmbH	PROJECT	DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-04
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt		Schematic, G1000 NXi	CODE 710197	SCALE

REV "D"

SH 02 OF 06

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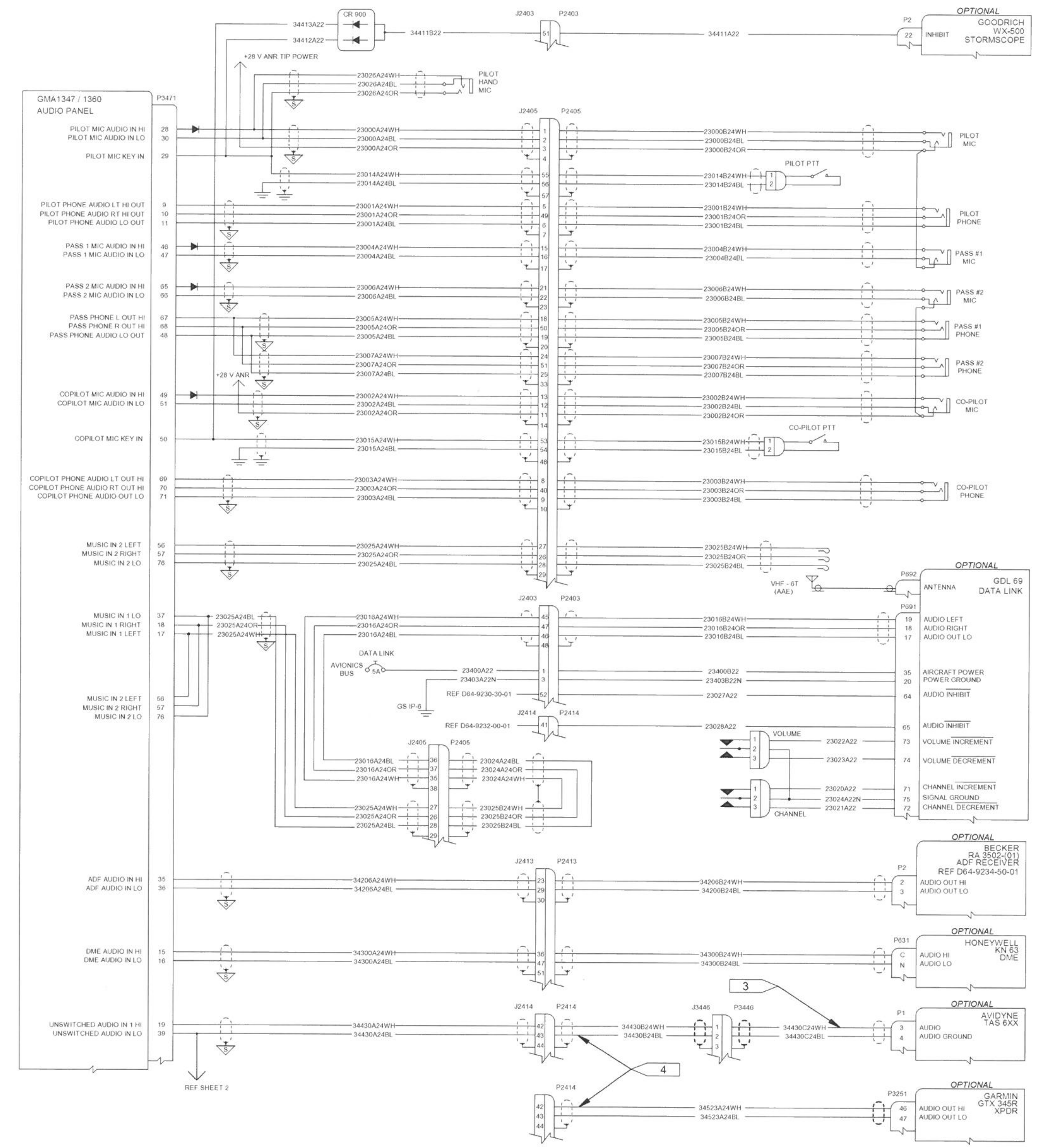
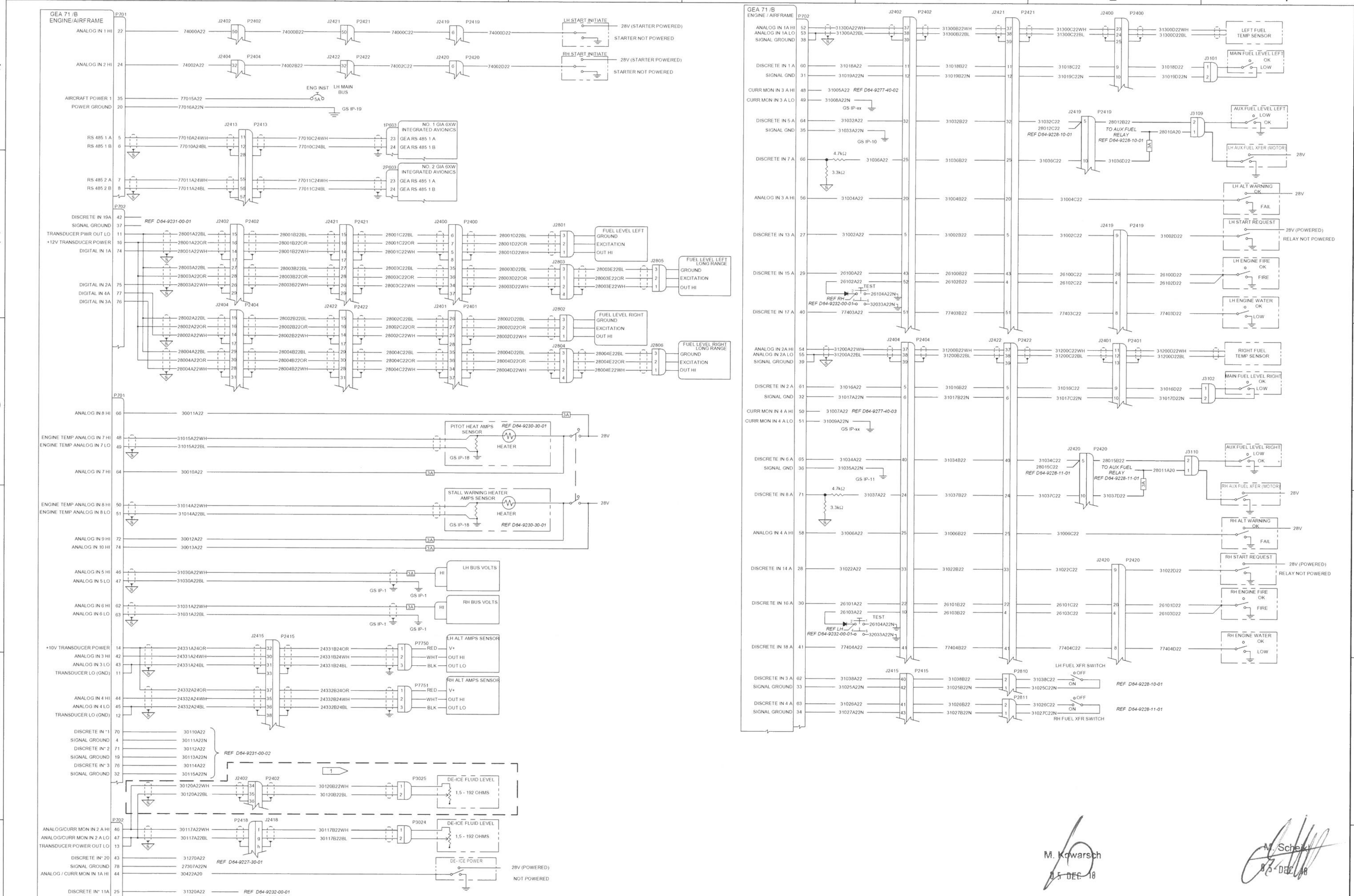


M. Kowarsch
05 DEC 18

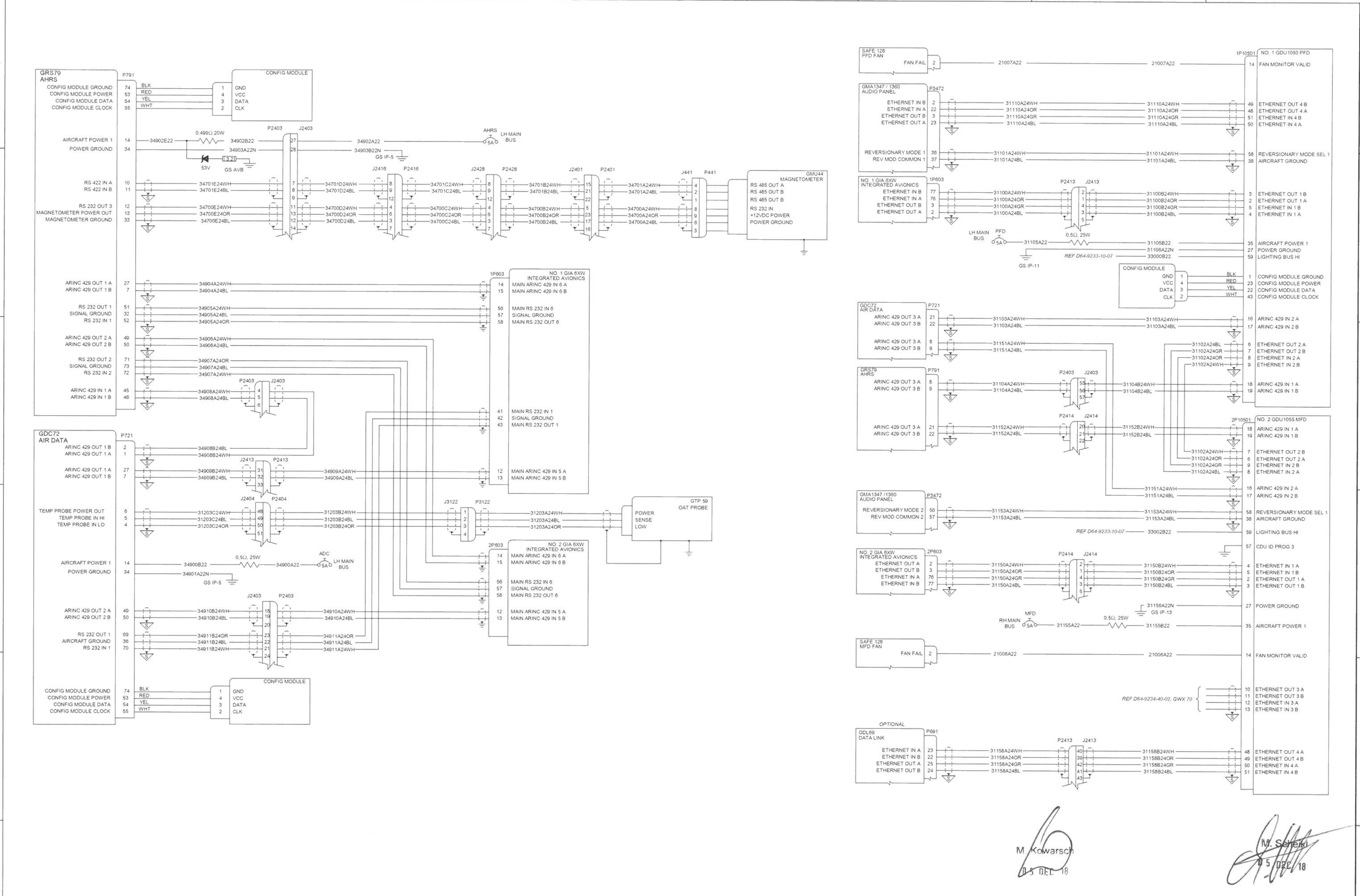
M. Schaly
05 DEC 18

Diamond Aircraft Industries GmbH	PROJECT **DA 42 NG**	TITLE	DWG.ORIG. **DAIA**
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	**Schematic, G1000 NXi**	DWG.NO. **D64-9231-60-04** REV "D"
			CODE 710197 SCALE SH 03 OF 06



Diamond Aircraft Industries GmbH	PROJECT: DA 42 NG	TITLE	DWG.ORIG.	DWG.NO.	REV
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	**Schematic, G1000 NXi**	**DAIA**	**D64-9231-60-04**	"D"
			CODE 710197	SCALE	SH 04 OF 06

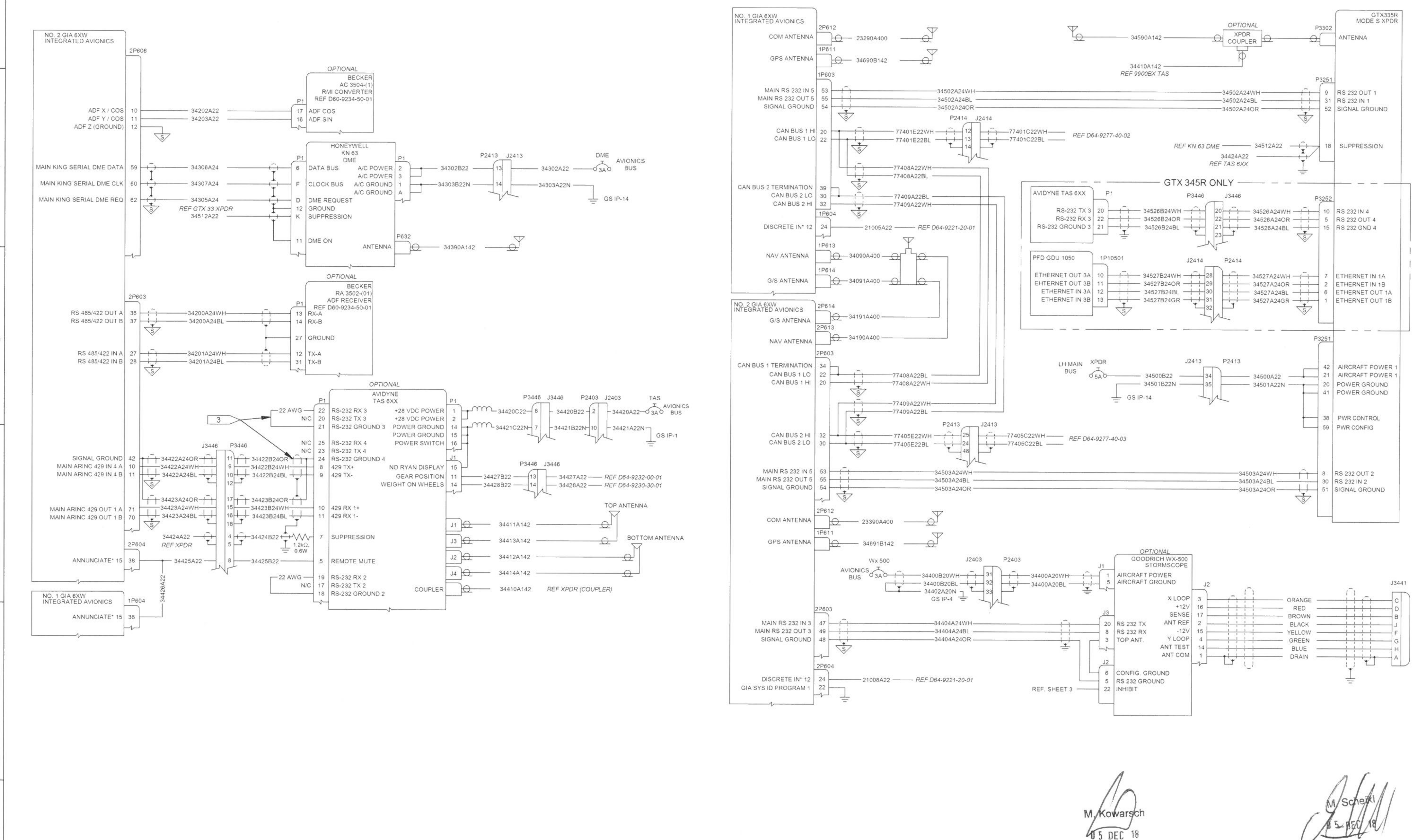
Confidential



Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE Schematic, G1000 NXi	DWG.ORIG. DAIA	DWG.NO. D64-9231-60-04	REV "D"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt		CODE 710197	SCALE	SH 05 OF 06

Confidential

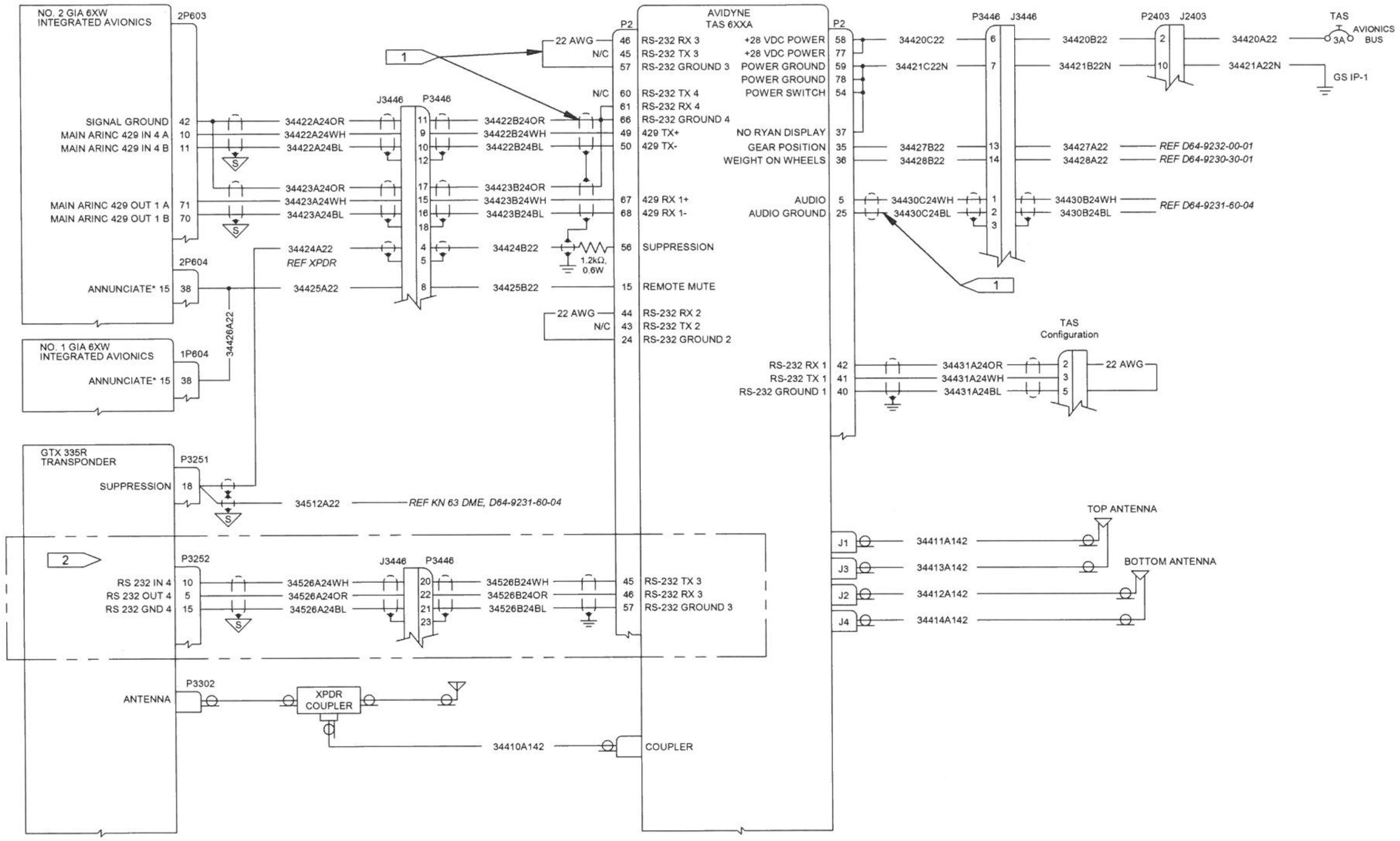
Confidential



Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG.	DWG.NO.	REV
Diamond Aircraft Industries	N. A. Otto-Straße 5, A-2700 Wiener Neustadt	Schematic, G1000 NXi	DAIA	D64-9231-60-04	"D"
			CODE 710197	SCALE	SH 06 OF 06

Confidential

REV	SH	ZONE	DESCRIPTION	DATE
-	01	ALL	NAD RELEASE NEW DRAWING, DOES NOT SUPERSEDE ANOTHER DRAWING.	15.07.2019
A	01	ALL	OÄM 42-349 AUDIO PANEL CONNECTION ADDED.	05.09.2019



FLAG NOTES

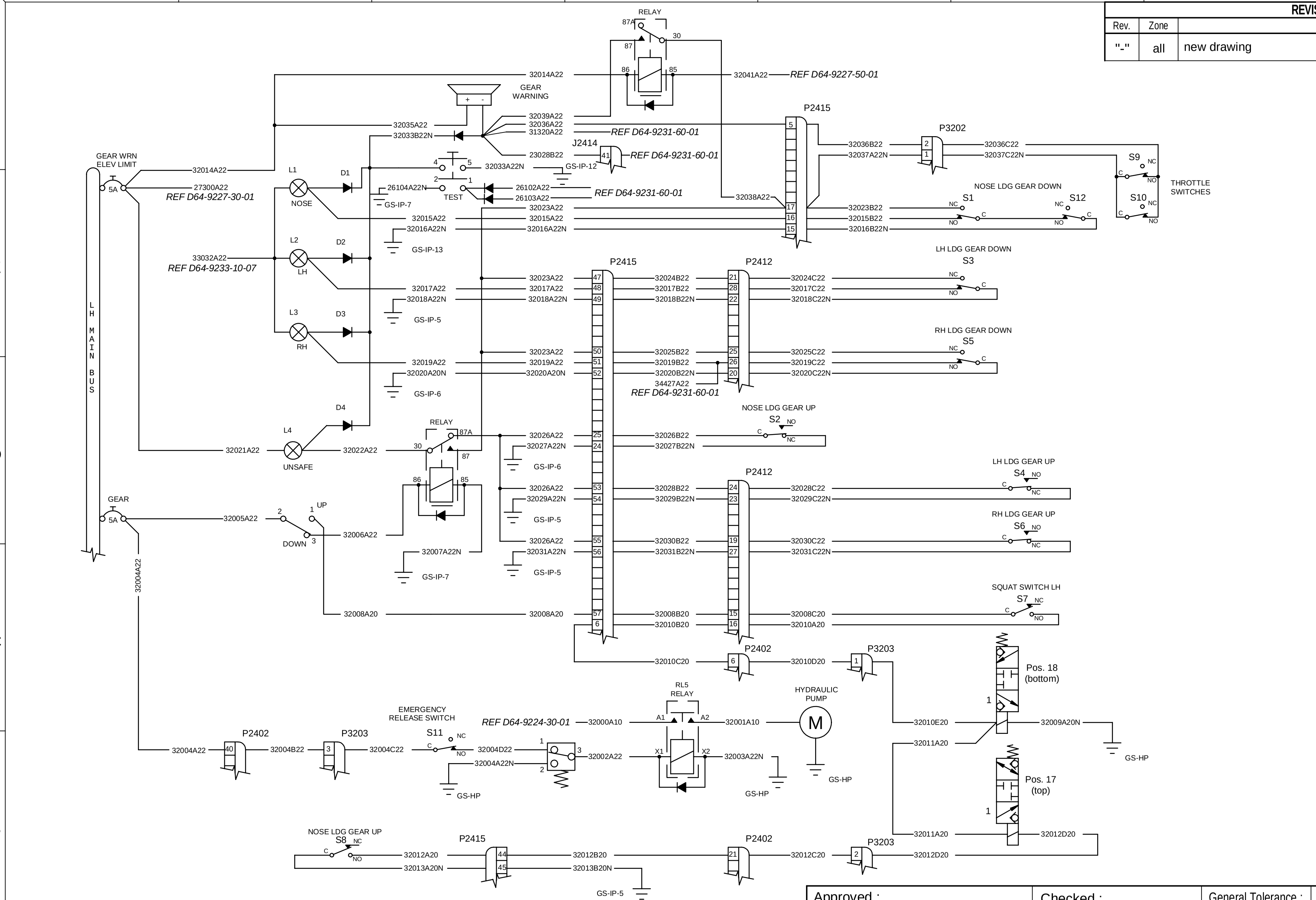
1 WIRES NOT INSTALLED WITH GTX345R TRANSPONDER.

2 FOR GTX345R TRANSPONDER OPTION ONLY.

IDENTIFICATION MARKINGS	DP-S-17-00001
CLASSIFICATION:	NONE
IF NOT OTHERWISE SPECIFIED GEOMETRIC DIMENSIONING AND TOLERANCING ACC. TO	ISO 2768-mK
SCALE	NTS
FORMAT	A3
SOLID EDGE	PDM N
FIRST ANGLE PROJECTION	
DIMENSIONS	METRIC / mm
PROJECT	DA 42 NG
WEIGHT:	N/A N/A
INTERCHANGEABLE PART	NO
DRAWN:	C. Dvorak 05 SEP 19
CHECKED:	M...sch 20 DEC 19
RELEASED:	C. Burger 19 DEC 19
TITLE	Schematic, TAS6XXA Wiring
DWG.NO.	D64-9231-60-04x02
REV	"A"
NEXT HIGHER ASSY	N/A
FILENAME	D64-9231-60-04x02a.dft
SH	01 OF 01

Diamond Aircraft Industries GmbH

Rev.	Zone	Description
"-"	all	new drawing



1. WIRING SHOWN WITH LANDING GEARS DOWN AND LOCKED, THROTTLE ON IDLE AND NOT POWERED.

2. S1, S3, S5, S12 CLOSED WHEN LANDING GEARS DOWN AND LOCKED, S7 OPENED WHEN AIRPLANE ON GROUND,
S2, S4, S6 OPENED WHEN LANDING GEARS UP AND LOCKED, S7 CLOSED WHEN AIRPLANE AIRBORN.
S8 OPENED WHEN NOSE LANDING GEAR DOWN, S8 CLOSED WHEN NOSE LANDING GEAR UP.
S9 AND S10 CLOSED WHEN BOTH POWER LEVERS ARE IN IDLE POSITION.

3. TEST SWITCH WIRED NORMALLY OPEN.

Weight:	N/A
Calculated Weight:	N/A

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Rev.	Change	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA42 NG Twin Star

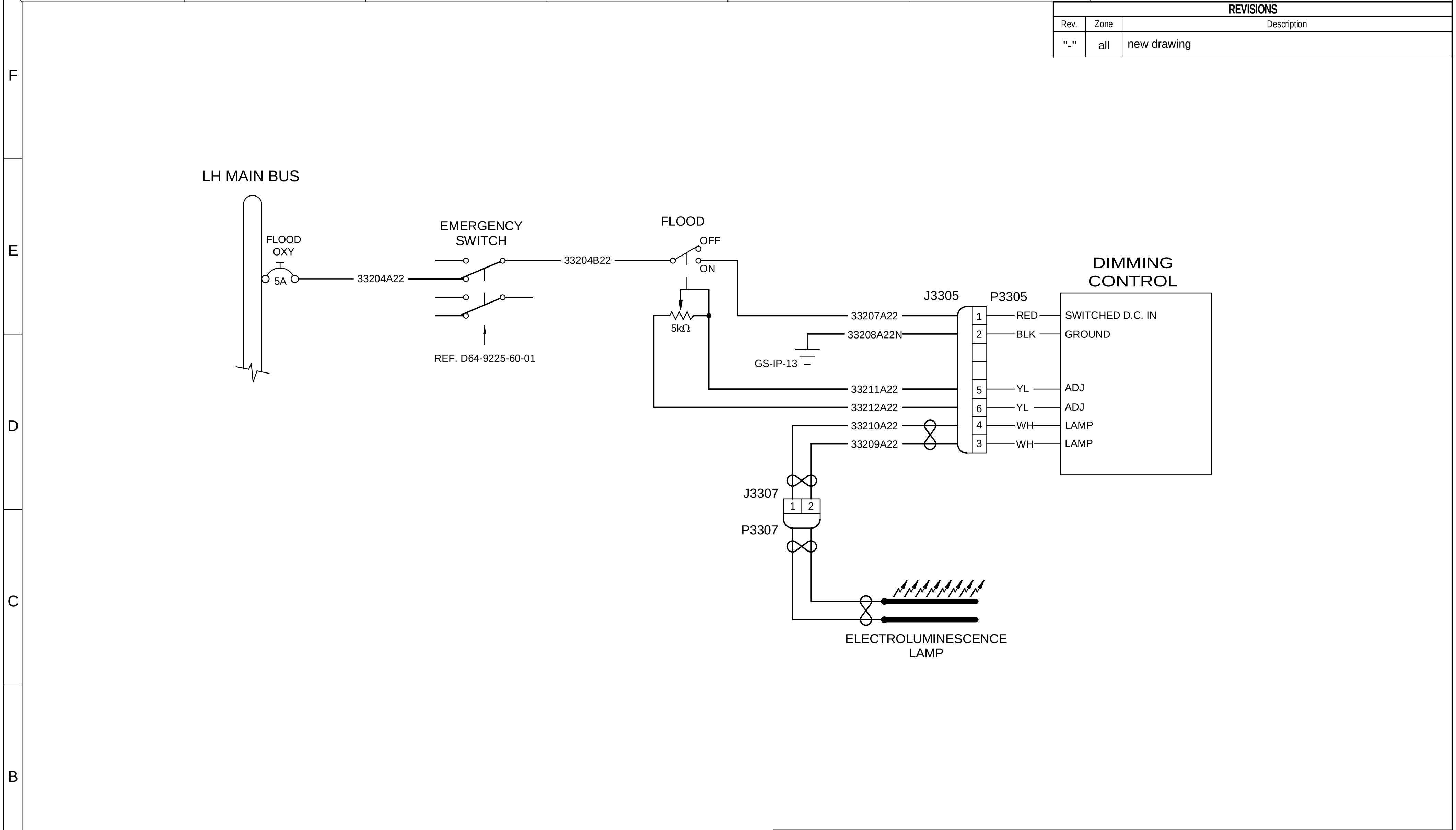
Title : Schematic, Landing Gear

Drawing Number: D64-9232-00-01

Sheet 1 from 1

Saved under : D64-9232-00-01.dft

REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing



Weight:	N/A
Calculated Weight:	N/A

Approved :		Checked :		General Tolerance : ISO 2768	Scale: NTS
Date	Name	Date	Name		

Rev.	Change	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

Title : Schematic, Flood Light

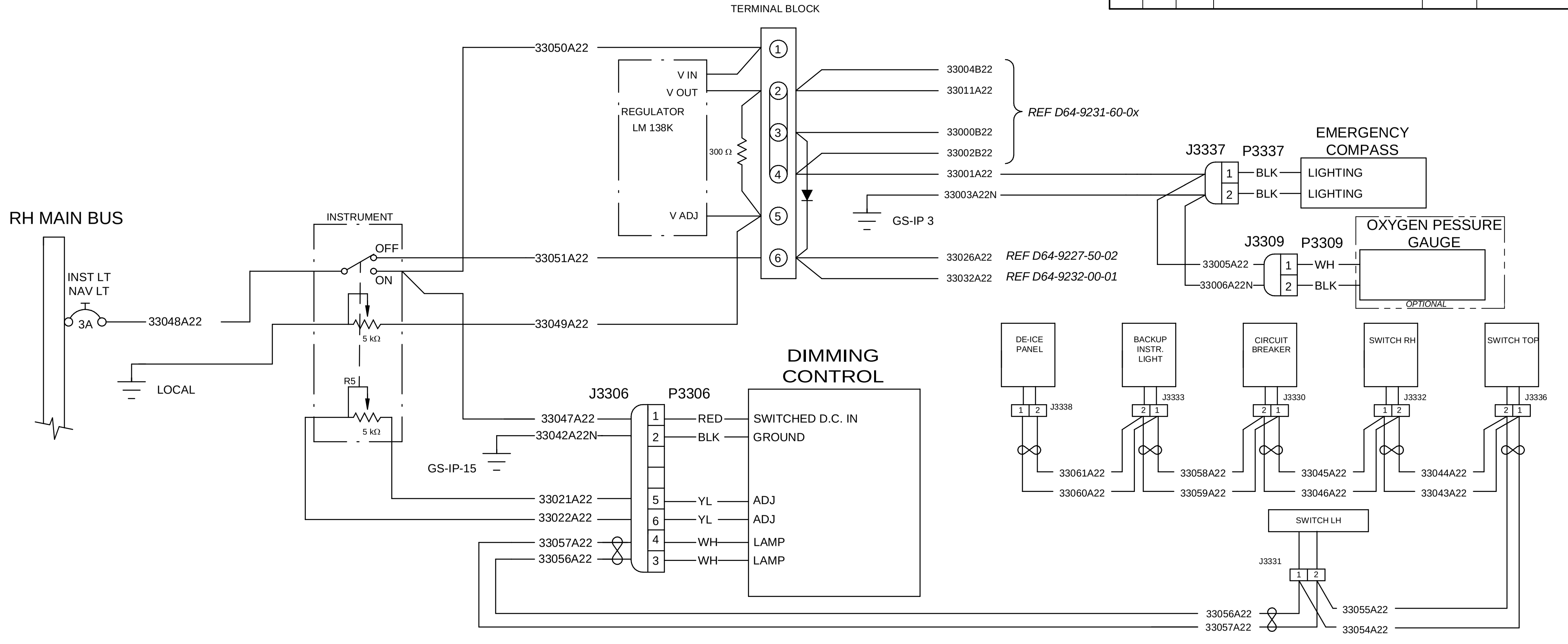
DA42 NG Twin Star

Drawing Number: D64-9233-10-01

Sheet 1 from 1

Saved under : D64-9233-10-01.dft

REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	VÄM 42-004 FIRST RELEASE	14.07.08	SEE TB
A	01	E-2 E-3	ÖÄM 42-171 corrected J3308 in J3337 changed REF to D64-9231-60-0x	18.05.09	SEE TB



DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT A3
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	
DIMENSION TOLERANCES	3.2 FINISH IN MICRO-METER
2 DECIMAL	±0,25
1DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

IDENTIFICATION MARKINGS: DE-S-10-00003

CLASSIFICATION: NONE

INTERCHANGEABLE PART: NO

THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18

FILENAME: D64-9233-10-07a.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		18.05.09
CHECKED:		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED: TL		

PROJECT: DA 42 NG

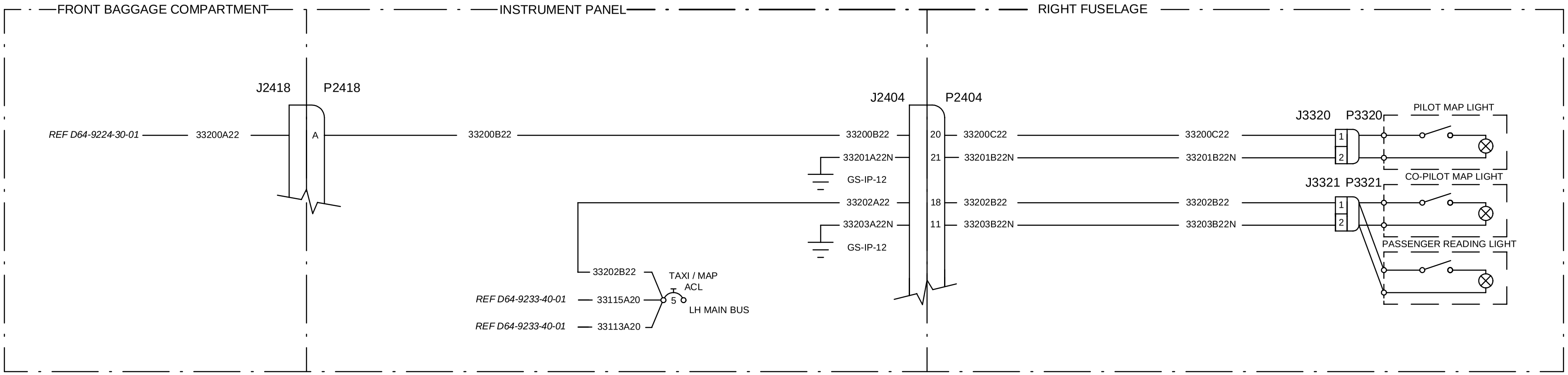
TITLE

Schematic, Dimming Regulator & Placards

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9233-10-07	A

CODE 710197 | SCALE NTS | SH 01 OF 01

REVISIONS		
Rev.	Zone	Description
"-"	all	new drawing
"A"	E7	corrected pinout of P2418

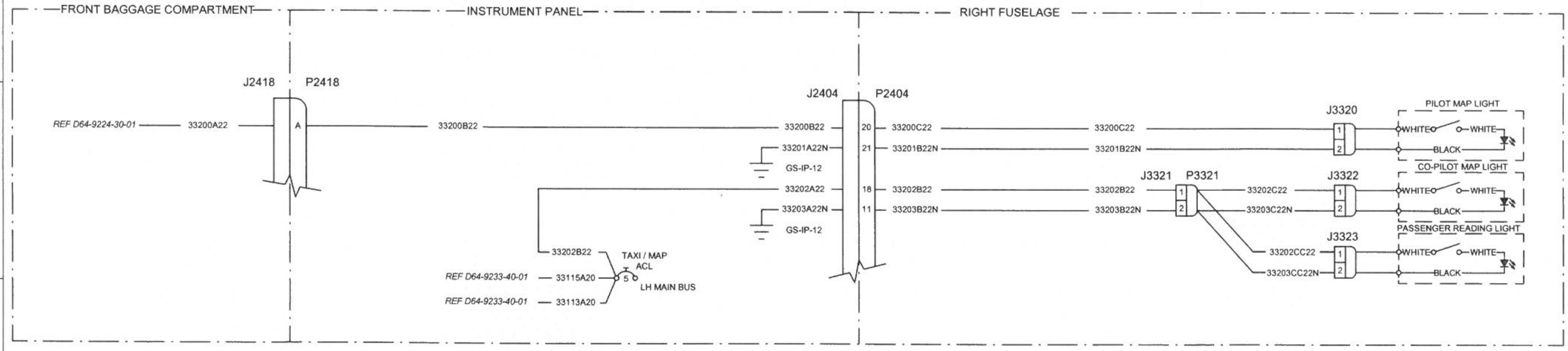


Weight:	N/A
Calculated Weight:	N/A

Approved :				Checked :		General Tolerance :	Scale:
Date			Name	Date	Name	ISO 2768	NTS
"A"	VÄM 42-004	13.08.08	Kowarsch	Next Higher Assembly : D64-9200-00-00		Title : Schematic, Map/Reading Lights	
"-"		14.07.08	M. Spanton	DA 42 NG		Drawing Number: D64-9233-20-01	Sheet 1 from 1
Rev.	Change	Date	Name	Saved under :		D64-9233-20-01a.dft	

Diamond AIRCRAFT Industries GmbH

REV	SH	ZONE	DESCRIPTION	DATE
-	01	ALL	MÄM 42-1024 NEW DRAWING SUPERSEDE D64-9233-20-01b.	08.01.2018



IDENTIFICATION MARKINGS **DP-S-17-00001**	FIRST ANGLE PROJECTION	DIMENSIONS **METRIC / mm**	PROJECT **DA 42** — **Diamond Aircraft Industries GmbH**
CLASSIFICATION: **NONE**	NAME / SIGN / DATE	WEIGHT: NA	INTERCHANGEABLE PART **No**
IF NOT OTHERWISE SPECIFIED GEOMETRIC DIMENSIONING AND TOLERANCING ACC. TO 3.2	DRAWN:	TITLE **Schematic, Map/Reading Lights, LED**	
SCALE 1:1	CHECKED:	DWG.NO. **D64-9233-20-01_02**	REV -
FORMAT **A3** SOLID EDGE PDM N	RELEASED:	NEXT HIGHER ASSY	
		FILENAME **D64-9233-20-01_02.dft**	SH **01** OF **01**

DAIA
DWG.ORIG. CODE: **710197**

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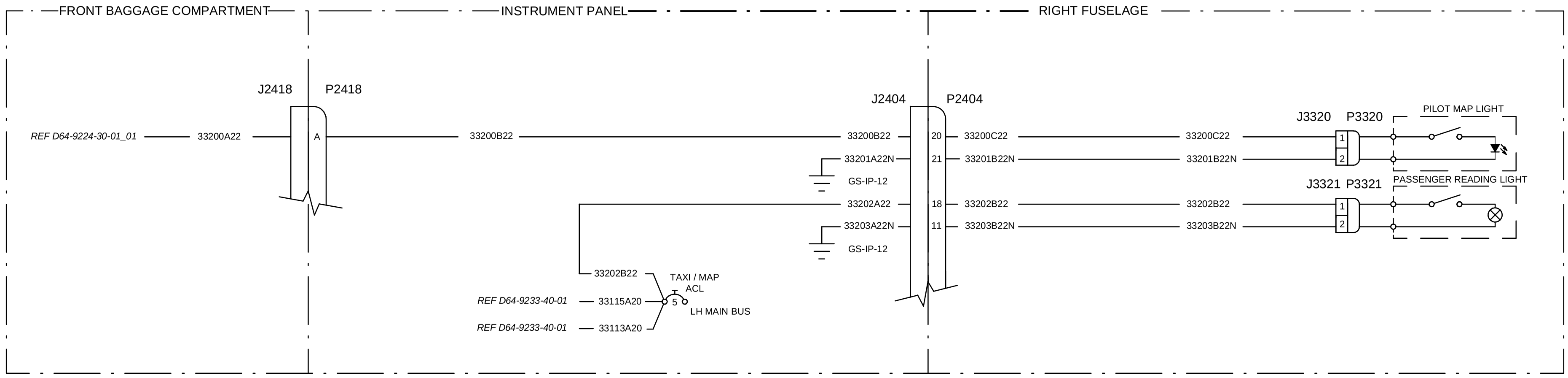
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-193 FIRST RELEASE	14.04.11	SEE TB



DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT: A3
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	
DIMENSION TOLERANCES	3.2 FINISH IN MICRO-METER
2 DECIMAL	±0,25
1DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

IDENTIFICATION MARKINGS	DP-S-17-00001
CLASSIFICATION:	NONE
INTERCHANGEABLE PART	NO
THIS DRAWING WAS PRODUCED USING SOFTWARE:	SOLID EDGE V18
FILENAME	D64-9233-20-01x01.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN			14.04.11
CHECKED:			
QA:	N/A		
STRESS:	N/A		
MANUF.:	N/A		
SYSTEM:	N/A		
APPROVED:	TL		

PROJECT: DA 42 NG

TITLE

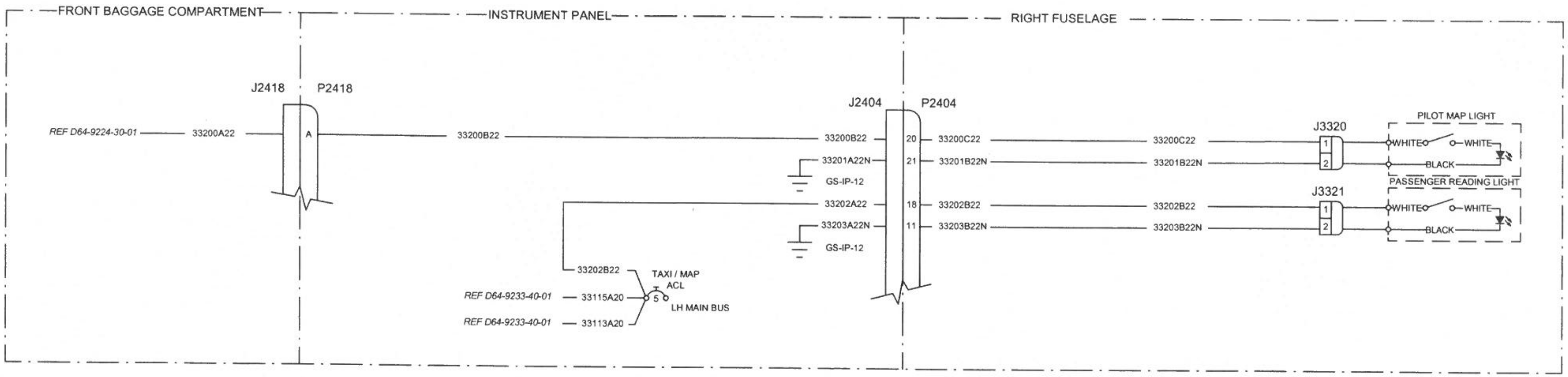
Schematic, Map/Reading Light Wiring, RACC

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9233-20-01x01	"-"

CODE 710197 | SCALE NTS | SH 01 OF 01

Confidential

REVISION				
REV	SH	ZONE	DESCRIPTION	DATE
-	01	ALL	MÄM 42-1024 NEW DRAWING SUPERSEDE D64-9233-20-01X01a.	08.01.2018



IDENTIFICATION MARKINGS **DP-S-17-00001**	FIRST ANGLE PROJECTION	DIMENSIONS **METRIC / mm**	PROJECT **DA 42**
CLASSIFICATION: **NONE**	NAME / SIGN / DATE	WEIGHT: NA	INTERCHANGEABLE PART **No**
IF NOT OTHERWISE SPECIFIED GEOMETRIC DIMENSIONING AND TOLERANCING ACC. TO **3.2**	DRAWN:	TITLE **Schematic, Map/Reading Lights Wiring (LED), RACC**	
SCALE 1:1	CHECKED:	DWG.NO. **D64-9233-20-01X02**	REV -
FORMAT **A3** SOLID EDGE PDM N	RELEASED:	NEXT HIGHER ASSY	
		FILENAME **D64-9233-20-01X02.dft**	SH **01** OF **01**

Diamond Aircraft Industries GmbH

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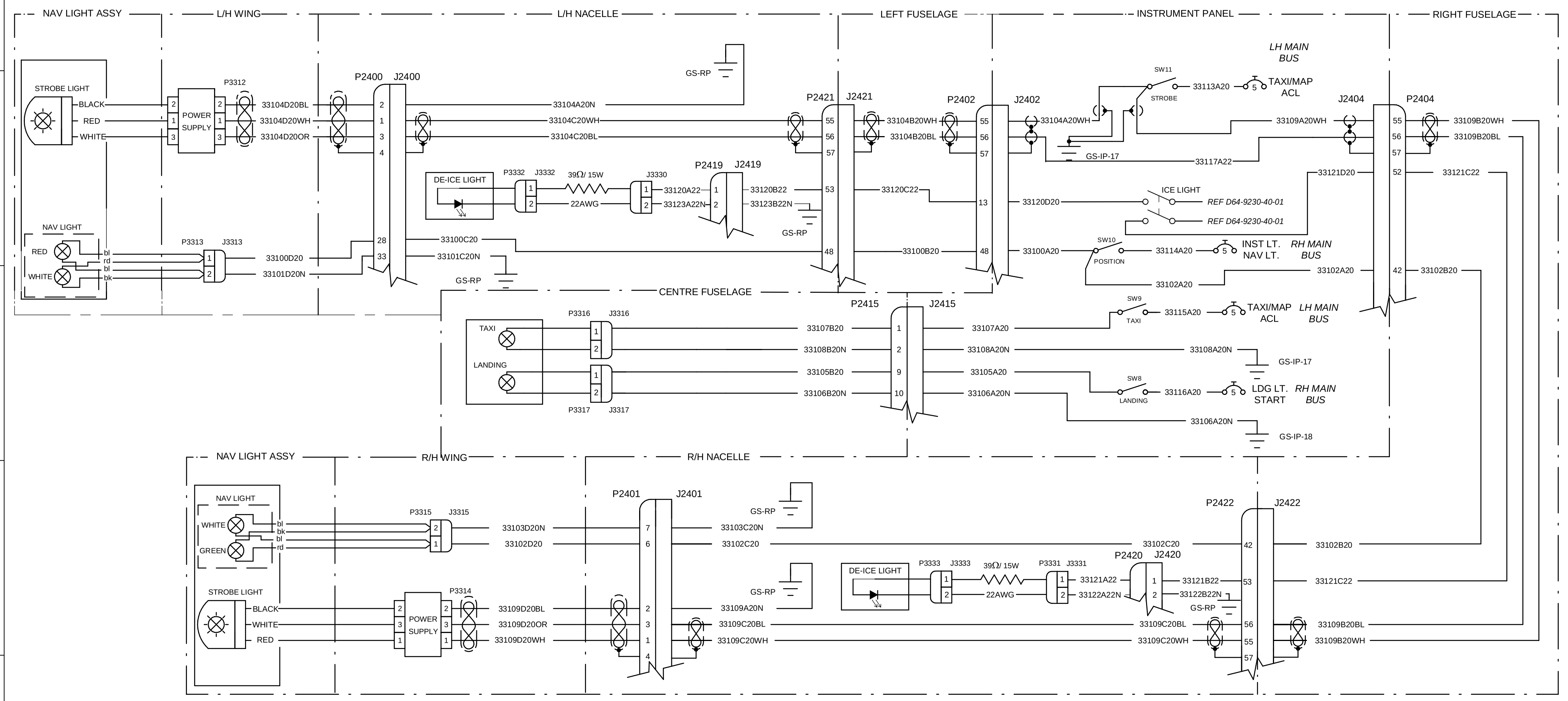

REVISION

REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	VÄM 42-004 FIRST RELEASE	14.07.08	R. Zeillinger
A	01	ALL	VÄM 42-004 CORRECTED ICE-LIGHTS WIRE GAUGES	12.08.08	R. Zeillinger
B	01	C4 E3-E2 E6-E5	OÄM 42-053/j REMOVED R/H DE-ICE LIGHT REMOVED DE-ICE LIGHT RESISTORS ADDED RESISTOR AND CONNECTOR J3332 FOR L/H DE-ICE LIGHT	04.05.09	R. Zeillinger
C	01	C4	OÄM 42-053/o ADDED R/H DE-ICE LIGHT, RESISTOR AND CONNECTOR J3333	14.12.09	SEE TB

DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT A3
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	3.2 FINISH IN MICROMETER
DIMENSION TOLERANCES	2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5
IDENTIFICATION MARKINGS	DE-S-10-00003
CLASSIFICATION:	NONE
INTERCHANGEABLE PART	NO
THIS DRAWING WAS PRODUCED USING SOFTWARE:	SOLID EDGE V18
FILENAME	D64-9233-40-01C.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		
CHECKED:		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED:		

PROJECT: DA 42 NG

TITLE:

Schematic, Exterior Lighting

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9233-40-01	C
CODE 710197	SCALE NTS	SH 01 OF 01

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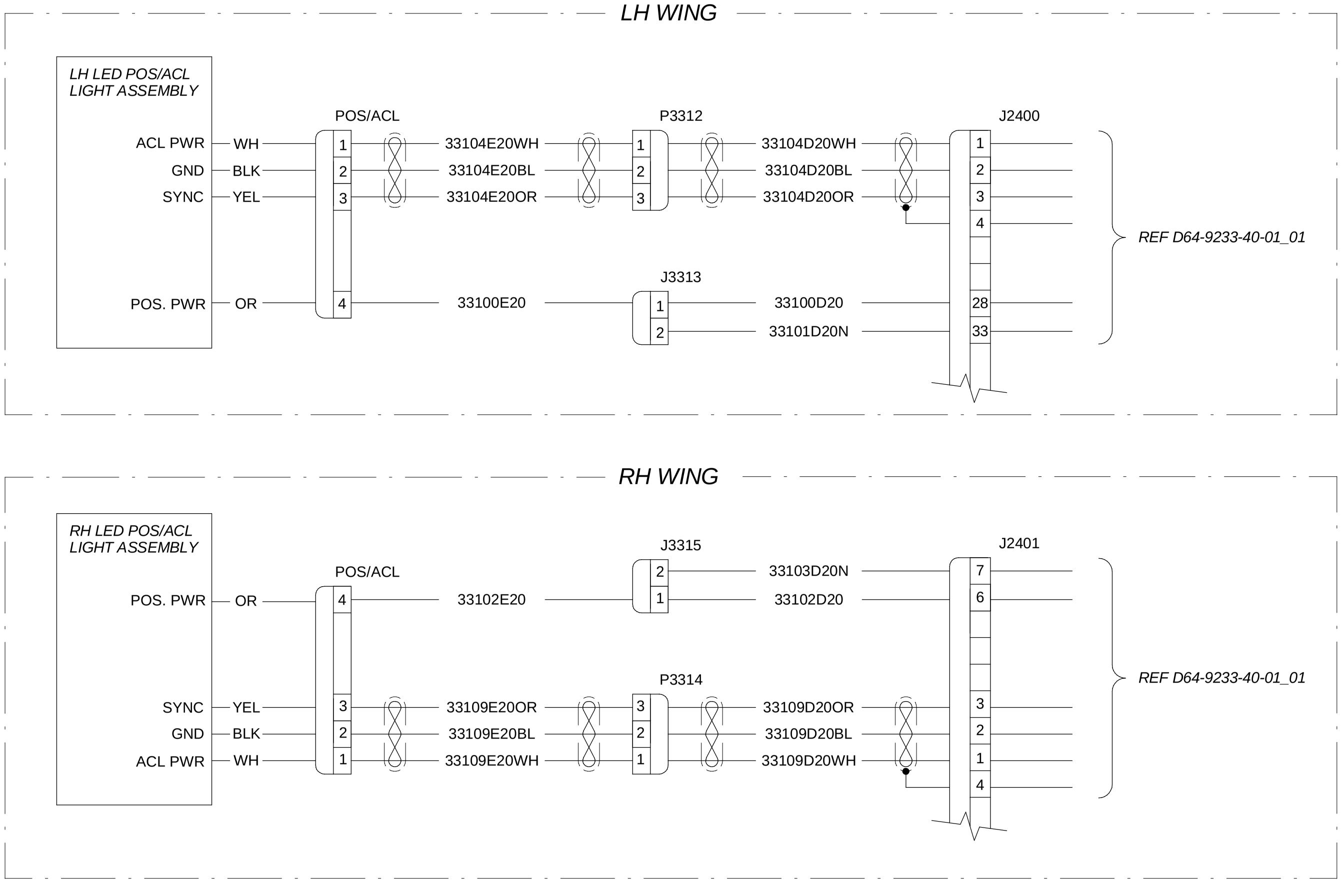
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-222 FIRST RELEASE	14.11.13	SEE TB



DIMENSIONS **METRIC**		IDENTIFICATION MARKINGS **DE-S-10-00003**	- / -
FIRST ANGLE PROJECTION	FORMAT **A3**	CLASSIFICATION: **NONE**	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART **NO**	
DIMENSION TOLERANCES 2 DECIMAL u0,25 1DECIMAL u0,5 DECIMAL u1 ANGLE u1° RAD u0,5	3.2 FINISH IN MICRO-METER	THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE V18**	
		FILENAME **D64-9233-40-01x01.dft**	

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		14.11.13
CHECKED:		
QA: **N/A**		
STRESS: **N/A**		
MANUF.: **N/A**		
SYSTEM: **N/A**		
APPROVED: **TL**		

PROJECT **DA 42 NG**

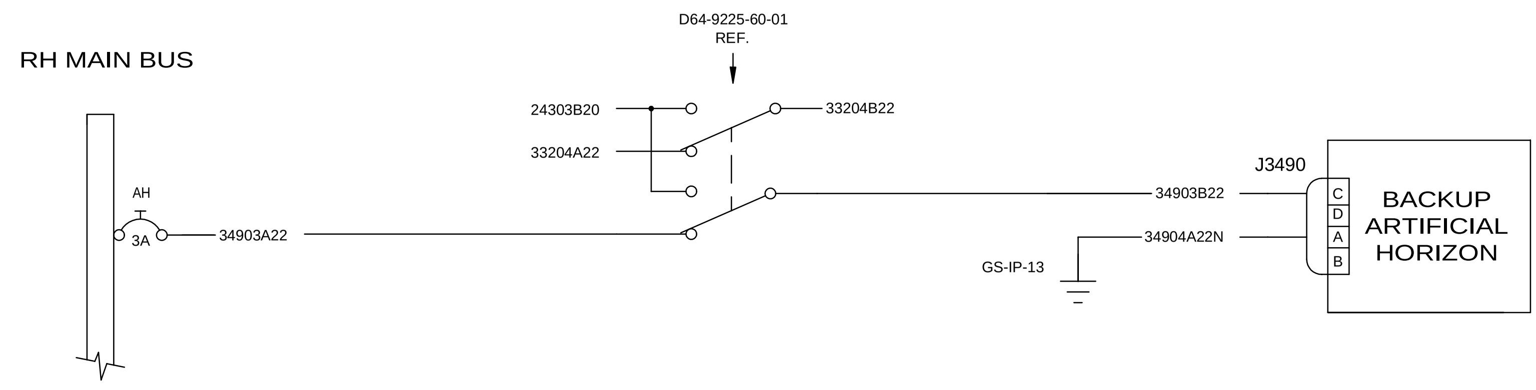
TITLE

Schematic, LED Position / Anti-Collision Lights

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9233-40-01x01**	"-"

CODE **710197** SCALE NTS SH **01** OF **01**

Confidential



REVISIONS

Rev.	Zone	Description
"-"	all	new drawing

Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

DA42 NG Twin Star

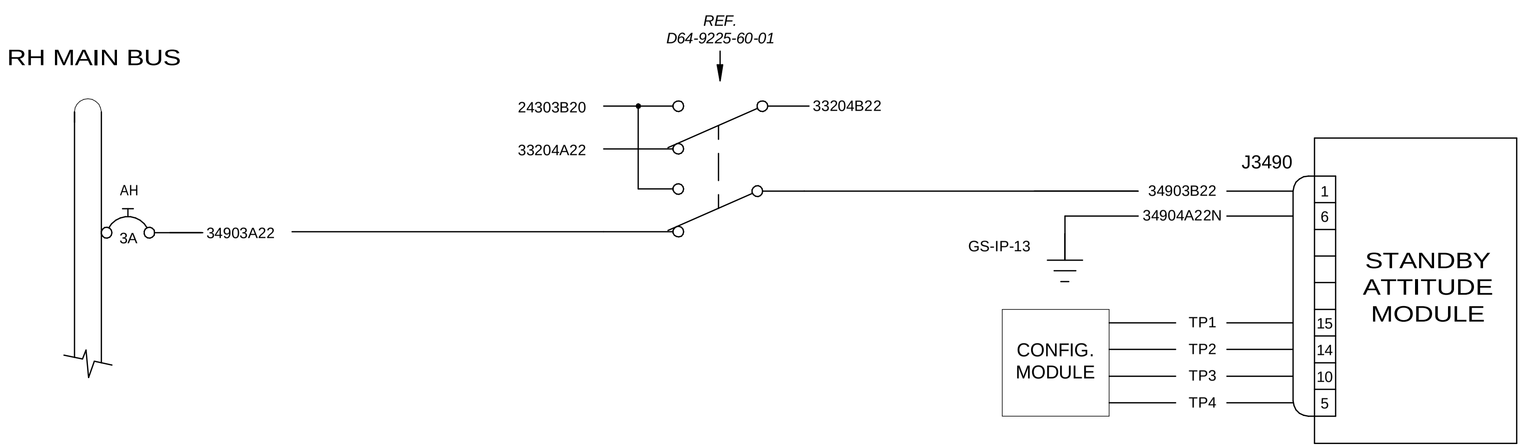
Title : Schematic, Attitude Gyro

Drawing Number: D64-9234-10-01

Sheet 1 from 1

Saved under : D64-9234-10-01.dft

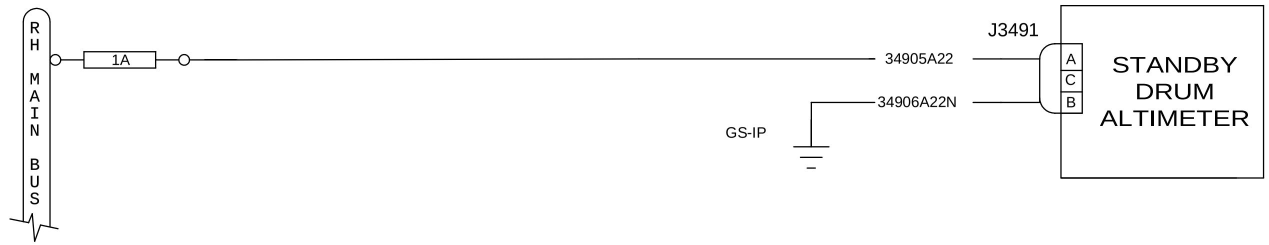
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-270 NEW DRAWING, DOES NOT SUPERSEDE ANOTHER DRAWING.	03.07.14	SEE TB



DIMENSIONS **METRIC**	IDENTIFICATION MARKINGS **DP-S-17-00001**	**Diamond Aircraft Industries GmbH** Diamond Aircraft Industries	N. A. Otto-Straße 5, A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION / FORMAT **A3**	CLASSIFICATION: **NONE**	DEPARTMENT / SIGN / DATE	PROJECT **DA 42 NG**
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART **NO**	DRAWN — **03.07.14**	TITLE **Schematic, MD302 Wiring**
DIMENSION TOLERANCES 3.2	THIS DRAWING WAS PRODUCED USING SOFTWARE **SOLID EDGE ST6**	CHECKED:	
2 DECIMAL ±0,25; 1DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5; FINISH IN MICRO-METER	FILENAME **D64-9234-10-02.dft**	QA: **N/A**; STRESS: **N/A**; MANUF.: **N/A**; SYSTEM: **N/A**; APPROVED: **N/A**	DWG.ORIG. **DAIA**; DWG.NO. **D64-9234-10-02**; REV "-"; CODE **710197**; SCALE NTS; SH **01** OF **01**

REVISIONS

Rev.	Zone	Description
"-"	all	new drawing



Weight:	N/A
Calculated Weight:	N/A

Rev.	Change	Date	Name
"-"	VÄM 42-004	14.07.08	M. Spanton

Approved : Date Name

Checked : Date Name

General Tolerance : ISO 2768

Scale: NTS

Next Higher Assembly : D64-9200-00-00

Diamond AIRCRAFT Industries GmbH

Title : Schematic, Drum Altimeter

DA42 NG Twin Star

Drawing Number: D64-9234-20-01

Sheet 1 from 1

Saved under : D64-9234-20-01.dft

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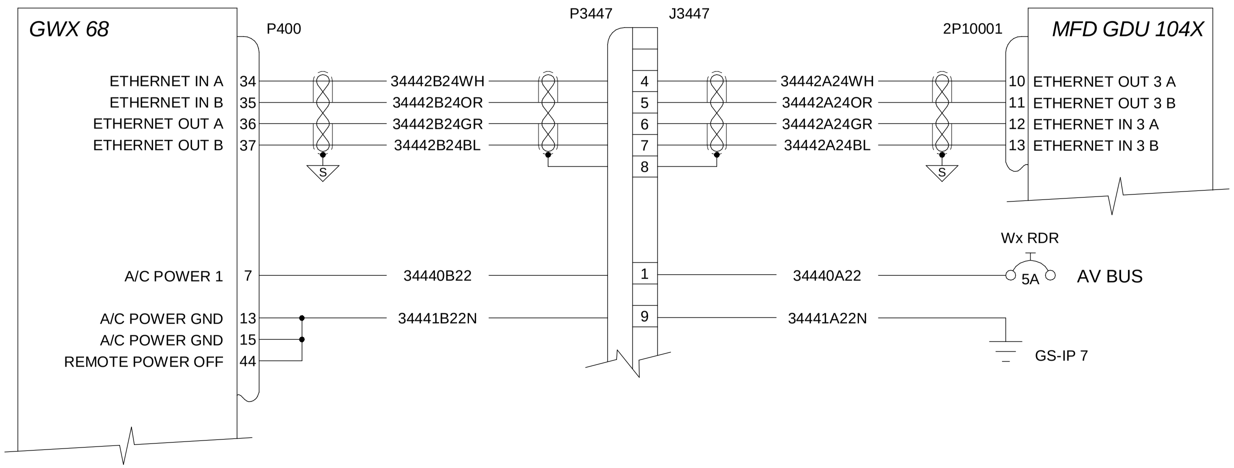
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-119 FIRST RELEASE	23.11.12	SEE TB



DIMENSIONS **METRIC**		IDENTIFICATION MARKINGS
FIRST ANGLE PROJECTION	FORMAT **A3**	**DP-S-17-00001**
		CLASSIFICATION: **NONE**
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART **NO**
DIMENSION TOLERANCES	3.2	THIS DRAWING WAS PRODUCED USING SOFTWARE **SOLID EDGE V18**
2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	FILENAME **D64-9234-40-01.dft**

Diamond Aircraft Industries GmbH — Diamond Aircraft Industries — N. A. Otto-Straße 5, A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN			**23.11.12**
CHECKED:			
QA:	**N/A**		
STRESS:	**N/A**		
MANUF.:	**N/A**		
SYSTEM:	**N/A**		
APPROVED:	**TL**		

PROJECT **DA 42 NG /M-NG**

TITLE

Schematic, GWX 68 Weather Radar Wiring

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9234-40-01**	"-"
CODE **710197**	SCALE NTS	SH **01** OF **01**

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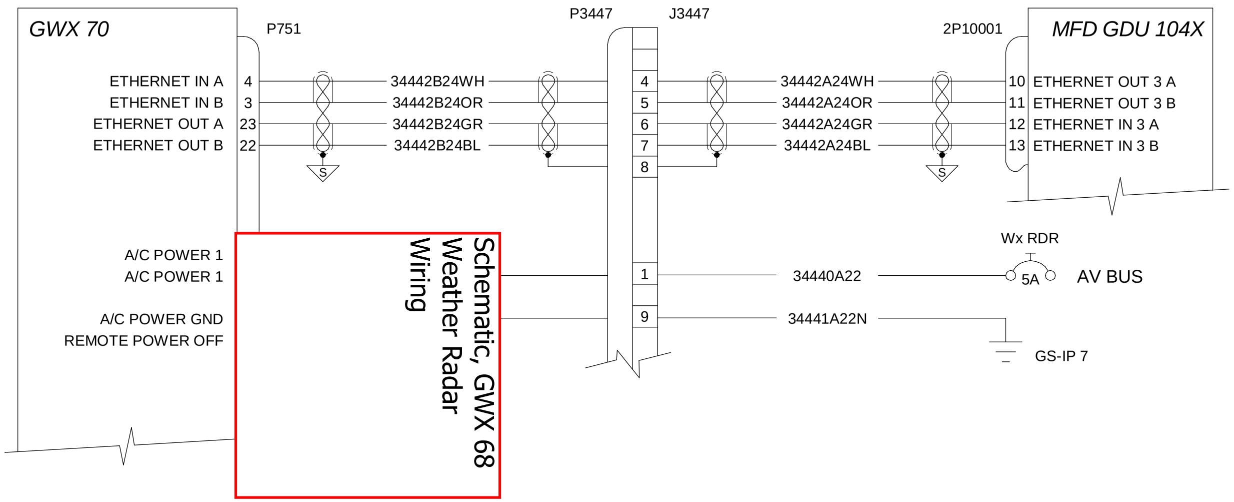
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	OÄM 42-273 FIRST RELEASE	12.09.14	SEE TB



DIMENSIONS **METRIC**	IDENTIFICATION MARKINGS **DP-S-17-00001**	**Diamond Aircraft Industries GmbH** Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION	FORMAT **A3**	CLASSIFICATION: **NONE**	PROJECT **DA 42 NG /M-NG**
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART **NO**		

DEPARTMENT	SIGN	DATE
DRAWN		12.09.14
CHECKED:		
QA: **N/A**		
STRESS: **N/A**		
MANUF.: **N/A**		
SYSTEM: **N/A**		
APPROVED: **TL**		

DIMENSION TOLERANCES

2 DECIMAL	±0,25
1 DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

3.2 FINISH IN MICRO-METER

THIS DRAWING WAS PRODUCED USING SOFTWARE **SOLID EDGE ST6**

FILENAME **D64-9234-40-02.dft**

TITLE

Schematic, GWX 70 Weather Radar Wiring

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9234-40-02**	"-"

CODE **710197** SCALE NTS SH **01** OF **01**

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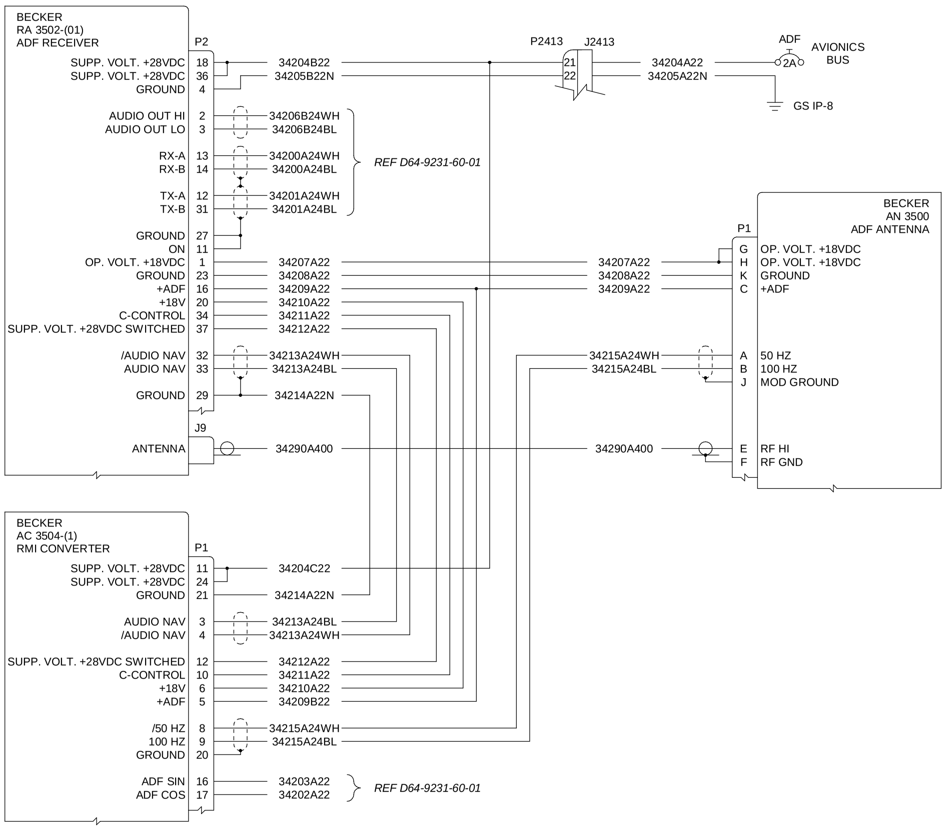
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	VÄM 42-004 FIRST RELEASE	14.07.08	SEE REV. "-"
A	01	ALL	MÄM 42-373, CORRECTED CO-AX WIRE NUMBER, NEW STANDARD.	11.08.09	SEE TB



DIMENSIONS **METRIC**

FIRST ANGLE PROJECTION | FORMAT **A3**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM

DIMENSION TOLERANCES

2 DECIMAL ±0,25
1DECIMAL ±0,5
DECIMAL ±1
ANGLE ±1°
RAD ±0,5

3.2 FINISH IN MICRO-METER

IDENTIFICATION MARKINGS **DE-S-10-00003**

CLASSIFICATION: **NONE**

INTERCHANGEABLE PART **NO**

THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE V18**

FILENAME **D64-9234-50-01a.dft**

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT	SIGN	DATE
DRAWN		11.08.09
CHECKED:		
QA: N/A		
STRESS: N/A		
MANUF.: N/A		
SYSTEM: N/A		
APPROVED:		

PROJECT **DA 42 NG**

TITLE

Schematic, ADF

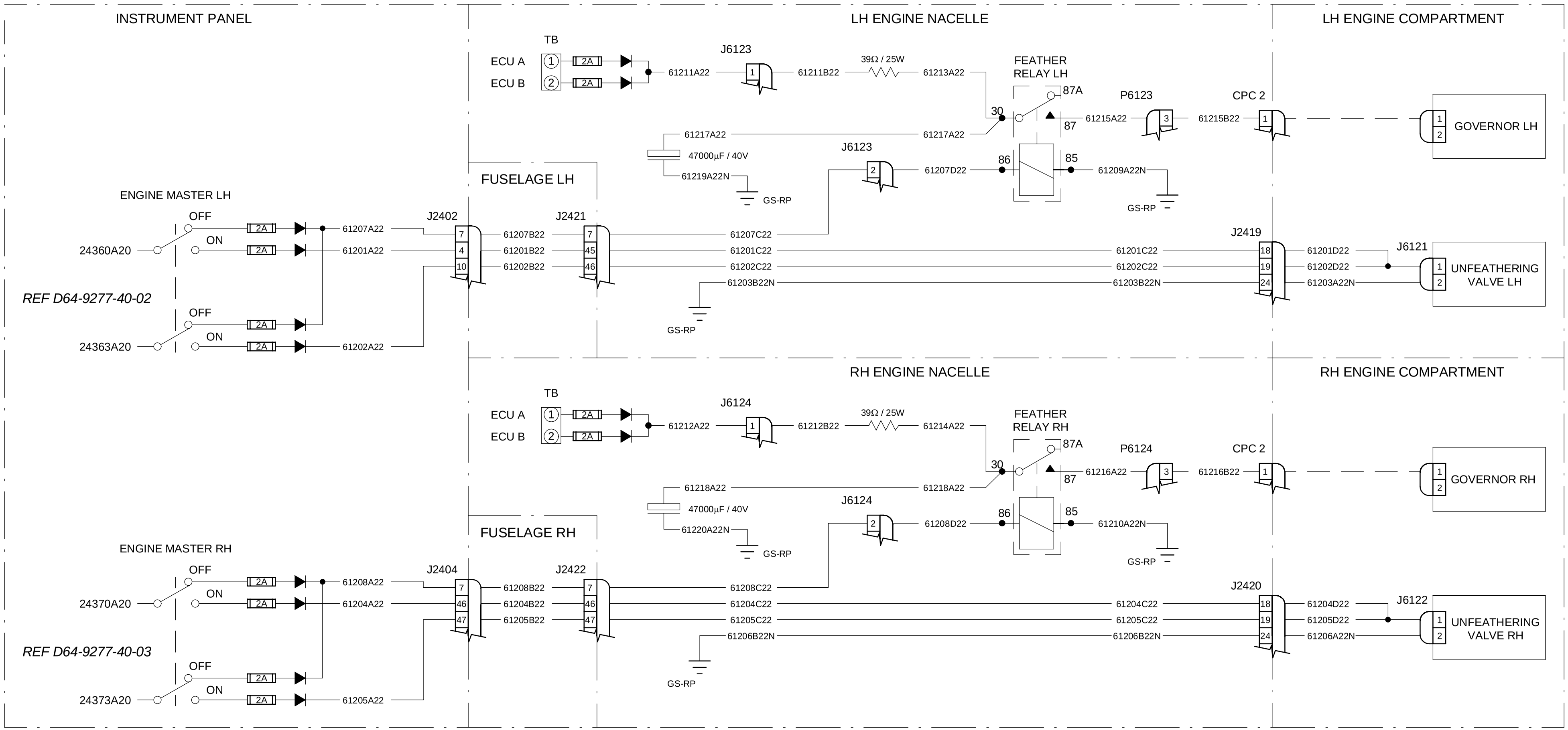
DWG.ORIG. **DAIA** | DWG.NO. **D64-9234-50-01** | REV "A"

CODE **710197** | SCALE NTS | SH **01** OF **01**

Confidential

Confidential

REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	01	ALL	MÄM 42-366 FIRST RELEASE	15.06.09	SEE TB



DIMENSIONS METRIC		IDENTIFICATION MARKINGS DE-S-10-00003	- / -
FIRST ANGLE PROJECTION	FORMAT A3	CLASSIFICATION: NONE	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART	NO
DIMENSION TOLERANCES	3.2	THIS DRAWING WAS PRODUCED USING	
2 DECIMAL ±0,25 1DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	SOFTWARE: SOLID EDGE V18	
		FILENAME D64-9261-20-01_01.dft	

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN	Kowarsch		15.06.09
CHECKED:	Kowarsch		
QA:	N/A		
STRESS:	N/A		
MANUF.:	N/A		
SYSTEM:	N/A		
APPROVED:	Zeillinger		

PROJECT DA 42 NG

TITLE

Schematic, Feathering System

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9261-20-01_01	"-"
CODE 710197	SCALE NTS	SH 01 OF 01

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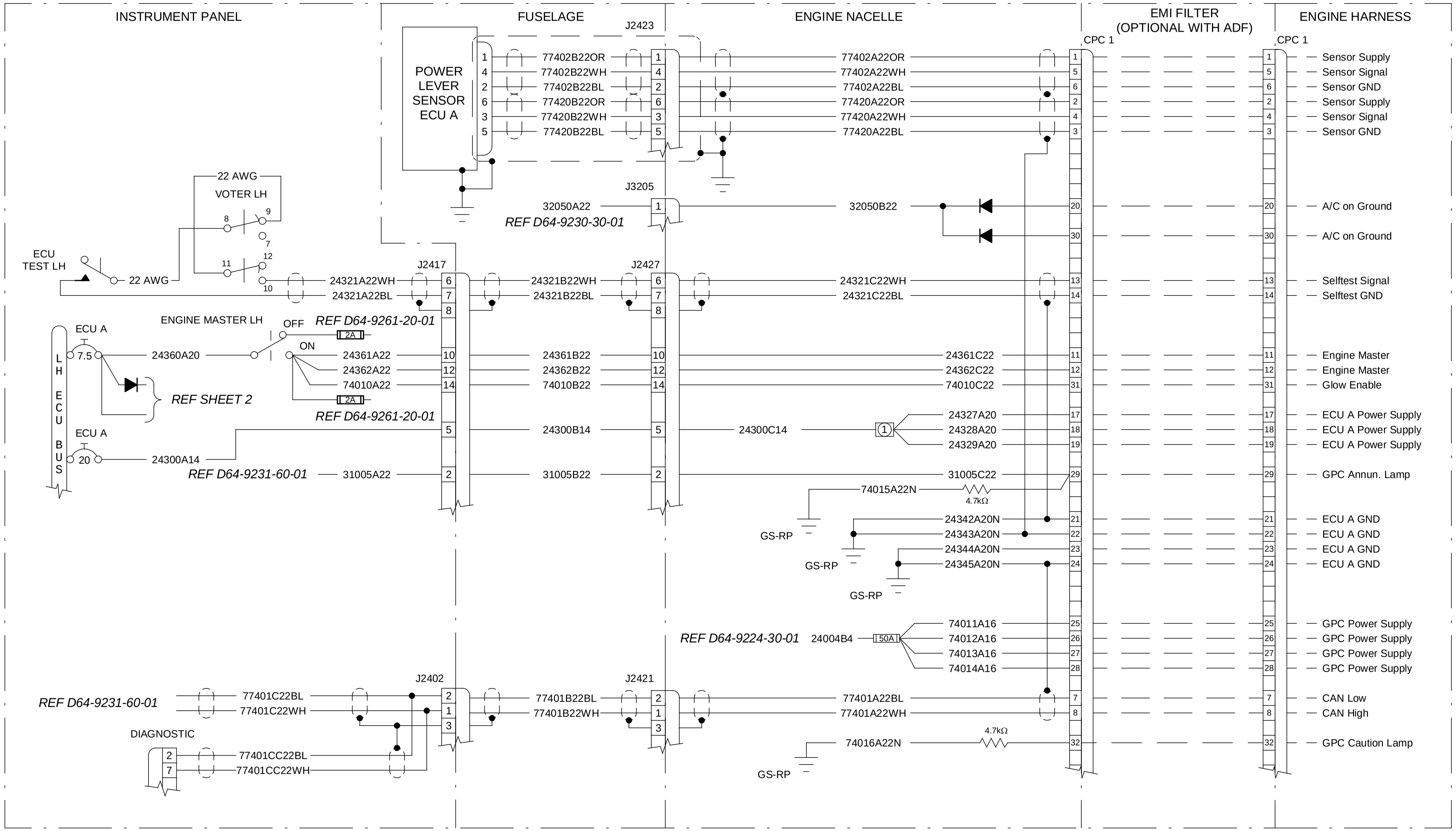
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
"-"	01 02	ALL	MÄM 42-388 FIRST RELEASE	07.09.09	SEE TB



DIMENSIONS **METRIC**		IDENTIFICATION MARKINGS **DE-S-10-00003**	- / -
FIRST ANGLE PROJECTION	FORMAT **A3**	CLASSIFICATION: **NONE**	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM		INTERCHANGEABLE PART **NO**	
DIMENSION TOLERANCES	3.2	THIS DRAWING WAS PRODUCED USING SOFTWARE: **SOLID EDGE V18**	
2 DECIMAL ±0,25 1 DECIMAL ±0,5 DECIMAL ±1 ANGLE ±1° RAD ±0,5	FINISH IN MICRO-METER	FILENAME **D64-9277-40-02_01.dft**	

Diamond Aircraft Industries GmbH — Diamond Aircraft Industries — N. A. Otto-Straße 5, A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN	**Kowarsch**		**07.09.09**
CHECKED:	**Kowarsch**		
QA:	**N/A**		
STRESS:	**N/A**		
MANUF.:	**N/A**		
SYSTEM:	**N/A**		
APPROVED:	**TL**		

PROJECT **DA 42 NG**

TITLE

Schematic, LH ECU

DWG.ORIG.	DWG.NO.	REV
DAIA	**D64-9277-40-02_01**	"-"
CODE **710197**	SCALE NTS	SH **01** OF **02**

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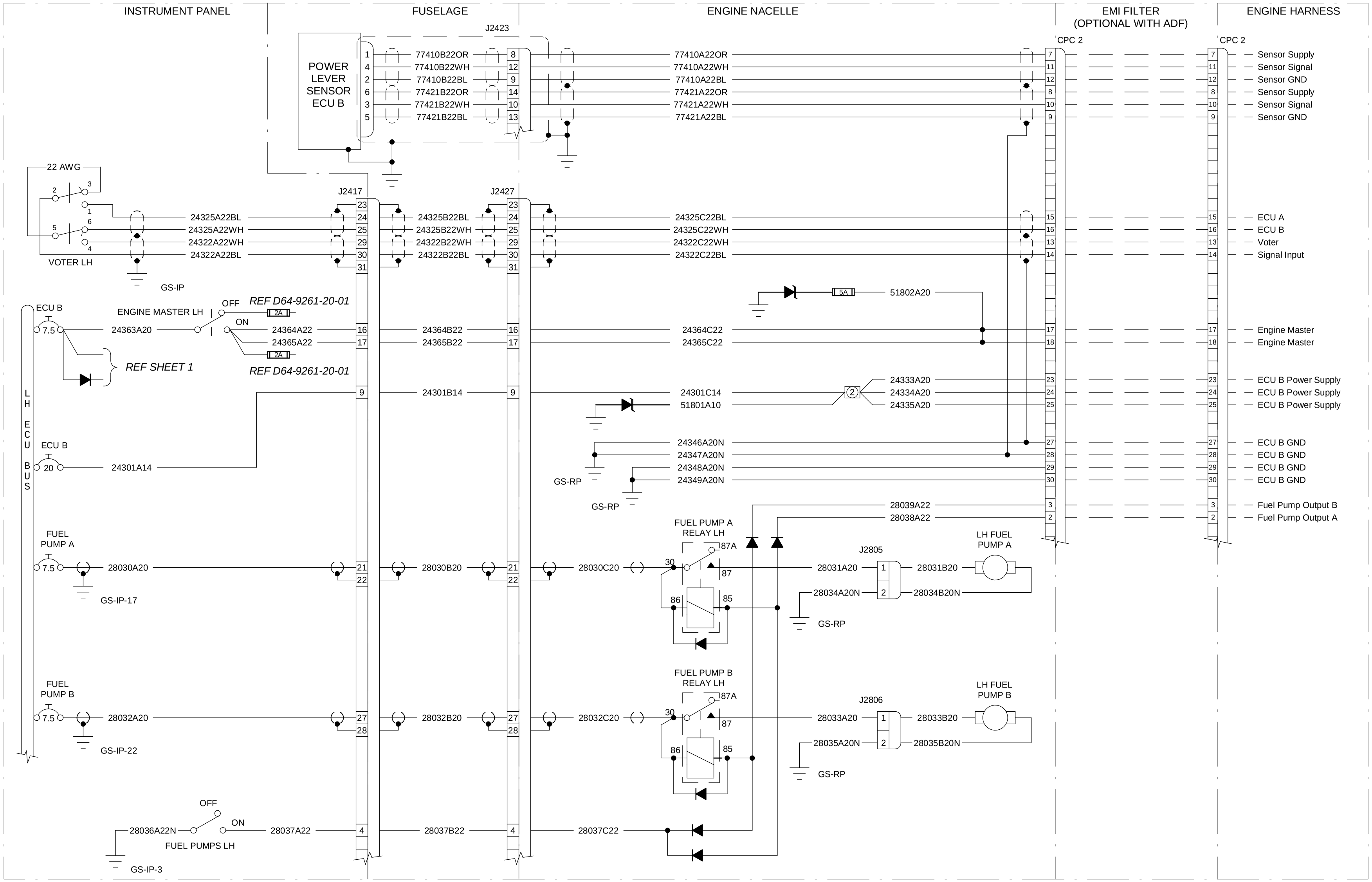

Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9277-40-02_01
Diamond Aircraft Industries	N. A. Otto-Straße 5, A-2700 Wiener Neustadt	Schematic, LH ECU	CODE 710197	SCALE 1:1
			SH 02 OF 02	REV "-"

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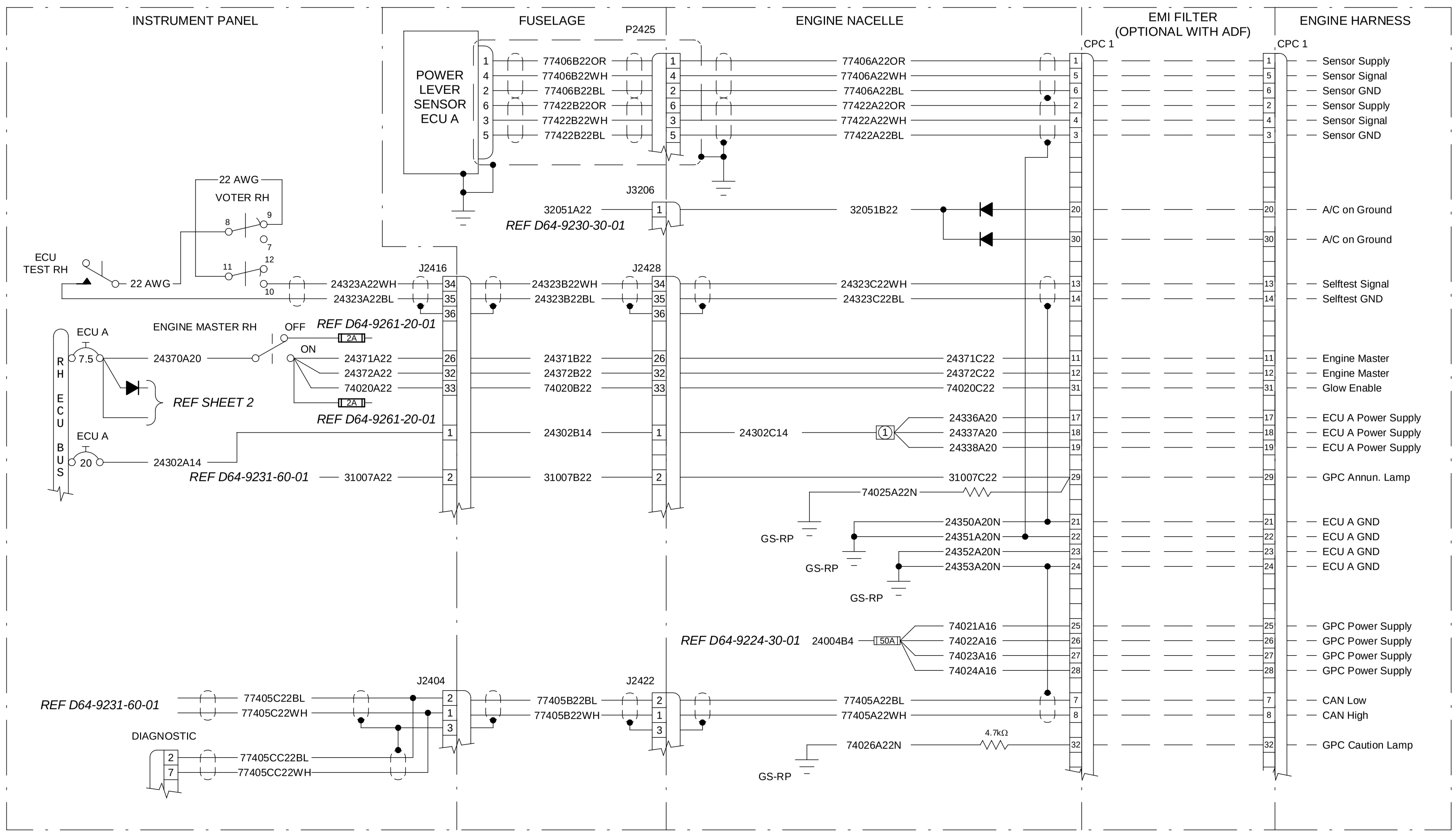
REVISION

REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
"-"	01 02	ALL	MÄM 42-388 FIRST RELEASE	07.09.09	SEE TB



DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT: A3
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	
DIMENSION TOLERANCES	3.2 FINISH IN MICROMETER
2 DECIMAL	±0,25
1 DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

IDENTIFICATION MARKINGS	DE-S-10-00003
CLASSIFICATION:	NONE
INTERCHANGEABLE PART	NO
THIS DRAWING WAS PRODUCED USING SOFTWARE:	SOLID EDGE V18
FILENAME	D64-9277-40-03_01.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN	Kowarsch		07.09.09
CHECKED:	Kowarsch		
QA:	N/A		
STRESS:	N/A		
MANUF.:	N/A		
SYSTEM:	N/A		
APPROVED:	TL		

PROJECT: DA 42 NG

TITLE

Schematic, RH ECU

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9277-40-03_01	"-"
CODE 710197	SCALE 1:1	SH 01 OF 02

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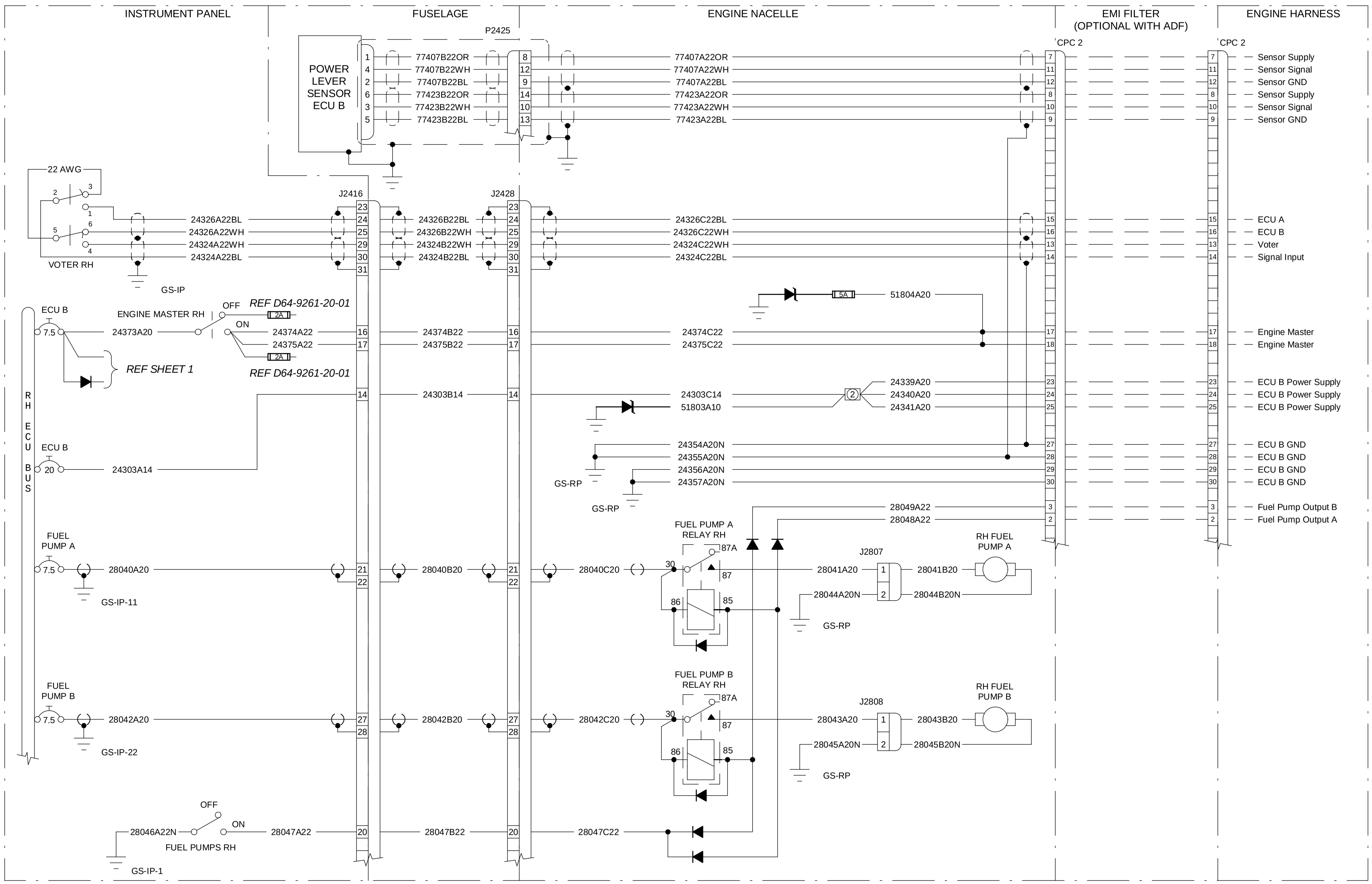

Diamond Aircraft Industries GmbH	PROJECT: DA 42 NG	TITLE: Schematic, RH ECU	DWG.ORIG.: DAIA	DWG.NO.: D64-9277-40-03_01
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt		CODE: 710197	SCALE: 1:1 · SH 02 OF 02 · REV "-"

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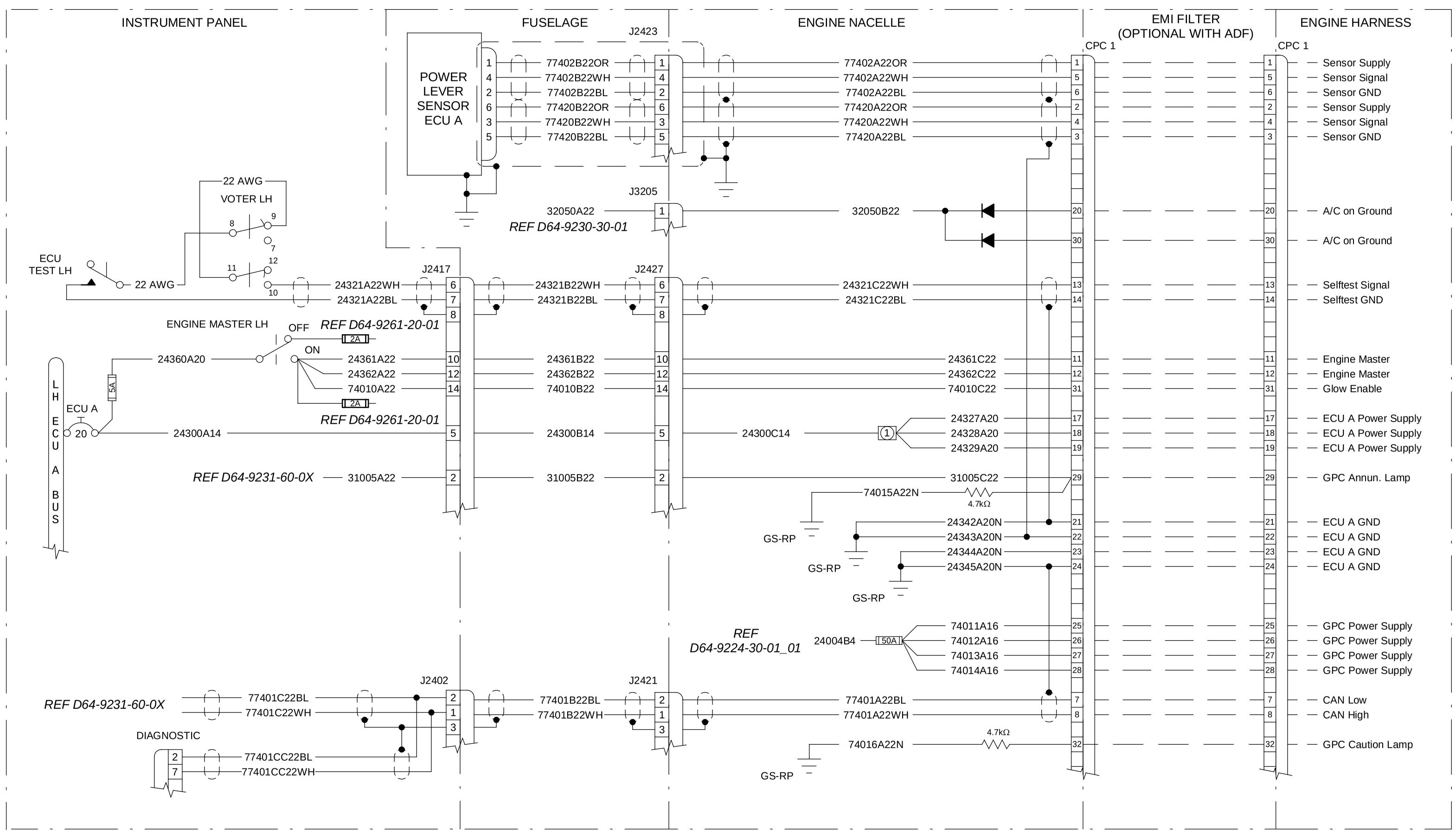
REVISION

REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	ALL	ALL	MÄM 42-403 FIRST RELEASE	27.11.09	SEE TB



DIMENSIONS METRIC	IDENTIFICATION MARKINGS DE-S-10-00003	Diamond Aircraft Industries GmbH — Diamond Aircraft Industries, N. A. Otto-Straße 5, A-2700 Wiener Neustadt
FIRST ANGLE PROJECTION — FORMAT A3	CLASSIFICATION: NONE	PROJECT DA 42 NG
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	INTERCHANGEABLE PART NO	TITLE Schematic, LH ECU
DIMENSION TOLERANCES: 2 DECIMAL ±0,25; 1DECIMAL ±0,5; DECIMAL ±1; ANGLE ±1°; RAD ±0,5 — 3.2 FINISH IN MICRO-METER	THIS DRAWING WAS PRODUCED USING SOFTWARE: SOLID EDGE V18	DWG.ORIG. DAIA — DWG.NO. D64-9277-40-02_02 — REV "-"
	FILENAME D64-9277-40-02_02.dft	CODE 710197 — SCALE NTS — SH 01 OF 02

DEPARTMENT		SIGN	DATE
DRAWN	Kowarsch		27.11.09
CHECKED:	Kowarsch		
QA:	N/A		
STRESS:	N/A		
MANUF.:	N/A		
SYSTEM:	N/A		
APPROVED:	TL		

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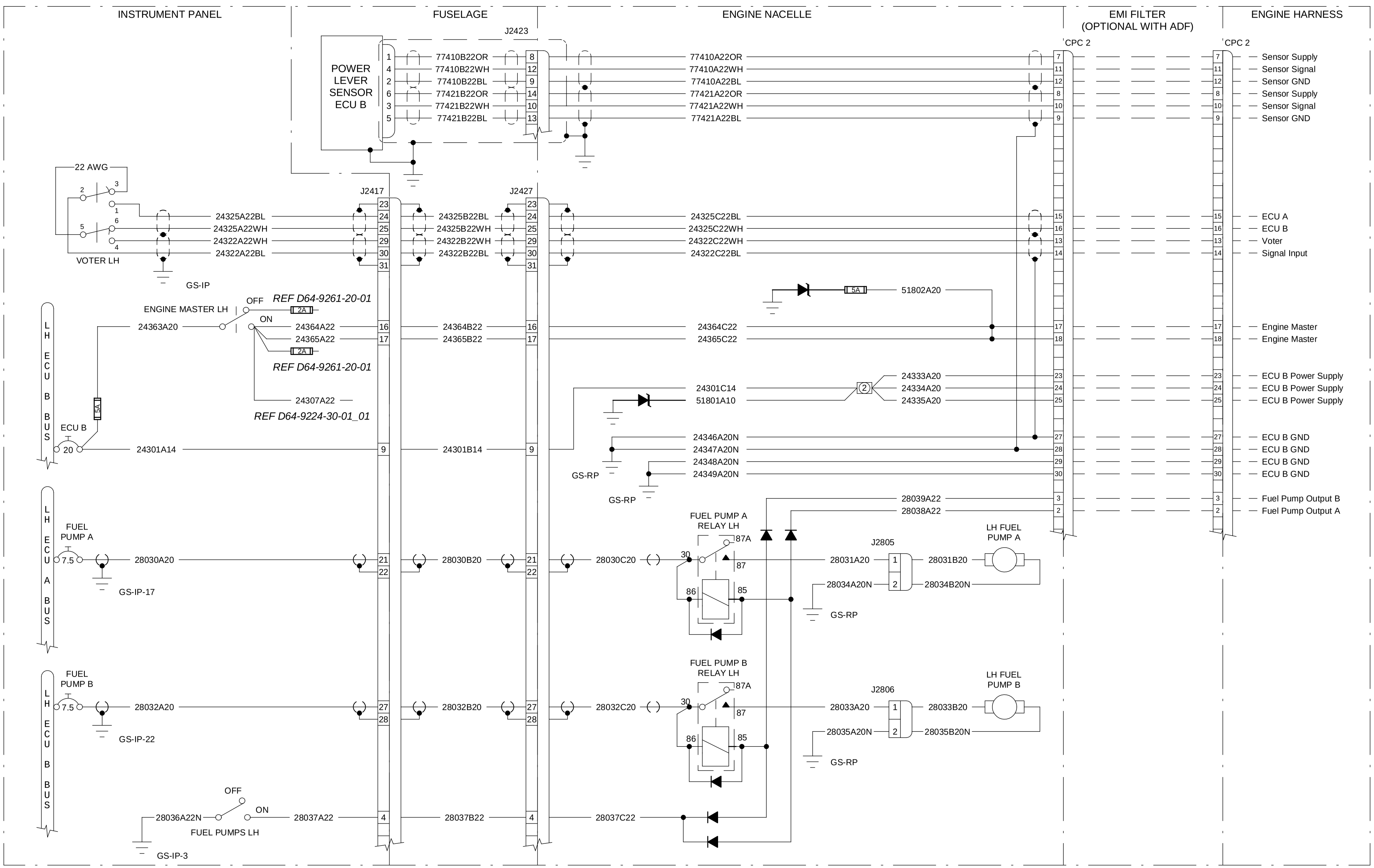

Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, LH ECU	DWG.NO. D64-9277-40-02_02
			REV "-"
			CODE 710197 SCALE NTS SH 02 OF 02

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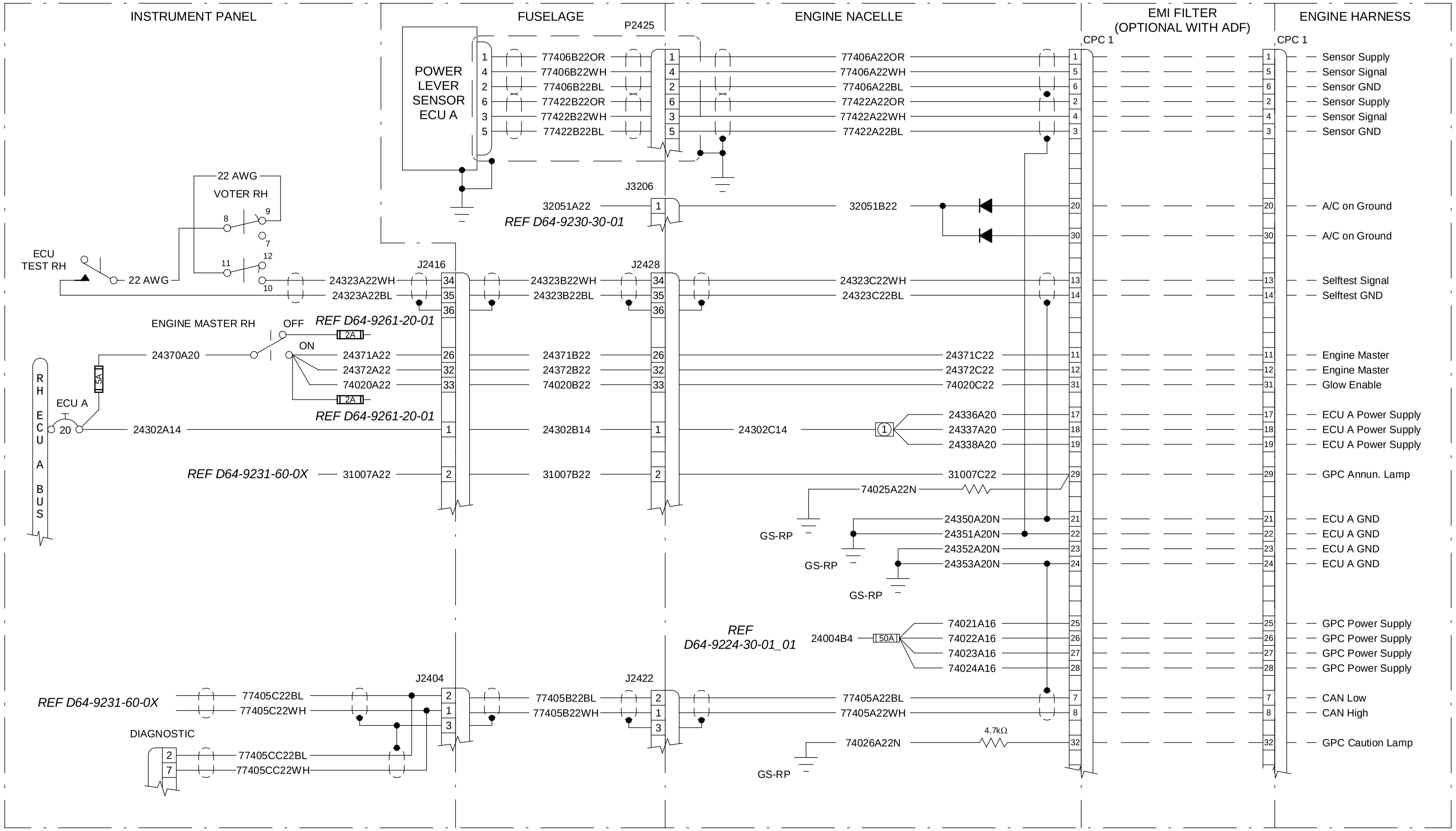
REVISION					
REV	SH	ZONE	DESCRIPTION	DATE	APPROVAL
-	ALL	ALL	MÄM 42-403 FIRST RELEASE	27.11.09	SEE TB



DIMENSIONS	METRIC
FIRST ANGLE PROJECTION	FORMAT A3
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM	
DIMENSION TOLERANCES	3.2 FINISH IN MICRO-METER
2 DECIMAL	±0,25
1DECIMAL	±0,5
DECIMAL	±1
ANGLE	±1°
RAD	±0,5

IDENTIFICATION MARKINGS	DE-S-10-00003
CLASSIFICATION:	NONE
INTERCHANGEABLE PART	NO
THIS DRAWING WAS PRODUCED USING SOFTWARE:	SOLID EDGE V18
FILENAME	D64-9277-40-03_02.dft

Diamond Aircraft Industries GmbH

Diamond Aircraft Industries

N. A. Otto-Straße 5
A-2700 Wiener Neustadt

DEPARTMENT		SIGN	DATE
DRAWN	Kowarsch		27.11.09
CHECKED:	Kowarsch		
QA:	N/A		
STRESS:	N/A		
MANUF.:	N/A		
SYSTEM:	N/A		
APPROVED:	TL		

PROJECT DA 42 NG

TITLE

Schematic, RH ECU

DWG.ORIG.	DWG.NO.	REV
DAIA	D64-9277-40-03_02	"-"
CODE 710197	SCALE 1:1	SH 01 OF 02

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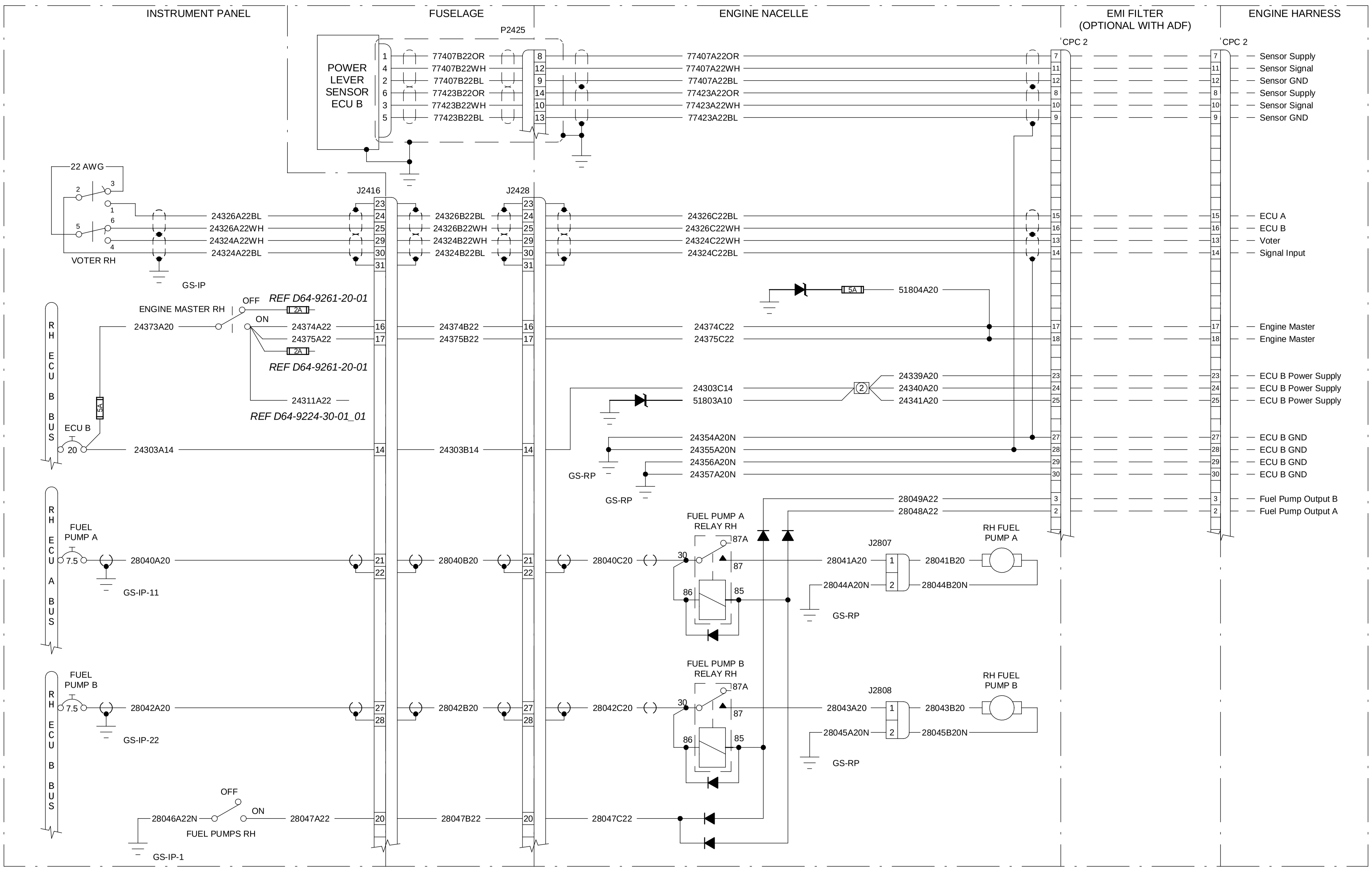

Diamond Aircraft Industries GmbH	PROJECT DA 42 NG	TITLE	DWG.ORIG. DAIA	DWG.NO. D64-9277-40-03_02	REV "-"
Diamond Aircraft Industries	N. A. Otto-Straße 5 A-2700 Wiener Neustadt	Schematic, RH ECU	CODE 710197	SCALE NTS	SH 02 OF 02