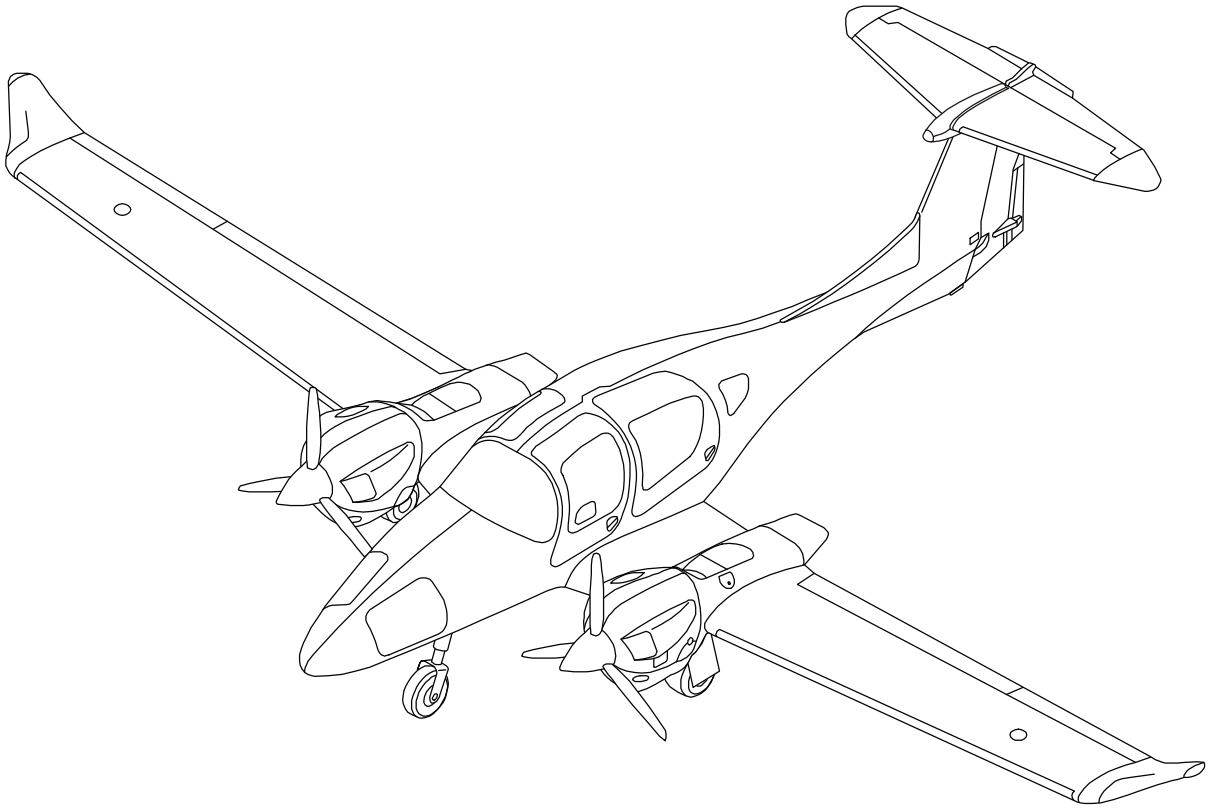
DA 62
AIRPLANE MAINTENANCE MANUAL



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MASTER TABLE OF CONTENTS

RECORD OF REVISIONS

1. Record of Revisions

This list is used to record and control all of the revisions for this Airplane Maintenance Manual (AMM). This manual is available on the Diamond Aircraft Website:

http://support.diamond-air.at/techpubs+M52087573ab0.html

NOTE: Hard copy revisions and incremental revisions are no longer available for the AMM and hard copies will not be distributed.

NOTE: The date of 08 Apr 2021 will show on all changed pages for Revision 3.
Revision bars in the LOEP will show the changed pages, for technical content.
Revision bars on the changed pages will show the where the content changes were made.
The Highlights pages will indicate why the changes were made.

DAIC - Diamond Aircraft Industries Canada.

Revision Number	Date Issued	Date Inserted	Inserted By
Original	01 Apr 2015	01 Apr 2015	DAI
1	03 Oct 2016		
2 Re-issue	18 Jul 2019	N/A	N/A
3	08 Apr 2021	08 Apr 2021	DAIC

Revision Number	Date Issued	Date Inserted	Inserted By

2. Record of Incorporated Temporary Revisions

The following Temporary Revisions have been incorporated into the DA 62 AMM at Revision 2:

Temporary Revision Number	Description of Temporary Revision
AMM-TR-MAM-62-023	Replacement Requirements (Ch. 4)
AMM-TR-MAM-62-192a	Flap Stop Removal (Ch. 6 & 27)
AMM-TR-MÄM-62-239	Fire Resistant Cowlings
AMM-TR-MÄM-62-249	Milled Alternate Air Lever (Ch. 11 & 71)
AMM-TR-MÄM-62-254	Garmin Hard and Software Upgrade 1 (Ch. 22, 31, 92)
AMM-TR-MÄM-62-261	Nacelle Air Outlet Duct (Ch. 81)
AMM-TR-MÄM-62-263	Emergency Gear Extension (Ch. 11)
AMM-TR-MÄM-62-277	Turbo Connector Shim (Ch. 81)
AMM-TR-MÄM-62-280	Engine Oils (Ch. 11)
AMM-TR-MÄM-62-281	NLG Improved Steering Brace (Ch. 32)
AMM-TR-MÄM-62-285	Control Surface Mass & Static Moment Adjustment II (Ch.51)
AMM-TR-MÄM-62-289	Referenced Maint Data Update (Ch. 5 & 32)
AMM-TR-MÄM-62-321	Worm Drive Clamp Installation (Ch. 20)
AMM-TR-MÄM-62-1005	Lap Belt Check (Ch. 25)
AMM-TR-MÄM-62-1007	Garmin G1000 Nxi PHASE II (Ch. 22, 23, 31, 34 92)
AMM-TR-MÄM-62-1020	Improved Fire Detector Installation (Ch. 26)
AMM-TR-MÄM-62-1021	DA 62 Additional Colours (Ch. 51)
AMM-TR-MÄM-62-1033	Changes to Fuel Filler Assembly Installation (Ch. 28
AMM-TR-MÄM-62-1036	Electrical Bonding Inspection (Ch.51)
AMM-TR-MÄM-62-1037	Rudder Contro Assembly (Ch. 55)
AMM-TR-MÄM-62-1044	Fuel Filler Assembly Sealant (Ch. 28)
AMM-TR-OAM-62-001a	Auxiliary Fuel Tanks (Ch. 20 & 28)
AMM-TR-OAM-62-031	Armrest with Integrated Keypad (Ch. 11 & 31)
AMM-TR-OAM-62-035	Debris Protection (Ch. 11 & 51)
AMM-TR-OAM-62-037a	Electrically Heated Static Port (Ch. 34)
AMM-TR-OAM-62-060	Larger Fuel Cooler (Ch. 73)
AMM-TR-OAM-62-1002a	28V Power Outlet Option(Ch. 11 & 92)

The following Temporary Revisions have been incorporated into the DA 62 AMM at Revision 3:

Temporary Revision Number	Description of Temporary Revision

HIGHLIGHTS

1. **General**

The table below highlights the changes that have been incorporated in Revision 3 of the AMM. Revision bars on the changed pages will show where the content changes were made.

CH-SE-SU	Page(s)	Highlights
Front Matter	ALL	Cover page, back of the cover page, Record of Revisions (ROR) and Temporary Revisions (TR), Highlights, and List of Effective Pages (LOEP) were revised.
ALL	ALL Applicable Pages.	To have the manual conform to the rules of simplilfied english: - Articles before nouns have been implemented. - The numbers 1, 2, 3 through 9 have been changed to read one, two, three through nine where applicable - Figures in the maintenance practices pageblocks have been renumbered to start at figure 201 and subsequent - Long nouns have been hyphenated (e.g. rudder trim tab control system revised to read rudder-trim-tab control system) - Indications of angles have been revised to read in degrees (e.g. 5° position changed to 5 degrees position). In these cases above, revision bars will not always be shown.
ALL	ALL Applicable Sections	Due to the manual being converted from WordPerfect to FrameMaker, some sections of the manual will not have the same number of pages. In these cases, revision bars will not always show to indicate the difference in the page numbers. The contents (TOC) for each chapter has been revised to agree with the FrameMaker format of other Diamond Canada manuals.
Master TOC	i - v	Header and footer revised to show the it is a “Master TOC.”
01-TOC	1	The TOC has been revised to the FrameMaker format.
01-00-00	1	Para 2 Revision Service and Para 3 Cautions, Warnings and Notes revised.
	2	Paras 4 and 5 added to the introduction chapter.
	4	Para 6.C. (1) revised to make it more clear.
	5 - 10	Paras 7 thru 16 added or revised. MCR form added.
02-TOC	1	The TOC has been revised to the FrameMaker format.

CH-SE-SU	Page(s)	Highlights
02-00-00	1 2	Changes made to the general and revisions paragraphs. Categories added for the service bulletins.
02-00-00	3 - 5 6 & 7	More abbreviations added to the table. Pagination.
03-TOC	1	The TOC has been revised to the FrameMaker format.
03-00-00	1, 3 & 9	Added para 1, the general paragraph. Paras re-numbered with the addition of para 1.
05-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
05-00-00	3	Added the Kannad 406 AF Integra ELT to the table listing.
05-10-00	3	Added maintenance requirements for the short pushrods for Ch 27.
05-25-00	1	Reference to the table revised to be more accurate.
	6	Added a paragraph after the table.
05-28-00	1	Revised the format of the table.
	2	Added a caution for the preparation.
	3	Added step 1. All the other steps (2 thru 9) are re-numbered.
	4	Re-worded steps 1 and 8 to be more clear.
	7	Re-worded step 16 to be more clear.
	8	Re-worded steps 17 and 21 to be more clear.
	9	Added step 25 for inspection of the additional alternator. Added steps 29 & 30 for EECU information.
	10	Re-worded steps 1 and 8 to be more clear.
	13	Re-worded step 16 to be more clear.
	14	Re-worded steps 17 and 21 to be more clear.
	15	Added steps 25 & 26 for EECU information.
	16	Para 5 re-numbered.

CH-SE-SU	Page(s)	Highlights
05-28-00	5, 6, 11 & 12	Pagination.
05-28-50	6	Revised step 1.D. 1. to be more clear.
	7 & 8	Added step 8 and revised step 12.
	9	Caution changed to a warning.
	21	Revised Item 3.A.6 to reference the test required
	27	Para C changed to para D. Header revised to be more clear.
	28	Put in the reference to the figure for section 27-30-00.
	37	Put in the reference to section 52-40 for steps 4 and 7.
	40	Put in the reference to section 52-40 for steps 3 and 8.
	44	Added a new step (Step 18) for the ice protection system being installed.
	10 - 20, 22-26, 29 -36, 38, 39, 41-43, 45 & 46	Pagination.
05-28-93	1	Revised the general para to indicate the manufacturer as Diamond Canada.
	2, 3 & 4	Pg. 2 Added to enter the data in the table provided. Pgs. 3 & 4 pagination.
05-50-00	1	Revised para 2 to indicate that figures 1 and 2 show the areas. Revised the table header for equipment.
	2	Changed the caution to a warning. Revised step (18) to conform.
	6	Revised the reference to the manual to refer to the latest revision.
	7	Revised both warnings to indicate what could result if instructions are not followed.
	12	Step (11) revised to refer to the Garmin line maintenance manual.
	13	Added the reference for the compass swing required.

CH-SE-SU	Page(s)	Highlights
05-50-00	3 - 5, 8 - 11 & 14	Pagination.
06-TOC	1	The TOC has been revised to the FrameMaker format.
07-TOC	1	The TOC has been revised to the FrameMaker format.
07-10-00	1 3 4	Added a warning before lifting the airplane on jacks. Revised the cautions and the procedure to be more clear. Revised the warning to indicate what could result if instructions are not followed. Simplified english corrections.
08-TOC	1	The TOC has been revised to the FrameMaker format.
08-10-00	8	Revised the maximum permitted all up weight.
09-TITLE	1	Revised the title to remove “General”.
09-TOC	1	The TOC has been revised to the FrameMaker format.
09-00-00	1	First warning revised. Second warning changed to a caution.
09-20-00	1 2 & 3	Warning revised to indicate what could result if instructions are not followed. Pagination.
10-TOC	1	The TOC has been revised to the FrameMaker format.
10-10-00	2 & 3 5	Warnings revised to indicate what could result if instructions are not followed. Caution revised to indicate what could result if instructions are not followed.
10-20-00	1	Added a para to indicate figure 1 shows the locations.
11-TOC	1	The TOC has been revised to the FrameMaker format.
11-20-00	1 - 6	First page explains that the next pages show the exterior placards. Pages 2 -6 pagination.
12-TOC	1	The TOC has been revised to the FrameMaker format.

CH-SE-SU	Page(s)	Highlights
12-00-00	1	Revised the note to be more clear.
12-10-00	4	Revised step (9) to indicate the correct steps to follow.
	7	Warning revised to indicate what could result if instructions are not followed. Added that the procedure is applicable to both engines. References revised to be more clear.
	9	Warnings revised to indicate what could result if instructions are not followed. Caution revised to indicate what could result if instructions are not followed. Procedure revised to be more clear.
	12	Warning revised to indicate what could result if instructions are not followed.
	13 & 14	Added a caution before the procedure. Revised the procedure.
12-20-00	3	Revised the notes to the table and re-numbered the notes (1) to (6).
	5	Revised the Figure. Items 16 and 17 were reversed.
12-30-00	1	Added para for interior cleaning.
	2	First caution revised to a warning. Cautions revised. Reference given.
20-TOC	1	The TOC has been revised to the FrameMaker format.
20-10-00	7	Torque provided for the horizontal stabilizer attaching bolts.
20-70-00	1 - 3	Revised the header for the tables, table 1 thru table 5.
21-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
21-20-00	1 - 4	Re-organized section from six pages to four pages.
	101	The indication for the table is given.
	201, 202, 204 - 206.	Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly.

CH-SE-SU	Page(s)	Highlights
21-20-00	203	Pagination due to the pageblock being authored in FrameMaker.
21-40-00	1 & 2	Re-organized section from four pages to two pages.
	201, 202 - 205, 207	Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly.
	206 & 208	Pagination due to the pageblock being authored in FrameMaker.
21-50-00	201, 202, 204, 205, 206, 209, 211 -213	Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly.
21-60-00	1 & 2	Re-organized section from four pages to two pages.
	201 - 204	Procedures have been revised, where required. Figure has been re-numbered to start at 201. References to the figure have been revised accordingly.
	205 & 206	Pagination due to the pageblock being authored in FrameMaker.
22-TOC	1	The TOC has been revised to the FrameMaker format.
22-10-00	201 - 222	Procedures have been revised, where required. Simplified english corrections. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required. Remove/Install of the yaw servo and yaw servo clutch added. Adjust the bridle cable tension of the yaw servo added. Pgs. 218, 219, 221 and 222 rev barred due to pagination.
23-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
23-60-00	201 & 202	Figure has been re-numbered to start at 201. Reference to the figure has been revised accordingly.
24-TOC	1 - 4	The TOC has been revised to the FrameMaker format.
24-00-00	1 - 14	Added safety precautions to first four pages, paras renumbered starting at para 4. Pagination due to pages being added.

CH-SE-SU	Page(s)	Highlights
24-30-00	2	Revised the first para due to figures being re-numbered.
	101	The general para has been revised to read better.
	202 - 205, 207 & 208	All figures have been re-numbered to start at 201. References to the figures have been revised accordingly.
24-31-00	101	The general para has been revised to read better.
	202 - 207	Procedures have been revised, where required, to apply DC4 to the battery terminal and lug. Figure in the pageblock has been re-numbered to start at 201. References to the figures have been revised accordingly.
24-33-00	101	The general para has been revised to read better.
	203	Revised the para 4 title.
24-40-00	101	The general para has been revised to read better.
	202 - 204	Figure in the pageblock has been re-numbered to start at 201. Reference to the figure has been revised accordingly. Internal and external references have been revised, where required.
24-60-00	1	References to the figures have been revised.
	3	Figure revised to change the CB panel naming at two places.
	101	The general para has been revised to read better.
	202 - 209	Figure in the pageblock has been re-numbered to start at 201. Reference to the figure has been revised accordingly. Procedures have been revised, where required. Internal and external references have been revised, where required.
25-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
25-10-00	201 - 203, 205, 207 - 216	Warning/caution revised, where required. Procedures have been revised, authored, where required. All figures in the pageblock have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required.

CH-SE-SU	Page(s)	Highlights
25-50-00	201	Revised the reference to the figure.
	203 & 204	Added para 3 A and B for the variable. Revised the figure reference.
25-60-00	201 - 207	All figures in the pageblock have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal references have been revised, where required. Kannad 406 AF-Integra ELT added to the pageblock.
26-TOC	1	The TOC has been revised to the FrameMaker format.
26-00-00	101	The general para has been revised to read better.
	201 - 202	Reference to the figure has been revised accordingly. Procedures have been revised, where required.
27-TOC	1 - 4	The TOC has been revised to the FrameMaker format.
27-00-00	201 - 204	Figure in the pageblock has been re-numbered to start at 201. Reference to the figure has been revised accordingly. Internal reference to the figure has been revised. Pagination for Page 202.
27-10-00	2	Information added to the figure for the bolts installation.
	202 & 204	Internal reference to the figure has been revised.
	205	Internal reference to figure has been revised. Warning changed to caution.
27-20-00	3	Revised the figure numbering in the second paragraph.
	5	Electrical adjustment moved to page 5 from page 7.
	7 & 8	Pagination.
	201	General para revised to indicate the instructions that will be given in the pageblock.
	203, 209 - 211, 213	References to the figures have been revised.
	205 - 208	Procedures revised to be more complete.
	214 - 216	New procedures included in the manual. (R&I of the Rudder/Brake Pedal Assembly)

CH-SE-SU	Page(s)	Highlights
27-20-00	217 - 220	New procedures included in the manual. (R&I of the Pedal Assembly)
27-20-00	221	Para re-numbered to para 8.
	202, 204, 212, 222	Pagination.
27-21-00	101	General para changed to rudder-trim-tab control system
	201 & 204	Warning added before the start of the procedure.
	203	Figure in the pageblock has been re-numbered to start at 201.
27-30-00	2	Information added to the figure for the bolts installation.
	202 & 204	Internal reference to the figure has been revised.
27-35-00	1 & 2	D&O added for the stall warning system.
	101 & 102	Troubleshooting added for the stall warning system.
	201 - 206	Maintenance practices added for the stall warning system.
27-38-00	201, 202, 204, 206 & 207	Internal references to the figures have been revised. Changes to conform with the rules of simplified english.
27-50-00	201, 205, 206, 208, 210	Internal references to the figures have been revised. Caution on page 205 revised. Figure in the pageblock on pg. 210 has been re-numbered to 201. Reference to the figure has been revised accordingly.
	208 - 209	Steps 13 to 22 renumbered.
28-TOC	1 - 2	The TOC has been revised to the FrameMaker format.
28-10-00	2	Revised the figure title.
	5	Revised the construction of para B. New para C “Fuel Tank Vents”.
	6	Revised figure 4 to figure 3 in the first para.
	7	Revised figure 4 to figure 3.
	8	Revised figure 5 to figure 4 in the first para.

CH-SE-SU	Page(s)	Highlights
28-10-00	9	Revised figure 5 to figure 4. Page 10 is blank.
	209 & 210	Revised the Key Items/References for step 5 to refer to Section 52-40. Page 210 pagination.
28-10-00	215 - 218	Added procedures to remove/disassemble and assemble/install the fuel filler cap for the outboard fuel chamber.
28-20-00	8	Reference to the figure revised.
28-20-00	201 - 204, 206 & 208	Figure in the pageblock on pg. 203 has been re-numbered to 201. References to the figure have been revised accordingly.
	210 - 221	Figures in the pageblock (on pgs. 210, 214, 216 & 221) have been re-numbered from 202 to 205. References to the figure have been revised accordingly.
	222 & 223	Added “A. Procedure” before the tables containing the test procedures.
28-40-00	201	Internal reference to the figure has been revised.
	203 & 204	Renumbered para 3. Was 2A. Changes to conform with the rules of simplified english.
	206 - 210	Renumbered paras 4 thru 6. Internal references to the figures have been revised. Procedures have been revised, where required.
29-TOC	1	The TOC has been revised to the FrameMaker format.
29-10-00	2	Figure 1 (new figure) introduced.
	101	Paras added to the general statement. Caution revised.
	101 - 106	References clarified.
	201	Listed the contents of the pageblock.
	202 & 203	Added hydraulic safety precautions.

CH-SE-SU	Page(s)	Highlights
29-10-00	204 - 260	Added a warning/caution before the procedure, where required. Warning/caution revised, where required. Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required. Some pagination due to the pageblock being authored in FrameMaker.
30-TOC	1	The TOC has been revised to the FrameMaker format.
30-00-00	12	Caution revised.
31-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
31-10-00	3 4 - 7 8 - 10 201 203	Reference made to figure 1 and to figure 2 with table 1 for the CB's. Figure 2 added along with a circuit breaker identifying table Figures 2 and 3 changed to 3 and 4. References to the figures revised. Added para A. "Remove the Engine Control Assembly". "Install the Engine Control Assembly" becomes para B.
31-40-00	203 - 226 223 & 224	All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Pagination due to the pageblock being authored in FrameMaker.
32-TOC	1 - 4	The TOC has been revised to the FrameMaker format. pg. 4 pagination.
32-10-00	101	Revised the General paragraph to be more clear.
32-10-00	201 202 - 244	Revised the General paragraph to be more clear. Added a warning/caution before the procedure, where required. Warning/caution revised, where required. New procedures introduced or have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required. Pgs. 215, 219, 222, 244 pagination due to new authoring environment.

CH-SE-SU	Page(s)	Highlights
32-20-00	101	Revised the general paragraph to be more clear.
	201	Revised the general paragraph to be more clear.
30-20-00	202 - 222	Added a warning/caution before the procedure, where required. Warning/caution revised, where required. Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
	213 & 222	Pagination due to the pageblock being authored in FrameMaker.
32-30-00	101	Revised the general paragraph to be more clear.
	102	Added to replenish the hydraulic system
	201 - 214	Revised the general paragraph to be more clear. Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
	210, 211, 214	Pagination due to the pageblock being authored in FrameMaker.
32-40-00	201 - 224	Added a warning/caution before the procedure, where required. Warning/caution revised, where required. Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
	205, 211, 213	Pagination due to the pageblock being authored in FrameMaker.
33-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
33-10-00	201 - 210	Procedures have been revised, where required. All figures have been re-numbered to start at 201. References to the figures have been revised accordingly. Internal and external references have been revised, where required.

CH-SE-SU	Page(s)	Highlights
33-10-00	207	Pagination due to the pageblock being authored in FrameMaker.
33-40-00	101 & 102	Warning added in the general para on page 101. 102 is pagination.
	201 - 210	Procedures have been revised, where required. All figures have been re-numbered to start at 201. New figures added. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
34-TOC	1 - 4	The TOC has been revised to the FrameMaker format.
34-10-00	201 - 206 212 - 215	Procedures have been revised, where required. All figures have been re-numbered to start at 201. New figure 202 added. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
	207	Pagination due to the pageblock being authored in FrameMaker.
34-20-00	2 - 4	Standby attitude module, MD302 information added.
	201 - 206	Revised the general paragraph to add the MD302. Removal and installation of the MD302 added. Procedures have been revised, where required. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
	203 & 206	Pagination due to the pageblock being authored in FrameMaker.
34-41-00	2	New figure added for lightning detection system - components.
	201 - 204	Procedures have been revised, where required. New figure 201 added. References to the figures have been revised accordingly. Internal and external references have been revised, where required.
34-42-00	1 & 2	General para revised to be more clear. Para C. revised to be more clear. New figure on page 2 added to show the TAS component locations.
	101	Repair procedures revised.

CH-SE-SU	Page(s)	Highlights
34-42-00	201 - 207	Procedures have been revised, where required. New figures 201 and 202 added. References to the figures have been revised accordingly.
	208	Pagination due to the pageblock being authored in FrameMaker.
34-43-00	201 - 204	Procedures have been revised, where required. Notes changed to a Caution or a Warning. New figure 201 added. References to the figures have been revised accordingly.
34-50-00	201, 203 & 204 206 - 211	Procedures have been revised, where required. All figures have been re-numbered to start at 201. New figure 204 added. References to the figures have been revised accordingly.
	202, 205, 212	Pagination due to the pageblock being authored in FrameMaker.
35-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
35-10-00	1 & 2	References to figures revised on pg. 1. New figure on pg. 2.
	201	Oxygen safety precautions added for para 2.
	202 - 214	Paras 2 - 9 revised to paras 3 - 10. New figures 201 - 203 added to the pageblock. References to the figures have been revised accordingly. Procedures have been revised, where required. Internal references have been revised, where required.
51-TOC	1 - 4	The TOC has been revised to the FrameMaker format.
51-20-00	2	Warnings re-located to come before the procedural statements.
	201	Caution added to para 2 for epoxy resin.
	207	Eurocell 502 added to the bonding paste material.
	208	The caution has been located before the procedure at step 3.

CH-SE-SU	Page(s)	Highlights
51-20-00	209, 216, 218, 223, 227 & 228,	References to figures have been revised.
51-20-00	210, 211, 215, 221, 224 & 226	Figures re-numbered to start at 201.
51-30-00	1, 1, 6 & 8	Added a note to para 1. Added RIMH937G to resin Hardener for Para 2.A. Updated information on the suppliers.
51-60-00	1 6 - 16 10 - 16	Revised the first para to explain the reports for the airplane serial numbers. The figure numbers have been revised. Revised the first para to explain the reports for the airplane serial numbers.
52-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
52-00-00	2	New figure added for doors and panels.
52-10-00	201 - 203	References to the figures have been revised accordingly. Warnings added before the door removal procedures. Procedures have been revised, where required.
52-30-00	101 201 & 202	General para revised. The repair for the first trouble has been revised. References to the figures have been revised accordingly. Procedures have been revised.
52-40-00	1 3 4 201 - 206	Added reference to figure 2 and revised the para for special instructions. Added para A for a description of the vented access panel. Added para B for a description of the hinged vented access-panel (if MÄM 62-1074 is installed). Figure 2 added to show access panel locations in the nose. Figure 3 added to show the vented access panel location. Maintenance Practices pageblock added for the removal and installation of the two vented access panels.
53-TOC	1	The TOC has been revised to the FrameMaker format.

CH-SE-SU	Page(s)	Highlights
55-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
55-10-00	201 - 206	Re-located the note to be applicable to both the removal and installation. Figure re-numbered to 201. References to the figures have been revised. Procedures have been revised, where required. Added torque information pg. 204 step B. (3).
55-20-00	3, 5 & 6 201 - 206	Para 2 - added the description for the three figures. Added figure 3 on pg. 5. Pagination for pg. 6. Added a new figure 201. Numbered second figure 202. References to the figures have been revised accordingly. Procedures have been revised, where required.
55-30-00	1	Figure 1 added to the page to show the lower fin.
55-40-00	201 - 206	General para has been revised. Figures re-numbered to start at 201. References to the figures have been revised. Procedures have been revised, where required.
56-TOC	1	The TOC has been revised to the FrameMaker format.
56-10-00	201 - 210	On pg. 201 Note revised, adhesive changed & warning revised. Pgs. 201 -204 the procedure has been revised. Pgs. 205 and 207 the figures are renumbered. Acryfix to Acrifix. Pg. 206 reference to figure. Acyfix 92 revised to Acrifix 192. Pgs. 208 and 209 the procedure has been revised. Pg. 210 pagination.
57-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
57-10-00	201 - 218	General para has been revised. Figures re-numbered to start at 201. Revised fig. 201. New fig. 204. References to the figures and internal references have been revised. Procedures have been revised, where required. Warnings placed before the procedural step, as required. New procedures “Remove/Install a Wing Tip” on pgs. 216 - 218. Pgs. 203, 206 & 210 pagination.

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57-50-00	201 - 208	General para has been revised. Figures re-numbered to start at 201. New figure for 201. References to the figures have been revised. Procedures have been revised, Pgs. 205 & 207 where required. Pgs. 202, & 208 pagination.
57-60-00	201 - 203	Figure re-numbered to start at 201. References to the figure have been revised.
61-TOC	1 & 2	The TOC has been revised to the FrameMaker format.
61-10-00	201 - 214	General para has been revised. Figures re-numbered to start at 201 and run to 203. References to the figures have been revised. Procedures have been revised, steps re-numbered, where required. Pgs. 206, 207, 210 & 214 pagination.
61-20-00	203 - 206	Figure re-numbered to 201. References to the figure have been revised.
71-TOC	1 - 3	The TOC has been revised to the FrameMaker format.
71-00-00	201 & 202 204 - 214	Warning on pg. 201 has been revised. Figures re-numbered to start at 201 and run to 204. References to the figures have been revised. Internal and external references revised.
71-10-00	201 - 203 & 205	Warning on pg. 201 has been revised. References to the figures have been revised. Para 3.C. revised to indicate that the procedure applies to all engine cowlings.
71-20-00	101 202 & 203	Revised the repair for an engine vibration. References to the figures have been revised. Internal references included or revised.
71-60-00	1, 3 & 4	New figures on pg. 3 and 4. References to the figures on pg. 1have been revised.

CH-SE-SU	Page(s)	Highlights
71-60-00	201 - 220	Added new figures on pgs. 207, 212 & 216. Numbered 201 - 203. References to the figures have been revised throughout the pageblock. Procedures have been revised, where required. Paras and steps re-numbered, where required. Pg. 220 pagination.
71-70-00	201 - 204	New figure on pg. 203. figure 201. References to the figure on pgs. 201 and 204 have been revised. Procedures have been revised, where required.
72-TOC	1	The TOC has been revised to the FrameMaker format. Two items added.
72-00-00	202 & 203.	Added a note for environment protection. Revised the procedure. Added notes and a caution. Steps re-numbered.
	204 & 205	Added warnings. Revised the caution. Revised the procedure. References to the figures have been revised. Steps re-numbered.
	206 - 208	Added a procedure for the EECU software update.
	209 & 210	Added a procedure for the readout of EECU data. Page 210 pagination.
73-TOC	1	The TOC has been revised to the FrameMaker format.
73-00-00	201 - 208	The general para on page 201 has been revised to be more clear. Warnings added after paras 2 and 3, before the start of the procedures. Figures re-numbered to 201 and 202. References to the figures have been revised. The pageblock has been re-organized into two main procedures and revised accordingly. Pg. 208 pagination.
75-TOC	1	The TOC has been revised to the FrameMaker format.
75-00-00	1 - 6	General para revised on pg. 1 The pageblock has been re-organized. Text first followed by the graphics. Pagination changes for 2 - 4 and pg. 6.

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75-00-00	201 - 224	Added new figures on pgs. 203, 206, 213, 218 & 220. Numbered 201 - 205. References to the figures have been revised throughout the pageblock. Internal references included to the pageblock or revised. Warning for the removal of the filler cap from the coolant tank revised throughout the pageblock. Each of the 10 procedures have been revised to be more clear. Pg. 224 pagination.
76-TOC	1	The TOC has been revised to the FrameMaker format.
76-00-00	4	New figure 2 - Engine Controls.
	6	Revision to the sensors table - four rows.
	201 - 214	Added new figures on pgs. 202 & 206 Re-numbered figures 201 - 204. References to the figures have been revised throughout the pageblock. Internal references included to the pageblock or revised. Revised procedures “Remove/Install an ECU” and “Remove/Install an Electrical Harness for the ECU” to be more clear. pgs. 204 & 214 pagination.
77-TOC	1	The TOC has been revised to the FrameMaker format.
77-00-00	201	Added the fuel metering valve to the list of sensors. Revised the para on where to refer for maintenance data on the sensors.
	202	References to the figures have been revised. The procedure has been revised to be more clear.
	203 - 208	Re-numbered the figures from 201 - 206.
78-TOC	1	The TOC has been revised to the FrameMaker format.
78-00-00	201 & 202	General para revised. References to the figure has been revised. The remove/install procedures have been revised to be more clear.
79-TOC	1	The TOC has been revised to the FrameMaker format.
79-00-00	1 & 2	Figures added on pages 1 and 2.
80-TOC	1	The TOC has been revised to the FrameMaker format.

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80-00-00	201 - 212	Added new figures on pgs. 202 & 205. Numbered figures in the pageblock from 201 - 204. References to the figures have been revised throughout the pageblock. Internal references included to the pageblock or revised. All of the procedures have been revised to be more clear. Pg. 212 pagination.
81-TOC	1	The TOC has been revised to the FrameMaker format.
81-00-00	201 - 210	Caution revised on pg. 201. New figure added on pg. 203. References to the figures have been revised. The procedures to remove an engine intercooler and to install an engine intercooler have been revised to be more clear.
92-TOC	1	The TOC has been revised to the FrameMaker format.
92-00-00	1, 2 & 3 4 - 6 17, 25, 30 - 47, 49 - 52 55, 65 & 66.	Seven new or revised schematics added to the table. Electrical/Electronic Symbols added to Chapter 92. New or revised schematic pages.

LIST OF EFFECTIVE PAGES

1. **General**

The List of Effective Pages (LOEP) uses the following abbreviations:

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

All Chapters have a Title page and the Table of Contents.

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

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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 62 airplane. It contains a full description of the systems, trouble shooting procedures, 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 wiring diagrams for the electrical system.

Use the DA 62 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 to the AMM. The revision shows design changes to the airplane or changes in procedures. Each page of the manual shows the date of first issue. If the page has changed, it shows the revision and date of the revision with revision bars showing the actual changes made. The List of Effective Pages (LOEP) is part of each revision. It also shows which pages have changed.

Diamond Aircraft will supply temporary revision service to this manual as necessary. The Temporary Revisions (TR) supply temporary instructions before the next scheduled revision. The TRs will be included in the manual at the next scheduled revision. The TRs are applicable to only one page block. The TRs are not revised. If changes are necessary to the TR, a new TR is supplied.

3. Warnings, Cautions and Notes

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

This Airplane Maintenance Manual contains warnings and cautions that will show 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.**
***WARNINGS WILL BE IN UPPERCASE AND BOLDED*.**

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

This Airplane Maintenance Manual also contains notes that can show before or after applicable instructions:

NOTE: A Note gives information to the person doing the maintenance that will assist in the performance of the task.
Notes will be in sentence case.

4. **Equivalent Tools, Fixtures, and Test Equipment**

The tools, fixtures, and test equipment which are necessary to a given maintenance task are supplied in a table (in the applicable maintenance procedure) with the heading Tools and Equipment. These items are the ones recommended by Diamond Aircraft to do the given maintenance procedure. The airplane operator can use equivalent tools, fixtures, or test equipment as alternatives to those given in the table (unless specified differently) if those items agree with the conditions that follow:

- They are functionally interchangeable with those given in the table.
- They are applicable to the given maintenance procedure.
- They are equally safe for the equipment and for the person or persons who do the maintenance.

5. **Equivalent Procedures**

The steps written within the procedures for the various tasks in the AMM are in logical order as interpreted by the Technical Writer. They are correct if followed step by step for the completion of the task. However, if the intent of the maintenance procedure is not altered and the objective is met, the order of the steps required to complete the task may be revised at the discretion of the technician (Example: step 4.f. before step 4.e.). Unless otherwise specified, the elapsed time between the start and the end of a procedure is not important. Diamond Aircraft assumes no responsibility for the precision of the revised maintenance procedure.

6. **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 three sources of words available to use in Simplified English (SE).

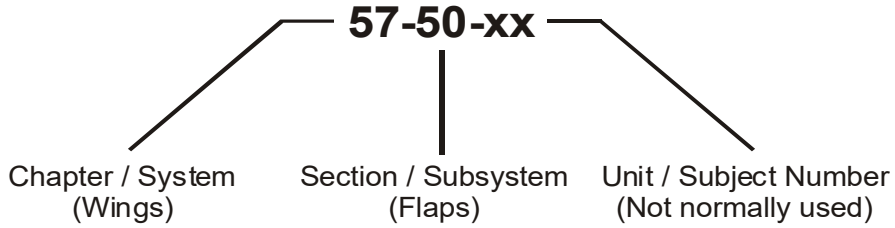
- Approved words from the SE Guide. These have defined meanings and selected parts of speech.
- Technical names as defined in the SE Guide. Used only as Adjectives or Nouns.
- Manufacturing processes as defined in the SE Guide. Always used as Verbs.

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 Numbering System

The ATA *i*Spec2200 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 Flaps. 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 the following groups:

Group A	Introduction	Chapters 01-02
Group B	Airplane General	Chapters 03-12
Group C	Airframe Systems	Chapters 20-37
Group D	Structure	Chapters 51-57
Group E	Propeller	Chapter 61
Group F	Power Plant	Chapters 71-81

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

C. The main contents of each group of chapters are given below:

(1) Group A - Introduction

Chapter 01 describes about the Airplane Maintenance Manual.

Chapter 02 describes the organization and handling of the Manual.

(2) Group B - Airplane General

Chapter 03 describes the general description of the airplane and its systems.

Chapter 04 describes the 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 chapter 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 tells you about the airframe systems. They include the avionics systems (such as communications (23)) and the mechanical systems (such as flight controls (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 describe 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.

7. Page Numbering System

This manual uses the ATA *i*Spec 2200 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/subject number.

The first page of each chapter shows the number of the chapter and the title. The second page shows the table of contents for that chapter.

Each subject in a Chapter has page numbering for the following page blocks:

- Description and Operation: Pages 1 to 99.
- Trouble-Shooting: Pages 101 to 199.
- Maintenance Practices: Pages 201 to 299.

A. Description and Operation page blocks (Pages 1 to 99).

The Description and Operation portion of the AMM gives the function, operation, configuration and control of the systems and components in the airplane. The information is given in sufficient detail to let the technician know the function and construction of the system.

B. Trouble-Shooting page blocks (Pages 101 to 199).

Trouble-Shooting is included with the AMM in the 101 to 199 range of pages. The function of the trouble-shooting page-blocks is to give airplane maintenance personnel sufficient data to isolate system/component malfunctions that occur in the airplane systems as quickly and as accurately as possible. Generally, the trouble-shooting is limited to the replacement of line replaceable units (LRU) and/or wiring repairs necessary to correct these malfunctions.
Regular or scheduled maintenance is not included as part of the trouble-shooting.

C. Maintenance Practices page blocks (Pages 201 to 299).
Where applicable the Maintenance Practices give data on the following procedures:

(1) Servicing.

Chapter 12 contains scheduled and unscheduled servicing applicable to the whole airplane. Included in this chapter are the replenishment of items such as: fuel, oil, hydraulic fluid, water, tire pressure, etc.

Servicing which is necessary to complete other maintenance tasks is found in related chapters. Tasks such as filling and draining of a component are included.

(2) Removal and Installation.

Removal/installation procedures have two independent tasks: one for the removal and one for the installation. However, the job “set-up” and job “close-out” procedures are not given in both tasks.

The job “close-out” procedures are not given in the removal task because the installation usually follows it. If the installation task does not immediately follow the removal task, it is assumed that the operator will use the applicable close-out procedures, related to what was required in the removal task.

For the installation task it is assumed that the airplane is in the same configuration as it was for the removal task. These steps can include:

- Circuit breaker adjustment.
- Access panels removed.
- Safety practices.
- Installation of safety stands, etc.

(3) Adjustment/Tests. There are three types of tests: operational, functional and system.

Operational Test - That procedure required to ascertain only that a system or unit is operable. These tests should require no special equipment or facilities other than that installed on the airplane and should be comparable to the tests performed by the flight crews. It is not intended that the operational test of the unit meet the specifications and tolerances ordinarily established for overhaul, or major maintenance periods.

Functional Test - That procedure required to ascertain that a system or unit is functioning in all aspects in accordance with minimum acceptable system or unit design specifications. These tests may require supplemental ground support equipment and should be more specific and detailed than an operational test. It should contain all necessary information to perform proficiency tests to maintain system or unit reliability at an acceptable level, without reference to additional documents.

System Test - That procedure containing all adjustment specifications and tolerances required to maintain system and/or unit performance at maximum efficiency and design specifications. It shall be self-contained and may duplicate other tests. It is normally used at major maintenance periods.

(4) Checking/Testing.

These Maintenance Practices contain information and instructions to inspect or perform a check of a system, a component, an area (zone) or connected parts.

(5) Cleaning/Painting.

These Maintenance Practices give the necessary procedures to clean and/or paint a part or area of the airplane.

(6) Repairs.

These Maintenance Practices give all approved repair procedures for the airplane. It does not include those repairs that would normally be contained in a Component Maintenance Manual or a Structural Repair Manual.

8. **Figures Numbering**

Figures are given numbers in sequence. The first figure in:

- The Description and Operation page block is Figure 1.
- The Troubleshooting page block is Figure 101.
- The Maintenance Practices page block is Figure 201.

References to the figures are given throughout the various page blocks to assist with the written text.

9. **Record of Revisions**

This Airplane Maintenance Manual has a Record of Revisions (ROR). The ROR shows when revision changes were included in the Airplane Maintenance Manual

10. **Revision Highlights**

The Revision Highlights pages indicate the reasons changes were made to the manual at the revision. Used with the List of Effective Pages (LOEP), the change can be identified in the manual.

11. **List of Service Bulletins**

Service Bulletins will be issued as required to provide information or instructions for modification and/or inspection of the airplane in service. A list is kept to show the Service Bulletins that have been issued against the airplane.

12. **List of Temporary Revisions**

This Airplane Maintenance Manual has a record of Temporary Revisions (TR). Use the TR Record List to record when temporary changes are included in the Airplane Maintenance Manual. The List is updated with each TR included in the Airplane Maintenance Manual .
All TR's should be incorporated at the next revision of the manual.

13. **List of Effective Pages**

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

- There will be a new LOEP given with each revision of the Airplane Maintenance Manual.
- Change Bars in the LOEP will show when a change has been made to a page.
- Change Bars on the page of the Airplane Maintenance Manual will show the change.
- The Revision Highlights will show the reason for the change.

14. **Safety**

This manual describes processes that may require the use of chemicals, solvents, paints or other commercially available materials.

Material Safety Data Sheets (MSDS) containing information about Trade name, Safety hazards, Health Hazards, Reactivity, Spill or Leak Procedures, Special Protection Information, Special Precautions and Transportation and Labelling are available from the manufacturer. Make sure that you read the applicable MSDS prior to using the consumable materials. Anyone using chemicals, solvents, paints or other materials in the performance maintenance on the airplane is responsible for knowing and complying with requirements of all governing agencies with jurisdiction at that location.

15. **Acronyms**

An acronym is defined the first time it is used within a unit of work with the abbreviation following in parenthesis (e.g. Air Transport Association (ATA)). Subsequent use, within that unit of work, will make use of the abbreviation.

16. **Request for Manual Change**

If operators have suggestions for improvement to the content of the manual or if errors or omissions are found, please submit the request via the Manual Change Request (MCR) form shown in Figure 1.
The MCR form is also available in a fillable PDF format that can be e-mailed directly to Tech Pubs.

Technical Publications - Manual Change Request

To: Diamond Aircraft Corporation
Technical Publications
1560 Crumlin Sideroad, London, Ontario, Canada N5V 1S2
techpubs@diamondair.com

Diamond Reference #:

Date:

All Fields marked with an asterisk * are required

Contact Information

*Name: and Name of Company	*Telephone:	*Department:
Mobile/Cell Phone:	Fax Number:	*E−Mail:

I would like to receive notification of actions on this request. *Media Type:

NOTE: Responses will only be sent by electronic mail.

Publication Information

*Publication Name:	Revision:	*What is the location of the data in the Publication: Chapter/Section/Subject/Task/IPC Figure/Page Number, etc.
*Publication Document/Part Number:		

*Description of Change Requested: (Attach sheets if more space is required)

Reason for change:

Reference Data Provided:

Description:

Figure 1 : Manual Change Request Form

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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 table of contents for the chapter follows the title pages.

2. Applicability

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

Valid for S/N 62.N001 thru 62.N099.

This shows that you can use this data for airplane with serial numbers 62.N001 through 62.N999 inclusive.

3. Revisions

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

NOTE: Hard copy revisions and incremental revisions are no longer available for the AMM and hard copies will not be distributed. The AMM is available on the Diamond Aircraft Website.

http://support.diamond-air.at/techpubs+M52087573ab0.html

A manual revision contains these items:

- The changed pages, contained within the complete manual.
- A vertical bar in the left margin of the changed page shows where the changes were made on the page.
- The reason for the revision/changed pages, contained in the highlights section of the manual.
- A new List of Effective Pages (LOEP).

A vertical bar in the left margin of the LOEP page shows the page changes, with the date of the change. Where a figure is changed, a vertical bar in the left margin shows where the change was made.

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 paper for temporary revisions. The manufacturer usually puts the contents of a temporary revision in the next approved revision.

5. **Service Bulletins**

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. SI62-001 for details on the organization of Service Bulletins and Service Instructions.

Service Bulletins have 4 categories:

A. Alert Service Bulletins

Alert Service Bulletins are issued if there is an immediate danger (risk of damage or total loss). They are sent immediately by the fastest means to all known addresses of operators and service stations which are affected.

B. Mandatory Service Bulletins

Mandatory Service Bulletins include the description of a problem and the solution. If you do not follow a mandatory Service Bulletin, failures or malfunctions can result during further operation.

You must do the work given in a Mandatory Service Bulletin.

C. Recommended Service Bulletins

Recommended Service Bulletins give data about:

- A minor problem and its correction.
- A better technical design.

If you do not follow a Recommended Service Bulletin, it will not cause a failure. But it may cause increased maintenance work.

If you do follow a Recommended Service Bulletin:

- The maintenance work may be reduced (for example, reduced wear, increased life).
- The operational behavior will be improved (for example, easier engine starting).

D. Optional Service Bulletins

Optional Service Bulletins give data about optional equipment that you can install in an airplane (for example, sailplane towing device).

The airplane owner makes the decision to follow an Optional Service Bulletin.

6. **Service Information**

A Service Information tells the operator about permitted installations or provided information to installed or additional equipment. It also gives the applicable technical data.

7. **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.

8. **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 Service and Support page of the Diamond Aircraft web site: www.diamondaircraft.com.

9. **Abbreviations**

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

A	Ampere
ACL	Anti-Collision Light (Strobe Lights)
ADF	Automatic Direction Finder
A.M.E.	Aircraft Maintenance Engineer
Ah	Ampere-Hour
A&P	Airplane and Power Plant Mechanic
ASI	Airspeed Indicator
CAN	Controller Area Network
CFRP	Carbon Fiber Reinforced Plastic
DME	Distance Measuring Equipment
DOHC	Double Overhead Camshaft
EECU	Electronic Engine Control Unit
ELT	Emergency Locator Transmitter
FRP	Fiber Reinforced Plastic

FWD	Forward
GFRP	Glass Fiber Reinforced Plastic
GPS	Global Positioning System
G/S	Glide Slope
IAU	Integrated Avionics Unit
ICS	Integrated Cockpit Unit
IFR	Instrument Flight Rules
I-Panel	Instrument-Panel
HSI	Horizontal Situation Indicator
LOC	Localizer
LPS	Low Pressure Switch
MED	Main Engine Display
MFD	Multi-Function Display
MSI	Major Structural Inspection
OAT	Outside Air Temperature
PFD	Primary Flight Display
RACC	Recirculating Air Cabin Cooling
RCPI	Remote Control Panel Indicator
RWD	Rearward
P/N	Part Number
SAM	Standby Attitude Module
SB	Service Bulletin
SI	Service INstruction
S/N	Serial Number
TBO	Time Between Overhaul
TSMOH	Time Since Major Overhaul
UHF	Ultra High Frequency
TTSN	Total Time Since New

TTSO	Total Time Since Overhaul
V	Volt
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	VHF Omni-directional Ranging
VSI	Vertical Speed Indicator
VT	Vertical Tail

10. **Conversion Factors and Abbreviations**

Dimension Units/Abbreviations	Conversion Factor SI to US/Imperial	Conversion Factor US/Imperial to SI
Length		
Meter [m]	[m] x 0.3048 = [ft]	
Millimeter [mm]	[mm] / 25.4 = [in]	
Kilometer [km]	[km] / 1.852 = [nm]	
Inch [in]		[in] x 25.4 = [mm]
Foot [ft]		[ft] x 0.3048 = [m]
Nautical mile [NM]	[km] / 1.609 =[sm]	[nm] x 1.852 = [km]
Statute mile [SM]		[sm] x 1.609 = [km]
Velocity		
Kilometers per hour [km/h]	[km/h] / 1.852 = [kts]	
Miles per hour [mph]	[km/h] / 1.609 = [mph]	[mph] x 1.609 = [km/h]
Meters per second [m/s]	[m/s] x (60/0.3048) = [fpm]	
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]	[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]
Force or Weight		
Newton [N]	[N] / (g x 0.45359) = [lbs]	
	where g = 9.80665 m/s^2	
Decanewton [daN]	[daN] / 0.4448 = [lb]	
Pound [lb]		[lb] x 4.448 = [N]
		[lb] x 0.4448 = [daN]

Dimension Units/Abbreviations	Conversion Factor SI to US/Imperial	Conversion Factor US/Imperial to SI
Mass		
Kilogram [kg]	[kg] / 0.45359 = [lbs]	
Pound [lb]		[lb] x 0.45359 = [kg]
Volume		
Liter [l]	[l] / 3.7853 = [US gal] [l] / 0.9464 = [US qts] [l] / 4.5459 = [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 4.5459 = [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]	
Foot pound [ft.lb]		[lbf-ft] x 1.3558 = [Nm]
Inch pound [in.lb]		[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.

11. **Torque Conversion Graphs**

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

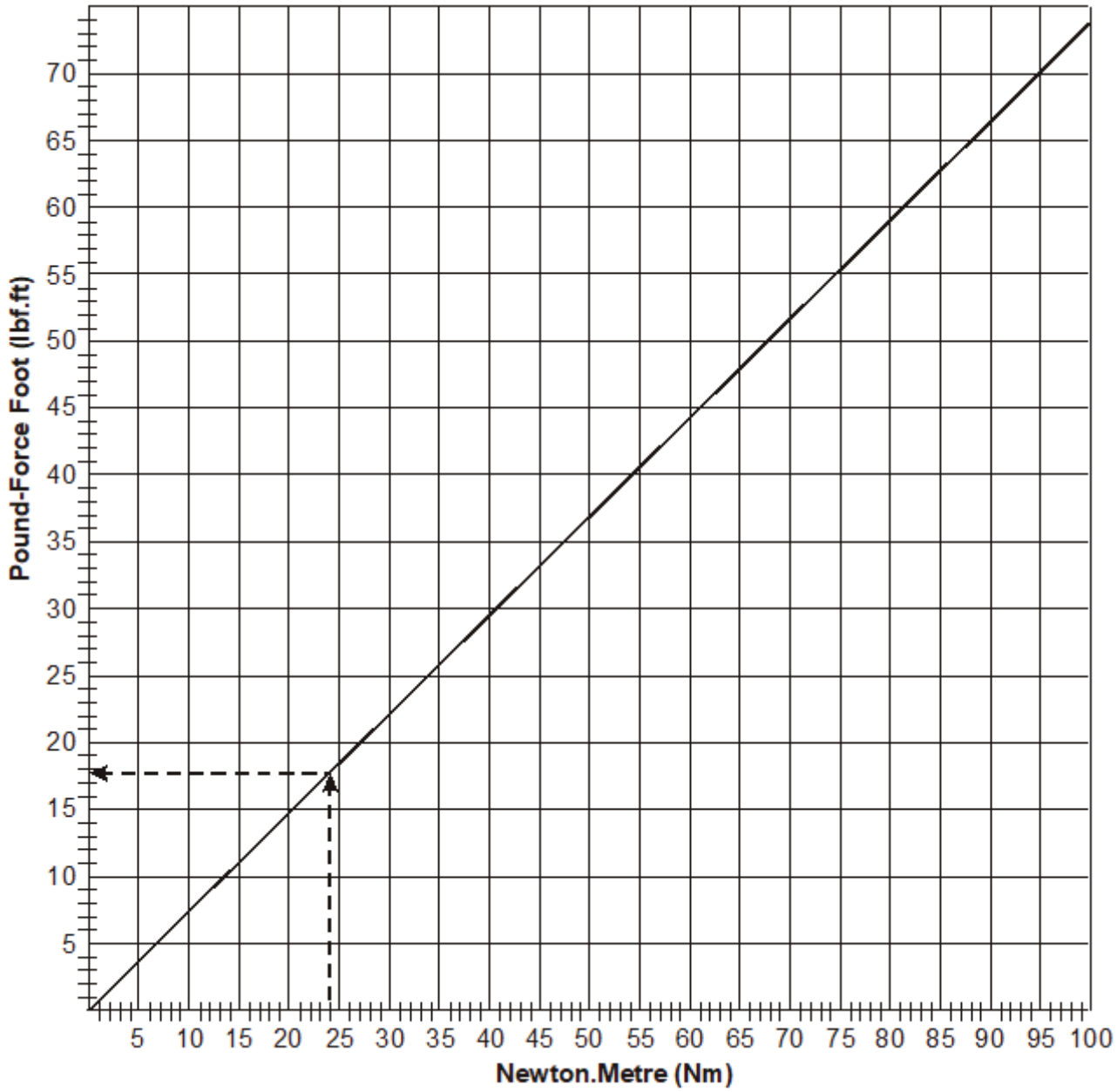

Figure 1 : Nm - lbf.ft.

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.

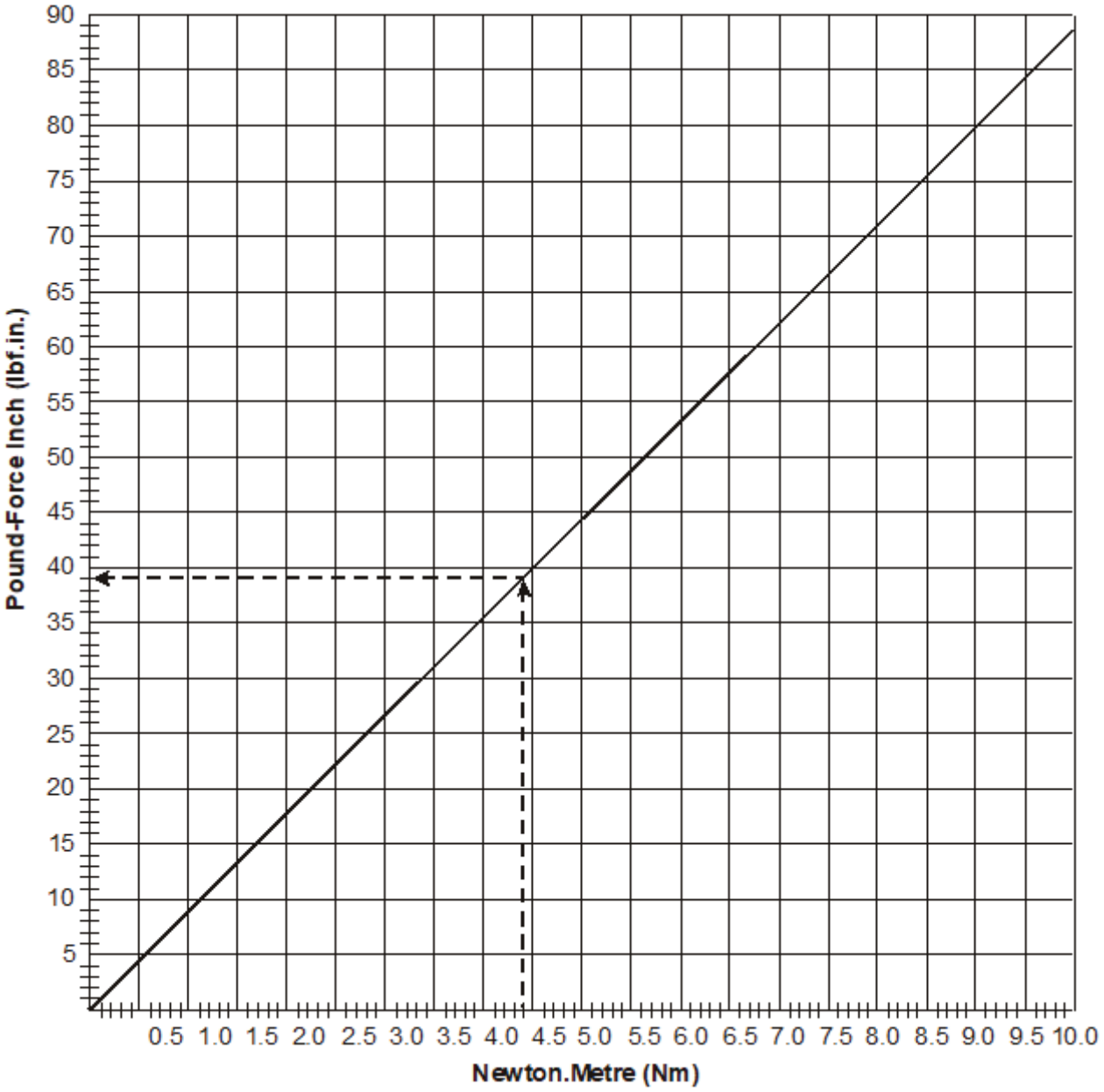

Figure 2 : Nm - lbf.in.

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.

12. **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
7.02.25-M15	INSTALLATION INSTRUCTIONS FOR SYSTEM M15 On Top Exhaust System	0	06 Jul 2016	[]	[]
7.02.25-N25	OPERATION IN MEXICO	0	16 Jun 2016	[]	[]
7.02.25-N022	OPERATION IN CHINA	0	23 Nov 2018	[]	[]
7.02.25-N023	OPERATION IN BRAZIL	0	15 Mar 2017	[]	[]
				[]	[]
				[]	[]

CHAPTER 03
GENERAL DESCRIPTION
OF THE AIRPLANE

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CHAPTER 03

GENERAL DESCRIPTION OF THE AIRPLANE

1. **General**

Diamond Aircraft Industries Inc. 1560 Crumlin Sideroad, London, Ontario Canada N5V 1S2, is the manufacturer of the DA 62 airplane.

2. **Description**

The DA 62 is a twin-engine, five 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.

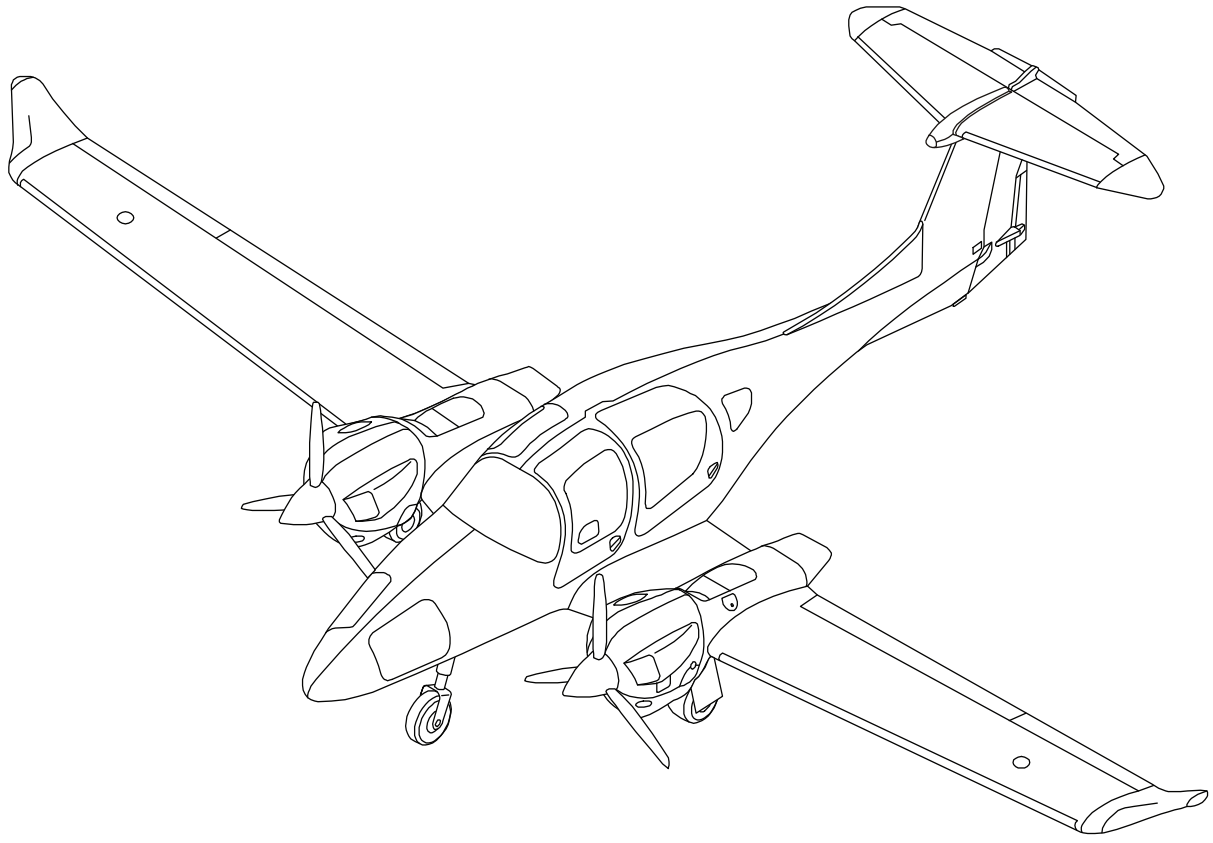

Figure 1 : DA 62 Airplane

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 CFRP with 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.

A two-part acrylic lacquer finish protects the outside skin of the airplane from ultraviolet rays and humidity and a p-static laquer protects against p-static influence.

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 DA 62 has three doors designed as gull wing doors in order to provide convenient access for crew and passengers. The doors are operated with door handles. To ensure that the doors are locked properly each door is locked via two bolts engaging bushings in the door frame. The opening of the doors is supported by gas springs pushing on the door hinges.

The flight control system uses conventional ailerons, elevator and rudder. The DA 62 has 2 control sticks (1 removable on the RH side, if OÄM 62-025 is carried out) 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 E4P-C 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. Auxiliary fuel tanks made of polyethylene plastics are optionally installed.

The airplane has three 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. Two push buttons control the engine starting system.

The DA 62 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

3. **Equipment Data**

The table below gives you the names and address of the manufacturers who supply systems and/or equipment for the DA 62. 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 62 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. 7.01.25-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 ZI 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

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
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
	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):	McMurdo / Kannad Z.I. des 5 Chemins BP 23 56520 Guidel France Tel: +33(0)297 02 4949 Fax: +33(0)297 65 0020 Website:www.mcmurdogroup.com	Yes

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
25	Safety Belts:	Schroth Safety Products GmbH P.O. Box 24 40 59714 Arnsberg Germany Tel: +49-2932-9742 Website: www.schroth.com	Yes
26	Fire Extinquisher:	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. 7.01.25-E, 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

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
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
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	Strobe Lights:	Whelen Engineering Company, Inc. Route 145, Winthrop Rd. Chester, CT 06412-0684 USA Tel: (860) 526-9504 Fax: (860) 526-2009 Website: www.whelen.com	Yes

ATA Chapter	Equipment/System	Manufacturer/Address	Direct Shipping Approved
33	Landing and Taxi Lights:	Aero Visions International, Inc. 2497 South 1760 West Ogden, UT 84401 USA Tel: (801) 622-7000 Website: www.aerovisions.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
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

4. **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.

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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 THE MINISTER IN ACCORDANCE WITH THE APPLICABLE CERTIFICATION PROCEDURES AND THE TYPE CERTIFICATION BASIS. IT SPECIFIES THE AIRWORTHINESS LIMITATIONS REQUIRED BY AWM 523.

THE AIRWORTHINESS LIMITATIONS SECTION IS FAA APPROVED AND SPECIFIES MAINTENANCE REQUIRED UNDER SECS. 43.16 AND 91.403 OF THE FEDERAL AVAITION 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 TRANSPORT CANADA CIVIL AVIATION (TCCA) APPROVED ARE CONSIDERED FAA APPROVED.

DocuSigned by:
Michael Lopez
C9358B25C4794F6...

11/12/2021

Chief, Engineering

National Aircraft Certification

Transport Canada

Date

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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 62.

Note: Regular inspections of the airplane including replacement and overhaul of certain components are required to ensure Continued Airworthiness of the DA 62.

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.
51	Bonding system and static discharging system.	Resistance measurements (refer to Section 51-80).	1000 ± 50	4 yrs. ± 60 days

(2) Life Time Limit / Structure Checks

There is no structural life limit.

A Major Structural Inspection (MSI) is required:

- at 6000 hours ± 50 or 12 years ± 6 months since new (that which comes first); and
- at 4000 hours ± 50 or 12 years ± 6 months since new (that which comes first) after the initial MSI.

Note: The DA 62 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 (if MÄM 62-002 is NOT installed).		2 yrs. ± 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

C. Colour of Airframe

It is mandatory to paint the DA 62 in accordance with the colour paint scheme provided in Section 51-20.

Before painting the DA 62 in a different shade than defined in Section 51-20 of this Manual, the type certificate holder 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.

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CHAPTER 05
TIME LIMITS AND MAINTENANCE CHECKS

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CHAPTER 05-00

TIME LIMITS AND MAINTENANCE CHECKS

NOTE: Maintenance and inspection requirements at more than 300 flight hours will become effective with the removal of the life time limit. Refer to Chapter 4.

1. General

This Chapter will help you to do the maintenance of the DA 62 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 override 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 information about the Drain Holes.

E. Section 05-28

Section 05-28 contains the Maintenance Checklist for the DA 62 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 62 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 62 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 62 Maintenance Report.

(4) Section 05-28-91

DA 62 Engine Ground Test Report.

(5) Section 05-28-92

DA 62 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

NOTE: Use the latest approved 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
Austro Engine	Austro Engine Operation Manual AE300	E4.01.02
Austro Engine	Austro Engine Maintenance Manual AE300	E4.08.04
Cleveland/Parker	Cleveland/Parker Maintenance Manual	AWBCMM0001-(x)
Cleveland/Parker	Cleveland/Parker Product Catalog	AWBPC0001-(x)
Cleveland/Parker	Cleveland/Parker Technician's Service Guide	AWBTSG0001-(x)
Concorde	RG® Series Main Aircraft Batteries Component Maintenance Manual	5-0171
Garmin	Garmin G1000 System Maintenance Manual	190-00907-00
Goodyear	Aircraft Tire Care & Maintenance	700-862-931-538 02/15
Kannad	Installation and Operation Manual for the 406 AF Compact ELT or the 406 AF-Integra	08038E
L-3	Stormscope WX-500 Installation Manual	009-11500-001
Mid Continent	Installation Manual and Operating Instructions Model MD 302 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 during a 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** Calendar 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	12 years ± 90 days
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 Inspection

Do 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	
			Hours	Calendar Time
NOTE: The mechanical check of the autopilot system is mandatory.				
22	Autopilot.	Mechanical Check.	-	1 yr ± 30 days
22	Autopilot.	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
26	Fire extinguisher.	Overhaul by fire extinguisher manufacturer (see Chapter 03).	-	10 yrs ± 90 days
27	Short pushrods connected to the aileron.	Boroscopic examination of the inner pushrod surface.	-	5 yrs ± 60 days
27	Short pushrods connected to the flap.	Boroscopic examination of the inner pushrod surface.	-	5 yrs ± 60 days
29	Hydraulic reservoir air filter.	Check.	1000 ± 50	-
30	De-icing fluid strainer (if OÄM 62-002 is installed).	Clean.	-	1 yr ± 15 days
30	LPS - function check.	Check (refer to Chapter 30).	-	2 yrs ± 30 days
30	HPS - function check.	Check (refer to Chapter 30).	2000 ± 50	-
34	Pitot-static system.	Leakage test (refer to Section 34-10).	1000 ± 50	2 yrs ± 30 days

ATA CH	COMPONENT	MAINTENANCE REQUIREMENT	INTERVAL	
			Hours	Calendar Time
34	Airspeed indicators (G1000 and backup).	Ensure correct indication.	-	4 yrs ± 60 days
34	Vertical speed indicator.	Ensure correct indication.	-	4 yrs ± 60 days
34	Altimeters (G1000 and backup).	Ensure correct indication.	-	2 yrs ± 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
35	Oxygen regulator valve (if OÄM 62-004 or OÄM 62-028 is installed).	Overhaul.	-	5 yrs ± 60 days
35	Oxygen masks (if OÄM 62-004 or OÄM 62-028 is installed).	Overhaul.	-	3 yrs ± 30 days
35	Oxygen cylinder (if OÄM 62-004 or OÄM 62-028 is installed).	Hydro test per DOT.	-	5 yrs ± 60 days
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	
		Hours	Calendar Time
24	Emergency battery package (if MÄM 62-002 is NOT installed).	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
25	Safety harnesses, front and rear.	-	12 yrs ± 90 days
25	First aid kit. Replace aseptic items.	Upon reaching the date marked on the kit.	
28	Electrical fuel pumps LH (2 pcs.).	2400 hours, or after a failure of one fuel pump.	
28	Electrical fuel pumps RH (2 pcs.).	2400 hours, or after a failure of one fuel pump.	
28	Fuel tank vent hoses.	-	8 yrs ± 60 days
28	Fuel hoses interconnecting the individual fuel tank chambers, and fuel hoses connecting fuel tank chambers to filler assemblies.	-	8 yrs ± 60 days
28	Fuel filter elements.	100 ± 10	1 yr ± 30 days
28	Fuel pressure pulsation damper.	Co-incident with engine TBO.	-
28	Check valves of the electrical fuel pumps (LH/RH, total 4 pcs.).	Co-incident with engine TBO.	-
28	Fuel bypass valve (LH/RH).	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	-

ATA CH	COMPONENT	REPLACEMENT TIME	
		Hours	Calendar Time
30	If the ice protection system is installed: Filter cartridge on the LH side.	2000 ± 50	-
32	Brake fluid, per MIL-PRF-87257.	-	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 OÄM 62-004 or OÄM 62-028 is installed).	-	15 yrs ± 90 days
35	Oxysaver cannulas (if installed).	200 of cumulative use.	-
35	Oxygen cylinder NR-SBR rubber supports (if OÄM 62-028 is installed).	-	15 yrs ± 90 days
61	V-belt of additional alternator (if OÄM 62-006 is installed).	2000 ± 50	-
71	Engine shock mounts (including bolts, washers and lock nuts).	Co-incident with engine TBO	-
71	Air Filter.	200 ± 10	-
71/81	Air intake and turbo charger hoses.	Co-incident with engine TBO	-
75	Coolant hoses.	-	8 yrs ± 60 days
75	Coolant silicate pouch.	Co-incident with engine TBO	6 yrs ± 60 days
81	All charge air hoses from turbo charger to engine air intake manifold.	Co-incident with engine TBO	-

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 mus t 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 firewall. It includes the cowlings and the propeller.

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, the main landing gear and the hydraulic system in the front fuselage.

(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 parts of the brake system, and the pilot doors (LH and RH) and passenger 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.

(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 62. 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 62.

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 (except in wing spar 7.12) 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 in the table that follows.

2. **Drain Holes Inspection Checklist**

DRAIN HOLES INSPECTION CHECKLIST			
REF.	**DRAIN HOLE LOCATION**	**HOURS**	**INITIALS**
1	**FUSELAGE**		
1.01	Lower shell, behind the radar frame, on the left and right side of EPU.	100	
1.02	Lower shell under the center console (front).	100	
1.03	Lower shell under the center console (rear).	100	
1.04	Lower fuselage shell, aft of baggage frame FWD base.	100	
1.05	On lowest point of the fin.	100	
1.06	Through lower end of radar frame.	200	
1.07	On lowest point of the oxygen compartment.	200	
1.08	In rear of nose baggage compartment.	200	
1.09	In the control spar, LH and RH.	100	
1.10	On lowest point of the cowling (3 LH and 3 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 five holes in line.	100	
1.17	Lower center wing shell, in front of rear box - spar three holes in line.	100	
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	

DRAIN HOLES INSPECTION CHECKLIST			
REF.	**DRAIN HOLE LOCATION**	**HOURS**	**INITIALS**
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 1.24	n.a.	-	
1.25	Lower shell, behind nose gear frame, on the left and right side of nose gear.	100	
1.26	Through baggage frame FWD, center position above lower fuselage shell.	200	
1.27	Through lower end of baggage frame RWD.	200	
1.28	Through lower end of ring frame 1.	100	
1.29	Through lower end of ring frame 2.	200	
1.30	Through lower end of ring frame 3.	200	
1.31	n.a.	-	
1.32	Lower fuselage shell, in front of vertical stabilizer rear web.	200	
1.33	In rib of vertical stabilizer, in front of vertical stabilizer rear web.	200	
1.34 1.35	n.a.	-	
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**
3	**HORIZONTAL STABILIZER**		
3.01	LH and RH rib, in front of the front spar, above the lower shell.	200	
3.02	LH and RH rib, aft of the front spar, above the lower shell.	200	
3.03	LH and RH rib, in front of the rear spar, above the lower shell.	200	
3.04	Elevator end rib, next to the rear spar, next to lower shell (LH and RH).	200	
3.05	Mid LH and RH rib, behind the front spar, above the lower shell.	2000	
3.06	Mid LH and RH rib, behind the rear spar, above the lower shell.	2000	
3.07	On the lowest point of the horizontal stabilizer tips (LH and RH).	100	
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	
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	

DRAIN HOLES INSPECTION CHECKLIST			
REF.	**DRAIN HOLE LOCATION**	**HOURS**	**INITIALS**
6	**RUDDER & RUDDER TRIM TAB**		
6.01	Lower edge of the rudder shell.	100	
6.02	Lower edge of the rudder trim tab 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	In aileron rib next to rear spar 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	First fuel tank rib, next to front and rear spar bonding 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, bonding at 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). Drain hole diameter has to be 4 mm (0.16 in).	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	

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

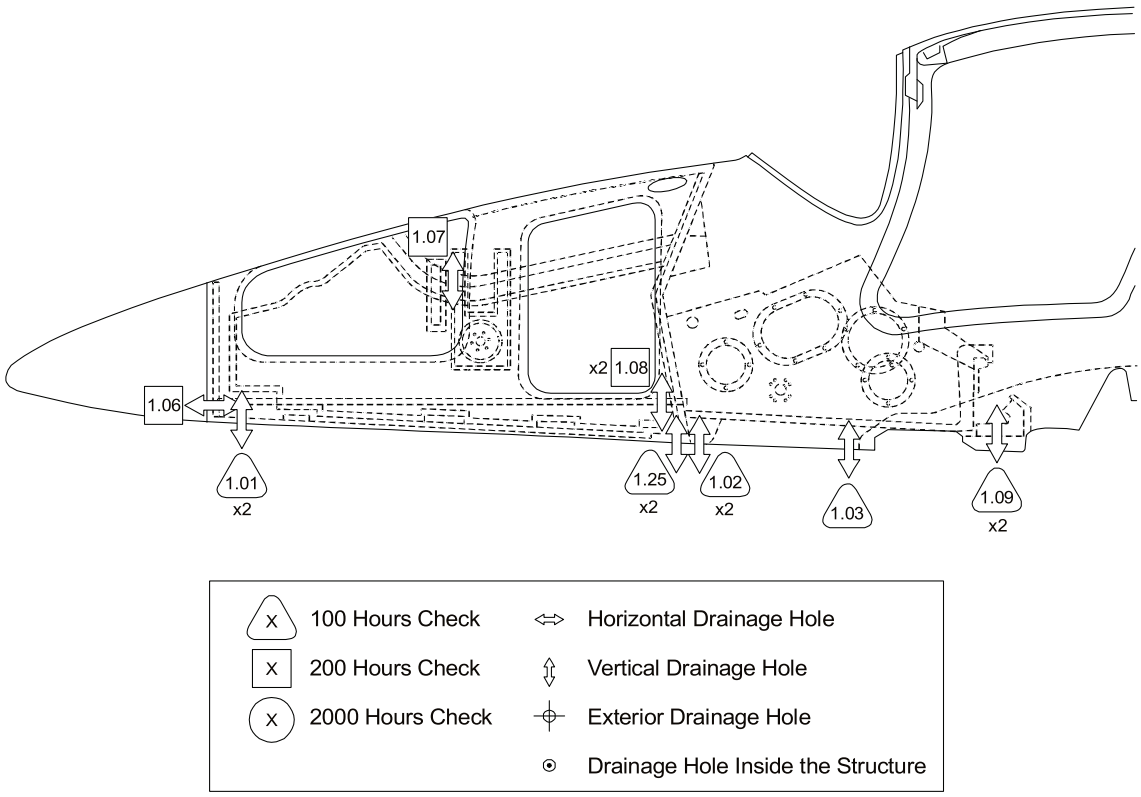


Figure 1 : Drain Holes - Fuselage (Part 1)

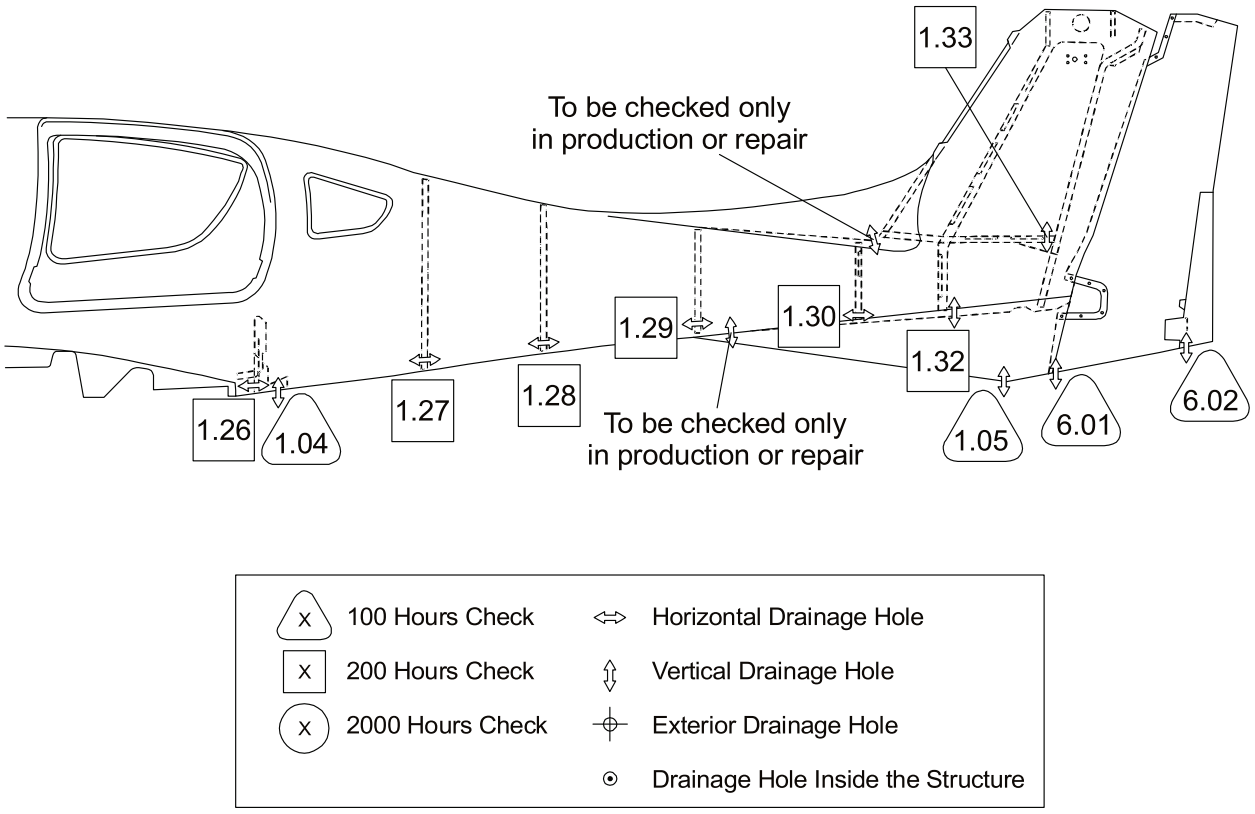


Figure 2 : Drain Holes - Fuselage (Part 2)

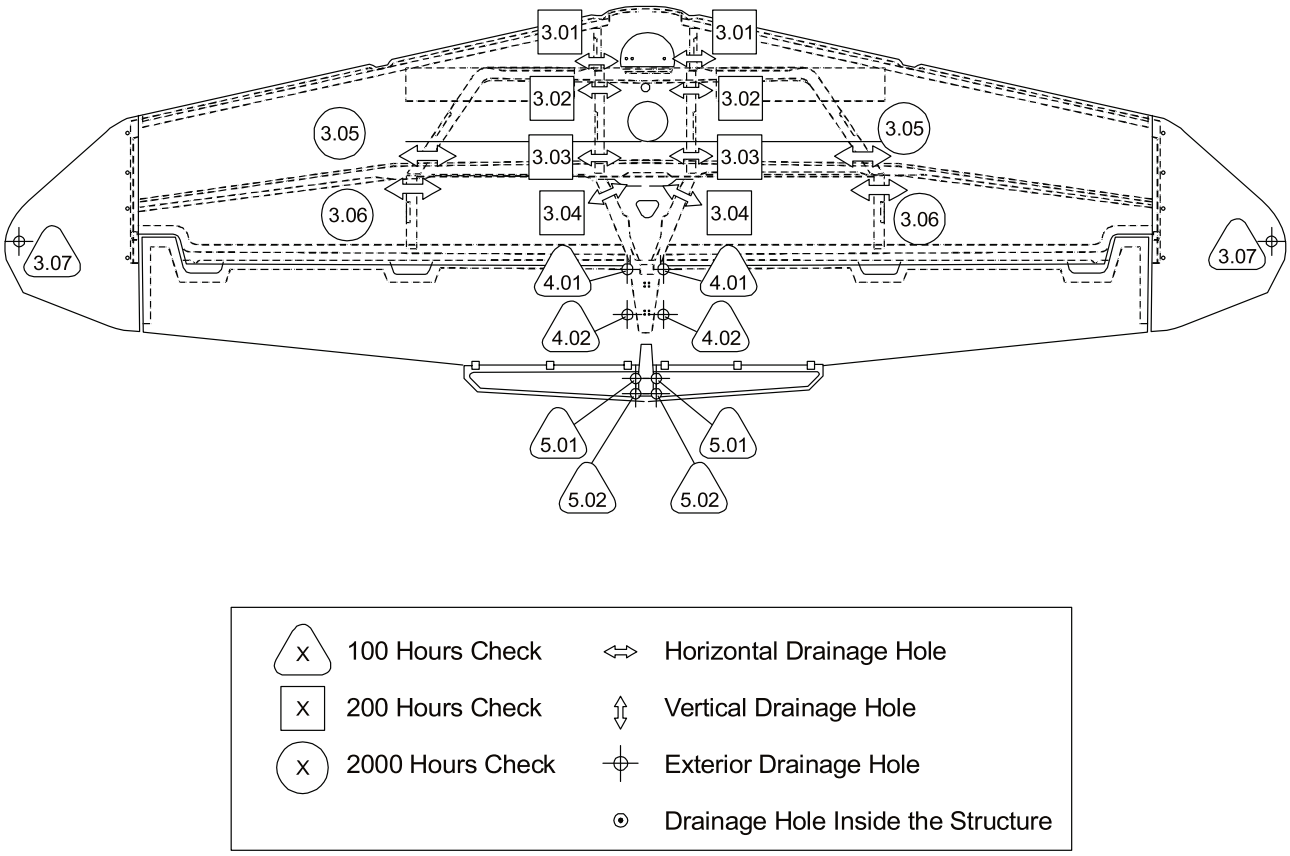


Figure 3 : Drain Holes - Horizontal Stabilizer, Elevator and Elevator Trim Tab

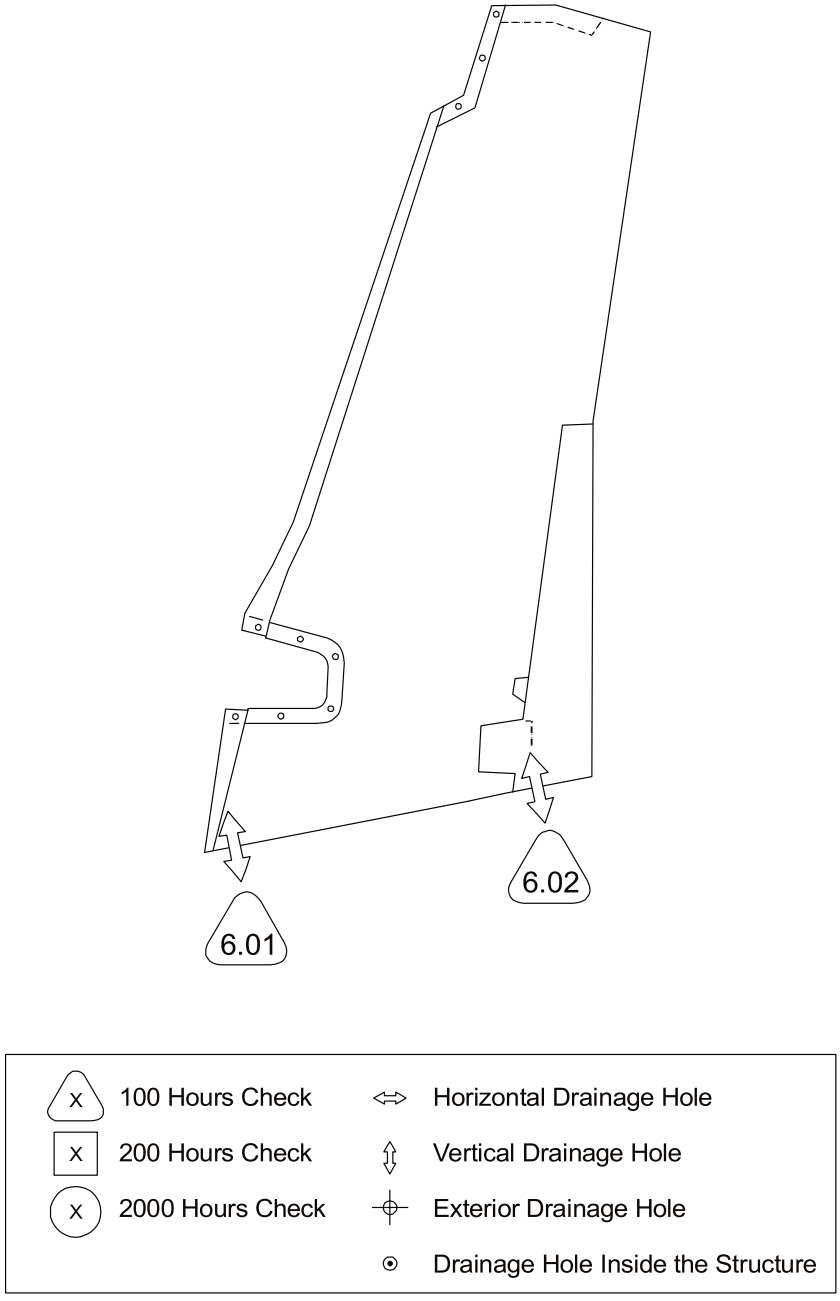


Figure 4 : Drain Holes - Rudder

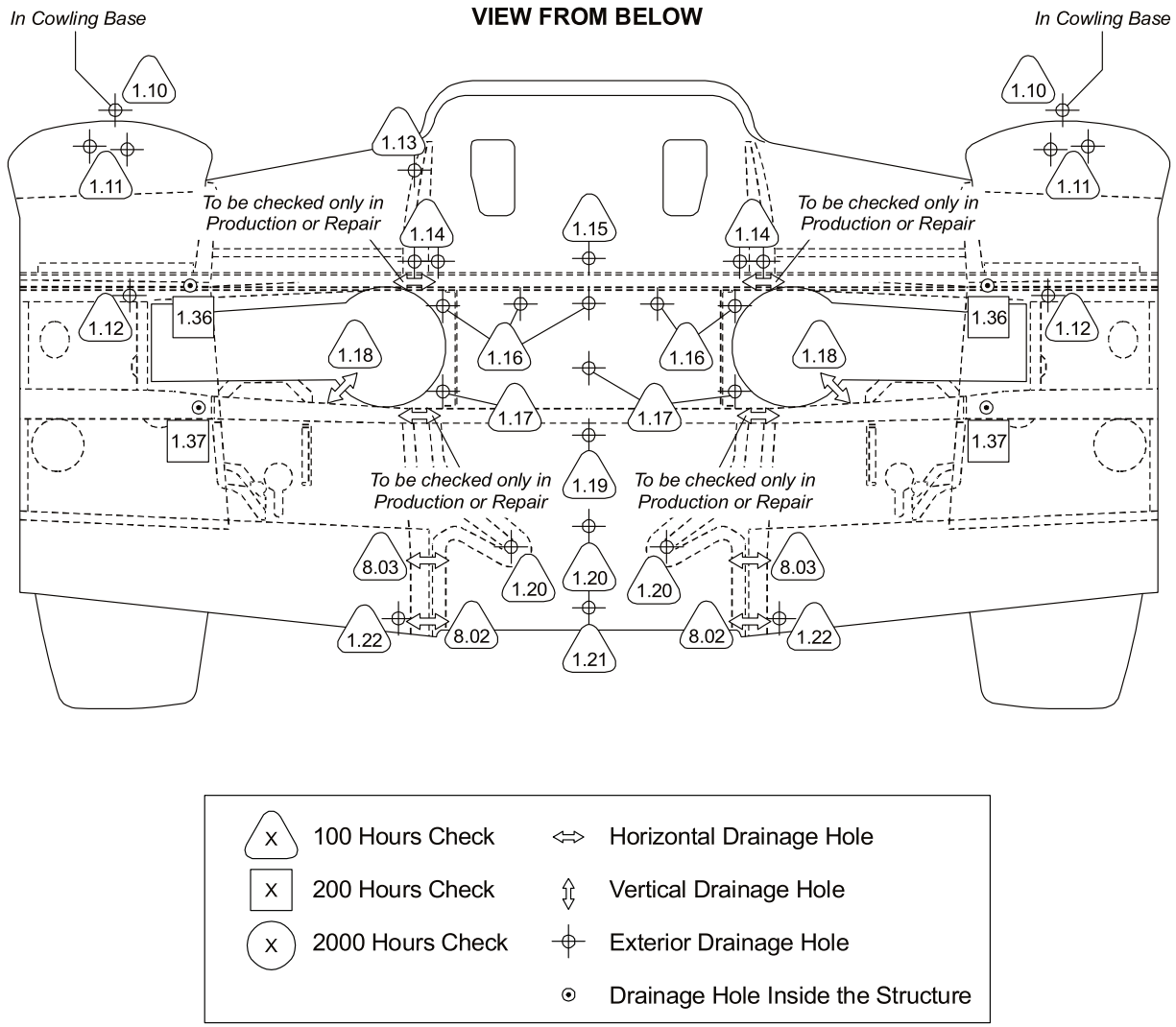


Figure 5 : Drain Holes - Center Wing

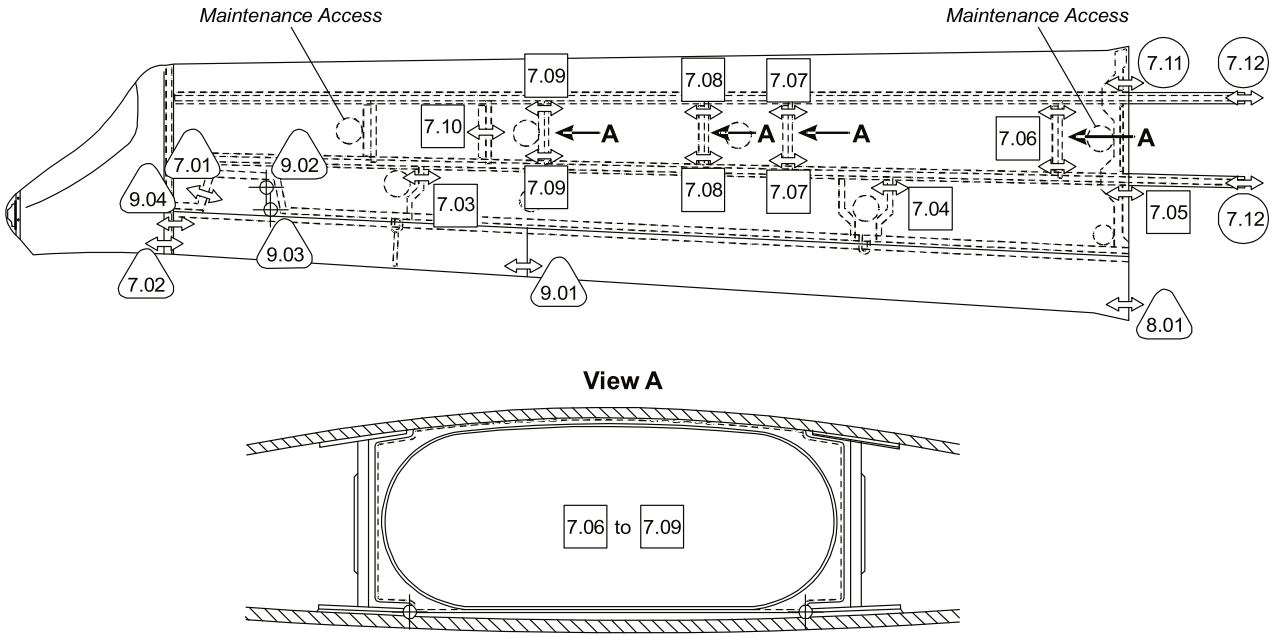


Figure 6 : Drain Holes - Wings, Flaps and Ailerons

Section 05-28

Maintenance Checklist DA 62

Section 05-28-00

Maintenance Checklist DA 62 Engines

1. **General**

Enter the applicable data in the blocks below:

REGISTRATION: _____	DATE: _____		
AIRPLANE S/N: _____		LH	RH
	ENGINE S/N:	_____	_____
AIRPLANE OPERATING HOURS: _____	ENGINE HOURS	LH	RH
	TTSN:	_____	_____
INSPECTION: _____		LH	RH
	PROPELLER S/N	_____	_____
(100, 200, 1000, 2000 HR, ANNUAL INSP.)	PROPELLER HOURS	LH	RH
	TTSN:	_____	_____

2. **Preparation**

CAUTION: OBSERVE THE COMPONENT TIME LIMITS STATED IN SECTIONS 04-00 AND 05-10 OF THIS AIRPLANE MAINTENANCE MANUAL.

Do the following items before you start the applicable check: :

	INSPECTION ITEMS	INTERVAL				INITIALS
		100	200	1000	2000	
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):

	INSPECTION ITEMS	INTERVAL					
		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.	Do an operational test of the parking brake.	X	X	X	X		
2.	Set the parking brake to ON.	X	X	X	X		
3.	Put the chocks against the airplane main wheels.	X	X	X	X		
4.	Do an engine ground run. (Refer to Section 71-00 and the AE Maintenance Manual, latest revision).	X	X	X	X		
5.	Check engine instruments.	X	X	X	X		
6.	Do a test of the crossfeed system. (Refer to Section 28-20).	X	X	X	X		
7.	Do a test of the feathering and unfeathering system. (Refer to Section 61-20).	X	X	X	X		
8.	Shut the engine down.	X	X	X	X		
9.	Examine the engine for oil/fuel/coolant leaks.	X	X	X	X		

4. **Engine Maintenance Checklist**

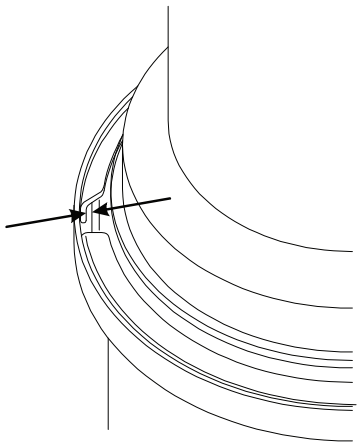
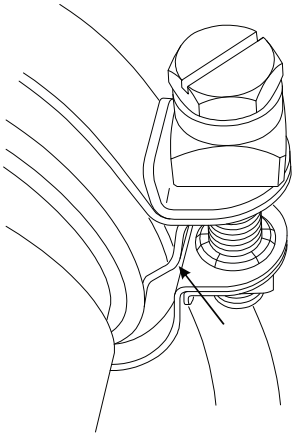
A. LH Engine

	100 hr items marked X* 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 cowling. (Refer to Section 71- 10). Examine the cowlings. Make sure that the fasteners are serviceable. Look for cracks and areas that have been exposed to high temperatures. Check the 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 the proper mixture ratio of the coolant. Refer to the AE Maintenance Manual, latest revision.	X*	X	X	X		
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	1 yr. ± 30 days	
7.	Check fuel pre-filter elements (2 pcs.).			X	X		
8.	Examine the exhaust system including the muffler. Look specially for cracks and heat damage or incorrect attachment.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, LH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
9.	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		
10.	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		
11.	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		
12.	Examine the oil breather line: - Look specially for chafing marks and hose damage. - Refer to the AE Maintenance Manual, latest revision.	X	X	X	X		

13.	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 10.3 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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, LH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
14.	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 that 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. 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.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, LH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	 - Inspect for signs of cracks in the edges of the ends of the V-bands of the V-clamp with a flashlight and mirror. 						
15.	Check cooling system for leaks. Look specially at these items: - Hoses and hose clamps (torque seal on hose clamps is intact). - Aluminum pipes.	X	X	X	X		
16.	Examine the coolant radiators: - Look specially for leakage, damage, and insecure attachment. - Make sure the cooling air flow through the radiator is not blocked due to bent fins.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, LH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
17.	Examine the coolant tank: - Look specially for leakage and damage. - Check the attachment brackets for cracks.	X	X	X	X		
18.	Perform a coolant tank pressure relief valve test. Refer to Section 75-00.	X	X	X	X		
19.	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		

20.	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		

21.	Check the bolts mounting the engine mount to firewall. Torque to the value given in Section 20-10. - At the first 100 hrs. check.	(X)			X		
22.	Examine the mounting bracket, pulley assembly and electrical connections of the additional alternator (if OÄM 62-006 is installed): - 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		
23.	Examine the v-belt of the additional alternator (if OÄM 62-006 is installed): - Visual inspection for damage and material deterioration. - Check the v-belt tension. Refer to Chapter 61.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, LH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
24.	Replace the v-belt of the additional alternator (if OÄM 62-006 is installed). Refer to Chapter 61.				X		
25.	Inspect the additional alternator in accordance with the Hartzell Aircraft Alternator Owner's Manual P/N ES1031, latest version (if OÄM 62-006 is installed).	X	X	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.	X	X	X	X		
29.	After the engine ground test run, read out EECU data using the AE300-Wizard. (Refer to Section 72-00-00, Maintenance Practices and the AE Maintenance Manual E4.08.04, latest revision) Send the following data to Austro Engine GmbH via e-mail. - Serial Number of the Engine - Serial Number of the Aircraft - Aircraft Registration Marks - Company - Engine event log - Event recorder - Engine data log.	X	X	X	X		
30.	Examine the fault code memory of the EECU for failure. (Refer to Section 72-00-00, Maintenance Practices)	X	X	X	X		

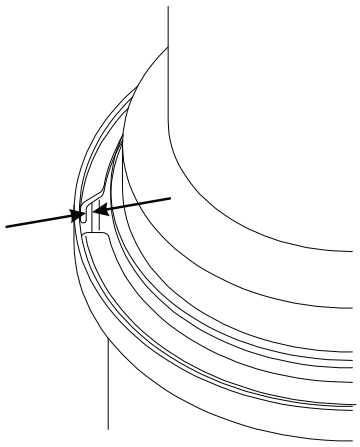
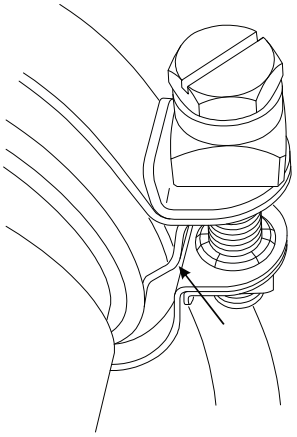
B. RH Engine

	100 hr items marked X* 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 cowling. (Refer to Section 71- 10). Examine the cowlings. Make sure that the fasteners are serviceable. Look for cracks and areas that have been exposed to high temperatures. Check the 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 the proper mixture ratio of the coolant. Refer to the AE Maintenance Manual, latest revision.	X*	X	X	X		
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	1 yr. ± 30 days	
7.	Check fuel pre-filter elements (2 pcs.).			X	X		
8.	Examine the exhaust system including the muffler. Look specially for cracks and heat damage or incorrect attachment.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, RH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
9.	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		
10.	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		
11.	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		
12.	Examine the oil breather line: - Look specially for chafing marks and hose damage. - Refer to the AE Maintenance Manual, latest revision.	X	X	X	X		

13.	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 10.3 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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, RH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
14.	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 that 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. 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.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, RH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	 - Inspect for signs of cracks in the edges of the ends of the V-bands of the V-clamp with a flashlight and mirror. 						
15.	Check the cooling system for leaks. Look specially at these items: - Hoses and hose clamps (torque seal on hose clamps is intact). - Aluminum pipes.	X	X	X	X		
16.	Examine the coolant radiators: - Look specially for leakage, damage, and insecure attachment. - Make sure the cooling air flow through the radiator is not blocked due to bent fins.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, RH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
17.	Examine the coolant tank: - Look specially for leakage and damage. - Check the attachment brackets for cracks.	X	X	X	X		
18.	Perform a coolant tank pressure relief valve test. Refer to Section 75-00.	X	X	X	X		
19.	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		

20.	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		

21.	Check the bolts mounting the engine mount to firewall. Torque to the value given in Section 20-10. - At the first 100 hrs. check.	(X)			X		
22.	Check the overheat detector for damage, loose connectors, and insecure attachment.	X	X	X	X		
23.	Do a function test of the overheat detector. (Refer to Section 26-00).	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, RH ENGINE	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
24.	Do an engine ground test run.	X	X	X	X		
25.	After the engine ground test run, read out EECU data using the AE300-Wizard. (Refer to Section 72-00-00, Maintenance Practices and the AE Maintenance Manual E4.08.04, latest revision) Send the following data to Austro Engine GmbH via e-mail. - Serial Number of the Engine - Serial Number of the Aircraft - Aircraft Registration Marks - Company - Engine event log - Event recorder - Engine data log.	X	X	X	X		
26.	Examine the fault code memory of the EECU for failure. (Refer to Section 72-00-00, Maintenance Practices)	X	X	X	X		

5. **Propellers**

A. LH Propeller

	100 hr items marked X* apply to US registered airplanes only	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: 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 X* apply to US registered airplanes only	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: 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 X* 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 X* 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, delamination and disbonding of adjacent bonding areas.	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.	X	X	X	X		
3.	Examine the nose wheel centering device. Look specially for damage, excessive wear, and looseness.	X	X	X	X		
4.	Examine the nose landing gear actuator. Look specially for leakage. (Refer to Section 32-20).	X	X	X	X		
5.	Examine the damper and the hydraulics. Look specially for leakage. (Refer to Section 32-20).	X	X	X	X		
6.	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		
7.	Examine the interior of the nose landing gear leg: - Disassemble the nose landing gear leg. (Refer to Section 32-20). - Disassemble the damper assembly. (Refer to Section 32-20). - Clean all parts. - Examine all parts. Look specially for deformation, cracks, wear and damaged surface protection. - Reassemble the nose landing gear leg. (Refer to Section 32-20).				X		
8.	Examine the nose landing gear assembly for damage. Look specially for cracks, deformation, wear, corrosion and damaged surface protection. (Refer to Section 32-20).	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Nose Landing Gear	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
9.	Ensure correct gas pressure in the damper (12 bar / 174 PSI with the wheel off the ground). (Refer to Section 32-20).	X*	X	X	X		
10.	Apply oil to the actuator bearing. (Refer to Sections 12-20 and 32-20).	X	X	X	X		
11.	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 X* 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, delamination and disbonding of adjacent bonding areas.	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 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, bush and sleeve that attach the trailing arm to the leg. Look specially for deformation, cracks and wear.				X		
11.	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 and trailing arms to the legs. (Refer to Section 32-10).				X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Main Landing Gear	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
13.	Ensure correct gas pressure in the dampers (20 bar / 290 PSI with the wheel off the ground). (Refer to Chapter 32).	X*				MSI	
14.	Apply oil 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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Wheels	**100**	**200**	**1000**	**2000**	**Time**	**Initials**

1.	Examine the tires (Refer to Goodyear Tire Care & Maintenance Manual):
	- Look for cuts and wear.
	- Check slip marks.
	- Ensure correct inflation pressure:
	  - nose wheel: 3.2 bar /46 PSI
	  - main wheels: 3.8 bar / 55 PSI.
		X	X	X	X		

2.	Examine the main wheel brakes (Refer to Cleveland/ Parker Maintenance Manual): - 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 X* 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.	Check LH and RH nose baggage door locks: Close nose baggage door and leave one lock open. Pull slightly on the open lock and check the closed lock. Repeat the procedure on the second lock.		X	X	X		
3.	Examine the avionic bay cover: - Check cover for damage. - Check screws for proper fixation of avionic bay cover.		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		
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 the Ice Protection System is installed on the airplane: Check the spraybar, located in front of the windscreen, for damage.	X*	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Fuselage Nose	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
9.	Check hydraulic module platform for improper or insecure attachment.		X	X	X		
10.	Check hydraulic components for damage and leakage.		X	X	X		
11.	Ensure correct level of hydraulic fluid.		X	X	X		
12.	Check condition of the reservoir air filter. Make sure that it is satisfactory.			X	X		
13.	Check accumulator for inner leakage and pre fill pressure.		X	X	X		

2. **Cabin**

A. Cabin, General

	100 hr items marked X* 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		
	WARNING: DO NOT PRESS THE RELEASE BUTTON OF THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.						
2.	Examine the front seats with adjustable backrest: - 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 egress hammer installation: - Check attachments for looseness. - Check release mechanism for interference or improper function.		X	X	X		
4.	If the sun visors (OÄM 62-022) are installed: - Check for obvious damage. - Check hook-and-loop-fasteners for lack of retention force.		X	X	X		

B. Windscreen, Doors and Windows

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Windscreen, Doors and Windows	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Examine the windscreen and the doors: - Make sure the door lock mechanisms operate correctly. (Refer to Section 52-10). - Examine the acrylic glass windows for damage. Look specially for cracks. - Inspect the acrylic glass windows for crazing and scratches. No crazing and scratches are acceptable which affect sight of the pilots. - Examine the bonding between the window and the windscreen frame. (Refer to Section 56-10). - Examine the emergency windows for damage.	X*	X	X	X		
2.	Do a function test of each door unlocked warning light system. (Refer to Section 52-10).	X	X	X	X		
3.	Examine the passenger door: - Make sure the door lock mechanism and the safety hook mechanism operate correctly. (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		
4.	Examine the safety hook mechanism. (Refer to Section 52-10).	X	X	X	X		
5.	Examine the passenger window and the rear windows (LH and RH): - Examine the acrylic glass windows for damage. Look specially for cracks. - Examine the bonding between the windows and the frames. (Refer to Section 56-10).	X*	X	X	X		

C. Cabin Structure

	100 hr items marked X* apply to US registered airplane 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 rear wall). 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			
3.	Visually inspect the interior structure of the front fuselage (from instrument panel frame to baggage compartment rear wall). Use mirror and flashlight where necessary. Check for damage, cracks, delamination and disbonding from the fuselage skin or center wing skin. Inspect the following components: - Front main spar. - Rear main spar. - Control bulkhead. - Floor element.				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 or center wing skin. Inspect the following components: - Baggage compartment rear wall. - Roll bar. - Front and rear seat crash elements.			X	X		
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 X* 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 in the rear fuselage).	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		
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 airframe (6 elements in the center, 1 element on each side).	X*	X	X	X		
5.	Examine the instrument panel for cracks.			X	X		
6.	Examine the emergency battery system (if installed): - 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 (if installed).	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Instrument Panel and Electrical System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
8.	Examine the backup instruments. Make sure that: –The markings are clear and correct. –The function is correct. –Connectors / fittings are correctly attached. –The instrument lights operate correctly (on the instrument panel cover), if applicable.	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		
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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	If OÄM 62-025 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		
2.	Examine the control sticks. Make sure that the control stick attachments are not loose and do not catch.	X*	X	X	X		
3.	Examine the control stick stops.	X*	X	X	X		
4.	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		
5.	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		
6.	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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
7.	Examine the rudder cables and pulleys. Look specially for: - Incorrect attachment and function. (Refer to Section 27-20). - Defective cable eyes. - Defective plastic sleeves. - Corrosion. - Rub marks. - Defective safety plates. - Worn out pulleys. - Broken strands.		X	X	X		
8.	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		
9.	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		
10.	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		
11.	Examine the push rod guides for the elevator push-rod. Look specially for incorrect attachment and interference.	X*	X	X	X		
12.	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. - Cracks in bond between rear main spar and bellcrank attachment bracket.	X*	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Flight Control System in Cabin	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
13.	Perform a flap actuator test. Look specially for: - Proper function of the switches. - Clearance to rods.		X	X	X		
14.	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. - Cracks in bond between rear main spar and the bellcrank attachment bracket.	X*	X	X	X		
15.	Check the following components of the autopilot system for wear and/or corrosion: - Servos. - Servo mounts. - Bridle cable assemblies.	X*	X	X	X		

F. Other Cockpit Controls

	100 hr items marked X* 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'. Refer to the AE Maintenance Manual, latest revision, Chapter 71-50-03.		X	X	X		
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		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Other Cockpit Controls	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
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		
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 the Cabin

	100 hr items marked X* 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.	Examine the belt cutter. Make sure that: - It is not damaged. - Stored correctly.		X	X	X		
4.	If the oxygen system is installed (OÄM 62-004 or OÄM 62-028): - Visually inspect each oxygen outlet port. Check for dust, damage and corrosion.		X	X	X		
5.	If the oxygen system is installed (OÄM 62-004 or OÄM 62-028): - 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 LH nose baggage compartment.		X	X	X		
6.	If the oxygen system is installed (OÄM 62-004 or OÄM 62-028): - Check the oxygen push-pull knob Bowden-cable assembly. Check for interference and corrosion.		X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Cabin, Miscellaneous	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
	WARNING: 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. SERIOUS INJURY COULD RESULT IF OTHER LUBRICATIONS COME IN CONTACT WITH OXYGEN.						
7.	If the oxygen system is installed (OÄM 62-004 or OÄM 62-028): - Visually inspect all oxygen tubes installed in the oxygen compartment and instrument panel. Check for improper fixture, chafing, leakage and improper ventilation of the high pressure tube.			X	X		
8.	If the oxygen system is installed (OÄM 62-004 or OÄM 62-028): - 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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Interior Structure of the Rear Fuselage	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Visually inspect the inner skin of the rear fuselage with mirror and flashlight. Check for damage, dents, cracks, delamination and disbonding from the sandwich foam.				X		
2.	Visually inspect the interior structure of the rear fuselage through all access holes with mirror and flashlight. Check for damage, cracks, delamination and disbonding from the fuselage skin.				X		
3.	Examine the RACC air inlets and outlets (if OÄM 62-005 is installed): - Two air outlets on the bottom. - Check the RACC compartment ventilation filter on the bottom of the fuselage for contamination. - Check evaporator drain on the bottom for blockage.	X*	X	X	X		
4.	Examine the RACC central unit (if OÄM 62-005 is installed). Look specially for: - Insecure attachment of hoses, shrouds and cables. - Leakage of hoses. - Cleanness of drain tubes.	X*	X	X	X		
5.	Examine the RACC central unit (if OÄM 62-005 is installed). 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			
6.	Perform a leakage test of the refrigerant circuit (if OÄM 62-005 is installed) Refer to 21-50-00 Maintenance Practices Para 4.A.(4).					1 yr.	

B. Control System in the Rear Fuselage

	100 hr items marked X* 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 levers (2 pcs). Look specially for: - Incorrect attachment. - Interference.	X*	X	X	X		
3.	Examine the elevator push-rod. Look specially for corrosion and damaged surface protection.	X*	X	X	X		
4.	Examine the rudder-control cables and turnbuckles. Look specially for: - Corrosion and wear. - Incorrect lock devices.	X*	X	X	X		
5.	Do a cable tension test of the rearward rudder control cables at the baggage frame. (Refer to Section 27-20).	X*	X	X	X		

C. Miscellaneous Items in the Rear Fuselage

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Miscellaneous Itemsin 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 GSR 77 AHRS behind the baggage compartment rear wall. Look specially for: - Insecure cable connections. - Insecure attachment.	X*	X	X	X		

4. **Center Wing**

A. Center Wing, Exterior

	100 hr items marked X* 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 leading edge on the RH side of the center wing.	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 X* 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 X* 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) and outboard of front attachment ribs (1 LH, 1 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). - Support rib outboard of rear attachment rib (LH, RH) - Trailing edge spar (LH, RH).				X		
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			
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 X* 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 the Center Wing and Nacelles

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Miscellaneous Items in the Center Wing and Nacelles	**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		

5. **Tail**

A. Tail, General

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Tail, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Remove the fairing for the horizontal stabilizer. (Refer to Section 55-10).	X*	X	X	X		
2.	Check rudder hinges for excessive play.	X*	X	X	X		
3.	Remove the rudder. (Refer to Section 55-40).	X*	X	X	X		
4.	Remove the elevator push-rod II. (Refer to Section 27-30-00, Figure 2).				X		
5.	Remove the horizontal stabilizer. (Refer to Section 55-10).					MSI	

B. Structure of the Vertical Tail

	100 hr items marked X* 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 vertical 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.	Examine the dorsal fin (upper strake) on the upper side of the fuselage tube. Look specially for: - Cracks at the junction to the fuselage.			X			
4.	Visually inspect the inner skin of the vertical stabilizer through all access holes with mirror and flashlight. Check for damage, cracks and delamination.					MSI	
5.	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.				X		

C. Structure of the Horizontal Stabilizer

	100 hr items marked X* 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	
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 X* 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 upper hinge bracket on the rudder. Look specially for: - Cracks and deformation. - Insecure attachment. - Loose or missing lock devices. - Defective surface protection.	X*	X	X	X		
3.	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 the Vertical Tail

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Rudder Hinges and Control System in the 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 lower rudder hinge and actuating mechanism. Look specially for: - Interference. - Cracks and deformation. - Insecure attachment. - Defective or worn stops. - Loose or missing lock devices. - Defective surface protection.	X*	X	X	X		
3.	Check the rudder top hinge 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		
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.	X*	X	X	X		

F. Elevator and Elevator Hinges

	100 hr items marked X* 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 the Tail

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Elevator Control System in the 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 elevator push-rod which was removed from the rear fuselage. Look specially for rub marks. (Refer to Section 27-30).				X		
3.	Examine the elevator bellcrank in the vertical tail: - Check for damage, deformation, corrosion and cracks. - Check for insecure mounting. - Check for loose or missing lock devices.	X*	X	X	X		
4.	Examine the elevator trim mechanism. Look specially for: - Deformation. - Incorrect attachment. - Loose or missing lock devices. - Wear. - Corrosion.	X*	X	X	X		
5.	Adjust the friction of the elevator trim mechanism.	X*	X	X	X		

H. Miscellaneous Items in the Tail

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Miscellaneous Items in the Tail	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Install the horizontal stabilizer. (Refer to Section 55-50)					MSI	
2.	Torque all 16 attachment bolts of the horizontal stabilizer: - At the first 100 hrs. check.	(X)			X		
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. (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. **Wings**

A. Wings, General

	100 hr items marked X* 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 (if OÄM 62-001 is 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		
4.	Examine the lens of the position and anti-collision lights for excessive scratching, discoloration and cracking. Replace if necessary.	X	X	X	X		

B. Wings, Structure

	100 hr items marked X* 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 (refer to Section 52-40) with a 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, scratches and looseness.				X		
7.	Visually inspect the interior structure of the LH and RH wing through all access holes (refer to Section 52-40) with a mirror and flashlight or endoscope. Check for damage, cracks, delamination and disbonding from the wing skin. Inspect the following components: - Front spar. - Rear spar. - Trailing edge web. - Root rib (front, middle and rear). - End rib (on outboard edge). - six fuel tank attachment ribs. - Rib supporting aileron bellcrank. - Rib supporting flap bellcrank.				X		

C. Ailerons and Outer Flaps,

	100 hr items marked X* 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		
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		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Ailerons and Outer Flaps	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Fuel Tanks	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
1.	Visually check fuel tank electrical 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 PERSONS 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 (refer to Section 52-40).		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		
8.	Install the access covers (refer to Section 52-40).		X	X	X		
9.	Examine the fuel tank vents for blockage. - 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 tanks are installed (OÄM 62-001): Examine the auxiliary fuel tank vents for blockage: - Open fuel filler cap and carefully blow through the vent lines from outside into the tank with compressed air. - Check vent hole in the fuel tank cap for blockage.	X	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, Fuel Tanks	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
11.	Examine the main 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		
12.	If the auxiliary tanks are installed (OÄM 62-001): Examine the auxiliary fuel tanks: - Look specially for material deterioration, chafings or damage of the tanks, the flexible fuel hoses on the tank and the fittings. - Look for leaks. - Look for foreign objects in the tank.				X	12 yrs	

E. Wings, Miscellaneous

	100 hr items marked X* 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 62-001), 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. **General**

	100 hr items marked X* 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 Aircraft 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	X	X		
7.	Do a function test of the rudder control system. (Refer to Section 27-20).		X	X	X		
8.	Do a function test of the elevator control system. (Refer to Section 27-30).		X	X	X		
9.	Do a function test of the rudder trim system. Look specially for incorrect operation and indication. (Refer to Section 27-21)		X	X	X		
10.	Do a function test of the elevator trim system. Look specially for incorrect operation and indication. (Refer to Section 27-38).		X	X	X		
11.	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	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
12.	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		
13.	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		
14.	Examine the anti-corrosion coating of exterior parts. (Refer to Section 12-30). Replace coating on condition.		X	X	X		
15.	Lower the airplane off jacks. (Refer to Section 07-10).	X*	X	X	X		
16.	Do an operational test of the external lights.	X*	X	X	X		
17.	Do an operational test of the Pitot heat.	X*	X	X	X		
18.	If the Ice Protection System is installed on the airplane: Do the Windshield Spraybar Check in the Operational Test of the Ice Protection System. Refer to Chapter 30-00. Maintenance Practices Para 2.B. Steps (14) thru (16).	X*	X	X	X		
19.	Perform a LH/RH ECU backup battery fuses (32 A) and wiring check.	X*	X	X	X		

	100 hr items marked X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
20.	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 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.						
21.	Put chocks against the main airplane wheels.	X	X	X	X		
22.	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		
23.	Examine the engines for leakage.	X	X	X	X		
24.	Make sure the engine oil filters are tight (LH and RH engine). (Refer to Section 79-00).	X	X	X	X		
25.	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 X* apply to US registered airplanes only	INTERVAL					
	INSPECTION ITEMS, General	**100**	**200**	**1000**	**2000**	**Time**	**Initials**
26.	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).						
27.	Complete the Structural Findings Report. Put one copy in the Airplane Maintenance Log. Send another copy to the manufacturer, i.e., Diamond Aircraft Industries Inc. 1560 Crumlin Sideroad London, Ontario, N5V 1S2 Canada. by mail, fax (519-457-4031) or e-mail (airworthiness@diamondair.com)					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 62	
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 Report

1. **Engine Ground Test Report**

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

	MAINTENANCE CHECK FLIGHT	**DA 62**
	(See Maintenance Checklist for Applicability)	**Page 1 of 7**

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.			
Pilot doors (LH and RH): locking mechanism, key lock, general condition / optics, open door warning.			
Passenger door: mechanism, key lock, open door warning.			
Seat belts : 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.			

	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 62 Page 2 of 7		
Functional Check, Flight Behavior		Findings		
		N/A	NO	YES
ON GROUND, ENGINES OFF				
Map / reading lights.				
G1000 manual dim.				

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	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 62 Page 3 of 7		
Functional Check, Flight Behavior		Findings		
		N/A	NO	YES
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.				
Gear unsafe warning light.				
Fire test.				
Fuel cross feed.				
Electrical trim.				

	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 62 Page 4 of 7		
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.				

	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 62 Page 5 of 7		
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 62-030 is NOT installed: Propeller feathering (engine shut down).				
If OÄM 62-030 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.				

	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 62 Page 6 of 7		
Functional Check, Flight Behavior		**Findings**		
		N/A	**NO**	**YES**
NAV 1 / 2, DME, ILS (LOC, GS, MKR) (if required).				
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.				

	MAINTENANCE CHECK FLIGHT (See Maintenance Checklist for Applicability)	DA 62 Page 7 of 7

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: _____

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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.

Send a copy of the completed Findings Report to the manufacturer:

DIAMOND AIRCRAFT INDUSTRIES INC.

Office of Airworthiness

1560 CRUMLIN SIDEROAD, LONDON, ONTARIO, CANADA N5V 1S2

by Fax (1-519-457-4031)

By e-mail (customer support - techs@diamondair.com)

NOTE: The manufacturer will use the completed Findings Reports for the continuous improvement of the checklist for the Major Structural Inspection (MSI).

Enter the applicable data in the blocks below:

STRUCTURAL FINDINGS REPORT DA 62 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: _____

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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

Figures 1 and 2 show 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 Number
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.
(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.	

	Detail Steps/Work Items	Key Items
(8)	Examine the wheels. Look specially for cracks or distortion of the rims. Look specially for play and irregular running of the wheel bearings.	
(9)	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.	
(10)	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.	
(11)	Examine the control surfaces. Look specially for: - Correct attachment of the hinges. - Correct attachment of the mass balance to the structure.	
(12)	Examine the leading edge of the wing for damage.	
(13)	Examine the area of the spar attachments to the wing shells. Look specially for cracks.	
(14)	Examine the leading edge of the horizontal and vertical stabilizers for damage.	
(15)	Examine the engine mounts.	
(16)	Examine the engine mount points on the firewall.	
(17)	Examine the propellers. Look specially to see if a propeller has touched the ground.	
	WARNING: 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	
(18)	Do a test of the backrest adjustment mechanism on both front seats.	Refer to Section 25-10

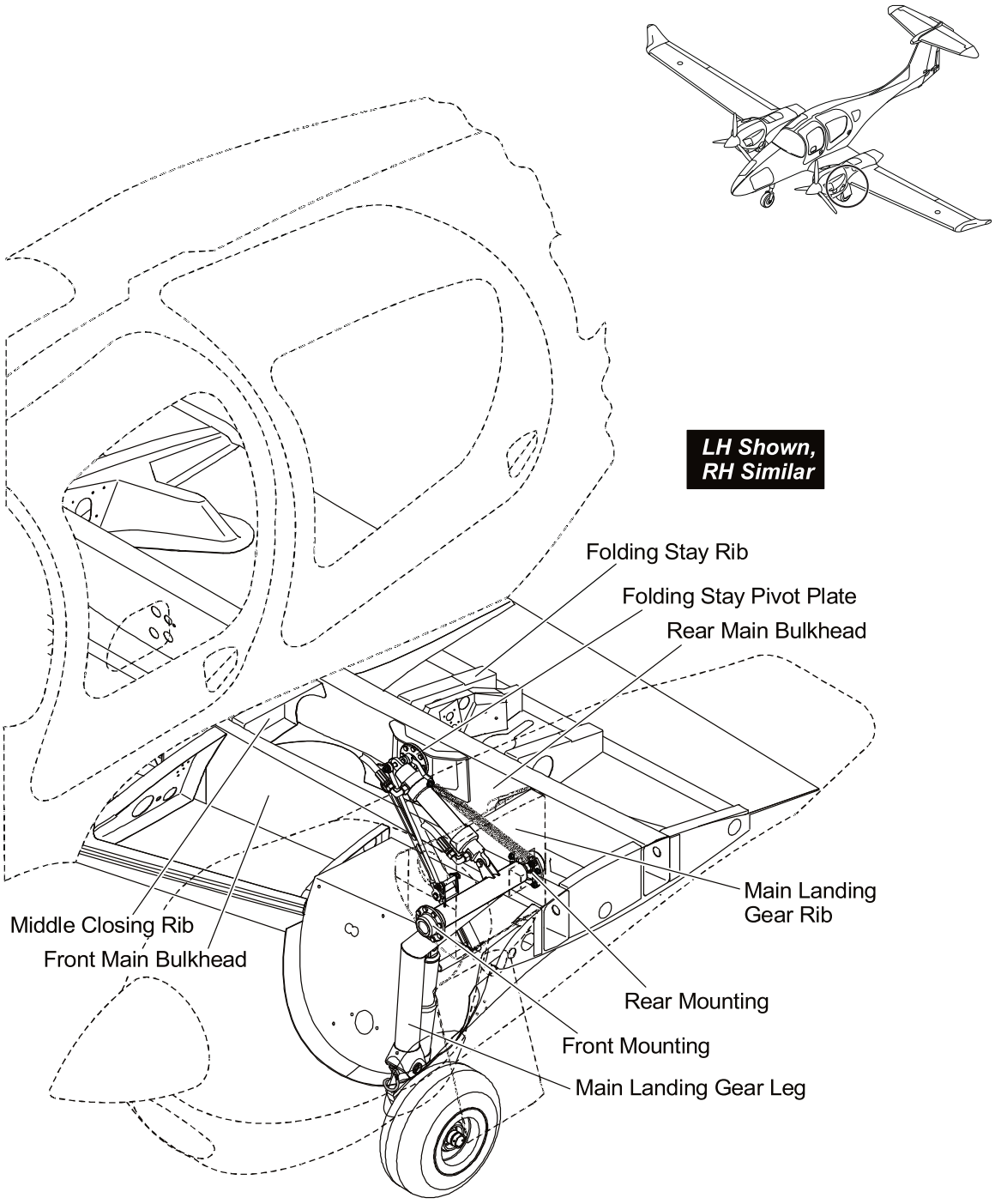

Figure 1 : Hard Landing Check Areas - Main Landing Gear

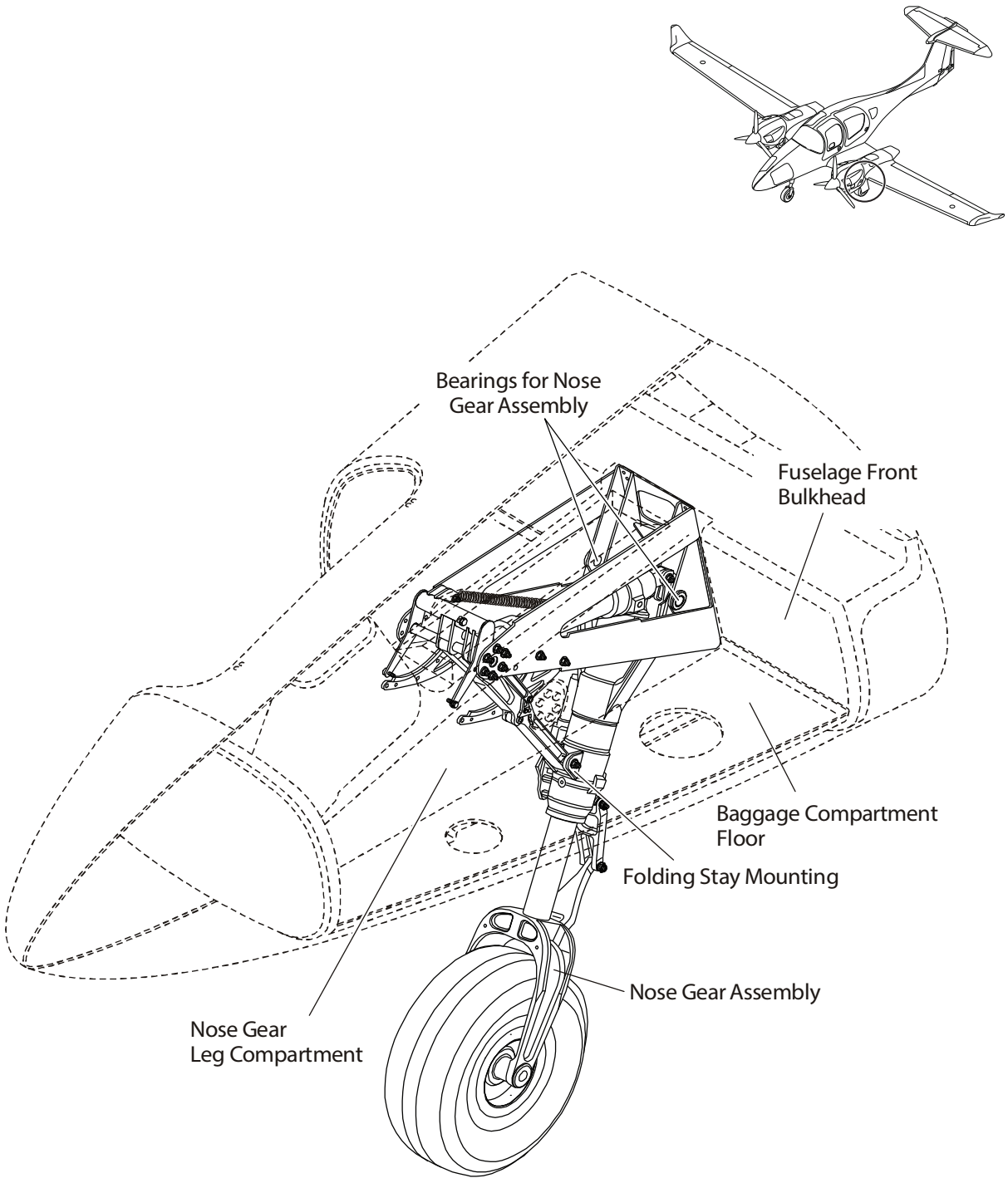

Figure 2 : Hard Landing Check Areas - Nose Landing Gear

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	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 and 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 exhaust pipes for damage.	
(10)	Examine the engine cowlings and cowling attachment surface for cracks.	
(11)	If auxiliary fuel tanks (OÄM 62-001) are installed examine forward aux tank bracket in the nacelle for cracks. Examine also the aft aux tank bracket installation to the nacelle floor for damage.	

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, latest revision.

B. Propeller is Hit by a Moving Object

If the 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 thePropeller Owner's Manual, latest revision.
(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. OTHERWISE SERIOUS INJURY COULD RESULT.**

WARNING: **FIRE CAN SERIOUSLY WEAKEN CFRP. IF YOU FIND ANY DAMAGE TO CFRP, DO NOT OPERATE THE AIRPLANE. ASK THE MANUFACTURER FOR ADVICE. ANY DAMAGE TO CFRP WILL MAKE THE AIRPLANE UNSAFE TO FLY AND ENDANGER THE CREW.**

	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 battery).	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.
(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.	

	Detail Steps/Work Items	Key Items
	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 battery).	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 Number
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: - Propeller and spinner. - Exhaust pipes. - Engine breather. - Door 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 propeller, spinner, exhaust pipe 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.
(2)	Examine the surface of the left wing for lightning damage. Look specially in these areas: - Pitot-static probe. - Stall warning switch. - Static dischargers. - 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.

	Detail Steps/Work Items	Key Items
(3)	Examine the surface of the right wing for lightning damage. Look specially in these areas: - Static dischargers. - 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.
(4)	Examine the surface of the horizontal stabilizer for lightning damage. Look specially in these areas: - Horizontal stabilizer tip. - Static dischargers. - 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.

	Detail Steps/Work Items	Key Items
(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.

(9)	Do a test of these lighting systems:
	- External lights:
	  - Position lights.
	  - Strobe lights.
	  - Landing light.
	  - Taxi light.
	- 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 of the Garmin G1000 system.	Refer to the Garmin G1000 Line Maintenance Manual, latest revision.
(12)	Operate the engine power controls through their range of movement. Look specially for: - Stiff or unusual feel during movement. - Restriction of movement. - Noisy operation.	Refer to Section 76-10.
(13)	Do a visual check of engine bondings and wirings.	
(14)	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.

	Detail Steps/Work Items	Key Items
(15)	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.
(16)	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.
(17)	Do an ECU test.	Refer to Section 76-00.
(18)	Do an ECU VOTER test.	Refer to Section 76-00.
(19)	Visually check engine-sensors, -harness and -systems for damages caused by indirect effects of lightning.	Ask the engine manufacturer for advice.
(20)	Do a compass check swing.	Refer to Section 34-20.

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 the voltage.	
(2)	Check the battery condition.	
(3)	Read out data and send to Austro Engine GmbH.	

CHAPTER 06
DIMENSIONS AND AREAS

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DIMENSIONS AND AREAS

1. General

The DA 62 uses the System Internationale (SI) for dimensions and areas. Imperial dimensions are also given in brackets. For example: Wing span 14.57 m (47 ft 10 in).

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

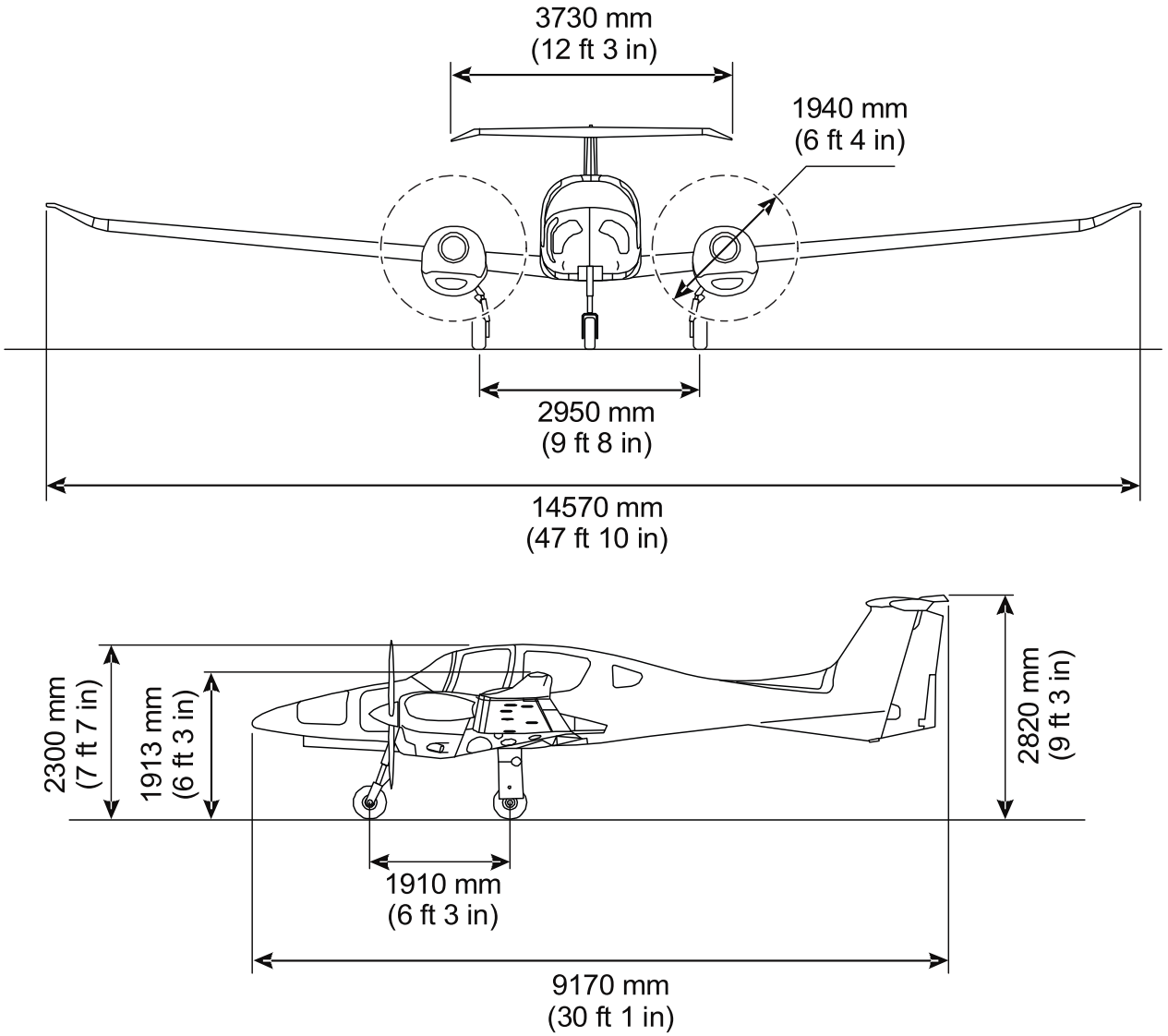


Figure 1 : DA 62 - Overall Dimensions (Approximate Values)

2. **Dimensions**

DA 62 Dimensions	
Overall Dimensions	
Wing span	14.57 m (47 ft 10 in) including ACL
Length	9.17 m (30 ft 1 in)
Height (nominal)	2.82 m (9 ft 3 in)
Wing Outer	
Airfoil	Wortmann FX 63-137/20-W4
Wing area (each wing, without winglets, flaps and aileron)	5.37 m² (57.8 ft²)
Winglets (each)	0.49 m² (5.27 ft²)
Dihedral (nominal)	5.2°
Aspect ratio	12.8
Sweep back	1°
Wing Center Section	
Area (total without inner flaps)	6.36 m² (68.46 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	3.73 m (12 ft 3 in)
Area (with tips, without elevator)	2.09 m² (21.53 ft²)
Angle of incidence	-1°
Elevator	
Span	2.96 m (9 ft 9 in)
Area (without trim-tab)	0.817 m² (8.79 ft²)
Trim-tab	0.08 m² (0.86 ft²)

DA 62 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	1.58 m (5 ft 2 in)
Area	0.74 m² (7.96 ft²)
Rudder Trim-Tab	
Span	0.72 m (2 ft 4 in)
Area	0.06 m² (0.65 ft²)
Landing Gear (typical static, normal load)	
Wheel track	2.95 m (9 ft 8 in)
Wheel base	1.910 m (6 ft 3 in)
Main Wheel	
Tire: Goodyear	6.00-6, 8 PR, TT, 160 mph, FS II or Flight Custom III
Tire inflation pressure	3.8 bar (55 PSI)
Damper gas pressure (unloaded)	20 bar (290 PSI)
Nose Wheel	
Tire: Goodyear	6.00-6, 8 PR, TT, 160 mph, FS II or Flight Custom III
Tire inflation pressure	3.2 bar (46 PSI)
Damper gas pressure (unloaded)	12 bar (174 PSI)

3. **Adjustment Reports**

The measurements of the DA 62 are recorded on an Adjustment Report and the Main Landing Gear Toe-In 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.

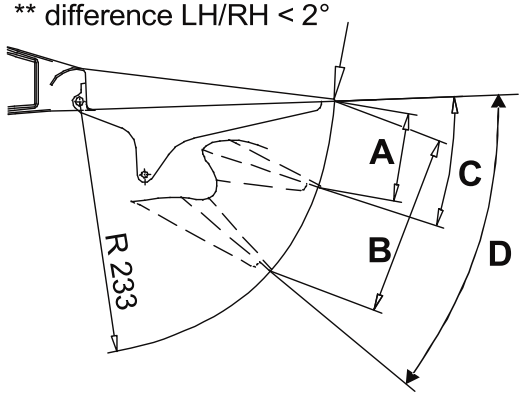
If the values are not within the limits in the Control Surface Balance Report, you must ask the manufacturer for advice before you adjust the balancing weight.

(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 +8/-8 (see A)		167 +4/-4 (see B)		87 ±7 (see E)		0 ±3.5		52 +7/-0 (see F)	
Travel Limits [in.]	0 +0.32/-0		3.19 +0.32/-0.32 (see A)		6.57 +0.16/-0.16 (see B)		3.41 ±0.27 (see E)		0 ±0.14		2.06 +0.27/-0 (see F)	
Travel Actual												
Angle Limits [°]	0 +2/-0*		20 +2/-2 (see C)**		42 +1/-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°



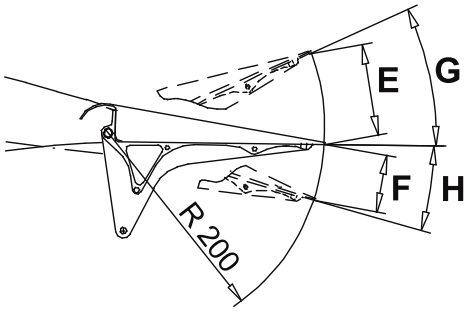
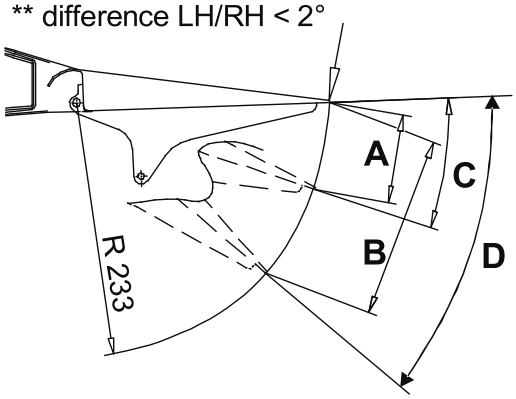


Figure 2 : Control Surface Adjustment Report - Flaps and Ailerons

	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 +8/-8 (see A)		167 +4/-4 (see B)		87 ±7 (see E)		0 ±3.5		52 +7/-0 (see F)	
Travel Limits [in.]	0 +0.32/-0		3.19 +0.32/-0.32 (see A)		6.57 +0.16/-0.16 (see B)		3.41 ±0.27 (see E)		0 ±0.14		2.06 +0.27/-0 (see F)	
Travel Actual												
Angle Limits [°]	0 +2/-0*		20 +2/-2 (see C)**		42 +1/-1 (see D)**		25 ±2 (see G)		0 ±1		+15 +2/-0 (see H)	
Angle Actual [°]												

	Split - Flap
Initial Load Limit [kp]	3-10 (6.6-22.0 lbf)
Initial Load Actual [kp]	

* difference LH/RH < 1°
** difference LH/RH < 2°



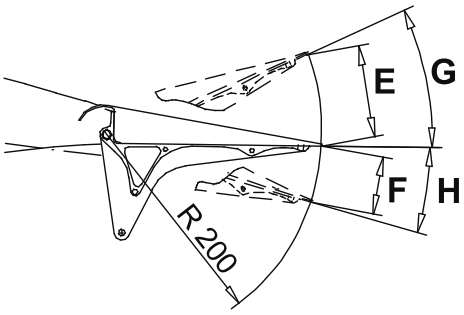
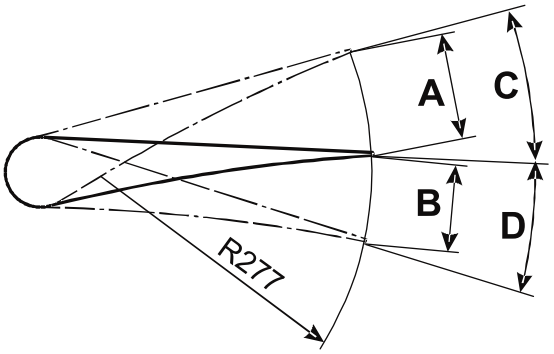
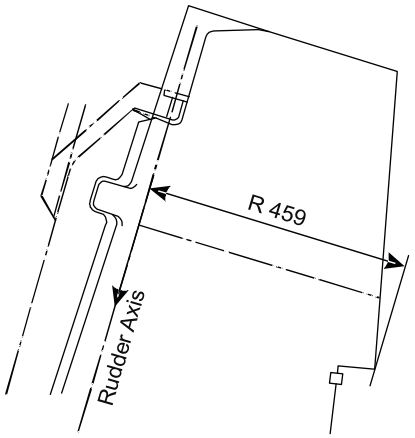


Figure 3 : Control Surface Adjustment Report - Flaps and Ailerons (if MÄM 62-192 is installed)

	Elevator		Rudder	
	up	down	left	right
Travel Limits [mm]	-87 ±2 (see A)	72 ±4 (see B)	238 ±8 (see E)	238 ±8 (see F)
Travel Limits [in.]	-3.41 ±0.10 (see A)	2.85 ±0.19 (see B)	9.35 ±0.32 (see E)	9.35 ±0.32 (see F)
Travel Actual				
Angle Limits [°]	18 ±0.5 (see C)	15 ±1 (see D)	30 ±1 (see G)	30 ±1 (see H)
Angle Actual [°]				





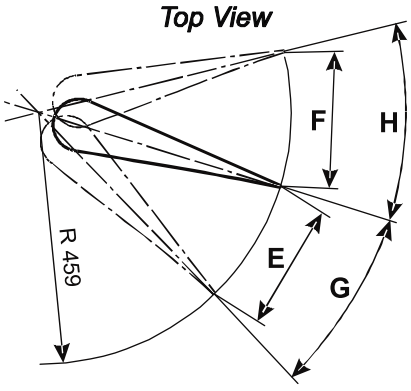


Figure 4 : Control Surface Adjustment Report - Elevator and Rudder

	Elevator Trim								
	Elevator 10° Up			Elevator Neutral			Elevator 10° Down		
	nose down	neutral	nose up		neutral	nose up	nose down	neutral	nose up
Travel Limits [mm]	-57 ±8	-23 ±5	28 ±8	-41 ±8	-18 ±5	46 ±8	-28 ±10	+5 ±5	73 ±7
Travel Limits [in.]	-2.25 ±0.33	-0.91 ±0.20	1.11 ±0.33	1.62 ±0.33	-0.72 ±0.20	1.81 ±0.33	-1.11 ±0.39	+0.20 ±0.20	2.86 ±0.26
Travel Actual									
Angle Limits [°]	-35 ±5	-14 ±3	+17 ±5	-25 ±5	-11 ±3	28 ±5	-17 ±6	+3 ±3	+45 ±4
Angle Actual [°]									

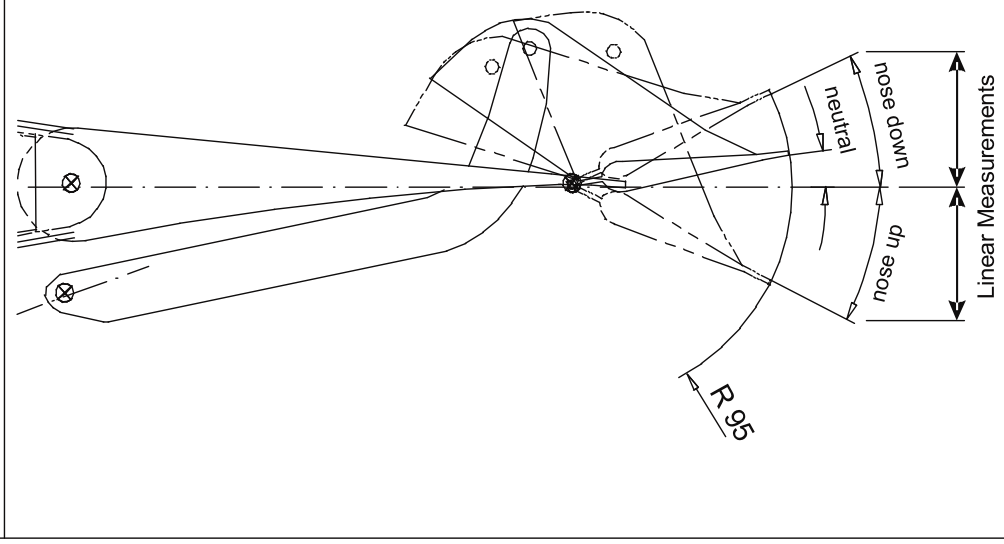


Figure 5 : Control Surface Adjustment Report - Elevator Trim

	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]	-51 ±6	-17 ±4	32 ±4	-48 ±4	-8 ±2	47 ±6	-35 ±4	1 ±4	56 ±6
Travel Limits [in.]	-2.02 ±0.23	-0.69 ±0.14	1.28 ±0.14	1.89 ±0.14	-0.32 ±0.09	1.85 ±0.23	1.37 ±0.14	0.05 ±0.14	2.19 ±0.23
Travel Actual									
Angle Limits [°]	45 ±5	15 ±3	28 ±3	42 ±3	7 ±2	41 ±5	30 ±3	1 ±3	49 ±5
Angle Actual [°]									

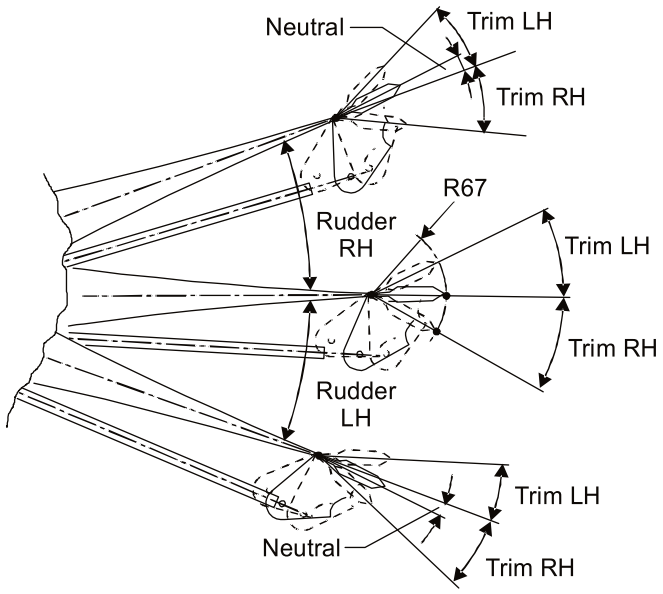


Figure 6 : Control Surface Adjustment Report - Rudder Trim

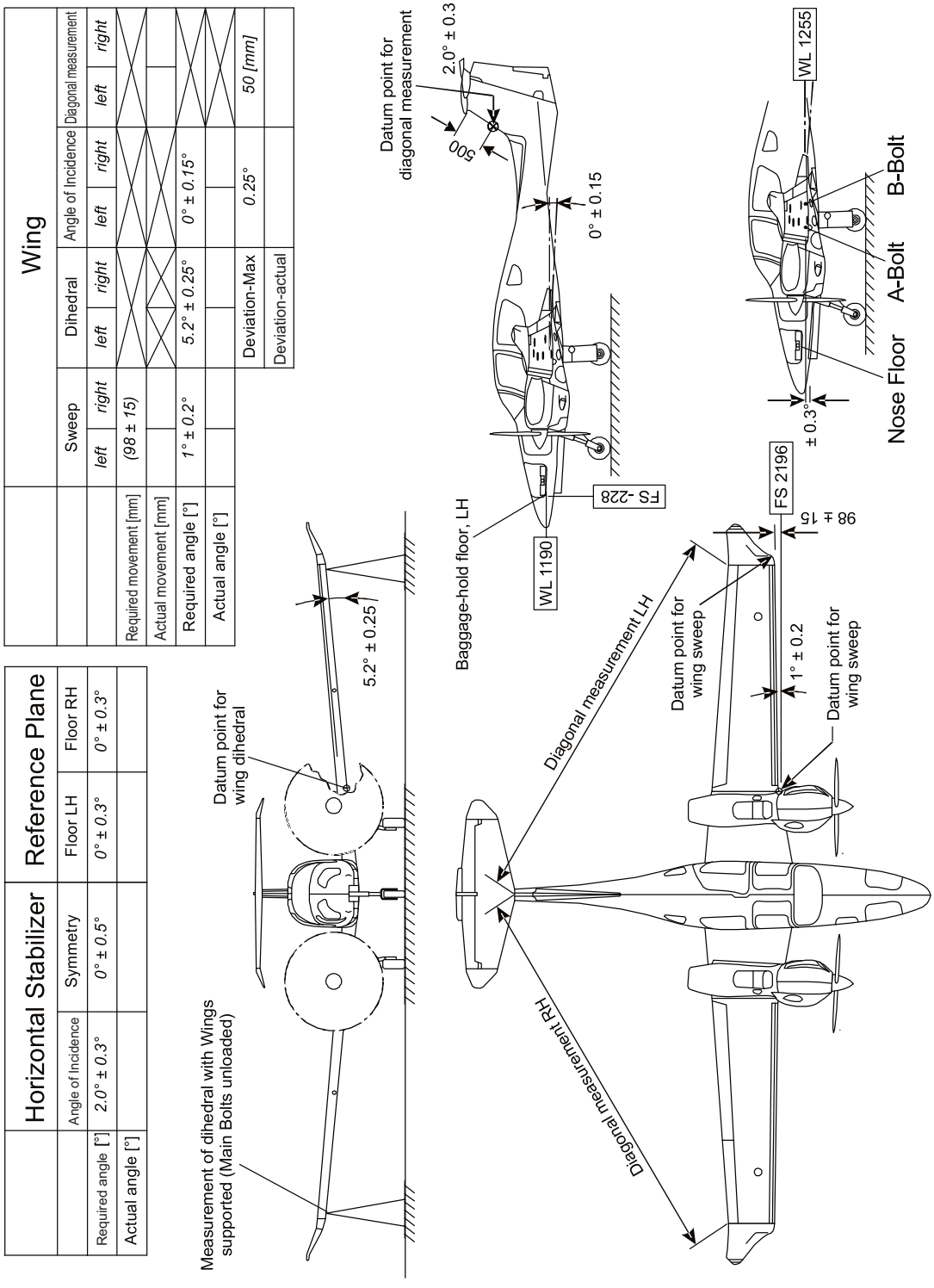


Figure 7 : Adjustment Report - General Items (Metric Dimensions)

	Horizontal Stabilizer		Reference Plane	
	Angle of Incidence	Symmetry	Floor LH	Floor RH
Required angle [°]	*2.0° ± 0.3°*	*0° ± 0.5°*	*0° ± 0.3°*	*0° ± 0.3°*
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)*							
Actual movement [in]								
Required angle [°]	*1° ± 0.2°*		*5.2° ± 0.25°*		*0° ± 0.15°*			
Actual angle [°]								
			Deviation-Max		*0.25°*		*1.97 [in]*	
			Deviation-actual					

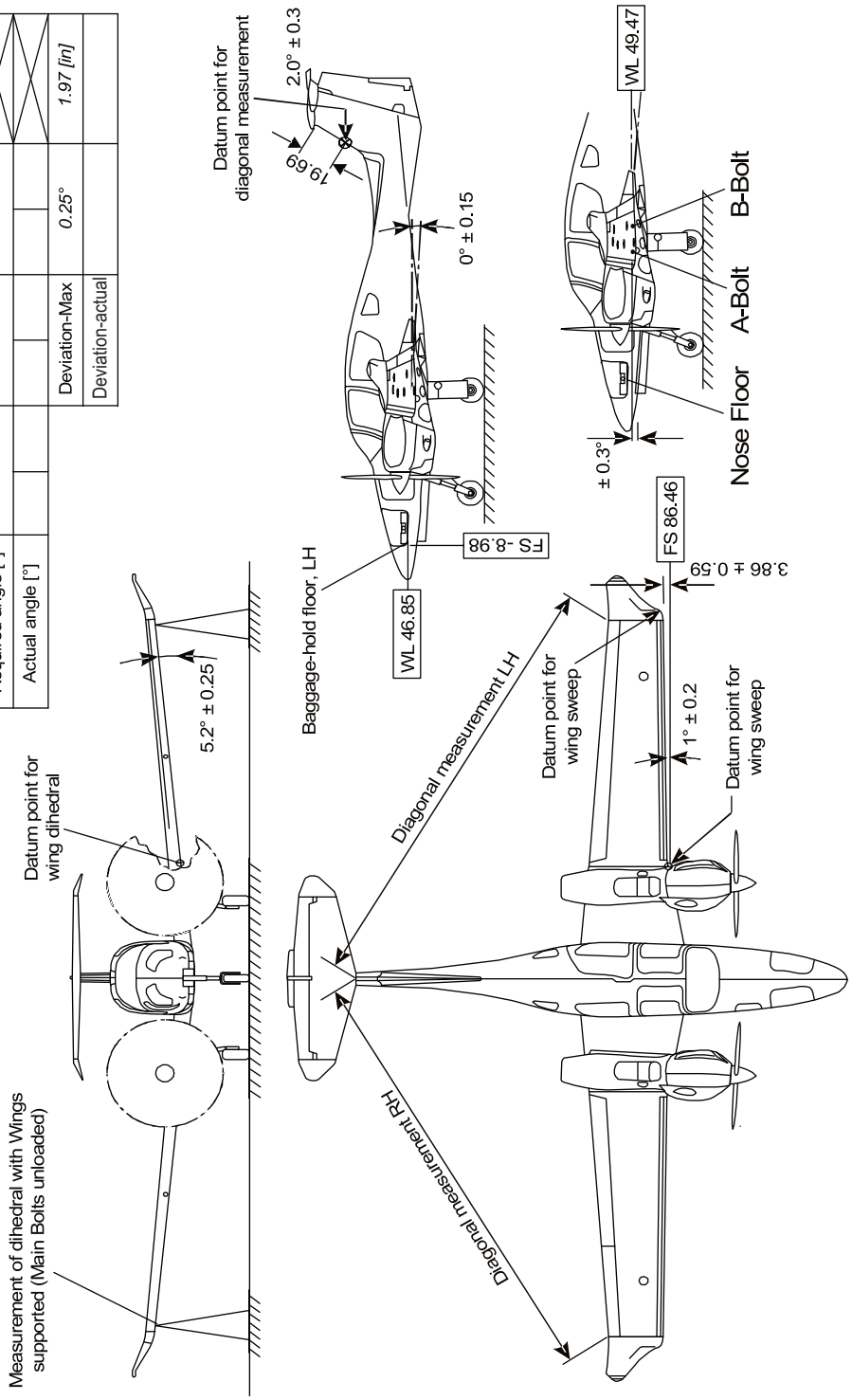


Figure 8 : Adjustment Report - General Items (Imperial Dimensions)

Main Landing Gear - Wheel Track and Camber Report (for test/adjustment procedure refer to Section 32-10 Paragraph 11)		
	Check Procedure	**Measured Data**
(1)	Perform check at basic 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	
(4)	Track LH wheel	dvsl= ° ----------
(5)	Track RH wheel	dvsr= ° ----------
(6)	Angle between LH and RH wheel (dvsl + dvsr)	dvs= ° ----------
	Measure Wheel Camber	
(7)	Camber LH wheel	gl= ° ----------
(8)	Camber RH wheel	gr= ° ----------
	Measure Track Width	
(9)	Overall track width	S= m ----------

Figure 9 : Main Landing Gear Wheel - Track and Camber Report

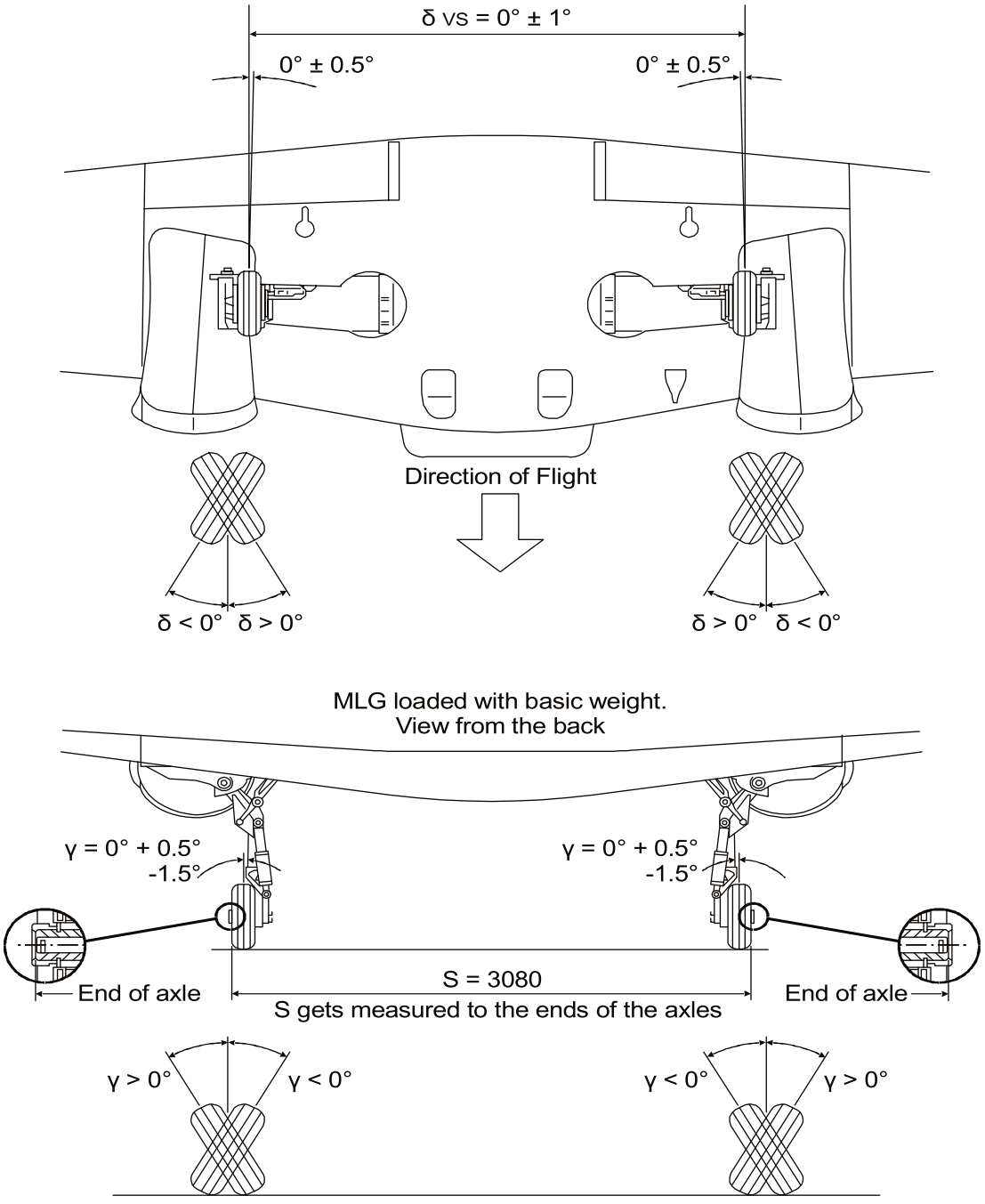


Figure 10 : Main Landing Gear - Track and Camber

CHAPTER 07
LIFTING AND SHORING - GENERAL

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CHAPTER 07

LIFTING AND SHORING - GENERAL

1. General

The DA 62 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 62 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.

WARNING: IF THE WIND SPEED IS MORE THAN 10 KM/H (6 KNOTS), DO NOT LIFT THE AIRPLANE ON JACKS OUTDOORS. IF YOU DO THIS, IT COULD CAUSE DAMAGE TO THE AIRPLANE AND/OR INJURY TO PERSONNEL.

2. Lifting the Airplane on Jacks

A. Equipment

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

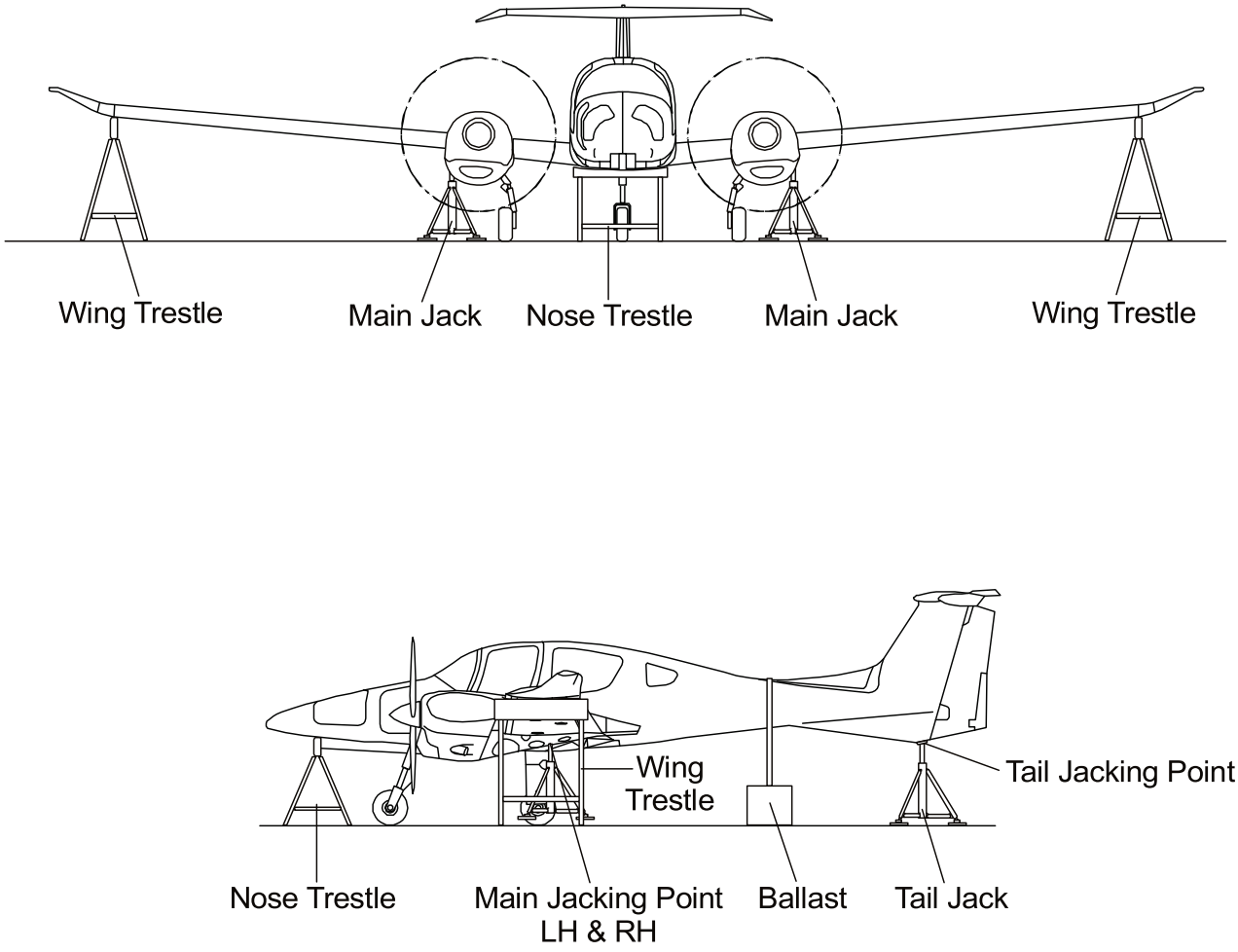

Figure 1 : Lifting the Airplane on Jacks

B. Lifting the Airplane on Jacks

Refer to Figure 1.

	Detail Steps/Work Items	Key Items/References
CAUTION:	IF THE AIRPLANE IS IN THE OPEN, THEN ALIGN IT INTO THE WIND. THE MAXIMUM WIND SPEED PERMITTED TO LIFT THE AIRPLANE OUTSIDE IS 10KMH (6 KTS).	
(1)	Apply the parking brake. Put chocks under the main wheels.	
(2)	Put the two jacks into position under the main jacking points. Extend the jacks to engage with the jacking plates.	The jacking plates are bonded to the bottom surface of the stub wing, under of the forward main spar.
(3)	Put a jack into position under the tail jacking point. Extend the jack until it engages 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	
CAUTION:	YOU MUST USE THE NOSE TRESTLE. CENTER OF GRAVITY MOVEMENTS, (E.G. RETRACTION/EXTENSION OF THE LANDING GEAR), MAY OVERBALANCE THE AIRPLANE. THE AIRPLANE CAN TILT FORWARD.	
(7)	Put the nose trestle in position under the front fuselage.	At the front bulkhead.

C. Lowering the Airplane on Jacks

Refer to Figure 1.

	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. THIS WILL PREVENT DAMAGE TO THE AIRPLANE OR INJURY TO PERSONNEL.	
(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 three jacks equally to keep the airplane level at all times.
(4)	Apply the parking brake. Put chocks under the wheels.	
(5)	Retract the three 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 2300 kg (5071lb). 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.**

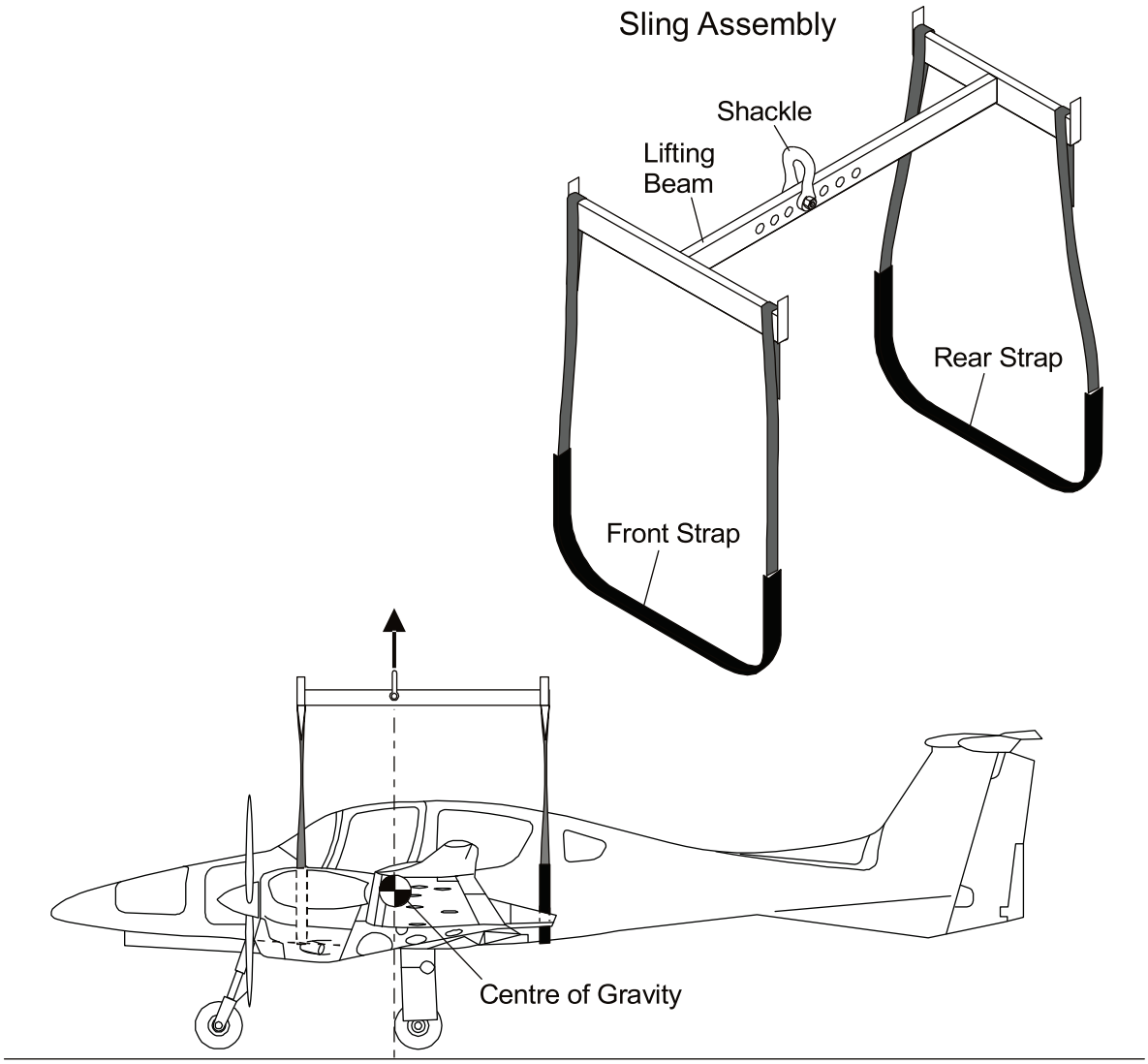

Figure 1 : Hoisting the Airplane

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 62 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.

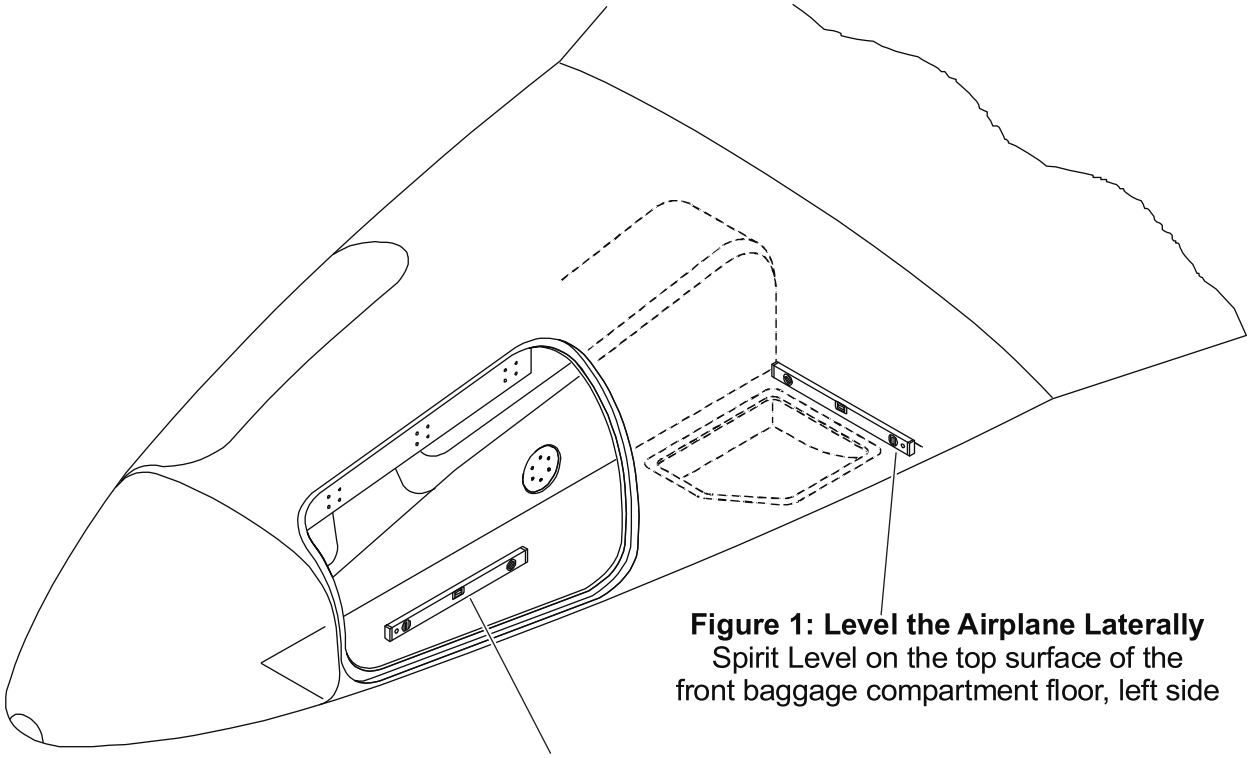


Figure 1: Level the Airplane Laterally
Spirit Level on the top surface of the
front baggage compartment floor, left side

Figure 2: Level the Airplane Longitudinally
Spirit Level on the top surface of the
front baggage compartment floor, left side.

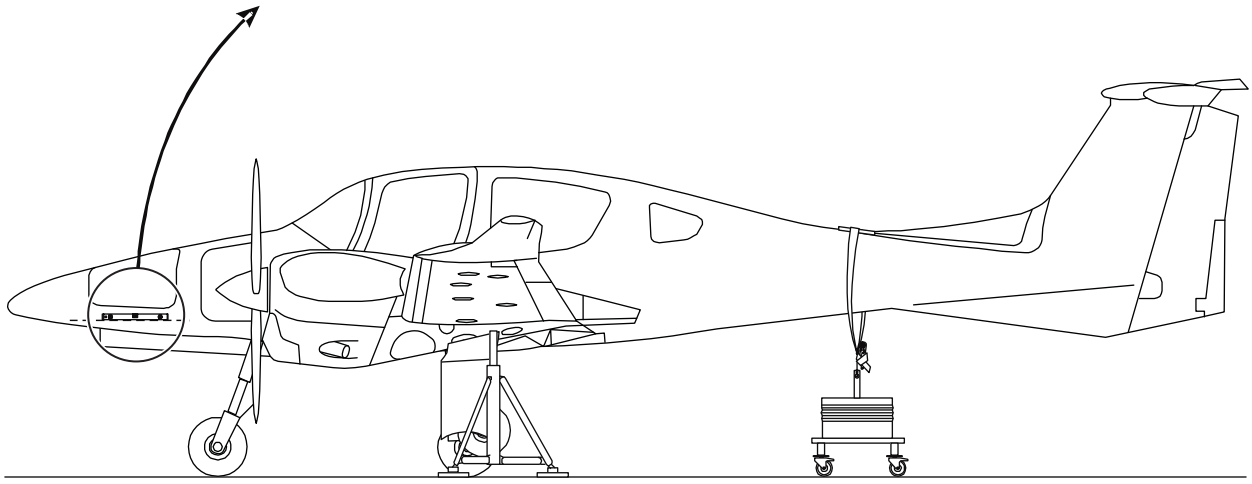
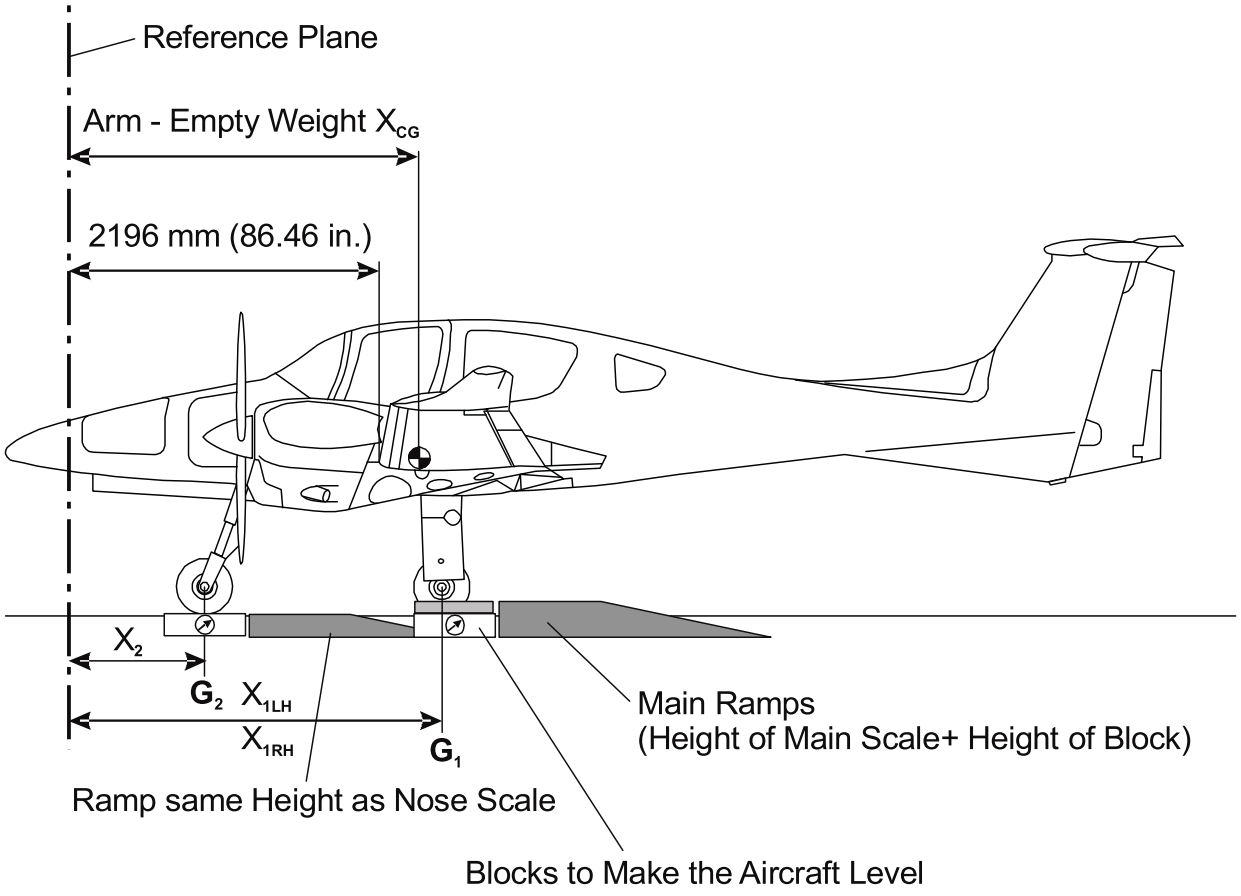


Figure 1 : Level the Airplane Laterally for Weighing
Figure 2 : Level the Airplane Longitudinally for Weighing



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 3 : 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 on 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 thickness)	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 causing weighing errors.	
(1)	Make a copy of the Weighing Report form.	Refer to Figure 4.
(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)	Lift the airplane on jacks.	Refer to Section 07-10.
(5)	Put the flat part of the ramps under each wheel.	
(6)	Lower the airplane onto the ramps with the jacks. Remove the jacks.	Refer to Section 07-10.
(7)	Put a wooden block on the scale in front of each main wheel.	The blocks should be of the same thickness. Refer to Figure 3.
(8)	Push the airplane forward onto the scales.	Make sure that the wheels are above the center of the scales.
(9)	Make the airplane level laterally: - Place a spirit level on the top surface of the front baggage compartment floor, left side. - 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. 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.
(10)	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.

	Detail Steps/Work Items	Key Items/References
(11)	Remove the leveling equipment from the airplane.	
(12)	Put the rear passenger seats in the upright position.	
(13)	Close all doors.	
(14)	Read the value from the left main wheel scale. Enter the value on the Weighing Form under MAIN G_{1LH} Gross.	
(15)	Read the value from the right main wheel scale. Enter the value on the Weighing Form under MAIN G_{1RH} Gross.	
(16)	Read the value from the nose wheel scale. Enter the value on the Weighing Form under NOSE G_2 Gross.	
(17)	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.
(18)	Use the plumb line to mark the position of the nose wheel center line on the floor.	
(19)	Use the plumb line to mark the position of each main wheel center line on the floor.	
(20)	Lift the airplane off the scales with the jacks.	Refer to Section 07-10.
(21)	Read the weight of the wooden blocks on each of the scales. Record the values in the column headed TARE in the Weighing Report.	
(22)	Remove the scales and the ramps.	

	Detail Steps/Work Items	Key Items/References
(23)	Measure the distance X_{1LH}. Record the value in the Weighing Report.	
(24)	Measure the distance X_{1RH}. Record the value in the Weighing Report.	
(25)	Measure the distance X_2. Record the value in the Weighing Report.	
(26)	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.	
(27)	Subtract each Tare value from the related Gross value. Record the result under Net in the Weighing Report.	
(28)	Lower the airplane with the jacks.	
(29)	Calculate the Empty Weight, G, from the Net values.	G = Net G_{1LH} + Net G_{1RH} + Net G_2
(30)	Calculate the Empty Weight Moment, M.	M = (G_{1LH} * X_{1LH})+(G_{1RH} * X_{1RH}) + (G_2 * X_2)
(31)	Calculate the position of the Empty Weight Center-of- Gravity, X_{CG}.	X_{CG} = M/G
(32)	Record the Empty Weight (G) and the Empty Weight Moment (M) in the Airplane Flight Manual.	

WEIGHING REPORT

Model: DA 62 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 (7.58 liter/ 2 US gal) and unusable fuel auxiliary tanks (if installed; 2.2 liter/ 0.58 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.	If OÄM 62-018 is installed or if MÄM 62-001 is not installed:	1999 kg (4407 lb).
	if MÄM 62-001 is installed	2300 kg (5071 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 4 : 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

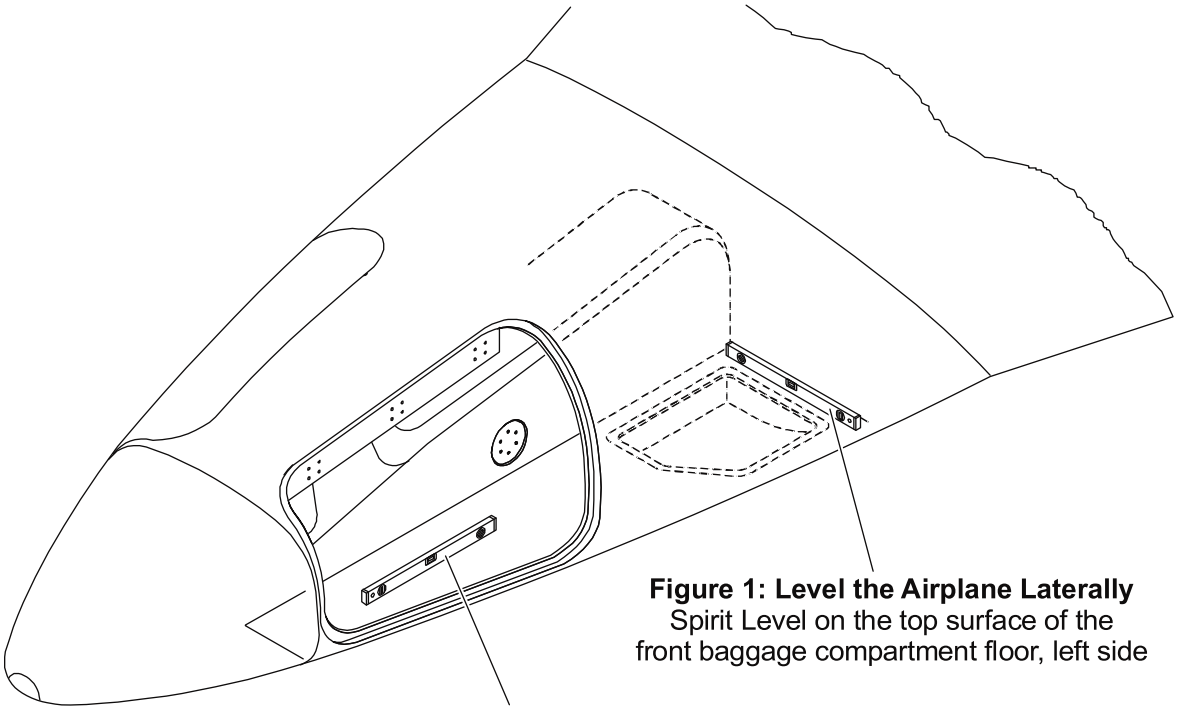


Figure 1: Level the Airplane Laterally
Spirit Level on the top surface of the
front baggage compartment floor, left side

Figure 2: Level the Airplane Longitudinally
Spirit Level on the top surface of the
front baggage compartment floor, left side.

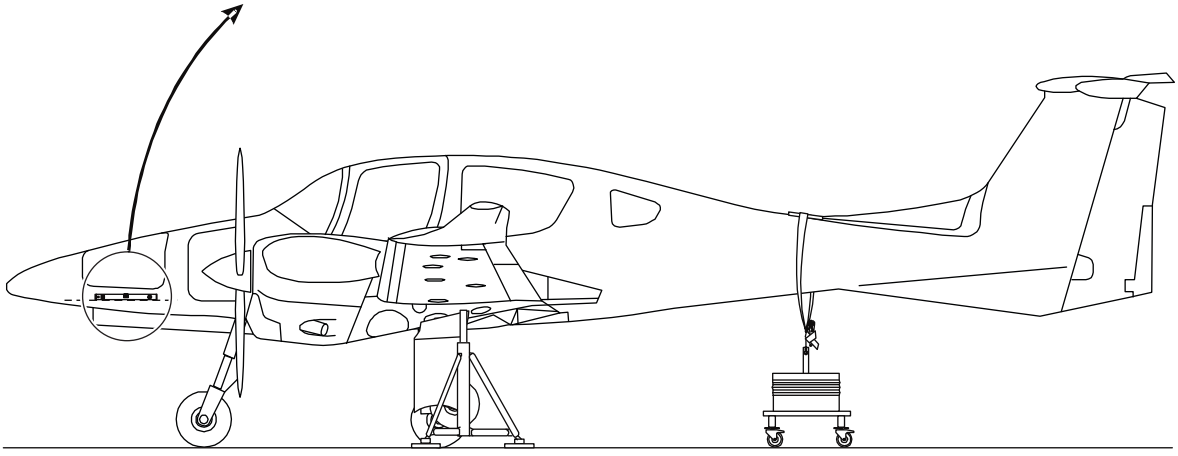


Figure 1 : Level the Airplane Laterally
Figure 2 : Level the Airplane Longitudinally

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: - Place a spirit level on the top surface of the front baggage compartment floor, left side. - Adjust the main jacks to bring the spirit level horizontal.	Refer to Figure 1.
(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 under 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

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CHAPTER 09

TOWING AND TAXIING

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. DAMGE TO THE AIRPLANE AND INJURY TO PERSONNEL COULD RESULT IF THESE RULES ARE NOT FOLLOWED.**

CAUTION: YOU MUST NOT TOW THE AIRPLANE WITH AN AIRCRAFT TRACTOR. TOWING THE AIRPLANE WITH AN AIRCRAFT TRACTOR MAY CAUSE 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 with or without using a tow bar. You can push or pull the DA 62 at the inner section of the propeller blades near the spinners. You can push the DA 62 at the wing nose and at the rough upper surface of the center wing, inboard of the engine nacelle. The use of a tow bar assisted by a person pulling or pushing on the wing or propeller (as described before) facilitates towing.

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.

CAUTION: NEVER USE FORCE ON THE PROPELLER TIPS OR ON THE CONTROL SURFACES. DO NOT PUSH ON THE DE-ICING NOZZLES (IF INSTALLED) AT THE PROPELLER BLADE ROOT. YOU CAN DAMAGE THE PROPELLERS AND THE CONTROL SURFACES AND THE DE-ICING NOZZLES.

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 30º TO THE LEFT AND RIGHT. IF YOU TURN THE WHEEL MORE THAN 30º YOU WILL CAUSE DAMAGE TO THE NOSE GEAR.

A. Forward Movement

Pull the airplane forward on the inner section of the propeller blades. The nose wheel will follow the movement of the airplane. You can change direction by pulling on the inner section of the appropriate propeller blade.

B. Rearward Movement

Use the tow bar for backward movement. Assisting persons may push on the propeller inner section and the inner wing leading edge.

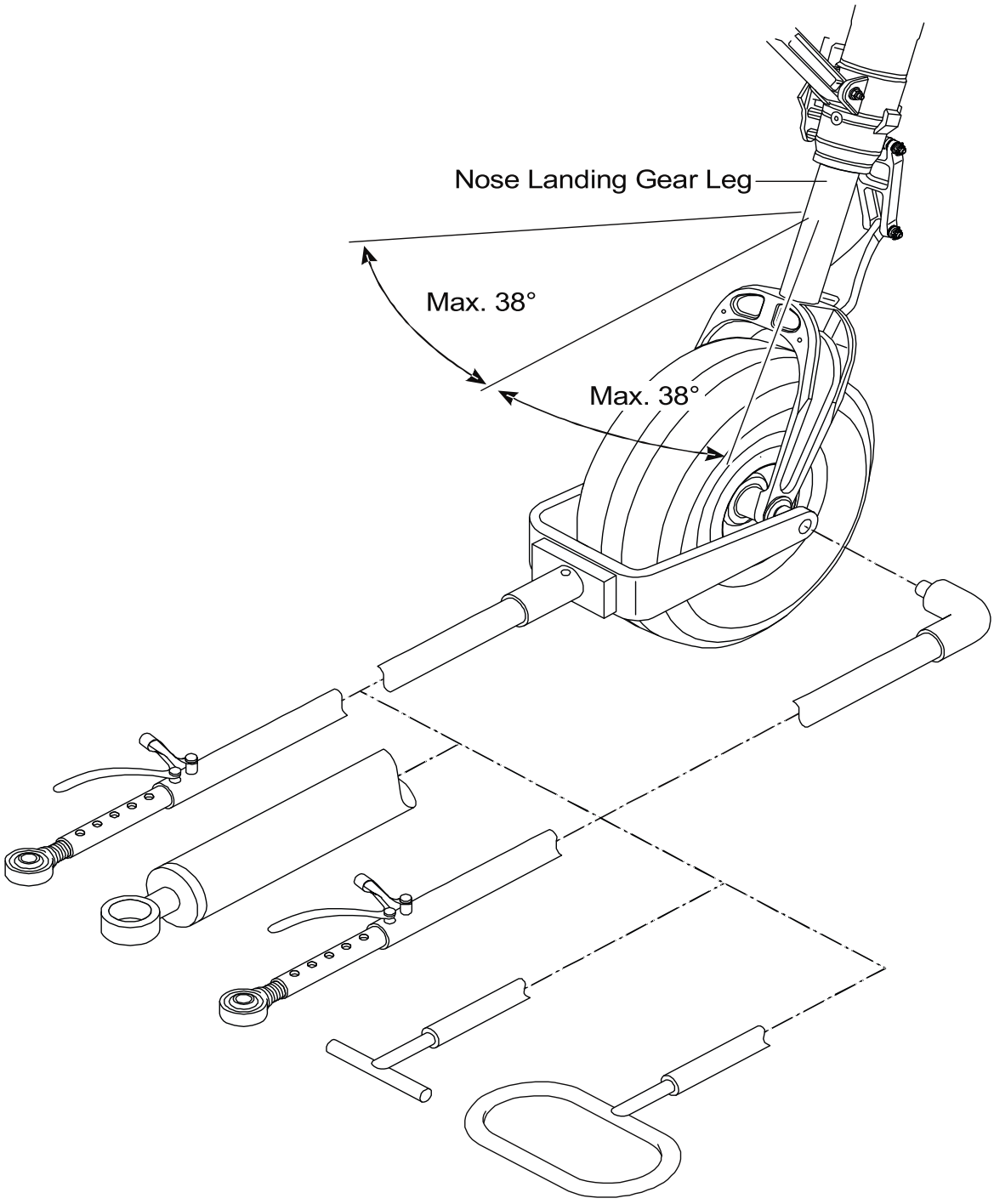

Figure 1 : Tow Bar

Section 09-20

Taxiing

1. General

The DA 62 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: YOU MUST NOT TAXI THE AIRPLANE UNLESS YOU HAVE BEEN TRAINED TO TAXI AND HAVE BEEN AUTHORIZED BY YOUR AIRWORTHINESS AUTHORITY. DAMGE TO THE AIRPLANE AND INJURY TO PERSONNEL COULD RESULT IF THESE RULES ARE NOT FOLLOWED.

CAUTION: THIS SECTION GIVES GENERAL DATA ON TAXIING ONLY. YOU MUST USE THE DA 62 AIRPLANE FLIGHT MANUAL WHEN YOU TAXI THE AIRPLANE.

2. Taxiing Procedure

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the area around the airplane is clear of objects.	For example: ground equipment and tools.
(2)	Operate the parking brake.	
(3)	If necessary remove: - The wheel chocks. - The tow bar. - The mooring ropes. - Any other support equipment attached to the airplane.	
WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR OBJECTS NEAR THE AIRPLANE. THE AIRPLANE CAN INJURE PERSONS. OBJECTS CAN DAMAGE THE AIRPLANE.		
(4)	Start the engines.	Refer to the DA 62 Airplane Flight Manual.
(5)	Release the parking brake.	

	Detail Steps/Work Items	Key Items/References
	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	
(6)	Taxi the airplane to its new position.	
(7)	Shut down the engines.	Refer to the DA 62 Airplane Flight Manual.
(8)	Park the airplane. If necessary, moor the airplane.	Refer to Chapter 10-00.

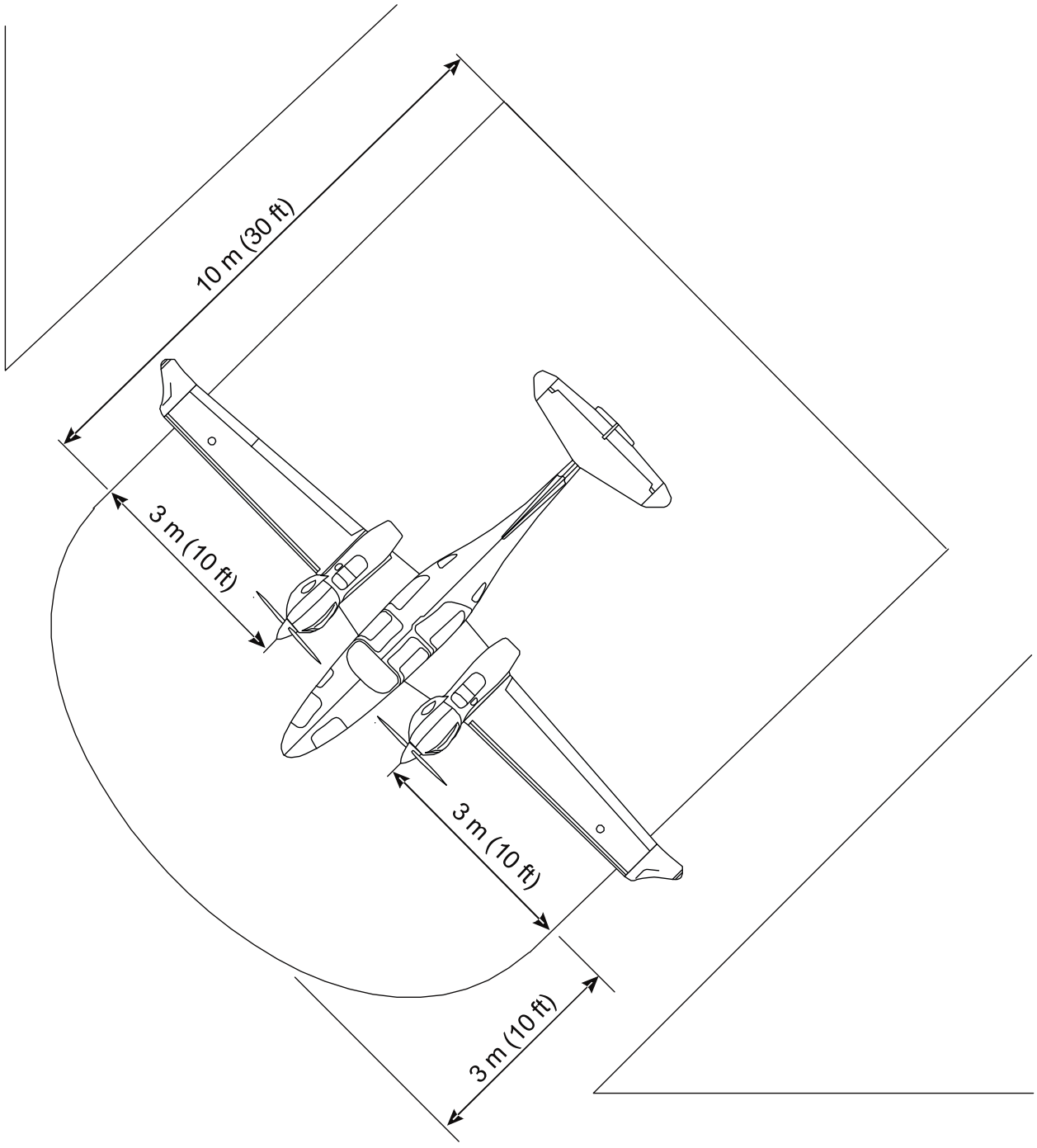

Figure 1 : The Safety Area for Taxiing the DA 62 Airplane

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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 62 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.

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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 62 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 lock.	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)	Keep both pedals pushed and push both the brake pedals at least two times. Lock the parking brake.	Lever fully downward.
(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.	
(9)	Set the flaps to UP position.	Fully up.
(10)	Make sure that all doors (LH & RH pilot, passenger and nose baggage doors) are closed and locked.	
WARNING: DO NOT INSTALL THE PITOT COVER WHILE THE PITOT TUBE IS HOT. A HOT PITOT TUBE CAN CAUSE SERIOUS BURNS.		
(11)	Install Pitot cover on the 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 1.B.
(2)	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 (2) every 15 days.	
	WARNING: DO NOT INSTALL THE PITOT COVER WHILE THE PITOT TUBE IS HOT. A HOT PITOT TUBE CAN CAUSE SERIOUS BURNS.	
(3)	Install Pitot cover on the Pitot tube.	Located on the lower surface of the LH wing.
(4)	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.	
(5)	Do the procedure for standstill period.	Refer to AE Operation Manual, latest revision.
(6)	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
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.C.
(3)	Do the procedure for storage of an already installed engine.	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.	

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. DAMAGE TO AIRCRAFT EQUIPMENT COULD RESULT.		
(4)	Relieve v-ribbed belt tension.	Refer to AE Maintenance Manual, latest revision.
(5)	Close all engine openings air proof.	

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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**

Figure 1 shows the location of the mooring points on the airplane.
There are three mooring points: One below each wing and one on the skid plate at the tail.

A. Equipment

Item	Quantity	Part Number
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 DAMAGE THE AIRPLANE. THIS IS MOST IMPORTANT WHEN YOU USE SECURE GROUND ANCHOR-POINTS.	
(3)	Attach a rope to each mooring point and to the ground anchor point. Do not make the ropes tight.	See Figure 1.
(4)	Remove all items from the area that may cause damage to the airplane.	

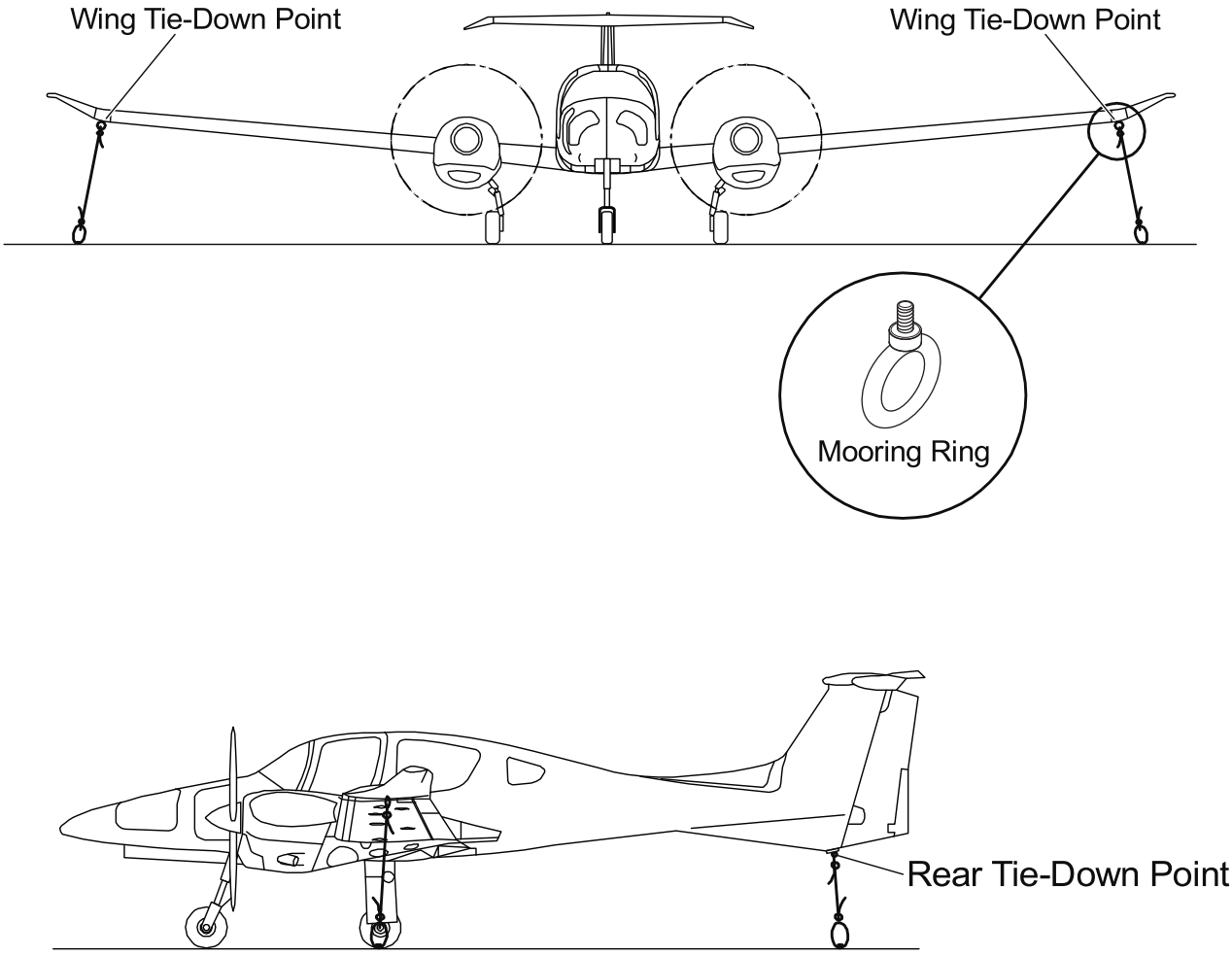

Figure 1 : Location of Mooring Points on the Airplane

Section 10-30

Return to Service

1. **General**

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

2. **Return to Service Procedure**

A. Storage Time is Less Than One Year

	Detail Steps/Work Items	Key Items/References
(1)	If necessary, install the 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 windshield 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.

	Detail Steps/Work Items	Key Items/References
(11)	Perform an engine ground run according to the AE Operation Manual, latest revision.	
(12)	Reactivate the ELT.	
(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.

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

Section 11-20

Exterior Placards and Markings

1. **General**

Figures 1 through 4 over the next pages show the exterior placards for the DA 62 airplane.

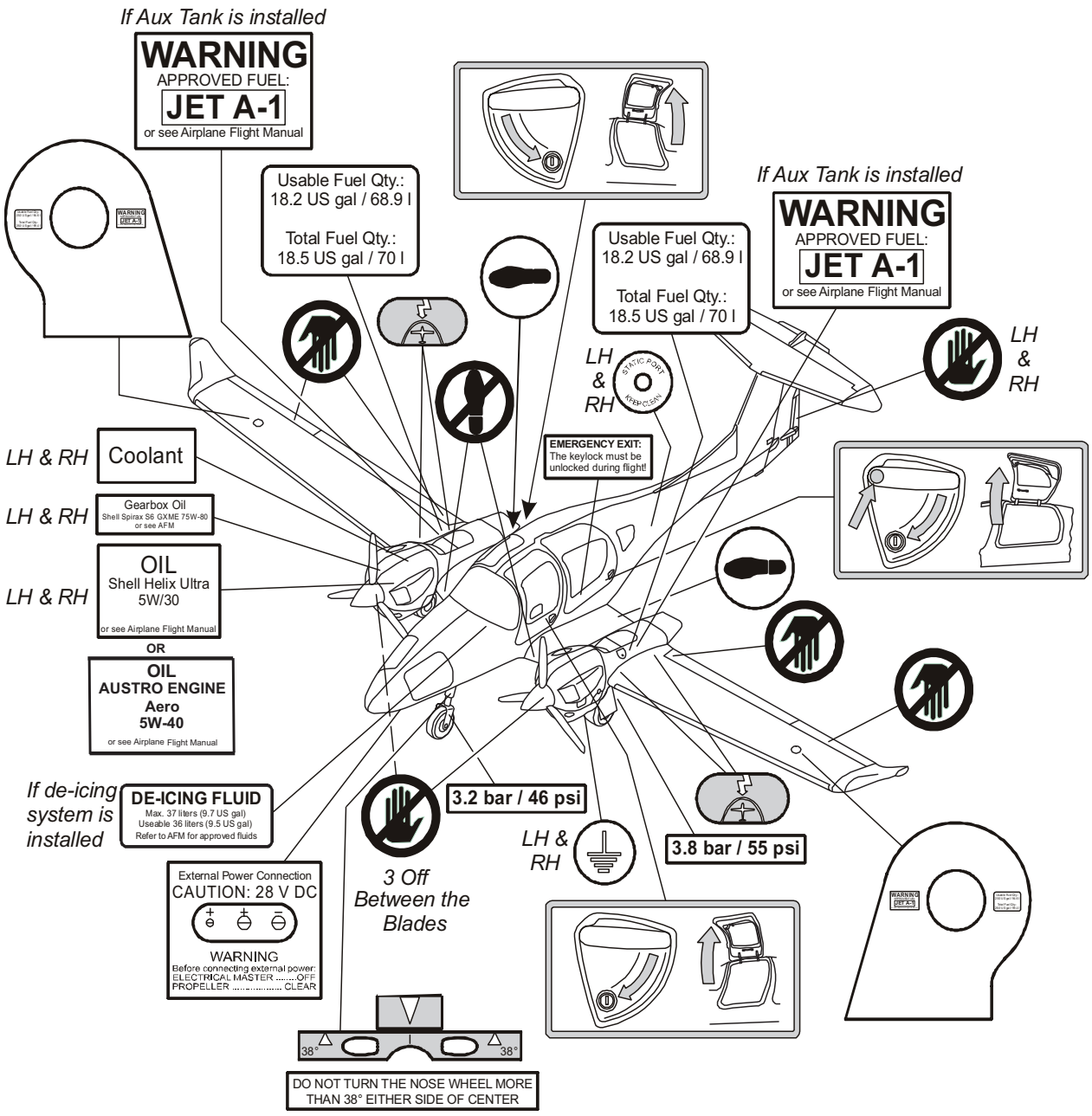


Figure 1 : Exterior Placards

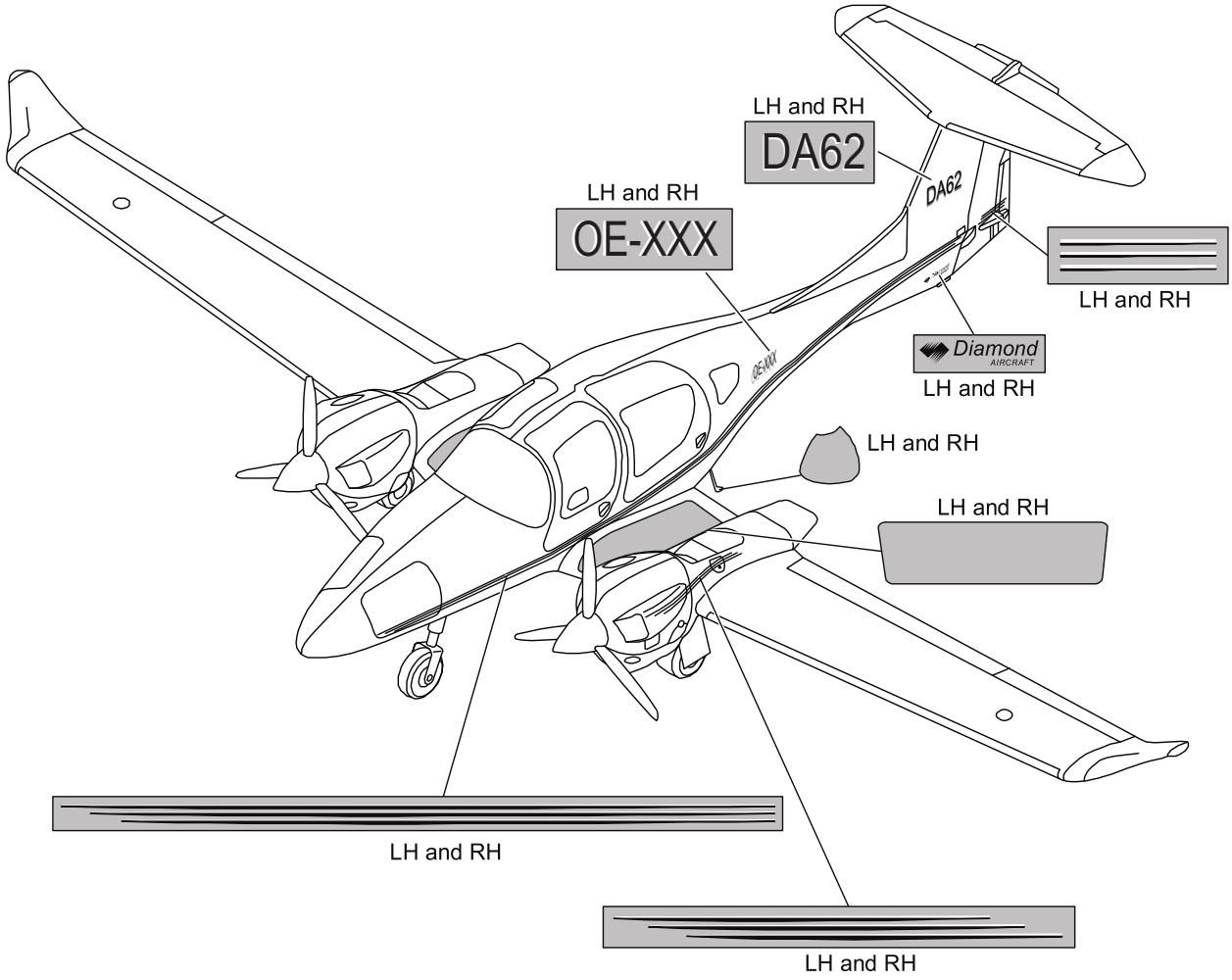
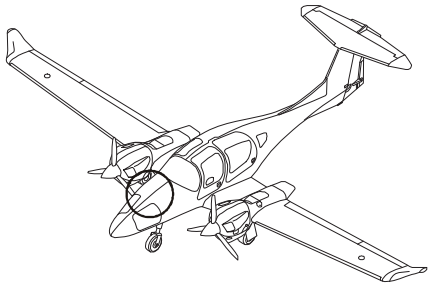


Figure 2 : Design Example for Exterior Markings



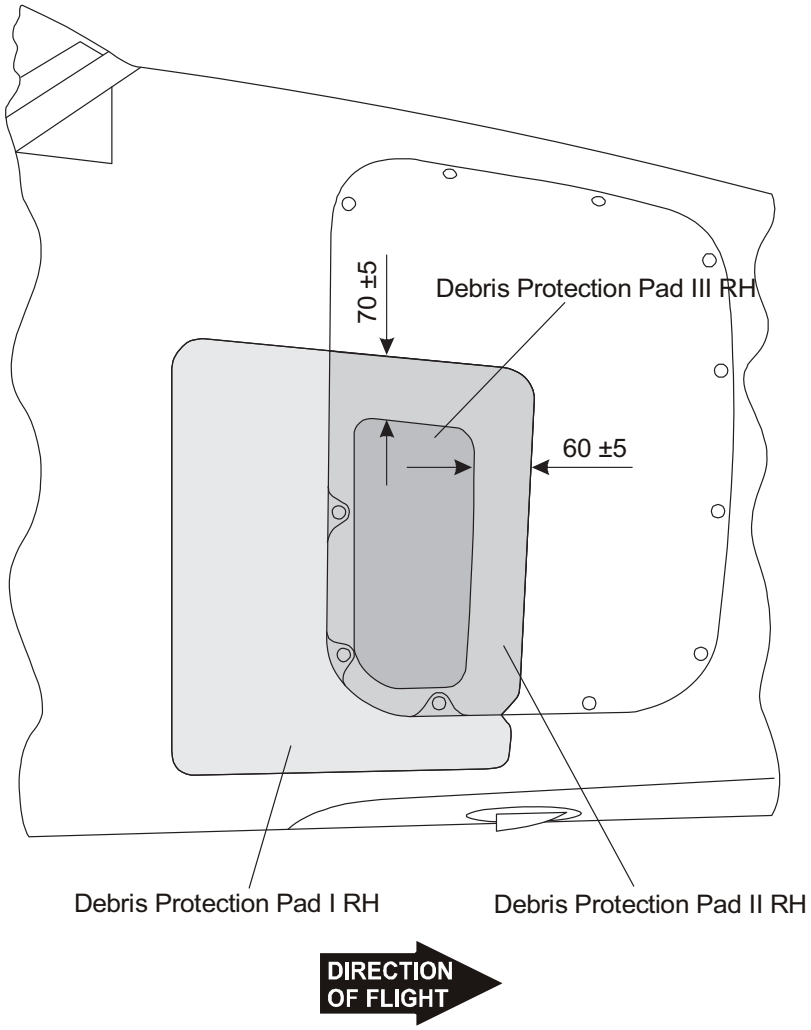
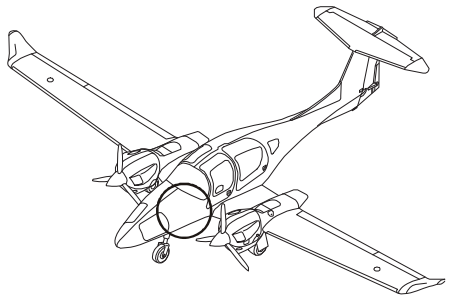


Figure 3 : Debris Protection Fuselage - RH Side



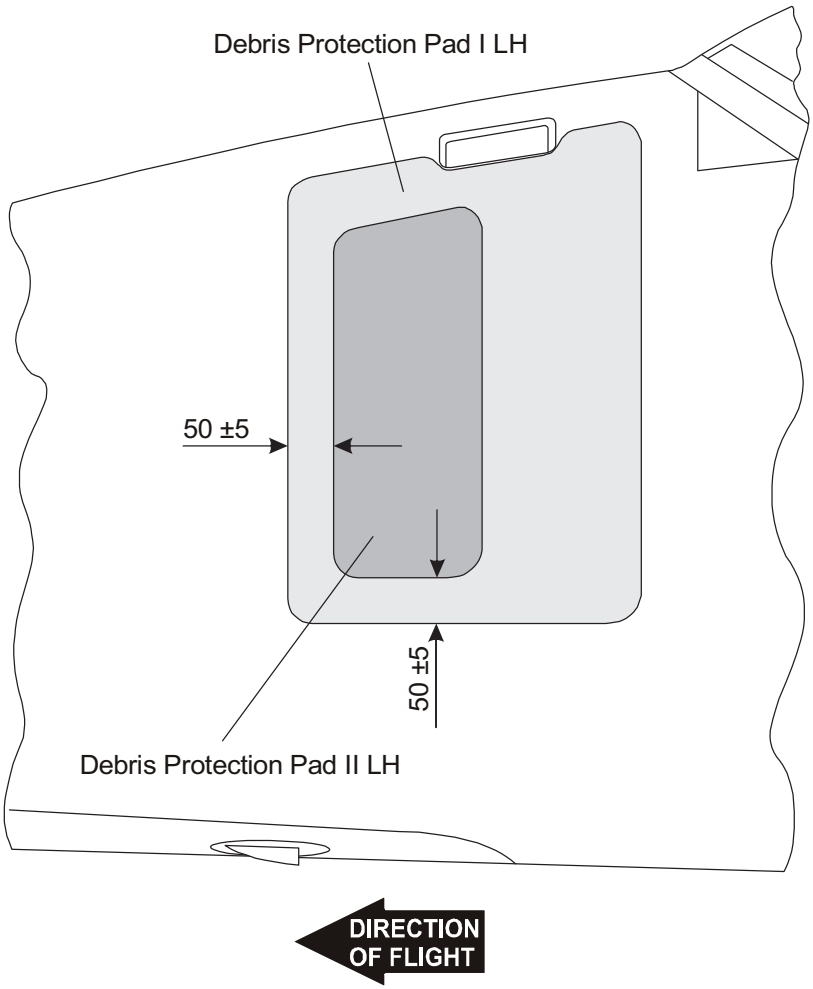


Figure 4 : Debris Protection Fuselage - LH Side

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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, 3A, 4 and 5 show the instrument panel placard panels.

2. **Description**

The DA 62 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 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.

You can replace each of the placard panels.

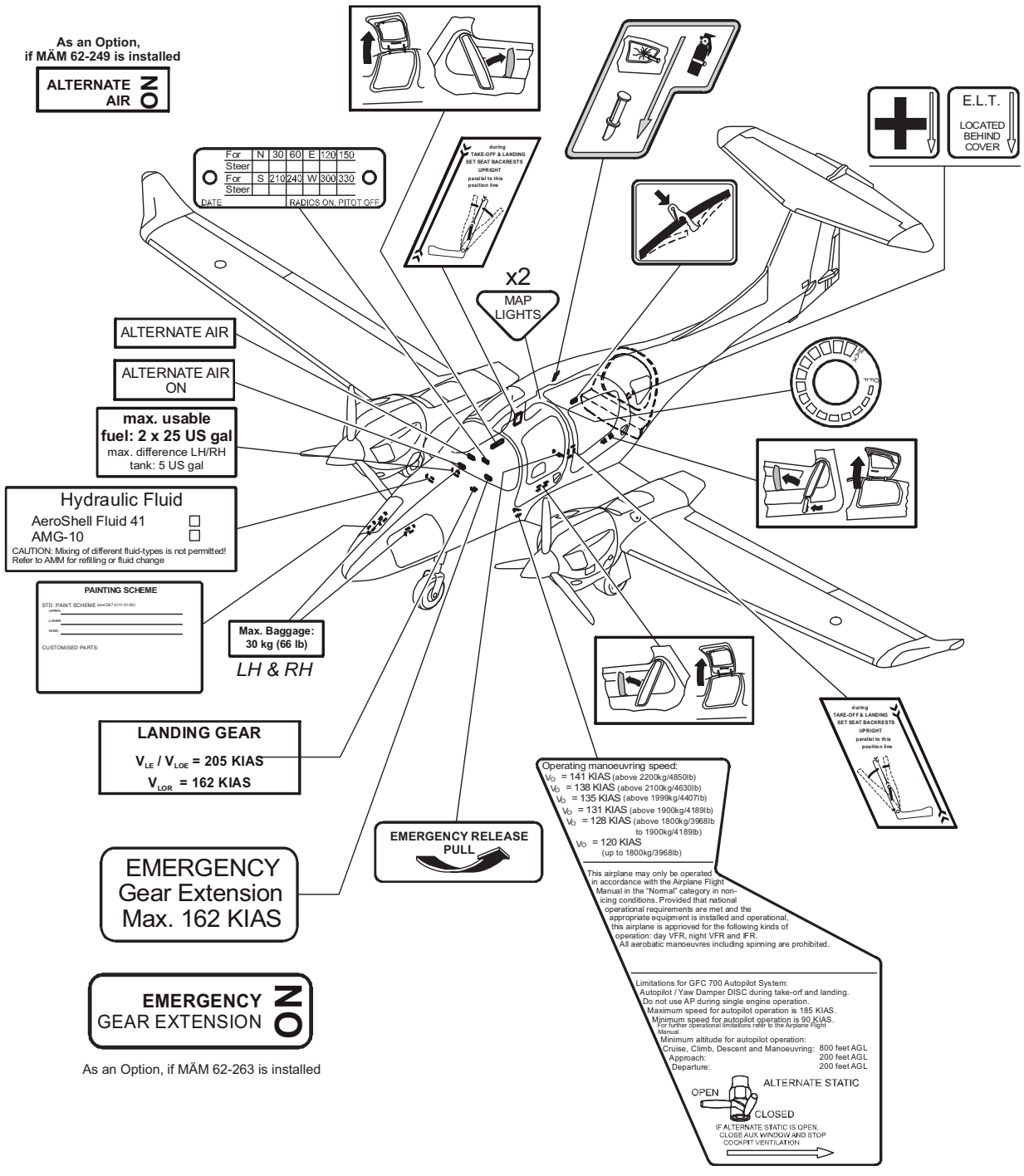

Figure 1 : Interior Placards and Markings (Standard Equipment)

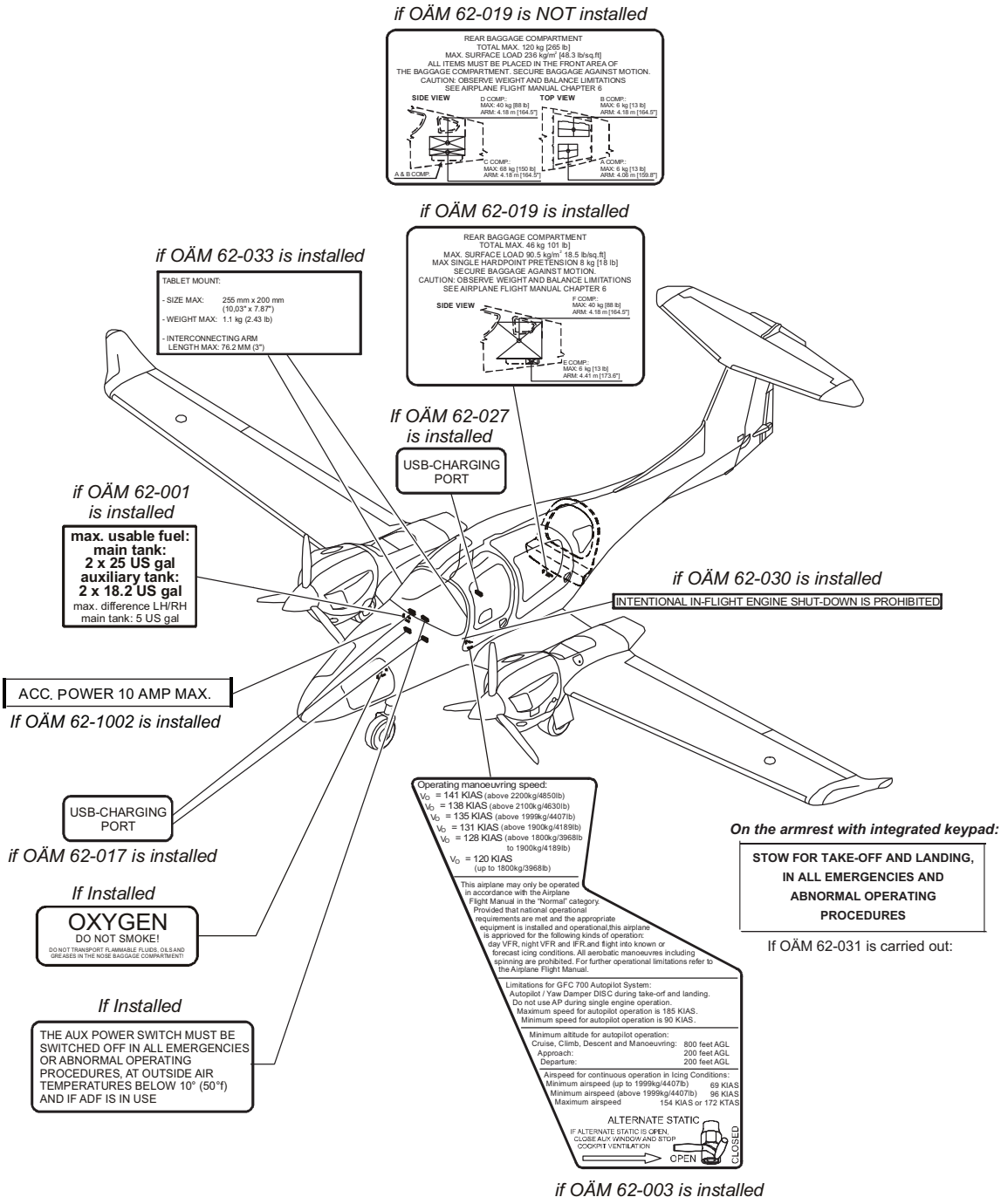

Figure 2 : Interior Placards and Markings (Optional Equipment)

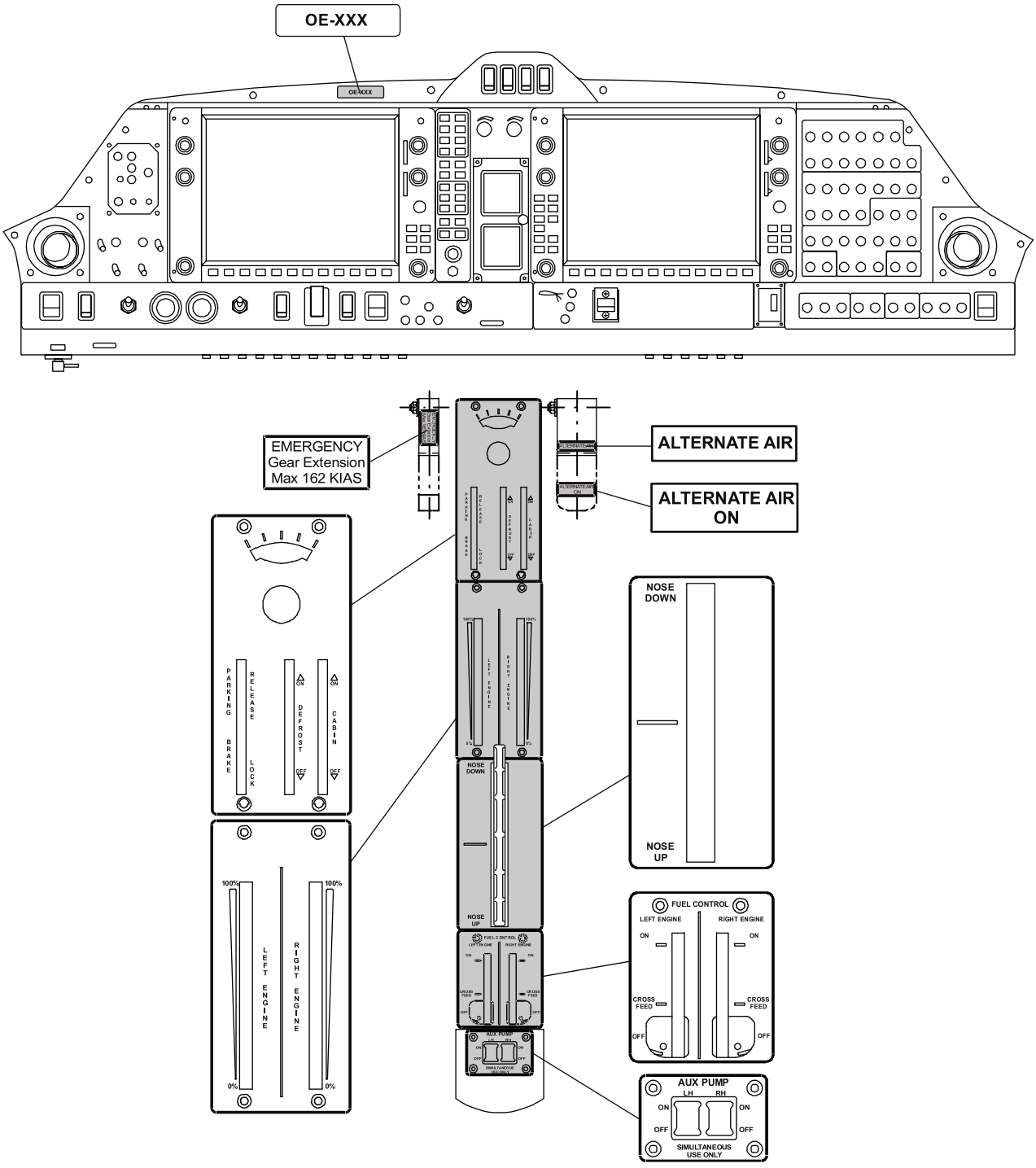

Figure 3 : Interior Placards - Instrument and Control Panels

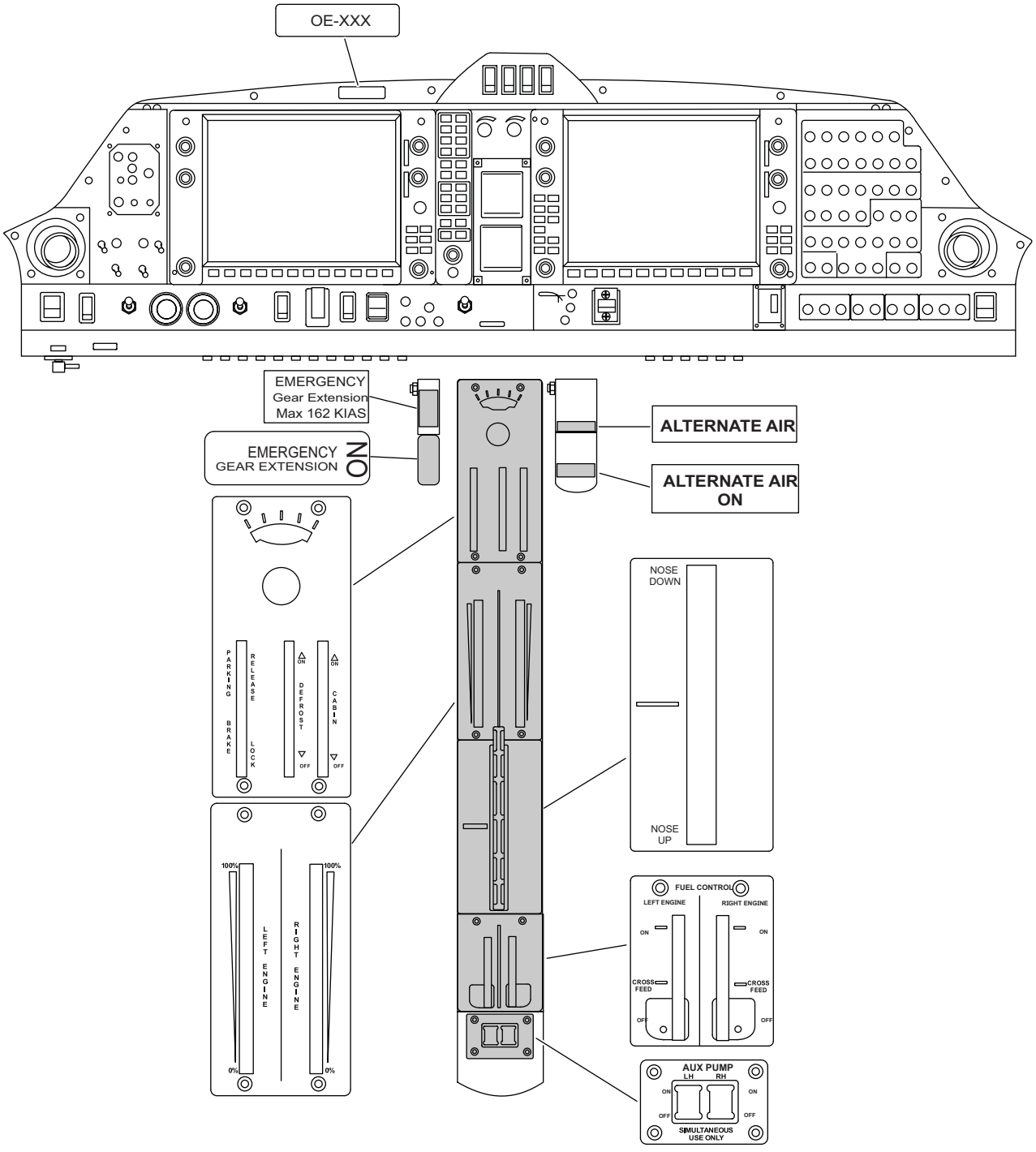

Figure 3A: Interior Placards - Instrument and Control Panels (if MÄM 62-263 is installed)

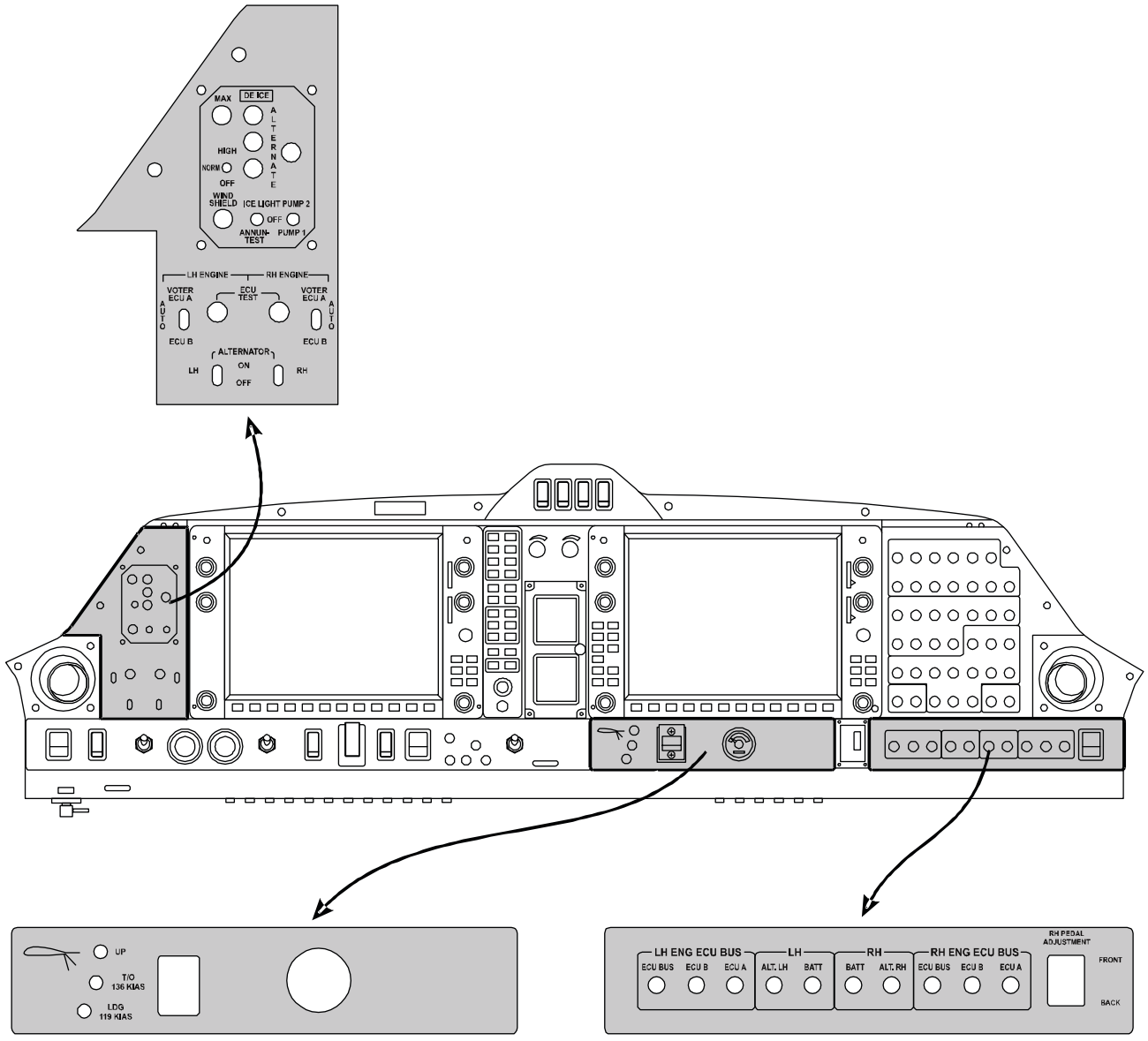

Figure 4 : Placard Panels - Sheet 1

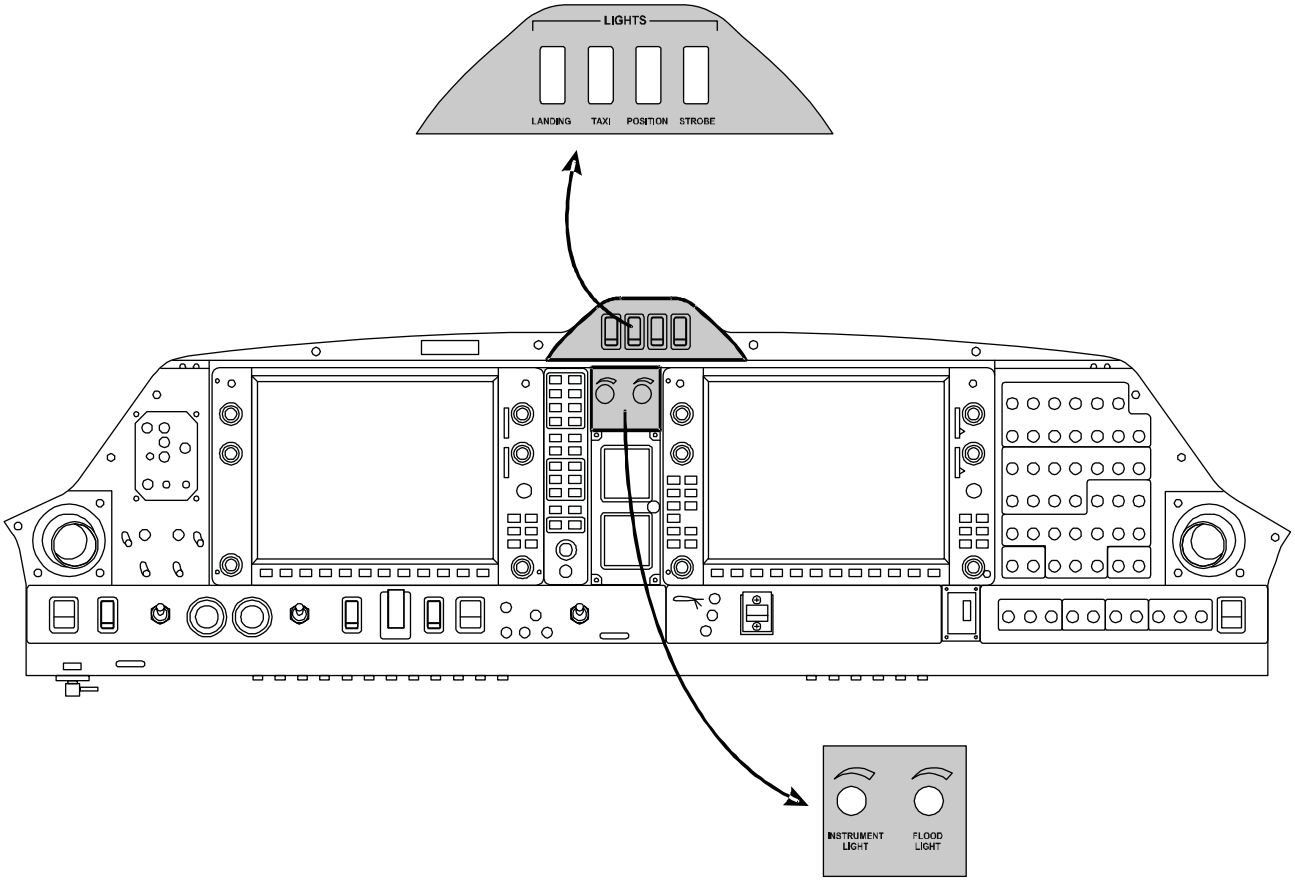

Figure 5 : Placard Panels - Sheet 2

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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 from 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. - Move the placard panel clear of the instrument panel. - Move the new placard panel into position on the instrument panel. - Install the screws that attach the placard panel to the instrument panel. - Connect the electrical cables for the placard panel.	Make sure that you remove all of the screws! Make sure that you route the electrical cables correctly. 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.
(7)	Do a test for the correct operation of the placard panel lights: - Set the ELECT. MASTER to ON. - Rotate the INSTRUMENT LIGHT dimmer switch fully clockwise. - Rotate the INSTRUMENT LIGHT dimmer switch a small amount counter-clockwise. - Rotate the INSTRUMENT LIGHT dimmer switch fully counter-clockwise. - Set the ELEC MASTER to OFF.	The placard lights must come on. The placard lights must dim. The placard lights must go out.

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CHAPTER 12
SERVICING - GENERAL

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CHAPTER 12

SERVICING

1. General

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

- Section 12-10. Replenishing 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 "for" and "aft" is based on the airplanes 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 62. 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 18.5 US gal (70 liter) per side. The total fuel capacity (main fuel tanks and auxiliary fuel tanks) is 44.5 US gal (168.4 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.

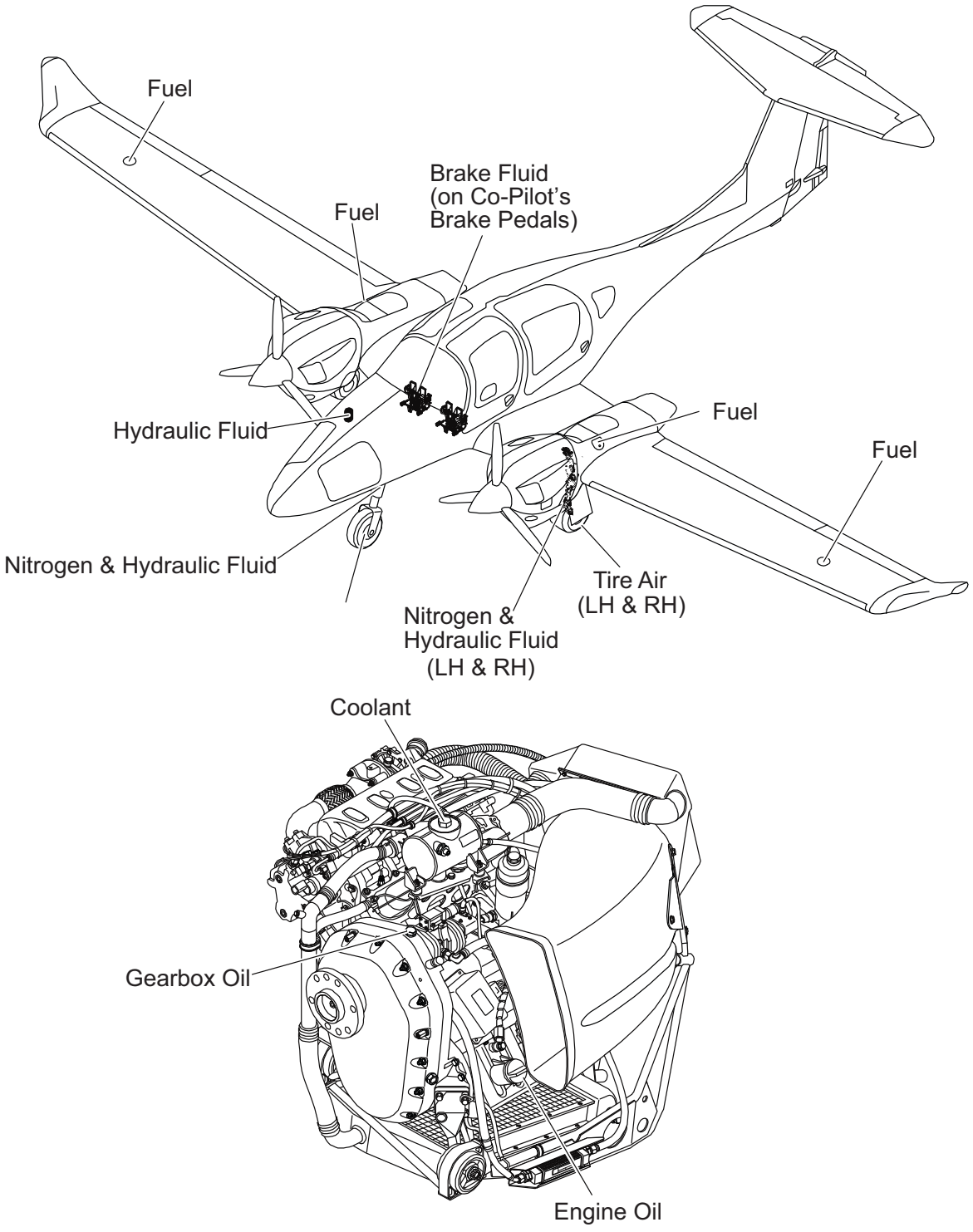

Figure 1 : Replenishment Points

3. **Refueling/Defueling**

A. Refueling.

	Detail Steps/Work Items	Key Items/References
(1)	Shut down the engines.	
(2)	Set 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 6 thru 8 for the other wing.	
(10)	Do steps 6 thru 8 for the auxiliary tanks, if installed (OÄM 62-001).	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 Steps/Work Items	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 (98.4 liters) 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 62-001).	Each auxiliary tank can hold approximately 18.5 US gal (70 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 one minute.	
(5)	Examine the fuel sample: - 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 three 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 ENGINE OIL (OR VERY LOW OIL LEVEL) WILL CAUSE AN ENGINE MALFUNCTION OR FAILURE. THIS COULD RESULT IN SERIOUS INJURY OR DEATH IF THE AIRPLANE IS IN FLIGHT.**

The engines installed in the DA 62 have a wet sump oil system. The engine oil sump can hold 7 liters (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 panel implemented at the side of the LH engine cowling. The oil filler has a dip-stick attached.

Usually oil consumption is very low. Measure the oil quantity before each flight (or engine ground run-up). If necessary, replenish the oil.

A. Replenish the Engine Oil System.

This procedure is applicable to the LH engine and the RH engine.

	Detail Steps/Work Items	Key Items/References
(1)	Open the access panel located at the left side of the LH cowling.	
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.		
(2)	Replenish the oil system to the correct level.	Refer to the AE Maintenance Manual, latest revision.
(3)	Close the access panel of the LH cowling.	

B. Change the Engine Oil.

Refer to Section 72-00, Maintenance Practices.

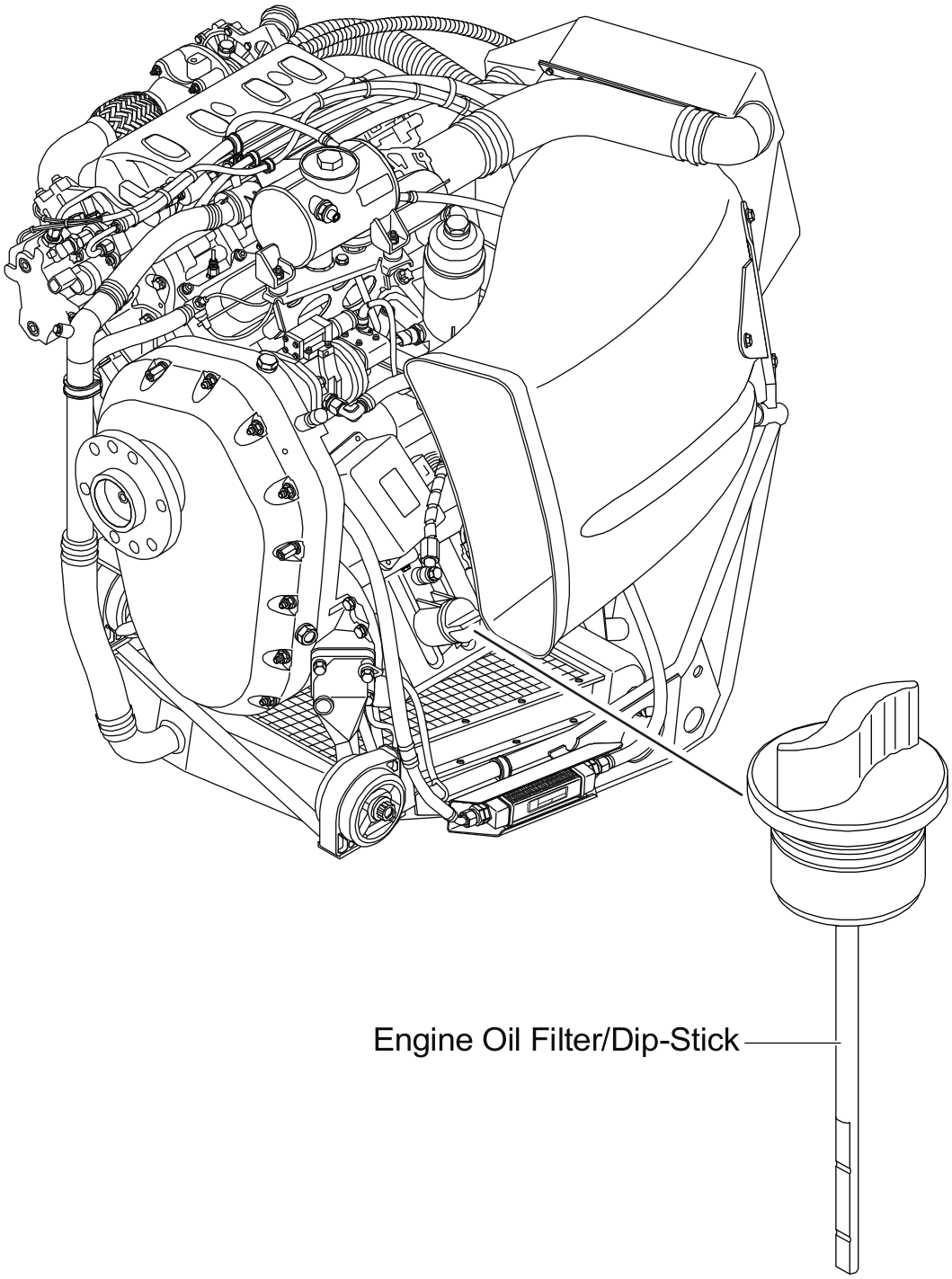

Figure 2 : Engine Oil Filler/Dip-Stick

6. **Gearbox Oil**

WARNING: **ENGINE OPERATION WITH NO GEARBOX OIL (OR VERY LOW OIL LEVEL) WILL CAUSE ENGINE MALFUNCTION OR FAILURE. THIS COULD RESULT IN SERIOUS INJURY OR DEATH IF THE AIRPLANE IS IN FLIGHT.**

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

A. Replenish the Gearbox Oil System.

This procedure is applicable to the LH engine and the RH engine

CAUTION: IF THE GEARBOX OIL LEVEL IS LOW THE REASON MUST BE DETERMINED AND THE PROBLEM MUST BE CORRECTED BY AUTHORIZED PERSONNEL. ENGINE OPERATION WITH A LOW GEARBOX OIL LEVEL WILL CAUSE DAMAGE TO THE ENGINE.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine top cowlings.	Refer to Section 71-10, Maintenance Practices.
CAUTION: USE ONLY APPROVED GEARBOX OIL. REFER TO CHAPTER 2 OF THE AIRPLANE FLIGHT MANUAL FOR APPROVED GEARBOX OIL SPECIFICATIONS. IF YOU DO NOT USE APPROVED GEARBOX OIL, THE ENGINE CAN BE DAMAGED.		
(2)	Replenish gearbox oil.	Refer to the AE Maintenance Manual, latest revision.
(3)	Install the engine top cowlings.	Refer to Section 71-10 Maintenance Practices.

B. Replace the Gearbox Oil.

Refer to Section 72-00, Maintenance Practices.

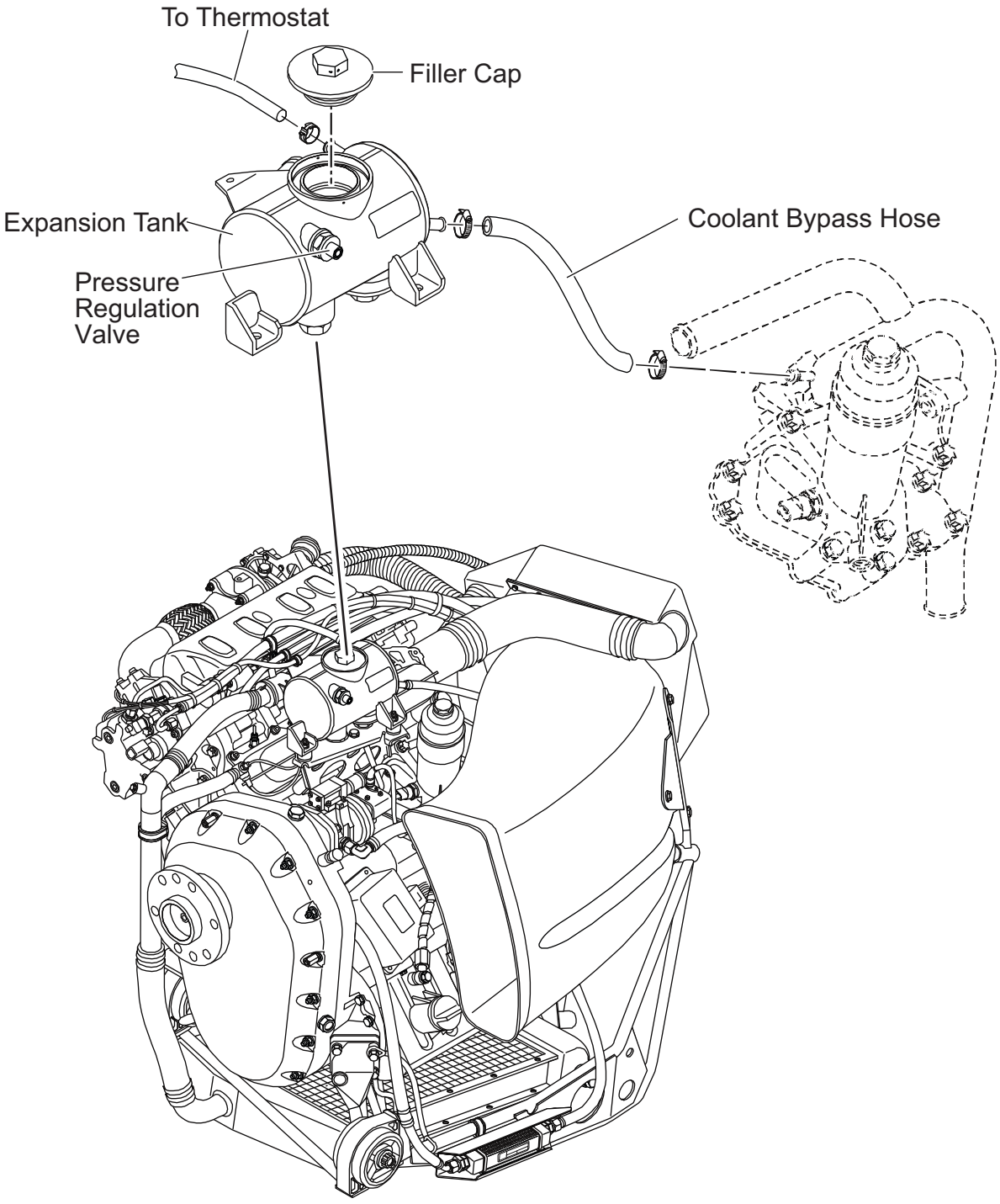

Figure 3 : Engine Coolant Expansion Tank / Filler Cap

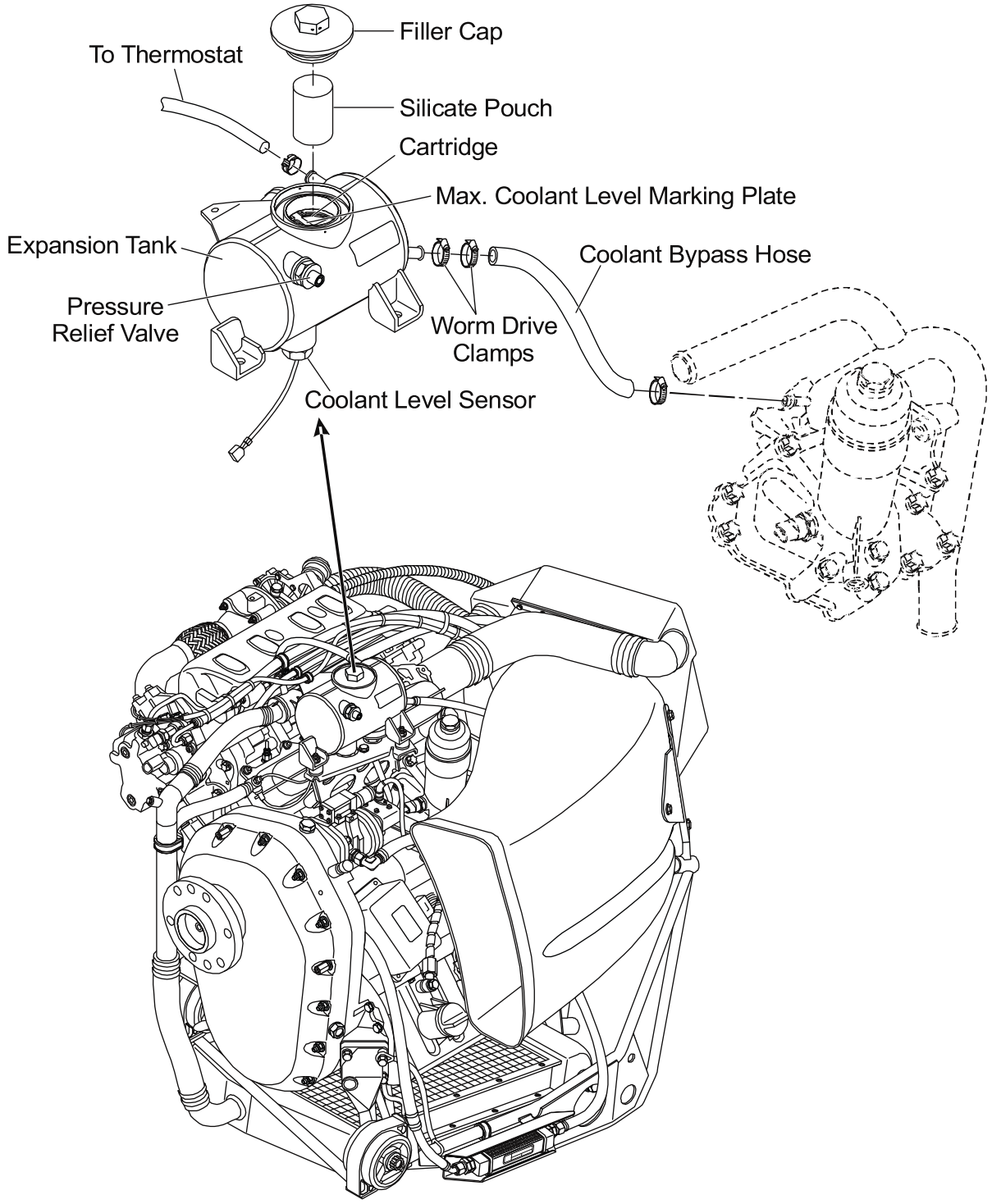

Figure 4 : Engine Coolant Expansion Tank / Filler Cap
(if MÄM 62-055 is installed

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. THIS COULD RESULT IN INJURY TO PERSONNEL.**

The DA 62 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 (Figures 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.

This procedure is applicable to the LH engine and the RH engine

CAUTION: IF THE COOLANT LEVEL IS LOW THE REASON MUST BE DETERMINED AND THE PROBLEM MUST BE CORRECTED BY AUTHORIZED PERSONNEL. ENGINE OPERATION WITH LOW COOLANT LEVEL WILL CAUSE DAMAGE TO THE ENGINE

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine top cowlings.	Refer to Section 71-10, Maintenance Practices.
	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.	
(2)	Carefully remove the filler cap from the coolant expansion tank. If MÄM 62-055 is installed: Remove safety lock wire first.	
	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.	
(3)	If MÄM 62-055 is NOT installed: Add coolant until the fluid level is at the bottom of the tank filler tab. If MÄM 62-055 is installed: Add coolant until the fluid level is at the “max. coolant level marking” in the filler neck.	
(4)	Install the filler cap. If MÄM 62-055 is installed: - Install the filler cap. - Install safety lock wire to secure the filler cap.	Make sure that the seal is in good condition. Torque refer to Section 20-70. Check O-Ring for deformation, apply EZ turn Wire diameter 0.8 mm (0.032 in).

	Detail Steps/Work Items	Key Items/References
(5)	Install the engine top cowlings.	Refer to Section 71-10, Maintenance Practices.
	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.	
(6)	Do an engine ground run until the engine reaches normal operating temperature. Then shut-down the engine.	Refer to the AE Operation Manual, Doc. No. E4.01.01, latest revision.
(7)	Repeat steps 1 thru 6 until the coolant level remains constant and is at the correct level.	

B. Fill and Bleed an Engine Cooling System.

Refer to Section 75-00, Maintenance Practices.

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: REMOVE 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 hydraulic fluid per MIL-PRF-87257. Fill to 12 to 25 mm (0.5 to 1 in) below the top of the filler hole.
(4)	Install the filler cap.	

9. **Tires**

The DA 62 uses these tires:

Main tires: 6.00-6; 8 PR, TT, 160 mph, Flight Special II, Goodyear
6.00-6; 8 PR, TT, 160 mph, Flight Custom III, Goodyear

Nose tire: 6.00-6; 8 PR, TT, 160 mph, Flight Special II, Goodyear
6.00-6; 8 PR, TT, 160 mph, Flight Custom III, 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: 3.8 bar (55 PSI). Nose tire: 3.2 bar (42 PSI).

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 Figures 1 and 2	1	2	3	4	5	6	7	(Hours) see Notes (1), (2)
(1)	Brake pedal pivot shaft interior.					X			1000
(2)	Rudder cable S-tubes.			X					200
(3)	Flap actuator extension rod.			X					200
(4)	Upper rudder pivot bearing.	X							200
(5)	Nose wheel bearing (see notes 3, 5 and 6).	X						X	200
(6)	Wing main bolts.	X							2000
(7)	Stick support pivot pins.	X							1000
(8)	Battery terminals.				X				1000
(9)	B-bolts.	X							2000
(10)	B-bolt spherical bearings.	X							2000
(11)	A-bolts.	X							2000
(12)	A-bolt spherical bearings.	X							2000
(13)	Brake pedal pivot		X						200
(14)	Flap actuator universal pivot block.	X							1000
(15)	Brake caliper locating pins.						X		1000
(16)	Main wheel bearings (see notes 3, 5 and 6).	X						X	200
(17)	Landing gear actuator bearings.					X			100

Notes to Table 2 - Lubrication Schedule:

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

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

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

(4) Do not get 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.

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

(6) 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 Company
TYPE 2		
MIL-L-7870	Royco 363	Royal Lubricants Co. Inc.
	Brayco 363	Bray Oil Co.
	LPS 2 (Warm climates only)	LPS
TYPE 3		
Greaseless Lubricant	LPS 1	LPS
Greaseless Lubricant	NYCO 65 Vaseline S-743	NYCO
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		
--	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.

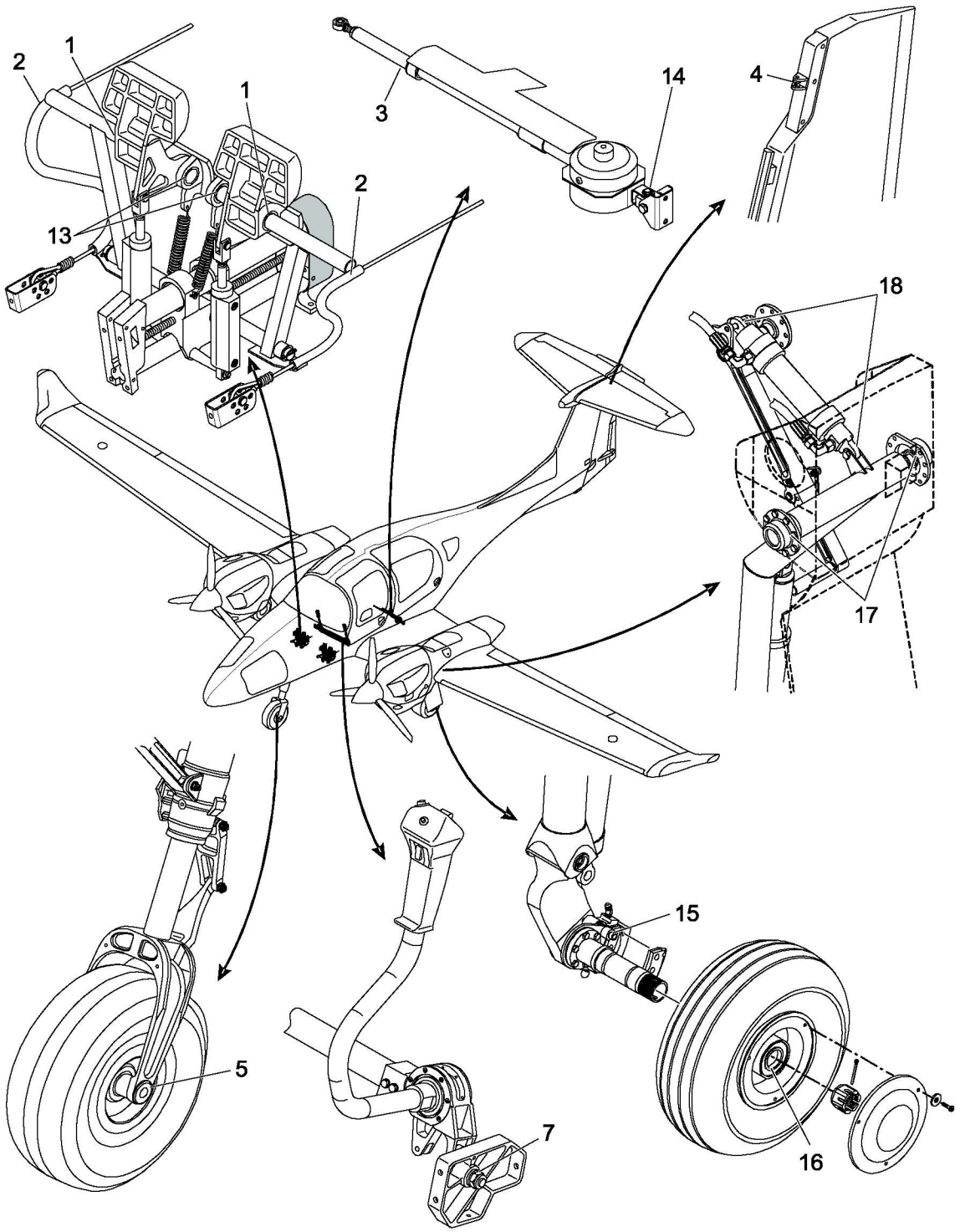

Figure 1 : Lubrication Points - Sheet 1

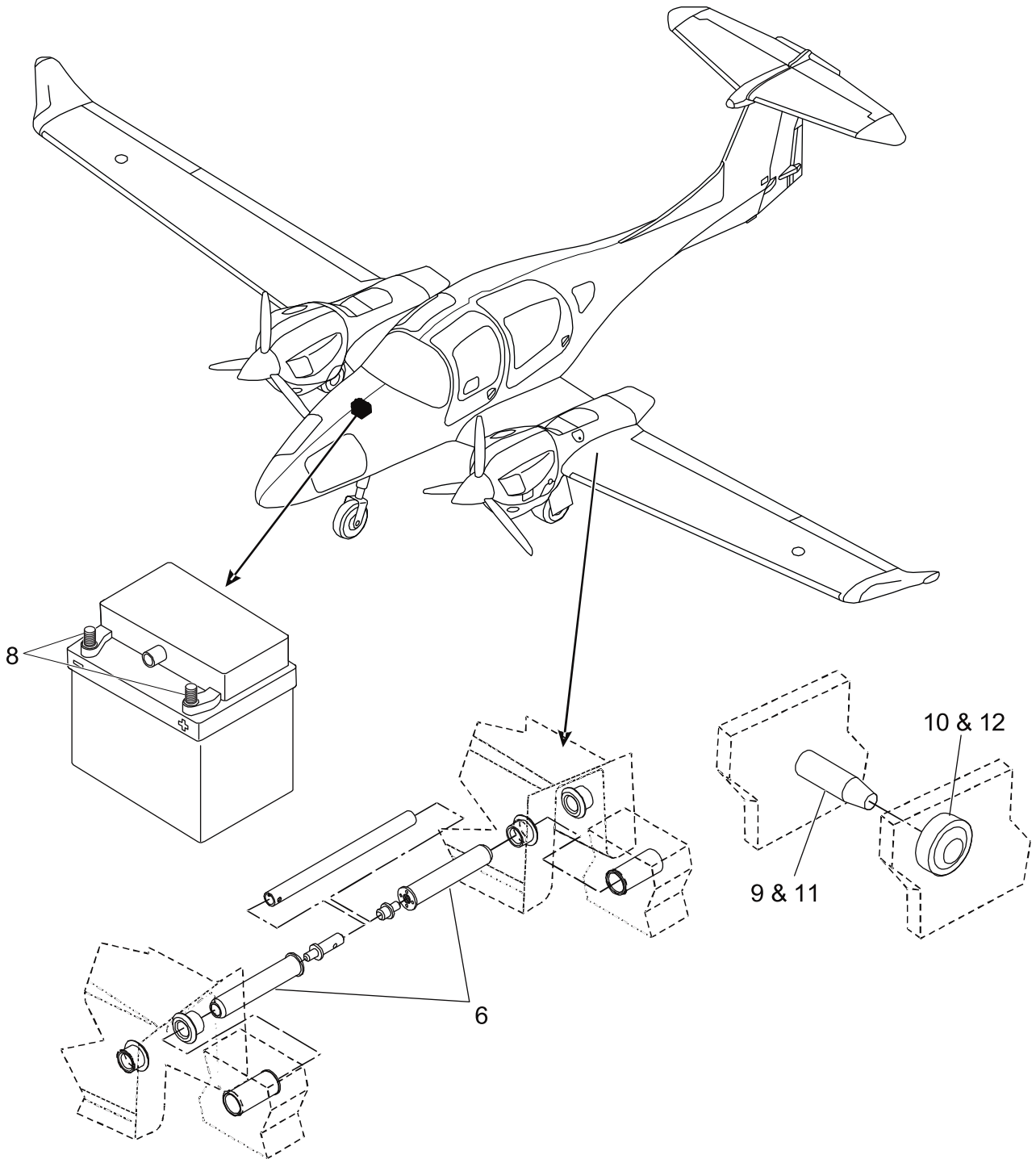

Figure 2 : Lubrication Points - Sheet 2

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 62 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. Transparency Cleaning

CAUTION: DO NOT RUB THE 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 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 with a flame-proof vacuum cleaner.

All plastic surfaces should be wiped clean using a damp cloth without any cleaning agents.

5. **Engine Cleaning**

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

WARNING: DO NOT CLEAN THE ENGINE WHILE THE ENGINE IS HOT. A HOT ENGINE CAN CAUSE SEVERE BURNS.

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

CAUTION: DO NOT LET THE CLEANING AGENT GET INTO ELECTRICAL COMPONENTS AND ENGINE INTAKES. IT CAN CAUSE DAMAGE TO THE ENGINE AND/OR THE ELECTRICAL COMPONENTS.

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).

Refer to the engine manufacturer's Maintenance Instruction Manual for more data.

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 the 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 16) 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 (2)	
1	Ball joint bolt and nut (2)	
	AILERONS LH/RH	
2	Control rod eye end fitting (2)	
2	Ball joint bolt and nut (2)	
	MAIN LANDING GEAR LH/RH	
4, 5	Tension spring	
4, 5	Forward pivot bearing, bolt head and nut	
4, 5	Aft pivot bearing, bolt head and nut	
4, 5	Latch operating arm, bolt heads and nuts (2)	
4, 5	Driver plate and folding stay bracket	
3	Main landing gear axle, bolt heads and nuts (4)	
3, 4	Main landing gear leg assy / trailing arm bolt head and nut	
3, 4	Damper upper bolt head and nut	
3, 4	Damper lower bolt head and nut	
5	Actuator nipples	
5	Actuator body	
5	Actuator rod end bearing	
3, 6	Main landing gear bay, door hinges (2), bolt heads (6), nuts (6) and MLG door actuation rod	
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	

Anti-Corrosion Coating Checklist		
Figure	**Part / Location**	**Initials**
9	Elevator push eye end fitting, bolt head and nuts (3)	
9	Elevator bellcrank, bolt heads (3) and nuts (3)	
	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, bolts (3)	
	NOSE LANDING GEAR	
12	Centering unit guidance plate and bolt heads (3	
12	Nose wheel fork bolt heads (3)	
12	Torque links bolt heads (5) and nuts (5)	
12	Damper bushing bolt (2)	
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	
13	Actuator eye end fitting	
14	Leg to mounting bracket bolt heads (1)	
14	Nose landing gear bracket and bolt heads LH (8), RH (9)	
14	Cardan joint bolt heads and nuts (4)	
14	Steering linkage bolt head, nut and rod end bearing head	
14	Actuator body	
14	Actuator nipples	
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)	

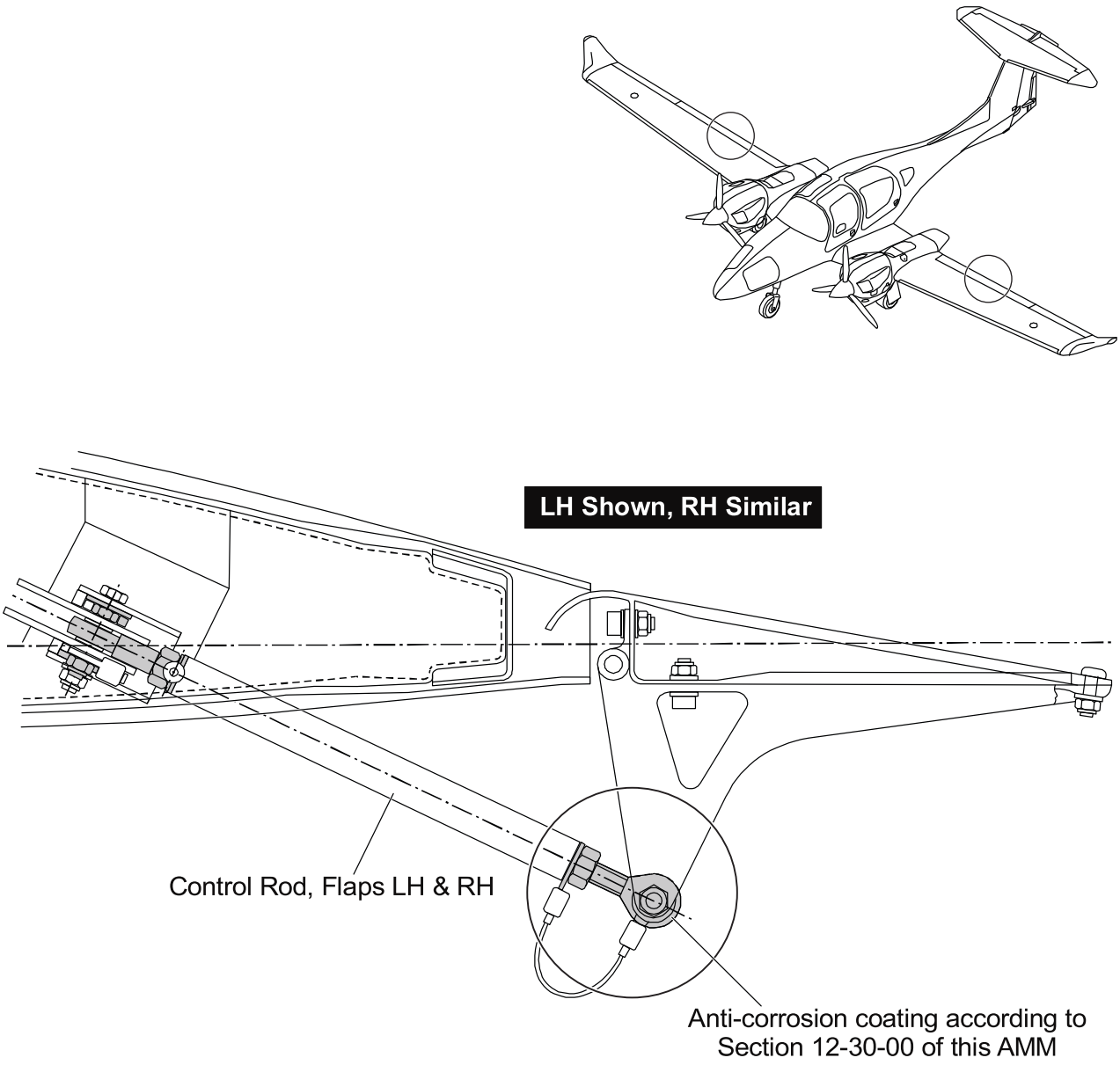

Figure 1 : Anti-Corrosion Coating - Control Rods Flaps LH/RH

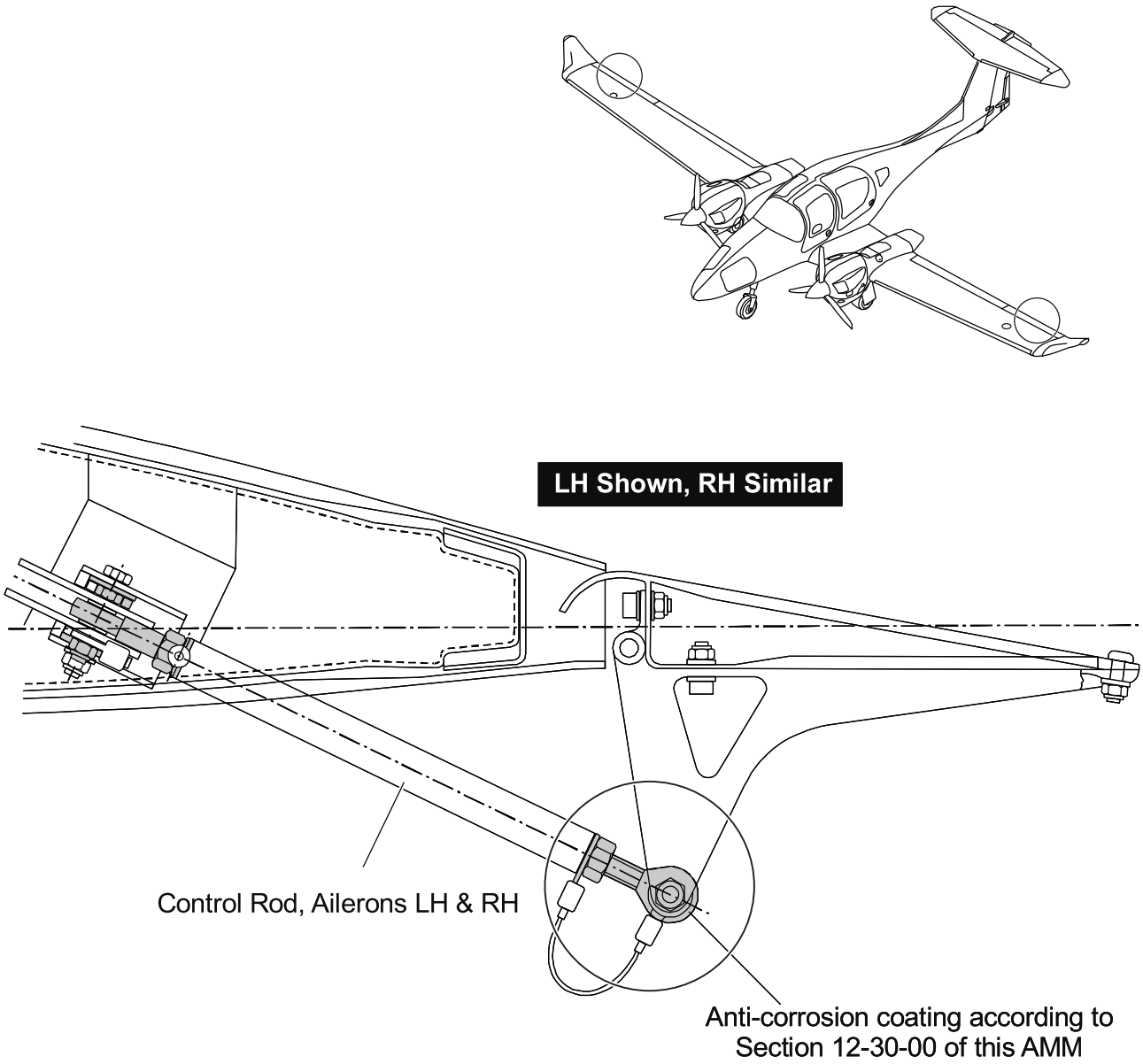

Figure 2 : Anti-Corrosion Coating - Control Rods Ailerons LH/RH

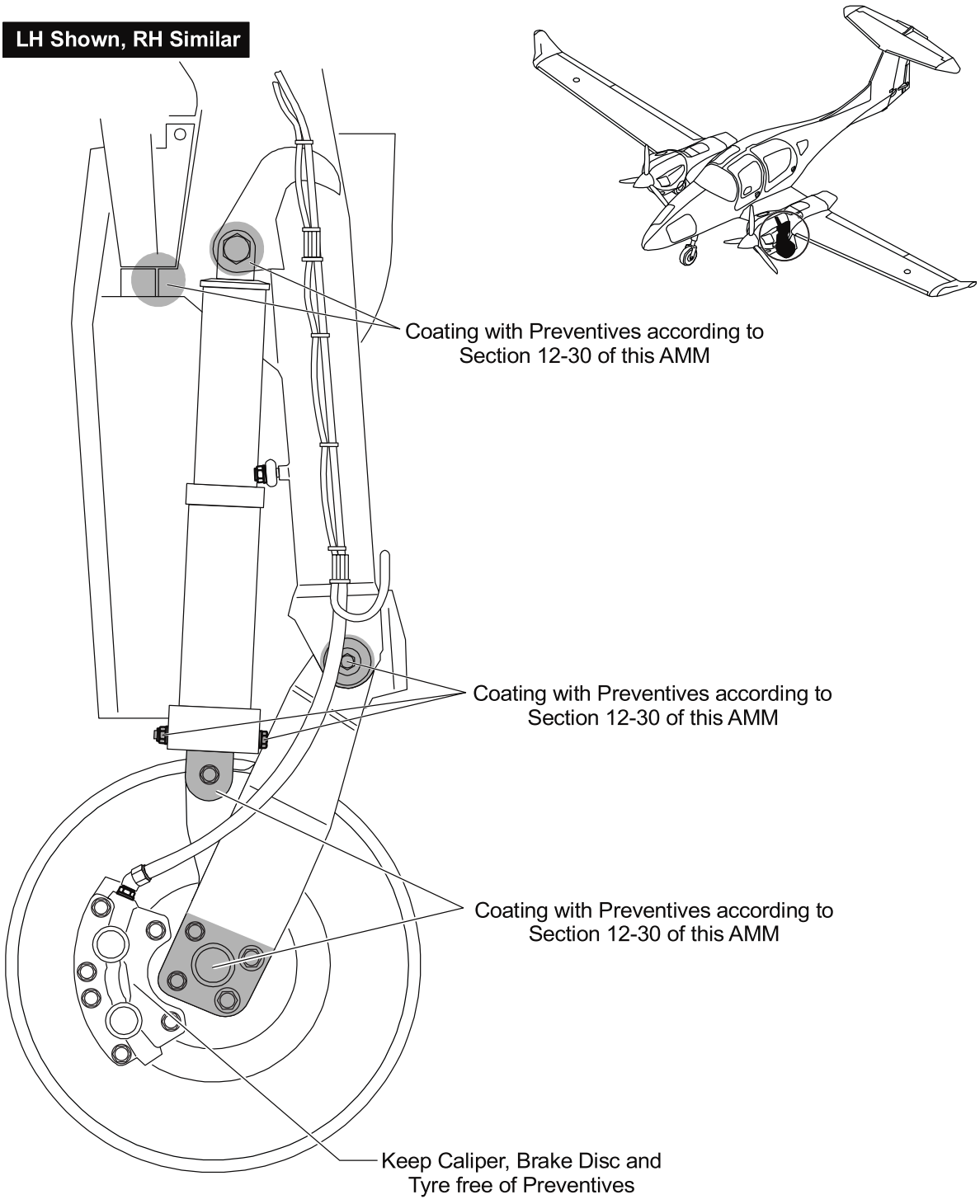

Figure 3 : Anti-Corrosion Coating - Main Landing Gear LH/RH (1)

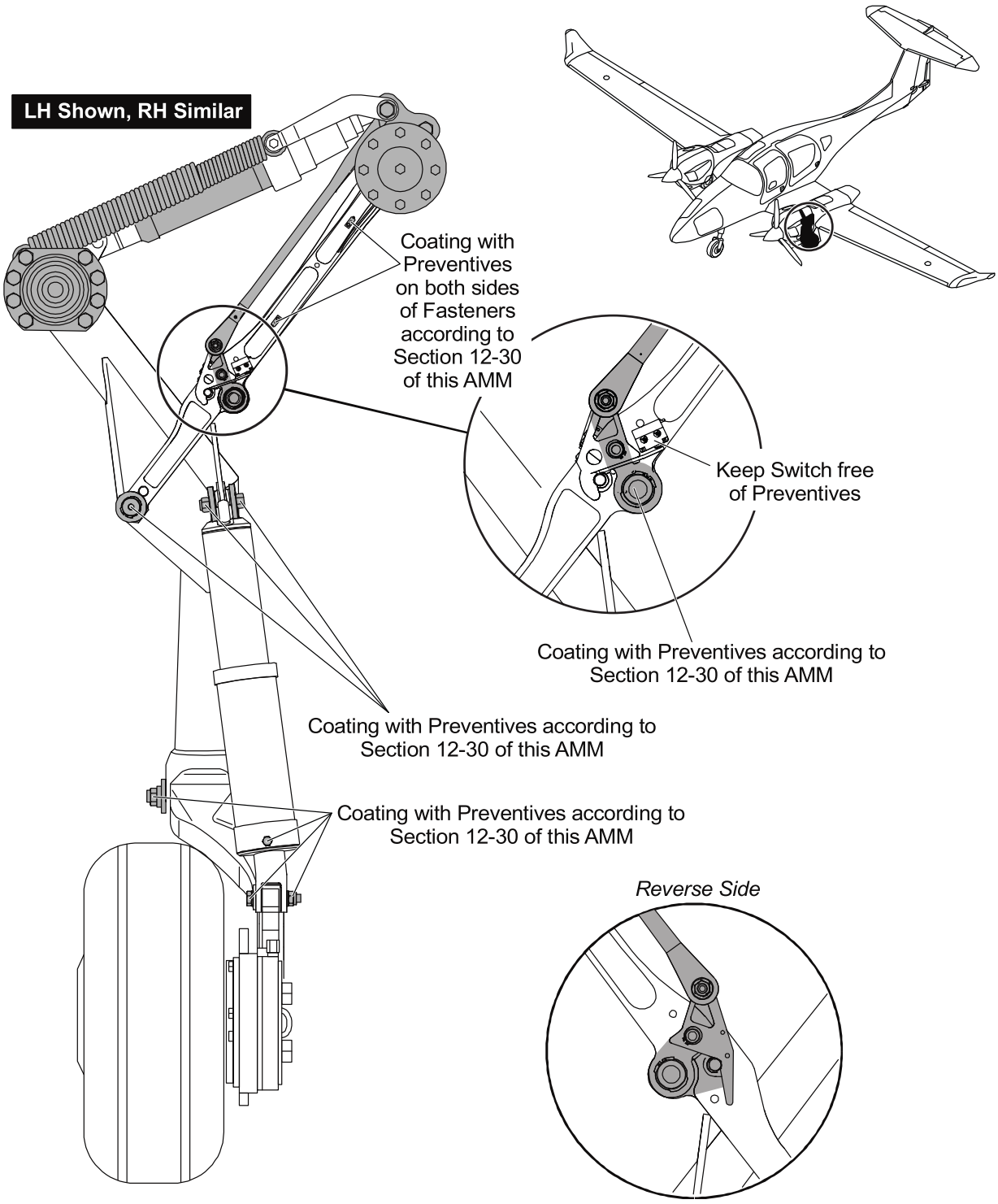

Figure 4 : Anti-Corrosion Coating - Main Landing Gear LH/RH (2)

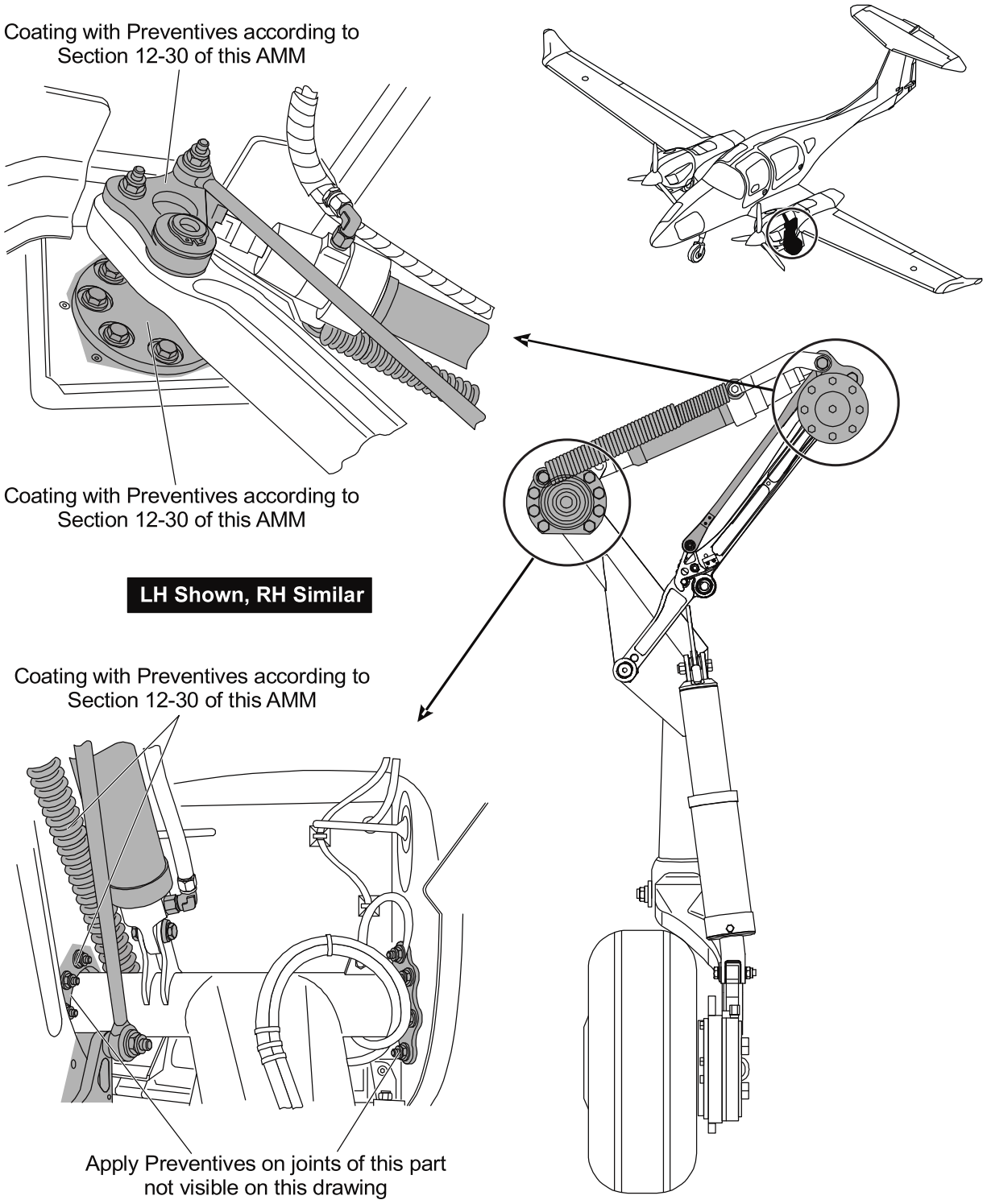

Figure 5 : Anti-Corrosion Coating - Main Landing Gear LH/RH (3)

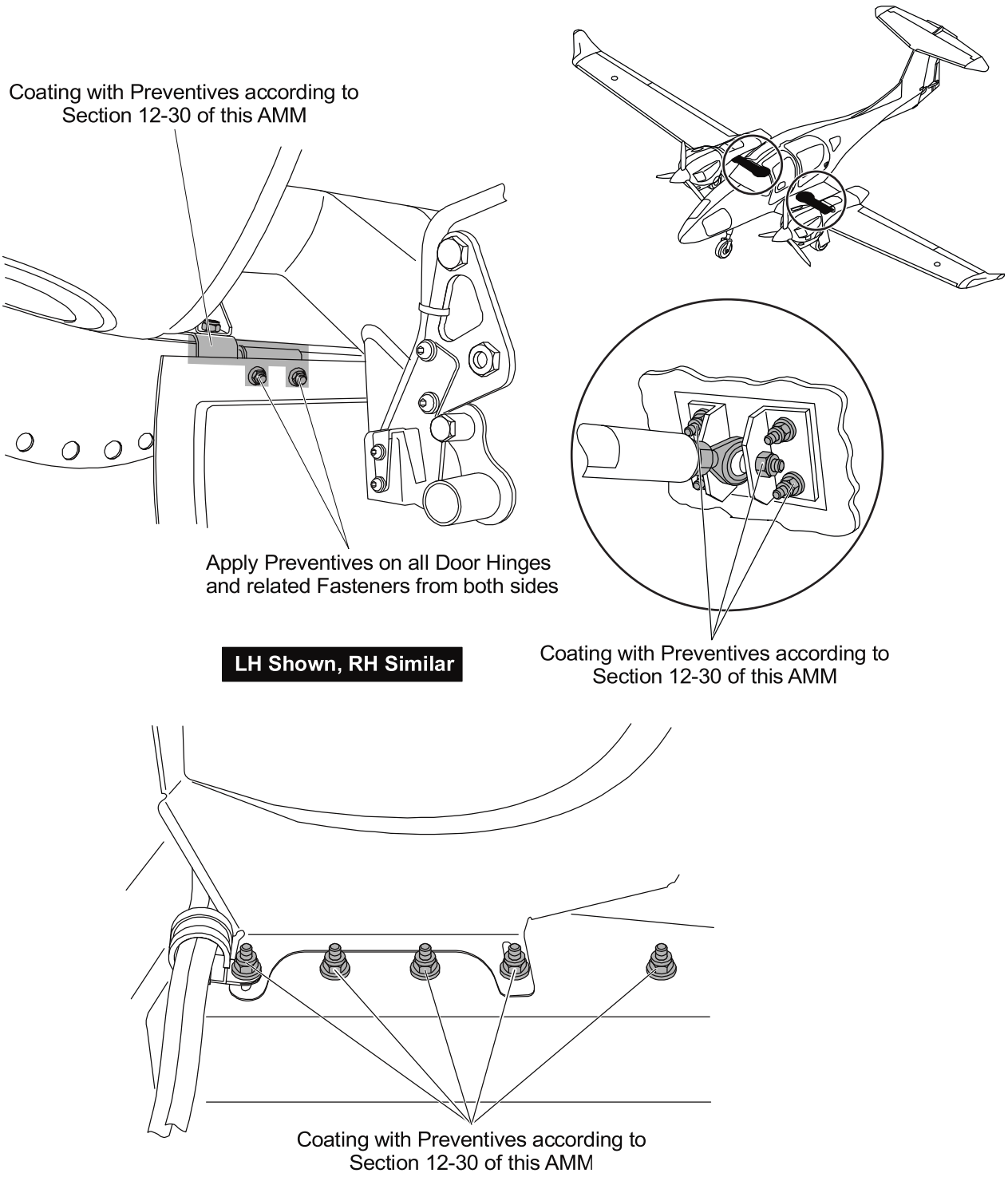

Figure 6 : Anti-Corrosion Coating - Main Landing Gear LH/RH (4)

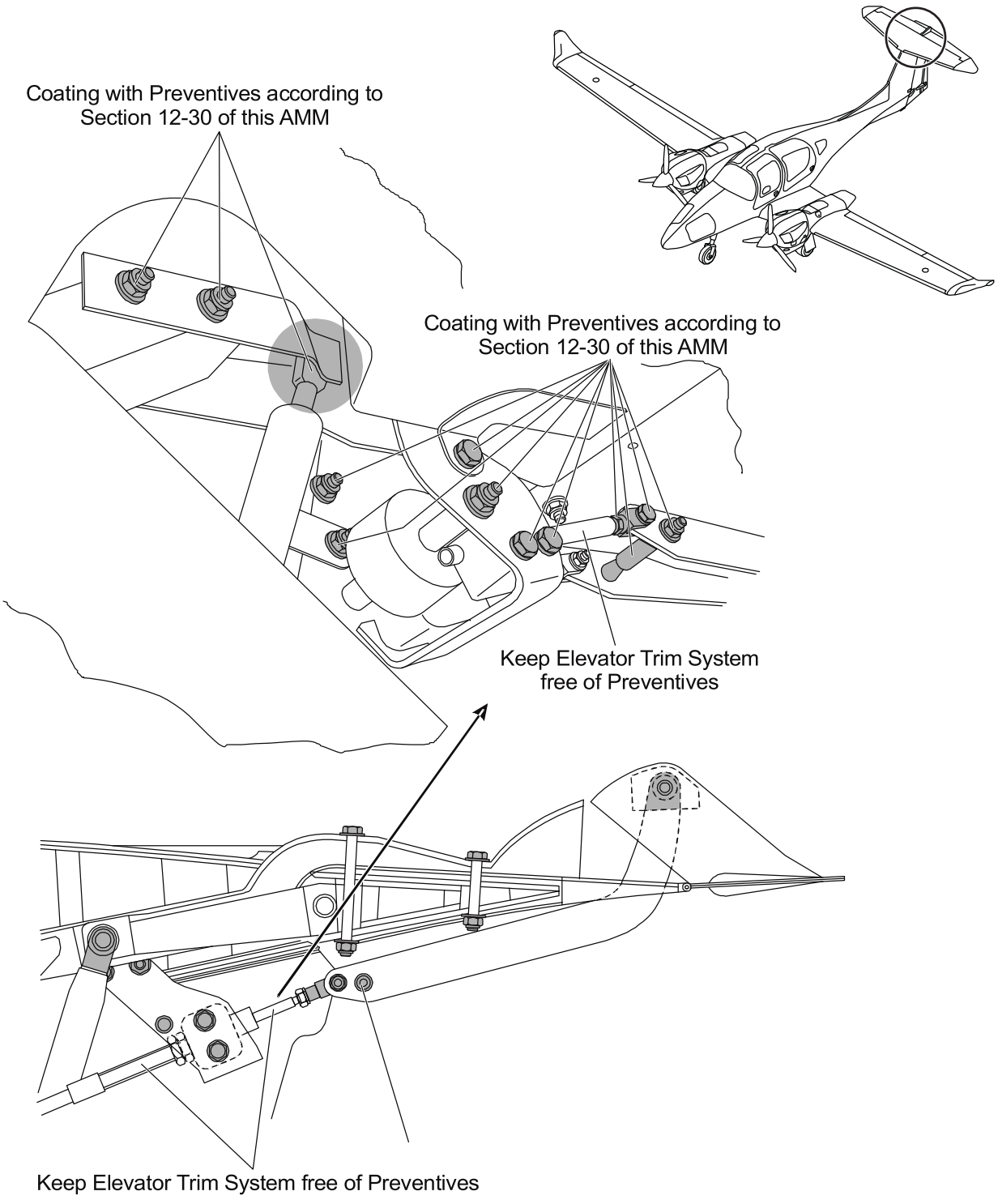

Figure 7 : Anti-Corrosion Coating - Elevator and Elevator Trim System (1)

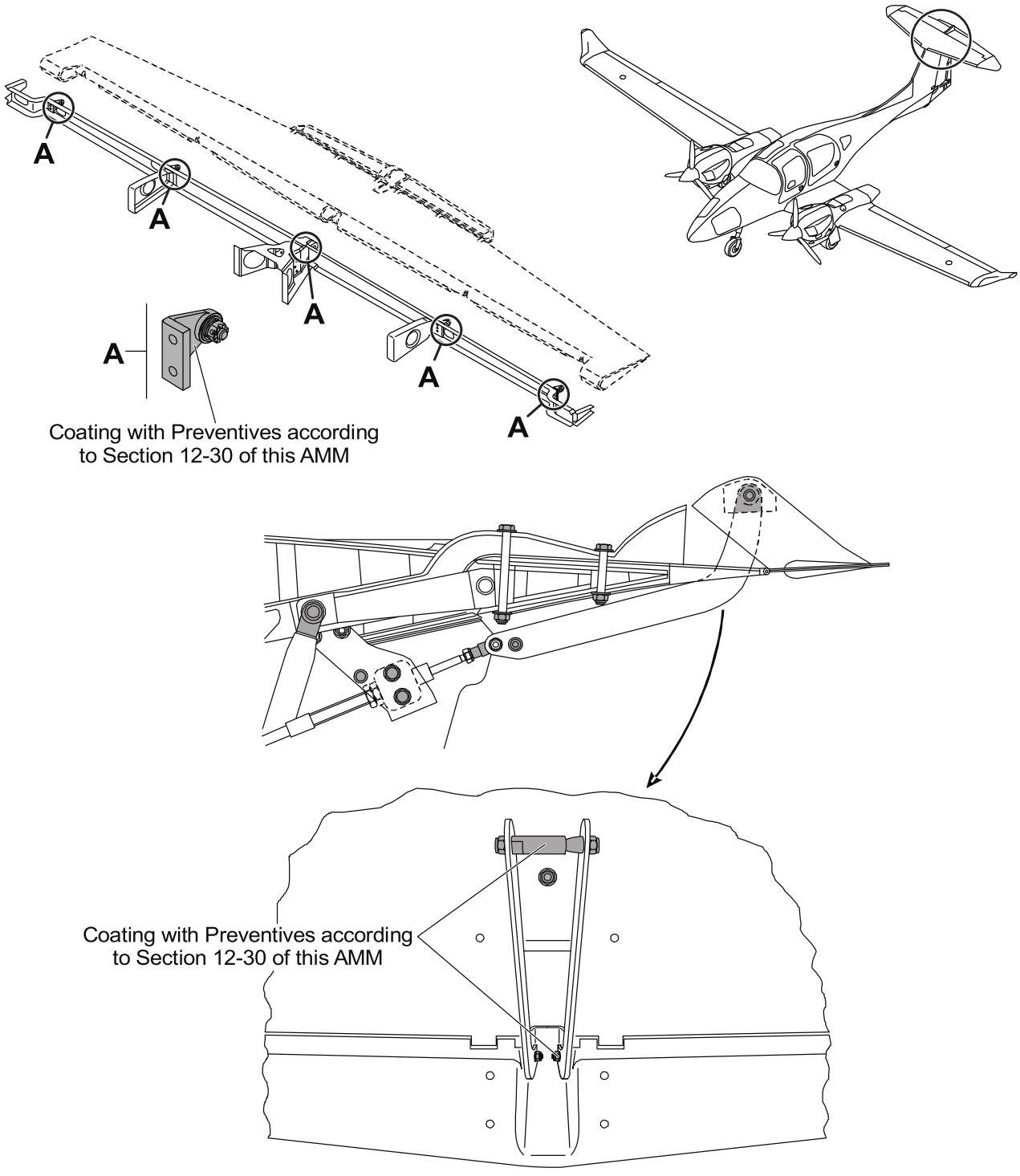

Figure 8 : Anti-Corrosion Coating - Elevator and Elevator Trim System (2)

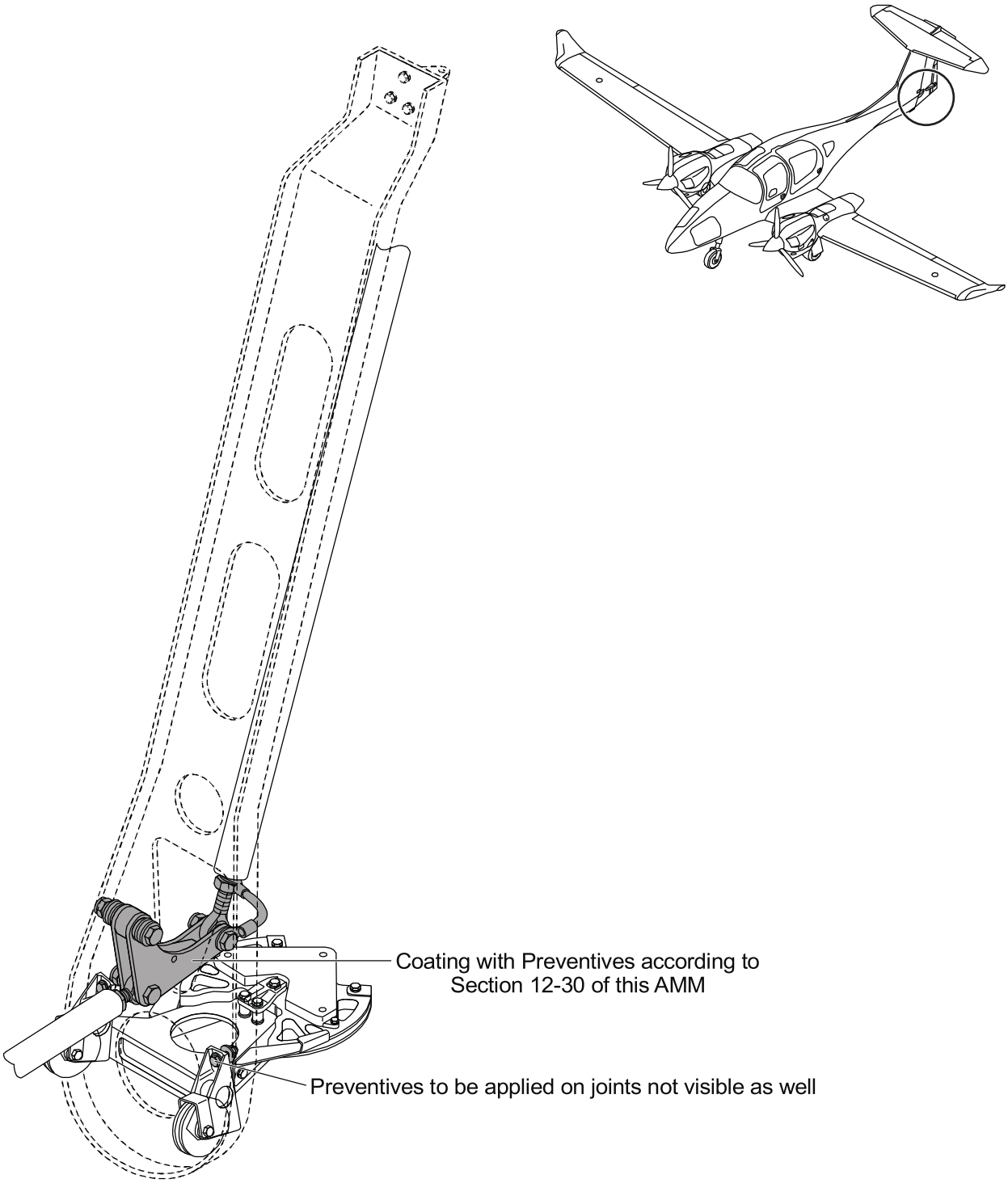

Figure 9 : Anti-Corrosion Coating - Elevator Controls

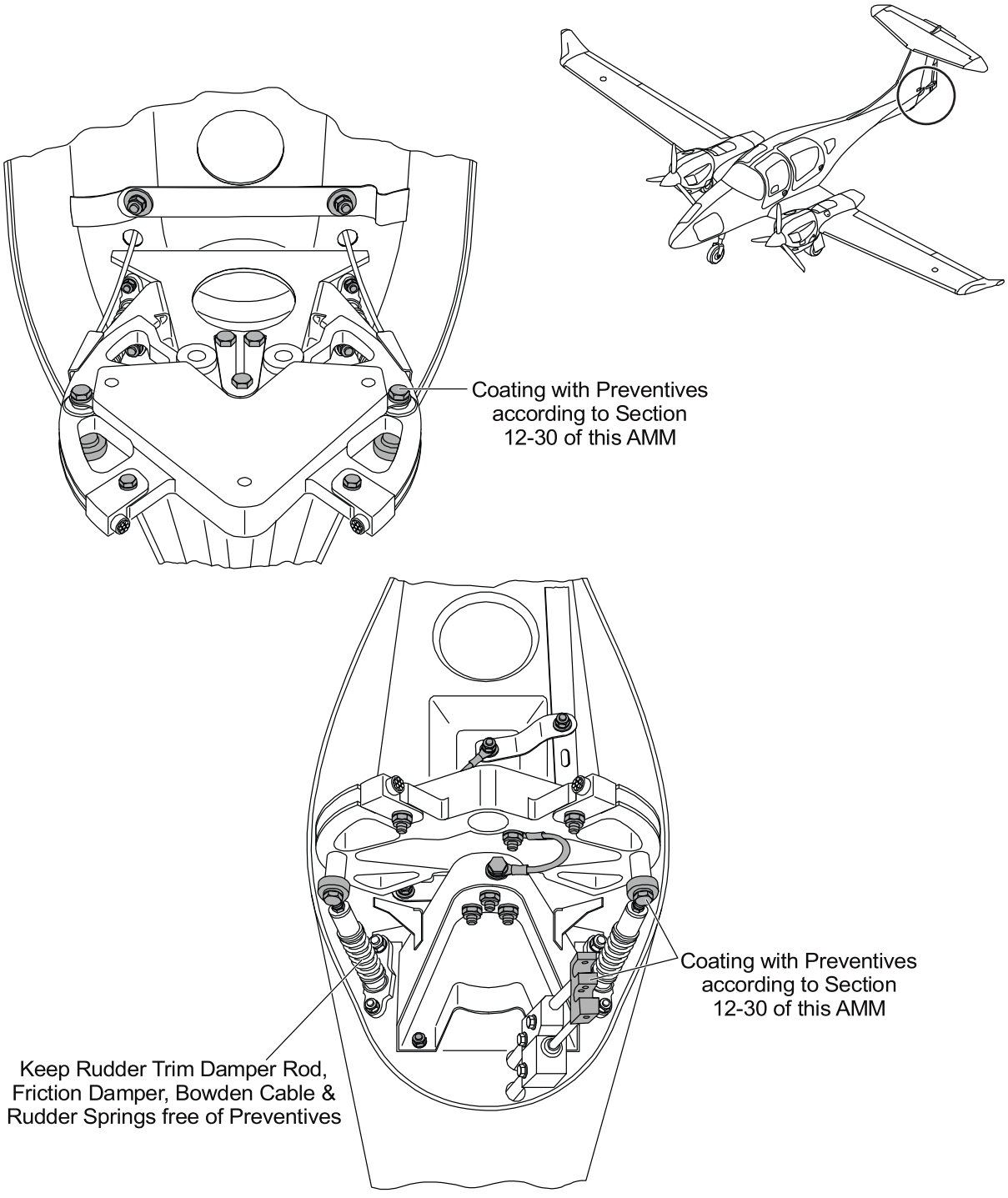

Figure 10 : Anti-Corrosion Coating - Rudder Pedestal

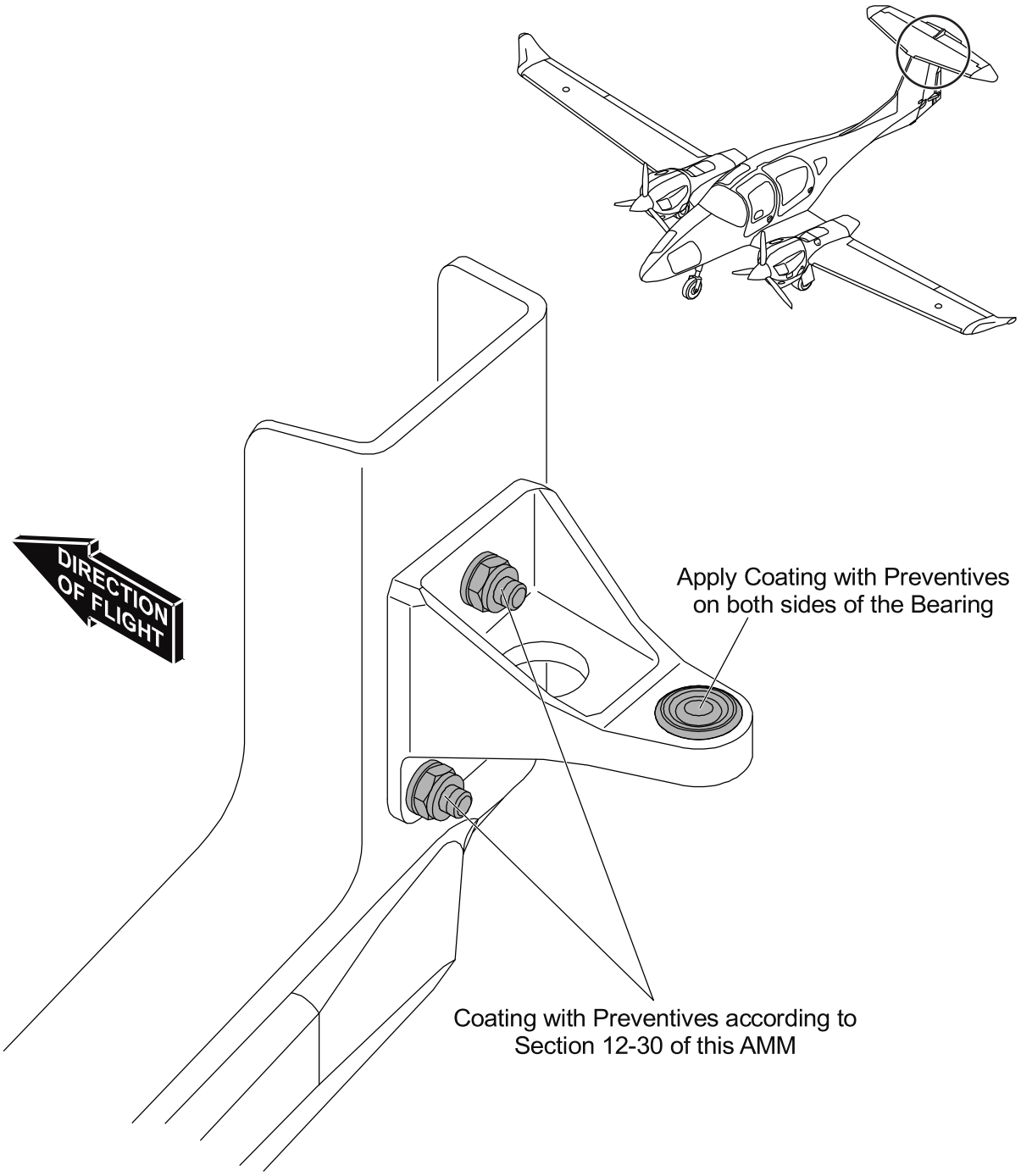

Figure 11 : Anti-Corrosion Coating - Rudder

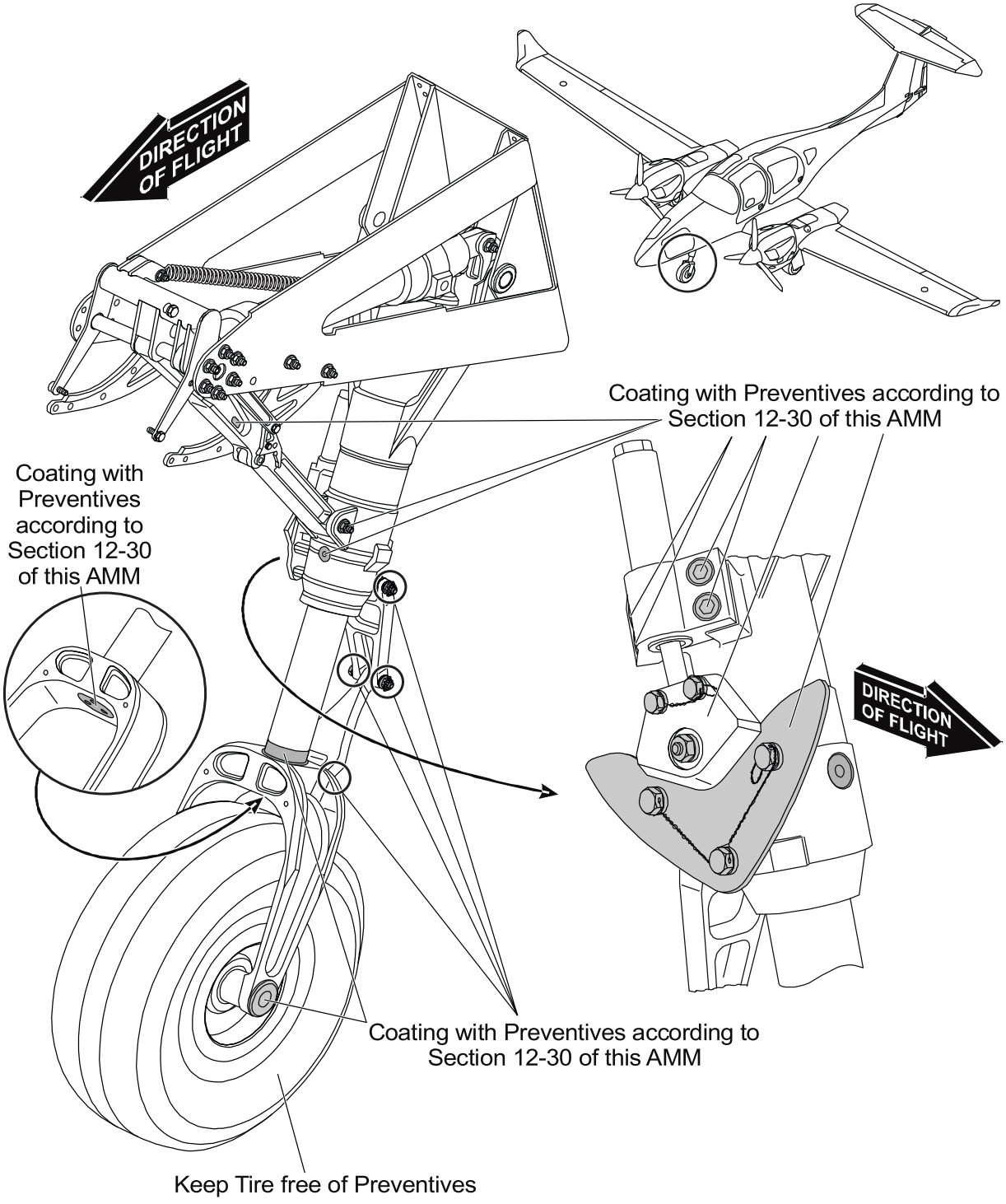

Figure 12 : Anti-Corrosion Coating - Nose Landing Gear (1)

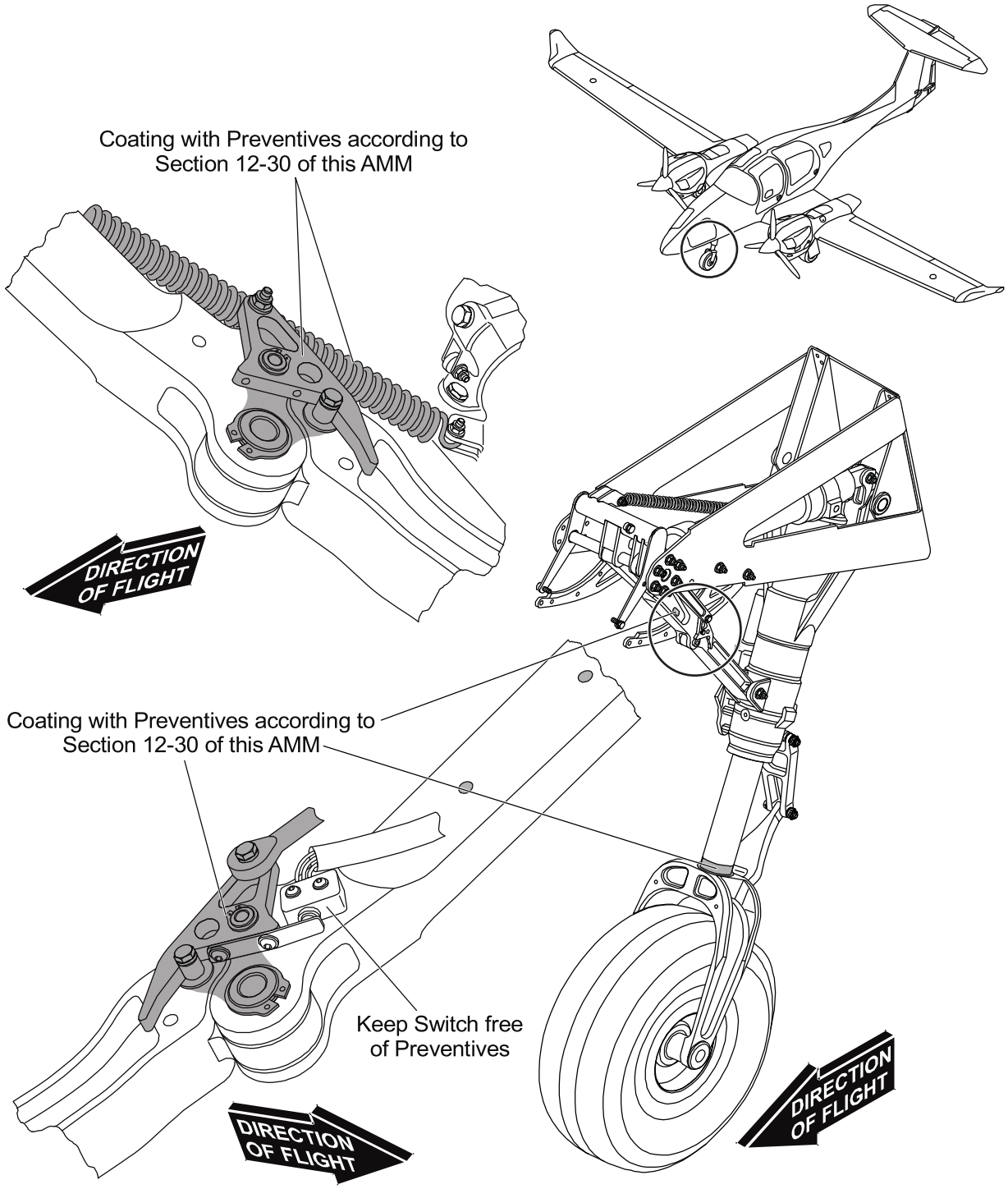

Figure 13 : Anti-Corrosion Coating - Nose Landing Gear (2)

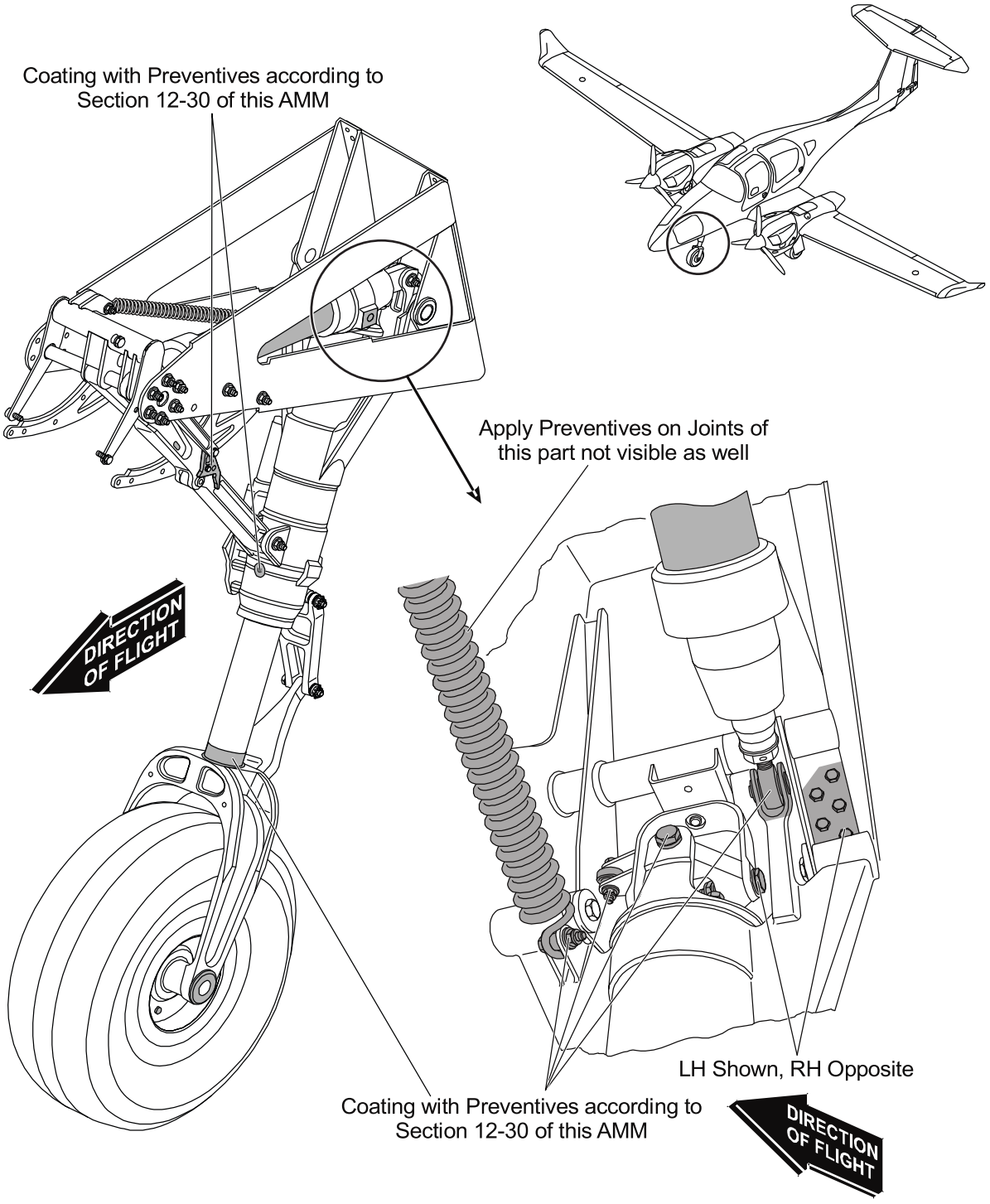

Figure 14 : Anti-Corrosion Coating - Nose Landing Gear (3)

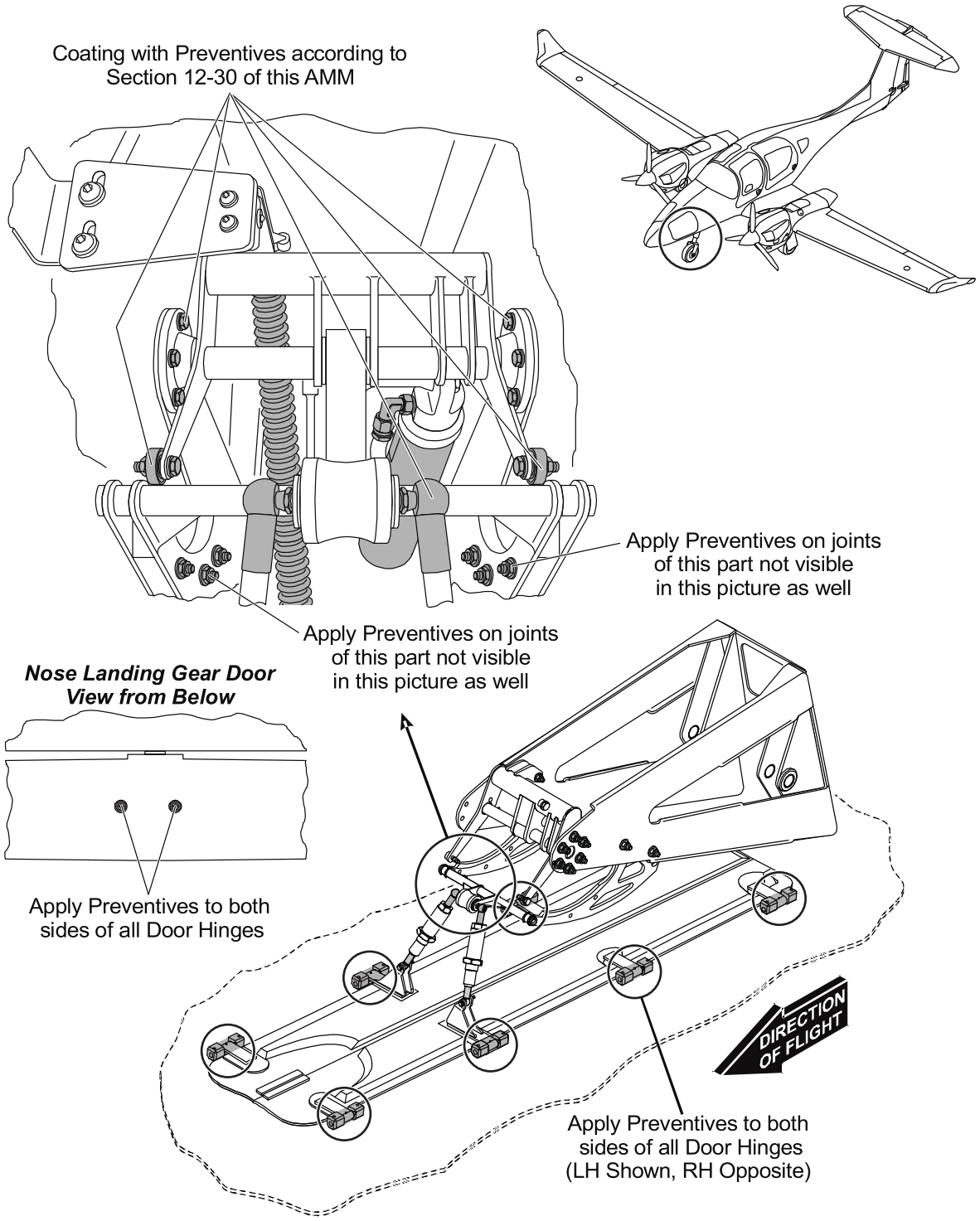

Figure 15 : Anti-Corrosion Coating - Nose Landing Gear (4)

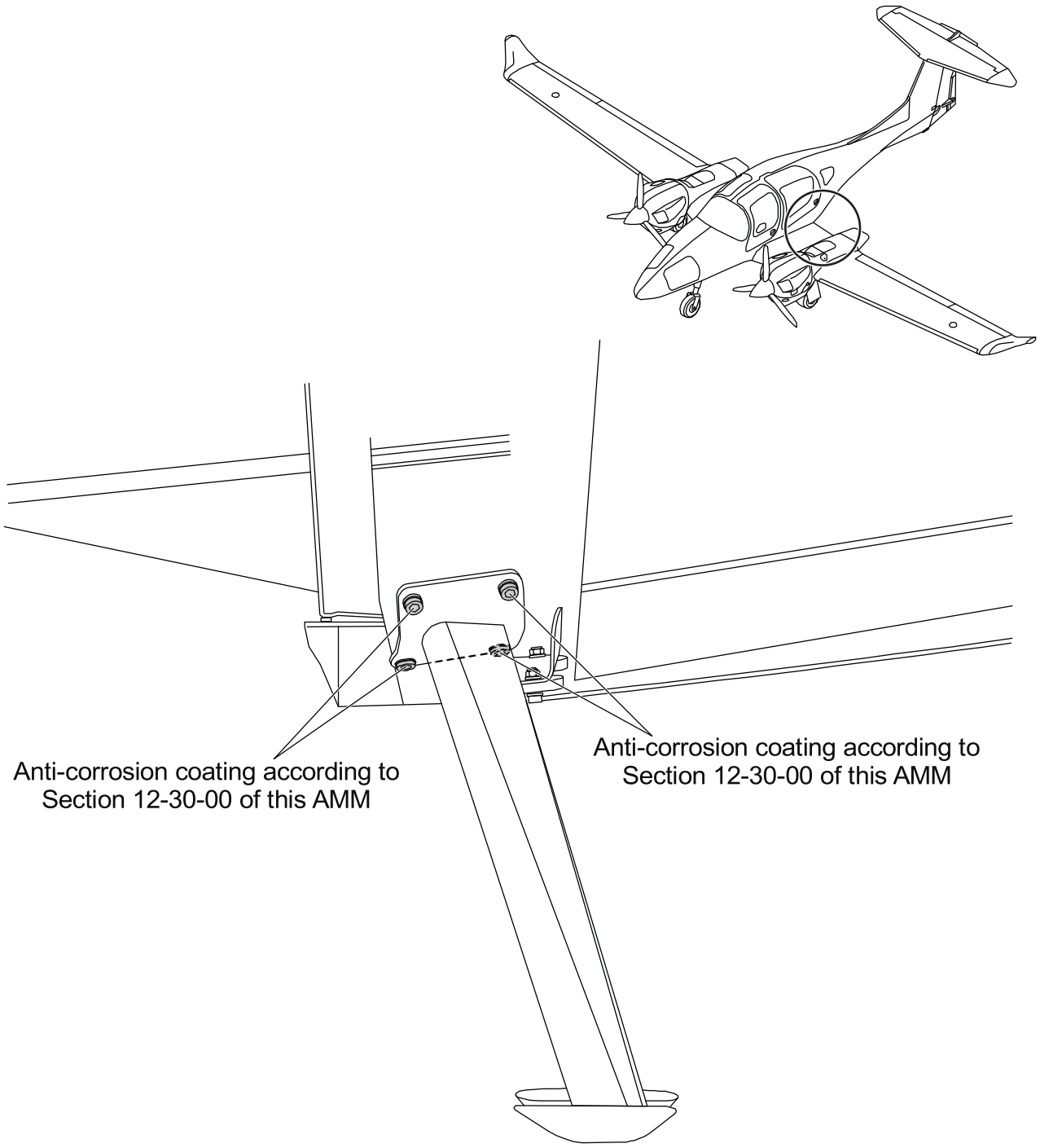

Figure 16 : Anti-Corrosion Coating - Foot Step Screws

CHAPTER 20
STANDARD PRACTICES

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TABLE OF CONTENTS

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STANDARD PRACTICES

1. General

This Chapter gives you the standard practices for the DA 62 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 - Engine.

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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 62 airplane and their related torque values. This Section tells you the procedures used to tighten the fasteners.

CAUTION: DISCARD SELF-LOCKING NUTS AFTER REMOVAL. THE FRICTION TORQUE REDUCES WITH USE.

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 62 uses three types of standard bolts:

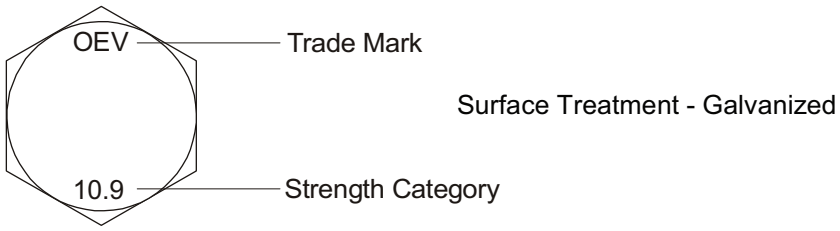
- DIN bolts
- LN bolts, and
- AN bolts.

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.

The DA 62 uses these types of standard nuts: DIN 934, DIN 985, AN 364, AN 365, MS21042, MS21044 and LN 9338.

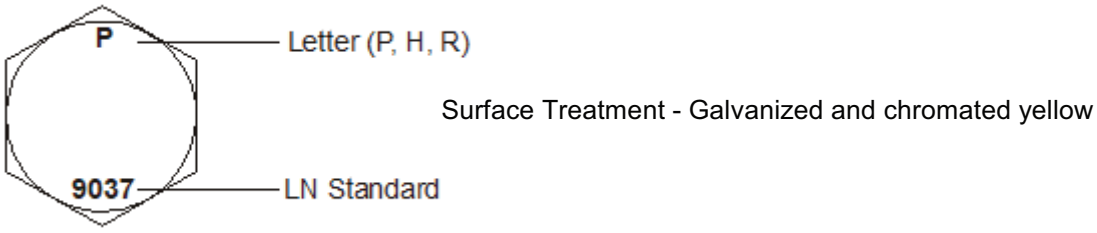
A. DIN Bolt

Bolt Head Identification



B. LN Bolts

Bolt Head Identification



C. AN Bolts

Bolt Head Identification

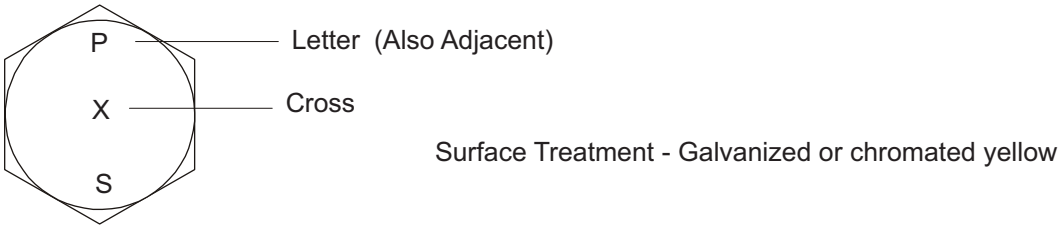


Figure 1 : Bolt Head Identification

3. **Standard Torques for Screwed Connections**

A. Obey the safety precautions for the torque procedures that follow:

(1) Do not put lubricant or anti−seize compounds on the threaded fasteners unless it is specified.

(2) Do not remove the lubricant or corrosion−preventive compound that is applied by the manufacturer.

(3) Remove unwanted materials such as contamination, paint or corrosion from the threads before you tighten the fastener.

(4) Turn the torque wrench with a slow and stable movement when you do the torque procedure.

(5) When it is possible, turn the nut when you tighten the fastener assemblies.

(6) When it is not possible to turn the nut, turn the bolt or screw to tighten the fastener assembly.

CAUTION: DO NOT TIGHTEN A FASTENER TO MORE THAN THE MAXIMUM RANGE FOR THE SPECIFIED TORQUE VALUE. ALSO, FOR FASTENERS WITH MORE THAN THREE-SIXTEENTHS OF AN INCH DIAMETER, DO NOT TIGHTEN TO MORE THAN 10 PERCENT ABOVE THE SPECIFIED TORQUE VALUE. YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(7) Torque the bolt or screw as follows:

(a) Do not torque to more than the maximum specified torque value.

(b) For fasteners with a diameter of more than 3/16 in., torque the bolt or screw to not more than 10% more than the specified torque.

(8) For nuts locked with cotter pins or lockwire, do the steps that follow:

(a) Tighten the nut to the minimum specified torque range.

(b) If necessary, continue to tighten the nut until the slot (in the nut) aligns with the hole (in the bolt) but not more than the maximum specified torque.

(c) Do not loosen the nut to align the slot with the hole.

(9) If necessary, use a torque wrench adaptor and calculate the correct dial indication.

4. **Standard Torque Values**

These tables show the correct torque values for bolts and nuts to AN and DIN specifications. Use the following torque values for all bolts, nuts and screws which meet the specifications unless they are in the list of special torque values in para 7.

A. AN Fine Thread Series.

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	79.0	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

5. **Standard Torques for Fittings**

These tables show the standard torque values for fittings.

A. Steel Fittings

Size	Torque Decanewton metre (daNm)	Torque (lbf-ft)
-3	1.07 - 1.35	7.89 - 9.95
-4	1.53 - 2.14	11.28 - 15.78
-6	2.43 - 3.16	17.92 - 23.30
-8	5.31 - 6.21	39.16 - 45.80
-10	7.00 - 8.41	51.62 - 62.02

B. Aluminum Fittings

Size	Torque Decanewton metre (daNm)	Torque (lbf-ft)
-3	0.56 - 0.90	4.13 - 6.63
-4	1.13 - 1.58	8.33 - 11.65
-6	1.69 - 2.20	12.46 - 16.22
-8	3.00 - 3.95	22.12 - 29.13
-10	4.07 - 4.85	30.01 - 35.77

6. **Standard Torques for Hose Clamps**

The standard torques are valid for standard worm drive hose clamps, if not otherwise stated in the referring design data.

If other hose clamps are required and the referring design data doesn't state tightening torques, instructions of the hose-clamp manufacturer apply.

A. Clamp width: Less than12mm

Range of Diameter (mm)	Torque (Nm)	Torque (lbf-in)
8 - 12	2.5 ±0.5	22.5 ±4.4
10 - 160	3.0 ±0.5	26.5 ±4.4

B. Clamp width: 12mm or larger

Range of Diameter (mm)	Torque (Nm)	Torque (lbf-in)
8 - 160	5.0 ±0.5	44.2 ±4.4

7. **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.	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 mounting arms.	28 ± 2.8	20.64 ± 2.06
Propeller to engine nuts.	85 - 90	62.7 - 66.4
V-clamp turbo charger.	5.0 ± 0.5	3.7 ± 0.4
V-clamp turbo charger (if MÄM 62-215/a is installed).	5.5 ± 0.5	4.0 ± 0.4
Fuel filter drain connection.	22	16.2
Fuel drain valve.	1 - 3	0.74 - 2.21
Horizontal stabilizer attaching bolts	45	33.2
Auxiliary tank fuel quantity probe (if OÄM 62-001/a is installed)	15 ± 2	11.1 ± 1.5
Bolts attaching the main landing gear brake back plates to the caliper.	Refer to the Cleveland/Parker Maintenance Manual, latest revision or placard on the brake cylinder assembly.	

* indicates values including friction.

8. **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 friction value from the torque wrench before the bolt seats.

9. **Torque Identification**

A. If applicable, identify all torqued threaded fasteners with a mark as follows:

Refer to Figure 2.

NOTE: Use the examples given in the illustration for the correct location of the identification mark.

(1) Apply a mark (blob or stripe) with the specified lacquer to identify the assembly as follows:

(a) If possible, put the mark on the surface of the nut.

(b) If this is not possible, put the mark on the head of the bolt or screw.

(c) Make sure that the edges of the mark are easy to see.

(d) If the torqued fastener moves, examine the parts of the stripe or blob.

(e) If the parts of the stripe or blob are not correctly aligned, it is necessary to torque the fastener again.

(f) Identify the fastener with a new blob or stripe.

(2) If you identify the fastener assembly with a stripe, do it as follows:

(a) To identify a bolt assembly with the head shown, apply a continuous straight stripe of lacquer across the head of the bolt.

(b) Continue the stripe down the two sides of the head and on the adjacent surfaces.

(c) To identify a bolt assembly with the nut shown, apply a continuous straight stripe of lacquer across the nut and the external threads of the bolt.

(d) Continue the stripe down the two sides of the nut.

(e) To identify a screw assembly, apply a continuous straight stripe of lacquer across the head of the screw and on the adjacent surfaces.

(3) If you identify the fastener assembly with a blob, do it as follows:

(a) To identify a bolt assembly with the head shown, apply the blob of lacquer on a part of the head of the bolt and on the adjacent surfaces.

(b) To identify a bolt assembly with the nut shown, apply the blob of lacquer on a part of the nut and on the external threads of the bolt.

(c) To identify a screw assembly, apply the blob of lacquer on the head of the screw and on the adjacent surfaces.

(4) Do not apply a mark or stripe of lacquer to the torqued fasteners if the conditions that follow occur:

(a) On the heads of the countersunk bolts or screws that are installed on the external surfaces of the aircraft.

(b) When the fastener is internal to the aircraft systems (for example, the fuel, hydraulic, or pneumatic systems).

(c) When the fastener is internal to the fuel tanks that are part of the wing or fuselage.

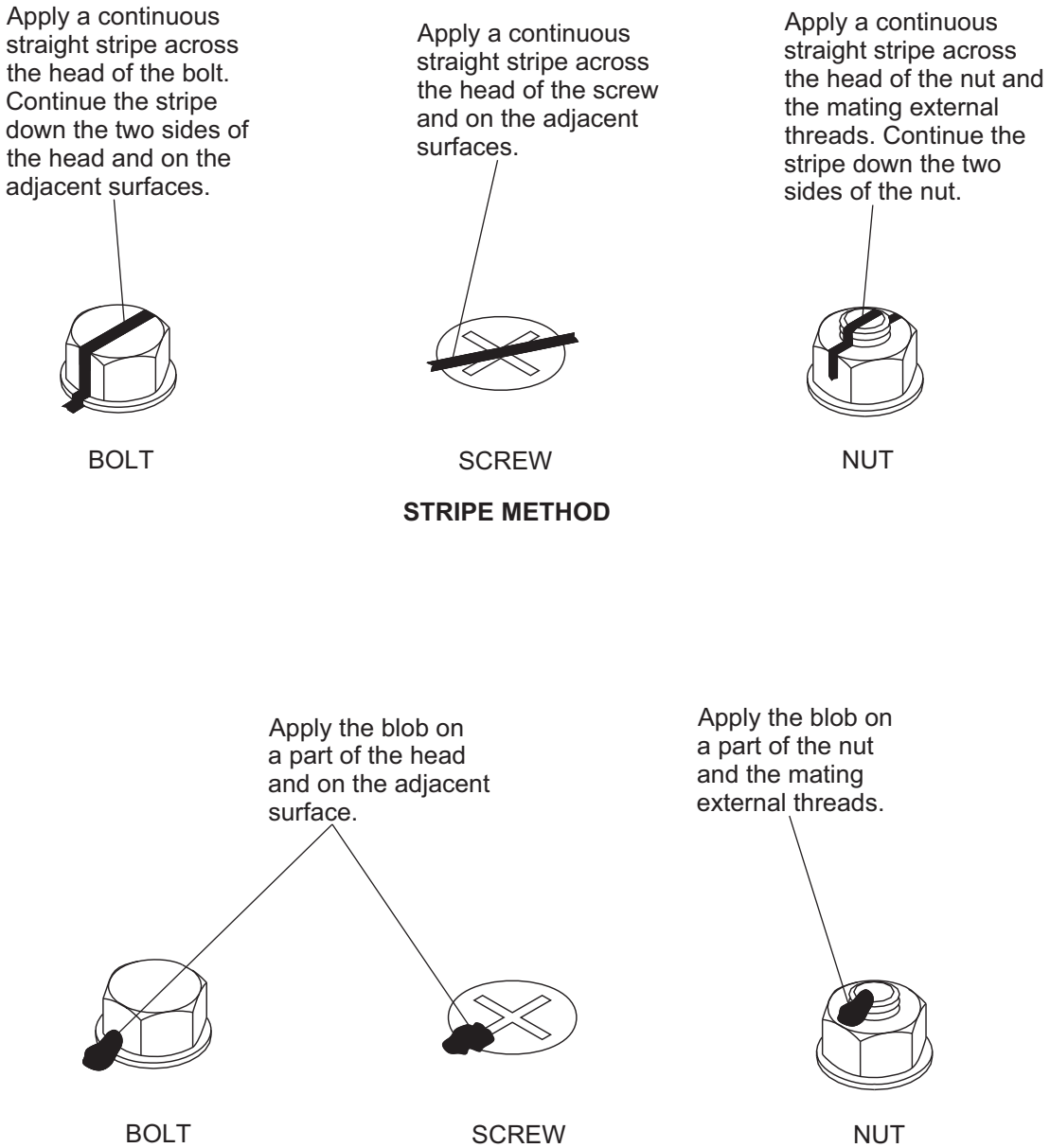
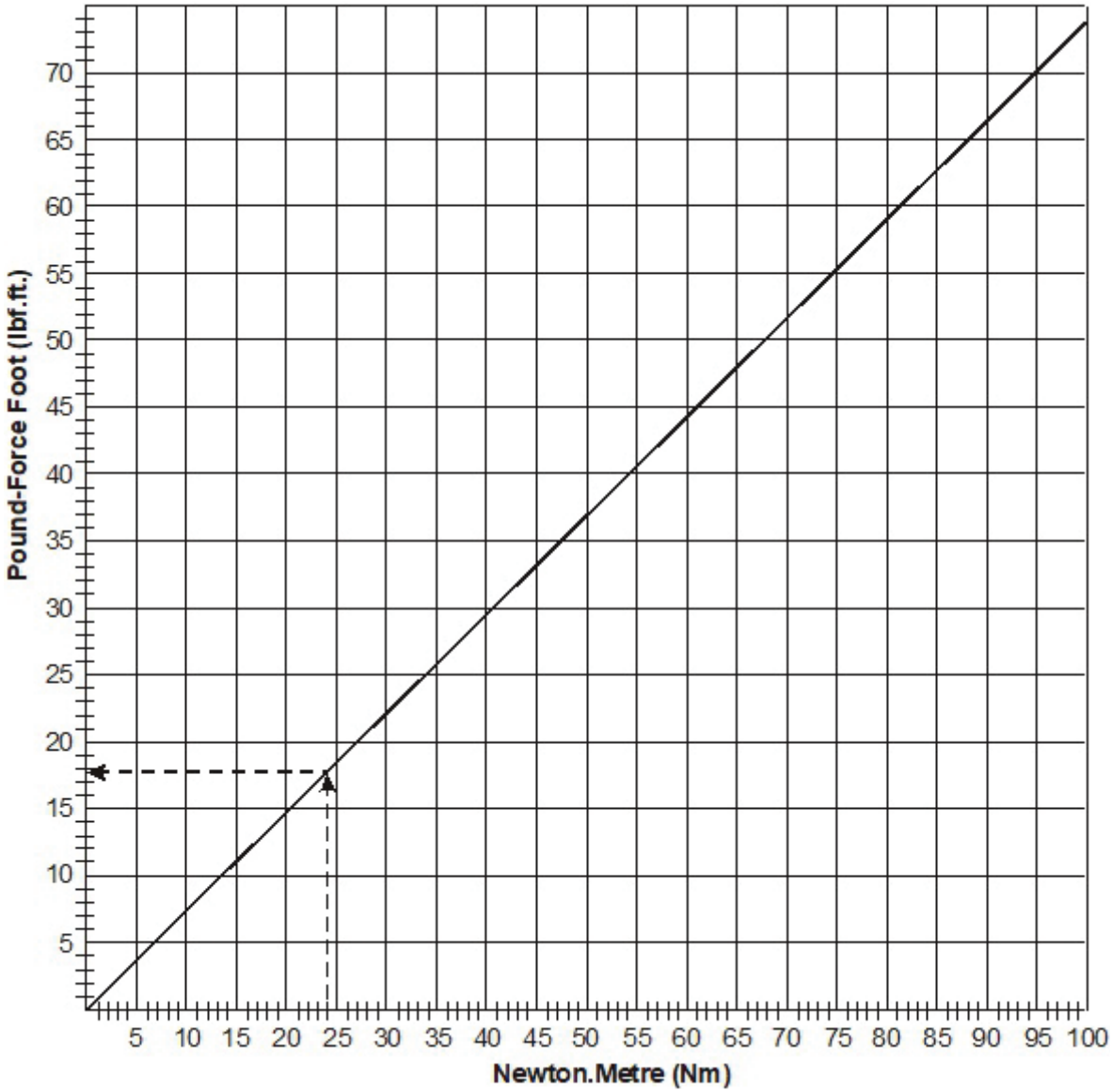


Figure 2 : Identification Marks on Torqued Fasteners

10. **Torque Conversion Graphs**

Use graph 1 for conversion of torque values (Nm - lbf-ft) and use graph 2 for conversion of (Nm - lbf-in)

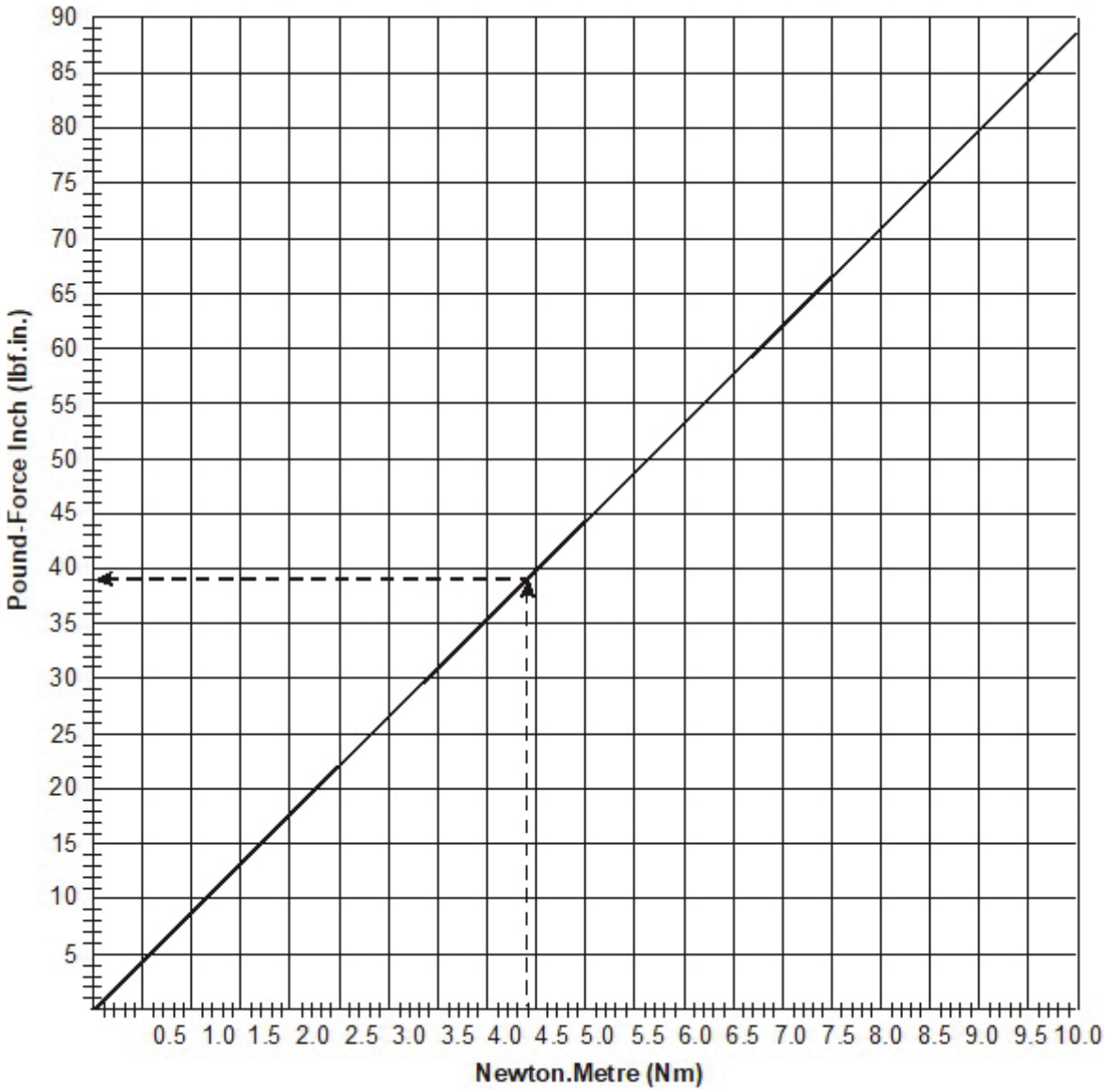
.



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.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.

Graph 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.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.

Graph 2 - Nm - lbf.in.

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 62, 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 62. 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 62:

- 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 62 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.

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Section 20-70

Standard Practices - Engine

1. General

This Section gives you data about the fasteners used on the AE E4P-C engines installed in the DA 62 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	18.44
Coolant silicate pouch cartridge	-	32.5 ± 2.5	24.0 ± 1.8
Coolant tank filler cap (if MÄM 62-055 is installed)	-	12-15	8.85-11.06
Pressure relief valve	-	12-15	8.85-11.06
Coolant level sensor	-	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. General.

Worm drive clamps are for single use only. Replace clamp with a new clamp every time the clamp is loosened or removed. Secure each worm drive clamp with safety wire once they are installed and tightened to the appropriate torque (see Paragraph D. Tightening Torques for Worm Drive Clamps).

CAUTION: REUSE OF WORM DRIVE CLAMPS CAN LEAD TO A FAILURE OF THE CLAMPS AND MAY CAUSE LOSS OF ENGINE POWER.

B. 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.

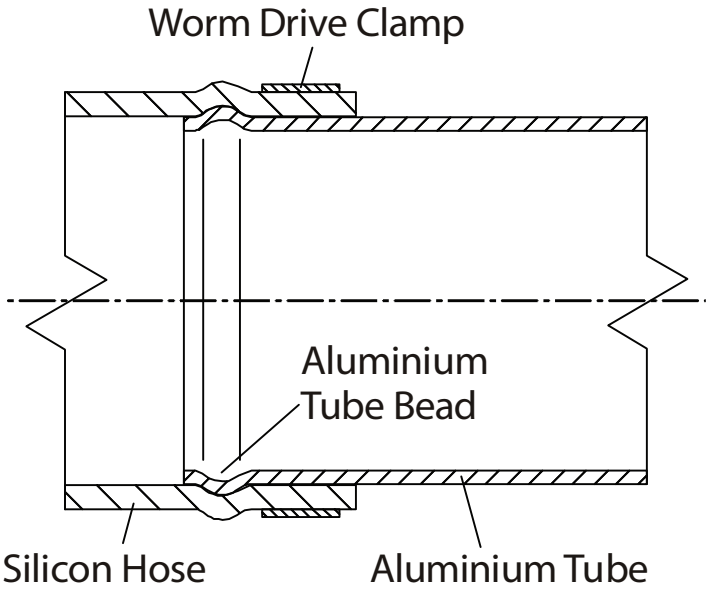

Figure 1 : Installation with a Single Worm-Drive Clamp

C. 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.

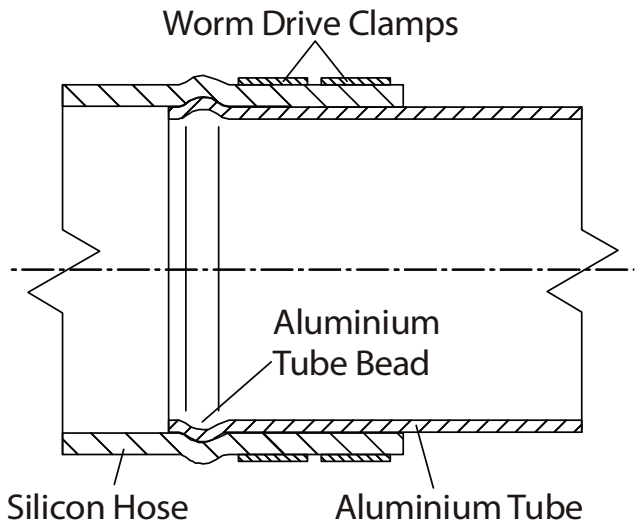

Figure 2 : Installation with Two Worm-Drive Clamps and Single Bead (Axial Placement)

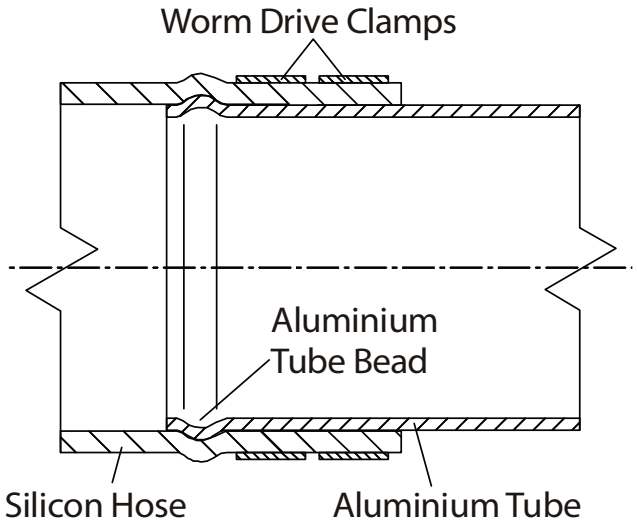

Figure 3 : Installation with Two Worm-Drive Clamps and Two Beads (Axial Placement)

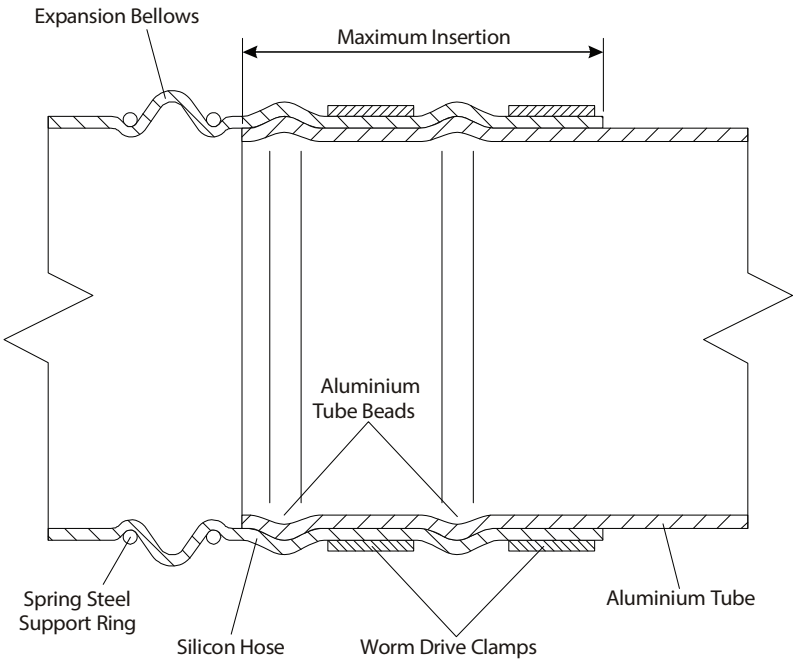

Figure 4 : Installation with Two Worm-Drive Clamps, Two Beads (Axial Placement) and a Hose with Flexible Bellows (if MÄM 62-130 or MÄM 62-260 is installed)

(2) Radial Placement

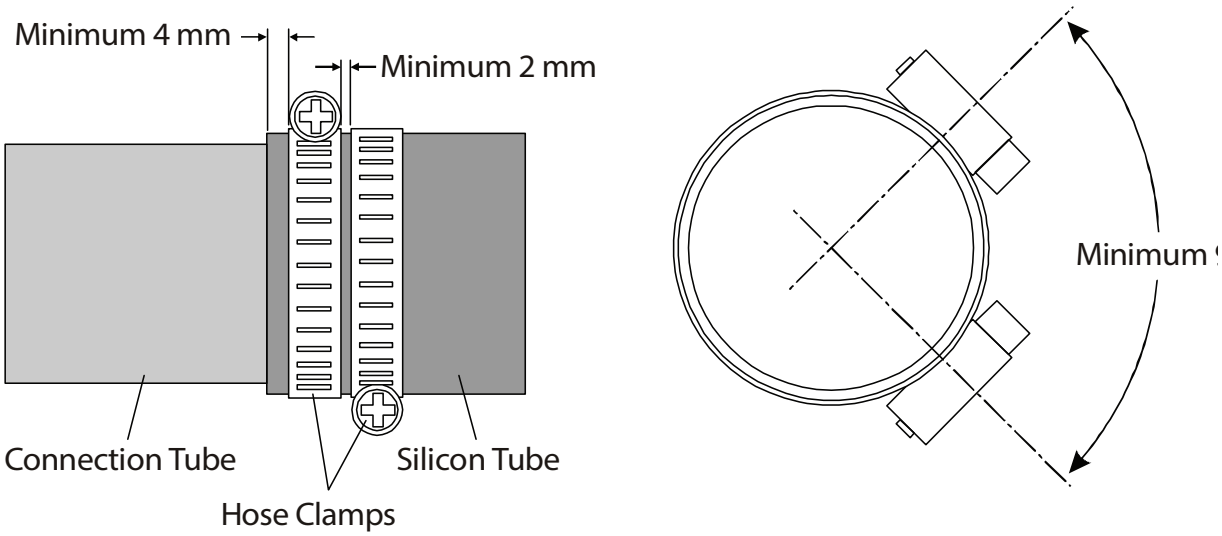

Figure 5 : Installation with Two Worm-Drive Clamps (Radial Placement)

D. 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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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 62. 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 62-005 is installed, a recirculating air-cabin cooling (RACC) system is installed. Refer to Section 21-50 for more detail 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 62 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 Windscreen Defog/Defrost

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 controlling the flow of heated air.

The warm air from the left engine installation supplies the windscreen 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 or right hand engine in operation, 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 center tunnel. 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.

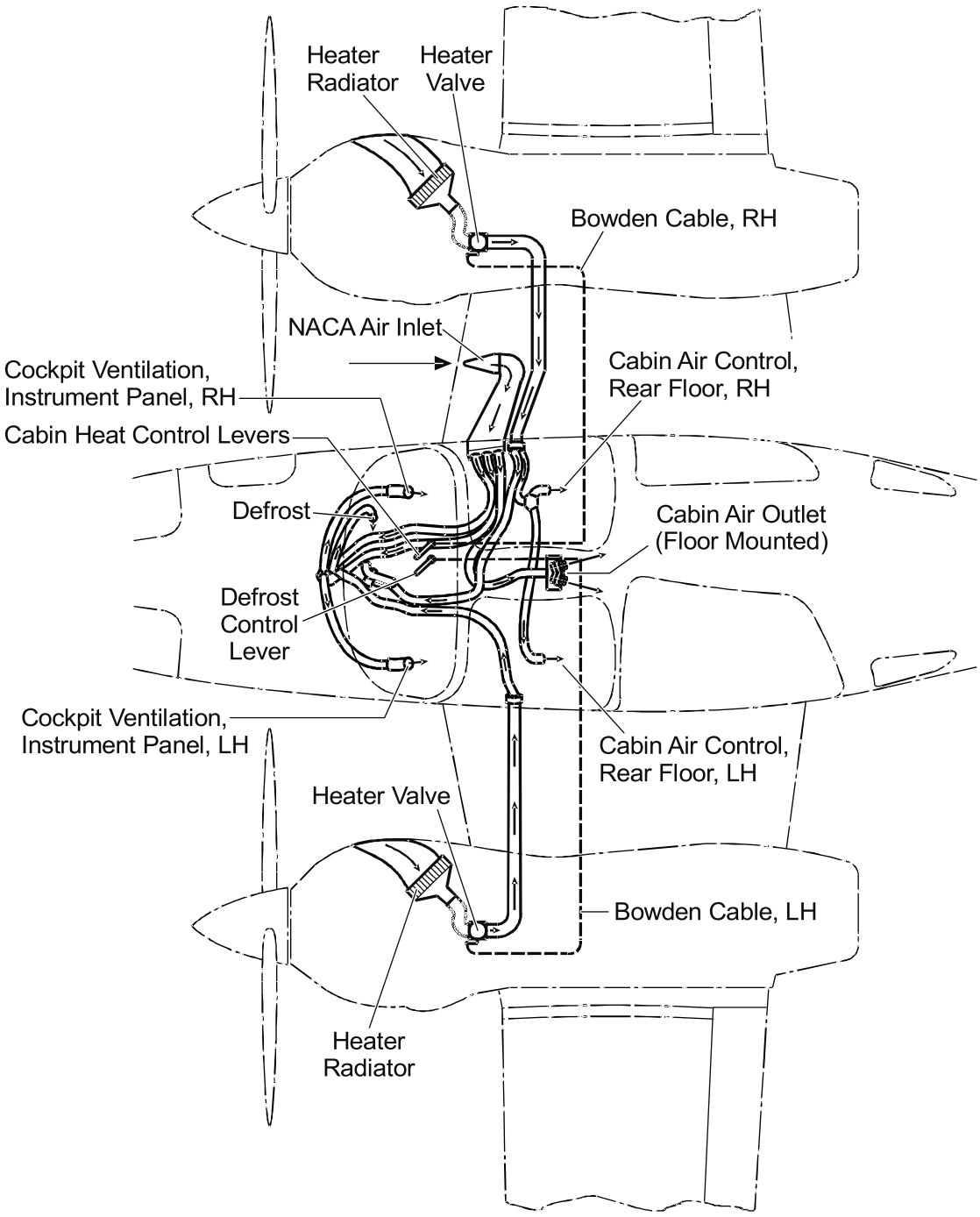

Figure 1 : Air Conditioning Schematic Diagram

Section 21-20

Air Distribution

1. General

The DA 62 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 62. 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.

A. Ventilation

Figure 1 shows the ventilation air distribution system. In normal flight or RH engine in operation ambient air flows through a NACA duct on the lower surface of the right-side center wing section. The air flows through a duct in the center wing section to the fuselage. At the fuselage the airflow is divided. Some of the air is directed to the two air outlets on the I-panel and to the two air outlets in the center tunnel for the rear passenger compartment.

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

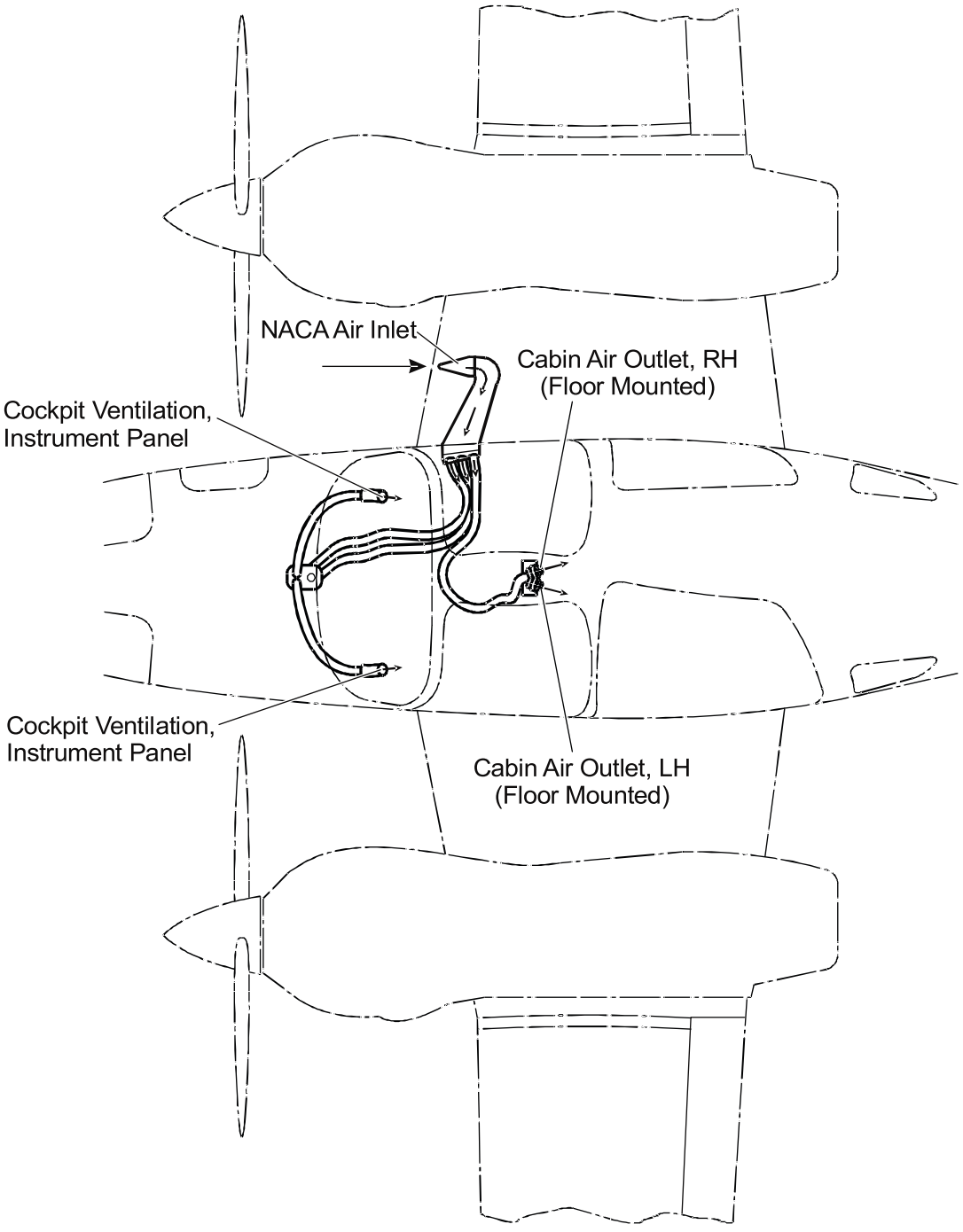

Figure 1 : Ventilation Air Distribution System Schematic Description and Operation

B. Heating and Defrosting

Figure 2 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 windscreen 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. A Bowden cable from each control lever attach the relay levers 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 is guided under the floor panel to the air distribution duct mounted on the glare shield. 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.

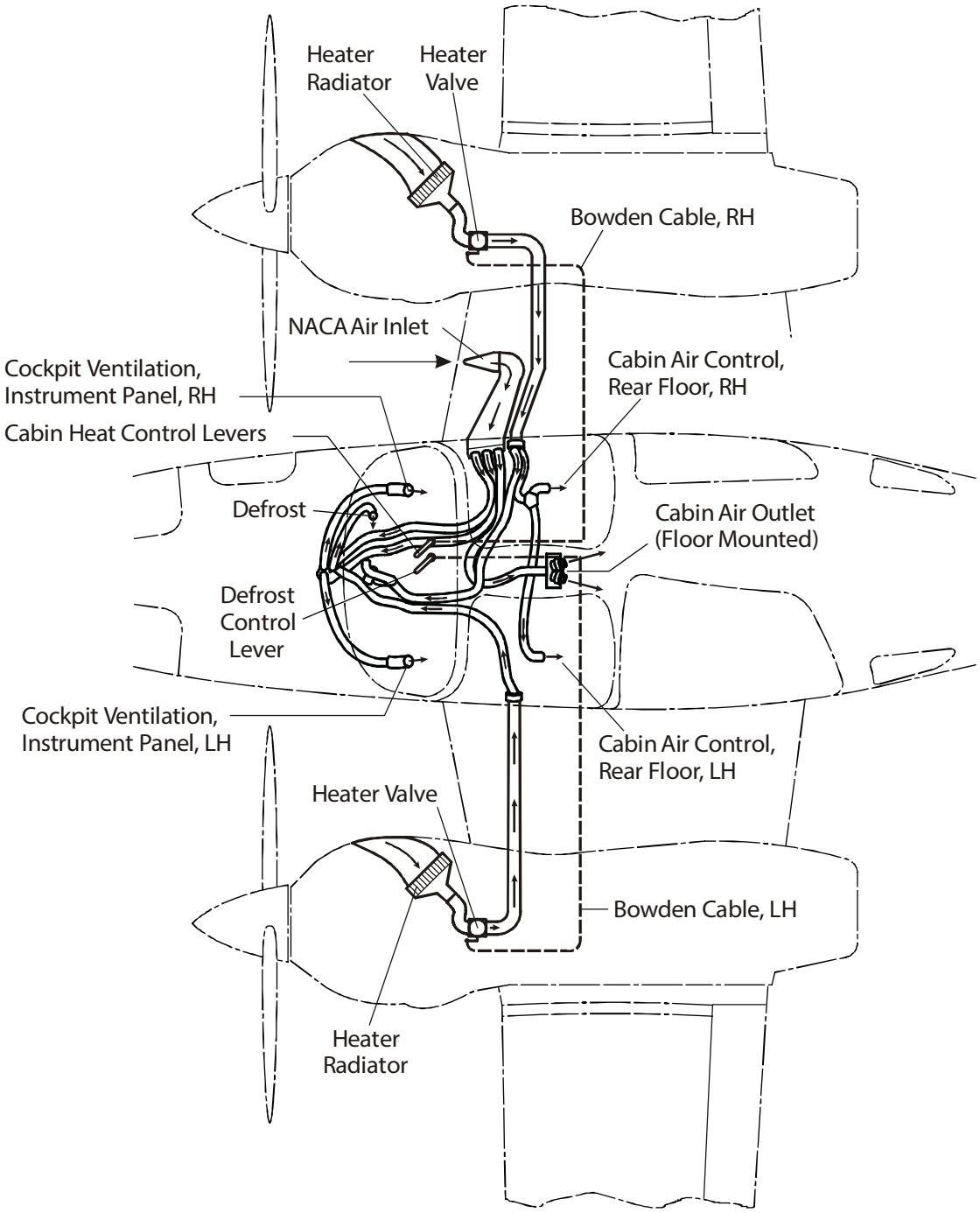

Figure 2 : Cabin Heating and Defrost Air Distribution System Schematic

Trouble-Shooting

1. General

This table on Page 102 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 cables out of adjustment.	Adjust the left engine heater valve control cables.
	Left engine heater valve control forward/aft cable broken.	Replace the left engine heater valve forward/aft control cable.
	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.
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 cables out of adjustment.	Adjust the right engine heater valve control cable. Refer to Section 21-20.
	Right engine heater valve forward/ aft control cables broken.	Replace the right engine heater valve forward/aft control cable. 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 Inner Control Cable**

Use these procedures for both the left and right heater valves. The left engine heater valve supplies the windscreen defrosting system and right engine heater valve supplies the cabin heating.

A. Replace a Heater Control Valve Inner Control Cable

Refer to Figures 201 and 202.

	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 cover plate from the CABIN and DEFROST control levers in the center console: - Remove the four screws that attach the cover plate to the center console. - Slide the cover plate clear of the control levers.	
(4)	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. - Pull the cable clear of the swivel fitting.	For access. Remove and retain the swivel fitting from the broken cable.

	Detail Steps/Work Items	Key Items/References
(5)	Disconnect the cable at the heater valve flap lever: - Loosen the screw that attaches the swivel fitting to the operating lever and cable. - Pull the cable clear of the swivel fitting.	Remove and retain the swivel fitting from the broken cable.
(6)	Pull the defective inner control cable clear of the cable outer sleeve from either end.	If the inner control cable is broken the pieces might have to be pulled from the outer sleeve from both ends.
(7)	Remove the defective inner control cable from the airplane.	

(8)	Install the new inner control cable:
	- Move the new inner control cable into position in the outer sleeve.
	- 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 related control lever:
	  - 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 control lever.
	  - Pass the cable through the swivel fitting.
	  - Tighten the swivel fitting screw.
		From the cockpit control lever.

	Detail Steps/Work Items	Key Items/References
(9)	Install the DEFROST/CABIN control-lever cover at the center console: - Move the cover into position at the center console. - Install the four screws that attach the cover to the center console. - Tighten the four screws. - Make sure that both control levers move freely through the full range of movement.	
(10)	Do a test for the correct operation of the related heater valve. If necessary, adjust the heater valve cable	Refer to Paragraph 3.
(11)	Install the engine cowlings that you removed.	Refer to Section 71-10.

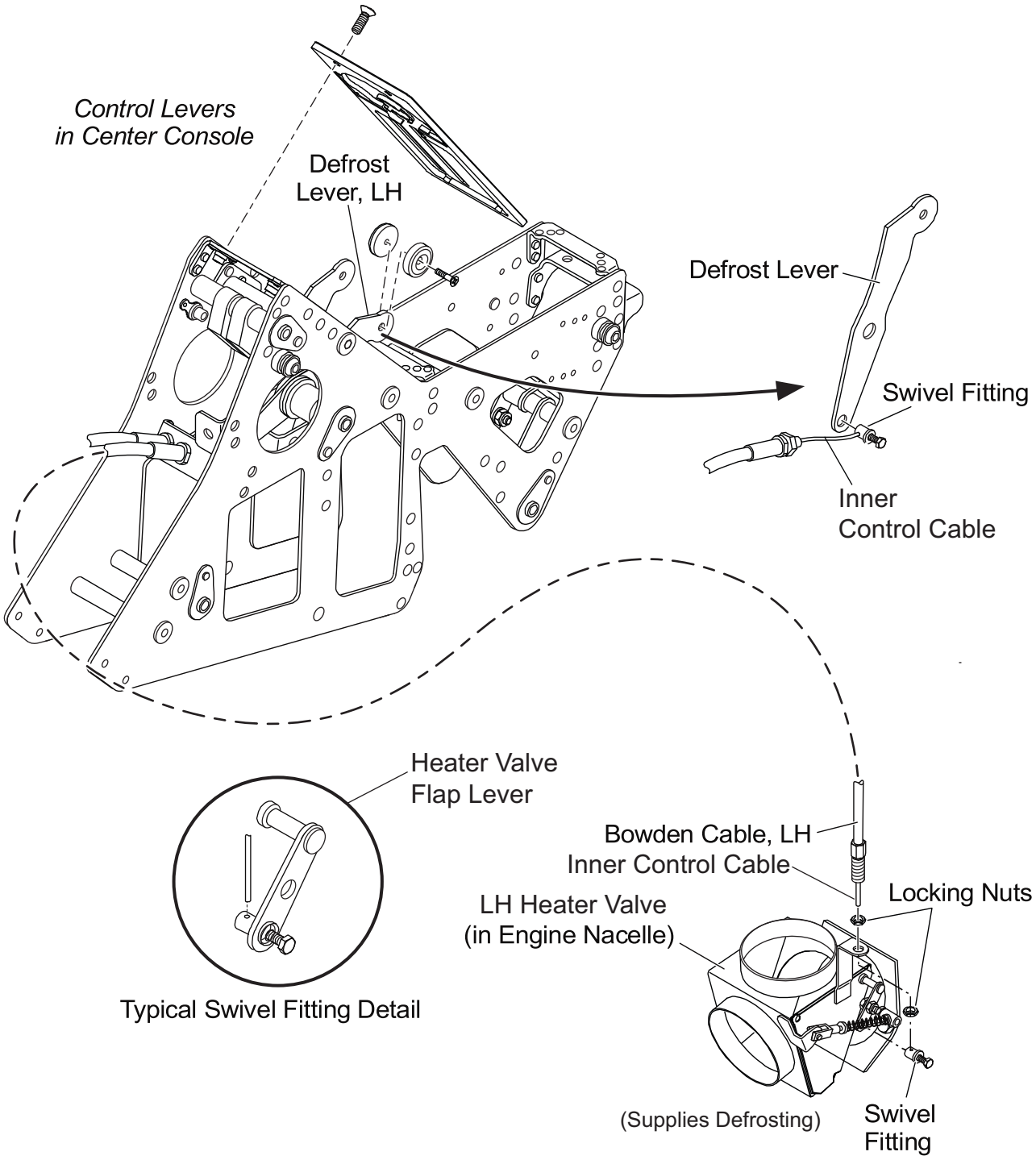

Figure 201 : LH Engine - Heater Valve Control Cable

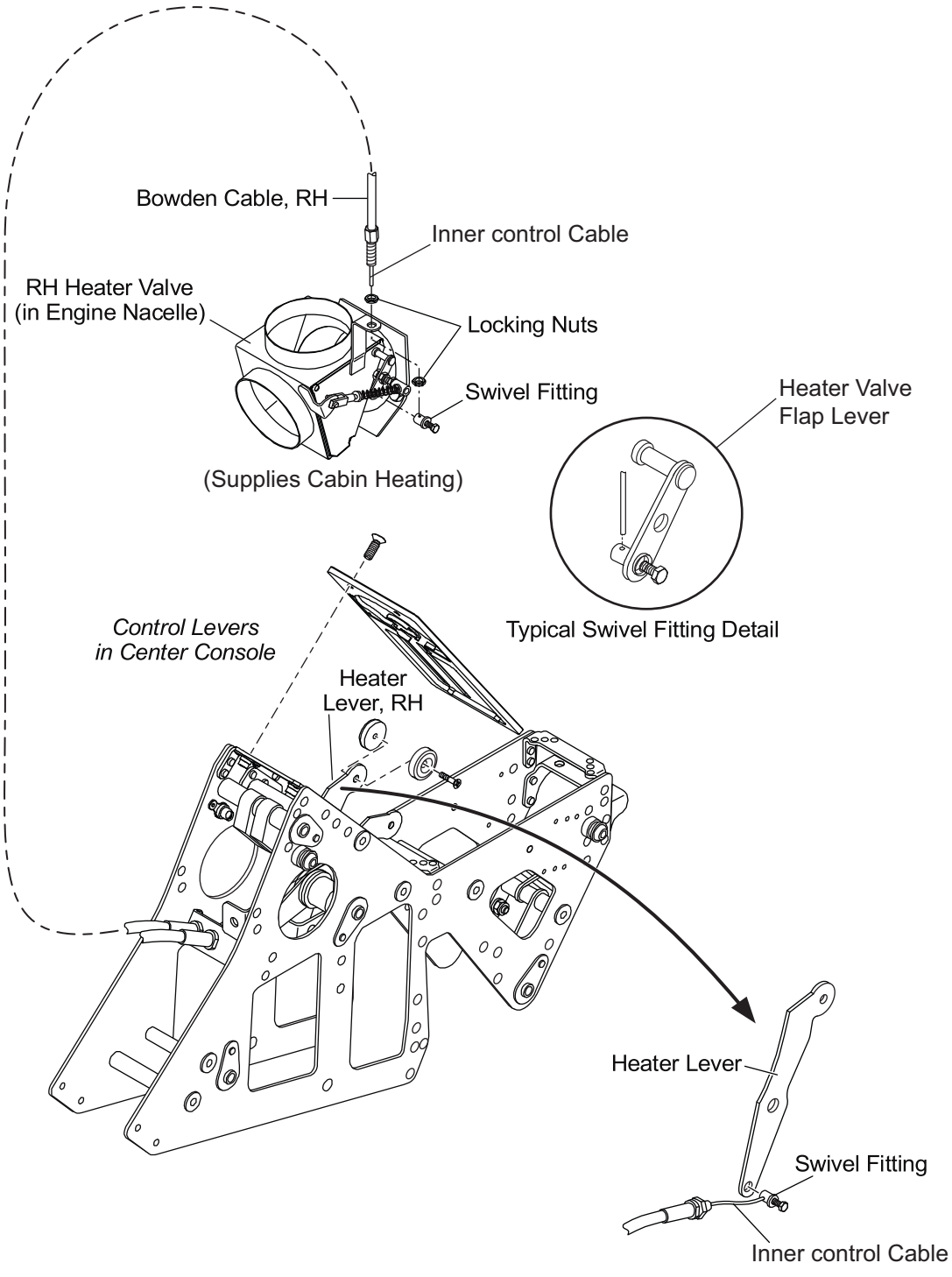

Figure 202 : RH Engine - Heater Valve Control Cable

3. **Test/Adjust a Heater Valve Control Cable**

Refer to Figure 202.

	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.
(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 62 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.

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

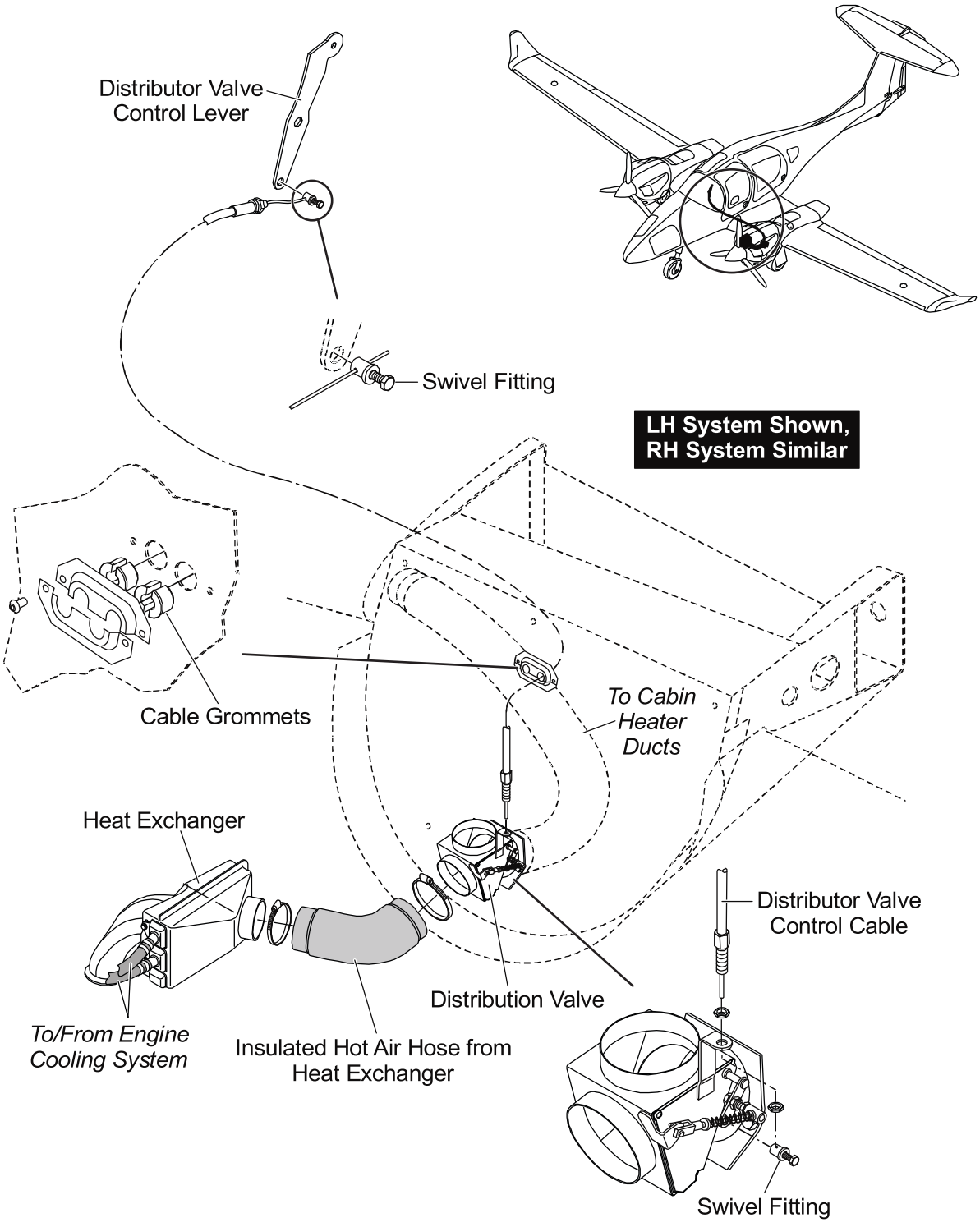

Figure 1 : Heating/Defrost System

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

Refer to Figures 201 thru 203..

	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.	
(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.

	Detail Steps/Work Items	Key Items/References
(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 202.
(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.	

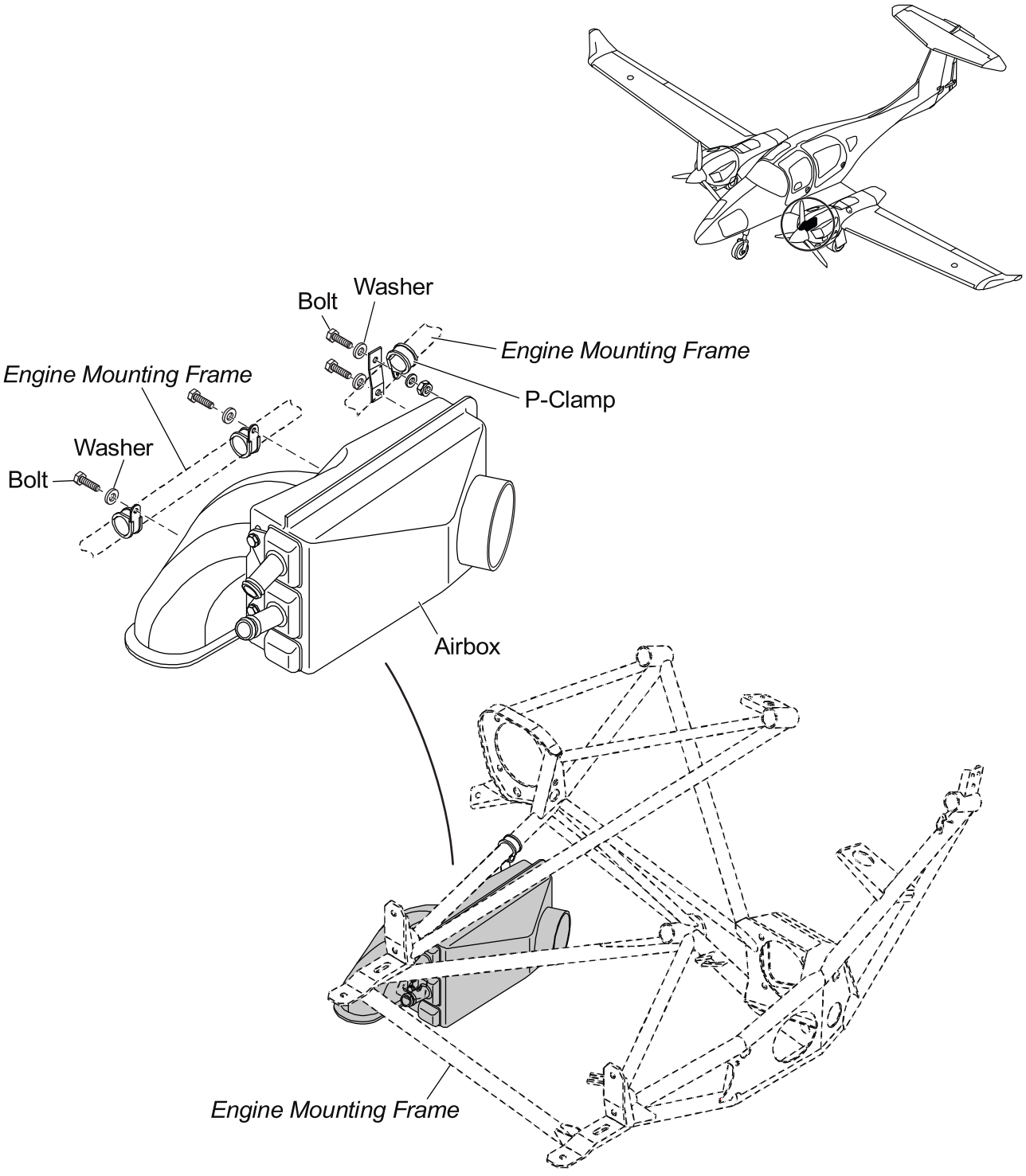

Figure 201 : Heat Exchanger Installation - Sheet 1 of 3

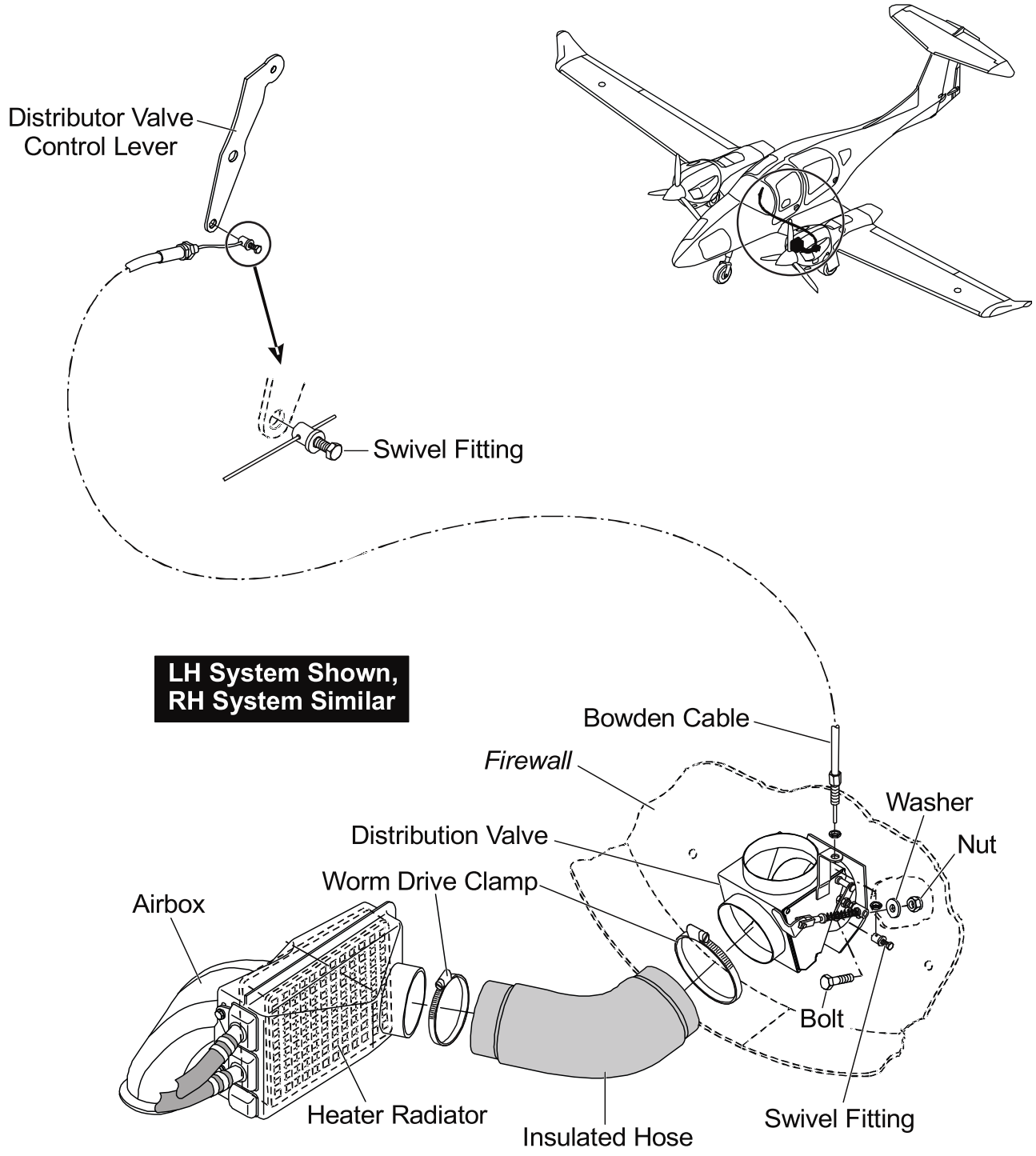

Figure 202 : Heat Exchanger Installation - Sheet 2 of 3

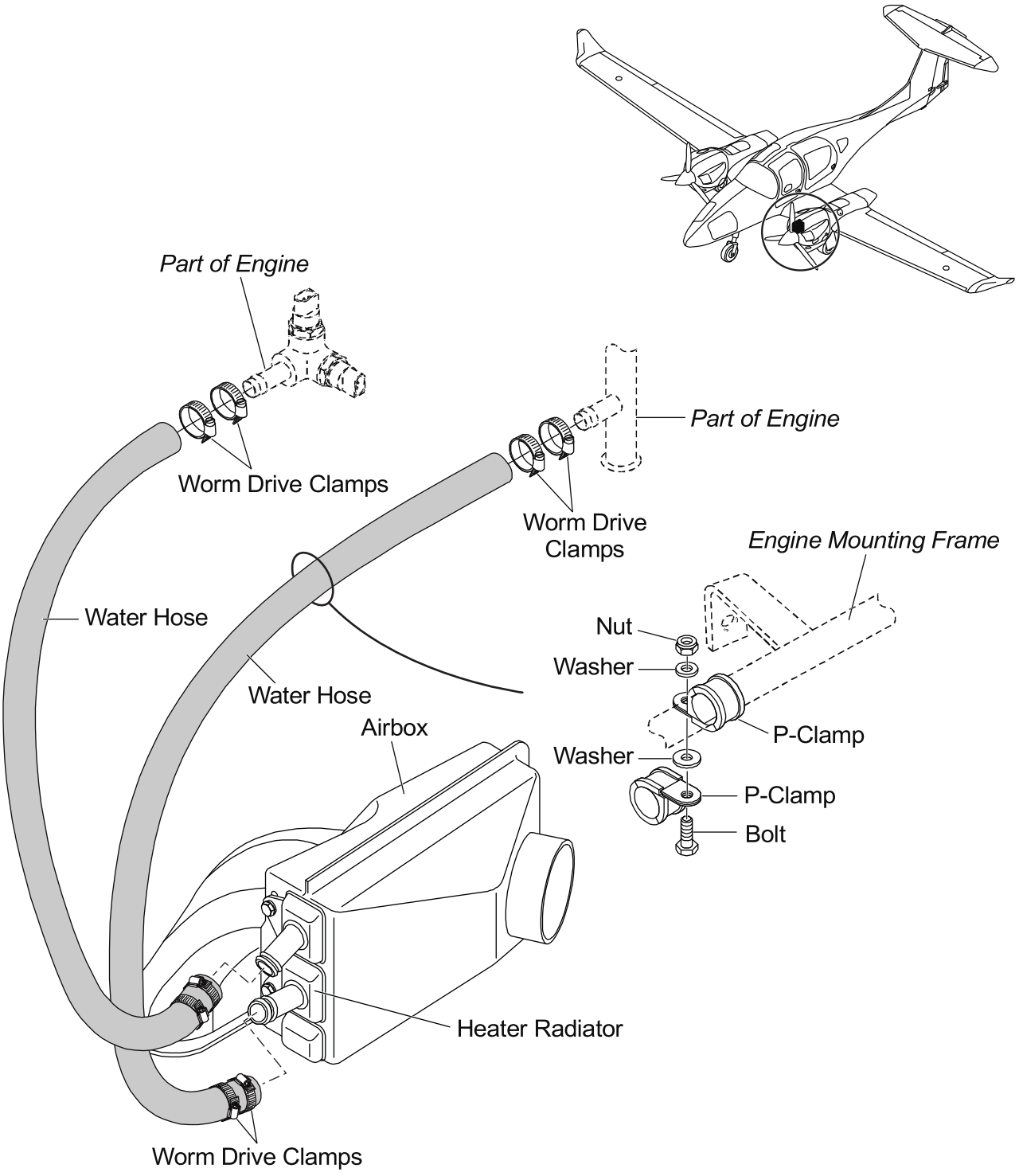

Figure 203 : Heat Exchanger Installation - Sheet 3 of 3

A. Install a Heat Exchanger Assembly

Refer to Figures 201 thru 203..

	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.
(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.

	Detail Steps/Work Items	Key Items/References
(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 (3).	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 62 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 62-005 installed)

1. General

If OÄM 62-005 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, in front of the central headliner device unit).

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.

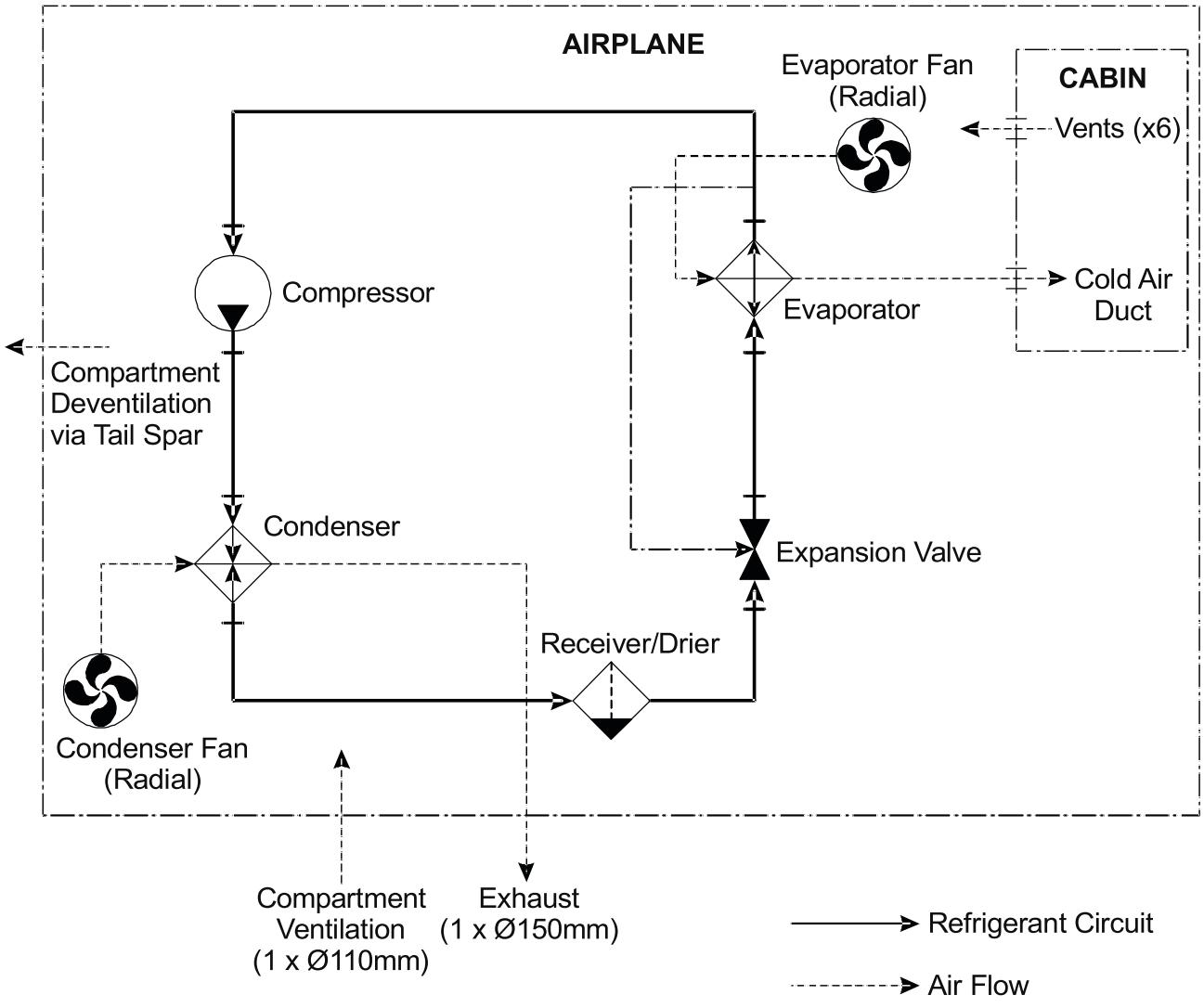

Figure 1 : RACC System Schematic (OÄM 62-005 is installed)

B. Control Panel

The control panel is situated in front of the central headliner device unit 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.

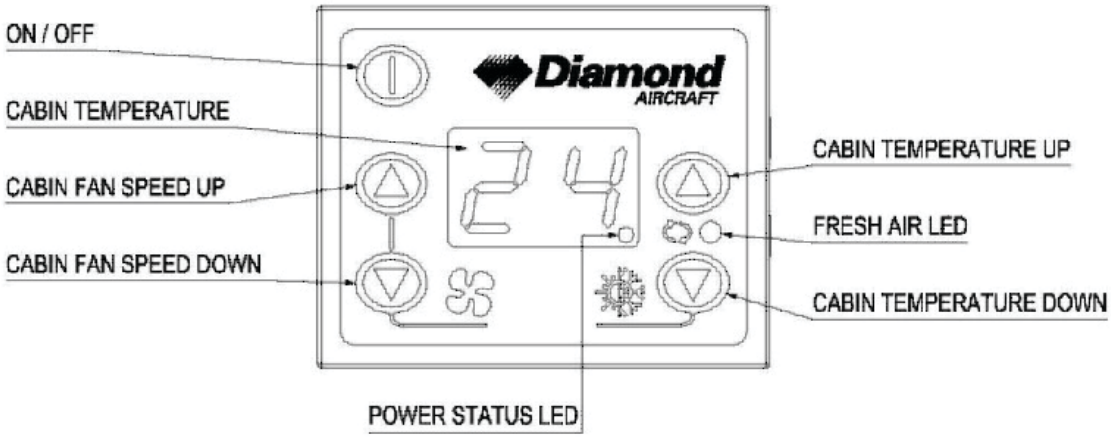

Figure 2 : RACC Control Panel (OÄM 62-005 is installed)

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 front of the central headliner device unit 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 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 front of the central headliner device unit. 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.	Set.
	Additional alternator defective.	Check RACC power supply of the airplane.
Central unit does not power up.	Control panel defective.	Replace.
	Electrical control unit defective.	Replace.
Insufficient cooling.	Hot air outlet on fuselage bottom 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.
	Electrical power source insufficient.	Check ground power source respective RACC power supply of the airplane.
	Filter/dryer assembly inoperative.	Replace filter/dryer assembly

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Maintenance Practices

1. **Remove/Install the Central Unit**

Refer to Figures 201, 202 and 203.

A. Remove the Central Unit.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the passenger seats.	Refer to Section 25-10.
(2)	Remove the baggage rear cover.	Refer to Section 25-10.
(3)	Remove the flexible air hoses from the RACC central unit: - Flexible cold air hoses. - Flexible hot air hose.	
(4)	Remove the hot exhaust air duct from the RACC central unit.	
(5)	Unplug the electrical connections from the RACC central unit to: - Two heavy connectors at the RACC central unit terminal board (LH). - One plug coming from the RACC control panel.	
(6)	Remove the drain hose from the RACC central unit: - Evaporator drain hose.	
(7)	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.	
(8)	Slide the RACC central unit forward.	
(9)	Lift the RACC central unit clear of the airplane.	

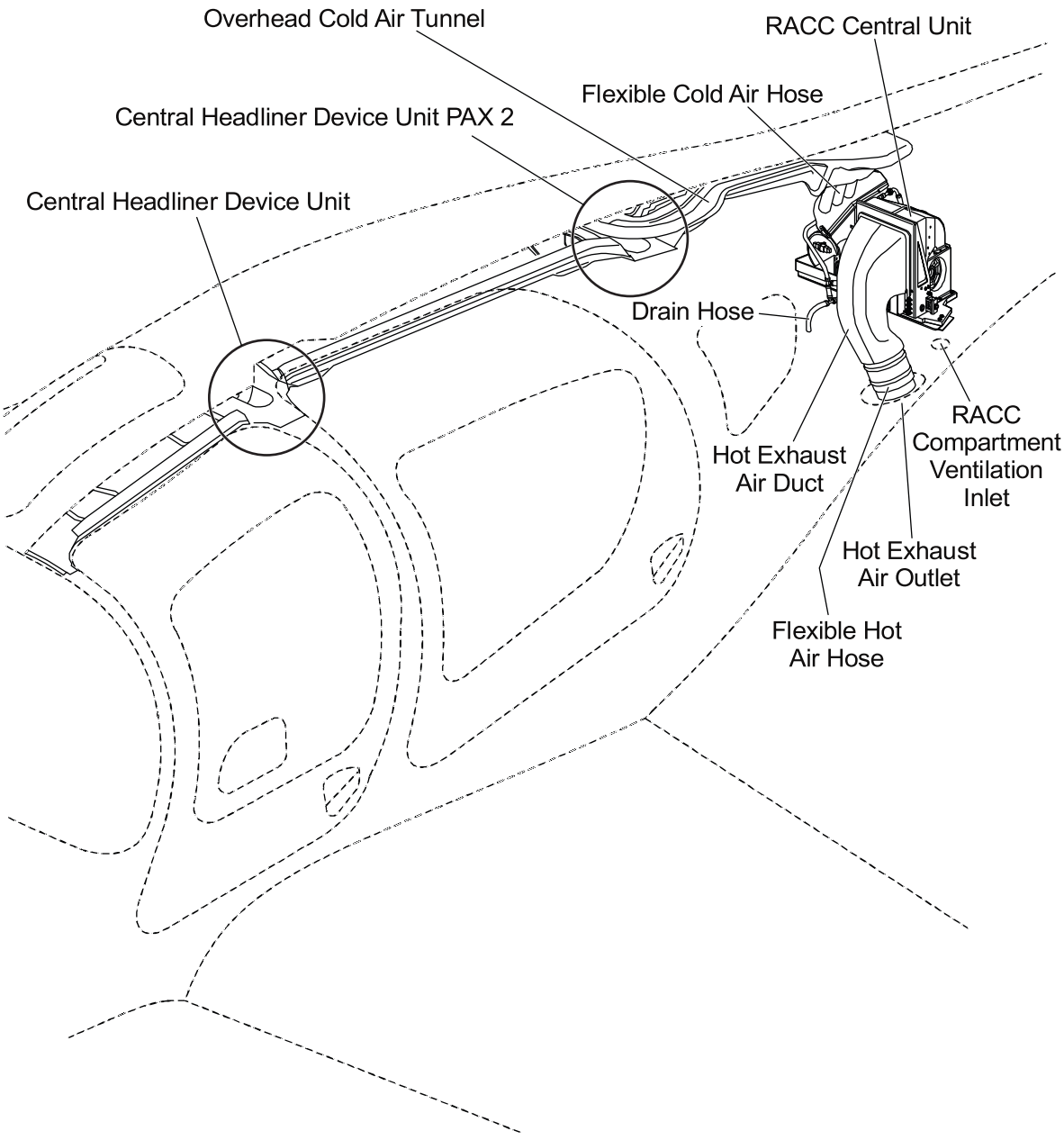

Figure 201 : RACC Central Unit Installation (if OÄM 62-005 is installed)

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 drain hose to the RACC central unit: - Evaporator drain hose.	
(5)	Connect the electric cables to the RACC central unit to: - Two heavy connectors of the RACC central unit terminal board (LH). - One plug coming from control panel.	
(6)	Install the hot exhaust air duct to the RACC central unit.	
(7)	Install the flexible air hoses to the RACC central unit: - Flexible cold air hoses. - Flexible hot air hose.	
(8)	Install the baggage rear cover.	Refer to Section 25-10.
(9)	Bring the passenger seats into upright position.	Refer to Section 25-10.
(10)	Perform a cooling test of the RACC system.	

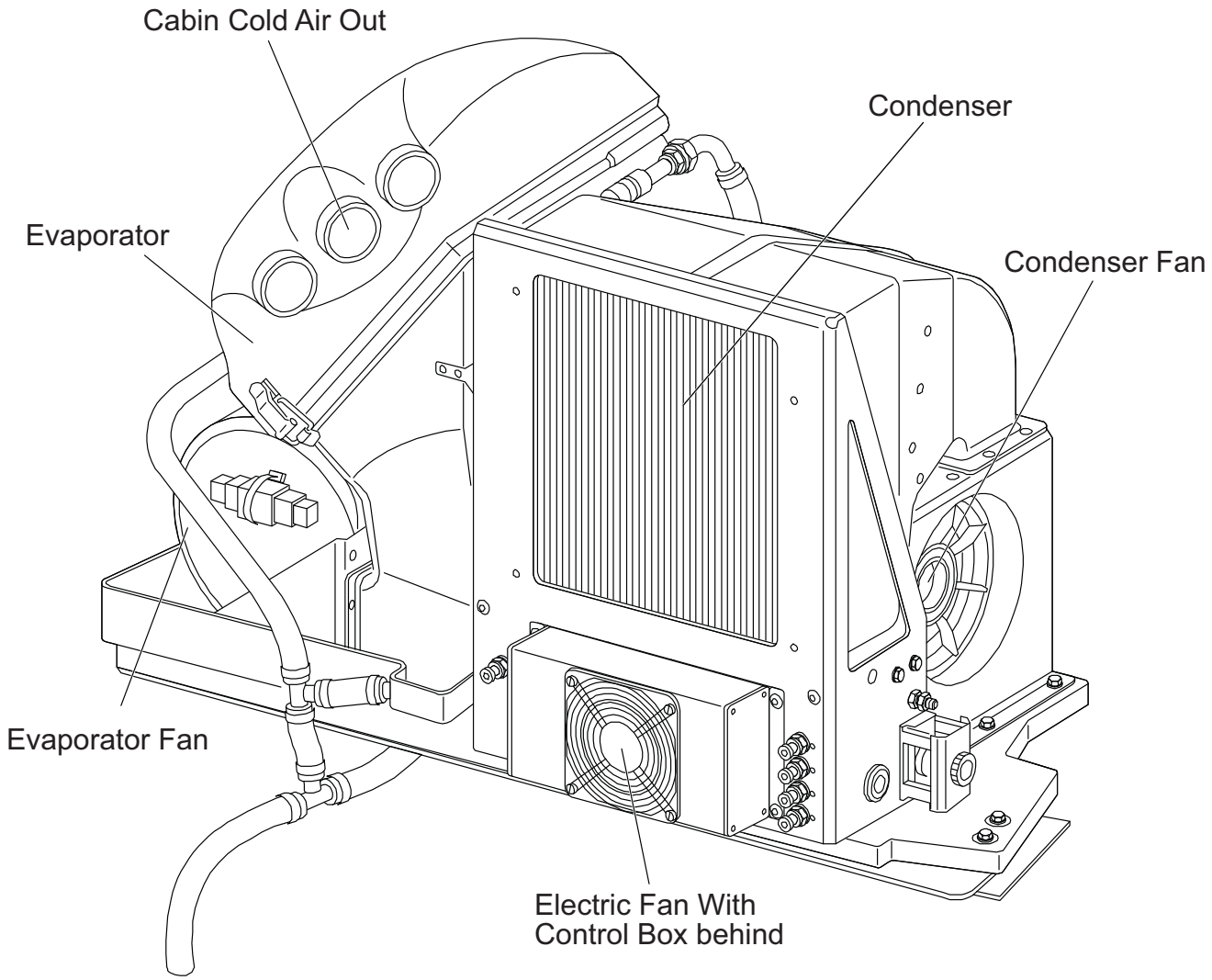

Figure 202 : Central Unit - Front and LH Side (if OÄM 62-005 is installed)

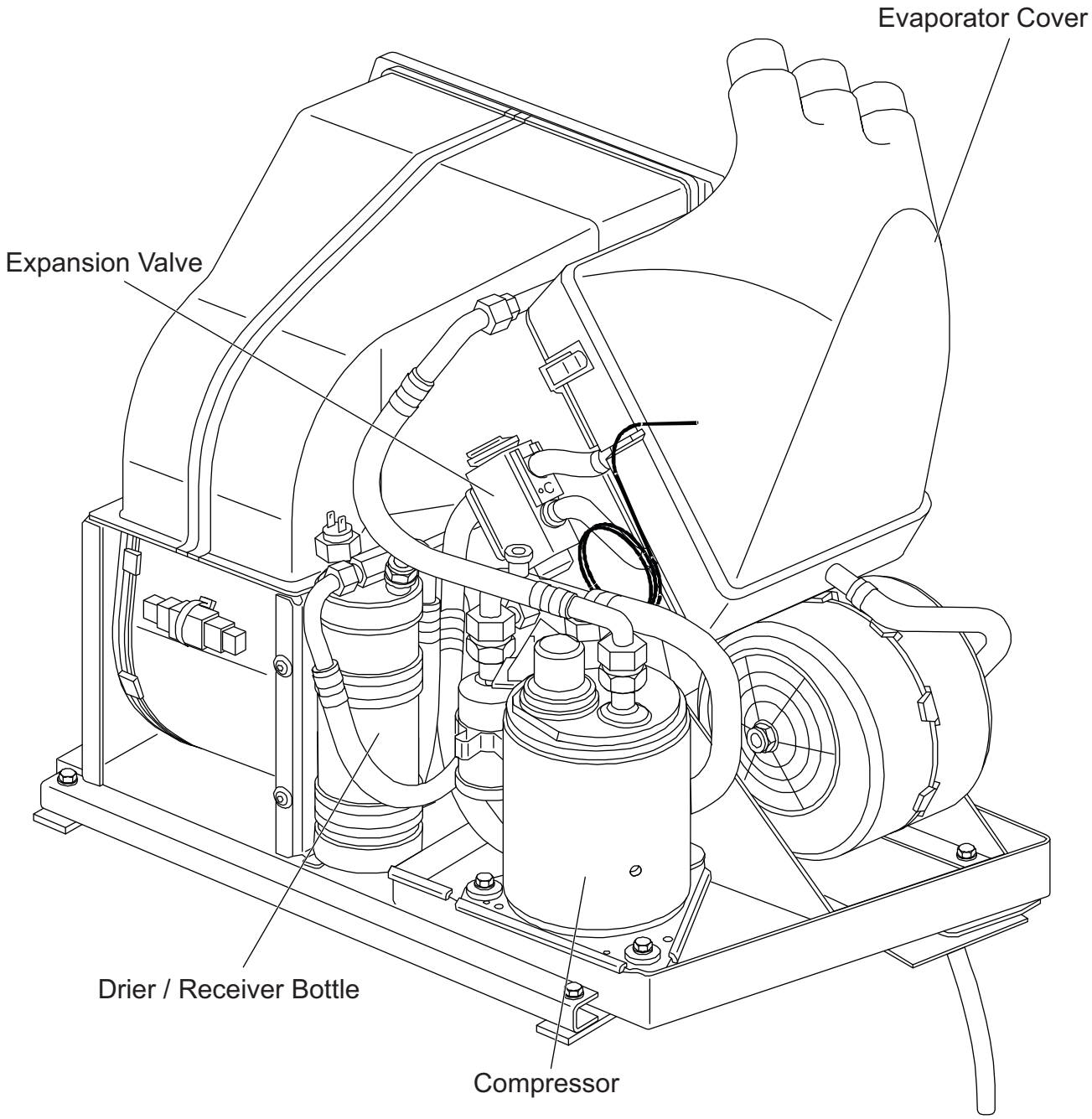

Figure 203 : Central Unit Back and RH Side (if OÄM 62-005 is installed)

2. **Remove/Install the RACC Control Panel**

Refer to Figure 2 in 21-50-00, Description and Operation.

A. Remove the RACC Control Panel.

	Detail Steps/Work Items	Key Items/References
(1)	Unscrew the overhead mounting plate of RACC control panel. (in front of central headliner device unit).	
(2)	Unplug the electrical connectors of the control panel.	
(3)	Unclip the RACC control panel from the mounting plate.	

B. Install the RACC Control Panel**.**

	Detail Steps/Work Items	Key Items/References
(1)	Move the RACC control panel in position on the mounting plate.	
(2)	Push the RACC control panel into the mounting plate until the clips hold the panel in place.	
(3)	Connect the electrical connectors to the control panel.	
(4)	Screw the overhead mounting plate with the RACC control panel into the ceiling. (In front of central headliner device unit.	
(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 DOWNbutton 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 one 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 assembly is not sealed, Diamond Aircraft recommends to replace the filter/dryer assembly with a new one.

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 with R134a (500 g ± 25 g) 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.A.(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.B.
(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/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

Refer to Figure 203.

(1) Remove the Compressor.

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4.A.(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.	
(6)	Remove the compressor from the airplane.	

(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 4.A.(3).
(6)	Perform a leakage check.	Refer to Paragraph 4.A.(4).

C. Remove/Install the Filter/Drier Assembly

Refer to Figure 203.

(1) Remove the Filter/Drier Assembly.

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4.A.(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.	
(6)	Remove the filter/drier assembly from the airplane.	

(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 and replace O-rings of circuit-hoses.
(4)	Connect the electrical connectors to the pressure sensor.	
(5)	Charge the refrigerant circuit.	Refer to Paragraph 4.A.(3).
(6)	Perform a leakage check.	Refer to Paragraph 4.A.(4).

D. Remove/Install the Expansion Valve

Refer to Figure 203.

(1) Remove the Expansion Valve.

	Detail Steps/Work Items	Key Items/References
(1)	Discharge the refrigerant circuit.	Refer to Paragraph 4.A.(2).
(2)	Open latches of evaporator cover and remove cover.	
(3)	Remove evaporator from the 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.	
(7)	Remove the expansion valve from the airplane.	

(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 4.A.(3).
(7)	Perform a leakage check.	Refer to Paragraph 4.A.(4).

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Section 21-60

Temperature Control

1. General

The DA 62 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.

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.

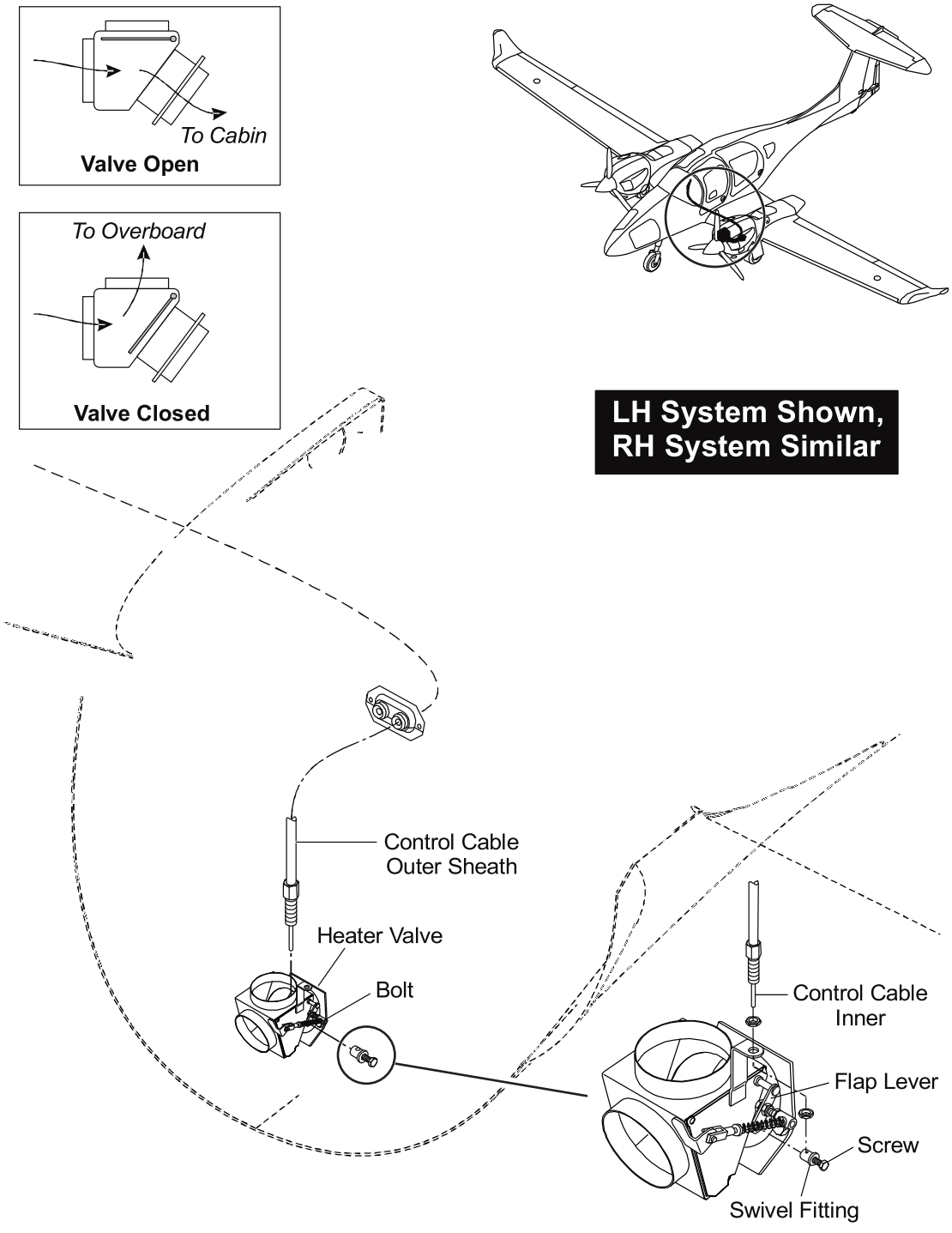

Figure 1 : Heater Valve Assembly

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 assembly.

2. **Remove/Install a Heater Valve Assembly**

Use these procedures for both the left and right heater valve assemblies.

A. Remove a Heater Valve Assembly

Refer to Figure 201.

	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 assembly.	Refer to Section 71-10.
(3)	Remove the flexible hose that attaches the heater valve assembly to the heat exchanger: - Remove the worm-drive-clamp that holds the hose to the valve inlet. - Remove the hose from the valve inlet.	
(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.	

	Detail Steps/Work Items	Key Items/References
(5)	Remove the flexible hose that attaches the heater valve assembly 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 two nuts, washers and bolts that attach the heater valve assembly to the engine firewall. - Move the heater valve assembly clear of the engine nacelle. - Remove the heater valve assembly from the airplane.	

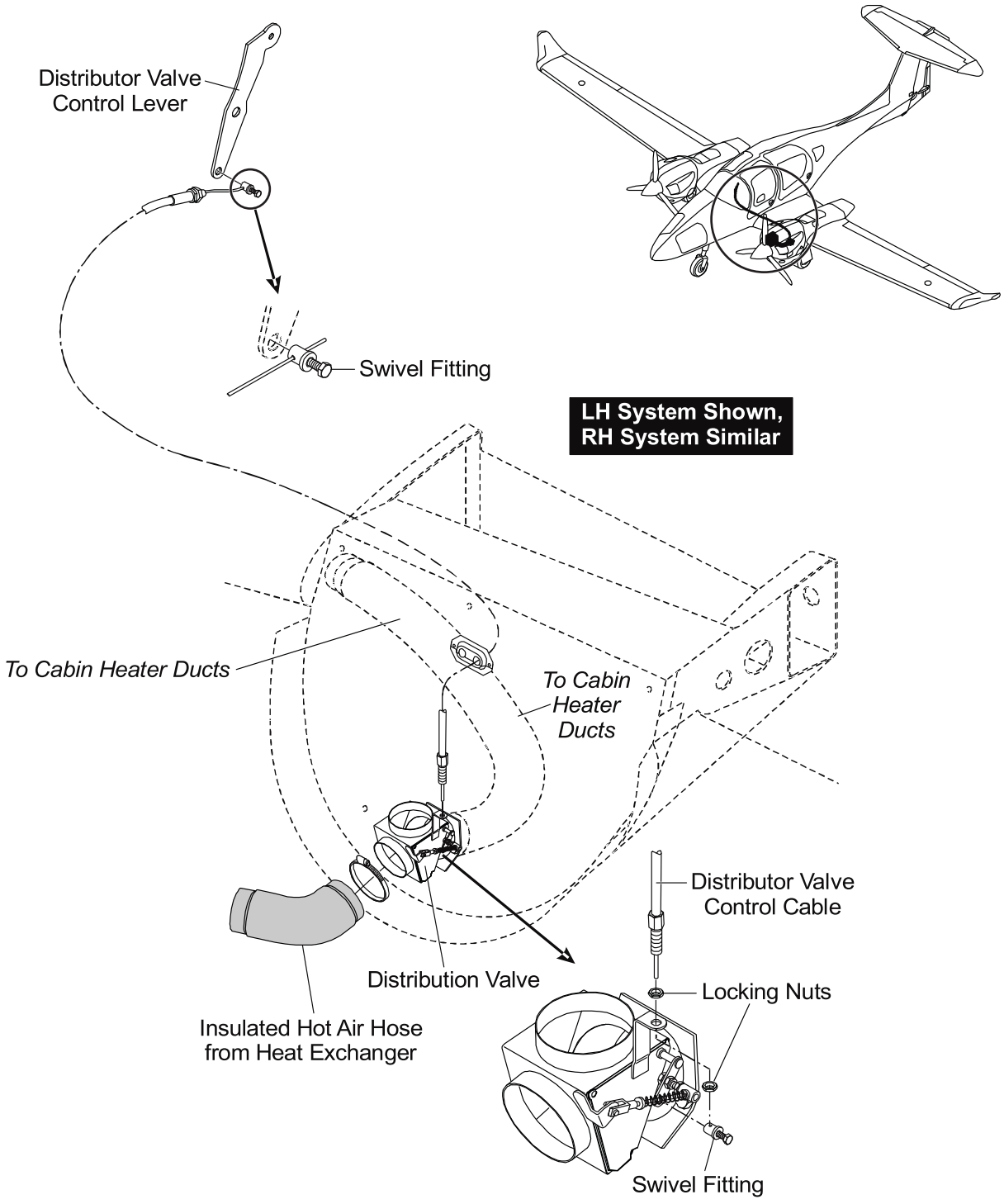

Figure 201 : Heater Valve Assembly Installation

B. Install a Heater Valve Assembly

Refer to Figure 201.

	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 two 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 62 Airplane Flight Manual.

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CHAPTER 22
AUTO FLIGHT

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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 62 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 62 airplane

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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 62.

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.

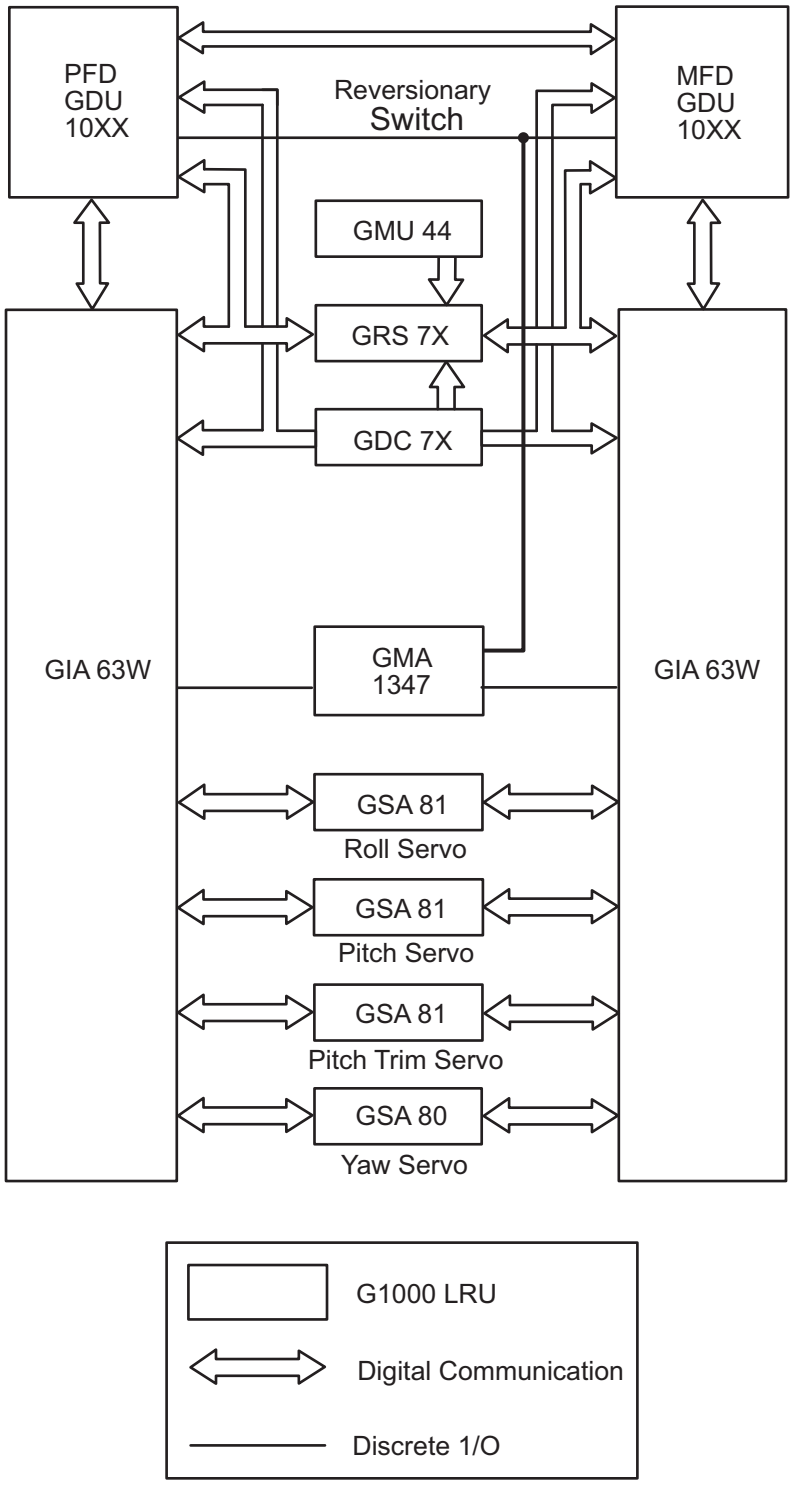


Figure 1 : GFC 700 Autopilot Schematic Diagram

A. GFC 700 Flight Control

For details about operation and the indications concerning GFC 700 functions refer to Garmin DA 62 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

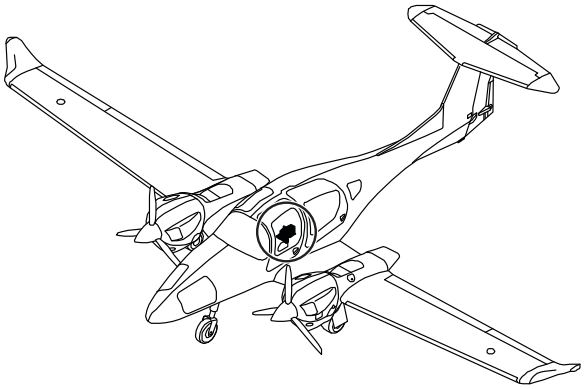
The pitch servo is located aft of the baggage compartment frame. It is mounted on a mounting plate which is made from sheet aluminum. Two aluminum clamps connect a bridle cable to the elevator push-rod.

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 aft of the baggage compartment frame. 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.



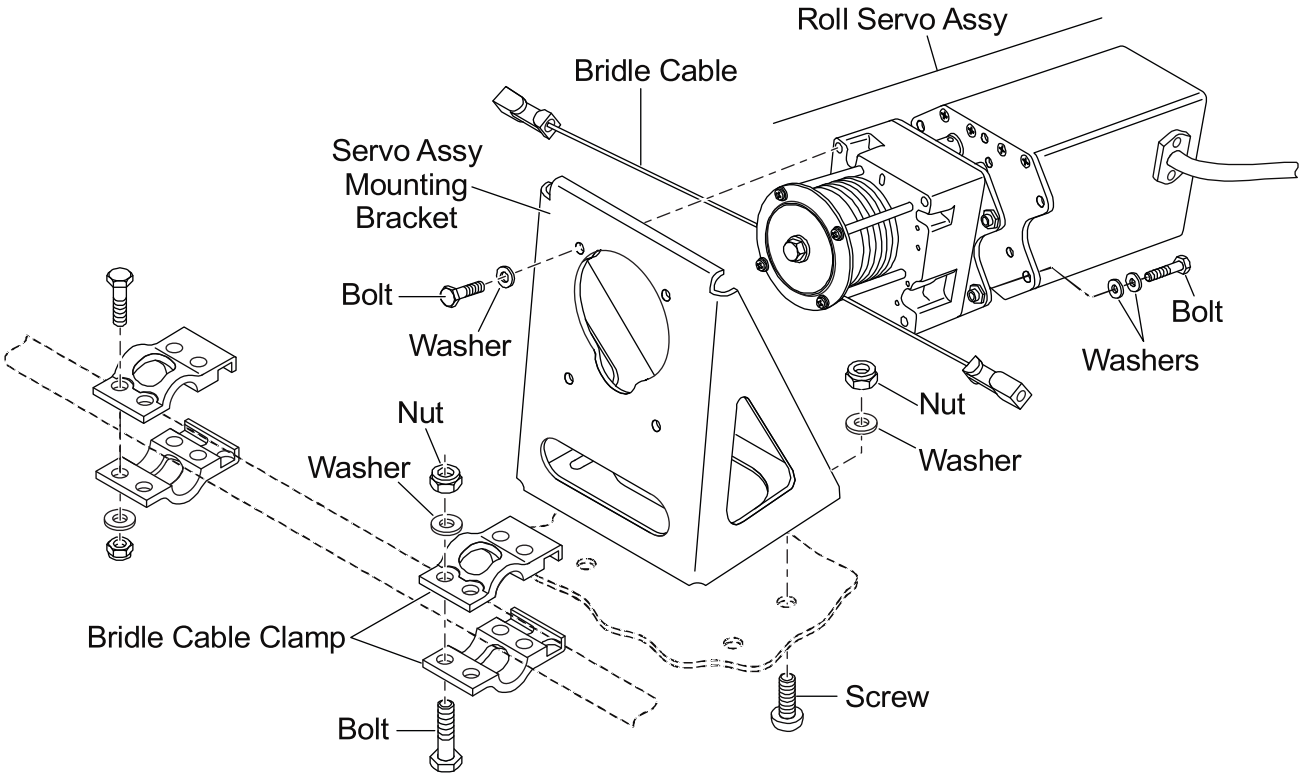


Figure 2 : Roll Servo Installation

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

Refer to Figure 2. (22-10-00 Page 4).

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 four mounting screws which attach the servo to the clutch.	Hold the servo.
(4)	Remove the servo from 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 four mounting screws which attach the servo to the mounting plate and 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 the self-test of the flight control computer. - Set AV. MASTER switch to OFF. - Set ELECT. MASTER key 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**

Refer to Figure 2. (22-10-00 Page 4).

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.A.
(2)	Release the clamps which connect the bridle cable to the aileron push-rod.	
(3)	Remove the cable guard.	
(4)	Remove the four screws which attach the clutch to the mounting plate.	Hold the clutch.
(5)	Remove the clutch from 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 four 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 upper most 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 the 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 the 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 lb). 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.B.

4. **Remove/Install the Pitch Servo**

Refer to Figure 201.

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.	
(2)	Disconnect the connector from the servo.	
(3)	Remove the four mounting screws which attach the servo to the clutch.	Hold the servo.
(4)	Remove the servo from 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 four mounting screws 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 the self-test of the flight control computer. - Set AV. MASTER switch to OFF. - Set ELECT. MASTER key switch to OFF.	If no error message appears, then the system is operative.
(5)	Install the trim/cover to the front face of the baggage compartment.	

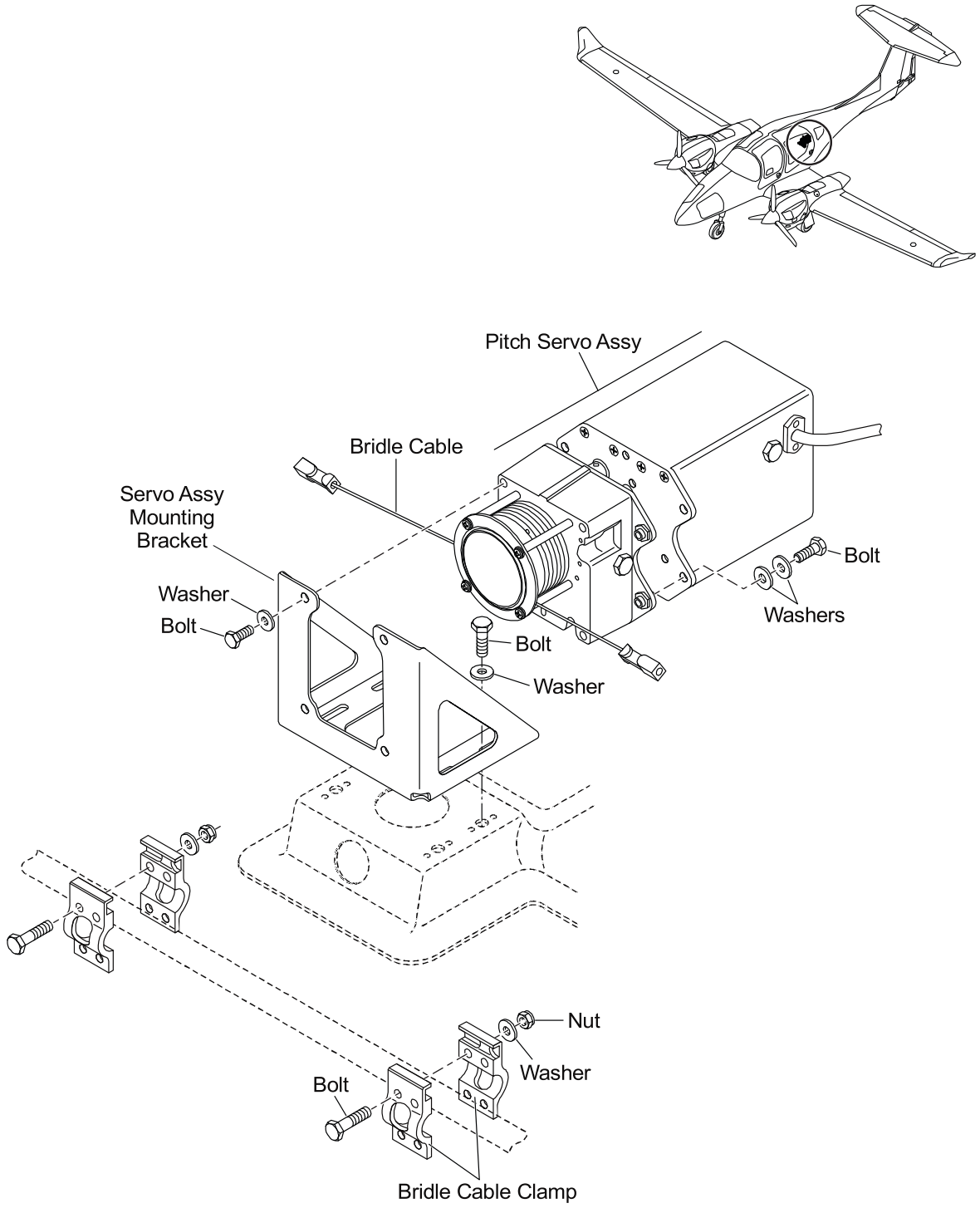


Figure 201 : Pitch Servo Installation

5. **Remove/Install the Pitch Servo Clutch**

Refer to Figure 201.

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.A.
(2)	Release the clamps which connect the bridle cable to the elevator push-rod.	
(3)	Remove the cable guard.	
(4)	Remove the four screws which attach the clutch to the mounting plate.	Hold the clutch.
(5)	Remove the pitch servo clutch from the airplane.	

C. Install the Pitch 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 pitch servo clutch in place on the mounting plate.	
(3)	Install the four screws which attach the clutch to the mounting plate.	
(4)	Center the elevator control system with a rigging pin at one control stick.	Refer to Section 27-30.
(5)	Center the capstan.	The recess for the ball in the middle of the bridle cable must be in the under most 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 the 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 elevator push-rod with the clamps.	Tighten the 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 lb). Measure cable tension with the 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 pitch servo.	Refer to Paragraph 4.B.

6. **Remove/Install the Pitch Trim Servo**

Refer to Figure 202.

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 four mounting screws which attach the servo to the clutch.	Hold the servo.
(4)	Remove the servo from 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 four mounting screws 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 the self-test of the flight control computer. - Set AV. MASTER switch to OFF. - Set ELECT. MASTER key 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.

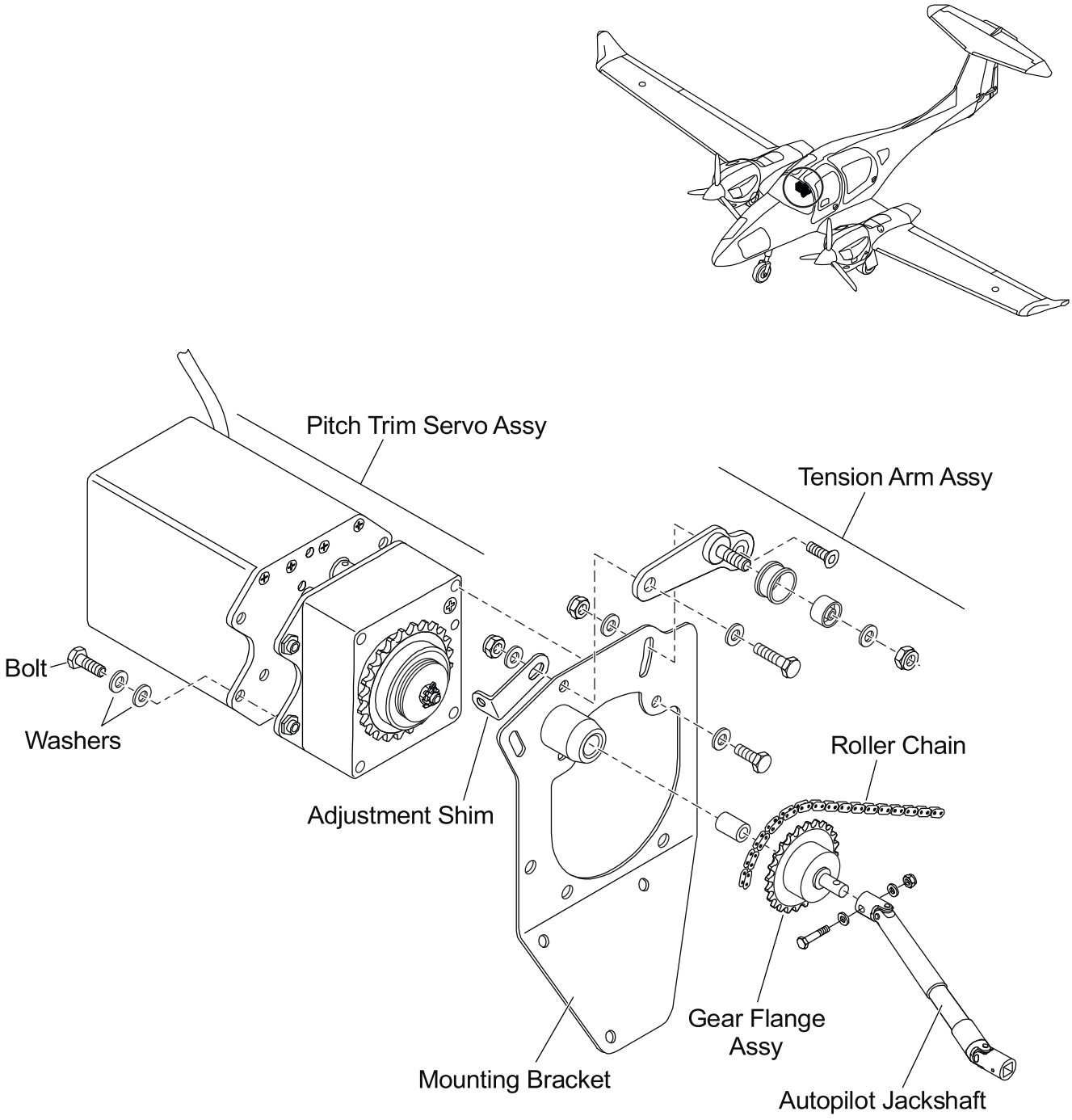


Figure 202 : Pitch Trim Servo Installation

7. **Remove/Install the Pitch Trim Servo Clutch**

Refer to Figure 202.

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.A.
(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 four screws which attach the clutch and the chain adjuster to the mounting plate.	Hold the clutch and the chain adjuster.
(7)	Remove the pitch-trim servo clutch and the chain adjuster from the airplane.	

B. Install the Pitch-Trim Servo Clutch.

	Detail Steps/Work Items	Key Items/References
(1)	Put the pitch-trim servo clutch and the chain adjuster in place on the mounting plate.	
(2)	Install the four 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.B.

8. **Remove/Install the Yaw Servo and Yaw Servo Clutch**

Refer to Figures 203 and 204.

A. Remove the Yaw Servo and Yaw Servo Clutch.

NOTE: The yaw servo and servo clutch are removed together as an assembly.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the trim/cover from the front face of the baggage compartment.	For access to the yaw servo and yaw servo clutch.
(2)	Pull open the AFCS ESP/USP circuit breaker.	Located on the AVIONICS BUS area of the circuit breaker panel.
(3)	Disconnect the electrical connector from the yaw servo.	
(4)	Remove the AP cable connectors: - Remove the bolts, washers and locknuts from the AP cable connectors on both sides of the assembly.	Refer to Figure 203. These cable connectors hold the bridle cables going to the rudder cables.
(5)	Release the bridle cables from the rudder cables.	
(6)	Remove the bridle cable.	From the pulley control bearing and the capstan.
(7)	Remove the pulley control bearings from the upper and lower pulley support: - Remove the bolt, locknut and washers that hold each bearing in place. - Remove the pulley control bearings from the airplane.	Refer to Figure 204.
(8)	Remove the four screw caps and washers that attach the upper pulley support and the lower pulley support to the yaw servo clutch.	
(9)	Remove the upper pulley support from the airplane.	
(10)	Remove the four bolts and washers that attach the yaw servo to the yaw servo clutch and lower pulley support.	Refer to Figure 203. Hold the servo and clutch.
(11)	Remove the yaw servo and yaw servo clutch from the airplane.	The capstan stays attached to the yaw servo clutch.

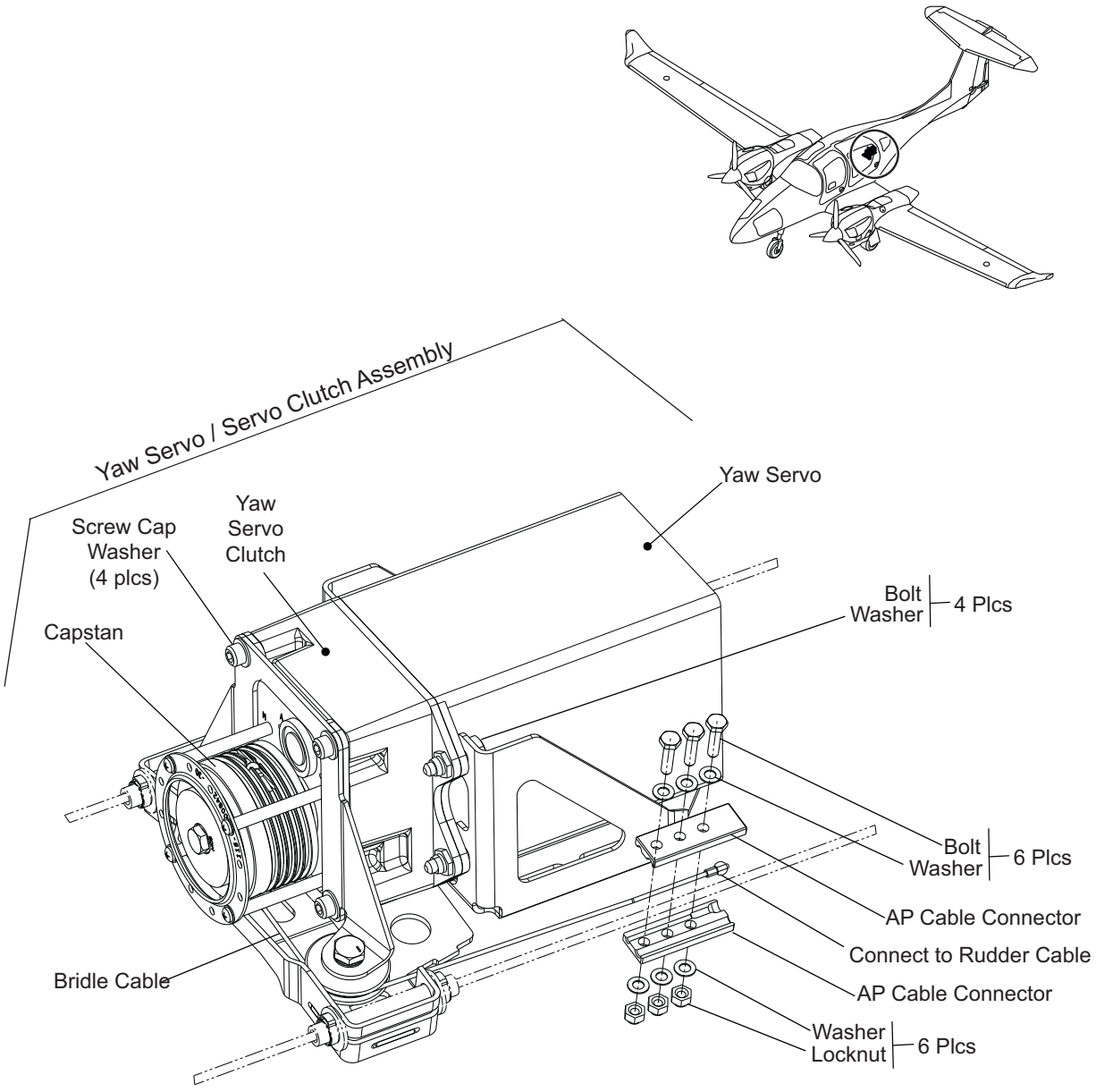


Figure 203 : Yaw Servo/Servo Clutch - Removal/Installation

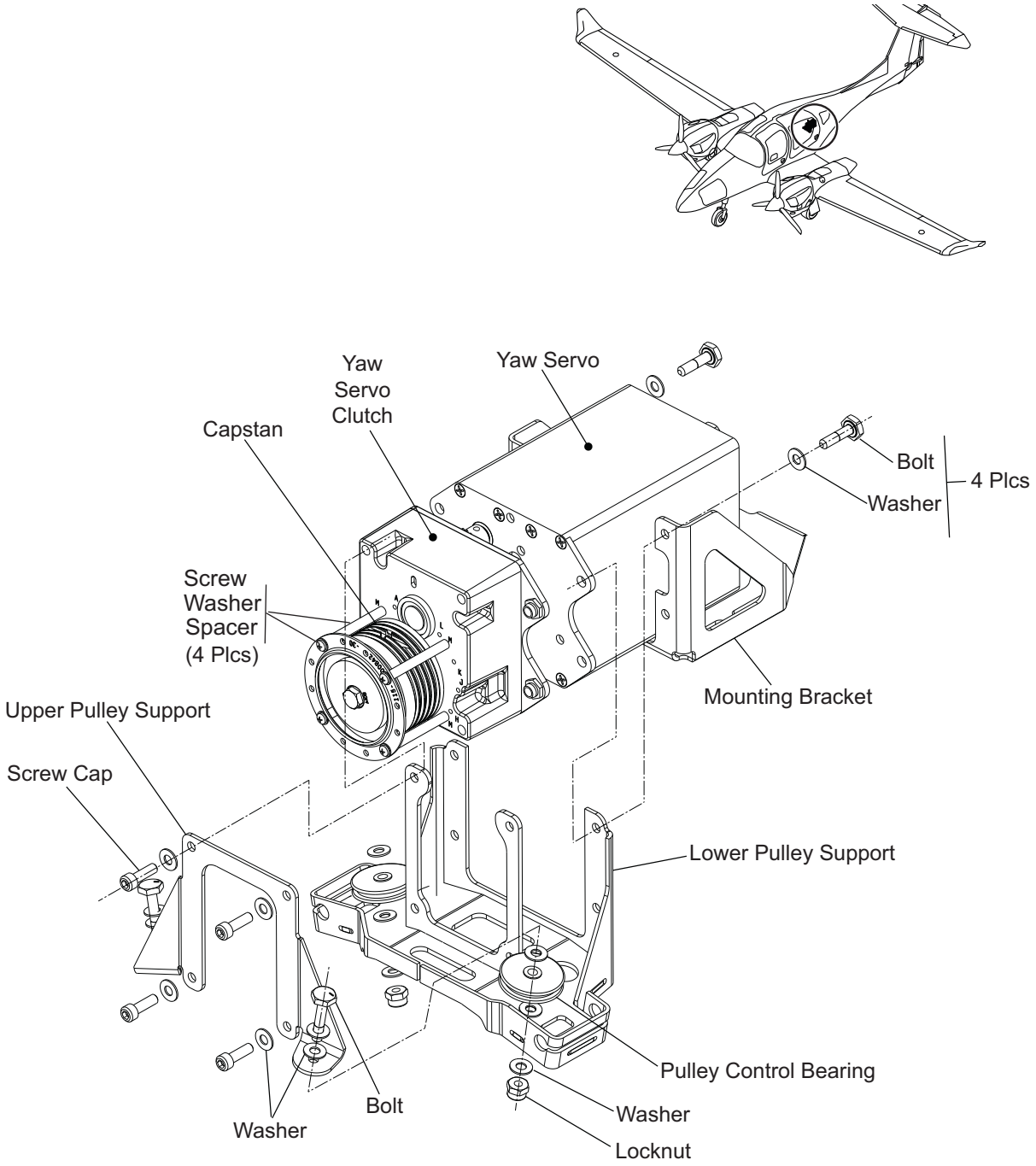


Figure 204 : Yaw Servo/Servo Clutch - Removal/Installation

B. Install the Yaw Servo and Yaw Servo Clutch.

NOTE: The yaw servo and servo clutch are installed together as an assembly.

	Detail Steps/Work Items	Key Items/References
(1)	Install the yaw servo and yaw servo clutch, with capstan, to the lower pulley support and mounting bracket.	
(2)	Install the four bolts and washers that attach the yaw servo to the yaw servo clutch and lower pulley support.	Refer to Figure 203. Torque the bolts to 3.9 ±0.6 Nm (35 ± 5 in.lbs.)
(3)	Install the upper pulley support. - Install the four screw caps and washers that attach the upper pulley support and the lower pulley support to the yaw servo clutch.	Torque the screw caps to 3.9 ± 0.6 Nm (35 ± 5 in.lbs.)
(4)	Install the pulley control bearings to the upper and lower pulley support: - Install the bolt, locknut and washers that hold each bearing in place.	Refer to Figure 204. Torque the bolts to 3.9 ± 0.6 Nm (35 ± 5 in.lbs.)
(5)	Center the capstan.	The recess for the ball in the middle of the bridle cable must be in the center up position.
(6)	Install the bridle cable around the pulley control bearings and to the capstan.	The ball in the middle of the bridle cable must engage in the recess on the capstan. Wrap the bridle cable around the capstan 1.5 turns to each side.
(7)	Put in place and install the AP cable connectors: - Install the bolts, washers and locknuts to the AP cable connectors on both sides of the assembly.	Refer to Figure 203. Use Loctite 222 (or equivalent) on all threads. Torque the bolts to 0.67 ±0.06 Nm (6 ± 0.5 in.lbs.)
(8)	Adjust the bridle cable tension.	Refer to Para 9.
(9)	Connect the electrical connector to the yaw servo.	
(10)	Close the AFCS ESP/USP circuit breaker.	

	Detail Steps/Work Items	Key Items/References
(11)	Do a test of the autopilot system: - Set ELECT. MASTER switch to ON. - Set AV. MASTER switch to ON. - Observe the self-test of the flight control computer. - Set AV. MASTER switch to OFF. - Set ELECT. MASTER key switch to OFF.	If no error message appears, then the system is operative.
(12)	Check all flight controls in working area for a minimum of 3 mm (0.12 in) clearance.	
(13)	Check if the rudder is in the neutral position, and the capstan ball cut-out is in the center up position.	
(14)	Install the trim/cover to the front face of the baggage compartment.	

9. **Adjust the Bridle Cable Tension of the Yaw Servo**

A. Equipment:

Item	Quantity	Part Number
Cable tension gauge.	1	Commercial

B. Adjustment Procedure.

Refer to Figure 205.

	Detail Steps/Work Items	Key Items/References
(1)	Center the rudder.	Pin the control wheel below the center console and block the aft rudder control assembly.
(2)	Loosen the four bolts which secure the mounting bracket to the floor.	
(3)	Loosen the bolt at the rear of the mounting bracket.	
(4)	Move the yaw servo/servo clutch assembly as far aft as possible.	
(5)	Attach the autopilot cable connectors to the bridle cables and the rudder cables.	
(6)	Set the bridle cable tension to 156 ± 22N (35 ± 5 lbf.)	Tension the bridle cables by adjusting the bolt at the rear of the mounting bracket. Tensioning will also increase the tension of the rudder cables aft of the yaw servo assembly.
(7)	Check the tension of the rudder cables aft of the yaw servo assembly.	Repeat steps 6 and 7 until the tension of the bridle cable and rudder cables are within limits.
(8)	Tighten the four bolts which secure the mounting bracket to the floor.	Torque to 6.8 ± 0.6 Nm (60 ± 5 in.lbs.)
(9)	Free the rudder controls.	
(10)	Make sure the clamps are 91 to 95 mm (3.6 to 3.7 in.) from the aft face of the lower pulley support assembly in the neutral position. Make sure the clamps are within 50 to 55 mm (2.0 to 2.2in.) from the aft face of the lower pulley support assembly at full rudder deflection.	Refer to Figure 205.

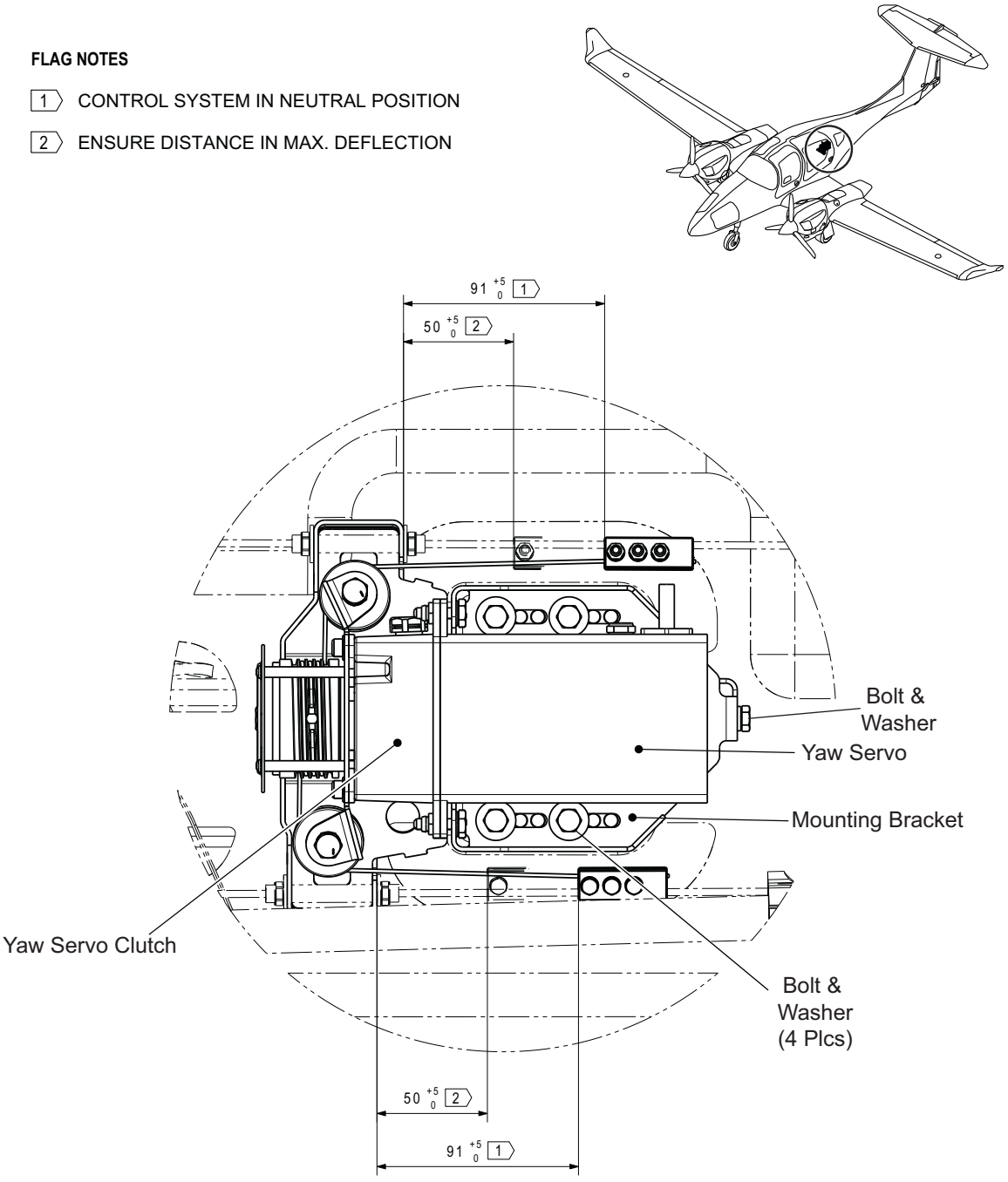


Figure 205 : Yaw Servo - Bridle Cable Tension Adjustment

10. **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 the tension to 156 ± 9 N (35 ± 2 lbf) for the pitch and roll servos. Measure cable tension with the cable tension gauge.
(3)	Tighten the bolts in the clamps which connect the bridle cable to the push-rod.	

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.
(4)	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 5.1 ± 0.7 Nm (45 ± 6 lbf.in.) Pitch servo 6.9 ± 1.0Nm (61 ± 9 lbf.in.) Pitch trim servo 5.1 ± 0.7 Nm (45 ± 6 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 in the airplane.	Refer to this Section.

12. **Mechanical Check of the Autopilot System**

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, Paragraph 8.
(2)	Check bridle cable tension for the pitch servo, adjust if necessary.	Refer to this Section, Paragraph 8.
(3)	Perform a slip clutch override procedure.	Refer to this Section, Paragraph 11.

13. **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.	

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CHAPTER 23
COMMUNICATIONS

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CHAPTER 23

COMMUNICATIONS

1. General

This Chapter tells you about the communications system in the DA 62 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 62 communication system has these components:

- GMA 13XX audio panel
- NAV/COM transceivers (integral with the Garmin GIA 6X W integrated avionics units).
- COM VHF antennas.
- NAV antenna 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 center console for both the pilots and the passengers on seat row 1. If OÄM 62-019 is installed, the headset sockets for passengers on seat row 2 are located on the LH/RH side of the fuselage. As the audio panel is limited to a maximum of 6 microphones, a switch is optionally installed, swapping the 6th microphone input between the 1st row middle seat and the 2nd row right seat. The headset phones are not affected by the switch.
- GSR 56 satellite transceiver (if OÄM 62-015 is installed).
- Iridium antenna (if OÄM 62-015 is installed).
- GDL 69A datalink (if OÄM 62-1001 is installed.

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Section 23-10

Speech Communications

1. **General**

This Section tells you about the speech communication system in the DA 62. 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.

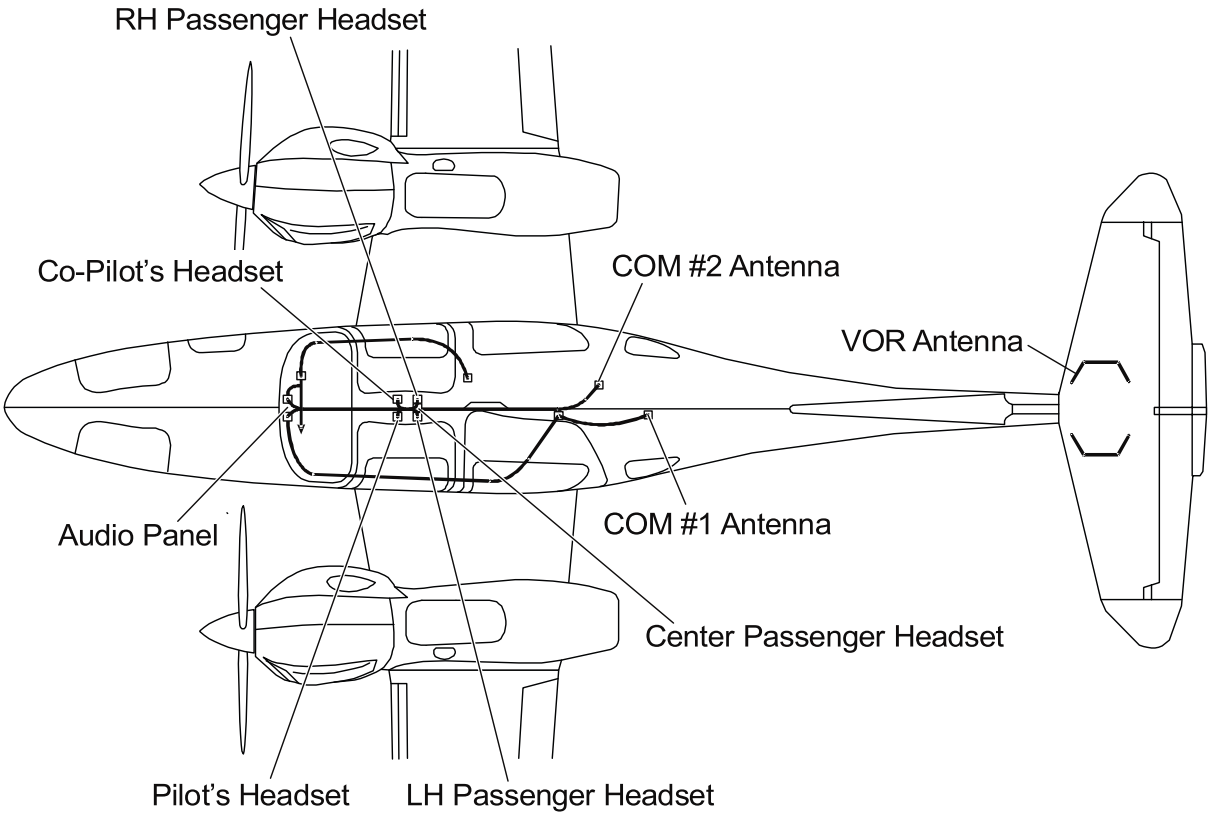

Figure 1 : Speech Communication System - Main Components

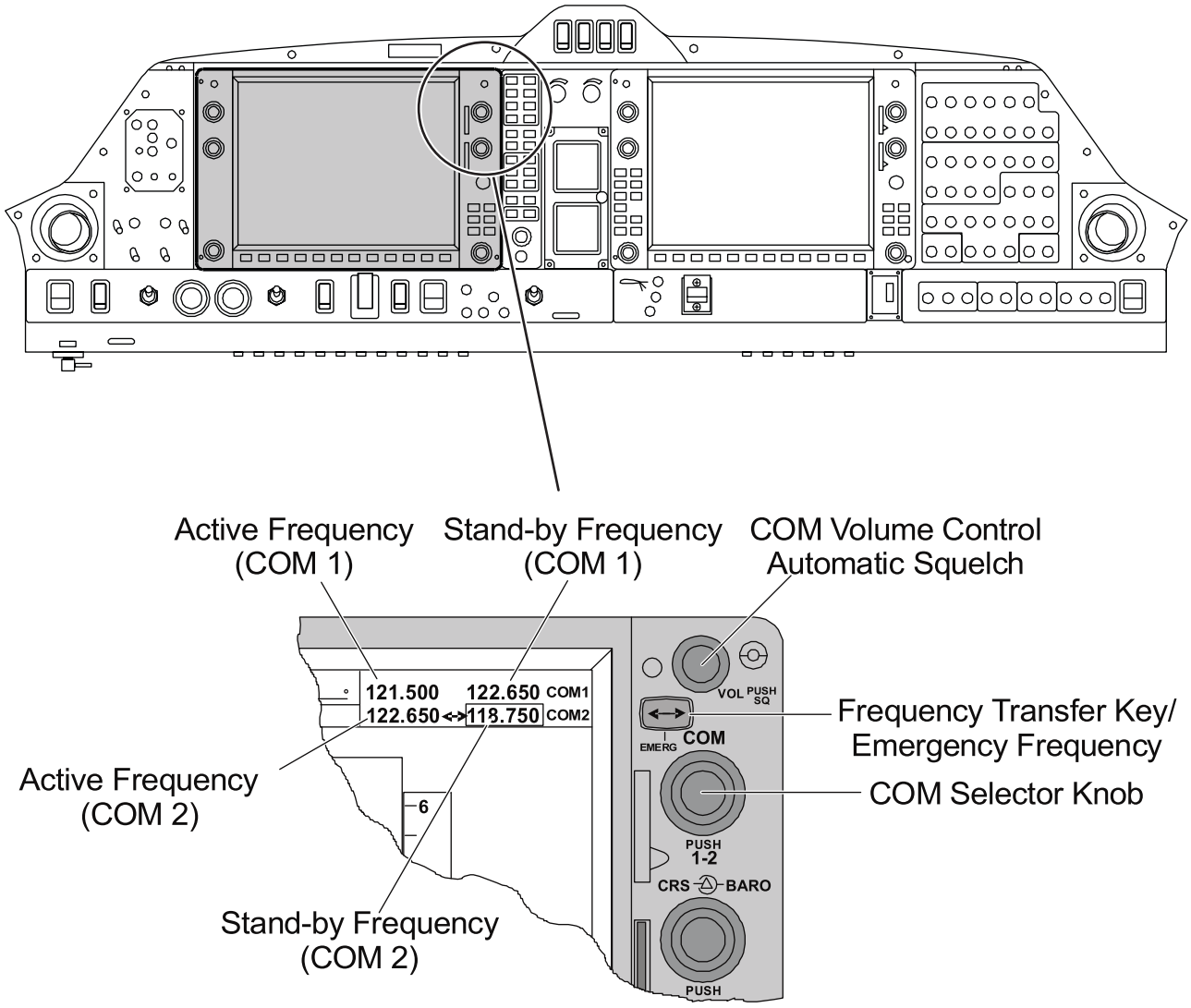

Figure 2 : Garmin G1000 Primary Flight Display Panel

2. Description

The DA 62 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 forward 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 G1000 ICS.

Figure 2 shows the Garmin G1000 primary flight display (PFD). The speech communication system is integral with the Garmin G1000 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 over-ride 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 62. Both speech and navigational audio can be sent to the pilots' or passengers' headphones. 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.	Replace the defective mic.
	Faulty related GIA 6X W IAU.	Replace the related GIA 6X W IAU.
Radio check reports readability poor, strength good.	Faulty related GIA 6X W IAU.	Replace the related GIA 6X W IAU.
	Faulty mic.	Replace the mic.
Radio check reports readability poor, strength poor on COM 1/ COM 2.	Coaxial cable connector faulty.	Examine the coaxial cable and connections for condition and security.
Received audio is poor.	Faulty related GIA 6X W IAU.	Replace the related GIA 6X W IAU
	Faulty antenna.	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.	Refer to Section 23-50.
	Related headset defective.	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 the 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)	Identify the antenna that you will replace.	Lower antenna COM 2, top antenna COM 1.
(2)	Remove the maintenance access cover of the rear door for the COM 1 antenna.	Refer to Section 52-10
(3)	Remove the aft baggage compartment frame for the COM 2 antenna.	Refer to Section 25-10.
(4)	Disconnect the coaxial cable from the antenna.	At the bayonet connector.
(5)	Remove the antenna: - Remove the four 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 four 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 frame or maintenance access cover.	Refer to Section 25-10.
(6)	Seal the outer edge of the antenna to the fuselage skin with sealant.	Use Dow Corning 732 RTV. Follow the sealant manufacturer’s instructions.

3. **Remove/Install a Press to Talk (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 ELEC. MASTER key 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 23-13

Satellite Transceiver System (if OÄM 62-015 is installed)

1. **General**

This Section tells you about the satellite transceiver system that can be installed in the DA 62. 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 in the avionic bay. 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 6X W. 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 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 avionic bay cover.	
(4)	Loosen the lock nut that attaches the transceiver to its mounting tray.	
(5)	Remove the satellite transceiver from the mounting tray and from the airplane.	

B. Install the GSR 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 avionic bay cover.	
(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)	Remove the avionic bay cover.	
(2)	Open the IRIDIUM circuit breaker	
(3)	Disconnect the connector of the Iridium antenna.	At the antenna.
(4)	Remove the antenna: - Remove the four 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 four 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.
(8)	Install the avionic bay cover.	

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)	Make sure that 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 13XX 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 23-15

Datalink System (if OÄM 62-1001 is installed)

1. General

This section tells you about the GDL 69A datalink system that may be installed in the DA 62. The GDL 69A provides real-time weather information, and audio entertainment. The GDL 69A communicates with the MFD via an Ethernet connection. The GDL 69A is located in the avionics bay in the fuselage nose.

Figure 1 shows the installation of the GDL 69A.

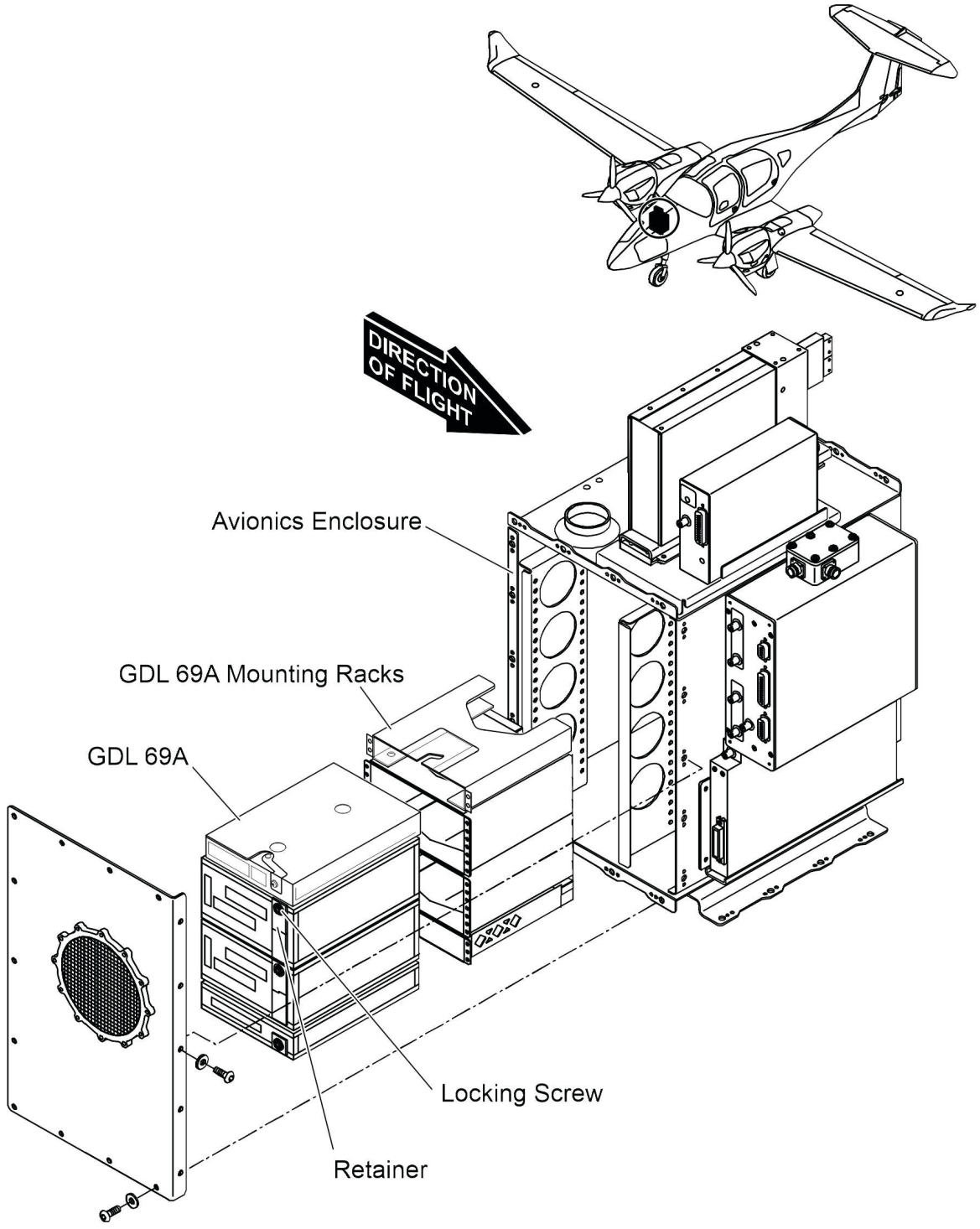

Figure 1 : GDL 69A Installation

Trouble-Shooting

1. **General**

Refer to the G1000 Pilot's Guide for the Diamond DA 62, P/N 190-01895-( ) for the G1000 installation, P/N 190-01904-( ) for the G1000 NXi Phase I installation, P/N 190-02621-( ) for the G1000 NXi Phase II installation.

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Maintenance Practices

1. **General**

The section tells you how to replace the GDL 69A datalink. Refer to the equipment manufacturer's manuals for more data on the GDL 69A.

2. **Remove/Install the GDL 69A**

Refer to Figure 1. (23-15-00 Page 2).

A. Remove the GDL 69A.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Remove the avionic bay cover.	
(3)	Remove the HIRF box cover.	
(4)	Remove the GDL 69A: - Identify the unit that you will remove. - Release the locking screw from the retainer. - Lift the retainer clear of the unit. - Lift the unit clear of the mounting rack and the airplane.	
(5)	Install the protective covers on the rear connectors of the unit.	

B. Install the GDL 69A.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the protective covers from the rear connectors of the unit.	
(2)	Install the GDL 69A: - Move the unit into position at the mounting and insert 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!
(3)	Install the HIRF box cover.	
(4)	Install the avionic bay cover.	

Section 23-50

Audio Integration

1. General

The DA 62 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 (if OÄM 62-025 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.

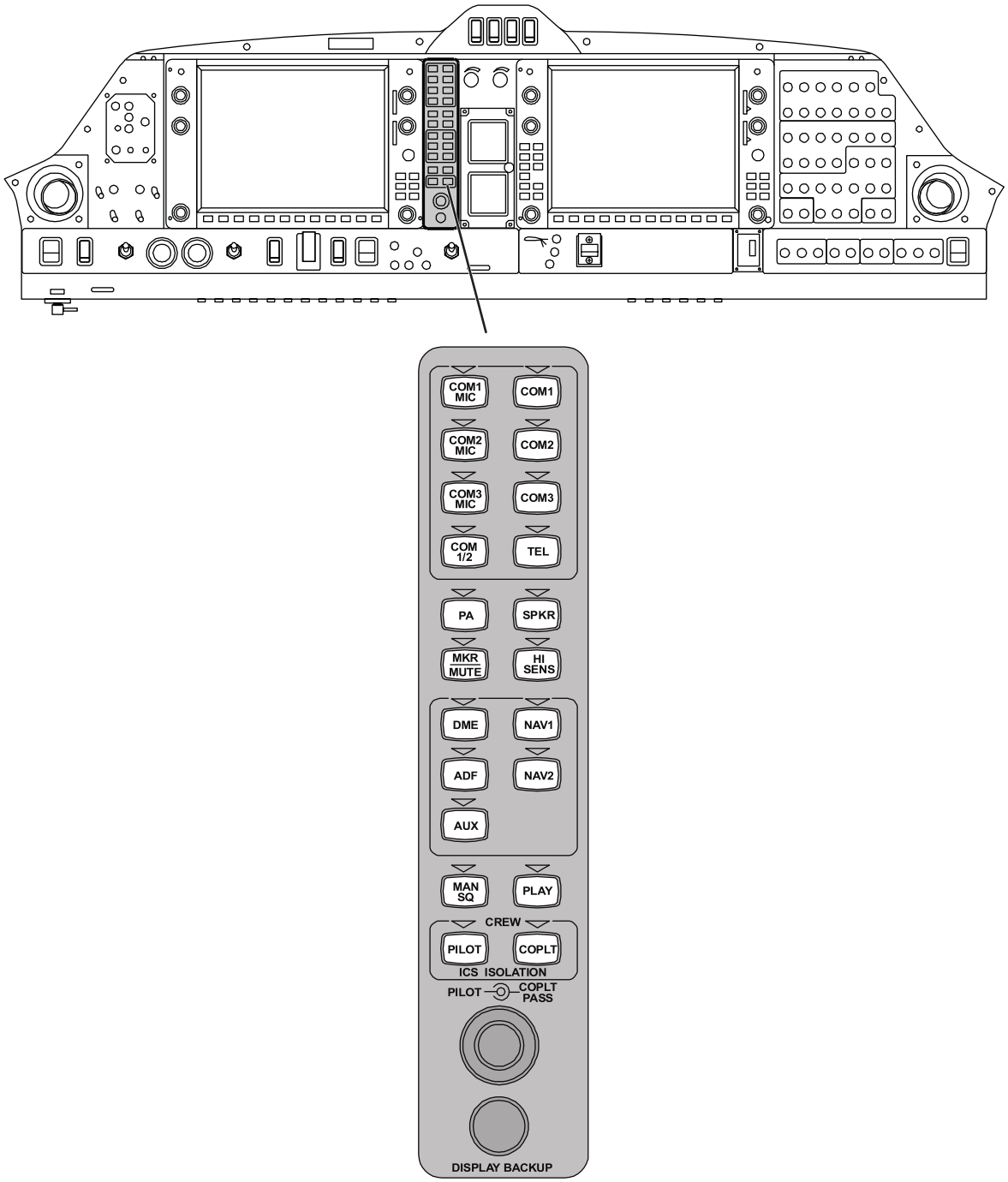

Figure 1 : Audio Control Panel

2. **Description and Operation**

Figure 1 shows the GMA 13XX audio control panel of the DA 62 airplane. The audio control panel is powered with the Garmin G 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.

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 3 MIC key. This key is not active in the DA 62 installation.
- 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.
- COM 3 key. This key is not active in the DA 62 installation.
- TEL key. This key is not active in the DA 62 installation.
- PA key. This key is not active in the DA 62 installation.
- AUX key. This key is not active in the DA 62 installation.
- SPKR key. This key is not active in the DA 62 installation

- 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 CO-PILOT 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 CO-PILOT 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 two 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.

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Trouble-Shooting

1. General

The table below lists the defects you could have with the audio integrating system. Refer to Section 23-10 for Trouble-Shooting the speech communication 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 voice modulation when transmitting from co-pilot's side on head-set. Pilot's side OK.	Faulty head-set. Open mic audio line. Faulty GMA 13XX.	Replace head-set. Do a test of the mic audio wiring. Refer to Chapter 92 for the wiring diagrams. Replace GMA 13XX.
No voice modulation when transmitting from pilot's side on head-set. Co-pilot's side OK.	Faulty head-set. Open mic audio line. Faulty GMA 13XX.	Replace head-set. Do a test of the mic audio wiring. Refer to Chapter 92 for the wiring diagrams. Replace GMA 13XX.
No intercom audio on pilot's head-set. Receives radio transmissions correctly.	ICS mode set incorrectly. Faulty GMA 13XX.	Set mode to required position, refer to Section 23-50 Paragraph 2 Replace the GMA 13XX.
No audio on pilot's head-set with the ICS set to OFF.	Faulty head-set. Open audio line.	Replace head-set. Do a test of the head-set audio wiring. Refer to Chapter 92 for the wiring diagrams.
No audio on co-pilot's or passenger's headsets.	Open audio line. Faulty GMA 13XX.	Do a test of the head-set audio wiring. Refer to Chapter 92 for the wiring diagrams. Replace the GMA 13XX.

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Maintenance Practices

1. **General**

This Section tells you how to remove/install the GMA 13XX 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 13XX Audio Control Panel**

Refer to Figure 1. (23-50-00 Page 2).

A. Remove the GMA 13XX 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 in 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.	

B. Install the GMA 13XX Audio Control Panel

	Detail Steps/Work Items	Key Items/References
(1)	Examine the connectors at the rear of the audio control panel. Look specially for bent or damaged pins.	
(2)	Insert a 3/32 in 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. - Insert a 3/32 in 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 the audio control panel fully engages with the connectors at the rear of the panel. 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 62. 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 62 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 62 airplane.

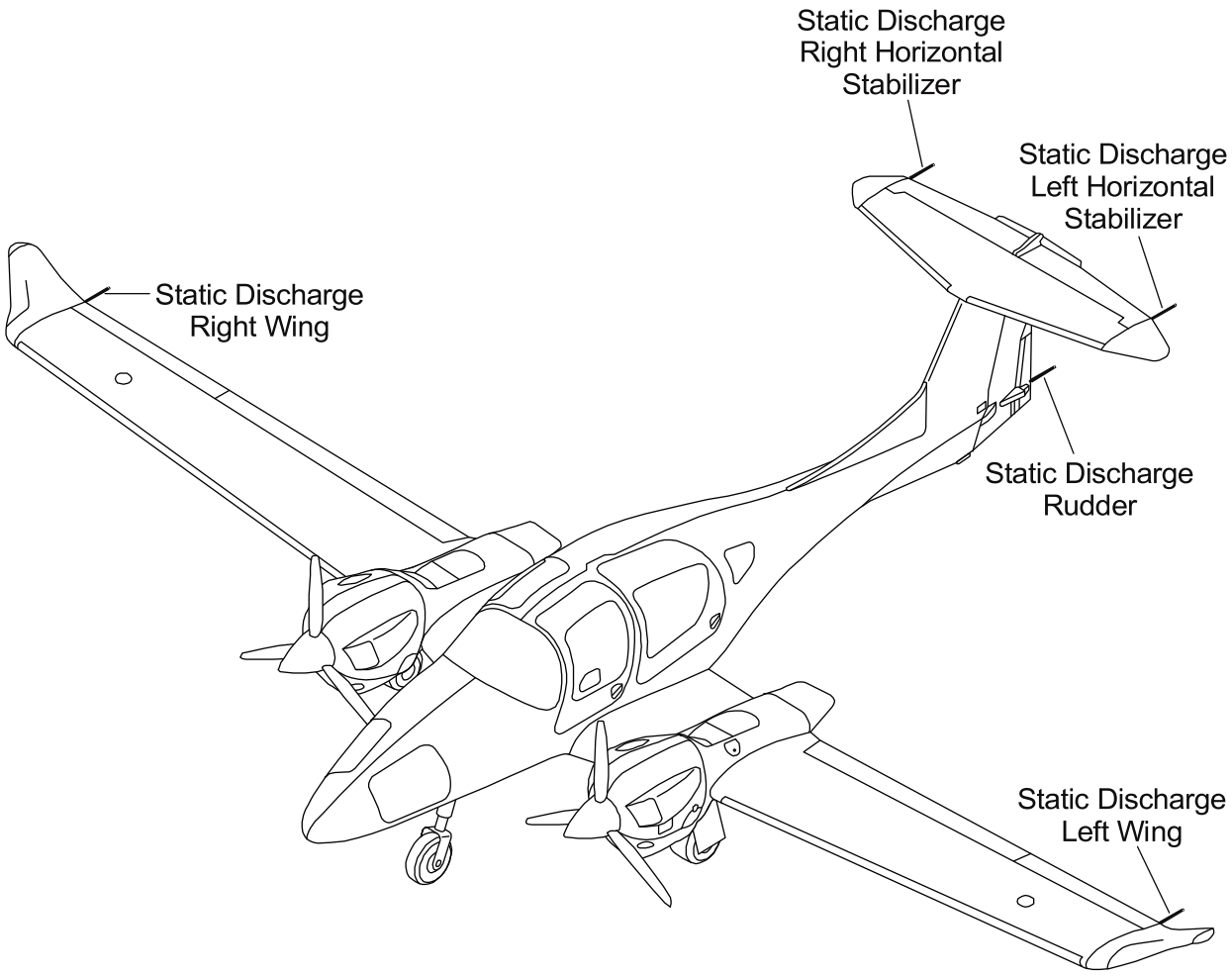

Figure 1 : Static Discharge Wick Locations DA62

Maintenance Practices

1. **General**

This Section tells you how to remove/install a static discharge wick and how to test a static discharge wick.

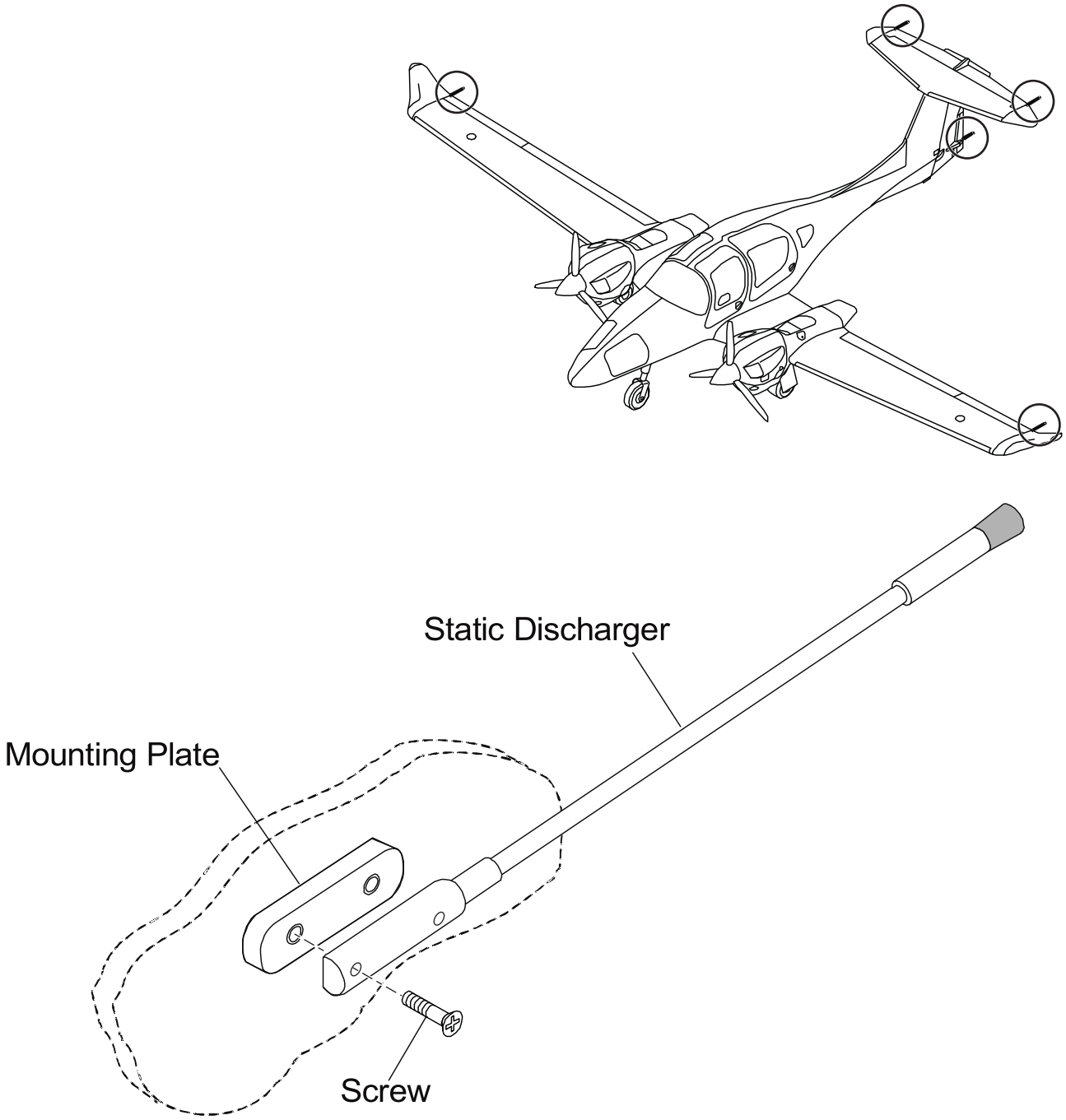

Figure 201 : Static Discharge Wick installation

2. **Replace a Static Discharge Wick**

Use this procedure for all the static discharge wicks.

A. Replace a Static Discharge Wick

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the two screws that attach the discharge wick to the wick mounting.	
(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 two 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, Maintenance Practices.

CHAPTER 24
ELECTRICAL POWER

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CHAPTER 24

ELECTRICAL POWER

1. **Safety Precautions**

A. These safety precautions are necessary when you do work on an electrical/electronic system or component or when electrical power is connected or removed from the airplane. The safety precautions that follow will help to prevent injury to persons and damage to equipment during maintenance operations:

- Electrical/electronic safety precautions.

- Electrostatic discharge safety precautions.

2. **Electrical/Electronic Safety Precautions**

A. General.

The maintenance procedures that follow contain the safety precautions when you do work on electrical/electronic systems or components.

B. General Safety Precautions.

WARNING: **OBEY ALL THE SAFETY PRECAUTIONS WHEN YOU DO MAINTENANCE ON OR NEAR ELECTRICAL/ELECTRONIC EQUIPMENT. IF YOU DO NOT DO THIS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.**

(1) Make sure that the airplane is safe for maintenance.

(2) Obey all local safety regulations during electrical system maintenance.

(3) Before electrical power is connected or removed, make sure that all persons read and fully know the maintenance practices that follow. To keep the risk of injury to persons or damage to equipment to a minimum, make sure that these practices are obeyed.

WARNING: **REMOVE ALL ELECTRICAL POWER FROM THE AIRPLANE BEFORE ELECTRICAL MAINTENANCE IS DONE. PUT WARNING PLACARDS AT THE EXTERNAL POWER RECEPTACLE AND IN THE FLIGHT COMPARTMENT. THIS IS NECESSARY TO PREVENT ELECTRICAL SHOCK TO THE PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.**

(a) Remove the source of power before you disassemble or disconnect the wiring from an electrical component or unit on the airplane. If you do not do this you can cause damage to the component or unit.

(b) Make sure that the master power switch in the flight compartment is set to the OFF position.

(c) Tag each switch that is in the OFF position and advise why it is OFF, similar to the following:

- DO NOT MOVE THIS SWITCH FROM THE OFF POSITION UNTIL THE MAINTENANCE TASK HAS BEEN COMPLETED.

(d) Obey the general safety precautions for circuit breakers that follow:

1 Open all applicable circuit breakers necessary to do the maintenance task and install safety clips.

2 Tag each open circuit breaker and advise why it is open, similar to the following:

- DO NOT CLOSE THIS CIRCUIT BREAKER. THIS CIRCUIT BREAKER MUST STAY OPEN UNTIL THE MAINTENANCE TASK IS COMPLETED.

3 When a circuit breaker opens without sufficient cause, do not close the circuit breaker until the source of the problem has been identified and corrected.

(e) When components are removed from the airplane, put a dust cap on all electrical connectors. Do not let moisture or other unwanted materials get into the electrical connectors.

(f) Before the installation of components, make sure that the surfaces that touch are clean and free of contamination. This is necessary to provide a good connection for electrical continuity.

(g) Make sure to align the electrical connector plug and connector pins before installation. This will prevent damage to the connector and pins.

(h) After the components are installed, remove the safety clips from the applicable open circuit breakers. Close the applicable circuit breakers. Make sure that they stay closed when power is applied.

(i) Do not use electrical test equipment that can cause sparks in areas where explosive gases occur.

WARNING: WARN ALL PERSONNEL ON THE AIRPLANE BEFORE YOU ENERGIZE THE ELECTRICAL SYSTEMS. IF YOU DO NOT DO THIS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.

(j) Energize only the airplane electrical systems necessary to do the maintenance task, with the available power source.

WARNING: GROUND THE AIRPLANE BEFORE YOU CONNECT THE EXTERNAL ELECTRICAL POWER. IF YOU DO NOT DO THIS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.

(k) Connect a static ground to the airplane at the recommended airplane ground point.

(l) When complete with a task, remove all tools, equipment and unwanted materials from the work area.

3. **Electrostatic Discharge Safety Precautions**

A. General.

The maintenance procedures that follow contain the safety precautions that are necessary when you work with electrostatic-discharge sensitive (ESDS) devices.

B. General Safety Precautions.

WARNING: **OBEY ALL THE SAFETY PRECAUTIONS WHEN YOU DO MAINTENANCE ON OR NEAR ELECTRICAL/ELECTRONIC EQUIPMENT. IF YOU DO NOT DO THIS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.**

(1) Obey all the local safety regulations during maintenance procedures on electronic units that contain electrostatic−sensitive devices. Many units have microprocessors and memory devices which can be damaged by electrostatic discharges. These units are identified as 'ESDS'. Do the steps that follow when you work on ESDS units:

(a) Remove all power, signal sources, and electrical loads used with the unit.

(b) Pull and tag the circuit breakers for the unit.

(c) Make sure that you are correctly grounded before maintenance is done.

(d) Wear a wrist strap, or an equivalent device with a 470−ohm resistor, that is grounded to the airframe.

(e) Make sure that you ground all the tools before they touch the unit.

(f) Remove the unit from the mounting tray and place it on a grounded work surface.

(g) Install caps on the electrical connectors for the unit and the mounting tray.

(h) Do not touch electrostatic−sensitive devices or remove them from their packages until they are required.

(i) When an electrostatic−sensitive device is removed from a unit, immediately place that device in an anti-static container or packaging.

(j) When complete with a task, remove all tools, equipment and unwanted materials from the work area.

4. Electrical General

The DA 62 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 system.
- Section 24-33. Additional alternator (if OÄM 62-006 is installed).
- Section 24-40. External power.
- Section 24-60. Power distribution.

NOTE: Equipment which is certified for installation in the DA 62 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.

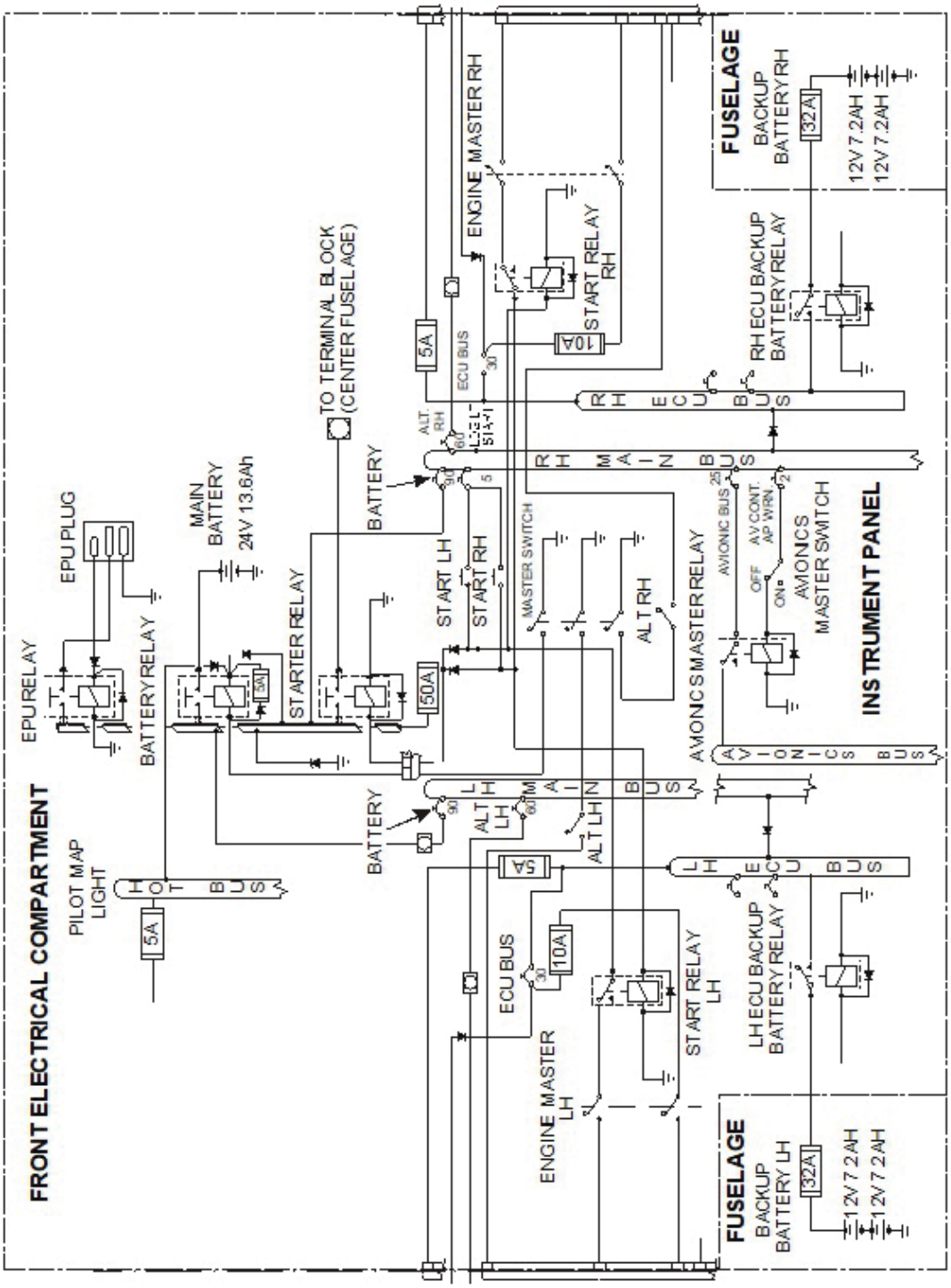

Figure 1 : Electrical System Schematic Diagram - Sheet 1

5. 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 electric/avionic 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 row 1.

(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 electric/avionic 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 SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

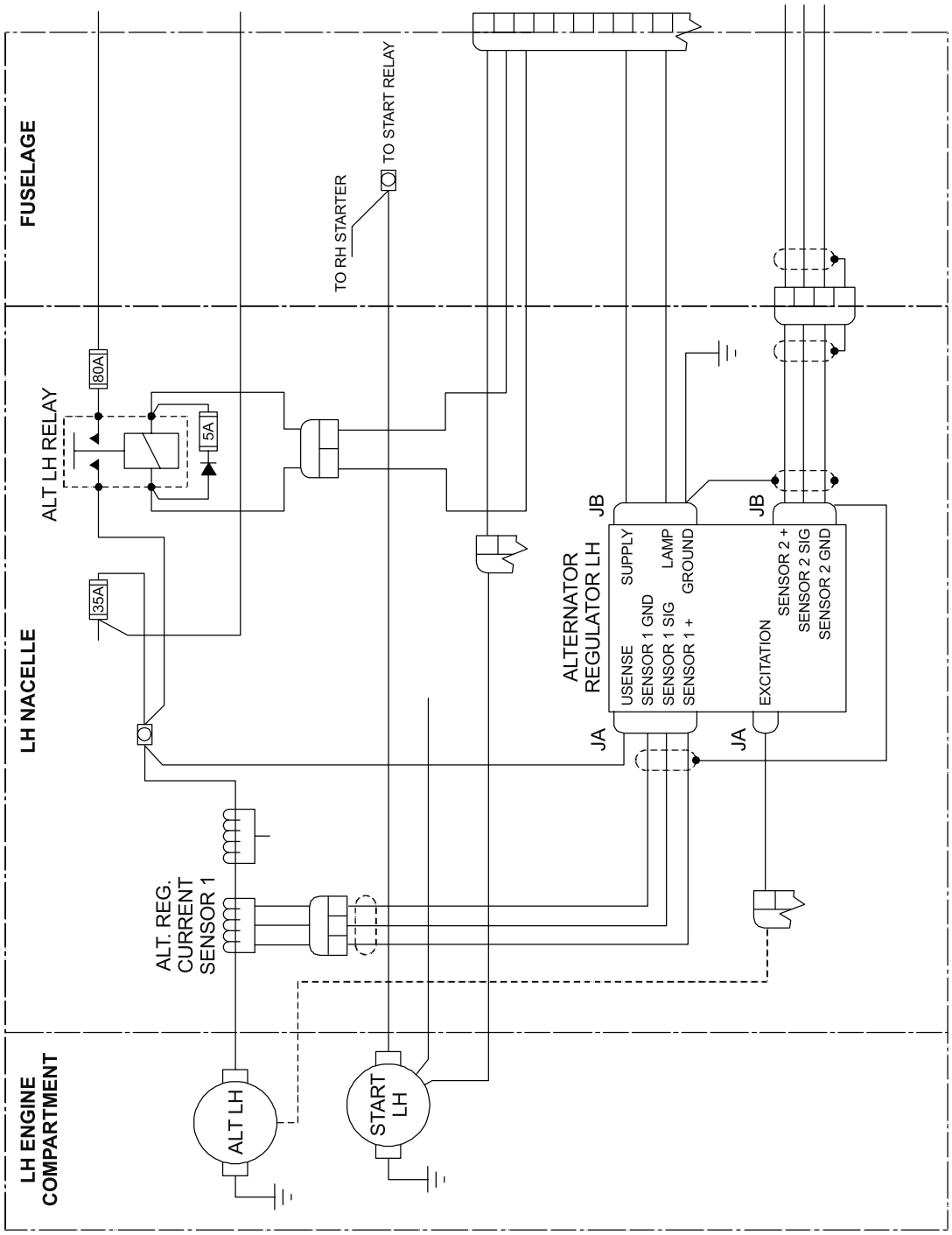

Figure 2 : Electrical Schematic (Simplified) - Sheet 2

B. Power Supply Control

(1) Battery Relay

The battery relay is located on the relay panel in the avionic bay. 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 avionic bay. 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 button (left or right) is pressed. 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.

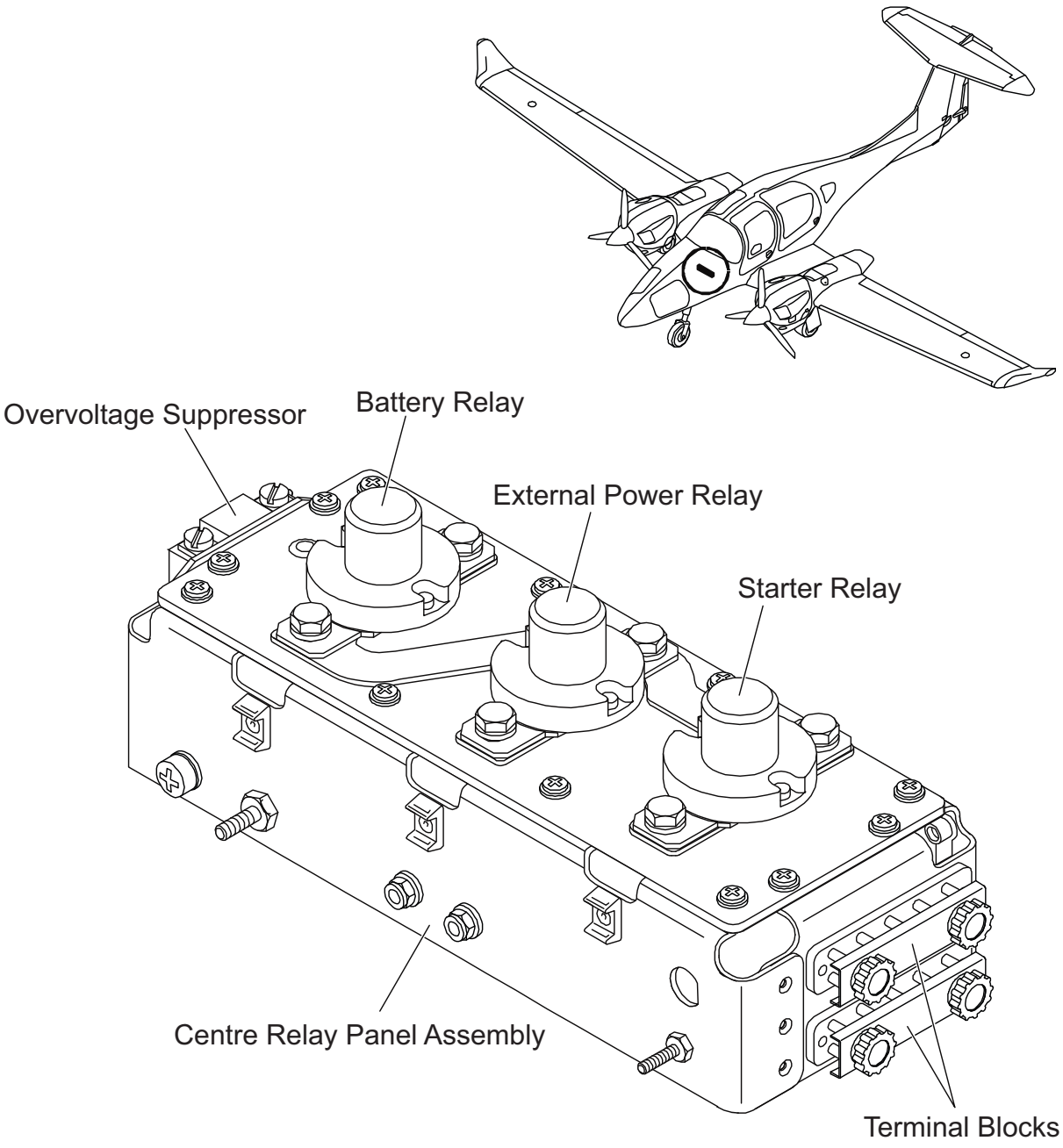

Figure 3 : Relay Locations in the Relay Box

(5) Relay Box Bus

Figure 3 shows the relays in the relay box. The RELAY BOX BUS is located in the avionic bay, 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 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.

(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

The LH ECU BUS is located on the right side 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. Both ECU A and ECU B supplies are protected by a 20 Ampere circuit breaker and a 5 Ampere fuse. The LH ECU BUS also provides electrical power for the RH ECU B and its fuel pump.

(10) RH ECU Bus

The RH ECU BUS is located on the right side 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 left 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. Both ECU A and ECU B supplies are protected by a 20 Ampere circuit breaker and a 5 Ampere fuse. 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 Buttons

Pressing the START button (left or right), 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 buttons. 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 62 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).
- 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 62. Refer to Section 24-00 for a general description of complete electrical system.

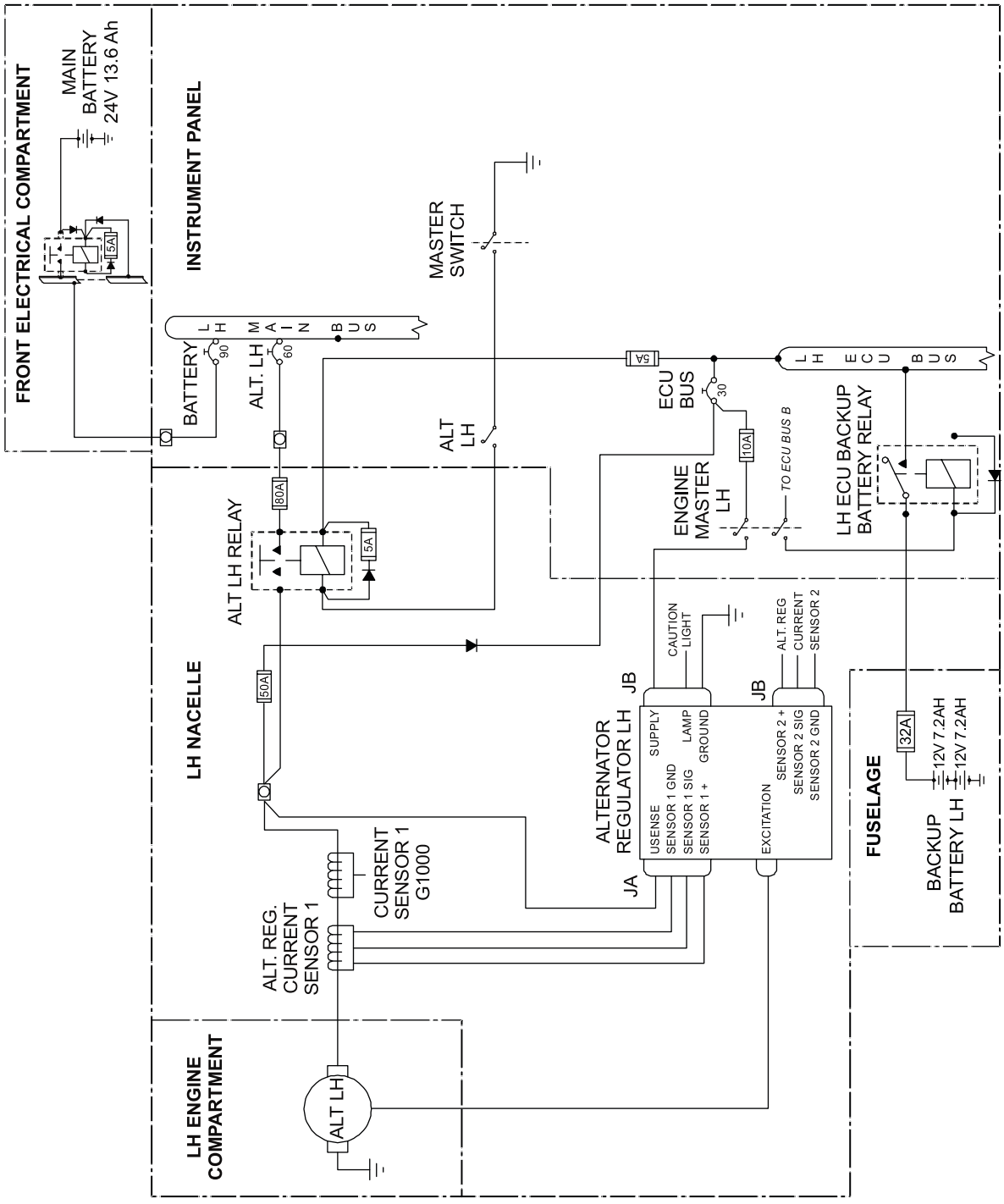

Figure 1 : DC Generation Schematic Diagram

2. **Description and Operation**

Figure 1 in the Description and Operation and Figures 201 and 202 in the Maintenance Practices show the generation system simplified schematic diagrams.

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, which is located in the engine nacelles.

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 sensors are located in the engine nacelles and monitor 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. 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 below lists the defects that you could have with the DC generation 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
LH or RH alternator warning light illuminated.	Related alternator defective.	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 62 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 SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

CAUTION: USE ONLY DA 62 SPARE PARTS APPROVED BY THE MANUFACTURER.

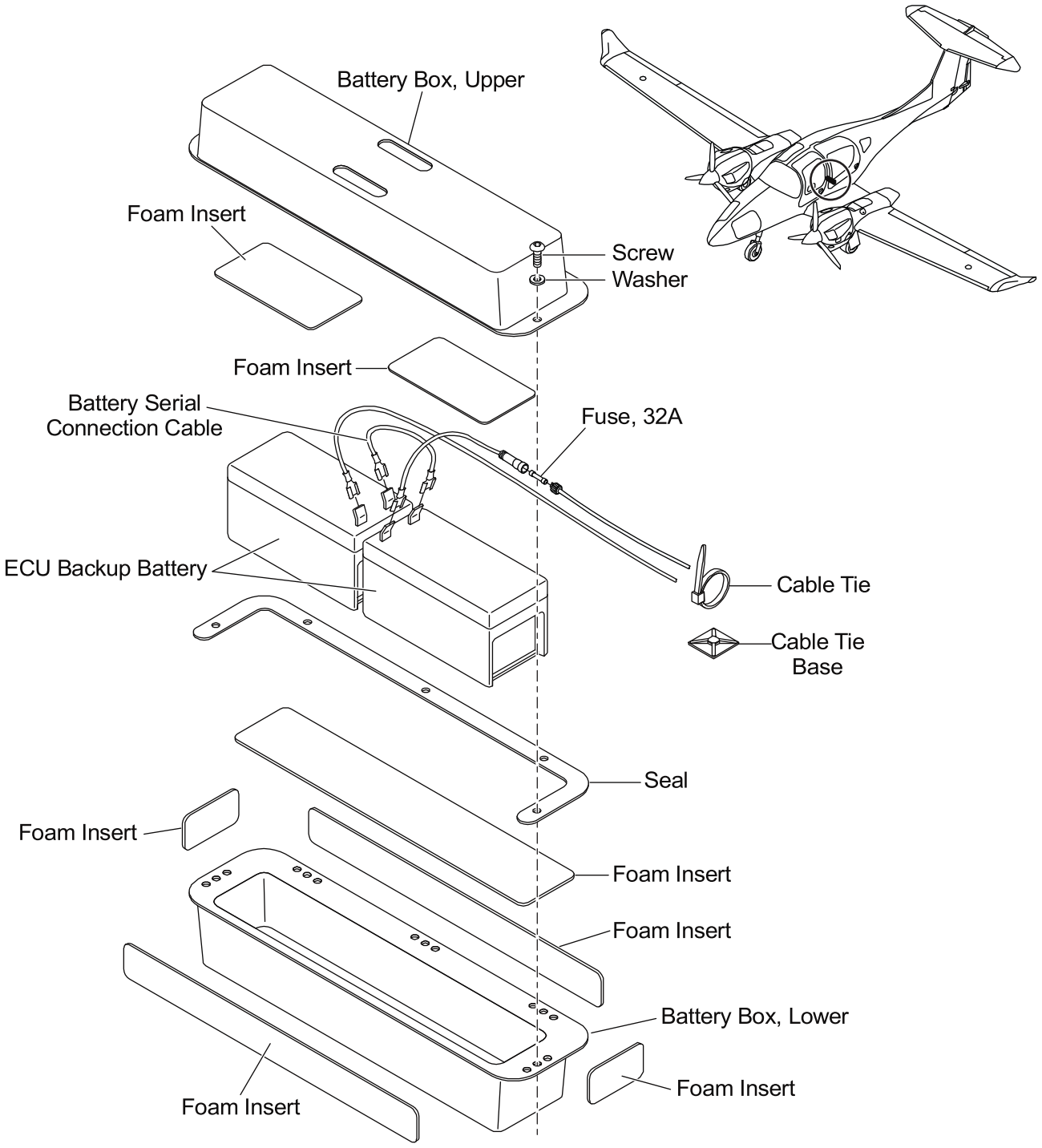

Figure 201 : ECU Backup Batteries Installation (LH)

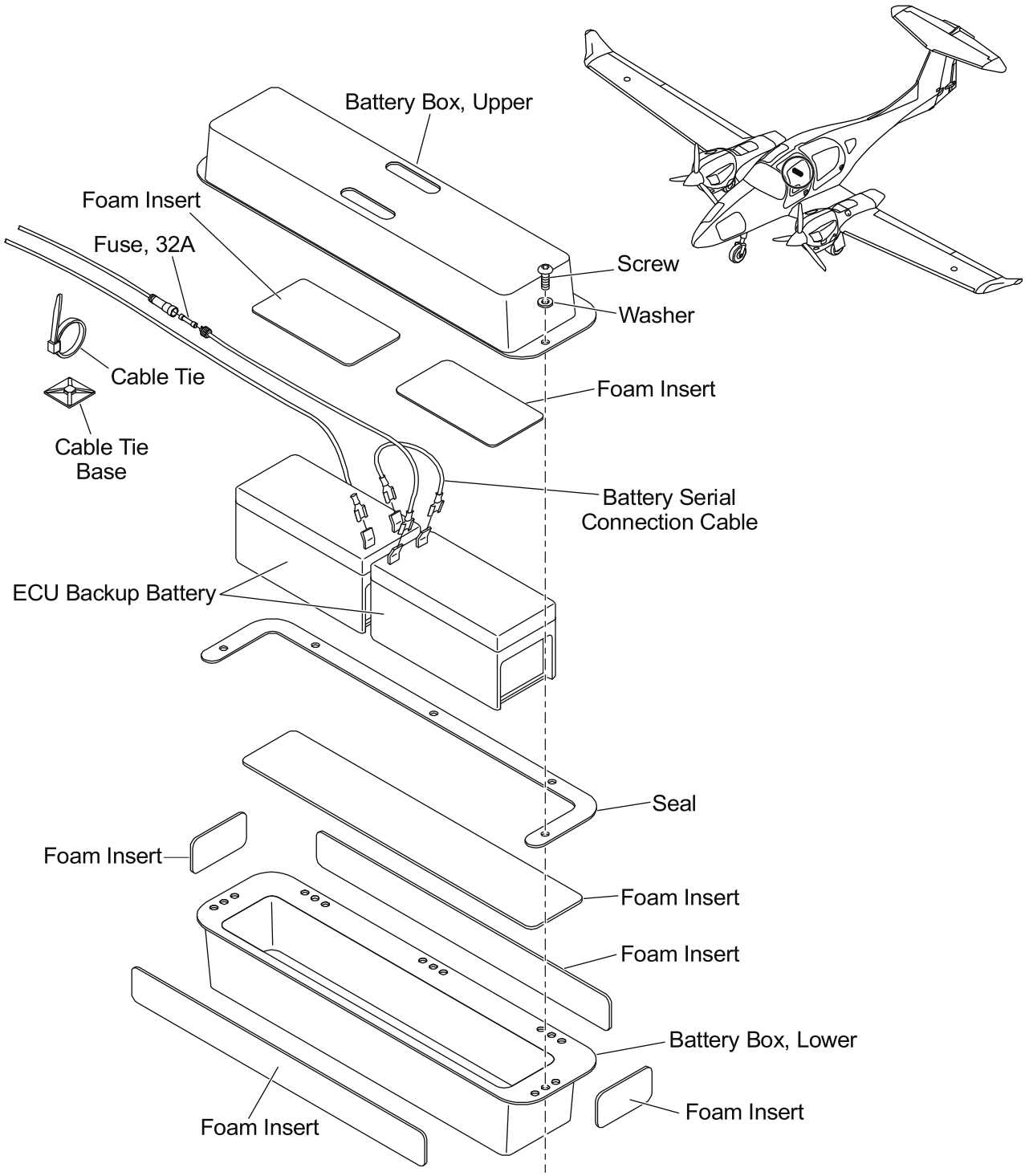

Figure 202 : ECU Backup Batteries Installation (RH)

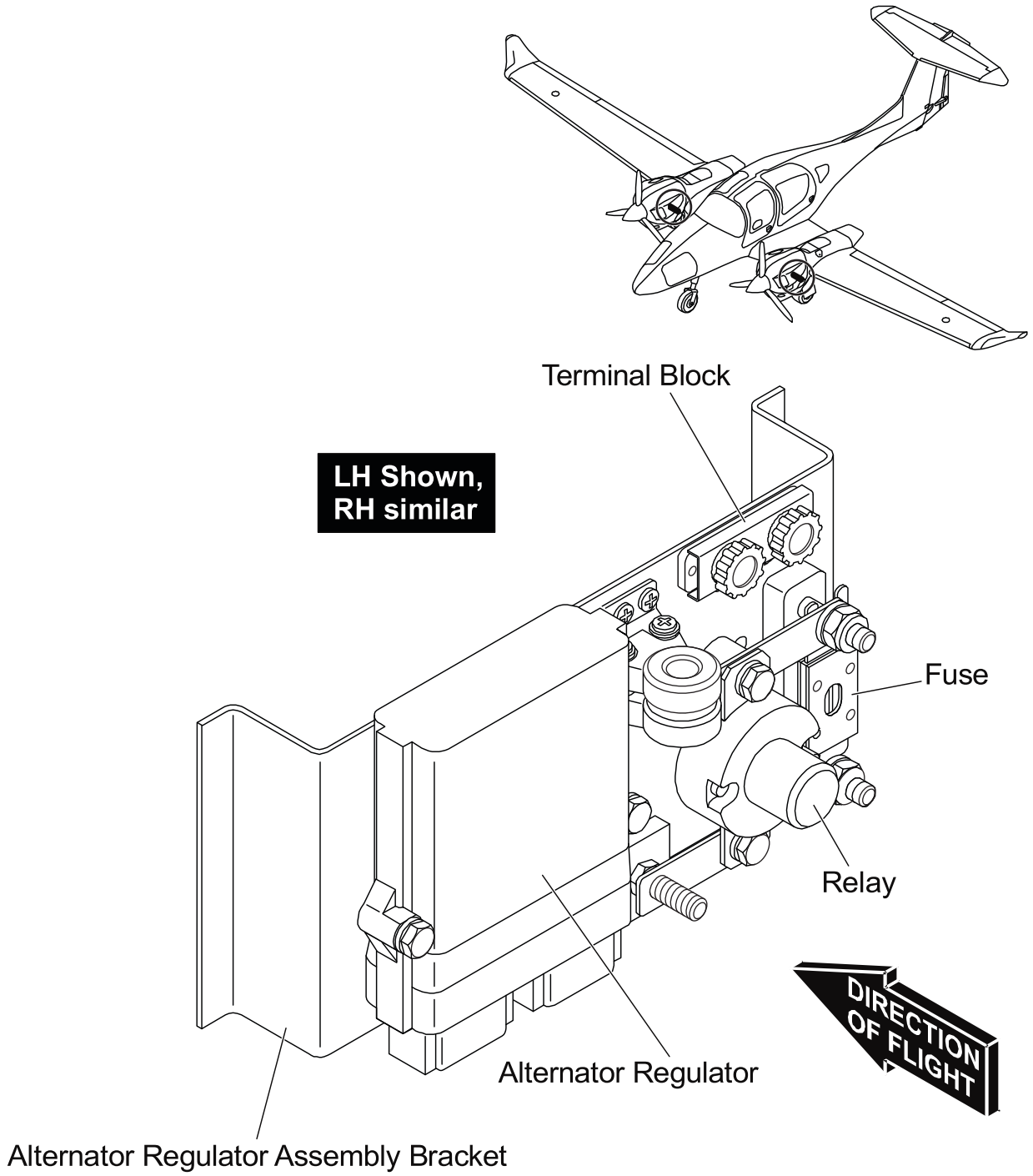

Figure 203 : LH/RH Alternator Relay Installation

3. **Remove/Install an Alternator Relay**

Refer to Figure 203.

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 large nacelle maintenance access door.	Refer to Section 52-40.
(2)	Disconnect the battery and ECU backup batteries for maintenance.	Refer to Section 24-31.
(3)	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.	
(4)	Disconnect the electrical cables from the external relay terminals.	
(5)	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)	Close the large nacelle maintenance access door.	
(6)	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 the ECU Backup Batteries**

Refer to Figures 201 and 202.

A. Remove the ECU Backup Batteries.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	Disconnect the airplane main battery.	
(3)	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 Section 25-10.

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)	Connect the airplane main battery.	Refer to Section 24-31.
(5)	Install the avionic bay cover.	
(6)	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 62 airplane. See Section 24-00 and 24-30 for the description and operation of the batteries in the electrical generation system.

The DA 62 has these battery systems:

- A main battery located in the front electric/avionic 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 avionic bay. 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.

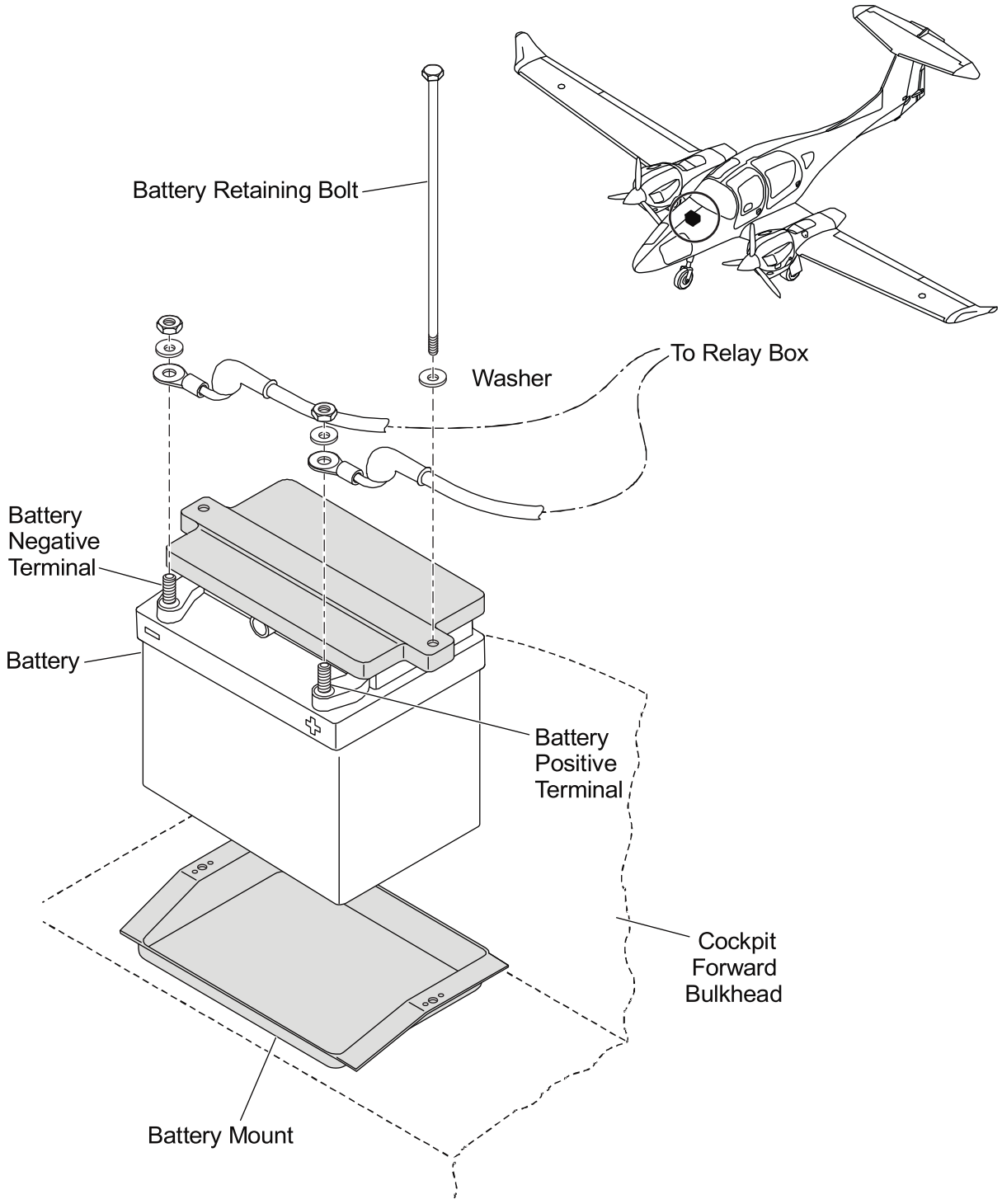

Figure 1 : Main Battery Installation

Trouble-Shooting

1. **General**

This table below lists the defects that you could have with the 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
Main battery voltage low.	Battery capacity low.	Do a capacity test. If necessary, replace the battery.
	Alternator(s) output low.	Trouble-Shoot the alternator, refer to Section 24-30.
Main battery will not connect to the RELAY BUS.	Battery relay defective.	Replace the battery relay.
	ELEC. MASTER key switch defective.	Replace the ELEC. MASTER switch.
	Battery system wiring defective.	Do a 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
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**

Refer to Figure 1. (24-31-00 Page 2).

A. Remove the Main Battery from the Airplane.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	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.	
(3)	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.	
(4)	Remove the battery retaining clamp: - Remove the 2 bolts and washers that hold the battery clamp. - Remove the battery clamp.	
(5)	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	
	CAUTION: MAKE SURE THAT YOU CONNECT THE CABLES TO THE CORRECT TERMINALS. INCORRECT CONNECTION CAN DAMAGE THE ELECTRICAL AND AVIONIC 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.	Apply Dow Corning compound (DC4) to the battery terminal and the cable lug.
(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.	Apply Dow Corning compound (DC4) to the battery terminal and the cable lug.
(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 avionic bay cover.	

4. **Disconnect/Connect the Main Battery for Maintenance**

Refer to Figure 1. (24-31-00 Page 2).

A. Disconnect the Main Battery for Maintenance

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	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.	
(3)	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 AVIONIC 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.	Apply Dow Corning compound (DC4) to the battery terminal and the cable lug.
(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.	Apply Dow Corning compound (DC4) to the battery terminal and the cable lug.
(3)	Install the avionic bay cover.	

5. **Remove/Install the Battery Relay**

Refer to Figure 201.

A. Remove the Battery Relay

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	Disconnect the battery for maintenance.	Refer to Paragraph 4.A.
(3)	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 two smaller cables clear of the relay terminal.	
(4)	Disconnect the battery relay from the RELAY BOX BUS bar: - Remove the bolt and washer that attaches relay to the RELAY BOX BUS bar.	
(5)	Disconnect the electrical cables from the terminal block.	
(6)	Remove the battery relay: - Lift the battery relay clear of the relay box.	

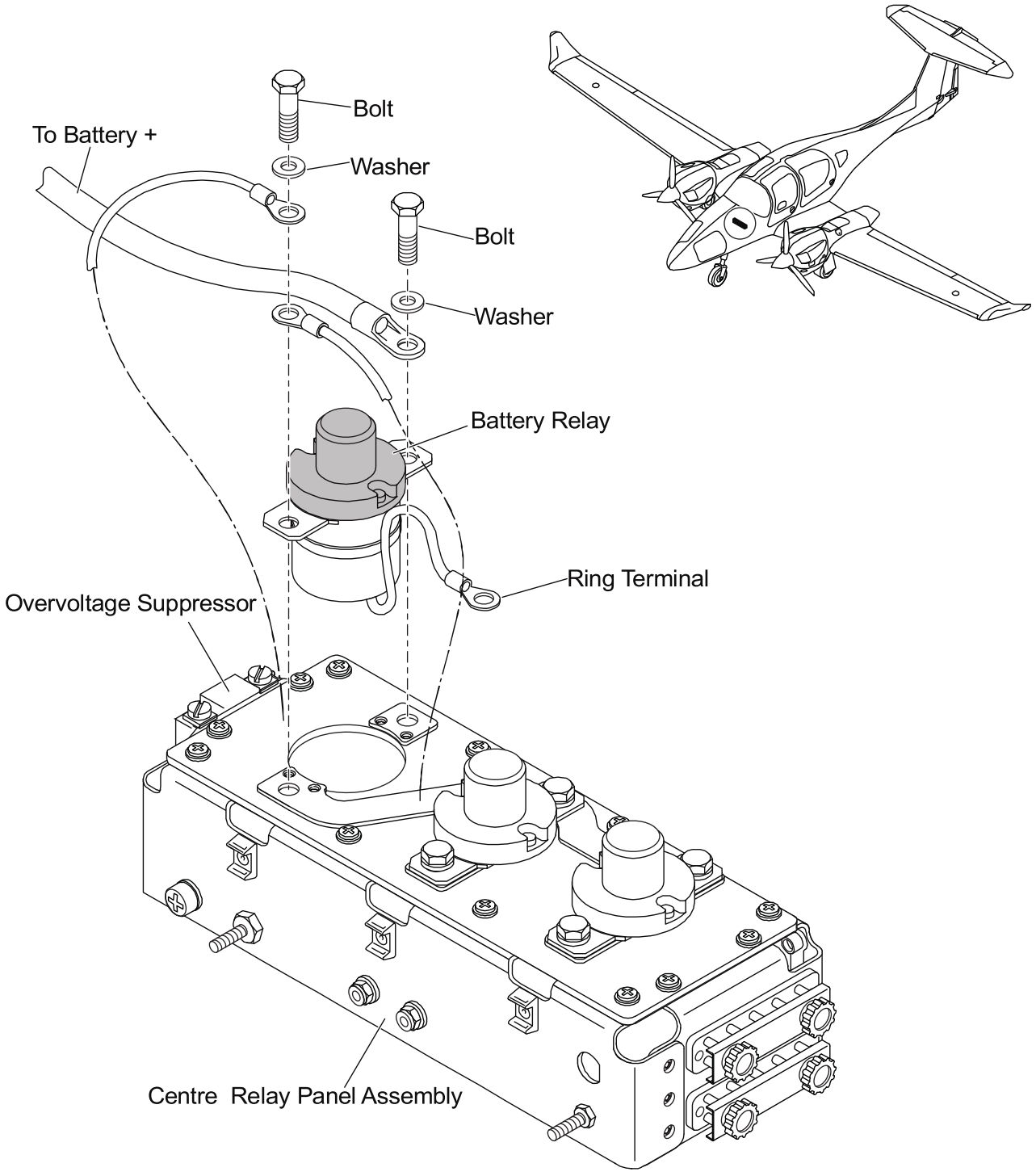

Figure 201 : Main Battery Relay Installation

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 two 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 three 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 avionic bay cover.	

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)	Press the START button of 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)	Release the START button.	
(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 24-33

Additional Alternator

1. General

If OÄM 62-006 is carried out, an additional alternator is installed at 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.
- Relay panel.

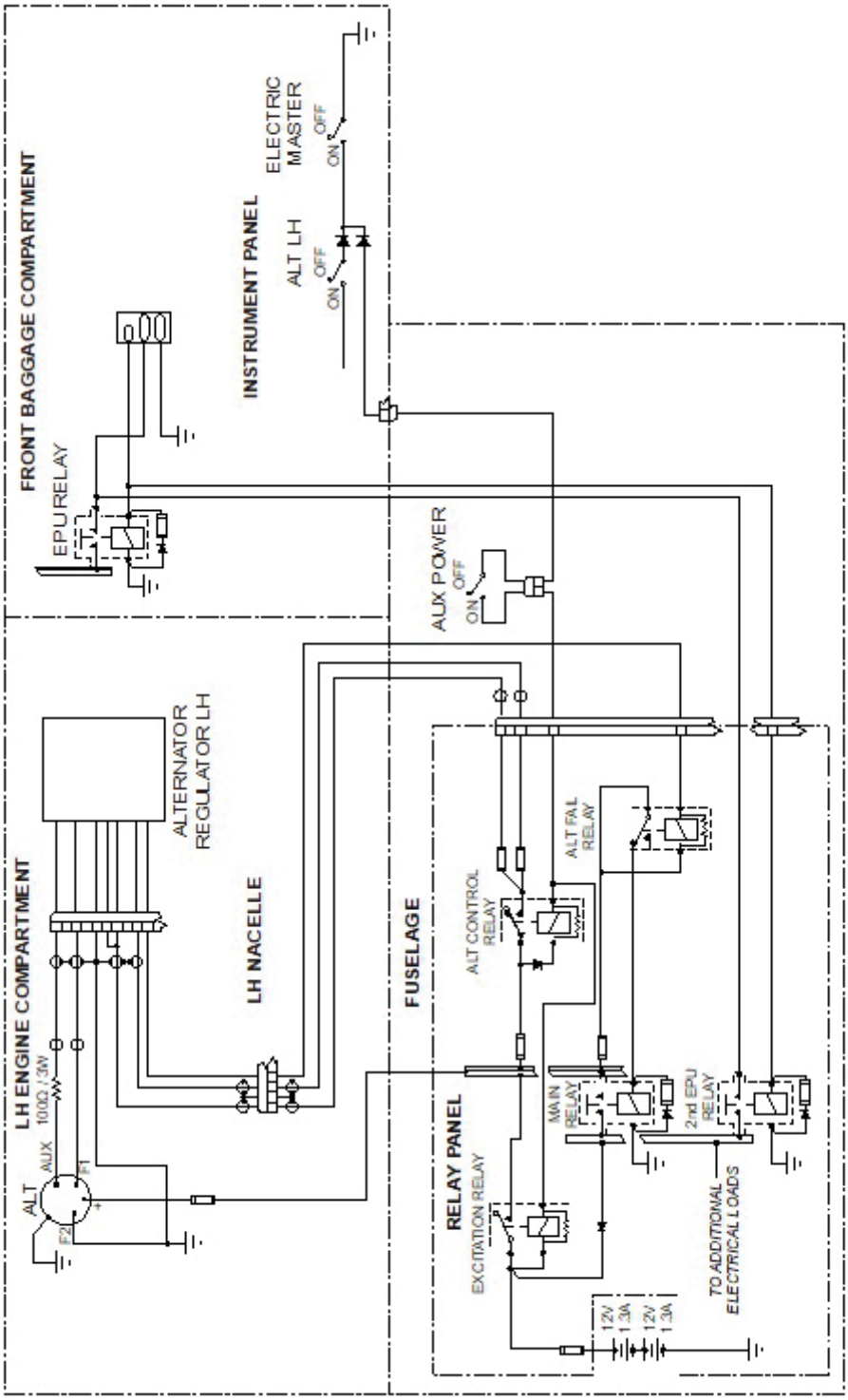

Figure 1 : Additional Alternator - Electrical System Schematic-Diagram

2. Description and Operation

Figure 1 shows the electrical system schematic-diagram for the additional alternator.

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

Two separately installed small batteries are connected in series and 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**

This table below lists the defects that 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 given 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 62 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 overhead panel.	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 overhead panel.	Refer to Section 25-10.

4. **Remove/Install the Additional Alternator Voltage-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.	
(4	Remove the two attachment bolts 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.	
(3)	Install the two bolts 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.
(5	Do an engine run-up. Do a test for correct operation of the regulator.	Refer to Section 71-10.

Section 24-40

External Power

1. General

The DA 62 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 in the avionic bay. You can access the relay box through the avionic bay. 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.

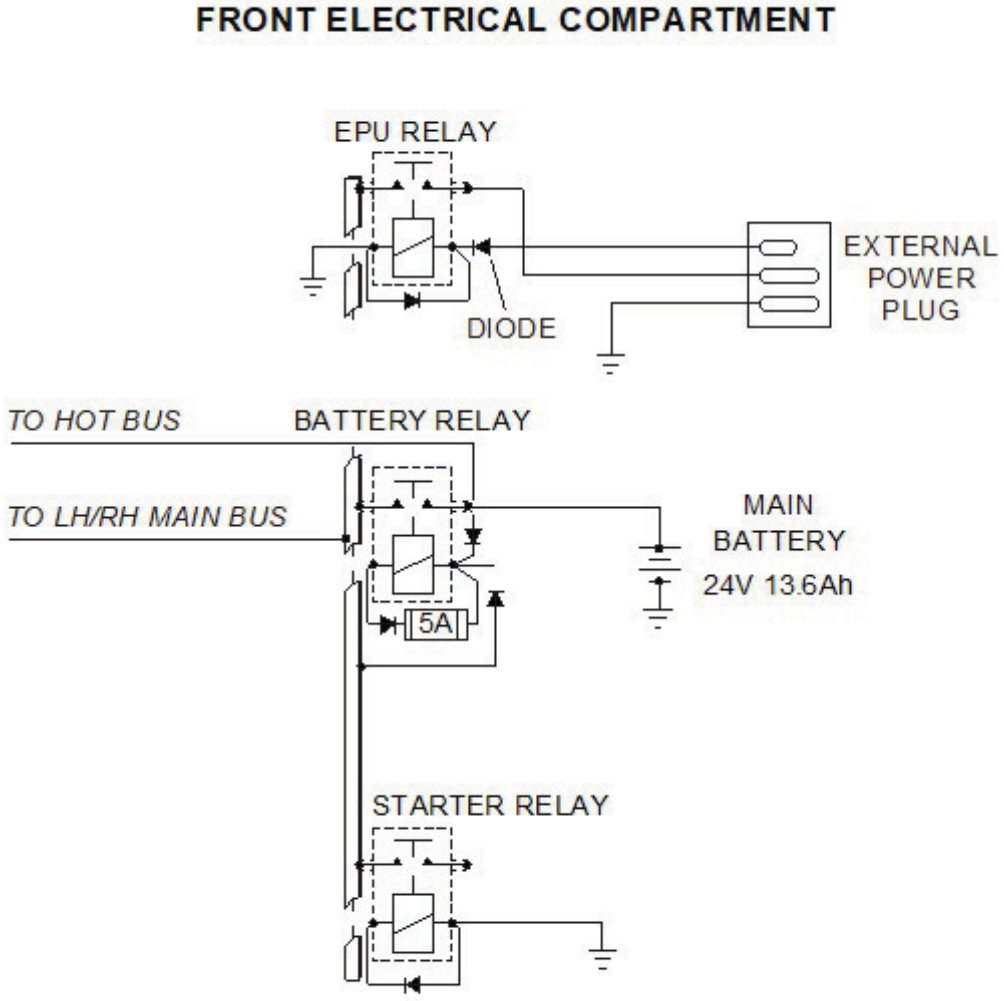

Figure 1 : External Power Supply - System Schematic

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 SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

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Trouble-Shooting

1. **General**

This table below lists the defects that 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. Make sure that the external power is operating correctly.
	External power relay is defective.	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 62 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 SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

CAUTION: USE ONLY DA 62 SPARE PARTS APPROVED BY THE MANUFACTURER.

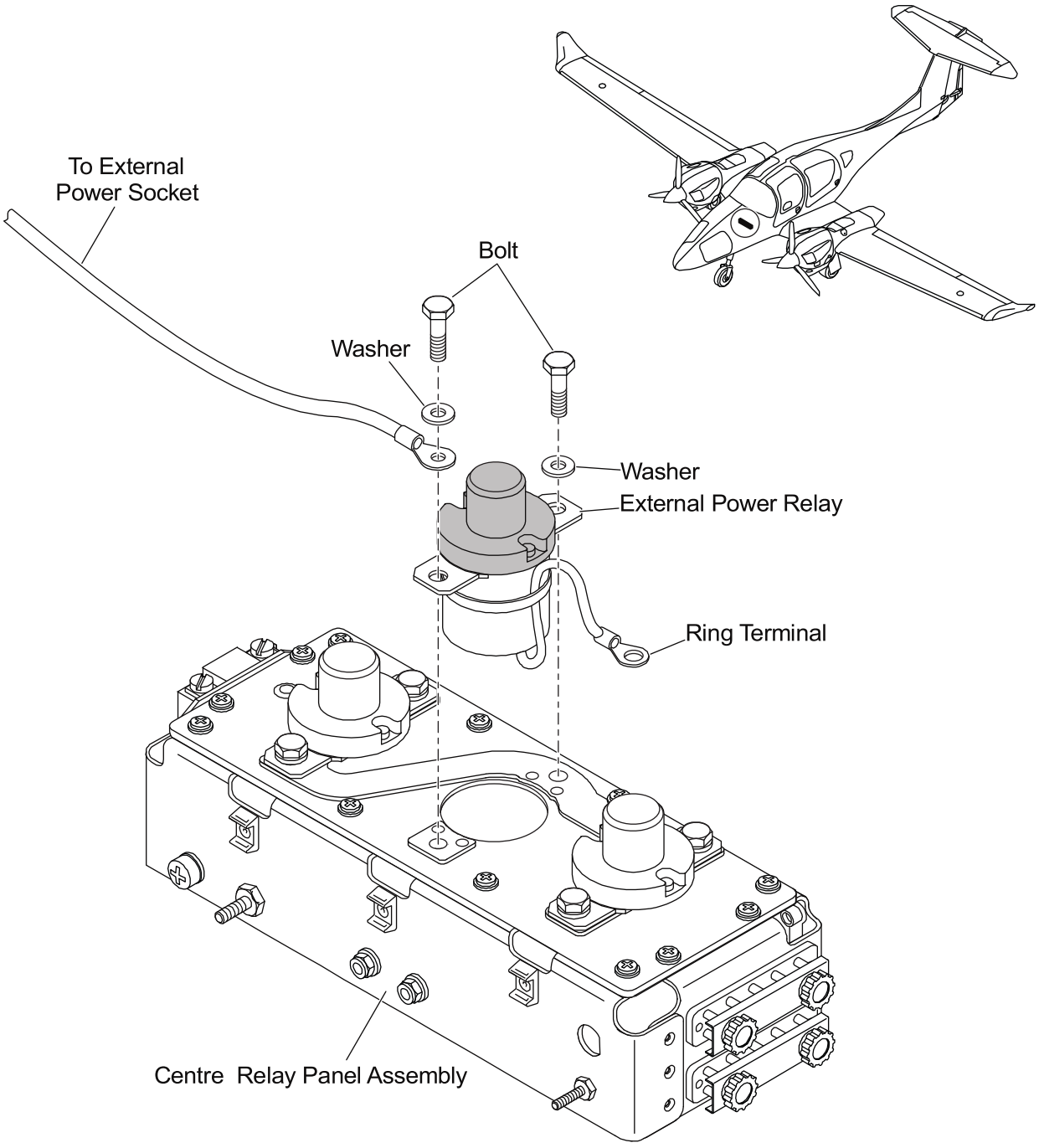


Figure 201 : External Power Relay

3. **Remove/Install an External Power Relay**

Refer to Figure 201.

A. Remove the External Power Relay.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	Disconnect the battery for maintenance.	Refer to Section 24-31. Maintenance Practices Para 4.A.
(3)	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.	
(4)	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	
(5)	Disconnect the electrical cables from the external relay terminals.	
(6)	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. Maintenance Practices Para 4.B.
(6)	Install the avionic bay cover.	
(7)	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 62.

Figure 201 in Maintenance Practices shows the layout of the switches and circuit breakers in the instrument panel.

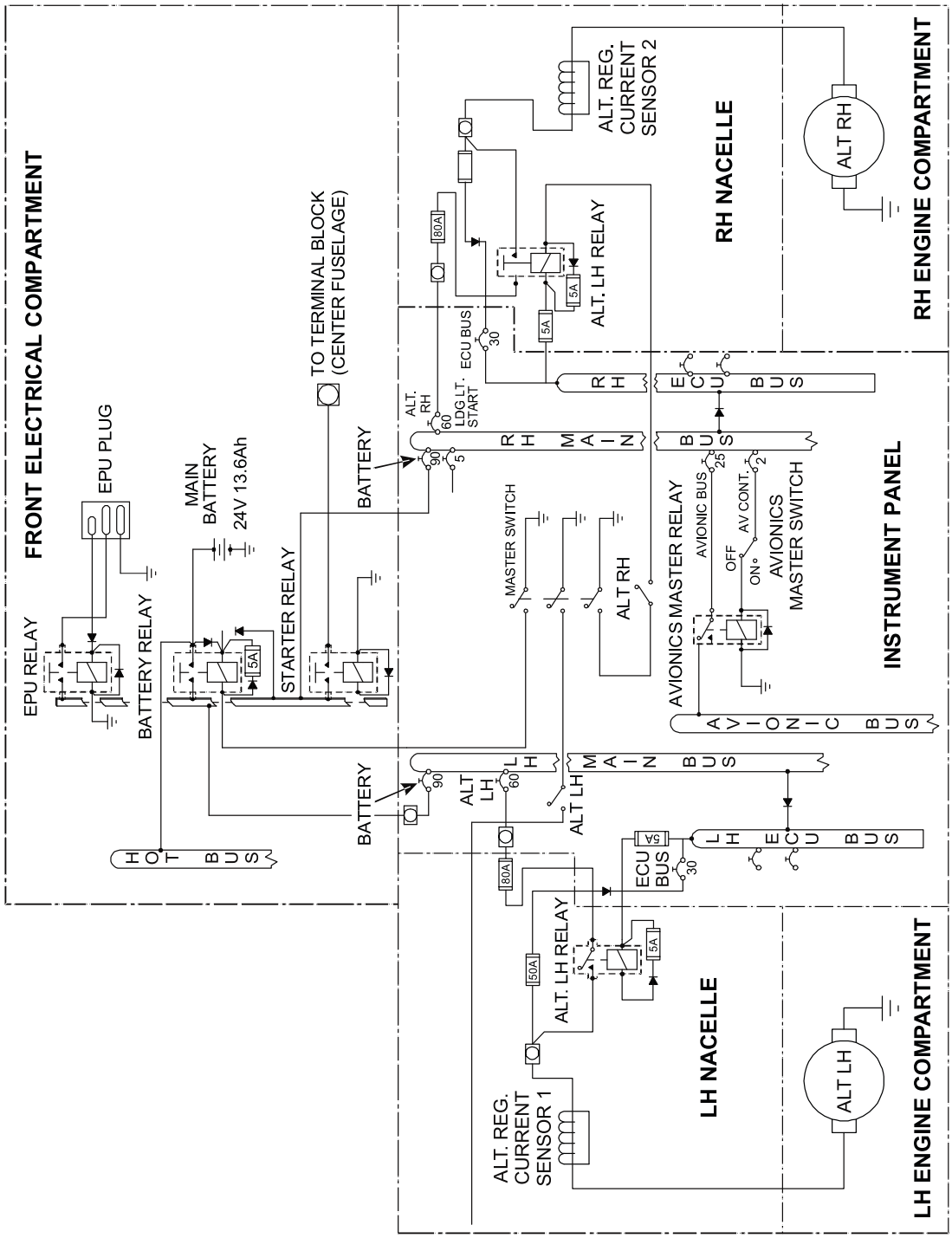
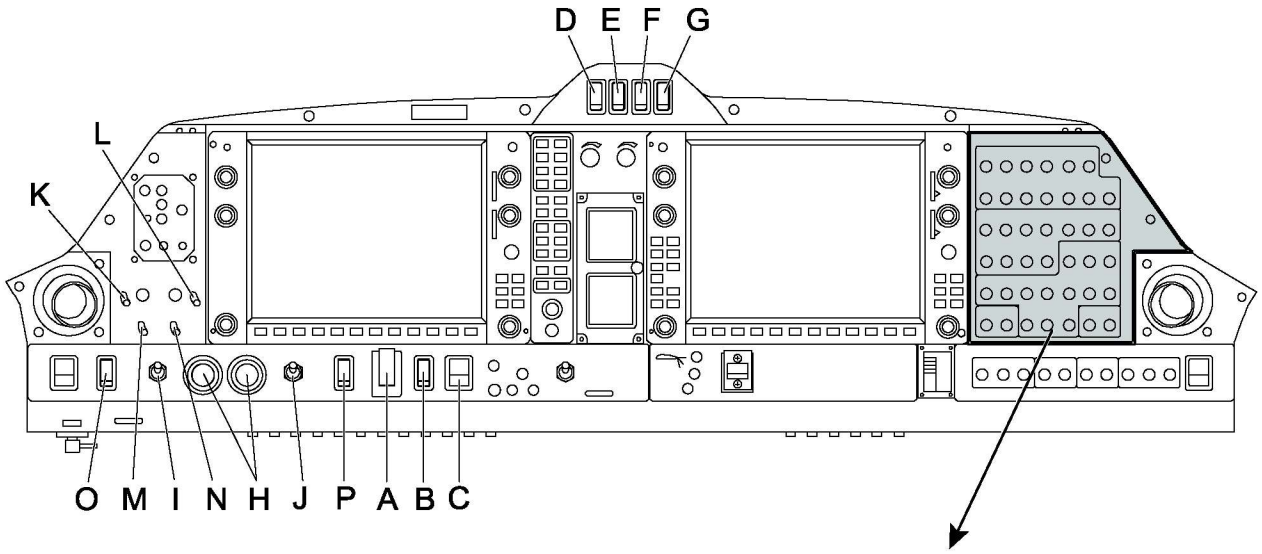


Figure 1 : Electrical System Bus-Structure - Simplified Diagram



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 - FUEL PUMP LH
P - FUEL PUMP RH

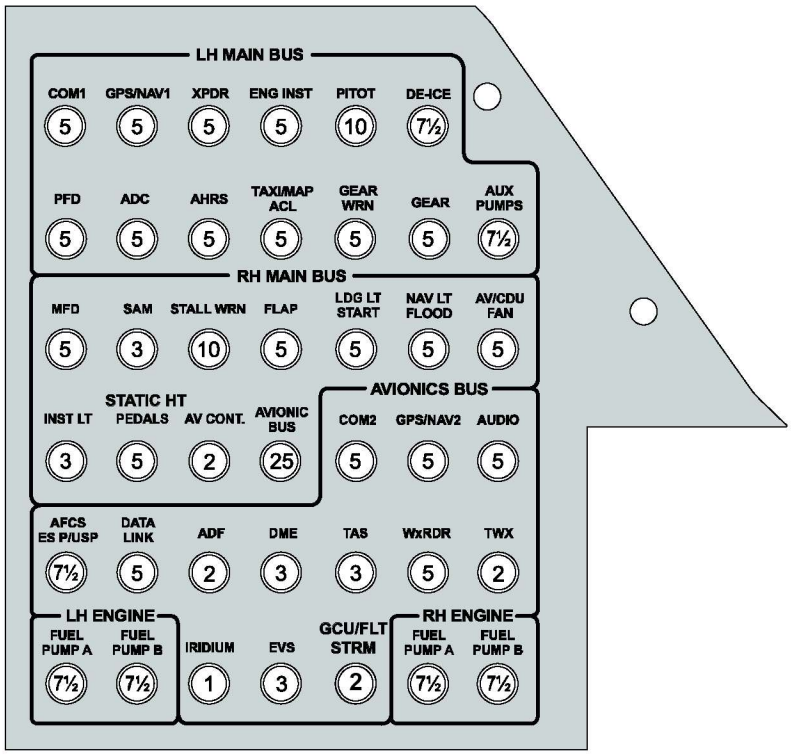


Figure 2 : Location of Electrical Switches and Circuit Breakers

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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 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
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.
	AV CONT. circuit breaker not set.	Set the AV CONT. circuit breaker.
	AVIONIC BUS circuit breaker not set.	Set the AVIONIC 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 62 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 SWITCH OFF BOTH (LH AND RH) ALTERNATOR SWITCHES. OTHERWISE THE ALTERNATORS MAY BE DAMAGED.

CAUTION: USE ONLY DA 62 SPARE PARTS APPROVED BY THE MANUFACTURER.

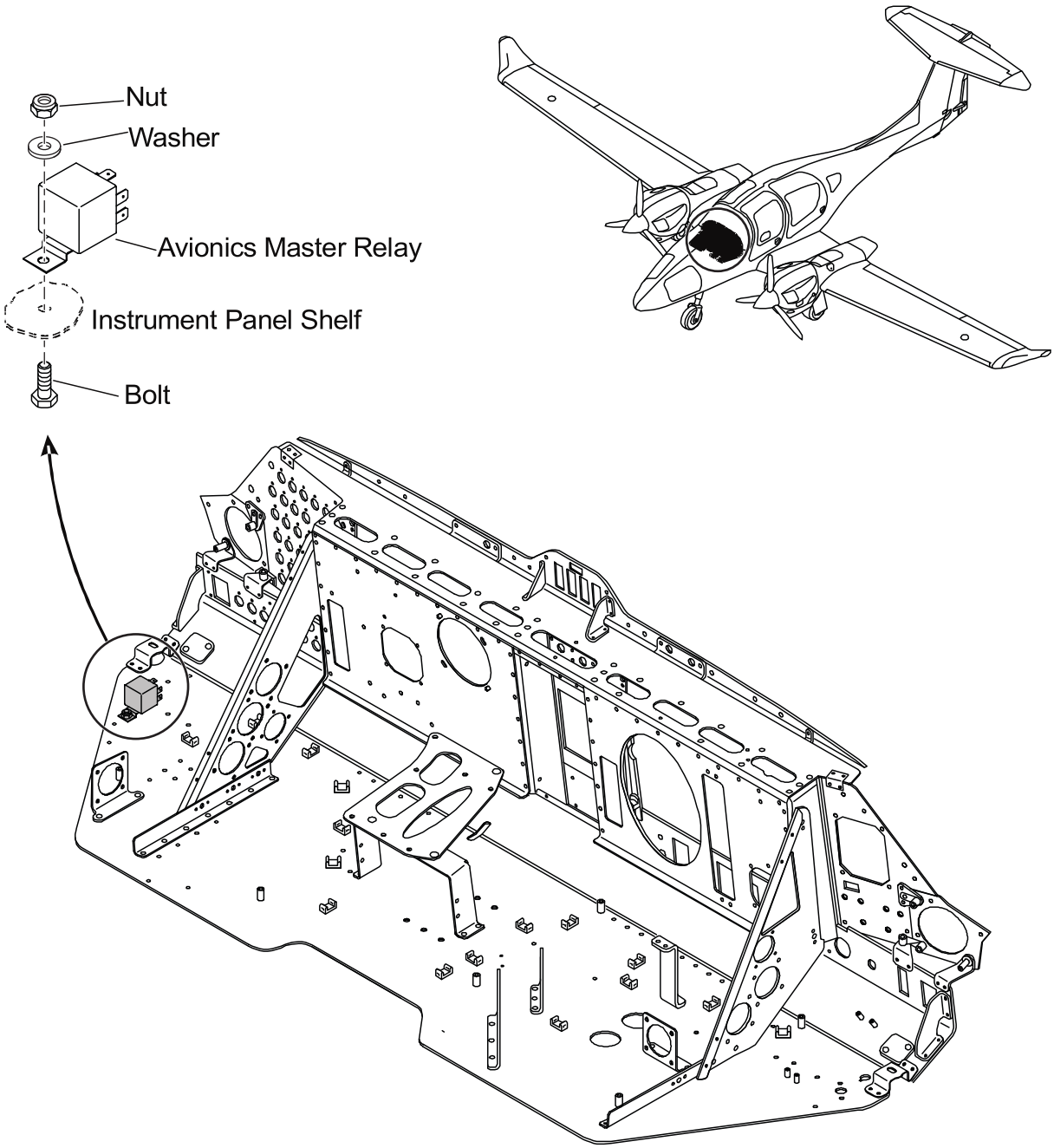

Figure 201 : Avionics Master Relay Installation

3. **Remove/Install the Avionics Master Relay**

Refer to Figure 201.

A. Remove the Avionics Master Relay.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	Disconnect the battery for maintenance.	Refer to Section 24-31. Maintenance Practices Para 4.A.
(3)	Remove the instrument panel cover.	Refer to Section 25-10.
(4)	Locate the avionics master relay.	
(5)	Disconnect the electrical cables from the relay.	Make a note of the connections.
(6)	Remove the nut, washer and bolt that attaches the relay to the instrument panel floor.	
(7)	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 Item (5) in Para 3.A. 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. Maintenance Practices Para 4.B.
(6)	Install the avionic bay cover.	
(7)	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.

Refer to Figure 2. (24-60-00 Page 3).

A. Remove a Circuit Breaker.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	Disconnect the battery and the ECU backup batteries for maintenance.	Refer to Section 24-30 and 24-31. Maintenance Practices.
(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 cable(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.	Install the instrument panel cover.
(6)	Install the instrument panel cover.	Refer to Section 25-10.
(7)	Reconnect the main battery and the ECU backup batteries.	Refer to Section 24-30 and 24-31. Maintenance Practices. Connect the positive cable first.
(8)	Install the avionic bay cover.	
(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)	Remove the avionic bay cover.	
(2)	Disconnect the battery and the ECU backup batteries for maintenance.	Refer to Section 24-30 and 24-31. Maintenance Practices.
(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 battery and the ECU backup batteries for maintenance.	Refer to Section 24-30 and 24-31. Maintenance Practices. Positive cables first.
(5)	Install the avionic bay cover.	
(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 related system must operate correctly. The related system must switch off.

Use the procedures in Sub-paragraphs C and D for these nut secured switches:

- START BUTTONS.
- ENGINE MASTER LH.
- ENGINE MASTER RH.
- ALT LH.
- ALT RH.
- VOTER LH.
- VOTER RH.
- ECU TEST LH/RH.

C. Remove a Nut-Secured-Type Instrument Panel Switch.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the avionic bay cover.	
(2)	Disconnect the battery and the ECU backup batteries for maintenance.	Refer to Section 24-30 and 24-31. Maintenance Practices.
(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 battery and the ECU backup batteries.	Refer to Section 24-30 and 24-31. Maintenance Practices. Positive cables first.
(7)	Install the avionic bay cover.	
(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 correctly. The related system must switch off.

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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 62 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 62 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.

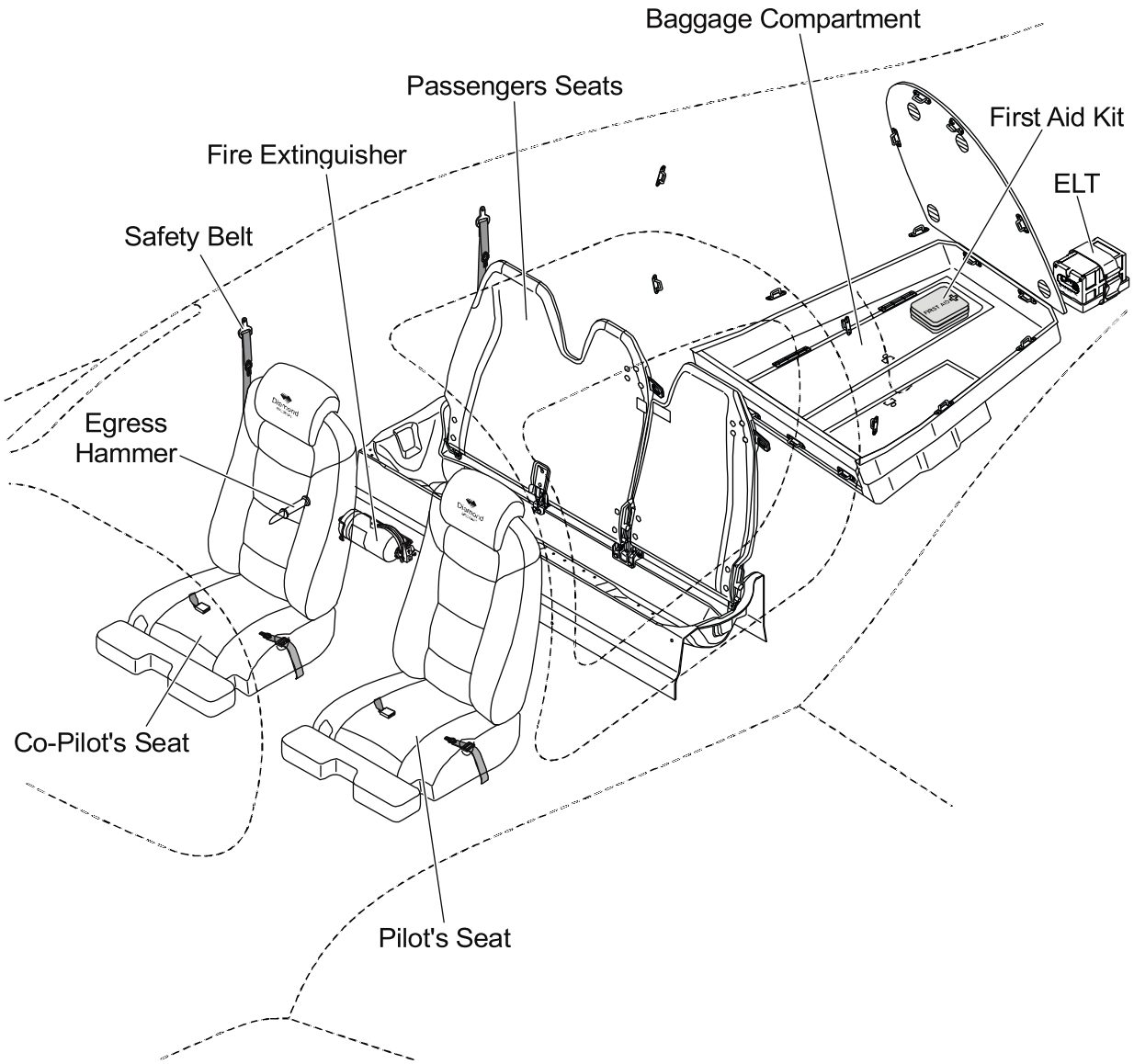

Figure 1 : Cabin Equipment

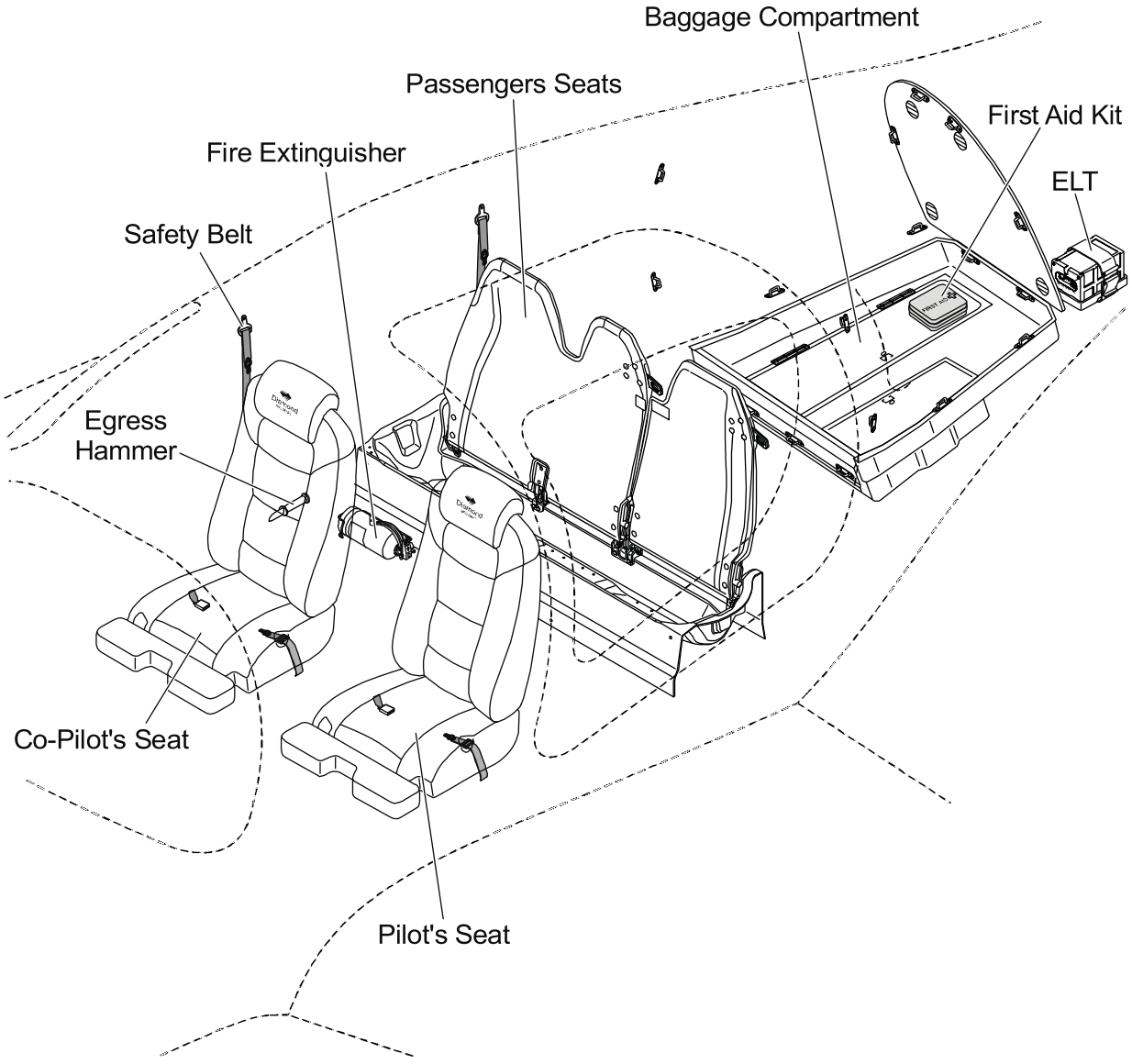

Figure 2 : Cabin Equipment 7-Seated Configuration (OÄM 62-019 is installed)

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Section 25-10

Flight Compartment

1. General

The flight compartment of the DA 62 has fixed seats for the two pilots and up to three (or five, if OÄM 62-019 is installed) passengers.

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 center console for 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.

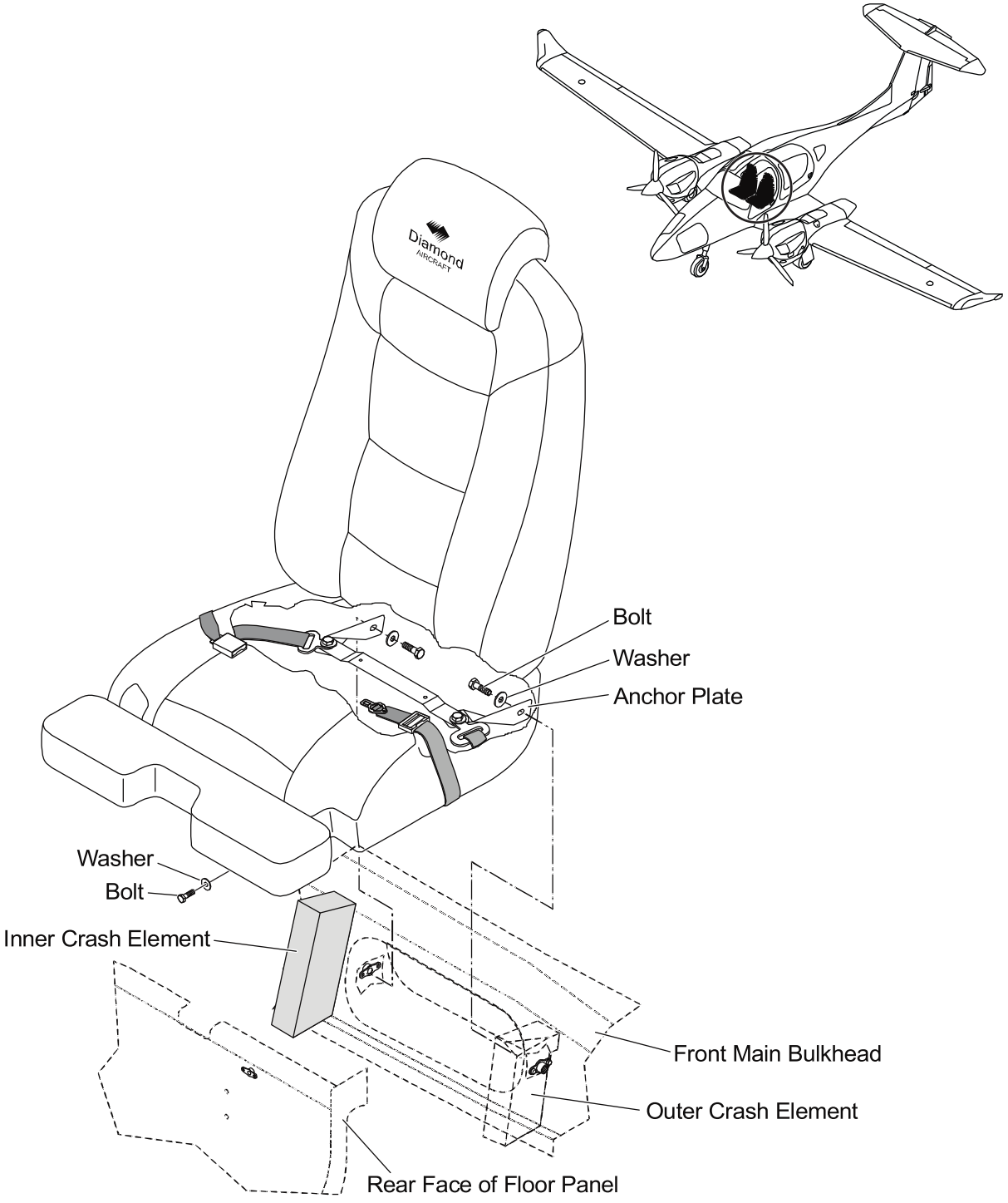

Figure 1 : Pilot's Seat Installation

2. **Description and Operation**

A. Pilots' Seats.

(1) Pilots' Seat with Adjustable Backrest

CAUTION: DO NOT PUSH THE RELEASE BUTTON FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.

Figure 1 shows the pilots' seat installation. Each pilot's 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. The seat pan and backrest are bolted 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. 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.

Pilot seats have a leg support for best comfort. The leg support is foldable for easy entrance and exit.

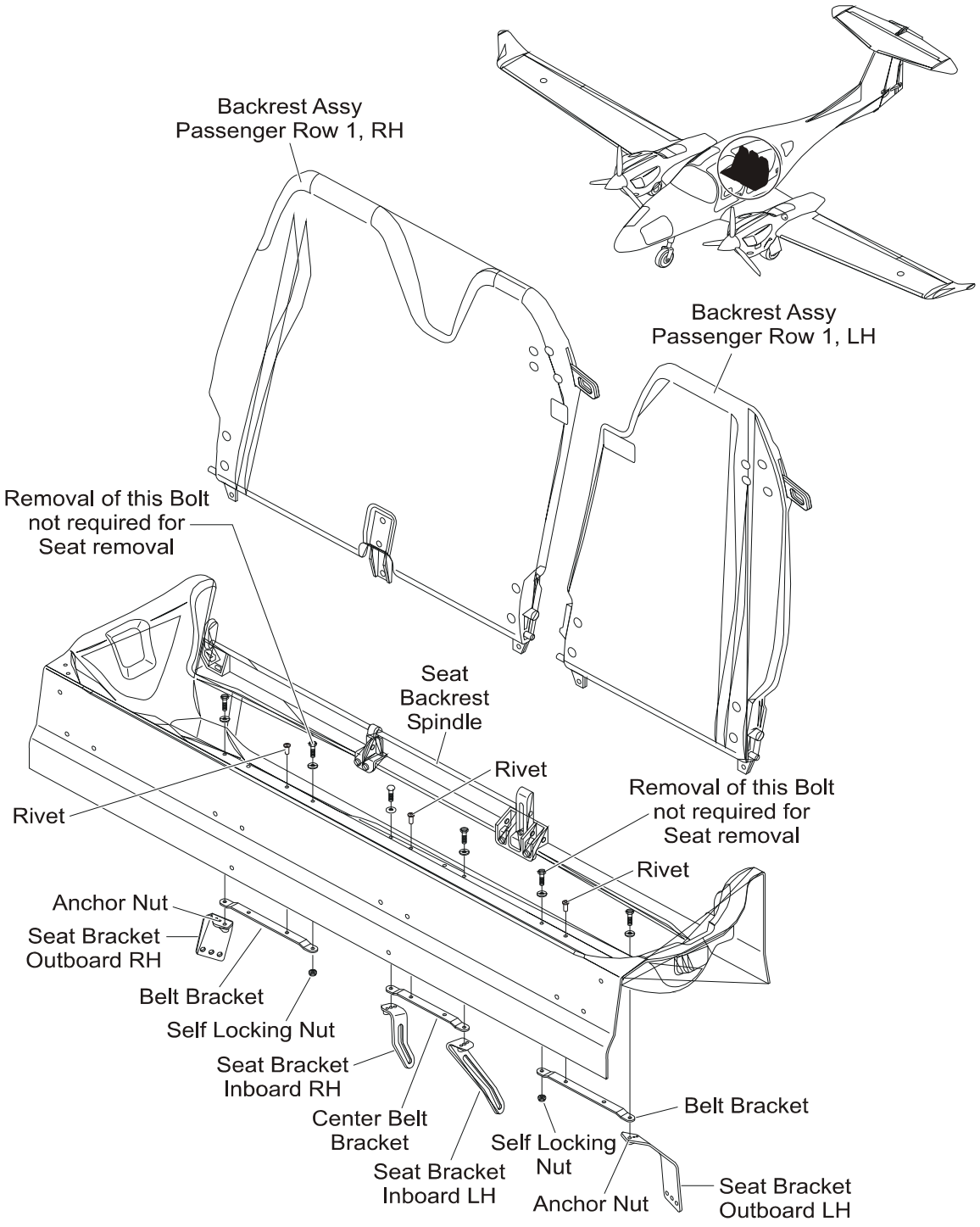

Figure 2 : Passenger Seat Installation - Row 1

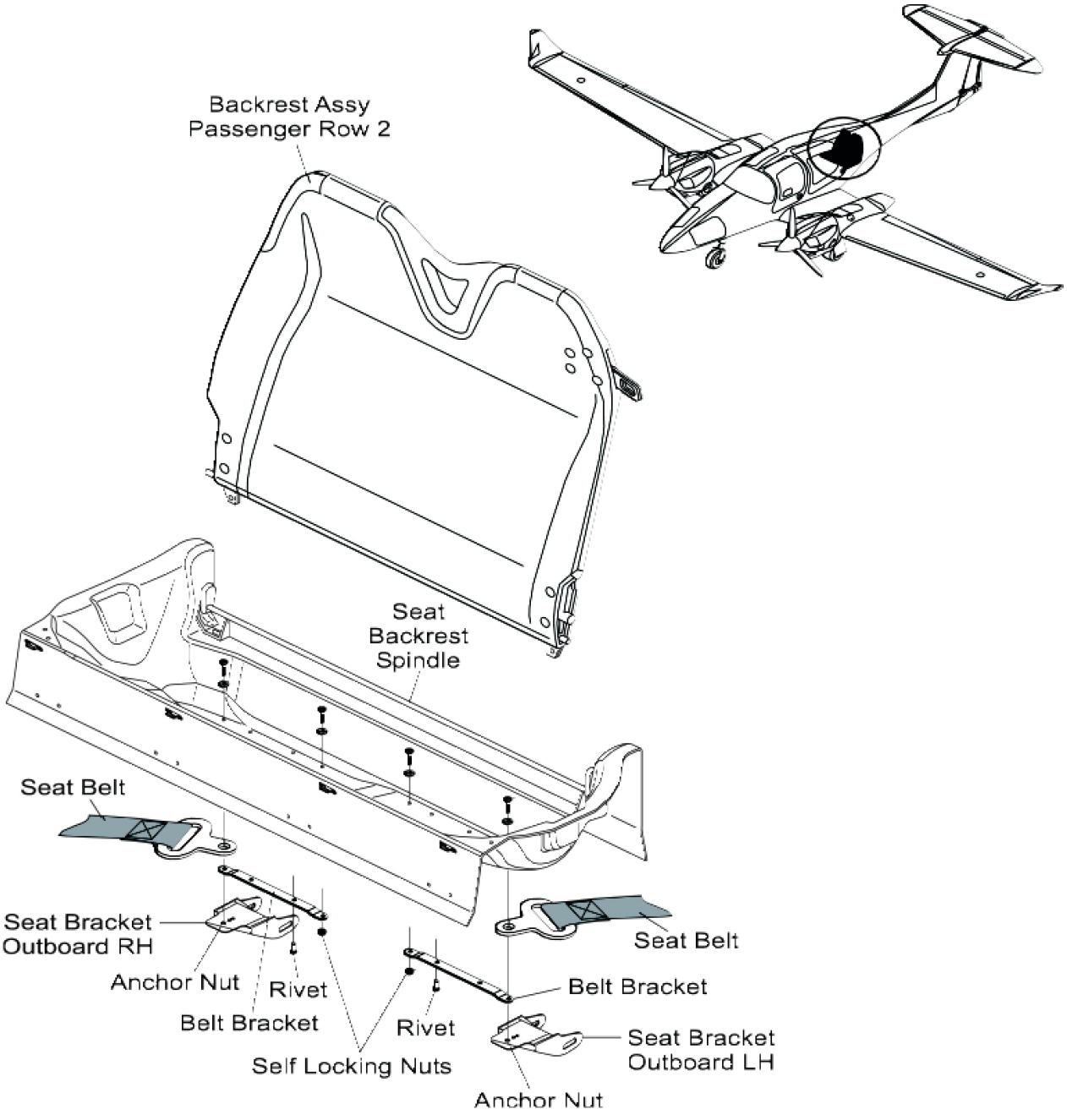

Figure 3 : Passenger Seat Installation - Row 2 (if OÄM 62-019 is installed)

B. Passenger Seat.

Figure 2 shows the passenger seat row 1 installation. The passenger seat row 1 has three main parts. It has a triple seat pan which is the full width of the cockpit. The passenger seat row 1 also has three seat backs (divided in two parts) 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-backs forward for access to the second pax row 2 and to the aft baggage compartment.

The LH backrest has an emergency release. If you pull the red handle, the backrest is released and can be put away. You can reattach the backrest by putting it into place and releasing the handle. The bolts are forced into locking position by springs.

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 wing center root rib. Two bolts with washer plates attach the front of the seat pan to ribs on top of the center tunnel rearward.

If OÄM 62-019 is installed:

Figure 3 shows the passenger seat row 2 installation. The passenger seat row 2 has two main parts. It has a douple seat pan which is the full width of the cockpit. The passenger seat row 2 also has two seat backs (one part) which attach to the seat pan with hinges. A latch at the left side of the left 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 wing center root rib. Two bolts with washer plates attach the front of the seat pan to ribs on top of the center tunnel rearward.

C. Crash Elements.

Each seat rests on crash elements. Each crash element has a special rigid foam. 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 three crash elements. They are located under the anchor plates on each side and in the middle.

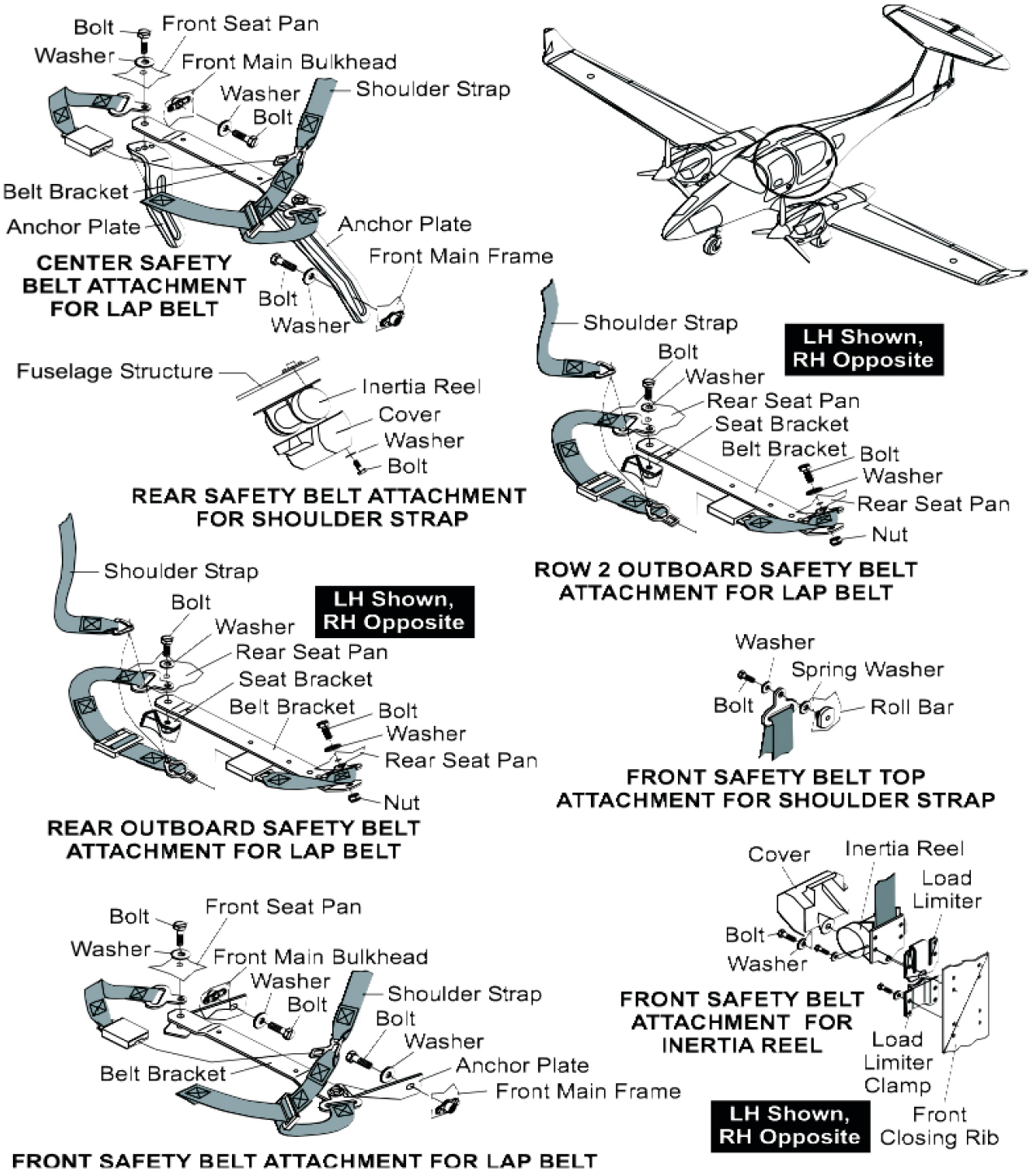

Figure 4 : Safety Harness Installation

D. Safety Harness

Figure 4 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 pul 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 reels for the passengers' safety harnesses are located on the fuselage wall behind the 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.

E. Fabric Wall Panels

Fabric wall panels bond to the inside of the fuselage shell.

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 guide hot air from the heating system onto the inside of the windscreen to windscreen defrost. 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, power levers, fuel control levers, com plugs and a center arm rest, if OÄM 62-020 is installed. It also seals the gap between the pilot's seats. There is a map pocket for each pilot installed on the side of the center console.

H. Baggage Compartment

A standard baggage compartment made of GFRP is located behind the pax seat row.

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**

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.

Refer to Figure 1. (25-10-00 Page 2).

A. Remove a Pilot's Seat.

	Detail Steps/Work Items	Key Items/References
CAUTION:	DO NOT PRESS THE PUSH BUTTON FOR THE ADJUSTABLE BACKREST OF THE FRONT SEATS UNINTENTIONALLY. THE SPRING LOADED BACKREST MAY SNAP FORWARD AND CAN CAUSE INJURY.	
(1)	Set backrest to the upright position: - Sit down in the front seat. - Press the release button. - Adjust the backrest to the upright position. - Release the release button.	
(2)	Release the velcro tapes at the front of the seat cushion.	Move the cushion to give access to the attaching bolts for the seat.
(3)	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.
(4)	Remove the bolts with washer plates which attach the front of the seat to the rear wall of the floor panel.	
(5)	Remove the lap strap from the seat.	
(6)	Lift the seat forward and out of the cockpit.	

B. Install a Pilot's Seat.

	Detail Steps/Work Items	Key Items/References
	CAUTION: DO NOT PRESS THE PUSH 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.	
(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.	
(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 velcro tapes which attach the seat cushion.	
(7)	Perform a test of the adjustable backrest: - 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 (B).

A. Test Procedures.

(1) Test the Backrest Adjustment Mechanism of a Front Seat.

	Detail Steps/Work Items	Key Items/References
	CAUTION: DO NOT PRESS THE PUSH 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.B.	
(1)	Sit down in the front seat.	
(2)	Lean against the backrest.	To counteract the spring loaded backrest mechanism.
(3)	Press the seat button.	
(4)	Move the backrest fully rearward:. - Check for limited range of movement and interference. - Let the seat lever move into the locking position at different backrest angles and check for proper fixation.	Press down the seat lever to ensure proper locking. Apply a test load of 75 - 80 daN (168.6 - 179.8 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 at different backrest angles and check for proper fixation.	Apply a test load of 75 - 80 daN (168.6 - 179.8 lbf.) to the top of the backrest at room temperature.
(7)	Move the seat back to the upright position.	
(8)	Let the seat move to the locking position.	

(2) Test the Lumbar Support Mechanism of a Front Seat.

	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.

B. Visual Inspection of the Adjustment Mechanism.

	Detail Steps/Work Items	Key Items/References
(1)	Remove seat from the airplane.	Refer to Para 2.A.
(2)	Carefully separate the leather lining from the backrest: - Remove cushion from seat pan (attached with velcro). - Release the three plastic brackets for the rubber bands to the seat pan. - Pull off the rubber bands from the plastic brackets. - Carefully remove the leather lining from the cover by opening all velcro fasteners.	Turn lining inside out together with the bag while pulling off.
(3)	Move cover forward to remove it from the hinge.	The cover remains attached to the cushion.
(4)	Check hydrolok installation for deformation and cleanness.	
(5)	Install cover by moving it over the hinge.	
(6)	Re-install the leather lining to the seat: - Attach the leather lining to the cover using the velcro fasteners. - Put the rubber bands into the plastic brackets. - Clip the plastic brackets onto the seat pan. - Attach the cushion to the seat pan using the velcro.	
(7)	Install the seat back in the airplane.	Refer to Para 2.B.

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 eight 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 eight bolts which attach the access panel to the seat.	
(3)	Fasten the cloth coating on the seat.	

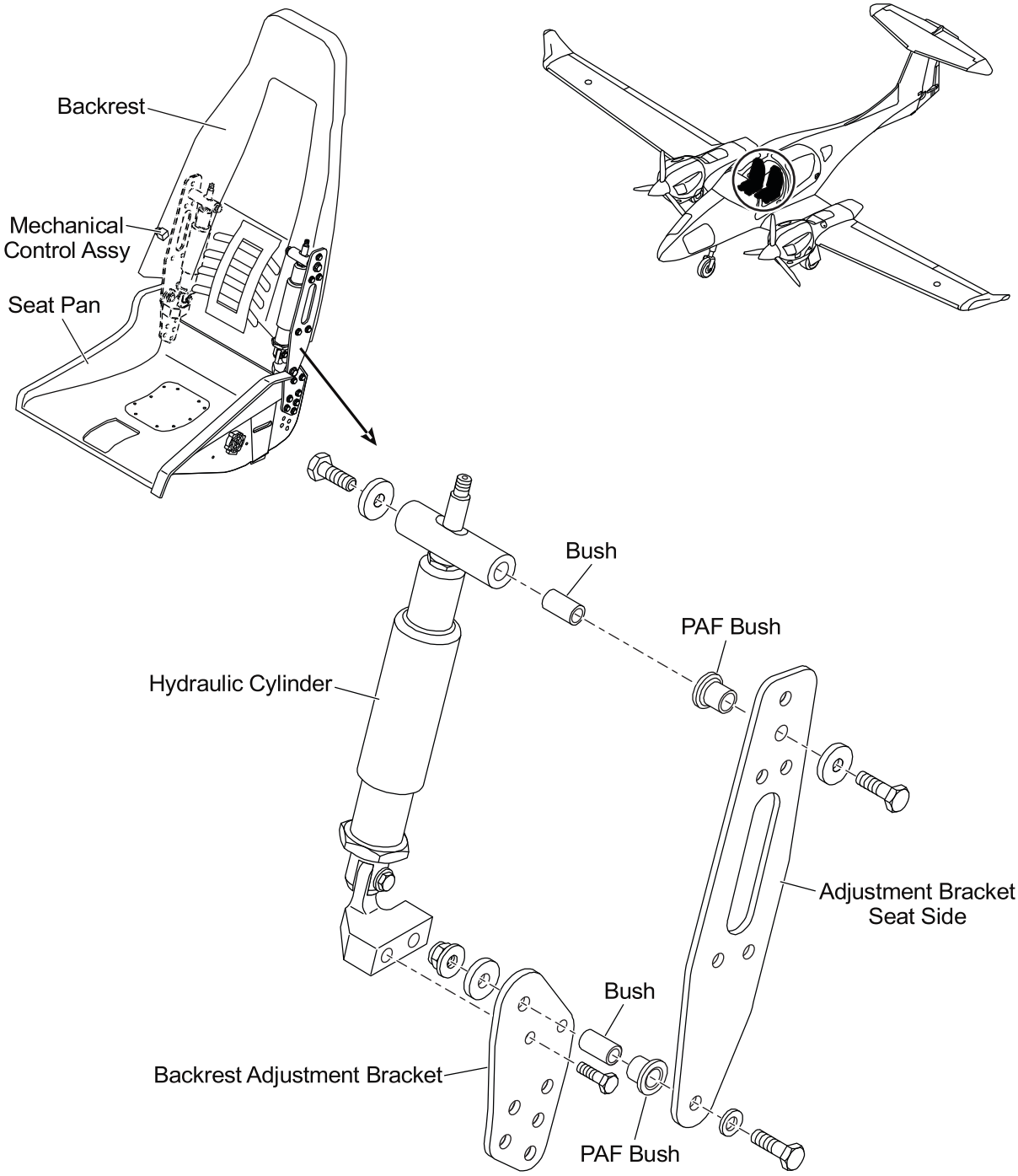

Figure 201 : Adjustable Backrest Assembly

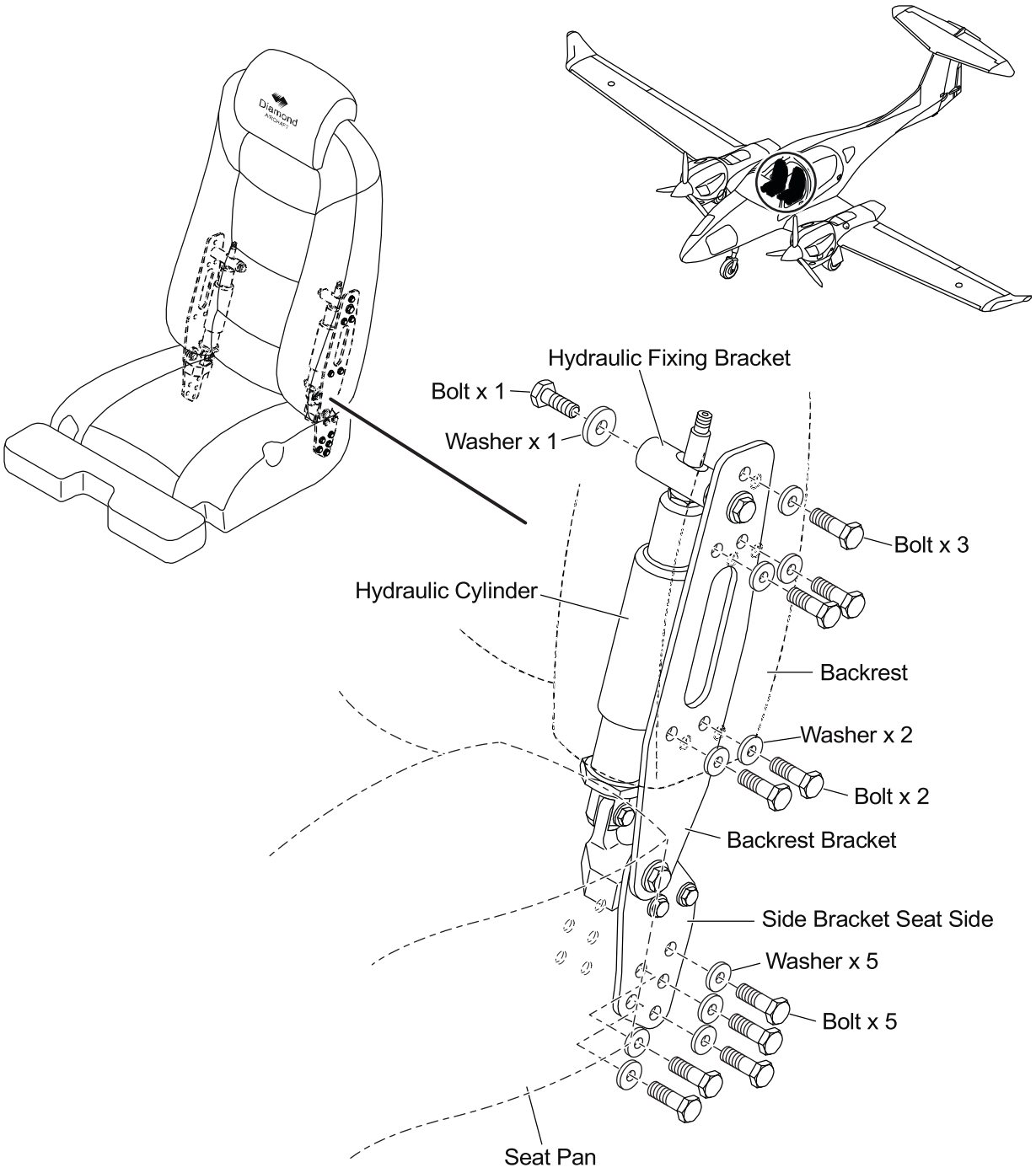

Figure 202 : Adjustable Backrest Assembly

5. **Disassemble/Assemble the Adjustable Backrest Mechanism**

Refer to Figures 201 and 202.

A. Remove the Backrest Assembly from the Seat.

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.	Refer to Para 2.A.
(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 five outboard and one inboard hexagon screws from the backrest brackets as they become accessible on both sides.	
(5)	Pull off the backrest shell.	

B. Disassemble the Adjustable Backrest Mechanism.

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.	
(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 two 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.	

C. Install the Adjustable Backrest Mechanism in the Seat.

	Detail Steps/Work Items	Key Items/References
(1)	Put the backrest shell on the seat.	
(2)	Install the one inboard and five outboard hexagon screws to the backrest brackets.	
(3)	Connect the lumbar actuator bowden cable.	
(4)	Carefully place the leather lining onto the backrest.	Turn lining to the correct status.
(5)	Install the seat back into the airplane.	Refer to Para 2.B.

6. **Remove/Install the Passenger Seat**

Refer to Figure 2. (25-10-00 Page 4).

A. Remove the Passenger Seat.

	Detail Steps/Work Items	Key Items/References
(1)	Release the velcro tapes at the front of the seat cushion.	Move the cushion to give access to the attaching bolts for the seat.
(2)	Remove the six bolts and washer plates which attach the seat pan to the rib on top of the rear main spar.	
(3)	Remove the four bolts and washer plates which attach the front of the seat pan to the rear crash elements.	
(4)	Fold the seat-backs forward.	Lift the handle on the backrest.
(5)	Remove the four bolts and washers which attach the rear of the seat pan to the footwell.	
(6)	Release the three inertia reels of the clip system.	
(7)	Lift the seat forward and up out of the fuselage.	

B. Install the Passenger Seat.

	Detail Steps/Work Items	Key Items/References
(1)	Examine the crash elements. Look specially for delaminating and buckling.	
(2)	Make sure that the area below the seat is clean and has no foreign 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)	Install the three inertia reels in the clip system.	
(5)	Install the four bolts and washer plates which attach the rear of the seat pan to the footwell.	Torque 6.4 Nm (4.7 lbf.ft.).
(6)	Put the lap strap ears between the seat pan and the metal plate. Make sure, that the bolts meet the mounting holes of the lap belt ears. Install the six bolts and washer plates which attach the seat pan to the rib on top of the rear main spar.	Do not tighten the bolts.
(7)	Check if the seat belt lower ends are held by the bolts.	Pull tightly on the lower ends of the seat belts.
(8)	Tighten the bolts from the top of the seat pan.	Torque 6.4 Nm (4.7 lbf.ft).
(9)	Install the four bolts and washer plates which attach the front of the seat pan to the rear crash elements.	Torque 6.4 Nm (4.7 lbf.ft.).
(10)	Fasten the velcro tapes which hold the seat cushion.	

C. Remove the Passenger Seat of Row 2 (if OÄM 62-019 is installed).

Refer to Figure 3. (25-10-00 Page 5).

	Detail Steps/Work Items	Key Items/References
(1)	Release the velcro tapes at the front of the seat cushion.	Move the cushion to give access to the attaching bolts for the seat.
(2)	Remove the eight bolts, washer plates and four D-plates which attach the seat pan to the baggage frame FWD.	
(3)	Remove the four bolts and washer plates which attach the seat pan to the seat brackets on the floor.	
(4)	Remove the two bolts and washers which attach the rear of the seat pan to the cargo tray.	
(5)	Fold the seat-backs forward.	Lift the handle on the backrest.
(6)	Release the safety belts.	
(7)	Lift the seat forward and up out of the fuselage.	

D. Install the Passenger Seat of Row 2 (if OÄM 62-019 is installed).

Refer to Figure 3. (25-10-00 Page 5).

	Detail Steps/Work Items	Key Items/References
(1)	Examine the crash elements. Look specially for delaminating and buckling.	
(2)	Make sure that the area below the seat is clean and has no foreign 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)	Put the lap strap ears between the seat pan and the metal plate. Make sure, that the bolts meet the mounting holes of the lap belt ears. Install the four bolts and washer plates which attach the seat pan to the seat brackets on the floor.	Do not tighten the bolts.
(5)	Check if the seat belt lower ends are held by the bolts.	Pull tightly on the lower ends of the seat belts.
(6)	Tighten the bolts from the top of the seat pan.	
(7)	Install the two bolts and washer plates which attach the rear of the seat pan to the cargo tray.	
(8)	Install the 8 bolts, washer plates and D-plates which attach the seat pan to the baggage frame FWD.	
(9)	Fasten the velcro tapes which hold the seat cushion.	

7. **Remove/Install a Safety Harness**

Use this procedure for both the pilots' seats and the passenger seat harnesses.

Refer to Figure 4. (25-10-00 Page 7).

A. Remove a Safety Harness.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the seat.	Refer to Para 2.A. for the pilot's seat. Refer to Para 6.A. or 6.C. for the passenger seat.
(2)	Remove the anchor nuts, washers and plates which attach the straps to the seat.	For the pilots' seats only: - Make a note of the position of the anchor plates which these bolts also hold.
(3)	For passenger row 2 (if OÄM 62-019 is installed): Remove the back wall.	
(4)	Move the straps through the holes in the seat pan and remove them.	
(5)	Release the bolt and washer which attach the inertia reel and its cover to the fuselage structure.	
(6)	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.
(7)	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 strap ears between the seat pan and the metal plate. Make sure, that the bolts meet the mounting holes of the lap belt ears. Install the bolts and washer plates from the top of the seat pan.	Do not tighten the bolts.
(3)	Check if the seat belt lower ends are held by the bolts.	Pull tightly on the lower ends of the seat belts.
(4)	Tighten the bolts from the top of the seat pan.	
(5)	Move the anchor plates into position on the bolts.	For the pilots’ seats only.
(6)	Install the seat.	Refer to Para 2.B. for the pilot’s seat. Refer to Para 6.B. or 6.D. for the passenger seat.
(7)	Install the bolt and washer which attach the guide to the roll-bar.	For the pilots’ seats only.
(8)	Install the bolt and washer which attach the inertia reel and its cover to the structure.	See the “rear safety belt attachment for shoulder strap” in Figure 4.
(9)	Install washer plates and self-locking nuts onto the bolts.	Torque 16 Nm (11.8 lbf.ft.).
(10)	For passenger row 2 (if OÄM 62-019 is installed): Install the back wall.	

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)	Disconnect the electrical connectors of the flood lights.	
(5)	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)	Connect the electrical connectors of the flood lights.	
(5)	Lower the cover into position on the instrument panel.	
(6)	Install the screws which attach the instrument panel cover to the instrument panel and the fuselage.	

9. **Remove/Install the Center Armrest**

A. Remove the Center Armrest.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the blind plug on both sides of the center armrest.	
(2)	Remove the screw and the washer on the LH side of the armrest.	
(3)	Remove the screw and the washer together with the bushing on the RH side.	
(4)	Lift armrest clear of lower assembly.	

B. Install the Center Armrest.

	Detail Steps/Work Items	Key Items/References
(1)	Move armrest into position.	
(2)	Insert bushing with washer and screw on the RH side.	Apply Loctite 243 on bolt thread
(3)	Install screw and washer on the LH side.	Apply Loctite 243 on bolt thread
(4)	Use screws to adjust the friction of the armrest.	
(5)	Install the blind plugs on both sides.	

10. **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

Use a mild soap solution to clean the straps of the harnesses.

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.

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 front of the baggage frame RWD. You can remove the aft baggage compartment.

The baggage compartment has two storage bays in the floor section of the compartment. Carpet covers the floor of the baggage compartment.

A cargo net covers 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 and side of the aft baggage compartment frame.

If OÄM 62-019 is installed:

Figure 2 shows the aft baggage compartment.

GFRP makes the aft baggage compartment. Bolts attach the front of the aft baggage compartment to the passenger seat row 2. The rear of the aft baggage compartment locates in front of the baggage frame RWD. You can remove the aft baggage compartment.

The aft baggage compartment has one storage bay in the floor section of the compartment. Carpet covers the floor of the baggage compartment.

A cargo net covers the aft baggage compartment and secures the contents of the aft baggage compartment, if the passenger seat row 2 is folded forward. The cargo net attaches to special net tie-down brackets that are bolted to the front and side of the aft baggage compartment frame.

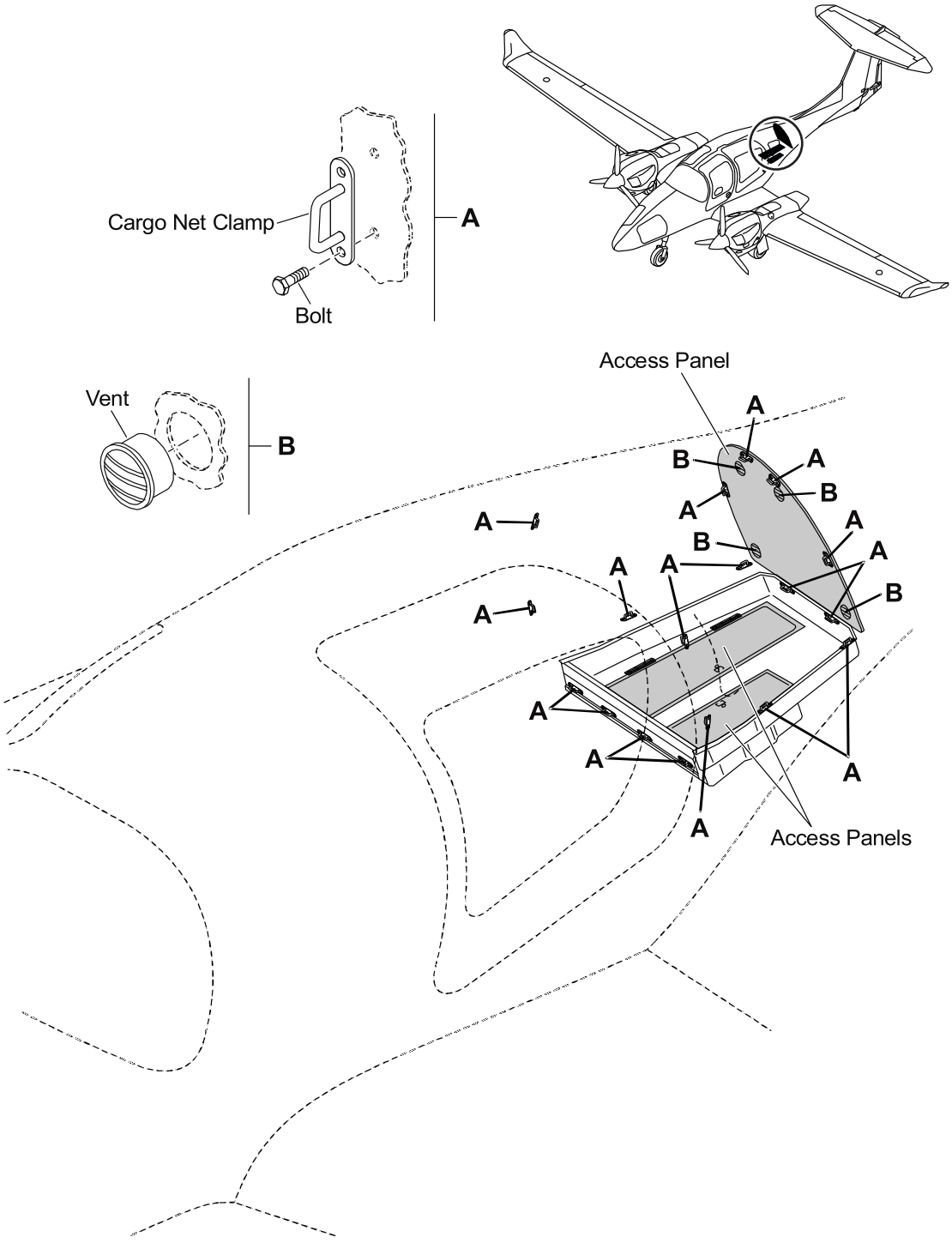

Figure 1 : Aft Baggage Compartment

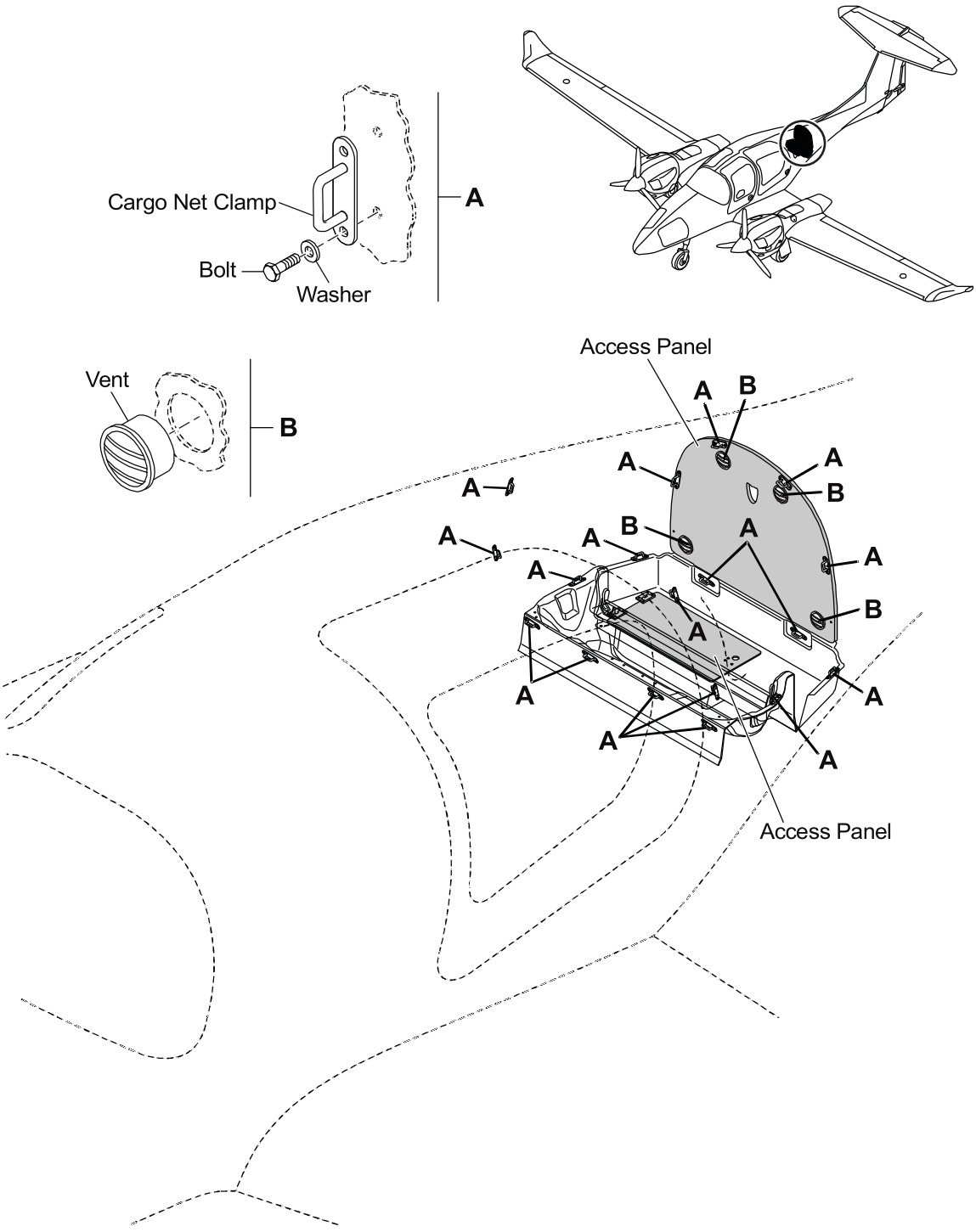

Figure 2 : Aft Baggage Compartment (if OÄM 62-019 is installed)

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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 Aft Baggage Compartment**

Refer to Figure 1. (25-20-00 Page 2).

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)	Remove the four forward and two rear cargo net clamps and the screw in each storage bays.	
(5)	Remove the aft baggage compartment: - Loosen the screws and clamps of the rear wall for easier handling. - 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. - Make sure that baggage compartment is fully into position and install the screw in each storage bay. - Install the four forward and two rear cargo net clamps. - Tighten the screws and clamps of the back wall.	
(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 (if OÄM 62-019 is installed)**

Refer to Figure 2. (25-20-00 Page 3).

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)	Remove the two bolts and washers from the seat pan rear and two rear cargo net clamps and the screw in the storage bay.	
(4)	Remove the aft baggage compartment: - Loosen the screws and clamps of the rear wall. - Remove the five bolts, washers and nuts from the cargo tray flange at the rear 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. - Make sure that baggage compartment is fully into position and install the screw in the storage bay. - Install the 2 bolts and washers on the seat pan rear and 2 rear cargo net clamps. - Install the 5 bolts, washers and nuts of the cargo tray flange at the rear baggage frame - Tighten the screws and clamps of the back wall.	
(3)	If necessary, install any equipment that you removed from the baggage compartment and install the cargo net.	
(4)	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 62 airplane. It tells you about the emergency location transmitter (ELT), the first aid kit, the egress hammer and the belt cutter (if OÄM 62-019 is installed). 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 62.

2. Description

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 48 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 and for further information to the Manufacturers Documentation.

An egress hammer is installed on the floor panel behind the co-pilot’s seat.

A belt cutter is installed on the RH side wall between passenger row 1 and passenger row 2 (if OÄM 62-019 is installed).

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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 Emergency Locator Transmitter (ELT) and the Remote Control Panel/Indicator (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.

Figure 201 shows the components of the system.

See the ELT manufacturer's Operator's Manual for more data about the ELT.

2. **Remove/Install the Kannad 406 AF-Compact or the 406 AF-Integra ELT**

Refer to Figure 202.

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)	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.	

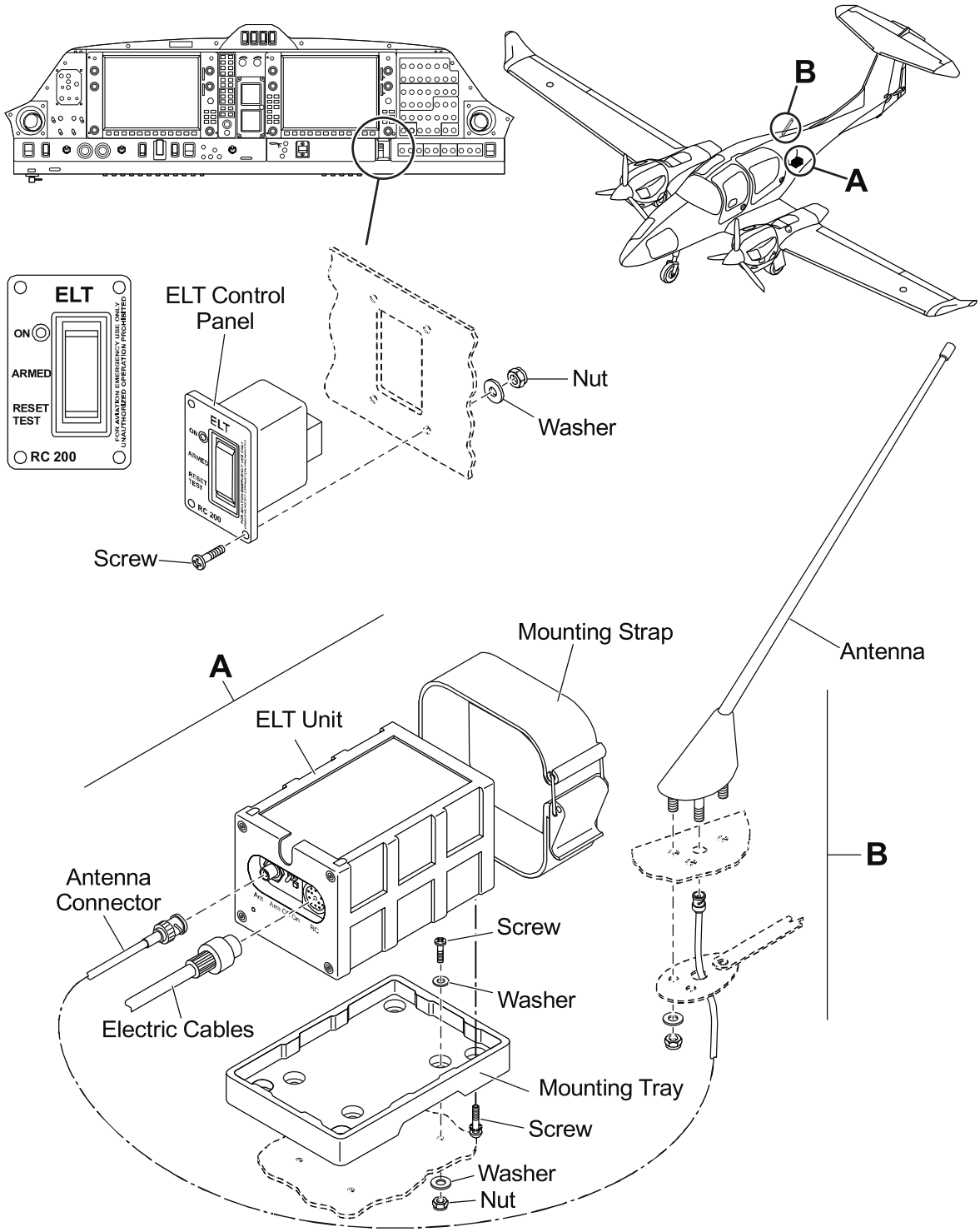
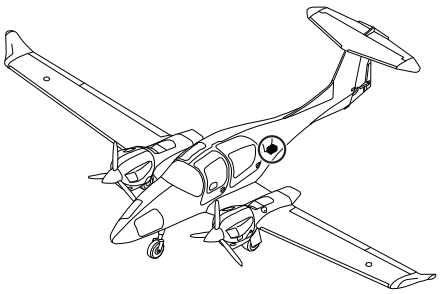


Figure 201 : ELT Main Components



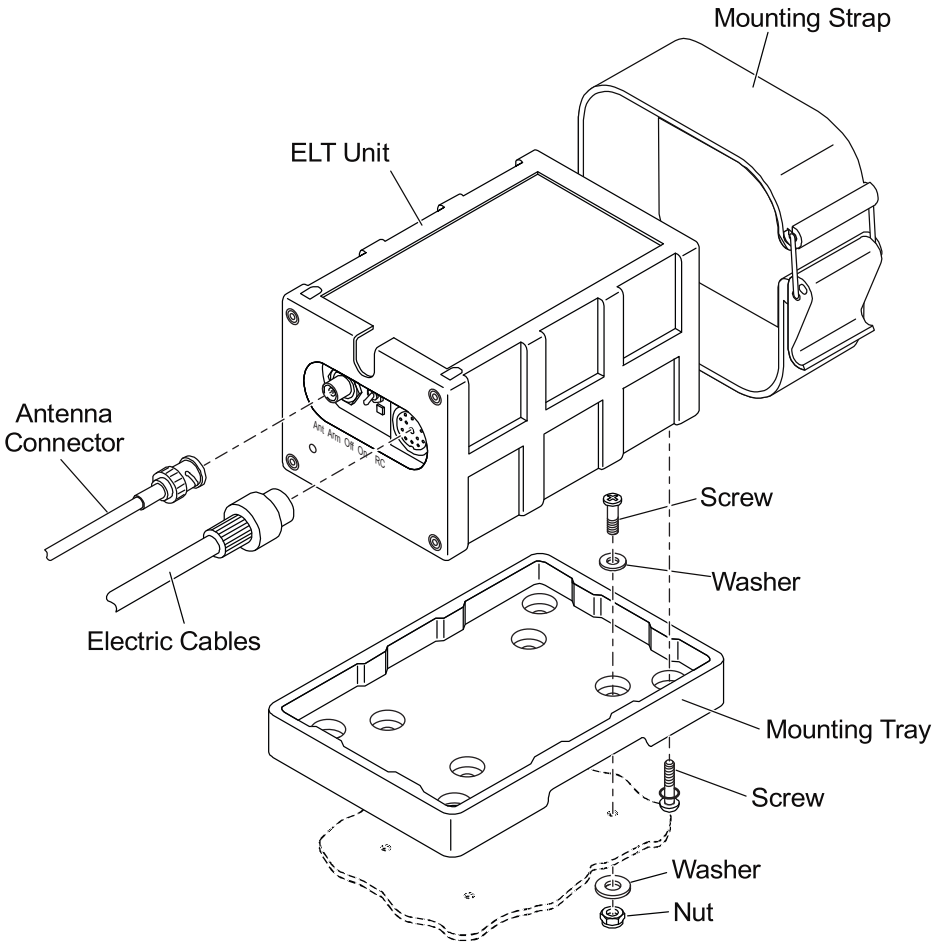


Figure 202 : ELT Installation

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.	
(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 Functional Test of the ELT system.	Refer to Paragraph 4.

3. **Remove/Install the Emergency Locator Transmitter (ELT) RCPI**

Refer to Figure 203.

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.	At the in-line connector.
(3)	Remove the RCPI: - Remove the four 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 four 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 4.

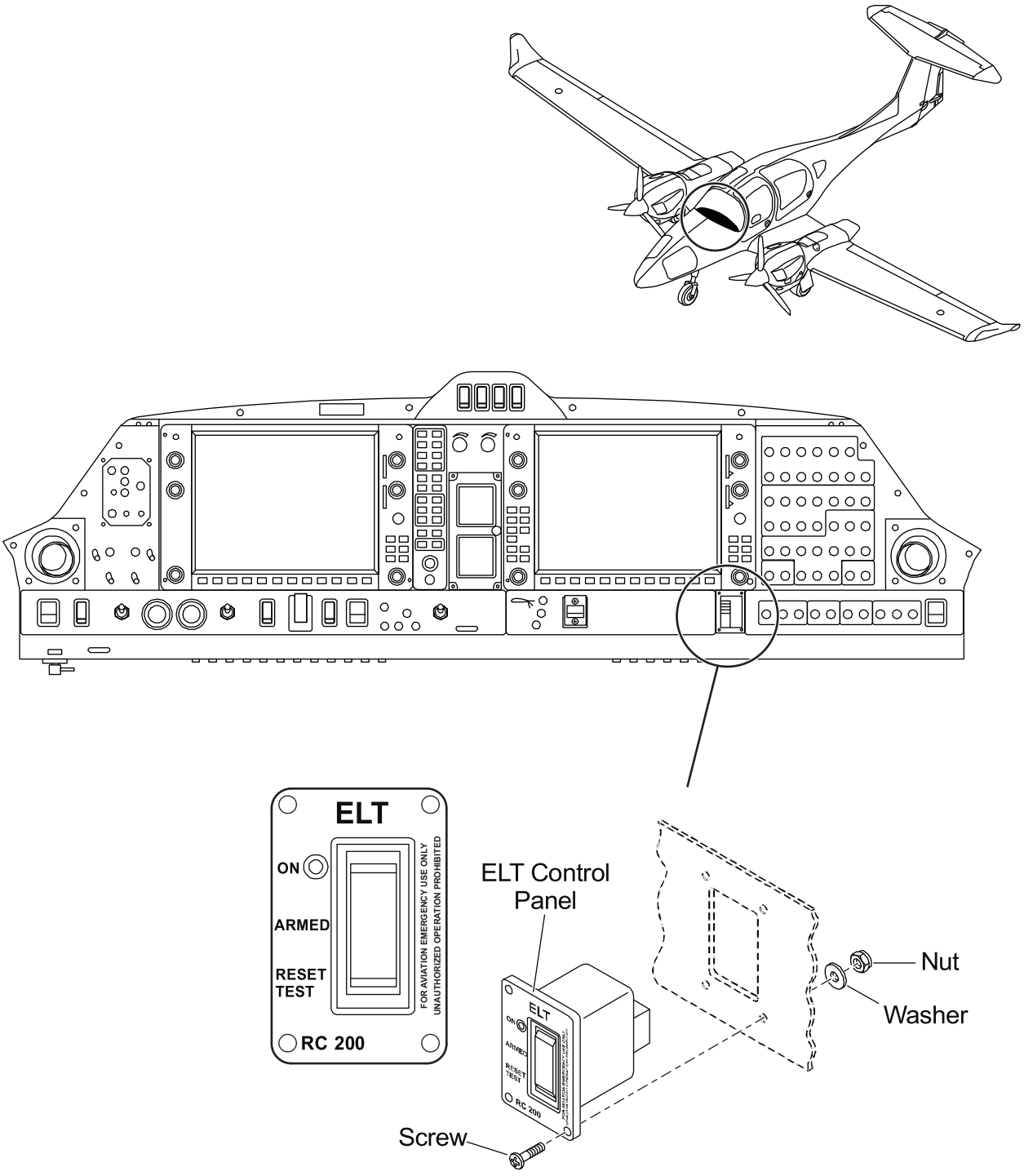


Figure 203 : RCPI Installation

4. **Kannad 406 AF-Compact or the 406 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.	

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CHAPTER 26

FIRE PROTECTION

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CHAPTER 26

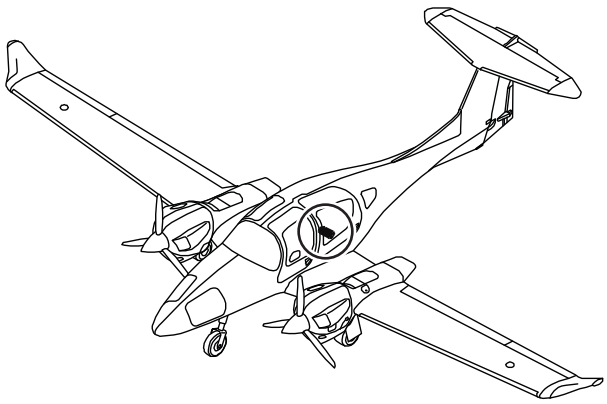
FIRE PROTECTION

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 62 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.



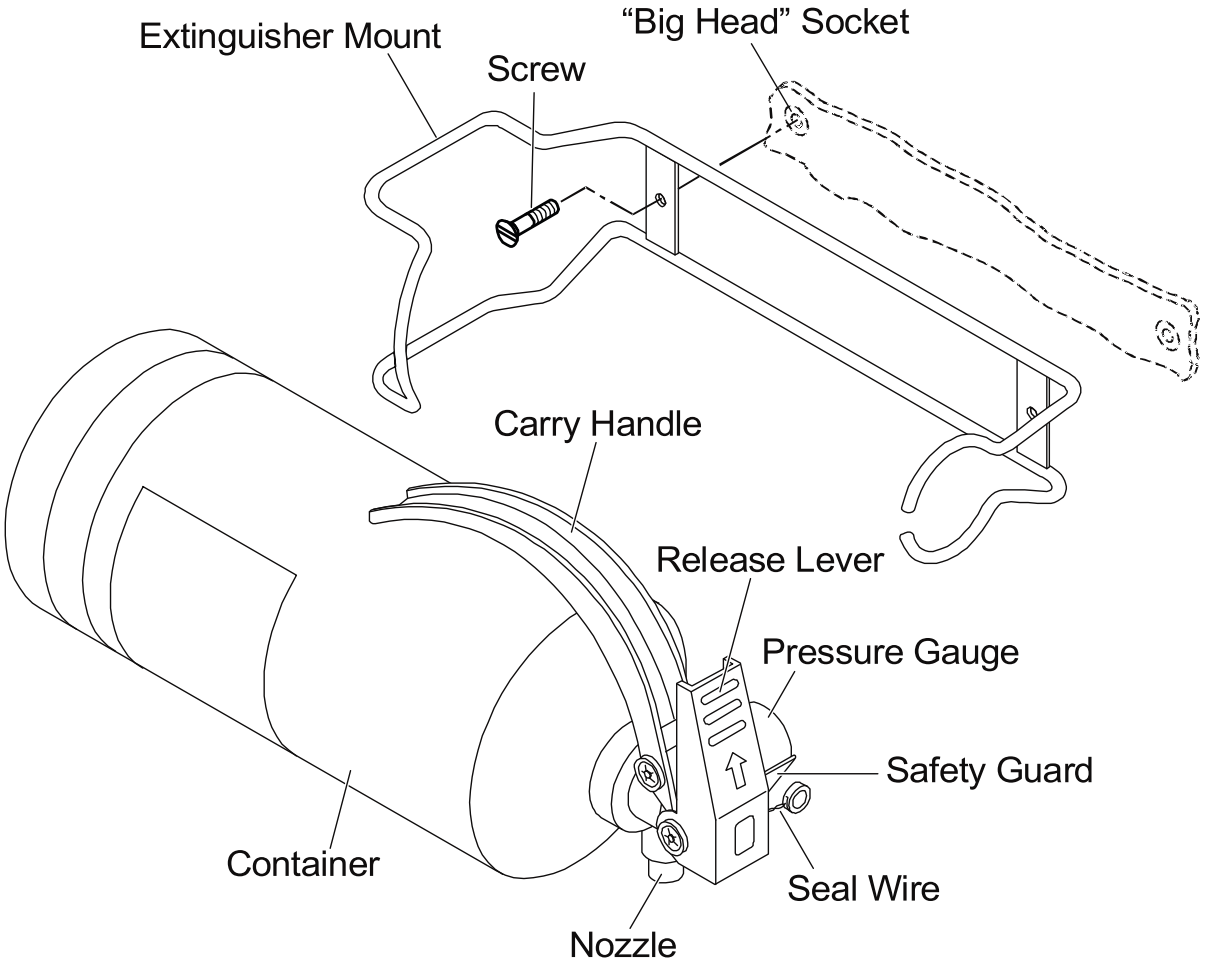


Figure 1 : Fire Extinguisher Installation

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 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.

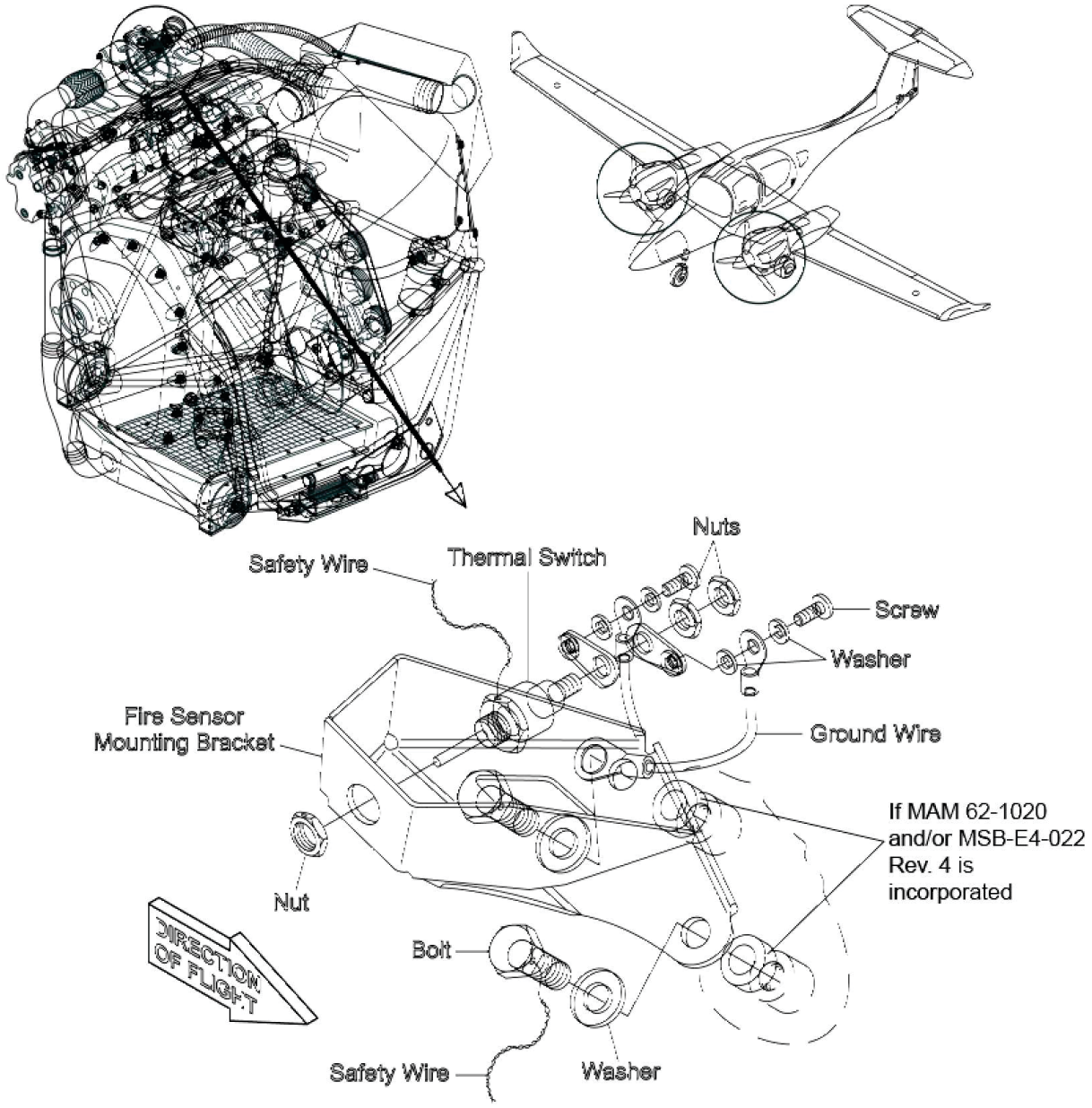


Figure 2 : Engine Overheat Detector Installation

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**

The table below lists some defects you could have with the fire 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
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**

Refer to Figure 2. (26-00-00 Page 4).

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 from the overheat detector and mounting bracket. - Carefully screw off the overheat detector from the mounting bracket.	
(5)	Disconnect the electrical cables for the overheat detector.	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.	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 62. 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 62 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 62. The DA 62 has the usual flight controls. An elevator attached to the horizontal stabilizer gives longitudinal control. Ailerons attached to the trailing edge of each wing gives lateral control. Rudder attached to the vertical stabilizer gives yaw control. Flaps attached to the trailing edge of each wing 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 62-025 is installed, the RH control stick is 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.

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.

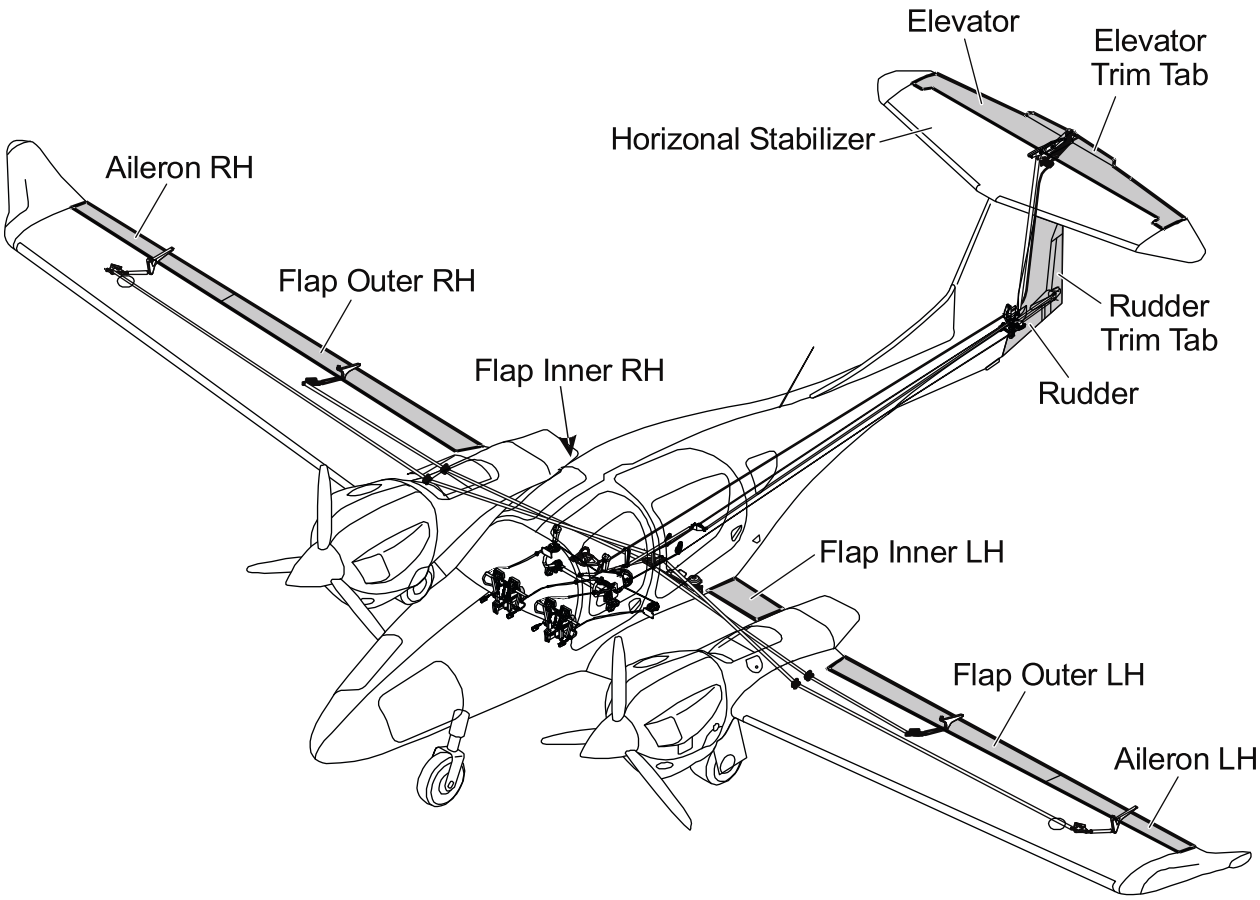

Figure 1 : DA 62 Control Surfaces

3. **Push-Rods**

The pushrods used in the DA 62 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. Toothed washers lock 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 62 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.

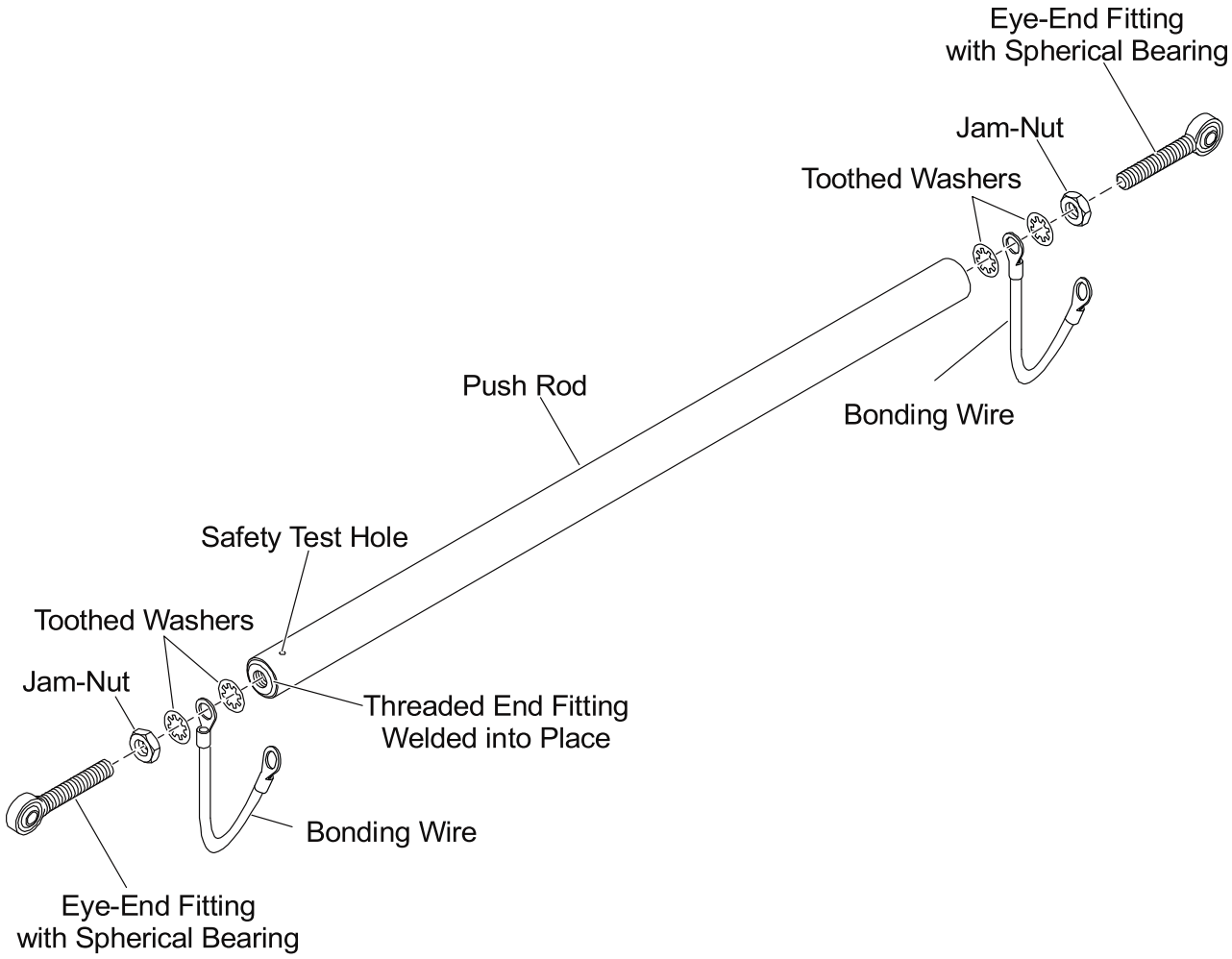

Figure 2 : DA 62 Standard Control Pushrod

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 2. (27-00-00 Page 4) Disconnecting not necessary.
(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.
(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 62 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 sides 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.).

	Detail Steps/Work Items	Key Items/References
(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. **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.

5. **Remove/Install the RH Control Stick (if OÄM 62-025 is installed)**

Refer to Figure 201.

If OÄM 62-025 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. With the control stick removed, the control stick base is protected with a dust cap. For removal/installation of the removable control stick refer to Supplement O08 of the AFM.

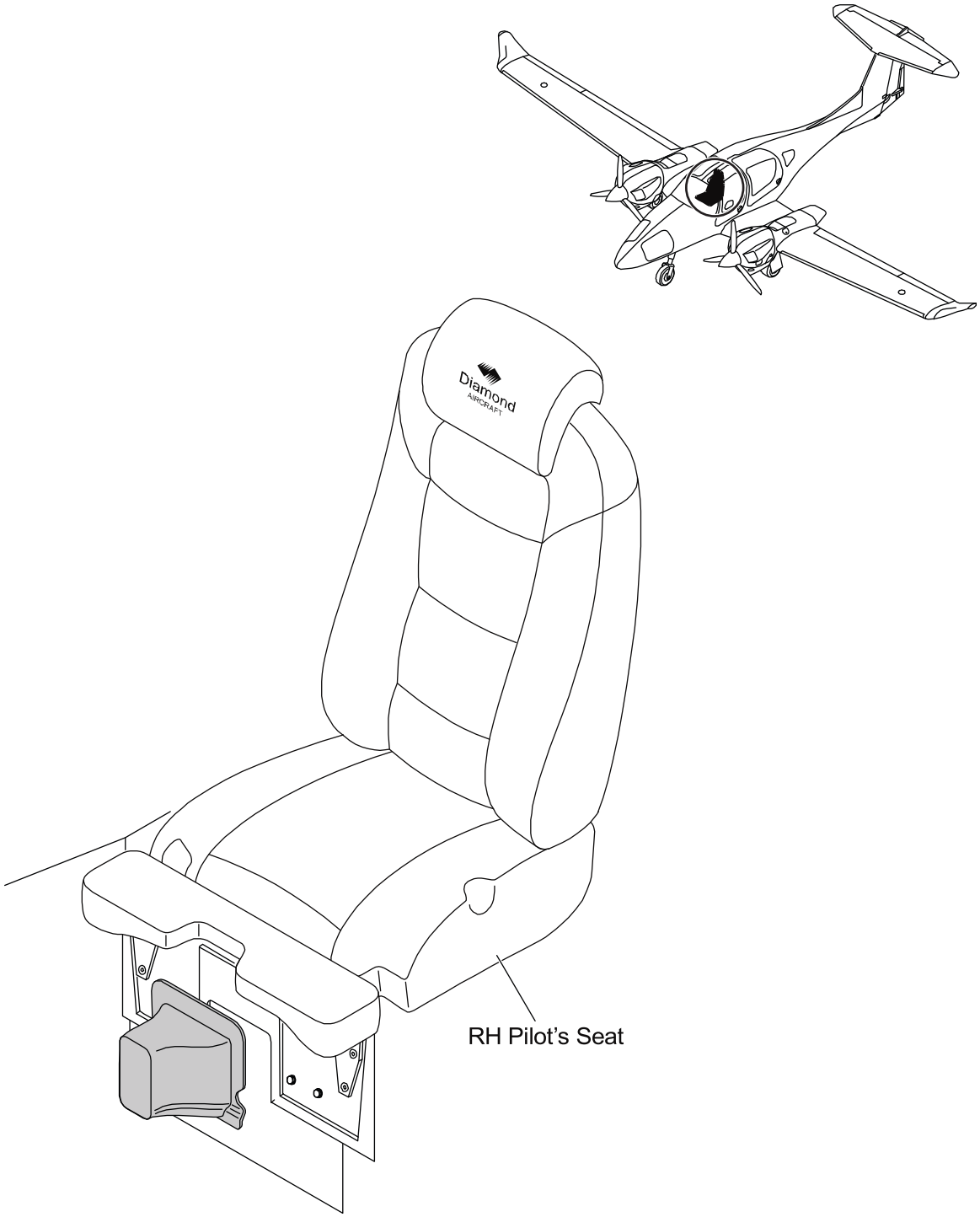

Figure 201 : RH Stick Removed (if OÄM 62-025 is installed)

Section 27-10

Flight Controls - Ailerons and Tabs

1. General

The DA 62 has two control sticks that operate the ailerons. If OÄM 62-025 is installed, the RH control stick is 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.

2. Description

The DA 62 has a control stick for each pilot. If OÄM 62-025 is installed, the RH control stick is 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 of 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.

The aileron rear bellcrank is secured with a guard.

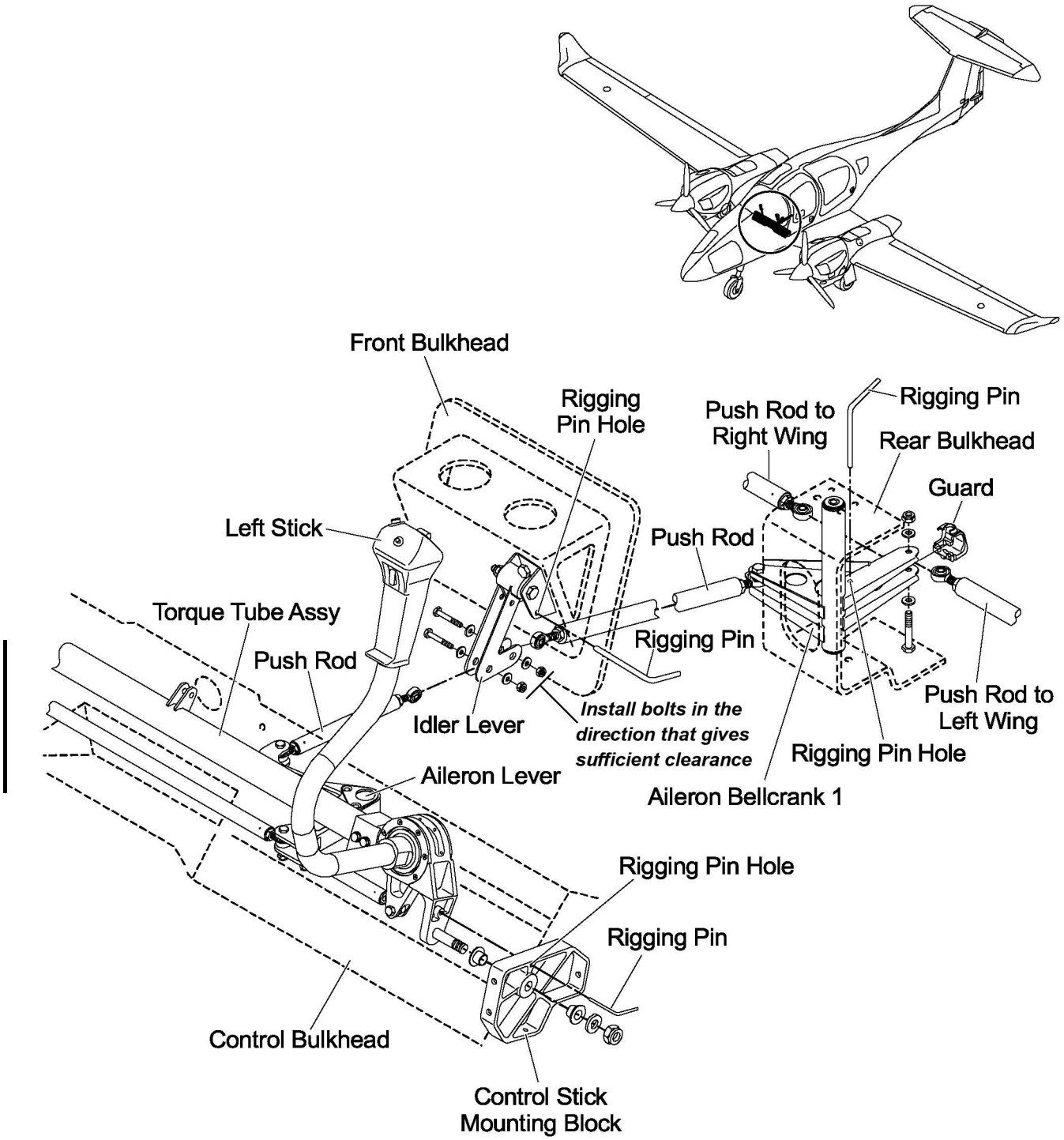

Figure 1 : Aileron Controls in the Fuselage (Sheet 1)

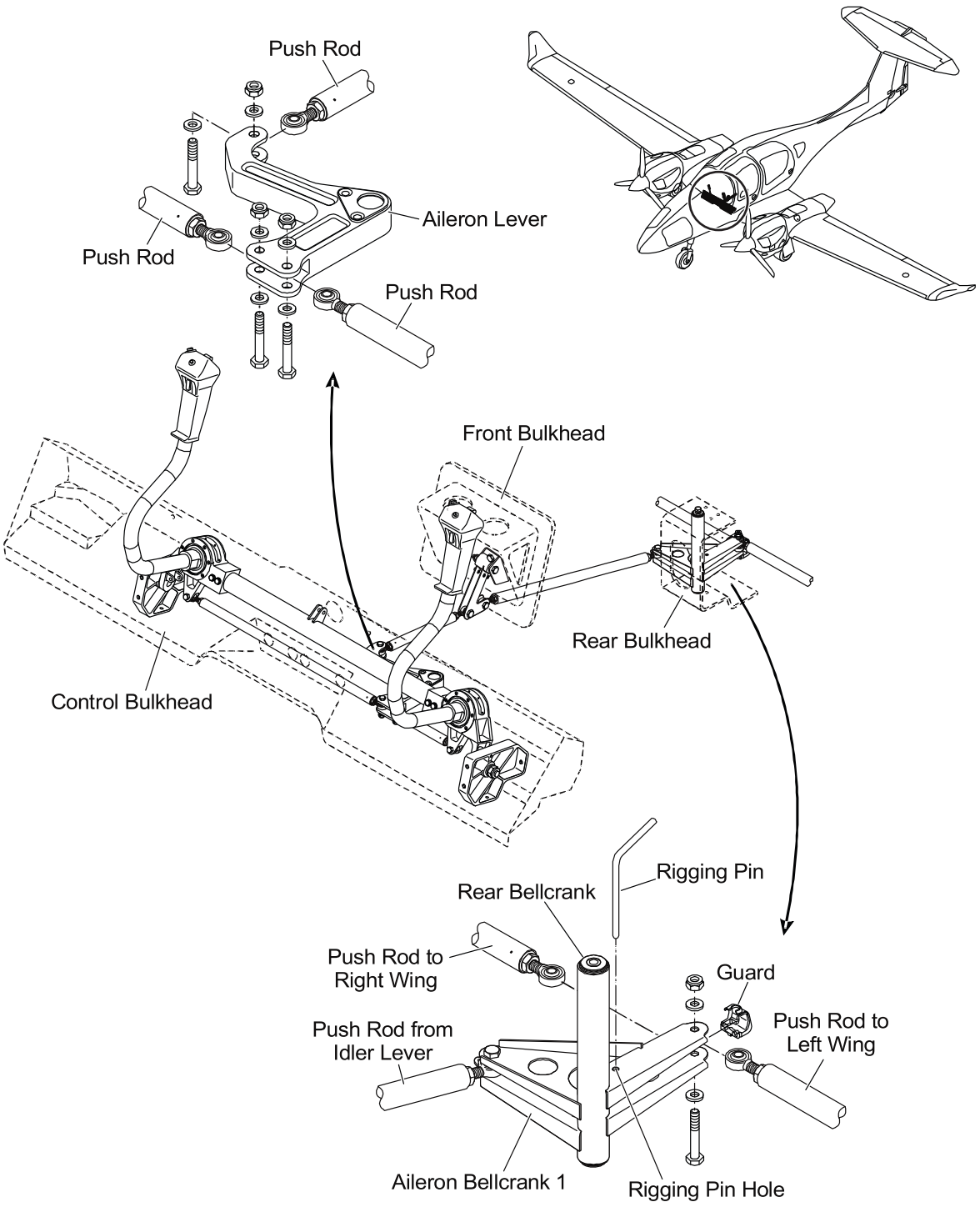

Figure 2 : Aileron Controls in the Fuselage (Sheet 2)

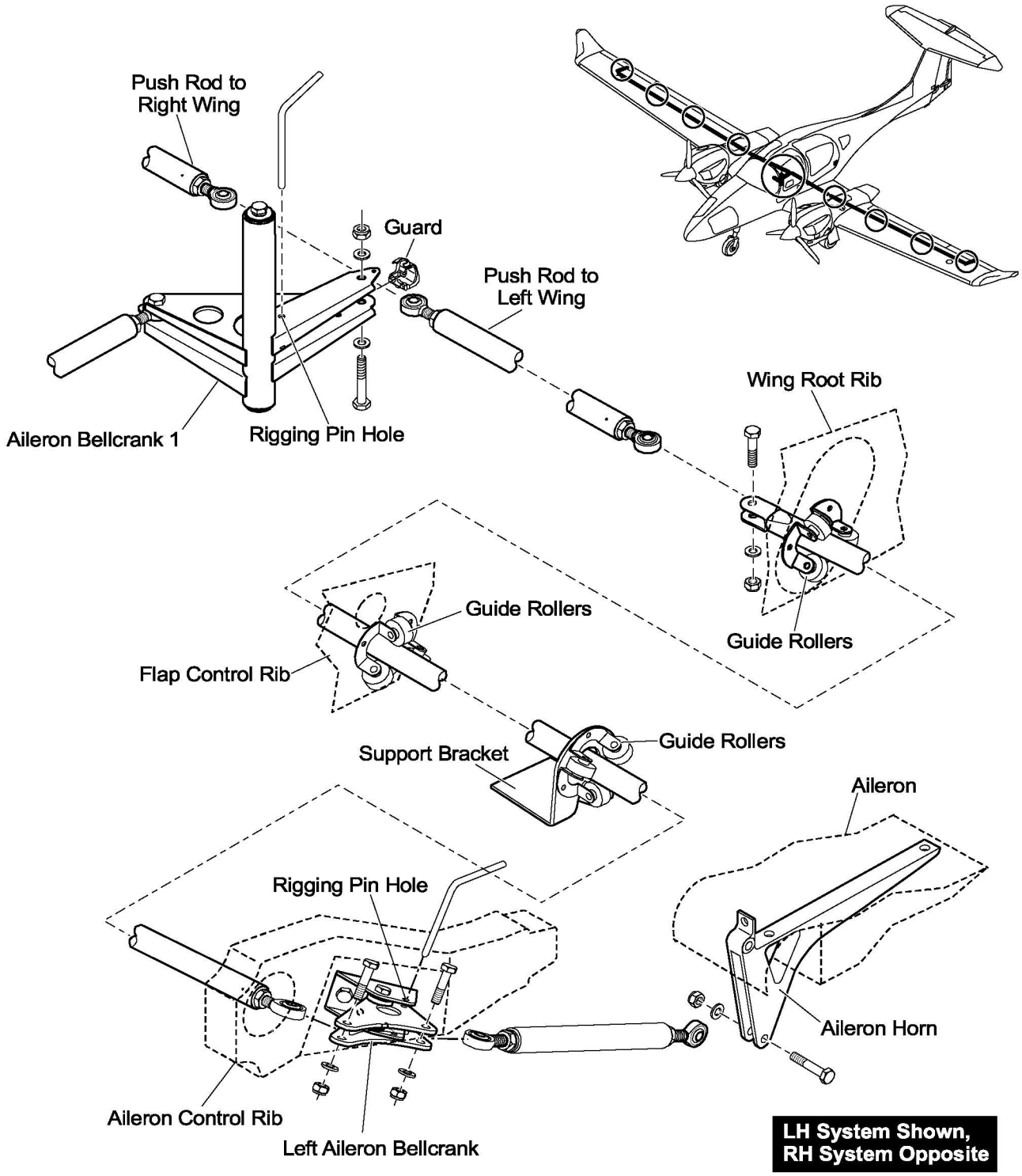

Figure 3 : Aileron Controls in the Wing

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.

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Trouble-Shooting

1. **General**

The table below lists the 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 eye end.
	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.
Flap / Aileron check gauge.	1	D60-5753-00-00-PL.

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 Section 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: - Through any of the six holes at the bottom of stick circumference. - Through the left mounting bracket.	Refer to Figures 1 and 2. (27-10-00 Pages 2 and 3). To lock aileron movement. To lock elevator movement.
(4)	Install the flap / aileron check gauge on the wings.	
(5)	Check the trailing edges of both ailerons. - Adjust the ailerons in accordance with Paragraph 3 if necessary. - Report the measurements in the adjustment report.	
(6)	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.	
(7)	Move the control stick fully to the left and hold it against the stop.	

	Detail Steps/Work Items	Key Items/References
(8)	Check the trailing edges of both ailerons. - Adjust the ailerons in accordance with Paragraph 3 if necessary. - Report the measurements in the adjustment report.	
(9)	Move the control stick fully to the right and hold it against the stop.	
(10)	Check the trailing edges of both ailerons. - Adjust the ailerons in accordance with Paragraph 3 if necessary. - Report the measurements in the adjustment report.	
(11)	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.
Flap / Aileron check gauge.	1	D60-5753-00-00-PL.

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: Refer to Section 25-10. Refer to Section 52-40.
(2)	Install rigging pins in the following: - The bottom of each control stick. - The left stick mounting bracket. - The front bellcrank. - The idler lever. - The rear bellcrank. - The left aileron bellcrank. - The right aileron bellcrank.	Refer to Figures 1, 2 and 3. (27-10-00 Pages 2, 3 and 4). To lock the stick to the torque tube. The lock the elevator movement. On the control bulkhead. On the front main bulkhead. On the rear main bulkhead. In the left wing. 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 push-\rod adjustment procedure.

	Detail Steps/Work Items	Key Items/References
(4)	Install the flap / aileron check gauge on the wings.	
(5)	Remove the rigging pins from the following: - The bottom of each control stick. - The left stick mounting bracket. - The front bellcrank. - The idler lever. - The rear bellcrank. - The left aileron bellcrank. - The right aileron bellcrank.	Refer to Figures 1, 2 and 3. (27-10-00 Pages 2, 3 and 4). On the control bulkhead. On the front main bulkhead. On the rear main bulkhead. In the left wing. In the right wing.
	CAUTION: ALL RIGGING PINS MUST BE REMOVED TO AVOID DAMAGE OF THE CONTROL SYSTEM.	
(6)	Do the Aileron Control System Test Procedure.	Refer to Paragraph 2.B.
(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. Remove guard on bellcrank if necessary. (Reattach after adjustment and secure with cable tie. Ratchet facing inward.)
(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. (27-10-00 Page 2). The aileron positions must be the distances shown in the original Control Surfaces Adjustment Report (measured from the neutral position).

	Detail Steps/Work Items	Key Items/References
(9)	Do an inspection of the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	Check correct position of guard and cable tie on bellcrank guard (Ratchet facing inward.)
(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.	Pilots' seats.	Refer to Section 25-10.
Between the bellcrank at the control bulkhead and the idler lever at the front main bulkhead.	Pilots' seats.	Refer to Section 25-10.
Between the idler lever at the front main bulkhead and the bellcrank at the rear main bulkhead.	Pilots' seats. Passenger seat.	Refer to Section 25-10.
Between the bellcrank at the rear main bulkhead. and the center section closing rib..	Pilots' seats. Center section access panels.	Refer to Section 25-10. Refer to 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.	Refer to Section 52-40.
Between the bellcrank in the left/right wing and the ailerons.	Aileron bellcrank access panels under each wing.	Refer to Section 52-40.

5. **Aileron Bellcrank and Lever Access**

Aileron Bellcrank/Lever	Remove/Install Access	References
Bellcrank at the control bulkhead.	Pilots' seats.	Refer to Section 25-10.
Idler lever at the front main bulkhead.	Pilots' seats.	Refer to Section 25-10.
Bellcrank at the rear main bulkhead.	Passenger seat.	Refer to Section 25-10.
Bellcrank in the wing.	Aileron bellcrank access panels under each wing.	Refer to Section 52-40.

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Section 27-20

Flight Controls - Rudder

1. General

The DA 62 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.

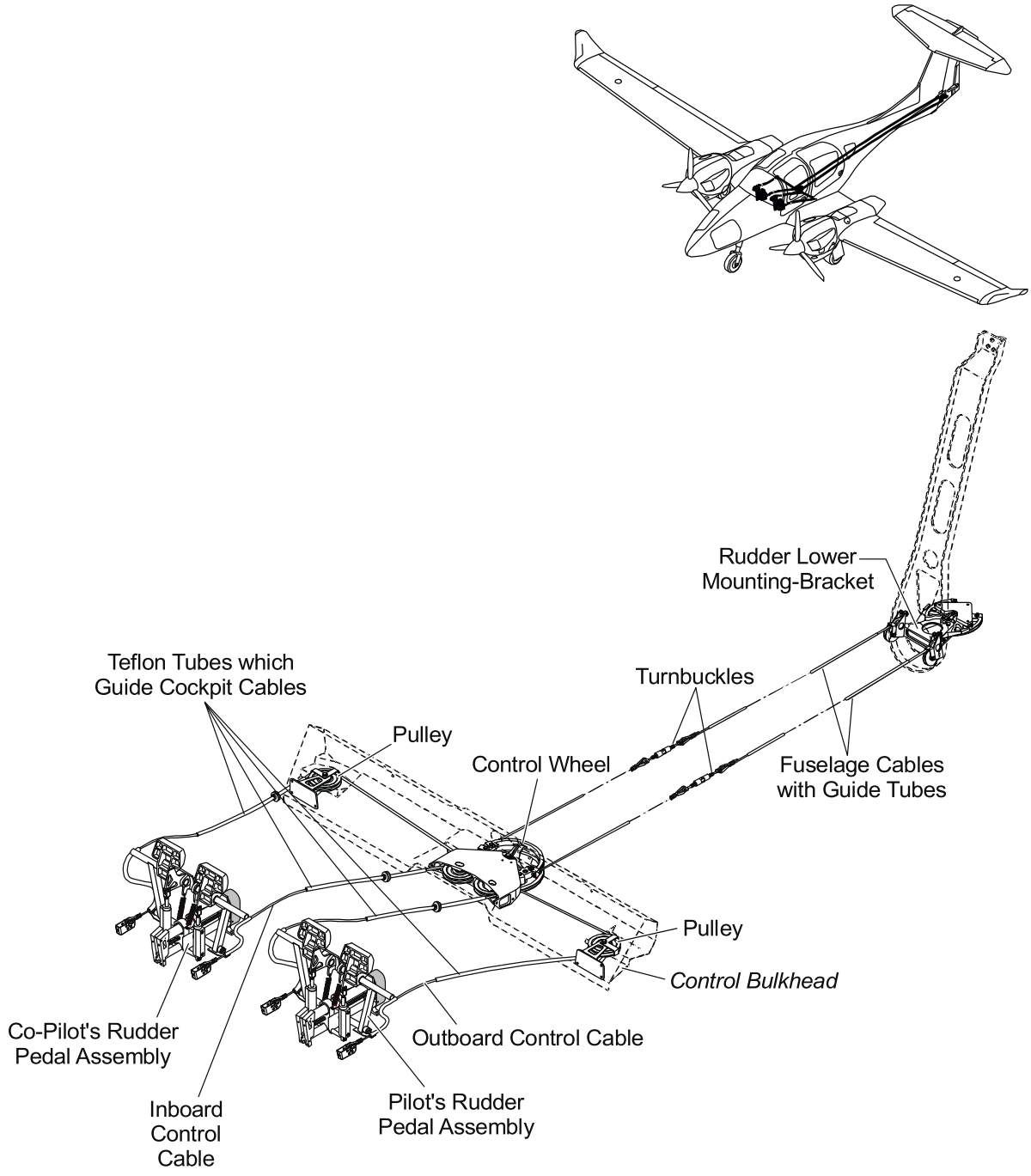


Figure 1 : Rudder Control System

2. Description

The DA 62 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 electrical pedal adjustment. Figure 3 shows the rudder control in the cockpit and Figure 4 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 switch for each pilot, located on each side of the instrument panel.
- A rudder control wheel assembly in the fuselage below the center console. The rudder control wheel bracket attaches to the bottom of the control bulkhead and to the fuselage shell.
- A rudder control assy 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 control assy.
- Cable assemblies. Flexible control cables connect the cockpit front bulkhead to the rudder control wheel. Two long flexible control cables connect the rudder control wheel to the rudder control rear assy. 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 out at the top of the tube. Each cable then goes from the tube to the idler pulley.

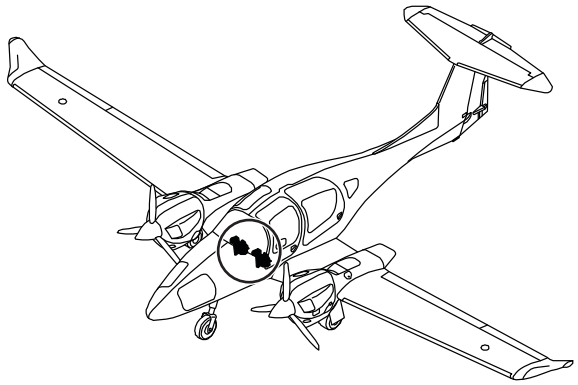
Each outboard control cable goes through a Teflon tube in the aft face of the floor panel. Each outboard control goes inboard through a guide pulley on the control bulkhead. The cables connect each outer pedal to the front arm of the idler pulley.

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 idler pulley.

Two cable assemblies (fuselage cables) attach to the rear of the IDLER PULLEY. 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 control rear assy.

The rudder stops which limit the rudder deflection to the left and to the right side are located in the rudder control rear assy (Figure 4).



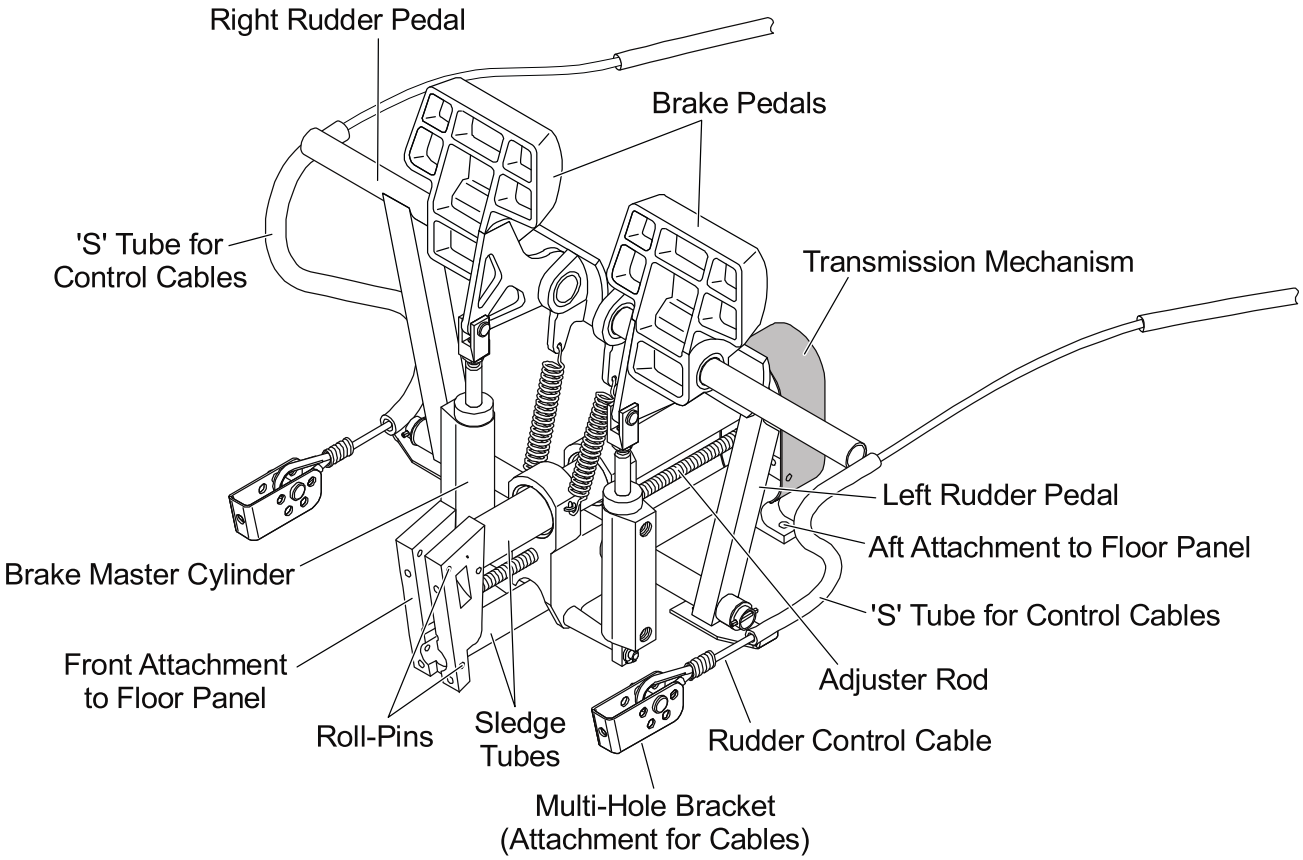


Figure 2 : Rudder Pedal Assembly

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 rudder control wheel assy.
- The rudder control wheel assy pulls the fuselage cable, the control rear assy and the rudder to the left side.
- The rudder movement pulls the other fuselage cable aft. This cable connects to the right side of the control wheel assy, the control wheel assy and to the right side of the rudder.

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.

A. Electrical Adjustment

Positioning switches are located on the LH and RH side, at the I-panel. 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.

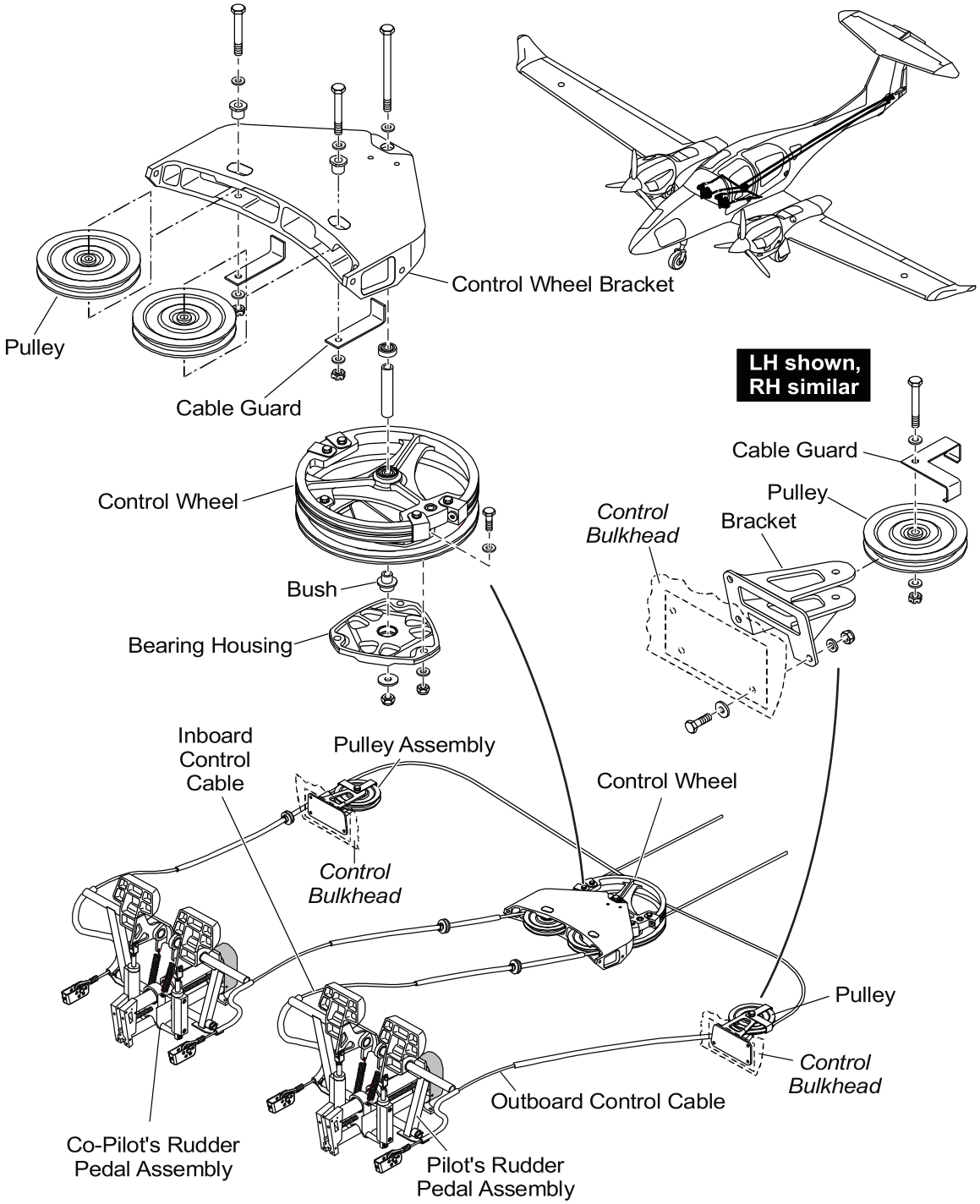


Figure 3 : Rudder Controls in the Cockpit

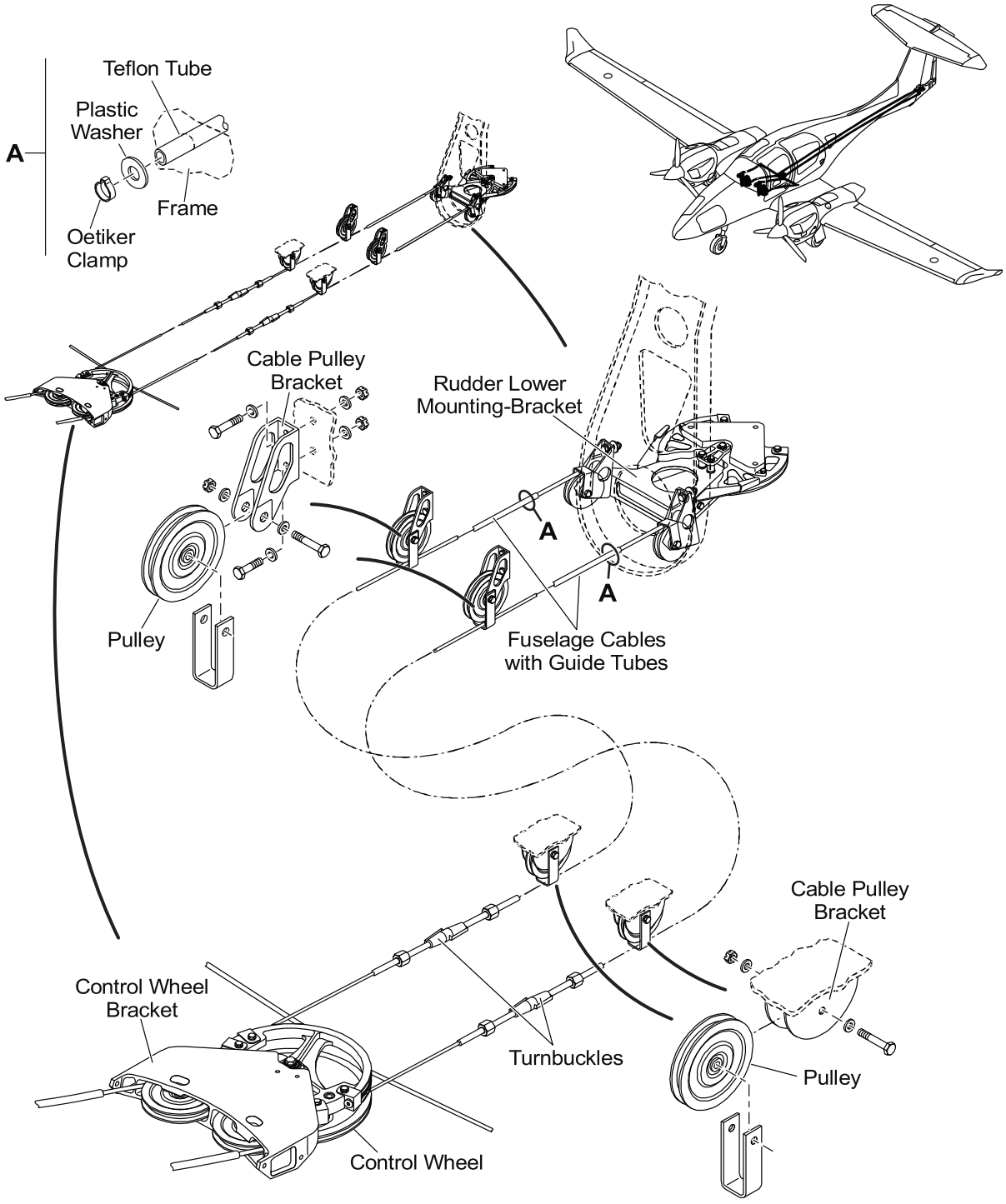


Figure 4 : Rudder Controls in the Fuselage

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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. 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 give instructions on how to:

- Adjust the rudder control system.
- Remove and install the rudder control cables.
- Remove and install the pulleys.
- Remove and install the rudder/brake pedal assembly.
- Remove and install the pedal assembly.

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 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 check gauge.	1	D67-5540-00-01-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)	Set both rudder pedals fully forward.	
(3)	Install the rudder check gauge.	The left pedal must align with the right pedal. Make sure the rudder is in the neutral position shown in the Control Surfaces Adjustment Report for the airplane.
WARNING:	**WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THE AREAS AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONS AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.**	
(4)	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.
(5)	Set the rudder pedals to fully left.	The rudder must hit the stops at the rudder control rear assy. The rudder position must be the distance to the left shown in the Control Surfaces Adjustment Report for the airplane.
(6)	Set the rudder pedals to fully right.	The rudder must hit the stops at the rudder control rear assy. The rudder position must be the distance to the right shown in the Control Surfaces Adjustment Report for the airplane.
(7)	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 check gauge.	1	D67-5540-00-01-PL.

B. Rudder Adjustment Procedure.

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: - Pilots' seats. - Passenger seat. Install the rudder/rudder trim check gauge	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 pedal must align with the right pedal.
(4)	If necessary, adjust the length of the cables between the rudder control wheel assy and the rudder control, rear assy: - Remove the lock wire from the turnbuckles. - Adjust the turnbuckles to set the rudder to neutral. - Do a test for the correct cable tension. - Tighten the turnbuckles and install the lockwire.	Refer to Figure 4. (27-20-00 Page 7). Below the passenger seat. Use the tensiometer. Required value: 15 daN (33.72 lbf.) - 17 daN (38.22 lbf.).
(5)	Set the rudder pedals to fully left.	The rudder must hit the stops at the rudder control rear assy. The rudder position must be the distance to the left shown in the Control Surfaces Adjustment Report for the airplane.

	Detail Steps/Work Items	Key Items/References
(6)	Set the rudder pedals to fully right.	The rudder must hit the stops at the rudder control rear assy. The rudder position must be the distance to the right shown in the Control Surfaces Adjustment Report for the airplane.
(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 these items: - The passenger seat. - The pilots' seats.	Refer to Section 25-10.
(9)	Remove the rudder/rudder trim check gauge.	

4. **Remove/Install Rudder Control Cables**

A. Equipment

Item	Quantity	Part Number
Rigging pins.	A/R	VR-D41-2723-5000.
Cable tension gauge (tensiometer).	1	Commercial
Swaging tool.	1	Commercial
Nicopress oval & stop sleeve gauge ('go-no-go gauge') for 1/8 inch sleeves.	1	--

B. Remove the Rudder Control Cables (Front Cables).

NOTE: The removal procedure is given for the pilot's side inboard and outboard control cables. The procedure for the co-pilot's side is similar.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilots' seat.	Refer to Section 25-10.
(2)	Install a rigging pin before removal of a cable.	The rigging pin is installed in the control wheel.

(3)	Remove the cable between the cockpit front bulkhead and the rudder control wheel assy:
	- Remove the nut, washers, bolt and spacer that attach the control cable to the multihole bracket at the bulkhead.
	- Remove the nut, washers, bolt, and clip that attach the cable to the rear control wheel assy.
	- Cut the eye end from the cable that you will remove, at the bulkhead end.
	- Remove the old cable.
	  - Outboard - Pull the cable out of the 'S' tube, through the pulley assembly at the control bulkhead and remove it from the control wheel assembly end.
	  - Inboard- Pull the cable out of the 'S' tube and remove it from the control wheel assembly end.
		Discard the eye end.

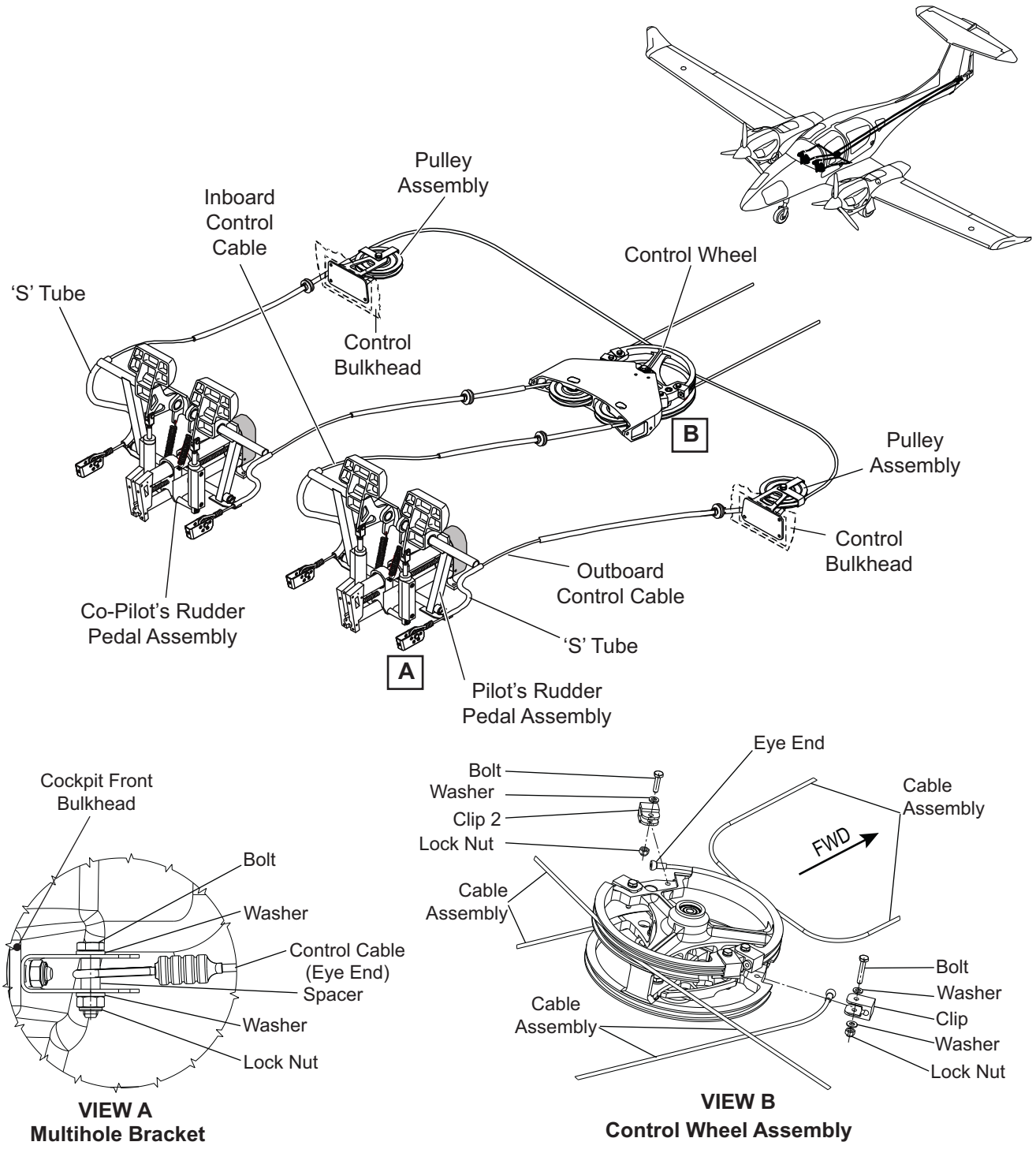


Figure 201 : Rudder Control (Front Cables) - Removal/Installation

C. Install the Rudder Control Cables (Front Cables).

NOTE: The installation procedure is given for the pilot's side inboard and outboard control cables. The procedure for the co-pilot's side is similar.

Refer to Figure 201.

	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 rudder control wheel assy end before you install the cable in the airplane and: - Use cables to specification LN9374 or ISO 2020 or MIL-DTL-83620, streched to 60% MBS. - Install the ball and shank fitting per MIL-DTL 83420. - Inspect the ball and shank fitting for correct assembly. - If necessary for your Airworthiness Authority, send a sample eye end for proof test.	
(2)	Make sure the cable is in the correct position on the pulley assembly (for the outer cables only).	
(3)	Push the cable through the "S" shaped tube on the rudder pedal assembly.	

	Detail Steps/Work Items	Key Items/References
(4)	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.
(5)	Install the cable to the rudder control wheel assy: - Install the bolt, washer and clip that attach the cable to the rear control wheel assy. - Install a washer and a new self-locking nut onto the bolt.	Torque: to 6.4 Nm (4.7 lbf.ft.). Always use new self locking nuts.
(6)	Install the cable to the bracket at the cockpit front bulkhead: - Install the bolt, washer and spacer that attach the cable to the multihole 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.
(7)	Remove the rigging pin from the control wheel.	
(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.	
(10)	Install the pilot's seat.	Refer to Section 25-10.

D. Remove the Fuselage Rudder Control-Cables (Rear Cables).

Refer to Figure 4. (27-20-00 Page 7).

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: - Pilots' seats. - The passenger seat.	Refer to Section 25-10.
(2)	Remove the cable between the rudder control wheel assy and the turnbuckle: - Remove the bolt and clip that attach the cable to the rudder control wheel assy. - Cut the ball and shank fitting from the cable that you will remove at the rudder control wheel assy. - Remove the old cable aft. - Cut the eye end from the cable that you will remove at the turnbuckle.	
(3)	Remove the cable between the turnbuckle and the rudder: - Remove the bolt and clip that attach the cable to the rudder rear assy ball and shank fitting. - Cut the ball and shank fitting 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).

Refer to Figure 4. (27-20-00 Page 7).

	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 the ball and shank fitting, 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 rudder control wheel assy 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. - Install the ball and shank fitting per MIL-DTL 83420. - Inspect the ball and shank fitting for correct assembly. - If necessary for your Airworthiness Authority, send a sample eye end for proof test.	
(2)	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.

	Detail Steps/Work Items	Key Items/References
(3)	Install a ball and shank fitting to the rear cable before you install the cable into the airplane: - Use cables to specification LN9374 or ISO 2020 or MIL-DTL-83420, stretched to 60% MBS. - Install the ball and shank fitting per MIL-DTL 83420. - Inspect the cable eye end for correct assembly. - If necessary for your Airworthiness Authority, send a sample eye end for proof test.	
(4)	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.	I 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)	Install the cable to the rudder rear assy: - Install the bolt and clip that attach the cable to the rudder rear assy. - Install a washer and new self-locking nut.	Torque 6.4 Nm (4.7 lbf.ft.). Use a new self-locking nut.
(6)	Install the cable to the rudder control wheel assy: - Install the bolt and clip that attach he cable to the rudder control wheel assy. - Install a washer and a new self-locking nut.	Torque: 6.4 Nm (4.7 lbf.ft.). Use a new self-locking nut.

	Detail Steps/Work Items	Key Items/References
(7)	Adjust both left and right rudder cable turnbuckles to give the correct tension to the control cables.	Refer to Paragraph 3.
(8)	Do a test for the correct range of rudder movement.	Refer to Paragraph 2.
(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 pilots' seats. - The passenger seat.	Refer to Section 25-10.

5. **Remove/Install the Pulleys**

Refer to Figure 3. (27-20-00 Page 6).

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.	Handle with care. Do not spoil the control cable.

A. 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.	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. **Remove/Install the Rudder/Brake Pedal Assembly**

A. Equipment

Item	Quantity	Part Number
Rigging pins.	A/R	VR-D41-2723-5000.

B. Remove the Rudder/Brake Pedal Assembly.

NOTE: The removal procedure is given for the pilot's rudder/brake-pedal assembly. The procedure for the co-pilot's rudder/brake-pedal assembly is similar.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilot's seat for access.	Refer to Section 25-10.
(2)	Remove the rudder (front) control cables.	Refer to Para 4.B.
(3)	Remove the brake master cylinders.	Refer to 32-40-00 Maintenance Practices, Para 6.C.
(4)	At the cockpit front bulkhead, remove the four luck nuts and bolts, the eight washers and two spacers that secure the front attachment of the rudder/brake pedal assembly to the front bulkhead.	Two persons may be required for this step.
(5)	At the aft attachment of the rudder pedal assembly, remove the two bolts, lock nuts and four washers that secure the aft attachment of the rudder/brake pedal assembly to the floor.	
(6)	Carefully remove the complete rudder/brake pedal assembly from the airplane.	

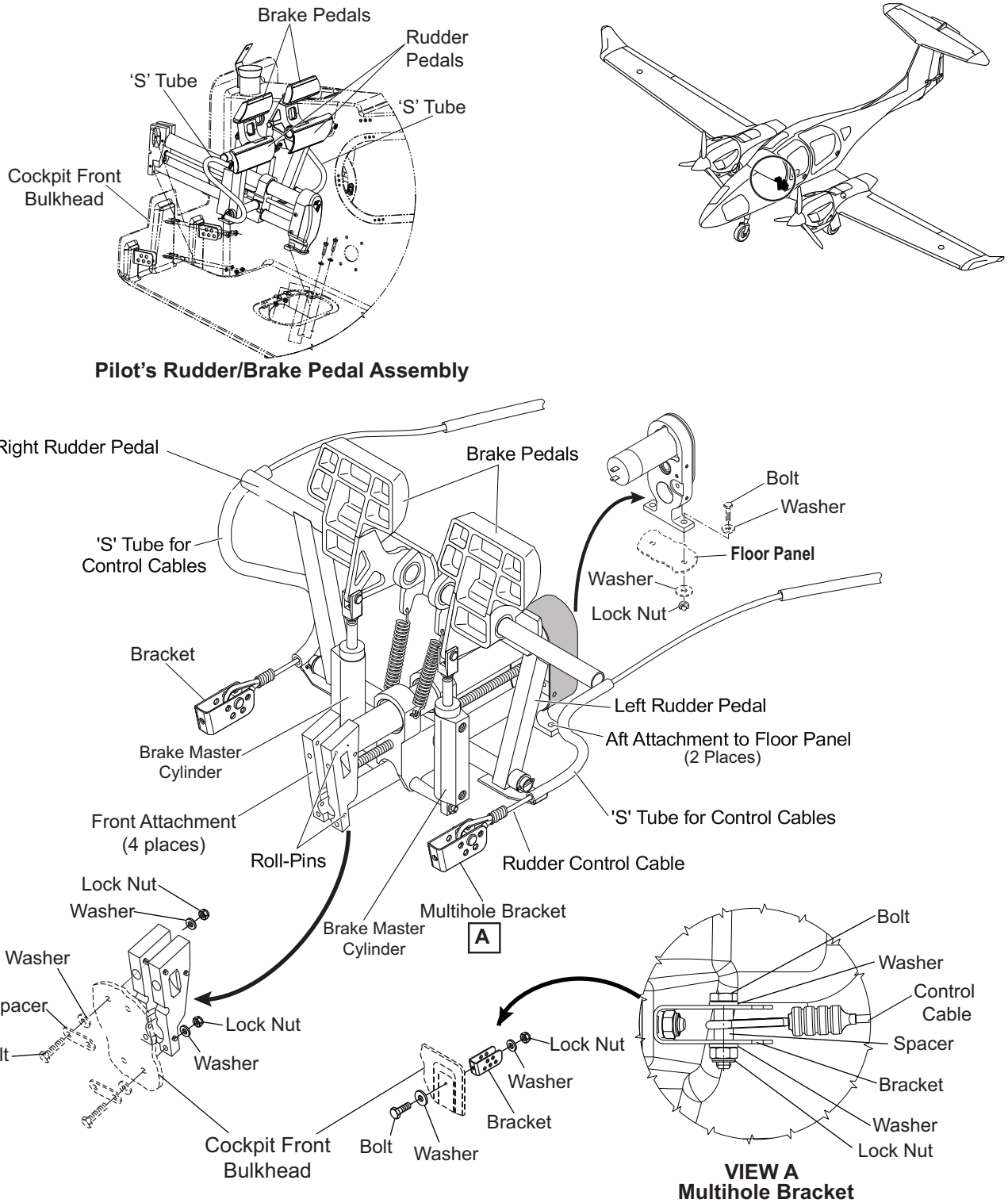


Figure 202 : Rudder/Brake Pedal Assembly - Removal/Installation

C. Install the Rudder/Brake Pedal Assembly.

NOTE: The installation procedure is given for the pilot's rudder/brake-pedal assembly. The procedure for the co-pilot's rudder/brake-pedal assembly is similar.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Carefully install the complete rudder/brake pedal assembly in the airplane. - Make sure that the aft attachment and front attachment of the assembly are positioned correctly at their locations.	
(2)	At the aft attachment of the rudder/brake pedal assembly, install the two bolts, four washers and two lock nuts that secure the aft attachment of the assembly to the floor.	Always use new self-locking nuts.
(3)	At the cockpit front bulkhead, install the four bolts, the eight washers, two spacers and four lock nuts that secure the front attachment of the rudder/brake pedal assembly to the front bulkhead.	Two persons may be required for this step. Always use new self-locking nuts.
(4)	Install the brake master cylinders.	Refer to 32-40-00 Maintenance Practices, Para 6.D.
(5)	Install the rudder (front) control cables.	Refer to Para 4.C.
(6)	Install the pilot's seat.	Refer to Section 25-10.
(7)	Do a test for the correct range of rudder movement. If necessary adjust the rudder controls.	Refer to Paragraph 2. Refer to Paragraph 3.
(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.	

7. **Remove/Install the Pedal Assembly**

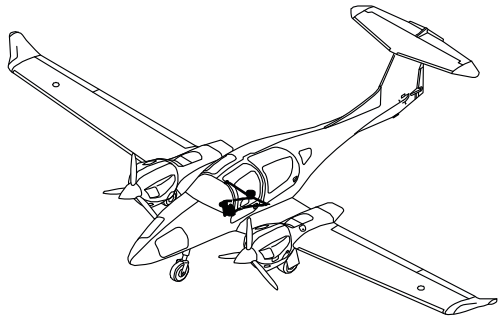
NOTE: The pedal assembly includes the brake pedal, the rudder pedal, the center tube and the rudder cable guide ('S' Tube).

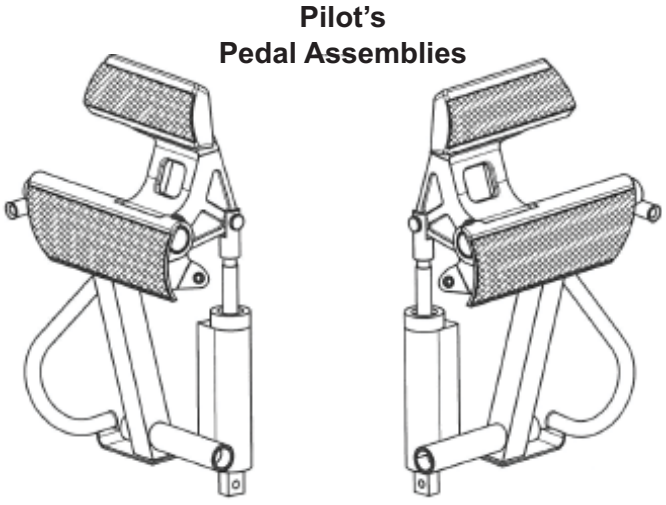
NOTE: There are four pedal assemblies, pilot's LH side and RH side and copilot's LH side and RH side. The procedures for the pilot's LH side are given.
All four assemblies are removed/installed in a similar manner

A. Remove the Pedal Assembly.

Refer to Figures 203 and 204.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the pilot's seat for access.	Refer to Section 25-10.
(2)	Remove the rudder (front) control cables.	Refer to Para 4.B.
(3)	Remove the upper clevis pin from the LH brake master cylinder. - Remove the cotter pin from the clevis pin. - Remove the washer. - Remove the clevis pin. Secure the brake master cylinder.	Refer to 32-40-00 Maintenance Practices, Para 6.C. Step (3). Discard the cotter pin.
(4)	Unlatch the spring (at the top) that attaches the LH pedal assembly to the pedal adjust-cage assembly. Secure the spring.	Refer to Figure 202.
(5)	Remove the upper bolt and washer that holds the top of the center tube, pedal assembly and 'S' tube in place.	
(6)	Remove the lower bolt and washer that holds the center tube, pedal assembly and 'S' tube in place.	
(7)	Pull the LH pedal assembly out from the pedal adjust cage assembly and sledge tubes.	
(8)	Remove the pedal assembly from the airplane.	





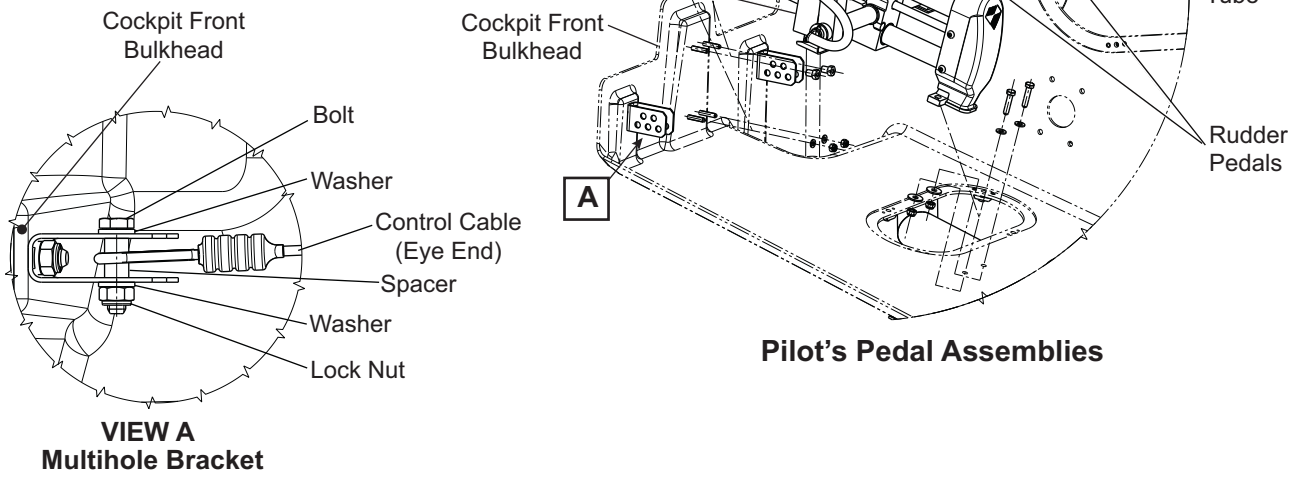
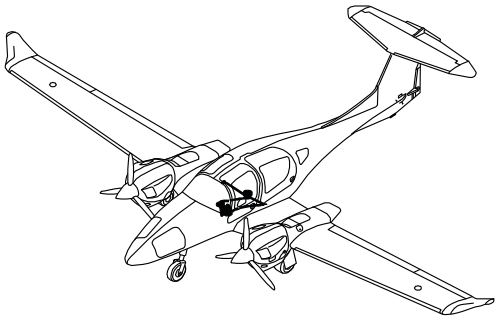
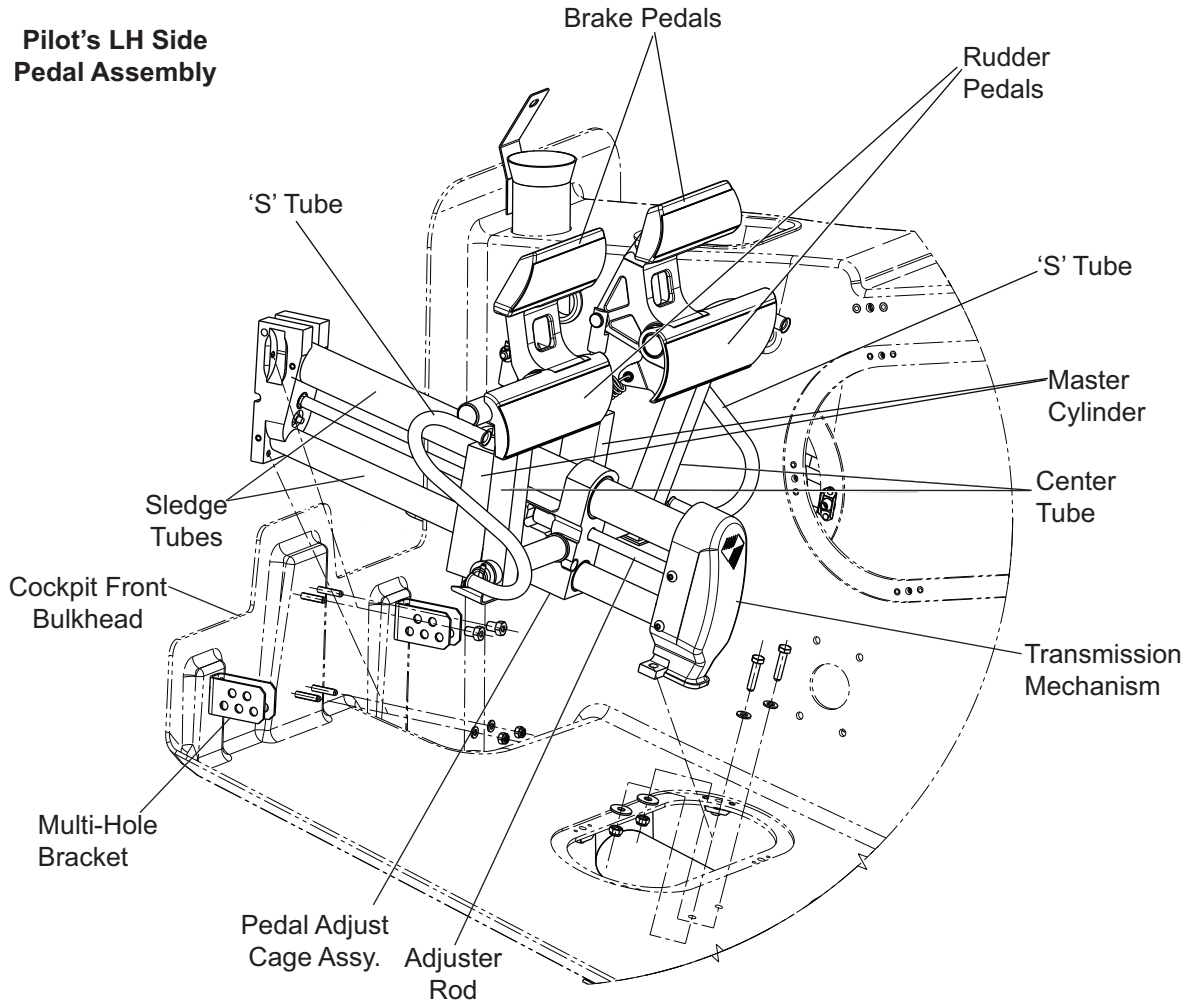


Figure 203 : Pedal Assembly - Removal/Installation (Sheet 1)

Pilot's LH Side Pedal Assembly





Pilot's Pedal Assemblies

Figure 204 : Pedal Assembly - Removal/Installation (Sheet 2)

B. Install the Pedal Assembly.

Refer to Figures 203 and 204.

	Detail Steps/Work Items	Key Items/References
(1)	Position the LH pedal assembly carefully in place on the pedal adjust cage assembly and sledge tubes.	
(2)	Install the lower bolt and washer that holds the center tube, pedal assembly and 'S' tube in place.	
(3)	Install the upper bolt and washer that holds the top of the center tube, pedal assembly and 'S' tube in place.	Bond with Loctite 243.
(4)	Latch the spring (at the top) that attaches the LH pedal assembly to the pedal adjust-cage assembly.	Refer to Figure 202.
(5)	Install the upper clevis pin of the LH brake master cylinder. - Align the top of the master cylinder with the mounting on the brake pedal. - Install the clevis pin. - install the washer onto the clevis pin. - Install the cotter pin.	Refer to 32-40-00 Maintenance Practices, Para 6.D. Step (3). Use a new the cotter pin.
(6)	Install the rudder (front) control cables.	Refer to Para 4.C.
(7)	Install the pilot's seat.	Refer to Section 25-10.
(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.	

8. **Rudder Control Cable and Rudder Control Wheel Assembly Access**

Rudder Cable/ Rudder Control Wheel Assembly	Remove/Install Access	References
Cockpit cables between the cockpit front bulkhead and the rudder control wheel assy.	Pilots' seats.	Refer to Section 25-10.
Rear fuselage cables between the rudder control wheel assy and the rudder rear assy.	Pilots' seats. Passenger seat. Rudder.	Refer to Section 25-10. Refer to Section 55-40.
Rudder control wheel assy.	Pilots' seats.	Refer to Section 25-10.

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Section 27-21

Flight Controls - Rudder Trim

1. General

The DA 62 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.

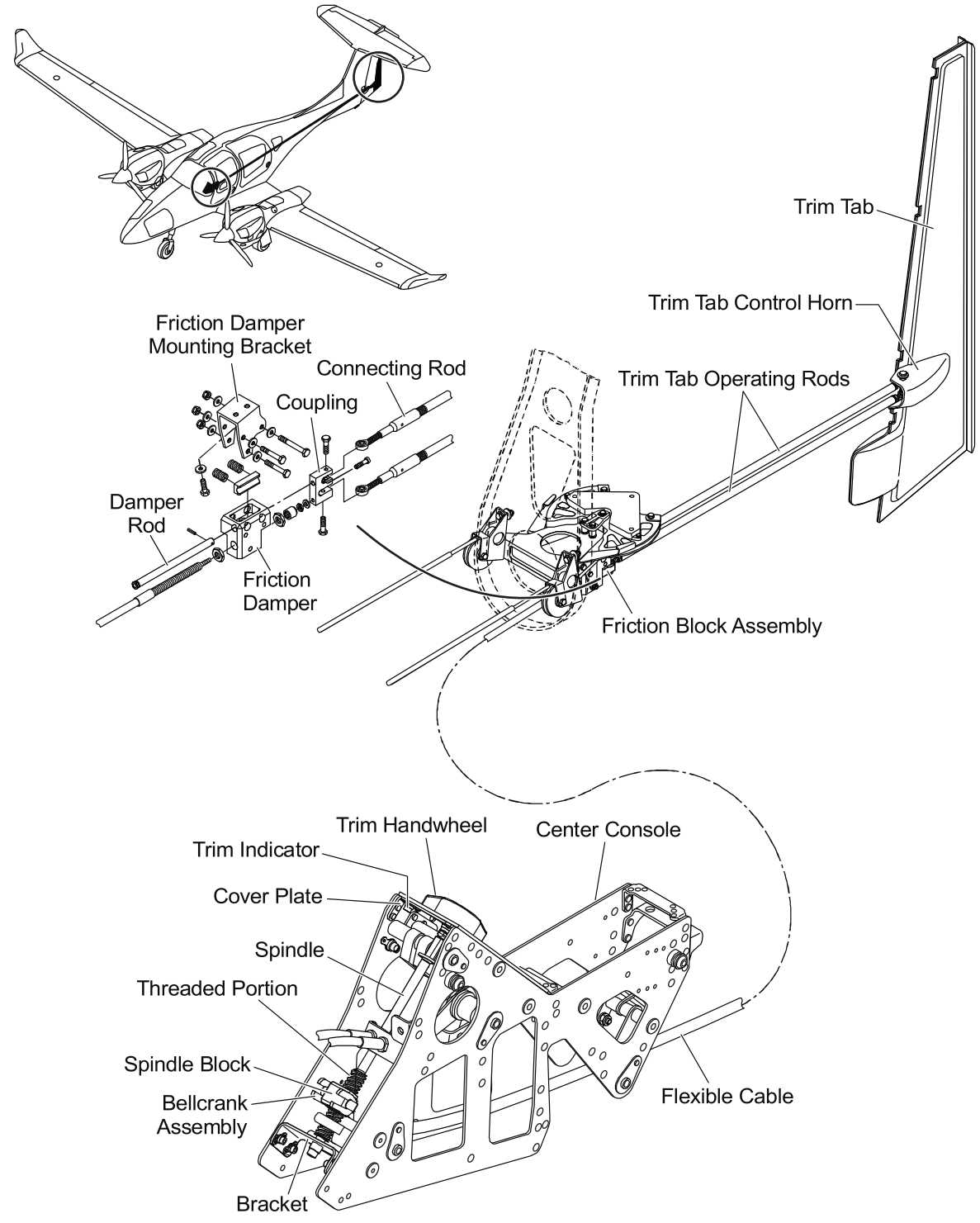

Figure 1 : Rudder Trim Control System - Main Components

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-trim-tab 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 its yaw axis with no input from the pilot.	Rudder control cable needs 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 check gauge.	1	D67-5540-00-01-PL.
Trim Rudder gauge.	1	D67-5544-00-00_01-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
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THE AREAS AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONS AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.	
(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 rudder is in the neutral position: - Install rudder check gauge. - Install trim rudder gauge.	Refer to Section 27-20. Hold the rudder in this 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. The rudder trim tab must be in the neutral position, aligned with the rudder.

	Detail Steps/Work Items	Key Items/References
(4)	Remove the access panel from the side of the center console: - Remove the three screws that attach the access panel to the structure. - Move the access panel clear of the center console.	
(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)	The trailing edge of the trim tab must align with the trailing edge of the rudder.	If necessary, adjust the lengths of both trim tab control rods. Refer to Paragraph 3.
(7)	Remove the rigging pin from the center console.	
(8)	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.
(9)	Turn the rudder trim control wheel fully counter-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.
(10)	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.
(11)	Remove the gauges: - Remove rudder check gauge. - Remove trim rudder gauge.	
(12)	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.	

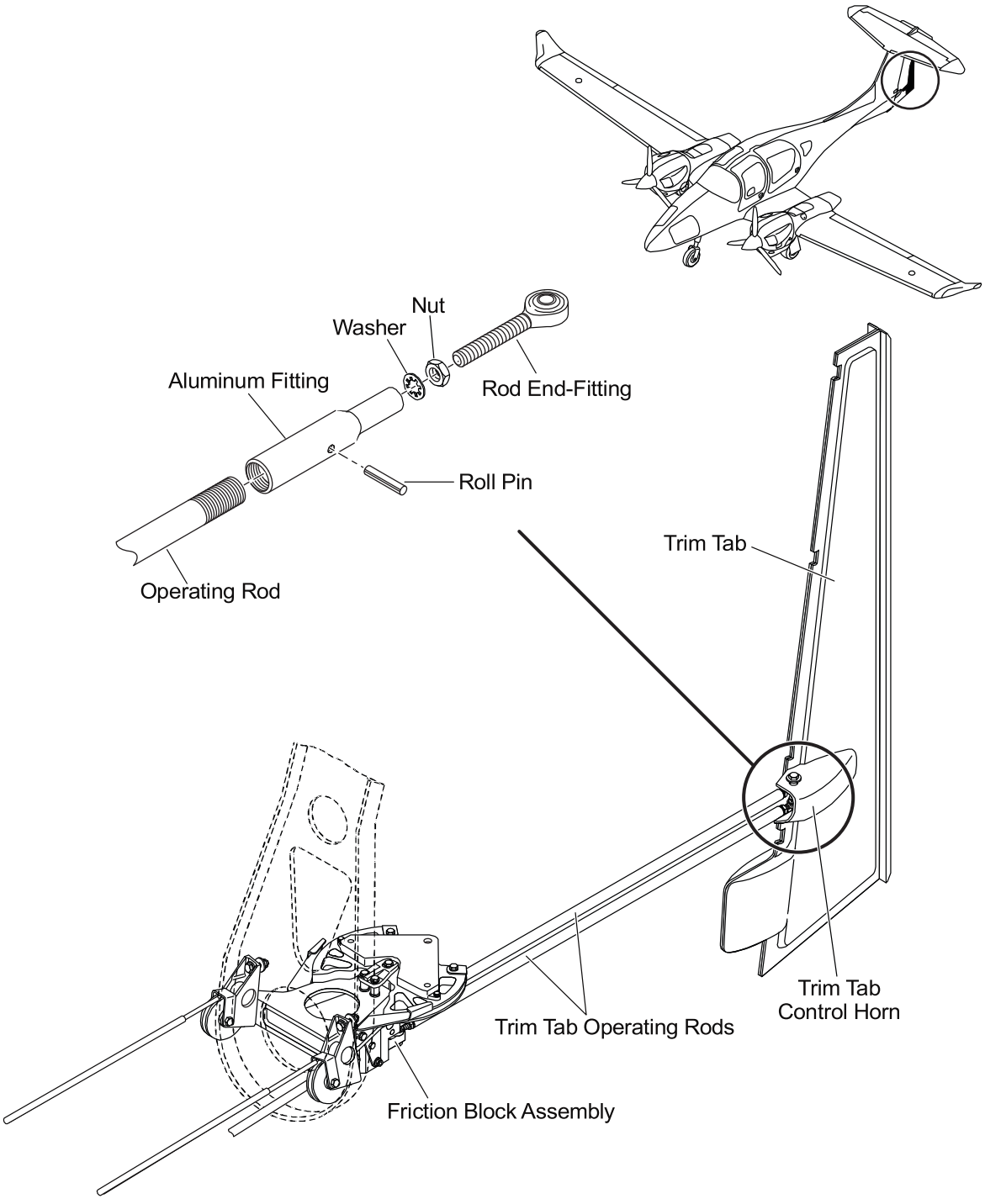

Figure 201 : Adjust the Rudder-Trim-Tab Control System

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
Trim Rudder gauge.	1	D67-5544-00-00_01-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
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THE AREAS AROUND THE CONTROL SURFACES ARE CLEAR OF PERSONS AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.	
(1)	Make sure that the rudder is in the neutral position: - Install rudder check gauge. - Install trim rudder gauge.	Refer to Section 27-20. Hold the rudder in this position.
(2)	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.
(3)	Remove the access panel from the side of the center console: - Remove the three screws that attach the access panel to the structure. - Move the access panel clear of the center console.	
(4)	Install a rigging pin through the holes in the center console structure and the bellcrank.	The rudder trim tab indicator should indicate neutral.

	Detail Steps/Work Items	Key Items/References
(5)	Adjust the rudder trim tab operating rods to set the rudder trim tab to the neutral position: - Remove the bolts that attach the spherical end fittings of the operating rods to the trim tab levers. - Loosen the locknut on the lower operating rod end fitting. - Screw the end fitting in/out of the operating rod half a turn. 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 rods. - Install the bolts that attach the spherical end fittings of the operating rods to the trim tab levers.	3 degrees like rudder trim control tab. 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 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.
(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)	Remove the rigging pin from the center control console.	

	Detail Steps/Work Items	Key Items/References
(8)	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 three screws that attach the access panel to the center console.	For example: rags or tools.
(9)	Remove the gauges: - Remove rudder check gauge. - Remove trim rudder gauge.	
(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.	

Section 27-30

Flight Controls - Elevator

1. General

The DA 62 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 62 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.

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 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.

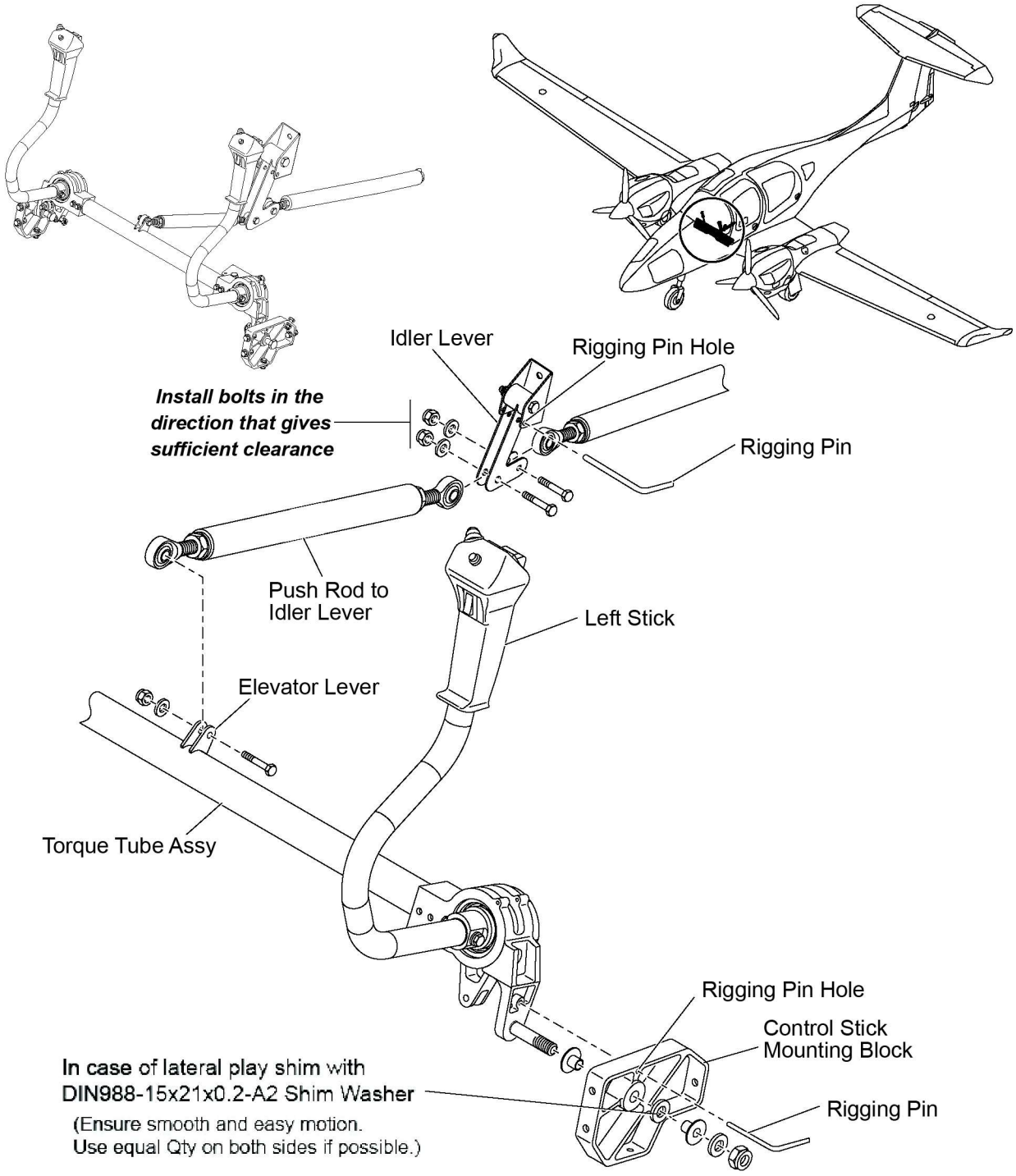

Figure 1 : Elevator Controls Installation in the Cockpit

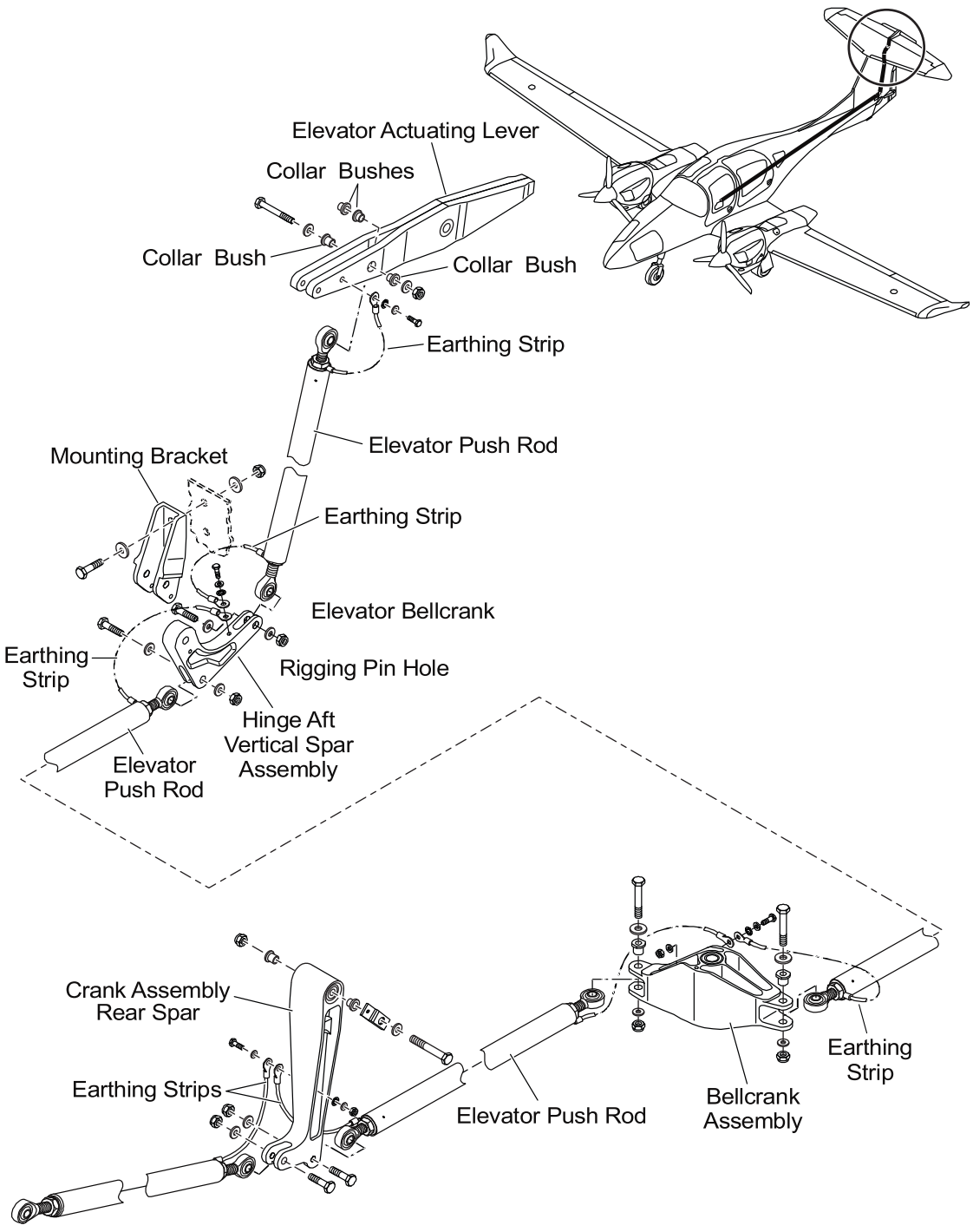

Figure 2 : Elevator Controls Installation in the Rear Fuselage

3. **Operation**

If you move the control stick forward:

- The torque tube assembly turns.
- The lever above 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.

Trouble-Shooting

1. **General**

The table below lists 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.
Elevator check gauge.	1	D67-5520-00-00-PL.
Fuselage trestle.	1	Commercial.
Airplane jacks.	3	Commercial.
Wing trestle.	2	Commercial.

B. Elevator Control Test Procedure

Refer to Figure 1. (27-30-00 Page 2).

	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)	Remove the left pilot's seat.	Refer to Section 25-10.
(3)	Install the rigging pin through the stick mounting block.	
	NOTE: Place the elevator check gauge between the stabilizer tips and the stabilizer so that the markings face backwards to the elevator.	
(4)	Make sure that the elevator check gauge is placed correctly.	At the stabilizer.
(5)	Read the angle of deflection of the elevator on the elevator check gauge.	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 THE AREAS 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 check gauge.	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.	

	Detail Steps/Work Items	Key Items/References
(10)	Read the angle of deflection of the elevator on the elevator check gauge.	Record the measurement. The distance must be as shown in the Control Surfaces Adjustment Report.
(11)	Install the left pilot's seat.	Refer to Section 25-10.
(12)	Remove the elevator check gauge.	At the stabilizer.

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
Elevator check gauge.	1	D67-5520-00-00-PL.
Rigging pins.	3	VR-041-2757-30-00.

B. Elevator Control Adjustment Procedure

Refer to Figures 1 and 2. (27-30-00 Pages 2 and 3)..

	Detail Steps/Work Items	Key Items/References
(1)	Remove these items for access: - The pilots' seats. - The rudder.	 Refer to Section 25-10. Refer to Section 55-40.
(2)	Install rigging pins in the following: - Through the stick mounting block. - The idler lever. - The rear bellcrank.	 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 pushrod adjustment procedure.
(4)	Make sure that the elevator is in the 0 degree position.	
(5)	If the elevator does not align with the elevator check gauge 0 degree position, adjust the vertical pushrod at the rear bellcrank.	Refer to Section 27-00 for the pushrod adjustment procedure.
(6)	Remove the rigging pins from the following: - The stick mounting block. - 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. Refer to Section 55-40.

Section 27-35

Flight Controls - Stall Warning System

1. General

The foundation of the Stall Warning System is the Lift Detector. The Lift Detector consists of a small tab or vane which senses the change of the stagnation point on the wing. A stall warning horn in the flight station area is used to advise the flight crew of a stall warning.

The lift detector of the DA 62 is located on the front edge of the left wing below the wing chord line. It is supplied electrically and provides a stall warning, before the angle of attack becomes critical. The stall status is announced to the pilot by a continuous sound in the cockpit.

The lift detector vane, the mounting plate and the complete housing are heated to prevent icing. Heating is engaged together with the Pitot heating.

2. Description and Operation

Refer to Figure 1.

As the aircraft's wing moves through the air, it divides the approaching air mass into two airflows.The center of this flow division is a narrow region of low pressure known as the stagnation point, and its position on the wing bears a definite and repeatable relationship to Angle of Attack. The stagnation point moves on the wing under surface as Angle of Attack changes. Decreasing Angle of Attack moves the stagnation point forward; increasing Angle of Attack moves it aft, to a maximum aft position at which stall occurs and the wing loses lift.

The lift detector is designed to detect the location of the stagnation point on the wing and relay this information to the pilot, via a stall warning horn, to aid him in awareness that he is nearing a stall. The lift detector, when properly installed and adjusted on the wing, senses the location of the stagnation point by means of a flat, spring-loaded vane which protrudes into the airflow on the wing under surface. Airflow from the stagnation point moves the vane against the internal spring force and displaces the vane relative to the stagnation point position. The location is carefully chosen on the wing so that air which flows aft from the stagnation point position at the approach Angle of Attack deflects the vane aft a specified amount.

Contoured mounting plates for the lift detector are designed to precisely fit the wing curvature of the DA62 airplane.

When speed is decreased, the stagnation point moves aft, decreasing the force against the forward face of the vane, and allowing the internal spring to move the vane forward. If speed is decreased sufficiently to allow the stagnation point to move aft of the vane, the vane is forced forward. The forward movement of the vane closes a switch contact which activates the stall warning horn to sound in the cockpit. At some further aft location of the stagnation point, the wing will reach stall Angle of Attack. Hence, forward movement of the vane which closes the switch, signifies that the aircraft is approaching a stall.

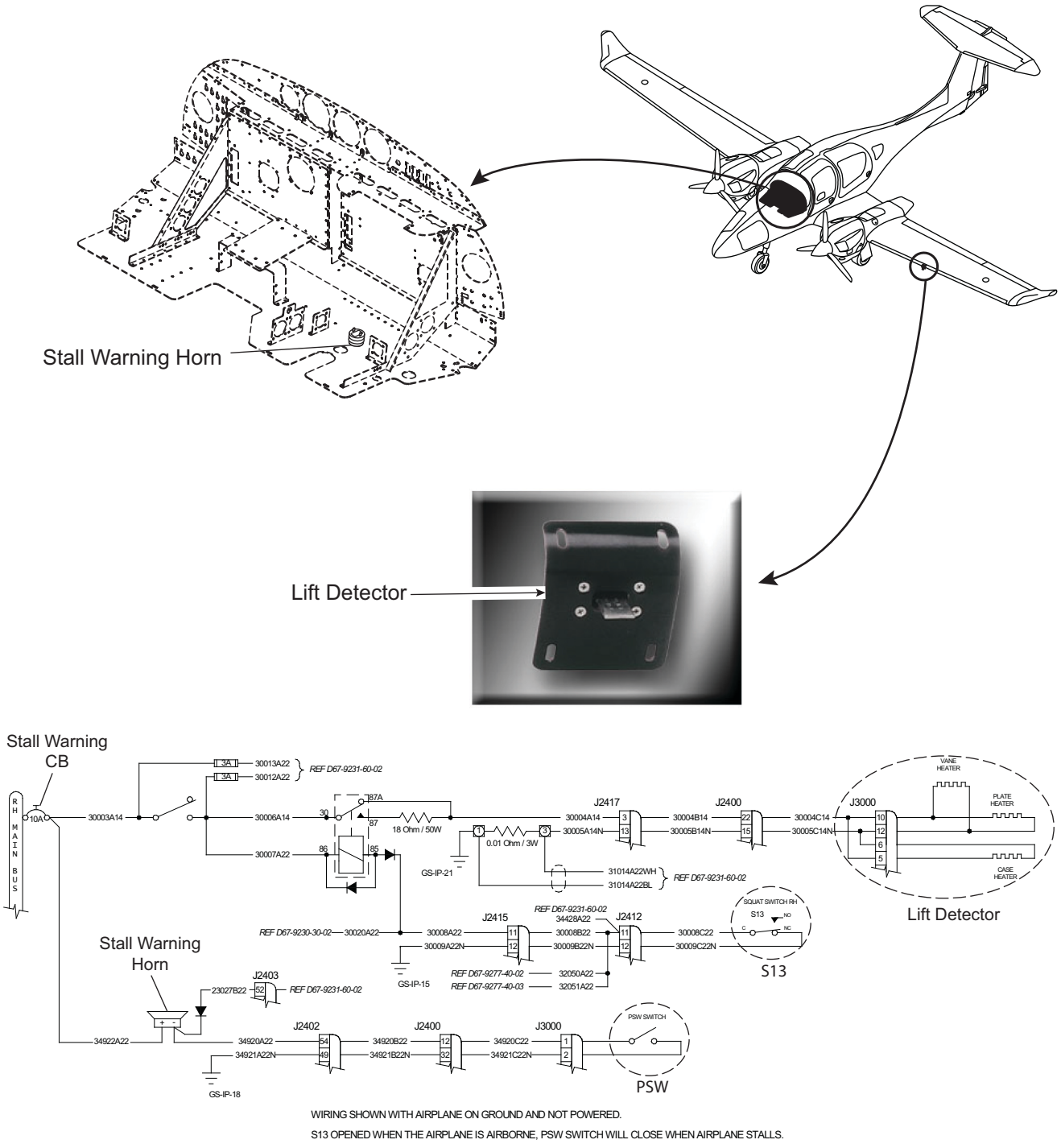

Figure 1 : Stall Warning System

Trouble-Shooting

1. **General**

The table below lists the defects you could have in 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.	STALL WRN Circuit-breaker is not set.	Set the circuit-breaker.
	Stall warning horn is defective.	Replace the stall warning horn.
	Stall warning lift detector is defective.	Replace the stall warning lift detector.
	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.
No heat to the lift detector assembly.	PITOT or STALL WRN Circuit-breaker is not set.	Set the circuit-breaker.
	PITOT or STALL WRN Circuit-breaker is defective.	Replace the circuit breaker.
	Vane, plate or case heater is defective.	Replace the lift detector.
	Stall heat control relay is defective.	Replace the 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.

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Maintenance Practices

1. **General**

These Maintenance Practices tell you how to remove and install the components of the Stall Warning System.

- The stall warning lift-detector
- The stall warning horn.

2. **Remove/Install the Stall Warning Lift-Detector**

A. Equipment.

Item	Quantity	Part Number
Stall Warning Installation Gauge.	1	D67-2737-11-00_PL.

B. Remove the Stall Warning Lift-Detector.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THE AREAS 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)	Pull the STALL WRN circuit breaker on the RH MAIN BUS.	
(2)	Locate the lift detector on the front edge of the left wing below the wing chord line.	
(3)	Remove the four fillister-head screws and four washers that secure the lift detector to the LH wing.	The three press nuts will not be removed.
(4)	Pull the lift detector out from the wing leading edge and disconnect the electrical connector.	
(5)	Remove the lift detector from the airplane.	

C. Install the Stall Warning Lift-Detector.

Refer to Figures 201 and 202.

	Detail Steps/Work Items	Key Items/References
	WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, YOU MUST MAKE SURE THE AREAS 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)	Make sure that the three press nuts are in satisfactory condition.	If they are not in satisfactory condition they must be replaced.
(2)	Make sure that the four fillister-head screws and four washers are in satisfactory condition.	If they are not in satisfactory condition they must be replaced.
(3)	Place the lift detector close to the install location and connect the electrical connector.	
(4)	Position the lift detector in the front edge of the left wing below the wing chord line, with the aid of the stall warning installation gauge.	Refer to Figure 202.
(5)	With the lift detector correctly positioned, install the four fillister-head screws and four washers that secure the lift detector to the LH wing.	
(6)	Push in the STALL WRN circuit breaker on the RH MAIN BUS.	
(7)	Turn on the pitot heat to test the heating of the lift detector. Once heating is confirmed, turn off the pitot heat.	Heating is engaged together with the Pitot heating. The lift detector vane, the mounting plate and the complete housing are heated to prevent icing.
(8)	Do a flight check of the stall warning system.	Refer to Chapter 5 the DA 62 Airplane Flight Manual, Doc # 11.01.05-E.

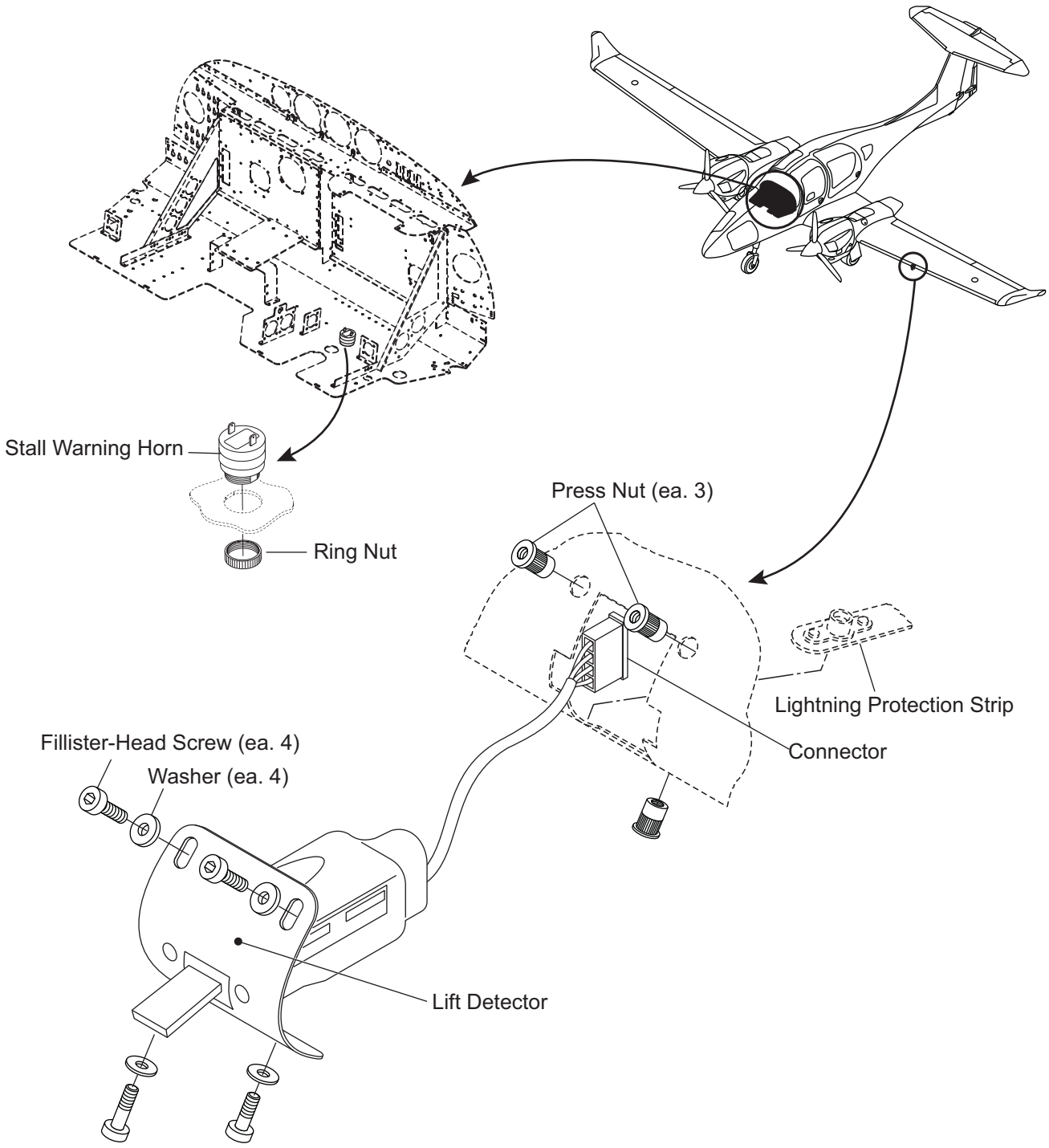
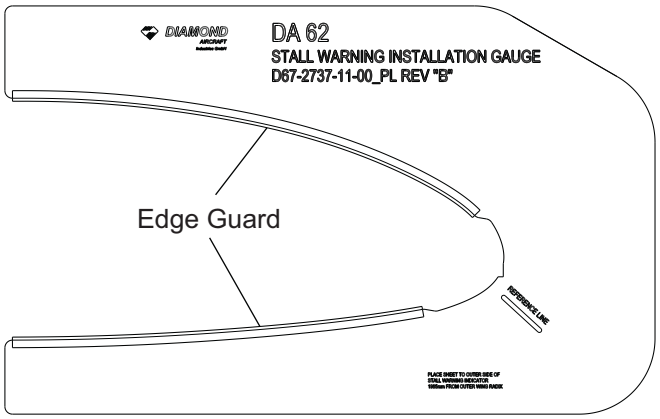
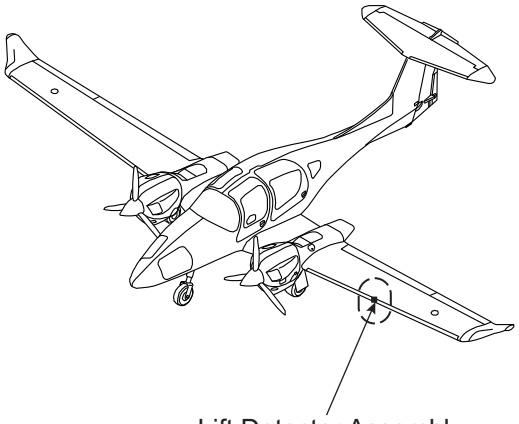


Figure 201 : Stall Warning System Components - Removal/Installation



Template D67-2737-11-00_PL



Flag Notes:
1 Use Template D67-2737-11-00_PL for the Installation.

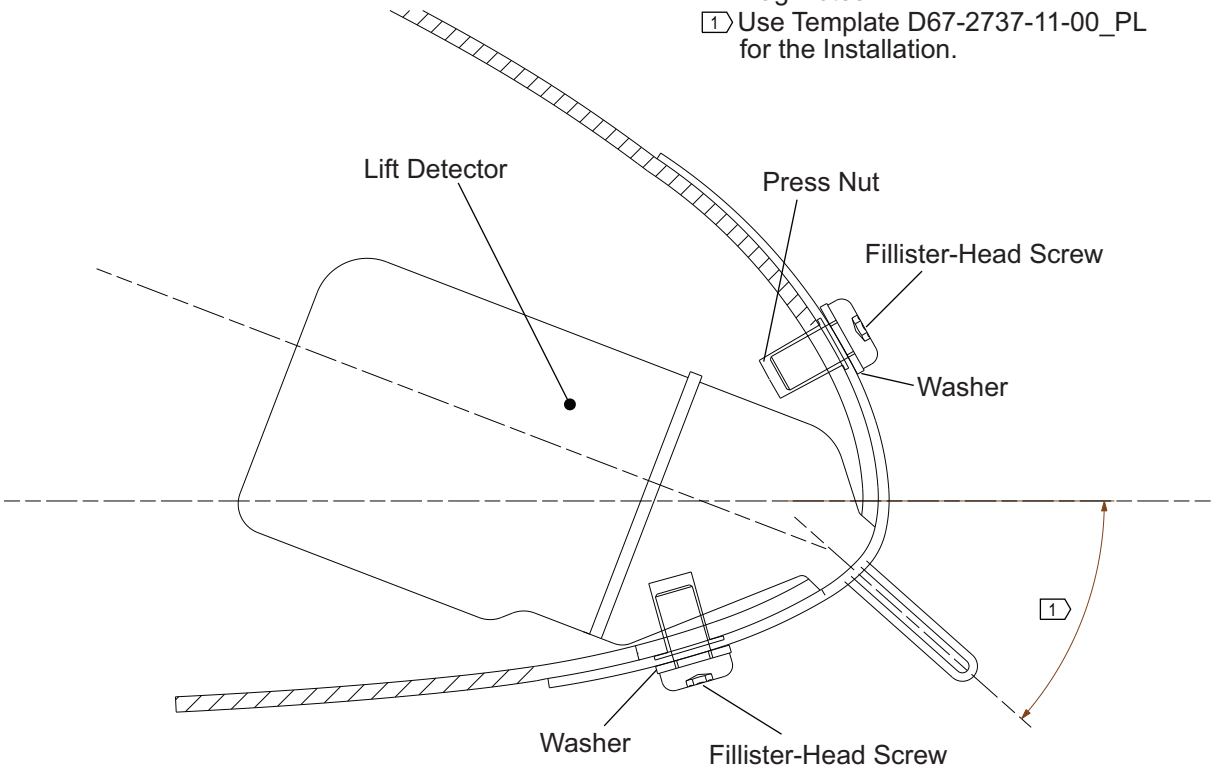


Figure 202 : Lift Detector - Installation

3. **Remove/Install the Stall Warning Horn**

A. Remove the Stall Warning Horn.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the STALL WRN circuit breaker on the RH MAIN BUS.	
(2)	Remove the instrument panel cover.	Refer to Section 25-10.
(3)	Locate the stall warning horn on the lower LH side, behind the instrument panel.	
(4)	Remove the wire connections at the stall warning horn.	
(5)	Below the instrument panel, at the location of the stall warning horn, remove the ring nut that holds the stall warning horn in place.	
(6)	Remove the stall warning horn from the airplane.	

B. Install the Stall Warning Horn.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Position the stall warning horn in it's correct location.	
(2)	Below the instrument panel, at the location of the stall warning horn, install the ring nut that holds the stall warning horn in place.	
(3)	Connect the wire connections at the stall warning horn.	
(4)	Push in the STALL WRN circuit breaker on the RH MAIN BUS.	
(5)	Install the instrument panel cover.	Refer to Section 25-10.
(6)	Do a flight check of the stall warning system.	Refer to Chapter 5 the DA 62 Airplane Flight Manual, Doc # 11.01.05-E.

Section 27-38

Flight Controls - Elevator Trim-Mechanical

1. General

The DA 62 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.

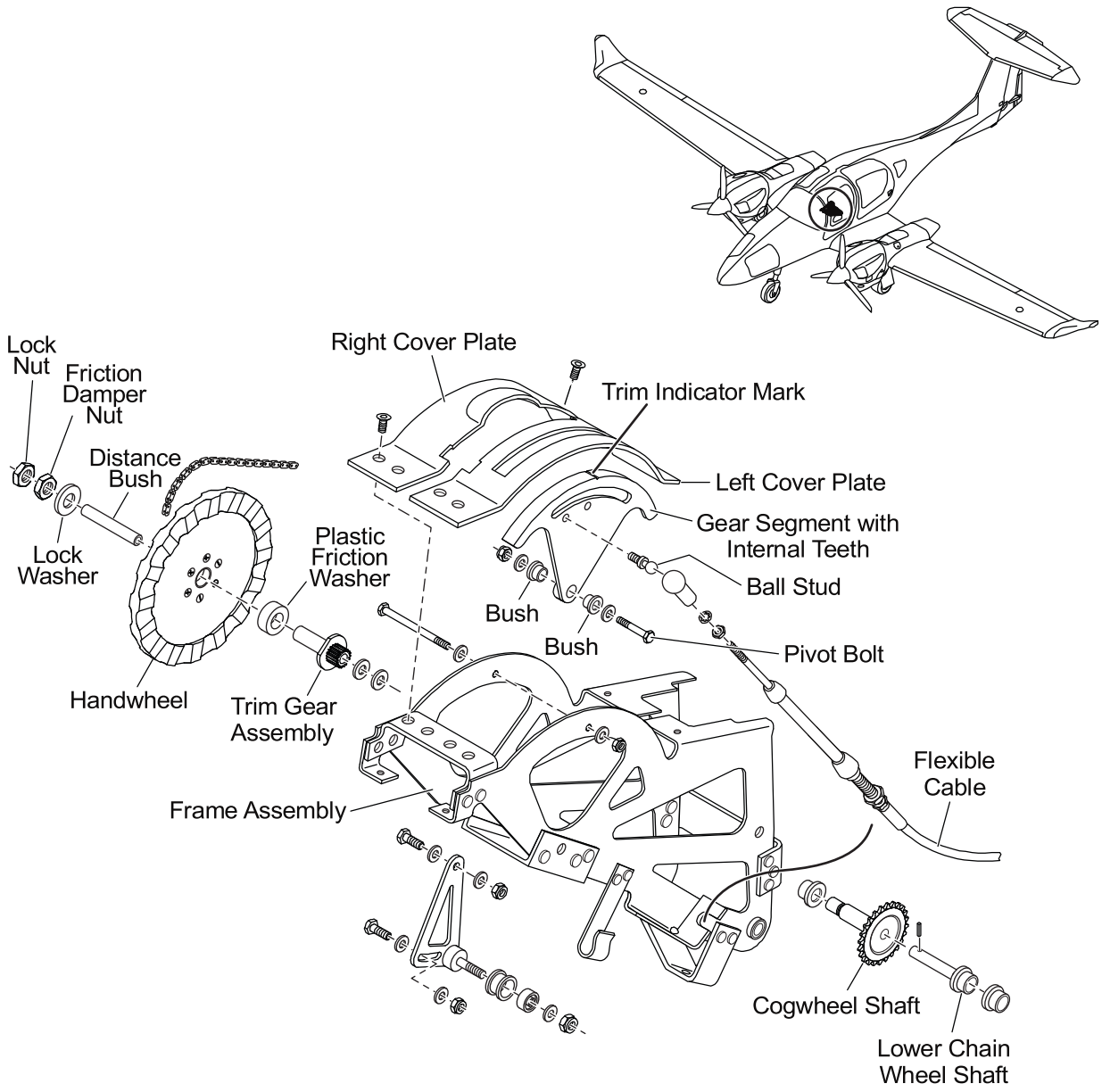


Figure 1 : Elevator Mechanical Trim-Mechanism in the Cockpit

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.

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.

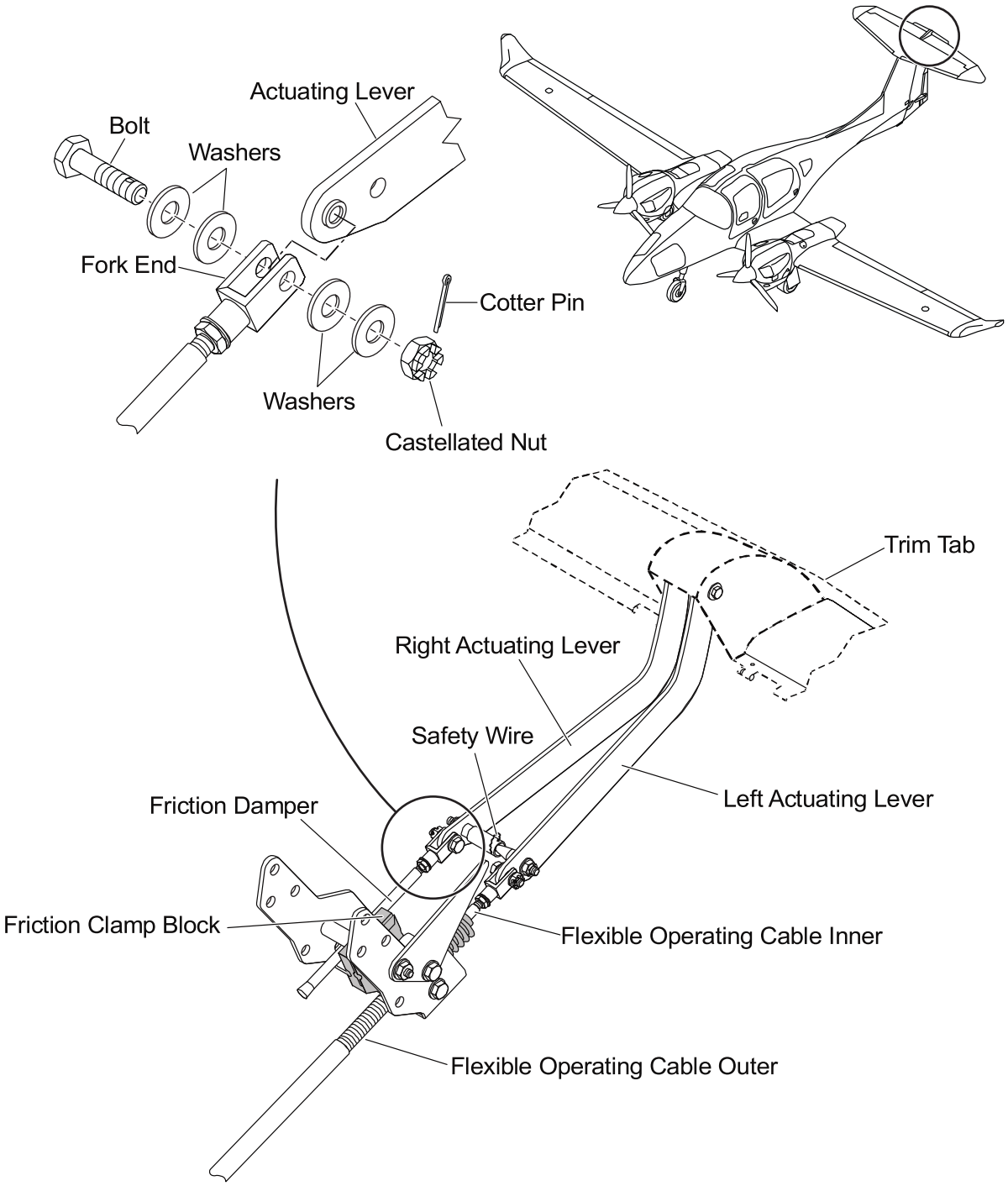


Figure 2 : Trim-Tab Actuator Assembly

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 lists 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 given 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 62.

2. Elevator Mechanical-Trim-Control System - Test for Correct Range of Movement

A. Equipment.

Item	Quantity	Part Number
Rigging pin.	1	VR-D41-2757-3000.
Elevator trim check gauge.	1	D67-5520-00-00-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 THE AREAS 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)	Make a copy of the Control Surfaces Adjustment Report.	Refer to Section 06-00. Use it to record the measurements.
(2)	Check elevator for correct range of movement.	Refer to Section 27-30.
(3)	Set the elevator to horizontal position: - Install the rigging pin through the stick mounting block.	Refer to Figure 1. (27-30-00 Page 2). Elevator should have 0 degree deflection referred later as the horizontal position.
(4)	Place the elevator trim check gauge onto the elevator.	Refer to Figure 2. (27-38-00 Page 4).
(5)	Set the elevator trim hand wheel to NEUTRAL.	

	Detail Steps/Work Items	Key Items/References
(6)	Check the elevator trim angle limits: - Read the angle deflection from the elevator trim check gauge. - Record your measurement.	Check your measurements with the elevator trim angle limits table in this section.
(7)	Set the elevator trim hand wheel to NOSE UP. Repeat step (6).	
(8)	Set the elevator trim hand wheel to NOSE DOWN. Repeat step (6).	
(9)	Set the elevator to 10 degree inclined position. Use the elevator trim check gauge to measure the inclined position.	
(10)	Set the elevator trim hand wheel to NEUTRAL. Repeat step (6).	
(11)	Set the elevator trim hand wheel to NOSE UP. Repeat step (6).	
(12)	Set the elevator trim hand wheel to NOSE DOWN.	
(13)	Set the elevator to 10 degree declined position. Use the elevator trim check gauge to measure the declined position.	
(14)	Set the elevator trim hand wheel to NEUTRAL. Repeat step (6).	
(15)	Set the elevator trim hand wheel to NOSE UP. Repeat step (6).	
(16)	Set the elevator trim hand wheel to NOSE DOWN. Repeat step (6).	

	Detail Steps/Work Items	Key Items/References
(17)	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 Para 3.
(18)	Remove the elevator trim check gauge from the elevator.	
(19)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	

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.
Elevator trim check gauge.	1	D67-5520-00-00-PL.
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. Install the elevator trim check gauge.	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)	Check elevator trim tab 0 degree position on the elevator trim check gauge. If necessary 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. Remove the elevator trim check gauge.	Refer to Figure 2. (27-38-00 Page 4). 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 pilot's seat. - The center console cover.	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. (27-38-00 Page 4).
(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.	
(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.

Refer to Figure 1. (27-38-00 Page 2).

	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 (2.4 - 3.2 lbf.ft) This corresponds to a force of 60 ± 10 N (13.5 ± 2.25 lbf) 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 -

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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 62 electrically controlled elevator trim system.

2. Description

The DA 62 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 62 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 lists 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 given 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.	Reset the autopilot circuit breaker.
	Elevator trim servo defective.	Replace the 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 62 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.

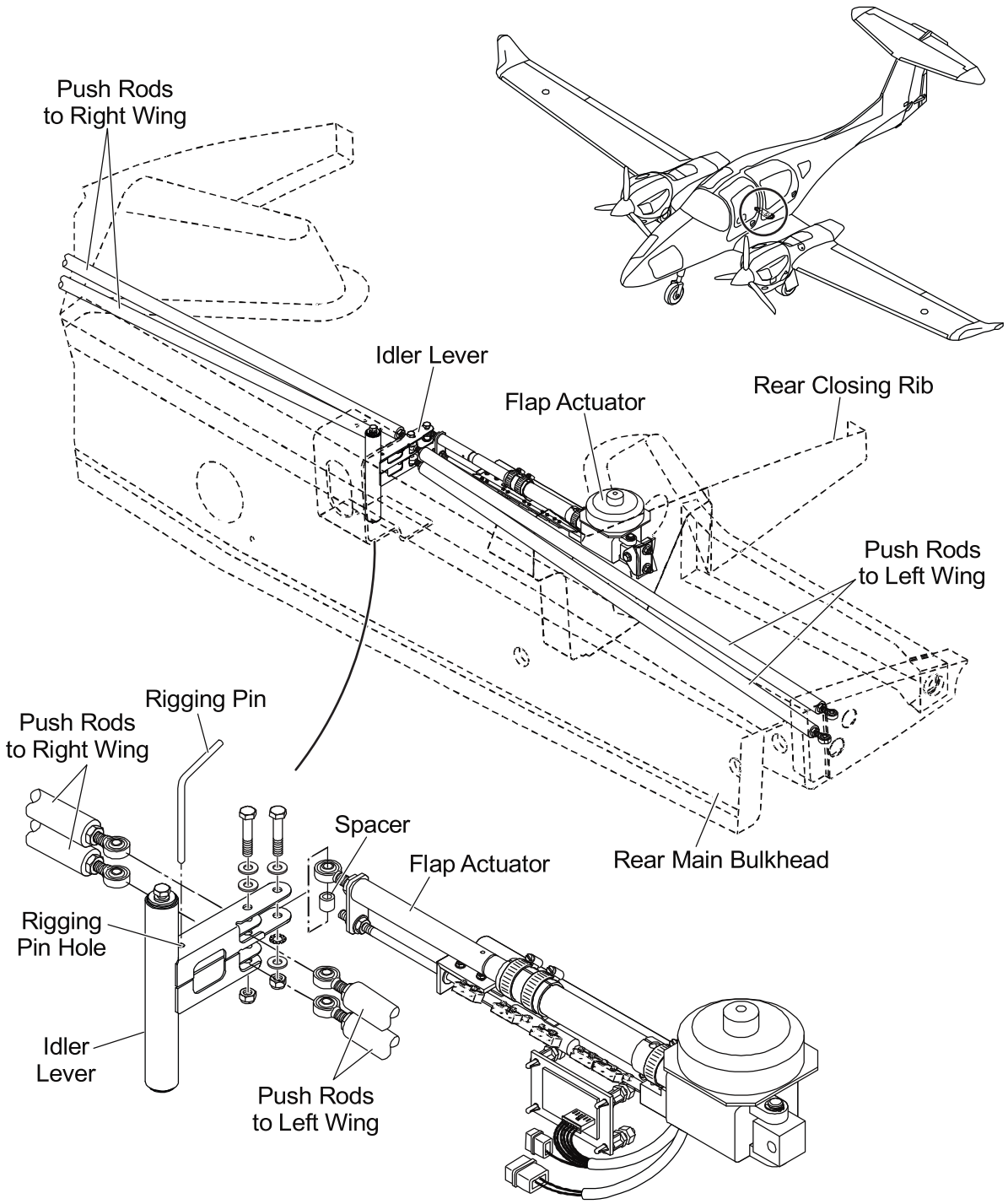

Figure 1 : Flap Control System in the Fuselage

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 second row 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 main 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.

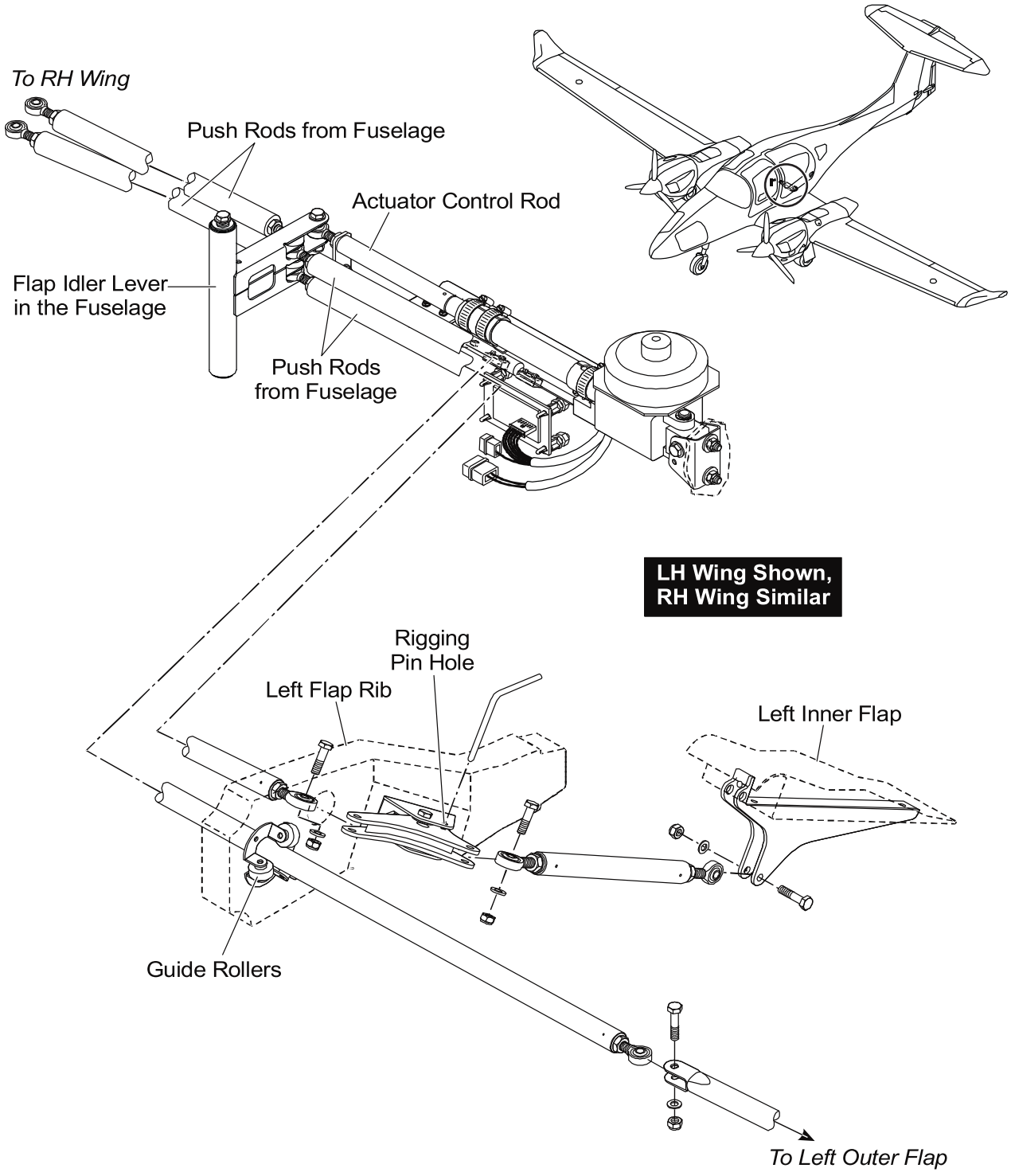

Figure 2 : Flap Push-Rods and Bellcranks in the Wings

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° +2° / -1°
- T/O (approach) 20° +4° / -2°
- LDG (landing) 42° +3° / - 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 T/O position moving down.
- Micro-switch 3 - T/O indication.
- Micro-switch 4 - LDG position.
- Micro-switch 5 - LDG indication T/O position moving up.

Cable harnesses with multi-pin connectors connect the components.

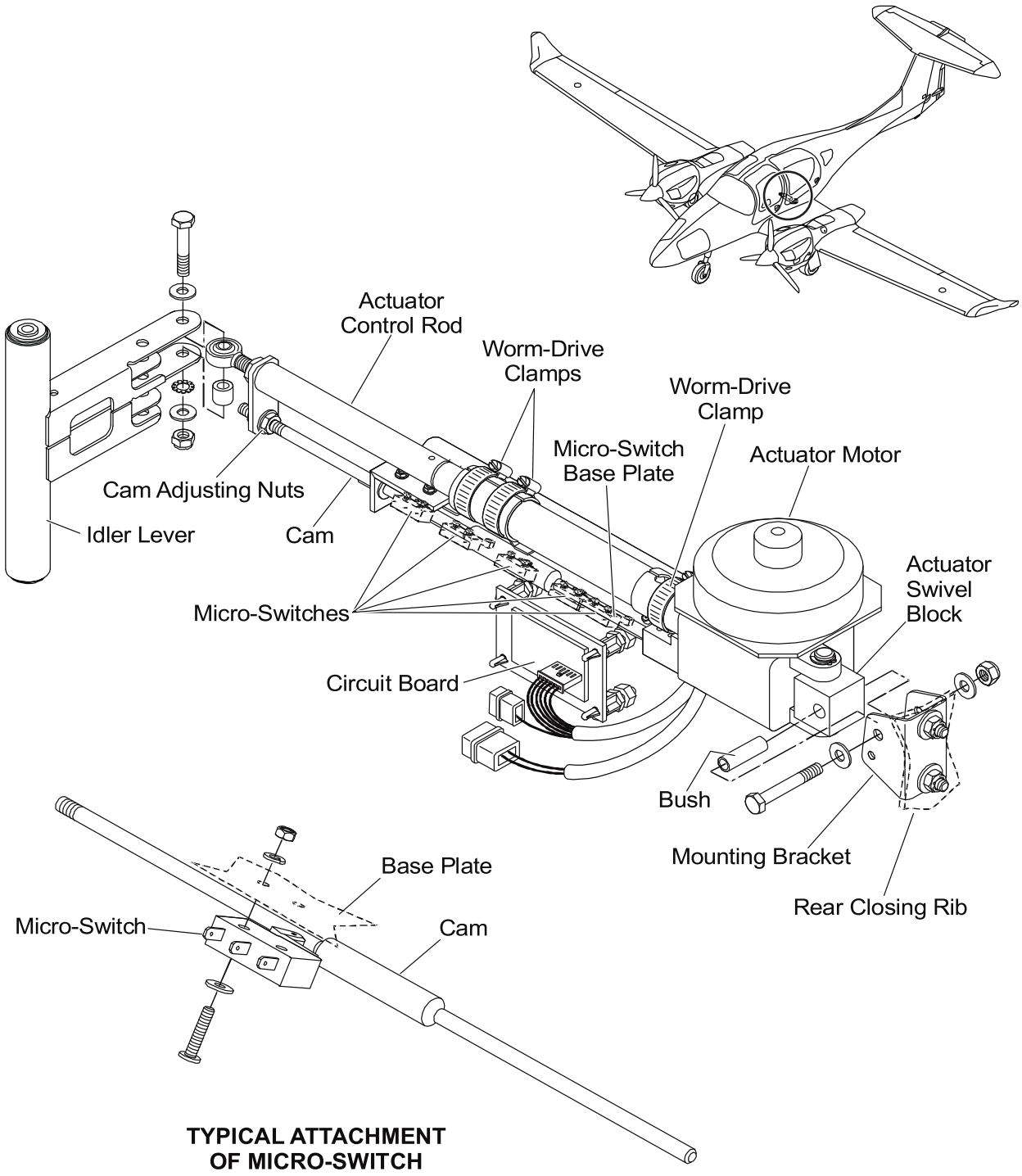

Figure 3 : Flap Actuator Installation

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, 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, 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.

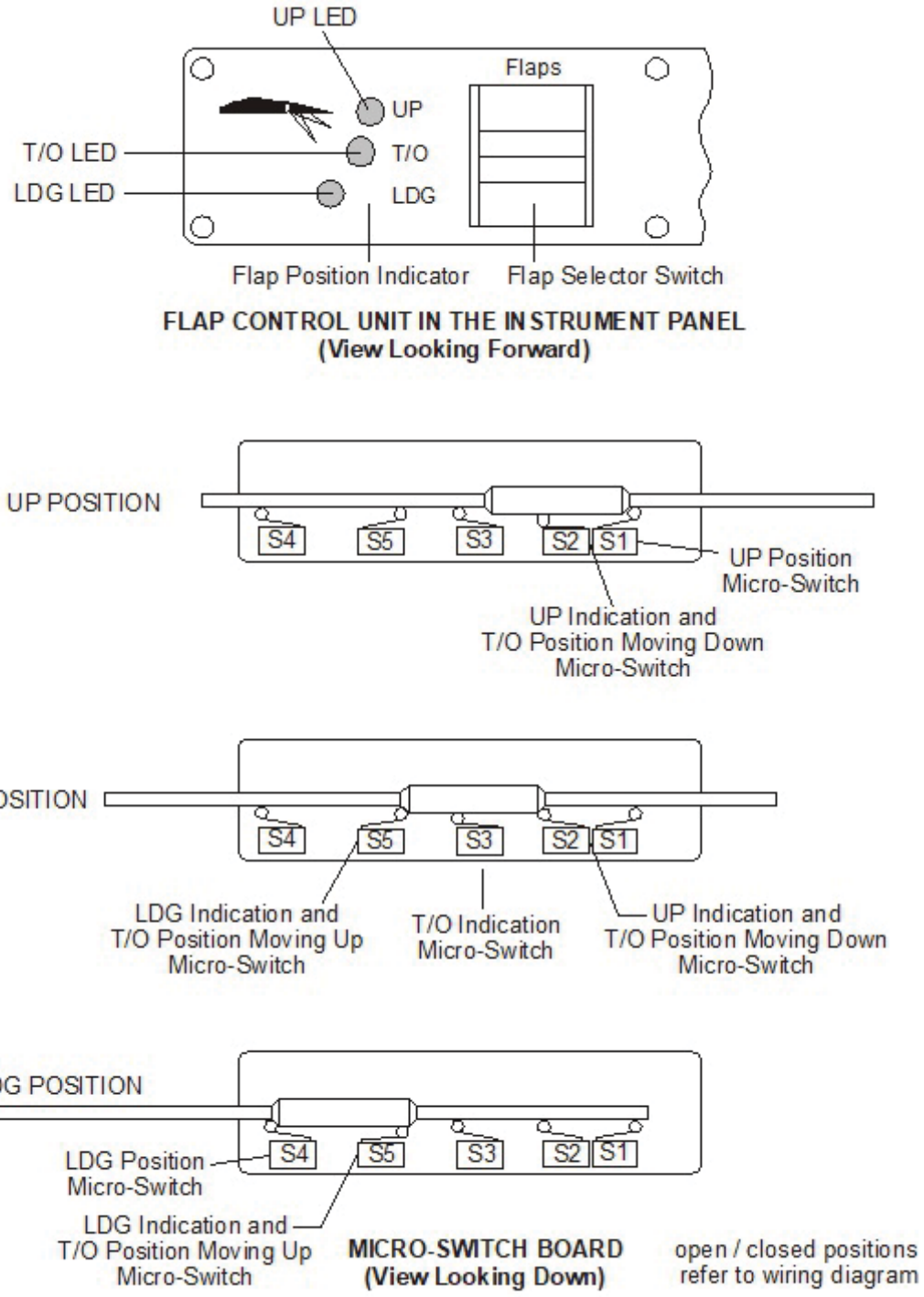

Figure 4 : Flap Electrical Control System

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 given in the Repair column.

Trouble	Possible Cause	Repair
Flaps do not operate.	Circuit breaker not set.	Set the flap circuit breaker.
	Airplane electrical system voltage low.	Do a test of the airplane electrical system voltage.
	Flap selector switch defective.	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.	Do an insulation test between each wire and ground. Repair or replace defective wires.
	Short to ground in the electrical control unit.	Replace the electrical control unit.
	Short to ground in a micro switch.	Replace the 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.
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 an airspeed.	Examine the flap system. Replace damaged parts. Adjust the system.
Flaps will not move to LDG position. Flaps move to T/O 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 T/O 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.
No LDG indication when the flaps are in the LDG position. Flaps will not move from LDG to T/O. 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.

Trouble	Possible Cause	Repair
No UP indication when the flaps are in the UP position. Flaps will not move from UP to T/O. 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 T/O indication when the flaps are in the T/O 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.
T/O LED stays on when the flaps are not in the T/O position. The other indications operate correctly.	micro switch 3 defective.	Replace the micro switch.
Flaps move to LDG when T/O set from UP.	micro switch 2 defective.	Replace the micro switch.
Flaps move to UP when T/O set from LDG.	micro switch 5 defective.	Replace the micro switch.

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Maintenance Practices

1. General

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. (27-50-00 Pages 2 and 6)

A. Remove the Flap Actuator

	Detail Steps/Work Items	Key Items/References
(1)	If possible, set the flaps to the T/O position.	
(2)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	Remove the passenger seat of the second row.	Refer to Section 25-10.
(4)	Disconnect the electrical supply connector to 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 reach the stop.	

	Detail Steps/Work Items	Key Items/References
(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 in position in the fuselage.	
(2)	Install the bolt which attaches the actuator body to the mounting bracket.	At the left rear closing rib. Make sure that the bush is in position in the actuator swivel block. Torque: 6.4 Nm (4.7 lbf.ft.).
(3)	Install the bolt which attaches the actuator pushrod to the idle lever.	At the rear main bulkhead. Hold the flaps. Take care of the spacer position. 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 in this pageblock.
(8)	Do an inspection of all the controls that you have 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
Flap / Aileron deflection check gauge.	1	D60-5753-00-00-PL.
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 flap selector switch to T/O. - When the flaps stop moving, set the flaps to UP. - When the flaps stop moving, set the ELECT. MASTER switch to OFF.	
(3)	Position the deflection check gauge: - Put the deflection check gauge on the wing between the flap and the aileron control surface.	
(4)	Set the flaps to T/O: - Set the ELECT. MASTER switch to ON. - Set the flap selector switch to T/O. - When the flaps stop moving, set the ELECT. MASTER switch to OFF.	
(5)	Read the angle of the left outer flap on the deflection check gauge. Record the value in the Control Surfaces Adjustment Report.	The value must be as shown in the Control Surfaces Adjustment Report.

	Detail Steps/Work Items	Key Items/References
(6)	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.	
(7)	Read the angle of the left outer flap on the deflection check gauge. Record the value in the Control Surfaces Adjustment Report.	The value must be as shown in the Control Surfaces Adjustment Report.
(8)	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.
Flap / Aileron deflection check gauge.	2	D60-5753-00-00-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. Use it to record the measurements.
(2)	Remove these items for access: The passenger seat of the second row. 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 pushrod to the idler lever.	At the rear main bulkhead. Hold the flaps.
(5)	Put a rigging pin in the idler lever.	Refer to Figures 1 and 3. (27-50-00 Pages 2 and 6). At the rear main bulkhead.
(6)	Put a rigging pin in the inner and outer bellcrank in the wings. If necessary adjust the push-rod between the idler lever and the bellcrank.	Refer to Section 27-00.
CAUTION: MAKE SURE THAT ALL THE RIGGING PINS ARE REMOVED TO PREVENT DAMAGE TO THE LNKAGE OF THE CONTROL SURFACES..		
(7)	Remove the rigging pins from the flap idler lever and the bellcranks in the wings.	
(8)	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.**	
(9)	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 T/O. - 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.
(10)	Adjust the flap control system: - Measure the extension of the actuator push-rod. - 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.	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). Refer to Figure 3. (27-50-00 Page 6). One turn clockwise decreases the extension by 1 mm (0.04 in). Torque: 6.4 Nm (4.7 lbf.ft.).
(11)	Repeat steps (9) and (10) as necessary to get the correct extension.	
(12)	Disconnect the rod end on the flap attachment on all four flap connections.	At the flap.
(13)	Set the flap actuator to flap UP.	
(14)	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.).
(15)	Install the deflection gauge on the wing.	

	Detail Steps/Work Items	Key Items/References
(16)	Connect the outer flap rod end LH and RH on flap lever and adjust it to 0 degrees.	
(17)	Connect the inner flap LH and RH on flap lever and adjust it to the flap stop.	
(18)	Measure flap deflection: - Set the flap selector switch to LDG. - Set the flap selector switch to T/O. - Set the flap selector switch to UP.	Record the value in the Control Surfaces Adjustment Report.
(19)	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.
(20)	Do a test and adjust flap pre-load.	Refer to Paragraph 4.C.
(21)	Do an inspection of all the controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection of the controls.	
(22)	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. Use it to record the measurements.
(2)	Connect external power source.	
(3)	Set the ELECT. MASTER switch to ON.	
(4)	Check flap deflection for UP, T/O, LDG position with deflection gauge according to the Control Surfaces Adjustment Report.	If deflection out of limit refer to Paragraph B.
(5)	If MÄM 62-192 is NOT installed: 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 201.
(7)	Put paper slip between the inner flap outer end and the flap stop.	
(8)	Set the flaps to 0 degrees.	
(9)	Connect the scale to the reinforced tape loop.	
(10)	Pull on the 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 the inner flap push rod and twist the rod end half a revolution. Connect the push rod and try again until limits are reached.	
(12)	Repeat steps (6) to (11) on other side.	
(13)	If MÄM 62-192 is installed: Remove the tape loop from the inner flaps on the LH and RH side.	
(14)	If MÄM 62-192 is NOT installed: Disconnect LH and RH inner flap push-rods.	

	Detail Steps/Work Items	Key Items/References
(15)	If MÄM 62-192 is NOT installed: Connect the LH and RH outer flap push-rods.	
(16)	If MÄM 62-192 is NOT installed: Put paper slip in the outer flap stop-fairing between the flap stop and flap stop lever.	
(17)	If MÄM 62-192 is NOT installed: Set the flaps to 0 degrees.	
(18)	If MÄM 62-192 is NOT installed: Position the scale on the screw head on the outer end of the flap.	
(19)	If MÄM 62-192 is NOT installed: Pull on the scale and paper slip until the paper slip is released.	
(20)	If MÄM 62-192 is NOT installed: 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.	
(21)	If MÄM 62-192 is NOT installed: Connect the inner flap push rods.	
(22)	Do an inspection of all controls that you have adjusted. If necessary for your Airworthiness Authority, do a duplicate inspection if the controls	

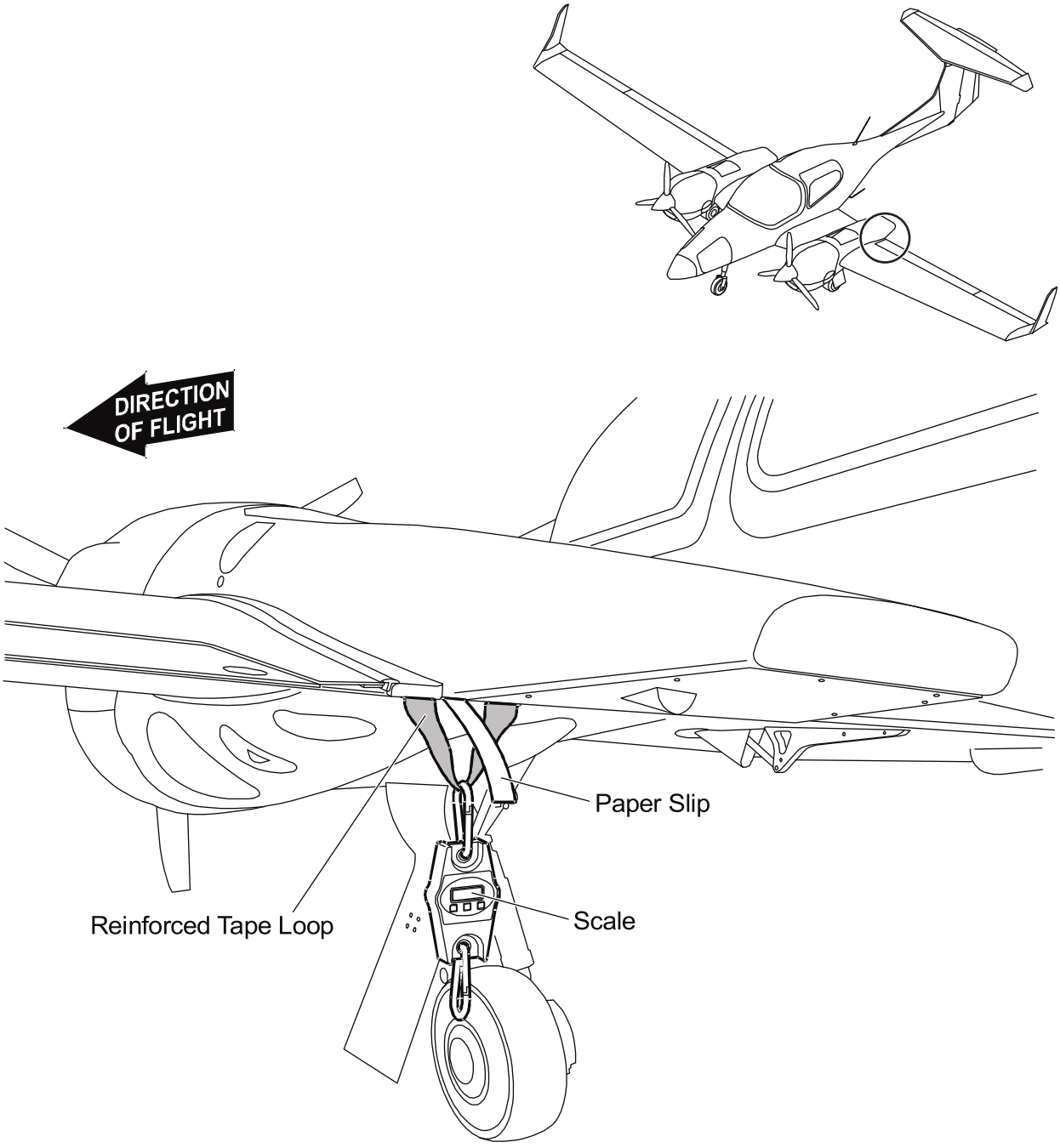

Figure 201 : Flap Preload Adjustment

5. **Flap Pushrod 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.	Refer to Section 25-10. Refer to 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 Bellcrank/Lever	Remove/Install Access	References
Idler lever at the rear main bulkhead.	Passenger seat.	Refer to Section 25-10.
Bellcranks in the wings.	Inner and outer bellcrank access panels under each wing.	Refer to Section 52-40.

7. **Overspeed Flap Extension**

If the flaps are extended above V_{FE} or are left extended above V_{FE} an inspection of the flap system, including the idler lever, must be completed.

	Detail Steps/Work Items	Key Items/References
(1)	Inspect the web at the trailing edge of the wing where the flap is attached. Pay special attention for cracks and delamination.	
(2)	Inspect the flaps, flap attachment brackets/hinges/ horns and flap control rods for any signs of damage.	Refer to Paragraphs 5 and 6 for information regarding access to components. Pay special attention to the hinges and brackets.
(3)	Inspect the idler lever and bellcranks for signs of damage using a bright flashlight and a mirror.	Pay special attention to the welds and to the composite where the idler lever and bellcranks attach.
(4)	If damage is suspected in the idler lever or the bellcranks: - Remove the suspect component. - If cracks are suspected, perform a fluorescent dye penetrant inspection in accordance with ASTM 1417 or equivalent method. - Repeat this inspection every 3000 hours.	A person appropriately certified in NDT shall carry out this inspection.
(5)	If there are signs of damage or cracks, the affected components shall be replaced.	

CHAPTER 28

FUEL

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CHAPTER 28

FUEL

1. General

This Chapter describes the DA 62 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 62 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 62-001). The auxiliary fuel tanks consist of a single fuel chamber in each engine nacelle. The additional fuel capacity is 18.5 US gal (70 liter) per side. The total fuel capacity (main fuel tank and auxiliary fuel tank) is 44.5 US gal (168.4 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.

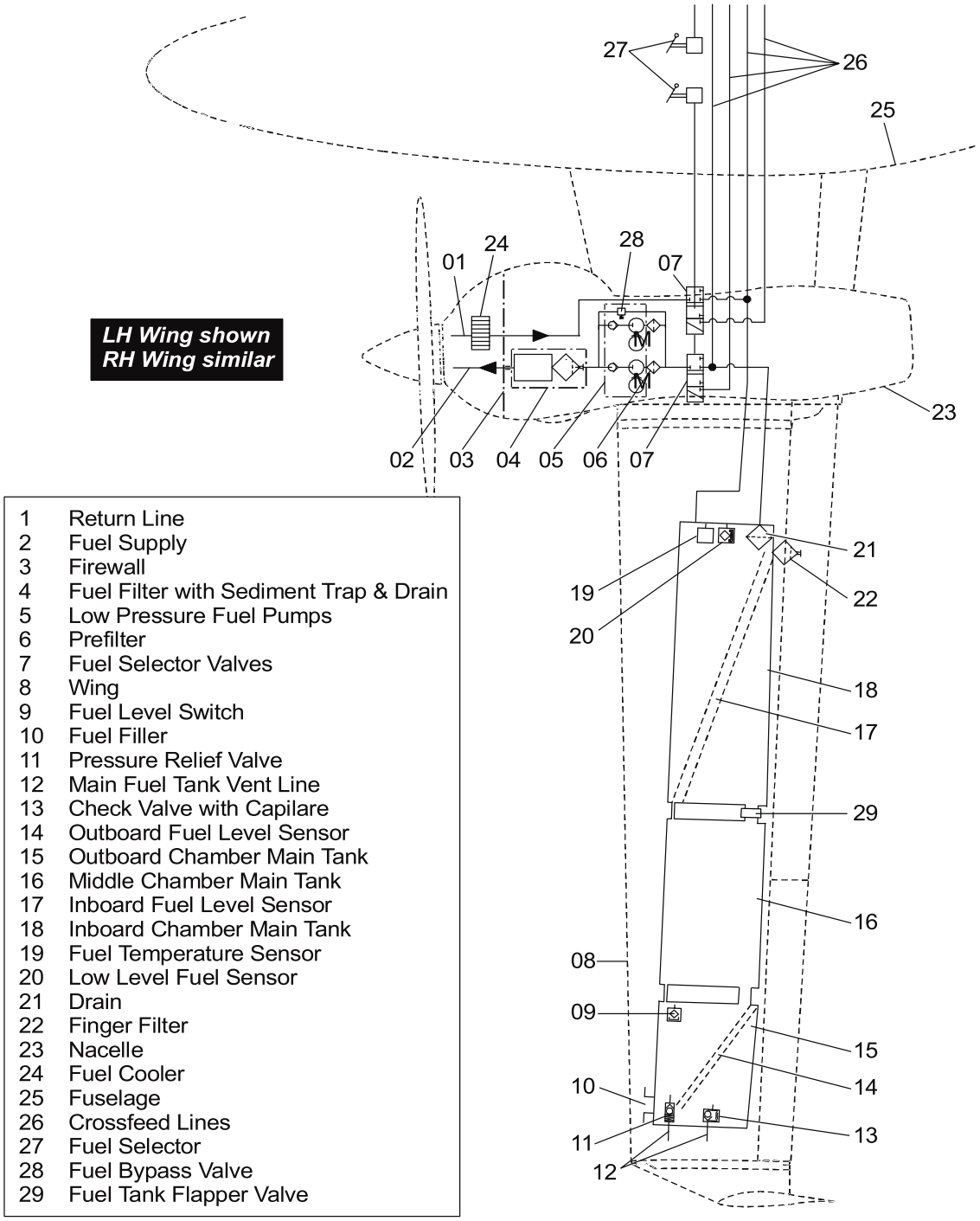
Fuel level sensors in the inboard and outboard chambers of each fuel tank assembly provide fuel quantity data which are displayed on the multi-function display (MFD) screen of the integrated cockpit system (ICS). Refer to these Sections for more data on these systems:

- Section 28-10. Fuel storage.
- Section 28-20. Fuel distribution.
- Section 28-40. Fuel indication.
- Section 73-00. Engine fuel system.

NOTE: Equipment which is certified for installation in the DA 62 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
28	Fuel Bypass Valve
29	Fuel Tank Flapper Valve

Figure 1 : Fuel System Schematic-Diagram - without Auxiliary Tanks

2. Description

Figure 1 shows the fuel system schematic diagram of the DA 62 airplane. The DA 62 has a fuel tank assembly in each wing.

Figure 2 shows the auxiliary fuel tank system schematic diagram of the DA 62 airplane. The auxiliary fuel tank system is optional equipment (OÄM 62-001). 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 62-001) 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 62-001). 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 is 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 is connected at the front section of the auxiliary fuel tank. A drain line is connected to the filler drip tray.

Prior to the auxiliary fuel pump an 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.

If OÄM 62-001/a and MÄM 62-254 are installed:

The fuel level sensor detects the level of fuel in the auxiliary fuel tank assemblies and displays the information on the MFD (multi-functional display) of the integrated cockpit system.

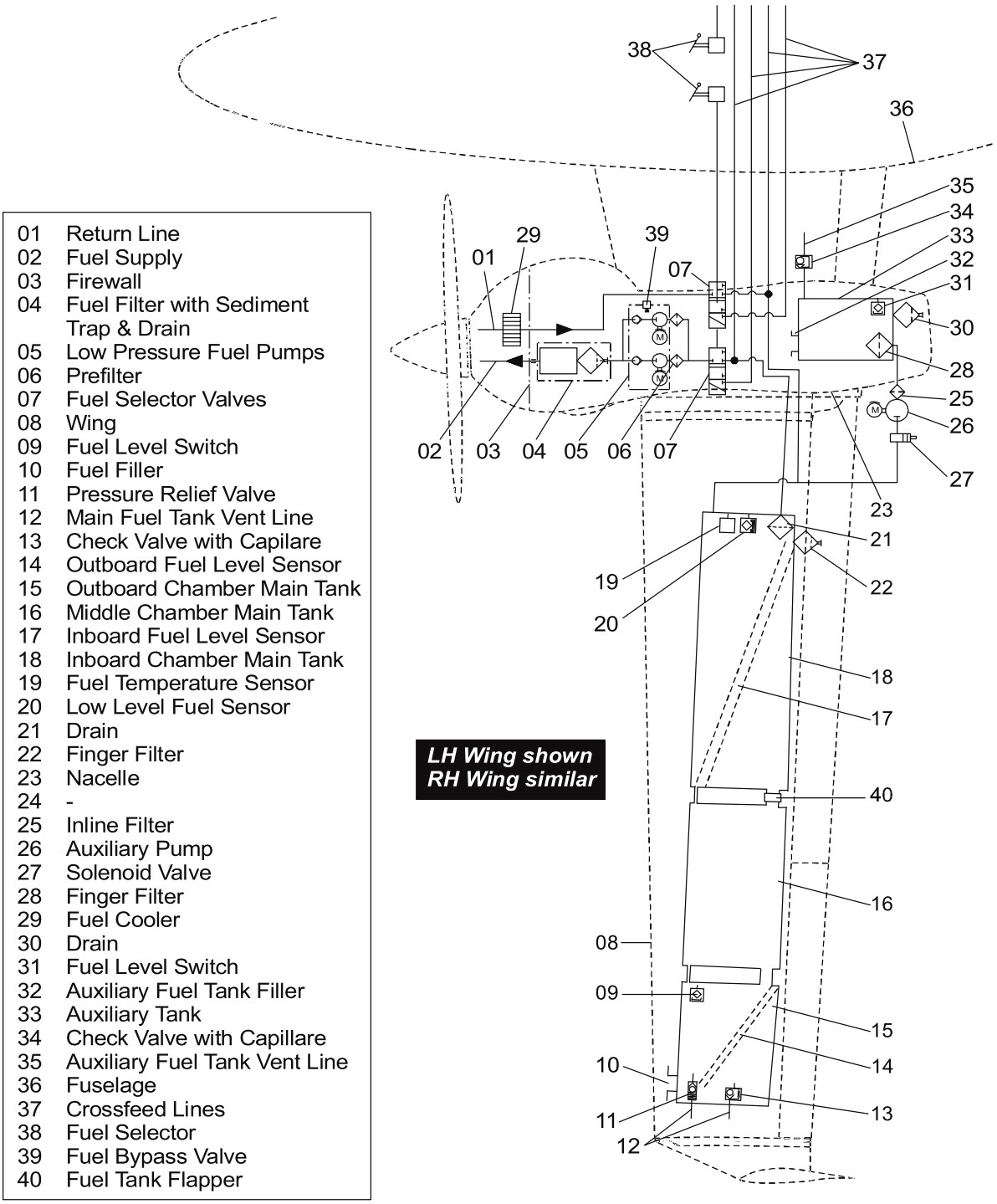


Figure 2 : Auxiliary Fuel-System Schematic-Diagram (OÄM 62-001 is installed)

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 to the main fuel tank through the fuel cooler (located in the engine compartment) and the fuel selector/shut-off valve. From there the fuel flows through a 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 62-001). 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 to 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.

Each fuel pump is electrically connected to the LH/RH ECU BUS and is 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. 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.

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Section 28-10

Fuel Storage System

1. General

This Section describes the fuel storage system of the DA 62 airplane, with 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

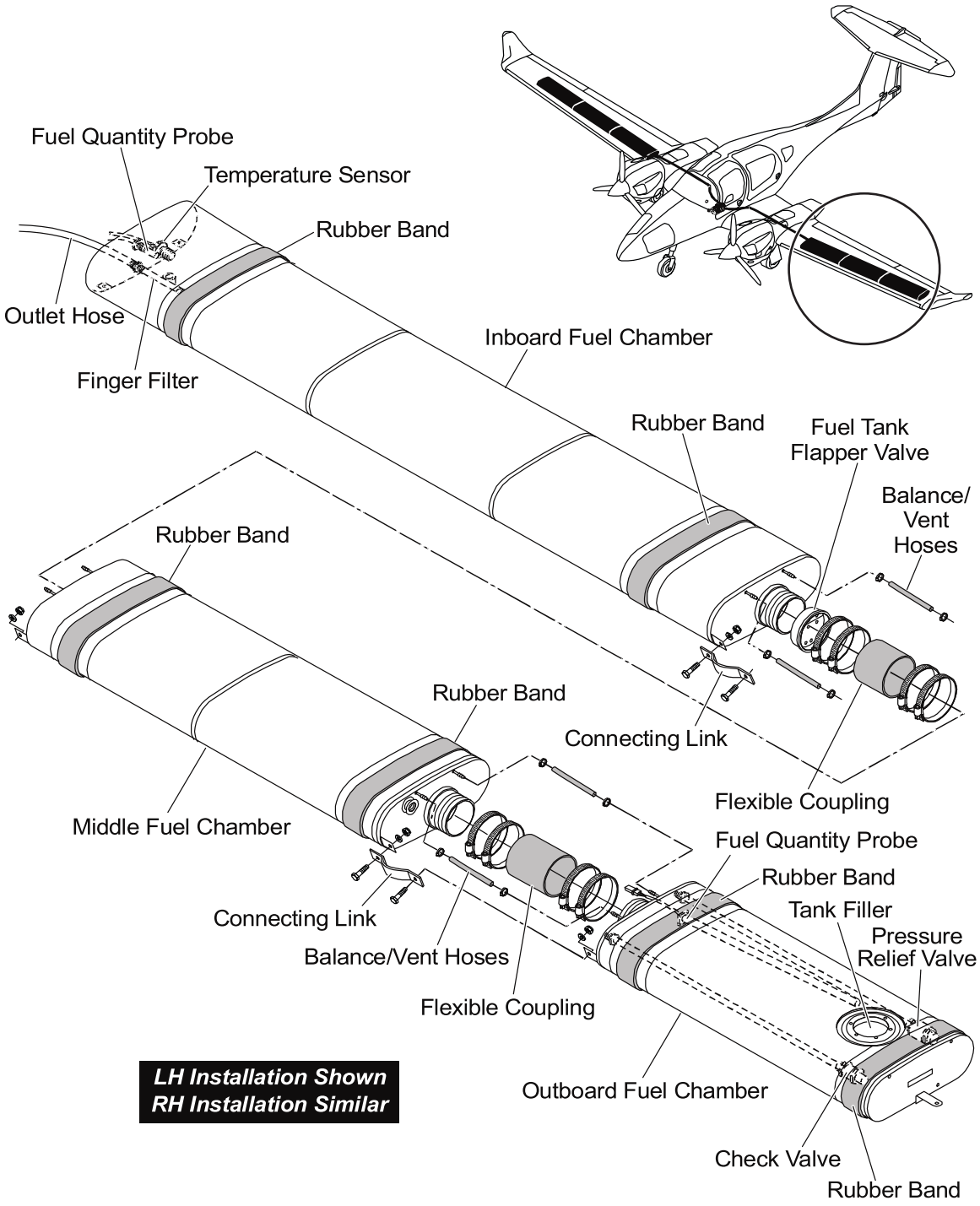

Figure 1 : Main Fuel Tank - Installation

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.

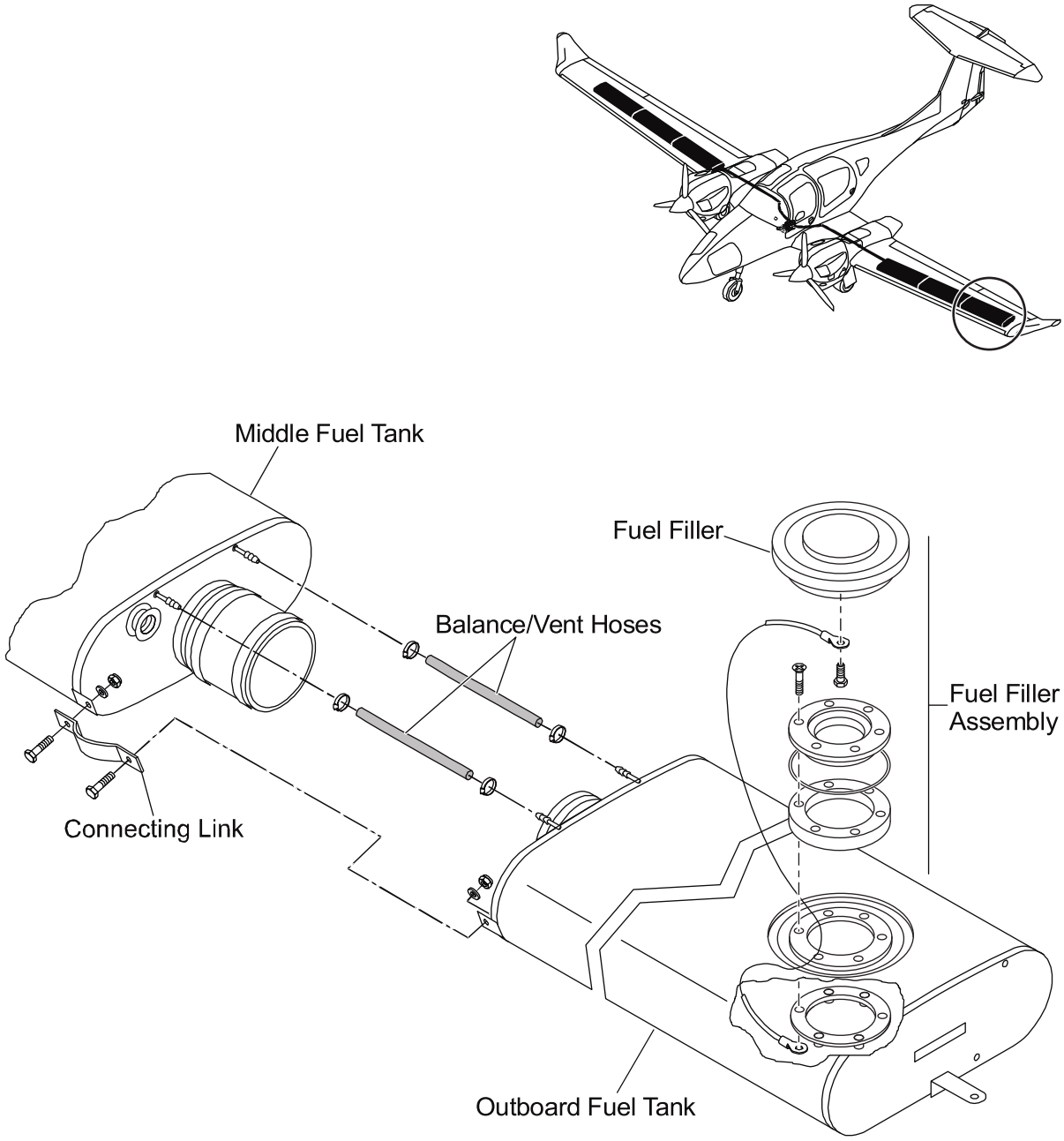

Figure 2 : Fuel Filler Assembly LH

B. Fuel Filler Assemblies.

Figure 2 shows the fuel filler assembly. 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. Pull the locking lever up and turn the filler cap counter-clockwise to release it. Turn the cap clockwise to install it and push down the locking lever to secure it.

Bonding strips connect the tank to the fuel filler assembly and the airplane bonding system.

C. Vented Access Panel.

A vented access panel is located on the bottom surface of each wing below the outboard fuel tank. The vented access panel has two plastic hoses (cover hoses) that slide over two rubber vent hoses from the outboard fuel tank. The vents allow pressure inside the fuel tank to equalize as the aircraft climbs, descends, and as fuel is consumed during flight.

Refer to Section 52-40 for more information on the vented access panel.

3. **Auxiliary Fuel Tank Description**

Figure 3 shows the auxiliary fuel tank installation. The airplane has two auxiliary fuel tank assemblies (optional equipment, OÄM 62-001). A single chamber makes the auxiliary fuel tank assembly. The chamber is located in the rear section of each engine nacelle.

The tank is a special PE structure. Baffles in the tank prevent the fuel from moving quickly from one end of the tank to the other. The tank has integrated inserts where fuel-vent hoses, level switch, anti chafing pads and fuel pump units are attached.

A tank drain is located at the inboard rear corner of the tank. You can use this drain valve during pre-flight inspection to check fuel contamination and for draining the auxiliary fuel tank assembly. A finger filter at the tank outlet and a fuel filter prior to the aux fuel pump unit prevents debris from entering the main fuel tank. A fuel low level sensor is also mounted on the rear side of the chamber.

If OÄM 62-001/a is installed:

One fuel level sensor is installed in each auxiliary fuel tank. The signals from the sensors are displayed on the MFD of the integrated cockpit system, if MÄM 62-254 is installed. Refer to Section 28-40 for more information about the fuel indicating system.

One rib in the nacelle combined with a mounting bracket hold the fuel chamber in position.

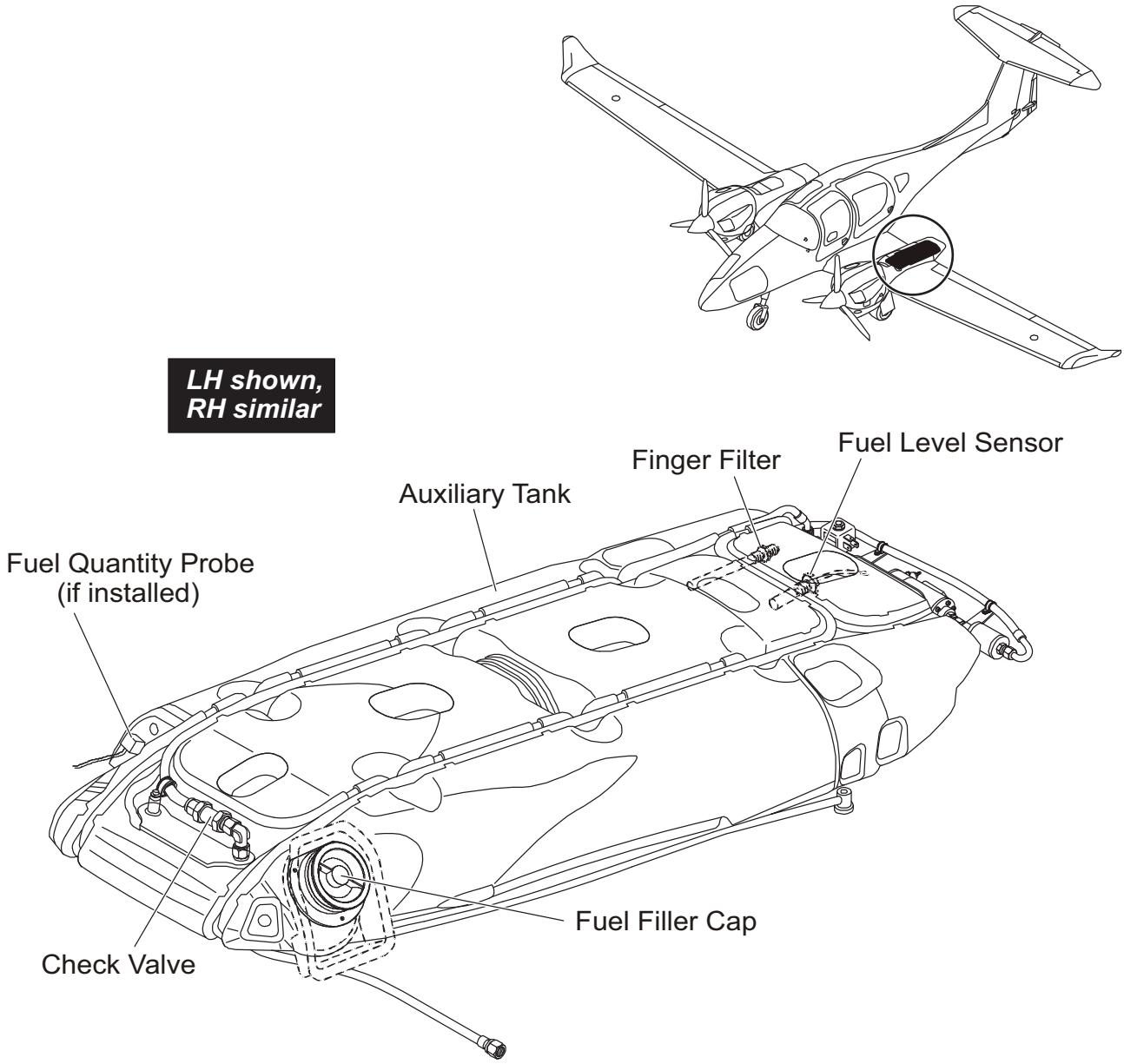

Figure 3 : Auxiliary Fuel Tank - Installation

4. **AuxiliaryTank Fuel-Filler**

Refer to Figure 4 for the auxiliary tank fuel-filler installation.

The auxiliary tank fuel-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.

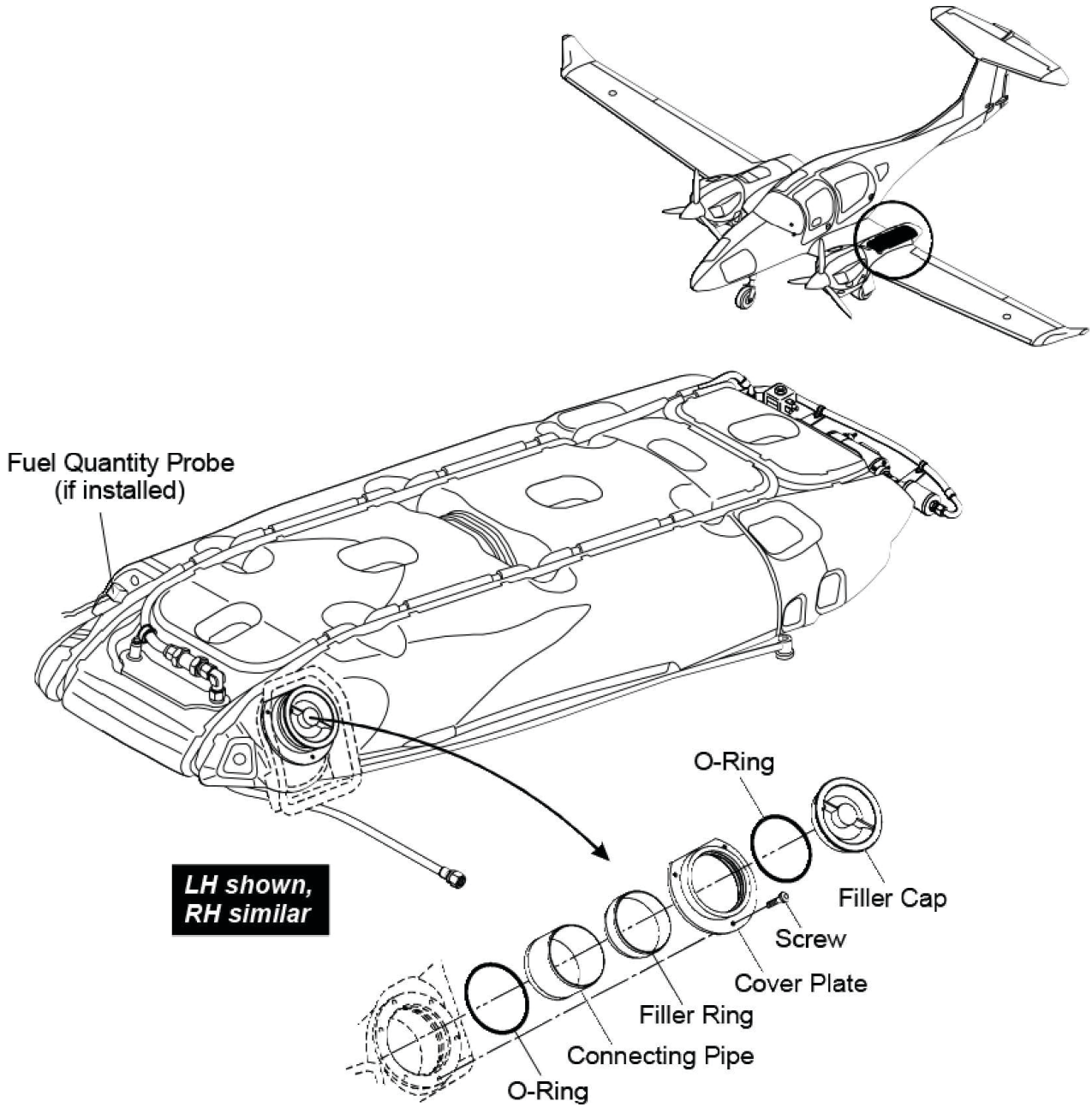

Figure 4 : Auxiliary Tank Fuel-Filler - Installation

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Trouble-Shooting

1. **General**

The table below lists the possible 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 gasket damaged. Filler cap does not have a tight fit.	Replace filler cap gasket. Tighten the nut on lower side of the cap.
Fuel drain valve leaking.	Drain valve damaged. Contamination in drain valve.	Replace the fuel 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 describe 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 BREATH 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)	Remove the fuel vent line access panel: - Remove the access panel from the outer lower surface of the wing.	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 six 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 bonding cable. Discard the O-ring seal.
(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.	
(4)	Remove the vent connector hoses that connect the inboard fuel chamber to the middle fuel chamber: - Remove the hose clips from the two 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 two hoses. - Pull the hoses off the fuel chamber connectors and clear of the fuel chambers.	

	Detail Steps/Work Items	Key Items/References
(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)
(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: - Install the fuel tank flapper on the large connector of the inboard 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 two flexible hoses over the vent connectors on the outboard fuel chamber. - Install the other end of the two flexible hoses on the vent connectors of the middle fuel chamber. - Install the worm-drive-clamps onto the flexible hoses. - Install the vent lines of the outboard fuel chamber which vent to the outside of the wing.	
(5)	Install the flexible vent hoses that connect the inboard fuel chamber to the middle fuel chamber: - Install two flexible hoses over the vent connectors on the middle fuel chamber. - Install the other end of the two flexible hoses on the vent connectors of the inboard fuel chamber. - Install the worm drive clamps onto the flexible hoses.	
(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 sealant to the tank filler mounting. - Install the spacer ring onto the tank filler mounting. - Install a new O-ring seal in position over the spacer ring. - Install the bonding wire cable. - Apply sealant to the top face of the spacer ring. - Install the six screws which attach the fuel filler to the outboard fuel chamber. - When all six screws are installed, then tighten the screws. **Important:** Be sure to remove any excess sealant squeeze out from the Fuel Filler Assembly. Failure to do so could lead to fuel contamination.	If necessary, move the tank assembly to give the correct alignment. Use WEICON GmbH Plast-O-Seal or equivalent. Follow the sealant manufacturer's instructions. At the position noted in Paragraph 2 A, step 10. Use WEICON GmbH Plast-O-Seal or equivalent. Follow the sealant manufacturer's instructions. Finger tight only. Tighten opposite screws.
(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.	
(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.	

	Detail Steps/Work Items	Key Items/References
(5)	Install the fuel vent line access panel: - Install the access panel from the outer lower surface of the wing.	Refer to Section 52-40.
(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 in-line 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	
(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.

	Detail Steps/Work Items	Key Items/References
(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 and the corresponding main fuel tank is empty.	Defuel and drain the auxiliary fuel tank and corresponding main fuel tank.
(2)	Remove the aux fuel tank access cone at the rear of the nacelle: - Remove the screws that attach the access cone to the rear nacelle. - Move the access cone clear of the nacelle.	
(3)	Disconnect the electrical connector for the fuel level switch and the aux fuel pump at the rearward end of the fuel tank. Disconnect the electrical connector of the auxiliary tank fuel probe (if installed).	
(4)	Disconnect the fuel line from the Y-connector	Access through inspection cover of fuel pump compartment below nacelle.
(5)	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	
(6)	Remove the bolts and washers of the aux fuel tank mounting brackets.	Access through inspection cover of fuel pump compartment below nacelle.
(7)	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
(8)	Disconnect the aux fuel tank vent hose at the rear lower part of the nacelle: - Gently move the tank with vent line rearward a small distance. - Feed the fuel line out of the fuel pump compartment as you move the aux tank rearward.	
(9)	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.	

A. Install an Auxiliary Fuel Tank

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel tank assembly: – Fix the fuel line with tape at the front of the aux fuel tank. –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)	Feed the fuel line into the fuel pump compartment as the aux tank is moved fully forward.	
(3)	Connect the aux tank vent hose at the bottom of the nacelle.	
(4)	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.
(5)	Install the fuel filler assembly: – Install the cover plate with the connection pipe. – 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.	
(6)	Connect the bonding strip to the cooler bracket.	
(7)	Install the aux fuel tank mounting bracket with bolts and washers to the nacelle floor.	Accessible through inspection cover below the nacelle.
(8)	Connect the fuel line to the fuel return line.	Access through the inspection cover of the fuel pump compartment.
(9)	Connect the electrical connector for the fuel level switch and the fuel pump at the rearward end of the fuel tank. Connect the electrical connector of the auxiliary tank fuel probe (if installed).	

	Detail Steps/Work Items	Key Items/References
(10)	Install the auxiliary fuel tank access cone to the engine nacelle: – Move the access cone in place on the nacelle. –Install the screws that attach the access panel to the nacelle.	
(11)	Refuel the auxiliary fuel tank.	
(12)	Check auxiliary fuel tank assembly for leakage.	

5. **Remove/Disassemble a Fuel Filler Cap (from the Outboard Fuel Chamber)**

A. Remove a Fuel Filler Cap.

	Detail Steps/Work Items	Key Items/References
(1)	Pull up on the fuel cap locking lever.	
(2)	Turn the fuel filler cap counter-clockwise to release it from the flange neck A500 of the outboard chamber.	
(3)	Remove the screw from the fuel cap retainer and remove the fuel filler cap from the airplane.	Be careful not to drop anything into the outboard fuel chamber.

B. Disassemble a Fuel Filler Cap.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	NOTE: The distance ring, the 'O' ring and the flange neck A500 held in place with the countersunk screws are not removed from the outboard fuel chamber.	Make sure that what can be seen is not damaged. If there is damage, the damaged part will have to be replaced.
(2)	Remove the screw and nyloc/self-locking nut that attaches the two washers, the fuel cap locking lever and the fuel filler cap together.	
(3)	Remove the rain seal 'O' ring.	Discard the 'O' ring.
(4)	If the fuel cap overhaul kit 500 has been installed remove the fuel seal 'O' ring.	Discard the 'O' ring.

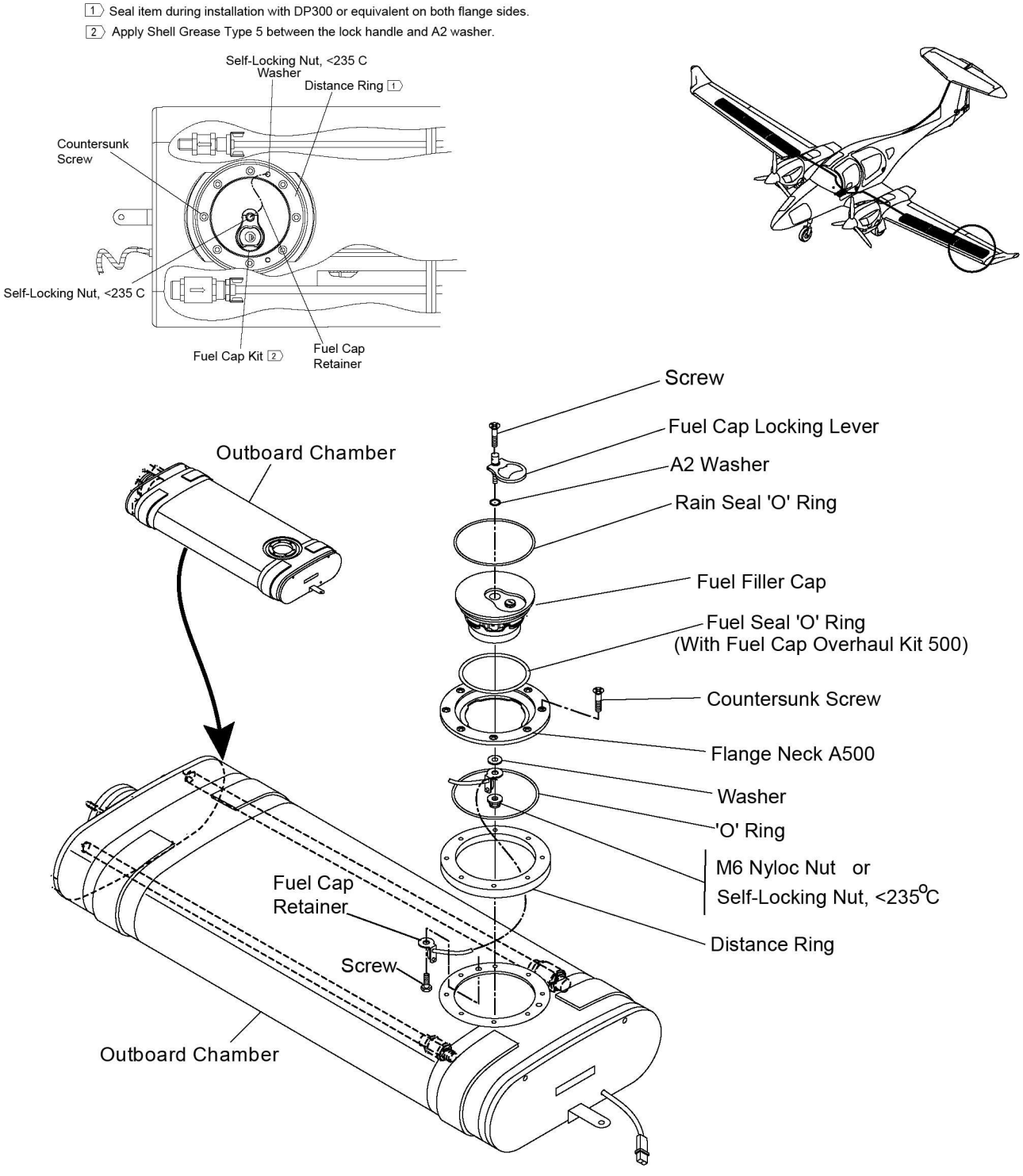

Figure 201 : Fuel Filler Cap - Disassembly/Assembly

6. **Assemble/Install a Fuel Filler Cap (from the Outboard Fuel Chamber)**

A. Assemble a Fuel Filler Cap.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	If the fuel cap overhaul kit 500 has been installed, install a new fuel seal 'O' ring.	
(2)	Install a new rain seal 'O' ring.	
(3)	Install the screw and nyloc/self-locking nut that attaches the two washers, the fuel cap locking lever and the fuel filler cap together.	- Use a self-locking nut after installation of the fuel cap retainer, if the original nyloc locknut provided with the fuel cap is damaged and will not provide sufficient locking safety. - Apply Shell Grease Type 5 between the fuel cap locking lever and the A2 washer.

B. Install a Fuel Filler Cap.

	Detail Steps/Work Items	Key Items/References
(1)	Put the fuel filler cap in position on the outboard fuel chamber.	
(2)	Install the screw to attach fuel cap retainer.	Be careful not to drop anything into the outboard fuel chamber.
(3)	Turn the fuel filler cap clockwise to install it to the flange neck A500 of the outboard chamber.	
(4)	Push down the locking lever to secure the fuel filler cap to the outboard chamber.	

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Section 28-20

Fuel Distribution

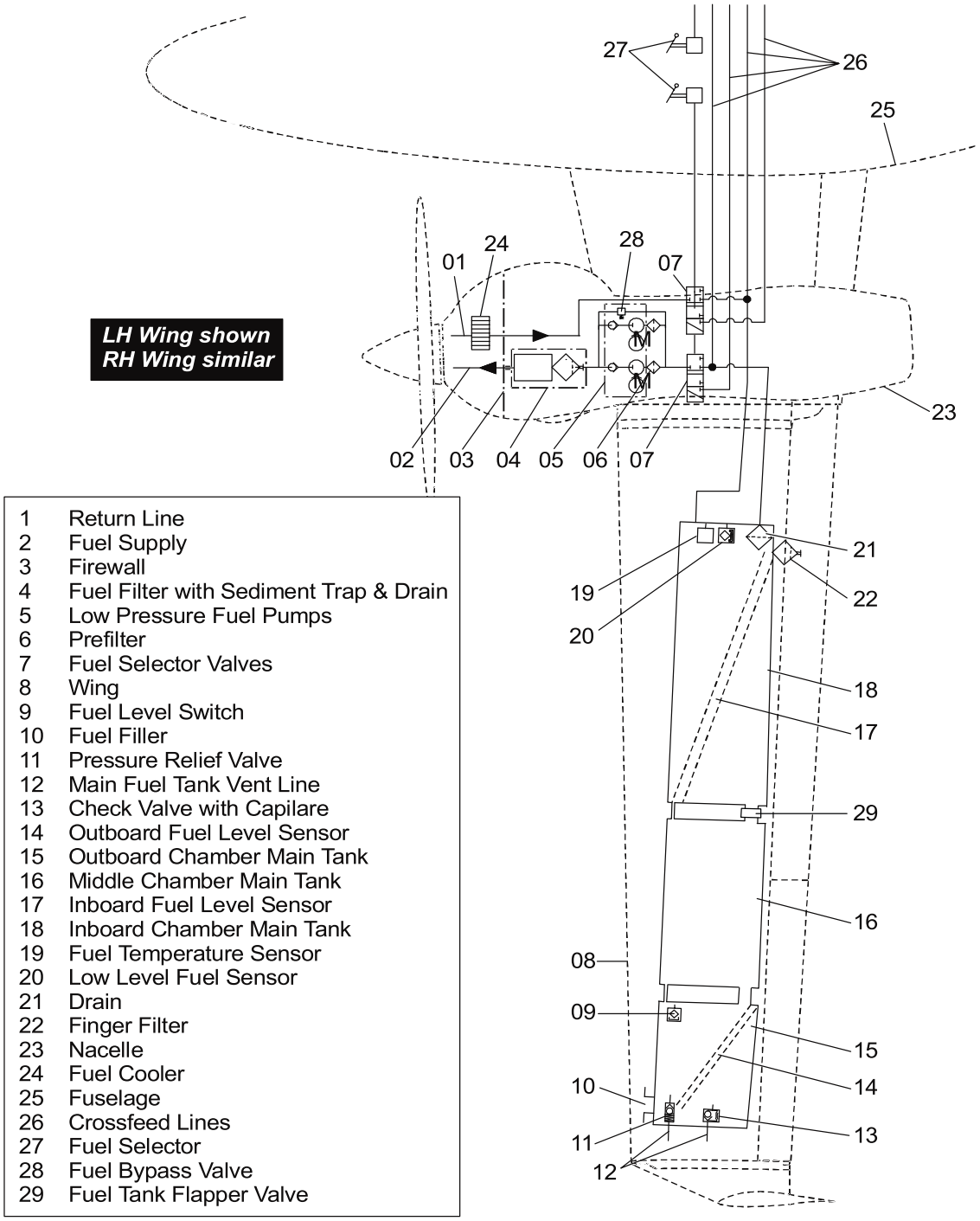
1. General

This Section describes the fuel distribution system for the DA 62 airplane. 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.
- Fuel pressure pulsation damper.

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.



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
28	Fuel Bypass Valve
29	Fuel Tank Flapper Valve

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 62 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 62-001), 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.

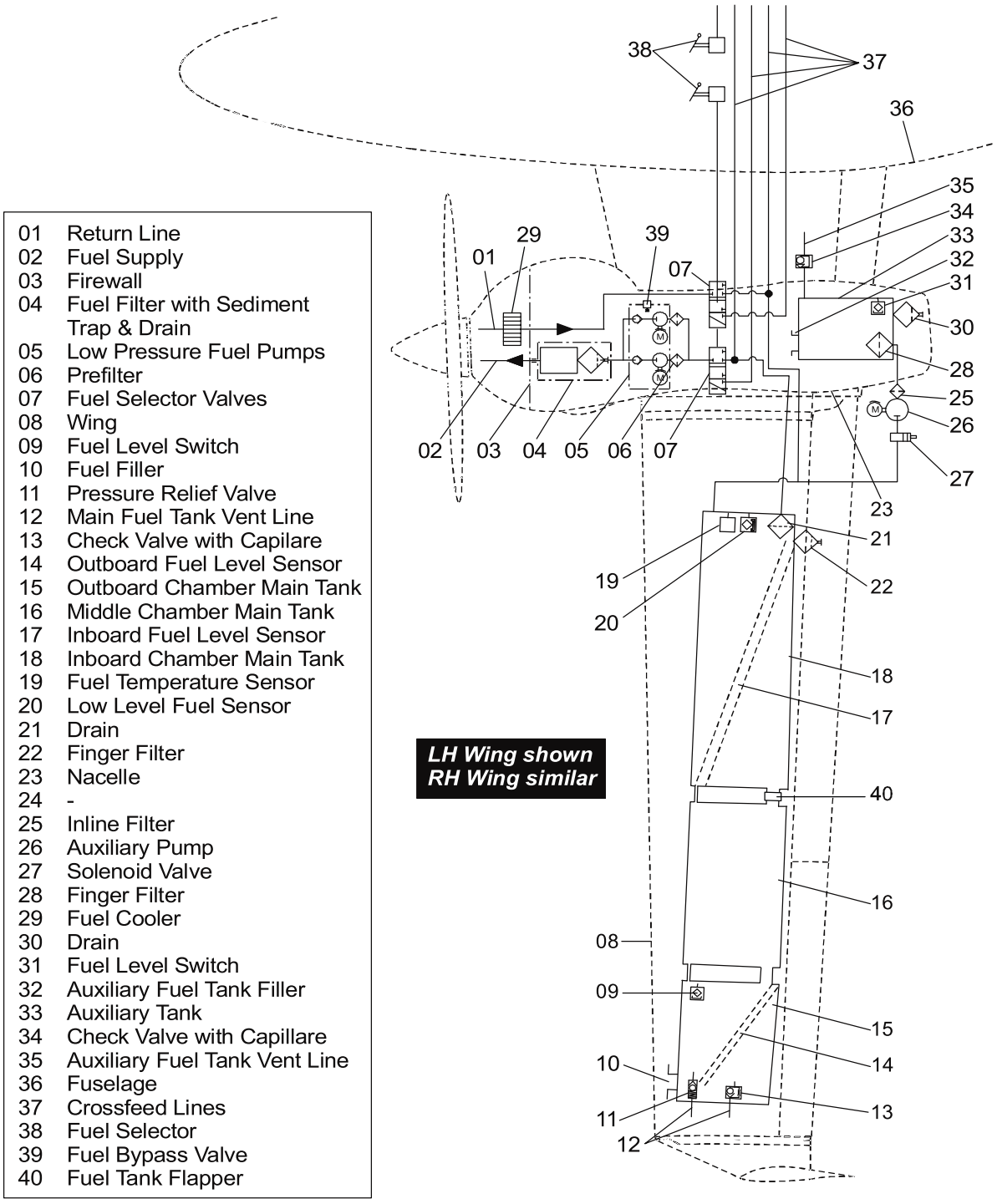


Figure 2 : Fuel Distribution System Schematic - with Auxiliary Tanks

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.

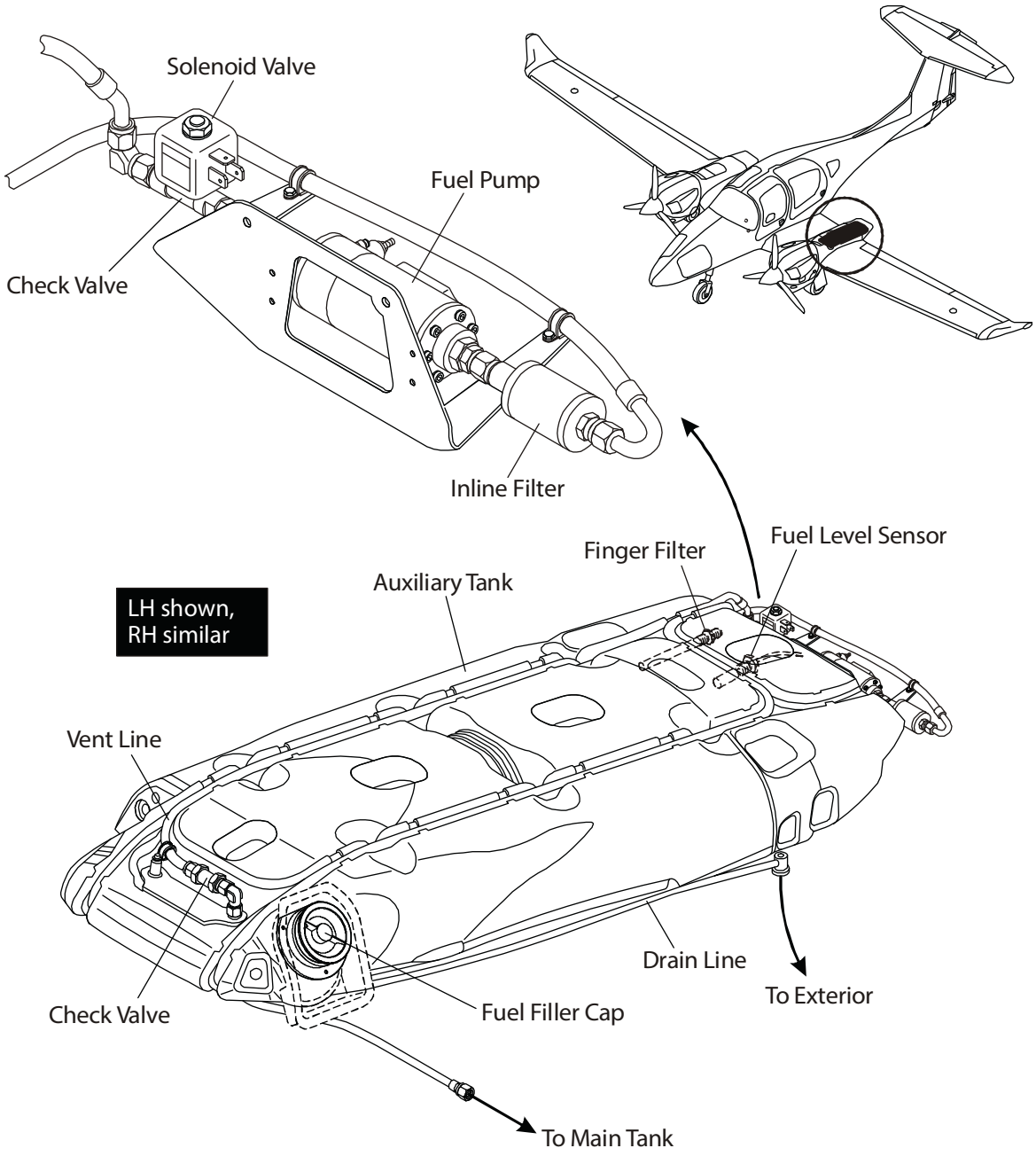


Figure 3 : Auxiliary Fuel Supply to the Main Fuel Tank

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 204 in the Maintenance Practices Pageblock (28-20-00 Page 216).

Trouble-Shooting

1. **General**

The table below lists the possible trouble you could have with the fuel distribution 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
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 BREATH FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. **Remove/Install a Fuel Transfer/Shut-Off Valve**

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Transfer/Shut-Off Valve.

Refer to Figure 201.

	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.	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 four 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.	

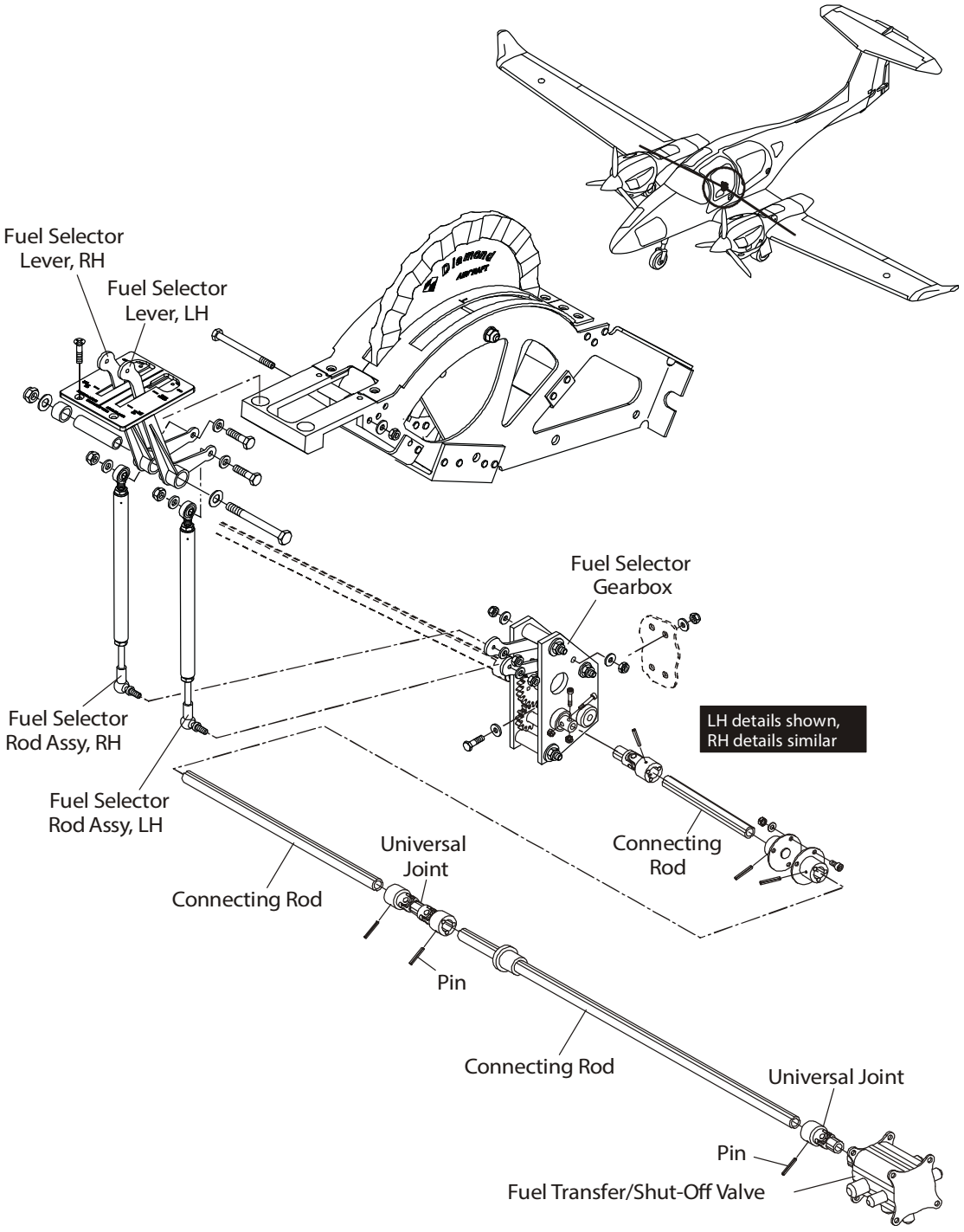


Figure 201 : Fuel Transfer/Shut-Off Valve Installation

B. Install a Fuel Transfer/Shut-Off Valve.

Refer to Figure 201.

	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 four 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 were removed.	Refer to Section 52-40.
(10)	Install the engine cowlings that were 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 201.

	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.
(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.	

	Detail Steps/Work Items	Key Items/References
(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 201.

	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.	
(11)	Remove both parts of the connection element.	

	Detail Steps/Work Items	Key Items/References
(12)	Drill holes in the undrilled part of the connection element.	Use the drilled part of the connection element in the marked position as a 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.

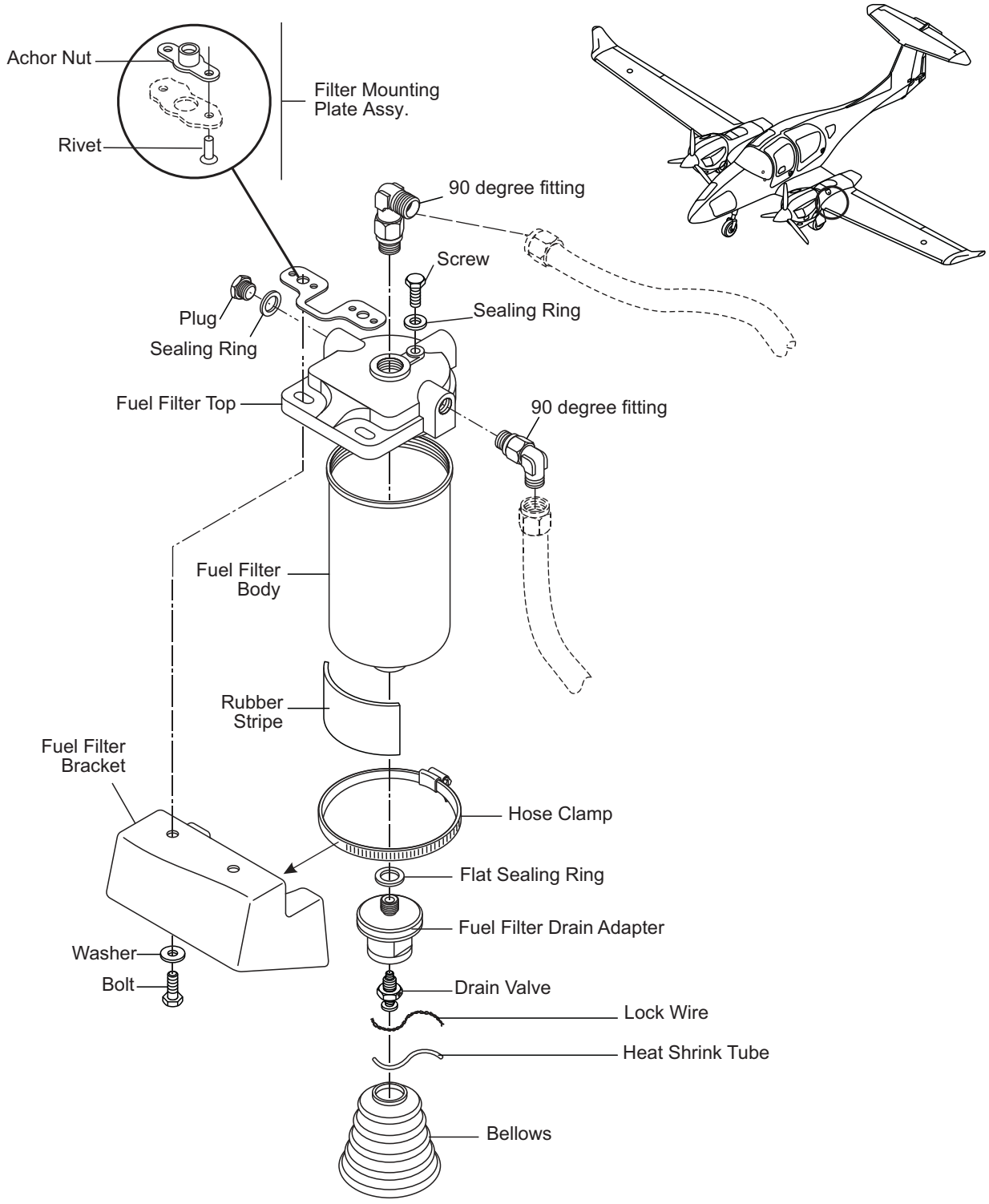


Figure 202 : Fuel Filter Assembly

4. **Remove/Install the Fuel Filter Body**

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Filter Body.

Refer to Figure 202.

	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.	From the fuel sediment bowl drain. Use a suitable container to catch spilt fluid.

B. Install the Fuel Filter Body.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel filter drain adapter and the drain valve into the new filter body.	Use Dow Corning DC-4 on the 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.	

5. **Remove/Install the Fuel Pre-Filters**

Obey the safety precautions for fuel at all times.

A. Remove the Fuel Pre-Filters.

Refer to Figure 205.

	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.	From the fuel filter drain. Use a suitable container to catch spilt fluid. The assemblies will contain fuel!

B. Clean the Fuel Pre-Filters.

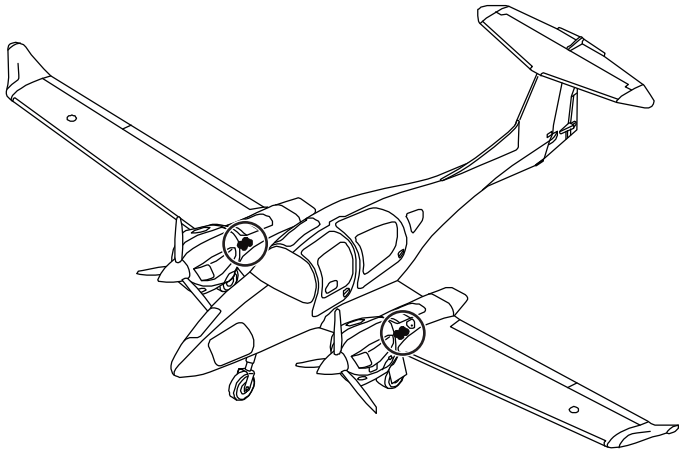
Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Disassemble the pre-filters.	
(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.

Refer to Figure 205.

	Detail Steps/Work Items	Key Items/References
(1)	Install the pre-filters: - Replace all aluminum 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.	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.	



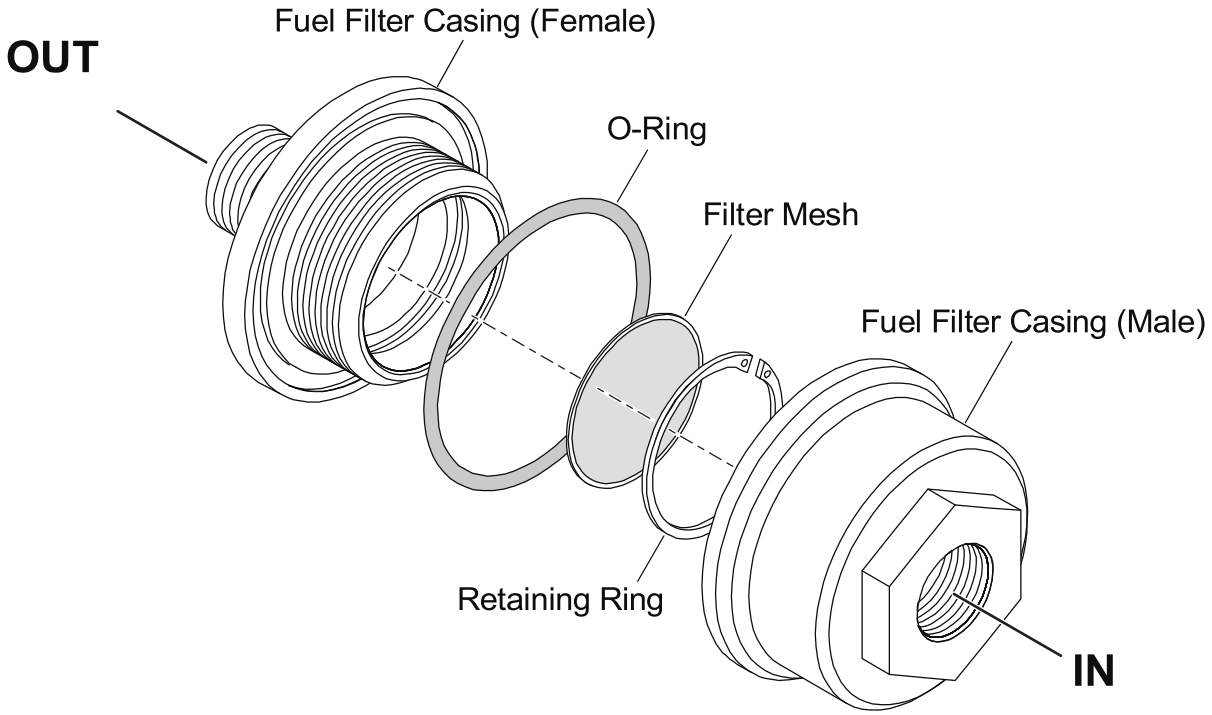


Figure 203 : Fuel Pre-Filter Assembly

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).

Refer to Figure 204.

	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.	

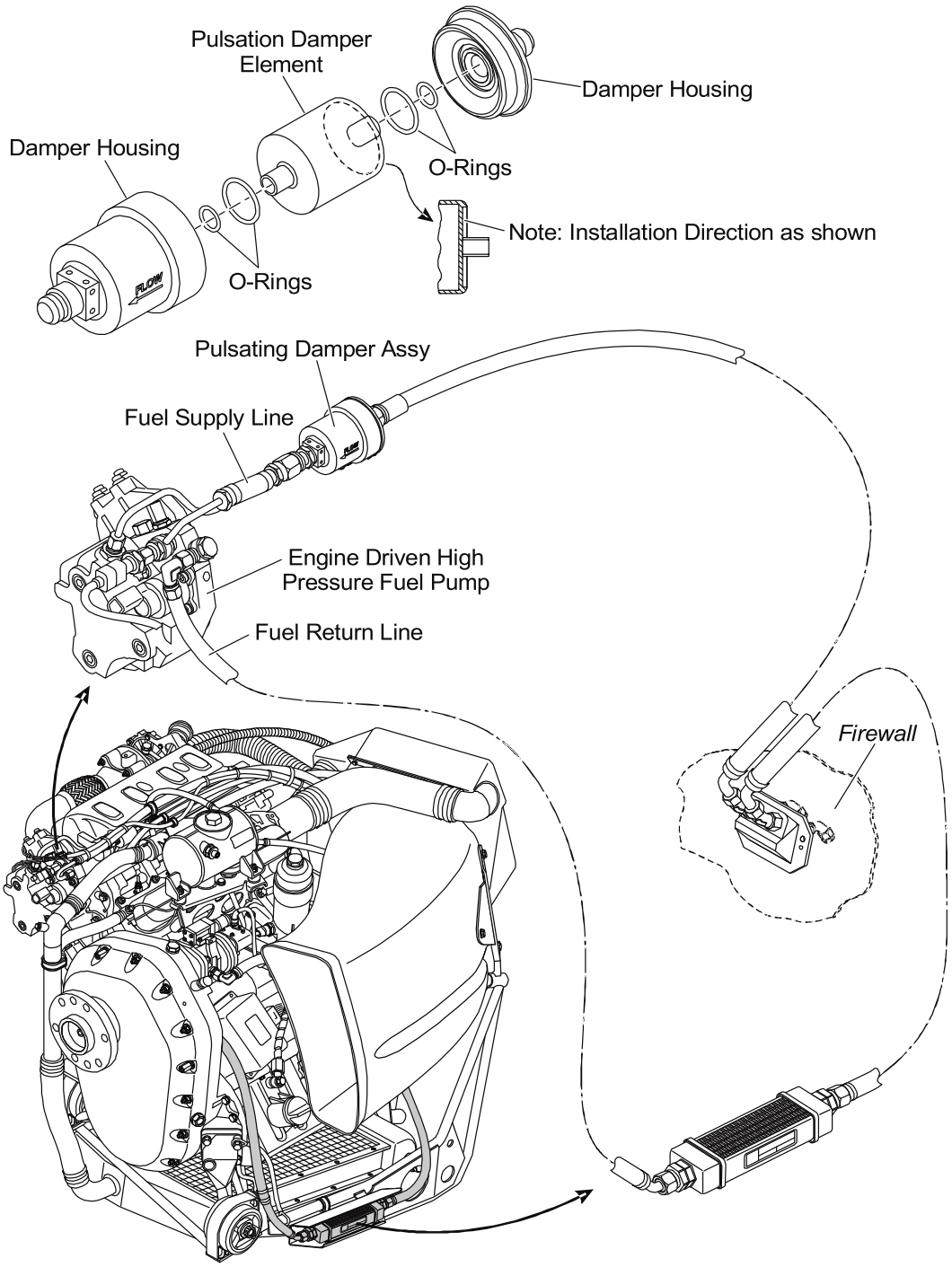


Figure 204 : Fuel System Components Firewall Forward LH and RH Engine

B. Replace the Fuel Pressure Pulsation Damper.

Refer to Figure 204.

	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.	
(8)	Tighten the fuel pressure pulsation damper housing.	
(9)	Secure the fuel pressure pulsation damper housing with locking wire.	

C. Install the Fuel Pressure Pulsation Damper Housing Assembly.

Refer to Figure 204.

	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.

Refer to Figure 205.

	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.	
(4)	Replace the fuel pumps and inspect / clean the pre-filters.	
(5)	Replace aluminium washers.	
(6)	Check hollow bolts and bridges for damage.	Replace damaged items.

B. Install the Low Pressure Fuel Pumps.

Refer to Figure 205.

	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.	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.	

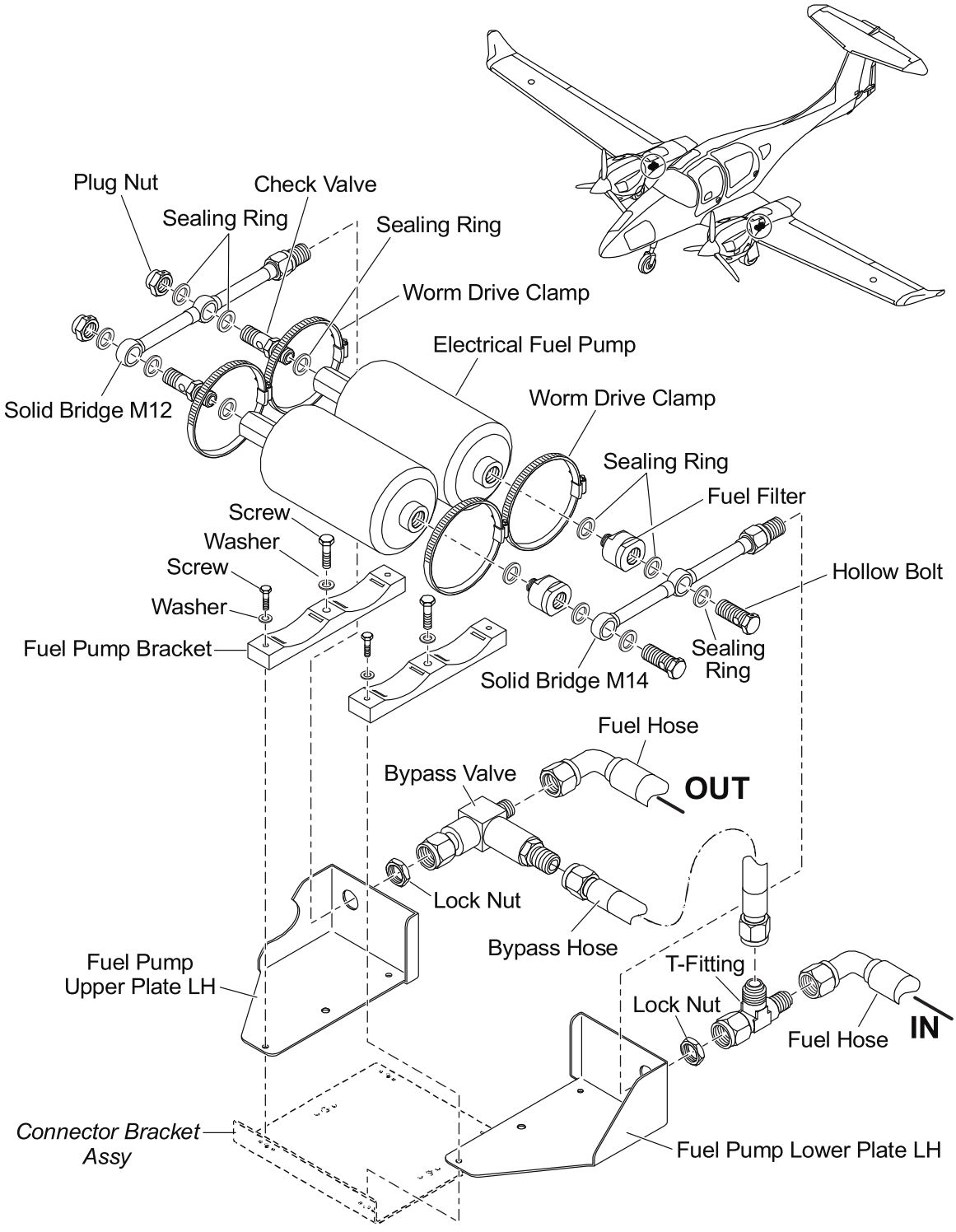


Figure 205 : Fuel Pumps Assembly

8. **Test the Solenoid Valve in the Fuel Transfer Line (If Auxiliary Tanks are Installed)**

Obey the safety precautions for fuel at all times.

CAUTION: YOU MUST REPLACE THE SOLENOID VALVE IF THE TEST FAILS.

A. Procedure.

	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 solenoid valve.	Put a cap on the fuel line.
(4)	Check for any leakage from the solenoid valve.	If leakage is observed, replace the solenoid valve.
(5)	Reconnect the fuel transfer line to the solenoid valve.	
(6)	Check for leakage while operating the auxiliary fuel pump.	If leakage is observed, replace the relevant fittings and hoses

9. **Test the Crossfeed Position of a Fuel Selector Valve**

Obey the safety precautions for fuel at all times.

A. Procedure.

	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 a Fuel Pump Filter**

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Pump 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 cone from the engine nacelle: - Remove the screws that attach the access cone to the nacelle. - Move the access cone clear of the nacelle.	
(3)	Disconnect the fuel transfer line from the fuel filter.	
(4)	Remove the filter from the auxiliary fuel pump.	

B. Install a Fuel Pump 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 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 cone to the engine nacelle: - Move the access cone in place on the nacelle. - Install the screws that attach the access cone 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 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 the 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 describes the fuel indicating systems of the DA 62. 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 62 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 62-001) 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 and of the LH and RH auxiliary tanks (if OÄM 62-001/a and MÄM 62-254 are installed).

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

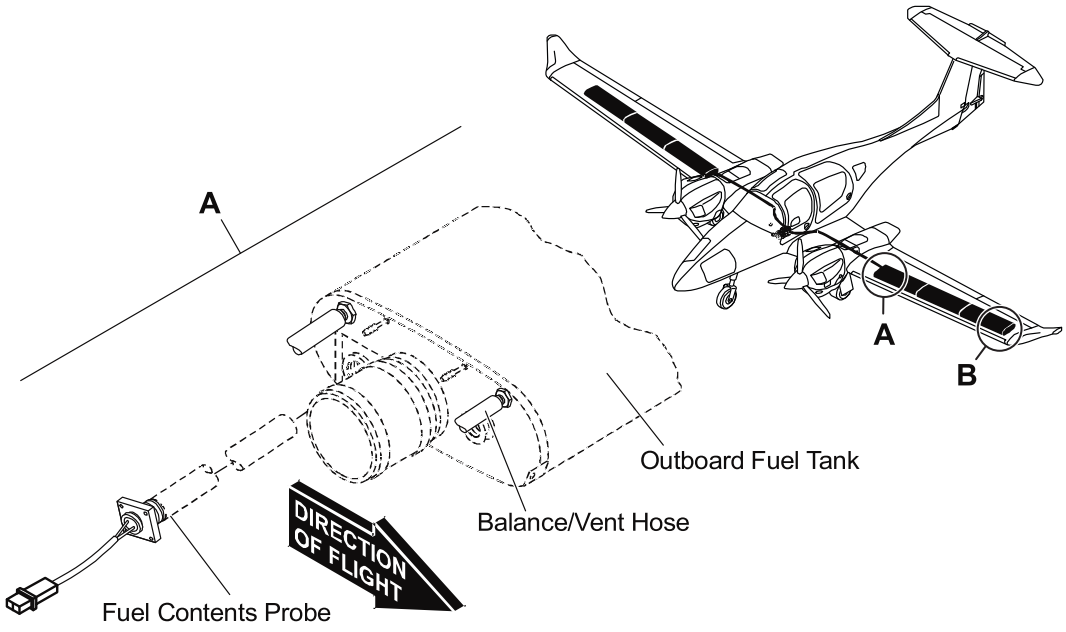
The electrical resistance of the fuel temperature probes change with temperature. This change of electrical resistance is used to set the fuel temperature indications shown on the ICS. Electrical cables connect the fuel temperature probes to the ICS.

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.

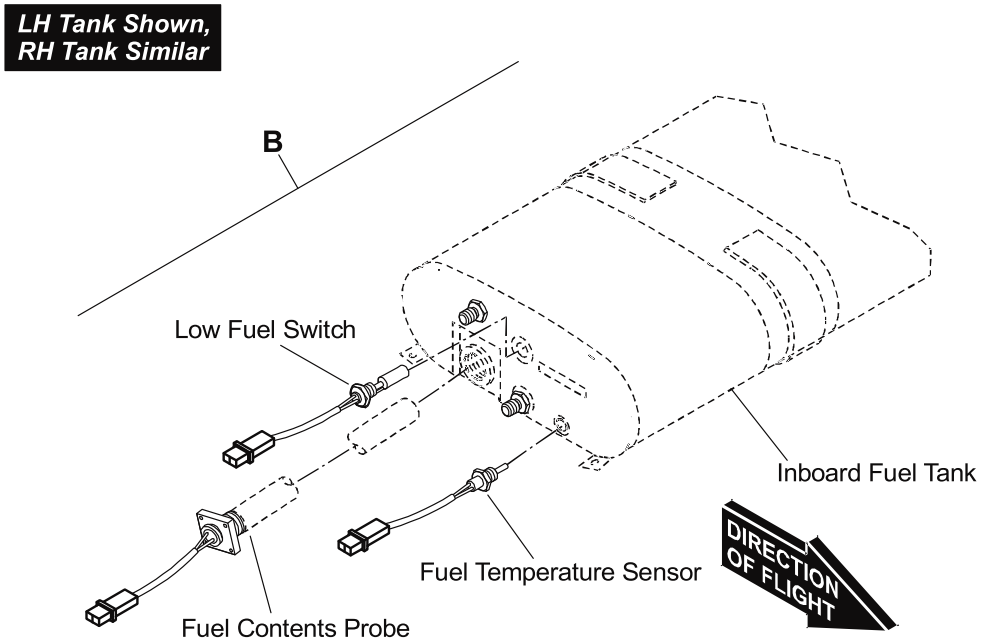
C. Fuel Low-Level

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 defects that you could have with the fuel indicating systems of the DA 62

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. If the indication is still incorrect then 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.
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.

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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 BREATH FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. **Remove/Install a Fuel Quantity Probe - Main Tanks**

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 - Main Tanks.

Refer to Figure 1 (28-40-00 Page 3).

	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's mounting: - Remove the lockwire from the probe. - Unscrew the probe from the fuel tank.	

B. Install a Fuel Quantity Probe - Main Tanks.

Refer to Figure 1 (28-40-00 Page 3).

	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 “seal-lube” or “fuel-lube” 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 Quantity Probe - Auxiliary Tanks (if installed)**

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Quantity Probe - Auxiliary Tank.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the auxiliary fuel tank access cone at the rear of the nacelle.	Refer to Section 28-10.
(2)	Disconnect the electrical connector for the level switch and the fuel pump at the rearward end of the fuel tank as well as the fuel quantity probe connector at the front of the fuel tank.	
(3)	Disconnect the fuel line from the Y - connector.	Refer to Section 28-10.
(4)	Remove the fuel filler assembly.	
(5)	Remove the bolts and washers at the auxiliary fuel tank mounting bridge.	
(6)	Disconnect the front bonding cable at the connection point, in the chamber below the tank compartment.	
(7)	Disconnect the auxiliary fuel tank vent hose at the rear lower part of the nacelle.	Refer to Section 28-10.
(8)	Remove the fuel tank assembly.	Refer to Section 28-10.
(9)	Remove the fuel quantity probe: - Remove the lock wire from the probe. - Unscrew the probe from the fuel tank.	

B. Install a Fuel Quantity Probe - Auxiliary Tank.

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel quantity probe into the auxiliary fuel tank: - Apply sealant to the thread and O-ring of the fuel quantity probe. - Install a new O-ring seal. - Carefully move the probe into position into the guide tube in the auxiliary fuel tank 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.	 Use Fuel Lube. Make sure that the fuel quantity probe is correctly positioned. Torque 15 ± 2 Nm (11.1 ± 1.5 lbf.ft).
(2)	Install the auxiliary fuel tank assembly.	Refer to Section 28-10.
(3)	Feed the fuel line into the fuel pump compartment as the aux tank is moved fully forward.	
(4)	Connect the auxiliary tank vent hose at the bottom of the nacelle.	
(5)	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.
(6)	Install the fuel filler assembly: - Install the cover plate with the connection pipe. - Install the three screws that attach the cover plate to the drip tray. - Install the fuel filler cap. - Close the access door to the fuel filler cap	
(7)	Connect the bonding strip to the cooler bracket.	
(8)	Install the auxiliary fuel tank mounting bracket with bolts and washers to the nacelle floor.	Accessible through the inspection cover below the nacelle.
(9)	Install the auxiliary fuel tank fuel line to the fuel return line (Y-connector).	Accessible through the inspection cover of the fuel pump compartment

	Detail Steps/Work Items	Key Items/References
(10)	Connect the electrical connector for the fuel level switch and the fuel pump at the rearward end of the fuel tank as well as the fuel quantity probe connector at the front of the fuel tank.	
(11)	Install the auxiliary fuel tank access cone to the engine nacelle: - Move the access cone in place on the nacelle. - Install the screws that attach the access panel to the nacelle.	
(12)	Refuel the auxiliary fuel tank.	
(13)	Check the auxiliary fuel tank assembly for leakage.	

4. **Remove/Install a Fuel Temperature Sensor**

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Temperature Sensor.

Refer to Figure 1 (28-40-00 Page 3).

	Detail Steps/Work Items	Key Items/References
(1)	Remove the outer wing section that has the fuel temperature sensor that you will remove. Support the wings 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.

Refer to Figure 1 (28-40-00 Page 3).

	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 outer wing section onto the airplane. Remove the trestles from the wings.	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.

5. **Remove/Install a Fuel Low-Level Sensor/Switch**

Obey the safety precautions for fuel at all times.

A. Remove a Fuel Low-Level Sensor/Switch.

Refer to Figure 1 (28-40-00 Page 3).

	Detail Steps/Work Items	Key Items/References
(1)	Remove the outer wing section that has the fuel low-level switch that you will remove. Support the wings 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)	Remove the lock-wire from the fuel low-level switch.	
(4)	Unscrew the fuel low-level sensor from the mounting boss.	
(5)	Move the low-level sensor out from the fuel tank and clear of the fuel tank.	
(6)	Discard the seal from the fuel low-level sensor.	

B. Install a Fuel Low-Level Sensor/Switch.

Refer to Figure 1 (28-40-00 Page 3).

	Detail Steps/Work Items	Key Items/References
(1)	Install a new seal onto the fuel low-level sensor.	
(2)	Screw the low-level 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 low-level sensor is pointing DOWN.
(3)	Secure the low-level sensor with lock-wire.	
(4)	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.	
(5)	Install the outer wing section onto the airplane. Remove the trestles from the wings.	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. - 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.
(8)	Do a test for fuel leaks. Specially around the fuel low-level sensor that you replaced.	

6. **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)	Remove the outer wing section that has the fuel high-level shut-off switch that you will remove. Support the wings 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)	Remove the lock-wire from the fuel high-level shut-off switch.	
(4)	Remove the outer wing section from the airplane.	Refer to Section 57-10.
(5)	Unscrew the fuel high-level shut-off sensor from the mounting boss.	
(6)	Move the high-level shut-off sensor clear off the fuel tank.	
(7)	Discard the seal from the fuel high-level shut-off sensor.	

B. Install a Fuel High-Level Shut-Off 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 outer wing section 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. - 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.
(8)	Do a test for fuel leaks. Specially around the fuel high-level shut-off sensor that you replaced.	

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CHAPTER 29

HYDRAULIC POWER

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CHAPTER 29

HYDRAULIC POWER

1. General

This Chapter tells you about the hydraulic system of the DA 62. 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 for the maintenance of the hydraulic system of the DA 62. 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 62. 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.

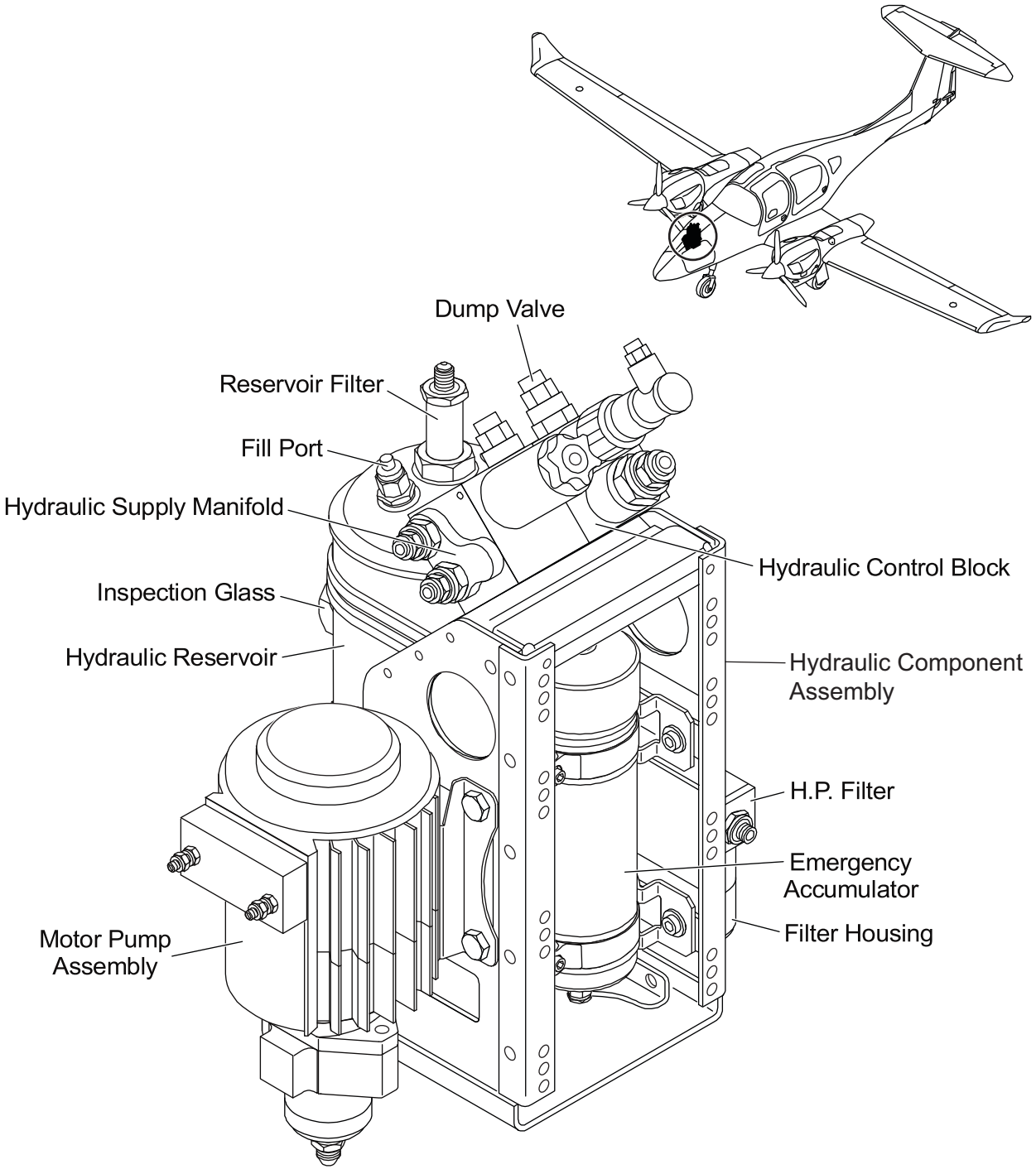

Figure 1 : Hydraulic Supply and Control Assembly

Trouble-Shooting

1. **General**

The table below lists the possible problems you could have related to hydraulic power.

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
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 (29-10-00 Page 2).
CAUTION: DO NOT OPERATE THE HYDRAULIC MAIN PUMP WITH A LOW FLUID LEVEL IN THE HYDRAULIC RESERVOIR. OPERATION WITH A LOW FLUID LEVEL WILL DAMAGE THE PUMP.		
Landing gear is not retracting.	Fill quantity of hydraulic reservoir is too low. Pump draws air and runs with high speed.	Check the fill quantity of the hydraulic reservoir. Fill the hydraulic reservoir with approved fluid. Refer to Section 29-10, Maintenance Practices (MP). (check reason for 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, MP.
	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, MP.

Trouble	Possible Cause	Repair
Landing gear is not retracting.	Hydraulic pump is not working (landing gear is moving until the accumulator is empty).	
	- Relay is damaged. Check if relay switches 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.
	- Emergency extension bowden cable pulled.	Release cable.
	- Emergency extension microswitch defect.	Replace microswitch.
Landing gear retracts too slow.	Dump valve is not fully closed (high re-pump cycles).	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 (29-10-00 Page 2).
	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, MP.
	Solenoid valves are not fully closed.	High rate of re-pump cycles or permanent operation of the pump. Replace solenoid valve. Refer to Section 29-10, MP.

Trouble	Possible Cause	Repair
Landing gear is not fully retracted.	Dump valve is not fully closed (long re-pump cycles).	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 (29-10-00 Page 2).
	Pressure relieve valve does not work correctly. Wrong system pressure.	Check the pressure relieve valve. Refer to Section 29-10, MP. Replace the pressure relieve valve. Refer to Section 29-10, MP.
	Level of hydraulic fluid in the hydraulic reservoir is too low. Pump draws air and runs with high speed. Check differential pressure mode for retracting of landing gear.	Check the level of the hydraulic reservoir. Refill the hydraulic reservoir, if necessary. Refer to Section 29-10. (check the reason for fluid leakage).
Landing gear is not extended.	Bottom solenoid valve is not switching. - Landing Gear switch defect. - Mechanical fault.	 Check power supply and cables. Replace defective solenoid valves. Refer to Section 29-10, MP.
Landing gear extends slow and irregular	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 (29-10-00 Page 2).
	Motor/Pump does not pump enough hydraulic fluid. - Power supply low.	 Check the power supply. Repair as necessary.

Trouble	Possible Cause	Repair
Hydraulic pump does not switch off after the landing gear is fully extended/retracted.	Dump valve is not fully closed (high re-pump cycles).	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 (29-10-00 Page 2).
	Solenoid valves are not fully closed. 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 defective solenoid valves. Refer to Section 29-10, MP.
	Pump pressure switch is damaged.	Check switching points (refer to the pump pressure switch operation test in Maintenance Practices). Replace the pump pressure switch. Refer to Section 29-10, MP.
	Pressure limitation valve does not work correctly. Wrong system pressure.	Check the pressure relieve valve. Refer to Section 29-10, MP. Replace the pressure relieve valve. Refer to Section 29-10, MP.
Charging time of the fully empty accumulator is too long (more than 25 sec).	Dump valve is not fully closed (high re-pump cycles).	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 (29-10-00 Page 2).
	Pre-fill pressure in hydraulic accumulator too low.	Check accumulator pressure. Refer to Section 29-10, MP. Charge accumulator to applicable pressure.

Trouble	Possible Cause	Repair
Charging time of the fully empty accumulator is too long (more than 25 sec).	Pressure limitation valve does not work correctly. Wrong system pressure.	Check the pressure limitation valve. Refer to Section 29-10, MP. Replace the pressure limitation valve.
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, MP. Charge accumulator to applicable 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, MP.
Re-pump cycles are too high (more than 1 cycle per 1 hour).	Dump valve is not fully closed (high re-pump cycles).	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 (29-10-00 Page 2).
	Pre-fill pressure in hydraulic accumulator is too low.	Check accumulator pressure. Refer to Section 29-10, MP. Charge accumulator to applicable pressure.
	Solenoid valves are not fully closed. 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 defective solenoid valves. Refer to Section 29-10, MP.

Trouble	Possible Cause	Repair
Emergency extension is slow or not completed.	High stream resistance in the hydraulic system.	Check hydraulic hoses for damage. Replace damaged hoses.
NOTE: If the emergency extension does not fully extend on the ground because of missing aerodynamic forces. Pull the gear backwards to extend it fully!		
Emergency extension is slow or not completed.	Pressure in the hydraulic reservoir.	Open FILL plug on the hydraulic reservoir to check if pressurized. Send reservoir to the vendor.
	High friction on landing gear legs and/or actuators.	Remove the hydraulic actuators and move the landing gear manually. Send the hydraulic actuators to vendor. Refer to Section 32-20.

Maintenance Practices

1. General

This Maintenance Practices Pageblock gives information on the items that follow:

- Hydraulic Safety Precautions.
- Check the Hydraulic Fluid Level of the Hydraulic System.
- Fluid Change of the Hydraulic System.
- De-pressurize the Hydraulic System.
- Bleed the Hydraulic System.
- Drain Fluid from the Hydraulic System.
- Remove/Install the Relay.
- Remove/Install the Hydraulic Reservoir.
- Remove/Install the Hydraulic Pump.
- First Fill/Replenishment of the Hydraulic System.
- Tests of the Hydraulic System.
- Hydraulic System Filters.
- Hydraulic System Valves.
- Remove/Install/Disassemble/Assemble Hydraulic Control Block.
- Bleed/Remove/Install the Accumulator.
- Check the Accumulator.
- Charge the Hydraulic Accumulator with Nitrogen.

2. **Hydraulic Safety Precautions**

A. The maintenance practices that follow are hydraulic safety precautions. Obey them when you work with hydraulic fluids or when you work on any hydraulic system or component.

(1) Make sure that only operators familiar with the necessary safety precautions are permitted to do work on any hydraulic system component.

WARNING: IF HYDRAULIC FLUID GETS INTO YOUR EYES, FLUSH THE EYES WITH COOL, CLEAN WATER. CONTINUE TO FLUSH THE EYES FOR 15 MINUTES. GET MEDICAL AID.

(2) Wear approved protective clothing. Wear cotton glove inner liners and fire and hydraulic fluid resistant industrial gloves.

(a) If hydraulic fluid gets on your skin, wash immediately.

(b) If hydraulic fluid gets on your clothing, replace your clothes immediately.

(c) Remove all protective clothing immediately after you complete the hydraulic maintenance.

WARNING: USE PERSONAL PROTECTIVE EQUIPMENT (PPE) WHEN HANDLING HYDRAULIC FLUIDS. HYDRAULIC FLUIDS CAN CAUSE INJURY TO PERSONNEL.

(3) Wear approved eye protection (goggles) when you are pressure testing components or systems or any time there is a possibility of hydraulic fluid splashing into the eyes.

- If hydraulic fluid gets into your eyes, flush the eyes with cool, clean water. Continue to flush the eyes for 15 minutes. Get medical aid.

WARNING: USE PERSONAL PROTECTIVE EQUIPMENT (PPE) WHEN HANDLING HYDRAULIC FLUIDS. HYDRAULIC FLUIDS CAN CAUSE INJURY TO PERSONNEL.

(4) Wear an approved respirator. Avoid breathing hydraulic fluid mist or vapor. Make sure that the work area is open to air flow.

- If hydraulic fumes get into your lungs, leave the contaminated area and breathe clean air. Get medical aid if necessary.

(5) If hydraulic fluid is accidentally swallowed, do not induce vomiting. Get medical help immediately.

(6) Do not apply hydraulic pressure to any system until all hydraulically operated components and circuits are inspected and cleared for operation.

(7) Make sure that all hydraulically actuated components and are clear of persons and equipment when hydraulic power is on.

(8) Make sure that all equipment and materials used in a test or function are resistant to hydraulic fluid.

(9) Clean all hydraulic fluid leakage from the work area. Use approved cleaning materials.

(10) Use approved plugs or caps on all open hydraulic lines and components to prevent fluid leakage and contamination.

(11) Make sure that all the electrical connectors that are removed during maintenance have approved caps to prevent contamination or damage.

(12) Make sure that there is no contamination in the hydraulic lines or components before installation.

(13) Use only clean hydraulic fluid during the flushing, servicing, and testing of hydraulic components.

(14) Do not permit the aircraft hydraulic fluid to be mixed with other fluids.

(15) Make sure that all the quick disconnects and hoses from the ground support equipment are cleaned before use.

(16) Use fingerprint neutralizer when you do work on close tolerance valves or other components. Skin oils and/or dirt can cause contamination.

(17) Make sure that the containers used for hydraulic fluid storage are clearly identified with the contents.

(18) Discard used or dirty hydraulic fluids in approved metal containers only.

3. **Check the Hydraulic Fluid Level of the Hydraulic System**

WARNING: **OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.**

	Detail Steps/Work Items	Key Items/References
(1)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(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. - 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 stay on a flat ground and the fluid level should be in the middle of the inspection glass.	

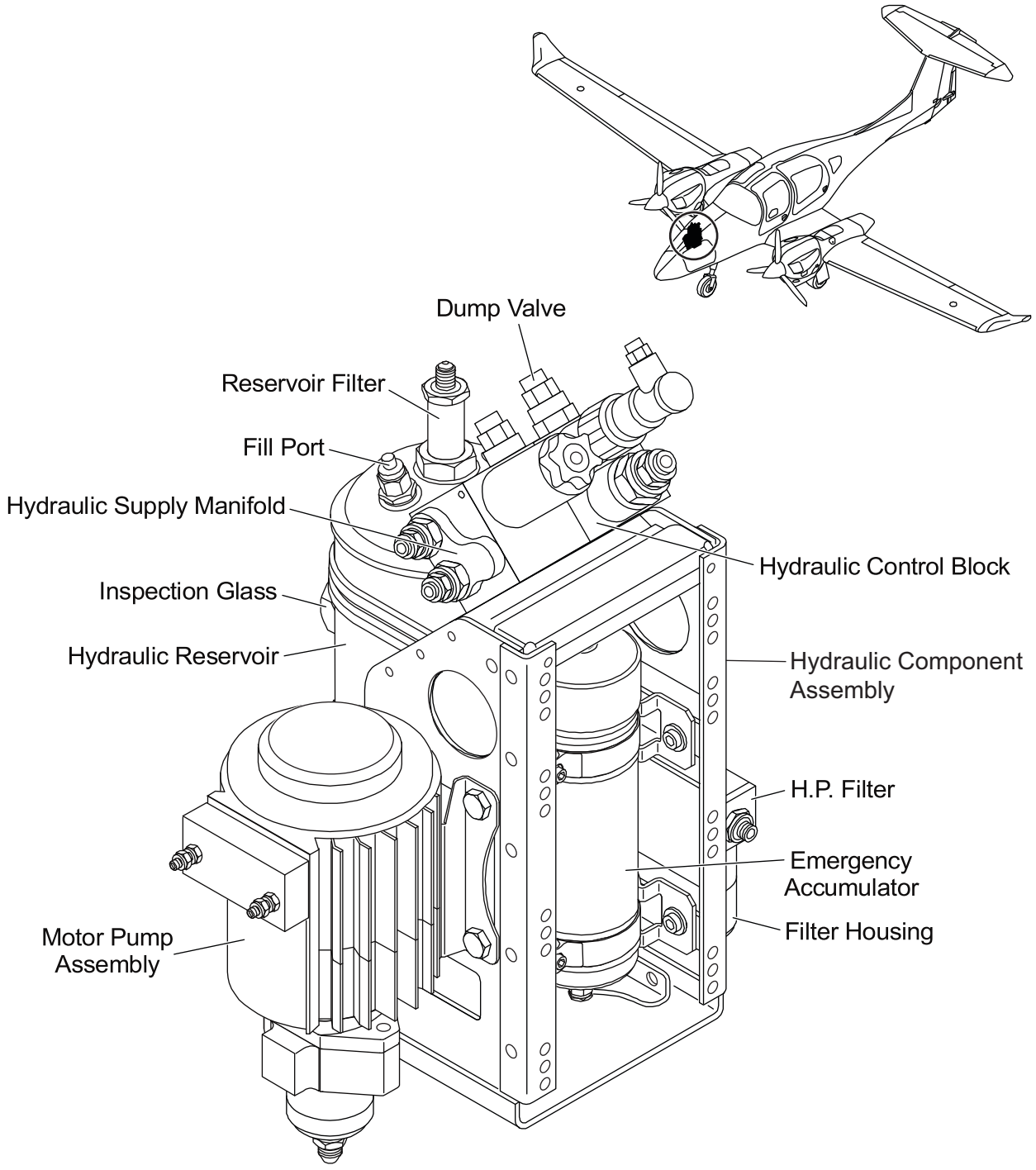

Figure 201 : Hydraulic Supply and Control Assembly

4. **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 WILL GET DAMAGED.

	Detail Steps/Work Items	Key Items/References
(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)	Retract the landing gear.	Refer to Section 32-30.
(4)	Pull the GEAR circuit breaker.	Right side of the instrument panel.
(5)	Extend the landing gear with the emergency extension switch.	

	Detail Steps/Work Items	Key Items/References
(6)	Set the landing gear handle down.	
(7)	Set the emergency gear lever up.	
(8)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(9)	Remove the fluid from the hydraulic reservoir using a pump to suck it out.	
(10)	Replace the high pressure filter.	Refer to this Maintenance Practices Section.
(11)	Do the maintenance of the hydraulic reservoir filter.	Refer to this Maintenance Practices Section.
(12)	First fill / refill the hydraulic system.	Refer to this Maintenance Practices Section.
(13)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(14)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(15)	Reset the GEAR circuit breaker.	Right side of the instrument panel.
(16)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(17)	Refill the hydraulic system, if necessary.	Refer to this Maintenance Practices Section.
(18)	Check level of the hydraulic reservoir.	Refer to this Maintenance Practices Section.
(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 three times.	Refer to Paragraph 4.B.
(2)	Apply the hydraulic fluid placard and mark the used fluid.	Refer to Figure 202. Mark hydraulic fluid type by punching.

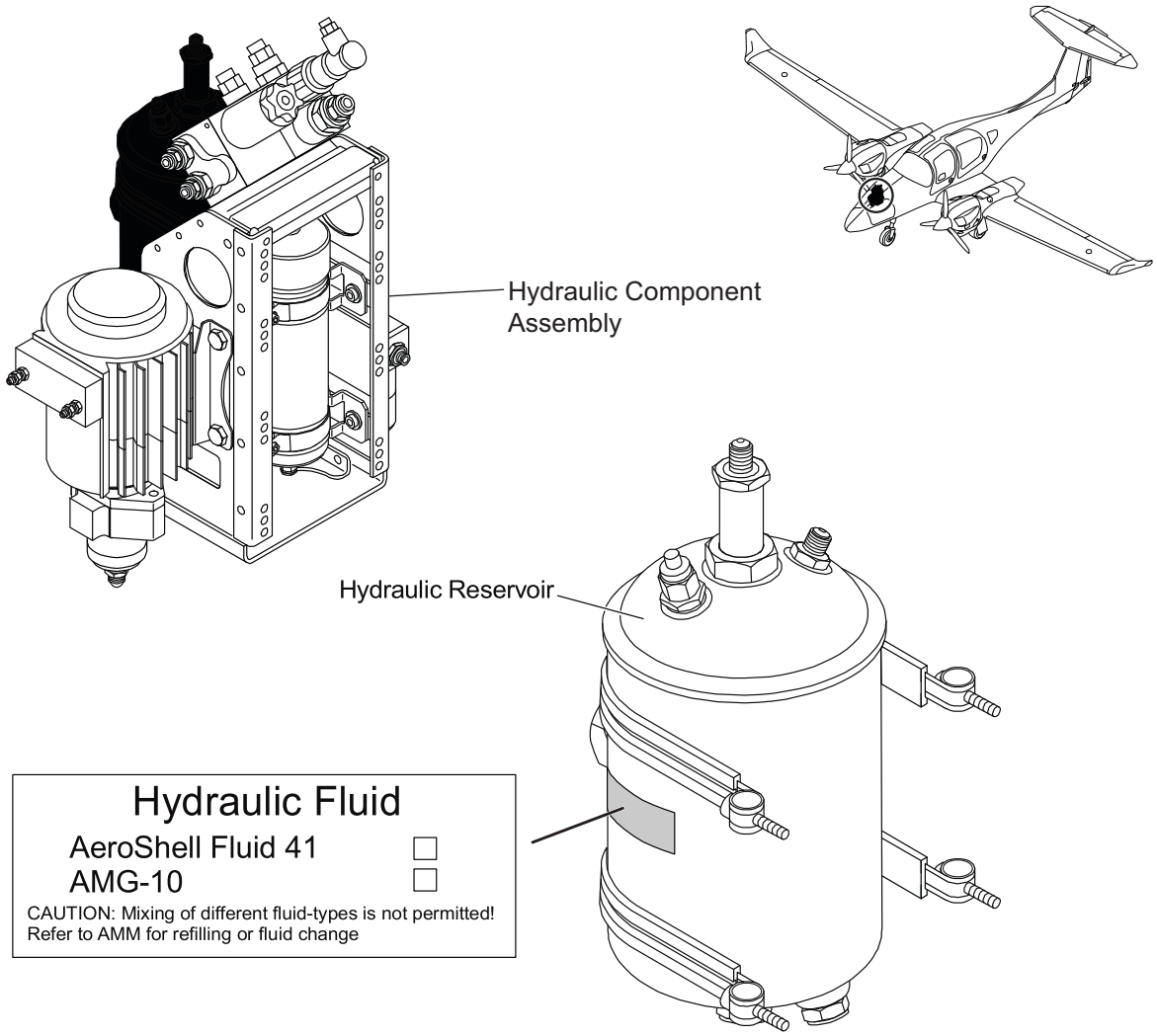

Figure 202 : Position of the Hydraulic Fluid Placard

5. **De-pressurize the Hydraulic System**

	Detail Steps/Work Items	Key Items/References
(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.	
(3)	Pull the GEAR circuit-breaker.	Located on the right side of the instrument panel.
(4)	Remove the protection cap from the MiniMess 1215 plug.	
(5)	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 204.
(6)	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.
(7)	Operate the pressure button on the upper solenoid valve, located on the top of the hydraulic control block.	See Figure 204. Use a little metal pin or ball pen to operate the button.
(8)	Check if pressure decreased on the manometer.	There should be no remaining pressure.
(9)	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.

	Detail Steps/Work Items	Key Items/References
(10)	Disconnect the test manometer from the MiniMess 1215 plug.	
(11)	Install the protection cap onto the MiniMess 1215 plug.	

6. **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.

WARNING: OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.

	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.	Located on the right side of the instrument panel
(2)	Lift 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/References
(4)	Extend and retract the landing gear to bleed the system: - Retract and extend the landing gear two to four times with short breaks in between. - Between the extension/retraction the dump valve should be operated three to four times to release possible air pockets. - Refill hydraulic fluid if necessary.	Refer to Paragraph 7 in Chapter 32-30. (Landing Gear Extension and Retraction Test). Check the times of extending and retracting the landing gear. Refer to this Maintenance Practices Section.
(5)	Operate the emergency extension of the landing gear (repeat this step two times).	Refer to this Maintenance Practices Section.
(6)	Move the wing and rear fuselage trestles clear of the airplane.	
(7)	Lower the airplane with the jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear.

7. **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 CAN BE DAMAGED.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit-breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door.	
(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 203.
(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 installed on the hydraulic control block. Refer to Figure 203.
(5)	Reset the GEAR circuit breaker.	Located on the right side of instrument panel.
(6)	Drain hydraulic fluid from the hydraulic system: - Turn the ELECT. MASTER switch to ON. - The hydraulic pump starts to pump and drains hydraulic fluid into the container. - Turn the ELECT. MASTER switch to OFF.	For most Maintenance Practices it is 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.	

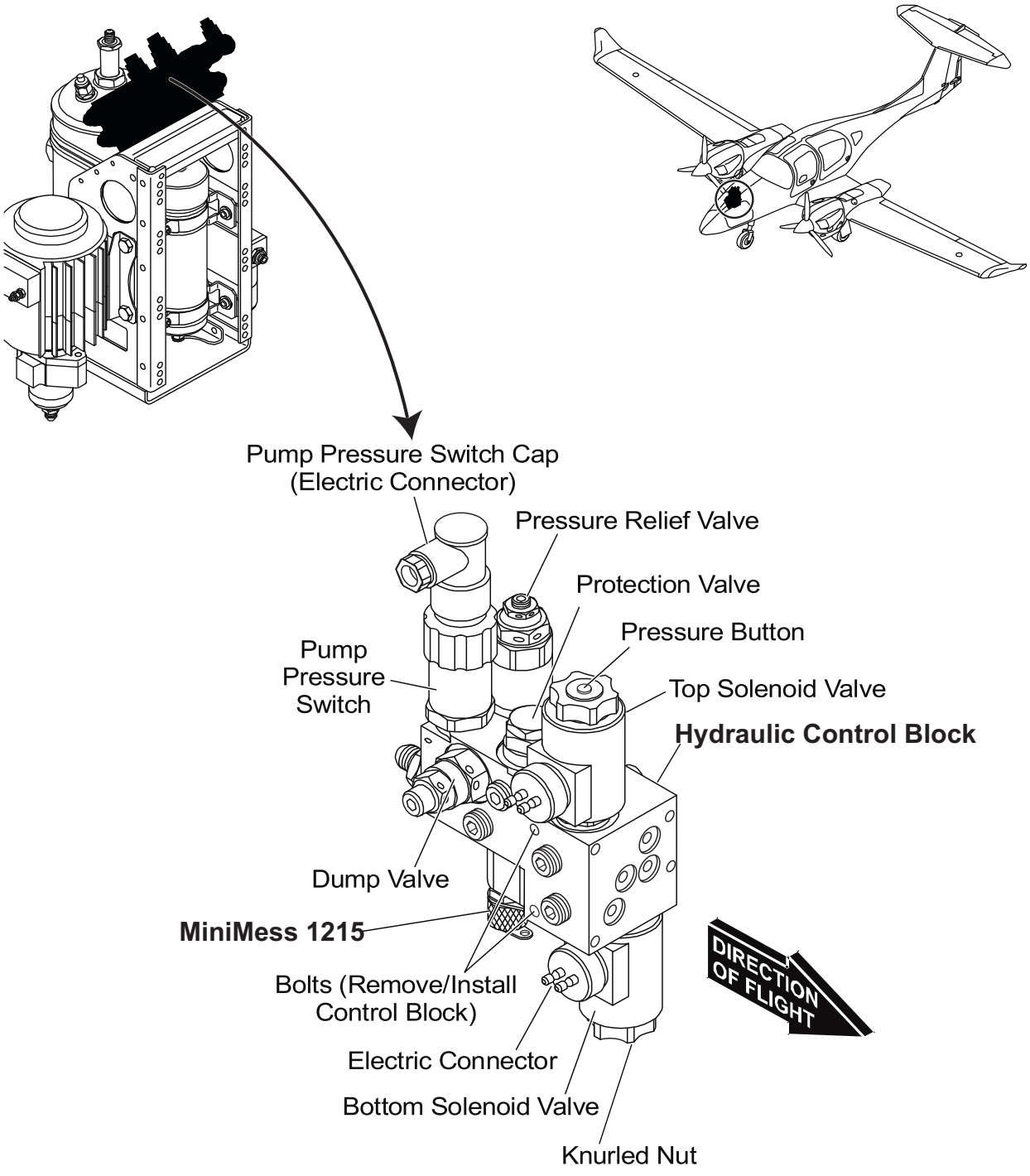

Figure 203 : MiniMess 1215 - Location on the Hydraulic Control Block

8. **Replace a Relay of the Hydraulic System**

NOTE: To replace 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.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Disconnect all electric connectors from the relay.	Note how the cables where connected to the relay for the new relay installation.
(4)	Remove the two bolts which hold the relay onto the mounting plate.	Discard the relay.
(5)	Install the new relay, with the two bolts, onto the mounting plate of the hydraulic panel.	
(6)	Reconnect all electric connectors to the relay.	
(7)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(8)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

9. **Remove/Install the Hydraulic Reservoir**

WARNING: OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS..

A. Remove the Hydraulic Reservoir.

Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(1)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(2)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section
(3)	Remove the hydraulic supply and control assembly.	Refer to this Maintenance Practices Section
(4)	Drain the hydraulic tank: - Remove the drain port from the hydraulic tank. - Remove the fluid from the hydraulic reservoir until the tank is fully empty.	
(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 four bolts from the clamp which secure the hydraulic tank. - Then move the tank clear from the hydraulic system.	

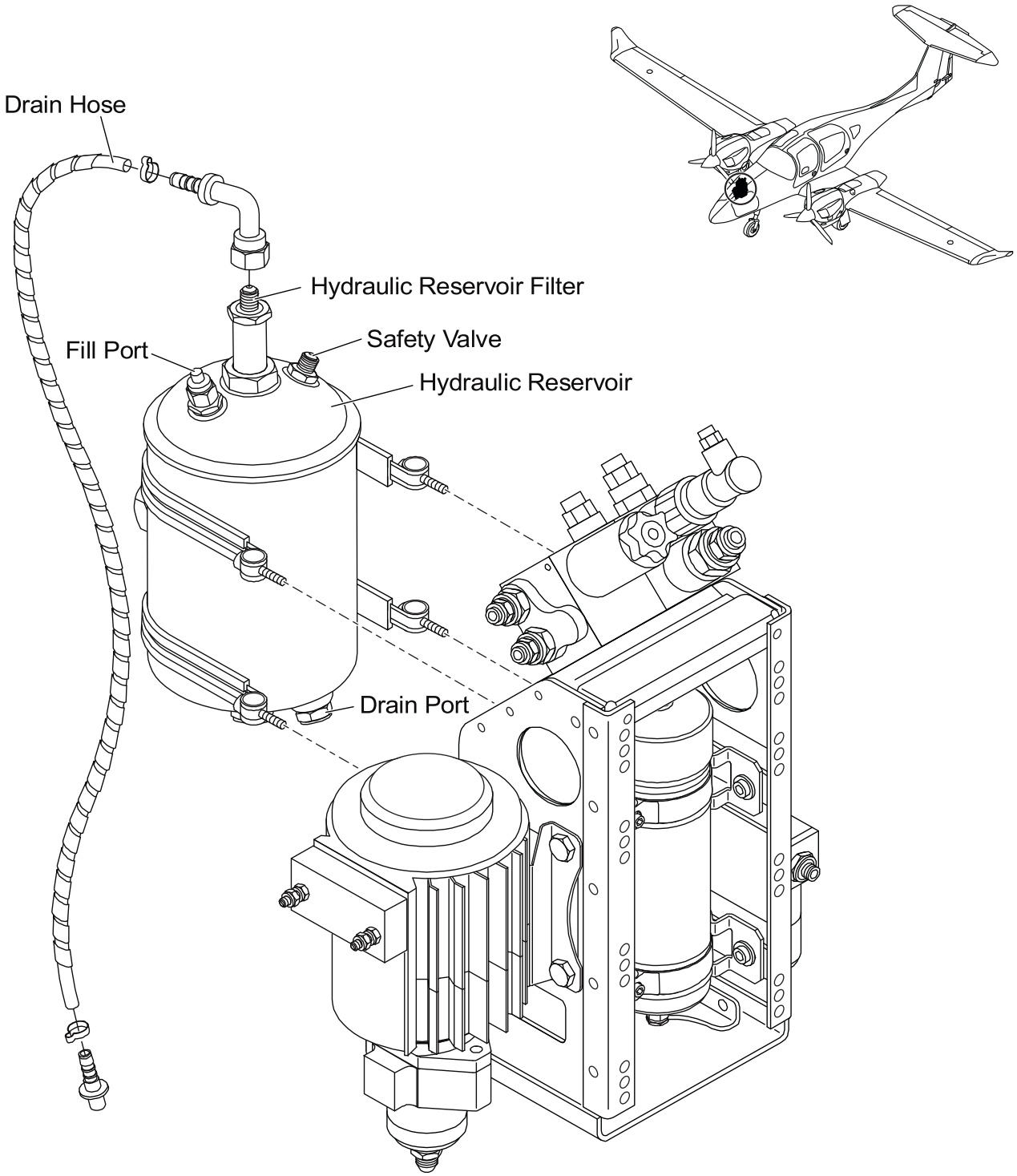

Figure 204 : DA 62 Hydraulic Reservoir Assembly

B. Install the Hydraulic Reservoir.

Refer to Figure 204.

	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)	Refill the hydraulic reservoir with hydraulic fluid	Refer to this Maintenance Practices Section.
(4)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(5)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(6)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(6)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

10. **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: OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.

WARNING: DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

B. Remove the Hydraulic Supply and Control Assembly.

Refer to Figure 201.

	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.	Located on the right side of the instrument panel.
(2)	Lift the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 7-10.

	Detail Steps/Work Items	Key Items/References
(3)	Release the hydraulic pressure from the hydraulic system: - Open the right nose baggage compartment door. - Depressurize the hydraulic system.	 Refer to Paragraph 5.
(4)	Disconnect these hydraulic hoses from the hydraulic supply manifold: - Disconnect the three return hoses from the hydraulic manifold. - Disconnect the pressure hose from the hydraulic manifold.	Use a suitable container to catch spilt fluid. Fit blanking caps to all connectors. Fit blanking caps to all connectors.
(5)	Disconnect these electrical cables from the hydraulic supply and control assembly: - Disconnect the electrical cables from the solenoid valves. - Disconnect the electrical cables from the hydraulic pump pressure switch. - Disconnect the electrical cables from the hydraulic pump motor.	 At the in-line connectors. At the in-line connectors. At the hydraulic pump electric motor.
(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 eight bolts and washers in the NLG compartment that attach the mounting tray to the surrounding structure. - Lift the complete assembly clear of the airplane. Hold the assembly level to minimize hydraulic fluid spillage.	 Note the location of the bonding strip connection and the earth wire. Use a suitable container/material to catch spilt hydraulic fluid.

C. Install the Hydraulic Supply and Control Assembly.

Refer to Figure 201.

	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 right nose baggage compartment. - Install the eight bolts and washers that attach the hydraulic supply and control assembly mounting to the nose landing gear compartment.	Attach the bonding strip and earth cable in the location noted in Paragraph 10.B. step (7).
(2)	Connect these flexible hydraulic hoses to the hydraulic supply and control assembly: - The three 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 solenoid valves. - Connect the electrical cables to the hydraulic pump pressure switch.	At the motor. At the in-line connectors. At the in-line connector.
(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 through the swivel fitting in the emergency extension valve operating lever and tighten the screw.	

	Detail Steps/Work Items	Key Items/References
(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 this Maintenance Practices Section.
(7)	If necessary, charge the hydraulic accumulator with nitrogen.	
(8)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(9)	Install the baggage compartment access panel.	
(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.
(12)	Move the wing and fuselage trestles clear of the airplane.	
(13)	Lower the airplane with the jacks.	Refer to Section 7-10. Make sure that the area around the airplane is clear.

11. **Replace the Hydraulic Pump**

Refer to Figure 201.

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WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.**

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
(4)	Drain fluid from the hydraulic system.	Refer to this Maintenance Practices Section. 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.	Remember which one is the plus and minus pole.
(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.	Shop maintenance will determine the action required for the removed pump.

	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 onto the motor. - Remove the caps from the hydraulic lines and the pump. - Connect the two hydraulic connectors onto the pump.	
(9)	If hydraulic fluid was drained, refill the hydraulic reservoir with hydraulic fluid.	Refer to this Maintenance Practices Section.
(10)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(11)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(12)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(13)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

12. **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.		
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-level on the inspection glass)
Extended landing gear (when hydraulic actuators are retracted).	All 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.	Located on the right side of the instrument panel.
(2)	Lift the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 7-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
	CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.	
(5)	ONLY FOR THE 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 204.
(6)	Reset the GEAR circuit-breaker.	Located on the right side of the instrument panel.
(7)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(8)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.

	Detail Steps/Work Items	Key Items/References
(9)	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. - Set the ELECT. MASTER switch to OFF.	Approx. 16 (+4/-3) sec with a completely empty accumulator.
(10)	Check the fluid level of the hydraulic reservoir.	Refer to this Maintenance Practices Section.
	CAUTION: DO NOT FILL THE HYDRAULIC TANK UNTIL FULL IN ONE STEP BECAUSE IT MAY OVERFLOW. FILL IT IN SMALL STEPS.	
(11)	Use the hand pump to refill the hydraulic reservoir to adjust the fluid level.	
(12)	Repeat steps (10) and (11) until the fluid level of the hydraulic reservoir is correct.	
(13)	Do the normal operational test of the hydraulic system.	Refer to this Maintenance Practices Section.
(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.

13. **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.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
(4)	Reset the GEAR circuit-breaker.	Located on the right side of the instrument panel.
(5)	Measure the charge time of the accumulator: - Set the ELECT. MASTER switch to ON. - Charge time of a fully empty accumulator until the electronic pump pressure switch turns it off. - Set the ELECT. MASTER switch to OFF.	16 (+4/-3) sec.
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) Time to Extend and Retract the Landing Gear.

These values assume that the hydraulic system is fully bled.

Cycle	Set-Point
Time to retract.	7 (+2/-1) sec.
Follow-up time of the pump.	12 (+3/-2) sec.
Time to extend.	7 (+2/-1) sec.
Follow-up time of the pump.	12 (+3/-2) sec.
NOTE: Make sure to lift 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 are equivalent to the set-points, the function of the “differential pressure mode for the retraction” is given automatically.	

(3) Differential Pressure Mode for the Retraction of the Landing Gear.

	Detail Steps/Work Items	Key Items/References
(1)	Retract the landing gear.	Refer to Section 32-30.
(2)	Get access to the hydraulic system: – Open the right nose baggage compartment door. – 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.	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 1 hour.

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 - Functional 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.	Located on the right side of the instrument panel.
(2)	Lift the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 7-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Retract the landing gear.	
(5)	Release the hydraulic pressure from the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	

	Detail Steps/Work Items	Key Items/References
(6)	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 the system is empty wait 10-15 min until the accumulator is thermally balanced.	 Wrench size 19 mm. Wrench size 1/4 in.
(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)	Reset the GEAR circuit-breaker.	Located on the right side of the instrument panel.
(9)	Emergency extension: - Set both engine power lever to 100% - Operate the emergency extension lever. (Located in the cockpit)	 This causes the solenoid valves to switch off and the landing gear extends. See Figure 205.
(10)	Check landing gear indication lights: - No red lights visible. - Three green lights visible.	Refer to Section 32-30.
(11)	Perform a normal extension and retraction.	Refer to Section 32-20.
(12)	Move the wing and rear fuselage trestles clear of the airplane.	
(13)	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: **OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.**

WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.**

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

Refer to Figure 205.

	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.	Located on the right side of the instrument panel.
(2)	Lift the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 7-10.
(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)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	

	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 205 to see the solenoid valve.
(7)	Drain fluid from the hydraulic system.	Refer to this Maintenance Practices Section. 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 205.
	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 five minutes and check for any pressure decrease. - Use checklist for leakage test.	The pressure should stay at 170 (-5) bar (2466 [-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 13.D. (Checklist for external leakage).
(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 205.

	Detail Steps/Work Items	Key Items/References
(12)	Move the wings and rear fuselage trestles clear of the airplane.	
(13)	Lower the airplane with the jacks. Make sure that the area around the airplane is clear.	
(14)	Reset the GEAR circuit-breaker.	Located on the right side of the instrument panel.

D. Checklist for External Leakage.

NOTE: Check the hydraulic hoses on the hydraulic kit which is installed in the right nose baggage compartment. 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 this Maintenance Practices Section.)

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 do not 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.	Located on the right side of the instrument panel.
(2)	Lift the airplane on jacks and move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 7-10.
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(5)	Remove the protection cap from the test plug (MiniMess 1215) located on the main control block and connect the manometer.	Refer to Figure 205.

	Detail Steps/Work Items	Key Items/References
(6)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.
(7)	Check of the pressure limitation valve: - Landing gear fully extended. - Pump is still running to charge the accumulator.	Set-point: 120 (-0 / +5) bar (1740 [-0 / +72] PSI).
	NOTE: The following two steps (8) and (9) are to test the pump pressure switch. These two steps are not required if the system is working properly.	
(8)	Check the switching point of the pump pressure switch: - Retract the landing gear fully. - 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. - The pressure on the manometer should decrease slowly. - When the pump switches on, read the manometer value.	Refer to Section 32-30, Paragraph 7. Refer to Figure 205. 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 the 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.	
	- Install the lock wire onto the dump valve.	8 Nm (5.9 lbf.ft.), wrench size 19 mm.
(10)	Install the cover and close the front baggage door.	
(11)	Move the wings 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.

14. **Filters**

A. Maintain the Hydraulic Reservoir Filter.

WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.**

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE 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.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Remove the vent hose by disconnecting the 90 degree fitting on the top of the hydraulic reservoir.	
(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.	Make sure to blow the filter in the correct direction.
(5)	If removed, install vent hose by connecting the 90 degree fitting on the top of the hydraulic reservoir.	
(6)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

B. Replace the High Pressure Filter.

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CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

CAUTION: BECAUSE OF ITS DESIGN THIS HIGH PRESSURE FILTER ELEMENT CAN NOT BE CLEANED. IT HAS TO BE REPLACED IF IT IS 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.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Remove the hydraulic unit.	
(4)	Replace the high pressure filter: - Remove the filter housing. - Pull the old filter element clear of the filter body. - Push and slightly turn the new filter element into the filter body until it's secure. - Install the filter housing.	Refer to Figures 201 and 202. Put paper towel underneath to avoid spilling of hydraulic fluid. Discard the old filter. New metal/paper filter element. Tighten the filter housing with your hand (approx. 5 Nm, 3.7 lbf.ft.)
(5)	Install the hydraulic unit.	
(6)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

15. **Valves**

A. Replace the Dump Valve.

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CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
(4)	Drain fluid from the hydraulic system.	Refer to this Maintenance Practices Section. 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.	Refer to Figure 203. Use wrench size 22. Put Rivolta F.L.A onto the thread and tighten the valve with 25 Nm (18.4 lbf.ft.).
(6)	If hydraulic fluid was drained in step (3), replenish the hydraulic reservoir with hydraulic fluid.	Refer to this Maintenance Practices Section.
(7)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(8)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(9)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(10)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

B. Replace the Pressure Relief Valve / Pump Pressure Switch.

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CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
(4)	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. If the pump pressure switch is to be replaced, discard the one removed.
NOTE: The following two steps (5) and (6) are not required if only the pump pressure switch should be replaced.		
(5)	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.
(6)	Replace the pressure relief valve: - Remove the valve carefully. - Install the new pressure relief valve.	Refer to Figure 203. 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.).
(7)	Install the pump pressure switch: - Install the pump pressure switch. - Install the electric connector back onto the switch.	 This could be a new pump pressure switch. Apply Rivolta F.L.A. onto the thread and tighten with 18 Nm (13.3 lbf.ft.).

	Detail Steps/Work Items	Key Items/References
(8)	If hydraulic fluid was drained in step (3), replenish the hydraulic reservoir with hydraulic fluid.	Refer to this Maintenance Practices Section.
(9)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(10)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(11)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(12)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

C. Replace/Check a Solenoid Valve.

(1) Replace a Solenoid Valve.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the 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 from the shaft.	Make sure all the O-rings are removed from the shaft.
(5)	Remove the solenoid valve from the control block.	Refer to Figure 203.
(6)	Install the new solenoid valve onto the control block.	Apply Rivolta F.L.A. onto the thread and O-ring and tighten with 25 Nm.
(7)	Install the new solenoid 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. Make sure the solenoid is installed in the correct direction
(8)	Plug the electric connector back onto the solenoid valve.	
(9)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(10)	Reset the GEAR circuit breaker.	Located on the right side of the 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.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
	NOTE: Make sure when loosening the counter nut that you don't accidentally loosen the whole accumulator charging valve.	
(3)	Release 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. Refer to Figure 206. Use wrench size 3/4 in.
(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.	Refer to Figure 206. MS-28889-2 standard valve is used. Use wrench size 3/4 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 this Maintenance Practices Section.
(6)	Test the accumulator charging valve for leak-tightness.	Apply some leak-finder spray onto the valve and look for air bubbles.
(7)	Install yellow protection cap.	
(8)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

E. Replace the Flow/Current Regulation Valves.

WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.**

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

NOTE: There are three Flow/Current Regulation Valves installed in the hydraulic supply block.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
(4)	Drain fluid from the hydraulic system.	Refer to this Maintenance Practices Section. The fluid level should be lower than the hydraulic control manifold.
(5)	Remove the flow/current regulation valves. - Remove the valves and the two O-rings on each valve. - Discard the O-rings. - Make sure to catch spilt hydraulic fluid.	Refer to Figure 205. The wrench size is 22 mm.
(6)	Install the flow/current regulation valves: - Install the M1.7 valve in the middle hole of the hydraulic supply manifold and tighten it with 15 Nm (11.1 lbf.ft.). - Install the two M1.5 valves in the top and bottom hole of the hydraulic supply manifold and tighten them with 15 Nm (11.1 lbf.ft.).	Refer to Figure 205. Put Rivolta F.L.A on both, the thread and the new O-rings. Put Rivolta F.L.A on both, the thread and the new O-rings.
(7)	Replenish the hydraulic reservoir with hydraulic fluid.	Refer to this Maintenance Practices Section.

	Detail Steps/Work Items	Key Items/References
(8)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(9)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(10)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(11)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

16. **Remove/Install Disassemble/Assemble the Hydraulic Control Block**

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A. Remove the Hydraulic Control Block.

NOTE: The Hydraulic Control Block includes the Control Block, the Emergency Extension Block and the Hydraulic Supply Block.

Refer to Figures 201 and 205.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
(4)	Remove all hydraulic hoses from the hydraulic control block.	Use a suitable container to catch spilt hydraulic fluid. Fit caps on all open connections.
(5)	Remove all electrical connections from the hydraulic control block.	(Pump pressure switch connector, solenoid valve connections)
(6)	Remove the emergency extension micro switch.	
(7)	Disconnect the Bowden cable from the emergency extension block.	
(8)	Remove the hydraulic control block: - Remove the three bolts which secure the hydraulic control block. - Move the control block clear from the rest of the hydraulic system.	

B. Install the Hydraulic Control Block.

NOTE: The Hydraulic Control Block includes the Control Block, the Emergency Extension Block and the Hydraulic Supply Block.

Refer to Figures 201 and 205.

	Detail Steps/Work Items	Key Items/References
(1)	Install the hydraulic 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 at this time.	Use hexagon socket size 4.
(2)	Connect the Bowden cable onto the emergency extension module.	
(3)	Install the emergency extension micro switch.	
(4)	Install all electrical connections onto the hydraulic control block (Pump pressure switch connector, solenoid valve connections).	Check polarity of the solenoid valve connections.
(5)	Install all 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 this Maintenance Practices Section.
(8)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(9)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(10)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.
(11)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.

C. Disassemble the Hydraulic Control Block.

NOTE: The Hydraulic Control Block includes the Control Block, the Emergency Extension Block and the Hydraulic Supply Block.

Refer to Figure 205.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the hydraulic control block.	Refer to this Maintenance Practices Section.
(2)	Remove the four bolts from the hydraulic supply block .	Size 4 hexagon socket head.
(3)	Separate the three main blocks.	The Control Block, the Emergency Extension Block and the Hydraulic Supply Block.
(4)	Clean the holes and bolts from residues of the adhesive on the three blocks. Remove the O-rings from the contact surfaces of the blocks.	 Discard the O-rings.

D. Assemble the Hydraulic Control Block.

NOTE: The Hydraulic Control Block includes the Control Block, the Emergency Extension Block and the Hydraulic Supply Block.

Refer to Figure 205.

	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 new O-rings onto the blocks.	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. Standard MS28778-4 O-rings are used.
(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 this Maintenance Practices Section.

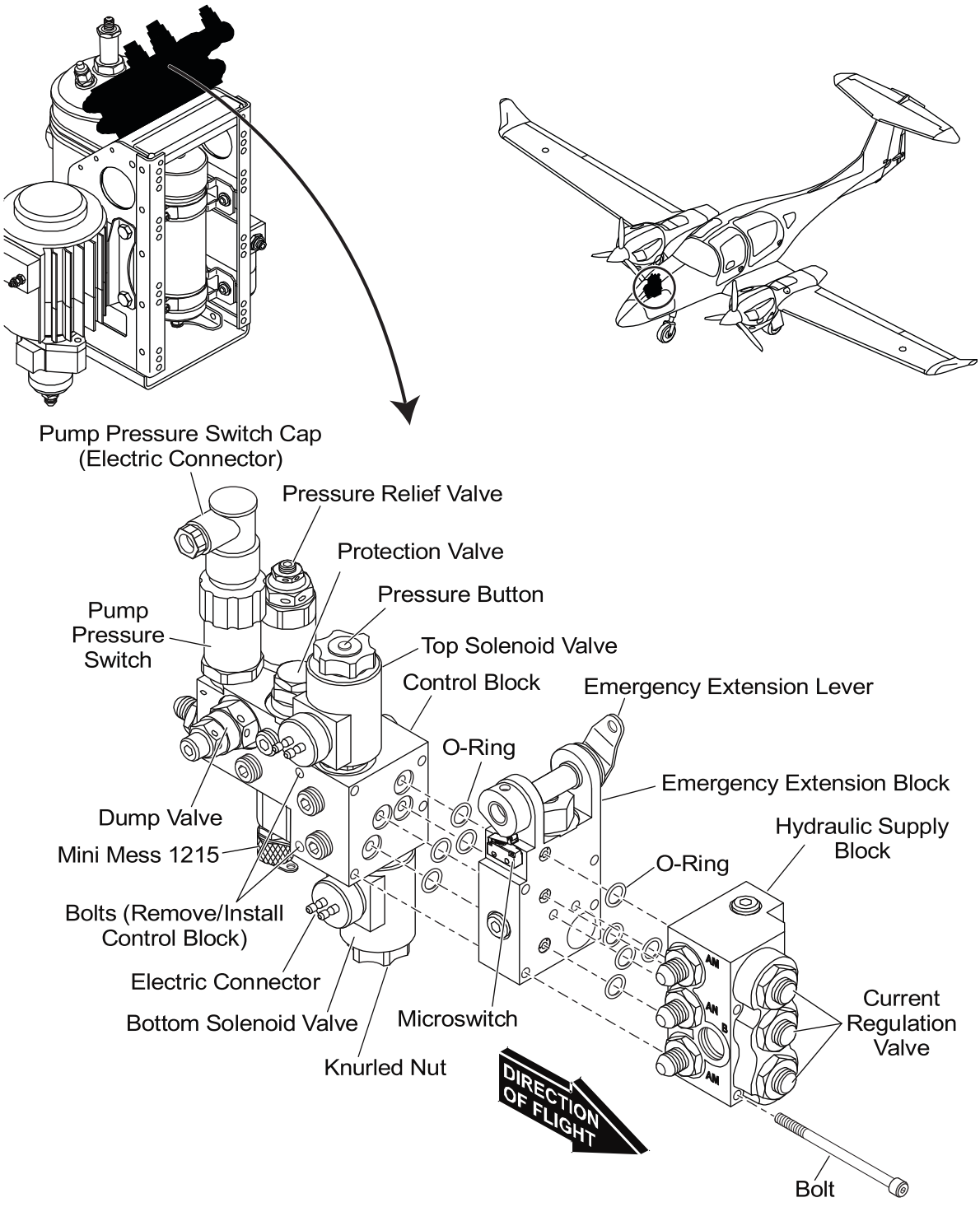

Figure 205 : Hydraulic Control Block
(Includes Control Block, Emergency Extension Block and Hydraulic Supply Block)

17. **Bleed/Remove/Install the Accumulator**

A. Bleed the Accumulator.

	Detail Steps/Work Items	Key Items/References
(1)	Check the level of the hydraulic reservoir.	Refer to this Maintenance Practices Section.
(2)	Replenish the hydraulic reservoir if necessary.	Refer to this Maintenance Practices Section.
(3)	Set the GEAR circuit breaker.	Located on the right side of the instrument panel.
(4)	Set ELECT. MASTER switch to ON.	
(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.	Refer to Figure 205. 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.	Refer to Figure 205. 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)	The hydraulic pump must operate until the system pressure stabilizes.	The hydraulic pump must stop operating.
(8)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(9)	Set the ELECT. MASTER switch to OFF.	

B. Remove the Accumulator.

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CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the 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 the dump valve. - After emptying wait 10-15 min until the accumulator is thermally balanced.	Refer to Figure 205. Wrench size 19 mm. Wrench size 1/4 in.
(3)	Operate the pressure button on the upper solenoid valve on the top of the control block.	See Figure 205. Use a little metal pin or ball pen to operate the button.
(4)	Remove the accumulator: - Remove the hydraulic hose from the accumulator. - Remove the four bolts which hold the accumulator and bracket in place on the hydraulic component assembly. - Remove the accumulator and bracket from the hydraulic component assembly. - Open the two clamps. - Move the accumulator clear from the clamps and the bracket.	Refer to Figure 206. Cap the hydraulic hose.

C. Install the Accumulator.

WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE. IT CAN ALSO DAMAGE CLOTHING.**

CAUTION: CLEAN UP SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN DAMAGE THE AIRPLANE STRUCTURE. IT CAN ALSO CAUSE DAMAGE TO AIRPLANE COMPONENTS.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Install the accumulator: - Move the accumulator into position on the bracket. - Close the two clamps that hold the accumulator to the bracket. - Install the four bolts which hold the accumulator and bracket in place on the hydraulic component assembly. - Remove the cap and install the hydraulic hose from the accumulator.	Refer to Figure 206. Tighten securely. Apply Rivolta F.L.A for corrosion protection. Tighten to 5 - 6 Nm (3.7 - 4.4 lbf.ft.).
(3)	Check the hydraulic fluid level of the hydraulic reservoir.	Refer to this Maintenance Practices Section.
(4)	Bleed the hydraulic system.	Refer to this Maintenance Practices Section.
(5)	Bleed the accumulator.	Refer to this Maintenance Practices Section.
(6)	Do the normal operation test for the hydraulic system.	Refer to this Maintenance Practices Section.

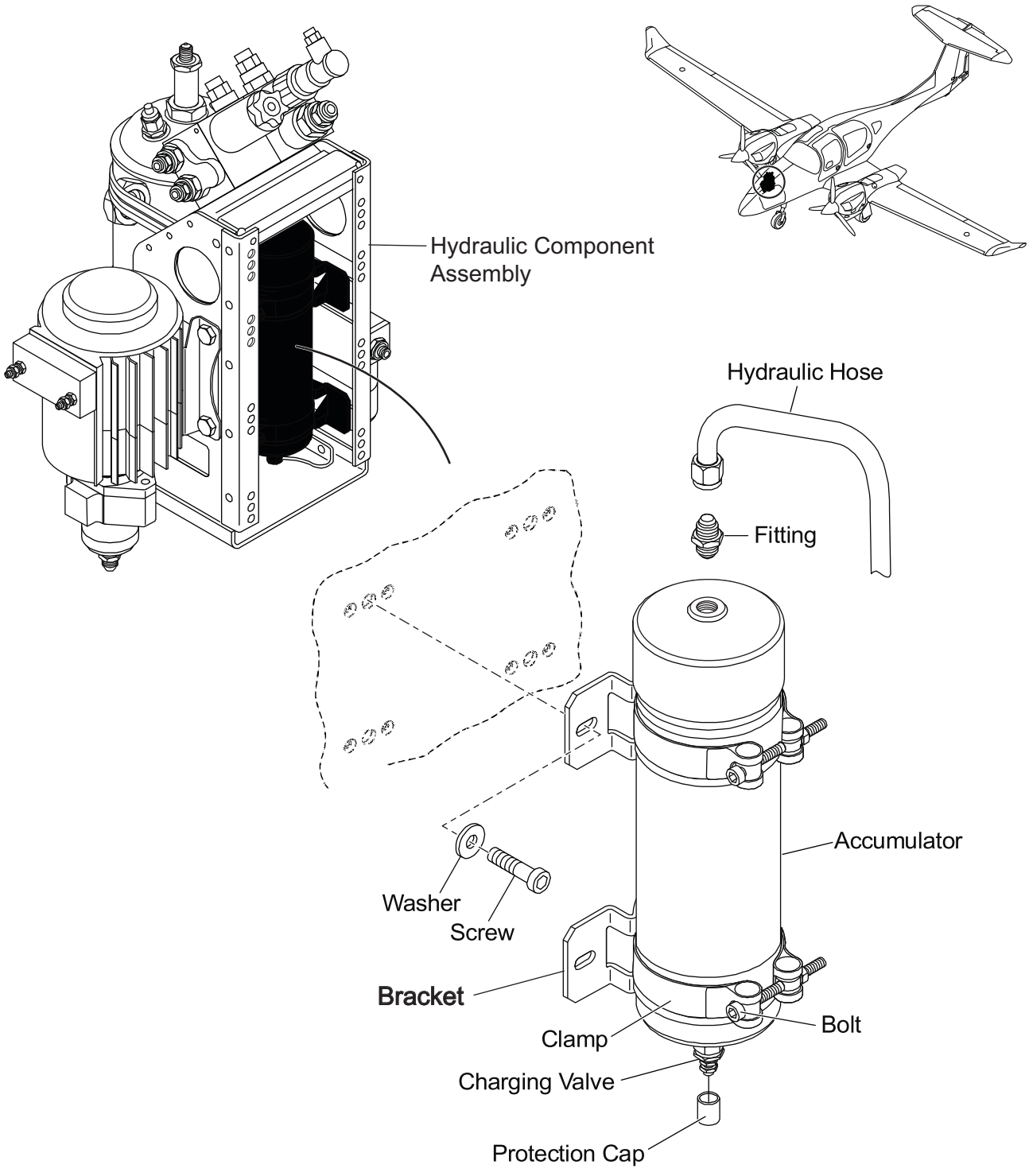

Figure 206 : Hydraulic Accumulator Installation

18. **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.

B. Testing Procedure.

	Detail Steps/Work Items	Key Items/References
(1)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(2)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
	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. **THE ACCUMULATOR HAS TO BE REFILLED ACCORDING TO SECTION 29-10 PARAGRAPH 17.**	
(3)	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.	Refer to Figure 206.

	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 to 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.	Located on the right side of the 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.
(8)	Install the cover. Close the right nose baggage compartment door.	

19. **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 the Accumulator with Nitrogen.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker.	Located on the right side of the instrument panel.
(2)	Get access to the hydraulic system: - Open the right nose baggage compartment door. - Remove the cover.	
(3)	Depressurize the hydraulic system.	Refer to this Maintenance Practices Section.
	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.	
(4)	Connect 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.	Refer to Figure 206.

	Detail Steps/Work Items	Key Items/References
(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)
(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.	Refer to Figure 206.
(7)	Reset the GEAR circuit breaker.	Located on the right side of the instrument panel.
(8)	Check the operation of the hydraulic accumulator.	Refer to this Maintenance Practices Section.
(9)	Install the cover. Close the right nose baggage compartment door.	

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 62 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.

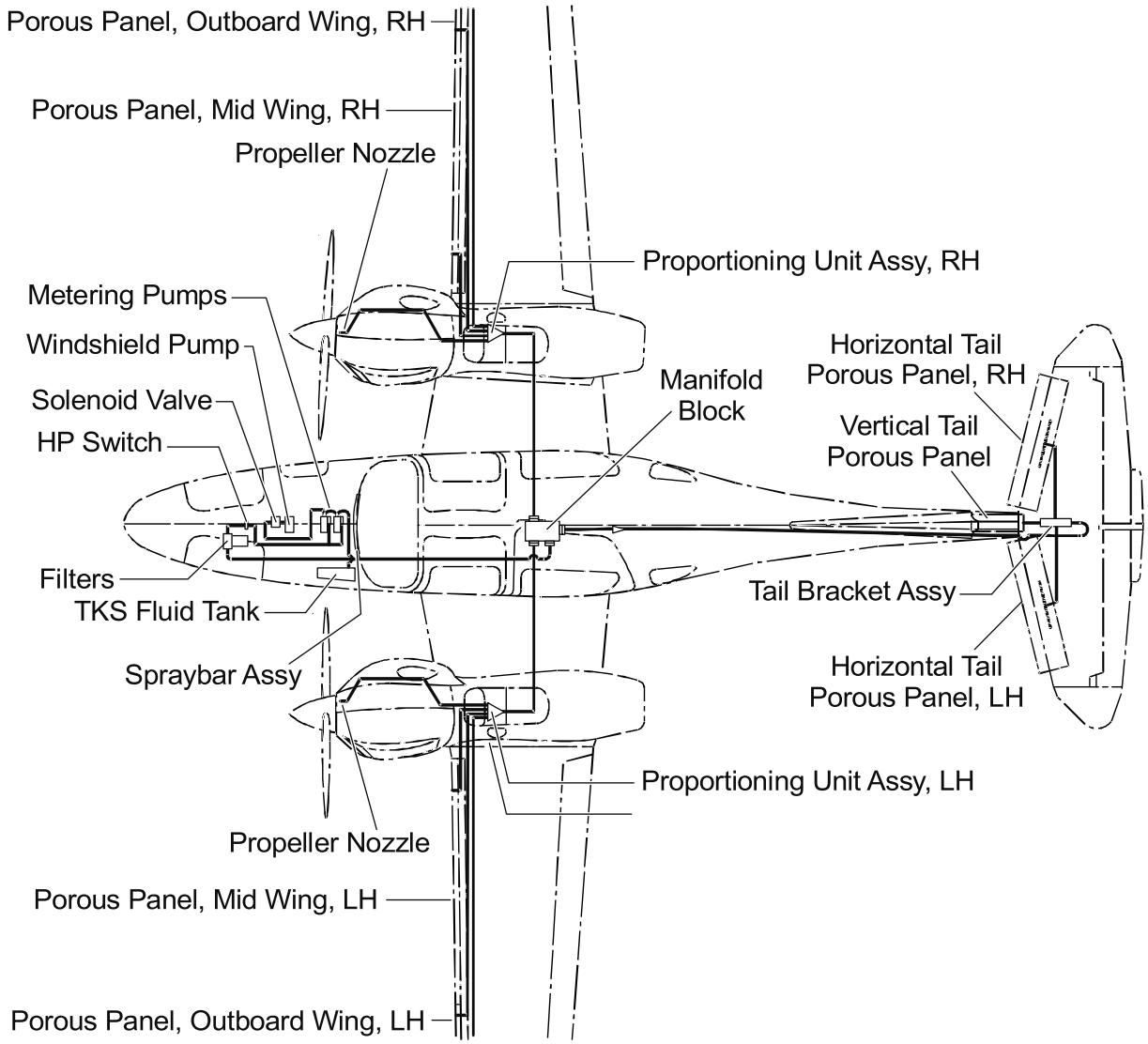

Figure 1 : Ice Protection System - Mechanical Schematic

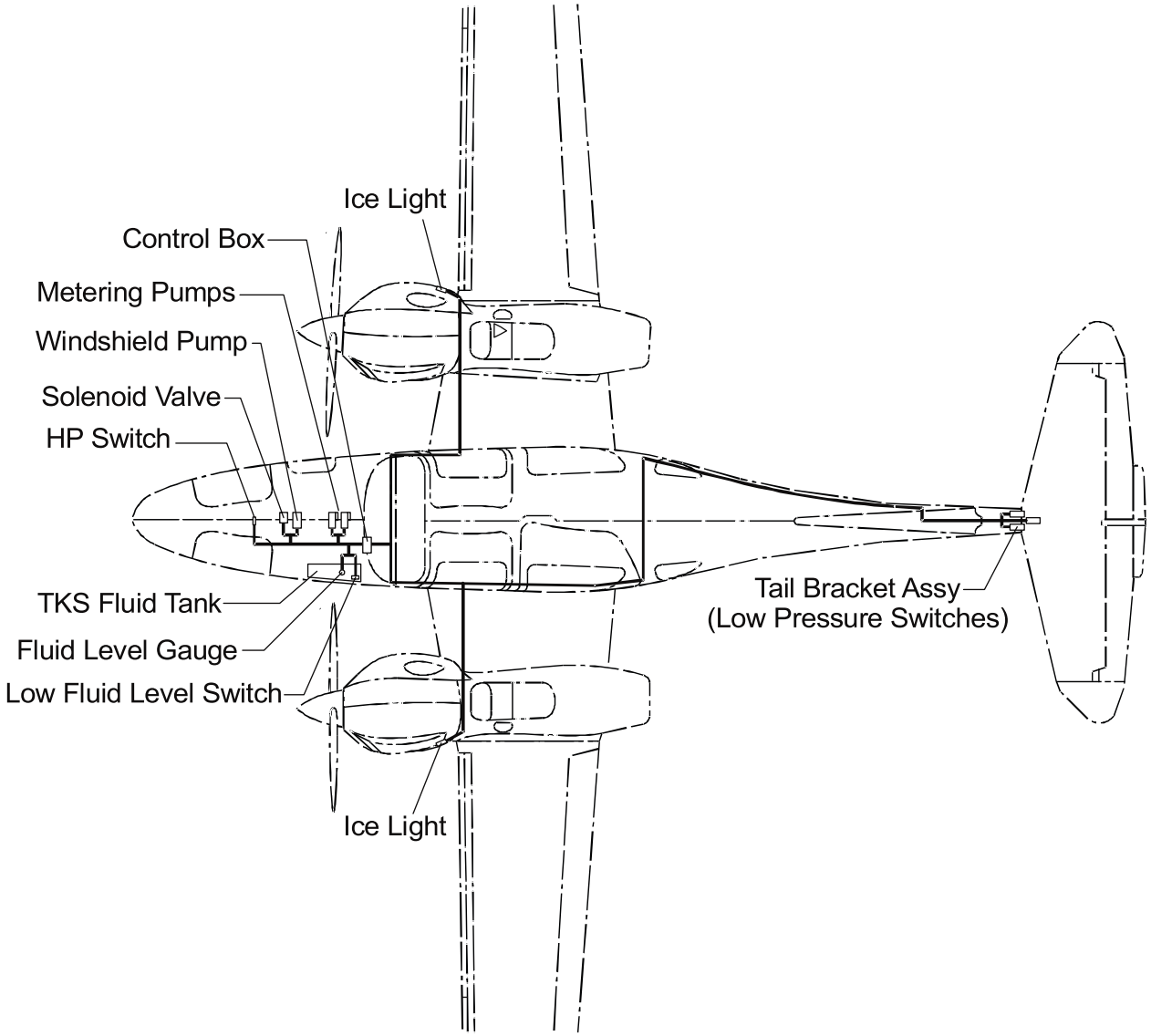

Figure 2 : Ice Protection System - Electrical Schematic

2. Description

Figure 1 shows the schematic diagram for the mechanical parts of the fluid based ice protection system on the DA 62. 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 outboard wings.
- De-icing fluid tank with integrated level sensor, level switch and inlet strainer.
- De-icing fluid metering pumps.
- De-icing fluid filter.
- Drain hose connector at the metering pump assembly.
- 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 in the fuselage nose.
- Windshield pump with solenoid valve in the fuselage nose.
- Spraybar in front of the windscreen.

These system components are connected with nylon tubing. For the ice protection of the propeller shielded Teflon lines through the engine nacelles to the slinger rings of the propeller are used.

Figure 2 shows the schematic diagram for the electrical parts of the fluid based ice protection system on the DA 62. 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 sensors.
- High pressure sensor.
- Metering pumps.
- Windshield pump.
- Solenoid valve.
- Ice lights.

The ice protection system is electrically operated. It is supplied with power via the 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 LH side. It consists of a single polyethylene (XPE) chamber with a usable capacity of 36 liter (9.5 US gal). The tank filler is located in the fuselage nose on the LH side, aft of the nose baggage 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 (11 liter) 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 metering pump assembly via a filter.

B. Metering Pump Assembly.

The metering 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 LH side.

The metering 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 mounted on the metering pump assy 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 cartridge must be replaced at the next scheduled inspection.

(2) De-Icing Fluid Filter.

One filter protects the capillaries in the proportioning units from fouling. The outlet is connected to the manifold block in the center of the airplane. The filter has a bleeding socket.

(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).Wing and Propeller Ice Protection System.

(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 maintenance cap.

(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 Pump.

One outlet of the main pump assembly is connected to the inlet of the windshield de-icing pump. The pump is mounted in the nose baggage compartment on the LH side next to the metering pump assembly.

(2) Solenoid Valve.

A solenoid valve is located in front of the 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 five seconds. The solenoid valve avoid that air is drawn into the system via the spraybar.

(3) Spraybar.

A spraybar is located in front of the windscreen. It is aligned parallel with the center axis of the airplane. When activated, it sprays de-icing fluid onto the windscreen.

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 DE-ICE circuit breaker. It is installed to control all 3 pumps of the ice protection system. The de-ice control box is mounted on the nose baggage frame in front of the i-panel.

(2) De-Ice Control Panel.

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 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 LH 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 three 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 hrs 40min.
- 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 1hr 20min.

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 two 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.

C. PUMP1/PUMP2 Switch.

The LH bottom switch selects one of the two main pumps.

Down position: PUMP 1. Main pump 1 is selected as the active pump in HIGH mode. Pump 2 is standby.

Up position: PUMP 2. Main pump 2 is selected as the active pump in HIGH mode. Pump 1 is standby.

D. WINDSHIELD Push Button.

The WINDSHIELD push button activates the windshield de-icing pump for a duration of five seconds. During this time it feeds de-icing fluid to the spraybar in front of the windshield.

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 11 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.
- Isopropyl alcohol.
- Ethyl alcohol.
- Industrial methylated spirit.

CAUTION: DO NOT USE SOLVENTS/MATERIALS OTHER THAN THOSE STATED ABOVE. THE MICROSCOPIC LASER DRILLED HOLES MAY BE CLOGGED BY THE USE OF ANY OTHER SOLVENTS/MATERIALS LIKE ADHESIVES, SEALANTS, PAINT, OR ANY FINE PARTICLES. THIS MAY AFFECT PANEL PERFORMANCE AND IS CAUSE FOR PANEL REJECTION.

Mask the 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 the control box.
No de-icing fluid comes out of the spraybar and porous panels.	De-icing fluid tank empty.	Replenish.
	De-icing fluid pump defective.	Replace the pump.
	De-icing fluid filter(s) clogged.	Replace the filter(s).
	De-icing fluid tubing leaky.	Replace the affected part of the tubing.
	De-icing fluid tubing clogged.	Replace the affected part of the tubing.
No fluid dissipates from part of the active area of a porous panel.	Trapped air in a porous panel.	Purge the system.

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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 of the Ice Protection System

A. Equipment.

Item	Quantity	Part Number
TKS system test set..	1	A 00305.
TKS system test cart.	1	D60-3004-00-00-ST.

B. Operational Test of the Ice Protection System.

	Detail Steps/Work Items	Key Items/References
(1)	Drain the de-ice fluid tank and verify that it is empty.	Use the drain line at the metering pump assy accessible via maintenance cap.
(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 Checkout	
(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. 11 liter (2.4 US gal) are in the de-icing fluid tank.
(6)	Wait two 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 the system is turned on inside of hangar. See also TKS system test cart.
(9)	Sprinkle all seven ice protection panels with approved de-icing fluid by using a clean, lint free cloth.	

	Detail Steps/Work Items	Key Items/References
(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 doors are closed.	
(15)	Check that each hole on the windshield 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. –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. 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)	Set the OFF/NORM/HIGH switch to the HIGH position and check operation of the middle, amber annunciation light on the de-ice control panel.	
(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 fluid temperature.
(21)	Check that each panel emits de-icing fluid with pump 1 and pump 2.	
(22)	Set the OFF/NORM/HIGH switch in NORM position and check the lower, white the annunciation light if 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.	
(25)	In the NORM - Mode the operation of both main pumps is cycled. Therefore check runtime of the cycles: –Pumps ON: 30 sec (Tolerance +1 s / -3 sec) –Pumps OFF: 90 sec (Tolerance +9 s / -1 sec)	
(26)	Set 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 sec (± 10 sec).	
(28)	Check the runtime of the WINDSHIELD-pump. Pump ON: 5 sec (± 1sec)	Verify that all doors are closed.
(29)	Set the OFF/NORM/HIGH switch in OFF position	

	Detail Steps/Work Items	Key Items/References
	ICE LIGHT / ANNUN-TEST - Test	
(30)	Set the ICE LIGHT / OFF/ ANNUN TEST switch in ICE LIGHT position and check operation of the LH and the RH Ice Light.	
(31)	Set 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 the blanking plug on the drain line at the metering pump assy accessible via maintenance cap on the lower LH side of the fuselage nose.	Refer to Figure 1. (30-00-00 Page 2).
(2)	Allow the de-icing fluid to flow into suitable containers.	
(3)	Close the blanking plug on the drain line at the metering pump assy accessible via maintenance cap on the lower LH side of the fuselage nose.	

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 LH door to the nose baggage compartment.	
(3)	Disconnect all hoses and electrical connections from the de-icing fluid tank.	Use caps to protect the loose line connections from contamination.
(4)	Remove the tank filler and strainer, four bolts and washers.	
(5)	Remove the five bolts and washers which attach the tank to the nose baggage compartment.	
(6)	Move the tank clear of the airplane.	

B. Install the De-Icing Fluid Tank.

	Detail Steps/Work Items	Key Items/References
(1)	Move the tank in position in the LH nose baggage compartment.	
(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 five bolts and washers which attach the tank to the nose baggage compartment.	
(4)	Install the tank filler and strainer, four bolts and washers.	
(5)	Close the LH door to the nose baggage compartment.	
(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	D67-3003-01-00-ST.

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)	Remove the 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 the drive slot tool.
(3)	Protect the filler neck with glycol cap.	

C. Install the De-Icing Fluid Inlet Strainer.

	Detail Steps/Work Items	Key Items/References
(1)	Remove glycol cap from the filler neck.	Verify that the interior of the 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)	Install the inlet strainer: - Move the 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 the strainer lock ring by twisting clockwise.	Use the drive slot tool.
(3)	Close the filler cap of the de-icing fluid tank.	

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 bolts and washers which attach the lid to the floor in the LH nose baggage compartment.	
(2)	Lift the lid upward.	
(3)	Disconnect all electrical connectors from the pumps.	
(4)	Remove the locking wire from all hose connections.	
(5)	Disconnect all hose connections from the pumps	Use caps to protect the loose line connections from contamination.
(6)	Remove the bolts and washers which hold the pump to the lid including the l-sections.	
(7)	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 the 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)	Bleed the de-icing system	Refer to Paragraph 9.
(10)	Carry out an operational test of the system.	Refer to Paragraph 2.

7. **Replace the High Pressure Switch or Windshield Pump or Solenoid Valve**

A. High Pressure Switch Values.

High Pressure Switch Value	
Activate.	10.34 bar / 150 PSI
Reset.	8.27 bar / 120 PSI

B. Procedure.

	Detail Steps/Work Items	Key Items/References
(1)	Open front baggage door LH.	
(2)	Remove the bolts and washers which attach the lid to the floor in the LH nose baggage compartment.	
(3)	Remove locking wire of hose connections.	
(4)	Disconnect hose line connections.	Use caps to protect the loose line connections from contamination.
(5)	Disconnect all electrical connectors from the high pressure switch/windshield pump/solenoid valve.	
(6)	Remove the bolts and washers which hold the component(s) to the lid.	
(7)	Replace component(s).	
(8)	Attach the bolts and washers which attach the new component(s) to the lid.	
(9)	Connect all hose connections to the new component(s).	Remove the caps. Use new seals.
(10)	Secure all hose connections with locking wire.	
(11)	Move the lid in place in the floor.	
(12)	Connect all electrical connectors of the high pressure switch/windshield pump/solenoid valve	

	Detail Steps/Work Items	Key Items/References
(13)	Attach the bolts and washers which attach the lids to the floor of the LH nose baggage compartment.	
(14)	Close the door of the LH nose baggage compartment.	
(15)	Bleed the de-icing system	Refer to Paragraph 9.
(16)	Carry out an operational test of the system.	Refer to Paragraph 2.

8. **Replace the Filter Cartridge.**

	Detail Steps/Work Items	Key Items/References
(1)	Open front baggage door LH.	
(2)	Drain the ice protection system.	Refer to Paragraph 3.
(3)	Remove the locking wires of the hose connections.	
(4)	Disconnect the hose connections.	Use caps to protect the loose line connections from contamination.
(5)	Unscrew the clamps that hold the filter cartridge housing/assembly.	
(6)	Open the housing.	
(7)	Check the O-ring for damage.	Replace if necessary.
(8)	Replace the filter cartridge.	
(9)	Close the filter cartridge housing.	
(10)	Check the securing clip for correct position.	
(11)	Tighten the clamps that hold the filter cartridge.	
(12)	Install the locking wire.	

	Detail Steps/Work Items	Key Items/References
(13)	Close the door of the LH nose baggage compartment.	
(14)	Bleed the de-icing system.	Refer to Paragraph 9.
(15)	Carry out an operational test of the system.	Refer to Paragraph 2.

9. **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 all doors.	
	- Operate the windshield pumps of the ice protection system several times.	To remove all the 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:	
	- Open the bleed valve screw on top of the filter cap (1 to 2 turns).	Prevent the baggage compartment floor from contamination.
	- Set the ELECT MASTER switch to ON.	
	- Set the OFF/NORM/HIGH switch of the de-icing control unit to HIGH.	
	- Operate system until fluid is discharged from the bleed valve of the filter element.	After appr. three min. the system operation in HIGH mode.
	- Close the bleed valve screw.	
	- Set the OFF/NORM/HIGH switch of the de-icing control unit to OFF.	
	- Set the ELECT MASTER switch to OFF.	

10. **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
(1)	Open the small inspection panels on the outboard side of the proportioning unit.	To give access to the proportioning units.
(2)	Open blanking plugs on the proportioning unit.	LH and RH nacelles.
(3)	Use TKS system test cart (max. 4 bar or 60 PSI) with filtration fitted (0.6 micrometers) to force de-icing fluid through the porous panels.	LH and RH. Refer to the AFM for approved de-icing fluids.
(4)	Close blanking plugs on the proportioning unit.	LH and RH nacelles.
(5)	Close the small inspection panels on the outboard side of the engine nacelles.	

11. **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 the 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 an operational test of the system.	Refer to Paragraph 2.

C. Remove the Low Pressure Unit from the Empennage.

	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)	Disconnect all hose connections from the low pressure unit.	Use caps to protect the loose line connections from contamination.
(3)	Remove the bolts and washers holding the low pressure unit.	Hold the proportioning unit.
(4)	Move the low pressure unit clear of the airplane	

D. Install the Low Pressure Unit to the Empennage.

	Detail Steps/Work Items	Key Items/References
(1)	Move the low pressure unit in position in the vertical tail.	
(2)	Install the bolts and washers which hold the low pressure unit.	
	CAUTION: YOU MUST CONNECT THE HOSES TO THE CORRECT PORTS. IF YOU DO NOT CONNECT THE HOSES CORRECTLY, THE SYSTEM WILL NOT WORK PROPERLY.	
(3)	Connect all hose connections to the low pressure unit.	Remove the caps.
(4)	Carry out an operational test of the system.	Refer to Paragraph 2.

12. **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.

13. **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)

14. **Replace Ice Protection Control Box**

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the DE-ICE circuit breaker is pulled.	
(2)	Remove the instrument panel cover.	
(3)	Unscrew the two mounting screws fixing the control box on the frame.	
(4)	Disconnect plug no.: P3011 from the control box.	
(5)	Connect plug no.: P3011 to the new control box.	
(6)	Move the de-ice control box to the prior position and fix it by using the two mounting screws.	
(7)	Install the instrument panel cover.	

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 the cable ties.	
	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.	
(3)	Disconnect all electrical connectors from the low pressure switches.	
(4)	Remove locking wire from the three hose connections pointing in flight direction.	
(5)	Disconnect the three hose connections to the low pressure switches.	Use caps to protect the loose line connections from contamination.
(6)	Remove the bolts and washers, which hold the low pressure switch proportioning unit to the vertical stabilizer.	
(7)	Pull the low pressure switch proportioning unit upward.	To give access to the feeder line of the fuselage section.
(8)	Remove locking wire from the feeder line connection.	
(9)	Disconnect the feeder line to the low pressure switch proportioning unit.	Use caps to protect the loose line connections from contamination.
(10)	Remove the low-pressure-switch proportioning unit from the airplane.	

B. Install the Low-Pressure-Switch Proportioning Unit.

	Detail Steps/Work Items	Key Items/References
(1)	Connect the feeder line to the low pressure switch proportioning unit.	
(2)	Secure the feeder line connection with locking wire.	
(3)	Move the 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.	
	CAUTION: YOU MUST CONNECT THE HOSES TO THE CORRECT PORTS. IF YOU DO NOT CONNECT THE HOSES CORRECTLY, THE SYSTEM WILL NOT WORK PROPERLY.	
(5)	Connect the three hose connections to the low pressure switches.	Remove the caps. Use new seals.
(6)	Secure the three hose connections with locking wire.	
(7)	Connect all electrical connectors from the low pressure switches.	
(8)	Install cable ties as required.	
(9)	Install fairing cover to the empennage.	
(10)	Carry out an operational test of the system.	Refer to Paragraph 2.

16. **Test the Low Pressure Switch**

	Detail Steps/Work Items	Key Items/References
(1)	Check that the ice protection system is set to OFF.	Must be off for a minimum of 5 min.
(2)	Remove the bullet fairing from the tail.	
(3)	Get access to the low-pressure-switch tail unit.	
(4)	Pull the black cap from the upper low pressure switch from the VT panel.	Do not damage the cap.
(5)	Perform a continuity test for the switch.	SYSTEM OFF - the low pressure switch must be in the OPEN position - therefore no continuity.
(6)	If continuity is measured, the switch is stuck in the closed position and needs to be replaced.	
(7)	Bring the black cap back in place of the switch.	
(8)	Repeat step (4) to (6) for the horizontal tail low pressure switch.	
(9)	Install the bullet fairing.	

17. **Test the High Pressure Switch**

	Detail Steps/Work Items	Key Items/References
	WARNING: TAKE PRECAUTIONS BEFORE YOU PERFORM THE HIGH PRESSURE SWITCH TEST. THE DE-ICING FLUID IS UNDER HIGH PRESSURE (UP TO 10 BAR / 150 PSI) AND CAN CAUSE SERIOUS INJURY TO PERSONS, IF THE SYSTEM IS NOT DEPRESSURIZED PROPERLY.	
(1)	Open the LH nose baggage door.	
(2)	Drain the ice protection system.	Refer to Paragraph 3.
(3)	Remove the lock wire from the inlet tube of the filter housing.	
(4)	Disconnect the inlet tube from the filler.	
(5)	Install a blind plug on the tube connection in order to block the line (simulation of a blocked filter).	Install a pressure gauge additionally if necessary.
(6)	Set the ice protection system to HIGH mode for a maximum of 30 sec.	The tube pressure shall reach the HPS set pressure (150 PSI).
(7)	Set the ice protection system to OFF.	
(8)	Turn the Annunciation Test ON.	
(9)	DEICE PRES HI annunciation shall appear. DEICE PRES LO annunciation shall appear.	After 15 seconds. After 120 seconds.
(10)	Set the Annunciation Test OFF.	
(11)	Drain the ice protection system for depressurization.	Refer to Paragraph 3.
(12)	Remove the blind plug.	Remove the pressure gauge, if installed
(13)	Connect the inlet tube filter.	Use a new seal.
(14)	Install the locking wire.	Use new locking wire.
(15)	Carry out an operational test of the system.	Refer to Paragraph 2. Check for leakage.

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CHAPTER 31

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 62.
- Section 31-20. Independent instruments.
- Section 31-40. The integrated cockpit system.

The DA 62 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 62 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 DAA 62 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.

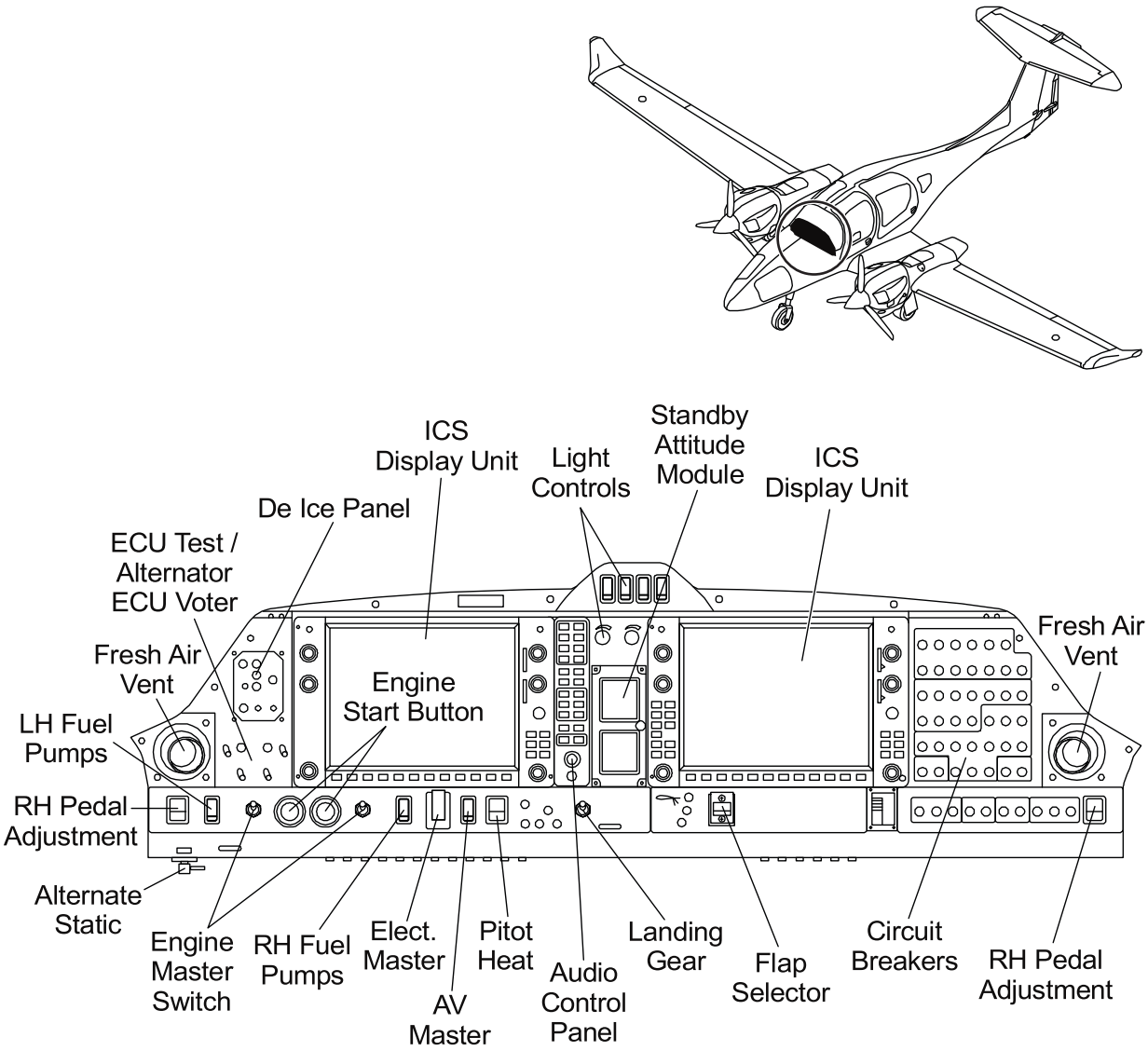

Figure 1 : Instrument Panel

2. Instrument Panel Description

Figure 1 shows the Instrument Panel.

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 62 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.

The Standby Attitude Module (SAM), located between the Audio Panel and the MFD, serves as backup instrument in the event of a power failure and loss of the ICS. The SAM has two separate displays in one unit. The upper display serves as an artificial horizon and the lower display incorporates an airspeed indicator and altimeter. The SAM has an internal battery which automatically provides electrical power to the SAM for at least 60 min. A magnetic compass is installed on the top center of the windshield.

The circuit breakers (see Figure 2 and Table 1) 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-center 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.

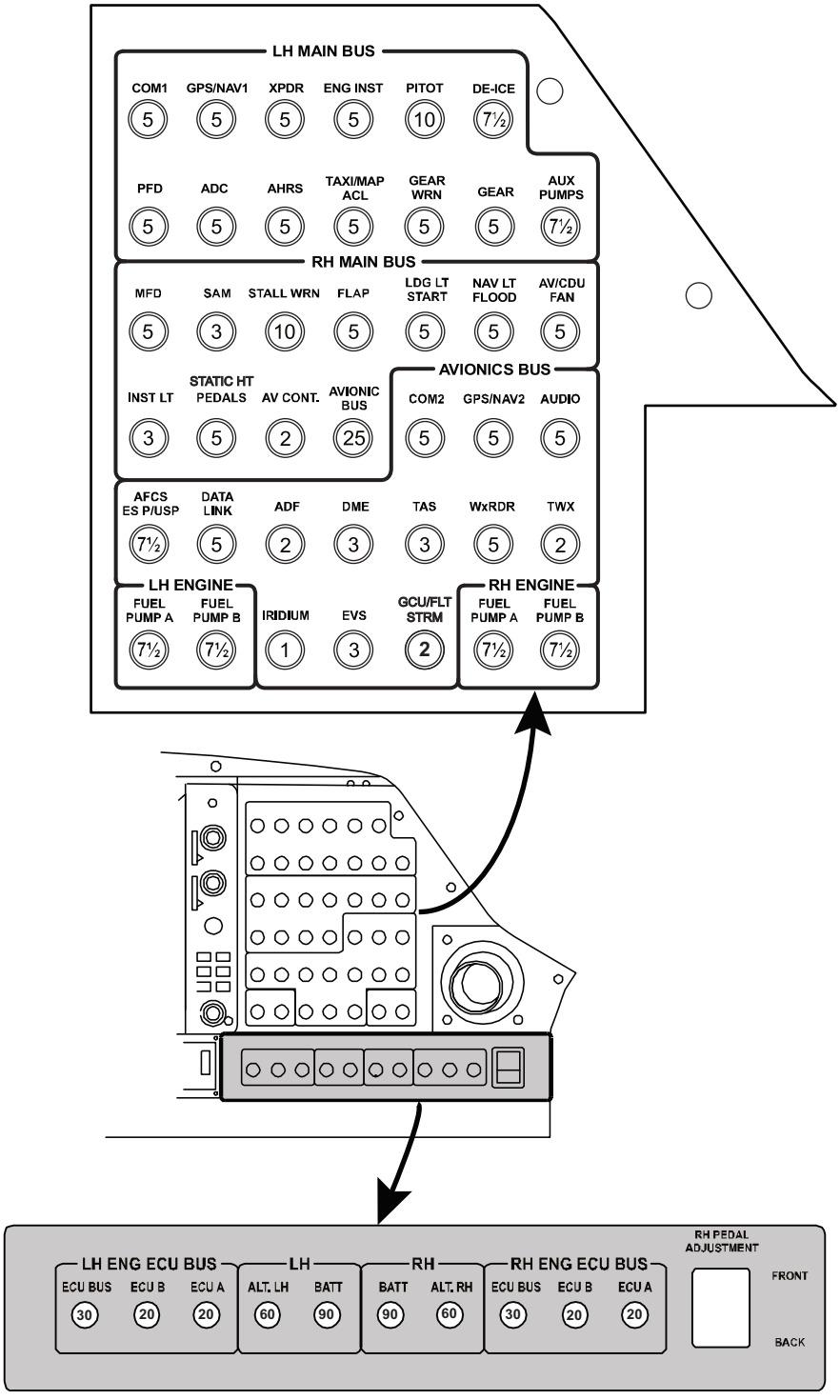

Figure 2 : Circuit Breakers

Table 1 : Circuit Breaker List

DESIGNATOR	LOCATION / PANEL	AMP.	CB NAME
LH MAIN BUS	Top of the Circuit Breaker Panel	5	COM1
LH MAIN BUS	Top of the Circuit Breaker Panel	5	GPS/NAV1
LH MAIN BUS	Top of the Circuit Breaker Panel	5	XPDR
LH MAIN BUS	Top of the Circuit Breaker Panel	5	ENG INST
LH MAIN BUS	Top of the Circuit Breaker Panel	10	PITOT
LH MAIN BUS	Top of the Circuit Breaker Panel	7½	DE-ICE
LH MAIN BUS	Top of the Circuit Breaker Panel	5	PFD
LH MAIN BUS	Top of the Circuit Breaker Panel	5	ADC
LH MAIN BUS	Top of the Circuit Breaker Panel	5	AHRS
LH MAIN BUS	Top of the Circuit Breaker Panel	5	TAXI/MAP ACL
LH MAIN BUS	Top of the Circuit Breaker Panel	5	GEAR WRN
LH MAIN BUS	Top of the Circuit Breaker Panel	5	GEAR
LH MAIN BUS	Top of the Circuit Breaker Panel	7½	AUX PUMPS
RH MAIN BUS	Middle of the Circuit Breaker Panel	5	MFD
RH MAIN BUS	Middle of the Circuit Breaker Panel	3	SAM
RH MAIN BUS	Middle of the Circuit Breaker Panel	10	STALL WARN
RH MAIN BUS	Middle of the Circuit Breaker Panel	5	FLAP
RH MAIN BUS	Middle of the Circuit Breaker Panel	5	LDG LT START
RH MAIN BUS	Middle of the Circuit Breaker Panel	5	NAV LT FLOOD
RH MAIN BUS	Middle of the Circuit Breaker Panel	5	AV/GDU FAN
RH MAIN BUS	Middle of the Circuit Breaker Panel	3	INST LT
RH MAIN BUS	Middle of the Circuit Breaker Panel	5	STATIC HT PEDALS

DESIGNATOR	LOCATION / PANEL	AMP.	CB NAME
RH MAIN BUS	Middle of the Circuit Breaker Panel	2	AV CONT
RH MAIN BUS	Middle of the Circuit Breaker Panel	25	AVIONIC BUS
AVIONICS BUS	Middle of the Circuit Breaker Panel	5	COM2
AVIONICS BUS	Middle of the Circuit Breaker Panel	5	GPS/NAV2
AVIONICS BUS	Middle of the Circuit Breaker Panel	5	AUDIO
AVIONICS BUS	Middle of the Circuit Breaker Panel	7½	AFCS ESP/USP
AVIONICS BUS	Middle of the Circuit Breaker Panel	5	DATA LINK
AVIONICS BUS	Middle of the Circuit Breaker Panel	2	ADF
AVIONICS BUS	Middle of the Circuit Breaker Panel	3	DME
AVIONICS BUS	Middle of the Circuit Breaker Panel	3	TAS
AVIONICS BUS	Middle of the Circuit Breaker Panel	5	WxRDR
AVIONICS BUS	Middle of the Circuit Breaker Panel	2	TWX
AVIONICS BUS	Middle of the Circuit Breaker Panel	1	IRIDIUM
AVIONICS BUS	Middle of the Circuit Breaker Panel	3	EVS
AVIONICS BUS	Middle of the Circuit Breaker Panel	2	GCU/FLT STRM
LH ENGINE	Middle of the Circuit Breaker Panel	7½	FUEL PUMP A
LH ENGINE	Middle of the Circuit Breaker Panel	7½	FUEL PUMP B
RH ENGINE	Middle of the Circuit Breaker Panel	7½	FUEL PUMP A
RH ENGINE	Middle of the Circuit Breaker Panel	7½	FUEL PUMP B
LH ENG ECU BUS	Lower part of the RH Instrument Panel	30	ECU BUS
LH ENG ECU BUS	Lower part of the RH Instrument Panel	20	ECU B
LH ENG ECU BUS	Lower part of the RH Instrument Panel	20	ECU A
LH	Lower part of the RH Instrument Panel	60	ALT.LH

DESIGNATOR	LOCATION / PANEL	AMP.	CB NAME
LH	Lower part of the RH Instrument Panel	90	BATT
RH	Lower part of the RH Instrument Panel	90	BATT
RH	Lower part of the RH Instrument Panel	60	ALT.RH
RH ENG ECU BUS	Lower part of the RH Instrument Panel	30	ECU BUS
RH ENG ECU BUS	Lower part of the RH Instrument Panel	20	ECU B
RH ENG ECU BUS	Lower part of the RH Instrument Panel	20	ECU A

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 LH 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.

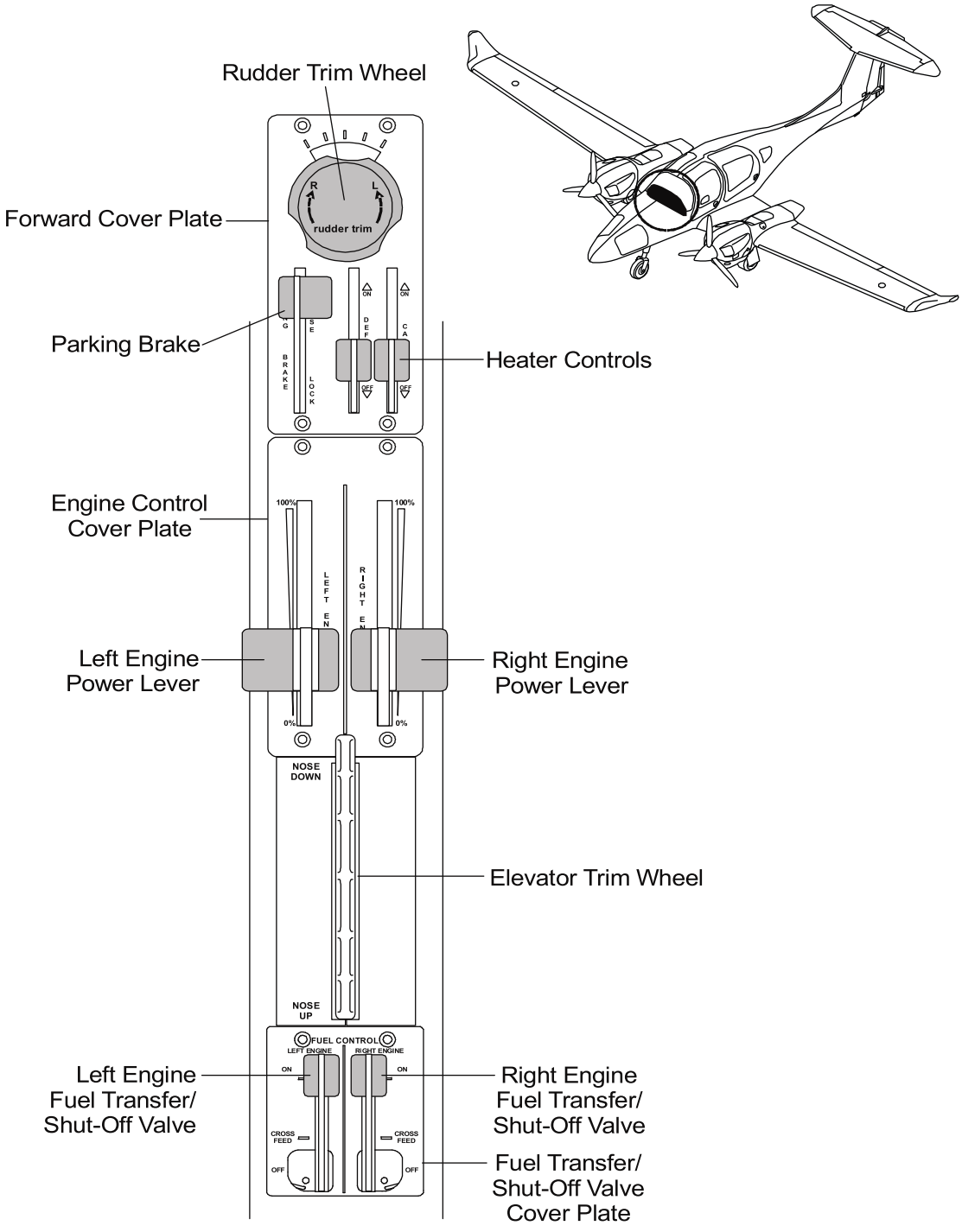

Figure 3 : Center Console

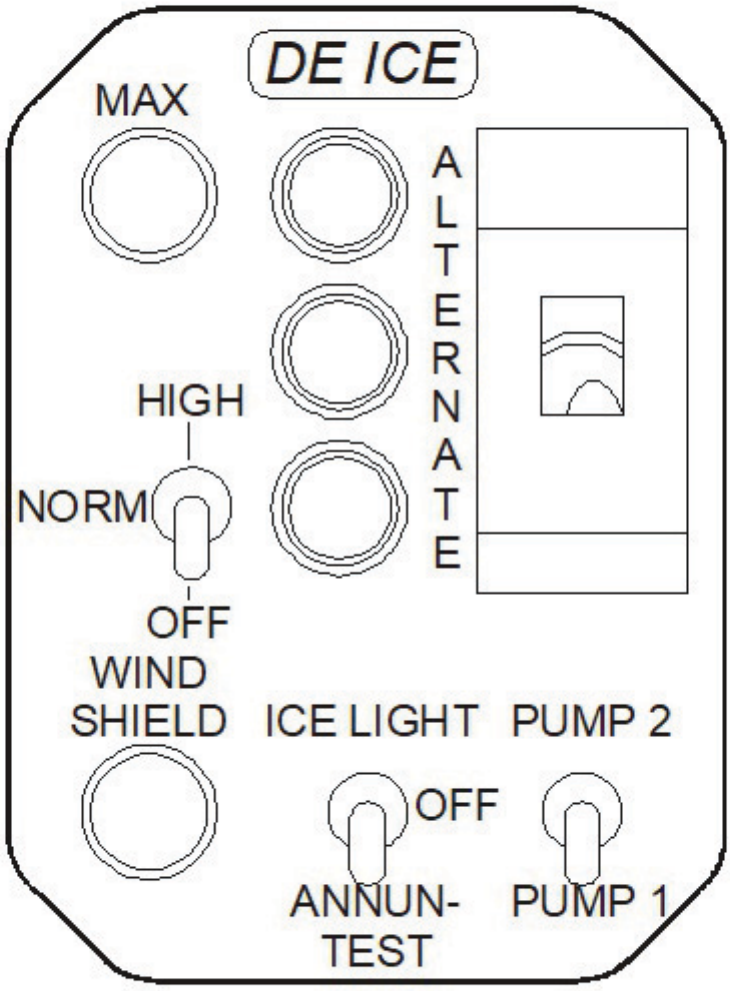

Figure 4 : DE-ICE Control Panel

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.	Adjust the friction.
	Too much wear in the friction washers.	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**

A. Remove 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 four screws that attach the cover plate to the engine control assembly. - Lift the cover plate clear of the engine control assembly.	
(5)	Remove the engine control cover plate: - Remove the four 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
(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 four screws that attach the cover plate to control assembly. - Move the cover plate clear of the center console.	

(8)	Remove the engine control assembly:
	- Remove the two 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.
	  - The heater control cables.
	  - The electrical cables for the engine power levers.
	  - The rudder trim cable.
	  - The electrical cables for the engine control assembly micro switches.
	- When all the components are released lift the engine control assembly clear of the center console.
		
		Refer to Section 32-40.
		Refer to Sections 21-20 and 21-40.
		Refer to Section 76-00.
		Refer to Section 27-21.
		At the in-line connectors.

B. 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.
	  - Connect the electrical cables for the micro switches in the engine control assembly.
	  - The electrical cables for the engine power levers.
	  - The heater control cables.
	  - The parking brake control cable.
	- When all the components are connected lower the engine control assembly into position in the center console.
	- Install the two bolts at the rear of the engine control assembly that attach the engine control assembly to the center console.
		
		Refer to Section 27-21.
		At the in-line connectors.
		
		Refer to Section 76-00.
		
		Refer to Sections 21-20 and 21-40.
		Refer to Section 32-40.

(2)	Install the fuel transfer/shut off control assembly cover plate: - Move the cover plate into position at the center console. - Install the four 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.	
(4)	Install the engine control cover plate: - Move the cover plate into position over the power levers. - Install the four screws that attach the cover plate to the engine control assembly.	

	Detail Steps/Work Items	Key Items/References
(5)	Install the forward cover plate: - Move the cover plate into position over the engine control assembly. - Install the four 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.	
(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 40

Central Computers

1. General

The DA 62 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 62 Airplane.

Figure 1 shows the ICS system schematic.

NOTE: When referencing the Garmin G1000 system with this document, this also includes the G1000 NXi system. The NXi system introduces new software and hardware. However, the maintenance details are the same as the original G1000 system. If MÄM 62-254 is installed, Phase I of the NXi upgrade is installed; this includes new GDUs, a new GRS, and a new GDC. If MÄM 62-1007 is installed, Phase I and Phase II of the Nxi upgrade is installed. In addition to the items from MÄM 62-254, Phase II includes new GIAs, a new GEA a New GMA, and allows the installation of the Flight Stream 510 Bluetooth and Wi-Fi transceiver.

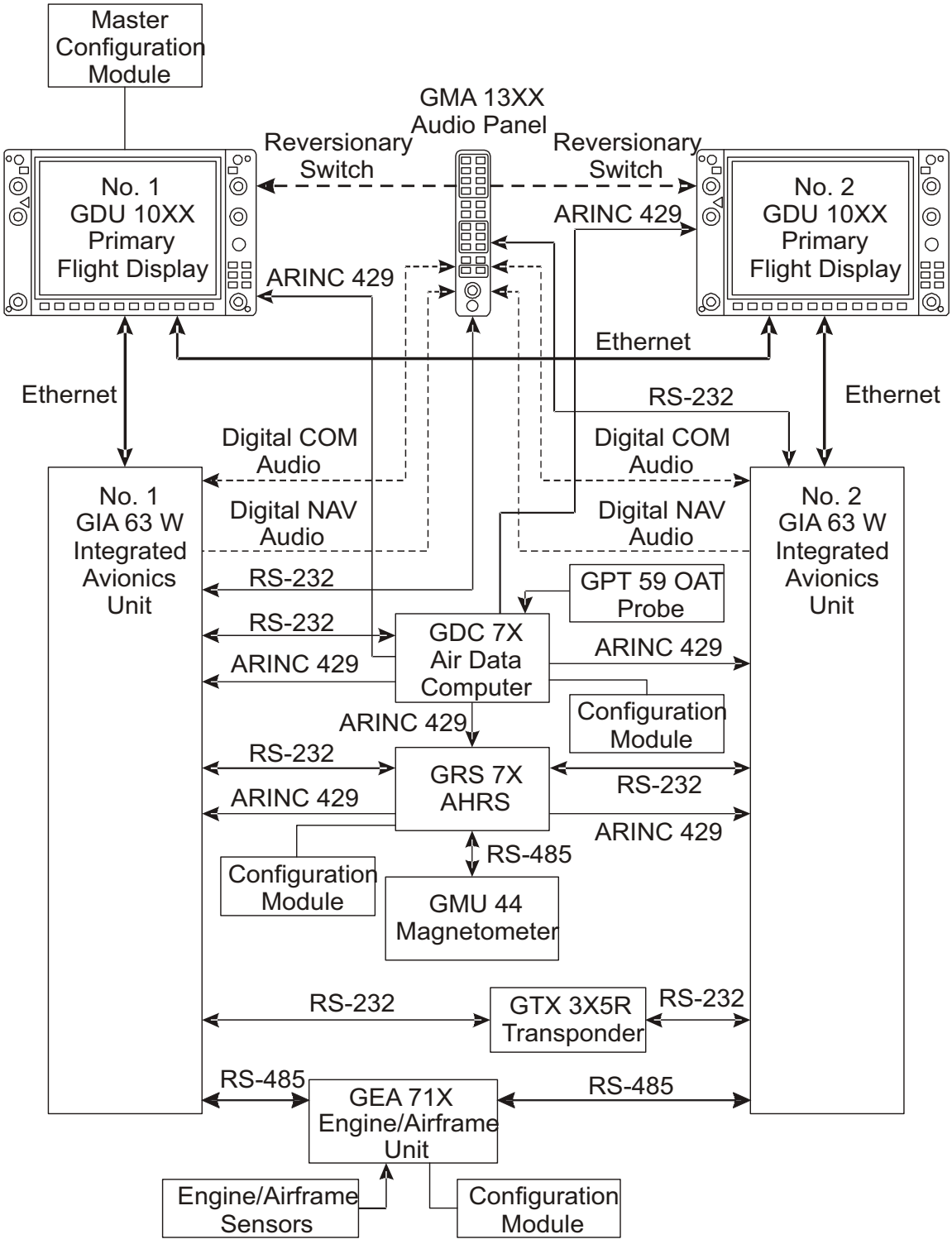

Figure 1 : Integrated Cockpit - System Schematic Diagram

2. **Description**

Figure 2 shows the display screens 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.

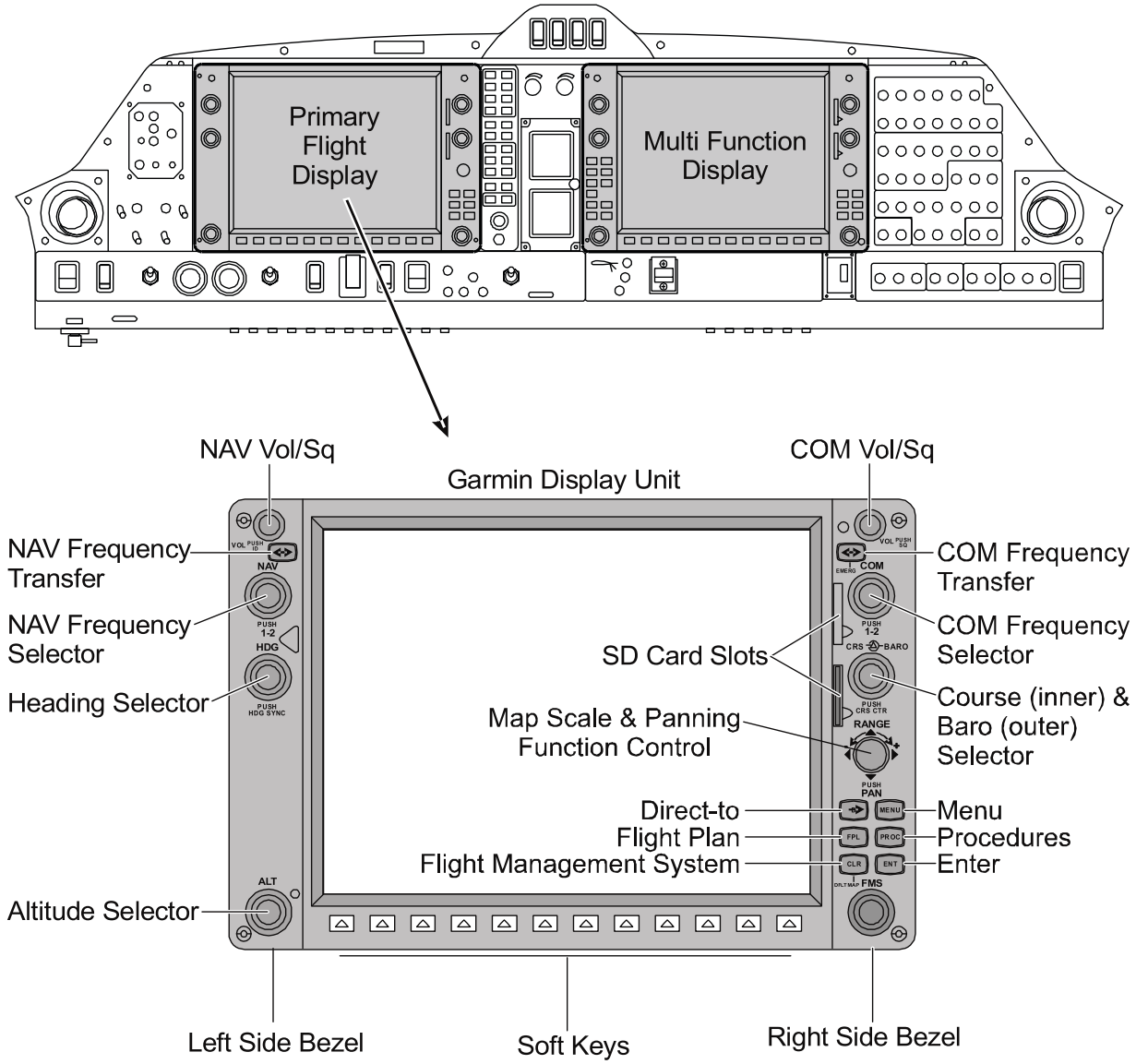

Figure 2 : Garmin G1000 Display Screens and Audio Integrating Unit

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.

- 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.

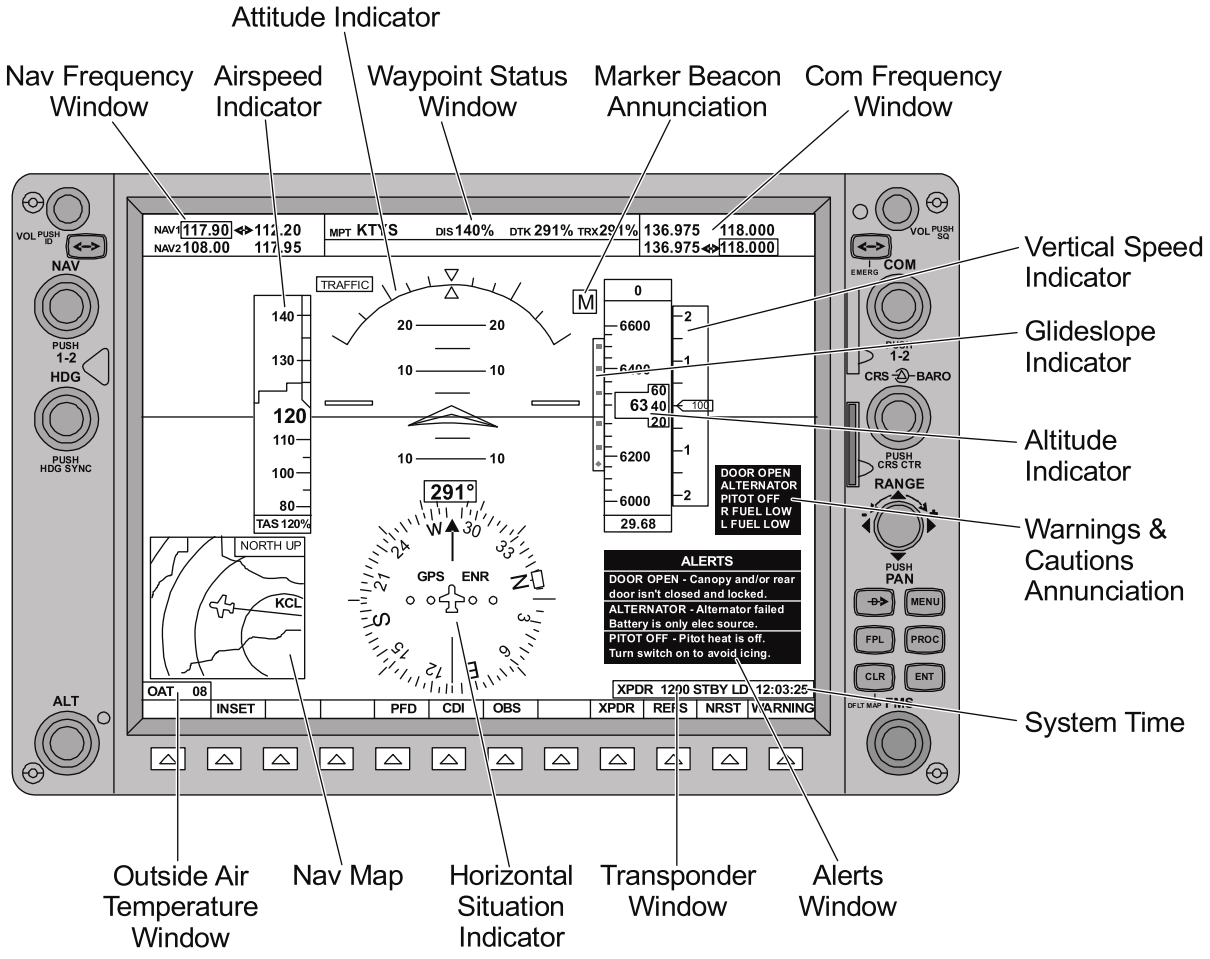

Figure 3 : Primary Flight Display

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 62-254 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 62-254 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 62-254 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 'X' and yellow text spelling out 'VERT SPEED FAIL' (if MÄM 62-254 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 the 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 62-254 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 62-254 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 62-254 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 4A.

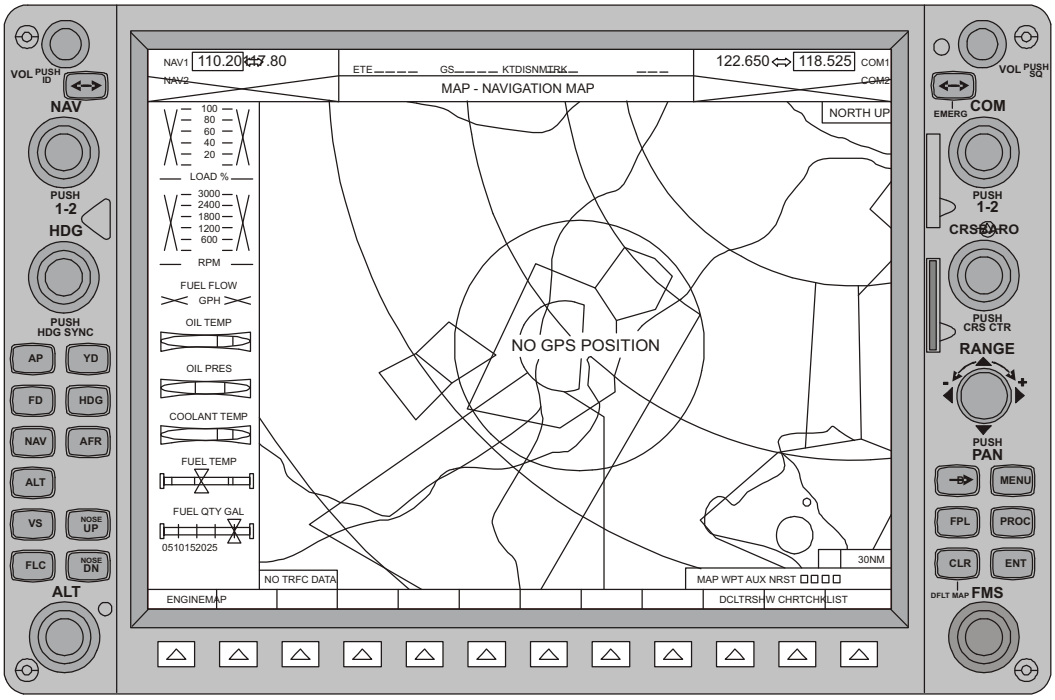

Figure 4: Multi Function Display

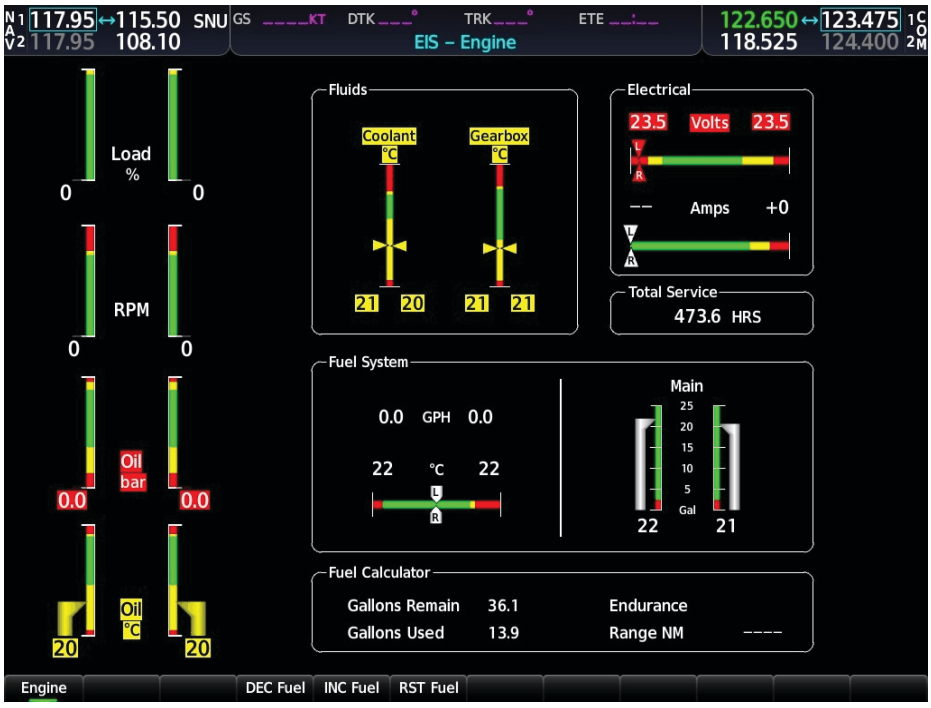

Figure 4A : MFD Full EIS Page

C. GMA 1347 Audio Control Panel.

The GMA 1347 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. The GMA 1347 communicates with both IAUs using RS-232 digital interface. For more data about the audio control panel refer to Section 23-50.

D. GIA 63 W Integrated Avionics Unit (IAU).

The ICS has two GIA 63 W IAUs. The two IAUs are identical and independent. They are both installed in the avionics rack in the fuselage nose. 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 IAUs.

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 in the avionics rack in the fuselage nose.

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 63 W. The GRS communicates with both the GIA 63 Ws and the cockpit dispays via ARINC 429 digital interface. The GRS 77/79 is located 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 63 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 63 Ws. The ADC is located on the instrument panel shelf.

H. GEA 71.

The GEA 71 is a microprocessor based unit that receives and processes signals from airframe and engine sensors. The GEA 71 communicates directly with both IAUs using RS 485 digital interface. The GEA 71 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 be accessed through a panel in the lower surface of the wing.

J. GCU 476 PFD / MFD Control Unit.

The optional PFD / MFD Control Unit is a user interface allowing data entry, PFD / MFD operation and NAV / COM tuning. The PFD / MFD Control Unit is installed in the center armrest.

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 Line Maintenance Manual.

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Maintenance Practices

1. General

These Maintenance Procedures 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 13XX 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 62-003 for data about the approved software configurations.

The specific DA 62 values as to the equipment basic setting are given in the table below:

Item	Basic Setting
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.	Music #1: -20 Music #2: -20 Unswitched in #1: -20 Unswitched in #2: -20 Unswitched in #3: -20 Altitude Warning: -20

Item	Basic Setting
GMA Configuration – Speaker Volume.	Crew Audio 5
GMA Configuration – Master Squelch.	Threshold Value -16
GMA Configuration – Marker Beacon.	HI SENSE THRESHOLD: specific to airplane LO SENSE THRESHOLD: specific to airplane
GMA Configuration – KEYPAD Annunciators.	Disable COM3: set Disable TEL: set Disable DME: specific to airplane Disable ADF: specific to airplane Disable AUX: set Disable SPEAKER: set 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 the 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.	On the right side of the instrument panel.
(3)	Remove the display unit: - Rotate the four 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 201. At the in-line connector.

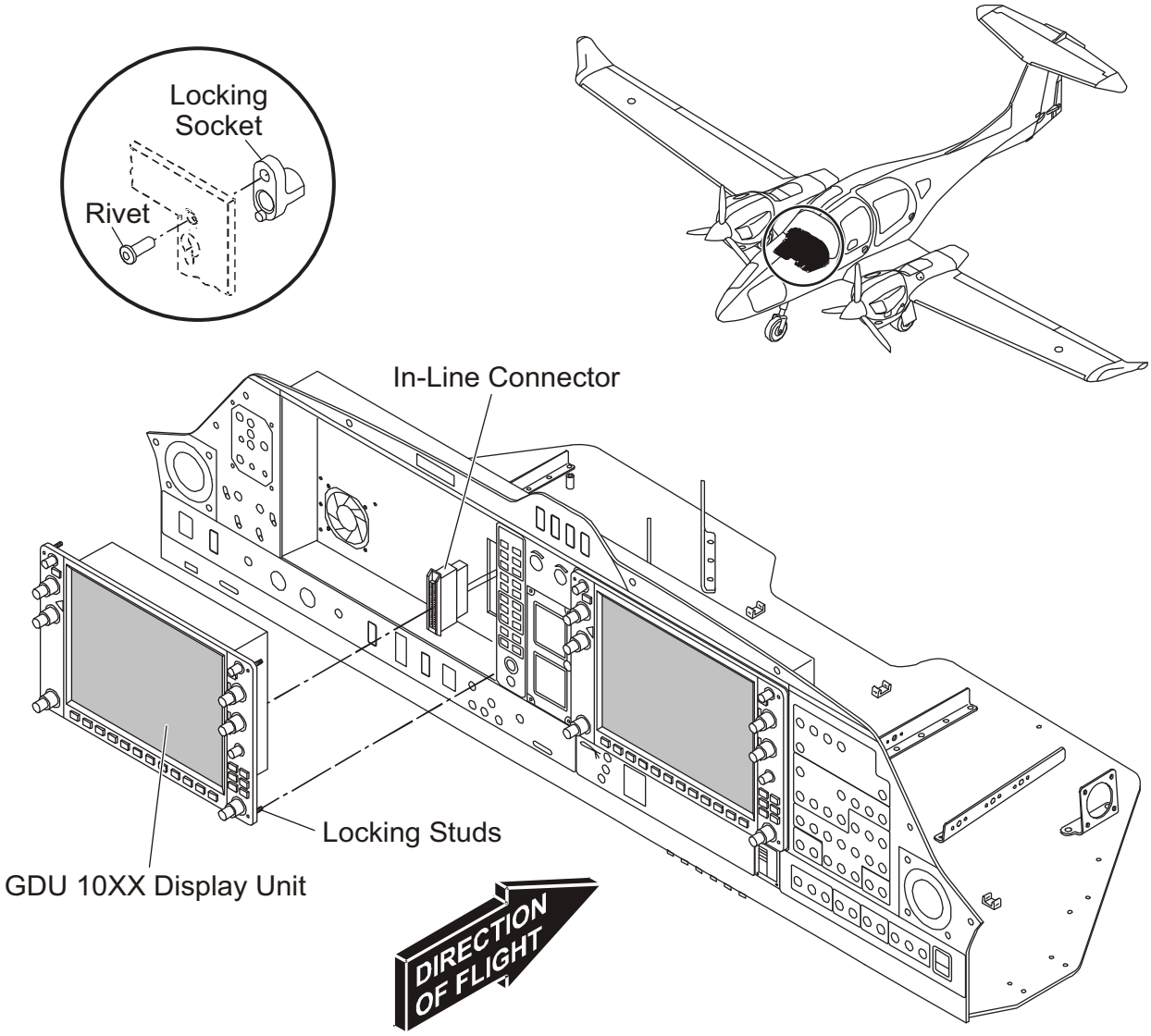

Figure 201 : GDU 10XX Display Unit Installation

B. Install the GDU 10XX Display.

	Detail Steps/Work Items	Key Items/References
(1)	If necessary, set the PFD and MFD circuit-breakers open.	On the right side of the 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 in the instrument panel. - Rotate the four locking studs that attach the display unit to the instrument panel 90° clockwise.	Refer to Figure 201. 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.	On the right side of the 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.

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 avionic bay cover.	
(3)	Remove the HIRF box cover.	This is a High Intensity Radiated Field (HIRF) box which contains electronic components.
(4)	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 202.

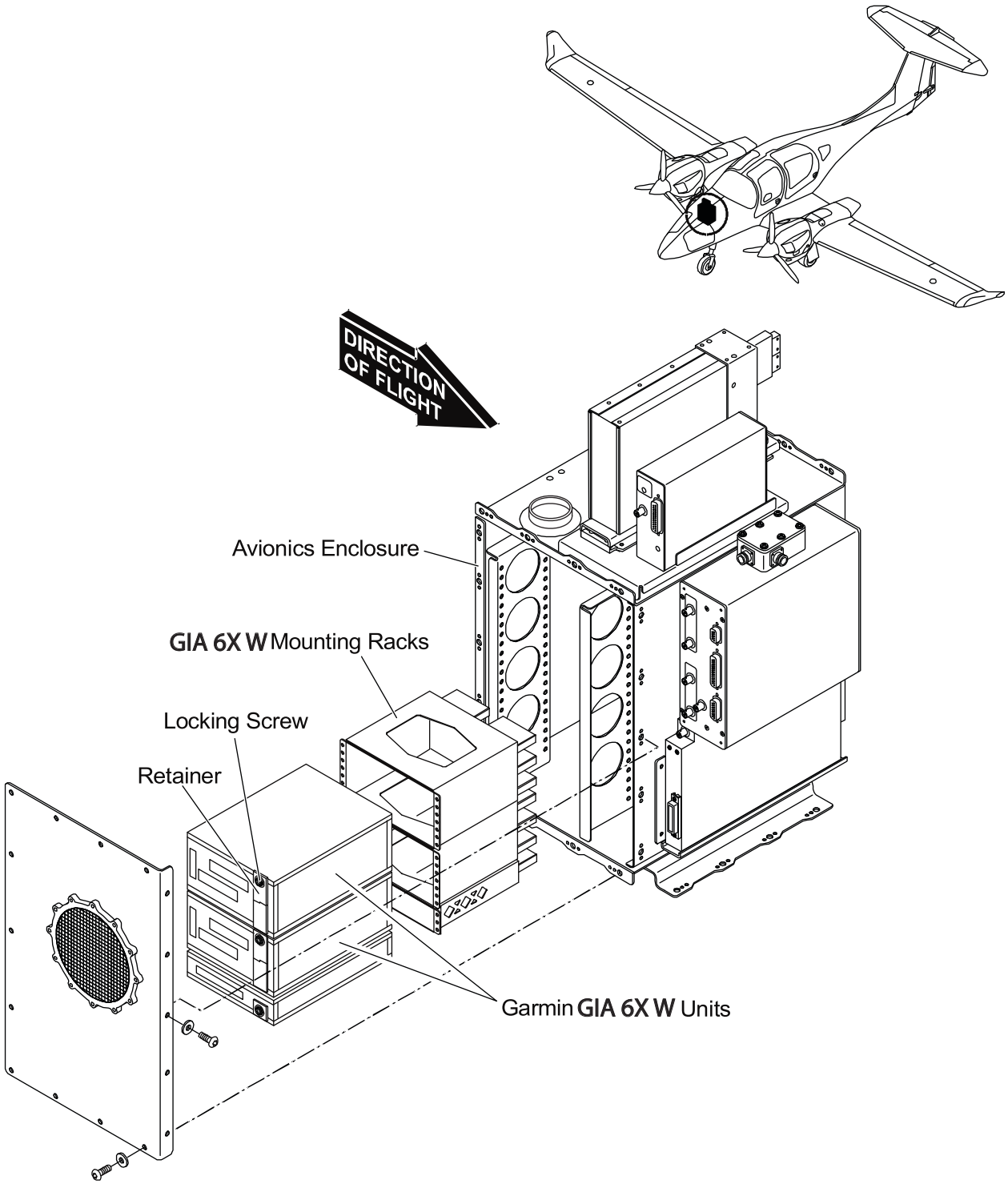

Figure 202 : GIA 6X W Integrated Avionics Unit (IAU) Installation

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.	Refer to Figure 202. Make sure that the unit is seated correctly. Do not force the unit into position!
(2)	Install the HIRF box cover.	
(3)	Install the avionic bay cover.	
(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.

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 avionic bay cover.	
(3)	Remove the HIRF box cover.	This is a High Intensity Radiated Field (HIRF) box which contains electronic components.
(4)	Remove the GTX33/335 R Transponder: - 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 Transponder clear of the mounting rack and the airplane.	Refer to Figure 203.

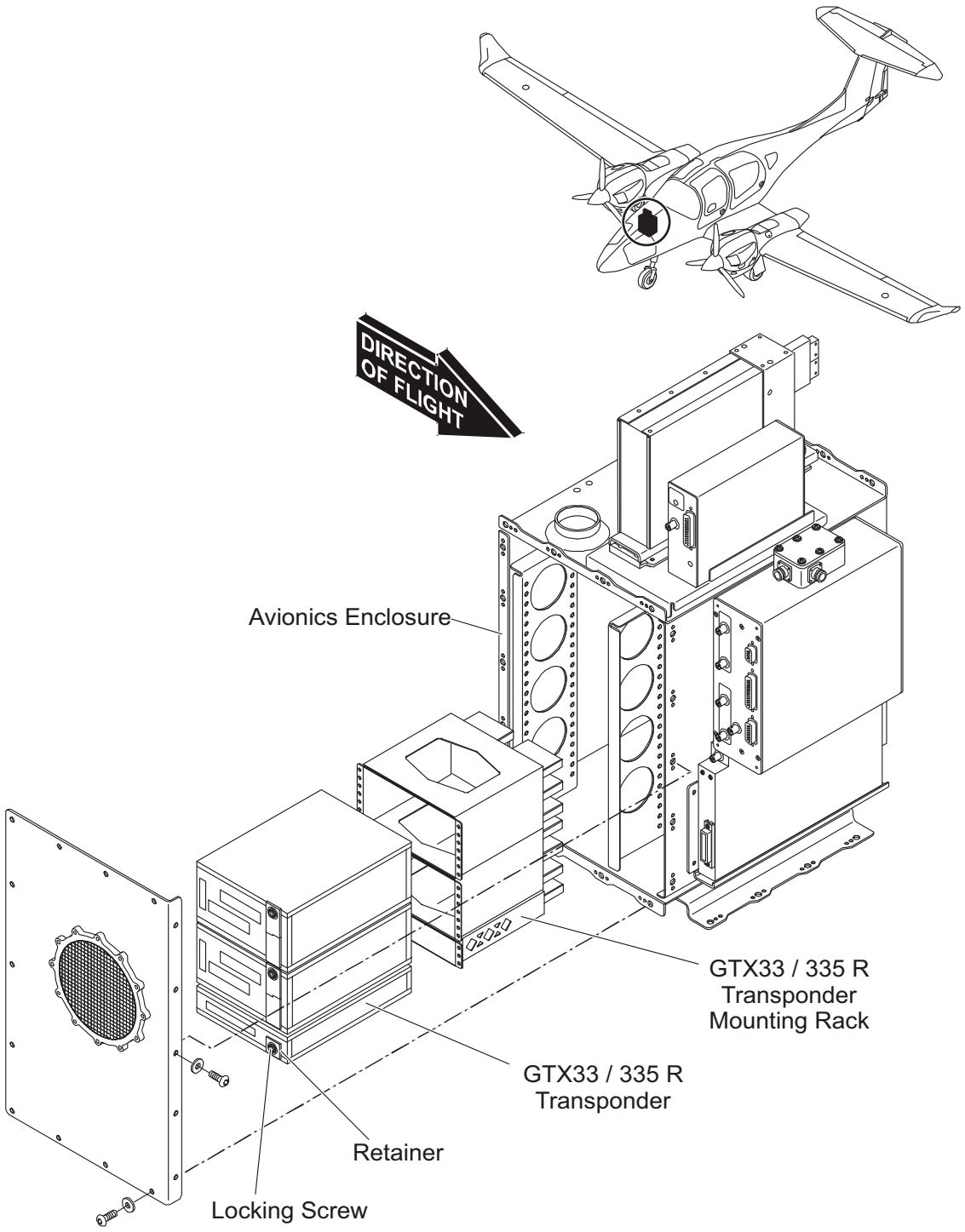

Figure 203 : GTX33/335 R Transponder Installation

B. Install the GTX33/335 R Transponder.

	Detail Steps/Work Items	Key Items/References
(1)	Install the GTX33/335 R Transponder: - Move the GTX33/335 R Transponder 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.	Refer to Figure 203. Make sure that the unit is seated correctly. Do not force the unit into position!
(2)	Install the HIRF box cover.	
(3)	Install the avionic bay cover.	
(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. **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 access panel of the rear baggage compartment.	Refer to Section 25-50.
(3)	Remove the GRS 7X: - Disconnect the electrical cables. - Loosen the four screws or two screws (if MÄM 62-254 is installed) that attach the GRS 7X to the mounting. - Remove the GRS 7X from the airplane.	Refer to Figure 204 or 205.

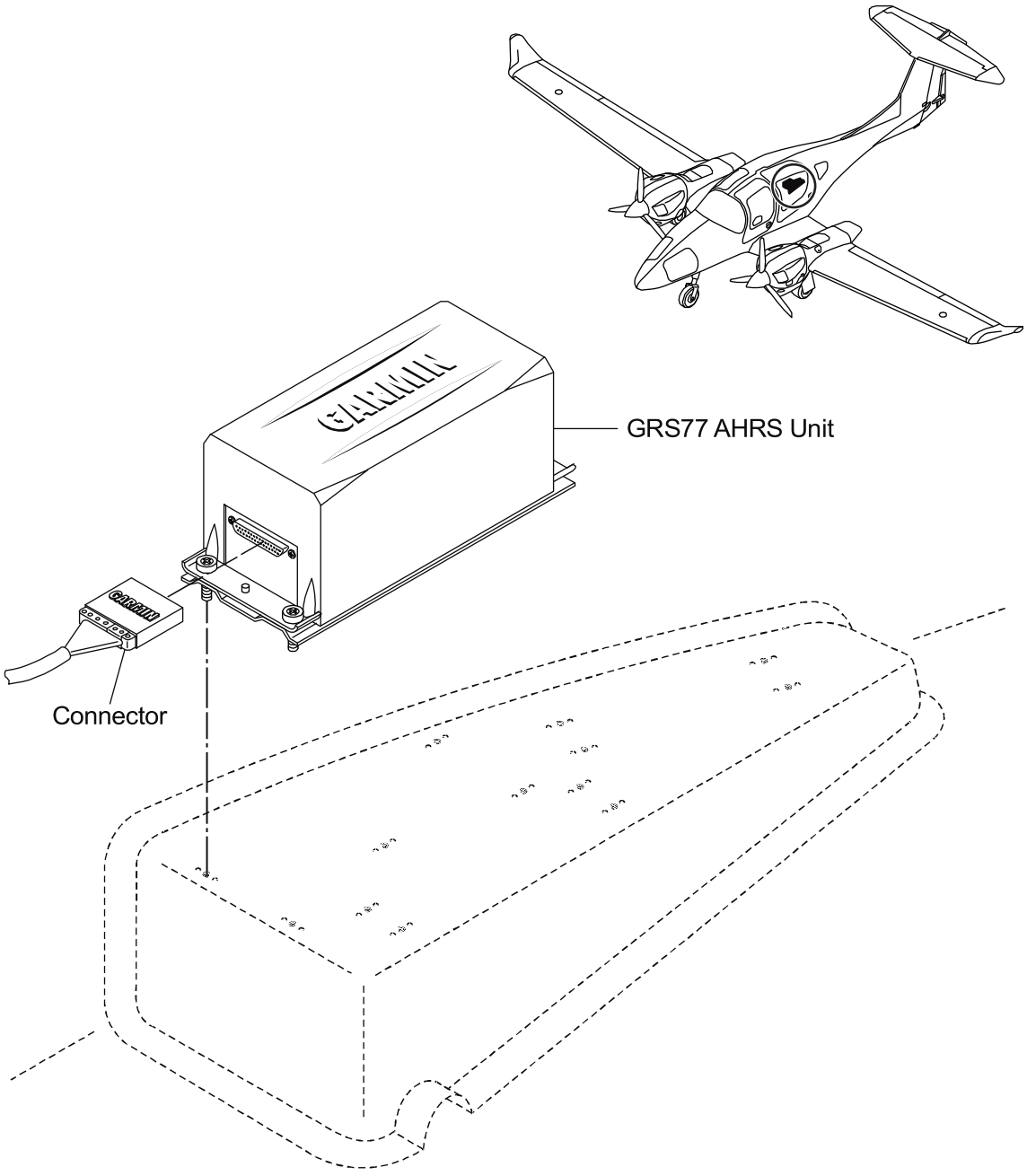

Figure 204 : GRS 77 Attitude, Heading and Reference Unit (AHRS) Installation

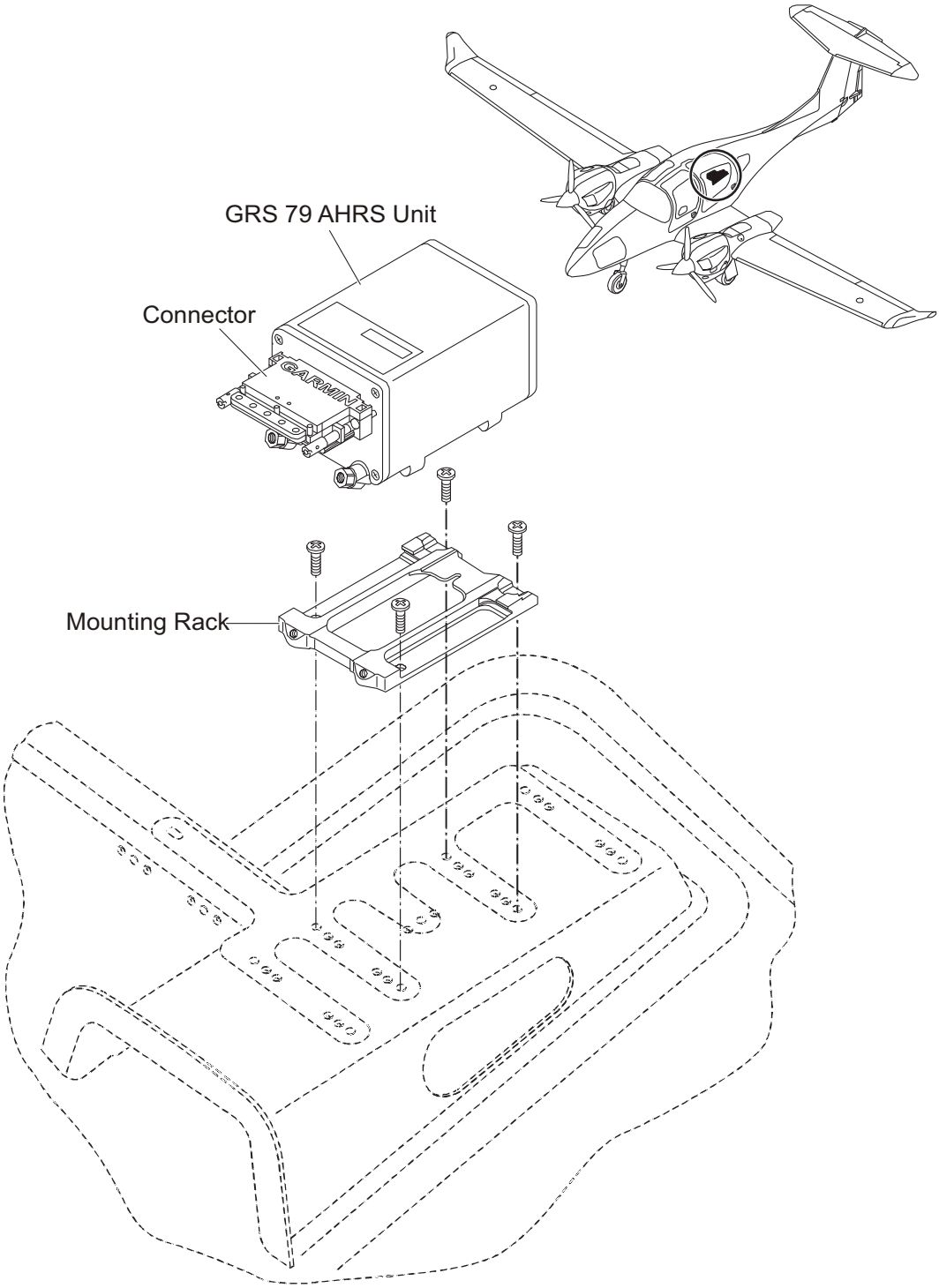

Figure 205 : GRS 79 Attitude, Heading and Reference Unit (AHRS) Installation

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 four screws or two screws (if MÄM 40-868 is installed) that attach the unit to the mount. - Connect the electrical cables.	Refer to Figure 204 or 205. At the in-line connector.
(2)	Install the access panel of 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.

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 two screws of the adapter plate that attaches the GDC 7X to its mounting rack. - Remove the GDC 7X from the airplane.	Refer to Figure 206. Note the connections!

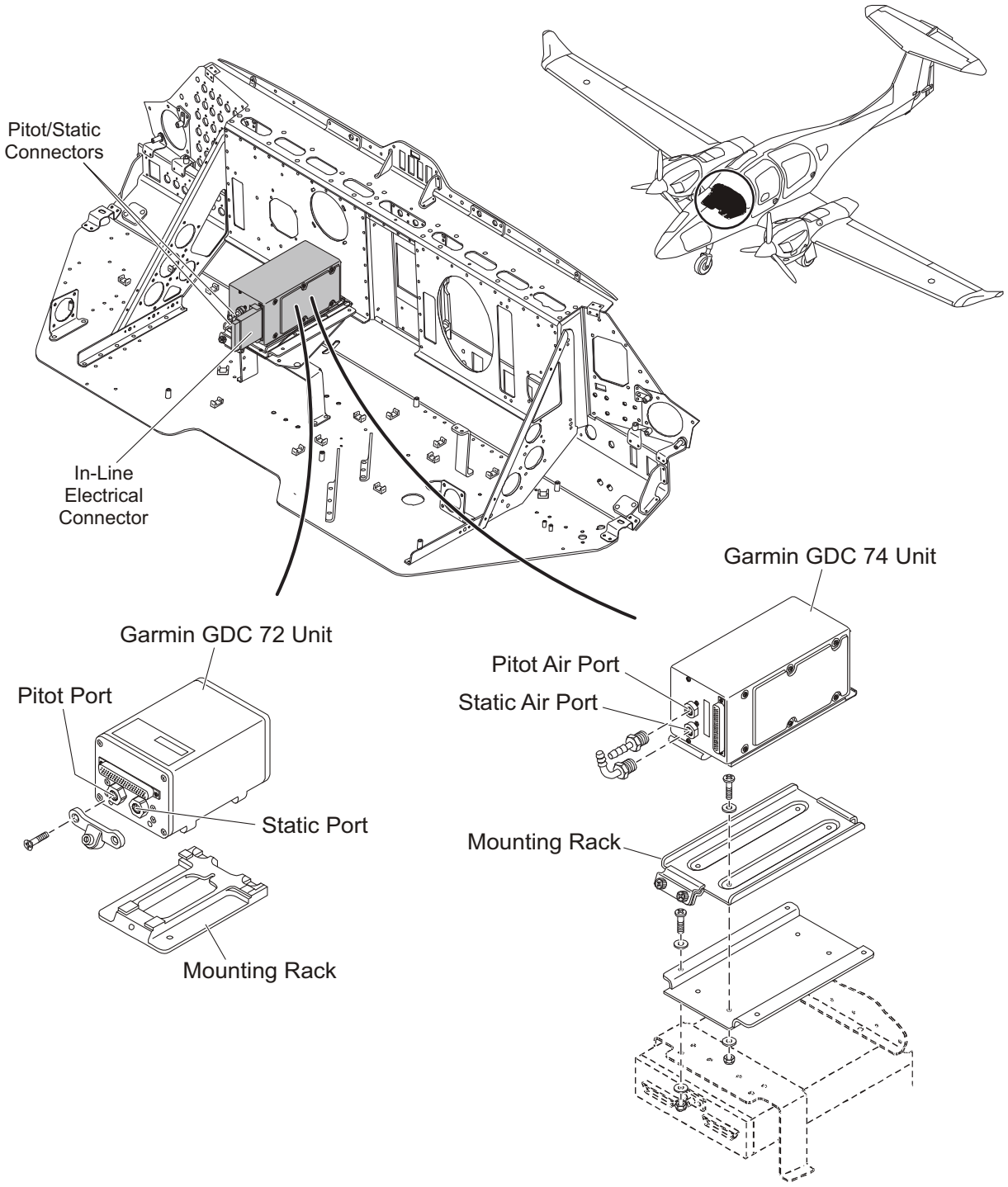

Figure 206 : GDC 7X Air Data Computer (ADC) Installation

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 into position on the mounting rack. - Install the adapter plate and tighten the two screws that attach the GDC 7X to the mounting rack. - Install the Pitot/Static tubes to the unit. - Connect the electrical cables.	Refer to Figure 206. As noted in 6A. Para (3) 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 71X Processor**

A. Remove the GEA 71X Processor.

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the airplane main battery.	Refer to Section 24-31.
(2)	Remove the PFD	Refer to Section 31-40.
(3)	Remove the GEA 71X: - Locate the GEA 71X on the instrument panel shelf. - Release the screw that secures the retainer. - Move the retainer clear and lift the GEA 71X clear of the mounting.	Refer to Figure 207.

B. Install the GEA 71X Processor.

	Detail Steps/Work Items	Key Items/References
(1)	Install the GEA 71X: - Move the GEA 71X into position at its mounting. - Lower the GEA 71X into its mounting. - Install the retainer and secure the retainer with the retaining screw.	Refer to Figure 207.
(2)	Install the PFD.	Refer to Section 31-40.
(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.

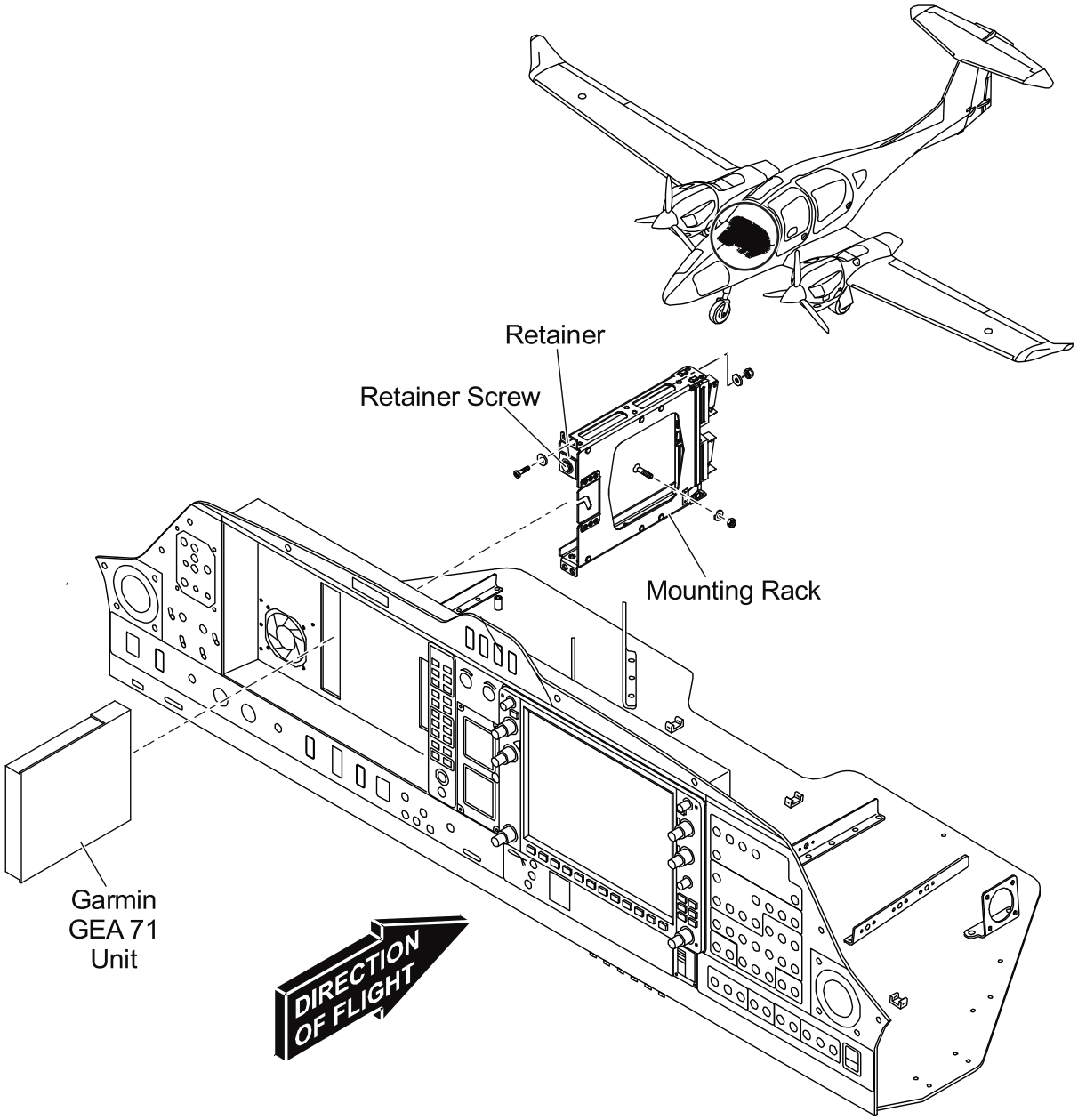

Figure 207 : GEA 71X Processor Installation

8. **Remove/Install the 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 three 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.	Refer to Figure 208. Support the assembly.
(3)	If necessary, remove the magnetometer from the panel.	

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 three screws that attach the magnetometer assembly to the wing.	Refer to Figure 208. 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 self-test procedure.
(3)	Do a magnetometer calibration.	Refer to Paragraph 9.

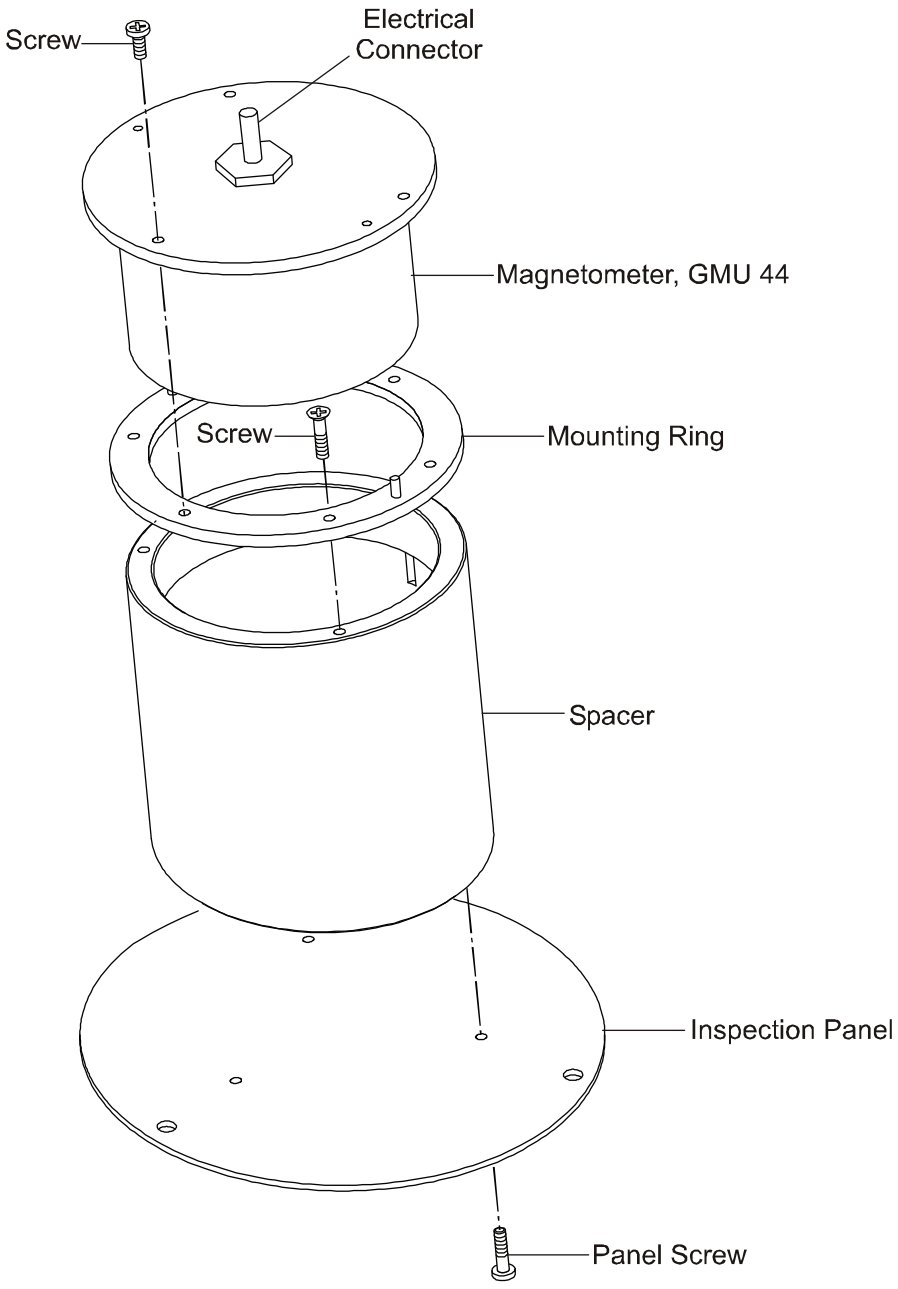

Figure 208 : Magnetometer Assembly Installation

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 (± 5degrees).	
(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.	
(3)	Upon advice to turn, taxi the airplane in a right turn. After approximately 25 degrees to 30 degrees of turn from the last heading the GDU display advises the operator to stop the airplane.	

	Detail Steps/Work Items	Key Items/References
(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 degrees 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 degrees (± 5 degree) 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 G1000 Line Maintenance Manual for more information on the post installation configuration and checkout procedure.

10. **Remove/Install the GCU 476 Control Unit**

A. Remove the GCU 476 Control Unit.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Set the GCU / FLT STRM circuit breaker open.	On the right side of the instrument panel.
(3)	Remove the control unit: - Turn the jackscrew counter-clockwise until the unit disengages from the mounting rack. - Move the control unit up and disconnect the electrical cables. - Move the control unit clear of the center armrest.	Refer to Figure 209. At the in-line connector.

B. Install the GCU 476 Control Unit.

	Detail Steps/Work Items	Key Items/References
(1)	If necessary, set the GCU / FLT STRM circuit breaker open.	On the right side of the instrument panel.
(2)	Install the control unit: - Move the control unit into position at the center armrest. - Connect the electrical cable to the control unit. - Move the control unit into position. - Turn the jackscrew clockwise until the control unit is firmly seated into the rack.	Refer to Figure 209. At the in-line connector. Make sure that you do not trap the electrical cables. Do not over-tighten the jackscrew.
(3)	Reset the GCU /FLT STRM circuit breaker.	On the right side of the instrument panel.
(4)	Do a test for the correct operation of the GCU 476 Control Unit.	

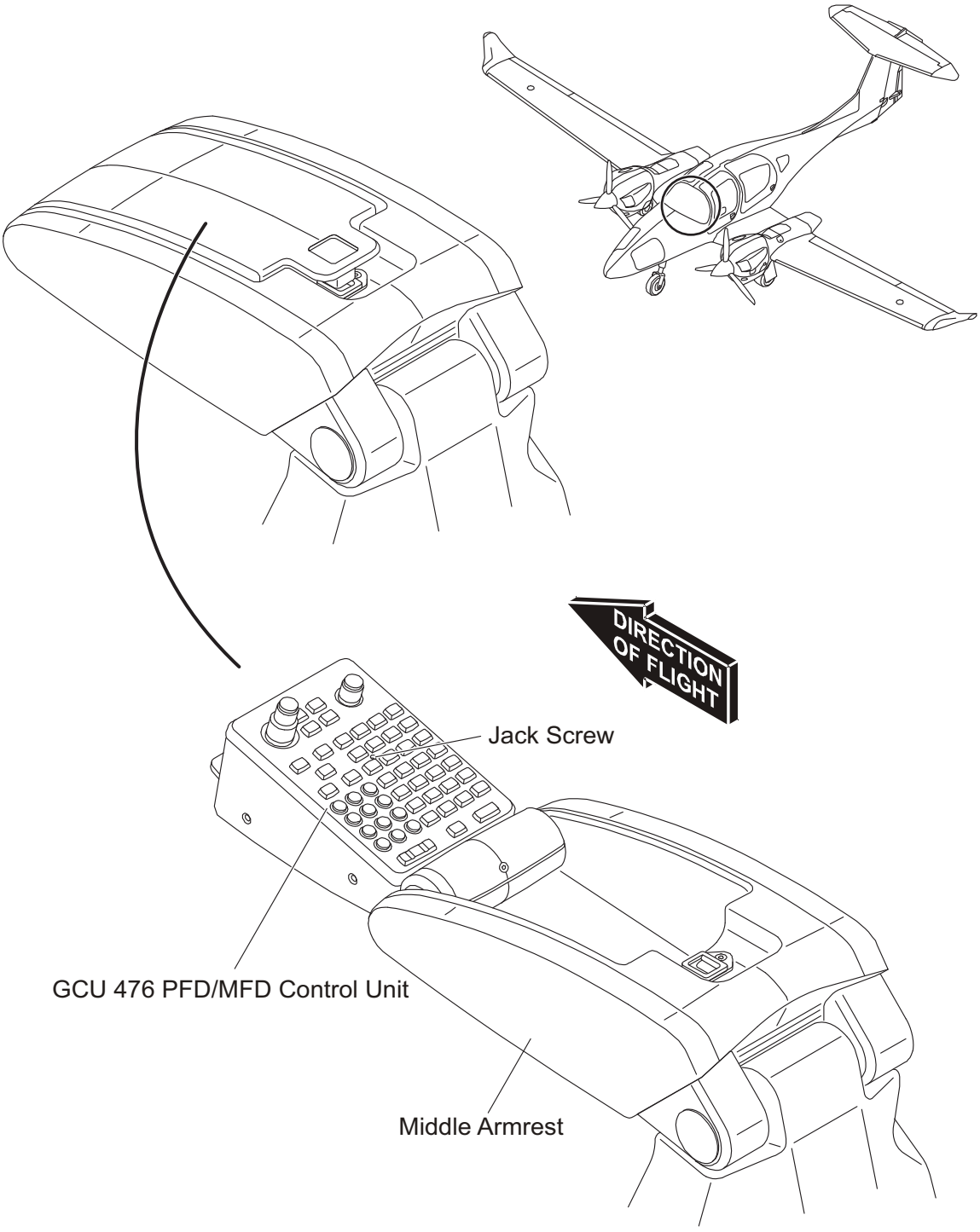

Figure 209 : GCU 476 PFD / MFD Control Unit - Installation

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 62 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 62 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 RH nose baggage compartment.
Refer to Chapter 29 and Section 32-30 for more data about the hydraulic system.

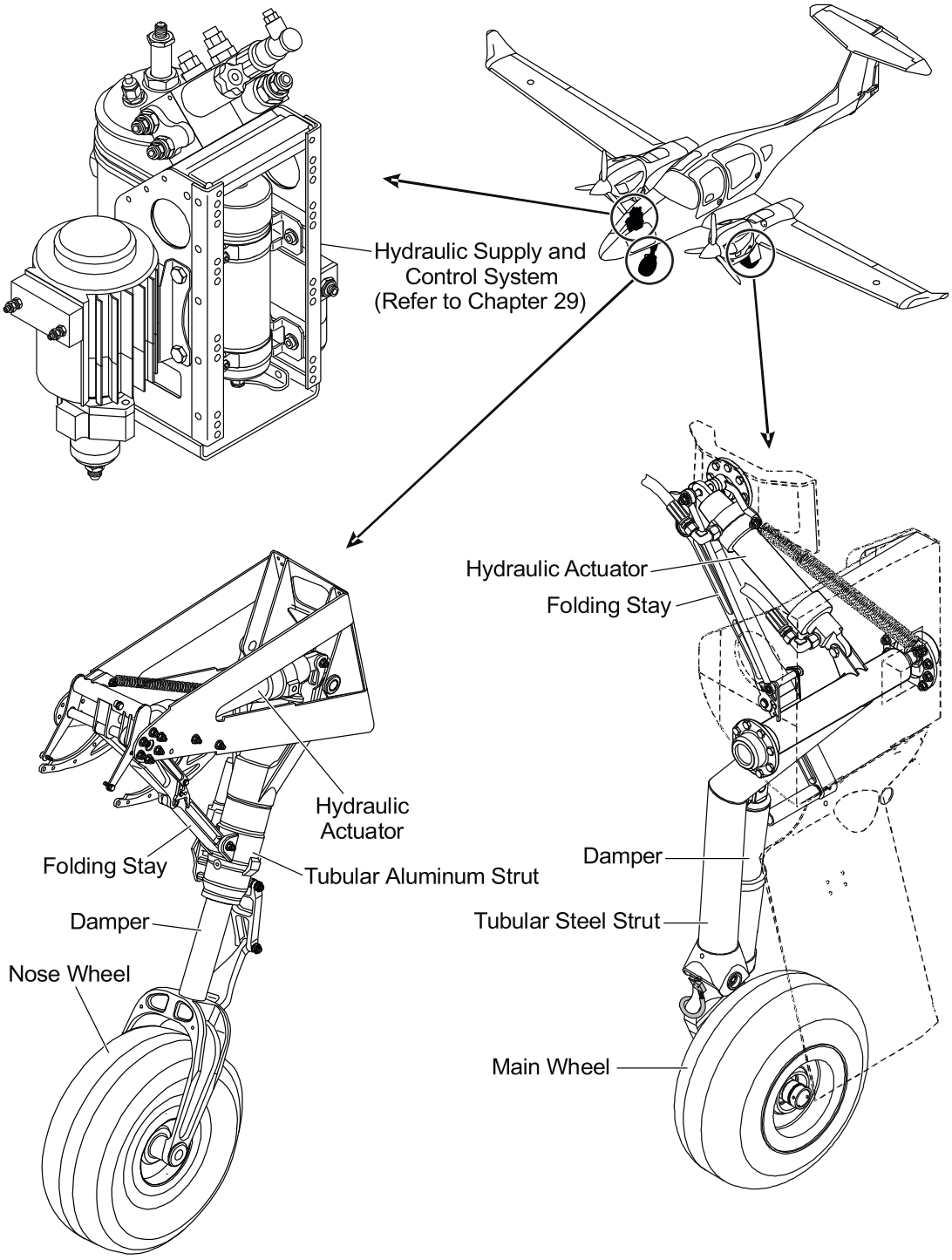

Figure 1 : Landing Gear - Main Components

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.

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.

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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.

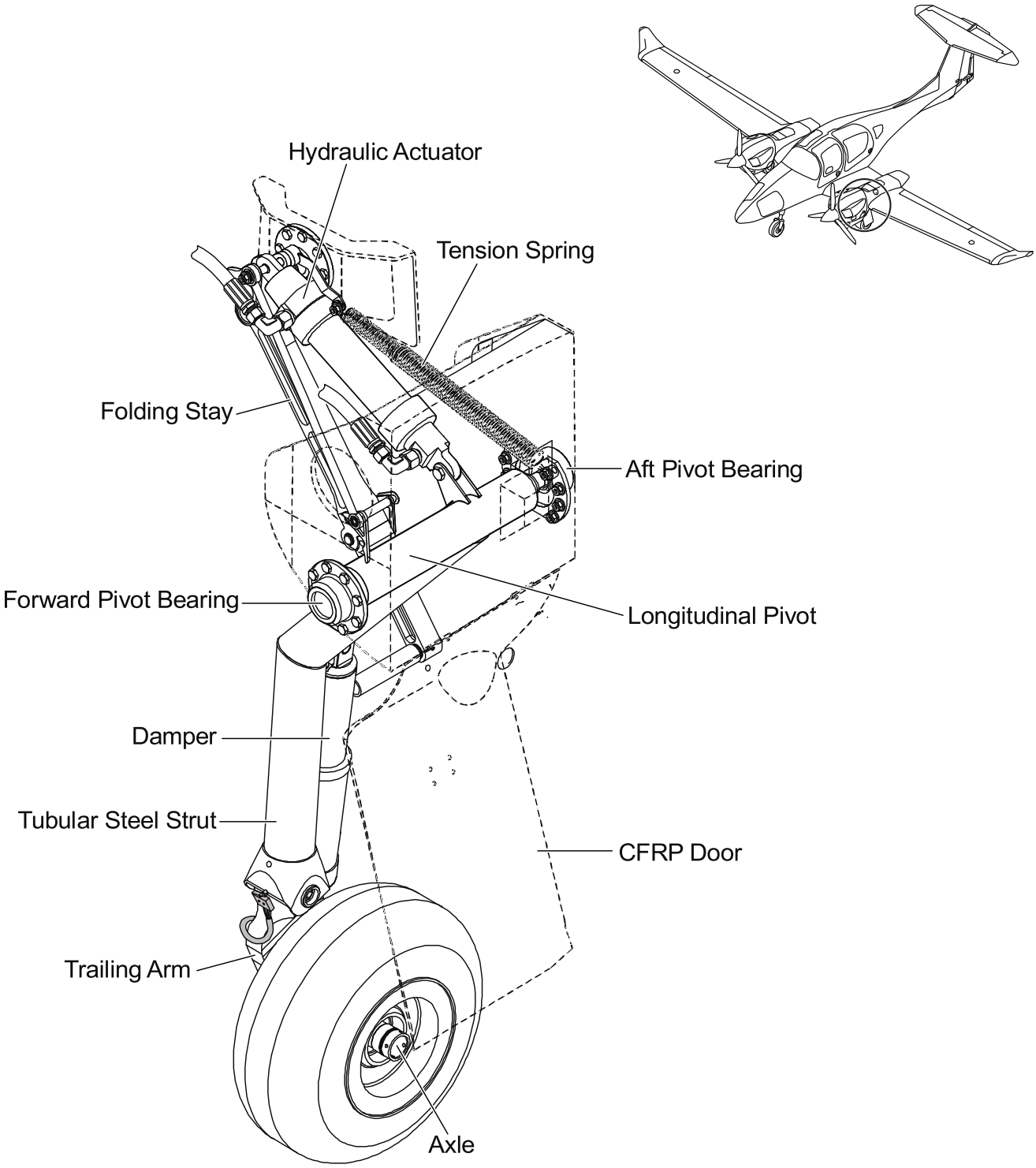

Figure 1 : Main Landing Gear

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 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 stands on ground with one wing low.	Airplane is on uneven ground.	Move the airplane to level ground.
	Heavy landing.	Do a test for heavy landing. Refer to Section 05-50. Replace damaged parts.
	Damper defective.	Replace the defective 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.

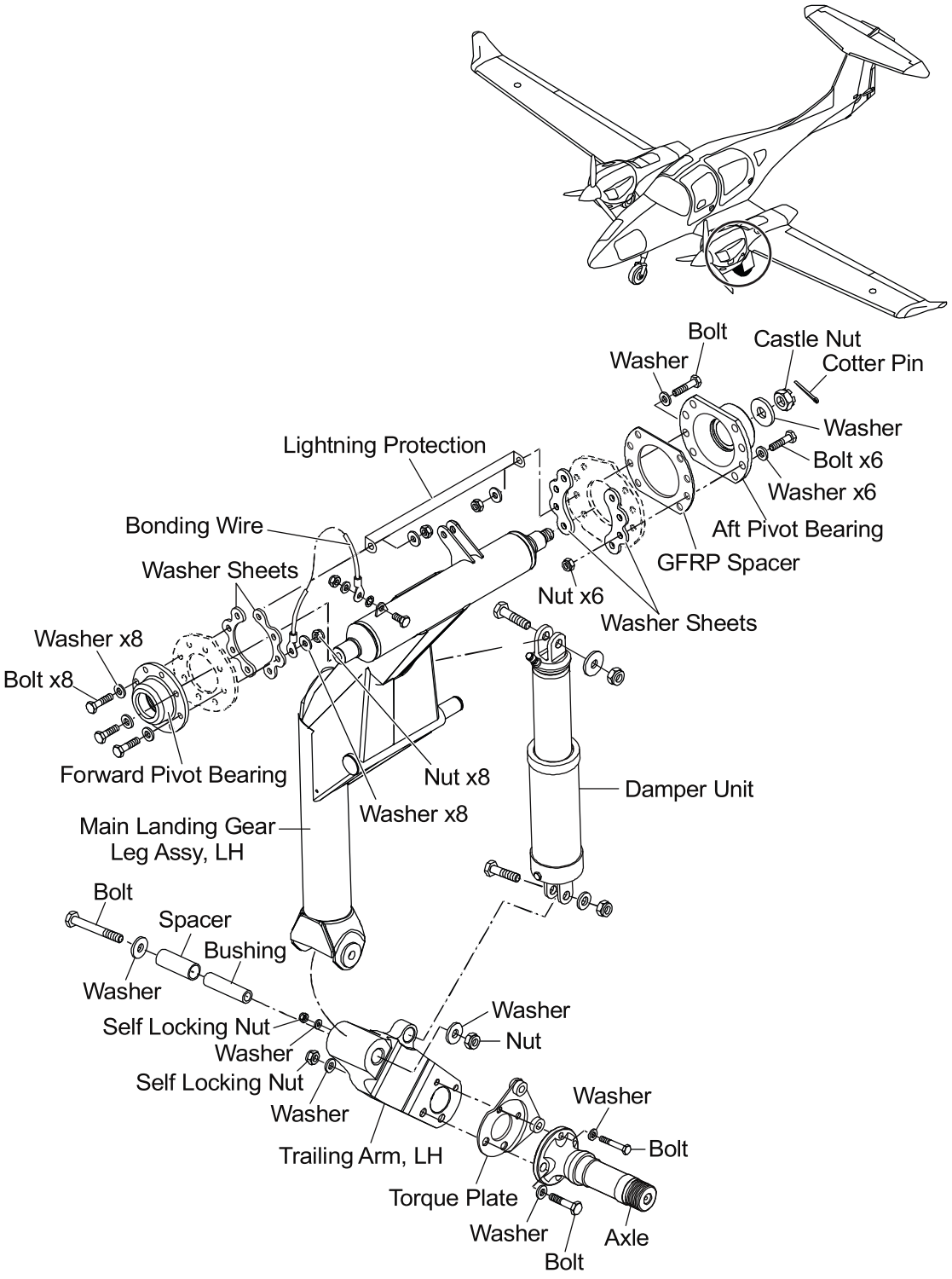


Figure 201 : Main Landing Gear - Leg Assembly

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 trestles.	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 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. Move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
(2)	Bleed the wheel brake 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 32-40.
(3)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.

	Detail Steps/Work Items	Key Items/References
(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 207.
(5)	Remove the brake caliper.	Refer to Section 32-40.
(6)	Remove the main-wheel.	Refer to Section 32-40.
(7)	Remove all cable ties 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 for more information.
(9)	Remove the MLG folding stay switch.	Refer to Section 32-60 for more information.
(10)	Disconnect the folding stay assembly of the MLG.	Refer to Paragraph 8.
(11)	Remove the rear bearing housing: - Remove the cotter-pin from the castle nut. - Remove the castle nut. - Remove the seven bolts, nuts and washers which hold the bearing housing onto the fuselage. - Remove the bolt, three washers, two 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 201, 202 and 203. Support the main gear leg and make sure not to scratch the surface.
(12)	Remove the fuel filter element.	Refer to Section 28-20.

	Detail Steps/Work Items	Key Items/References
(13)	Optional: Remove the flexible heat pipe from the clamp to gain more space to reach the front bearing housing.	
(14)	Remove the front bearing housing: - Remove the eight bolts, nuts and washers which hold the bearing housing onto the fuselage. - Remove one bonding wire and one lightning protection sheet. - Use the bearing housing puller to get the bearing housing off the longitudinal pivot.	Refer to Figures 201 and 203.
(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 housing. - Move the leg clear of the airplane.	Refer to Figures 201 and 203.

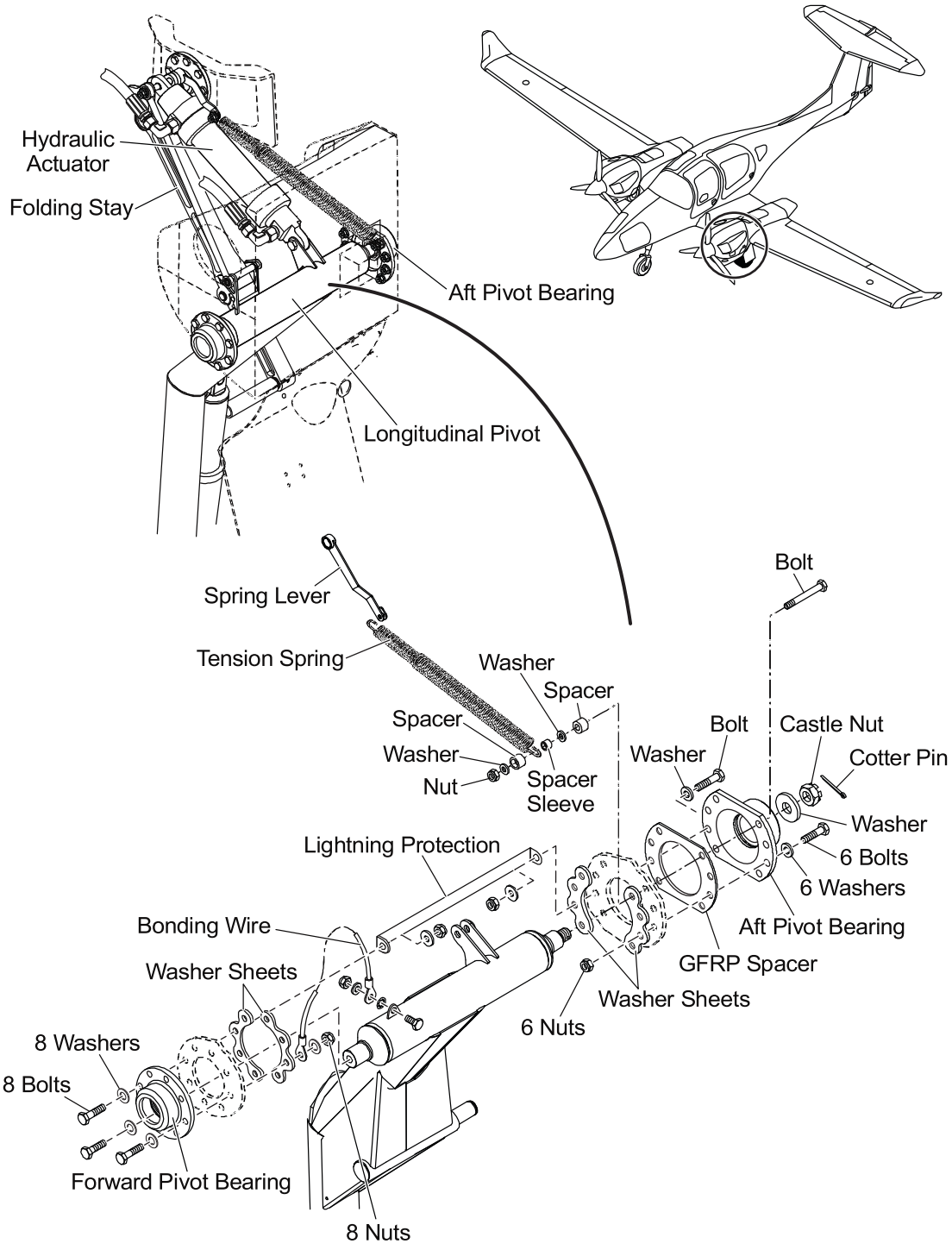


Figure 202 : Main Landing Gear Installation

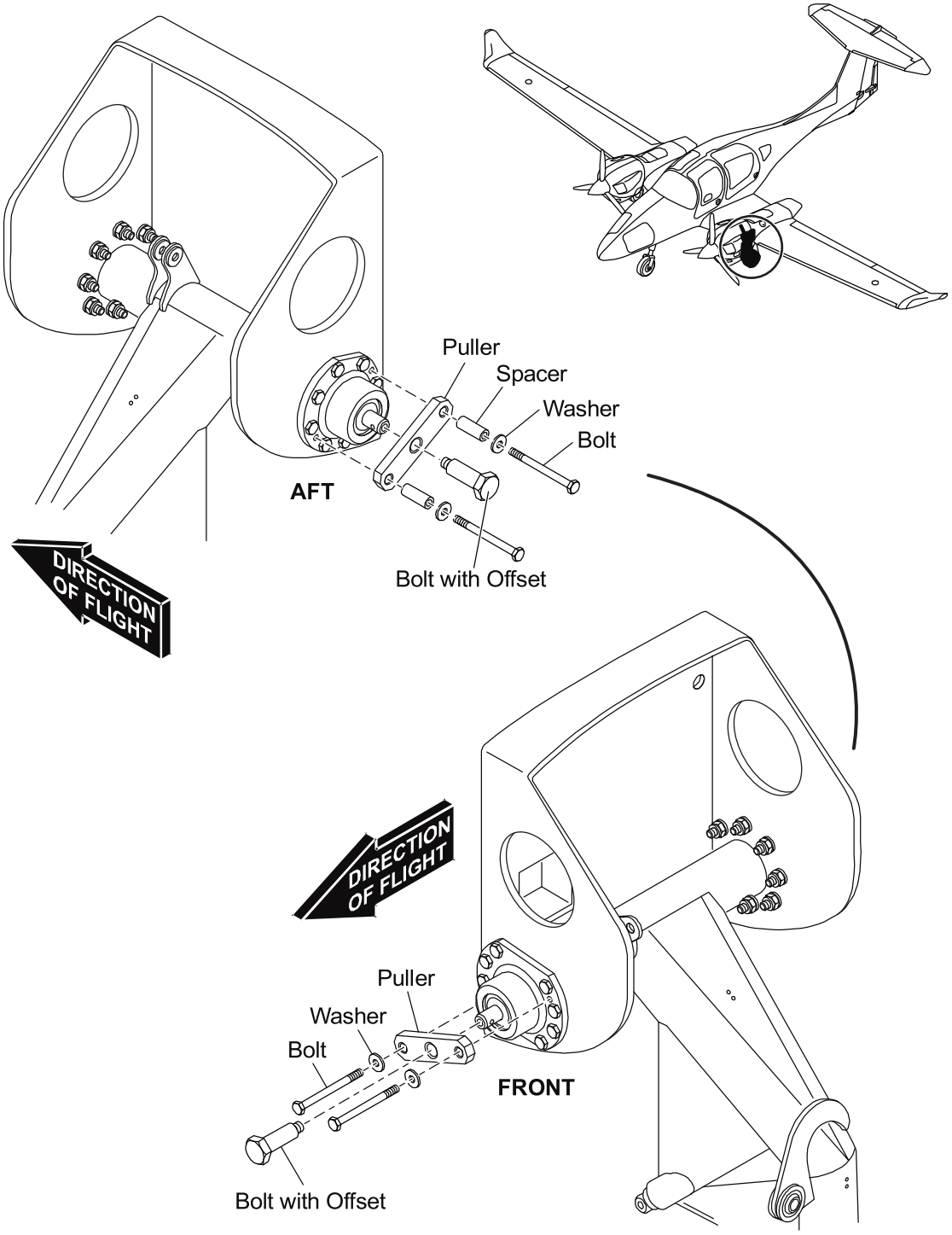


Figure 203 : Removal of the Main Landing-Gear Leg

C. Install the Main Gear Leg.

	Detail Steps/Work Items	Key Items/References
(1)	Install the main gear leg: - 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. For wet installation of components use CA 1000.
(2)	Install the front bearing housing: - Use the front bearing centering tool to push the bearing housing onto the longitudinal pivot. - Install the eight bolts, nuts, washer and sheets which secure the bearing housing onto the fuselage.	Refer to Figures 201, 202 and 203. Use new self-locking nuts. Take care to reinstall the bonding wire and lightning protection sheet.
(3)	Install the rear bearing housing: - Use the aft bearing centering tool to push the bearing housing onto the longitudinal pivot. - Install the seven bolts, nuts, washers and sheets which secure the bearing housing onto the fuselage. - Install the bolt, three washers, two 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 Figures 201, 202 and 203. For wet installation of components use CA 1000. Use new self-locking nuts. Take care to reinstall the lightning protection sheet. Use a new self-locking nut. 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 8.
(7)	Install the main gear wheel.	Refer to Section 32-40.

	Detail Steps/Work Items	Key Items/References
(8)	Install the brake caliper.	Refer to Section 32-40.
(9)	Bleed the wheel brake system.	Refer to Section 32-40.
(10)	Install the weight on wheels switch	Refer to Section 32-60 for more information.
(11)	Install the MLG folding stay switch.	Refer to Section 32-60 for more information.
(12)	Adjust the weight on wheels switch and the MLG folding stay switch.	Refer to Section 32-60 for more information.
(13)	Install all cable ties to secure the electrical cables and the flexible brake hose.	
(14)	Reset the GEAR circuit breaker.	On the right side of instrument panel.
(15)	Adjust the wheel in retracted position and check MLG door pre-load.	Refer to Paragraph 11.
(16)	Move the wing and rear fuselage trestles clear of the airplane.	
(17)	Lower the airplane on jacks.	Refer to Section 07-10.

3. **Disassemble/Assemble a Main Landing Gear Leg**

A. Equipment.

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestles.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Disassemble a 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 a main landing gear leg.	Refer to Section 32-10, Para 2.B.
(2)	Optional: If not removed before, remove the main gear wheel.	Refer to Section 32-40.
(3)	Remove the main landing 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.	Refer to Figure 201.
(5)	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.	Refer to Figure 201.

C. Assemble a 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.	Refer to Figure 201. Use new self locking nuts.
(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.	Refer to Figure 201. Use a new self locking nut.
(4)	Install the lower end of the damper to the main landing gear leg.	Refer to Paragraph 6.B.

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 the damper assemblies 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 trestles.	2	Commercial.
Rear fuselage trestle.	1	Commercial.
Nose trestle.	1	Commercial.
Bent valve extension.	1	Commercial.

B. Material.

Item	Quantity	Part Number
CAUTION: DO NOT MIX OR REPLACE HYDRAULIC FLUIDS OF DIFFERENT TYPES OR MANUFACTURERS.		
NOTE: A placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes have been manufactured with hydraulic Fluid per 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.	Hydraulic Fluid per MIL-PRF-5606 H or AMG-10 (GOST 6794-75 Amdt 1-5), see the CAUTION above.
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.**

WARNING: **ALWAYS WEAR SAFETY GLASSES TO PREVENT EYE DAMAGE.**

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 and tag to prevent inadvertent operation.	On the right side of instrument panel.
(2)	Raise the airplane on jacks. Move the wing and rear fuselage trestles into position to support the airplane.	Refer to Section 07-10.
	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.**	

	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.	Refer to Figure 204.
(4)	Compress the damper assembly.	
(5)	Remove the core of the charging valve from 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: A placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes have been manufactured with Hydraulic Fluid per 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 hydraulic fluid per MIL-PRF-5606 H or AMG-10 (GOST 6794-75 Amdt 1-5) hydraulic fluid (see CAUTION above).
(8)	Extend the damper assembly slowly by hand to allow the hydraulic fluid to fill the damper assembly.	
(9)	Compress and extend the damper not less than six times to release the air from the damper and allow the hydraulic fluid to flow into the damper.	
(10)	Compress the damper completely and then extend it again to damper length 336.5 mm (13.25 in). Close the bottle and remove the tube from the charging valve.	Keep the damper in that position. Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
NOTE: Take care to extend the damper 336.5 mm (13.25 in). This is necessary for correct damper characteristic of the MLG.		
(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.	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.	On the 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.

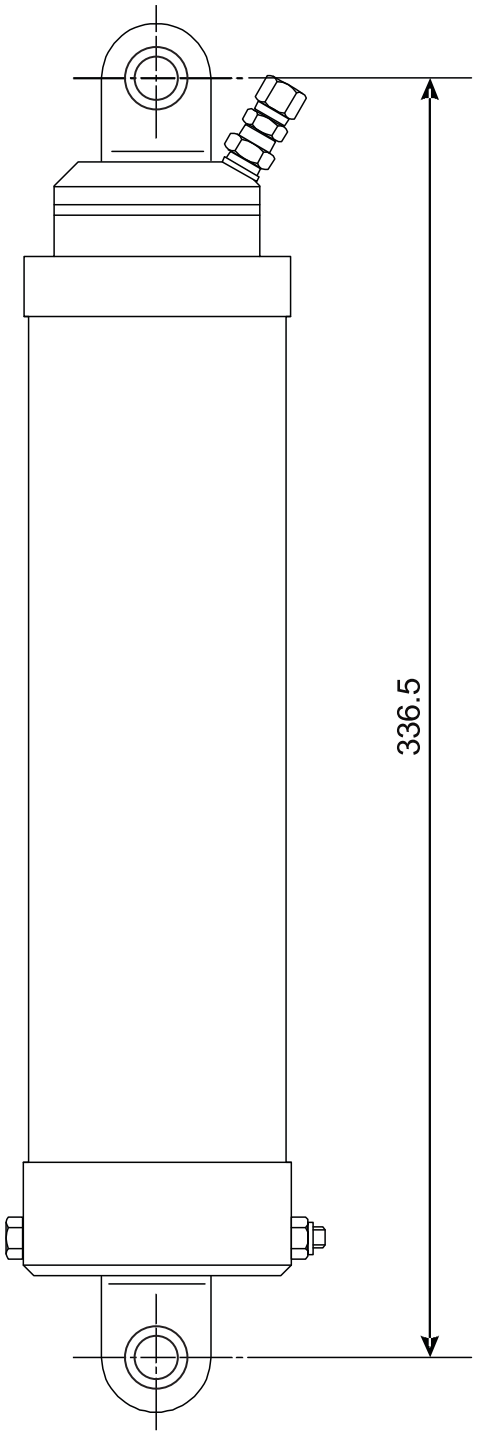


Figure 204 : Fill/Charge the Damper

D. Hydraulic Fluid Change.

	Detail Steps/Work Items	Key Items/References
	NOTE: If the damper is disassembled, clean the inner surface of the damper and fill with approved hydraulic fluid. 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 three times.	Refer to Paragraph 4.C.
(2)	Apply the hydraulic fluid placard and mark the used fluid.	Refer to Figure 205. Mark hydraulic fluid type by punching.

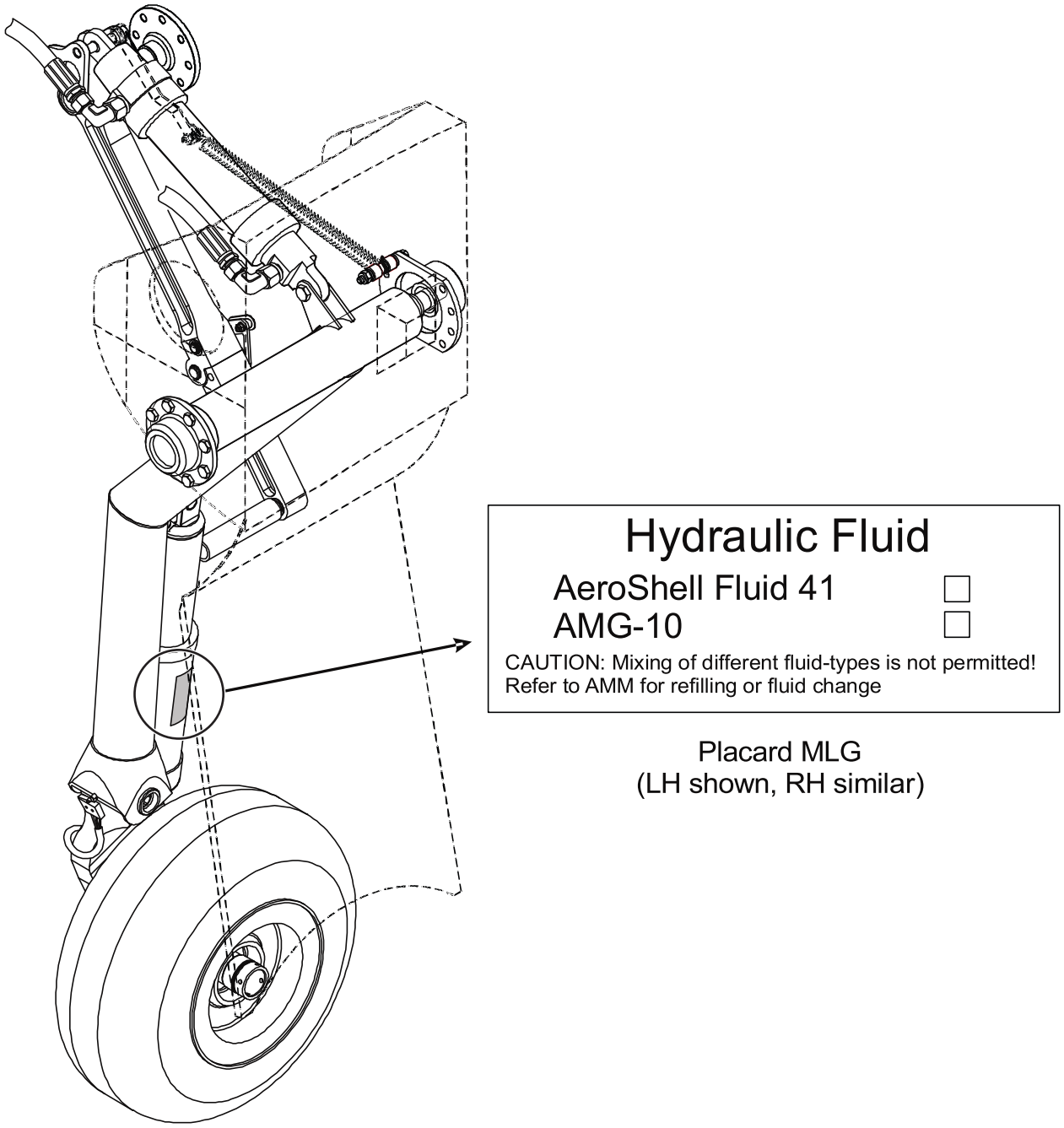


Figure 205 : Position of the Hydraulic Fluid Placard - Main Landing Gear Dampers

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	18.5 cm (7.3 inches)	20 bar (290 PSI).
RH	18.5 cm (7.3 inches)	20 bar (290 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.** **WARNING: DO NOT GET HYDRAULIC FLUID ON YOUR SKIN OR YOUR CLOTHES. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.** **WARNING: ALWAYS WEAR SAFETY GLASSES TO PREVENT EYE DAMAGE.**	
(1)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.
(2)	Raise the airplane on jacks. 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.	Refer to Figure 204.
(4)	Remove the nut, washer and bolt that attach the top of the damper to the main gear leg.	Refer to Figure 201.
(5)	Remove the 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.	Label the damper's location of installation (LH/RH), if both dampers are removed.

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.	Make sure to use the correct damper for the LH and RH side.
	NOTE: Different damper lengths may be used on LH and RH MLG of the airplane. The damper length is used to adjust the clearance of the wheel in the MLG bay.	
(2)	Install the nut, washer and bolt that attach the bottom of the damper to the trailing arm.	Use a new lock nut. Wet installation of bolt with CA 1000. Take care to reinstall the two plastic washers between the spherical bearing and damper.
(3)	Install the nut, washer and bolt that attach the top of the damper to the main gear leg.	Use a new lock nut. Wet installation of bolt with CA 1000. Take care to reinstall the two plastic washers between the spherical bearing and damper.
(4)	Fill the damper if necessary.	Refer to Paragraph 4.
(5)	Charge the damper.	Refer to Paragraph 4.
(6)	Remove the wing and rear fuselage trestles.	
(7)	Lower the airplane with the jacks.	Refer to Section 07-10.
(8)	Reset the GEAR circuit breaker.	On the right side of instrument panel.

These damper lengths are available:

P/N	Extended Length	Distance Ring P/N	Height
D67-3210-10-00	507.5 mm	D67-3210-10-04	2 mm
D67-3210-10-00x01	505.5 mm	-	-
D67-3210-10-00x02	510.5 mm	D67-3210-10-05	5 mm

7. **Disassemble/Assemble a Main Landing Gear Damper**

A. Disassemble a Main Landing Gear Damper

Refer to Figure 206.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the main landing gear damper.	Refer to Section 32-10-00 Para 6.A.
(2)	Make sure that the nitrogen pressure has been released 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.	
(3)	Release the hydraulic fluid from the damper: - Install a drain hose onto the charging valve of the damper. - Compress the damper to drain the fluid.	Use a suitable container to catch the damper fluid (approx. 0.5 liter [0.13 US gal])
(4)	Remove the charging valve from the damper.	
(5)	Remove the bottom cap from the damper: - Remove the cross bolt, two washers and the lock nut. - Pull the bottom cap from the damper assembly. - Remove the O-ring from the cap.	Discard the lock nut. Be careful not to damage the bottom cap. Discard the O-ring.
(6)	Disassemble the MLG damper tube: - Slide the inner tube out of the outer tube. - Remove the seal and bearing ring from the outer and inner tubes.	Make sure not to damage the parts.
(7)	Disassemble the inner tube: - Remove the lock nut below the middle cap and pull the middle cap from the inner tube. - Loosen the top cap from the inner tube and pull the top cap with the center bolt from the inner tube. - Remove the O-ring from the top cap.	Be careful not to damage the middle cap. Discard the lock nut. Discard the O-ring.

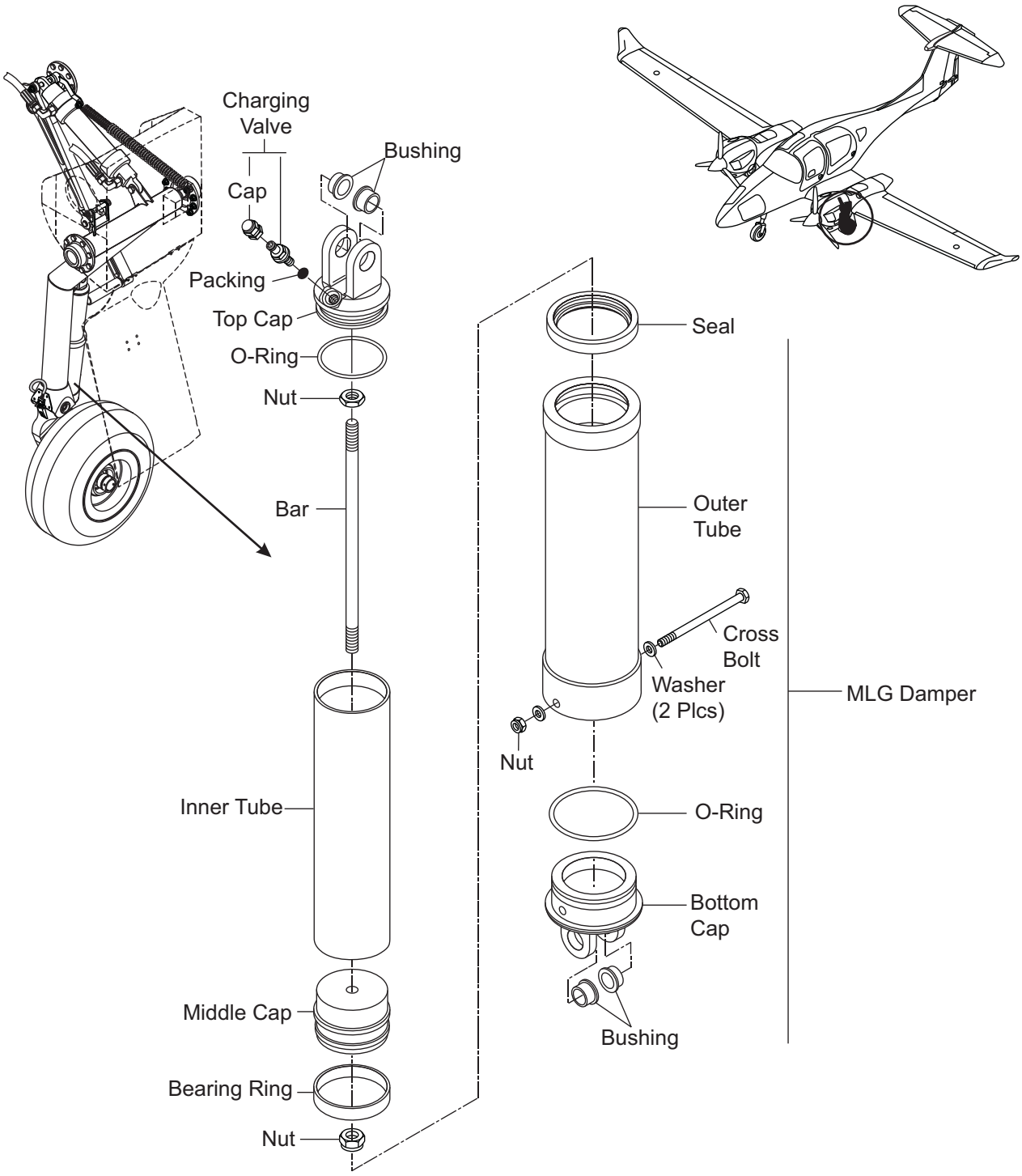


Figure 206 : Main Landing Gear Damper Assembly

B. Assemble a Main Landing Gear Damper

Refer to Figure 206.

	Detail Steps/Work Items	Key Items/References
(1)	Assemble the inner tube: - Install the O-ring onto the top cap. - Install the top cap together with the center bolt into the inner tube. - Tighten the top cap to the inner tube. - Install the middle cap into the inner tube. - Install the lock nut.	Use a new O-ring. Apply Teflon oil S408 onto the new O-ring. Be careful not to damage the middle cap. Use a new self-locking nut. Apply Loctite 262 on the center bolt thread and tighten the lock nut with 15 Nm (11.1 lbf.ft.).
(2)	Assemble the MLG damper tube: - Install the bearing ring to the middle cap in the inner tube and the seal to the top of the outer tube. - Slide the assembled inner tube into the outer tube.	
(3)	Install the bottom cap into the outer tube: - Install the O-ring onto the bottom cap. - Push the bottom cap into the outer tube. - Line up the holes and install the cross bolt, two washers and the lock nut. - Make sure that the bottom cap is secure.	Use a new O-ring. Apply Teflon oil S408 onto the new O-ring. Use a new self-locking nut. Apply Loctite 262 on the cross bolt thread.
(4)	Install the O-ring and charging valve onto the damper.	Apply Teflon oil S408 onto the O-ring.
(5)	Install the MLG damper.	Refer to Section 32-10-00 Para 6.B.
(6)	Charge the damper with nitrogen and hydraulic fluid.	Refer to Section 32-10-00 Para 4. Pay careful attention to Para 4.D., as the damper was disassembled and assembled.

8. **Remove/Install a Main Landing-Gear Door**

A. Remove a Main Landing-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 and tag to prevent inadvertent operation.	On the right side of instrument panel.
(2)	Disconnect the door operating rod from the door that will be removed: - Remove the nut, washers, spacers and the bolt from the rod end. - Pull the operating rod clear of the angle bracket.	Refer to Figure 207. At the door end of the rod.
(3)	Remove the door: - Remove the two bolts, washers and self locking nuts from one of the hinges. - Remove the hinge from the door. - Slide the other door hinge from the hinge bushing of the gear bay hinge and move the door clear of the main gear bay. - Mount the removed hinge back on the door with the two bolts, washers and self locking nuts.	 At the hinge mounted on the door. Support the door. The second door hinge stays on the door. This is done to not lose the hinge and hardware.

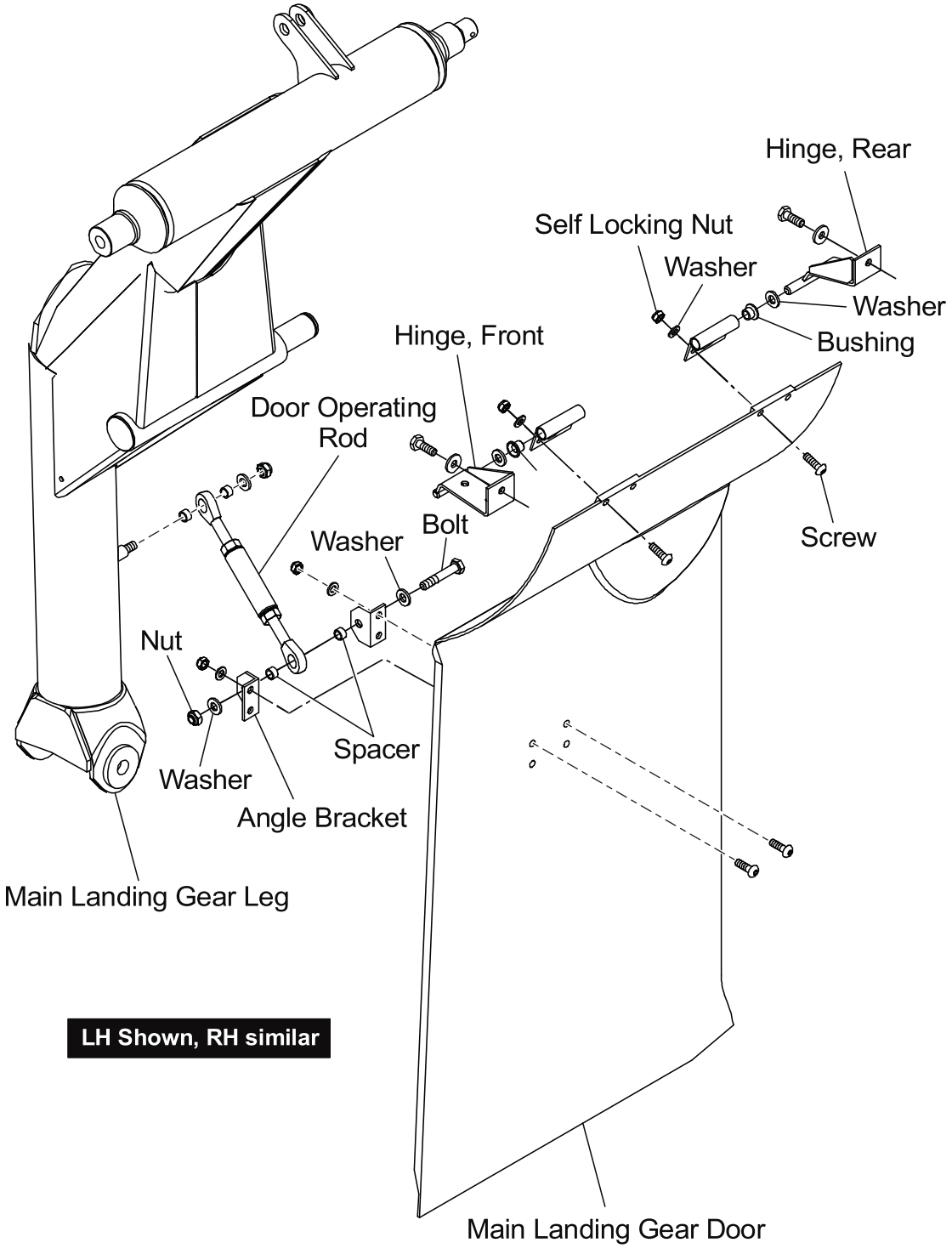


Figure 207 : Main Landing-Gear Door

B. Install a Main Landing-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 the hinge that was first removed from the main gear door. - Remove the hinge from the door. - Move the main gear door into position at the main gear bay. - Slide the still installed hinge on the door into the hinge bushing of the gear bay hinge. - Push the removed hinge onto the hinge bushing 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 207. 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 207. 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 11.
(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. ALWAYS WEAR SAFETY GLASSES.**

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 trestles.	2	Commercial
Rear fuselage trestle.	1	Commercial

B. Remove the MLG 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.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
(3)	Retract the landing gear.	Use the landing gear switch.
(4)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.
(5)	Set the ELECT. MASTER switch to OFF.	
(6)	Depressurize the hydraulic system: - Operate the emergency extension lever of the landing gear.	Refer to Section 29-10. Para 3.
(7)	Disconnect the main landing gear door from the main landing gear leg.	Refer to Figure 207.

	Detail Steps/Work Items	Key Items/References
(8)	Remove the folding stay switch.	Refer to Section 32-60 for more information.
(9)	Disconnect the MLG folding stay assembly.	Refer to Figure 209.
(10)	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.
(11)	Measure and record the distance from the actuator safety lock washer to the center of spherical rod-end bearing.	Refer to Figure 208. Note the distance marked ‘x’.
(12)	Disassemble the folding stay/actuator: - Remove the nut, four 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 209.

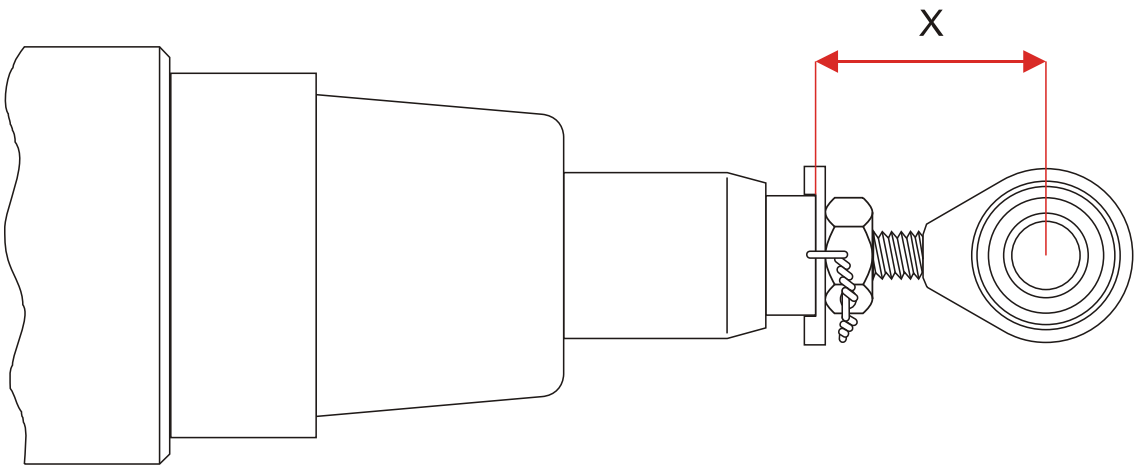


Figure 208 : MLG Actuator Measurement

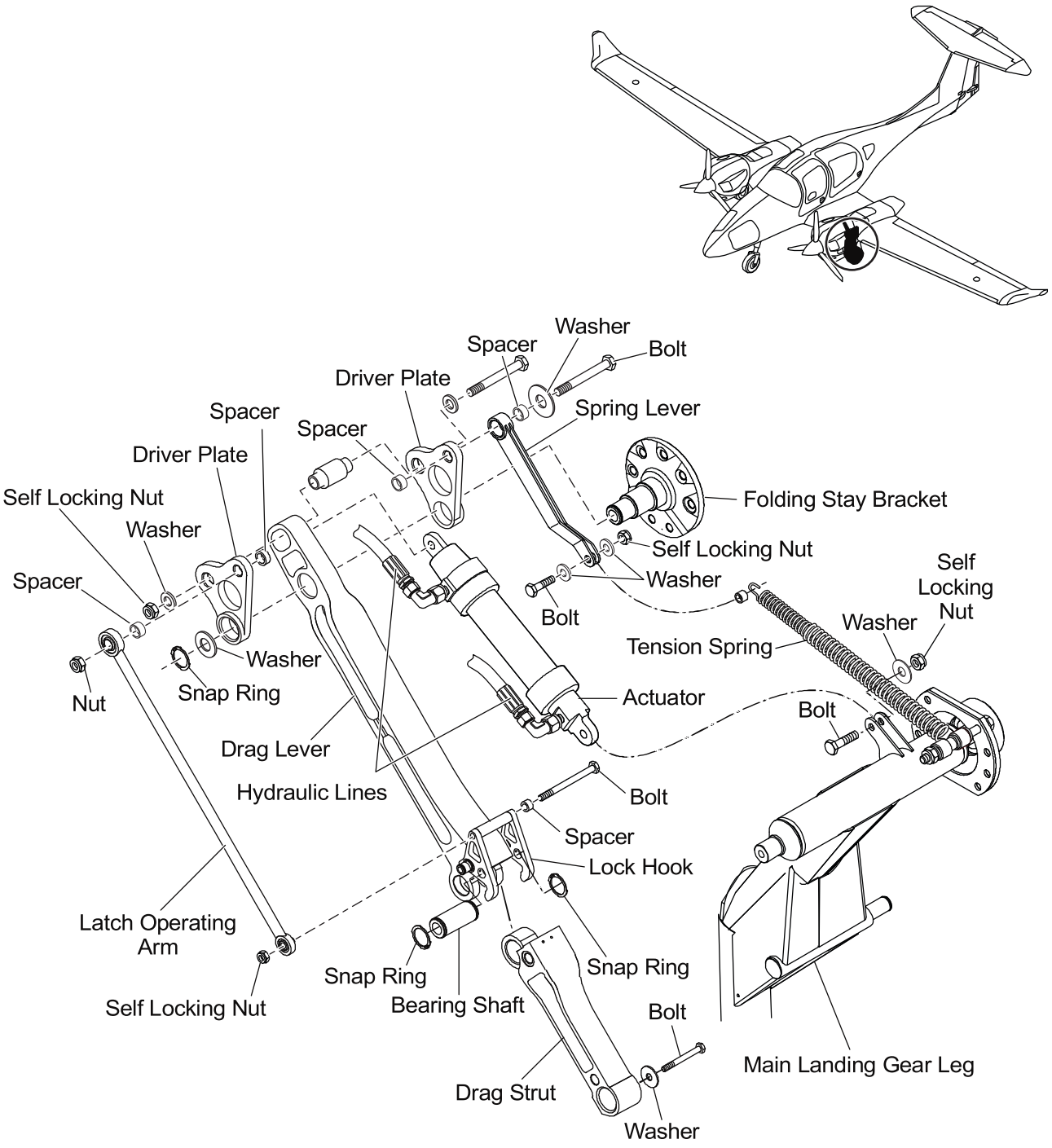


Figure 209 : Main Landing Gear Folding Stay
(Folding Stay Bracket according to MÄM 62-170)

C. Install the MLG 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 208. The 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: - The following parts will be connected in the next step: Spring lever, latch operating arm, the drag lever assembly and the actuator. - Install the nut, four spacers, washer and bolt onto the driver plate.	Refer to Figure 209.
(3)	Connect the hydraulic lines with the actuator.	Remove the 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 Figure 209.
(6)	Install and adjust the folding stay assembly of the MLG.	Refer to Section 32-60 for more information.
(7)	Reset the GEAR circuit-breaker.	On the 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 with the jacks.	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 MLG 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 MÄM 62-170 is carried out). - Remove the eight bolts and washers. - Move the folding stay bracket clear from the airplane.	Refer to Figure 209.

B. Install a Folding Stay Bracket.

	Detail Steps/Work Items	Key Items/References
(1)	Move the folding stay bracket in place. If MÄM 62-170 is carried out: Make sure that the flange is orientated like your record or marking.	Refer to Figure 209.
(2)	Install the folding stay bracket: - Install eight bolts and washers.	For wet installation of components use CA 1000.
(3)	Install the MLG Folding Stay / Hydraulic Actuator.	Refer to Paragraph 9., Section C.

11. **Test the Main Landing Gear**

A. Equipment

Item	Quantity	Part Number
Slide sheets - 2 per side.	4	Commercial
E-protractor.	1	Commercial

B. Test the 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.
(2)	Remove the main landing gear doors.	Refer to Paragraph 8.A.
(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 211.
(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 of the rim in the front and the rear. - Subtract the two measurements and write this wheel track measurement down. - Use the wheel track table to convert your wheel track measurement into degrees.	Refer to Figures 210 and 211.
(5)	Measure the camber using an e-protractor.	
(6)	Fill out the Wheel Track and Camber Report.	Refer to Section 06-00.

	Detail Steps/Work Items	Key Items/References
(7)	If the Wheel Track and Camber Report does not meet the requirement: Contact DAI.	
(8)	Measure the wheel track. If the wheel track does not meet the requirement: Contact DAI.	Refer to Figure 210 and Section 06-00.
(9)	Move the airplane off the slide sheets.	
(10)	Install the main gear door.	Refer to Paragraph 8.B.

DA 62 Wheel Track Table					
(valid for DA 62 with 6" - Parker rim P/N: 40-406C)					
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 210 : DA 62 Wheel Track Table

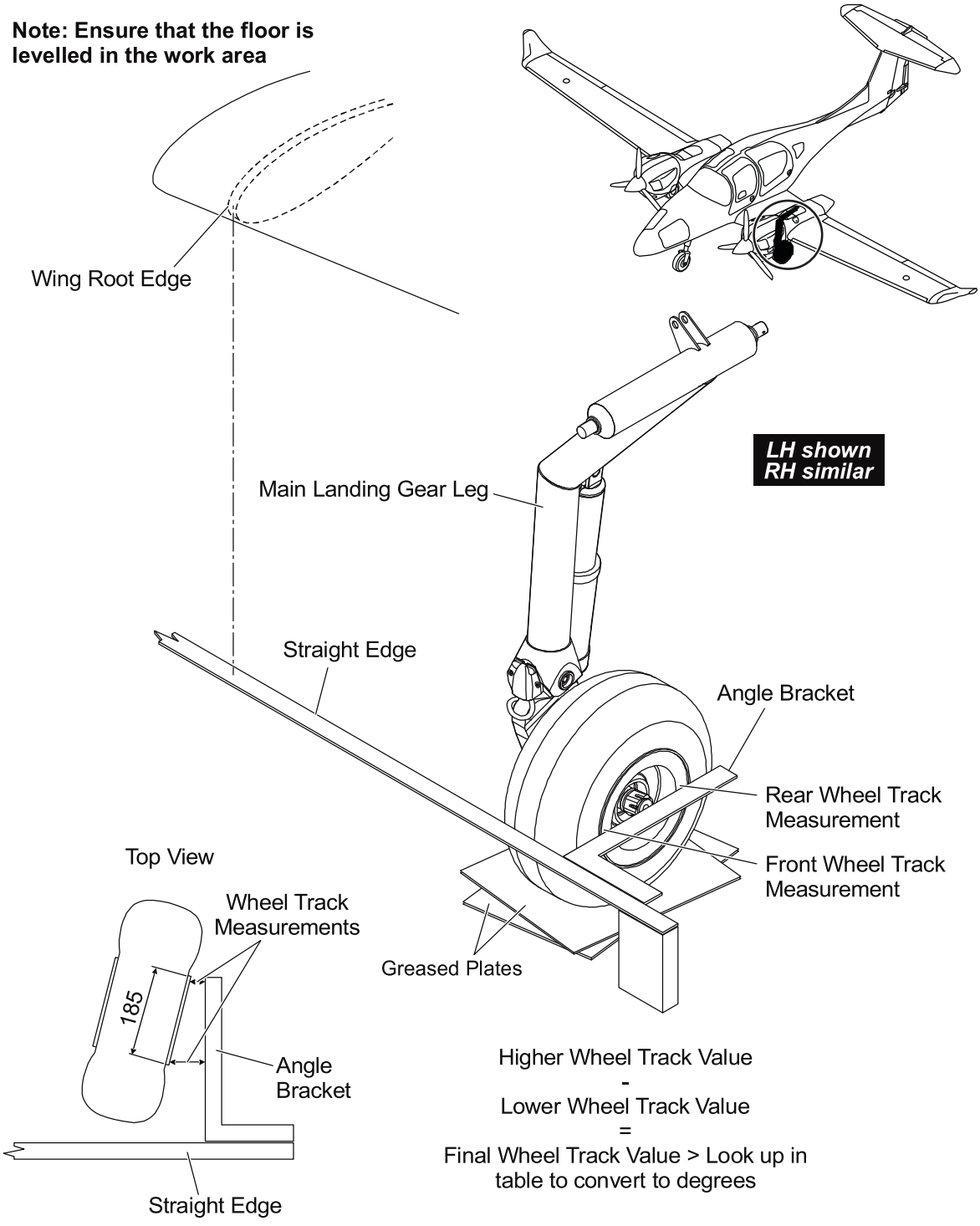


Figure 211 : Main Gear - Wheel Track

12. **Adjustment of the MLG Wheel in the Retracted Position and Check of MLG Door Pre-Load**

A. Adjustment of the Main Landing Gear Wheel in the 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.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
(3)	Remove the dust cup from the wheel.	
(4)	Verify the tire pressure.	Refer to Section 12-10.
(5)	Disconnect the MLG door from the MLG leg.	Refer to Paragraph 7.A.
(6)	Set the ELECT. MASTER switch to ON.	
(7)	Retract the landing gear.	Refer to Section 32-30.
(8)	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 211. - Measure the clearance between the MLG tire and the wheel bay cutout. - Remove the trestle and extend the landing gear.	Refer to Figure 211. Minimum clearance: 10 mm (0.4 in) circumferential.
(9)	If the clearance is asymmetric between front and rear side: - Adjust the clearance by use of a larger or shorter MLG damper. - Too small gap on front side: use a shorter damper. - Too big gap on front side: use a longer damper.	For replacement refer to Paragraph 6.

B. Check of the Main Landing Gear Door Pre-Load.

	Detail Steps/Work Items	Key Items/References
(1)	Connect the MLG door to the MLG leg.	Refer to Paragraph 8.B.
(2)	Push the emergency landing gear extension lever.	
(3)	Set the ELECT. MASTER switch to ON.	
(4)	Retract the landing gear.	Refer to Section 32-30.
(5)	Measure the distance between the end plane of the wheel axle and the lower wing shell.	Refer to Figure 213.
(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 the assembly for minimum screw-in depth.	
(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 214.
(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.	Refer to Section 32-30.

	Detail Steps/Work Items	Key Items/References
(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 with the jacks.	Refer to Section 07-10.

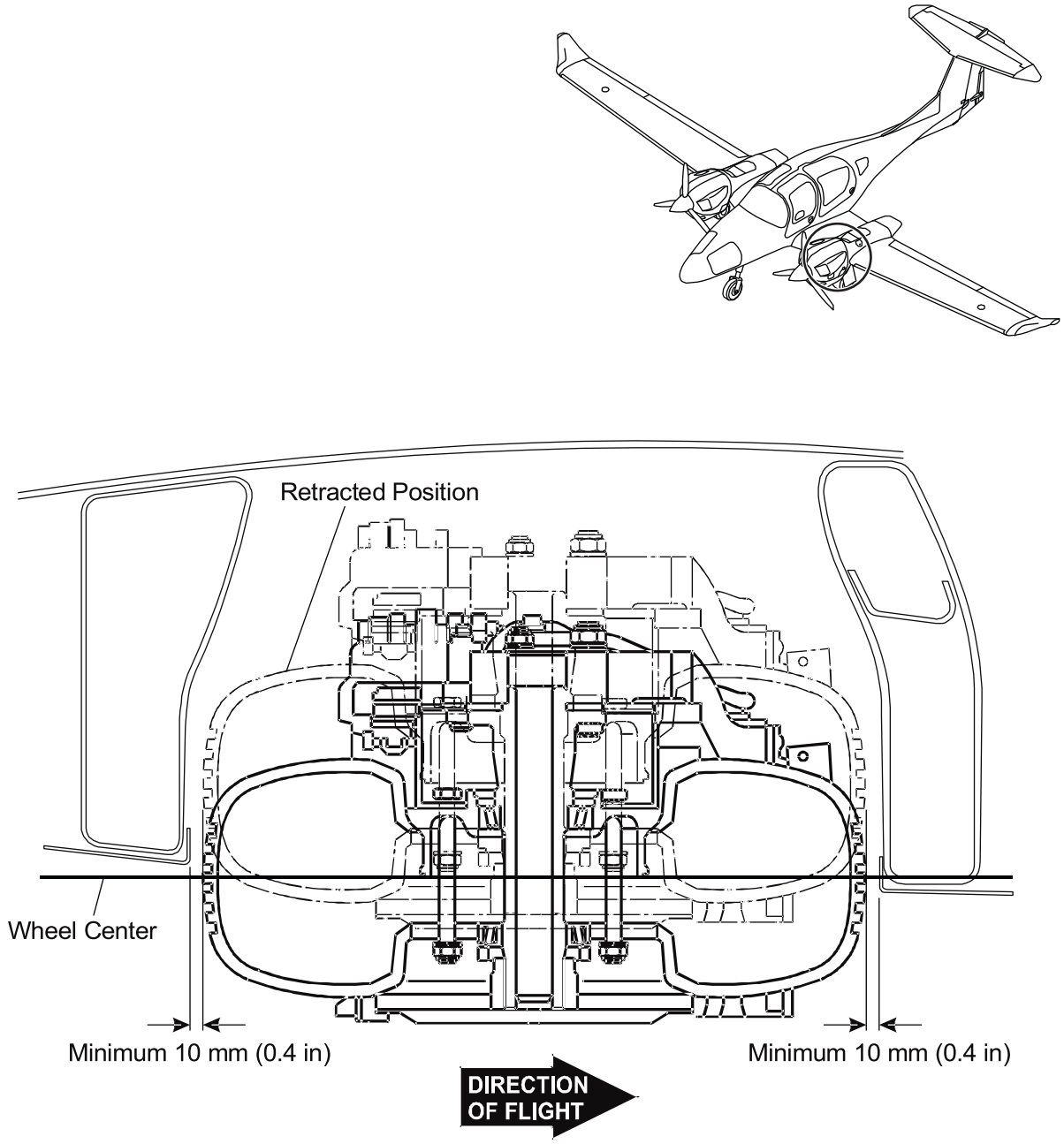
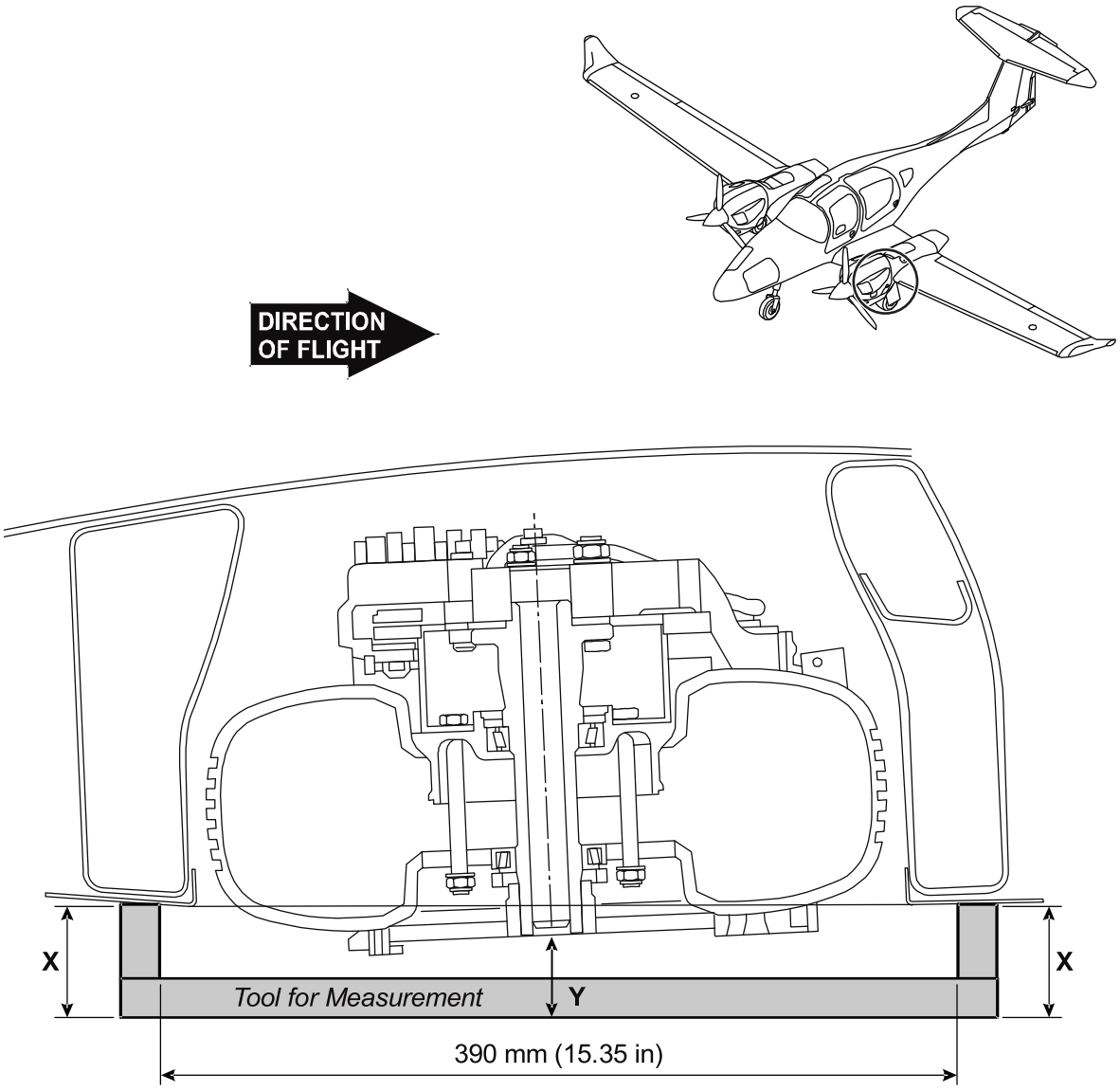


Figure 212 : Main Landing Gear - Tire Clearance Measurement



X - Y = 8 mm +/- 7mm (0.31 in +/- 0.28 in)
Measurement with connected MLG doors
with 5 - 10 kg (11 - 22 lb) pre-load.

Figure 213 : Main Landing Gear - Door Measurement

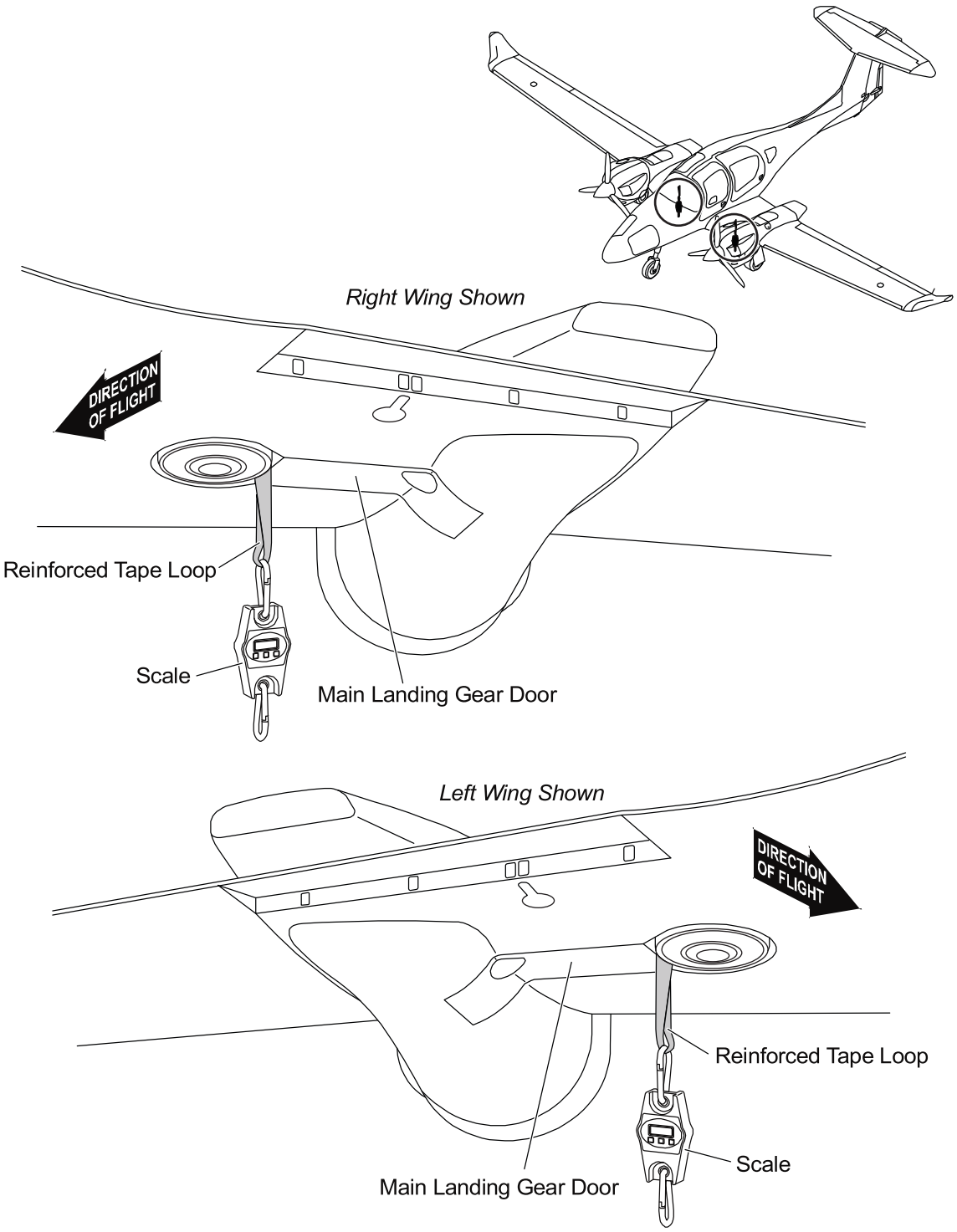


Figure 214 : Main Landing Gear - Door Pre-Load Measurement

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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 pedestal and two reinforcement sheets. 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 pedestal and two reinforcement sheets. Bolts attach the pedestal and two reinforcement sheets to the fuselage front bulkhead and the nose gear bay.

The nose gear leg has a tubular aluminum housing. The tubular aluminum housing makes the top of the leg and has the leg swivel mountings. Plastic bushes in the tubular aluminum housing hold a tubular strut. The strut can turn in the housing. Stops on the tubular aluminum 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.

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.

Three bolts secure the conical connection between the nose wheel fork and 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.

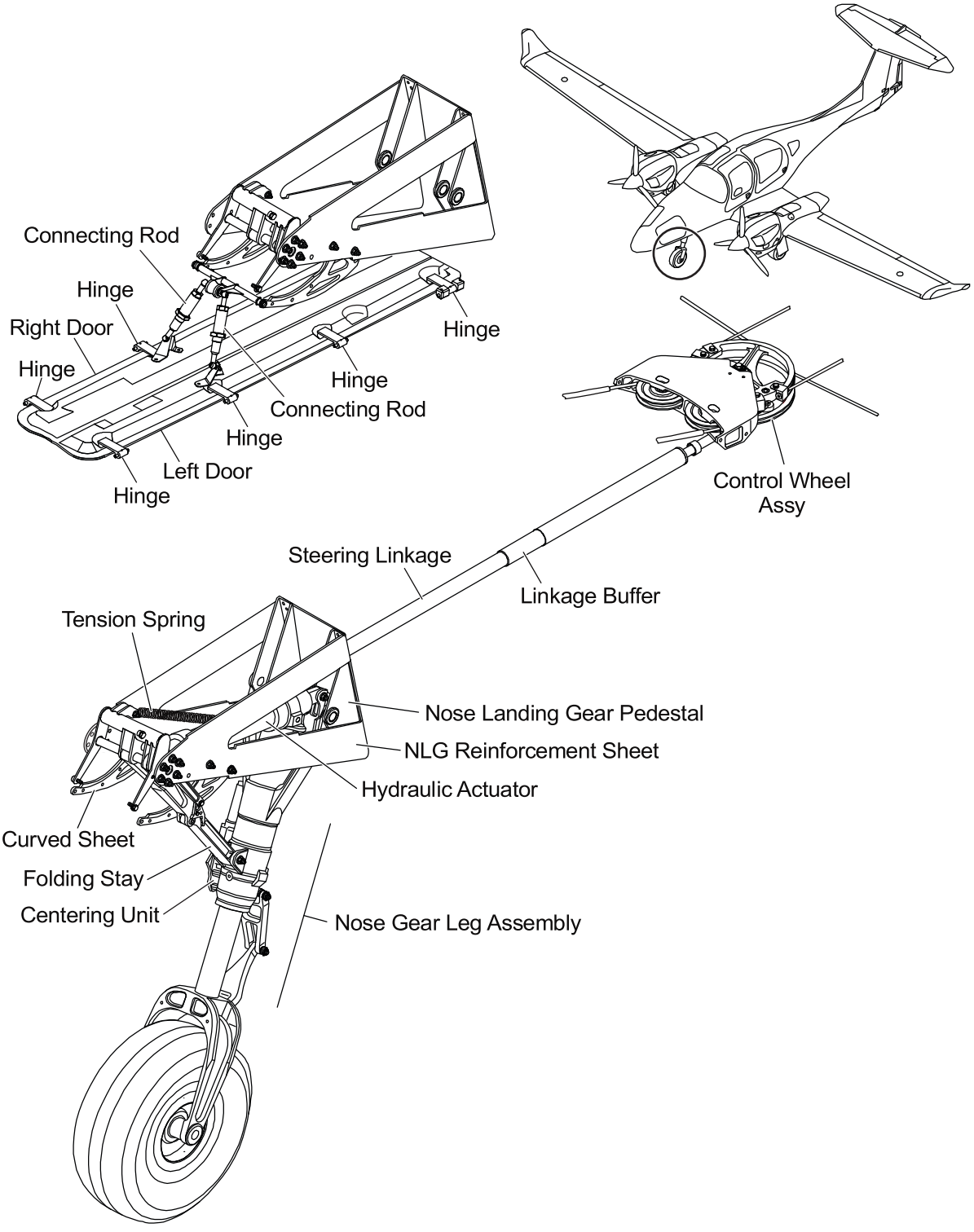

Figure 1 : Nose Gear Assembly

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 forces hydraulic fluid through the middle cap and 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 valve in the middle cap. This prevents the airplane from being pushed up after the landing and it also prevents vibration.

Refer to Section 32-30 for data about the extension and retraction system.

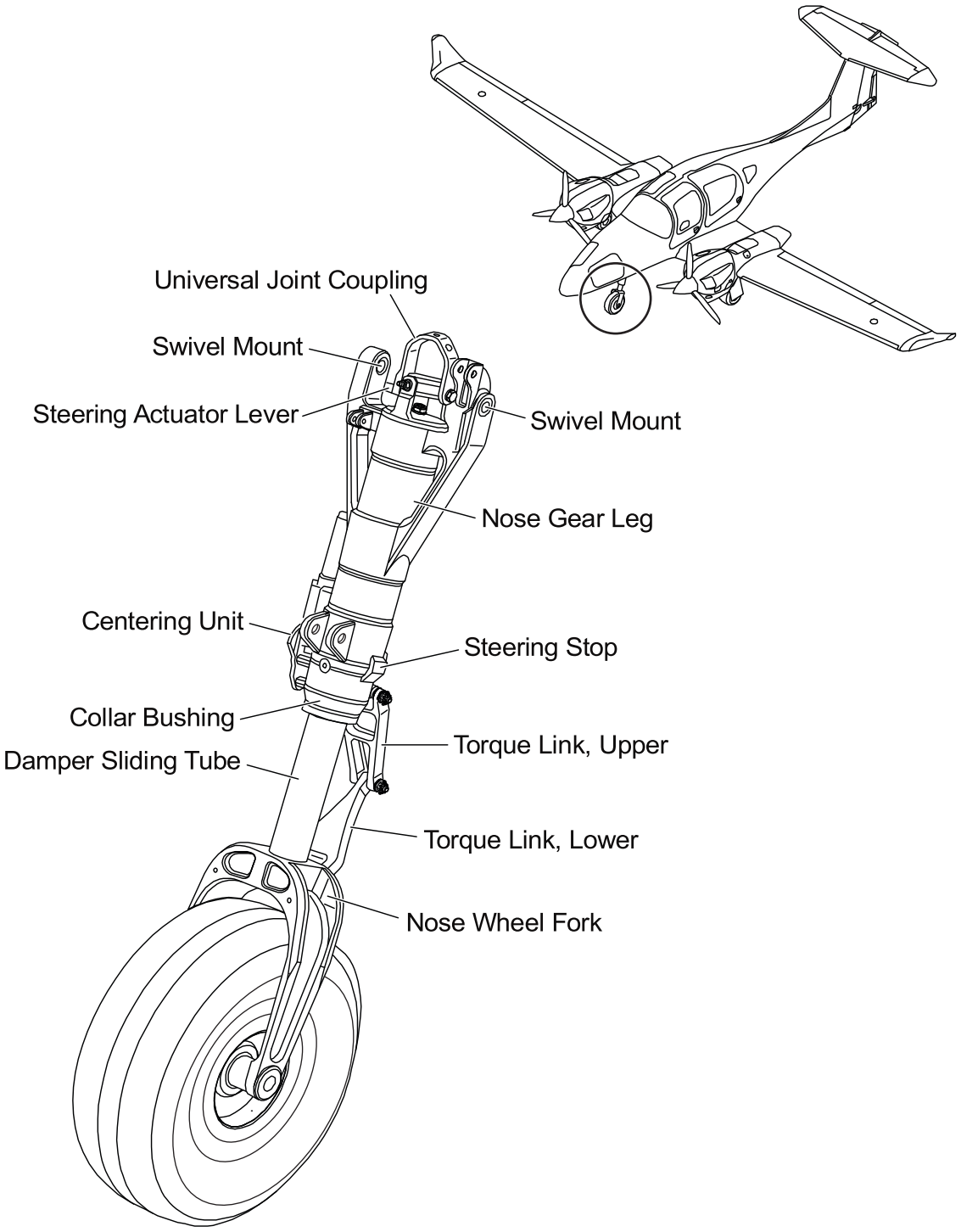

Figure 2 : Nose Gear Leg Assembly

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 32-60 for trouble-shooting the nose landing gear position and 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
Nose gear leg cracked or bent	Hard landing of the airplane.	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 low.	Charge the leg with nitrogen to the correct pressure. Refer to Maintenance Practices, Paragraphs 5 and 6.
	Damper is defective.	Replace the damper.

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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 abut the landing gear position and warning system.

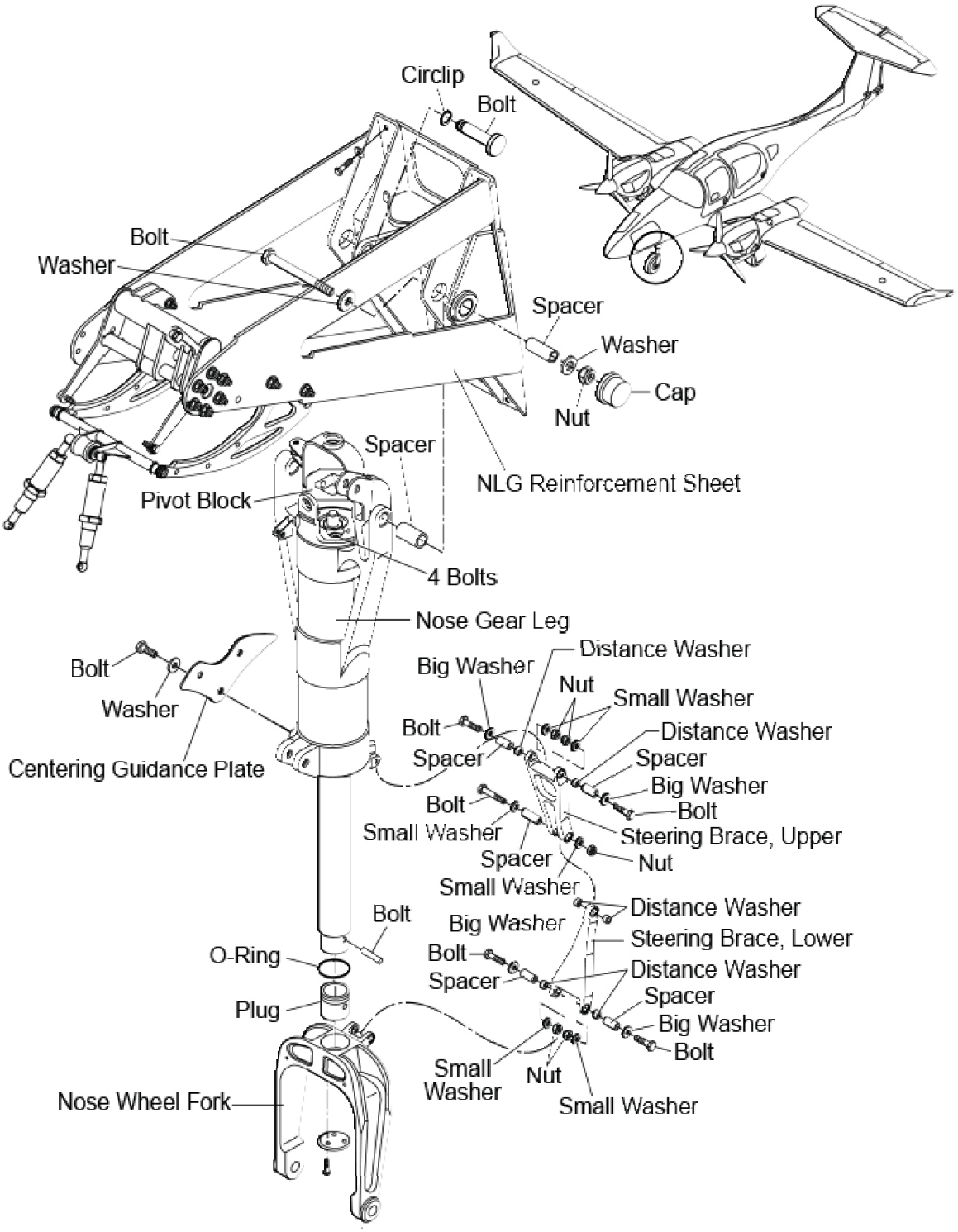

Figure 201 : Nose Landing Gear - Leg Assembly

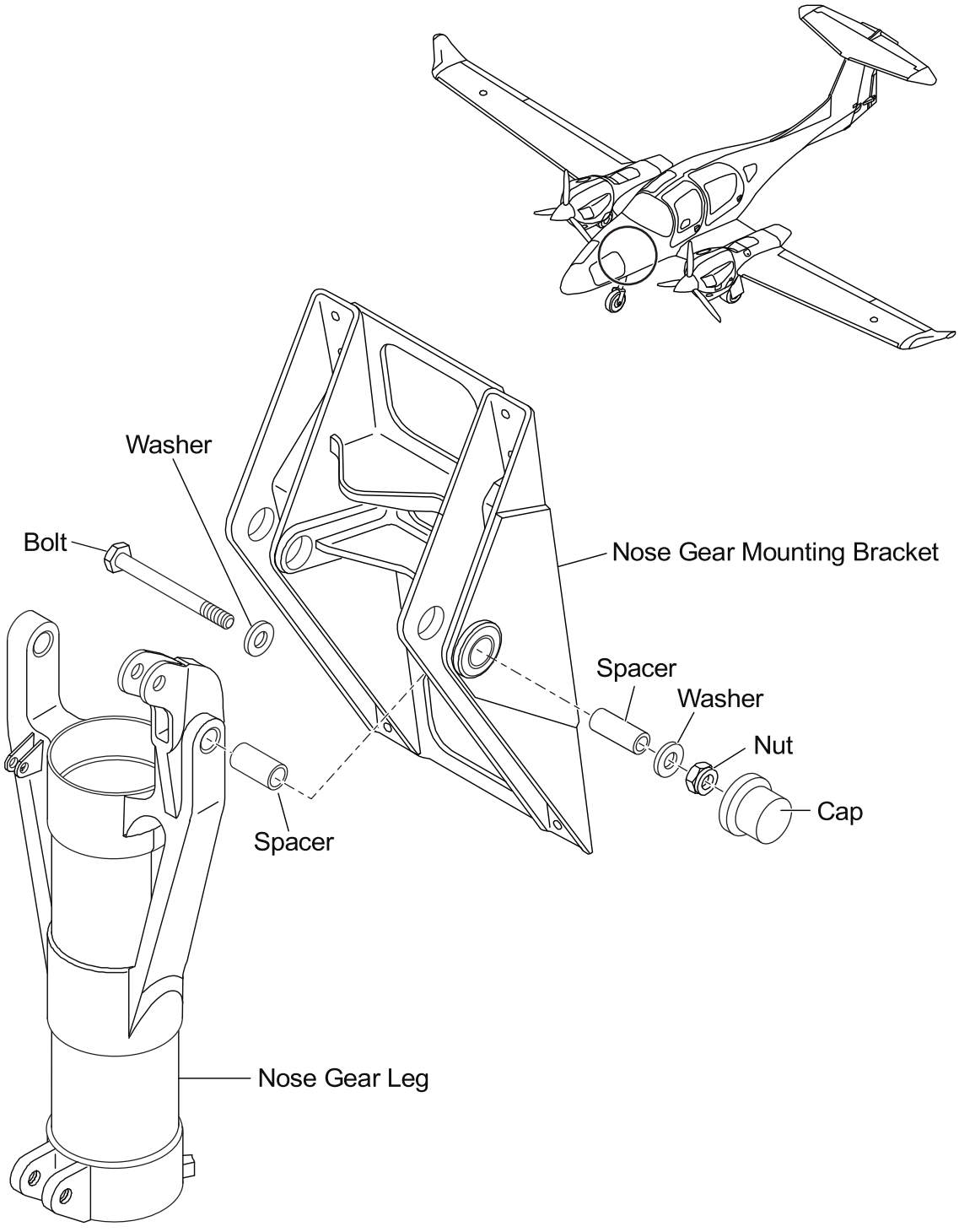

Figure 202 : Nose Landing Gear Leg

2. **Remove/Install the Nose Gear Leg**

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.**

A. Equipment.

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestles.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Nose Gear Leg.

	Detail Steps/Work Items	Key Items/References
(1)	Raise the airplane on jacks.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
(3)	Depressurize the hydraulic system.	Refer to Section 29-00.
(4)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.
(5)	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 for more information.
(6)	Disconnect the NLG folding stay assembly.	Refer to Section 32-20.
(7)	Disconnect the NLG actuator from the NLG leg.	
(8)	Remove the NLG damper assembly.	Refer to Paragraph 4.B.

	Detail Steps/Work Items	Key Items/References
(9)	Remove the nose gear leg: - Remove the bolt, bushing, sleeve, washer and nut on the LH side of the nose gear. - Remove the circlip on the bolt on the RH side of the NLG. - Move the nose gear leg clear of the airplane.	Refer to Figure 201 and 202. Use a M12 bolt to pull bolt from its housing. Support the nose gear.

C. Install the Nose 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 and circlip on the RH side of the NLG. - Install the bolt, bushing, sleeve, washer and nut on the LH side of the nose gear.	Refer to Figure 201 and 202. Support the nose gear. Use a M12 bolt and nut to push the bolt into its housing. Take care to align the flange of the bolt correctly into the housing.
(2)	Install the NLG damper assembly.	Refer to Paragraph 4.C.
(3)	Connect the NLG actuator to the NLG leg.	Make sure the lock wire for the hydraulic actuator is installed correctly.
(4)	Connect the NLG folding stay assembly.	Refer to Section 32-20.
(5)	Install the two nose gear folding stay switches and secure the electrical connections with cable binder.	Refer to Section 32-60 for more information.
(6)	Reset the GEAR circuit breaker.	On the right side of instrument panel.
(7)	Do a test for the correct operation of the landing gear retraction and extension system.	Refer to 32-30, Para 3.
(8)	Move the wing and rear fuselage trestles clear of the airplane.	
(9)	Lower the airplane on jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

3. **Remove/Install a Nose Gear Door**

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.**

A. Equipment.

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestles.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove a Nose Gear Door.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.
(2)	Raise the airplane on jacks.	Refer to Section 07-10.
(3)	Move the wing and rear fuselage trestles into position to support the airplane.	
(4)	Disconnect the door connecting 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	Refer to Figure 1. (32-20-00, Page 2). Disconnect at the door-end of the rod
(5)	Remove the nose gear door: - Remove the bolts, washers and nuts from the door hinges. - Move the door including the hinges clear of the nose gear bay.	Refer to Figure 1. (32-20-00, Page 2). All four hinges. Support the door.

	Detail Steps/Work Items	Key Items/References
(6)	Remove the door hinges from the door: - Remove the bolt-pins from the door hinges. - Remove the four hinge pins from the door. - Move the door hinges clear of the door.	Refer to Figure 1. (32-20-00, Page 2). All four hinges.

C. Install the Nose Gear Door.

	Detail Steps/Work Items	Key Items/References
(1)	Install the nose gear door hinges to the door: - Move the nose gear door hinges into position at the nose gear door. - Align the hinges of the door with the hinges of the nose gear bay and install the four hinge pins. - Install the roll-pins into the door hinges.	Refer to Figure 1. (32-20-00, Page 2). Use new roll-pins.
(2)	Install the nose gear door: - Move the nose gear door into position at the nose gear bay. - Install the bolts, washer and nuts.	Refer to Figure 1. (32-20-00, Page 2). Use new self-locking nuts.
(3)	Connect the door connecting 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.	Refer to Figure 1. (32-20-00, Page 2).
(4)	Reset the GEAR circuit breaker.	On the right side of instrument panel.
(5)	Do a test of the retraction/extension system.	Refer to 32-30, Para 3.
(6)	Move the wing and rear fuselage trestles clear of the airplane.	
(7)	Lower the airplane on jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

4. **Remove/Install the Nose Landing-Gear Damper-Assembly**

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.

A. Equipment.

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestles.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Remove the Nose Landing-Gear Damper-Assembly.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.
(2)	Raise the airplane on jacks.	Refer to Section 07-10.
(3)	Move the wing and rear fuselage trestles into position to support the airplane.	
(4)	Remove the nose wheel.	Refer to Section 32-40.
(5)	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.	
(6)	Remove the universal joint coupling: - Remove the bolt, washer and nut from the front of the universal joint coupling. - Remove the assembly of the top pivot gimbal and central block from the upper pin and bottom pivot gimbal.	Refer to Figures 201 and 202.

	Detail Steps/Work Items	Key Items/References
(7)	Remove the nose gear damper-assembly: - Remove the four bolts which hold the whole damper assembly. - Remove the bottom pivot gimbal, the slide plate and shim (if installed). - Slide the damper assembly out of the nose gear. - Remove the centering unit clear from the leg.	Refer to Figure 2. (32-20-00, Page 4) and Figure 201. Support the nose gear. Support the centering unit while sliding the damper assembly out of the nose gear leg
(8)	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.	 Note the sequence and number of installed washers and distance washers.
(9)	Remove the centering guidance plate: - Remove the locking wire from the bolts. - Remove the washers and bolts. - Move the centering guidance plate clear from the damper assembly.	Refer to Figures 201 and 202. Alternatively the bolts may be secured with Loctite.

C. Install the Nose Landing-Gear Damper-Assembly.

	Detail Steps/Work Items	Key Items/References
(1)	Install the centering guidance plate: - Move the centering guidance plate into position. - Install the three washers and bolts.	Refer to Figures 201 and 202. Apply Loctite 243 on the thread. Alternatively secure the bolts with locking wire if bolts with drilled heads are used.

	Detail Steps/Work Items	Key Items/References
(2)	Install the torque links: - Move the torque links into position. - Install the bolts, washers, spacer and lock nuts onto the nose gear.	Refer to Figures 201 and 202. Installation according to the note made at the disassembly. Use new self locking nuts. Wet installation of bolts with CA 1000. There must be a play sideways of 0.1 - 0.3 mm (0.004 - 0.012 in). Symmetric installation is necessary.
(3)	Install the nose gear damper-assembly: - Install the centering unit on the leg. - Slide the damper assembly into the nose gear. - Move the shim, slide plate and the bottom pivot gimbal into position. - Install the four bolts which hold the whole damper assembly.	Refer to Figure 2. (32-20-00, Page 4) and Figure 201. Apply Loctite 243 onto the threads.
(4)	Install the universal joint coupling.	
(5)	Connect the nose wheel steering rod to the steering lever at the top of the nose gear leg.	
(6)	Install the nose wheel.	Refer to Section 32-40.
(7)	Reset the GEAR circuit breaker.	On the right side of instrument panel.

5. **Required Strut Extension of the Nose 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)	12 bar (179 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 the damper assembly 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 trestles.	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: A placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes have been manufactured with hydraulic Fluid per 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 the CAUTION above.
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.**

WARNING: **ALWAYS WEAR SAFETY GLASSES TO PREVENT EYE DAMAGE.**

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 and tag to prevent inadvertent operation.	On the right side of instrument panel.
(2)	Raise the airplane on jacks.	Refer to Section 07-10.
(3)	Move the wing and rear fuselage trestles into position to support the airplane.	
	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.**	

	Detail Steps/Work Items	Key Items/References
(4)	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.	
(5)	Remove the core of the charging valve from the damper assembly.	
(6)	Compress the damper assembly.	
	WARNING: DO NOT GET HYDRAULIC FLUID ON YOUR SKIN. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE.	
(7)	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: A placard is installed by the airplane manufacturer identifying the type of hydraulic fluid. All airplanes 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.	
(8)	Turn the bottle to the open position and allow the hydraulic fluid to flow from the bottle into the damper.	Use hydraulic fluid per MIL-PRF-5606 H or AMG-10 (GOST 6794-75 Amdt 1-5) hydraulic fluid (see the CAUTION above).
(9)	Extend the damper assembly slowly by hand to allow the hydraulic fluid to fill the damper assembly.	
(10)	Compress and extend the damper not less than six times to release the air from the damper and allow the hydraulic fluid to flow into the damper.	
(11)	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.
(12)	Install the core of the charging valve.	

	Detail Steps/Work Items	Key Items/References
(13)	Connect the gaseous nitrogen charging equipment to the damper charging valve.	Allow the damper to extend as it is charged.
(14)	Charge the damper with nitrogen to the correct pressure.	Refer to Paragraph 5. The damper must be fully extended.
(15)	Disconnect and remove the gaseous nitrogen charging equipment from the damper charging valve.	
(16)	Install the dust cap onto the charging valve.	
(17)	Reset the GEAR circuit breaker.	On the right side of instrument panel.
(18)	Remove the rear fuselage and wing trestles clear of the airplane.	
(19)	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 AeroShell 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 203. Mark hydraulic fluid type by punching.

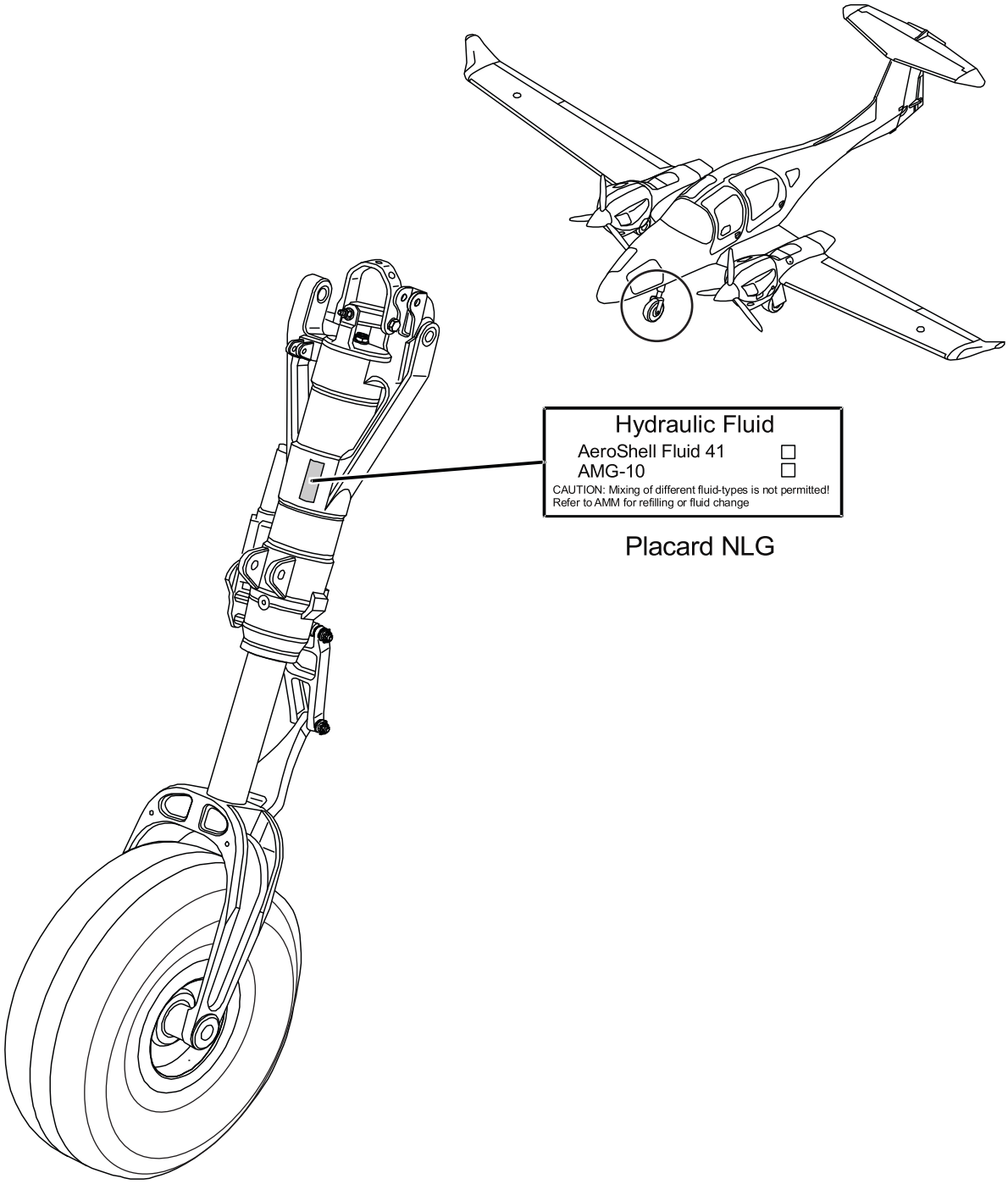

Figure 203 : Position of the Hydraulic Fluid Placard - Nose Landing-Gear Damper

7. **Remove/Install the Nose Landing Gear (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 trestles.	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.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
(3)	Retract the landing gear.	Use the landing gear switch.
(4)	Pull the GEAR circuit breaker and tag to prevent inadvertent operation.	On the right side of instrument panel.
(5)	Set the ELECT. MASTER switch to OFF.	
(6)	Depressurize the hydraulic system: - Operate the emergency extension lever of the landing gear.	Refer to Section 29-10. Para 3.

	Detail Steps/Work Items	Key Items/References
	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.	
(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.	Refer to Figure 1. (32-20-00, Page 2). Make sure to collect all pins.
	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	
(8)	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 spring tension is fully released.	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
(9)	Disconnect the hydraulic lines from the actuator	Use a suitable container to catch spilt hydraulic fluid. Fit caps on all open connections.

	Detail Steps/Work Items	Key Items/References
(10)	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 from the LH NLG baggage compartment. - Remove the bolt from the nose landing gear brace assembly. - Move the actuator clear of the airplane.	Remove the carpet from the LH front baggage compartment sidewall.
(11)	Measure and record the distance from the actuator safety lock washer to the center of the ball joint.	Refer to Figure 204. Note the distance marked 'Y'.

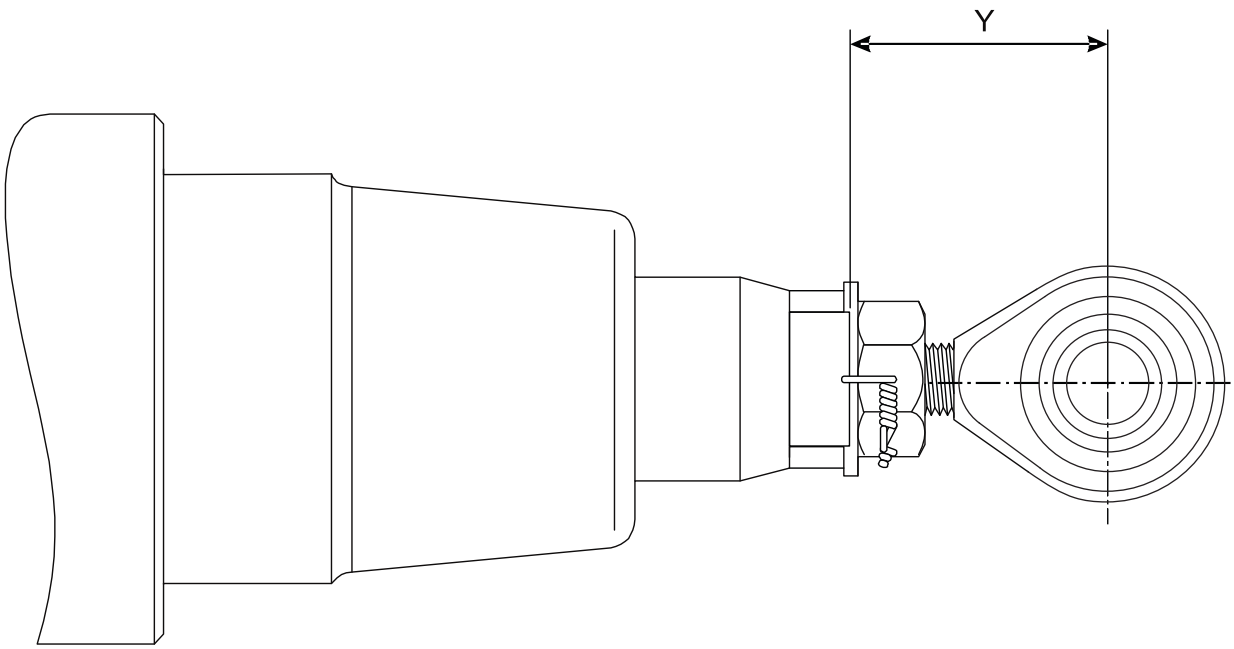

Figure 204 : Nose Landing Gear - Actuator Measurements

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 that the orientation is correct. 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 204, if the ball joint rod was removed.
(3)	Tighten the NLG actuator counter nut and install the safety lock wire.	
(4)	Connect the hydraulic lines to the actuator.	Remove all caps.
(5)	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. Reinstall the carpet of baggage compartment sidewall.
(6)	Bleed the hydraulic system.	Refer to Section 29-10.
(7)	Replenish the hydraulic reservoir as necessary.	Refer to Section 29-10.
	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.	
(8)	Set the GEAR circuit breaker.	On the right side of instrument panel.
(9)	Set the ELECT. MASTER switch to ON.	

	Detail Steps/Work Items	Key Items/References
(10)	Retract the landing gear: - Set the Landing Gear switch to the UP position and secure it against inadvertent operation.	
(11)	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).	Refer to Figures 204 and 205. If necessary, adjust the pushrod of the NLG actuator. Maximum distance of Y (Min. Screw-in depth of rod end bearing): 34 mm (1.34 in).
(12)	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).	Refer to Figures 204 and 205. If necessary, adjust the pushrod of the NLG actuator. Maximum distance of Y (Min. Screw-in depth of rod end bearing): 34 mm (1.34 in).
(13)	Check the clearance between the folding stay hook and the nose wheel bay roof. The clearance must be at least 2 mm (0.08 in)	Refer to Figures 204 and 205. If necessary, adjust the pushrod of the NLG actuator. Maximum distance of Y (Min. Screw-in depth of rod end bearing): 34 mm (1.34 in).
(14)	Set the Landing Gear switch to DOWN.	
(15)	Connect the nose landing gear door arms to the nose landing gear doors.	
(16)	Perform a test of the correct operation of the landing gear extension and retraction system.	Refer to Section 32-30.
(17)	Move the wing and rear fuselage 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.

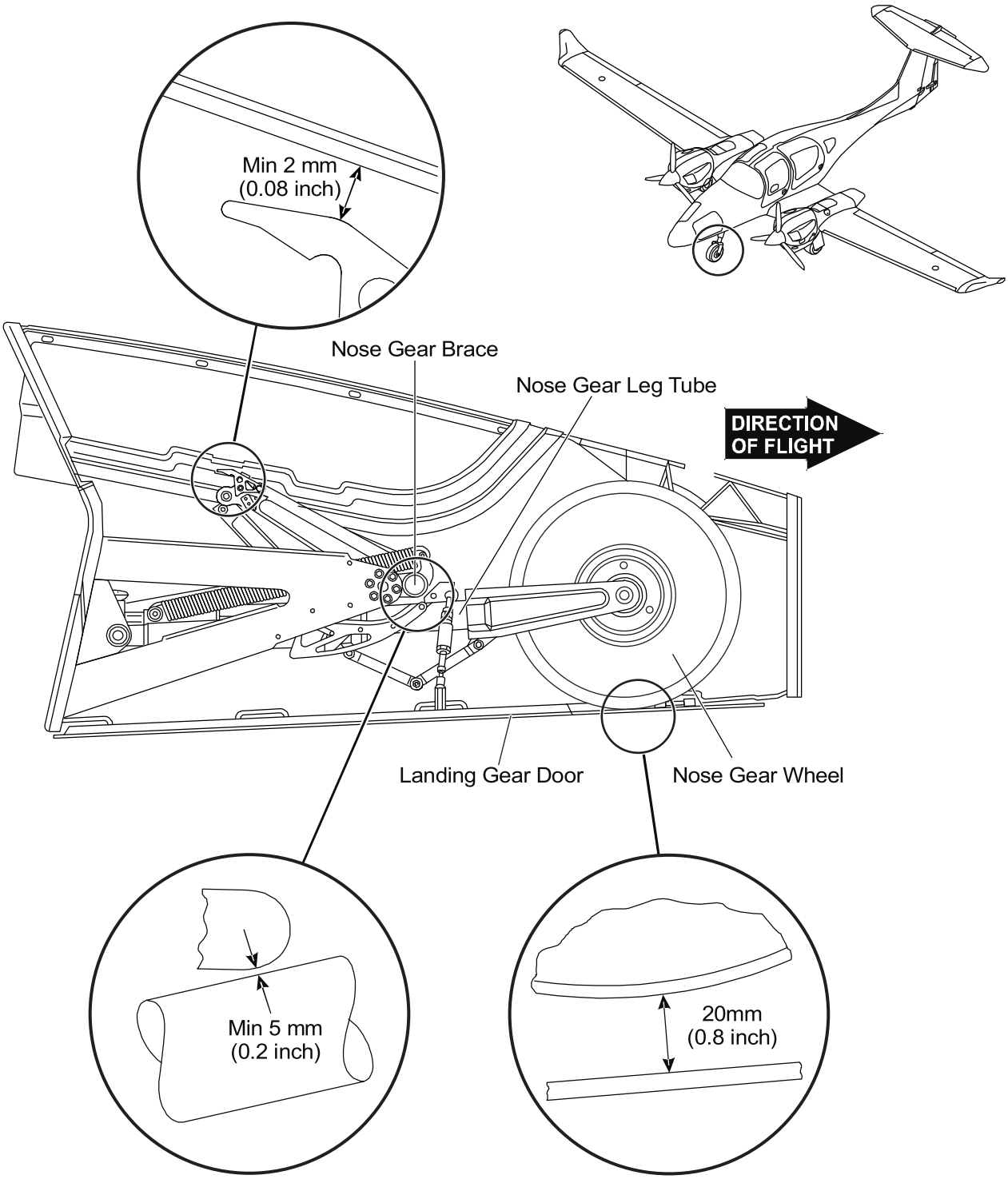

Figure 205 : Nose Landing Gear - Actuator Measurements

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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.

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 hold 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.

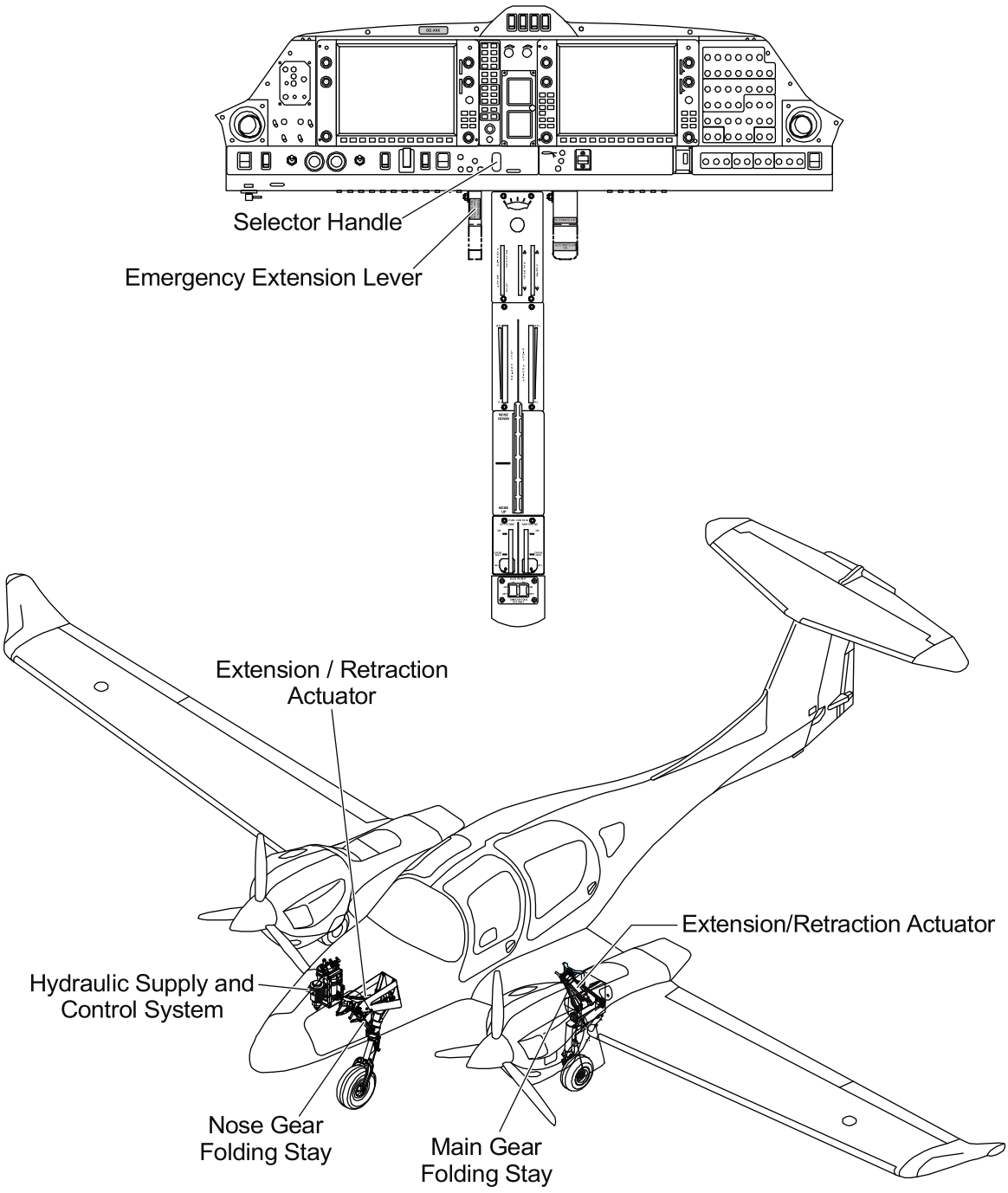


Figure 1 : Extension and Retraction System - Main Components

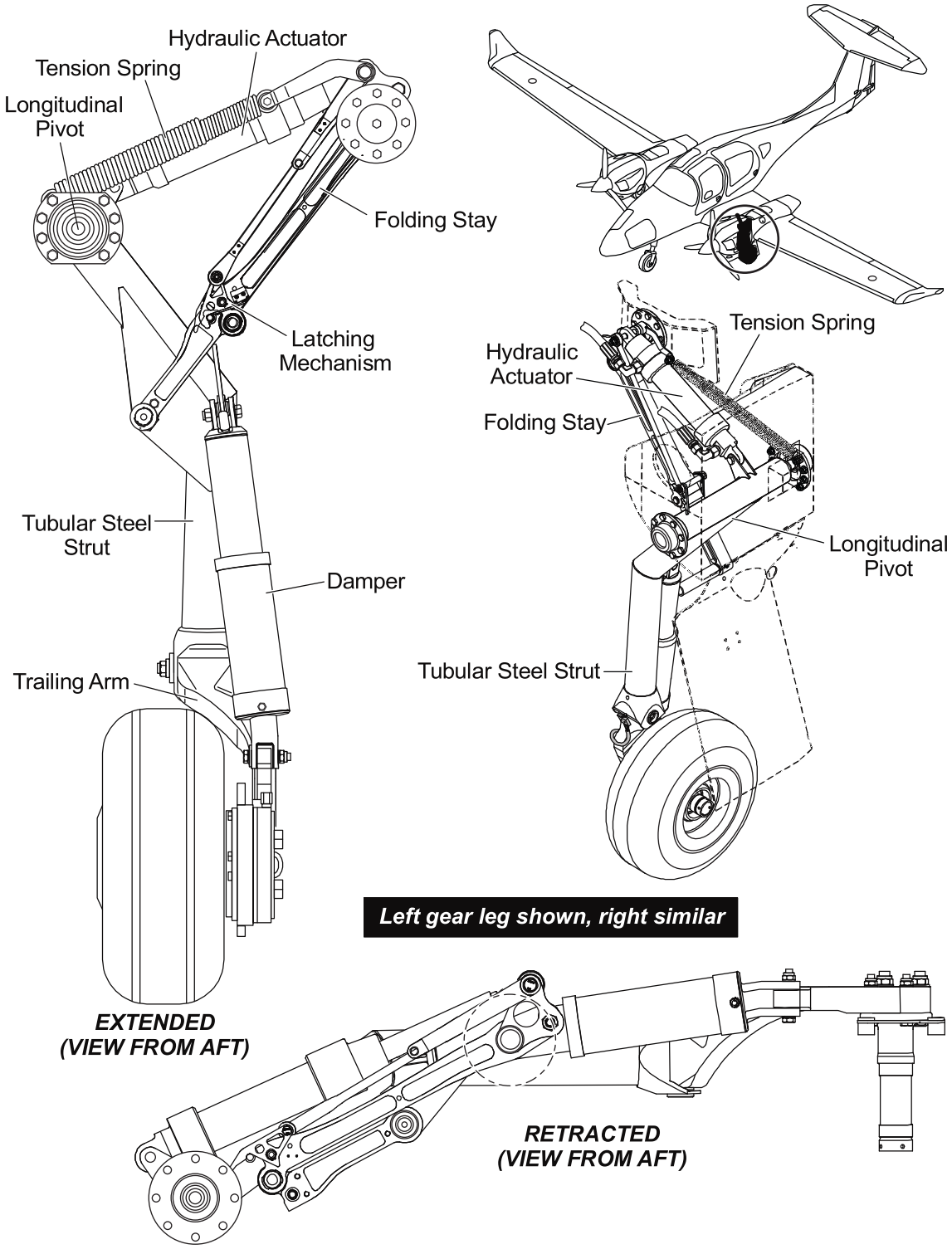


Figure 2 : Main Landing Gear - Extension and Retraction

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.

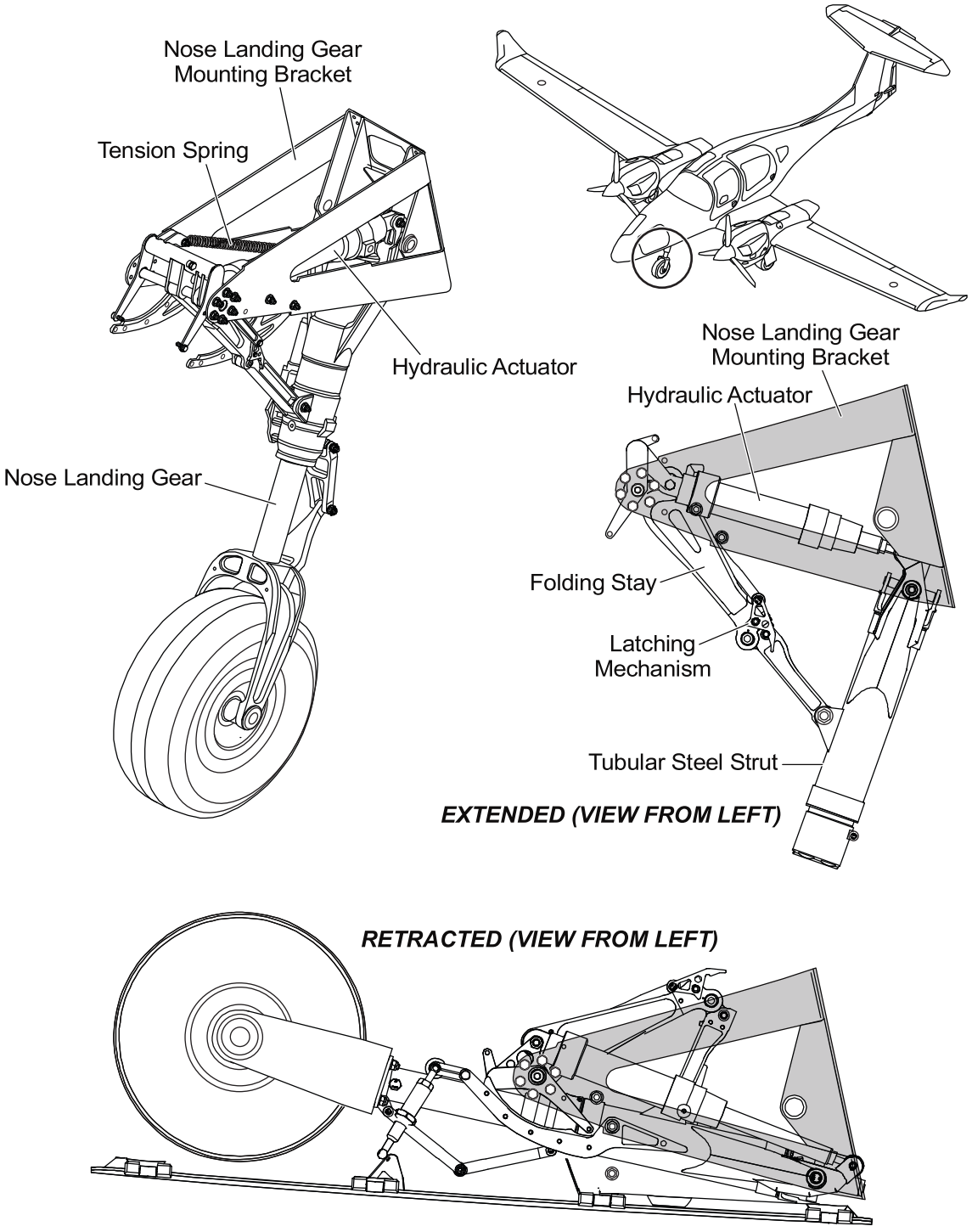


Figure 3 : Nose Landing Gear - Extension and Retraction

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

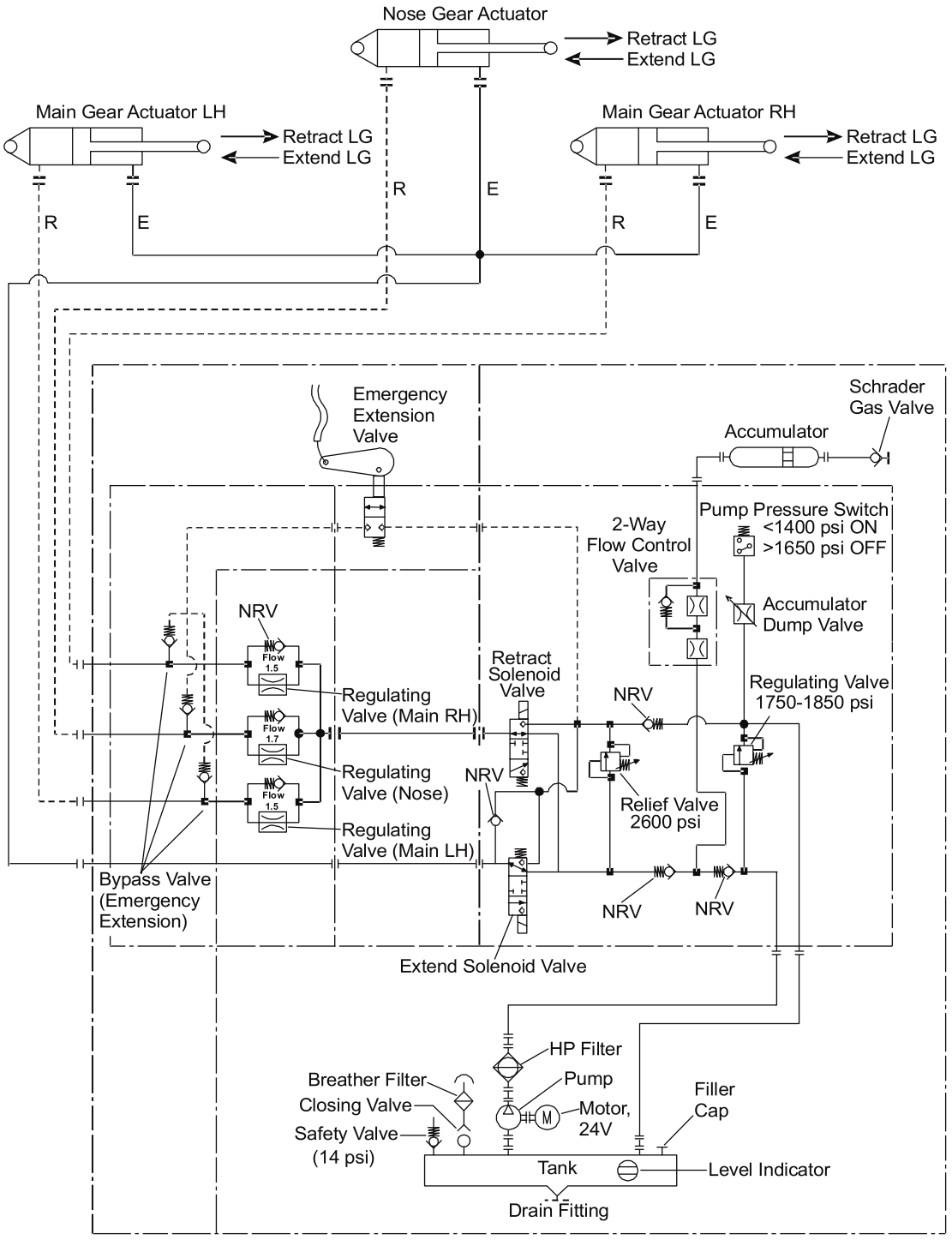


Figure 4 : Hydraulic Schematic Diagram - 'Differential Pressure' Retraction Operation

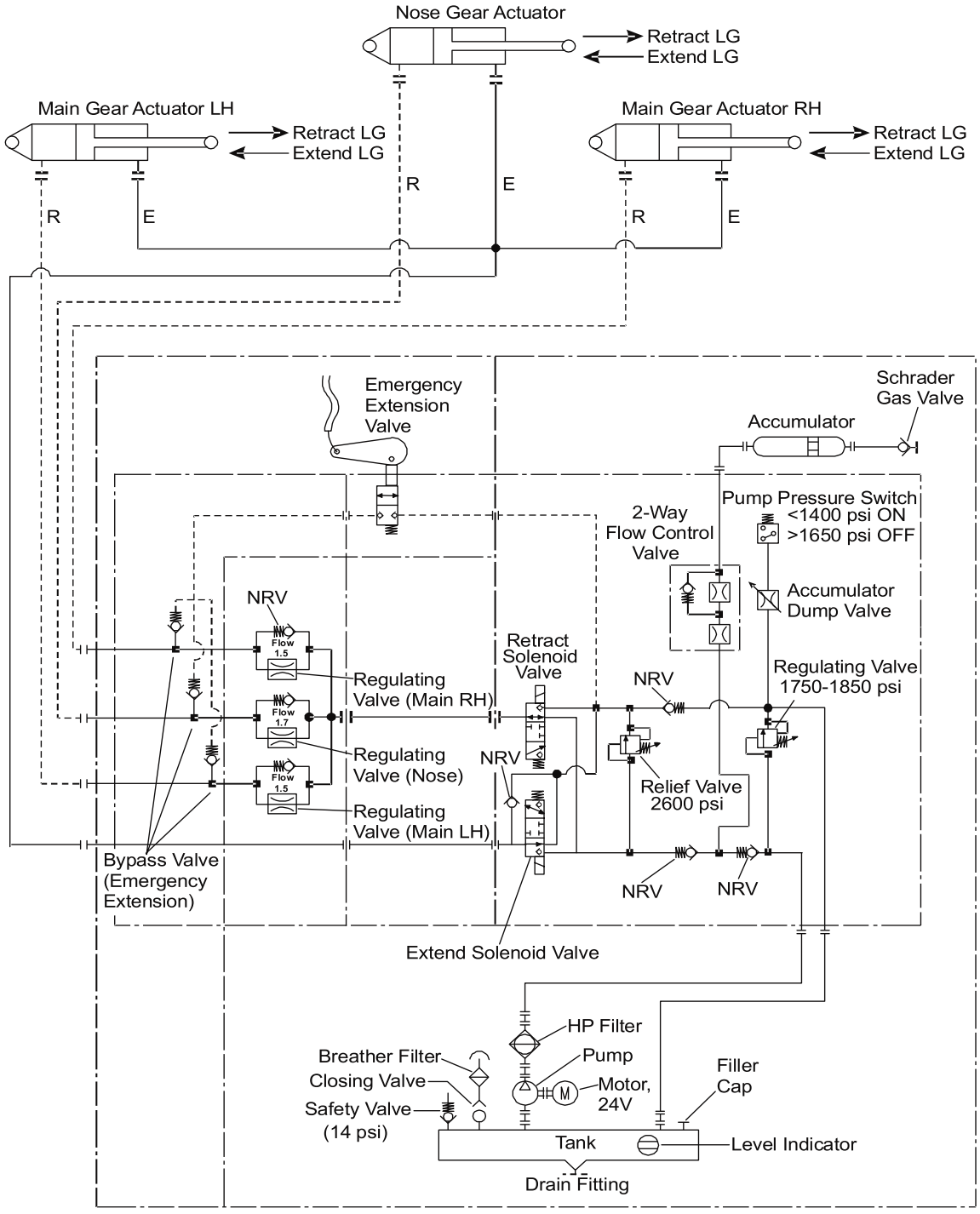


Figure 5 : Hydraulic Schematic Diagram - 'Full Pressure' Retraction Operation

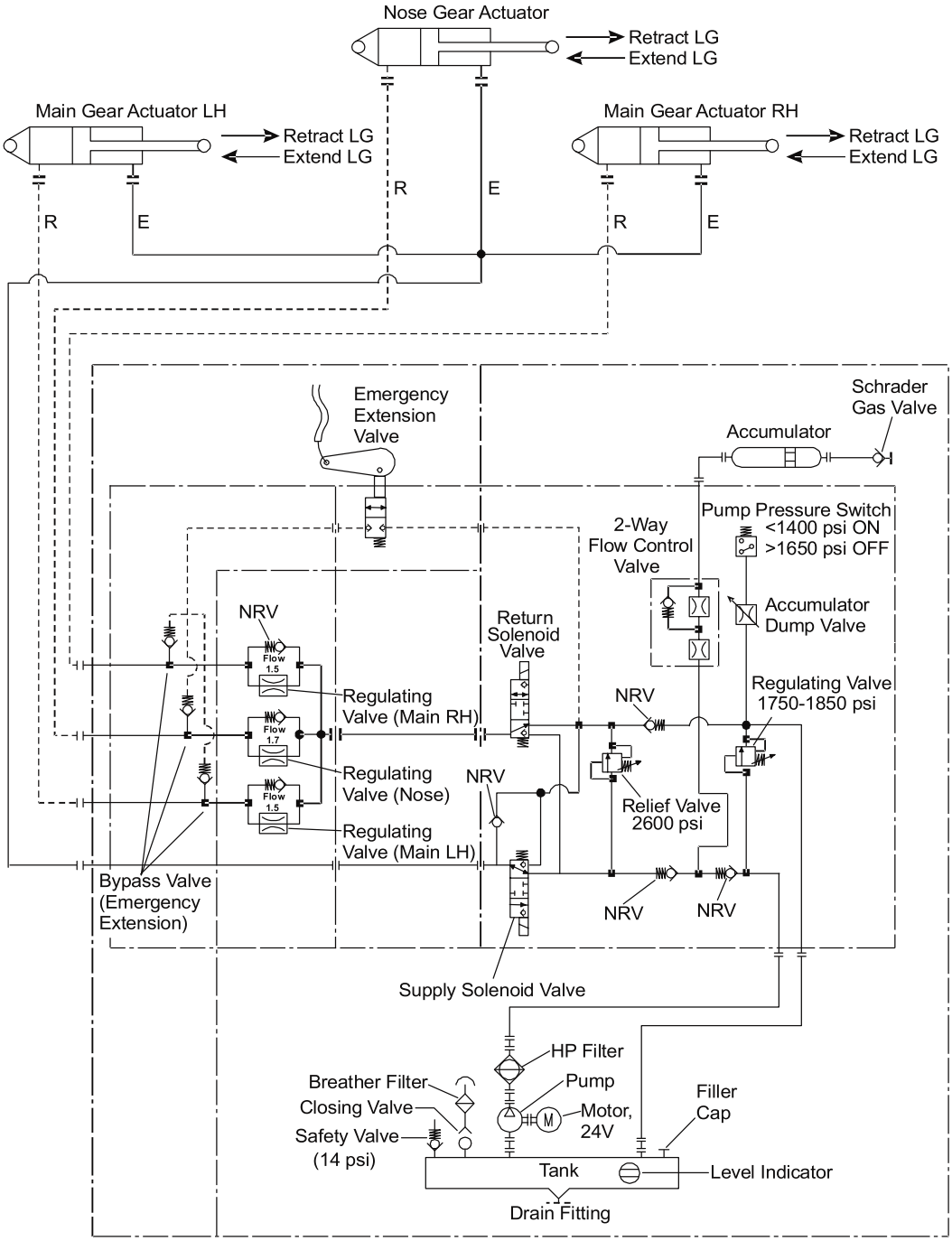


Figure 6 : Hydraulic Schematic Diagram - Normal Extension Operation

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.

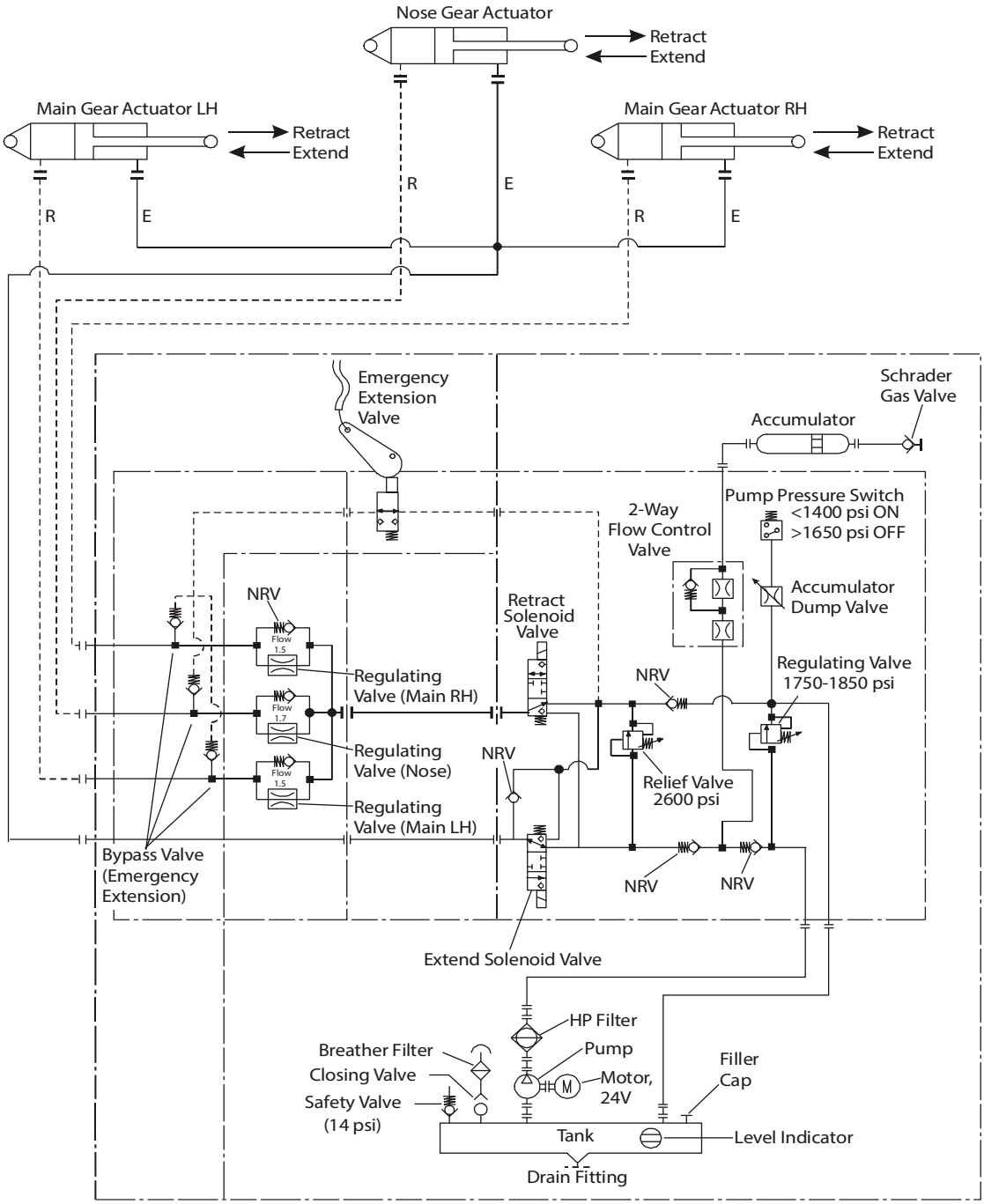


Figure 7 : Hydraulic Schematic Diagram - Emergency Extension Operation

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 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
Landing gear does not retract when the selector lever is set to UP.	Hydraulic pump (GEAR) circuit breaker pulled.	Reset GEAR the circuit breaker.
	Emergency extension lever operated.	Reset the emergency extension lever.
	Hydraulic pump defective.	Replace the hydraulic pump.
	Hydraulic supply and control assembly defective.	Replace the 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 the 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 the defective hydraulic actuator.
Hydraulic pump runs continuously / keeps cycling.	Accumulator pressure low/ defective.	Recharge/replace the accumulator.
	Pump pressure switch defective.	Replace the pump pressure switch. Refer to MAINTENANCE PRACTICES, Paragraph 5.
	Internal leak in the hydraulic supply and control assembly.	Replace the 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. Replenish the hydraulic system.

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.

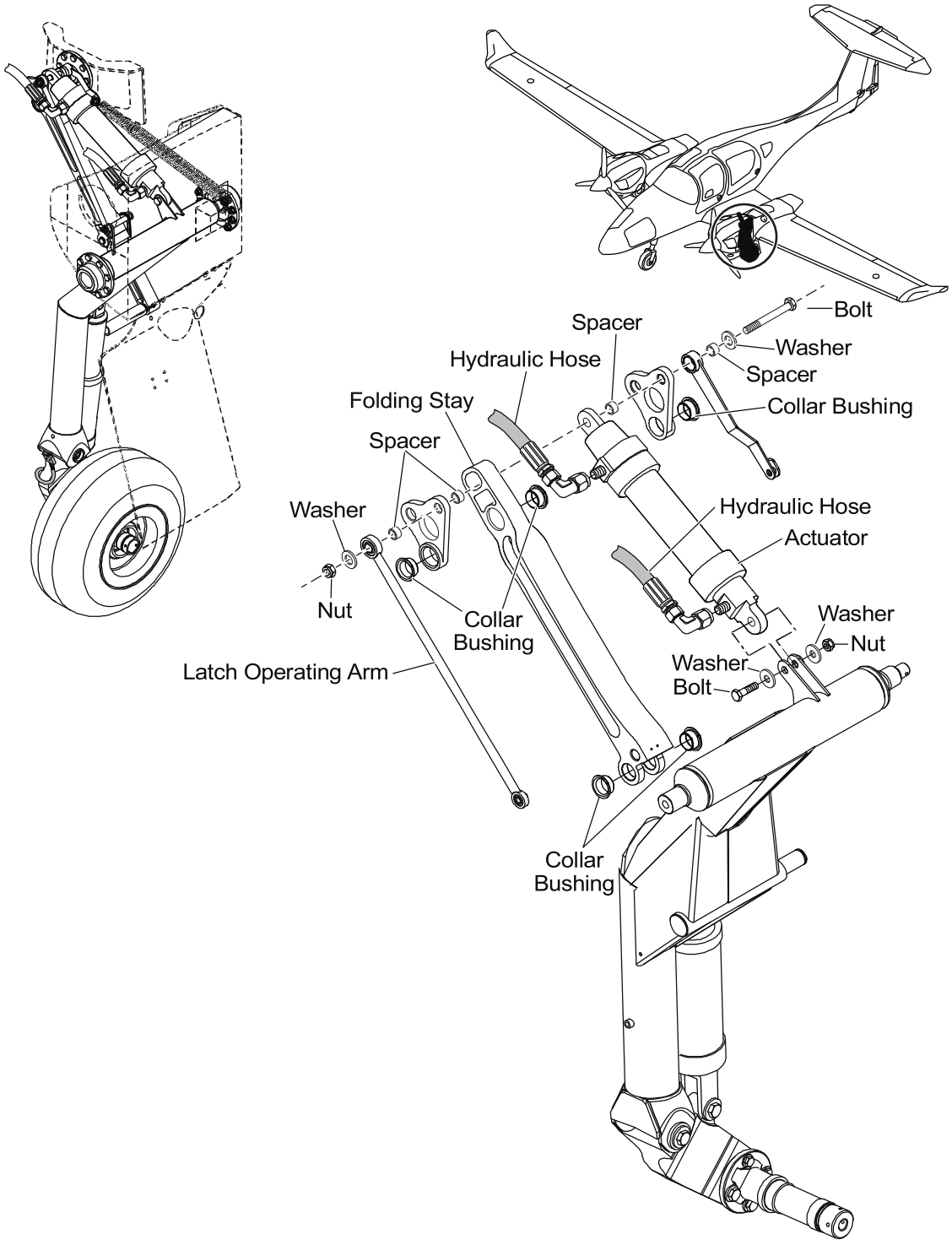


Figure 201 : Main Landing Gear - Hydraulic Actuator Installation

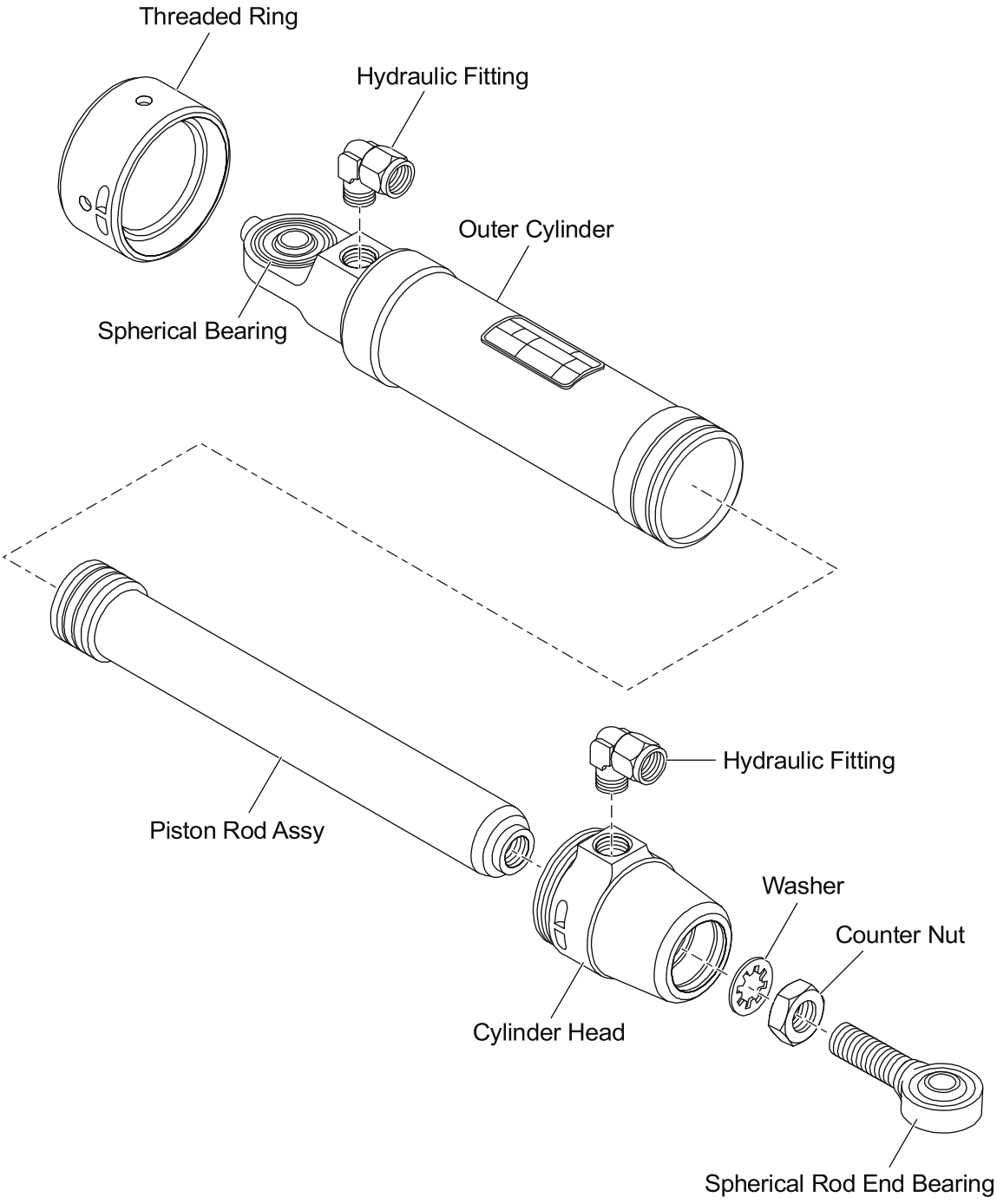
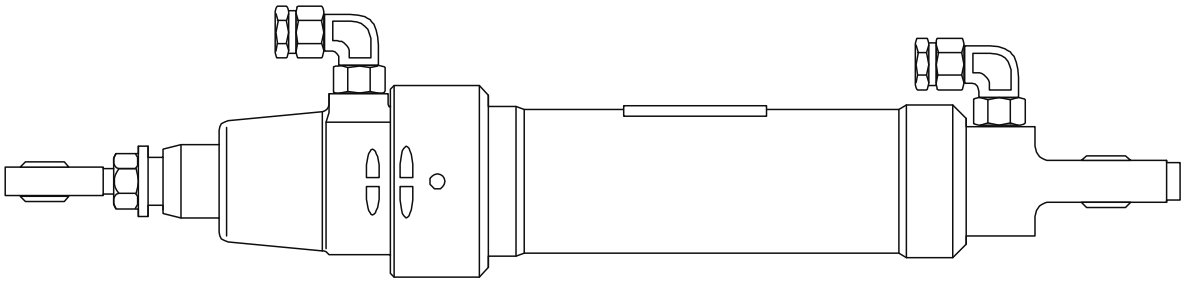


Figure 202 : Landing Gear Hydraulic Actuator Assembly
(for Correct Alignment of Hydraulic Fittings Refer to Figure 10)

Main Landing Gear Actuator



Nose Landing Gear Actuator

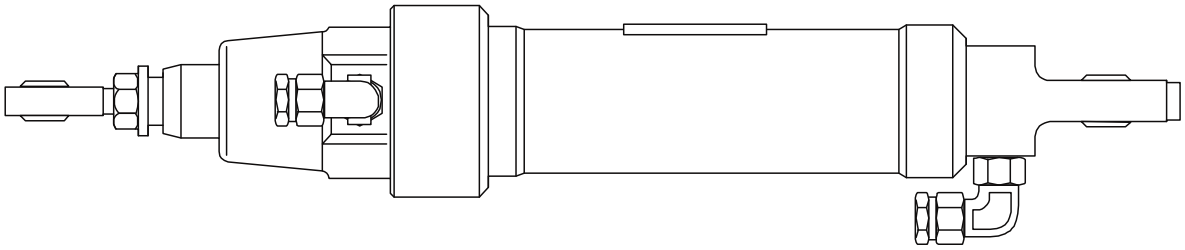


Figure 203 : Hydraulic Actuator Alignments

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 204. Measurement X.
(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 202.
(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 202.
(5)	Remove the hydraulic fitting, the threaded ring and the piston rod from the actuator.	Refer to Figure 202.

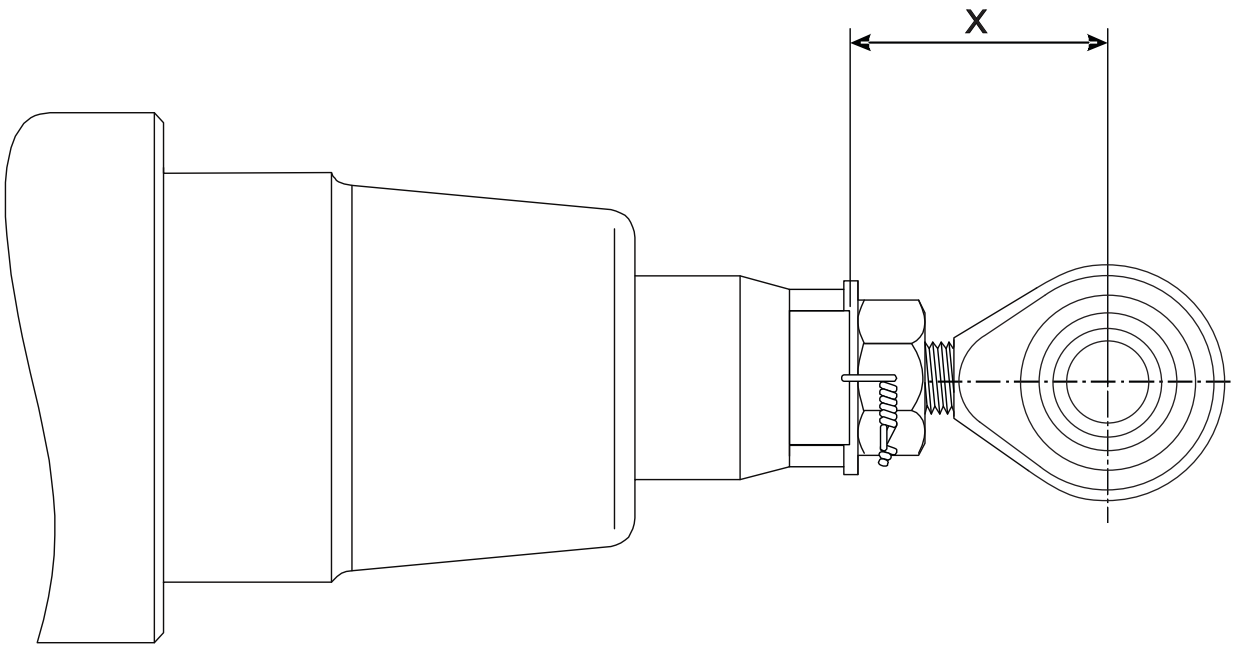


Figure 204 : MLG Actuator Measurement

C. Assemble the Actuator.

	Detail Steps/Work Items	Key Items/References
(1)	Install the piston rod.	Slide it 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 202.
(3)	Install the hydraulic fitting onto the actuator.	Refer to Figure 202.
(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.	Refer to Figure 203. Make sure the alignment of the cylinder head is correct.

	Detail Steps/Work Items	Key Items/References
(5)	Install the spherical rod end bearing: - Apply Rivolta F.L.A on the spherical rod end bearing thread. - Install the rod end together with the counter nut and washer. - 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. - Tighten the counter nut.	Do not Install the lock wire until installing the actuator into the airplane because of correct alignment. Refer to Figure 202. Refer to Figure 204. Base settings equals min. screw-in depth. Maximum distance x (min. screw-in depth): 34 mm (1.34 in).
(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 trestles.	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.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Set the ELECT. MASTER switch to ON.	
(5)	Set both engine power levers to 100%.	Fully forward.

	Detail Steps/Work Items	Key Items/References

(6)	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.

(7)	Do a test for the correct operation of the landing gear warning horn: - Move the left engine power lever to IDLE. - Move the right engine power lever to IDLE. - Move the left engine power lever to 100%.	 The landing gear warning horn must operate. The landing gear warning horn must operate. The landing gear warning horn must operate.

(8)	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.	

(9)	Set the ELECT. MASTER switch to OFF.	

	Detail Steps/Work Items	Key Items/References
(10)	Disconnect the external power supply from the airplane.	Refer to Section 24-40.
(11)	Move the wing and fuselage trestles clear of the airplane.	
(12)	Lower the airplane on jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

4. **Landing-Gear Emergency-Extension-System Test**

A. Equipment.

Item	Quantity	Part Number
Airplane jacks.	3	Commercial.
Wing trestles.	2	Commercial.
Rear fuselage trestle.	1	Commercial.

B. Landing-Gear Emergency-Extension-System 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.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
(3)	Connect an external power supply to the airplane.	Refer to Section 24-40.
(4)	Set the ELECT. MASTER switch to ON.	

(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.

	Detail Steps/Work Items	Key Items/References

(6)	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 three green (SAFE) leds illuminate.
		Pull fully aft.

(7)	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..
(10)	Do a test of the correct operation of the landing gear normal retraction and extension system.	Refer to Paragraph 3.
(11)	Disconnect the external power supply from the airplane.	Refer to Section 24-40.
(12)	Move the wing and fuselage trestles clear of the airplane.	
(13)	Lower the airplane on jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

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Section 32-40

Wheels and Brakes

1. General

The DA 62 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 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.

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 a ring grease seal and a molded grease seal. Snap rings hold each bearing assembly in position.

Each main wheel has a Goodyear 6.00-6, 8 PR, TT, 160 mph, FS II tire with a Goodyear 6.00-6 / 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 6.00-6, 8 PR, TT, 160 mph, FS II or FC III tire with a Goodyear G15/6.00-0 inner tube, valve type TR 20.
Two red slip marks - one on the tire and the other on the wheel - are aligned.

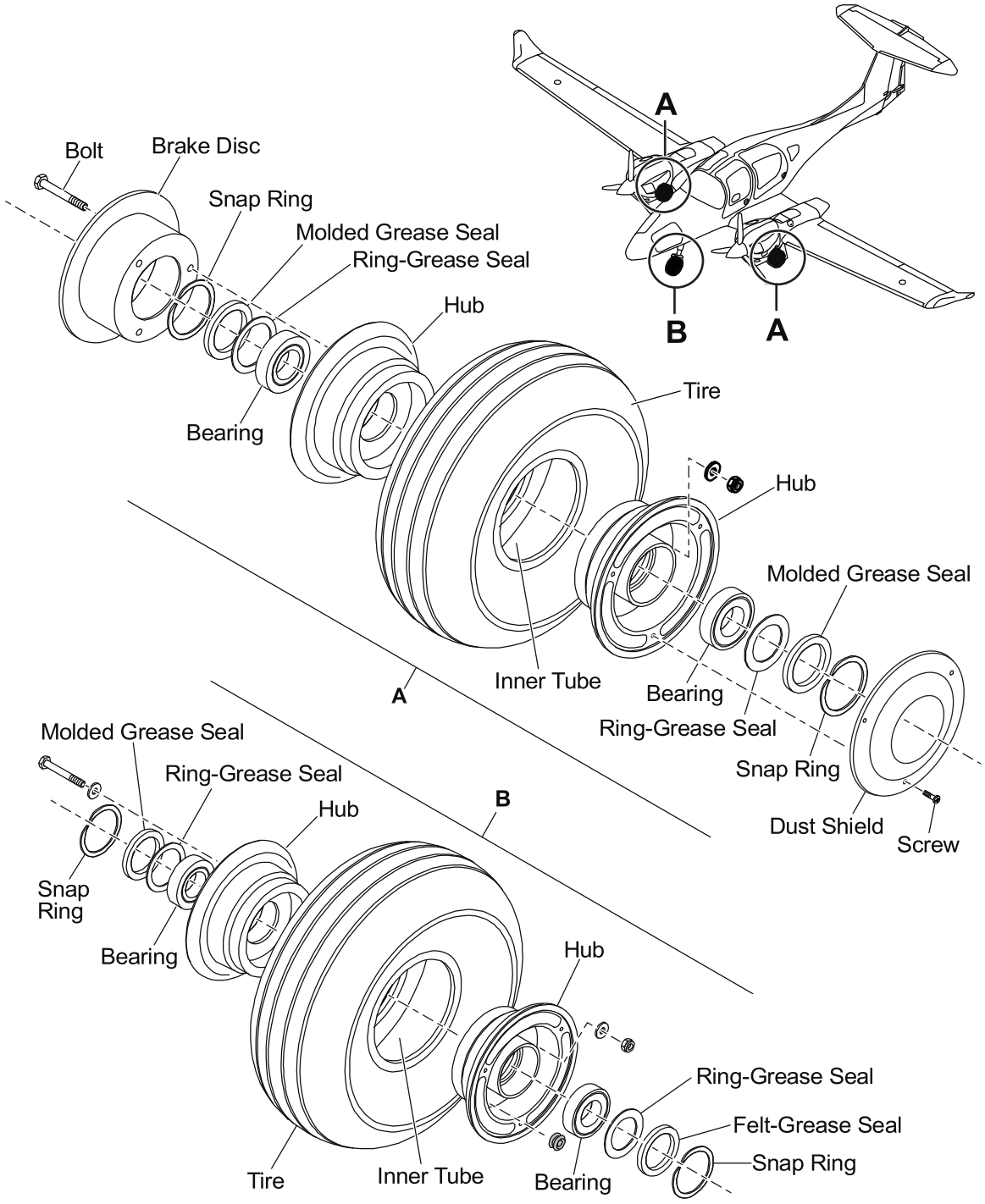


Figure 1 : Main and Nose Wheel Assemblies

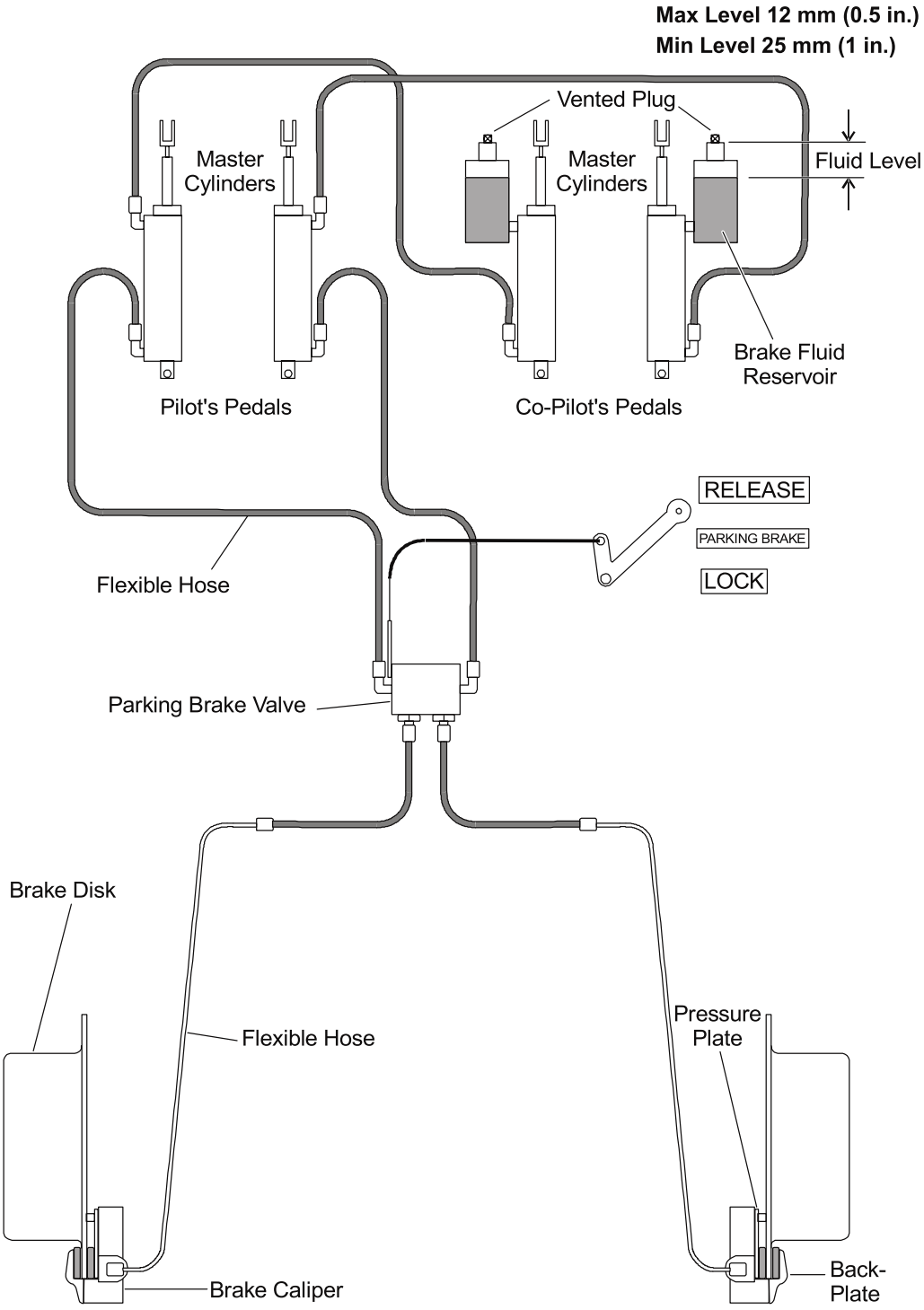


Figure 2 : Wheel Brake System - Schematic Diagram

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 LH side panel of the center console. 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.

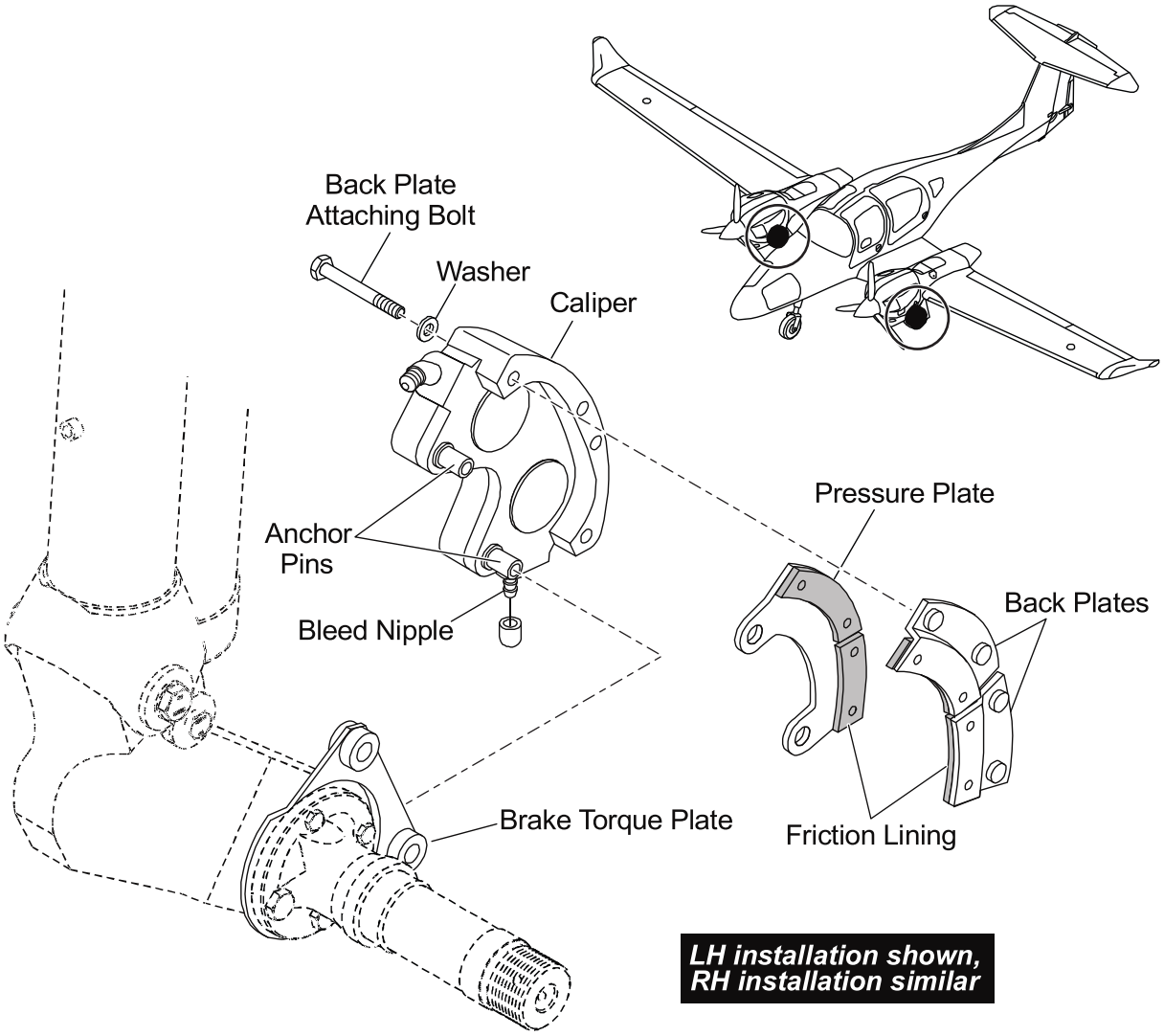


Figure 3 : Main Wheel - Brake Assembly

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 operates 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.

Trouble-Shooting

1. **General**

This table gives you the trouble-shooting data for the wheels and brakes.

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
Too much wheel run-out.	Wheel bearing(s) defective.	Replace the defective wheel bearing(s).
Brake disk is damaged.	Hard landing.	Replace the damaged brake disk. Do a hard landing inspection. Refer to Section 05-50.
	Excessive braking.	Replace the brake disk(s).
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 the 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 defective caliper.
	Brake friction linings worn excessively.	Replace the brake friction linings.
	Brake hose connector leaking.	Tighten/replace the leaking connector(s).

Trouble	Possible Cause	Repair
Parking brake does not operate correctly.	Parking brake valve operating cable out of adjustment. Parking brake valve defective.	Adjust the parking brake valve operating cable. Replace the 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 trestles.	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). DAMAGE TO THE AIRPLANE AND INJURY TO PERSONNEL COULD RESULT.

	Detail Steps/Work Items	Key Items/References
(1)	Lift the airplane on jacks.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestles into position to support the airplane.	
	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.	
(3)	Pull the GEAR circuit breaker.	On the 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.	

	Detail Steps/Work Items	Key Items/References
(4)	Release the brake caliper: - Remove the four bolts that attach the back-plates to the caliper. - Move the back-plates clear of the wheel disk	Refer to Figure 201. Do NOT remove the brake caliper from the torque plate.
(5)	Examine the wheel. Make sure that the wheel turns smoothly.	
(6)	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.	
(7)	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

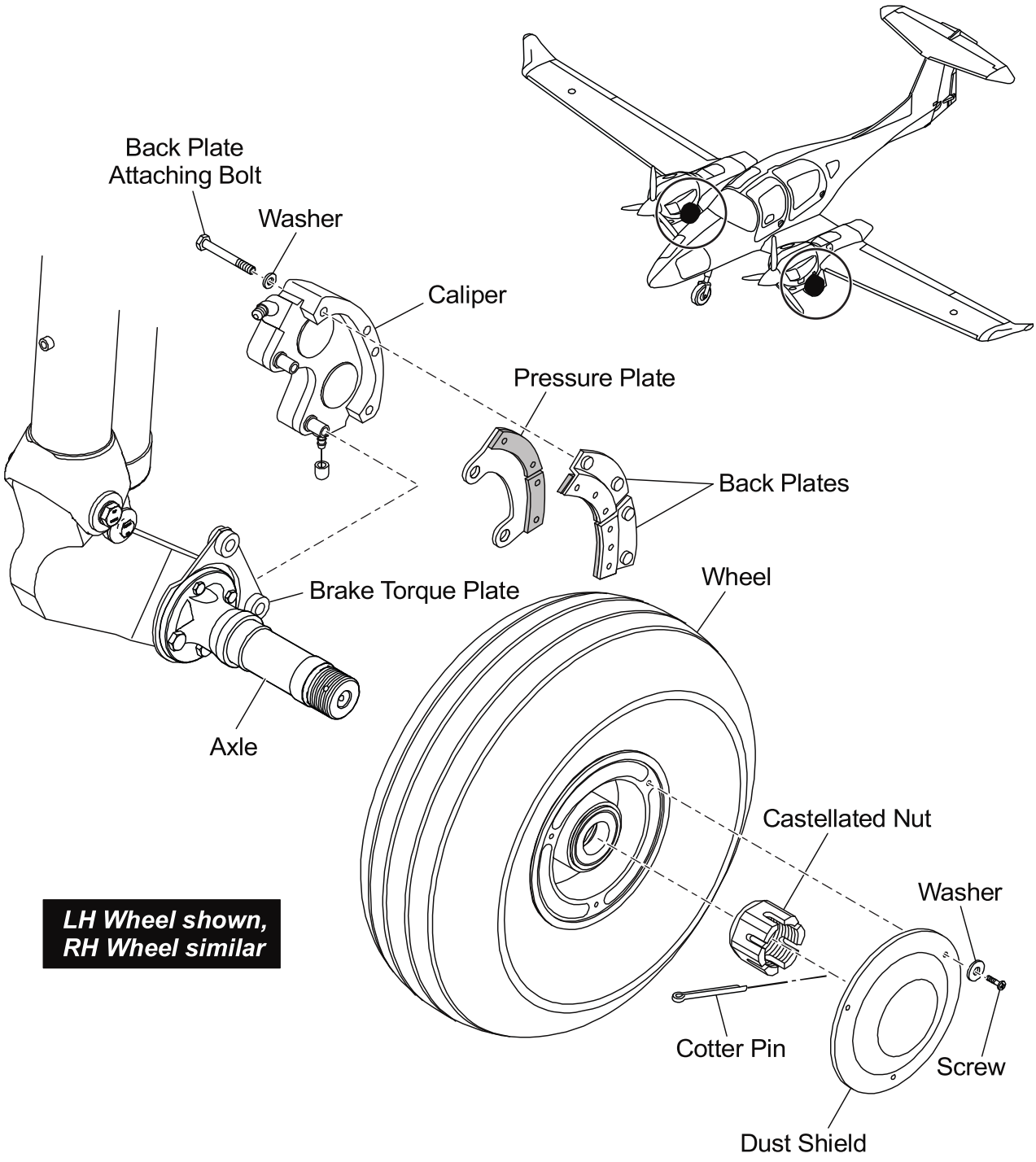


Figure 201 : Main Wheel - Removal/Installation

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.) while turning the wheel. Thereafter loosen it completely. Repeat fastening with 5 Nm (3.7 lbf.ft.). Then tighten the wheel nut until split pin fits into next drill-hole. - Install the cotter pin.	Refer to Figure 201.
(2)	Make sure that the wheel turns freely and with no noise.	No observable 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 four 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 the rim.
(5)	Install the dust shield.	
	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.	
(6)	Reset the GEAR circuit breaker and make sure that the landing gear selector is set to DOWN.	

	Detail Steps/Work Items	Key Items/References
(7)	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.
(8)	Carry out a test of the correct operation of the landing gear retraction and extension system.	Refer to Section 32-30.
(9)	Move the wing and rear fuselage trestles clear of the airplane.	
(10)	Lower the airplane on jacks.	Refer to Section 07-10. Make sure that the area around the airplane is clear of equipment.

3. **Remove/Install the Nose Wheel**

A. Equipment.

Item	Quantity	Part Number
Airplane jack.	1	Commercial
Wing trestles.	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.	Refer to Section 07-10.
(2)	Move the wing and rear fuselage trestle into position to steady the airplane.	
(3)	Examine the wheel. Make sure that the wheel can turn easily and quietly.	
(4)	Remove the nose wheel from 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 202. Support the nose wheel.
(5)	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.

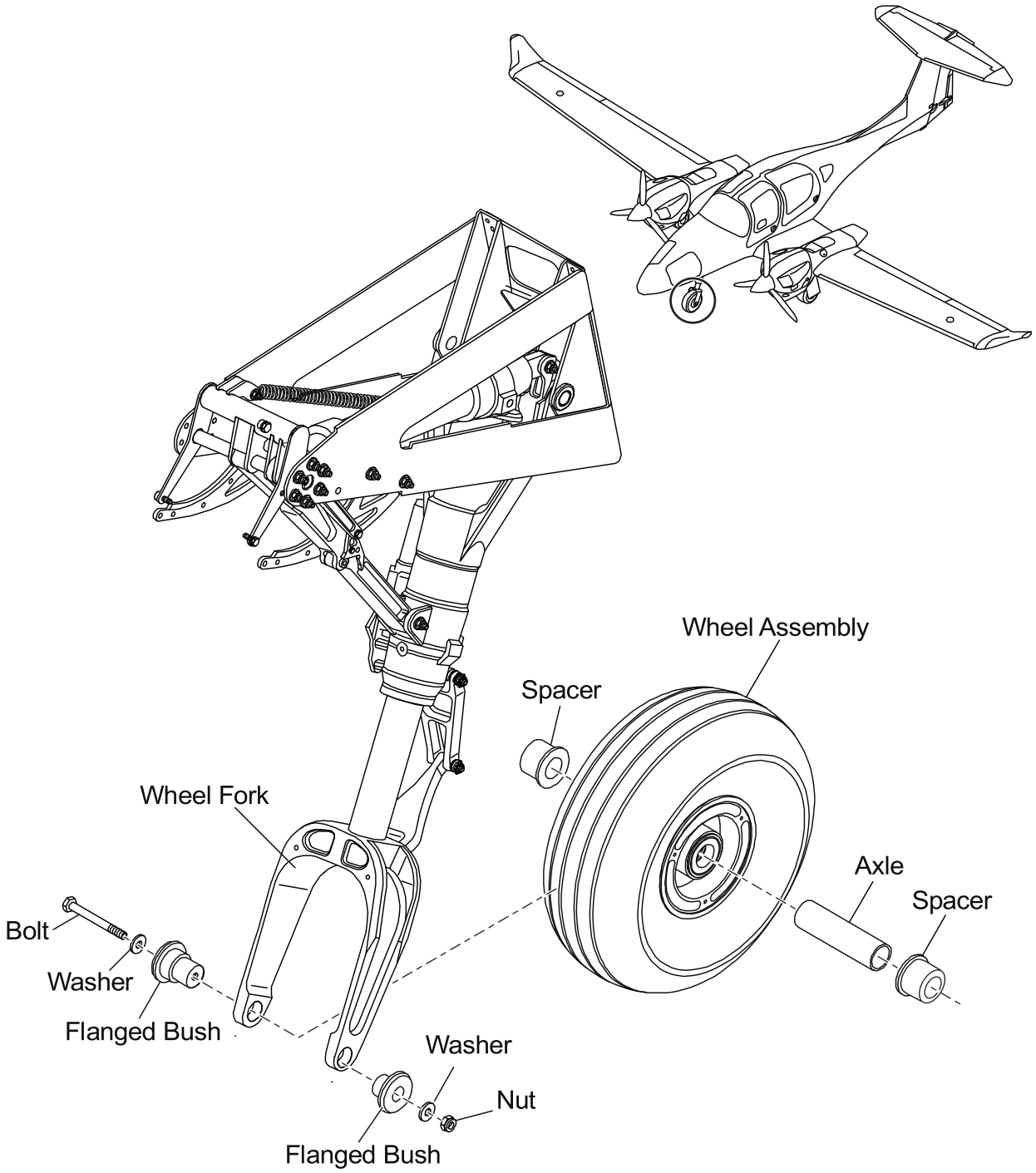


Figure 202 : Nose Wheel - Removal/Installation

C. Install the Nose Wheel.

	Detail Steps/Work Items	Key Items/References
(1)	Install the nose 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.	Refer to Figure 202. Wet installation with CA 1000. Wet installation with CA 1000. Torque 16 Nm (11.8 lbf.ft.).
(2)	Make sure that the wheel turns freely and with no noise.	No observable play in the bearings allowed
(3)	Make sure that the nose gear leg is locked down.	
(4)	Move the wing and rear fuselage trestles clear of the airplane.	
(5)	Lower the nose of the airplane with the jack.	Refer to Section 07-10. Make sure that the area around the nose of the airplane is clear of equipment.

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.	For the main wheel refer to Para 2.B. For the nose wheel refer to Para 3.B.
(2)	Deflate the tire.	
(3)	Remove the bolts that hold the two halves of the hub together.	Refer to Figure 1. (32-40-00, Page 2).
(4)	Remove the brake disk from the wheel.	Applies to the main wheels only.
(5)	Remove the hubs from the tire.	Refer to Figure 1. (32-40-00, Page 2).
(6)	Remove the inner tube from the tire.	
(7)	Remove the bearings from each hub of the wheel: - Remove the snap ring. - Remove the ring grease seal and the molded grease seal from the hub. - Remove the bearing cones.	Note the order of the seals. Refer to the Cleveland/Parker Maintenance Manual, latest revision.
(8)	Examine the wheel hubs, brake disc and the bearings for wear/damage.	Applies to the main wheels only. Refer to the Cleveland/Parker Maintenance Manual, latest revision.
(9)	Examine the wheel hubs and bearings for wear/damage.	Refer to the Cleveland/Parker Maintenance Manual, latest revision.

B. Assemble the 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 ring grease seal and molded grease seal. - Install the snap ring.	Refer to Figure 1. (32-40-00, Page 2). 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.	Refer to Goodyear Tire Care & Maintenance Manual. Prior to mounting, make sure tire bead is clean. Apply talcum powder to the outside of the inner tube. Align valve on the tube with red balance dot on tire.
(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 two hub halves. - Install the washers and nuts onto the bolts	Refer to Figure 1. (32-40-00, Page 2). View A. 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.	Refer to Figure 1. (32-40-00, Page 2). View B. 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.	For the main wheel refer to Para 2.C. For the nose wheel refer to Para 3.C.

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: **ALWAYS WEAR SAFETY GLASSES TO PREVENT EYE INJURY.**

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
Pressure-hydraulic bleeding equipment.	1	Commercial
Syringe for hydraulic fluid.	1	Commercial

B. Material.

Item	Quantity	Part Number
Hydraulic fluid.	A/R	MIL-PRF-87257 (for example, Aeroshell Fluid 51).

C. Remove a Brake Master Cylinder.

Refer to Figure 203.

Figure 2 (32-40-00, Page 3) will show the four brake master cylinders.

	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.	

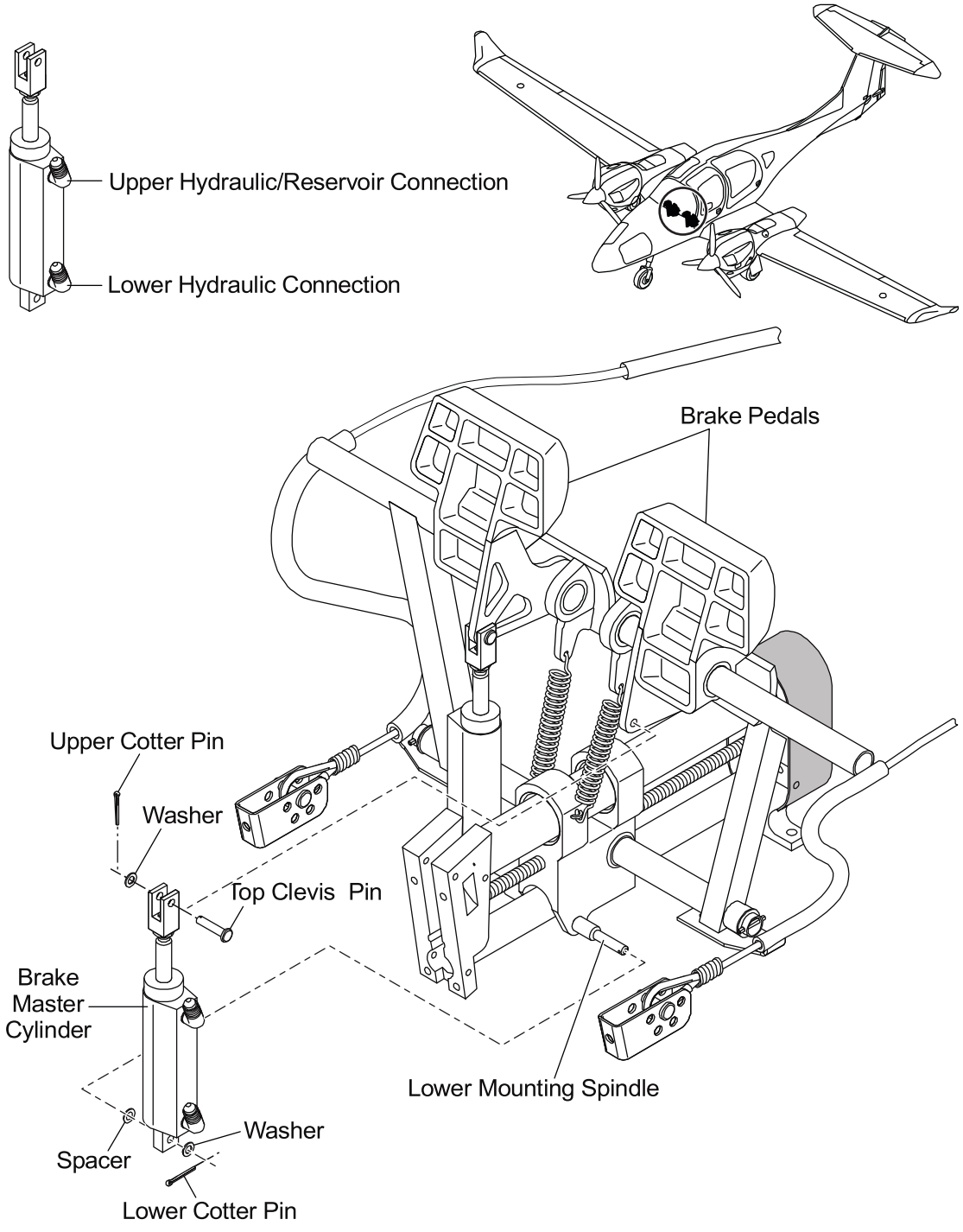


Figure 203 : Brake Master Cylinder - Removal/Installation

D. Install a Brake Master Cylinder.

Refer to Figure 203.

Figure 2 (32-40-00, Page 3) will show the four brake master cylinders.

	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)	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 wheel brake system.	Refer to Paragraph 9.
(8)	Do a test for the correct operation of the brake system.	

7. **Remove/Install the Parking Brake Valve**

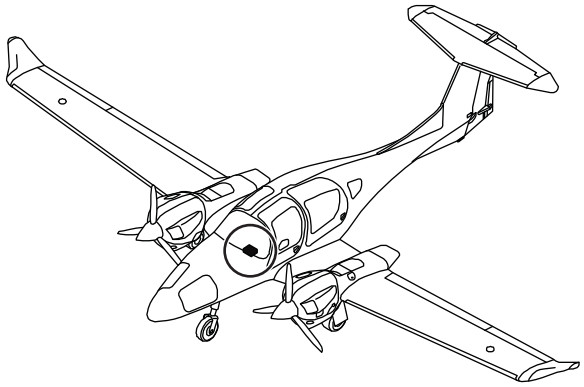
WARNING: **DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID CAN CAUSE SKIN DISEASE AND IT CAN DAMAGE CLOTHING.**

CAUTION: CLEAN OFF SPILT HYDRAULIC FLUID IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE STRUCTURE AND IT CAN REMOVE PAINT FROM COMPONENTS.

A. Remove the Parking Brake Valve.

Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(1)	Open the cover in the center console.	
(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.	
(3)	Disconnect the four 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 two nuts, bolts and washers that attach the parking brake valve to its mounting.	
(5)	Move the valve clear of the airplane.	



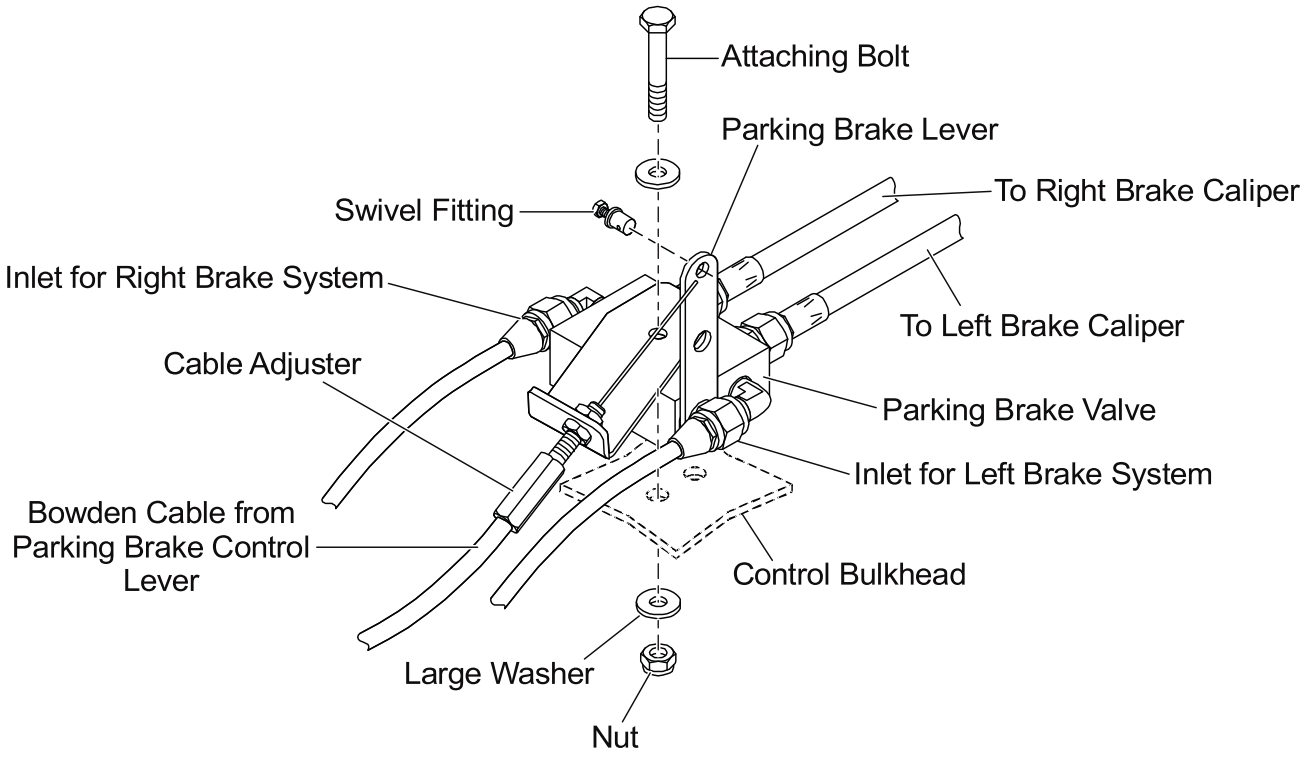


Figure 204 : Parking Brake Valve - Removal/Installation

B. Install the Parking Brake Valve.

Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(1)	Move the parking brake valve into position by its mounting.	
(2)	Install the two bolts, washers and nuts that attach the parking brake valve to its mounting.	Use new self locking nuts.
(3)	Connect the four 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 cover in the center console.	

8. **Remove/Install a Brake Caliper**

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.

A. Remove a Brake Caliper.

Refer to Figure 205.

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the brake hose from the brake caliper.	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 four bolts and washers that attach the backing plate to the brake caliper. - Remove the backing plates.	
(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.

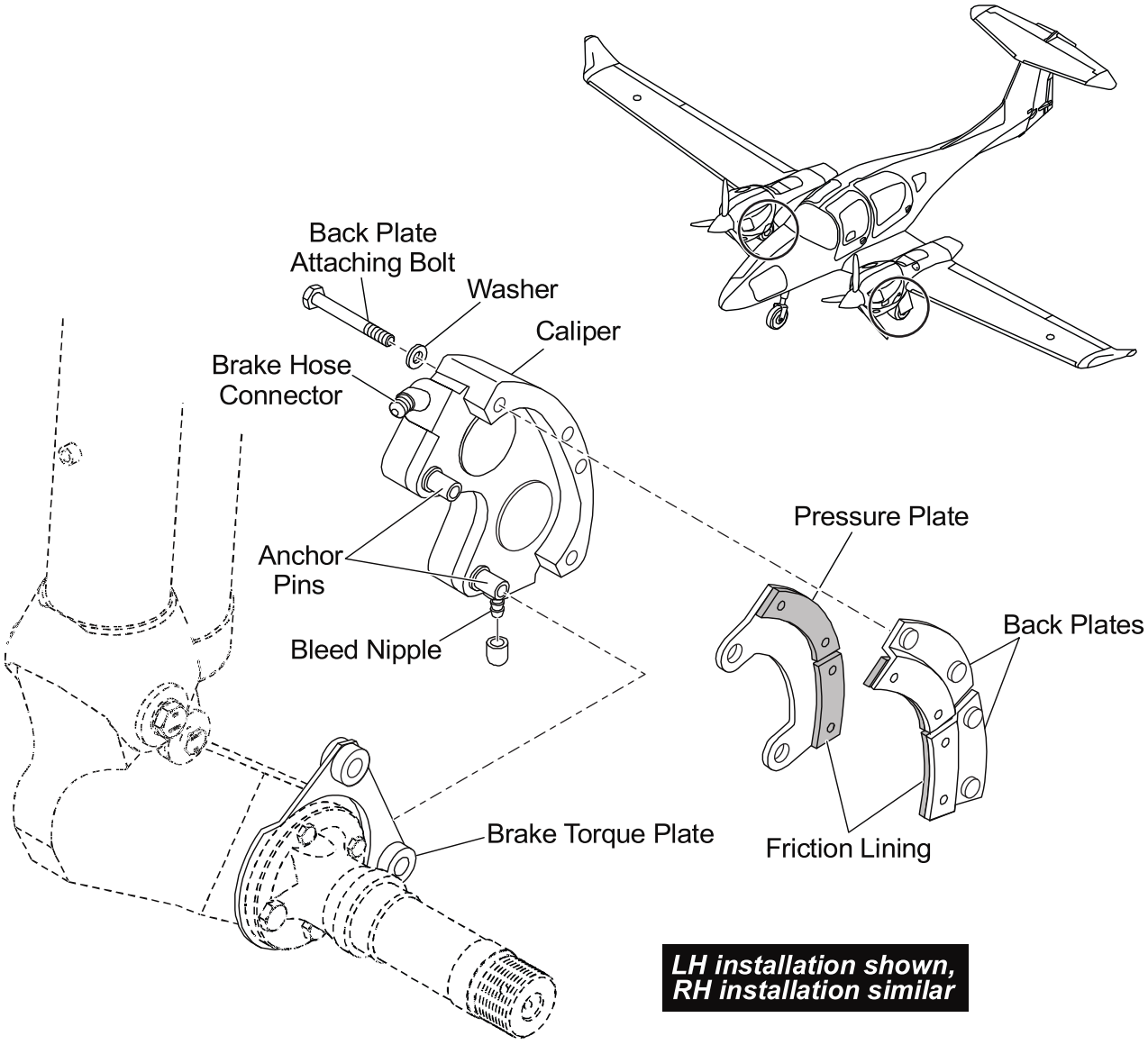


Figure 205 : Brake Caliper - Removal/Installation

B. Install a Brake Caliper.

Refer to Figure 205.

	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 the 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.	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 four 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 the Cleveland/Parker Maintenance Manual, latest revision or placard on the caliper.
(6)	Connect the hydraulic brake hose to the connection on the caliper.	Remove all blanking caps.
(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 for hydraulic fluid.	1	Commercial

B. Material.

Item	Quantity	Part Number
Hydraulic fluid.	A/R	MIL-PRF-87257 (for example, Aeroshell Fluid 51).

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 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..

Figure 2 (32-40-00, Page 3) will show the master cylinders and the brake fluid reservoirs.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the cap from the brake fluid reservoirs. 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.	Refer to Figure 205.

	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 brake fluid 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.	Refer to Figure 205. 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. Refer to Figure 2. (32-40-00, Page 3).
(7)	Install both the left and right reservoir plugs onto the reservoirs.	Use "vented plugs".
(8)	Do a test for the correct operation of the wheel brake systems.	

10. **Replace the Brake Friction Linings**

A. Material.

Item	Quantity	Part Number
Cleveland metallic brake friction linings for Brake Caliper 30-233E.	Four per brake.	Cleveland 066-15500.

B. Replace the Brake Friction Linings.

NOTE: For detailed instructions refer to the Cleveland/Parker Maintenance Manual, latest revision.

For brake component limits refer to the Cleveland/Parker Maintenance Manual, latest revision.

	Detail Steps/Work Items	Key Items/References
	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.	
(1)	Remove the brake caliper from the wheel assembly.	Refer to Paragraph 8.A.
(2)	Remove the pressure plate from the caliper.	Refer to Figure 205.
(3)	Remove the brake friction lining from the pressure plate by prying off with a screwdriver.	Refer to the Cleveland/Parker Maintenance Manual, latest revision. Check lining attachment pins for damage.
(4)	Remove the brake friction lining from the back plates by prying off with a screwdriver.	Refer to the Cleveland/Parker Maintenance Manual, latest revision. Check lining attachment pins for damage.
(5)	Install the new friction linings onto the pressure plate and the back-plates.	Use only approved parts. Check lining attachment pins for a tight fit to the linings. Refer to the Cleveland/Parker Maintenance Manual, latest revision.
(6)	Install the pressure plate into the caliper.	
(7)	Install the brake caliper.	Refer to Figure 205.
(8)	Do a test for the correct operation of the airplane braking system. Perform conditioning procedure for metallic brake linings.	Refer to the Cleveland/Parker Maintenance Manual, latest revision.

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.

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.

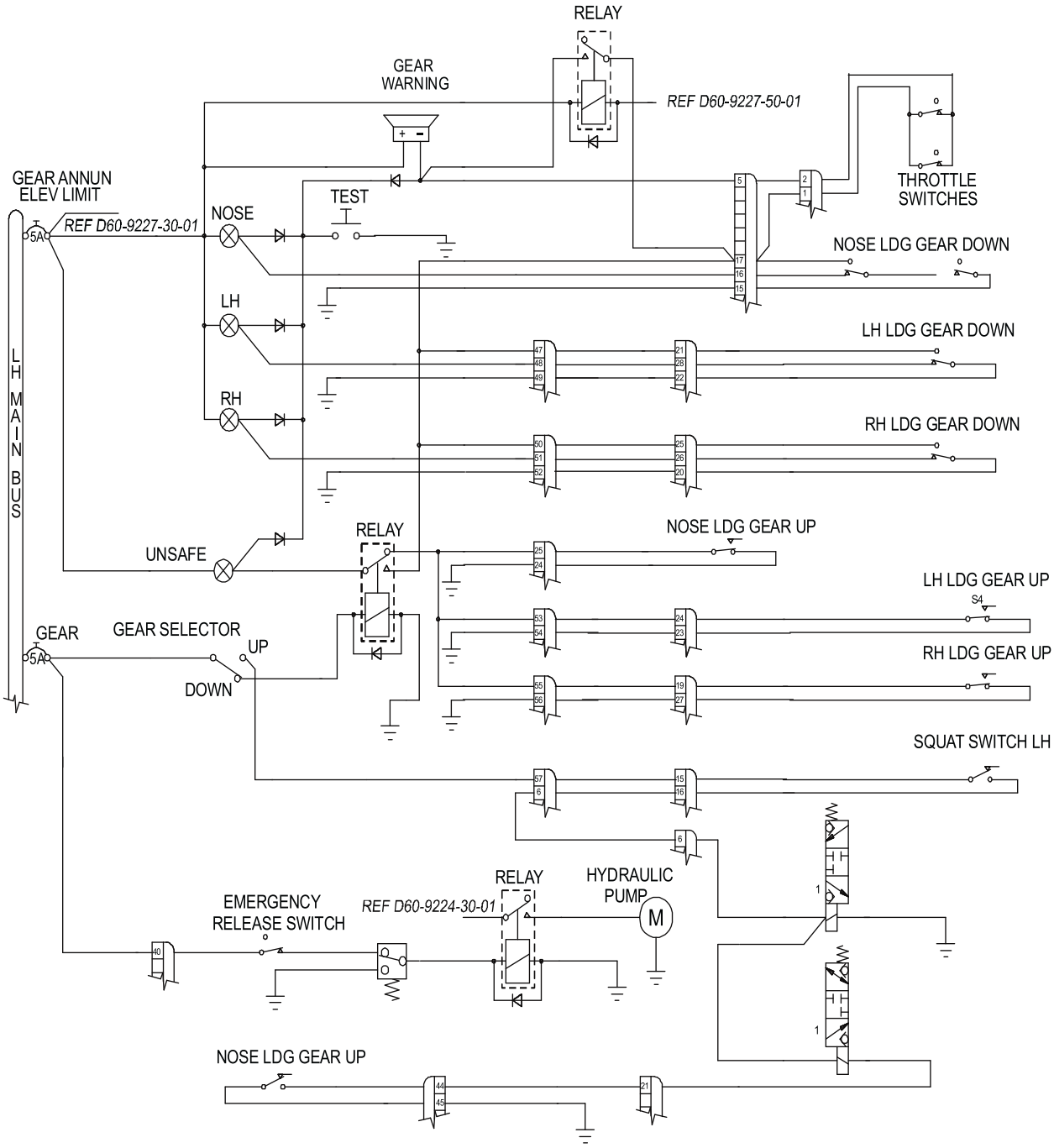


Figure 1 : Landing Gear - Electrical Schematic Diagram

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 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 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 defective control relay.
The red UNSAFE indicator stays lit when the landing gear is down. One of the three green indicators is not lit.	The folding-stay switch is not adjusted correctly.	Adjust the folding-stay switch correctly.
	The folding-stay switch is 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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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 62. 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 62 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 62 has these exterior lights in one light unit at each wing tip:

- Left and right position lights.
  The front part of the assembly has red (left) or green (right) LEDs with clear lenses. The light can only be seen from the front and the side.
- Rear position lights.
  The aft part of each wing tip light unit has a clear lens with white LEDs. 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. White LEDs provide a high-intensity flash. The strobe light can be seen from all directions.

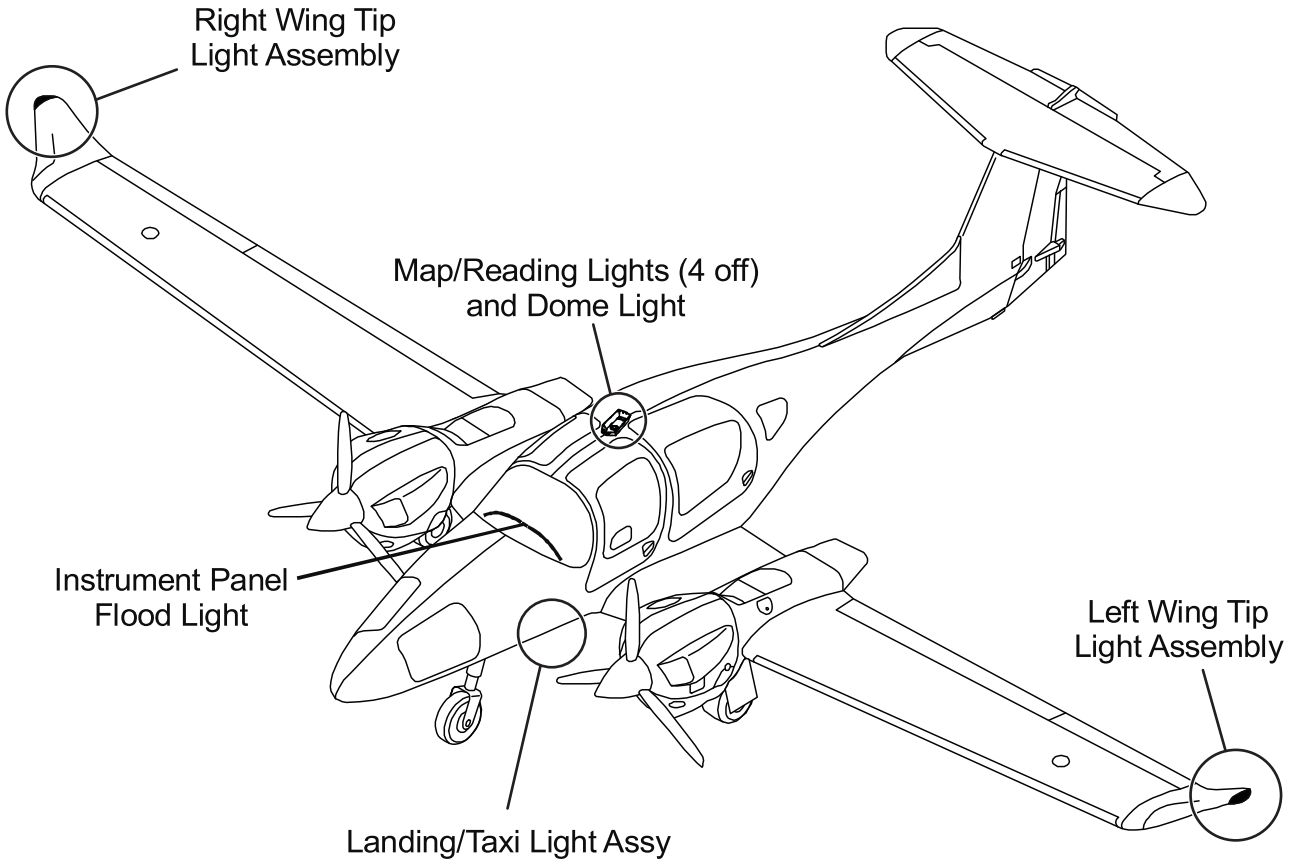

Figure 1 : Flight Compartment and Exterior Lights

The DA 62 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 center 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 62 airplane. Refer to Chapter 92 for the wiring diagrams.

2. Description

Refer to Figure 1.

The DA 62 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.

B. Instrument Panel Flood Lighting.

Two 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 center 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 lights are 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

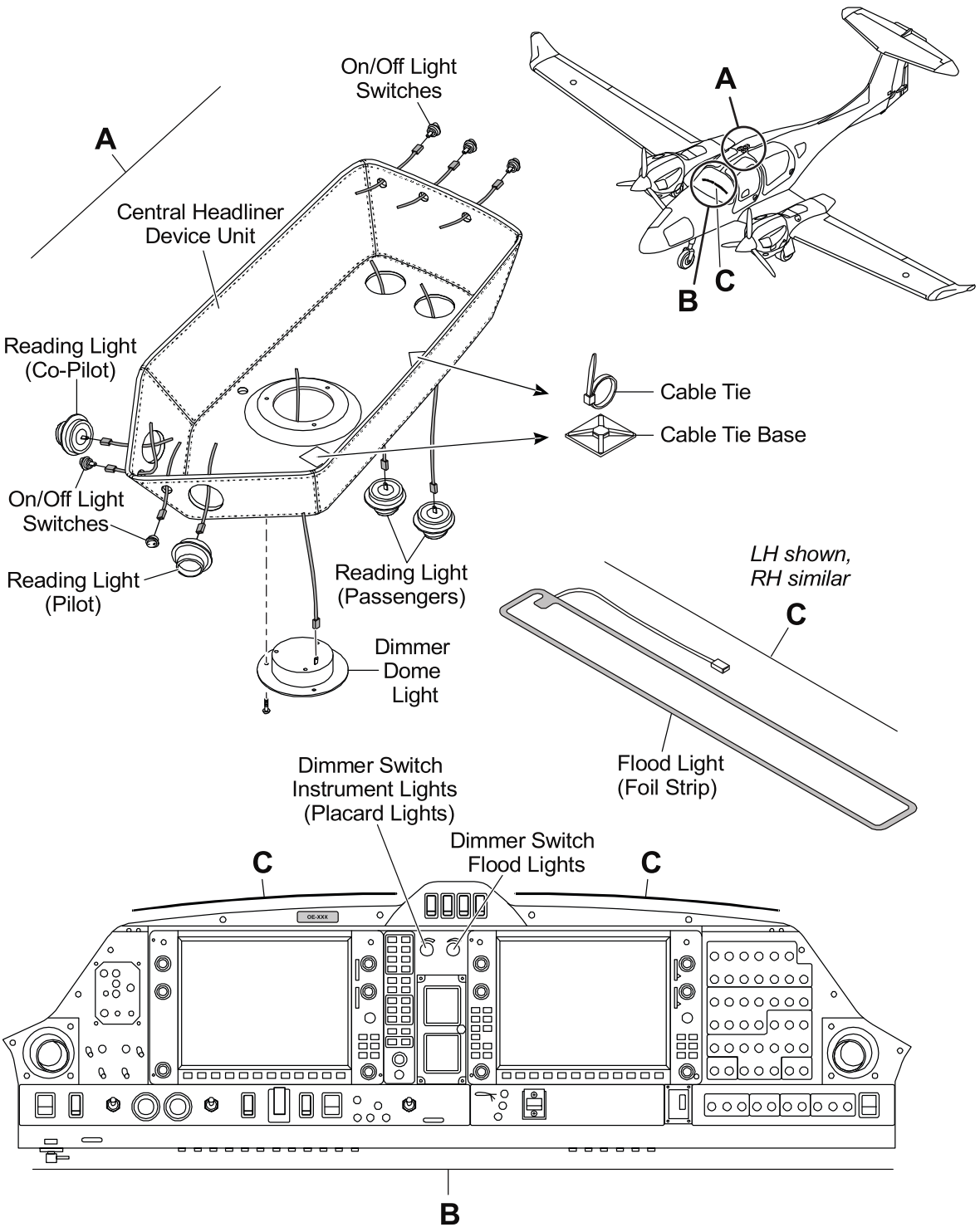

Figure 1 : Flight Compartment Lights

C. Instrument Lights (Placard Lights).

The DA 62 has placards that are attached onto panels. There are 11 placard panels on the DA 62 instrument panel. Most placard panels have 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 center 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.

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Trouble-Shooting

1. **General**

The table below lists some defects that you could have with the flight compartment lighting 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
One of the map/reading lights does not operate.	Defective filament.	Replace the filament.
	Defective light unit.	Replace the light unit.
The instrument panel flood light does not operate correctly.	Circuit-breaker not set.	Set the circuit-breaker.
	Dimmer switch defective.	Replace the dimmer switch.
	Solid state inverter defective.	Replace the solid state inverter.
	Light strip defective.	Replace the light strip.
	Defective wiring.	Do a continuity check 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.	Reset the circuit breaker.
	One or more light panels defective.	Replace defective light panel(s).
	Dimmer switch defective.	Replace the dimmer switch.
	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 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 the Map/Reading Light Assembly

A. Remove the Map/Reading Light Assembly.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the TAXI/MAP/ACL circuit breaker.	On the right side of the instrument panel.
(2)	Remove the Map/Reading light assembly: - Release the screws that 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.	Hold the Map/Reading light assembly. At the in-line connectors. Mark the cables for the installation.

B. Install the Map/Reading Light Assembly.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Move the Map/Reading light assembly into position in the airplane cabin.	Hold the Map/Reading light assembly.
(2)	Connect the electrical cables to the lights and connectors in the assembly.	At the in-line connectors. Connect the cables to the correct lights.
(3)	Move the Map/Reading light assembly into position and install the screws.	Make sure that the light assembly is correctly installed.
(4)	Reset the TAXI/MAP/ACL circuit breaker.	On the right side of the instrument panel.
(5)	Do a test for the correct function of the Map/ Reading light assembly.	

3. **Replace a Filament in the Map/Reading Light Assembly**

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Pull the TAXI/MAP/ACL circuit breaker	On the right side of the instrument panel.
(2)	Remove the Map/Reading light assembly.	Refer to Paragraph 2.A.
(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 Map/Reading light assembly.	Refer to Paragraph 2.B.
(7)	Reset the TAXI/MAP/ACL circuit breaker.	On the right side of the instrument panel.
(8)	Do a test for the correct function of the Map/ Reading light assembly.	Make sure that the replaced filament is operational.

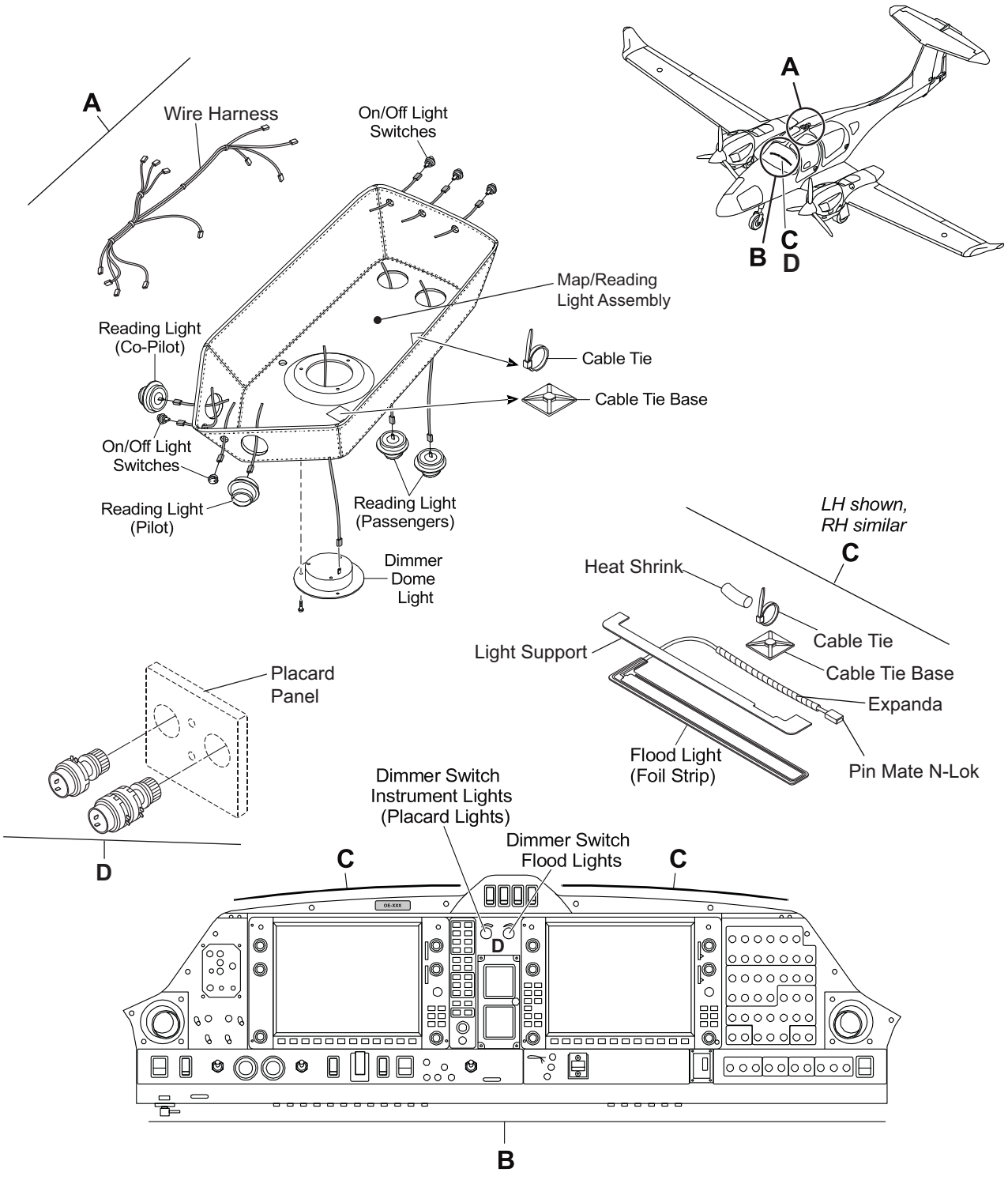

Figure 201 : Flight Compartment Lights - Removal/Installation

4. **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.

Refer to Figure 201.

	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.

Refer to Figure 201.

	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.

5. **Replace a Flood Light Strip**

You cannot remove a flood light strip without causing damage to the strip.
Only remove the flood light/instrument light strip if it is defective.

A. Replace a Flood Light Strip.

Refer to Figure 201.

	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 it on a clean work bench.	Refer to Section 25-10.
(3)	Remove the light strip from the inside of the instrument panel cover: - Disconnect the electrical connection. - Remove the cable-tie and heat shrink. - Peel the light strip away from the light support on 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 strip on the panel light support and firmly press it into place. - Install heat shrink where required. - Install a new cable-tie. - Connect the electrical connection.	Use a commercial solvent. Obey the solvent manufacturer's directions. Use the tape specified in the DA 62 Illustrated Parts Catalog or that is supplied with the flood light strip. Make sure that the light support is not damaged. Replace it if damaged.
(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 dimmer switch fully clockwise.	The light strips must come on bright.
	- Rotate the FLOOD l light dimmer switch a small amount counter-clockwise.	The light strips must go dimmer.
	- Rotate the FLOOD light dimmer switch fully counter-clockwise.	The light strips must go off.
	- Set the ELECT. MASTER switch to OFF.	

6. **Remove/Install a Solid State Inverter for the Flood Light/Instrument Lights**

Use this procedure for both the flood lights inverter and the placard/instrument lights inverter

A. Remove a Solid State Inverter.

Refer to Figure 202.

	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 for removal.	At the in-line connector.
(4)	Remove the flood lights inverter: - Remove the two screws, washers and nuts that attach the flood lights inverter to the instrument panel floor. - Move the inverter clear of the instrument panel floor and remove it from the airplane. Remove the placards/instrument lights inverter: - Remove the PFD. - Remove the two screws, washers and nuts that attach the placards/instrument lights inverter to the instrument panel. - Move the inverter clear of the instrument panel and remove it from the airplane.	Refer to Section 31-40.

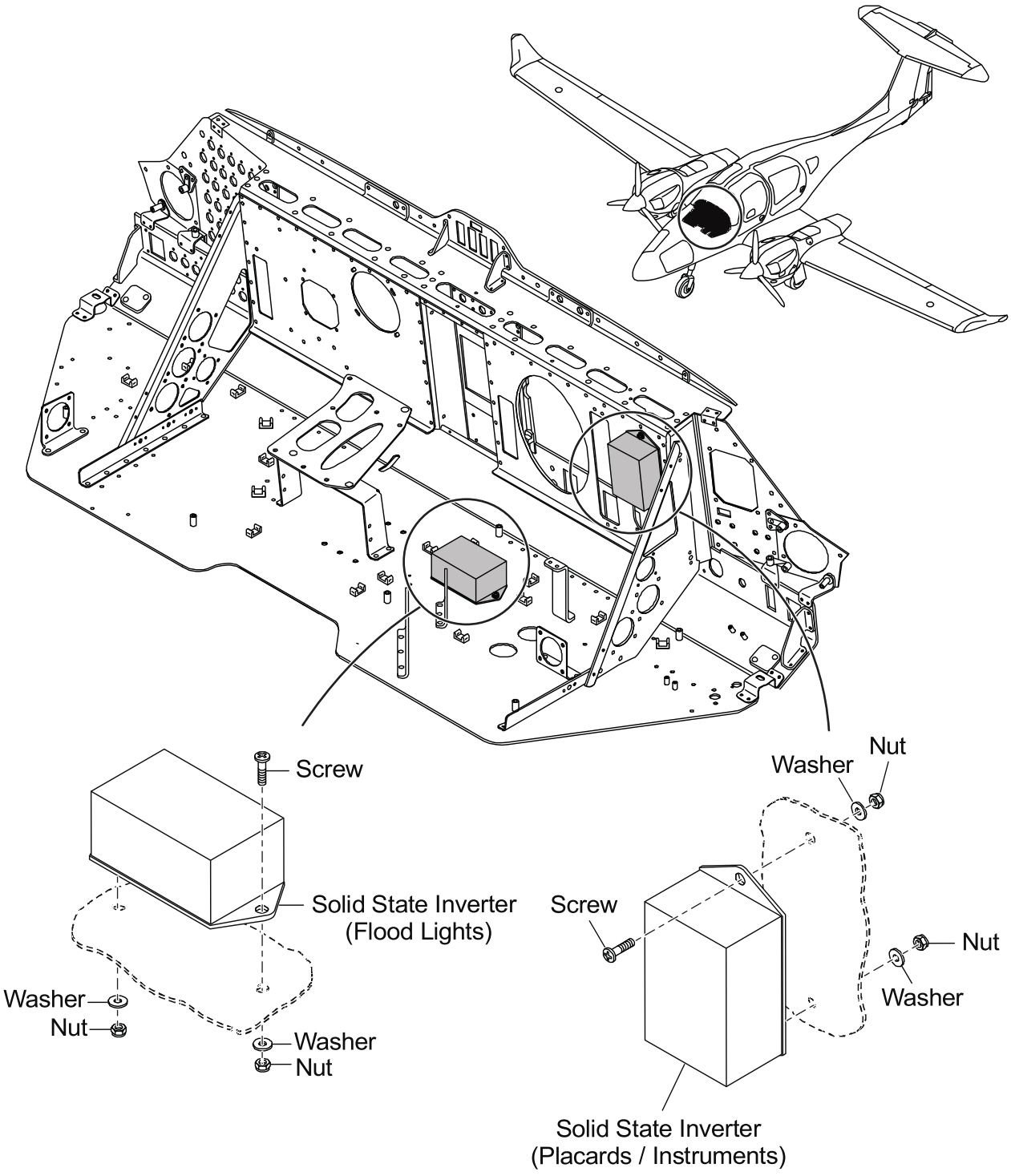

Figure 202 : Solid State Inverters for the Instrument and Flood Lights

B. Install a Solid State Inverter.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Install the flood lights inverter: - Move the inverter into position on the instrument panel floor. - Install the two screws, washers and nuts that attach the flood lights inverter to the instrument panel floor. Install the placards/instrument lights inverter: - Move the inverter into position on the instrument panel. - Install the two screws, washers and nuts that attach the placards/instrument lights inverter to the instrument panel. - Install the PFD.	Refer to Section 31-40.
(2)	Connect the electrical cables to the inverter that was installed.	At the in-line connector.
(3)	Install the instrument panel cover.	Refer to Section 25-10.
(4)	Connect the airplane main battery.	Refer to Section 24-31.
(5)	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.

Section 33-40

Exterior Lights

1. General

This Section tells you about the exterior lights of the DA 62. The DA 62 has these exterior lights:

- Position lights.
- Strobe lights.
- Landing light.
- Taxi light.

2. Description

The DA 62 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 shows the wing tip light unit.
- Figure 2 shows the landing and taxi lights.

A. Position Lights and Strobe Light (Anti-Collision Light - ACL).

The DA 62 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.

B. 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.

C. 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.

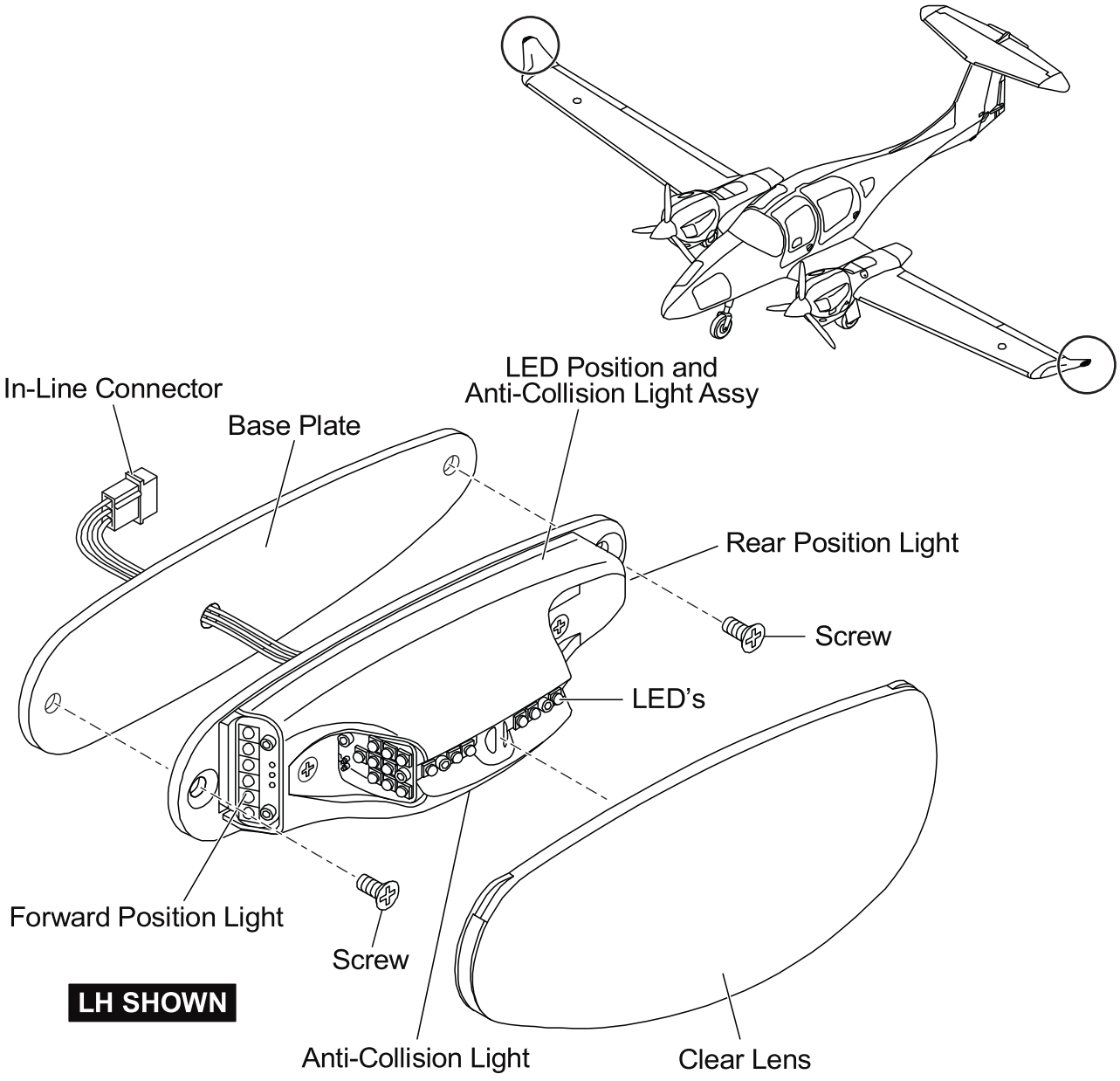

Figure 1 : Wing-Tip Light Unit

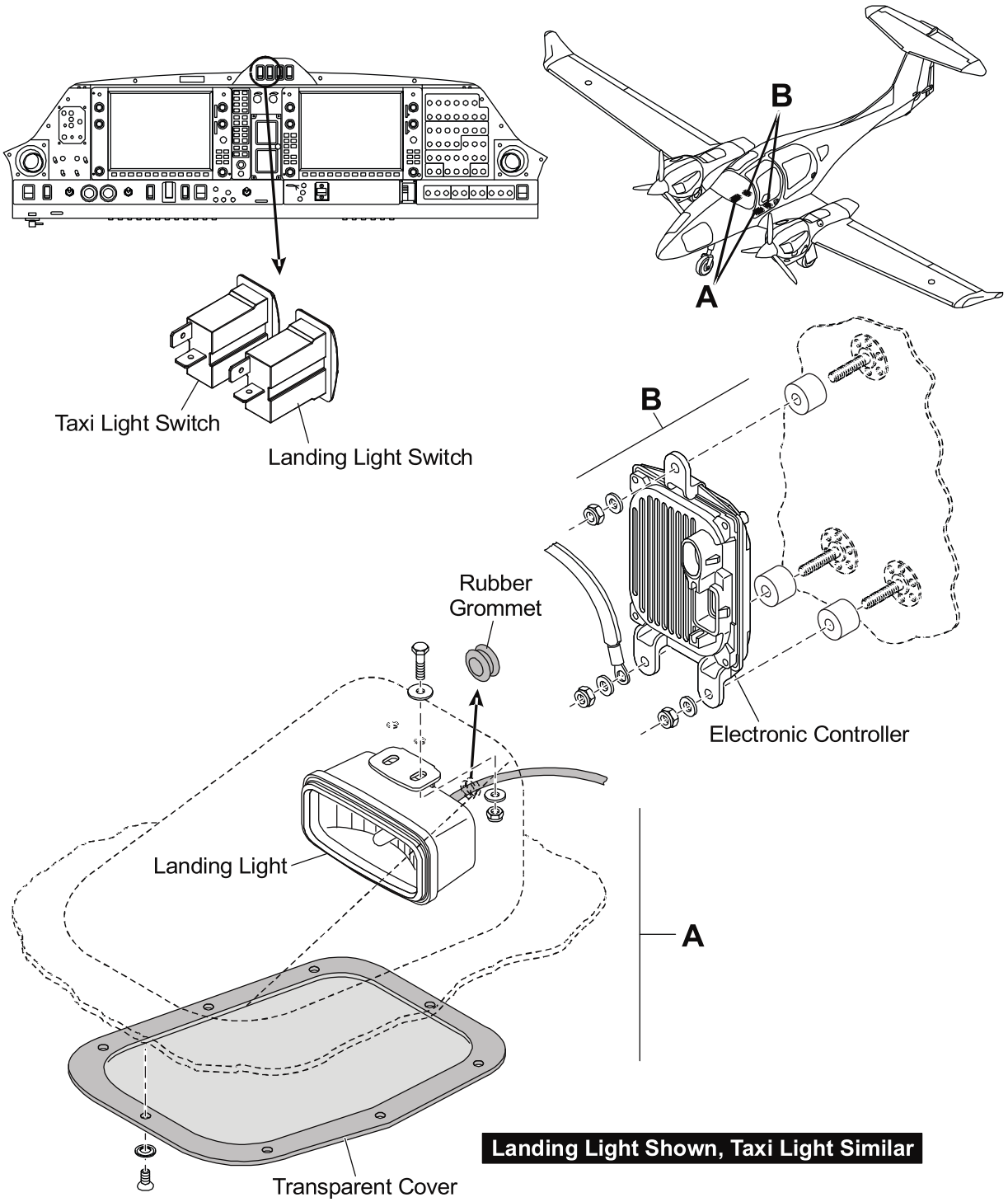

Figure 2 : Landing and Taxi Light Installation

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Trouble-Shooting

1. **General**

The table below lists some defects that you could have with the exterior lighting 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 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.

Trouble	Possible Cause	Repair
Both position lights do not operate.	Circuit breaker not set or defective.	Set/replace the circuit-breaker.
	Defective position light switch.	Replace the switch.
	Defective wiring.	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 light unit.	Replace the light unit.
	Defective wiring.	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.	Set/replace the circuit-breaker.
	Defective strobe light switch.	Replace the switch.
	Defective wiring.	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 light unit. Defective wiring.	Replace the light unit. Do a continuity test of the wiring. Repair/replace defective wiring. Refer to Chapter 92 for the wiring diagrams.
Strobe and position light does not operate on one side.	Connector at the wing root 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 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.

2. Remove/Install the Taxi Light

A. Remove the Taxi Light.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	On the left, lower side of the instrument panel.
(2)	Set the TAXI light switch to OFF.	On the top left of the instrument panel.
(3)	Set the TAXI/MAP/ACL circuit breaker open.	On the right side of the instrument panel.
(4)	Remove the pilot's seat.	Refer to Section 25-10.
(5)	Remove the taxi light cover from below the center fuselage: - Remove the eight screws and washers that attach the light cover to the housing. - Move the light cover clear of the housing.	
(6)	Remove the two nuts, washers and bolts that attach the taxi light unit to the structure.	
(7)	Hold the taxi light and move it out a small way from the housing. Disconnect the electrical cables. Move the taxi light clear of the housing and remove it from the airplane.	At the in-line connector.

B. Install the Taxi Light.

Refer to Figure 201.

	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 two bolts, washer and nuts that attach the light unit to the structure.	At the in-line connector.
(2)	Install the light cover: - Move the light cover into position below the fuselage. - Install the eight screws and washers that attach the light cover to the light housing.	
(3)	Reset the TAXI/MAP/ACL circuit breaker.	On the right side of the instrument panel.
(4)	Set the ELECT. MASTER switch to ON.	On the left side of the 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.	On the top left of the instrument panel.
(6)	Set the ELECT. MASTER switch to OFF.	On the lower, left side of the instrument panel.
(7)	Install the pilot's seat.	Refer to Section 25-10.

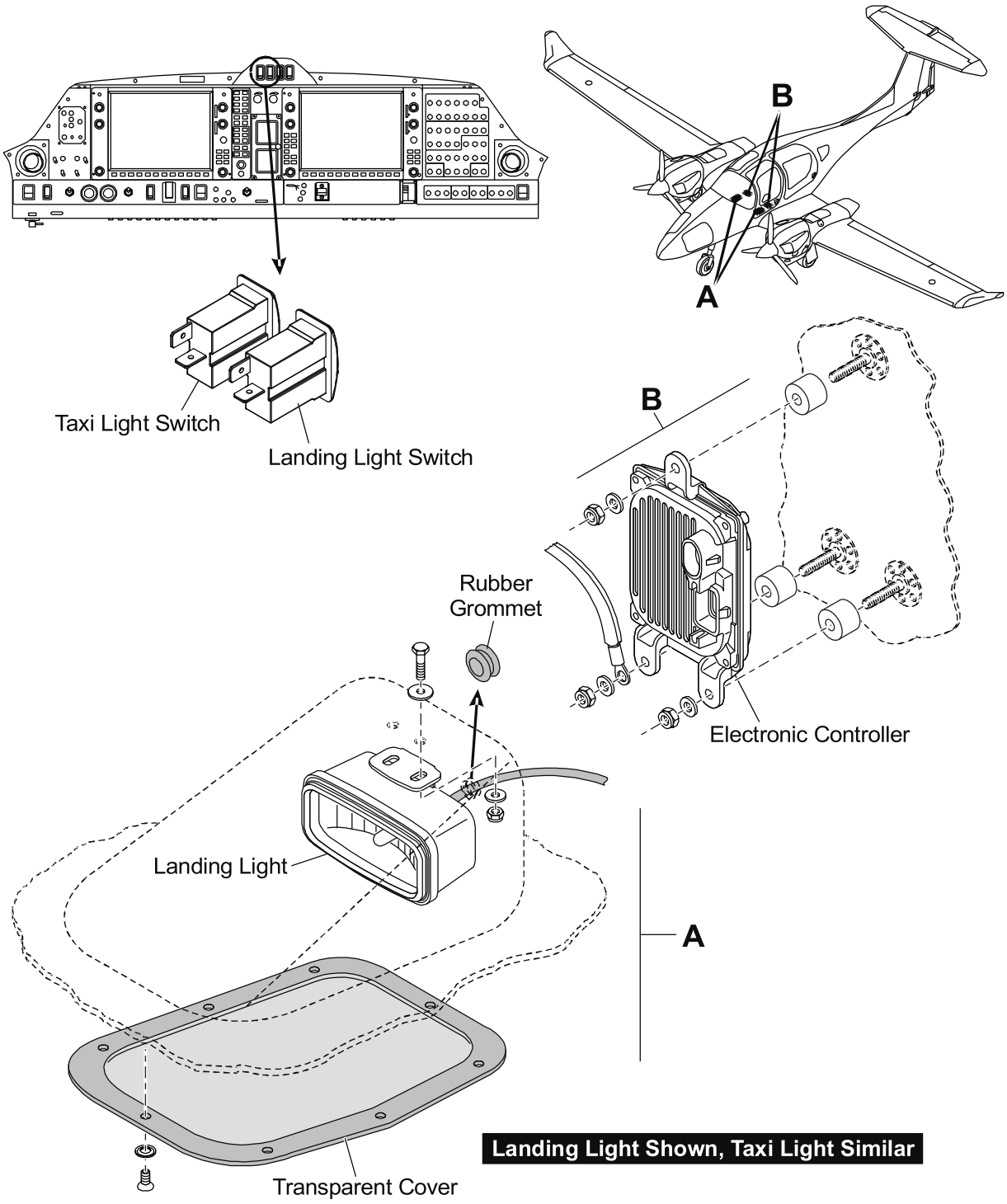

Figure 201 : Exterior Lights - Components Removal/Installation

3. **Remove/Install the Landing Light**

A. Remove the Landing Light.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	On the left side of the instrument panel.
(2)	Set the LANDING light switch to OFF.	On the top left of the instrument panel.
(3)	Set the LDG LT/STARTcircuit breaker open.	On the right side of the instrument panel.
(4)	Remove the co-pilot's seat.	Refer to Section 25-10.
(5)	Remove the landinglight cover from below the center fuselage: - Remove the eight screws and washers that attach the light cover to the housing. - Move the light cover clear of the housing.	
(6)	Remove the two nuts, washers and bolts that attach the taxi light unit to the structure.	
(7)	Hold the landing light and move it out a small way from the housing. Disconnect the electrical cables. Move the landing light clear of the housing and remove it from the airplane.	At the in-line connector.

B. Install the Landing Light.

Refer to Figure 201.

	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 two bolts, washer and nuts that attach the light unit to the structure.	At the in-line connector.
(2)	Install the light cover onto the housing: - Move the light cover into position at the housing. - Install the eight screws and washers that attach the light cover to the light housing.	
(3)	Reset the LDG LT/START circuit breaker.	On the right side of the instrument panel.
(4)	Set the ELECT. MASTER switch to ON.	On the left side of the 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.	On the top left of the instrument panel.
(6)	Set the ELECT. MASTER switch to OFF.	On the left side of the 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.

A. Remove an Electronic Controller.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	On the left side of the instrument panel.
(2)	Set the LANDING/TAXI light switch to OFF.	On the top left of the instrument panel.
(3)	Set the LDG LT/START or TAXI/MAP/ACL circuit breaker open as necessary.	On the right side of the 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.	Note the position of the wire bonding lead.
(6)	Remove the three bushings/spacers from behind the electronic controller.	Make sure that they are in good condition. If they are not, replace them.

B. Install an Electronic Controller.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Install the three bushings/spacers that sit behind the electronic controller.	Install new ones if required.
(2)	Install the electronic controller: - Move the controller into position under the pilot's/co-pilot's seat. - Install the bolts, washers, wire bonding lead and nut that attaches the controller to the airplane structure.	
(3)	Connect the electrical cables to the controller.	At the in-line connectors.
(4)	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 left side. The related light must come on. The related light must go off.
(5)	Install the pilot's/co-pilot's seat as required.	Refer to Section 25-10.

5. **Remove/Install a Wing Tip Light-Unit**

A. Remove a Wing Tip Light-Unit.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	On the instrument panel, lower left side.
(2)	Set these circuit breakers open: - NAV LT/FLOOD. - TAXI/MAP/ACL.	
(3)	Remove the light unit cover from the wing tip unit: - Remove the screws that attach the cover to the unit. - Remove the cover. - Remove the seals.	Hold the cover and glasses.
(4)	Remove the light unit from the wing tip: - Remove the screws that attach the light unit to the wing tip. - Carefully move the light unit out from the wing tip. - Disconnect the electrical in-line connector from the rear of the light unit. - Move the light unit clear of the airplane.	

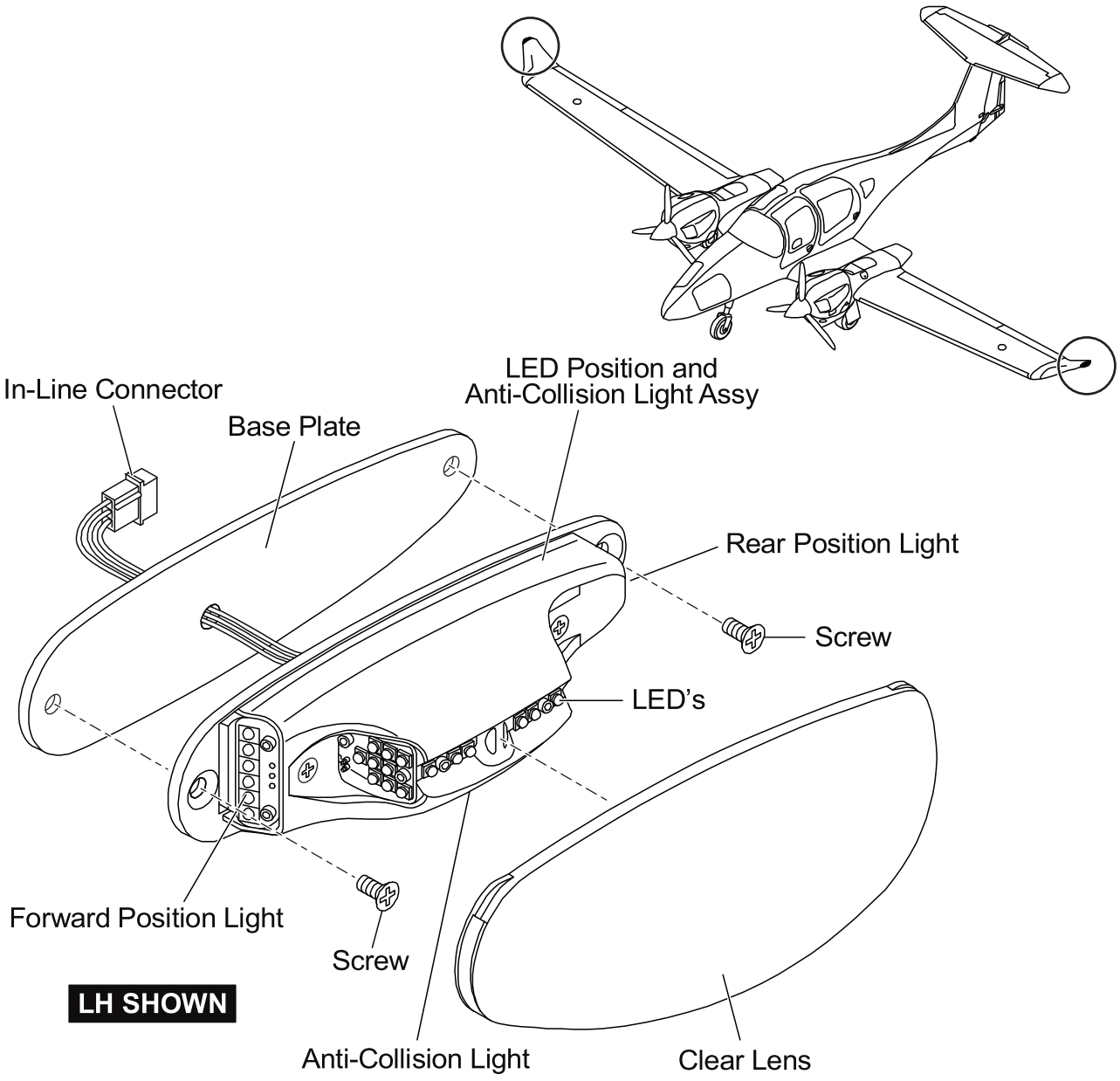

Figure 202 : Wing Tip Light-Unit - Removal/Installation

B. Install a Wing Tip Light-Unit.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Install the light unit: - Move the light unit into position at the wing tip. - Connect the in-line electrical connector 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.	
(2)	Install the light unit cover: - Move the light unit cover into position. - Install the screws that attach the cover to the wing tip.	Make sure that the seals are correctly located.
(3)	Set these circuit breakers closed: - NAV LT/FLOOD. - 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.**	
(4)	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.
(6)	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.

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 62 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/GPS).

2. Description

A. Flight Environment Data.

The DA 62 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:

- Standby attitude module.
- Integrated cockpit system (ICS).

The DA 62 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 avionic bay.

B. Attitude and Direction.

The DA 62 has a magnetic compass mounted on the windscreen, at the top center. The airplane is also equipped with a standby attitude module mounted on the instrument panel, centrally arranged

C. Landing and Taxiing Aids.

The DA 62 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. Dependent Positioning Determining.

The DA 62 has these dependent position determining systems that are integral with the ICS:

- VOR/LOC.
- Global positioning system (GPS).
- Transponder.
- DME.
- Marker beacon receiver.

Refer to Section 31-40 for more data about the integrated cockpit system.

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 Pitot and the static system schematic diagram, if OÄM 62-037 or OÄM 62-037/a is installed.

A. Pitot System

The Pitot system supplies Pitot pressure to the standby attitude module 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.

With OÄM 62-037 installed, the static port has a heater element to prevent icing. It is activated together with the pitot heater switch and has a circuit breaker in combination with the adjustable pedals.

Flexible hoses connect the Pitot probe and the alternate static vent to the standby attitude module 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.

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.

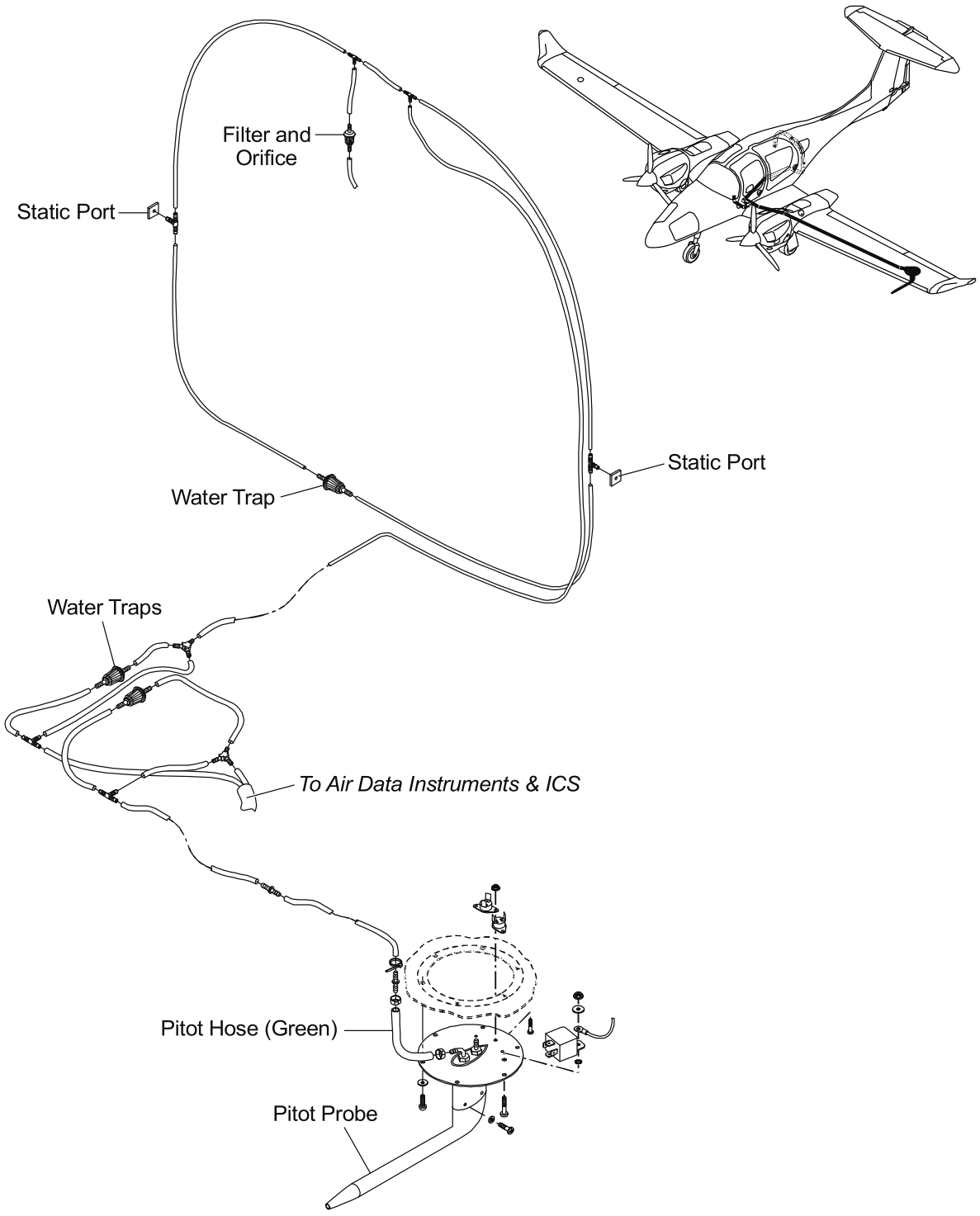

Figure 1 : Pitot Probe and Static System Hoses

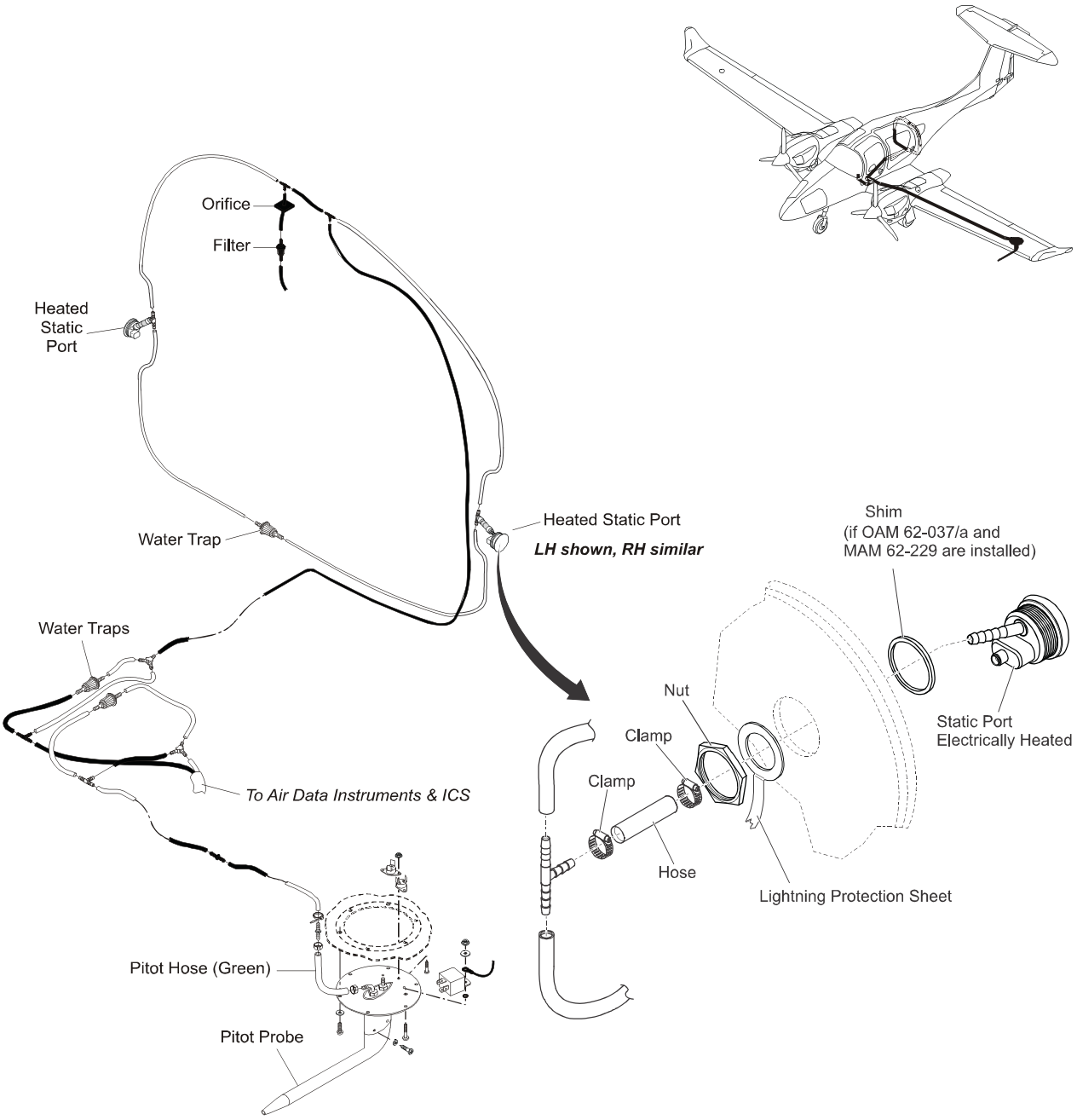

Figure 2 : Pitot Probe and Static System Hoses
(If OÄM 62-037 or OÄM 62-037/a is installed)

B. Outside Air Temperature (OAT) Probe.

The OAT indicator is integral with the ICS. The OAT sensor is located below the avionic 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 62 has an airspeed indicator integral of the standby attitude module as well as the speed indication displayed on the G1000's PFD.

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 62 has an altimeter integral of the standby attitude module as well as the altimeter displayed on the G1000's PFD.

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.

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.

Trouble	Possible Cause	Repair
Altimeter lags or reads incorrectly. VSI (on the ICS) reads incorrectly.	Faulty indicator.	Replace the indicator.
	Blocked or kinked static hose.	Clear the hose.
	Water in the static system.	Drain the water from the static system.
Airspeed indicator reads low.	Faulty indicator.	Replace the indicator.
	Blocked or kinked pitot hose.	Clear/straighten the hose.
	Water in the system.	Drain the water from the pitot system.
Pitot heater does not operate.	Pitot heat circuit-breaker open.	Close the circuit-breaker. If the circuit-breaker opens again, do a test for a short-circuit in the Pitot heat wiring.
	Pitot heat circuit-breaker defective.	Replace the circuit-breaker.
	Pitot heat wiring open-circuit.	Do a continuity test of the wiring. Repair or replace defective wiring. Refer to Chapter 92 for the Wiring Diagrams
	Pitot probe defective.	Replace the Pitot probe.
OAT indication (on the ICS) is incorrect.	OAT probe defective.	Replace the OAT probe.

Trouble	Possible Cause	Repair
Static port heater does not operate.	STATIC HT / PEDALS circuit breaker open.	Close the circuit breaker. If the circuit breaker opens again, do a test for a short-circuit in the static heat wiring system.
	STATIC HT / PEDALS circuit breaker defective.	Replace the circuit breaker.
	Static heat wiring open-circuit.	Do a continuity test of the static port heating wiring system. Repair or replace defective wiring. Refer to Chapter 92 for the Wiring Diagrams.
	Static port defective.	Replace the static port.

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 the Pitot Probe

A. Remove the Pitot Probe.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Open the PITOT circuit breaker.	On the 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 hose connections.	Install dust caps on the hose.
(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.

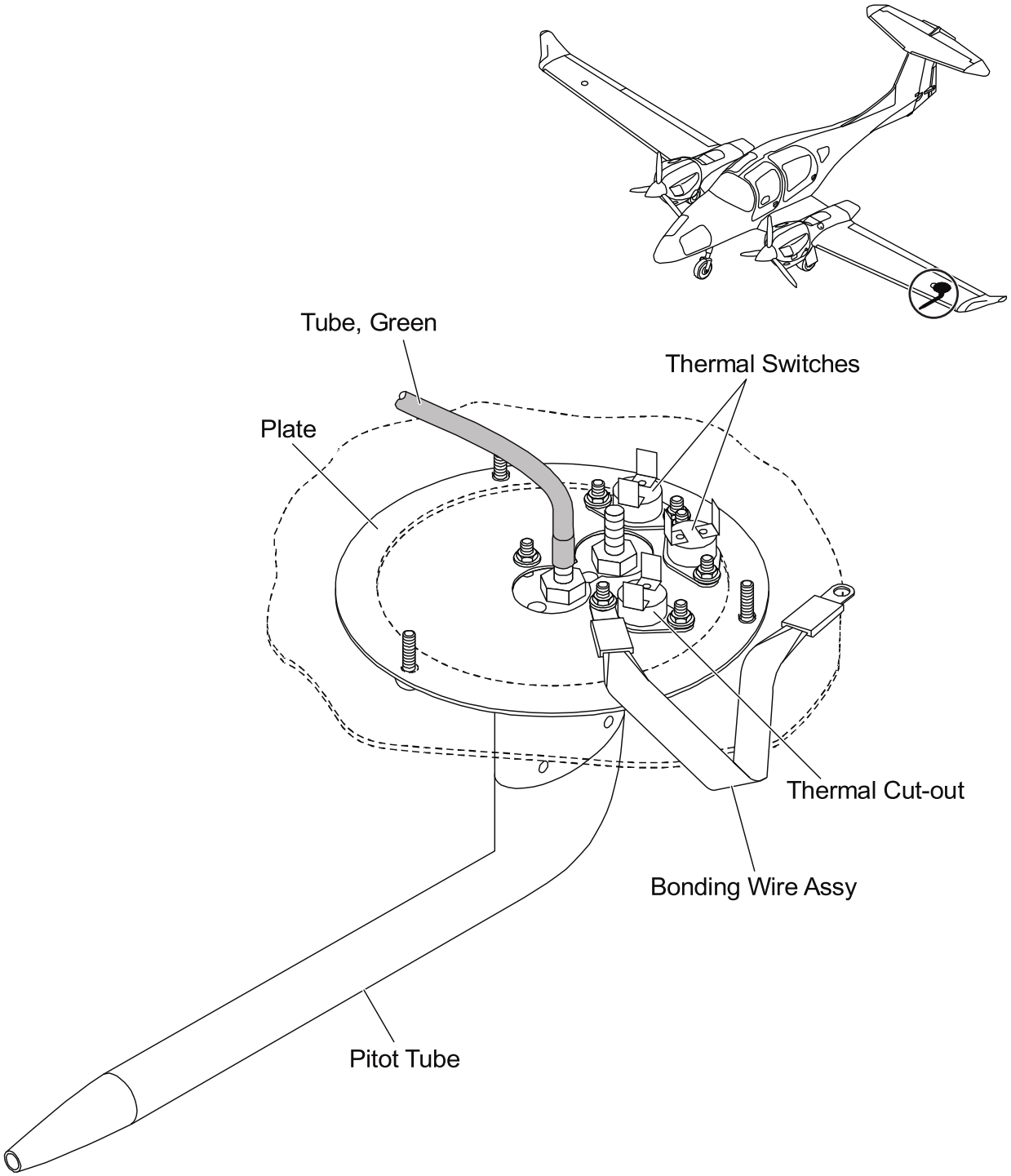

Figure 201 : Pitot Probe - Removal/Installation

B. Install the Pitot Probe.

Refer to Figure 201.

	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 hose (green) to the probe.	
(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 six 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.
	- Open the STALL WRN 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.
	- Reset the STALL WRN circuit breaker.
		Instrument panel, left side.
		Instrument panel, right side.
		
		Instrument panel, left side.

(7)	Do a Pitot leak test.	Refer to Paragraph 5.D.
(8)	Install a cover with a red pennant onto the Pitot probe.	Make sure that the pitot probe has cooled down before the cover is installed.

3. **Remove/Install the Static Port**

A. Remove the Static Port.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Open the STATIC HT / PEDALS circuit breaker.	On the instrument panel, right side.
(3)	Disconnect the electrical cable from the static port.	
(4)	Disconnect the static hose connection.	Install dust caps on the hose.
(5)	Mark the hole orientation vertical on the fuselage with tape.	
(6)	Remove the locking wire and the M40 nut from the back of the static port.	Have someone hold the static port from the outside of the fuselage. The static port should come out when the M40 nut is removed. If the static port does not come out, gently push it out.
(7)	Remove the gasket material and the shim ring (if installed) around the static port.	Use a plastic scraper to remove any excess gasket material from the fuselage. Make sure you do not damage the static port or the paint on the fuselage.
(8)	If required: Remove the static port placard and clean the surface.	For installation use a new placard.

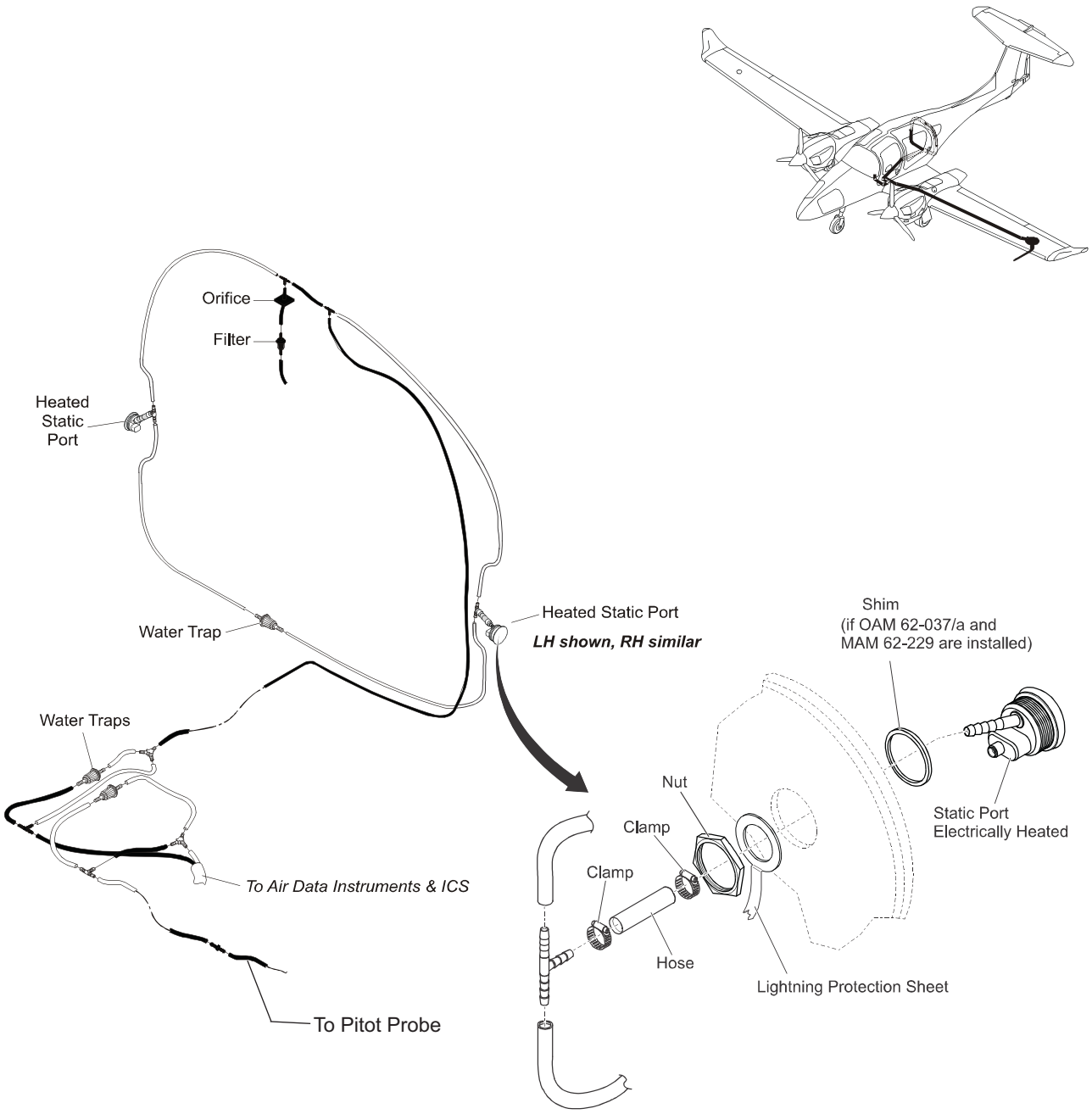

Figure 202 : Static Port - Removal/Installation

B. Install the Static Port.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Move the static port into position at the rear fuselage.	
(2)	Connect the static hose connection.	
(3)	Connect the electrical cables to the static port.	
(4)	Seal the static port and the shim ring (if installed) into the fuselage from the outside. Pay attention to the correct orientation: - The three small static pressure port holes on the port cap are in a vertical line on the outside (tape marking on fuselage). - The hose connection of the port is pointing upward inside the fuselage.	Use EASY GASKET.
(5)	Secure the static port from the inside with the appropriate M40 nut and a wire locking.	

(6)	Do a test of the pitot static port heat system:
	- Set the ELECT. Master switch to ON.
	- Reset the STATIC HT / PEDALS circuit breaker.
	- Set the PITOT HEAT switch to ON.
	  - Check if the static port gets warm.
	- Set the PITOT HEAT switch to OFF.
	  - Check if the static port cools down.
	- Set the ELECT. MASTER switch to OFF.	

(7)	If required, move the static port self adhesive placard into position and apply it around the static port cutout.	
(8)	Do a Low Range Static Leak Test	Refer to Paragraph 5.C.

4. **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. Test Precautions.

- The pressure in the Pitot system must always be equal to (or greater than) the pressure in the static system.
- Reversal of the Pitot and static pipes can cause damage to the air data instruments.
- The applied pressure (and rate of change of pressure) must not be greater than the design limits of the equipment which you will test.
- After doing the test, you must always return the system to its 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 test equipment 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 frame.	Refer to Section 25-10.
(4)	Block the static line.	At the filter on top of the fuselage.
(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 13XX 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.

	Detail Steps/Work Items	Key Items/References
(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)	Stop the Pitot-static leak-tester.	
(9)	Monitor the system pressure.	The system pressure loss must not be more than 100 ft/min.
(10)	Compare the test equipment altimeter and the airplane altimeter.	The indication error must be less than shown in Table 1 below.
(11)	Slowly adjust the system pressure to the ambient pressure.	
(12)	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.
(13)	Disconnect the Pitot-static probe adaptor and install a blanking cap, with pennant, onto the airplane Pitot static probe.	
(14)	Remove the blockage of the static line.	At the filter on top of the fuselage.
(15)	Install the aft baggage compartment frame.	Refer to Section 25-10.

Table 1 : Altimeter Indication Error

Altitude	Permissible Error
-1,000 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 test equipment 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

5. **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 an 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 ELEC. MASTER switch is set to OFF.	On the instrument panel, left side.
(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 frame.	
(5)	Disconnect the Pitot static hoses from the rear of the standby attitude module (SAM).	
(6)	Disconnect the Pitot static hoses from the air data computer (ADC).	
(7)	Disconnect the Pitot hose to the Pitot probe	

	Detail Steps/Work Items	Key Items/References
(8)	Disconnect the Pitot static hoses from the water traps.	Two under the pilot's seat, one below the aft baggage compartment.
(9)	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).
(10)	Check the water traps for dirt. Replace the water trap(s) if necessary.	
(11)	Reconnect the Pitot static hoses to the water traps.	Two under the pilot's seat, one below the aft baggage compartment.
(12)	Reconnect the Pitot hose to the Pitot probe	
(13)	Reconnect the Pitot static hoses to the air data computer (ADC).	
(14)	Reconnect the Pitot static hoses to the rear of the standby attitude module (SAM).	
(15)	Do a low-range static leak test.	Refer to Paragraph 5.C.
(16)	Do a Pitot leak test.	Refer to Paragraph 5.D.
(17)	Install the pilot's seat.	Refer to Section 25-10.
(18)	Install the instrument panel cover.	Refer to Section 25-10.

6. **Remove/Install the Outside Air Temperature (OAT) Probe**

A. Remove the OAT Probe.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Remove the avionic bay cover and the access panel on the avionic bay floor.	
(3)	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.
(4)	Remove the nut and the sealing washer that attach the OAT probe to the access panel	Located on the lower surface of the fuselage nose, on the RH side of the nose landing gear bay.
(5)	Move the OAT probe clear of the access panel and from the airplane.	Note the position of the bonding wire.

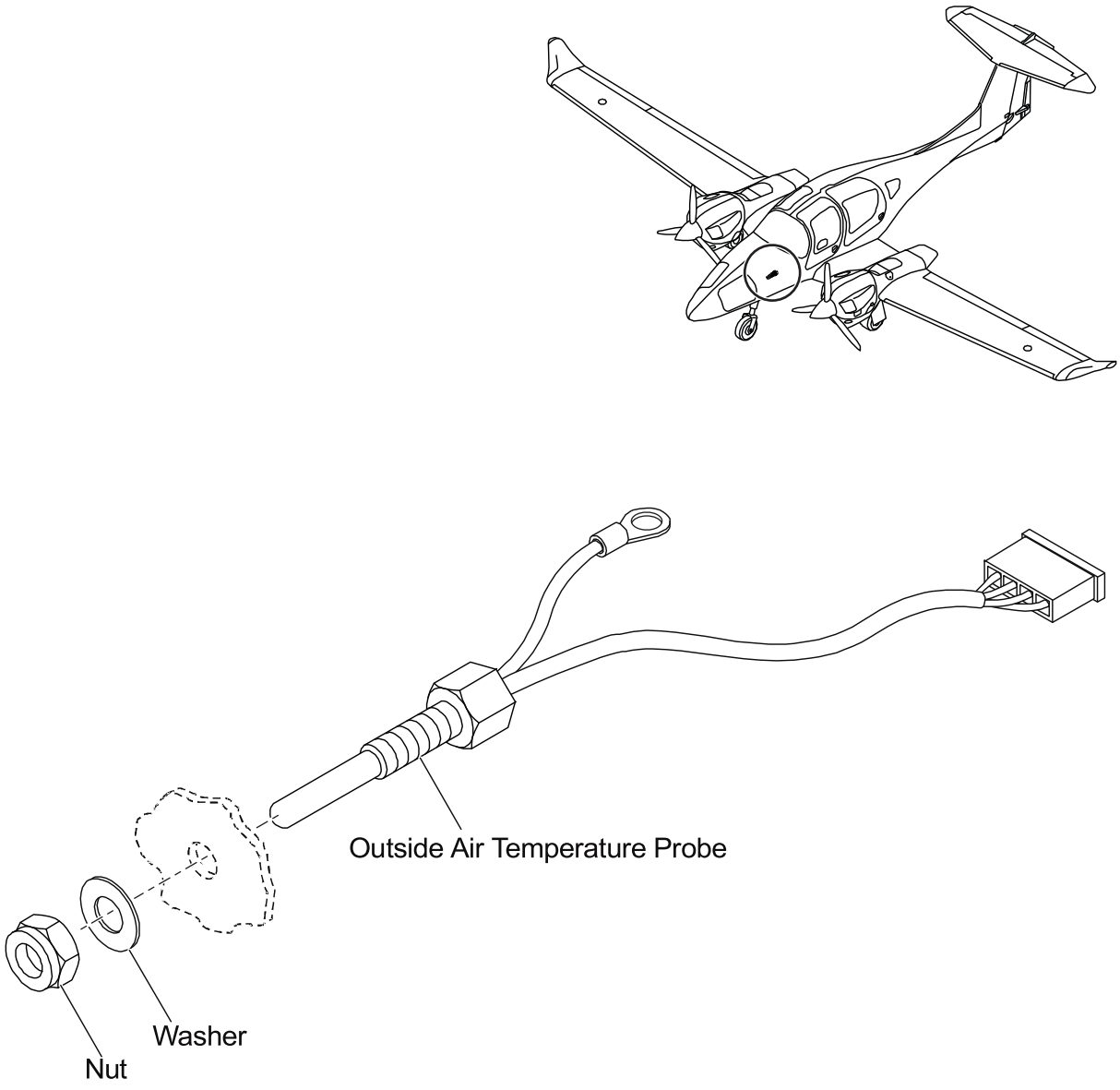

Figure 203 : OAT Probe - Removal/Installation

B. Install the OAT Probe.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Connect the bonding wire to the OAT Probe.	Install the bonding wire as noted in Paragraph 7 A, step (5).
(2)	Move the OAT probe into position on the access panel.	
(3)	Install the sealing washer and the nut that attach the probe to the access panel.	
(4)	Connect the electrical cables from the OAT probe.	
(5)	Close the access hole on the avionic bay floor and install the avionic bay cover.	
(6)	Set the ELECT. MASTER switch is set to ON.	On the instrument panel, left side.
(7)	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.

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Section 34-20

Attitude and Direction

1. General

This Section tells you about the attitude and direction systems installed in the DA 62 airplane. The main attitude and direction systems are integral with the integrated cockpit system (ICS) that is installed in the DA 62 airplane. Refer to Section 31-40 for more data about the ICS.

The DA 62 has the usual magnetic compass. The magnetic compass is installed on the windscreen at the top, center. There is also an artificial horizon integral of the standby attitude module installed in the instrument panel, 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 dgrees.

A compass deviation card is located next to the compass. 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. Standby Attitude Module, MD302

See Figure 1.

The model MD302 series SAM® Standby Attitude Module is a self-contained situational awareness instrument that provides aircraft attitude, altitude, airspeed, and slip indication.

The MD302 provides critical flight and situational data to the pilot and crew under any circumstances likely to encounter. The design is built around a solid-state electronic sensor array for high reliability and contains an integral and rechargeable battery that can power the unit for up to two hours if main aircraft power is lost. The dual, high-resolution liquid crystal display uses smooth graphics, daylight-readable brightness and a configurable lighting response curve to ensure optimal visibility in all conditions.

The top 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.

The MD302 has an internal battery for backup power. Scheduled maintenance of the internal battery is not required. The battery will recharge itself from aircraft power while in normal mode. A battery capacity check occurs each time the unit is powered on. If the battery capacity is determined to be more than 80%, no message is displayed and the battery is good.

Refer to the Mid-Continent ® Installation Manual and Operating Instructions for more information of the Model MD302 Standby Attitude Module.

For Trouble-Shooting of the MD302 Standby Attitude Module, refer to the Mid-Continent ® Installation Manual and Operating Instructions

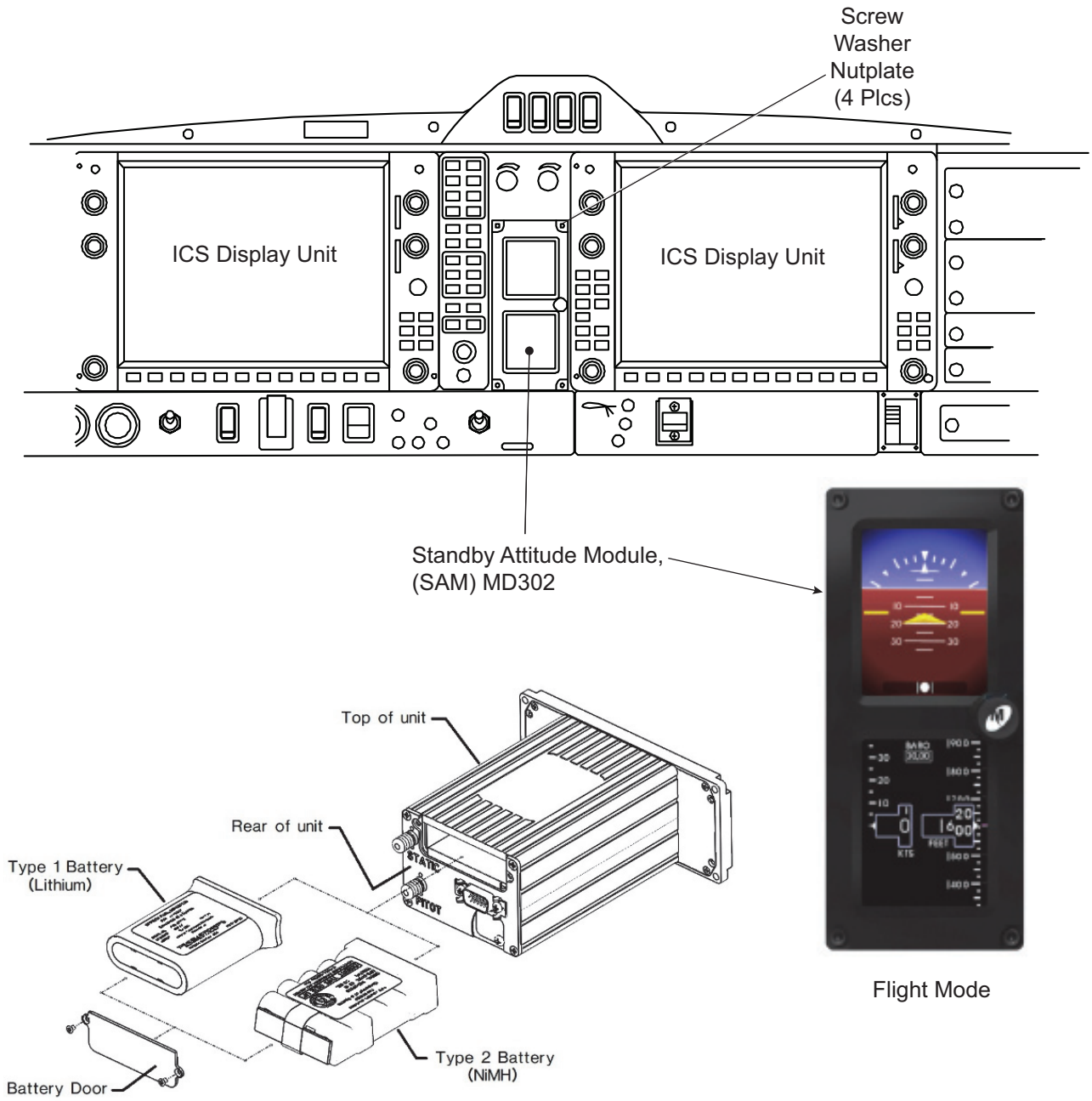

Figure 1 : Standby Attitude Module, MD302

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Trouble-Shooting

1. **General**

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.

A. Magnetic Compass.

Trouble	Possible Cause	Repair
Magnetic compass damping fluid leaking.	Defective compass housing.	Replace the compass.
Compass deviation of more than 10 degrees.	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.

B. Standby Attitude Module - MD302.

For Trouble-Shooting of the MD302 Standby Attitude Module, refer to the Mid-Continent® Installation Manual and Operating Instructions, Section 5.1.4.

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Maintenance Practices

1. General

This Section tells you how to remove/install the magnetic compass and the standby attitude module (MD302). 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.	On the instrument panel, left side.
(2)	Disconnect the electrical cables.	At the in-line connector.
(3)	Remove the two screws that attach the compass to the windscreen.	Hold the compass!
(4)	Move the compass clear of the windscreen.	Remove and discard the compass deviation table in the compass card holder.

B. Install the Magnetic Compass.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Move the magnetic compass into position at the windscreen.	Hold the compass in position.
(3)	Install the two screws that attach the compass to the windscreen.	
(4)	Connect the electrical cables.	At the in-line connector.
(5)	Do a compass swing.	Refer to Paragraph 3.

3. **Test/Adjust the Magnetic Compass (Compass Swing)**

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.

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 airplanes 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 a calibrated and reliable land compass to make sure of the airplane heading.	
(4)	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 degrees.

	Detail Steps/Work Items	Key Items/References
(5)	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 degrees°.
(6)	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 degrees.
(7)	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 degrees.
(8)	Turn the airplane through 360 degrees, record the deviation at each 30 degree radial. Prepare a deviation table that shows the corrections that must be applied to each of the 30 degree radials.	If large deviations occur when you operate electrical equipment/systems, the deviation table must also show the corrections to apply to each 30 degree radial when that particular equipment/system is operating.
(9)	Install the new deviation table in the compass card holder next to the compass.	

4. **Remove/Install the Standby Attitude Module, MD302**

A. Remove the Standby Attitude Module, MD302

Refer to Figure 1. (34-20-00, Page 3).

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	
(2)	Open the SAM circuit-breaker.	Located on the RH Main Bus.
(3)	Remove the instrument panel cover.	Refer to Section 25-10.
(4)	If necessary for access to the standby attitude module, remove the right side GDU display.	Refer to Section 31-40.
(5)	Disconnect the electrical connector at the back of the standby attitude module.	
(6)	At the back of the standby attitude module: - Cut the cable tie. - Disconnect the red PVC tubing at the quick disconnect fitting	This is the static connection to the standby attitude module. Put air tight caps on the connections. (On both the standby attitude module and the tubing to the standby attitude module.)
(7)	At the back of the standby attitude module: - Cut the cable tie. - Disconnect the green PVC tubing at the quick disconnect fitting	This is the pitot connection to the standby attitude module. Put air tight caps on the connections. (On both the standby attitude module and the tubing to the standby attitude module.)
(8)	At the front of the instrument panel, remove the four screws and washers which attach the standby attitude module to the instrument panel nutplates.	Hold the standby attitude module.
(9)	Move the standby attitude module out of the instrument panel and remove it from the airplane.	

B. Install the Standby Attitude Module, MD302

Refer to Figure 1. (34-20-00, Page 3).

	Detail Steps/Work Items	Key Items/References
(1)	Move the standby attitude module into its position in the instrument panel.	
(2)	Install the four screws and washers which attach the standby attitude module to the instrument panel nutplates.	Apply LOCTITE 222 onto the screw threads.
(3)	Remove the air tight caps from the tubing connections and the standby attitude module.	
CAUTION: LOCK THE QUICK DISCONNECT BEFORE CONNECTING IT TO THE UNIT TO AVOID DAMAGING THE O-RING.		
(4)	At the back of the standby attitude module, connect the green PVC tubing at the quick disconnect fitting. Secure the connection with a cable tie.	This is the pitot connection to the standby attitude module.
(5)	At the back of the standby attitude module, connect the red PVC tubing at the quick disconnect fitting. Secure the connection with a cable tie.	This is the static connection to the standby attitude module.
(6)	Connect the electrical connector to the back of the standby attitude module.	
(7)	If it was removed for access to the standby attitude module, install the right side GDU display.	Refer to Section 31-40.
(8)	Install the instrument panel cover.	Refer to Section 25-10.
(9)	Close the SAM circuit-breaker.	Located on the RH Main Bus.
(10)	Do a low-range static leak check and a Pitot leak check.	Refer to Section 34-10 Paragraph 4.
(11)	Do an Operational Check of the Standby Attitude Module, MD302.	Refer to the Section 3 of the Mid-Continent ® Installation Manual and Operating Instructions.

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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 62.

Refer to the equipment manufacturers' manuals for more data about other options of landing and taxiing aids.

2. Description

The DA 62 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 62. Refer to these Sections for data about the systems:

Section 34-41. Lightning detection system (OÄM 62-010).

Section 34-42. Traffic advisory system (TAS) (OÄM 62-011) or (OÄM 62-1019)

Section 34-43. Weather radar (OÄM 62-009).

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Section 34-41

Lightning Detection System

1. General

This Section tells you about the lightning detection system that can be installed in the DA 62. Refer to the manufacturer´s manual for more data about the equipment.

The lightning detection system consists of the following items:

- Lightning detection processor.
- Lightning detection 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. Lightning Detection Processor.

The lightning detection processor is tray mounted and is located in the avionic bay.

The AVIONICS BUS power to the lightning detection system. The ELECT. MASTER switch and the AV. MASTER switch must be set to ON to supply power through the TWX circuit breaker to the lightning detection 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 functions are controlled through the MFD of the G1000 system.

B. Lightning Detection Antenna.

The lightning detection antenna is located on the bottom fuselage, aft of the COM #2 antenna. The antenna is a combined cross-loop and sense antenna. The antenna is sealed against environmental extremes and is non-repairable.

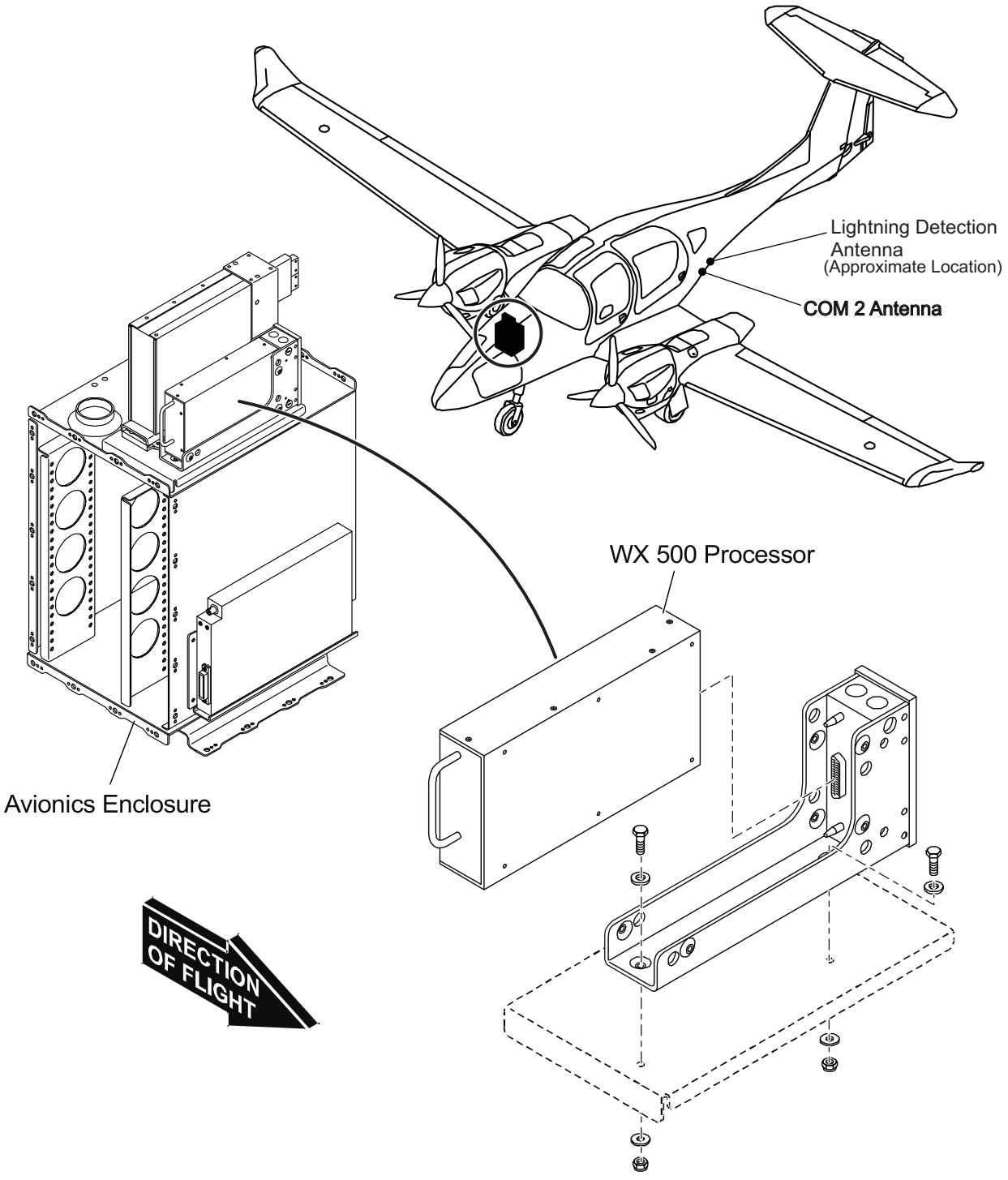

Figure 1 : Lightning Detection System - Components

Trouble-Shooting

1. **General**

The table below lists the defects you could have with the lightning detection 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
Lightning detection system 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 a 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 lightning detection system. It also tells you how to test the lightning detection system.

2. **Remove/Install the Lightning Detection Processor**

A. Remove the Lightning Detection Processor.

Refer to Figure 1. (34-41-00, Page 2).

	Detail Steps/Work Items	Key Items/References
(1)	Open the TWX circuit breaker.	
(2)	Remove the avionic bay cover.	
(3)	Loosen the screw that attaches the processor to its mounting tray.	At the front of the tray.
(4)	Remove the lightning detection processor from the mounting tray and from the airplane.	

B. Install the Lightning Detection Processor.

Refer to Figure 1. (34-41-00, Page 2).

	Detail Steps/Work Items	Key Items/References
(1)	Put the lightning detection processor in position in the mounting tray.	Make sure that the processor is set in correctly.
(2)	Tighten the screw that attaches the processor to its mounting tray.	
(3)	Install the avionic bay cover.	
(4)	Close the TWX circuit breaker.	
(5)	Do a test of the lightning detection system.	Refer to Paragraph 4.

3. **Remove/Install the Lightning Detection (WX-500 Processor) Antenna**

A. Remove the Lightning Detection Antenna.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Open the TWX circuit breaker.	
(2)	Remove the rear baggage compartment frame.	
(3)	Disconnect the coaxial antenna cable from the antenna.	
(4)	From outside the airplane, remove the lightning detection antenna and gasket: - Remove the bolts and washers which attach the antenna and gasket to the doubler plate and mounting bracket. - If necessary, use a knife to carefully remove the sealant that seals the antenna and gasket to the airplane outer surface. - Move the lightning detection antenna clear of the airplane.	Hold the antenna. Take care not to damage the airplane surface. Discard the gasket.

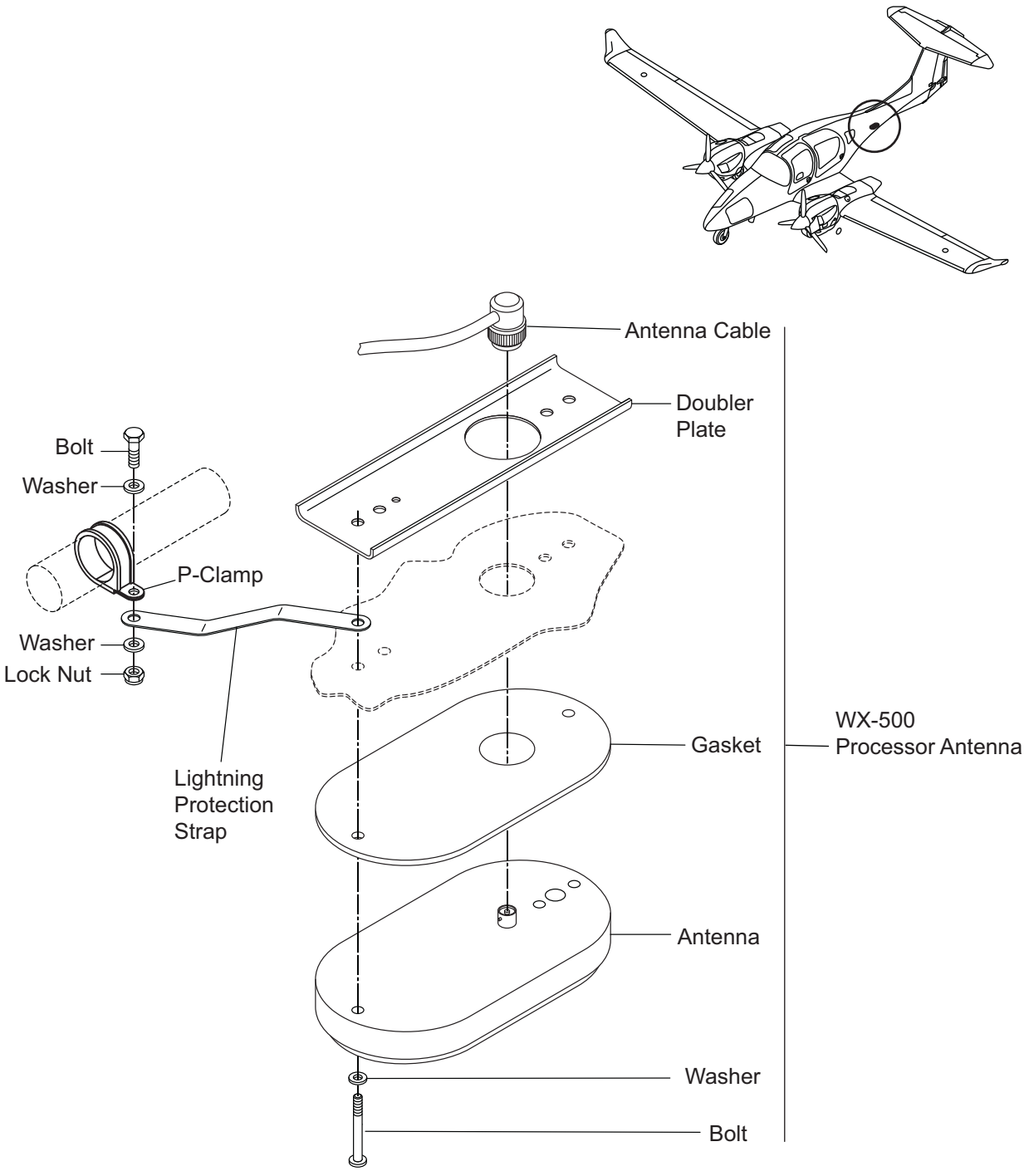

Figure 201 : WX-500 Processor Antenna - Removal/Installation

B. Install the Lightning Detection Antenna.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	From outside the airplane, install the lightning detection antenna and gasket: - Make sure that the contact surfaces of the antenna and the airplane surface where the antenna and gasket will be installed are clean and free of grease. - Put the lightning detection antenna and new gasket in position under the fuselage. - Seal the outer edge of the antenna where it contacts the airplane surface with sealant. - Install the bolts and washers which attach the antenna and gasket to the doubler plate and mounting bracket. - Remove the excess sealant that has been forced out of the joint between the antenna and the airplane surface.	The arrow on the antenna must point in the direction of flight. Refer to Section 34-50 Para 4. Sealant Specifications.
(2)	Connect the connector of the lightning detection antenna.	
(3)	Install the rear baggage compartment frame.	
(4)	Close the TWX circuit breaker.	
(5)	Do a test of the lightning detection system.	Refer to Paragraph 4.

4. **Test of the Lightning Detection System**

Perform the installation checkout as outlined in L-3 Stormscope Installation Manual. P/N 009-11500-001 Chapter 3, ‘Installation Checkout’.

Section 34-42

Traffic Advisory System (TAS)

1. General

This Section tells you about the traffic advisory system (TAS) that can be installed in the DA 62. Refer to the manufacturer´s manual for more data about the equipment.

The TAS consists of the following items:

Refer to Figure 1.

- TAS Processor.
- Transponder coupler.
- Top (single blade) antenna.
- Bottom (double blade) 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 in the forward electric/avionic compartment.

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 directly above the TAS processor. 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 (single blade) is located on top of the fuselage between the LH and RH pilot doors, and the bottom antenna (double blade) is located on the fuselage bottom between the taxi - and landing lights.

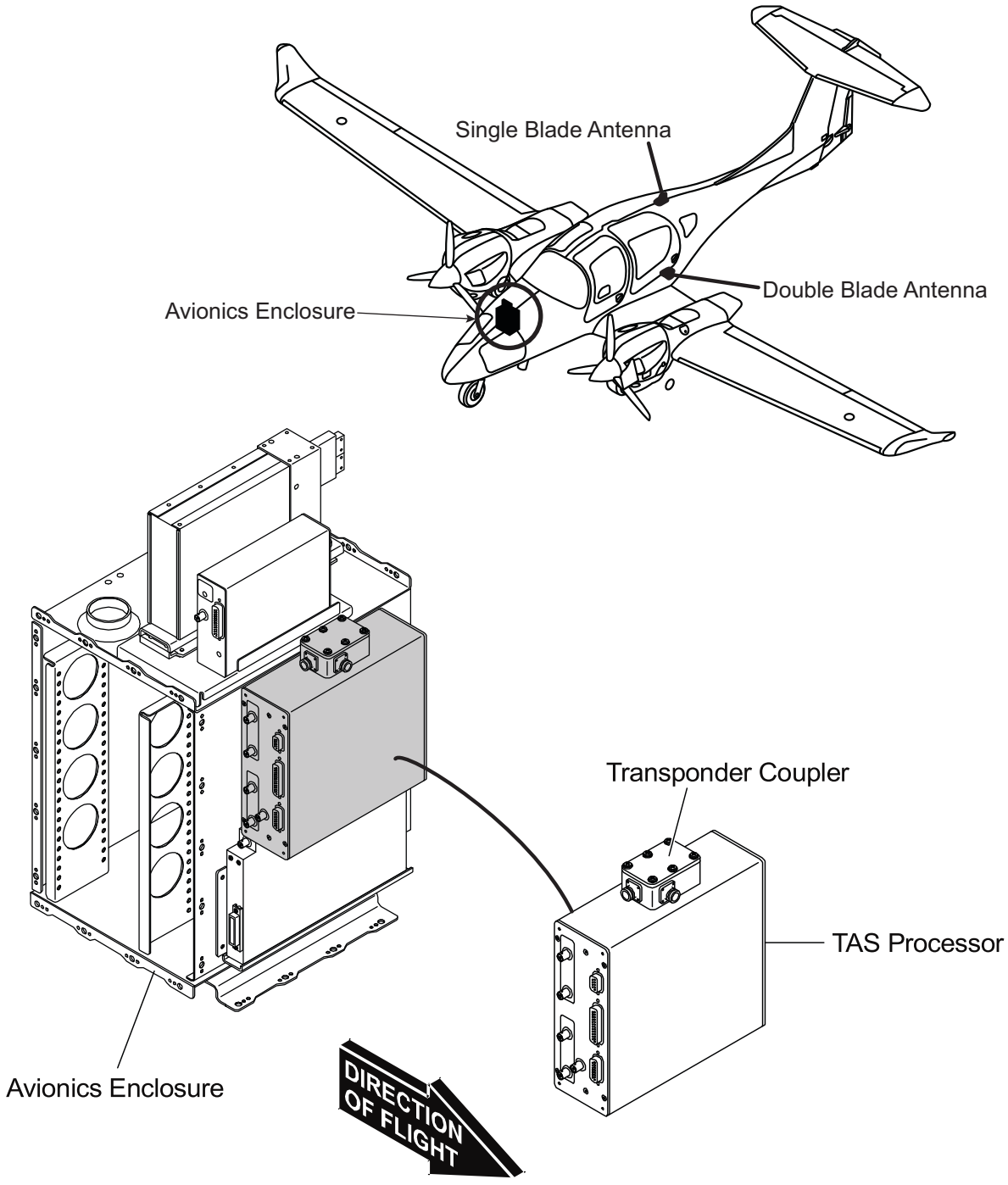

Figure 1 : Traffic Advisory System (TAS) - Component Locations

Trouble-Shooting

1. **General**

The table below lists the defects you could have with the traffic advisory system (TAS).

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 the continuity on each cable. Do a test for a 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 the antenna connections. Change the connections as necessary.
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 the antenna connections. Change the connections as necessary.

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Maintenance Practices

1. **General**

This Section tells you how to remove/install the components of the traffic advisory system (TAS).

2. **Remove/Install the TAS Processor**

A. Remove the TAS Processor.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Open the TAS circuit breaker.	On the instrument panel, right side.
(3)	Remove the avionic bay cover.	Refer to Section 25-50.
(4)	Disconnect the connectors and antenna cables from the TAS processor.	
(5)	Loosen the four retaining screws, washers and lock nuts that attach the processor to its mounting tray.	The mounting tray is above the TAS processor. Hold the TAS processor.
(6)	Remove the TAS processor from its mounting tray and clear of the airplane.	Along the rails. Fit dust caps to all of the connections.

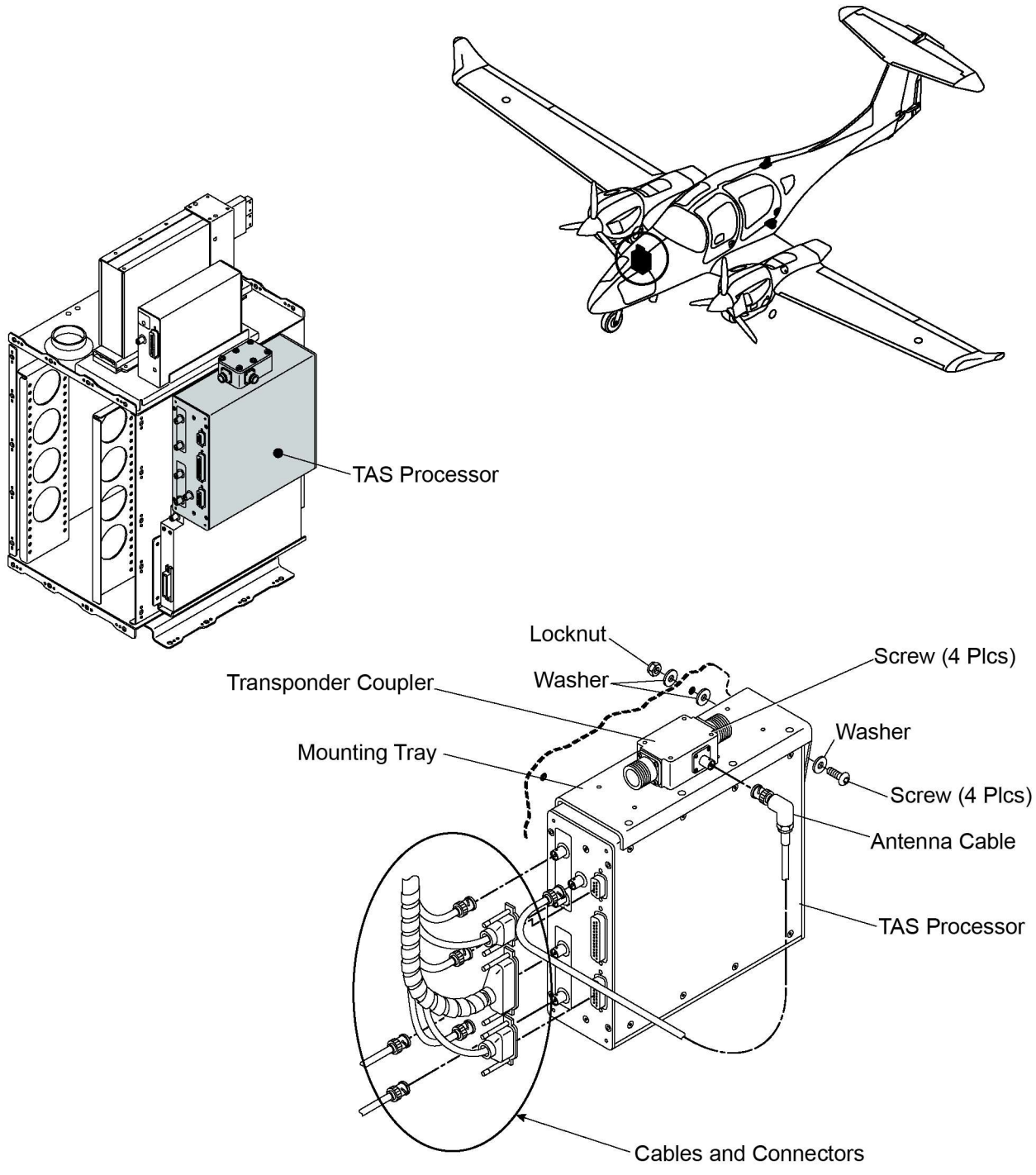

Figure 201 : TAS Processor / Transponder Coupler - Removal/Installation

B. Install the TAS Processor.

Refer to Figure 201.

	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 onto the TAS processor that you removed.
(2)	Slide the TAS processor into its mounting tray.	Along the rails. The mounting tray is above the TAS processor.
(3)	Install and tighten the four retaining screws, washers and lock nuts that attach the processor to its mounting tray.	
CAUTION: A WRONG CONNECTION OF THE ANTENNA CABLES WILL LEAD TO A WRONG INDICATION.		
(4)	Connect the connectors and antenna cables to the TAS processor.	
(5)	Close the TAS circuit breaker.	
(6)	Install the avionic bay cover.	
(7)	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.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Open the TAS circuit breaker.	On the instrument panel, right side.
(3)	Remove the avionic bay cover.	Refer to Section 25-50.
(4)	Disconnect the antenna cable from the transponder coupler.	
(5)	Remove the screws that attach the transponder coupler to the mounting tray.	Hold the transponder coupler.
(6)	Remove the transponder coupler clear of the airplane.	Fit dust caps to all of the connections.

B. Install the Transponder Coupler.

Refer to Figure 201.

	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 mounting tray.	Hold the transponder coupler.
(3)	Install the screws that attach the transponder coupler to the mounting tray.	
(4)	Connect the antenna cable to the transponder coupler.	
(5)	Install the avionic bay cover.	Refer to Section 25-50.
(6)	Close the TAS circuit breaker.	On the instrument panel, right side.
(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.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Open the TAS circuit breaker.	On the instrument panel, right side.
(3)	To remove the top, single blade antenna: - Remove the maintenance access cover for the LH & RH pilot door. To remove the bottom, double blade antenna: - Remove both pilots' seats.	 Refer to Chapter 52. Refer to Section 25-10.
(4)	Disconnect the co-axial cables from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: - Remove the four screws that attach the antenna to the ground plate assembly and airplane surface. - 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!

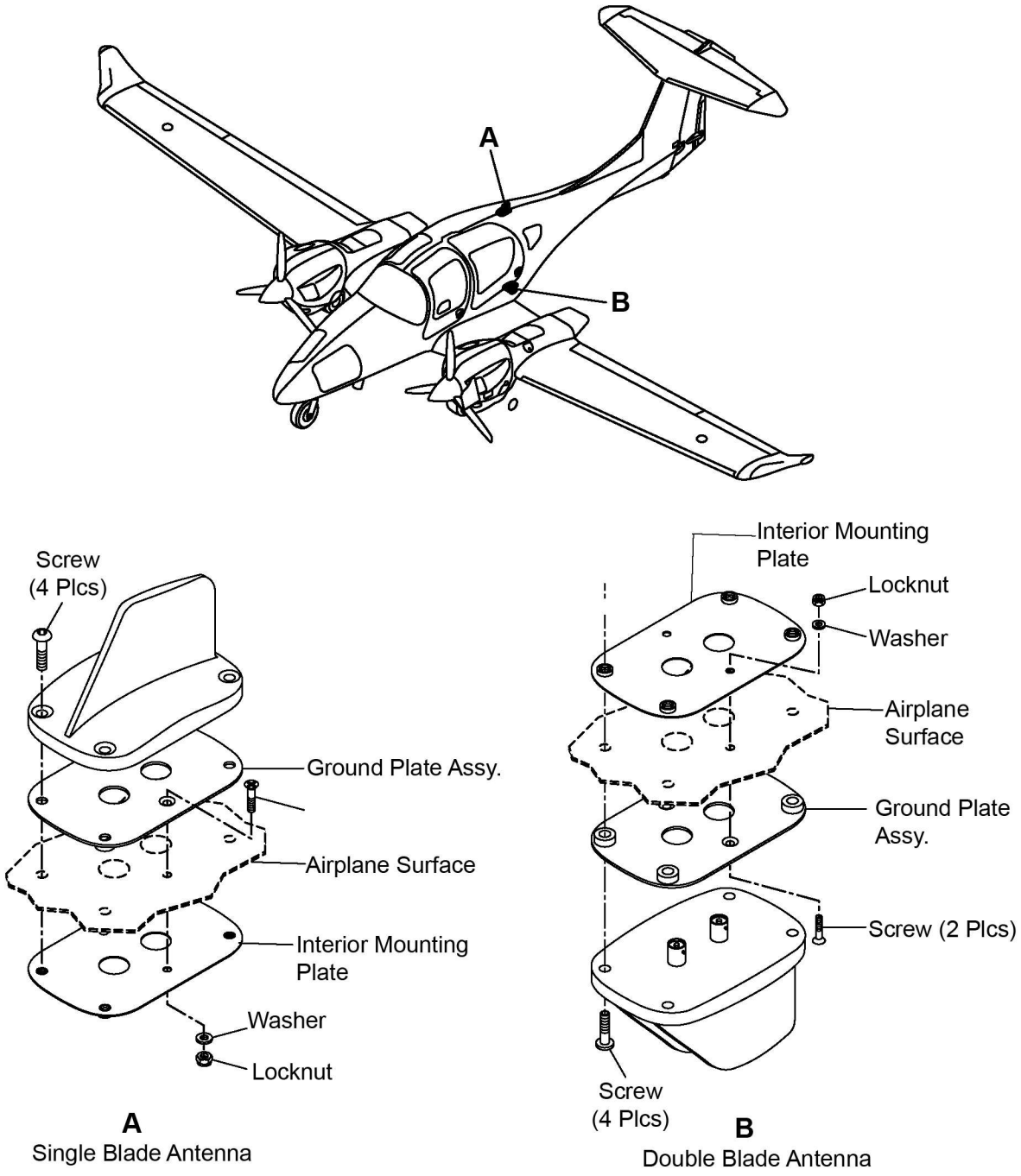

Figure 202 : TAS Antenna - Removal/Installation

B. Install a TAS Antenna.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the contact surfaces of the antenna and ground plate assembly where the antenna will be installed are clean and free of grease.	
(2)	Move the antenna into position.	
(3)	Seal the outer edge of the antenna where it contacts the airplane surface and ground plate assembly with sealant.	Refer to Section 34-50 Para 4. Sealant Specifications.
(4)	Install the four screws that attach the antenna to the airplane.	
(5)	Remove the excess sealant that has been forced out of the joint between the antenna and the airplanes surface.	
CAUTION: A WRONG CONNECTION OF THE ANTENNA CABLES WILL LEAD TO A WRONG INDICATION.		
(6)	Connect the co-axial cables to the antenna.	At the antenna.
(7)	If the top, single blade antenna was removed: - Install the maintenance access cover for the LH & RH pilot door. If the bottom, double blade antenna was removed: - Install both pilots' seats.	Refer to Chapter 52. Refer to Section 25-10.
(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.

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Section 34-43

Garmin GWX 70 Weather Radar System

1. General

This Section tells you about the weather radar system that can be installed in the DA 62. Refer to the manufacturer's manual for more data about the equipment.

2. Description and Operation

A. Radar Nose Cone.

The radar nose cone is made of GFRP and protects the GWX 70 weather radar system mechanically and is transparent for the transmitted microwaves. For lightning protection four strips are mounted to the surface and connected to the airplanes lightning protection system with a lightning plate.

B. Garmin GWX 70 Weather Radar System.

The Garmin 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 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 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.

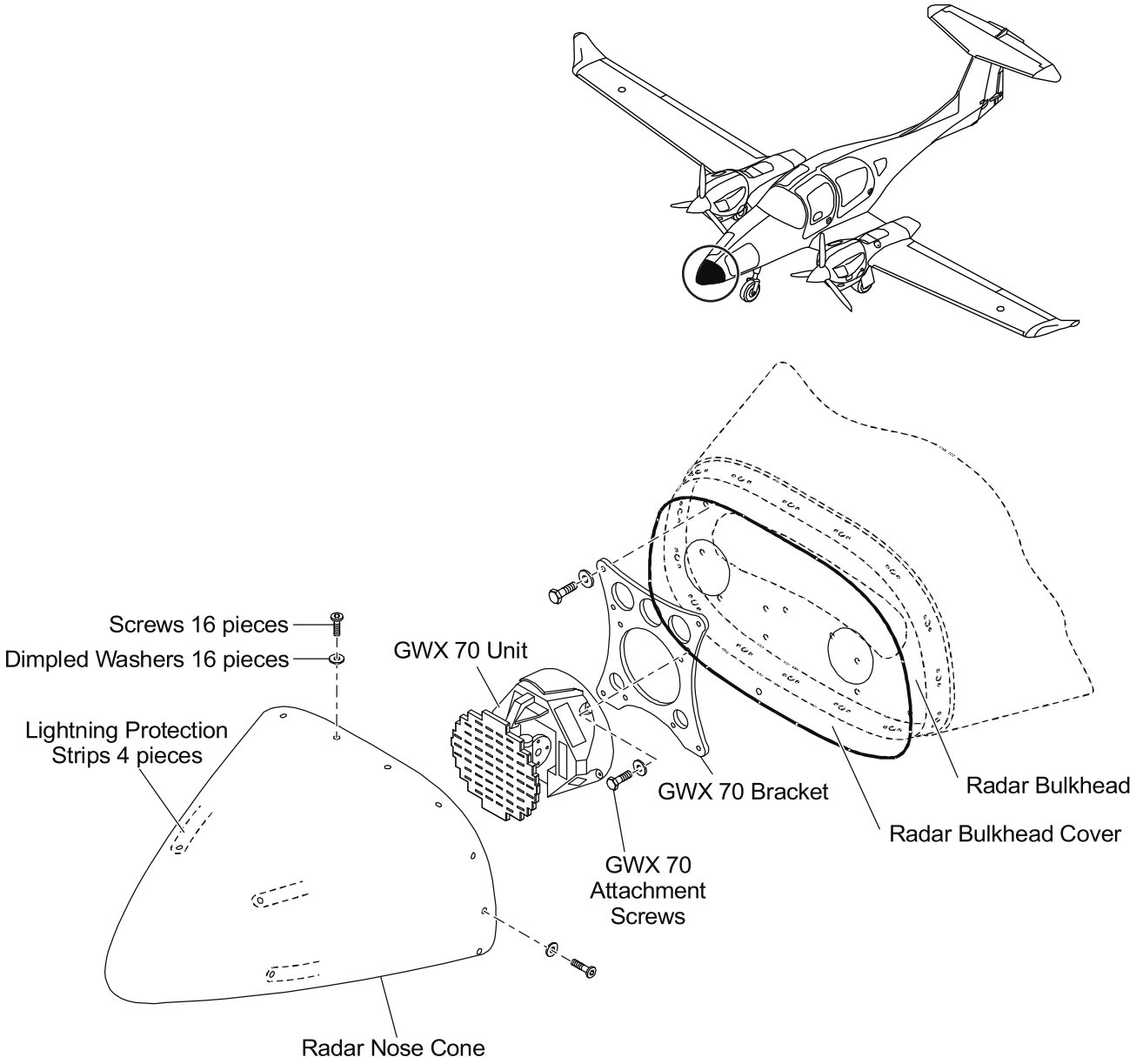

Figure 1 : Installation of the Garmin GWX 70 Weather Radar System

Trouble-Shooting

1. **General**

The table below lists the trouble you could have with the Garmin 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.	The circuit breaker is open.	Set the circuit breaker closed.
	Faulty cables / connectors.	Do a test for continuity 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 is damaged / scratched.	Replace the radome.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to replace the Garmin GWX 70 weather radar system. Refer to the equipment manufacturers' manuals for more data about the equipment.

2. Remove/Install the Garmin GWX 70 Weather Radar System

A. Remove the Garmin GWX 70 Weather Radar System.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
	CAUTION: 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 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. - Clean the sealed gap between fuselage and the radar nose cone. - Remove the 16 screws which attach the radar nose cone to the fuselage. - Move the radar nose cone straight forward.	 Use a plastic spattle. Hold and support the radar nose cone.
(3)	Disconnect the electrical connector.	
(4)	Remove the GWX 70 unit: - Remove the four screws which attach the GWX 70 unit to the GWX 70 bracket on the radar bulkhead. - Move the GWX 70 unit free of the airplane.	 Hold and support the GWX 70 unit on the mounting plate. Do not touch the delicate radar antenna.

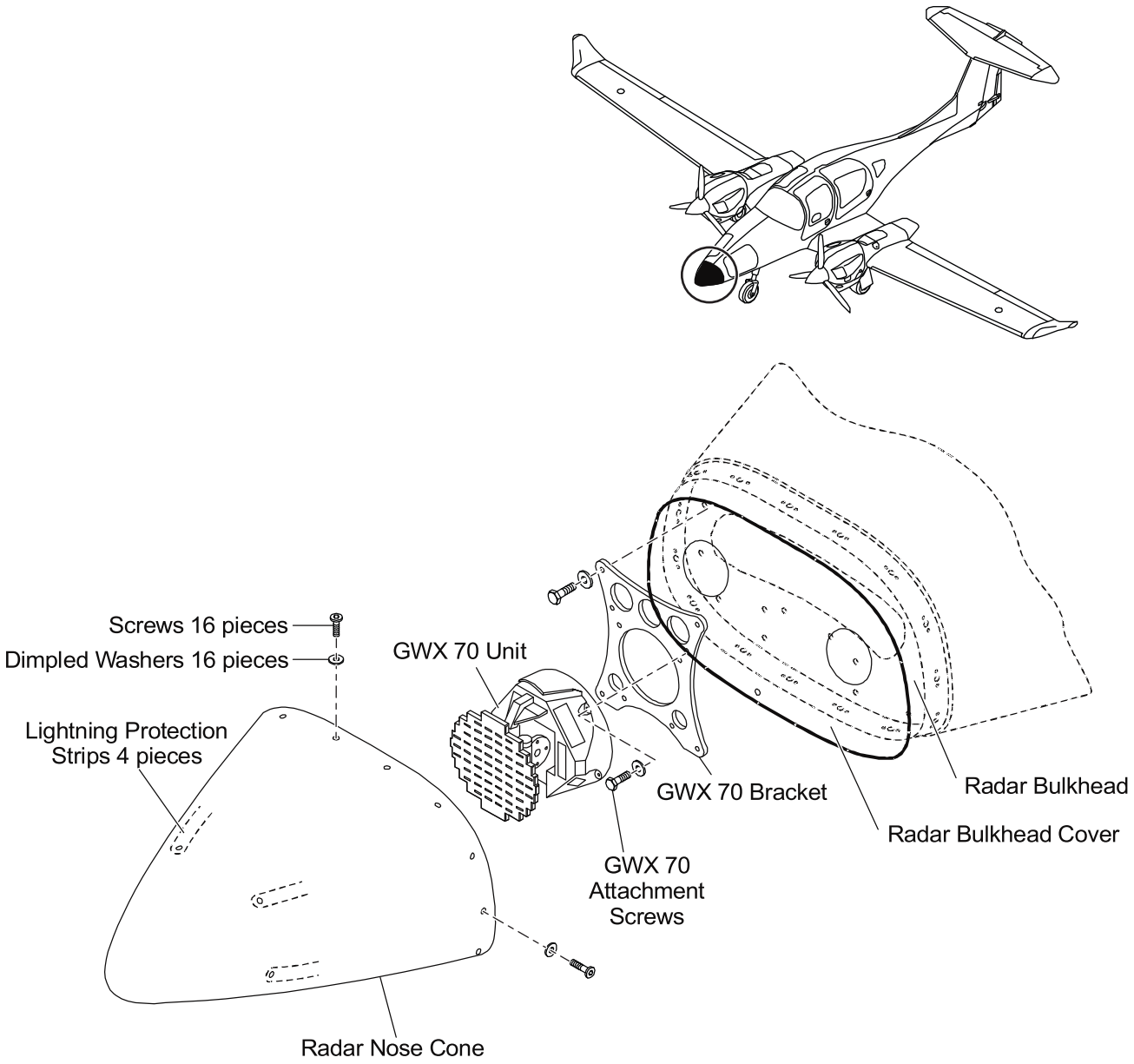

Figure 201 : Garmin GWX 70 Weather Radar System - Removal/Installation

B. Install the Garmin GWX 70 Weather Radar System.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
	CAUTION: 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 70 UNIT.	
(1)	Install the GWX 70 unit: - Move the GWX 70 unit in place in front of the GWX 70 bracket. - Install the four screws which attach the GWX 70 unit to the GWX 70 bracket on the radar bulkhead.	Hold and support the 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
(4)	Seal the joint between fuselage and the radar nose cone: - Apply the thin red tesafilm tape and the masking tape on both sides of the joint. - Fill the joint with sealant. - Use a plastic or rubber spattle to remove excess sealant. - Spray the joint with water / cleaning solvent solution and create a smooth surface by hand. - Remove all adhesive and masking tapes. - Allow the sealant to cure for at least 12 hrs.	Refer to Figure 202. Use gloves to protect the skin.

	Detail Steps/Work Items	Key Items/References
	WARNING: **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 70 IS 2.3M (7.4 FT). INJURY TO PERSONNEL COULD REULT IF SAFETY PRECAUTIONS ARE NOT FOLLOWED.**	
(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.	

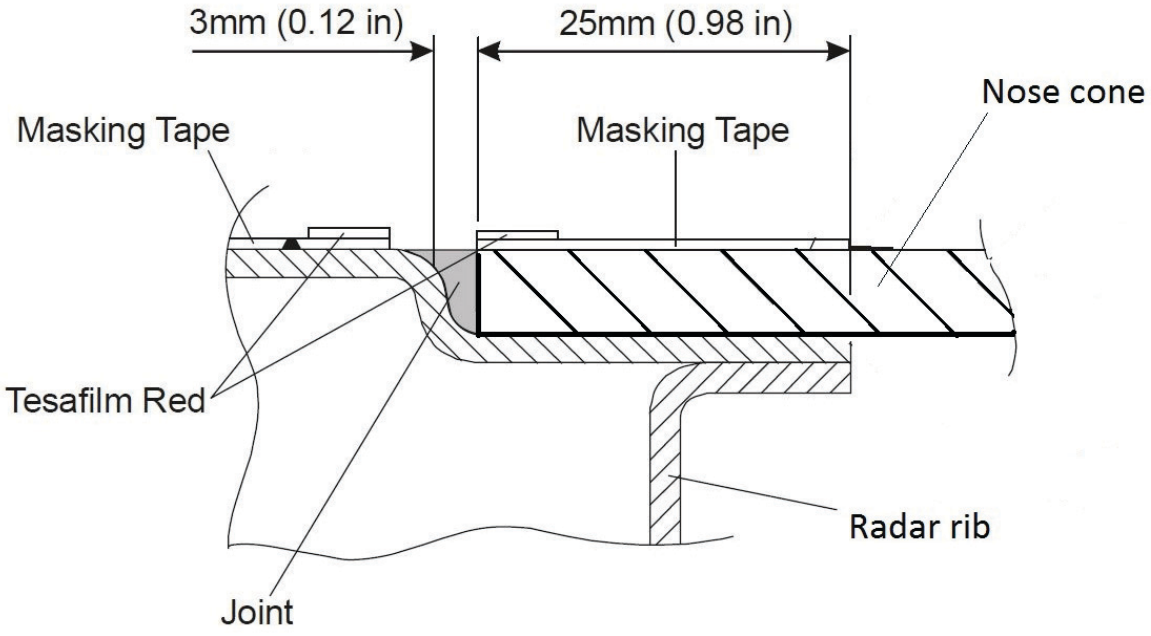

Figure 202 : Radar Nose Cone - Sealed Joint

Section 34-50

Dependent Position Determining

1. General

The DA 62 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 62 has these dependent position-determining systems and antennas:

- Transponder.
- DME.
- GPS (x2).
- Marker.
- VOR.

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.

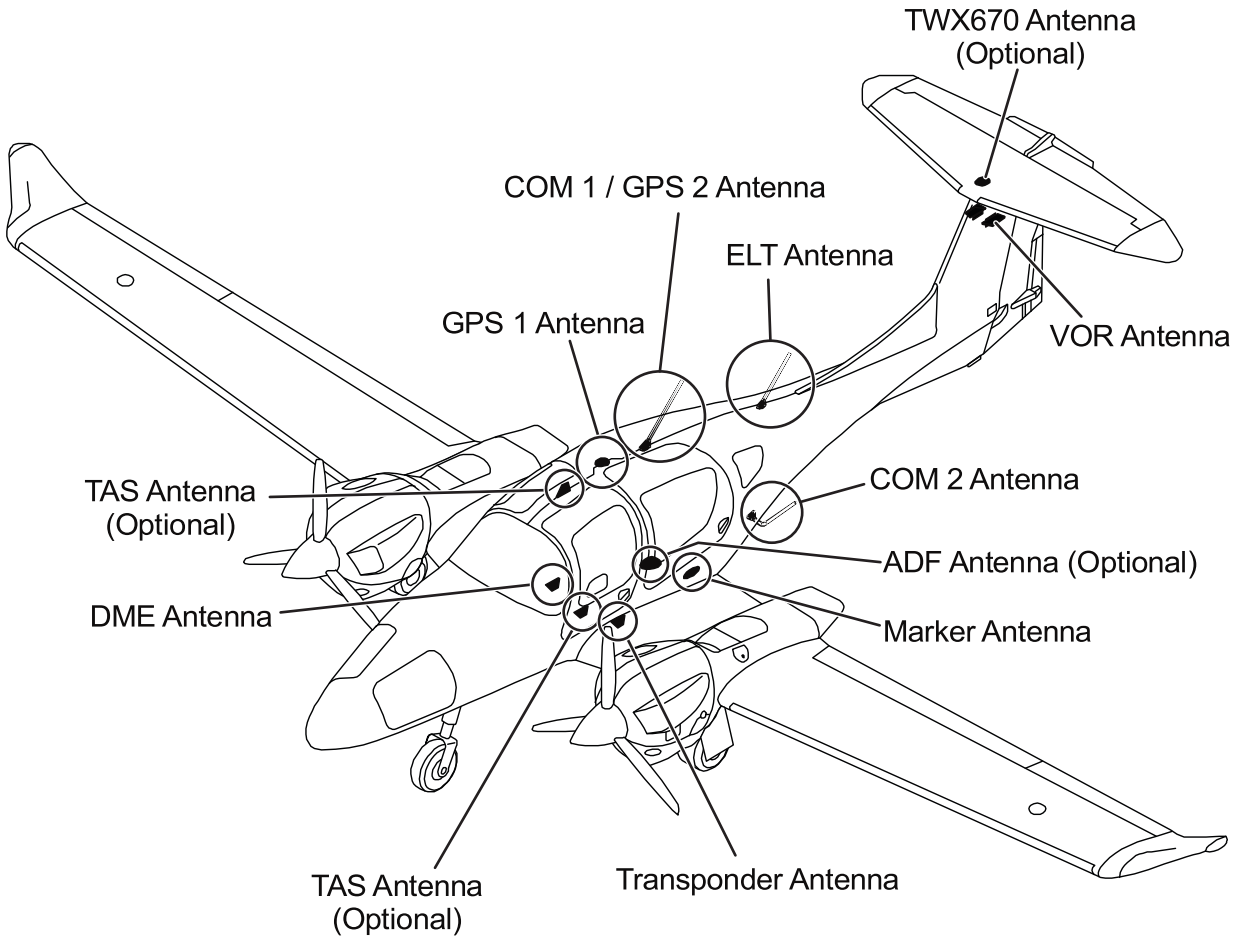

Figure 1 : Antenna Locations

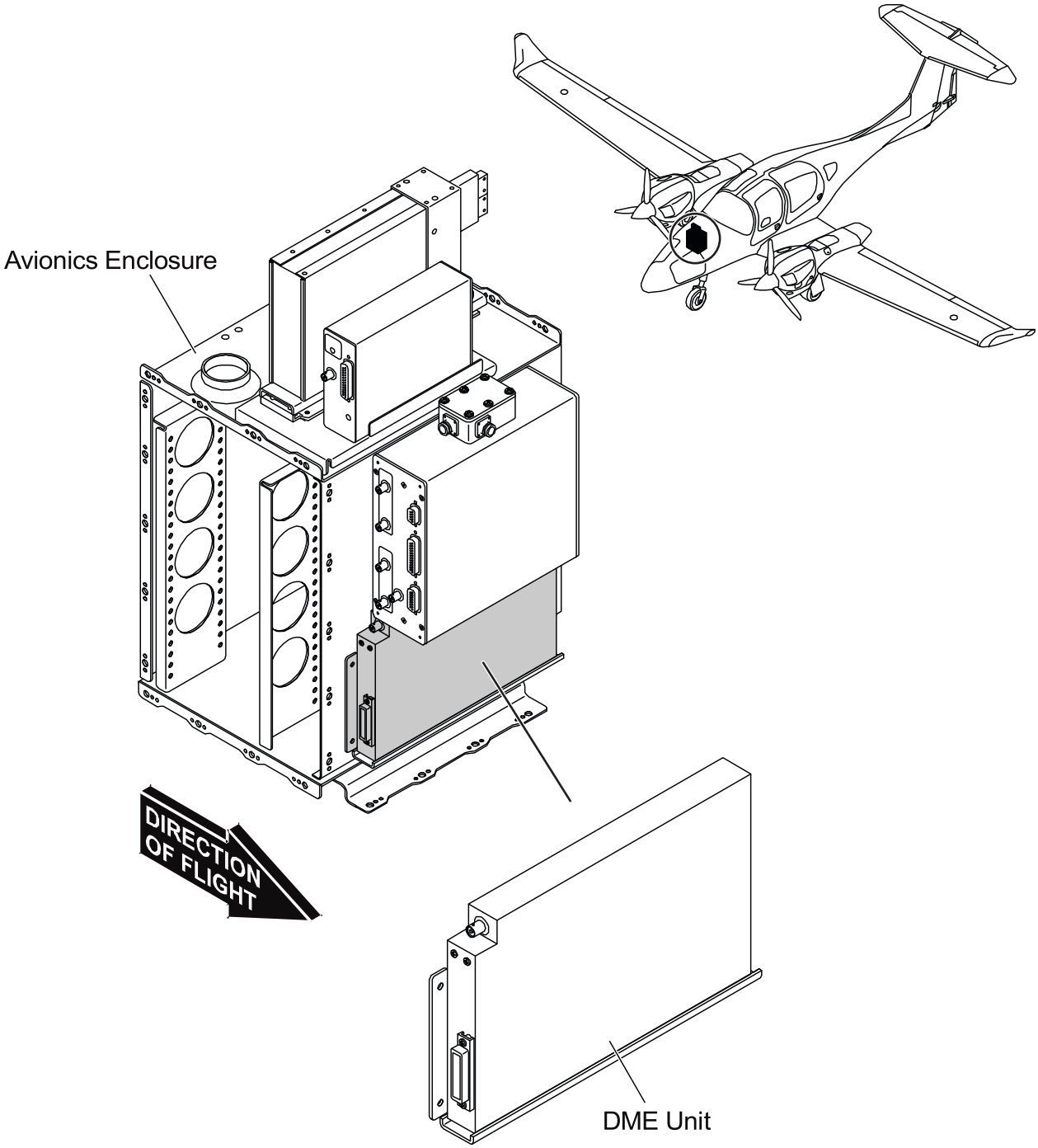

Figure 2 : DME Installation

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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 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
ATC reports no transponder reply. Transponder reply symbol operates.	Low output power.	Examine and repair/replace defective antenna connections. Replace the antenna.
ATC reports no transponder reply. Transponder reply symbol not operating.	Poor received signal.	Examine and repair/replace defective antenna connections. Replace the antenna.
DME/GPS/MARKER/ VOR/G/S systems give poor performance	Poor received signal.	Examine and repair/replace defective antenna connections. Replace the 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.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Pull open the XPDR/DME circuit-breaker.	On the 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. Refer to Section 25-10.
(4)	Disconnect the co-axial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: - Remove the two 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 two 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 co-axial cable to the antenna.	At the antenna.
(8)	Install the seat(s) that you removed.	Refer to Section 25-10.
(9)	Close the XPDR/DME circuit-breaker.	On the 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.

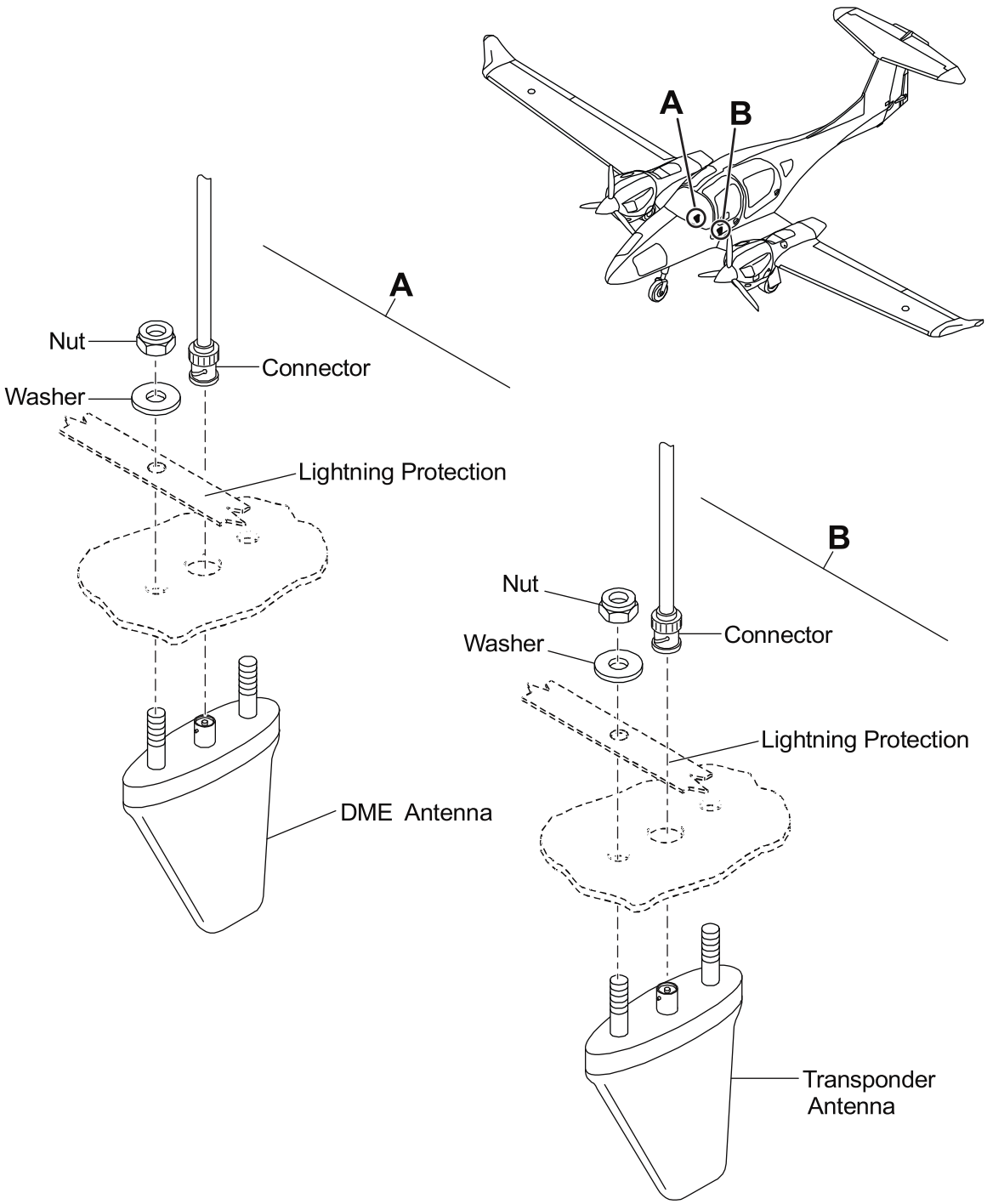

Figure 201 : Transponder and DME Antenna - Removal/Installation

B. Replace a GPS Antenna.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Pull open the GPS/NAV1 and/or GPS/NAV2 circuit-breaker.	On the 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 co-axial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: - Remove the four 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.
(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. - Install the ground-plate. - Install the four screws, washers and nuts that attach the antenna to the airplane.	 Use sealant. Refer to Paragraph 4. Torque 2.5 ± 0.3 Nm (1.8 ± 0.22 lbf.ft.).

	Detail Steps/Work Items	Key Items/References
(7)	Connect the co-axial cable to the antenna.	At the antenna.
(8)	Install the reading/map light(s) that you removed at step 3.	
(9)	Close the GPS/NAV1 and/or GPS/NAV2 circuit-breaker.	On the instrument panel, right side.
(10)	Do a test of the GPS system(s).	Refer to Section 31-40.

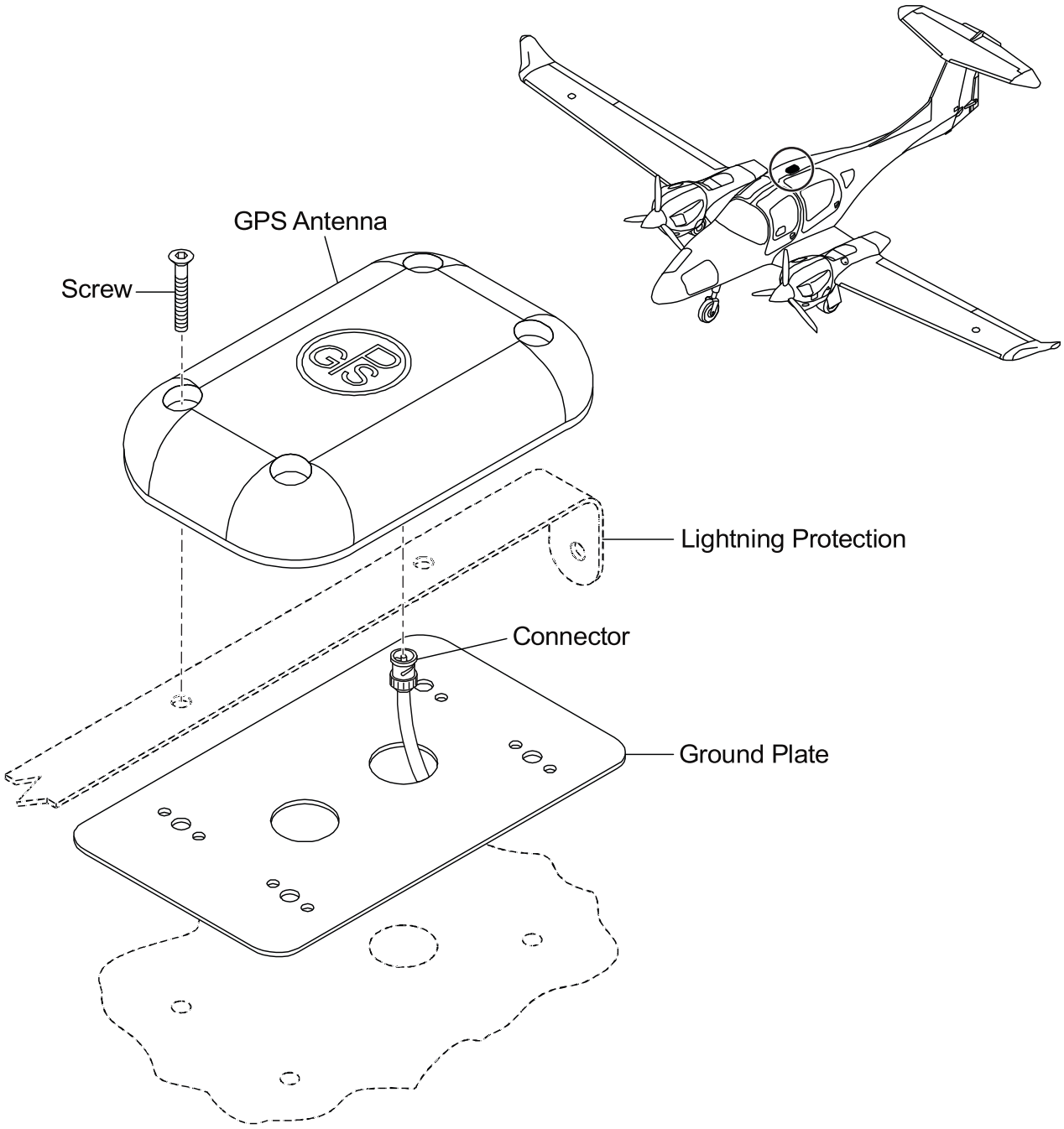

Figure 202 : GPS Antenna - Removal/Installation

C. Replace a Marker Antenna.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Remove the passengers' seats.	Refer to Section 25-10.
(3)	Disconnect the co-axial cable from the antenna that you will replace.	At the antenna.
(4)	Remove the antenna: - Remove the three 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.
(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 three screws, washers and nuts that attach the antenna to the airplane.	Use sealant. Refer to Paragraph 4.
(6)	Connect the co-axial cable to the antenna.	At the antenna.
(7)	Install the passengers' seats.	Refer to Section 25-10.
(8)	Do an operational test of the marker system on the next flight.	

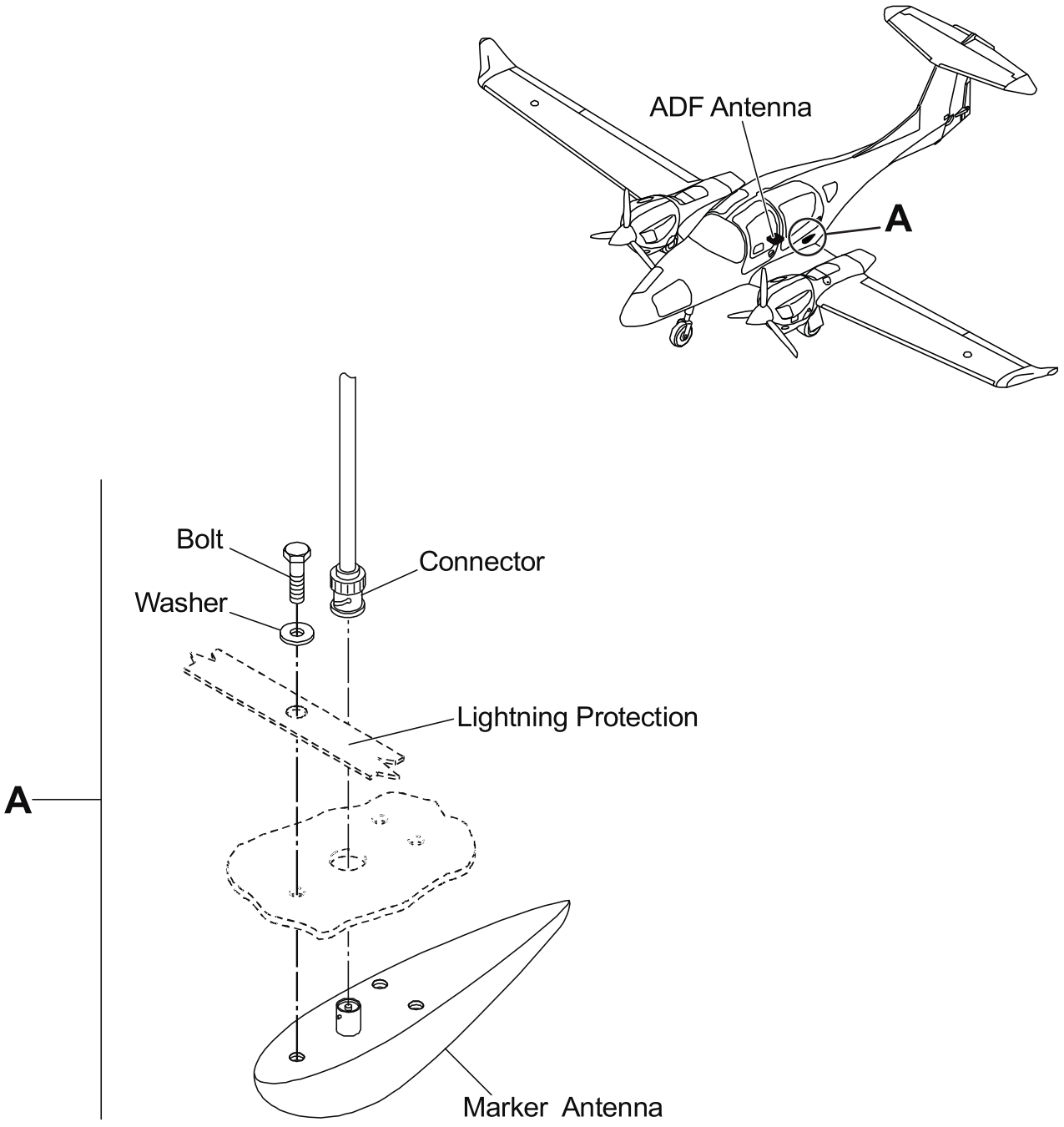

Figure 203 : Marker Antenna - Removal/Installation

D. Replace a NAV/Glideslope Antenna.

Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the ELECT. MASTER switch is set to OFF.	On the instrument panel, left side.
(2)	Pull open the GPS/NAV1 and/or GPS/NAV2 circuit-breaker.	On the instrument panel, right side.
(3)	Remove the rudder to gain access to the NAV/Glideslope antenna via the hole in the stabilizer spar.	Refer to Section 27-20 for information on the rudder.
(4)	Disconnect the co-axial cable from the antenna that you will replace.	At the antenna.
(5)	Remove the antenna: - Remove the four screws and washers that attach the antenna and base plate to the airplane. - If necessary, use a knife to carefully remove the sealant that seals the antenna and base plate to the airplane outer surface. - Move the antenna and base plate clear of the airplane.	 Hold the antenna. Take care not to damage the airplane surface. From the outside.
(6)	Install the antenna: - Make sure that the contact surfaces of the antenna, base plate and the airplane surface where the antenna will be installed are clean and free of grease. - Move the antenna and base plate into position on the bottom of the fuselage. - Seal the outer edge of the antenna and base plate where it contacts the airplane surface with sealant. - Install the four screws and washers that attach the antenna to the airplane.	 Use sealant. Refer to Paragraph 4.

	Detail Steps/Work Items	Key Items/References
(7)	Connect the co-axial cable to the antenna.	At the antenna.
(8)	Install the rudder.	Refer to Section 27-20 for information on the rudder.
(9)	Close the GPS/NAV1 and/or GPS/NAV2 circuit-breaker.	On the instrument panel, right side.
(10)	Do an operational test of the marker system on the next flight.	

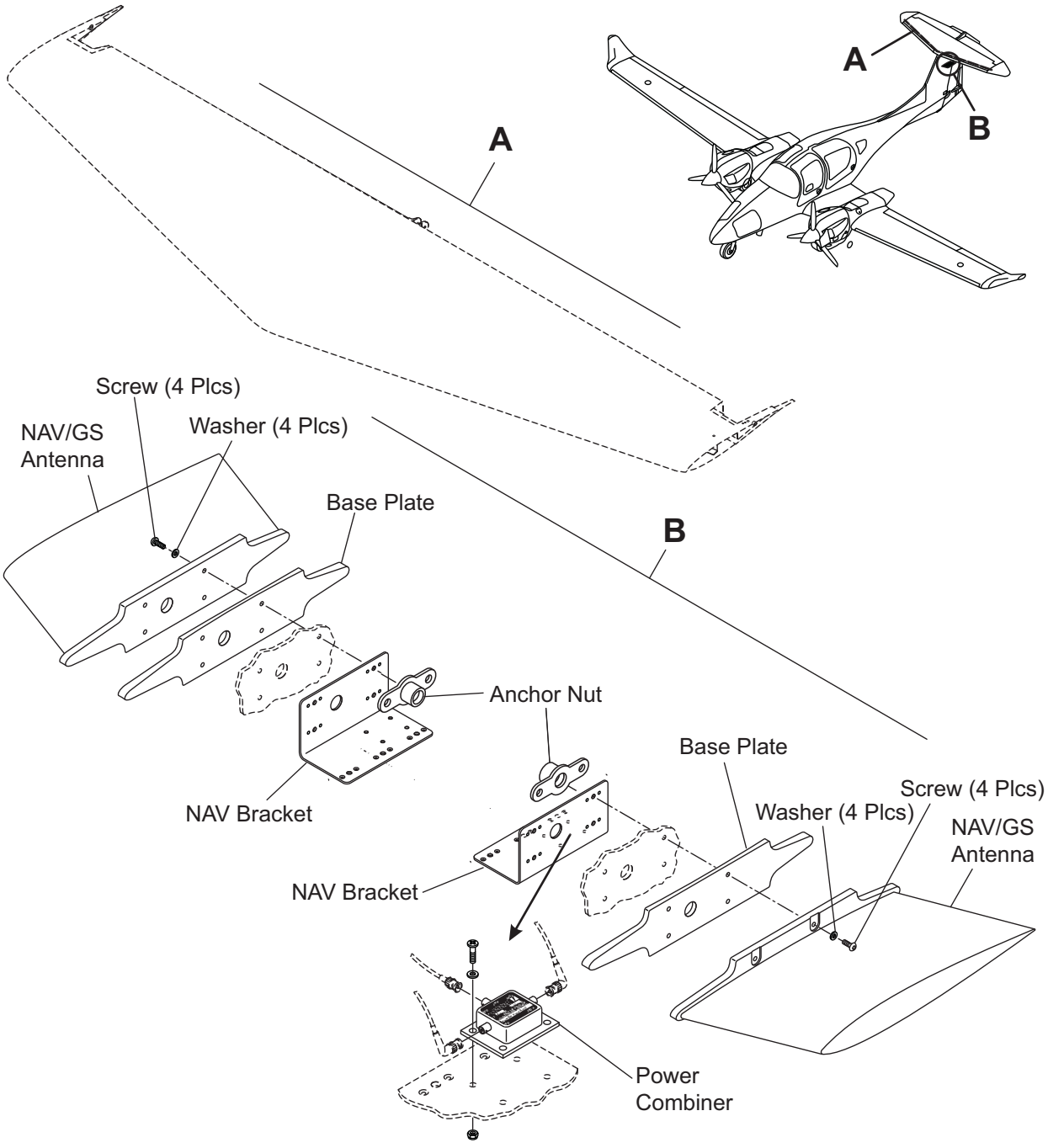

Figure 204 : NAV/Glideslope Antenna - Removal/Installation

3. **Used Types of Flexible Co-Axial Cables**

	Antenna/Receiver	Co-Axial Cable
(1)	Transponder	RG 142
(2)	DME	RG 142
(3)	GPS	RG 400
(4)	Marker	RG 400

4. **Sealant Specification**

Use an adhesive bonding compound on the basis of polyurethane or acrylic 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).

Section 34-56

Transponder (XPDR)

1. General

The DA 62 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, for more details about the transponder (XPDR) system of the DA 62 airplane.

Refer to the Garmin Installation Manual, Doc. No. 190-00734-10, latest revision, for more information about the GTX335 or the GTX345 series transponders installed on the DA 62 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 62 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 13,000 ft or more then 30 minutes above 10,000 ft. Each pilot or passenger can connect a mask or cannula to the oxygen system via an separate outlet port. 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 lower 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 13,000 ft or more then 30 minutes above 10,000 ft. Each pilot or passenger can connect a mask or cannula to the oxygen system via five or if OÄM 62-019 is installed seven 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 lower right side of the instrument panel next to the flaps switch.

An oxygen system overview is given in Figures 1 and 2.

The system consists of five main sections:

- Pressure gauge on the instrument panel.
- Oxygen cylinder.
- Regulator valve assembly.
- Filling block.
- Outlet ports.

The oxygen compartment is vented.

This is 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.

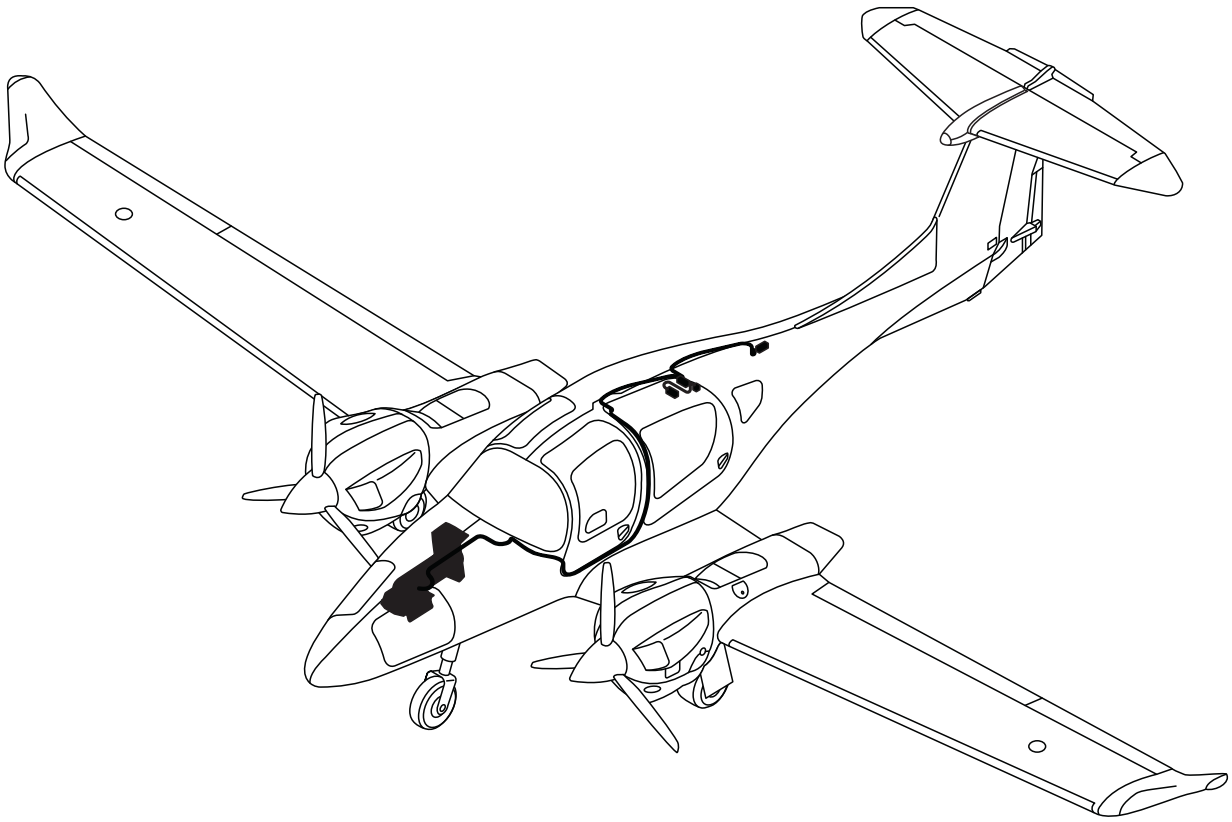

Figure 1 : Crew and Passenger Oxygen System

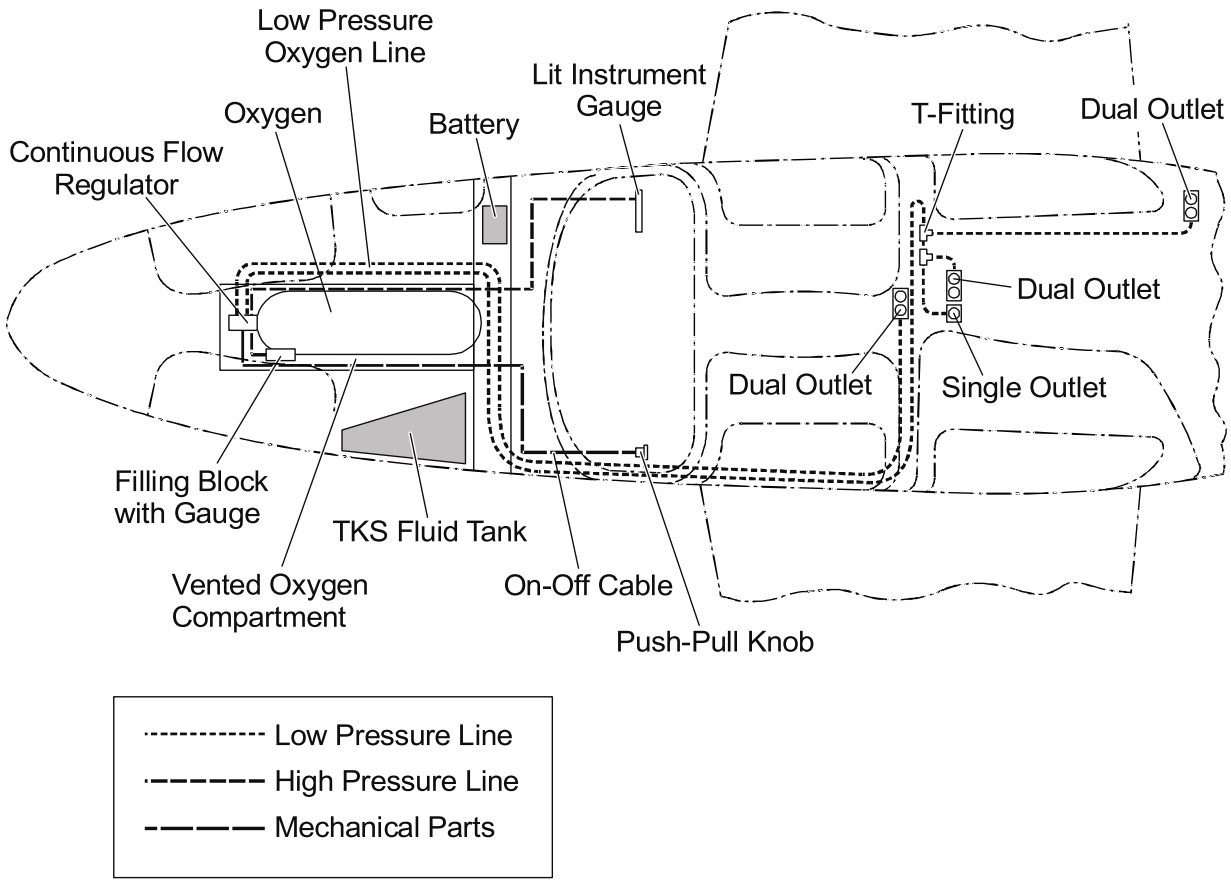

Figure 2 : AEROX Oxygen System

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.

There are no indications and warning lamps of the oxygen system connected to the Garmin G1000 system.

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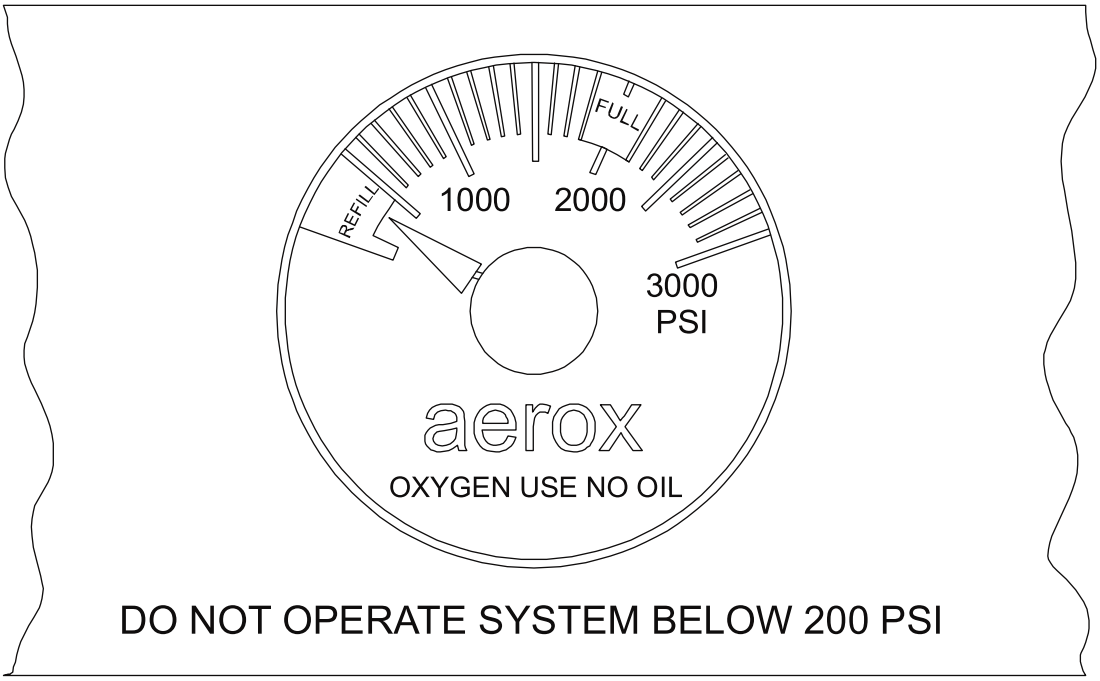

Figure 3 : Oxygen Pressure Gauge

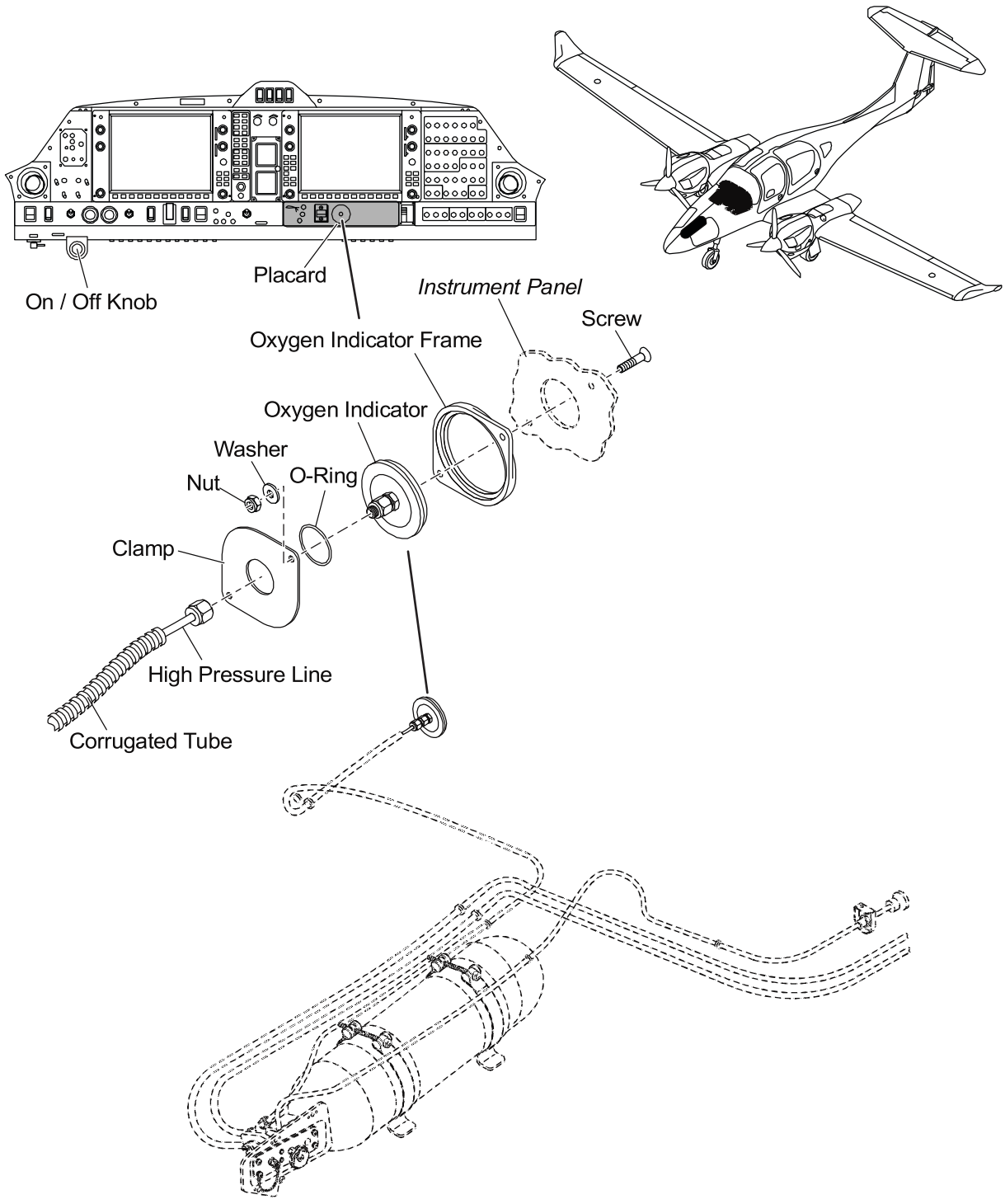

Figure 4 : Pressure Gauge Installation on the Instrument Panel

B. Oxygen Cylinder.

The Kevlar oxygen cylinder is installed in the front baggage compartment in its own vented compartment.

If OÄM 62-004 is installed the cylinder capacity is 16 liters (970 cu.in), respectively 2183 liters (77.1 cu.ft) of compressed oxygen at 128 bar (1850 PSI).

If OÄM 62-028 is installed the cylinder capacity is 10.7 liters (650 cu.in), respectively 1419 liters (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 4.8 bar (70 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 7 min with OÄM 62-004 installed or 3.5 min with OÄM 62-028 installed (refill with 150-300 PSI per minute).

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 connected 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 oxygen system provides the supplementary oxygen necessary for continuous flight at high altitude for all occupants. 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 oxygen cylinder (capacity: 77 cubic feet/2.18 cubic meters, if OÄM 62-004 is installed respectively 50 cubic feet/1.42 cubic meters, if OÄM 62-028 is installed) may be filled to 1850 PSI while installed in the airplane and 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 lower RH side of the instrument panel (next to the flaps switch).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 dome panel / middle ceiling panel for the pilot and co-pilot. The passengers' oxygen ports for the first passenger row are located overhead next to the pilot/co-pilot ports, for the second passenger row are located overhead on the ceiling. 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 77 cubic feet / 2.18 cubic meters (if OÄM 62-004 is installed) respectively 50 cubic feet / 1.42 cubic meters (if OÄM 62-028 is installed) 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)	1515	16 (60)	1800
-12 (10)	1565	21 (70)	1850
-7 (20)	1610	27 (80)	1900
-1 (30)	1660	32 (90)	1945
4 (40)	1705	38 (100)	1995
10 (50)	1755	43 (110)	2040

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 the flow meter-needle valve.
	Flow meter-needle valve defective.	Replace the flow meter-needle valve.
	Outlet port defective.	Replace the outlet port.
	Regulator valve assembly defective.	Replace the 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 oxygen system.

The oxygen safety precautions that follow will help prevent injury to persons and/or damage to equipment during maintenance operations on the oxygen system.

2. Oxygen Safety Precautions

Obey the oxygen safety precautions that follow during maintenance operations on the oxygen system:

A. Make sure that dirt, oil, grease, or solvents do not get on your hands, clothes, oxygen components or the equipment being used. Oils, grease, or solvents can burn or explode when they touch pressurized oxygen.

B. Make sure that the work area is well ventilated.

C. Put "NO SMOKING" placards in the work area.

D. Do not smoke or use a flame near the aircraft.

E. Make sure that no electrical power is connected to the aircraft.

F. Make sure that the aircraft is grounded.

G. Make sure that the outlet valve on the oxygen cylinder is closed and that the system pressure is released before you remove a component of the oxygen system.

H. Put a cap or plug on or each line or component that you disassemble.

I. Use a clean, damp cloth to remove leak detector fluid immediately after you complete a leak test. Leak detector fluid can cause corrosion. Then dry the component fully with a clean dry cloth.

J. Do not use materials other than leak detector fluid, on oxygen system connections or unions.

K. Only remove caps or plugs immediately before you will connect the related line or component.

3. **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
(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.

4. **Empty the Oxygen System**

	Detail Steps/Work Items	Key Items/References
(1)	Move the airplane outside of the 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 the 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 towards oil or grease (engine).	
(7)	The cylinder is depleted when the flow meter ball shows no flow.	

5. **Remove/Install the Instrument Panel Pressure-Gauge**

A. Remove the Instrument Panel Pressure Gauge.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the oxygen cylinder is empty.	
(2)	Remove the glare shield and the lower part of the instrument panel.	Below the MFD.
(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 two 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 o-ring and the oxygen indicator frame from the indicator.	

B. Install the Instrument Panel Pressure Gauge.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Place the oxygen indicator in the frame.	
(2)	Attach the o-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 placard.	
(5)	Connect the high pressure copper tube to the gauge.	
(6)	Fix the tube which surrounds the copper tube with heat shrink tube and cable ties.	Take care that the cable ties do not clamp this plastic tube.
(7)	Install the glare shield and the lower part of the instrument panel.	Below the MFD.

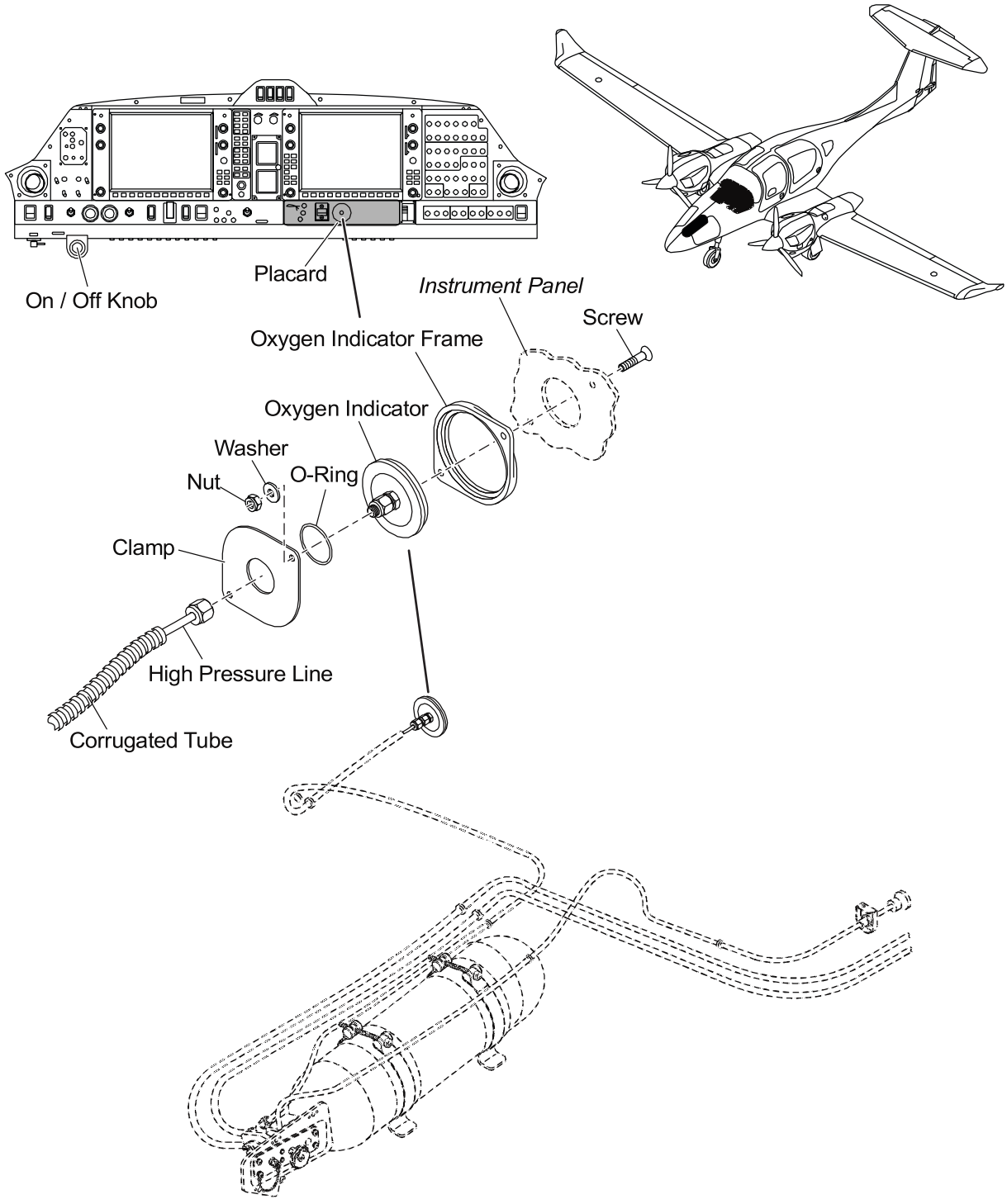


Figure 201 : Pressure Gauge - Removal/Installation

6. **Remove/Install the Oxygen Cylinder**

A. Remove the Oxygen Cylinder.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Empty the oxygen cylinder.	Refer to Paragraph 4.
(2)	Check the oxygen pressure gauge in the cockpit. Make sure that the ON/OFF knob is in the OFF position.	Make sure that the oxygen pressure gauge shows that the system is empty. Refer to Figure 201.
(3)	Open the door to the LH nose baggage compartment.	
(4)	Remove the oxygen compartment cover.	Make sure that the oxygen pressure gauge next to the filler valve shows that the system is empty.
(5)	Remove one low pressure line PFA tubing.	
(6)	Pull the ON/OFF knob to the ON position and confirm that the cylinder is empty.	Refer to Figure 201.
(7)	Remove the high pressure line of the filler block on the regulator.	
(8)	Remove the filler block together with the refill bracket assembly.	
(9)	Disconnect all other lines and the Bowden cable from the regulator.	
(10)	Open the two clamps which hold the oxygen cylinder into the two brackets.	The two brackets are fixed to the airplane oxygen compartment.
(11)	Remove the oxygen cylinder, shims and regulator from the airplane.	Remove the two silicon protection shims if the oxygen cylinder will be replaced with another.
(12)	If the oxygen regulator is to be removed, refer to Para 7.A.	

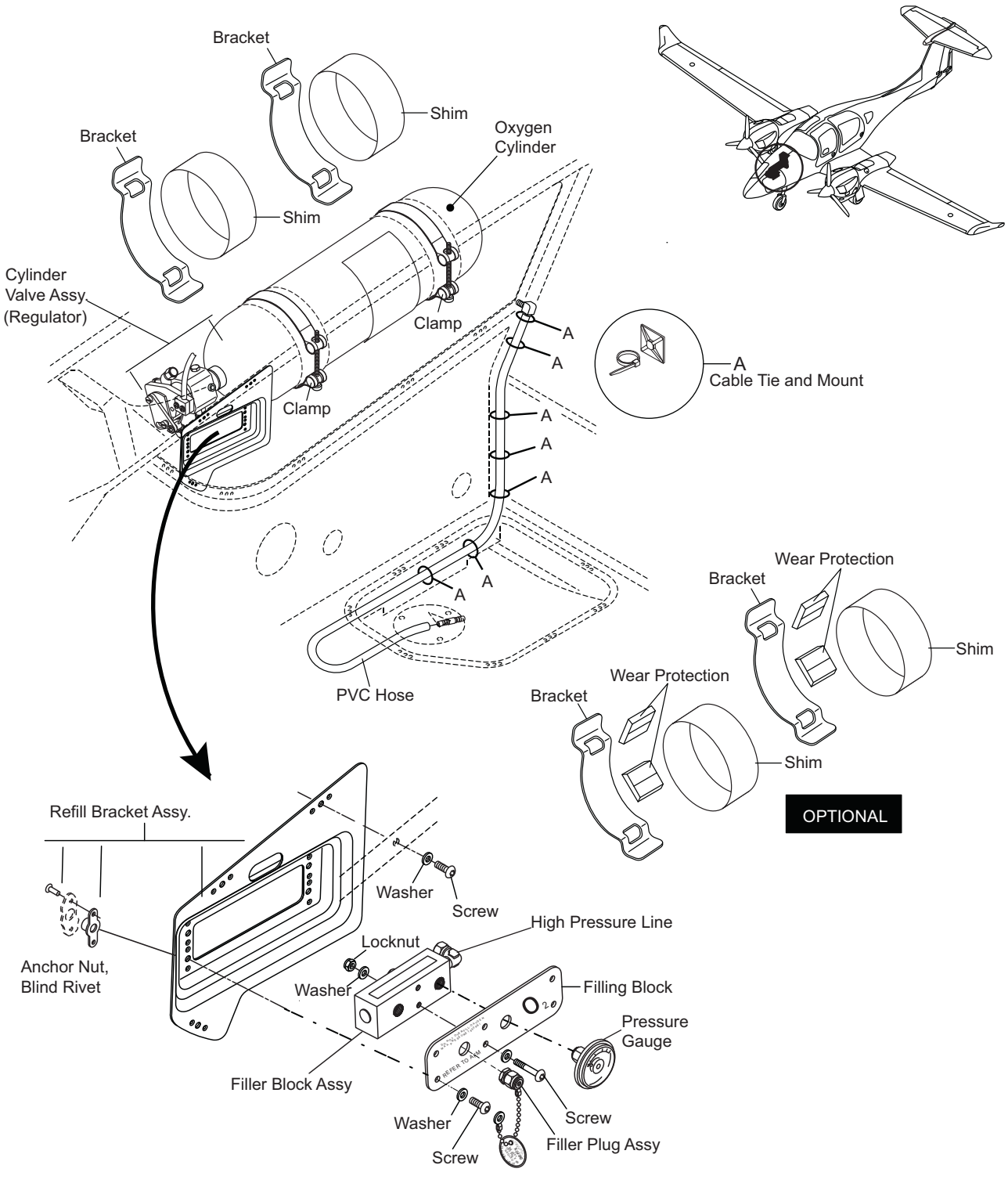


Figure 202 : Oxygen System Components - Removal/Installation

B. Install the Oxygen Cylinder.

Refer to Figure 202.

	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)	If the oxygen regulator was removed, install the regulator on the cylinder. Refer to Para 7.B.	
(3)	If the oxygen cylinder was replaced, install the two silicon protection shims onto the cylinder.	
(4)	Install the oxygen cylinder, with the shims and regulator installed, in its designated position.	The regulator points forward in the airplane.
(5)	Fix the cylinder securely in place by using the silicon protection shims and the clamps.	
(6)	Connect all pressure lines and the Bowden cable, except the high pressure refill line, to the regulator.	
(7)	Install the refill bracket assembly with the filler block and connect the high pressure line to the filler block.	
(8)	Close the oxygen compartment cover.	
(9)	Close the door to the LH nose baggage compartment.	
(10)	Perform an operational test.	Refer to Para 3.

7. **Remove/Install the Oxygen Regulator**

A. Remove the Oxygen Regulator.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the oxygen cylinder.	Refer to Para 6.A.
(2)	Remove the regulator from the cylinder: - Secure the cylinder in position. - Turn the regulator counter-clockwise to unscrew it from the cylinder. - Remove and discard the rubber ring. - Clean the threads of the Teflon tape remains.	

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 on or near the oxygen cylinder.	
(2)	Wrap the threads of the regulator with Teflon tape and install a new rubber ring.	
(3)	Install the regulator onto the cylinder: - Make sure that the threads of the oxygen cylinder are clean. - Secure the cylinder in position. - Turn the regulator clockwise to screw it into the cylinder.	
(4)	Install the oxygen cylinder.	Refer to Para 6.B.

8. **Remove/Install the Filler Block Assembly**

A. Remove the Filler Block Assembly.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Empty the oxygen cylinder.	Refer to Paragraph 4.
(2)	Check the oxygen pressure gauge in the cockpit. Make sure that the ON/OFF knob is in the OFF position.	Make sure that the oxygen pressure gauge shows that the system is empty. Refer to Figure 201.
(3)	Open the door to the LH nose baggage compartment.	
(4)	Remove the oxygen compartment cover.	Make sure that the oxygen pressure gauge next to the filler valve shows that the system is empty.
(5)	Remove one low pressure line PFA tubing.	
(6)	Pull the ON/OFF knob to the ON position and confirm that the cylinder is empty.	Refer to Figure 201.
(7)	Carefully disconnect the high pressure filling copper line from the regulator.	
(8)	Remove the screws on the composite bracket (filling block) and pull out the filler block assembly.	

B. Install the Filler Block Assembly.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Mount the filler block assembly in the composite bracket (filling block) with the four screws.	
(2)	Connect the high pressure filling copper line to the regulator.	Use a new compression ring in the fitting to the regulator.
(3)	Install the low pressure line PFA tubing that was removed.	
(4)	Close the oxygen compartment cover.	
(5)	Close the door to the LH nose baggage compartment.	
(6)	Perform an operational test.	Refer to Para 3.

9. **Remove/Install the Pilot/Co-Pilot Outlet Manifold/First Passenger Row Outlet Manifold**

A. Remove the Pilot/Co-Pilot Outlet Manifold/First Passenger Row Outlet Manifold.

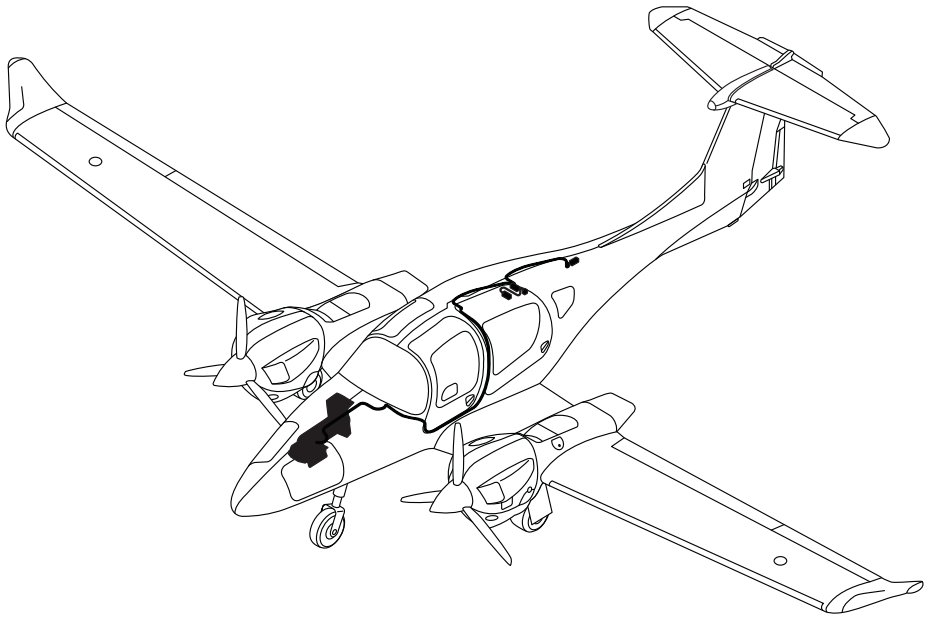
Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the oxygen system is switched OFF.	
(2)	Remove the central headliner device unit 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/First Passenger Row Outlet Manifold.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the central headliner device unit.	
(2)	Install the manifold on the central headliner device unit. Confirm that the two PA rings are on the manifold. - One PA ring is between the central headliner device unit and the outlet manifold and the other one is between the central headliner device unit and the placard.	
(3)	Connect the outlet manifold to the PFA tubing.	
(4)	Install the central headliner device unit and check the operation of the manifold.	



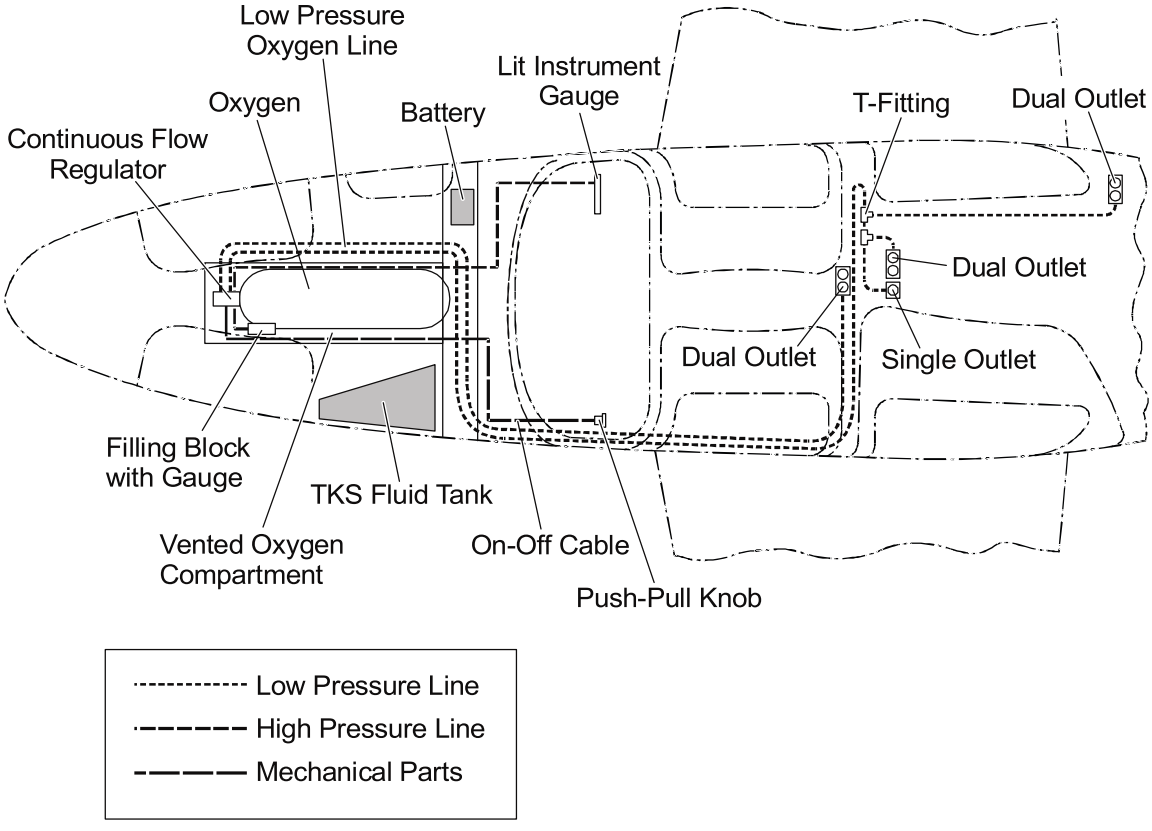


Figure 203 : Outlet Manifold - Removal/Installation

10. **Remove/Install the Second Passenger Row Dual-Outlet Manifold (if OÄM 62-019 is installed)**

A. Remove the Second Passenger Row Dual-Outlet Manifold.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Confirm that the oxygen system is switched OFF.	
(2)	Remove the Headliner Pax 2 cover.	
(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.	
(5)	Disconnect the PFA tubing from the dual outlet manifold.	
(6)	Protect the open end of the PFA tubing against debris with tape.	

B. Install the Second Passenger Row Dual-Outlet Manifold.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Put the two PA rings (one at each outlet) on the dual outlet manifold.	Use a small amount of adhesive to hold them in place.
(2)	Place the dual outlet manifold into the Headliner Pax 2 cover.	
(3)	Remove the tape and connect the PFA tubing with the outlet manifold.	
(4)	Place the outlet manifold in position and fix it with two 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.	
(7)	Install the Headliner Pax 2 cover.	

CHAPTER 51

STANDARD PRACTICES/STRUCTURES

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CHAPTER 51

STANDARD PRACTICES/STRUCTURES

1. General

The DA 62 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.

The DA 62 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 62 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 CFRP 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 three doors are a CFRP molding with inner and outer frames that bond together. Each door has an acrylic transparency. The windscreen is an acrylic transparency.

A polyurethane paint finish protects the outer skins of the airplane from ultraviolet rays and humidity.

2. **Types of Structures**

The DA 62 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 other GFRP parts, metal attachment brackets or metal bushings.

The glass fibers are woven to make glass cloth. The orientation and 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 other CFRP parts, 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 and lighter 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 62 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).

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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 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 62 and for repair limitations. Refer to Section 51-20 for general repair procedures.

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.

Major structural damage that requires partial replacing of structural components or extensive repairs is counted among Class 1:

- Damage that intermits the main flow of forces within the airframe structure as a whole.
- Damage that interrupts transmission and transfer of force to primary structural components (fuselage, wings, empennage) and control surfaces (rudder, elevator, ailerons, flaps).
- Damage to large areas (dimensions >25 mm [1.0 in] in either direction).

Examples: fuselage tube broken, spar caps (wings, empennage) damaged, canopy frame (fuselage sided) broken, fuselage structure surrounding the landing gear attachments defective, hinge joints of control surfaces torn out

NOTE: Class 1 damage restricts or voids airworthiness.

B. Class 2 Damage.

Damage to primary structural components (fuselage, wings, empennage) and control surfaces (dimensions <25 mm [1.0 in] in either 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 13 mm (0.5 in) diameter circle.

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. Visually 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 THE COMPOSITE.

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**

Even small holes or buckling deeper than 1.5 mm 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 51-10-00 of the basic AMM (latest revision) for classification and repair of probable fuselage damage. Scratches and little damages in the border area are acceptable. If damage occurs outside of the debris protection check position of the protection or contact the airplane manufacturer.

For debris protection replacement refer to Chapter 11-00-00 of the basic AMM (latest revision).

Section 51-20

Repair Processes

1. General

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 62 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 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**

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

Most resins can cause skin disease. When you use resin/hardener use a protective barrier cream on your hands and exposed skin. You must always wear plastic gloves.

WARNING: DO NOT GET RESINS, HARDENERS OR SOLVENTS IN YOUR MOUTH OR IN YOUR EYES. THESE CHEMICALS CAN CAUSE DISEASE.

The resins, hardeners and solvents used for composite repairs are poisonous. You must not take food into the work area. Use a mask to protect your face and use eye-protection.

WARNING: DO NOT GET COMPOSITE DUST PARTICLES IN YOUR EYES, OR IN YOUR MOUTH, OR ON YOUR SKIN. THESE PARTICLES 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 composite particles, 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 flowing water. Do not rub your skin while it has dust on it.

7. **Workshop Conditions**

WARNING: DO NOT GET COMPOSITE DUST PARTICLES IN YOUR EYES, OR IN YOUR MOUTH, OR ON YOUR SKIN. THESE PARTICLES CAN CAUSE DISEASE.

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 between 18 °C (65 °F) and 27 °C (81 °F) and must not fall below 15 °C (59 °F). The relative humidity during mixing, applying or curing resins must not be allowed to rise above 65%.

Maintain the workshop temperature as near to 25 °C (77 °F) as possible during curing.

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 approved by the manufacturer. 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. Failure of the structure can cause an accident.

2. Resin

CAUTION: EPOXY RESIN CURES IN AN EXOTHERMAL REACTION. DEPENDING ON RESIN/ HARDENER COMBINATION, AND POT LIFE OF THE COMBINATION, AND WORKING TEMPERATURE THE MIXTURE CAN REACH HIGH TEMPERATURES. DO NOT USE HOT RESIN. HOT RESIN CAN INFLAME. PUT IT TO A SAFE LOCATION UNTIL HARDENED.

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 in shallow containers. This will increase the ratio surface area to volume which will reduce the risk of an exothermic reaction.

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 with particles of skin protecting cream on your hands. This may act as a separating agent within the lamination.	Refer to the relevant repair procedure in this Section.
(2)	Prepare the layers of cloth that you will use for the repair.	Refer to the lay-up drawing.
(3)	Protect the area of the structure around the repair from contamination by the repair materials.	Use plastic/polythene sheet material 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.**	
(4)	Apply a thin coat of resin to the repair.	
(5)	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.
(6)	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.	
(7)	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.
(8)	Do steps (6) and (7) as necessary until all the layers of cloth are in place.	

	Detail Steps/Work Items	Key Items/References
(9)	Use the roller and squeegee to remove the excess resin.	
(10)	Put a layer of peel ply over the laminate.	
WARNING: DO NOT PUT HOLLOW COMPONENTS COMPLETELY INTO A VACUUM BAG. YOU MAY DESTROY THEM.		
(11)	If necessary, apply a vacuum bag to the laminate.	Refer to the lay-up drawing and/or repair drawing.

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 from contamination.	Refer to the relevant repair procedure in this Section.
(2)	Prepare the layers of cloth that you will use for the repair.	Refer to the lay-up drawing.
(3)	Put a layer of clean transparent plastic/ polythene sheeting over the repair area and hold in place with self-adhesive tape.	Colored sheet should be preferred.
(4)	Use an indelible felt 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.
(5)	Remove the transparent sheet from the repair area and place the sheet 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.	
(6)	Cut the layers of cloth to fit the contour lines that you traced onto the transparent sheet.	
	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)	Apply a thin coat of resin to the transparent sheet.	
(8)	Apply the first inner layer of cloth to the transparent sheet and trim it to the correct size.	Make sure that the fibers in the cloth point in the correct direction.

	Detail Steps/Work Items	Key Items/References
(9)	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.	
(10)	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.
(11)	Do steps (9) and (10) as necessary until all the layers of cloth are in place.	
(12)	Apply a thin coat of resin to the area of the repair on the airplane structure where you will attach the laminate patch.	
(13)	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.
(14)	Carefully remove the transparent sheet from the laminate patch.	
(15)	Use a roller and squeegee to make sure that the laminate patch is firmly in position and that any excess resin is removed from the repair laminate.	
(16)	Put a layer of peel ply over the laminate.	
(17)	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 filers make the bonding paste. Table 1 gives you the proportion by weight of resin to thickening fillers. You can change the proportion of Sil-Cell and Cotton Flakes relative to each other but you must keep the total weight of the Sil-Cell/Cotton Flakes mix constant.

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.

	Detail Steps/Work Items	Key Items/References
(1)	Bring and maintain the temperature of the repair at 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)	After 10 hours raise the temperature of the repair to at least 130 ± 5 °C (266 ± 41 °F) over a minimum of 4 hours.	
CAUTION:	DO NOT HEAT UP ABOVE 135 °C (275 °F). THE FOAM CORE MIGHT BE DESTROYED.	
(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 a minimum of 14 hours lower the temperature to room temperature over a minimum of 4 hours.	

8. **Exterior Paint Finish**

A. Paint Color Scheme.

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.

Since full strength of the fiber composite structure has only been shown up to the most critical climate 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 Figures 201, 202 and the Tables for the details of the paint color scheme

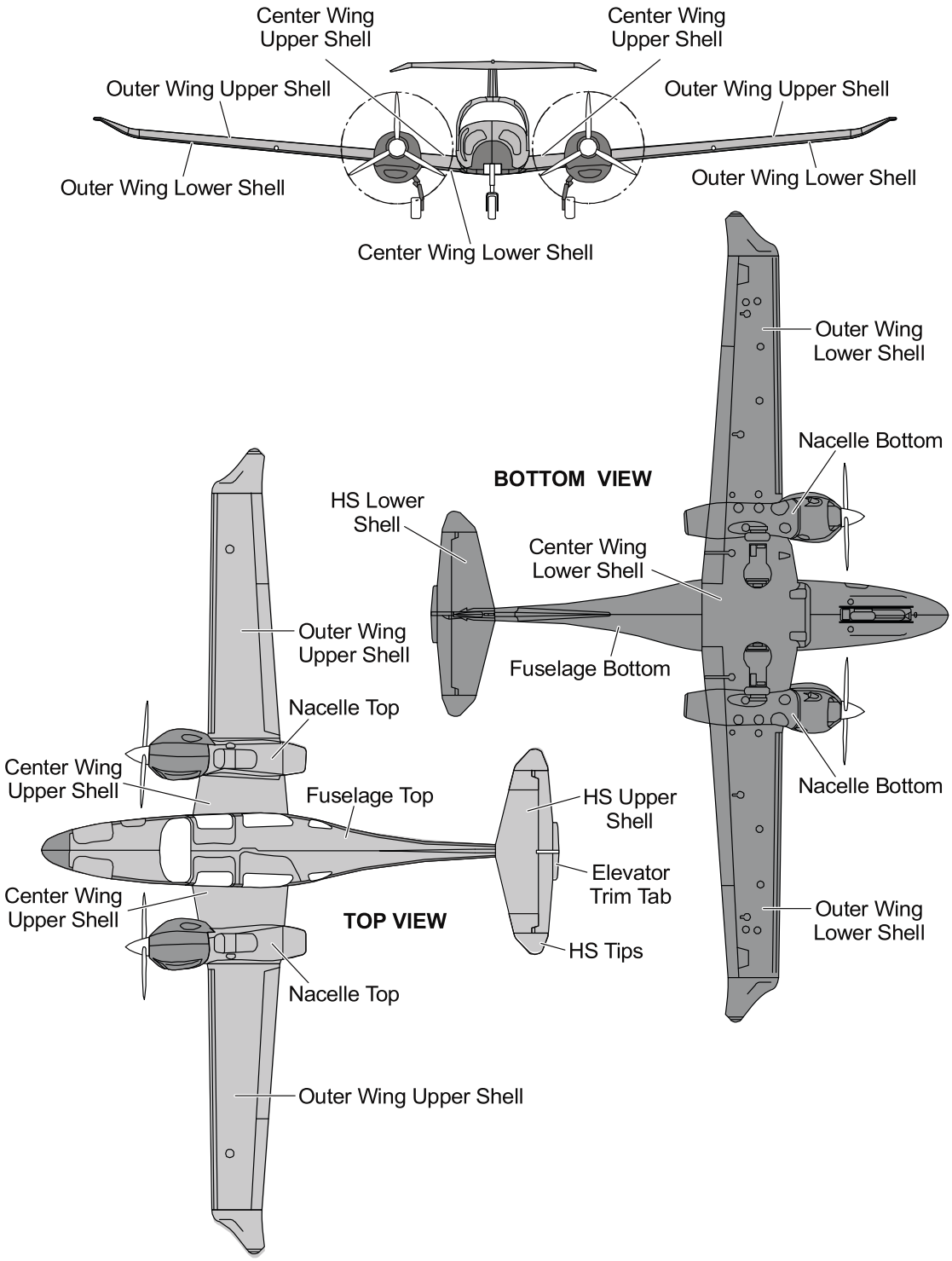

Figure 201 : Paint Color Scheme, Part I

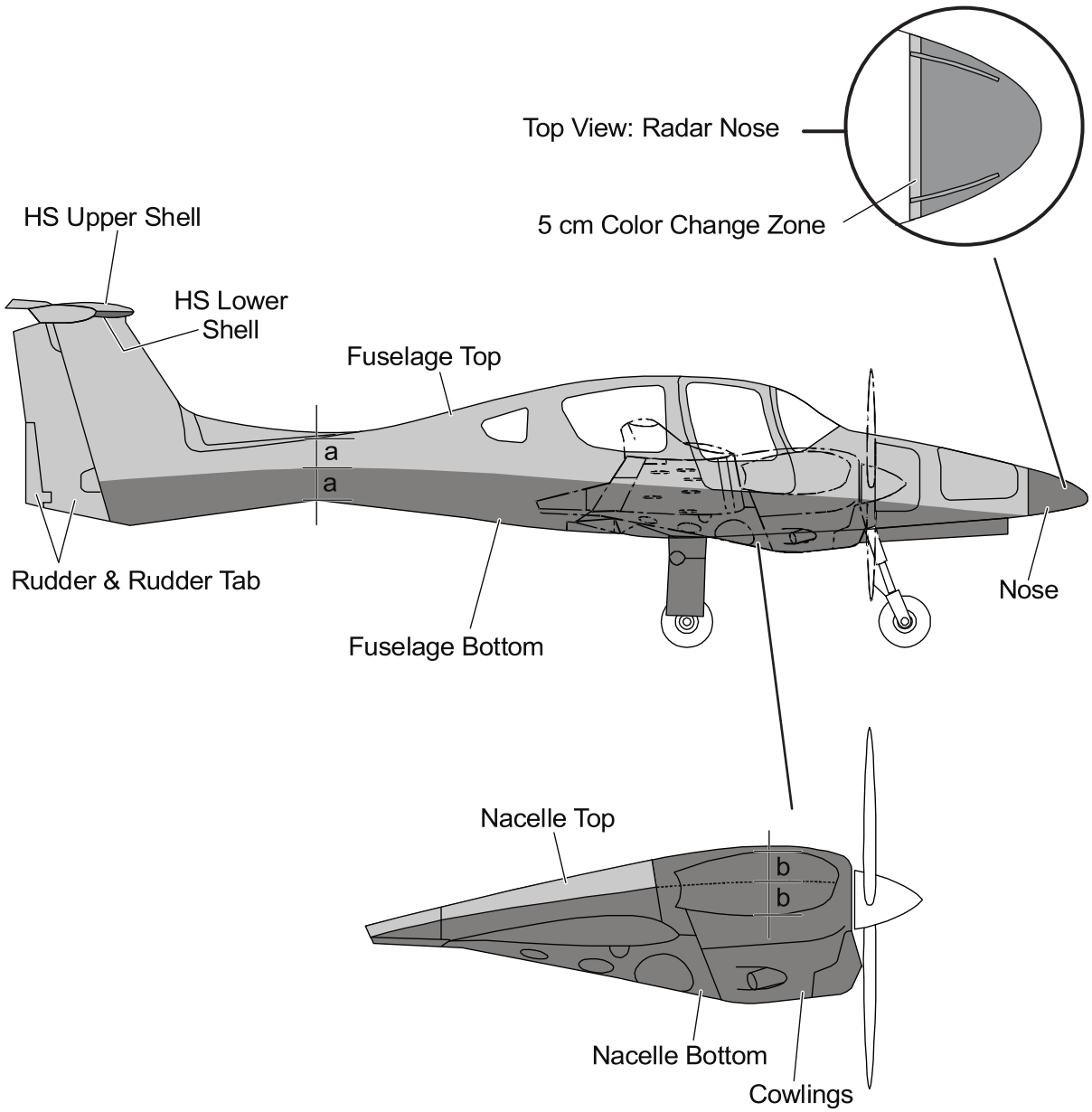

Figure 202 : Paint Color Scheme, Part II

Table 2 : APPROVED AIRPLANE PART COLOR CODES			
Airplane Part Paint Scheme according to Figures 1 & 2	**Area / Shell**	**Any* Color**	**A000 - A017**
Fuselage	Top		x
	Bottom	x	x
Outer Wing	Upper		x
	Lower	x	x
Center Wing	Upper		x
	Lower	x	x
Engine Nacelle	Top		x
	Bottom	x	x
Cowling	All	x	x
Horizontal Stabilizer	Upper		x
	Lower	x	x
Winglets	Upper		x
	Lower	x	x
Horizontal Stabilizer Tips	Upper		x
	Lower	x	x
Aileron	Upper		x
	Lower	x	x
Flaps	Upper		x
	Lower	x	x
Elevator and Trim Tab	Upper		x
	Lower	x	x
Rudder and Rudder Trim Tab	All		x
Nose Cone (if weather radar is not installed)	All	x	x
Nose Cone (if weather radar is installed)	All	N***	

* Any PU-based color.
For Suppliers other than MIPA, compatibility with the basis paint layers must be checked.

Table 3 : APPROVED BASE COAT COLORS					
CODE	**Base Coat Color Number (Airplane)**	**Supplier**	**CODE**	**Base Coat Color Number (Metal Free Colors)**	**Supplier**
A000	White PU-based color with a 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	6-KVW, Diamond Weiss PPG P493	PPG
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 PEARL FEU-MLTC	MIPA
A005	BC A-10416 RUMPF GOLD MET BMW-301	MIPA	N005	BC A-10417 RADARNASE GOLD PEARL 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	MIPA PU 240-05 FS 35237 STUMPFMATT (LUFTÜBERLEGENHEITSGRAU EINSCHICHT)	MIPA	N008	MIPA PU 240-05 FS 35237 STUMPFMATT (LUFTÜBERLEGENHEITSGRAU EINSCHICHT)	MIPA
A009	BC A-60667 PANTONE 3302c GREEN PEARL	MIPA	N009	BC A-60667 PANTONE 3302c GREEN PEARL	MIPA
A020	BC A-3855 PANTONE 201c SEMINOLE RED PEARL	MIPA	N010	BC A-3855 PANTONE 201c SEMINOLE RED PEARL	MIPA
A011	TSR-2655 LIGHT SUNSET ORANGE	MIPA	N011	TSR-2655 LIGHT SUNSET ORANGE	MIPA

Table 3 : APPROVED BASE COAT COLORS					
CODE	**Base Coat Color Number (Airplane)**	**Supplier**	**CODE**	**Base Coat Color Number (Metal Free Colors)**	**Supplier**
A012	TSR-2656 DARK SUNSET ORANGE	MIPA	N012	TSR-2656 DARK SUNSET ORANGE	MIPA
A013	TSR-3993 FLAMENCO RED	MIPA	N013	TSR-3993 FLAMENCO RED	MIPA
A014	TSR-50652 SAN MARINO BLUE	MIPA	N014	TSR-50652 SAN MARINO BLUE	MIPA
A015	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL MT	MIPA	N015	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL MT	MIPA
A016	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL SM	MIPA	N016	TSR-71229 AIR SUPERIORITY GREY GLOSS LEVEL SM	MIPA
A017	TSR-50687 LIGHT BLUE	MIPA	N017	TSR-50687 LIGHT BLUE	MIPA

* For Suppliers other than MIPA, compatibility with the basis paint layers must be checked.

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

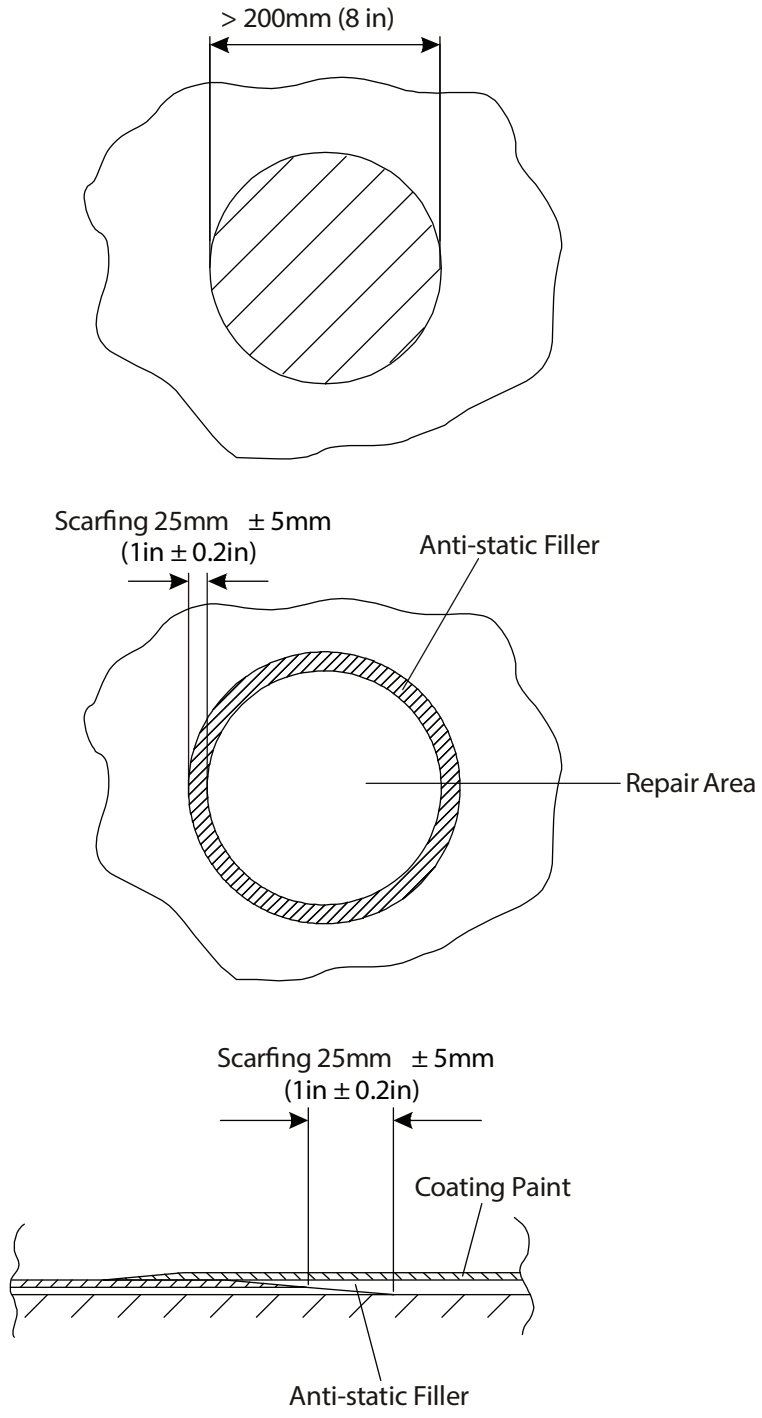

Figure 203 : Scarfing the Paint Coat

B. Painting a Large Repair Area.

Refer to Figure 203.

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.	Do not sand through the existing anti-static filler. Minimum scarf length: 25 mm (1 in). To make sure that the anti-static filler of the existing paint is electrically connected to the anti-static 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.	Two 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.
(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 anti-static filler with 320 grit sanding paper.	Remove as little anti-static 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.

	Detail Steps/Work Items	Key Items/References
(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 two days at 20 °C (68 °F).

C. Painting a Small Repair Area.

This procedure must be followed when the diameter of the area which must be painted 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 two layers of HS filler to the repair area.	Obey the filler manufacturer's instructions.
(3)	Allow the HS filler to cure.	Two 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 two days at 20 °C (68 °F).

D. Coated Safety Walk Repair.

(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	D67-1120-20-01-LV.
Safety walk cover RH.	1	D67-1120-20-02-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 THE HEALTH AND SAFETY REGULATIONS GIVEN BY THE MANUFACTURER OF THE CHEMICALS.	
(1)	Clean the entire area between the 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 center wing surface.	Refer to Figure 204.
(4)	Make sure that the safety walk cover orientation is parallel to flight direction.	

	Detail Steps/Work Items	Key Items/References
(5)	Remove the protective layer from the safety walk cover.	
(6)	Place the safety walk cover corresponding to the marks on the 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.	
(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 for two minutes before and after operating the red button. Press the red button with the ball of your hand until the 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 the cutouts.	

	Detail Steps/Work Items	Key Items/References
(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 the direction of the strips within 15 minutes.	
(16)	Let the system dry for 12 hours 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 (around the safety walk cover).	

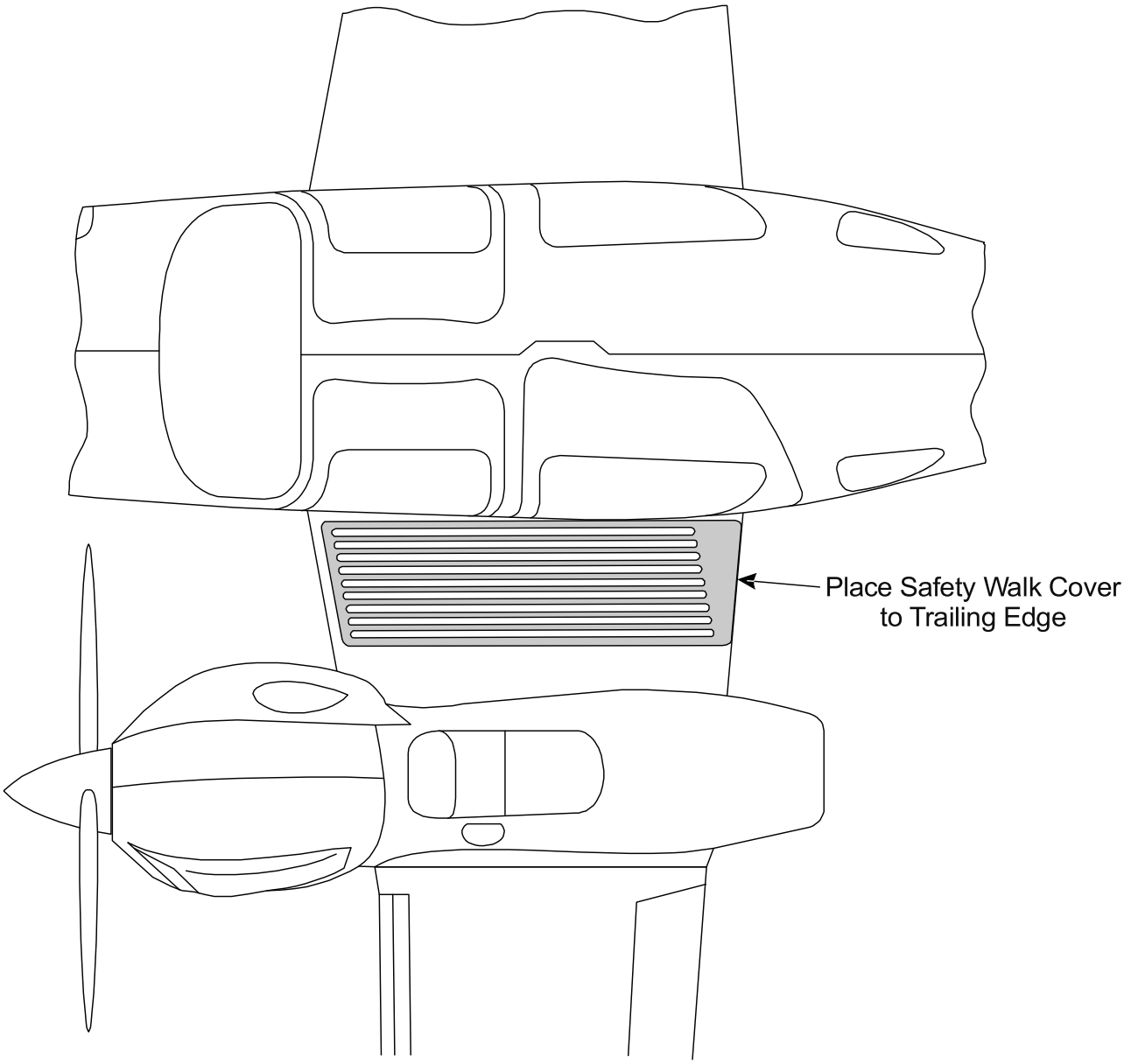

Figure 204 : Safety Walk Cover - Positioning

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 205 for an example of a typical Class 3 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 the damaged/loose laminate until the edges of the laminates are bonded together and to any core material.	Refer to Figure 205. Use a sharp knife or grinding disk.
(4)	Scarf the edges of the repair area with a grinding disk or block.	Scarf glass cloth at 50:1 (50x cloth thickness) minimum and carbon cloth at 100:1 (100x cloth thickness) minimum.
(5)	Count the layers of fabric that you will need to replace.	Refer to the lay-up drawing for the related structure for data about the cloth type and orientation.
	WARNING: DO NOT GET ACETONE ON YOUR SKIN. ACETONE CAN CAUSE SKIN DISEASE. **WARNING: DO NOT BREATHE ACETONE FUMES. ACETONE 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.	If you use acetone to remove any grease or dirt then you must re-sand the repair area.

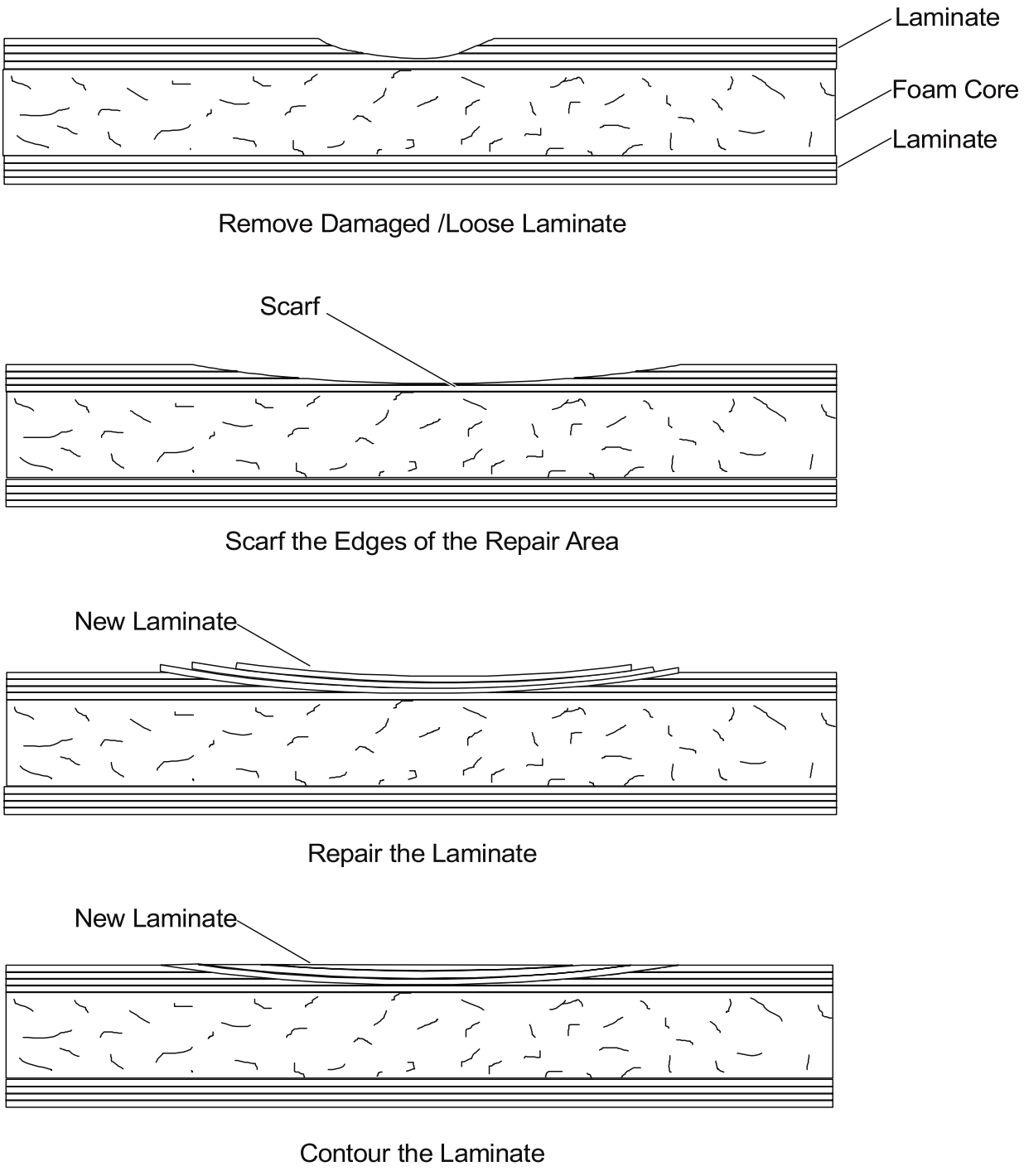

Figure 205 : Typical Class 3 Repair

	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 two methods given in Paragraph 5.
(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.

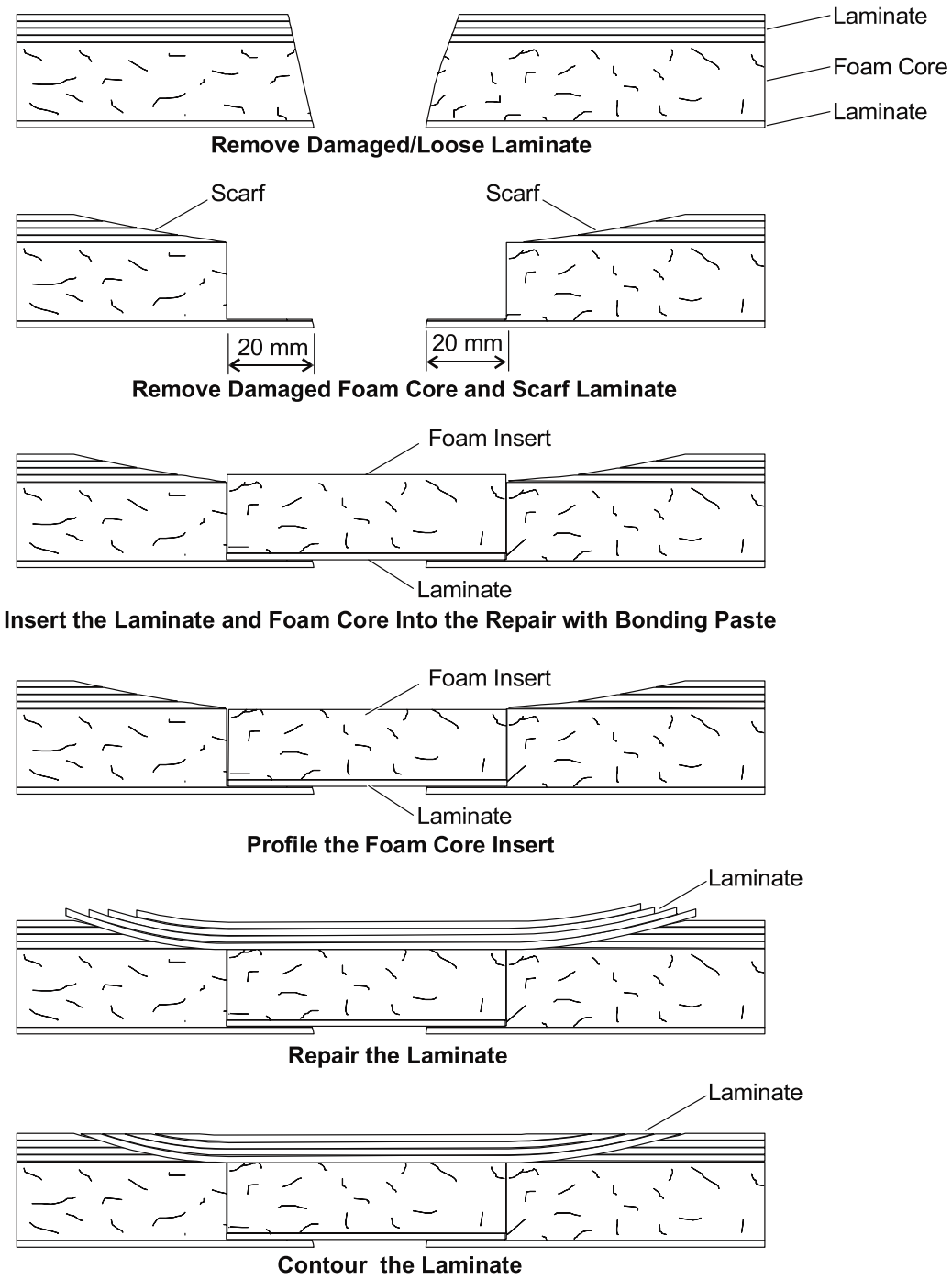

Figure 206 : Typical Class 2 Repair

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 13 mm (0.5 in) diameter circle.

Refer to Figure 206 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 206. Use a sharp knife or grinding disk.
(4)	Remove the damaged foam core.	Remove sufficient foam core to give a minimum of a 20 mm (0.8 in) edge around the outside of the damaged area. Refer to Figure 206.
(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.
(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.

	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.**	
(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 in the cloth point in the correct direction.	Refer to Paragraph 6. Use one of the two 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 to the correct shape.	Refer to Figure 206.
(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 two methods given in Paragraph 5.
(18)	Pre-cure the repair.	Refer to Paragraph 7.
(19)	Post-cure the repair.	Refer to Paragraph 7.

	Detail Steps/Work Items	Key Items/References
(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 slightly lower than the original surrounding area.	Use 150 grit sanding paper. To allow for the paint coat.
(22)	Apply filler(s) and paint coat.	Refer to Paragraph 8.

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Section 51-30

Materials

1. **General**

You must only use approved materials from approved sources to repair the DA 62 airplane.

NOTE: If the approved material for the repair work is not available please contact Diamond Aircraft Industries for information about alternative materials.

2. **Approved Materials**

A. Resin System.

Resin : RIM 935

Hardener : RIMH937 or RIMH937G

Mixture : 100 parts resin and 38 ± 2 parts hardener (by weight)

Supplier : Hexion Speciality Chemicals Stuttgart GmbH
Am Ostkai 21/22
D-70327 Stuttgart, Germany
Phone: +49-711-323081
Fax: +49-711-3280041

B. Self-Extinguishing Resin System.

Resin : L940

Hardener : H286

Mixture : 100 parts resin and 21 ± 2 parts hardener (by weight)

Supplier : Hexion Speciality Chemicals Stuttgart GmbH
Am Ostkai 21/22
D-70327 Stuttgart, Germany
Phone: +49-711-323081
Fax: +49-711-3280041

C. Fire Resistant Resin System.

(1) Resin and Hardener.

Resin : Biresin® CR132 FR

Hardener : CH132-2 or CH132-5

Mixture : 100 parts resin and 20 parts hardener (by weight)

Supplier : Sika Deutschland GmbH
Subsidiary Bad Urach
Stuttgarter Strasse 139
D - 72574 Bad Urach
Germany
Phone : +49 (0) 7125 940 492
Fax : +49 (0) 7125 940 401

(2) Pigment.

Pigment : Universal Colour Paste deep black (RAL 9005)

Part number : 1321300

Mixture : 100 parts resin/hardener mix and 5 parts pigment (maximum, by weight)

Supplier : R&G Faserverbundwerkstoffe GmbH
Headquarters: Im Meißel 7
Logistics center: Bonholzstr. 17
71111 Waldenbuch
Germany
Phone : +49 (0) 7157 530460
Fax: : +49 (0) 7157 530470

D. Glass Fiber Cloth.

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
8.4520.6	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 fabric : Porcher Industrietextilien GmbH
Holzgraben 13/15
D-52062 Aachen, Germany
Phone : +49-241-48225
Fax : +49-241-48229

E. Carbon Fiber Cloth.

WLB No. (German Aviation Standard)	Weave	Mass per Unit Area [g/m²]	ECC Type	SGLType	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	
	UD cloth	280	CCC796		
	plain	80	CCC461		16563

The cloth complies with LN9169 (German aviation standard).

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 Cramer cloth : ECC GmbH + CoKG
Weberstrasse 21
D-48619 Heek-Nienborg, Germany
Phone : +49-2568-3883-34
Fax : +49-2568-3883-97

Supplier for SGL tape : SGL Technik GmbH
Wernen von Siemens-Str. 8
D-86405 Meitingen, Germany
Phone: +49-8271-832152
Fax: +49-8271-831427

F. Peel Ply.

Type : PA 20-63, compliant with LN 98690

Supplier : Strübel Vertriebs GbR
Herrlingerstr. 36/1
D-89081 Ulm, Germany
Phone: +49-731-388577-1, -2
Fax: +49-731-9387353

G. 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

H. Fillers for Resin.

Type : Cotton Flakes FB1/035.

Supplier : Rudolf Usner GmbH

Type : Silcell 300, Eurocell 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

I. Exterior Painting Materials.

(1) Putty

(a) 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

(b) 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 : ICI P580-2100

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

(3) Anti Static Filler : 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

(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

(b) Other Colors

Type : Refer to Section 51-20-00

Manufacturer : MIPA Professional Coating System AG

Supplier : MIPA Professional Coating System AG
Am Oberen Moos 1
D-84051 Essenbach, Germany

J. Interior Painting Materials.

(1) Putty

(a) 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

(b) 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) Coating Paint

Glare shield : Nuvovern DS 10/1 + Nuvovern ACR

Instrument 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

K. Fire Retardant Paint.

(1) PPG Aerospace

Fire retardant paint : 7330BP0802

Finishing varnish : PU 2K- Klarlack CA9008BO900D_DESOTHANE HSBUFFABLE

Hardener : PU-Härter FN39-1327

Supplier : PRO-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 84 f

Supplier : Rudolf Hensel GmbH
Lack- und Farbenfabrik
Lauenburger Landstrasse 11
D-21039 Börnsen, Germany
Phone: +49-40-72106210
Fax: +49-40-72106252

L. 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 62 airplane.

2. Description

The DA 62 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 degrees it engages the cam-track in the receptacle and pulls the access panel into position. When the stud is turned fully 90 degrees 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.

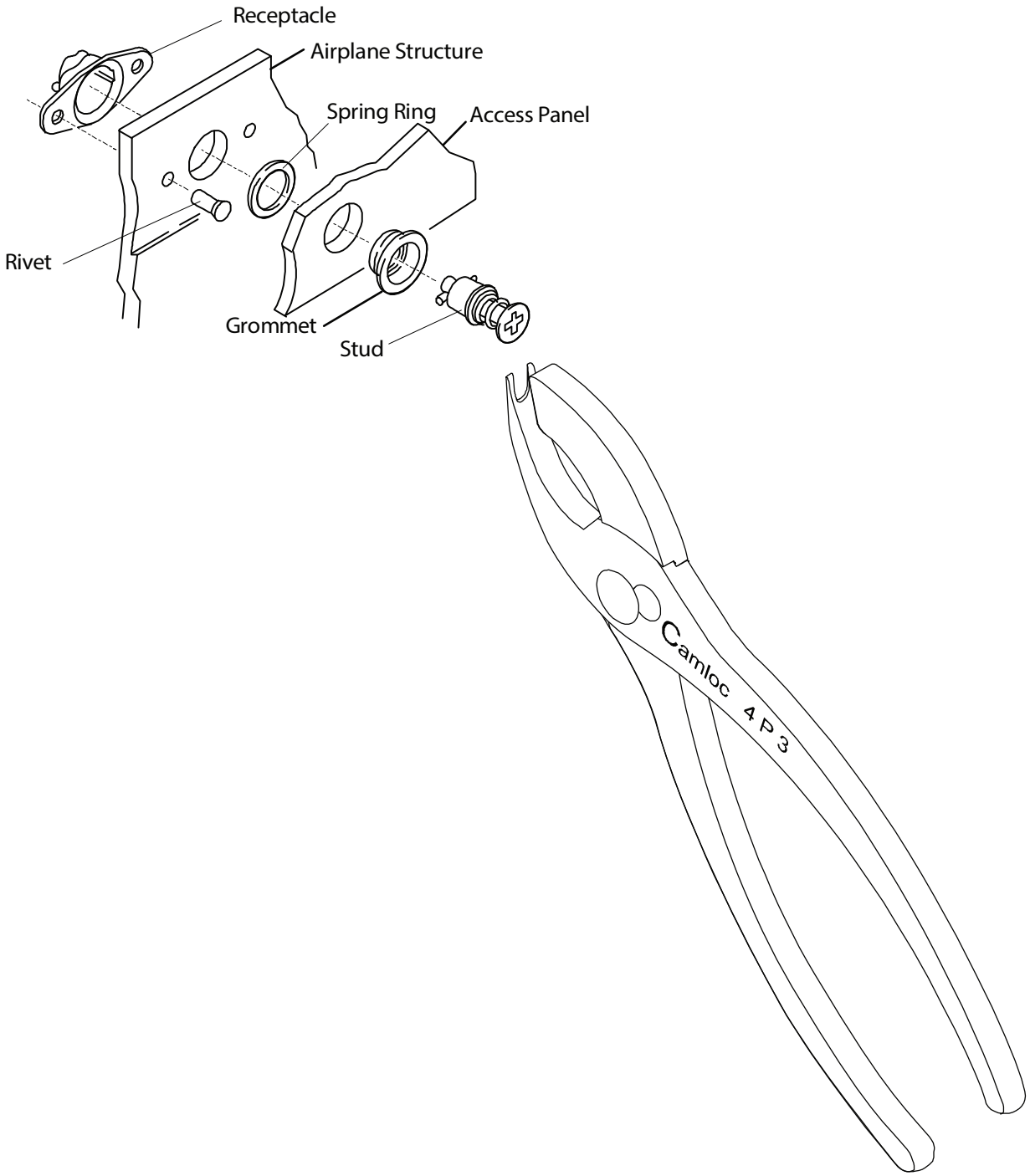

Figure 1 : Quick-Release Fastener Assembly

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 degrees 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 in the Description and Operation Pageblock 51-40-00. Turn the stud assembly approximately 30 degrees 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 degrees clockwise to lock the stud.	 Turn the stud assembly approximately 30 degrees 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.

- For Airplane Serial Numbers up to 62.018, Figures 1 thru 4 show typical Weights and Residual Moments Reports for the DA 62 airplane.
- For Airplane Serial Numbers 62.019 and subsequent, Figures 5 thru 8 show typical Weights and Residual Moments Reports for the DA 62 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 the aileron and the rope sling = 3.8 kg (8.378 lb).
- Weight of the rope sling = 0.7 kg (1.543 lb).
- Weight of the 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 rudder upper hinge and the bottom mounting bracket. The center line of the rudder must be horizontal.

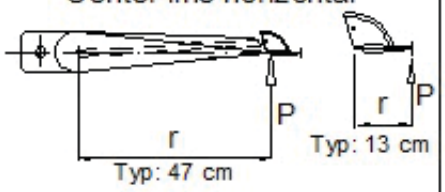
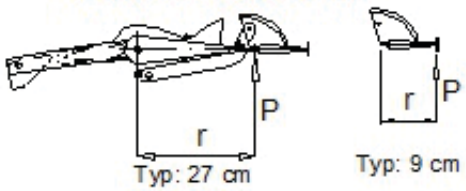
DA 62 SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [kp]	7.0 to 8.2	0.40 to 0.55	9.3 to 10.3	0.28 to 0.39
	Actual [kp]				
Mass Balance [kg]		Leading Edge Mounted Balancing Mass [1.8 ± 0.1]		Centre: [1.615 ± 0.1] Push Rod: [0.718 ± 0.1] L: R: [0.850 ± 0.05]	
P [kp]					
r [cm]					
Static Moment	Limits [kp cm]	74 to 92	1.5 to 2.4	1.0 to 10.1	1.0 to 1.5
	Actual [kp cm]				
M = P*r P [kp] r [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 62 Airplane - Sheet 1, for Serial Numbers up to 62.018 (Metric Dimensions)

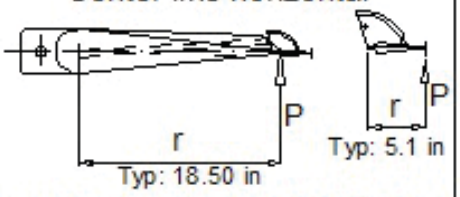
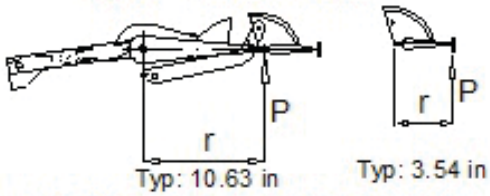
DA 62 SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [lbf]	15.4 to 18.08	0.88 to 1.21	20.5 to 22.7	0.62 to 0.86
	Actual [lbf]				
Mass Balance [lb]		Leading Edge Mounted Balancing Mass [4.0 ± 0.22]		Centre: [3.560 ± 0.22] Push Rod: [1.583 ± 0.22] L: R: [1.874 ± 0.11]	
P [lbf]					
r [in]					
Static Moment	Limits [lbf in]	64.23 to 79.85	1.30 to 2.08	0.87 to 8.77	0.87 to 1.3
	Actual [lbf in]				
M = P*r P [lbf] r [in]		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 62 Airplane - Sheet 1, for Serial Numbers up to 62.018 (Imperial Dimensions)

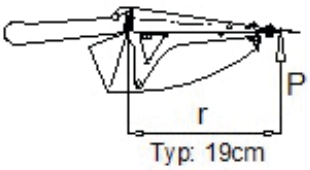
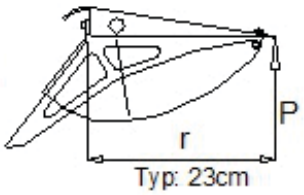
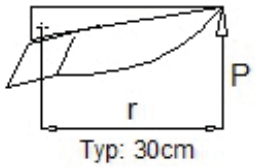
DA 62 SN:		Aileron		Outer Flap		Inner Flap	
		Left	Right	Left	Right	Left	Right
Weight incl. mass balance	Limits [kp]	2.65 to 3.25		3.5 to 4.1		2.3 to 2.8	
	Actual [kp]						
Mass Balance [kg]		0.7 ± 0.03	0.7 ± 0.03				
P [kp]							
r [cm]							
Static Moment	Limits [kp cm]	-3.4 to -0.9 Leading Edge Heavy		26.0 to 34.0		27.0 to 33.0	
	Actual [kp cm]						
M = P*r P in [kp] r in [cm]		Upper surface horizontal 		Upper surface horizontal 		Upper surface horizontal 	

Figure 3 : Typical Weights and Residual Moments Report DA 62 Airplane - Sheet 2, for Serial Numbers up to 62.018 (Metric Dimensions)

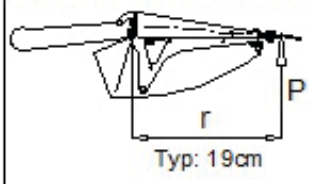
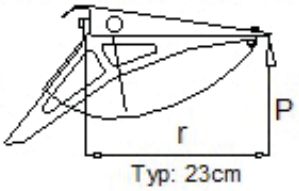
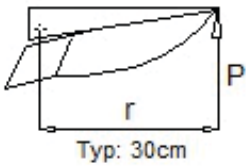
DA 62 SN:		Aileron		Outer Flap		Inner Flap	
		Left	Right	Left	Right	Left	Right
Weight incl. mass balance	Limits [lbf]	5.84 to 7.17		7.72 to 9.04		5.07 to 6.17	
	Actual [lbf]						
Mass Balance [lb]		1.543 ± 0.07	1.543 ± 0.07				
P [lbf]							
r [in]							
Static Moment	Limits [lbf in]	-2.95 to -0.78 Leading Edge Heavy		22.57 to 29.51		23.44 to 28.64	
	Actual [lbf in]						
M = P*r P in [lbf] r in [in]		Upper surface horizontal 		Upper surface horizontal 		Upper surface horizontal 	

Figure 4 : Typical Weights and Residual Moments Report DA 62 Airplane - Sheet 2, for Serial Numbers up to 62.018 (Imperial Dimensions)

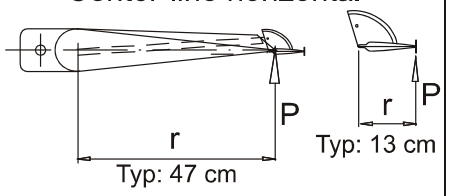
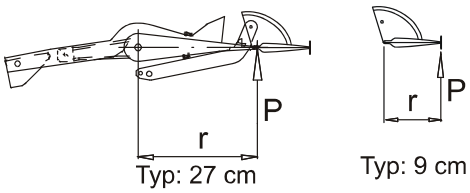
DA 62 SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [kp]	7.0 to 8.2	0.4 to 0.55	8.7 to 10.3	0.28 to 0.39
	Actual [kp]				
Mass Balance [kg]		Leading Edge Mounted Balancing Mass [1.8 ± 0.1]		Centre: [1.615 ± 0.1] Push Rod: [0.718 ± 0.1] L: R: [0.850 ± 0.05]	
P [kp]					
r [cm]					
Static Moment	Limits [kp cm]	74 to 92	1.0 to 2.4	1.0 to 10.1	0.8 to 1.5
	Actual [kp cm]				
M = P*r P [kp] r [cm]		Center-line horizontal  Rudder Trim Tab and Push Rod		Center-line horizontal  Elevator Trim Tab and Push Rod	

Figure 5 : Typical Weights and Residual Moments Report DA 62 Airplane - Sheet 1, for Serial Numbers 62.019 and subsequent (Metric Dimensions)

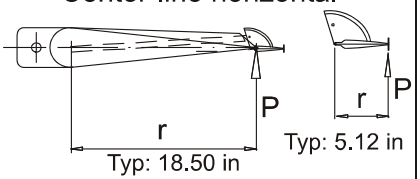
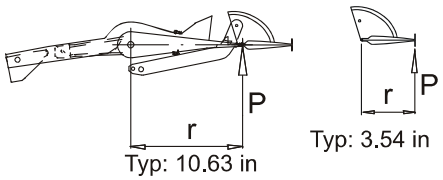
DA 62 SN:		Rudder	Rudder Trim	Elevator	Elevator Trim Tab
Weight incl. mass balance	Limits [lbf]	15.43 to 18.08	0.88 to 1.21	19.18 to 22.71	0.62 to 0.86
	Actual [lbf]				
Mass Balance [lb]		Leading Edge Mounted Balancing Mass [4.0 ± 0.22]		Centre: [3.560 ± 0.22] Push Rod: [1.583 ± 0.22] L: R: [1.874 ± 0.11]	
P [lbf]					
r [in]					
Static Moment	Limits [lbf in]	64.23 to 79.85	0.87 to 2.08	0.87 to 8.77	0.69 to 1.30
	Actual [lbf in]				
M = P*r P [lbf] r [in]		Center-line horizontal  Rudder Trim Tab and Push Rod		Center-line horizontal  Elevator Trim Tab and Push Rod	

Figure 6 : Typical Weights and Residual Moments Report DA 62 Airplane - Sheet 1, for Serial Numbers 62.019 and subsequent (Imperial Dimensions)

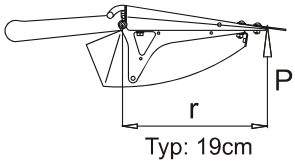
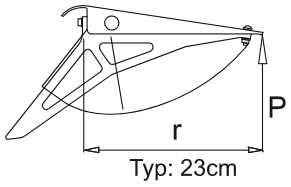
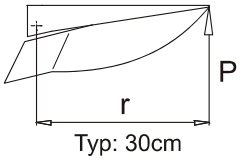
DA 62 SN:		Aileron		Outer Flap		Inner Flap	
		Left	Right	Left	Right	Left	Right
Weight incl. mass balance	Limits [kp]	2.60 to 3.25		3.5 to 4.1		2.3 to 2.8	
	Actual [kp]						
Mass Balance [kg]		0.7 ± 0.03	0.7 ± 0.03				
P [kp]							
r [cm]							
Static Moment	Limits [kp cm]	-3.4 to -0.9 Leading Edge Heavy		26.0 to 34.0		27.0 to 33.0	
	Actual [kp cm]						
M = P*r P in [kp] r in [cm]		Upper surface horizontal 		Upper surface horizontal 		Upper surface horizontal 	

Figure 7 : Typical Weights and Residual Moments Report DA 62 Airplane - Sheet 2, for Serial Numbers 62.019 and subsequent (Metric Dimensions)

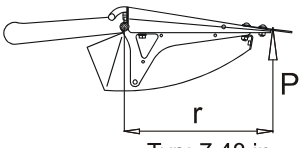
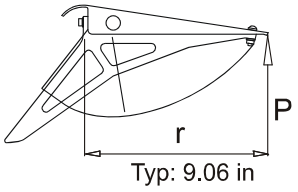
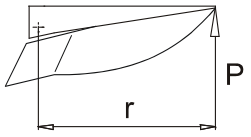
DA 62 SN:		Aileron		Outer Flap		Inner Flap	
		Left	Right	Left	Right	Left	Right
Weight incl. mass balance	Limits [lbf]	5.73 to 7.17		7.72 to 9.04		5.07 to 6.17	
	Actual [lbf]						
Mass Balance [lb]		1.543 ± 0.07	1.543 ± 0.07				
P [lbf]							
r [in]							
Static Moment	Limits [lbf in]	-2.95 to -0.78 Leading Edge Heavy		22.57 to 29.51		23.44 to 28.64	
	Actual [lbf in]						
M = P*r P in [lbf] r in [in]		Upper surface horizontal 		Upper surface horizontal 		Upper surface horizontal 	

Figure 8 : Typical Weights and Residual Moments Report DA 62 Airplane - Sheet 2, for Serial Numbers 62.019 and subsequent (Imperial Dimensions)

2. **Rudder - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 1 and 2 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 5 and 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.

The residual moment is tail heavy.

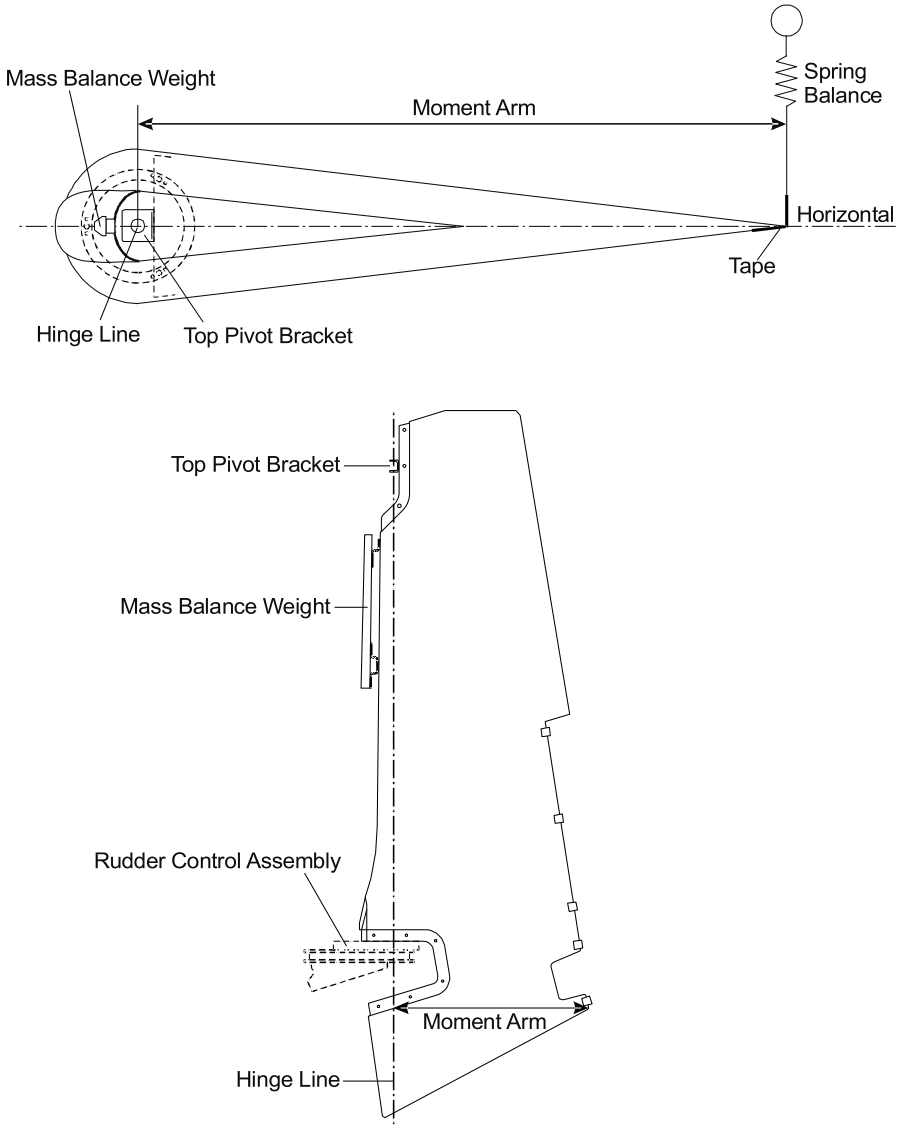


Figure 9 : Rudder - Static Balance

3. **Rudder Trim Tab - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 1 and 2 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 5 and 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.

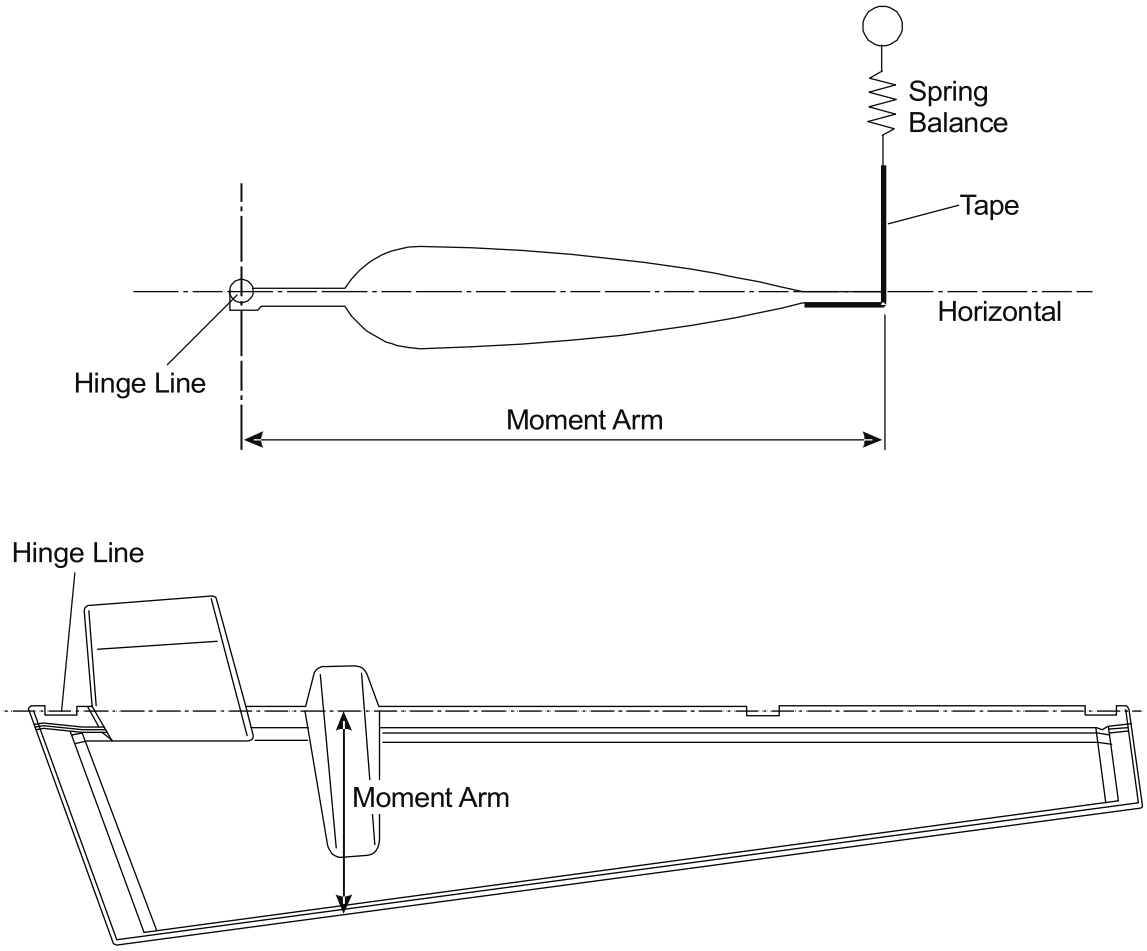


Figure 10 : Rudder Trim Tab - Static Balance

4. **Elevator - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 1 and 2 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 5 and 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.

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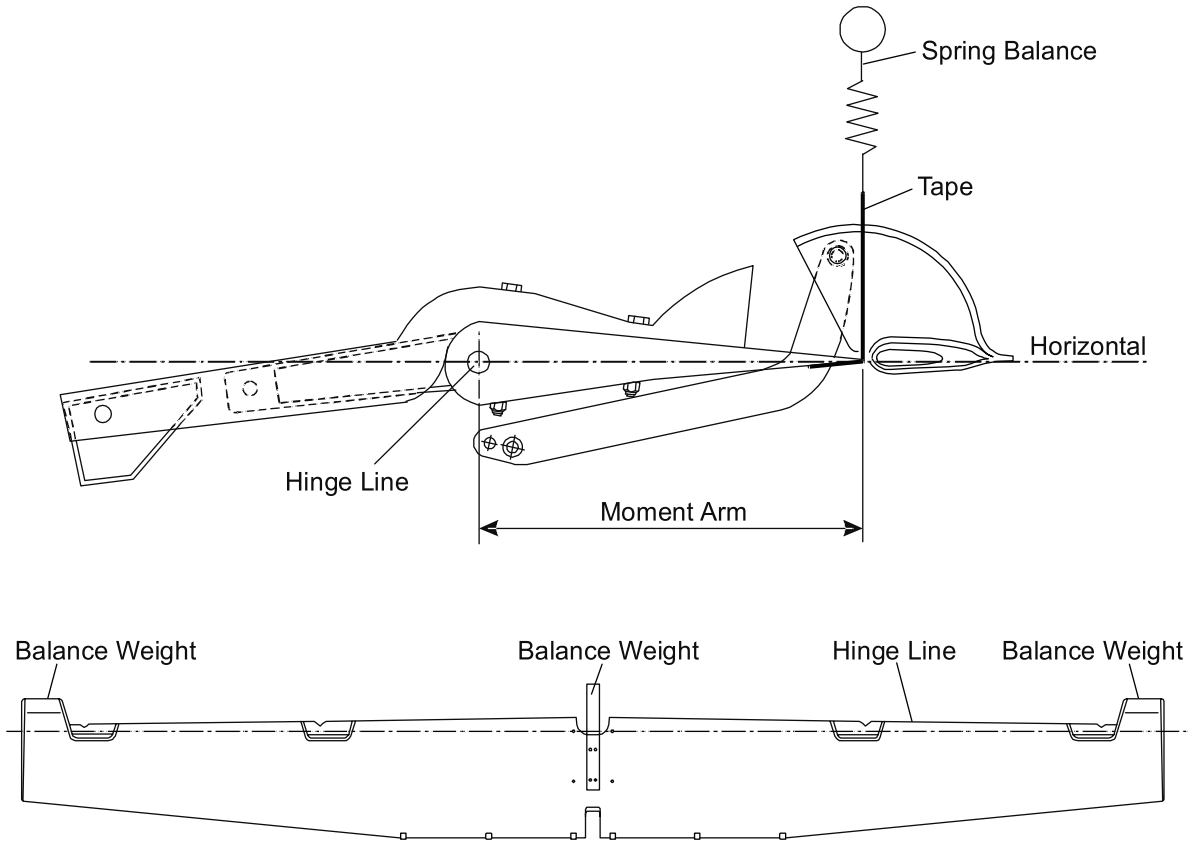

Figure 11 : Elevator - Static Balance

5. **Elevator Trim Tab - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 1 and 2 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 5 and 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.

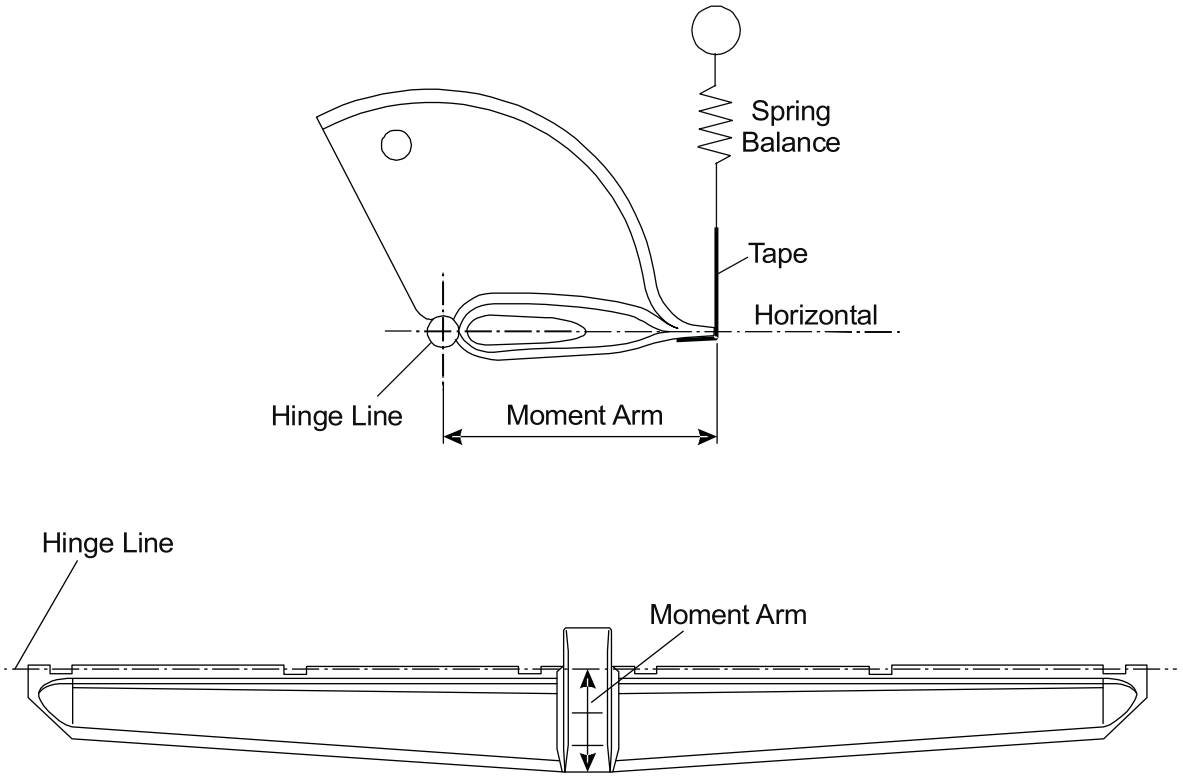

Figure 12 : Elevator Trim Tab - Static Balance

6. **Aileron - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 3 and 4 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 7 and 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, fairing, trim plate and hinges

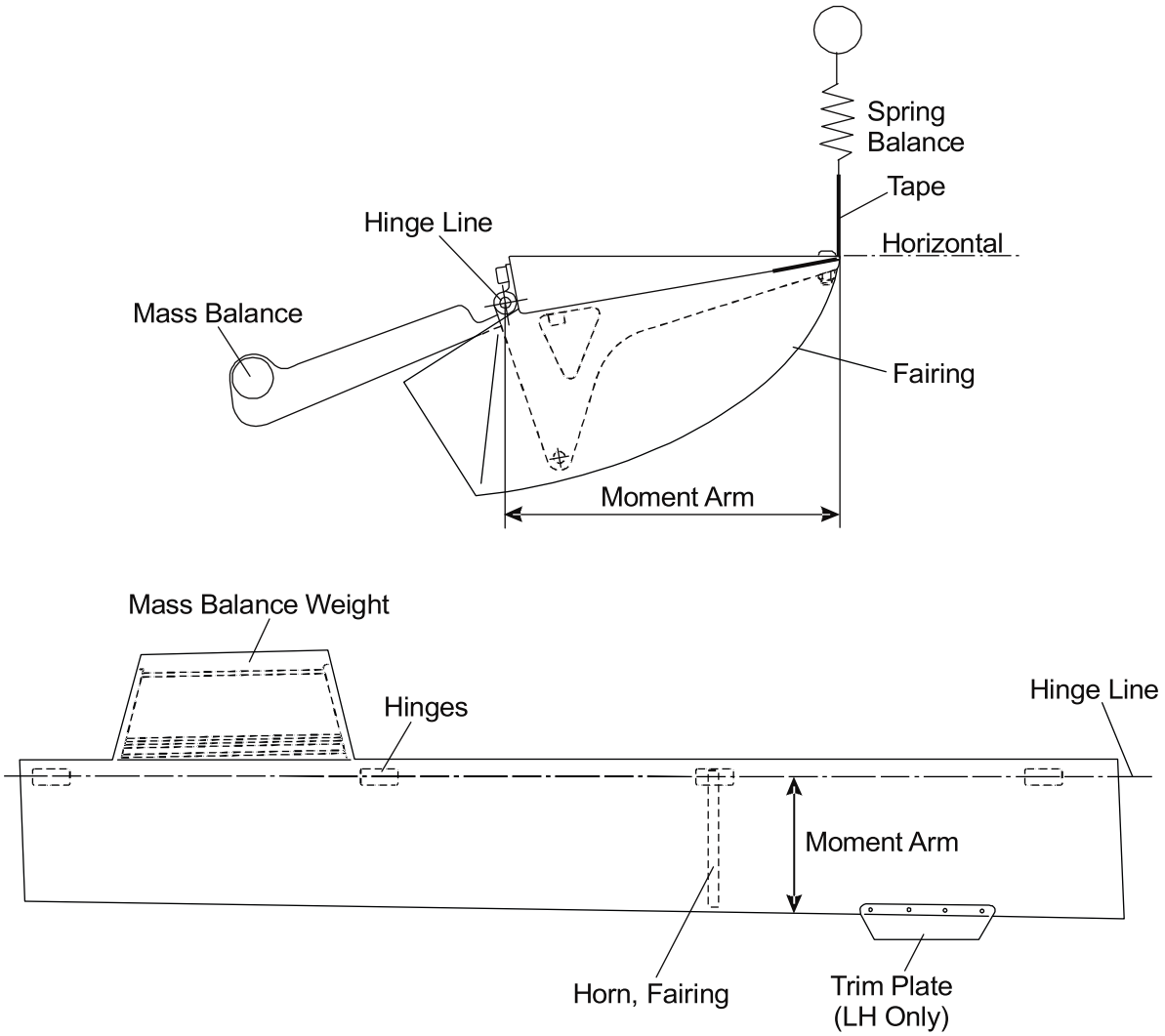

Figure 13 : Aileron Static Balance

7. **Wing Outer Flap - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 3 and 4 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 7 and 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, fairing and hinges.

The residual moment is tail heavy.

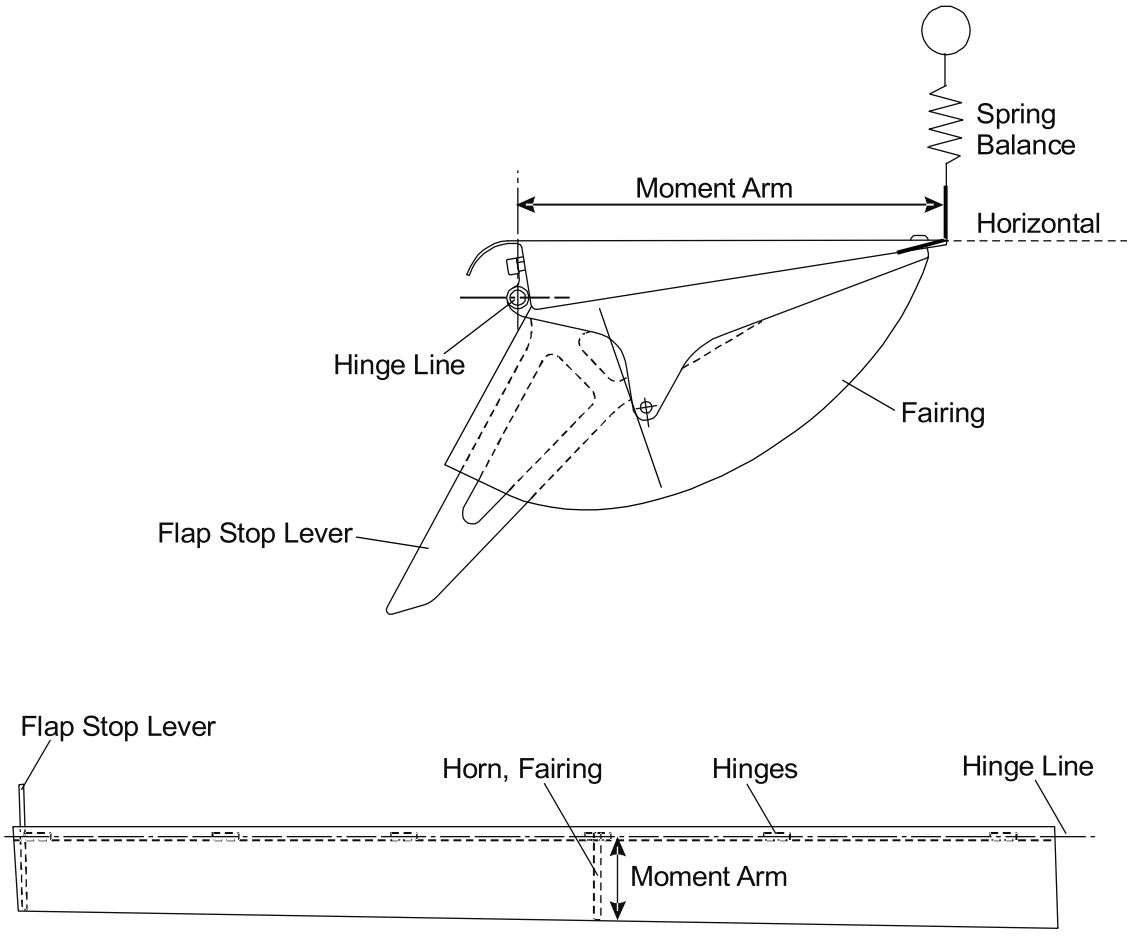

Figure 14 : Wing Outer Flap - Static Balance

8. **Wing Inner Flap - Static Balance**

For Airplane Serial Numbers up to 62.018, refer to Figures 3 and 4 for the weight and residual moment.

For Airplane Serial Numbers 62.019 and subsequent, refer to Figures 7 and 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, fairing and hinges.

The residual moment is tail heavy.

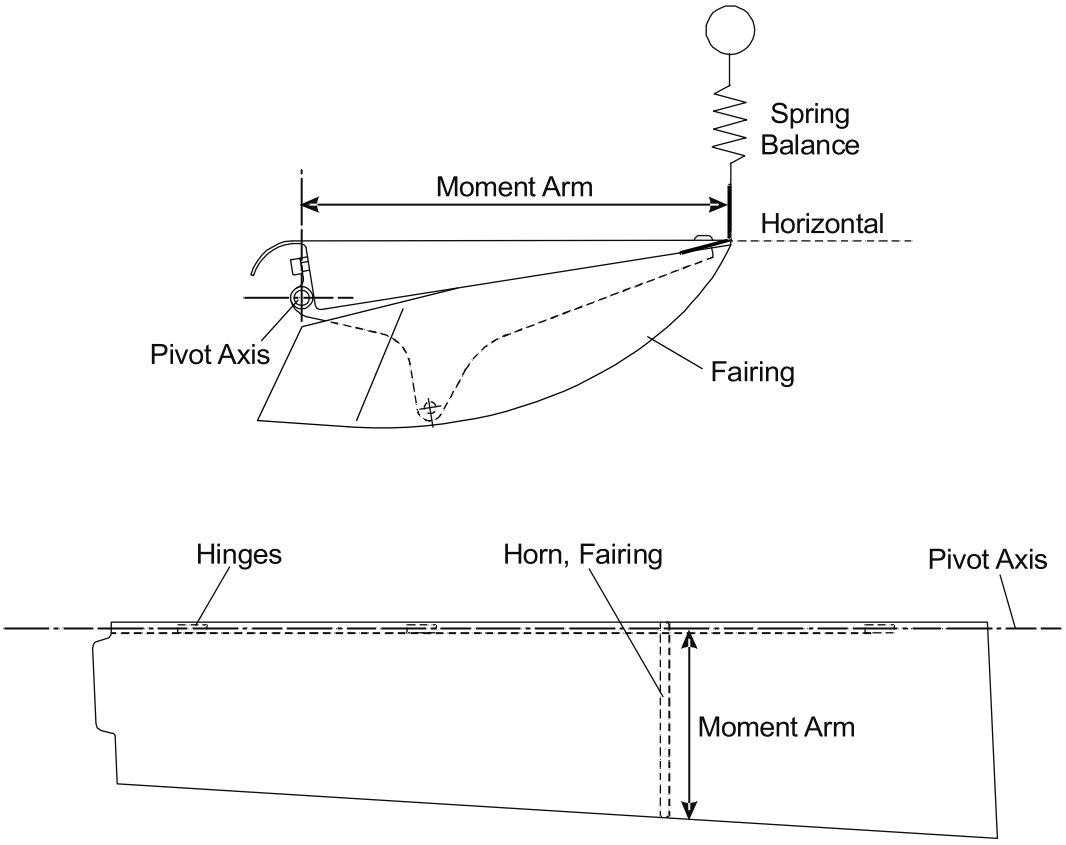

Figure 15 : Wing Inner Flap - Static Balance

Section 51-80

Lightning Protection

1. General

Lightning protection for the DA 62 is provided by the airplane bonding system. A special bonding system is necessary for the composite structure of the DA 62. 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 right 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.

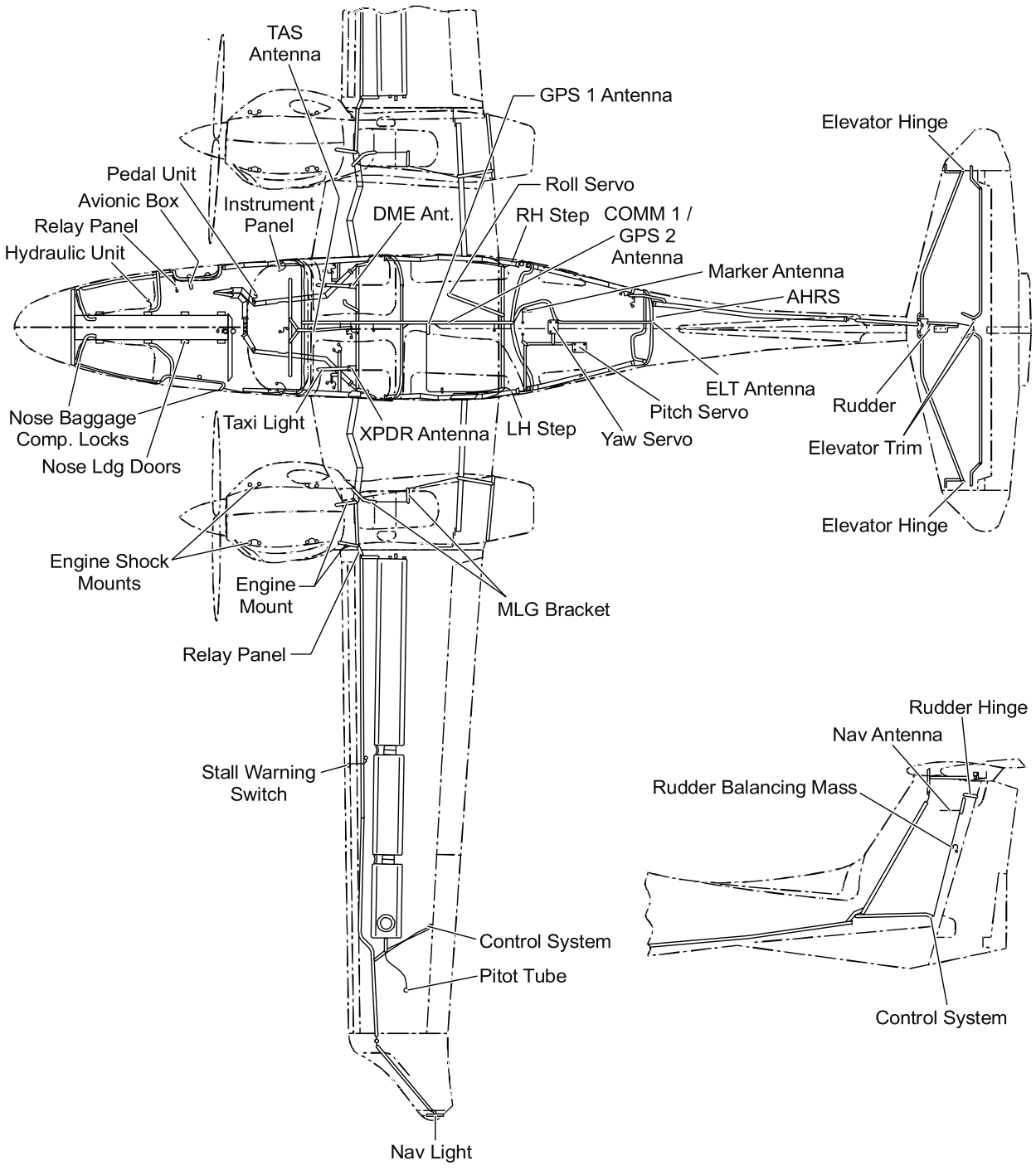

Figure 1 : Lightning Protection System - Schematic Diagram

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.
- Lightning conductor strips are 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.

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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 62 are divided into three 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 doors.
- High resistance measurements for anti-static precipitation i.e. static wicks.

Do the low resistance bonding measurements with a milliohmmeter and Kelvin probes. The test current must be approximately two 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 Measurement.

Item	Attachment Point	Maximum Allowable [mΩ]	Measured [mΩ] LH/RH	Passed
ENGINE COMPARTMENT				
Firewall		6.0	/	
Engine mount		6.0	/	
Engine	Propeller bearing, front	5.0	/	
Heating cooler	Case	6.0	/	
Fuel cooler	Case	6.0	/	
Water cooler	Case	6.0	/	
Inter cooler	Case	6.0	/	
Engine breather	Tube	10.0	/	

Item	Attachment Point	Maximum Allowable [mΩ]	Measured [mΩ] LH/RH	Passed
Engine to firewall	Engine block - firewall	3.0	/	
2nd alternator LH (optional)	Case	10.0		
NACELLE COMPONENTS				
Electrical junction box fwd	Sheet metal	5.0	/	
Electrical junction box aft	Sheet metal	10.0	/	
Fuel pumps	Mounting bracket	10.0	/	
Nacelle fuel filler	Mounting bracket	10.0	/	
Aux fuel tank refill (option)	Tube	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	3.0		
Relay panel	Case	3.0		
Avionic comp. cover	Mounting screws	5.0		
Hydraulic module	Sheet metal	4.0		
Nose LDG gear door hinge	Front hinge	10.0	/	
Nose baggage door lock	Front lock	10.0	/	
TKS spray bar (optional)	Center	5.0		
TKS refill (optional)	Fwd Mounting screws	10.0		
Weather radar (optional)	Mounting bracket	8.0		

Item	Attachment Point	Maximum Allowable [mΩ]	Measured [mΩ] LH/RH	Passed
EXTERNAL CONDUCTIVE PARTS				
LH/RH step	Mounting screws	5.0	/	
LH/RH static port		10.0	/	
OAT sensor		10.0		
Front LDG gear	Yoke exposure mount screw	10.0		
Main LDG gear LH	Axis mounting screw	10.0		
Main LDG gear RH	Axis mounting screw	10.0		
RACC outlet scoop (optional)	Tube	10.0		
RACC inlet scoop (optional)	Tube	15.0		
Radome lightning diverter strips (optional)	Top mounting screws	8.0	/	
ANTENNAS				
Top COM/GPS antenna	Mounting screws	6.0		
Bottom COM antenna	Mounting screws	6.0		
GPS antenna	Mounting screws	6.0		
ELT antenna	Mounting screws	6.0		
NAV antenna	Mounting screws	10.0	/	
Top TAS antenna (optional)	Mounting screws	6.0		
Bottom TAS antenna (optional)	Mounting screws	5.0		
Iridium antenna (optional)	Mounting screws	5.0		
WX-500 antenna (optional)	Mounting screws	10.0		

Item	Attachment Point	Maximum Allowable [mΩ]	Measured [mΩ] LH/RH	Passed
STABILIZER				
Vert. lightning protection tube	Upper end	8.0		
H-stab LH lightning strap	Tip	15.0		
H-stab RH lightning strap	Tip	15.0		
Horizontal stabilizer	Front bracket	10.0		
Horizontal stabilizer	Rear bracket	10.0		
H-stab TKS panel (optional)	Inner panel section	15.0	/	
H-stab TKS panel (optional)	Outer panel section	15.0	/	
V-stab TKS panel (optional)	Upper panel section	25.0		
V-stab TKS panel (optional)	Bottom panel section	25.0		
TKS low pres. switches (optional)	Center 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		
Wingtip light	Cover mounting screws	10.0		
Aileron pushrod attachment	Bond. strap connection	50.0		
Outer Flap pushrod attachment	Bond. strap connection	50.0		
Inner Flap pushrod attachment	Bond. strap connection	50.0		
Stall warning switch	Mounting screw	10.0		

Item	Attachment Point	Maximum Allowable [mΩ]	Measured [mΩ] LH/RH	Passed
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		
Wingtip light	Cover mounting screws	10.0		
Aileron pushrod attachment	Bond. strap connection	50.0		
Outer Flap pushrod attachment	Bond. strap connection	50.0		
Inner Flap pushrod attachment	Bond. 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 Measurement.

Item	Attachment Point	Maximum 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 door LH	Mounting screws	100.0		
Canopy door RH	Mounting screws	100.0		
Cabin rear door	Mounting screws	100.0		

C. High Resistance Measurement.

Use a wet sponge to obtain a constant electrical connection to the static dischargers.

Item	Attachment Point	Maximum Allowable [mΩ]	Measured [mΩ] (500 V)	Passed
STATIC WICKS				
LH wingtip		200.0		
RH wingtip		200.0		
Rudder		200.0		
Horizontal stabilizer LH		200.0		
Horizontal stabilizer RH		200.0		
TIRES				
Nose		100.0		
LH		100.0		
RH		100.0		

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CHAPTER 52

DOORS

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CHAPTER 52

DOORS

1. General

Section 52-10 tells you about the pilot doors (LH & RH) 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

Each pilot door is a CFRP molding with inner and outer frames. The frames bond together. Each door has a large one-piece acrylic glass window. Each window has direct vision panels. You can open the direct vision panels in flight. Refer to Chapter 56 for data about the window.

Two hinges attach the door to the top of the fuselage near the center-line. A gas strut is integrated into each hinge. The gas strut holds the door open.

Each door has a handle, which operates two locking bolts. The handle is red on the inside of the door and gray on the outside. The locking bolts are at the bottom front and rear corners of the door.

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 is integrated into each hinge. The gas strut holds the door open.

A handle on the door operates two locking bolts. The handle is red on the inside of the door and gray on the outside. The locking bolts are at the bottom front and rear corners of the door.

The DA 62 has a 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 62 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.

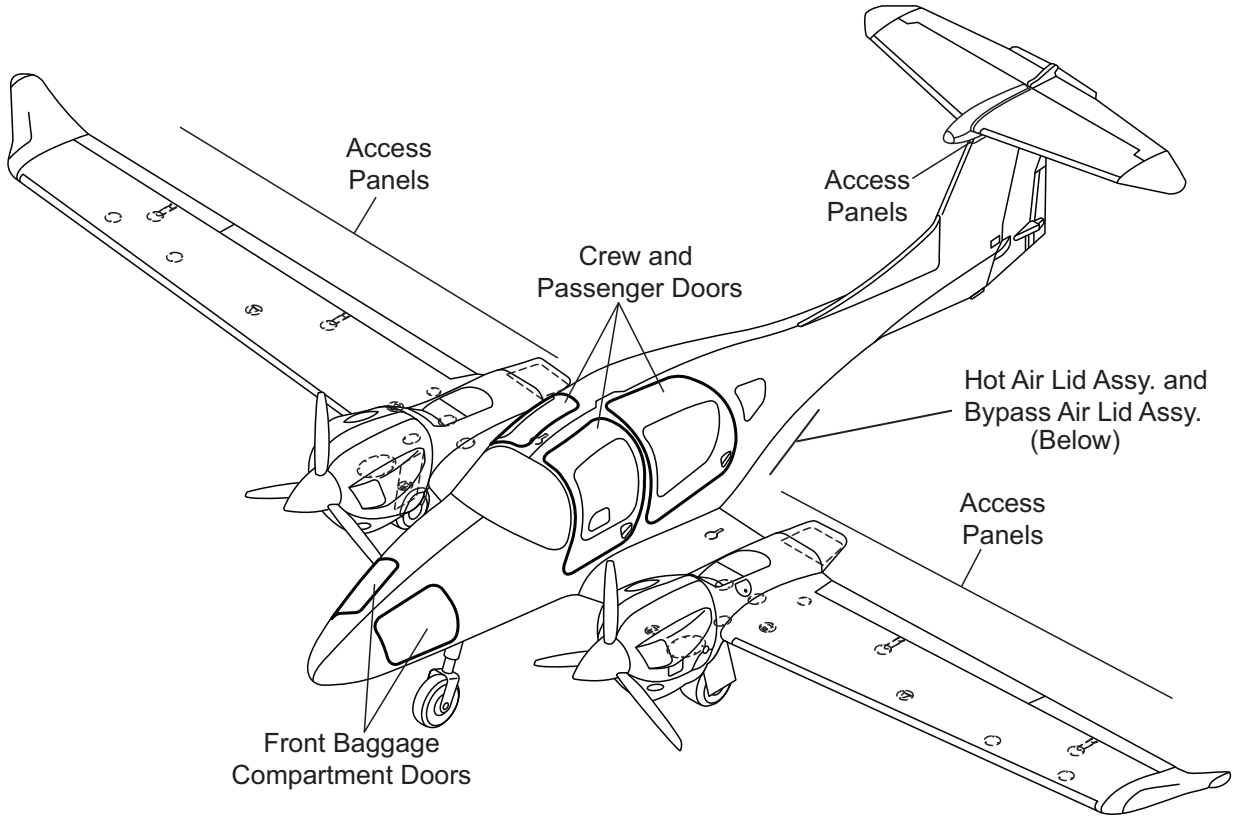

Figure 1 : Doors and Panels

Section 52-10

LH/RH Pilot Door and Passenger Door

1. General

This Section tells you about the structure, operation and maintenance of the LH/RH pilot door and the passenger door.

Refer to Chapter 56-00 for data about the windows in the pilot doors and the passenger door.

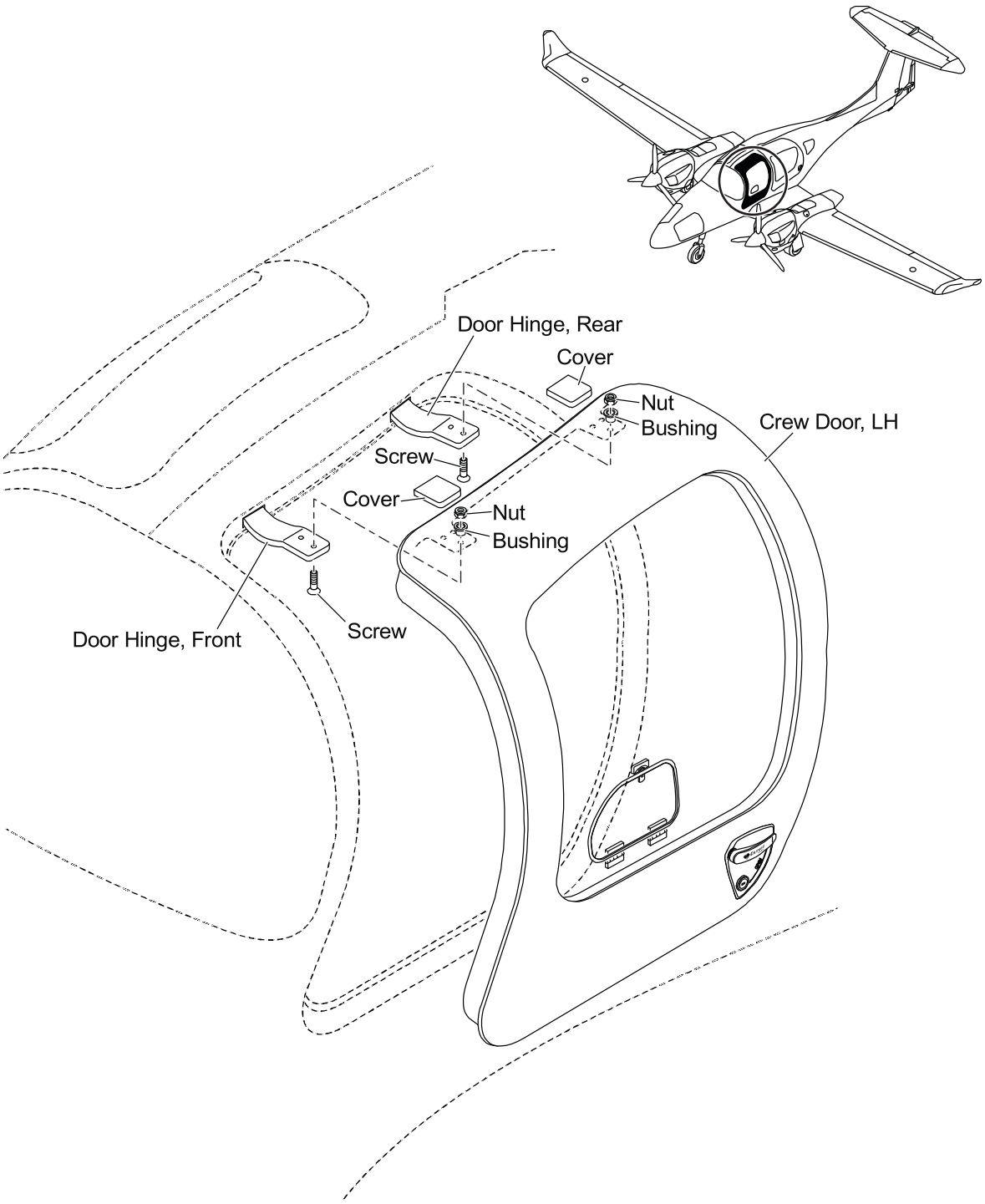

Figure 1 : Pilot Door Installation

2. **LH/RH Pilot Door Description and Operation**

Figures 1 and 2 show the LH/RH pilot door installation and locking mechanism.

The LH/RH pilot 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 are screwed to the inside of the frame.

The door has a large one-piece 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.

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.

Two hinges attach the door to the top of the fuselage near the center-line. A gas strut is integrated into each hinge. The gas strut holds the door open.

You can remove the door by removing the bolts and nuts on each hinge.

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. Both locking bolts operate a 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.

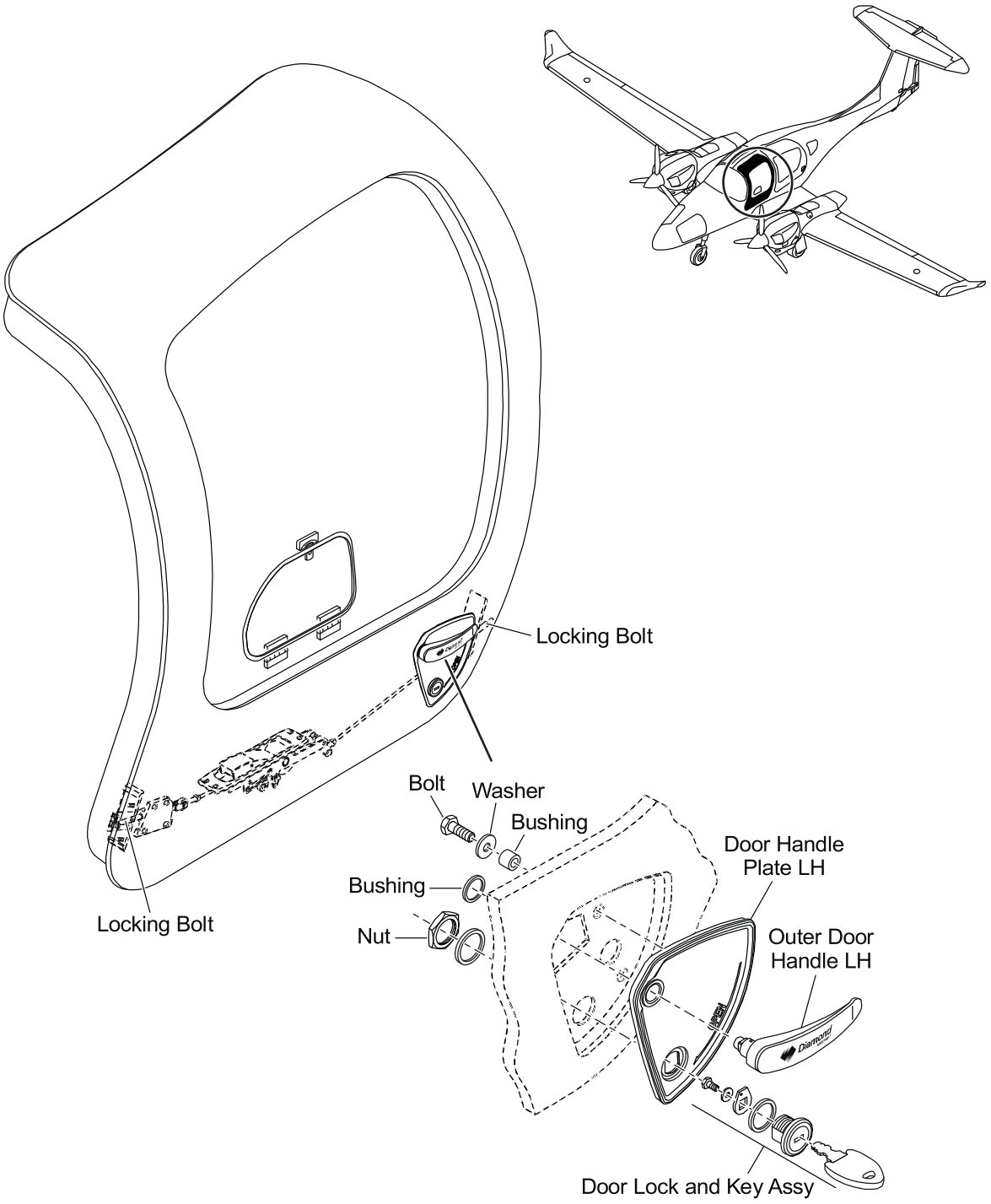

Figure 2 : Pilot Door - Locking Mechanism

3. **Passenger Door Description and Operation**

Figures 3 and 4 show the passenger door installation and locking mechanism. The passenger door is a CFRP molding with inner frame and outer frame with foam core. 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 are screwed to the inside of the frame.

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. A gas strut is integrated into each hinge. 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 door operates two locking bolts. The locking bolts are at the bottom front and rear corners of the door.

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.

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. Both locking bolts operate a 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.

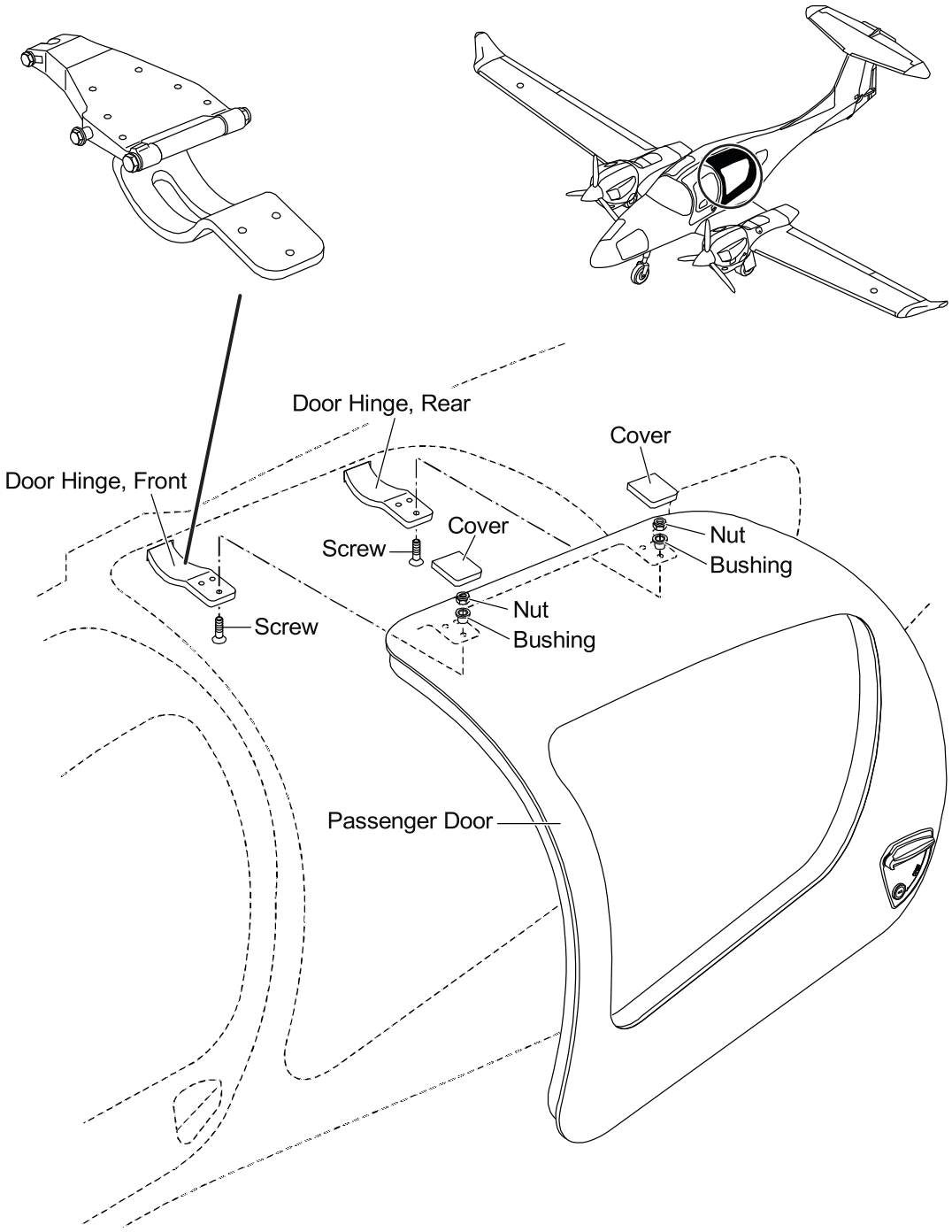

Figure 3 : Passengers Door Installation

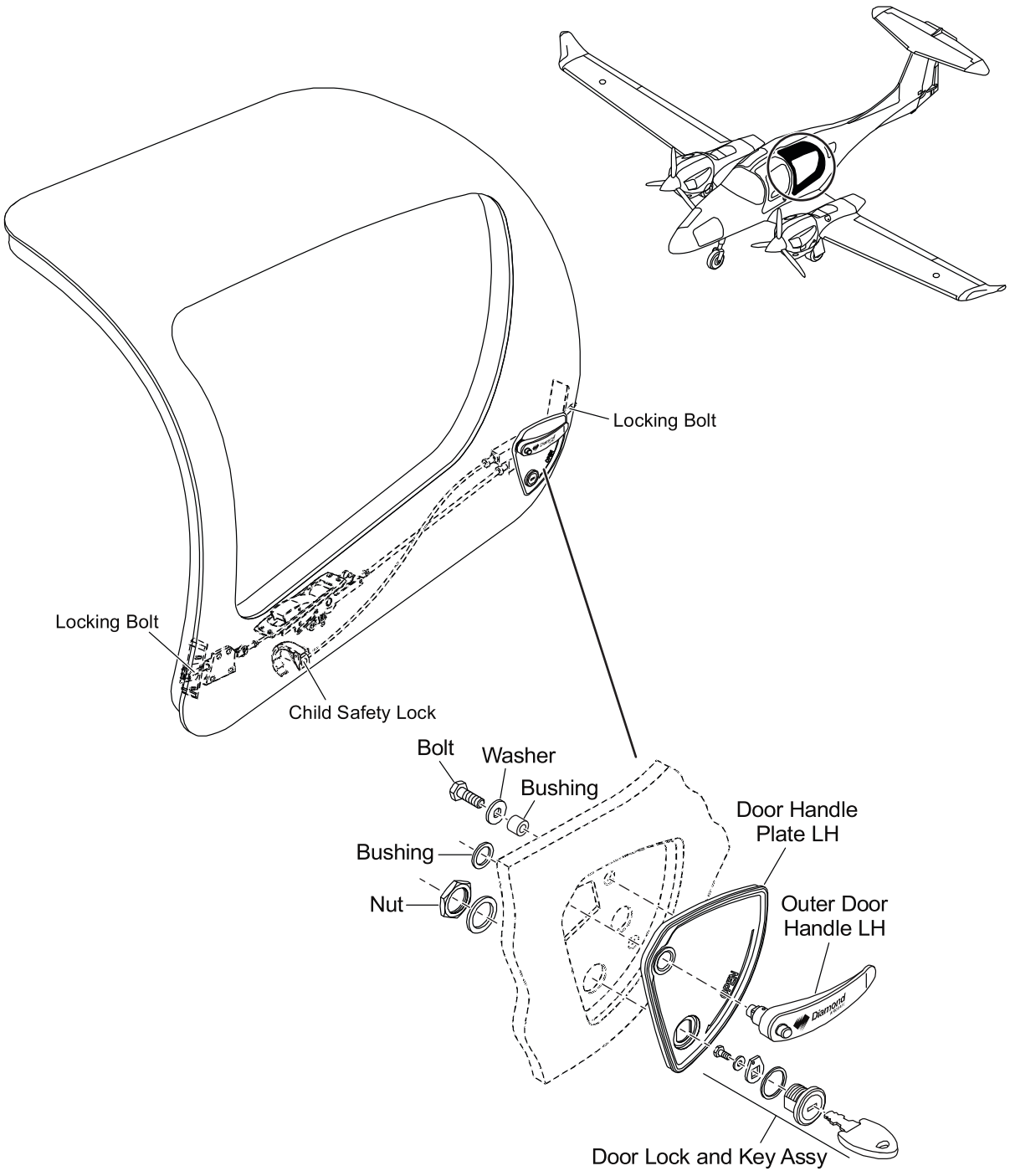

Figure 4 : Passengers Door - Locking Mechanism

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Trouble-Shooting

1. **General**

The table below lists the defects you could have with the LH/RH pilot doors and the passengers 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
Door is difficult to move.	Door frame is damaged.	Replace the door.
	Door hinges are damaged.	Replace the door.
Door handle is difficult to move.	Locking bolts are damaged.	Replace the door.
	Handle bushes are damaged.	Replace the door.
Incorrect operation of door warning caption on the ICS display.	Door micro switch is defective.	Replace the defective micro switch.
	Defective wiring.	Do a continuity test of the 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 and install the LH/RH pilot door and passenger door. They also tell you how to inspect the door locking mechanism.

2. **Remove/Install the LH/RH Pilot Door**

A. Remove the LH/RH Pilot Door.

Refer to Figure 1. (52-10-00, Page 2).

	Detail Steps/Work Items	Key Items/References
WARNING:	**ALWAYS OPEN THE DOOR COMPLETELY BEFORE REMOVING THE BOLTS/SCREWS AND NUTS. DUE TO THE HIGH FORCES INVOLVED, THE GAS STRUT CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Open the pilot door until it reaches the stop.	Have the door held in place when it reaches the stop by a second person.
(2)	Remove the cover off of both door hinges.	
(3)	Remove the two nuts, bushings and screws that attach the door to each door hinge.	Hold the door. Two persons are required to support the door.
(4)	Lift the door clear and remove it from the airplane.	Two persons are required to move the door.

B. Install the LH/RH Pilot Door.

Refer to Figure 1. (52-10-00, Page 2).

	Detail Steps/Work Items	Key Items/References
(1)	Move the door into position on the airplane.	Two persons are required to support the door.
(2)	Align the door mountings with the door hinges and: - Install the two screws, bushings and nuts that attach the door to each door hinge. - Install the cover on both door hinges.	Two persons are required to support the door.
(3)	Close the door.	Make sure that the door is aligned to close and open correctly.

3. **Remove/Install the Passenger Door**

A. Remove the Passenger Door.

Refer to Figure 3. (52-10-00, Page 6).

	Detail Steps/Work Items	Key Items/References
WARNING:	**ALWAYS OPEN THE DOOR COMPLETELY BEFORE REMOVING THE BOLTS/SCREWS AND NUTS. DUE TO THE HIGH FORCES INVOLVED, THE GAS STRUT CAN CAUSE SERIOUS INJURY TO PERSONS.**	
(1)	Open the passenger door until it reaches the stop.	Have the door held in place when it reaches the stop by a second person.
(2)	Remove the cover off of both door hinges.	
(3)	Remove the three nuts, bushings and screws that attach the door to each door hinge.	Hold the door. Two persons are required to support the door.
(4)	Lift the door clear and remove it from the airplane.	Two persons are required to move the door.

B. Install the Passenger Door.

Refer to Figure 3. (52-10-00, Page 6).

	Detail Steps/Work Items	Key Items/References
(1)	Move the passenger door into position on the airplane.	Two persons are required to support the door.
(2)	Align the door mountings with the door hinges and: - Install the three screws, bushings and nuts that attach the door to each door hinge. - Install the cover on both door hinges.	Two persons are required to support the door.
(3)	Close the door.	Make sure that the door is aligned to close and open correctly.

4. **Inspection of the Door Locking and Safety Hook Mechanisms**

This inspection is applicable to the LH/RH pilot door and the passenger door.

Refer to Figure 2. (52-10-00, Page 4), and Figure 4.(52-10-00, Page 7).

	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.	Check from inside and outside of the airplane.
(2)	Make sure the safety hook mechanism works correctly: - Make sure the safety hook engages correctly into the retaining block on the fuselage when the door is closed but unlatched.	Check from inside and outside of the airplane.

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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 62 has access doors to the front baggage compartment on each side of the fuselage.

2. Description

Figures 1 and 2 show the front baggage compartment doors.

The doors are CFRP moldings with a foam core. Each door has a finishing layer of glass cloth.

Both doors are hinged at the upper edge and lift up. Door locking latches are installed at the bottom corners of the doors. Each door is mounted with two gooseneck hinges supported by a gas spring mounted to the forward gooseneck hinge and a support in a opening of the NLG compartment.

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.

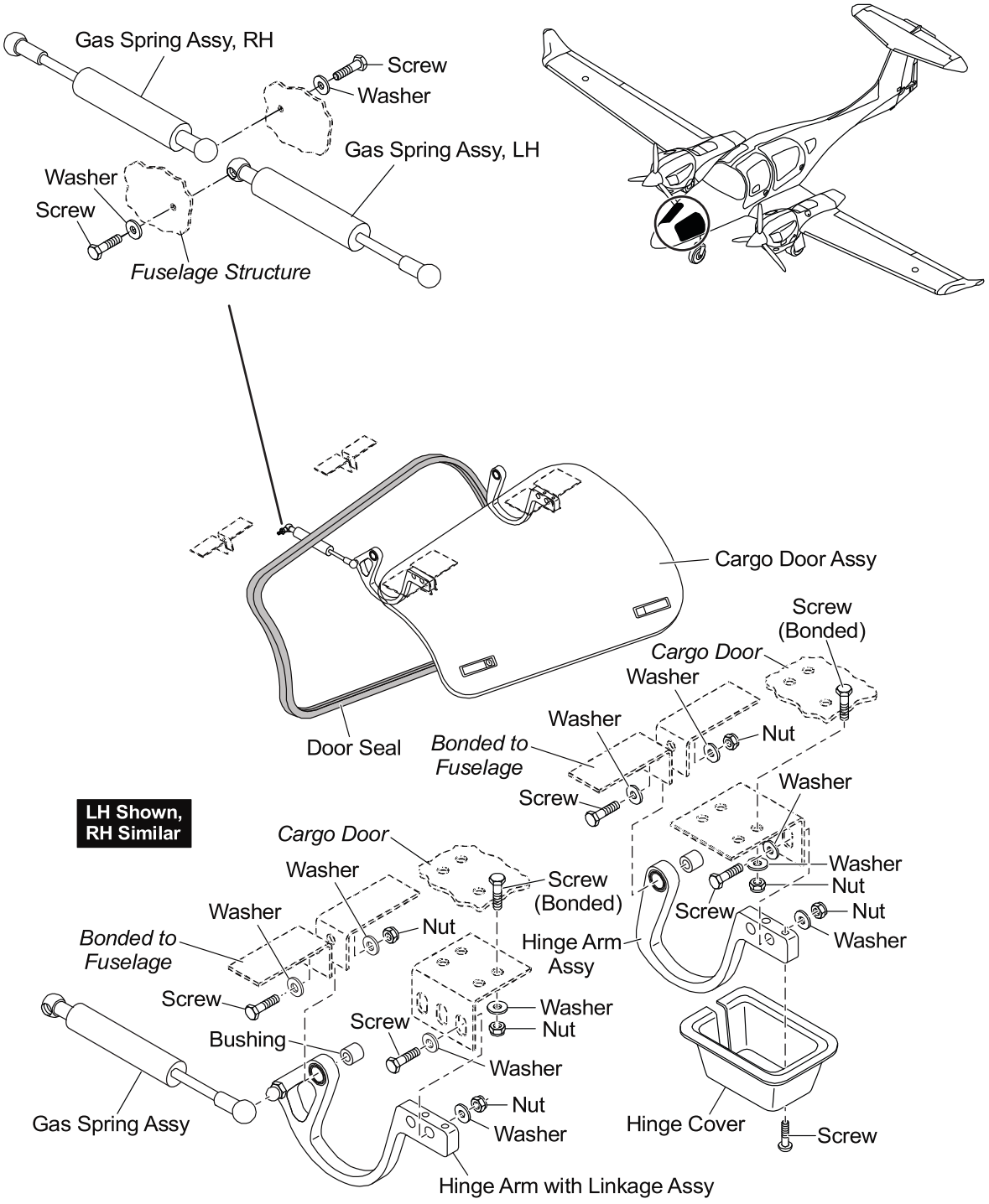

Figure 1 : Front Baggage Compartment - Access Doors

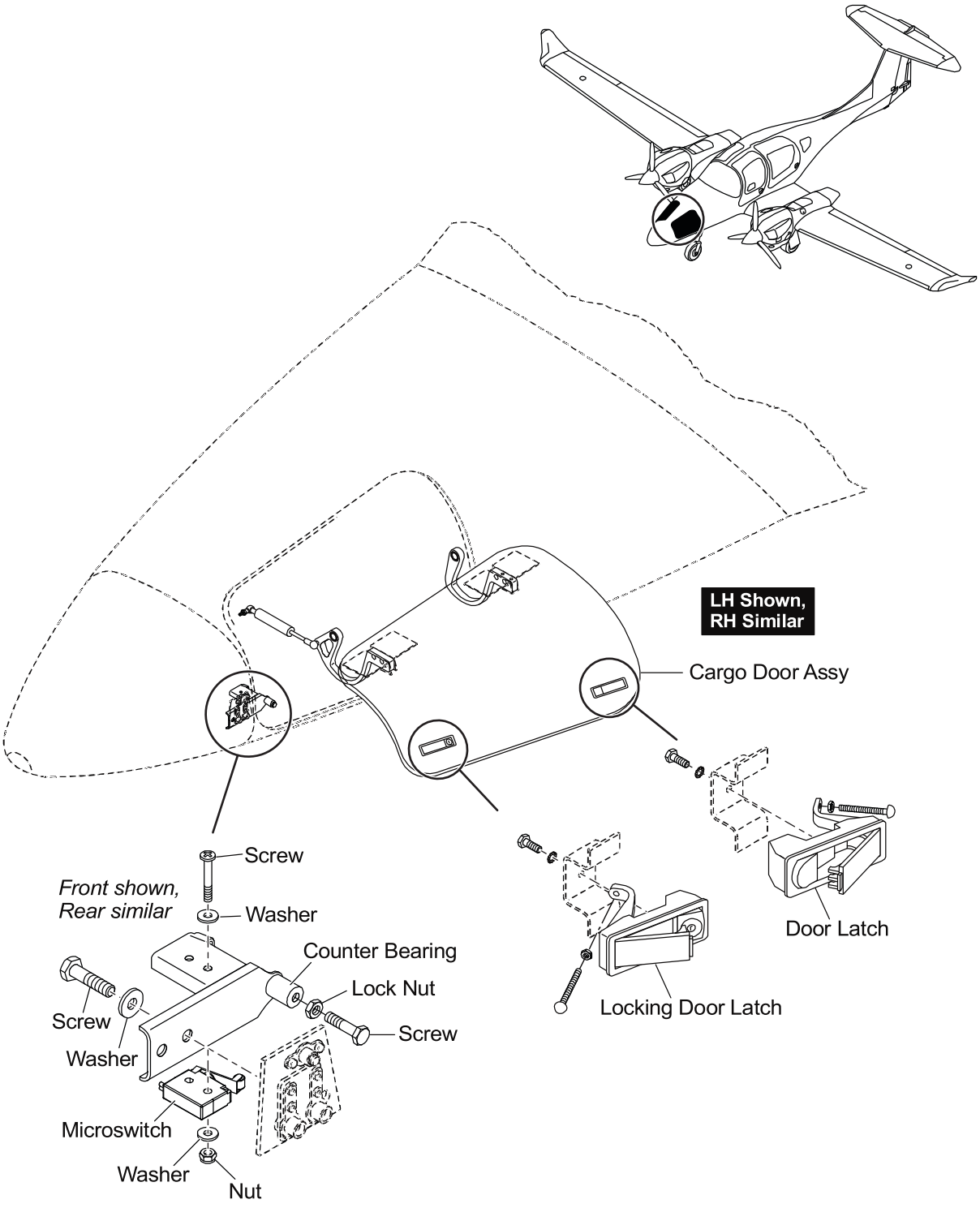

Figure 2 : Front Baggage Compartment - Access Doors

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Trouble-Shooting

1. **General**

The table below lists the defects you could have with a 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 given in the Repair column.

Trouble	Possible Cause	Repair
Access door is difficult to move.	Door is damaged.	Replace the door.
	Door hinges are damaged.	Replace the damaged hinge.
	Gas spring is defective.	Replace the defective gas spring.
Door handle is difficult to move.	Locking bolts are damaged.	Replace the damaged bolt.
	Door locking mechanism is defective.	Replace the door locking mechanism.

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the front baggage-compartment doors. 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.

Refer to Figures 1 and 2. (52-30-00, Pages 2 and 3).

	Detail Steps/Work Items	Key Items/References
(1)	Open the front baggage-compartment door that you will remove until it reaches the stop.	Have the door held in place when it reaches the stop by a second person.
(2)	Remove the gas spring from the door, at the door attachment	
(3)	Remove the door and hinge arms from the fuselage nose: - Remove the screws, washers and nuts from the two attachment brackets in the fuselage nose.	Support the door. They attach each hinge arm to the fuselage.
(4)	Lift the door clear and remove it, with the hinge arms, from the airplane.	

B. Install a Front Baggage-Compartment Door.

Refer to Figures 1 and 2. (52-30-00, Pages 2 and 3).

	Detail Steps/Work Items	Key Items/References
(1)	Move the door with the installed hinge arms into position and align the hinge arms with the attachment brackets in the fuselage nose.	Two persons are required to support the door.
(2)	Install the screws, washers and nuts that attach the hinge arms to the two attachment brackets in the fuselage nose.	Two persons are required to support the door.
(3)	Install the gas spring to the door, at the door attachment	
(4)	Close and lock the door.	Make sure that the door is aligned to close and open correctly.
(5)	Do a test for the correct operation of the door warning caption: - Make sure that the LH/RH pilot doors, passenger door and both forward baggage compartment doors are closed. - Set the ELECT. MASTER switch to ON. - Move the operating handle of the baggage compartment door that you replaced towards the open position. - Move the door operating handle to the fully closed position. - Set the ELECT. MASTER switch to OFF.	The DOOR warning caption must be off. The DOOR warning caption must come on when the operating handle has moved away from the door frame. The DOOR warning caption must go off.

Section 52-40

Access Panels

1. General

The DA 62 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.

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.

Figure 2 shows the location of access panels/covers in the forward baggage compartment.

Most panels are CFRP/GFRP moldings. Screws hold the panels in position. There are no special procedures for the removal and installation of these access panels. Though, there are special instructions for the removal and installation of vented access panels. When access panels are installed you must make sure that the area inside the access panel has no loose objects (for example, tools or rags).

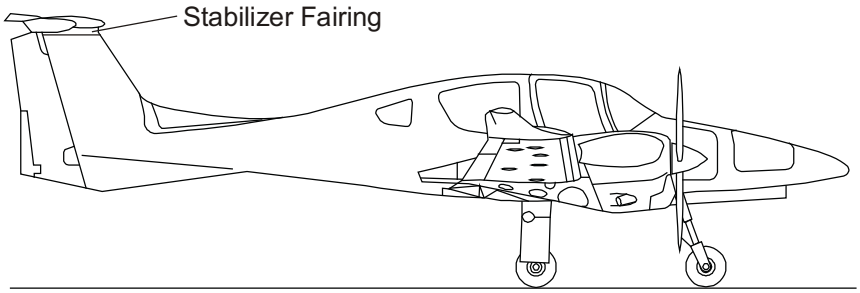
A. Vented Access Panel.

Figure 3 shows the vented access panel location. The vented access panel is located on the bottom surface of each wing below the outboard fuel tank. The vented access panel has two plastic hoses (cover hoses) that slide over the two rubber vent hoses from the outboard fuel tank. A bonding strap connects the drain cover to the airplane bonding system.

B. Hinged Vented Access-Panel (if MÄM 62-1074 is installed).

Figure 3 (insert) shows the hinged vented access-panel that can replace the vented access panel described in para A.

The hinged vented access-panel has two plastic hoses (cover hoses) on one side of the panel and a flap on the other side of the panel. The flap, opened, can be used to inspect the hoses for correct engagement.



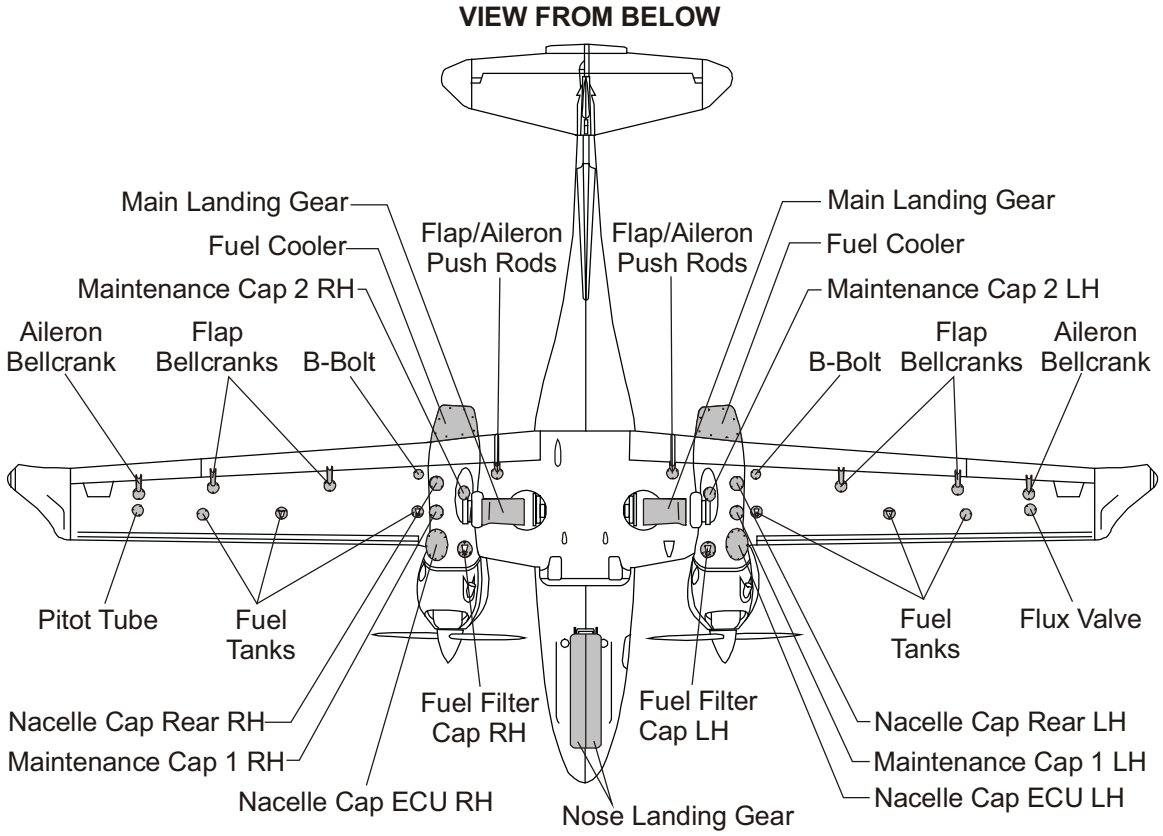


Figure 1 : Access Panel Locations

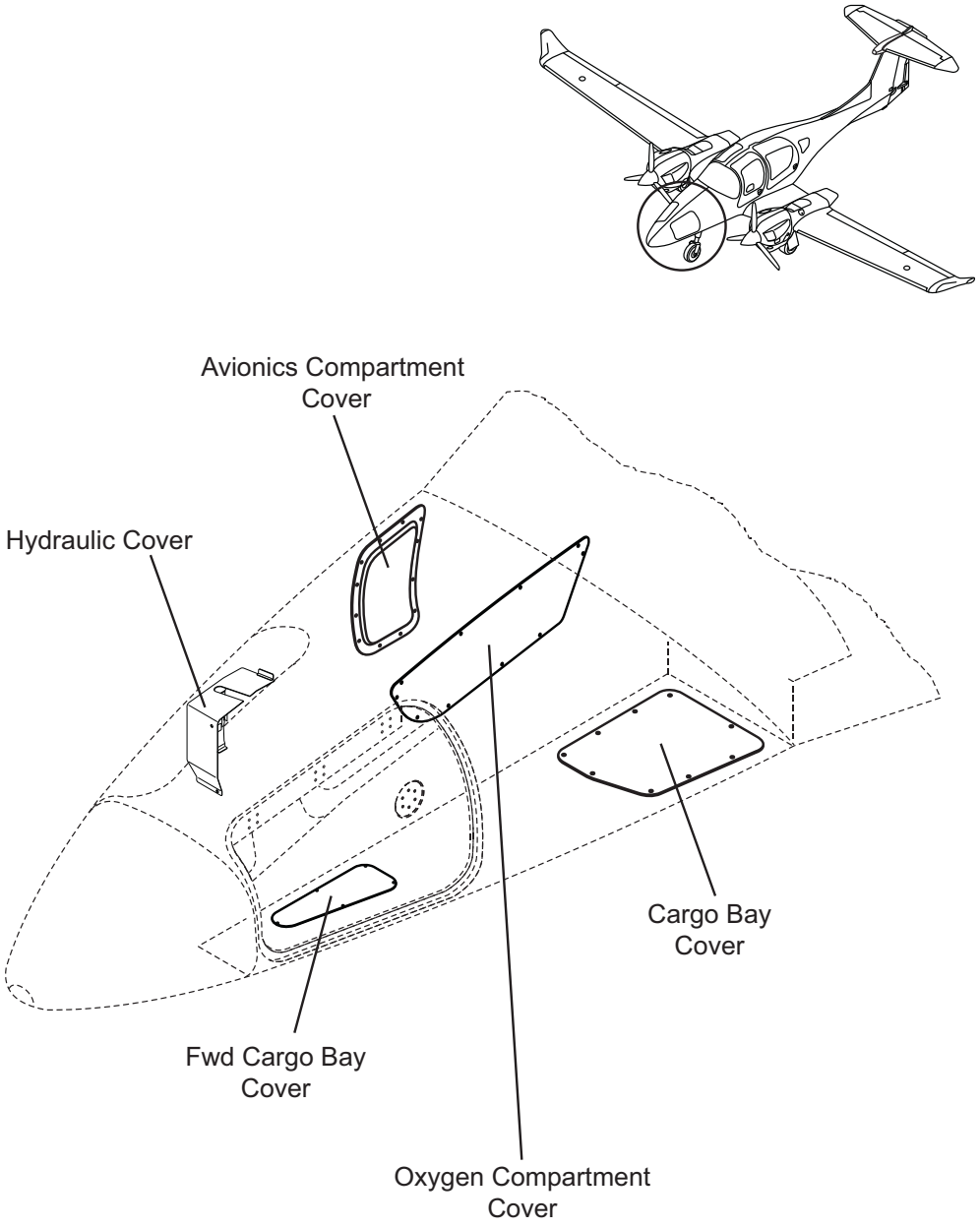
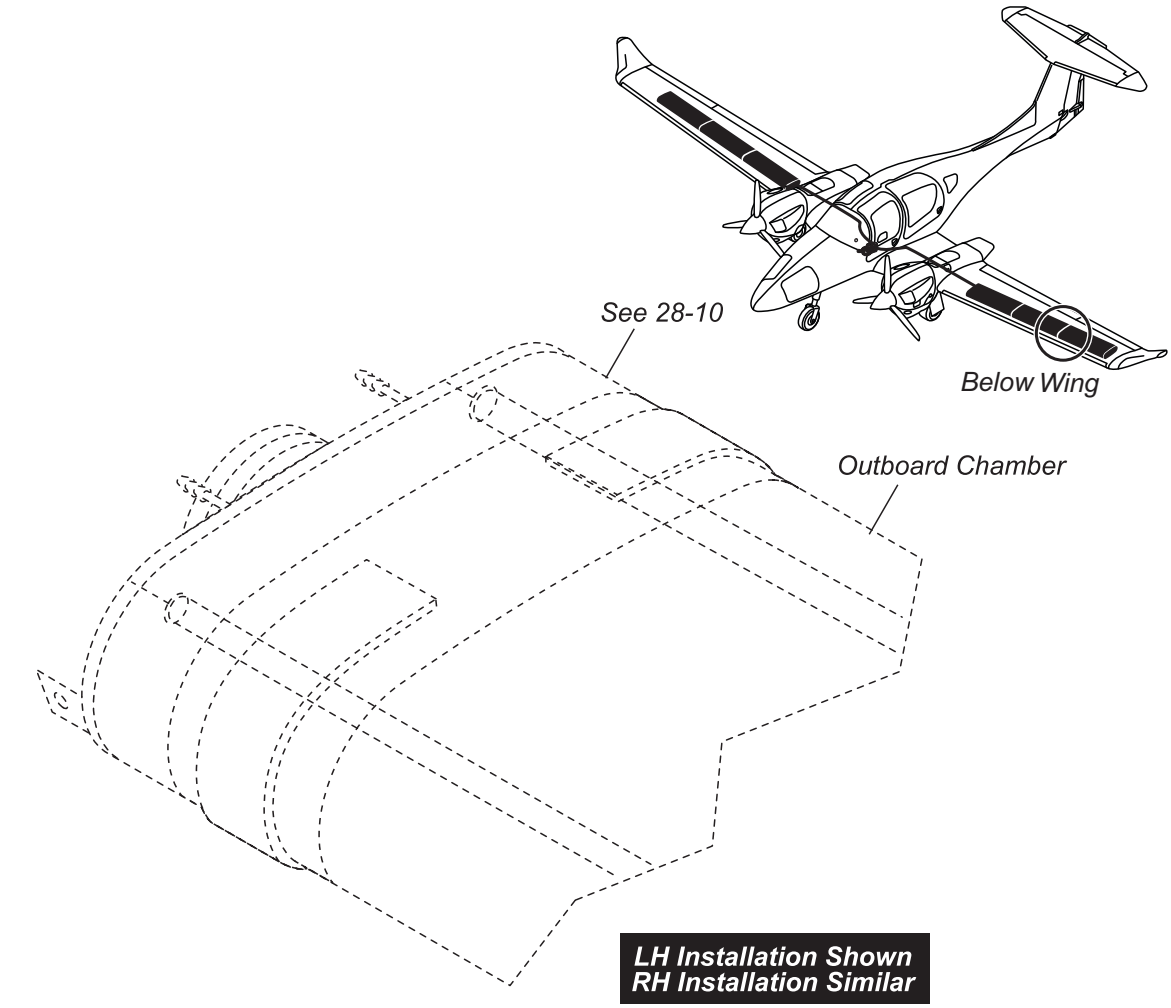


Figure 2 : Access Panel Locations



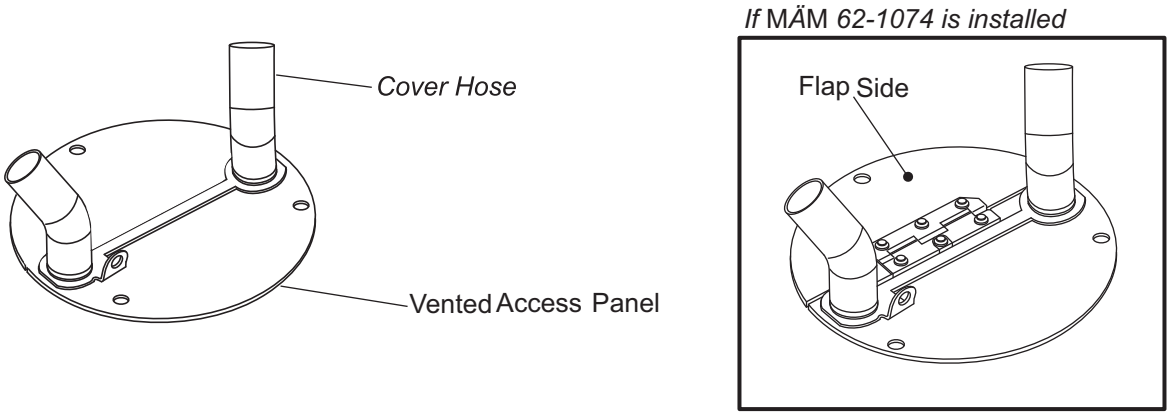


Figure 3 : Vented Access Panel - Location

Maintenance Practices

1. **General**

These Maintenance Practices tell you how to remove and install the vented access panel.

2. **Remove/Install the Vented Access Panel**

A. Remove the Vented Access Panel.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Locate the vented access panel for removal.	On the bottom surface of the wing, below the outboard fuel tank.
(2)	Remove the three screws and washers that attach the access panel to the bottom surface of the wing.	
(3)	Carefully pull the access panel from the bottom surface of the wing.	
(4)	Access and remove the screw, two washers and nut that connects the bonding wire to the access panel.	
(5)	Remove the access panel from the airplane.	Make sure that the two cover hoses pull off of the two vent hoses and stay with the access panel.

B. Install the Vented Access Panel.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the two vent hoses on the 90 degree fittings are in satisfactory condition.	
(2)	Make sure that all components on the vented access panel are in satisfactory condition.	
(3)	Make sure that the cover hose ends are circular.	If necessary, warm the cover hoses by hand or use warm water to make the ends circular.

	Detail Steps/Work Items	Key Items/References
(4)	Carefully install the access panel to the bottom surface of the wing. - Install the screw, two washers and nut that connects the bonding wire to the access panel. - Push the access panel up to the bottom surface of the wing. Make sure that the cover hoses slide over the vent hoses. - Install the three screws and washers to attach the access panel to the bottom surface of the wing.	Do not use force to install the access panel as you may kink the hoses. Make sure that the hoses do not kink.

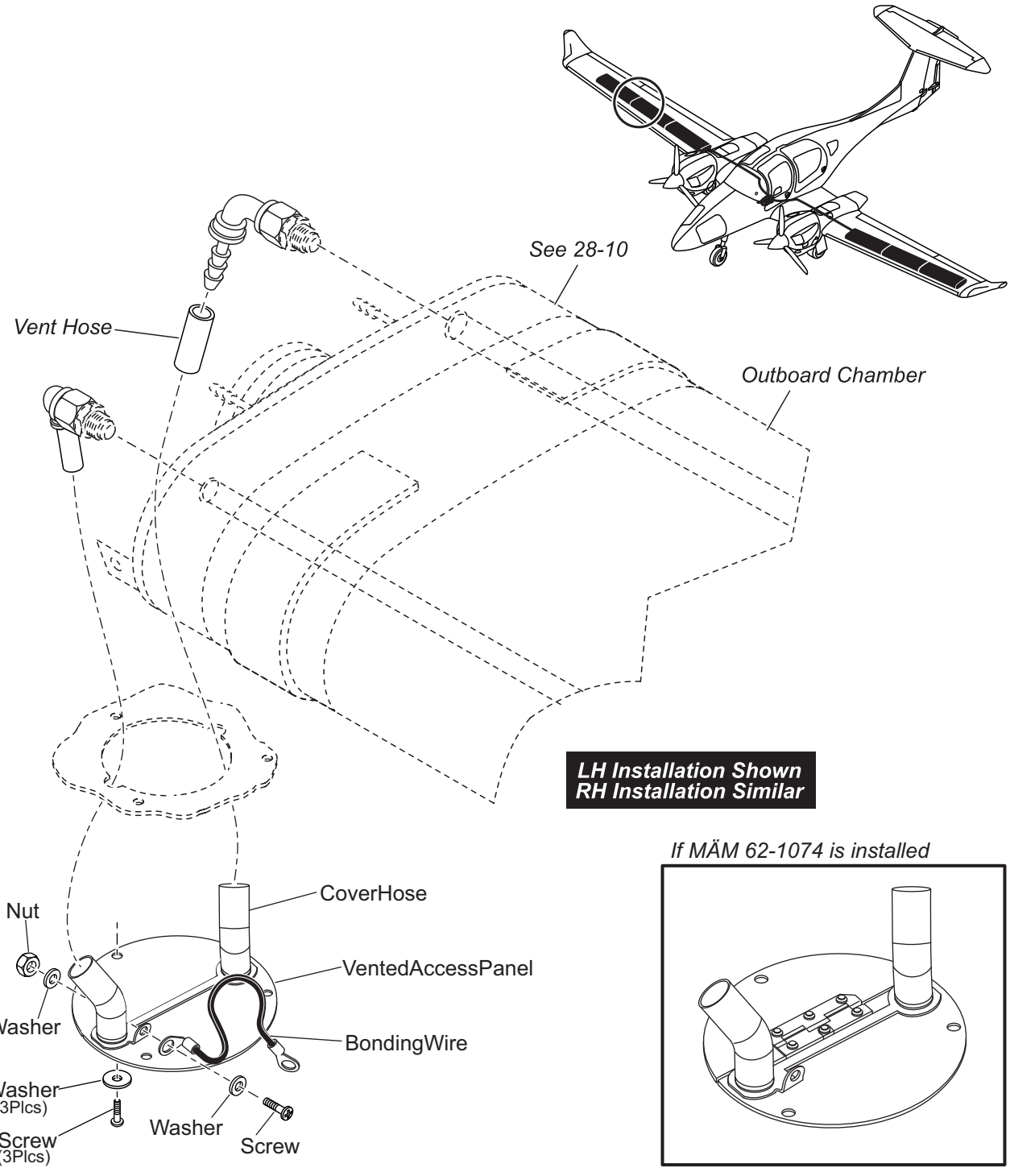


Figure 201 : Vented Access Panel - Removal/Installation

3. **Remove/Install the Hinged Vented Access-Panel (if MÄM 62-1074 is installed).**

A. Remove the Hinged Vented Access-Panel.

Refer to Figure 201 (insert).

NOTE: To inspect inside the wing, the access panel must be fully removed.

	Detail Steps/Work Items	Key Items/References
(1)	Locate the vented access panel for removal.	On the bottom surface of the wing, below the outboard fuel tank.
(2)	Remove the three screws and washers that attach the access panel to the bottom surface of the wing.	
(3)	Carefully pull the access panel from the bottom surface of the wing.	
(4)	Access and remove the screw, two washers and nut that connects the bonding wire to the access panel.	
(5)	Remove the access panel from the airplane.	Make sure that the two cover hoses pull off of the two vent hoses and stay with the access panel.

B. Install the Hinged Vented Access-Panel.

Refer to Figure 201 (insert).

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the two vent hoses on the 90 degree fittings are in satisfactory condition.	
(2)	Make sure that all components on the vented access panel are in satisfactory condition.	
(3)	Make sure that the cover hose ends are circular.	If necessary, warm the cover hoses by hand or use warm water to make the ends circular.

	Detail Steps/Work Items	Key Items/References
(4)	Carefully install the access panel to the bottom surface of the wing. - Install the screw, two washers and nut that connects the bonding wire to the access panel. - Push the access panel up to the bottom surface of the wing. Make sure that the cover hoses slide over the vent hoses. - Install the two screws and washers on the larger part of the panel. - Inspect to make sure that the hoses are not kinked and are fully engaged. - Close the flap side of the panel and install the third screw and washer.	Do not use force to install the access panel as you may kink the hoses.

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CHAPTER 53

FUSELAGE

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CHAPTER 53

FUSELAGE

1. General

The DA 62 fuselage has a semi-monocoque structure. Two CFRP half-shells make the fuselage skin. CFRP 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 carbon cloth. Some components also have rigid inserts of CFRP for attaching brackets or other components.

Section 53-10 gives the data for the fuselage structure.

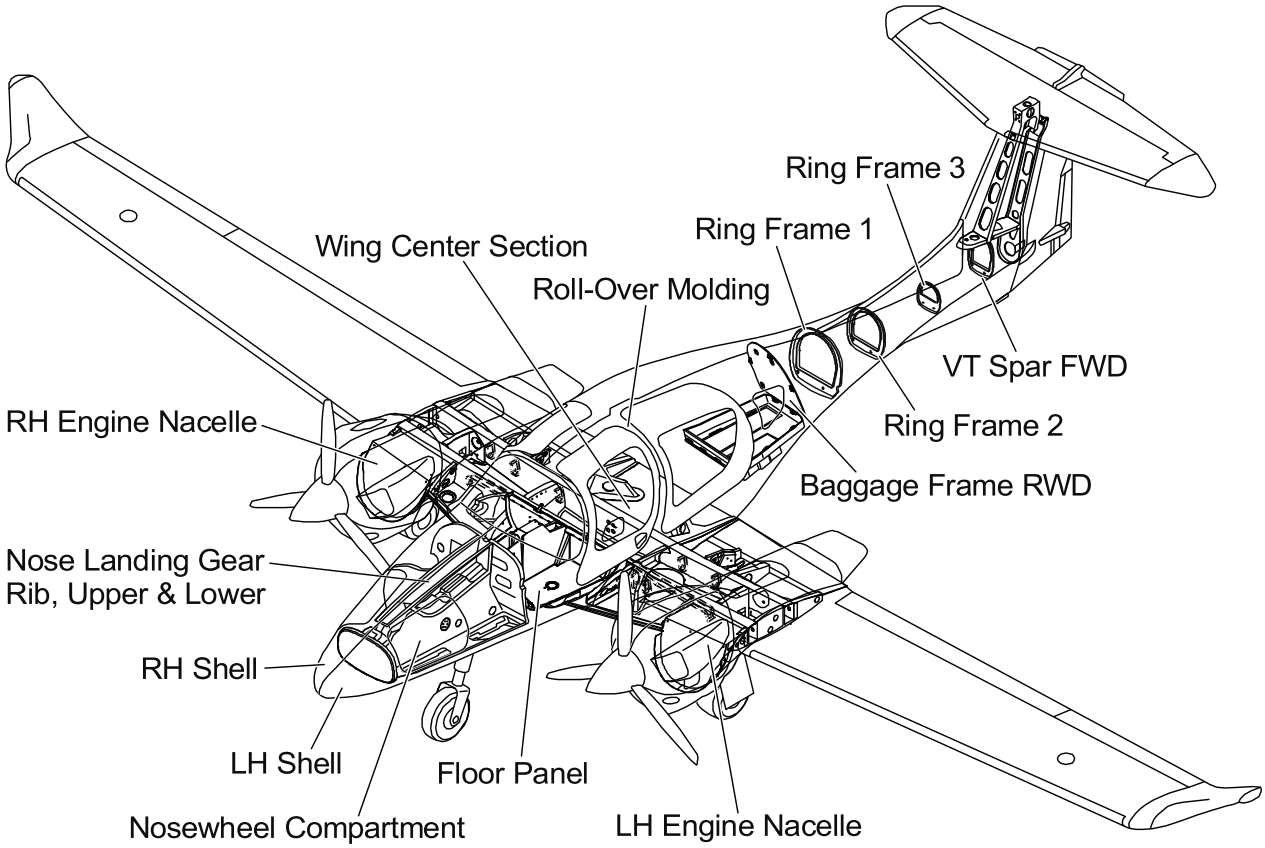

Figure 1 : Fuselage Structure - Main Components

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 and GFRP 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.

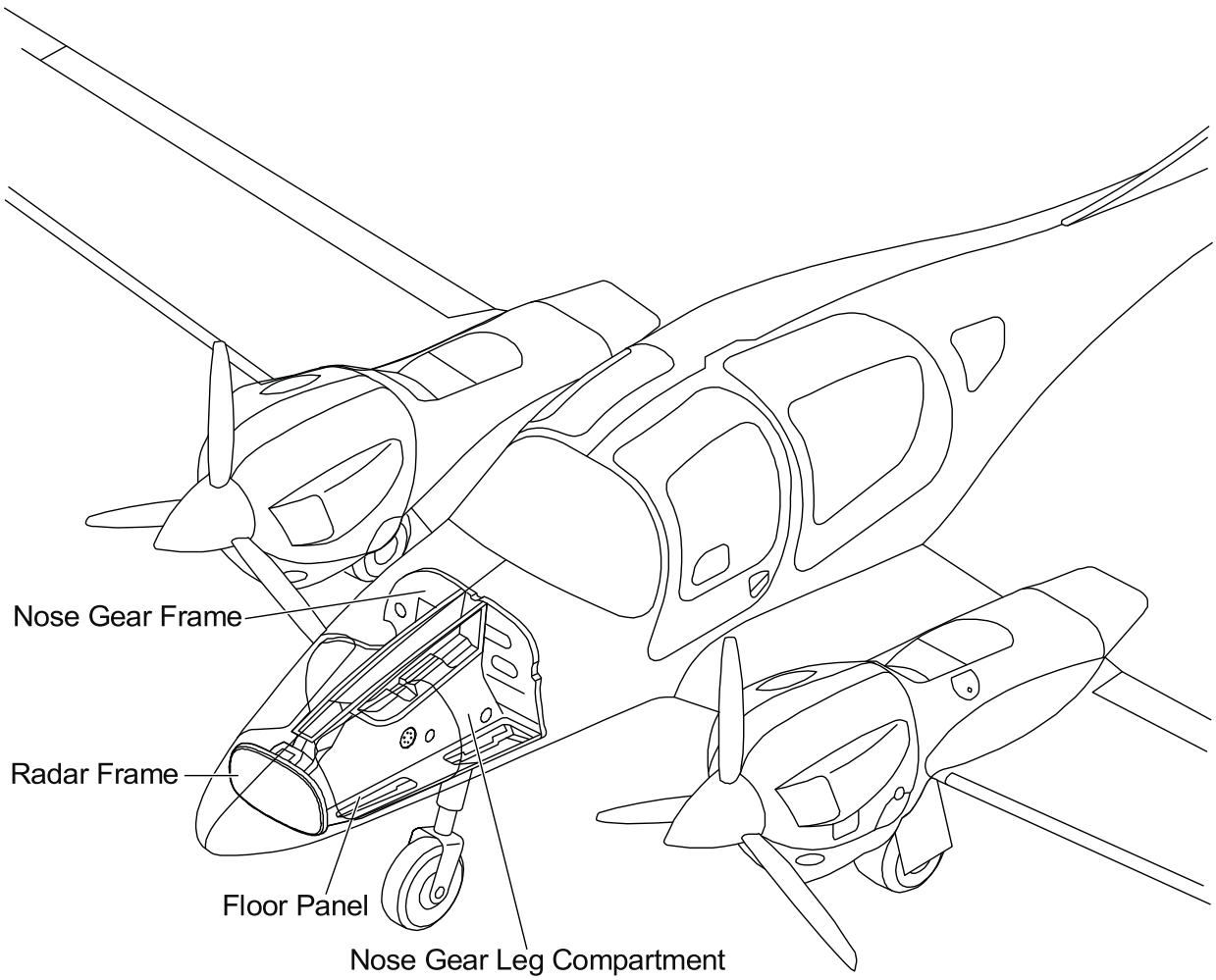

Figure 1 : Fuselage Structure - Nose Section

2. **Description**

Figures 1 thru 4 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 is part 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 fuselage front bulkhead closes the front of the cockpit and makes the rear of the nose section. The nose gear leg compartment attaches to the fuselage front bulkhead 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. The nose cone is bonded to the nose section shell.

The Avionic bay is installed on the right side behind the nose baggage compartment. It can be accessed thru a separate cover.

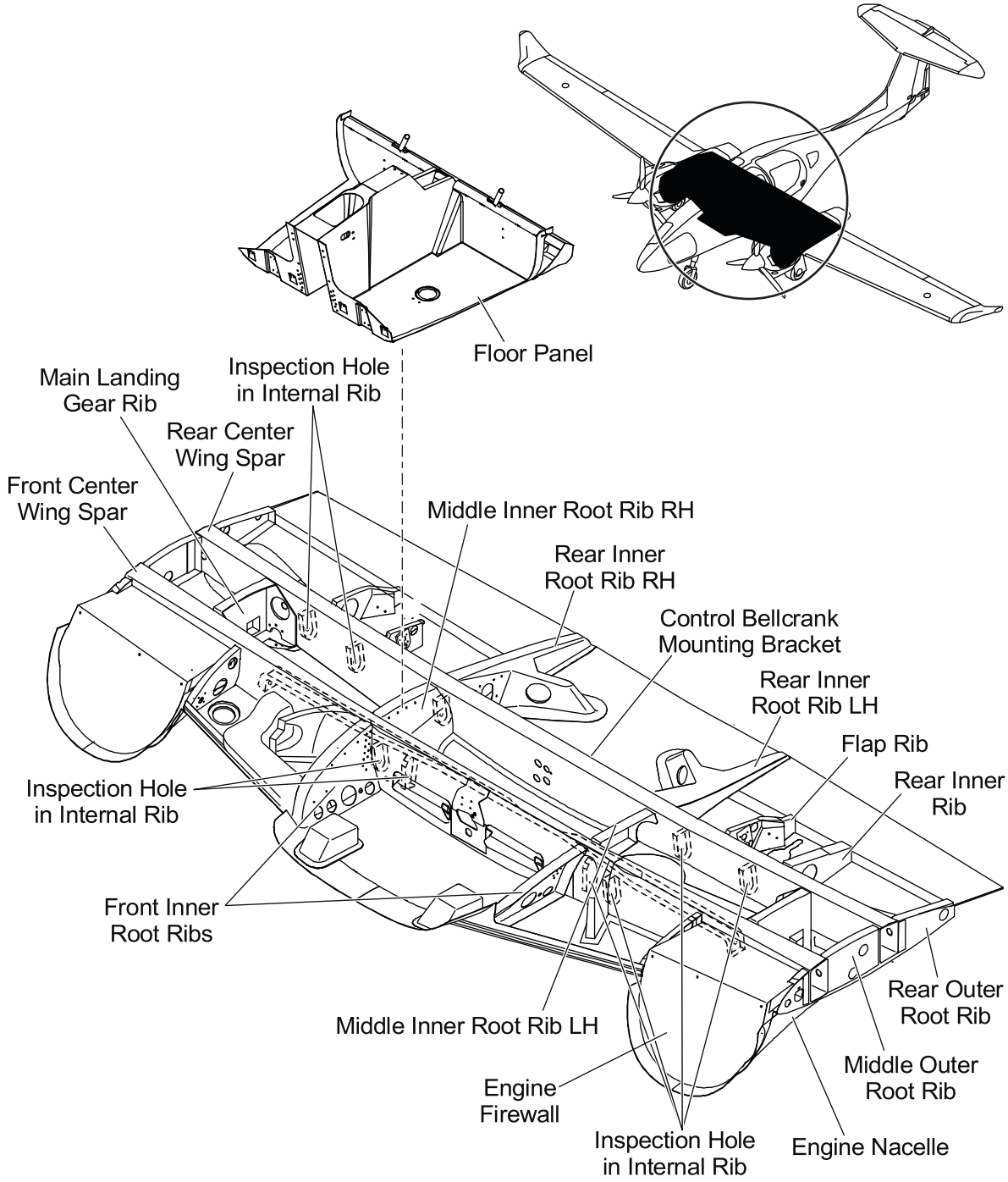

Figure 2 : Fuselage Structure - Wing Center Section

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 CFRP 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.

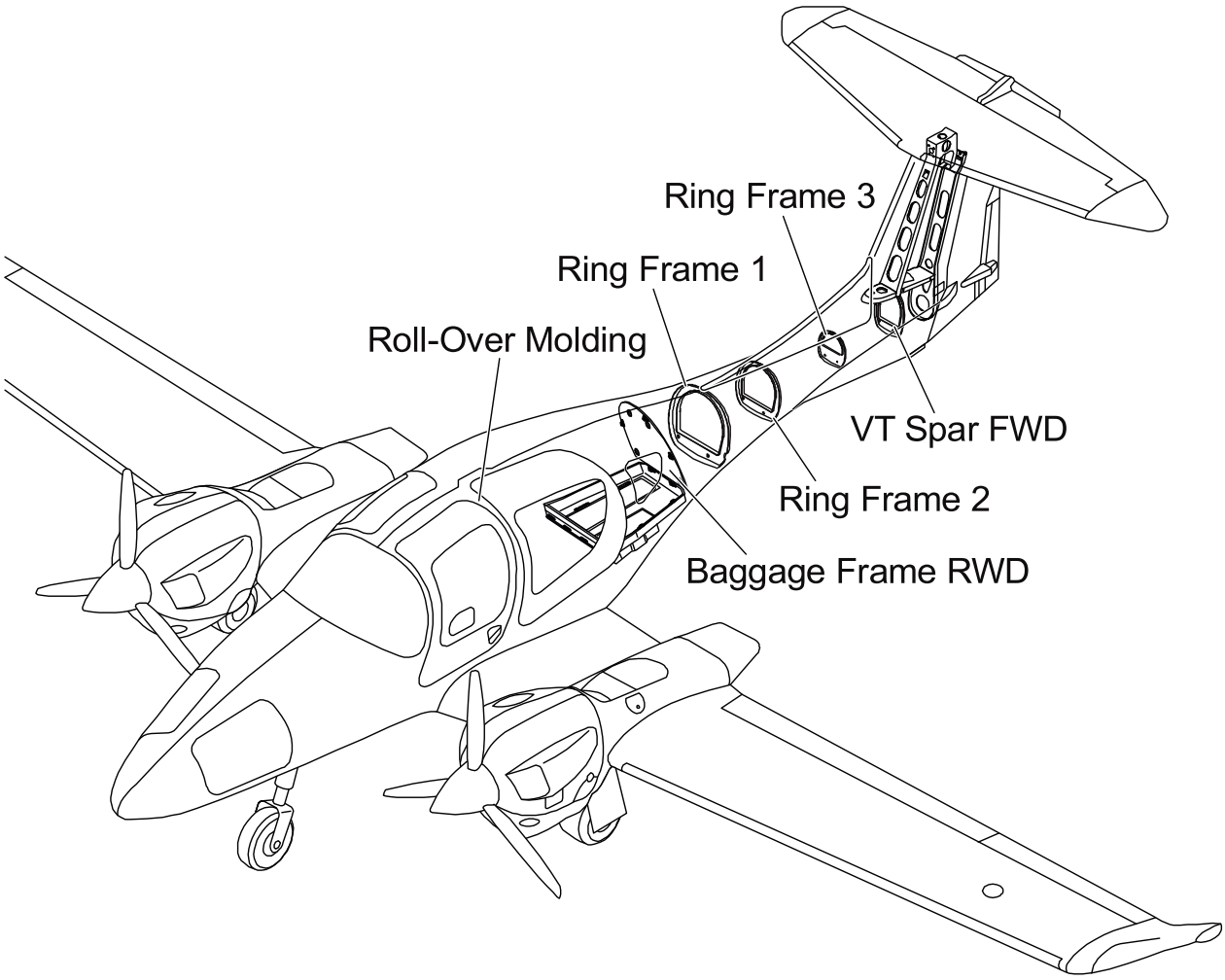

Figure 3 : Fuselage Structure - Rear Fuselage

E. Roll Over Molding.

The roll-over molding is a rigid CFRP 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. Baggage Frame Rearward.

The baggage frame rearward is a rigid CFRP molding. It closes the rear of the cabin and makes a support for the rear baggage compartment or the pax row II. 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 CFRP 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 CFRP 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 CFRP molding. It bonds to the fuselage shells just forward of the vertical stabilizer. It has holes for the rudder control cables and trim control.

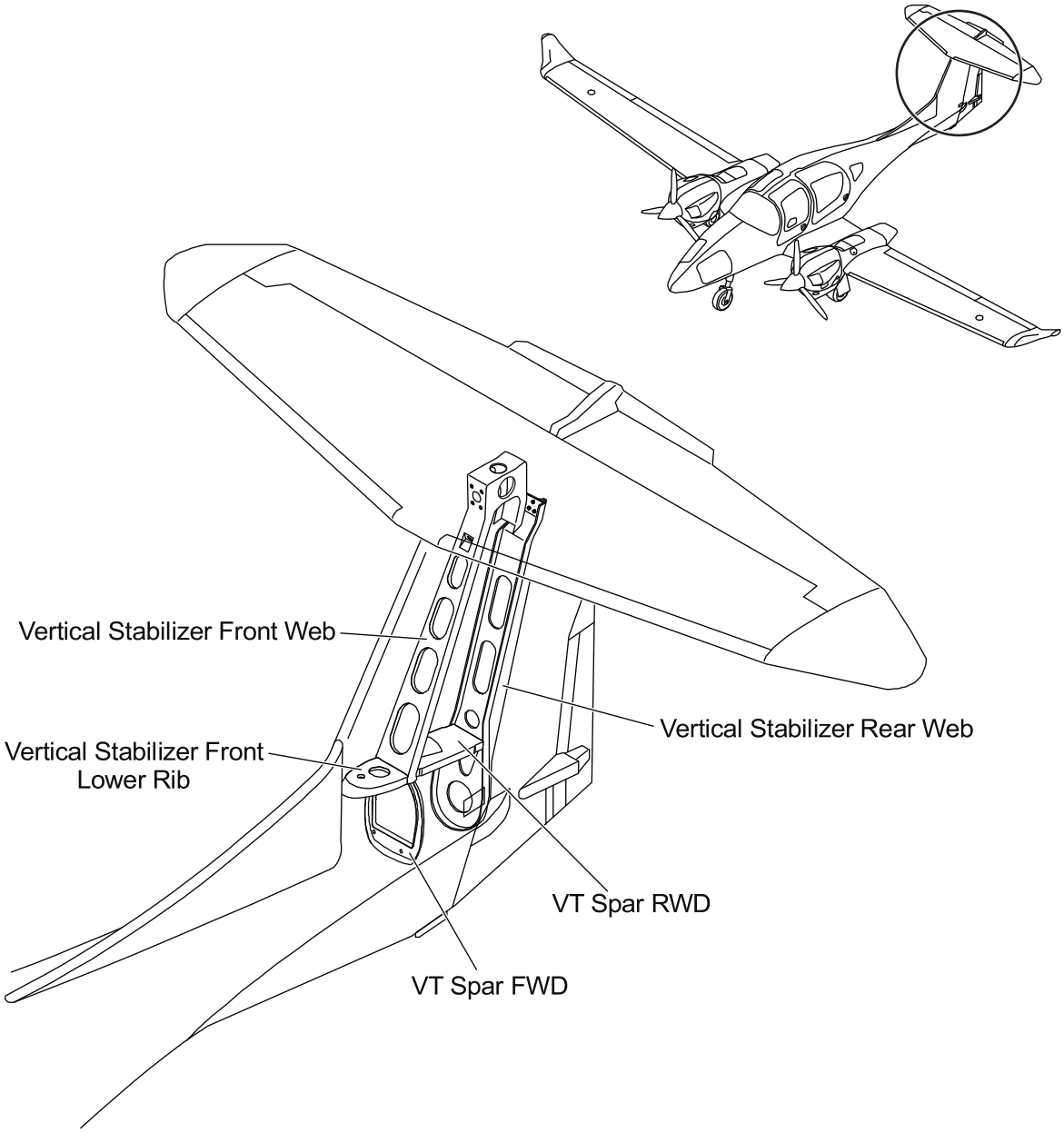

Figure 4 : Fuselage Structure - Vertical Stabilizer

J. Vertical Stabilizer Front Lower Rib.

The vertical stabilizer front lower rib is a rigid CFRP 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 CFRP 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 CFRP 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.

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Maintenance Practices

1. **General**

There are no special Maintenance Practices for the DA 62 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 62 airplane.

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CHAPTER 55

STABILIZERS

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CHAPTER 55

STABILIZERS

1. General

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 upper and lower shells. Each shell has CFRP 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 CFRP 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 CFRP molding. Bolts attach the lower fin to the bottom of the fuselage.

The rudder has left and right shells. Each shell has CFRP 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.

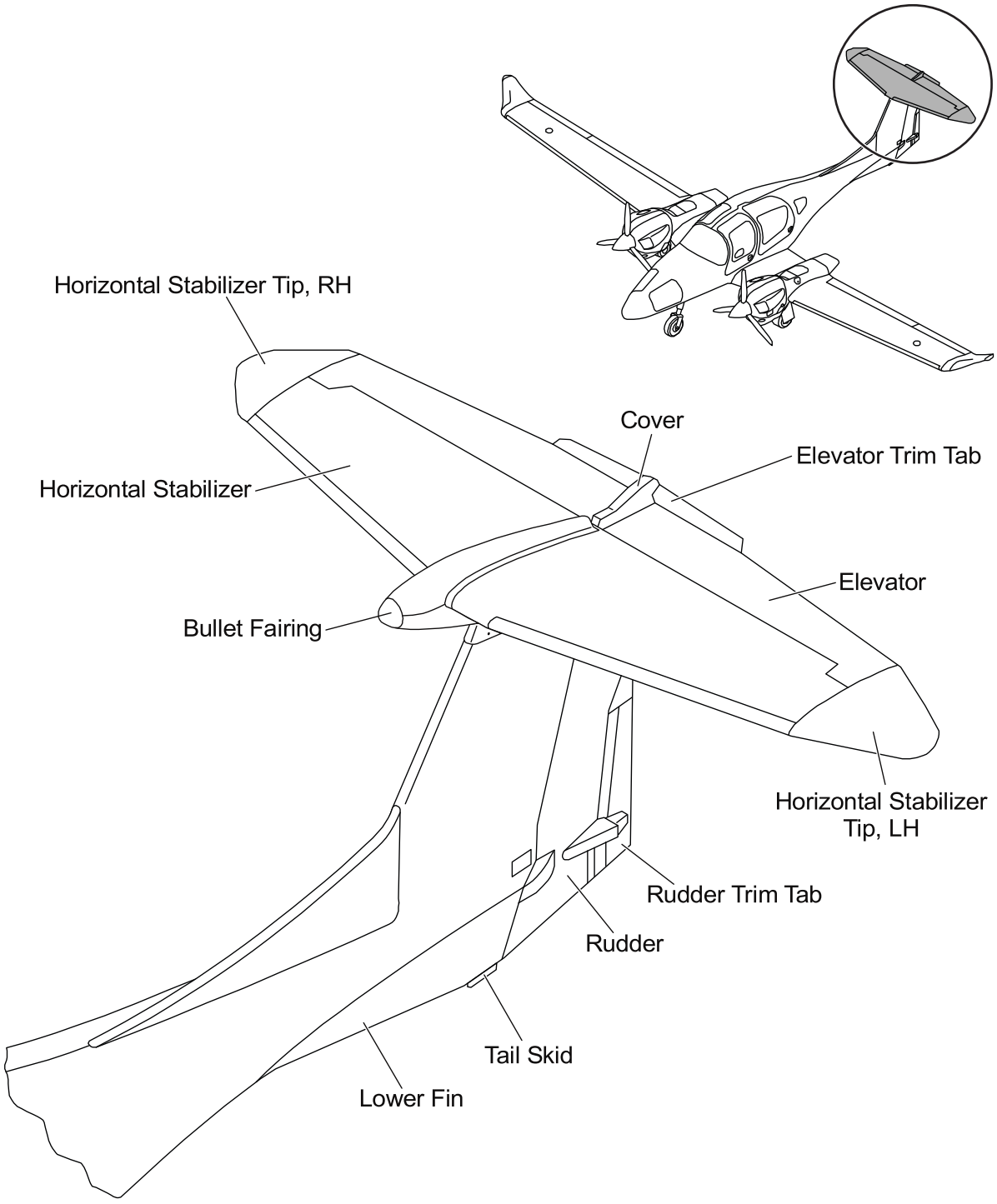

Figure 1 : Stabilizers

Section 55-10

Horizontal Stabilizer

1. General

The DA 62 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 CFRP 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 CFRP skins with rigid CFRP 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 CFRP 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 aft stringer.

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.

One trailing edge stringer close the trailing edges of the top and bottom shells. The outboard end of the stringer 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 aft stringer bond to the top and bottom shells and the rear and rear 'box' ribs with resin. The aft stringer supports 4 hinges for the elevator. The outboard stabilizer supports a GFRP rib, upper and lower shell, aft stringer and aft spar bonding.

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.

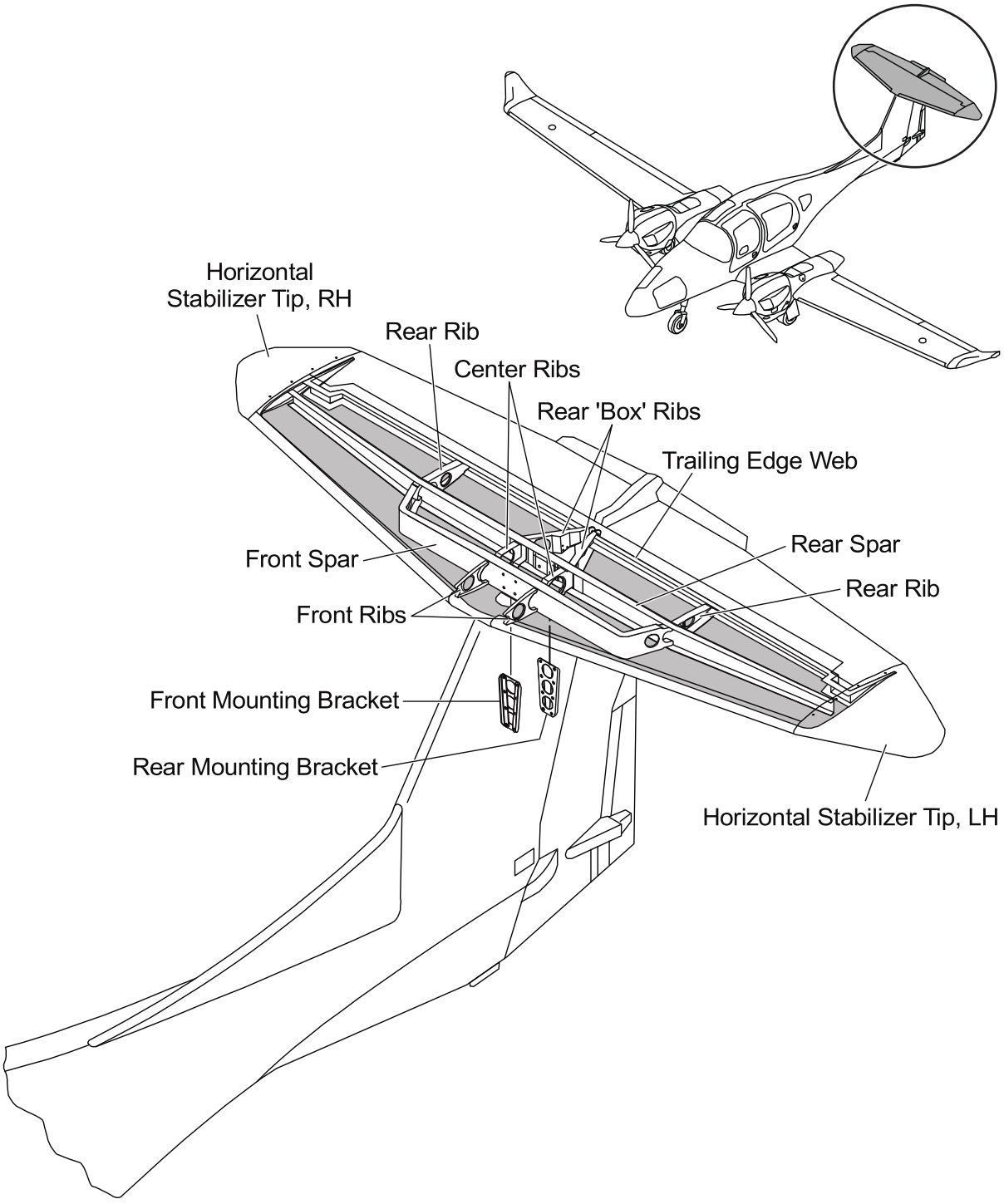

Figure 1 : Horizontal Stabilizer Structure

Maintenance Practices

1. **General**

These Maintenance Practices tell you how to remove and install the horizontal stabilizer.

2. **Remove/Install the Horizontal Stabilizer**

NOTE: Two persons are necessary to remove/install the horizontal stabilizer.

A. Remove the Horizontal Stabilizer.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the horizontal stabilizer bullet fairing. - Remove the screws that attach the fairing to the structure.	Refer to Figure 1 (55-00-00, Page 2). Hold the fairing.
(2)	Release the two fork-end fittings from the elevator 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.	Refer to Figure 1 (55-00-00, Page 2). 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.	

	Detail Steps/Work Items	Key Items/References
(5)	Move the trim-tab mechanism forward through the hole in the vertical stabilizer web, clear of the mounting bracket.	
(6)	Disconnect the elevator push-rod from the elevator horn: - Loosen the four bolts holding the elevator mass-balance lever. - Remove the nut, bolt and washer which connects the elevator vertical push rod to the elevator horn. - Remove and retain the large washer, bush and spacer from the push rod to elevator horn assembly.	Refer to Figure 2. (55-20-00, Page 4). Note the location of the large washer, bush and spacer.
(7)	Remove the eight lower bolts which attach the horizontal stabilizer and lightning protection strip to the front and rear mounting brackets.	Hold the horizontal stabilizer.
(8)	Lift the horizontal stabilizer clear of the airplane.	

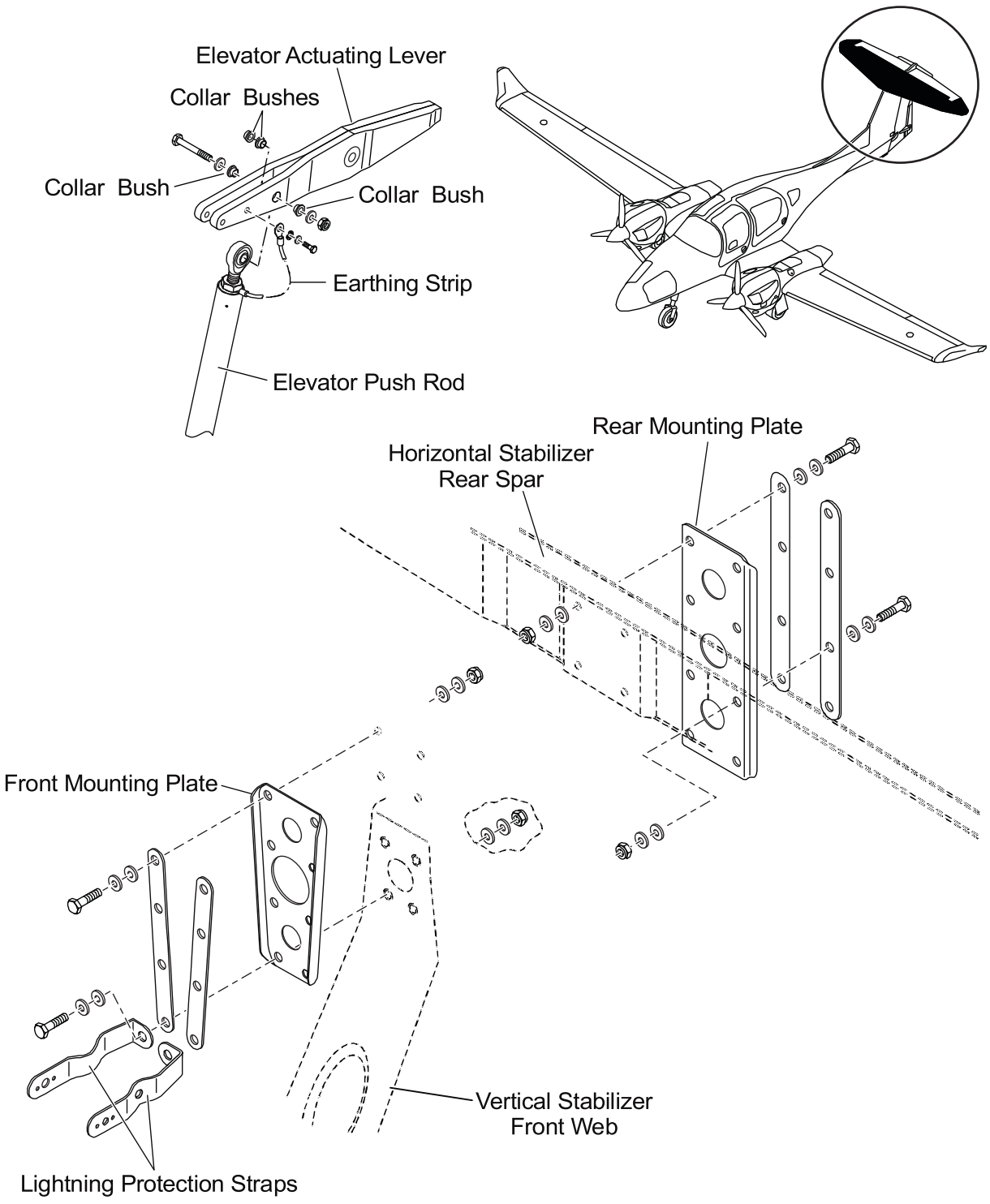

Figure 201 : Horizontal Stabilizer - Removal/Installation

B. Install the Horizontal Stabilizer.

Refer to Figure 201.

	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)	Install the eight 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 to 45 Nm (33.2 lbf.ft.), as per Section 20-10 Special Torque Values.
(4)	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 four bolts holding the elevator mass-balance lever.	As noted in Paragraph 2A, step (6). Torque: 1.7 Nm (1.2 lbf.ft.). Use a new self-locking nut. That you loosened in Paragraph 2A, step (6).
(5)	Move the trim-tab mechanism aft through the hole in the vertical stabilizer web, through the mounting bracket for the trim mechanism.	
(6)	Attach the trim-tab mechanism to its mounting bracket: - Install the two bolts, washers and nuts.	Use a new self-locking nut.

	Detail Steps/Work Items	Key Items/References
(7)	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.	
(8)	Connect the two fork-end fittings to the trim-tab cranked actuating-levers: - Install the two 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.	Refer to Figure 1 (55-00-00, Page 2). Under the elevator.
(9)	Do a test for correct, full and free movement of the elevator control. If necessary, adjust the elevator control.	Refer to Section 27-30.
(10)	Do a test for correct, full and free movement of the trim control. If necessary, adjust the trim control.	Refer to Section 27-38.
(11)	If necessary for your Airworthiness Authority, do a duplicate inspection of the elevator control and elevator trim control system.	
(12)	Install the horizontal stabilizer bullet fairing: - Install the screws that attach the fairing to the structure.	Refer to Figure 1 (55-00-00, Page 2).

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Section 55-20

Elevator

1. **General**

The DA 62 has the usual elevator. The elevator attaches to the aft stringer of the horizontal stabilizer.

See Section 27-30 for data about the elevator controls.

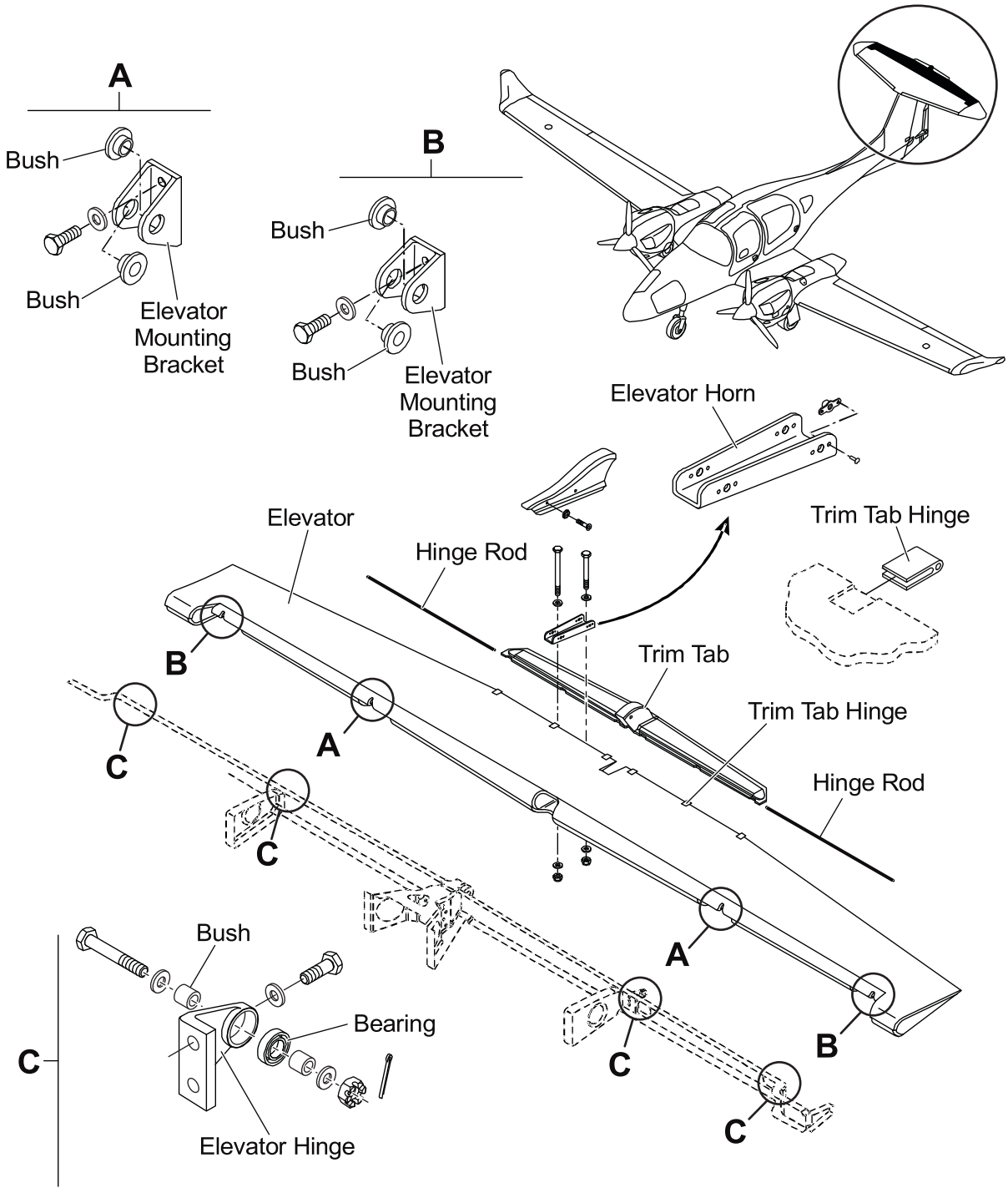

Figure 1 : Elevator Structure

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 on the elevator.

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. Four 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 aft stringer of the horizontal stabilizer.

The hinge assembly has an eye-end connected to a clevis assy. The eye-end has a spherical bearing. The shank engages in a bush in the aft stringer

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.

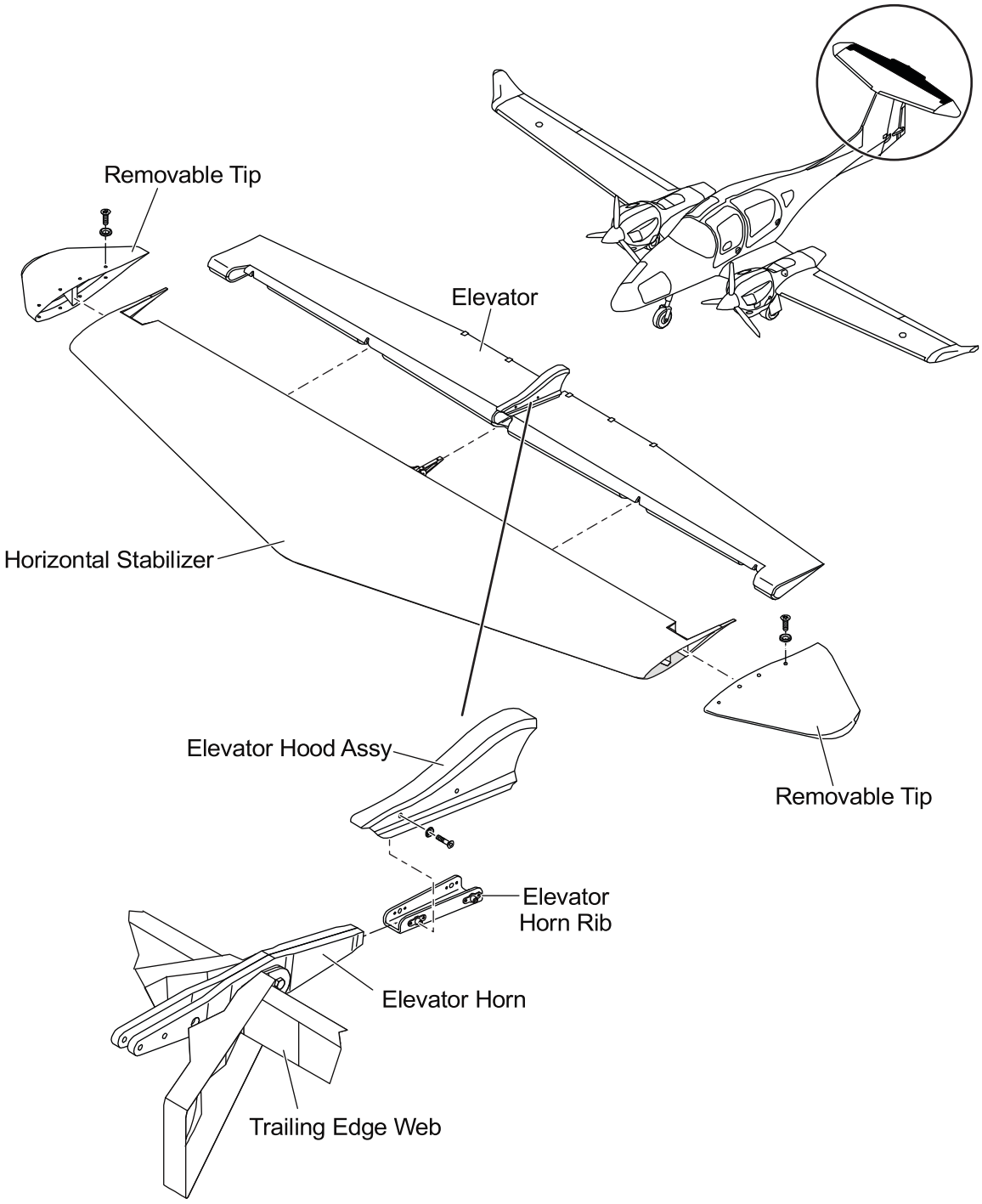

Figure 2 : Horizontal Stabilizer - Elevator Installation

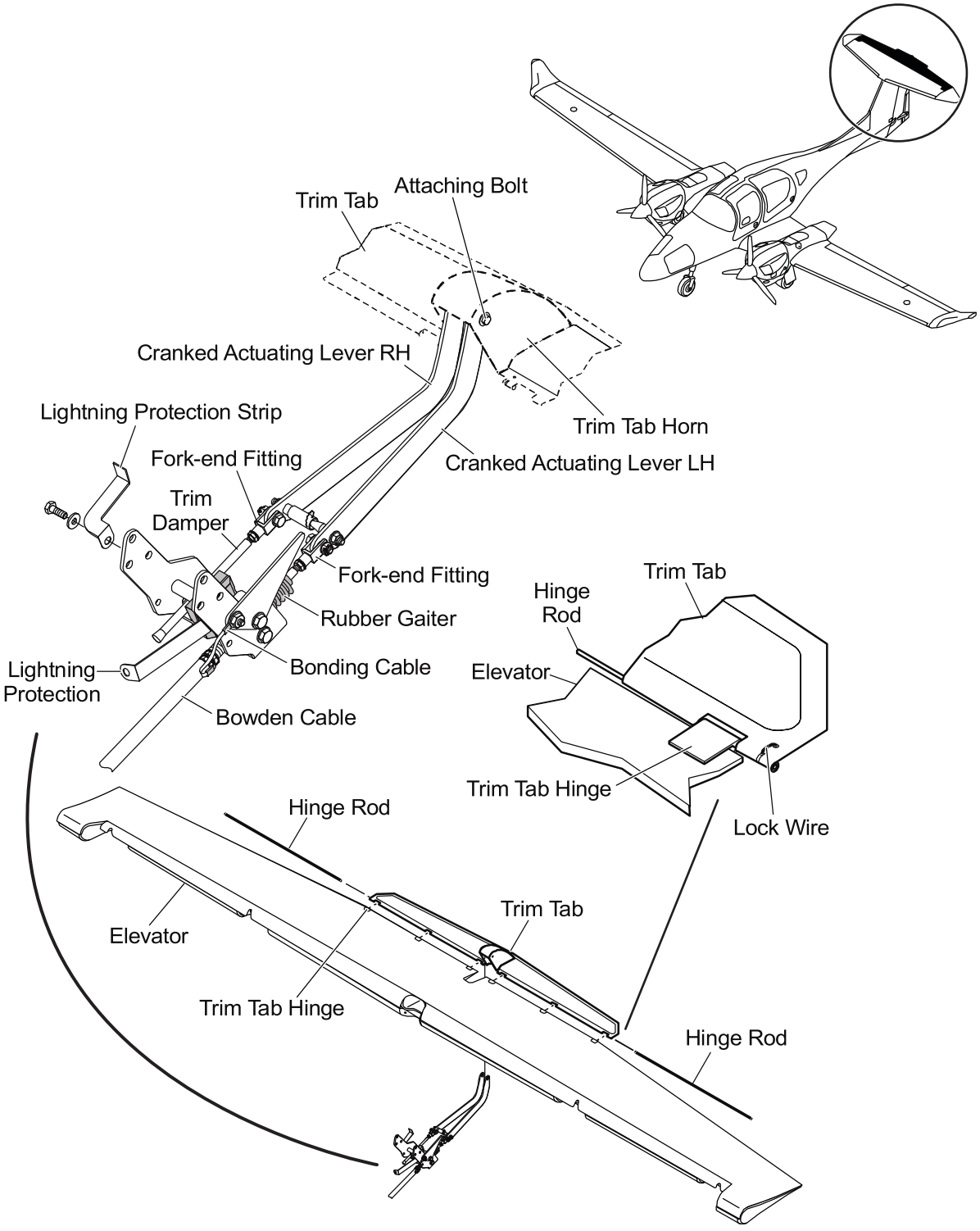

Figure 3 : Elevator - Trim-Tab Installation

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Maintenance Practices

1. General

These Maintenance Practices tell you how to remove and install the elevator and the elevator trim tab. Refer to Sections 27-30 and 27-31 for data on the elevator and elevator trim tab control setting.

2. Remove/Install the Elevator

NOTE: Two persons are necessary to remove/install the elevator.

A. Remove the Elevator.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the horizontal stabilizer bullet fairing. - Remove the screws that attach the fairing to the structure.	
(2)	Release the two fork-end fittings from the trim-tab cranked actuating levers.	Under the elevator.
(3)	Remove the four bolts, nuts and washers which attach the elevator horn rib to the elevator.	
(4)	Remove the pivot pins from the hinge: - Remove the bolts, washers and nuts.	A second person is required to hold the elevator.
(5)	Pull the elevator aft to release the elevator horn and hinge assemblies.	
(6)	Remove the elevator from the airplane.	
(7)	Put the elevator in a stand or on a padded surface.	

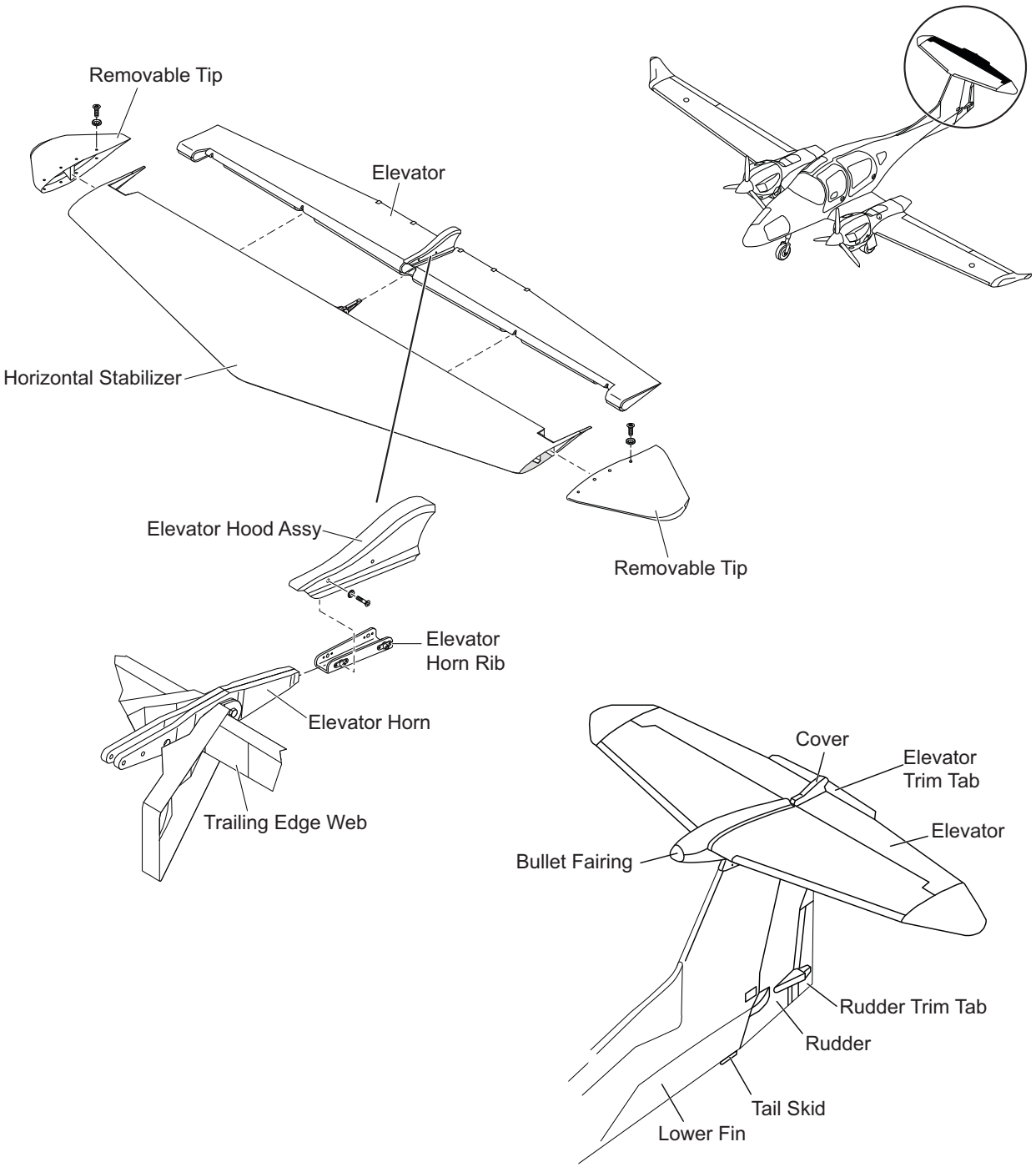

Figure 201 : Elevator - Removal/Installation

B. Install the Elevator.

Refer to Figure 201.

	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 eye brackets and clevis assemblies at mid-span with the bushes in the trailing edge web of the horizontal stabilizer. - Push the elevator forward to install the attaching hardware.	
(2)	Install the bolts, washers and nuts which attach the elevator to the elevator horn.	Torque: 6.4 Nm (4.7 lbf.ft.). Use new lock nuts.
(3)	Install the two fork-end fittings for the trim-tab cranked actuating levers.	Under the elevator.
(4)	Install the horizontal stabilizer bullet fairing: - Install the screws that attach the fairing to the structure.	
(5)	Do a test for correct range of movement of the elevator control.	Refer to Section 27-30.
(6)	Do a test for correct range of movement of the elevator trim control.	Refer to Section 27-38.
(7)	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.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the nut, washer and bolt which attaches the cranked actuating levers to the trim tab.	
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.	

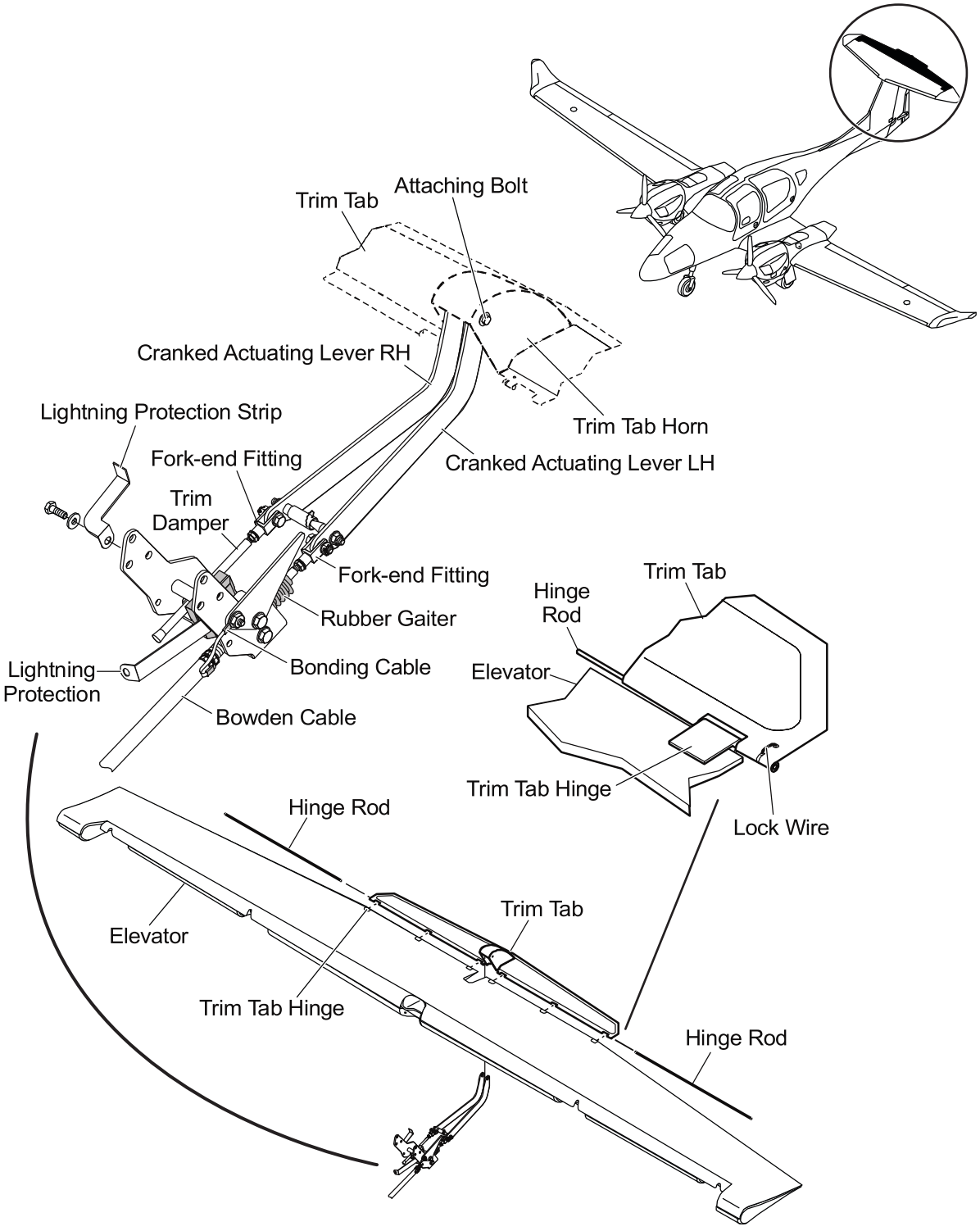

Figure 202 : Elevator Trim Tab - Removal/Installation

B. Install the Elevator Trim Tab.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Put the trim tab in position on the elevator.	
(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.	

Section 55-30

Lower Fin

1. **General**

The DA 62 has a lower fin. The lower fin is a CFRP molding that is bonded to the bottom of the rear fuselage. A tail-skid is attached to the bottom of the lower fin.

2. **Description**

Refer to Figure 1.

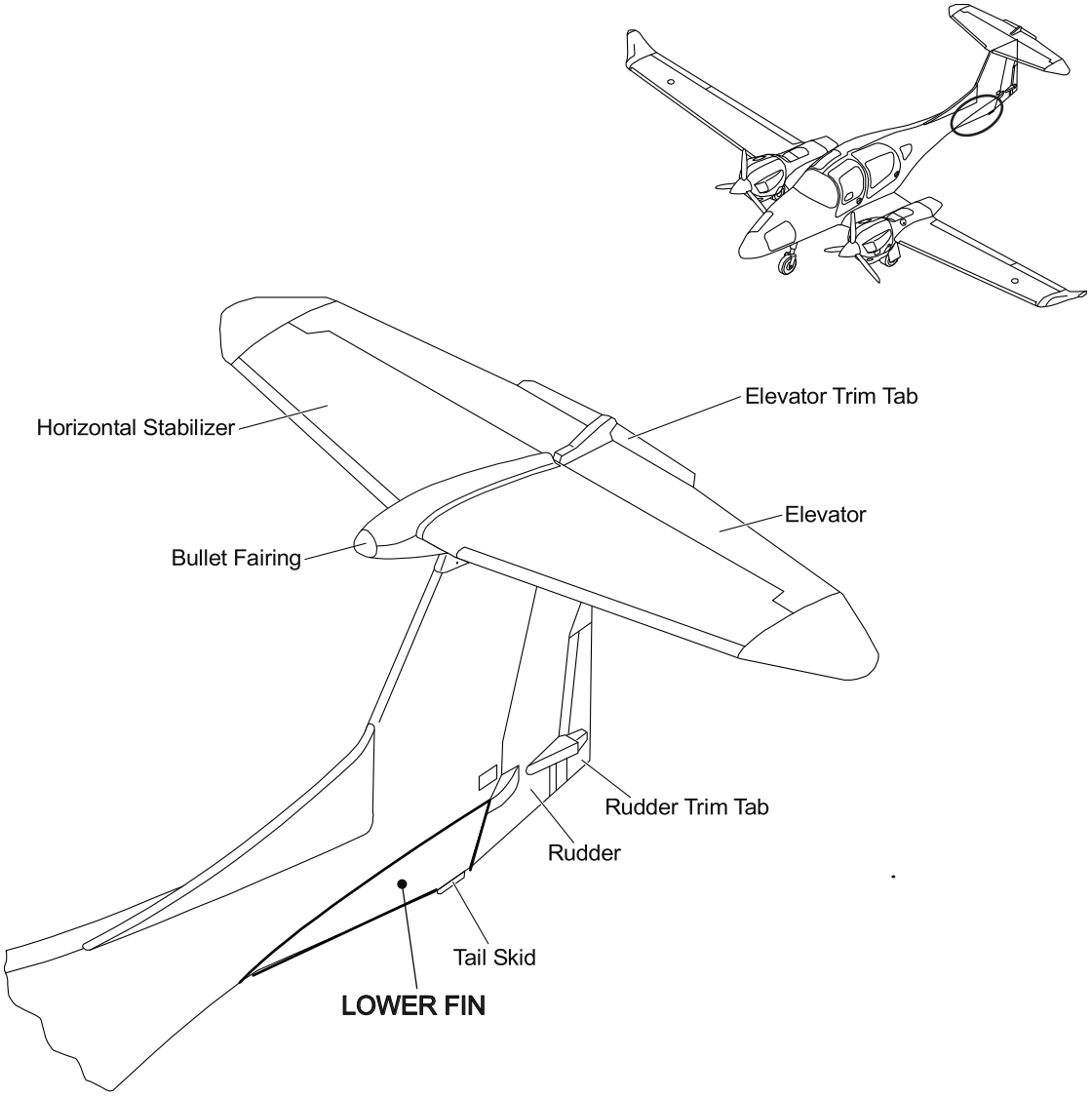

Figure 1 : DA 62 Lower Fin

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Section 55-40

Rudder and Trim Tab

1. General

The DA 62 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 screwed tog edge near the top and in its rudder horn. You cannot adjust the mass balance.

The control block contains one hinge on the upper attachment and the rudder rear control assembly

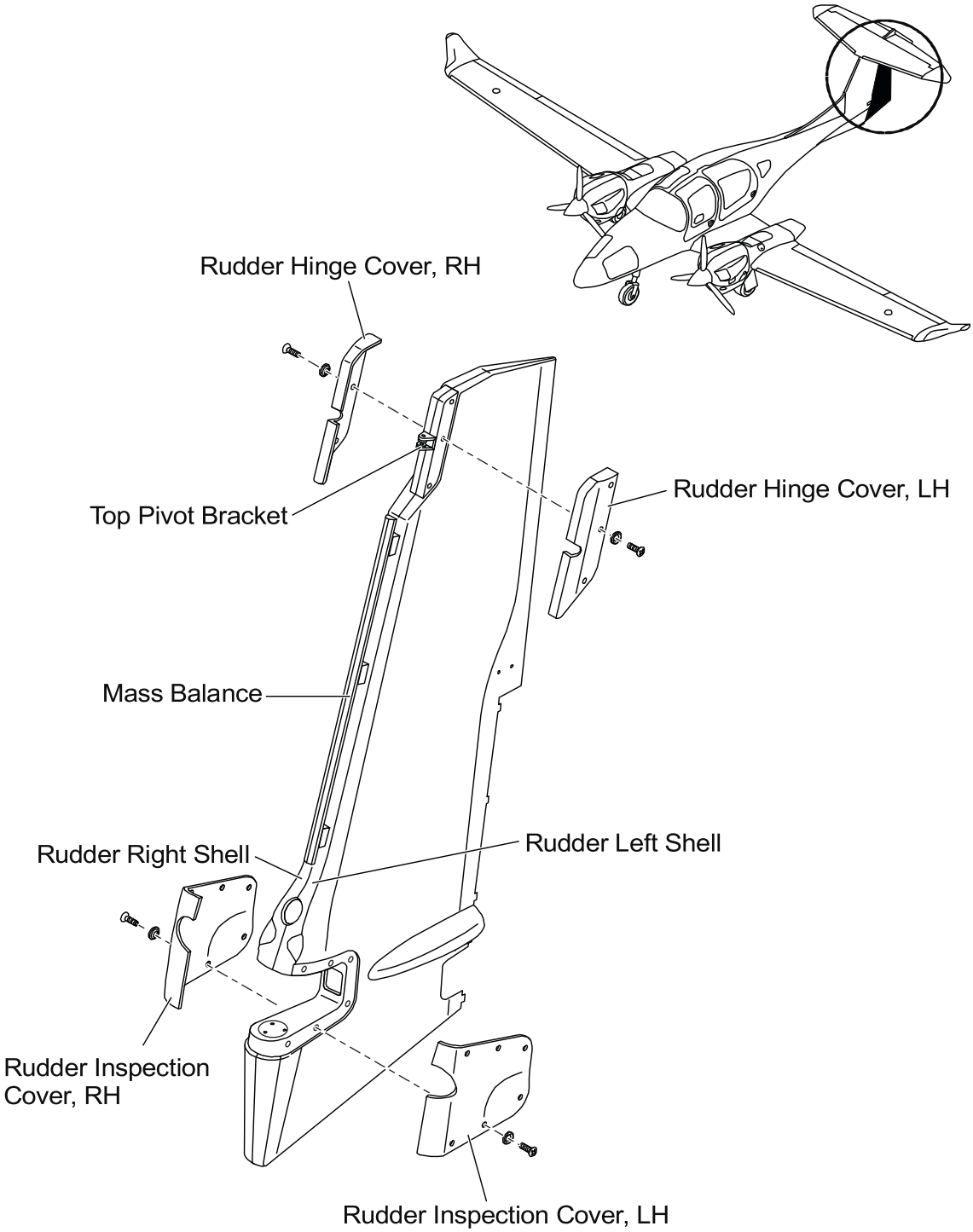

Figure 1 : Rudder Assembly

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.

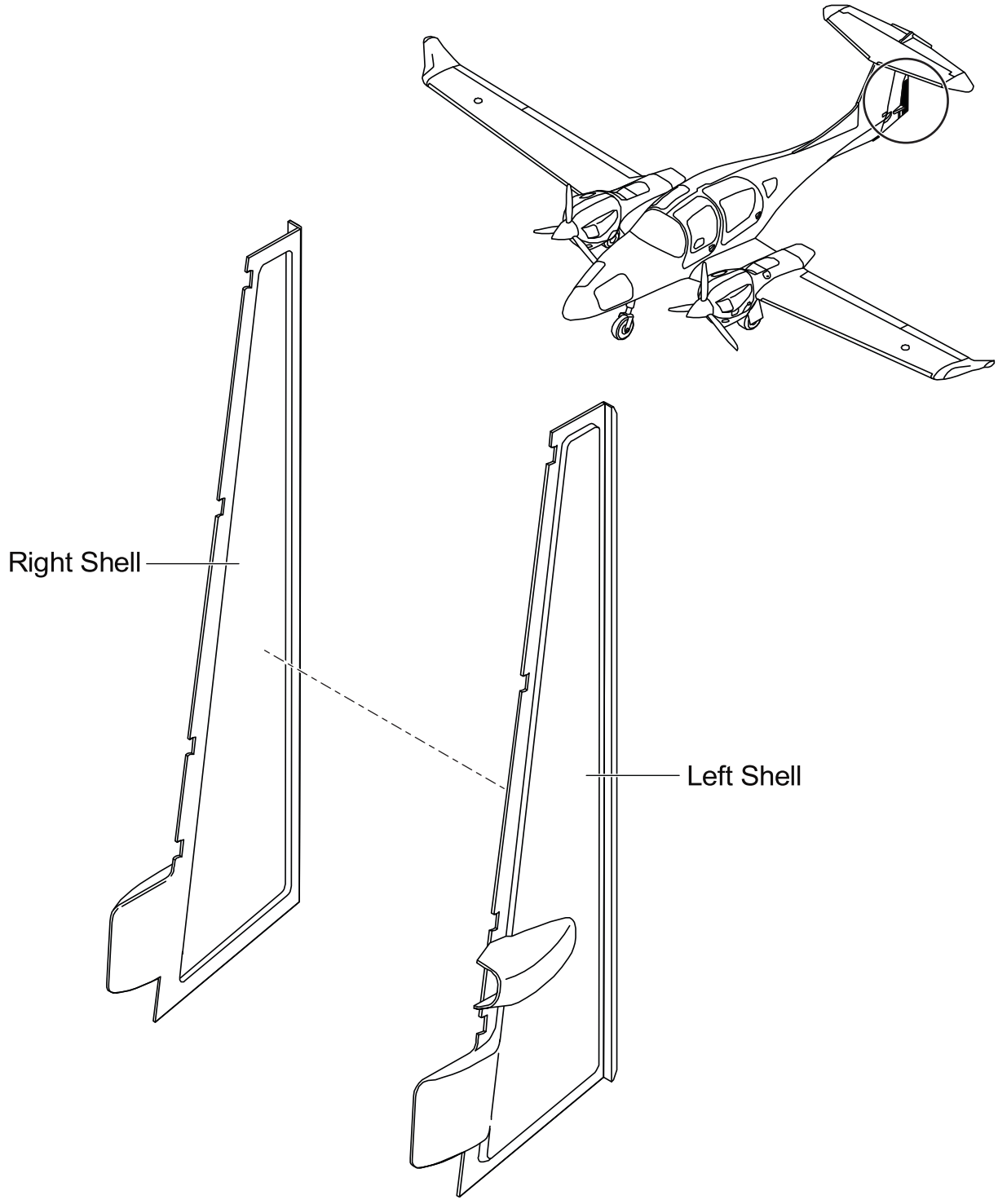

Figure 2 : Rudder Trim-Tab

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.

Refer to Section 27-21 for the rudder trim-tab setting.

2. **Remove/Install the Rudder Assembly**

NOTE: Two persons are necessary to remove/install the rudder assembly.

A. Remove the Rudder Assembly.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the upper and lower hinge covers: - Remove washers and bolts. - Remove the covers.	
(2)	Install surface protection on the rudder.	
(3)	Disconnect the two control rods for the rudder trim-tab: - Remove the two nuts, washers and bolts that attach the control rods to the trim operating lever. - Move the rods clear of the operating lever.	At the rudder bottom bracket.
(4)	Disconnect the upper hinge: - Remove pin. - Remove nut, bolt and bushing.	
(5)	Remove the three bolts and washers which attach the rudder to the rudder rear control assy.	Hold the rudder.
(6)	Pull the rudder aft to disengage the rudder of the vertical stabilizer.	
(7)	Remove the rudder from the airplane.	
(8)	Put the rudder in a stand or on a padded surface.	

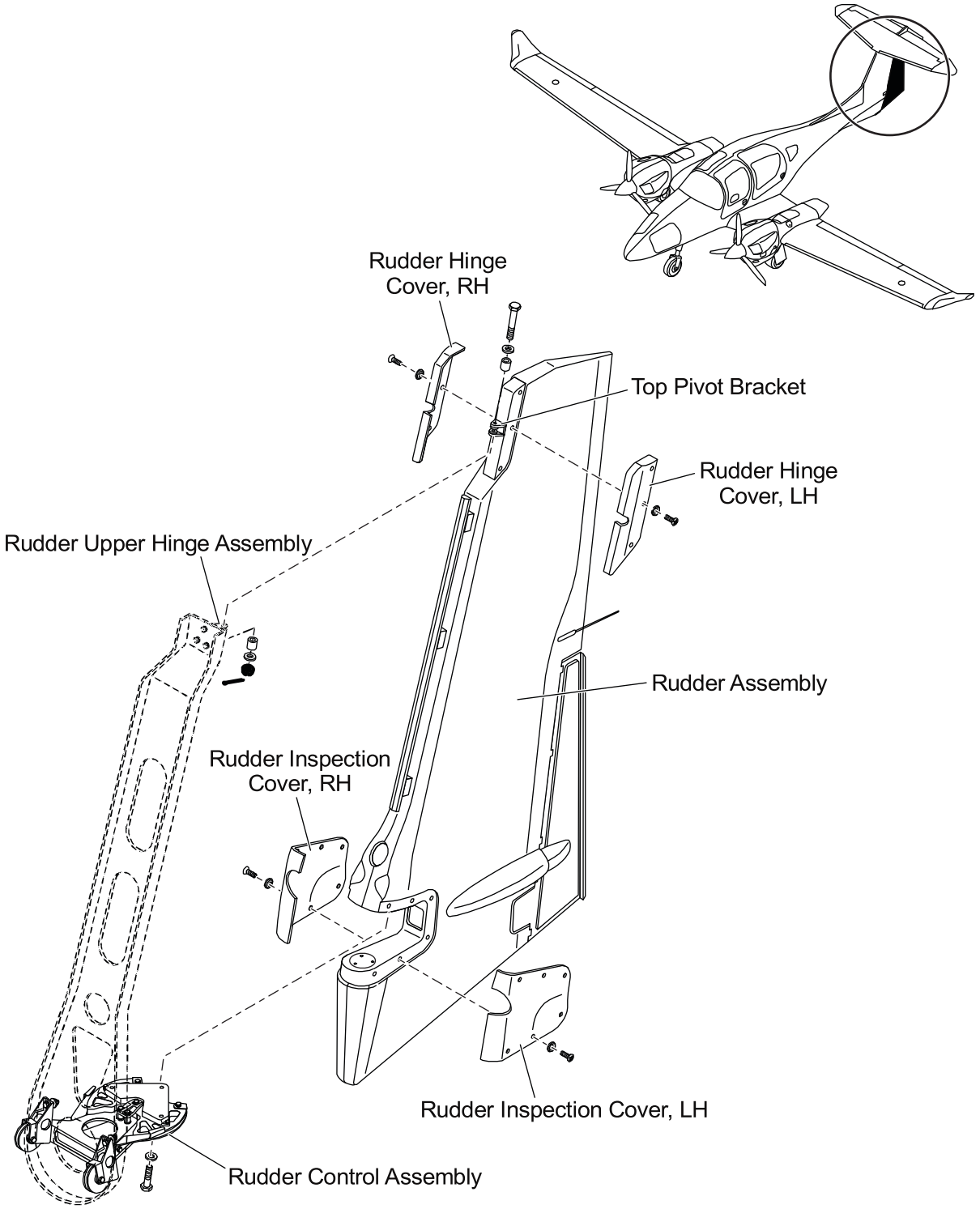

Figure 201 : Rudder Assembly - Removal/Installation

B. Install the Rudder Assembly.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Move the rudder assembly into position at the vertical stabilizer.	
(2)	Install the rudder assembly: - Move the rudder to engage the rudder upper hinge assy. - Install the bolt, washer and nut that attach the rudder to the rudder upper hinge assy. - Install the pin.	 Torque: 6.4 Nm (4.7 lbf.ft.). Use a new pin.
(3)	Connect the rudder control assembly: - Coat each bolt with a thin film of corrosion inhibitive compound CA 1000 or JC 11. - Install the three bolts and washers on the rudder rear control assy.	 Use PPG Aerospace CA 1000, JC 11 (Celloseel QH) or equivalent. Follow the compound manufacturer's instructions.
(4)	Connect the trim-tab control rods: - Align the control rod eye-ends with the trim control levers. - Install the two bolts, washers and nuts that attach the eye-ends to the control levers.	
(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)	Install upper and lower hinge covers.	
(8)	Remove the surface protection from the rudder.	
(9)	If necessary for your Airworthiness Authority do a duplicate inspection of the rudder control system.	

3. **Remove/Install the Rudder Trim-Tab**

A. Remove the Rudder Trim-Tab.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Disconnect the two control rods for the rudder trim-tab: - Remove the two nuts, washers and bolts that attach the trim control rods to the trim control horn. - Move the rods clear of the operating lever.	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.

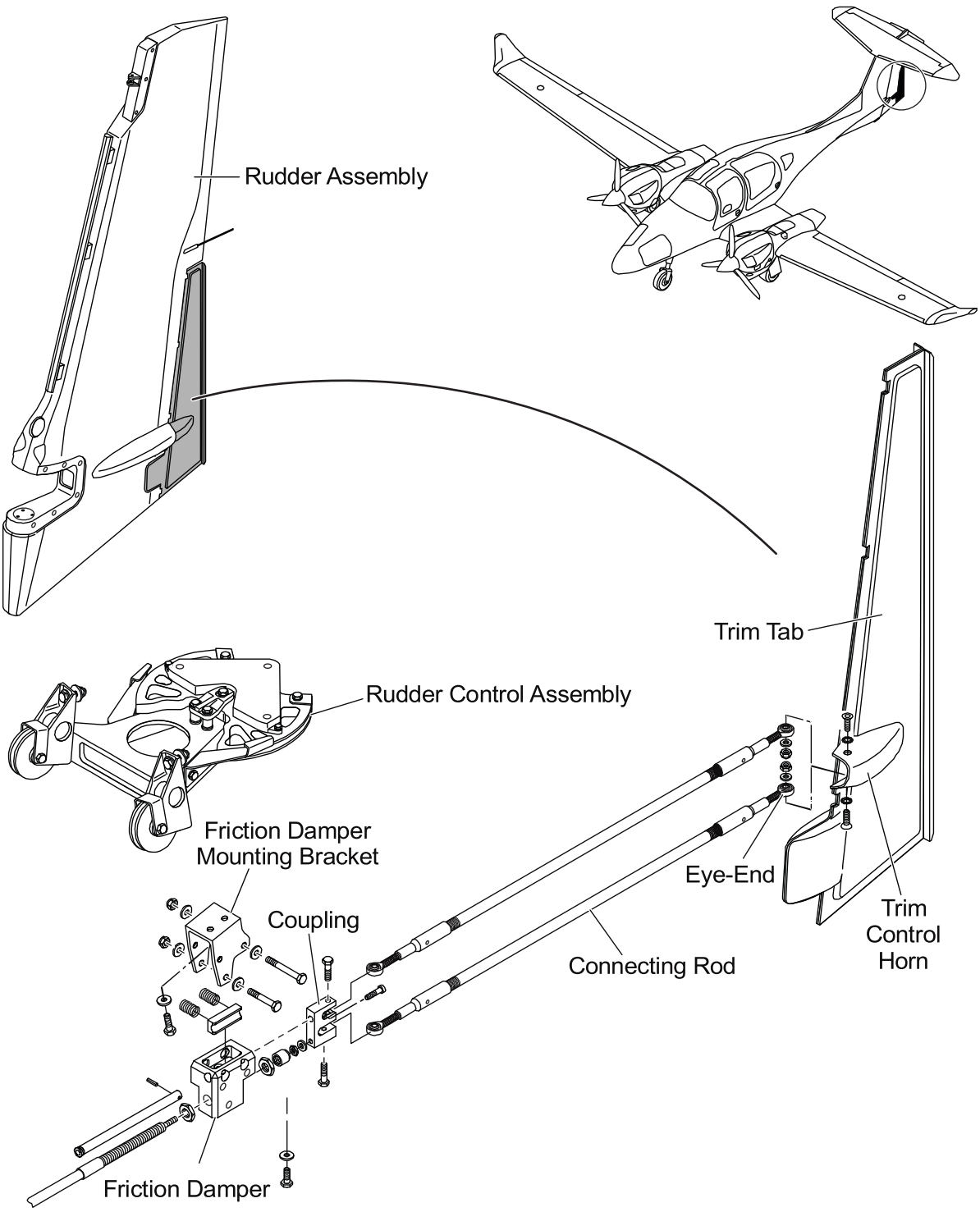

Figure 202 : Rudder Trim-Tab - Removal/Installation

B. Install the Rudder Trim-Tab.

Refer to Figure 202.

	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.	

CHAPTER 56

WINDOWS

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CHAPTER 56

WINDOWS

1. General

The DA 62 has seven windows. All of the windows are molded acrylic glass (plexiglass). Each pilot door (LH/RH) has a window. The passenger door has a window. The right side of the fuselage has a window for the passenger seat row 1 and two additional small windows for the passenger seat row 2.

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 LH/RH pilot door and passenger door structure.

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Section 56-10

Flight Compartment Windows

1. **General**

This Section tells you about the windows in the doors and fuselage.

Refer to Section 52-10 for data about the LH/RH pilot door and passenger door structure.

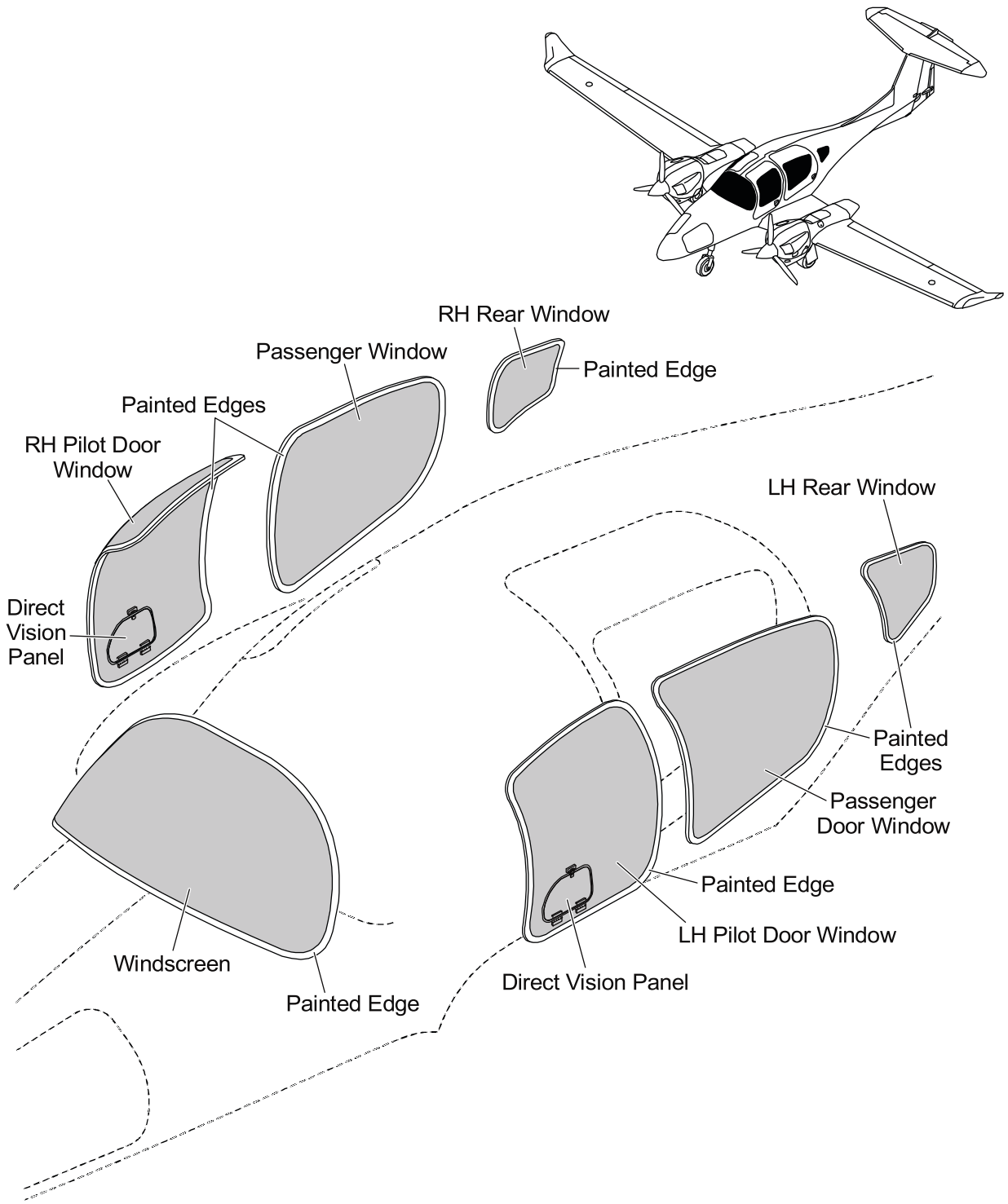

Figure 1 : Windows

2. Description and Operation

Figure 1 shows the windows.

The DA 62 has seven windows. Each window is polycast molded acrylic glass (plexiglass). A high-performance elastic adhesive bonds each window to the structure. A flexible sealant fills the small gap between the edge of the window and the structure.

The two gull wing doors cover the pilots' cockpit. The windscreen is separated. Each pilot door 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 seat row 1 and two additional small windows for the passenger seat row 2.

Each window has a band of white paint over the area where it bonds to the structure. New windows are painted by the manufacturer.

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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**

NOTE: You must cut the window from the frame to replace it.

A. Equipment.

Item	Quantity	Part Number
Rocker saw with non-rotating saw blade.	1	Commercial
Adhesive.	A/R	Sika Primer 209D
Promoter for PMMA.	A/R	PPG PR-1861
Promoter for Composite.	A/R	PPG PR-148
Sealant - black.	A/R	Terostat MS 9380.

B. Procedure.

	Detail Steps/Work Items	Key Items/References
	WARNING: THE MIXING AND APPLICATION OF ADHESIVES MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. IF THE MANUFACTURERS INSTRUCTIONS ARE NOT FOLLOWED, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL COULD RESULT. NOTE: Use cleaning agent Isopropanol on windows	
(1)	If a door window must be replaced, remove the applicable door.	Refer to Section 52-10, Maintenance Practices.
(2)	Put the door on a firm working surface. - Go to Step (4) of this procedure.	To work on the window replacement.

	Detail Steps/Work Items	Key Items/References
(3)	If the windscreen window, the passenger RH side window or a LH/RH rear window must be replaced. - Put protective covers on the inside of the airplane adjacent to the window to be replaced. - Go to Step (4) of this procedure.	
(4)	Cut the damaged window from the window door frame or the fuselage door frame.	Use the rocker saw with non-rotating saw blade.
(5)	Grind the frame in order to remove the remaining window material and sealant.	
(6)	Put the new window in the window door frame or the fuselage door frame position. Align the two holes in the window (center front and back) with the holes in the frame.	
(7)	Carefully remove the protective coating from the new window on the future bonding surface.	
(8)	Prepare the window bonding surfaces:	Use sand paper (grid size 220) on the bonding surfaces until they are rough and not shiny. Apply a thin coat of PR-1861 to the cleaned surface (don't apply on the composite) by brush and allow to dry for at least 40 minutes.
(9)	Prepare the door frame/fuselage frame bonding surfaces:	Use sand paper (grid size 80) on the bonding surfaces until they are rough and not shiny. Apply a thin coat of PR-148 to the cleaned surfaces (don't apply on PMMA) by brush and allow to dry for at least 30 minutes. After drying remove excess adhesion promoter PR-148 from composite bonding area with a clean cloth.
(10)	Remove dust from all of the bonding surfaces and make sure to not get any grease or silicone on the bonding surfaces.	
NOTE: The primed surfaces must not be contaminated. Bonding must be done within eight hours, otherwise the priming must be repeated.		

	Detail Steps/Work Items	Key Items/References
(11)	Apply thin red adhesive tape on the frame and the window.	Refer to Figure 201.
NOTE:	It is very important that the window is positioned within 30 minutes after the adhesive has been applied.	
(12)	Apply the adhesive and follow the suggested shape and positioning around the entire door window frame/fuselage window frame.	Refer to Figure 201. Make sure to apply a constant amount of adhesive.
(13)	Position the window in place on the door frame/ fuselage frame by use of the two pins.	
(14)	Push the window into position. After first positioning, do not move the window again, to prevent adhesive smearing.	Refer to Figure 201. Align the window with the frame surface
(15)	Carefully remove the excess adhesive along the joint (1 - 2 mm [0.04 - 0.08 in] deep).	Use a plastic spattle.
(16)	Use adhesive tape to hold the window in place.	
(17)	Allow the adhesive to cure.	According to the manufacturers instructions
(18)	Remove the two pins.	
(19)	Remove the adhesive tape which held the window in place on the frame.	
(20)	Apply masking tape on both sides of the joint.	Refer to Figure 201.
(21)	Use sealant to fill the joint and the pinholes and smoothen the surface.	Use a plastic spattle.
(22)	Spray the joint with a water/cleaning solvent solution and smooth the surface by hand.	

	Detail Steps/Work Items	Key Items/References
(23)	Remove all adhesive and masking tapes.	
(24)	Allow the sealant to cure.	A minimum of 24 hours is required.
(25)	If a door window was replaced, install the applicable door.	Refer to Section 52-10, Maintenance Practices.
(26)	If the windscreen window, the passenger RH side window or a LH/RH rear window was replaced. - Remove the protective covers on the inside of the airplane adjacent to the window that was replaced.	

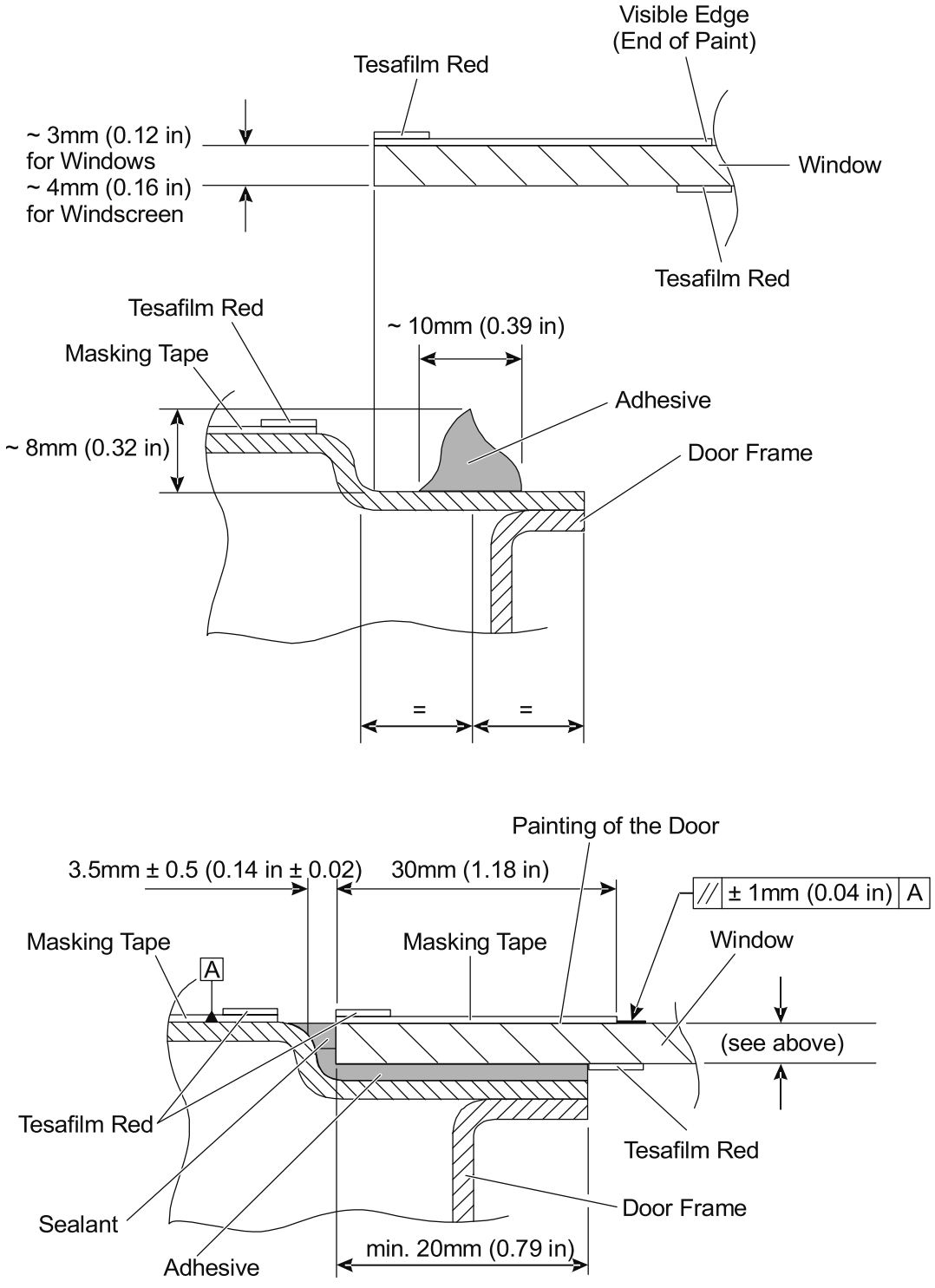

Figure 201 : Position and Form of the Applied Adhesive and Sealant

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: Acrifix 192 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 Acrifix 192).	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 202.

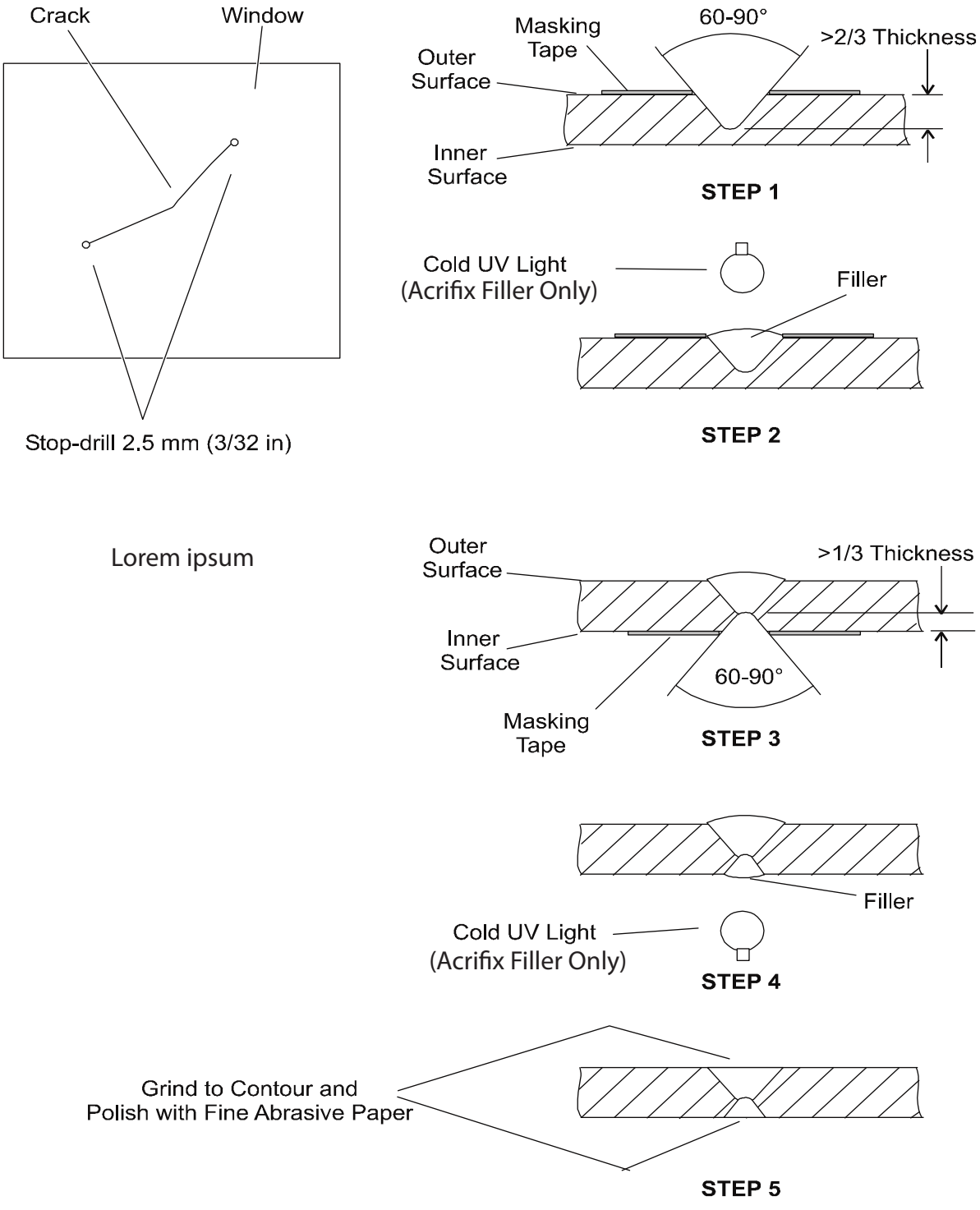

Figure 202 : Window Repairs

D. Permanent Repairs to Windows.

	Detail Steps/Work Items	Key Items/References
(1)	If a door window must be repaired, remove the applicable door.	Refer to Section 52-10, Maintenance Practices.
(2)	Put the door on a firm working surface. - Go to Step (4) of this procedure.	To work on the window repair.
(3)	If the windscreen window, the passenger RH side window or a LH/RH rear window must be repaired. - Put protective covers on the inside of the airplane adjacent to the window to be repaired. - Go to Step (4) of this procedure.	
(4)	Mask the area around the crack on both the inner and outer surfaces.	
(5)	Cut a groove along the crack in the outer surface of the window.	Refer to Figure 202, step 1.
(6)	Countersink temporary stop-drill holes.	
(7)	Seal the stop-drill holes on the inner surface.	Use plastic adhesive tape.
(8)	Apply filler to the groove and the stop-drill holes.	Refer to Figure 202, step 2. Use Acrifix 192 or Tensol cement No. 70.
(9)	Let the filler cure.	
(10)	If possible, turn the window so that the inner surface is up. Remove any plastic adhesive tape.	
(11)	Cut a groove along the crack in the inner surface of the window.	Refer to Figure 202, 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.		
(12)	Countersink the filler in the stop-drill holes on the inner surface to 1 mm (0.04 in).	
(13)	Apply filler to the groove and the stop-drill holes.	Refer to Figure 202, step 4.

	Detail Steps/Work Items	Key Items/References
(14)	Let the filler cure.	Refer to the manufacturer's data.
(15)	Remove the masking materials.	
(16)	Grind the filler to the profile of the surface.	Grind both sides. Refer to Figure 202, step 5.
(17)	Polish the repair area with fine abrasive paper.	
(18)	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).
(19)	If a door window was repaired, install the applicable door.	Refer to Section 52-10, Maintenance Practices.
(20)	If the windscreen window, the passenger RH side window or a LH/RH rear window was repaired. - Remove the protective covers on the inside of the airplane adjacent to the window that was repaired.	

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CHAPTER 57

WINGS

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CHAPTER 57

WINGS

1. General

The DA 62 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.

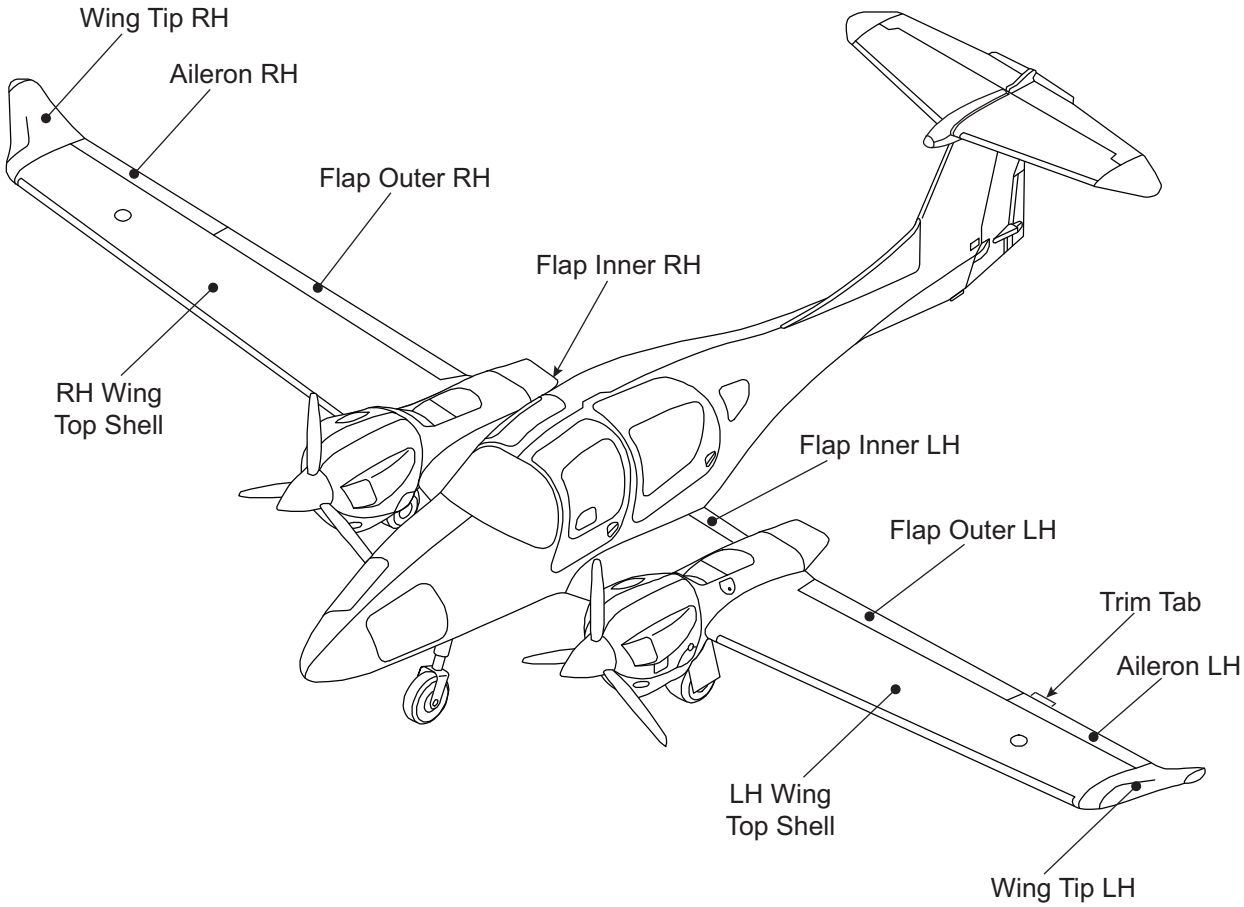

Figure 1 : Wing Components

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.

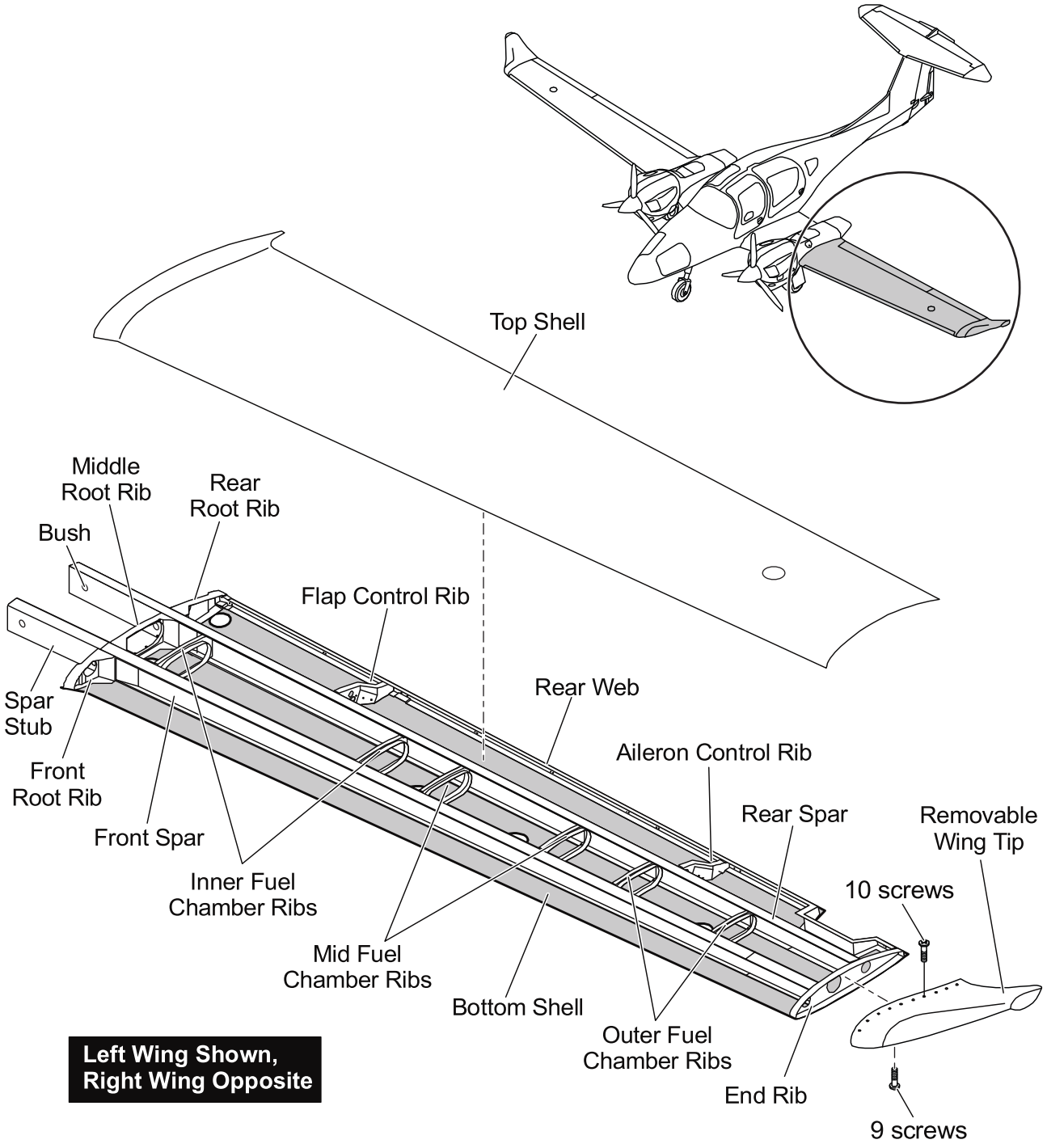

Figure 1 : Wing Structure

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 CFRP 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 explain how to remove and install the outer wings and the wing tips. They also explain how to remove and install the A or B-Bolts and the control surface hinge-brackets.

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

B. Remove the Wings.

Refer to Figure 201.

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 push-rod: - Remove the nut, washer and bolt.	At the wing root. Through the engine nacelle access panels.

	Detail Steps/Work Items	Key Items/References
(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 in color). The hose is 8 mm (5/16 in) diameter (purple in color).
(9)	Disconnect the wing electrical connector.	Through the engine nacelle access panels.
(10)	Disconnect the wing bonding connections.	Through the engine nacelle access panels.
	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.**	
(11)	Disconnect the fuel lines.	
(12)	Disconnect the fuel hose from the fuel tank.	Put a container to catch the small quantity of fuel that can come from the fuel hose. Clean up any spilled 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: THREE PERSONS ARE REQUIRED TO LIFT THE WING. OTHERWISE 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.	

	Detail Steps/Work Items	Key Items/References

(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 on a wing stand.	
NOTE: If you use trestles, put one trestle under the spar stubs. Put the second trestle under the wing end rib.		

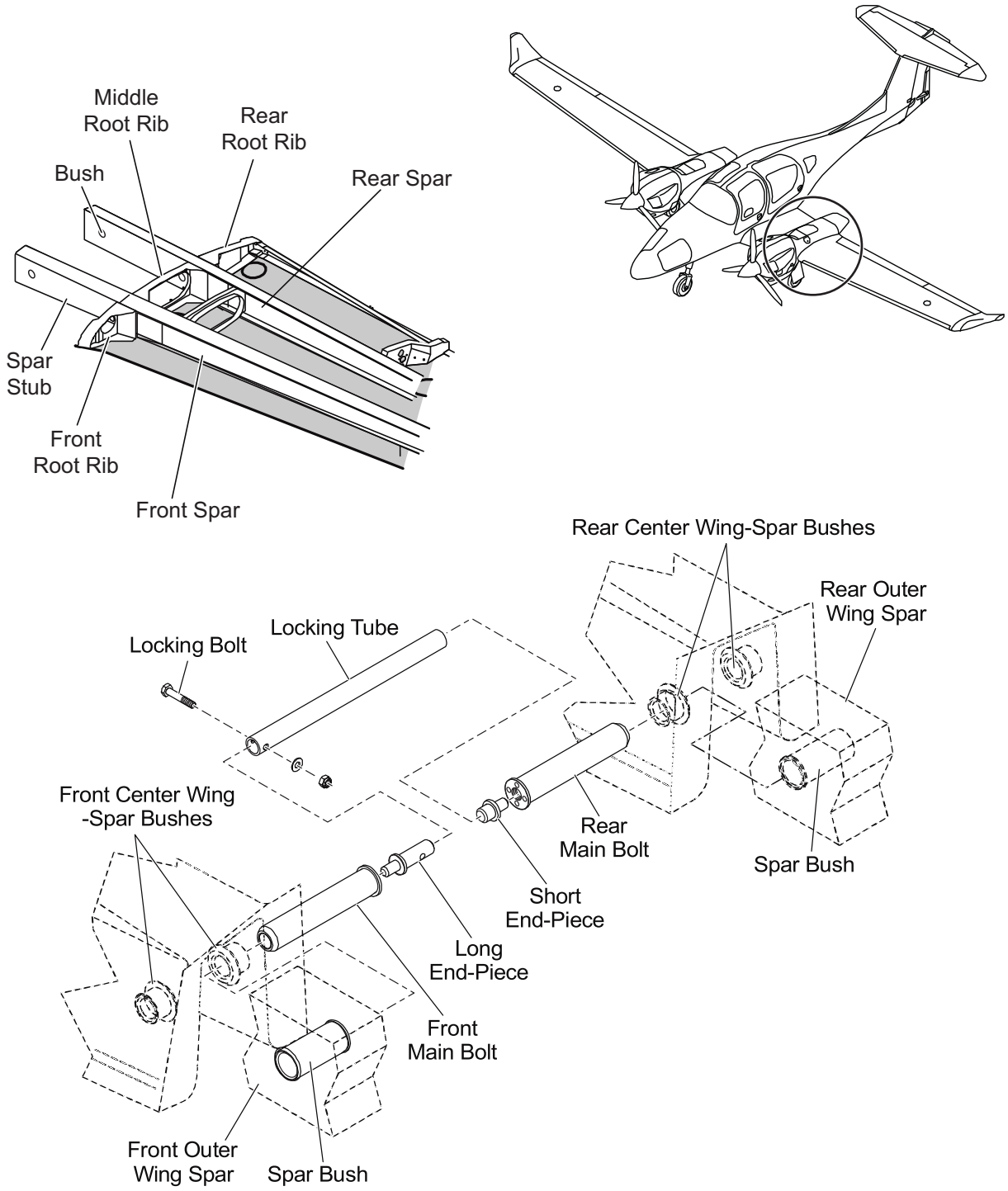

Figure 201 : Outer Wing - Removal/Installation

C. Pre-Installation Procedure.

Do this check before you install the wings.

Refer to Figures 201 and 202.

	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 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.	

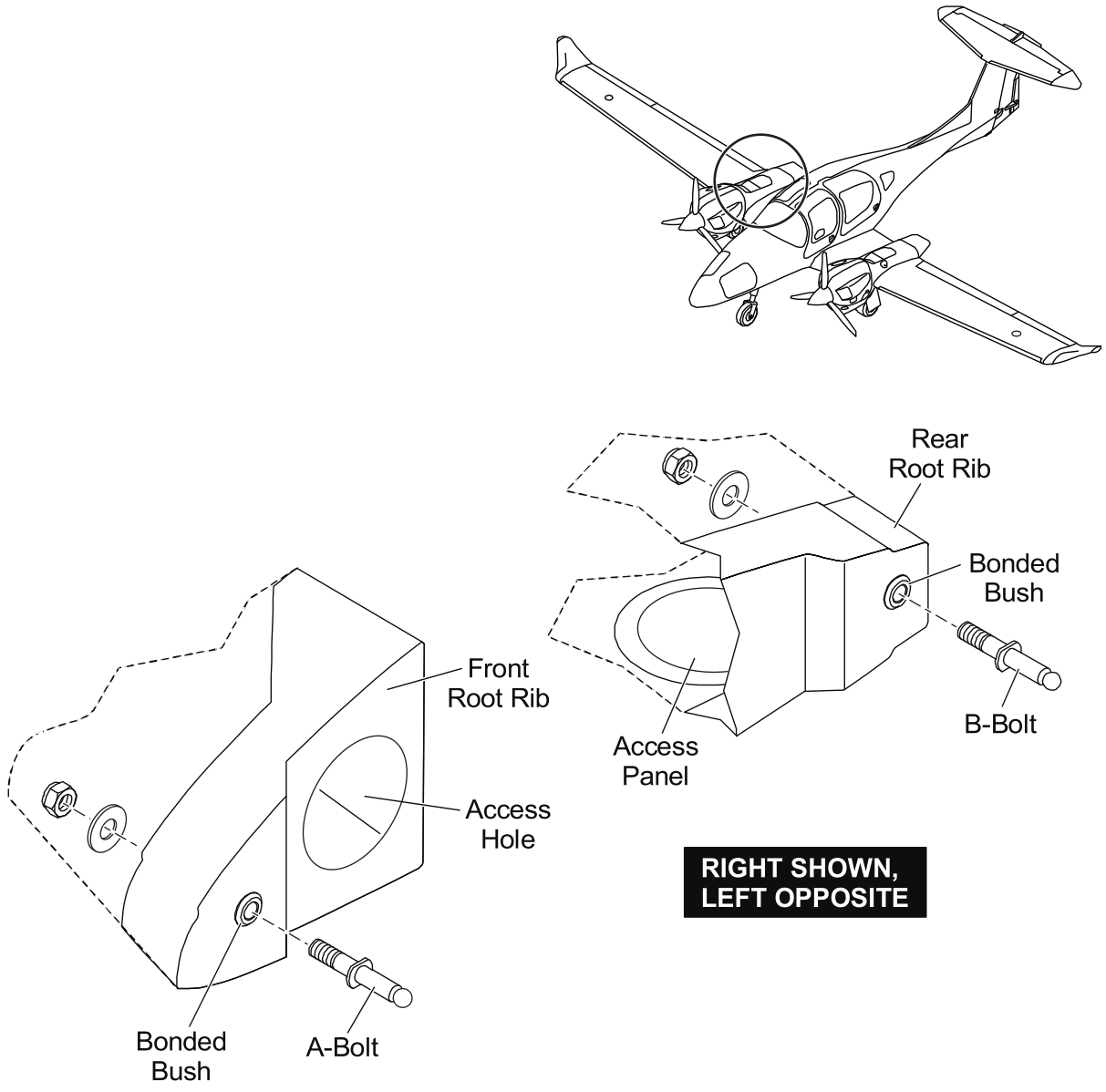

Figure 202 : A-Bolt and B-Bolt Installation

D. Install the Wings.

Refer to Figure 201.

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.

	Detail Steps/Work Items	Key Items/References
(1)	Do the pre-installation check.	Refer to Paragraph 2.C.
	WARNING: THREE PERSONS ARE REQUIRED TO LIFT THE WING. OTHERWISE 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.	
	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.	
(2)	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.	 Hold the wing in position. Hold the wing in position. Pitot static tube left wing only. Hold the wing in position.
(3)	Install the main bolts: - Hold the weight of the wing. - Install each bolt.	If necessary, move the wing tip a small amount up and down to help install the main bolts.

	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.	
(5)	Connect these items: - The Pitot hose. - The static hose.	Left wing only. The hose is 8 mm (5/16 in) diameter (green in color). The hose is 8 mm (5/16 in) diameter (purple in color).
(6)	Connect the electrical connector.	Through the engine nacelle access panels.
(7)	Connect the bonding connections.	Through the 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 at the wing root: - Install the bolt, washer and self-locking nut.	Through the engine nacelle access panels. Torque: 6.4 Nm (4.7 lbf.ft.).
(11)	Connect the aileron pushrod at the wing root: - Install the bolt, washer and self-locking nut.	Through the 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.	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 62 Airplane Flight Manual.

3. **Remove/Install the A or B-Bolts**

A. Remove the A or B-Bolts.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the wing.	Refer to Paragraph 2.B.
(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.	Access the A-bolt through the hole in the front root rib. Access the B-bolt through the access panel in the bottom shell.

B. Install the A or B-Bolts.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Examine the A or B-bolt. Look specially for: - Corrosion. - Scratches on the bearing surfaces. - Deformation. - Damage to the threads.	 No corrosion permitted. Maximum depth 0.1 mm (0.004 in). No deformation permitted. 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: - Install the bolt in the bush. - Hold the flats on the flange of the bolt with a wrench. - Install the washer and self-locking nut.	Access the A-bolt through the hole in the front root rib. Access the B-bolt through the access panel in the bottom shell. Torque: 32 Nm (23.6 lbf.ft.).
(4)	Install the wing.	Refer to Paragraph 2.D.

4. **Remove/Install Control Surface Hinge-Brackets**

A. Remove a Control Surface Hinge-Bracket.

Refer to Figure 203.

	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 three bolts. The aileron brackets have two 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 two bolts.

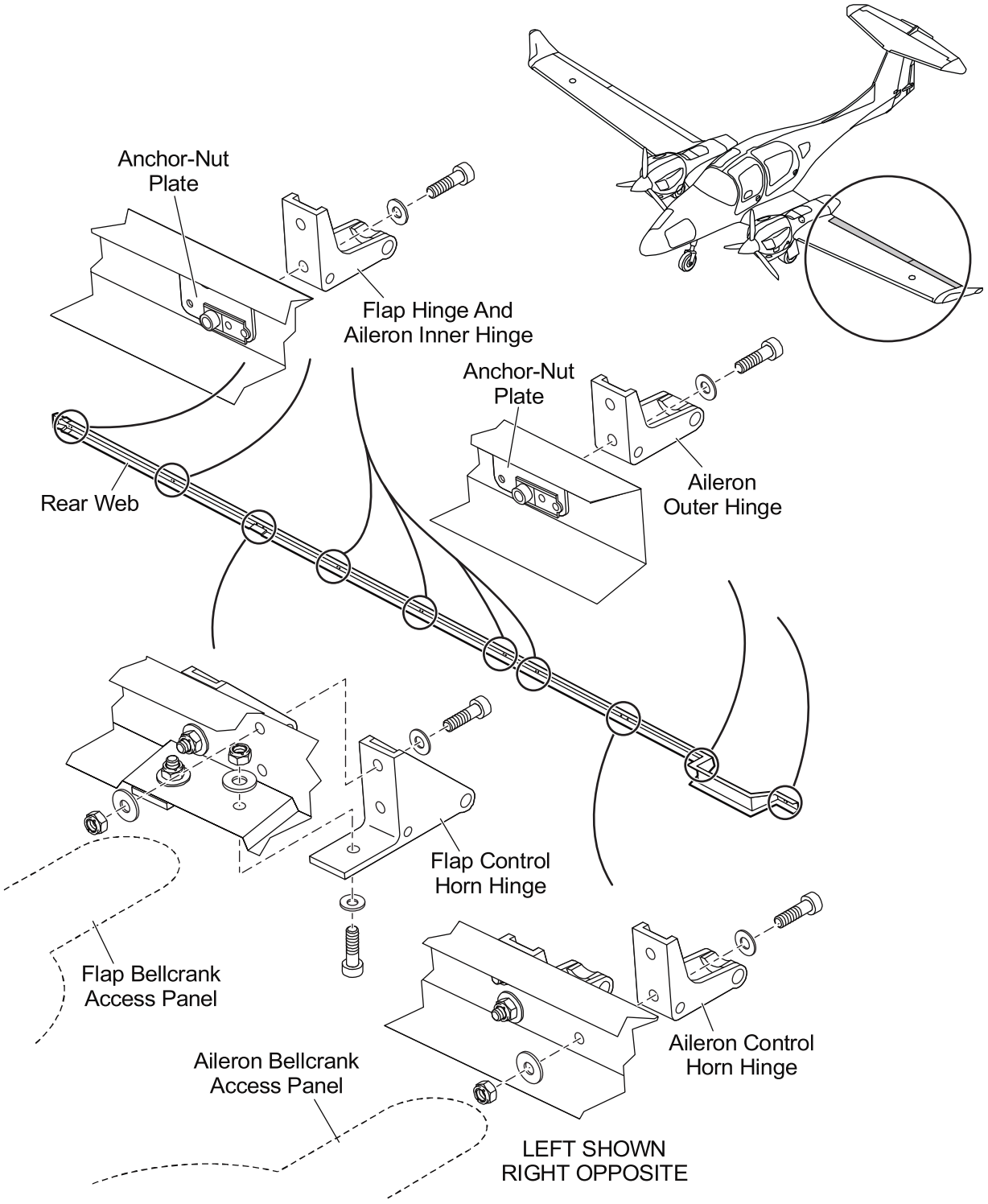

Figure 203 : Control Surface Hinge-Bracket - Removal/Installation

B. Install a Control Surface Hinge-Bracket.

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	For brackets at the control horn hinge: - Put the bracket in position on the rear web. - Install the bolts with small washers. - Install the large washers and self-locking nuts. - Install the control bellcrank access panel under the wing.	The flap brackets have three bolts. The aileron brackets have twobolts. From inside of the wing. Torque: 3.6 Nm (2.7 lbf.ft.).
(2)	For brackets not at the control horn hinge: - Put the bracket in position on the rear web. - Install the bolts and small washers.	All brackets have two bolts. Torque: 3.6 Nm (2.7 lbf.ft.).
(3)	Install the control surface.	Refer to Sections 57-50 and 57-60.

5. **Remove/Install a Wing Tip**

A. Remove a Wing Tip.

Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(1)	Set the ELECT. MASTER switch to OFF.	
(2)	Set these circuit breakers open. - NAV LT/FLOOD. - TAXI/MAP/ACL.	
(3)	Remove the countersunk screws and dimpled washers from under the wing tip.	
(4)	Remove the countersunk screws and dimpled washers from the top side of the wing tip.	Hold the wing tip.
(5)	Pull the wing tip out from the outer wing and disconnect the wiring to the wing tip lighting.	
(6)	Remove the wing tip from the airplane.	The ACL/POS lights remain with the wing tip.

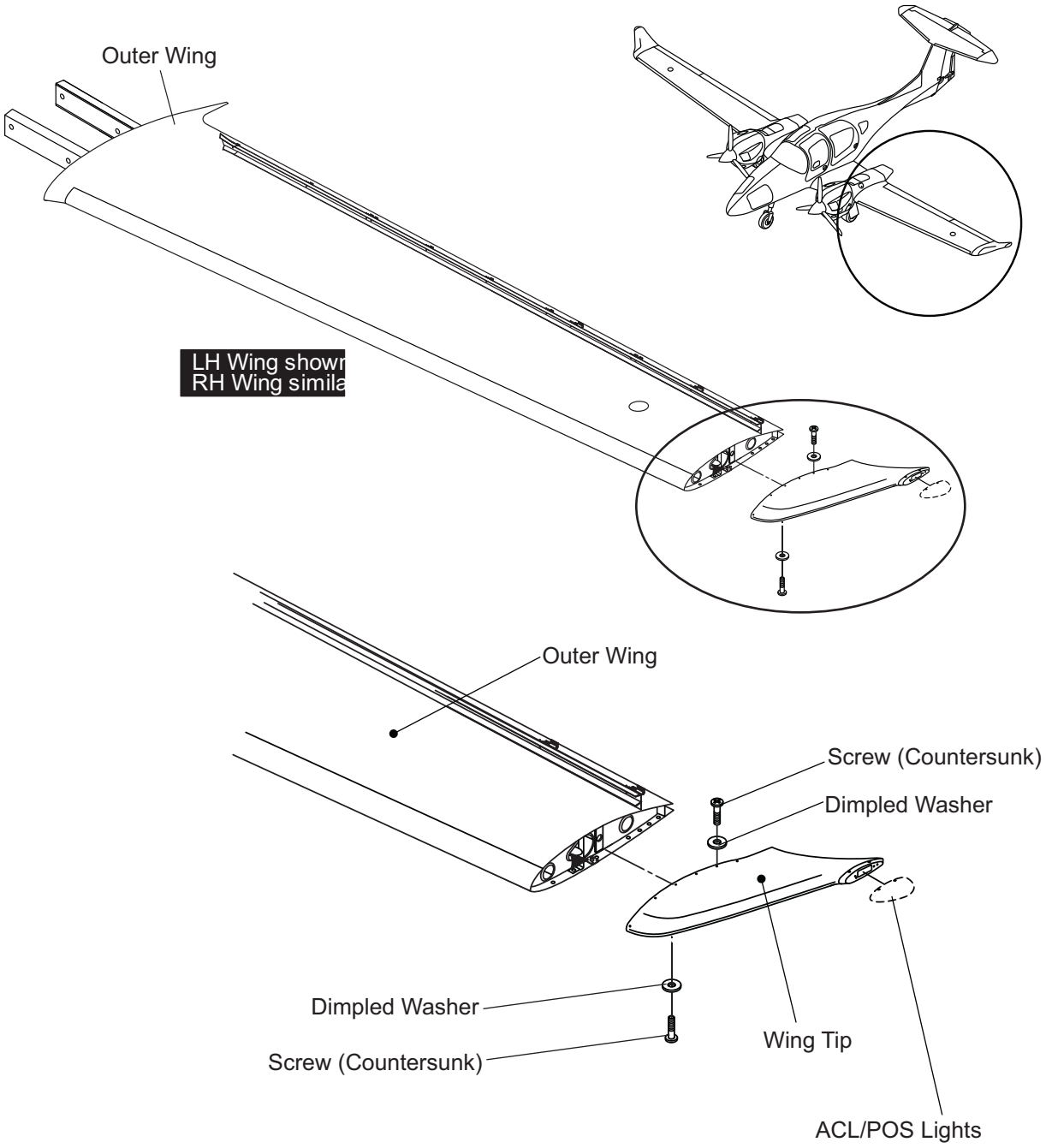

Figure 204 : Wing Tip - Removal/Installation

B. Install a Wing Tip.

Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(1)	Put the wing tip close enough to connect the wiring to the wing tip lighting.	
(2)	Put the wing tip in position on the airplane outer wing.	
(3)	Install the countersunk screws and dimpled washers on the top side of the wing tip.	Hold the wing tip in place. Make sure that the lightning protection strapping is in place.
(4)	Install the countersunk screws and dimpled washers on the underside of the wing tip.	
(5)	Close these circuit breakers: - NAV LT/FLOOD. - TAXI/MAP/ACL.	
(6)	Set the ELECT. MASTER switch to ON.	
	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.**	
(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.	 The strobe lights must both operate. The strobe lights must all go off.
(8)	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.

Section 57-50

Flaps

1. General

This Section tells you about the flap of the DA 62. The DA 62 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.

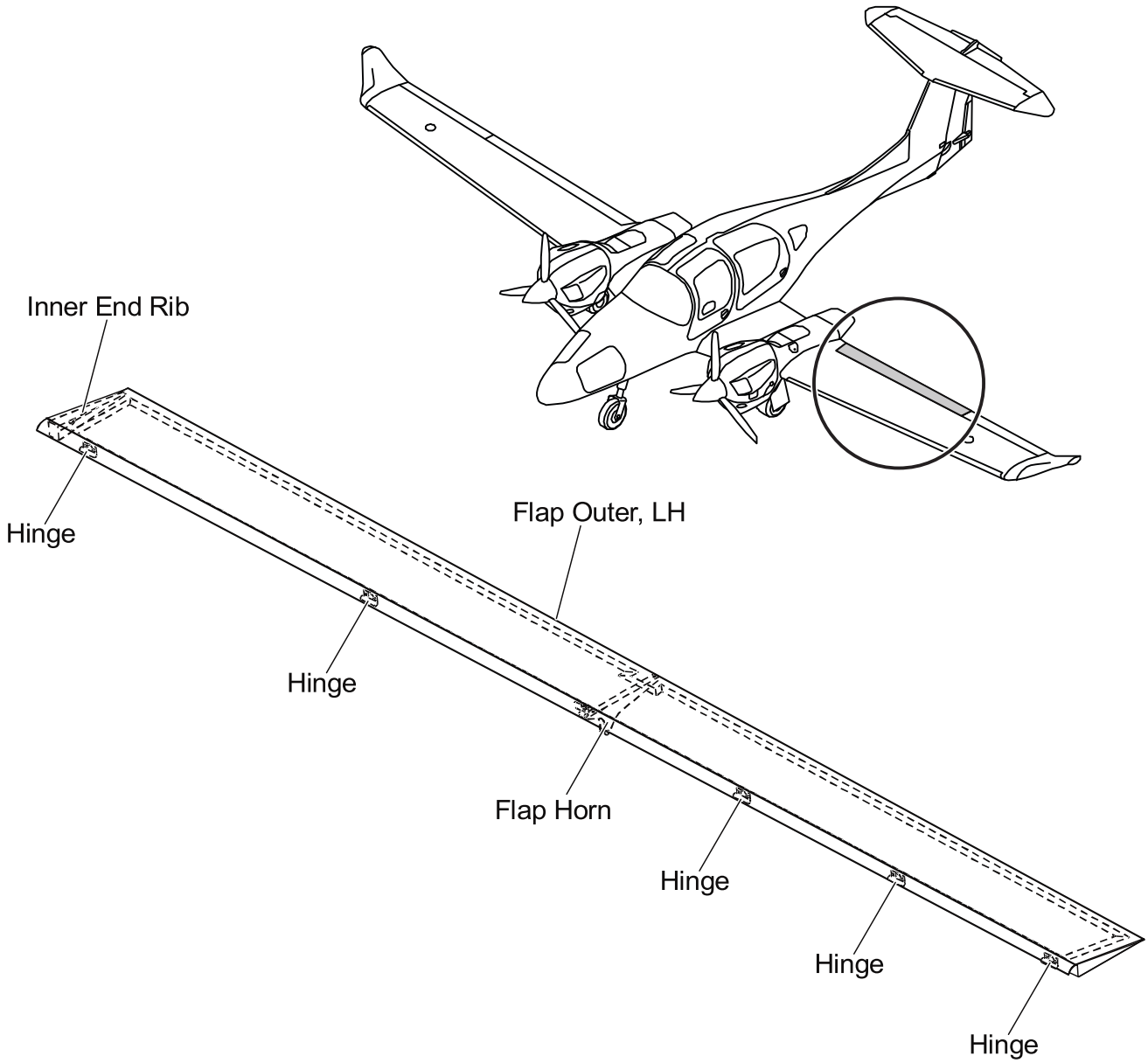

Figure 1 : Outer Flap Assembly

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.

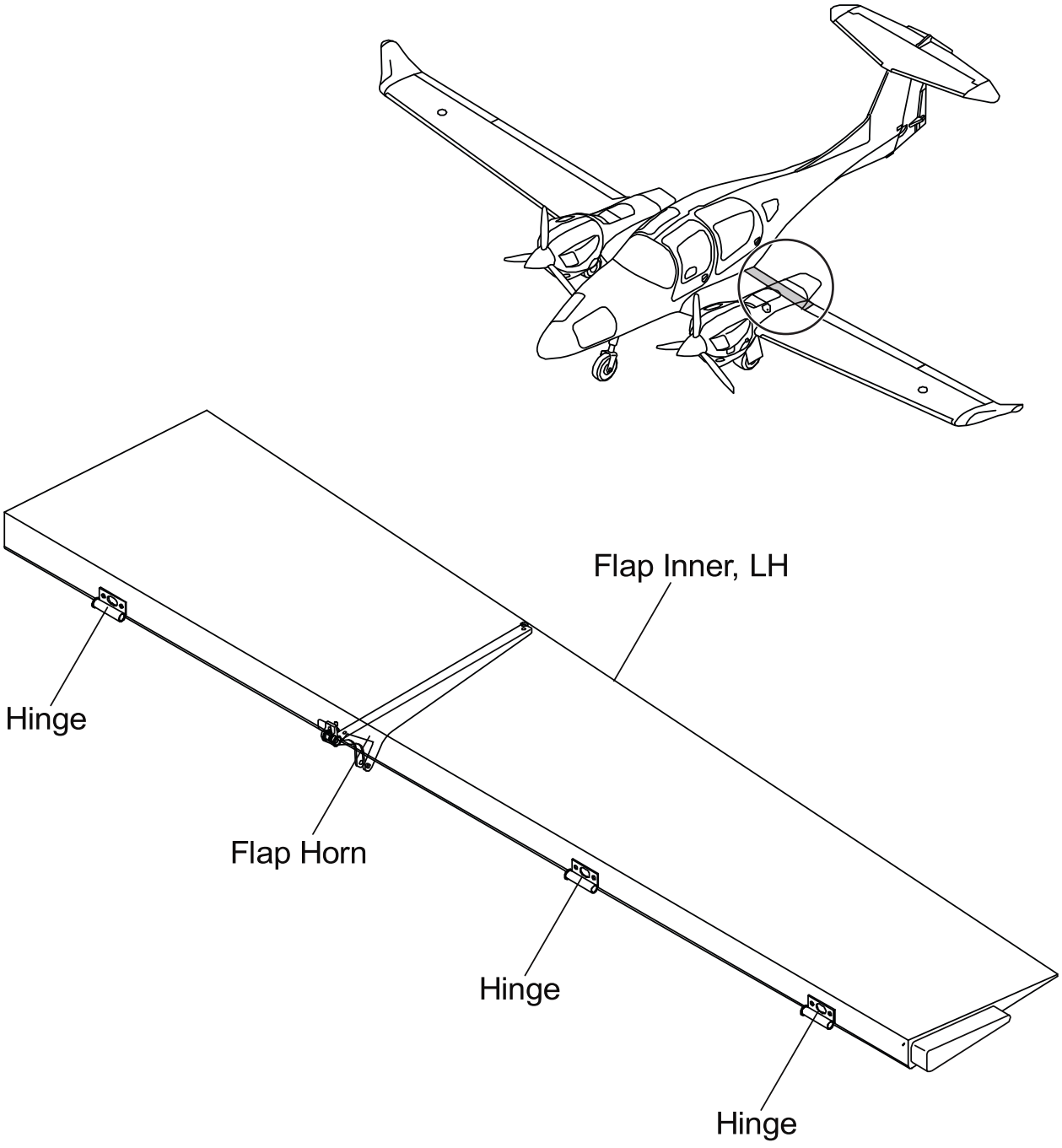

Figure 2 : Inner Flap Assembly

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 outer and inner flaps.
Refer to Section 27-50 for the flap setting procedure.

2. Remove/Install an Outer Flap

A. Remove an Outer Flap.

Refer to Figure 201.

	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.	On the instrument panel, RH side.
(3)	Remove the flap hinge cover: - Remove the screws 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 screw which attaches the push rod to the horn. - Remove the attachment screw and washer from the horn.	Hold the flap.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the six hinge pins from the flap hinges and the flap horn: - Remove the split 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.	

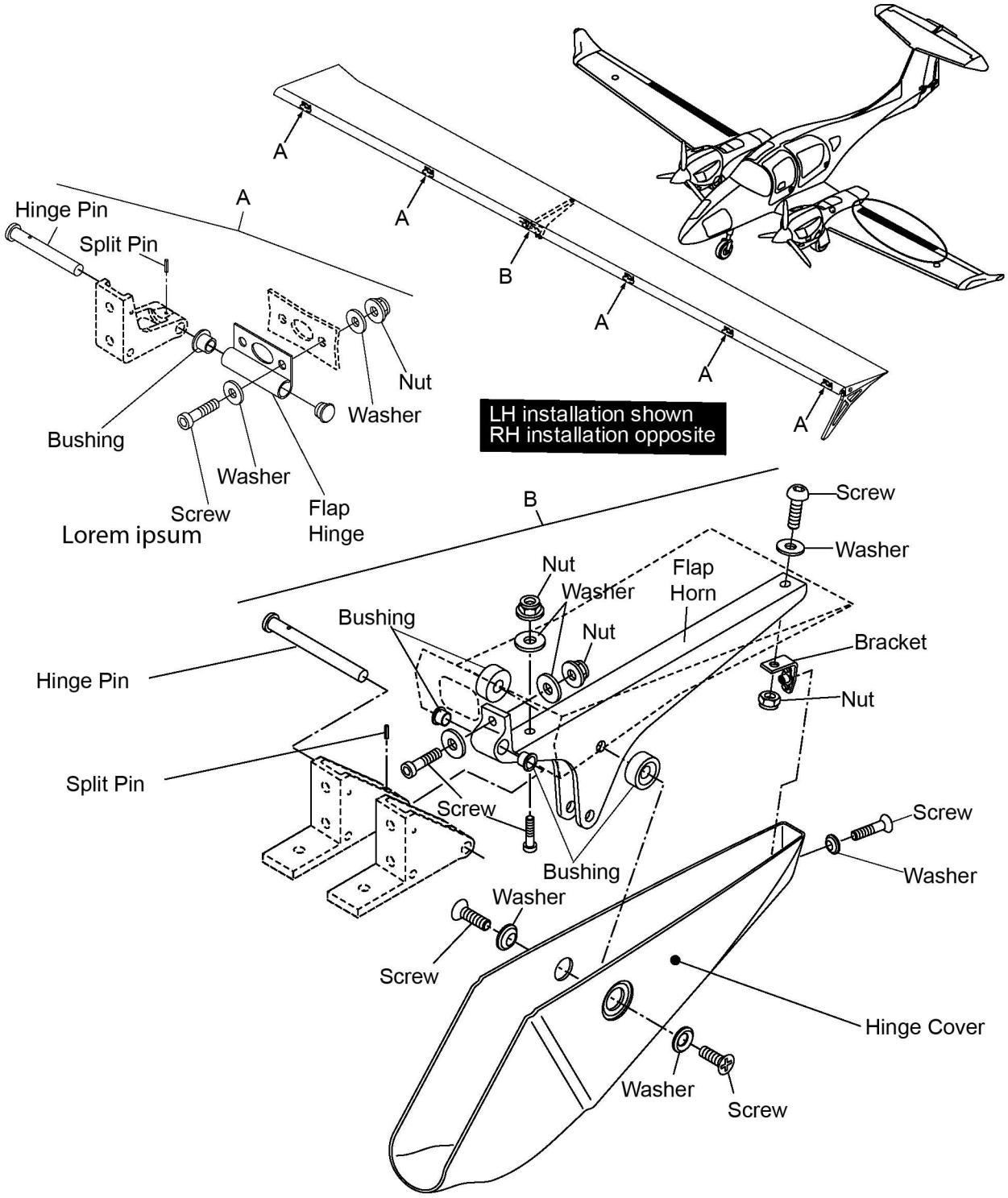

Figure 201 : Outer Flap - Removal/Installation

B. Install an Outer Flap.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the hinge pins are clean and not damaged.	
(2)	Put the outer flap into position on the airplane.	
(3)	Install the six 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 split 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 screw which attaches the flap push rod to the flap horn: - Install a washer on the screw. - Push the screw through the horn and the push rod. - Install the washer and the nut on the screw.	
(5)	Do a test for correct adjustment of the flaps.	Refer to Section 27-50.
(6)	Install the flap hinge cover: - Position the flap hinge cover to the flap horn. - Install the bushings. - Install the washers and screws.	Apply Loctite Screw Locking 243 (blue) or equivalent.
(7)	If necessary for your Airworthiness Authority, do a second inspection of the flap controls.	

3. **Remove/Install an Inner Flap**

A. Remove an Inner Flap.

Refer to Figure 202.

	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.	On the instrument panel, RH side.
(3)	Remove the flap hinge cover: - Remove the screws 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 screw which attaches the push rod to the horn. - Remove the attachment screw and washer from the horn.	Hold the flap.
(5)	Remove the four hinge pins from the flap hinges and the flap horn: - Remove the split pins which locate the flap hinge pins. - Move the hinge pins inboard, and clear of the hinges.	Support the flap assembly.
(6)	Disconnect the bonding wires.	
(7)	Carefully move the flap aft, and clear of the airplane.	

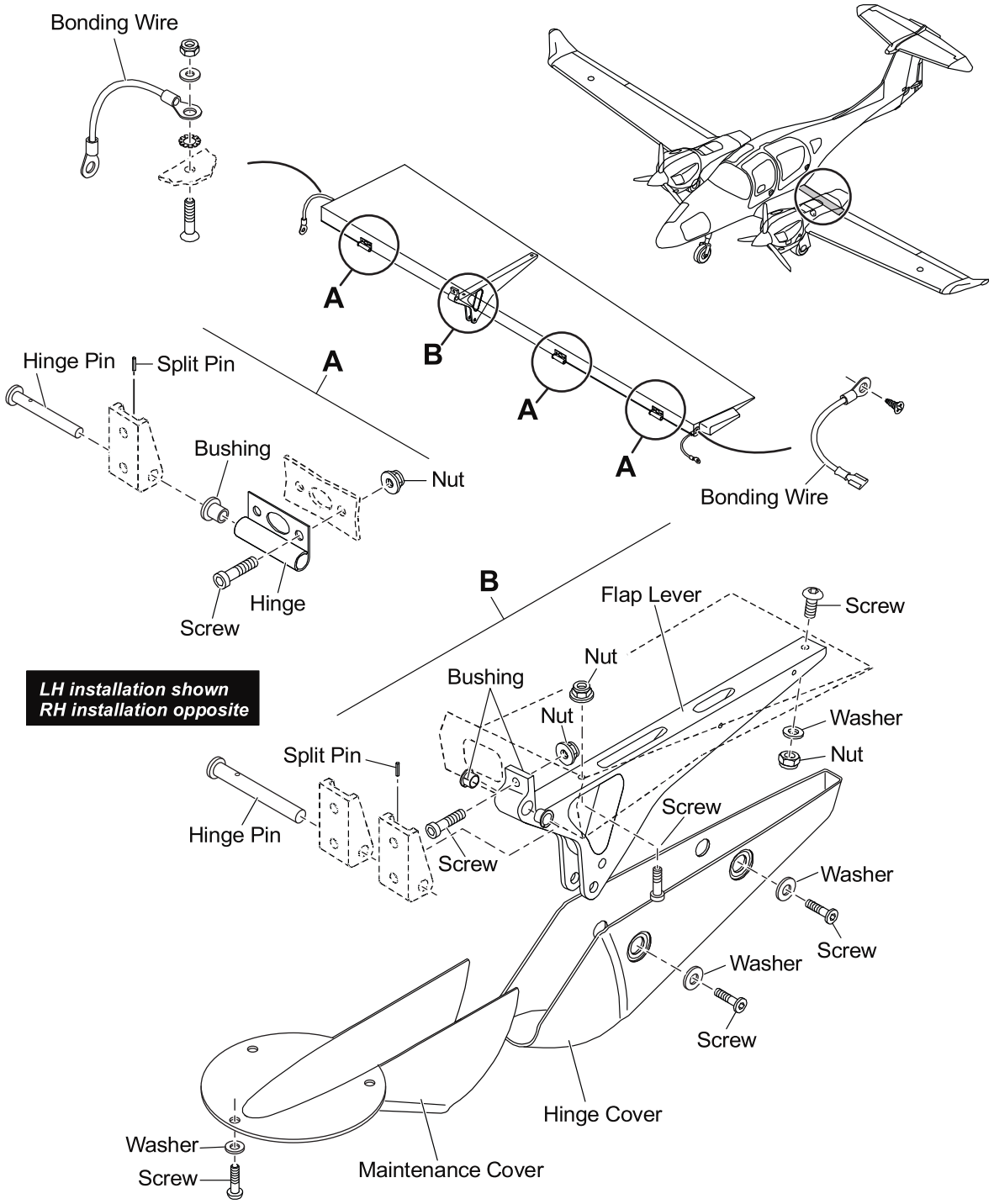

Figure 202 : Inner Flap - Removal/Installation

B. Install an Inner Flap.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the hinge pins are clean and not damaged.	
(2)	Put the inner flap into position on the airplane.	
(3)	Install the four 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 split 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 screw which attaches the flap push rod to the flap horn: - Install a washer on the screw. - Push the screw through the horn and the push rod. - Install the washer and the nut on the screw.	
(5)	Connect the bonding wires.	
(6)	Do a test for correct adjustment of the flaps.	Refer to Section 27-50.
(7)	Install the flap hinge cover: - Position the flap hinge cover to the flap horn. - Install the bushings. - Install the washers and screws.	Apply Loctite Screw Locking 243 (blue) or equivalent.
(8)	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 structure.
Refer to Section 27-10 for data about the aileron control system

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.

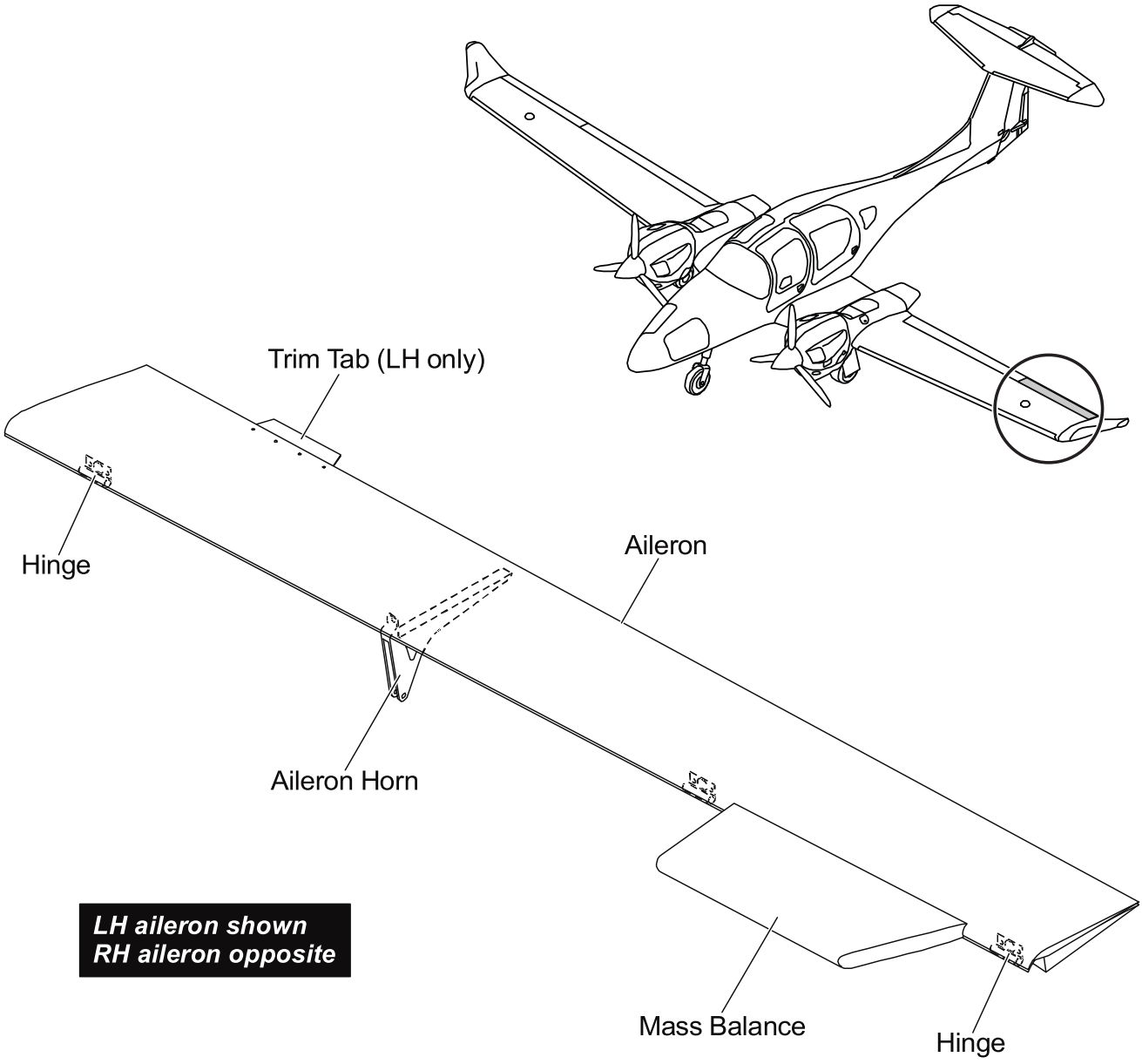

Figure 1 : Aileron Assembly

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.

2. Remove/Install an Aileron

A. Remove an Aileron.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the aileron hinge cover: - Remove the screws 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 screw which attaches the push rod to the horn. - Remove the attachment screw and washer from the horn.	Hold the aileron.
(3)	Remove the four 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.	

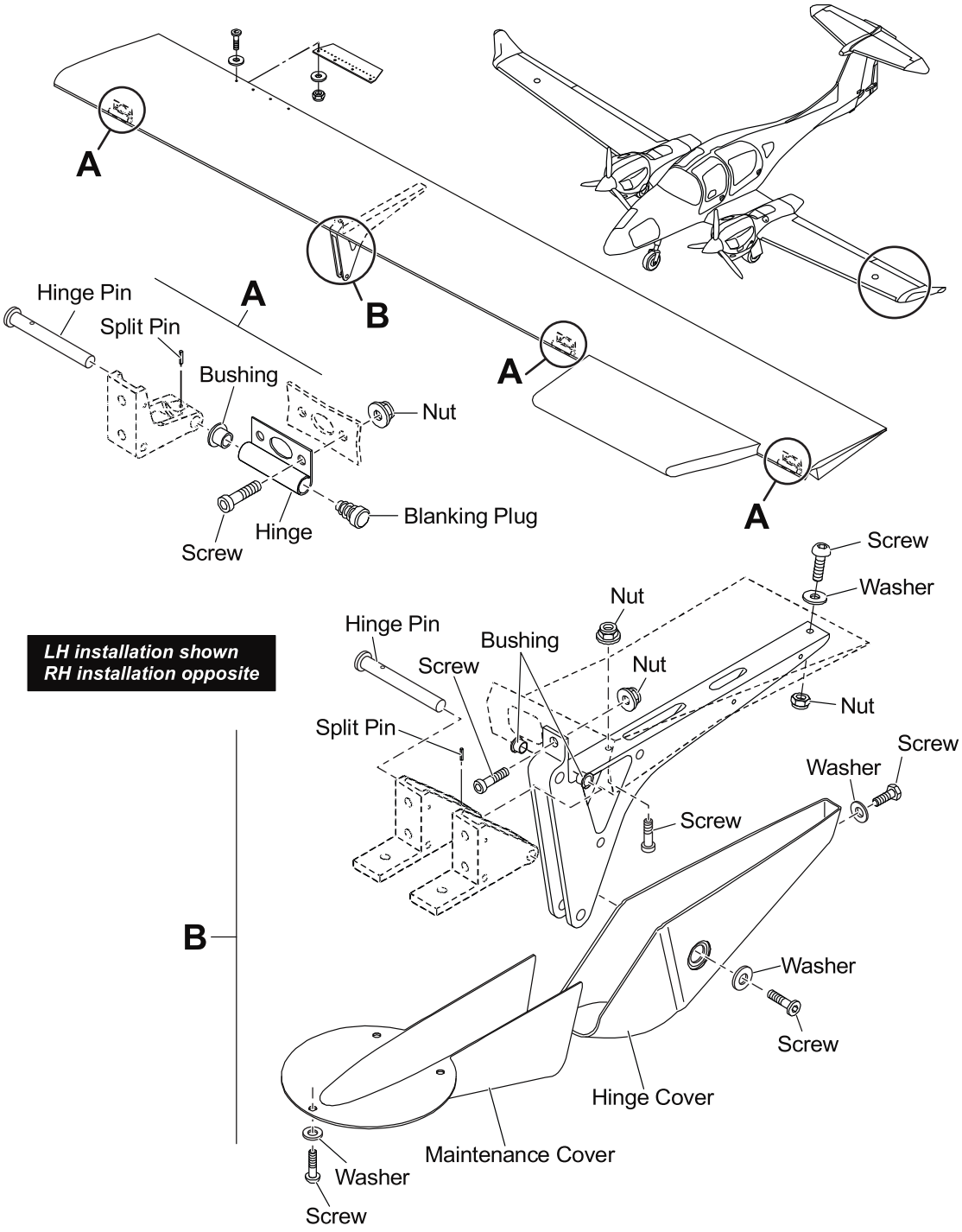

Figure 201 : Aileron - Removal/Installation

B. Install an Aileron.

Refer to Figure 201.

	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 four 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 split 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 screw which attaches the aileron push rod to the aileron horn: - Install a washer on the screw. - Push the screw through the horn and the push rod. - Install the washer and the nut on the screw.	
(5)	Do a test for correct adjustment of the ailerons.	Refer to Section 27-60.
(6)	Install the aileron hinge cover: - Position the aileron hinge cover to the aileron horn. - Install the bushings. - Install the washers and screws.	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 62. 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 62 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.

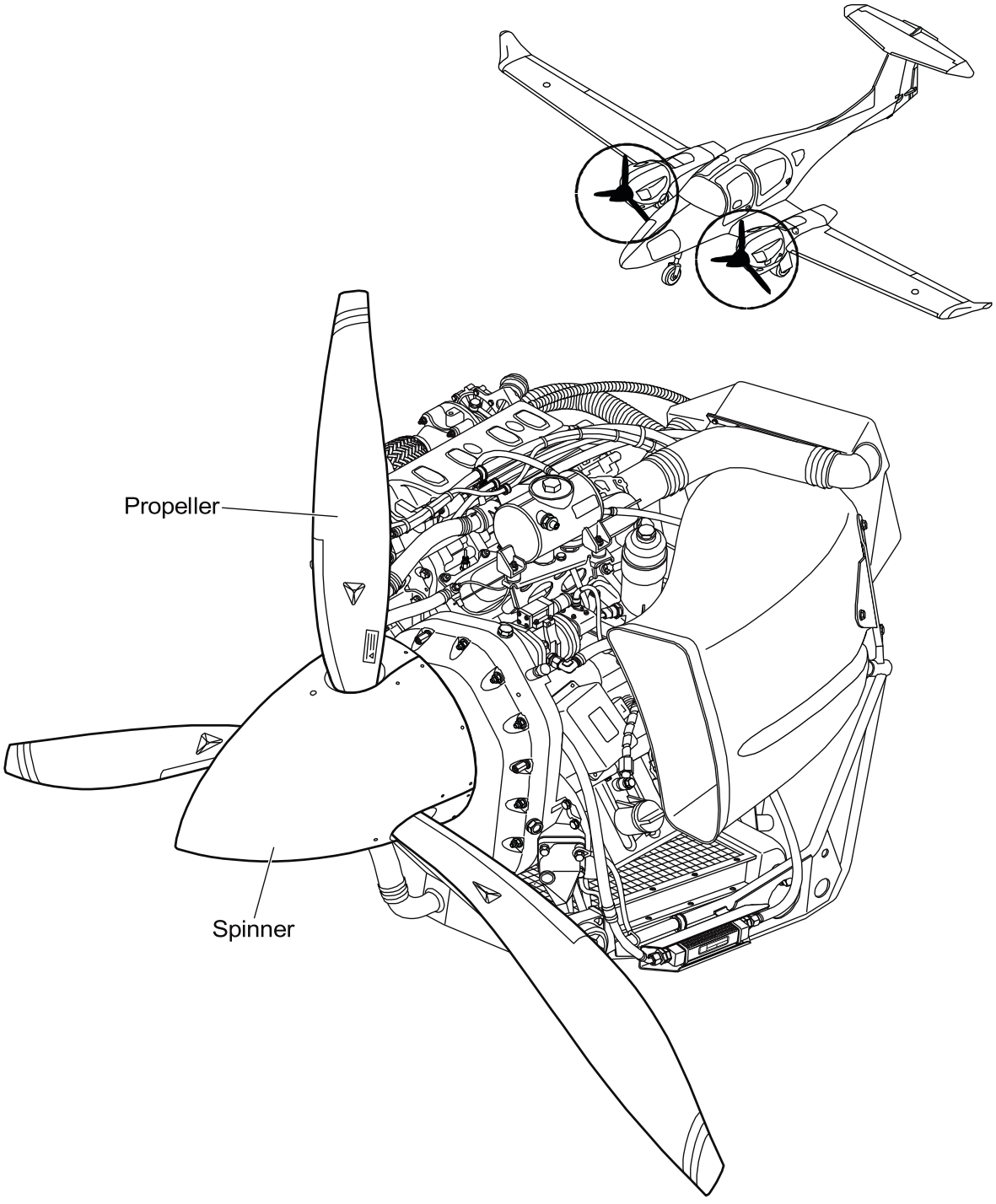

Figure 1 : Propeller Assembly

Section 61-10

Propeller Assembly

1. General

The DA 62 has MTV-6-R-C-F/CF194-80 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).

If OÄM 62-006 is installed, a gearbox fan with an additional alternator pulley is installed on the gearbox flange of the LH engine.

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.

2. Description

Figures 1 and 2 show 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 62-006 is installed, 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.

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 62 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.

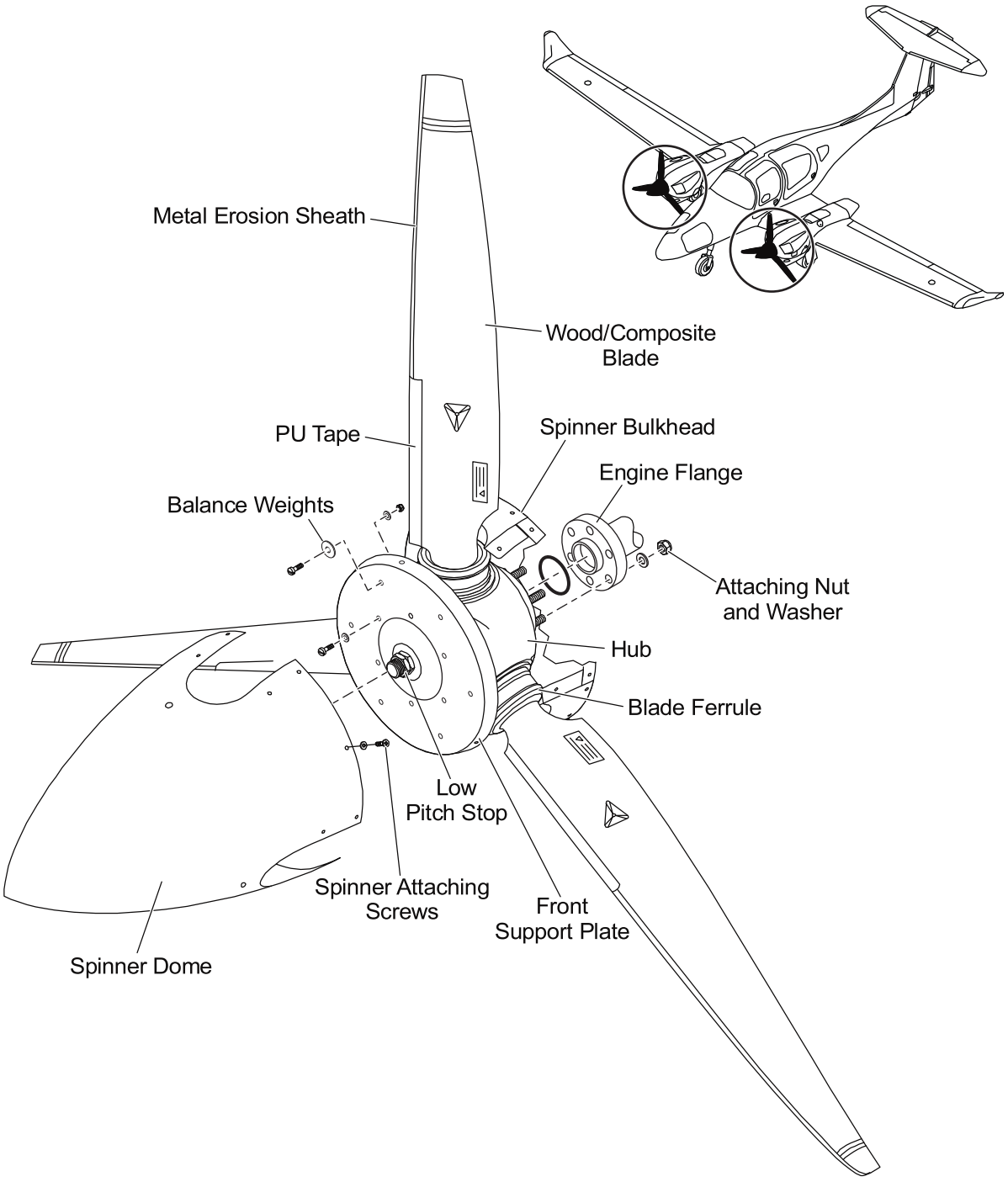

Figure 1 : Propeller Assembly

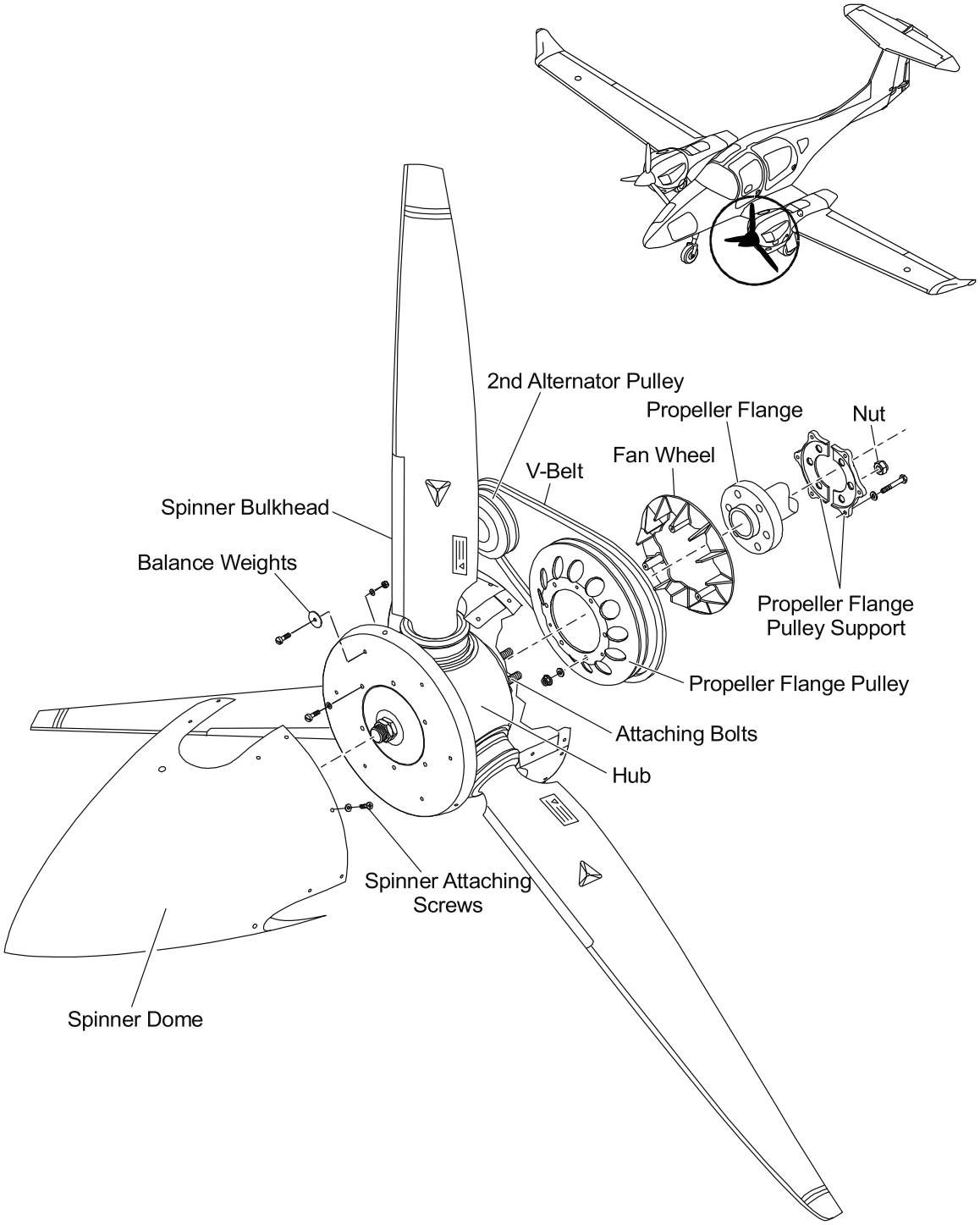

Figure 2 : Propeller Assembly (if OÄM 62-006 is installed)

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 62 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.

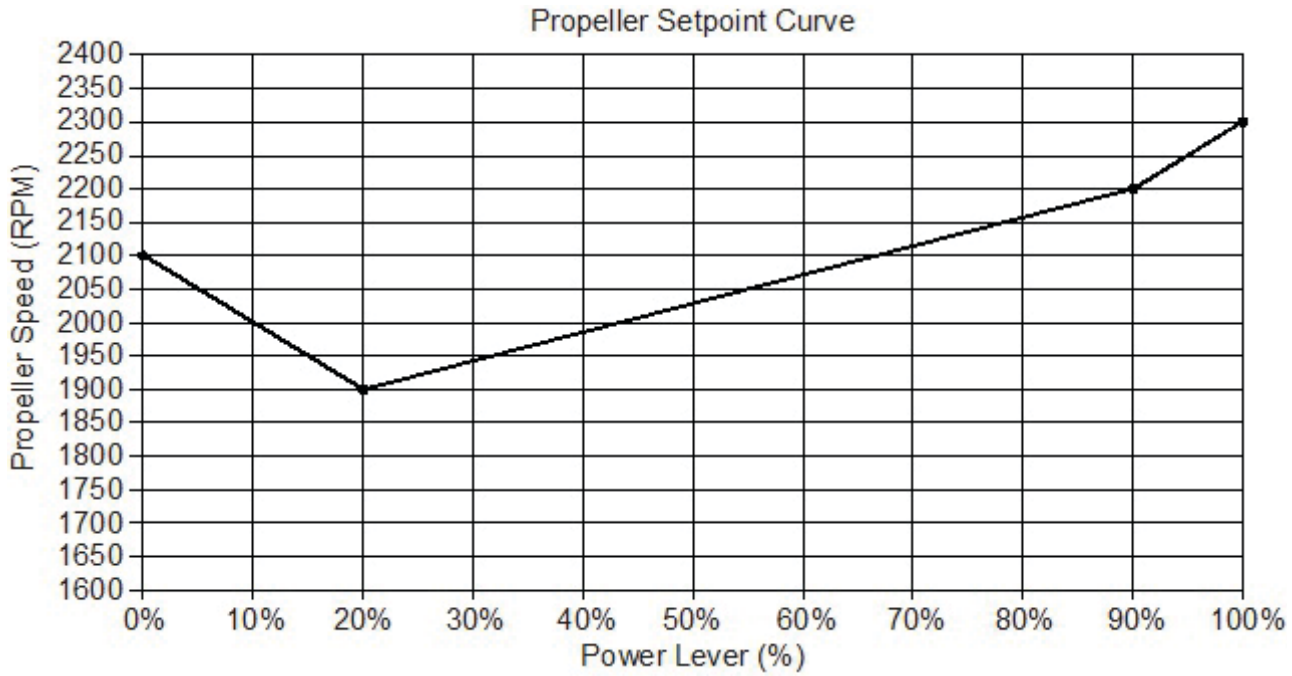

Figure 3 : Propeller RPM Adjusted by the Engine ECU System

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Trouble-Shooting

1. **General**

The table below lists the possible 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 given 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 describe how to remove and install the propeller, how to conduct a propeller blade tracking-test, how to remove and install the additional alternator pulley assembly and to remove and install the additional alternator (if OÄM 62-006 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.
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 201 or 202.
(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. Remove the propeller from the airplane.	
(7)	Use caps to cover open lines.	

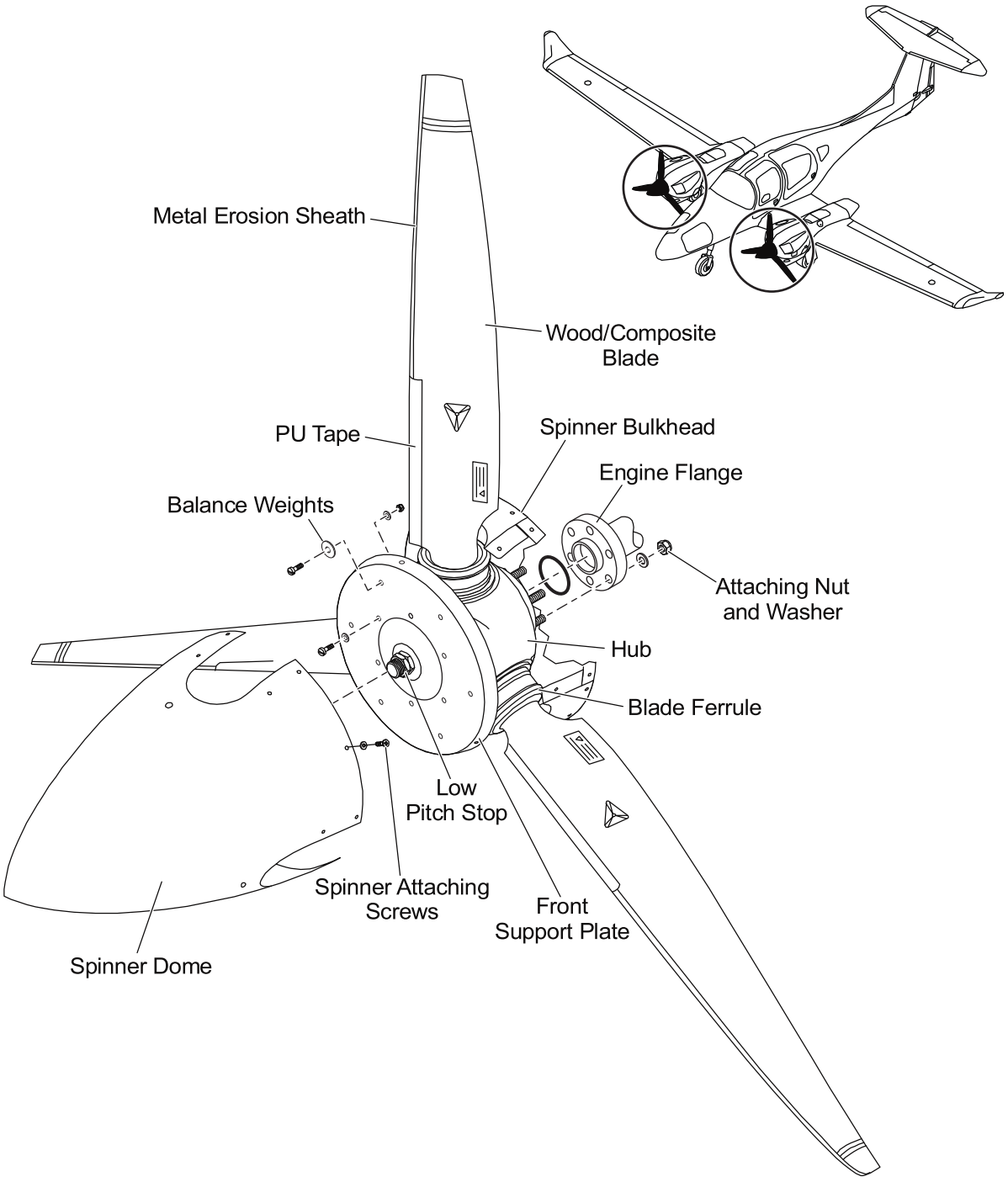

Figure 201 : Propeller Installation (if OÄM 62-006 is not installed)

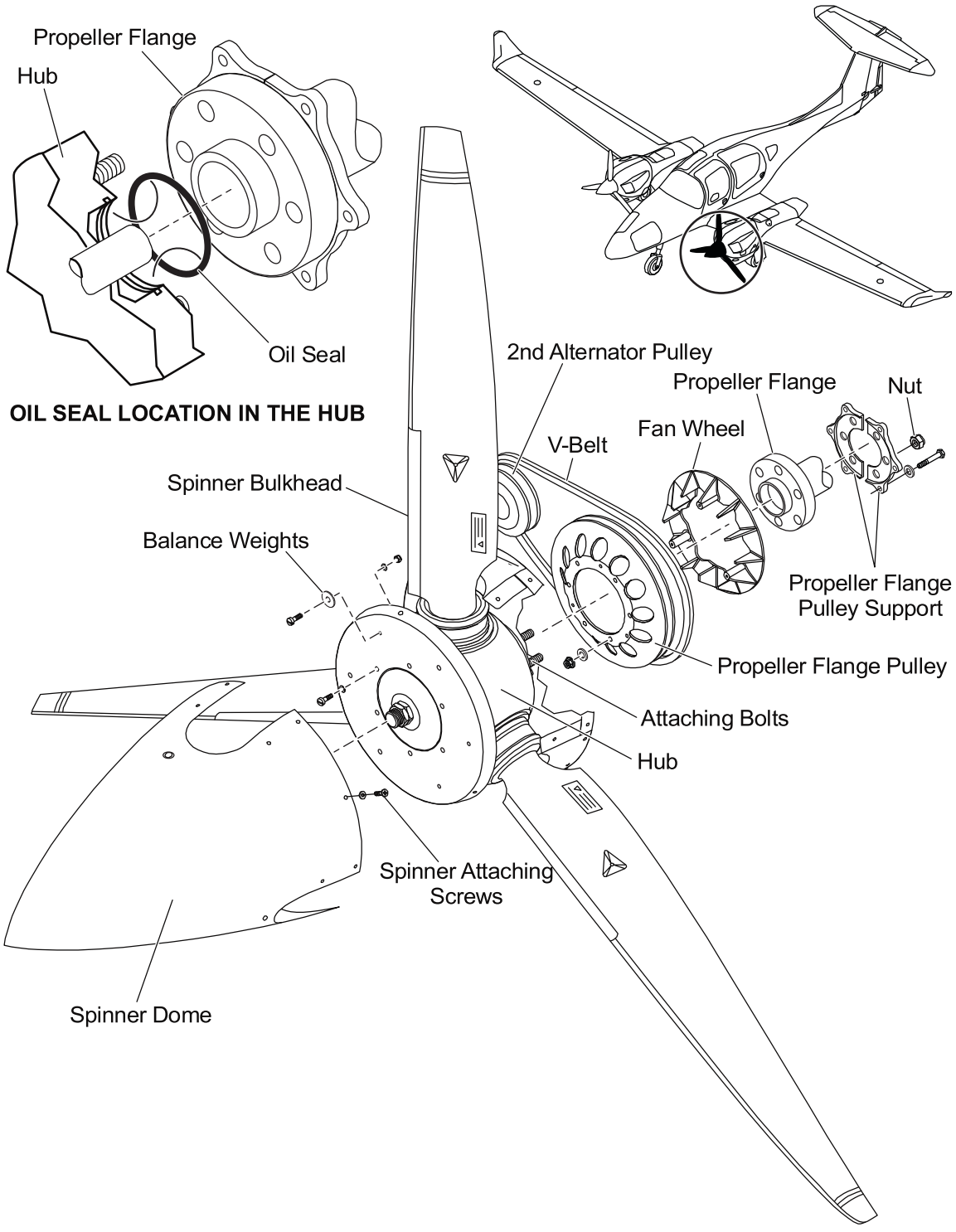

Figure 202 : Propeller Installation (if OÄM 62-006 is installed)

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)	Verify that the airplane battery is disconnected.	
(3)	Make sure that the propeller shaft flange and the propeller flange are clean and dry.	
(4)	Make sure that the shipping plug is removed and check the inside of the propeller hub area for contamination.	
(5)	Make sure that a new O-ring oil seal is in place in the propeller hub. Lightly oil the seal.	Refer to Figure 201 or 202. Use clean gearbox oil.
(6)	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.	
(7)	Install the six washers and nuts.	
(8)	When the propeller is in the correct position, fully tighten the nuts in opposing pairs.	Torque 85 - 90 Nm (63 - 66 lbf.ft.).
(9)	Check the gearbox oil level and refill if necessary.	Refer to Section 12-10.
(10)	Do a test for correct blade track.	Refer to Paragraph 3.

	Detail Steps/Work Items	Key Items/References
(11)	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.).
(12)	Install the engine cowlings.	Refer to Section 71-10.
(13)	Do an engine run-up. Do a test for the correct operation of the propeller.	Refer to Section 71-00.
(14)	Check for oil leaks.	
(15)	Check the 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 62-006 is installed)**

	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 is 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.
(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 four times turning the propeller blade each time 90 degrees. 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.	Recommended tension gauge: CONTI® VSM-1.

	Detail Steps/Work Items	Key Items/References
	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 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 the Diamond tool. - Tighten the bracket bolts. - Install the safety wires.	Use Diamond tool No. D44-6116-00-00-SW. Refer to item 4 of this checklist.
(5)	Install the engine cowlings.	Refer to Section 71-10.
(6)	Connect the airplane main battery.	Refer to Section 24-31.
(7)	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 62-006 is installed)**

A. Remove the Additional Alternator V-Belt.

	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 is 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.
(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 202.
(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 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 is 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.
(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 202. 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 the 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.
(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 the gearbox oil level and refill if necessary.	Refer to Section 12-10.
(19)	Check - and if necessary adjust - the tension of the V-belt.	Refer to Paragraph 4.
(20)	If the V-belt was replaced, check the V-belt tension after five hours of operation.	

6. **Remove/Install the Additional Alternator (if OÄM 62-006 is installed)**

A. Remove the Additional Alternator.

	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 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 LH engine cowling.	Refer to Section 71-10.
(4)	Remove the safety wires on the additional alternator bracket bolts.	
(5)	Release the two alternator bracket bolts.	Refer to Figure 203.
(6)	Lift the V-belt from the additional alternator pulley.	
(7)	Remove the two additional alternator bracket bolts.	Support for the additional alternator.
(8)	Remove the additional alternator composite cover.	Refer to Figure 203.
(9)	Remove the alternator cooling hose from the additional alternator.	
(10)	Remove the electrical wiring harness from the additional alternator.	
(11)	Remove the bolt or bolts attaching the additional alternator to the RH engine mounting arm.	Support the additional alternator. Refer to Figure 203.
(12)	Move the additional alternator clear of the airplane.	

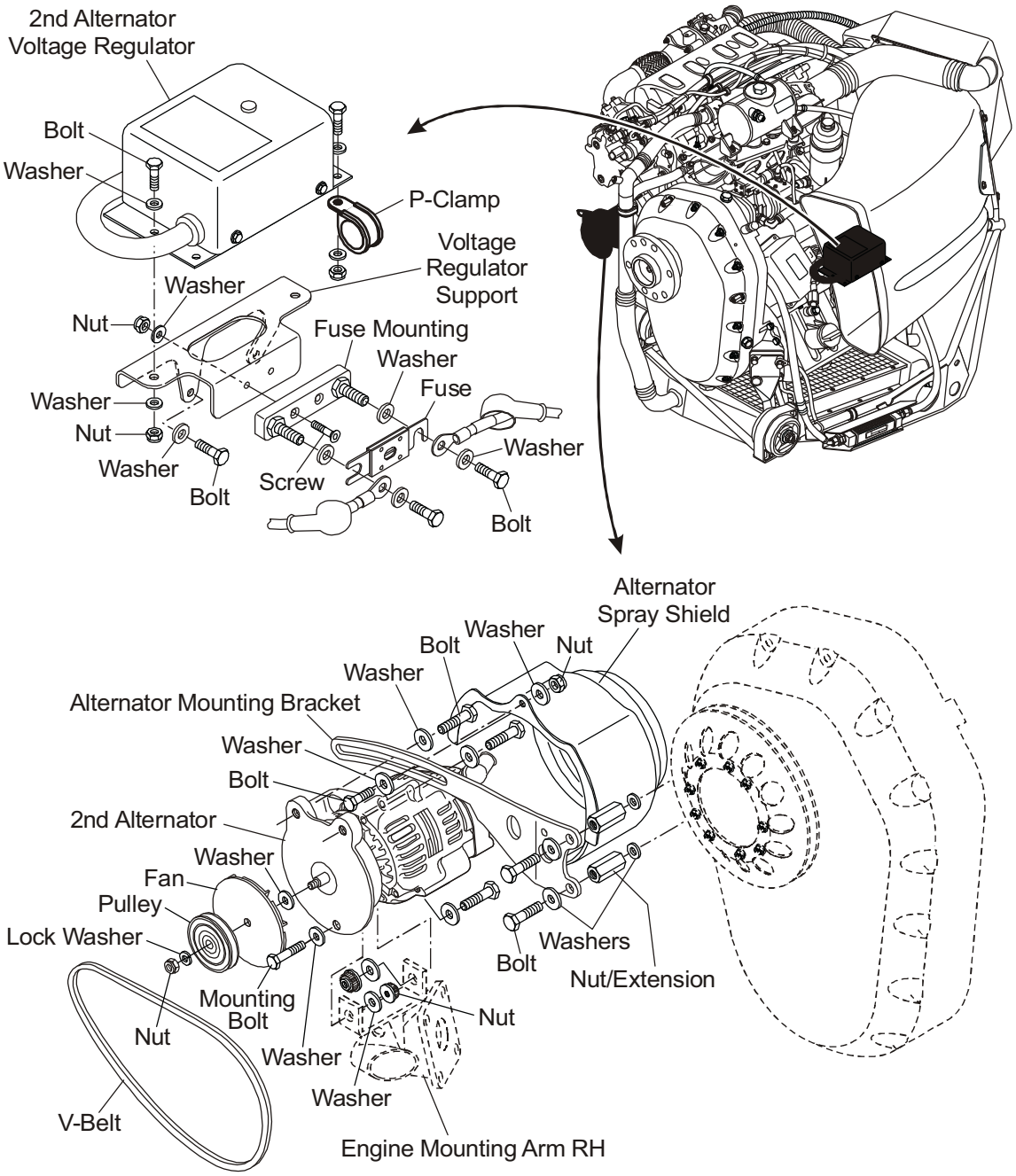

Figure 203 : Additional Alternator and Regulator Installation (if OÄM 62-006 is installed

B. Install the Additional Alternator.

	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 is safe: - Set the ELECT. MASTER switch to OFF. - Set the ENGINE MASTER switch to OFF. - Set the power lever to 0%.	
(2)	Verify that the airplane main battery is disconnected.	Refer to Section 24-31.
(3)	Position the additional alternator on the forward RH engine mounting arm.	Refer to Figure 203.
(4)	Connect the electrical wiring harness to the additional alternator.	Refer to Section 24-33.
(5)	Install the bolt or bolts which attaches the additional alternator to the forward RH engine mounting arm.	Refer to Figure 203. Torque: 6.4 Nm (4.7 lbf.ft).
(6)	Install the composite cover to the additional alternator.	Refer to Figure 203.
(7)	Attach and secure the additional alternator cooling hose.	
(8)	Install the additional alternator mounting bracket to the gear box and tighten the bolts.	
(9)	Position the V-belt on the propeller pulley assembly and the additional alternator pulley.	
(10)	Adjust the V-belt tension.	Refer to Paragraph 4.
(11)	Check the two safety wires on the additional alternator bracket bolts.	
(12)	Connect the airplane main battery.	Refer to Section 24-31.

	Detail Steps/Work Items	Key Items/References
(13)	Install the engine cowlings.	Refer to Section 71-10.
(14)	Do an engine run-up. Do a test for correct operation of the propeller.	Refer to Section 71-00.

Section 61-20

Propeller Control

1. General

The DA 62 has two MTV-6-R-C-F/CF194-80 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.

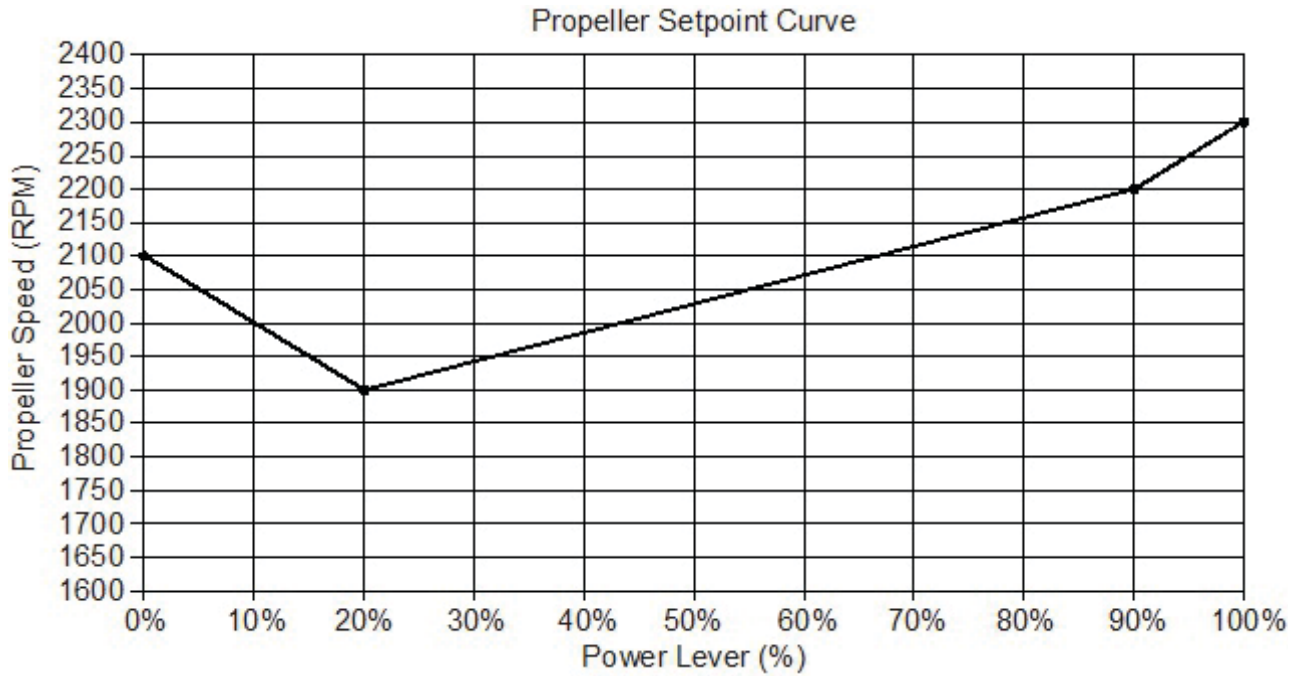

Figure 1 : Propeller RPM Adjusted by the EECU System

2. Description and Operation

The DA 62 has two MTV-6-R-C-F/CF194-80 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 80 degrees ± 1 degree.

A nitrogen-oil type accumulator is installed in the propeller control system. If OÄM 62-030 is carried out, 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 11 degrees ± 0.2 degrees. As soon as the propeller starts turning and the gearbox oil operates, the accumulator will be refilled.

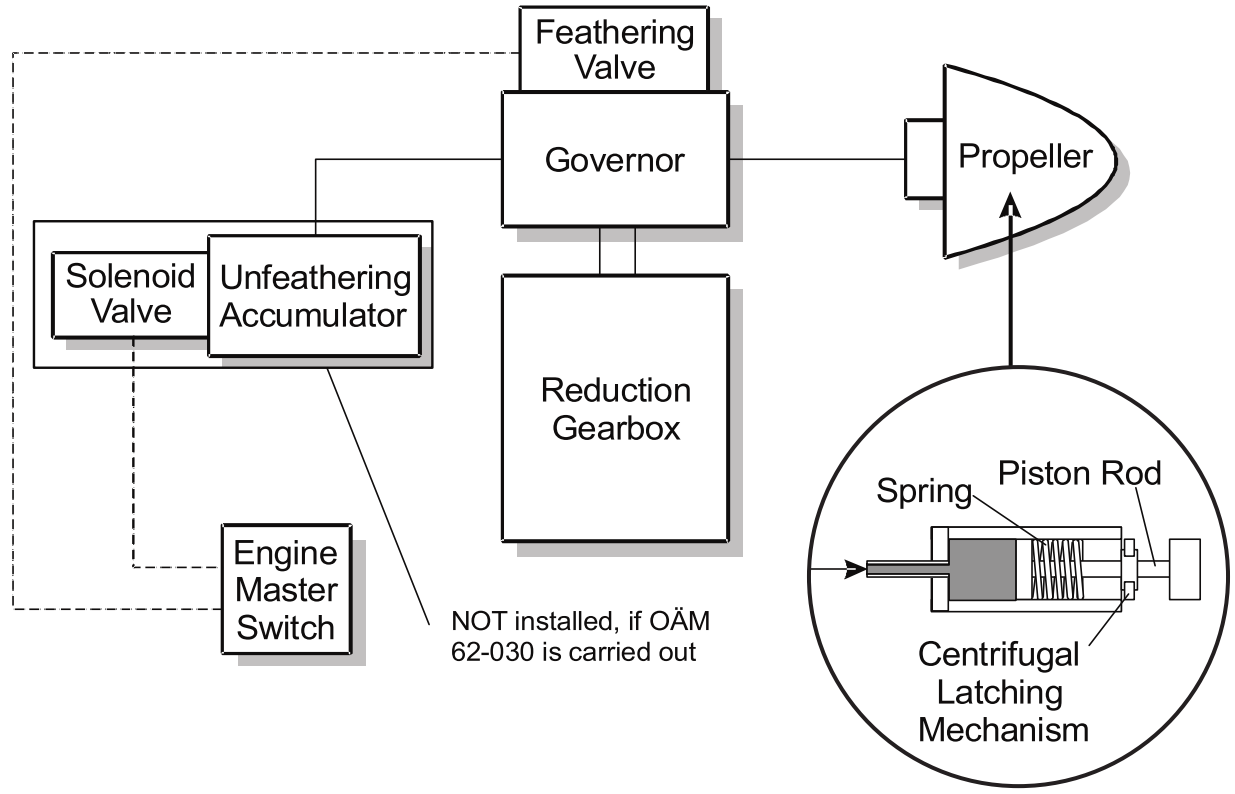

Figure 2 : Propeller Control System - Schematic Diagram

The specified propeller settings are given as follows:

- Low pitch: 11 degrees ± 0.2 degrees
- Start lock position: 15 degrees ± 1.5 degrees
- Feathered position: 80 degrees ± 1 degree

Technical data governor:

- Specific installation: DA 62
- Specific engine: Austro Engine E4P-C
- Max. revolution: 2680 RPM ± 10 RPM
- Min. revolution: 2030 RPM ± 10 RPM
- Rotation: LH
- Control head position: 355 degrees

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Trouble-Shooting

1. **General**

The table below lists the possible 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 given in the Repair column.

Trouble	Possible Cause	Repair
Propeller RPM fluctuating.	Engine gearbox oil level low.	Replenish the gearbox oil level. Refer to Chapter 72.
	Engine gearbox oil contaminated.	Replace the 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.
(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 62-030 is carried out, 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 the 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 the installation direction.
(3)	Install the four washers and nuts which attach the governor to the drive pad.	Torque 22 Nm (16 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 62-030 is carried out, install the safety cap to the governor.	
(6)	Install the engine cowling.	Refer to Section 71-10.
(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.

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 ADDITIONAL ALTERNATOR ASSEMBLY. 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 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 engine cowlings.	Refer to Section 71-10.
	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.	
(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 two bolts on the engine mount that hold the accumulator. - Remove both mounting clamps. - Lift the accumulator clear of the mounting bracket.	Refer to Figure 201. Support the accumulator.

	Detail Steps/Work Items	Key Items/References
(8)	Remove the accumulator spray shield. Remove the bolt and washer.	Refer to Figure 201.
(9)	Disconnect the oil hose from the accumulator.	Use a suitable container to collect spilt oil. Cap the open oil lines.

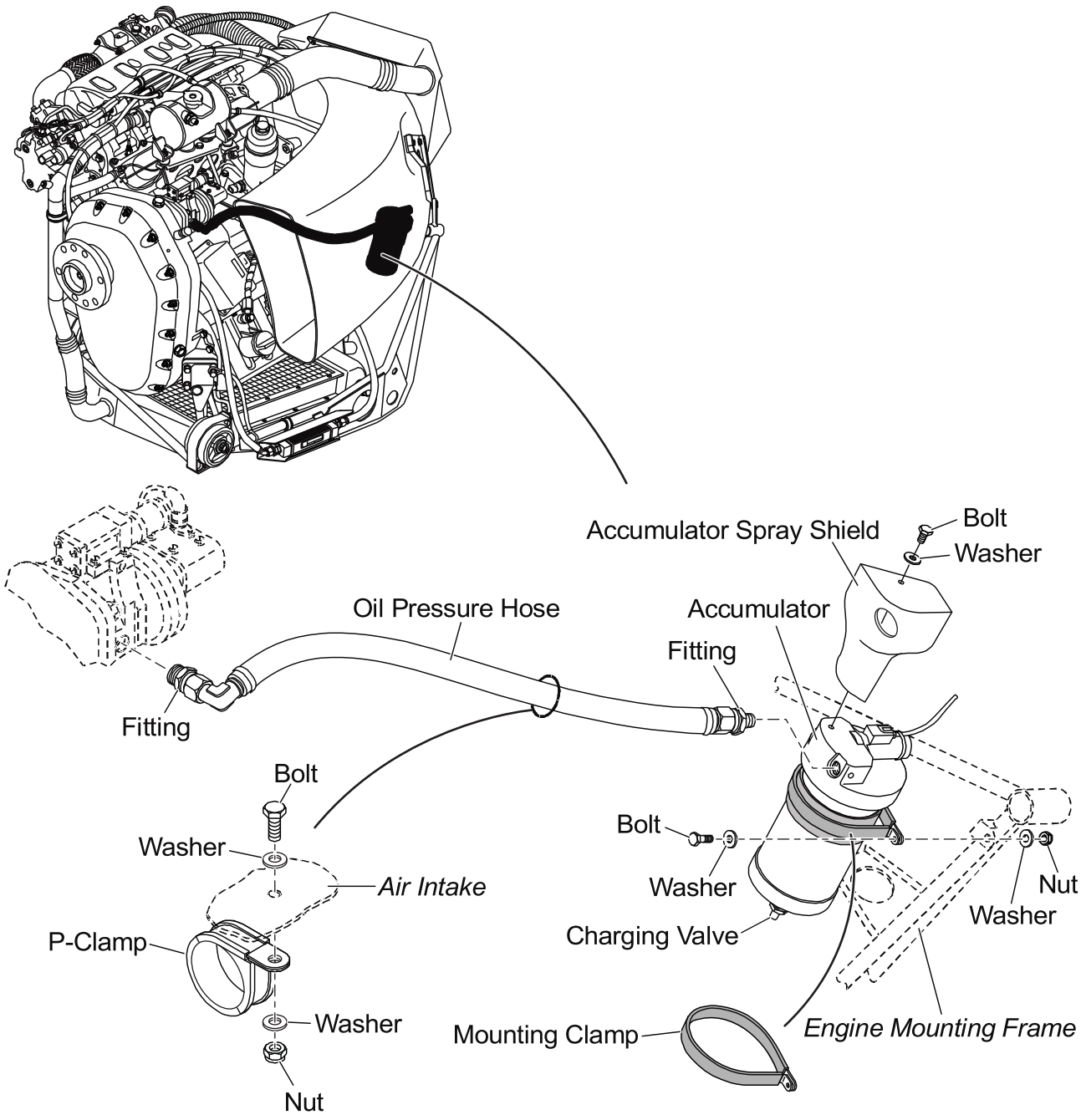

Figure 201 : Propeller Un-Feathering Accumulator - Removal/Installation

B. Install the Propeller Un-Feathering Accumulator.

	Detail Steps/Work Items	Key Items/References
(1)	Install the oil hose to the governor.	Refer to Figure 201.
(2)	Install the accumulator: - Install the spray shield. - Move the accumulator into position in the mounting bracket. - Install both mounting clamps. - Install the two bolts that attach the accumulator to the mounting bracket. - Tighten the bolts.	Refer to Figure 201. 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. 10.3 bar (150 PSI).
(5)	Install the engine cowlings.	Refer to Section 71-10.
(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.
(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 cowlings.	Refer to Section 71-10.

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.	
(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.	

	Detail Steps/Work Items	Key Items/References
(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 three 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 four 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: 80 degrees).
(19)	Reset the ENGINE MASTER switch to ON.	Do not start the engine.
(20)	Observe the change in propeller pitch angle. If the unfeathering accumulator is NOT installed (if OÄM 62-030 is carried out): Restart the engine: - STARTER of affected engine: engage, five 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: 11 degrees). Check the functional efficiency of the accumulator if the propeller does not unfeather.
(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 degrees (-> start lock position: 15 degrees). 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%.	

	Detail Steps/Work Items	Key Items/References
(23)	Redo steps (9) thru (22) for the other engine.	
(24)	Set the ELECT. MASTER switch to OFF.	

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CHAPTER 71

POWER PLANT

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CHAPTER 71

POWER PLANT

1. General

This Chapter contains information about the Austro Engine E4P-C engines installation in the DA 62. It describes the removal/installation of the power plant.

For data on the engine test after installation refer to the Operation Manual for the E4P-C engine. Refer to the DA 62 Airplane Flight Manual for engine start/stop procedures. For particular information on the applicable firmware refer to DAI Service Bulletin MSB-62-002.

Refer to these Chapters for data about other engine systems:

- Chapter 72. Engine. 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 62 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.

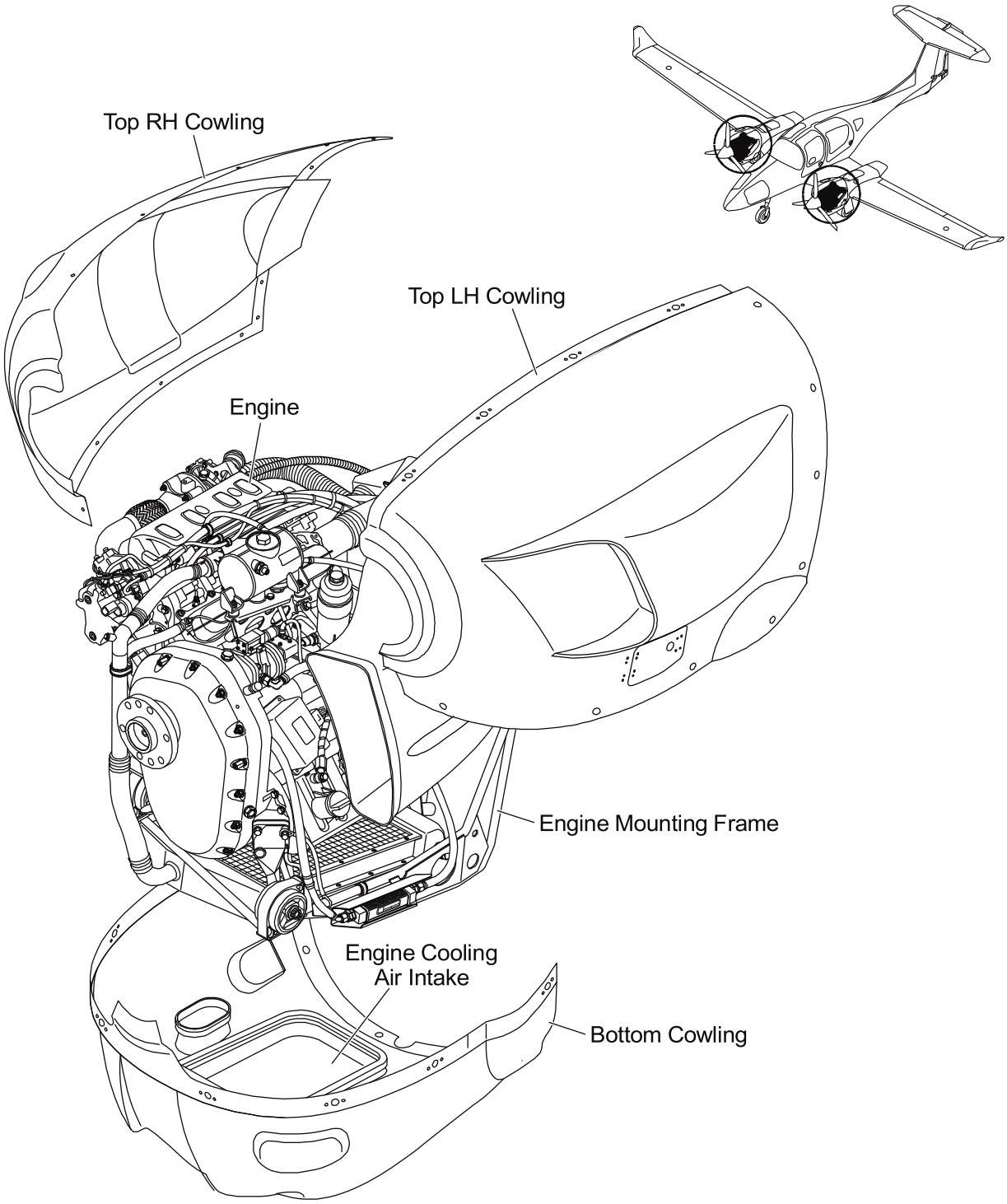

Figure 1 : Power Plant

2. Description and Operation

The DA 62 has a E4P-C 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 intercooler.

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.

E4P-C Engine Specification	
Engine manufacturer.	Austro Engine GmbH.
Engine model.	E4P-C.
Engine operating limits: - Maximum take-off power. - Maximum continuous power. - Maximum overspeed (max. 20 sec).	 132.0 kW (177.0 DIN-hp) at 2300 RPM. 126.0 kW (169.0 DIN-hp) at 2200 RPM. 2500 RPM.
Oil pressure (indicated values are corrected for pressure altitude):	Refer to the Airplane Flight Manual.
Oil temperature:	Refer to the Airplane Flight Manual.
Oil consumption: - Maximum.	 0.1 liter/hr. (0.11 US qt/hr.).
Oil quantity:	Refer to the Airplane Flight Manual.
Coolant temperature:	Refer to the Airplane Flight Manual.
Fuel consumption:	Refer to the Airplane Flight Manual.
Gearbox oil capacity:	Refer to the Airplane Flight Manual.
Engine weight, bare:	185 kg (407.9 lb).
Fuel grade:	Refer to the Airplane Flight Manual.
Engine oil specification:	Refer to the Airplane Flight Manual.
Coolant:	Refer to the Airplane Flight Manual.
Gearbox oil:	Refer to the Airplane Flight Manual.

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.

When experiencing trouble as 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 imbalance.	Balance the propeller.
	Engine operates with only three fuel injectors.	Refer to the engine manufacturer.
Engine does not produce full power.	Engine air intake blocked.	Examine the air intake. Clear the blockage
	Air filter blocked.	Examine/Replace the air filter.
	Sensor signal out of limits.	Read AE engine data with a laptop computer via the 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. THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.**

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.

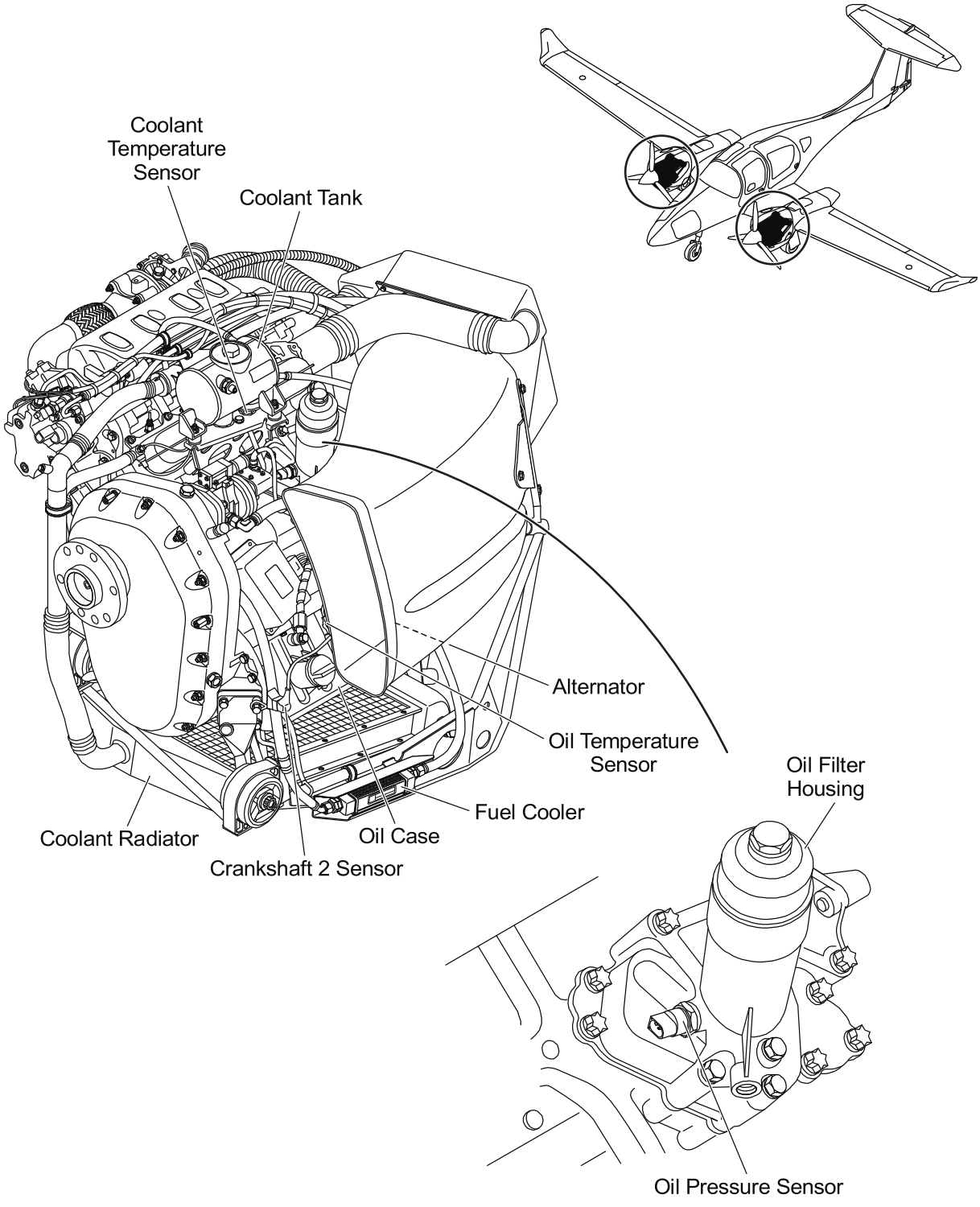

Figure 201 : Left Side of Engine

2. **Remove/Install the Engine**

A. Equipment.

Item	Quantity	Part Number
Engine hoist.	1	Commercial.
Engine sling.	1	Commercial.
Engine stand.	1	Commercial.
Tail trestle.	1	Commercial.
Hoisting points.	4	Delivered with engine.

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 the 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.
(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.	

	Detail Steps/Work Items	Key Items/References
(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 eight worm-drive-clamps. - Remove the hoses. - Remove the cooling pipe.	Refer to Section 75-00. Four on each hose.
(12)	Disconnect the coolant hoses from the heating radiator.	Refer to Section 75-00.
(13)	Disconnect the oil hose from the accumulator.	Use a suitable container to catch the oil in the tubes.
(14)	Remove the propeller accumulator.	Refer to Section 61-20.
(15)	Disconnect the breather line.	
(16)	Disconnect the electrical cables on the alternator. - Release all clips and ties holding the cables to the engine.	
(17)	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 the clips and ties on the engine mount.
(18)	Disconnect all electrical connections (glow plugs, injectors, etc.).	Refer to the AE Maintenance Manual, latest revision.
(19)	Remove the hose that connects the turbo charger outlet to the inter-cooler: - Remove the four worm-drive-clamps. - Remove the hose.	Refer to Section 73-00.
(20)	Remove the exhaust.	Refer to Section 78-00.

	Detail Steps/Work Items	Key Items/References
(21)	Release the clips, ties and clamps holding the engine wire harness to the engine mount. Move the harness clear of the engine.	
(22)	Disconnect the fuel supply hose and remove the fuel line mounting bracket.	At the high-pressure fuel pump.
(23)	Disconnect the fuel return hose.	Behind the rail pressure regulator.
(24)	Remove the bonding cable at the engine near each engine shock-mount and safety cables.	
(25)	Support the airplane at the tail.	Use the tail trestle. Refer to Section 07-10.
(26)	Remove the TKS bracket: - Remove the three bolts located at the upper right side of the gearbox and engine housing.	
(27)	Install the hoisting points.	
(28)	Attach the sling to the engine. Attach the sling to the hoist.	There are lifting points at: - The front right cylinder head. - The front left of the reduction gear housing. - The rear left of the cylinder head near the coolant pump. - The rear right at the alternator bracket. Refer to the AE Installation Manual, latest revision.
(29)	Take the weight of the engine with the hoist.	
(30)	Remove the nuts, bolts and washers that attach the engine support brackets to the engine mount.	Refer to Figure 203.
(31)	Remove the safety ropes from the engine.	Refer to Figure 203.
(32)	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.
(33)	Remove the support bracket from the engine.	

	Detail Steps/Work Items	Key Items/References
(34)	Attach the shipping stand to the engine.	Refer to the AE Installation Manual, latest revision.
(35)	Put caps on the open end pipes and connections.	
(36)	Prepare the engine for shipping.	Note the TTSO hours and the reason for removal.
(37)	Clean the firewall and engine mount.	
(38)	Examine the engine mounting frame for cracks and corrosion.	Refer to Figure 203
(39)	Check the lifetime of the elastomer hoses and replace as necessary.	
(40)	If the engine was removed because of oil system contamination: - Remove and discard the oil radiator and oil hoses.	Refer to Section 79-00.

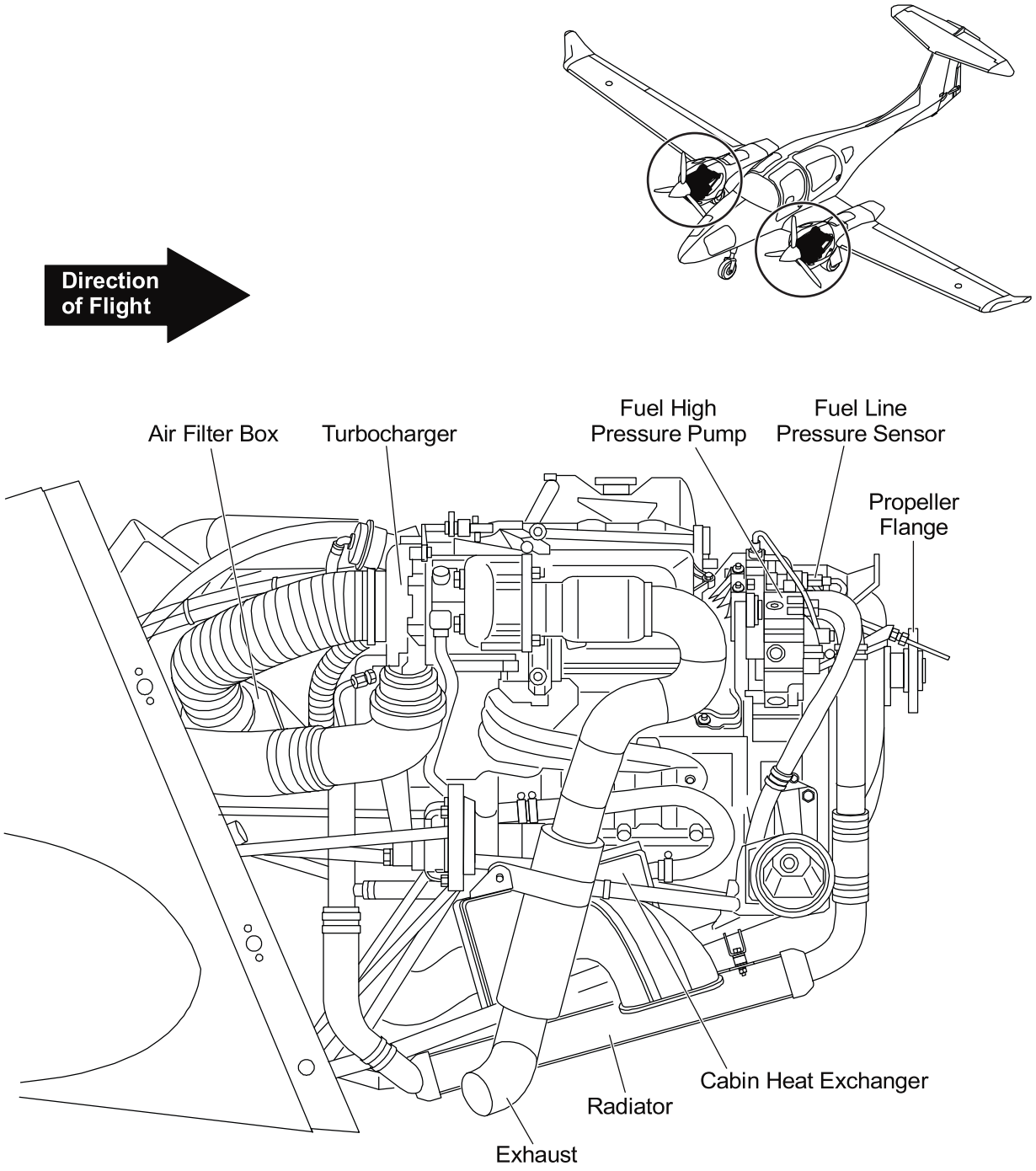

Figure 202 : Right Side of the Engine

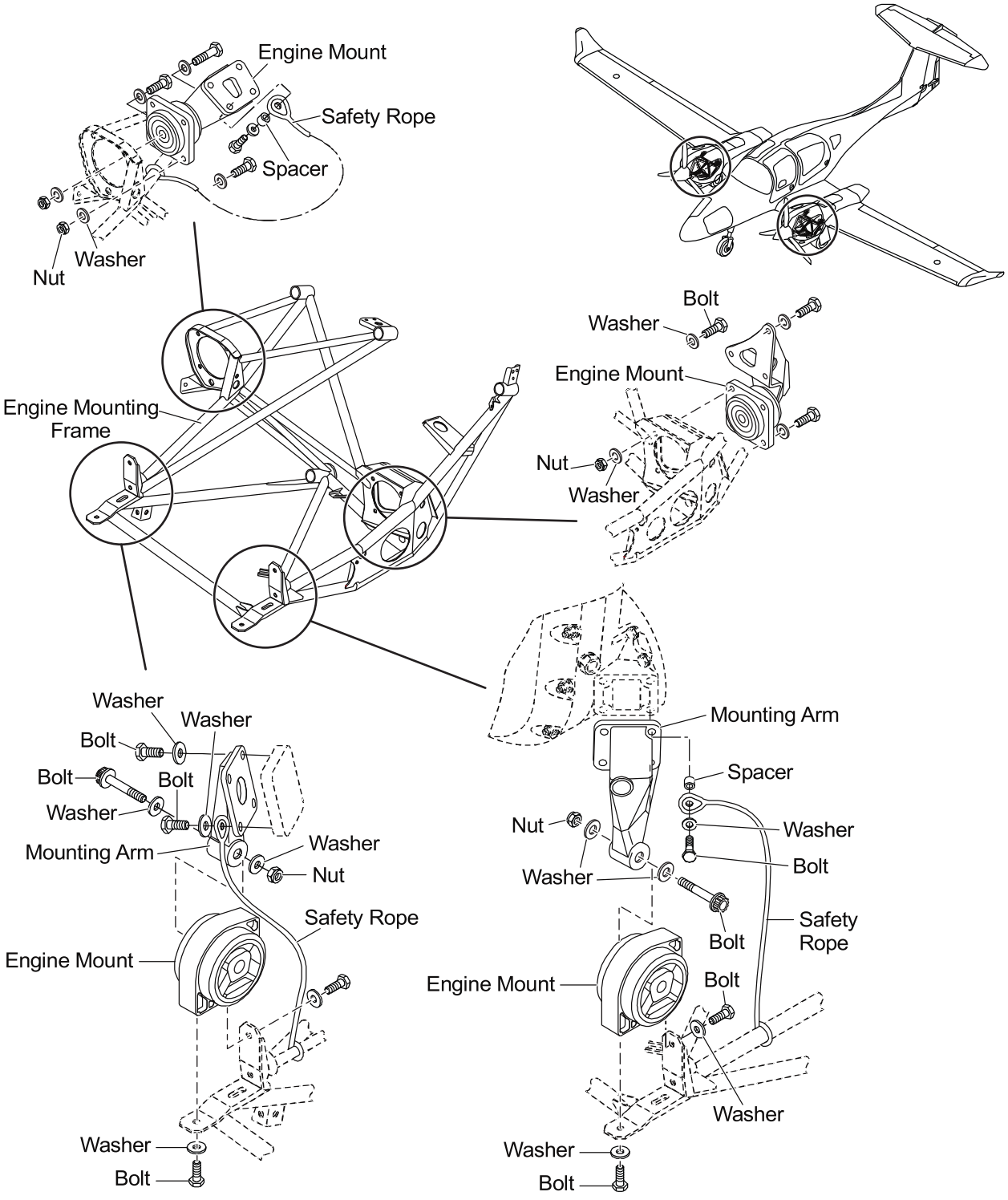

Figure 203 : Engine Shock-Mounts

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: - The front right cylinder head. - The front left of the reduction gear housing - The rear left of the cylinder head near the coolant pump. - The rear right at the alternator bracket.
(2)	Remove the shipping stand from the engine.	
(3)	Install the engine shock-mounts at the engine mount.	Refer to Figure 203. Front: Torque: 20 Nm (14.75 lbf.ft.) Rear: Torque: 28 Nm (20.64 lbf.ft.) Use Loctite 243.
(4)	Install the engine support bracket at the engine with the safety rope.	Refer to Figure 203. 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 Figure 203. 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, 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.	
(8)	Install the safety cables at the engine near each shock-mount, except the rear LH shock-mount.	Refer to Figure 203.
(9)	Install the water tube with a clamp at the engine mount.	

	Detail Steps/Work Items	Key Items/References
(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 the clips and tie 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 two hoses, at the radiator. - Install the eight worm-drive-clamps that hold the hoses.	Refer to Section 75-00. Four on each hose.
(17)	Install the hose which connects the alternate air to the turbo charger.	Refer to Figure 202.
(18)	Install the hose which connects the intercooler to the turbo charger.	Refer to Figure 202.
(19)	Connect the breather tube.	At the oil pre-separator.
(20)	Install exhaust pipe flange.	Refer to Section 78-00. Torque: 25 - 34 Nm (18.44 - 25.08 lbf.ft.).

	Detail Steps/Work Items	Key Items/References
(21)	Install the propeller accumulator. Connect the hose to the governor.	Refer to Section 61-20.
(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.
(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.

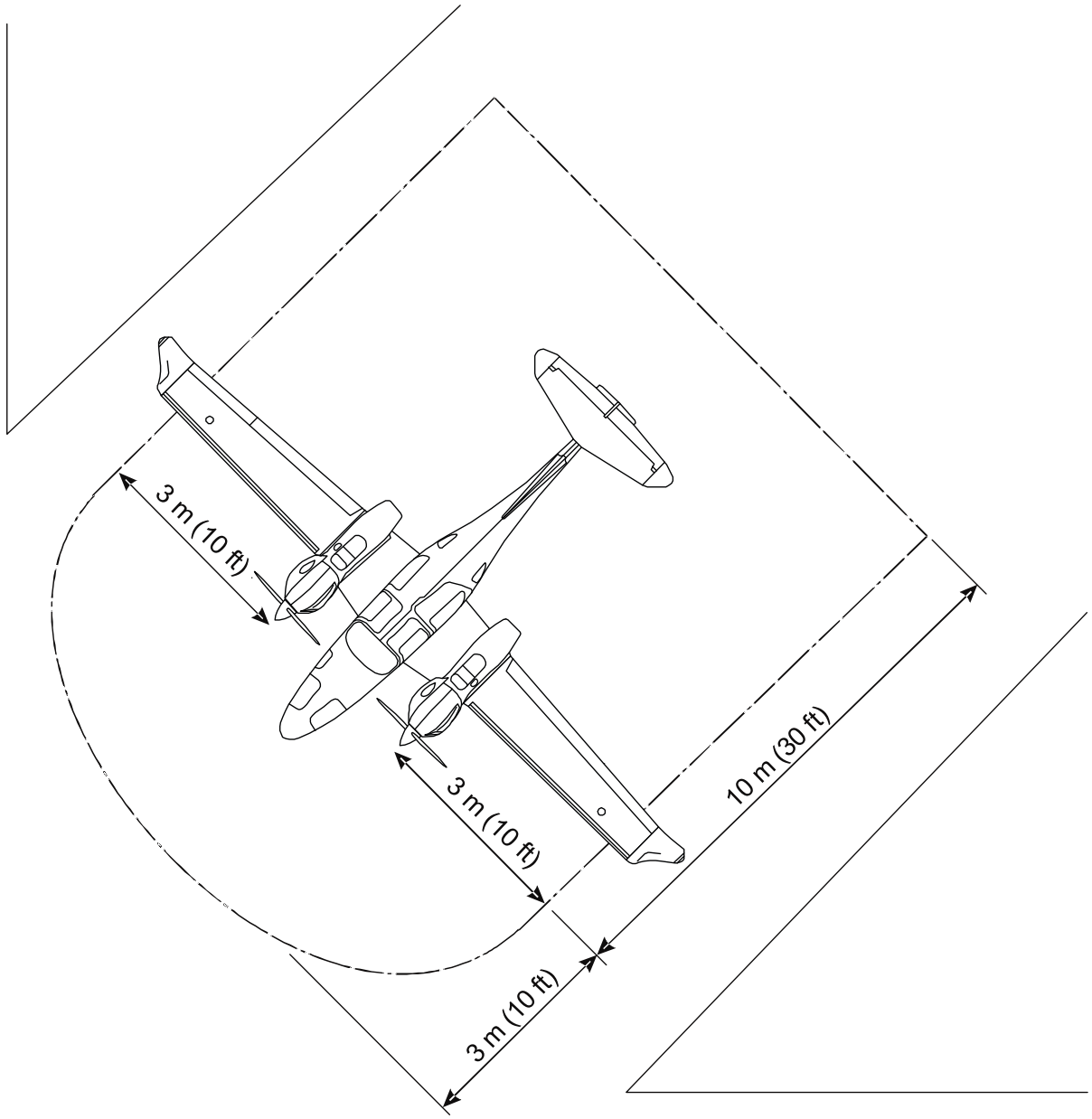

Figure 204 : Engine Testing Safety Zone

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 E4.01.02, latest revision and the 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
	<u>WARNING:</u> 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 204.
(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.	

C. Refer to AE Operation Manual E4.01.02, latest revision and the Airplane Flight Manual, latest revision for:

- Engine starting and warm-up,
- ECU test,
- Propeller control test,
- ECU swap test, and
- Performance check.

Section 71-10

Engine Cowlings

1. General

The DA 62 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

Figures 1 and 2 show 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 two air intakes at the front of the cowling. The intake at the front bottom of the lower cowling supplies air to the coolant radiator, the fuel cooler and the cabin heat exchanger. The intake of the upper front supplies air for gearbox oil cooling.

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.

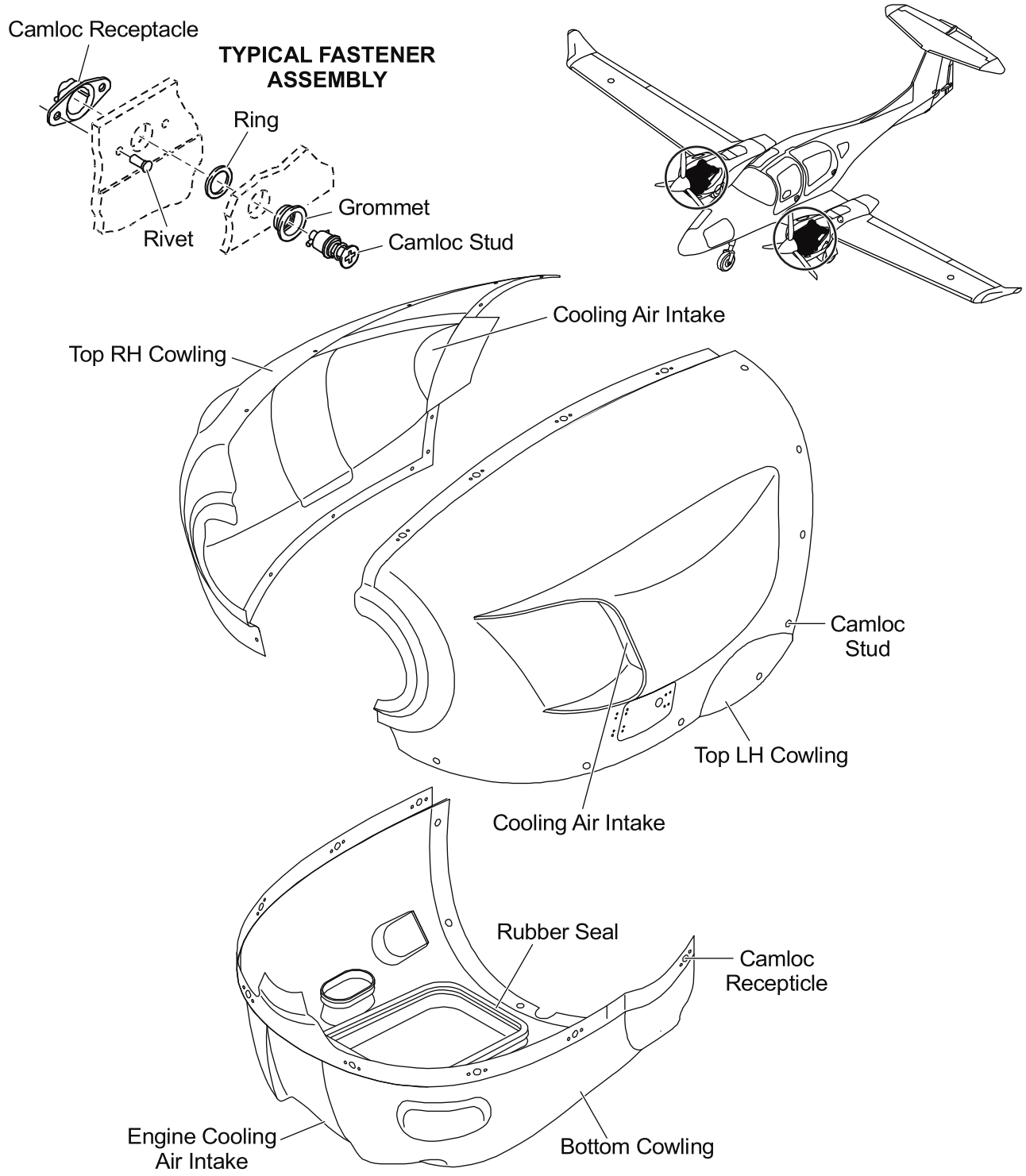

Figure 1 : Engine Cowlings - Sheet 1 of 2

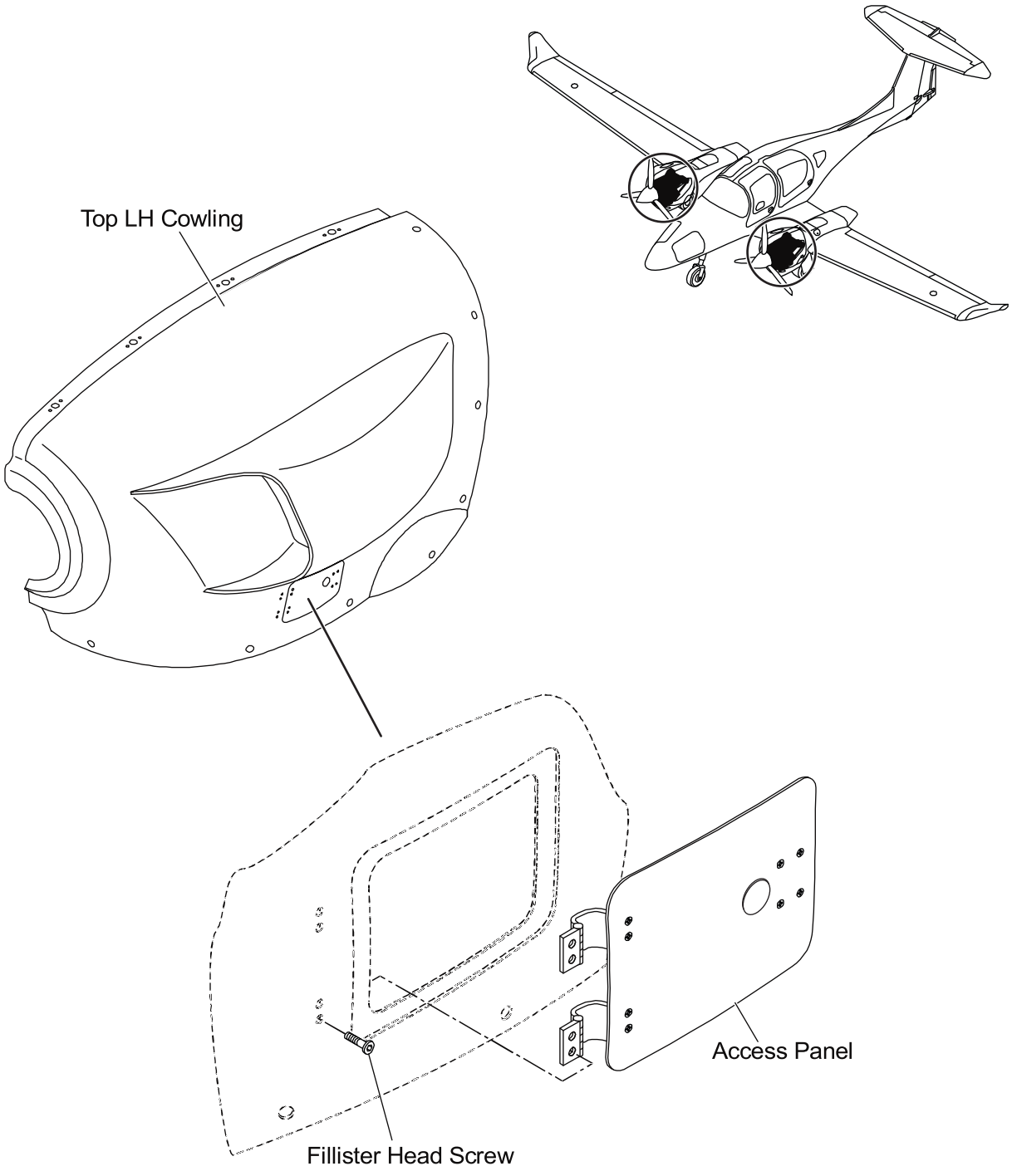

Figure 2 : Engine Cowlings - Sheet 2 of 2

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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 given in the Repair column.

Trouble	Possible Cause	Repair
Outer surface of the cowling is 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 the 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 and install the cowlings. It also tells you how to clean and paint the cowlings.

2. Remove/Install the Engine Cowlings

Use these procedures for both the left engine and the right engine.

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.
IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.

A. Remove the Engine Left and Right Top Cowlings.

	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 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 Figures 1 and 2. (71-10-00, Pages 2 and 3).
(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.
(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 quick-release fasteners which hold the bottom cowling to the engine nacelle..	Refer to Figure 1. (71-10-00, Page 2). Hold the bottom cowling.
(2)	Remove the bottom cowling. - Lower first the left side of the cowling. - Move the cowling down. - Move the cowling clear of the engine.	Be careful 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.	Refer to Figure 1. (71-10-00, Page 2). Repair any damage. Replace missing/damaged fasteners.
(2)	Lift the cowling into position: - First, move 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.

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.	Refer to Figures 1 and 2. (71-10-00, Pages 2 and 3). 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.	Refer to Para 3.A.
(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.

C. Applying Fire Resistant Resin inside the Cowling.

This Paragraph gives the data for applying fire resistant resin to the inside of the engine cowling, instead of painting the cowling with fire resistant paint. It applies to all engine cowlings.

	Detail Steps/Work Items	Key Items/References
WARNING:	**DO NOT BREATHE THE DUST FROM THE FIRE RESISTANT PAINT; IT IS HARMFUL.**	
(1)	Wet the inside of the cowling with water, and use a scraper to remove the paint inside the cowling.	The fire resistant paint has a clear lacquer on it. The surface of the paint may have to be scored to allow the water to affect the paint.
(2)	Sand the inside of the cowling using 80 to 120 grit sandpaper.	Make sure there are no shiny surfaces in order for the resin to have a good bonding surface.
(3)	Remove dust from the inside of the cowling by vacuum cleaning or rinsing with water.	Do not blow off dust e.g. with pressurized air.
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 IN THE COWLING. GREASE AND DUST PREVENT A GOOD BOND.	
(4)	Wet a clean, lint-free cloth with acetone and wipe the inside of the cowling. Immediately wipe off with another clean, lint-free cloth.	Do not pour acetone onto the cowling. Do not allow acetone to dry on the surface. Do not reuse cloths.
(5)	Pigment the Sika CR132 FR self-extinguishing resin/hardener mixture with Universal Colour Paste deep black (RAL 9005), P/N 1321300.	Do not add more than 5% colour paste by weight.
(6)	Coat the inside of the cowling with the pigmented Sika CR132 FR self-extinguishing resin.	
(7)	Cure the cowling at 55 °C for 6 hours.	

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Section 71-20

Engine Mounting

1. General

Refer to Figure 1.

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.

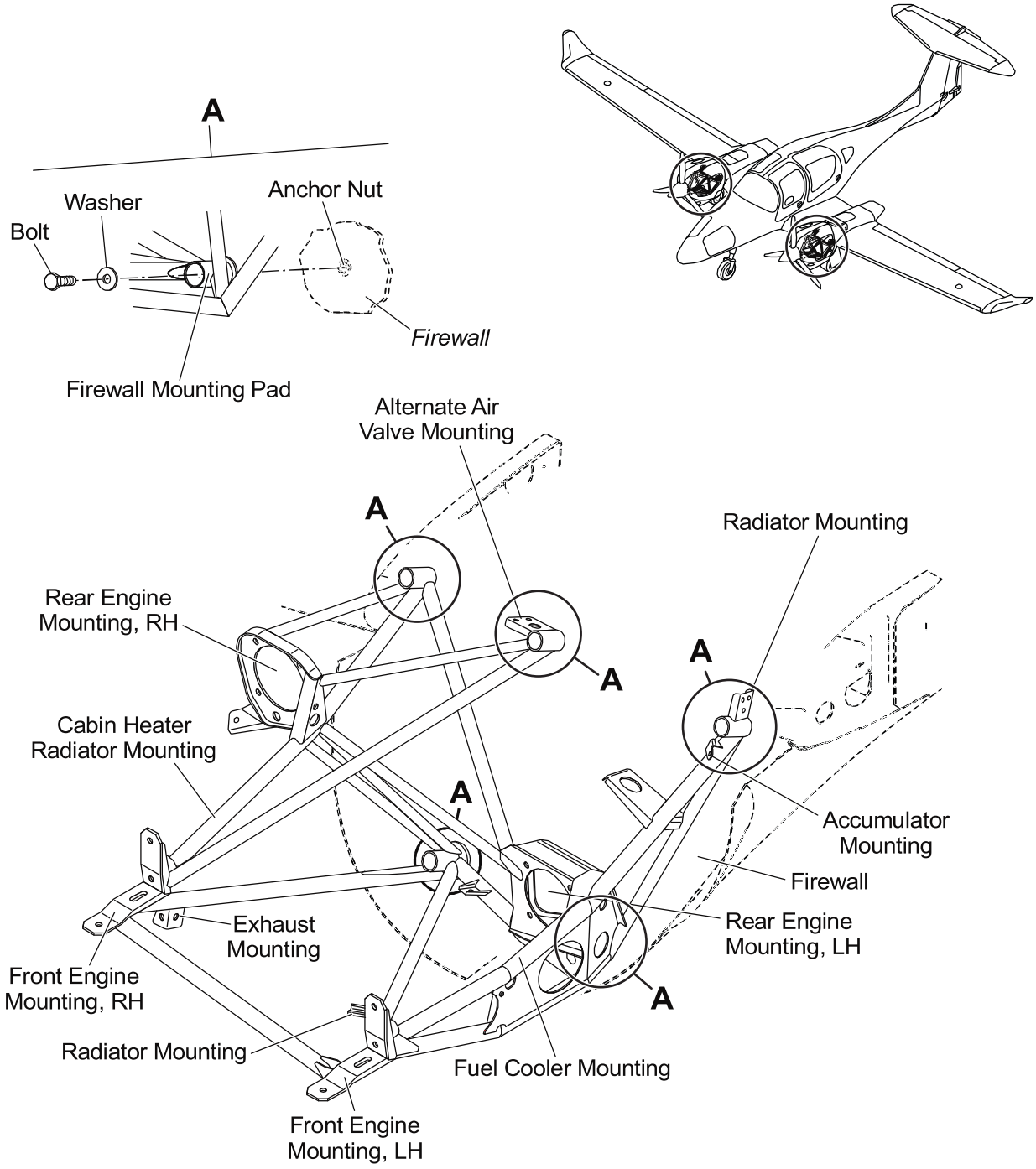

Figure 1 : Engine Mount Assembly

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 given 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. Replace the engine mount if it is cracked.
Defective shock mounts.	Refer to the engine manufacturer.	Refer to the engine manufacturer.

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MAINTENANCE PRACTICES

1. **General**

The Maintenance Practices for the engine mount are limited to the removal and 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
Engine hoist.	1	Commercial.
Engine sling.	3	Commercial.
Engine stand.	1	Commercial.
Tail trestle.	1	Commercial.
Hoisting Points.	4	Delivered with the 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 five bolts and washers which attach the engine mount to the firewall at the engine nacelle.	Refer to Figure 1. (71-20-00, Page 2).
(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 five bolts which attach the engine mount to the engine nacelle firewall: - Fasten the bolts through the firewall.	Refer to Figure 1. (71-20-00, Page 2). Use new bolts. Torque: 40 Nm (29.5 lbf.ft.).
(3)	Install the engine coolant radiator.	Refer to Section 75-00.
(4)	Install the inter-cooler mounting bracket.	Refer to Section 81-00.
(5)	Install the turbo charger inter-cooler.	Refer to Section 81-00.
(6)	Install the inter-cooler.	Refer to Section 81-00.
(7)	Install the engine air filter housing and alternate air valve.	Refer to Section 71-60.
(8)	Install the cabin heating heat-exchanger and shroud.	Refer to Section 21-40.
(9)	Install the propeller un-feathering accumulator.	Refer to Section 61-20.
(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).
(11)	If required at this time, install the engine.	Refer to Section 71-00.

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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 of the DA 62 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 assembly.

2. Description

The air intake has four main parts:

- Alternate air-valve assembly.
- Air filter housing.
- Air filter.
- Alternate air valve operating cables.

A. Alternate Air-Valve Assembly.

Refer to Figures 1 and 2.

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.

Refer to Figure 1.

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 K&N RU high-flow air filter. The air filter is connected to the alternate air valve assembly via 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. 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.

3. **Operation**

When the pilot pulls the alternate air valve control lever aft:

- 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).

When the pilot moves the alternate air valve control lever forward both alternate air valves move back to the normal (OFF) position.

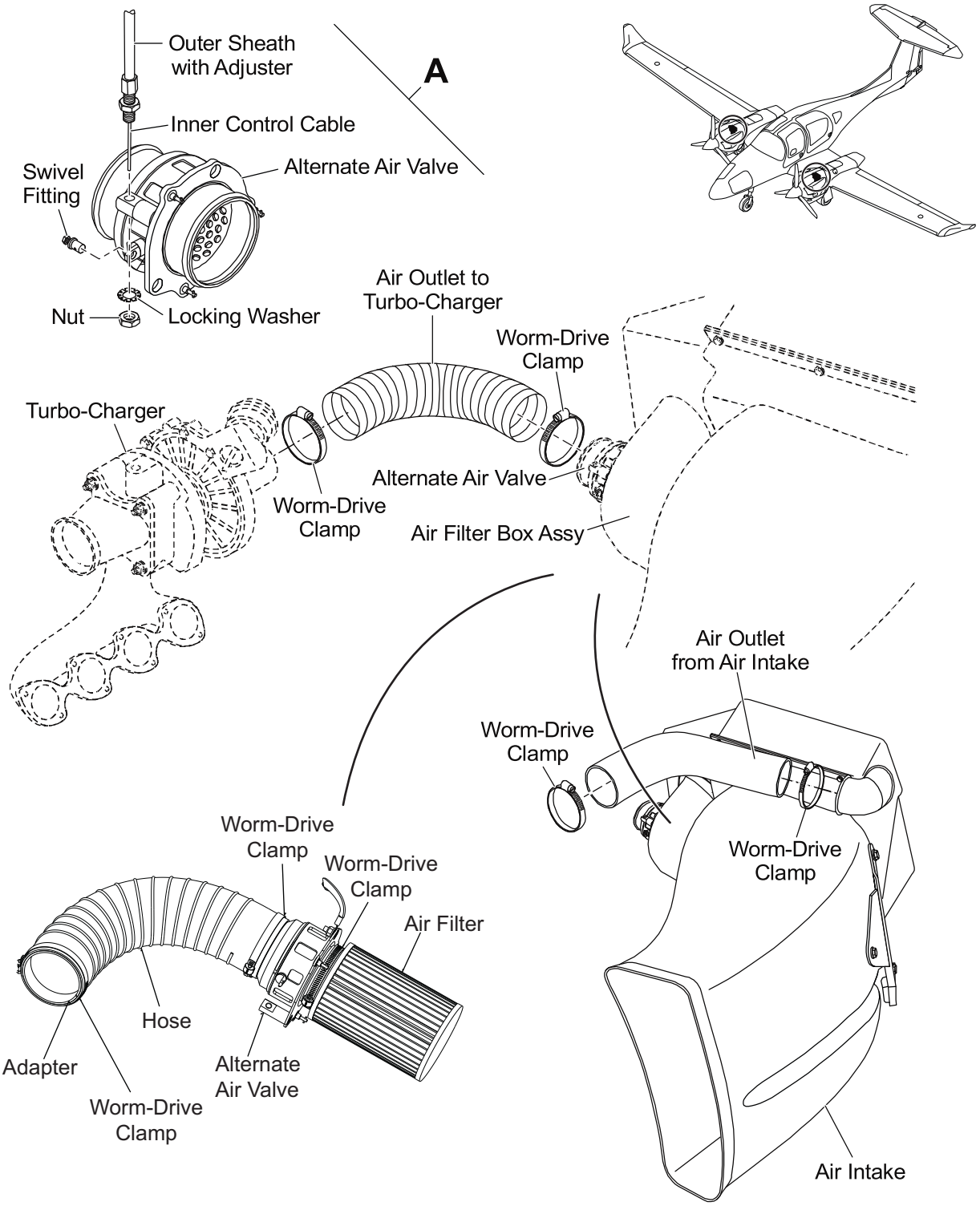

Figure 1 : Air Filter and Alternate Air-Valve Assembly

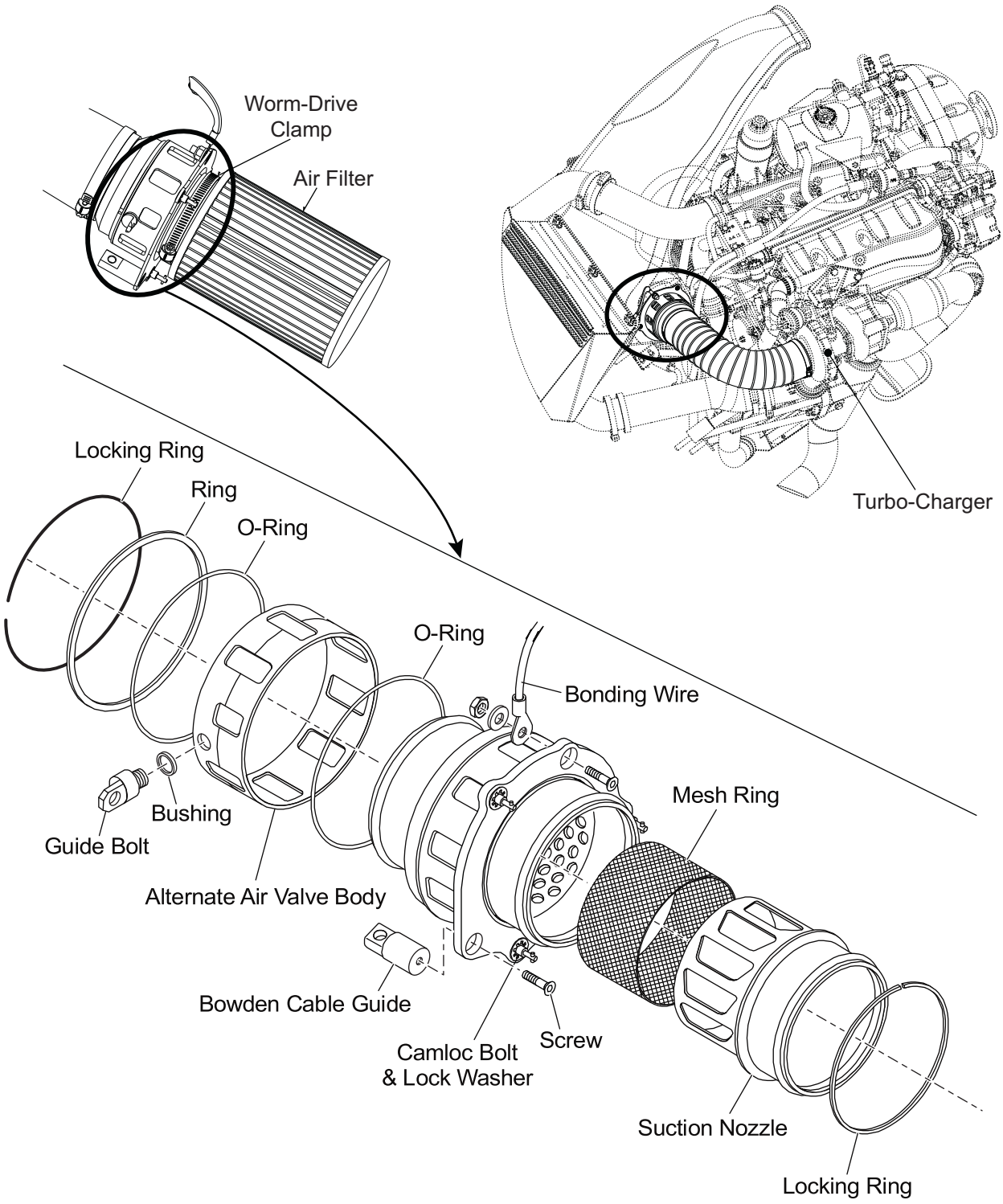

Figure 2 : Alternate Air-Valve Assembly

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 the related engine.	Replace the air filter on the related engine.

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Maintenance Practices

1. **General**

These Maintenance Practices describe how to remove and install the air filter and the alternate air-valve assembly. They also describe how to remove, install and adjust the alternate air control cable.

2. **Remove/Install an Air Filter**

A. Remove an Air Filter.

Refer to Figures 1 and 2. (71-60-00, Pages 3 and 4).

	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 alternate air valve Bowden cables.	
(5)	Open the three 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 alternate air valve.	

B. Install an Air Filter.

Refer to Figures 1 and 2. (71-60-00, Pages 3 and 4)

	Detail Steps/Work Items	Key Items/References
(1)	Place the filter on the alternate 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 a 9 mm (3/8 in) wide worm drive clamp instead.	
(2)	Place the alternate air valve with the attached filter element in the air filter-box assembly.	
(3)	Close the three camloc bolts of the alternate air valve.	
(4)	Connect the alternate air valve Bowden cables.	
(5)	Check if the position of the alternate air valve is in accordance to the selector handle position.	Make sure that it agrees with the selector handle position.
(6)	Install the engine top cowlings.	Refer to Section 71-10.
(7)	Connect the airplane main battery.	Refer to Section 24-31.

3. **Remove/Install an Alternate Air Valve**

A. Remove an Alternate Air Valve.

Refer to Figures 1 and 2. (71-60-00, Pages 3 and 4).

	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 bolts, nuts and washers that hold the alternate air valve to the air filter-box assembly.	
(5)	Disconnect the alternate air control cable.	
(6)	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.
(7)	Move the alternate air valve clear of the airplane.	
(8)	Open the worm-drive clamp which holds the filter element. Pull off the filter from the alternate air valve.	
(9)	If the FOD mesh screen of the alternate air valve is contaminated: - Clean the FOD mesh screen.	

B. Install an Alternate Air Valve.

Refer to Figures 1 and 2. (71-60-00, Pages 3 and 4).

	Detail Steps/Work Items	Key Items/References
(1)	Place the filter on the alternate 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 a 9 mm (3/8 in) wide worm drive clamp instead.	
(2)	Install the alternate air valve with the attached filter element to the air filter box assembly.	Apply fire resistant sealant (Dow Corning 736 or equivalent) between air filter box housing and alternate air valve.
(3)	Move the alternate air valve enough to connect the control cable to the valve.	
(4)	Check if the position of the alternate air valve is in accordance to the selector handle position.	Make sure that it agrees with the selector handle position.
(5)	Adjust the alternate air-valve control-cable.	Refer to Paragraph 7.
(6)	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.
(7)	Install the engine top cowlings.	Refer to Section 71-10.
(8)	Connect the airplane main battery.	Refer to Section 24-31.

4. **Remove/Install an Alternate Air-Valve Control Inner-Cable**

A. Remove an Alternate Air-Valve Control (Inner-Cable).

Refer to Figure 201.

	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)	In the cockpit, disconnect the bowden control cables, swivel fitting and angle bracket from the operating lever: - Remove the outboard screw on the cable swivel fitting at the operating lever. - Remove the screws, washers, spacer and bushing and pull the angle bracket free from the operating lever.	
(6)	Disconnect the inner control cables from the swivel fitting at the angle bracket: - Loosen the inboard screw on the cable swivel fitting. - Remove the swivel fitting from the inner control cables.	Retain the swivel fitting.
(7)	At the engine, disconnect the inner control cable from the swivel fitting at the alternate air valve: - Remove the cable swivel fitting at the relay lever.	Retain the swivel fitting.

	Detail Steps/Work Items	Key Items/References
(8)	Remove the inner control cable from the sheath: - At the alternate air valve, attach a length of suitable cord to the end of the inner cable. - In the cockpit, pull the inner cable from the outer sheath and pull the length of cord into the outer sheath. - Make sure that the cord extends out at both ends of the outer sheath. - Disconnect the inner cable from the length of cord and remove it from the airplane.	Two persons are required, one in the cockpit and one at the engine. The cord must be longer than the inner cable. The person at the engine will make sure that the cord will enter the outer sheath correctly. Leave the length of cord in the outer sheath.

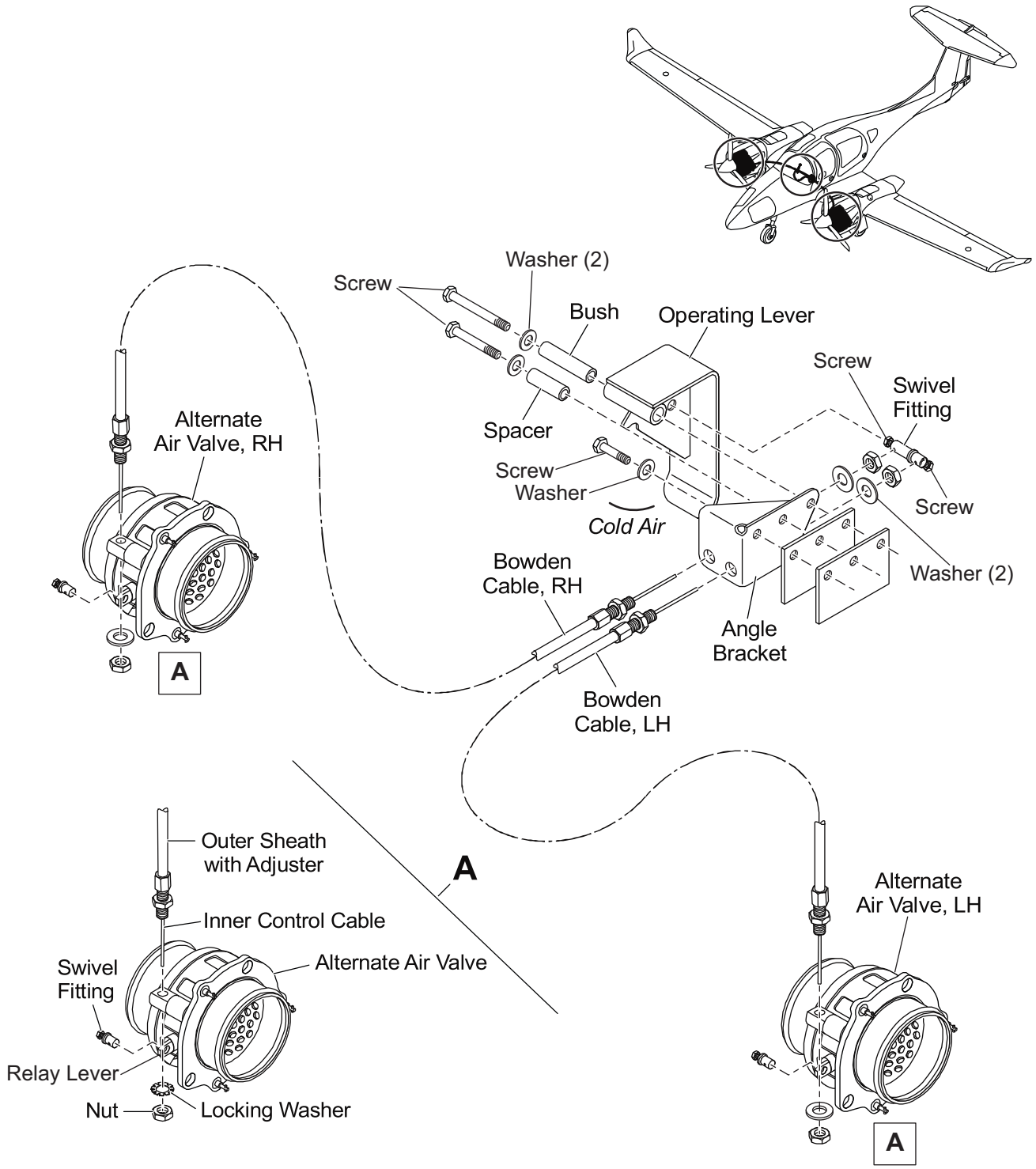


Figure 201 : Alternate Air Valve - Operating Cables

B. Install an Alternate Air-Valve Control (Inner-Cable).

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the outer sheath of the alternate air-valve control-cable is in good condition and is not kinked.	If the outer sheath is not in satisfactory condition it will have to be replaced.
(2)	Make sure that the new forward inner control-cable for the alternate air valve is clean and dry.	
(3)	Install the new forward inner control-cable for the alternate air valve: - In the cockpit, attach the end of the length of cord that is in the control cable outer-sheath to the new inner control cable. - Round the cable end. - At the engine, from the alternate air valve, pull the new cable into the outer sheath with the length of cord. - When the new inner cable is fully through the outer sheath: - Disconnect the length of cord from the inner cable.	Two persons are required, one in the cockpit and one at the engine. Grease the cable end lightly with Grease 5 The person in the cockpit will make sure that the cable will enter the outer sheath correctly. Apply a light coat of grease to the cable as it enters the outer sheath. Discard the cord.

(4)	In the cockpit, connect the forward inner control-cable for the alternate air valve to the operating lever:
	- Pass the inner cables through the swivel fitting and tighten the inboard screw on the cable swivel fitting.
	- Connect the bowden control cables, swivel fitting and angle bracket to the operating lever.
	  - Put the angle bracket in place.
	  - Install the screws, washers, spacer and bushing to hold the angle bracket securely to the operating lever.
	  - Install the outboard screw on the cable swivel fitting at the operating lever	

	Detail Steps/Work Items	Key Items/References
(5)	At the engine, connect the forward inner-cable to the alternate air valve: - 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-valve control-cable that you installed.	Refer to Paragraph 7.
(7)	Install the engine top cowlings.	Refer to Section 71-10.
(8)	Install the pilot's seat.	Refer to Section 25-10.
(9)	Connect the airplane main battery.	Refer to Section 24-31.

5. **Remove/Install an Alternate Air-Valve Control Inner-Cable (if MÄM 62-249 is installed)**

A. Remove an Alternate Air-Valve Control (Inner-Cable) if MÄM 62-249 is installed.

Refer to Figure 202.

	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)	In the cockpit, disconnect the control cables from the alternate air-control operating-lever: - Remove the screws on the end plate of the operating lever. - Remove the end plate. - Lift the operating lever (watch out for the spring loaded aretation ball). - Loosen the grub screws on the cable swivel fitting at the operating lever. - Remove the swivel fitting from the inner cables.	Retain the swivel fitting.
(5)	At the engine, disconnect the inner control cable from the swivel fitting at the alternate air valve: - Remove the cable swivel fitting at the relay lever.	Retain the swivel fitting.

	Detail Steps/Work Items	Key Items/References
(6)	Remove the inner control cable from the sheath: - At the alternate air valve, attach a length of suitable cord to the end of the inner cable. - In the cockpit, pull the inner cable from the outer sheath and pull the length of cord into the outer sheath. - Make sure that the cord extends out at both ends of the outer sheath. - Disconnect the inner cable from the length of cord and remove it from the airplane.	Two persons are required, one in the cockpit and one at the engine. The cord must be longer than the inner cable. The person at the engine will make sure that the cord will enter the outer sheath correctly. Leave the length of cord in the outer sheath.

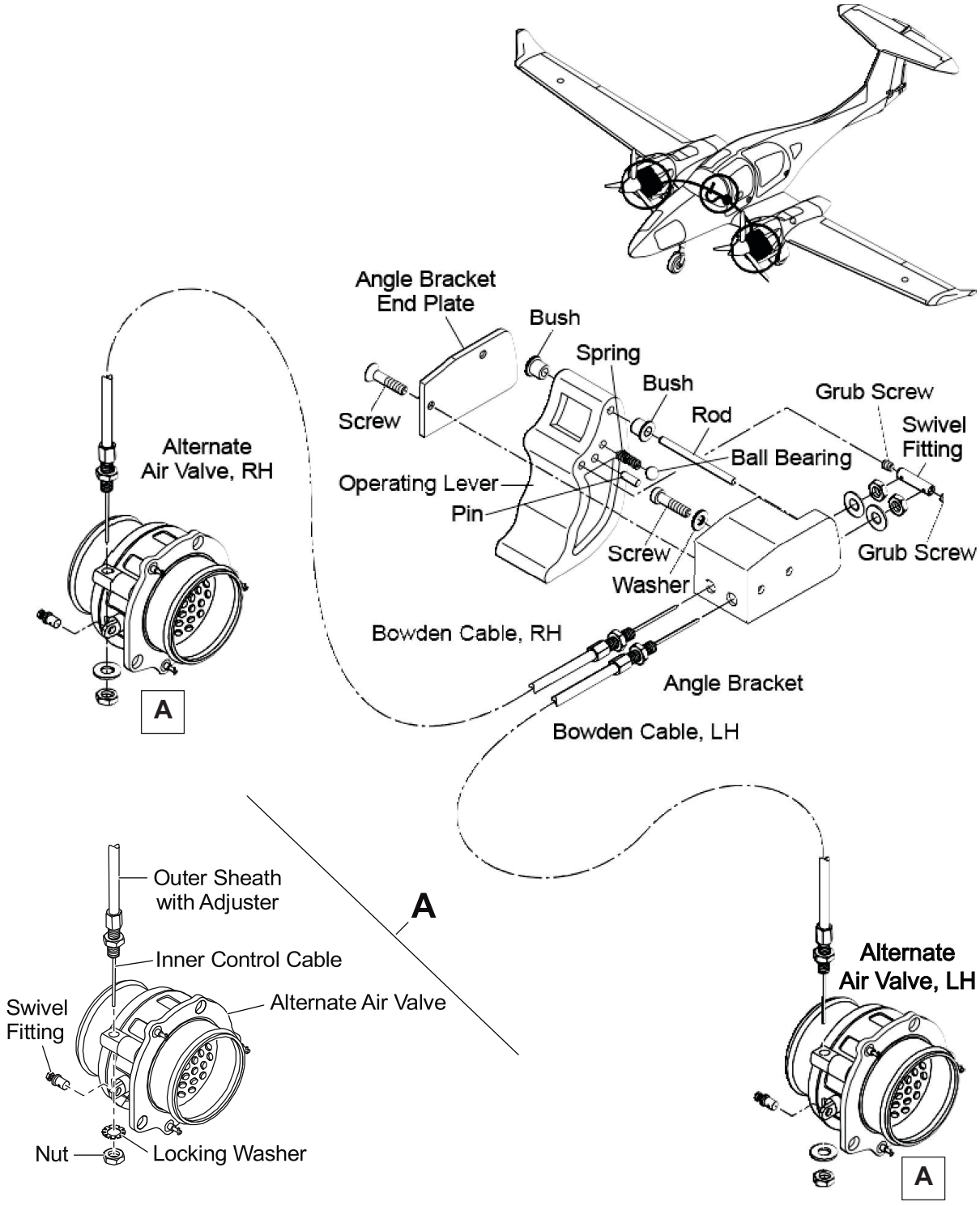


Figure 202 : Alternate Air Valve - Operating Cables (if MÄM 62-249 is installed)

B. Install an Alternate Air-Valve Control (Inner-Cable) if MÄM 62-249 is installed.

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the outer sheath of the alternate air-valve control-cable is in good condition and is not kinked.	If the outer sheath is not in satisfactory condition it will have to be replaced.
(2)	Make sure that the new forward inner control-cable for the alternate air valve is clean and dry.	
(3)	Install the new forward inner control-cable for the alternate air valve: - In the cockpit, attach the end of the length of cord that is in the control cable outer-sheath to the new inner control cable. - Round the cable end. - At the engine, from the alternate air valve, pull the new cable into the outer sheath with the length of cord. - When the new inner cable is fully through the outer sheath: - Disconnect the length of cord from the inner cable.	Two persons are required, one in the cockpit and one at the engine. Grease the cable end lightly with Grease 5 The person in the cockpit will make sure that the cable will enter the outer sheath correctly. Apply a light coat of grease to the cable as it enters the outer sheath. Discard the cord.
(4)	In the cockpit, connect the control cables to the alternate air-control operating-lever: - Install the swivel fitting onto the inner cables. Tighten the grub screws. - With the use of Figure 202, attach together the end plate, operating lever, angle bracket and swivel fitting.	
(5)	Connect the inner-cable to the alternate air valve: - 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-valve control-cable that you installed.	Refer to Paragraph 7.
(7)	Install the engine top cowlings.	Refer to Section 71-10.
(8)	Connect the airplane main battery.	Refer to Section 24-31.

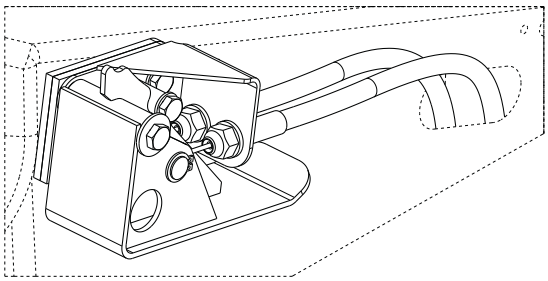
6. **Remove/Install an Alternate Air-Valve Control-Cable (Left/Right Cable)**

A. Remove an Alternate Air-Valve Control-Cable (Left/Right Cable).

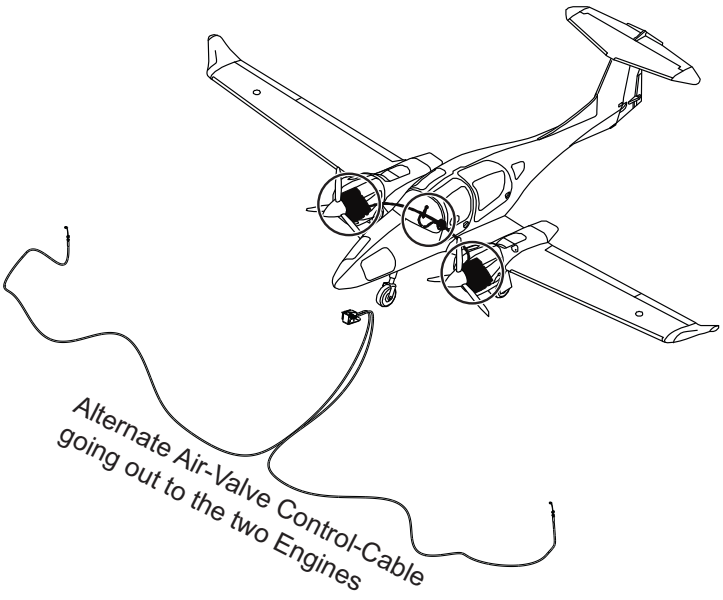
Refer to Figure 203.

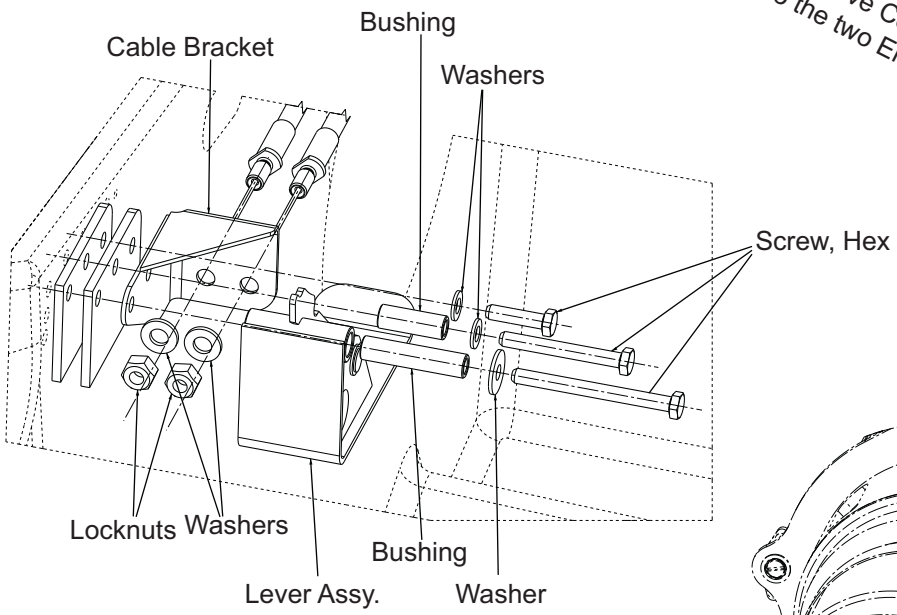
	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS 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. Remove the engine bottom cowling if necessary for access.	Refer to Section 71-10.
(4)	Remove the pilot's seat.	Refer to Section 25-10.
(5)	In the cockpit, disconnect the bowden control cables, swivel fitting and angle bracket from the operating lever: - Remove the outboard screw on the cable swivel fitting at the operating lever. - Remove the screws, washers, spacer and bushing and pull the angle bracket free from the operating lever.	
(6)	Disconnect the inner control cables from the swivel fitting at the angle bracket: - Loosen the inboard screw on the cable swivel fitting. - Remove the swivel fitting from the inner control cables.	Retain the swivel fitting.

	Detail Steps/Work Items	Key Items/References
(7)	Disconnect the bowden control cable from the angle bracket: - Remove the nut and lock washer from the bowden control cable that you are going to remove. - Pull the bowden control cable, with the inner control cable, free from the angle bracket.	
(8)	At the engine, disconnect the bowden control cable from the related alternate air valve: - Remove the cable swivel fitting at the relay lever. - Remove the nut and lock washer from the bowden control cable. - Pull the bowden control cable, with the inner control cable, free from the alternate air valve.	Retain the swivel fitting.
(9)	Remove the complete outer sheath with the adjusters and inner control cable: - Follow the routing of the entire bowden cable from the alternate air valve to the angle bracket below the pilot's seat. - Remove the panels necessary for access to the control cable routing. - Cut the cable ties and remove any clamps that hold the bowden cable in place along the routing. - Carefully remove the alternate air-valve control-cable from the airplane.	Make note of the bowden cable routing and any cable ties, clamps along the routing. Refer to Section 52-40. Make note of the locations of the cable ties and clamps. Discard the cable ties. This includes the complete outer sheath with the adjusters and inner control cable

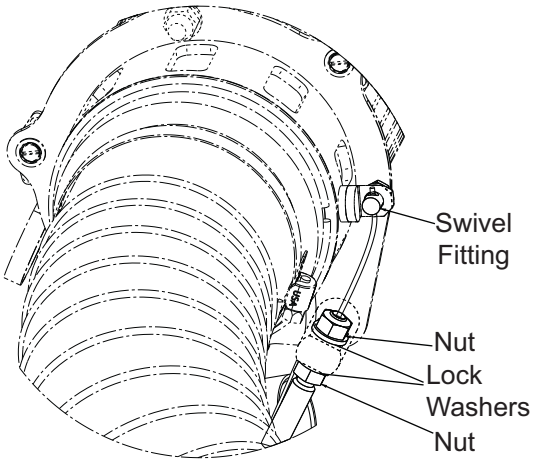


Mount on the Floor Panel





Installation View



Bowdencable Mount on Alternate Air (FWD Firewall)

Figure 203 : Alternate Air-Valve Control-Cable - Removal/Installation

A. Install an Alternate Air-Valve Control-Cable (Left/Right Cable).

Refer to Figure 203.

	Detail Steps/Work Items	Key Items/References
(1)	Install the alternate air-valve control-cable along it's designated route from the mount on the floor panel to the alternate air valve on the engine. - Remove the panels necessary for access to the control cable routing.	Refer to Section 52-40.
(2)	Install the cable ties and clamps to the control cable at the designated locations, as noted in step (9) of the removal procedure.	Do not tighten the cable ties and clamps at this time. Use new clamps as necessary.
(3)	At the engine, connect the bowden control cable to the related alternate air valve: - Install the cable swivel fitting at the relay lever. - Push the inner control cable through the lock washer and nut to fit in the swivel fitting. Tighten the swivel fitting to the inner control cable. - Install the lock washer and nut to the bowden control cable. - Tighten the lock washer and nut to the bowden control cable	
(4)	At the mount on the floor panel, connect the bowden control cable to the angle bracket: - Install the cable swivel fitting at the lever assembly. - Push the control cable through the bracket, washer and locknut to the stop, so that the inner control cable fits in the swivel fitting. Tighten the swivel fitting to the inner control cable. - Tighten the lock washer and nut to the bowden control cable at the cable bracket. - Install the lever assembly to the cable bracket with the bushings, washers and screws.	

	Detail Steps/Work Items	Key Items/References
(5)	Secure the cable ties and clamps to the control cable at the designated locations, as noted in step (2) of the install procedure.	
(6)	Close the panels that were opened for access to the control cable routing.	Refer to Section 52-40.
(7)	Move the alternate air lever in the cockpit from OFF to ON: - Make sure the lever moves freely with no restrictions.	
(8)	Adjust the alternate air cable that you installed.	Refer to Paragraph 7.
(9)	Install the engine top cowlings. Install the engine bottom cowling if it was removed for access.	Refer to Section 71-10.
(10)	Install the pilot's seat.	Refer to Section 25-10.
(11)	Connect the airplane main battery.	Refer to Section 24-31.

7. **Adjust the 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)	Disconnect the airplane main battery.	Refer to Section 24-31.
(3)	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.	Lever will be fully aft.
(5)	Set the alternate air lever in the cockpit to OFF and hold it in position: - Make sure that the alternate air valves (both left and right engines) are fully closed.	Lever will be fully forward.
(6)	Set the alternate air lever in the cockpit to ON and hold it in position: - Make sure that the alternate air valves (both left and right engines) are in the fully open position.	Lever will be fully aft.
(7)	If necessary, adjust the alternate air control cable to get the correct settings at step (5).	At the alternate air lever on the engine.
(8)	Do steps (5) to (7) again as necessary.	
(9)	Connect the airplane battery.	Refer to Section 24-31.
(10)	Install the engine top cowling.	Refer to Section 71-10.

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Section 71-70

Engine Drains

1. General

The DA 62 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 E4P-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 adapter 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.

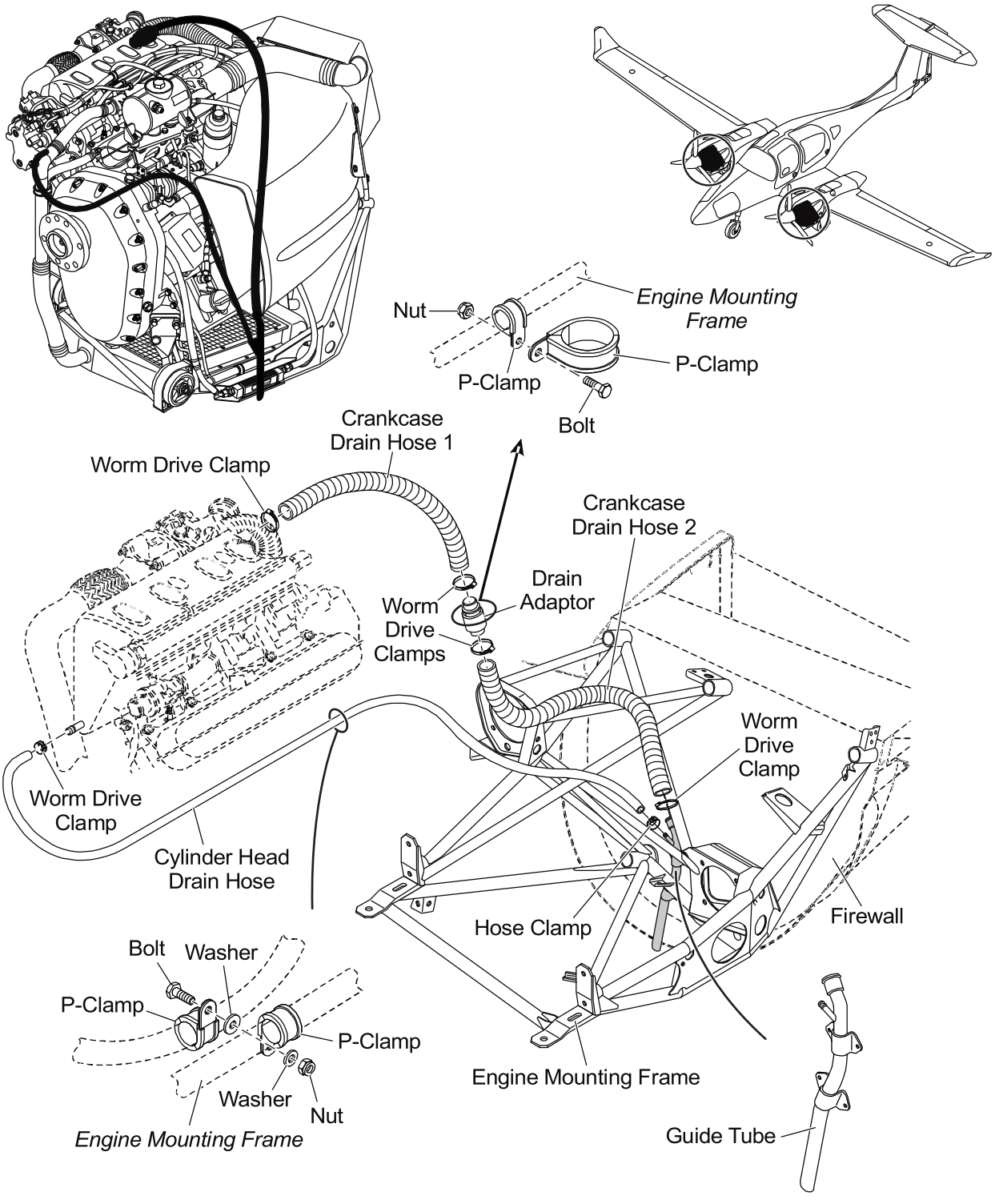

Figure 1 : Engine Cylinder Head Drain and Breather Hose Assembly

Maintenance Practices

1. **General**

These Maintenance Practices describe how to remove/install the oil separator breather-hose-assembly.

2. **Remove/Install the Breather Hose Assembly**

Use these procedures for both the left engine and the right engine.

A. Remove the Breather Hose Assembly.

Refer to Figure 201.

	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-clamps that secure the breather hose assembly to the engine mounting frame **{A}**.	Mark the attachment points of the oil breather hose assembly before removing it.
(5)	Remove the breather hose assembly: - Remove the worm drive clamp **{B}** that secures the breather hose assembly to the outlet at the top aft side of the rail cover. - Remove the worm drive clamp **{C}** that secures the breather hose assembly to the guide tube. - Move the breather hose assembly clear of the engine.	

	Detail Steps/Work Items	Key Items/References
(6)	Disassemble the breather hose assembly: - Remove the worm drive clamps **{D}** and **{E}** which secure the breather drain adapter to the breather hoses.	Note the orientation of the drain adapter.

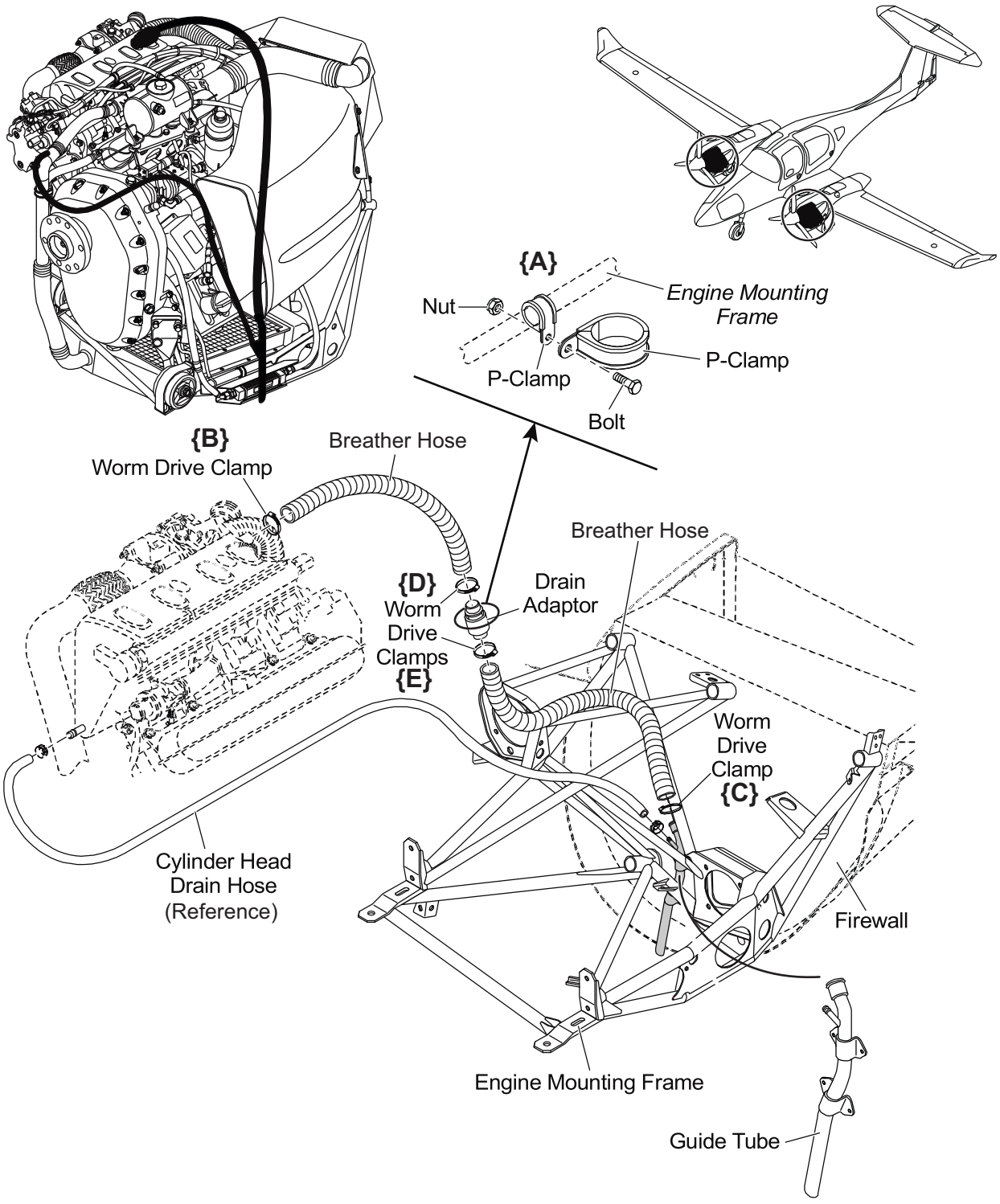

Figure 201 : Breather Hose Assembly - Removal/Installation

B. Install the Breather Hose Assembly.

Refer to Figure 201.)

	Detail Steps/Work Items	Key Items/References
(1)	Assemble the breather hose assembly: - Install the short breather line to the breather drain adapter and secure it with worm drive clamp **{D}**. - Install the long breather line to the breather drain adapter and secure with it worm drive clamp **{E}**.	Make sure to install the breather drain adapter with correct orientation.
(2)	Install the breather hose assembly along the engine and engine mounting frame according to the previously marked attachment points.	As noted in step (4) of the removal. Do not secure the breather hose at this time.
(3)	Install the breather hose assembly to the guide tube and secure it with worm drive clamp **{C}**.	
(4)	Install the breather hose assembly to the outlet at the top aft side of the rail cover and secure it with worm drive clamp **{B}**	
(5)	Secure the breather hose assembly with cable ties and P-clamps according to the previously marked attachment points.	As noted in step (4) of the removal.
(6)	Install the engine cowlings.	Refer to Section 71-10.
(7)	Connect the airplane main battery.	Refer to Section 24-31.

CHAPTER 72

ENGINE

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CHAPTER 72

ENGINE

1. General

This Section gives you background data about the AE E4P-C engines installed in the DA 62 airplane. This Section also tells you about the maintenance of the oil system of the AE E4P-C 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 Austro Engine (AE) authorized maintenance organizations may carry out maintenance and inspection work on the AE E4P-C engine. Any engine malfunction must be reported to AE.

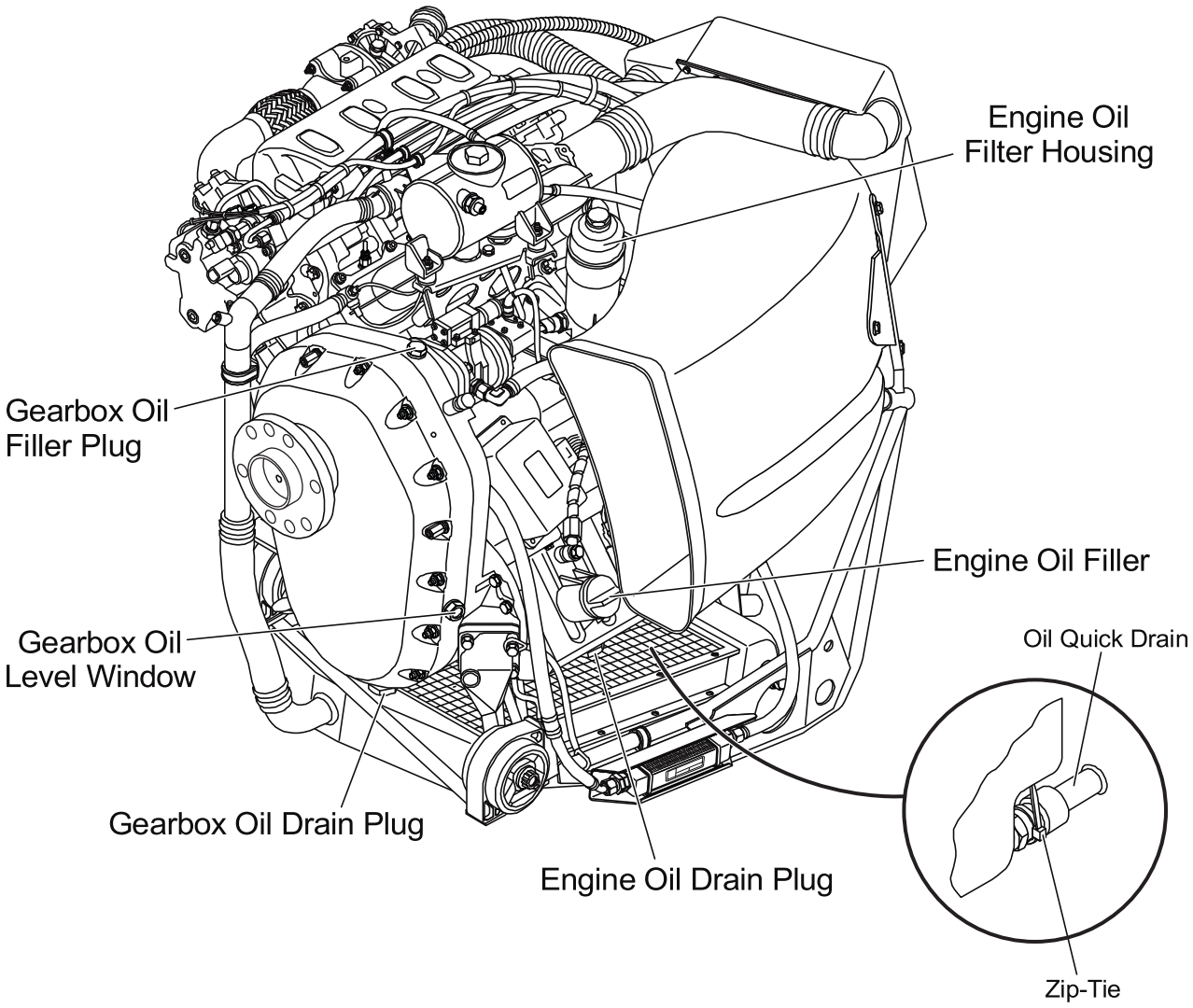

Figure 1 : Oil System - Maintenance Locations

2. Description

The Austro Engine E4P-C 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 E4P-C 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, refer to an approved Austro Engine (AE) E4P-C repair facility or the engine manufacturer.

When experiencing trouble as 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 oil pressure is 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 is 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 E4P-C 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:** **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: For environment protection, changing the engine oil is only allowed on sealed surfaces. Used engine oil has to be disposed according to the applicable regulations. The environment and ground water must not be contaminated.	
(1)	Do an engine ground run until the engine oil has reached operating temperature.	Refer to the AE Operation Manual, latest revision and the Airplane Flight Manual.
(2)	Make sure that the engine is safe: - Set the ELECT. MASTER key 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 engine cowlings.	Refer to Section 71-10.
	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.	
(5)	Change the engine oil and replace the engine oil filter.	Refer to Figure 1. (72-00-00, Page 2).
	NOTE: For the change of engine oil and replacement of the oil filter procedures refer to the AE Maintenance Manual, latest revision. NOTE: The DA 62 is equipped with an oil quick drain to ease the oil draining. After draining the oil quick drain has to be secured in the closed position via a zip-tie. Refer to Figure 1. (72-00-00, Page 2).	
(6)	Install the engine cowlings.	Refer to Section 71-10.

	Detail Steps/Work Items	Key Items/References
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do a ground test of the related engine, allow the engine to reach normal operating temperatures.	Refer to Section 71-00 and the AE Maintenance Manual, latest revision.
(9)	Shut down the engine and do a test for oil leaks: - Remove the engine cowlings. - Look for oil leaks, specially in the areas where you have done the work. - Install the engine cowlings.	 Refer to Section 71-10. Refer to Section 71-10.

3. **Replace the Gearbox Oil**

	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: 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: 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)	Do an engine ground run until the gearbox oil has reached operating temperature.	
(2)	Make sure that the engine is safe: - Set the ELECT. MASTER key 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 engine cowlings.	Refer to Section 71-10.
(5)	Remove the gearbox oil filler plug.	Refer to the AE Maintenance Manual, latest revision.
(6)	Remove the gearbox oil drain plug.	Refer to the AE Maintenance Manual, latest revision.
(7)	Drain the gearbox oil.	Refer to the AE Maintenance Manual, latest revision.
(8)	Drain the propeller un-feathering accumulator: - Set the ELECT. MASTER ON. - Set the ENGINE MASTER ON - OFF three times. - Set the ENGINE and ELECT. MASTER OFF.	
(9)	Install the gearbox oil drain plug.	Refer to the AE Maintenance Manual, latest revision.

	Detail Steps/Work Items	Key Items/References
	CAUTION: USE ONLY APPROVED GEARBOX OIL. REFER TO CHAPTER 2 OF THE AIRPLANE FLIGHT MANUAL FOR APPROVED GEARBOX OIL SPECIFICATION. IF YOU DO NOT USE APPROVED GEARBOX OIL, THE ENGINE CAN BE DAMAGED.	
(10)	Fill the gearbox with appropriate oil.	Refer to the AE Maintenance Manual, latest revision.
(11)	Install the gearbox oil filler plug.	Refer to the AE Maintenance Manual, latest revision.
(12)	Install the engine cowlings.	Refer to Section 71-10.
(13)	Connect the airplane main battery.	Refer to Section 24-31.
(14)	Do a ground test of the related engine, allow the engine to reach normal operating temperatures.	Refer to Section 71-00 and the AE Maintenance Manual, latest revision.
(15)	Shut down the engine and check for leakage. Remove the engine cowlings.	Refer to Section 71-10.
(16)	Check for leakage, especially at the gearbox oil drain plug and gearbox oil filler plug.	Refer to Figure 1. (72-00-00, Page 2).
(17)	If necessary, correct the 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.
(18)	Install the engine cowlings.	Refer to Section 71-10.

4. **Complete an Engine Electronic Control Unit (EECU) Software Update, if required**

NOTE: Only Austro Engine GmbH service partners may do software updates

The intention of this procedure is to:

- Record the status of the EECU
- Update the EECU Software (SW) according to MSB-E4-003 with the AE300-Wizard
- Record the updated status of the EECU.

The AE300-Wizard uses a Flash Container, which includes the Software file to update the EECU. The Flash Container is available on the Austro Engine Homepage / Client Area.

Obey the diagram below for the Software Update procedure by use of references to the AE300-Wizard. For detailed instructions, refer to latest revision of the AE300-Wizard User Guide E4.08.09.

Use the appendix of MSB E4-003 “Execution Report” to record the updated status of the EECU.

Refer to MSB E4-003 for current software versions and compatibility information.

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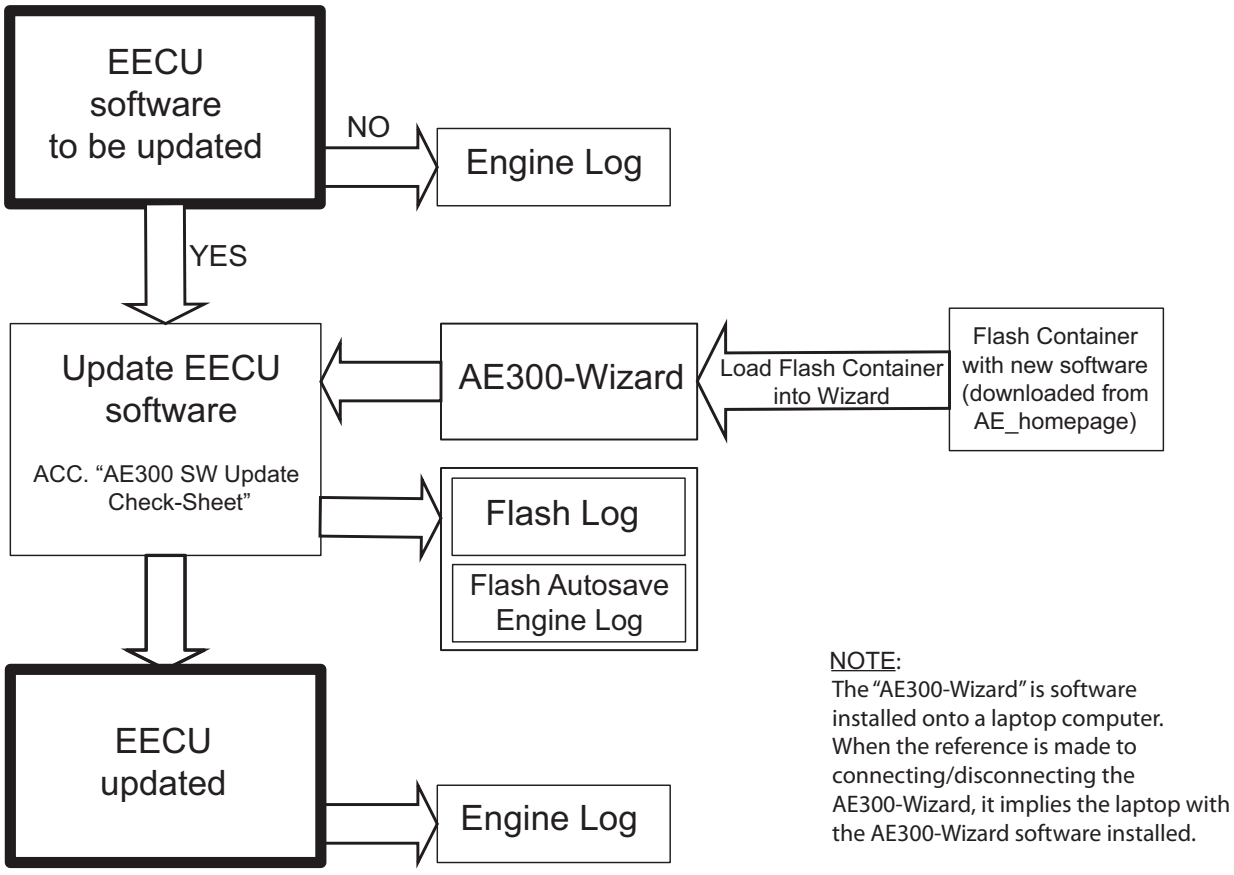

Figure 201 : Update of the EECU Software

A. Software Update Procedure

NOTE: The “AE300-Wizard” is software installed onto a laptop computer. When the reference is made to connecting/disconnecting the AE300-Wizard, it implies the laptop with the AE300-Wizard software installed.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
NOTE: For reference, use the latest revision of the AE300-Wizard User Guide E4.08.09. Always use the latest AE300-Wizard software version.		
(1)	Connect the AE300-Wizard to the EECU.	
(2)	Identify the EECU software version on ECU A and ECU B.	
(3)	Compare the EECU software version on ECU A and ECU B with the last valid EECU software version.	Refer to MSB E4-003 for the last valid software version. If the EECU software version is obsolete and/or not the last version, continue with the following steps.
(4)	Upload the last valid “Flash Container” of the EECU software version into the AE300-Wizard.	The last valid EECU software version according to MSB E4-003.
(5)	Do the “EECU SW Update”.	Refer to the AE300-Wizard User Guide section “EECU Software Update.”
(6)	Make sure that the GREEN MESSAGE BOX shows.	- Update process successful. - If the RED MESSAGE BOX shows, obey the steps explained in the AE300-Wizard User Guide section “Detailed Steps of the Software Update Process”.
(7)	Identify the EECU software version on ECU A and ECU B.	
(8)	Compare the EECU software version on ECU A and ECU B.	Make sure that ECU A and ECU B have the same EECU software version according to the AE300-Wizard User Guide.
(9)	Read out “Engine Log” and compare with the last valid EECU software version.	

	Detail Steps/Work Items	Key Items/References
(10)	Do a check of the function and connection to the Engine Display: - Start the engine - Set manually to ECU A - Make sure the engine data is correctly displayed - Make sure that no engine caution Indication is generated or active - Set manually to ECU B - Make sure the engine data is correctly displayed - Make sure that no engine caution Indication is generated or active - Stop the engine.	
(11)	Disconnect the AE300-Wizard.	

B. Examine the EECU Fault Log.

	Detail Steps/Work Items	Key Items/References
(1)	Read the fault code memory of the EECU. Examine for “real time clock failure” occurrences (DTC 1d06).	If this failure shows on one of the ECUs (ECU A or ECU B) with the error type “NPL: RTC-oscillator has stopped, time/date 00:00:00 2000- 01-01 substituted”, replace the EECU within the next 12 months. Refer to the 76-00-00, Maintenance Practices.
		If this failure shows on the two ECUs (ECU A and ECU B) with minimum one with error type “NPL: RTC-oscillator has stopped, time/date 00:00:00 2000-01-01 substituted”, replace the EECU immediately. Refer to the 76-00-00, Maintenance Practices

5. **Read out EECU data using the AE300-Wizard Software**

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.
EECU software (latest approved version).	N/A	N/A.
AE300-Wizard software (latest approved version).	N/A	N/A.
CAN driver for the AE300-Dongle.	1	Commercial.
AE-300 Dongle [connects the EECU (9-pin CAN connector) to your Laptop (USB connector)].	1	Commercial.
Latest revision of the AE300-Wizard User Guide E4.08.09.	1	Commercial.

B. Set up the laptop with AE300-Wizard software on the airplane and download the following data:

NOTE: Refer to the latest revision of the AE300-Wizard User Guide E4.08.09. for set up of the laptop on the airplane and saving of information.

- Engine event log
- Event recorder
- Engine data log.

Send the recorded data to Austro Engine GmbH via e-mail.

For the list of engine control system errors and their error handling refer to the latest revision of the Austro Engine Operation Manual, Doc. No. E4.01.02.

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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 E4P-C engines. 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.

2. Description and Operation

Figure 1 shows the schematic diagram for DA 62 with the E4P-C engine.

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.

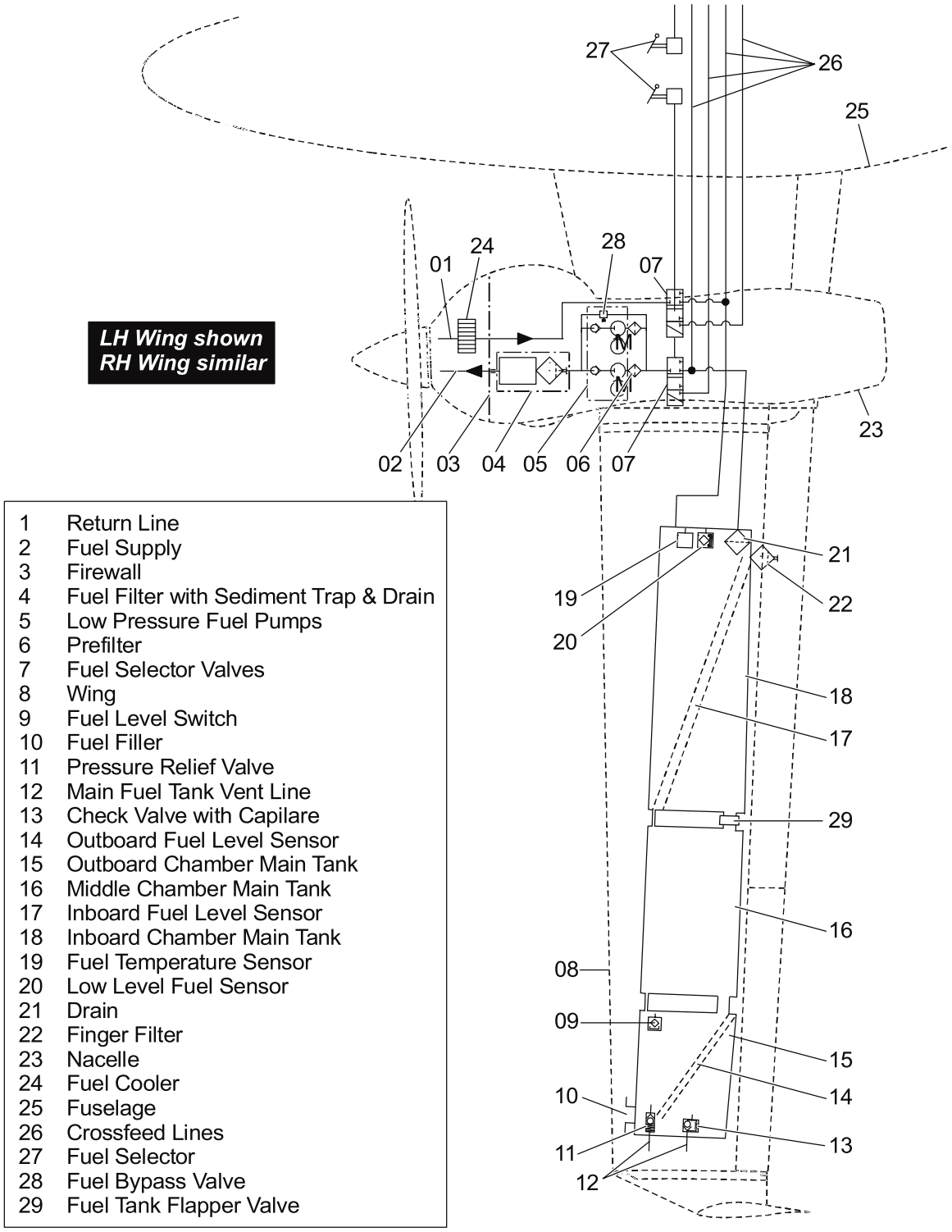
The air intake system has an air filter located in the aft middle of the engine compartment. The filter attaches to the forward face of the alternate air valve. The alternate air valve also has an inlet direct from the engine compartment. The valve can select either filtered air or warm, unfiltered air. Refer to Section 71-60 for more data on the air filter and alternate air valve.

The outlet from the alternate air valve connects to the turbo charger. The outlet from the turbo-charger 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.

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 in the engine compartment. From the fuel cooler the fuel returns to the main fuel tanks.



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
28	Fuel Bypass Valve
29	Fuel Tank Flapper Valve

Figure 1 : Engine Fuel System Schematic

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.

When experiencing trouble as 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.
	Dirty/damaged air filter.	Replace the air filter. Refer to Section 71-60.
	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.

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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 for more data on the fuel distribution system.
- Refer to Section 71-60 for maintenance data on the air filter and alternate air valve.
- Refer to Section 81-00 for maintenance data on the turbo charging system.

2. **Remove/Install a Fuel Cooler**

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 BREATH FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

A. Remove a Fuel Cooler.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the engine is safe: - Set the ELECT. MASTER key 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)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(5)	Disconnect the flexible fuel hoses that connect to the fuel cooler. - Remove the wire locking from the fuel hose connectors.	Use a suitable container to catch spilt fuel. Put caps on all open connections.
(6)	Remove the fuel cooler: - Remove the two bolts and washers that attach the fuel cooler to the engine mount. - Lower the cooler including the 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 as the cooler will contain fuel.

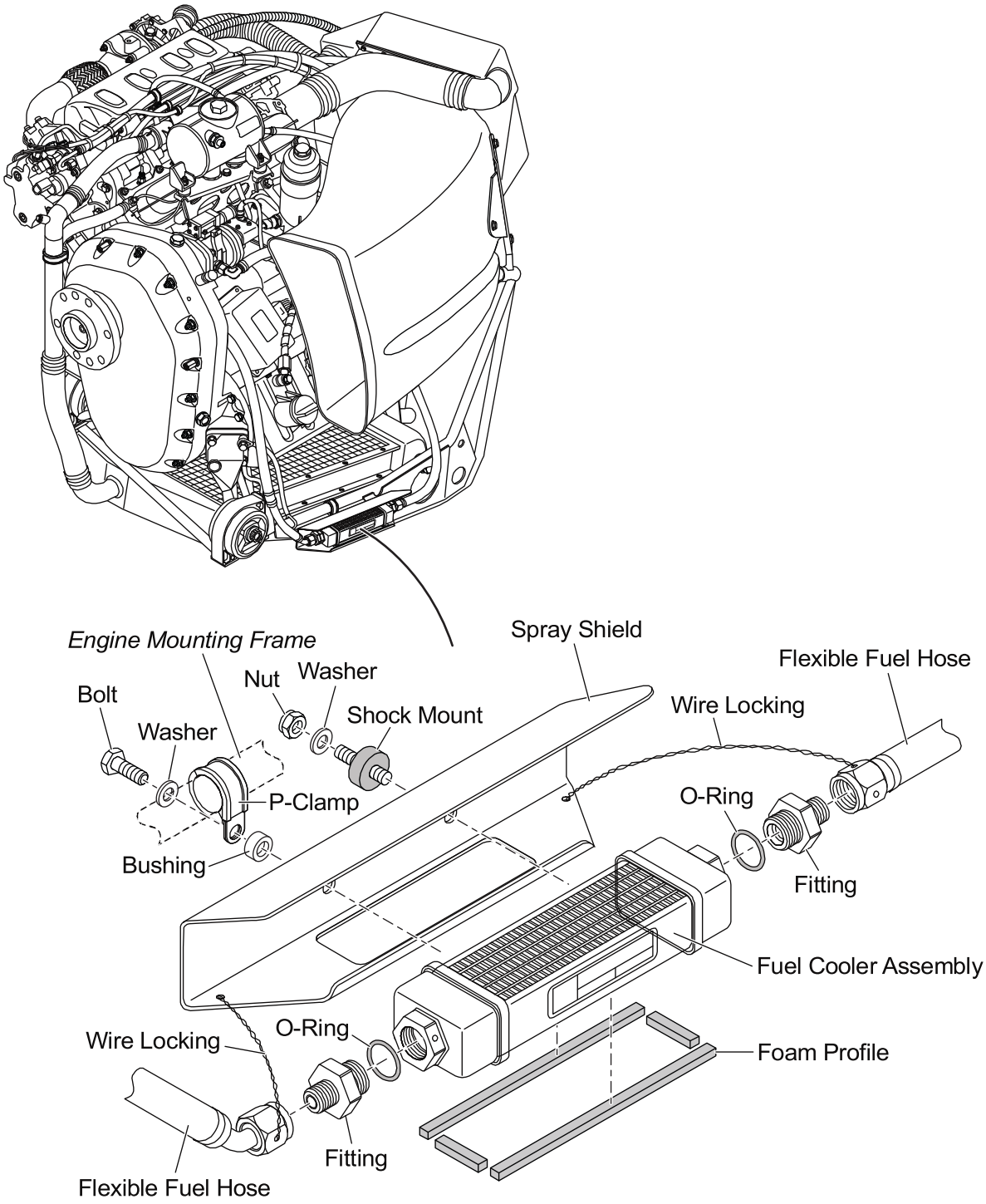

Figure 201 : Fuel Cooler - Removal/Installation

B. Install a Fuel Cooler.

Refer to Figure 201.

	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 two bolts and washers that attach the fuel cooler to the engine mount.	
(2)	Remove all the blanking caps. Connect the flexible hoses to the fuel cooler. Secure fuel line connections with wire locking.	
(3)	Do a test for leaks. Specially at the flexible hose connections to the fuel cooler.	
(4)	Install the engine cowlings.	Refer to Section 71-10.
(5)	Connect the airplane main battery.	Refer to Section 24-31.

3. **Remove/Install a Fuel Cooler (if OÄM 62-060 is installed)**

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 BREATH FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

A. Remove a Fuel Cooler (if OÄM 62-060 is installed)

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Make sure that the engine is safe: - Set the ELECT. MASTER key 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)	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
(5)	Disconnect the flexible hoses that connect to the fuel cooler. - Remove the wire locking from the fuel hose connectors.	Use a suitable container to catch spilt fuel. Put caps on all open connections.
(6)	Remove the fuel cooler: - Remove the four bolts and washers that attach the fuel cooler to the spray shield. - Lower the cooler from the spray shield and clear of the engine nacelle. - Empty the fuel from the cooler into a suitable container.	Support the cooler. Take care as the cooler will contain fuel.

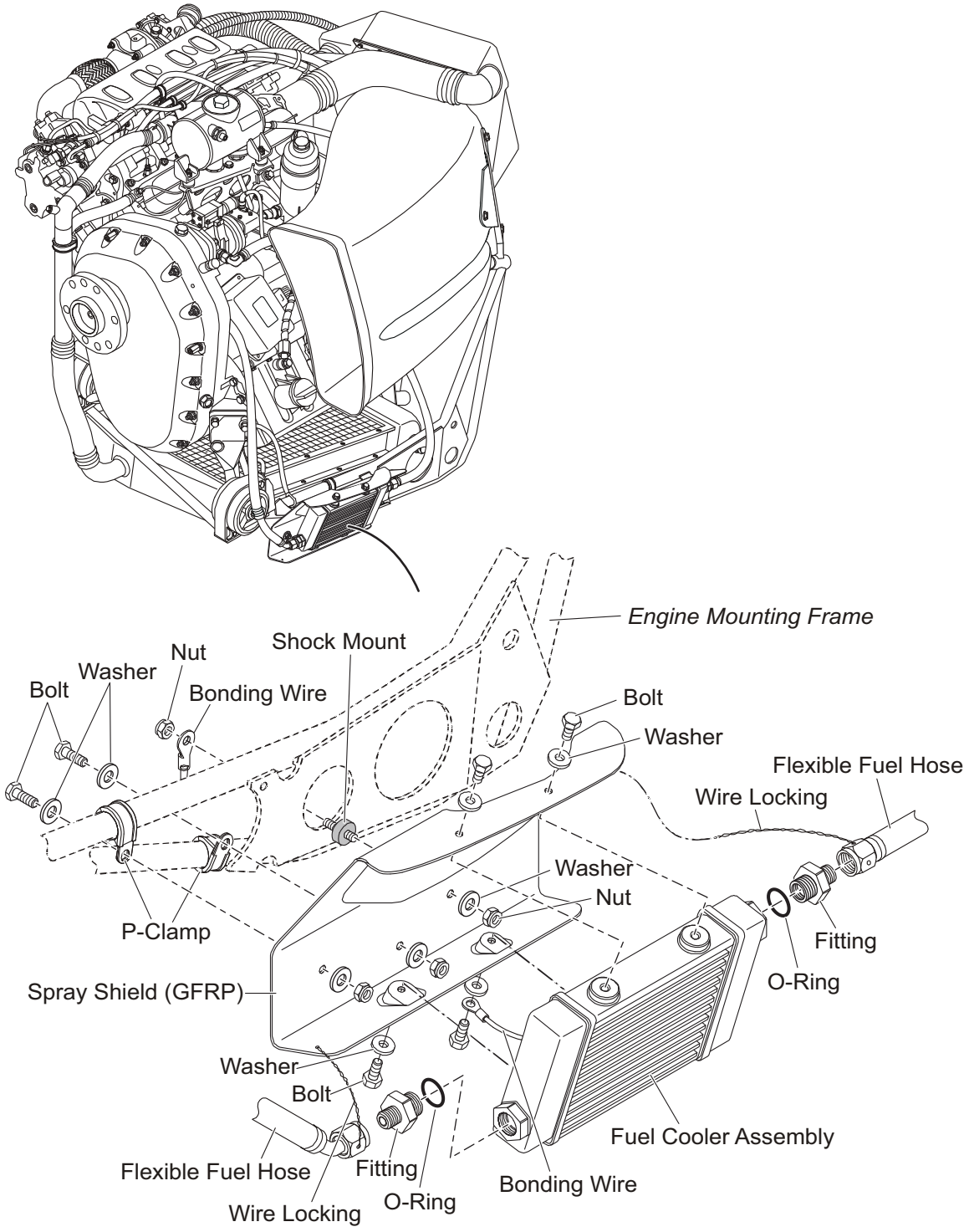

Figure 202 : Fuel Cooler - Removal/Installation (if OÄM 62-060 is installed)

B. Install a Fuel Cooler (if OÄM 62-060 is installed)

Refer to Figure 202.

	Detail Steps/Work Items	Key Items/References
(1)	Install the fuel cooler: - Move the fuel cooler into position on the spray shield. - Align the cooler with the mounting holes on the spray shield and install the four bolts and washers that attach the fuel cooler to the spray shield.	
(2)	Remove all the blanking caps. Connect the flexible hoses to the fuel cooler. Secure fuel line connections with wire locking.	
(3)	Do a test for leaks. Specially at the flexible hose connections to the fuel cooler.	
(4)	Install the engine cowlings.	Refer to Section 71-10.
(5)	Connect the airplane main battery.	Refer to Section 24-31.

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CHAPTER 75

LIQUID COOLING SYSTEM

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CHAPTER 75

LIQUID COOLING SYSTEM

1. General

This Section describes the liquid cooling system for the DA 62 airplane and the Maintenance Practices to remove/install the system components.

Figure 1 shows the liquid cooling system schematic diagram. Figures 2 and 3 show the installation of components on the airplane.

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, behind 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 cools the engine. The coolant leaves the engine through a thermostat valve at the top of the engine left of the crankcase.

A temperature sensor in the front 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 consists of three circuits:

- Cooling circuit I contains the engine gearbox oil/coolant heat exchanger and cabin heat exchanger and is always in operation.
- Cooling circuit II leads from the thermostat back to the engine coolant inlet. This cooling circuit is active at coolant temperatures below 80°C and allows quick engine warm up.
- Cooling circuit III is activated above 80°C coolant temperatures and contains the large coolant heat exchanger.

For the cooling circuit III, large diameter hoses and pipes connect the thermostat valve to the inlet of a large coolant heat exchanger. The coolant heat exchanger is located below the engine. Large hoses and pipes connect the outlet from the coolant heat exchanger to an inlet on the engine crankcase at the rear, top. This is the inlet to the engine coolant pump.

Cooling circuit II consists of large diameter hoses and pipes, that connect the outlet of the thermostat valve with the inlet of the engine coolant pump.

A coolant expansion tank is located on top of the engine, left of 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.

Coolant circuit I contains smaller diameter hoses, that connect to the engine coolant outlet and inlet of the cabin heating heat-exchanger. The return flow from the cabin heat exchanger connects to a tapping on the main circuit pipe on the rear side of the engine.

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 62-055 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 62-055 is installed:

A cartridge contains a replaceable silicate pouch and is situated in the filler neck of the coolant expansion tank.

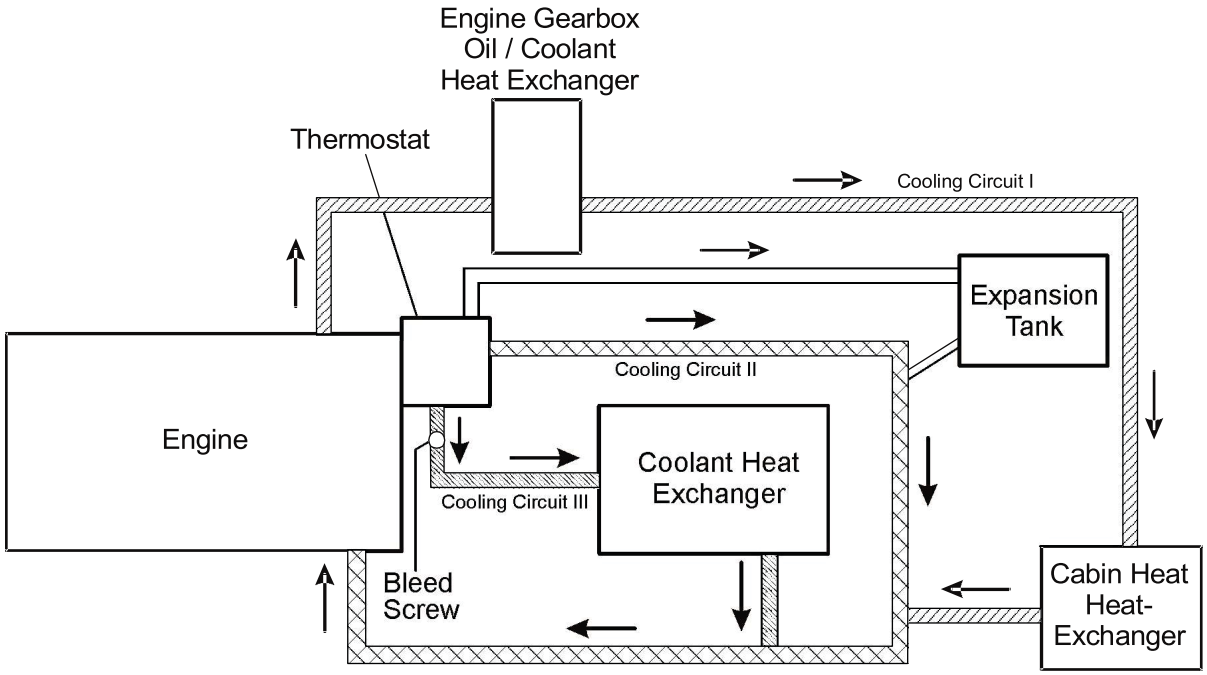
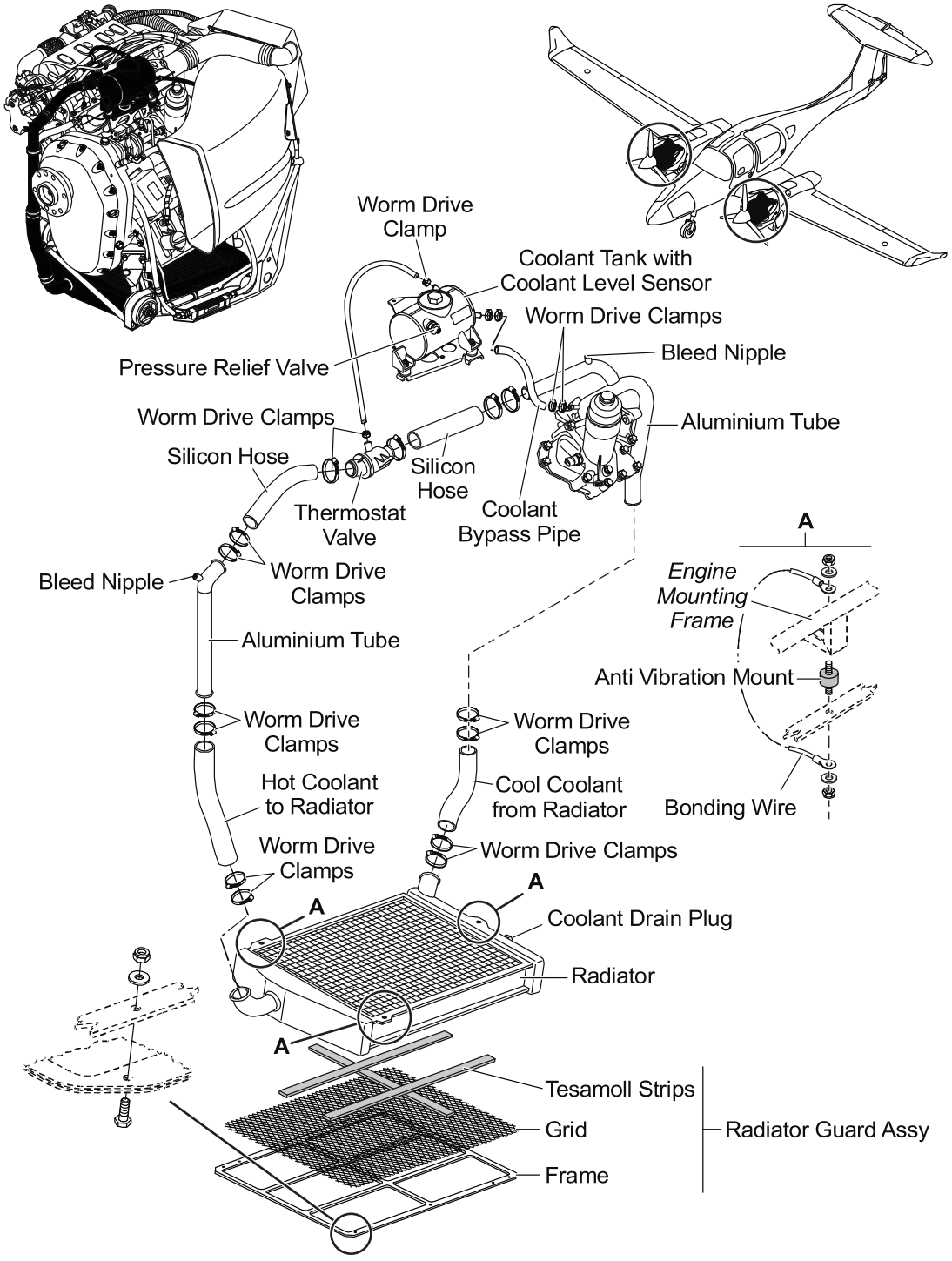
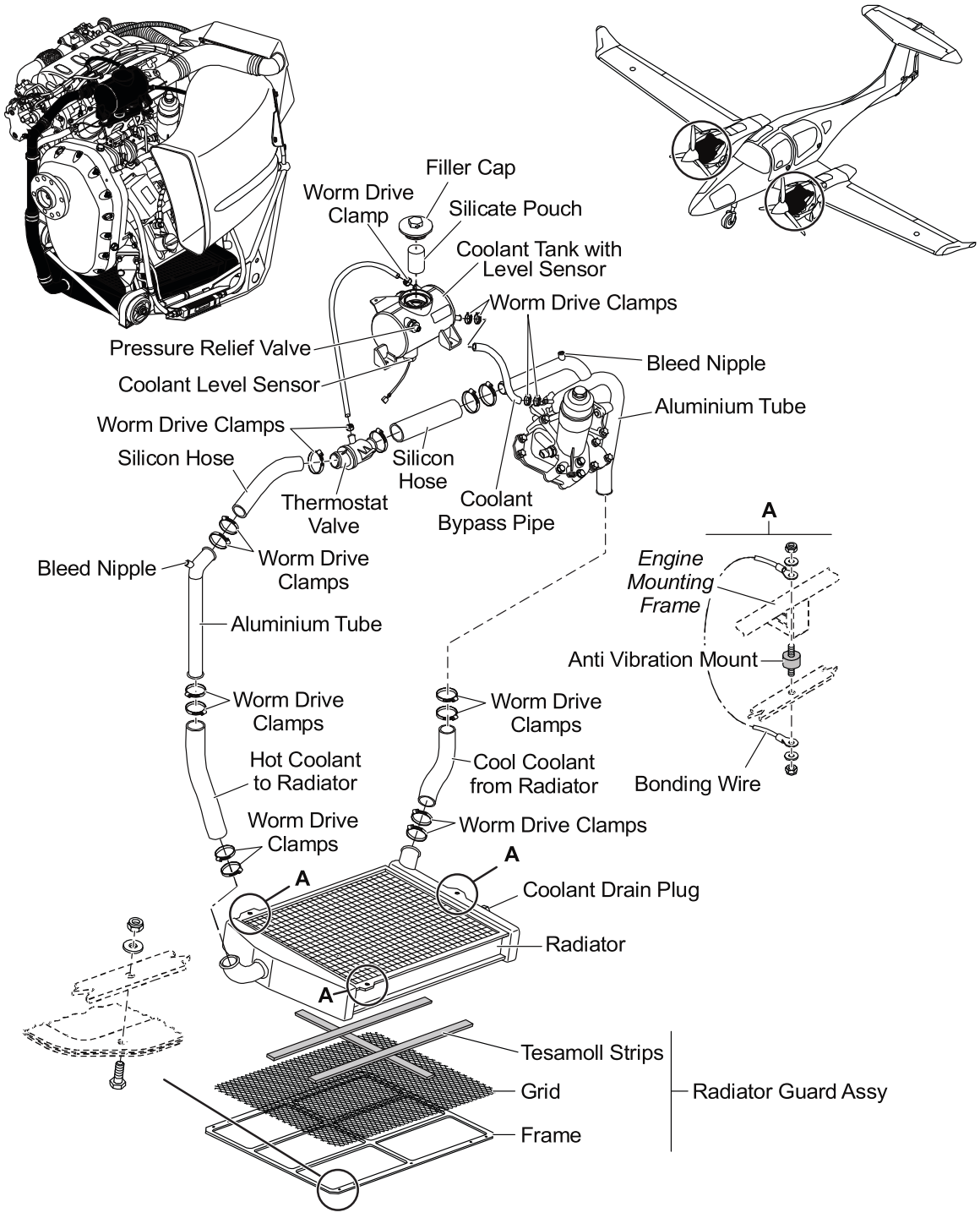


Figure 1 : Liquid Cooling - System Schematic Diagram



* Hose connections with single worm-drive-clamp must be secured with wire locking.

Figure 2 : Liquid Cooling System - Installation



* Hose connections with single worm-drive-clamp must be secured with wire locking.

Figure 3 : Liquid Cooling System - Installation (if MÄM 62-055 is installed)

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TROUBLE-SHOOTING

1. **General**

This table describes how to troubleshoot the liquid cooling system. This table gives only troubles to the airplane parts of the cooling system.

When experiencing trouble as 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 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 the 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 describes the Maintenance Practices for the components in the liquid cooling system.
The Maintenance Practices are valid for the LH engine components and the RH engine components.

2. **Remove/Install the Coolant Expansion Tank**

A. Remove the Coolant Expansion Tank.

Refer to Figure 201.

	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: 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 cowling.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(4)	Remove the filler cap from the coolant tank: - If installed, remove the safety lock wire from the filler cap. - Turn the cap counterclockwise a small distance to release the pressure. - When the pressure has fully released, remove the cap. - Drain the coolant.	Refer to Paragraph 9.

	Detail Steps/Work Items	Key Items/References
(5)	Disconnect the hose that connects the expansion tank to the supply system through the coolant bypass pipe: - Remove the worm-drive clamp that secures the hose. - Pull the hose from the connector at the expansion tank.	 Discard the worm-drive clamp. Use a suitable container to collect the coolant.
(6)	Disconnect the electrical cables for the coolant tank level sensor.	At the inline connector, at the sensor.
(7)	Remove the hose from the coolant tank which connects to the thermostat valve. - Remove the wire locking from the worm-drive clamps. - Remove the worm-drive clamps and the hose.	 Discard the worm-drive clamp.
(8)	Remove the nut which also holds cable clamps of the fuel and electrical system on top of the thermostat valve.	
(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.	

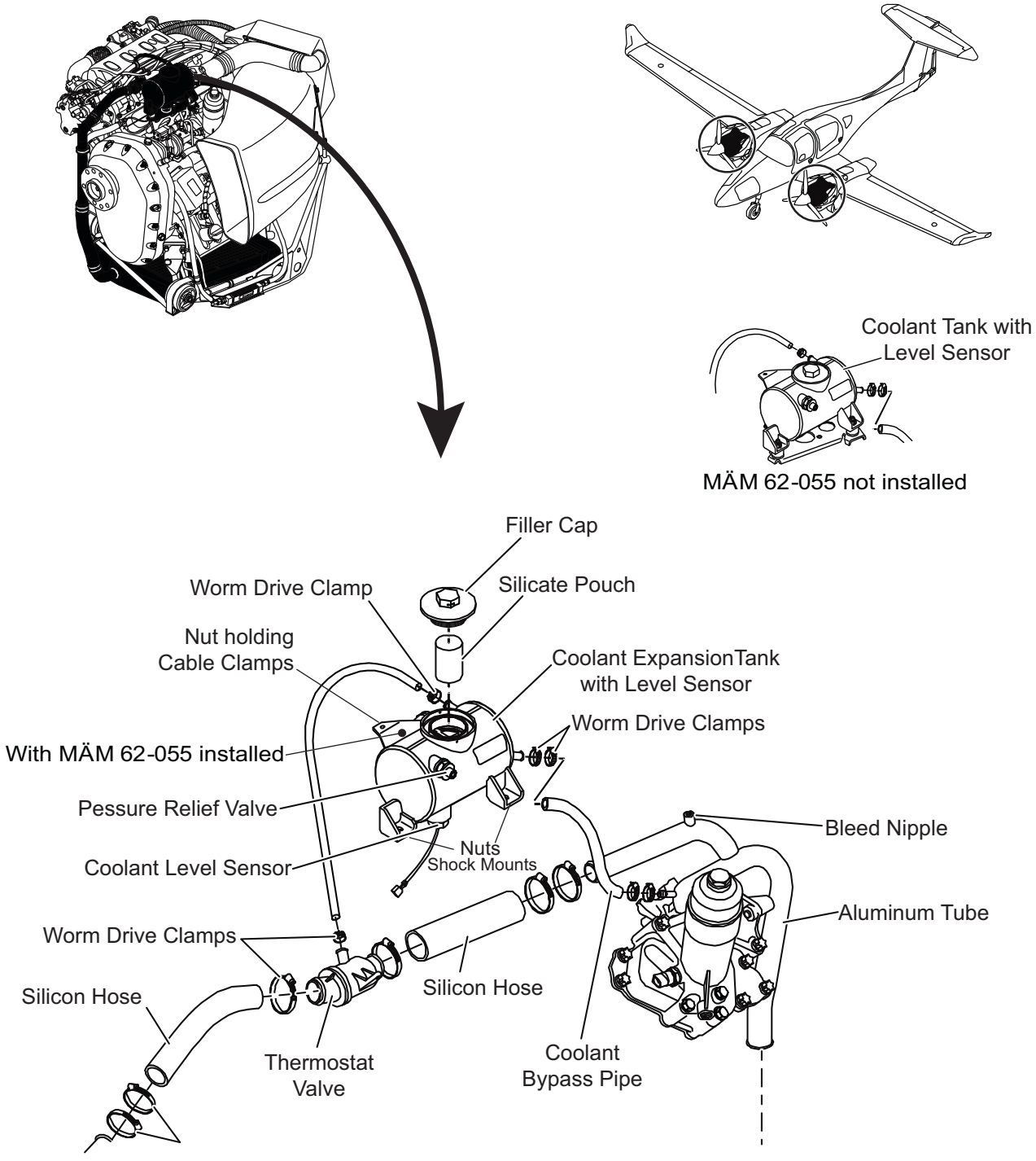


Figure 201 : Coolant Expansion Tank - Removal/Installation

B. Install the Coolant Expansion Tank.

Refer to Figure 201.

NOTE: Use only new worm-drive clamps for hose installation in the liquid cooling system.

	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 valve.	
(4)	Connect the electrical cables for the coolant level sensor.	
(5)	Connect the balance hose that connects the cabin heat pipe and the bypass vent to the expansion tank: - Push the hose onto the connector at the expansion tank. - Push the hose onto the connector at the thermostat valve. - 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 engine cooling system.	Refer to Paragraph 8.
(8)	Perform a coolant system pressure-test.	Refer to Paragraph 10.
(9)	Install the engine cowlings.	Refer to Section 71-10.
(10)	Connect the airplane main battery.	Refer to Section 24-31.

3. **Remove/Install the Pressure Relief Valve**

A. Remove the Pressure Relief Valve.

Refer to Figure 202.

	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: 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 cowling.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(3)	Remove the filler cap from the coolant tank: - If installed, remove the safety lock wire from the filler cap. - Turn the cap counterclockwise a small distance to release the pressure. - When the pressure has fully released, remove the cap.	
(4)	At the side of the coolant tank, remove the locking wire from the pressure relief valve.	
(5)	Remove the pressure relief valve.	

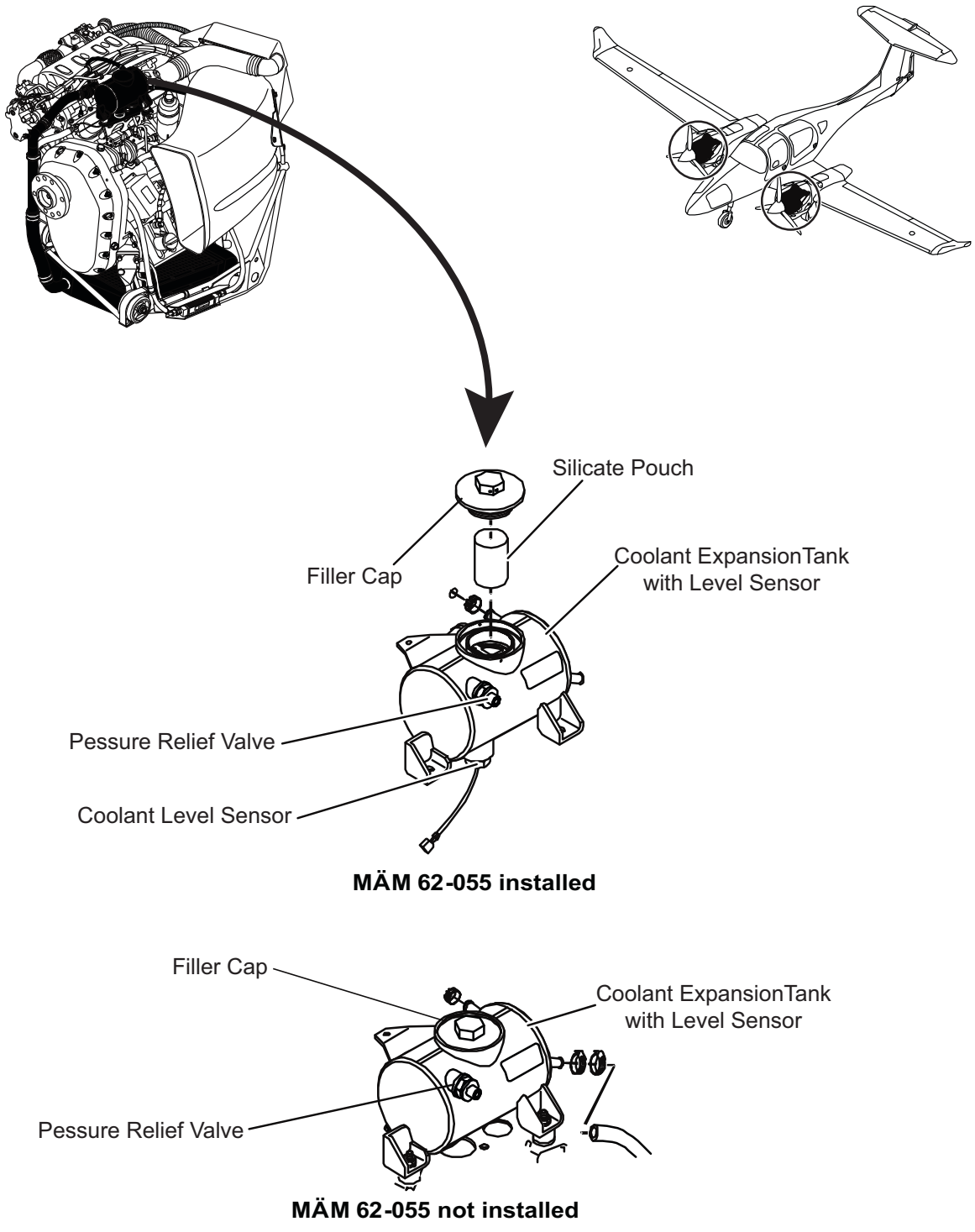


Figure 202 : Pressure Relief Valve - Removal Installation

B. Install the Pressure Relief Valve.

Refer to Figure 202

	Detail Steps/Work Items	Key Items/References
(1)	Install the pressure relief valve.	Torque 12-15 Nm (8.85 - 11.06 lbf.ft.). Check the O-ring for deformation and correct placement. Apply EZ TURN.
(2)	Install new locking wire on the pressure relief valve.	Wire diameter 0.8 mm (0.032 in).
(3)	Install the filler cap on the coolant tank: - Tighten securely. - If safety lock wire was removed, install new the safety lock wire on the filler cap.	
(4)	Install the engine cowling.	Refer to Section 71-10.

4. **Replace the Silicate Pouch (If MÄM 62-055 IS installed)**

Refer to Figure 201.

NOTE: If MÄM 62-055 is **NOT** installed, refer to Paragraph 5.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine cowlings.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(2)	Remove the safety lock wire from the filler cap on the coolant expansion tank.	
(3)	Remove the filler cap from the coolant expansion 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.	
(4)	Remove the retaining ring inside the filler neck.	
(5)	Remove the max coolant level plate.	
(6)	Remove the used silicate pouch and replace it with the new silicate pouch. Remove the cartridge and clean it with water. Reinstall the 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 the coolant level, refill if required.	
(10)	Install the filler cap on the coolant expansion tank. Check the O-ring for deformation.	Refer to Section 20-70. Torque 12-15 Nm (8.85 - 11.06 lbf.ft.). Replace the O-ring if necessary. Apply EZ TURN.
(11)	Install safety lock wire to secure the filler cap.	Wire diameter 0.8 mm (0.032 in).

5. **Replace the Silicate Pouch (If MÄM 62-055 is NOT installed)**

Refer to Figure 201.

NOTE: If MÄM 62-055 **IS** installed, refer to Paragraph 4.

	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: 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 coolant system.	Refer to Paragraph 9.
(2)	Remove the coolant expansion tank.	Refer to Paragraph 2.A.
(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 the 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.B.
(10)	Fill and bleed the engine coolant system.	Refer to Paragraph 8.
(11)	Perform a coolant system pressure test.	Refer to Paragraph 10.

6. **Replace the Coolant Level Sensor**

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Remove the engine cowlings.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(2)	If MÄM 62-055 is installed: Remove the safety lock wire from the filler cap on the coolant expansion tank.	
(3)	Remove the filler cap from the coolant expansion 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 the engine cooling system.	Refer to Paragraph 9.
(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 a new coolant level sensor. Use a 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 8.

7. **Remove/Install the Coolant Radiator**

A. Remove the Coolant Radiator.

Refer to Figure 203.

	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: 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 cowling.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(4)	Remove the filler cap from the coolant tank to relief any pressure which may be resident in the system:: - If installed, remove the safety lock wire from the filler cap. - 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 engine coolant system.	Refer to Paragraph 9.
(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, for the installation.
(7)	Remove the radiator: - Remove the nuts, washers and bolts that attach the radiator guard assembly to the radiator. - Remove the nuts, washers, bolts, bonding wires and anti vibration mounts that attach the radiator to the engine mounting frame. - Move the radiator clear of the engine nacelle.	

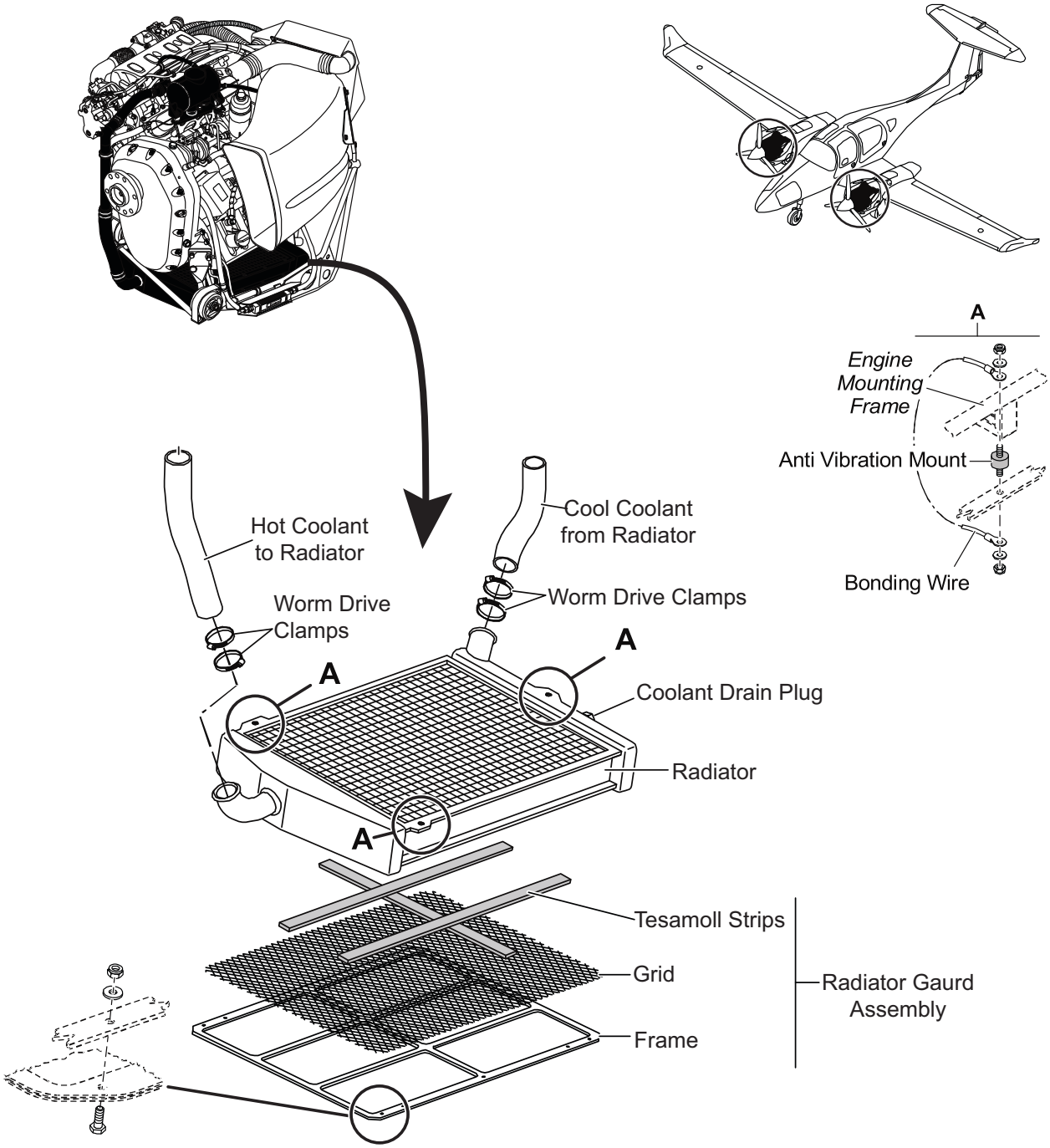


Figure 203 : Coolant Radiator - Removal/Installation

B. Install the Coolant Radiator.

Refer to Figure 203.

NOTE: Use only new worm-drive clamps for hose installation in the liquid cooling system.

	Detail Steps/Work Items	Key Items/References
(1)	Install the radiator: - Install the radiator guard assembly. - Move the radiator into position at the bottom of the engine nacelle. - Install the bolts, washers, nuts, bonding wires and anti vibration mounts that attach the radiator to the engine mounting frame.	
(2)	Install the hoses onto the radiator that you removed in Paragraph 7.A, Step (6): - Install the radiator hoses onto the radiator inlet and outlet. - 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 7.A, Step (6). Use only new worm-drive clamps.
(3)	Fill and bleed the liquid coolant system.	Refer to Paragraph 8.
(4)	Perform a coolant pressure test.	Refer to Paragraph 10.
(5)	Install the engine cowling.	Refer to Section 71-10.
(6)	Connect the airplane main battery.	Refer to Section 24-31.

8. **Fill and Bleed the Engine Cooling System**

A. Equipment.

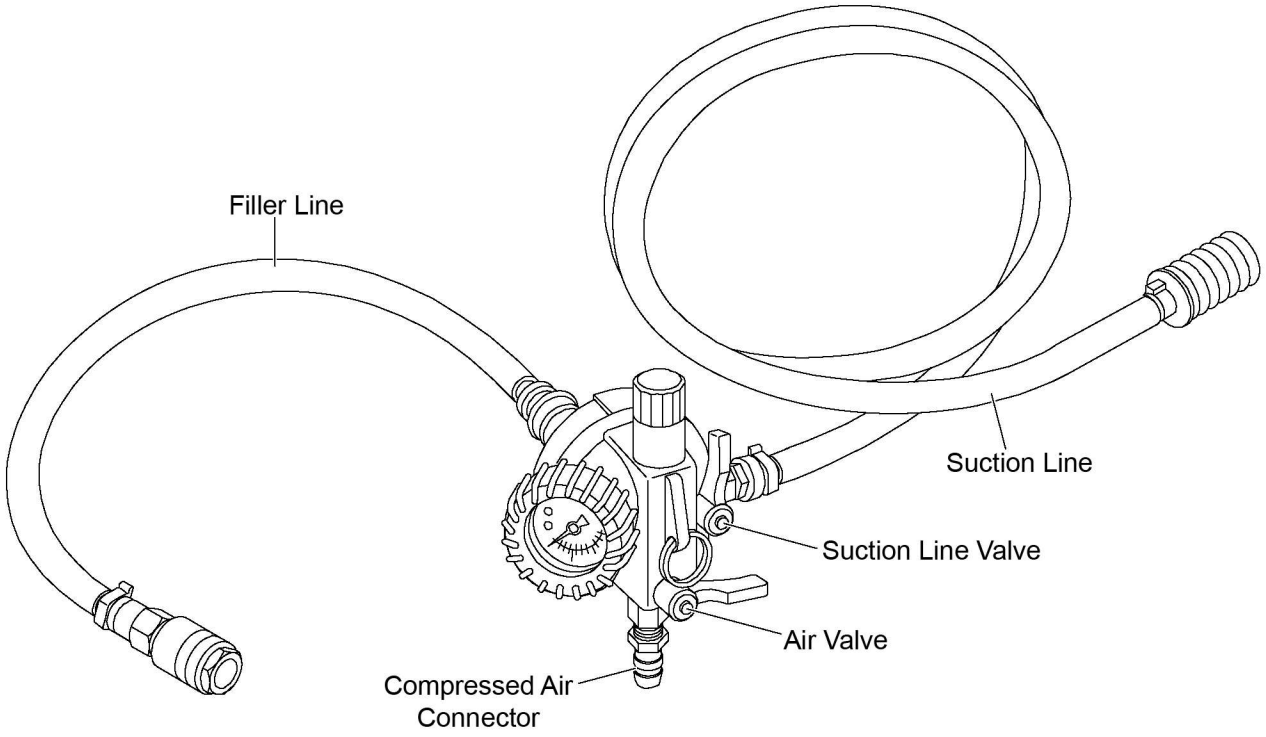
Item	Quantity	Part Number
Vacuum filler device for cooling system.	1	DAI-7500-10-00-ST
Pressure tool cap.	1	D44-7521-00-00-ST
Pressure relief valve blocking tool.	1	DAI-7500-01-00-ST

B. Fill and Bleed the Engine Cooling System.

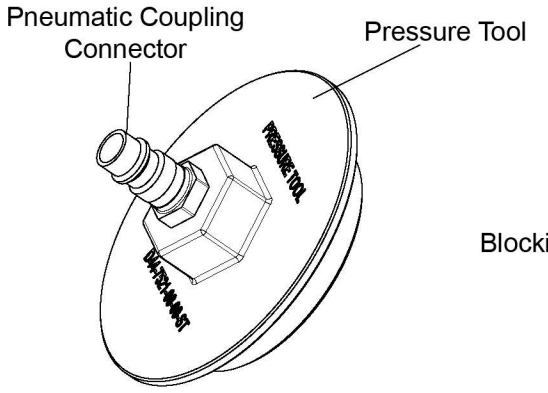
	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. **WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS 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.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(4)	Fill the cooling system. If MÄM 62-055 is NOT installed: - Remove the filler cap. - Install the rubber cone of the filler device. If MÄM 62-055 is installed: - Remove the lock wire. - Remove the filler cap. - Install the pressure tool cap.	D44-7521-00-00-ST - Refer to Figure 204.

	Detail Steps/Work Items	Key Items/References
(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 - Refer to Figure 204. 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 eight liters of coolant fluid. Place the container on a pedestal at engine level.	Refer to Chapter 2 of the AFM for the approved coolant. Make sure, that the suction line is completely filled with coolant.
	WARNING: USE ONLY AN 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 approximately two minutes.	Make sure the filler device gauge shows -0.6 to -0.8 bar.
(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 10.
(15)	Remove the pressure relief valve blocking tool.	
(16)	If MÄM 62-055 is installed: - Perform a pressure relief valve test.	Refer to Paragraph 11.

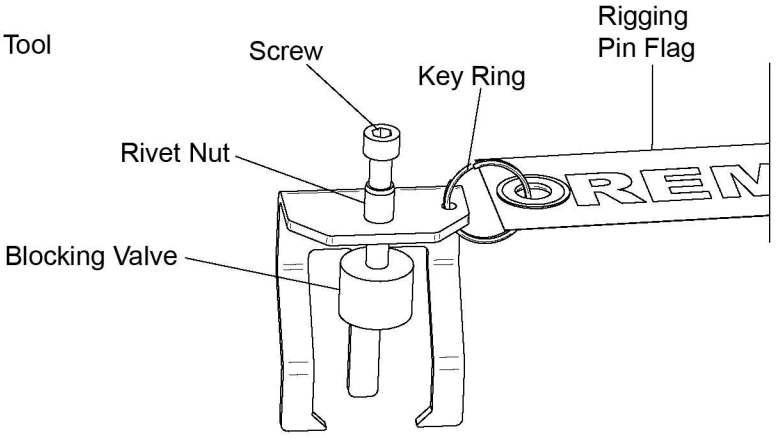
	Detail Steps/Work Items	Key Items/References
(17)	If MÄM 62-055 is NOT installed: - Fill coolant to max. Coolant level marking in the filler neck. - Install the filler cap. If MÄM 62-055 is installed: - Fill coolant to maximum. Coolant level marking in the filler neck. - Check O-ring for deformation. - 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.).
(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 FILLER CAP FROM THE COOLANT TANK IF THE ENGINE IS HOT. THE PRESSURE IN THE SYSTEM CAN FORCE HOT COOLANT TO COME OUT AND CAN CAUSE INJURY TO PERSONNEL.	
(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 the coolant tank remains constant.	
(22)	If MÄM 62-055 is installed: - Install safety lock wire to secure the filler cap.	Wire diameter 0.8 mm (0.032 in).
(23)	Install the engine cowlings.	Refer to Section 71-10.
(24)	Connect the airplane main battery.	Refer to Section 24-31.



Vacuum Filler Device (DAI-7500-10-00-ST)



Pressure Tool Assy. (D44-7521-00-00-ST)



Pressure Relief Valve Blocking Tool (DAI-7500-01-00-ST)

Figure 204 : Equipment - Fill and Bleed the Engine Cooling System

9. **Drain the Engine Coolant System**

Refer to Figure 205.

	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: 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.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(4)	Remove the filler cap from the coolant tank to relief any pressure which may be resident in the system: - If installed, remove the safety lock wire from the filler cap. - Turn the cap counterclockwise a small distance to release the pressure. - When the pressure has fully released, remove the cap.	
(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.	
(6)	If the airplane is to be left without coolant, make sure to enter the information in the log books.	

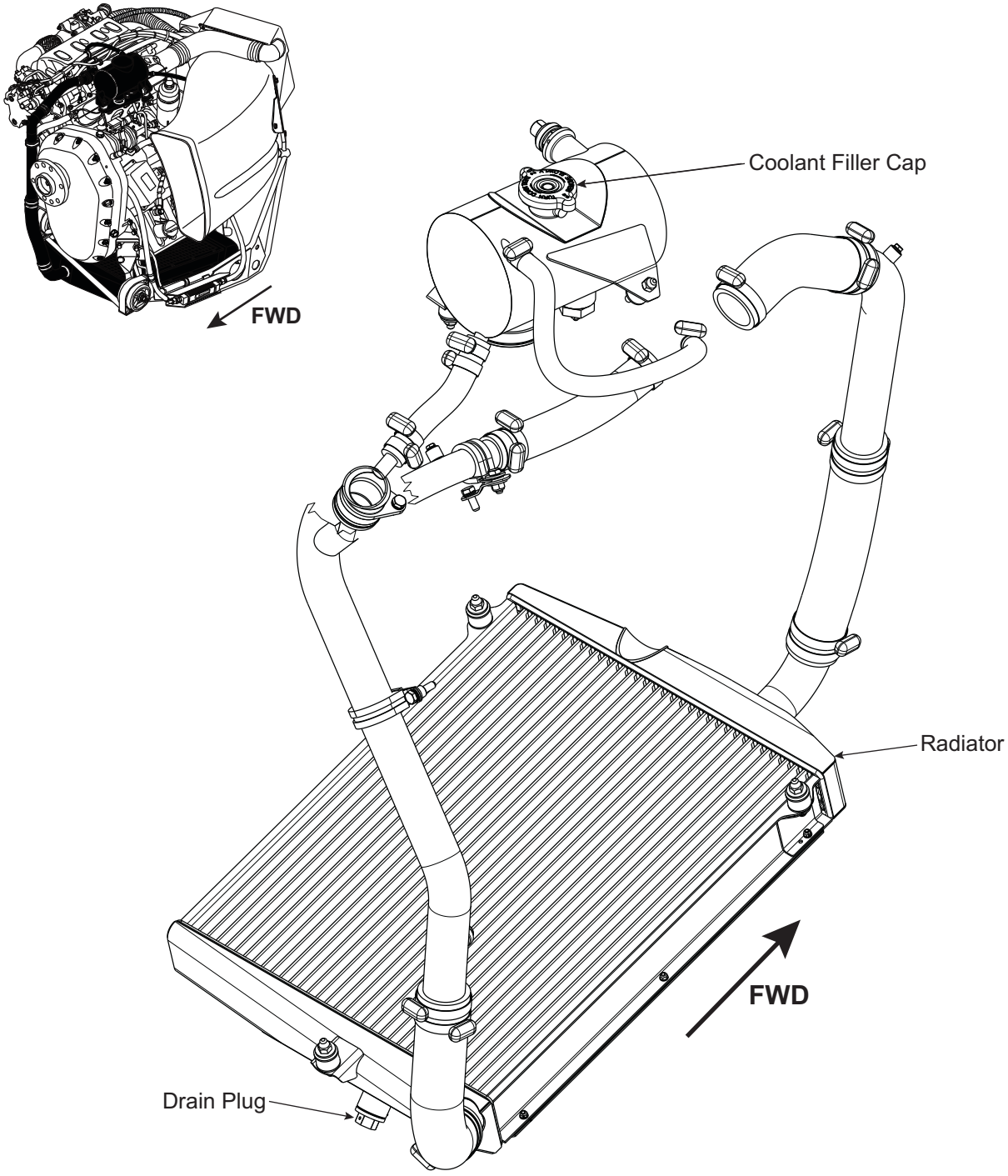


Figure 205 : Engine Coolant System

10. **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.

Refer to Figure 205.

	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: 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 cowling.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	
(4)	Remove the filler cap from the coolant tank: - If installed, remove the safety lock wire from the filler cap. - 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)	Install the pressure test equipment in place of the filler cap.	DAI-7500-02-00-ST
(6)	Remove the locking wire and remove the pressure relief valve. Install the pressure relief valve blocking tool.	 DAI-7500-01-00-ST
(7)	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).
(8)	Check the coolant system for leaks.	Make sure that there are no leaks.
(9)	Remove the pressure test equipment from the coolant tank. - Open the pressure relief valve of the test equipment. - Remove the test equipment carefully to relieve the remaining pressure.	DAI-7500-02-00-ST
(10)	Remove the pressure relief valve blocking tool. Install the pressure relief valve. Safety lock wire the pressure relief valve.	DAI-7500-01-00-ST Wire diameter 0.8 mm (0.032 in).
(11)	Install the filler cap to the coolant tank. If MÄM 62-055 is installed: - Install safety lock wire to secure the filler cap.	 Torque refer to Section 20-70. Check O-ring, apply EZ TURN Wire diameter 0.8 mm (0.032 in).
(12)	Install the engine cowling.	Refer to Section 71-10.
(13)	Connect the airplane main battery.	Refer to Section 24-31.

11. **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 62-055 is installed).

B. Pressure Relief Valve Test.

Refer to Figure 202.

	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: 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 cowling.	Refer to Section 71-10.
	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 CAN CAUSE INJURY TO PERSONNEL.	

	Detail Steps/Work Items	Key Items/References
(4)	Remove the filler cap from the coolant tank: - If installed, remove the safety lock wire from the filler cap. - Turn the cap counterclockwise a small distance to release the pressure. - When the pressure has fully released, remove the cap.	
(5)	Install the pressure test equipment in place of the filler cap.	DAI-7500-02-00-ST (if MÄM 62-055 is NOT installed). D44-7521-00-00-ST (if MÄM 62-055 is installed).
(6)	Pressurize the coolant system.	Apply 2.3 bar (33.4 PSI).
(7)	Verify: - The 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.	
(8)	Remove the pressure test equipment.	DAI-7500-02-00-ST (if MÄM 62-055 is NOT installed). D44-7521-00-00-ST (if MÄM 62-055 is installed).
(9)	Install the filler cap to the coolant tank. - If safety lock wire was removed, install safety lock wire to secure the filler cap.	Wire diameter 0.8 mm (0.032 in).
(10)	Install the engine cowling.	Refer to Section 71-10.
(11)	Connect the airplane main battery.	Refer to Section 24-31.

CHAPTER 76

ENGINE CONTROLS

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CHAPTER 76

ENGINE CONTROLS

1. General

This Section tells you about the DA 62 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 has an electronic engine control system (EECS).

Each engine control system has two independent computers, either of which can provide all control functions for the engine and propeller. Each system has these main parts:

- Two digital engine control units (ECU A and ECU B located in one box 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.

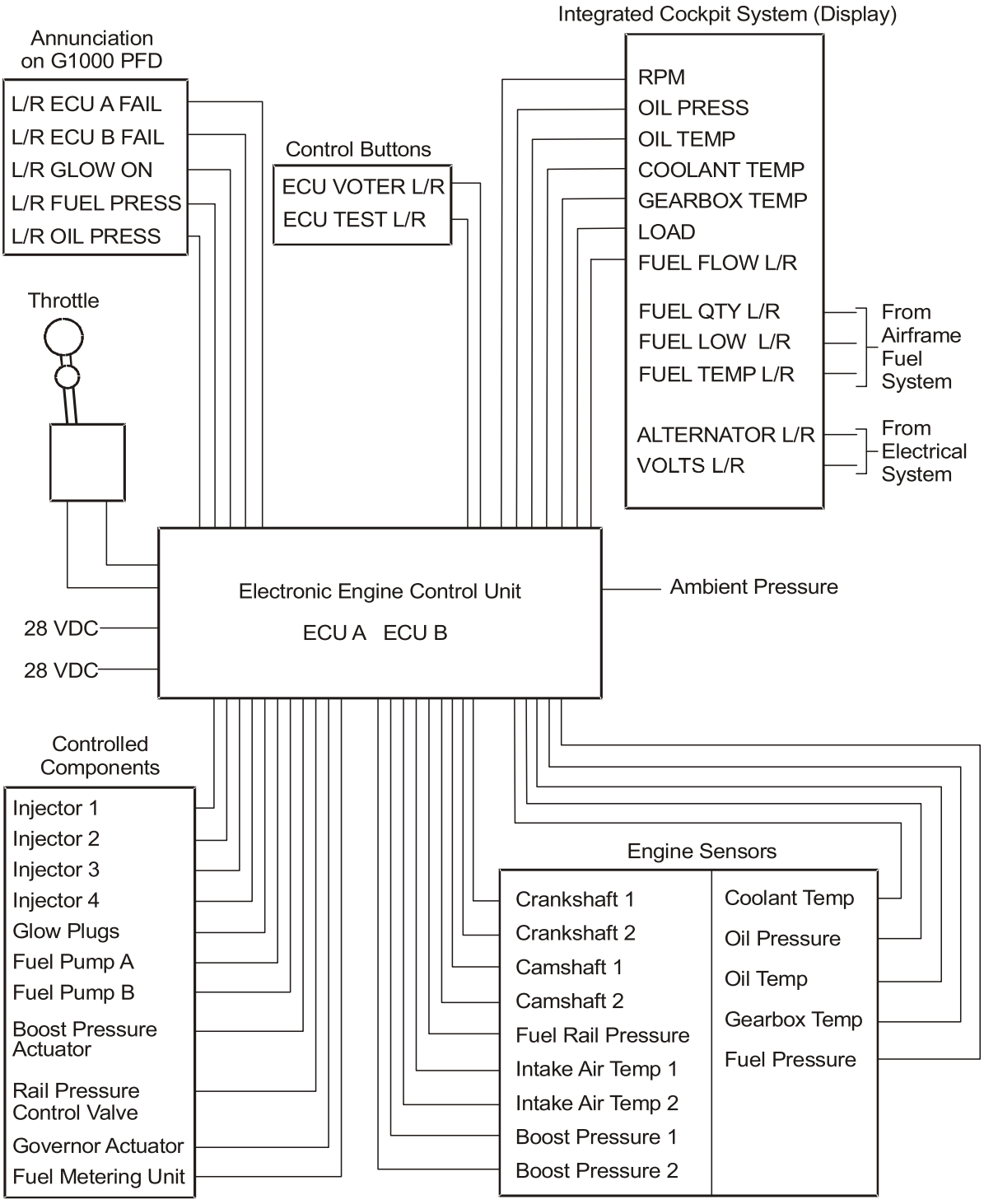


Figure 1 : Engine Control System - Schematic Diagram

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.

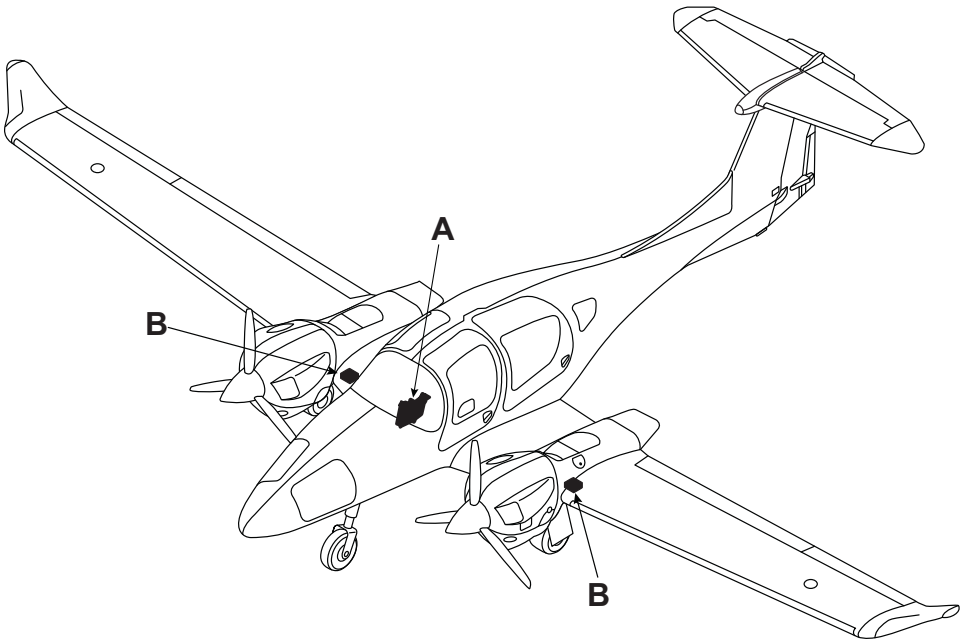
Each engine has a dedicated engine electrical harness. The electrical harness is an engine component. The harness connects the power lever and sensors to the ECU A and ECU B. It also provides connections for the ECU buttons and the ICS.

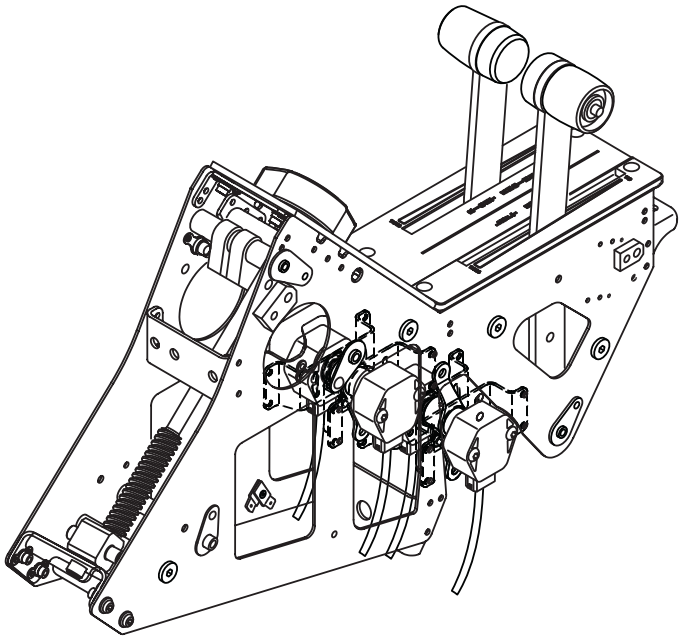
The electrical harness comes through the engine firewall. P-clamps and tie-wraps attach the electrical harness to the engine. The harness goes forward and divides to go down both sides of the engine.

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.

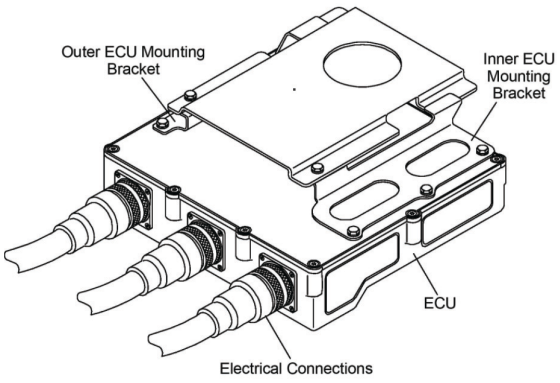
The left side of the engine has cables to the sensors for oil pressure and oil temperature and cables for the starter and alternator.

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.





View A
Power Lever Quadrant



View B
Engine Control Unit

Figure 2 : Engine Controls

C. Manifold Pressure.

Manifold pressure is measured by two sensors for each ECU located at the air intake manifold.

D. Power Lever.

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 hall angle 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.	On inlet valve cover between cylinders 3 and 4.
Camshaft 2.	On inlet valve cover between cylinders 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.	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 possible defects of the engine control system.

When experiencing trouble as 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 troubles, refer to the engine manufacturer.

Trouble	Possible Cause	Repair
An ECU caution light comes ON.	The related ECU is defective.	Read the engine event log (Refer to Section 72-00). Refer to the engine manufacturer.
The engine does not respond correctly to power lever movement.		Run the diagnostic routine in the 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 an Austro Engine (AE) approved maintenance shop or the manufacturer.

2. Remove/Install a Power Lever Hall-Angle-Sensor

A. Remove a Power Lever Hall-Angle-Sensor.

Refer to Figure 201.

	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)	Lift the power lever control-quadrant from the center console: - Remove the four screws that attach the top covers to the power lever quadrant. - Remove the two top cover plates from the power lever quadrant. - Remove the two screws that attach the aft end of the power lever quadrant to the fuel selector mounting.	
(3)	Remove a control lever 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 two bolts and washers that attach the hall angle sensor that you will remove to the power lever quadrant. - Pull the hall angle sensor off 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 hall angle sensor are long enough to just lift the quadrant clear of the center console.

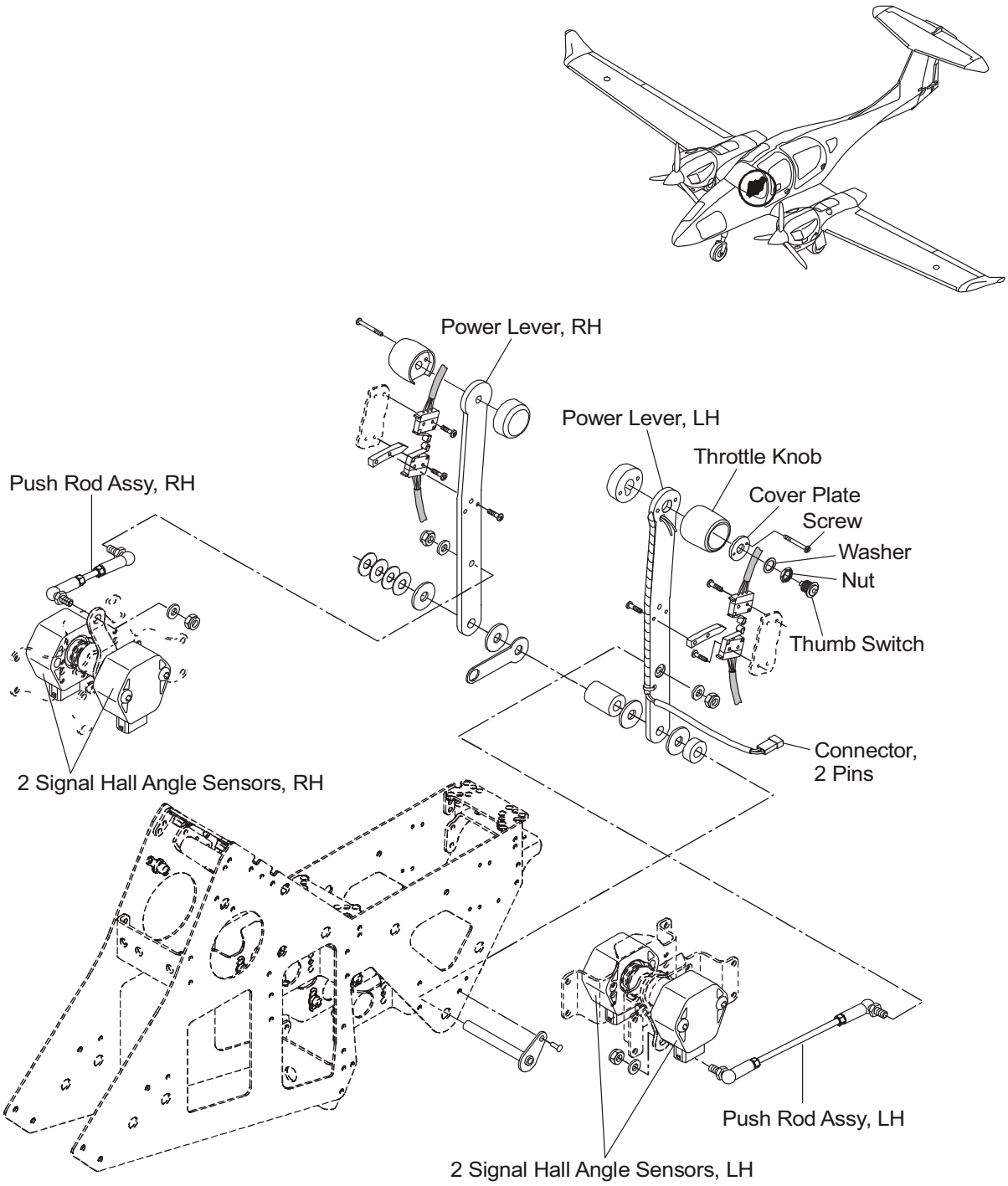

Figure 201 : Hall Angle Sensor - Removal/Installation

B. Install a Power Lever Hall-Angle-Sensor.

Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
(1)	Install the hall angle sensor: - Move the new hall angle sensor into position at the power lever quadrant. - Make sure that the drive of the hall angle sensor aligns with the quadrant drive-shaft. - Push the hall angle sensor onto the quadrant drive-shaft. - Install the two washers and bolts that attach the hall angle 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 two 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.
(4)	Start the engines and allow them to reach normal operating temperatures: - 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. - Set both engine to 0%. - Stop the engines.	Refer to Section 71-00. Use the power lever for which you did NOT replace the hall angle sensor as the datum. Refer to Section 71-00.

	Detail Steps/Work Items	Key Items/References
(5)	If necessary, adjust the power lever alignment: - Lift the power lever control-quadrant from the center console. - Loosen the two jam nuts on the hall angle 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. - Tighten the jam-nuts on the hall angle sensor link rod. - Install the power lever control-quadrant into the center section.	Refer to Paragraph 2 A, step (2) in this Section. Hold the input lever to the hall angle sensor stationary and turn the control rod to move the power lever the distance noted in step (4) of this procedure. Refer to step (3) in this procedure.
(6)	Repeat steps (4) and (5) of this procedure as necessary, until the power levers align correctly.	
(7)	Install the top covers on the power lever quadrant: - Move the top covers into position on the power lever control-quadrant. - Install the four 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 power lever hall-angle-sensor.	Refer to Section 71-00.

3. **Remove/Install an Engine Control Unit (ECU)**

A. Remove an Engine ECU.

Refer to Figure 202.

	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: 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)	Read out and write down the ECU IQA-Codes and the 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)	Disconnect the three electrical connectors from the ECU.	
(6)	Remove the ECU from the top mounting bracket: - Release the two bolts and washers that hold the ECU to the top mounting bracket. - Slide the ECU forward until it drops down and comes free of the top mounting bracket. - Remove the ECU from the airplane.	
(7)	Remove the inner and outer ECU mounting brackets from the ECU.	Keep the two brackets for the installation procedure.

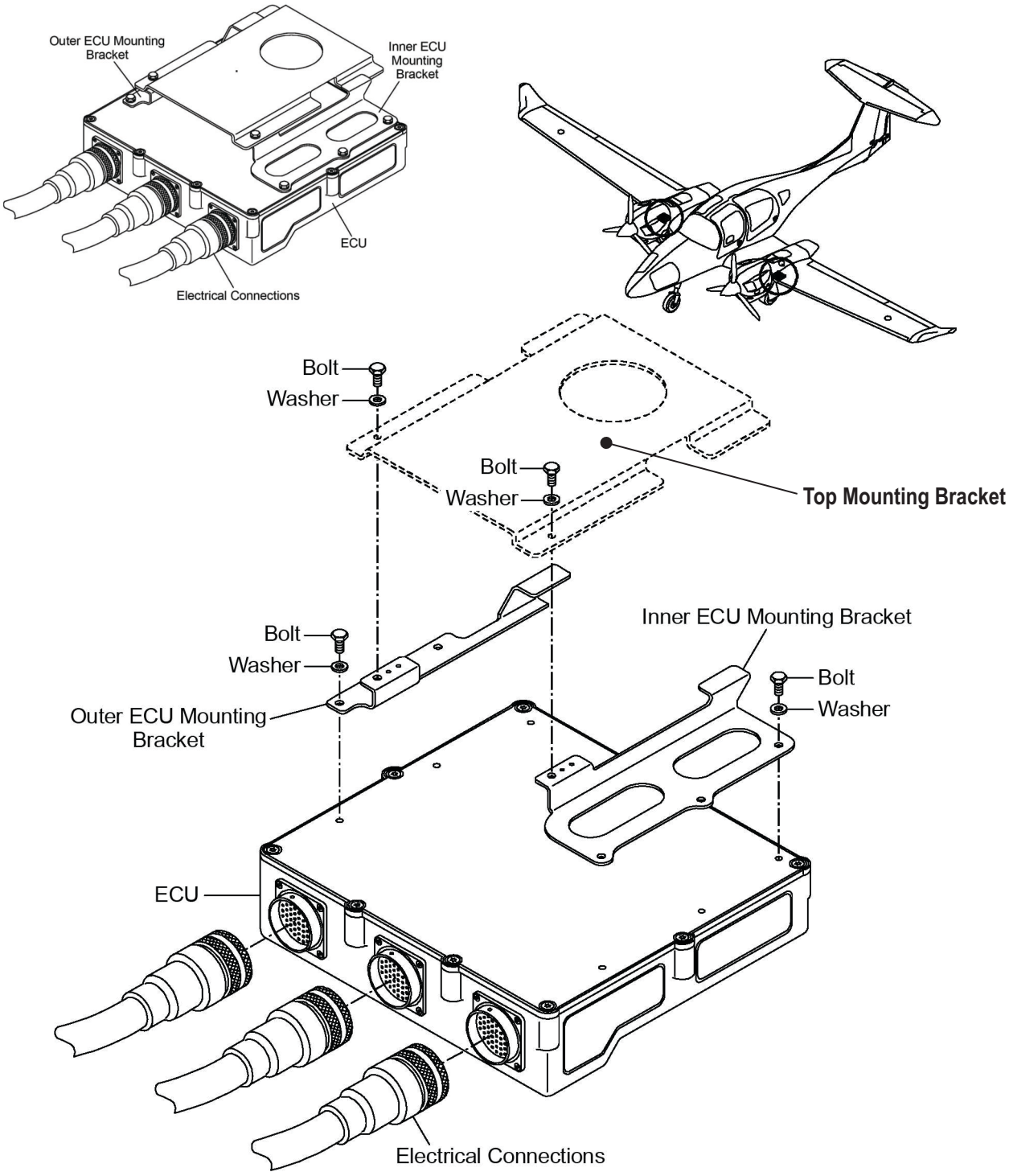

Figure 202 : Engine Control Unit (ECU) - Removal/Installation

B. Install an Engine ECU.

CAUTION: YOU MUST CONTACT THE ENGINE MANUFACTURER BEFORE YOU INSTALL A NEW ECU.

Refer to Figure 202.

	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 ECU mounting brackets to the ECU.	Brackets from 3.A. Step (7).
(3)	Install the ECU: - Move the ECU into position in the related engine nacelle by sliding the ECU into the top mounting bracket. - Install the two washers and bolts that attach the ECU to the top mounting bracket.	Use Loctite 243 to secure the bolts.
(4)	Connect the three electrical connectors to the ECU.	Make sure that the bayonet locks are correctly engaged.
(5)	Install the access panel for the ECU on the related engine nacelle.	Refer to Section 52-40.
(6)	Connect the airplane main battery.	Refer to Section 24-31.
(7)	Check that IQA-Codes and engine serial number at the new ECU match the ones of the engine.	Refer to the AE Maintenance Manual, latest revision.

4. **Remove/Install an Electrical Harness for the Engine Control System**

A. Remove an Electrical Harness for the Engine Control 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: 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 access panel for the ECU on the related engine nacelle.	Refer to Section 52-40.
(4)	Disconnect the three electrical connectors from the ECU.	Refer to Figure 202.
(5)	Remove the related engine cowlings.	Refer to Section 71-10.
(6)	Release the cable connections at the related ECU relay panel.	In the engine nacelle, aft of the firewall.

	Detail Steps/Work Items	Key Items/References
(7)	Disconnect the engine wire harness and bonding cables from these electrical sensors:	Refer to Figures 203 and 204.
	- 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.	On the air intake manifold.
	- 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.
	- Gearbox temperature.	At the backside of the gearbox next to the starter.
	- Waste gate valve solenoid.	At the lower crankcase cover.
	- 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.	

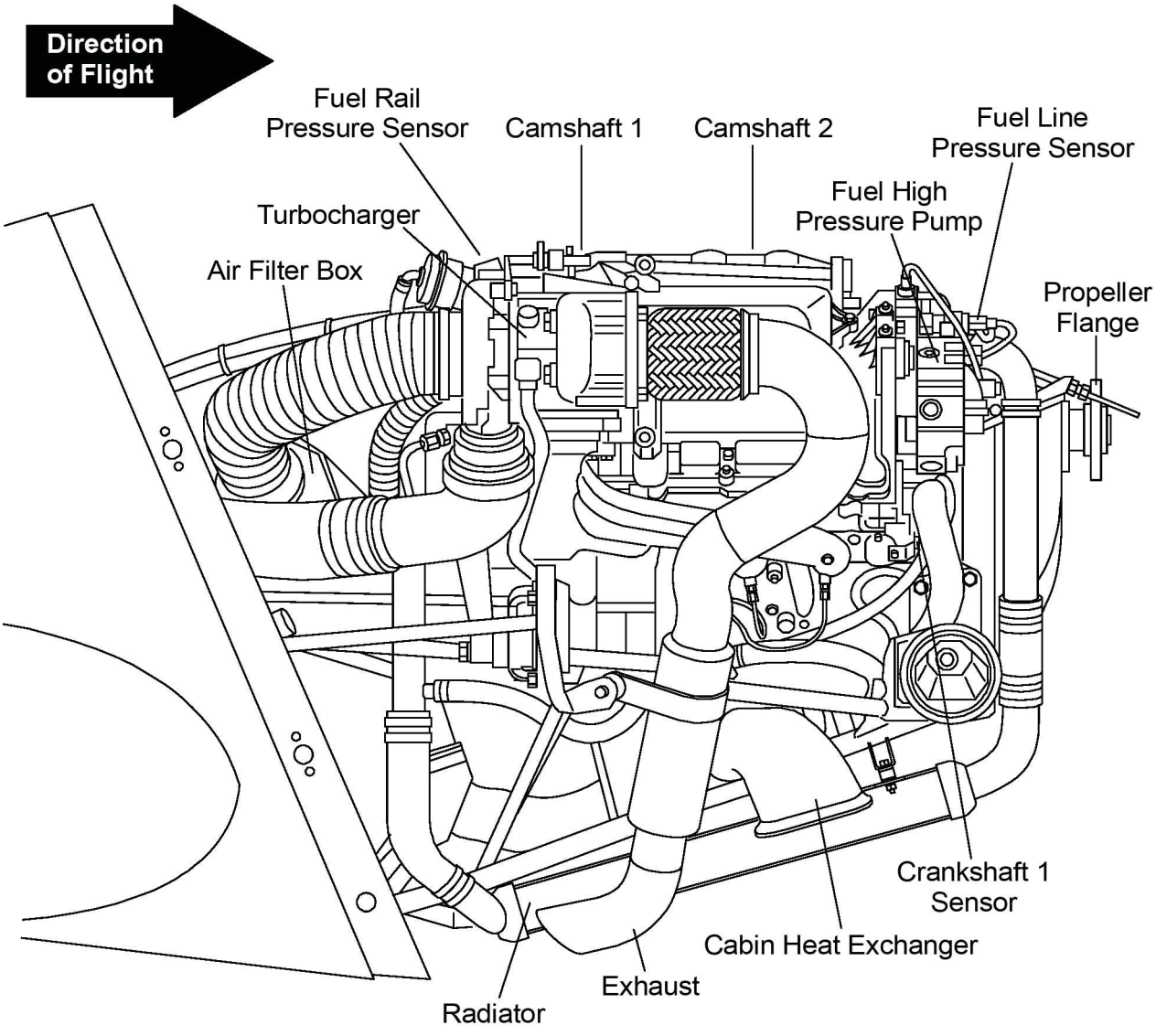

Figure 203 : Engine Sensors - RH Side of the Engine

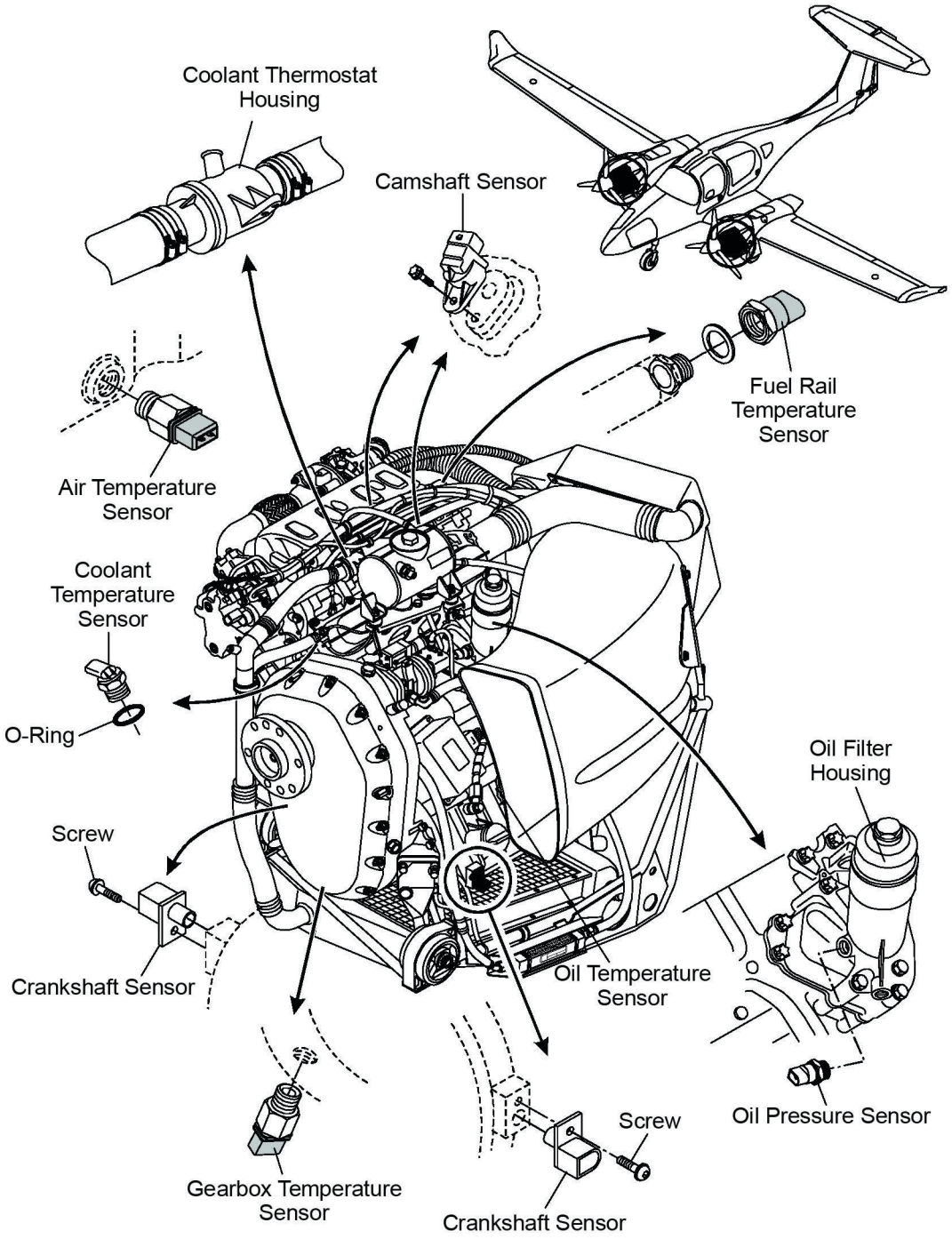

Figure 204 : Engine Sensors - LH Side of the Engine

B. Install an Electrical Harness for the Engine Control System.

	Detail Steps/Work Items	Key Items/References
(1)	Carefully move the engine end of the wire 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:	Refer to Figures 203 and 204.
	- 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.	On the air intake manifold.
	- 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.
	- Gearbox temperature.	At the backside of the gearbox next to the starter.
	- Waste gate valve solenoid.	At the lower crankcase cover.
	- Fuel injectors.	At each fuel injector.
	- Glow plugs.	At the lower camshaft.
	- Waste gate control valve.	At the rear camshaft cover.
(3)	Connect the cables at the related ECU relay panel	In the engine nacelle, aft of the firewall.
(4)	Connect the three electrical connectors to the ECU.	Refer to Figure 202. Make sure that the bayonet locks are correctly engaged.
(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. Refer to Para 4.A. Step (8).

	Detail Steps/Work Items	Key Items/References
(6)	Install the shields for the feed-through at the firewall.	Seal with PR 812 or equivalent.
(7)	Install the related engine cowlings.	Refer to Section 71-10.
(8)	Install the access panel for the ECU on the related 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. - Make sure that all indications from the electrical sensors display correctly.	Refer to Section 71-00.

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CHAPTER 77

ENGINE INDICATING

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CHAPTER 77

ENGINE INDICATION

1. General

This Section tells you about the engine indicating system for the DA 62 airplane. An integrated cockpit system (ICS) with two large display screens located in the instrument panel show all engine related indications.

Engine control units (ECUs) 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.

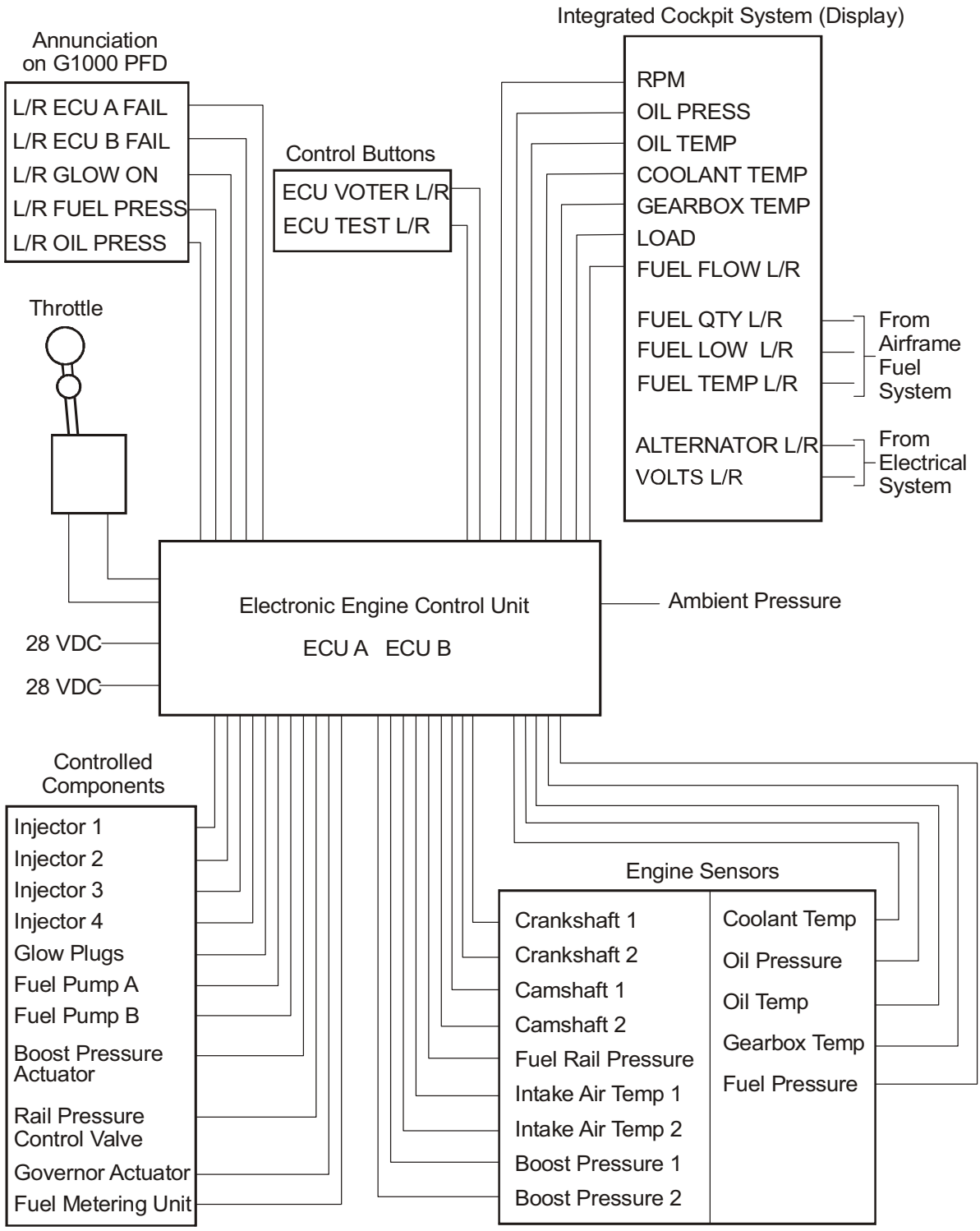

Figure 1 : Engine Control and Indication - Schematic Diagram

Section 77-40

Engine Indicating System

1. General

This Section tells you about the engine indicating system for the DA 62 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 (ECU) 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.

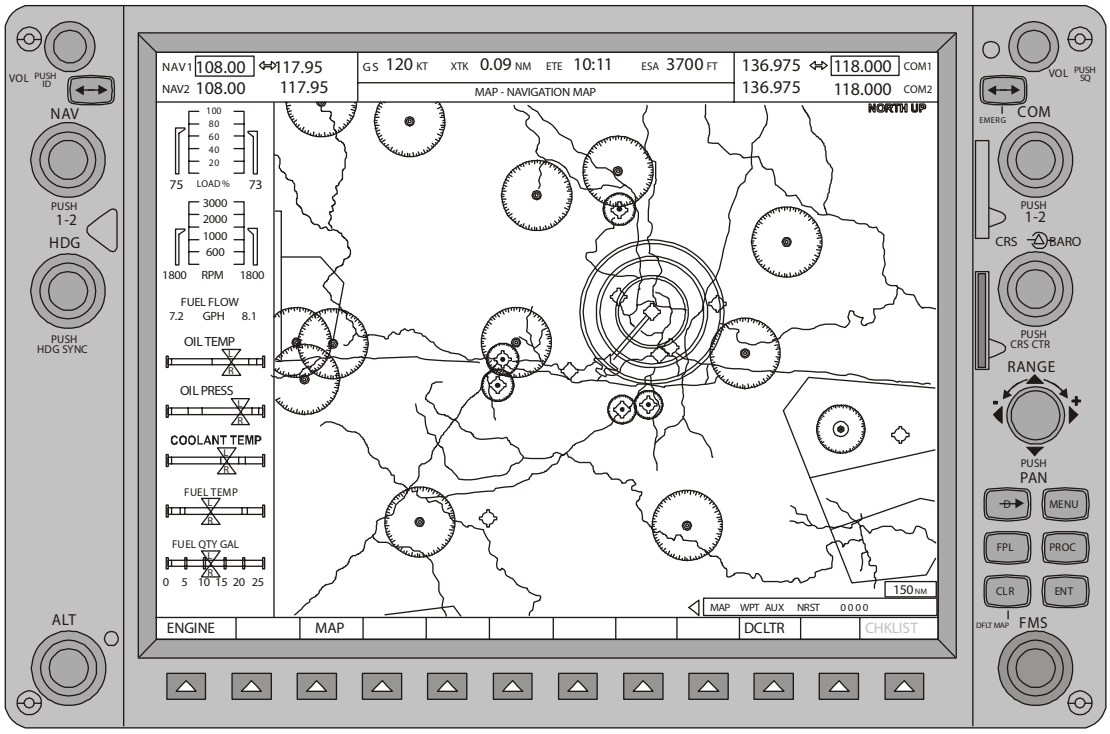

Figure 1 : Display Screen - Integrated Cockpit System

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 possible defects you could have with the engine indication system. For more data on the system refer to the equipment manufacturer's manual.

When experiencing trouble as 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 give instructions on how to replace the following sensors:

- Crankshaft (RPM).
- Fuel Metering Valve.
- Liquid coolant temperature.
- Engine oil temperature.
- Engine oil pressure.
- Gearbox oil temperature.

Refer to the related Chapter or the Austro Engine (AE) Maintenance Manual, latest revision for maintenance data on the sensors.

Where the engine control system provides data for the engine indicating system, only the engine manufacturer or an AE-approved maintenance shop can replace sensors.

2. **Replace a Sensor**

Figures 201 through 206 show the locations of 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: 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)	Locate the sensor that you will replace.	Refer to Figures 201 thru 206.
(5)	Disconnect the electrical cables for the sensor.	At the sensor or at the in-line connector.
(6)	Replace the sensor.	Refer to the AE Maintenance Manual, latest revision for the procedures to replace a sensor.
(7)	Connect the electrical cables to the sensor.	At the sensor or at the in-line connector.
(8)	Install the engine cowling.	Refer to Section 71-10.
(9)	Connect the airplane main battery.	Refer to Section 24-31.
(10)	Do a ground test of the engine and monitor the related engine indication.	Refer to Section 71-00.

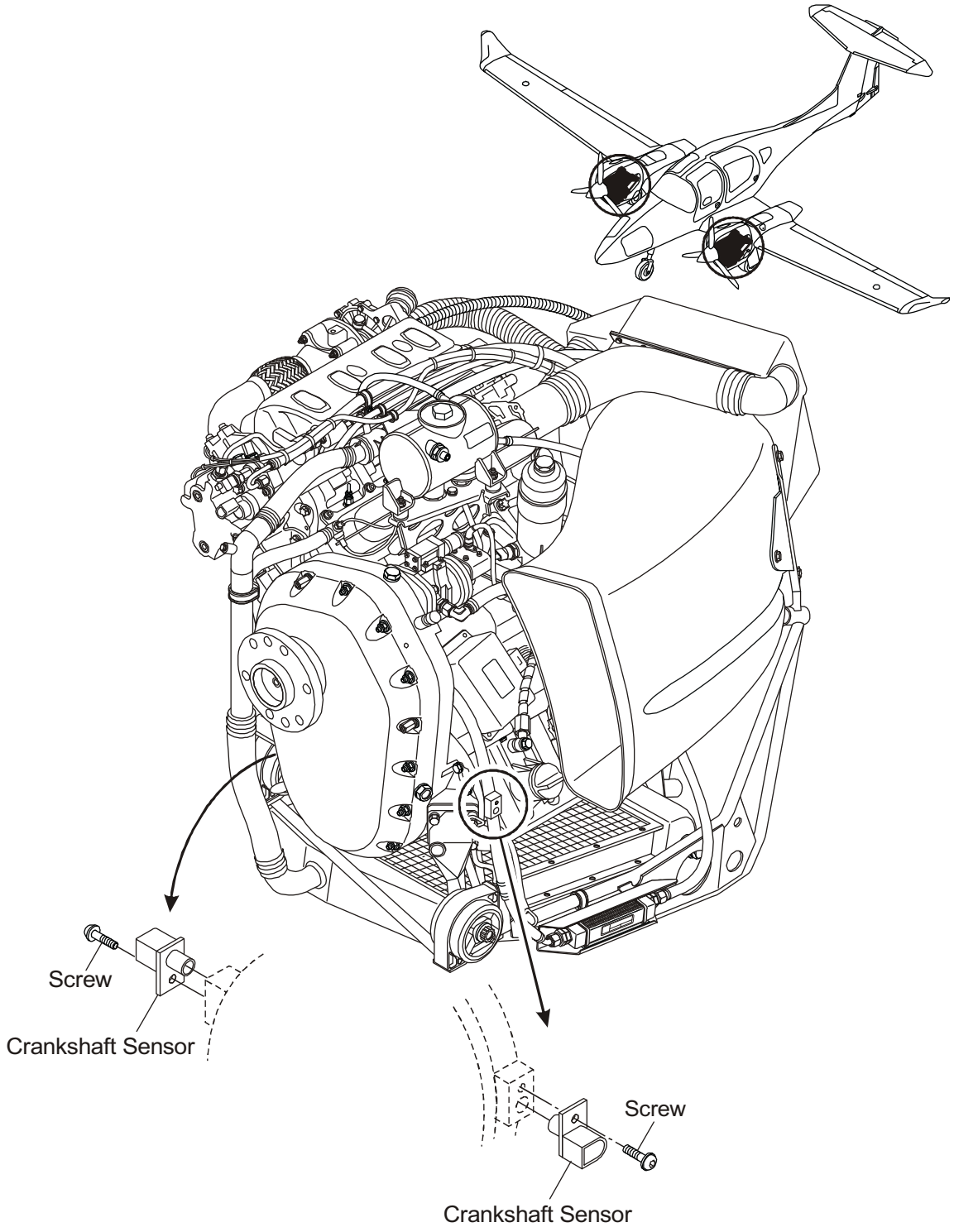

Figure 201 : Crankshaft (RPM) Sensor - Installation

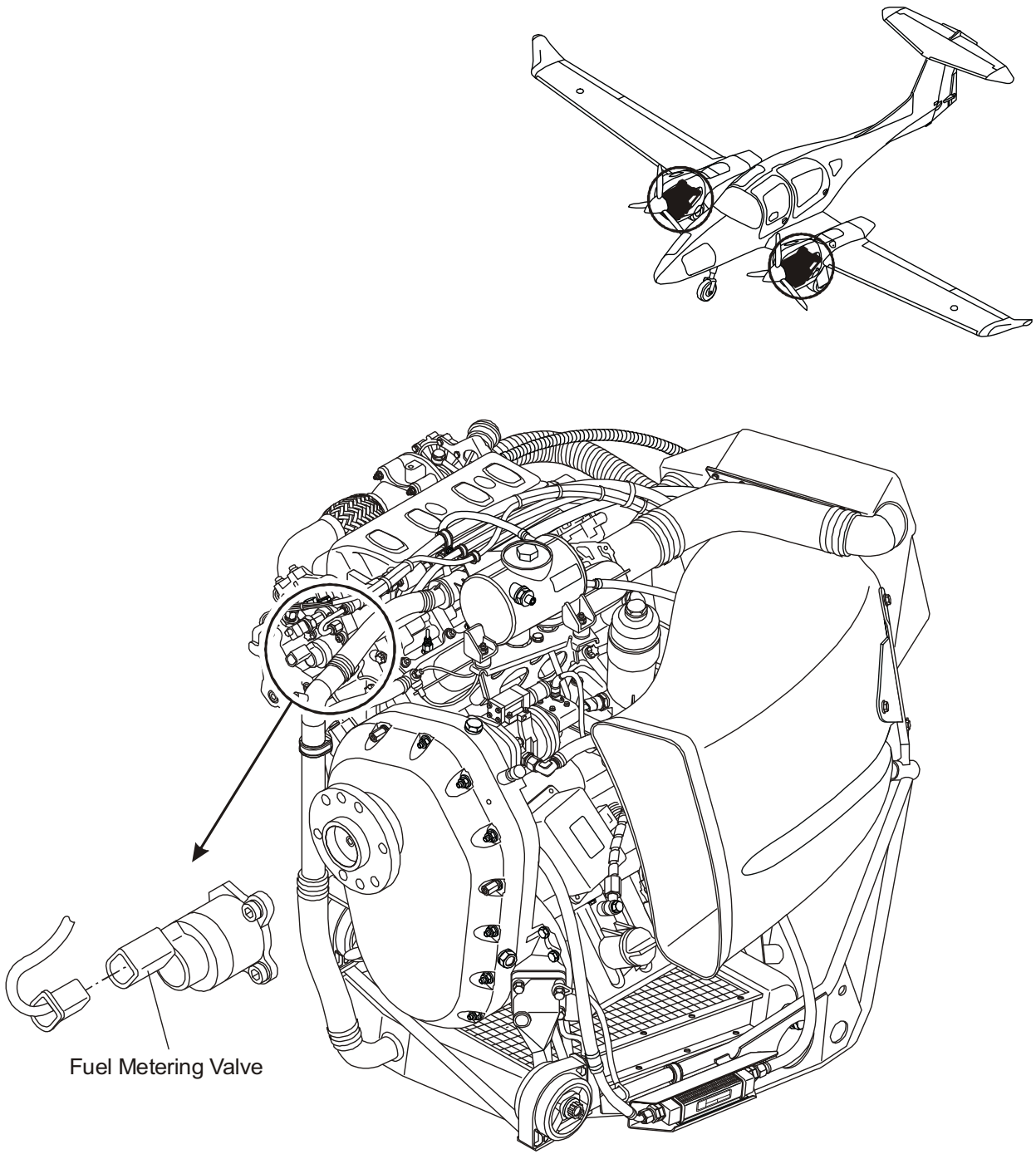

Figure 202 : Fuel Metering Valve - Installation

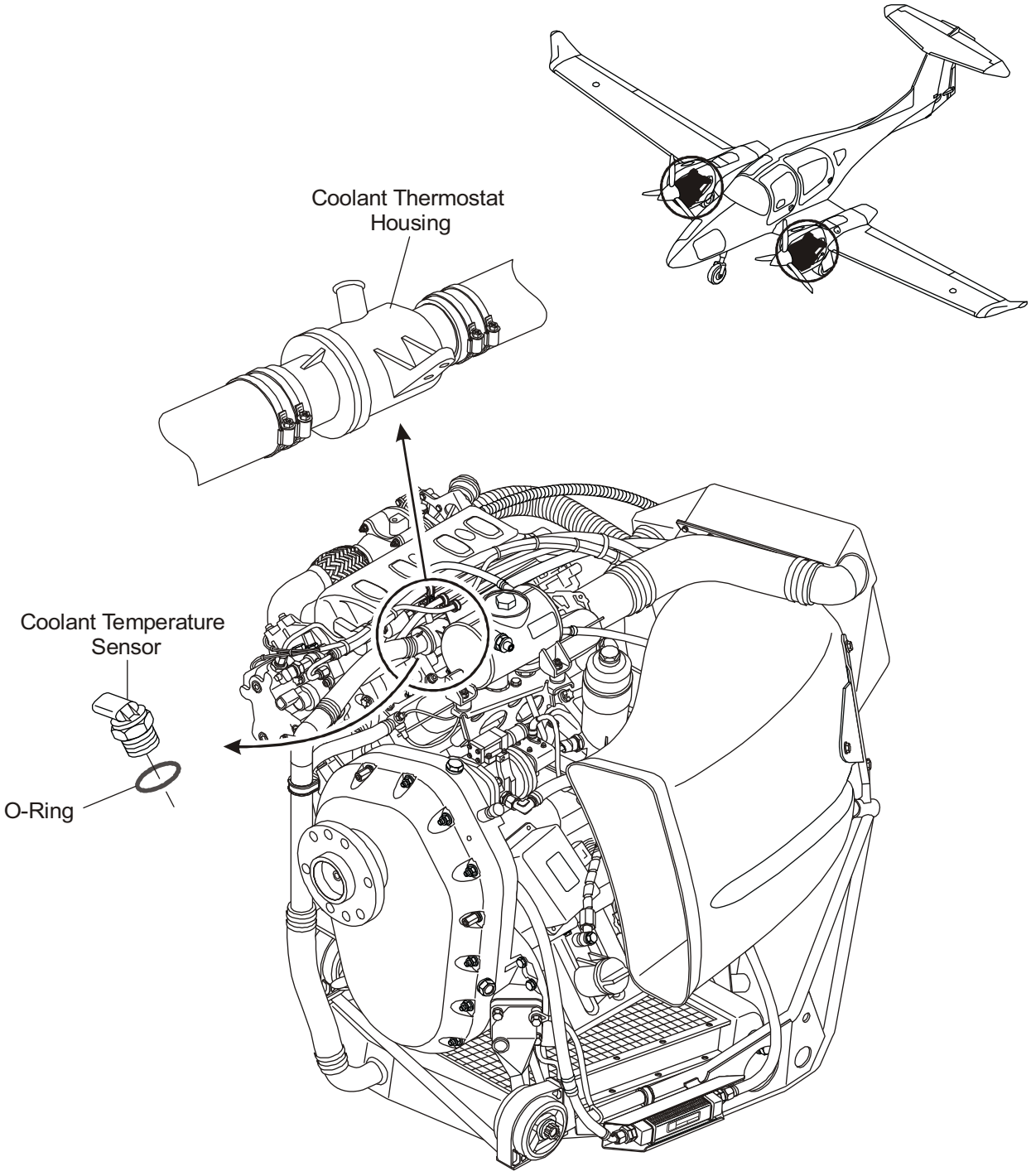

Figure 203 : Engine Coolant Temperature-Sensor - Installation

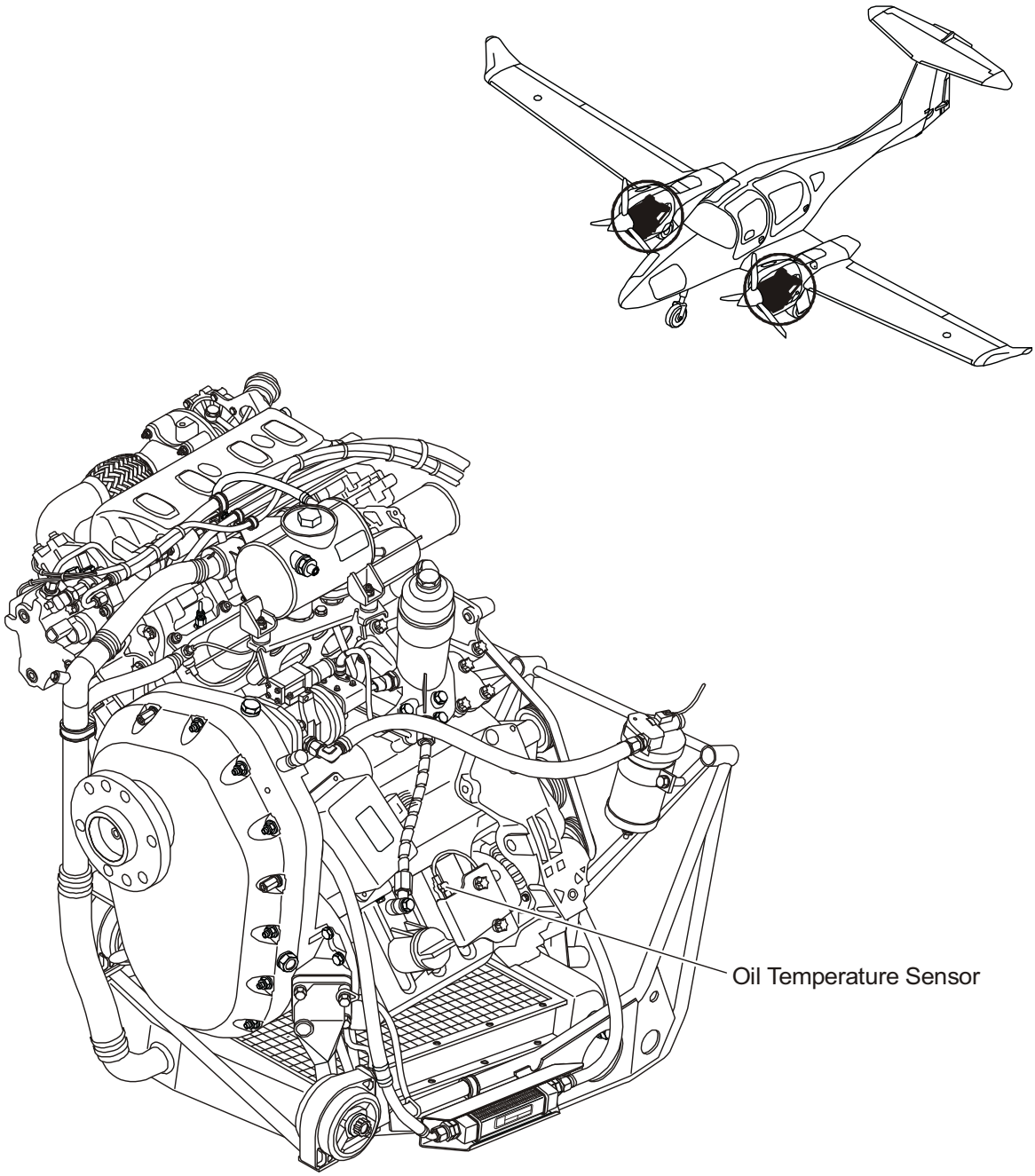

Figure 204 : Engine Oil Temperature-Sensor - Installation

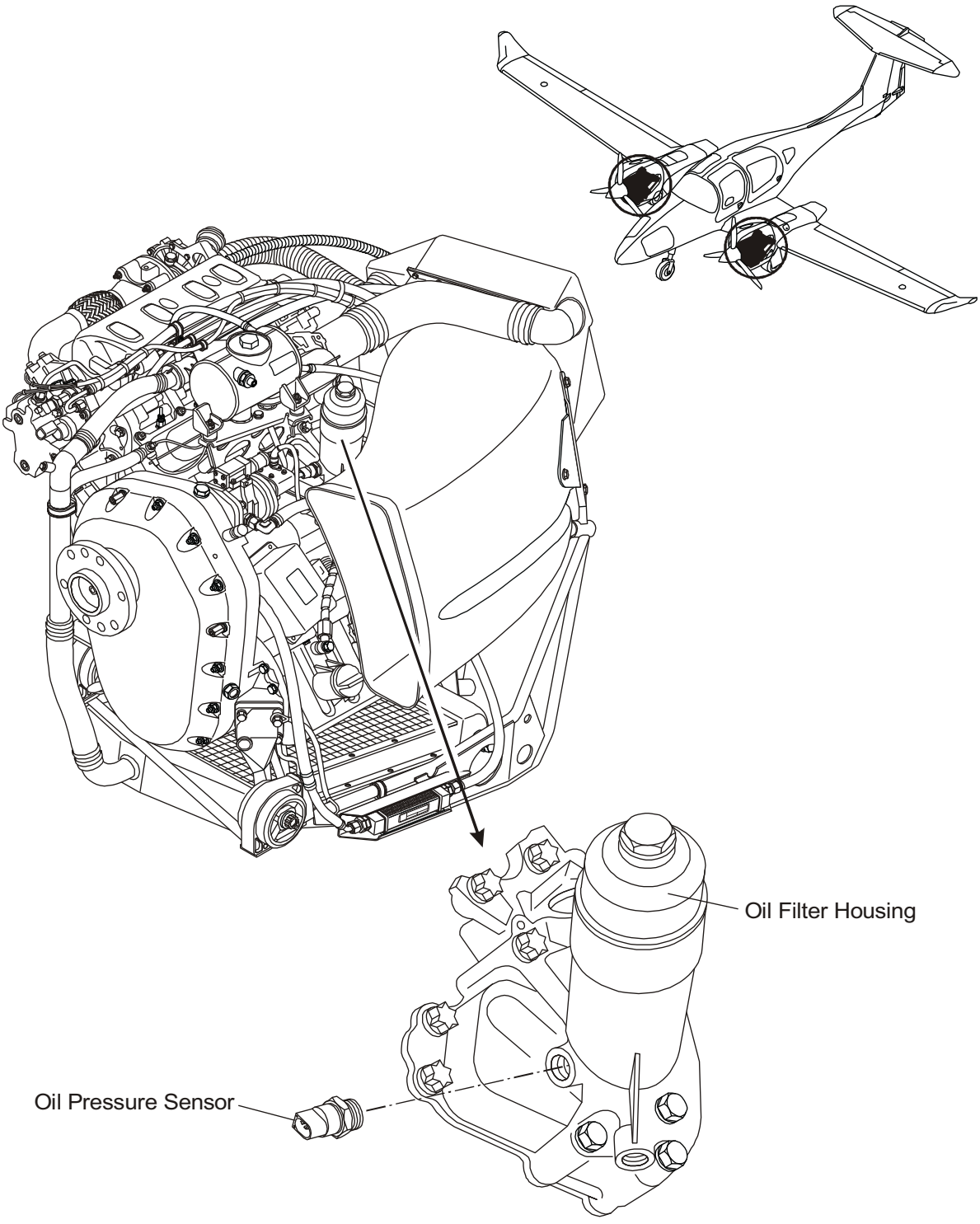

Figure 205 : Engine Oil Pressure-Sensor - Installation

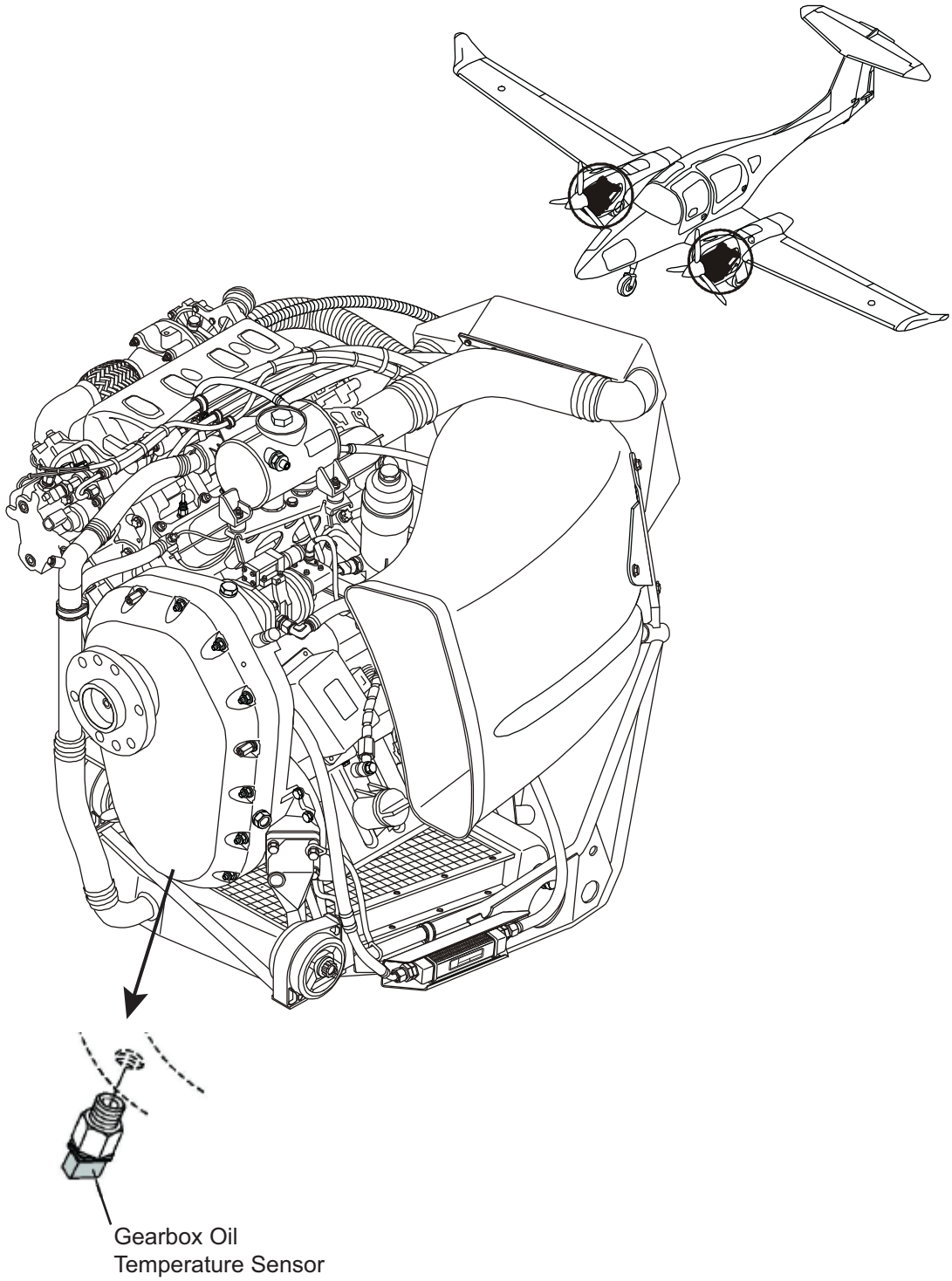

Figure 206 : Gearbox Oil Temperature-Sensor - Installation

CHAPTER 78

EXHAUST

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CHAPTER 78

EXHAUST

1. General

The DA 62 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. The exhaust system has a fixed integral muffler.

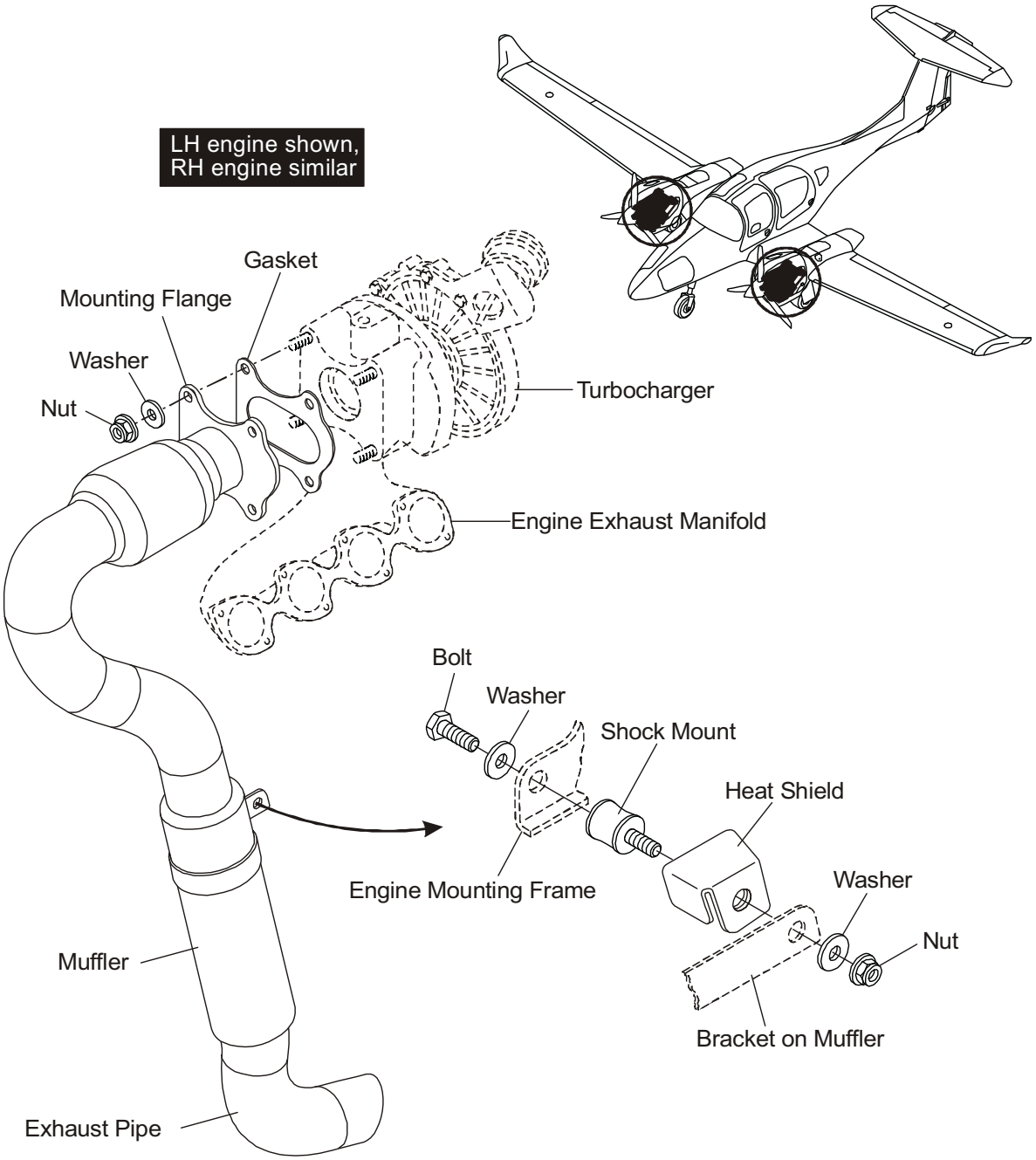

Figure 1 : Exhaust System Installation

Trouble-Shooting

1. **General**

The table below lists possible defects with the exhaust system.

When experiencing trouble as 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 is cracked.	Look for signs of exhaust gas leaks. Replace cracked pipes.
Signs of exhaust gas leaks in the engine compartment.	Exhaust pipe is 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 and fixed integral muffler.
Refer to Section 81-00 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: 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 exhaust pipe: - Remove the four lock nuts and washers that attach the exhaust pipe and integral muffler to the gasket and turbo charger. - Remove the lock nut, bolt and two washers to remove the shock mount and heat shield from the exhaust pipe. - Remove the exhaust pipe and integral muffler from the airplane.	Refer to Figure 1. (78-00-00 Page 2). Make sure that the gasket is in good condition. If it is not in good condition, remove it for replacement.

B. Install 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:** **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)	Install the exhaust pipe: - Install a new gasket if required. - Move the exhaust pipe and integral muffler into position in the engine nacelle. - Move the exhaust pipe mounting-flange over the studs and gasket on the turbo charger outlet. - Install the four lock nuts and washers that attach the exhaust pipe to the turbo charger outlet. - Install the shock mount and heat shield to the exhaust pipe with the bolt, two washers and lock nut.	Refer to Figure 1. (78-00-00 Page 2). Reference 2.A. Step (4). Use new lock nuts. Use a new lock nut.
(2)	Install the engine cowling.	Refer to Section 71-10.
(3)	Connect the airplane main battery.	Refer to Section 24-31.
(4)	Do an engine ground run-up and then check the exhaust pipe for leaks. - Make sure that there are no leaks.	Specially around the gasket at the turbo charger outlet.

CHAPTER 79

OIL COOLING

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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.

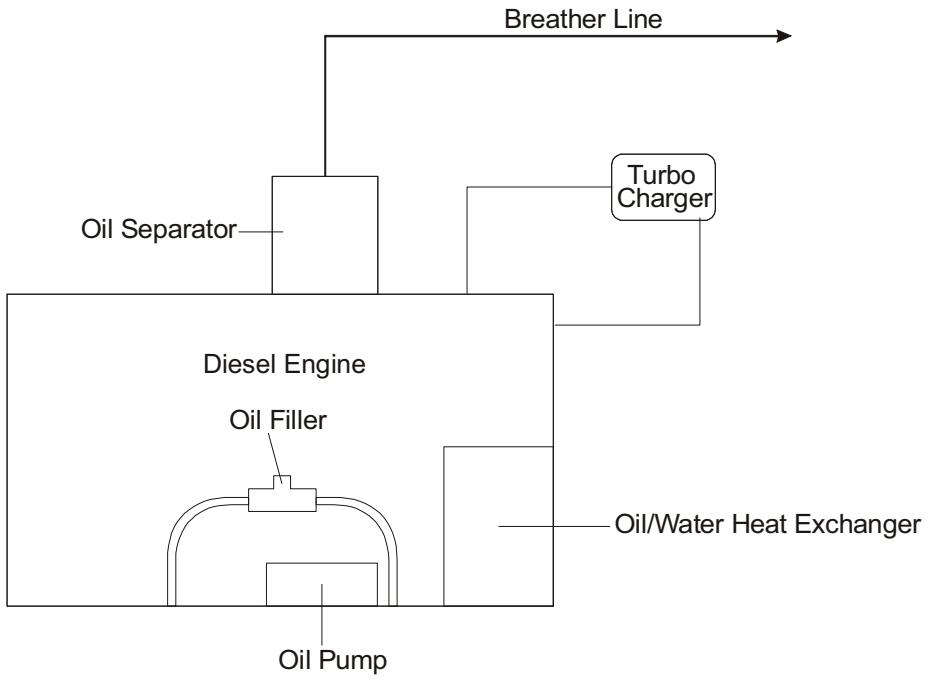

Figure 1 : Oil Cooling - Simplified Schematic

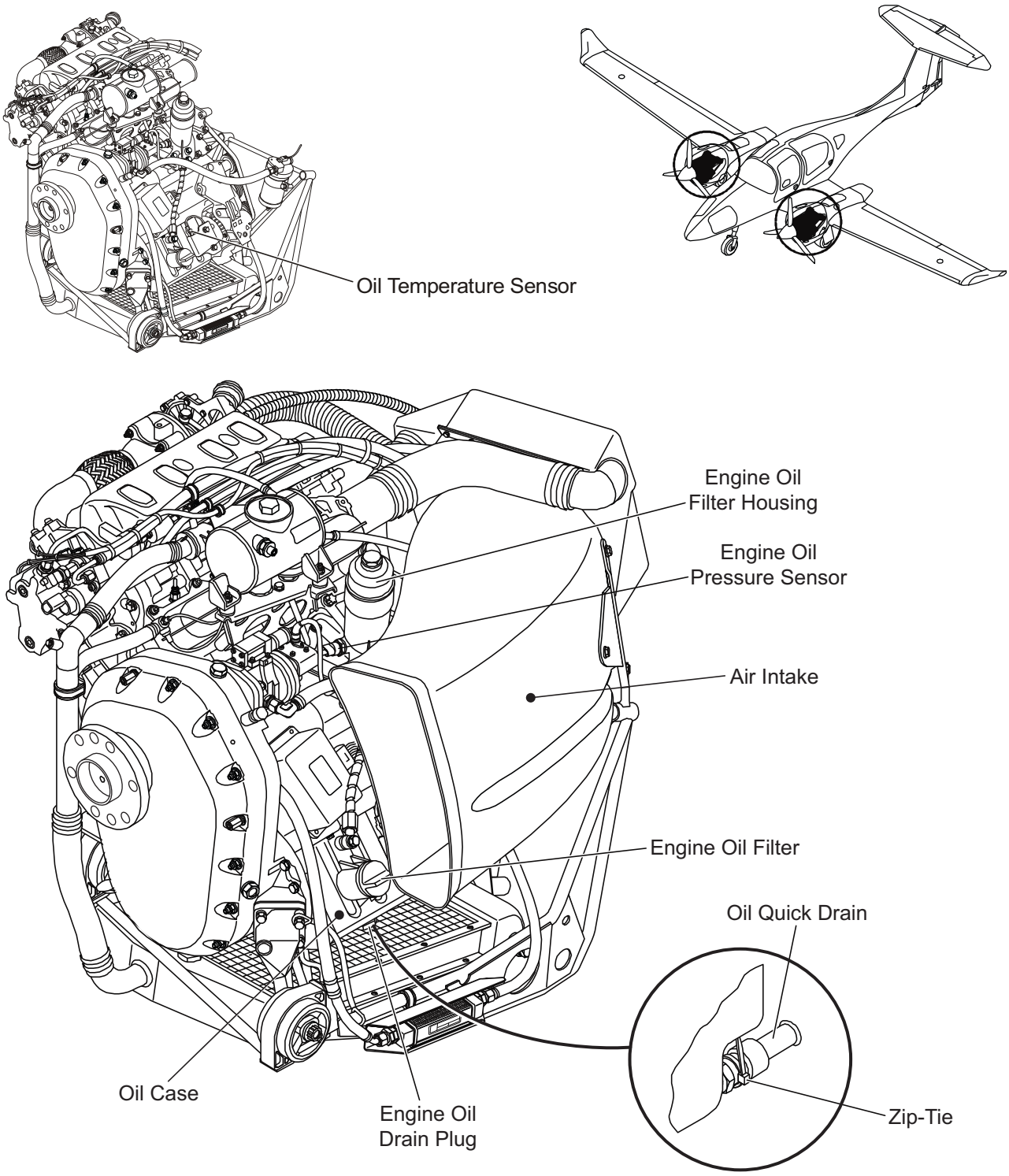

Figure 2 : Oil System - Component Locations

Trouble-Shooting

1. **General**

The table below lists possible defects with the oil system.

When experiencing trouble as 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.	The oil cooler is blocked internally.	Contact the engine manufacturer.
	Low oil level for the engine.	Replenish the oil system. Refer to Section 12-10
An engine oil pressure is too high.	A defective oil pressure sensor.	Refer to the AE Maintenance Manual, latest revision.
An engine oil pressure is too low at normal operating temperatures.	Low oil level for the engine.	Replenish the oil system. Refer to Section 12-10.
	A defective oil pressure sensor.	Refer to the AE Maintenance Manual, latest revision.

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CHAPTER 80

STARTING

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CHAPTER 80

STARTING

1. General

This Section tells you about the system that cranks the E4P-C 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 E4P-C 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 master 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. The START push buttons are located between the LEFT ENGINE and RIGHT ENGINE master switches operates the related engine starter.

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.

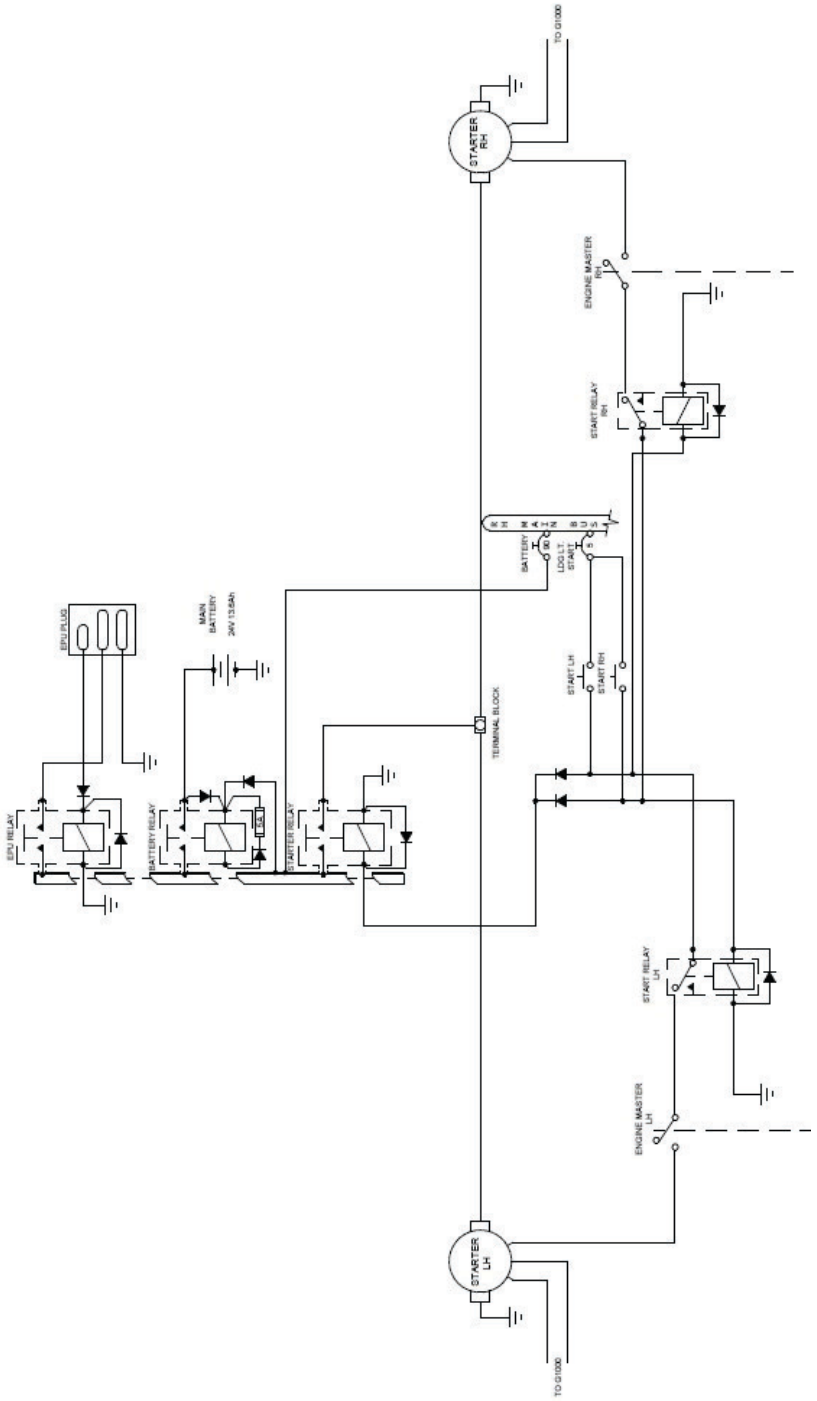

Figure 1 : Engine Starter System - Schematic Diagram

Trouble-Shooting

1. **General**

The table on page 102 lists the defects you could have with the starting system.

When experiencing trouble as 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 THE 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 START 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 button is pressed.	The airplane main battery is discharged.	Charge airplane main battery.
	The related ENGINE MASTER switch is defective.	Replace the related ENGINE MASTER switch.
	The related START button is defective.	Replace the related START button.
	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.
A starter power-on light stays on after the START push button is released.	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.	The glow plugs are worn.	Replace the glow plugs. Refer to the engine manufacturer.
	The glow fuse is defective.	Replace the glow 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 E4P-C engine. Only an Austro Engine (AE) authorized repair shop or the manufacturer can repair the engine part of the system.

2. **Remove/Install an Engine Master Switch**

Use these procedures for both the left and right engine switches.

A. Remove an Engine Master Switch.

	Detail Steps/Work Items	Key Items/References
WARNING:	**MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS, THE PROPELLER TURNS AND CAN CAUSE INJURY OR DEATH.**	
(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)	Disconnect the ECU backup batteries.	Refer to Section 24-30. Just disconnect, do not remove the batteries,
(4)	Remove the instrument panel cover.	Refer to Section 25-10.
(5)	Release the lower placard panel from the instrument panel. - Remove the four screws. - Move the panel as necessary to get access to the electrical cables	Remove the GDU display if necessary to get access to the back of the panel. Refer to Section 31-40. Just release the panel to get access to the electrical cables. Removal is not necessary.
(6)	Remove the related ENGINE MASTER switch: - Remove the nut and washer from the front of the placard panel. - Move the switch forward and clear of the placard panel. - Hold the switch and disconnect the electrical cables. - Move the switch clear of the placard panel and remove it from the airplane.	Refer to Figure 201. Note the position of the cables.

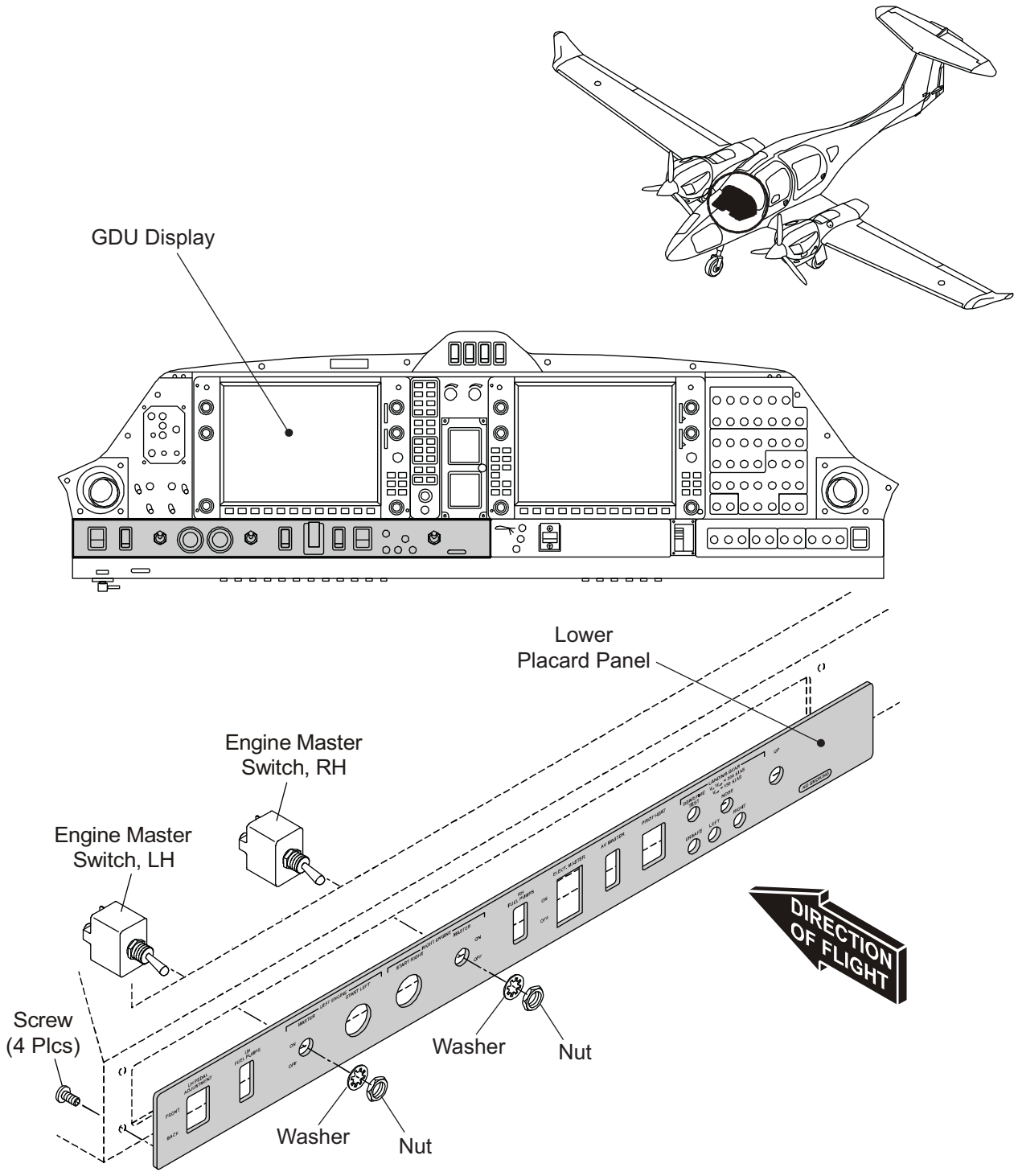

Figure 201 : Engine Master Switch - Removal/Installation

B. Install an Engine Master Switch.

	Detail Steps/Work Items	Key Items/References
(1)	Install the ENGINE MASTER switch: - Move the switch into position on the placard panel and hold the switch. - Connect the electrical cables to the terminals on the switch. - Move the switch fully into position in the placard panel. - Install the washer and nut onto the front of the switch.	Refer to Figure 201. Refer to Chapter 92 for the wiring diagrams. Make sure that the switch is correctly orientated.
(2)	Position and install the lower placard panel onto the instrument panel. - Install the four screws.	Be careful of all the wiring connections to the switches on the placard panel.
(3)	If the GDU display was removed to get access to the back of the placard panel, install the GDU.	Refer to Section 31-40.
(4)	Connect the ECU backup batteries.	Refer to Section 24-30.
(5)	Connect the airplane main battery.	Refer to Section 24-31.
(6)	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 an Engine Start Push-Button**

Use these procedures for both the left and right engine start push-buttons.

A. Remove an Engine Start Push-Button.

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS, THE PROPELLER TURNS AND CAN CAUSE INJURY OR DEATH.	
(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 instrument panel cover.	Refer to Section 25-10.
(4)	Release the lower placard panel from the instrument panel. - Remove the four screws. - Move the panel as necessary to get access to the electrical cables	Remove the GDU display if necessary to get access to the back of the panel. Refer to Section 31-40. Just release the panel to get access to the electrical cables. Removal is not necessary.
(5)	Remove the related engine start push-button switch: - Remove the nut and washer from the rear of the placard panel. - Move the engine start push-button switch and ring rearward and clear of the placard panel. - Hold the switch and unsolder the electrical cables. - Move the switch clear of the placard panel and remove it from the airplane.	Refer to Figure 202. Note the position of the cables. Keep the ring for the installation.

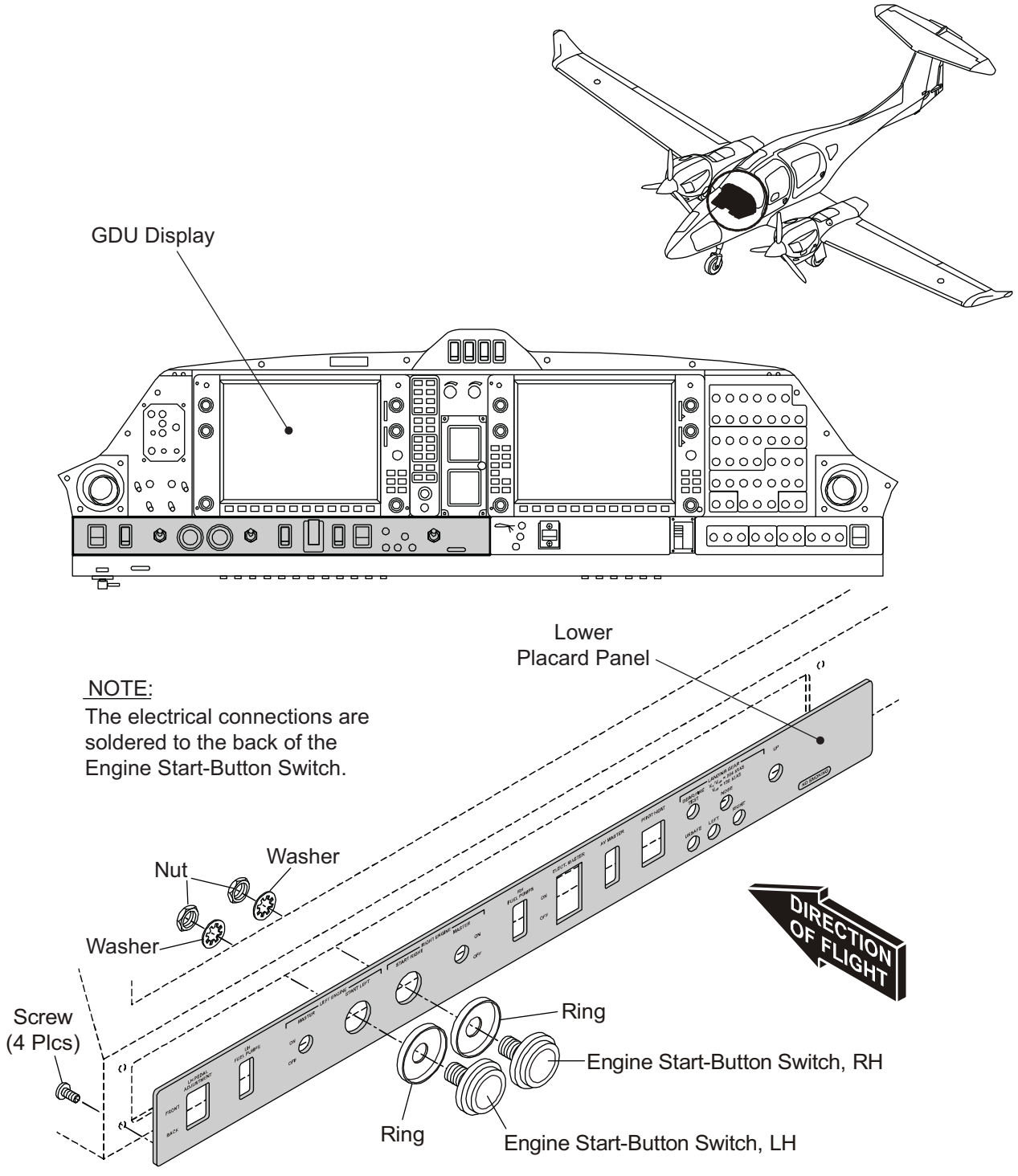

Figure 202 : Engine Start-Button Switch - Removal/Installation

B. Install an Engine Start Push-Button.

	Detail Steps/Work Items	Key Items/References
(1)	Install the engine start push-button switch: - Move the push button switch and ring into position on the placard panel and hold the push button switch. - Move the washer and nut down on the electrical cables. - Solder the electrical cables to the terminals on the push button switch. - Move the switch fully into position in the placard panel. - Install the washer and nut onto the rear of the switch.	Refer to Figure 202. Refer to Chapter 92 for the wiring diagrams. Make sure that the switch is correctly orientated.
(2)	Position and install the lower placard panel onto the instrument panel. - Install the four screws.	Be careful of all the wiring connections to the switches on the placard panel.
(3)	If the GDU display was removed to get access to the back of the placard panel, install the GDU.	Refer to Section 31-40.
(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.

4. **Remove/Install the Engine Start Relay**

A. Remove the Engine Start Relay.

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS, THE PROPELLER TURNS AND CAN CAUSE INJURY OR DEATH.	
(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 avionic compartment cover for access to the relay panel.	Refer to Section 52-40.
(4)	Disconnect the control cables (ring terminals) from the starter relay.	At the terminal block.
(5)	Remove the starter relay: - Remove the two bolts and washers that attach the relay to the relay panel. - Move the relay up and clear of the relay panel and the airplane.	Refer to Figure 203.

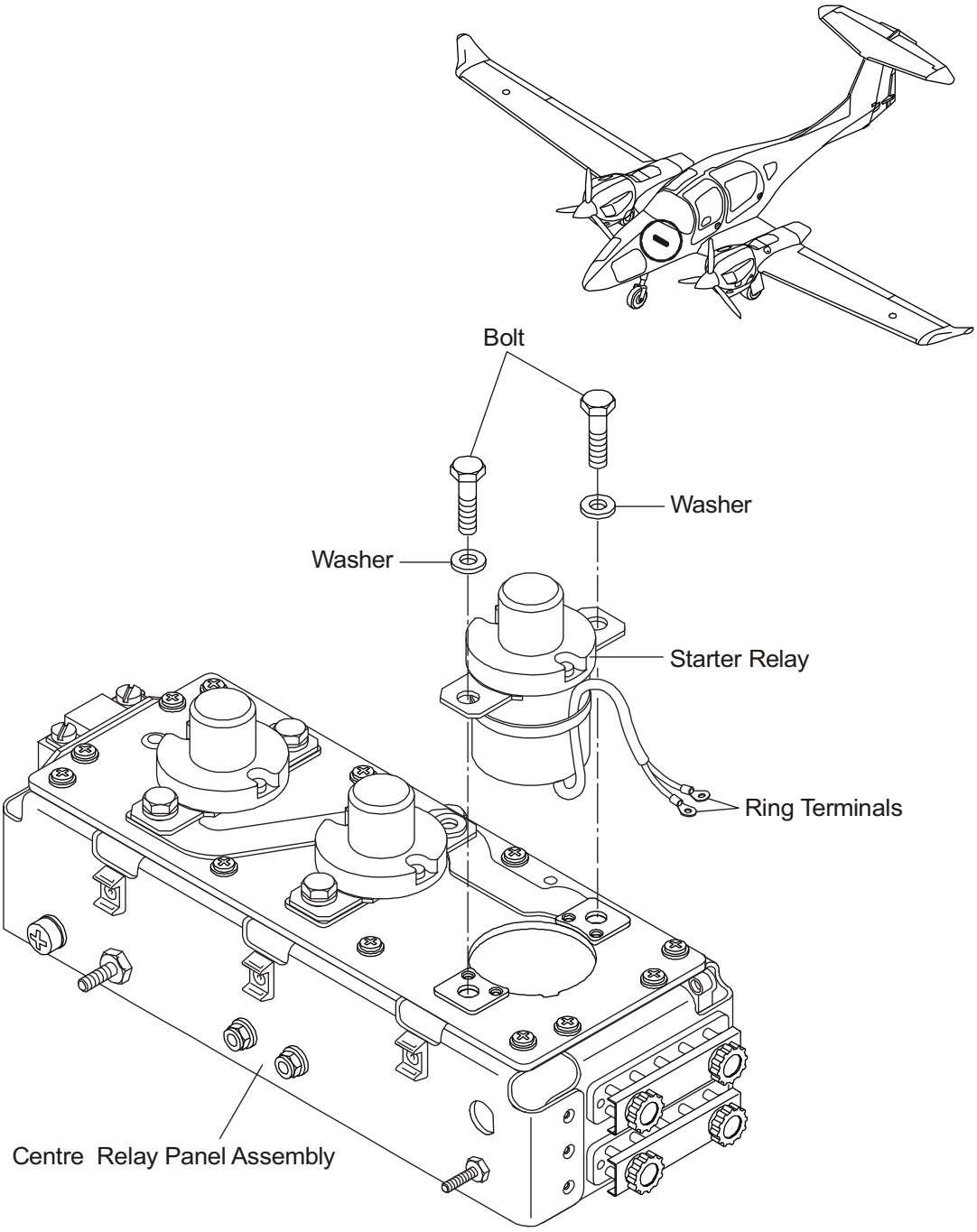

Figure 203 : Engine Starter Relay - Removal/Installation

B. Install the 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 two washers and bolts that attach the relay to the relay panel.	Refer to Figure 203.
(2)	Connect the control cables (ring terminals) to the starter relay.	At the terminal block.
(3)	Connect the airplane main battery.	Refer to Section 24-31.
(4)	Install the avionic compartment cover.	Refer to Section 52-40.
(5)	Start the related engine and do a test for the correct operation of the engine starting system.	Refer to Section 71-00.

5. **Replace the Glow Fuse**

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS, THE PROPELLER TURNS AND CAN CAUSE INJURY OR DEATH.	
(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 from the related engine nacelle for access to the relay panel.	Refer to Section 52-40.
(4)	Remove the glow 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 204. Top side. Do not remove the nut. Bottom side. Do not remove the nut.
(5)	Install a new fuse: - Move the new fuse into position at the fuse holder. - Tighten the two nuts.	
(6)	Install the access panel onto the related engine nacelle.	Refer to Section 52-40.
(7)	Connect the airplane main battery.	Refer to Section 24-31.
(8)	Do an engine ground run-up and make sure that the glow plugs operate correctly.	Refer to Section 71-00.

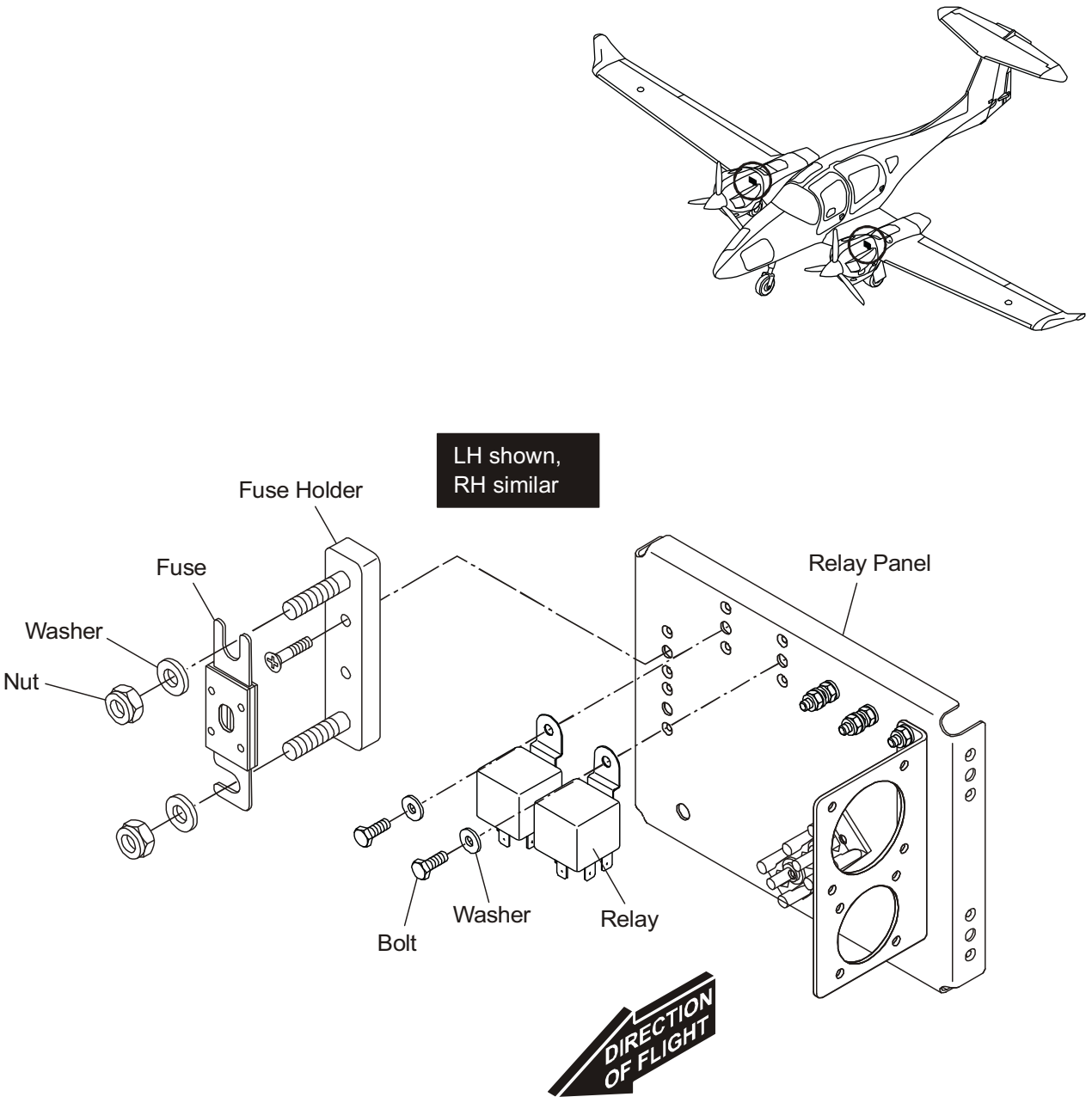

Figure 204 : Engine Glow Fuse - Replacement

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CHAPTER 81

TURBO CHARGER

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CHAPTER 81

TURBO CHARGER

1. General

This Chapter describes the turbo-charger system of the Austro Engine E4P-C.

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 71-60 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 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.

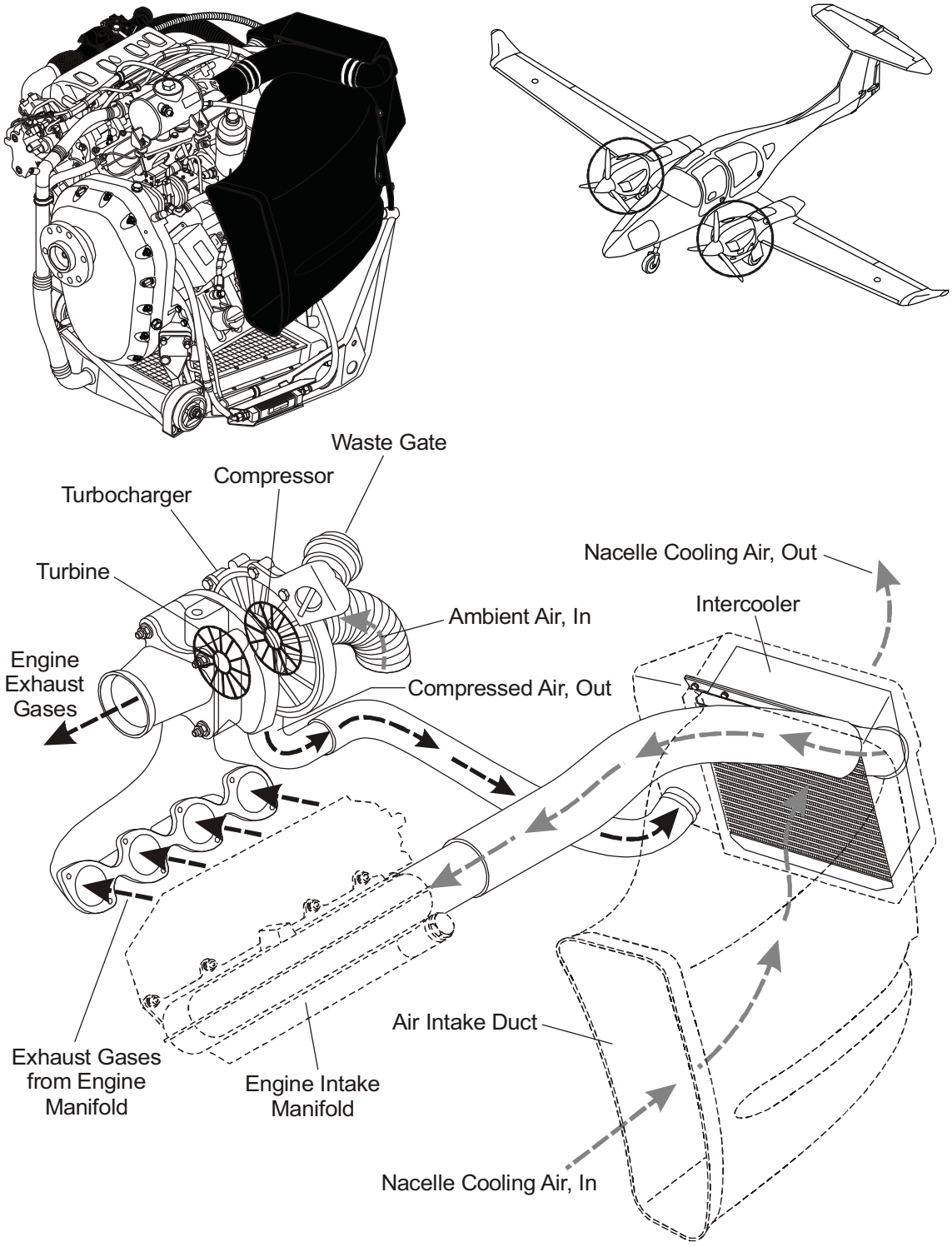

Figure 1 : Engine Turbo Charger - Schematic Diagram

3. Operation

Figure 1 shows the schematic diagram.for the turbo charger system.

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 ECU.

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.

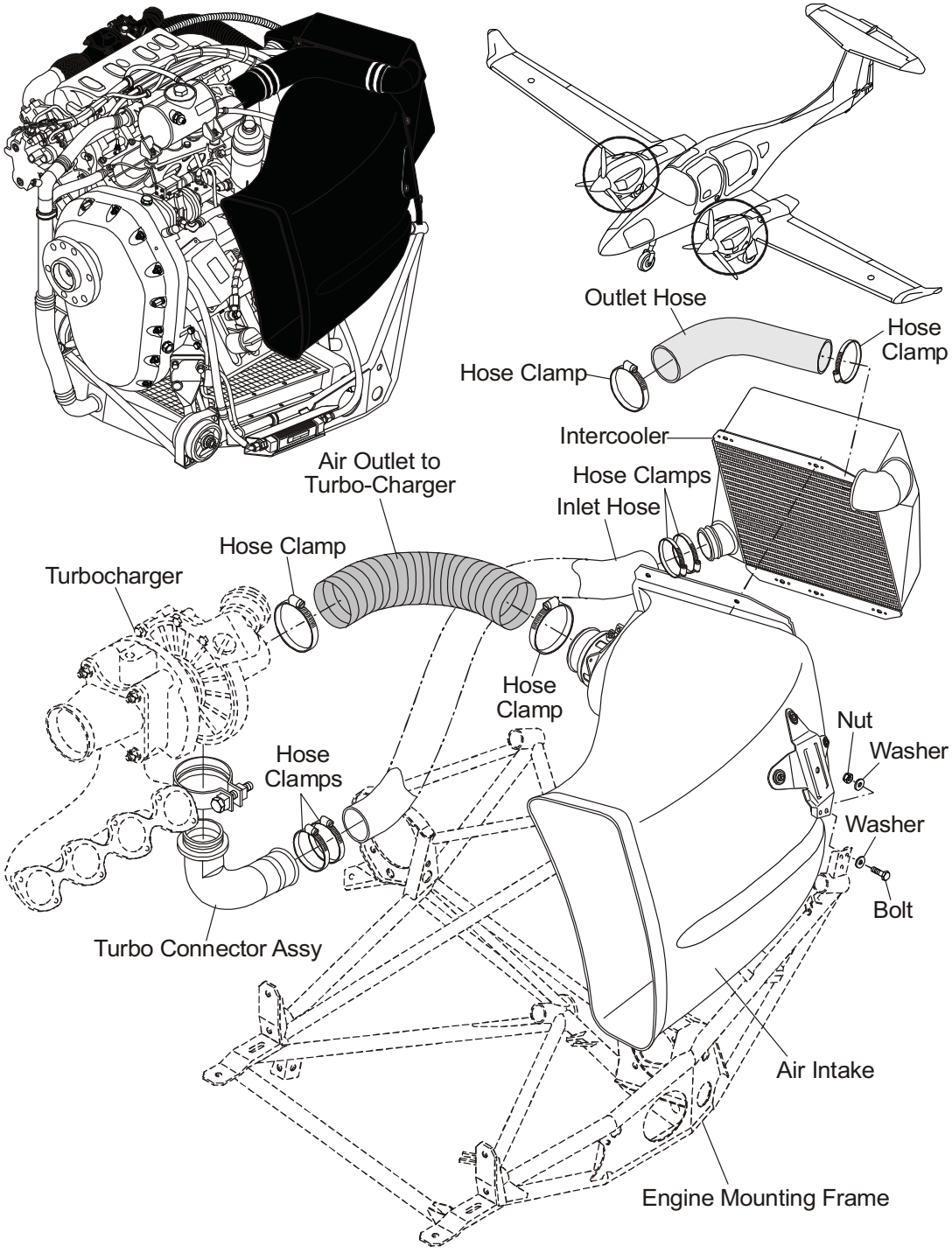

Figure 2 : Intercooler Installation

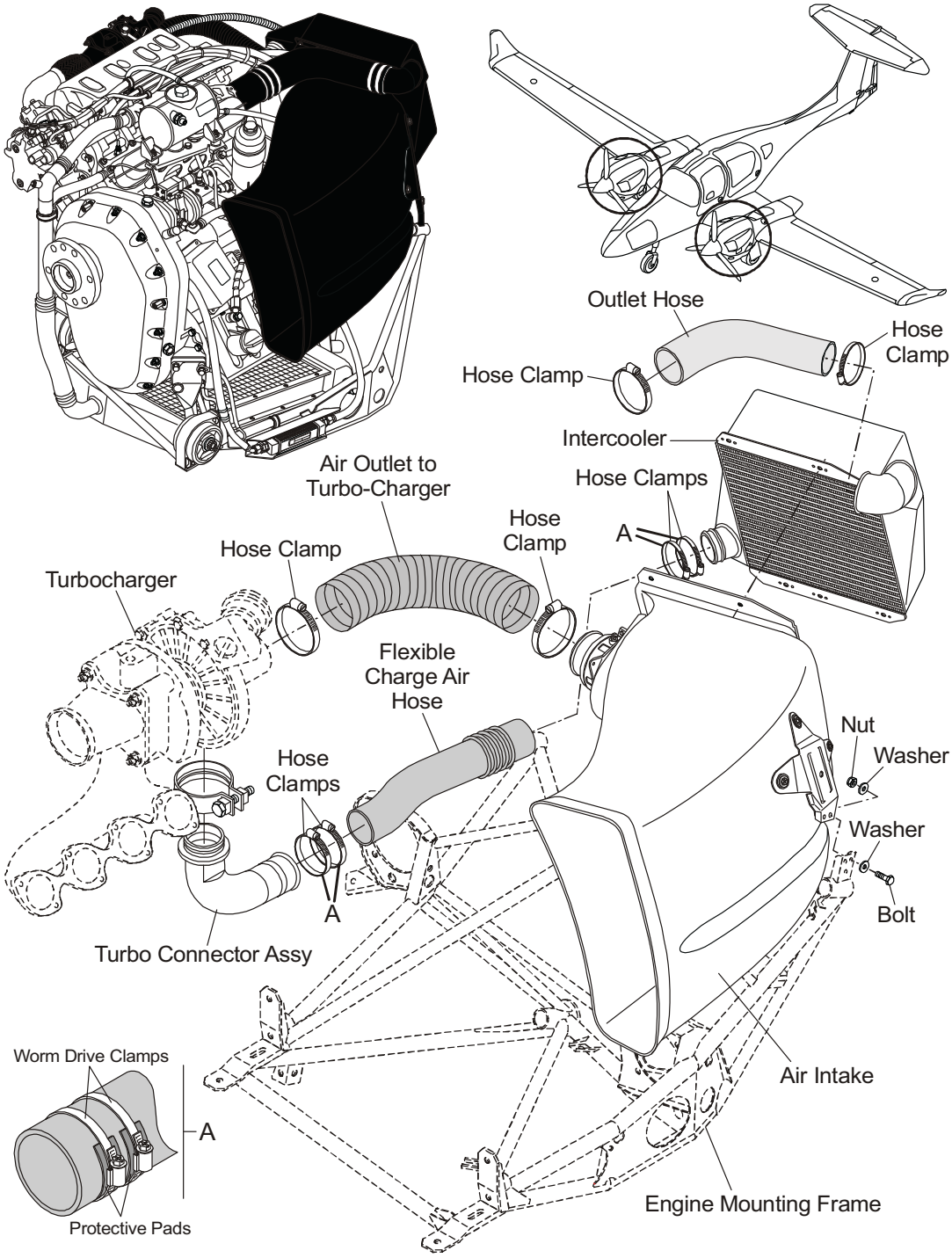

Figure 3 : Intercooler Installation (if MÄM 62-130 is installed)

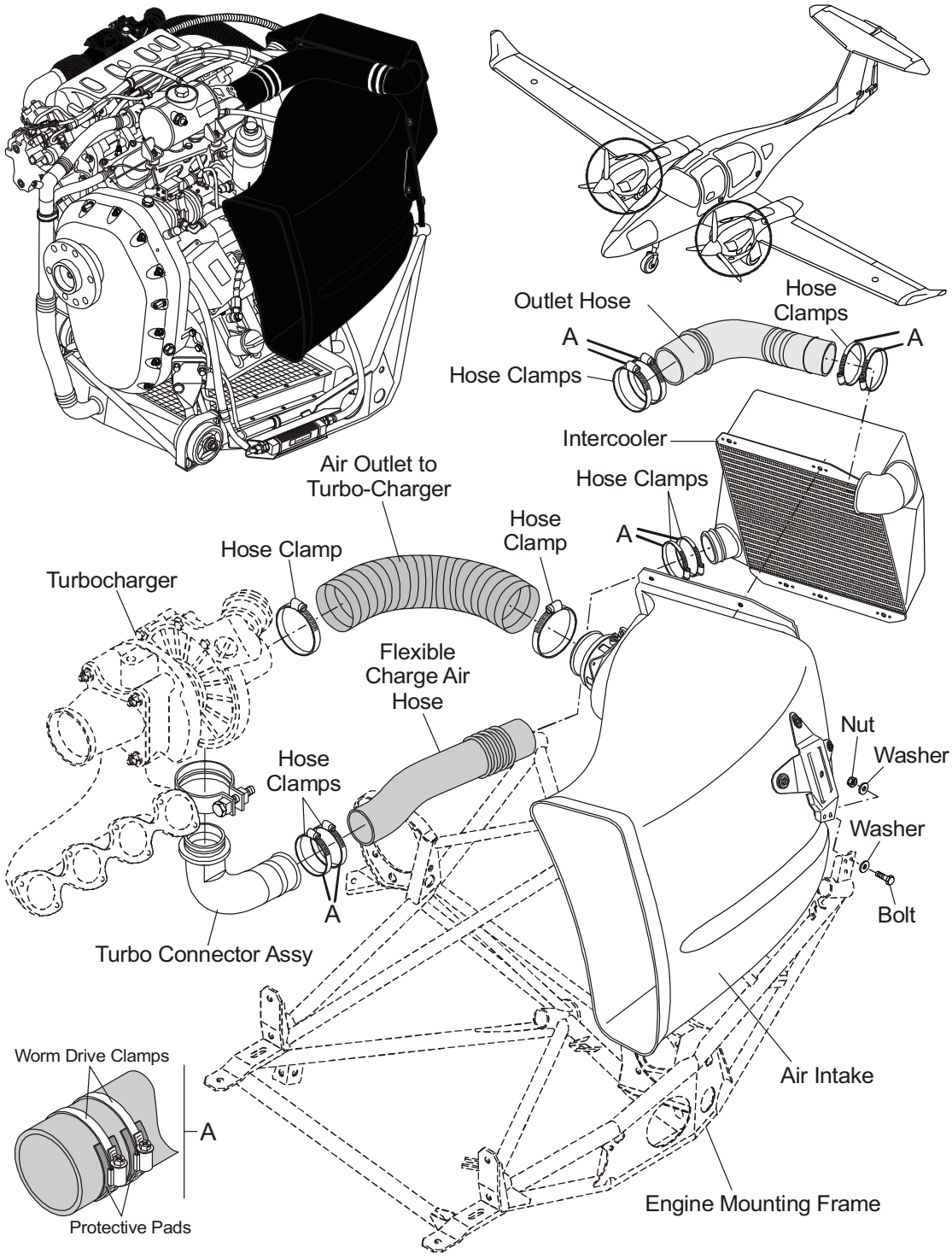

Figure 4 : Intercooler Installation (if MÄM 62-260 is installed)

Trouble-Shooting

1. **General**

The table below lists the possible defects of the turbo charger system.

When experiencing trouble as 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 engine intake manifold pressure is too low/ too high.	The waste gate valve is defective.	Refer to the engine manufacturer.
The inlet air temperature is too high.	The intercooler matrix is blocked or damaged.	Clear the intercooler matrix of obstructions. Replace the intercooler if necessary.

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Maintenance Practices

1. **General**

This Section tells you how to remove/install the engine intercooler.

CAUTION: YOU CANNOT DO MAINTENANCE ON THE INTERCOOLER. ANY MAINTENANCE WILL AFFECT THE CHARACTERISTICS OF THE ELECTRONIC CONTROL SYSTEM.

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 those 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 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 cowling.	Refer to Section 71-10.

	Detail Steps/Work Items	Key Items/References
(5)	Remove the intercooler air intake-duct, the air filter and the intercooler:	
	- Remove the air filter with the alternate air valve.	Refer to Figure 201.
	- Remove the bolts, nuts and washers that hold the alternate air valve and air filter to the air filter-box assembly.	
	- Move the alternate air valve and air filter clear of the air filter-box assembly.	
	- Remove the charge air hoses (outlet and inlet hoses) which are connected to the intercooler.	
	- If MÄM 62-260 is installed, remove the six bolts which attach the intercooler to the nacelle air outlet aluminum duct.	Refer to Figure 4. (81-00-00 Page 6).
	- Remove the bolts and washers which fix the intercooler air intake-duct to the engine mounting frame.	Refer to Figure 201.
	- 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.	
	- Move the intercooler clear of the engine and off the airplane.	Take care not to damage the intercooler matrix!

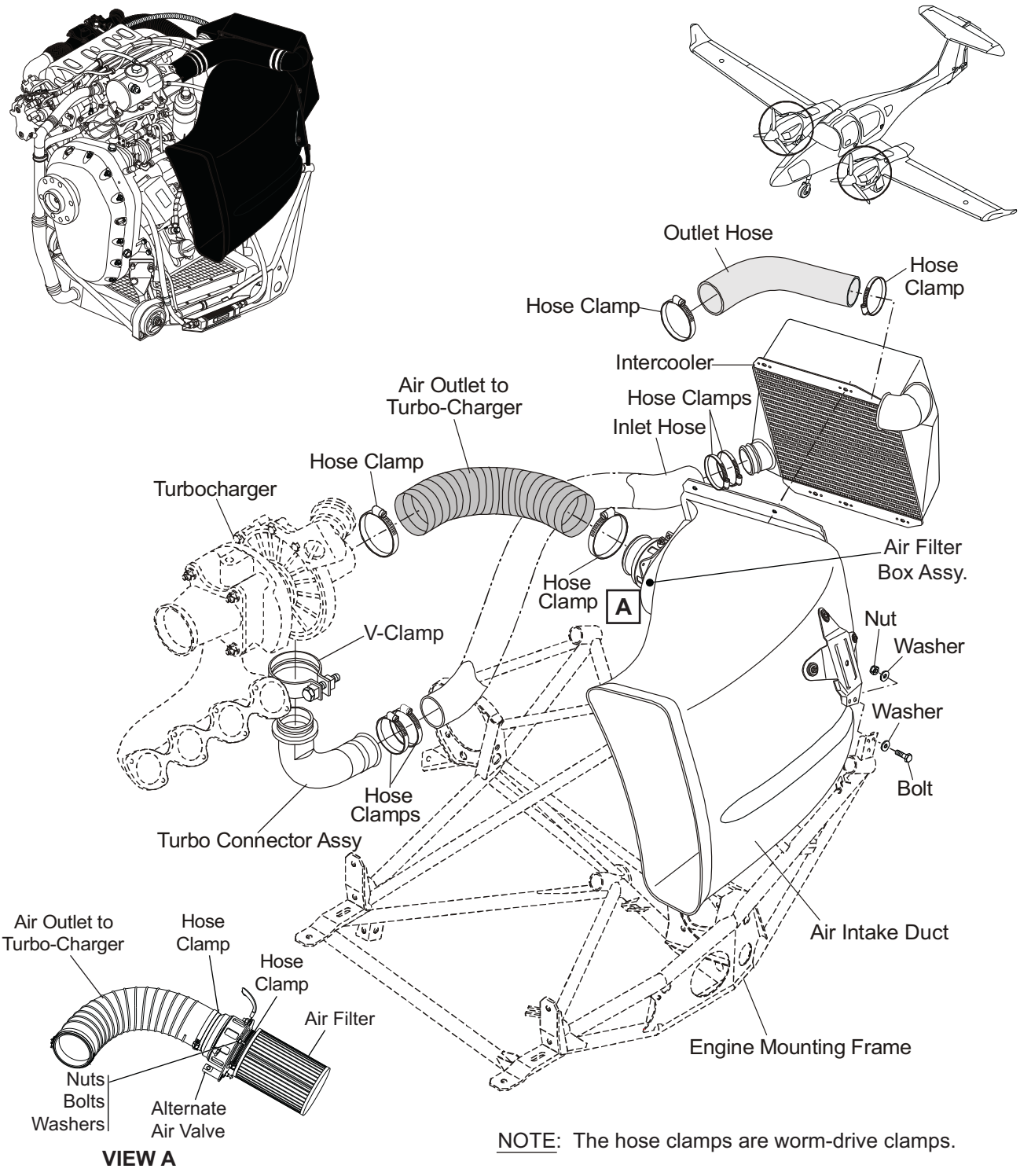
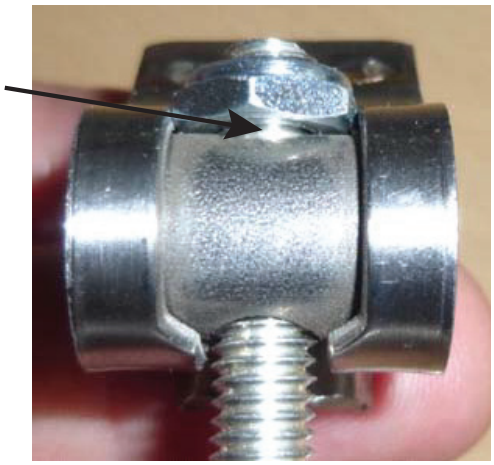


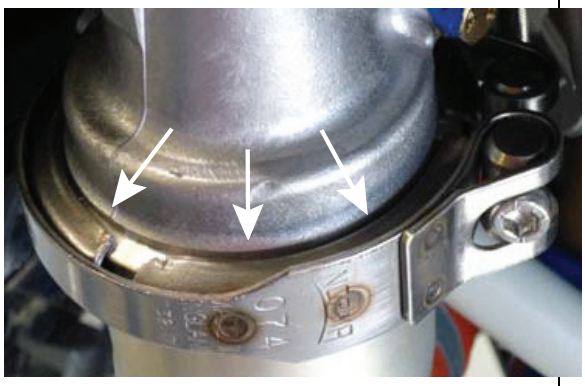
Figure 201 : Engine Intercooler - Removal/Installation

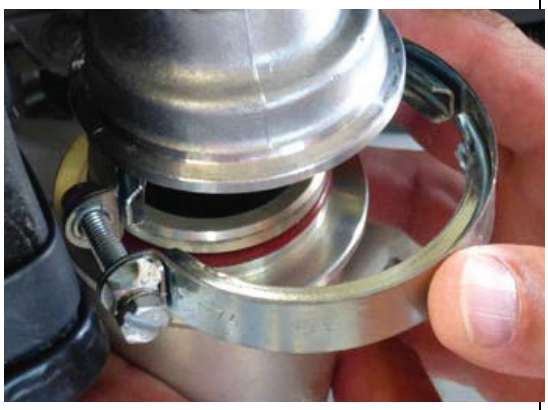
B. Install an Engine Intercooler.

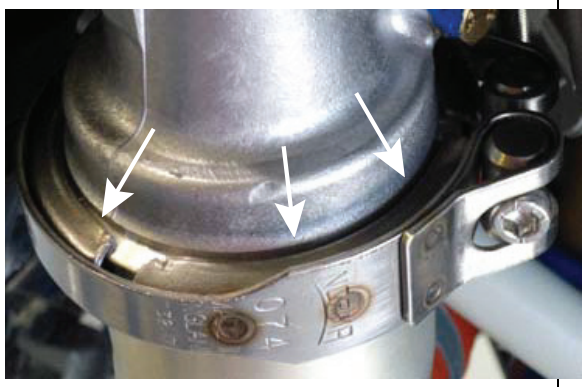
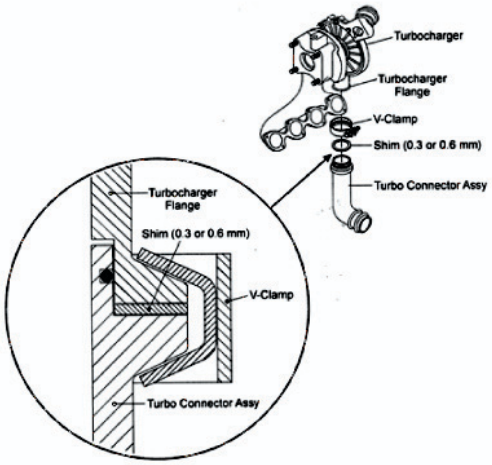
	Detail Steps/Work Items	Key Items/References
	CAUTION: MAKE SURE THAT THE TURBO CHARGER INLET HOSES ARE ROUTED CORRECTLY, WITHOUT KINKS. INCORRECTLY INSTALLED HOSES MAY RESULT IN DAMAGE TO THE TURBO CHARGER.	
(1)	Install the intercooler, the intercooler air intake-duct and the air filter: - Position the intercooler on the nacelle air outlet aluminum duct.	Refer to Figure 201.
	If MÄM 62-260 is installed: - Install the bolts and washers that attach the intercooler to the nacelle air outlet aluminum duct. - Position the composite air intake duct on the intercooler and install the bolts and washers which connect both parts. - Install the bolts and washers which fix the intercooler air intake-duct to the engine mounting frame.	Refer to Figure 4. (81-00-00 Page 6).
	NOTE: Do not bend or kink the charge air hoses during installation. If there are signs of kinking, replace the engine charge air hose.	

	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:	Refer to Figure 201.
	- Move the intercooler air duct with the 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 62-130 or MÄM 62-260 is installed:	Refer to Figures 3 and 4. (81-00-00 Pages 5 and 6).
	- 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.	Refer to Figure 201. Do not tighten the worm-drive-clamps at this time.
	- If MÄM 62-130 or MÄM 62-260 is installed, bond the protective pad using Dow Corning 736 to the red turbocharger hoses underneath the housing of the worm-drive-clamps.	

	Detail Steps/Work Items	Key Items/References
(3)	If MÄM 62-215/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 the V-clamp on turbo-charger. Make sure the circumferential gap to the turbo charger is equal (if not, use a rubber mallet to tap the V-clamp into position). If tapping with a rubber mallet was required, re-tighten the V-clamp.	Torque: 5.5 ± 0.5 Nm (4.0 ± 0.4 lbf.ft).
		
	If MÄM 62-215/a is NOT installed: - Put the V-clamp in position on the flanges.	

	Detail Steps/Work Items	Key Items/References
	Note: Do not pull the V-clamp over the turbo charger tube since the V-clamp will be permanently deformed.	
		
	- Tighten the V-clamp on turbo-charger.	Torque: 5.0 ± 0.5 Nm (3.7 ± 0.4 lbf.ft)
		
	- Secure the bolt of the V-clamp with lock wire. - Make sure the circumferential gap to the turbo charger is equal (if not, use a rubber mallet to tap the V-clamp into position). If tapping with a rubber mallet was required, re-tighten the V-clamp.	

	Detail Steps/Work Items	Key Items/References
		
	- Make sure that the distance between the V-flanges is between 6 and 10 mm (0.24 - 0.39 in.) If necessary insert turbo connector shims to obtain the required distance.	
		

	Detail Steps/Work Items	Key Items/References
		
(4)	Install the intercooler air duct: - Position the intercooler air duct on the intercooler so that it aligns with the engine mounting brackets. - Install the bolts and washers that attach the intercooler air duct to the engine mounting frame.	
(5)	Install the alternate air valve and air filter: - Move the alternate air valve and air filter into of the air filter-box assembly. - Install the bolts, nuts and washers that hold the alternate air valve and air filter to the air filter-box assembly. - Tighten the worm-drive-clamps on the flexible hoses of the intercooler and apply torque seal (no red or 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 71-10.
(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 71-10.

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.

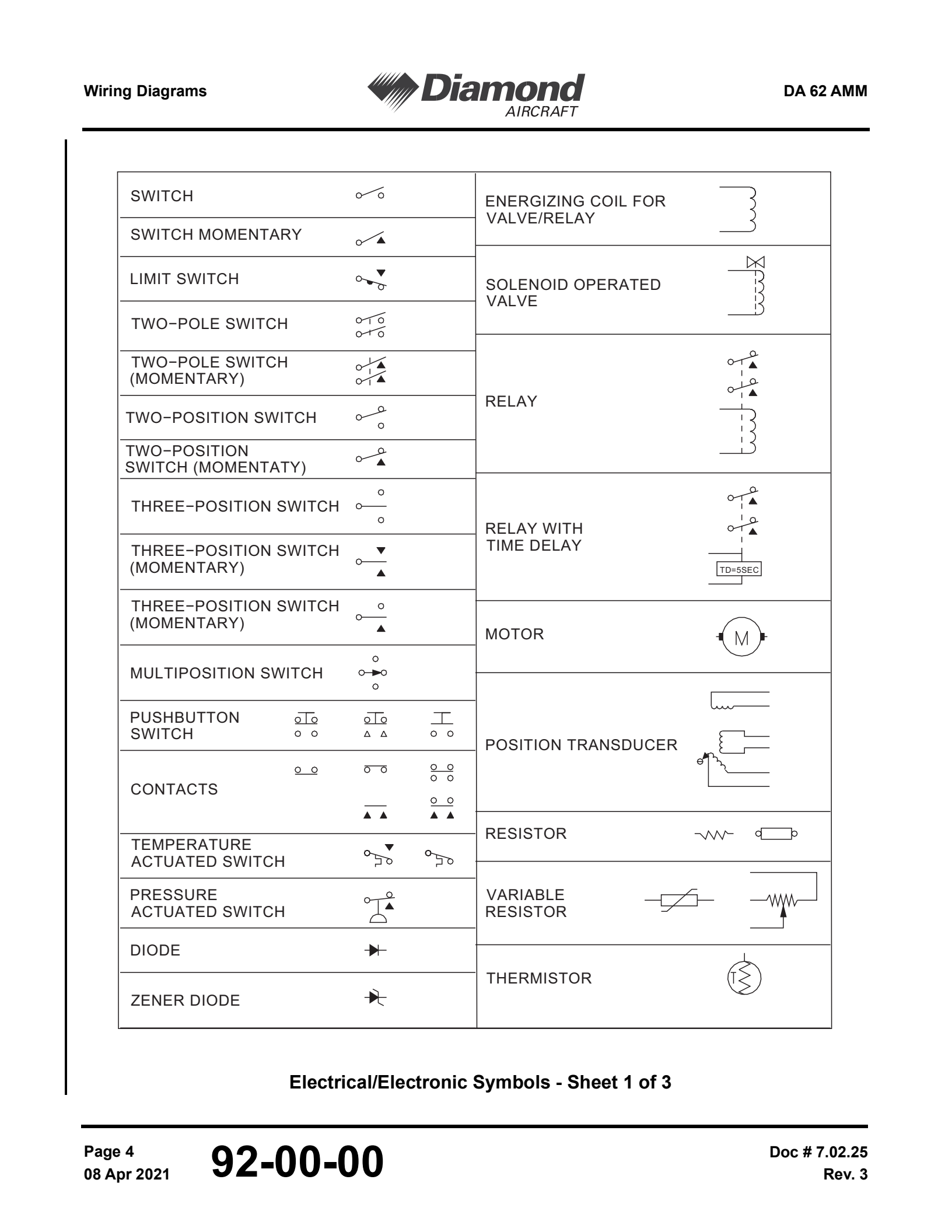
Title	Drawing Number	Rev. No.	No. of Sheets
Schematic, Equipment Cooling	D67-9221-20-01	B	1
Schematic, RACC Wiring	D67-9221-50-01	-	1
Schematic, GFC 700 Wiring	D67-9222-10-01	B	1
Schematic, GSR56 Wiring	D67-9223-15-00	-	1
Schematic, Audio Panel 3rd Seat Row	D67-9223-50-01_01	-	1
Schematic, Bose/Lemo Jacks Wiring	D67-9223-50-02	-	1
Schematic, Electrical System	D67-9224-30-01	E	2
Schematic, Electrical System	D67-9224-30-01_01	-	2
Schematic, Second Alternator	D67-9224-30-02	-	1
Schematic, USB Charging Ports	D67-9224-60-01	A	1
Schematic, USB Charging Port, Pax Row 1	D67-9224-60-02	-	1
Schematic, ACC-Power 3-pins connector	D67-9224-60-03	-	1
Schematic, ACC-Power 4-pins connector	D67-9224-60-04	-	1
Schematic, Emergency Power	D67-9225-60-01	-	1
Schematic, ELT Kannad 406 AF-Compact ELT or 406 AF-Integra ELT	D67-9225-60-03	-	1
Schematic, Removable Co-Pilot Stick Wiring	D67-9227-03-00	-	1
Schematic, Rudder Pedals Wiring	D67-9227-20-01	C	1
Schematic, Flaps Wiring	D67-9227-50-01	C	1

Title	Drawing Number	Rev. No.	No. of Sheets
Schematic, Flaps Wiring	D67-9227-50-01-01	-	1
Schematic, LH Aux Fuel Wiring	D67-9228-10-01	D	1
Schematic, RH Aux Fuel Wiring	D67-9228-11-01	C	1
Schematic, Pitot and Stall Heat Warning	D67-9230-30-01	D	1
Schematic, Pitot and Stall Heat Warning	D67-9230-30-01_01	-	1
Schematic, Heated Static Ports	D67-9230-30-02	A	1
Schematic, De-Ice Control System	D67-9230-40-01	B	1
Schematic, Door Warning Switches	D67-9231-00-01	C	1
Schematic, De-Ice Warning System	D67-9231-00-02	-	1
Schematic, G1000	D67-9231-60-01	J	6
Schematic, G1000 NXi	D67-9231-60-02	C	6
Schematic, G1000 Nxi	D67-9231-60-03	A	6
Schematic, Landing Gear	D67-9232-00-01	C	1
Schematic, Landing Gear	D67-9232-00-01_01	-	1
Schematic, Flood Light	D67-9233-10-01	B	1
Schematic, Dimming Regulator & Placards	D67-9233-10-07	C	1
Schematic, Map Reading Lights	D67-9233-20-01	-	1
Schematic, Interior Lightning	D67-9233-20-02	A	1
Schematic, Exterior Lightning	D67-9233-40-01	C	1
Schematic, MD302 Wiring	D67-9234-10-02	A	1
Schematic, GWX 70 Weather Radar Wiring	D67-9234-40-01	-	1
Schematic, ADF	D67-9234-50-01	A	1

Title	Drawing Number	Rev. No.	No. of Sheets
Schematic, Feathering System	D67-9261-20-01	A	1
Schematic, LH ECU	D67-9277-40-02	C	2
Schematic, LH ECU	D67-9277-40-02_01	-	2
Schematic, RH ECU	D67-9277-40-003	B	2
Schematic, RH ECU	D67-9277-40-003_01	A	2

NOTE: The Schematics that follow can be printed off individually on 11" x 17" paper in Landscape Format.

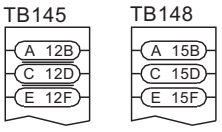
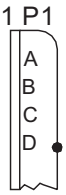
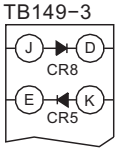
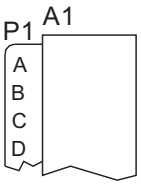
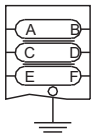
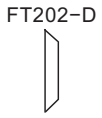
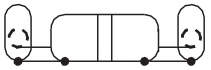
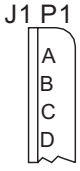
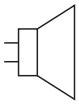
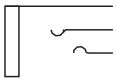
SWITCH	ENERGIZING COIL FOR VALVE/RELAY
SWITCH MOMENTARY	
LIMIT SWITCH	SOLENOID OPERATED VALVE
TWO−POLE SWITCH	
TWO−POLE SWITCH (MOMENTARY)	RELAY
TWO−POSITION SWITCH	
TWO−POSITION SWITCH (MOMENTATY)	
THREE−POSITION SWITCH	RELAY WITH TIME DELAY
THREE−POSITION SWITCH (MOMENTARY)	
THREE−POSITION SWITCH (MOMENTARY)	MOTOR
MULTIPOSITION SWITCH	
PUSHBUTTON SWITCH	POSITION TRANSDUCER
CONTACTS	
TEMPERATURE ACTUATED SWITCH	RESISTOR
PRESSURE ACTUATED SWITCH	VARIABLE RESISTOR
DIODE	THERMISTOR
ZENER DIODE	



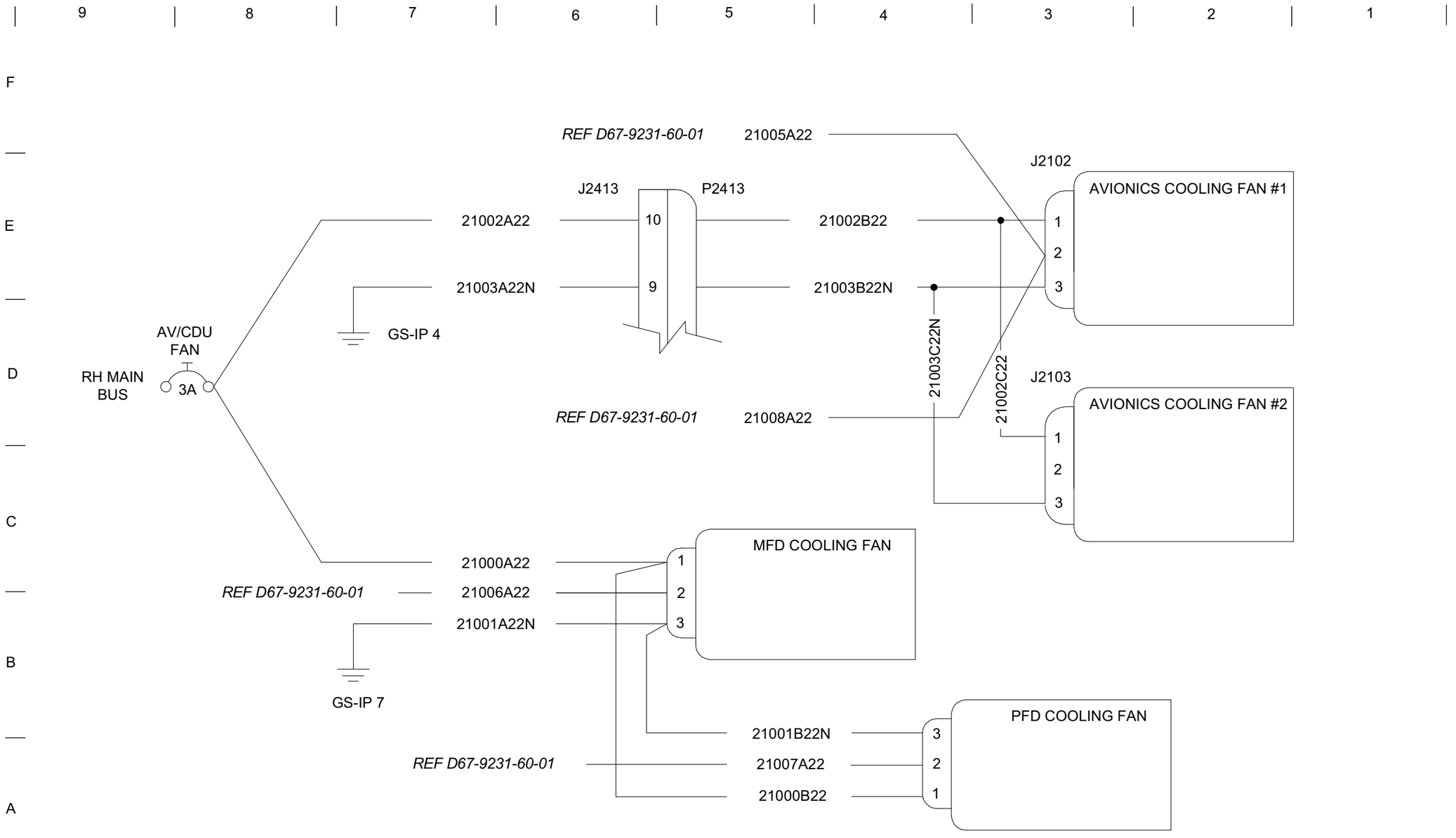
Electrical/Electronic Symbols - Sheet 1 of 3

THERMAL OVERLOAD DEVICE	CIRCUIT BREAKER
HEATER ELEMENT	CIRCUIT BREAKER THREE−PHASE
TRANSFORMER	WIRE WITH IDENTIFICATION (FB3A22)
INDUCTANCE	COAXIAL CABLE
VARIABLE INDUCTANCE	STOWED WIRE
THERMOCOUPLE	SHIELDED WIRE
SQUIB	DOUBLE TWISTED AND SHIELDED CONDUCTOR
CAPACITOR	DOUBLE TWISTED CONDUCTOR
TEMPERATURE SENSING ELEMENT/WIRE FIRE	TRIAX SHIELDED CONDUCTOR
INCADESCENT LAMP	WIRE GROUP
INDICATOR LIGHT (A = AMBER, B = BLUE, G = GREEN, R = RED, Y = YELLOW)	SPLICE (SP1 CRIMP TYPE, SP2 SOLDER TYPE)
FLUORESCENT LIGHT	GROUND STUD
INTEGRAL LIGHTING CONNECTOR	GROUND CONNECTION
BUS BAR CURCUIT BREAKER	CHASSIS OR FRAME GROUND
BUS BAR WITH THREE−PHASE CIRCUIT BREAKER (øA, øB, øC)	STUD TERMINAL BLOC (PARTIAL ASSEMBLY) (TB205, TB209) WITH BUS

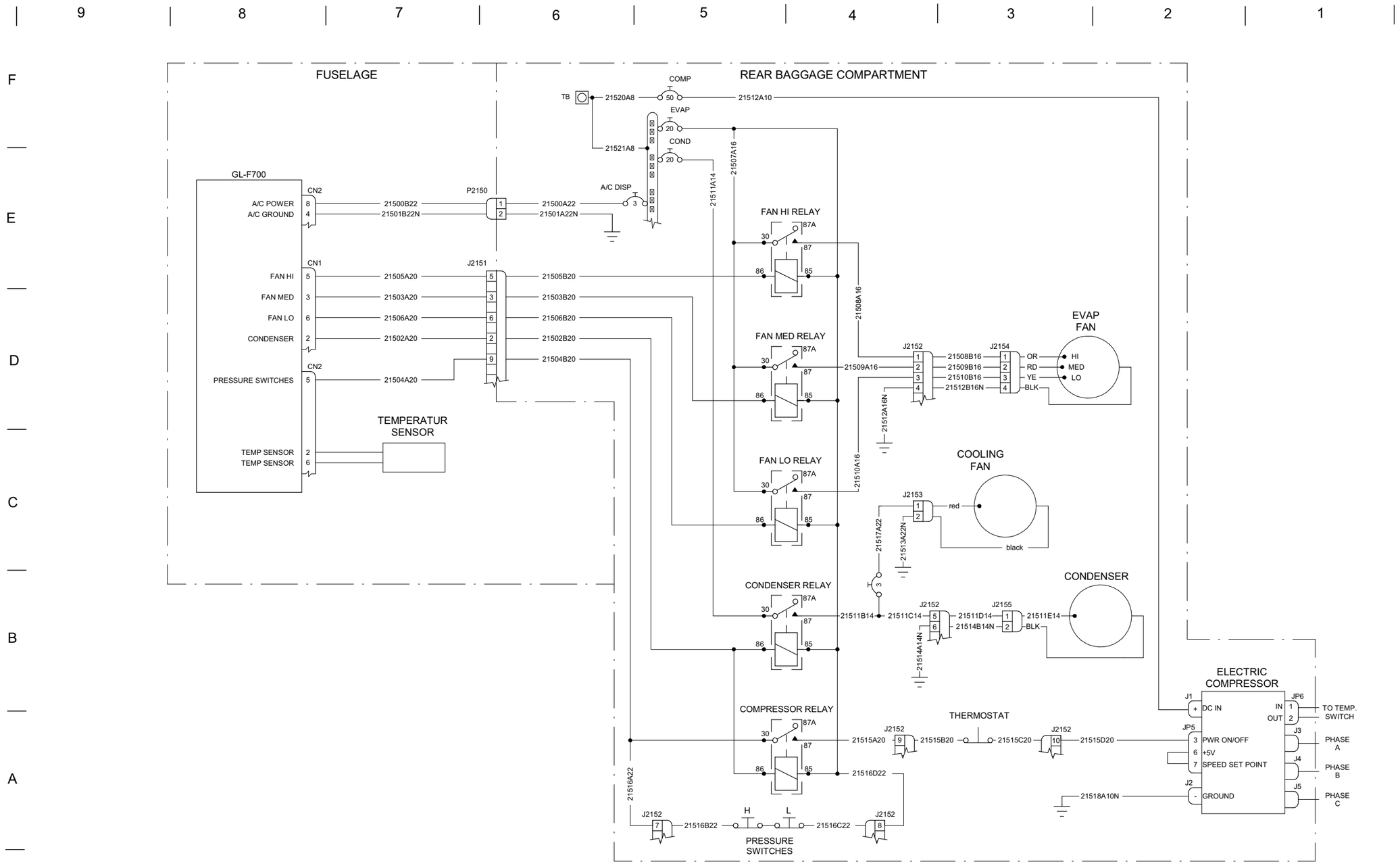
Electrical/Electronic Symbols - Sheet 2 of 3

TERMINAL BLOC MODULE PARTIAL ASSEMBLY WITH BUS 	CONNECTOR WITH BACKSHELL CONNECTION (PARTIAL ASSEMBLY) 
DIODE MODULE (PARTIAL ASSEMBLY) 	EQUIPMENT CONNECTION (PLUG IS PART OF EQUIPMENT) 
GROUND STUD MODULE (PARTIAL ASSEMBLY) 	COAX CONNECTOR 
FEEDTHROUGH 	COAX CONNECTOR WITH BULKHEAD ADAPTER 
CONNECTOR (COMPLETE ASSEMBLY) 	ANTENNA (GENERAL) 
CONNECTOR (PARTIAL ASSEMBLY) 	SPEAKER 
	PHONE JACK 

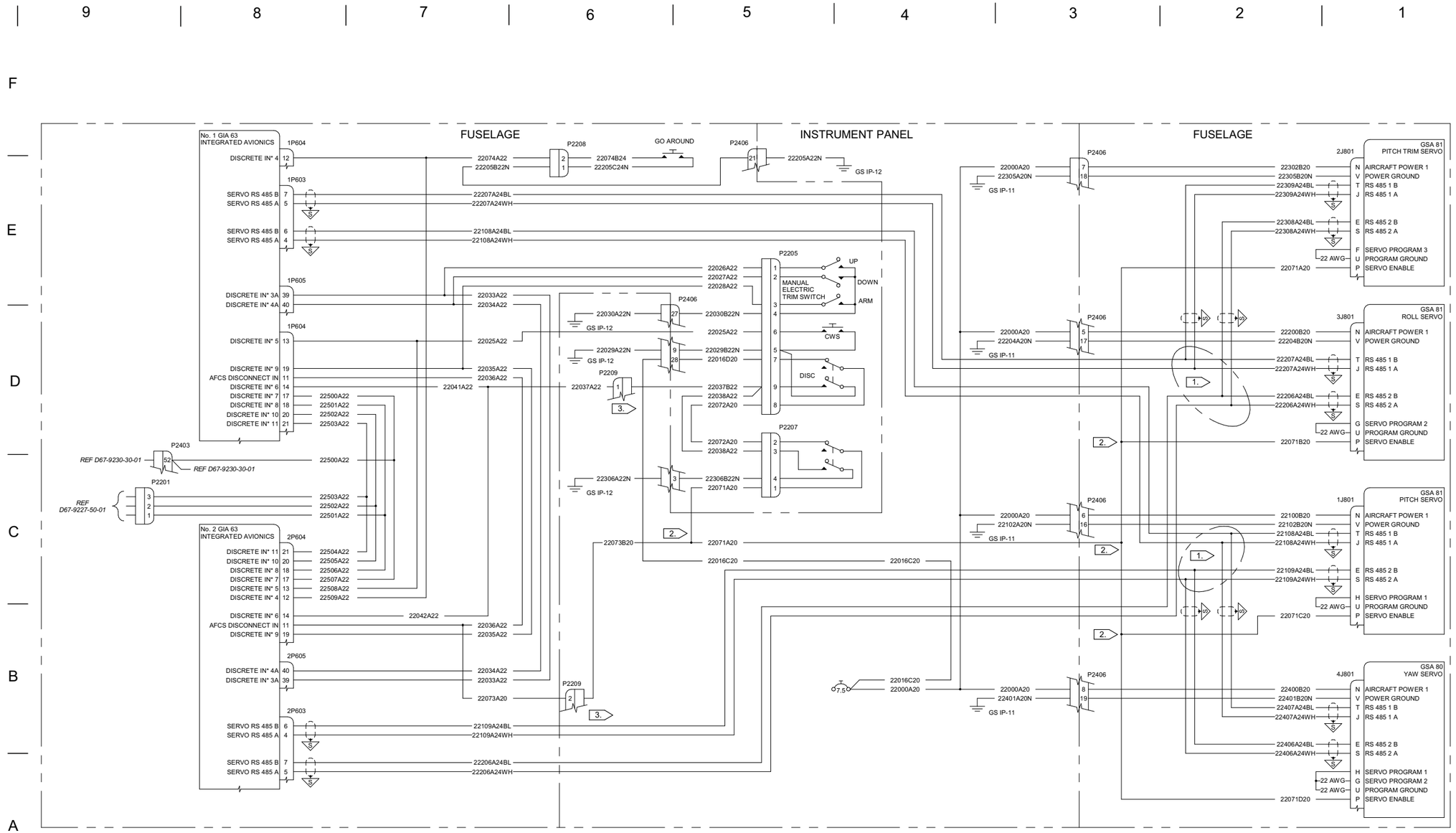
Electrical/Electronic Symbols - Sheet 3 of 3



REV.	SCHEMATIC	DRAWING NO.	SHEET
D	Equipment Cooling	D67-9221-20-01	1/1



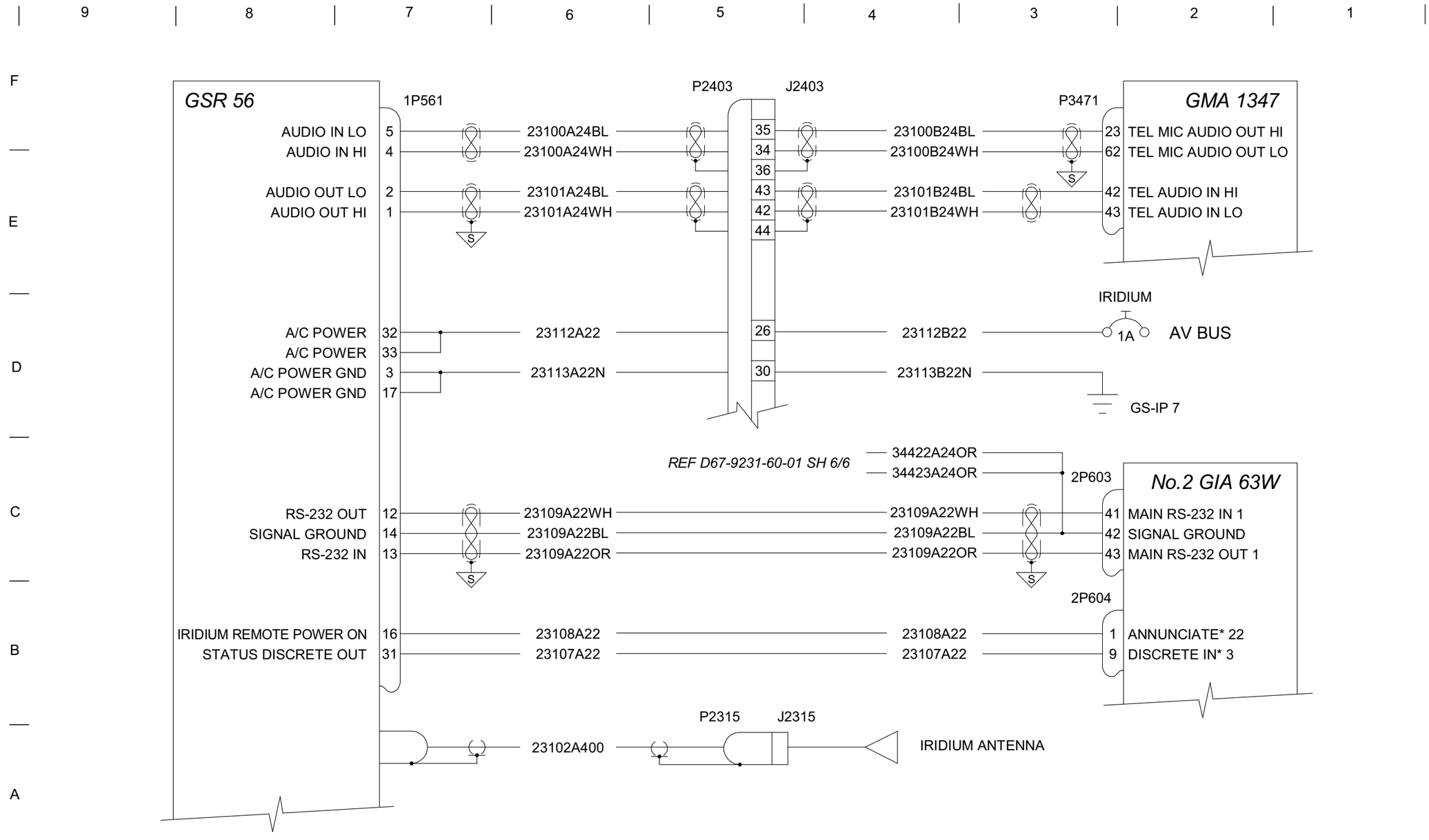
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	RACC Wiring	D67-9221-50-01	1/1



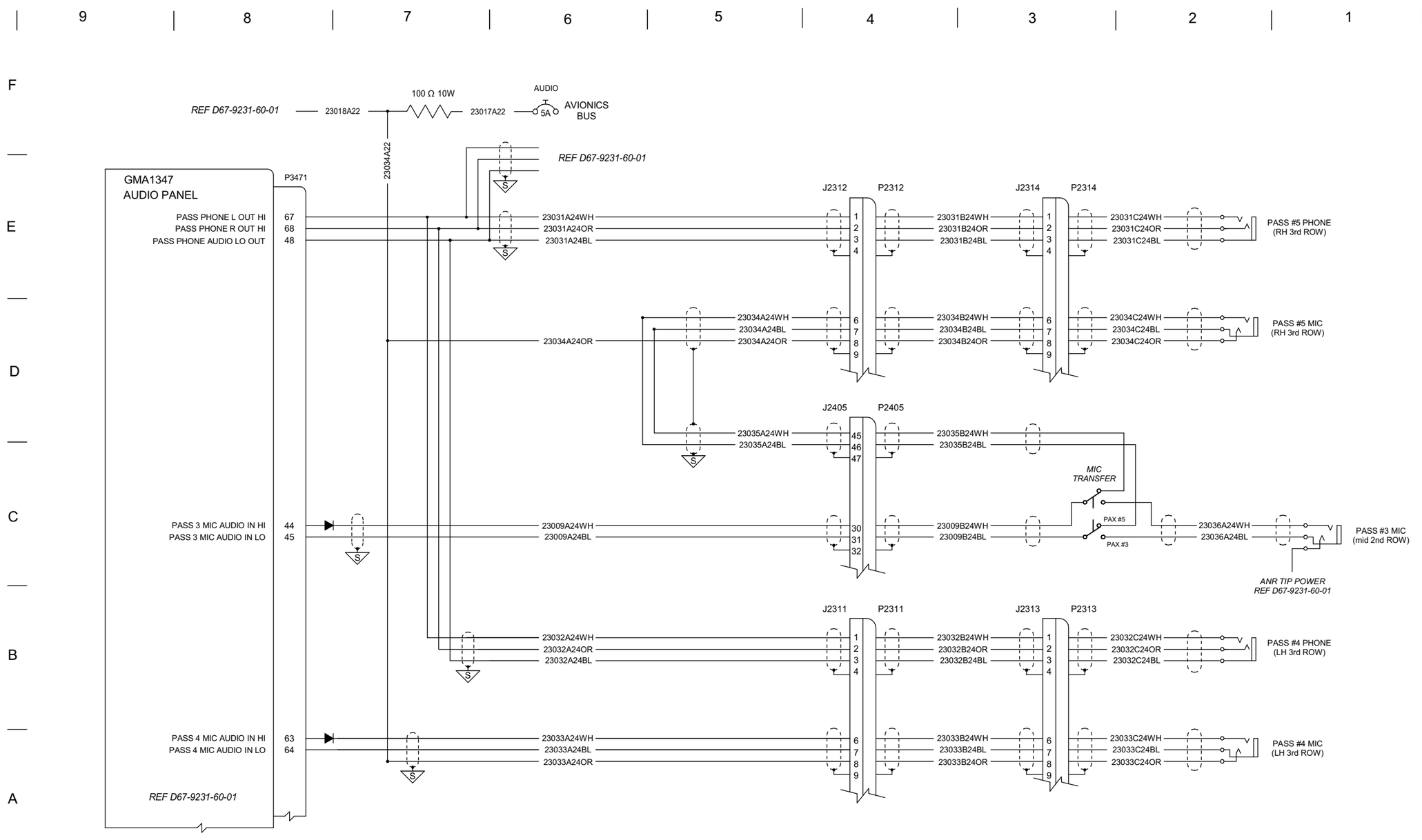
FLAG NOTES

1. TERMINATED AT GIA CONNECTORS
2. TERMINATED AT CONNECTOR J2207
3. LOCATED IN FUSELAGE

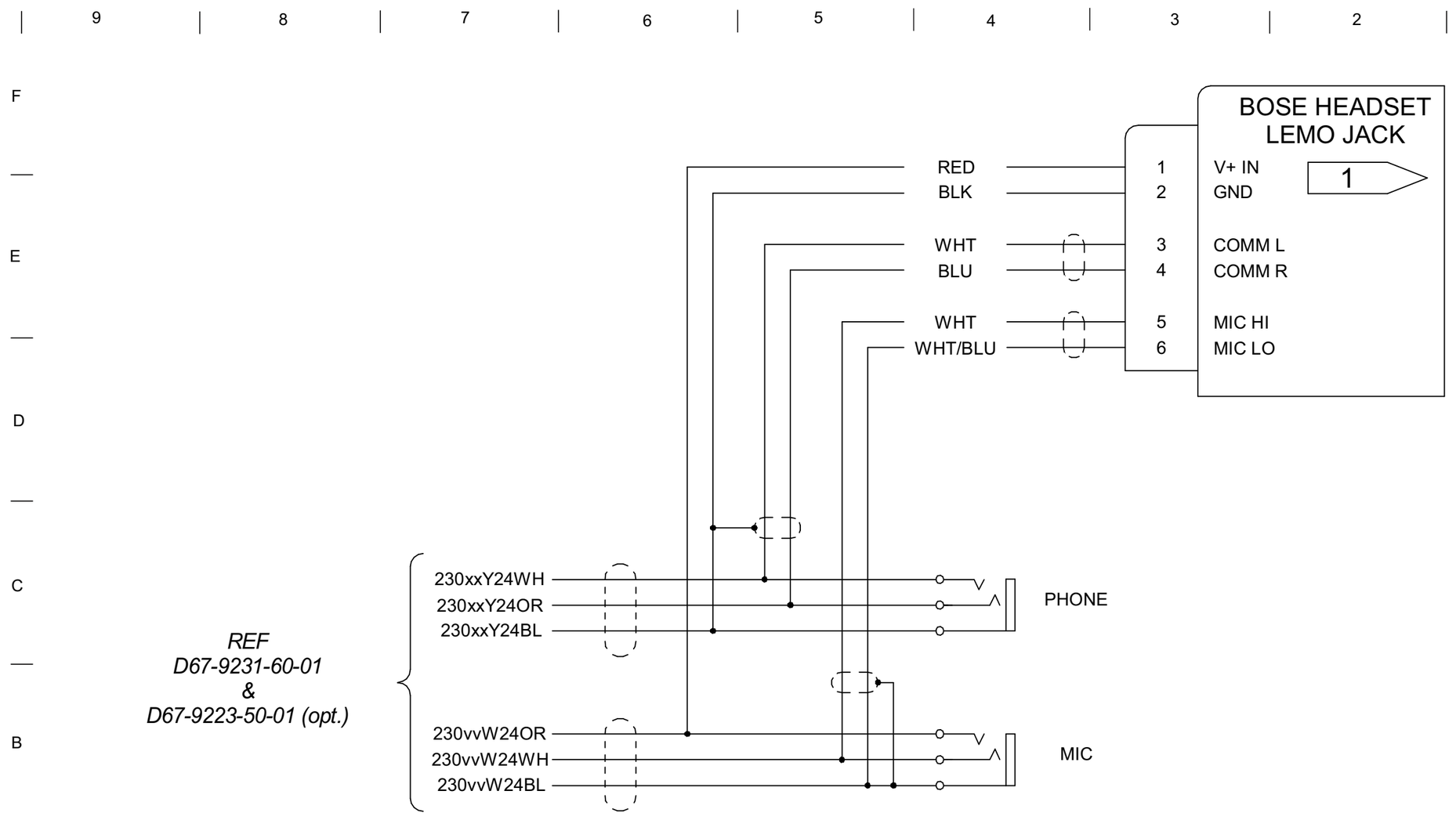
REV.	SCHEMATIC	DRAWING NO.	SHEET
B	GFC 700 Wiring	D67-9222-10-01	1/1



REV.	SCHEMATIC	DRAWING NO.	SHEET
—	GSR 56 Wiring	D67-9223-15-00	1/1



REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Audio Panel 3rd Seat Row	D67-9223-50-01_01	1/1



REF
D67-9231-60-01
&
D67-9223-50-01 (opt.)

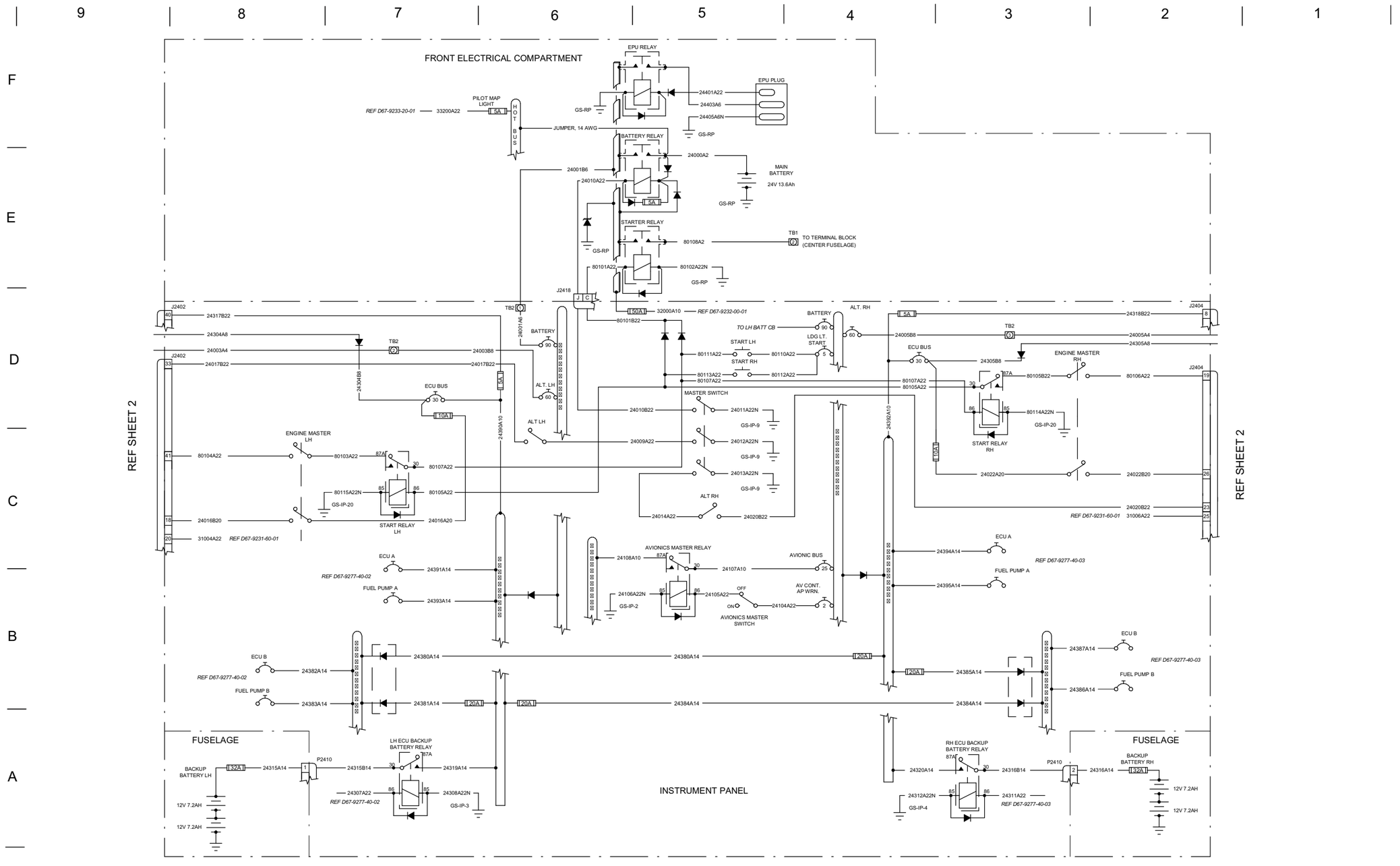
FLAG NOTES

1 CONNECT BOSE CONNECTOR KIT P/N 323172-0010 TO EXISTING HEADSET JACKS AS SHOWN.

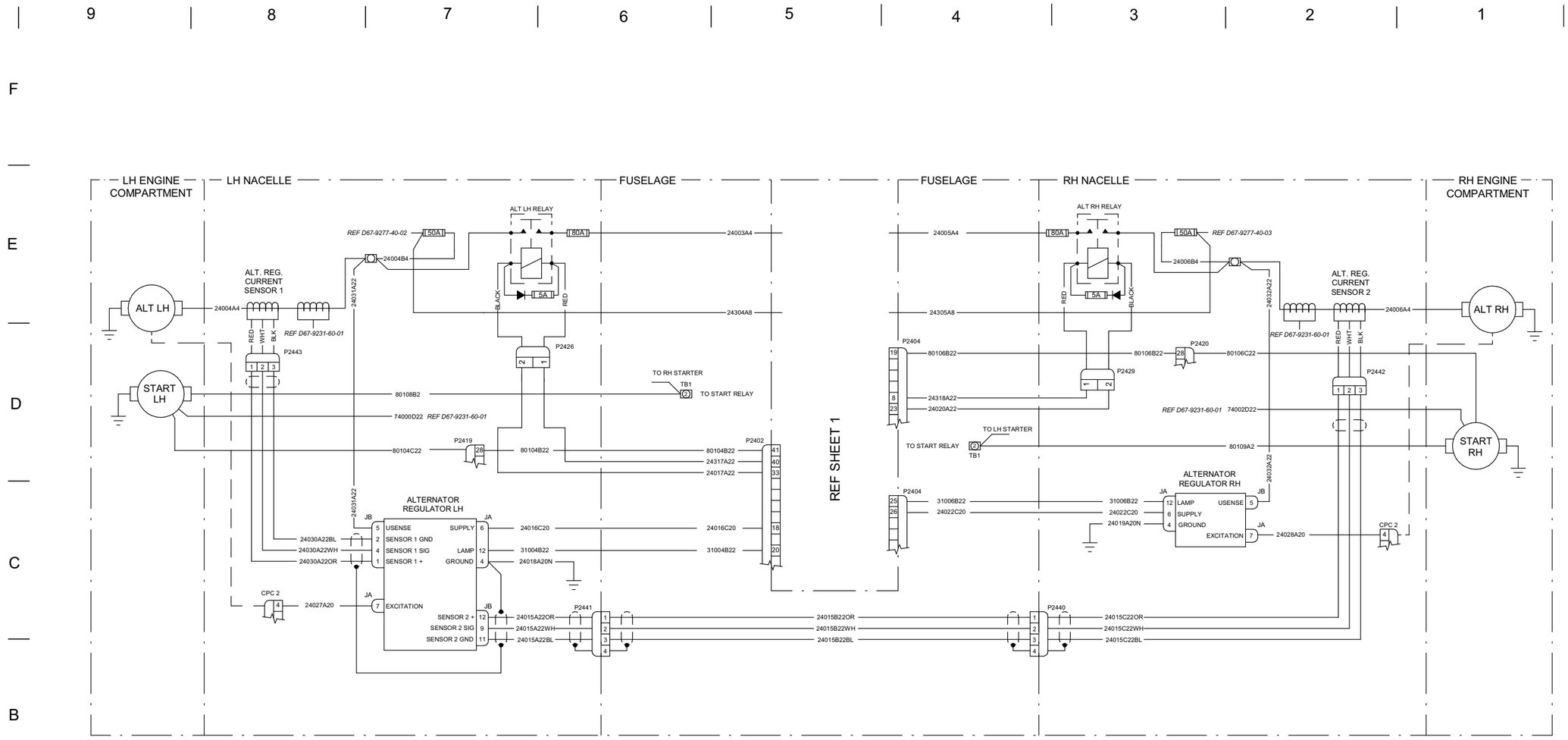
GENERAL NOTES

1. REFER TO WIRING SCHEMATIC D67-9231-60-01 AND OPTIONAL ALSO TO D67-9223-50-01.

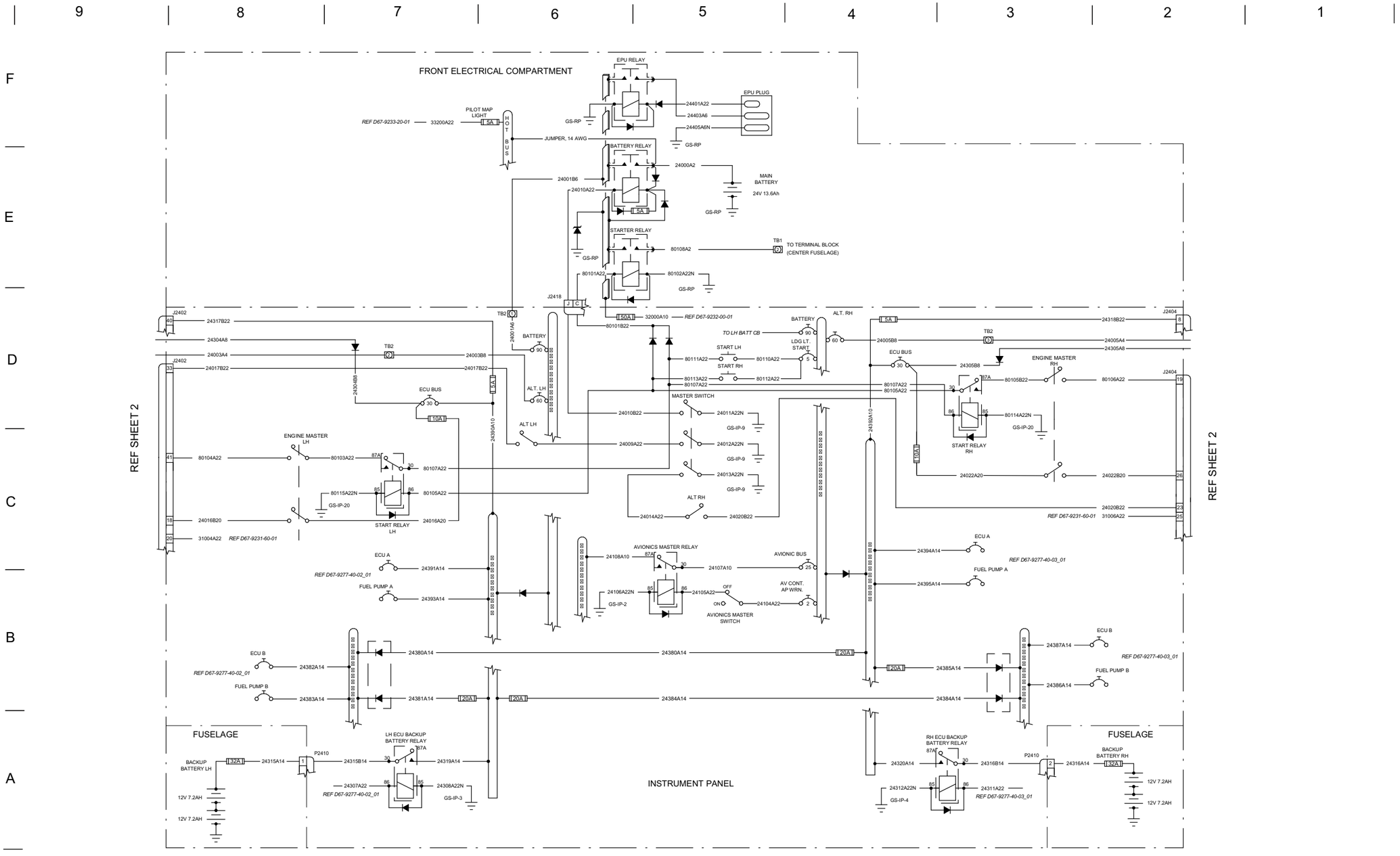
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Bose/Lemo Jacks Wiring	D67-9223-50-02	1/1



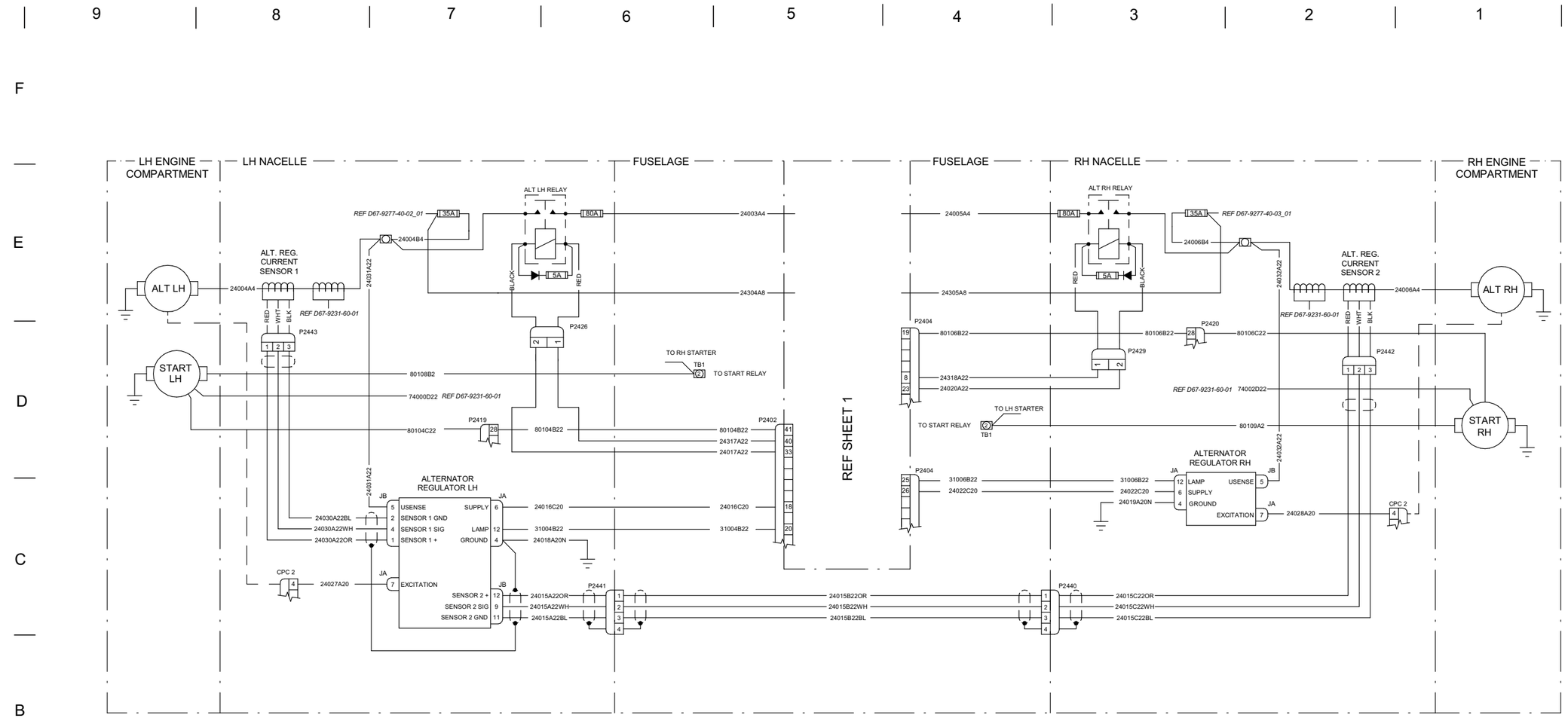
REV.	SCHEMATIC	DRAWING NO.	SHEET
E	Electrical System	D67-9224-30-01	1/2



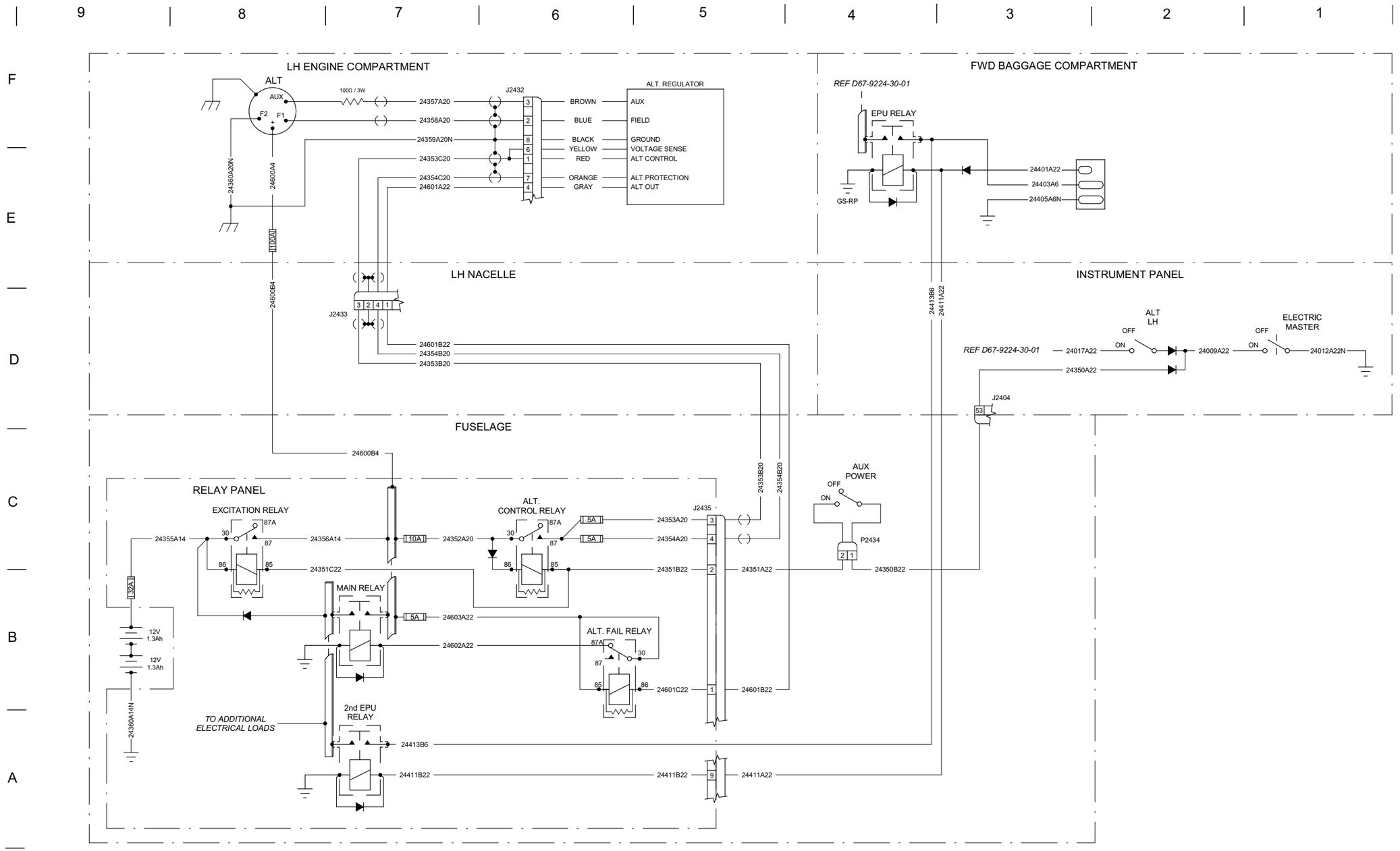
REV.	SCHEMATIC	DRAWING NO.	SHEET
E	Electrical System	D67-9224-30-01	2/2



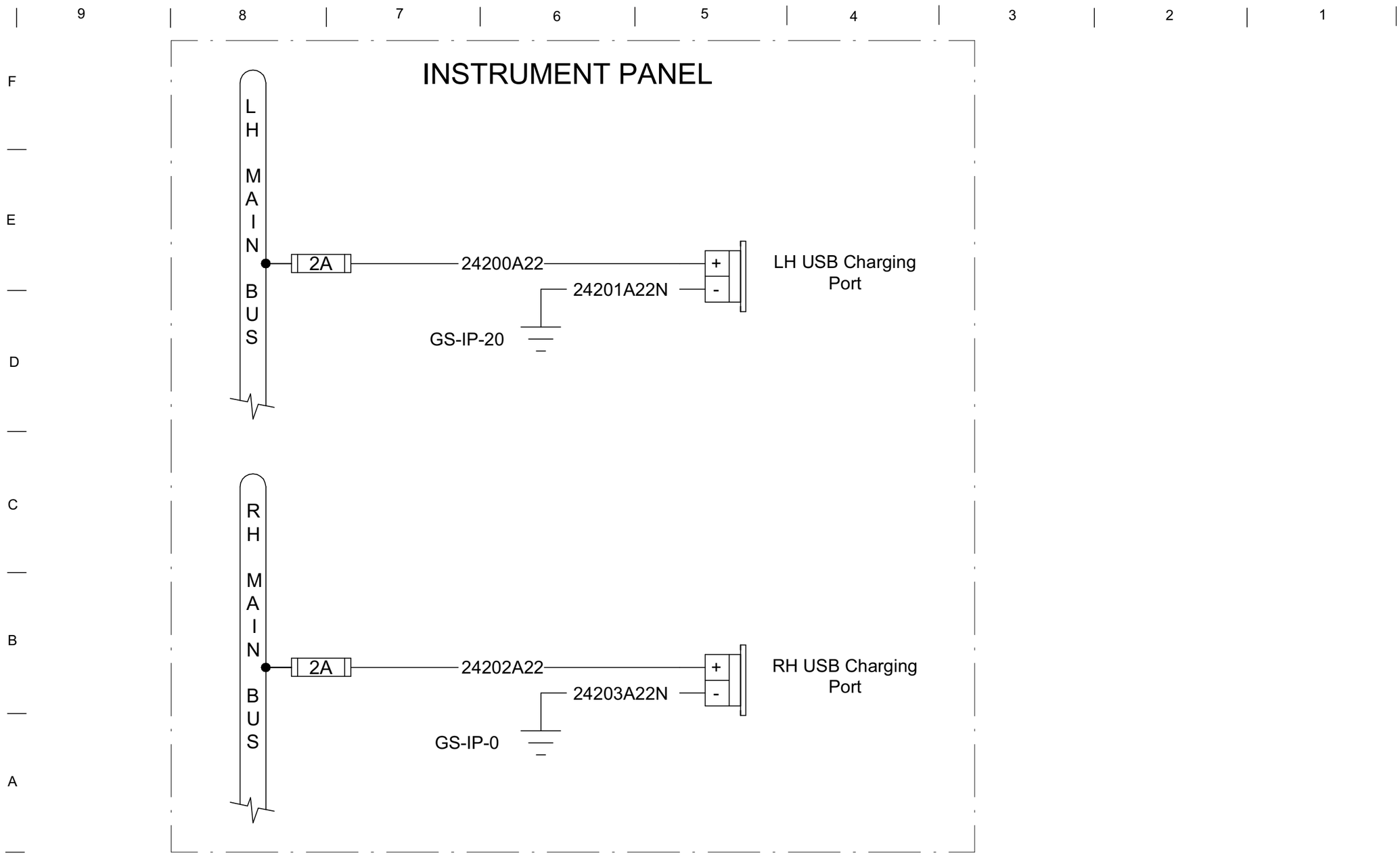
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Electrical System	D67-9224-30-01_01	1/2



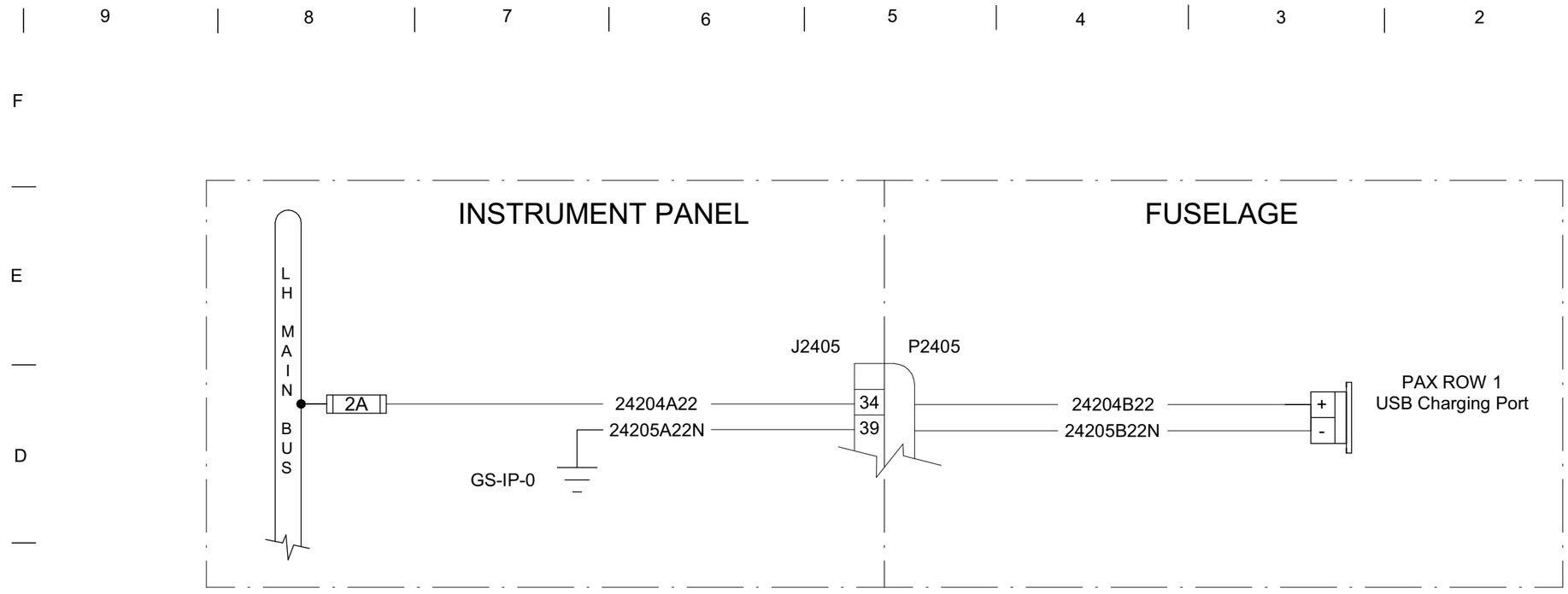
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Electrical System	D67-9224-30-01_01	2/2



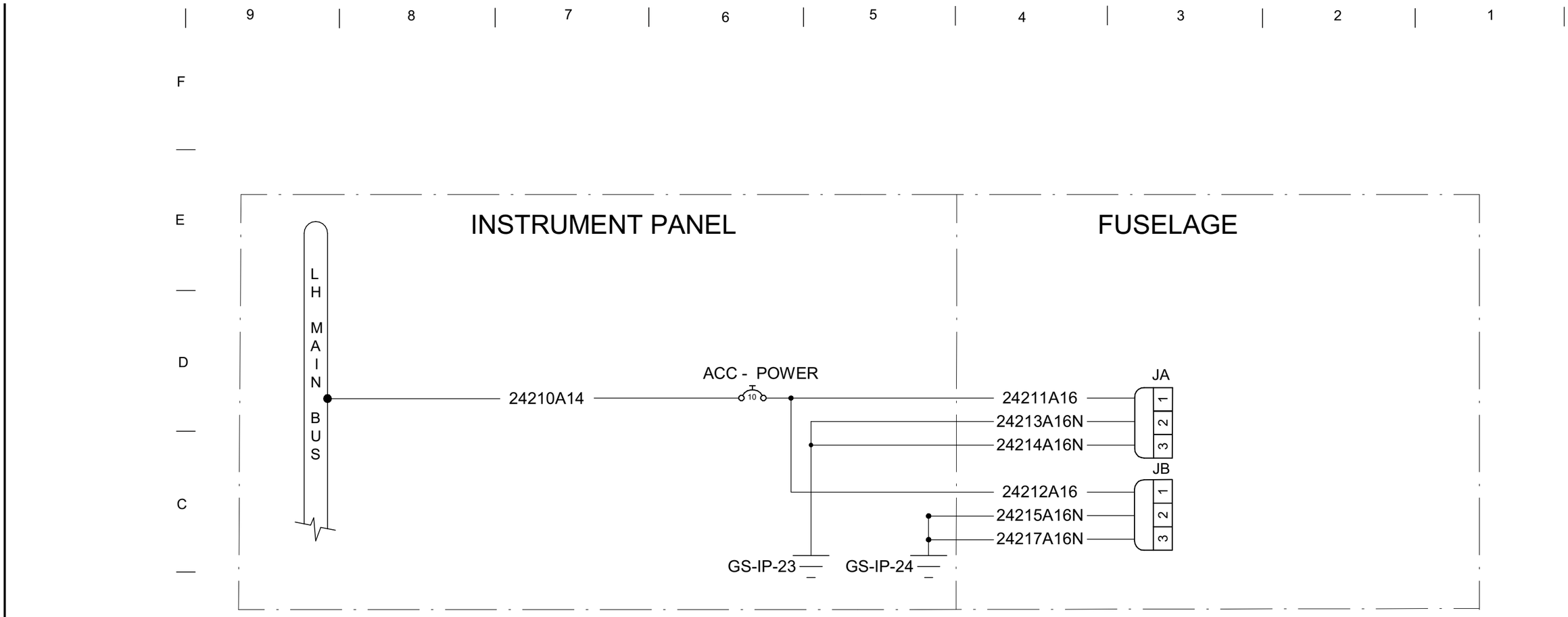
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Second Alternator	D67-9224-30-02	1/1



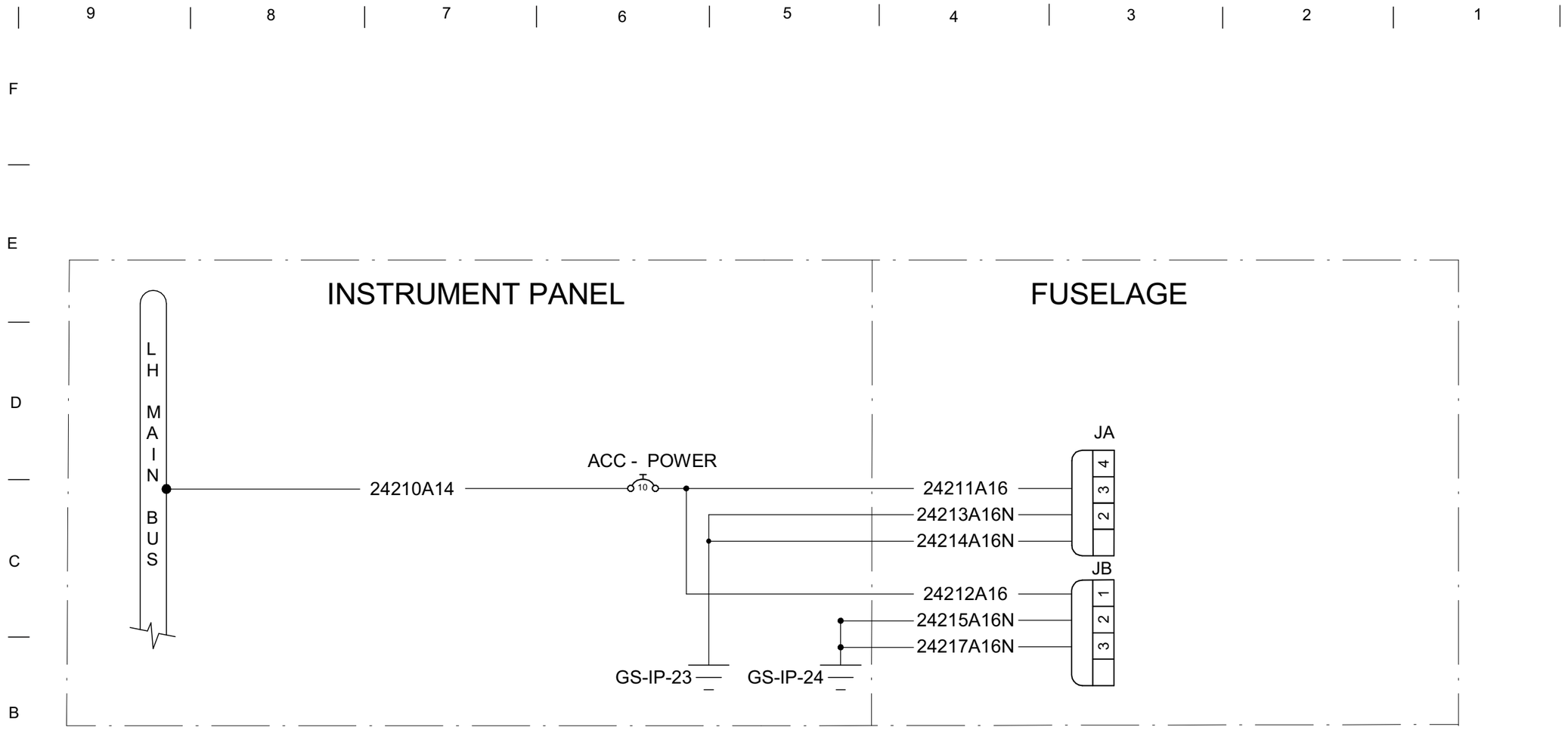
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	USB Charging Ports	D67-9224-60-01	1/1



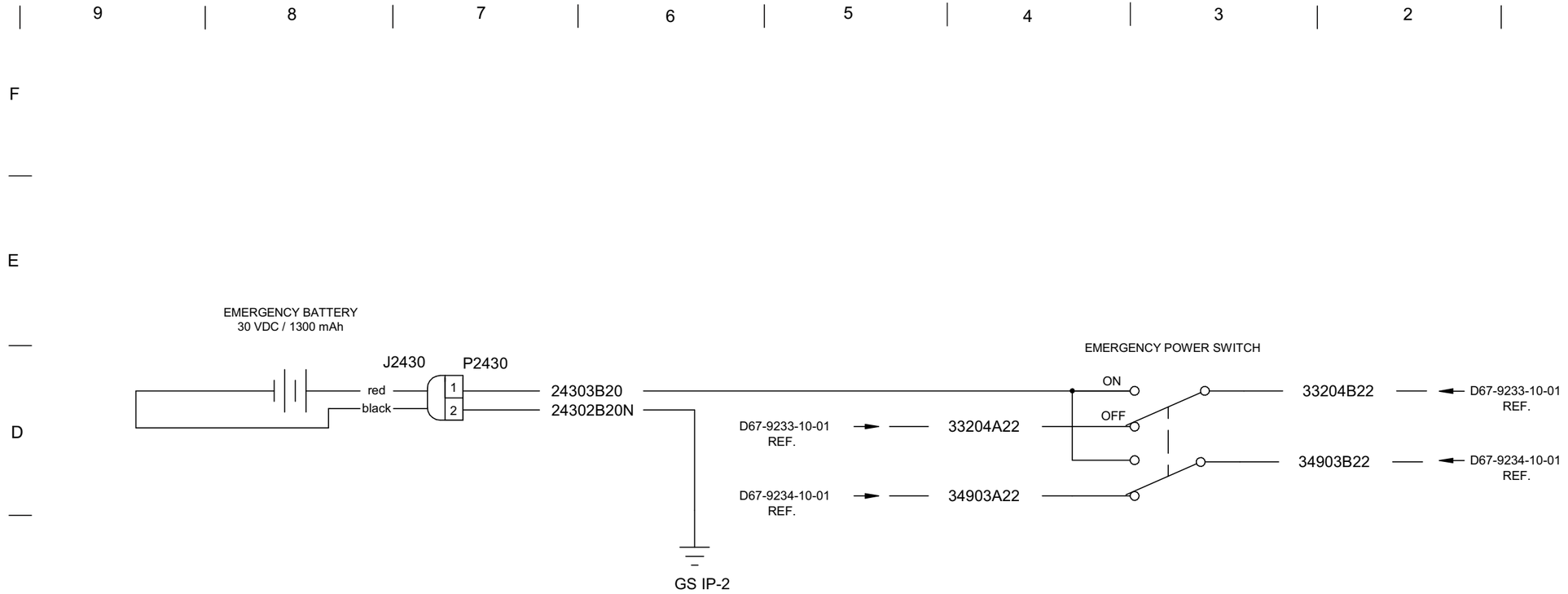
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	USB Charging Port, Pax Row 1	D67-9224-60-02	1/1



REV.	SCHEMATIC	DRAWING NO.	SHEET
—	ACC-Power 3-pins connector	D67-9224-60-03	1/1

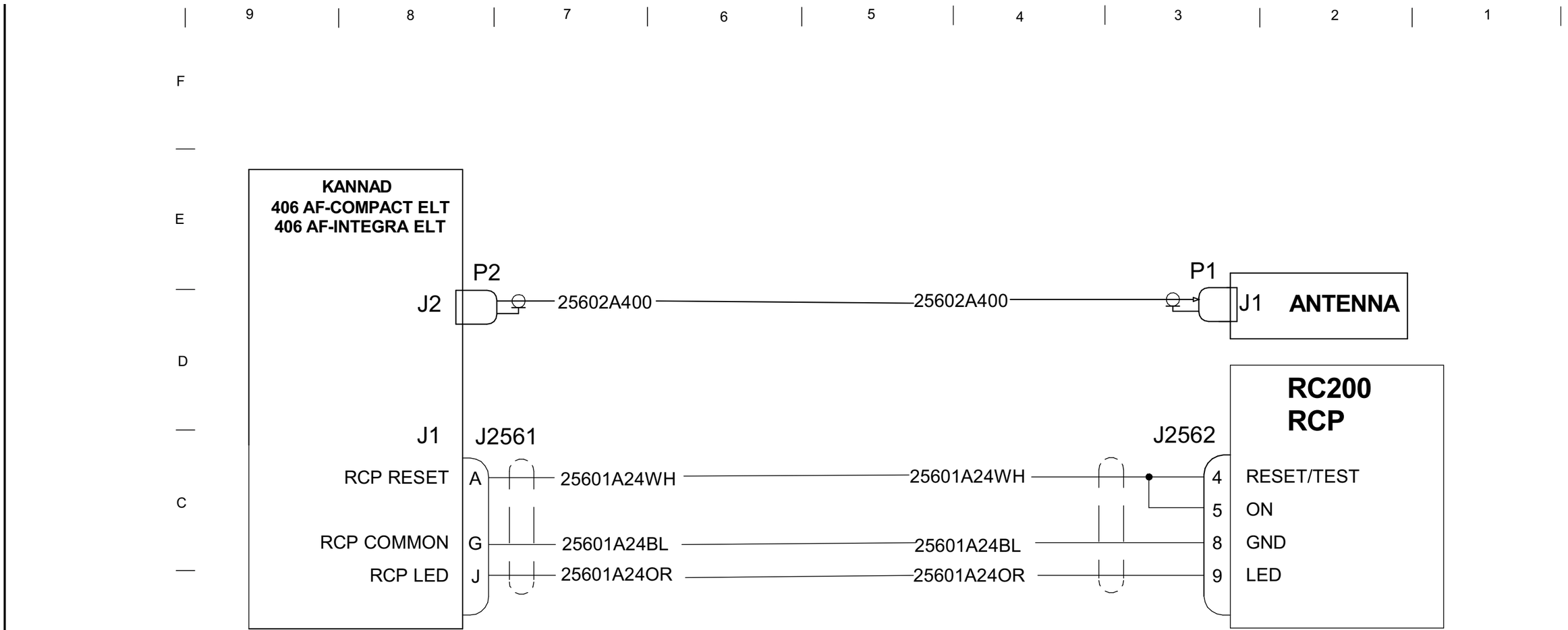


REV.	SCHEMATIC	DRAWING NO.	SHEET
—	ACC-Power 4-pins connector	D67-9224-60-04	1/1

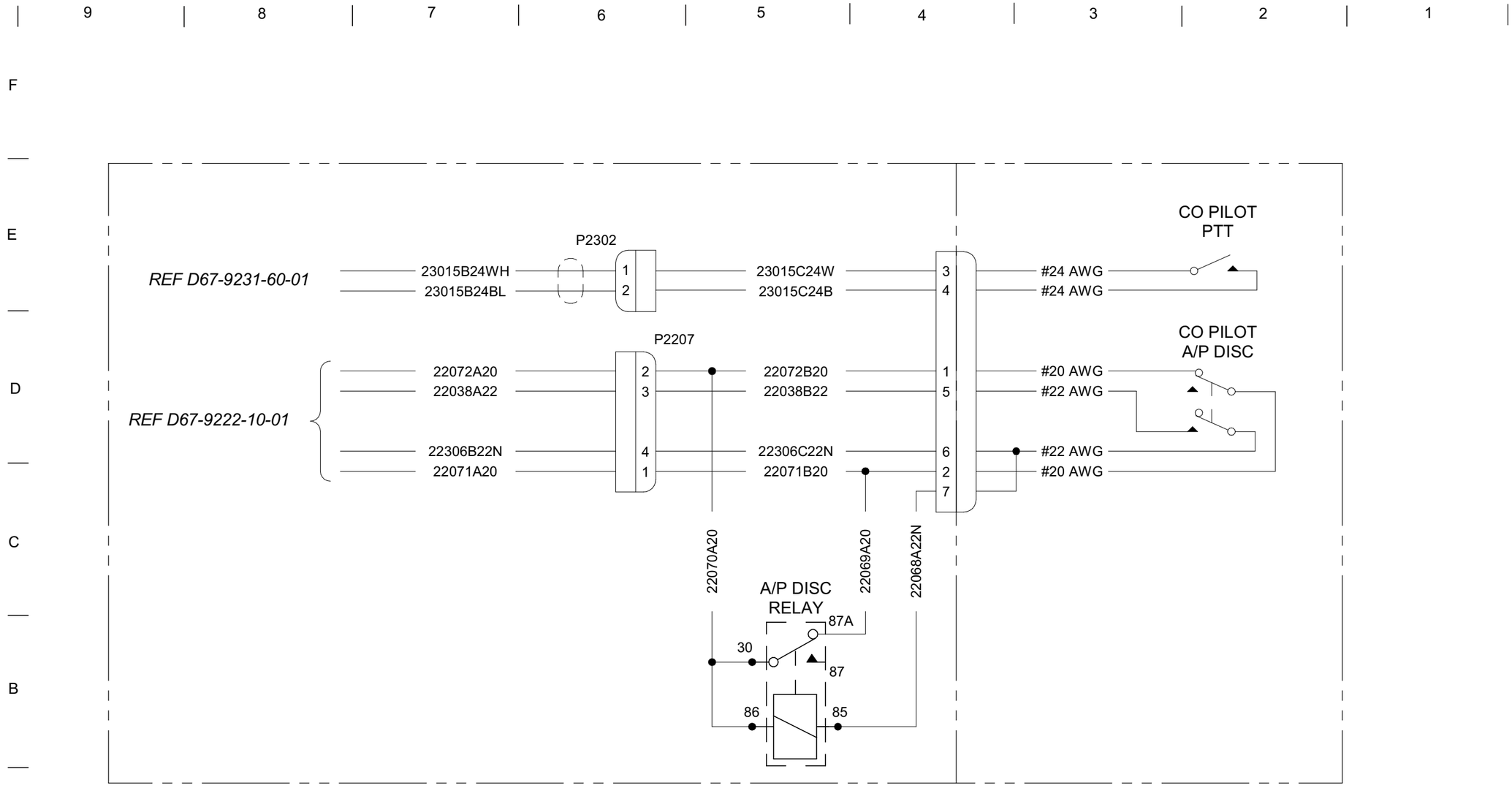


GS IP-2

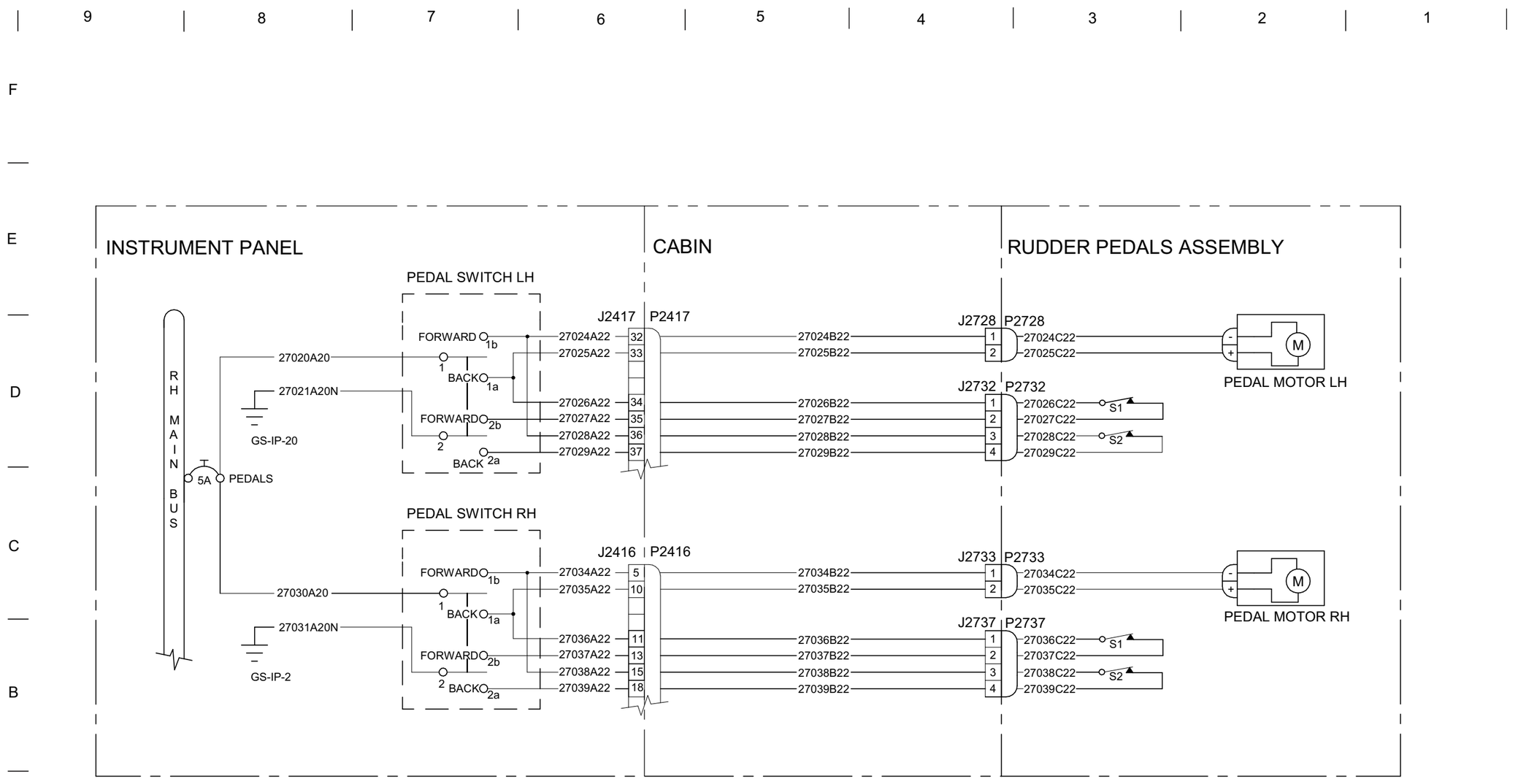
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Emergency Power	D67-9225-60-01	1/1



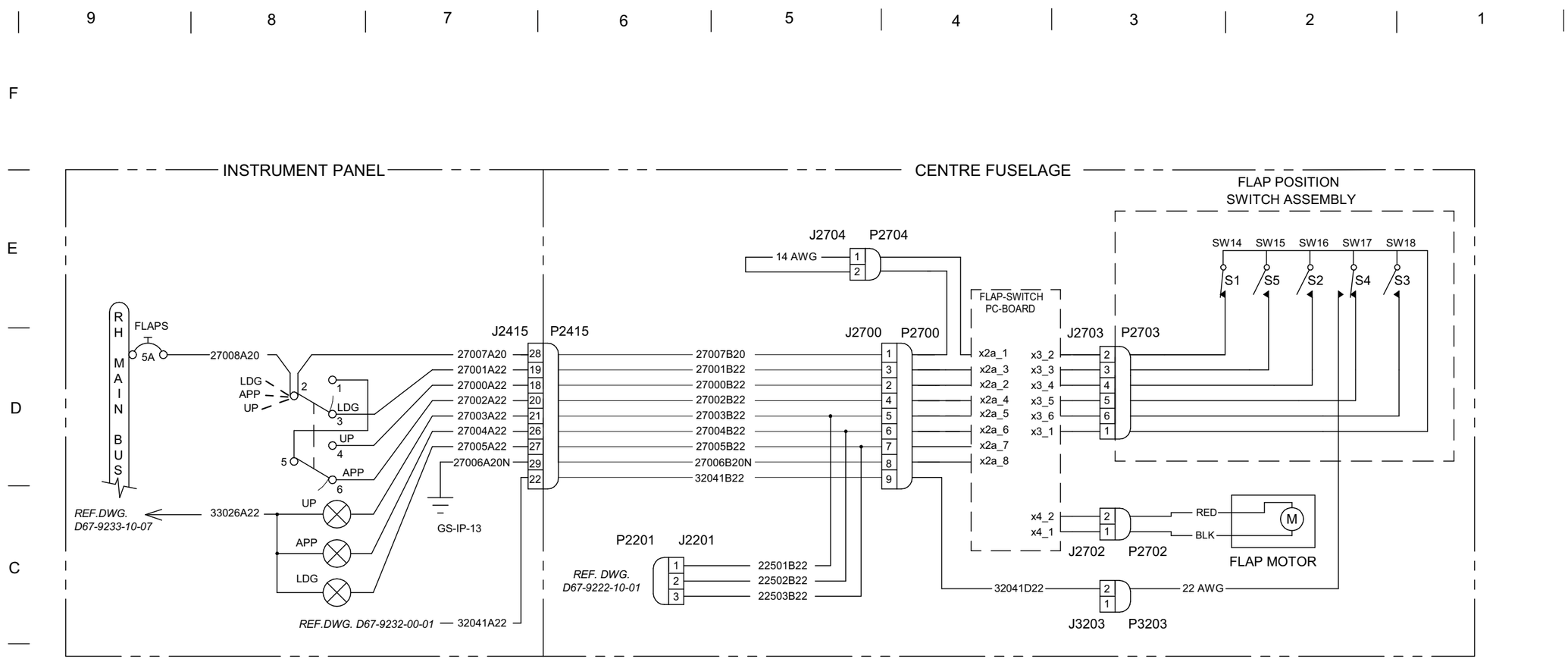
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Kannad 406 AF-Compact ELT Kannad 406 AF-Integra ELT	D67-9225-60-03	1/1



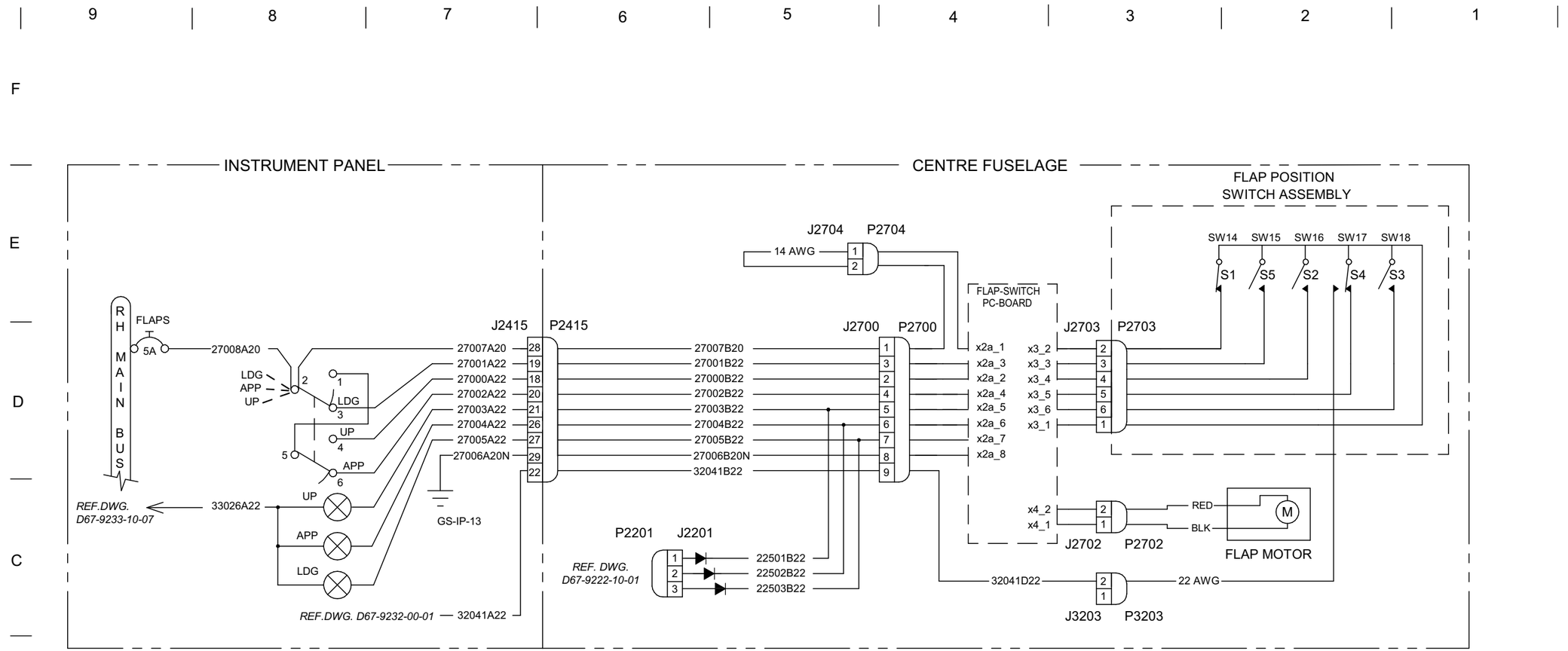
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Removable Co-Pilot Stick Wiring	D67-9227-03-00	1/1



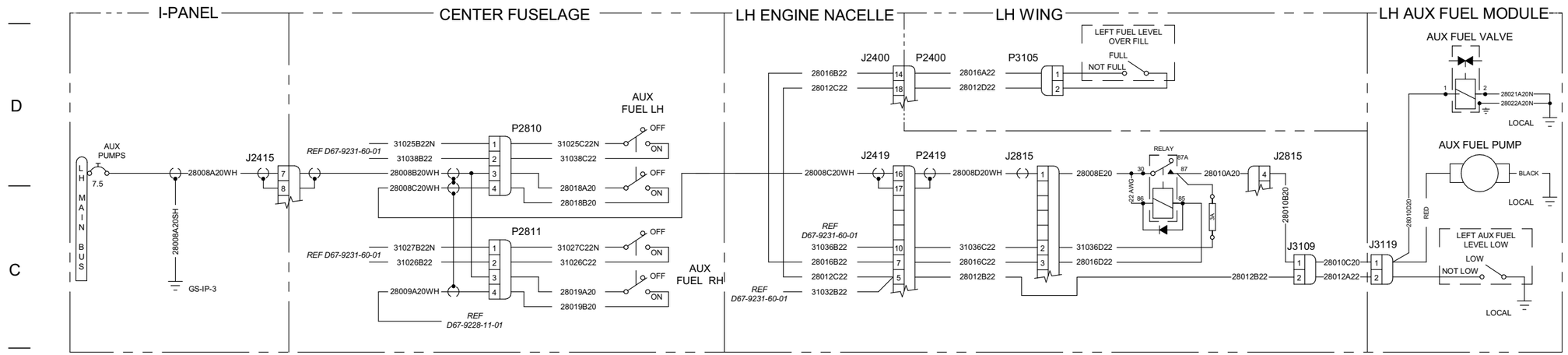
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	Rudder Pedals Wiring	D67-9227-20-01	1/1



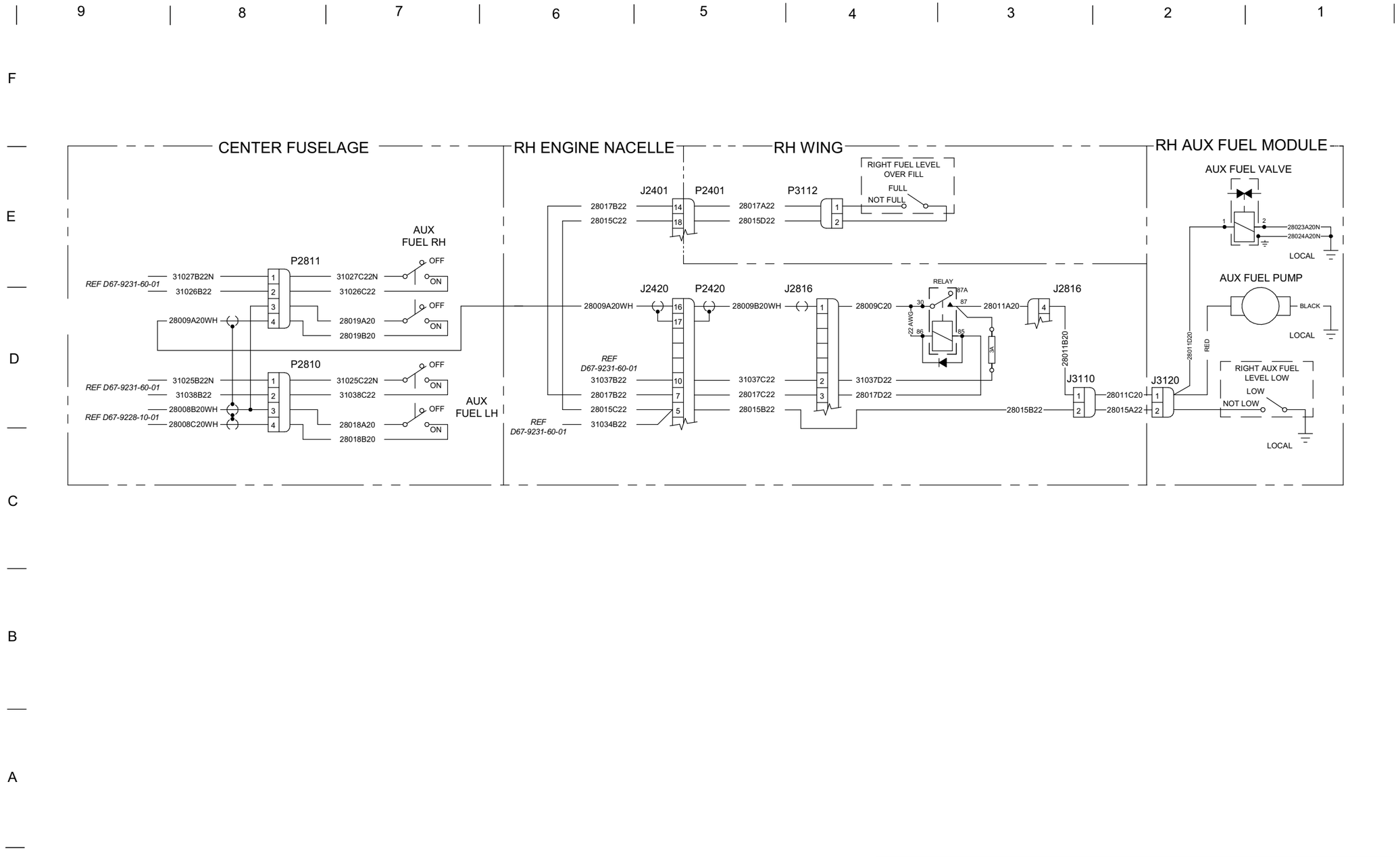
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	Flaps Wiring	D67-9227-50-01	1/1



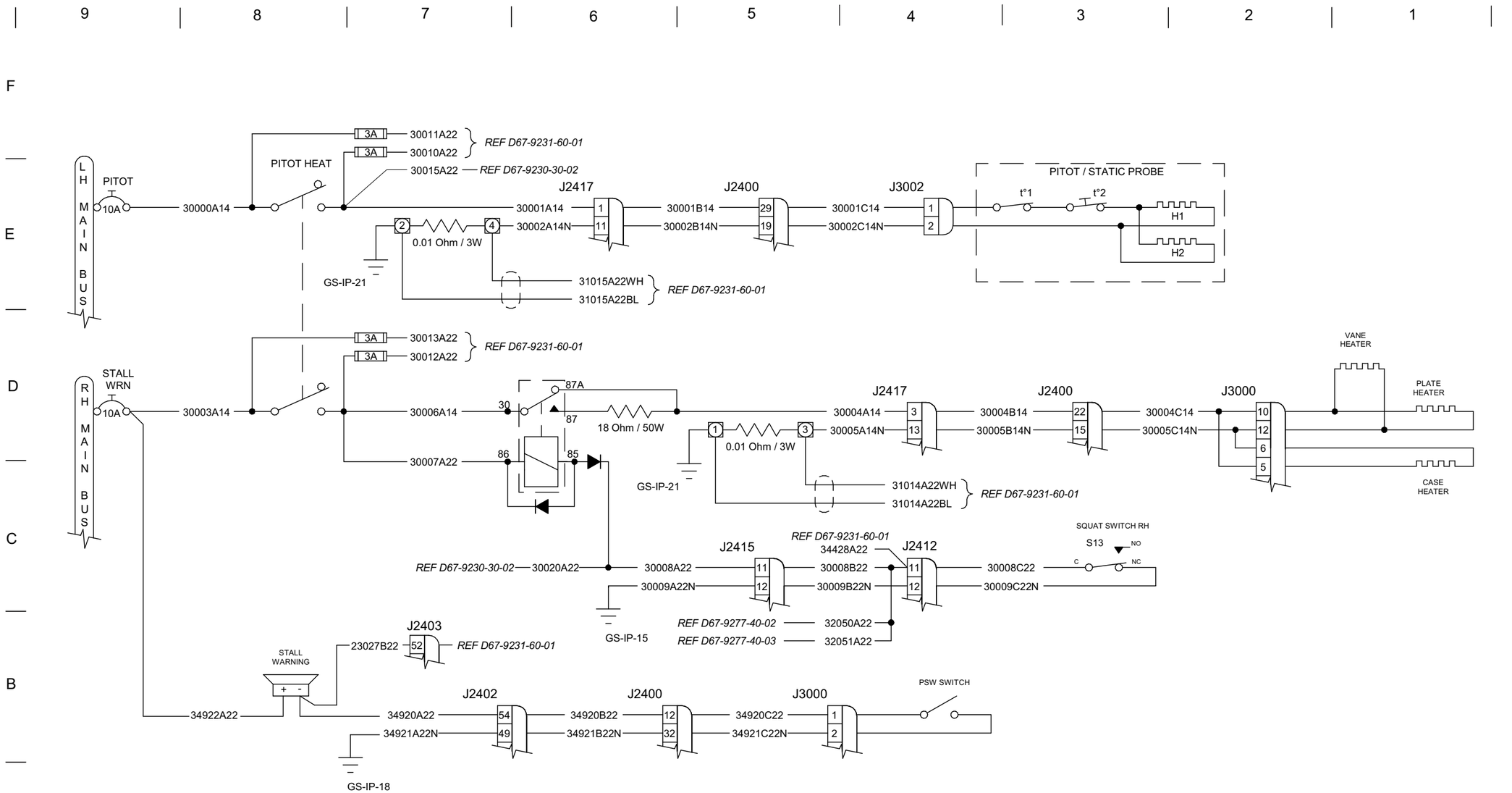
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Flaps Wiring	D67-9227-50-01-01	1/1



REV.	SCHEMATIC	DRAWING NO.	SHEET
D	LH Aux Fuel Wiring	D67-9228-10-01	1/1

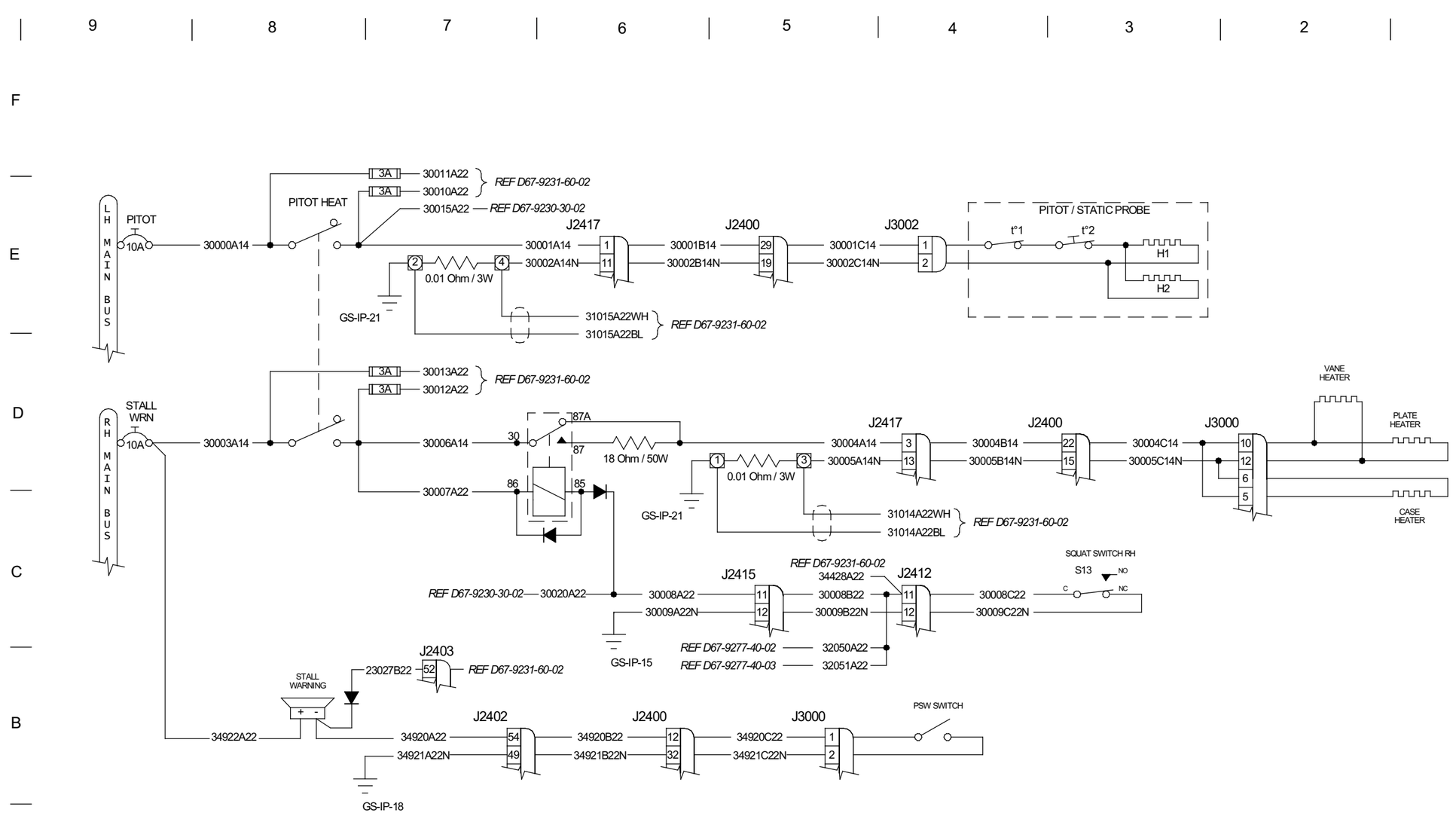


REV.	SCHEMATIC	DRAWING NO.	SHEET
C	RH Aux Fuel Wiring	D67-9228-11-01	1/1



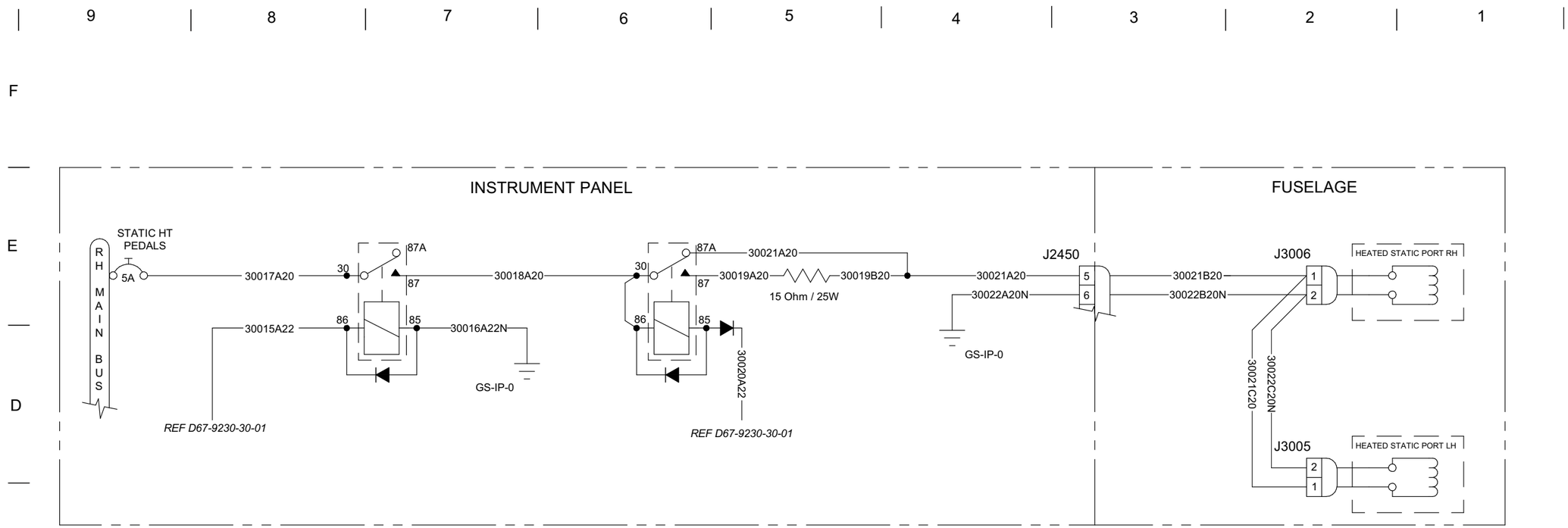
1. WIRING SHOWN WITH AIRPLANE ON GROUND AND NOT POWERED.
2. S13 OPENED WHEN THE AIRPLANE IS AIRBORNE, PSW SWITCH WILL CLOSE WHEN AIRPLANE STALLS.

REV.	SCHEMATIC	DRAWING NO.	SHEET
D	Pitot and Stall Heat Warning	D67-9230-30-01	1/1

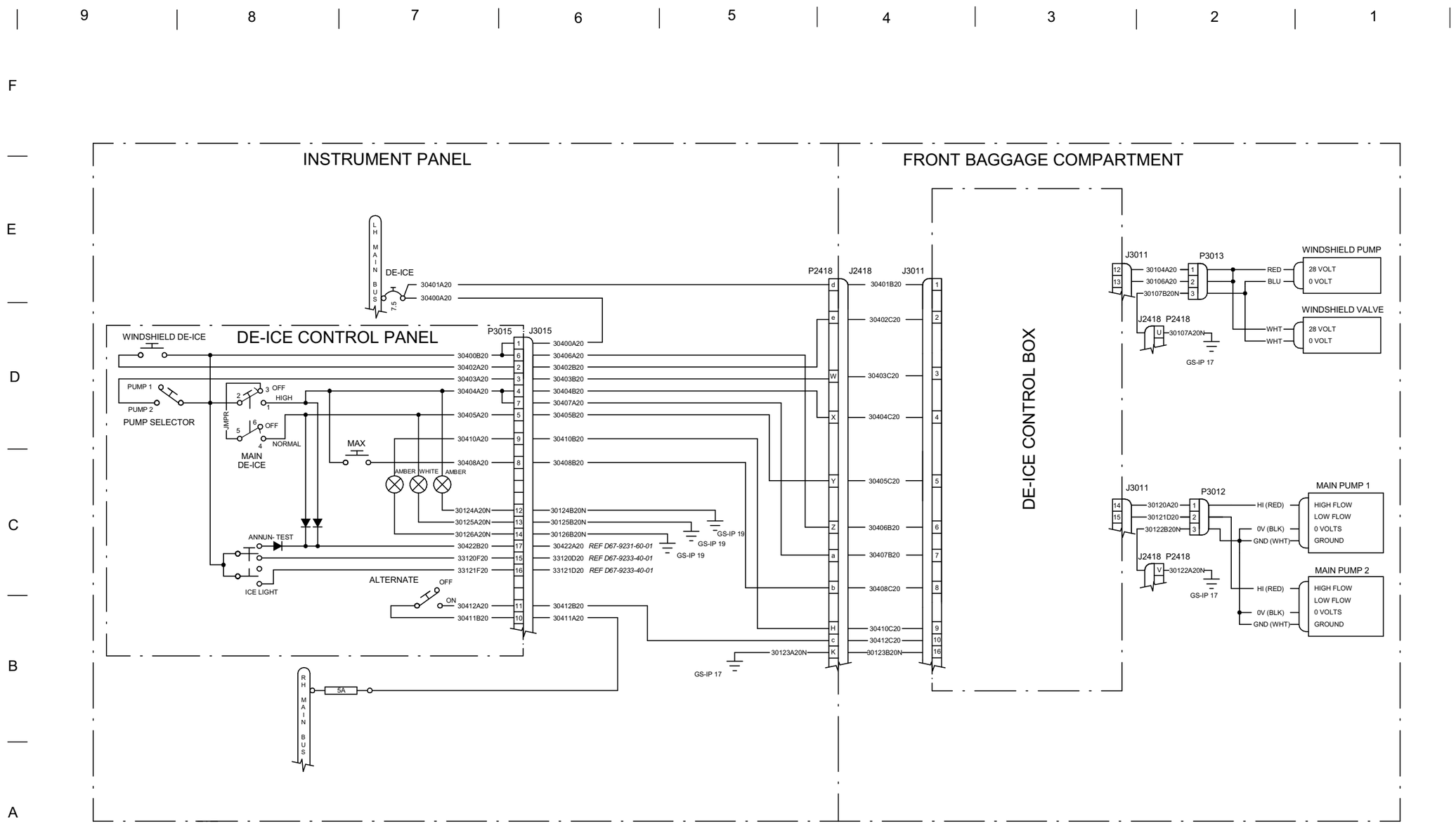


1. WIRING SHOWN WITH AIRPLANE ON GROUND AND NOT POWERED.
2. S13 OPENED WHEN THE AIRPLANE IS AIRBORNE, PSW SWITCH WILL CLOSE WHEN AIRPLANE STALLS.

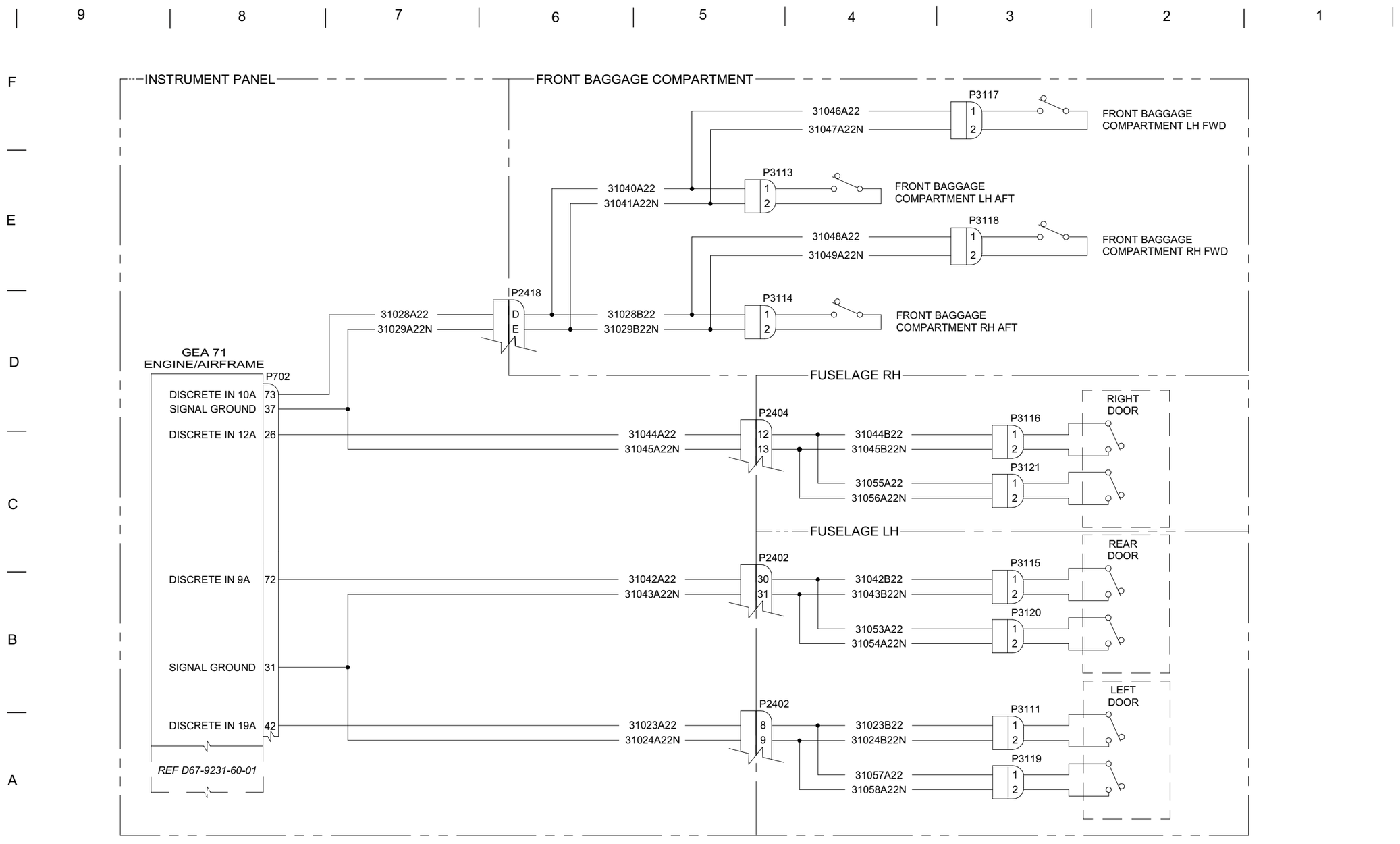
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Pitot and Stall Heat Warning	D67-9230-30-01_01	1/1



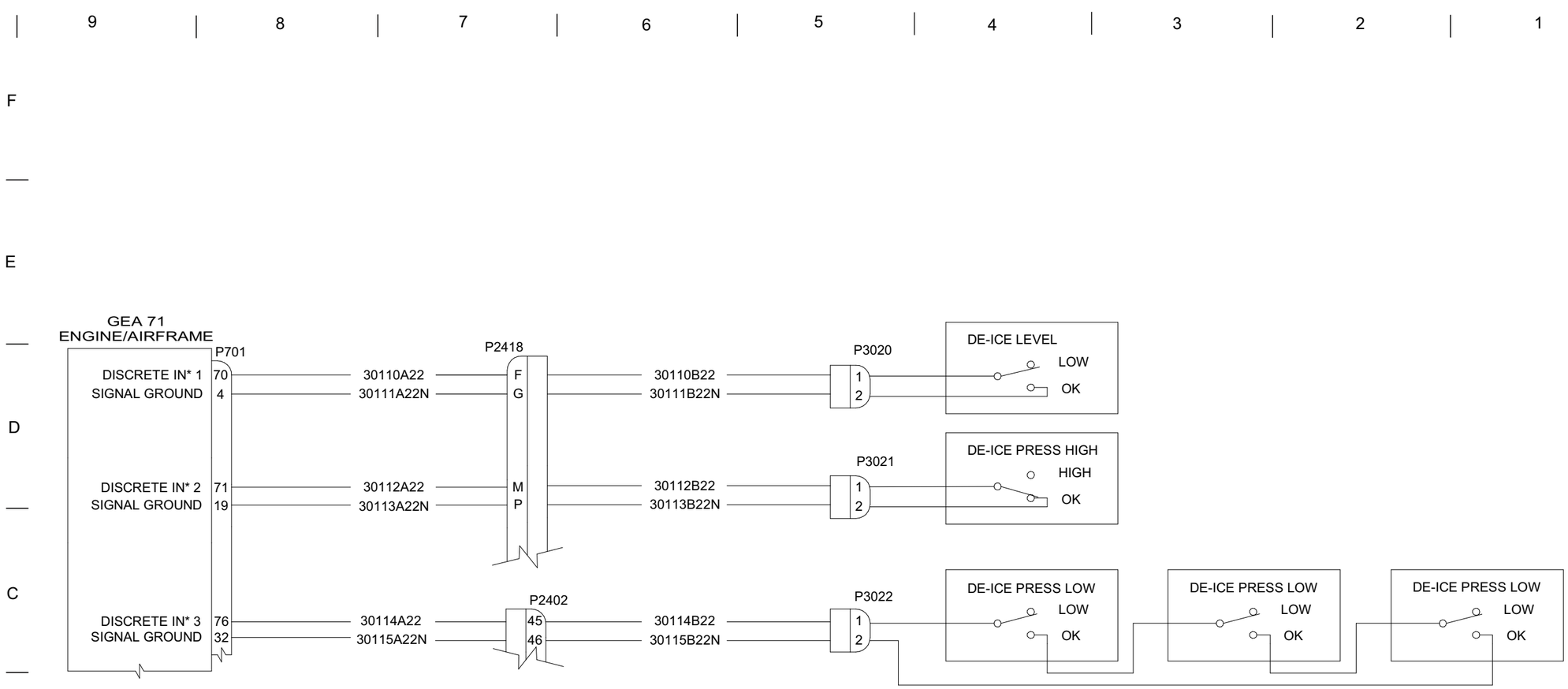
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	Heated Static Ports	D67-9230-30-02	1/1



REV.	SCHEMATIC	DRAWING NO.	SHEET
B	De-Ice Control System	D67-9230-40-01	1/1



REV.	SCHEMATIC	DRAWING NO.	SHEET
C	Door Warning Switches	D67-9231-00-01	1/1



GENERAL NOTES

1. SWITCHES SHOWN IN UNPOWERED STATE AND NO FLUID IN DE-ICE TANK

REV.	SCHEMATIC	DRAWING NO.	SHEET
—	De-Ice Warning System	D67-9231-00-02	1/1

9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

F

E

D

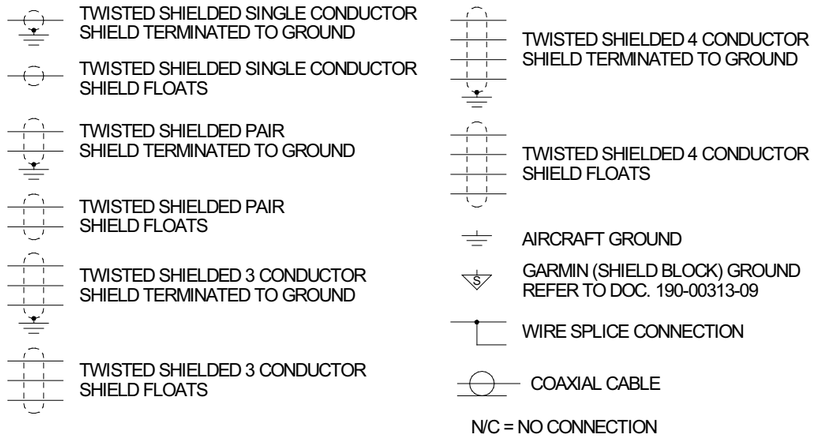
C

B

A

NOTES:

1. SYMBOL DESIGNATIONS

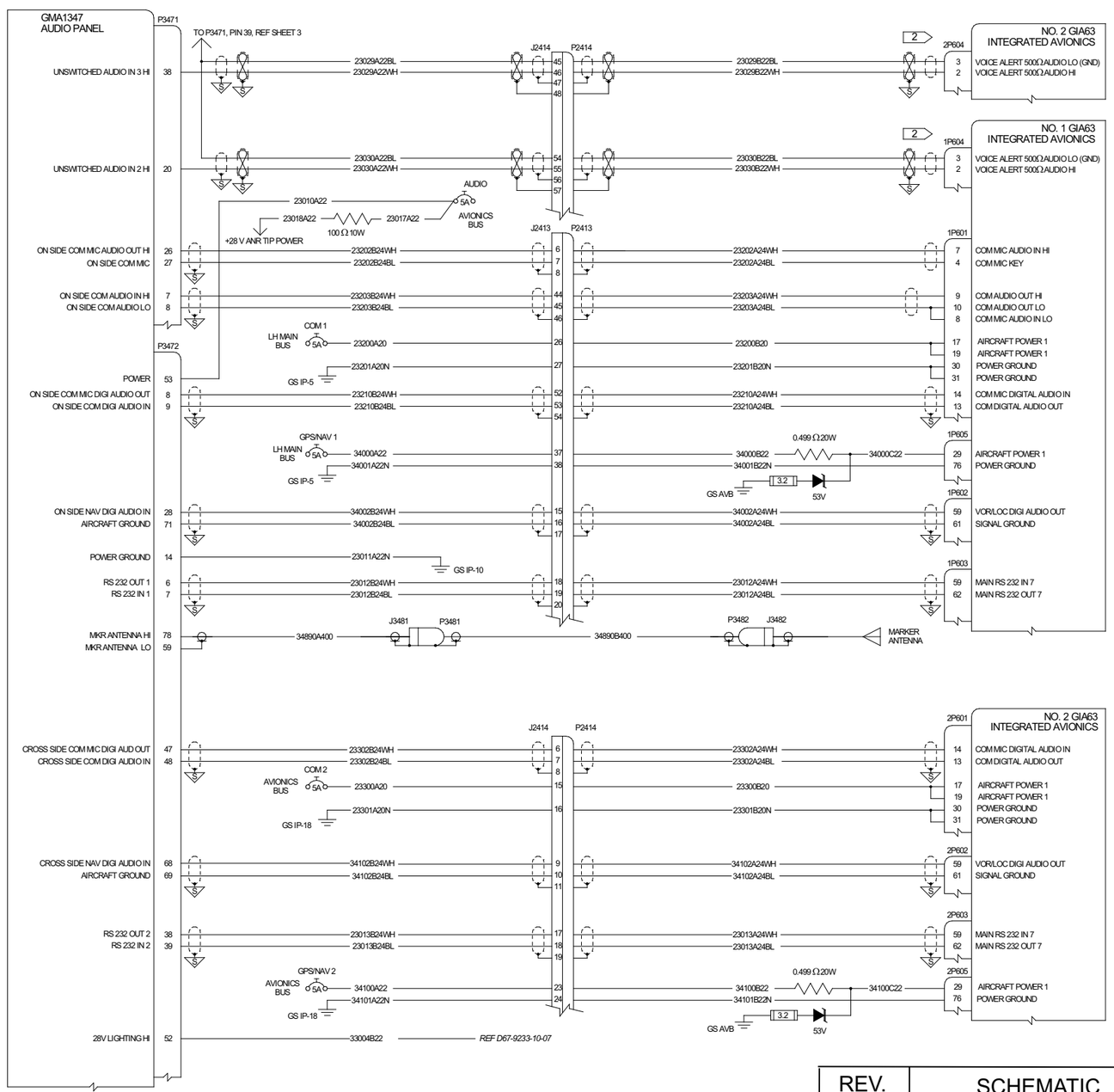


2. USE DOUBLE-SHIELDED WIRING: BOTH SHIELDS SHOULD BE GROUNDED ON THE RECEIVING SIDE; ON THE TRANSMITTING SIDE, ONLY THE OUTER SHIELD SHOULD BE GROUNDED, WHILE THE INNER SHIELD SHOULD FLOAT.

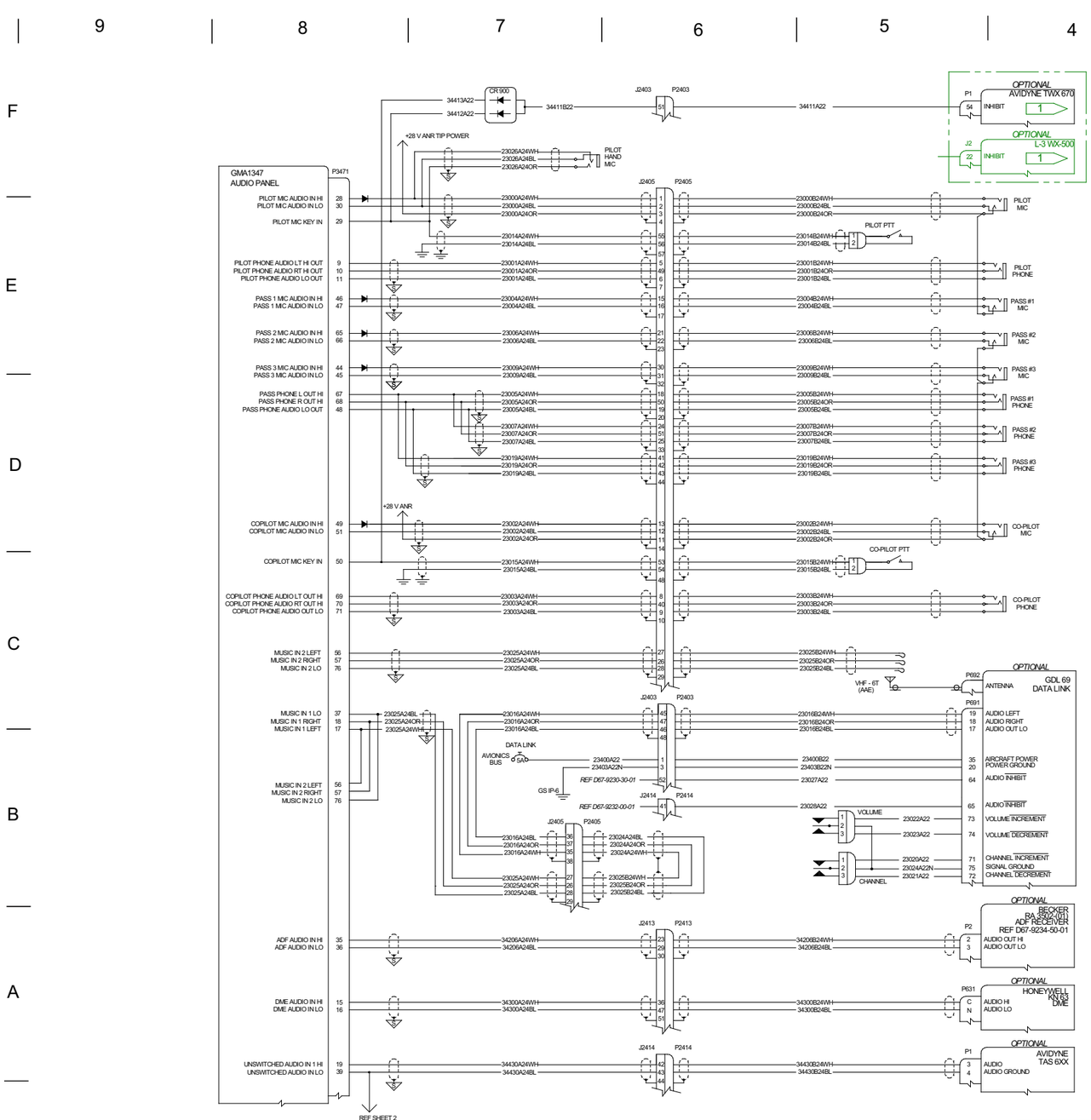
FLAG NOTES

1 EITHER OÄM 62-010 TWX 670 OR OÄM 62-021 WX- 500 CAN BE INSTALLED.

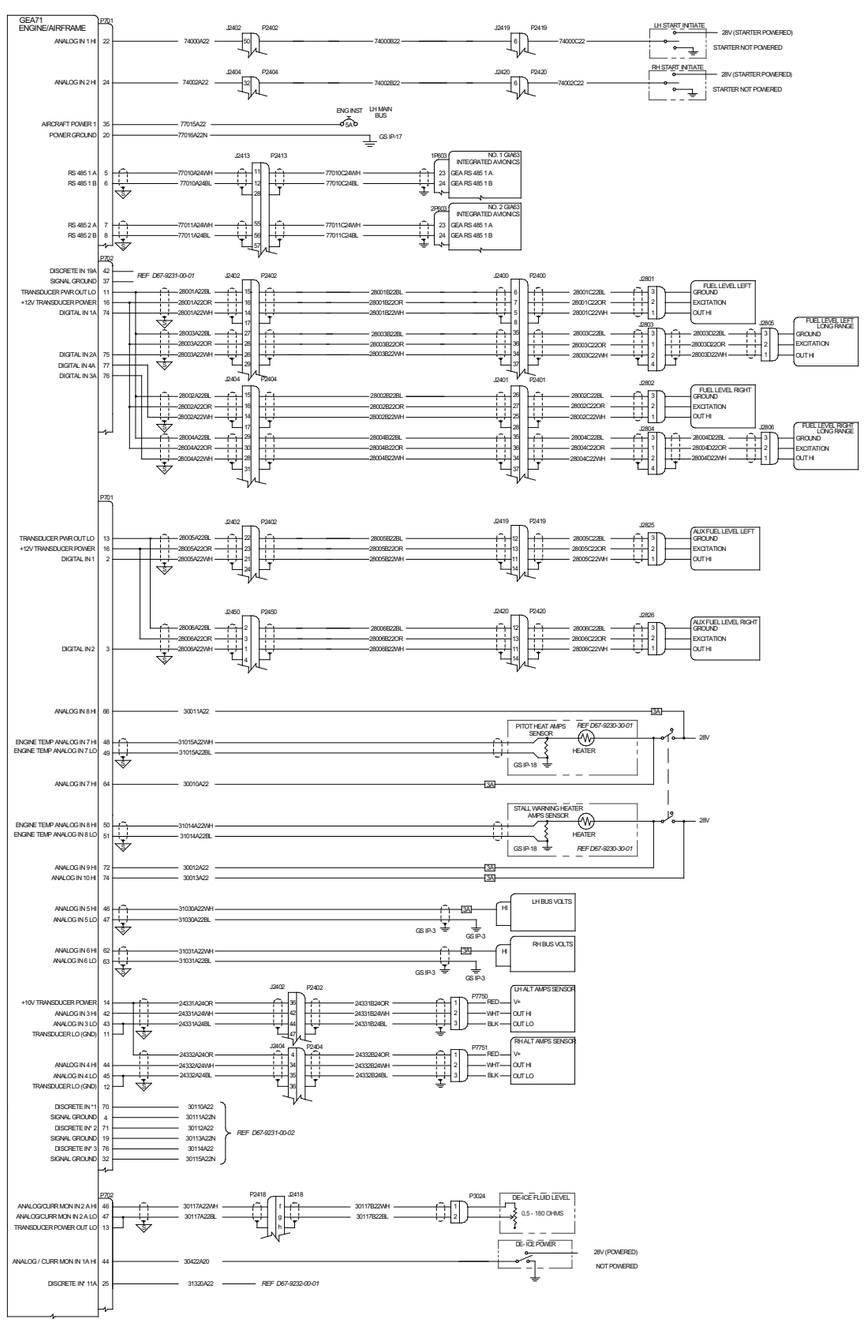
REV.	SCHEMATIC	DRAWING NO.	SHEET
J	G1000	D67-9231-60-01	1/6

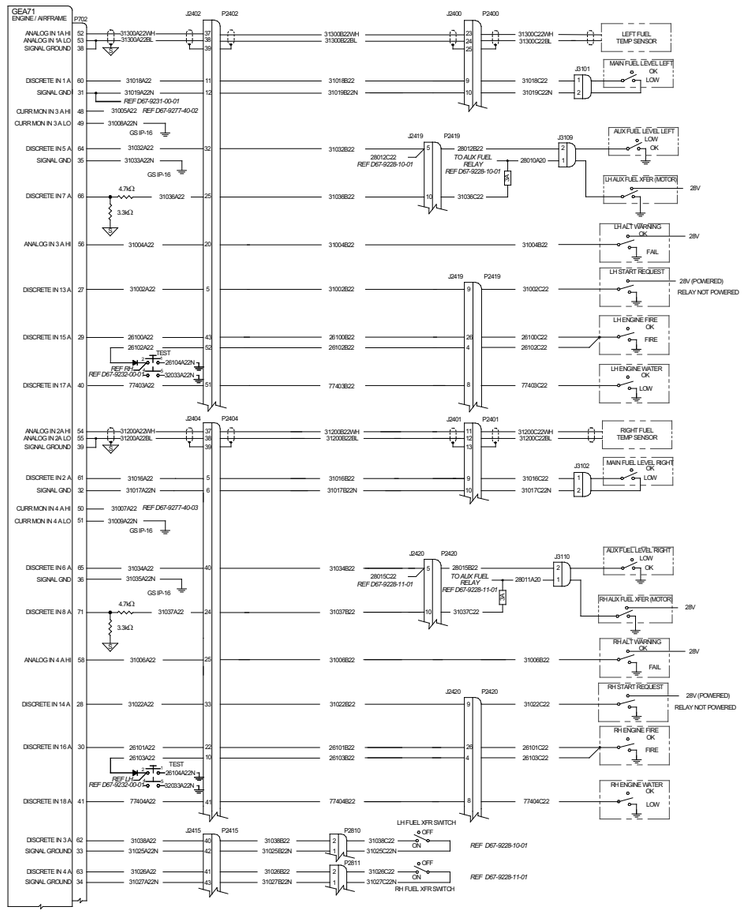


REV.	SCHEMATIC	DRAWING NO.	SHEET
J	G1000	D67-9231-60-01	2/6

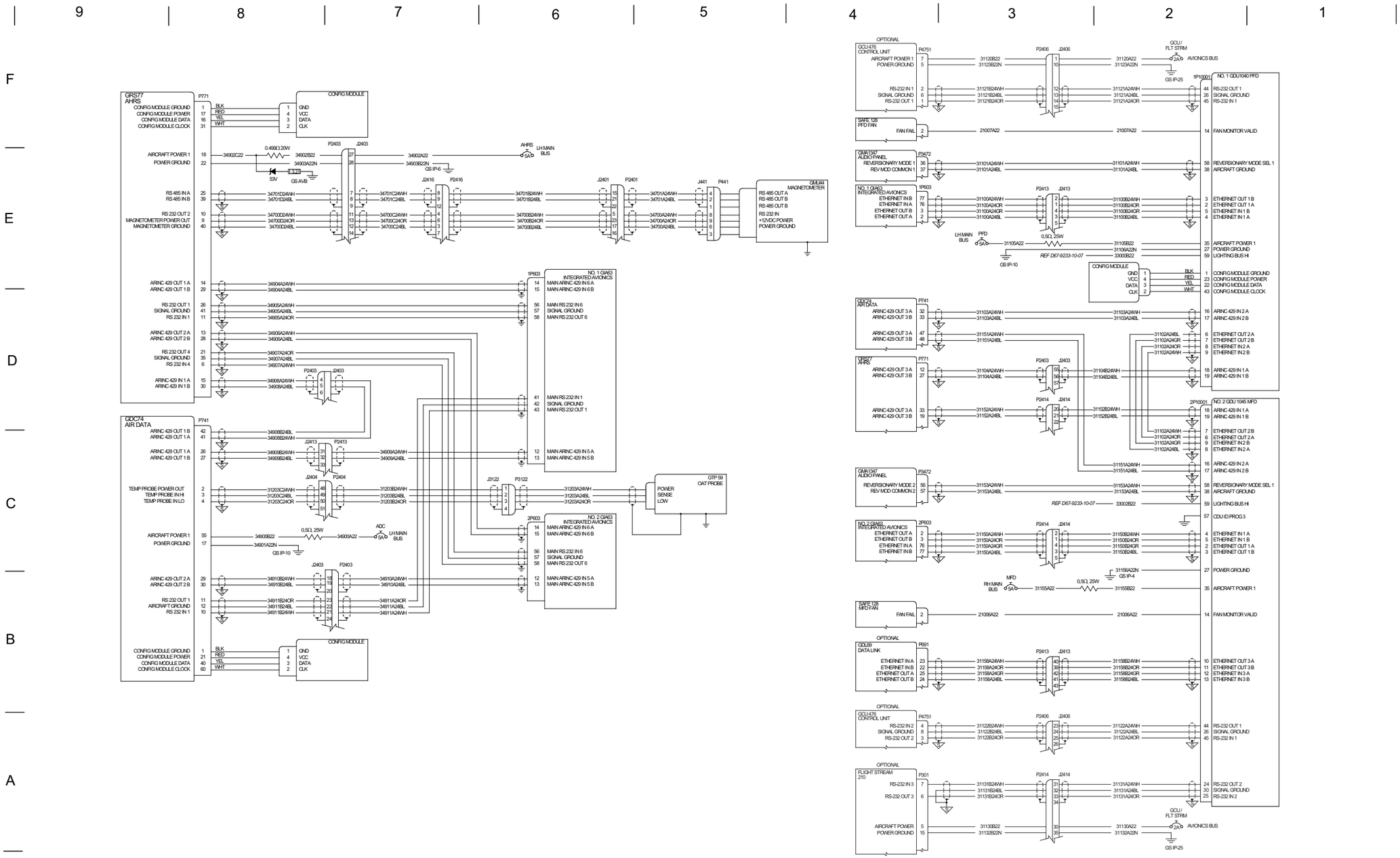


REV.	SCHEMATIC	DRAWING NO.	SHEET
J	G1000	D67-9231-60-01	3/6

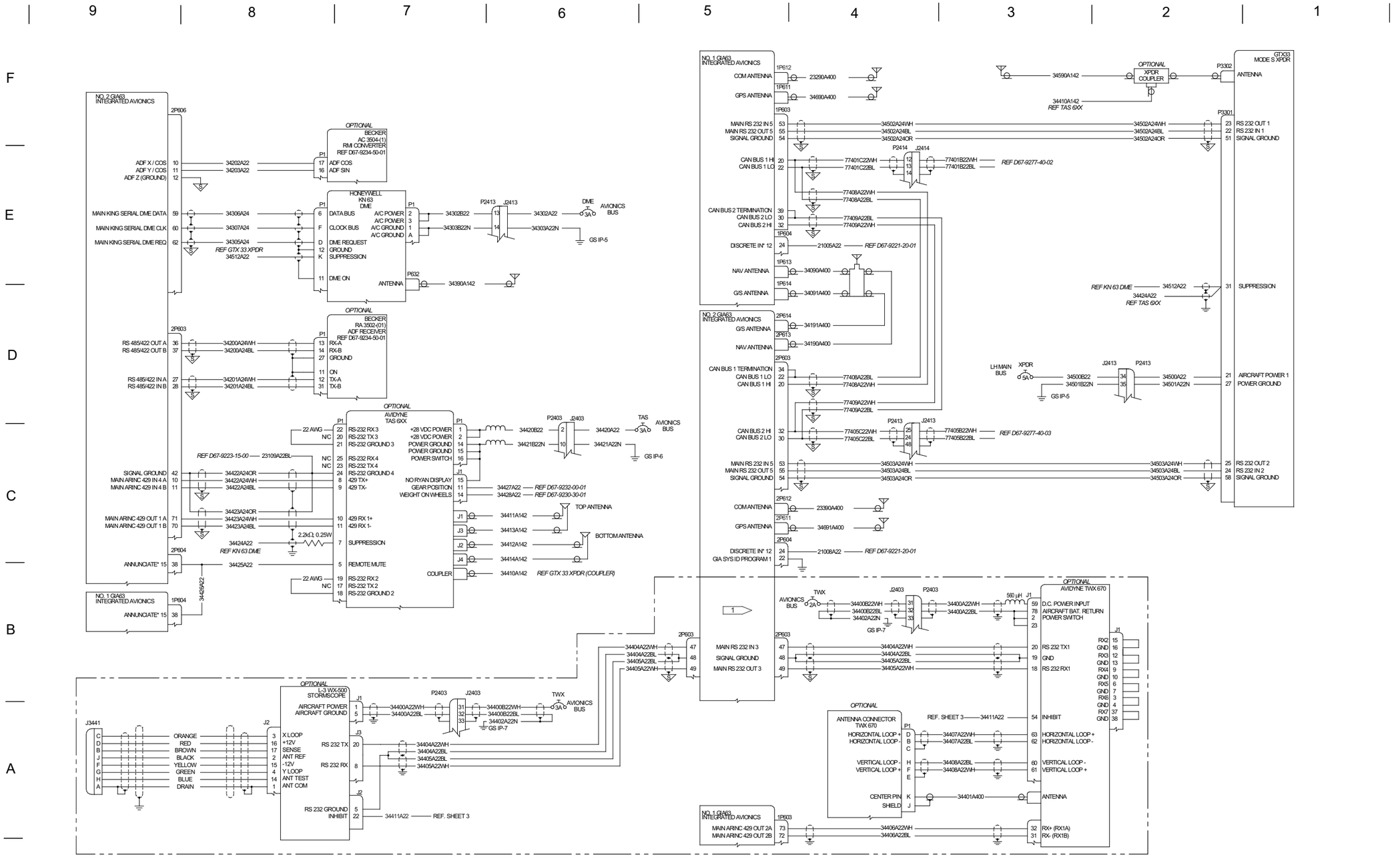




REV.	SCHEMATIC	DRAWING NO.	SHEET
J	G1000	D67-9231-60-01	4/6



REV.	SCHEMATIC	DRAWING NO.	SHEET
J	G1000	D67-9231-60-01	5/6



REV.	SCHEMATIC	DRAWING NO.	SHEET
J	G1000	D67-9231-60-01	6/6

9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

F

E

D

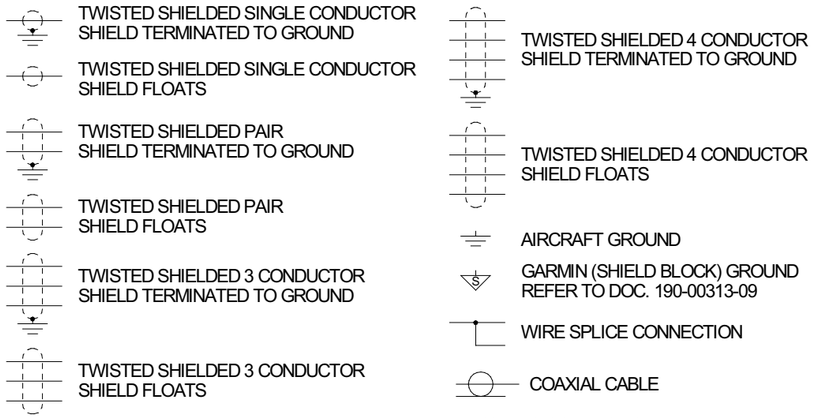
C

B

A

NOTES:

1. SYMBOL DESIGNATIONS

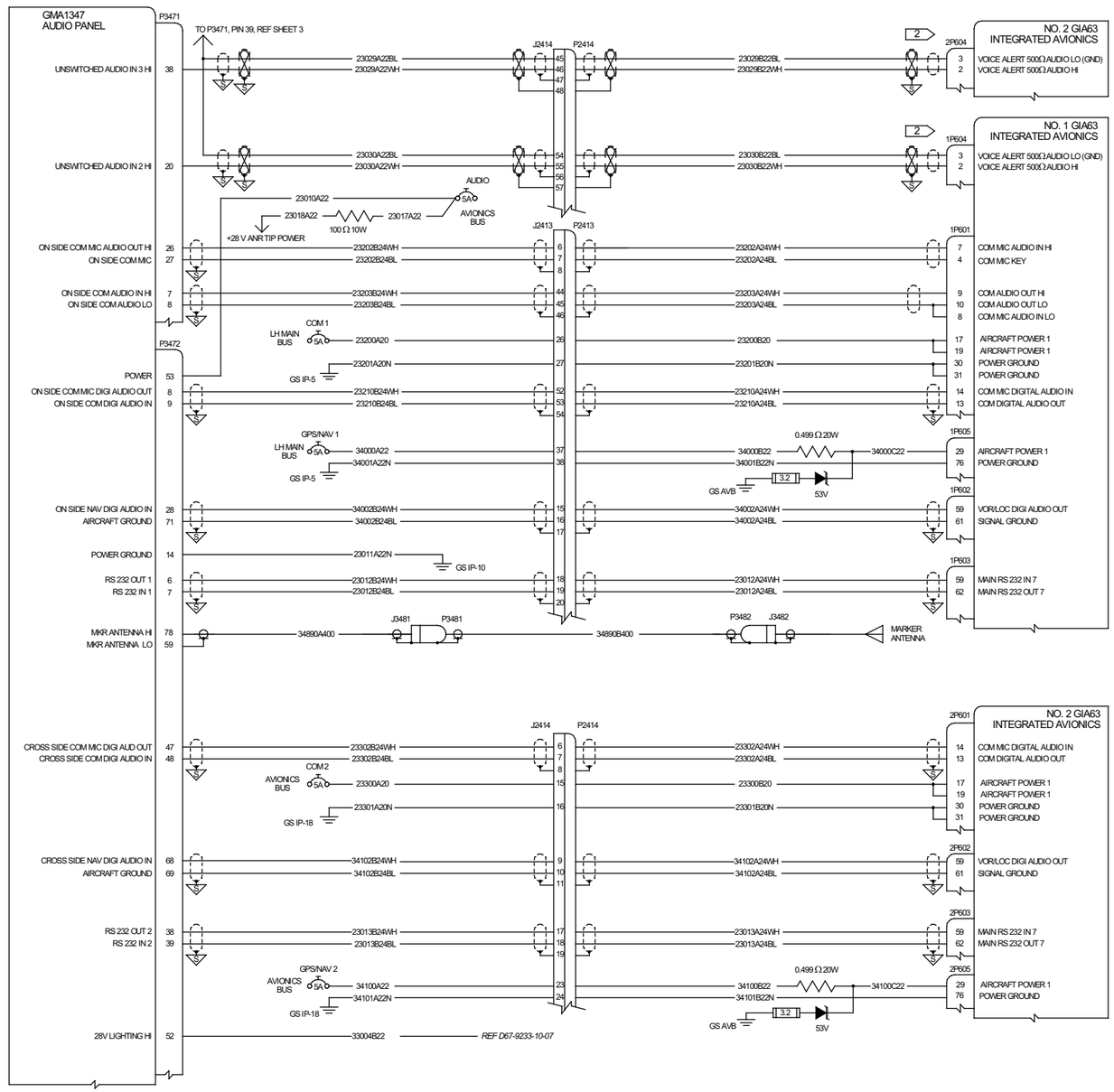


N/C = NO CONNECTION

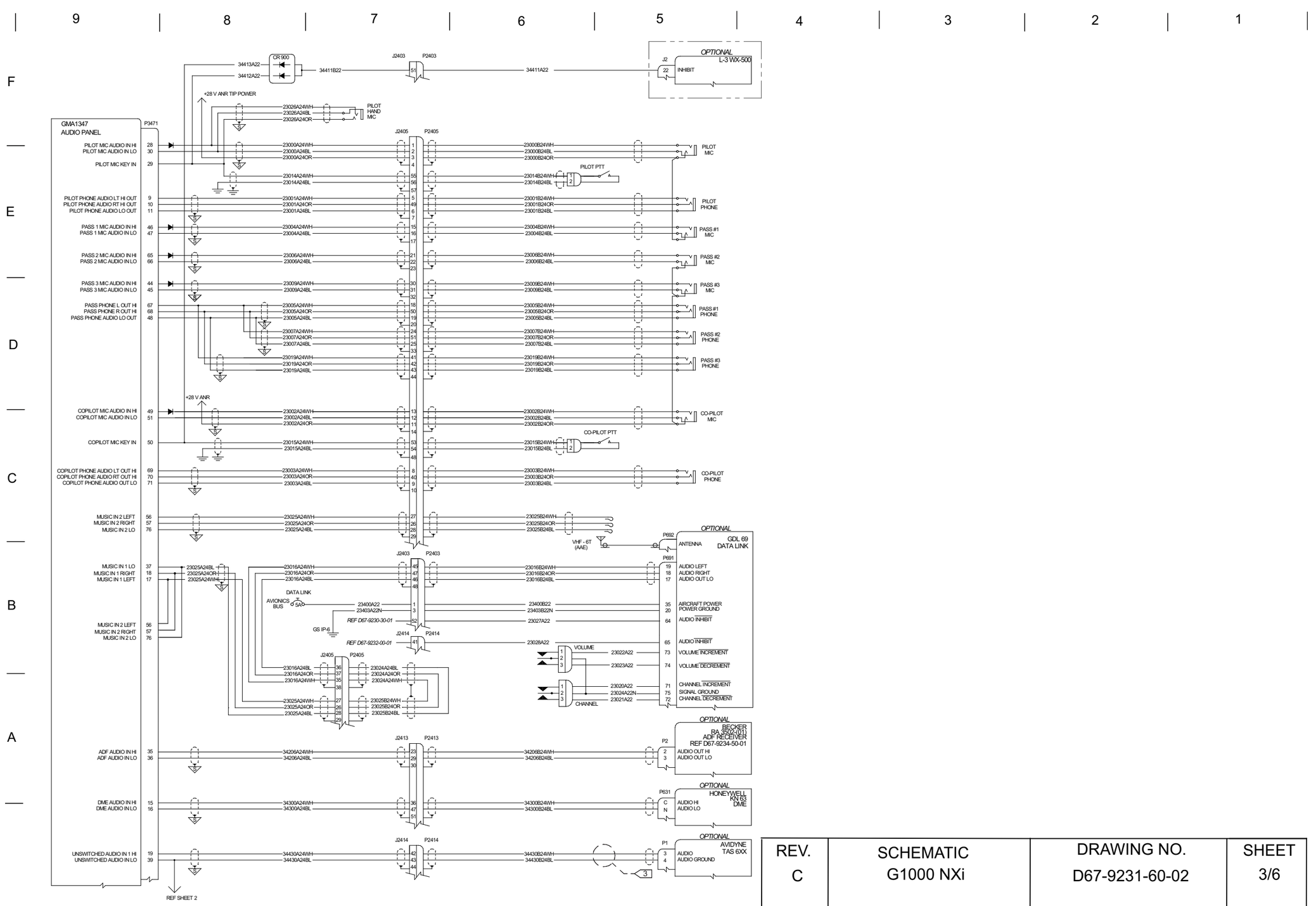
2. USE DOUBLE-SHIELDED WIRING: BOTH SHIELDS SHOULD BE GROUNDED ON THE RECEIVING SIDE; ON THE TRANSMITTING SIDE, ONLY THE OUTER SHIELD SHOULD BE GROUNDED, WHILE THE INNER SHIELD SHOULD FLOAT.

3. CAP AND STOW IF GTX345 IS INSTALLED.

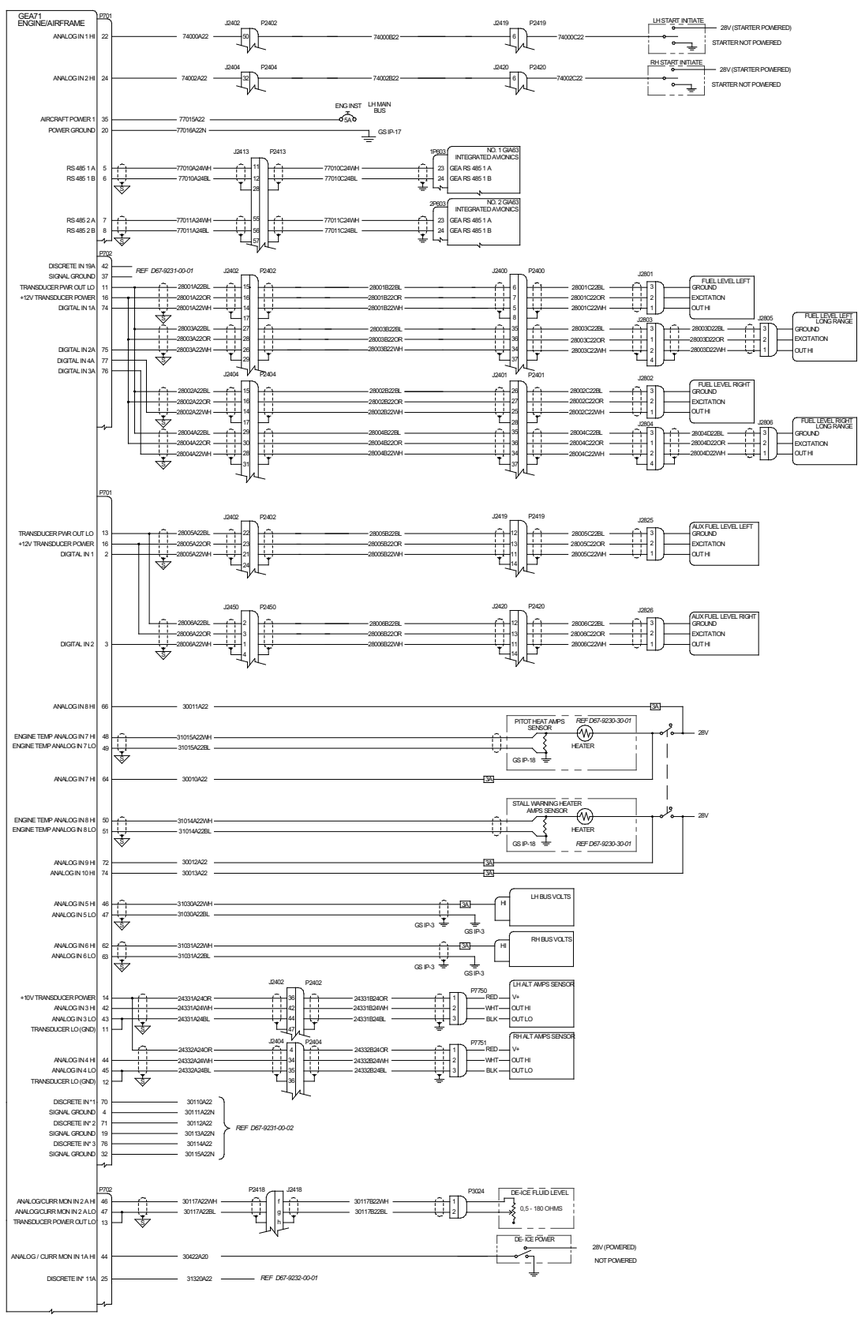
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	G1000 NXi	D67-9231-60-02	1/6

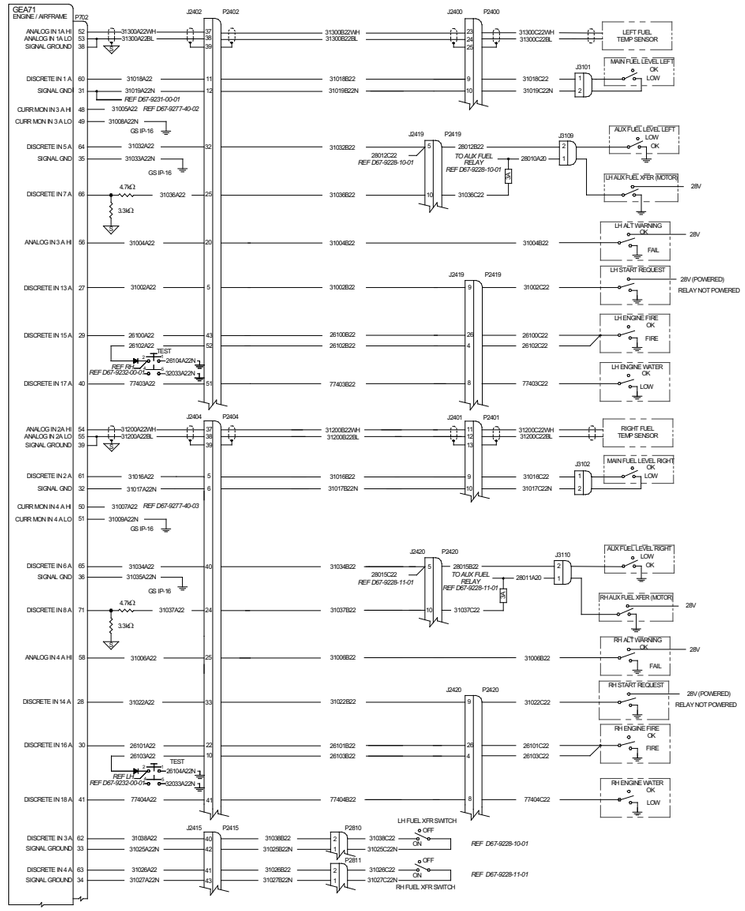


REV.	SCHEMATIC	DRAWING NO.	SHEET
C	G1000 NXi	D67-9231-60-02	2/6

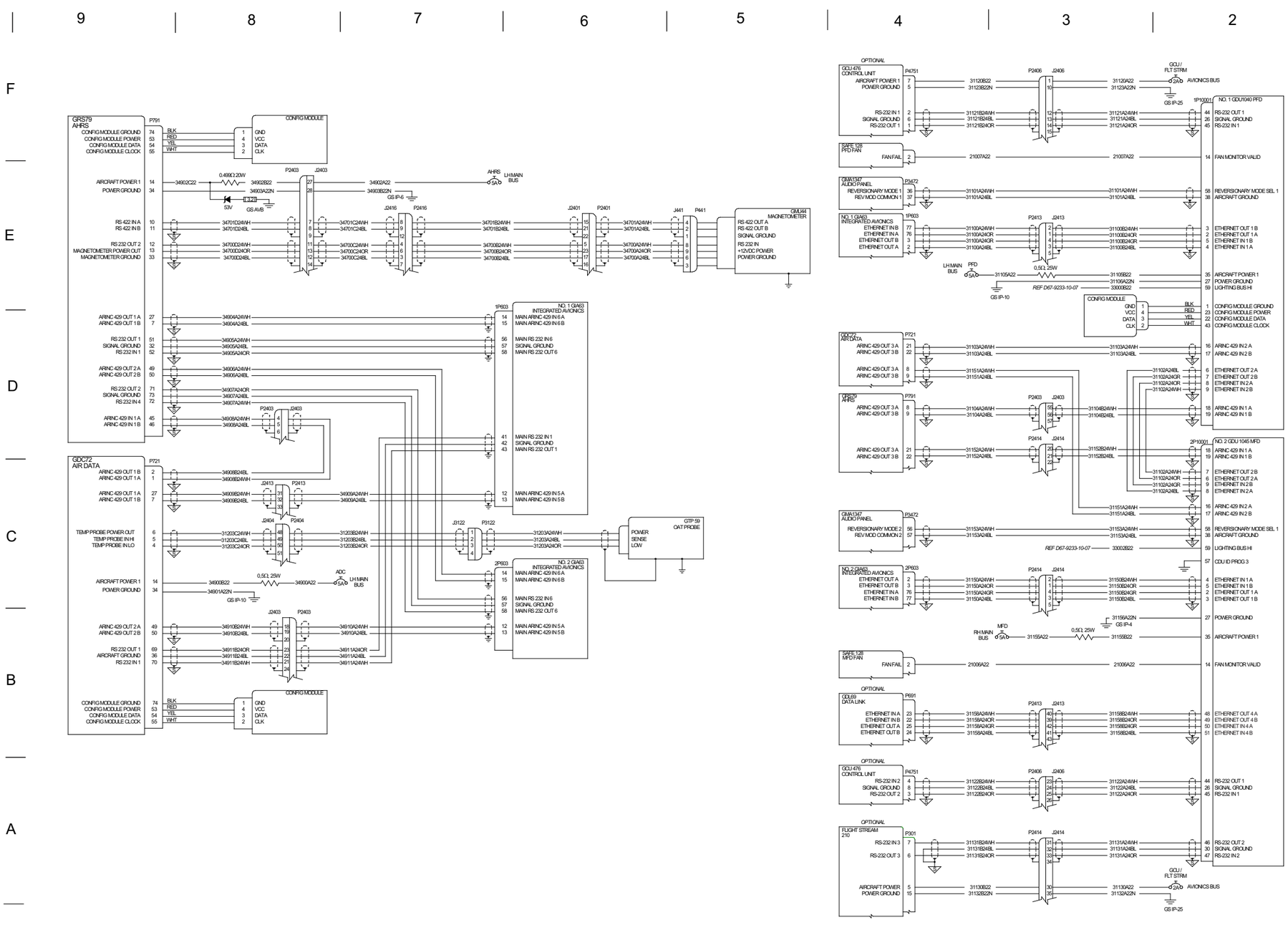


REV.	SCHEMATIC	DRAWING NO.	SHEET
C	G1000 NXi	D67-9231-60-02	3/6

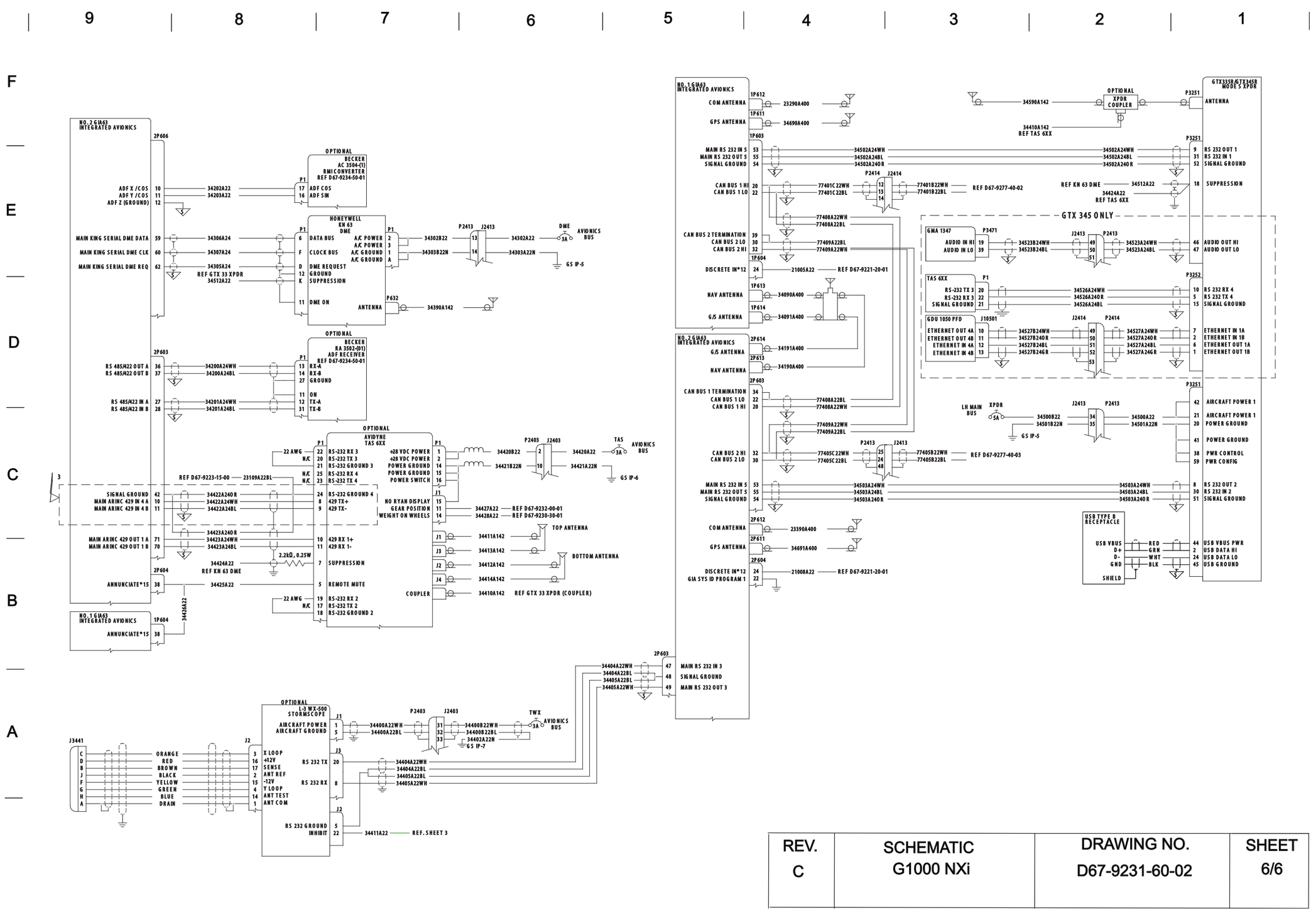




REV.	SCHEMATIC	DRAWING NO.	SHEET
C	G1000 NXi	D67-9231-60-02	4/6



REV.	SCHEMATIC	DRAWING NO.	SHEET
C	G1000 NXi	D67-9231-60-02	5/6



REV.	SCHEMATIC	DRAWING NO.	SHEET
C	G1000 NXi	D67-9231-60-02	6/6

9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

F

E

D

C

B

A

NOTES:

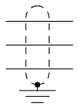
1. SYMBOL DESIGNATIONS


TWISTED SHIELDED SINGLE CONDUCTOR
SHIELD TERMINATED TO GROUND

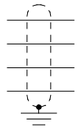

TWISTED SHIELDED SINGLE CONDUCTOR
SHIELD FLOATS

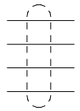

TWISTED SHIELDED PAIR
SHIELD TERMINATED TO GROUND


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

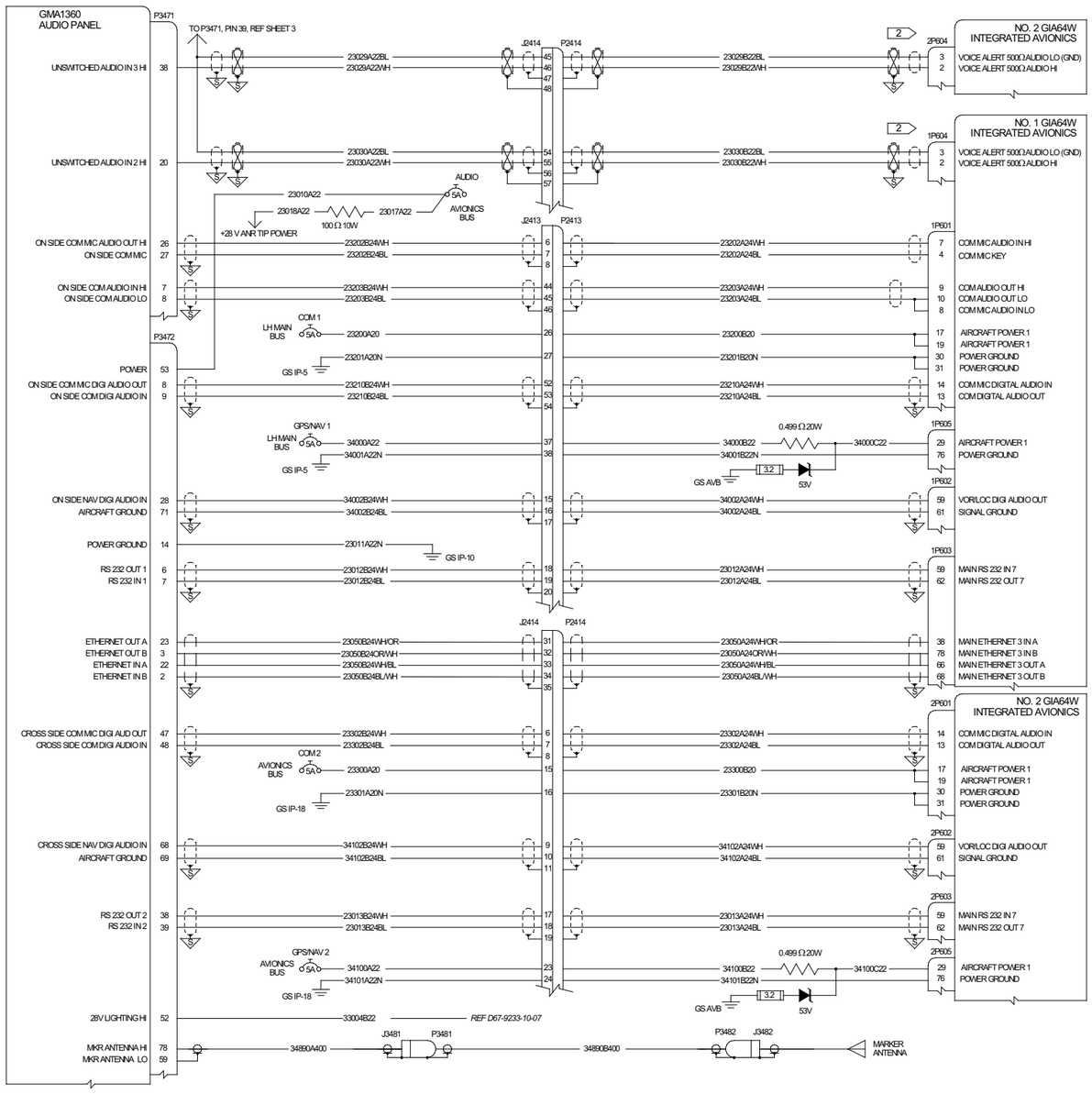
2. USE DOUBLE-SHIELDED WIRING: BOTH SHIELDS SHOULD BE GROUNDED ON THE RECEIVING SIDE; ON THE TRANSMITTING SIDE, ONLY THE OUTER SHIELD SHOULD BE GROUNDED, WHILE THE INNER SHIELD SHOULD FLOAT.

3. CAP AND STOW IF GTX345 IS INSTALLED.

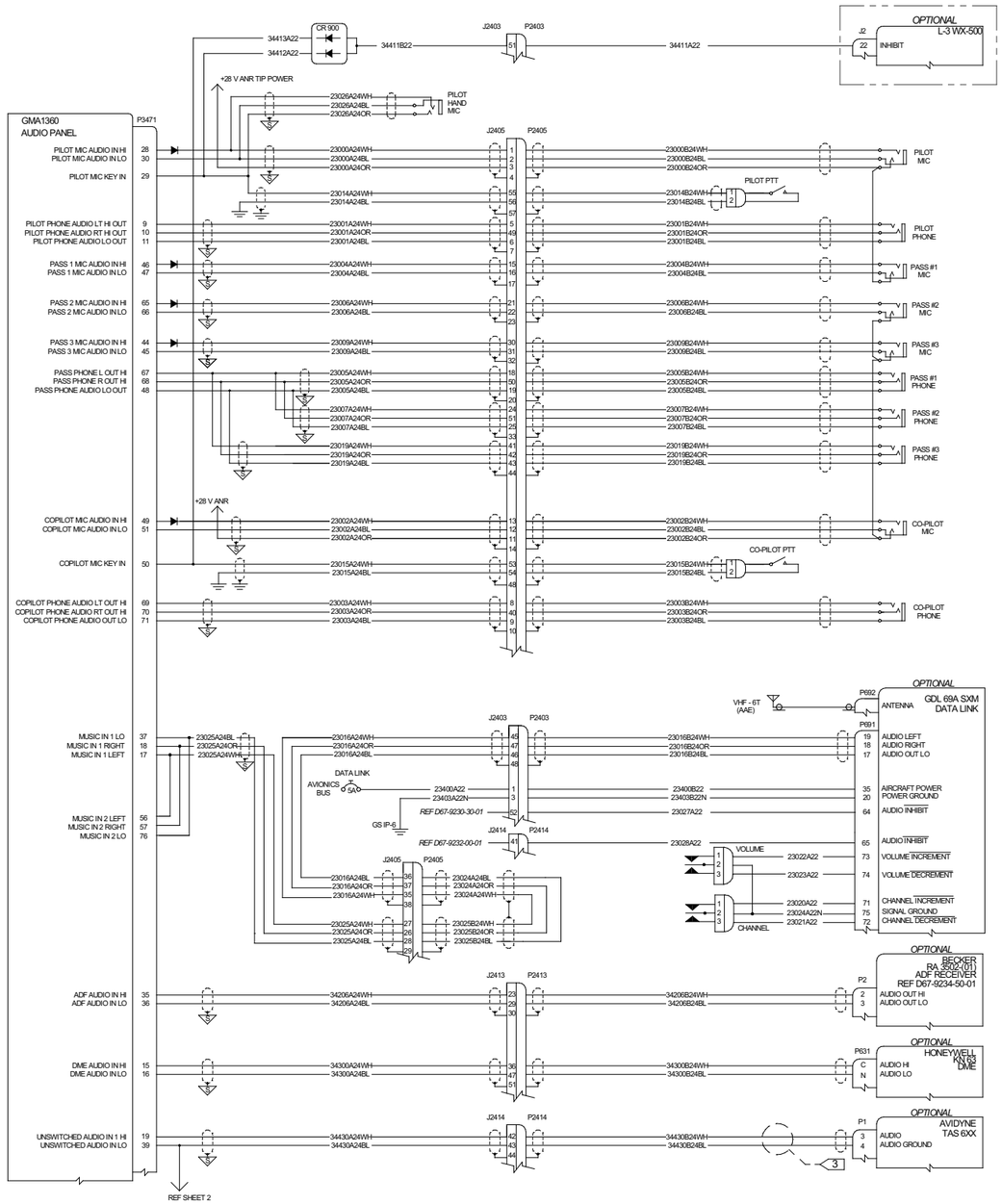
4. ETHERNET COLOUR CODING MAY VARY DEPENDENT ON ETHERNET CABLE TYPE. BELOW ARE EQUIVALENT WIRE COLOUR CODES.

ETHERNET CABLE LEGEND	
E40424 (PIC WIRE)	392404 (CARLISLE)
WHITE	WHITE w/ORANGE STRIPE
ORANGE	ORANGE w/WHITE STRIPE
GREEN	WHITE w/BLUE STRIPE
BLUE	BLUE w/WHITE STRIPE

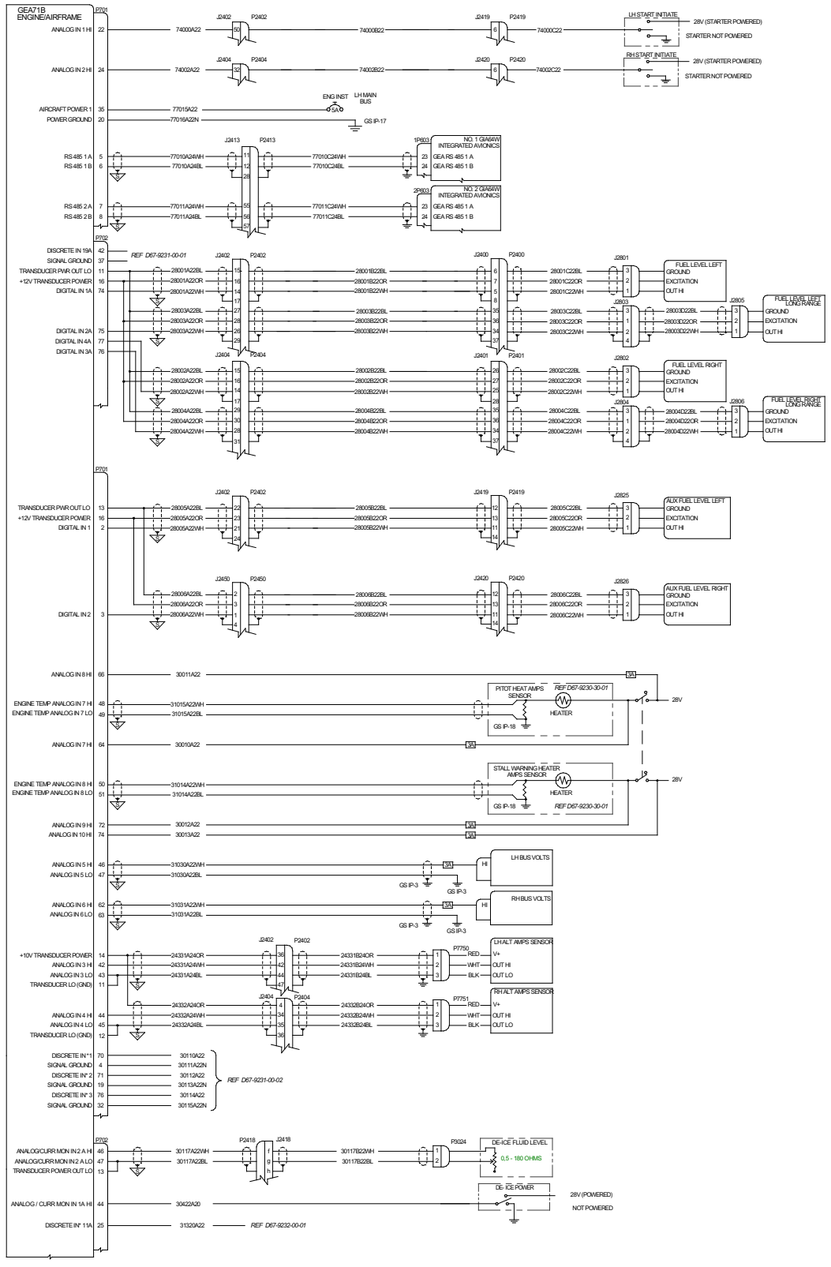
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	G1000 NXi (Phase I and Phase II)	D67-9231-60-03	1/6

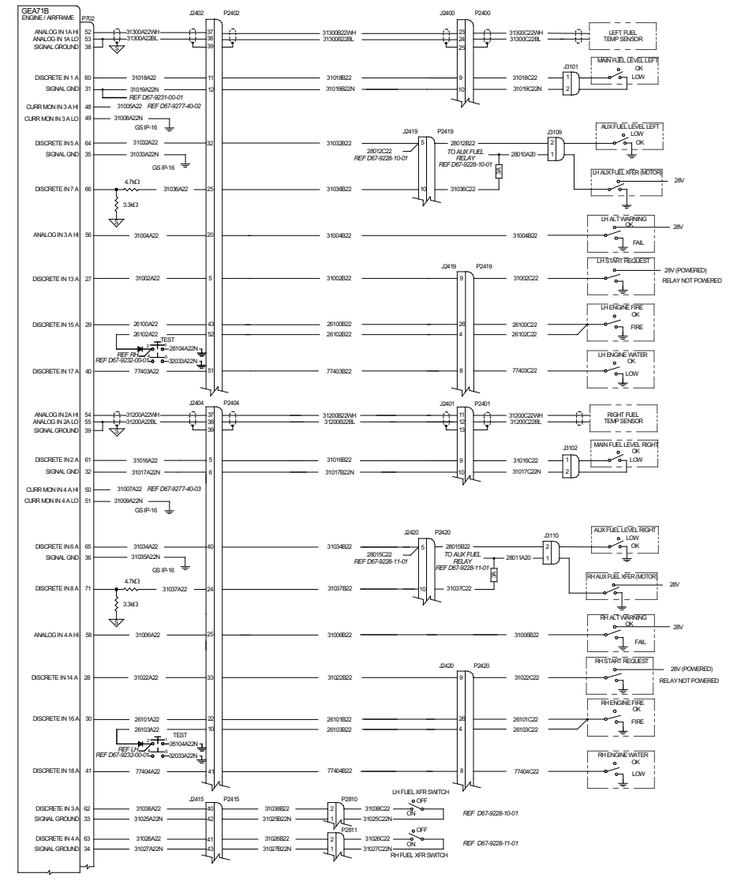


REV.	SCHEMATIC	DRAWING NO.	SHEET
A	G1000 NXi (Phase I and Phase II)	D67-9231-60-03	2/6

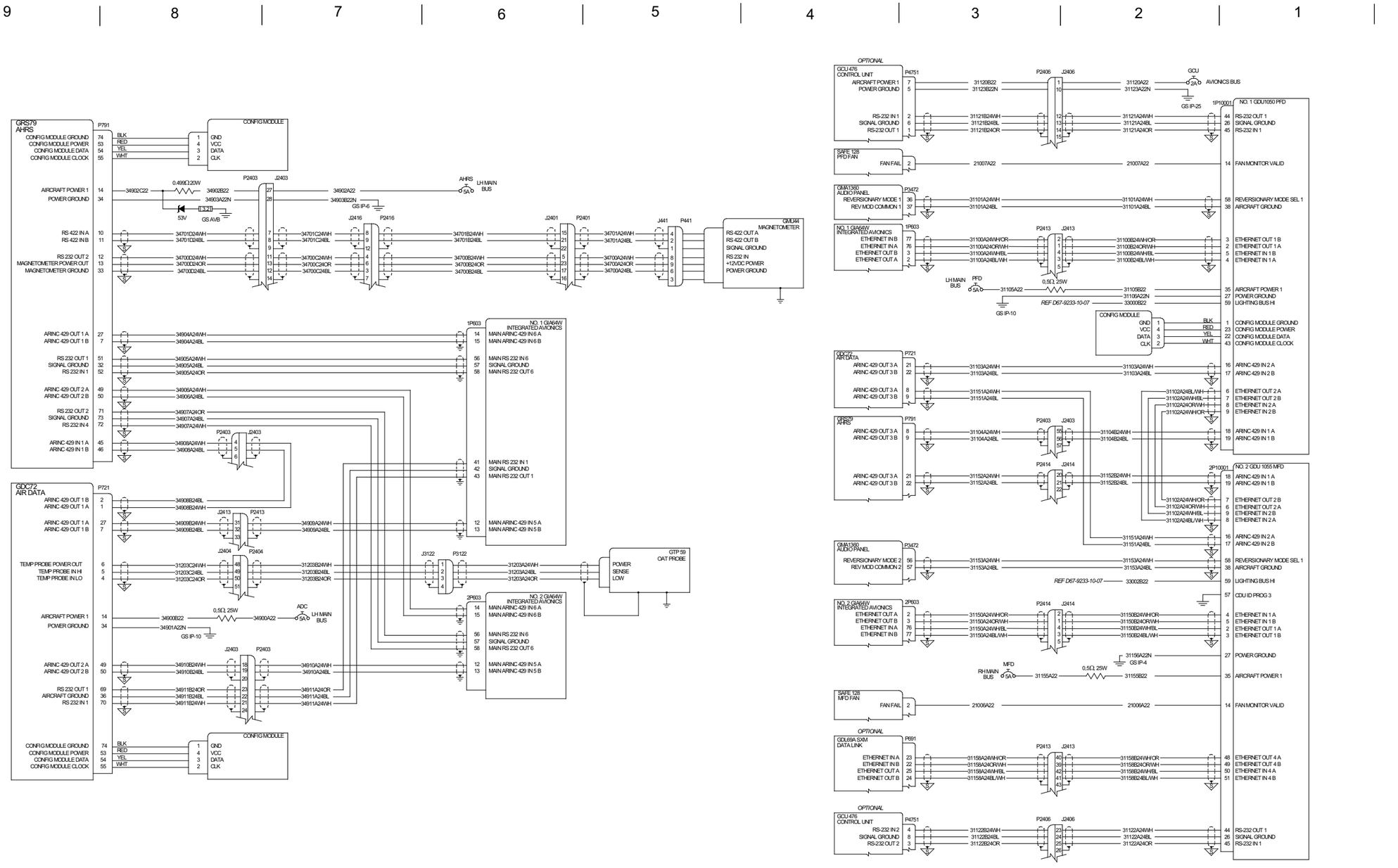


REV.	SCHEMATIC	DRAWING NO.	SHEET
A	G1000 NXi (Phase I and Phase II)	D67-9231-60-03	3/6

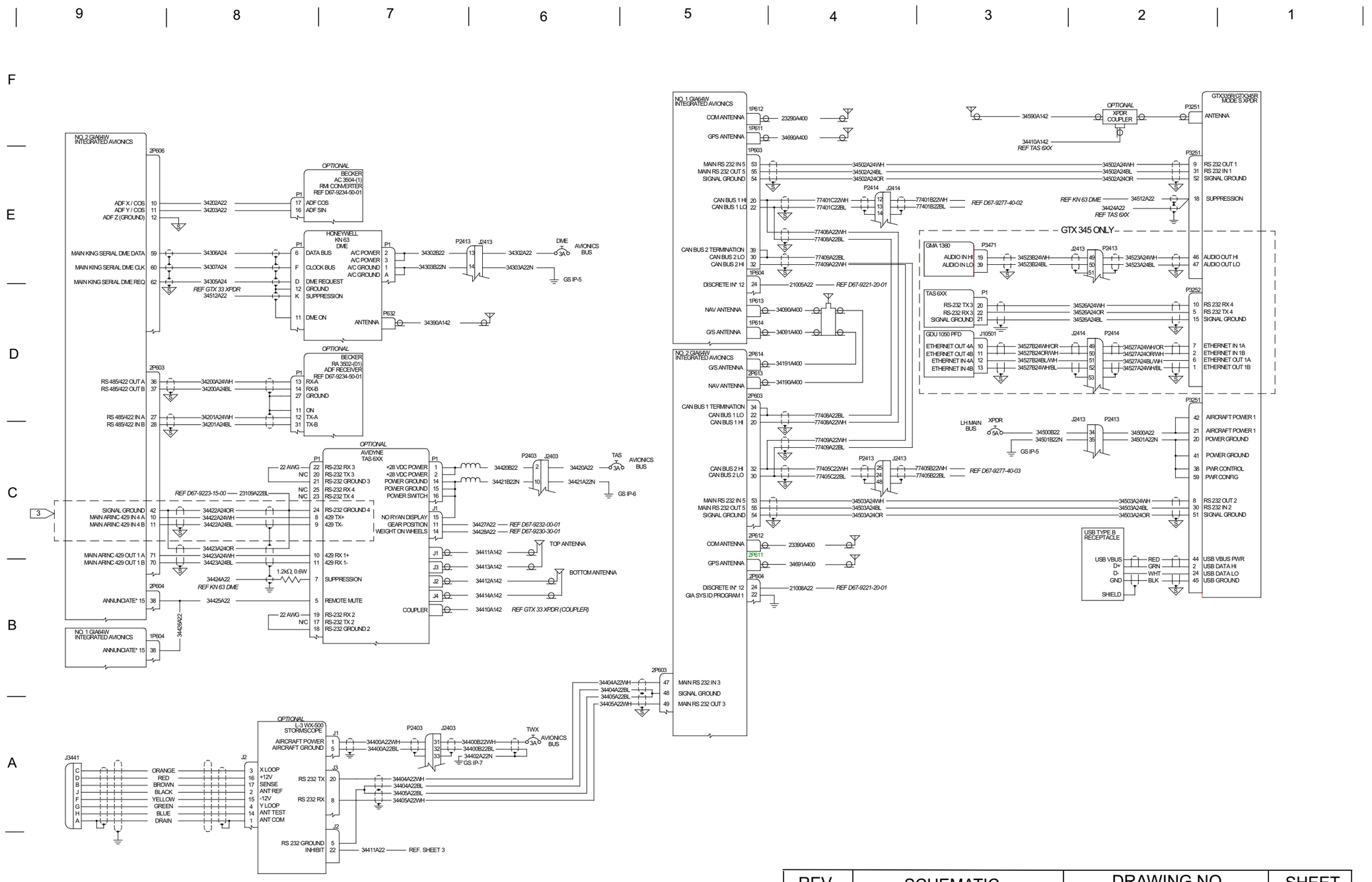




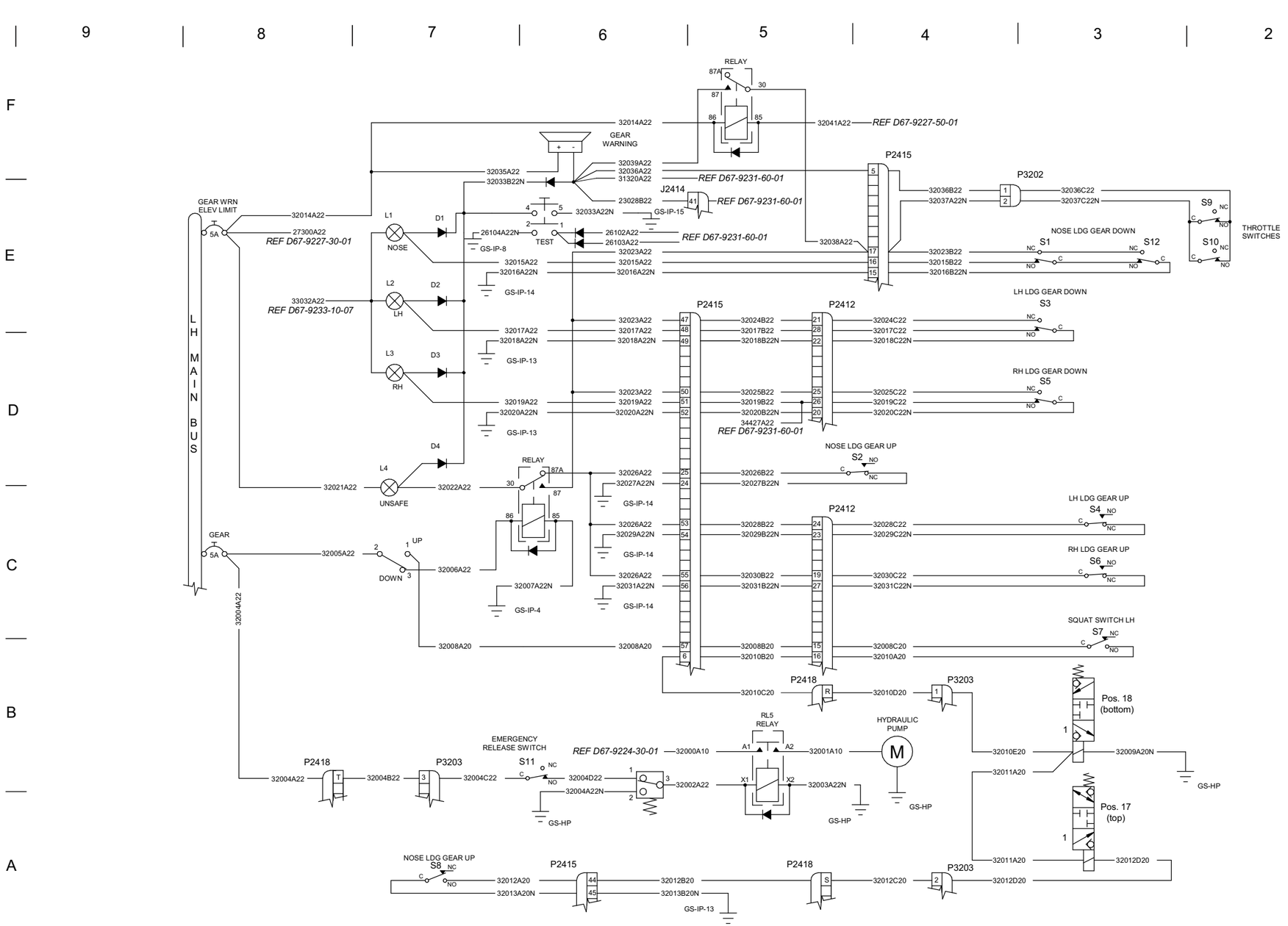
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	G1000 NXi (Phase I and Phase II)	D67-9231-60-03	4/6



REV.	SCHEMATIC	DRAWING NO.	SHEET
A	G1000 NXi (Phase I and Phase II)	D67-9231-60-03	5/6



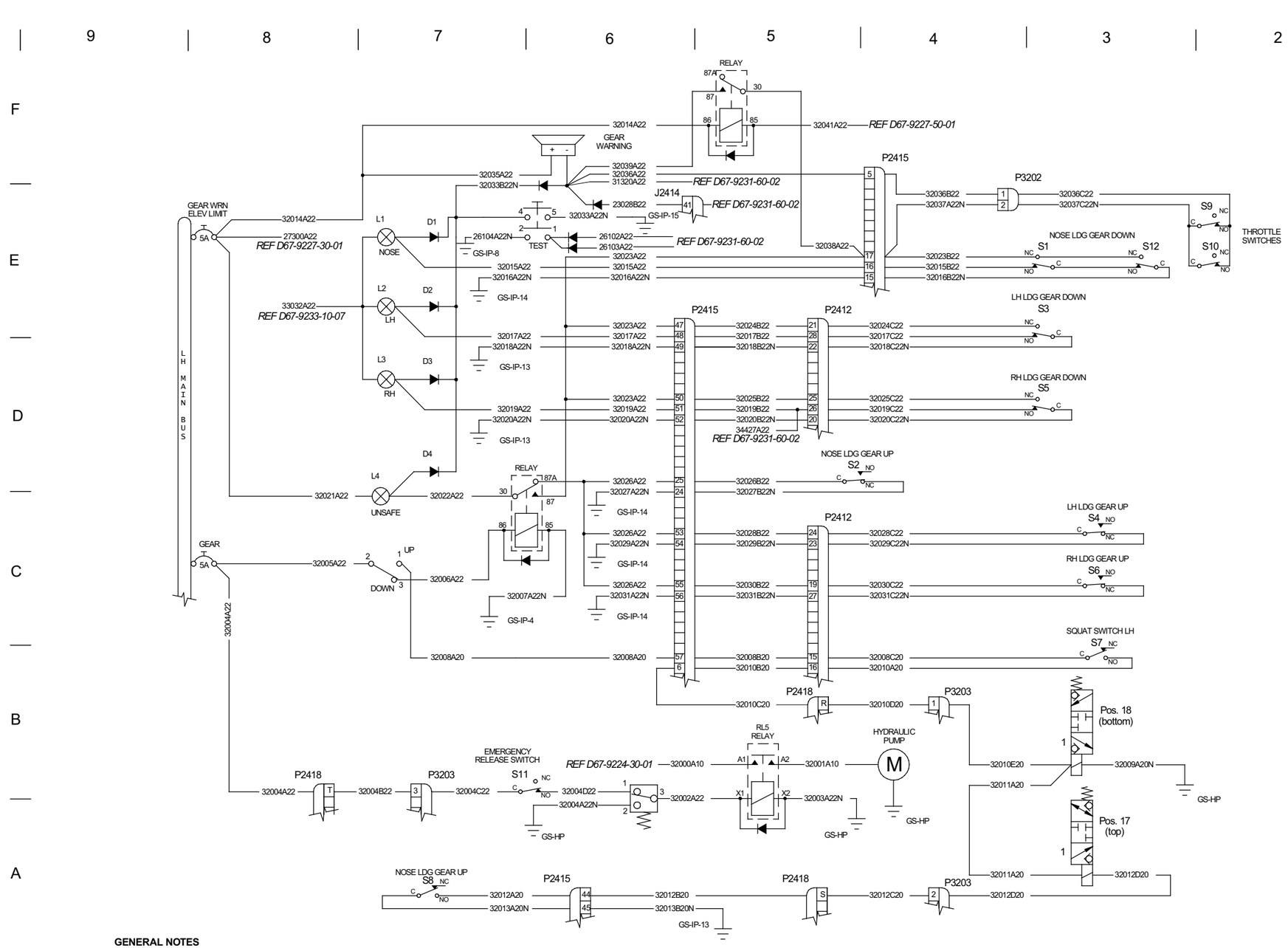
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	G1000 NXi (Phase I and Phase II)	D67-9231-60-03	6/6



GENERAL NOTES

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.

REV.	SCHEMATIC	DRAWING NO.	SHEET
C	Landing Gear	D67-9232-00-01	1/1



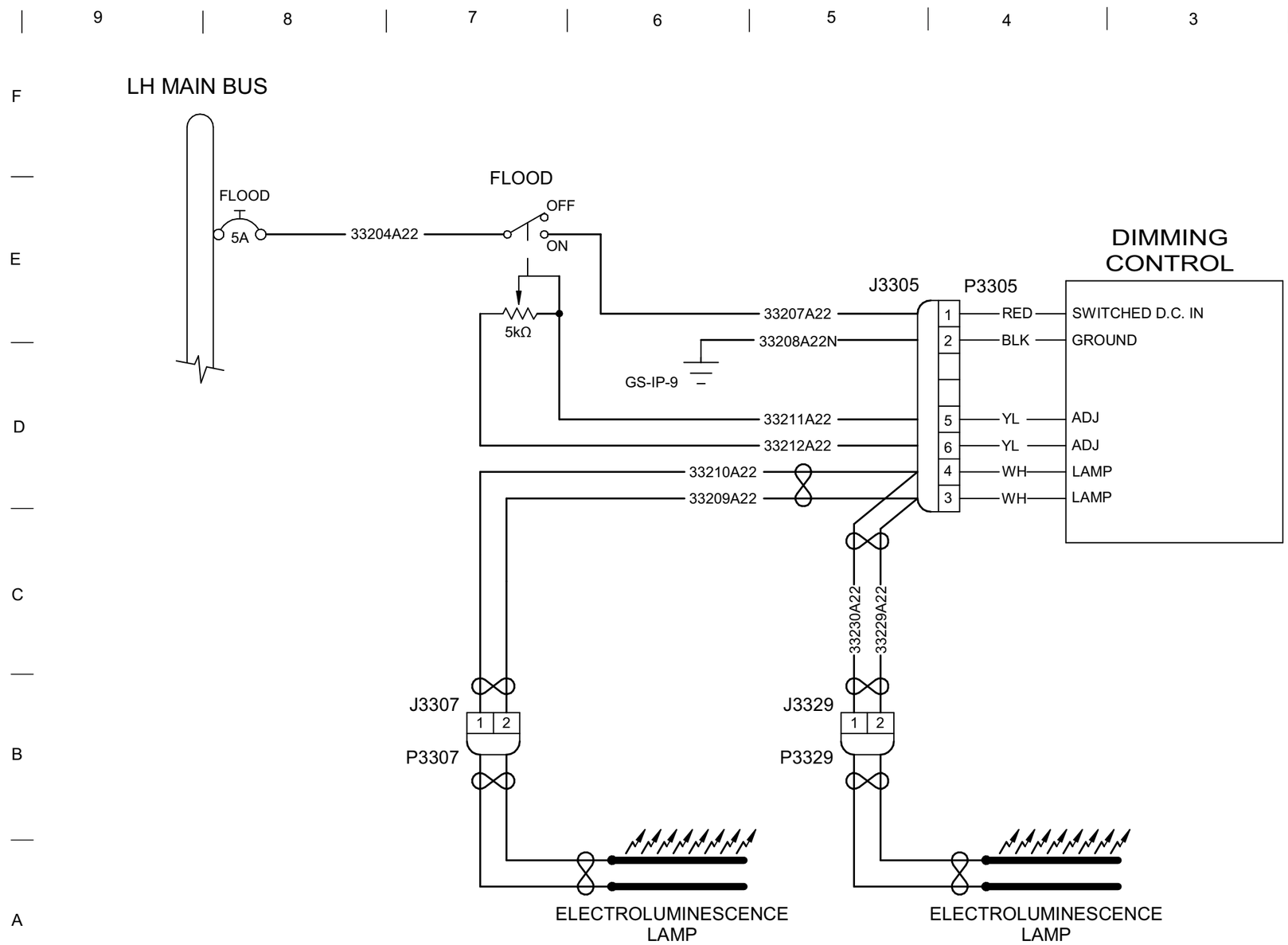
GENERAL NOTES

1. WIRING SHOWN WITH LANDING GEARS DOWN AND LOCKED, THROTTLE ON IDLE AND NOT POWERED.

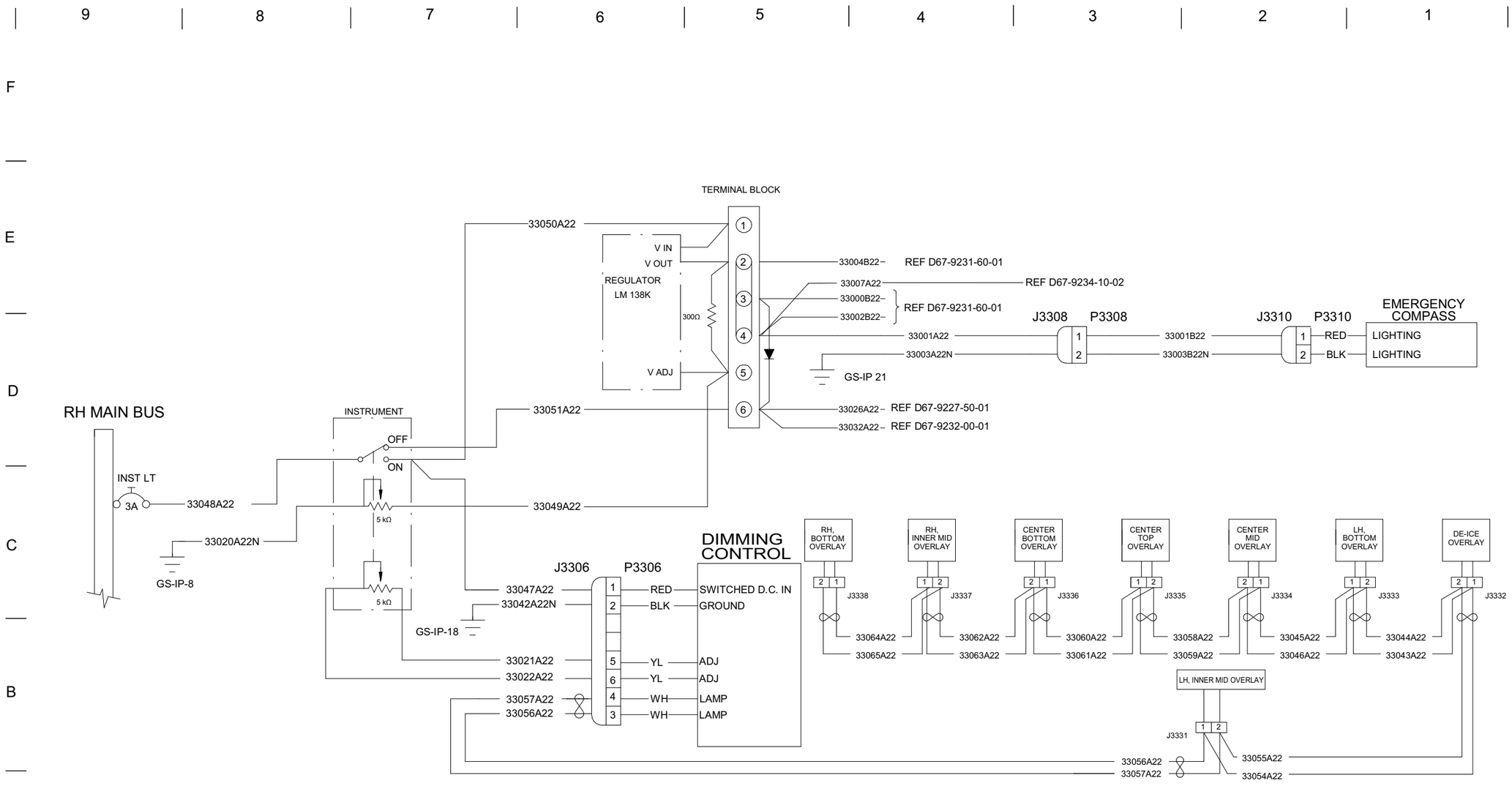
2. S1, S3, S5, S12 CLOSED WHEN LANDING GEARS DOWN AND LOCKED, S7 OPENED WHEN AIRPLANE ON GROUND,
   S2, S4, S6 OPENED WHEN LANDING GEARS UP AND LOCKED, S7 CLOSED WHEN AIRPLANE AIRBORN.
   S8 OPENED WHEN NOSE LANDING GEAR DOWN, S8 CLOSED WHEN NOSE LANDING GEAR UP.
   S9 AND S10 CLOSED WHEN BOTH POWER LEVERS ARE IN IDLE POSITION.

3. TEST SWITCH WIRED NORMALLY OPEN.

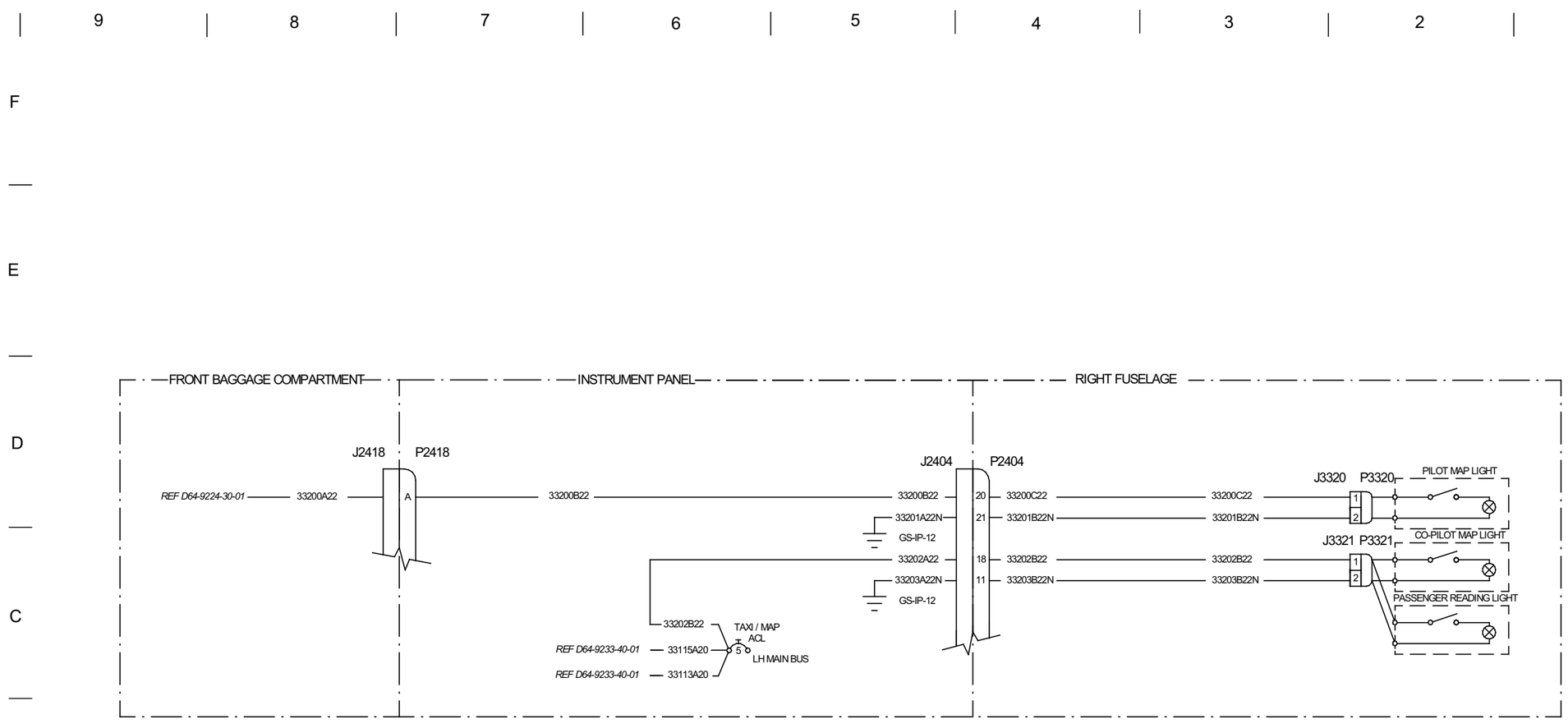
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Landing Gear	D67-9232-00-01_01	1/1



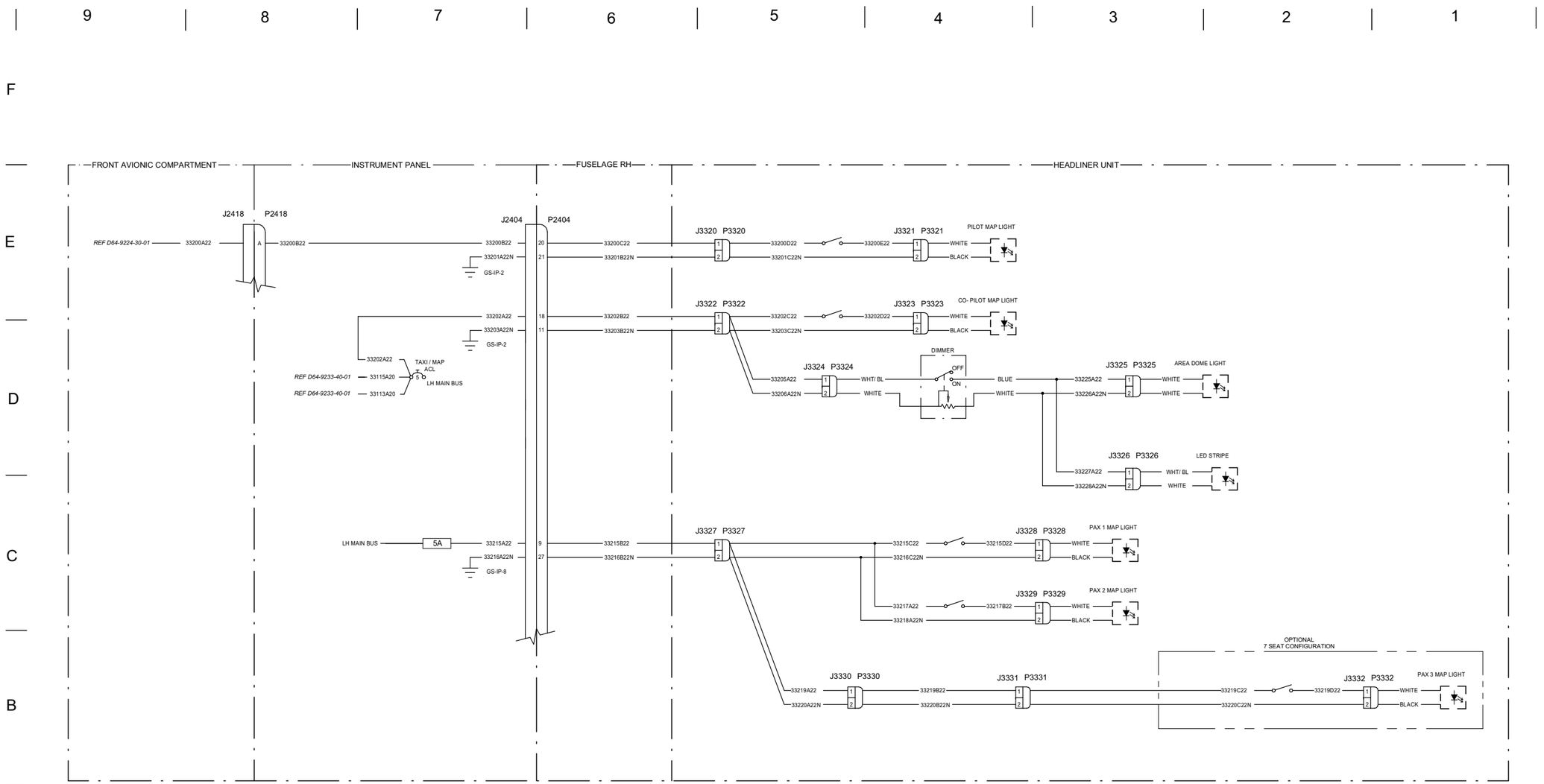
REV.	SCHEMATIC	DRAWING NO.	SHEET
B	Flood Light	D67-9233-10-01	1/1



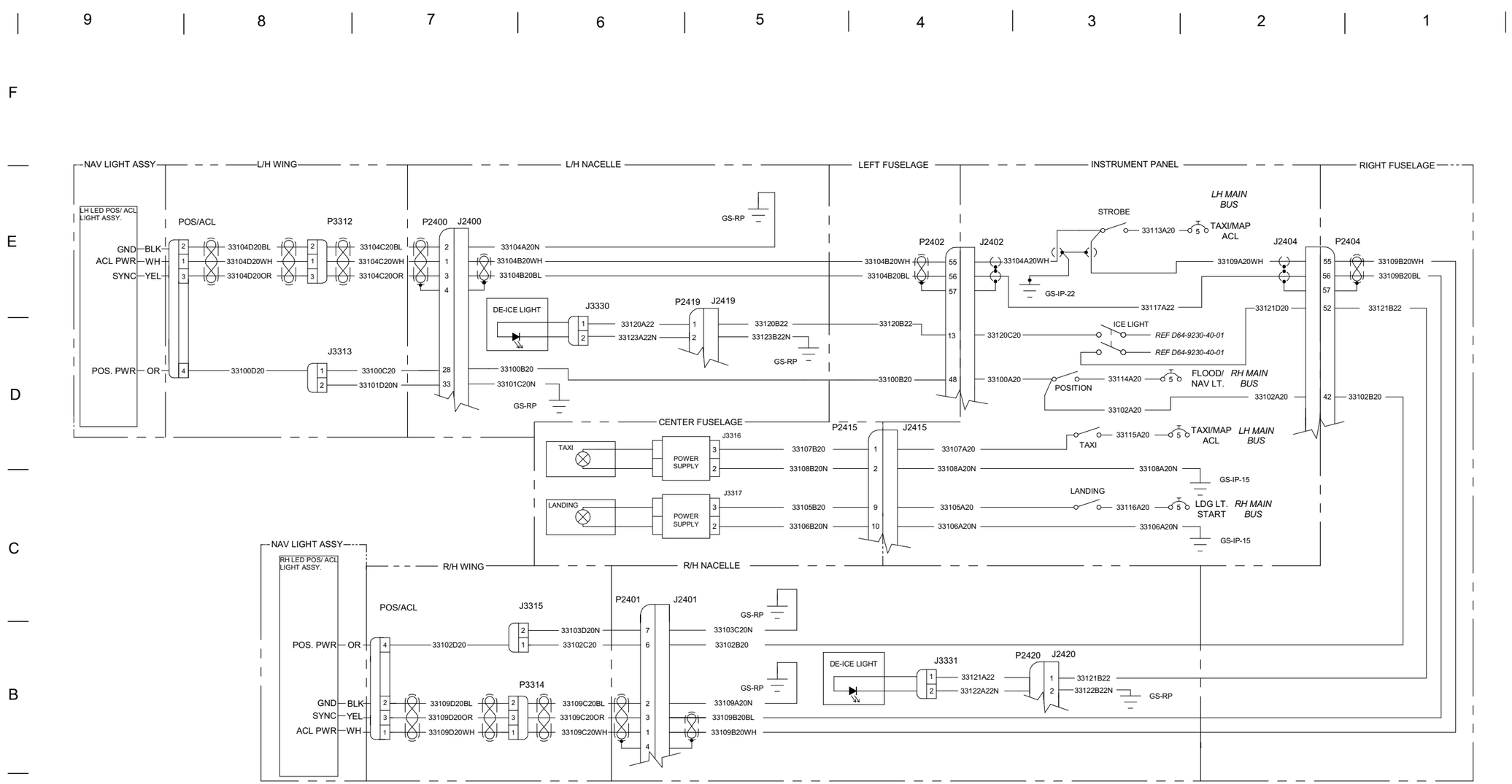
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	Dimming Regulator and Placards	D67-9233-10-07	1/1



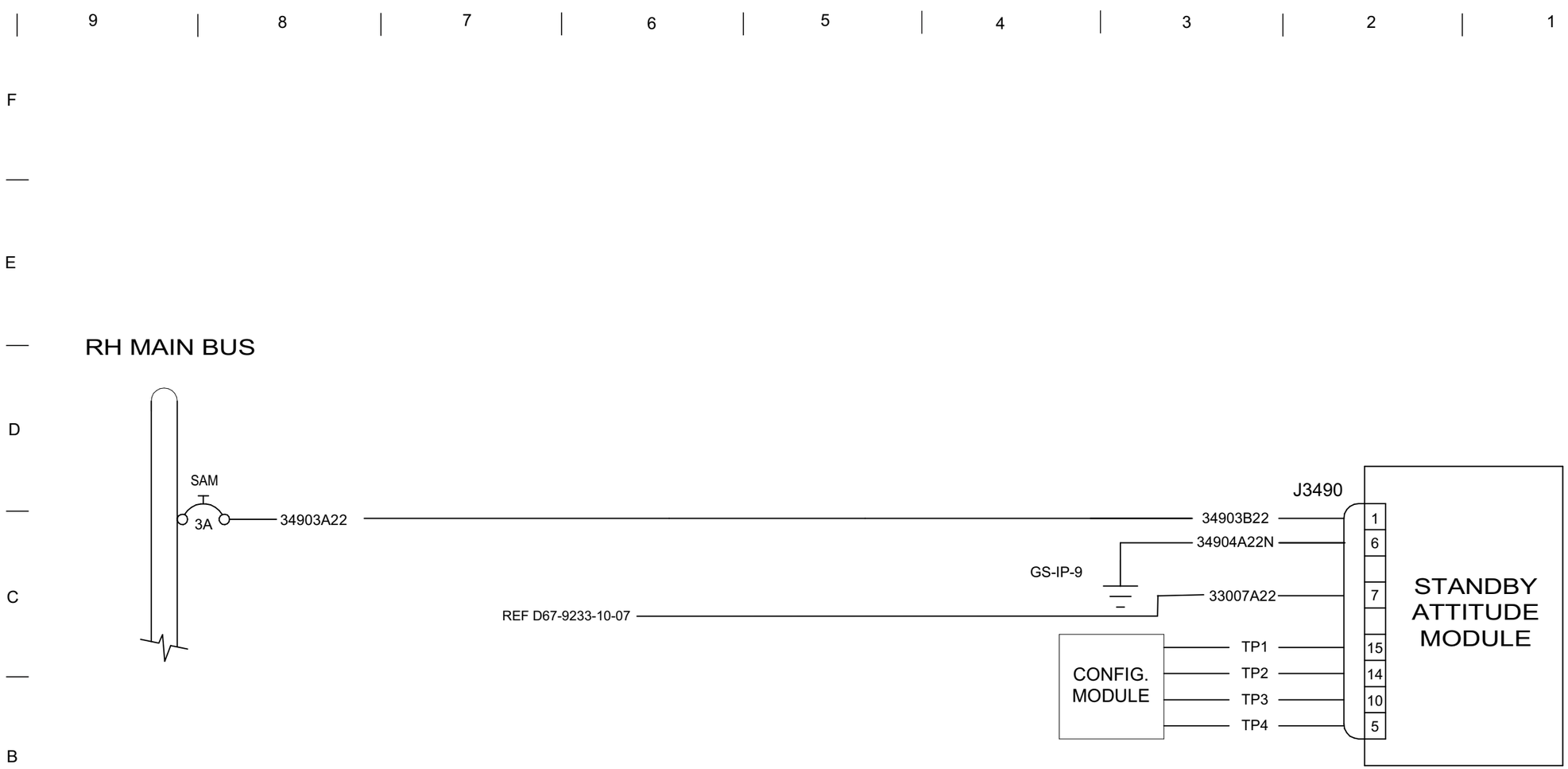
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	Map Reading Lights	D67-9233-20-01	1/1



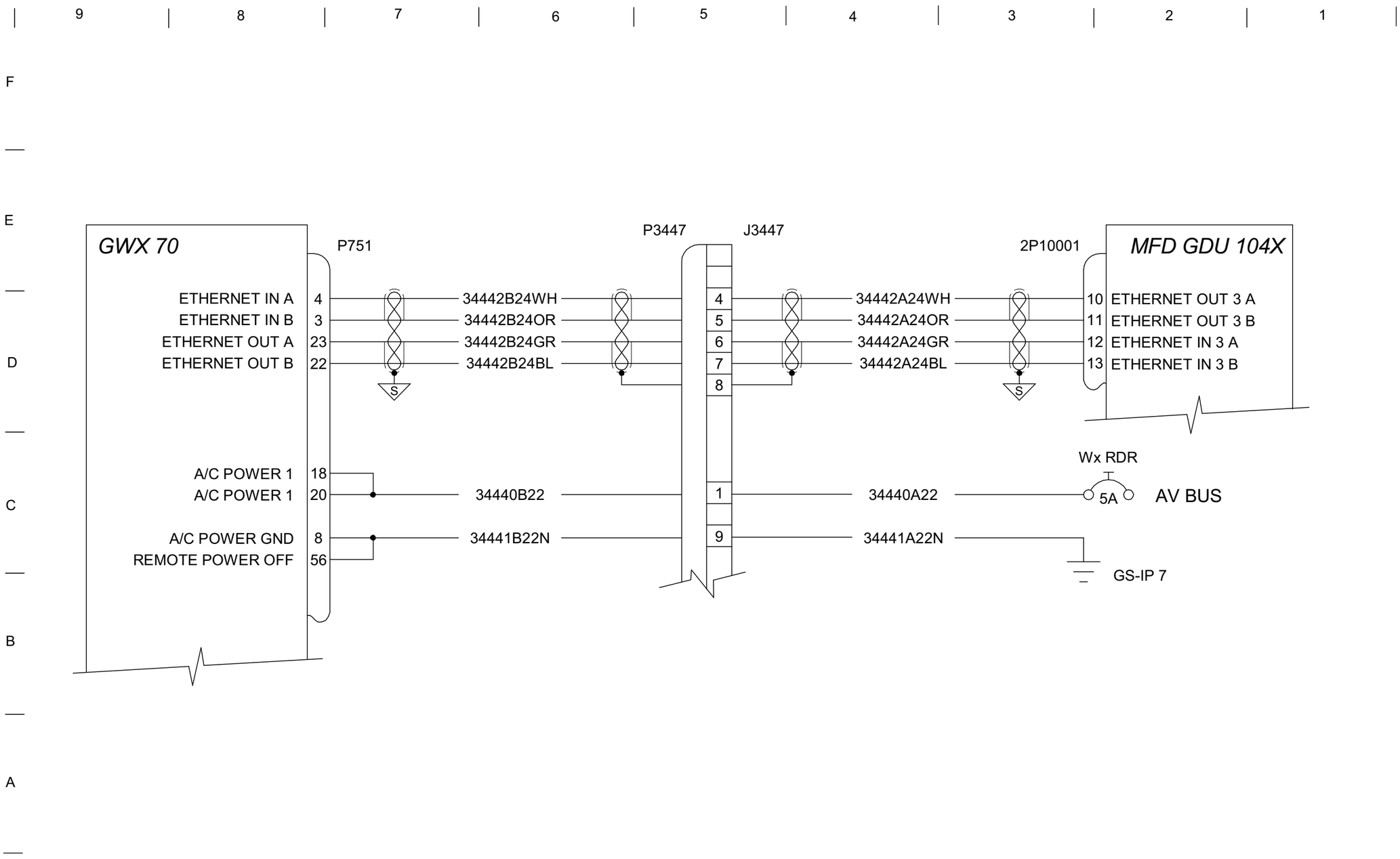
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	Interiior Lighting	D67-9233-20-02	1/1



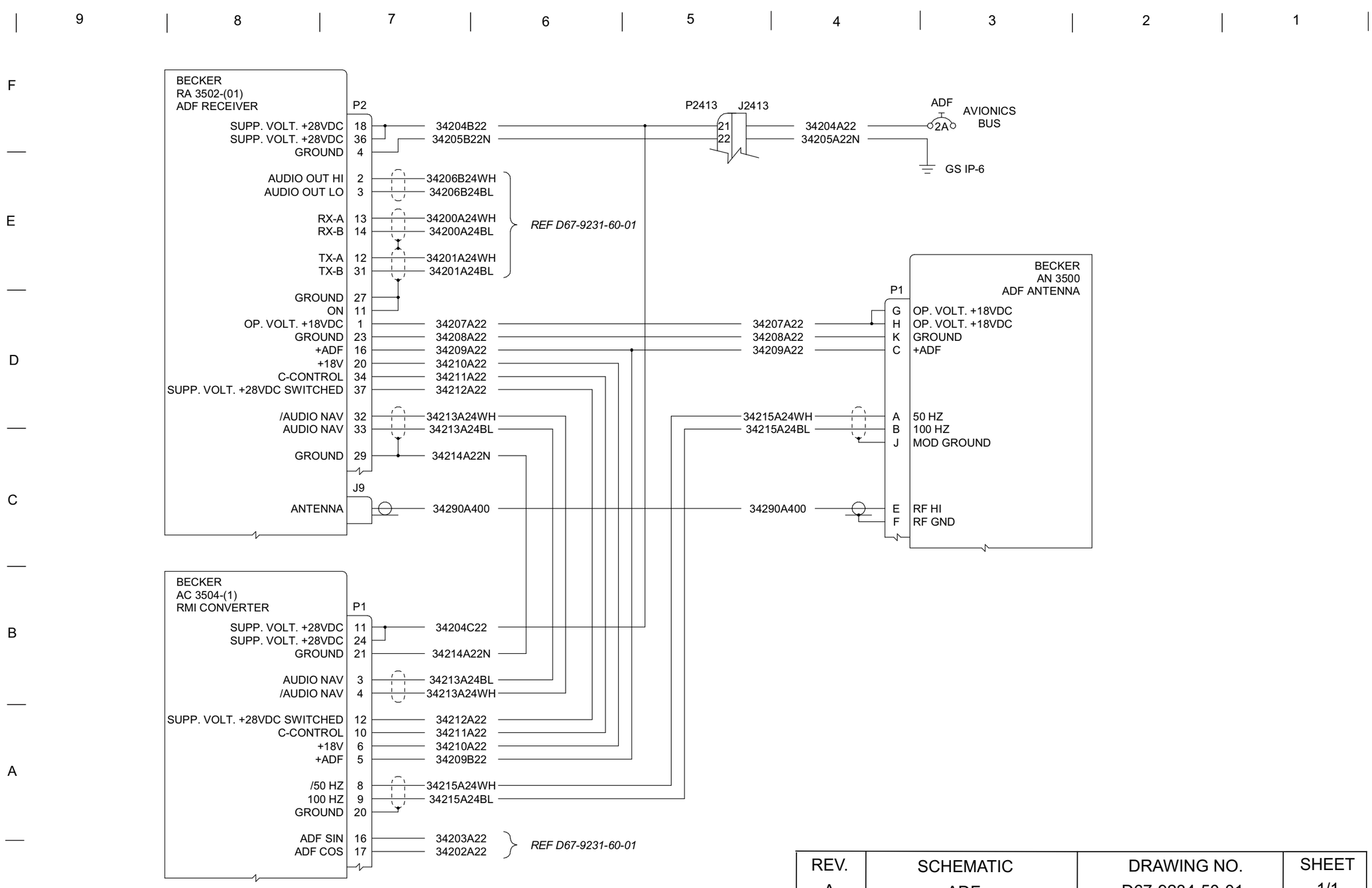
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	Exterior Lighting	D67-9233-40-01	1/1



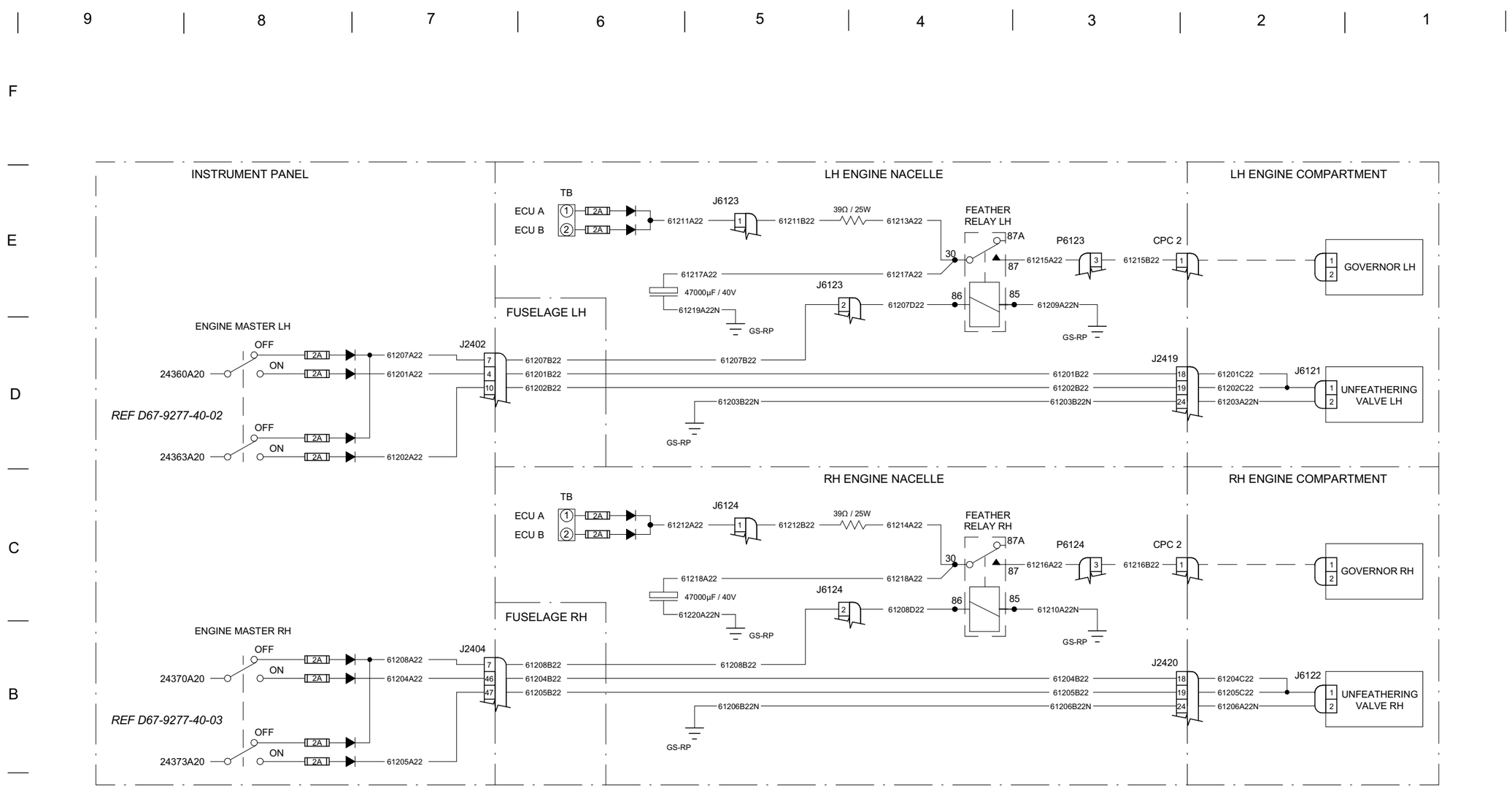
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	MD302 Wiring	D67-9234-10-02	1/1



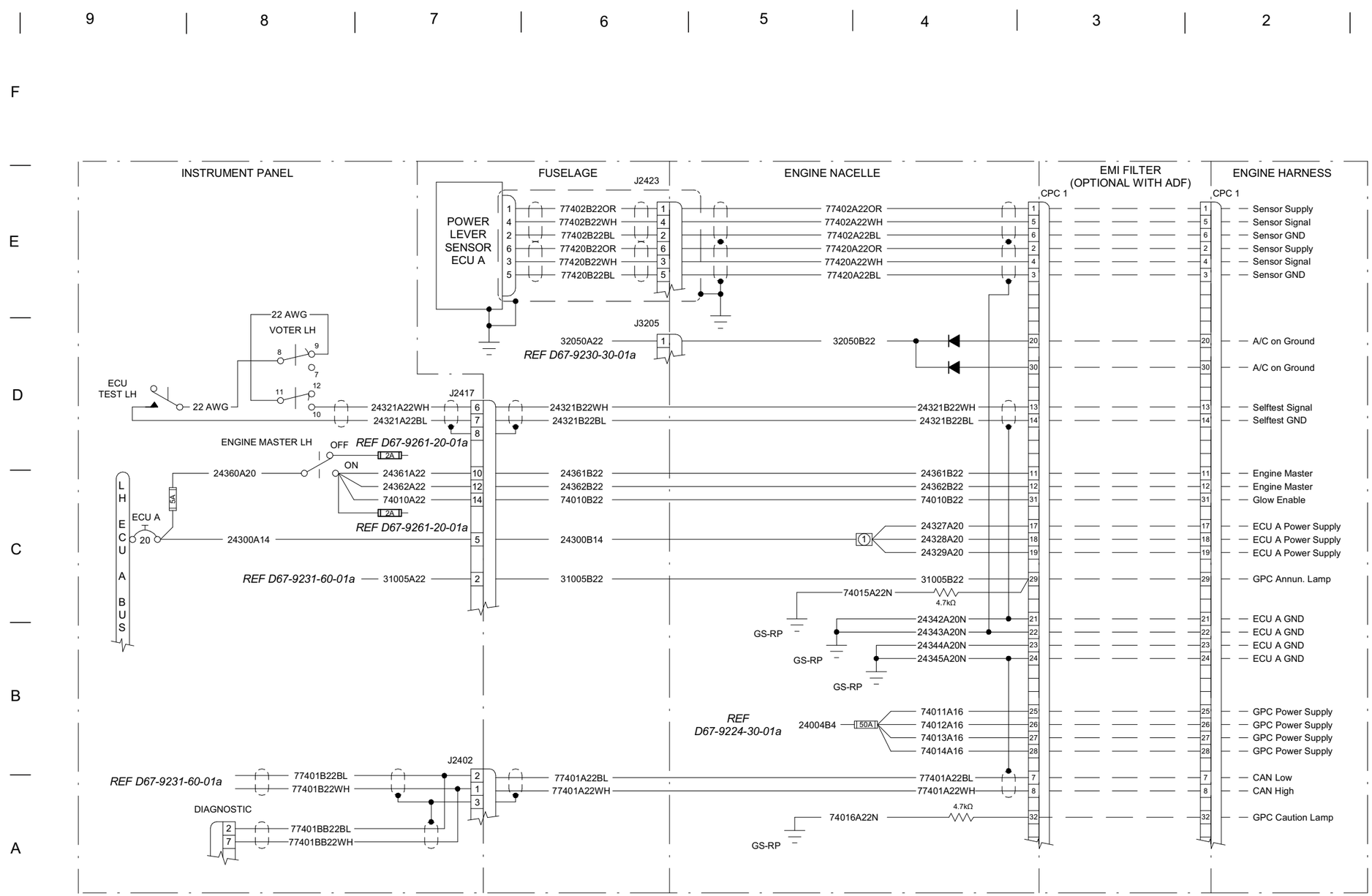
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	GWX 70 Weather Radar Wiring	D67-9234-40-01	1/1



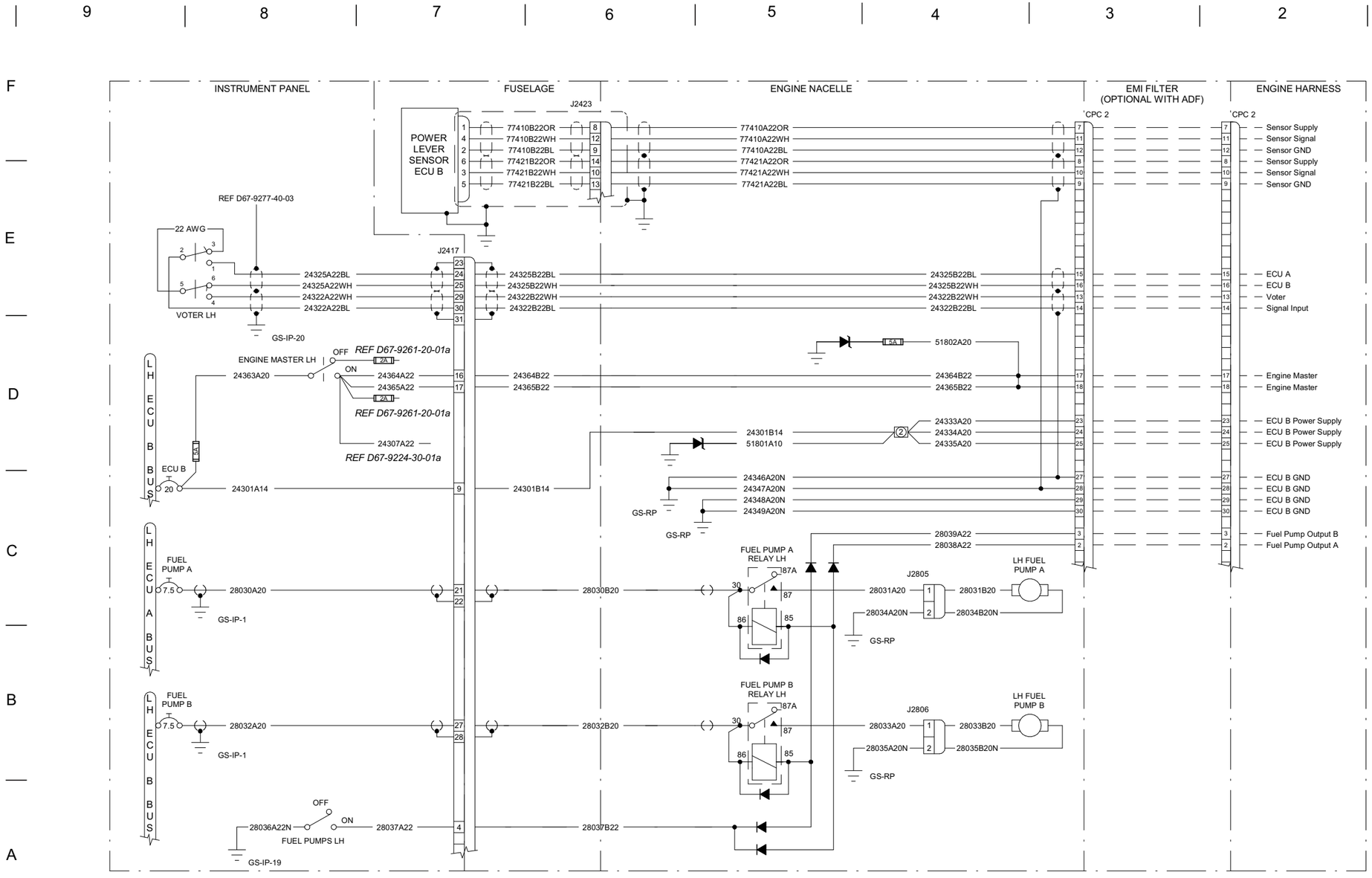
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	ADF	D67-9234-50-01	1/1



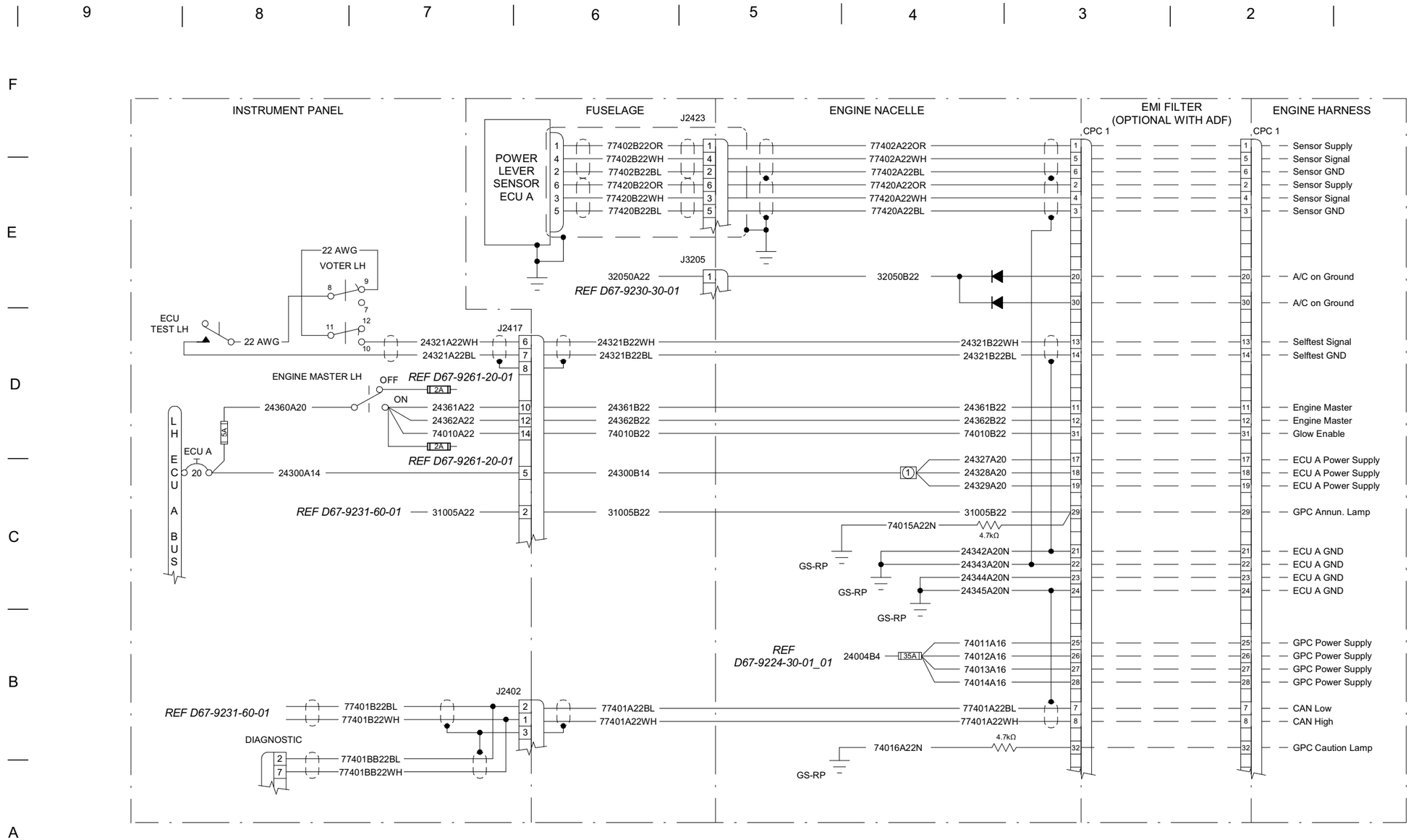
REV.	SCHEMATIC	DRAWING NO.	SHEET
A	Feathering System	D67-9261-20-01	1/1



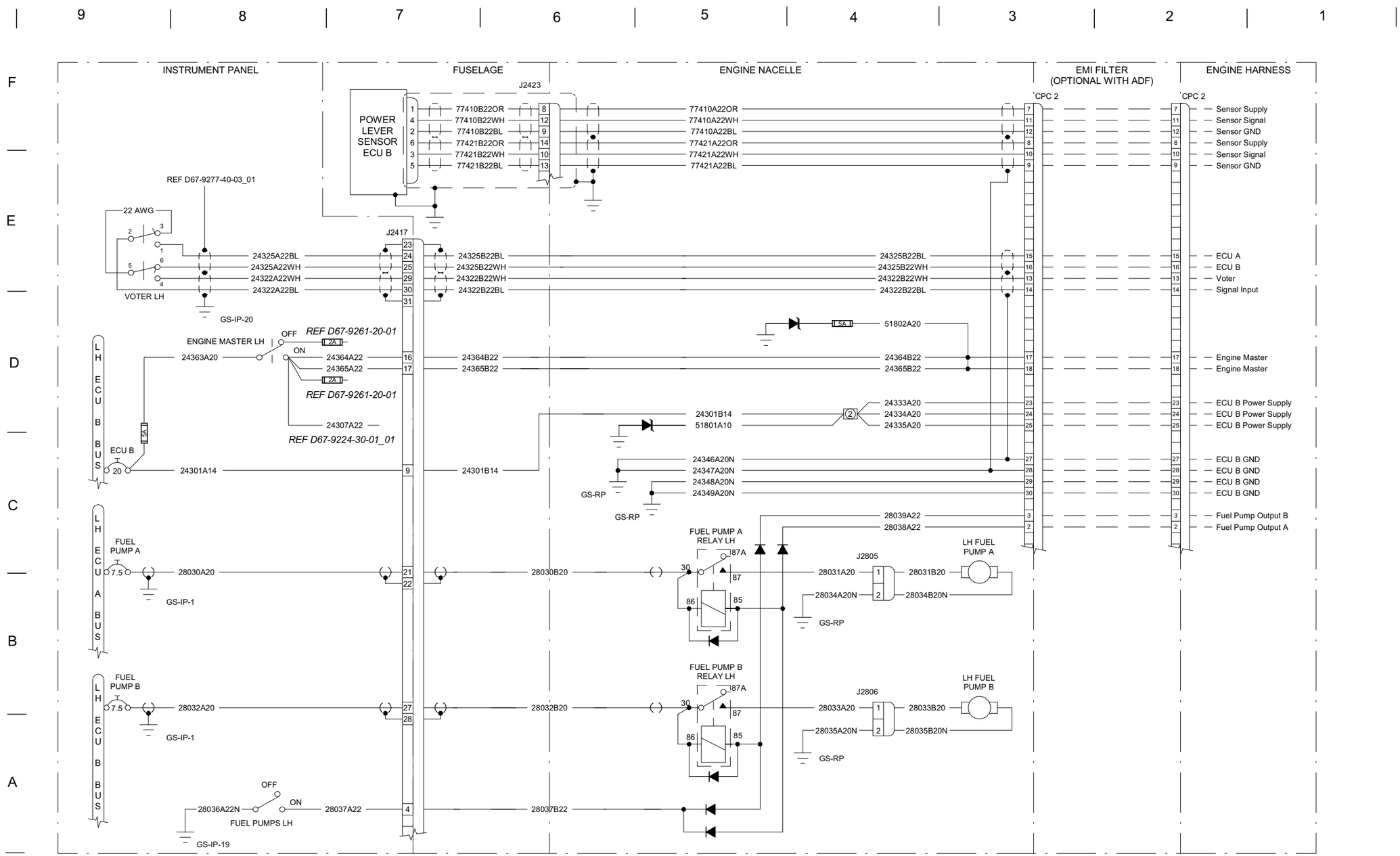
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	LH ECU	D67-9277-40-02	1/2



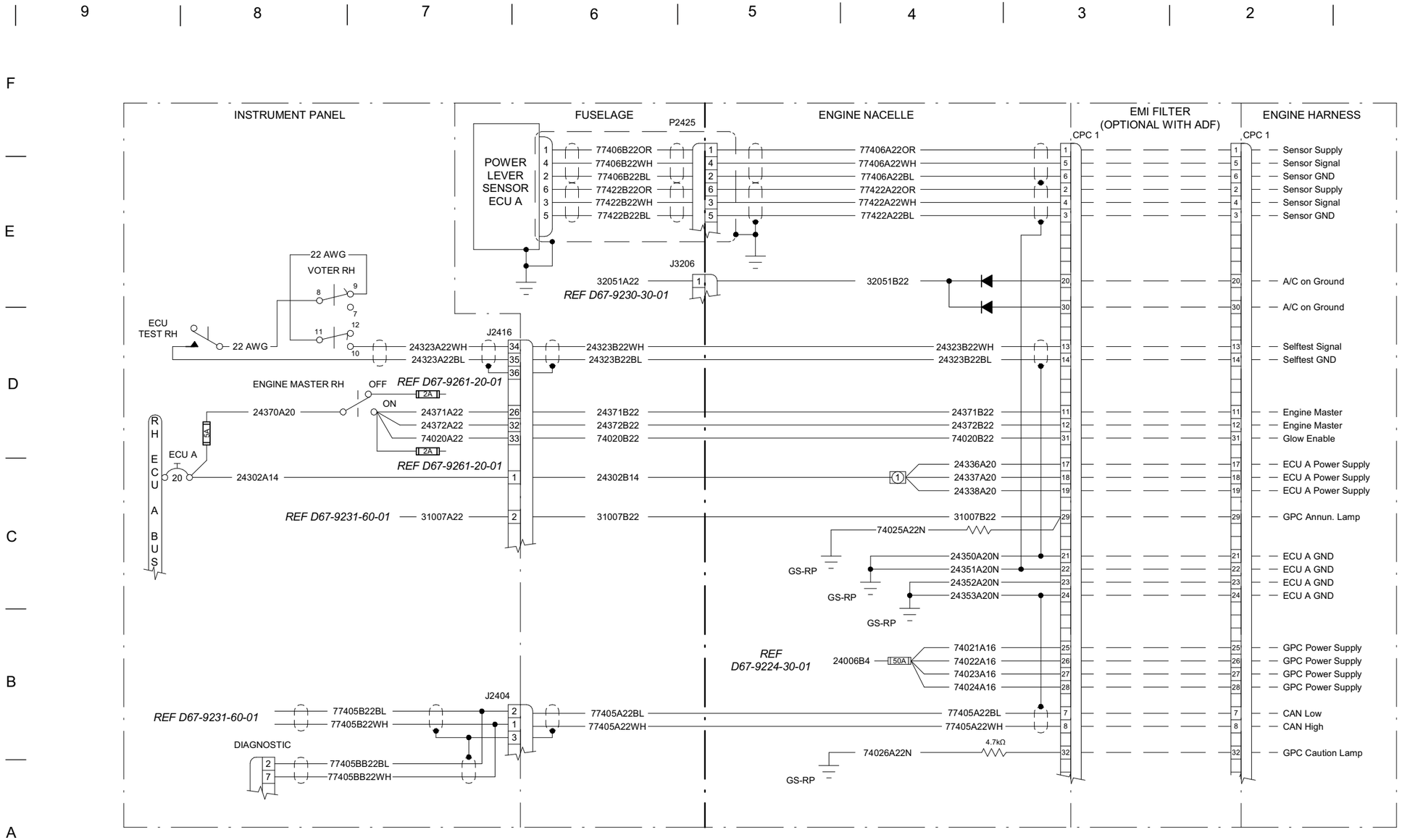
REV.	SCHEMATIC	DRAWING NO.	SHEET
C	LH ECU	D67-9277-40-02	2/2



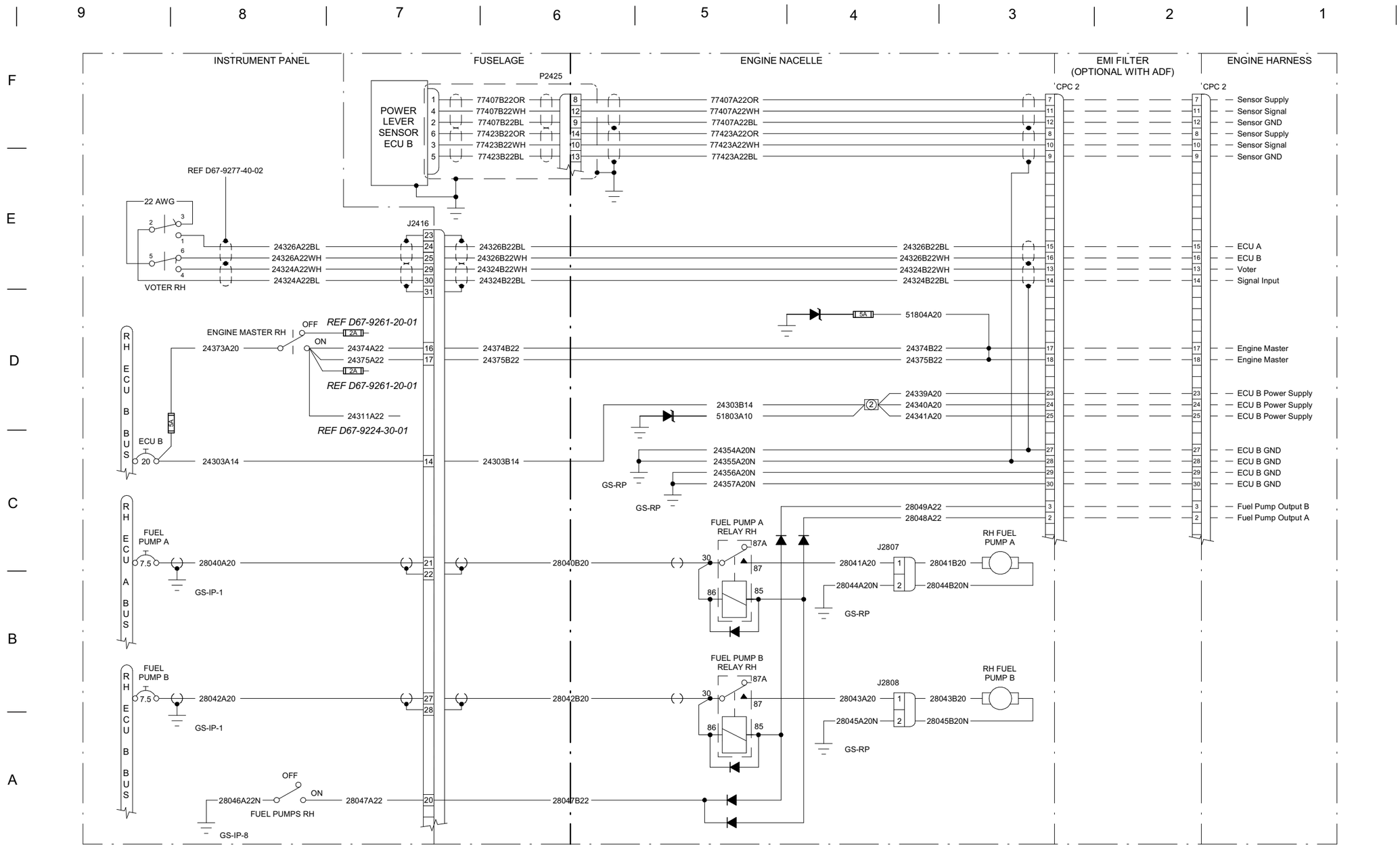
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	LH ECU	D67-9277-40-02_01	1/2



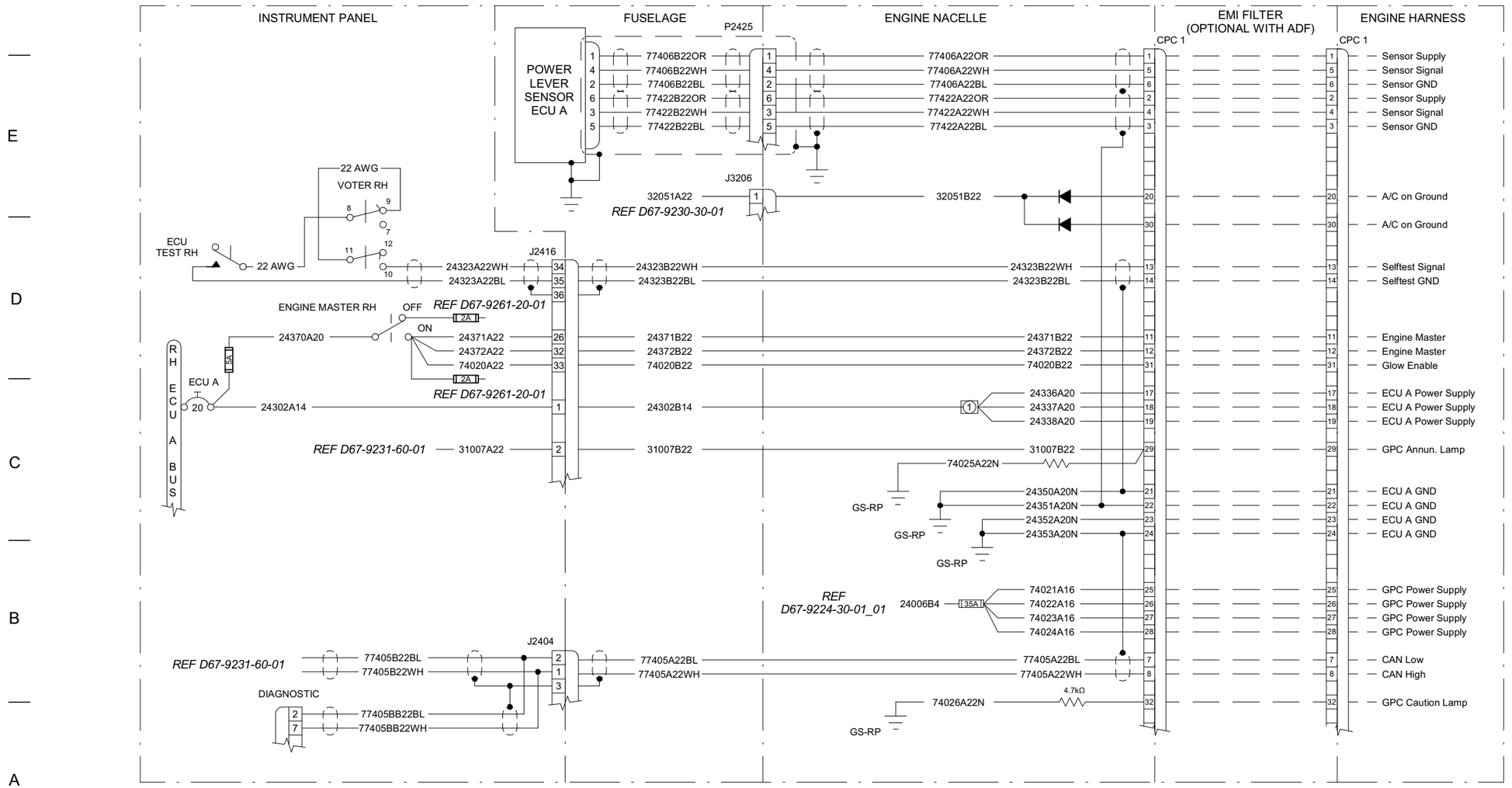
REV.	SCHEMATIC	DRAWING NO.	SHEET
—	LH ECU	D67-9277-40-02_01	2/2



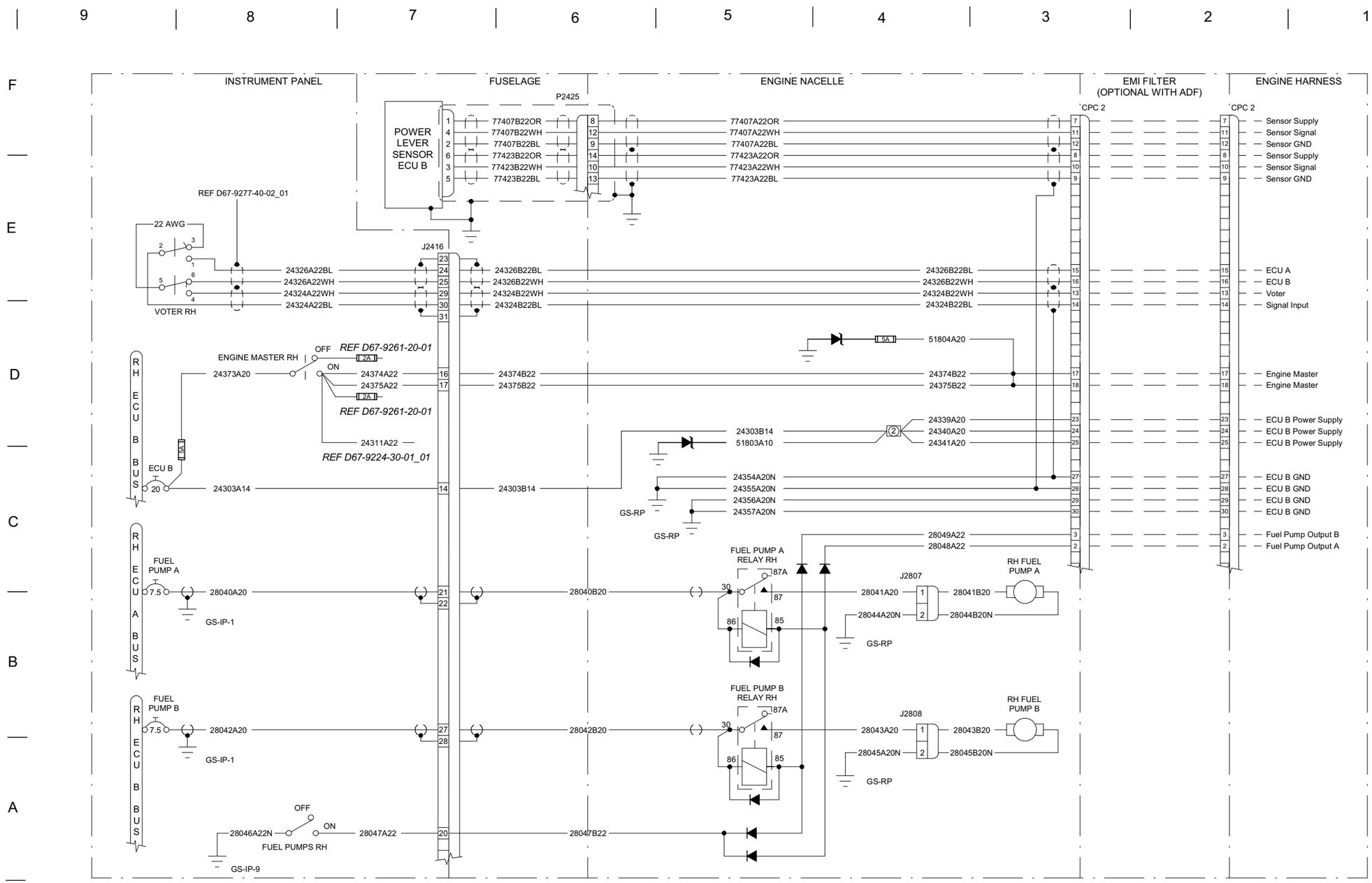
REV.	SCHEMATIC	DRAWING NO.	SHEET
B	RH ECU	D67-9277-40-03	1/2



REV.	SCHEMATIC	DRAWING NO.	SHEET
B	RH ECU	D67-9277-40-03	2/2



REV.	SCHEMATIC	DRAWING NO.	SHEET
A	RH ECU	D67-9277-40-03_01	1/2



REV.	SCHEMATIC	DRAWING NO.	SHEET
A	RH ECU	D67-9277-40-03_01	2/2