

MANDATORY SERVICE BULLETIN

NO. MSB-42-042/1

SUPERSEDES MSB-42-042

I TECHNICAL DETAILS

I.1 Category

Mandatory

I.2 Airplanes Affected

Type: DA 42

Serial Numbers: 42.004, 42.006, 42.009 to 42.156, 42.158 to 42.176,
42.178 to 42.190, 42.192 to 42.233, 42.235 to 42.246,
42.248 to 42.254, 42.256 to 42.261 42.263 to 42.269
42.AC001 to 42.AC109

I.3 Time of Compliance

Immediate Action: Strictly follow SI 42-040, latest effective issue.

All other accomplishments/ Instructions within the next 100 hours of operation but not later than 31 October 2007.

I.4 Subject

Installation of additional ECU Backup Batteries to supply electric power solely to the ECU in the course of high transient causing a short term voltage drop in case of insufficient main battery power.

ATA-Code: 72

I.5 Reason

On one occasion after starting the engines using ground power due to fully depleted main battery without following the procedures published in the AFM the airplane experienced a dual engine failure and total loss of electrical power.

In the course of the investigation ground tests on production aircraft in a similar scenario were carried out without showing the same results. Testing done by the engine manufacturer and subsequent further analysis revealed a potential for experiencing the above mentioned failures under the circumstances of failed or fully depleted main battery and non adherence to the published AFM procedures.

According to the Thielert Aircraft Engines Installation Instructions, the alternator of the engine is viewed as the engine's own electrical power source. The battery is the source of electric power in the electrical system of the aircraft. The alternator is certified as part of the engine. The FADEC, alternator and battery are wired in such a way that the FADEC electrical power supply is provided by the alternator in the event of a failure of the battery as required by the Thielert Aircraft Engines Installation Instructions. It has been observed, that the alternator is not able to provide adequate electric power under such circumstances. Inrush currents of electric consumers may cause short term voltage drops (3 to 5 ms) which trigger a FADEC reset. During such a reset which lasts about 1.28 seconds the FADEC gives no commands to the fuel injectors or the propeller control system. This leads to a sudden engine RPM drop due to no combustion and a propeller auto feather command with subsequent insufficient electrical power generation if the engine RPM are below a certain limit. This results in a total loss of engine thrust and electric power.

I.6 Concurrent Documents

EASA Safety Information Notice No.: 2007 -08, Issued 13 April 2007

I.7 Approval

The technical information or instructions contained in this document relate to the Design Change Advisory No. MÄM 42-240, which has been approved under the authority of EASA Design Organization Approval No. EASA.21J.052.

The technical content of this document has been approved und the authority of DOA No. EASA.21J.052.

I.8 Accomplishment/Instructions

Strictly follow SI 42-040, latest effective issue.
Comply with WI-MSB-42-042, latest effective issue.
Incorporate TR-MÄM-42-240
Incorporate AMM-TR-MÄM 42-240

I.9 Mass (Weight) and CG

Update the Weight and Balance report of the aircraft in accordance with AMM Airplane Maintenance Manual, Doc. No. 7.02.01, latest effective issue.

II PLANNING INFORMATION

II.1 Material & Availability

See WI-MSB-42-042, latest effective issue.

II.2 Special Tools

See WI-MSB-42-042, latest effective issue.

II.3 Labor Effort

Approx. 7 to 9 hours, depending on airplane configuration

II.4 Credit

For credit contact Diamond Aircraft.

II.5 Reference Documents

Diamond Aircraft DA 42 Airplane Maintenance Manual, Doc. No. 7.02.01, latest effective issue.

WI-MSB-42-042, latest effective issue.

AMM-TR-MÄM 42-240

TR-MÄM-42-240

SI 42-040

III REMARKS

1. All measures must be carried out by a certified aircraft station or a certified aircraft mechanic.
2. Accomplishment of the measures must be confirmed in the log book.
3. In case of any doubt, contact Diamond Aircraft Industries.

EXECUTION REPORT

for MSB 42-042/1

AIRPLANE DATA

Airplane Serial Number: _____

Airplane Registration: _____

Airplane Operator: _____

Hours of operation of airplane: _____

No. of landings: _____

Hours of operation-engine LH: _____

RH: _____

Typical operation of airplane: private, club, training, other _____

Date, Name, Sign

Please fax the completed form to Fax No. **43-2622-26700-369 or e-mail to
airworthiness@diamond-air.at

WORK INSTRUCTION

WI-MSB-42-042

„INSTALLATION OF ECU BACKUP BATTERIES“

I GENERAL INFORMATION

I.1 Subject:

Installation of ECU backup batteries and modifications to the electrical system.

I.2 Reference Documents:

Diamond Aircraft DA42 Airplane Maintenance Manual, Doc. No. 7.02.01, latest effective issue.

I.3 Remarks:

- a) The work must be carried out by a certified aircraft service station or a certified aircraft maintenance mechanic. In case of doubt, contact Diamond Aircraft.
- b) All works, particular those that are not especially described in this work instruction, have to be carried out in accordance with the referenced maintenance manual.

II DRAWINGS, SPECIAL TOOLS & MATERIALS

II.1 Drawings:

- D60-2463-01-00, Battery Box Installation
- D60-2463-21-00, Diode Assembly
- D60-2463-24-00, LH Battery/Diode Cable
- D60-2463-25-00, RH Battery/Diode Cable
- D60-2463-26-00, Battery Serial Connection Cable
- D60-2463-27-00, Batteries Ground Cables
- D60-2463-28-00, Excitation Battery Fuse Assy
- D60-2463-29-00, Fuse Assembly, 5A
- D60-2463-30-00, Cable, Diode Assembly
- D60-2463-31-00-SB, Adapter Harness 1
- D60-2463-32-00-SB, Adapter Harness 2
- D60-2463-50-00, Battery Mounting for ECU
- D60-9224-30-01-SB, Schematic, Electrical System
- D60-9224-30-02-SB, Schematic, Electrical System w/o GPC
- D60-9224-30-01_02, Schematic, Electrical System, TAE 125-02

II.2 Special Tools:

- D60-2463-50-BV, Drilling Template

II.3 Material

Qty	Description	Part Number
Material for Instructions given in Section III.2.		
2	Battery Mount for ECU	D60-2463-50-00
6	Screw	ISO 7380-6x20-A2
6	Washer	DIN 125-M6-A2
6	Locknut	DIN 985-M6-A2
1	LH USense Cable	D60-2407-31-00
1	RH USense Cable	D60-2407-32-00
2	Fuse Assembly, USense	D60-2407-33-00
1	Diode Assembly	D60-2463-21-00
1	LH Relay/Diode Cable	D60-2463-22-00
1	RH Relay/Diode Cable	D60-2463-23-00
1	LH Battery/Diode Cable	D60-2463-24-00
1	RH Battery/Diode Cable	D60-2463-25-00
2	Battery Serial Connection Cable	D60-2463-26-00
1	Batteries Ground Cables	D60-2463-27-00
1	Excitation Battery Fuse Assy	D60-2463-28-00
2	Fuse Assembly, 5A	D60-2463-29-00
2	Cable, Diode Assy	D60-2463-30-00
3	Adapter Harness 1	D60-2463-31-00-SB
3	Adapter Harness 2	D60-2463-32-00-SB
1	Terminal Block	MS27212-1-8
1	Terminal Block Cover	MS18029-11S-8
3	Screw	MS35206-216
3	Washer	AN960-C4
3	Locknut	MS21083B04
1	Grommet diameter 6mm	5616632
1	Drilling Template	D60-2463-50-BV
2	Insulating Boot	MS25171-3S
8	Locknut	MS21044N06
8	Washer	AN960D6L
1	Faston Receptacle	245-5446
Material for Instructions given in Section III.3.		
2	Battery Mount for ECU	D60-2463-50-00
6	Screw	ISO 7380-6x20-A2
6	Washer	DIN 125-M6-A2
6	Locknut	DIN 985-M6-A2
1	LH USense Cable	D60-2407-31-00
1	RH USense Cable	D60-2407-32-00
2	Fuse Assembly, USense	D60-2407-33-00
1	Diode Assembly	D60-2463-21-00

Qty	Description	Part Number
1	LH Relay/Diode Cable	D60-2463-22-00
1	RH Relay/Diode Cable	D60-2463-23-00
1	LH Battery/Diode Cable	D60-2463-24-00
1	RH Battery/Diode Cable	D60-2463-25-00
2	Battery Serial Connection Cable	D60-2463-26-00
1	Batteries Ground Cables	D60-2463-27-00
1	Excitation Battery Fuse Assy	D60-2463-28-00
2	Fuse Assembly, 5A	D60-2463-29-00
2	Cable, Diode Assy	D60-2463-30-00
1	Grommet diameter 6mm	5616632
1	Drilling Template	D60-2463-50-BV
2	Insulating Boot	MS25171-3S
1	Rubber	D60-3553-41-02

II.4 Recommended consumables

Qty	Description	Part Number
A/R	Cable Tie	PLT1MM30
A/R	Cable Tie	PLT2SM30
A/R	Cable Tie Base	EMS-A-D0
A/R	Spiral Wrap	T25N-C

III INSTRUCTIONS

III.1 General

1	Open the front baggage compartment doors. Refer to Section 52-40 of the AMM.
2	Remove the baggage compartment rear covers in accordance with the AMM.
3	Disconnect the airplane main battery in accordance with the AMM, Section 24-31.
4	Disconnect the alternator excitation batteries, at the fuse and remove the fuse assembly (if not crimped onto the wire).

- 5 If the installed relay panel looks like the figure below, proceed with the instructions given in section III.2.



Figure 1

- 6 If the installed relay panel looks like the figure below, proceed with the instructions given in section III.3.

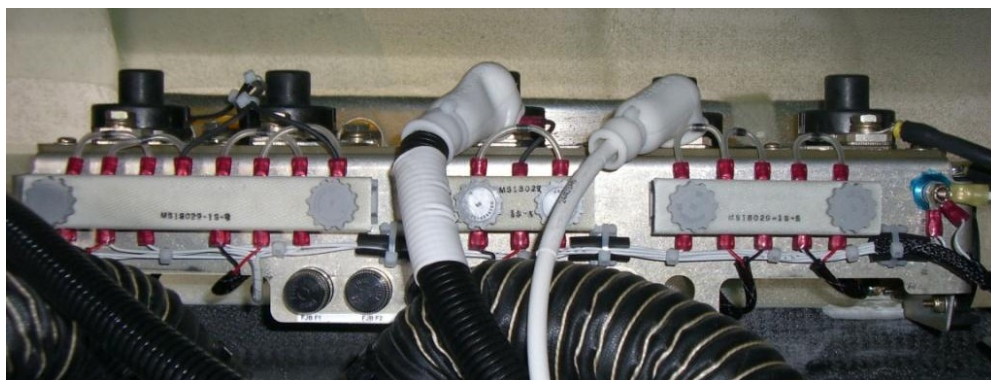
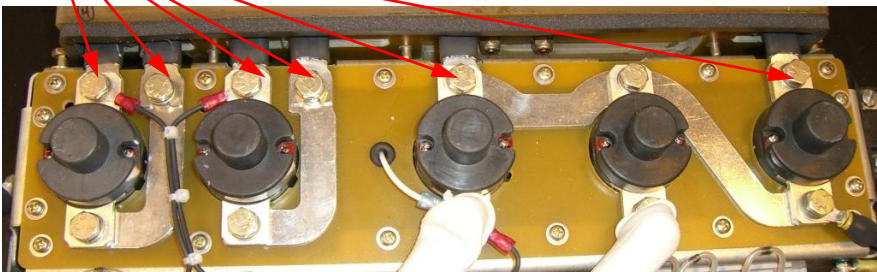

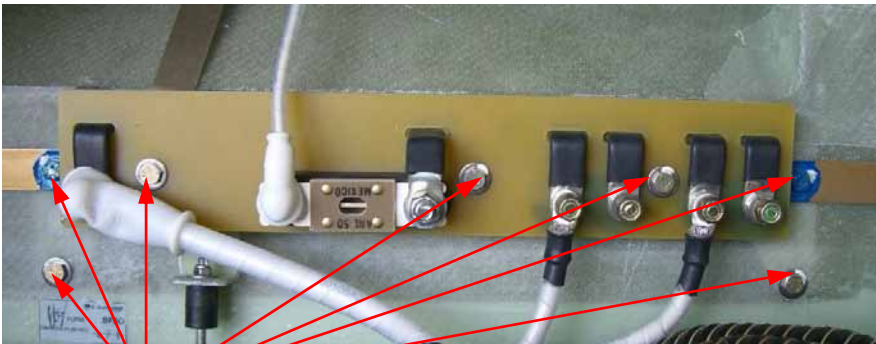



Figure 2

III.2 Instructions without terminal blocks installed

1	Remove the instrument panel cover in accordance with the AMM.
2	If the airplane is equipped with an oxygen system, disconnect the connector P2418, which is located on the left side of the front landing gear spar, on the instrument panel side.
3	If the airplane is equipped with an oxygen system, remove the connector J2418, mounted with 4 screws to the front landing gear spar.
4	<p>Loosen the 6 bolts of the relay panel in the forward baggage compartment using an "offset box wrench", as shown below. Modifications may be necessary to the wrench to gain access to the bolts of the relays.</p> <p>loosen this bolts</p>  <p>Figure 3</p> <p>if necessary grind here</p>  <p>Figure 4</p>

5	<p>Remove the 7 screws of the relay panel on the instrument panel side, as shown below.</p>  <p style="text-align: center;">Figure 5</p> <p style="text-align: center;">remove this screws</p>
6	<p>Disconnect the cables 24405A6N (EPU Ground), 24403A6 (EPU Plus) and 24001A2N (Battery Ground) from the relay panel. If more clearance is required or an oxygen system is installed, disconnect all wires necessary to proceed as stated in Step 7.</p>
7	<p>Move the relay panel forward, as far as possible. If the airplane is equipped with an oxygen system remove the relay panel clear of the airplane.</p>
8	<p>Modify the relay panel according the steps below.</p>
9	<p>Install the terminal block (P/N MS27212-1-8) 6 cm from the right edge (as shown below), using the hardware MS35206-216 (screw), AN960-C4 (washer) and MS21083B04 (locknut). Two holes (3.0mm) must be drilled into the relay panel first. The two most outboard mounting holes of the terminal block should be used for mounting.</p>  <p style="text-align: center;">Figure 6</p>
10	<p>Disconnect RH alternator relay coil at the inline connector on the bottom side of the relay panel.</p>

- 11 Remove the jumper from the power side of the relay to the connector. Cut-off the ring terminal and the wire (including diode) as near as possible at the connector as shown below.



Figure 7a



Figure 7b



Figure 7c

- 12 Install the adapter harnesses D60-2463-31-00-SB and D60-2463-32-00-SB onto the connectors as shown below.



Figure 8

- 13 Repeat the steps above for the LH alternator relay and for the battery relay.
NOTE: The battery relay does not have a diode installed as the alternator relays.
NOTE: On the battery relay are two wires connected. The wire with the smaller gauge is the wire that must be removed.



Figure 9

- 14 Connect the ring terminals of the 6 adapter harnesses (D60-2463-31-00-SB and D60-2463-32-00-SB), the fuse assemblies (D60-2463-29-00), the wires 24315A14/24317A14, part of D60-2463-24-00, the wires 24316A14/24318A14, part of D60-2463-25-00 and the cable, diode assemblies (D60-2463-30-00) to the terminal block as shown below.

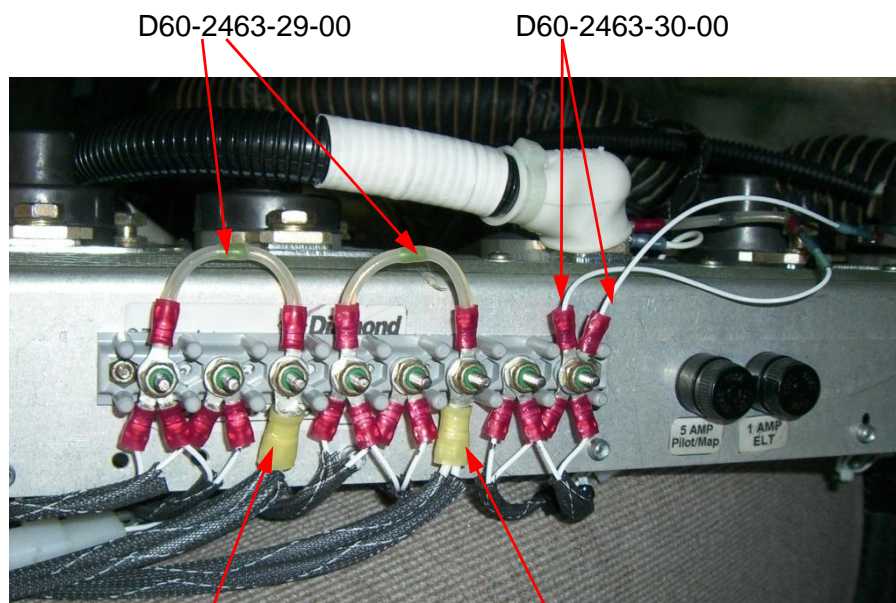


Figure 10a

24316A14 / 24318A14

24315A14 / 24317A14

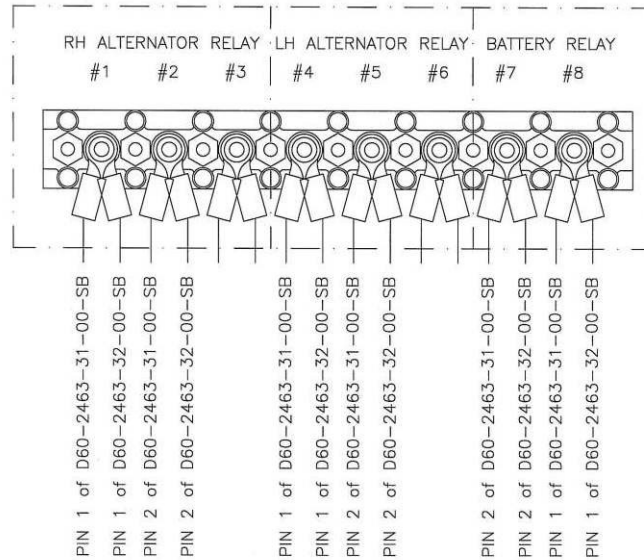


Figure 10b

15 Install the terminal block cover P/N MS18029-11S-8.

16 Install the batteries ground cables assembly (D60-2463-27-00) to the left ground stud on the relay panel and route the wires to the ECU backup batteries.

D60-2463-27-00

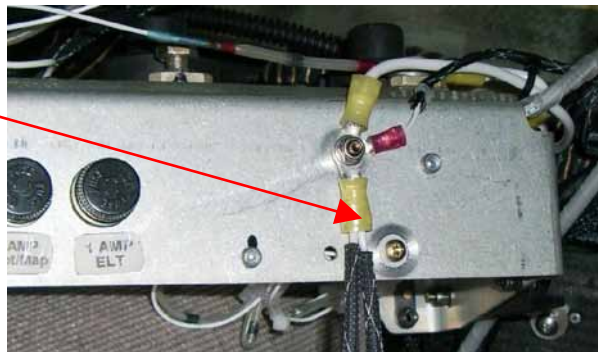


Figure 18

- 17 Install the relay panel including the diode assy D60-2463-21-00 on the right side of the front landing gear spar (instrument panel side) as shown below, using the two mounting bolts of the relay panel.

D60-2463-21-00



Figure 11

- 18 Drill the 6 holes (3 left, 3 right) diameter 6,3 mm (0.25") for the ECU backup batteries mounting brackets by using the drilling template D60-2463-50-BV. Refer also to figure 12a and 12b.
- NOTE:** The drilling template is used for LH and RH side, watch the markings on the template itself while marking and drilling.
- NOTE:** The drill holes are located in the area of the lightning protection strap, drill through both, the LP strap and the FRP.
- NOTE:** If necessary, relocate the Excitation Batteries on the left side to gain enough clearance for the ECU Backup Batteries, Refer also to figure 12c.



Figure 12a

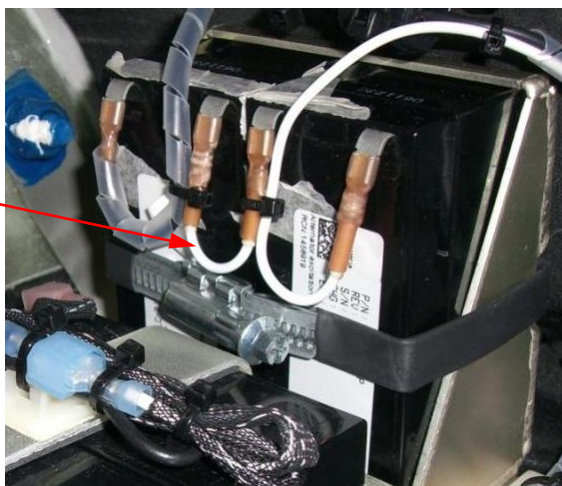

Recommended positions for cable tie bases



Figure 12b



Figure 12c

19	Mount the ECU backup battery brackets using the screws, washers and locknuts. NOTE: Newer versions of the ECU backup battery assemblies are already pre-assembled whereby the screws, the foam, the batteries and the clamp are already installed. Then the washers and locknuts have to be installed only and the two steps below do not apply.
20	Insert the supplied foam into the mounting brackets.
21	Install the ECU backup batteries and tighten the clamps, as shown on drawing D60-2463-50-00. CAUTION: Isolate the contacts of the batteries prior to the installation of the clamp to prevent short circuits.
22	Install the battery serial connection cables (D60-2463-26-00) onto the positive and negative terminals of each battery pack to gain 24V. Refer also to figure 13.
	 <p>D60-2463-26-00</p> <p>Figure 13 (LH shown)</p>
23	If the fuse of the excitation batteries is crimped onto its wires, cut-off the fuse and crimp the faston receptacle P/N 245-5446 onto this wires 24027A22 and 24028A22.
	 <p>Figure 14</p>
24	Connect the fuse assembly D60-2463-28-00 to the faston, installed above.

- 25 If the airplane is not equipped with an oxygen system, replace rubber plug with grommet dm 6 mm (P/N 5616632).
If the airplane is equipped with an oxygen system, drill a hole diameter 8,5 mm adjacent to the existing holes (see Figure 15) and protect edges with grommet diameter 6 mm (P/N 5616632).

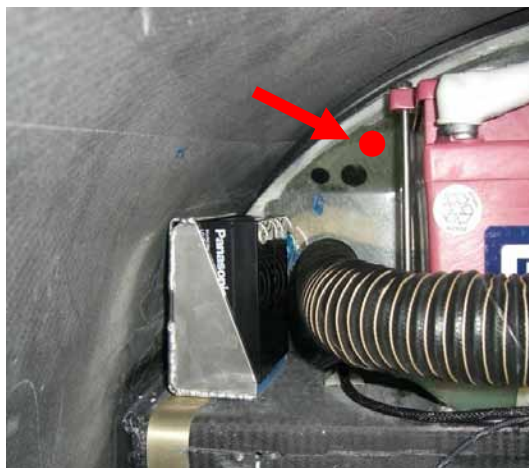


Figure 15

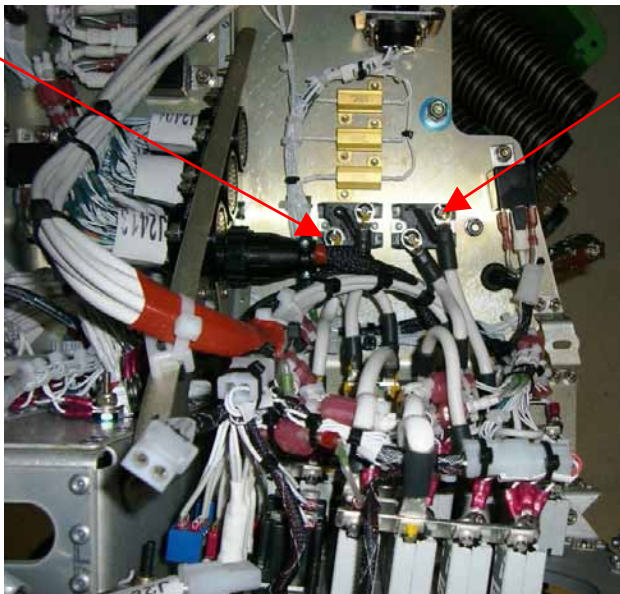
- 26 Route the wires 24315A14 and 24316A14 (part of D60-2463-24-00 and D60-2463-25-00) through the front landing gear spar.
- 27 Disconnect the cables 24304A8 and 24305A8 at the LH and RH alternator relays respectively.

- 28 Install the cables D60-2463-22-00 (LH relay) and D60-2463-23-00 (RH relay), which are part of the diode assembly D60-2463-21-00, onto the above mentioned terminals of the alternator relays, including the insulating boots P/N MS 25171-3S.



Figure 16

CAUTION: The cables D60-2463-22-00 and D60-2463-23-00 must have enough clearance to the canopy arm when in closed position.

29	Connect the cable 24304A8 (including insulating boot) to the positive side (marked "+") of the diode, installed on the top of the bracket. Refer also to drawing D60-2463-21-00 and the step above.
30	Connect the cable 24305A8 (including insulating boot) to the positive side (marked "+") of the diode, installed on the bottom of the bracket. Refer also to drawing D60-2463-21-00 and the step above.
31	Crimp the supplied ring terminals onto the wires 24315A14 and 24316A14, part of D60-2463-24-00 and D60-2463-25-00, prior routed through the front landing gear spar.
32	<p>Connect the wires 24315A14 and 24316A14 to the two diodes installed on the bottom of the instrument panel sheet metal. Refer also to figure 17.</p> <p>CAUTION: Attention should be paid to the polarity of the diodes.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>24315A14</p>  </div> <div style="text-align: center;"> <p>24316A14</p> </div> </div> <p style="text-align: center;">Figure 17</p>
33	Remove the left and right outboard nacelle access covers.
34	Locate connector J2443 (USense) in the left nacelle and J2442 (USense) in the right nacelle.
35	Disconnect the connectors mentioned above and seal them by appropriate heatshrink.
36	Connect the LH USense cable D60-2407-31-00, including Fuse Assembly, USense, D60-2407-33-00 to the voltage sense connector of the alternator harness in the left nacelle.
37	Connect the RH USense cable D60-2407-32-00, including Fuse Assembly, USense, D60-2407-33-00 to the voltage sense connector of the alternator harness in the right nacelle.

- 38 Connect the Fuse Assembly, USense, D60-2407-33-00 to the top terminal of the fuse holder. Refer also to figure 19.

LH shown, RH mirrored

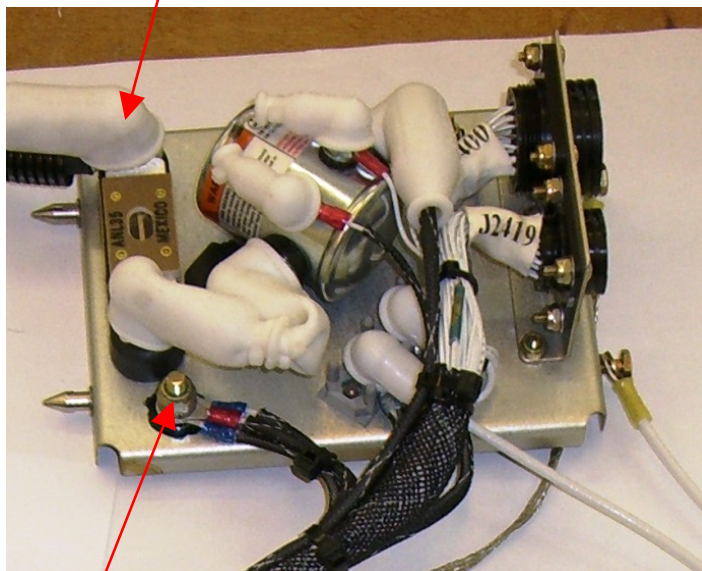




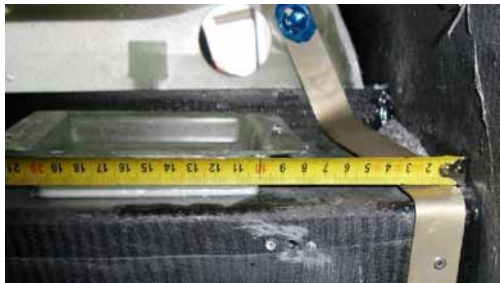
Figure 19

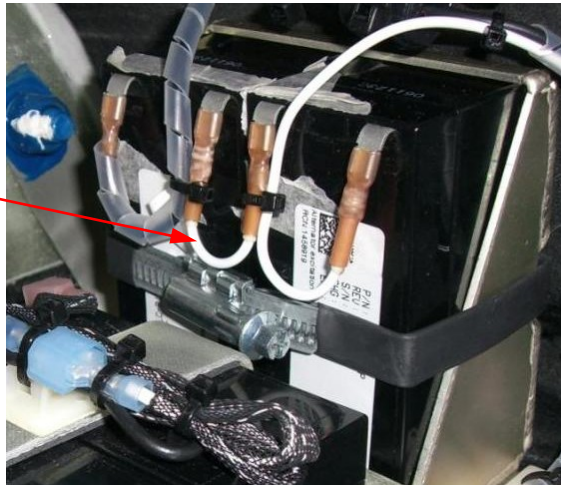
Connect the ring terminal of the cable here

- 39 Secure all cables using appropriate cable ties and cable tie bases.
- 40 Clean working areas, check for foreign objects.
- 41 Install the main battery, if removed.
- 42 Install the instrument panel cover in accordance with the AMM.
- 43 Connect the ECU backup batteries.
- 44 Connect the alternator excitation batteries.
- 45 Connect the main battery in accordance with the AMM, Section 24-31.
- 46 Install the baggage compartment rear covers.
- 47 Conduct function check of the electrical system as shown below:
- During all this test the engines must not stop.
 - Start both engines and run them on IDLE.
 - Switch OFF the LH alternator switch.
 - Pull the LH ECU Bus circuit breaker.
 - Switch OFF the RH alternator switch.
 - Pull the RH ECU Bus circuit breaker.
 - Switch OFF the electric master switch. Both engines must still run. All other electrical equipment will loose power.
- Bring the system back to normal operating condition.
- 48 Check all altered, replaced, repaired parts for proper function.

49	Test all systems in working area for proper function.
50	Update the current weight and balance report of the airplane with following values: Lever arm: 1270 mm Mass: 3.0 kg
51	Make appropriate entries into aircraft log.
52	Insert the temporary AFM revision AFM-TR-MÄM 42-240 into the airplane flight manual.
53	Insert the temporary AMM revision AMM-TR-MÄM-42-240 into the airplane maintenance manual.

III.3 Instructions with terminal blocks installed

1	Connect the fuse assembly D60-2463-28-00 to wires (24027A22 and 24028A22) of the excitation battery.
2	<p>Drill the 6 holes (3 left, 3 right) diameter 6,3 mm (0.25") for the ECU backup batteries mounting brackets by using the drilling template D60-2463-50-BV. Refer also to figure 20a and 20b.</p> <p>NOTE: The drilling template is used for LH and RH side, watch the markings on the template itself while marking and drilling.</p> <p>NOTE: The drill holes are located in the area of the lightning protection strap, drill through both, the LP strap and the FRP.</p> <p>NOTE: If necessary, relocate the Excitation Batteries on the left side to gain enough clearance for the ECU Backup Batteries, Refer also to figure 20c.</p> <div data-bbox="609 766 1101 1131" data-label="Image">  </div> <p data-bbox="790 1137 933 1171">Figure 20a</p> <p data-bbox="252 1205 826 1238">Recommended positions for cable tie bases</p> <div data-bbox="620 1288 1104 1650" data-label="Image">  </div> <p data-bbox="790 1675 933 1709">Figure 20b</p> <div data-bbox="606 1720 1107 2002" data-label="Image">  </div> <p data-bbox="790 2045 933 2078">Figure 20c</p>

3	<p>Mount the ECU backup battery brackets using the screws, washers and locknuts.</p> <p>NOTE: Newer versions of the ECU backup battery assemblies are already pre-assembled whereby the screws, the foam, the batteries and the clamp are already installed. Then the washers and locknuts have to be installed only and the two steps below do not apply.</p>
4	<p>Insert the supplied foam into the mounting brackets.</p>
5	<p>Install the ECU backup batteries and tighten the clamps, as shown on drawing D60-2463-50-00.</p> <p>CAUTION: Isolate the contacts of the batteries prior to the installation of the clamp to prevent short circuits.</p>
6	<p>Install the battery serial connection cables (D60-2463-26-00) onto the positive and negative terminals of each battery pack to gain 24V. Refer also to figure 21</p> <div data-bbox="245 891 467 925" data-label="Text"> <p>D60-2463-26-00</p> </div> <div data-bbox="571 757 1134 1240" data-label="Image">  </div> <div data-bbox="708 1258 1002 1296" data-label="Caption"> <p>Figure 21 (LH shown)</p> </div>
7	<p>Remove the instrument panel cover in accordance with the AMM.</p>

- 8 If the airplane is not equipped with an oxygen system, replace rubber plug with grommet dm 6 mm (P/N 5616632).
If the airplane is equipped with an oxygen system, drill a hole diameter 8,5 mm adjacent to the existing holes (see Figure 22) and protect edges with grommet diameter 6 mm (P/N 5616632).

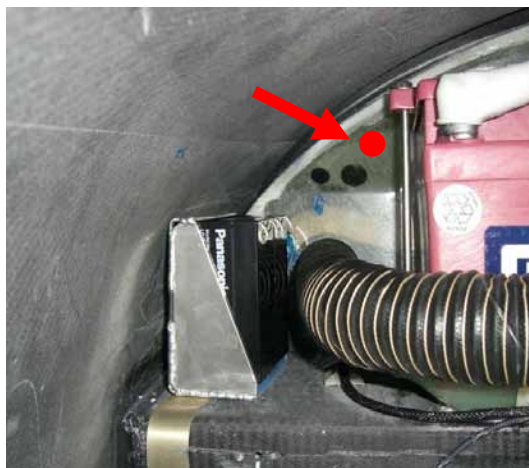


Figure 22

- 9 Route the wires 24315A14 and 24316A14 (part of D60-2463-24-00 and D60-2463-25-00) through the front landing gear spar, whereby the fuse holder and the wires 24317A14 and 24318A14 remain in the front baggage compartment.

- 10 Install the "Diode Assembly" D60-2463-21-00 onto the front landing gear spar by using the two mounting screws of the forward relay panel. Refer also to figure 23.

D60-2463-21-00



Figure 23

- 11 Disconnect the cables 24304A8 and 24305A8 at the LH and RH alternator relays respectively.

- 12 Install the cables D60-2463-22-00 (LH relay) and D60-2463-23-00 (RH relay), which are part of the diode assembly D60-2463-21-00, onto the above mentioned terminals of the alternator relays, including the insulating boots P/N MS 25171-3S.

D60-2463-22-00

D60-2463-23-00



24304A8

24305A8

Figure 24

CAUTION: The cables D60-2463-22-00 and D60-2463-23-00 must have enough clearance to the canopy arm when in closed position.

- 13 Connect the cable 24304A8 (including insulating boot) to the positive side (marked "+") of the diode, installed on the top of the bracket. Refer also to drawing D60-2463-21-00.
- 14 Connect the cable 24305A8 (including insulating boot) to the positive side (marked "+") of the diode, installed on the bottom of the bracket. Refer also to drawing D60-2463-21-00.
- 15 Crimp the supplied ring terminals (P/N 130094-0) onto the wires 24315A14 and 24316A14, part of D60-2463-24-00 and D60-2463-25-00.

- 16 Connect the wires 24315A14 and 24316A14 to the two diodes installed on the bottom of the instrument panel sheet metal. Refer also to figure 25.
CAUTION: Attention should be paid to the polarity of the diodes.

24315A14

24316A14

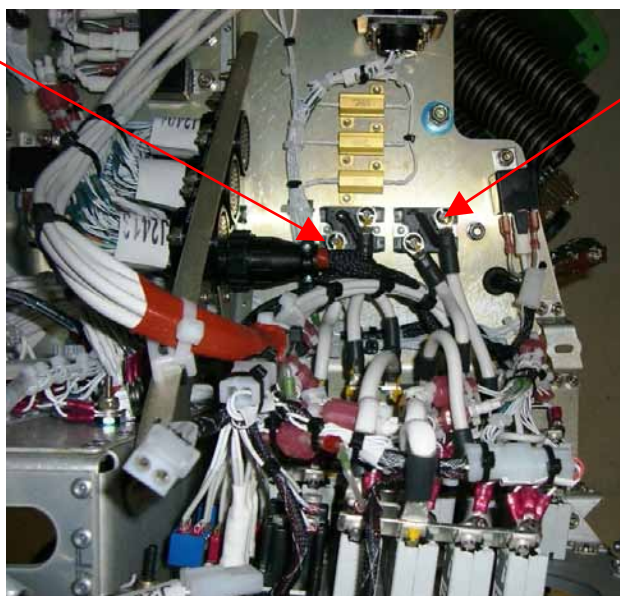


Figure 25

- 17 If the airplane is equipped with an oxygen system, remove the main battery and remove the oxygen bottle in accordance with the AMM, Section 35-10.
- 18 Drill a hole (maximum 65mm diameter) into the mounting bracket of the oxygen bottle to gain access to the terminal block mentioned in the steps below.

CAUTION: Insert a sheet metal or equivalent between the bracket and the relay panel to avoid damage to the relay panel.

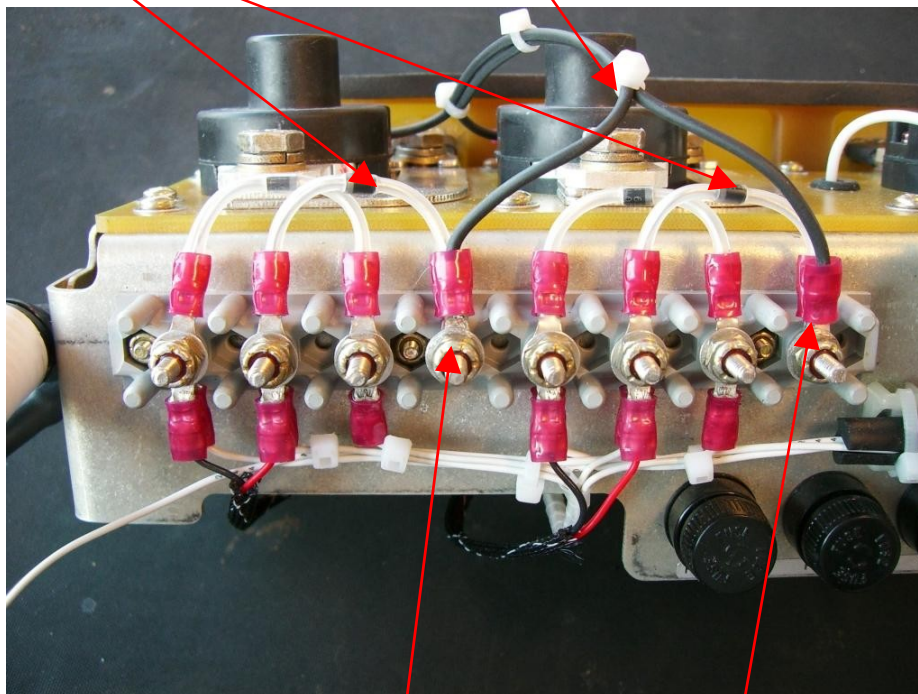


Figure 26

- 19 Disconnect the two wires connected to the alternator relay power side and sealed them with appropriate heatshrink. Replace the diode assemblies with the fuse assemblies D60-2463-29-00. Connect wires 24315A14 / 24317A14 and 24316A14 / 24318A14, part of D60-2463-24-00 and D60-2463-25-00. Refer to Figure 27

Replace diode assy's

Disconnect and seal wires

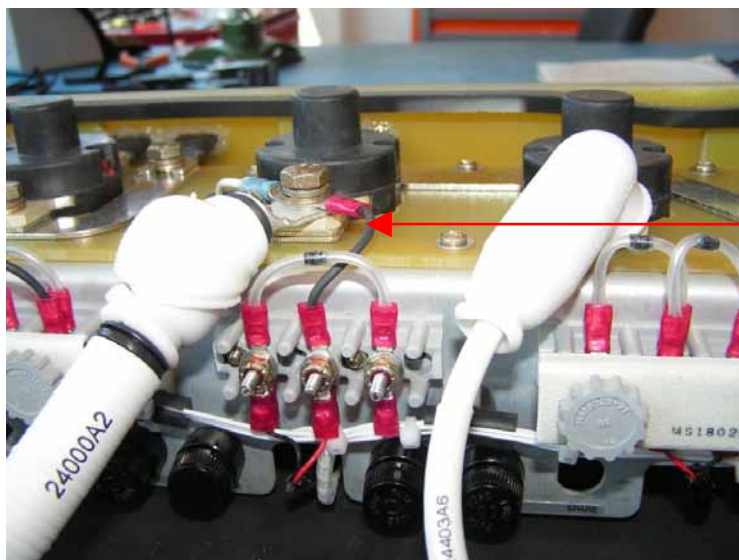


Connect wires 24316A14 / 24318A14 and 24315A14 / 24317A14

Figure 27

- 20 Install the batteries ground cables assembly (D60-2463-27-00) to the left ground stud on the relay panel and route the wires to the ECU backup batteries.

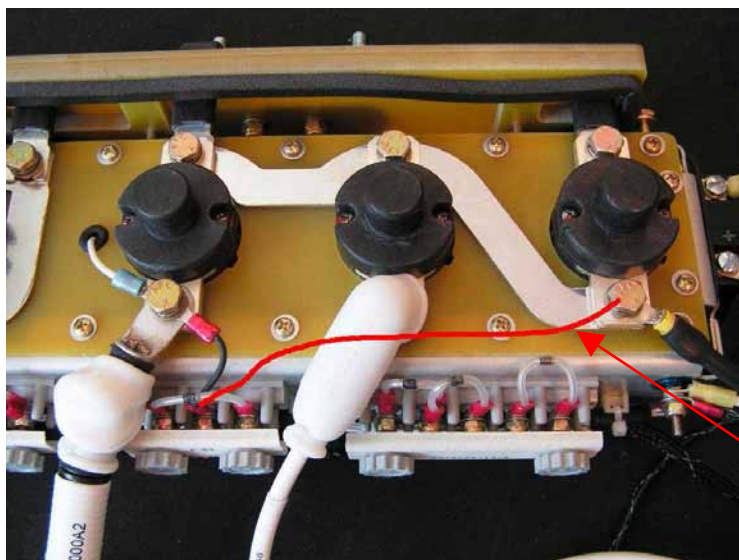
- 21 Replace the positive coil connection of the battery relay with the "Cable, diode assembly" D60-2463-30-00. Note the polarity of the diode. Refer to drawing D60-9224-30-01-SB, D60-9224-30-02-SB or D60-9224-30-02_02 and also to figure 28.



Replace cable with
D60-2463-30-00

Figure 28

- 22 Install the second "Cable, diode assembly" D60-2463-30-00 between the battery bus and the positive coil connection of the battery relay. Note the polarity of the diode. Refer to drawing D60-9224-30-01-SB, D60-9224-30-02-SB or D60-9224-30-02_02 and also to figure 29.



Install D60-2463-30-00

Figure 29

- 23 If the airplane is equipped with an oxygen system, install the supplied rubber D60-3553-41-02 onto the hole prior drilled into the oxygen bottle mounting bracket.

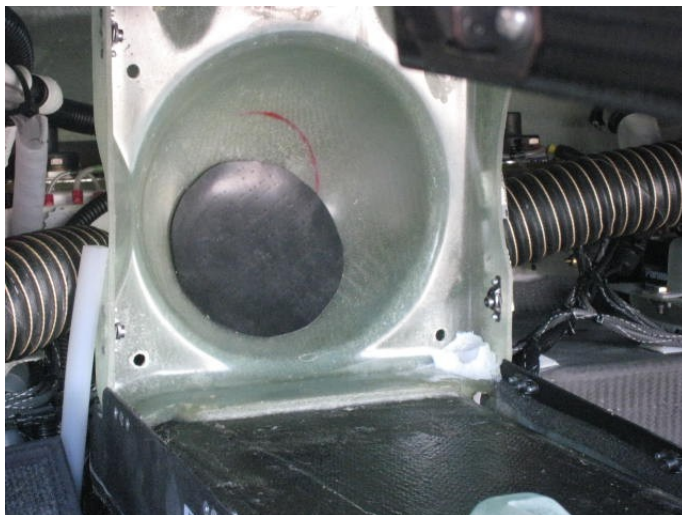


Figure 30

- | | |
|----|--|
| 24 | Remove the left and right outboard nacelle access covers. |
| 25 | Locate connector J2443 (USense) in the left nacelle and J2442 (USense) in the right nacelle. |
| 26 | Disconnect the connectors mentioned above and seal them by appropriate heatshrink. |
| 27 | Connect the LH USense cable D60-2407-31-00, including Fuse Assembly, USense, D60-2407-33-00 to the voltage sense connector of the alternator harness in the left nacelle. |
| 28 | Connect the RH USense cable D60-2407-32-00, including Fuse Assembly, USense, D60-2407-33-00 to the voltage sense connector of the alternator harness in the right nacelle. |

- 29 Connect the Fuse Assembly, USense, D60-2407-33-00 to the top terminal of the fuse holder. Refer also to figure 31.

LH shown, RH mirrored

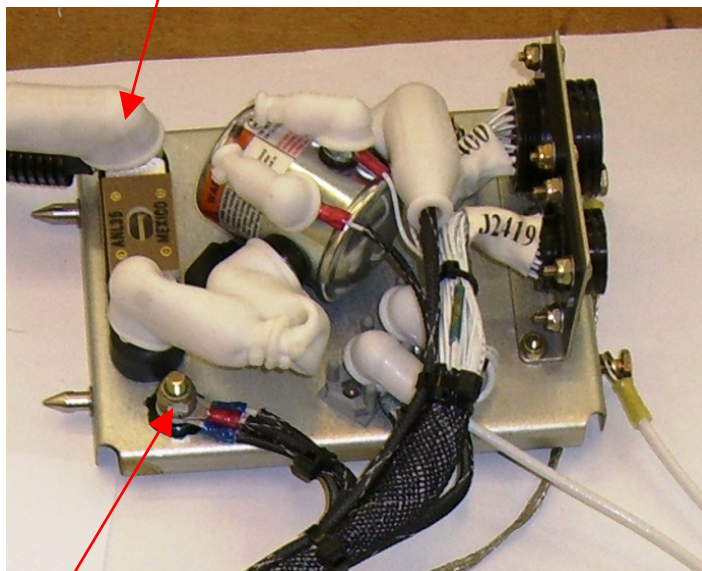
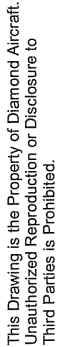


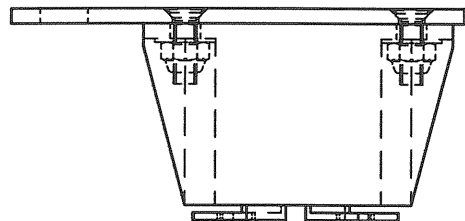
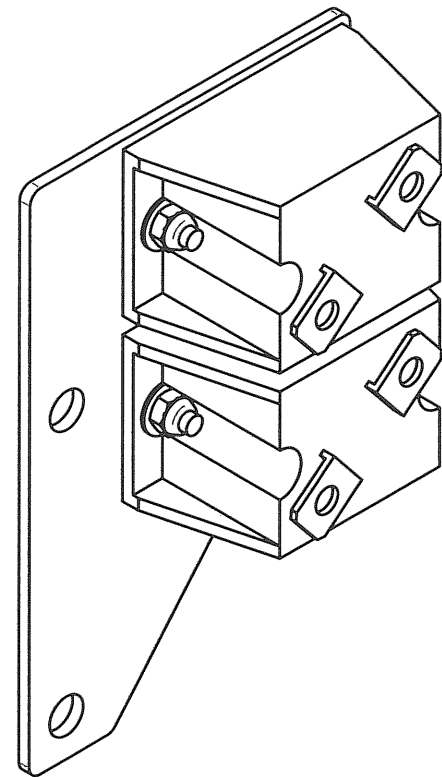
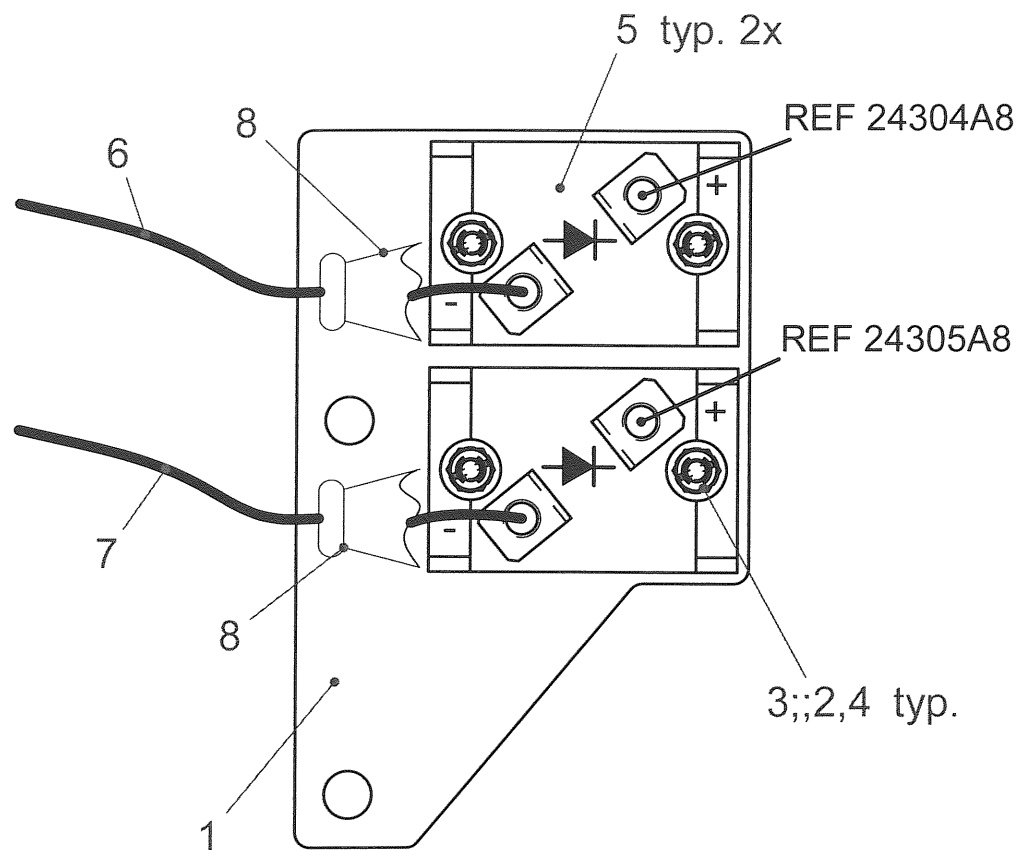
Figure 31

Connect the ring terminal of the cable here

- 30 Secure all cables using appropriate cable ties and cable tie bases.
- 31 Clean working areas, check for foreign objects.
- 32 Install the oxygen bottle, if removed. Refer to Section 35-10 of the AMM.
- 33 Install the main battery, if removed. Refer to Section 24-31 of the AMM.
- 34 Install the instrument panel cover in accordance with the AMM.
- 35 Connect the ECU backup batteries.
- 36 Connect the alternator excitation batteries.
- 37 Connect the main battery in accordance with the AMM, Section 24-31.
- 38 Install the baggage compartment rear covers.
- 39 Conduct function check of the electrical system as shown below:
- During all this test the engines must not stop.
 - Start both engines and run them on IDLE.
 - Switch OFF the LH alternator switch.
 - Pull the LH ECU Bus circuit breaker.
 - Switch OFF the RH alternator switch.
 - Pull the RH ECU Bus circuit breaker.
 - Switch OFF the electric master switch. Both engines must still run. All other electrical equipment will loose power.
 - Bring the system back to normal operating condition.

40	Check all altered, replaced, repaired parts for proper function.
41	Test all systems in working area for proper function.
42	Update the current weight and balance report of the airplane with following values: Lever arm: 1270 mm Mass: 2.9 kg
43	Make appropriate entries into aircraft log.
44	Insert the temporary AFM revision AFM-TR-MÄM 42-240 into the airplane flight manual.
45	Insert the temporary AMM revision AMM-TR-MÄM-42-240 into the airplane maintenance manual.





8	2	-	MS25171-1S	Insulating Boot		
7	1	-	D60-2463-23-00	RH Relay/Diode Cable		Diamond
6	1	-	D60-2463-22-00	LH Relay/Diode Cable		Diamond
5	2	-	395-9163	Diode, T70HF40		RS Components
4	4	-	DIN 985-M3-A2	Locknut		
3	4	-	DIN 963-M3x10	Screw		
2	4	-	DIN 125A-3.2-A2	Washer		
1	1	-	D60-2463-21-01	Mounting Bracket, Diodes		Diamond Aircraft
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremnitzner Date 27. JULI 2007 Name			Checked: M. Kowarsch Date 23. JULI 2007 Name		General Tolerance : ISO 2768 medium 	Scale: 1:1
				Next Higher Assembly : D60-2463-00-00	Title : Diode Assembly	
						
				DA 42 Twin Star	Drawing Number: D60-2463-21-00	
"a"	MÄM 42-240a	12.07.07	Kowarsch			
".."	MÄM 42-240	18.04.07	Kowarsch			
Rev.	Change	Date	Name	Saved under : D60-2463-21-00a.dft		

Weight: 0,088 kg
Calculated Weight: calculated

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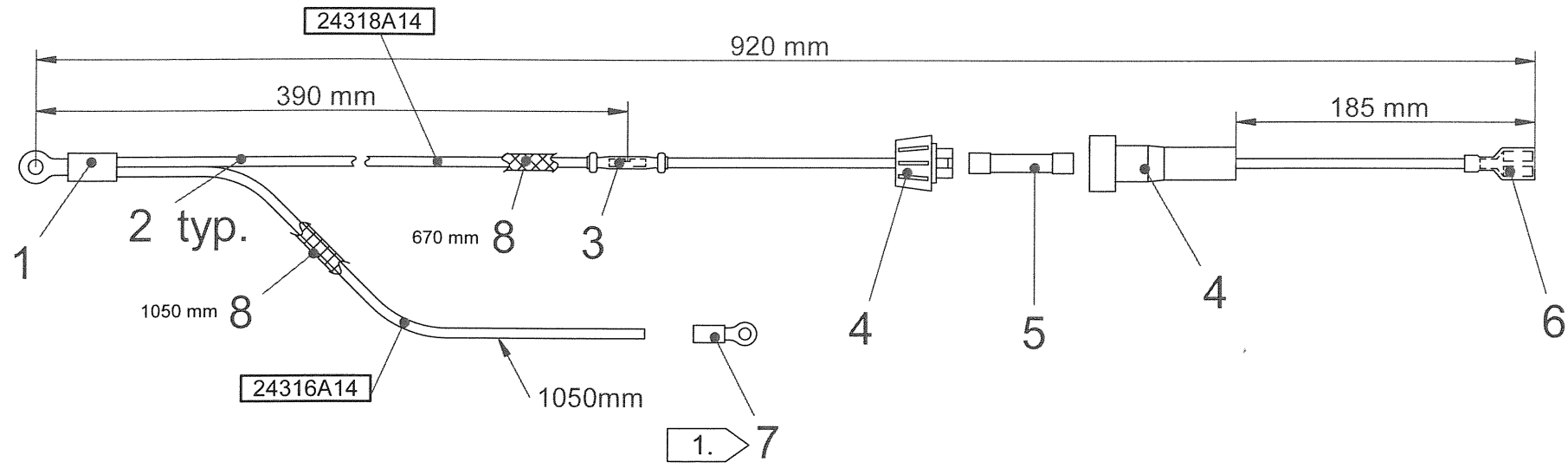
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NOTES:

1. SUPPLY LOOSE.

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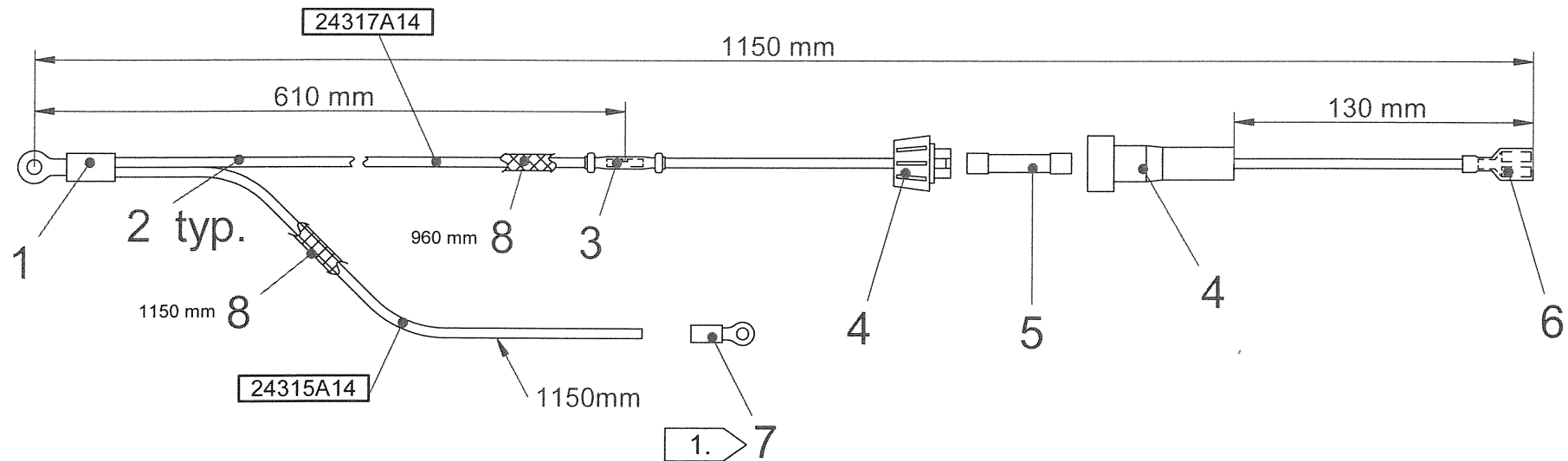
8	1.72m	-	5021000632	Expando		Bently Harris
7	1	-	130094-0	Ring Terminal		AMP
6	1	-	834410	Faston, sealed		Noviqua
5	1	-	270378	Fuse, 32A		Distrelec
4	1	-	HRJ	Fuse Holder		Cooper
3	1	-	D436-38	Splice		AMP
2	1.44m	-	M22759/16-14-9	Wire, 14 AWG		
1	1	-	35108	Ring Terminal		AMP
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremnitzer			Checked: M. Kowarsch		General Tolerance: ISO 2768 +/- 5mm	Scale: NTS
Date: 27. JUL 2007			Date: 23. JUL 2007			
			Next Higher Assembly: D60-2463-40-00_01		Title: RH Battery/Diode Cable	
"a"	MÄM 42-240a	16.07.07	Kowarsch	Drawing Number: D60-2463-25-00		Sheet 1 from 1
"-"	MÄM 42-240	25.04.07	Kowarsch			
Rev.	Change	Date	Name	Saved under: D60-2463-25-00a.dft		

Weight: N/A
Calculated Weight: N/A

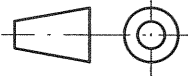

NOTES:

1. SUPPLY LOOSE.

Weight: N/A
Calculated Weight: N/A



1.

8	2.11m	-	5021000632	Expando		Bently Harris
7	1	-	130094-0	Ring Terminal		AMP
6	1	-	834410	Faston, sealed		Noviqua
5	1	-	270378	Fuse, 32A		Distrelec
4	1	-	HRJ	Fuse Holder		Cooper
3	1	-	D436-38	Splice		AMP
2	1.76m	-	M22759/16-14-9	Wire, 14 AWG		
1	1	-	35108	Ring Terminal		AMP
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremplitzer			Checked: M. Kowarsch		General Tolerance : ISO 2768 +/- 5mm	Scale: NTS
Date: 27. JULI 2007			Date: 23. JULI 2007			
				Next Higher Assembly : D60-2463-40-00_01	Title : LH Battery/Diode Cable	
						
"a"	MÄM 42-240a	16.07.07	Kowarsch	DA 42 Twin Star	Drawing Number: D60-2463-24-00	Sheet 1 from 1
"-"	MÄM 42-240	25.04.07	Kowarsch			
Rev.	Change	Date	Name	Saved under : D60-2463-24-00a.dft		

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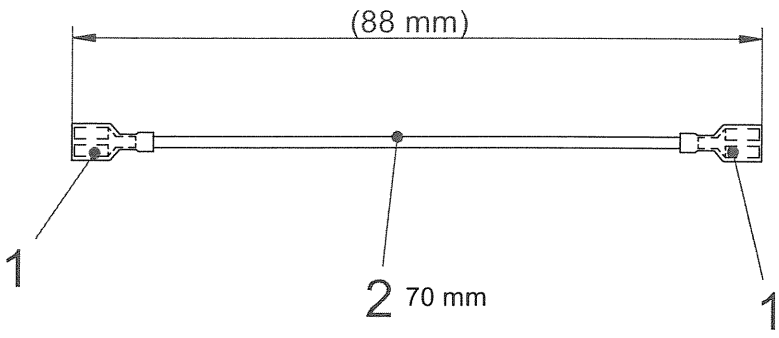
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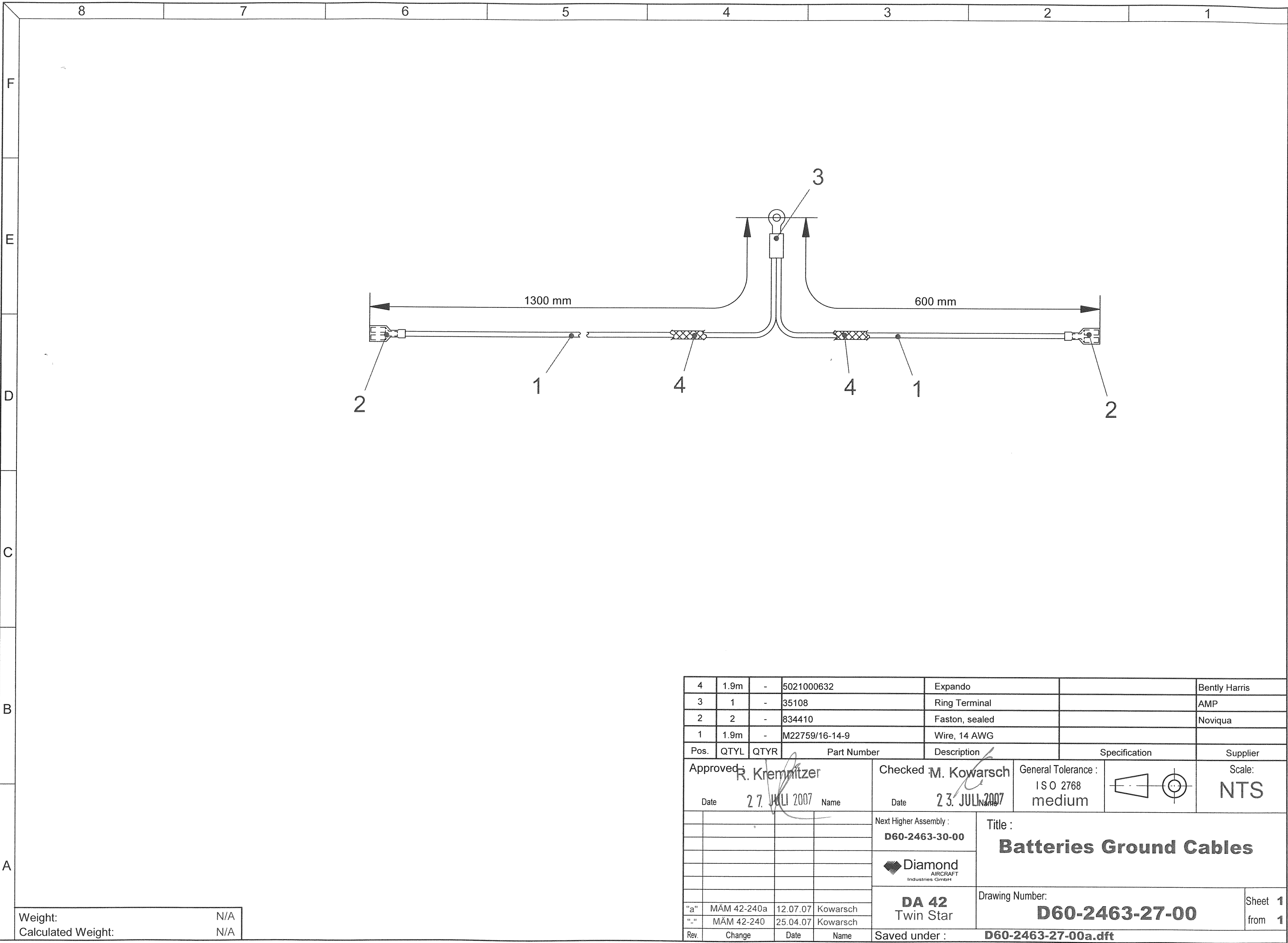
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Weight: N/A
Calculated Weight: N/A

2	0.07m	-	M22759/16-14-9	Wire, 14 AWG		
1	2	-	834410	Faston, sealed		Noviqua
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremmitzer			Checked: M. Kowarsch		General Tolerance: ISO 2768 +/- 5mm	Scale: NTS
Date: 27. JULI 2007			Date: 23. JULI 2007			
				Next Higher Assembly:	Title: Battery Serial Connection Cable	
				DA 42 Twin Star	Drawing Number: D60-2463-26-00	
					Sheet 1 from 1	
Rev.	Change	Date	Name	Saved under: D60-2463-26-00a.dft		



4	1.9m	-	5021000632	Expando		Bently Harris
3	1	-	35108	Ring Terminal		AMP
2	2	-	834410	Faston, sealed		Noviqua
1	1.9m	-	M22759/16-14-9	Wire, 14 AWG		
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremplitzer			Checked: M. Kowarsch	General Tolerance : ISO 2768 medium		Scale: NTS
Date 27. JULI 2007 Name			Date 23. JULI 2007 Name			
				Next Higher Assembly : D60-2463-30-00	Title : Batteries Ground Cables	
						
				DA 42 Twin Star	Drawing Number: D60-2463-27-00	Sheet 1 from 1
Rev.	Change	Date	Name	Saved under : D60-2463-27-00a.dft		

Weight: N/A
Calculated Weight: N/A

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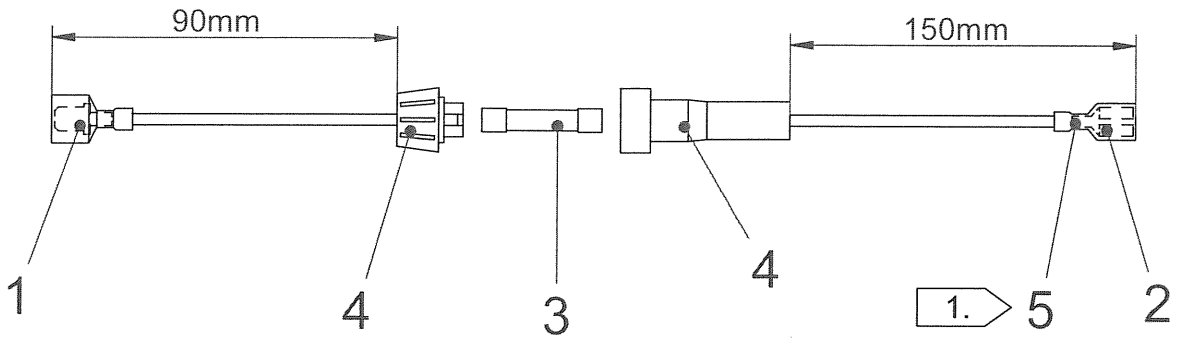
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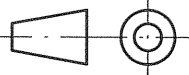

NOTES:

1. USE WITH ITEM 2a ONLY.

Weight: N/A
Calculated Weight: N/A



1.

5	1	-	RNF100-1-4 WHT	Heat Shrink		
4	1	-	HRJ	Fuse Holder		Cooper
3	1	-	AGC10	Fuse, 10A		
2a	alt	-	640915-1	Faston, sealed		AMP
2	1	-	834410	Faston, sealed		Noviqua
1	1	-	3-520107-2	Faston		AMP
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved R. Kremnitzer			Checked M. Kowarsch		General Tolerance : ISO 2768 medium	Scale: NTS
Date 27. JUL 2007 Name			Date 23. JUL 2007 Name			
				Next Higher Assembly : D60-2463-00-00	Title : Excitation Battery Fuse Assy	
						
				DA 42 Twin Star	Drawing Number: D60-2463-28-00	Sheet 1 from 1
Rev.	Change	Date	Name	Saved under : D60-2463-28-00a.dft		

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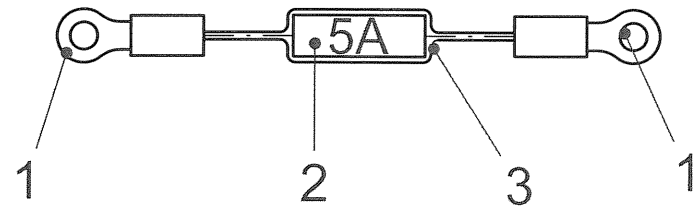
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Weight: N/A
Calculated Weight: N/A

3a	alt	-	RNF100-1/8-CLEAR	Heatshrink, clear		
3	A/R	-	N820320	Heatshrink, clear		Noviqua
2a	alt	-	263005	Fuse, 5A		
2	1	-	422-084	Fuse, 5A		RS Components
1a	alt	-	36151	Ring Terminal		AMP
1	2	-	31890	Ring Terminal		AMP
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremnitzer			Checked: M. Kowarsch		General Tolerance : ISO 2768 medium	Scale: NTS
Date 27. JULI 2007 Name			Date 23. JULI 2007 Name			
				Title : Fuse Assembly, 5A		
				Drawing Number: D60-2463-29-00		
"a"	MÄM 42-240a	20.07.07	Kowarsch	Sheet 1 from 1		
"-"	MÄM 42-240	25.04.07	Kowarsch			
Rev.	Change	Date	Name	Saved under : D60-2463-29-00a.dft		

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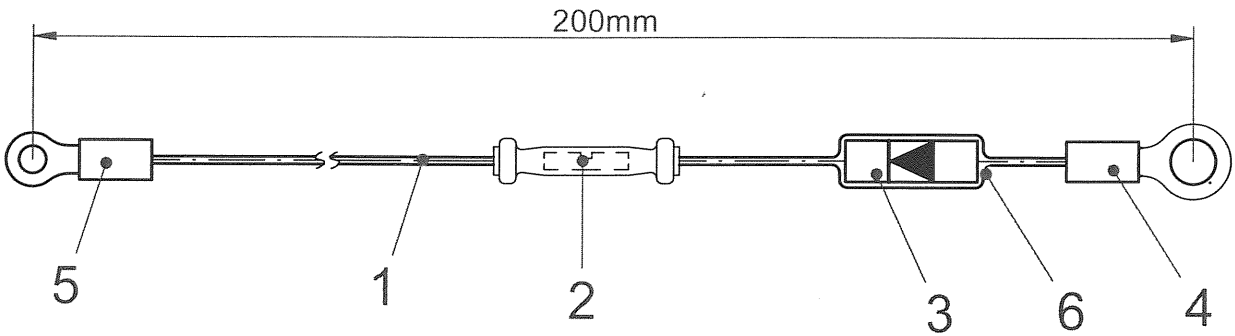
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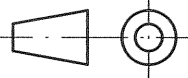

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6a	alt	-	RNF100-1/8-CLEAR	Heatshrink, clear		
6	A/R	-	N820320	Heatshrink, clear		Noviqua
5a	alt	-	36151	Ring Terminal		AMP
5	1	-	31890	Ring Terminal		AMP
4	1	-	31894	Ring Terminal		AMP
3a	alt	-	1N4007	Diode		
3	1	-	1N4006	Diode		
2	1	-	D-436-36	Splice		AMP
1	0.12m	-	M22759/16-22-9	Wire, 22 AWG		
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved : R. Kremnitzer			Checked : M. Kowarsch		General Tolerance : ISO 2768 medium	Scale: NTS
Date 27. JUL 2007			Date 23. JUL 2007			
			Next Higher Assembly : D60-2463-40-00_01		Title : Cable, Diode Assembly	
						
			DA 42 Twin Star			
			Drawing Number: D60-2463-30-00			
"a"	MÄM 42-240a	12.07.07	Kowarsch	Sheet 1 from 1		
"_"	MÄM 42-240	20.06.07	Kowarsch			
Rev.	Change	Date	Name	Saved under : D60-2463-30-00a.dft		

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Weight: N/A
Calculated Weight: N/A

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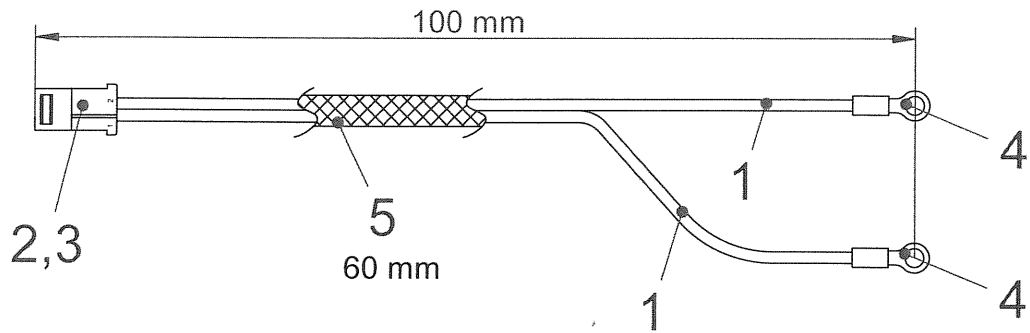
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PIN	WIRE
1	PIN 1
2	PIN 2



8	0.06m	-	5021000632	Expando		
4	2	-	31890	Ring Terminal		AMP
3	2	-	60617-1	Socket		AMP
2	1	-	1-480318-0	Connector, 2 Socket		AMP
1	0.2m	-	M22759/16-22-9	Wire, 22 AWG		
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremnitzer			Checked: M. Kowarsch	General Tolerance : ISO 2768 +/- 5mm		Scale: NTS
Date 27. JUL 2007 Name			Date 23. JUL 2007			
				Next Higher Assembly : N/A	Title : Adpater Harness 1	
						
				DA 42 Twin Star	Drawing Number: D60-2463-31-00-SB	Sheet 1 from 1
"-"	MÄM 42-240a	17.07.07	Kowarsch			
Rev.	Change	Date	Name	Saved under :	D60-2463-31-00-SB.dft	

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Weight: N/A
Calculated Weight: N/A

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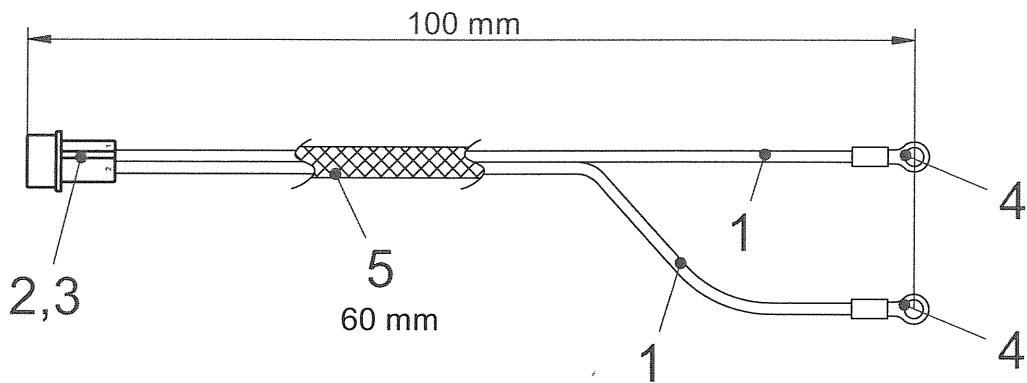
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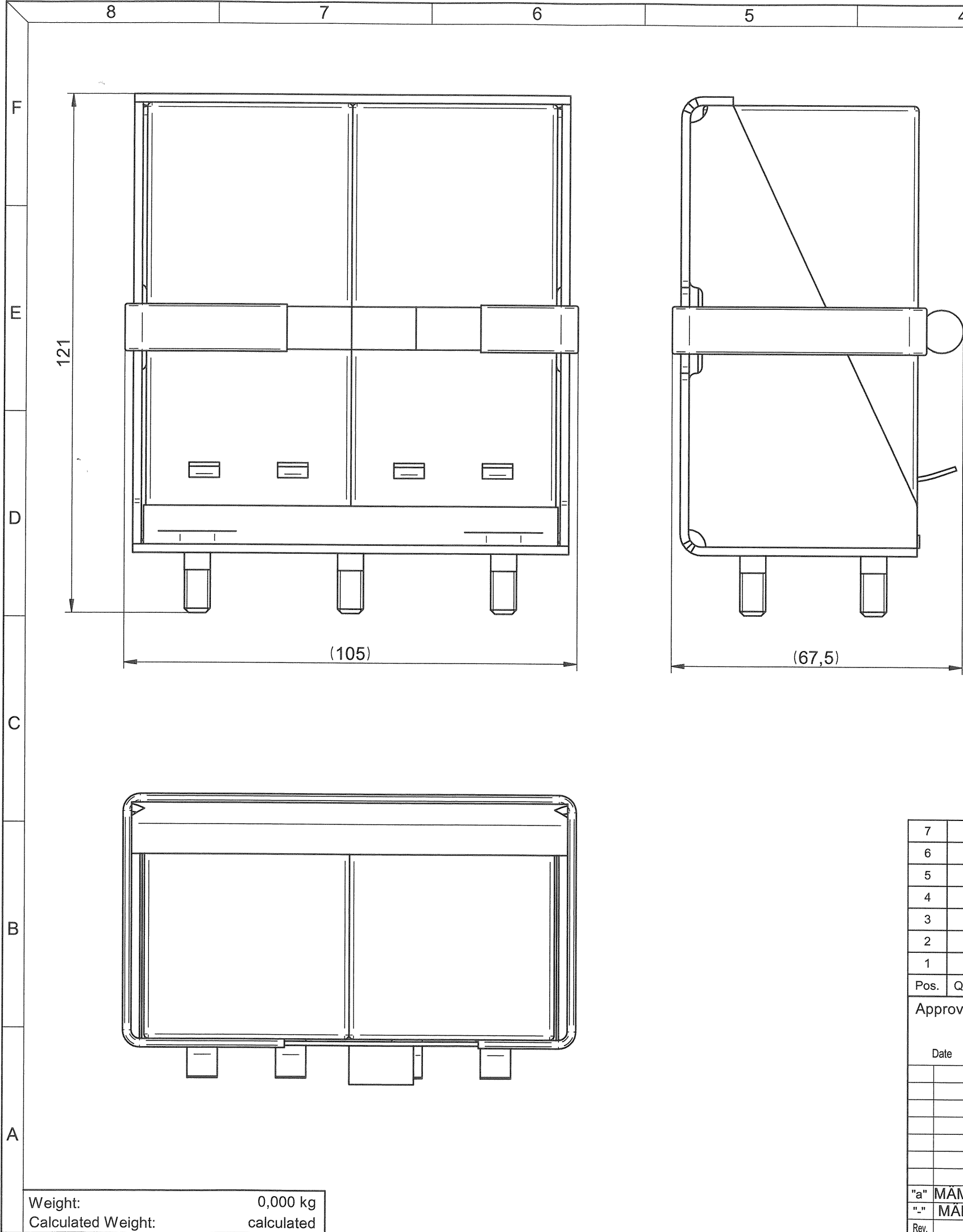
PIN	WIRE
1	PIN 1
2	PIN 2



8	0.06m	-	5021000632	Expando		
4	2	-	31890	Ring Terminal		AMP
3	2	-	60618-1	Pin		AMP
2	1	-	1-480319-0	Connector, 2 Pins		AMP
1	0.2m	-	M22759/16-22-9	Wire, 22 AWG		
Pos.	QTYL	QTYR	Part Number	Description	Specification	Supplier
Approved: R. Kremnitzner			Checked: M. Kowarsch		General Tolerance : ISO 2768 +/- 5mm	Scale: NTS
Date 27. JUL 2007 Name			Date 23. JUL 2007 Name			
				Next Higher Assembly : N/A	Title : Adpater Harness 2	
				DA 42 Twin Star	Drawing Number: D60-2463-32-00-SB	Sheet 1 from 1
Rev.	Change	Date	Name	Saved under : D60-2463-32-00-SB.dft		
"-"	MÄM 42-240a	17.07.07	Kowarsch			

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7	2	LC-R121R3-P	Battery		Panasonic
6	2	DN 127 12,7-6,4	Schrumpfschlauch	290mm	
5	3	LN 9037-M6x16	Sechskantschraube		Boisen
4	1	D60-2463-51-00	Battery Box		
3	1	D60-2463-50-81	Hose Clamp	80-100mm	
2	1	D60-2463-50-02	Sheet Metal 1	3 mm	
1	1	D60-2463-50-01	Foam 1	10 mm	
Pos.	QTY	Part Number	Description	Specification	Supplier
Approved : 			Checked: 	General Tolerance : ISO 2768 medium	Scale:  1:1
Date 18. JULI 2007			Date 18. JULI 2007		
			Next Higher Assembly :	<div>Title : Battery Mounting For ECU</div>	
					
			DA 42 Twin Star	Drawing Number: D60-2463-50-00	Sheet 1 from 1
Rev.	Change	Date	Name	Saved under : D60-2463-50-00a.asm	

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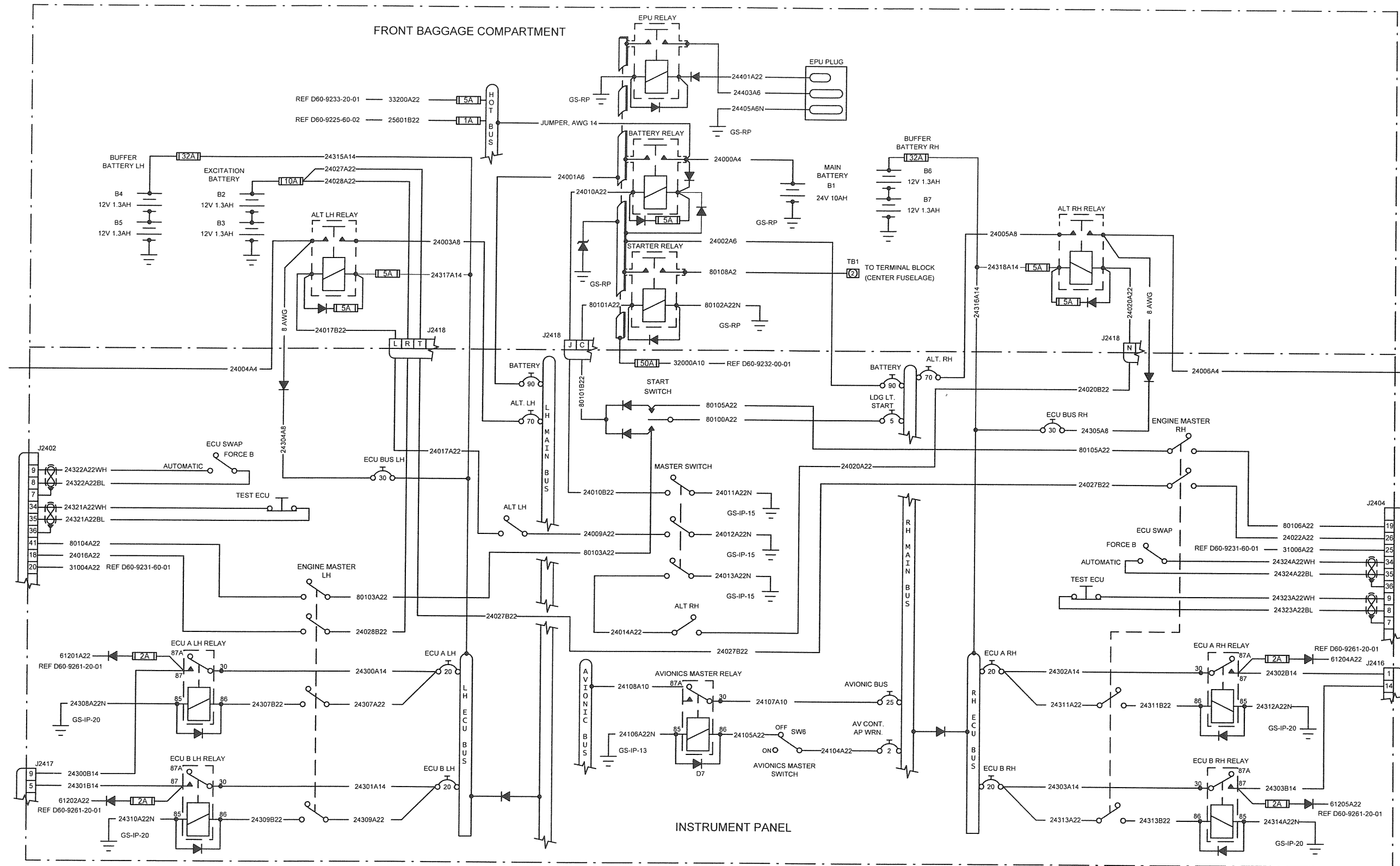
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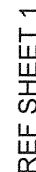


REF SHEET 2

REF SHEET 2

Approved : B. Jäger		Checked M. Kowarsch		General Tolerance : ISO 2768		Scale: NTS	
Date: 21 JUNI 2007		Date: 20 JUNI 2007					
		Next Higher Assembly : D60-9200-00-00		Title : Schematic, Electrical System			
		Diamond AIRCRAFT Industries GmbH					
		DA 42 Twin Star		Drawing Number: D60-9224-30-01-SB		Sheet 1 from 2	
Rev. Change		Date		Name		Saved under : D60-9224-30-01-SB.dft	

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Approved  Date 21. JUNI 2007 Name				Checked M. Kowarsch Date 20. JUNI 2007 Name		General Tolerance : ISO 2768				Scale: NTS			
				Next Higher Assembly : D60-9200-00-00		<div>Title : Schematic, Electrical System</div>							
													
				DA 42 Twin Star									
				Drawing Number: D60-9224-30-01-SB								Sheet 2 from 2	
"..."	MÄM 42-240	16.04.07	Kowarsch										
Rev.	Change	Date	Name	Saved under : D60-9224-30-01-SB.dft									

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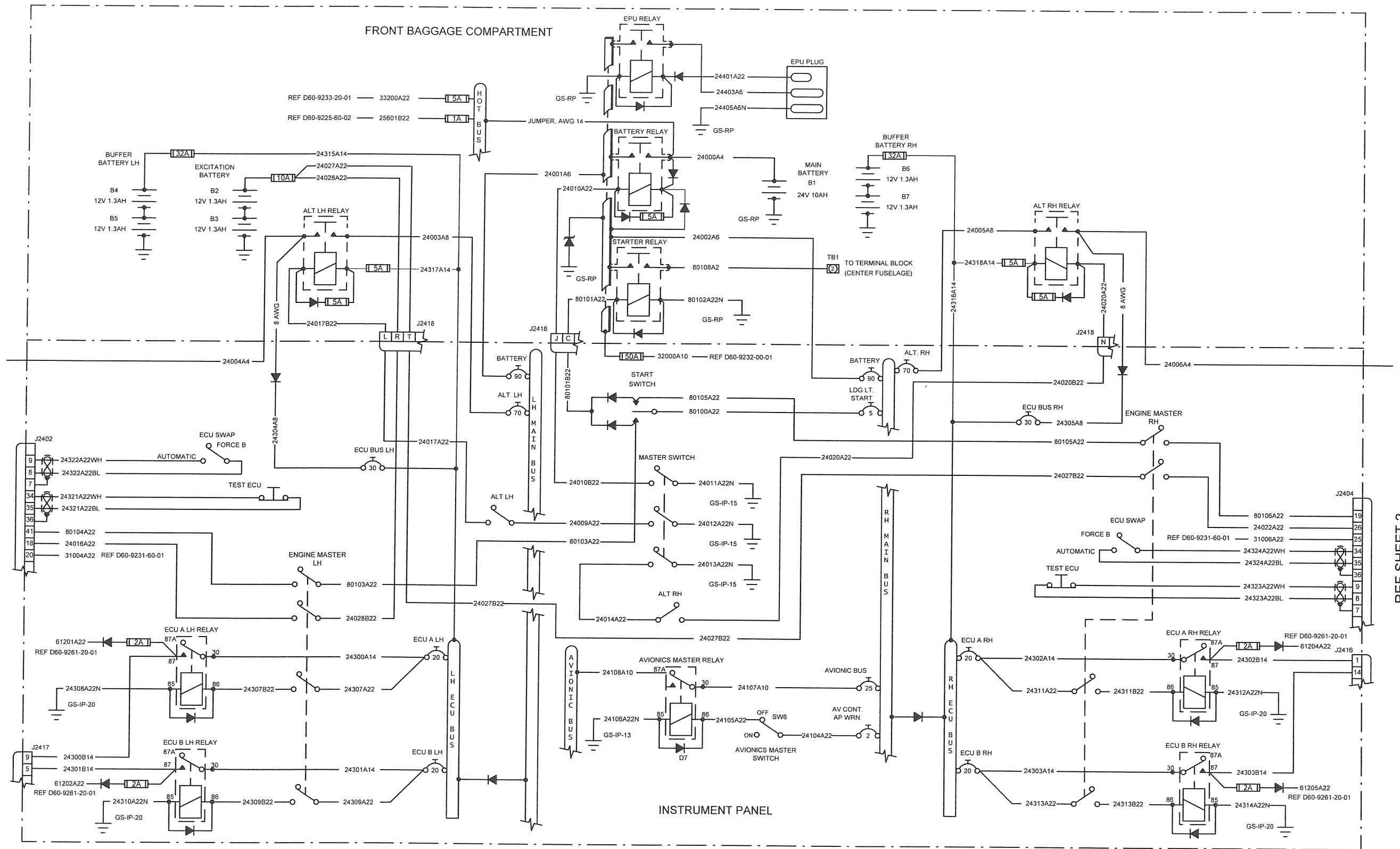
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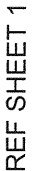
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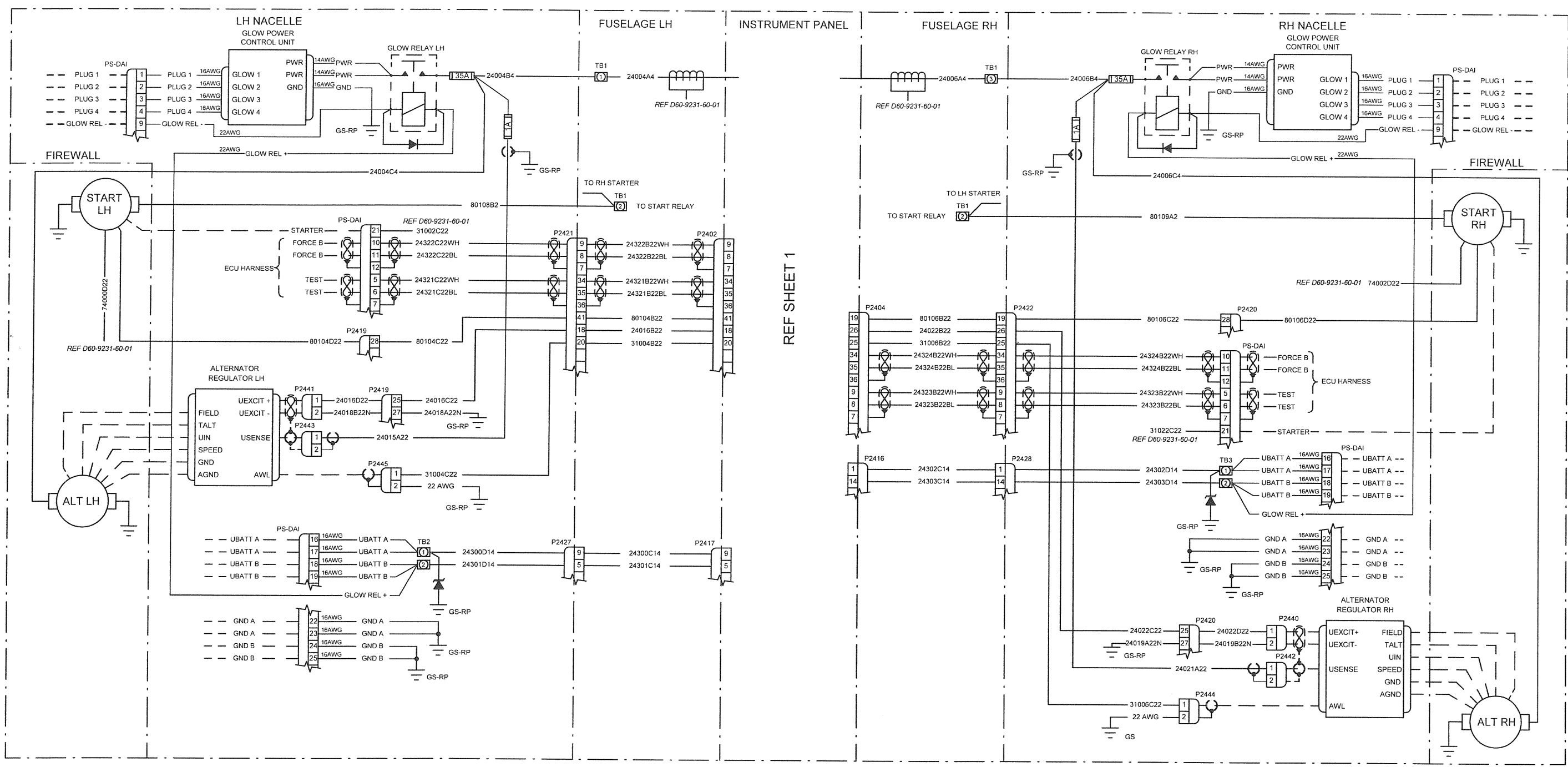
REF SHEET 2

Approved : B. Jäger		Checked M. Kowarsch		General Tolerance : ISO 2768		Scale: NTS	
Date 21 JUNI 2007		Date 20. JUNI 2007		Next Higher Assembly : D60-9200-00-00		Title : Schematic, Electrical System w/o GPC	
				Diamond AIRCRAFT Industries GmbH		Drawing Number: D60-9224-30-02-SB	
Rev. 1		Change MÄM 42-240		Date 16.04.07		Name Kowarsch	
				Saved under : D60-9224-30-02-SB.dft		Sheet 1 from 2	



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REF SHEET 1

NOTES:

- 1. DASHED LINES INDICATE A THIELERT HARNESS.

Approved: B. Jäger Date: 21. JUNI 2007 Name:		Checked: M. Kowarsch Date: 20. JUNI 2007 Name:		General Tolerance: ISO 2768		Scale: NTS	
		Next Higher Assembly: D60-9200-00-00		Title: Schematic, Electrical System, TAE 125-02			
		Diamond AIRCRAFT Industries GmbH		Drawing Number: D60-9224-30-01_02			
"a" MÄM 42-240 23.04.07 Kowarsch		"b" 16.04.07 Kowarsch		DA 42 Twin Star		Sheet 2 from 2	
Rev. Change Date Name		Saved under: D60-9224-30-01_02a.dft					

Weight: N/A
Calculated Weight: N/A

EASA	AIRWORTHINESS DIRECTIVE
	<p>AD No : 2007-0183 R2 [Corrected: 07 November 2007]</p> <p>Date: 06 November 2007</p>
No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive unless otherwise agreed with the Authority of the State of Registry.	
Type Approval Holder's Name : Diamond Aircraft Industries GmbH	Type/Model designation(s) : DA 42
TCDS Number : EASA A.005	
Foreign AD : not applicable	
Revision: This Airworthiness Directive (AD) revises and replaces EASA AD 2007-0183 R1 dated 28 August 2007.	
ATA 76	Engine Controls – Engine Control Unit Back-up Batteries - Installation
Manufacturer:	Diamond Aircraft Industries GmbH
Applicability:	DA 42 airplanes, serial numbers 42.004, 42.006, 42.009 through 42.156, 42.158 through 42.176, 42.178 through 42.190, 42.192 through 42.233, 42.235 through 42.246, 42.248 through 42.254, 42.256 through 42.261, 42.263 through 42.269; and 42.AC001 through 42.AC109 (Canadian production line)
Reason:	<p>Recently, a double in-flight engine shut down incident occurred on a DA42 aircraft equipped with TAE125-01 engines. The BFU (German Accident Investigation Body) found the root cause to be a violation of the Airplane Flight Manual procedures (taking-off with an insufficiently charged main aircraft battery) and momentary low voltage in the electrical system of the aircraft when retracting the main landing gear. This has been the subject of Diamond Service Information (SI) 42-040 and a subsequent EASA Safety Information Notice, SIN 2007-08, issued on 18 April 2007.</p> <p>The TAE125-01 and TAE125-02-99 engines, approved for installation on the DA42, are FADEC (Full Authority Digital Engine Control) controlled and are not totally independent from the aircraft electrical power supply. A significant drop of the voltage causes simultaneously a reset of the FADEC on both engines with subsequent feathering of the propeller blades. In the case of an empty battery this scenario may be considered as catastrophic at the aircraft level.</p> <p>The Thielert Aircraft Engines (TAE) Installation Manuals IM-02-01 Issue 4 and IM-02-02 Issue 1 have been revised to address this issue, which is the subject of EASA Airworthiness Directive (AD) 2007-0182.</p> <p>AD 2007-0183 was issued to require installation of additional Engine Control Unit</p>

	<p>(ECU) Backup Batteries to supply electrical power to the ECU, preventing high transient power drains from causing a short-term voltage drop when insufficient power from the main battery might exist.</p> <p>This AD has been revised to extend the compliance time by one month, to 30 November 2007, and to include reference to an approved alternative method of compliance. Aircraft already in compliance with EASA AD 2007-0183 or its revision 1 are not affected by this change.</p> <p>This AD has been republished to correct a typographical error.</p>
Effective Date:	16 July 2007
Compliance:	<p>Within the next 200 Flight Hours, but not later than 30 November 2007, whichever occurs first after the effective date of this directive, accomplish the following:</p> <ul style="list-style-type: none"> • Modify the engine electrical system of the DA 42 by installing additional ECU backup batteries in accordance with Diamond Aircraft Industries (DAI) Mandatory Service Bulletin (MSB) 42-042 dated 22 June 2007 and DAI Work Instruction WI-MSB-42-042 dated 20 June 2007 or later approved revisions of these documents; and • Amend the DA 42 Aircraft Maintenance Manual by inserting DAI AMM-TR-MÄM-42-240 Temporary Revision dated 17 June 2007 or later approved AMM Revision, update the operator's maintenance programme and maintain the aircraft accordingly; and • Amend the DA 42 Airplane Flight Manual (AFM) by inserting a copy of AFM TR-MÄM-42-240 dated 17 June 2007 or later approved AFM Revision into the AFM, as instructed in that document. <p>Note: Modification of the engine electrical system of the DA 42 and accomplishment of related actions in accordance with the instructions contained in DAI Optional Service Bulletin (OSB) 42-050/1 or later approved revisions, including associated documents referenced therein, has been approved as an alternative method of compliance for the requirements of this AD.</p>
Ref. Publications:	<p>Diamond Aircraft Industries (DAI) Mandatory Service Bulletin MSB-42-042; DAI WI-MSB-42-042; DAI Service Information SI 42-040; DAI AFM TR-MÄM-42-240 and AMM-TR-MÄM-42-240;</p> <p>TAE Installation Manual IM-02-01 Issue 4, Revision 1, Chapter 13 (02-IM-13-01); and IM-02-02 Issue 1, Revision 3, Chapter 13, (02-IM-13-02).</p> <p>DAI Optional Service Bulletin OSB-42-050/1; DAI WI-OSB-42-050 Revision 2; DAI AFM TR-OÄM-42-129 and AMM-TR-OÄM-42-129.</p>
Remarks :	<ol style="list-style-type: none"> 1. If requested and appropriately substantiated, EASA can accept Alternative Methods of Compliance for this AD. 2. The original issue of this AD was posted as PAD 07-074 for consultation on 04 May 2007 with a comment period until 18 May 2007. The Comment Response Document can be found at http://ad.easa.europa.eu/. 3. Enquiries regarding this AD should be addressed to the AD Focal Point - Certification Directorate, EASA. E-mail: ADs@easa.europa.eu 4. For any question concerning the technical content of the requirements in this AD, please contact Diamond Aircraft Industries GmbH, Austria. Ph.: +43 2622 26700 ; Fax: +43 2622 26780; E-mail: office@diamond-air.at