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SB-GA8-2022-206
Issue 2

OPTIONAL

Service Bulletin

Subject:

Airframe Installation of Lycoming Electronic Ignition System (EIS)

Applicability:

This Service Bulletin is applicable to the aircraft identified in Table 1.

Table 1 – Applicability

AIRCRAFT	SERIAL NUMBER(s)
GA8	This Service Bulletin is applicable to all GA8 aircraft. Written authorisation to install this optional Service Bulletin must be obtained from GippsAero before installation.
GA8-TC 320	This Service Bulletin is applicable to all GA8 TC 320 aircraft. Written authorisation to install this optional Service Bulletin must be obtained from GippsAero before installation.

Amendments:

Issue 1: Initial Issue

Issue 2: Adds the airframe side modifications for the installation of right-hand Lycoming Electronic Ignition System Refer GAE11#2756.

Background:

This Service Bulletin provides instructions for installing the required airframe side modifications in support of installing a single or dual 66K6D3SN-01 Lycoming Electronic Ignition System (EIS) in accordance with Service Instruction No. 1569B to the Textron Lycoming IO-540-K1A5 or Textron Lycoming TIO-540-AH1A engines.

Part A : Installs the airframe side modifications for a LH EIS.

Part B : Installs the airframe side modifications for a RH EIS and Integrated Back-Up Battery System (IBBS).

Part A or B may be installed to enable a single Lycoming Electronic Ignition System installation or both Part A and B to provide for dual Lycoming Electronic Ignition System Installation.

Compliance:

The accomplishment instructions contained within this Service Bulletin are optional and may be incorporated at the Operator's, Owner's or Maintenance Provider's discretion.

Part A is only approved for installation with a magneto, or a Lycoming EIS and Part B installed in the RH side.

Co-requisites:

This Service Bulletin requires the concurrent installation of 66K6D3SN-01 6CYL, 20° Fixed Timing Lycoming Ignition Module(s) in accordance with Service Instruction No. 1569B (or later approved issue).

Compatible equipment:

The installer must ensure this design change is compatible with configuration of the aircraft. Any installed equipment should be assessed for compatibility with this and co-requisite design changes.

At time of writing, it is noted that the following design changes may be affected by or incompatible with, Lycoming EIS installation.

Design Change / Equipment	Issue
Electronic Tachometers EDM 800 / 830 / 900 Garmin G500/600 TXI Engine Indicating System GippsAero SB-GA8-2016-165	These design changes typically use an RPM sensor located on the slick magnetos. As no such sensor location is available on the EIS an alternate rpm source is required. The following equipment may utilised: • Electronic Tachometer with UMA, T1A3-4 TSO'd Tachometer Rotating Sending Unit • Surefly. TACH2 Tachometer Signal Converter • Lycoming OEM engine RPM sensor. **This equipment not approved by this service bulletin and will require additional regulatory approval.**

Weight and Balance:

The effect of this Service Bulletin's incorporation on the aircraft's weight and balance is shown in Table 3.

Table 2 – Weight and Balance

	WEIGHT		ARM		MOMENT	
ITEM(S) REMOVED	(kg)	(lb)	(mm)	(in)	(kg.mm)	(in.lb)
SlickSTART (if installed)	-0.27	-0.6	-13	-0.5	+3.5	+0.3

	WEIGHT		ARM		MOMENT	
ITEM(S) ADDED	(kg)	(lb)	(mm)	(in)	(kg.mm)	(in.lb)
Back-Up Battery	0.5	1.1	1862	73.3	931	80.6
LH EIS[1]	0.4	0.9	-231	-9.1	-92.4	-8.2
RH EIS[1]	0.4	0.9	-231	-9.1	-92.4	-8.2

The aircraft's weight and balance record shall be updated to include this information.

Electrical Load Analysis:

The effect of this Service Bulletin's incorporation on the aircraft's electrical load is shown in Table 3:

Table 3 – Electrical Load Analysis

COMPONENT	NOMINAL CURRENT @ 14V	CIRCUIT BREAKER LABEL	ELECTRICAL BUS	PHASES OF FLIGHT
LH EIS	1.2A	LH EIS IGN	BATTERY	ALL
RH EIS	1.2A	RH EIS IGN	Bus 1	ALL
Back-Up Battery	1.8A (charging) 0.7A (heating)			

The aircraft's electrical load analysis shall be updated to include this information.

[1] Values shown are net weight and balance change when replacing a Slick model 6393 or 6350 magneto with an EIS. When replacing other magneto types, the weight and balance changes must be determined by the installer.

Approval:

The airframe and/or electrical system modification/repair described in this Service Bulletin has been approved pursuant to Australian Civil Aviation Safety Regulation 21.098 (1998). GippsAero Reference GAE11#2756.

Parts:

Table 4 – Lycoming Parts

ITEM	PART No.	DESCRIPTION	QTY
1	66K6D3SN-01	6CYL, 20° Fixed Timing Lycoming Ignition Module, c/w 66K6D Hardware Kit	A/R

The following parts (Table 5) are required to accomplish Part A of this Service Bulletin. A kit P/N SB-GA8-2022-206-1 is available.

Table 5 – Part A Parts

ITEM	PART No.	DESCRIPTION	QTY
2	GA8-246024-011	WIRE KIT	1
3	GA8-246024-021	CIRCUIT BREAKER PANEL	1
4	GA8-246024-023	BUS BAR	1
5	GA8-246024-025	EIS WARNING PLACARD	1
6	GA8-246024-027	BREAKER PANEL PLACARD	1
7	2TC2-10	CIRCUIT BREAKER 10A	1
8	MS25036-149	TERML LUG INSUL RING 22-18AWG #8 DIA RD	1
9	MS25036-103	TERML LUG INSUL RING 22-18AWG #10 DIA RD	3
10	MS25036-102	TERML LUG INSUL RING 22-18AWG #6 DIA RD	1
11	M81824/1-1	RED WIRE SPLICE (D-436-36)	1
12	M83519/2-7	SOLDER SLEEVE AS83519/2-7 (S0207S)	2
13	M22759/16-22	WIRE 22AWG ETFE 600V WHITE	12”

For aircraft up to S/N GA8-06-098, without SB-GA8-2008-50 embodied, the following additional parts are required to accomplish this Service Bulletin.

Table 6 – Part A Optional Parts

ITEM	PART No.	DESCRIPTION	QTY
21	2TC2-1	CIRCUIT BREAKER 1A	3

The following parts (Table 7) are required to accomplish Part B of this Service Bulletin. A kit P/N SB-GA8-2022-206-2 is available.

Table 7 – Part B Parts

ITEM	PART No.	DESCRIPTION	QTY
31	IBBS-12v-3ah-CRT	INTEGRATED BACKUP BATTERY SYSTEM	1
32	IBBS-CRT-Install Kit	IBBS INSTALLATION KIT	1
33		. SWITCH	1[2]
34		. LED	1[2]
35		. IBBS WIRING LOOM	1[2]
36	GA8-246025-011	WIRE KIT	1
37	GA8-246025-023	RH EIS PLACARD	1

[2] Provided with IBBS-CRT-Install Kit

ITEM	PART No.	DESCRIPTION	QTY
38	GA8-246025-025	CB PLACARD	1
39	2-411-120W	UMA ELECTRO-LUMINESCENT LIGHT STRIP, WHITE, 1.2 X 11.5 IN	1
40	W23-X1A1G-7.50	CIRCUIT BREAKER 7.5A	1
41	W23-X1A1G-10	CIRCUIT BREAKER, 10A	1
42	GA8-311022-031	BUS BAR 2	1
43	GA8-311022-033	BUS BAR 3	1
44	GA8-311022-041	BREAKER BUS BAR No.1	1
45	1-480705-0	CONN CAP HOUSING 6 POS UNI. MATE-N-LOK (J107)	1
46	1-480704-0	CONN PLUG HOUSING 6 POS UNI. MATE-N-LOK (P107)	1
47	350690-1	CONTACT, PIN 24-18 AWG CRIMP MATE-N-LOK	6
48	350689-1	CONTACT, SKT 24-18 AWG CRIMP MATE-N-LOK	6
49	MS25036-149	TERML LUG INSUL RING 22-18AWG #8 DIA RD	6
50	MS25036-103	TERML LUG INSUL RING 22-18AWG #10 DIA RD	8
51	M83519/1-2	SOLDER SLEEVE AS83519/1-2 (S0102S)	1
52	M83519/2-7	SOLDER SLEEVE AS83519/2-7 (S0207S)	1
53	M81824/1-1	RED WIRE SPLICE (D-436-36)	2
54	M81824/1-2	BLUE WIRE SPLICE (D-436-37)	2
55	HSA-BLACK 1X19x10	TAPE FOAM POLYETHYLENE FILM BLACK 19mm Wide	3”
56	XLP25BK	HEAT SHRINK 25.4MM BLK 2:1 SHRINK RATIO (CABAC)	3.5”
57	TY075-18X	CABLE TIE NON RELEASE 91mm L 2.4mm NYLON BLK	1
-	RESERVED	-	-
60	GA8-246025-031	BATTERY BRACKET	1
61	GA8-246025-033	BATTERY VENT HOUSING	1
62	GA8-246025-035	BATTERY VENT	1
63	MS21069L08	NUT PLATE, REDUCED RIVET SPACING	9
64	NAS1097AD3-3	RIVET, SOLID, FLUSH SHEAR HEAD	18
65	MS20470AD3-3	RIVET, SOLID, UNIVERSAL HEAD	2
67	AN525-832R6	SCREW, WASHER HEAD	9
68	AN833-4D	ELBOW – FLARED TUBE, BULKHEAD UNIVERSAL, 90°	1
69	AN924-4W	NUT, TUBE, BULKHEAD AND UNIVERSAL FITTING (ALT: AN924-4D)	2
70	MS20819-4D	SLEEVE, FLARED TUBE FITTING	1
71	MS35489-6	GROMMET	1
72	AN818-4W	NUT, TUBE COUPLING, SHORT (ALT: AN818-4D)	1

Table 8 – Compounds

ITEM	PART No.	DESCRIPTION	QTY
1	-	General purpose, non-acidic sealant such as Dow Corning 747 RTV, DINITROL 410 UV or Sikaflex-227. PR 1422 1B or PR 1422 2B may also be used.	A/R

Parts Availability:

New parts can be obtained directly from GippsAero.

Tel: +61 (0)3 5172 1200

Fax: +61 (0)3 5172 1201

Email: PARTS@gippsaero.com.au

Labour:

8 man hours should be allocated for completing the work detailed in Part A of this Service Bulletin.

8 man hours should be allocated for completing the work detailed in Part B of this Service Bulletin.

This time does not include set up etc.

Warranty:

This is an optional modification. The cost of installation is not eligible for warranty claims, however, component warranties are provided by the respective manufacturers.

Tel: +61 (0)3 5172 1200

Fax: +61 (0)3 5172 1201

Email: SUPPORT@gippsaero.com.au

Accomplishment Instructions:

WARNING:

IT IS THE RESPONSIBILITY OF ALL PERSONNEL TO ENSURE WORK HEALTH AND SAFETY REQUIREMENTS ARE MET AT ALL TIMES. ALL PERSONNEL MUST COMPLY WITH ALL WORK HEALTH AND SAFETY REQUIREMENTS AS DEFINED OR RECOMMENDED BY:

- EQUIPMENT OEM INSTALLATION AND OPERATION MANUALS;

- AIRCRAFT MAINTENANCE AND OPERATION MANUALS;

- ASSOCIATED AIRCRAFT MODIFICATION INSTRUCTIONS;

- RELEVANT NAA REGULATIONS AND ADVISORY DOCUMENTATION;

- ORGANISATION MANUALS, INCLUDING NAA ENDORSED OPERATIONAL AND MAINTENANCE MANUALS; AND

- RELEVANT LOCAL, STATE AND FEDERAL GOVERNMENT REQUIREMENTS.

WARNING:

READ THE APPLICABLE MATERIAL SAFETY DATA SHEET (MSDS) FOR ANY MATERIAL/CONSUMABLE USED DURING THE ACCOMPLISHMENT OF THIS SERVICE BULLETIN AND EMPLOY ANY RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) CONTAINED THEREIN.

NOTE:

Unless otherwise specified, reference to the GA8/GA8-TC 320 Service Manual and FAA Advisory Circular (AC) 43.13-1B should be made when carrying out the procedures prescribed in this Service Bulletin. In case of a discrepancy between the Service Manual and the AC, the Service Manual takes precedence.

Part A – LH EIS Electrical Installation

1. Make the aircraft safe for maintenance.

WARNING:

THE CAPACITOR IS A POTENTIAL HAZARD TO PERSONNEL MAINTAINING THE AIRCRAFT BY VIRTUE OF THE POTENTIAL FOR INADVERTENT SHORTING OF THE POSITIVE SIDE TO GROUND. THIS WOULD CAUSE A SIGNIFICANT ARC/SPARK, WHICH, IF IT CAME INTO CONTACT WITH ANY PART OF THE BODY, COULD RESULT IN A MINOR BURN OR CAUSE A REFLEX ACTION THAT MAY SHORT OUT OTHER ELECTRICAL CONNECTIONS.

ENSURE THAT THE CIRCUIT BREAKER REMAINS OPEN AND THE MASTER SWITCH REMAINS ON FOR THE DURATION THAT THE COVER PANEL IS REMOVED. NOTE THAT BUS 2 IS NOT LIVE WHILST THE BUS CIRCUIT BREAKER IS PULLED.

2. Discharge the alternator field capacitor by:
   (I) Pull the 1 Amp BUS 2 CONTROL circuit breaker and collar.
   (II) Switch the BUS 2 master switch on.
   (III) Ensure that the circuit breaker remains open and the master switch remains ON for the duration that the cover panel is removed. BUS 2 is not live whilst the BUS2 CONTROL circuit breaker is pulled.
3. For GA8 Aircraft and GA8-TC 320 aircraft with SB-GA8-2016-164 installed, disconnect and remove the SS1001 Slick start. Refit fasteners to fill the mounting holes. Cap and stow wire JS1A18/1. Remove and discard wires JS1C18/1, JS1B18/1, JS1D18N.
4. Remove the battery in accordance with the GA8/GA8-TC 320 Service Manual Section 24-00-10
5. Disconnect wires PB4A8, PB2A6 & PB6A18 from the BUS 1 & BUS 2 Solenoids and gain access to the underside of the Circuit Breaker Panel Assy.
6. Disconnect wires PB4B8 & PB2B6 from the BUS 1 MAIN and BUS 2 MAIN Circuit Breakers.

7. Remove and discard the GA8-311022-033 bus bar from the BUS1, BUS2 & STALL circuit breakers.

NOTE

For aircraft up to S/N GA8-06-098, if W23-X1A1G-X circuit breakers are installed as the "STALL" "BUS1 CONTROL" or "BUS2 CONTROL" circuit breakers, remove and replace with ITEM 21 circuit breakers (REF SB-GA8-2008-50).

8. Remove circuit breakers, capacitor, and shunt from the GA8-246022-033 or GA8-246022-037 Breaker Panel and refit to the Circuit Breaker Panel (item 3).
9. Install EIS Power wire 1JE001A18 between LH Engine ignition Module and the LH EIS IGN 10A circuit breaker. Terminate the wire with ring terminals and solder sleeves.
10. Tie the wire into the main loom using lacing tape or tie-wraps
11. Connect wire 1JE001A18 to the Power Terminal of the LH Engine Ignition Module. Connect the power wire shield and P-Lead wire shield to the P-Lead Shield (Ground) terminal.
12. Connect the P-Lead to the P-Lead Terminal of the LH Engine Ignition Module
13. Connect wire 1JE001A18 to the LH EIS IGN 10A circuit breaker (item 7). Connect the shield wire to the capacitor ground.
14. Install the Bus Bar (item 4) and reconnect master feed bus wire PB6A18.
15. Reconnect wires PB4B8 & PB2B6 from the BUS 1 MAIN and BUS 2 MAIN Circuit Breakers.
16. Reconnect wires PB4A8, PB2A6 to the BUS 1 & BUS 2 Solenoids
17. Carry out a bonding and continuity check and ensure all wires are connected in accordance with the GA8/GA8-TC 320 Service Manual wiring diagrams and Figure 5
18. Apply Breaker Panel Placard (item 6) to the Circuit Breaker Panel (item 3), refer Figure 2.
19. Apply EIS Warning Placard (item 5) to the instrument panel, adjacent to the ignition switch refer Figure 1.
20. Refit the battery in accordance with the GA8/GA8-TC 320 Service Manual Section 24-00-10 (including electrical system functional test).
21. Carry out a functional test of the Alternator Excitation System.
22. Carry out an EMC test (located after Part B of this Service Bulletin).

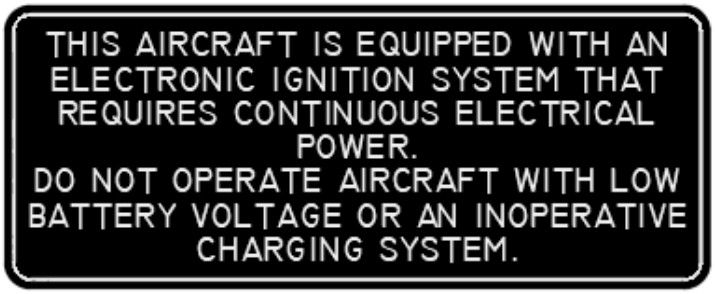

Figure 1 – EIS Warning Placard

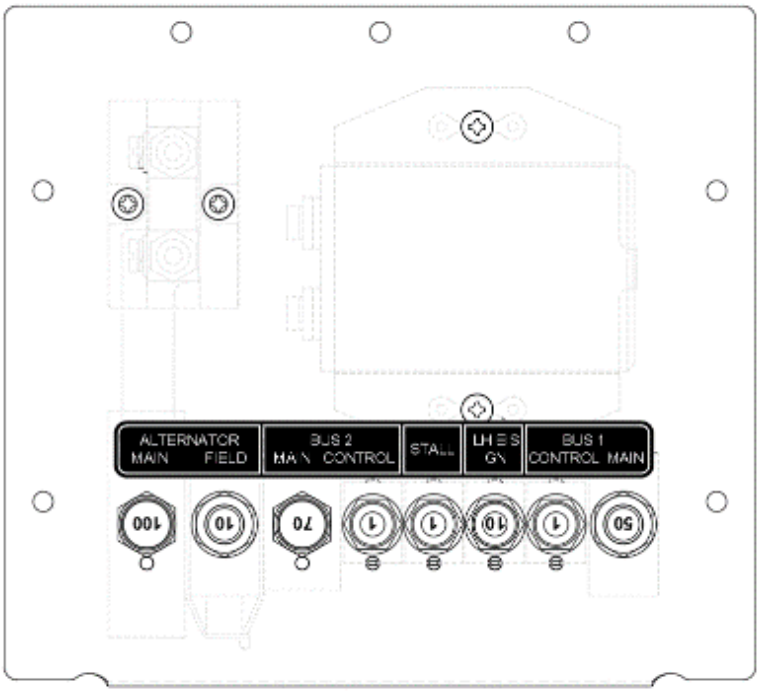

Figure 2 – Circuit Breaker Panel Assembly (top view)

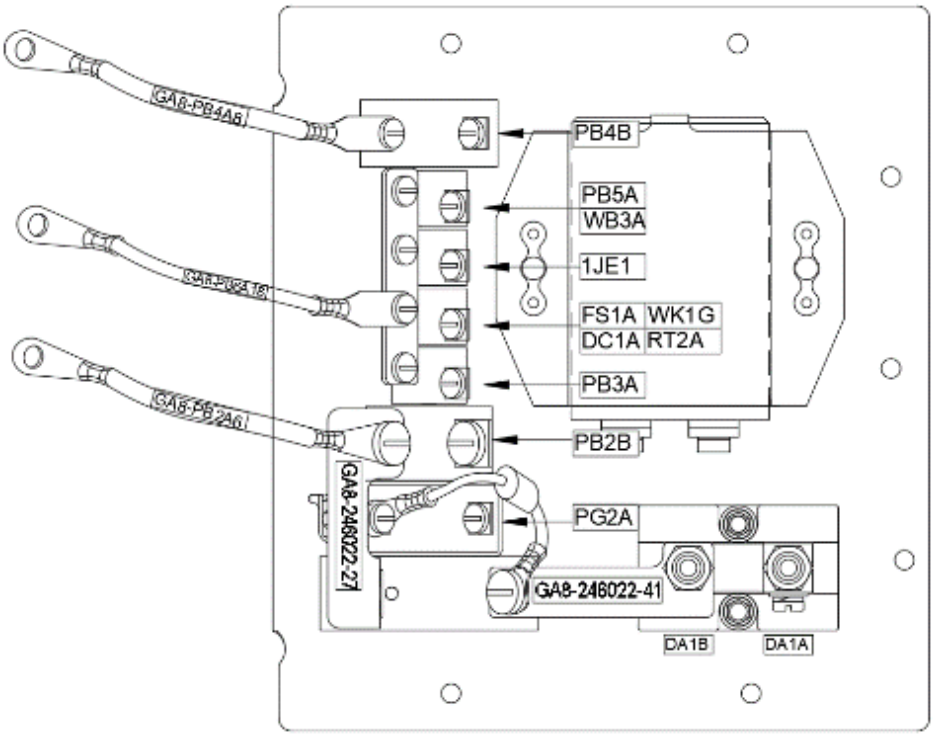

Figure 3 – Circuit Breaker Panel Assembly (bottom view)

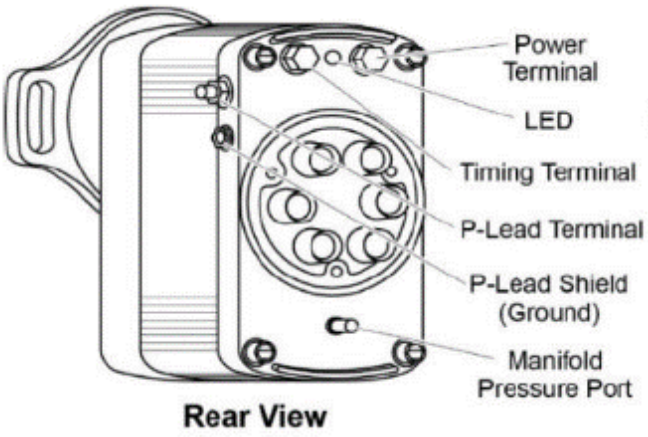

Figure 4 – EIS Electrical connections

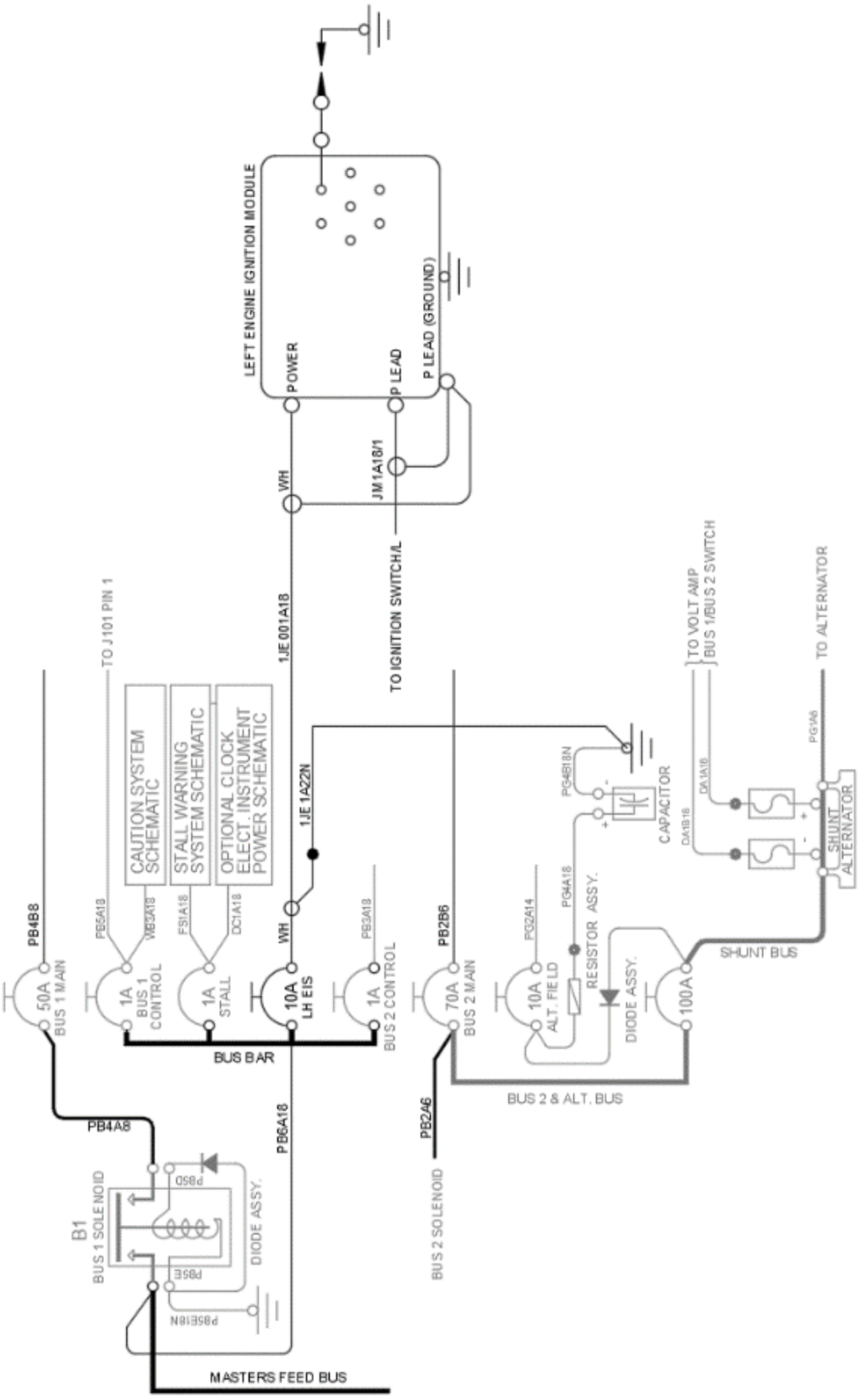

Figure 5 – LH EIS Wiring Diagram

~~End of Part A~~

Part B – RH EIS Electrical Installation

Preparation

1. Make the aircraft safe for maintenance.

WARNING:

THE CAPACITOR IS A POTENTIAL HAZARD TO PERSONNEL MAINTAINING THE AIRCRAFT BY VIRTUE OF THE POTENTIAL FOR INADVERTENT SHORTING OF THE POSITIVE SIDE TO GROUND. THIS WOULD CAUSE A SIGNIFICANT ARC/SPARK, WHICH, IF IT CAME INTO CONTACT WITH ANY PART OF THE BODY, COULD RESULT IN A MINOR BURN OR CAUSE A REFLEX ACTION THAT MAY SHORT OUT OTHER ELECTRICAL CONNECTIONS.

ENSURE THAT THE CIRCUIT BREAKER REMAINS OPEN AND THE MASTER SWITCH REMAINS ON FOR THE DURATION THAT THE COVER PANEL IS REMOVED. NOTE THAT BUS 2 IS NOT LIVE WHILST THE BUS CIRCUIT BREAKER IS PULLED.

2. Discharge the alternator field capacitor by:
   (I) Pull the 1 Amp BUS 2 CONTROL circuit breaker and collar.
   (II) Switch the BUS 2 master switch on.
   (III) Ensure that the circuit breaker remains open, and the master switch remains ON for the duration that the cover panel is removed. BUS 2 is not live whilst the BUS2 CONTROL circuit breaker is pulled.
3. For GA8 Aircraft and GA8-TC 320 aircraft with SB-GA8-2016-164 installed, disconnect and remove the SS1001 Slick start. Refit fasteners to fill the mounting holes. Cap and stow wire JS1A18/1. Remove and discard wires JS1C18/1, JS1B18/1, JS1D18N.
4. Remove the battery in accordance with the GA8/GA8-TC 320 Service Manual Section 24-00-10
5. Remove the interior linings aft of the overhead panel
6. Disconnect and remove the overhead panel

EIS Battery Installation

7. Refer Figure 7 through Figure 14. Items used in this section are listed in Table 7 unless stated otherwise.
8. Apply sealant, Item 1 of Table 8, to the battery as shown in Figure 6.
9. Rivet the nut plates (Item 63) to the battery bracket (Item 60) using rivets (Item 64) as shown in Figure 7.
10. Install the two corner rivets (Item 65) at the locations indicated in Figure 7, Left.
11. Install the elbow fitting (Item 68) using two nuts (Item 69) as shown in Figure 8.
12. Install the battery vent housing (Item 61) using two screws (Item 67) as shown in Figure 8.
13. Test fit the bracket in port wing root as shown in Figure 10. Ensure clearance between the outboard fuselage wing root rib and the bracket nut plates and screw tails (Figure 12). Mark and drill screw holes.
14. Seal the battery vent housing (Item 61) using Item 1 of Table 8 as shown in Figure 11.
15. Fix the battery, bracket and vent assembly in place, using three screws (Item 67).
16. Mark the location of the vent outlet on the lower port wing fairing and drill a Ø0.438” hole. Install grommet (Item 71).
17. Fit the battery vent (Item 62) using the sleeve and nut (Item 70 and 69). Direct the vent opening aft as shown in Figure 12. Carefully open and close the rear cabin door while monitoring the gap between the vent and the door. If required, the vent may be shortened to suit, however, the highest part of the vent opening must be at least 0.040” below the lower surface of the grommet.
18. Install the EIS backup battery onto the battery bracket.

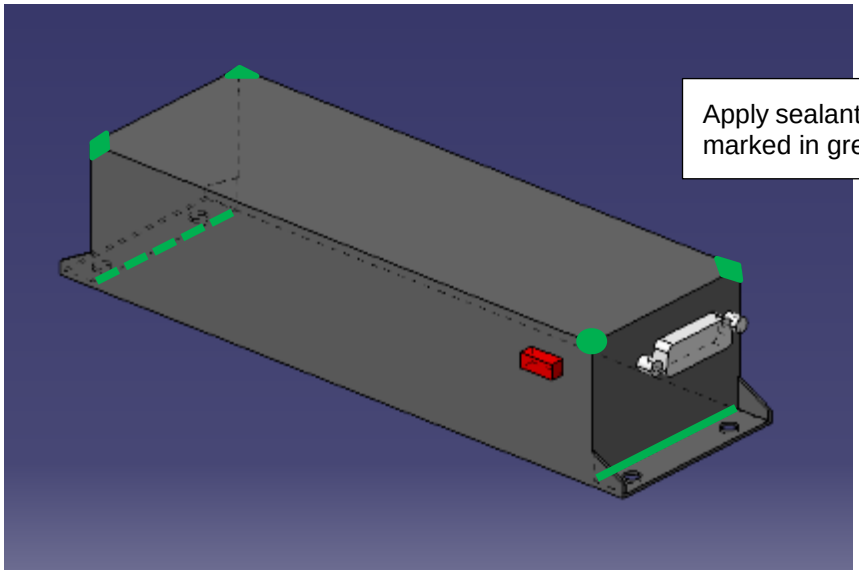

Figure 6 – Sealing Battery

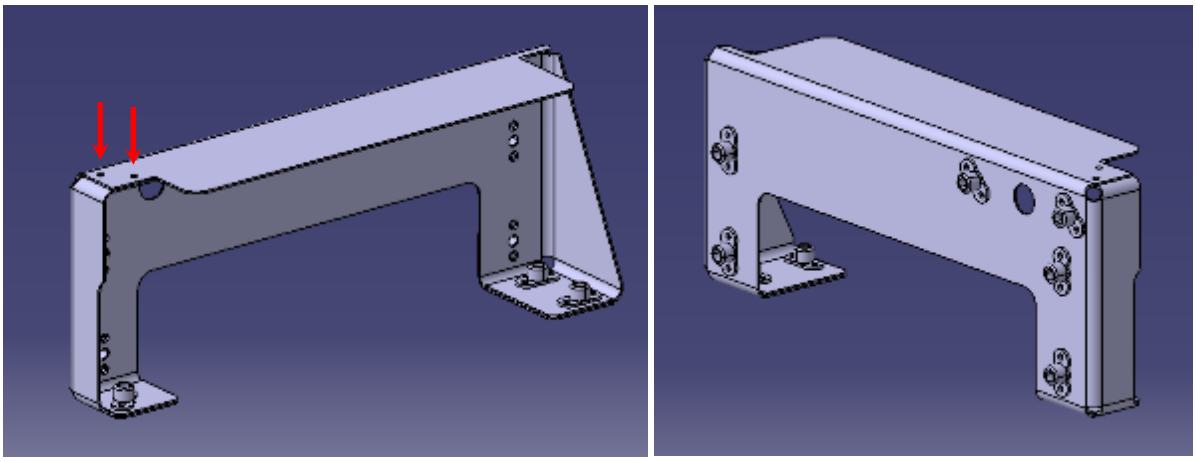

Figure 7 – Bracket Assembly and Nut Plate Installation

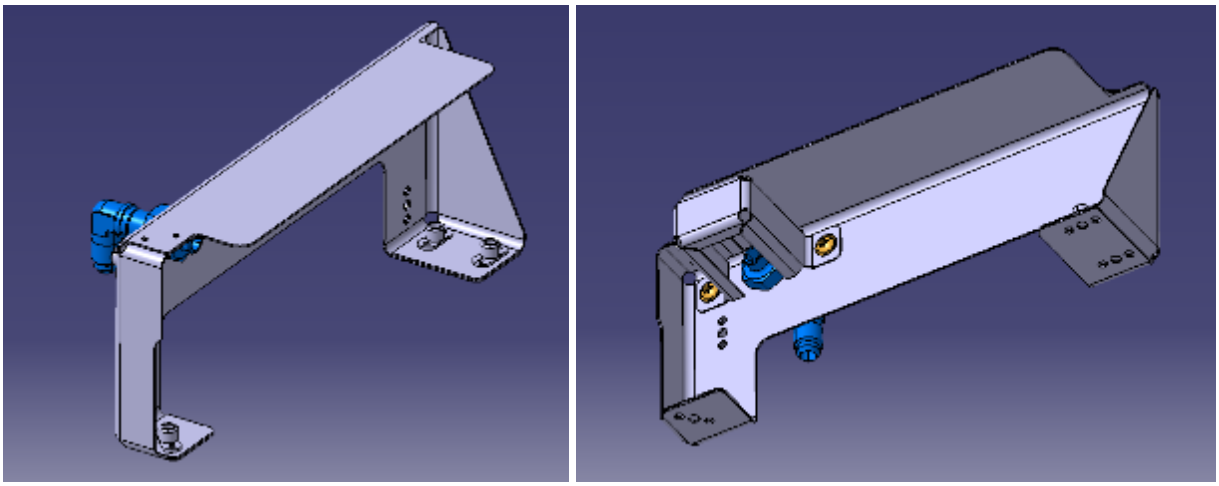

Figure 8 – Battery Vent Installation

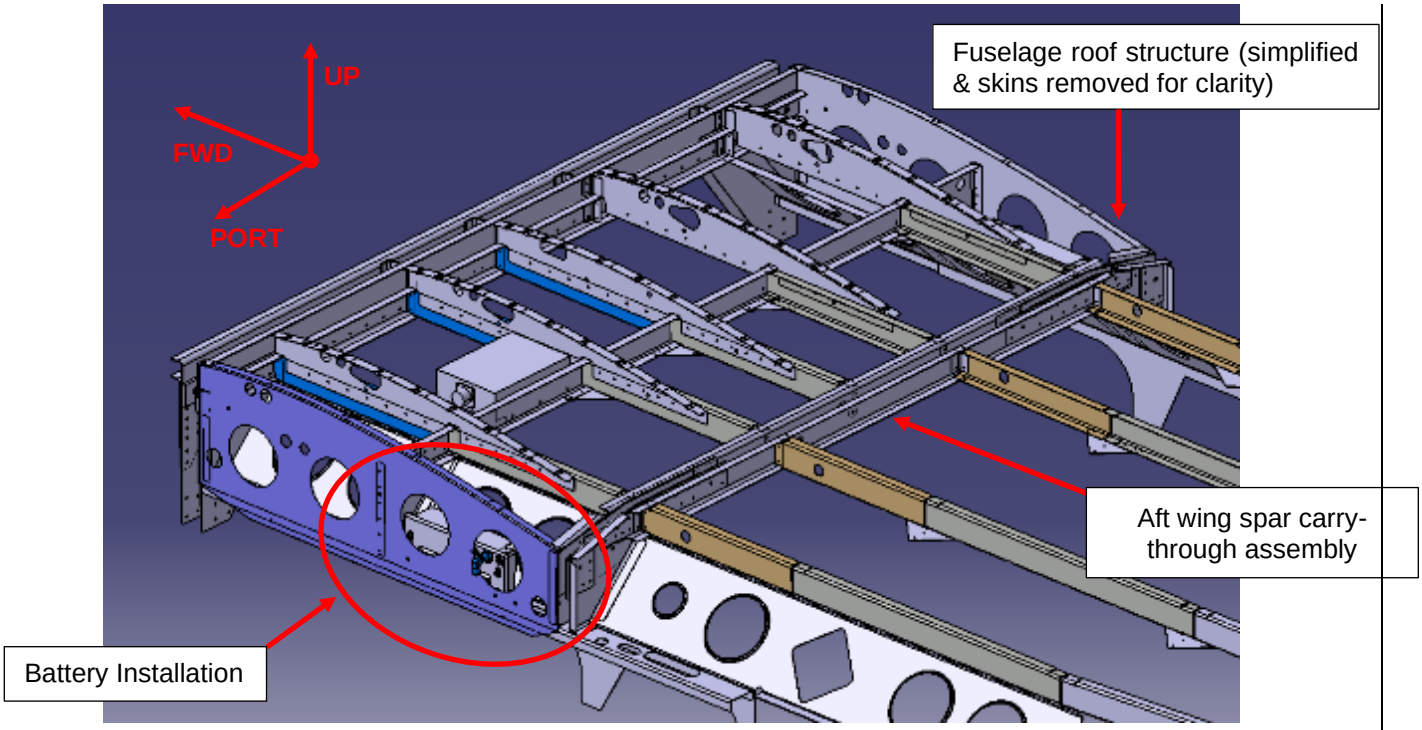

Figure 9 – General Location of Battery Installation

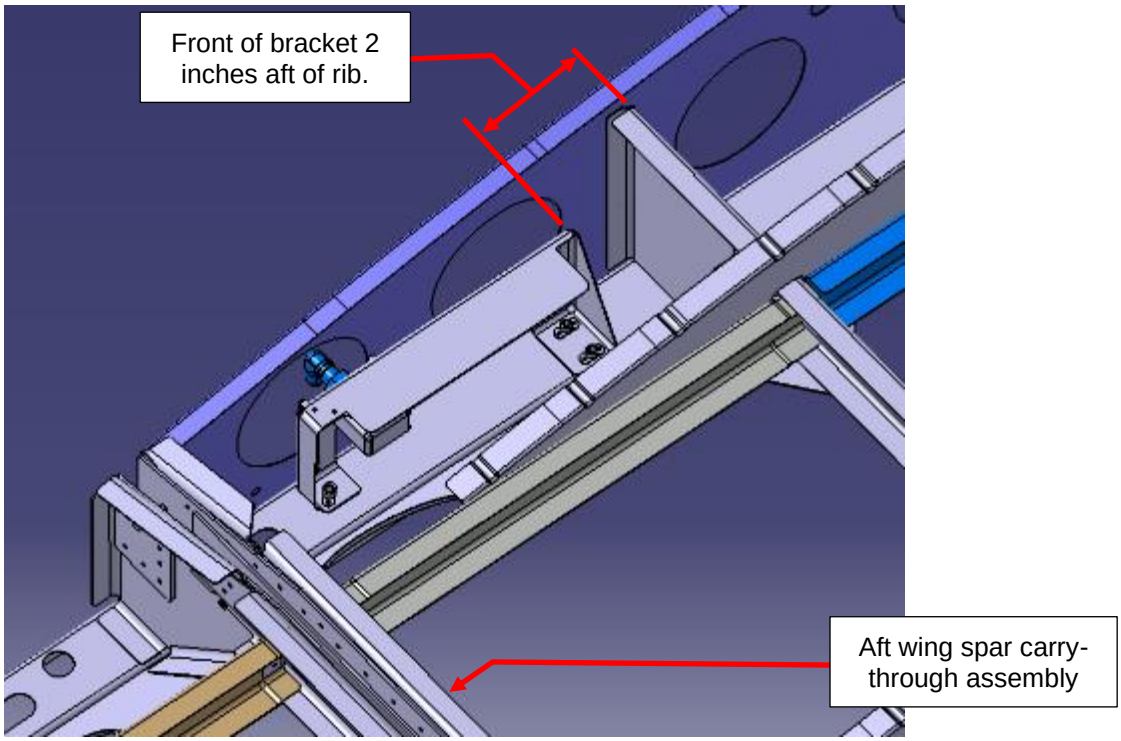

Figure 10 – Battery Bracket Installation

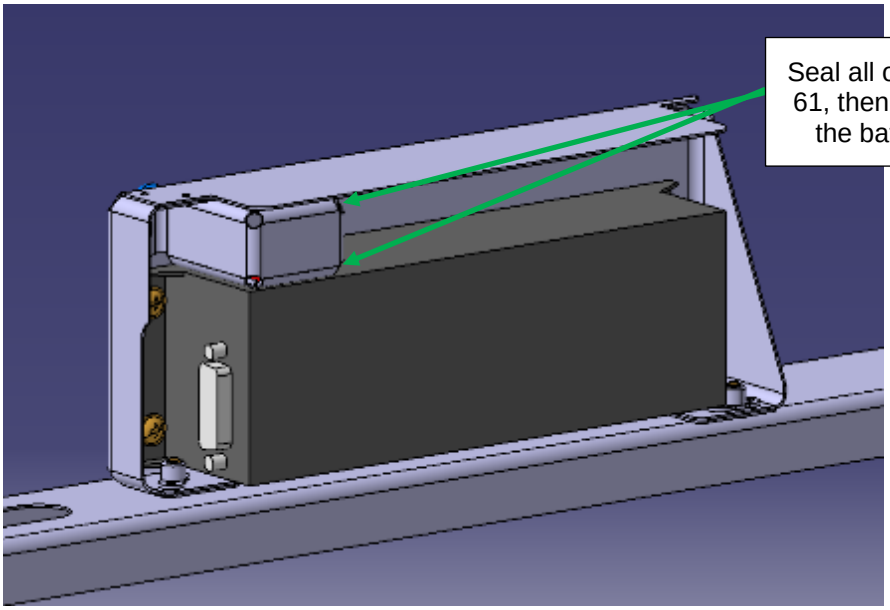

Figure 11 – Sealing of Battery Vent

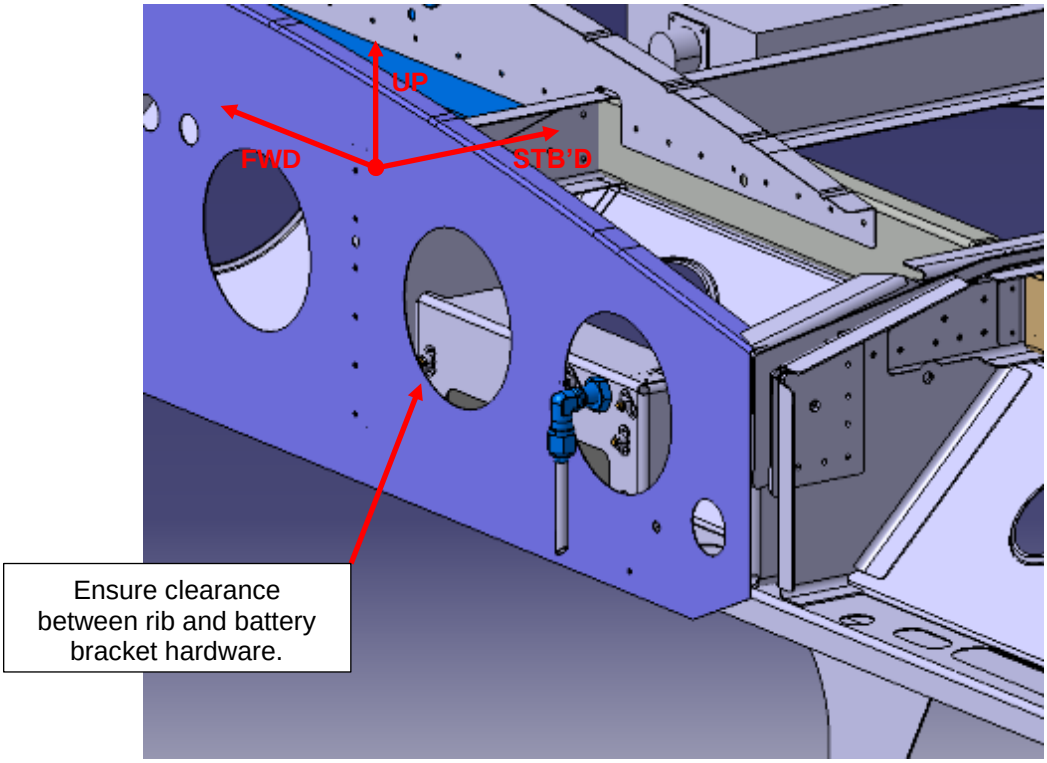

Figure 12 – Vent Installation

Overhead Panel Modification

19. Refer Figure 14, the overhead panel requires the installation of the IBBS CHARGE and IBBS/EIS POWER circuit breakers. Both of these circuit breakers are connected to BUS 1 via bus bars and should be installed on LH side of the panel. As the layout of the overhead panel varies depending on both the basic configuration and modified state of the overhead panel there are several options to effect this change.

    (I) Install the IBBS CHARGE and IBBS/EIS POWER into vacant positions on BUS 1.

    (II) If there are no vacant BUS 1 positions any vacant position on the LH side of the overhead panel may be used. Use bus bars (ITEMS 44-46) as required or 8g wire links to connect the circuit breakers to BUS 1.

    (III) If there are no vacant BUS 2 positions on the left hand side of the overhead panel the MAP LIGHT and RADIO LIGHT may be relocated to the RH side of the overhead panel

20. Identify the IBBS CHARGE and IBBS/EIS POWER circuit breakers using the placard (Item 38). For option I, trim the “BUS 1” identifier off the placard if desired.
21. Refer Figure 15, cut holes to suit the “LOW VOLT” LED and RH EIS switch. Cut a slot for the electroluminescent strip and radius the slot to remove sharp corners that could damage the strip
22. Refer Figure 17, trim the electro luminescent strip so that when secured there will be 2.75” showing through the slot. Refer Figure 16, remove the electro luminescent strip backing and secure the strip to the overhead panel
23. Using a sharp knife or scalpel, trim the electro luminescent strip to allow the installation of the light and switch. A 1/16” (1.5mm) clearance should be added around the switch hole to prevent a short circuit in the EL strip.
24. Install the RH EIS BATT PLACARD.
25. Install the “LOW VOLT” LED and RH EIS Switch.
26. Disconnect and remove the GA8-242011-11 EL Inverter Assy., located in the overhead panel.
27. Remove the heat shrink enclosing the EL Inverter Assy. Refer Figure 12, Using the wired connector supplied with the UMA Electro-Luminescent Light Strip, solder in the wire blue and violet wires to one of the + and ip connections. Inverter Blue and violet wires are to be twisted at least 8 turns per foot (1 turn per 38mm). Remove flux and apply non-acetoxy (neutral cure) RTV over the solder joint to support the wires.

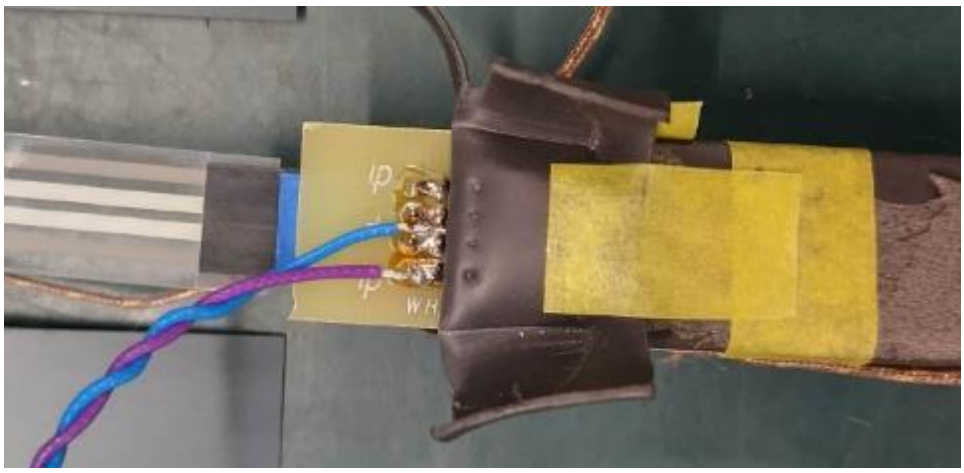

Figure 13 Solder connection

28. Refer Figure 13, slide a new piece of heat shrink over the EL Inverter Assy, shrink using a heat gun, secure wires with a tyrap. Apply Foam tape.

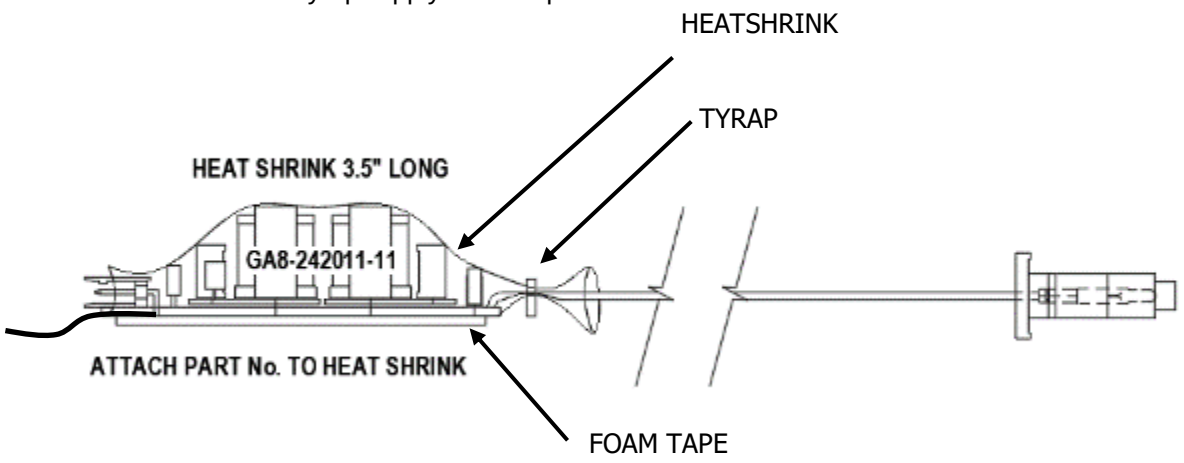

Figure 14 EL Inverter Assy.

29. Refit the EL Inverter Assy and connect the existing and EIS Electro luminescent strips.
30. Reconnect the EL Inverter Assy power connector (P19)
31. Install Backup battery wiring loom, allowing sufficient length in the for the connector to engage the EIS battery.
32. Install P107 and label.

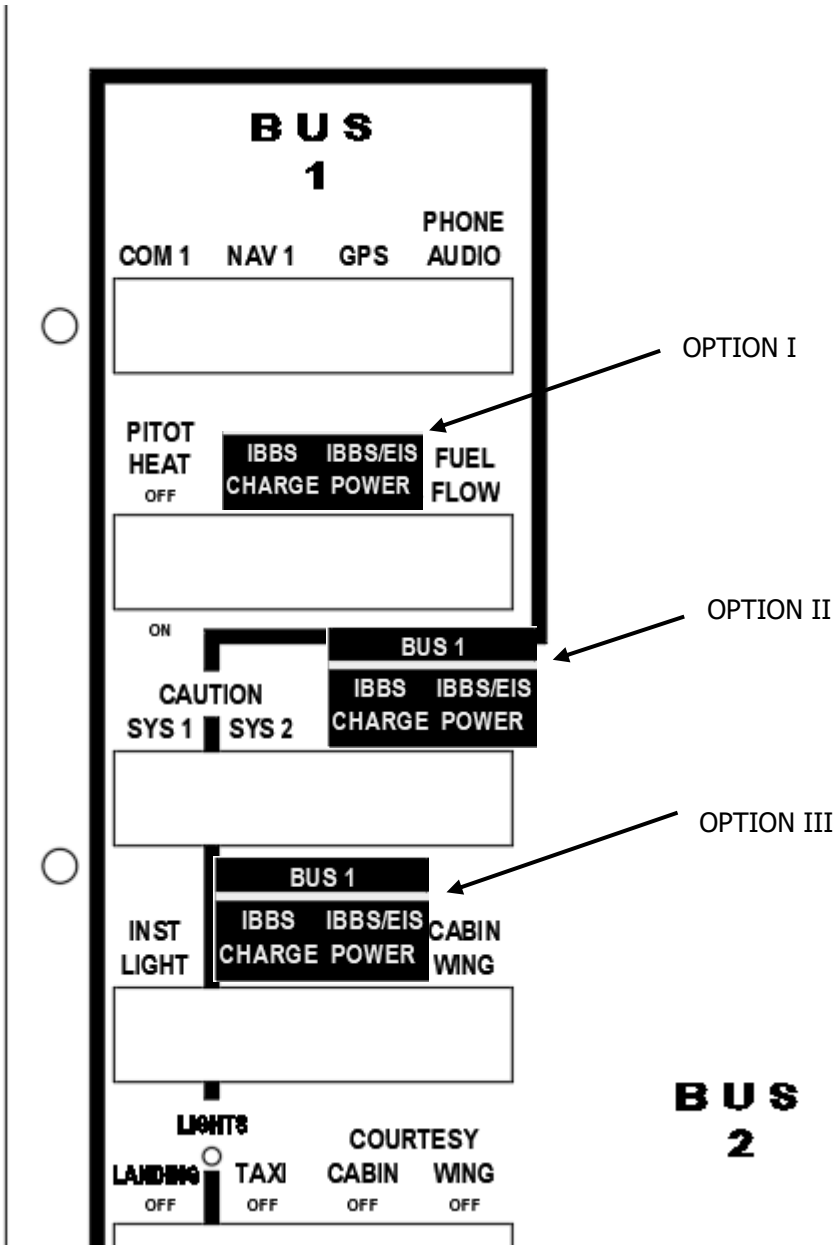

Figure 15 Circuit Breaker & Decal Location

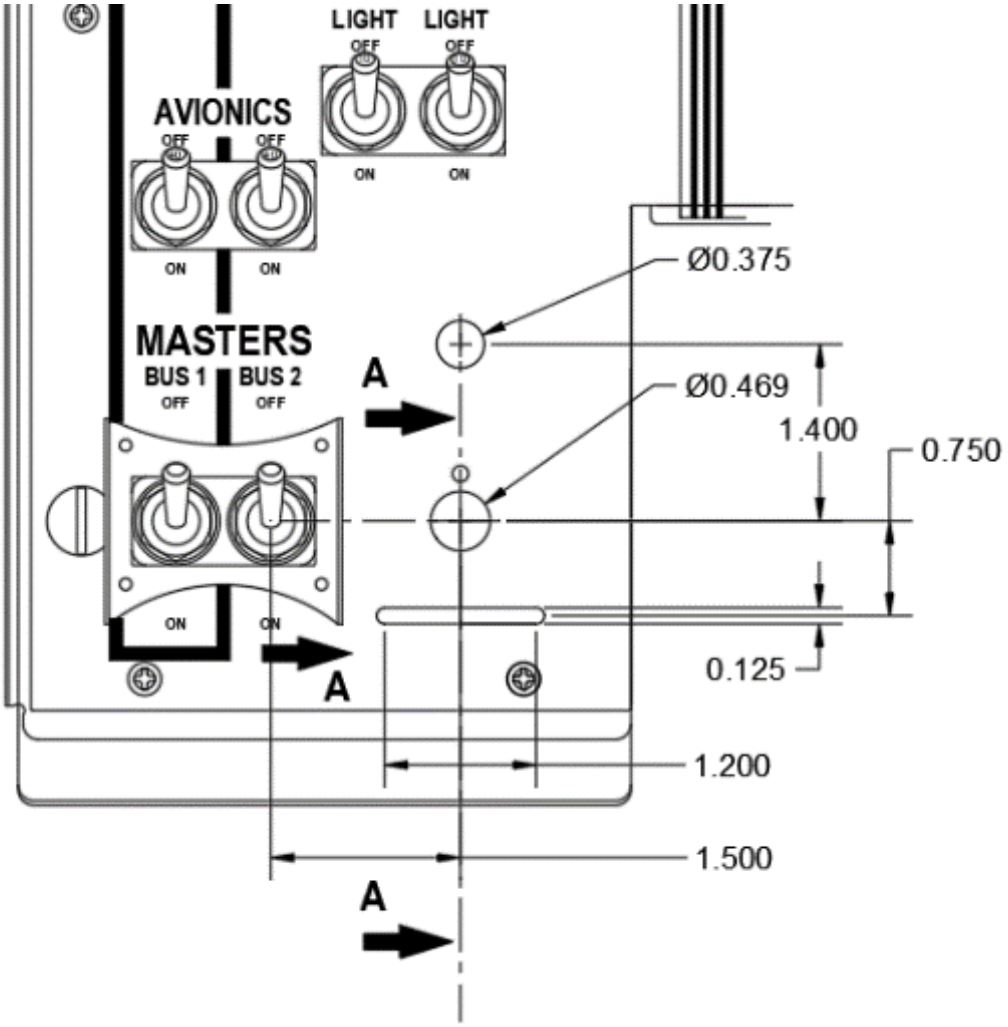

Figure 16 Switch and LED Cut-Out

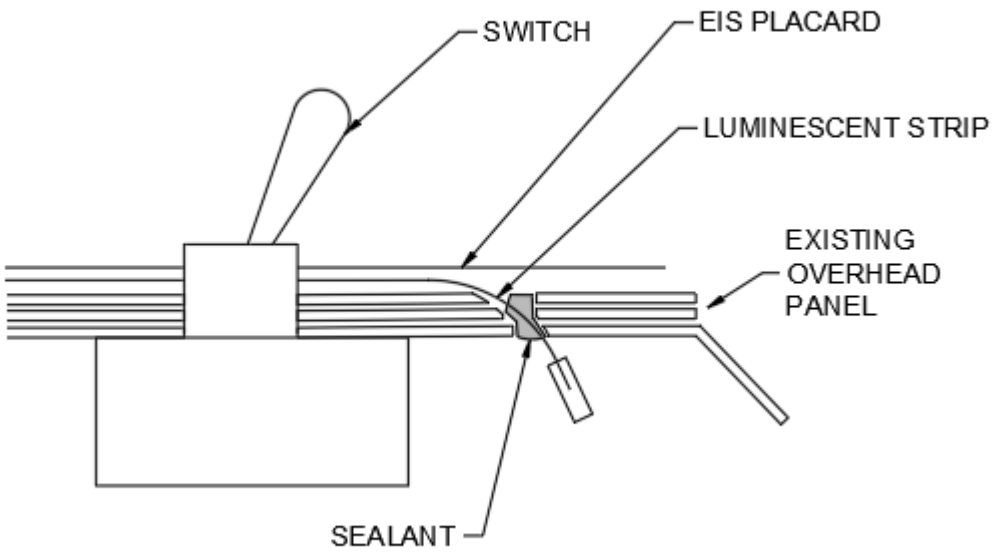

Figure 17 View A-A Electro luminescent Strip and Placard Installation

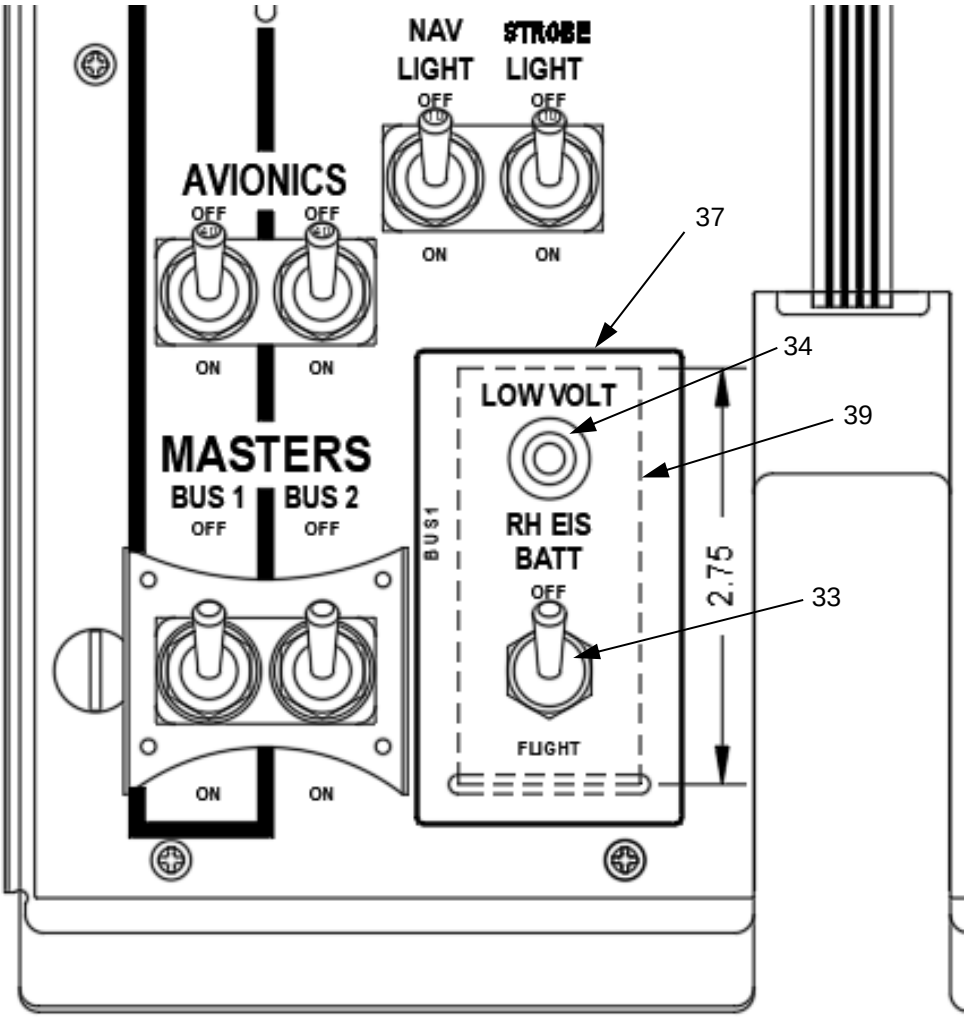

Figure 18 Switch and Indicator installation

Wiring Installation

33. Install EIS Power wire 2JE001A18 between RH Engine ignition Module and the J107. Terminate the wire with ring terminals, pin and solder sleeves.
34. Tie the wire into the main loom using lacing tape or tie-wraps
35. Connect wire 2JE001A18 to the Power Terminal of the RH Engine Ignition Module. Connect the power wire shield and P-Lead wire shield to the P-Lead Shield (Ground) terminal.
36. Connect the RH P-Lead to the P-Lead Terminal of the RH Engine Ignition Module
37. Connect wire 2JE001A18/1 to J107 Pins 4 & 5 (item 7). Connect the shield wire to the ground point on the battery tray.
38. Install the ground wires on J107
39. Carry out a continuity check in accordance with Figure 18.
40. Carry out a functional test on all disturbed systems

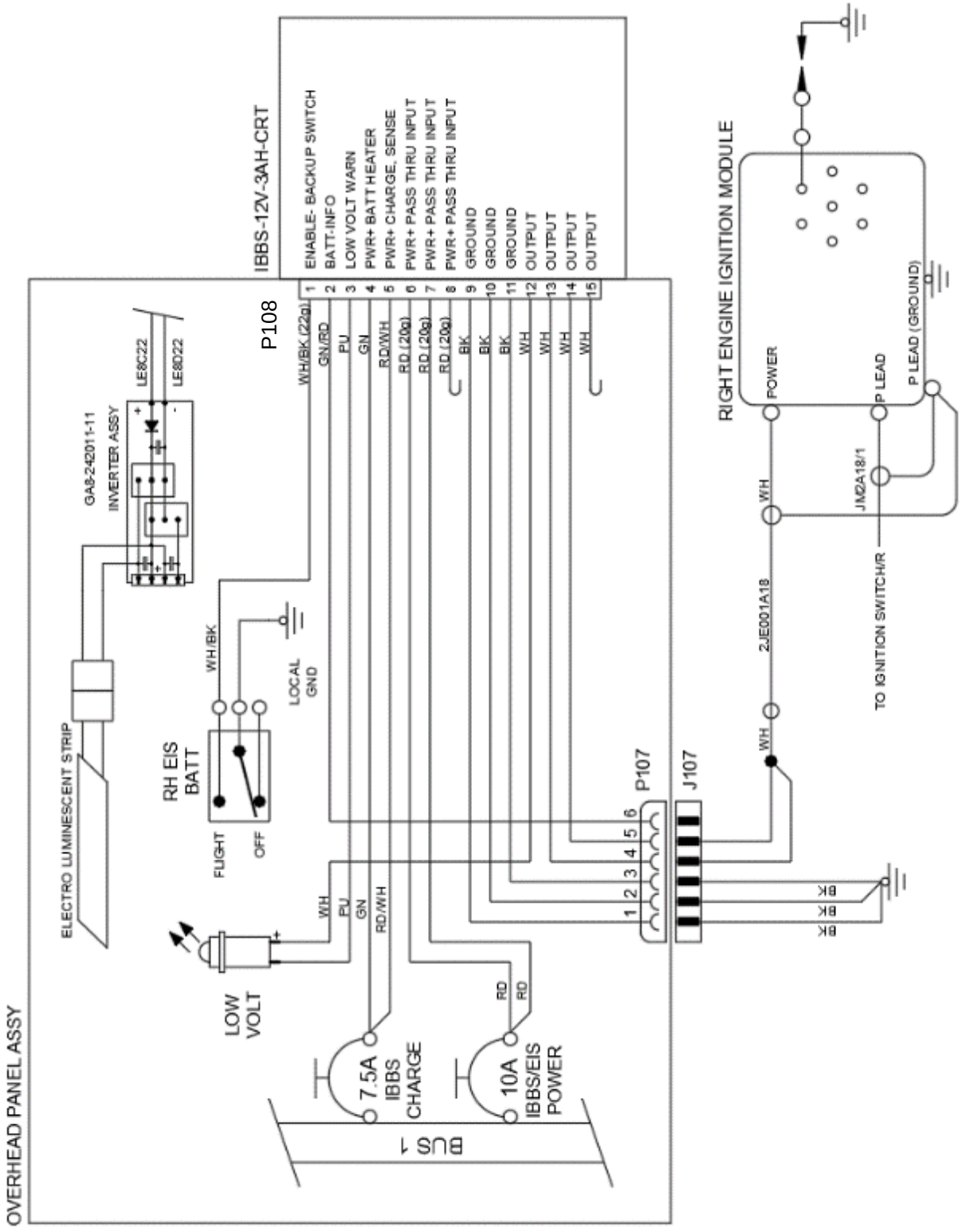

Figure 19 – RH EIS Wiring Diagram

Testing

41. Carry out a ground run to check the operation of the IBBS & EIS as below.
42. Prior to turning on the Aircraft Master Switch, turn ON the IBBS Back-up Power master switch.
43. Using a multi meter or test lamp, ensure there is power to the RH EIS.
44. Verify the IBBS low voltage warning light is indicating a low voltage condition
45. Turn on the Aircraft Master Switch; ensure the connected equipment remains energized. The low voltage warning light should go out.

46. Start and operate the aircraft according to normal operating procedures.
47. Switch the Ignition switch to R. Pull the IBBS CHARGE and IBBS/EIS POWER circuit breakers. Verify the low voltage warning light is indicating a low voltage condition and the engine remains running. Re-set the IBBS CHARGE and IBBS/EIS POWER circuit breakers. Select Ignition switch to BOTH.
48. Shut down the aircraft engine using normal procedures
49. Shut down the Aircraft Master Switch
50. Verify that the RH EIS has power.
51. Turn off the RH EIS BATT switch. Verify that the RH EIS has no power.
52. During dark conditions, check the RH EIS placard backlighting levels are consistent with the remainder of the overhead panel and the placard does not create any light source which is distracting to the pilot or causes adverse glare in the windscreen.

Close up

53. Refit all panels and trim removed to gain access
54. If not installed Apply EIS Warning Placard (item 5) to the instrument panel, adjacent to the ignition switch refer Figure 1.
55. Carry out EMC Test below.
56. Add Flight Manual Supplement C01-04-172 to the flight manual.
57. Add this Service bulletin and Service Manual Supplement (ICA), C05-96-97 to the Service Manual.

~~End of Part B~~

EMC Test

1. As part of the engine run operational check of Service Instruction No. 1569, carry out an Electromagnetic compatibility test on the aircraft instruments and systems to ensure there is no interference from or to the EIS & IBBS. The test is a source-victim test to ensure the new equipment does not generate any interference and that any installed systems do not interfere with the operation of the EIS.

SAFETY PRECAUTIONS

2. Observe all standard flight line safety precautions and Aircraft Flight manual safety precautions during the conduct of this test.
3. Ensure that all personnel are well clear of the radio antennae prior to transmitting. The safe specific absorption level is 0.4 W/kg. A minimum distance of at least 2.5 (8ft) metres should be sufficient for most VHF antennae with less than 25 W transmission power.
4. Exposure to microwave radiation is a serious health hazard. Observe the manufacturer's safety precautions in the aircraft flight manual and guidelines of AC 20-68B. Ensure that all personnel are well clear of the front of the aircraft prior to operating the weather radar. The minimum exclusion zone for the Bendix King RDR-2000, a typical 4kW weather radar, is a 3m (10 ft) radius semi-circle extending 90° to either side of the aircraft centreline and forward from the plane of the Antenna.
5. Prepare the aircraft for an engine ground run in a safe place away from buildings, spectators, or other hazards. Observe operational safety precautions. Face the aircraft into the wind.
6. Designate one person as Safety Officer, equipped with a warning horn, with safety oversight for the test. If the Safety Officer uses the warning horn all external staff must stop movement.

LH EIS as a source of interference

7. With the engine running and the below systems operating;
   - Cycle power to the LH Engine Ignition module using the Ignition switch setting it to R, observe the affected system and note any changes. Set the Ignition switch to BOTH.
   - Pull the IBBS/EIS POWER circuit breaker, Turn the RH EIS BATT to OFF, pull the IBBS CHARGE circuit breaker. Observe the affected system and note any changes. Close the IBBS/EIS POWER and IBBS CHARGE circuit breakers, and set the RH EIS BATT to FLIGHT
   - Repeat the above steps for each system listed in Table 9

   Expect an RPM drop when turning off the EIS
8. In order to be considered a pass, systems must not suffer adverse effects that prevents it from performing its' intended function. An example list of failures:
   - Lack of indicator stability
   - Erratic operations
   - Inadvertent operation of annunciators
   - Pronounced changes to luminance
   - Hum/whine/distortion in audio
   - Misleading indications
   - Permanent displacement of indicator needles

An example list of acceptable EMI:

   - Momentary flicker of indicators
   - "Pops" or "clicks" and other temporary audio noises
   - Most momentary/transitory affects as may be observed

9. Any observed interference other than momentary upsets when power is cycled should be reported to GippsAero.

Table 9 EIS as a source of EMI

System	Victim State	Comments	LH OK?	RH OK?
Engine Instruments	Operating			
Fuel Quantity	On			

System	Victim State	Comments	LH OK?	RH OK?
Electronic flight instruments	On			
Warning Lights	Either on and/or off depending on the normal state.			
Magnetic Compass		Note any deviations		
Lighting (internal and external)	On and Off			
ELT	Standby	Check for uncommanded operation		
Internal Communication System	On	Cycle the IBBS Charge Circuit breaker while holding an open mic. Listen for ignition noise		
Primary Com/Nav Audio	On	Tune to a high, medium, and low frequency and listen for interference. Tune the receiver(s) into the local modulated frequencies e.g Automatic Terminal Information Service (ATIS) and listen for interference.		
Secondary Com/Nav Audio	On			
Other Radio systems e.g., HF, CB	On			
VOR / ILS / ADF / DME / MKR	On	Refer expanded test below		
Rad Alt	On	Check for changes in altitude.		
GPS	On	Refer expanded test below		
Transponder / ADS-B	On	Use an appropriate test set (e.g. IFR 6000) and ensure the standard mode A/C/S/ADSB functional tests are passed with the EIS & IBBS operating normally.		
Traffic (if installed)	On	Monitor local traffic for signal loss or target ghosting.		
TCAS (if installed)	On			
Autopilot	On - engaged	Check for movement of the flight controls.		
Additional Installed Systems Not Already Listed				

10. Navigation System Detailed Requirements

To test the VOR, ILS and DME systems, tune the NAV radios to the following frequencies on the Ramp test set and monitor the audio output while verifying the correct indicator function.

Set the Ramp test set to +3 dBm above the minimum threshold at which the warning flags appear:

VOR and ILS tests are to be performed using a radiating antenna connected to the test set and to be set up in accordance with the test set operating manual. Parameters to be recorded below;

VOR			
Test Frequencies	108.000	115.000	117.000

□ Pass / □ Fail			

Record Test Set Parameters (iaw Test set operating manual)			
Test Antenna location WRT aircraft			
30Hz mod level		9960Hz mod level	
RF set LvL		Mod tone	

ILS			
Test Frequencies	108.100	109.700	111.900
□ Pass / □ Fail			

Record Test Set Parameters (iaw Test set operating manual)			
Test Antenna location WRT aircraft			
Loc RF Set LvL		M Mod %	
Mod Tone			

Simulate a DME input at 108.00 MHz and 100NM at 150 knots using the ramp test set, set to +3 dBm above the minimum threshold at which the warning flags appear.

DME			
Test Frequencies	108.000	115.000	117.000
□ Pass / □ Fail			

Test Antenna location / distance WRT aircraft			
Ant Cable Loss		Ant Gain	

Local NDB beacons / AM Radio Stations may be used in lieu of a test set.

ADF			
Test Frequencies			
Identifier			
□ Pass / □ Fail			

Test Antenna location / distance WRT aircraft			
Ant Cable Loss		Ant Gain	

MKR BEACON			
Marker	OM	MM	IM
Test Frequency (MHz)	75.00		
Modulation Tone (Hz)	400	1300	3000
□ Pass / □ Fail			

Test Antenna location / distance WRT aircraft			
Ant Cable Loss		Ant Gain	

11. GPS Navigation Systems Detailed Requirements

Select the GPS reception page and watch for changes in the signal strength, GPS accuracy or satellite drop out when the item being tested is operated. If the data is provided, observe GPS signal to noise ratio for several satellites and look for changes corresponding to the equipment operation.

LH EIS as a victim of interference

12. The EIS would be most susceptible to close or high-power sources of interference such as equipment using 25 Amps or more to operate, radios that transmit 30 Watts or more, antennas located within 0.5 metres, or High Frequency (HF) transmitters of any power.

13. With the engine running operate or Cycle power to below systems and observe the engine tacho and note any changes or rough running.

Table 10 EIS as a victim of EMI

System	Comments	LH OK?	RH OK?
Alternator	Cycle the 10A Alternator field circuit breaker.		
Pitot Heat			
VHF / HF	Carry out a test transmission at various frequencies in accordance with para 14 and fill in Table 11 and Table 12 below		
Landing / Taxi Lights			
Strobe lights / Beacon light			
Lighting Dimmer			
24V system (if installed)	Cycle and loads used by the 24V System.		
Any equipment using 25 Amps or more to operate.			
Any radios that transmit 30 Watts or more			
Any equipment with antennas located within 0.5 metres of the EIS, IBBS or wiring			

14. COMMS AND INTERCOM SYSTEMS

- Check interference with each HF or VHF (COM 1 and COM 2) for at least 20 seconds for each of the following frequencies:
- The carrier must be modulated i.e. there must be audio; speak into the microphone during the transmission.
- Observe the duty cycle limits of the transmitters.

Table 11

VHF Comm Frequencies (MHz)				
Item	COM 1		COM 2	
	□ Pass	□ Fail	□ Pass	□ Fail
118.000				
121.000				
125.000				
130.000				
133.000				
136.000				

Table 12

HF Comm Frequencies (MHz)		
Item	HF	
	□ Pass	□ Fail
2.500		
15.000		
28.900		

Record any observed adverse EMI effects in the space below:

Record any corrective action and the result in the space below:

Documentation:

Update aircraft log book to reflect incorporation of this Service Bulletin.

Insert this Service Bulletin and Service Manual Supplement (ICA), C05-96-97, Lycoming Electronic Ignition System, into the aircraft's Service Manual.

Insert Flight Manual Supplement C01-04-172 Lycoming Electronic Ignition System to the flight manual.

Continuing Airworthiness:

Instructions for Continued Airworthiness are contained in Service Manual Supplement (ICA), C05-96-97

Compliance Notice:

Complete the Document Compliance Notice and return to GippsAero by mail, fax or email.

DOCUMENT COMPLIANCE NOTICE

	Document: **SB-GA8-2022-206** **Issue 2**

Aircraft Serial Number: GA8-_____

Service Bulletin SB-GA8-2022-206, Issue 2 has been incorporated in the above aircraft.

Date of Incorporation:_____

_____
Signed

Print Name: _____

If this Service Bulletin requires any inspections be carried out, describe the result of these inspections:

Please post, fax or email this compliance notice to:

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