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SB-GA8-2019-197

Issue 1

OPTIONAL

Service Bulletin

Subject:

Replacement of UniPoint SNLS-135 starter solenoid with Lamar STS-S12 starter solenoid.

Applicability:

Table 1 – Applicability.

AIRCRAFT	SERIAL NUMBER(s)
GA8	GA8-00-004 to GA8-18-248
GA8-TC 320	GA8-TC 320-09-120 to GA8-TC 320-19-256

Amendments:

Issue 1: Initial Issue. GippsAero reference GAE11#2597.

Background:

The UniPoint SNLS-135 starter solenoid is installed in the underfloor solenoid box. The part can no longer be sourced by GippsAero and so the “on condition” replacement of the part with a Lamar PMA P/No. STS-S12 solenoid is authorised by this Service Bulletin.

The change is applicable to Solenoid Box P/No. GA8-246012-111. As the STS-S12 is not a “drop-in replacement” for the UniPoint SNLS-135 solenoid the solenoid box and the GP Start Bus (located in the solenoid box) require modification. Note that the UniPoint SNLS-135 cannot be re-fitted to the solenoid box after completing this Service Bulletin.

This Service Bulletin also installs an additional ground wire between the solenoid box and the ground power earth terminal.

The modifications described in this Service Bulletin have been incorporated in solenoid box P/No. GA8-246012-115 and fitted to aircraft with serial numbers higher than those listed in the Table 1.

Figure 1 – Lamar starter solenoid

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.

Labour:

Up to 4 man-hours should be allocated to the incorporation of this Service Bulletin.

Warranty:

This is an optional modification. Installation warranty is not applicable, however component warranties are provided by the respective manufacturers.

Approval:

The modification described in this Service Bulletin has been approved pursuant to Australian Civil Aviation Safety Regulation 21.095 (1998).

Weight and Balance:

Weight and balance is unchanged.

Required Documents:

The GA8 Service Manual applicable to the aircraft.

Parts and Materials:

Refer to Table 2 which defines Service Bulletin Kit SB-GA8-2019-197-01

Table 2 – Parts List

ITEM	PART NUMBER	DESCRIPTION	QTY
1	STS-S12	SOLENOID START 12V (LAMAR)	1
2	GA8-533012-029	ANCHOR NUT RETAINER ASSY	1
3	MS25036-103	TERML LUG INSUL RING 22-18AWG #10 DIA RD	3
4	MS25036-105	TERML LUG INSUL RING 22-18AWG 3/8 DIA RD	1
5	M22759/16-20-9	WIRE 20AWG ETFE 600V WHITE M22759	6"
6	M22759/16-18-9	WIRE 18AWG ETFE 600V WHITE M22759	32"
7	MS20470AD3-3	RIVET	2

Table 3 – Compounds

ITEM	COMPOUND NUMBER	DESCRIPTION
C1	BMS10-11 TY I CL A GR A or BMS10-79 TYII CL A or MIL-PRF-23377 Type I & II Class C2	INTERIOR PRIMER *(Sourced Locally)*

Parts Availability:

Required parts can be purchased directly from GippsAero.

Tel: +61 (0)3 5172 1200

Fax: +61 (0)3 5172 1201

Email: aircraft.parts@mahindraaerospace.com

1 Accomplishment Instructions:

NOTE:

Ensure the aircraft is prepared for maintenance and that appropriate safety precautions are taken when performing work outlined in this Service Bulletin.

Unless otherwise specified, reference to the GA8 or GA8-TC 320 Service Manual as well as FAA AC43.13-1B & FAA AC43.13-2B should be made when carrying out the procedure prescribed in this Service Bulletin. In case of discrepancy between the Service Manual and the AC, the Service Manual takes precedence.

All work specified in this Service Bulletin shall be carried out by appropriately qualified personnel.

1.1 INITIAL PREPARATION

1.1.1 Disconnect the aircraft battery in accordance with directions contained in the GA8 or GA8-TC-320 Service Manual, Section 24-00-10 “Battery”

1.1.2 Discharge the alternator excitation system per Section 24-00-40 of the GA8 or GA8-TC-320 Service Manual.

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.

BEFORE REMOVING THE COVER PANEL TO ACCESS THE UNDERFLOOR AREA IN FRONT OF THE PILOT’S SEAT, PERFORM THE FOLLOWING ACTION TO ENSURE THAT THE CAPACITOR CIRCUIT IS DISARMED:

(I) PULL THE 1 AMP BUS 2 CIRCUIT BREAKER

(II) SWITCH THE BUS 2 MASTER SWITCH ON

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 2 CIRCUIT BREAKER IS PULLED.

WARNING:

DO NOT PERFORM ANY MAINTENANCE ON THE ELECTRICAL SYSTEM IN CONJUNCTION WITH MAINTENANCE ON THE FUEL SYSTEM. THE ESCAPE OF FUEL FUMES UNDER THE FLOOR AND/OR IN THE AIRCRAFT MAY CAUSE AN EXPLOSION.

1.2 PART A – SOLENOID BOX REMOVAL

1.2.1 The entire solenoid box must be removed from the aircraft and modified. Removing the battery box is also recommended to improve access.

1.2.2 Remove the fasteners, disconnect and remove the Circuit Breaker Panel Assembly (Figure 2). Ensure connections are clearly marked or photographed before removal to enable correct re-assembly. Retain fasteners for re-use.

1.2.3 Remove the fasteners, disconnect and remove the Solenoid Box. Ensure connections are clearly marked or photographed before removal to enable correct re-assembly. Retain fasteners for re-use.

Figure 2 – Solenoid Box Covers

1.3 PART B – SOLENOID BOX MODIFICATION

1.3.1 Remove the starter solenoid marked “ST” in Figure 3.

1.3.2 Remove the ground power solenoid marked “GP”. This will be re-inserted later.

1.3.3 Remove the GP ground power bus as noted in Figure 3. This will be modified as described later in this Service Bulletin.

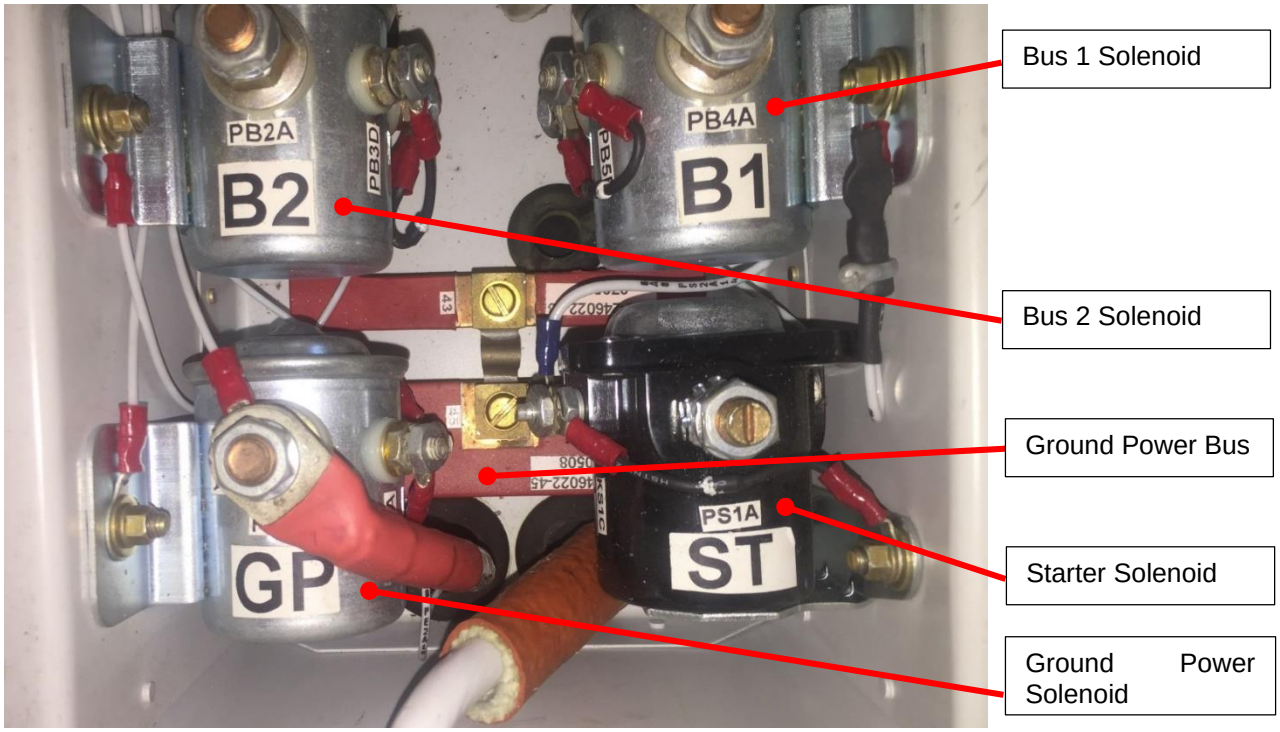

Figure 3 – Solenoid box with SNLS-135 starter solenoid prior to modification

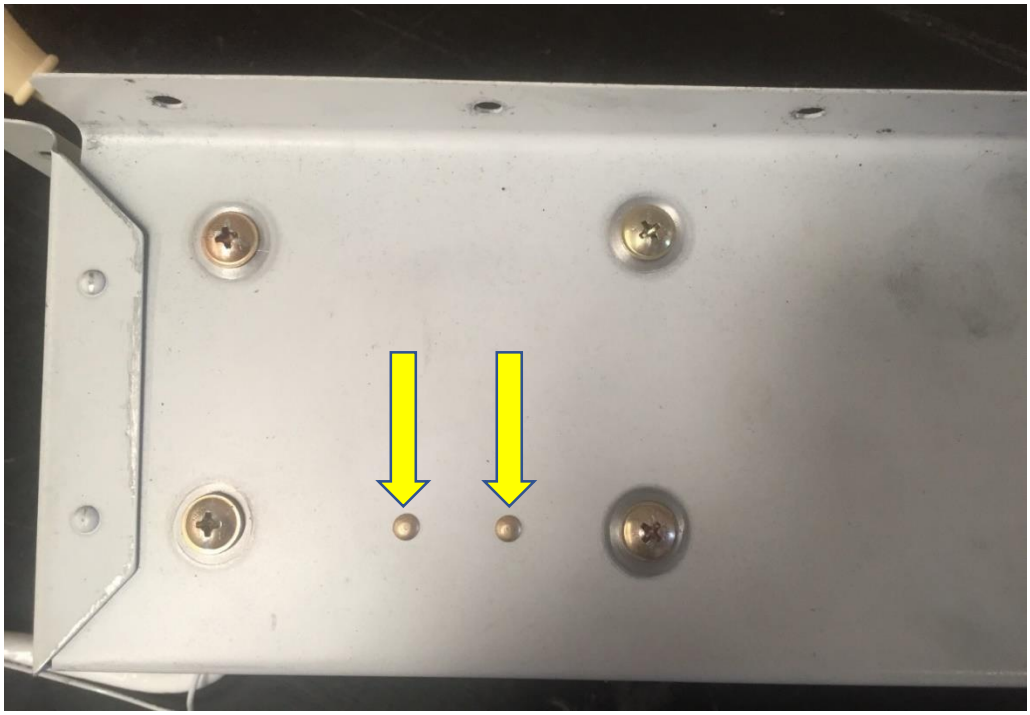

Figure 4 – Side view of unmodified solenoid box (Starter and Bus 1 solenoids).

1.3.4 The lower fasteners for the Bus 1 and Starter solenoids are secured with an anchor nut retainer. This is to be replaced with Item 2.

1.3.5 De-rivet the anchor nut retainer as indicated by arrows in Figure 4. This is on the inboard side of the solenoid box.

1.3.6 Elongate the hole in the base of the solenoid box as shown in Figure 5.

1.3.7 Elongate the two holes in the starter solenoid side of the box as shown in Figure 6.

1.3.8 Restore surface protection to holes using Compound C1 (Table 3).

1.3.9 Replace retainer with Item 2 using rivets Item 7. Orient rivet heads to the outside of the box as shown in Figure 4. Note that Item 2 is **not** symmetric about the rivet holes and correct orientation must be confirmed before riveting.

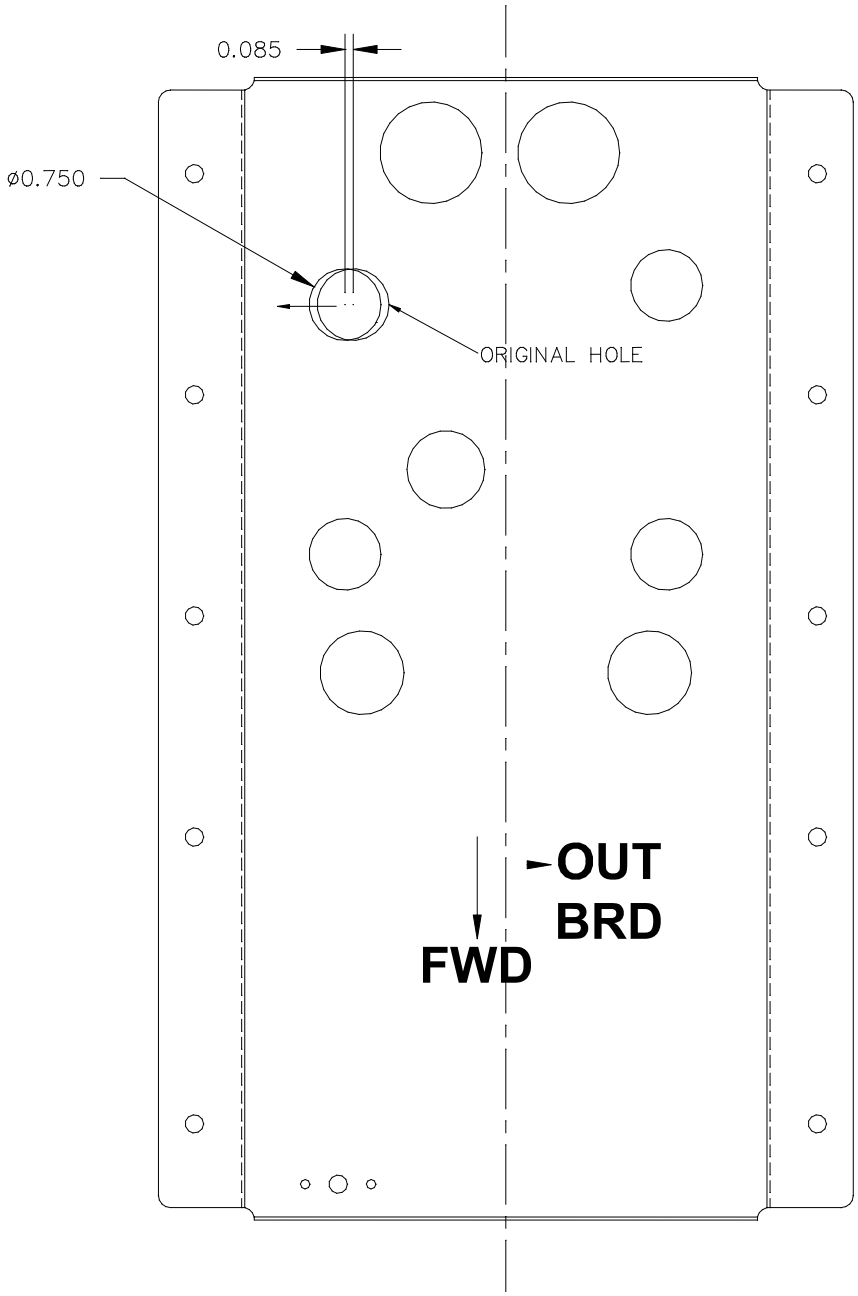

Figure 5 – Modification to the floor of the solenoid box.
(Viewed looking down into the enclosure.)

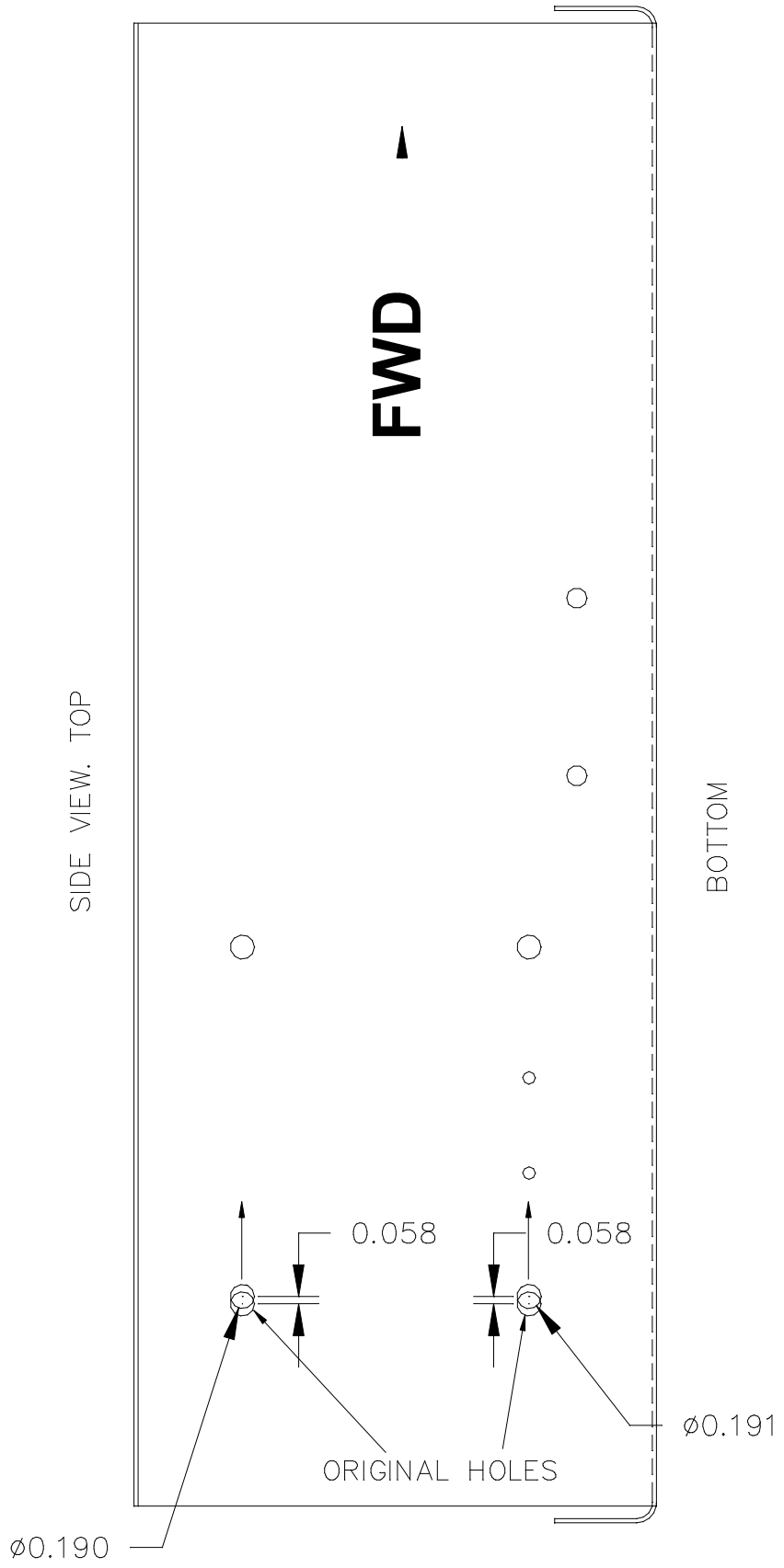

Figure 6 – Modification to side of enclosure. Starter Solenoid side.
(Viewed looking towards the enclosure, inboard side.)

1.4 MODIFY P/No. GA8-246022-045 GP-START BUS

1.4.1 The GP Start Bus bar is located below the Ground Power and Starter Solenoids. The hole used to secure the starter solenoid is to be elongated by 0.085".

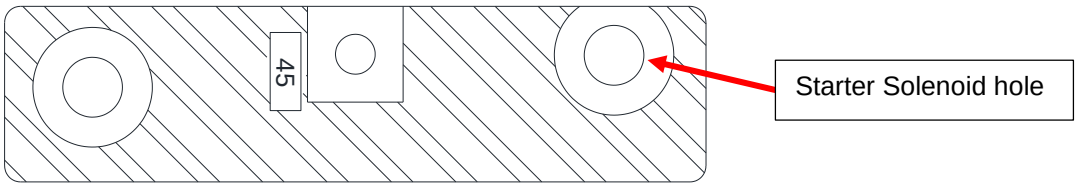

Figure 7 – Un-modified GP Start Bus
(Oriented as shown in Figure 3)

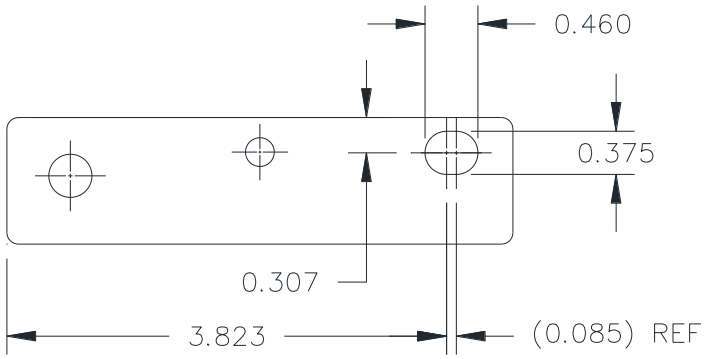

Figure 8 – GP Start Bus After Modification

1.5 PART B – SOLENOID BOX MODIFCATION: ELECTRICAL

1.5.1 If a three-stud solenoid is supplied, electrical connections are made to the solenoid case in lieu of the coil negative (-) terminal.

1.5.2 Fabricate and apply labels to the Starter Solenoid as shown in Figure 12 & Figure 13. Alternately, the part may be marked directly using indelible means.

1.5.3 Install the solenoids and bus bars to the solenoid box.

1.5.4 The original wiring in the solenoid box is given in Figure 24-1 "Power Distribution Schematic" of the GA8/GA8-TC 320 Service Manual. The modification to be made is shown in Figure 10. Figure 9 and Figure 10 are a partial view of the entire wiring made within the solenoid box. Figure 9 is a close-up view of the wiring associated with the starter solenoid.

1.5.5 For a four-stud solenoid, an earth wire link is required between the starter solenoid coil negative terminal and the earth point on the box. The supplied wire assembly is too short and is to be replaced with Items listed in Figure 10 for the "GND EXTENSION WIRE".

1.5.6 This wire shall be placed in the locations as directed by Figure 11 & Figure 12.

1.5.7 An additional earth wire is installed which has been denoted PE5A18N. Install this to the solenoid box as noted in Figure 13. The other end of this wire will be terminated after the solenoid box has been re-installed in the aircraft.

1.5.8 Torque the nuts used on the contactor terminals to 40in-lb.

1.5.9 Torque the nuts on the field terminals to 20in-lb.

NOTE:

Always hold the backing up nut (closest to the solenoid body)
with a wrench while tightening the outer nut.

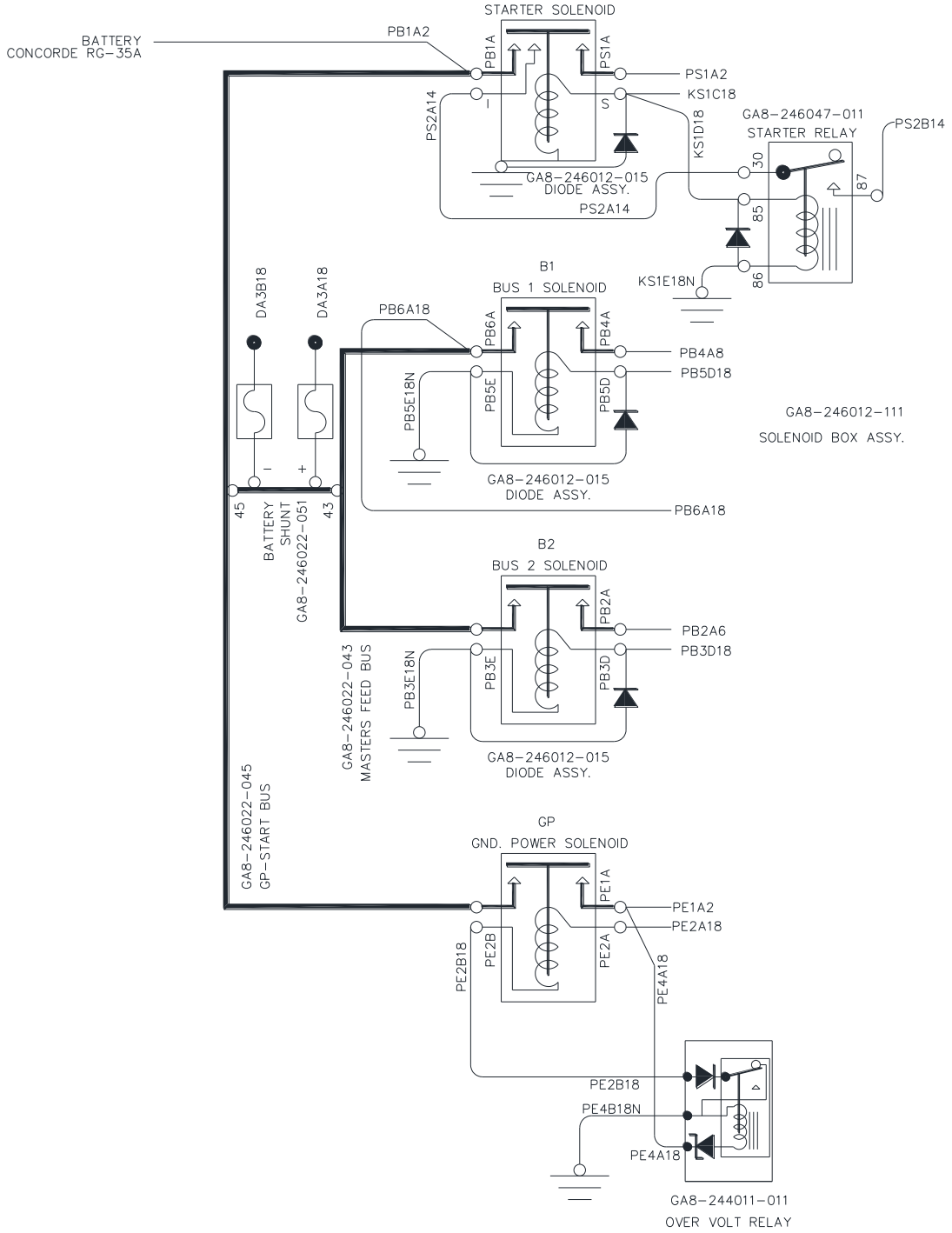

Figure 9 – Original solenoid wiring (partial)

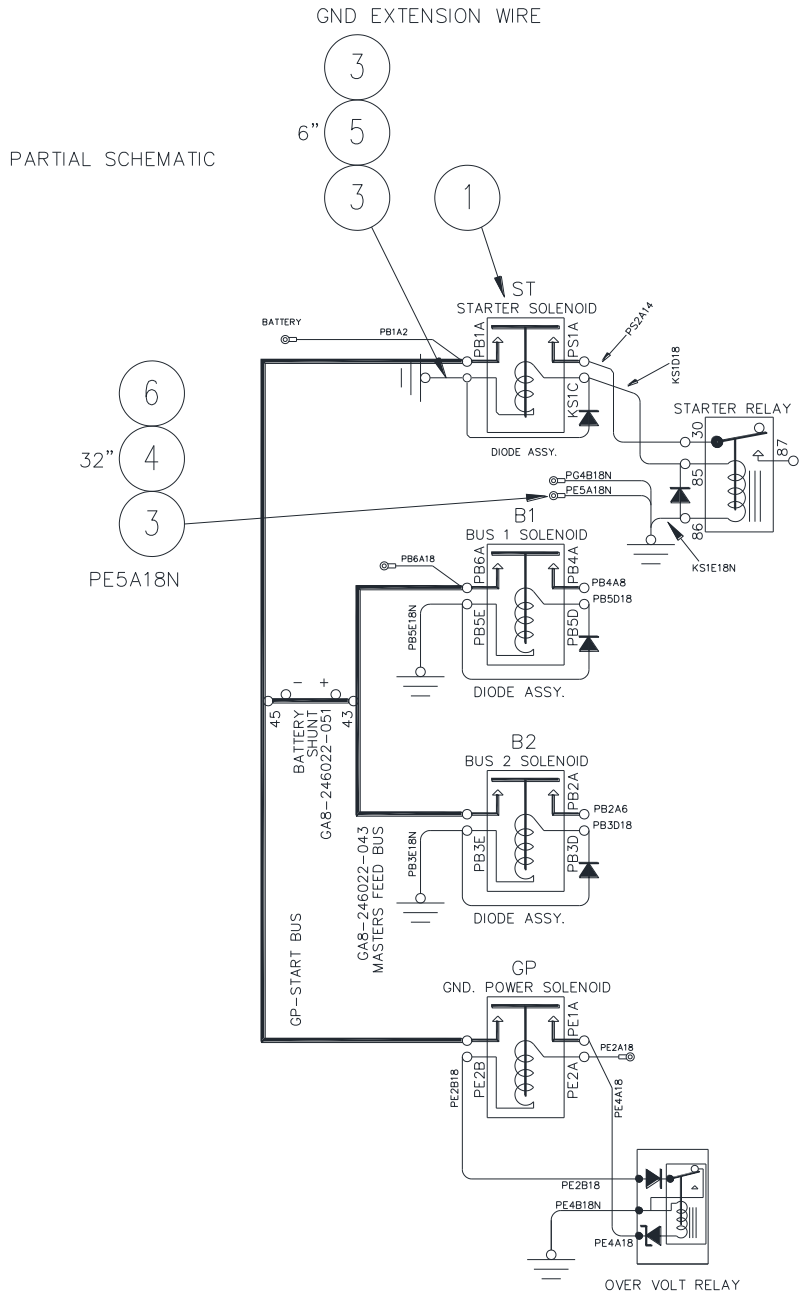

Figure 10 – Modified wiring (partial)

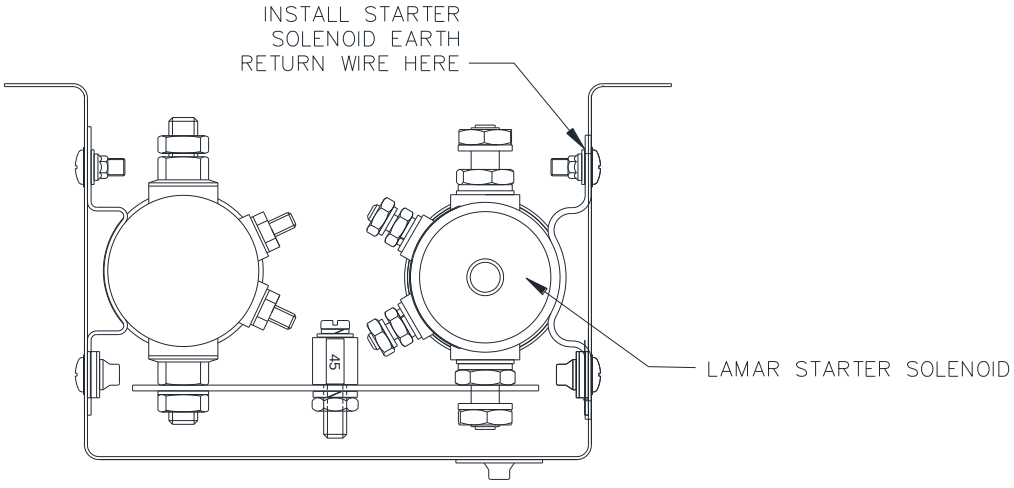

Figure 11 – Side view showing earthing point for starter solenoid to the box.

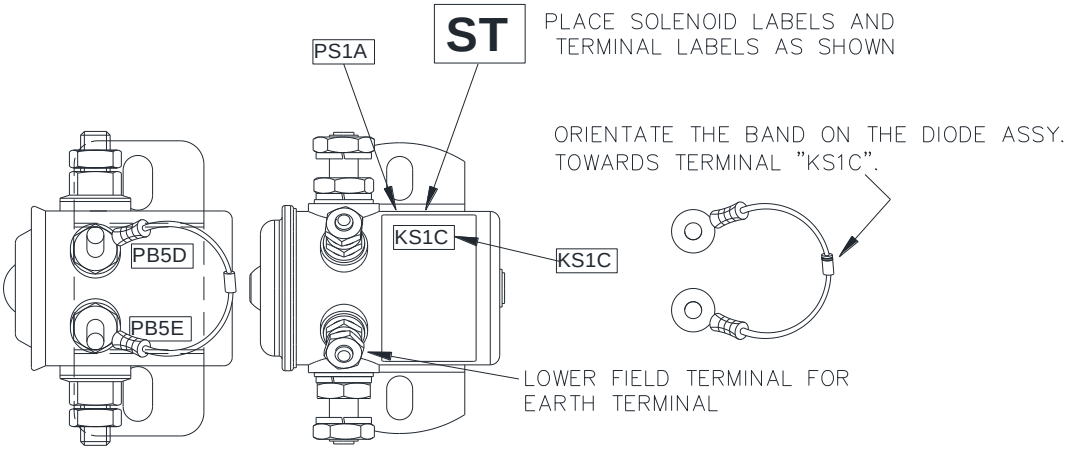

Figure 12 - Location for placement of solenoid starter earth return.

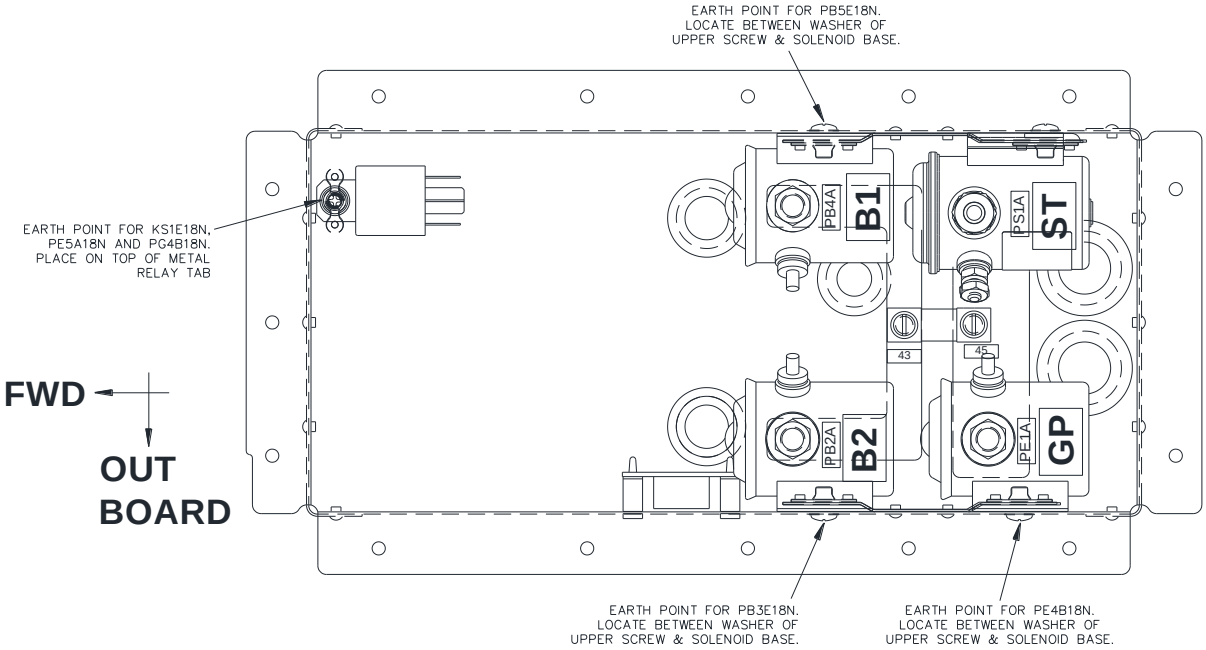

Figure 13 – Earth point locations

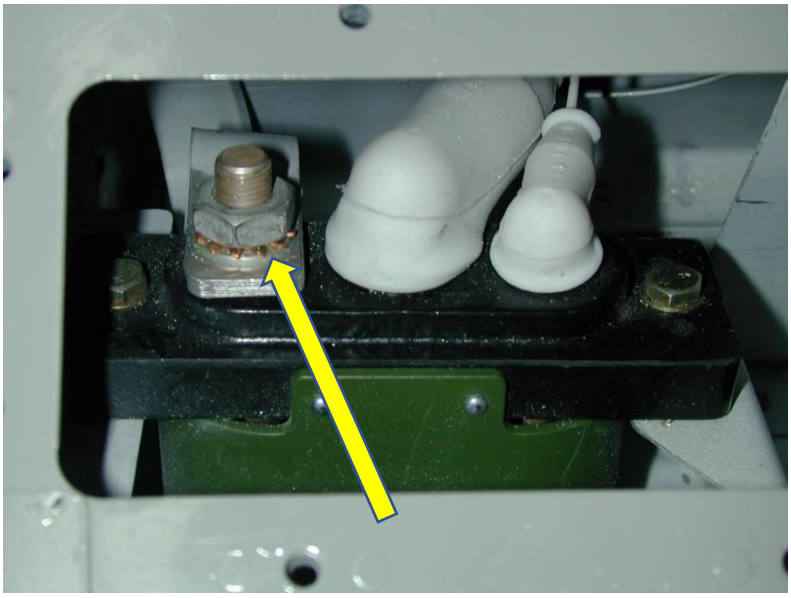

Figure 14 – Termination point for circuit PE5A18N

1.5.10 Return all previously disconnected wires to their original locations.

1.5.11 Re-install the solenoid box into the aircraft floor. If removed in Section 1.2, also re-install the battery box.

1.5.12 Connect circuit denoted PE5A18N to the ground power earth point per Figure 14.

1.5.13 Inspect the wiring to ensure that all terminals are secure.

1.5.14 Inspect the solenoid box for security and remove any debris.

1.5.15 Re-connect the Circuit Breaker Panel Assembly, returning all previously disconnected wires to their original locations and re-install the Circuit Breaker Panel Assembly.

1.6 COMPLETION AND TESTING

1.6.1 Apply a ground power source to the external Ground Power connector.

1.6.2 Push in all under floor circuit breakers.

1.6.3 Verify and test the system for correct operation in accordance with Service Manual Section 80-10-30 “Starter Solenoid and Relay Test.”

1.6.4 Remove the ground power source and pull up all under floor circuit breakers.

1.6.5 Re-install the aircraft battery.

1.6.6 Functionally test the capacitor system in accordance with Section 24-00-40 Alternator Excitation System of the GA8/GA8-TC 320 Service Manual.

1.6.7 Re-install the battery covers and pilot seat.

1.6.8 Push in all under floor circuit breakers.

Documentation:

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

Continuing Airworthiness:

Maintenance of the Solenoid Box is on condition. The electrical system is checked as part of the 100 hourly inspection. This includes components located within the Solenoid Box.

Compliance Notice:

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

DOCUMENT COMPLIANCE NOTICE

A Mahindra Aerospace Company

Document:

SB-GA8-2019-197

Issue 1

Aircraft Serial Number: GA8-_____

Service Bulletin SB-GA8-2019-197 Issue 1 has been incorporated in the above aircraft.

Date: _____

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Signed

Print Name: _____

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