A Mahindra Aerospace Company

PO Box 881, Morwell, Victoria 3840, Australia
Ph + 61 (0) 3 5172 1200
Fax + 61 (0) 3 5172 1201
www.gippsaero.com

SB-GA8-2014-116
Issue 3

OPTIONAL

Service Bulletin

1 Subject:

Installation of a Secondary Starter Solenoid

2 Applicability:

All GA8 & GA8-TC 320 aircraft

3 Amendments:

Issue 1: Initial issue. GippsAero Reference GAE11#1448

Issue 2: Alternative solenoid listed. Ring terminal part numbers and descriptions revised. Orientation of SNLS-135 changed. Ref GAE11#2109.

Issue 3: New Figure 5 added. Provision for "Lamar Technologies" STS-S12 Solenoid added. Formatting updates. Ref GAE11#2512

4 Background:

This Service Bulletin details and approves the installation of a secondary starter solenoid which will be mounted on the forward face of the firewall. This Service Bulletin applies to aircraft which are fitted with an alternative PMA'd or Lycoming approved starter motors that do not have an in-built solenoid. Examples include the Sky-Tec 149NL or Prestolite MZ4222.

Two options for the solenoid models are provided. GippsAero recommends the P/No. STS-S12 unit, when manufactured by "Sky-Tec" or "Lamar Technologies".

This Service Bulletin also authorises the replacement of an existing SNLS-135 solenoid with the P/No. STS-S12 solenoid for the application defined by this Service Bulletin.

5 Compliance:

This optional Service Bulletin may be incorporated at the owner's discretion. The installer shall ensure the suitability of this option in conjunction with existing modifications/repairs to the aircraft. Contact GippsAero if clarification is required.

6 Weight and Balance:

Item	Weight kg [lb]	Arm mm [inch]
Solenoid Installation per SB-GA8-2014-116 Issue 1 & 2	0.5 [1.1]	-25.4 [-1]
Solenoid Installation per SB-GA8-2014-116 Issue 3 or later.	0.6 [1.3]	-25.4 [-1]

7 Electrical Load Analysis:

The solenoid field coil will draw a current of 3A maximum for the duration of engine cranking.

8 Approval:

This Service Bulletin has been approved pursuant to Regulation 21.095 of CASR (1998).

9 Parts:

The following parts are necessary to accomplish the requirements of this Service Bulletin. Two configurations are available, denoted "-1" and "-2" as listed in Table 1.

Table 1: Parts List

ITEM	PART No.	DESCRIPTION	QTY (-1)	QTY (-2)
1	GA8-714025-023	FIREWALL SOLENOID BRACKET[1]	1	1
2	GA8-246019-011	DIODE ASSEMBLY SCHOTTKY 8A #10-#10	1	1
3	CR3523-4-01[2]	RIVET, CHERRYMAX, MONEL	8	8
4	AN3-3A	BOLT, MACHINE, STRUCTURAL, UNDRILLED	1	1
5	AN3-4A	BOLT, MACHINE, STRUCTURAL, UNDRILLED	1	1
6	AN960-10	WASHER, FLAT	2	2
7	AN970-3	WASHER, FLAT (INSIDE FIREWALL)	2	2
8	M22759/16-2-9	WIRE, ELECTRICAL	55"	55"
9	MS21042-3	NUT, SELF-LOCKING, REDUCED-HEX, THIN	2	2
10	MS25171-3S	TERMINAL NIPPLE	2	2
11	MS25171-1S	TERMINAL NIPPLE	1	1
12	324112	TERML LUG RING 2AWG 5/16 DIA (TE CONNECTIVITY)	3	3
13	MS25036-108	TERML LUG INSUL RING 14-16AWG #10 DIA BL	1	1
14	SNLS-135	SOLENOID, STARTER 12V (INCLUDES WASHERS AND NUTS)	1	0
15	STS-S12	SOLENOID, STARTER 12V FAA PMA (INCLUDES WASHERS AND NUTS) ("Sky-Tec" or "Lamar Technologies" Brand)	0	1
16	Duralac	CORROSION PROTECTIVE COMPOUND.	1	1

10 Parts Availability:

Parts can be obtained directly as Kit No. SB-GA8-2014-116-1 or SB-GA8-2014-116-2 (recommended) from GippsAero.

Tel: +61 03 5172 1200

Fax: +61 03 5172 1201

Email: aircraft.parts@mahindraaerospace.com

[1] GA8-714025-021 FIREWALL SOLENOID BRACKET was used in Issue 1 and 2 of this Service Bulletin and is available as a spare part on request.
[2] MS20615-4MP4, Rivet, Solid-Universal (Monel) may be used as an alternative.

11 Labour:

Approximately 5-man hours should be allocated for completing the work detailed in this Service Bulletin.

12 Accomplishment Instructions:

NOTE:

Prepare the aircraft for Maintenance and ensure 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.

WARNING:

DO NOT CARRY OUT ANY SORT OF WORK 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.

NOTE:

For existing installations, solenoid P/No. SNLS-135 may be replaced by P/No. STS-S12 as detailed in Section 12.2.

12.1 Mounting the Solenoid – New Installation

12.1.1 Remove the engine cowls. Retain the cowls and fasteners.

12.1.2 Disconnect the aircraft battery in accordance with directions contained in the GA8 or GA8-TC-320 Service Manual.

12.1.3 In the cockpit locate the LH Underdash Kick Panel Assembly (GA8-252015-017) as shown in Figure 1. Remove the 3 screws (6 x ½ PTA) that attach to the firewall heating duct and retain for re-assemble. The Kick Panel can be lowered and slid forward to release the upper slot attachment to the Instrument Panel.

Figure 1: LH Underdash Kick Panel Location

12.1.4 Locate and undo the Insulation Firewall Centre LH (GA8-258012-025) to provide access to aft face of the firewall in the area of the solenoid mounting. Retain the fastening hardware.

12.1.5 Place the Firewall Solenoid Bracket (item 1) in position as per Figure 2 and back drill the 8 x ø0.098" bracket mounting holes through the firewall. Open holes up to ø0.128" and clip in location.

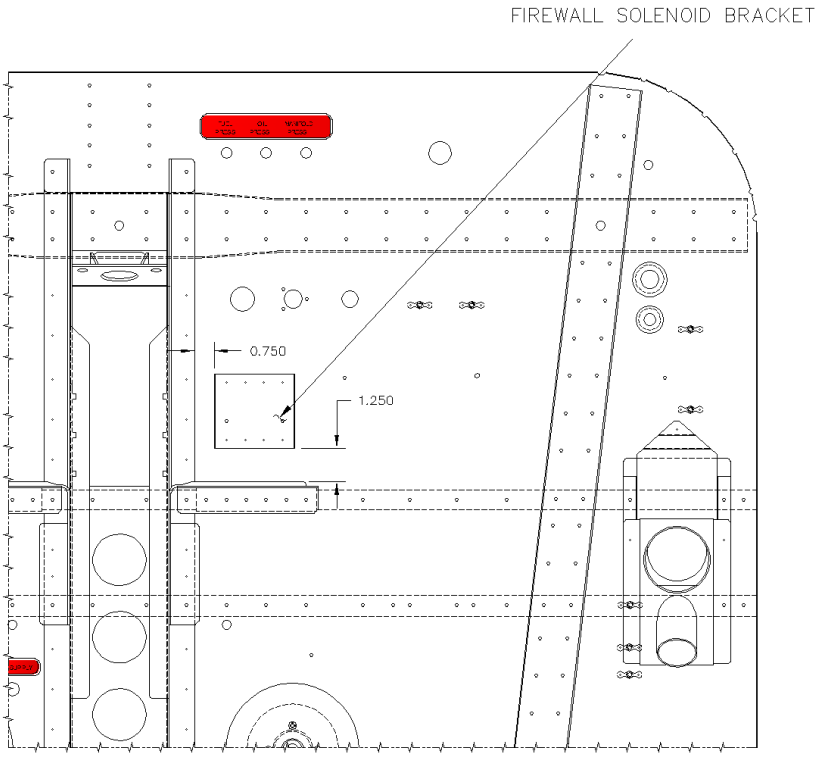

Figure 2: View Looking Aft on Firewall

12.1.6 Back drill 2 x ø0.128" solenoid mounting holes through the firewall. Open holes up to ø0.191".

12.1.7 Disassemble and deburr all drilled components and restore any primer removed.

NOTE:

Ensure any swarf is vacuum cleaned from the aircraft work area.

12.1.8 Wet assemble the bracket to the firewall with a suitable aerospace dissimilar metal jointing compound (Item 16 or equivalent) and install 8 x rivets (Item 3).

Figure 3 - Orientation of P/No. SNLS-135 Solenoid

Figure 4 - Orientation of "Sky-Tec" P/No. STS-S12 Solenoid

Figure 5 - Orientation of "Lamar Technologies" P/No. STS-S12 Solenoid

12.1.9 The mounting orientation of the SNLS-135 solenoid is given in Figure 3

12.1.10 The mounting orientation of the "Sky-Tec" STS-S12 solenoid is given in Figure 4.

12.1.11 The mounting orientation of the "Lamar Technologies" STS-S12 solenoid is given in Figure 5. Note the attached earth lead.

12.1.12 Mount the inboard lug of the solenoid (Item 14 or Item 15) using Bolt (Item 5), Diode Assembly, Washer (Item 6), Penny Washer (Item 7 on aft face of firewall) and Nut (Item 9). Refer to Figure 6 for the diode orientation. The STS-S12 solenoid does not have a dedicated "S" terminal. The cathode of the diode assembly is placed in parallel with the positive terminal of the coil windings.

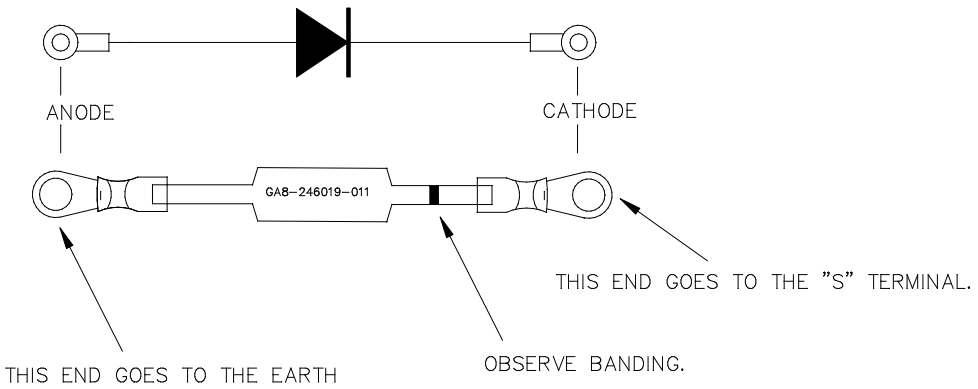

Figure 6 - Diode Assembly Marking & Orientation

12.1.13 Mount the outboard lug of the solenoid using bolt (Item 4), Washer (Item 6), Penny Washer (Item 7 on aft face of firewall), and Nut (Item 9).

NOTE:

A low resistance bond is required between the solenoid and the firewall. The bolts used to secure the solenoid shall provide the conductive path to the firewall. A resistance of less than 0.1 ohms is required.

12.2 Mounting the Solenoid – Solenoid Replacement

12.2.1 This section provides details to replace a P/No. SNLS-135 solenoid with a P/No. STS-S12.

12.2.2 Prepare the aircraft and gain access to the solenoid mounting bracket as detailed in Sections 12.1.1 through 12.1.4.

12.2.3 Disconnect and remove the existing solenoid.

12.2.4 Trial fit the P/No. STS-S12 to the solenoid mounting bracket. Typically, parts manufactured by "Sky-Tec" fit without further modification; in this case, proceed with the solenoid installation & connection as detailed in Sections 12.1 and 12.3. Otherwise, proceed to the next point below.

12.2.5 P/No. STS-S12 solenoids made by "Lamar Technologies" have slightly different mounting plates which may impact the solenoid mounting bracket in some cases. Where this occurs, the solenoid may be modified as detailed in Figure 7 below:

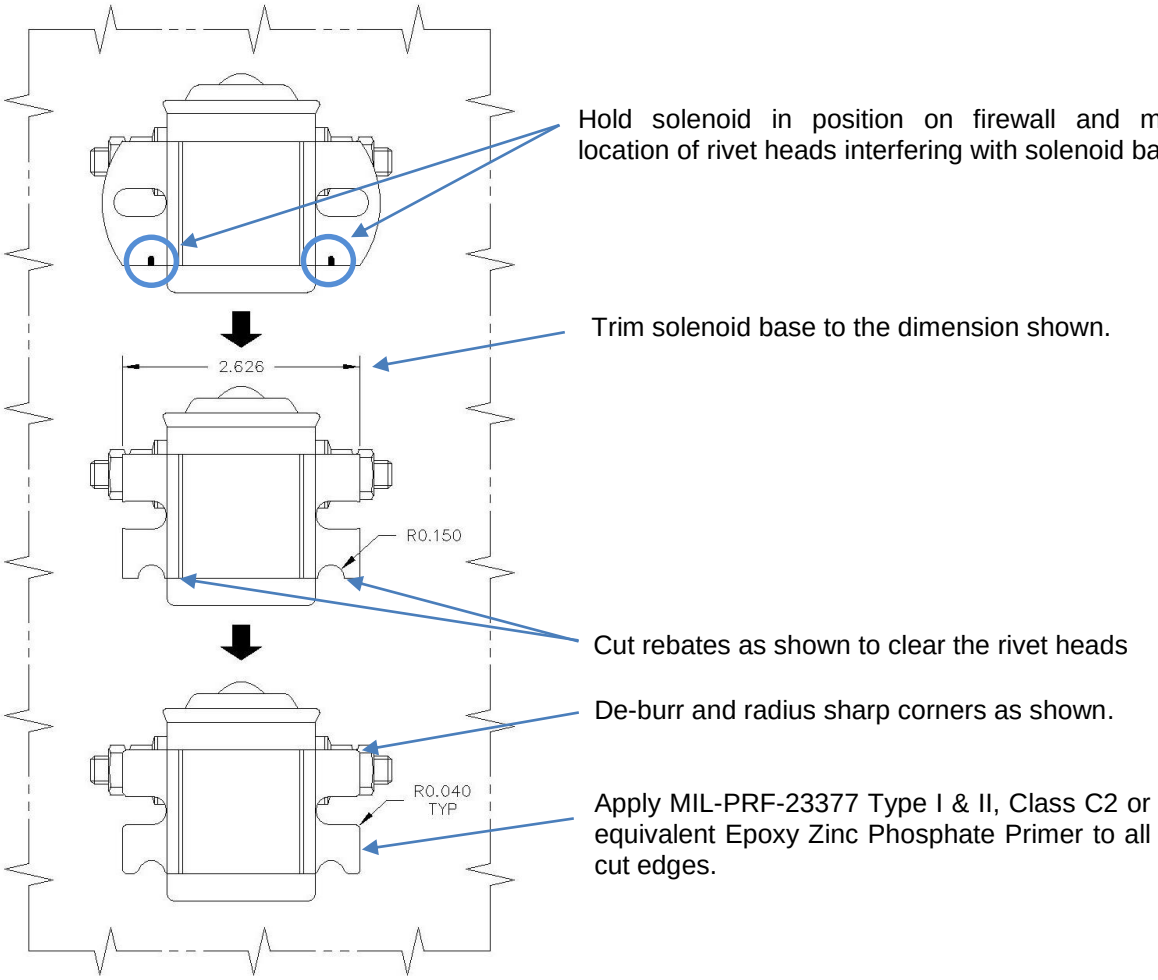

Figure 7: P/No. STS-S12 Solenoid Modification

12.2.6 The modified solenoid may then be affixed to the firewall in accordance with the details provided in Sections 12.1.10 through 12.1.13.

12.3 Electric Connection of Solenoid

12.3.1 An overview of the original and modified wiring diagrams is shown in Figure 9 and Figure 10.

12.3.2 Refer to Figure 9, on the engine starter motor (mounted below the engine) locate the terminals PS1A & PS2B. Undo the cables attached to the terminals identified as PS1A2 & PS2B14. Retain hardware for reinstallation. Remove both cables through the existing fire sleeve back to the firewall.

12.3.3 Cut PS1A2 and PS2B14 to length for connection to newly installed solenoid.

12.3.4 Crimp the terminal ring (Item 12) to the PS1A2 cable and heat shrink the sleeve.

12.3.5 Crimp the terminal ring (item 13) to the PS2B14 cable and heat shrink the sleeve.

12.3.6 Pass the cable assembled in Step 12.3.4 through the supplied Terminal nipple (Item 10) and attached to the respective terminal of the Solenoid with the hardware supplied. Torque the nuts to 40in-lb.

NOTE:

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

12.3.7 The cable assembled in Step 12.3.5 is to be inserted through the supplied Terminal nipple (Item 11) and attached to the respective terminal of the solenoid with the hardware supplied. Torque to 20in-lb.

12.3.8 Slide the Terminal nipple into position. Refer to Figure 8 for the cable routing for PS1A2 & PS2B14 from firewall to Solenoid.

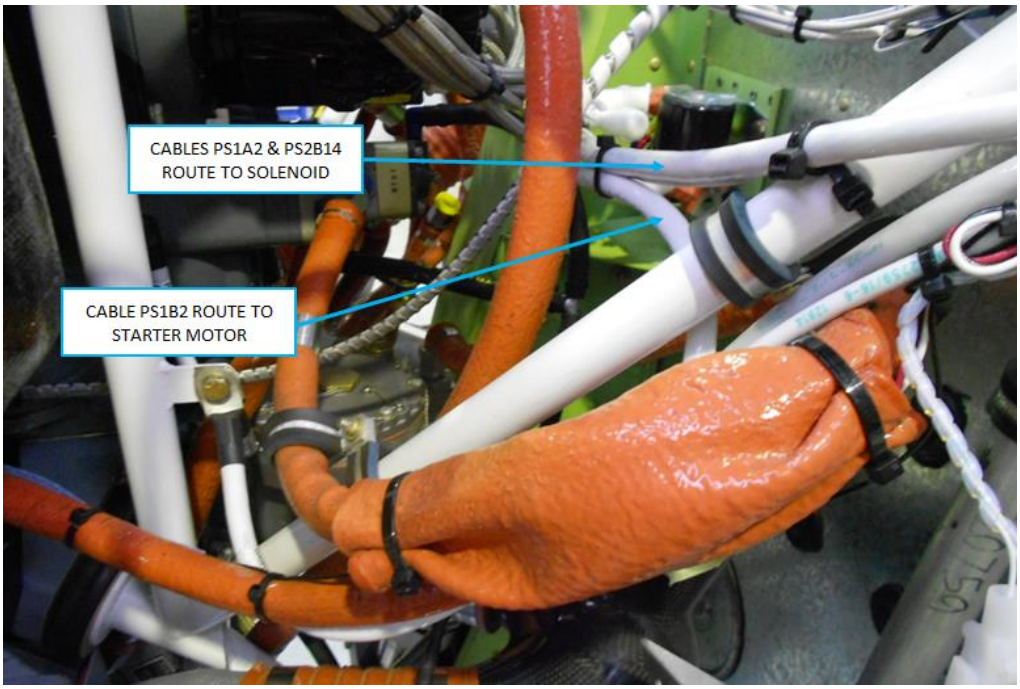

Figure 8: Cable Routing, View Looking Inboard/Aft On Firewall LHS

12.3.9 Using the supplied 55" length of 2 AWG White ETFE (MS22759/16-2-9), crimp the terminal ring red (Item 12) and heat shrink the sleeve to both ends. Label the cable PS1B2.

12.3.10 Slide the cable PS1B2 assembled in step 12.3.9 through the fire sleeve forward to the engine starter motor and attach with the hardware retained in step 12.3.2. Pass the other end through the supplied terminal nipple (Item 10) and attach to the outboard terminal of the solenoid with the hardware supplied. Slide the terminal nipple into position. For routing details refer to Figure 8.

12.3.11 If installing a new starter at this time, verify freedom from rubbing or chafing of looms with adjacent equipment or structure. In particular, verify that that wiring connected to the starter motor is not chafing against the second alternator if installed.

12.3.12 When cables pick up on existing looms, remove existing cable ties and attach new ties to the looms. Where there are no existing looms, the new cables are to be tied together. For both cases an approved aerospace cable tie is to be used at standard spacing.

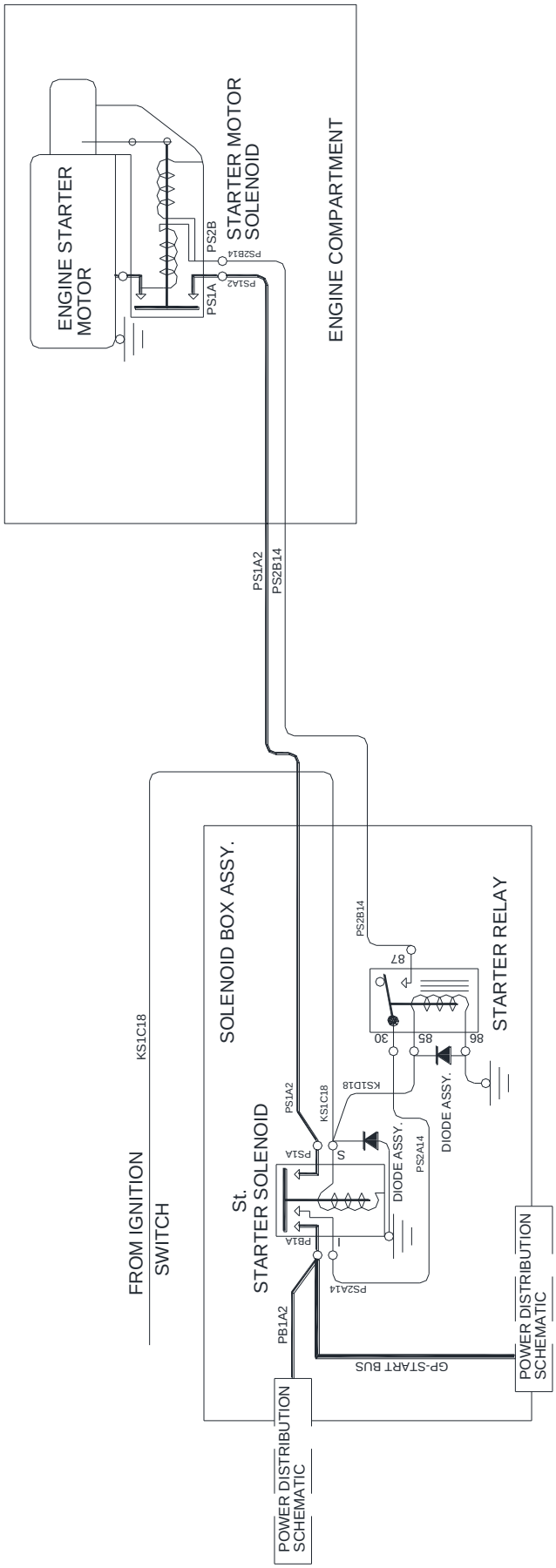

Figure 9: Original Configuration

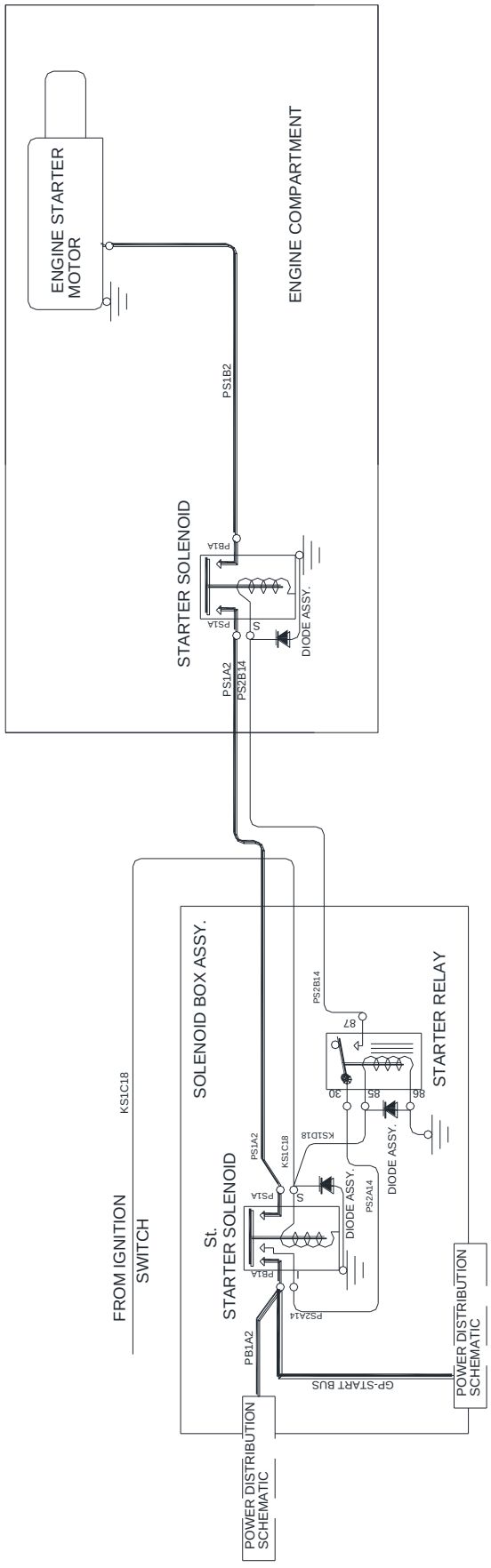

Figure 10: Modified Configuration

12.4 Reassembly

NOTE:

If any hardware retained is unserviceable it should be replaced with new.

12.4.1 Reinstall the Insulation Firewall Centre LH (GA8-258012-025) to the aft face of the firewall with the hardware retained in step 12.1.4.

12.4.2 Reinstall the LH Underdash Kick Panel Assembly (GA8-252015-017) by engaging the slot along the top edge into the instrument panel and attach the lower edge to the firewall heating duct with 3 screws (6 x ½ PTA) retained in step 12.1.3.

12.5 Testing

12.5.1 Prepare the aircraft for an engine run.

12.5.2 Undertake an engine start to confirm the operation of the starter. Undertake this for no more than 3 seconds.

12.5.3 Reinstall the engine cowls.

13 Documentation:

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

14 Continuing Airworthiness:

Instructions for Continued Airworthiness are contained in Service Manual Supplement C05-96-77. The document shall be included in the aircraft Service Manual.

15 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-GA8-2014-116

Issue 3

Aircraft Serial Number: GA8-_____

Service Bulletin SB-GA8-2014-116 Issue 3 has been incorporated in the above aircraft.

Date of Incorporation:_____

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Signed

Print Name: _____

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GippsAero Technical Services
P.O. Box 881
Morwell Victoria 3840
Australia
Fax.: +61 03 5172 1201
Email: aircraft.techpubs@mahindraaerospace.com