GARMIN

# GI 275 Part 23 AML STC Maintenance Manual

**Contains Instructions for Continued Airworthiness for STC SA02658SE**

Aircraft make, model, registration number, and serial number, along with the applicable STC configuration information, must be completed in Appendix A and saved with aircraft permanent records.

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## RECORD OF REVISIONS

| Revision | Revision Date | Description |
|---|---|---|
| 5 | 05/26/22 | Updated software to v2.52. Added GPT pressure sensors. |
| 6 | 01/18/23 | Updated software to v2.60. Added interface to GDL 60. |
| 7 | 06/23/23 | Added GEA 24B interface. |

## DESCRIPTION OF CHANGES

| Section | Description |
|---|---|
| All | Updated references to “GEA 24” to “GEA 24(B)” or “GEA 24/GEA 24B” where appropriate. |
| 5.3 | Added GEA 24B to Figure 5-5 Example GEA 24/GEA 24B Installation. |
| 5.3.2 | Clarified when the Fuel Quantity Calibration is required. |
| 5.3.3 | Added requirement to recalibrate Fuel Quantity when replacing GEA 24(B). |
| 5.13.6 | Added Fuel Quantity Calibration procedure for reference. |

## DEFINITIONS OF WARNINGS, CAUTIONS, AND NOTES

**WARNING**
***Warnings*** *indicate that injury or death is possible if the instructions are disregarded.*

**CAUTION**
***Cautions*** *indicate that damage to the equipment is possible.*

**NOTE**
***Notes*** *provide additional information.*

**WARNING**
*This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This notice is being provided in accordance with California's Proposition 65. For questions or additional information, refer to www.garmin.com/prop65.*

**WARNING**
*Perchlorate Material – special handling may apply.*
*Refer to www.dtsc.ca.gov/hazardouswaste/perchlorate.*

**WARNING**
*Failure to properly configure the EIS gauges per the POH/AFM and other approved data could result in serious injury, damage to equipment, or death.*

**WARNING**
*This product contains a Lithium-ion battery that must be recycled or disposed of properly. Battery replacement and removal must be performed by a licensed A&P technician.*

**CAUTION**
*To avoid damage to the GI 275, take precautions to prevent electrostatic discharge (ESD) when handling the unit, connectors, and associated wiring. ESD damage can be prevented by touching an object of the same electrical potential as the unit before handling the unit itself.*

**CAUTION**
*Do not store any GI 275 component in or near water.*

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# 1 INTRODUCTION

## 1.1 Purpose

The purpose of this document is to provide Instructions for Continued Airworthiness (ICA) and maintenance information for Garmin GI 275 system as installed under STC SA02658SE. This document also satisfies the requirement for continued airworthiness as required by 14 CFR 23.1529 and Part 23 Appendix G.

## 1.2 Scope

This document provides maintenance instructions and identifies the Instructions for Continued Airworthiness for the installation and maintenance of the Garmin GI 275 system as installed under the AML STC.

## 1.3 Organization

The following outline briefly describes the organization of this manual:

### *Section 2.1: System Overview*

Provides a description of the GI 275 system equipment installed by this STC.

### *Section 2.2: LRU Description, Control, and Operation*

Provides basic control and operation information specifically tailored to maintenance practices.

### *Section 3: Instructions for Continued Airworthiness*

Provides Instructions for Continued Airworthiness of the GI 275 system LRUs.

### *Section 4: Troubleshooting*

Provides troubleshooting information, including connector information, pinouts, and flowcharts to aid in diagnosing and resolving problems with GI 275 system equipment.

### *Section 5: Equipment Maintenance and Checkout Procedures*

Provides instructions for the removal and replacement of GI 275 system LRUs, including system checkout procedures.

### *Appendix A: Installation-Specific Information*

Provides a template to record aircraft-specific installation and configuration data for the GI 275 system.

## 1.4 Applicability

This document applies to all aircraft with the GI 275 system installed in accordance with AML STC SA02658SE. Modification of an aircraft by this STC obligates the aircraft operator to include the maintenance information provided by this document in the operator's Aircraft Maintenance Manual and the operator's Aircraft Scheduled Maintenance Program.

## 1.5 Publications

In addition to this manual, the following documents are recommended for performing maintenance on the GI 275 system. It is the responsibility of the owner/operator to ensure the latest applicable versions of these documents are used during operation, servicing, or maintenance of the GI 275 system.

**Table 1-1 Reference Documentation**

| Document | Garmin P/N |
|---|---|
| *GI 275 Part 23 AML STC Equipment List* | 005-01208-42 |
| *GI 275 Part 23 AML STC Airplane Flight Manual Supplement* | 190-02246-12 |
| *GI 275 Part 23 AML STC Installation Manual* | 190-02246-10 |
| *GI 275 STC EIS & MFD Installation Manual* | 190-02246-14 |

## 1.6 Revision and Distribution

This document is required for maintaining the continued airworthiness of the aircraft. Garmin dealers may obtain the latest revision of this document at the Garmin Dealer Resource Center website. Dealers are notified of manual revision changes via Garmin Service Bulletins posted to the Dealer Resource Center. Owners and operators may obtain the latest revision of this document at flyGarmin.com or by contacting a Garmin dealer. Garmin contact information is available at flyGarmin.com.

## 1.7 Terminology and Acronyms

### 1.7.1 Terminology

Except where specifically noted, references made to "GI 275" will apply to all variants of the GI 275 (i.e., GI 275 Base, GI 275 ADAHRS, and GI 275 ADAHRS+AP).

Except where specifically noted, references made to the "GI 275 system" will apply to an installed system with one or more GI 275 displays and all LRUs interfaced to the GI 275(s).

Throughout this document, references will be made to metallic aircraft. For the purposes of this manual, metallic aircraft will be those with an aluminum skin. Non-metallic aircraft refers to aircraft with an airframe constructed from wood or composite, including exterior skin, or aircraft with metal tubular truss airframe and fabric or composite exterior skin.

Unless otherwise stated, all units of measure are US standard units.

Throughout this manual references will be made to aircraft class. With regards to usage in this manual, the classes are defined as follows:

- Class I: Single reciprocating engine airplane with GTOW of 6,000 lbs or less
- Class II: Multi reciprocating engine or turbine engine airplane with GTOW of 6,000 lbs or less
- Class III: Airplane with GTOW of more than 6,000 lbs
- Class IV: Commuter category aircraft

Refer to AC 23.1309-1E for more information on airplane classes.

### 1.7.2 Acronyms

The following terminology is used within this document:

| | | | |
|---|---|---|---|
| **AC** | Alternating Current | **IAS** | Indicated Air Speed |
| **ADAHRS** | Air Data Attitude Heading Reference System | **ICA** | Instructions for Continued Airworthiness |
| **ADC** | Air Data Computer | **LOC** | Localizer |
| **ADI** | Attitude Direction Indicator | **LRU** | Line Replaceable Unit |
| **ADS-B** | Automatic Dependent Surveillance Broadcast | **MFD** | Multi-Function Display |
| **AFMS** | Aircraft Flight Manual Supplement | **OAT** | Outside Air Temperature |
| **AHRS** | Altitude and Heading Reference System | **ODA** | Organization Designation Authorization |
| **AML** | Approved Model List | **POH** | Pilot's Operating Handbook |
| **A/P** | Autopilot | **PPS** | Pulse Per Second |
| **ASI** | Airspeed Indicator | **RPM** | Revolutions Per Minute |
| **BIT** | Built-In Test | **SBAS** | Satellite Based Augmentation System |
| **CFR** | Code of Federal Regulations | **SD** | Secure Digital |
| **CHT** | Cylinder Head Temperature | **SDI** | Source/Destination Identifiers |
| **DC** | Direct Current | **STC** | Supplemental Type Certificate |
| **EGT** | Exhaust Gas Temperature | **TAS** | Traffic Advisory System |
| **EIS** | Engine Indicating System | **TAWS** | Terrain Awareness and Warning System |
| **FAA** | Federal Aviation Administration | **SSM** | Sign/Status Matrix |
| **FD** | Flight Director | **TCAS** | Traffic Collision Avoidance System |
| **FIS-B** | Flight Information Services Broadcast | **TCAD** | Traffic Collision Avoidance Device |
| **GDC** | Garmin Data Computer | **TIS** | Traffic Information Service |
| **GDU** | Garmin Display Unit | **TSO** | Technical Standard Order |
| **GEA** | Garmin Engine Adapter | **UAT** | Universal Access Transceiver |
| **GMU** | Garmin Magnetometer Unit | **UTC** | Coordinated Universal Time |
| **GPS** | Global Positioning System | **VHF** | Very High Frequency |
| **GRS** | Garmin Reference System | **VOR** | VHF Omni-Directional Range |
| **GTP** | Garmin Temperature Probe | **WAAS** | Wide Area Augmentation System |
| **HSI** | Horizontal Situation Indicator | **WXR** | Weather Radar |

# 2 SYSTEM DESCRIPTION

## 2.1 System Overview

The GI 275 installation can provide Primary ADI, HSI, MFD/Standby ADI, HSI/Standby ADI, MFD, and EIS functions. Three unit variants are available: the baseline GI 275 Base, the GI 275 ADAHRS which contains an integrated ADAHRS, and the GI 275 ADAHRS+AP which includes the functionality of the GI 275 ADAHRS but can also drive an approved autopilot. The GI 275 system utilizes engine sensors and a GEA 24(B) or GEA 110 engine adapter to provide EIS functions.

System limitations are contained in Section 2 of the GI 275 installation manuals (refer to Table 1-1). Model-specific limitations are contained in Appendix D of the GI 275 installation manuals. This information includes specific installation limitations for type rated, commuter category/Class IV, as well as Class I - III aircraft.

### 2.1.1 Primary ADI Functionality

The Primary Attitude Direction Indicator provides attitude, airspeed, altitude, and heading. The required Primary ADI installation consists of:

- GI 275 ADAHRS or ADAHRS+AP
- If configured for 3-in-1 ADI
  - GTP 59 OAT Probe (optional for Class I & II aircraft)
  - Internal or external WAAS GPS source
  - Pitot-static connection

### 2.1.2 HSI Functionality

The Horizontal Situation Indicator provides magnetically stabilized heading based on magnetometer data. The HSI can provide course error and deviations to an autopilot if the GI 275 ADAHRS+AP is used. The required HSI installation consists of:

- GI 275 display (the GI 275 Base can be used if it receives AHRS from a GI 275 ADAHRS or ADAHRS+AP)
- ADAHRS capability, via internal ADAHRS (included with GI 275 ADAHRS and ADAHRS+AP variants)
- GMU 11 or GMU 44B Magnetometer

### 2.1.3 MFD/Standby ADI Functionality

The MFD/Standby ADI provides the same information as the Primary ADI, but can additionally display information on pages similar to the MFD during normal operation. The standby indicator has the same installation requirements as the GI 275 Primary ADI but with the additional requirement to install a GTP 59, backup battery, and potentially a display backup switch. Refer to *GI 275 Part 23 AML STC Installation Manual* for switch requirements.

### 2.1.4 HSI/Standby ADI Functionality

The HSI/Standby ADI provides the same information as the Primary ADI, but additionally displays HSI information during normal operation. The standby indicator has the same installation requirements as the GI 275 Primary ADI and GI 275 HSI but with the additional requirement to install a GTP 59, backup battery, and a display backup switch. Refer to *GI 275 Part 23 AML STC Installation Manual* for switch requirements.

### 2.1.5 MFD Functionality

The Multi-Function Display provides, at a minimum, a moving map display. The display can optionally provide traffic, terrain, and weather functions depending on installed equipment. The required MFD system installation consists of:

- GI 275 display

### 2.1.6 EIS Functionality

The Engine Indicating System is an optional feature for single- and twin-engine reciprocating engine equipped aircraft listed on the STC AML. The EIS will display 4 and 6 cylinder engine data and select airframe parameters. The EIS can display engine and airframe operating parameters on the GI 275. Configurable EIS gauges include optional gauges and those required by the aircraft POH and manufacturer.

This manual only provides information for the EIS sensors installed per the GI 275 AML STC. Table 2-1 lists the sensors that are maintained in this manual. Refer to the applicable maintenance data and/or TSO manual for other sensors that are interfaced to the EIS.

**Table 2-1 AML STC Installed Sensors**

| Function | Manufacturer P/N, Description | Garmin P/N |
|---|---|---|
| Oil Press | Garmin 150 PSIG pressure, (Brass) | 011-04202-30 |
| | Garmin 150 PSIG pressure, (Stainless) | 011-05783-30 |
| | Kulite APT-20GX-1000-150G (Stainless) | 494-30032-00 |
| Oil Temp | UMA T3B3-2.5G | 494-70009-00 |
| Manifold Press | Garmin 30 PSIA pressure, (Brass) | 011-04202-00 |
| | Garmin 30 PSIA pressure, (Stainless) | 011-05783-00 |
| | Kulite APT-20GX-1000-25A (Stainless) | 494-30030-00 |
| Fuel Press | Garmin 75 PSIG pressure, (Brass) | 011-04202-20 |
| | Garmin 15 PSIG pressure, (Brass) | 011-04202-10 |
| | Garmin 75 PSIG pressure, (Stainless) | 011-05783-20 |
| | Garmin 15 PSIG pressure, (Stainless) | 011-05783-10 |
| | Kulite APT-20GX-1000-50G (Stainless) | 494-30031-00 |
| | Kulite APT-20GX-1000-15G (Stainless) | 494-30029-00 |
| Fuel Flow | EI FT-60 (Red) | 494-10001-00 |
| | EI FT-90 (Gold) | 494-10001-01 |
| RPM | N/A (Magneto P-lead) | N/A |
| Carb Air Temp | UMA T3B10-SG | 494-70010-00 |
| Outside Air Temp | Garmin GTP 59 | 011-00978-00 |

### 2.1.7 Electrical Load Information

Electrical load information for the GI 275 system LRUs is provided below. Appendix A of this document contains details specific to the load changes for the specific aircraft installation.

**Table 2-2 GI 275 LRU Electrical Load**

| LRU | Current Draw [1] | | | |
|---|---|---|---|---|
| | 14V System | | 28V System | |
| | Typical | Maximum | Typical | Maximum |
| GI 275 Base (without battery) | 0.65 A | 0.75 A | 0.32 A | 0.40 A |
| GI 275 Base (with battery) | 0.65 A | 1.70 A | 0.32 A | 0.80 A |
| GI 275 ADAHRS (without battery) | 0.75 A | 0.90 A | 0.35 A | 0.50 A |
| GI 275 ADAHRS (with battery) | 0.75 A | 2.00 A | 0.35A | 1.00 A |
| GI 275 ADAHRS+AP (without battery) | 0.80 A | 1.10 A | 0.35 A | 0.50 A |
| GI 275 ADAHRS+AP (with battery) | 0.80 A | 2.00 A | 0.40 A | 1.00 A |
| GEA 110 | 0.30 A | 0.60 A | 0.15 A | 0.30 A |
| GEA 24/GEA 24B | 0.20 A | 0.40 A | 0.10 A | 0.20 A |
| GSB 15 Dual Type-A (charging from both ports) | Varies | 2.86 A | Varies | 1.43 A |
| GSB 15 Type-A & C and Dual Type-C (charging from both ports) | Varies | 4.86 A | Varies | 2.43 A |

**Notes:**

[1] All GI 275 current draws include the GMU 11/44B and GTP 59.

## 2.2 Normal Mode Operation

Control and operation of the GI 275 in Normal mode occurs through the use of the touch display and dual rotary knob. The Normal mode home page differs depending on the configuration and purpose of the GI 275 unit. The menu can be accessed on any page by swiping up from the bottom of the screen or by pressing and holding the inner knob for 2 seconds.

An example of a GI 275 Normal mode page and associated menu is shown in Figure 2-1 and describes some key aspects of the GI 275 features and controls:

- **Message Annunciation** – A silver flashing triangle appears on screen until the associated message(s) are acknowledged in the menu. Typically the annunciation appears in the top-left of the display screen
- **Photocell** – The photocell may be configured as the lighting source for the display and/or knob to automatically adjust the backlighting with no further prompt
- **Selectable Field** – Some pages contain selectable that can be adjusted using the inner knob. Simply touch the field on the screen and turn the inner knob to change the value
- **Outer Knob** – Control knob that can be used to scroll between pages or menu options
- **Inner Knob** – Control knob that can be used to adjust selectable fields
- **Menu page** – Accessible from any Normal mode. Contains page-specific options and system-wide options
- **Navigation buttons** – Back and arrow buttons can be used to navigate menu pages in lieu of using the touch screen


**Figure 2-1 GI 275 Normal Mode**

## 2.3 Configuration Mode Operation

### 2.3.1 Entering Configuration Mode

The Configuration mode of the GI 275 can be accessed by holding down the inner knob located at the bottom-left of the unit upon initial power-up. The knob must be pressed until the splash screen shown in Figure 2-2 appears. Touch **Accept** to proceed to the Configuration mode home page.


**Figure 2-2 Entering Configuration Mode on the GI 275**

### 2.3.2 Wireless Connectivity

The GI 275 is capable of connecting to Wi-Fi and Bluetooth via the Garmin Pilot application to update flight databases. Refer to Section 5.14 of *GI 275 Part 23 AML STC Installation Manual* for procedures.

### 2.3.3 Import Configuration

Configuration settings can be imported via USB using the following procedure:

1. Power the GI 275 and all LRUs in the system on in Configuration mode.
2. Insert the USB drive containing the configuration files into the USB dongle or GSB 15 (if installed). A USB icon should appear on the left of the display once the GI 275 has recognized the device. If the icon doesn't appear after 1 minute, remove the drive and re-insert it.
3. Navigate to the ***Config Options*** page (***SW/Config → Config Options***).
4. Touch the **Import Configuration** button.
5. Touch the **Select Files** button and select the configuration file to be imported.
6. Touch the **Select Configuration** button.
7. Select the applicable configurations and then touch the **Back** button.
8. Touch the **Import Config ( )** button and then touch the **Start** button.

### 2.3.4 Export Configuration

Configuration settings can be exported via USB using the following procedure:

1. Power the GI 275 and all LRUs in the system on in Configuration mode.
2. Insert a USB drive into the USB dongle or GSB 15 (if installed). A USB icon should appear on the left of the display once the GI 275 has recognized the device. If the icon doesn't appear after 1 minute, remove the drive and re-insert it.
3. Navigate to the ***Config Options*** page (***SW/Config → Config Options***).
4. Touch the **Export Config** button.
5. Touch the **Select Name** field and enter a name for the saved file.
6. Touch the **Export Config** button.

## 2.4 LRU Description, Control, and Operation

### 2.4.1 GI 275 Display

The GI 275 is a multi-function electronic instrument display. The GI 275 can be configured as a Primary ADI, HSI, MFD/Standby ADI, HSI/Standby ADI, MFD, or EIS display. The GI 275 ADAHRS and ADAHRS+AP variants include an integrated ADAHRS.

**Figure 2-3 GI 275 Display**

### 2.4.2 VFR GPS Antenna

The GI 275 has an internal VFR GPS that may be used as a primary GPS source for VFR navigation only or as a backup GPS. The internal VFR GPS is not approved as an IFR navigation source. If the VFR GPS antenna is installed, the internal VFR GPS is automatically used when the primary GPS source is unavailable. The GI 275 internal GPS antenna is installed on the instrument panel glareshield. Only one antenna is required for all installed GI 275s in the system. GPS data will be forwarded from the GI 275 directly interfaced to the GPS antenna.

**Figure 2-4 VFR GPS Antenna**

### 2.4.3 Integrated ADAHRS

The GI 275 ADAHRS and ADAHRS+AP variants have an integrated ADAHRS that provides altitude, vertical speed, airspeed, attitude, OAT, and heading data for flight instrumentation. The internal ADAHRS receives data from the GMU 11/44B, GTP 59, and pitot-static system. The integrated ADAHRS utilizes GPS signals sent from the internal VFR GPS or an external GPS/SBAS source. Attitude, heading, and air data can be sent to external LRUs via ARINC 429.

### 2.4.4 GMU 11 Magnetometer

The GMU 11 Magnetometer senses the magnetic field and sends the data to the internal ADAHRS to determine aircraft magnetic heading. This unit receives power directly from the GI 275 and communicates with the AHRS board via RS-232. The GMU 11 is applicable to Class I & II aircraft only.

**Figure 2-5 GMU 11 Magnetometer**

### 2.4.5 GMU 44B Magnetometer

The GMU 44B Magnetometer senses the magnetic field and sends the data to the internal ADAHRS to determine aircraft magnetic heading. This unit receives power directly from the GI 275 and communicates with the AHRS via RS-485 and RS-232.

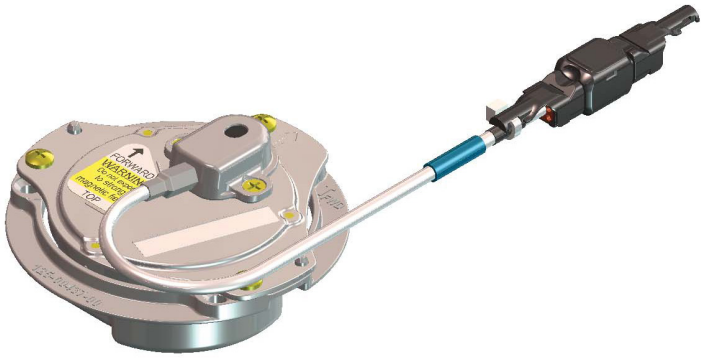


**Figure 2-6 GMU 44B Magnetometer**

### 2.4.6 GTP 59 OAT Probe

The GTP 59 is a remotely mounted temperature probe that interfaces to the internal ADC or EIS adapter for OAT display and computations. The GTP 59 is mounted externally on the aircraft and is powered from the GI 275.

**Figure 2-7 GTP 59 Outside Air Temperature Probe**

### 2.4.7 Backup Battery

The backup battery is a lithium-iron battery that is required when the GI 275 is installed as a standby indicator that does not utilize an electrical power source that is independent from the aircraft's primary electrical power source. The battery will power the essential primary or standby display sensors for a minimum of 60 minutes. The battery is charged by the aircraft electrical system when not in use.

**Figure 2-8 Backup Battery**

### 2.4.8 GSB 15

The GSB 15 is an optional LRU that mounts into the instrument panel and provides two USB ports for charging and data transfer to a GI 275 unit. Variants include dual USB Type-A ports, dual USB Type-C ports, and single USB Type-A/single USB Type-C ports. Each variant also has the option to have the connector on the rear or side of the unit.

The USB ports can be used in place of a USB dongle to update the software on the GI 275 system and to charge devices while in-flight.

**Figure 2-9 GSB 15 Charging Hub Variants**
**(Left: Dual Type-A, Center: Type A & C, Right: Dual Type-C)**

### 2.4.9 EIS Components

#### 2.4.9.1 GEA 24/GEA 24B Engine Adapter

The GEA 24(B) is a remotely mounted engine interface and monitoring module that gathers sensor input parameters from the engine and processes the signals for the GI 275. The GEA 24(B) communicates with the GI 275 via RS-232. The GEA 24(B) is applicable to Class I & II aircraft only.


**Figure 2-10 GEA 24(B) Engine Adapter**
**(GEA 24 Shown; GEA 24B Similar)**

#### 2.4.9.2 GEA 110 Engine Adapter

The GEA 110 is a remote mount engine interface and monitoring module that gathers sensor input parameters from the engine and processes the signals for the GI 275. The GEA 110 communicates with the GI 275 via RS-485.


**Figure 2-11 GEA 110 Engine Adapter**

### 2.4.9.3 Engine Annunciator

An engine annunciator will only be installed if the EIS display is not installed within the pilot's maximum field-of-view. There are two options for EIS annunciators.

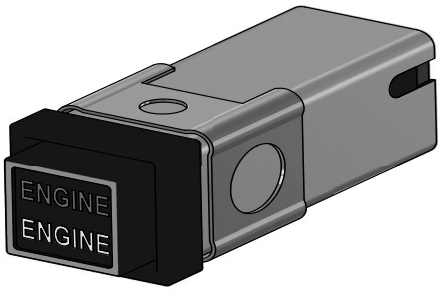



**Figure 2-12 Engine Annunciator (Single)**


**Figure 2-13 Engine Annunciator (Separate)**

### 2.4.9.4 Carburetor Temperature Probe

The carburetor temperature probe is a Type-K thermocouple (Chromel and Alumel) probe.

**Figure 2-14 Carburetor Temperature Probe**

### 2.4.9.5 Oil Temperature Probe

The oil temperature probe is a Type-K thermocouple (Chromel and Alumel) probe.

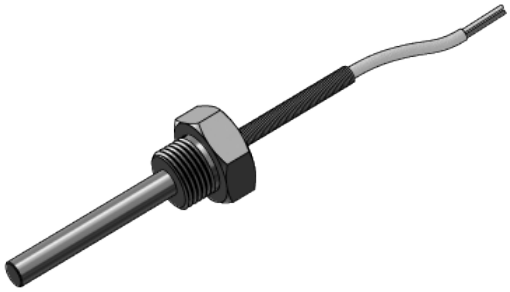


**Figure 2-15 Oil Temperature Probe**

### 2.4.9.6 Fuel Flow Sensors

The fuel flow sensor is incorporated in an aluminum housing that is installed in-line to the engine fuel supply. There are two STC approved options available for installation to suit most aircraft applications.

**Figure 2-16 Fuel Flow Sensor FT-60 (Left) and FT-90 (Right)**

### 2.4.9.7 Pressure Sensors

The Garmin GPT and brass pressure sensors have NPT pressure ports and Packard style electrical connectors. They are interchangeable, however the sensor configuration must be updated if they are swapped. The mil-spec style sensors are a durable all-metal design featuring a 37 degree flared fitting and round electrical connector.


**Figure 2-17 Pressure Sensors**

### 2.4.9.8 P-Lead RPM Pickup

A wire with two parallel resistors in-line connects from each P-lead, at the Magneto or the ignition switch, to the GEA 24(B)/110 to sense RPM.

# 3 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

## 3.1 Airworthiness Limitations

There are no new (or additional) airworthiness limitations associated with this equipment and/or installation.

**The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§ 43.16 and 91.403 of Title 14 of the Code of Federal Regulations unless an alternative program has been FAA approved.**

FAA APPROVED

JR Brownell

ODA STC Unit Administrator

ODA-240087-CE

6/23/2023

Date

## 3.2 Servicing Information

There are no servicing requirements for the GI 275 system. In the event of a system or LRU failure, troubleshoot the GI 275 system in accordance with Section 4.

### 3.2.1 Periodic Maintenance Instructions

GI 275 system LRUs are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in tests are continuously executed while the LRUs are operating. Detected errors are indicated on the GI 275 display via failure annunciations, system messages, or a combination of the two. A list of reported errors for the system can be printed in the form of a maintenance log using the instructions provided in Section 4.1.

### 3.2.2 Special Tools

A milliohm meter with an accuracy of ±0.1 mΩ (or better) is required to measure the electrical bonding between the GI 275 system components and aircraft ground.

A pitot-static ground tester is required for internal ADAHRS and standby instrument checkout procedures and maintenance.

## 3.3 Maintenance Intervals

**Table 3-1 Periodic Maintenance**

| Item | Description/ Procedure | Interval |
|---|---|---|
| GI 275 System Visual Inspection | All installed system LRUs, switches, knobs, and wiring harnesses must be inspected to ensure continued integrity of the installation. The inspection must be performed in accordance with Section 3.4. | 12 calendar months |
| Backup Battery Check | If installed, perform a Backup Battery Check as described in Section 5.13.5.<br>If the backup battery does not pass the Backup Battery Check, it must be replaced using the procedure found in Section 5.5. | 12 calendar months |
| EIS Annunciator Lamp Check | If an EIS annunciator(s) is installed, perform a check of the annunciator lamps using the following procedure:<br>1. Power on the GI 275 directly interfaced to the annunciator in Configuration mode.<br>2. Navigate to ***Diagnostics*** → ***Discrete Outputs***.<br>3. Toggle the state of the Engine Caution and Engine Warning discrete outputs to *Active*.<br>4. Verify that the respective engine annunciator lights have illuminated.<br>5. Toggle the state of the Engine Caution and Engine Warning discrete outputs to *Inactive*. | 12 calendar months |
| AHRS Magnetic Field Model Update | The GI 275 Integrated ADAHRS utilizes an Earth magnetic field model that is updated once every 5 years as part of the Aviation Database maintained by the owner/operator. If the magnetic model is not up-to-date, the unit will issue an alert upon start-up indicating the model has expired. A Service Bulletin containing the updated magnetic field model and instructions for installation can be obtained from the Dealer Resource Center or by contacting Garmin. | Every 5 years |
| Electrical Bonding Check | Perform an electrical bonding check of the GI 275 system LRUs in accordance with Section 3.5. | Every 2000 flight hours or 10 years, whichever comes first |
| Altimeter Checks | Test according to 14 CFR §43 Appendix E.<br>Refer to the pitot-static checkout procedure in Section 5.15.2 for system-specific checkout procedure. | Interval must be in accordance with Title 14 CFR §91.411 and 91.413 |
| Test TVS Lightning Protection (Class II & III composite only) | The GI 275 main power inputs have a TVS/fuse located at the GI 275 connector. Each TVS and fuse must be checked or replaced in accordance with Section 3.7. | 24 calendar months |
| Lightning Damage Check | Conduct an inspection of the GI 275 system in accordance with Section 3.7.<br>**Class II & III composite aircraft only:** Each TVS and fuse must be checked or replaced in accordance with Section 3.7. | After a suspected or actual lightning strike |

| Item | Description/ Procedure | Interval |
|---|---|---|
| Equipment Removal and Replacement | Removal and replacement of the GI 275 system LRUs can be accomplished by referring to Section 5 for instructions. | On Condition |
| Cleaning GI 275 Touchscreen | The display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical cleaning agents. Care should be taken to avoid scratching the surface of the display. | On Condition |
| Display Backlight | Over time, the backlight lamp may dim and the display may not perform as well in direct sunlight conditions. The user must determine by observation when the display brightness is not suitable for its intended use. Contact a Garmin authorized repair station when the backlight lamp requires service. | On Condition |
| Pitot-Static Drains | Drain(s) in pitot and static lines added to GI 275 connection with the existing aircraft pitot-static system must be opened and discharged. Drains may not be present in all aircraft. Drains are added only if added pneumatic lines cannot be routed to continuously slope down from the GI 275 unit to connection with existing pitot-static system. | 12 calendar months |

## 3.4 Visual Inspection

Operation of the GI 275 system is not permitted unless an inspection, as described in this section, has been completed within the preceding 12 calendar months. Conduct the following visual inspection of the GI 275 system LRUs and associated wiring harnesses to ensure installation integrity:

1. Inspect all units for security of attachment, including visual inspection of brackets and other supporting structure attaching all units to the airframe.
2. Inspect all switches, annunciators, knobs, and buttons for legibility.
3. Visually inspect each unit's wiring (including electrical bonding straps), overbraid, and connectors for chafing, deterioration, damage, or wear.
4. Visually check for any signs of corrosion.

### 3.4.1 Aluminum Foil Tape (Non-metallic Aircraft Only)

Any aluminum foil tape used in the GI 275 installation for grounding of a GEA 24(B) or GEA 110 (refer to Appendix A of this document) must be inspected every 12 calendar months. The inspection must verify that the foil tape is not torn, damaged, or showing signs of corrosion. If any of these conditions are found, the tape must be replaced in accordance with Section 4 of *GI 275 Part 23 AML STC Installation Manual*.

## 3.5 Electrical Bonding Maintenance Check

GI 275 LRU electrical bonding must be checked every 2,000 flight hours or 10 years, whichever occurs first. During the check, any cables normally attached to the LRU must be disconnected from the LRU. Resistance must be measured from a bare metal portion of the LRU to an airframe grounding location. The airframe grounding location should be as close to the LRU as possible, unless otherwise noted in Table 3-2. If the measured resistance is greater than applicable values in the table, bonding must be improved to meet applicable requirements for a new installation in accordance with Section 4 of *GI 275 Part 23 AML STC Installation Manual*.

**Table 3-2 Electrical Bonding Maintenance Requirements**

| LRU | Maintenance Requirement |
|---|---|
| GI 275 Base<br>GI 275 ADAHRS<br>GI 275 ADAHRS+AP | 5 mΩ (from unit to instrument panel) |
| Engine Annunciator(s) | 20 mΩ (from unit to instrument panel) |
| GEA 24/GEA 24B<br>GEA 110 | 5 mΩ (from unit to local structure) |
| GTP 59<br>GMU 44B | 5 mΩ (or electrically isolated per Appendix D of *the GI 275 installation manuals listed in Table 1-1*) |
| GMU 11 | None, except when overbraid is required. Overbraid bond must meet 5 mΩ. |
| GSB 15 | 5 mΩ (from unit to instrument panel or local structure) |

## 3.6 Overhaul Period

The system does not require overhaul at a specific time period. Power on self-test and continuous BIT will monitor the health of the GI 275 system. If any LRU indicates an internal failure, the unit may be removed and replaced. Refer to Section 4 of this document for fault corrective actions.

## 3.7 Special Inspection Requirements

After a suspected lightning strike, the following actions must be performed for the specified LRU.

### 3.7.1 GTP 59 OAT Probe

Inspect the GTP 59 for signs of lightning damage. Check the self-sealing washer (P/N 212-00026-00) used on the probe tip outside of the aircraft for any evidence of melting or lack of seal. Replace the washer if damaged. If there is evidence of lightning strike to the OAT or any lightning damage, replace the GTP 59 OAT Probe.

Tube-and-fabric aircraft must replace the OAT probe bond strap (if installed). The bonding strap must:

1. Have the cross-sectional area greater than 0.016 square inches (approx 20,800 circular mils). QQB575R30T437 7/16” tubular braid (24,120 circular mils) or QQB575F36T781 3/4” flat braid (20,800 circular mils) meet this requirement.
2. Be as short as possible, not to exceed 6 inches. When installed, the strap must not loop back on itself.
3. Use MS20659-130 lug and #10 stud (or larger) attached to local aircraft metallic structure with minimum thickness of 0.032 inches.
4. Use a 5/16 stud size terminal lug connected directly to GTP 59 probe.

### 3.7.2 GMU 11/44B

Aircraft with a GMU mounted in the wingtip of metallic aircraft with non-metallic wingtip covers must inspect the magnetometer installation for the following conditions:

1. Check the GMU magnetometer body and mount for scorching, soot, melting, pitting, denting, or discoloration.
2. Check the GMU connectors for melting or pin damage.
3. Check the cable overbraid for pinching, melting, or evidence of arcing.
4. Check the lug for evidence of arcing and verify that the lug is still secured to the overbraid.
5. Check electrical bonding between the GMU overbraid and adjacent aircraft structure. Resistance should be less than 5 mΩ.
6. If any of these checks shows evidence of a lightning strike, replace the overbraid assembly and affected components.

### *Overbraid Fabrication and Installation*

The length of overbraid required is approximately equal to the length of the GMU 11 service loop (measured from the wing rib to the collar of connector P111) plus 4 inches.

Refer to Figure 3-1 and Figure 3-2 while completing the following overbraid installation procedure:

**NOTE**

*It is recommended that this procedure is completed prior to terminating wires to connector P111. If this procedure is completed before assembly of P111, proceed to step 3.*

1. Disconnect P111 from the GMU 11.
2. De-pin wires from P111 to facilitate placing overbraid over wire bundle.
3. Slide the overbraid over wire bundle extending from wing rib.
4. Terminate the end nearest the metal wing rib with the overbraid in accordance with one of the two Overbraid Termination Methods below using a #8 terminal lug.
5. Secure the overbraid pigtail to the shield block when assembling P111.
6. Terminate the end nearest the GMU 11 with the overbraid in accordance with one of the two Overbraid Termination Methods below using a #10 terminal lug.
7. Secure the overbraid pigtail to a #10 terminal stud. Refer to Overbraid Termination Bonding for stud location instructions.

### *Overbraid Termination Methods*

Overbraid must be terminated with an appropriate lug by one of the two following approved methods. Whichever method is used, overbraid pigtail length must not exceed 6 inches. Refer to Figure 3-2.

#### *Method A*

1. Carefully separate overbraid wire strands by hand to create an opening in the overbraid for passage of the GMU 11 connector and cables.

**CAUTION**

*Do not cut an opening in the overbraid strands. Loose overbraid wire ends can chafe the cable and cause the GMU 11 to malfunction.*

2. Trim the overbraid pigtail to a maximum length of 2 inches.
3. Terminate the braid pigtail in an appropriate terminal lug.

#### *Method B*

1. Comb out a maximum of 2 inches of overbraid pigtail.
2. Twist the pigtail and terminate it in an appropriate terminal lug.

### *Overbraid Terminal Bonding*

Electrical bond preparation for all aluminum-to-aluminum interfaces must be done in accordance with SAE ARP1870A Section 5.1 and re-finished in accordance with Section 5.5. The overbraid terminal lug must be electrically bonded to a #10 stud installed in accordance with AC 43.13-1B Section 11-189, as well as the following restrictions:

1. If possible, use an existing tooling hole to install the stud.
2. If no suitable tooling hole exists, use an existing fastener (#10 or larger).
3. If there is no suitable fastener, install a new #10 stud as follows:
   a. When adding a new stud hole to the rib, the center of the hole must be located a minimum of 1 inch away from any existing, non-stiffened rib holes.
   b. The new stud hole must be located such that the terminal lug face, neck, or attaching hardware will not intrude into the flange bend radius of any rib edge or stiffened rib hole. Refer to SAE AS25036 for terminal lug dimensions.
4. Verify overbraid terminal bonding by checking resistance between the overbraid and the rib with the GMU 11 connector disconnected. Resistance should be less than 2.5 mΩ.

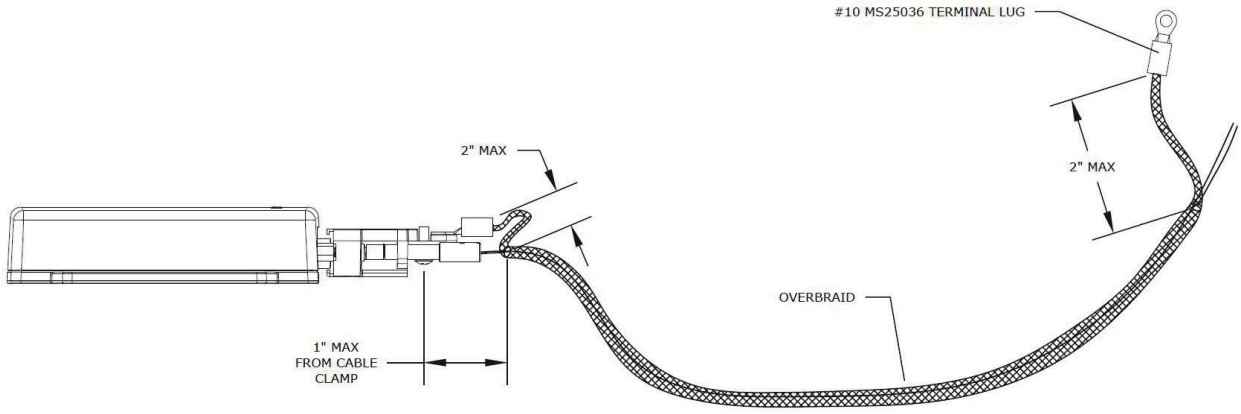
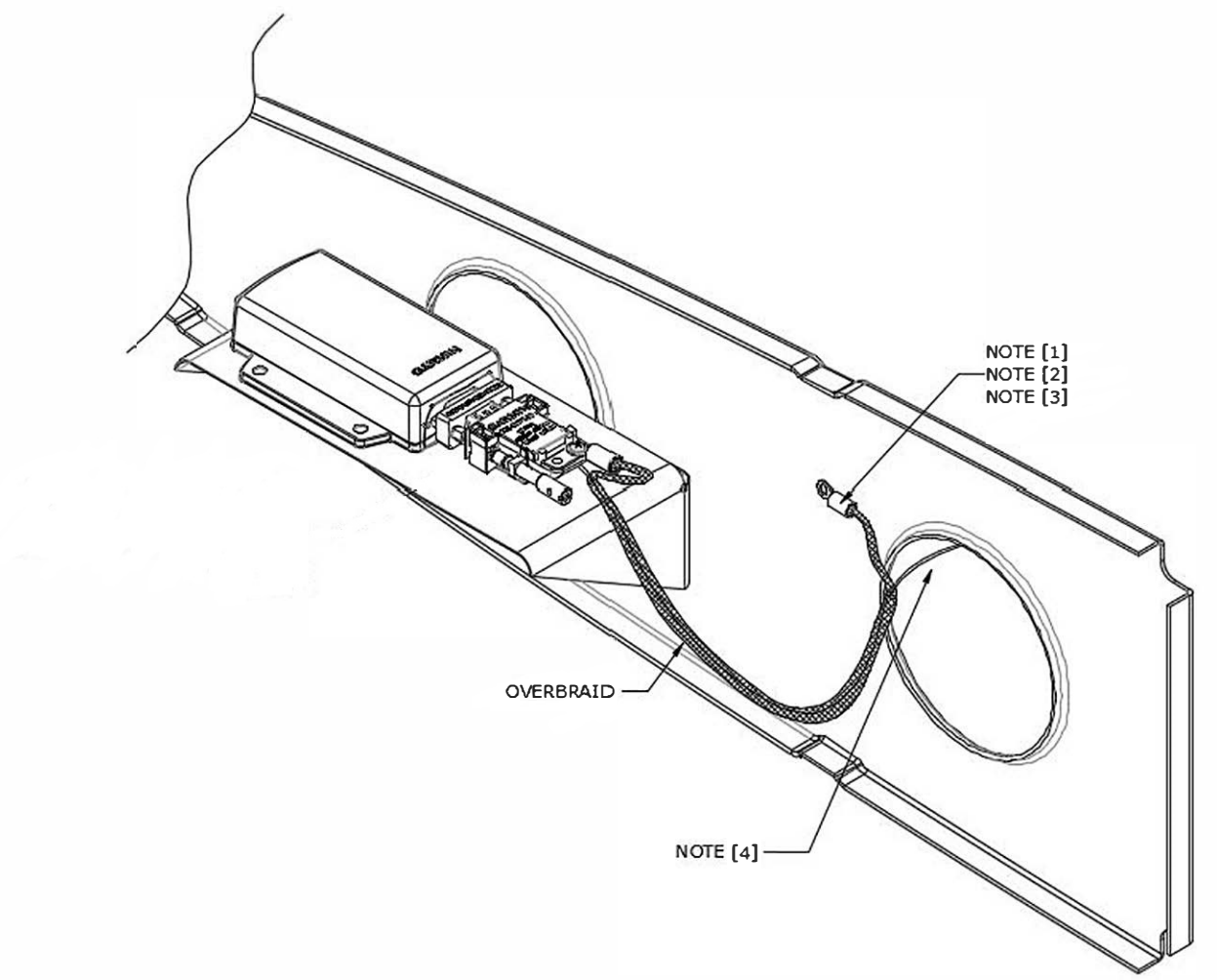



**Figure 3-1 GMU 11 Overbraid Installation**




**NOTES**

[1] Install #10 grounding hardware in accordance with AC 43.13-1B Section 11-189. If there is an existing hole located in an appropriate area it may be utilized for the grounding hardware. If there is no existing hole usable for this purpose, then drill and de-burr a 0.196-0.206 inch hole.

[2] MS25036-103 terminal lug (or equivalent).

[3] Terminal lug face or connecting hardware must not interfere with bend radius of rib edge or stiffened holes. Stud hole must be located a minimum of 1 inch from unstiffened holes. Refer to SAE AS25036 for lug dimensions.

[4] The exposed cable not having overbraid in the wingtip areas must be 6 inches or less.

**Figure 3-2 GMU 11 Overbraid Termination**

Perform the Magnetic Interference Check in accordance with Section 5.13.1.6. The purpose of this check is to ensure the structure around the GMU did not get magnetized by the lightning event to the point of affecting magnetometer performance.

### 3.7.3 Transient Voltage Suppressor (TVS) (If Installed)

After a suspected lightning strike and every 24 calendar months, each TVS and TVS assembly (on installations that require TVS protection) must be checked and replaced as necessary. Refer to Section 5.12 for guidance on replacing in-line TVS diodes and fuses.

The power line circuit breaker must be opened prior to this check. If the GI 275 is not the only LRU on the corresponding circuit breaker, it must be disconnected from the power bus in order to perform this check. All parallel paths to ground, or parallel units on the bus with their own TVS lightning protection, must be removed or erroneous readings may occur.

To check TVS protection on the GI 275 power inputs, use the following procedure:

1. Remove the P2751 connector D-Sub from the back of the GI 275.
2. Open the GI 275 circuit breaker and use a multimeter to perform a diode check between the aircraft power 1 pin (connector P2751 pin 2) and the ground lead on the TVS assembly.
    a. The meter should indicate open with the red lead on the power pin and the black lead on the ground.
    b. The meter should indicate a diode drop of 1.5V to 2.0V for the 15KPA48A TVS diode when the red lead is on ground and the black lead is on the power pin.
        i. If the diode drop is outside of the above range, replace the TVS.
        ii. If the meter indicates a short during steps 2a or 2b, replace the TVS.
        iii. If the meter indicates an open in both directions, check the continuity of the fuse.
        iv. If the fuse is open, replace the fuse and repeat the check.
        v. If the fuse is good, check the wiring for faults. If the wiring is good, replace the TVS.
3. If GI 275 aircraft power 2 is used in the installation, repeat above for the TVS/fuse installed on GI 275 aircraft power 2 (connector P2751 pin 3).

## 3.8 Application of Protective Treatments

None.

## 3.9 Data Relative to Structural Fasteners

Data relative to structural fasteners, such as type, torque, and installation requirements can be found in Section 5 of this manual.

## 3.10 Additional Instructions

None.

# 4 TROUBLESHOOTING



This section provides information to assist troubleshooting if fault codes are displayed on the GI 275 or problems occur after completing system maintenance. Refer to Appendix A of this document retained in the aircraft permanent records for a list of the interfaced equipment and system configuration data. When troubleshooting the GI 275 system, refer to wire routing drawings and interconnect diagrams retained in Appendix A of this document or with the aircraft's permanent records.

## 4.1 General System Troubleshooting

Before troubleshooting the GI 275 system, print the current configuration log using the procedure in Section 2.3.4 to ensure that system configuration settings match those recorded in the aircraft's permanent records as applicable to the aircraft's current configuration.

If the GI 275 configuration does not match the configuration log retained with the aircraft permanent records, load the saved configuration from the USB drive retained with the aircraft records. If this cannot be accomplished, or does not correct the configuration, the issue must be corrected by a Garmin dealer using the configuration instructions provided in Section 5 of the GI 275 installation manuals (refer to Table 1-1). Basic troubleshooting of the GI 275 system can be accomplished using the instructions provided in Table 4-1.

**Table 4-1 GI 275 Failures**

| Symptom | Recommended Action |
|---|---|
| GI 275 screen is blank | Check power/ground wiring for GI 275. |
| EIS Gauge Fault/Failure | Troubleshoot the problem using the EIS gauge troubleshooting flowchart provided in Section 4.3. |
| An alert message is displayed on the GI 275 or present in the maintenance log | Troubleshoot the alert message using the flowcharts provided in Section 4.3. |

### 4.1.1 System Maintenance Log

The GI 275 system has a maintenance and error log that can be accessed or printed to assist with system maintenance and troubleshooting.

The maintenance and error log can be printed using the following procedure:

1. Power on all GI 275s in the system in Configuration mode in accordance with Section 2.3.1.
2. Insert a USB drive into the USB dongle or GSB 15 (if installed). A USB icon should appear on the left of the display once the GI 275 has recognized the device. If the icon doesn't appear after 1 minute, remove the drive and re-insert it.
3. Navigate to the ***Maintenance*** page.
4. Press the **Export Logs** button.
5. Select which log to download: Assert, Flight Data, Aircraft Report, or Fault Log.
    - For downloading Flight Data logs, select the desired option for the Download Log Style and enter the applicable date if downloading flight data logs for a specific date
6. Press the **Start Download** button.
7. Once the save process is completed, disconnect the USB drive and insert it into a computer.
8. On the computer, navigate to the USB drive and open the "maintenance_logs" directory.
9. Open the .htm file.
10. The file should open in your computer's Internet browser and can be printed using your selected Internet browser print function (in most cases, pressing **Ctrl** + **P** buttons simultaneously will access this function).

The maintenance log will display reported system faults. The alert message that is displayed on the GI 275 for that fault (if any) will display frequency, most recent occurrence time of the fault, and any additional information about the fault that might be helpful. If any faults are reported on the maintenance log, refer to the troubleshooting flowcharts contained in Section 4.3.

## 4.2 Connector Information

This section contains connector information and description of pin functions for all LRUs that can be installed as part of the GI 275 STC.

### 4.2.1 GI 275

**NOTE**

*The J2752/P2752 connector is only included with GI 275 ADAHRS and ADAHRS+AP models.*

GI 275 displays have up to three connectors:

- J2751/P2751 - 78 pin female contact HD D-sub
- J2752/P2752 - 78 pin female contact HD D-sub (GI 275 ADAHRS and ADAHRS+AP units only)
- BNC, Male

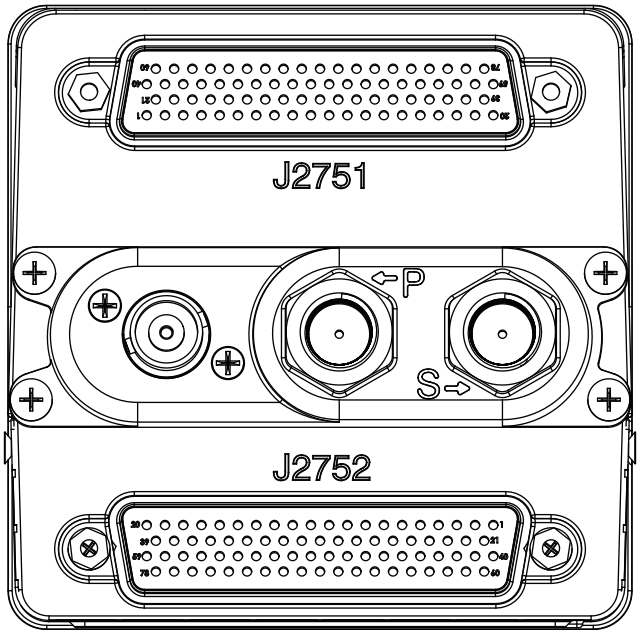



**Figure 4-1 GI 275 Connectors**

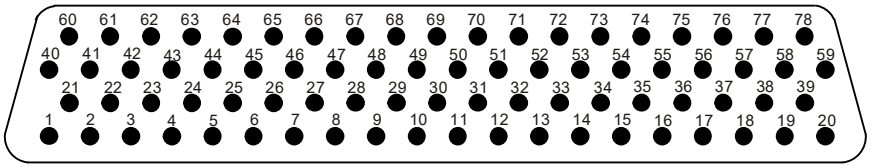



**Figure 4-2 GI 275 J2751 Connector (Looking at Connector)**

**Table 4-2 GI 275 J2751/P2751 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | CONFIG MODULE GROUND | -- |
| 2 | AIRCRAFT POWER 1 | IN |
| 3 | AIRCRAFT POWER 2 | IN |
| 4 | DISCRETE OUT 1 LO | OUT |
| 5 | VOR/LOC COMPOSITE LO | IN |
| 6 | GLIDESLOPE DEVIATION +UP | IN |
| 7 | LATERAL -FLAG | IN |
| 8 | ETHERNET OUT 2A | OUT |
| 9 | ETHERNET OUT 2B | OUT |
| 10 | OBS STATOR F | OUT |
| 11 | GLIDESLOPE +FLAG | IN |
| 12 | DISCRETE IN 4 LO | IN |
| 13 | OBS ROTOR H | IN |
| 14 | ARINC 429 IN 2B | IN |
| 15 | ARINC 429 IN 4B | IN |
| 16 | ARINC 429 OUT 1A | OUT |
| 17 | SPARE GROUND | -- |
| 18 | RS-232 OUT 2 | OUT |
| 19 | LRU GROUND | -- |
| 20 | LRU POWER | OUT |
| 21 | CONFIG MODULE POWER | OUT |
| 22 | LIGHTING BUS HI | IN |
| 23 | DISCRETE IN 1 LO | IN |
| 24 | DISCRETE OUT 3 LO | OUT |
| 25 | LATERAL DEVIATION +LEFT | IN |
| 26 | LATERAL +FLAG | IN |
| 27 | ETHERNET IN 2A | IN |
| 28 | ETHERNET IN 2B | IN |
| 29 | OBS STATOR D | OUT |
| 30 | ALERT AUDIO OUT HI | OUT |
| 31 | GLIDESLOPE -FLAG | IN |
| 32 | TO/FROM -FLAG | IN |
| 33 | ARINC 429 IN 1B | IN |
| 34 | ARINC 429 IN 3B | IN |
| 35 | ARINC 429 OUT 2A | OUT |
| 36 | SPARE GROUND | -- |
| 37 | RS-232 IN 2 | IN |
| 38 | RS-232 OUT 1 | OUT |
| 39 | USB DATA LO | I/O |

| Pin | Function | I/O |
|---|---|---|
| 40 | CONFIG MODULE DATA | I/O |
| 41 | AIRCRAFT GROUND | -- |
| 42 | LIGHTING BUS LO | IN |
| 43 | DISCRETE OUT 2* | OUT |
| 44 | VOR/LOC COMPOSITE HI | IN |
| 45 | GLIDESLOPE DEV +DOWN | IN |
| 46 | ETHERNET OUT 1A | OUT |
| 47 | ETHERNET OUT 1B | OUT |
| 48 | ALERT AUDIO OUT LO | OUT |
| 49 | RS-485 A | I/O |
| 50 | TO/FROM +FLAG IN | IN |
| 51 | SPARE GROUND | -- |
| 52 | ARINC 429 IN 1A | IN |
| 53 | ARINC 429 IN 3A | IN |
| 54 | SPARE GROUND | -- |
| 55 | ARINC 429 OUT 1B | OUT |
| 56 | SPARE GROUND | -- |
| 57 | RS-232 IN 1 | IN |
| 58 | USB DATA HI | I/O |
| 59 | USB GROUND | -- |
| 60 | CONFIG MODULE CLOCK | OUT |
| 61 | AIRCRAFT GROUND | -- |
| 62 | DISCRETE IN 2 LO | IN |
| 63 | DISCRETE IN 3 LO | IN |
| 64 | LATERAL DEVIATION +RIGHT | IN |
| 65 | ETHERNET IN 1A | IN |
| 66 | ETHERNET IN 1B | IN |
| 67 | OBS STATOR G | IN |
| 68 | OBS STATOR E | OUT |
| 69 | RS-485 B | I/O |
| 70 | SPARE GROUND | -- |
| 71 | OBS ROTOR C | IN |
| 72 | ARINC 429 IN 2A | IN |
| 73 | ARINC 429 IN 4A | IN |
| 74 | ARINC 429 OUT 2B | OUT |
| 75 | SPARE GROUND | -- |
| 76 | RS-232 2 GROUND | -- |
| 77 | RS-232 1 GROUND | -- |
| 78 | USB VBUS POWER | OUT |

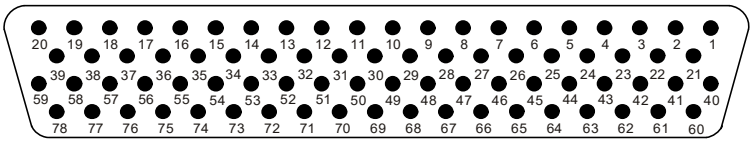



**Figure 4-3 GI 275 J2752 Connector (Looking at Connector)**

**CAUTION**

*Pins highlighted in gray are not present in GI 275 ADAHRS units (P/Ns 011-04489-10 and 011-04489-30) and should be treated as Not Connected. All pins listed in Table 4-3 are present in GI 275 ADAHRS+AP units (P/Ns 011-04489-20 and 011-04489-40).*

**Table 4-3 GI 275 J2752/P2752 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | DISCRETE OUT 7 LO | OUT |
| 2 | SPARE | -- |
| 3 | GYRO VALID COMMON | -- |
| 4 | DISCRETE IN 5 LO | IN |
| 5 | VERTICAL -FLAG OUT | OUT |
| 6 | PITCH AC OUT HI | OUT |
| 7 | 26 VAC REF LO | IN |
| 8 | HEADING SYNCRO X | OUT |
| 9 | VERTICAL +UP OUT | OUT |
| 10 | LATERAL +RIGHT OUT | OUT |
| 11 | RADAR ROLL HI | OUT |
| 12 | CAN LO | I/O |
| 13 | A/P HEADING ERROR HI | OUT |
| 14 | DISCRETE OUT 5 LO | OUT |
| 15 | YAW RATE HI | OUT |
| 16 | HEADING SYNCRO Y | OUT |
| 17 | DISCRETE OUT 9 LO | OUT |
| 18 | FD ENABLE HI | IN |
| 19 | FD PITCH UP | IN |
| 20 | DISCRETE OUT 6 LO | OUT |
| 21 | OAT PROBE IN LO | IN |
| 22 | AP INTERLOCK RELAY NC | -- |
| 23 | GYRO VALID RELAY NO | OUT |
| 24 | VERTICAL +FLAG OUT | OUT |
| 25 | LATERAL SUPER FLAG | OUT |
| 26 | ROLL AC OUT HI | OUT |
| 27 | 10 VAC REF HI | IN |
| 28 | SPARE | -- |
| 29 | TO/FROM +FLAG | OUT |
| 30 | RADAR PITCH LO | -- |
| 31 | CAN HI | I/O |
| 32 | A/P COURSE ERROR HI | OUT |
| 33 | SPARE | -- |
| 34 | ROLL DC OUT | OUT |
| 35 | BARO CORRECTION HI | OUT |

| Pin | Function | I/O |
|---|---|---|
| 40 | DISCRETE OUT 8 LO | OUT |
| 41 | AP INTERLOCK RELAY COM | IN |
| 42 | GYRO VALID RELAY NC | OUT |
| 43 | DISCRETE IN 6 LO | IN |
| 44 | VERTICAL SUPERFLAG | OUT |
| 45 | ROLL AC OUT LO | -- |
| 46 | 10 VAC REF LO | IN |
| 47 | HEADING SYNCHRO Z | -- |
| 48 | LATERAL +LEFT OUT | OUT |
| 49 | TO/FROM -FLAG OUT | OUT |
| 50 | RADAR ROLL LO | -- |
| 51 | CAN TERMINATION A | I/O |
| 52 | A/P HEADING ERROR LO | OUT |
| 53 | SPARE | -- |
| 54 | BARO CORRECTION LO | IN |
| 55 | PITCH DC OUT | OUT |
| 56 | RS-232 IN 3 | IN |
| 57 | SPARE | -- |
| 58 | FD PITCH DOWN | IN |
| 59 | SPARE GROUND | -- |
| 60 | OAT PROBE IN HI | IN |
| 61 | AP INTERLOCK RELAY NO | OUT |
| 62 | OAT PROBE POWER | OUT |
| 63 | LATERAL +FLAG OUT | OUT |
| 64 | PITCH AC OUT LO | OUT |
| 65 | 26 VAC REF HI | IN |
| 66 | LATERAL -FLAG OUT | OUT |
| 67 | SPARE GROUND | -- |
| 68 | VERTICAL +DOWN OUT | OUT |
| 69 | RADAR PITCH HI | OUT |
| 70 | CAN TERMINATION | I/O |
| 71 | A/P COURSE ERROR LO | OUT |
| 72 | DISCRETE OUT 4 LO | OUT |
| 73 | YAW RATE LO | -- |
| 74 | SPARE GROUND | -- |

| | | |
|---|---|---|
| 36 | RS-232 3 GROUND | -- |
| 37 | DC REF IN | IN |
| 38 | FD ROLL RIGHT | IN |
| 39 | TIME MARK A | IN |

| | | |
|---|---|---|
| 75 | RS-232 OUT 3 | OUT |
| 76 | SPARE GROUND | -- |
| 77 | FD ROLL LEFT | IN |
| 78 | TIME MARK B | IN |

The Active-Low discrete outputs shall provide a connection to ground with a resistance of no more than 25Ω when in the active state.

### 4.2.2 GEA 24/GEA 24B

The GEA 24(B) has four connectors:

- J241/P241 9-pin male contact HD D-sub
- J242/P242 25-pin female contact HD D-sub
- J243/P243 37-pin male contact HD D-sub
- J244/P244 50-pin male contact HD D-sub

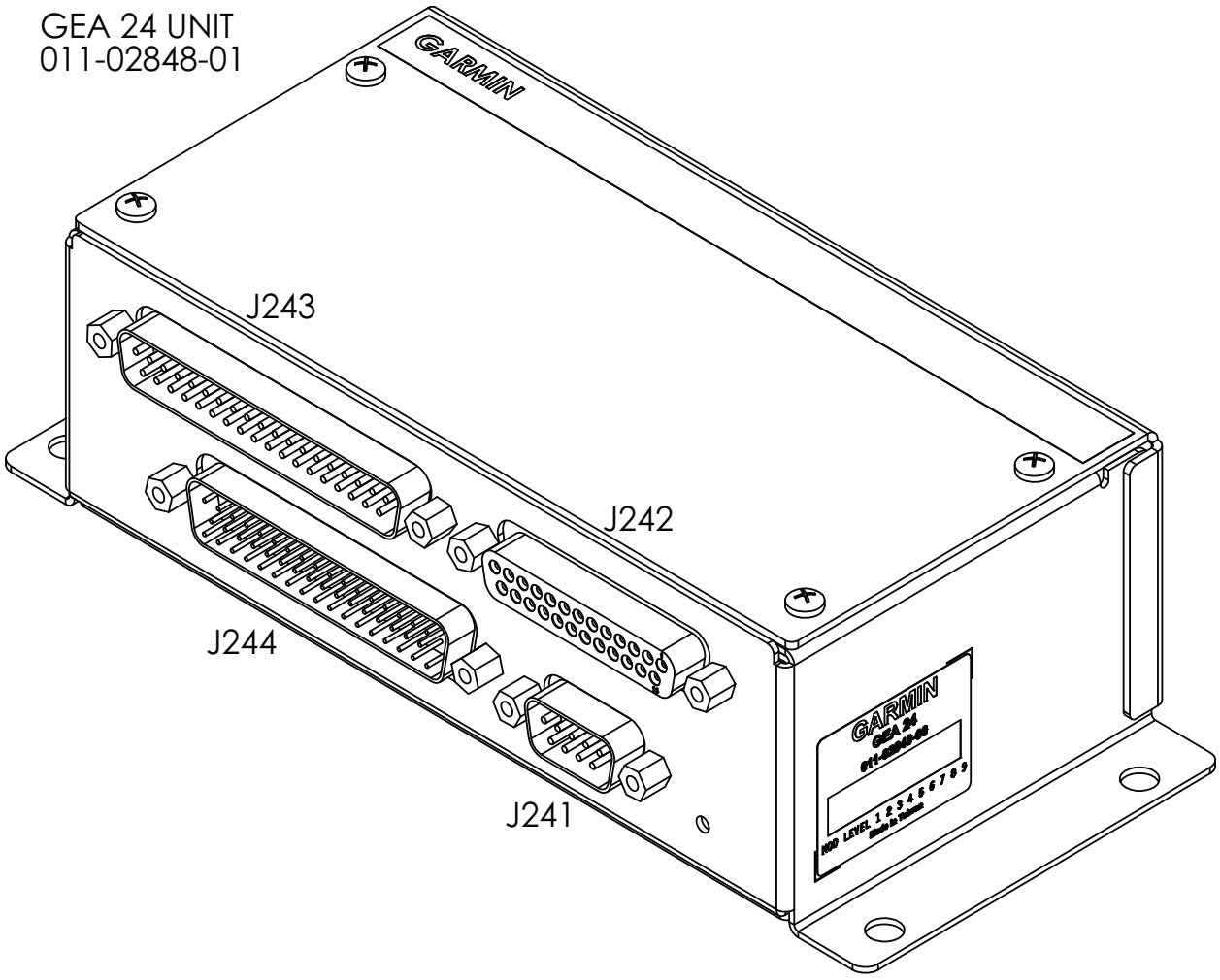



**Figure 4-4 GEA 24/GEA 24B Connectors**
**GEA 24 Shown, GEA 24B Similar**

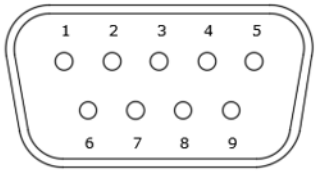



**Figure 4-5 GEA 24/GEA 24B J241/P241 Connector (Looking at the Connector)**

**Table 4-4 GEA 24/GEA 24B J241/P241 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | CAN HI | I/O |
| 2 | CAN LO | I/O |
| 3 | RESERVED | -- |
| 4 | RS-232 RX | IN |
| 5 | RS-232 TX | OUT |
| 6 | GROUND | -- |
| 7 | AIRCRAFT POWER 1 | IN |
| 8 | AIRCRAFT POWER 2 | IN |
| 9 | GROUND | -- |

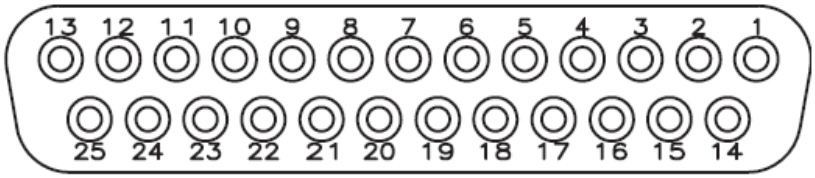



**Figure 4-6 GEA 24/GEA 24B J242/P242 Connector (Looking at the Connector)**

**Table 4-5 GEA 24/GEA 24B J242/P242 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | RESERVED | -- |
| 2 | CHT 6 LO / CHT 2 RESIST LO | IN |
| 3 | EGT 6 LO | IN |
| 4 | CHT 5 LO / CHT 1 RESIST LO | IN |
| 5 | EGT 5 LO | IN |
| 6 | CHT 4 LO | IN |
| 7 | EGT 4 LO | IN |
| 8 | CHT 3 LO | IN |
| 9 | EGT 3 LO | IN |
| 10 | CHT 2 LO | IN |
| 11 | EGT 2 LO | IN |
| 12 | CHT 1 LO | IN |
| 13 | EGT 1 LO | IN |

| Pin | Function | I/O |
|---|---|---|
| 14 | CHT 6 HI / CHT 2 RESIST HI | IN |
| 15 | EGT 6 HI | IN |
| 16 | CHT 5 / CHT 1 RESISTIVE HI | IN |
| 17 | EGT 5 HI | IN |
| 18 | CHT 4 HI | IN |
| 19 | EGT 4 HI | IN |
| 20 | CHT 3 HI | IN |
| 21 | EGT 3 HI | IN |
| 22 | CHT 2 HI | IN |
| 23 | EGT 2 HI | IN |
| 24 | CHT 1 HI | IN |
| 25 | EGT 1 HI | IN |

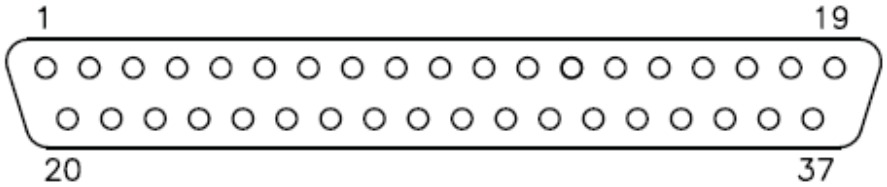



**Figure 4-7 GEA 24/GEA 24B J243/P243 Connector (Looking at Connector)**

**Table 4-6 GEA 24/GEA 24B J243/P243 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | FUEL PRESS GROUND | -- |
| 2 | FUEL PRESS | IN |
| 3 | FUEL PRESS XDCR +12V | OUT |
| 4 | FUEL PRESS XDCR +5V | OUT |
| 5 | RPM XDCR GROUND_2 | -- |
| 6 | RPM 2 | IN |
| 7 | RPM XDCR GROUND_1 | -- |
| 8 | RPM 1 | IN |
| 9 | RPM XDCR +12V_1 | OUT |
| 10 | RPM XDCR +12V_2 | OUT |
| 11 | RESERVED / SPARE | IN |
| 12 | MANIFOLD PRESS GROUND | -- |
| 13 | MANIFOLD PRESS | IN |
| 14 | MANIFOLD PRESS XDCR +12V | OUT |
| 15 | MANIFOLD PRESS XDCR +5V | OUT |
| 16 | OIL PRESS GROUND | -- |
| 17 | OIL PRESS HI | IN |
| 18 | OIL PRESS XDCR +12V | OUT |
| 19 | OIL PRESS XDCR +5V | OUT |

| Pin | Function | I/O |
|---|---|---|
| 20 | FUEL XDCR GROUND_1 | -- |
| 21 | FUEL RETURN (shared w/Pin 37, J244 connector) | IN |
| 22 | FUEL XDCR GROUND_2 | |
| 23 | FUEL FLOW (shared w/Pin 36, J244 connector) | IN |
| 24 | FUEL XDCR +12V_1 | OUT |
| 25 | FUEL XDCR +12V_2 | OUT |
| 26 | GP +5V_1 | OUT |
| 27 | GP GROUND_1 | -- |
| 28 | POS 7 / TIT 2 / MISC TEMP 2 LO | IN |
| 29 | POS 7 / TIT 2 / MISC TEMP 2 HI | IN |
| 30 | POS 6 / TIT 1 / MISC TEMP 1 LO | IN |
| 31 | POS 6 / TIT 1 / MISC TEMP 1 HI | IN |
| 32 | OIL TEMP LO | IN |
| 33 | OIL TEMP HI | IN |
| 34 | SHUNT 2 LO (shared w/Pin 47, J244 connector) | IN |
| 35 | SHUNT 2 HI (shared w/Pin 46, J244 connector) | IN |
| 36 | SHUNT 1 LO | IN |
| 37 | SHUNT 1 HI | IN |

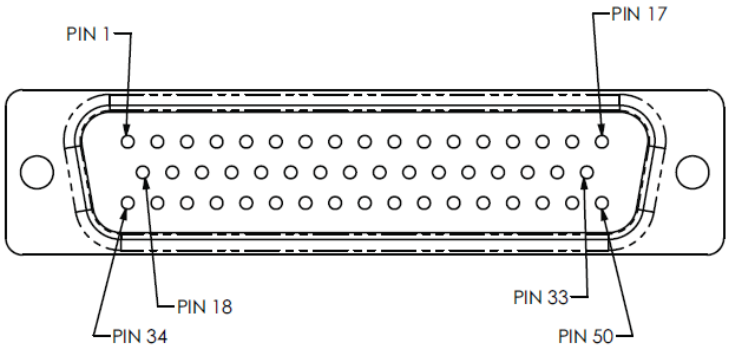



**Figure 4-8 GEA 24/GEA 24B J244/P244 Connector (Looking at the Connector)**

**Table 4-7 GEA 24/GEA 24B J244/P244 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | SYSTEM ID 1A* | IN |
| 2 | SYSTEM ID 1B / GROUND | -- |
| 3 | RESERVED | -- |
| 4 | RESERVED | -- |
| 5 | FUEL QTY +5V_1 | OUT |
| 6 | FUEL QTY 1 | IN |
| 7 | FUEL QTY 1 GROUND | -- |
| 8 | FUEL QTY +5V_2 | OUT |
| 9 | FUEL QTY 2 | IN |
| 10 | FUEL QTY 2 GROUND | -- |
| 11 | POS 3 HI / +5V_3 | OUT |
| 12 | POS 3 / GP 3 / FUEL QTY 3 | IN |
| 13 | POS 3 LO / GROUND | -- |
| 14 | POS 4 HI / +5V_4 | OUT |
| 15 | POS 4 / GP 4 / FUEL QTY 4 | IN |
| 16 | POS 4 LO / GROUND | -- |
| 17 | CAN2_H | I/O |
| 18 | GP1 HI / +5V | OUT |
| 19 | GP1 / POS 1 | IN |
| 20 | GP1 LO / GROUND | -- |
| 21 | GP2 HI / +5V | OUT |
| 22 | GP2 / POS 2 | IN |
| 23 | GP2 LO / GOURND | -- |
| 24 | GP +5V_2 | OUT |
| 25 | VOLTS 1 | IN |

| Pin | Function | I/O |
|---|---|---|
| 26 | GP GROUND_2 | -- |
| 27 | GP +5V_3 | OUT |
| 28 | VOLTS 2 | IN |
| 29 | GP GROUND 3 | -- |
| 30 | POS 5 HI / +5V | OUT |
| 31 | POS 5 / MISC PRESS | IN |
| 32 | POS 5 LO / GROUND | -- |
| 33 | CAN2_L | I/O |
| 34 | FUEL QTY +12V 1 | OUT |
| 35 | FUEL QTY +12V 2 | OUT |
| 36 | RESERVED | IN |
| 37 | RESERVED | IN |
| 38 | RESERVED | -- |
| 39 | RESERVED | -- |
| 40 | DISCRETE IN 1** | IN |
| 41 | DISCRETE IN 2** | IN |
| 42 | DISCRETE IN 3** | IN |
| 43 | DISCRETE IN 4** | IN |
| 44 | DISCRETE OUT 1* / MASTER WARNING | IN |
| 45 | DISCRETE OUT 2* / MASTER CAUTION | IN |
| 46 | SHUNT 2 HI (shared w/Pin 35, J243 connector) | IN |
| 47 | SHUNT 2 LO (shared w/Pin 34, J243 connector) | IN |
| 48 | RESERVED / SPARE 1 | IN |
| 49 | RESERVED / SPARE 2 | IN |
| 50 | GP +12V | OUT |

*Indicates Active-Low

**Can be configured as Active-High or Active-Low

### 4.2.3 GEA 110

The GEA110 has two connectors:

- J1101/P1101 15-pin female contact HD D-Sub
- J1102/P1102 78-pin female contact HD D-Sub

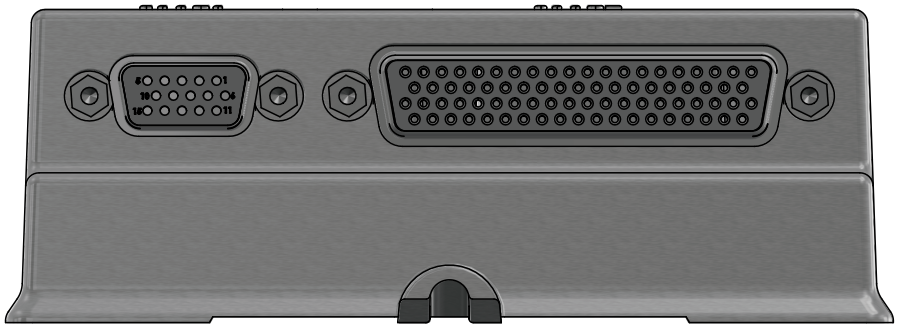


**Figure 4-9 GEA 110 Connectors**

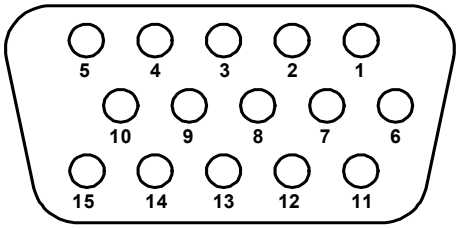



**Figure 4-10 GEA 110 J1101/P1101 Connector (Looking at Connector)**

**Table 4-8 GEA 110 J1101/P1101 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | AV PWR IN 1 | IN |
| 2 | RESERVED | -- |
| 3 | DISCRETE OUT 1 | OUT |
| 4 | RS 485 2A | I/O |
| 5 | RS 485 1A | I/O |
| 6 | AV PWR IN 2 | IN |
| 7 | RESERVED | -- |
| 8 | DISCRETE OUT 2 | OUT |
| 9 | RS 485 2B | I/O |
| 10 | RS 485 1B | I/O |
| 11 | DISCRETE IN 5 | IN |
| 12 | SYS ID #1 | IN |
| 13 | SYS ID #2 | IN |
| 14 | GND | -- |
| 15 | GND | -- |

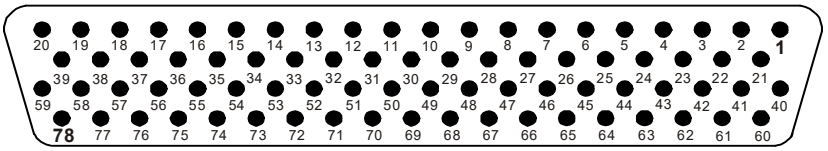



**Figure 4-11 GEA 110 J1102/P1102 Connector Looking at Unit**

**Table 4-9 GEA 110 J1102/P1102 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | CHT 1 (+) | IN |
| 2 | CHT 2 (+) | IN |
| 3 | CHT 3 (+) | IN |
| 4 | CHT 4 (+) | IN |
| 5 | CHT 5 (+) | IN |
| 6 | CHT 6 (+) | IN |
| 7 | GENERAL PURPOSE 1 (+) | IN |
| 8 | GENERAL PURPOSE 2 (+) | IN |
| 9 | +10 VDC | OUT |
| 10 | FUEL PRESSURE (+) | IN |
| 11 | DISCRETE IN 1 | IN |
| 12 | FUEL QUANTITY 1 / GENERAL PURPOSE 3 (+) | IN |
| 13 | FUEL QUANTITY 3 / GENERAL PURPOSE 5 (+) | IN |
| 14 | GND | IN |
| 15 | FUEL FLOW 1 | IN |
| 16 | FUEL FLOW 2 | IN |
| 17 | +12 VDC | OUT |
| 18 | RPM IN 1 (+) | IN |
| 19 | RPM IN 2 (+) | IN |
| 20 | CONFIG MOD PWR | OUT |
| 21 | CHT 1 (-) | IN |
| 22 | CHT 2 (-) | IN |
| 23 | CHT 3 (-) | IN |
| 24 | CHT 4 (-) | IN |
| 25 | CHT 5 (-) | IN |
| 26 | CHT 6 (-) | IN |
| 27 | GENERAL PURPOSE 1 (-) | IN |
| 28 | GENERAL PURPOSE 2 (-) | IN |
| 29 | +5 VDC | OUT |
| 30 | FUEL PRESSURE (-) | IN |
| 31 | DISCRETE IN 2 | IN |
| 32 | FUEL QUANTITY 1 / GENERAL PURPOSE 3 (-) | IN |
| 33 | FUEL QUANTITY 3 / GENERAL PURPOSE 5 (-) | IN |
| 34 | GND | -- |

| Pin | Function | I/O |
|---|---|---|
| 40 | EGT 1 (+) | IN |
| 41 | EGT 2 (+) | IN |
| 42 | EGT 3 (+) | IN |
| 43 | EGT 4 (+) | IN |
| 44 | EGT 5 (+) | IN |
| 45 | EGT 6 (+) | IN |
| 46 | CARB TEMP (+) | IN |
| 47 | OIL TEMP (+) | IN |
| 48 | OIL PRESSURE (+) | IN |
| 49 | GND | -- |
| 50 | MANIFOLD PRESSURE (+) | IN |
| 51 | DISCRETE IN 3 | IN |
| 52 | FUEL QUANTITY 2 / GENERAL PURPOSE 4 (+) | IN |
| 53 | FUEL QUANTITY 4 / GENERAL PURPOSE 6 (+) | IN |
| 54 | GND | -- |
| 55 | SHUNT 1 (-) | IN |
| 56 | SHUNT 2 (-) | IN |
| 57 | BUS 1 | IN |
| 58 | BUS 2 | IN |
| 59 | CONFIG MOD CLOCK | OUT |
| 60 | EGT 1 (-) | IN |
| 61 | EGT 2 (-) | IN |
| 62 | EGT 3 (-) | IN |
| 63 | EGT 4 (-) | IN |
| 64 | EGT 5 (-) | IN |
| 65 | EGT 6 (-) | IN |
| 66 | CARB TEMP (-) | IN |
| 67 | OIL TEMP (-) | IN |
| 68 | OIL PRESSURE (-) | IN |
| 69 | +12 VDC | OUT |
| 70 | MANIFOLD PRESSURE (-) | IN |
| 71 | DISCRETE IN 4 | IN |
| 72 | FUEL QUANTITY 2 / GENERAL PURPOSE 4 (-) | IN |
| 73 | FUEL QUANTITY 4 / GENERAL PURPOSE 6 (-) | IN |

| | | |
|---|---|---|
| 35 | SHUNT 1 (+) | IN |
| 36 | SHUNT 2 (+) | IN |
| 37 | RPM IN 1 (-) | IN |
| 38 | RPM IN 2 (-) | IN |
| 39 | CONFIG MOD DATA | I/O |

| | | |
|---|---|---|
| 74 | GND | -- |
| 75 | SPARE | -- |
| 76 | +5 VDC | OUT |
| 77 | BUS 3 | IN |
| 78 | CONFIG MOD GND | -- |

### 4.2.4 GMU 44B

The GMU 44B has one connector:

- J442/P442 6-pin rectangular connector

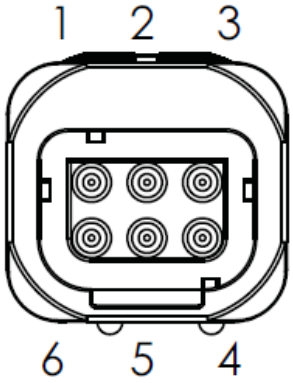



**Figure 4-12 J442/P442 Connector**

**Table 4-10 GMU 44B J442/P442 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | SHIELD GROUND | -- |
| 2 | RS-485 OUT B | OUT |
| 3 | RS-485 OUT A | OUT |
| 4 | POWER GROUND | -- |
| 5 | RS-232 IN | IN |
| 6 | MAG POWER INPUT | IN |

### 4.2.5 GMU 11

The GMU 11 has one connector:

- J111/P111 9-pin female connector

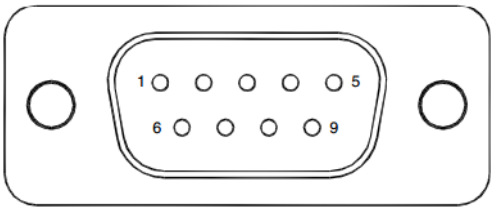



**Figure 4-13 GMU 11 Connector**

**Table 4-11 GMU 11 J111/P111 Connector**

| Pin | Function | I/O |
|---|---|---|
| 1 | CAN BUS HI | I/O |
| 2 | CAN BUS LO | I/O |
| 3 | UNIT ID 1 | IN |
| 4 | RS-232 IN | IN |
| 5 | RS-232 OUT | OUT |
| 6 | SIGNAL GROUND | -- |
| 7 | AIRCRAFT PWR 1 | IN |
| 8 | AIRCRAFT PWR 2 | IN |
| 9 | POWER GROUND | -- |

### 4.2.6 GTP 59

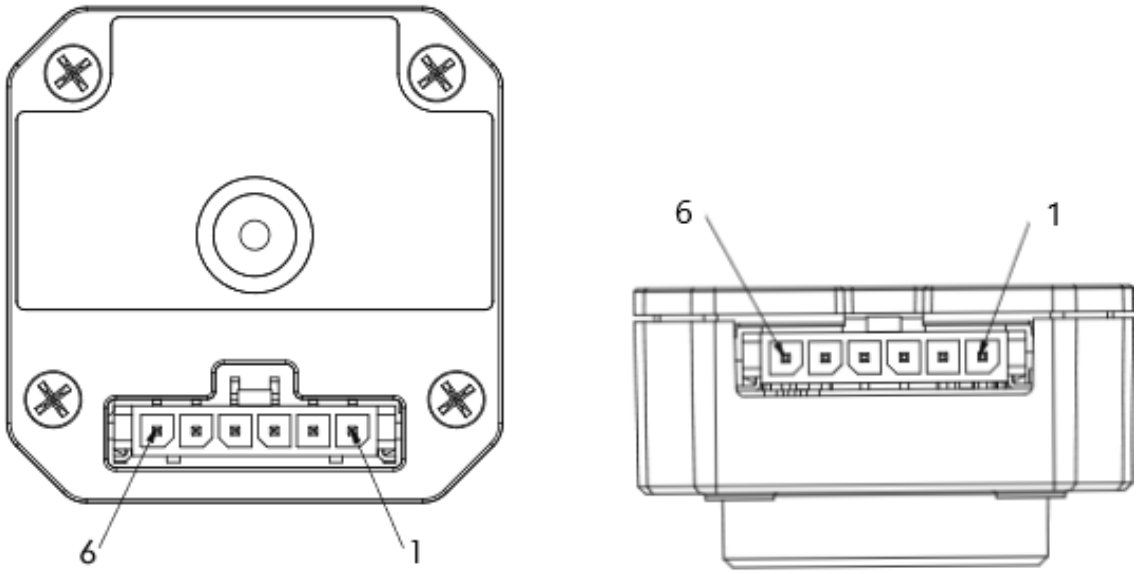
The GTP 59 Temperature Probe does not have a connector. Rather, a 3-conductor shielded cable extends from the sensor for interface with a GI 275 or GEA.

**Table 4-12 GTP 59 3-Conductor Shielded Cable**

| Conductor Color | Name | I/O |
|---|---|---|
| White | Probe Power Lead | IN |
| Blue | Resistive Element HI | OUT |
| Orange | Resistive Element LO | OUT |

### 4.2.7 GSB 15

The GSB 15 has a 6-pin connector in either a rear or side position. The connector designation (P201 or P202) is dependent on the part number, but the pin numbers and functions are identical.




**P201, GSB 15 Rear Unit**
**P/N 011-04937-00, -20, -40**

**P202, GSB 15 Side Unit**
**P/N 011-04937-01, -30, -50**

**Figure 4-14 GSB 15 Connectors**

**Table 4-13 GSB 15 J201/P201 & J202/P202**

| Pin | Function | I/O |
|---|---|---|
| 1 | AIRCRAFT POWER | IN |
| 2 | USB DN | I/O |
| 3 | USB DP | I/O |
| 4 | USB GND | -- |
| 5 | BACKLIGHT ENABLE | IN |
| 6 | POWER GROUND | -- |

## 4.3 Troubleshooting Flow Charts

This section provides troubleshooting flow charts for most system failures and alert messages. It is recommended that system troubleshooting and repair only be completed by a Garmin authorized repair facility. If a specific alert or fault condition is not listed, or the fault still exists after completing the given corrective action, contact Garmin Aviation Technical Support at the number listed for your specific region on the "Support" tab of the flyGarmin.com website.

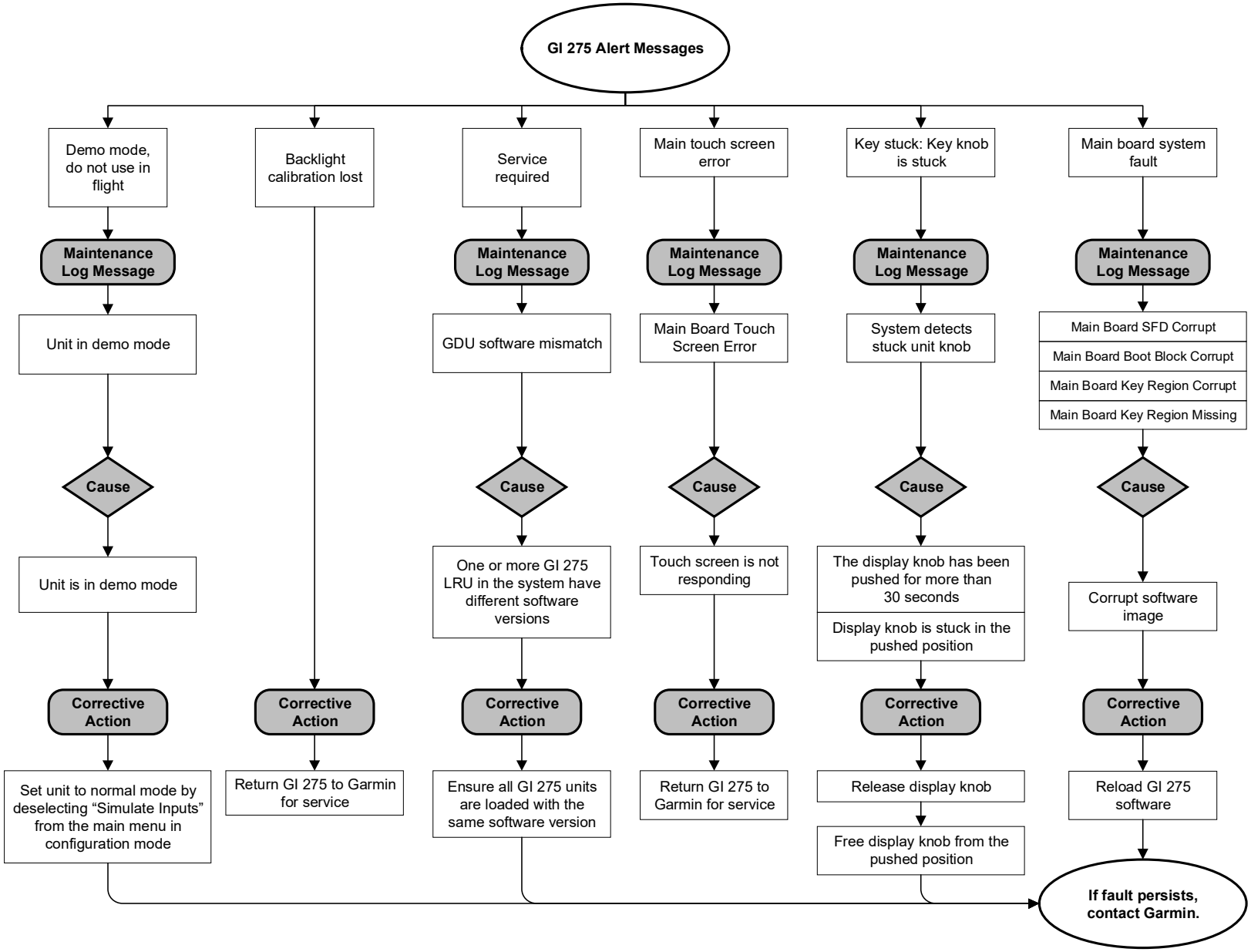



**Figure 4-15 GI 275 Alert Message Troubleshooting**
**Sheet 1 of 2**

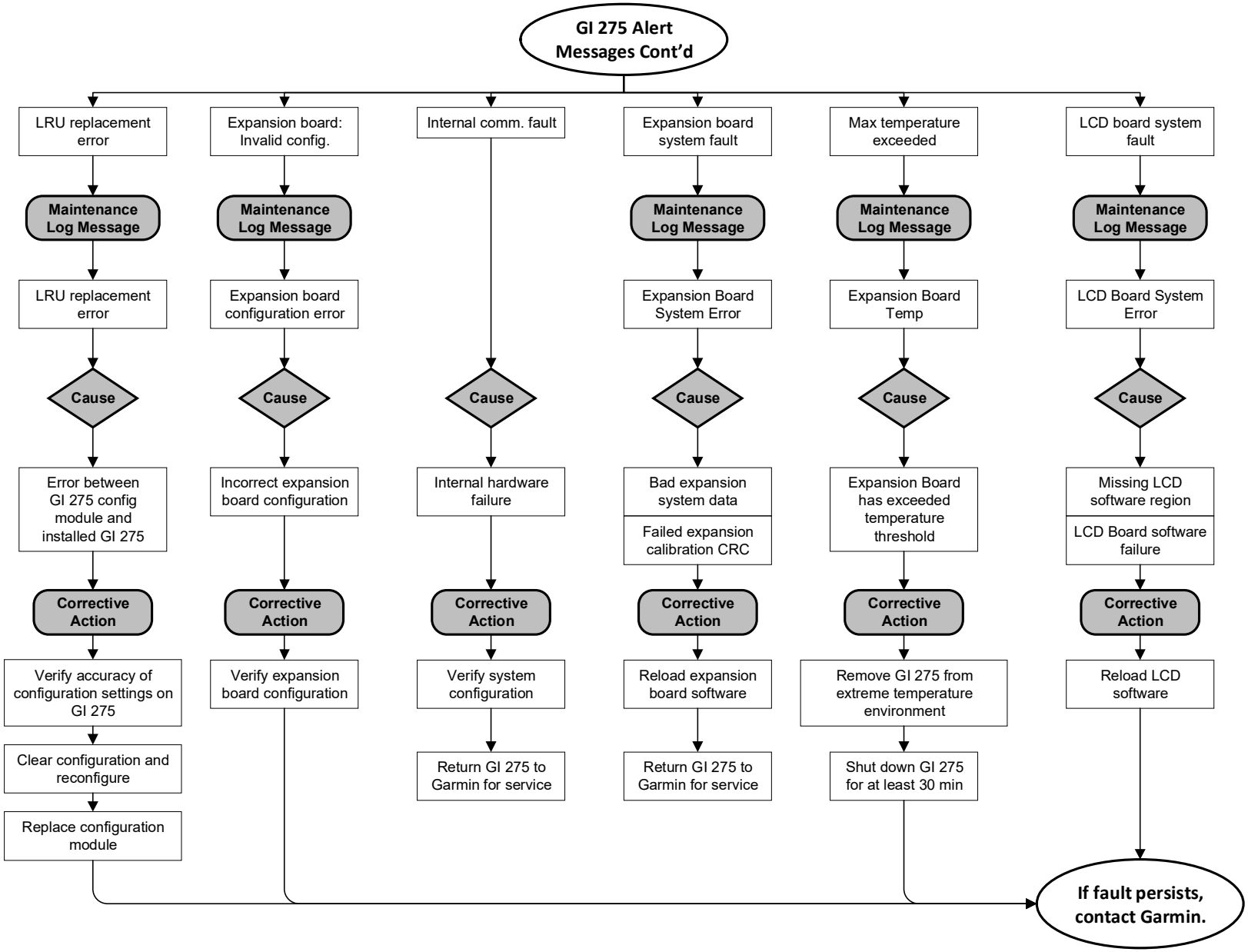



**Figure 4-15 GI 275 Alert Message Troubleshooting**
**Sheet 2 of 2**

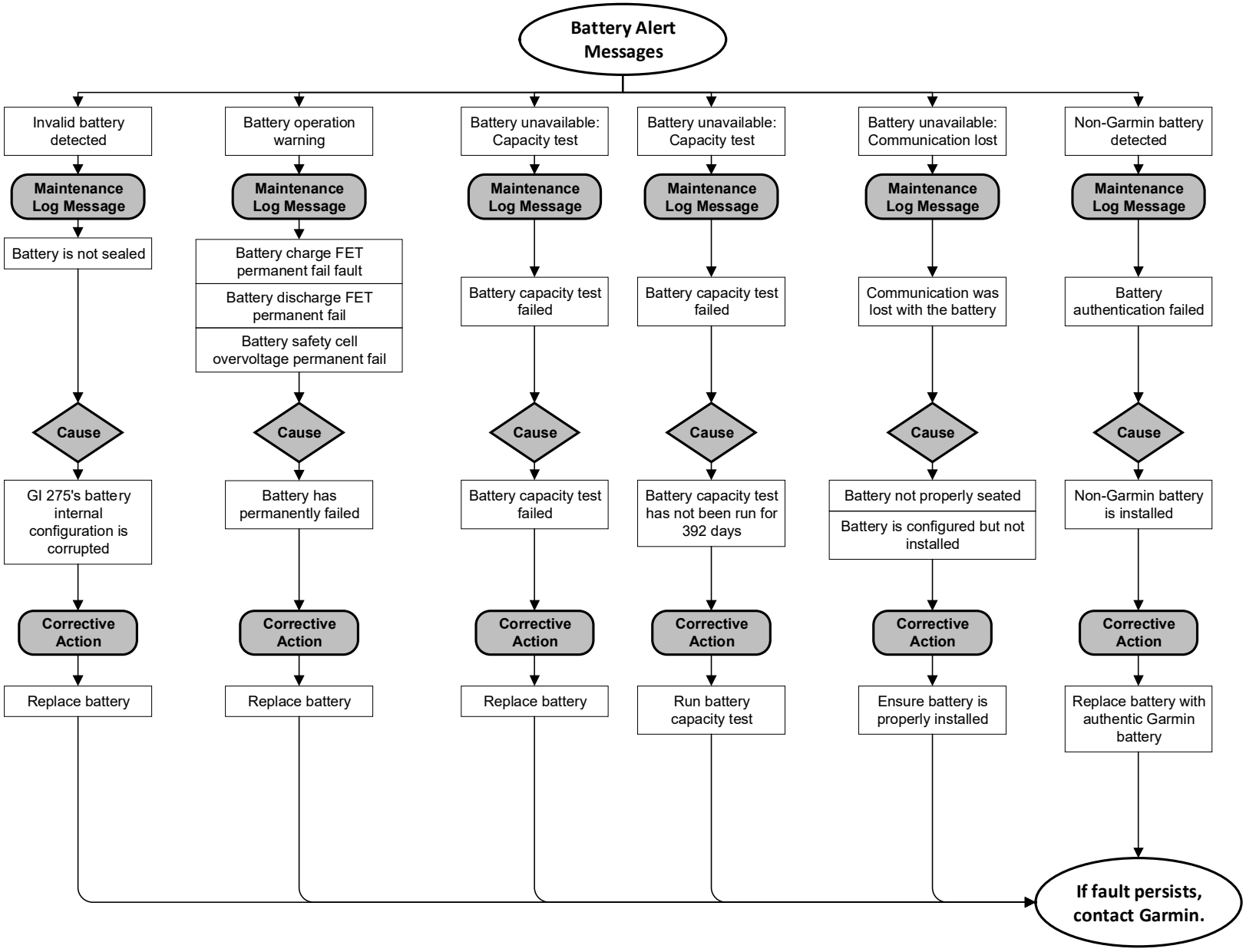



**Figure 4-16 Battery Alert Message Troubleshooting**
**Sheet 1 of 4**

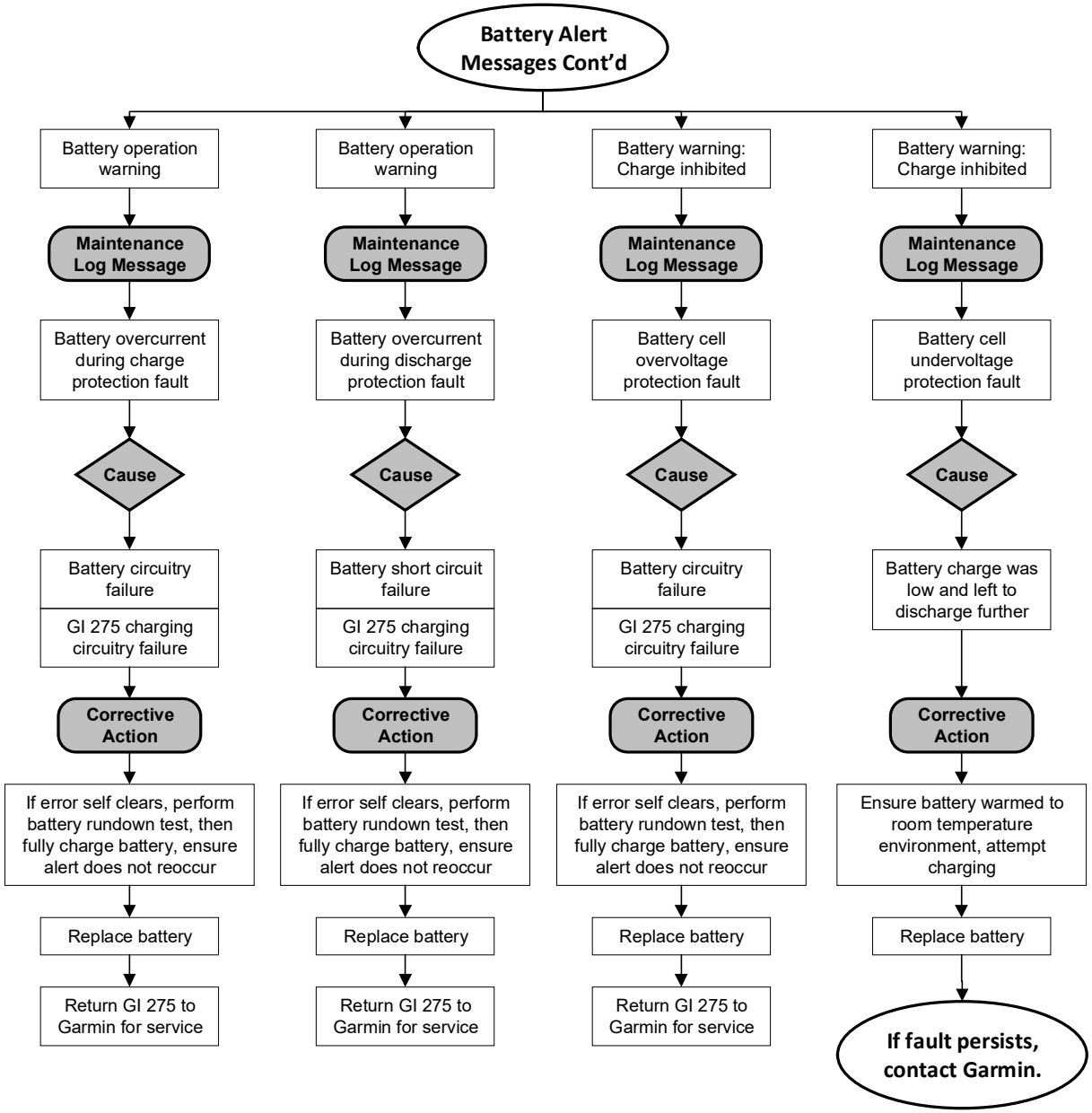



**Figure 4-16 Battery Alert Message Troubleshooting**
**Sheet 2 of 4**

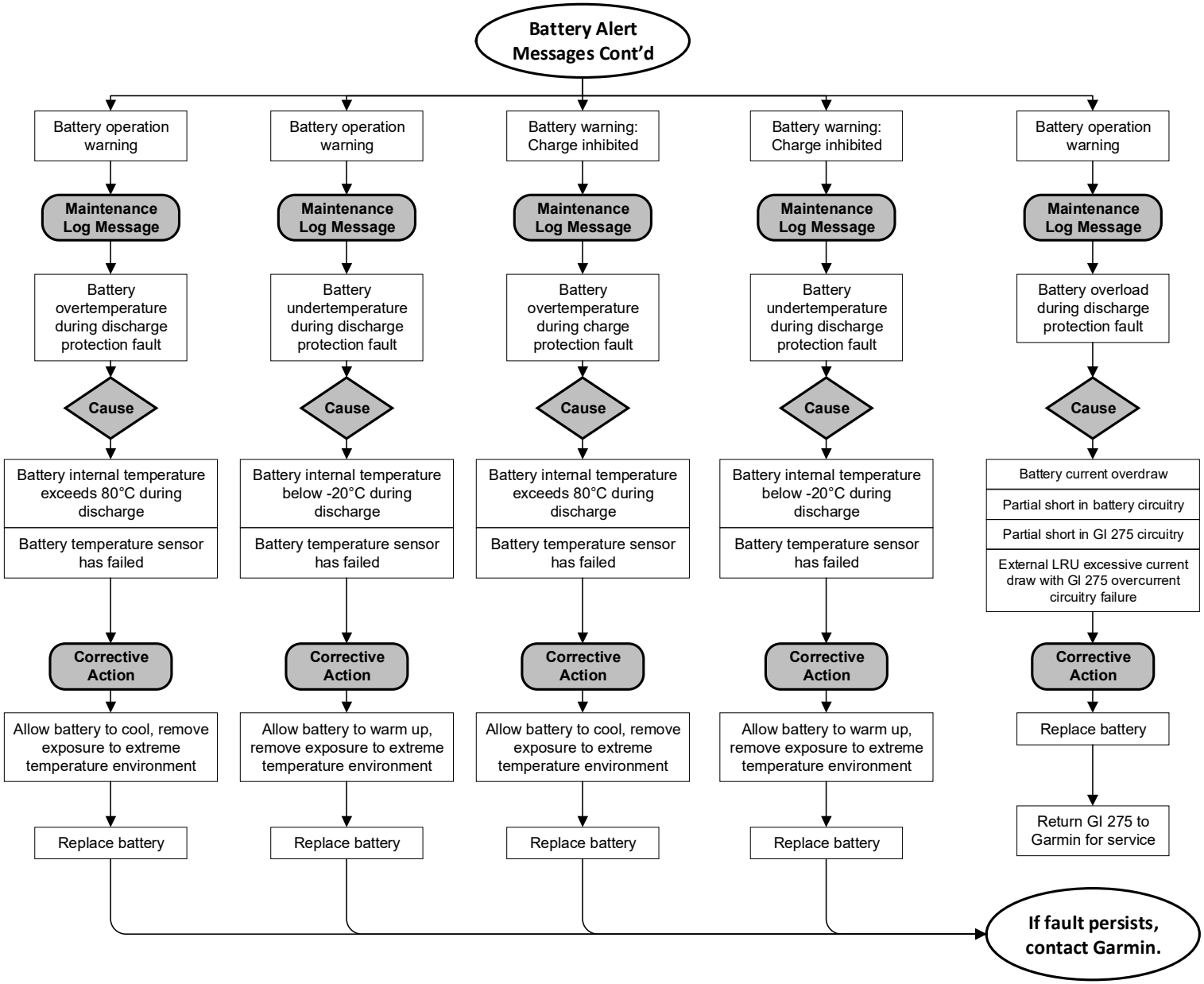



**Figure 4-16 Battery Alert Message Troubleshooting**
**Sheet 3 of 4**

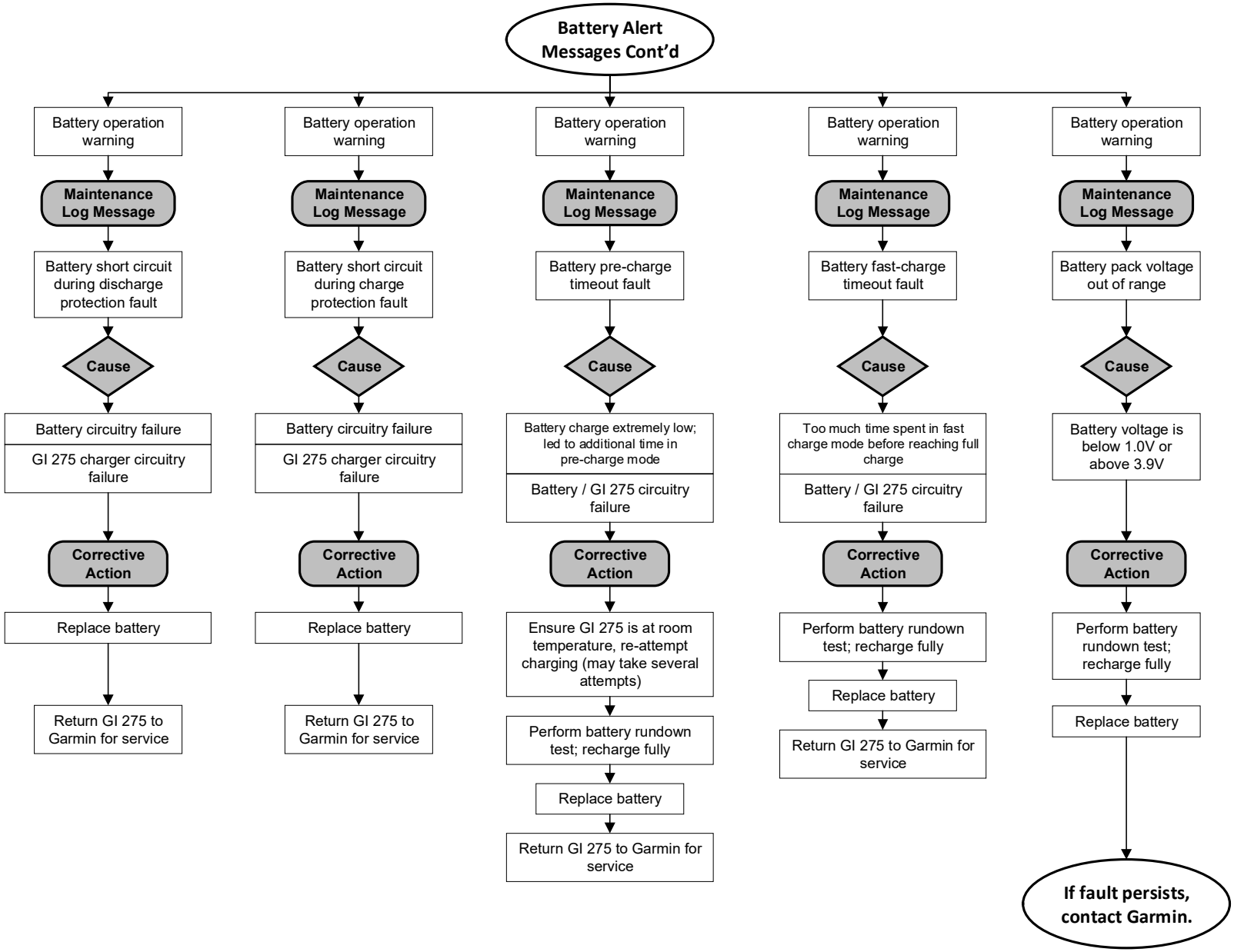



**Figure 4-16 Battery Alert Message Troubleshooting**
**Sheet 4 of 4**

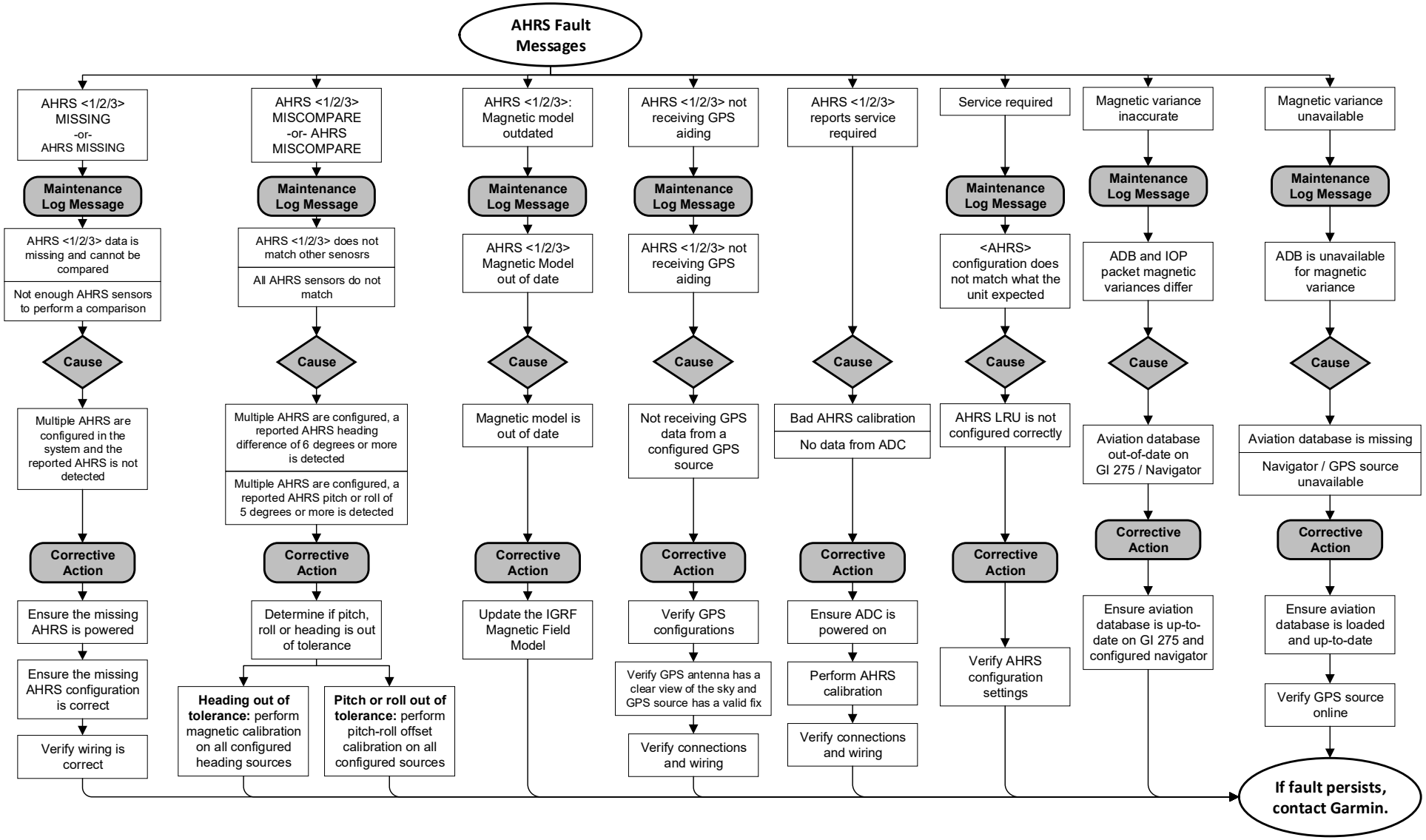



**Figure 4-17 AHRS Alert Message Troubleshooting**

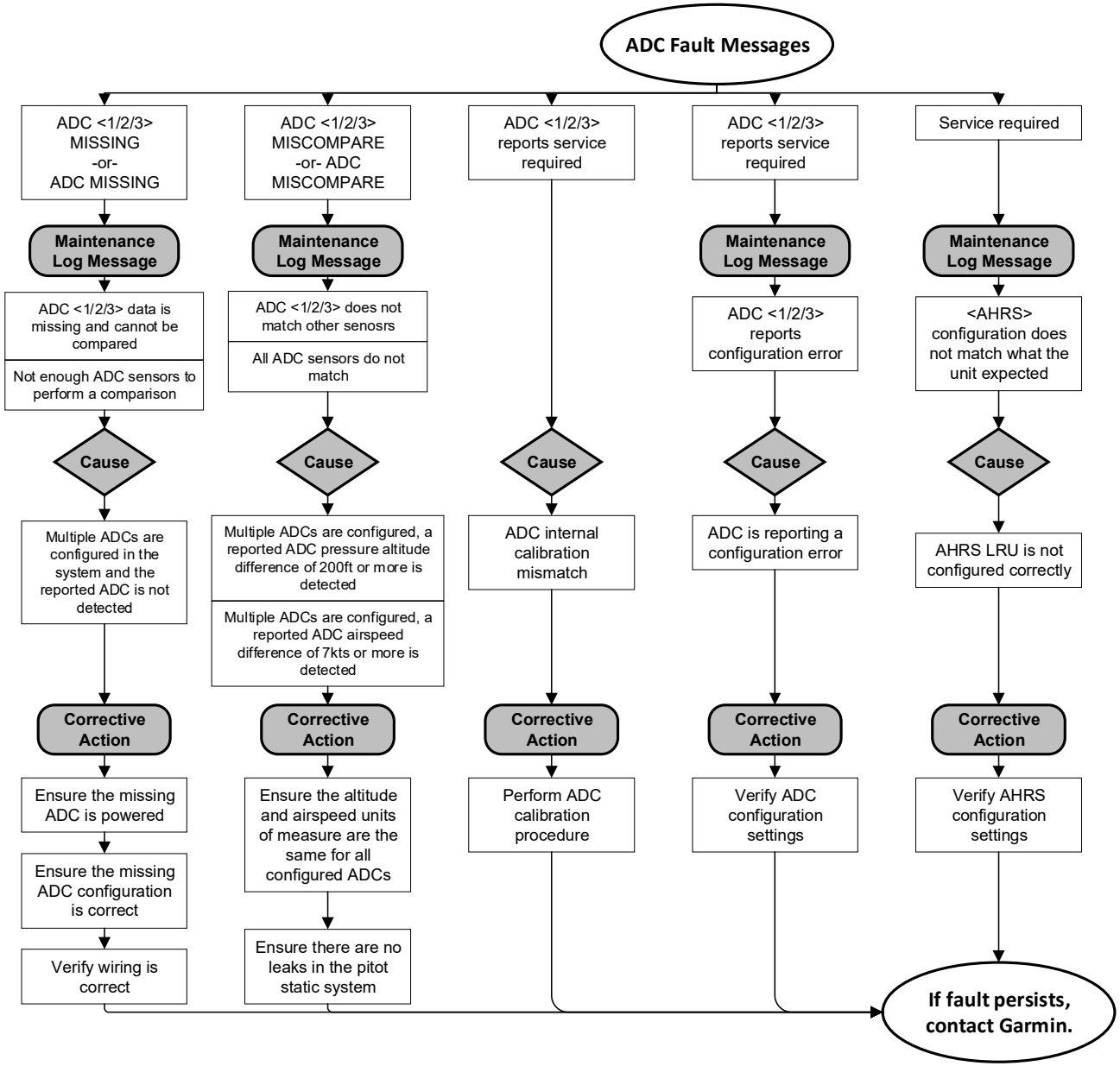



**Figure 4-18 ADC Alert Message Troubleshooting**

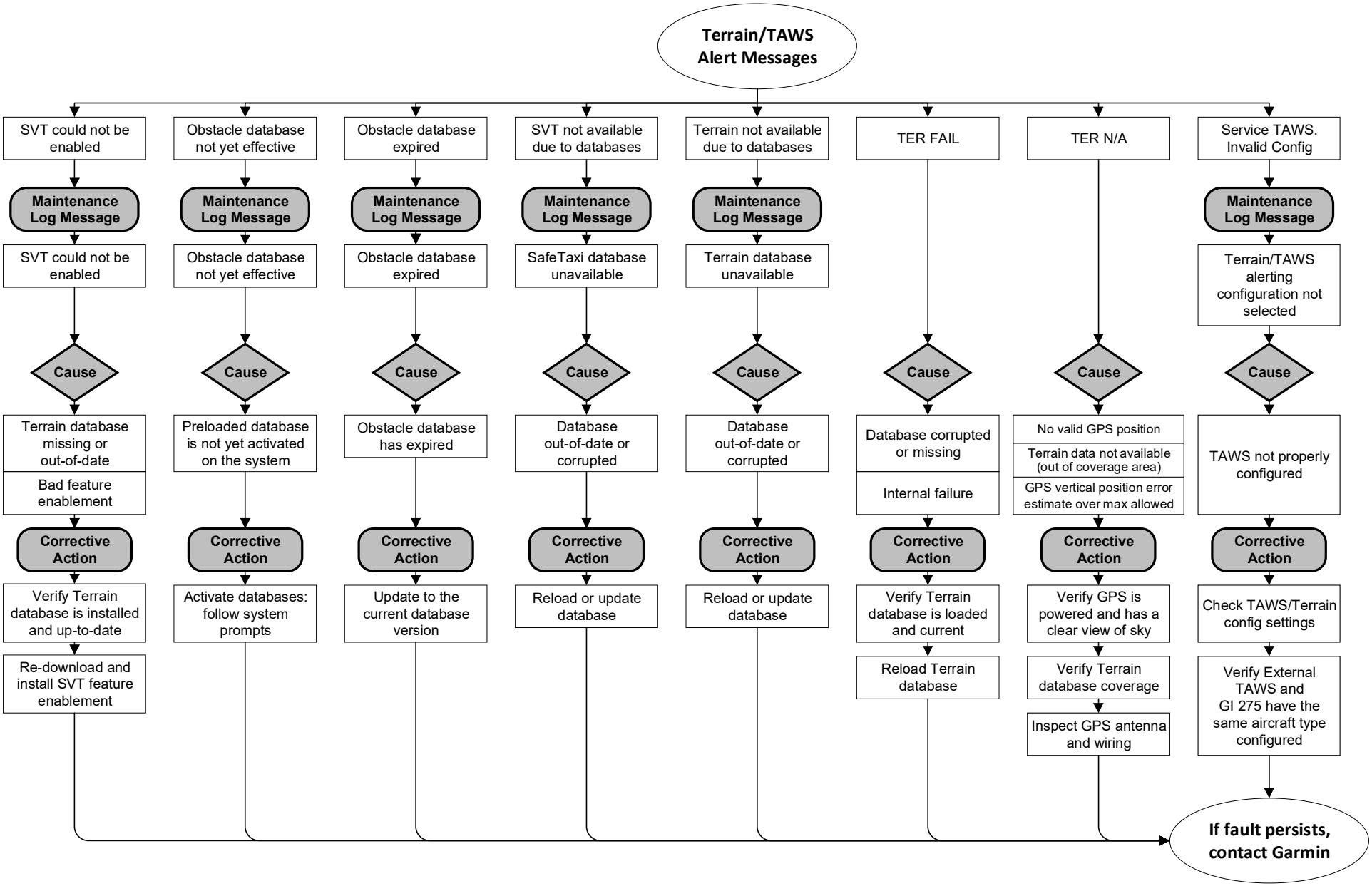



**Figure 4-19 Terrain/TAWS Alert Message Troubleshooting**

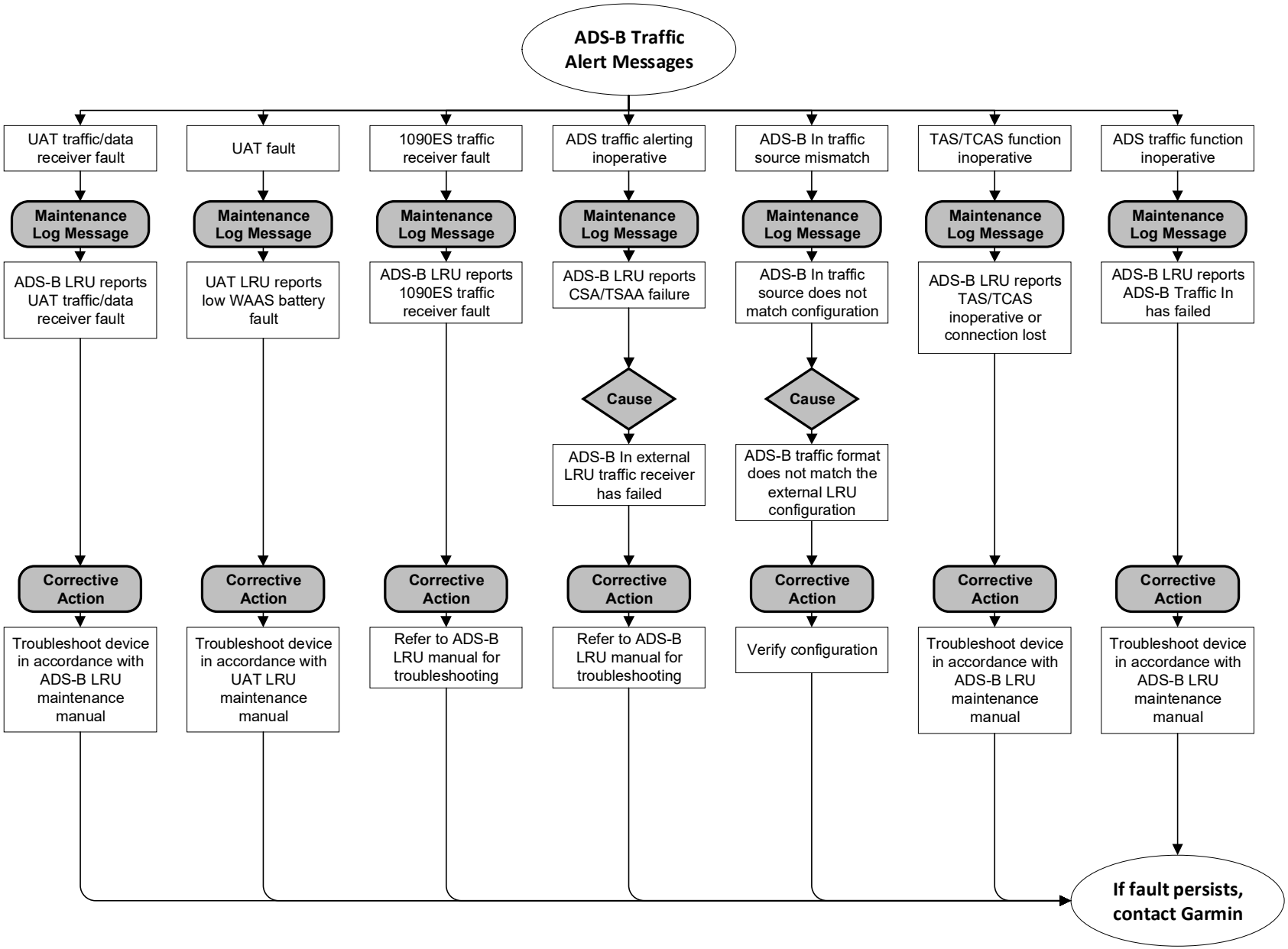



**Figure 4-20 Traffic Alert Message Troubleshooting**
**Sheet 1 of 2**

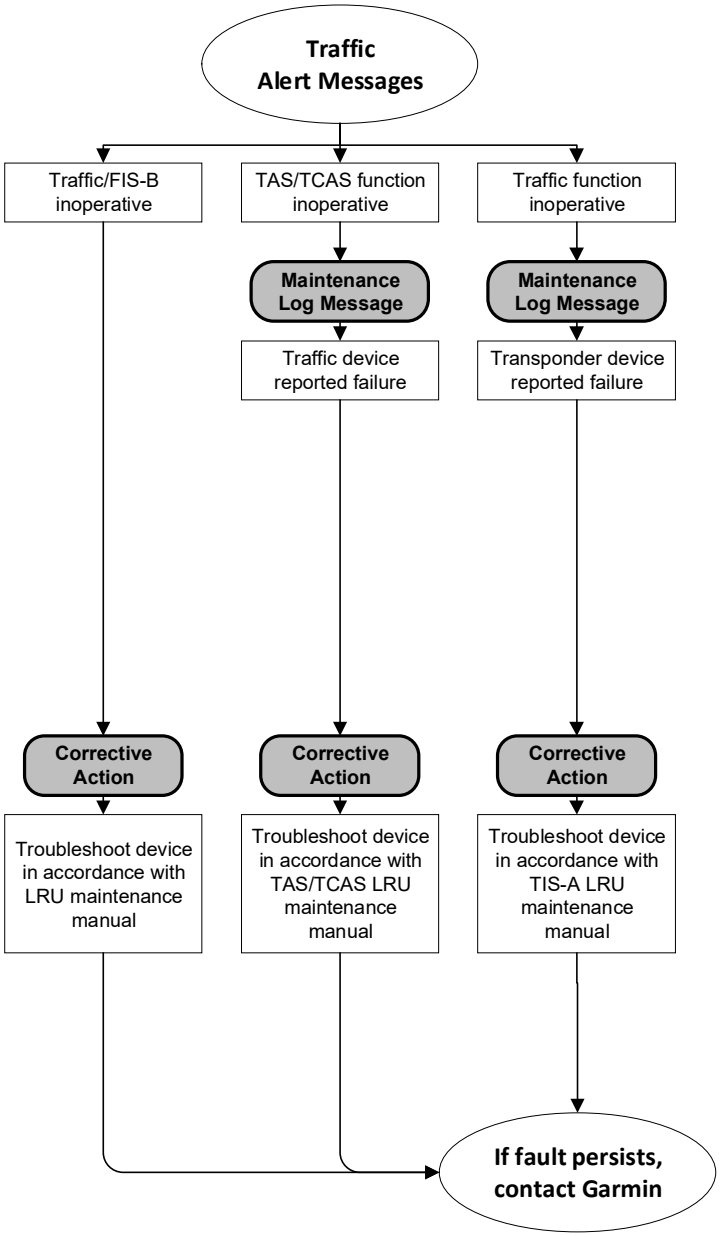



**Figure 4-20 Traffic Alert Message Troubleshooting**
**Sheet 2 of 2**

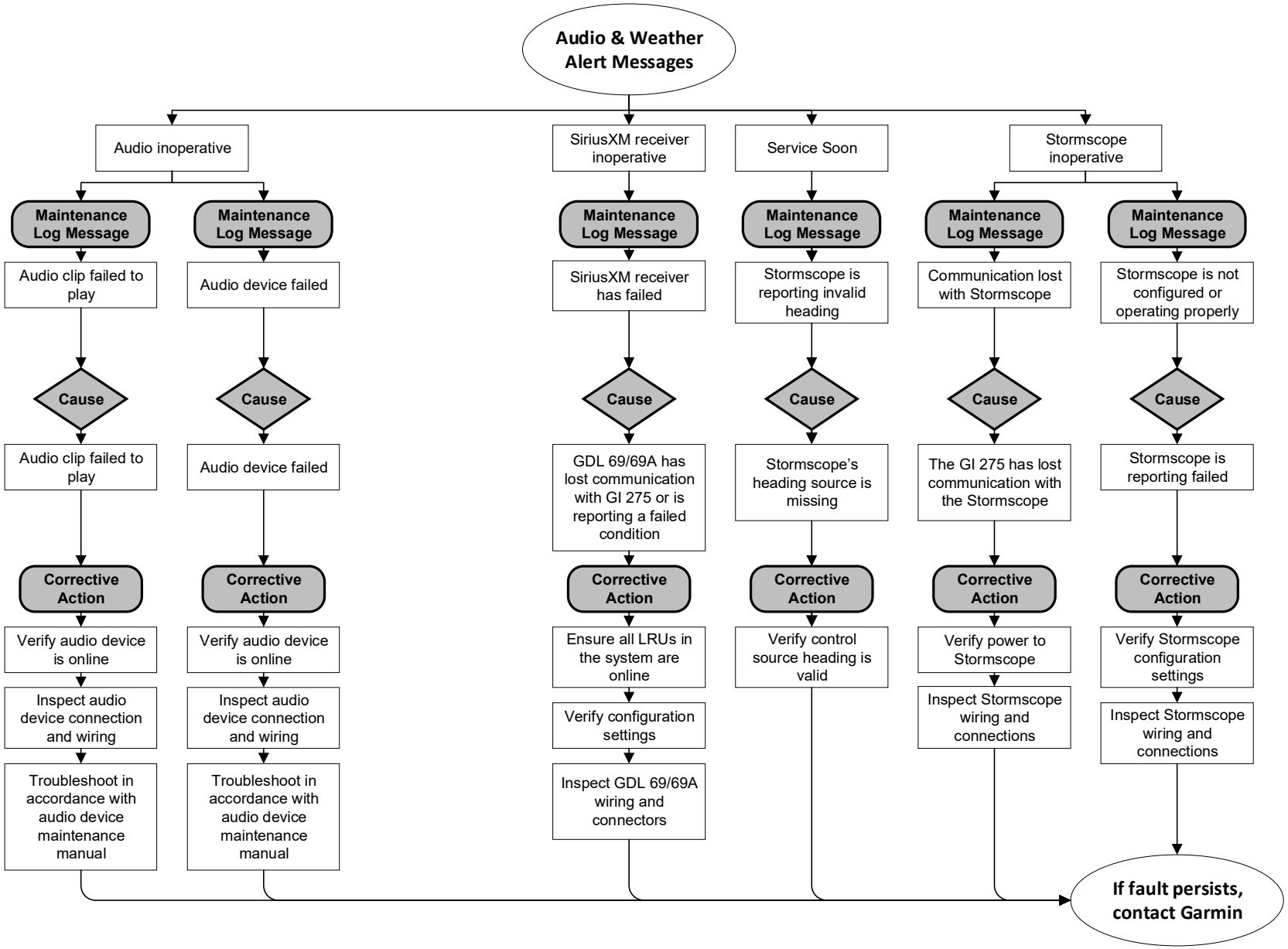



**Figure 4-21 Audio and Weather Alert Message Troubleshooting**

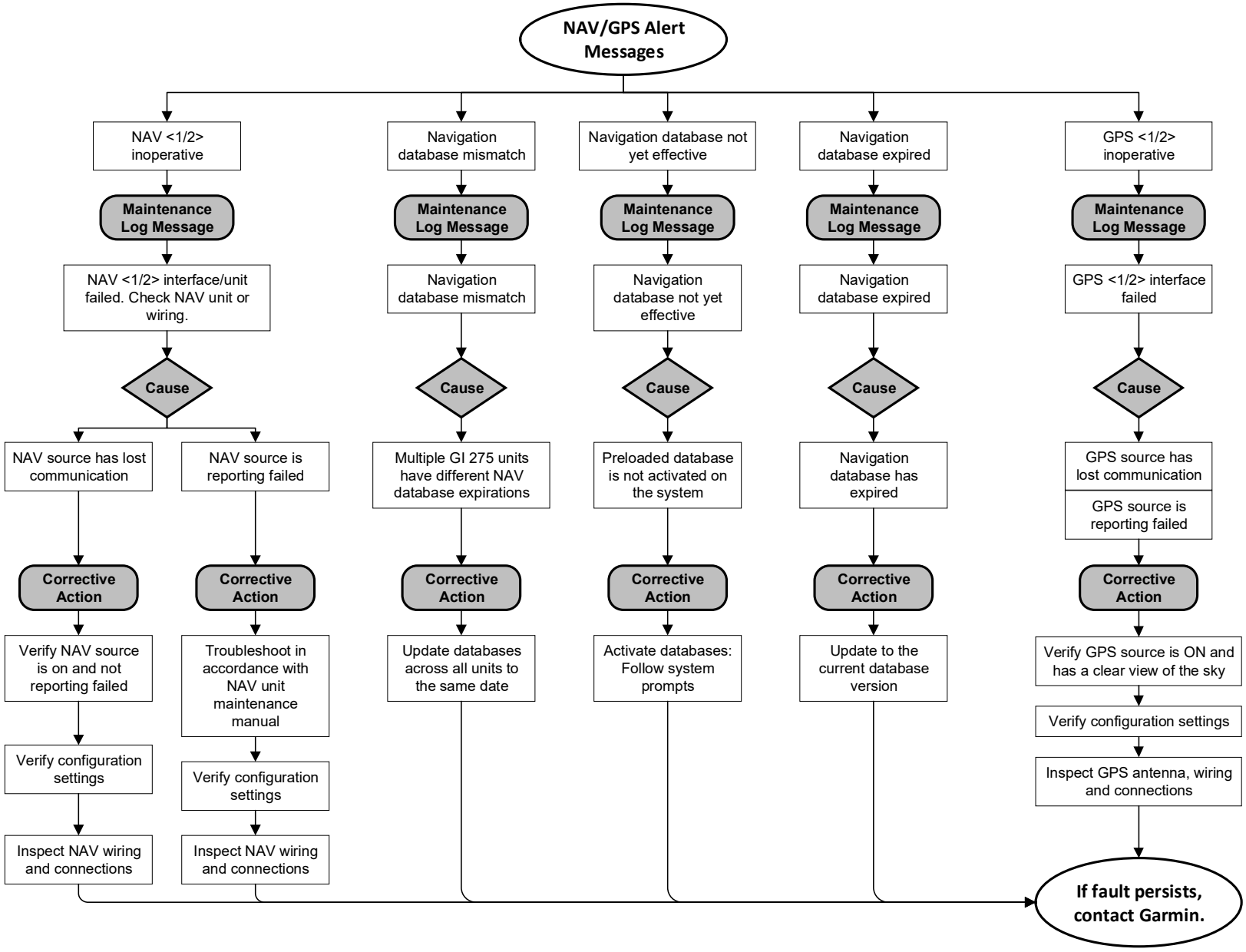



**Figure 4-22 NAV Alert Message Troubleshooting**

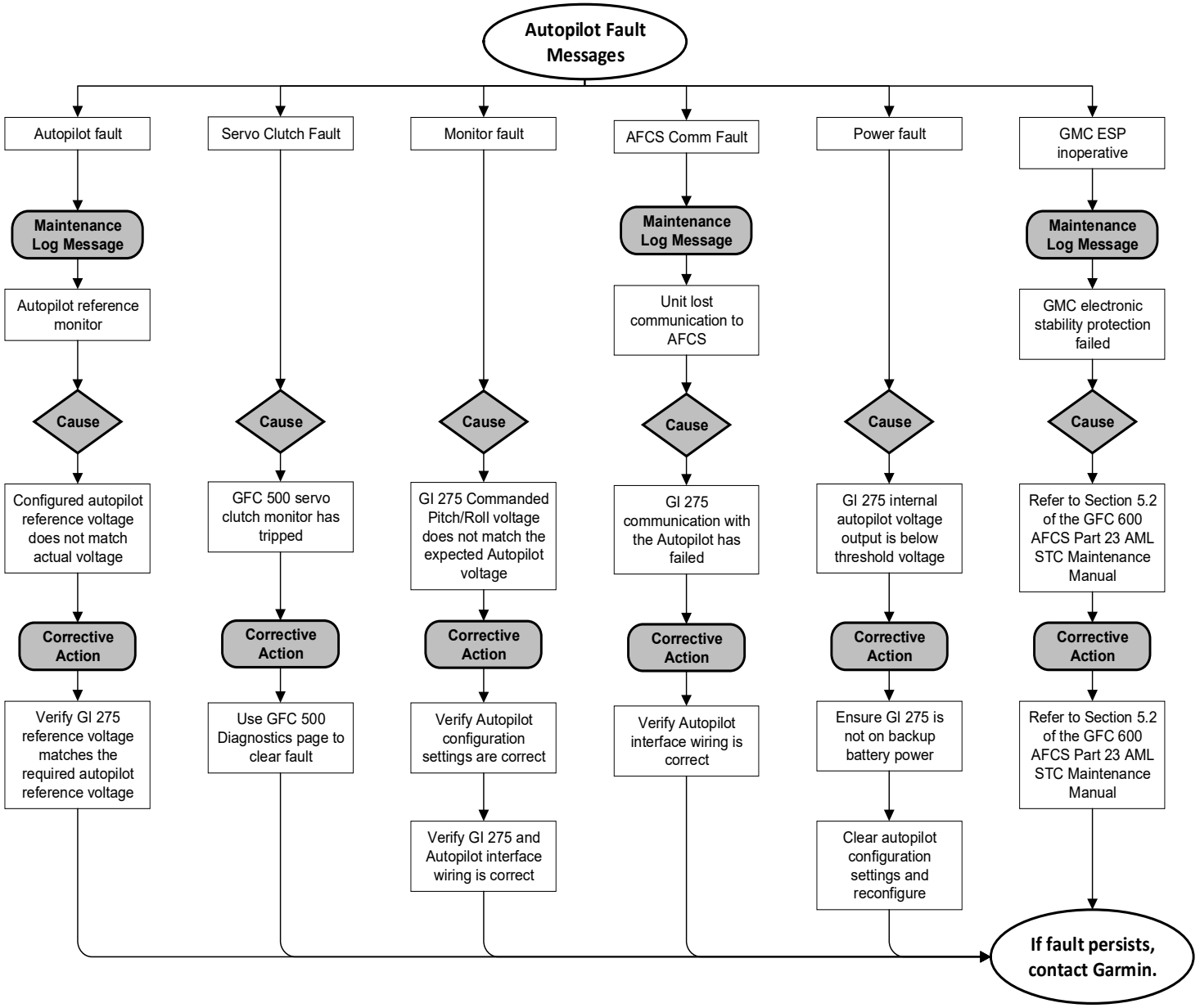



**Figure 4-23 Autopilot Alert Message Troubleshooting**

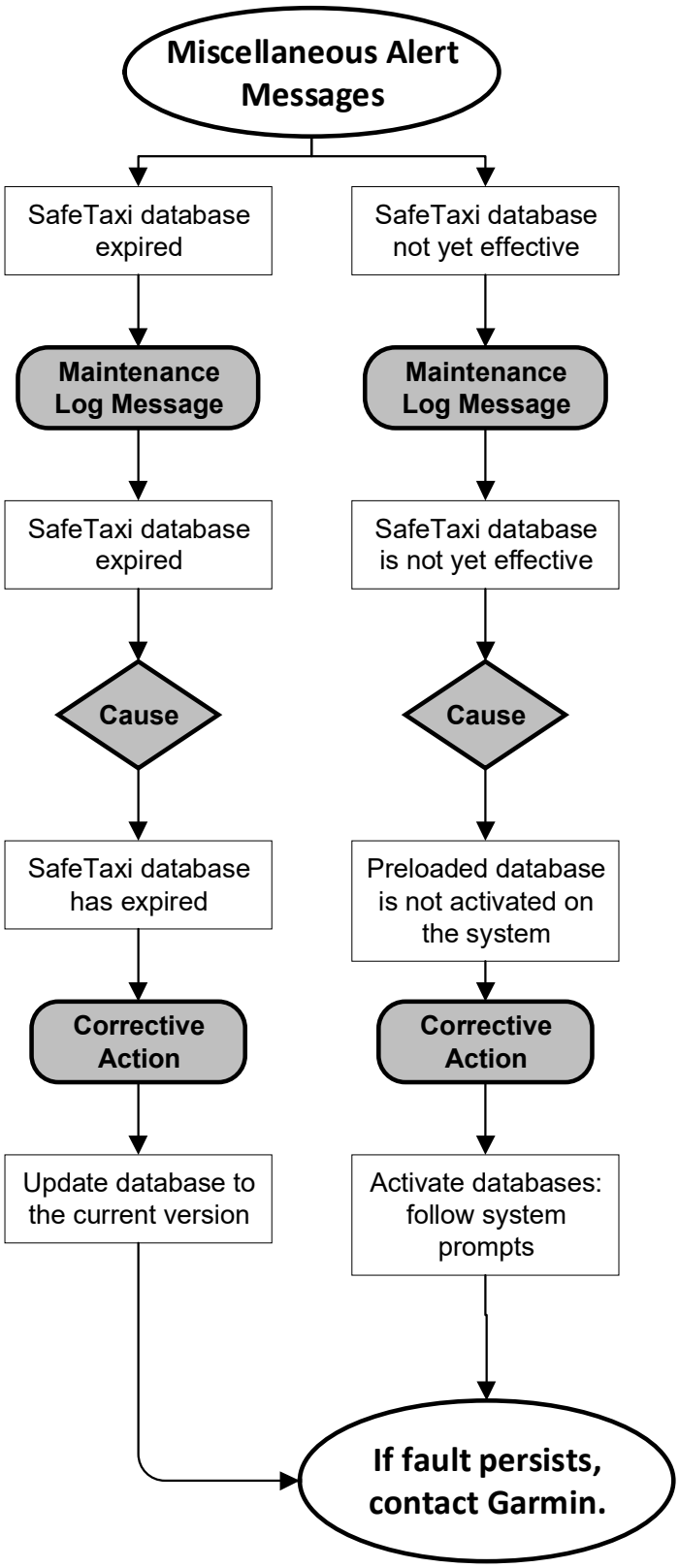



**Figure 4-24 Miscellaneous GI 275 Alert Messages**

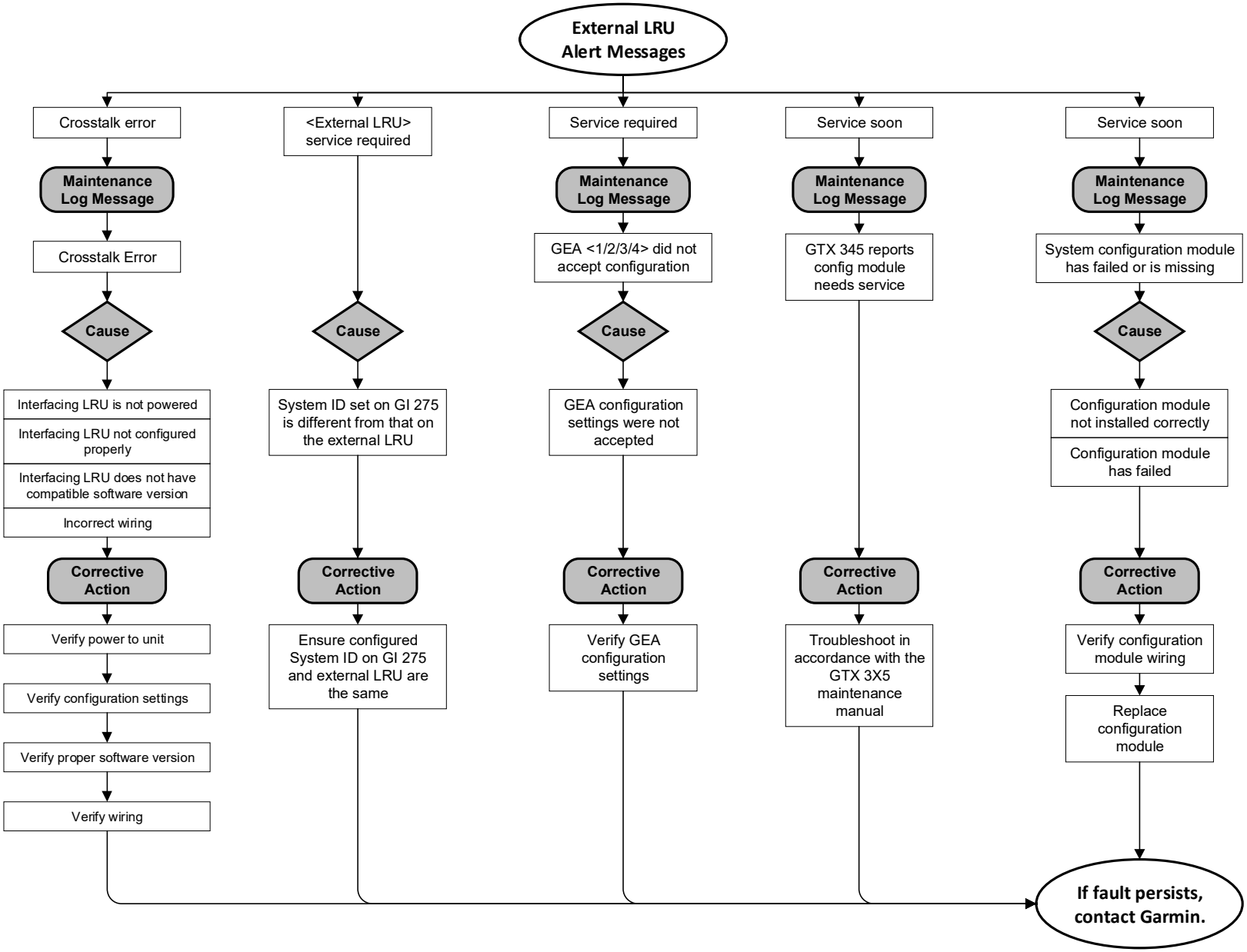
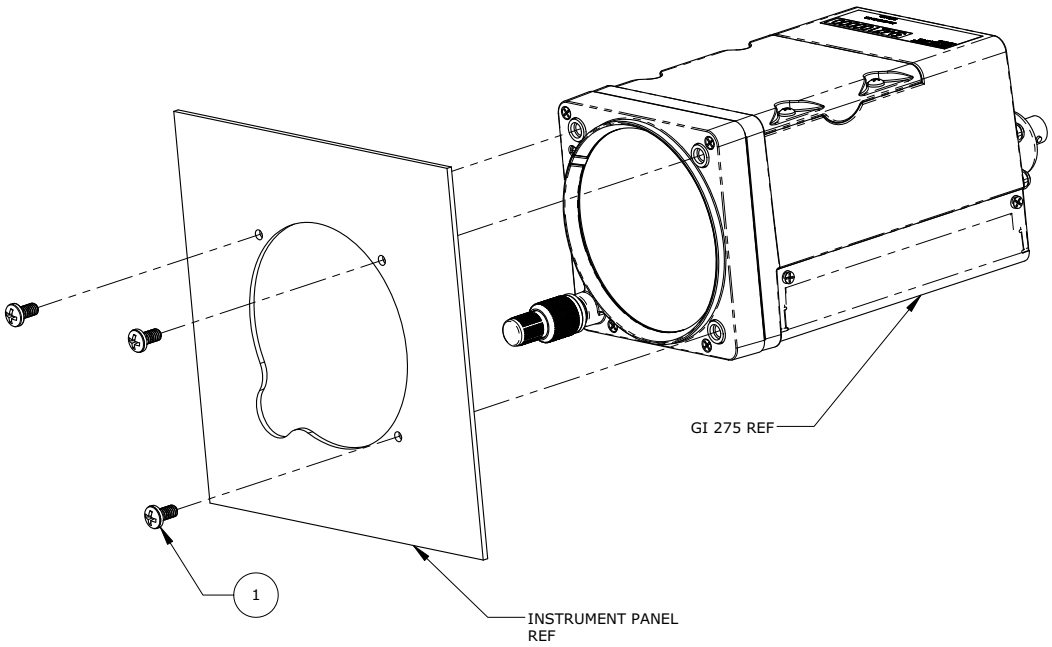



**Figure 4-25 External LRU Alert Message Troubleshooting**

# 5 EQUIPMENT MAINTENANCE AND CHECKOUT PROCEDURES

This section provides the procedures to remove, replace, and re-install required and optional LRUs that are part of the GI 275 system. Refer to Section 4.2 for the definition of connectors and pin functions for GI 275 system LRUs. Before performing any maintenance on the GI 275 system, all information in Appendix A must be filled out. It is highly recommended to save the system configuration to a USB drive and print the configuration log before replacing any system LRUs.

## 5.1 GI 275




| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 3 | MS35214-XX [1] [2] | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED, BRASS 0.164-32 UNC-24 |
| | | OR | |
| | | MS24693BB-XX [1] [2] | SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, CROSS-RECESSED, BRASS, #8-32 UNC-2A |

**Notes:**

[1] Screws can be substituted with any other suitable aerospace steel screws.

[2] Torque screws to 8.0 ± 1.0 in-lbf.

**Figure 5-1 GI 275 Installation**

### 5.1.1 GI 275 Removal

Remove the GI 275 using the following procedure:

1. Ensure the current configuration is saved to a USB drive in accordance with the instructions in Section 2.3.4.
2. Power off the GI 275 and remove power. If the GI 275 is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.

**NOTE**

*The remaining steps can be performed in any order, if more practical and convenient.*

3. Remove the three screws retaining the GI 275 in the instrument panel.
4. Loosen retaining screws and disconnect the backshell connector(s) from the back of the GI 275.
5. Remove the BNC connector, if installed.
6. Disconnect the pitot-static connections.

### 5.1.2 GI 275 Configuration Module Replacement

To replace a GI 275 configuration module, perform the following procedure. All item numbers in this procedure refer to Figure 5-2. If replacing the configuration module on the Master display, the System ID will change and must be updated on the associated flyGarmin.com account to re-enable purchased feature enablements on the system.

1. Save the current configuration in accordance with the instructions in Section 2.3.4.
2. Remove the GI 275 in accordance with Section 5.1.1.
3. Remove the backshell cover (**7**) from connector J2751 by removing the two screws (**8**).
4. Remove the screw (**10**) securing the configuration module (**1**) to the backshell (**6**).
5. Lift the configuration module (**1**) out of the backshell (**6**) and disconnect the wiring harness (**3**) from the module.
6. Inspect the wiring harness (**3**) and connector pins (**4**) for damage, loose wiring, or corrosion. Replace all deficient components if any of these conditions are found.
7. Connect the harness to the new configuration module.
8. Install the new configuration module in the connector backshell (**6**) and re-install the cover (**7**).
9. Re-install the GI 275 in accordance with Section 5.1.3.
10. If desired, import the saved configuration into the new configuration module using the procedure in Section 2.3.3.

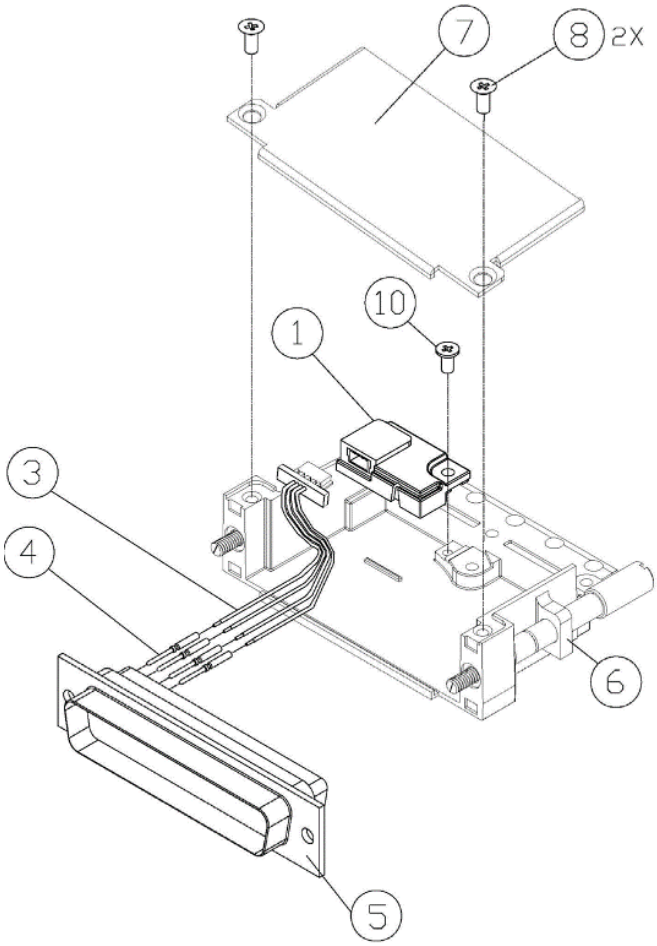



**Figure 5-2 Configuration Module Installation**

### 5.1.3 GI 275 Re-installation

To re-install the GI 275, perform the following procedure:

1. Place the GI 275 into the instrument panel cutout.
2. Install the three screws. Torque to specifications in Figure 5-1.

**NOTE**

*Steps 3 through 5 can be performed in any order, if more practical and convenient.*

3. If removed, seal the 1/8-27-NPT male thread fittings with MIL-S-15204 Sealing Compound (Type A or B) and connect the pitot-static lines to the unit.
4. Connect the backshell wiring connector(s) to the back of the GI 275 and tighten the retaining screws.
5. Connect the antenna BNC connector, if installed.
6. Perform Pitot-static System Leak Check per Section 5.15.2.5, if applicable.
7. Perform the Configuration mode ground checks in Section 5.15.1 and checkouts specified in Section 5.1.4.

### 5.1.4 GI 275 Checkout

Perform the following checkout procedures to return the aircraft to service after re-installation of a GI 275 unit:

- For all re-installed GI 275 units:
  - Verify the electrical bond is in accordance with Section 3.5
- For each re-installed GI 275 ADAHRS unit:
  - Perform the Pitch/Roll Offset per Section 5.13.1.3
  - Perform the Engine Vibration Check per Section 5.13.1.5
  - Perform the Magnetometer Calibration per Section 5.13.1.7
  - Perform the Pitot-Static and Airspeed Tape Settings Checks per Section 5.15.2
- For each re-installed GI 275 that is interfaced to the backup GPS antenna:
  - Perform the Backup GPS Signal Check per Section 5.15.4
- For each re-installed GI 275 that is interfaced to a GSB 15:
  - Perform the GSB 15 Connection Check per Section 5.15.5
- For each re-installed GI 275 that is interfaced to a GTP 59:
  - Perform the OAT Checks per Section 5.15.3

## 5.2 EIS Annunciator

### 5.2.1 EIS Annunciator Removal

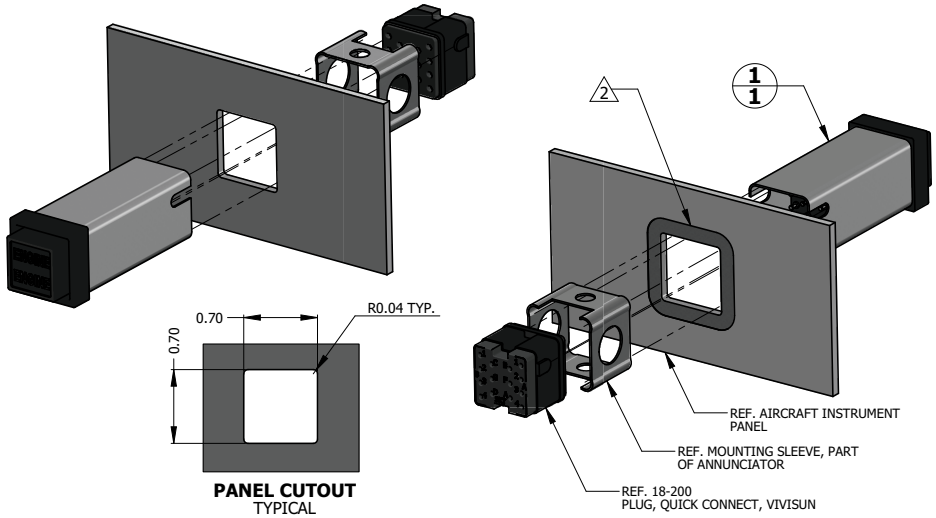
The Applied Avionics EIS caution and warning annunciator can be removed using the following procedure:

1. Using an Aerospace Optics cap extraction tool (P/N 17-150), locate the two extraction slots positioned on either side of the pushbutton cap.
2. Insert the tool into the extraction slots and pull the cap out from the module.

**NOTE**

*The cap will rotate 90° on two hinged slide retainer pins to allow access to the module mounting screws.*

3. Loosen the two small flat head module mounting screws located behind the pushbutton cap until the module can be removed from the housing.
4. Insert an Aerospace Optics connector extraction tool (P/N 18-234) into the slots at the top and bottom of the electrical connector.
5. Push to release the snap tabs in the switch housing and gently pull the connector out of the module.




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 95-40-17-B4-E1WPM | ANNUNCIATOR, 14 VDC INCANDESCENT, CAUTION AND WARNING, ENGINE INDICATION, AEROSPACE OPTICS |
| | | LED-40-17-BM-E1WPM | ANNUNCIATOR, 28 VDC LED, CAUTION AND WARNING, ENGINE INDICATION, AEROSPACE OPTICS |

**NOTES**

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. AREA IN DIRECT CONTACT WITH ANNUNCIATOR MOUNTING SLEEVE AT THE BACK SIDE OF INSTRUMENT PANEL MUST BE PREPARED FOR ELECTRICAL BOND TO ACHIEVE DIRECT CURRENT RESISTANCE LESS THAN OR EQUAL TO 10 MILLIOHMS AS MEASURED BETWEEN ANNUNCIATOR BODY AND AIRCRAFT INSTRUMENT PANEL WITH CONNECTOR DISCONNECTED.

**Figure 5-3 EIS Caution and Warning Annunciator Installation**

### 5.2.2 EIS Annunciator Re-installation

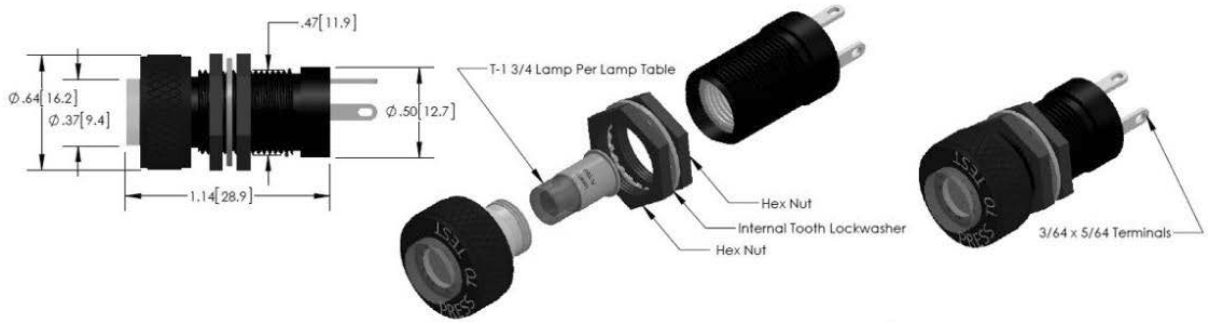
Re-installation of the annunciator is accomplished using the following procedure:

1. Orient the keyed electrical connector to the module and press together until locked.
2. Orient the annunciator for proper viewing and gently slide the module into the housing until seated.
3. Tighten the mounting screws until the module is fully seated in the housing.
4. Rotate the cap back into position on the module and gently press until secured.

### 5.2.3 Separate EIS Annunciator Removal

The Mil-Spec EIS annunciators can be removed using the following procedure:

1. Remove the lens holder from the indicator.
2. Remove the lamp from the lens holder.
3. Remove the MS25041 assembly.




| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | MS25041-4-327 | ANNUNCIATOR, YELLOW, PRESS TO TEST FOR 28V AIRCRAFT |
| 2 | 1 | MS25041-2-327 | ANNUNCIATOR, RED, PRESS TO TEST FOR 28V AIRCRAFT |
| 3 | 1 | MS25041-4-330 | ANNUNCIATOR, YELLOW, PRESS TO TEST FOR 14V AIRCRAFT |
| 4 | 1 | MS25041-2-330 | ANNUNCIATOR, RED, PRESS TO TEST FOR 14V AIRCRAFT |

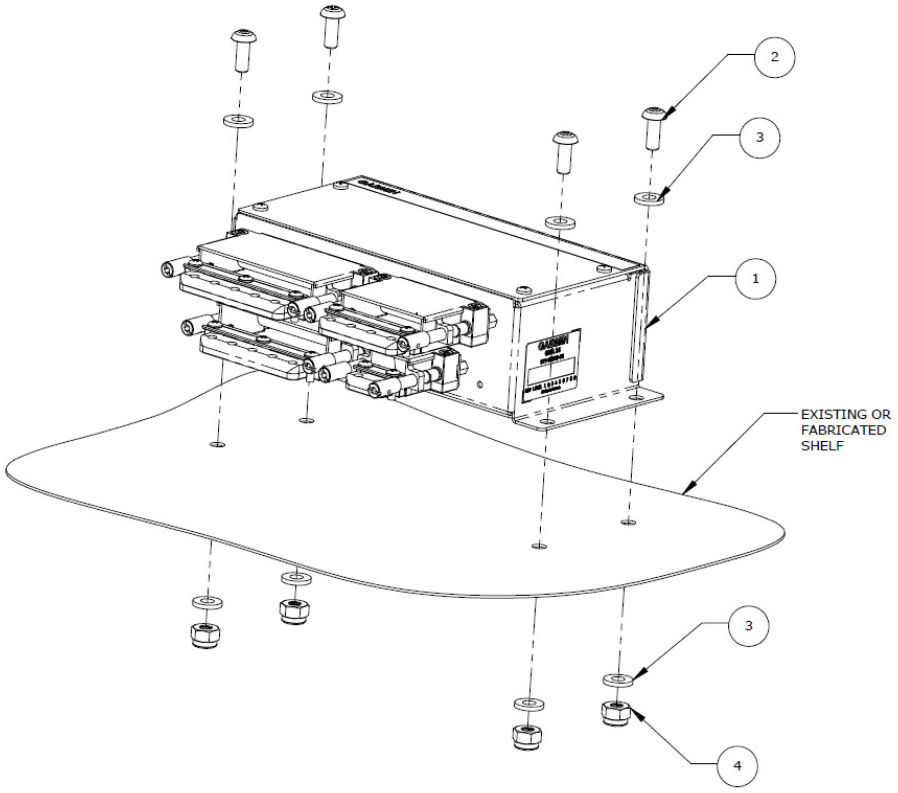
**Figure 5-4 Separate EIS Annunciator Installation**

### 5.2.4 Separate EIS Annunciator Re-installation

Re-installation of the annunciators is accomplished using the following procedure:

1. Insert the MS25041 assembly without lens holder from the forward side of the panel and secure.
2. Install lamp on the lens holder.
3. Install and secure lens holder on the indicator.

## 5.3 GEA 24/GEA 24B




| ITEM | QTY | PART NUMBER | DESCRIPTION | |
|---|---|---|---|---|
| 1 | 1 | 011-02848-01 | GEA 24 REMOTE MOUNTED ENGINE INTERFACE UNIT | OR |
| | | 011-05991-01 | GEA 24B REMOTE MOUNTED ENGINE INTERFACE UNIT | |
| 2 | 4 | MS35207-XX [1] [2] | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED, CARBON STEEL, CADMIUM PLATED, #10-32 UNF-2A | |
| 3 | 8 | NAS1149F0363P | WASHER | |
| 4 | 4 | MS21044N3 [3] | NUT SELF-LOCKING, HEXAGON REGULAR HEIGHT, 250°F, CADMIUM PLATED, STEEL, #10-32 | |

**Notes:**

[1] Screws can be substituted by any other suitable aerospace steel screws.

[2] Torque 0.190-32 UNF-2A screws 13.5 ± 1.0 in-lbf.

[3] Nut can be substituted by any suitable aerospace steel self-locking nuts or nutplates.

**Figure 5-5 Example GEA 24/GEA 24B Installation**

### 5.3.1 GEA 24/GEA 24B Removal

To remove the GEA 24(B), perform the following procedure:

1. Remove power from the GEA 24(B). If the GEA is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.
2. Disconnect the four electrical connectors.
3. Remove the four screws.

### 5.3.2 GEA 24/GEA 24B Re-installation

To re-install the GEA 24(B), perform the removal procedures in reverse. Recalibration of the fuel quantity gauges is required if a GEA 24 was replaced by a GEA 24B, or if a GEA 24B is replaced by a GEA 24.

If the GEA 24(B) was replaced, the sensor configurations must be loaded to the new unit using the following procedure:

1. Power on the GI 275 that is directly interfaced to the GEA 24(B) into Configuration mode.
2. Insert the USB drive containing the saved configuration into the USB dongle or GSB 15. A USB icon should appear in the bottom-left of the display once the GI 275 has recognized the device. If the icon doesn't appear after 1 minute, remove the drive and re-insert it.
3. Touch the **SW/Config** button, then the **Config Options** button.
4. Touch the **Import Configuration** button.
5. Touch the **Select Files** button and select the appropriate aircraft configuration file.
6. Touch the **Select Configuration** button.
7. Touch the **EIS Sensor Config** button to select it. Touch the **Back** button.
8. Touch the **Import Config** button and then the **Start** button.
9. A restart is required to complete import. Touch the **Restart Now** button.

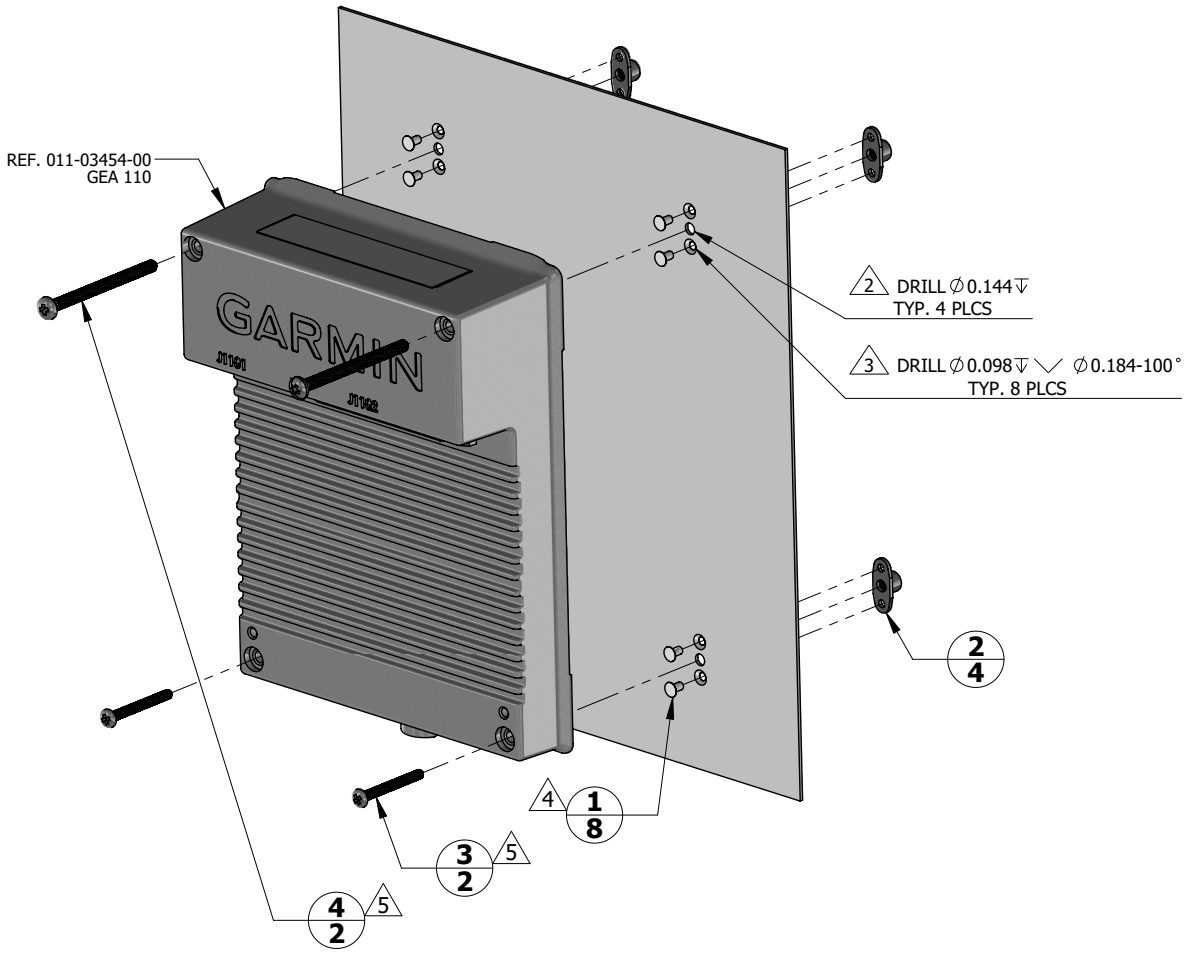
### 5.3.3 GEA 24/GEA 24B Checkout

Perform the Configuration Mode Ground Checks described in Section 5.15.1. If the GEA 24(B) does not pass the checks in this step, reload the sensor configurations using the procedure in Section 5.3.2 and perform the checkout procedure again.

If a GEA 24(B) was replaced or did not initially pass the checkout procedure, perform the EIS Ground Checks described in Section 5.15.6.

If a GEA 24 was replaced by a GEA 24B, or a GEA 24B was replaced by a GEA 24, the Fuel Quantity Calibration must be performed again using the procedure in Section 5.13.6.

## 5.4 GEA 110




| QTY. | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 2 | 4 | MS35206-237 | SCREW, MACHINE, PAN HEAD, CROSS RECESSED, CAD PLATED .1380- 32 UNC-2A, 1.750 IN LONG |
| 2 | 3 | MS35206-234 | SCREW, MACHINE, PAN HEAD, CROSS RECESSED, CAD PLATED .1380- 32 UNC-2A, 1.000 IN LONG |
| 4 | 2 | MS21069L06 | NUT, SELF-LOCKING, PLATE, TWO-LUG, REDUCED RIVET SPACING, LOW HEIGHT, STEEL .138-32 UNJC-3B |
| 8 | 1 | MS20426AD3-3 | RIVET, SOLID, COUNTERSUNK 100 DEG, PRECISION HEAD, 3/32 IN OD, 3/16 IN LONG |

**NOTES**

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

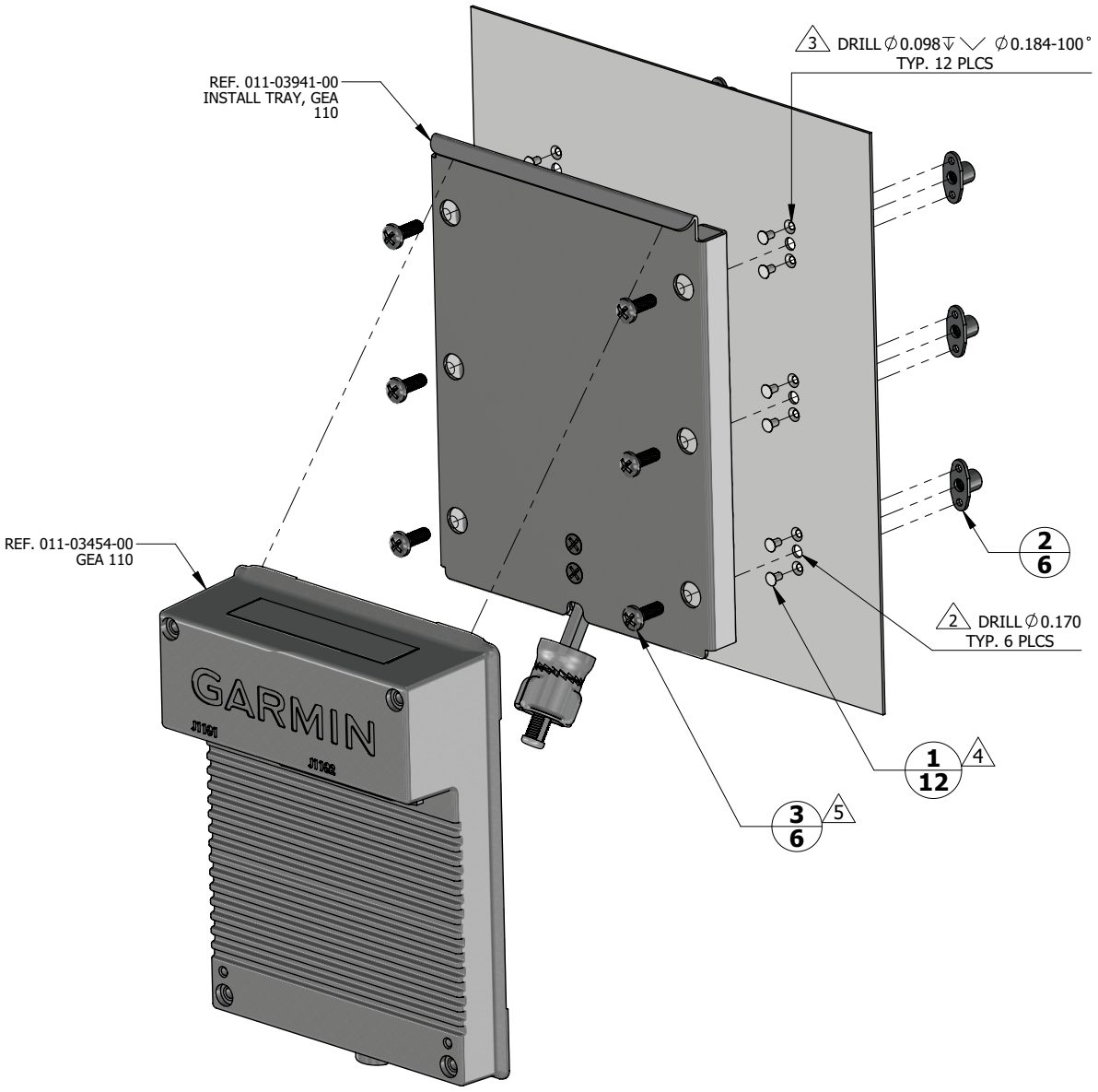
2 FASTENER HOLES ARE LOCATED TO MATCH GEA 110.

3 FASTENER HOLES ARE LOCATED TO MATCH NUTPLATE ITEM 2.

4 RIVETS ARE INSTALLED PER MIL-R-47196 (NASM47196) RIVET, BUCK TYPE, *PREPARATION FOR AND INSTALLATION,* OR PER MIL-STD-403 *PREPARATION FOR AND INSTALLATION OF RIVETS AND SCREWS, ROCKET MISSILE, AND AIRFRAME STRUCTURES.*

5 TORQUE .1380-32 UNC-2A SCREWS 8.0 ±1.0 LBF-IN.

**Figure 5-6 GEA 110 Installation (Mounted Directly to Airframe Example)**




| QTY. | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 6 | 3 | MS27039-0807 | SCREW, MACHINE, PAN HEAD, STRUCTURAL, CROSS RECESSED .1640-32 UNC-3A, 0.469 IN |
| 6 | 2 | MS21069L08 | NUT, SELF-LOCKING, PLATE, TWO-LUG, REDUCED RIVET SPACING, LOW HEIGHT, STEEL .164-32 UNJC-3B |
| 12 | 1 | MS20426AD3-3 | RIVET, SOLID, COUNTERSUNK 100 DEG, PRECISION HEAD, 3/32 IN OD, 3/16 IN LONG |

**NOTES**

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

△2 FASTENER HOLES ARE LOCATED TO MATCH GEA 110 INSTALL TRAY.

△3 FASTENER HOLES ARE LOCATED TO MATCH NUTPLATE ITEM 2.

△4 RIVETS ARE INSTALLED PER MIL-R-47196 (NASM47196) RIVET, BUCK TYPE, *PREPARATION FOR AND INSTALLATION,* OR PER MIL-STD-403 *PREPARATION FOR AND INSTALLATION OF RIVETS AND SCREWS, ROCKET MISSILE, AND AIRFRAME STRUCTURES.*

△5 TORQUE .1640-32 UNC-2A SCREWS 13.5 ±1.5 LBF-IN.

**Figure 5-7 GEA 110 Installation (Mounted on a Tray Example)**

### 5.4.1 GEA 110 Removal

To remove the GEA 110, perform the following procedure:

1. Remove power from the GEA 110. If the GEA is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.
2. Disconnect the two electrical connectors.
3. If the unit is mounted on a tray, as shown in Figure 5-7, pull out on the mounting knob and turn counterclockwise to loosen it enough to rotate the arm down and away from the unit.
4. If the unit is mounted to the airframe using screws, as shown in Figure 5-6, loosen the four screws securing the unit to the airframe.

### 5.4.2 GEA 110 Re-installation

To re-install the GEA 110, perform the removal procedures in reverse. If the unit is mounted to the airframe, torque the screws to the specification in Figure 5-6. For units that are mounted in a mounting tray, tighten the mounting screw by hand until the unit is secure.

If the GEA 110 was replaced, the sensor configurations must be loaded to the new unit using the following procedure:

1. Power on the GI 275 that is directly interfaced to the GEA 110 into Configuration mode.
2. Insert the USB drive containing the saved configuration into the USB dongle or GSB 15. A USB icon should appear in the bottom-left of the display once the GI 275 has recognized the device. If the icon doesn't appear after 1 minute, remove the drive and re-insert it.
3. Touch the **SW/Config** button, then the **Config Options** button.
4. Touch the **Import Configuration** button.
5. Touch the **Select Files** button and select the appropriate aircraft configuration file.
6. Touch the **Select Configuration** button.
7. Touch the **EIS Sensor Config** button to select it. Touch the **Back** button.
8. Touch the **Import Config** button and then the **Start** button.
9. A restart is required to complete import. Touch the **Restart Now** button.

### 5.4.3 GEA 110 Checkout

Perform the Configuration Mode Ground Checks described in Section 5.15.1. If the GEA 110 does not pass the checks in this step, reload the sensor configurations using the procedure in Section 5.4.2 and perform the checkout procedure again.

If the GEA 110 was replaced or did not initially pass the checkout procedure, perform the EIS Ground Checks described in Section 5.15.6.

## 5.5 Backup Battery

### 5.5.1 Backup Battery Periodic Maintenance

For maximum battery longevity, store within a temperature range of -4°F to 68°F (-20°C to 20°C). The GI 275 battery should be kept partially charged when unused for longer periods of time and should not be stored when completely discharged. Charge the battery to 30% within 1 year of receipt and recharge to 30% every 2 years thereafter if the GI 275 is not in use.

### 5.5.2 Backup Battery Removal

1. Remove the GI 275 in accordance with Section 5.1.1.
2. Remove the four screws securing the battery cover to the top of the GI 275 and remove it.
3. Remove the battery by pulling the battery pack straight up until it is unseated from the connector.

### 5.5.3 Backup Battery Re-installation

**CAUTION**

*Prior to installation of a new battery or re-installation of the existing battery, visually inspect the battery for physical damage, swelling, or signs of leakage or burning. If damage is found, properly discard the battery immediately and install a new battery (P/N 011-04528-00).*

**CAUTION**

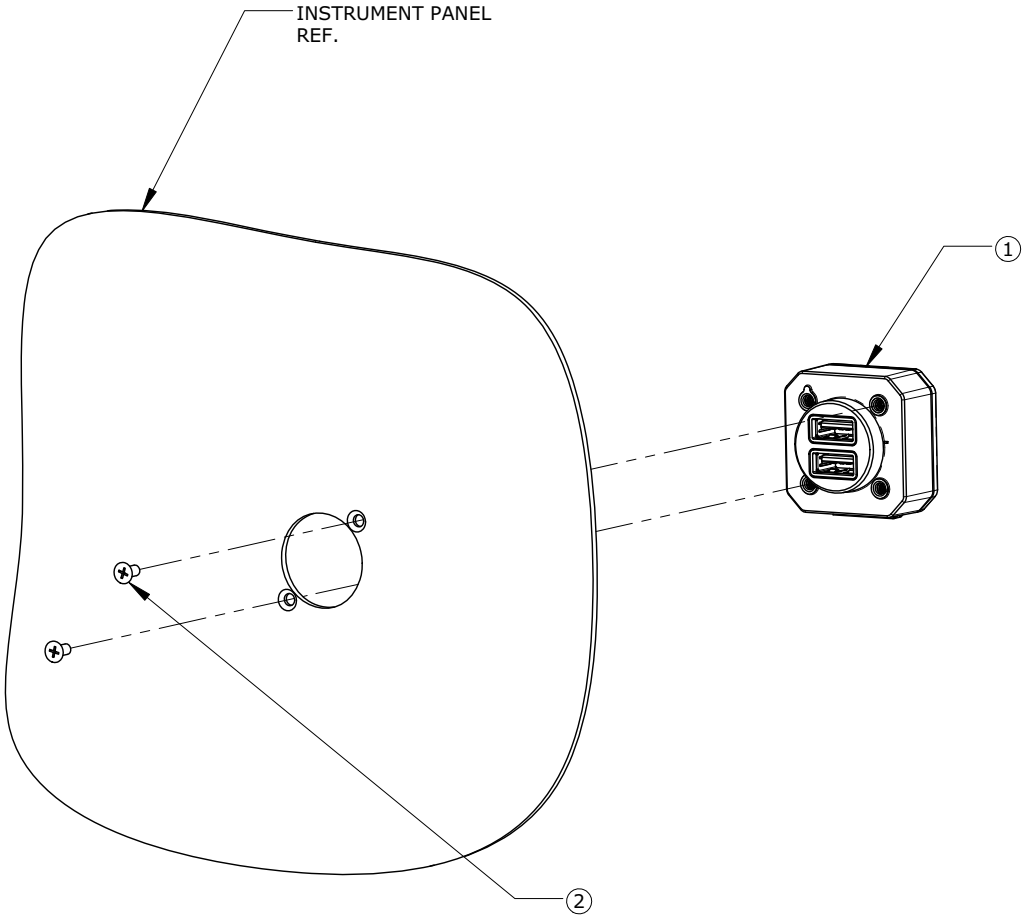
*Use care when handling the backup battery. Installation of the battery in the GI 275 requires the two included end caps to be placed on each end of the battery. The battery leads are conductive. Care should be taken to ensure the battery contacts do not touch surfaces that would result in arching and potentially damage to the cells. The installer must use care when handling and storing the backup battery. Do not install batteries that have been dropped or damaged during handling.*

1. Lower the battery with the rubber end caps onto the GI 275 connector. Ensure proper alignment and push down to seat the connector.
2. The unit will automatically power on. Power off the unit.
3. Re-install the battery access panel and the four panel screws. Torque screws 6 to 8 in-lbf.
4. Re-install the GI 275 in accordance with Section 5.1.3. If not replacing the GI 275 unit, GI 275 checkout procedures do not need to be completed.

### 5.5.4 Backup Battery Checkout

1. Perform an LRU Status Check as described in Section 5.15.1.1 to ensure the battery is connected properly.
2. If the battery was replaced, perform the Backup Battery Check as described in Section 5.13.5.

## 5.6 GSB 15



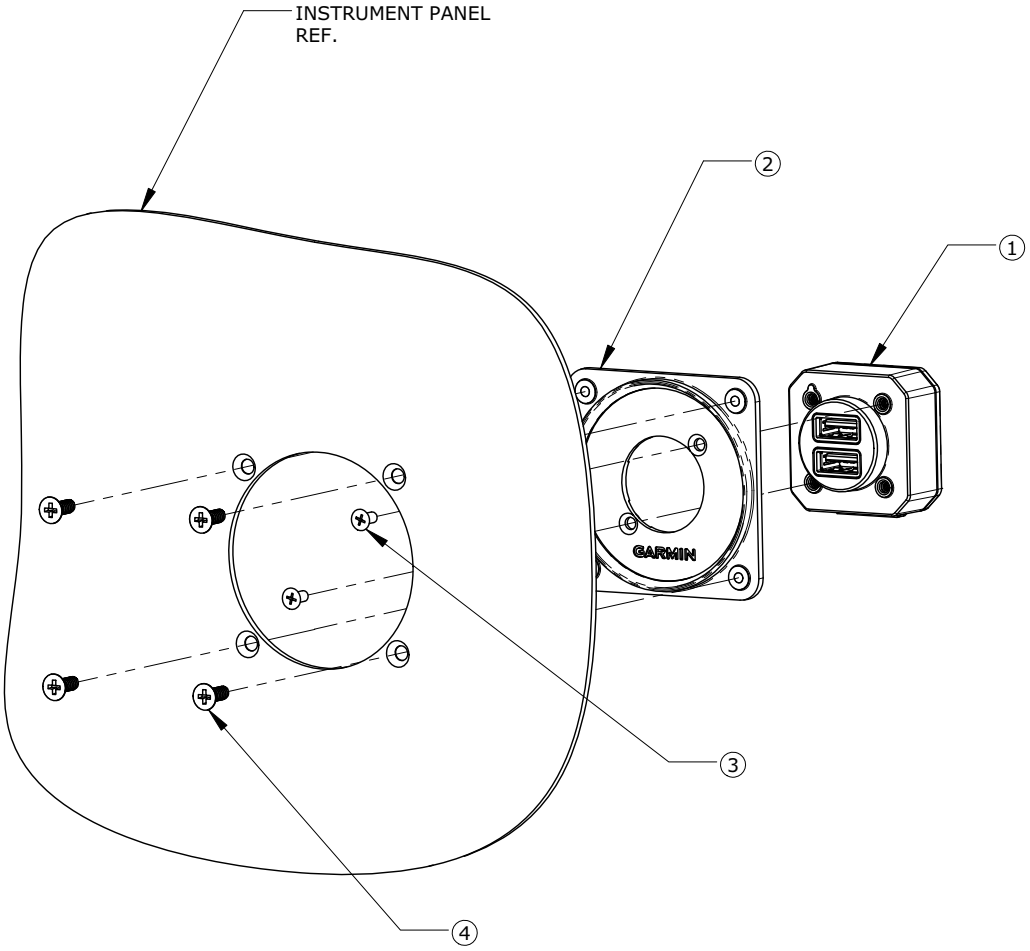

| ITEM | QTY | PART NUMBER | DESCRIPTION | |
|---|---|---|---|---|
| 1 | 1 | 010-02201-00, -20, -40 | GSB 15, REAR, UNIT | OR |
| | | 010-02201-01, -30, -50 | GSB 15, SIDE, UNIT | |
| 2 | 2 | MS35214-XX [1] [2] | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED, BRASS, 0.112-40 UNC-2A | OR |
| | | MS24693-XX [1] [2] | SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, CROSS-RECESSED, BRASS, #4-40 UNC-2A | |

**Notes:**

[1] Screws can be substituted by any other suitable pan head or countersink #4-40 UNC-2A aerospace steel screws.

[2] Torque 0.112-40 UNC-2A screws to 5.0 ± 1.0 in-lbf.

**Figure 5-8 GSB 15 Cutout Installation**




| ITEM | QTY | PART NUMBER | DESCRIPTION | |
|---|---|---|---|---|
| 1 | 1 | 010-02201-00, -20, -40 | GSB 15, REAR, UNIT | OR |
| | | 010-02201-01, -30, -50 | GSB 15, SIDE, UNIT | |
| 2 | 1 | 011-05043-00 | SUB-ASSY, MOUNTING KIT, 2.25”, GSB 15 | |
| 3 | 2 | MS24693BB-XX [1] [2] | SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°P, CROSS-RECESSED, BRASS, #4-40 UNC-2A | |
| 4 | 4 | MS35214-XX [1] [3] | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED, BRASS, 0.138-32 UNC-2A | OR |
| | | MS24693BB-XX [1] [3] | SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°P, CROSS-RECESSED, BRASS, #6-32 UNC 2-A | |

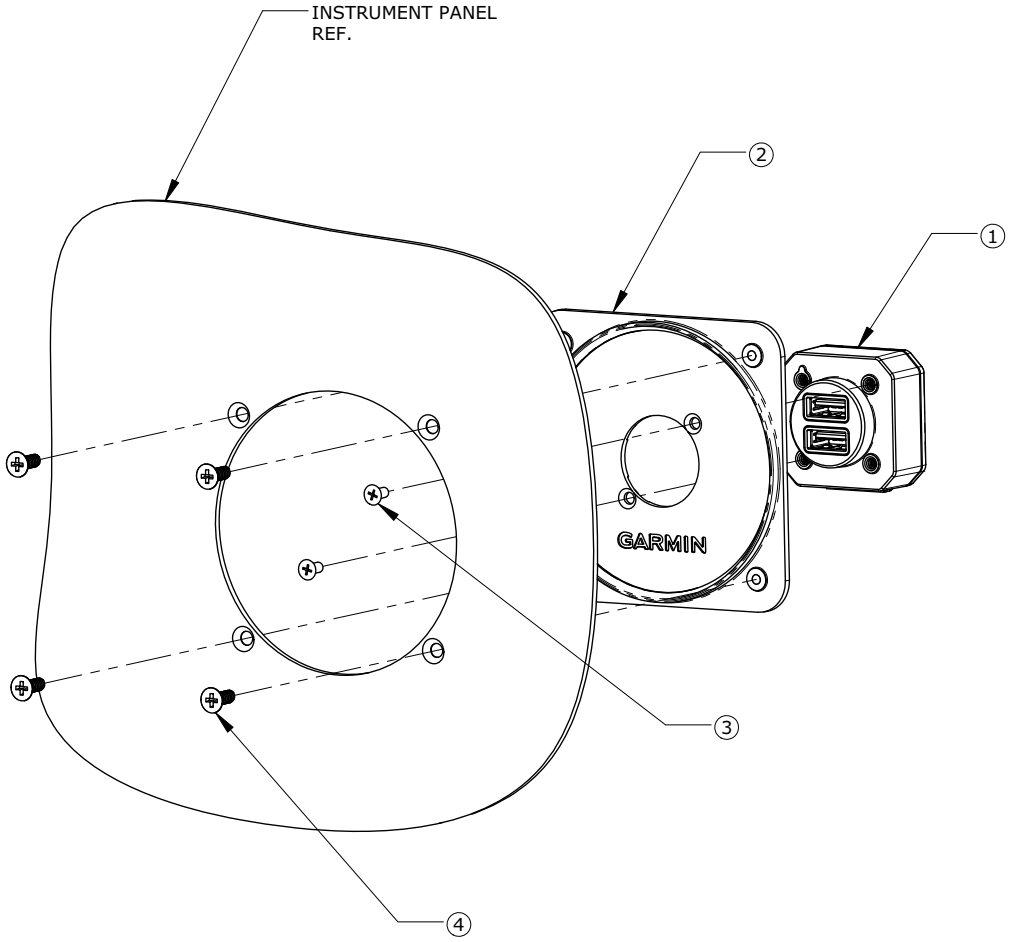
**Notes:**

[1] Screws can be substituted by any other suitable aerospace steel screws.

[2] Torque 0.112-40 UNC-2A screws to 5.0 ± 1.0 in-lbf.

[3] Torque 0.138-32 UNC-2A screws to 8.0 ± 1.0 in-lbf.

**Figure 5-9 GSB 15 Installation with Mounting Kit (2.25-Inch Cutout)**




| ITEM | QTY | PART NUMBER | DESCRIPTION | |
|---|---|---|---|---|
| 1 | 1 | 010-02201-00, -20, -40 | GSB 15, REAR, UNIT | OR |
| | | 010-02201-01, -30, -50 | GSB 15, SIDE, UNIT | |
| 2 | 1 | 011-05043-01 | SUB-ASSY, MOUNTING KIT, 3.125”, GSB 15 | |
| 3 | 2 | MS24693BB-XX [1] [2] | SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°, CROSS-RECESSED, BRASS, #4-40 UNC-2A | |
| 4 | 4 | MS35214-XX [1] [3] | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED BRASS, 0.138-32 UNC-2A | OR |
| | | MS24693BB-XX [1] [3] | SCREW, MACHINE, FLAT COUNTERSUNK HEAD, 100°P, CROSS-RECESSED, #6-32 UNC-2A | |

**Notes:**

[1] Screws can be substituted by any other suitable aerospace steel screws.

[2] Torque 0.112-40 UNC-2A screws to 5.0 ± 1.0 in-lbf.

[3] Torque 0.138-32 UNC-2A screws to 8.0 ± 1.0 in-lbf.

**Figure 5-10 GSB 15 Installation with Mounting Kit (3.125-Inch Cutout)**

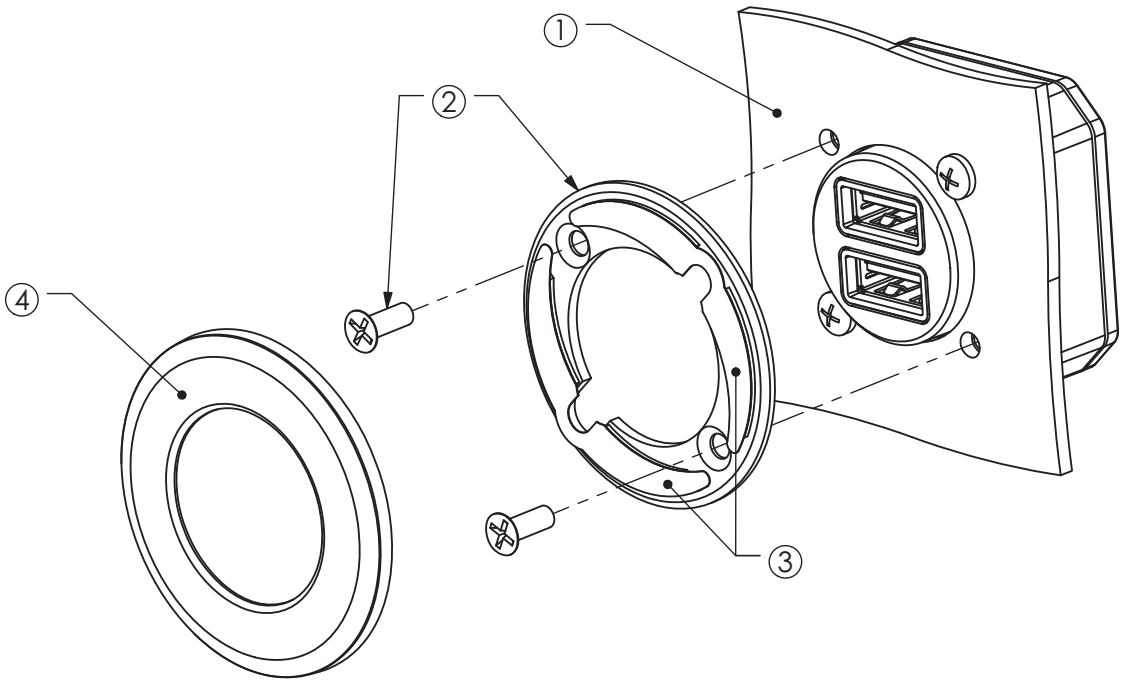



**Figure 5-11 GSB 15 Decorative Cover Installation**

### 5.6.1 GSB 15 Removal

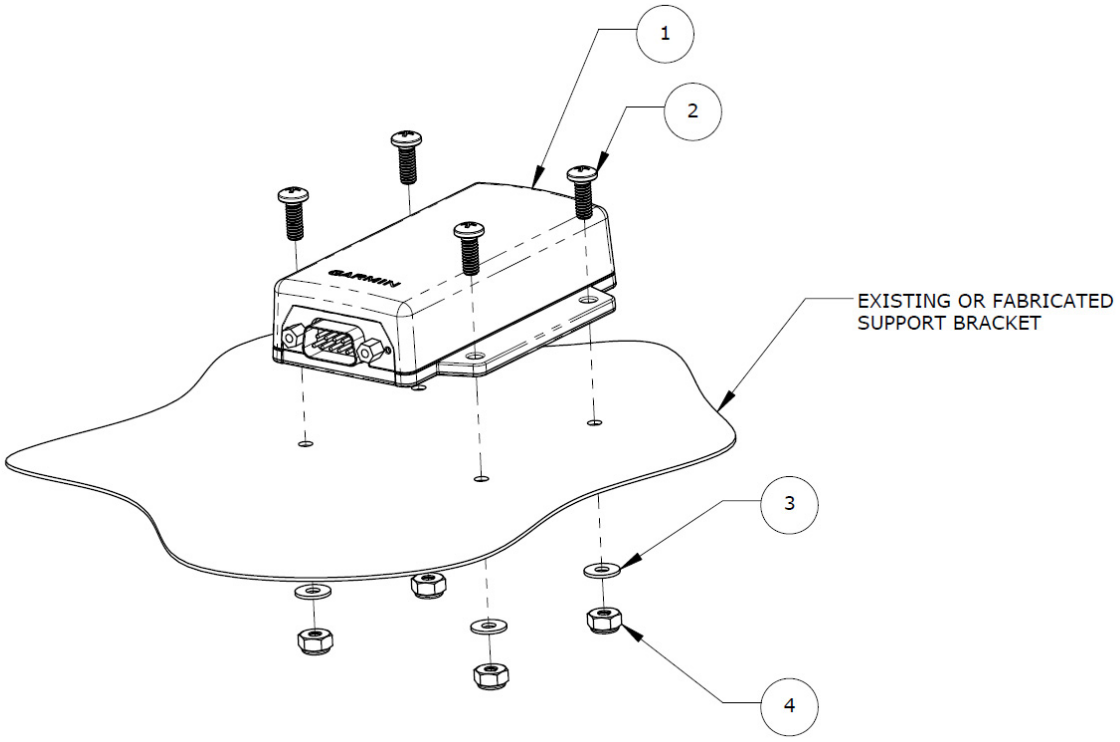
To remove the GSB 15, perform the following procedure:

1. Disconnect the GSB 15 connector.
2. If installed with a mounting kit, remove the four screws securing the mounting plate to the instrument panel (refer to Figure 5-9 or Figure 5-10). If installed with a decorative cover, remove the cosmetic piece from the intermediate piece by using the pry tab and then unscrew the screws out of the intermediate piece to remove.
3. Remove the two screws securing the GSB 15 to the instrument panel/mounting plate/mounting surface.

### 5.6.2 GSB 15 Re-installation

To re-install the GSB 15, perform the removal procedure in reverse. Torque all screws in accordance with Figure 5-8, Figure 5-9, or Figure 5-10. Torque decorative cover screws 4-6 in-lbf.

## 5.7 GMU 11




| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 011-04349-01 | GMU 11 MAGNETOMETER UNIT |
| 2 | 4 | MS51957-XX [1] [2] | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED CORROSION RESISTANT STEEL, 0.138-32 UNC-2A |
| 3 | 4 | NAS1149CN632R | WASHER |
| 4 | 4 | MS21044C06 [3] | NUT SELF-LOCKING, HEXAGON REGULAR HEIGHT, 250°F, 125 KSI Ftu AND 60 KSI Ftu |

**Notes:**

[1] MS5195 screws can be substituted by any other equivalent aerospace steel screws.

[2] Torque 0.138-32 UNC-2A screws 8.0 ± 1.0 in-lbf.

[3] Nuts can be substituted by any other equivalent aerospace steel nutplates.

**Figure 5-12 Example GMU 11 Installation**

**NOTE**

*Removal, re-installation, or replacement of the GMU 11 will require a recalibration of the AHRS. Additionally, any removal or addition of electrical components or ferrous materials within 10 feet of the GMU 11 will require recalibration of the AHRS.*

### 5.7.1 GMU 11 Removal

To remove the GMU 11, perform the following procedure:

1. Remove power from the GI 275 directly connected to the GMU 11. If the GI 275 is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.
2. Disconnect the GMU 11 connector.
3. Remove the four screws securing the GMU 11 (refer to Figure 5-12).

### 5.7.2 GMU 11 Re-installation

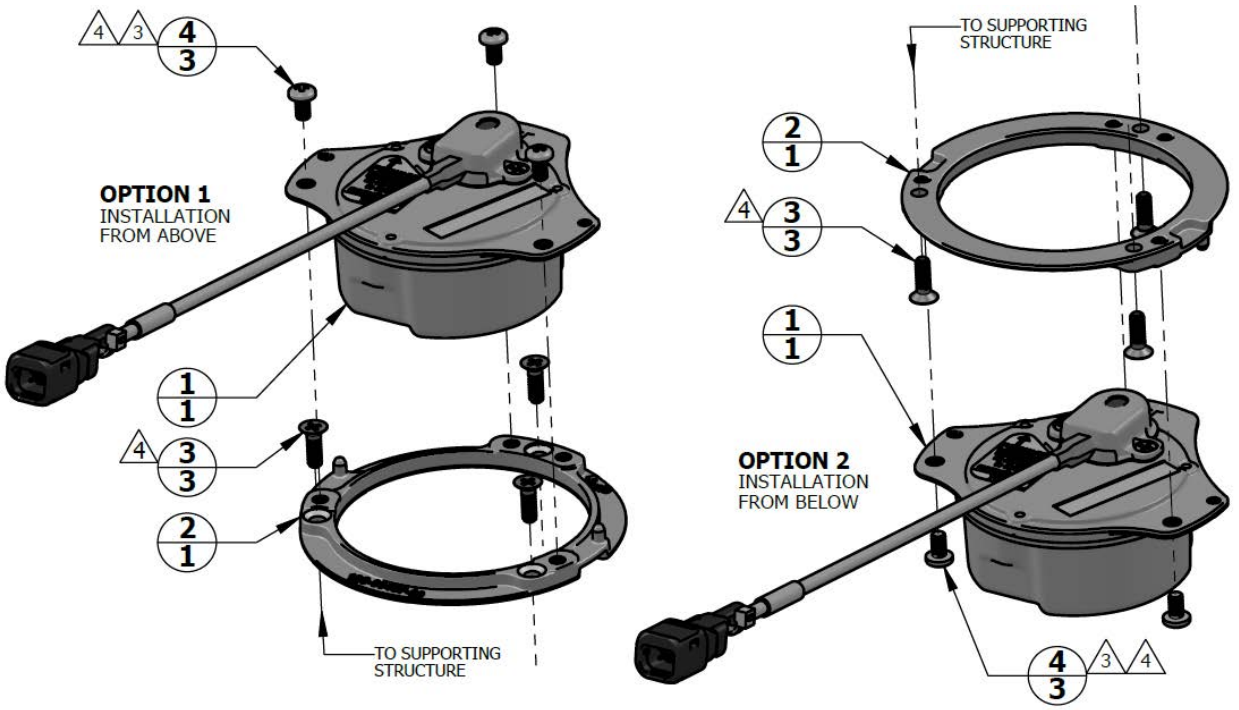
To re-install the GMU 11, perform the removal procedure in reverse. Torque the screws to 8.0 ± 1.0 in-lbf. Perform the checkout procedure in Section 5.7.3.

### 5.7.3 GMU 11 Checkout

Perform the following AHRS ground checks in Section 5.13.1 to return the aircraft to service:

- Magnetometer Calibration
- Compass Swing
- Heading Offset Compensation (if required by the previous step)
- Engine Run-up Vibration Check

## 5.8 GMU 44B




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 3 | 4 | MS35214-23 | SCREW, MACHINE, PAN HEAD, CROSS-RECESSED, BRASS, 0.1380-32 UNC-2A, 0.25 IN LONG |
| 3 | 3 | MS24693-B27 | SCREW, MACHINE, FLAT, COUNTERSUNK HEAD 100 DEG, CROSS-RECESSED, 0.1380-32UNC-2A, 7/16 LONG |
| 1 | 2 | 125-00437-00 | INSTALL RACK, GMU 44B |
| 1 | 1 | 011-04201-00 | GMU 44B MAGNETOMETER |

**NOTES**

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. SUPPORTING STRUCTURE NOT SHOWN. FASTENER HOLES ARE LOCATED TO MATCH GMU 44B INSTALL RACK, ITEM 2

△3 SCREWS ARE PART OF 011-04205-00 GMU 44B CONNECTOR KIT. INSTALL WITH MEDIUM STRENGTH THREADLOCKER.

△4 TORQUE .1380-32 UNC-2A BRASS SCREWS 7.0 ±0.5 LBF-IN.

**Figure 5-13 GMU 44B Installation**

**NOTE**

*Removal, re-installation, or replacement of the GMU 44B will require a recalibration of the AHRS. Additionally, any removal or addition of electrical components or ferrous materials within 10 feet of the GMU 44B will require recalibration of the AHRS.*

### 5.8.1 GMU 44B Removal

To remove the GMU 44B, perform the following procedure:

1. Remove power from the GI 275 directly connected to the GMU 44B. If the GI 275 is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.
2. Disconnect the GMU 44B connector.
3. Remove the three screws shown in Figure 5-13.
4. Remove the GMU 44B from the mounting bracket.

### 5.8.2 GMU 44B Re-installation

**NOTE**

*If reusing the original mounting screws, the anti-rotation properties of the mounting screws must be restored. This may be done by replacing the screws with new Garmin P/N 211-60037-08. If original screws are reused, coat screw threads with Loctite 242 (blue) thread-locking compound (Garmin P/N 291-00023-02) or equivalent.*

To re-install the GMU 44B, perform the following procedure:

1. Place the GMU 44B in the mounting bracket.
2. Install the three screws and torque to the specifications shown in Figure 5-13.
3. Connect the GMU 44B electrical connector.
4. Restore power to the GI 275.
5. Perform the checkout procedure in Section 5.8.3.

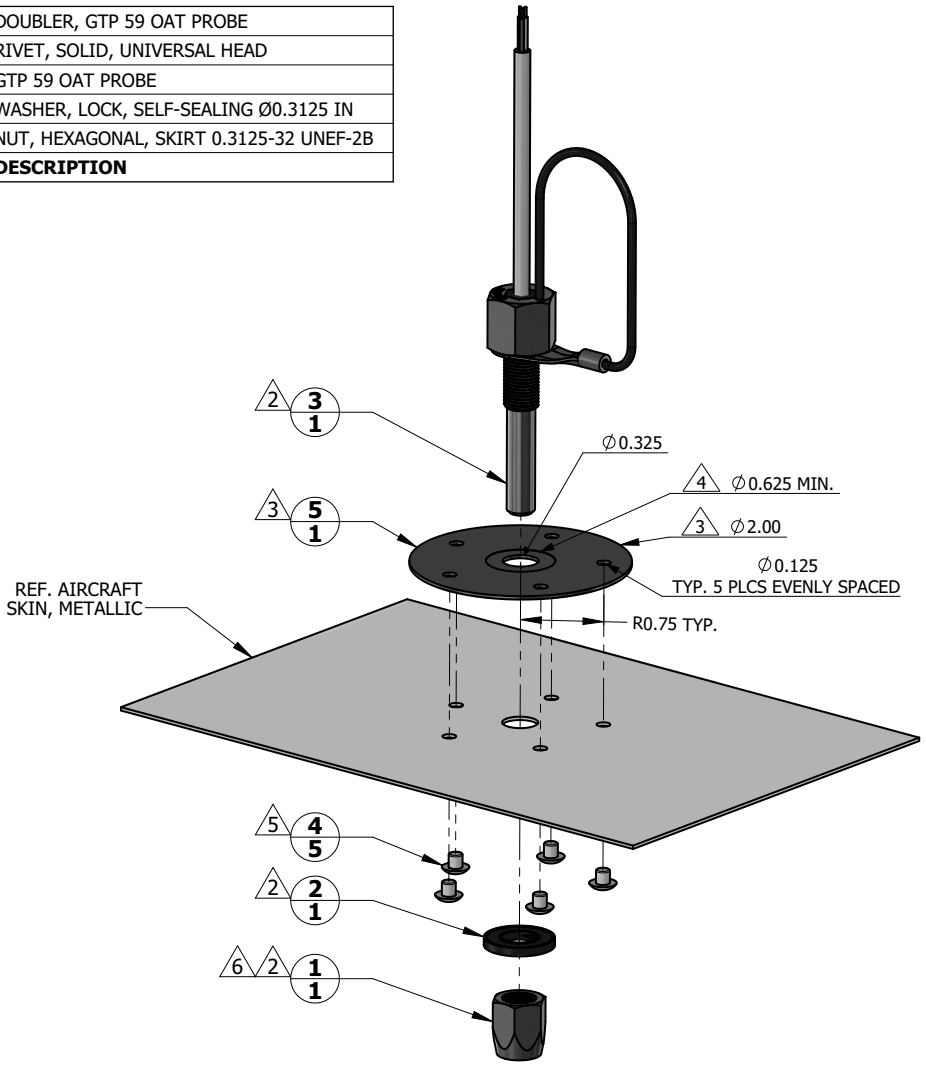
### 5.8.3 GMU 44B Checkout

Perform the following AHRS ground checks to return the aircraft to service:

- Magnetometer Calibration (Section 5.13.1.7)
- Compass Swing (Section 5.13.1.8)
- Heading Offset Compensation (if required by the previous step) (Section 5.13.1.9)
- Engine Run-up Vibration Check (Section 5.13.1.5)

## 5.9 GTP 59

| QTY. | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 5 | | DOUBLER, GTP 59 OAT PROBE |
| 5 | 4 | MS20470AD4-2 | RIVET, SOLID, UNIVERSAL HEAD |
| 1 | 3 | 494-00022-00 | GTP 59 OAT PROBE |
| 1 | 2 | 212-00026-00 | WASHER, LOCK, SELF-SEALING Ø0.3125 IN |
| 1 | 1 | 210-00055-00 | NUT, HEXAGONAL, SKIRT 0.3125-32 UNEF-2B |




**NOTES**

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. NUT ITEM 1, WASHER ITEM 2, AND PROBE ITEM 3 ARE PART OF GTP 59 OAT PROBE ASSEMBLY (KIT), GARMIN P/N 011-00978-00.
3. MINIMUM DOUBLER SIZE SHOWN. CIRCULAR SHAPE OPTIONAL. DOUBLER THICKNESS IS ONE GAUGE THICKER THAN AIRCRAFT SKIN.
4. SPOT FACE TO REMOVE COATING AS REQUIRED TO MAINTAIN ELECTRICAL BOND.
5. RIVETS ARE INSTALLED PER MIL-R-47196 (NASM47196) RIVET, BUCK TYPE, *PREPARATION FOR AND INSTALLATION,* OR PER MIL-STD-403 *PREPARATION FOR AND INSTALLATION OF RIVETS AND SCREWS, ROCKET, MISSILE, AND AIRFRAME STRUCTURES.*
6. TORQUE .3125-32 UNEF-2B NUT 100.0 ± 20.0 LBF-IN.

**Figure 5-14 GTP 59 Installation (Aircraft with Metallic Skin Example)**

### 5.9.1 GTP 59 Removal

To remove the GTP 59, perform the following procedure:

1. Remove power from the GI 275 or GEA that is directly interfaced to the GTP 59. If the GI 275 or GEA is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.
2. Remove the mounting nut shown in Figure 5-14.
3. Remove the GTP 59 from the hole.

### 5.9.2 GTP 59 Re-installation

1. Place the GTP 59 in the previous installation hole.
2. Install washer and nut and torque to specifications in Figure 5-14.

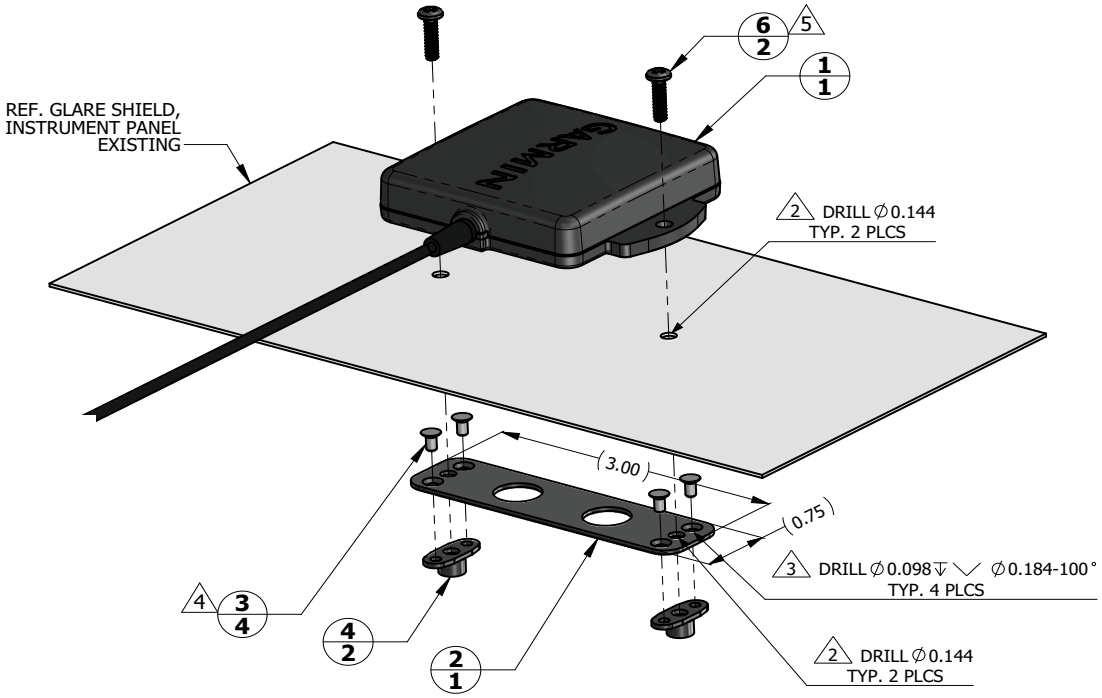
### 5.9.3 GTP 59 Checkout

Perform the OAT Checks in Section 5.15.3.

## 5.10 VFR GPS Antenna

The VFR GPS antenna is designed for installation on top of an existing instrument panel glareshield. The selected location must offer good visibility of the sky through the windshield.

The optimal antenna position is horizontal or as close to horizontal as practical given the shape of the glareshield.




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 2 | 6 | MS35206-229 | SCREW, MACHINE, PAN HEAD, CROSS RECESSED, CAD PLATED .1380- 32 UNC-2A, 0.438 IN LONG |
| | | MS35214-26 | SCREW, MACHINE, PAN-HEAD, CROSS RECESSED, BLACK OXIDE FINISH .1380- 32 UNC-2A, 0.438 IN LONG |
| 2 | 4 | MS21069L06 | NUT, SELF-LOCKING, PLATE, TWO-LUG, REDUCED RIVET SPACING, LOW HEIGHT, STEEL .138-32 UNJC-3B |
| 4 | 3 | MS20426AD3-3 | RIVET, SOLID, COUNTERSUNK 100 DEG, PRECISION HEAD, 3/32 IN OD, 3/16 IN LONG |
| 1 | 2 | PLATE DETAIL | SHEET, 6061-T6 AL, 0.040 INCH THICK PER AMS 4025, AMS 4027, AMS-QQ-A-250/11 |
| 1 | 1 | 011-04036-10 | BACKUP GPS ANTENNA |

**NOTES**

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

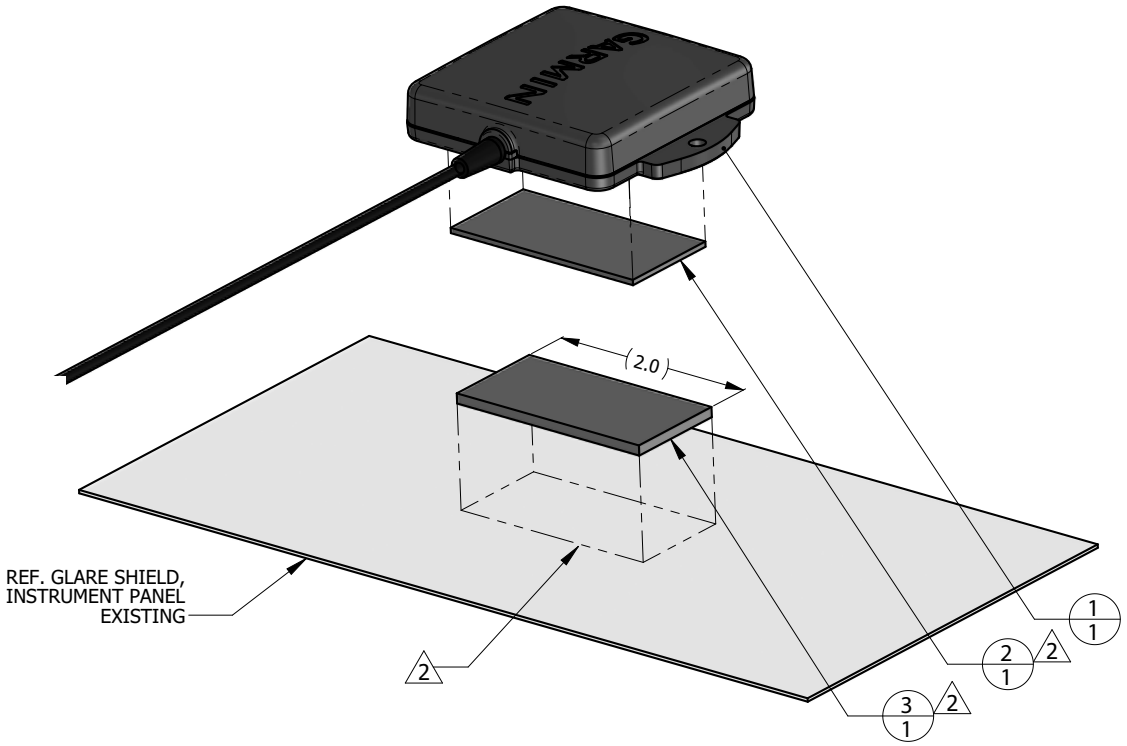
△2 FASTENER HOLES ARE LOCATED TO MATCH BACKUP GPS ANTENNA ITEM 1.

△3 FASTENER HOLES ARE LOCATED TO MATCH NUTPLATE ITEM 4.

△4 RIVETS ARE INSTALLED PER MIL-R-47196 (NASM47196) RIVET, BUCK TYPE, *PREPARATION FOR AND INSTALLATION,* OR PER MIL-STD-403 *PREPARATION FOR AND INSTALLATION OF RIVETS AND SCREWS, ROCKET MISSILE, AND AIRFRAME STRUCTURES.*

△5 USE FASTENER WITH BLACK OXIDE FINISH IF ANTENNA LOCATION IS SUCH THAT FASTENERS ARE VISIBLE TO THE PILOT OR COPILOT AND MIGHT BECOME A SOURCE OF ACCIDENTAL GLARE. TORQUE .1380-32 UNC-2A SCREWS HAND TIGHT.

**Figure 5-15 VFR GPS Antenna Installation (Non-removable Installation Example)**




| | | | |
|---|---|---|---|
| 1 | 3 | A-A-55126 △3 | FASTENER TAPE, SYNTHETIC, ADHESIVE BACKED, A-A-55126 CLASS 1/2, TYPE 1, LOOP 1.0 INCH WIDE |
| | 2 | | FASTENER TAPE, SYNTHETIC, ADHESIVE BACKED, A-A-55126 CLASS 1/2, TYPE 1, HOOK 1.0 INCH WIDE |
| 1 | 1 | 011-04036-10 | BACKUP GPS ANTENNA |
| QTY | ITEM | PART NUMBER | DESCRIPTION |

NOTES

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

△2 PEEL OFF ADHESIVE PROTECTING FILM AND PRESS THE FASTENER TAPE IN TO BOND. SURFACES MUST BE CLEAN AND FREE FROM OIL OR OTHER CONTAMINANTS. LOOP FASTENER IS BONDED TO GLARE SHIELD AND HOOK FASTENER IS BONDED TO ANTENNA. TAPE FASTENER MUST BE 2.0 INCHES OR LONGER.

△3 GPS ANTENNA KIT, GARMIN PART NO. 010-12444-00 INCLUDES DUAL LOCK FASTENER, GARMIN PART NO. 252-00433-00 WHICH CAN BE USED INSTEAD OF A-A-55126 FASTENER TAPE.

**Figure 5-16 VFR GPS Antenna Installation (Removable Installation Example)**

### 5.10.1 VFR GPS Antenna Removal

Use the following procedure to remove the VFR GPS antenna:

1. Remove power from the GI 275 connected to the VFR GPS antenna. If the GI 275 is connected to a GDL 60, remove power from the GDL 60 by opening its circuit breaker.
2. Disengage the BNC connector from the GI 275.
3. Remove the two screws securing the antenna (if installed per Figure 5-15 only).
4. Lift up on the VFR GPS antenna to remove it.

### 5.10.2 VFR GPS Antenna Re-installation

Install the VFR GPS antenna in the reverse order of the removal procedure.

### 5.10.3 VFR GPS Antenna Checkout

Perform the Backup GPS Signal Check in Section 5.15.4.

## 5.11 EIS Sensors

In addition to the data in this manual, replacement or re-installation of each probe/sensor and wire must be accomplished in accordance with the sensor manufacturer instructions or as recommended by the engine manufacturer. Wire routing and clamping must follow procedures defined in the aircraft maintenance manual, standard practices manual, or practices defined in Chapter 11, *Electrical Systems*, of AC 43.13-1B *Aircraft Inspection and Repair*.

Sensors must be connected using hoses and fittings approved as part of aircraft or engine type certificated design or standard aircraft parts (AN/MS).

After removing or replacing any EIS sensor, perform the EIS ground checkout procedure in Section 6 of the GI 275 installation manuals (refer to Table 1-1) for the sensor that was affected.

**CAUTION**

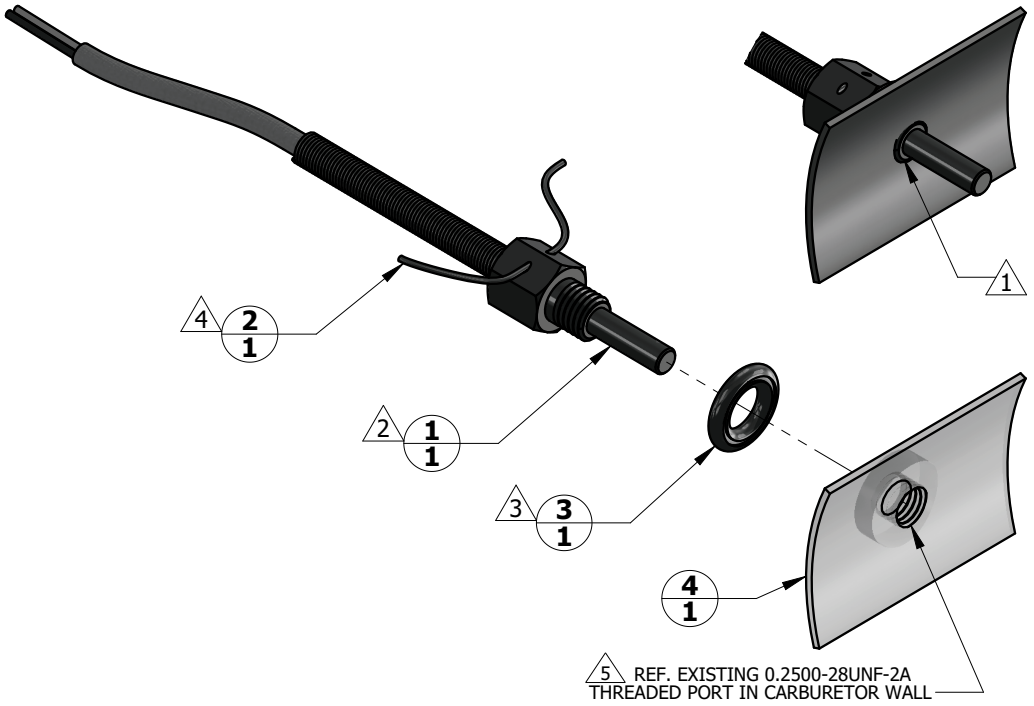
*Check hose routing for sharp bends. Check sensors and fittings for leaks during engine run-up and correct prior to flight.*

**CAUTION**

*When performing maintenance on EIS sensors that are connected to a GDL 60, first remove power from the GDL 60 by opening its circuit breaker. Failure to do so may result in damage to components.*

### 5.11.1 Carburetor/Induction Air Temperature

The sensor location will vary for different carburetors. Refer to the engine or carburetor manufacturer data for temperature sensor location, if required.




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 4 | | CARBURETOR, EXISTING |
| 1 | 3 | MS35769-2 | GASKET, METALLIC, ENCASED, ANNULAR, COPPER, Ø1/4 ID×Ø1/2 OD |
| 1 | 2 | MS20995 | WIRE, SAFETY OR LOCK |
| 1 | 1 | T3B10-SG | PROBE, CARBURETOR TEMPERATURE |

**NOTES**

1. WHEN INSTALLED, FACE OF THE SENSOR THREADED BOSS IS FLUSH WITH THE INSIDE OF CARBURETOR BARREL. USE WASHER(S) IF REQUIRED TO SPACE THE SENSOR ACCORDINGLY.
2. T3B10-SG TEMPERATURE SENSOR HAS 0.2500-28UNF-2A THREAD. INSTALL WITH LOCTITE 242 MEDIUM STRENGTH THREADLOCKER, OR EQUIVALENT. EXERCISE CAUTION TO PREVENT FUEL CONTAMINATION.
3. SPLIT FACE OF THE GASKET FACES NON-ROTATING SURFACE.
4. SAFETY WIRE PROBE IN ACCORDANCE WITH MS33540 *SAFETY WIRING AND COTTER PINNING*.
5. SENSOR INSTALLATION IN EXISTING CARBURETOR PORT ONLY. ADDITION OF NEW TAPPED HOLES TO CARBURETOR BARREL NOT ALLOWED.

**Figure 5-17 Carburetor Temperature Sensor Installation Example**

**CAUTION**

*Fuel and air passages must remain free of contaminants during work near and around the carburetor.*

### 5.11.2 Oil Temperature Sensor

When installing the oil temperature sensor, the unbroken side of the crush washer must face the sensor flange. The sensor is torqued finger tight plus one-half turn and safety wired in accordance with practices defined in Section 7, *Safetying*, of Chapter 7, *Aircraft Hardware, Control Cables and Turnbuckles*, of AC 43.13-1B *Aircraft Inspection and Repair*.

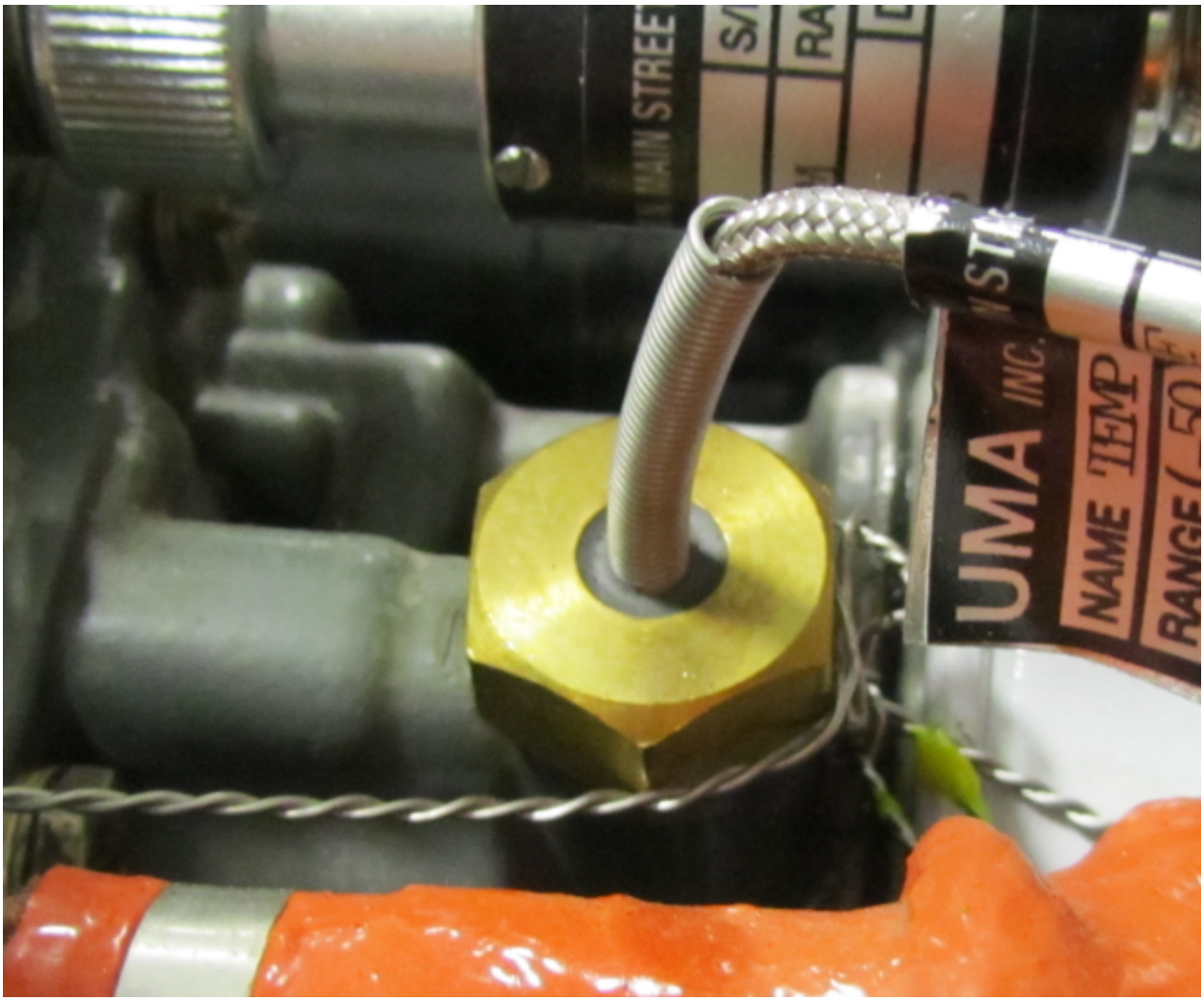



**Figure 5-18 Oil Temperature Sensor Installation Example**

### 5.11.3 Pressure Sensors

Manifold pressure, oil pressure, and fuel pressure sensor installations are similar. Garmin pressure sensors with a brass housing are limited to aircraft with operational ceilings up to 32,000 feet. Garmin pressure sensors with a stainless steel housing may be used on all aircraft on the AML.

When replacing existing sensors:

- Do not remove engine and fuel fittings with an intentionally reduced orifice. It may limit fluid loss and fire damage in the event of a hose failure
- Inspect the condition of all existing tubes, hoses, and fittings that are being reused; replace if necessary

**NOTE**

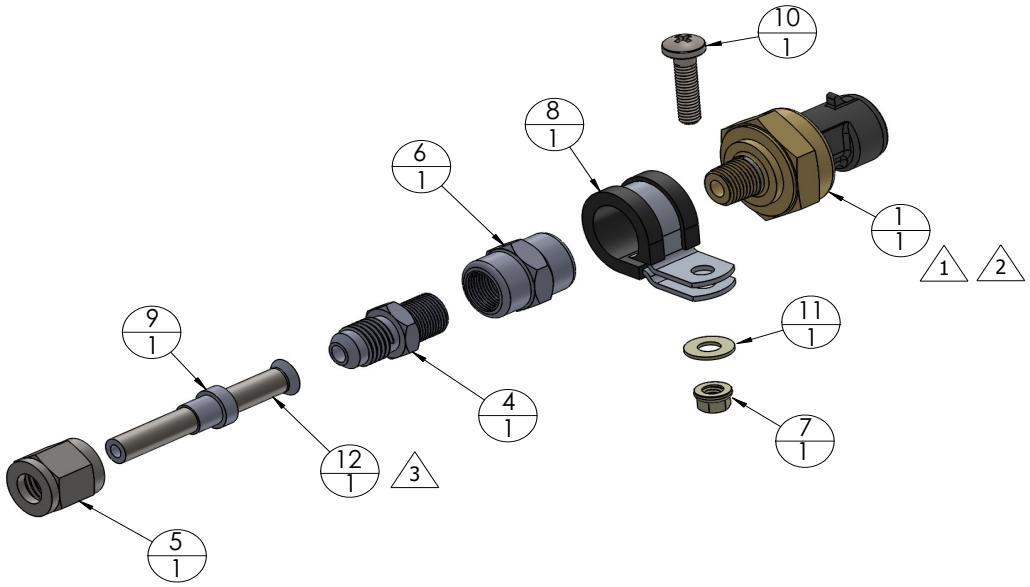
*The GPT series pressure sensors (P/N 011-05783-XX) can replace the brass sensors (P/N 011-04202-XX) of the same range. The Sensor Configuration setting in Config mode must be updated to their respective GPT part number (***EIS → Sensors → Manifold PRESS/Oil PRESS/Fuel PRESS***).*

When installing pressure sensors:

- Fuel and oil hoses in the engine compartment must meet TSO-C53a Type C or D (fire resistant)
- Do not install sensors directly below fittings or components that may leak flammable fluid
- Thread sealant must be used for the NPT threads. To reduce the risk of system contamination, a minimal amount of sealant should be applied leaving at least two threads at the end of the fitting clear of sealant
- Sensors must be routed as far away from the aircraft exhaust system as practical and no closer than 6 inches

**Table 5-1 Pressure Sensor Equipment List**

| Function | Manufacturer P/N, Description | Garmin P/N | Authorization |
|---|---|---|---|
| Oil Press | Kavlico P4055-5020-4, Press (Brass) | 011-04202-30 (494-30027-30) | GI 275 STC |
| | Garmin 150 PSIG, Press (Stainless) | 011-05783-30 | |
| | Kulite APT-20GX-1000-150G, Press (Stainless) | 494-30032-00 | |
| Manifold Press | Kavlico P4055-5020-1, Press (Brass) | 011-04202-00 (494-30027-00) | GI 275 STC |
| | Garmin 30 PSIA, Press (Stainless) | 011-05783-00 | |
| | Kulite APT-20GX-1000-25PSIA, Press (Stainless) | 494-30030-00 | |
| Fuel Press | Kavlico P4055-5020-3, Press (Brass) | 011-04202-20 (494-30027-20) | GI 275 STC |
| | Kavlico P4055-5020-2, Press (Brass) | 011-04202-10 (494-30027-10) | |
| | Garmin 75 PSIG, Press (Stainless) | 011-05783-20 | |
| | Garmin 15 PSIG, Press (Stainless) | 011-05783-10 | |
| | APT-20GX-1000-50PSIG, Press (Stainless) | 494-30031-00 | |
| | APT-20GX-1000-15PSIG, Press (Stainless) | 494-30029-00 | |




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 12 | | TUBE, Ø0.190 IN OD |
| 1 | 11 | NAS1149F0332P | WASHER, FLAT, STEEL, CAD PLATED, 0.032 INCH THICK, ID 0.203, OD 0.438 |
| 1 | 10 | MS51958-65 | SCREW, MACHINE, PAN HEAD, CROSS RECESSED .190-32UNF-2A, 3/4 INCH LONG |
| 1 | 9 | MS51533B3 | SLEEVE, COMPRESSION, TUBE FITTING, 37° FLARED, Ø3/16 TUBE OD |
| 1 | 8 | MS21919WDG9 | CLAMP, LOOP TYPE, CUSHIONED, Ø9/16 TUBE |
| 1 | 7 | MS21042L3 | NUT, SELF-LOCKING, REDUCED HEXAGON, REDUCED HEIGHT, RING BASE .1900-32UNJF-3B |
| 1 | 6 | AN910-1W | COUPLING, PIPE, 1/8-27 ANPT |
| 1 | 5 | AN818-3 | NUT, TUBE COUPLING, SHORT, Ø0.188 TUBE OD .3750-24UNJF-3B |
| 1 | 4 | AN816-3 | ADAPTER, STRAIGHT, PIPE TO TUBE, 1/8-27 NPT TO .3750-24 UNJF-3A |
| | | AN822-3 | ADAPTER, ELBOW 90 DEG, PIPE TO TUBE, 1/8-27 NPT TO 0.3750-24 UNJF-3A |
| | | AN823-3 | ADAPTER, ELBOW 45 DEG, PIPE TO TUBE, 1/8-27 NPT TO 0.3750-24 UNJF-3A |
| 1 | 1 | 011-04202-XX | PRESSURE SENSOR |

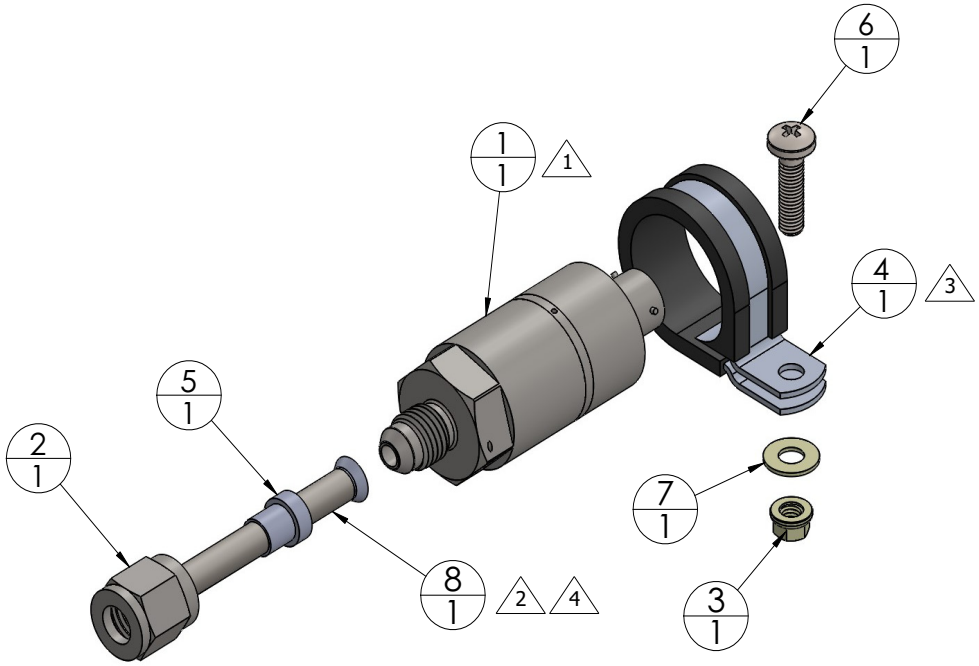
**NOTES**

1. TO PREVENT FLUID ENTRAPMENT, ORIENT THE SENSOR SO IT IS NOT STRAIGHT UP.

2. PRESSURE SENSOR HAS 1/8-27 NPT PIPE THREAD. SEE ADDITIONAL LOCATION AND INSTALLATION INFORMATION IN THIS SECTION.

3. IF HOSE OR TUBING IS PREVIOUSLY INSTALLED, USE APPROVED AIRCRAFT FITTINGS (e.g., AN/AS-SPEC OR MIL-SPEC) TO CONNECT THE SENSOR.

**Figure 5-19 Brass Sensor Installation (Coupling Mount Example)**

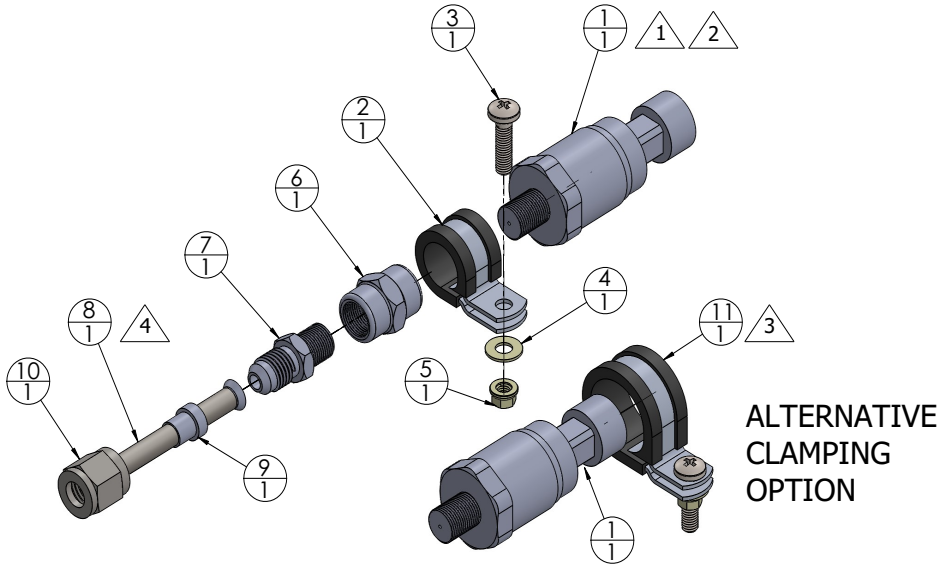



| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 8 | | TUBE, Ø0.250 IN OD |
| 1 | 7 | NAS1149F0332P | WASHER, FLAT, STEEL, CAD PLATED, 0.032 INCH THICK, ID 0.203, OD 0.438 |
| 1 | 6 | MS51958-65 | SCREW, MACHINE, PAN HEAD, CROSS RECESSED .190-32UNF-2A, 3/4 INCH LONG |
| 1 | 5 | MS51533B4 | SLEEVE, COMPRESSION, TUBE FITTING, 37° FLARED, Ø1/4 TUBE OD |
| 1 | 4 | MS21919WDG16 | CLAMP, LOOP TYPE, CUSHIONED, Ø1.00 TUBE |
| 1 | 3 | MS21042L3 | NUT, SELF-LOCKING, REDUCED HEXAGON, REDUCED HEIGHT, RING BASE .1900-32UNJF-3B |
| 1 | 2 | AN818-4 | NUT, TUBE COUPLING, SHORT, Ø0.250 TUBE OD .4375-20UNJF-3B |
| 1 | 1 | 494-30030-00 | PRESSURE TRANSDUCER, VENTED GAGE |

**NOTES**

1. TO PREVENT FLUID ENTRAPMENT ORIENT THE SENSOR SO IT IS NOT STRAIGHT UP.
2. PRESSURE SENSOR HAS A STANDARD FITTING (MS33656) WITH 7/16-20UNJF-3A THREAD AND REQUIRES 37 DEGREE FLARED TUBE CONNECTION.
3. CLAMP THE SENSOR BODY (ITEM 1) TO MOUNT. CLAMP NOT TO BLOCK VENT HOLES IN SENSOR BODY, IF PRESENT.
4. IF HOSE OR TUBING IS PREVIOUSLY INSTALLED, USE APPROVED AIRCRAFT FITTINGS (e.g., AN/AS-SPEC OR MIL-SPEC) TO CONNECT THE SENSOR.

**Figure 5-20 Mil-Spec Style Sensor Installation (Housing Mount Example)**




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 11 | MS21919WDG15 | CLAMP LOOP TYPE, CUSHIONED, SUPPORT, Ø15/16 TUBE |
| 1 | 10 | AN818-3 | NUT, TUBE COUPLING, SHORT, Ø0.188 TUBE OD, 0.375-24 UNJF-3B |
| 1 | 9 | MS51533B3 | SLEEVE, COMPRESSION, TUBE FITTING, 37° FLARED |
| 1 | 8 | | TUBE, Ø0.190 IN OD |
| 1 | 7 | AN816-3 | ADAPTER, STRAIGHT, PIPE TO TUBE 1/8-27 NPT TO 0.375-24 UNJF-3A |
| | | AN822-3 | ELBOW, PIPE TO TUBE, 90°, 1/8-27 NPT TO 0.375-24 UNJF-3A |
| | | AN823-3 | ELBOW, PIPE TO TUBE, 45°, 1/8-27 NPT TO 0.375-24 UNJF-3A |
| 1 | 6 | AN910-1W | COUPLING, PIPE, 1/8-27 ANPT |
| 1 | 5 | MS21042L3 | NUT, SELF-LOCKING, 450°F, REDUCED HEXAGON, REDUCED HEIGHT, RING BASE, NON-CORROSION RESISTANT STEEL, 0.190-32UNF-3B |
| 1 | 4 | NAS1149F0332P | WASHER, FLAT, STEEL, CAD PLATED, 0.032 INCH THICK, ID 0.203, OD 0.438 |
| 1 | 3 | MS51958-XX | SCREW, MACHINE PAN-HEAD, CROSS-RECESSED, CORROSION RESISTING STEEL, 0.190-32UNF-2A |
| 1 | 2 | MS21919WDG9 | CLAMP LOOP TYPE, CUSHIONED, SUPPORT, Ø9/16 TUBE |
| 1 | 1 | 011-05783-XX | PRESSURE SENSOR, GPT |

**NOTES**

1. TO PREVENT FLUID ENTRAPMENT ORIENT THE SENSOR SO IT IS NOT STRAIGHT UP.
2. PRESSURE SENSOR HAS 1/8-27 PIPE THREAD. SEE ADDITIONAL LOCATION AND INSTALLATION INFORMATION IN THIS SECTION.
3. ALTERNATIVE METHOD, CLAMP AROUND THE SENSOR BODY (ITEM 1).
4. IF HOSE OR TUBING IS PREVIOUSLY INSTALLED, USE APPROVED AIRCRAFT FITTINGS (e.g., AN/AS-SPEC OR MIL-SPEC) TO CONNECT THE SENSOR.

**Figure 5-21 GPT Sensor Installation**

### 5.11.4 Fuel Flow

The fuel flow transducer can be mounted using the bracket or clamping hoses connected to the transducer. If mounting with clamps, the placement must be no further than 6 inches from the clamp to the nearest face of the transducer.

- The transducer can be oriented with the wires pointing up, or the cap with five bolts pointing up, or the output port pointing up, or any combination thereof
- The hose connected to the IN port must be straight for a minimum of 4 inches
- The hose connected to the OUT port should be level or slope up. It must not slope down more than 4 inches per foot

Hoses and fittings connected to fuel flow transducer must meet the following:

1. New hoses must have the same internal diameter as the hose being replaced and meet TSO-C53a Type C or D (fire resistant) specifications.
2. Fuel compatible thread sealant or tape must be used for the NPT threads. To reduce the risk of fuel system contamination, a minimal amount of sealant should be applied leaving at least two threads at the end of the fitting clear of sealant/tape.
3. Fitting torque must not exceed 12 ft-lbf **or** two full turns past finger tight, whichever occurs first.
4. The transducer and fuel hoses must be routed as far away from the aircraft exhaust system as practical. The transducer must be protected with Aeroquip AE102-( ) fire-sleeve if within 6 inches of any exhaust component.

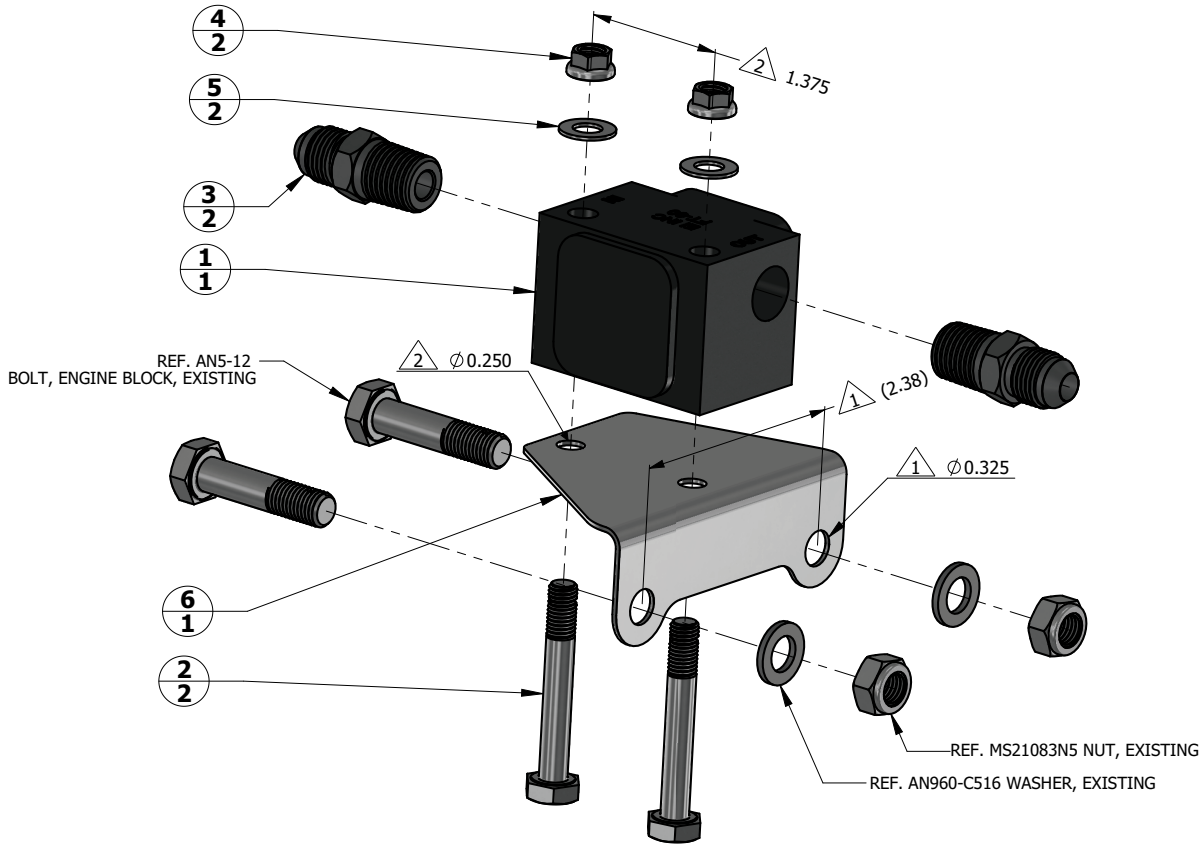
**WARNING**

*Ensure the fuel flow transducer installation does not introduce thread sealant or debris into the fuel system.*

**CAUTION**

*Do not blow pressurized air through the flow transducer.*

If the fuel flow transducer bracket must be replaced, the replacement bracket must be fabricated from 300 series austenitic stainless steel (annealed per AMS 5901 or ½ hard per AMS 5517), sheet thickness 19 gauge minimum (0.044 inches) and installed as provisioned by the aircraft structural repair manual or standard practices manual. Methods, techniques, and practices defined in Chapter 4, *Metal Structure, Welding and Brazing*, of AC 43.13-1B *Aircraft Inspection and Repair* are acceptable.




| QTY | ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | | BRACKET, FUEL FLOW SENSOR |
| 2 | 5 | NAS1149F0432P | WASHER, FLAT, STEEL, CAD PLATED, 0.032 INCH THICK, ID 0.265, OD 0.5 |
| 2 | 4 | MS21042L4 | NUT, SELF-LOCKING, REDUCED HEXAGON, REDUCED HEIGHT, RING BASE .2500-28UNJF-3B |
| 2 | 3 | AN816-5-4 | ADAPTER, STRAIGHT, PIPE TO TUBE, 1/4-18 NPT TO .5000-20 UNJF-3A |
| 2 | 2 | AN4-16 | BOLT, MACHINE, AIRCRAFT, .2500-28 UNF-3A, 1-5/16 IN GRIP, DRILLED SHANK |
| 1 | 1 | 1030032 | FT-60 FUEL FLOW TRANSDUCER, ELECTRONICS INTERNATIONAL |

**NOTES**

1. HOLE SIZE AND SPACING TO MATCH ENGINE CASE BOLTS.
2. HOLE SIZE AND SPACING TO MATCH FUEL FLOW TRANSDUCER.

**Figure 5-22 Fuel Flow Transducer Installation**

### 5.11.5 Engine RPM

The GI 275 system can use the electrical signal generated by the primary magneto coils or "P-Lead" to display RPM. When used, the left and right magneto P-Lead signals must both be connected to the GEA 24(B)/110. The connection can be made at the magneto or the ignition switch.

To replace the P-Lead wire, remove the old section of wire and replace the entire wire and parallel resistors in accordance with the P-Lead installation instructions contained in Section 4 of the GI 275 installation manuals (refer to Table 1-1).

## 5.12 TVS and Fuse (Class II & III Composite Aircraft Only)

This section applies to IFR Class II & III composite aircraft only. Refer to *GI 275 Part 23 AML STC Installation Manual* for more information.

Class II & III composite aircraft require a Transient Voltage Suppressor and fuse at the main power input(s) of the GI 275.

The following materials are used to construct the TVS assembly:

- Littlefuse P/N 15KPA48A, TVS diode, 48V Vrb, 77.7V clamp at Ipp
- Littelfuse P/N 0225005.MXUP, 2AG cartridge fuses 125V 5A fast acting
- Littelfuse P/N 01500274ZXU, fuse holder, inline

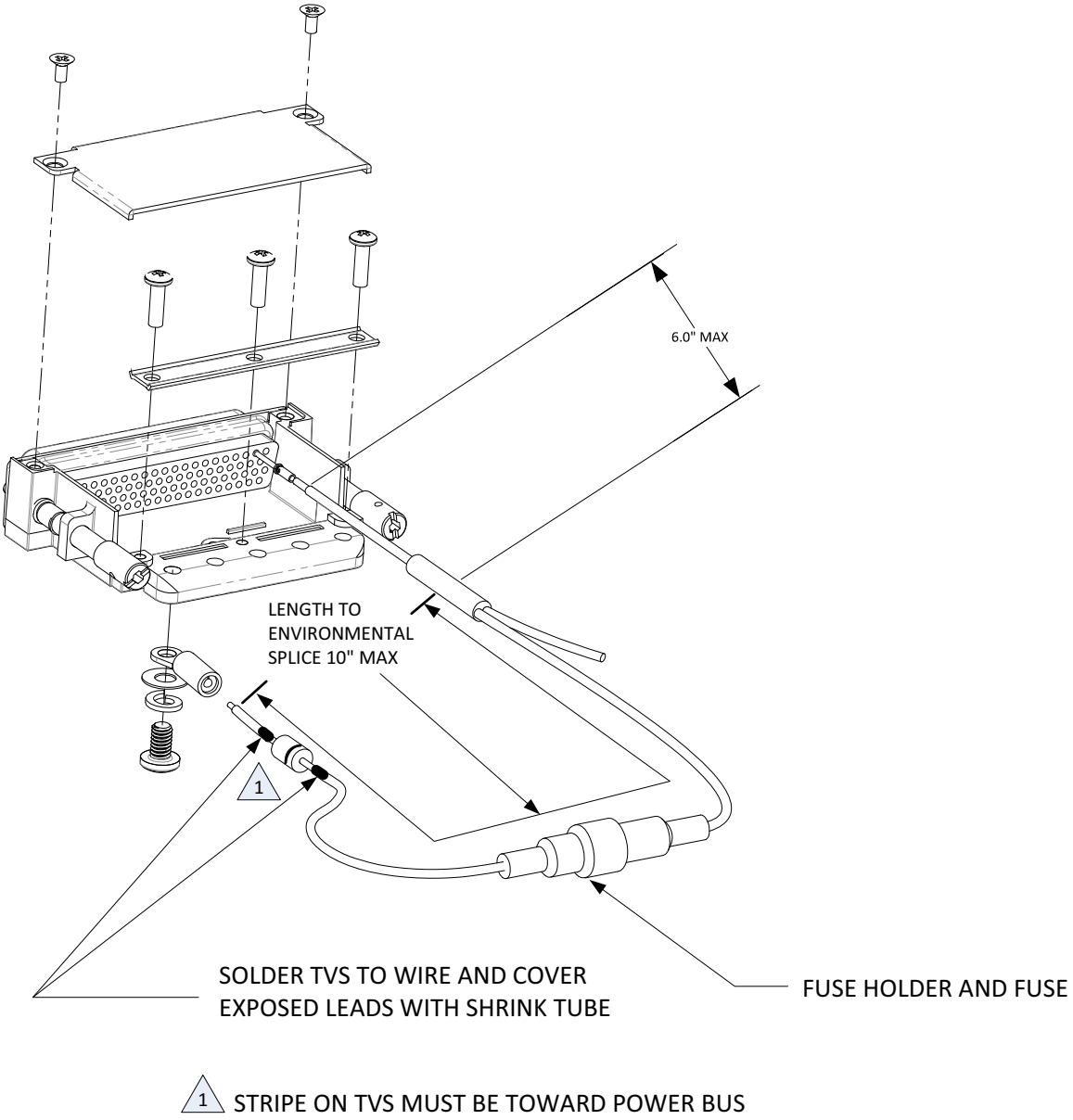



**Figure 5-23 TVS and Fuse Installation**

### 5.12.1 TVS Removal

1. Remove the shield block grounding screw and remove the ring terminal from the backshell of the connector (as shown in Figure 5-23).
2. Open the fuse holder and remove the fuse.
3. Carefully remove the heat shrink from the TVS ensuring not to cut the insulation on the wire.
4. Desolder the TVS lead from the wire connecting it to the fuse holder.

### 5.12.2 TVS Replacement

**CAUTION**

*Be aware of the orientation of the TVS during installation. Refer to Figure 5-23 for proper alignment and lengths.*

1. Solder new TVS onto the exposed wire from the fuse holder.
2. Solder the other end of the TVS to the other wire (with the ring terminal attached). The total wire length between the ring terminal and environmental splice shall not exceed 10 inches.
3. Install heat shrink over the exposed TVS and solder joints.
4. Attach the ring terminal to the new lead, as shown in Figure 5-23.
5. Install the fuse into the fuse holder and close the holder.
6. Re-attach the ring terminal to the backshell of the connector.

### 5.12.3 Fuse Removal

The inline fuse holder can be opened by unscrewing the two halves.

### 5.12.4 Fuse Re-installation

1. Check the fuse continuity visually and with a digital multimeter.
2. If the fuse has continuity, re-install the fuse and close the fuse holder by screwing the two halves of the fuse holder together.
3. If the fuse does not have continuity, replace with a new fuse and re-check continuity. Then close the fuse holder by screwing the two halves of the fuse holder together.

## 5.13 Calibration

This section provides guidance for calibrating the GI 275 system if the previous calibration has become invalid.

### 5.13.1 Attitude/Heading

The interfaced AHRS will not provide valid outputs until the calibration procedures in this section are completed. Prior to completing the Pitch/Roll Offset Compensation (Section 5.13.1.3) and Magnetometer Calibration (Section 5.13.1.7) procedures, the annunciation "CALIBRATE AHRS/MAG" will be displayed on the ADI, and the attitude and heading will be displayed. Once the aircraft is moved, the attitude and heading display will show a red "X". This condition is normal and will automatically clear when the two aforementioned calibration procedures are completed.

#### 5.13.1.1 Site Evaluation of Magnetic Disturbances

Typically, a compass rose is an acceptable location to perform the Magnetometer Calibration Procedure. However, even an existing compass rose can be evaluated to determine if it is free of magnetic disturbances. If the evaluation of an existing compass rose indicates that magnetic disturbances are present, an alternative location must be found to perform the Magnetometer Calibration Procedure.

An aircraft equipped with a GI 275 can be used to evaluate a candidate site for magnetic disturbances and determine whether it is a suitable location to perform the Magnetometer Calibration Procedure. The Magnetometer Calibration Procedure itself contains the logic to simultaneously survey the location for magnetic cleanliness while it is computing the magnetometer calibration parameters.

The aircraft equipped with a GI 275 used to evaluate the site must have already completed the Pitch/Roll Offset Compensation Procedure (Section 5.13.1.3). The completion of the Magnetometer Calibration Procedure (Section 5.13.1.7) is not required. In order to evaluate a site, the Magnetometer Calibration Procedure must be performed twice: once turning clockwise around the site and once turning counterclockwise. Both times, the procedure should be conducted as described in Section 5.13.1.7, with the exception of the direction of turns around the site.

If, upon completion of the Magnetometer Calibration Procedure in each clockwise and counterclockwise direction, the GI 275 displays the "CALIBRATION SUCCESSFUL/SITE IS CLEAN" message, then the candidate site is sufficiently free of magnetic disturbances and is acceptable for performing the Magnetometer Calibration Procedure. It is important to obtain successful results in both the clockwise and counterclockwise directions.

If, upon completion of the Magnetometer Calibration Procedure in either of the two directions, the GI 275 displays either the "MAG FIELD AT SITE NOT UNIFORM" or "MAG FIELD AT SITE DIFFERS FROM IGRF MODEL" message, then the site contains magnetic disturbances that are too large, and an alternate site should be used for the AHRS magnetic calibration.

#### 5.13.1.2 Calibrate Yaw Offset

If required for the installation, set the yaw offset. The range is -15.0 and 15.0 and the default is 0.

#### 5.13.1.3 Calibrate Pitch/Roll Offset

This procedure must be completed on each GI 275 with an integrated ADAHRS. This procedure can be conducted for each AHRS simultaneously on each display. The aircraft must be leveled to within 0.25° of zero pitch and zero roll using the procedures in the aircraft maintenance manual or AFM/POH. The following procedures must be completed with the engine off:

1. Navigate to the ***Calibrate Pitch/Roll*** page (***Calibration/Test → Attitude/Heading → Calibrate Pitch/Roll***).
2. Complete the steps listed on the display. Touch the **Start** button to begin the calibration procedure.
3. Follow the on-screen command prompts.

The Magnetometer Calibration (Section 5.13.1.7) and Compass Swing (Section 5.13.1.8) are completed after the initial Engine Run-up Test has been completed.

#### 5.13.1.4 Manual Pitch/Roll

Allows the pitch and roll values to be set manually.

#### 5.13.1.5 Engine Vibration Test

The calibration procedures in Section 5.13.1.2 through Section 5.13.1.4 do not have to be completed prior to performing this procedure.

For dual AHRS installations, the following procedure must be performed for each AHRS on the display it is wired to. The procedure can be done simultaneously on each display. Follow the prompts on each display. Initiate the Engine Vibration Test by performing the following steps:

1. Start the aircraft engine in accordance with the AFM/POH.
2. Power on the display(s) in Configuration mode.
3. Navigate to the test page (***Calibration/Test → Attitude/Heading → Engine Vibration Test***).
4. Complete the Before Calibration steps listed on the display; touch **Next** after completing each step to move to the next step.
5. Touch **Start** to begin the procedure.
6. Gradually increase the engine throttle in small increments from idle to full and back to idle over a period of approximately 1 minute.
7. Observe the readout on the display while performing the engine run-up. The values shown during the test must not exceed 100 in order for the test to be considered a pass. Values in excess of 100 will cause the display to indicate a failure.
8. Select **DONE** when finished.

If failures are indicated, the engine run-up check may be repeated up to two more times. If the check does not pass after three attempts, the installation cannot be considered reliable until the source of the vibration problem is identified and fixed. In the event of repeated failures during the engine run-up check, record the values that are reported to be out of range for future reference.

The following are potential causes for a failure of the engine run-up check:

- Vibration motion of AHRS and/or GMU 11/44B caused by neighboring equipment and/or supports
- Mounting screws and other hardware for AHRS and/or GMU 11/44B are not firmly attached
- AHRS connector is not firmly attached to unit
- Wiring connected to the remotely mounted AHRS or GMU 11/44B is not firmly secured to supporting structure
- An engine/propeller is significantly out of balance
- GI 275 does not have up-to-date software
- A connector is inadequately torqued (loose connectors can affect the Acceleration and Gyro data very easily)
- Harnesses are inadequately secured (if there is a 'pre-load' from the harness or P/S lines, this can cause a specific axis to fail)
- Batteries are not properly installed with dampers
- Mounting hole and screws are not properly torqued (verify the seating of the GI 275)
- The panel mounting provisions are inadequate:
    - The panel thickness is inadequate
    - Adjacent instrumentation insecurely mounted (any external mounted items, such as an iPad attached to the panel, can result in issues)
    - Pull the power to any other instrument on the panel that might have a gyro, such as the Turn Coordinator

After the AHRS calibration is complete, the AHRS attitude and heading information displayed will become valid within 1 minute of power-up in Normal mode.

#### 5.13.1.6 Magnetic Interference Test

It is recommended to run the Magnetic Interference Test using the GI 275. Alternatively, the GMU 44 Location Survey Tool and a PC can be used in lieu of the GI 275 display. Refer to *AHRS/Magnetometer Installation Considerations* (P/N 190-01051-00).

During the survey test sequence, it is required to use a stopwatch or watch with a second hand to measure the time for turning equipment on and off.

Prepare the aircraft and GMU 11/44B for the location survey by completing the following steps:

1. Prepare a detailed Test Sequence List with start and stop times for exercising all aircraft components and devices that may affect the operation of the GMU through movement of ferrous metal parts or electrical inductance. Aircraft components included on the list will vary depending on aircraft model. An example survey sequence is provided in Table 5-2.
2. Position the aircraft in a magnetically quiet area. This step may involve repositioning large metal objects including aircraft and ground support equipment away from the survey area.
3. Before beginning the survey, ensure that all items listed on the test sequence are in their pre-exercise states (e.g., control surfaces neutral, lights off).

For dual AHRS installations, the following procedure must be performed on each AHRS through the display it is directly wired to. The test can be done simultaneously on each display. Follow the display prompts.

1. Power on the display(s) in Configuration mode.
2. Navigate to the test page (***Calibration/Test → Attitude/Heading → Interference Test***).
3. Complete the Before Calibration steps listed on the display; touch **Next** after completing each step to move to the next step.
4. Touch **Start** to start the procedure.
5. Perform each action on the Test Sequence List at its specified elapsed time and duration. This will help ensure correct identification of magnetic field deviation sources after the survey is complete.
6. Monitor the magnetic field deviation percentage throughout the survey. If deviation levels exceed thresholds, mark the survey sequence exercises during which these deviations occurred.
7. Touch **Done** when the test sequence is completed. The GI 275 will display a test Pass or Fail, the worst-case percentage of magnetic interference, and the time stamp at which it occurred.
8. Repeat the procedure for each installed AHRS unit if they were not completed simultaneously.
9. If the check passes, no further action is required.

If the check fails, the installation is considered unreliable until the source of magnetic interference is identified and fixed. The Magnetometer Interference Test must be repeated until passed. When the Magnetic Interference Test fails, record the three magnetometer maximum deviation values and their corresponding timestamps. A maximum deviation value greater than 5.0 mGauss in either the X or Y axes, or greater than 8.0 mGauss in the Z axis, indicates a problem that must be resolved. Compare the corresponding timestamps with the prepared test sequence to identify which action produced the failure. Contact Garmin Support for assistance.

Two common reasons for a failed Magnetic Interference Test are:

- Equipment, wiring, or ferro-magnetic items are installed too close to the magnetometer
- An electronic device has become grounded through the aircraft structure instead of the proper ground wire in a twisted shielded pair, especially if the ground return path through the aircraft structure passes near the GMU
- The Interference Test was not run for a long enough duration. At least 25 seconds are required for the test to properly complete

**Table 5-2 Example Magnetic Interference Test Sequence List**

**A/C Reg.:_____** **Survey data file name:_____**

| Elapsed Time (sec) | Elapsed Time (min:sec) | Action |
|---|---|---|
| 0 | 0:00 | Test begins (calibration period – no activity permitted) |
| 20 | 0:20 | Calibration period ends |
| 30 | 0:30 | Navigation lights on |
| 40 | 0:40 | Navigation lights off |
| 50 | 0:50 | Landing lights on |
| 60 | 1:00 | Landing lights off |
| 70 | 1:10 | Taxi lights on |
| 80 | 1:20 | Taxi lights off |
| 90 | 1:30 | Air conditioning on |
| 100 | 1:40 | Air conditioning off |
| 110 | 1:50 | Landing lights and taxi lights on |
| 120 | 2:00 | Landing lights and taxi lights off |
| 140 | 2:20 | Strobes on |
| 160 | 2:40 | Strobes off |
| 180 | 3:00 | Recognition lights on |
| 190 | 3:10 | Recognition lights off |
| 200 | 3:20 | Beacon on |
| 210 | 3:30 | Beacon off |
| 220 | 3:40 | AP engaged in a pitch and roll made (to engage servos) |
| 230 | 3:50 | AP disengaged |
| 240 | 4:00 | Pitot heat on |
| 250 | 4:10 | Pitot heat off |
| 260 | 4:20 | End of test |

### 5.13.1.7 Magnetometer Calibration

Use the compass rose or a calibrated magnetic sight compass to calibrate the magnetometer. Ensure the aircraft and compass is located away from magnetic buildings, materials, and other structures. The accuracy of the AHRS cannot be guaranteed if the calibration is not performed in an area that is free of metallic structure or objects. Refer to Section 5.13.1.1 for guidance in evaluating a site for magnetic disturbances.

**NOTE**

*The Pitch/Roll Offset Compensation Procedure in Section 5.13.1.3 must be completed prior to performing this procedure.*

Performing the Magnetometer Calibration removes any previously stored heading offset values. For multiple AHRS installations, the calibration can be done simultaneously using multiple displays.

1. Start the aircraft engine per the POH/RFM.
2. With all of the aircraft systems powered on and operating normally, position the aircraft on a compass rose at a heading of 360° (Magnetic North), or select a level and magnetically clean location and use a calibrated sight compass.
3. Power on the GI 275(s) in Configuration mode.
4. Navigate to the test page (***Calibration/Test → Attitude/Heading → Calibrate Magnetometer***).
5. Complete the Before Calibration steps listed on the display; touch **Next** after completing each step to move to the next step.
6. Touch the **Start** button when it becomes available to start the calibration procedure.
7. Follow the on-screen commands to complete the calibration.
8. Repeat the steps 4 - 7 for each installed AHRS unit if not completed simultaneously.

A successful heading calibration point is a full 18-second countdown followed by instruction to move. Due to the difficulties in executing smooth, accurate turns, the display may incorrectly interpret the approach heading point and instruct to “HOLD POSITION” prior to full completion of a 36° turn. If this condition is encountered, use outside references to complete the approximate 36° turn, instead of using the display instructions of when to complete the turn (use the compass rose radial to make the 36° (±5°) turn increments). Accurately completing each 36° heading point for the required time as instructed will result in a successful calibration.

Due to high winds or excessive airframe vibration, the operator may encounter a condition where the 18-second countdown is restarted without full completion of the previous countdown. If this is experienced more than once for a given heading point, the operator should begin turning to the next station (approximately 36°). A minimum of two successful heading points per quadrant is required. It may sometimes be required to hold at a station after a countdown restart. A maximum of 20 heading points are allowed for the entire calibration procedure. If too many countdown restarts are encountered, the calibration will fail with the message, “TOO MANY STATIONS”.

### 5.13.1.8 Compass Swing

After the Magnetometer Calibration Procedure is completed, a compass swing must be performed to verify the AHRS heading accuracy.

1. With all of the aircraft and avionics systems powered on and operating normally, position the aircraft on a compass rose at a heading 360° (Magnetic North) or select a level and magnetically clean location and use a calibrated sight compass.
2. With the GI 275 in Normal mode, hold the knob in to open the menu.
3. Navigate to the ***Units*** page (**System → Units**).
4. Toggle the Nav Angle field to *Magnetic*.
5. Close the menu.
6. Record the HDG value displayed on the display as indicated in Table 5-3.
7. Record the heading displayed on the standby compass and non-stabilized compass. Verify or correct the standby compass deviation card.
8. Calculate the heading errors by subtracting the displayed (B) value from the actual (A) value for each of the headings. If each heading displayed on the display (or display #1 and display #2) is at or within ±3° of the actual heading, no further adjustments are necessary. If one or more of the displayed heading values are outside this range, further calibration is needed.
9. If all calculated heading errors are between -5° and +5° inclusive, the heading offset procedure can be used for the Heading Offset Compensation Procedure. Proceed to Section 5.13.1.9.

**NOTE**

*If at least one Heading Error (A-B) is greater than 5°/less than –5°, DO NOT perform the Heading Offset Procedure in Section 5.13.1.9 until the GMU 44B installation has been physically corrected.*

10. If at least one Heading Error (A-B) is greater than 5°/less than -5°, calculate the average error by adding all errors and dividing by 12. This is the angle by which the GMU 11/44B must be physically rotated to correct the installation.
11. Modify the installation to rotate the GMU 11/44B by the amount calculated in the previous step. When looking down at the GMU 11/44B, rotate clockwise for positive values and counterclockwise for negative values.
12. After physically correcting the GMU 11/44B installation, repeat the procedures in Section 5.13.1.7 and Section 5.13.1.8.

**Table 5-3 Heading Verification AHRS**
**AHRS #1**

| Heading (A) | Displayed AHRS or AHRS #1 Heading (B) | Heading Error (A-B) | Standby Compass Heading |
|---|---|---|---|
| 360° (North) | | | |
| 30° | | | |
| 60° | | | |
| 90°(East) | | | |
| 120° | | | |
| 150° | | | |
| 180°(South) | | | |
| 210° | | | |
| 240° | | | |
| 270°(West) | | | |
| 300° | | | |
| 330° | | | |

**AHRS #2 (For Dual Installations Only)**

| Heading (A) | Displayed AHRS or AHRS #2 Heading (B) | Heading Error (A-B) | Standby Compass Heading |
|---|---|---|---|
| 360° (North) | | | |
| 30° | | | |
| 60° | | | |
| 90°(East) | | | |
| 120° | | | |
| 150° | | | |
| 180°(South) | | | |
| 210° | | | |
| 240° | | | |
| 270°(West) | | | |
| 300° | | | |
| 330° | | | |

#### 5.13.1.9 Heading Offset Compensation

The Heading Offset Compensation Procedure is not required if it was determined in Section 5.13.1.8 that all calculated heading errors are between -3° and +3° inclusive. It is recommended to perform the Heading Offset Compensation Procedure only if the calculated heading errors indicate a constant (i.e., same direction and same approximate magnitude) heading offset at all headings around the compass rose, not exceeding 5° in magnitude. Otherwise, physically correct the GMU 11/44B installation and repeat the Magnetometer Calibration Procedure.

**NOTE**

*If the Heading Offset Compensation Procedure must be performed on both AHRS #1 and AHRS #2, it is permitted to run the procedure below simultaneously on two displays.*

The Magnetometer Calibration Procedure must be performed before the Heading Offset Compensation Procedure. Performing the magnetometer calibration removes any stored heading offset values.

1. Start the aircraft engine in accordance with the aircraft AFM/POH.
2. Power the displays on in Configuration mode.
3. Touch **Heading Offset** from the Procedure menu (***Calibration/Test→ Attitude/Heading***).
4. Select the desired AHRS unit to calibrate from the AHRS Unit selection.
5. Complete the Before Calibration steps listed on the display; touch each step when complete so that a green check mark appears next to the selection.
6. Touch the **Calibrate** button when it becomes active to start the calibration procedure.
7. Follow the on-screen commands to complete the calibration.

### 5.13.2 Autopilot Calibration

If it becomes necessary to re-calibrate the autopilot, refer to the calibration procedure contained in *GI 275 Part 23 AML STC Installation Manual* (P/N 190-02246-10).

### 5.13.3 Analog NAV Calibration

If it becomes necessary to re-calibrate the Analog NAV, refer to the calibration procedure contained in Section 6 of the GI 275 installation manuals (refer to Table 1-1).

### 5.13.4 Fuel Level Calibration

If it becomes necessary to re-calibrate the fuel level, refer to the calibration procedure contained in the GI 275 installation manuals (refer to Table 1-1).

### 5.13.5 Backup Battery Check

This procedure will analyze the voltage and discharge qualities of the installed backup battery. The procedure is required to be completed on initial installation and every 12 calendar months when a backup battery is installed in the system. A fault indication message will be displayed in Normal mode until this procedure is completed.

**NOTE**

*The battery rundown test may take up to 150 minutes to complete.*

**NOTE**

*The battery rundown test date is reported in UTC.*

To complete the backup battery test, complete the following steps:

1. Power on each GI 275 with an installed backup battery in Configuration mode.
2. Navigate to the ***Backup Battery Test*** page (***Calibration/Test → Backup Battery Test***).
3. Touch the **Before Test Checklist** button.
4. Verify that "Discharging" is not displayed under Battery State.
5. Touch the **Test Date** button and enter the current date.
6. Complete the on-screen checklist. Touch each checklist item once completed. Once all checklist items have a green check mark, touch the **Back** button.
7. Touch the **Start Test** button and follow the on-screen commands.
8. The GI 275 will power off automatically when the test is completed.
9. Power on the GI 275(s) in Configuration mode and navigate to the ***Backup Battery Test*** page.
10. Touch the **Test Results** button and then **Rundown Test Results** button.
    a. The results are displayed the date the test was performed and how many minutes until the battery ran down.
11. For aircraft that are approved for flight over 25,000 feet, a rundown time of at least 60 minutes is required to be considered a PASS.

    For aircraft that are only approved for flight at 25,000 feet or less, a rundown time of at least 30 minutes is required to be considered a PASS.
12. If the test results were not a PASS as described in the previous step, the battery must be replaced using the procedure in Section 5.5.

### 5.13.6 Fuel

#### 5.13.6.1 Fuel Quantity Calibration

**NOTE**

*Recalibration of the fuel quantity gauges is required if a GEA 24 was replaced by a GEA 24B, or if a GEA 24B is replaced by a GEA 24.*

The Fuel Quantity Calibration is performed in Configuration mode (***EIS*** → ***Fuel*** → ***Quantity Cal*** or ***Calibration/Test*** → ***Fuel*** → ***Quantity Cal***). Ensure the settings on the ***Fuel*** page are configured.

**NOTE**

*GEA 24 units are wired to the fuel probes with resistors and use the "0-5V" configuration. GEA 24B units are wired directly using the "0-620 Ohm" configuration or wired with resistors using the "0-5V" configuration. If the GEA 24(B) was replaced, verify the applicable configuration is selected prior to calibration.*

This procedure is used to calibrate the GI 275 fuel quantity gauges. It begins with drained fuel tanks, then unusable fuel is added, and then fuel is added in specified quantities during the fueling process. Tank calibration takes time and cannot be interrupted once initiated. The Fuel Quantity Calibration procedure is not required to be performed immediately following the setup of the fuel quantity gauge; however, it must be completed before flight.

When determining the number of calibration points and amount of fuel to add at each, it is recommended to take the total usable fuel capacity of each tank and divide it by a number of points that results in an easily measurable amount of fuel to be added at each point (e.g., for a 24 GAL (of usable fuel) tank, divide 24 (gallons of usable fuel) by 6 (calibration points) to equal 4 (gallons of fuel to be added at each point). Take that number of points (6 in this example) and add 1 more for the unusable fuel (Point 1). So, a tank that holds 24 gallons of usable fuel could perform the calibration with 7 points, adding 4 gallons at each point after the unusable fuel is added in the first point.

#### 5.13.6.2 Required Information and Equipment

A calibrated/verified fueling system is required to add known quantities. The aircraft manufacturer's information for aircraft leveling requirements/procedures and the unusable fuel quantity is required.

Table 5-4 is used as a guide to calibrate the fuel quantity gauge(s). If the installation does not include auxillary tanks, set the Aux Tank field to *None*. Table 5-5 describes each of the settings during the calibration of the fuel quantity.

**Table 5-4 Fuel Page Settings**

| Setting | Options |
|---|---|
| Main Tank | Single Main<br>Left & Right |
| AUX Tank | None<br>Single AUX/Tip<br>Left & Right |
| AUX Label | AUX<br>Tip |
| Fuel Type | Avgas<br>Jet A<br>Jet B |
| Full Capacity | *Refer to AFM/POH* |
| Tab Capacity | *Refer to AFM/POH* |

**Table 5-5 Fuel Quantity Calibration Settings**

| Setting | Options | Notes |
|---|---|---|
| Gauge Max Main | Main Gauge Maximum<br>(0-2980 GAL) | Set to match the maximum range from the gauge being removed. This is configured on the ***EIS*** → ***Gauges*** → ***Fuel (Main)*** page. |
| Gauge Max AUX | AUX Gauge Maximum<br>(0-2980 GAL) | Set to match the maximum range from the gauge being removed. This is configured under the ***EIS*** → ***Gauges*** → ***Fuel (Aux)***. |
| Num Points | 5 to 16 points | The accuracy of the fuel quantity indication will increase with more calibration points. It is recommended to use at least the same number of points as graduations on the gauge being replaced. Refer to Section 5.13.6.1 for details. |
| Procedure | Single Main<br>Single AUX/Tip<br>Main L & R (Recom.)<br>AUX/Tip L & R (Recom.)<br>Main L<br>Main R<br>AUX/Tip L<br>AUX/Tip R | Main L & R and Aux/Tip L & R procedures alternate left then right calibration points to keep the aircraft balanced. These are recommended if the aircraft has left and right tanks. The available options are dependent on “Main Tank” and “Aux Tank” settings on the ***Fuel*** page. |

#### 5.13.6.3 Fuel Quantity Calibration Procedure

Complete the following procedure using a calibrated fueling system:

1. Drain the fuel from the aircraft in accordance with the aircraft manufacturer's instructions.
2. Level the aircraft in accordance with the aircraft manufacturer's instructions.
3. Navigate to the ***Fuel*** page (***Calibration/Test → Fuel***).
4. Configure the fuel tank settings using Table 5-4.
5. Touch the **Quantity Cal** button.
6. Verify the Gauge Max Main and Gauge Max Aux settings are correct using Table 5-5.
7. Touch the **Check gauge max** button. A green checkmark will appear.
8. Touch the **Drain fuel** button if step 1 was completed. A green checkmark will appear.
9. Touch the **Level aircraft** button if step 2 was completed. A green checkmark will appear.
10. Touch the **Num Points** button and enter the number of calibration points to be performed. Refer to Table 5-5 and Section 5.13.6.1 for guidance in determining the number of calibration points.
11. Touch the **Select num points** button. A green checkmark will appear.
12. Touch the Procedure button and select the procedure using Table 5-5.
13. Touch the **Select procedure** button. A green checkmark will appear.
14. When all steps are checked, the **Begin** button will be available. Touch it to begin.
15. Add the amount of unusable fuel determined from the aircraft manufacturer or other approved data using a calibrated/verified fueling system.
16. Touch the corresponding button once the fuel has been added to check it off (refer to Figure 5-24).
17. Once the sensor readout has stabilized in the tenths place, touch the corresponding button to check it off (refer to Figure 5-24).
    a. It may be required to manually vibrate the area near the fuel sensor to prevent the float from sticking and to improve the sensor response during each calibration point.
18. Touch the **Calibrate** button to set the first point with 0.0 GAL of usable fuel (i.e., tank only has the required amount of unusable fuel).
19. If the Left & Right procedure was selected, repeat steps 15 through 18 for the other tank.
20. Fill the indicated tank with the specified amount of usable fuel using a calibrated fueling system.
    a. The GI 275 will calculate an estimated amount of fuel to be added based on the number of calibration points and the gauge max.
    b. If more than the indicated amount of fuel was added, touch the **Add Fuel Amount** button and enter the actual amount of fuel that was added. The GI 275 will automatically compensate for the difference during the next calibration point for that tank.
21. Touch the corresponding button on the display once the fuel has been added to check it off.
22. Once the sensor readout has stabilized in the tenths place, touch the corresponding button.
23. Touch **Calibrate** to accept that value.
24. Repeat steps 20 through 23 for any other tanks included in the calibration and for each remaining calibration point.
    a. Touch the **View ( ) tank status** button at any point to view a graphical representation of the process (refer to Figure 5-25).
    b. Do not add more fuel than the maximum gauge range. The manual entry field will not allow more fuel than the maximum to be entered.

c. It is common for fuel tanks to hold more fuel than shown on the fuel indicator; however, the indicator will not show fuel above the maximum gauge range.

d. Some fuel tank designs can hold more fuel when the aircraft is not level, so the maximum gauge range may not be obtainable. Fill the tank as much as possible and enter the actual amount that was added. The final fill point must be within 10% of the gauge range (e.g., if the gauge range is 50 gallons, the final calibration point for that tank must fall between 45 and 50 gallons).

25. Repeat the Fuel Quantity Calibration for any remaining fuel tanks not included in this calibration (e.g., auxillary tank).


**Figure 5-24 Fuel Quantity Calibration Page**

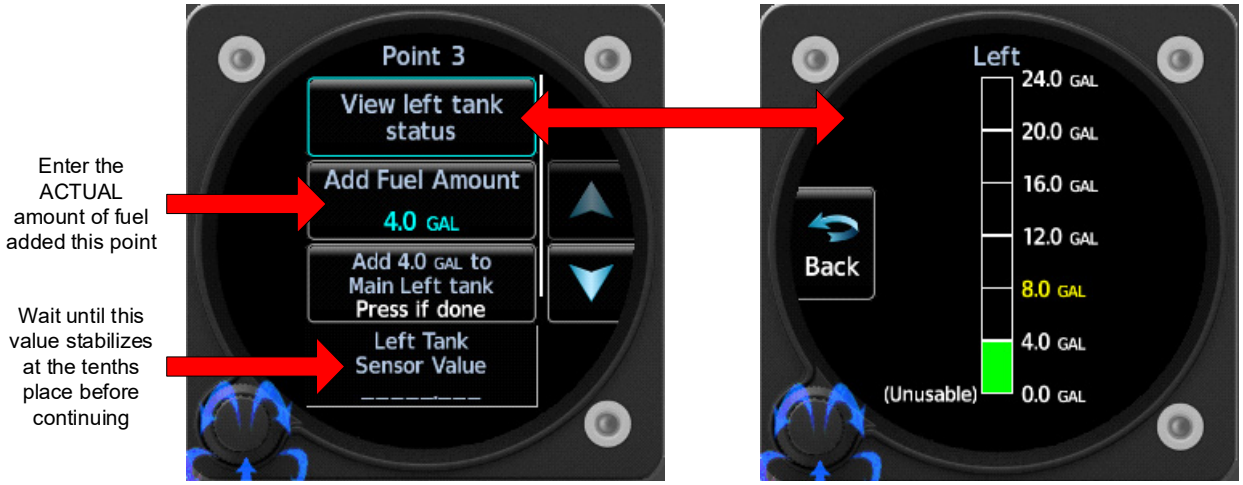



**Figure 5-25 Fuel Quantity Calculation Procedure**

**NOTE**

*It is recommended that the display configuration be saved to a USB drive immediately after the Fuel Quantity Calibration is completed.*

## 5.14 Uploading Software

The ***SW/Config*** page is used to update the software for the GI 275 and any LRUs directly interfaced to the GI 275. The approved software version and part numbers can be found in the most recent revision of *GI 275 Part 23 AML STC Equipment List* (P/N 005-01208-42). Ensure the Unit ID is properly configured prior to loading software to the GI 275. After loading software to the GI 275, configure all interfaced LRUs.

Software updates can be accomplished via USB using the following procedure:

1. Create a Software Loader Card using the latest software and instructions available on the Garmin Dealer Resource Center.
2. Power on all GI 275s in the system in Configuration mode.
3. Insert the USB drive into the USB dongle or GSB 15 (if installed). A USB icon should appear on the left of the display once the GI 275 has recognized the device. If the icon doesn't appear after 1 minute, remove the drive and re-insert it.
4. Navigate to the ***Loader Card*** page (***SW/Config → Loader Card***).
5. Select the applicable updates or touch the **Select All** button.
6. Touch **Update Packages ( )** and then **Begin Update**. A restart is required when completed.

## 5.15 System Checks

Periodic system checks that do not require a Garmin dealer to perform are contained in this section. For complete system checkout procedures, refer to Section 6 of the GI 275 installation manuals (refer to Table 1-1).

### 5.15.1 Configuration Ground Check

The configuration ground check procedures are intended to verify that each LRU and interface in the GI 275 system has been properly configured. Steps not applicable to a particular installation may be skipped.

**NOTE**

*Throughout the configuration ground check section, references are made to particular functions and screens. If a function or screen is not available, ensure that the system has been configured correctly.*

The configuration ground checks must be performed on every GI 275. Before starting the configuration mode checkout, the following conditions must be met:

1. All GI 275 displays in the system must be powered on in Configuration mode.
2. All system LRUs must be powered on.
3. All installed LRUs must be configured per the printed configuration log contained in Section 5.

#### 5.15.1.1 LRU Status check

The ***System Info*** page contains the ***Devices Online*** page, which reports the status of installed LRUs. The icon next to each LRU reports one of three colored symbols to indicate the status of each LRU, as described in Table 5-6. Verify that all LRUs connected or configured to each display have a green checkmark indicator.

**Table 5-6 LRU Status Indicators**

| Status Color | LRU Condition |
|---|---|
| Green Checkmark | The LRU is online. No faults are detected. |
| Yellow Question Mark | The LRU is configured but not sending any data. |
| Red X | The LRU is online. A fault, warning, and/or error is detected. |
| (Empty) | The LRU is not configured. |

#### 5.15.1.2 Device Info

The ***Device Info*** page (***System Info*** → ***Device Info***) provides information for each configured LRU as part of the GI 275 system.

1. Touch the **Device** button and select an interfaced LRU.
2. Verify that all software versions are up-to-date for the interfaced LRU.
3. Repeat steps 1 and 2 for each interfaced LRU.

### 5.15.2 Pitot-Static and Airspeed Tape Settings Checks

The following section verifies the correct operation of the GI 275 altitude and airspeed tapes, standby altimeter, and standby airspeed indicator using a pitot-static ramp tester. When using a pitot-static ramp tester, only simulate normal aircraft operating conditions as defined in the aircraft Type Data (POH/AFM) or other approved STC to avoid component damage.

**NOTE**

*The ADC may require a warm-up period of 15 minutes to reach full accuracy; however, 30 minutes may be required if the environmental temperature is below 0º C.*

The GI 275 airspeed tape display and settings must be verified using the procedures in Section 5.15.2.1 or Section 5.15.2.2 depending on the airspeed tape configuration (Basic or Advanced, respectively). The airspeeds referenced in the following steps must match those shown in the printed configuration log.

#### 5.15.2.1 Basic Airspeed Tape Setting

If the airspeed Configuration Type is set to *Basic* (***Setup → Airframe Config → Airspeed Configuration***), verify correct operation of the internal ADAHRS as follows:

**NOTE**

*If the internal ADAHRS and standby airspeed indicator are on separate pitot-static systems, it is recommended to set up the test set so that both systems can be tested at the same time, or separate tests must be completed for each system.*

1. Power on the GI 275 system in Normal mode.
2. Using a pitot-static test set, increase the airspeed until the ADI airspeed tape pointer is at the bottom of the white band (Vs0).
3. Verify that the bottom of the white arc/band on the standby ASI and ADI airspeed tape are at the same airspeed value.
4. **For twin-engine aircraft with a minimum control speed:** Increase the airspeed to the lower red radial (Vmca). Verify that the red radial on the standby ASI and ADI airspeed tape are at the same airspeed value.
5. Change the airspeed until the ADI airspeed tape pointer is at the bottom of the green band (Vs1).
6. Verify that the bottom of the green arc/band on the standby ASI and ADI airspeed tape are at the same airspeed value.
7. **For twin-engine aircraft only:** Increase the airspeed to the blue radial (Vyse). Verify that the blue radial on the standby ASI and ADI airspeed tape are at the same airspeed value.
8. Change the airspeed until the ADI airspeed tape pointer is at the top of the white band (Vfe).
9. Verify that the top of the white arc/band on the standby ASI and ADI airspeed tape are at the same airspeed value.
10. Change the airspeed until the ADI airspeed tape pointer is at the top of the green band/bottom of the yellow band (Vno).
11. Verify that the top of the green arc/band on the standby ASI and ADI airspeed tape are at the same airspeed value.
12. Increase the airspeed to the upper red radial/top of yellow arc (Vne).
13. Verify that the red radial on the standby ASI and ADI airspeed tape are at the same airspeed value.

14. Starting at the current airspeed, decrease the airspeed to zero, stopping at each of the airspeeds listed in Table 5-7 (airspeeds above Vne should not be checked), verifying that the ADI and standby ASI airspeed values are within the tolerances indicated in Table 5-7.

**Table 5-7 Airspeed Test Points**

| Test Set Airspeed (kt) | PFD Allowed Tolerance (kt) |
|---|---|
| 50 | ±5.0 |
| 80 | ±3.5 |
| 100 | ±2.0 |
| 120 | ±2.0 |
| 150 | ±2.0 |
| 180 | ±2.0 |
| 210 | ±2.0 |
| 250 | ±2.0 |
| 290 | ±3.0 |

### 5.15.2.2 Advanced Airspeed Tape Setting

If the Configuration Type is set to *Advanced*, verify correct operation of the internal ADAHRS as follows:

**NOTE**

*If the internal ADAHRS and standby airspeed indicator are on separate pitot-static systems, it is recommended to set up the test set so that both systems can be tested at the same time, or separate tests must be completed for each system.*

1. Power on the GI 275 system in Normal mode.
2. Using a pitot-static test set, increase the airspeed until the ADI airspeed tape pointer is at the bottom of the white band (Vs0).
3. Verify that the bottom of the white arc/band on the standby ASI and ADI airspeed tape are at the same airspeed value.
4. Increase the IAS throughout the range of the ASI – stop at the limits of all Arc Ranges, and at all Marking values configured per the instructions in Table 5-8 and Table 5-9 and listed in the printed configuration log.
5. Verify that the ranges and markings on the standby ASI and ADI are located at the same airspeed values. The last value verified should be the beginning of the barber pole (Vne/Vmo/Mmo).
6. The following applies to Variable Vne/Vmo/Mmo aircraft only:
   a. Decrease the IAS to 25 knots below the barber pole on the ADI. Increase the indicated altitude to the maximum operating altitude or service ceiling. Verify that the barber pole on the ADI and standby ASI are at the same airspeed (±5 kt). Decrease the airspeed as needed to ensure the IAS does not exceed the barber pole during the simulated climb.
   b. Decrease the indicated altitude (do not exceed vertical speed limitations) back to ambient static pressure.
7. Starting at the current airspeed, decrease the airspeed to zero, stopping at all of the relevant airspeeds listed in Table 5-7 (airspeeds above Vne should not be checked). Verify that the ADI and standby ASI values are within the tolerances indicated.

**Table 5-8 Advanced Airframe Specific Configuration Data – Arc Ranges**

| Arc Color | Description | POH/AFM Section | Notes |
|---|---|---|---|
| RED (LOW SPEED) | Low speed awareness | 2 - Limitations | If the aircraft has a defined WHITE or GREEN arc, set the RED arc to *ON*. Set the MAX value of the RED arc to the lowest value of the WHITE or GREEN arc (Vs0). A RED low-speed awareness arc will appear below the lowest marked stall speed.<br>If the aircraft does not have defined white or green arc, set the red arc to *OFF*, and enter the lowest stall speed in the STALL SPEED setting at the bottom of the page. |
| WHITE | Full flap operational range | 2 - Limitations | Set the Min value to the bottom of the POH/ AFM defined range.<br>If WHITE and GREEN arcs overlap, set the Max value to the beginning of the WHITE/ GREEN arc.<br>If WHITE and GREEN arcs do not overlap, set the Max value to the top of the POH/ AFM or aircraft specification defined range.<br>If a WHITE arc is not defined by the AFM/ POH or aircraft specifications, set both the Min and Max values to the aircraft stall speed in the landing configuration (Vs0). This setting will not display a white arc, but the system needs it to characterize aircraft performance. |
| HALF WHITE | Standard operational range | 2 - Limitations | If the HALF WHITE arc range is not defined by the AFM/POH or aircraft specification, set to *OFF*.<br>This may sometimes be called a “narrow WHITE arc”. |
| WHITE/ GREEN | Overlap between standard operational and flaps operational ranges | 2 - Limitations | If a WHITE/GREEN arc is not defined by the AFM/POH or aircraft specification, set to *OFF*.<br>If WHITE and GREEN arcs overlap, configure to the range they overlap within. |
| GREEN | Standard operational range | 2 - Limitations | If the GREEN arc is not defined by the AFM/POH or aircraft specification, set to *OFF*.<br>If WHITE and GREEN arcs overlap, set Min value to the Max of WHITE/GREEN.<br>If the YELLOW arc is defined, set to the Min of the YELLOW arc (Vno).<br>If the YELLOW arc is **not** defined, set Max value to Vno/Vne. |

| Arc Color | Description | POH/AFM Section | Notes |
|---|---|---|---|
| YELLOW | Caution / smooth air operational range | 2 - Limitations | If the YELLOW arc is defined by the AFM/ POH or aircraft specification, set to *ON* with Min value equal to Maximum structural speed (Vno). Max value should be configured to Vne, or the highest value of Vne if variable.<br>If the YELLOW arc is not defined, set to *OFF*. |
| Vne/Vmo/Mmo | Never exceed speed/ max operating speed/ max operating mach number | 2 - Limitations | If defined as a fixed value, set to *Fixed*, and enter POH/AFM defined Vne/Vmo as the Min value.<br>If variable with altitude, set to *Variable*, and set overspeeds in accordance with Appendix E in *GI 275 Part 23 AML STC Installation Manual*. |

**Table 5-9 Advanced Airframe Specific Configuration Data – Markings**

| Marking | Description | POH/AFM Section | Note |
|---|---|---|---|
| Vle | Maximum landing gear extended speed | 2 - Limitations | Set to *OFF* for fixed gear aircraft. |
| BLUE BAR | Typically marks the single engine best rate-of-climb speed for a twin-engine aircraft | 3 - Emergency Procedures | Blue radial on ASI of light twins.<br>Set to *OFF* for single-engine aircraft. |
| RED BAR | Typically marks the minimum controllable airspeed for twin-engine aircraft with only one engine operational (Vmca) | 3 - Emergency Procedures | Lower red radial on ASI of light twins.Set to *OFF* for single-engine aircraft. |
| RED/WHITE BAR | Varies – sometimes used as a fixed point Vne marking | 2 - Limitations | If a fixed RED/WHITE bar, (not a barber pole) is shown in the POH/AFM, set to given value. Else, set to *OFF*. |
| WHITE TRIANGLE | A small white triangle – meaning varies by airframe | 2 - Limitations | If defined in POH/AFM, set to given value. Else, set to *OFF*. |

#### 5.15.2.3 Altimeter Check

The GI 275 standby altitude displays must be verified per Title 14 of the CFR 91.411 and Part 43 Appendix E, with the following exception to 14 CFR Part 43 Appendix E, paragraph (b)(1):

- The tests of sub-paragraphs (iv) (Friction) and (vi) (Barometric Scale Error) are not applicable to the GI 275 due to the internal ADAHRS interface and instrument display being digital

#### 5.15.2.4 Calibrate Static Pressure

This procedure is used to perform an altimeter calibration, if required.

The Static Pressure Calibration requires the use of a pressure control system (test set) with an altitude accuracy of at least ±5 feet at sea level and ±20 feet at 30,000 feet. It is necessary to re-calibrate to sea level (0 feet), 10,000 feet, 20,000 feet, and optionally to 30,000 feet. The calibration is allowed to be finished after the 20,000 feet calibration if the aircraft operational ceiling is below 20,000 feet.

**CAUTION**

*To avoid damaging the GI 275 pressure sensors, both the pitot and static ports must be connected to the test set.*

**CAUTION**

*Prior to performing the Calibrate Static Pressure procedure, perform a Static System Leak Test in accordance with 14 CFR Part 43 Appendix E.*

1. Navigate to the ***Calibrate Static Pressure*** page (***Calibration/Test*** → ***Attitude/Heading*** → ***Calibrate Static Pressure***).
2. Ensure the on-screen instructions have been followed. Touch the **OK/Next/Start** buttons to continue to the next screen.
3. At each calibration point, the display will indicate the pressure altitude to set (e.g., "Set pressure to sea level"). Once the altitude is set, touch **Ready** to calibrate.
   a. During the calibration at each pressure, the pressure must be held constant for 30 seconds for the calibration step to be successful. The calibration may be canceled at any point should the test setup require adjustment before repeating.
4. Select **Done** when the calibration is successfully completed.

#### 5.15.2.5 Pitot-Static Leak Test

To perform the Pitot-Static Leak Test, follow the procedure outlined in the aircraft maintenance manual. AC 43-6D, Appendix E, is an acceptable means of compliance when no other manufacturer data is available.

The Pitot-Static Leak Test must be performed after disconnecting and re-connecting any system fitting.

### 5.15.3 OAT Checks

#### 5.15.3.1 ADI OAT Check

1. Power on all GI 275s in the system in Normal mode.
2. On the ***ADI*** page, navigate to the Misc. Field options (**Menu → ADI Options → Misc. Field**).
3. Touch the button that displays temperature and select *OAT*. Touch the **OAT** button to enable it.
4. Exit the menu and verify that OAT is displayed in the bottom-left of the ***ADI*** page.

#### 5.15.3.2 MFD OAT Check

1. Power on all GI 275s in the system in Normal mode.
2. Navigate to the ***MFD Data*** page (**Menu → Select Page → MFD Data** or turn the outer knob).
3. Navigate to the MFD Data Options menu (**Menu → MFD Data Options**) and select the desired air temperature reference units page to match the type specified in the AFM/POH:
   a. **OAT (Static)** (static air temperature)
   b. **OAT (Total)** (total air temperature)
4. Verify the correct units (Celsius or Fahrenheit) and temperature reference (static or total) are displayed in the field.

### 5.15.4 Backup GPS Signal Check

This check is required for units configured as a Primary ADI, Standby ADI, HSI, and MFD (with the ***CDI*** page) **only** if the VFR GPS is enabled and the antenna installed.

1. Power on the GI 275 system in Normal mode and verify that the aircraft has an unobstructed view of the sky (or GPS repeater coverage).
2. Verify GPS1 and GPS2 (if equipped) are powered on.
3. Wait at least 5 minutes to allow GPS1, GPS2, and the VFR GPS to acquire a position.
4. Power off GPS1 and GPS2 (if equipped).
5. Verify message icon is annunciated on the top-left of the display.
6. Open the menu and touch **Messages (Msgs)**. Verify that the message “VFR GPS is being used” is present.
7. Verify ownship symbol is displayed on the map.

### 5.15.5 GSB 15 Connection Check

This check is required to test the connection if a GSB 15 is re-installed.

1. Power on all GI 275s in the system in Configuration mode.
2. Follow the Export Configuration procedure in Section 2.3.4 using the GSB 15.
3. When completed, remove the USB drive.
4. Insert a charging cable into the GSB 15 and connect it to a device. Ensure the device shows charging.

### 5.15.6 Engine Indication System (EIS) Checks

This section contains procedures to verify proper installation, operation, and gauge markings of the EIS. Begin with the engine off and at ambient temperature.

#### 5.15.6.1 Temperature Sensor Checks

This check applies to all temperature sensors interfaced to the EIS.

1. Power on each EIS display in Normal mode.
2. Navigate to the ***CHT/EGT*** page (**Menu → Select Page → CHT/EGT** or turn the outer knob).
3. Verify the temperatures being displayed are within ± 2°C of the ambient temperature.

**NOTE**

*If the engine has not had sufficient time to reach ambient temperature, it is necessary to verify each temperature source independently.*

4. Verify each CHT, EGT, TIT, and TIT2 (if installed) probe is wired to the corresponding cylinder number by applying heat to each sensor and monitoring the temperature rise on the EIS display.

**NOTE**

*If the temperature decreases when heat is applied, the wire polarity may be reversed.*

#### 5.15.6.2 EIS Gauge Layout and Marking Checks

1. Power on the GI 275 system in Normal mode.
2. Verify that no red or amber "X" marks are present on any EIS gauge.
3. Verify the gauges on each EIS display match the required layout per the POH/AFM.

**WARNING**

*Failure to properly configure the EIS gauges per the POH/AFM and other approved data could result in serious injury, damage to equipment, or death.*

##### 5.15.6.2.1 Manifold Pressure Sensor Check

In Normal mode, verify that the gauge reads ambient pressure ±1 inHg (inches of mercury).

**NOTE**

*Estimate the ambient pressure by subtracting 1 inHg for every 1,000 ft of field elevation from the current barometric pressure.*

##### 5.15.6.2.2 Oil Pressure Sensor Check

In Normal mode, verify that the gauge reads 0 ±1 psi.

#### 5.15.6.2.3 Fuel Pressure Sensor Check

1. In Normal mode, verify that the gauge reads 0 ±1 psi. It may be necessary to manipulate the throttle/mixture to reduce residual fuel pressure.
2. If installed, turn on the fuel boost pump and verify the fuel pressure increases. Turn off the boost pump.

#### 5.15.6.2.4 Tachometer Check

In Normal mode, verify that the gauge indicates 0 RPM.

#### 5.15.6.2.5 Fuel Quantity Check

1. In Normal mode, verify the indicated fuel quantities are accurate for each tank (Main and AUX).
2. Verify that the unusable fuel quantity established by the aircraft manufacturer is the zero reading and a red line is present at zero.

#### 5.15.6.2.6 Fuel Flow Sensor Check

In Normal mode, verify that the gauge reads 0 GPH.

#### 5.15.6.2.7 Shunt and Voltage Sensor Checks

1. In Normal mode, verify all intended gauges are available.
2. Verify that the gauge(s) show the correct aircraft voltage and amperage with the engine off.

**NOTE**

*An alternator load meter may indicate a small current if the alternator field is on.*

#### 5.15.6.2.8 OAT (EIS) Check

This check only applies to standalone GI 275 EIS units with an interfaced OAT sensor.

**NOTE**

*If the GI 275 EIS is interfaced to a PFD, the OAT sensor must be interfaced to that PFD and not to a GEA.*

1. In Normal mode, navigate to the ***AUX EIS*** page and touch a configurable field button.
2. Select *OAT(EIS)* and verify that the field displays the correct outside air temperature.

### 5.15.6.3 EIS Engine Run-up Checks

An Engine Run-up Check must be performed to ensure proper installation and configuration of the EIS sensors and gauges. Always follow engine start-up procedures as provided in the aircraft POH.

**CAUTION**

*If the engine indications are not within operating specifications shortly after starting, IMMEDIATELY shut down the engine and troubleshoot the problem. Failure to do so may cause engine damage.*

1. Obtain an optical tachometer to monitor propeller RPM.
2. Place the aircraft in an open and clear area appropriate for an extended engine run-up.
3. Follow the engine start-up procedure as outlined in the aircraft POH. Adhere to the required observations immediately following the start, such as oil pressure within 30 seconds.
4. For twin-engine aircraft, verify the appropriate engine gauges respond corresponding to the correct side (left/right or front/rear).
5. Verify the EIS RPM gauge(s) match the optical tachometer reading ±50 RPM.
6. Allow the engine to warm-up and oil temperature to increase to at least 100°F.
7. Verify the engine oil pressure gauge is reading within the green arc.
8. Verify the EIS RPM gauge matches the optical tachometer reading ±50 RPM during all phases of the engine run-up.
9. Verify the alternator load meter (if installed) and battery charge/discharge ammeter (if installed) indicate a positive load.
10. Perform individual magneto checks as specified by the aircraft POH. If the RPM does not drop as expected when switching from both magnetos to one, the P-lead, ignition switch wiring, or magneto timing is incorrect. Discontinue the test immediately and repair the ignition system.
11. Perform the engine pre-takeoff run-up checklist in accordance with the aircraft POH.
12. Verify all EIS readings are consistent with normal operation performance.
13. Verify all installed sensors and fittings are free of leaks.

### 5.15.6.4 EIS Annunciator Light Check

If an EIS annunciator(s) is installed, perform the following procedure:

1. In Configuration mode, navigate to the ***Discrete Outputs*** page (***Diagnostics → Discrete Outputs***).
2. Toggle the discrete labeled as “Engine Warning” to *Active* and verify that the red engine annunciator lamp illuminates. Toggle back to *Inactive*.
3. Toggle the discrete labeled as “Engine Caution” to *Active* and verify that the yellow engine annunciator lamp illuminates. Toggle back to *Inactive*.

**NOTE**

*For separate annunciators, if the annunciator lights do not illuminate, verify the lamp operation by pressing on the lens holder. If the lamp does not illuminate, inspect and/or replace the lamps and repeat the check.*

4. If the annunciator(s) do not illuminate, remove power from the aircraft and inspect the wiring.

# APPENDIX A INSTALLATION SPECIFIC INFORMATION

## A.1 General Information

Date:_____ /_____ /_____ By:_____

**AIRCRAFT**

AIRCRAFT YEAR: _____

AIRCRAFT MAKE: _____

AIRCRAFT MODEL: _____

AIRCRAFT SERIAL #: _____

AIRCRAFT REG. #: _____

| Installed System | | |
|---|---|---|
| ❑ GI 275 | | |
| ☑ GI 1 | ❑ Base ❑ ADAHRS ❑ ADAHRS+AP | ❑ ADI ❑ HSI ❑ MFD/Standby ADI ❑ HSI/Standby ADI ❑ MFD ❑ EIS |
| ❑ GI 2 | ❑ Base ❑ ADAHRS ❑ ADAHRS+AP | ❑ ADI ❑ HSI ❑ MFD/Standby ADI ❑ HSI/Standby ADI ❑ MFD ❑ EIS |
| ❑ GI 3 | ❑ Base ❑ ADAHRS ❑ ADAHRS+AP | ❑ ADI ❑ HSI ❑ MFD/Standby ADI ❑ HSI/Standby ADI ❑ MFD ❑ EIS |
| ❑ GI 4 | ❑ Base ❑ ADAHRS ❑ ADAHRS+AP | ❑ ADI ❑ HSI ❑ MFD/Standby ADI ❑ HSI/Standby ADI ❑ MFD ❑ EIS |
| ❑ GI 5 | ❑ Base ❑ ADAHRS ❑ ADAHRS+AP | ❑ ADI ❑ HSI ❑ MFD/Standby ADI ❑ HSI/Standby ADI ❑ MFD ❑ EIS |
| ❑ GI 6 | ❑ Base ❑ ADAHRS ❑ ADAHRS+AP | ❑ ADI ❑ HSI ❑ MFD/Standby ADI ❑ HSI/Standby ADI ❑ MFD ❑ EIS |

## A.2 LRU Information

For each unit included in the installation, record the LRU information in the table below.

| Unit | Part Number | Serial Number | Mod Level |
|---|---|---|---|
| GI 275 #1 | 011-04489- | | |
| GI 275 #2 | 011-04489- | | |
| GI 275 #3 | 011-04489- | | |
| GI 275 #4 | 011-04489- | | |
| GI 275 #5 | 011-04489- | | |
| GI 275 #6 | 011-04489- | | |
| GMU 11 #1 | 011-04349- | | |
| GMU 11 #2 | 011-04349- | | |
| GMU 44B #1 | 011-04201- | | |
| GMU 44B #2 | 011-04201- | | |
| GTP 59 #1 | 011-00978- | | |
| GTP 59 #2 | 011-00978- | | |
| VFR GPS Antenna | 011-04036- | | |
| GEA 24(B) #1 | 011-02848- | | |
| GEA 24(B) #2 | 011-02848- | | |
| GEA 110 #1 | 011-03454- | | |
| GEA 110 #2 | 011-03454- | | |
| Backup Battery | 011-04528- | | |
| GSB 15 | 011-04937- | | |

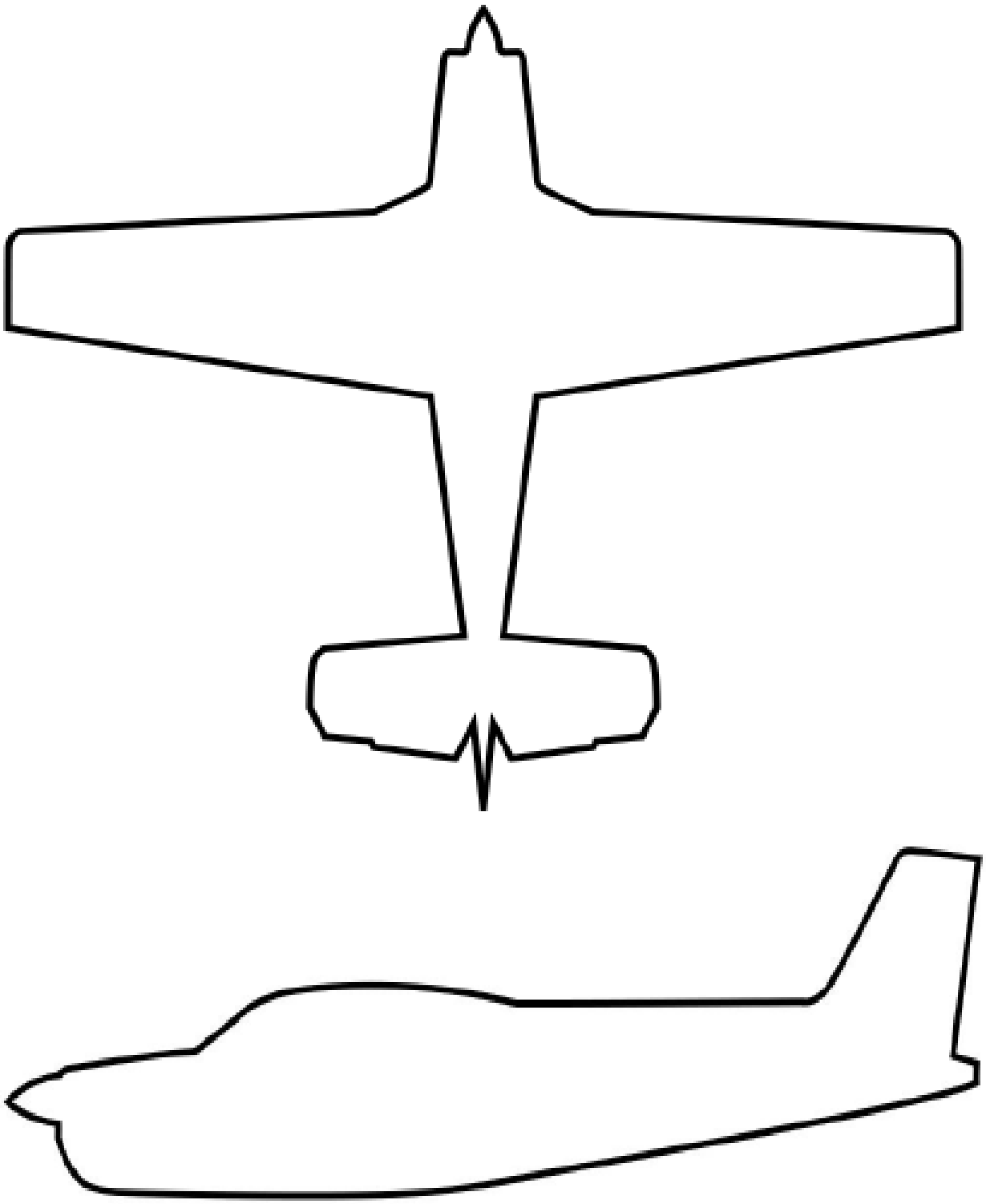
## A.3 Equipment Location

For each unit included in the installation, record the fuselage station and provide a brief description of the location.

| Unit | Station | Description of Location |
|---|---|---|
| GI 275 #1 | in. | |
| GI 275 #2 | in. | |
| GI 275 #3 | in. | |
| GI 275 #4 | in. | |
| GI 275 #5 | in. | |
| GI 275 #6 | in. | |
| GMU 11 #1 | in. | |
| GMU 11 #2 | in. | |
| GMU 44B #1 | in. | |
| GMU 44B #2 | in. | |
| GTP 59 #1 | in. | |
| GTP 59 #2 | in. | |
| GEA 24(B) #1 | in. | |
| GEA 24(B) #2 | In. | |
| GEA 110 #1 | in. | |
| GEA 110 #2 | in. | |
| Backup Batt | in. | |
| GSB 15 | in. | |

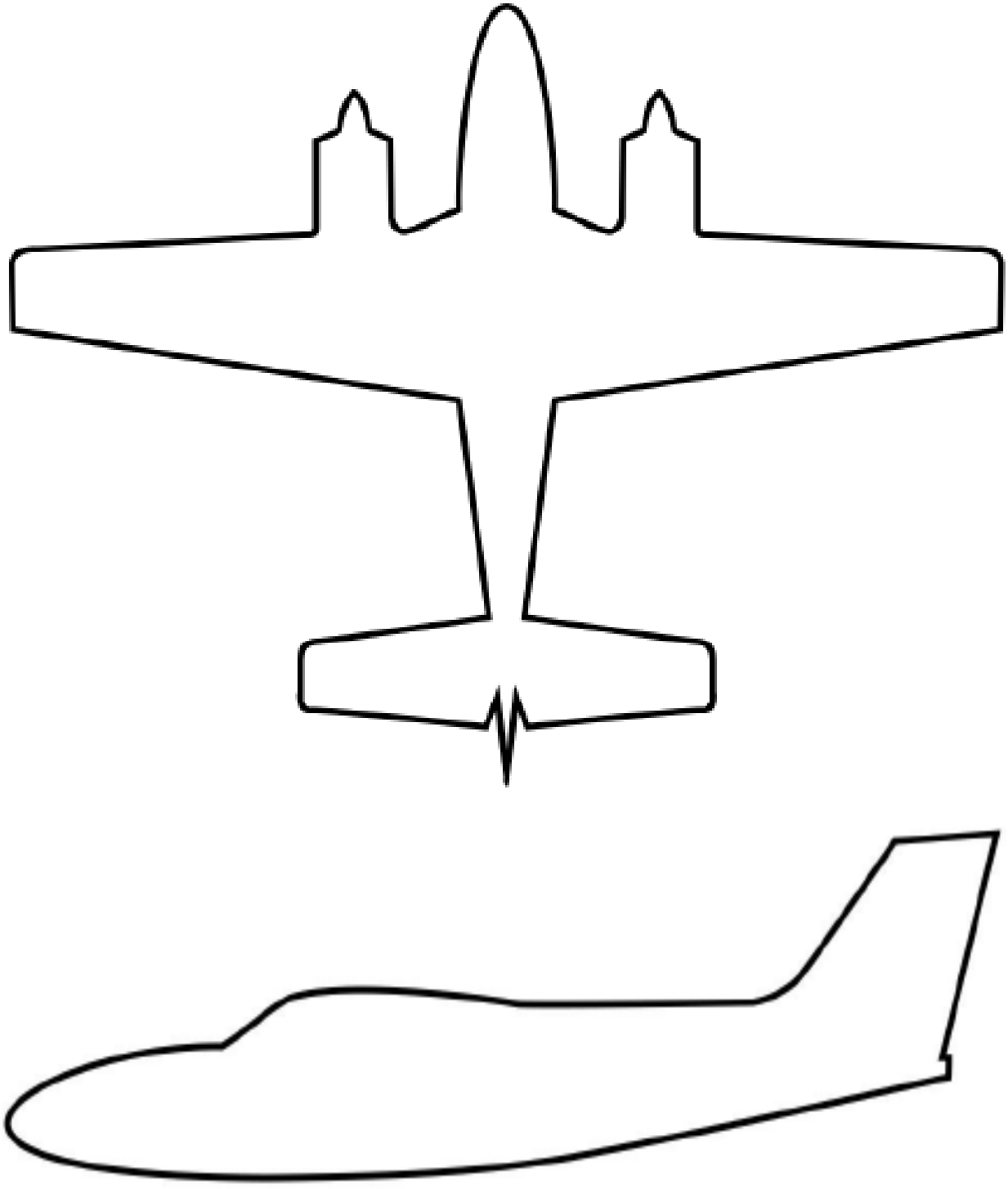
## A.4 Wire Routing - Single Engine

The following diagram depicts the wire routing for the GI 275 LRUs throughout the aircraft structure for a single-engine aircraft.



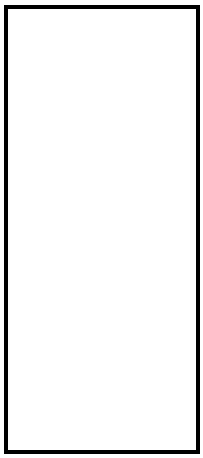
## A.5 Wire Routing - Twin Engine

The following diagram depicts the wire routing for the GI 275 LRUs throughout the aircraft structure for a twin-engine aircraft.



## A.6 Saved Configuration File

The GI 275 system configuration must be saved to a USB drive and placed with the permanent aircraft maintenance records. For instructions on saving the aircraft configuration file to a USB drive, refer to Section 2.3.4. It is recommended that the USB drive be taped or otherwise secured to this page in the location marked below.



**Aircraft Configuration USB Drive**

## A.7 Print Configuration Log

The GI 275 system configuration log must be printed out and included with the permanent aircraft maintenance records. To print the system configuration log, perform the following procedure:

1. Save the aircraft configuration file to a USB drive (refer to Section 2.3.4).
2. Insert the USB drive into a computer.
3. Open the USB drive main directory.
4. Navigate to the “summary” folder.
5. Open the file with the name you entered to save your aircraft configuration.
6. Print the configuration log.

**NOTE**

*It is recommended that the configuration log be attached to the back of this document for continuity and ease of use. It is required that the MM/ICA, USB drive, and configuration log be included in the permanent aircraft maintenance records.*

The configuration log printout contains configuration info for configured EIS gauges, including configured markings and gauge layout for each GI 275 displaying EIS gauges.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