GI 275

STC EIS & MFD
Installation Manual

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RECORD OF REVISIONS

Rev	Revision Date	Description
14	06/14/23	Added GEA 24B interface.
15	08/04/23	Updated software to v3.01.
16	02/01/24	Updated software to v3.10.

DESCRIPTION OF REVISION CHANGES

Section	Description
3.2.2	Updated CHT and EGT to allow for one probe per engine as well in Table 3-13 Available EIS Parameters.
3.4.2	Updated EGT/TIT and CHT section to include Single CHT/EGT configuration.
	Added example of twin-engine fuel quantity wiring.
4.6.7	Added instructions to install single CHT/EGT probes in same location as factory installed probes.
5.5.5	Corrected ARINC 429 speed settings.
5.6.1	Added Brightness Offset Configuration section.
5.6.4	Added Section 5.6.4 Unit Alerting Config.
5.7.1	Added Single EGT/CHT setting.
5.7.3.2	Added Note that the CHT/EGT page is not available when Single CHT/EGT is enabled.
5.14	Updated wireless connectivity instructions.
7.3	Directed to FlyGarmin.com for flight data and engine log resources.
Appendix B	Added Surefly Tach2 interface, Flag Note 23, and Flag Note 24, and clarified channels in Flag Note 2 for 4-cylinder, 6-cylinder, and single CHT/EGT configurations in Figure B-6 GEA 24(B) Sensor Interconnect.
C.1	Corrected CDI Key setting options for GTN 6XX/7XX.
C.12	Added Surefly Tach2 RPM sensor.
E.1	Added description of Single CHT/EGT configuration and updated Figure E-4 CHT/EGT Graph Examples to include example.
E.3	Added Note that CHT/EGT page is not available when GI 275 EIS is configured for Single CHT/EGT.

DEFINITIONS

WARNING
*A **Warning** means injury or death is possible.*

CAUTION
*A **Caution** means that damage to the equipment is possible.*

NOTE
*A **Note** provides additional information.*

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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.

Acronyms

A	
ADS-B	Automatic Dependent Surveillance - Broadcast
AFCS	Automatic Flight Control System
AFMS	Aircraft Flight Manual Supplement
AFM	Aircraft Flight Manual
AGL	Above Ground Level
ALT	Altitude
AML	Approved Model List
ASTM	American Society for Testing and Materials
C	
CDI	Course Deviation Indicator
CDT	Compressor Discharge Temperature
CFR	Code of Federal Regulation
CHT	Cylinder Head Temperature
CWS	Control Wheel Steering
D	
DC	Direct Current
E	
EAR	Export Administration Regulations
ECDI	Electronic Course Deviation Indicator
EFIS	Electronic Flight Instrument System
EGT	Exhaust Gas Temperature
EHSI	Electronic Horizontal Situation Indicator
EIS	Engine Indication System
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
F	
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FIS-B	Flight Information Services-Broadcast
FLTA	Forward Looking Terrain Avoidance
FOV	Field of View
G	
GDL	Garmin Data Link
GDU	Garmin Display Unit
GEA	Garmin Engine and Airframe
GMA	Garmin Marker/Audio

GNS	Garmin Navigation System
GNSS	Global Navigation Satellite System
GP	General Purpose
GPS	Global Positioning System
GPSS	Global Positioning System Steering
GPWS	Ground Proximity Warning System
GS	Glideslope
GSB	Garmin Serial Bus
GTN	Garmin Touchscreen Navigator
GTOW	Gross Takeoff Weight
GTS	Garmin Traffic System
GTX	Garmin Transponder
GWX	Garmin Weather Radar
H	
HSDB	High Speed Data Bus
HSI	Horizontal Situation Indicator
I	
IAT	Induction Air Temperature
IFR	Instrument Flight Rules
IGRF	International Geomagnetic Reference Field
ILS	Instrument Landing System
ISA	International Standard Atmosphere
L	
LCD	Liquid Crystal Display
LOC	Localizer
LRU	Line Replaceable Unit
M	
MFD	Multi-Function Display
N	
NAV	Navigator
O	
OEM	Original Equipment Manufacturer
P	
PFD	Primary Flight Display
P/N	Part Number
POH	Pilot’s Operating Handbook
R	
RAS	Remote Aircraft Status

RPM	Revolutions Per Minute
S	
SAE	Society of Automotive Engineers
SBAS	Satellite-Based Augmentation System
STC	Supplemental Type Certificate
SXM	Sirius XM
T	
TA	Traffic Advisory
TAS	Traffic Advisory System
TAWS	Terrain Awareness and Warning System
TC	Type Certificate
TCAD	Traffic Collision Avoidance Device
TCAS	Traffic Alert and Collision Avoidance System
TCDS	Type Certificate Data Sheet
TIS-B	Traffic Information Service - Broadcast
TIT	Turbine Inlet Temperature
TNC	Threaded Neill-Concelman
TSO	Technical Standard Order
U	
UTC	Universal Time Coordinated
V	
VHF	Very High Frequency
VFR	Visual Flight Rules
VLOC	VOR/Localizer
VOR	Very High Frequency Omni-directional Range
W	
WAAS	Wide Area Augmentation System

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1 GI 275 DESCRIPTION

This installation manual is intended for use by those authorized to perform maintenance and/or avionics installations on approved aircraft. This manual only approves the installation of the GI 275 Base (including backup battery and backup GPS antenna), GSB 15, and GEA 24(B) (including EIS annunciator(s) and engine sensors). Other compatible LRUs listed in Appendix C must use other installation approvals and may require installation and/or configuration by an authorized Garmin dealer per Garmin's installation policy. It includes installation data and checkout procedures for the GI 275 Multi-Function Instrument and refers to standards described in Title 14 CFR Part 43. Installation personnel must be familiar with the contents of this manual prior to performing modifications to the aircraft.

This manual can only be used to install the Base variant of the GI 275 as an MFD and/or EIS display(s) in Class I & II aircraft only. This manual cannot be used to install a GI 275 in aircraft considered to be Class III or IV.

Installations of a GI 275 ADAHRS unit or ADAHRS+AP unit must use *GI 275 Part 23 AML STC Installation Manual* (P/N 190-02246-10) for installation guidance.

Terms frequently used in this manual include:

- **GI 275**: Unless otherwise specified, refers equally to all variants of the GI 275.
- **Metal aircraft**: Aircraft with an aluminum (metallic) airframe, including exterior skin.
- References made to **HSDB** and **Ethernet** are used interchangeably.
- **Non-metal aircraft**: 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.
- **Primary EGT**: Exhaust gas temperature that is displayed independently from the exhaust gas temperature associated with each cylinder. This is typically a probe installed downstream in the exhaust to detect temperature from multiple cylinders. Used for EGT limitations in some aircraft.
- **X**: An "X" denotes variations of LRUs. Examples include:
  - "GTN 6XX" refers to the GTN 625/635/650.
- **( )**: Parenthesis denote an undetermined value. Examples include:
  - "GI ( )" refers to GI 1, GI 2, etc. depending on the context.
- 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 or turbine engine airplane with GTOW of 6,000 lbs or less.

  Refer to AC 23.1309-1E for more information on airplane classes.
- "GEA 24(B)" refers to both GEA 24 and GEA 24B. Specific references exclude the other variant.

1.1 STC Applicability

This manual defines aircraft modifications required to install the GI 275 Multi-Function Instrument under the GI 275 Part 23 AML STC. It is only applicable to aircraft models listed on the Approved Model List. Aircraft modifications per this STC involve the installation of components and LRUs specified in the STC Equipment List, which include sensors common for engine parameters. Installation of components and LRUs not included in the STC Equipment List require a separate airworthiness approval.

The GI 275 Multi-Function Instrument installed as an EIS display or MFD is approved for installation in Class I & II aircraft, with certain limitations; refer to Section 2.

Applicability of this STC for a particular aircraft must be verified before the modification based on the data contained in this manual. Some aircraft may have been modified or equipped with systems in which the GI 275 interface is not defined nor approved. The installer must make the final determination if this STC is applicable to a given aircraft.

The installation of the GI 275 Multi-Function Instrument in accordance with this STC is a major alteration to the aircraft. Following a major alteration, the aircraft must be returned to service in a means acceptable to the cognizant aviation authority. An example would be compliance with 14 CFR 43.9, 14 CFR 91.417, and submission of an FAA Form 337 “Major Repair and Alteration Airframe, Powerplant, Propeller, or Appliance” completed in accordance with AC43.9-1F *Instructions for Completion of FAA Form 337*.

Consistent with FAA Order 8110.4B and AC 21-40, a permission letter to use this STC data is available for download from the Garmin Dealer Resource Center.

1.2 System Overview

The GI 275 is a multi-function electronic instrument display capable of operating as a standalone display. It features a bright, sunlight readable, 3⅛-inch diameter color display that is sized to fit in a standard instrument cutout.

The GI 275 Multi-Function Instrument can be configured as the following indicator types:

- Multi-Function Display Indicator (MFD) functions shown in Section 1.2.2.1.
- Engine Instrument System Indicator (EIS) functions shown in Section 1.2.2.2.

The following dedicated pages are available on a GI 275 MFD:

- CDI (MFD only)
- HSI
- Stormscope
- Terrain
- Moving Map
- Radar Altimeter
- Traffic
- Weather
- Transponder

The GI 275 EIS uses the GEA 24(B) and sensors to replace various engine instruments and provide indication of engine parameters. For a single engine, a single GI 275 with multiple pages can be used; however, all primary alerting gauges must fit on the primary gauge page.

For twin-engine EIS, each engine must have a dedicated GEA 24(B) and each engine must have separate GI 275 indicators. Only one indicator is permitted per engine. If multiple indicators are needed to display all primary alerting gauges, then certain existing gauges must be retained instead.

EIS units may not share a GEA 24(B) interface with a G3X system. If using a GI 275 for EIS, then the EIS interface may only be connected and displayed on the GI 275 system, and may not be connected or displayed on a G3X system.

A typical modification to an aircraft instrument panel to install the GI 275 system is shown in Figure 1-1, which illustrates an MFD and EIS installation.

Figure 1-1 GI 275 System Installation (Before and After Example)

Additional information on the GI 275 system can be found in the Garmin documents listed in Table 1-1. Additional information on Garmin equipment that can be interfaced to the GI 275 system can be found in the Garmin documents listed in Table 1-2. Technical information applicable to the GI 275 system installation can be found in the public documents listed in Table 1-3.

Table 1-1 Garmin Manuals and References for GI 275 System

Document Title	Garmin P/N
GI 275 Part 23 AML STC Installation Manual	190-02246-10
GI 275 Part 23 AML STC Maintenance Manual/ICA	190-02246-11
GI 275 Part 23 AML STC Airplane Flight Manual Supplement	190-02246-12
GI 275 TSO Installation Manual	190-02246-00
GI 275 Pilot's Guide	190-02246-01
GSB 15 TSO Installation Manual	190-00303-A3
GEA 24 Installation Manual	190-00303-55

Table 1-2 Garmin Installation Manuals for Other Systems

Document Title	Garmin P/N
G500/G600 TXi Part 23 AML STC Installation Manual	190-01717-B3
G500/G600 Part 23 AML STC Installation Manual	190-00601-06
G3X Touch EFIS Part 23 AML STC Installation Manual	190-02472-01
GTN 6XX/7XX Part 23 AML STC Installation Manual	190-01007-A3
GTN Xi Part 23 AML STC Installation Manual	190-01007-C0
400W Series Installation Manual	190-00356-02
500W Series Installation Manual	190-00357-02
GNS 480 Installation Guide	190-00504-00
GTX 3XX Part 23 AML STC Installation Manual	190-00734-10
GTS 8X5 Part 23 AML STC Installation Manual	190-01279-00
GTS 8X0 / GPA 65 Installation Manual	190-00587-00
GDL 60 Part 23 AML STC Installation Manual	190-02525-10
GDL 69/69A Installation Manual	190-00355-02
GPS 175 Part 23 AML STC Installation Manual	190-02207-A1
GNX 375 Part 23 AML STC Installation Manual	190-02207-A4
GNC 355 Part 23 AML STC Installation Manual	190-02207-A5
GTR 225/GNC 255 TSO Installation Manual	190-01182-02
Garmin Pilot for iOS User's Guide	190-01501-00
Garmin Pilot for Android User's Guide	190-01532-00

Table 1-3 Technical References

Document Title	Document Number
FAA Advisory Circular, Powerplant Guide for Certification of Part 23 Airplanes and Airships	FAA AC 23-16A
FAA Advisory Circular, Installation of Electronic Display in Part 23 Airplanes	FAA AC 23.1311-1C
FAA Advisory Circular, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair	FAA AC 43.13-1B
FAA Advisory Circular, Acceptable Methods, Techniques, and Practices - Aircraft Alterations	FAA AC 43.13-2B
Aerospace Systems Electrical Bonding and Grounding for Electromagnetic Compatibility and Safety	SAE ARP1870
Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis	ASTM F2490-05

1.2.1 Model Specifics

The GI 275 Base unit has one 78-pin D-sub connector and is capable of functioning as an MFD or EIS unit. A backup battery can optionally be installed internally in a GI 275 Base configured as an MFD.

1.2.2 Functions

1.2.2.1 Multifunction Flight Display (MFD)

The GI 275 can function as a MFD with configurable pages to show information from other interfaced LRUs.

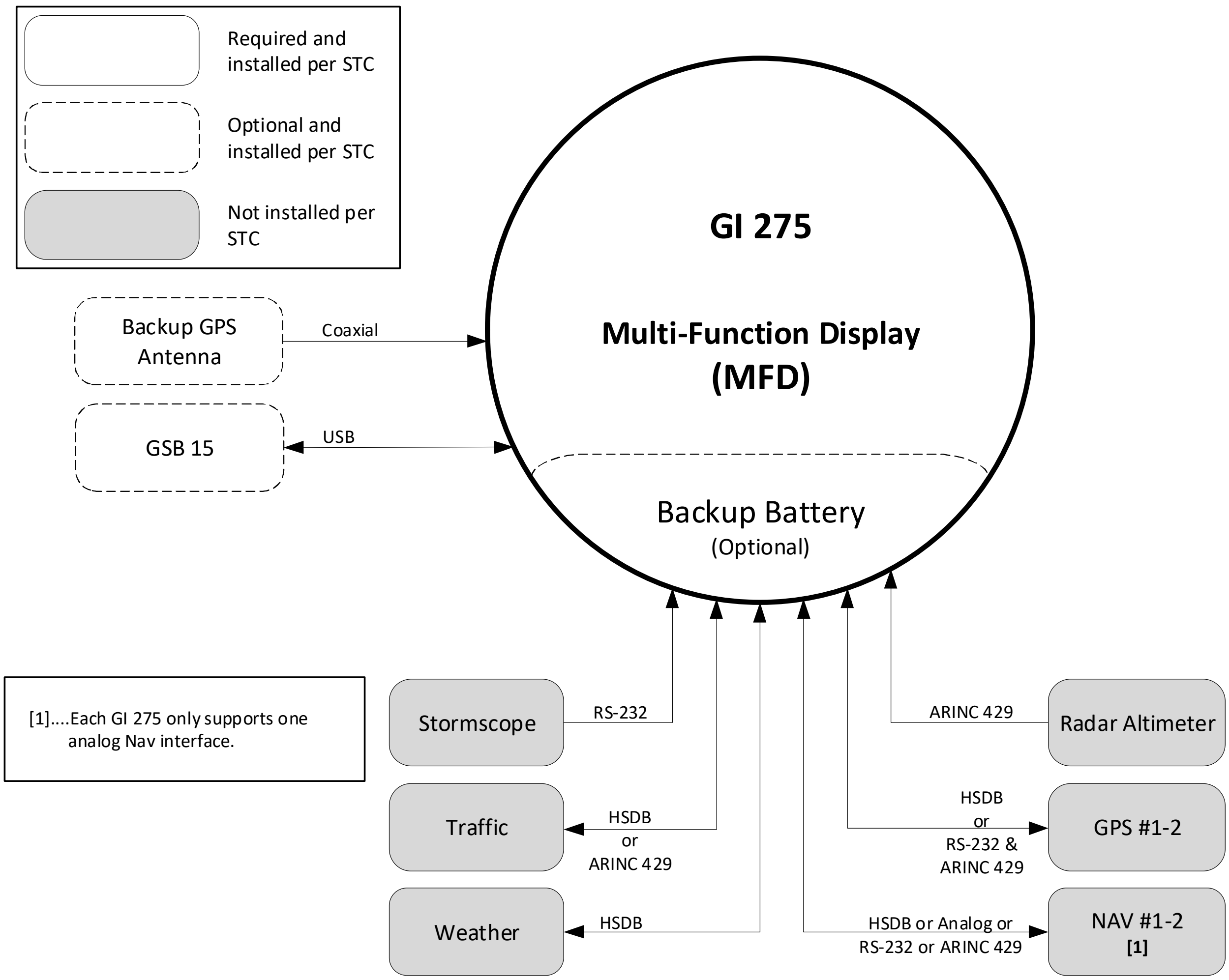


Figure 1-2 GI 275 Multi-Function Display Indicator

The following features are available on a GI 275 configured as an MFD:

- Configurable Multi-function Display (MFD).
- Electronic Course Deviation Display, ECDI with map underlay.
- MFD Data Display.
- Traffic (ADS-B, TCAS with control).
- Weather (FIS-B, SXM).
- Moving map with direct-to navigation, terrain traffic, and weather overlay.
- Query map items (limited to waypoint information).
- Nearest airport information.
- Terrain display.
- Direct-to nearest airport with internal GPS.
- Connext and LRU status.
- Radar altitude.
- Secondary EIS display.
- Transponder control (GTX 345 only).

The configurable MFD pages that show the above information can be independently enabled or disabled to show applicable data from connected LRUs, which include:

- CDI (requires GPS or NAV source).
- Traffic display (requires traffic source).
- Moving map with weather, terrain, and traffic overlays.
- MFD data page with waypoint information (requires GPS or NAV).
- Supplemental EIS display (only the ***Fuel*** page for installations with multiple primary EIS displays).
- Radar Altitude digital gauge display (requires radar altimeter).
- Transponder Control page (requires GTX 345 series transponder).

1.2.2.1.1 Standalone Course Deviation Indicator (CDI)

The Electronic Course Deviation Indicator provides a display for lateral and vertical deviations and is displayed on a GI 275 configured as an MFD.

NOTE

When the GI 275 is configured as a standalone CDI, the HSI and Enhanced HSI pages must be configured Off.

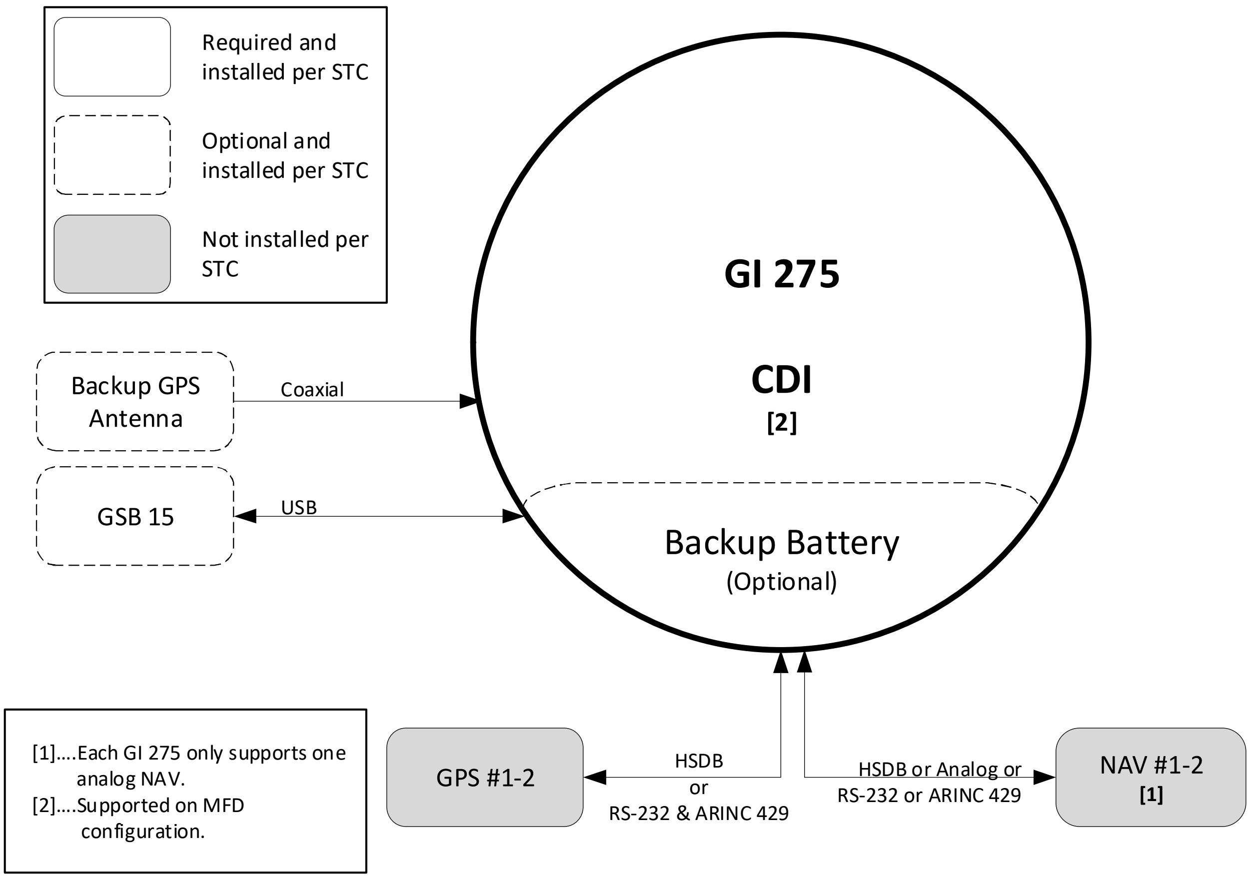


Figure 1-3 GI 275 Course Deviation Indicator

The following features are available on the ***CDI*** page on a GI 275 configured on as an MFD:

- Electronic Course Deviation Indicator.
- Direct-to nearest airport with internal GPS.
- Connext and LRU status.

1.2.2.2 Engine Indication System (EIS)

The GI 275 provides EIS display for four- and six-cylinder reciprocating engines. EIS does not include turbine engines. An EIS installation consists of one GEA 24(B) per engine and one GI 275 per engine.

The EIS display can drive caution and warning lights that may be required for installation when the indicator is not installed in the primary field-of-view.

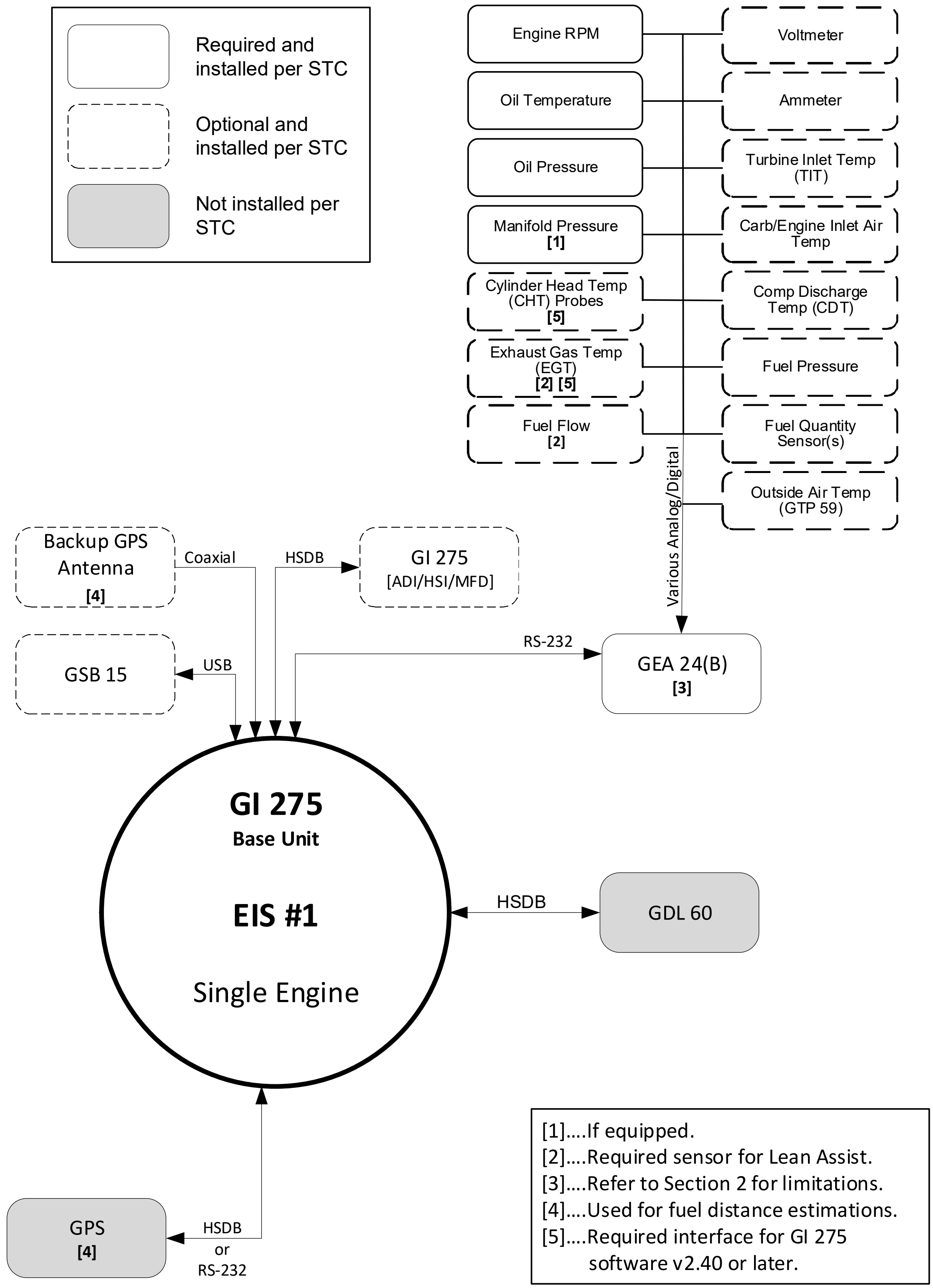
The EIS display collects powerplant data and utilizes an automatic monitoring system that interprets and reports the data to the pilot in the form of an alert. The crew can acknowledge the alert, which prompts the indicator to display page one, which contains the data parameter in question. This reduces the amount of information displayed at a given time to the crew, allowing the EIS indicator to work for the pilot by monitoring engine data and notifying the crew with an alert.

The EIS has the capability to configure up to five pages. Each configured parameter with alerting markings on page one is tied to an alert that will be displayed across the bottom of the screen when an exceedance occurs. Additionally, critical performance data is displayed on every page: fuel quantity, RPM, and if applicable, manifold pressure.

GI 275 with EIS offers three aircraft timers: Flight Hours, Hobbs Timer, and Tach Timer. Flight Hours accrue in-air, as the status is derived from weight-on-wheels, GPS speed, or engine RPM. The Hobbs Timer is activated by engine oil pressure (was Engine Time in software v2.11 or earlier). Tach Time (software v2.20 or later) accrues relative to engine cruise RPM.

In addition to this section, the following sections provide information that must be considered for EIS installations:

- Section 2.1.3 - EIS limitations.
- Section 3.2.2 - Minimum EIS requirements and available EIS gauges.
- Section 3.4.2 - Sensor selection criteria.
- Section 5.7.4.2 - Gauge markings and configuration requirements.
- Appendix Section C.12 - Approved sensor interface or installation, includes configuration.
- Appendix D - Model-Specific Info to determine if a Fuel Pressure Test is required.
- Appendix E - EIS gauge layouts.



[1]....If equipped.
[2]....Required sensor for Lean Assist.
[3]....Refer to Section 2 for limitations.
[4]....Used for fuel distance estimations.
[5]....Required interface for GI 275 software v2.40 or later.

Figure 1-4 GI 275 Single-Engine EIS Interfaces

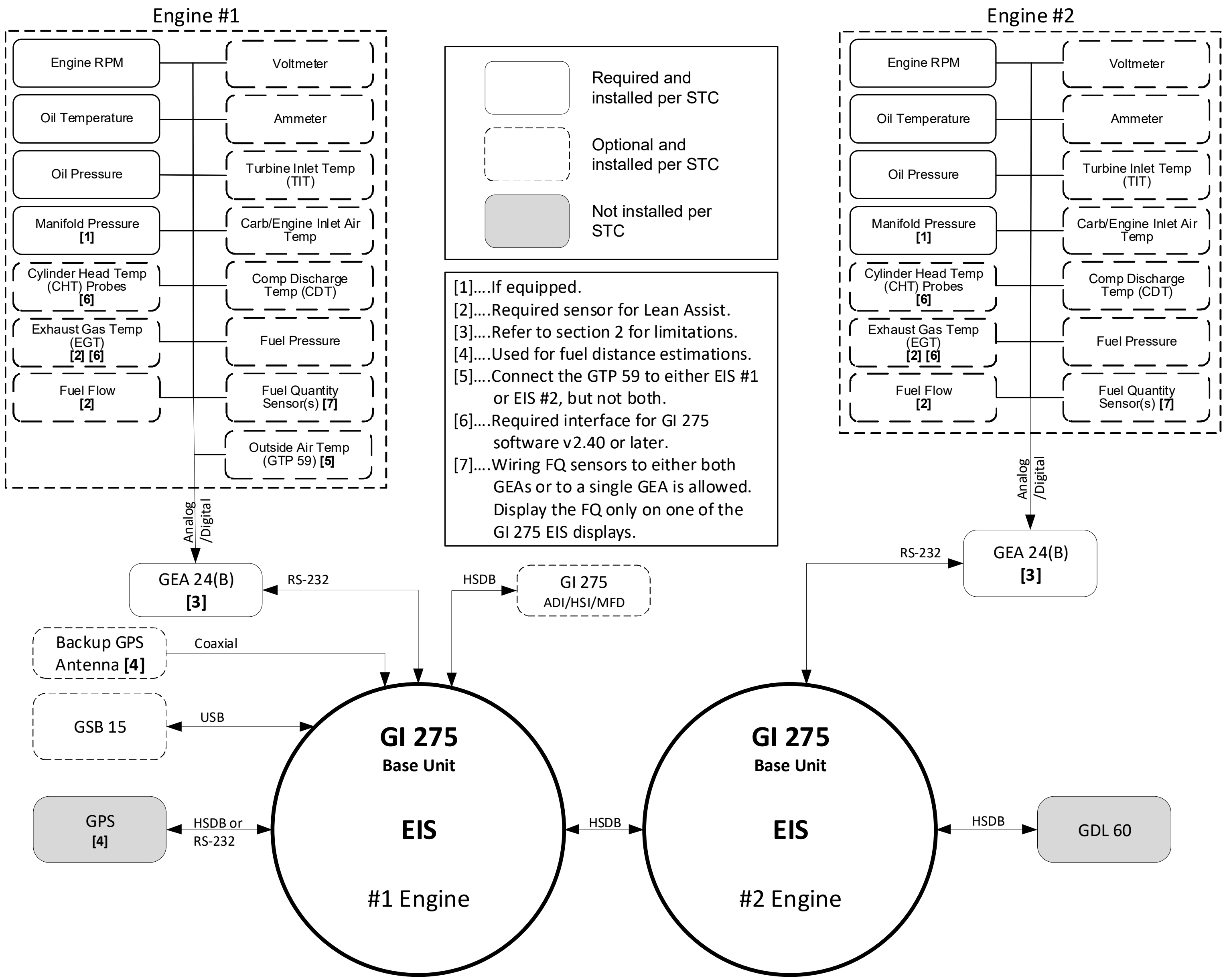


Figure 1-5 GI 275 Twin-Engine EIS Interfaces

1.2.2.3 Wireless Connectivity

With the Garmin Pilot application (iOS and Android) installed on a personal electronic device, users can update databases (refer to Section 5.14 for procedures), sync flight plans from an installed GPS 175, GNX 375, or GNC 355, log flight data, and review traffic, weather, and location data from externally connected LRUs. When paired to the GI 275, the Garmin D2 Delta Pilot watch can display key flight information, such as position, airspeed, and altitude.

NOTE

Updating databases is disabled in flight. Databases must be updated while the aircraft is on the ground.

NOTE

Visit flyGarmin.com to purchase flight databases. The GI 275 System ID is required when purchasing databases from Garmin. Refer to Section 5.3.2 for instructions on obtaining the System ID.

1.3 Equipment

Equipment installed by this STC is grouped into three categories:

1. Display Sensors
2. Engine Sensors
3. Other Equipment

1.3.1 Display Sensors

1.3.1.1 VFR GPS

The GI 275 contains a VFR GPS that can be used as a backup GPS or as a restricted primary GPS source.

NOTE

Credit is not taken for the GI 275 internal GPS for GPS navigation (NAV) in IFR flight; the equipment and operational requirements for IFR must be met by other navigation source(s) in the aircraft.

The VFR GPS will be capable of displaying moving map functions depicting ownship position, velocity, ground speed, ground track, traffic overlay, weather, Stormscope, and direct-to only functions in certain instances.

The internal VFR GPS interfaces to a glareshield-mounted GPS antenna, which can be used in the event of a failure of the primary GPS source or to provide VFR only situational information. Only one VFR GPS antenna is needed for all GI 275s. The GPS data will be used by the interfacing GI 275 and it will forward the data to any GI 275 configured to receive the data.

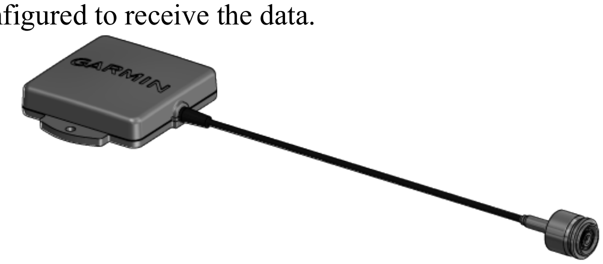


Figure 1-6 VFR GPS Antenna

1.3.1.2 GTP 59

The GTP 59 Outside Air Temperature (OAT) Probe is a remote-mounted sensor that interfaces to a GEA for OAT display. OAT is used to produce supplemental percent power for the powerplant on EIS units. When interfaced to a GEA, only Total Air Temperature (TAT) is displayed as “OAT (EIS)”.

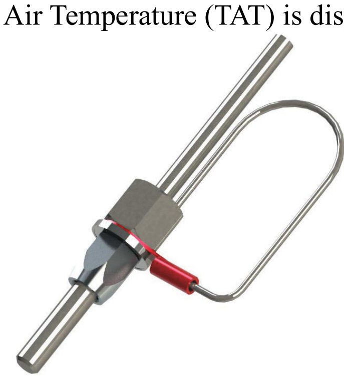


Figure 1-7 GTP 59 OAT Probe

1.3.2 Engine Sensors

Each engine requires a single GEA 24(B) adapter that is mounted remotely. Refer to Section 4.6.1 for installation instructions.

1.3.2.1 GEA 24(B) Engine Adapter

The GEA 24(B) is an engine interface and monitoring module that collects signals from the engine sensors and communicates the engine parameters to the GI 275 via RS-232. The GEA 24(B) is approved for single and multi-engine aircraft with a gross takeoff weight of 6000 lbs or less (i.e., Class I & II aircraft).

Figure 1-8 GEA 24(B) Engine Adapter (GEA 24 Shown; GEA 24B Similar)

1.3.2.2 EIS Annunciator

EIS annunciation can be provided by a single warning (red)/caution (amber) indicator (Figure 1-9) or separate warning and caution lamps (Figure 1-10), which is required for EIS installations when the EIS display is located outside the pilot's primary field-of-view. Refer to Section 4.3 for field-of-view requirements.

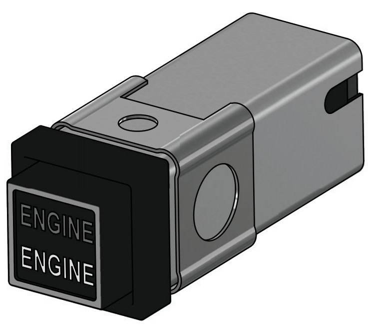


Figure 1-9 EIS Annunciator (Single)

Figure 1-10 EIS Annunciator (Separate)

1.3.2.3 Miscellaneous Engine Sensors

The **carburetor temperature probe** is a K-Type thermocouple.

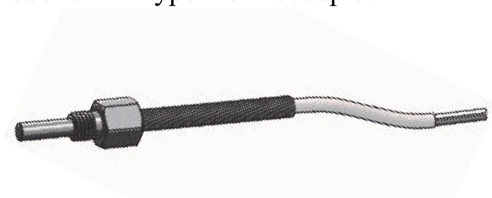


Figure 1-11 Carburetor Temperature Probe

The **oil temperature probe** is a K-Type thermocouple.

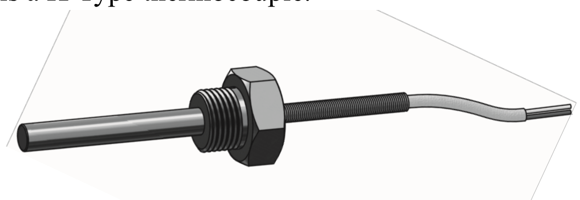


Figure 1-12 Oil Temperature Probe

There are two options for **fuel flow transducers**; refer to Section 3.4.2 for descriptions and restrictions. The fuel flow transducers are installed in-line with the engine fuel delivery system. The display of fuel flow under the GI 275 STC supports the following engines:

1. Fuel injected engines with and without the fuel servo return line (systems with return line will require two fuel flow transducers).
2. Carbureted engines with a fuel pump, without the carburetor return line, and with the carburetor return line (will require two fuel flow transducers).
3. Carbureted engines with gravity-fed fuel delivery system.

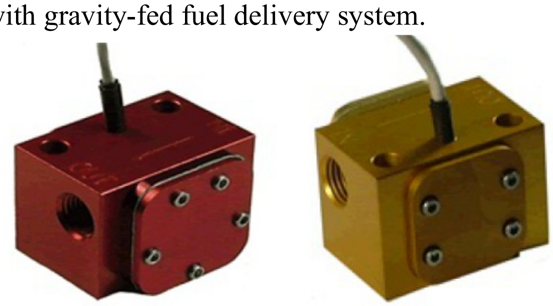


Figure 1-13 Fuel Flow Transducer FT-60 (Left) and FT-90 (Right)

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.

Refer to Section 3.2.2 and Section 3.4.2 for more information.

Figure 1-14 Pressure Sensors

1.3.3 Other Equipment

1.3.3.1 Backup Battery

The backup battery is a lithium-iron battery that is optional for MFD installations. The battery will power the essential display sensors for a minimum of 60 minutes. The battery is charged by the aircraft electrical system when not in use.

Figure 1-15 Backup Battery

1.3.3.2 GSB 15

The GSB 15 is an optional LRU that mounts into the instrument panel and provides two USB connections 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. A decorative cover can optionally be installed.

Figure 1-16 GSB 15 Variants
(Left: Dual Type-A, Center: Single Type-A/Single Type-C, Right: Dual Type-C)

1.4 System Architecture Example

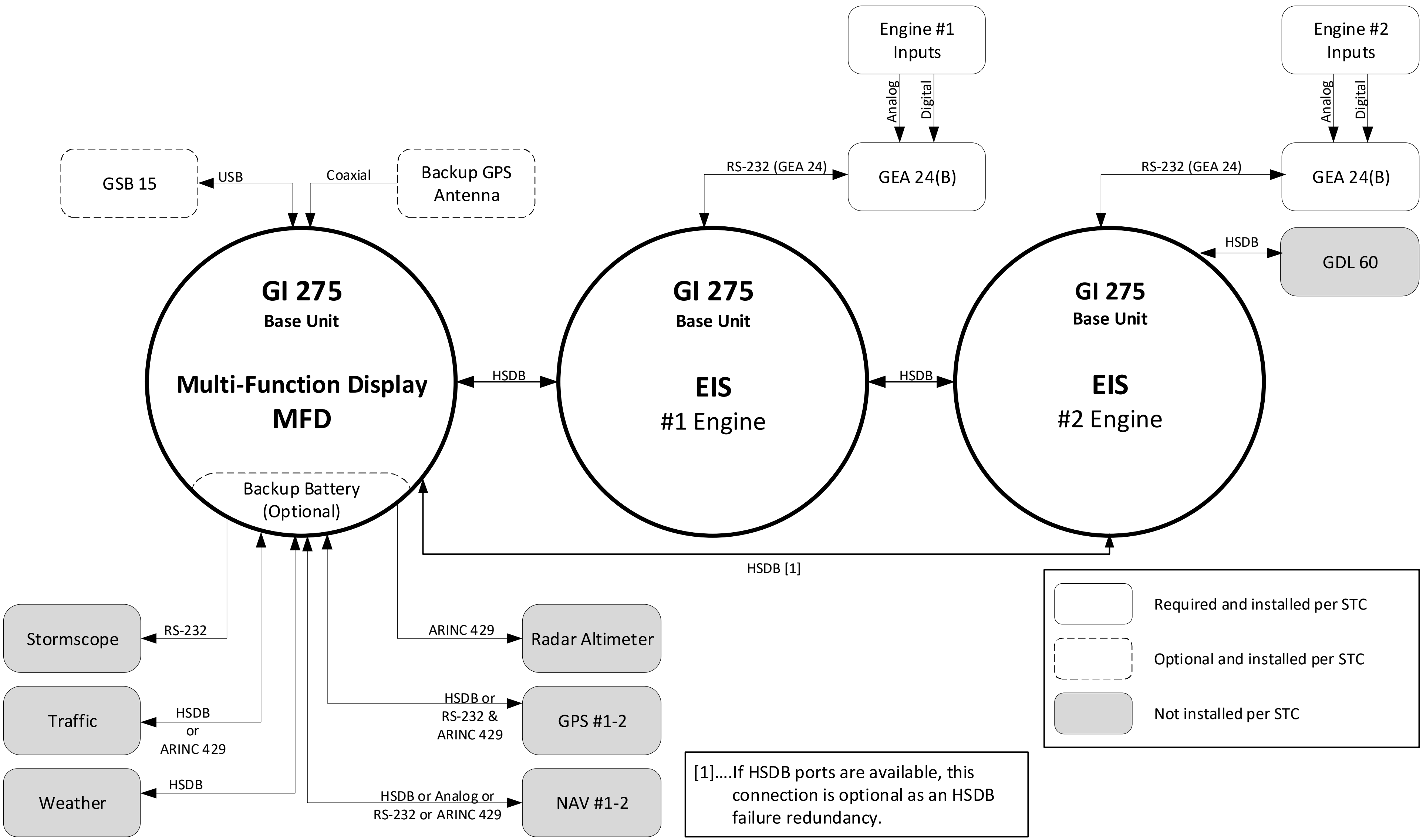


Figure 1-17 GI 275 MFD and EIS

2 LIMITATIONS

2.1 Installation Limitations

2.1.1 System

Only the equipment or aircraft systems with interface(s) approved by this STC can be connected to the GI 275. Installation of equipment that is not on the STC Equipment List but is interfaced to a GI 275 requires separate airworthiness approval.

Configuration and number of GI 275 displays installed under this STC is limited to a maximum of:

- Six displays total.
- Two EIS displays.

CAUTION

The total weight of new equipment installed in the instrument panel must not exceed the total weight of equipment removed from the panel, unless the total weight of all the equipment installed in the instrument panel is within the weight limits established by the aircraft manufacturer.

2.1.2 General Installation

The GI 275 is designed to replace existing 3⅛-inch gauges. Therefore, minimum modification of the panel will be necessary.

For GI 275 system components that are mounted outside the pressure vessel of pressurized aircraft, wires that penetrate the pressure vessel must use aircraft type design provisions such as spare pins in existing bulkhead connectors or existing cutouts in the aircraft pressure bulkheads. Substantiation for additional holes or cutouts in the aircraft pressure vessel are beyond the scope of the GI 275 AML STC and require separate airworthiness approval.

2.1.3 EIS

The existing engine gauges can be replaced by an EIS display only if the functionality, markings, and operational limits of the original gauges are capable of being replicated on the EIS display. The original gauge must not be removed if any operating parameter, marking, or annunciation required by aircraft type design, engine type design, or aircraft POH/AFM (or similar) cannot be replicated on the display or an appropriate placard cannot be installed.

GI 275 EIS is limited to one EIS display for single-engine aircraft and one EIS display **per engine** for twin-engine aircraft. In twin-engine aircraft with two GI 275 EIS displays and a GI 275 MFD, the ***Fuel*** page is the only EIS page approved to be displayed on the MFD. All other EIS pages must be disabled on the MFD.

EIS is only approved for air-cooled 4- and 6-cylinder reciprocating engine equipped aircraft. Select aircraft models on the AML have EIS limitations. Refer to notes in Table D-1.

All gauges with red and/or yellow markings, if intended to be replaced by a GI 275 EIS display, must be identically configured on the ***Main EIS*** page. In some cases, one GI 275 will not have enough available spaces for gauges on the Main EIS page. Any of the following cases will require the retention of the original gauge(s):

- Three or more of the following gauges have red or yellow marks: Fuel Flow, Fuel Pressure, CDT, IAT, Carb Temp, and CDT/IAT Diff.
- Two of the following gauges have red or yellow marks: Fuel Flow, Fuel Pressure, CDT, IAT, Carb Temp, and CDT/IAT Diff, and one of the following is true:

    - Dual Aux Fuel Tanks are configured and one or more electrical gauges have a red or yellow marking.
    - A Single Aux Fuel Tank is configured and two or more electrical gauges have a red or yellow marking.
- Three or more electrical gauges have a red or yellow marking.

The ***Main EIS*** page can display up to four strip gauges along with a CHT/EGT/TIT graph and two digital readout gauges. Refer to Section 5.7.4 and Appendix E for more information on gauge layout requirements.

If an oil temperature, oil pressure, or fuel pressure sensor is being replaced, the GI 275 sensor must use the same port(s) as the original sensor, unless otherwise specified.

The GI 275 EIS does not currently support aircraft with:

- Turbine engines.
- Radial engines.
- Engines with FADEC or electronic ignition systems.
- CDT, IAT, DIFF engine indications for more than one inter-cooler per engine.
- Indications for more than two ammeters per engine (alternator amps, battery charge/discharge).
- Indications for more than two voltmeters per engine (bus volts, battery volts).
- Engine turbochargers that have an oil system separate from the engine oil system and have turbocharger oil pressure or temperature gauge(s).

The Prop Sync Wheel is limited to conventional twin-engine aircraft and prohibited in centerline thrust aircraft (e.g., Cessna Skymaster).

Percent Power display is prohibited from replacing the Cirrus SR22 horsepower display in all models where the existing horsepower gauge is used to control the engine per the POH.

2.1.3.1 Engine Adapter

Only one engine adapter per engine may be installed.

GEA 24(B) installations are limited to single and twin reciprocating engine aircraft with a gross takeoff weight of 6,000 lbs or less and a service ceiling of 32,000 feet or less (Class I & II). The GEA 24(B) must be mounted remotely and cannot be installed within the engine compartment or areas with water or fluids. The GEA 24(B) cannot be interfaced to resistive fuel quantity floats in twin-engine aircraft (i.e., Class II) in some installations. Refer to the aircraft model notes in Table D-1.

EIS units may not share a GEA 24(B) interface with a G3X system. If using a GI 275 for EIS, then the EIS interface may only be connected and displayed on the GI 275 system, and may not be connected or displayed on a G3X system.

2.1.3.2 Pressure Sensors

Brass body pressure sensors are not approved for installation in aircraft that have an operational ceiling greater than 32,000 feet. Refer to Table C-13 for part numbers.

2.1.4 VFR GPS

The VFR GPS can be used with an installed glare shield antenna as a backup GPS source or in an aircraft without a primary GPS source. If the aircraft is IFR rated, the aircraft must maintain its equipment for IFR requirements (i.e., NAV sources). The display of primary VFR GPS is for situational awareness only and is not approved for IFR navigation credit.

2.1.5 USB Connection

Each installed GI 275 unit must have a dedicated USB connection. This can be accomplished with either the USB pigtail (P/N 325-00238-02) that is included in each GI 275 connector kit or with the optional GSB 15.

The USB pigtail is for maintenance purposes only and is prohibited from being used while in-flight. The USB pigtail must be capped and stowed prior to returning the aircraft to service. The GSB 15 is capable of powering PEDs using its USB ports while in-flight.

2.1.6 Part 121/135 Operations

Single-engine aircraft operated under 14 CFR Part 135 must have two independent electrical sources or a standby battery or generator/alternator capable of supplying 150% of the electrical loads of all required instruments and equipment necessary for safe emergency operations of the aircraft for 60 minutes in accordance with 135.163(f).

For multi-engine aircraft operated under 14 CFR Part 135, the electrical load of all required instruments and equipment necessary for emergency operations must not be greater than one-half of the total generated power in accordance with 14 CFR 135.163(g).

2.1.7 VHF HSI

Unless the aircraft is placarded VFR Only, the GI 275 MFD must be configured to hide the ***HSI*** page when the GI 275 is connected to a VHF NAV source. The ***CDI*** page may be used for VHF NAV.

2.1.8 Transponder Control

The Transponder Control function is only provided when the GI 275 is interfaced to a GTX 345 series transponder. If configured, the ***Transponder Control*** page must be set as the final page on an MFD unit.

The GI 275 must be the only control source for the GTX 345 if used for the transponder control function; control using another source, such as a GTN 6XX or GTN Xi, is outside the scope of this STC.

2.2 Operational Limitations

All functions of the GI 275 system meet the appropriate design assurance qualifications for all aircraft listed on the AML. References listed in Table 1-1 provide a comprehensive list of TSO authorizations by function. The instructions in this manual must be followed in order to ensure an airworthy installation for aircraft operating under Title 14 CFR Parts 91, 121, and 135 with the limitations of those installations listed here.

3 PREPARATION

3.1 Materials and Parts

Equipment must be sourced from both Garmin and commercial vendors for installation of the GI 275. This section provides a description of the equipment and the installation kits available from Garmin and also commercially available parts and their requirements.

3.1.1 Garmin

GI 275 components and applicable installation kits are supplied by Garmin. Refer to the Aviation Price Catalog on flyGarmin.com for details once the selection for a particular aircraft installation is determined. Refer to the latest revision of GI 275 Part 23 AML STC Equipment List (P/N 005-01208-42) for the approved Mod Status of equipment. Engine sensors with Garmin part numbers listed in Table C-13 are available from Garmin.

Table 3-1 GI 275 Units

Unit	Part Number	
	Unit	Catalog
GI 275 Base	011-04489-00	010-01912-00
GI 275 Base NVIS	011-04489-60	010-01912-60

Table 3-2 GI 275 Connector Kits

Connector Kit	Part Number
GI 275 connector kit (GI 275 Base units)	011-04809-00
Configuration Module	011-04038-00 [1]

Notes:

[1] Included with connector kit. Listed for reference only.

Table 3-3 GI 275 LRUs

Unit	Part Number	
	Unit	Catalog
GEA 24	011-02848-01	010-01042-01
GEA 24B	011-05991-01	010-02770-01
Backup Battery	011-04528-00	010-02304-00
GSB 15, Dual Type-A, Rear	011-04937-00	010-02201-10
GSB 15, Type-A & Type-C, Rear	011-04937-20	010-02544-21
GSB 15, Dual Type-C, Rear	011-04937-40	010-02544-41
GSB 15, Dual Type-A, Side	011-04937-01	010-02201-11
GSB 15, Type-A & Type-C, Side	011-04937-30	010-02544-31
GSB 15, Dual Type-C, Side	011-04937-50	010-02544-51
GTP 59	011-00978-00	011-00978-00
Backup GPS Antenna	011-04036-10	010-12444-10

Table 3-4 LRU Installation Kits

Remote LRU Connector Kit	Part Number
GEA 24 connector kit	011-02886-01
GSB 15, 2.25-inch mounting kit	011-05043-00
GSB 15, 3.125-inch mounting kit	011-05043-01
GSB 15 decorative cover kit, unfinished [1]	011-05291-00
GSB 15 decorative cover kit, black powder coat [1]	011-05291-01
GSB 15 connector kit	011-05044-00

Notes:

[1] The GSB 15 decorative cover is optional and is for aesthetic purposes only.

3.1.2 Commercial

The GI 275 equipment is designed to be installed using standard commercially available parts and accessories. The following may be required for the installations:

1. MS26574 or MS22073 push-pull manually resettable circuit breakers or other trip-free, push-pull circuit breaker type as specified in the aircraft manufacturer's parts catalog.
2. MIL-W-22759/16 or MIL-W-22759/18 electrical wire.

NOTE

MIL-W-22759/18 wire is recommended due to the insulation diameter being more compatible with high-density connectors.

3. MIL-C-27500 shielded cable with M22759/16 wire (TE) or M22759/18 wire (TG) and ETFE jacket (14).
4. MS25036 or MS20659 ring terminals.
5. M83519/2-X shield terminators.
6. A-A-59163 (MIL-I-46852C) silicone fusion tape.
7. Wire bundle routing, securing, and management supplies, as required.
8. 2024-T3 aluminum per AMS-QQ-A-250/5, or 6061-T6 aluminum per AMS 4025, AMS 4027, or AMS-QQ-A-250/11, varying thickness.
9. TSO-C53a Type C or D hose (e.g., Aeroquip 303 hose with AE102 sleeve and 900591B clamps or Aeroquip AE466) for installation of fuel flow transducers and pressure sensors.
10. 22 or 24 AWG stranded thermocouple extension wire to match K-Type or J-Type probe, with a minimum continuous temperature rating of 400°F and ASTM E230 Standard Limits or NIST ITS 90 electrical qualifications (e.g., Watlow SERV-RITE P/Ns K24-3-507 and J24-3-507).

11. Ethernet cable, aircraft grade category 5 (required only for HSDB interfaces). Only Ethernet cables listed in Table 3-5 can be used. 24 AWG is preferred.

Table 3-5 HSDB Cables

Manufacturer	Cable Part Number	Gauge
PIC WIRE AND CABLE	E10422 [1]	22 AWG
	E10424	24 AWG
	E12424	24 AWG
EMTEQ	D100-0824-100	24 AWG
THERMAX	MX100Q-24	24 AWG
CARLISLE IT	392404	24 AWG
GIGAFLIGHT CONNECTIVITY	GF100T-24CAT5	24 AWG

Notes:

[1] E10422 cable is not recommended because of the larger insulation diameter, making it very hard to work with in the high density connectors. E1042x cable is also not recommended due to insulation shrinkage that can occur.

12. EIS annunciator indicator(s) capable of displaying warning (red) and caution (yellow) annunciations.

Table 3-6 EIS Annunciators

Manufacturer	Annunciation	Aircraft System	
		14V	28V
Applied Avionics	Caution/Warning	95-40-17-B4-E1WPN	LED-40-17-BA2-E1WP6 [1]
Mil-Spec (Various)	Caution	MS25041-4 Cap MS25237-330 Lamp	MS25041-4 Cap MS25237-327 Lamp
	Warning	MS25041-2 Cap MS25237-330 Lamp	MS25041-2 Cap MS25237-327 Lamp

Notes:

[1] Requires two 47Ω, 1/4 WATT -55 C to +125 C resistors. Refer to Figure B-8.

13. **For resistive fuel probe connection with GEA 24 EIS adapter (not applicable to GEA 24B):** 2.2k Ω (± 1%), 0.25W (or greater) resistors qualified to retain power rating at 70 °C and qualified to MIL-R-10509. Acceptable resistors include:
    - RN60D2201FB14 (ref. Garmin Kit P/N 011-05829-00)
    - RN60C2201DB14
    - RN65E2201FB14
14. Standard heat shrink tubing (M23053/5, X = color)
    - M23053/5-104-X for single conductor wire
    - M23053/5-105-X for insulating twisted-pair wire
    - M23053/5-106-X for insulating triple conductor wire or RG-400 coax
15. **For GDL 60 Remote Aircraft Status installation:** RAS relay components:
    - M12883/41-16 Relay Socket
    - M83536/10-15M Relay for 14V Systems
    - M83536/10-024M Relay for 28V Systems

      OR
    - M12883/45-01 Relay Socket
    - M83536/2-024M Relay for 28V systems

3.1.3 Special Tools Required

The following tools are required for building the wire harness.

Milliohm Meter

A milliohm meter with an accuracy of ±0.1 milliohm (or better) to perform continuity and power/ground checks.

Crimp Tool

A crimp tool meeting MIL specification M22520/2-01 and a positioner/locator are required to ensure consistent, reliable crimp contact connections for the rear D-sub connectors. Refer to Table 3-7.

Table 3-7 Recommended Crimp Tools

Manufacturer	Hand Crimping Tool	22-28 AWG		22-24 AWG	
		Positioner [1]	Insertion/ Extraction Tool	Positioner	Insertion/ Extraction Tool
Military P/N	M22520/2-01	M22520/2-09	M81969/14-01	M22520/2-08	M81969/1-02
ITT Cannon	995-0001-584	995-0001-739	N/A	N/A	N/A
Positronic	9507	N/A	N/A	9502-5	M81969/1-02
AMP	601966-1	601966-6	91067-1	601966-5	91067-2
Daniels	AFM8	K42	N/A	K13-1	M81969/1-02
Astro	615717	615725	N/A	615724	M81969/1-02

Non-Garmin part numbers shown are not maintained by Garmin and are subject to change without notice.

Notes:

[1] For configuration module pins, verify the crimp tool is set to crimp 28 AWG wire.

GSB 15 Installation

A crimp tool is required for the GSB 15 installation. The recommended crimp tool is Molex Hand Crimp Tool (P/N 638190000). For other options, refer to *GSB 15 Installation Manual* (P/N 190-00303-A3).

3.2 GI 275 Installation Requirements

This section provides installation requirements for the GI 275 system.

3.2.1 Power Distribution

GI 275 LRUs cannot share circuit breakers or ground return wires with each other or with other equipment.

For the purpose of the GI 275 system installation, the "essential bus" is a bus that receives power when the battery master is switched on and is not automatically shed with the loss of a generator or alternator. Power distribution requirements are summarized in Table 3-8.

Table 3-8 Power Distribution

LRU	BUS Requirement
MFD	• Avionics bus.
EIS Display	• No. 1 EIS display on essential bus. • No. 2 EIS display on essential bus. • If dual essential buses are available, connect each EIS display to a separate essential bus.
GEA 24(B)	• No. 1 GEA 24(B) on essential bus. • No. 2 GEA 24(B) on essential bus. • If dual essential buses are available, connect each GEA 24(B) to a separate essential bus.
GSB 15	• If connected to a GI 275, it is recommended to connect the GSB 15 to same bus as GI 275 to ensure the GSB 15 is powered on with the GI 275. • If not connected to a GI 275, connect GSB 15 to avionics bus.

Circuit breakers and switches added as part of GI 275 system installation must be labeled as shown in Table 3-9 (single bus) and Table 3-10 (independent buses). Labels must be readable in all lighting conditions. Ambient flood lighting is acceptable. The labeling for each LRU denotes the following where applicable:

- **Number designation** – LRUs of same type/function in the system.
- **A/B designation** – Differentiates the essential bus.

Table 3-9 Circuit Breaker Labels - Single Essential Bus

Description	Label		CB Value
	Single LRU	Dual LRU	14V / 28V System
GI 275 configured as MFD	MFD [1]	MFD 1 [1] MFD 2 [1]	5A
GI 275 configured as EIS	EIS	EIS 1 EIS 2	5A
GEA 24(B)	ENG SNSR	ENG SNSR L ENG SNSR R	5A
GSB 15	USB	USB 1 USB 2	5A or 7.5A [2] [3]

Notes:

[1] Not connected to essential bus. Refer to Table 3-8.

[2] It is acceptable to use a fuse in lieu of a circuit breaker for the GSB 15.

[3] If a GSB 15 Type-C unit (P/Ns 011-04937-20, -30, -40, -50) is installed in a 14V electrical system, a 7.5A breaker or fuse is required.

Table 3-10 Circuit Breaker Labels - Independent Essential Busses

Description	Label		CB Value
	Single LRU	Dual LRU	14V / 28V System
GI 275 configured as MFD	MFD [1]	MFD 1 [1] MFD 2 [1]	5A
GI 275 configured as EIS	EIS A EIS B	EIS L A EIS L B EIS R A EIS R B	5A
GEA 24(B)	ENG SNSR	ENG SNSR L ENG SNSR R	5A
GSB 15	USB	USB 1 USB 2	5A or 7.5A [2] [3]

Notes:

[1] Not connected to essential bus. Refer to Table 3-8.

[2] It is acceptable to use a fuse in lieu of a circuit breaker for the GSB 15.

[3] If a GSB 15 Type-C unit (P/Ns 011-04937-20, -30, -40, -50) is installed in a 14V electrical system, a 7.5A breaker or fuse is required.

3.2.2 Engine Indication System (EIS)

Installation of the EIS must maintain compliance with the minimum number of gauges required by 14 CFR 91.205 for the type of flight allowed by the aircraft's Type Certificate. The following must be considered for an EIS installation:

CAUTION

Engine damage may occur if length of oil temperature probe is incorrect. Refer to Section 4.6.3.

1. Only install EIS in aircraft that comply with all limitations in Section 2.1.3.
2. Engine RPM, Oil Temperature, Oil Pressure, EGT, CHT, and Manifold Pressure (if installed) must be displayed on the EIS.
3. Optional EIS gauges listed in Table 3-12 that are not currently installed in the aircraft may be added as approved in this STC.
4. No indication/parameter on the EIS display(s) can be duplicated by any other installed indicator that is not connected to the GEA.
5. Ensure engine sensors can be installed and the corresponding gauges can be displayed. Refer to Appendix E, Table 3-11, and Table 3-12 for gauge layout information. Depending on the number of gauges, a second EIS display may be required (only permitted in single-engine aircraft). Refer to Section 2.1.3.
6. Some turbocharged aircraft require a differential pressure sensor for fuel pressure. This STC provides electrical interface for select differential pressure sensors (refer to Appendix Section C.12); however, installation approval is not provided and must be obtained separately
7. Do not replace an existing gauge if the GI 275 will not provide the functions and markings required by the POH/AFM, TCDS, or other aircraft model-specific data. Refer to Section 5.7.4.2 for available EIS gauge markings. If the EIS gauges cannot be configured as noted in the POH/AFM, the installation does not qualify for EIS unless alternate airworthiness approval is obtained.
8. Annunciator lights, including alternator/generator annunciators operated by a sensor or switch independent of the existing gauge, must remain operative and independent from the GI 275 EIS. If an annunciator is operated by a gauge that might be replaced by the GI 275 EIS, the associated annunciator can be deactivated only if the GI 275 Caution/Warning alert activates for the same condition as the original annunciator. The GI 275 Caution/Warning alert is provided on the display or an independent annunciator. However, if the new GI 275 EIS gauge does not support a Caution/Warning alert for the same condition, the existing gauge and annunciator must remain installed.
9. If an annunciator is replaced by the GI 275 EIS display, deactivate the existing annunciator so it does not illuminate and then install a placard over the deactivated lens or as close as practical within view of the pilot that states: "X ANNUN DISABLD", with "X" being the deactivated annunciator(s). Modification of the existing annunciator panel is outside the scope of this STC.
10. All placards that were associated with any/all gauges being replaced (non-limitation data) must remain in the proximity of the EIS display.
11. Reused sensors must function through the sensor's entire range. For example, fuel tank floats may have worn resistive elements that will result in performance issues with the gauge display.
12. If the aircraft POH or AFM has a fuel flow limit (i.e., red line), the installer must verify fuel flow accuracy ±10% of the full scale range and adjust the K-Factor if necessary. Obtain the correct fuel flow value using the engine or aircraft manufacturer manuals. If that data is not available, perform a pre-installation static RPM ground check and document the pre-installation fuel flow using the existing fuel flow indicator. Refer to Section 6.8.2 for post-installation K-Factor adjustment.
13. A single display that is a standalone EIS allows for the GPS connection to be optional. Standalone EIS displays that do not have a GPS source connected will display dashes (---) for Fuel Endurance.

For cases where the standard gauge marking configuration cannot be used, aircraft-specific solutions for unique gauge markings are provided in Appendix Section E.6.2.

Table 3-11 Required Gauges for EIS

Indicator	Notes
RPM	
Oil Pressure	
Oil Temperature	
EGT	
CHT	
Manifold Pressure	If applicable.

Table 3-12 Additional Gauges

<table>
<tr><th>Indicator [1]</th><th>Notes</th></tr>
<tr><td>Fuel Flow</td><td>Flow check may be required prior to de-modification; refer to Appendix D.</td></tr>
<tr><td>Primary EGT [2]</td><td rowspan="6">Only required if existing gauge had colored markings, alerts, and/or associated POH/AFM limitations.</td></tr>
<tr><td>Turbo/Turbine Inlet Temperature (TIT) [2]</td></tr>
<tr><td>Carburetor Temperature</td></tr>
<tr><td>Inlet Air Temperature (IAT)</td></tr>
<tr><td>Compressor Discharge Temperature (CDT)</td></tr>
<tr><td>IAT/CDT Differential (DIFF)</td></tr>
<tr><td>Fuel Quantity (Main)</td><td rowspan="2">AUX fuel quantity can only be displayed when main fuel quantity is also displayed. GI 275 interface to fuel quantity sensors is not approved in certain aircraft models. Refer to Appendix D for model-specific information.</td></tr>
<tr><td>Fuel Quantity (Aux)</td></tr>
<tr><td>Amps/Volts
• load meter
• battery charge/discharge
• bus voltmeter
• battery voltmeter</td><td>Only two of the four parameters may be gauges with colored markings, alerts, and/or associated POH/AFM limitations (the same parameter cannot be displayed twice).</td></tr>
<tr><td>Prop Sync Wheel</td><td>Configure if replacing an existing indicator. Optional if not previously installed.</td></tr>
<tr><td>Percent Power [3]</td><td>Percent Power indication can be provided when a Manifold Pressure, RPM, OAT, and Fuel Flow sensor are all installed and interfaced with the GI 275 EIS. Percent Power cannot be configured on the Main EIS page if a Prop Sync Wheel is shown on the other EIS gauge. Percent Power can be configured on the Aux EIS page if a Prop Sync is present.</td></tr>
</table>

Notes:

[1] Gauges in this table are required if the existing aircraft gauge had colored markings, alerts, and/or associated POH/AFM limitations. If the number or required gauges exceeds the available space on the display, a second primary EIS display is required. Refer to Appendix E for gauge layouts.

[2] Primary EGT and TIT cannot both be indicated on the GI 275. Only one TIT or Primary EGT sensor can be displayed on the GI 275 EIS.

[3] If there is an existing percent power gauge with colored markings, alerts, and/or associated POH/AFM limitations, then the existing percent power gauge must be retained and percent power must not be configured or displayed on the GI 275.

All EIS sensors approved to interface with the GI 275 are listed in Appendix Section C.12.

Compare the range, markings, and colors in Table 3-13 to the required aircraft parameters. Ensure sensor range is wide enough for each planned gauge. This STC requires that all lines/ranges that are red or yellow generate an alert. Blue, green, and white markings do not generate alerts. If there was no alert associated with the red or yellow line/radials on the original gauge, this STC approves the addition of an alert to the associated line/radial.

The sensor ranges in Table 3-13 are only for reference to help determine if EIS is compatible with the aircraft; specific approved sensors may have different ranges than those shown. If an aircraft gauge has markings outside the available sensor range, but the sensor range includes all limits for the gauge specified by the POH/AFM, TCDS, or other aircraft model-specific data, the gauge may be replaced by the GI 275 EIS per this STC.

Table 3-13 Available EIS Parameters

Display	Display Range	Available Gauge Markings	Available Marking Colors	Approved Units
Tachometer (RPM)	0 – 4000 RPM	Arc	R, Y, B, G, W	RPM
Manifold Pressure	0 – 60 in Hg	Arc	R, Y, B, G, W	in Hg, PSI
Oil Pressure	0 – 150 PSI	Line/Range	R, Y, B, G, W	PSI
Oil Temperature	-24 – 300° F	Line/Range	R, Y, B, G, W	°C, °F
Main Fuel Quantity	0-2980 Gallons	Line/Range	R, Y, B, G, W	GAL
Aux Fuel Quantity	0-2980 Gallons	Line/Range	R, Y, B, G, W	GAL
Fuel Flow	0 – 80 GPH	Line/Range	R, Y, B, G, W	GAL/HR Pounds/HR
Fuel Pressure	0 – 75 PSI	Line/Range	R, Y, B, G, W	PSI
CHT (1 probe per cylinder or 1 probe per engine)	0 – 900° F	Line/Range	R, Y, B, G, W	°C, °F
EGT (1 probe per cylinder or 1 probe per engine)	0 – 1800° F	None	N/A	°C, °F
Primary EGT (1 probe per engine)	0 – 1800° F	Line/Range	R, Y, B, G, W	°C, °F
TIT #1	0 – 1800° F	Line/Range	R, Y, B, G, W	°C, °F
TIT #2	0 – 1800° F	Line/Range	R, Y, B, G, W	°C, °F
Carb Temperature	-24 – 34° C	Line/Range	R, Y, B, G, W	°C
CDT	32 – 1800° F	Line/Range	R, Y, B, G, W	°C, °F
IAT	-100 – 1800° F	Line/Range	R, Y, B, G, W	°C, °F
CDT/IAT Diff Temp	-100 – 1800° F	Line/Range (max 2 ranges)	R, Y, B, G, W	°C, °F
Load Meter (alternator current) or Ammeter (charge/discharge)	-150 – 150 A	Line/Range	R, Y	Amps
Battery Voltage / Bus Voltage	-80 – 80 VDC	Line/Range	R, Y	Volts
Prop Sync Wheel	N/A	N/A	N/A	N/A
OAT	-125 – 175° C	N/A	N/A	°C, °F
Percent Power	0 – 100%	N/A	N/A	N/A

3.2.3 GPS Requirements

The GI 275 can be interfaced with up to two independent GPS sources and/or the internal VFR GPS. Refer to Appendix Section C.1 for approved GPS sources. A GPS source is optional.

3.2.4 Display Lighting Control

Lighting on the GI 275 display can be controlled by either the lighting bus or the built-in photocell. The photocell can be used for lighting control for all installations. If there is a significant reduction in lighting bus load due to the GI 275 system installation, it is recommended that the photocell be used to control the lighting.

3.2.5 HSDB Architecture

The HSDB architecture allows for many connection possibilities. The Ethernet architecture limitations/ options shown in this section are used as a guide for common LRU combinations. Block diagrams are illustrated in Figure 3-2 and Figure 3-3. A summary of Garmin LRUs with HSDB capability and available ports is shown in Table 3-14.

Table 3-14 Garmin LRU HSDB Port Summary

LRU	Number of HSDB Ports
GI 275	2
GTN 6XX/7XX	4
GTN Xi	4
GTS 8XX	1
GDL 60	2
GDL 69 series	4
GTX 345	2
GPS 175/GNX 375/GNC 355	1
G500/G600 TXi	4

The following steps/figures are used to guide in making HSDB connections (not all possibilities are included):

1. When multiple GI 275 indicators are installed, they must be connected to each other directly in series.
2. The GTN 6XX/7XX, GTN Xi, GPS 175, GNX 375, or GNC 355, if installed, must be connected directly to a GI 275.
3. LRUs not installed under this STC must still meet the installation requirements that are applicable to those LRUs.
4. Choose the figure that most closely represents the aircraft's equipment and cross out any LRUs not installed. Apply the rules above to complete the HSDB connections, if necessary.
5. It is acceptable to connect GI 275 units with other Garmin LRUs using redundant HSDB paths if there are enough available HSDB ports. Redundant HSDB connections provide extra data paths in case of LRU failure. Refer to Figure 3-2 for an example.

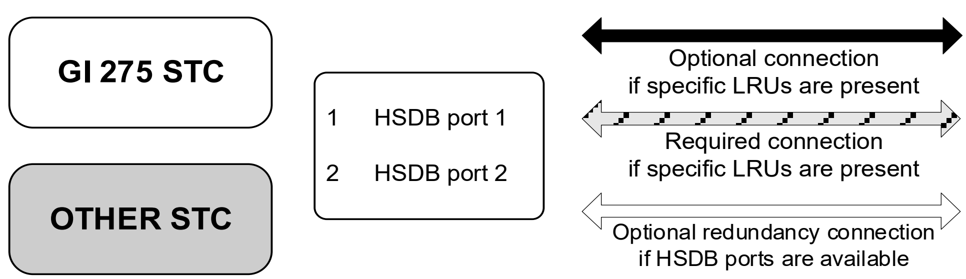


Figure 3-1 HSDB Architecture: Legend

NOTE

The orientation of LRUs and HSDB ports in the following diagrams do not represent the actual orientation of the installation in the aircraft.

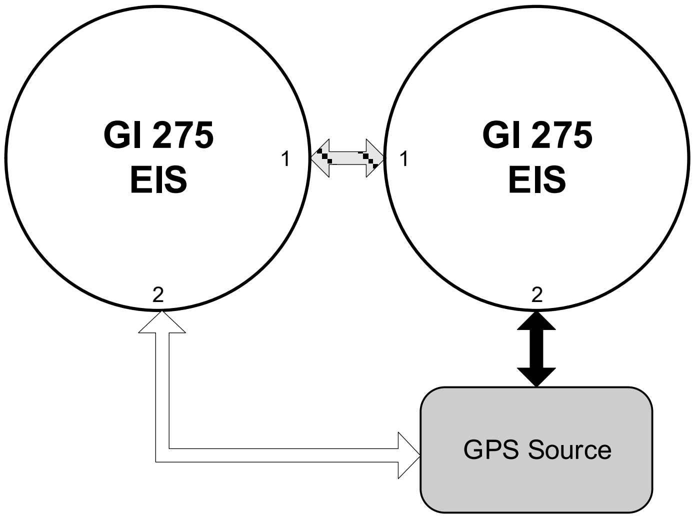


Figure 3-2 HSDB Architecture: EIS

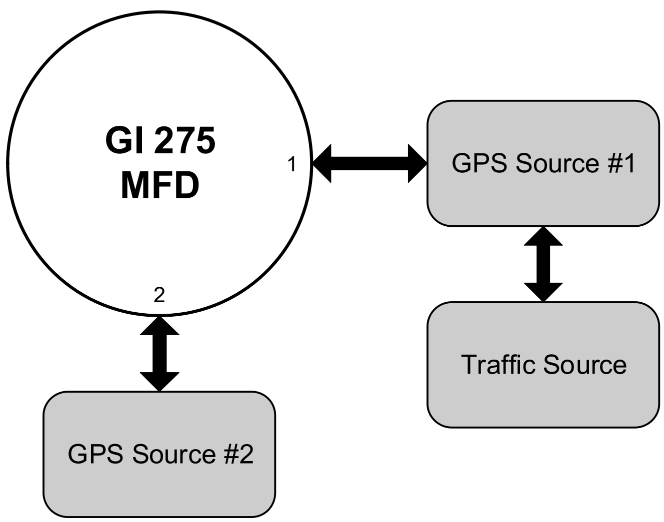


Figure 3-3 HSDB Architecture: MFD

3.3 Interfaces to Other Equipment

Information in this section provides details for interfacing to equipment not installed by the GI 275 STC. The information provided must be reviewed when these interfaces are considered.

3.3.1 GPS Source

The GI 275 has a built-in VFR GPS source that can be used with the backup GPS antenna installed. Up to two additional external GPS sources can be interfaced to the GI 275.

3.3.2 Navigation Receiver

The GI 275 display uses data from a navigation receiver to display VOR and ILS information on the ***HSI*** page. Up to two independent navigation receivers can be interfaced to a display. The third-party composite NAV connection must be directly connected to a GI 275 display when present.

3.3.3 Radar Altimeter

The GI 275 can receive data from a digital radar altimeter system to provide the display of radar altitude. The display can also be configured to allow for the initiation of the radar altimeter self-test for certain radar altimeter models. Radar altimeters must be wired to a discrete output from the GI 275 to enable self-test.

3.3.4 Traffic

The GI 275 can receive data from an ADS-B/TIS/TAS/TCAS I traffic system to display traffic.

3.3.4.1 TIS-A

Traffic Information Service-equipped aircraft receive limited traffic information from nearby ground radar uplinks. The GI 275 can interface with a GTX 33X to provide TIS-A. The traffic data can be crossfilled to display on other GI 275 units.

3.3.4.2 TAS / TCAS

The GI 275 can interface with a number of traffic sources that function as Traffic Advisory Systems (TAS) or Traffic Alert and Collision Avoidance Systems (TCAS). The traffic data can be crossfilled to display on other GI 275 units.

3.3.4.3 TIS-B / FIS-B / ADS-B

TIS-B/FIS-B/ADS-B In-equipped aircraft receive traffic information from nearby ADS-B ground stations and ADS-B Out-equipped aircraft. The GI 275 can receive and display weather and traffic services with compatible equipment installed. The traffic data can be displayed on all GI 275 units capable of displaying traffic data. Refer to Appendix Section C.7 for compatible equipment.

3.3.5 Data Link

The GI 275 can interface to a GDL 69/69A SXM to receive SiriusXM weather service with a valid subscription. It does not provide control for music.

3.3.6 WX-500 Stormscope®

The GI 275 can receive data from a WX-500 Stormscope® system to provide the display of lightning data. The GI 275 cannot be used to control the Stormscope® system. A controlling display (e.g., GDU 620, GDU 700/1060, GTN 6XX/7XX, or GTN Xi) must be present in the system to display Stormscope data on the GI 275.

3.3.7 Audio Panel

The GI 275 can be interfaced to an audio panel for audio alerting. An interfaced audio panel cannot be controlled via the GI 275.

3.3.8 Transponder Control

The GI 275 can interface to GTX 345 series transponders to provide a ***Transponder Control*** page when configured as an MFD. This allows the GI 275 to control transponder code, the IDENT function, and the mode of operation for up to two interfaced GTX 345 transponders.

3.3.9 External TAWS

Only one TAWS that generates aural and visual annunciations is permitted in the aircraft. If the aircraft has a TAWS installed, the GI 275 must be configured to prevent conflicting aural and visual annunciations. Combinations of external TAWS sources, GI 275 settings, and the resulting alert sources are shown in Table 3-15.

The GI 275 provides the terrain alerting from the GTN 6XX/7XX, GTN Xi, or GNS 400W/500W; however, the GI 275 does not provide all of the necessary annunciations and therefore the GTN 6XX/7XX, GTN Xi, or GNS 400W/500W may still require an external TAWS annunciator panel.

Table 3-15 External TAWS Setup with GI 275

Aircraft Setup			LRU Alert Source			
External TAWS System	**Terrain/ TAWS Mode** [2]	**External TAWS**	**PFD Annunciation Text Source**	**MFD Map Impact Area/Pop-up Alerts**	**MFD Terrain Proximity Shading**	**Aural Callouts from LRU**
GTN TAWS [1]	External	Installed (HSDB)	GTN TAWS	GTN TAWS	***Terrain*** page	GTN TAWS
	External	Installed (HSDB)	GTN TAWS	GTN TAWS	***Terrain*** page	GTN TAWS
GNS TAWS [1]	External	Installed (MapMX)	GNS TAWS	None	***Terrain*** page	GNS TAWS
	External	Installed (MapMX)	GNS TAWS	None	***Terrain*** page	GNS TAWS
Non-Garmin TAWS	External	Installed (Other)	None	None	***Terrain*** page	Non-Garmin TAWS
	External	Installed (Other)	None	None	***Terrain*** page	Non-Garmin TAWS

Notes:

[1] If GNS/GTN TAWS becomes unavailable, the display will revert to Terrain Proximity.

[2] The Terrain Mode is automatically configured to *External* when any External TAWS setting is configured to anything other than *Not Installed*.

3.4 Selection of GI 275 System Components

3.4.1 Aircraft Eligibility Checklist

The aircraft must meet the requirements for the GI 275 system installation set forth by this STC. The following checklist is used as a guide to identify if those requirements are satisfied. Complete the checklist before the aircraft is modified.

Table 3-16 Aircraft Eligibility Checklist

Completed	Item	Reference
	GENERAL	
❑	Verify the aircraft is on the Approved Model List.	Appendix D
❑	Verify an approved external GPS/navigation data source is installed.	Appendix Section C.1
❑	Select the GI 275 equipment that will be installed.	Section 3.4
❑	Identify the equipment that will be interfaced, and verify each interface is approved.	Appendix C
❑	Determine if the STC limitations applicable to the aircraft are acceptable.	Section 2
❑	Determine if the aircraft electrical system is adequate.	Section 3.5
❑	Obtain the current aircraft weight and balance data.	POH/AFM
	INSTRUMENT PANEL	
❑	Determine the location of each display.	Section 4.3
❑	Determine the location for each circuit breaker and its placard.	Section 3.2
❑	Verify the total mass of equipment being installed in the instrument panel is not more than the total mass of the equipment being removed from the panel.	Section 4.8
	EIS	
❑	Perform Fuel Flow Baseline Check, if required.	Section 3.2.2
❑	Determine which parameters will be displayed on the EIS, and verify they can be displayed.	Section 3.2.2 Appendix E
❑	Determine the location of all gauges that must be retained and verify the operating limits for each.	Section 3.2.2
❑	Determine the GEA 24(B) location(s).	Section 4.6.1
❑	Determine the GTP 59 OAT Probe location(s), if used.	Section 4.5.2
❑	Select engine sensors for parameters determined to be displayed on the EIS.	Section 3.4.2

Table 3-17 is provided to assist with the selection of GI 275 components. Mark the applicable entry based on the criteria given in the section. Review the relevant wiring diagram(s) to determine the installation.

Table 3-17 GI 275 System Components

Equipment Selection					Notes	Location
Backup Battery	❑	GI 275 BB (Optional for GI 275 Base)				
USB	❑	GSB 15	❑	Dongle		
Backup GPS	❑	Backup GPS antenna				
Engine Adapter	❑	GEA 24(B) #1				
	❑	GEA 24(B) #2 (required for twin-engine aircraft)				
Engine Annunciation	❑	GI 275	❑	Annunciator(s)	Section 4.3.3	
Engine Sensors [2]	❑	EGT probe for each cylinder			[1]	
	❑	Single EGT probe (i.e., Primary EGT)			[1]	
	❑	CHT probe for each cylinder			[1]	
	❑	Turbine Inlet Temp Sensor			[1]	
	❑	Induction Air Temp Sensor			[1]	
	❑	Compressor Discharge Temp Sensor			[1]	
	❑	Manifold Pressure Sensor				
	❑	Oil Pressure Sensor				
	❑	Oil Temp Sensor				
	❑	RPM Sensor				
	❑	Carb Temp Sensor				
	❑	Fuel Pressure Sensor				
	❑	Fuel Flow				
	❑	Fuel Quantity			[1]	
	❑	Shunt (Amperage)			[1]	
	❑	OAT			[3]	

Notes:

[1] Not installed under this STC.

[2] Refer to Appendix Section C.12 for STC compatibility.

[3] Interface a single OAT probe to only one GEA Engine Adapter.

External data sources intended for use with the GI 275 must be checked for compatibility before installation. These checks must be accomplished in accordance with procedures and data furnished by the equipment manufacturer.

3.4.2 EIS Equipment

A GEA 24(B) is required for each aircraft engine if EIS is installed. EIS sensor options and configurations are presented in Appendix Section C.12. Select the sensors required to support the EIS gauges determined in Section 3.2.2. Specific sensors are discussed below.

1. EGT/TIT and CHT

The number of probes required for aircraft installation when display of all cylinder temperatures is configured is shown in Table 3-18. Only a single CHT probe and a single EGT probe are required for each engine when configured for Single CHT/EGT. The Primary EGT/TIT and CHT indication, if applicable, must be retained. Primary EGT/TIT indication is not compatible with Single CHT/EGT. The primary EGT/TIT probe can be changed, but the installed location must remain the same.

Table 3-18 EGT and CHT Probe Quantity

Aircraft Engines		Single		Twin	
Cylinders per engine		4	6	4	6
PROBE QTY [1]	EGT	4	6	8	12
	CHT	4	6	8	12
	PRIMARY	AS REQUIRED			

Notes:

[1] GI 275 EIS also provides a configuration option for Single CHT/EGT, which requires only a single EGT probe and a single CHT probe per engine. TIT and Primary EGT sensors are not compatible with the Single CHT/EGT configuration.

All thermocouple lead wires must match the thermocouple type (K- or J-Type). Do not crimp connector pins to a single-strand thermocouple wire. Only use a multi-strand lead wire for connector pins. Copper wire must never be used for thermocouples.

2. Oil Pressure Sensor

Select the most suitable sensor from Table C-13.

3. Oil Temperature Sensor

Use the engine manufacturer's guidance for probe length/location.

CAUTION

Ensure the oil temperature probe is the correct length. Installation of the incorrect probe may result in engine damage.

4. Manifold Pressure Sensor

Select the most suitable sensor from Table C-13.

5. Fuel Pressure Sensor

Select the most suitable sensor from Table C-13.

Some fuel injected engines use a fuel pressure sensor to indicate fuel flow. This STC requires that when replacing such a sensor, individual EIS sensors for **both** fuel flow and fuel pressure must be installed.

Some turbocharged aircraft use a differential pressure sensor. Refer to Section 3.2.2 for more information.

6. Fuel Quantity Sensor

The fuel quantity sensors must be either resistive float sensors with a resistance range between 25-620 Ω **or** CiES CC Series Fuel Senders. It is permissible to re-use existing fuel quantity wiring. Extension splices are permissible. This STC does not approve alteration of the fuel tank wiring, fuel tank equipment, or grounding provisions for the fuel system. For resistive fuel quantity sensors, the maximum resistance of the tank must be no more than 620Ω, and the resistive range from full to empty must be at least 25Ω.

For resistive float sensors interfaced to a GEA 24, parallel resistors spliced from the fuel excitation pin are required, and the sensor configuration must be set as 0-5 Volt sensors. For new installations of a GEA 24B, use a direct connection to the resistive fuel floats and set the sensor configuration to "0-620ohm". If replacing a GEA 24 with a GEA 24B, use the original parallel resistor wiring and set the sensor configuraton to "0-5 Volt". A new fuel quantity calibration must be conducted when a GEA 24 is replaced by a GEA 24B (refer to Section 5.7.5).

Fuel Quantity Tank sensors are correlated to the GEA inputs, with Fuel Quantity 1 being Left Main, Fuel Quantity 2 being Right Main, Fuel Quantity 3 being Left Aux, and Fuel Quantity 4 being Right Aux. These inputs must be used for the desired tank, regardless of the connected GEA (i.e., a multiengine configuration). Refer to Figure 3-11 for an example of twin-engine fuel quantity wiring to the GEA.

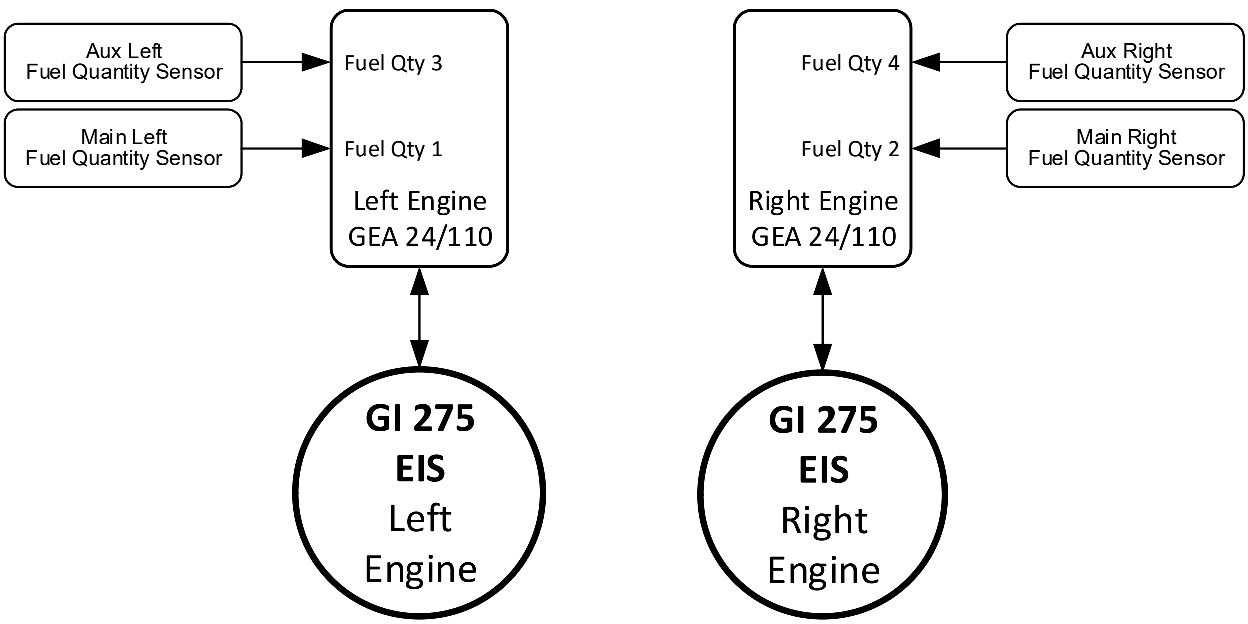


Figure 3-4 Fuel Quantity Wiring in Twin-Engine Installations

Refer to Appendix B for wiring diagrams and Appendix C for compatible part numbers. All CiES CC Series Fuel Quantity Senders approved in STC SA02511SE are compatible.

7. Fuel Flow Sensor(s)

Select a fuel flow sensor that is approved under this STC listed in Appendix Section C.12 and suitable for the engine horsepower and aircraft fuel supply type:

i. Electronics International FT-60 (Red Cube) - For aircraft with up to 350 HP and an engine-driven fuel pump.

ii. Electronics International FT-90 (Gold Cube) - For aircraft with 350-550 HP or with gravity-fed fuel systems.

The fuel flow sensor will introduce a small pressure drop. Refer to Appendix D to determine if a fuel pressure test is required for a specific aircraft model. If required, the installer must perform the Minimum Inlet Pressure Test as documented in AC 23-16 to ensure the minimum inlet fuel pressure and a safety margin are available. Refer to AC 23-16, paragraph 23.955(a) for additional information and procedures. If the AFM/POH has an operating limitation based only on fuel flow, the fuel flow must be accurate within 10% to ensure the limitation is maintained. Refer to Section 6.5.3.6 for the fuel flow check procedure, if it is required.

8. RPM Sensor

Methods for RPM sensing appropriate to the engine should be selected as follows:

1. P-lead sensor – One per magneto or two per dual magneto. Resistors must be installed in accordance with Figure B-6.
2. Magneto vent mounted sensor – Not compatible with geared engines. One sensor for each engine on non-pressurized magnetos only (e.g., Bendix -20, -21, -200, 1200 series, and Slick 6000, 4000 series).

9. Shunt

Compatible shunts are listed in Appendix Section C.12. The EIS configuration setting must match the shunt rating and type. The shunt rating is the maximum current and is typically marked on the shunt. The type is the voltage between the shunt posts at maximum current rating. The shunt rating and type may also be found in the aircraft data.

If the shunt rating cannot be determined by part markings or the aircraft data, the following procedure may be used for 50 mV shunts:

1. With the aircraft power ON, no ground-power applied, and a minimal electrical load ON, measure the millivolts between the shunt terminals using a calibrated voltmeter. Record the millivolt measurement (V1).
2. Apply an electrical load (L1) as follows:
   a. If an alternator load meter is installed, the shunt will measure the charging current from the alternator to the main bus. With the engine running, apply an electrical load and measure the current (L1) from the alternator using a calibrated ammeter. Measure and record the new shunt millivolt value (V2).
   b. If a battery ammeter is installed, the shunt will measure the current from the battery to the main bus. Without the engine running, apply an electrical load and measure the current (L1) from the battery using a calibrated ammeter. Measure and record the new shunt millivolt value (V2).
3. Record the millivolt change (V_{change}) between steps 1 and 2. $V_{change} = V2 - V1$.
4. Determine the shunt rating using the following calculation.

$$\text{Shunt Rating (Amps)} = \frac{\text{L1 (Amps)} \times 50\text{mV}}{V_{change}\ \text{(mV)}}$$

If the shunt value cannot be determined, retain the existing gauge(s) or install an appropriately rated compatible 50 mV shunt. Shunt installation is outside the scope of this STC and must be approved using other means.

10. OAT

For standalone EIS installations that display horsepower but do not have an air data computer in the system, an OAT probe can be connected to the GEA 24(B) as an EIS sensor. Refer to Appendix Section C.12 for sensor compatibility.

11. Remote Aircraft Status

For installations with a GDL 60 that wish to utilize the Remote Aircraft Status feature, a number of relay assemblies will need to be installed. A relay assembly consists of a relay socket, a relay bracket, and a relay. Refer to Section 3.1.2 for part numbers. Refer to Figure B-29 for specific interconnect drawings.

NOTE

It is recommended to connect an OAT probe directly to the GEA if it is desired to receive Air Temperature data as part of the Remote Aircraft Status.

3.5 Electrical Load Analysis

An Electrical Load Analysis (ELA) must be completed before the GI 275 is installed to verify that the aircraft electrical system is adequate. The purpose of the ELA is to show compliance with 14 CFR 23.1351 and 23.1353(h) by demonstrating that the maximum electrical system demand does not exceed 80% of the alternator data plate rating and the aircraft battery is capable of providing electrical power to equipment essential for continued safe flight and landing in the event of a complete loss of the primary electrical system. Satisfactory completion of the ELA must be recorded on FAA Form 337.

NOTE

Certain operating requirements (e.g., 14 CFR Part 135) may impose additional requirements in the event of electrical power loss. It is the installer's responsibility to ensure that the aircraft meets the additional requirements if used for these operations.

Typical current draw of all GI 275 system components is summarized in Table 3-19.

Table 3-19 LRU Current Draw

LRU	Current Draw			
	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
GEA 24(B)	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

Net change to the electrical load with the GI 275 installed must be determined. Net decrease in electrical load requires no further analysis, assuming that the electrical system is within limits. This is likely to occur when existing equipment is removed or older systems are replaced with newer equipment that requires less power to operate. The amended electrical load calculation documenting load reduction should be filed with other aircraft permanent records. A sample net electrical load calculation is shown for a 14V aircraft in Table 3-20.

Table 3-20 Net Electrical Load Change Calculation Example (14 VDC Aircraft)

Equipment Removed		Equipment Added	
Item	Load [A]	Item	Load [A]
Mid-Continent MD 200-206 VOR/LOC/GS Indicator	0.30	Garmin GI 275 Base	0.75
SUBTOTAL	**0.30**	**SUBTOTAL**	**0.75**
		NET CHANGE	**+0.45**

A complete Electrical Load Analysis must be performed to show adequate capacity of the alternator/ generator if the electrical load is increased with GI 275 installed. ASTM F 2490-05 *Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis* offers guidance on preparing an ELA. Alternatively, electrical loads under different operating conditions can be measured (refer to Section 3.5.1).

3.5.1 Measurement of Electrical Loads

It must be shown that the maximum electrical demand for each alternator does not exceed 80% of the alternator data plate rating. Discussed in this section is the ELA for a single alternator/single battery electrical system determined by load measurement. It must be modified accordingly for aircraft with multiple batteries or alternators. During measurement, applied electrical system loads must account for combinations and durations for probable aircraft operations.

NOTE

Circuits must be protected and LRU circuit breaker ratings must meet specifications in Section 3.2. Additionally, follow guidelines in AC 43.13-1B, Chapter 11, Section 4.

CAUTION

To avoid damage to equipment, the ammeter must be capable of handling the anticipated load.

The current measurement is best accomplished with an in-circuit or clamp-on calibrated ammeter with 0.5 A or better precision. Continuous rate, as indicated on the alternator and the battery data plate/nameplate, must be noted.

1. The tabulated form provided in Figure 3-6 can be used to compile a list of electrical loads on the aircraft. Typically, the list is comprised of existing circuit breakers and circuit breaker switches as shown by the example in Figure 3-7. Continuous (e.g., GPS) or intermittent (e.g., stall warning horn, landing gear) loads must be identified.
2. Use the worst-case flight condition and identify which phase of flight each particular load is used in for normal flight operation. Certain loads are mutually exclusive and will not be turned on at the same time (e.g., pitot heat and air conditioning). Use only the worst-case load conditions for each phase of flight.

NOTE

Normal operation is when the primary electrical power generating system is operating normally. Emergency operation is when the primary electrical power generating system is inoperative.

3. Use the worst-case flight condition and identify which phase of flight each load is used in for emergency flight operation. At a minimum, the list of equipment must include:
   a. PFD
   b. AHRS #1
   c. ADC #1
   d. GI 275 EIS (if applicable)
   e. COM radio #1
   f. GPS #1
   g. Audio panel [1]
   h. Stall warning system (if applicable)
   i. Pitot heat
   j. Landing light (switched on during landing only)
   k. Instrument panel lighting
   l. Landing gear indication lights
   m. Navigation lights
   n. Strobe lights

Notes:

[1] If the landing gear warning or stall warning audio requires the audio panel, then the audio panel must be included; otherwise, the audio panel is not essential for continued safe flight/landing and may be omitted.

CAUTION

The pitot heat must be switched on long enough to take the current measurement and then switched off. Since the pitot probe may get hot, ensure the probe cover is removed. Care must be taken to avoid burns or damage to the unit.

4. The ammeter must be connected in line between the external power source and the master relay circuit, as shown in Figure 3-5. This will eliminate errors due to the charging current drawn by the battery.

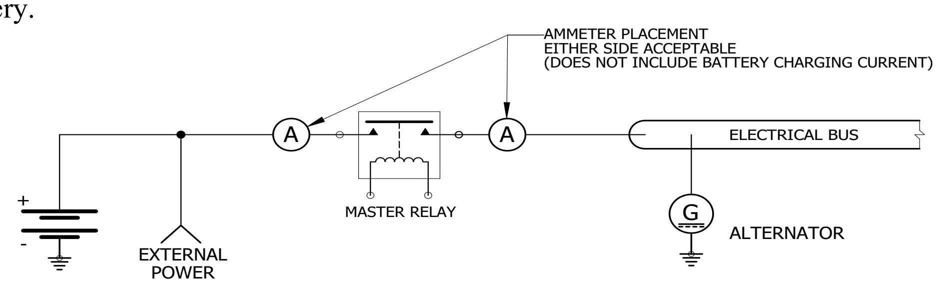


Figure 3-5 Ammeter Placement for Current Measurement

5. With all circuit breakers closed, external power must be applied to the aircraft and voltage set to the nominal alternator voltage (usually 13.8 VDC or 27.5 VDC).
6. The battery master switch must be turned on. Do not measure intermittent electrical loads. It is assumed if any additional current is required beyond the alternator capability, this short-duration demand will be supplied by the battery.
7. The following lighting settings must applied during the entire electrical load measurement:
   a. All instrument panel and flood lights set to maximum brightness.
   b. The GI 275 backlight set to 50% brightness.
   c. All other backlit displays, including GPS navigator, set to 50% brightness.
8. Switch on all continuous electrical loads that are used for the taxiing phase of flight and record the current that is measured by the ammeter (tabulated ELA form in column 1, Figure 3-6). The autopilot circuit breaker must be closed, but the autopilot must not be engaged during the measurement.
9. Switch on all continuous electrical loads that are used for the normal takeoff/landing phase of flight and record the current that is measured by the ammeter (tabulated ELA form in column 2, Figure 3-6). Measurements must be taken with the landing lights ON and OFF. The autopilot circuit breaker must be closed and the autopilot must be engaged.
10. Switch on all continuous electrical loads that are used for the normal cruise phase of flight and record the current that is measured by the ammeter (tabulated ELA form column 3, Figure 3-6). The autopilot circuit breaker must be closed and the autopilot must be engaged.
11. Switch on all continuous electrical loads that are used for the emergency cruise phase of flight and record the current that is measured by the ammeter (tabulated ELA form column 4, Figure 3-6). Measurements must be taken with the landing lights ON and OFF.
12. Switch on all continuous electrical loads that are used for the emergency landing phase of flight and record the current that is measured by the ammeter (tabulated ELA form column 5, Figure 3-6). Measurements must be taken with the landing lights ON and OFF.

The aircraft electrical system is capable of supporting the GI 275 system if the maximum electrical system demand, as documented on the tabulated ELA form, does not exceed 80% of the alternator capacity. It is permissible for the electrical load to exceed 80% of the alternator capacity when the pitot heat and landing light are both switched on during the takeoff/landing phase of flight. In this case, the electrical load must not exceed 95% of the alternator capacity. If the pitot heat is on and the landing light is off, the electrical load may not exceed 80% of the alternator capacity.

NOTE

The Electrical Load Analysis for this installation is only valid for modifications performed under this STC. Subsequent changes to the aircraft electrical system will require a new load analysis.

Date: __________ Tail Number: __________

Circuit/System	Circuit Breaker Number	Operating Time	Phase(s) of flight during which circuit/system is used				
			Normal Operation			Emergency Operation	
			Taxiing 10 min	TO/Land 10 min	Cruise 60 min	Cruise (*Calculated*)	Land 10 min
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
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Figure 3-6 Tabulated Electrical Load Form
Sheet 1 of 2

Date: __________ Tail Number: _________

Circuit/System	Circuit Breaker Number	Operating Time	Phase(s) of flight during which circuit/system is used				
			Normal Operation			Emergency Operation	
			Taxiing 10 min	TO/Land 10 min	Cruise 60 min	Cruise (*Calculated*)	Land 10 min
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
________	____	____	☐	☐	☐	☐	☐
Total current used (amps):			____ (a)	____ Ldg Lt ON (b1) ____ Ldg Lt OFF (b2)	____ (c)	____ (d)	____ (e)
÷ Alternator rating (amps): ____							
x 100% = Percent of alternator capacity used:			____% (< 80%)	____% Ldg Lt ON (< 95%) ____% Ldg Lt OFF (< 80%)	____% (< 80%)	N/A	N/A
Pass/Fail:			____	____	____		

Notes:

Figure 3-6 Tabulated Electrical Load Form
Sheet 2 of 2

Date: 12/04/2019 **Tail Number:** N5272K

Circuit/System	Circuit Breaker Number	Operating Time	Phase(s) of flight during which circuit/system is used				
			Normal Operation			Emergency Operation	
			Taxiing 10 min	TO/Land 10 min	Cruise 60 min	Cruise (*Calculated*)	Land 10 min
Alternator Field	A1	Continuous	☒	☒	☒	☐	☐
Annunciator Panel	C1	Continuous	☒	☒	☒	☒	☒
Vacuum Warning	C2	Intermittent	☐	☐	☐	☐	☐
Stall Warning	C3	Intermittent	☐	☐	☐	☐	☐
Gear Warning	C4	Intermittent	☐	☐	☐	☐	☐
Gear Actuator	C5	Intermittent	☐	☐	☐	☐	☐
Cluster Gauge	D1	Continuous	☒	☒	☒	☒	☒
Ignition	D2	intermittent	☐	☐	☐	☐	☐
GI 275 Base	D3	Continuous	☒	☒	☒	☒	☒
Turn Coordinator	D4	Continuous	☒	☒	☒	☐	☐
Gear Relay	D5	Intermittent	☐	☐	☐	☐	☐
Panel Lights	E2	Continuous	☒	☒	☒	☒	☒
Glareshield Lights	E3	Continuous	☒	☒	☒	☒	☒
Flap Actuator	E5	Intermittent	☐	☐	☐	☐	☐
COM 1	F1	Continuous	☒	☒	☒	☒	☒
GPS/NAV 1	F2	Continuous	☒	☒	☒	☒	☒
COM 2	F3	Continuous	☒	☒	☒	☐	☐
GPS/NAV 2	F4	Continuous	☒	☒	☒	☐	☐
Autopilot [1]	F5	Continuous	☒	☒	☒	☐	☐
Audio Panel	G1	Continuous	☒	☒	☒	☒	☒
Radio Blower	G2	Continuous	☒	☒	☒	☐	☐
ADF	G3	Continuous	☒	☒	☒	☐	☐
Transponder	G4	Continuous	☒	☒	☒	☒	☒
GDL 69	H1	Continuous	☒	☒	☒	☐	☐
TCAD	H2	Continuous	☒	☒	☒	☐	☐
JPI Engine Monitor	H3	Continuous	☒	☒	☒	☒	☒
Bose Headsets	H5	Continuous	☒	☒	☒	☒	☒
Altitude Encoder	J1	Continuous	☒	☒	☒	☒	☒
Strobe Light	SW1	Continuous	☒	☒	☒	☒	☒
Nav Lights	SW2	Continuous	☒	☒	☒	☒	☒
Pitot Heat	SW5	Continuous	☐	☒	☒	☒	☒
Elevator Trim	SW6	Intermittent	☐	☐	☐	☐	☐
Boost Pump	SW7	Intermittent	☐	☐	☐	☐	☐

Figure 3-7 Example of Completed Tabulated Electrical Load Form
Sheet 1 of 2

Date: 12/04/2019 **Tail Number:** N5272K

Circuit/System	Circuit Breaker Number	Operating Time	Normal Operation: Taxiing 10 min	Normal Operation: TO/Land 10 min	Normal Operation: Cruise 60 min	Emergency Operation: Cruise (*Calculated*)	Emergency Operation: Land 10 min
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
			☐	☐	☐	☐	☐
Total current used (amps):			45.7 (a)	60.0 Ldg Lt ON (b1) 44.7 Ldg Lt OFF (b2)	43.5 (c)	34 (d)	48.1 (e)
÷ Alternator rating (amps): 70							
x 100% = Percent of alternator capacity used:			68 % (< 80%)	86 % Ldg Lt ON (< 95%) 64 % Ldg Lt OFF (< 80%)	62 % (< 80%)	**N/A**	**N/A**
Pass/Fail:			PASS	PASS	PASS		

Phase(s) of flight during which circuit/system is used

Notes:

[1] During taxi phase, autopilot circuit breaker is closed but autopilot is not engaged.

Figure 3-7 Example of Completed Tabulated Electrical Load Form Sheet 2 of 2

3.5.2 Battery Capacity Analysis

NOTE

A Battery Capacity Analysis is not required if only installing the GI 275 as an MFD.

The capacity of the aircraft battery must be verified if the GI 275 installation increases the electrical load on the system. The capacity of the existing battery is adequate if it supports loads essential to the continued safe flight and landing for a minimum of 30 minutes. For aircraft with a maximum service ceiling greater than 25,000 feet and certified with FAR 23.1353(h) at amendment 23.62, the battery must support 60 minutes of continued safe flight. Otherwise, the battery must be replaced with a battery that has sufficient capacity.

Refer to ASTM F 2490-05 *Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis* for more information.

Verification of the battery capacity can be accomplished following these steps:

1. **Battery Capacity** (de-rated) – 75% of the battery capacity (as indicated on battery nameplate) is assumed available (this value has units of Amp Hrs). Ensure the value is converted to Amp Mins.
2. **Normal Operation Load** – Worst-case cruise condition (cruise at night) during normal operation is assumed with 5 minutes given to the pilot to shed non-essential loads. Any automatic load shedding can be considered immediate and does not need to be considered in the calculations. Multiply the normal operation load (Amps) by t_1 (mins) [t_1 = 5 min].
3. **Emergency Landing Load** – Electric load during the approach and landing with failed generator/alternator. This load is assumed to drain the battery for 10 minutes and needs to be determined. Multiply the emergency landing operation load (Amps) by t_2 (mins) [t_2 = 10 min].
4. **Emergency Cruise Load** – Minimum load necessary to maintain flight in cruise after the generator/alternator has failed needs to be determined.

The following equation determines the battery capacity for emergency cruise expressed as time (**t_3**):

$$t_3 = \frac{\text{Battery Capacity - Normal Operation - Emergency Landing}}{\text{Emergency Cruise Load}} = \frac{(1) - (2) - (3)}{(4)}$$

The duration of the entire emergency flight on battery power is:

$t = t_1 + t_2 + t_3$

$t = 5\text{ min} + 10\text{ min} + t_3$

$t = 15\text{ min} + t_3$

EMERGENCY POWER OPERATION CALCULATION EXAMPLE

Date: 12/04/2019 Registration No.: N5272K

POWER SOURCE	QTY. INSTALLED	VOLTAGE	MANUFACTURER	MODEL
ALTERNATOR	1	13.75 VDC	PRESTOLITE	AL 12-P70
BATTERY	1	12.00 VDC	GILL	G-35

Assumptions:

1. Most severe operating condition is considered to be night IFR with the pitot heat operating.
2. Load demands are shown for steady state operation and do not include inrush current draw.
3. Load shedding is accomplished manually by the pilot within five minutes of warning annunciation.
4. Loads measured using a calibrated Extech DC ammeter clamped on the cable between battery terminal and master relay.

Analysis:

(1) Battery Capacity

0.75×35 Amp hrs = $26.25\text{Ah} \times 60$ min = **1575 A-min**

(2) Normal Operation Load [t_1 = 5 minutes duration]

Current drawn in normal cruise 43.5 A

Load 5 min×43.5 A = **217.5 A-min**

(3) Emergency Landing Load [t_2 = 10 minutes duration]

Current drawn in emergency landing 48.1 A

Load 10 min×48.1 A = **481 A-min**

(4) Emergency Cruise Load.

Current drawn in emergency cruise **34.0 A**

(5) Battery capacity for emergency cruise

$$t_3 = \frac{(1) - (2) - (3)}{(4)} = \frac{1575 - 217.5 - 481}{34} = \mathbf{25.8\ minutes}$$

(6) Total duration of flight on emergency (battery) power

$t = t_1 + t_2 + t_3$

t = 5 min + 10 min + 25.8 min = **40.8 min**

Results:

The total required flight duration on emergency power is 30 minutes. The existing battery capacity provides **40.8 minutes** for emergency flight duration. The battery is adequate.

4 INSTALLATION

WARNING

This manual only approves the installation of the GI 275 Base (including backup battery and backup GPS antenna), GSB 15, and GEA 24(B) (including EIS annunciator(s) and engine sensors). Other compatible LRUs listed in Appendix C must use other installation approvals and may require installation and/or configuration by an authorized Garmin dealer per Garmin's installation policy.

4.1 Wire Routing and Installation

GI 275 LRU connector definitions and pin functions are defined in Appendix A. System installation requires fabrication of electrical wire harnesses. When fabricating and installing each harness:

- Reference the aircraft manufacturer (electrical) standard practices manual and equipment manufacturer documentation for guidance on wire type, gauge, routing, and wire identification. Methods, techniques, and practices defined in AC 43.13-1B Chapter 11, *Aircraft Electrical Systems*, are acceptable.
- Refer to the equipment manufacturer for any specific shield requirements, or follow general practices and guidance in this manual if none exist.
- For all existing wiring that is overbraided, the overbraid must be maintained and include the new wire added between the GI 275 and the existing system. It is acceptable to install new overbraid containing the new wire provided the existing wire and overbraid routing is maintained. The overbraid should be terminated in the same or better manner at each connector. If pigtails are used, then they should be kept as short as possible and no longer than the original overbraid.
- Ensure the wiring does not contact sources of heat or RF/EMI interference (power sources) and is not routed near moving components of aircraft controls or other systems. Wire routing must preclude accidental impact or damage.
- Provide adequate space for the LRU or sensor connector(s). Include additional wire length to create a service loop for maintenance, where appropriate.
- Shield terminations must be as short as possible and not exceed 3.0 inches unless otherwise specified. Shields may be connected to the metal connector backshell when the backshell is grounded to the airframe chassis ground, unless otherwise specified by equipment manufacturer. Alternately, the shield termination may be directly connected to the airframe ground.
- The GEA 24(B) wiring must be routed away from any windows. Installed GI 275s must not share any circuit breakers or ground returns. The standby instruments must not share any circuit breakers or ground returns with any GI 275.
- Intermediate connections must be minimized to maintain certified electromagnetic compatibility. All shields must have continuity at intermediate connections (e.g., bulkhead connectors, terminal blocks, splices, etc.). If intermediate connectors are installed, unless otherwise specified, the shield must be terminated at both sides of the intermediate connector backshells (if metal connector) or to airframe ground on both sides of the intermediate connectors.

NOTE

Interconnect diagrams in this manual only show end-to-end connections and do not show intermediate connections that may be present in an aircraft.

4.1.1 Shielded Cable Preparation

Prepare all of the shielded cables in accordance with Figure 4-1. When terminating shield drains, a maximum of two shields can be daisy-chained together. The daisy-chaining method may only be used if the six tapped holes in the shield block are insufficient to ground all shields.

1. At the end of the shielded cable, strip back a 2.5-inch maximum length of the jacket to expose the braid.
2. Remove this exposed braid.
3. Carefully score the jacket 1/4 to 5/16 inches from the end and remove the jacket to leave the braid exposed.

NOTE

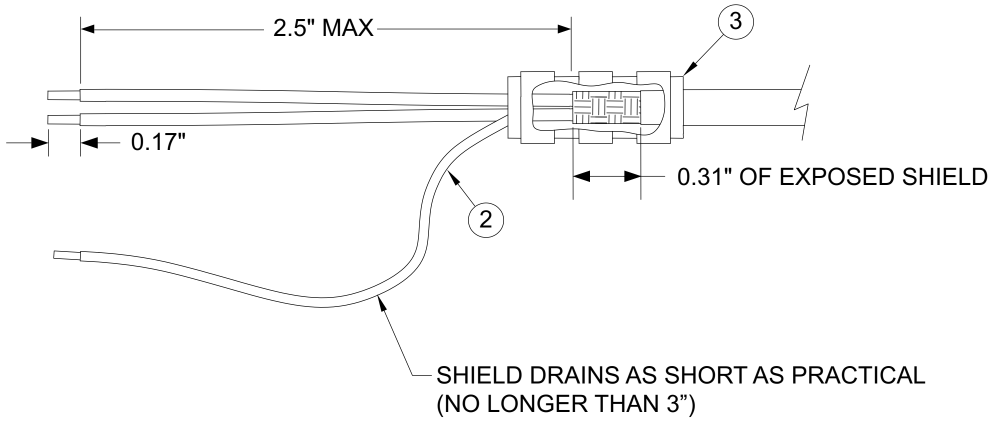
Solder sleeves with pre-installed shield drains may be used instead of separate shield terminators and individual wires.

4. Connect a 20 or 22 AWG wire (**2**) to the exposed shield of the prepared cable assembly. Refer to Figure 4-1. Refer to AC 43.13-1B for termination techniques.

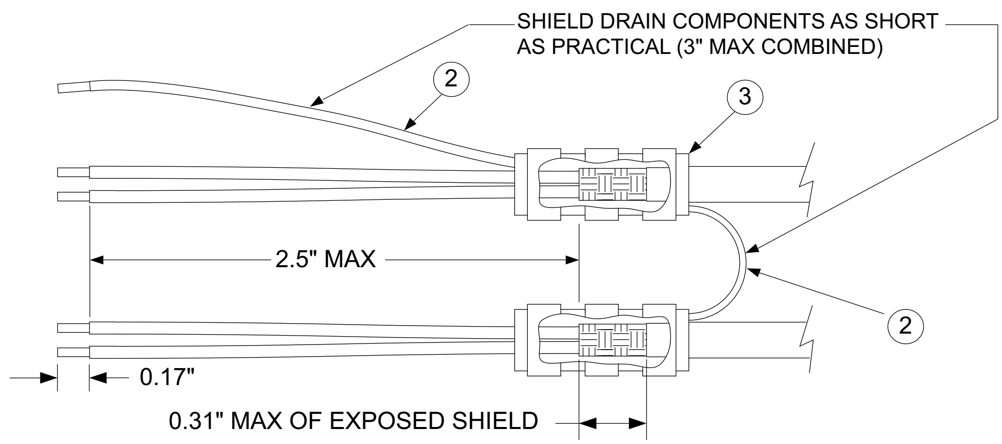
NOTE

Solder Sleeves with pre-installed lead: *A preferred solder sleeve is the Raychem S03 Series with the thermochromic temperature indicator. These solder sleeves come with a pre-installed lead and effectively take the place of items (**2**) and (**3**). For detailed instructions on product use, refer to Raychem installation procedure.*

5. Slide a shield terminator (**3**) onto the prepared cable assembly.
6. Connect the shield wire (**2**) to the shield using a heat gun approved for use with solder sleeves. The chosen size of solder sleeve must accommodate both the number of conductors present in the cable and the shield wire (**2**) to be attached.
7. Crimp contacts onto the cable wires.
8. Repeat steps 1 through 7 as needed for the remaining shielded cables.
9. Wrap the cable bundle with silicone fusion tape A-A-59163 (MIL-I-46852C) at the point where the backshell strain relief and cast housing will contact the cable bundle.
10. Install a ring terminal onto the cable shield termination wires (**2**), grouping wires as applicable for the connector.



PREFERRED METHOD



ALTERNATE METHOD (DAISY-CHAIN)

Figure 4-1 Shield Termination Methods

4.2 Equipment Bonding

All installed items listed in Table 4-1 must be electrically bonded to the same airframe ground plane and meet the listed milliohm requirement. The resistance must be verified with a calibrated milliohm meter with ±0.1 mΩ (or better) accuracy with all connector(s) disconnected.

All existing third-party remote equipment interfaced to a GI 275 must be electrically bonded to the airframe ground. It is not acceptable to interface the GI 275 equipment to existing third-party equipment that relies only on power ground return wires as an electrical ground.

Electrical bonding can be achieved with mounting hardware (e.g., rivets, bolts, nuts, washers, etc.) or via bond straps. Bonding surfaces must be clean of any primer, grease, or dirt. If mounting hardware is used to create the electrical bond, the area under the head of the bolt or washer must be free of primer and a spot face prepared that is at least 0.125 inches wider than the head of the bolt or the washer. Any exposed area still visible after the bond is completed must be primed and finished with the original coating or other suitable film. Rivets used to mechanically attach brackets and shelves provide an inherent electrical bond through the rivets and require no additional bond preparation. The top or bottom side of the Garmin racks or equipment flanges do not need any special bond preparations. Reference the aircraft manufacturer (electrical) standard practices manual for procedures on electrical bond preparation, or follow SAE ARP 1870 *Aerospace Systems Electrical Bonding and Grounding for Electromagnetic Compatibility and Safety*, Section 5, *Detail Requirements*.

Table 4-1 Bonding Requirements

Unit	Value
GI 275 Base	2.5 mΩ (from unit to instrument panel).
Engine Annunciator(s)	10 mΩ (from unit to instrument panel).
GEA 24(B)	2.5 mΩ (from unit to local structure).
GTP 59	2.5 mΩ or electrically isolated per Appendix D (from unit to local structure).
GSB 15	2.5 mΩ (from unit to instrument panel or local structure).

The instrument panel must be metal construction allowing a ground path for instrument panel installations. For metal and tube-and-fabric aircraft, the ground path is inherently achieved through the metallic airframe structure. For composite aircraft, a ground plane (or reference) must be used to achieve a comparable ground.

The face sheet on honeycomb shelves must be metal when equipment is mounted to the shelf. The honeycomb material between the face sheets is not conductive; therefore, care must be taken to ensure proper bonding of the equipment. The top and bottom face sheets must be grounded to each other and at least one of face sheets must be grounded to the airframe.

4.2.1 Vibration Mounts

For instrument panels with vibration mounts, verify the mounts are grounded to the metallic airframe structure with a bonding jumper. Ensure the jumper meets the following specifications:

- The cross-sectional area of the strap is greater than 0.016 square inches (approximately 20,800 circular mils).
- The braid is a 7/16" or wider tubular braid (P/N QQB575R30T437, 24,120 circular mils) or a 3/4" or wider flat braid (P/N QQB575F36T781, 20,800 circular mils).
- The braid contains a terminal lug (mil-spec MS20659-130) at each end.
- The strap length is as short as possible, not exceeding 6 inches.

Ensure each terminal lug is secured to its respective mating surface with a #10 steel bolt and one flat washer (P/N AN970-3). Lugs and washers should be center-aligned and flush on all outside edges. These components should be in full contact with the mating surface.

4.2.2 Aluminum Surface Preparation

In order to prepare the aluminum surface for proper bonding, the following general steps should be followed. For a detailed procedure, refer to SAE ARP1870 Sections 5.1 and 5.5.

1. Clean grounding location with solvent.
2. Remove non-conductive films or coatings from the grounding location. When area is cleaned around fastener heads or washers, the area cleaned should be 0.125 inches wider than the footprint of the washer or the bolt head.
3. Apply a chemical conversion coat, such as Alodine 1200, to the bare metal.
4. Once the chemical conversion coat is dry, clean the area.
5. Install bonding aluminum tape or equipment at grounding location.
6. After the bond is complete, if any films or coatings were removed from the surface, re-apply a suitable film or coating to the surrounding area.

4.3 Instrument Panel Installations

The GI 275 is primarily designed to replace existing 3-inch diameter flight instruments on the instrument panel. For all GI 275 installations, the instrument panel must be constructed from metallic materials.

The GI 275 must be electrically bonded to the aircraft instrument panel with a direct current (DC) resistance specified in Table 4-1. Electrical bond is accomplished through GI 275 surface to backside of instrument panel surface contact.

The GI 275 display(s) must be located such that it is within the pilot's field-of-view and also within reach of the pilot. The GI 275 display(s) must not interfere with the installation of flight control systems or control lock devices.

FAA AC 23.1311 defines the pilot's field-of-view as the ability to view the flight instruments with "minimum head and eye movement". Figure 4-2 provides an example of the pilot's field-of-view based on a distance of 30 inches from the pilot eye to the instrument panel, as recommended in AC 23.1311.

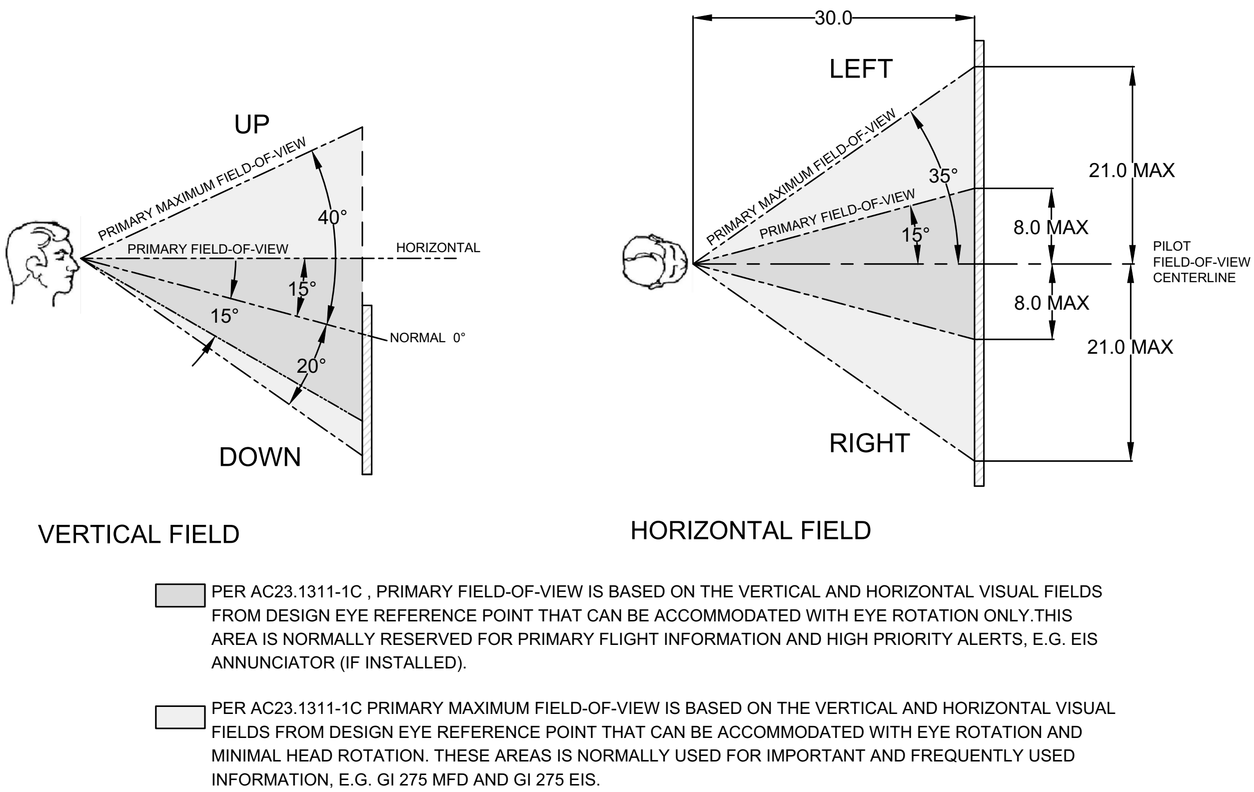


Figure 4-2 Example of Pilot Field-of-View Installation

NOTE

Display location must not affect the readability of any existing or added switches under all lighting conditions, including switches that maybe blocked from the instrument flood lights.

In Figure 4-2, the pilot's field-of-view centerline is coincident with:

1. A projection of the centerline of the pilot's seat onto the instrument panel; or
2. The center of control yoke or stick in neutral position if the control yoke or stick are offset from the centerline of the pilot's seat.
3. Per AC 23.1311, it is acceptable for the pilot field-of-view centerline to deviate horizontally from the actual centerline by ±2.0 inches.

NOTE

If the GI 275 EIS is installed outside the pilot's maximum field-of-view, and a PFD capable of annunciating EIS warnings and cautions is not installed, a remote annunciator(s) will be required as an engine caution and warning advisory. The annunciator(s) must be located within the pilot's primary field-of-view. Refer to Section 4.3.3.

4.3.1 GI 275 Multifunction Indicator

The GI 275 MFD is designed to be installed in a standard 3.125-inch instrument slot in the instrument panel as long as the data provided by that instrument is provided somewhere else within the viewing angles in the instrument panel. GI 275 EIS units in multi-engine aircraft must be located adjacent to each other and oriented (i.e., vertically or horizontally) the same as the previously approved installation.

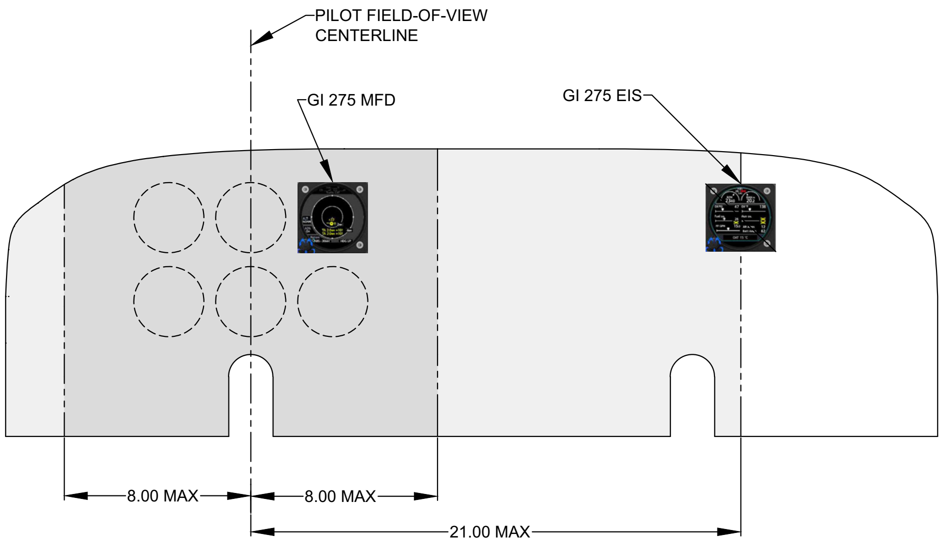


Figure 4-3 Example of GI 275s in "Six Pack" Instrument Panel (Single-Engine)

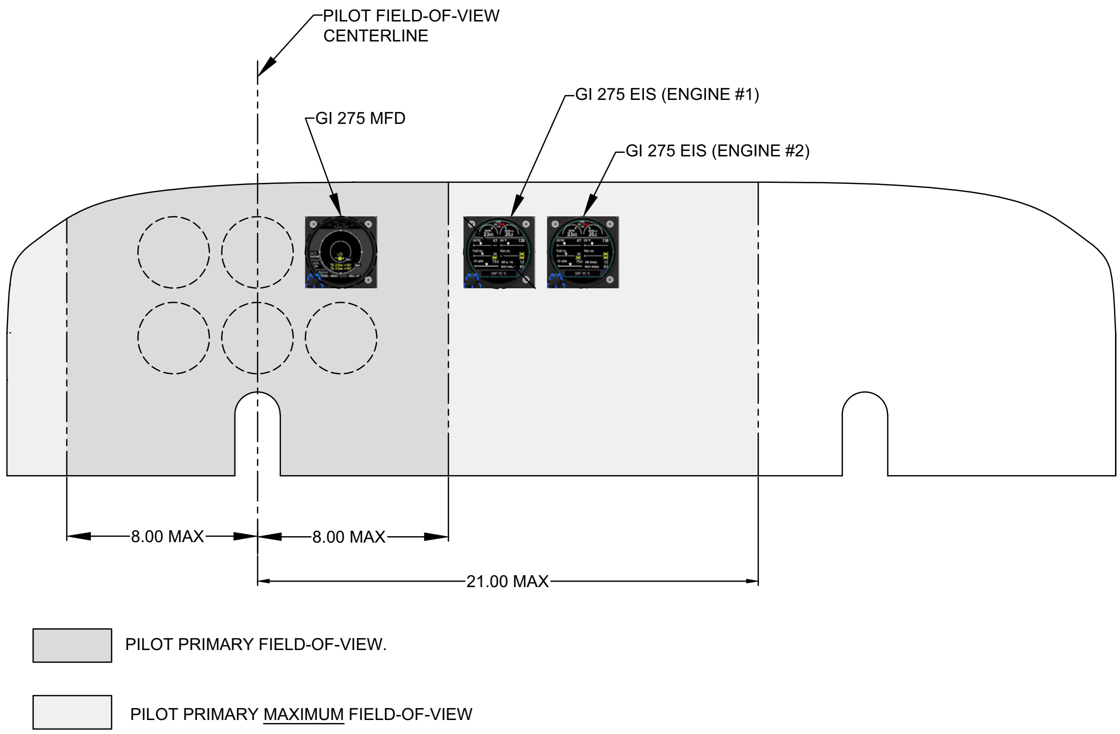


Figure 4-4 Example of GI 275s in "Six Pack" Instrument Panel (Multi-Engine)

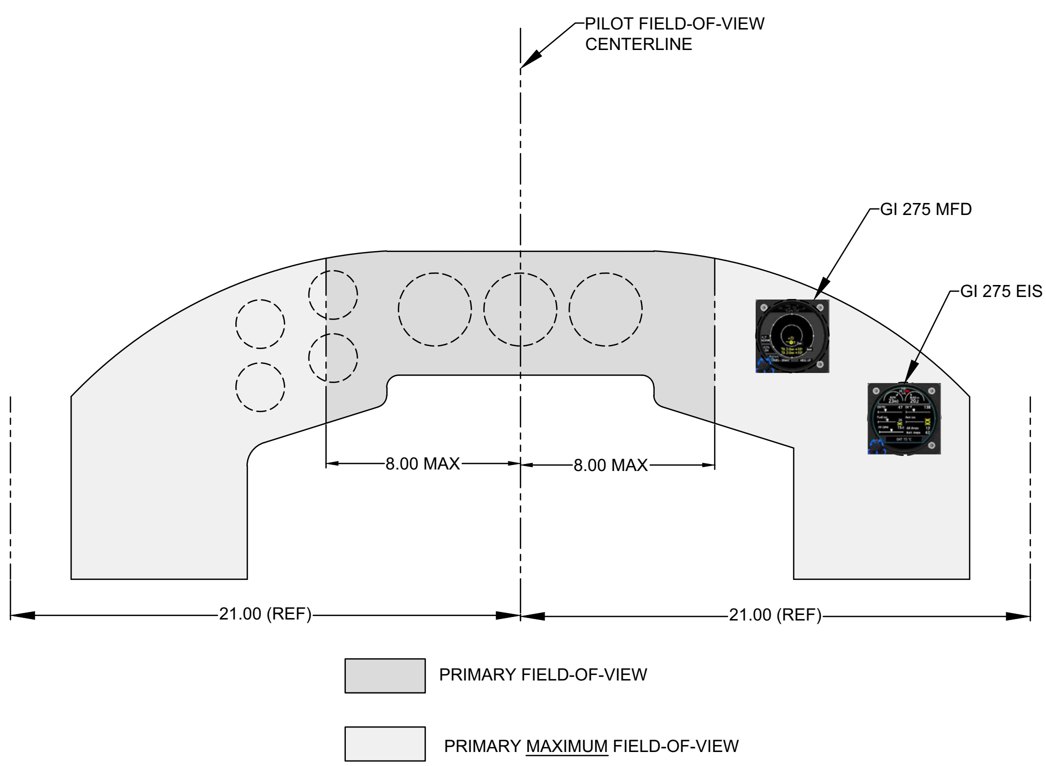


Figure 4-5 Example of GI 275s in Non-"Six Pack" Instrument Panel (Single-Engine)

Table 4-2 GI 275 Multifunction Indicator Weight & Size

Item	Weight lb. (kg)	Dimensions in. (mm)		
		Height	Width	Depth
GI 275 Base (-00, -60)	1.58 (0.71)	3.25 (82.6)	3.25 (82.6)	6.44 (163.5)
GI 275 Base (-00, -60) with connector kit	1.87 (0.85)			7.40 (188.0)

Notes:

[1] Does not include the weight of the backup battery. If the battery is installed, add 0.32 lbs (0.145 kg).

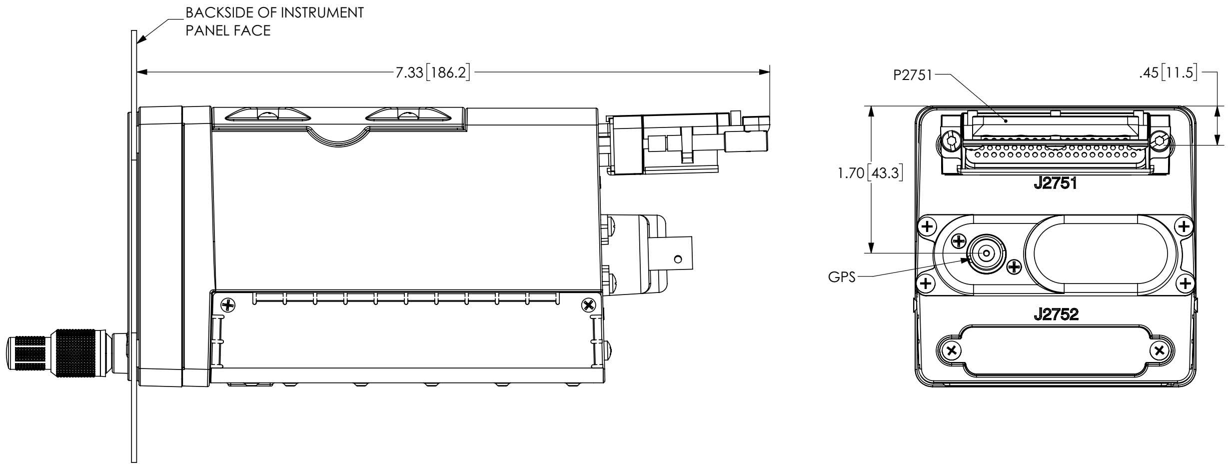


Figure 4-6 GI 275 Multifunction Indicator Dimensions

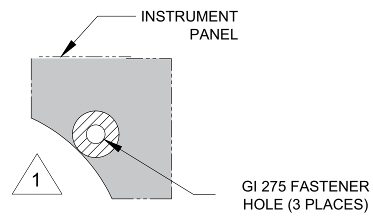
In most cases, installation of the GI 275 requires minimal modification to the existing instrument panel, as shown in Figure 4-7.

CAUTION

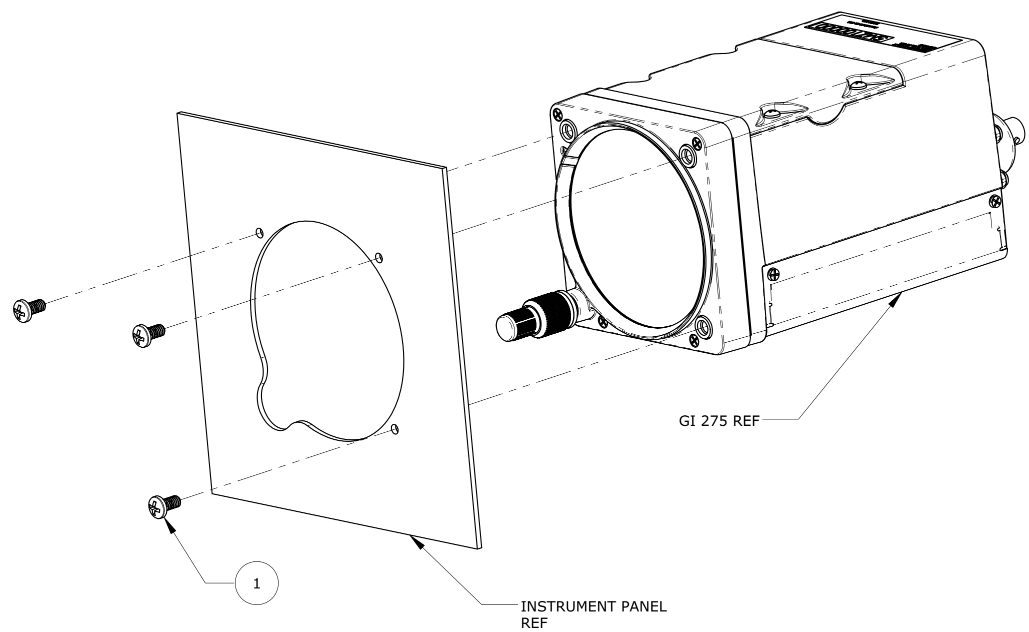
The instrument panel coating that surrounds the fastener holes and contacts directly with the GI 275 unit must be removed prior to installation in accordance with Section 4.2.2.

If modification is required, typically it will be trimming an existing 3-inch cutout on the instrument panel to accommodate the knob on the unit. It may also be necessary to enlarge the instrument panel fastener holes. Refer to Figure 4-8 for the recommended fastener hole diameter.

BACK OF INSTRUMENT PANEL PREPARATION



INSTALLATION IN INSTRUMENT PANEL



1 THE AREA ON THE BACK OF THE INSTRUMENT PANEL THAT COMES IN DIRECT CONTACT WITH THE GI 275 MUST BE PREPARED FOR ELECTRICAL BOND PER SECTION 4.2.2. PREPARE AREA 0.125 INCHES LARGER THAN THE GI 275 METAL INSERTS.

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

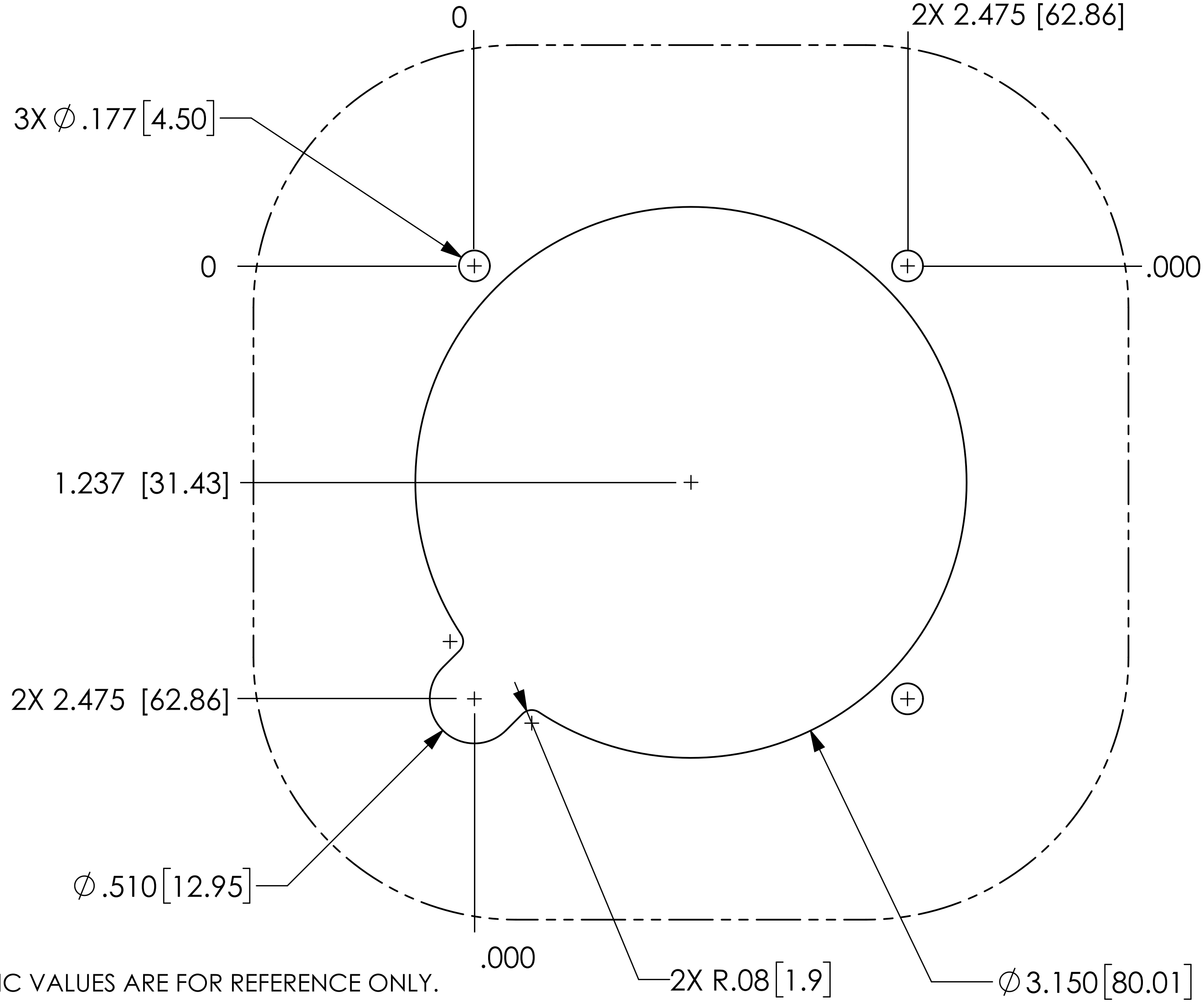
Notes:

[1] Screws can be substituted with any suitable pan head or countersink #8-32 UNC-2A aerospace steel screws.

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

Figure 4-7 Installation of GI 275 Display in the Instrument Panel

If new cutouts for the GI 275 are required, the dimensions and minimum spacing are shown in Figure 4-8.



NOTES:

1. DIMENSIONS: INCHES[mm]. METRIC VALUES ARE FOR REFERENCE ONLY.
2. TOLERANCES:

INCHES	mm
.XX ±0.01	.X ±0.3
.XXX ±0.005	.XX ±0.13

3. MINIMUM RECOMMENDED SEPARATION UNIT TO UNIT (CENTER TO CENTER DISTANCE IN ANY DIRECTION IS 3.32[84.4].

Figure 4-8 GI 275 Cutout

When fabricating a new instrument panel, it must:

1. Use the same thickness, material type, and corrosion protection as the original instrument panel.
    a. If existing instrument panel material isn't known, 2024-T3 aluminum per AMS-QQ-A-250/5, 6061-T6 aluminum per AMS 4025, AMS 4027, or AMS-QQ-A-250/11 must be used.
    b. Corrosion protection must be in accordance with aircraft model-specific standard practices manual, or alternatively chemical conversion coating per MIL-DTL-5541 Type II, or MIL-DTL-81706 Type II, and high-solids chemical and solvent resistant epoxy primer per MIL-PRF-23377, Class N.
2. Be manufactured using methods and procedures defined in an aircraft standard practices manual, maintenance manual, or structural repair manual. Methods, techniques, and practices defined in AC 43.13-1B Chapter 4, Section 4, *Metal Repair Procedures*, are acceptable.
3. Maintain the form of the existing instrument panel, including the location of fasteners, and retain all elements of the instrument panel structure (if comprised of multiple parts assembled together), such that every feature of the instrument panel is preserved or duplicated.
    a. Multiple individual pieces of instrument panel assembly must not be combined.
    b. Single pieces must not be split into smaller components.
4. Remain at the location where it was originally installed in the aircraft, use the same type of fasteners as specified in the aircraft model-specific parts catalog, and retain the same instrument panel installation method as defined by aircraft type design.
5. Retain the lighting for all previously installed instrument(s) that will be re-installed.

Installation and placement of the required placards and limitations must be in accordance with the applicable aircraft data and aircraft type TCDS.

If any placards were relocated as a result of a display installation, verify the following:

- The font size of the new placard is the same as the placard it is replacing.
- The color of the new placard is identical to the color of the placard it is replacing.
- The text on the new placard is identical to the text on the placard that it is replacing (it can be arranged differently as required by space constraints, but the wording must be the same).
- The new placard must be legible and not obscured to the pilot by the glareshield, in all flight control positions, or by any other component in the flight deck.

If new switch labels were added as a result of the GI 275 installation, verify the following:

- The font size and label is legible from the pilot's seat.
- The labels are legible in all ambient light conditions. In particular, the labels are legible with ambient flood lighting in darkness.
- The switch label must be legible and not obscured to the pilot by the glareshield, in all flight control positions, or by any other component to include the switch position.

For all aircraft listed on the AML, electrical bonding and wire routing must be considered for aircraft with non-metallic airframes.

4.3.2 Backup Battery

The backup battery is internal to the GI 275. Captive screws secure a cover plate protecting the battery. The battery pack will not be vented outside the aircraft. The backup battery can optionally be installed in a GI 275 MFD. The battery must be installed in the GI 275 unit prior to installation in the instrument panel.

Table 4-3 Backup Battery Weight and Size

Item	Weight lb. (kg)	Dimensions in. (mm)		
		Height	Width	Depth
GI 275 Backup Battery	0.32 (0.145) [1]	2.36 (60.0)	2.60 (66.0)	1.13 (28.7) (connector end) 0.85 (21.5) (non-connector end)

Notes:

[1] Weight includes the silicone end cap (seen in Figure 4-10).

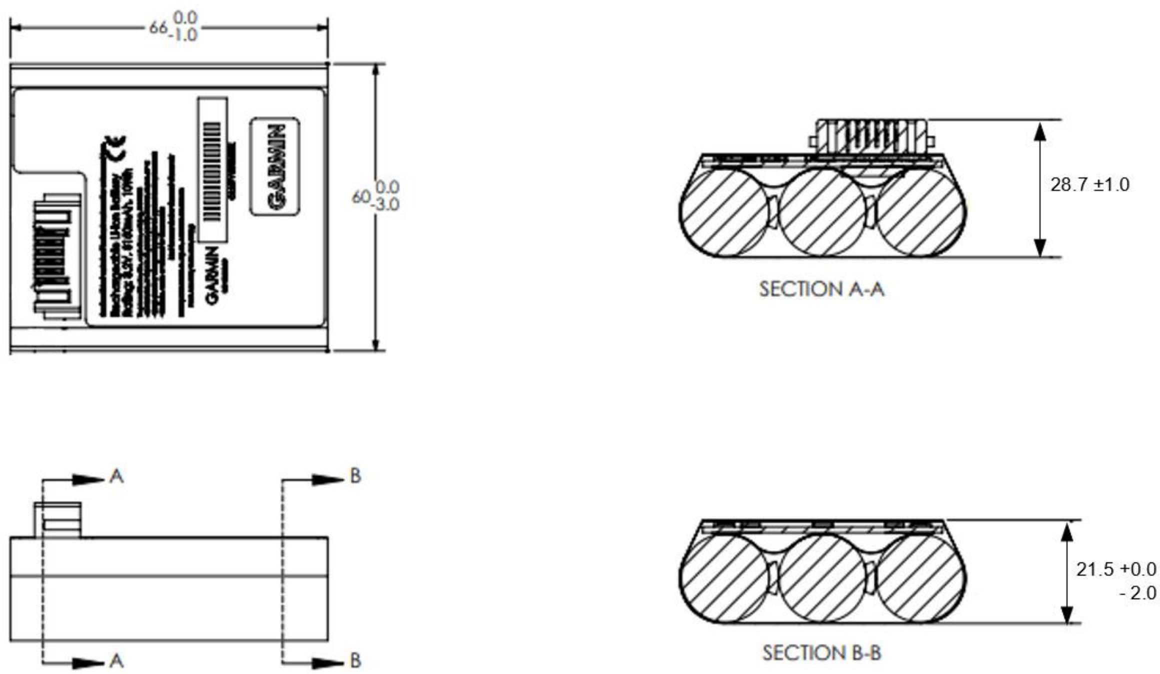


Figure 4-9 Backup Battery Dimensions (Shown without required silicone cap)

To install the backup battery in the GI 275:

1. Remove the four screws and cover plate from the top of the GI 275 unit.
2. Place the two included end caps onto each end of the battery.

CAUTION

The battery end caps are required for installation of the backup battery in the GI 275.

3. Insert the battery into the GI 275 ensuring the battery connector aligns with the GI 275 connector.
4. Press down to fully seat the battery. It should be level with the top of the unit when fully seated.
5. When the battery is installed correctly, the GI 275 will power on. Power off the unit before continuing with the installation.
6. Replace the cover and torque the screws to 8 ± 1 in-lbf. Ensure the cover is fully seated.

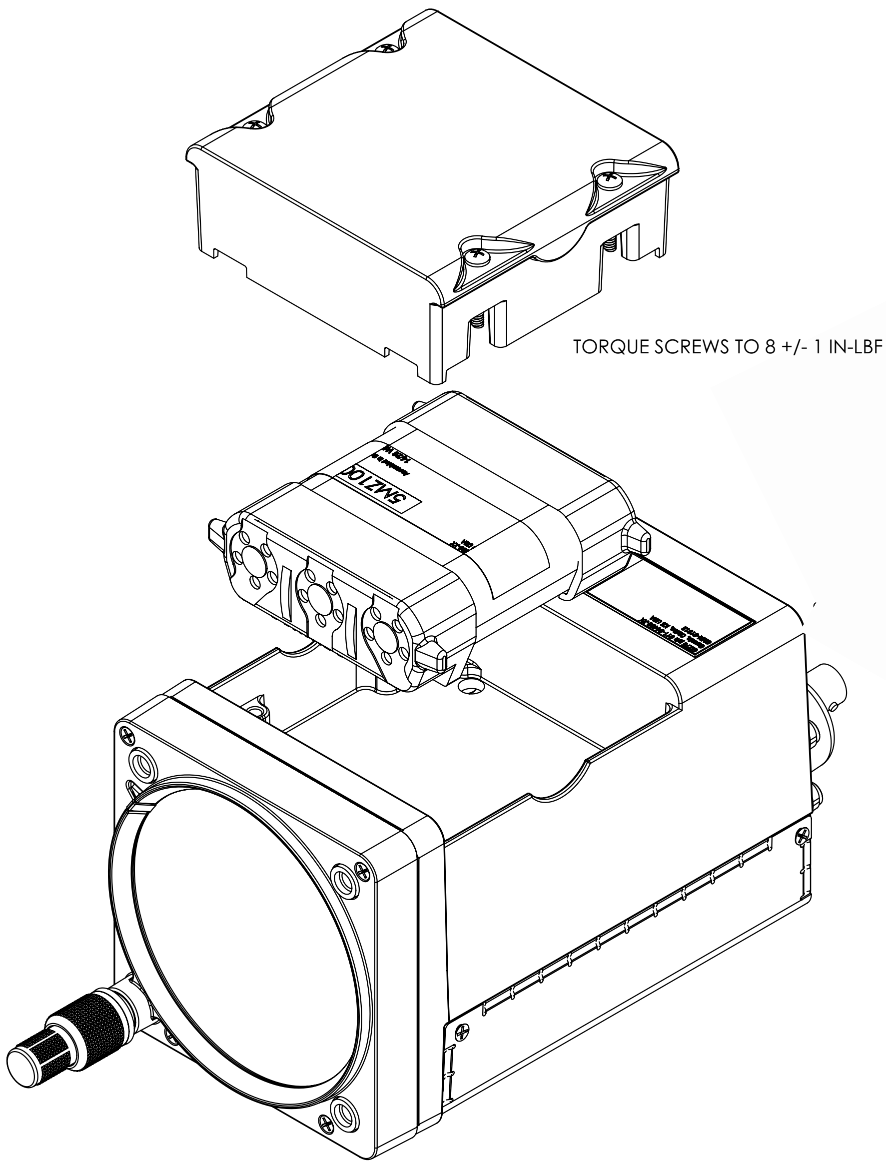


Figure 4-10 GI 275 Backup Battery Installation

4.3.3 EIS Annunciator

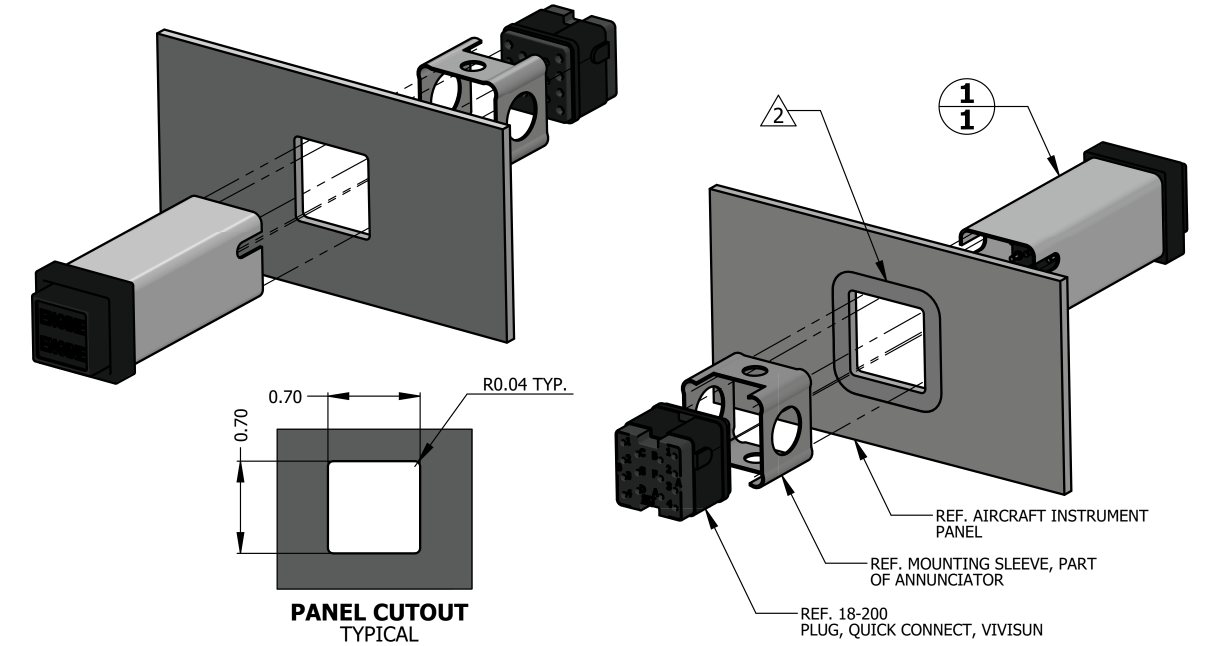
EIS annunciation is required if the GI 275 EIS is located outside the pilot's maximum field-of-view.

The EIS annunciator(s) must be located within the pilot's primary field-of-view. Refer to Figure 4-2 for the definition of the pilot's field-of-view.

Two types of EIS annunciators are approved for installation.

4.3.3.1 EIS Annunciator

The Applied Avionics EIS annunciator provides a red "ENGINE" warning and yellow "ENGINE" caution.



1	1	95-40-17-B4-E1WPN	ANNUNCIATOR, 14 VDC INCADECENT, CAUTION AND WARNING, ENGINE INDICATION, AEROSPACE OPTICS
		LED-40-17-BA2-E1WP6	ANNUNCIATOR, 28 VDC LED, CAUTION AND WARNING, ENGINE INDICATION, AEROSPACE OPTICS
QTY	**ITEM**	**PART NUMBER**	**DESCRIPTION**

NOTES

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

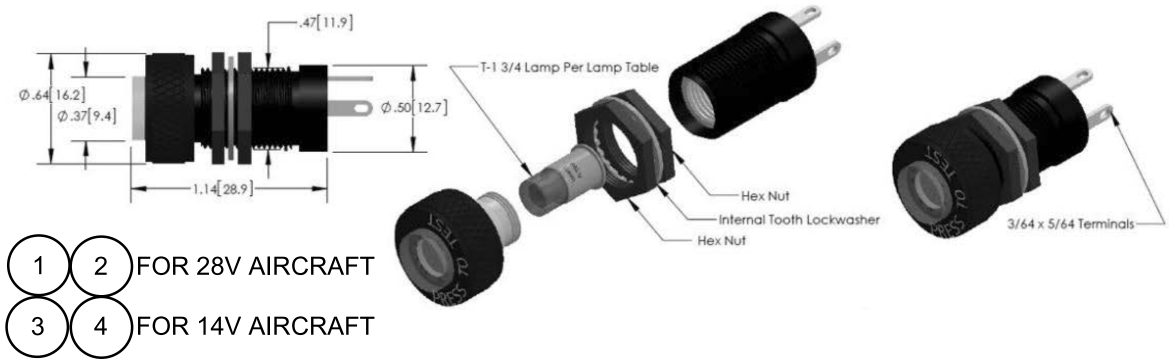
2. AREA IN DIRECT CONTACT WITH ANNUNCIATOR MOUNTING SLEEVE AT THE BACK SIDE OF INSTRUMENT PANEL MUST BE PREPARED FOR ELECTRICAL BOND TO ACHIEVE DIRECT CURRENT RESISTANCE LESS THAN OR EQUAL TO 10 MILLIOHMS AS MEASURED BETWEEN ANNUNCIATOR BODY AND AIRCRAFT INSTRUMENT PANEL.

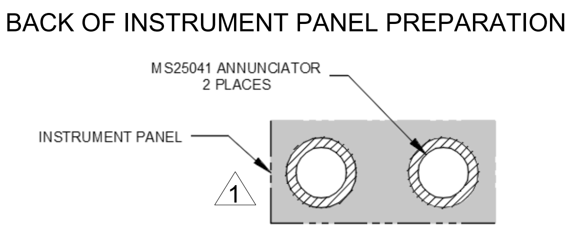
Figure 4-11 EIS Caution and Warning Annunciator Installation

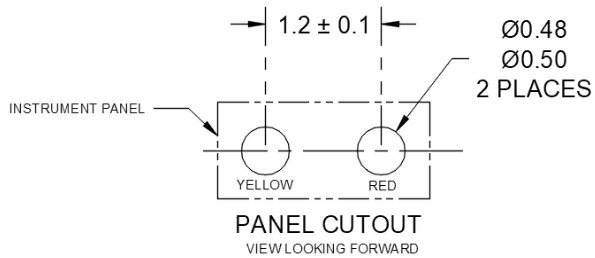
4.3.3.2 Separate EIS Annunciator

The Mil-Spec annunciators must be installed side-by-side with the caution (yellow) annunciator on the left and the warning (red) annunciator on the right. Install using the following procedure:

1. Drill the cutouts to the dimensions in Figure 4-12.
2. Insert MS25041 assembly without the lens holder from the forward side of the panel and secure.
3. Install lamp on the lens holder.
4. Install and secure lens holder on the indicator.
5. Install a placard or label as outlined in Section 6.6.







1 THE AREA ON THE BACK OF THE INSTRUMENT PANEL THAT COMES IN DIRECT CONTACT WITH THE ANNUNCIATOR MUST BE PREPARED FOR ELECTRICAL BOND PER SECTION 4.3.2. IT IS RECOMMENDED THAT THE PREPARED AREA BE 0.125 INCHES LARGER THAN THE CUTOUT.

ITEM	OTY	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 4-12 Separate EIS Caution and Warning Annunciators Installation

4.3.4 GSB 15

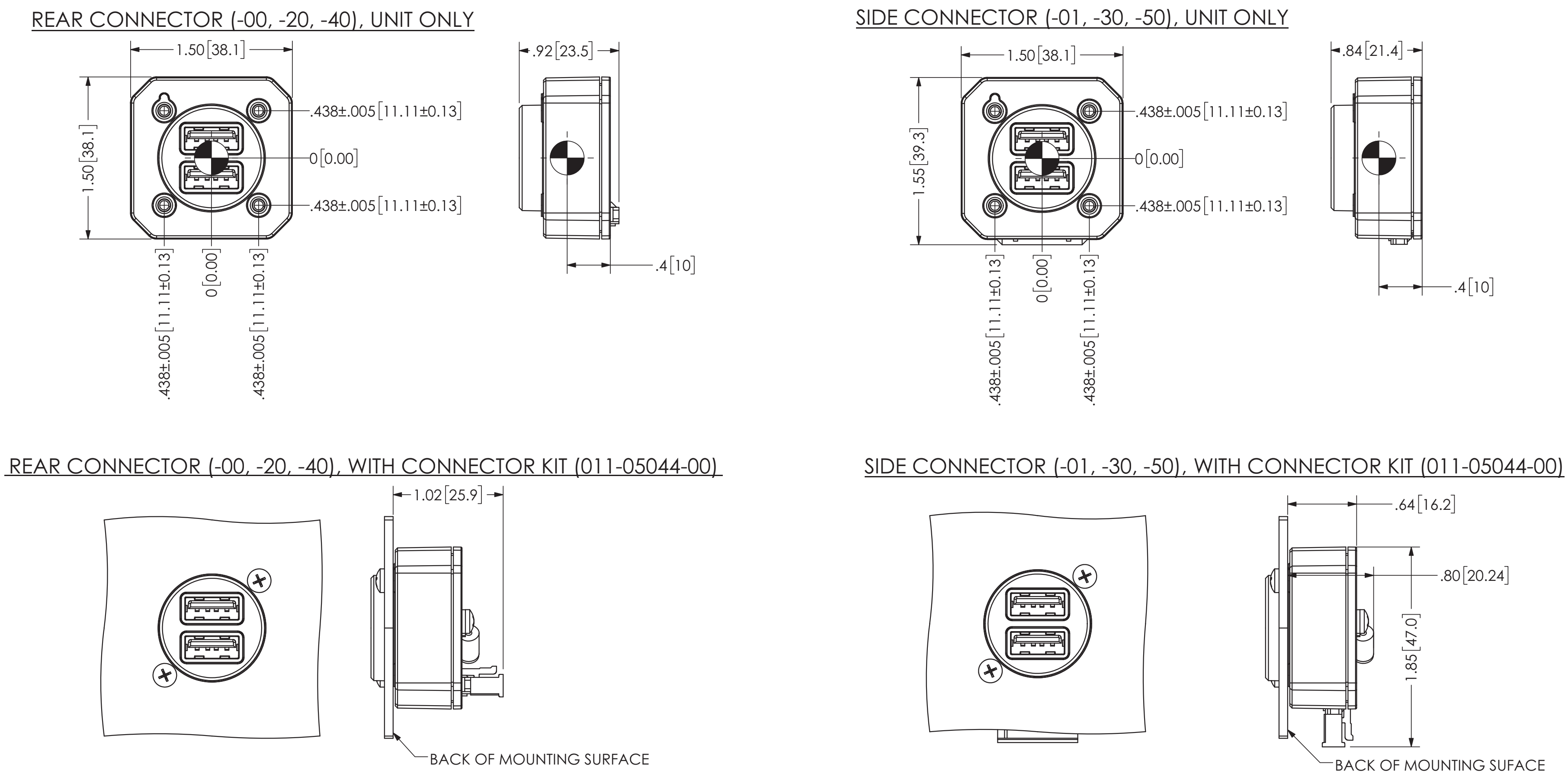
The GSB 15 is a USB database and charging hub. The GSB 15 is designed to be mounted on a vertical surface, where moisture and fluids are less likely to be trapped inside the USB ports but still be visible and accessible to the user.

The preferred location for the GSB 15 is the instrument panel. Other locations are acceptable provided that they do not interfere with the safe operation of the aircraft. Only units installed in the pilot's side of the instrument panel are approved for USB connections (refer to Figure B-13). All other installations (including co-pilot) are limited to power only.

There are six variants of the GSB 15. 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.

Table 4-4 GSB 15 Weight and Size

Item	Weight lb. (kg)	Dimensions in. (mm)		
		Height	Width	Depth
GSB 15 Rear Connector (P/N 011-04937-00, -20, -40)	0.16 (0.07)	1.50 (38.1)	1.50 (38.1)	1.225 (31.1)
GSB 15 Side Connector (P/N 011-04937-01, -30, -50)	0.16 (0.07)	1.85 (46.99)	1.50 (38.1)	0.844 (21.4)
2.25" Mounting Kit	0.11 (0.05)			
3.125" Mounting Kit	0.20 (0.09)			
GSB 15 decorative cover, unfinished	0.03 (0.01)			
GSB 15 decorative cover, black	0.03 (0.01)			



NOTES:
1. DIMENSIONS: INCHES[mm]. METRIC VALUES ARE FOR REFERENCE ONLY.
2. DIMENSIONS ARE NOMINAL AND TOLERANCES ARE NOT IMPLIED UNLESS SPECIFICALLY STATED.

Figure 4-13 GSB 15 Dimensions

If a new cutout for the GSB 15 is required on the instrument panel, the dimensions of the cutout is shown in Figure 4-14. Note that the location of the GSB 15 on the instrument panel is not required to meet any particular field-of-view requirements. When installing the decorative cover, the cutout with four screw holes is required.

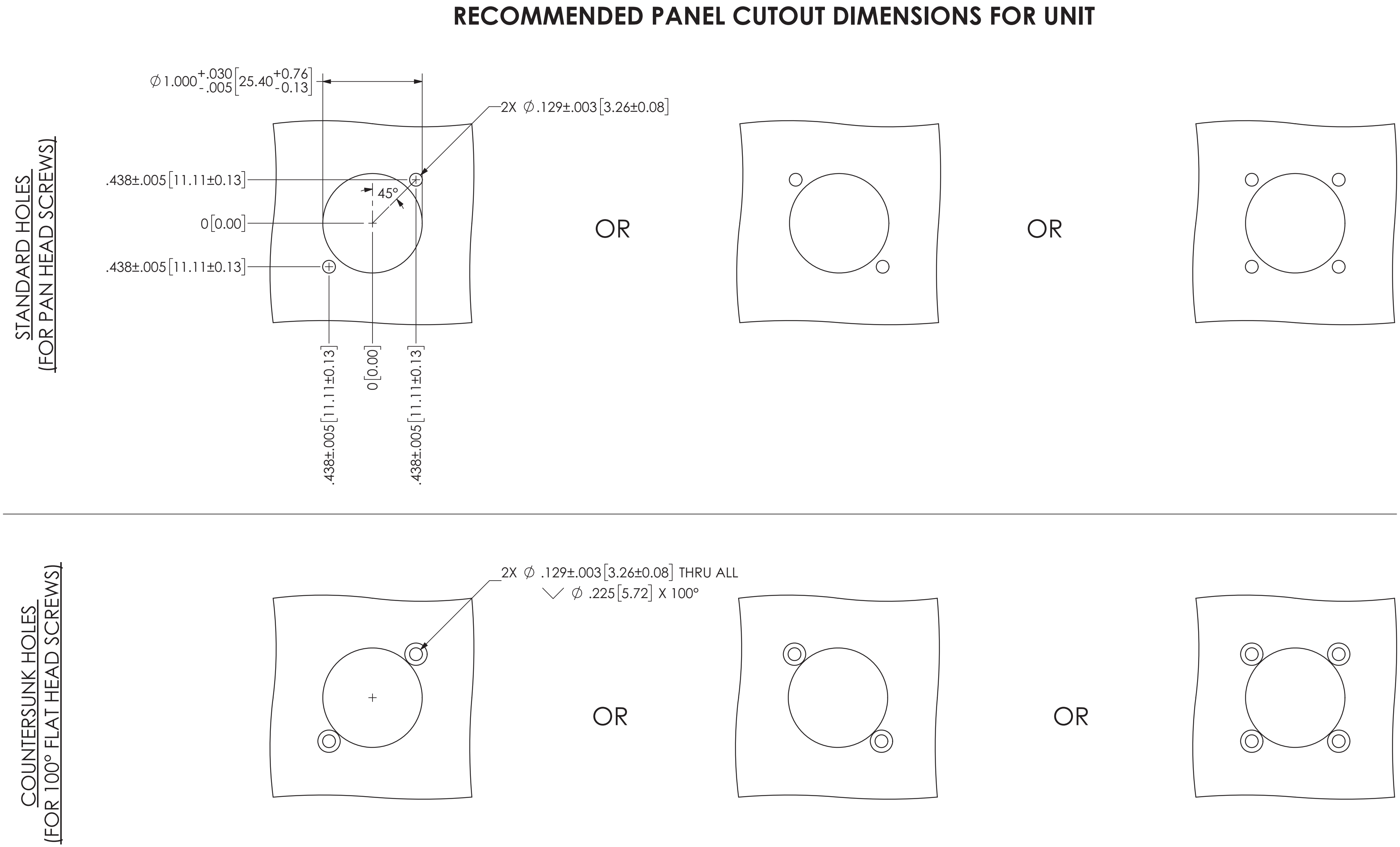
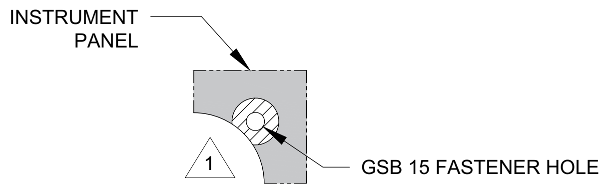


Figure 4-14 GSB 15 Cutout Dimensions

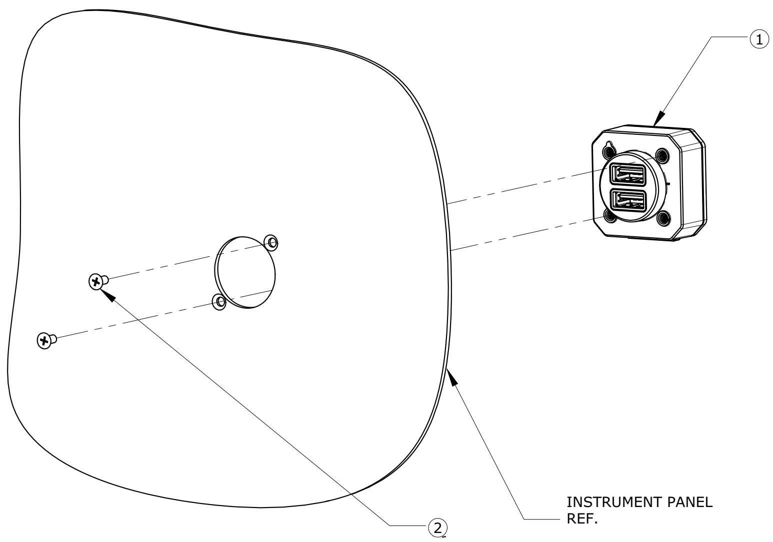
CAUTION

The instrument panel coating that surrounds the fastener holes and contacts directly with the GSB 15 unit must be removed prior to installation.

BACK OF INSTRUMENT PANEL PREPARATION



INSTALLATION IN INSTRUMENT PANEL



1 THE AREA ON THE BACK OF THE INSTRUMENT PANEL THAT COMES IN DIRECT CONTACT WITH THE GSB 15 MUST BE PREPARED FOR ELECTRICAL BOND PER SECTION 4.2.2. PREPARE AREA 0.125 INCHES LARGER THAN THE GSB 15 METAL INSERTS.

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.

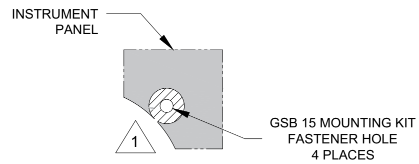
Figure 4-15 GSB 15 Cutout Installation

The GSB 15 can be installed directly into an existing 2-inch diameter flight instrument cutout without modifying the instrument panel using the GSB 15 2.25” Mounting Kit (P/N 011-05043-00).

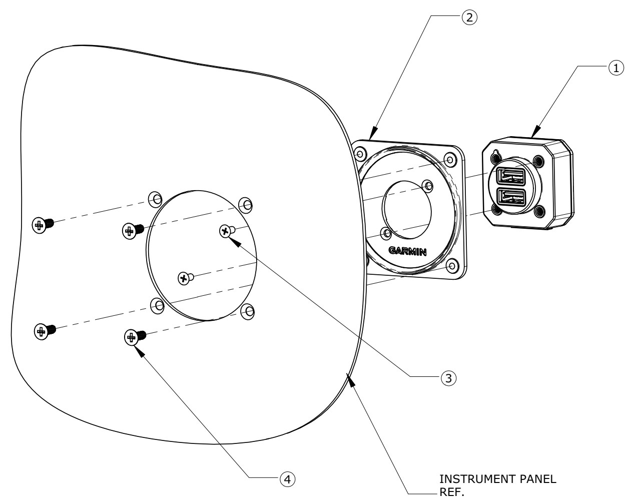
CAUTION

The instrument panel coating that surrounds the fastener holes and contacts directly with the GSB 15 Mounting Kit (Item 2) must be removed prior to installation.

BACK OF INSTRUMENT PANEL PREPARATION



INSTALLATION IN INSTRUMENT PANEL



1 THE AREA ON THE BACK OF THE INSTRUMENT PANEL THAT COMES IN DIRECT CONTACT WITH THE GSB 15 MUST BE PREPARED FOR ELECTRICAL BOND PER SECTION 4.2.2. PREPARE AREA 0.125 INCHES LARGER THAN THE GSB 15 METAL INSERTS.

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.

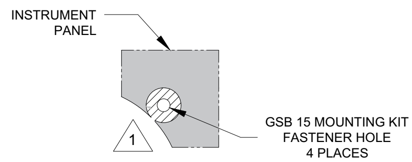
Figure 4-16 GSB 15 Installation with Mounting Kit (2.25-Inch Cutout)

The GSB 15 can be installed directly into an existing 3-inch diameter flight instrument cutout without modifying the instrument panel using the GSB 15 3.125" Mounting Kit (P/N 011-05043-01).

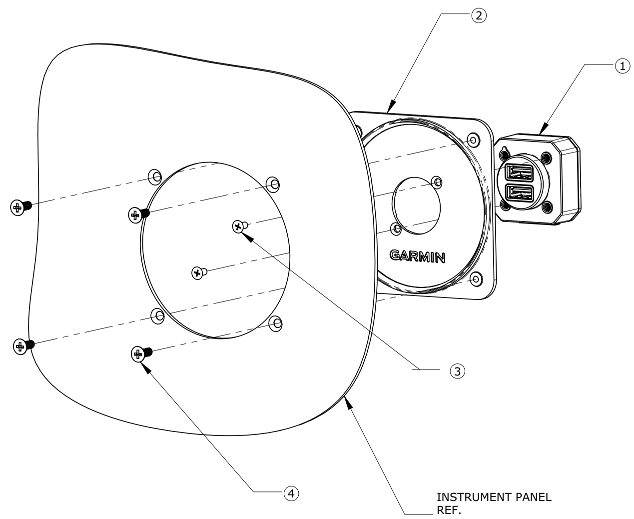
CAUTION

The instrument panel coating that surrounds the fastener holes and contacts directly with the GSB 15 Mounting Kit (Item 2) must be removed prior to installation.

BACK OF INSTRUMENT PANEL PREPARATION



INSTALLATION IN INSTRUMENT PANEL



1 THE AREA ON THE BACK OF THE INSTRUMENT PANEL THAT COMES IN DIRECT CONTACT WITH THE GSB 15 MUST BE PREPARED FOR ELECTRICAL BOND PER SECTION 4.2.2. PREPARE AREA 0.125 INCHES LARGER THAN THE GSB 15 METAL INSERTS.

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 4-17 GSB 15 Installation with Mounting Kit (3.125-Inch Cutout)

4.3.4.1 GSB 15 Decorative Cover

NOTE

If using the unfinished version of the decorative cover, finishing methods that require less than 120° C are recommended. If the finishing method (such as powder coating) exceeds 120° C, it is recommended to pre-heat the cosmetic piece to 200° C or greater before applying a finish in order to prevent cosmetic defects.

Perform the following steps to install the Decorative Cover Kits listed in Table 3-4.

1. Install the GSB 15 unit per Section 4.3.4.
2. Install the intermediate piece using the two provided screws.
3. Peel off the tape liners from the intermediate piece.
4. Install the cosmetic piece.

For best results, install the decorative cover as specified below:

- Recommended installation temperature: 70-100°F (21-38°C).
- Minimum installation temperature: 50°F (10°C).
- Recommended screw torque: 4-6 in-lbf.
- After removing the tape liners from the intermediate piece, avoid touching the exposed adhesive.
- Before installing, clean the inside of the cosmetic piece with a 50-90% isopropyl alcohol and water mixture. Allow it to fully dry before proceeding.
- When installing the decorative cover, apply an evenly distributed minimum force of 7 lbf (3 kgf or 30 N).
- The adhesive will fully cure within 72 hours (90% strength after 24 hours).

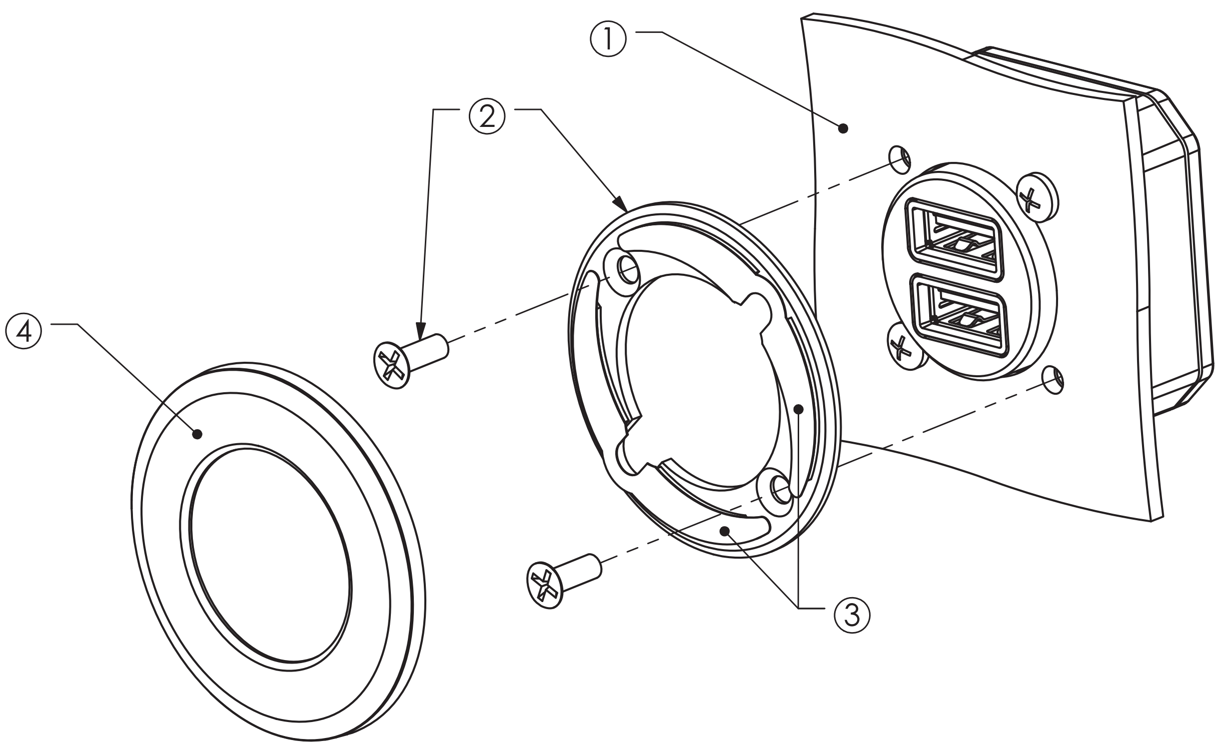


Figure 4-18 GSB 15 Decorative Cover Installation

4.4 Backshell Assembly

Prepare the shielded cables to be connected to the LRU in accordance with Section 4.1.1, then terminate the cables to the LRU jackscrew backshell assembly using the following procedure. Refer to Figure 4-19 and Figure 4-20.

1. Terminate the crimped pin/socket contacts (**4**) in the D-sub connector (**7**) in accordance with the aircraft wiring drawings.
2. Place the smooth side of the backshell strain relief clamp (**9**) across the cable bundle and secure using three 4-40 x 0.375 pan head screws (**10**).

CAUTION

*Place smooth side of strain relief (**9**) across cable bundle. DO NOT place grooved side across cable bundle. Placing the grooved side of the strain relief across the cable bundle may damage wires.*

3. Terminate the ring terminals (**6**) to the tapped holes on the backshell (**8**) by placing items on the 8-32 x 0.312 pan head shield terminal screw (**13**) in the following order before finally inserting the screw into the tapped holes on the shield block:
   a. split washer (**14**)
   b. flat washer (**15**)
   c. first ring terminal (**6**)
   d. second ring terminal (**6**) (if needed)

NOTE

*Each tapped hole on the backshell (**8**) may accommodate only two ring terminals (**6**). It is preferred that a maximum of two wires (**2**) be terminated per ring terminal. Two wires per ring terminal will necessitate the use of a ring terminal, #8, insulated, 14-16 AWG (MS25036-153). If only a single wire is left or if only a single wire is needed for this connector a ring terminal, #8, insulated, 18-22 AWG (MS25036-149) can accommodate this single wire. If more wires exist for the connector than two per ring terminal, it is permissible to terminate three wires per ring terminal.*

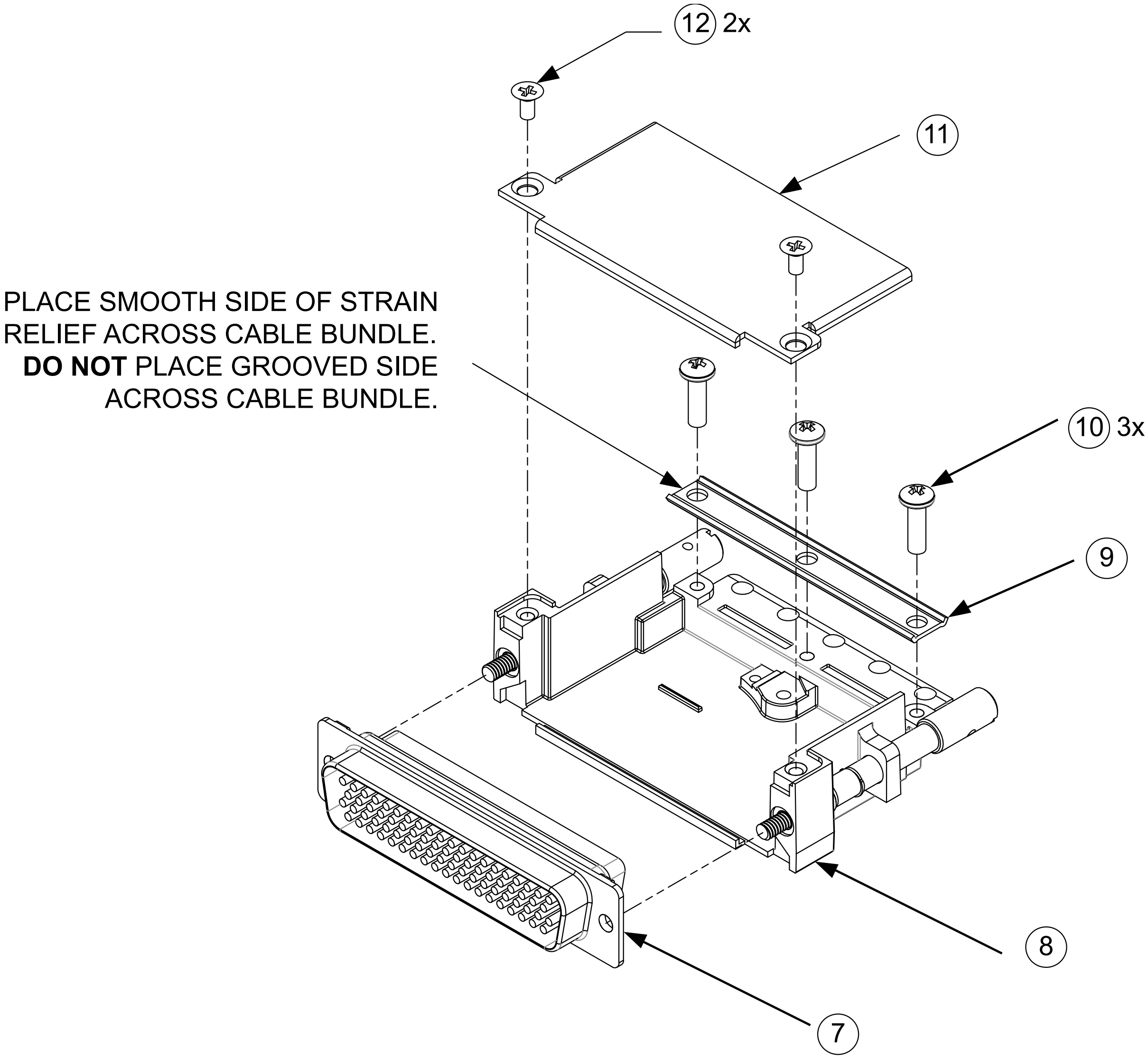
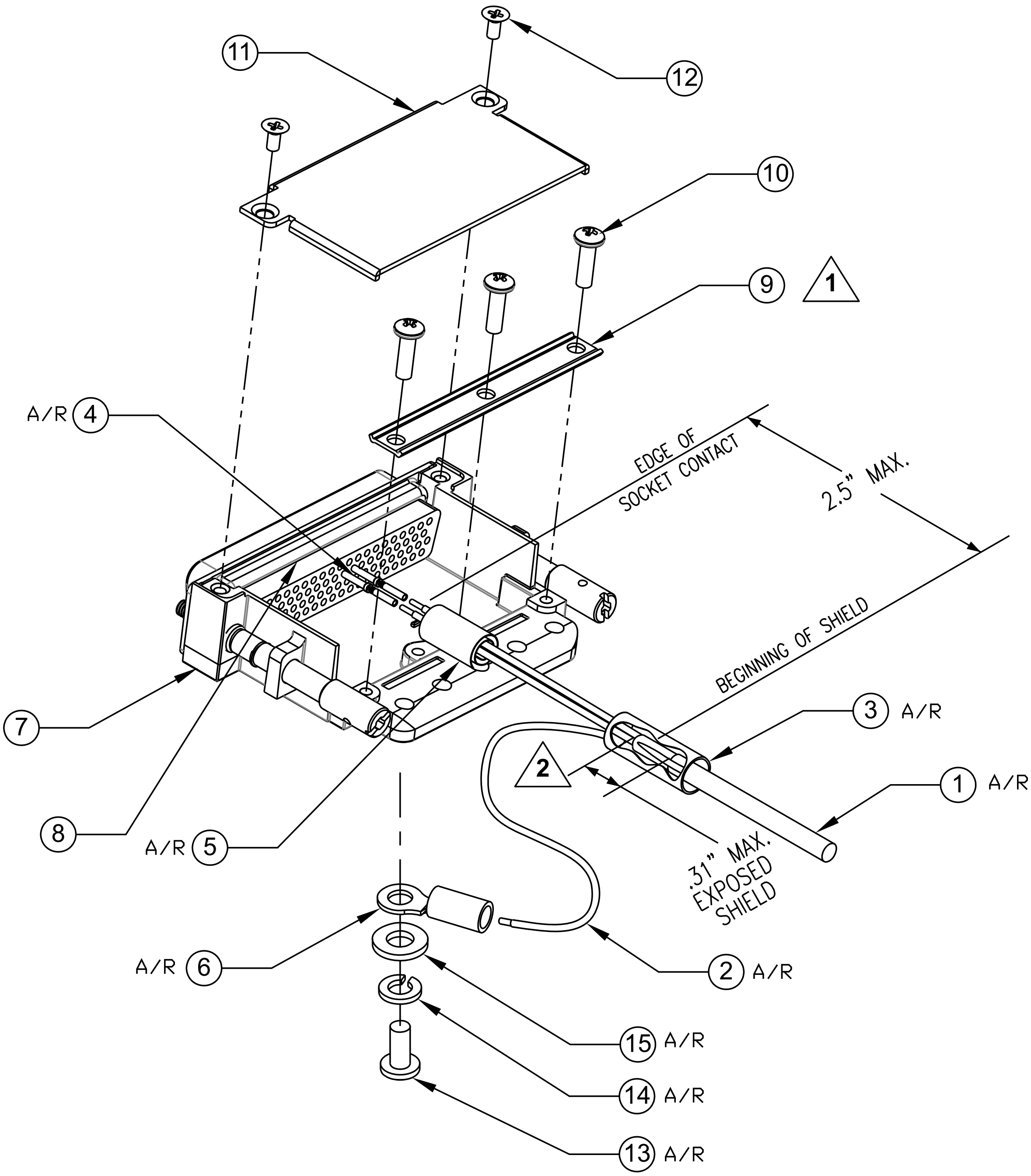


Figure 4-19 Jackscrew Backshell and Shield Block Assembly



NOTES

1. PLACE SMOOTH SIDE OF STRAIN RELIEF ACROSS CABLE BUNDLE. DO NOT PLACE GROOVED SIDE ACROSS CABLE BUNDLE.

2. PREFERRED SHIELD TERMINATION METHOD SHOWN.

Figure 4-20 Shield Block Termination on Jackscrew Backshell Assembly

4.4.1 Configuration Module Installation

GI 275 connector assemblies serve as housing for configuration modules. This section lists configuration module assemblies and installation procedures for installations.

Refer to Figure 4-21 for details and item numbers referenced in the following procedure.

1. Strip back approximately 0.17 inches of insulation from each wire of the 4-conductor wire harness (**3**). It is the installer's responsibility to determine the proper length of insulation to be removed.
2. Crimp a pin (**4**) to each conductor.
3. Ensure that the wire is visible in the inspection hole, and that the insulation is 1/64 to 1/32 inches from the end of the contact.
4. Insert newly crimped pins and wires (**3, 4**) into the connector housing (**5**) location. For details, refer to the applicable interconnect drawings.
5. Attach the module (**1**) to the backshell (**6**) using a pan head screw (**10**).
6. Plug the 4-conductor wire harness (**3**) into the connector on the module (**1**).
7. Orient the connector housing (**5**) so that the 4-conductor wire harness (**3**) is on the same side of the backshell (**6**) as the module (**1**).
8. Attach the cover (**7**) to the backshell (**6**) using two screws (**8**).

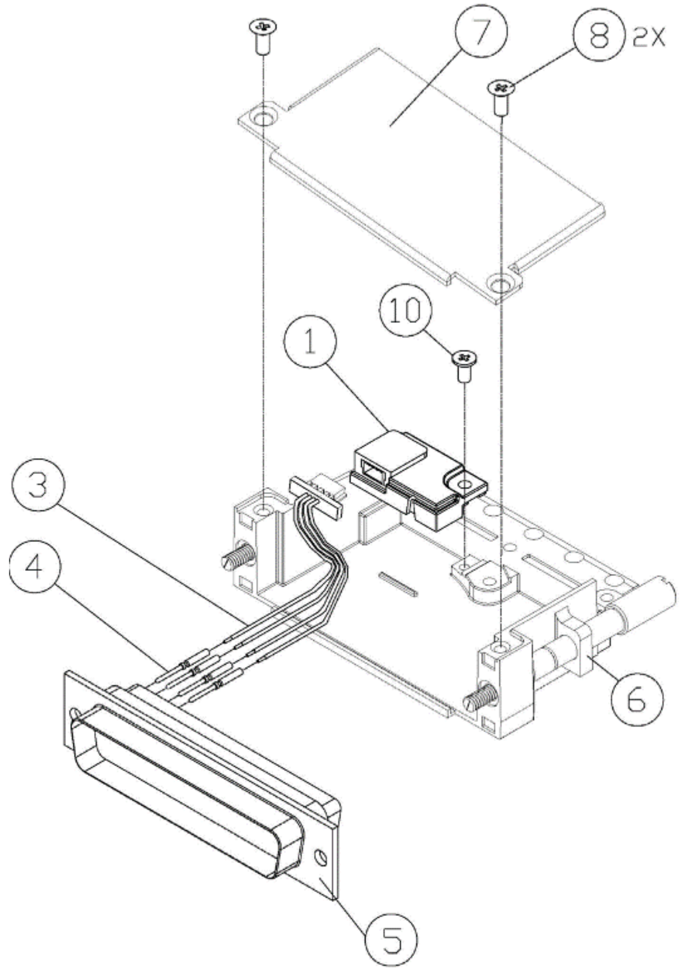


Figure 4-21 Jackscrew Backshell Assembly (Potted Configuration Module)

4.4.2 GSB 15 Connector Assembly

Prepare the shielded cables to be connected to the LRU in accordance with Section 4.1.1, then terminate the cables to the LRU ground lug using the following procedure:

1. Terminate the crimped pin/socket contacts in the locking connector in accordance with the aircraft wiring drawings.
2. Attach the locking connector to the GSB 15, paying attention to the keying and latching features of the connector.
3. If the data transfer functionality is intended to be used, terminate the shield drain ring terminal to the ground lug on the back of the GSB 15 unit using the 4-40 x 0.125 pan head screw. This step is not required if the GSB 15 will be used for charging only.

4.5 Display Sensors

4.5.1 Backup GPS Antenna

The backup 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.

Installation of the backup GPS antenna is optional. When installed, the antenna cannot obstruct or limit the pilot's vision (even though the antenna has a low profile). The optimal antenna position is horizontal or as close to horizontal as practical given the shape of the glareshield.

Fastener holes for non-removable antenna installation, as depicted in Figure 4-23, must not penetrate through the ventilation or defrost channels built into the glareshield, if present. If the glareshield is part of the instrument panel structure, fastener holes may only be drilled if allowed by the aircraft maintenance manual or structural repair manual.

Table 4-5 Backup GPS Antenna Weight and Size

Item	Weight lb. (kg)	Dimensions in. (mm)		
		Height	Width	Depth
Backup GPS Antenna	0.20 (0.092)	0.60 (15.2)	2.88 (73.2)	2.22 (56.4)

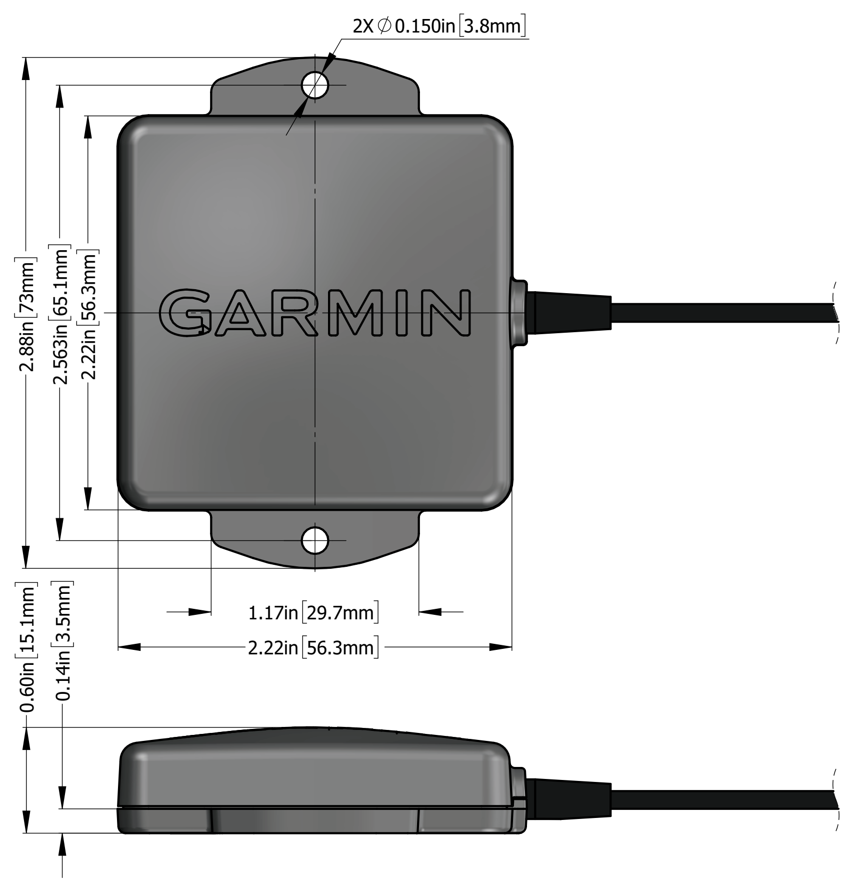
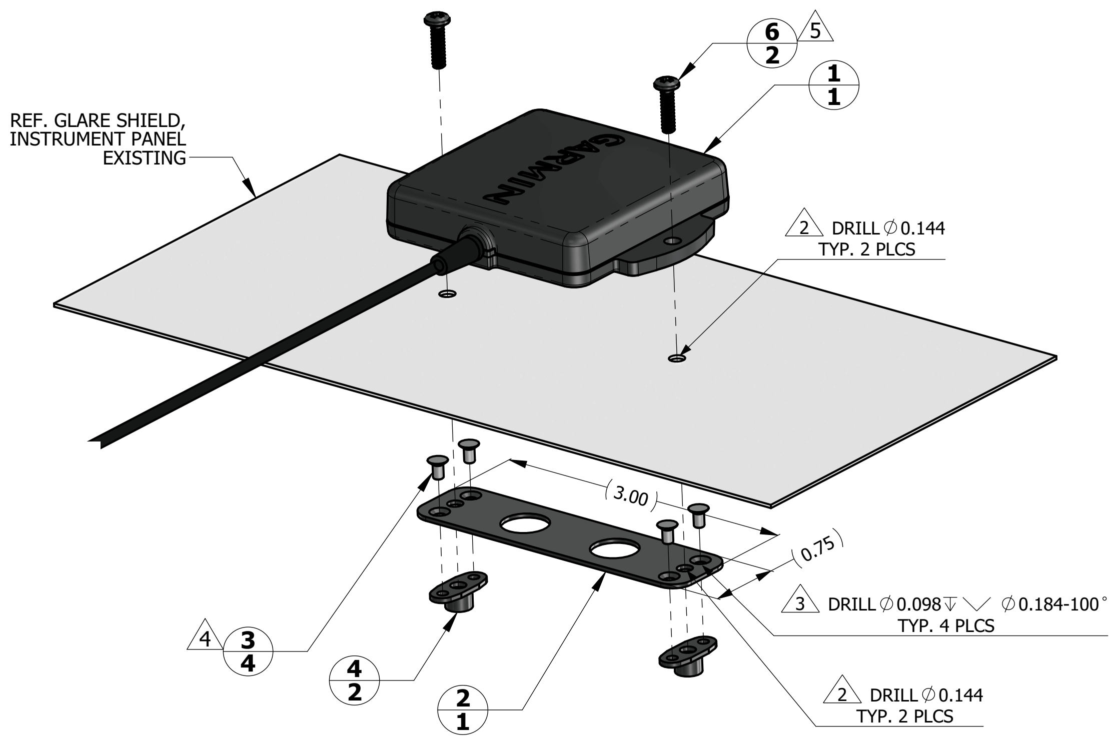


Figure 4-22 Backup GPS Antenna Dimensions



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
QTY	**ITEM**	**PART NUMBER**	**DESCRIPTION**

NOTES

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

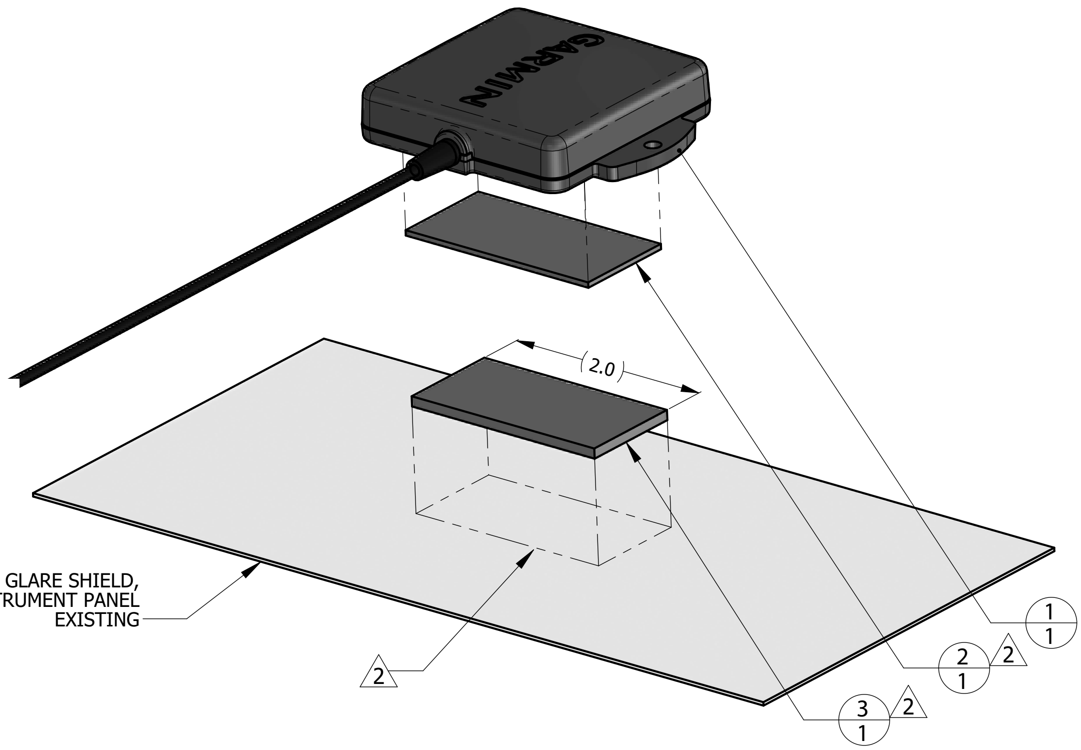
2 FASTENER HOLES ARE LOCATED TO MATCH BACKUP GPS ANTENNA ITEM 1.

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 4-23 Backup 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 4-24 Backup GPS Antenna Installation (Removable Installation Example)

4.5.2 GTP 59

An effective location for the GTP 59 OAT Probe is on or near an access panel on the bottom of the wing, or in areas where it would mostly be shaded in straight and level flight.

For composite aircraft, the probe must be mounted on an access panel or inspection cover. A typical installation example is shown in Figure 4-27. If the access panel or inspection cover is conductive, a non-conductive doubler must be used and a minimum 0.5 inches of clearance maintained between the GTP 59 probe/terminal lug and any conductive element of aircraft structure. A typical installation example is shown in Figure 4-28.

For metal and tube-and-fabric aircraft, electrical bond between GTP 59 and nearby aircraft metallic structure must achieve a direct current (DC) resistance less than or equal to 2.5 mΩ with the connector disconnected. It may be necessary to use a bonding strap to electrically bond the probe. 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.

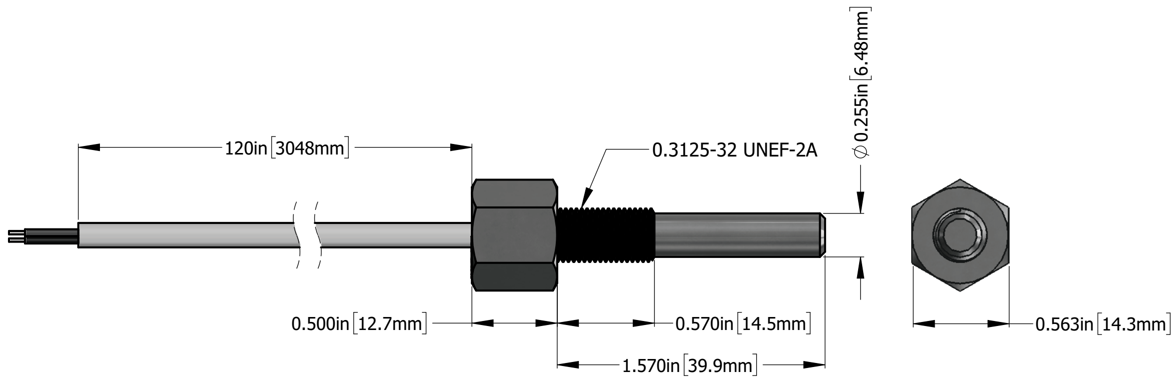


Figure 4-25 GTP 59 OAT Probe Dimensions

For metal and tube-and-fabric aircraft, if the GTP 59 is installed in an access panel in Lightning Zone 2A (refer to Appendix Section F.2), the access panel must be at least 0.032-inch thick aluminum **or**, if the access panel is less than 0.032-inch thick aluminum, a doubler that is at least 0.032-inch thick aluminum (per Figure 4-26) must be installed.

For aircraft with metallic airframes, a doubler is required when the GTP 59 probe is installed in the skin. The doubler must be a minimum of 2 inches and at least one gauge thicker than the skin with a minimum doubler thickness of 0.032 inches. The doubler material and installation must be provisioned by the aircraft structural repair manual or standard practices manual, or alternatively:

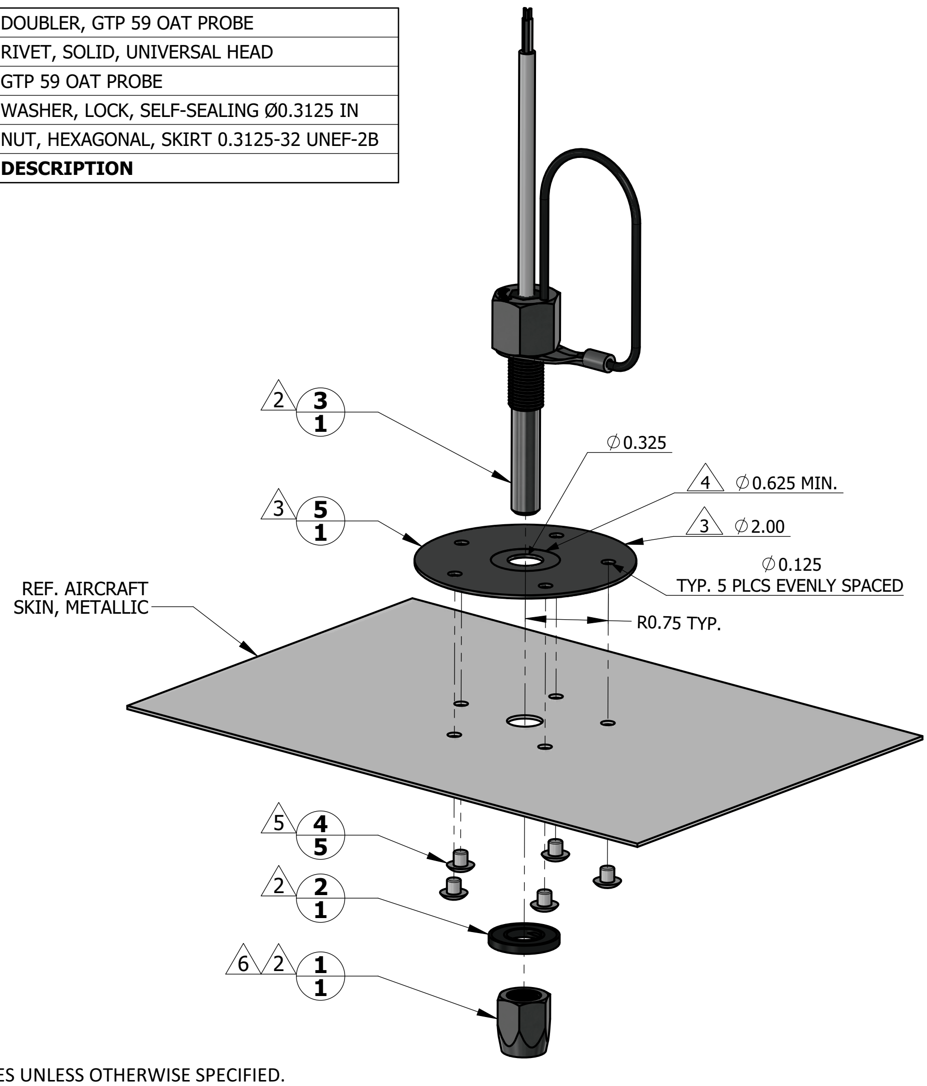
1. Use the same material as the aircraft skin. If the material used in the construction of the aircraft skin is not known, 2024-T3 aluminum per AMS-QQ-A-250/5 can be used.
2. If corrosion protection methods are not specified by the model-specific aircraft standard practices manual, the doubler material must be chemical conversion coated per MIL-DTL-5541 Type II or MIL-DTL-81706 Type II and primed with a high-solids chemical and solvent resistant epoxy primer per MIL-PRF-23377, Class N.

The GTP 59 probe must not be mounted in a fuel tank area (wet or dry). An air scoop or a ducted inlet are an adequate location for the GTP 59 probe. The probe must be located no closer to the inlet edge than the width of its narrowest opening.

The probe has no icing protection. Temperature measurements may be incorrect if ice accumulates on the probe, which in turn may affect Engine Percent Power or other data that depend on the measurement of air temperature.

It is recommended the GTP 59 probe is installed in Lightning Zone 3, although Zone 2A may be an acceptable location for certain aircraft.

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
QTY.	**ITEM**	**PART NUMBER**	**DESCRIPTION**



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.

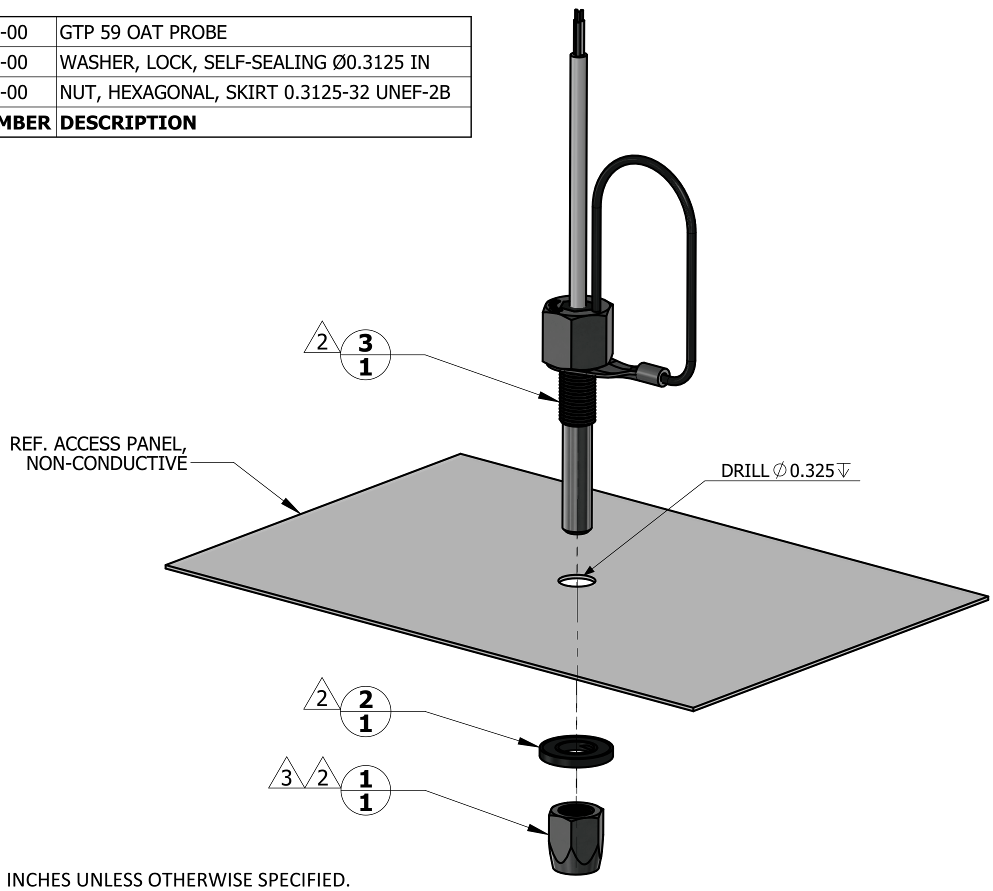
5. RIVETS ARE INSTALLED PER MIL-R-47196 (NASM47196) RIVET, BUCK TYPE, *PREPARATION FOR AND INSTALLATION,* OR PER MIL-STD-403 *PREPARATION FOR AND INSTALLATION OF RIVETS AND SCREWS, ROCKET MISSILE, AND AIRFRAME STRUCTURES.*

6. TORQUE .3125-32 UNEF-2B NUT 100.0 ± 20.0 LBF-IN.

Figure 4-26 GTP 59 Installation in Metallic Aircraft

For composite aircraft, the GTP 59 probe must be installed in Lightning Zone 3 and installed such that it is electrically isolated. For aircraft model-specific information regarding acceptable lightning zones for the GTP 59, refer to Table D-1. Refer to Appendix F for lightning zone details. Regardless of its location, the probe must protrude into the air flow when the aircraft is in flight and be kept away from direct sources of heat (e.g., engine exhaust, direct sunlight, cabin exhaust, etc.) to provide an accurate air temperature measurement.

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
QTY.	**ITEM**	**PART NUMBER**	**DESCRIPTION**



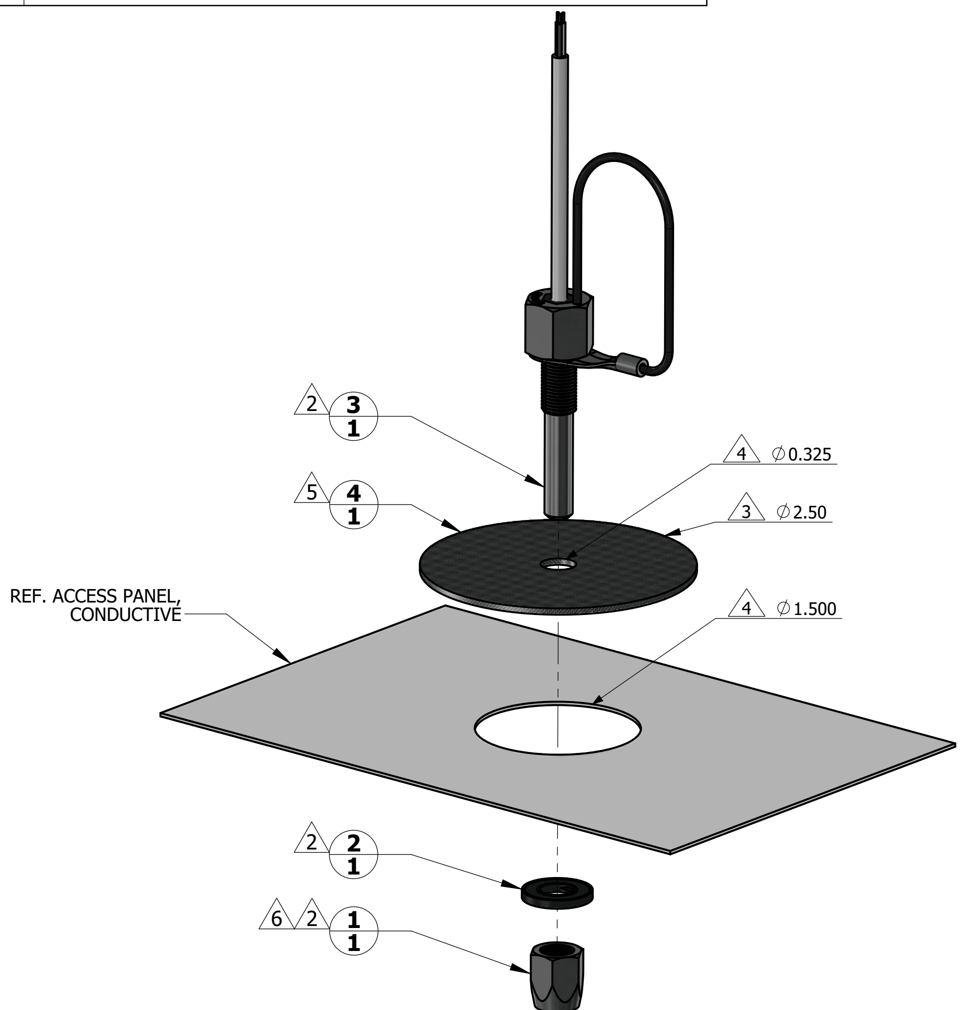
NOTES
1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

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. TORQUE .3125-32 UNEF-2B NUT 100.0 ± 20.0 LBF-IN.

Figure 4-27 GTP 59 Installation in Composite Aircraft (Non-Conductive Access Panel)

QTY.	ITEM	PART NUMBER	DESCRIPTION
1	4		DOUBLER, GTP 59 OAT PROBE, PHENOLIC WITH COTTON FIBRE MIL-I-34768/1-S
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 0.060 INCH MINIMUM.

4. DOUBLER IS LOCATED SUCH THAT THE PROBE HOLE IS CENTERED ON THE HOLE IN ACCESS PANEL.

5. BOND DOUBLER TO ACCESS PANEL USING PROCESS AND MATERIALS AS SPECIFIED IN AIRCRAFT MAINTENANCE MANUAL AND/OR STRUCTURAL REPAIR MANUAL FOR NON-STRUCRTURAL APPLICATIONS.

6. TORQUE .3125-32 UNEF-2B NUT 100.0 ±20.0 LBF-IN.

Figure 4-28 GTP 59 Installation in Composite Aircraft (Conductive Access Panel)

4.6 Engine Indicating System

The aircraft must retain all engine indications for engine and aircraft operations within the limits defined in the Pilot's Operating Handbook or other approved manual.

Only the GI 275 EIS sensors specified in this section are approved for installation as part of the GI 275 STC. Installation of other sensors requires separate airworthiness approval from the cognizant authority. The following sections contain information applicable to EIS sensor installation:

- List of compatible sensor interfaces – Appendix Section C.12.
- Selection of aircraft specific sensors – Appendix Section C.12.
- Sensor configuration – Section 5.7.2 and Appendix Section C.12.
- Interconnect diagrams of sensor connections to the GEA 24(B) – Appendix B.

NOTE

This STC does not approve any modifications to the engine firewall.

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

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

Sensors must not be mounted directly to the engine or engine baffle unless otherwise instructed in this manual.

CAUTION

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

4.6.1 GEA 24(B)

The GEA 24(B) must be installed in the fuselage cabin environment where it is protected from accidental damage by occupants and rapid thermal change. It can be mounted directly or indirectly (i.e., via a support structure) on the aircraft structure. It can be mounted in any orientation, but vertical with the connectors pointing down is preferred. The unit should be mounted so that the connectors and status LED is viewable and where it can be inspected and serviced.

CAUTION

The GEA 24(B) cannot be mounted in the engine compartment or where it could be exposed to moisture or fluids.

If provisioned by the aircraft structural repair manual or standard practices manual, the GEA 24(B) can be mounted on the engine firewall (opposite surface of the powerplant), fuselage frames, or stringers. The GEA 24(B) wiring must be routed through existing pass-through holes in the firewall or use existing bulkhead connectors; otherwise, separate airworthiness approval is required for added holes in the engine firewall.

The GEA 24(B) must not be placed directly below fluid lines (e.g., fuel lines, oil or hydraulic lines). It also must be installed as far away as practical from heat sources.

If installing the GEA 24(B) on the avionics shelf or the instrument panel, ensure the new fastener holes maintain a minimum of 2D edge distance and 3D spacing from existing holes. Additionally, ensure the combined weight of the GEA 24(B) and existing equipment remain within the established weight limit of the shelf or instrument panel.

If an avionics shelf or suitable platform for the GEA 24(B) is not available, a support structure can be fabricated. The support structure must:

- Be electrically bonded to the airframe per Section 4.2.
- Be made from 2024-T3 aluminum per AMS-QQ-A-250/5, minimum 0.040 inches thick.
- Be protected from corrosion by applying conversion coating per MIL-DTL-5541 Type II or MIL-DTL-81706 Type II and primed with epoxy primer per MIL-PRF-23377, Class N.
- Be fabricated in accordance with methods outlined in AC 43.13-2B chapters 1 and 2 and AC 43.13-1B chapter 4.
- Allow a minimum clearance of 3.0 inches between the connector end of the GEA 24(B) and any structures for proper wire harness routing.
- Maintain a maximum load capacity of 3.0 lbs.

An example of the support bracket for a GEA 24(B) is shown in Figure 4-29.

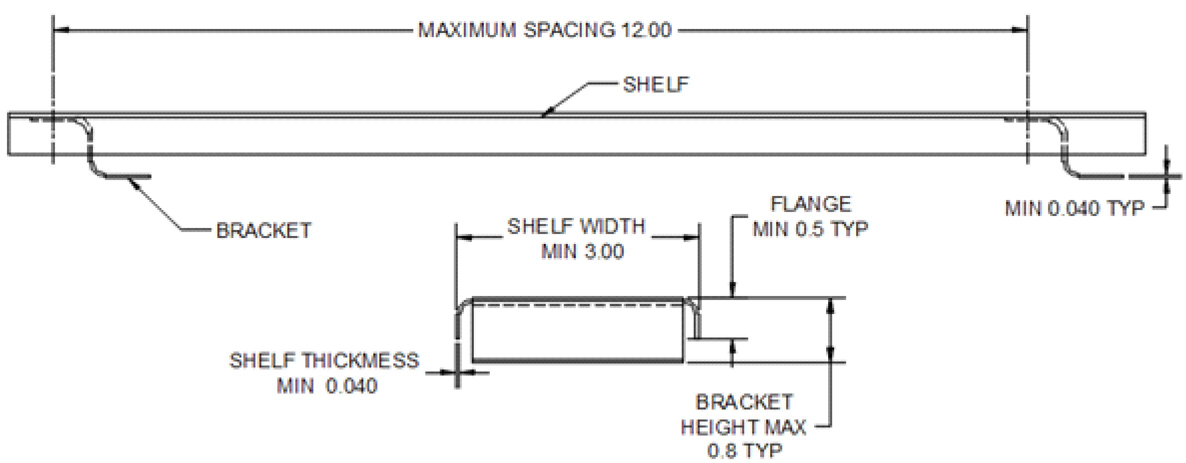


Figure 4-29 Example Support Structure

Table 4-6 GEA 24(B) Weight and Size

Item	Weight lb. (kg)	Dimensions in. (mm)		
		Height	Width	Depth
GEA 24 unit	0.71 (0.322)	1.9 (48.3)	6.5 (165.1)	3.0 (76.2)
GEA 24B unit	0.74 (0.336)			
GEA 24 with connector	1.60 (0.725)			5.0 (127.0)

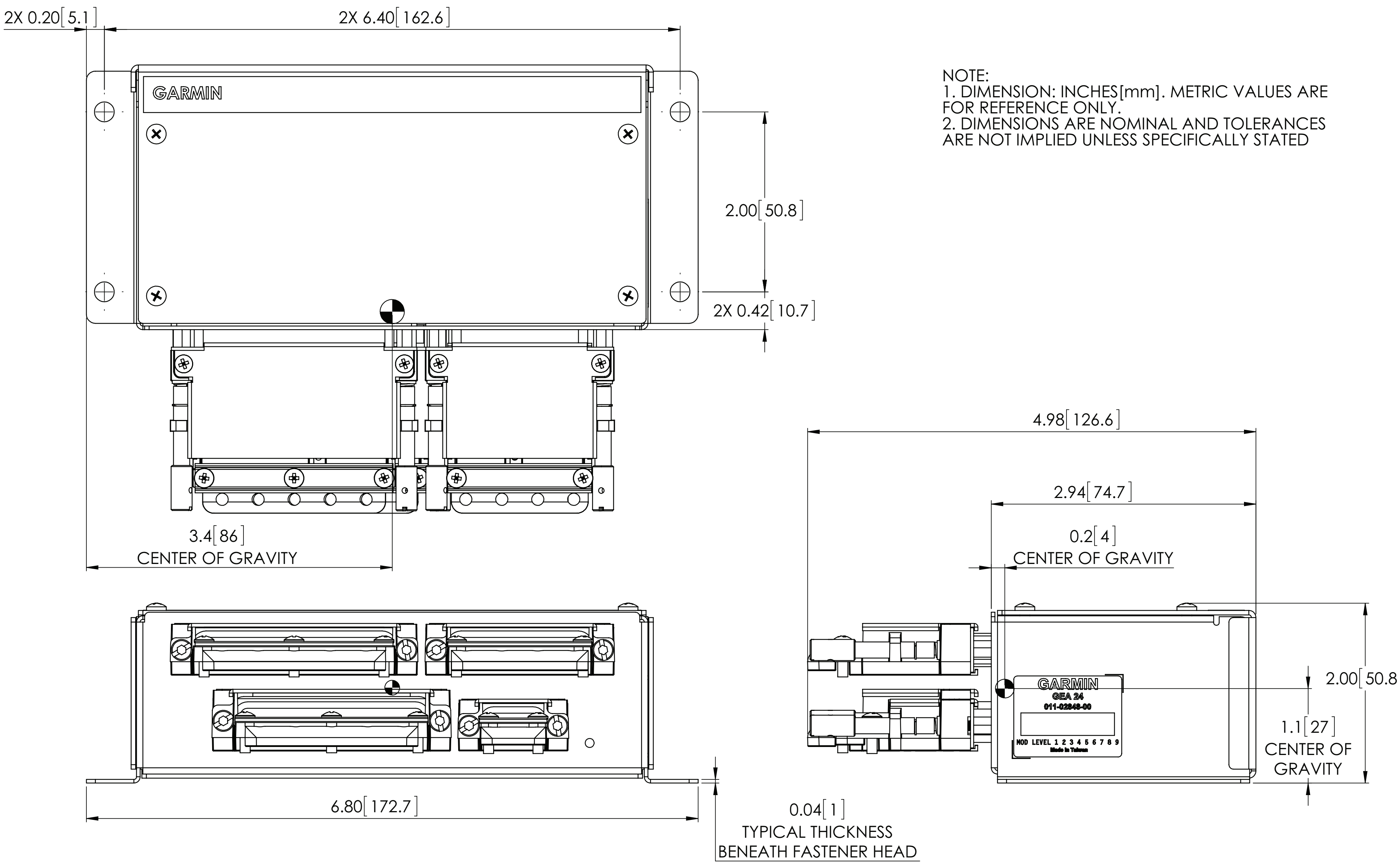
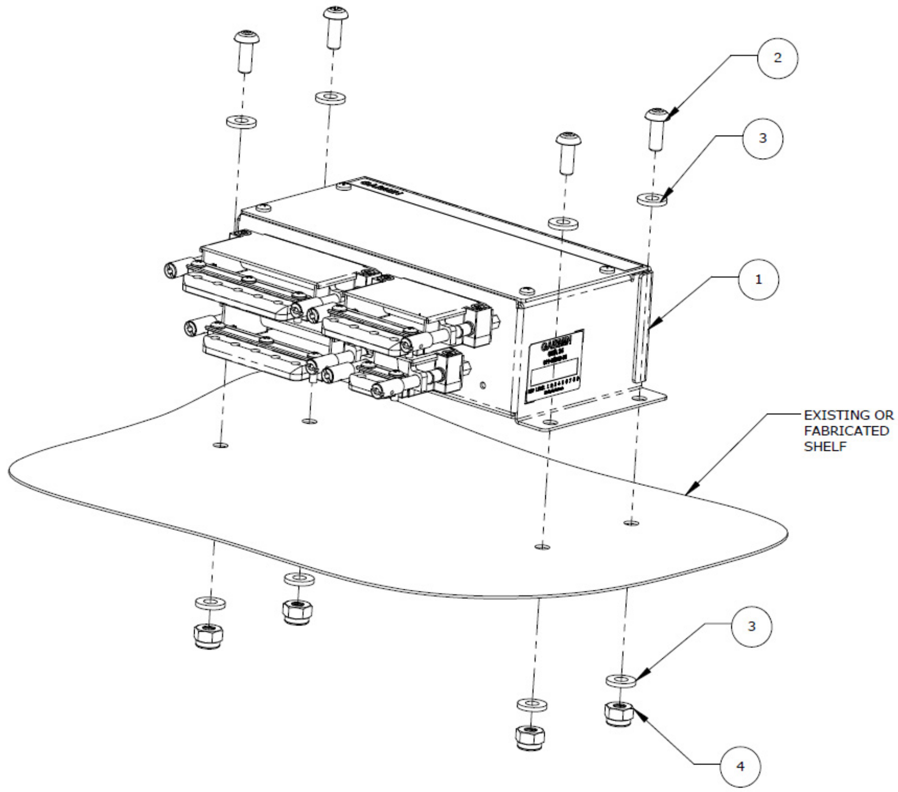


Figure 4-30 GEA 24(B) Dimensions



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 equivalent aerospace steel screws.

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

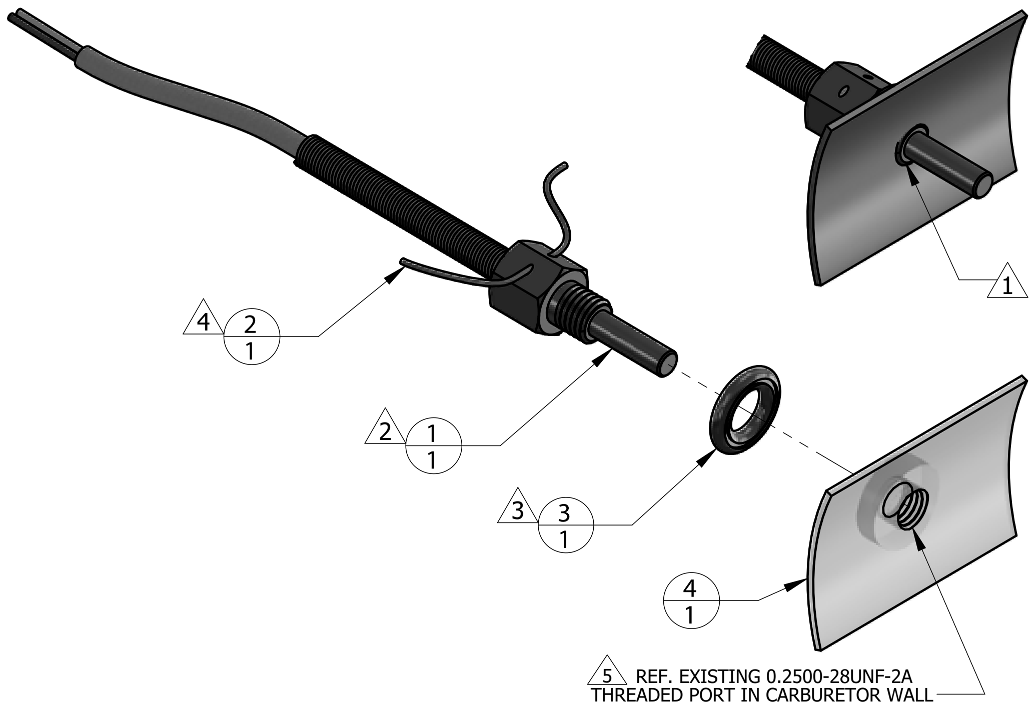
[3] Nut can be substituted by any suitable aerospace steel self-locking nuts or nutplates.

Figure 4-31 GEA 24(B) Mounting Hardware

4.6.2 Carburetor Air Temperature

The sensor location will vary for different carburetors. This STC provides the basis for airworthiness approval only for the temperature sensor installed in the existing port with 0.2500-28UNF-2A thread.

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 MEDIUM STRENGTH THREADLOCKER. EXERCISE CAUTION TO PREVENT FUEL CONTAMINATION.
3. SPLIT FACE OF THE GASKET FACES NON-ROTATING SURFACE.
4. SAFETY WIRE PROBE IN ACCORDANCE WITH SECTION 7, SAFETYING OF CHAPTER 7, AIRCRAFT HARDWARE, CONTROL CABLES AND TURNBUCKLES OF AC43-13-1B, AIRCRAFT INSPECTION AND REPAIR.
5. SENSOR INSTALLATION IN EXISTING CARBURETOR PORT ONLY. ADDITION OF NEW TAPPED HOLES TO CARBURETOR BARREL NOT ALLOWED.

Figure 4-32 Carburetor Temperature Sensor Installation Example

CAUTION

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

4.6.3 Oil Temperature

CAUTION

Severe engine damage may occur if the incorrect probe length or type is installed. Use the engine manufacturer's guidance for proper oil temperature probe length and type.

When installing the oil temperature sensor, use the engine manufacturer's guidance for probe length and location. 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*.

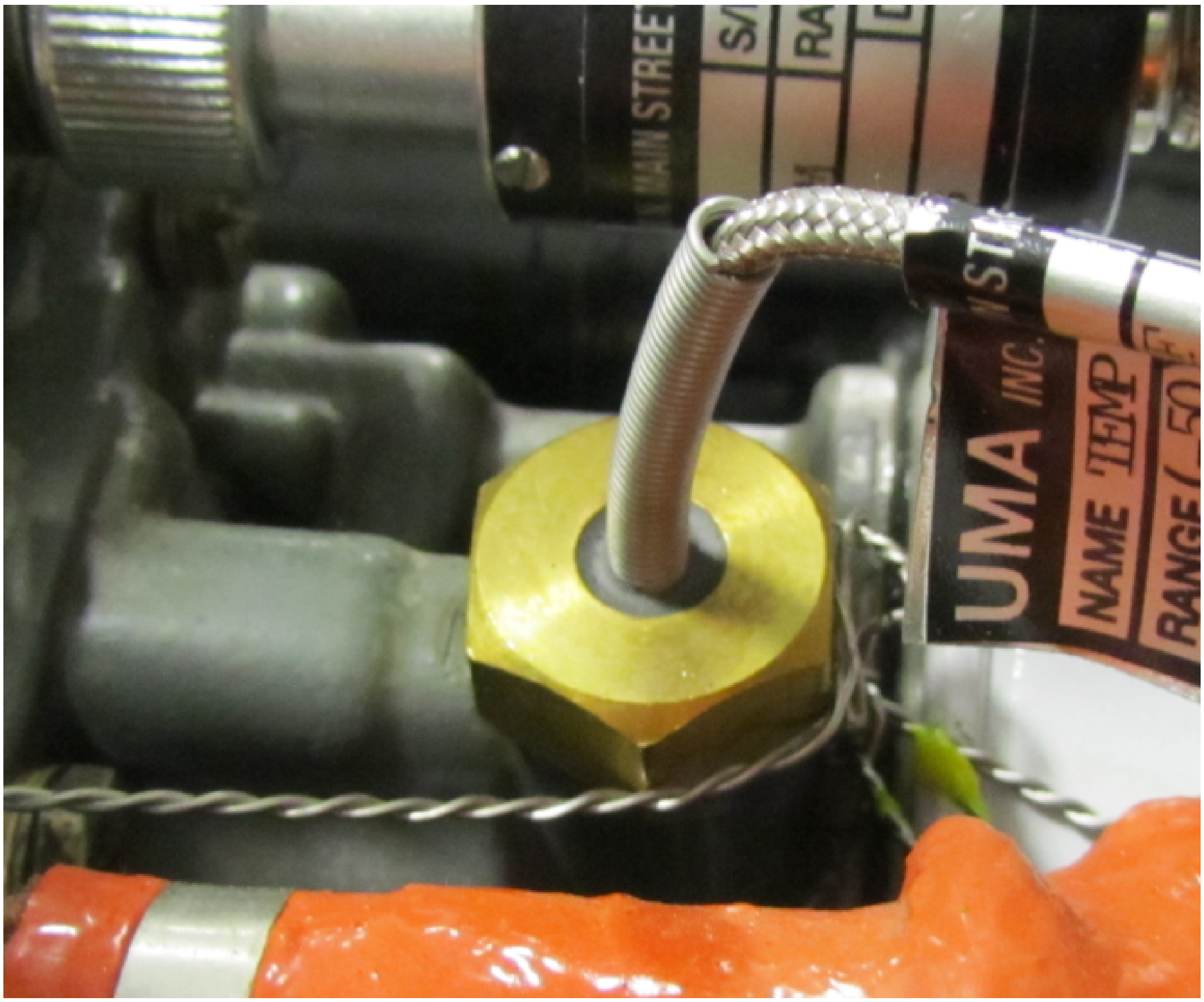


Figure 4-33 Oil Temperature Sensor Installation Example

4.6.4 Pressure

The manifold pressure, oil pressure, and fuel pressure sensors all have similar installation requirements and processes.

When replacing existing sensors/instruments:

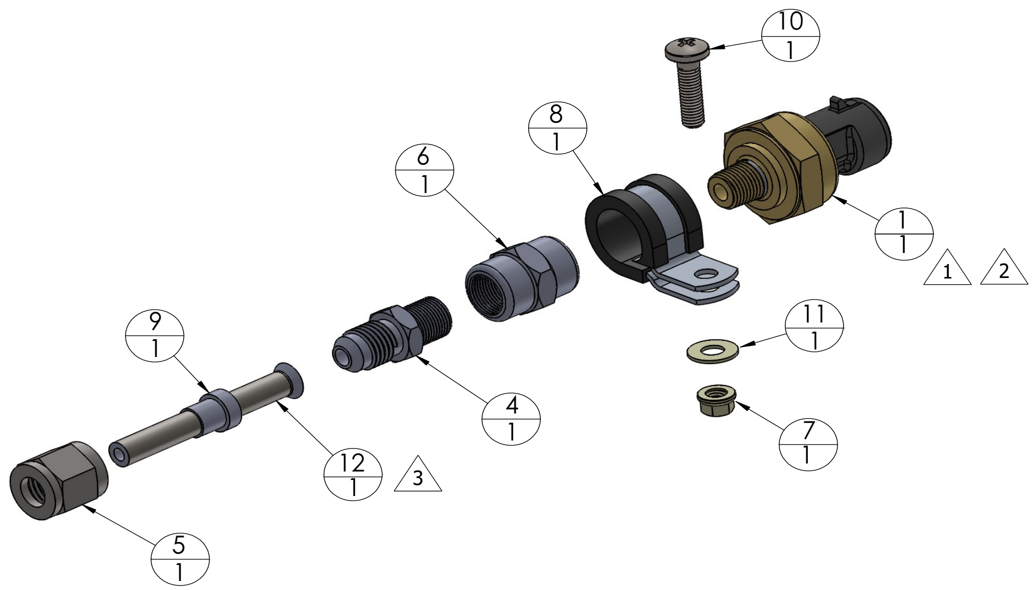
- Do not remove fittings with small orifices that are installed in existing hoses or plumbing. It may limit fluid loss and fire damage in the event of a hose failure.
- If the sensors/instruments were installed on the cold side of the firewall, reuse the lines and fittings. This STC does not approve the routing of new fuel or oil lines into the cockpit.
- Do not remove previously installed devices designed to absorb pressure shock/surge (snubber).
- Reuse manifold tubing if it has a vent hole, and install the manifold pressure sensor so that it is not at the low point in the line.
- Inspect the condition of all existing tubes, hoses, and fittings that are being reused; replace as necessary.
- Replace the fuel and oil hoses with new hoses if they are used by the sensors installed under this STC and are located in the engine compartment.
- Install oil and fuel pressure sensors in the same compartment as the sensor being replaced. This ensures the same ambient reference pressure is used and the indication is consistent with the previous gauge.
- Verify that the supply voltage and sensor configuration are correct if a different sensor is installed (e.g., if a brass sensor is replaced by a GPT sensor).

When installing pressure sensors:

- Install sensors in accordance with the applicable installation example (refer to Figure 4-34 (brass), Figure 4-35 (mil-spec), and Figure 4-36 (GPT).
- Fuel and oil hoses installed in the engine compartment must meet TSO-C53a Type C or D (fire resistant). Only use approved aircraft fittings (e.g., AN/AS-spec or Mil-spec) and hoses (e.g., Aeroquip 303 or Aeroquip AE 466). All hoses must be rated for the pressure and temperature and be compatible with the fuel or oil.
- 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.
- Sensor hoses must be routed as far away from the aircraft exhaust system as practical and no closer than 6 inches.
- Line fittings, routing, alignment, bonding, and support spacing must be installed as defined in the aircraft maintenance manual or Section 8-31 of AC 43.13-1B *Aircraft Inspection and Repair.*

WARNING

Ensure the pressure sensor installation does not introduce thread sealant or debris into the aircraft system.

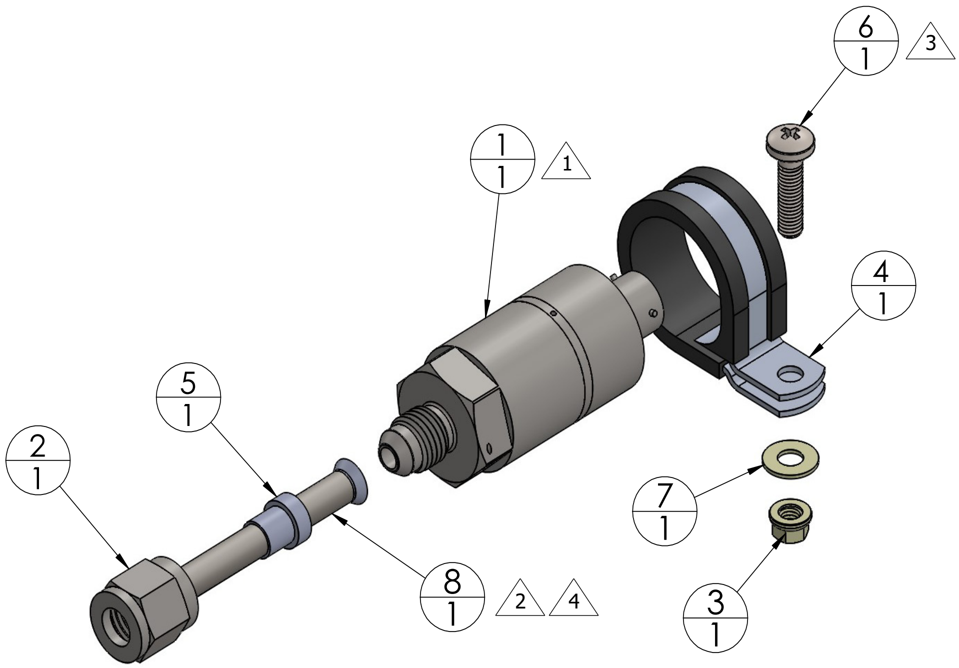


1	12		TUBE, Ø0.190 IN OD
1	11	NAS1149F0332P	WASHER, FLAT, STEEL, CAD PLATED, 0.032 INCH THICK, ID 0.203, OD 0.438
1	10	MS51958-65	SCREW, MACHINE, PAN HEAD, CROSS RECESSED .190-32UNF-2A, 3/4 INCH LONG
1	9	MS51533B3	SLEEVE, COMPRESSION, TUBE FITTING, 37° FLARED, Ø3/16 TUBE OD
1	8	MS21919WDG9	CLAMP, LOOP 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, Ø0.1875 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
QTY	**ITEM**	**PART NUMBER**	**DESCRIPTION**

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 4-34 Brass Sensor Installation (Coupling Mount Example)

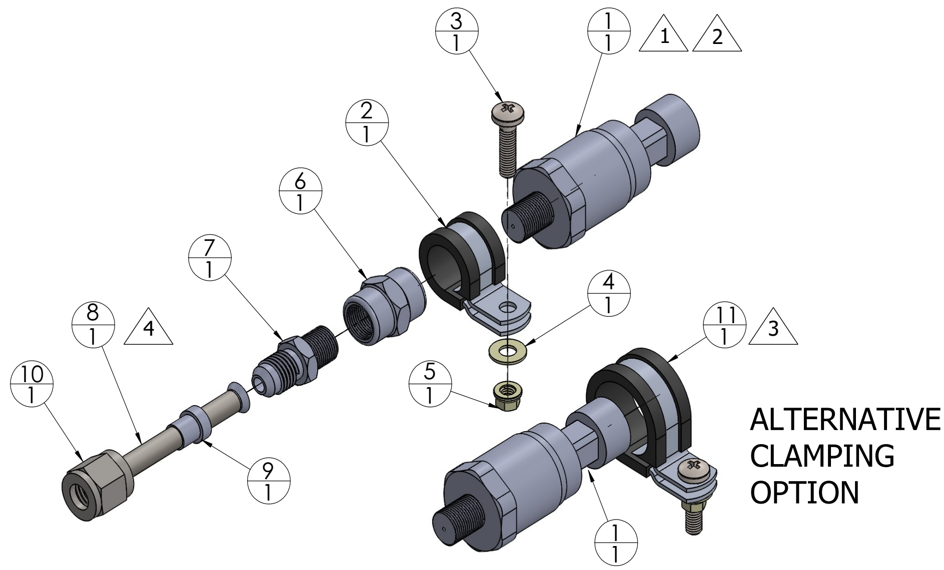


1	8		TUBE, Ø0.250 IN OD
1	7	NAS1149F0332P	WASHER, FLAT, STEEL, CAD PLATED, 0.032 INCH THICK, ID 0.203, OD 0.438
1	6	MS51958-65	SCREW, MACHINE, PAN HEAD, CROSS RECESSED .190-32UNF-2A, 3/4 INCH LONG
1	5	MS51533B4	SLEEVE, COMPRESSION, TUBE FITTING, 37° FLARED, Ø1/4 TUBE OD
1	4	MS21919WDG16	CLAMP, LOOP TYPE, 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
QTY	**ITEM**	**PART NUMBER**	**DESCRIPTION**

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 4-35 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, Ø0.250 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 RESTING 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 4-36 GPT Sensor Installation (Housing Mount Example)

4.6.5 Fuel Flow

Refer to Figure 4-37 to determine the fuel flow transducer installation for the specific aircraft fuel system.

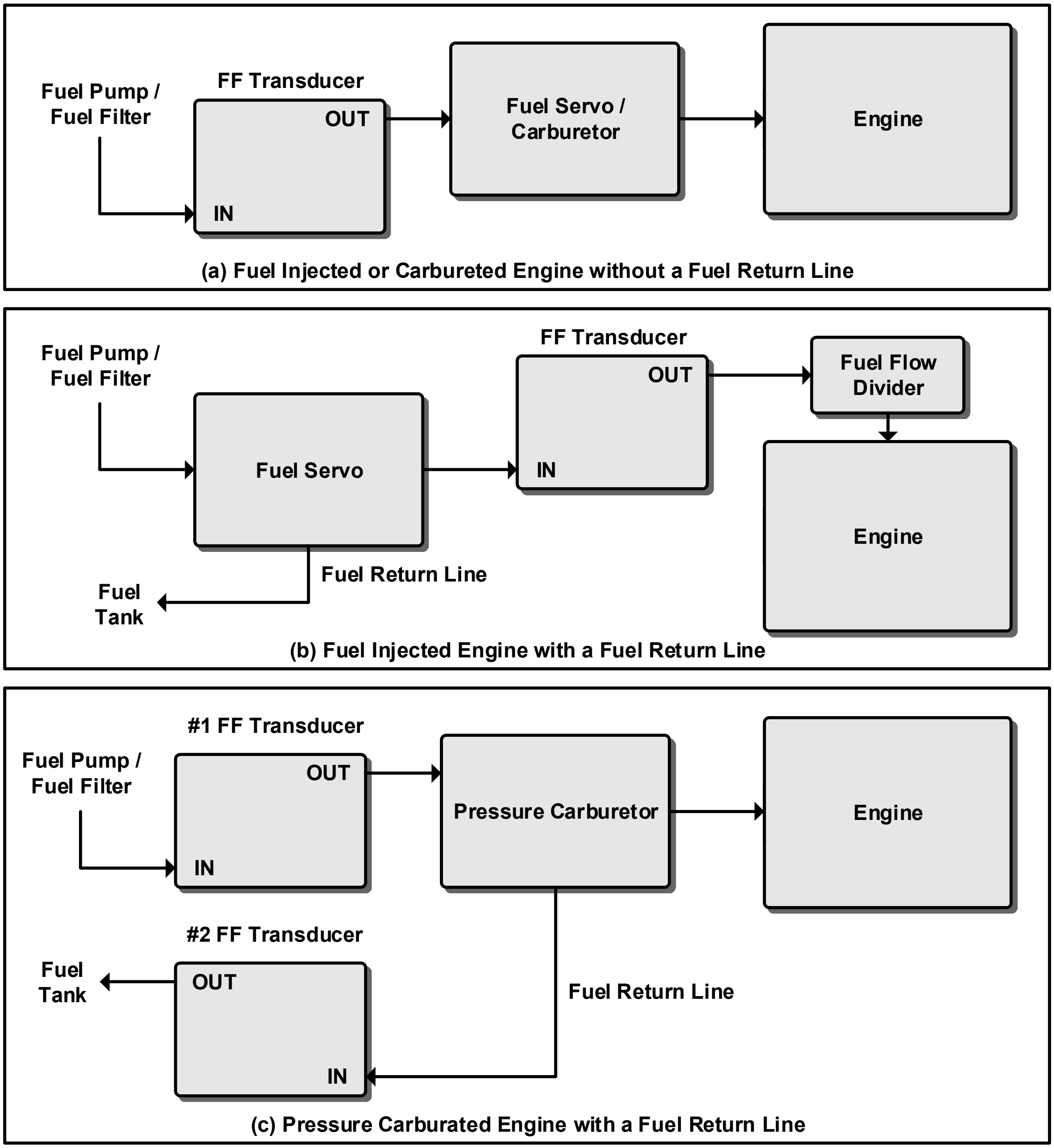


Figure 4-37 Fuel Flow Installation Configurations

NOTE

The fuel flow sensor will introduce a small pressure drop. Refer to Appendix D to determine if a fuel pressure test is required for the aircraft model.

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

- The transducer can be installed in the following orientations:
  - The wires pointing up.
  - The cap with five bolts pointing up.
  - The output port pointing up.
  - Any combination thereof.
- The flow must follow the direction marked on the ports.
- The hose connected to the IN port should be straight for a minimum of 4 inches.
- The length of hose connected to the OUT port should be level or slope up. It must not slope down more than 4 inches per foot.

If mounting the transducer with a bracket, the bracket must be fabricated. The bracket can be fastened at the top of the engine using the existing engine crankcase fasteners. The amount of available space between the top of the engine and the engine cowling needs to be considered in the design of the bracket. The location of the bracket and position of the fuel flow transducer must result in as few bends in the fuel lines as possible.

The 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.

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

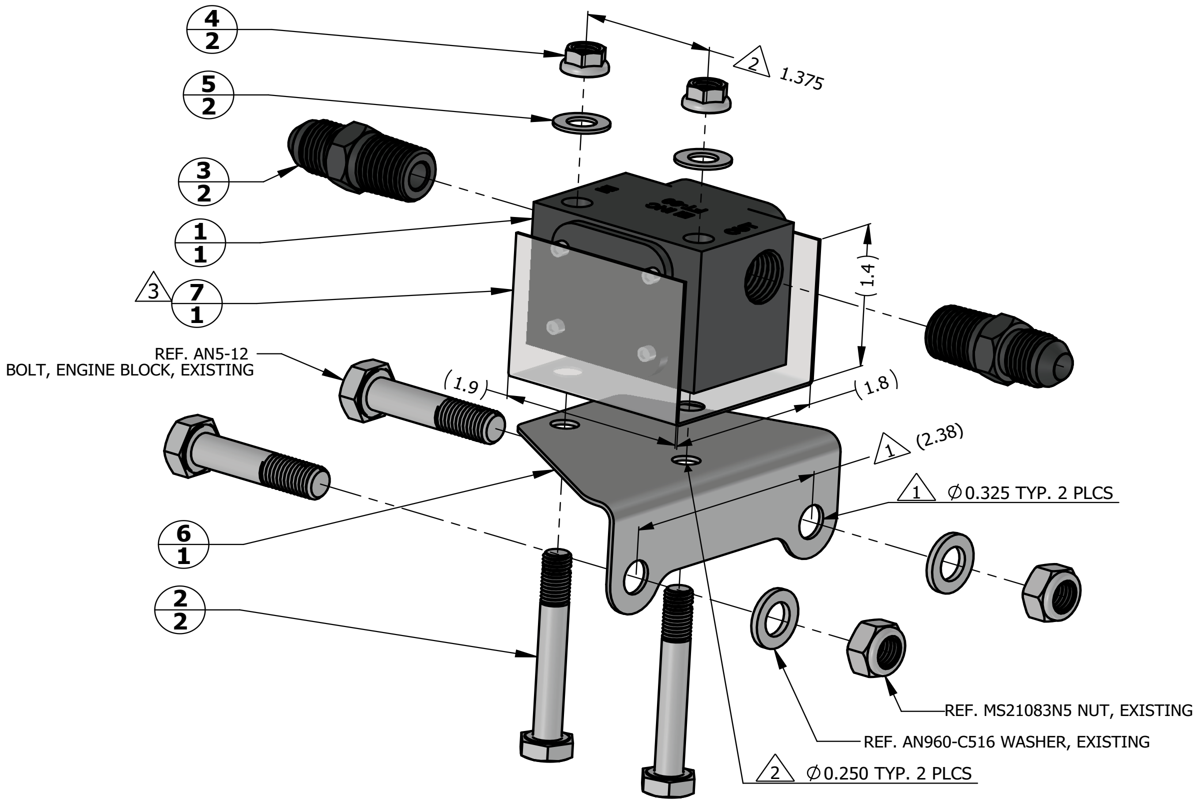
- The fuel flow transducer must be connected with new hoses and the hoses must not be subject to movement that could loosen the fittings.
- The hoses must have the same internal diameter as the hose being replaced and meet TSO-C53a Type C or D (fire-resistant) specifications.
- Fuel-compatible thread sealant 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.
- Fitting torque **must not exceed** 15 ft-lbf **or** two full turns past finger-tight, whichever occurs first.
- 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.
- Line fittings, routing, alignment, bonding, and support spacing must be installed as defined in the aircraft maintenance manual or Section 8-31 of AC 43.13-1B *Aircraft Inspection and Repair.*

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.



1	7		SHIELD, FUEL SENSOR, 5052H2 ALUMINUM, 0.025 IN THICK
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	FT-60	FUEL FLOW TRANSDUCER, 68000 PULSES/GAL, ELECTRONICS INTERNATIONAL
QTY	**ITEM**	**PART NUMBER**	**DESCRIPTION**

NOTES

1. HOLE SIZE AND SPACING TO MATCH ENGINE CASE BOLTS.
2. HOLE SIZE AND SPACING TO MATCH FUEL FLOW TRANSDUCER.
3. TRANSDUCER SHIELD IS REQUIRED ONLY IF FUEL FLOW INDICATION FAILS EMI CHECK.

Figure 4-38 Example Fuel Flow Transducer Installation

4.6.5.1 Fuel Flow EMI

NOTE

The installation of EI FT-60/90 fuel flow sensors must be checked for EMI in accordance with the procedure defined in Section 6.7.

If the fuel flow gauge fluctuates during the EMI checkout procedure (refer to Section 6.7), an EI FT-60 or EI FT-90 fuel flow sensor must be installed with shield bracket and wire overbraid. Refer to Figure 4-38 for the installation that illustrates how the fuel flow sensor cover plates are shielded by the bracket (**7**). The overbraid must cover the unshielded portion of the sensor wiring and must be terminated such that the overbraid is connected to the fuel flow sensor and the shielding of the wire. Refer to Figure 4-39 for overbraid installation.

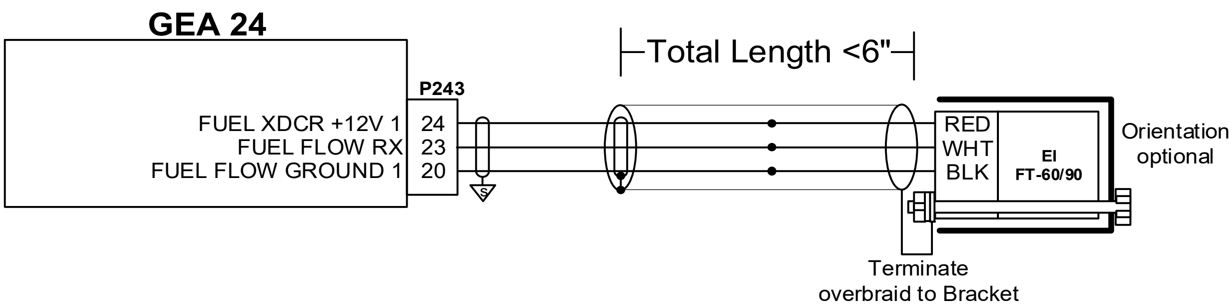


Figure 4-39 Fuel Flow Overbraid

4.6.6 RPM

The GI 275 system can use the electrical signal generated by the primary magneto coils or “P-Lead” to display RPM. Both magneto P-Lead signals, left and right, must be connected to the GEA 24(B). The connection is made at the ignition switch if the magneto does not have a ring terminal stud; otherwise, the connection can be made at the magneto or at the ignition switch, whichever minimizes the length of wire required to connect the GEA 24(B). The wire length between the P-Lead connection and the resistors must not exceed 6 inches. Shielded wires must be used as shown in Appendix B.

If the P-Lead on TCM/Bendix magnetos was used, torque the P-Lead nut between 15 and 17 in-lbf. If the P-Lead on Slick magnetos was used, torque P-Lead nut between 13 and 15 in-lbf.

This STC only provides interface approval to magnetic pickup RPM sensors. It does not provide installation approval for magnetic pickup sensors. For TCM/Bendix magnetos, the magnetic pickup must be installed in the vent hole furthest from the distributor cap. Refer to Figure 4-40.

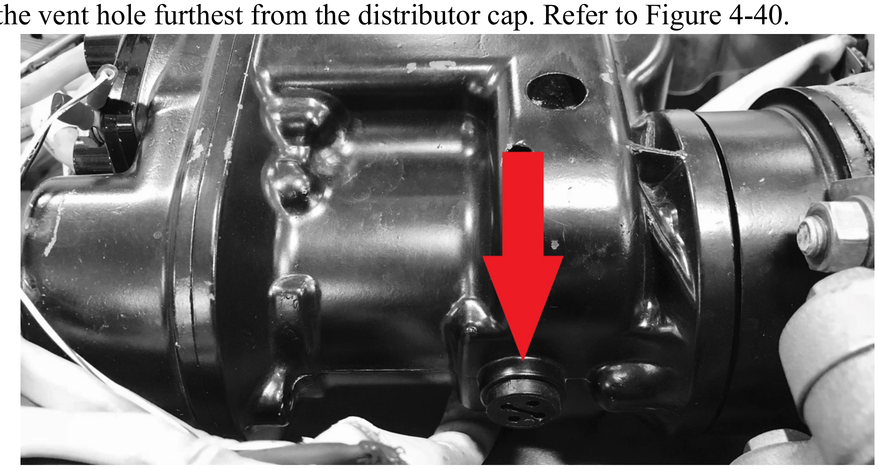


Figure 4-40 TCM/Bendix Magneto Vent Hole

For Slick magnetos, the magnetic pickup must be installed in the vent hole furthest from the distributor cap. Refer to Figure 4-41.

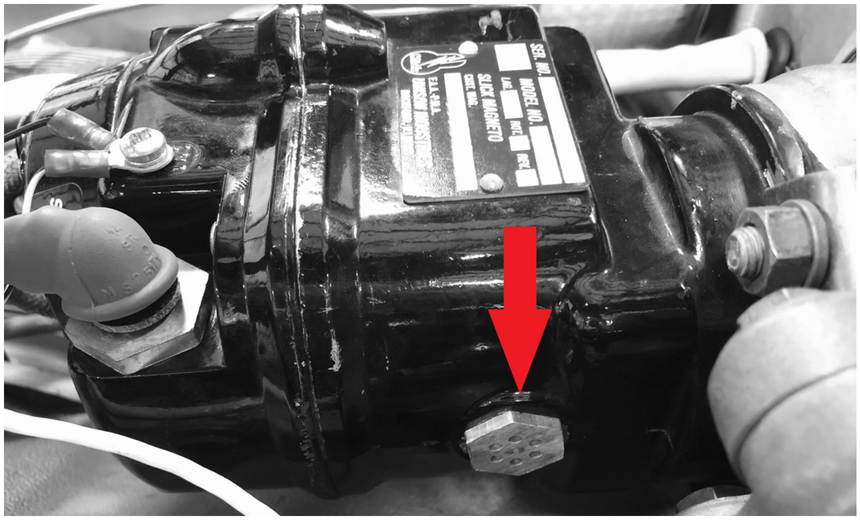


Figure 4-41 Slick Magneto Vent Hole

Following the installation of the P-Lead signal wires, verify the continuity of each magneto P-Lead to ground while the ignition key is off. If there is evidence of discontinuity in the magneto P-Lead grounding circuit, it must be corrected before further engine maintenance or checks. Continuity can only be measured if the magneto points are open or the wire is disconnected from the magneto. Use a magneto timing light to ensure the ohmmeter will not measure false continuity through the points or coil windings.

CAUTION

Do not turn the propeller and stay clear of the propeller arc when installing the P-Lead signal wires.

WARNING

The P-Lead sensor wiring must include the resistors as shown in Appendix B. The resistors prevent magneto shut-off in the event of a shorted RPM P-Lead wire. The resistors must be installed as close as practical to the P-lead connection, near either the magneto or the ignition switch.

4.6.7 CHT, EGT, TIT Probes

Garmin stocks certain probes to simplify the EIS sensor ordering process. Sensor part numbers are cross-referenced with Alcor STC SA522SW part numbers. The GI 275 STC does not provide installation approval for CHT, EGT, and TIT probes; however, the data in STC SA522SW is adequate for many installations.

For GI 275 software v3.10 or later, display of Single CHT/EGT is available. Use the same location as factory installed probes. If not previously installed, refer to STC SA522SW.

4.7 Remote Aircraft Status Relay Installation

Relays are required if a GDL 60 is installed and the Remote Aircraft Status (RAS) feature is desired. The quantity of relays required depends on the aircraft electrical system architectures, as shown in Figure B-15.

RAS 1 relay must be installed adjacent to the battery. For other relays (RAS 2 and on), it is recommended install them at the circuit breaker panel or in vicinity of the circuit breaker panel. Installation in a location which exposes the relays directly to outside environment is not permitted.

When drilling new fastener holes for the relay bracket, avoid drilling new fastener holes on fatigue-critical structures (e.g., wing and empennage structures) or pressurized fuselage (i.e. pressurized bulkheads, frames and skin).

When drilling new fastener holes on an existing platform for the relay bracket, the new holes must maintain 2D edge distance (D is the fastener diameter) and 3D distance from existing holes.

Before installing the relay bracket, apply a chemical conversion coating per aircraft structure repair manual or SAE ARP 1870 Section 5.1. Priming of the relay bracket is optional. If primer is applied, prime the relay bracket per aircraft structural repair manual.

The relay bracket shall be electrically bonded. The electrical bond shall achieve direct current (DC) resistance of 2.5 milliohms or less between bracket faying surface and aircraft structure. Electrical bonding is achieved through the fasteners as follows:

- If using screw/nuts/washers, use cadmium plated steel hardware and ensure the area underneath each hardware is burnished a minimum of 1/4 inch greater than the hardware diameter. The surface preparation shall be per SAE ARP 1870, Section 5.
- If using rivets, a minimum of three rivets shall be installed per aircraft structural repair manual.

Relays/sockets approved for installation are listed in Section 3.1.2.

4.7.1 Relay Installation Examples

Example 10A relay brackets are shown in Figure 4-42. Example 5A relay brackets are shown in Figure 4-43. The bracket can be either flat or L-angle. The bracket can be fabricated from 6061-T6 or 2024-T3 aluminum, min 0.032 inch thick. Fabrication methods, techniques, and practices provided by aircraft structural repair manual or standard practices defined in advisory circular AC43.13-1B, *Aircraft Inspection and Repair*, are acceptable.

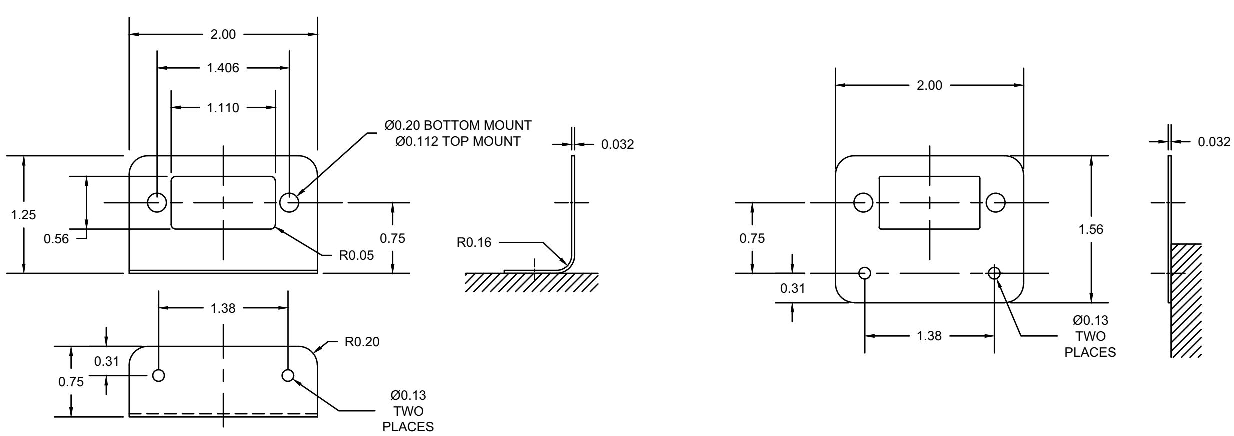


Figure 4-42 10A Relay Bracket Examples

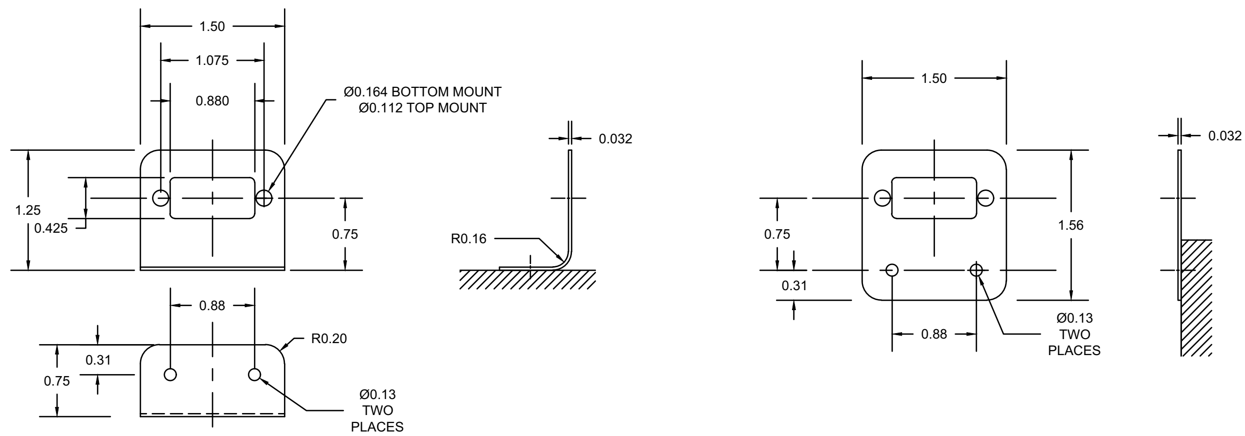


Figure 4-43 5A Relay Bracket Examples

If more than one relay is required, the relay bracket can be extended to house multiple relays. Examples of multiple relay brackets are shown in Figure 4-44.

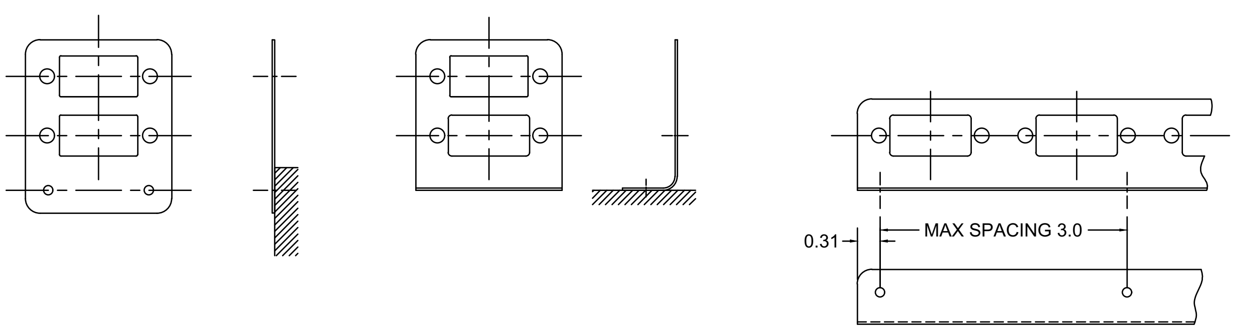


Figure 4-44 Multiple Relay Bracket Examples

4.8 Weight and Balance

The aircraft weight and balance record must be updated after the GI 275 system is installed by following the procedures typically detailed in Section 8 of the aircraft maintenance manual. Practices defined in Chapter 10, Section 2, *Weighing Procedures,* of AC 43.13-1B *Aircraft Inspection and Repair* are acceptable.

The aircraft Equipment List must be updated to include items that are added, removed, or relocated. The updated list must be dated, include the name (and certificate number) of the person that updated the list, and be retained with aircraft records.

5 SYSTEM CONFIGURATION

WARNING

This manual only approves the installation of the GI 275 Base (including backup battery and backup GPS antenna), GSB 15, and GEA 24(B) (including EIS annunciator(s) and engine sensors). Other compatible LRUs listed in Appendix C must use other installation approvals and may require installation and/or configuration by an authorized Garmin dealer per Garmin's installation policy.

5.1 System Configuration Preparation

Once all GI 275 components are installed in the aircraft, the system must be configured.

Due to the many different layout options of the GI 275, information contained in this section may not be applicable to every installation. Follow the configuration flow shown in Figure 5-1. A summary of the steps for system configuration and calibration follows:

1. Assign each GI 275 a unique Unit ID. This must be done prior to configuration of each unit.
2. Verify the GI 275 software level is current with this STC. If necessary, update the software in accordance with Section 5.2.
3. Configure the GI 275 for the particular installation, as specified in Section 5.2 through Section 5.9. This includes:
    a. Setting the airframe-specific parameters.
    b. Configuring interfaces to external systems.
4. Perform necessary system calibrations, as specified in Section 5.8.
5. Load required and optional databases, as specified in Section 5.15.
6. Perform the ground checks applicable to the installation, beginning in Section 6.2.
7. Verify all placards have been relocated, as specified in Section 6.6.
8. Perform the flight checks specified in Section 6.8.
9. Update the aircraft documentation, as specified in Section 6.9.

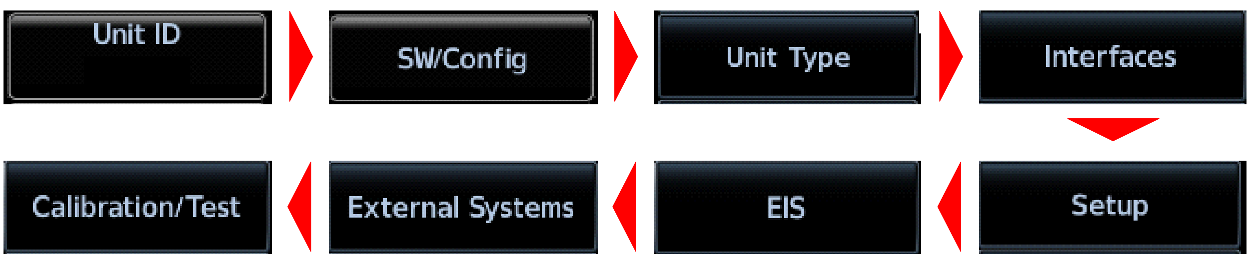


Figure 5-1 System Configuration Flow

5.1.1 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 held until the Garmin logo with "Configuration Mode" below it appears. For installations with multiple GI 275s, all other units can be easily powered on in Configuration mode by navigating to the ***Restart Options*** page from the Configuration mode home page on one unit and touching the **Restart All to Config** button.

Figure 5-2 Entering the Configuration Menu

NOTE

When making configuration selections on the GI 275, in many cases, there is no dedicated Enter selection. The selections made are confirmed by touching the ***Back*** *button to exit the particular screen/page.*

NOTE

When powering on the GI 275 in Configuration mode for the first time, a Unit ID must be assigned before any configuration settings can be changed. Refer to Section 5.3.1.

5.2 Software / Configuration

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). The Unit ID must be properly configured prior to loading software to the GI 275. After loading software to the GI 275, configure all interfaced LRUs.

NOTE

When connecting a USB drive to the GI 275 (whether via USB dongle or GSB 15), ensure that the USB icon appears on the left side of the display before proceeding. If the icon doesn't appear after 1 minute, remove the drive, re-insert it, and wait for the icon to appear.

5.2.1 Loader Card

Software updates for the GI 275 and GEA 24(B) can be accomplished via USB using the following procedure:

1. Create a Software Loader Card using the latest software and instructions available on flyGarmin.com.
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).
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.

Figure 5-3 Software Update

5.2.2 Config Options

5.2.2.1 GFC 500 Manifest

Not configured per this manual.

5.2.2.2 Summary

A configuration summary can be saved to a USB drive by touching the **Save Summary** button. The file will detail configuration settings for all GI 275s in the system and can be viewed on a computer web browser.

NOTE

Files will be saved to a "aircraft_cfg" folder on the USB drive.

5.2.2.3 Import Configuration

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

1. Power on the GI 275 and all LRUs in the system in Configuration mode.

NOTE

Unit ID must be set before importing configuration. Refer to Section 5.3.1.

2. Insert the USB drive containing the configuration files into the USB dongle or GSB 15 (if installed).
3. Navigate to ***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.

5.2.2.4 Export Config

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).
3. Navigate to ***SW/Config → Config Options***.
4. Touch the **Export Configuration** button.
5. Touch the **Select Name** button and enter a name for the saved file.
6. Touch the **Export Config** button.

NOTE

Files will be saved to a "aircraft_cfg" folder on the USB drive.

5.3 Unit Type

The ***Unit Type*** page is used to configure the GI 275 unit as a specific type of display. This includes Unit ID, System ID, Airframe Info, and Unit Configuration.

5.3.1 Unit ID

CAUTION

*Failure to follow the procedure to set **Unit ID** before performing any other configuration steps may result in configuration errors or configuration settings being overwritten by another display. Unit IDs must be **unique** for each unit in the system.*

A Unit ID must be assigned to each installed GI 275 prior to configuring the function of each unit.

- ***Unit ID*** – A unique ID number between 1 – 6 for each GI 275 installed in the system. Unit ID is set to a blank default at the factory and must be manually set. For a single GI 275 installation, set the ID to *GI 1*. The unit assigned GI 1 should also be set as the Master display (refer to Section 5.3.2). Each Unit ID must be unique and set using the following procedure:

When the GI 275 is powered on in Configuration mode for the first time (or after configuration settings are cleared), it will automatically prompt the user to assign a Unit ID. This cannot be skipped.

Alternatively, the Unit ID can be configured by following the steps:

1. Verify all GI 275 units are powered off.
2. Power up a single GI 275 in Configuration mode, as described in Section 5.1.1.
3. From the home page, touch **Unit Type → Unit ID → LRU** and select a unique Unit ID between 1 and 6.
4. Touch **Restart** to apply the assignment.
5. Power down the display (do not power back on at this time).
6. Repeat steps 2 through 5 for the remaining installed GI 275s.
7. When all Unit ID assignments have been made, power up all displays in Configuration mode before moving to the next configuration steps. The Unit ID assigned to each display is shown on the left side of the display on the Configuration mode home page or on the ***Unit Type*** page.

CAUTION

For installations with more than one GI 275, all configuration settings made after the steps in Section 5.3.1 must be done with all displays powered on and in Configuration mode.

CAUTION

Once all GI 275s have been configured, the Unit ID should not be changed. Doing so will result in a loss of configuration settings.

5.3.2 System ID Source

The ***System ID Source*** page is used to set a GI 275 unit as the Master, which will generate the System ID for the whole GI 275 system (generally, GI 1 is designated the Master). To set a GI 275 as the Master, touch the **Master** button and select **Yes** to confirm the change. The System ID will be displayed below the button.

CAUTION

Changing the designated Master display will change the GI 275 System ID. This will cause any previously unlocked features and installed databases to become unavailable. New feature unlocks will be required for the new System ID. Databases will also have to be re-installed; a new subscription may be required for some databases.

NOTE

Feature unlocks and databases will not become unavailable until the system is rebooted after the designation is changed.

5.3.3 Airframe Info

The ***Airframe Info*** page is used to configure the GI 275 for a Fixed Wing or Rotorcraft installation in a single or multi engine aircraft.. Set the Category to *Fixed Wing* per this STC. Configure the Engine Config as either *Single Engine* or *Multi Engine*.

5.3.4 Unit Configuration

Instrument Type

NOTE

Verify that installation specifications for the instrument type are followed as described in Section 4.3.

After the Unit ID has been selected, configure the instrument type. Refer to Section 5.6.2 for available page configurations for each indicator/display type. To set the instrument type, touch the **Instrument Type** button and then select the desired indicator/display. The options are:

- MFD
- EIS

Unit Location

Select the location of the display installation. Selections are:

- Pilot
- Co-Pilot

NOTE

When configured for Co-Pilot unit selection, the output of Baro correction is suppressed.

5.4 Feature Enable

The GI 275 system capabilities can be further enhanced by feature enablement options.

Follow these procedures to enable an applicable feature:

1. Obtain the System ID (alphanumeric).
   a. In Configuration mode, navigate to the ***System ID Source*** page (**Unit Type → System ID Source**).
   b. In Normal mode, open the menu, touch **System**, then touch **Info**.
2. Log in to the associated flyGarmin.com account.
3. Select the GI 275 feature and enter the System ID to download the enablement to a USB drive.
4. Power on all GI 275s in Configuration mode.
5. Insert the USB drive into the USB pigtail or GSB 15 (if installed).

NOTE

When connecting a USB drive to the GI 275 (whether via USB dongle or GSB 15), ensure that the USB icon appears on the left side of the display before proceeding. If the icon doesn't appear after 1 minute, remove the drive, re-insert it, and wait for the icon to appear.

6. On the display connected to the USB drive, navigate to the ***Features*** page by touching the **Feature Enable** button.
7. Touch the applicable feature button to enable the feature (it will be illuminated green).
8. A system message will appear alerting the user that the feature has been enabled.
9. Restart all GI 275s for the enablement to take effect.

5.5 Interfaces

This section specifies the configuration and setup of the GI 275 in order to interface to all required and optional equipment allowed by this AML STC. Each display must be individually configured to match all applicable interconnects (refer to Appendix B) that define each display as either an MFD or EIS display.

The ***Interfaces*** page allows the GI 275 display to be configured to interface to LRUs installed as part of the GI 275 system as well as previously installed equipment that is approved to interface to the GI 275 under this STC. Refer to Appendix C for equipment compatibility.

The configuration for a particular display will vary based on the Instrument Type (MFD or EIS) and number and type of other GI 275s in the system.

Each installed display must be individually configured based on the interfaced equipment.

Depending on the interface that is selected, further actions may be required by selecting the setting, as shown in Figure 5-4, and configuring them appropriately. Some selections may be grayed out until a preceding selection has been configured.

Figure 5-4 Interface and Ports/Config Selections

The configuration tables in this section show available interface options as well as available ports. The port assignments must be made to match the aircraft wiring.

NOTE

The port availability at each LRU configuration will vary depending on previous configuration actions. If a port was previously configured for another LRU, then that port will be grayed out and not available for selection.

NOTE

Interfaces not shown in the following tables are not approved per this STC.

5.5.1 GI 275s Installed

The ***GI 275s Installed*** page is used to identify which GI 275s are installed as part of the system, allowing data to be crossfilled between units via HSDB.

Verify the following for each installed GI 275:

- The Unit ID must be set and must be unique, as described in Section 5.3.1.
- The the current assigned Unit ID for each display is denoted on the ***GI 275s Installed*** page by a grayed out selection.

Perform the following steps to configure the GI 275 system:

1. Power on all GI 275s in the system in Configuration mode.
2. Navigate to the ***GI 275s Installed*** page (***Interfaces → GI 275s Installed***).
3. Select the Unit ID for each GI 275 in the system.
4. Repeat step 2 and 3 on each GI 275 unit.
5. Once each unit's ***GI 275s Installed*** page has been configured, navigate to the ***Devices Online*** page (***System Info → Devices Online***).
6. Ensure each Unit ID in the system shows a green square.

5.5.2 Wireless

The ***Wireless*** page allows you to connect the GI 275 unit to a Bluetooth connection or to generate a Wi-Fi signal. Refer to Section 5.14 or *GI 275 Pilot's Guide* for more information on wireless functionality.

The Wi-Fi functionality should only be enabled on one Garmin LRU at a time.

5.5.3 ADC

Not configured per this manual.

5.5.4 AHRS

Not configured per this manual.

5.5.5 GPS

Configure each GI 275 for a GPS source for GPS 1 and GPS 2 (if equipped) per the settings in Table 5-1.

Table 5-1 GPS Interfaces and Configuration Settings

GPS	Interface	Ports/Config - Settings			Notes
		Port	Number	Speed	
GTN 625/635/650	GTN 6XX				
GTN 625Xi/635Xi/650Xi					
GTN 725/750	GTN 7XX				
GTN 725Xi/750Xi					
GPS 400W / GNC 420W / GNS 430W	GNS 4XXW	A429 IN	1 Thru 4	High	
		A429 OUT	1 Thru 2	Low	
		RS-232 RX	1 Thru 2		
GPS 500W / GNS 530W	GNS 5XXW	A429 IN	1 Thru 4	High	
		A429 OUT	1 Thru 2	Low	
		RS-232 RX	1 Thru 2		
GNS 480	GNS 480	A429 IN	1 Thru 4	High	
		A429 OUT	1 Thru 2	Low	
		RS-232 RX	1 Thru 2		
GPS 175	GPS 175				
GNX 375	GNX 375				
GTX 3X5	GTX 3X5	RS-232 RX	1 Thru 2		
Other GI 275	Other GI 275				
GNC 355	GNC 355				
Generic MapMX	MAPMX	RS-232 RX	1 Thru 2		[1]

Notes:

[1] The Generic MAPMX GPS format may be used for Garmin GNS 4XXW/5XXW and GNS 480 interfaces if there are not enough data ports. This interface only requires RS-232 and provides the GI 275 with GPS position for moving map and AHRS aiding.

TAWS Installations

If a single TAWS-equipped GTN 6XX/7XX, GTN Xi, or GNS 500W unit is installed, it must be configured as GPS 1. Only TAWS annunciations from GPS 1 are displayed on the GI 275.

GNS 400W/500W Series and GNS 480 Installations

In dual GNS installations, the ARINC 429 OUT port selection is configured the same for both GPS 1 and GPS 2. The GPS 2 ARINC 429 OUT port is automatically set based on the port selection made on GPS 1, or vice versa. Changing the port selection on one will automatically change it on the other. Set the remaining ports for both per the associated aircraft wiring diagram.

5.5.6 VFR GPS

The VFR GPS antenna must be installed to enable the VFR GPS per this STC. Set VFR GPS to *Internal* if the antenna is directly connected to the unit. Otherwise, set to *Other GI 275* if installed on another GI 275.

The built-in VFR GPS is only approved for VFR navigation.

5.5.7 NAV

Configure each GI 275 for a NAV source for NAV 1 or NAV 2 (if equipped) per the settings in Table 5-2.

Table 5-2 NAV Interfaces and Configuration Settings

NAV	Interface	Ports/Config - Settings				Notes
		Port		Number	Speed	
Garmin GTN 650	GTN 650					[1]
Garmin GTN 650Xi						
Garmin GTN 750	GTN 750					[1]
Garmin GTN 750Xi						
Garmin GNS 430W/530W	GNS 430/530	A429 IN		1 Thru 4	Low	
Garmin GNS 480	GNS 480	A429 IN		1 Thru 4	Low	
Garmin GNC 255	GNC 255	RS-232 RX/TX		1 Thru 2		
Garmin SL 30	SL 30	RS-232 RX/TX		1 Thru 2		
Collins VIR-32/33	Composite	ILS Energize	Discrete In Lo	1 Thru 4		
Honeywell KN-53/KX-155/ KX-155A/KX-165/KX-165A						
NAV from other GI 275	Other GI 275					

Notes:

[1] If Course Selection is disabled, configure CRS A429 port and speed.

Course Selection

Disabling Course Selection allows the GI 275 to slave to the Selected Course from an external source. Set the Course Selection to Disabled when an external system is providing the primary Selected Course data. Set the Course Selection to *Enabled* when the GI 275 is the primary source for selected course data. The *Pilot Control* configuration setting for Course Selection is not currently approved under this STC.

5.5.8 Radar Altimeter

Configure the Radar Altimeter per the settings in Table 5-3.

Table 5-3 RAD ALT Interfaces and Configuration Settings

Radar Altimeter	Interface	Ports/Config - Settings			
		Port		Number	Speed
Garmin GRA 55/5500	GRA 55/5500	A429 IN		1 Thru 4	Low
Collins RAC 870	RAC 870	A429 IN		1 Thru 4	Low
		Rad Alt Test	Discrete Out Lo	1 Thru 9	
Free Flight RA 4500	RA 4500	A429 IN		1 Thru 4	Low
Honeywell KRA 405B	KRA 405B	A429 IN		1 Thru 4	Low
		Rad Alt Test	Discrete Out Lo	1 Thru 9	
Rad Alt from other GI 275	Other GI 275				

5.5.9 Autopilot

Not configured per this manual.

5.5.10 AHRS Emulation

Not configured per this manual.

5.5.11 Transponder

Configure the available interfaces for Transponder 1 and Transponder 2 per Table 5-4 to provide the ***Transponder Control*** page. Only the GTX 345 series transponder is compatible for the Transponder Control feature. Refer to the GTX 345 Installation Manual for configuration details for the GTX 345 unit.

Table 5-4 Transponder Configuration Settings

Transponder	Interface	Ports/Config - Settings	
Garmin GTX 345	GTX 345	Mode 1 Code	4 Digit
		VFR Code Recall	Enabled/Disabled [1]

Notes:

[1] With VFR Code Recall enabled, touching the **VFR** button on the ***XPDR*** page in Normal mode a second time will revert to the previously entered code.

5.5.12 EIS

Configure the EIS per the settings for EIS 1 or EIS 2 (if equipped) in Table 5-5. For twin-engine EIS, EIS 1 must be configured as left or front engine and EIS 2 must be configured as right or rear engine.

For twin-engine EIS, the first GI 275 display should have EIS 1 configured according to Table 5-5 and EIS 2 configured as *Other GI 275*. The second GI 275 display should have EIS 1 configured as *Other GI 275* and EIS 2 configured according to Table 5-5.

Table 5-5 EIS/GEA Configuration Settings

EIS	Interface	Ports/Config - Settings	Port Numbers
GEA 24(B)	GEA 24	RS-232	1 Thru 2
		Annunciations [1]	
EIS from other GI 275	Other GI 275	Annunciations [1]	

Notes:

[1] Annunciations are required if the GI 275 EIS is installed outside of 35° of the centerline. Refer to Section 4.3.3 for installation information. Refer to Table 5-6 for configuration settings.

5.5.12.1 Engine Annunciator

Configure the Engine Annunciator Interface per the settings in Table 5-6. In multi-engine aircraft and in single-engine aircraft with two EIS displays, only configure the annunciator discretes on EIS 1. Configure the annunciator discretes on EIS 2 as *None*.

Table 5-6 Engine Annunciator Configuration Settings

Aircraft System	Engine Annunciator	Engine Caution	Engine Warning
28V	LED-40-17-BA2-E1WP6	Discrete Out Lo 1 Thru 9	Discrete Out Lo 1 Thru 9
	MS25041		
14V	95-40-17-B4-E1WPN		
	MS25041		

5.5.13 Traffic

Configure the available Traffic interface to match the particular installation per Table 5-7. Refer to the appropriate Garmin ADS-B STC installation manual for more information on installation and configuration requirements for systems with multiple traffic systems. When configuring the traffic interface, first select the type of traffic system installed. Then select the appropriate interface and configure per the settings in Table 5-7.

Table 5-7 Traffic System Configuration Settings

Traffic Source	Type	Interface (Type)	Ports/Config - Settings			Port Numbers	
Traffic from other GI 275	Active Traffic/ TIS-A	Other GI 275					
L-3 Avionics SKY497	Active Traffic	SKY497	A429 IN [1]			1 Thru 4	
			Control Traffic	De-select			
				Select	TAS STBY/ON	Discrete Out Lo	1 Thru 9
					TAS TEST	Discrete Out Lo	1 Thru 9
L-3 Avionics SKY899	Active Traffic	SKY899	A429 IN [1]			1 Thru 4	
			Control Traffic	De-select			
				Select	TAS STBY/ON	Discrete Out Lo	1 Thru 9
					TAS TEST	Discrete Out Lo	1 Thru 9
L-3 Avionics SKY899 TCAS I	Active Traffic	SKY899 TCAS I	A429 IN [1]			1 Thru 4	
			Control Traffic	De-select			
				Select	TAS STBY/ON	Discrete Out Lo	1 Thru 9
					TAS TEST	Discrete Out Lo	1 Thru 9
Bendix/King Honeywell KTA 870 KMH 820	Active Traffic	KTA 870/ KMH 820	A429 IN [1]			1 Thru 4	
			Control Traffic	De-select			
				Select	TAS STBY/ON	Discrete Out Lo	1 Thru 9
					TAS TEST	Discrete Out Lo	1 Thru 9
Bendix/King Honeywell KTA 970 KMH 920	Active Traffic	KTA 970/ KMH 920	A429 IN [1]			1 Thru 4	
			Control Traffic	De-select			
				Select	TAS STBY/ON	Discrete Out Lo	1 Thru 9
					TAS TEST	Discrete Out Lo	1 Thru 9

<table>
<tr><th>Traffic Source</th><th>Type</th><th>Interface (Type)</th><th colspan="3">Ports/Config - Settings</th><th colspan="2">Port Numbers</th></tr>
<tr><td rowspan="6">GTS 8XX</td><td rowspan="5">Active Traffic</td><td>GTS (HSDB)</td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td rowspan="4">GTS 8XX (A429)</td><td>A429 IN [1]</td><td></td><td></td><td colspan="2">1 Thru 4</td></tr>
<tr><td rowspan="3">Control Traffic</td><td>De-select</td><td></td><td colspan="2"></td></tr>
<tr><td rowspan="2">Select</td><td>TAS STBY/ON</td><td>Discrete Out Lo</td><td>1 Thru 9</td></tr>
<tr><td>TAS TEST</td><td>Discrete Out Lo</td><td>1 Thru 9</td></tr>
<tr><td>ADS-B</td><td>GTS ADS-B</td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td>Avidyne (Ryan) TAS 6XX/ TCAD</td><td>Active Traffic</td><td>TAS 6XX/ TCAD</td><td>A429 IN [1]</td><td colspan="2"></td><td colspan="2">1 Thru 4</td></tr>
<tr><td>GTX 345</td><td>ADS-B</td><td>GTX 345</td><td>Active Traffic</td><td colspan="2">TAS/TCAS</td><td colspan="2"></td></tr>
<tr><td>GNX 375</td><td>ADS-B</td><td>GNX 375</td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td rowspan="2">GTX 33X</td><td rowspan="2">TIS-A</td><td rowspan="2">GTX 33X</td><td>A429 IN [1]</td><td colspan="2"></td><td colspan="2">1 Thru 4</td></tr>
<tr><td colspan="2"></td><td>TIS STBY/ON</td><td>Discrete Out Lo</td><td>1 Thru 9</td></tr>
</table>

Notes:

[1] Refer to Section 5.5.20 to configure the ARINC 429 OUT port to provide data to the traffic system, if applicable.

5.5.14 GDL 60

Configure the data link interface per the settings in Table 5-8.

Table 5-8 GDL 60 Configuration Settings

<table>
<tr><th>Data Link</th><th>Interface</th><th>Ports/Config - Settings</th><th>Port Numbers</th><th>Notes</th></tr>
<tr><td rowspan="2">GDL 60</td><td rowspan="2">GDL 60</td><td rowspan="2">Connected to</td><td>HSDB Port 1-2</td><td rowspan="2">[1]</td></tr>
<tr><td>Other LRU</td></tr>
</table>

Notes:

[1] Select the appropriate HSDB port if directly connected to the configured GI 275 unit. Select *Other LRU* if the configured GI 275 is connected to the GDL 60 via another LRU. If Remote Aircraft Status is desired, the GDL 60 must be directly connected to the GI 275 EIS unit.

5.5.15 GDL 69

Configure the data link interface per the settings in Table 5-9.

Table 5-9 GDL 69 Configuration Settings

Data Link	Interface	Ports/Config - Settings	Port Numbers	Notes
GDL 69/69A SXM	GDL 69			[1]
	GDL 69A			[1] [2]

Notes:

[1] The GI 275 will only display data from the GDL 69/69A SXM. Another LRU must be used to configure the GDL 69/69A SXM. Refer to *GDL 69/69A Installation Manual* (P/N 190-00355-02) for more information.

[2] If a GDL 69A SXM is installed, it is permissible to configure it as a GDL 69. In this case, the XM weather from the GDL 69A SXM will be displayed on the GI 275 MFD, but no audio control will be available on the display.

[3] Only second generation GDL 69/69A SXM models are compatible with the GI 275.

5.5.16 Stormscope

Configure the Stormscope interface per the settings in Table 5-10.

Table 5-10 Stormscope Configuration Settings

Stormscope	Interface	Ports/Config - Settings	Port Numbers	
WX-500	WX-500		RS-232 RX	1 Thru 3
Wired to other GI 275	Other GI 275			

5.5.17 PFD Sync

Not configured per this manual.

5.5.18 General Purpose Discrete In

Configure the General Purpose Discrete In ports and speeds per the settings in Table 5-11.

Table 5-11 General Purpose Discrete In Settings

General Purpose Discrete In	Ports/Config - Settings	Port Numbers	
Discrete In	Audio Inhibit	Discrete In Lo	1 Thru 6

5.5.19 General Purpose Discrete Out

Configure the General Purpose Discrete Out ports and speeds per the settings in Table 5-12.

Table 5-12 General Purpose Discrete Out Settings

General Purpose Discrete Out	Ports/Config - Settings	Port Numbers	
Discrete Out	On Ground	Discrete Out Lo	1 Thru 9
	Terrain Aud Actv		

5.5.20 General Purpose ARINC 429 (A429) Out

Configure the General Purpose ARINC 429 port(s) and speeds per the settings in Table 5-13. The A429 Out from the GI 275 may be provided to the following LRUs. Refer to Appendix C for required information on each LRU settings.

Table 5-13 General Purpose A429 Output Settings

General Purpose A429 Out	Interface	Ports/Config - Settings	Port Numbers	
A429 Out	Present	General Purpose 1 #1	1 Thru 2	Low
				High
		General Purpose 1 #2	1 Thru 2	Low
				High
		General Purpose 2 #1	1 Thru 2	Low
				High
		General Purpose 2 #2	1 Thru 2	Low
				High

Notes:

- GTX 33/330/335/345 - GP 1 A429 Low Speed **OR** GP 2 A429 Low Speed.
- GTS 8XX - GP 1 A429 Low Speed or High Speed.
- TAS 6XX/9900BX - GP 1 A429 Low Speed or High Speed.
- TRC 497/899 - GP 1 A429 Low Speed **OR** GP 2 A429 Low Speed.
- KTA 810/910, KMH 820/920 - GP 2 A429 Low Speed **AND** Integrated AHRS/ADAHRS High Speed OR GP2 A429 High Speed.
- ART 2000/2100 - GP 2 A429 High Speed **OR** Integrated AHRS/ADAHRS High Speed.

5.5.21 General Purpose RS-232 Out

Configure the General Purpose serial port per the settings in Table 5-14.

Table 5-14 General Purpose Serial Port Setting

General Purpose RS-232 Out	Ports/Config - Settings	Port Numbers	Notes
Altitude Format 3	RS-232 Out	1 Thru 3	

5.5.22 Airspeed Switches

These settings are not approved per this STC.

5.6 Setup

This section describes the setup for lighting, page configuration, audio alerts, Terrain/TAWS, backup battery, and other miscellaneous settings. Ensure all interfaces necessary in Section 5.5 have been successfully configured prior to continuing with setup. Some pages contained in this section may not be applicable to every installation or may not be available.

5.6.1 Lighting

This section outlines the preferred method for configuring the GI 275 lighting in the aircraft. The GI 275 STC allows display/knob lighting control with or without the Enhanced Lighting mode selection. The Enhanced Lighting mode allows a more customized lighting curve.

Configure Day Mode Curve is the only setting available for configuration when Enhanced Lighting mode is selected. Figure 5-5 shows the ***Lighting*** page.

NOTE

All lighting conditions must be considered when configuring the display for photocell only. If the aircraft is equipped with an instrument panel flood or wash lighting, the installation must be evaluated to verify the flood/wash lighting does not affect the GI 275 lighting level. If the display lighting level is adversely affected by the flood/wash lighting, then the GI 275 must be connected to a lighting bus to control the display brightness.

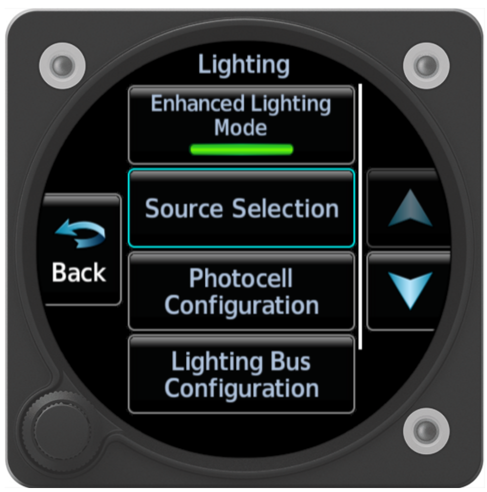


Figure 5-5 Lighting Page

To accurately configure the lighting, the ability to adjust ambient light conditions is required. The installer must have the means to simulate complete darkness in the cockpit. Simply covering the photocells may not allow the installer's eye to properly judge whether the display brightness is too bright or too dim for night use.

The following tables must be used for lighting configuration:

- Table 5-16 - Photocell for display/knob (Enhanced Lighting mode de-selected).
- Table 5-17 - Lighting bus for display/knob (Enhanced Lighting mode de-selected).
- Table 5-18 - Photocell for display/knob (Enhanced Lighting mode selected).
- Table 5-19 - Lighting Bus for display (Enhanced Lighting mode selected).
- Table 5-20 - Lighting Bus for knob (Enhanced Lighting mode selected).

Due to the complicated nature of configuring the Enhanced Lighting mode, Table 5-15 provides suggested settings as a starting point for lighting curve configuration. Other user-defined curves can be used, as well as modifying these values to better match the overall cockpit lighting scheme and installation.

Table 5-15 Example of Enhanced Lighting Mode Curve Configuration

Setting	Value	Setting	Value
Vertex 1	20.0, 0.1	Max Level	100.00%
Vertex 2	50.0, 2.0	Min Level	0.10%
Vertex 3	70.0, 5.0	Transition	5.00%
Vertex 4	80.0, 100.0		

Photocell Configuration - Enhanced Lighting De-selected

The Display Lighting and the Knob Lighting curves must be set individually as noted per Table 5-16.

Table 5-16 Photocell Configuration Procedure

Step	Photocell Curve	
	Display	**Knob**
1	Under Source Selection, set *Photocell as* the source for Display Source.	Under Source Selection, set *Photocell as* the source for Knob Source.
2	Under the Photocell Configuration, set the Photocell - Response Time to a low level (e.g., 2 sec) to allow the display to adjust more quickly to light conditions.	
3	Touch **Lighting Curve Configure** and then **Display Lighting**. It is recommended to start configuration with a Slope of 50%. This can be done by selecting **Slope** and entering the value (refer to Figure 5-6).	Touch **Lighting Curve Configure** and then **Knob Lighting**. It is recommended to start configuration with a Slope of 50%. This can be done by selecting **Slope** and entering the value (similar to Figure 5-6 for display lighting).
4	Turn on all instrument panel and cockpit lighting.	
5	Minimize photocell input levels by simulating night conditions in the cockpit. Complete steps 6 - 11 with the goal of achieving consistency between all cockpit lighting.	
6	If the display is too bright, lower the Min Level and/or adjust the lighting Slope to achieve the desired brightness.	If the keys are too bright, lower the Min Level and/or adjust the lighting Slope to achieve the desired brightness.
7	If the display is not bright enough, raise the Min Level to the desired brightness.	If the keys are not bright enough, raise the Min Level to the desired brightness.
8	Simulate direct maximum sunlight in the cockpit.	
9	Verify that the display produces maximum brightness on the backlight output level. Adjust Max Level if needed.	Adjust the Cutoff percentage as shown in Figure 5-7, such that the key backlighting is switched off in bright light.
10	Simulate average sunlight conditions/average input conditions in the cockpit (average Source Input Level%).	
11	If the display is too bright or too dim, vary the Slope and/or Offset percentage to achieve desired brightness at mid-range lighting input levels.	If the key is too bright or too dim, vary the Slope and/or Offset percentage to achieve desired brightness at mid-range lighting input levels.
12	Verify that the lighting Slope, Offset, and Min Level still maintain the low-light visibility requirements achieved in previous steps. Repeat any steps necessary to re-adjust night lighting settings.	
13	Adjust the Response Time to smooth changes to brightness, as required.	
14	Verify that adjustments made in the preceding steps are appropriate for all expected lighting conditions.	

Figure 5-6 Lighting Curve Slope Configuration

Figure 5-7 Cutoff Percentage Configuration

Lighting Bus Configuration - Enhanced Lighting De-selected

The Display Lighting and the Knob Lighting curves must be set individually as noted in Table 5-17.

Table 5-17 Lighting Bus Configuration Procedure

Step	Lighting Bus Curve	
	Display	**Knob**
1	Under Source Selection, set *Lighting Bus* as the source for Display Source.	Under Source Selection, set *Lighting Bus* as the source for Knob Source.
2	Under Lightning Bus Configuration, set the Input Type to match the aircraft lighting bus voltage and the Response Time to a low level (e.g., 0 sec) to allow the display to adjust more quickly to dimmer bus input changes.	
3	Follow steps 4 - 12 to achieve consistency between all cockpit lighting. Figure 5-8 shows the primary settings on both the display lighting and the keys lighting curves.	
4	Simulate night conditions in the cockpit.	
5	Touch **Lighting Curve Configuration** and then **Display Lighting**.	Touch **Lighting Curve Configuration** and then **Knob Lighting**.
6	Set the Transition to *5%*. Below this source input value, the photocell will override the dimmer bus for display backlighting control. **NOTE**: This also allows the photocell to function as a backup in the event of a lighting bus failure.	
7	Turn the dimmer bus knob to its minimum setting or below the transition % value. **NOTE**: Steps 7 - 9 and 11 will set the photocell functionality when the lighting bus is below the transition % value.	Turn the dimmer bus knob to its minimum setting.
8	If the display is too bright, lower the Min Level and/or adjust the Slope to achieve the desired brightness.	If the knob is too bright, lower the Min Level and/or adjust the Slope to achieve the desired brightness.
9	If the display is too dim, increase the Min Level to achieve desired levels.	If the knob is too dim, increase the Min Level to achieve desired levels.
10	With the dimmer bus still off or below the transition % value, adjust the Offset such that the display remains readable.	With the dimmer bus still off, adjust the Offset such that the bezel key remains visible.
11	Slowly move the dimmer bus knob towards its maximum setting. Observe the rate of change between the display lighting, bezel key lighting, and any other cockpit illuminated information over the full range above transition % value of the dimmer bus. Adjust the Slope and/or Offset to obtain consistency.	Slowly move the dimmer bus knob towards its maximum setting. Observe the rate of change between the display lighting, bezel key lighting, and any other cockpit illuminated information over the full range of the dimmer bus. Adjust the Slope and/or Offset to obtain consistency.
12	With the dimmer bus off, simulate direct sunlight conditions in the cockpit. If the brightness is below the desired level, adjust the Slope setting to achieve maximum desired brightness.	
13	Adjust the Response Time to smooth changes to brightness, as required. This can be done from the ***Lighting Bus Configuration*** page (***Setup*** → ***Lighting*** → ***Lighting Bus Configuration***). You will need to save your configuration when exiting the ***Lighting Curve Configuration*** page.	
14	Verify that adjustments made in the preceding steps are appropriate and functional for all expected lighting conditions.	

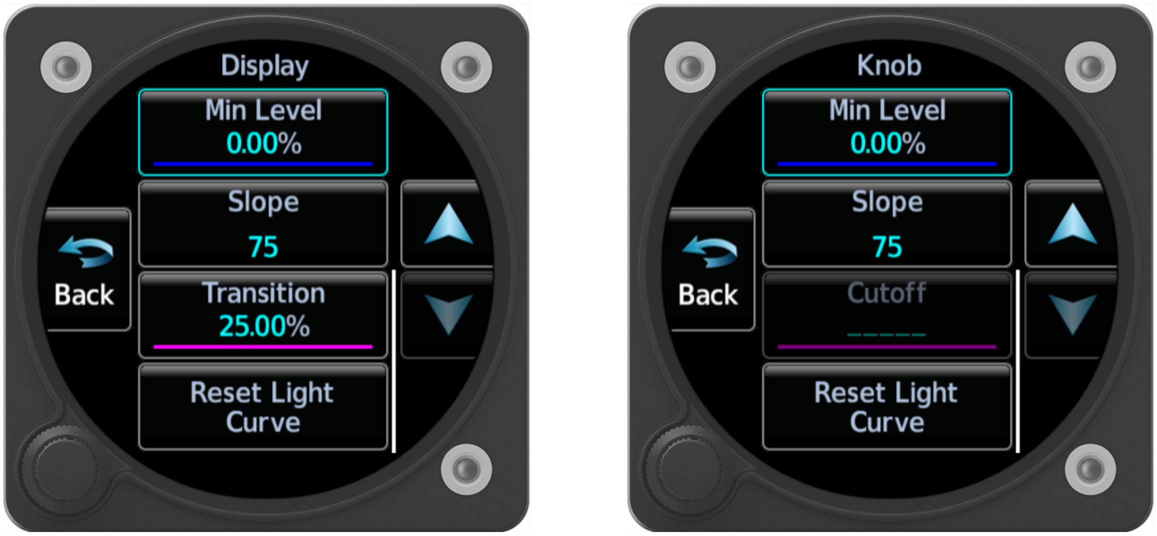


Figure 5-8 Display Lighting (Left) and Knob Lighting (Right) Curves

Enhanced Lighting Mode Configuration

The Enhanced Lighting mode can be used to better control the display and knob lighting to match varying lighting conditions. When the lighting bus is selected as the source for the display lighting control, a backup photocell curve will be configured in the event of lighting bus failure.

Configure the Enhanced Lighting function using the instructions contained in Table 5-18, Table 5-19, and Table 5-20.

Table 5-18 Photocell Configuration Procedure - Enhanced Lighting

Step	Display	Keys
1	Under Source Selection, set *Photocell* as the input source for both the Display Source and/or Keys Source.	
2	Under Photocell Configuration, set the Response Time to a level between 2 - 7 seconds.	
3	Touch **Enhanced Lighting Mode** on. The button should be highlighted green.	
4		Touch **Lighting Curve Configuration** → **Knob Lighting Day Mode** and adjust the Cutoff percentage. This allows for the key backlighting to be switched off in bright light.
5	Simulate night conditions in the cockpit by using blankets or a similar method, such that the cockpit can be made progressively brighter for steps 6 and 7.	
6	Under **Lighting Curve Configuration** → **Display/Knob Lighting Day Mode**, set the Min Level and Vertex 1 while the panel is experiencing night conditions. The level adjustments can be made by selecting **Vertex ( )** and changing the values (refer to Figure 5-12). Seek consistency between all cockpit lighting. **NOTE**: A vertex represents a specific output value based on a given input value, where the goal is to customize the lighting curve by manipulating the vertices	
7	Set the remainder of the vertices while progressively introducing light to the interior of the aircraft. Set the Max Level as desired. It is recommended to configure the curve to such that the display reaches the desired max output level (%) prior to 100% input. A linear curve for the photocell typically works well (refer to Figure 5-9).	

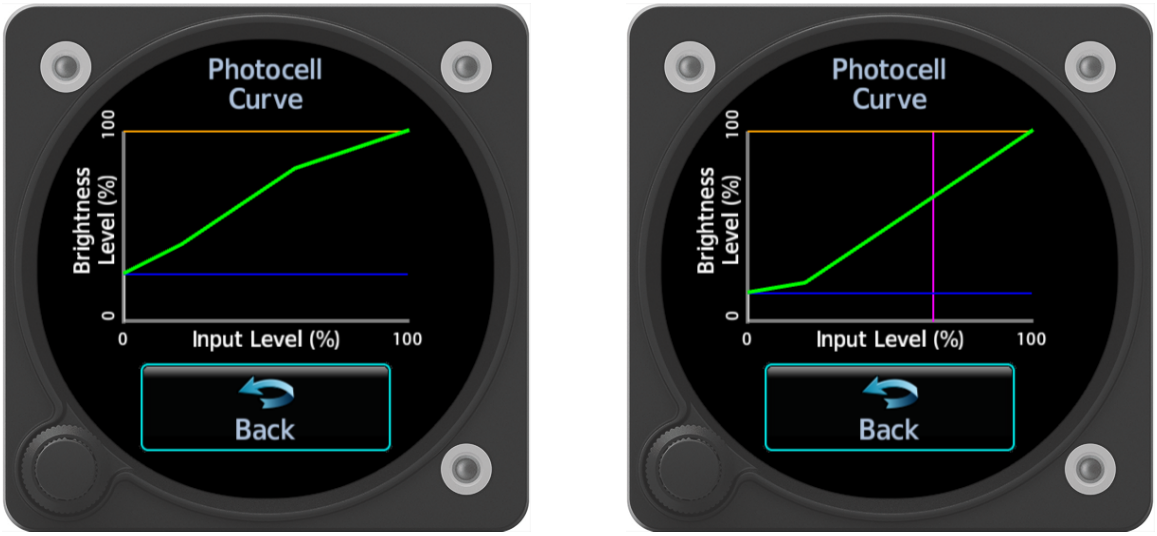


Figure 5-9 Enhanced Lighting Mode Example Photocell Display (Left) and Knob (Right)

Table 5-19 Lighting Bus Configuration Procedure - Enhanced (Display)

Step	Lighting Bus Day Mode Curve - Display
1	Under Source Selection, set Display Source to *Lighting Bus*.
2	Under Lightning Bus Configuration, set the Input Type to match the aircraft lighting bus voltage, and set the Response Time to a value between 0 - 7 seconds.
3	Touch **Enhanced Lighting Mode** on. The button should be highlighted green.
4	Touch **Lighting Curve Configuration** → **Display Lighting Day Mode** and set the Transition percentage to *5%* (refer to Figure 5-10). Below this set value, the display brightness will be controlled by the photocell.
5	Set the dimmer knob to the off position. The Source Input level (%) must be below the transition point set previously.
6	Touch the **Curve** button to change it to the Photocell Backup option (refer to Figure 5-11). **NOTE:** The Max Level and the Min Level set in the next steps will also set the max and min levels for the dimmer mode operation curve.
7	Simulate night conditions in the cockpit by using blankets or a similar method, such that the cockpit can be made progressively brighter for steps 8 and 9.
8	Set the Min Level and Vertex 1 while the panel is experiencing night conditions. The level adjustments can be made by selecting **Vertex ( )** and changing the values (refer to Figure 5-12). Seek consistency between all cockpit lighting. **NOTE:** A vertex represents a specific output value based on a given input value, where the goal is to customize the lighting curve by manipulating the vertices.
9	Set the remainder of the vertices while progressively introducing light to the interior of the aircraft. Set the Max Level as desired. It is recommended to configure this curve to make sure the display reaches the desired max output level (%) prior to 100% input. A linear curve for the photocell typically works well.
10	Touch the **Curve** button to change it to the Lighting Bus option (refer to Figure 5-11). This sets the curve for the dimmer bus functionality.
11	Verify functionality of dimmer knob. Re-adjust Transition point if/as required.

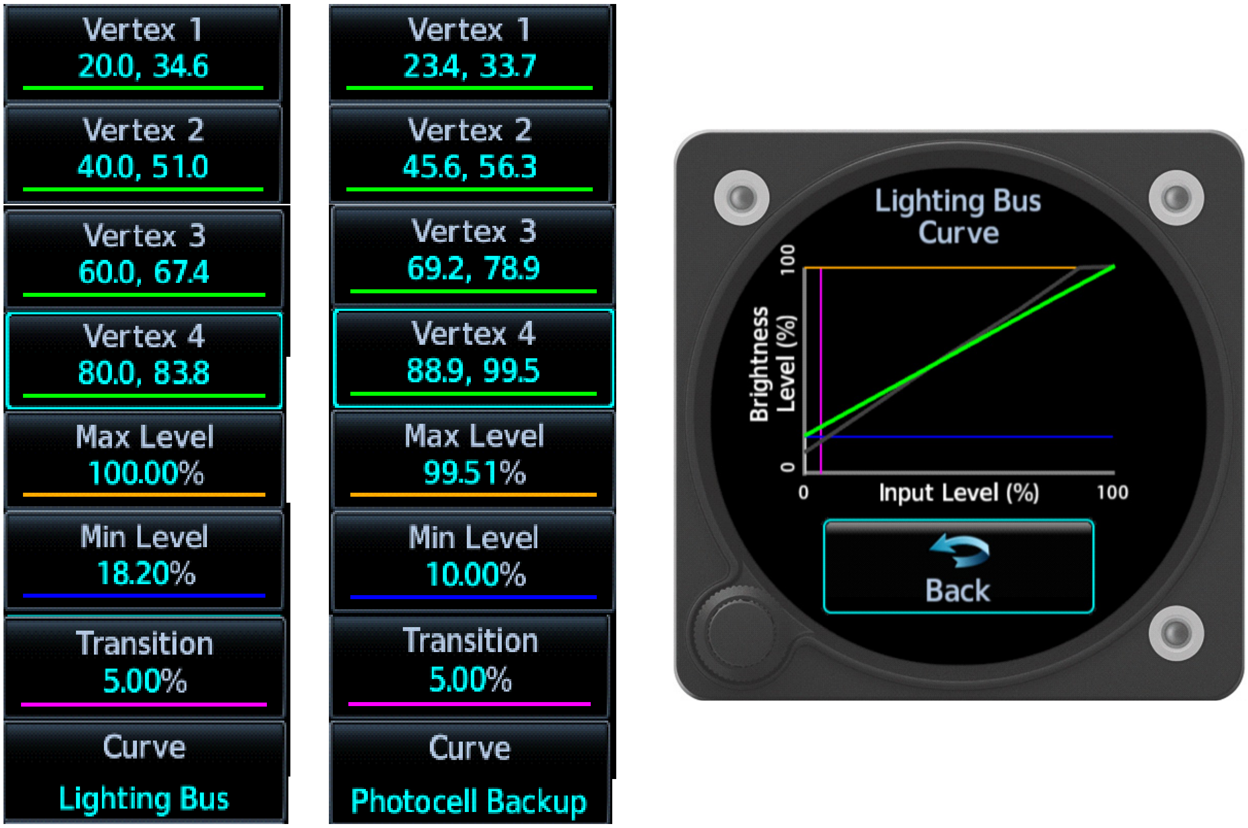


Figure 5-10 Enhanced Lighting Mode Example Lighting Bus - Display

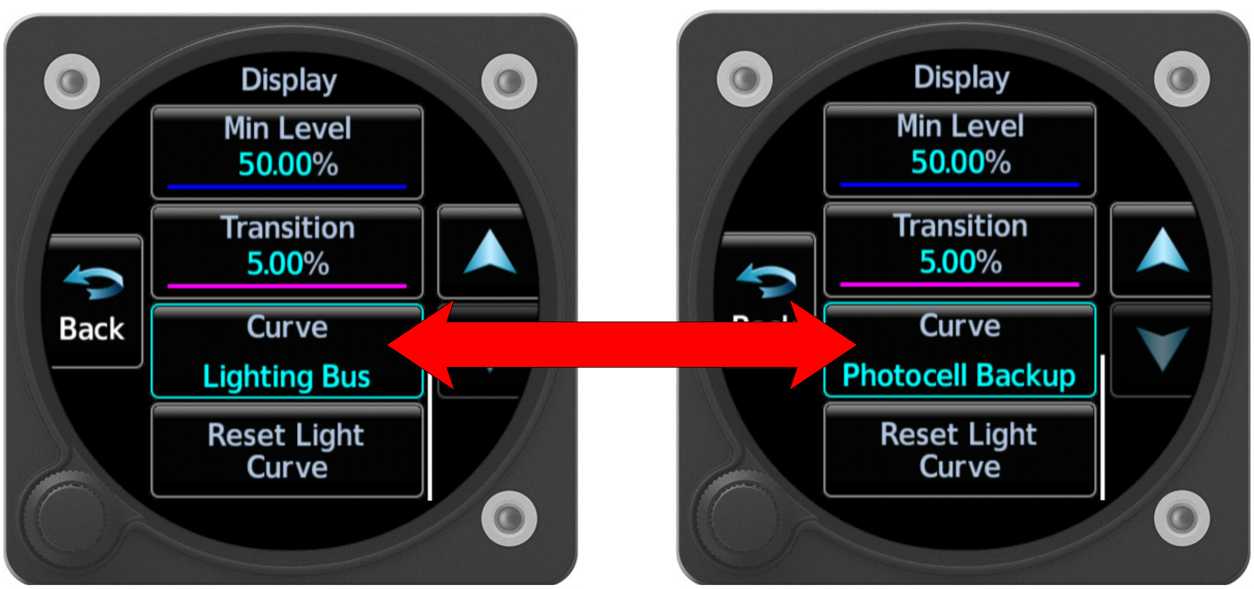


Figure 5-11 Selection Between Lighting Bus and Photocell Backup Curves

Table 5-20 Lighting Bus Configuration Procedure - Enhanced (Knob)

Step	Lighting Bus Day Mode Curve - Knob
1	Under Source Selection, set Knob Source to *Lighting Bus*.
2	Set the Lighting Bus - Input Type to match the aircraft lighting bus voltage, and set the Response Time to a value between 0 - 7 seconds.
3	Touch **Enhanced Lighting Mode** on. The button should be highlighted green.
4	Touch **Lighting Curve Configuration** → **Knob Lighting Day Mode**.
5	Simulate night conditions in the cockpit by using blankets or a similar method, such that the cockpit can be made progressively brighter for steps 6 and 8.
6	Set the Min Level and Vertex 1 while the panel is experiencing night conditions. The level adjustments can be made by selecting **Vertex ( )** and changing the values (refer to Figure 5-12). Seek consistency between all cockpit lighting. **NOTE:** A vertex represents a specific output value based on a given input value, where the goal is to customize the lighting curve by manipulating the vertices.
7	Set the remainder of the vertices while progressively introducing light to the interior of the aircraft. Set the Max Level as desired. It is recommended to configure this curve to make sure the display reaches the desired max output level (%) prior to 100% input. A linear curve for the photocell typically works well (refer to Figure 5-12).
8	Verify functionality of dimmer knob. Re-adjust Transition point if/as required.

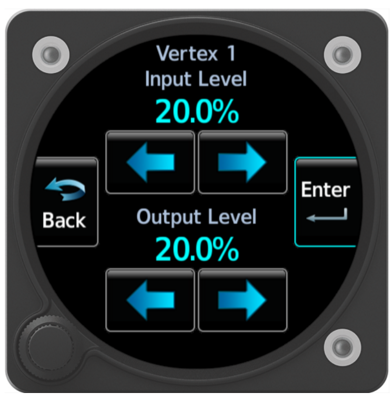


Figure 5-12 Vertex Adjustment Dialog Box

CAUTION

The display must be viewable under all anticipated lighting conditions, including:

- *When the display is in direct sunlight.*
- *When the cockpit is bright but the photocell is in heavy shadow (such as flight into a setting sun).*
- *When the cockpit is very dim, the display must not be excessively bright.*

Brightness Offset Configuration

The Brightness Offset Configuration page can be used to set the limits of pilot-controlled brightness offset from the display/knob lighting curve and whether the offset level persists through system restarts. If Offset Persistence is enabled, the brightness offset selected by the pilot in Normal mode will be retained through power cycles of the GI 275; if disabled, there will be no offset from the display/knob lighting curve. The Min Offset and Max Offset fields determine the bounds of pilot-controlled lighting curve offset.

5.6.2 Page Configuration

The ***Page Config*** page contains options that determine which pages will display in Normal mode based on the primary function(s) of the specific display as configured on the ***Unit Configuration*** page (refer to Section 5.3.4). Refer to Section 5.6.2.3 for an example of each page displayed in Normal mode.

In Configuration mode, navigate to the ***Setup* → *Page Config*** page, as shown in Figure 5-13. Some instrument types contain optional pages that can be toggled on and off or pages that can be rearranged.

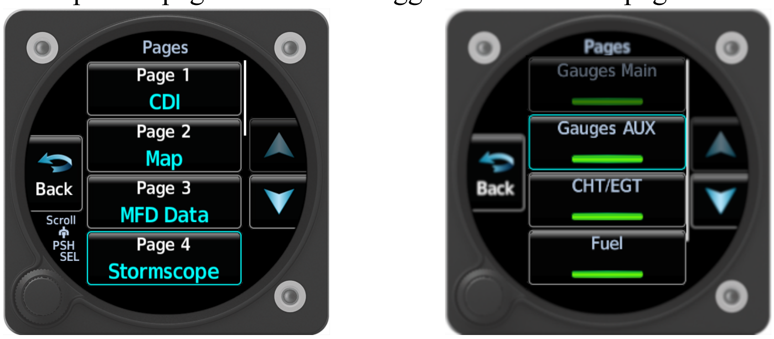


Figure 5-13 Page Config Page - MFD (Left) and EIS (Right)

5.6.2.1 MFD Page Options

The MFD configuration contains configurable pages from 1 - 17. To configure a page as a certain function, touch the **Page ( )** button and select the desired page from the list. The GI 275 will automatically populate the maximum number of pages based on the interfaced equipment. To limit the number of displayed pages in Normal mode, configure unwanted pages to *None*.

- ***CDI*** page — Displays lateral and vertical deviations.
- ***Standard HSI*** page — Provides magnetically stabilized primary heading.
- ***Enhanced HSI*** page — Provides map underlay capable of displaying ownship on a moving map with traffic and weather overlays.
- ***Traffic*** page [1] — Provides depiction of traffic (ADS-B, TIS-A, TCAS).
- ***SXM Weather*** page [1] — Provides depiction of SXM weather (with valid subscription).
- ***FIS-B Weather*** page [1] — Provides depiction of FIS-B weather.
- ***Stormscope*** page [1] — Provides depiction of lightning strikes.
- ***Terrain*** page — Provides depiction of terrain.
- ***Map*** page — Displays moving map with ownship icon.
- ***Gauges Main*** page [2] [3] — Displays required EIS gauges (***Main EIS*** page in Normal mode).
- ***Gauges AUX*** page [2] [3] — Displays additional EIS gauges (***AUX EIS*** page in Normal mode).
- ***CHT/EGT*** page [2] [3] — Displays a graph depicting cylinder head temperature and exhaust gas temperature for each cylinder.
- ***Fuel*** page [2] [3] — Displays additional fuel data.
- ***Summary*** page [2] — Displays supplementary EIS data, such as flight/engine timers and max temperatures.
- ***MFD Data*** page — Displays configurable navigation information. Requires interface to external navigator to populate information.
- ***Radio Altimeter*** page [1] — Displays altitude above terrain.
- ***Transponder*** page [1] [4] — Provides control and display of GTX 345 transponders.

Notes:

[1] Page only available when the GI 275 is interfaced to an applicable LRU.
[2] EIS pages only available when fully configured in accordance with Section 5.7.

[3] GI 275 MFDs must not display any EIS pages other than the ***Summary*** page in twin-engine EIS installations or installations with more than one primary EIS display.

[4] The ***Transponder*** page must be set as the final page, if configured.

5.6.2.2 EIS Page Options

- ***Gauges Main*** page — Displays required EIS gauges (***Main EIS*** page in Normal mode).
- ***Gauges AUX*** page — Displays additional EIS gauges (***AUX EIS*** page in Normal mode).
- ***CHT/EGT*** page — Displays a graph depicting cylinder head temperature and exhaust gas temperature for each cylinder.
- ***Fuel*** page — Displays additional fuel data.
- ***Summary*** page — Displays supplementary EIS data, such as flight/engine timers and max temperatures.

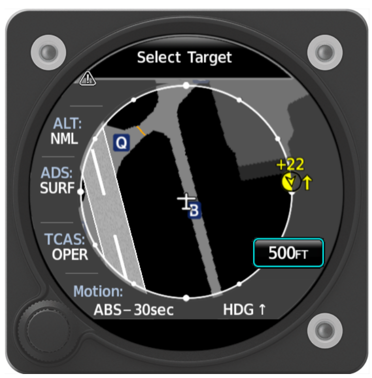
5.6.2.3 GI 275 Normal Mode Page Options

MFD Data page

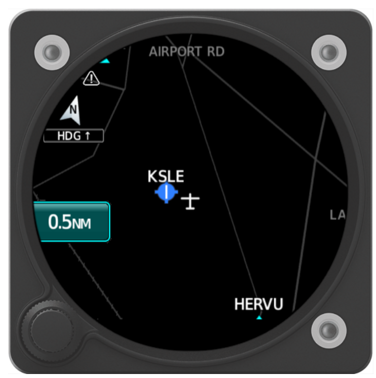
CDI page

Standard HSI page

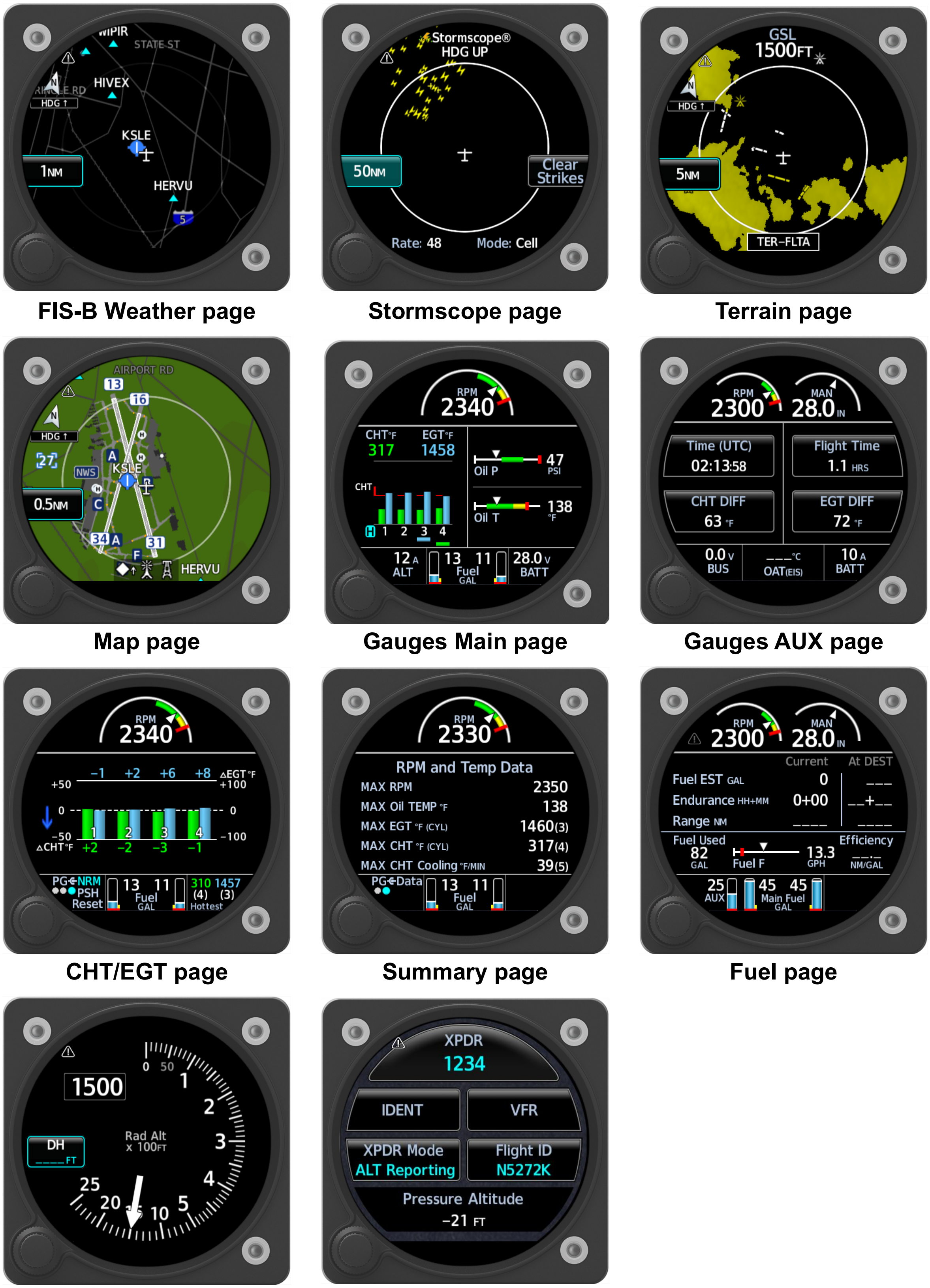
Enhanced HSI page



Traffic page



SXM Weather page



FIS-B Weather page | **Stormscope page** | **Terrain page**

Map page | **Gauges Main page** | **Gauges AUX page**

CHT/EGT page | **Summary page** | **Fuel page**

Radar Altimeter page | **Transponder page**

Figure 5-14 GI 275 Normal Mode Pages

5.6.3 Audio Alert Config

Audio Out

This determines which GI 275 unit will produce audio. Must be set to the unit with Terrain Alerting enabled, if applicable. The default is GI 1.

Voice Type

This makes the selection between Male and Female voices for alerts. The default is Female.

Alert Volume

This sets the audio level. Audio alerts must be loud, attention-getting, and clearly intelligible under all cockpit noise conditions. Audio alerts should be set slightly louder than the normal volume of COM and intercom transmissions. The default is 50%.

Audio Test

This allows the testing of associated audio clips. Touch the ▶ icon on any/all annunciations to verify volume audibility set in the previous step. Adjust the Alert Volume as desired to match audio levels of other systems installed in the aircraft.

5.6.4 Unit Alerting Config

Terrain Popup Alert

This setting determines if the Terrain Popup will occur on a GI 275 configured for Terrain Alert. This setting must be enabled unless the GI 275 is interfaced with a compatible TXi PFD or GTN 6XX/7XX/Xi that is providing the Terrain Alerting functionality.

Traffic Popup Alert

This setting determines if the Traffic Popup will occur on a GI 275 configured for Traffic Alerting. This setting must be enabled unless the GI 275 is interfaced with a compatible TXi PFD or GTN 6XX/7XX/Xi that is providing the Traffic Alerting functionality.

5.6.5 Terrain/TAWS

If the GI 275 system does not have TAWS B enabled, then configure the Terrain/TAWS for one of the following options (*Terrain-FLTA* is automatically set if SVT is enabled):

Table 5-21 Terrain/TAWS Setting

External TAWS	Terrain Mode
Not Installed	Terrain-FLTA
	Terrain-Proximity (Off)
Installed (MapMX)	External
Installed (Other)	
Installed (HSDB)	

The GI 275 is capable of producing aural and visual TAWS alerts. The alerting algorithm relaxes the terrain alerting criteria at nearby airports. An airport is considered to be a “nearby airport” if the runways at the airport meet certain criteria. Select the runway Surface Type and Minimum Length for the aircraft, as described in Table 5-22.

Table 5-22 TAWS Airframe-Specific Configuration Data

Selection	Description	Notes
Runway Surface	Required runway surface type	Set the type of runway surface for which the aircraft is authorized.
Runway Min Length	Minimum runway length for TAWS/Terrain Alerting	Set the shortest distance required for takeoff and landing (typically the distance given for sea level using the coldest temperature given in the POH/AFM).

5.6.6 Miscellaneous

Traffic Color

Must be set to *White*. This color designates the base color for traffic targets.

Altitude Alerter

Not configured per this manual.

Database Sync

NOTE

For GI 275 software v2.60 or later, Database Sync with GTN 6XX/7XX units is not supported. However, Database Sync with GTN Xi units is supported.

GI 275 and GTN 6XX/7XX or GTN Xi units synchronize databases using Database Sync in order to minimize user effort when loading/updating databases. The user only has to insert an SD card with databases to be loaded into the GTN 6XX/7XX or GTN Xi and the databases will be updated on all connected LRUs for all displays with Database Sync enabled rather than having to update each unit individually. The GI 275 system and GTN 6XX/7XX or GTN Xi will have different system IDs. The databases being synchronized must be enabled for both system IDs in order to allow the Database Sync to take place. Refer to Section 5.2 for more information on acquiring and loading databases.

The following databases are synchronized:

- Airport directory
- Aviation
- Obstacle
- SafeTaxi
- Basemap

The following databases are not synchronized:

- Terrain

Make the desired selection between *Pilot Control* and *Disabled* for Database Sync functionality. Selecting *Pilot Control* enables Database Sync functionality.

CDI & BARO Side SYNC

With this setting enabled, changing the CDI source on the GI 275 will also change it on the other GI 275. Choose from *Always On* or *Pilot Control*. The default is Pilot Control.

Outside Air Temp

This setting is not applicable for MFD and EIS installations.

5.6.7 Battery

This configures whether a backup battery is installed in the GI 275. The backup battery is optional. This should only be enabled if the GI 275 backup battery is installed per Section 4.3.2.

When toggled from disabled to enabled (illuminated green), the GI 275 will trigger a requirement to perform a Battery Rundown Test (refer to Section 5.8.2). Until this test is completed, the GI 275 will produce an annunciation in Normal mode.

5.6.8 Ownship Icon Configuration

- **Icon** – Select one of the following appropriate icons to match the aircraft type:
    - Low Wing Prop
    - High Wing Prop
    - Turboprop
    - Twin Engine Prop
    - Arrow
    - Basic Aircraft
- **Color** – Select *White* as the display option.

5.7 EIS

This section provides data for the configuration of a GI 275 EIS. Prior to beginning EIS configuration, an EIS data source (GEA 24(B)) must be configured via the ***Interfaces*** page, per the directions found in Section 5.5.12. Refer to Section 2.1.3.1 for limitations and guidance on selection of engine adapter(s). The GI 275 must be configured as either an EIS display or an MFD in order for the ***EIS*** page to be available.

There are six subsections of the EIS configuration. The subsections must be completed in the following order:

1. Engine – Enter number of cylinders, engine power settings, flight hours, HOBBS hours, and Tach hours.
2. Sensors – Select the sensors that are installed in the aircraft for EIS 1 or EIS 2 (if applicable).
3. Pages – Configure Full Time Gauges, Full Time Extra Info, CHT/EGT page extra info, and lean parameters.
4. Gauges – Configure the gauge markings and layout.
5. Fuel – Enter fuel tank specifications and fuel type, and perform a Quantity Calibration.
6. Diagnostics – View the status of the engine sensors and GEA.

The sections below outline the data required and the data entry procedure for the first three subsections. Fuel Quantity Calibration is outlined in Section 5.8.3.1. Procedures begin assuming the GI 275 is powered on in Configuration mode.

5.7.1 Engine

Configure the EIS for a 4- or 6-cylinder engine depending on the aircraft. Enable Single EGT/CHT to provide CHT/EGT gauges for only a single CHT and a single EGT sensor. Primary EGT and TIT are not available with Single CHT/EGT enabled. Ensure the correct Engine Configuration is set per Section 5.3.3.

Set the Engine Power parameters for supplemental Percent Engine Power indication if desired. The following items under Engine Power must be configured for engine power to be available:

- Maximum Rated Engine Horsepower.
- Maximum Manifold Pressure.
  - If normally-aspirated, defaulted to 29.92 in-Hg.
- RPM at Maximum Rated Engine Horsepower.
- Verify configured RPM value type matches the display RPM type (i.e., engine RPM vs propeller RPM).
- Minimum Brake Specific Fuel Consumption.
  - Defaulted to 0.39 lb/hr/BHP.

NOTE

Minimum BSFC should not be changed from the default value unless an alternate value can be identified in a specific installation's engine operator's manual. Some engine operator's manuals graphically depict minimum BSFC on engine performance curves.

Refer to the aircraft time meter(s), tachometer, and the aircraft records to ensure the times are entered in the correct field and are accurate.

Flight Hours accumulate when the aircraft is in the air. The EIS will increment this value when the engine exceeds 1250 RPM. HOBBS Hours accumulate when the engine is running and the oil pressure exceeds 5 psi. Tach Hours increment at a normal rate when the RPM is equal to cruise RPM, slower when RPM is less than cruise RPM, and faster when RPM is above cruise RPM.

Table 5-23 EIS Configuration - Engine

Engine	Engine		Number of Cylinder	
	Single Engine **or** Multi Engine		4 cylinders **or** 6 cylinders	
Acft/Eng Time	**Flight Hours**	**HOBBS Hours**	**Tach Hours**	**Cruise RPM [1]**

Notes:

[1] Set Cruise RPM based on the removed tachometer. Refer to Table 5-24.

Obtain the required information for the Engine subsection using Table 5-23, and populate all fields on the ***Engine*** page.

Table 5-24 Cruise RPM Setting

GI 275 Config	Removed Tachometer				Example Aircraft, Reference Only
Cruise Setting	IFR	Mitchell	Stewart Warner	AC Type	
2300	55-35-7	D1-112-5023	P-551-AZ	RT-7	Commander 112, 114; Grumman/American AA-1, AA-1A; Beech C35, D35, E35, F35; Bellanca/Champion 7EC, 7FC, 7GC, 7HC,7GCB, 7ECA, 7GCAA, 7GCBC, 7KCAB, 8KCAB, 14-19; Cessna 120, 140, 170, 180, 182, 185 (with IO-470 eng); Lake Aircraft C-1, C-2, L-4; Mooney M20, M20A, M20D; Piper PA-12, PA-18, PA-20, PA-22, PA-23, PA-24, PA-28, PA-30, PA-32, PA-39
2050	55-35-8	D1-112-5122	P-551-AYZ	RT-8	Beech 35, A35, B35, 35R
2300	55-35-9	D1-112-5030	P-551-AZH	RT-9	Aeronca Champion, Chief (early models); Piper PA18 (w/TCM eng)
2050	55-35-10	D1-112-5124	P-551-AZJ	RT-10	Aeronca Champion, Chief (late models), 7AC, 11AC; Beech Musketeer
2566	55-35-11	D1-112-5025	P-551-TA	RT-11	Bonanza: G35, H35, J35, K35, M35, N35, P35, S35, V35, 36, A36, 95, B95, B95A, D95A; Cessna 150, 152, 172, 177, 185, 188 (with IO-520 eng), 206, 207, 210, 310, 320; Helio H250, H391, H395; Navion E, F, G
2566	55-35-12	D1-112-5032	P-551-AZK	RT-12	Bellanca Champion: 7AC
1800	55-35-14	D1-112-5028	P-551-AZA	RT-14	
3000	55-35-15	D1-112-5034	P-551-AZB	RT-15	Cessna 175
1800	55-35-16	D1-112-5029	P-551-AZL	RT-16	
2400	55-35-17	D1-112-5024	N/A	RT-17	Maule M5/6/MX7-180, M5/6/7/MX7-235

If the Cruise RPM cannot be determined from Table 5-24 or from markings on the original tachometer, use the POH/AFM to find the cruise RPM for 65% HP, 6000 ft PA, Standard Temperature, at 21 in. Hg (if applicable). Verify the Cruise RPM value type matches the display RPM type (i.e. engine RPM or propeller RPM).

5.7.2 Sensors

Configure each connected EIS sensor as shown in Appendix Section C.12. The following steps are required for this section:

1. Determine all installed EIS sensors that interface to the GI 275 system.
2. Navigate to the ***System Info → Devices Online*** page and verify that EIS 1/2 has a green checkmark.
3. Navigate to ***EIS → Sensors***.
4. Select the Sensor Model configuration shown in Appendix Section C.12 for each sensor.

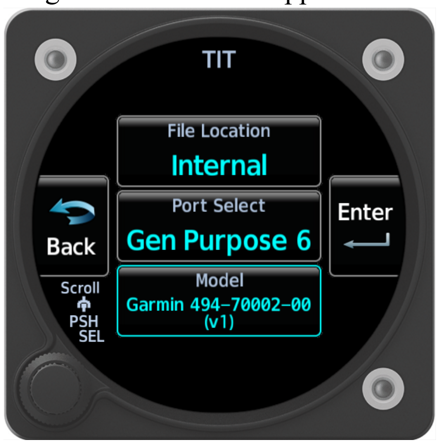


Figure 5-15 Sensor Menu Example

a. Touch **File Location** and then select the source.
b. Select the wired GEA port, if applicable, via the **Port Select** field. If not applicable, there will be no **Port Select** field.
c. Touch **Model** and then select the installed sensor. A silver checkmark will appear if the configuration is valid. A yellow triangle will appear if the configuration is not valid.
d. Touch **Enter**.

An example configuration of a TIT sensor is shown in Figure 5-16. The selection sequence is highlighted.

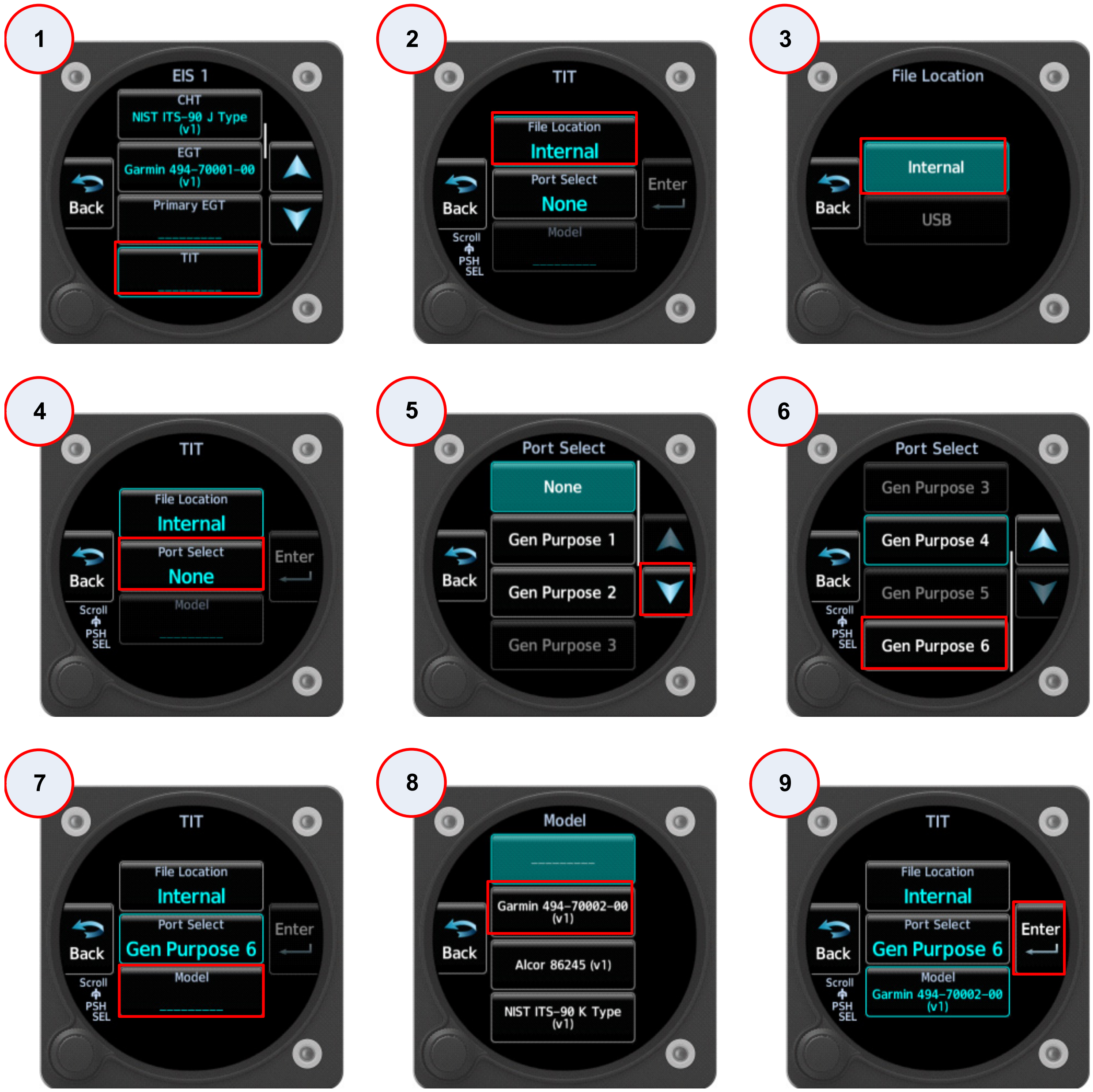


Figure 5-16 TIT Sensor Configuration Example

Additional specific sensor configurations are as follows:

RPM

- The RPM must display the originally intended RPM based on the aircraft/engine performance. The following information can be found either on the engine TCDS or Operator's Manual. Only the P-Lead can be used for geared engines.
- Select the RPM sensor type:
  - **P-Lead -** select configuration to match the engine magneto type, two single magnetos or one dual-magneto. Select the engine reduction gear ratio (if applicable) to ensure the RPM gauge displays the AFM/POH values.
  - **Mag Vent Pickup**.

Shunt - Alternator Load

1. Select the model.
2. The shunt can be calibrated only if it is out of tolerance. For calibration:
   a. With the aircraft alternator OFF, select the installed shunt.
   b. Reselect the Shunt - Alternator Load.
3. Touch **Calibrate** to zero the indication.

The displayed shunt value is a static value captured upon entering the ***Shunt*** page; if the electrical load changes, the page must be reloaded to display the new value.

Manifold Pressure

1. Select the sensor ***(Sensor→ Manifold PRESS)***.
2. For the Garmin 011-04202-00 and 011-05783-00 sensor configurations, if the displayed manifold pressure value is incorrect, perform the calibration.
   a. Reselect the manifold pressure sensor model, then touch the **Calibration**. button.
   b. Enter the local Barometric Pressure, then touch the **Current BARO** button.
   c. Enter the local field elevation, then touch the **Field Elevation** button.
   d. Touch the **Calibrate** button.

Fuel Quantity

Select the fuel quantity sensor model (refer to Section 3.4.2 for sensor selection details). Refer to Section 5.8.3.1 for the calibration procedure.

Fuel Flow

1. Select the sensor model. Most aircraft will use *Low* for less filtering with a more responsive gauge. Select *Hi* if the fuel flow gauge is unsettled (e.g., to smooth carburetor float surges).
2. Enter the nominal fuel flow sensor K-Factor. Use the Floscan 201B-6 sensor configuration for a JPI P/N 700900-1. Use the Floscan 231 sensor configuration for a JPI P/N 700900-2.

For all aircraft with an existing fuel flow limitation, the EIS fuel flow must be within 10% of actual; refer to the fuel flow check in Section 6.5.3.6. The pilot can make adjustments in Normal mode, which is limited to 15%.

Refer to Table 5-25 for the nominal K-factor values.

CAUTION

K-Factor must be in units of pulses per gallon. Different units will result in inaccurate fuel flow and fuel computer results.

Table 5-25 Fuel Flow K-Factor

Sensor	K-Factor
EI FT-60 (Red Cube) (Hi or Low)	68,000
EI FT-90 (Gold Cube)	33,800
Floscan 201B-6 (Hi or Low)	[1]
Floscan 231 (Hi or Low)	[1]
JPI 700900-1 (201)	[1]
JPI 700900-2 (231)	[1]
Beech 102-389012-11 (Hi or Low)	84,949

Notes:

[1] Use the tag attached to transducer for K-Factor value. Data must be entered as XX,XXX. For example, if the value is XY.XX, multiply the K-factor value from the tag by 1000 and enter XY,XXX. If there is no K-factor available on the attached tag, use a K-factor value of 29000.

5.7.3 Pages

5.7.3.1 All Pages

Full Time Gauges

Configures which gauges will display as half-arc gauges at the top of every EIS page (from left to right).

RPM and Manifold Pressure (if applicable) must be selected as full time gauges per this STC. The order that they are displayed (left or right) must be configured so that the RPM gauge is the same orientation (left or right) as the aircraft's throttle control.

Full Time Extra Info

Configures which extra information will display on each EIS page above the full time gauges. Select from the following options:

- Percent Power (requires RPM, Manifold Press, Fuel Flow, and OAT).
- Prop Sync (limited to conventional twin-engine aircraft; prohibited in centerline thrust aircraft, such as Cessna 337).
- Off.

NOTE

Prop Sync will only display on one of the two EIS displays in a conventional twin-engine installation. Percent Power must be configured off if the other EIS has Prop Sync configured.

5.7.3.2 CHT/EGT Page

NOTE

The CHT/EGT page and the Lean Assist function are not available when the GI 275 EIS is configured for Single CHT/EGT.

Leaning Source

Configures which temperature sensor is used as the source for Lean Assist. The options are EGT and TIT. Using TIT as the Leaning Source is not approved for aircraft with multiple TIT sensors.

Advanced

Configures Lean Assist settings. Configure the settings per Figure 5-26.

Table 5-26 CHT/EGT Page Advanced Settings

Setting	Description
Lean – Temp Incr	Select the temperature increase threshold. The default is 14°F.
Lean – Temp Drop	Select the temperature drop threshold. The default is 7.2°F.
Lean – Use FFlow? [1]	Enable or Disable the use of fuel flow sensor data for lean assist aiding.
Lean – FFlow Hyst	Select the fuel flow hysteresis threshold. The default is 0.2 gal/hr

Notes:

[1] When the use of Fuel Flow sensor data is disabled, only Rich of Peak Lean Assist is available.

5.7.4 Gauges

If configured for twin-engine EIS, a **Source** button will be selectable at the top of the ***Gauges*** page. The GI 275 that is directly interfaced to the GEA connected to Engine 1 (i.e., EIS 1) must have *Engine 1* selected as the Source per this STC. The GI 275 that is directly interfaced to the GEA connected to Engine 2 (i.e., EIS 2) must have *Engine 2* selected as the Source per this STC.

5.7.4.1 Gauge Layout

Refer to Appendix E for gauge layout information.

5.7.4.2 Gauge Markings and Ranges

Obtain the AFM/POH or other approved data to set the gauge markings and gauge ranges. If the existing aircraft gauges that are being replaced do not match the AFM/POH or other approved data, the installer must resolve the discrepancy. Prior modifications may have altered the aircraft limitations and operating parameters.

WARNING

Gauge markings, limitations, and units present in the AFM/POH, this manual, or other approved data must be represented on the EIS gauge. No additional markings are permitted on required gauges.

NOTE

The GI 275 EIS typically utilizes bar gauges instead of full radial gauges. Because of this, colored "arcs" listed in the POH/AFM should be configured as colored "ranges" on the GI 275 instead.

NOTE

Only red or yellow colors are capable of alerting. A red range will alert and can be used for items such as low fuel quantity alerting. Refer to Appendix Section E.6.1.

Gauge markings are not approved for the following gauges:

- EGT

If replacing an existing gauge, all markings will need be replicated on the EIS display. Use Table 5-27 to gather the marking and range information for each gauge specified in the AFM/POH or other approved data.

If configuring a new EIS gauge, only configure the Units and the Gauge Range. All units must match the AFM/POH, if applicable, and values selected must be appropriate for the gauge function.

Table 5-27 Original Gauge Settings

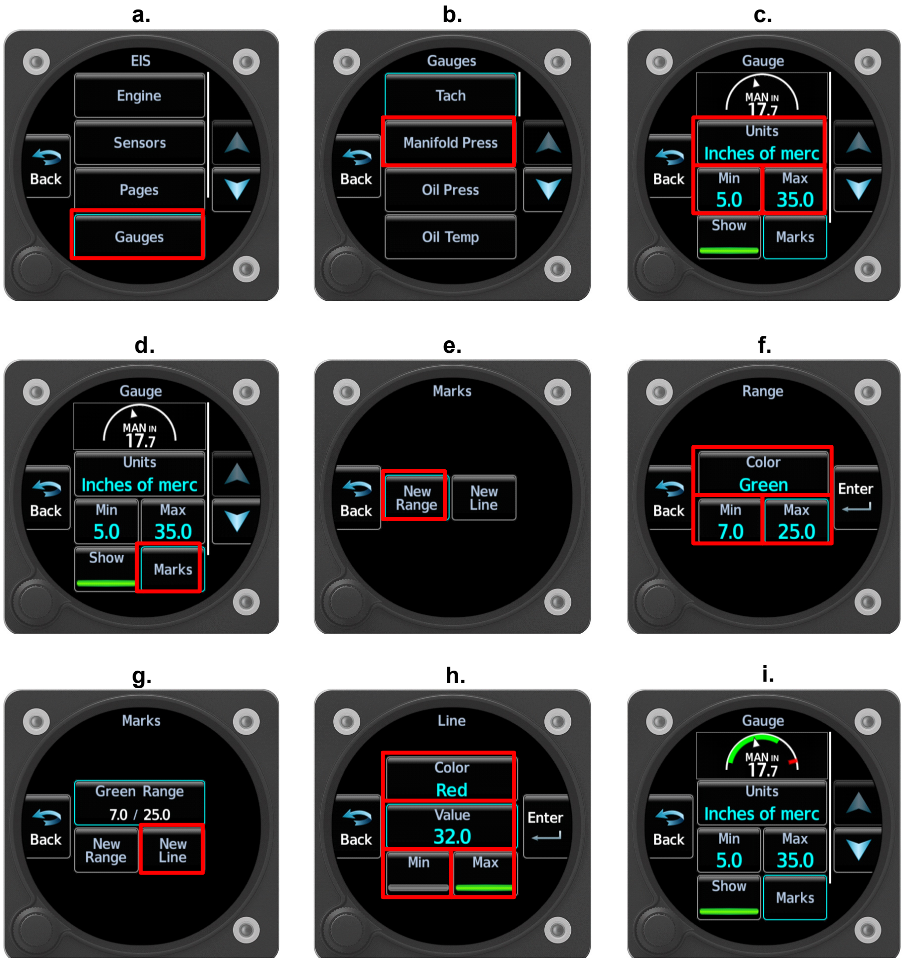
Attribute	Data
Gauge Type	
Units	
Arc(s)	Color: Min: Max:
Minimum Line (minimum safe operating limit)	Color Min: Max:
Maximum Line (maximum safe operating limit)	Color: Min: Max:
Line/Radial(s)	Color: Min: Max:
Gauge Range	Minimum (lowest value on gauge): Maximum (highest value on gauge):
Other Markings	

Include the settings in Table 5-28 for the specific gauge. If the markings in Table 5-28 conflict with AFM/POH or other approved data, use the AFM/POH or other approved data.

Table 5-28 Additional Gauge Settings

Gauge	Marking
Carb Temp	Blue range from -15°C to 5°C
Fuel Quantity	Red line at 0 (usable fuel)

As an example only, the configuration of a pressure gauge is shown in Figure 5-17.



a. Select **Gauges** from the ***EIS*** page.
b. Select the gauge type to be configured.
c. Configure the gauge units and Gauge Range.
d. Select **Marks**.
e. Select **New Range** to add a range.
f. Configure color, range minimum, and range maximum. Select **Enter** to confirm. Repeat as necessary to configure markings.
g. Select **New Line** to add a line.
h. Configure line color, value, and as a minimum or maximum. Select **Enter** to confirm. Repeat as necessary to configure markings.
i. Verify final gauge presentation.

Figure 5-17 Gauge Configuration Example

Use the following procedure for gauge configuration:

1. Complete Table 5-27 for each gauge specified in the AFM/POH or other approved data, and refer to Table 5-28 for additional settings.
2. Using the information gathered in step 1, configure each gauge as shown in the example in Figure 5-17. The EIS gauge settings must accurately convey the limitations in the AFM/POH or other approved data.
3. Use Table 5-29 as an additional guide to set the gauge ranges. When setting the gauge range, verify the minimum and maximum values are captured within the physical markings of the gauge. It may be necessary to adjust the minimum and maximum gauge range so that the gauge needle has a value represented. Refer to Figure 5-18 for an example.
4. When configuring gauge ranges that include red line markings, the total gauge range must be configured so that the pilot can identify an exceeded value if the gauge passes the redline marking.

a. The range markings of 5 PSI and 110 PSI are not captured within gauge presentation.

b. To capture the range between 5 PSI and 110 PSI, it may be necessary to extend the range.

Figure 5-18 Gauge Range Marking Example

If a gauge range is not specified by the AFM/POH or other approved data, an appropriate range must be defined based on the gauge function, as specified in Table 5-29.

Table 5-29 Gauge Minimum and Maximum Ranges

Gauge	Guidelines
General	If a new gauge is being added, configure the gauge range for the functional range of the parameter (refer to Figure 5-18).
	Unless noted below, the gauge range must include all markings.
Tachometer	Configure the gauge range minimum and maximum based on the range of the tachometer being replaced.
Manifold Press	The minimum value must be the lower of the following: 10 inHg or 1 inch below the lowest range marking. Use 1 inch above the highest marking as the maximum value.
Oil Press	Use 0 psi as the range minimum. Use 5-10 psi above the highest marking as the range maximum.
Oil Temp	Use 0°F as the range minimum. Use 10°F above the redline as the range maximum.
Fuel (Main/Aux)	Use 0 as the range minimum. Use the same range maximum as the fuel indicator being replaced. It is common for the fuel tank to hold more fuel than the system can measure.
Fuel Flow	Use 0 GPH as the range minimum. Use +10% of the highest marking or +10% of the highest takeoff fuel flow at sea level as the range maximum.
Fuel Press	Use 0.0 psi as the range minimum. Use +10% above the highest marking as the range maximum.
CHT	Use 25°F below the lowest marking as the range minimum. Use 25°F above the highest marking as the range maximum. If no markings are present, use a range of 200°F-500°F.
Primary EGT	Use 1000°F as the range minimum. Use 50°F above the redline as the range maximum. If no markings are present, use a range of 1000°F-1700°F.
Carb	The range must be set to -24°C to 34°C.

Side Text

The GI 275 EIS provides the Side Text feature for twin-engine aircraft. Side Text allows each gauge to be labeled *L, R,* or *F* to more easily differentiate between EIS 1 and EIS 2 in left/right twin-engine aircraft as well as centerline thrust (forward/rear) twin-engine aircraft. In single-engine aircraft, this feature should remain set to the default *None*.

Figure 5-19 Side Text Example

5.7.5 Fuel

Main Tank

Configure to *Single Main* or *Left & Right* for the aircraft main tank.

AUX Tank

Configure to *None*, *Single AUX/Tip*, or *Left & Right* for the aircraft auxiliary tank.

AUX Label

Configure to *AUX* or *Tip* for the auxiliary tank label.

Fuel Type

Configure to *Avgas*, *Jet A*, or *Jet B* for the aircraft fuel type.

Quantity Calibration

Refer to Section 5.8.3.1 for the Fuel Quantity Calibration procedure.

Full Capacity

Configure the full capacity of the main tank.

Tab Capacity

Configure the tab capacity of the main tank.

5.7.6 Diagnostics

Sensor Status

Displays information on installed GEAs, including temperature and port configurations. Select between EIS 1 and EIS 2 (if applicable) in the Selected Unit field.

GEA Status

Displays status of configured EIS sensors.

Fuel Calibration

Shows information on the last completed Fuel Quantity Calibration.

5.8 Calibration/Checks

This section provides guidance for calibrating the GI 275 system after the configuration steps have been completed.

5.8.1 Composite NAV Calibration

If a Composite NAV connection is interfaced to a GI 275, the displays must be calibrated to each individual NAV radio using the following procedure:

1. Power on the GI 275 in Configuration mode and then power on NAV1.
2. Navigate to the ***Analog NAV Calibration*** page (***Calibration/Test → Analog NAV***).
3. Touch the **Localizer** button.
4. Use an appropriate NAV tester to generate a localizer signal with 0.155 DDM left or right, and tune the NAV radio to the test frequency.
5. Touch the **Calibrate** button and then the **OK** button.
6. Wait for the calibration to complete (approximately 6 seconds) and touch the **OK** button.
7. Verify that the DDM readout is 0.155 ± 0.010.
8. If the DDM readout is not within the specified value, adjust the Gain value manually so that the readout is 0.155 ± 0.010 DDM.
9. Touch the **Back** button and then the **VOR** button.
10. Use a NAV radio tester to generate a 0° FROM radial VOR signal, and tune the NAV radio(s) to the test frequency.
11. Press the **Calibrate** button and then the **OK** button.

5.8.2 Backup Battery Test

This procedure will analyze the voltage and discharge qualities of the installed backup battery. The procedure is required to be completed 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 **Backup Battery Test** page will only be available if a backup battery is configured on the **Battery** page (refer to Section 5.6.7).*

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 complete.
9. Power on the GI 275(s) in Configuration mode and verify a PASS was achieved by navigating to the ***Backup Battery Test*** page and touching the **Test Results** button and then the **Rundown Test Results** button.
10. 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.

5.8.3 Fuel

5.8.3.1 Fuel Quantity Calibration

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.

CAUTION

Ensure the correct Fuel Quantity sensor configuration before calibration. If using a GEA 24(B) with resistive fuel probes, the fuel quantity sensor must be configured as 0-5 Volt. Refer to Appendix C.

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.

5.8.3.2 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 5-30 is used as a guide to calibrate the fuel quantity gauge(s). If the installation does not include auxiliary tanks, set the Aux Tank field to *None*. Table 5-31 describes each of the settings during the calibration of the fuel quantity.

Table 5-30 Fuel Page Settings

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

Table 5-31 Fuel Quantity Calibration Settings

Setting	Options	Notes
Gauge Max Main	Main Gauge Maximum (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 (0-2980 GAL)	Set to match the maximum range from the gauge being removed. This is configured on the ***EIS → Gauges → Fuel (Aux)*** page.
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 5.8.3.1 for details.
Procedure	Single Main Single AUX/Tip Main L & R (Recom.) AUX/Tip L & R (Recom.) Main L Main R AUX/Tip L 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.

5.8.3.3 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 5-30.
5. Touch the **Quantity Cal** button.
6. Verify the Gauge Max Main and Gauge Max Aux settings are correct using Table 5-31.
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 5-31 and Section 5.8.3.1 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 5-31.
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 <u>unusable fuel</u> 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 5-21).
17. Once the sensor readout has stabilized in the tenths place, touch the corresponding button to check it off (refer to Figure 5-21).
    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 <u>unusable fuel</u>).
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 5-21).
    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., auxiliary tank).

Figure 5-20 Fuel Quantity Calibration Page

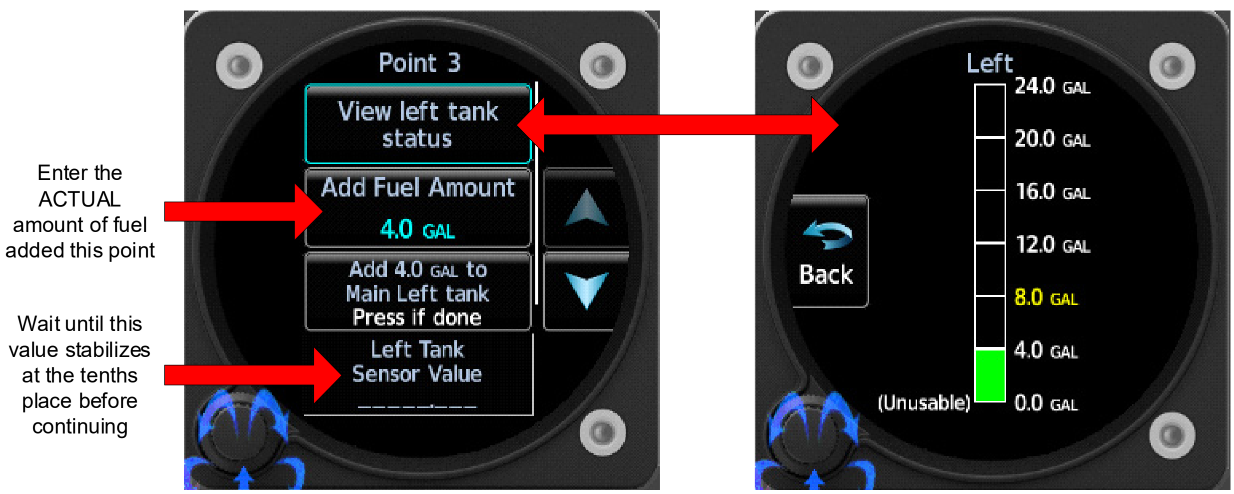


Figure 5-21 Fuel Quantity Calculation Procedure

NOTE

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

5.9 External Systems

5.9.1 Stormscope Config Status

The ***Stormscope Config Status*** page provides a means to view the configuration status and system information of a configured WX-500 Stormscope. Instructions for configuration of the Stormscope interface are contained in Section 5.5.16.

5.10 Diagnostics

The ***Diagnostics*** page provides additional information useful for installation and configuration troubleshooting.

5.10.1 VFR GPS

GPS Signal Strength

This displays information on the VFR GPS, including whether the antenna is connected, GPS signal strength, and GPS coordinates.

5.10.2 Backup Battery Status

This displays the charge, temperature, and cell voltage of an installed backup battery.

Rundown Test Results

This displays the most recent Battery Rundown Test results.

Clear Test Results

This clears the most recent Battery Rundown Test results.

5.10.3 HSDB Status

The ***HSDB Status*** page shows the status of both GI 275 HSDB connections.

5.10.4 CAN Network

The ***CAN*** page provides CAN bus error and warning information for any devices connected on the CAN bus network.

5.10.5 Temp/Pwr Stats

The ***Temp/Pwr Stats*** page shows the total number of power ups, operating hours, and CPU temperatures.

5.10.6 Discrete Inputs

The ***Discrete In*** page shows the status (Active/Inactive) of each Discrete Input and how it is configured.

5.10.7 Discrete Outputs

The ***Discrete Out*** page shows the status (Active/Inactive) of each Discrete Output. Connected and configured outputs can be toggled Active and Inactive by touching the associated button. Active outputs say “Active” in green lettering, while inactive or not configured outputs say “Inactive” in gray lettering.

5.10.8 Analog Inputs

The ***Analog In*** page shows the voltage of each Analog Input.

5.10.9 GDL69

The ***GDL 69*** page shows information for a configured GDL 69/69A SXM.

5.10.10 ARINC 429

The ***ARINC 429*** page shows the status of each ARINC 429 port.

5.10.11 RS-232

The ***RS-232*** page shows the status (Active/Inactive) of each RS-232 connection. Yellow indicates that the port is not actively receiving or transmitting data.

5.10.12 RS-485

The ***RS-485*** page shows the status (Active/Inactive) of the RS-485 connection. Yellow indicates that the port is not actively receiving or transmitting data.

5.10.13 Clear Config

CAUTION

*Touching the **Clear Config** button will erase all configuration settings.*

5.10.14 Factory Reset

CAUTION

*Touching the **Factory Reset** button will restore the unit to its factory defaults, including resetting calibration results. It is not recommended to select this option when troubleshooting.*

5.11 System Info

This provides the option to review a configured device's detailed information, such as serial number, part number, and software versions. LRUs must be configured in order for their data to be displayed.

5.11.1 Devices Online

The ***Devices Online*** page 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 5-32. Verify that all LRUs connected or configured to each display have a green checkmark.

Table 5-32 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 the GI 275 is not receiving data.
Red X	The LRU is configured, but a warning is present.
Empty	The LRU is not configured.

5.11.2 Device Info

The ***Device Info*** page provides information for each configured LRU in the GI 275 system. Touch the **Device** button and select an LRU to view information such as serial number, part number, and software version.

5.12 Maintenance

Config Mode Fast Sync

Configure this setting on to expedite maintenance log downloads to a USB drive.

Export Logs

The GI 275 has maintenance and error logs that can be downloaded to a USB drive with the following procedure:

1. Power on all GI 275s in the system in Configuration mode.
2. Insert a USB drive into the USB dongle or optional GSB 15 and wait for the GI 275 to recognize the drive (a USB icon will appear in the bottom-left of the screen).
3. Navigate to the ***Maintenance*** page.
4. Touch the **Export Logs** button.
5. Touch the **Download Log** button and select the log type to download: *Assert*, *Flight Data*, *Aircraft Report*, or *Fault Log*.
   a. If Flight Data was selected, touch the **Download Log Style** button and select *All* or *From Date*. If *From Date* was selected as the Log Style, enter the date in the fields below.

Touch the **Start Download** button and then the **Begin Download** button.

Export Config

Export configuration settings via USB. Refer to Section 5.2.2.4 for procedure.

Export External LRU Logs

To download external LRU error logs:

1. Power on all GI 275s in the system in Configuration mode.
2. Power on all LRUs in the system.
3. Insert a USB drive into the USB dongle or optional GSB 15 and wait for the GI 275 to recognize the drive (a USB icon will appear in the bottom-left of the screen).
4. Navigate to the ***Maintenance*** page.

Touch the **Export External LRU Logs** button. The available logs will automatically download. Exported logs can be viewed and printed using a computer's web browser.

Logging Options

This gives the option to enable or disable the logging of flight data during operation. The default is *Enabled*.

Clear Assert Logs

This clears the assert logs. This cannot be undone.

Clear Flight Logs

This clears the flight logs. This cannot be undone.

Clear Databases

This clears all flight databases. This cannot be undone.

View Event Log

This allows all events to be displayed and reviewed based on configurable filters. Select the number of power cycles to be included in the log, a specific Event ID (optionally select *All*), and a date range to be included. Touch **View events** to view a list of events. Select each event to view additional information.

5.13 Restart Options

Restart All to Config

Restarts all GI 275s in the system in Configuration mode.

Restart All to Normal

Restarts all GI 275s in the system in Normal mode.

GI ( )

Select restart options for the GI 275 unit. Options are *Do Not Restart*, *Normal Mode*, and *Config Mode*.

Restart

Restarts the GI 275 according to the above selection. If *Do Not Restart* is selected, the unit will not restart.

5.14 Wireless Connectivity

The GI 275 has built-in Wi-Fi and Bluetooth capabilities. Garmin Connext allows for a wireless connection between the GI 275 and a personal electronic device (PED) running the Garmin Pilot application to update flight databases (refer to Section 5.15) and other functions (refer to Section 1.2.2.3).

Only one Wireless source can be configured in the system at a time.

If a Flight Stream is installed as part of the system, the GI 275 wireless setting must be set to *Other LRU*. If the cockpit has an ADS-B source with Bluetooth (e.g., GTX 345), a GI 275 should be configured as the wireless source, and the Bluetooth should be deactivated on the ADS-B source.

To configure a wireless connection:

1. Power on the GI 275 in Configuration mode.
2. Navigate to the ***Wireless*** page (**Interfaces → Wireless**).

NOTE

The Wireless page may take up to 2 minutes to become available after power on.

3. Touch **Wireless GI** and select the device for the wireless source:
   - *This LRU* – The specific GI 275 being configured.
   - *GI ( )* – A different GI 275 with that Unit ID.
   - *Disabled* – Disables the wireless functionality and allows an interfaced Garmin LRU to provide the wireless functionality.

SSID

Enter the built-in Wi-Fi SSID. A maximum of eight characters is allowed. The built-in Wi-Fi is used to transfer databases via Database Concierge. Refer to Section 5.15.

Password

Enter the Wi-Fi password. The password must be eight characters.

The built-in Wi-Fi is used to transfer databases via Database Concierge. Refer to Section 5.15.

Connext Features

- Database Update – Allows flight databases to be updated via the Bluetooth from Garmin Pilot.
- Flight Plan Import – Allows flight plans to be synced from a GPS 175, GNX 375, or GNC 355.

Pair a Device

Connect to a Bluetooth-enabled PED with the Garmin Pilot application. Refer to *Garmin Pilot for iOS User's Guide* or *Garmin Pilot for Android User's Guide* for more information on the Garmin Pilot application. To pair a device:

1. Open the Garmin Pilot application on the PED and follow in the instructions in the applicable user's guide to enable Bluetooth connectivity.
2. On the GI 275, touch the **Pair a Device** button.
3. Touch the **Bluetooth Name** button and select the device.
4. Touch the **Pair** button. The GI 275 can store up to 13 paired devices. Once a device is paired, it can be connected to automatically in Normal mode to initiate database uploads.

Bluetooth Devices

Manage and delete paired devices. Auto-Reconnect can be enabled from this menu.

5.15 Database Loading

NOTE

When updating databases on the GI 275, ensure the aircraft has been on the ground since the unit was powered on, otherwise certain database update options are disabled.

The GI 275 system uses several databases depending on its configuration. These databases (and database updates) are available for purchase at flyGarmin.com. Databases are locked to a System ID and cannot be used in more than one system. The system ID is the same for each GI 275 installed in the system.

Databases are typically updated using a portable electronic device (PED) with the Garmin Pilot application.

After obtaining the appropriate databases from flyGarmin.com, they can be loaded to the GI 275 system by USB drive, another Garmin LRU via Database Sync, or through the Database Concierge feature (Wi-Fi).

5.15.1 Automatic Database Updates

The GI 275 will automatically prompt the user to update databases on startup in Normal mode if the following conditions are met:

- A newer database is detected in the standby queue (refer to *GI 275 Pilot's Guide* for details) or on a connected compatible Garmin LRU.
- The newer database is within its effective dates.
- The aircraft is on the ground.

Follow the on-screen prompts to update a database. A dedicated page will display during this process.

NOTE

The Basemap and Terrain databases will automatically update when the above conditions are met without user input. In this case, a unit restart is not required.

NOTE

The GI 275 can receive database updates from other compatible LRUs, but it can only provide database updates to GPS 175, GNX 375, GNC 355, and other GI 275 units.

Load Databases via Database Sync

If Database Sync is enabled on the GI 275 (refer to Section 5.6.6), then databases on each GI 275 in the system can be synchronized by the following procedure:

5. Power on all GI 275s in the system in Normal mode.
6. Databases will synchronize automatically in the background. A "Database sync transfer in progress" message will appear.
   a. Selecting the **Fast Sync** button to increases the transfer speed, but disables screen use until the transfers are complete
7. When the sync is done, a "Database Sync Complete Activate Now?" prompt will appear.
8. Touch the **Yes** button and then the **Update Selected** button.
9. When all the database updates are complete, touch the **Restart Unit** button.

If a GTN 6XX/7XX or GTN Xi with a Flight Stream 510 is installed in the system, then it can also be used to update all GI 275s in the system using the above procedure.

5.15.2 Database Updates via USB

1. Download appropriate databases from flyGarmin.com onto a USB drive.
2. Power on all GI 275s in the system in Normal mode.
3. On the display connected to the USB dongle or GSB 15, hold the knob or swipe up from the bottom of the screen to open the menu.
4. Touch the **System** button.
5. Touch the **Databases** (or **DB**) button.
6. Verify the listed databases that show out-of-date (amber) have updated versions on the USB drive.
7. Touch the **Update** button.
8. Insert the USB drive into the USB dongle or optional GSB 15 and wait for the GI 275 to recognize the drive (USB status will change from "Not Connected" to "Connected" at the top of the screen).
9. Touch the **USB** button.
10. Select the individual databases to update and then touch the **Update Selected** button or touch the **Update All** button.
11. When the databases have finished updating, touch the **Restart Unit** button and remove the drive.

5.15.3 Transferring Databases via Database Concierge (Wi-Fi)

Database Concierge allows wireless transfer of databases from a PED with the Garmin Pilot application via Wi-Fi while the aircraft is on the ground using the following procedure:

1. Download the appropriate databases onto a PED with the Garmin Pilot application.
2. Power on all GI 275s in the system in Normal mode.
3. Touch the **System** button, then the **Databases** (or **DB**) button.
4. Touch the **Update** button. The GI 275 internal Wi-Fi will now be available to be connected with a PED.
5. Connect the PED to the GI 275's Wi-Fi network. The SSID and password can be set or viewed on the ***Wireless*** page.
6. Follow the on-screen prompts.

NOTE

New databases with current effective dates will replace expired databases on the GI 275, and databases with future effective dates will be added to the internal standby queue for automatic updates in the future.

5.15.4 GI 275 Databases

Table 5-33 Database Summary

Database	Update Rate
Navigation Database	28 Days
Basemap Database	Periodic (when available)
Obstacle Database with Hotlines	56 Days
Terrain Database	Periodic (when available)
SafeTaxi Database	56 Days

6 SYSTEM CHECKOUT

WARNING

This manual only approves the installation of the GI 275 Base (including backup battery and backup GPS antenna), GSB 15, and GEA 24(B) (including EIS annunciator(s) and engine sensors). Other compatible LRUs listed in Appendix C must use other installation approvals and may require installation and/or configuration by an authorized Garmin dealer per Garmin's installation policy.

6.1 Checkout Log

Refer to *GI 275 Part 23 AML STC Maintenance Manual/ICA* (P/N 190-02246-11) for configuration, serial number, and LRU location documentation procedures.

Complete all relevant checks as described in the following section using the checkout log as a guide.

GI 275 Checkout Log

Date:_____________Completed by:______________________

Table 6-1 Checkout Log

Check	Task	Section Reference
	Calibration Checkout	
❑	Analog NAV Calibration (*if applicable)*	Section 5.8.1
❑	EIS Fuel Calibration (*if applicable)*	Section 5.8.3.1
❑	Backup Battery Test (*if applicable)*	Section 5.8.2
	Ground Checkout	
❑	Configuration Ground Check LRU status check Device Info	Section 6.2
❑	MFD Ground Check *(complete all applicable checks)* GPS NAV Traffic Weather Stormscope Radar Altimeter Transponder Control Databases MFD-Specific	 Section 6.4.1 Section 6.4.2 Section 6.4.3 Section 6.4.5 Section 6.4.6 Section 6.4.7 Section 6.4.8 Section 6.4.9 Section 6.4
❑	EIS Ground Check *(complete all applicable checks)* EIS-Specific Temperature sensor EIS gauge layout and markings Manifold pressure Oil pressure Fuel pressure Tachometer Fuel quantity Fuel flow Shunt/Voltage OAT (EIS) Check EIS engine run-up	 Section 6.5 Section 6.5.2 Section 6.5.3 Section 6.5.3.1 Section 6.5.3.2 Section 6.5.3.3 Section 6.5.3.4 Section 6.5.3.5 Section 6.5.3.6 Section 6.5.3.7 Section 6.5.3.8 Section 6.5.4

❑	Placards, Switches, and Labels	Section 6.6
❑	EMI/RFI Checks	Section 6.7
Flight Checkout		
❑	MFD Flight Check	Section 6.8.1
❑	EIS Flight Check	Section 6.8.2
Documentation		
❑	AFMS filled in	Section 6.9.1
❑	ICA filled in	Section 6.9.2

6.2 Configuration Ground Checks

These ground check procedures are intended to verify that each LRU and interface in the GI 275 system has been properly configured. Complete these checks before continuing with further ground checks.

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.

These ground checks must be performed on every GI 275. Before starting the checkout, ensure:

1. All GI 275 displays in the system are powered on in Configuration mode.
2. All system LRUs are be powered on.
3. All installed LRUs have been configured per Section 5.5.

6.2.1 LRU Status Check

The ***Devices Online*** page (***System Info → Devices Online***) 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 5-32. Verify that all LRUs connected or configured have a green indicator.

6.2.2 Device Info

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

6.2.3 GSB 15 Connection Check

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

1. Power on all GI 275s in the system in Configuration mode.
2. Follow the Export Configuration procedure in Section 5.2.2.4 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.

6.3 Interfaced Equipment Ground Checks

Table 6-2 shows all compatible LRUs that can be installed in the GI 275 system and have required ground checks. Cross-reference each configured LRU with the installed GI 275 indicator type for a list of required ground checks. Additionally, each indicator type may have specific checks associated with it that must also be completed (these checks are listed on the bottom row of the table). Not all checks in a section may be applicable to a particular installation. It is the installer's responsibility to complete all applicable checks for the installation.

Table 6-2 Interfaced Equipment Ground Check Section Reference

Interfaced LRU	Indicator Type	
	MFD	**EIS**
GPS source	6.4.1	
NAV source	6.4.2 [1]	
Traffic source	6.4.3 [2]	
Terrain	6.4.4	
Weather source	6.4.5 [2]	
Stormscope	6.4.6 [2]	
Radar altimeter	6.4.7 [2]	
Transponder Control	6.4.8	
Other Checks		
Database checks	6.4.9	
Indicator-specific checks	6.4	6.5

Notes:

[1] Only required if the ***CDI***, ***Standard HSI***, or ***Enhanced HSI*** pages are configured on the MFD.

[2] Only required if the applicable page is configured on the MFD. Refer to Section 5.6.2 for page options.

6.4 Multifunction Display (MFD) Ground Checks

All applicable MFD checkout procedures must be conducted on each MFD installed in the GI 275 system. Not all checks in a section may be applicable to a particular installation. It is the installer's responsibility to complete all applicable checks for the installation. The following sections must be completed as part of the MFD checkout process.

6.4.1 GPS Ground Checks

6.4.1.1 GPS Receiver Interface Check

This check is required for units configured as an MFD with the ***CDI*** page configured on.

NOTE

GPS satellite reception is required for the following steps.

1. Power on the GI 275 system in Normal mode.
2. Select GPS (or GPS1) as the CDI source by touching the **CDI** button until "GPS" is displayed on the left side of the display.
3. Verify the external GPS1 navigator is powered on and, if dual GPS navigators are installed, ensure the second GPS navigator (GPS2) is powered off.
    a. For a GNS 4XXW/5XXW series, GTN 6XX/7XX series, or GTN Xi series navigator, while on the ***Power-up Self-test*** page, verify that the ADI displays the correct lateral and vertical deviation information.
    b. For a GNS 480 unit, while it is going through its power-up sequence, verify that the ADI displays the correct lateral and vertical deviation information.
4. Continue in Normal mode after the self-test and wait until the navigator acquires a position before proceeding.
5. Review the active alerts on the display (if any) and verify that there are no alerts, service soon, or service required alerts associated with the GPS unit.
6. Create/activate a flight plan on the GPS navigation source.
7. Verify that the magenta deviation bar displays in the center of the display.
8. If the ***MFD Data*** page is configured, navigate to it and verify that the waypoint in the Active WPT field is the same as the one on the GPS navigator.
9. On the GPS navigator, enter OBS mode.
10. Exit OBS mode on the navigator.
11. If dual GPS receivers are installed, power off GPS1 and power on GPS2.
12. Select GPS2 as the CDI source and repeat steps 3 through 10.

6.4.1.2 Backup GPS Signal Check

This check is required for units configured as an 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.

6.4.2 NAV Ground Checks

6.4.2.1 NAV Receiver Check – ARINC 429

This check is required for units configured as an MFD with the ***CDI*** page configured.

1. Power on the GI 275 system in Normal mode.
2. Verify the NAV1 receiver is powered on and, if dual NAV receivers are installed, verify the second NAV receiver (NAV2) is powered off.
3. Select the NAV receiver as the CDI source by touching the **CDI** button until "VOR" is displayed on the left side of the display.
4. Tune the NAV receiver to a localizer frequency (it is not necessary that a valid localizer signal is being received).
5. Verify that the CDI on the GI 275 displays "LOC" (or "LOC1"/"LOC2" for installations with dual navigators).
6. If dual navigation receivers are installed, power off NAV 1 and power on NAV 2.
7. Select NAV2 as the CDI source and repeat steps 3 through 5.

6.4.2.2 NAV Receiver Check – Analog

This check is required for units configured as an MFD with the ***CDI*** page configured. Prior to conducting this check, ensure the GI 275 has been calibrated to the NAV receiver in accordance with Section 5.8.1.

1. Verify the NAV1 receiver is turned on and, if dual NAV receivers are installed, ensure the second NAV receiver (NAV2) is powered off.
2. Select the NAV receiver as the CDI source by touching the **CDI** button until "VOR" is displayed in green on the left side of the screen.
3. Tune the NAV receiver to a VOR frequency (it is not necessary that a valid VOR signal is being received).
4. Using a VOR/ILS test set, generate a 0° FROM radial VOR signal and tune the NAV receiver to the test frequency.
5. Adjust the course pointer until the deviation is centered and FROM is indicated.
6. Verify that the course pointer setting is 0 ± 4°.
7. Repeat the above steps using VOR FROM signals at 90°, 180°, and 270°. Verify that the course pointer is within 4° of the simulated VOR bearing.
8. Tune the navigation receiver to a localizer frequency (it is not necessary that a valid localizer signal is being received).
9. Verify that "LOC" (or "LOC1"/"LOC2" for installations with dual navigators) is displayed.
10. Set the course pointer to the current heading (i.e., straight up on the GI 275 CDI).
11. Using a VOR/ILS test set, generate a localizer and glideslope signal as specified in Table 6-3.
12. Verify that the course pointer deviation bar and glideslope indications are as specified in Table 6-3.
13. If dual NAV receivers are installed, power off NAV1 and power on NAV2.
14. Select NAV 2 on the CDI. Repeat the NAV receiver check.

Table 6-3 Localizer/Glideslope Checks

Test Set Setting (DDM)		PFD Indication	
Localizer	**Glideslope**	**Localizer**	**Glideslope**
0.000	0.000	Centered (within fuselage on aircraft symbol)	Centered (covering horizontal white line)
0.078 Right	0.088 Down	Half-scale right (dev bar inside of first dot)	Half-scale down (first dot covered by diamond)
0.155 Right	0.175 Down	Full-scale right (dev bar inside of second dot)	Full-scale down (second dot covered by diamond)
0.078 Left	0.088 Up	Half-scale left (dev bar inside of first dot)	Half-scale up (first dot covered by diamond)
0.155 Left	0.175 Up	Full-scale left (dev bar inside of second dot)	Full-scale up (second dot covered by diamond)

6.4.3 Traffic Ground Checks

6.4.3.1 ADS-B In Interface Check

This check is required for units configured as an MFD with the ***Traffic*** page configured and an ADS-B traffic source configured per Section 5.5.13.

If the installed system is configured to receive ADS-B In data through an interface with an ADS-B In capable unit (e.g., GTX 345, GTS ADS-B, or GNX 375), the interface is verified as follows:

NOTE

The following steps may be performed as a ground check as long as the aircraft is within range of an FAA ground station with available targets of opportunity. If this is not the case, it is recommended that these checks be performed in-flight within range of an FAA ground station.

1. Power on the GI 275 in Normal mode.
2. Navigate to the ***Traffic*** page.
3. Turn on the interfacing ADS-B In capable equipment.
   a. If the installation includes TAS/TCAS correlated traffic, turn on the TAS/TCAS source.
4. Verify an amber “NO DATA” message is not displayed over the ownship icon.
5. Verify there are no “FAIL” annunciations in traffic status window.
6. If the installation includes TAS/TCAS correlated traffic, verify that the TAS/TCAS status is either “OPER” or “STBY”.
7. Observe targets of opportunity from ADS-B equipped aircraft or an FAA ground station.

6.4.3.2 TAS/TCAS Traffic Interface Check

This check is required for units configured as an MFD with ***Traffic*** page configured and a TAS/TCAS traffic source configured per Section 5.5.13.

NOTE

If the GI 275 system is configured for an external control (i.e., a display other than the MFD is controlling the traffic system), then the Standby/Operate testing does not have to be completed.

If the interfaced traffic system is any of the following, then verify the interface per the instructions included in this section:

- L3 Communications SKY497/SKY899 SkyWatch®
- Honeywell (Bendix/King) KTA 870/KMH 820, KTA 970/KMH 920
- Avidyne TAS 6XX (Ryan 9900BX TCAD)
- GTS 8XX

1. Power on the GI 275 in Normal mode.
2. Navigate to the ***Traffic*** page.
3. Verify that no TAS/TCAS failure annunciations (e.g., “NO DATA”, “TRFC FAIL”, “NO TRFC DATA”, “DATA FAILED”, “FAILED”) are shown on the traffic map.
4. In the upper-left corner of the ***Traffic*** page, verify that the Traffic Status is either “TAS/TCAS: OPER” or “TAS/TCAS: STBY” (i.e., “TIS: FAIL” or “TAS/TCAS: FAIL” must not be displayed).
5. Change the Traffic Status mode between Operate and Standby (**Menu** → **Traffic Options**).

6. Verify that the mode of the traffic system is updated accordingly ("STBY" will be annunciated above ownship icon when in Standby mode; "TRAFFIC" will be annunciated at the top of the screen in Operate mode).
7. Put the traffic system in Standby mode and initiate a traffic system self-test by selecting the **Test** button ("TEST MODE" will annunciate at the top of the screen for approximately 5 seconds).
8. Verify that the traffic system runs a self-test and the self-test traffic pattern is displayed.

6.4.3.3 TIS-A Traffic Interface Check

This check is required for units configured as an MFD with ***Traffic*** page configured **only** if a Garmin GTX 33X Transponder is connected to the GI 275 system and no other traffic systems covered in Section 6.4.3.1 or Section 6.4.3.2 are installed.

1. Power on the GI 275 in Normal mode.
2. Navigate to the ***Traffic*** page.
3. Power on the GTX 33X by pressing **ALT** on the GTX 33X.
4. On the GI 275, verify that the Traffic Status is not "TIS Fail" (i.e., no fail annunciations).
5. Verify that the amber "NO DATA" is not displayed over the ownship symbol.
6. Verify that the Traffic Status is in Standby mode (**Menu → Traffic Options**).
7. Attempt to place the system in Operate mode. If the aircraft is within TIS-A coverage, the system will display "TRAFFIC". If the aircraft is not within TIS-A coverage, the unit will display "Unavailable".

6.4.4 Terrain Checks

6.4.4.1 External TAWS Check

This check is required if the GI 275 MFD is configured for External TAWS.

1. Power on the GI 275 in Normal mode.
2. Power on the External TAWS source (GNS 400W/500W, GTN 6XX/7XX or GTN Xi).
3. Wait for the GPS signal to be acquired and the TAWS system check to report "OK".
4. From the menu, select **TAWS Test** and verify that the GI 275 displays "TAWS Test".
5. Once the test is complete, select **TAWS Inhibit** and verify that the GI 275 displays "TAWS Inhibit".
6. De-select **TAWS Inhibit**.

6.4.4.2 Terrain Display

This check is required for an MFD displaying the ***Terrain*** page.

1. Power on the GI 275 in Normal mode.
2. Navigate to the ***Terrain*** page (**Menu** → **Select Page** → **Terrain** or turn the outer knob).
3. Verify the display shows a red background (indicating surrounding terrain is 100 feet below the aircraft and above).
4. Touch the radius button on the left side of the screen and adjust the radius wider with the inner knob until an obstacle (tower figure) is displayed on the screen.
5. Change the view from *360°* to *Arc* (**Menu** → **Terrain Options** → **View**) and verify that the view on the display changes.
6. Perform a Terrain Test (**Menu** → **Terrain Options** → **Terrain Test**). “TER TEST” will display in white at the bottom of the screen.

6.4.5 Weather Ground Checks

6.4.5.1 FIS-B Weather (ADS-B In)

This check is required for units intending to display weather on an MFD with ***FIS-B Weather*** page **only** if a compatible ADS-B traffic source (GTX 345, GTS ADS-B, GNX 375) is configured.

NOTE

The following steps may be performed as a ground check as long as the aircraft is within range of an FAA ground station. If this is not the case, it is recommended that these checks be performed in-flight within range of an FAA ground station.

1. Power on the GI 275 system in Normal mode.
2. Verify the GPS navigator and GDL 69/69A are in Normal mode.
3. Allow up to 5 minutes for the GPS navigator to obtain a position.
4. Navigate to the ***FIS-B Weather*** page (**Menu** → **Select Page** → **Weather** or turn the outer knob).
5. Verify there are no warnings displayed.
6. Press the knob until the menu displays, touch **FIS-B WX Options** → **Layers** and then select several FIS-B weather products to display.

NOTE

It may take up to 10 minutes after power-on for the system to begin receiving FIS-B weather products.

7. Verify at least one of the selected products displays a valid time stamp by selecting the **Time Stamps** button on the bottom of the display.
8. Verify there are no status fail messages regarding FIS-B weather.

6.4.5.2 GDL 69 Series Weather

This check is required for units intending to display weather on an MFD with the ***SXM Weather*** page **only** if a GDL 69/69A is configured and a valid Sirius XM subscription is obtained.

This procedure does not activate the GDL 69 series XM data link radio. The instructions for activating the GDL 69 series XM data link radio can be found in *GDL 69 Series SiriusXM Satellite Radio Activation Instructions* (P/N 190-00355-04).

1. Position the aircraft where there is a clear view of the southeastern or southwestern sky (XM Satellite Radio satellites are located above the equator over the eastern and western coasts of the continental United States).
2. Power on the GI 275 system in Normal mode.
3. Verify the GPS navigator and GDL 69/69A are in Normal mode.
4. Allow up to 5 minutes for the GPS navigator to obtain a position and the GDL 69/69A to obtain data.
5. Navigate to the ***SXM Weather*** page (**Menu → Select Page → Weather** or turn the outer knob).
6. Verify there are no warnings displayed.
7. Hold the knob to display the menu, then touch **SXM WX Options**, then **Datalink Status**.
   a. Verify the Data ID field has a valid value and is not blank.
   b. Verify the Data and Audio signal bars are in the green and that the displayed subscription level is accurate.

6.4.6 WX-500 Stormscope Interface Check

This check is required for units intending to display Stormscope (lightning) on an MFD.

1. Power on the GI 275 in Normal mode.
2. Power on the LRU controlling the Stormscope.
3. Allow up to 5 minutes for the GPS navigator to obtain a position.
4. Navigate to the ***Lightning*** page (**Menu → Select Page → Lightning** or turn the outer knob).
5. Verify there are no warnings displayed.
6. Press the knob until the menu displays, then touch the **Lightning Opts** button.
7. Toggle between Cell and Strike modes and verify that the corresponding mode is displayed on the bottom of the MFD.
8. Toggle between *360°* and *Arc* views and verify the image switches between a 360° view surrounding the aircraft icon to an arc placed in front of the aircraft icon.

6.4.7 Radar Altimeter Check (ARINC 429)

This check is required for units intending to display radar altitude on an MFD.

NOTE

The GRA 55/5500 and FreeFlight RA4500 radar altimeters provide an automated self-test during power cycles; therefore, no pilot-initiated self- test is required. After the power-up sequence, verify that no faults are detected, "RA FAIL" is not displayed, and the RA value displays "0" after the self-test is complete.

1. Power on the GI 275 in Normal mode.
2. Navigate to the ***Rad Alt*** page (**Menu** → **Select Page** → **Rad Alt** or turn the outer knob).
3. Initiate a radar test (**Menu** → **Rad Alt Options** → **Test**).
   a. Verify that the radar altimeter increases to an altitude of 50 feet before decreasing to 0 feet.

6.4.8 Transponder Control Check

This check is required for units configured as an MFD that is interfaced to a GTX 345R remote transponder or a GTX 345 configured as a remote transponder.

1. Power on the GI 275 in Normal mode.
2. Navigate to the ***Transponder*** page (it must be configured as the last page per Section 5.6.2).
3. With the GTX 345 transponder powered on, verify that there is not a yellow "X" over the XPDR field.
4. Enter a code into the XPDR field using the keypad and touch **Enter**.

CAUTION

When entering a code to check the transponder, do not enter a code that begins with a "7" to avoid accidentally triggering an alarm at an ATC facility.

5. Verify that the code that was entered is now displayed in the XPDR field.
6. If dual transponders are installed, select XPDR 2 as the active transponder and repeat steps 3 through 5.
7. If dual transponders are installed, with XPDR 1 set as the active transponder, pull the #1 transponder circuit breaker and verify that XPDR 1 shows a yellow "X". Select XPDR 2 as the active transponder and verify that it does not show a yellow "X". If the behavior above does not occur, verify that the wiring is correct.

6.4.9 Flight Databases Check

This section verifies that all databases are up-to-date.

1. Power on the GI 275 in Normal mode.
2. Navigate to the Database menu (**Menu** → **System** → **Databases (DB)**).
3. Verify that all databases are up-to-date. Outdated databases will be in amber.
4. If any databases are out-of-date, follow the instructions in Section 5.15.

NOTE

The Basemap and Terrain databases do not have expiration dates.

6.5 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.

6.5.1 Fuel Computer Check (GPS)

This check is required if the ***Fuel*** page is intended to be configured on an MFD or EIS display and a GPS source is configured.

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 is powered on and, if dual GPS navigators are installed, verify GPS 2 is powered off.
3. Wait approximately 5 minutes to allow the GPS navigator to acquire a position.
4. Navigate to the ***Fuel*** page (**Menu → Select Page → Fuel** or turn the outer knob).
5. Verify that all "Current" information on the display populates.
6. Create/activate a flight plan on the GPS navigator.
7. Verify that all "At Dest" information on the display populates.

6.5.2 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.

6.5.3 EIS Gauge Layout and Marking Checks

1. Power on the GI 275 system in Normal mode.
2. Verify that no or marks are present on any EIS gauge.
3. Verify the gauges on each EIS display match the required layout per the POH/AFM. Refer to Appendix E for details on EIS gauge layouts.
4. Verify that the instrument gauge markings and ranges match the aircraft data gathered in Section 5.7.4.2, Table 5-27, and Table 5-28.

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.

6.5.3.1 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.

6.5.3.2 Oil Pressure Sensor Check

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

6.5.3.3 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.

6.5.3.4 Tachometer Check

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

6.5.3.5 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.

6.5.3.6 Fuel Flow Sensor Check

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

6.5.3.7 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.

6.5.3.8 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.

6.5.4 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.

6.5.5 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” (as configured in Section 5.5.12.1) to *Active* and verify that the red engine annunciator lamp illuminates. Toggle back to *Inactive*.
3. Toggle the discrete labeled as “Engine Caution” (as configured in Section 5.5.12.1) 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 annunciators do not illuminate, remove power from the aircraft and inspect the wiring.

6.6 Placards and Switch Labeling Check

If any placards were replaced or relocated as a result of a display installation, verify the following:

- The font size of the new placard is the same as the old placard it is replacing.
- The color of the new placard is identical to the color of the placard it is replacing.
- The text on the new placard is identical to the text on the placard it is replacing (it can be arranged differently as required by space constraints, but the wording must be the same).
- The placard must be legible and not obscured to the pilot by the glareshield, in all flight control positions, or by any other component in the flight deck.

If the new switch labels were added as a result of the GI 275 installation, verify the following:

- The font size and label is legible from the pilot's seat.
- The labels are legible in all ambient light conditions. In particular, the labels are legible with ambient flood lighting in darkness.
- The switch label must be legible and not obscured to the pilot by the glareshield, in all flight control positions, or by any other component to include the switch position.

If the GI 275 installation is limited to VFR operation only, and the criteria in Section 2.2 determined a placard is required, verify the following:

- The text on the placard reads: "AIRCRAFT LIMITED TO VFR".
- The font is at least 0.25 inches high.
- The placard is legible from the pilot's seat.

If separate EIS annunciators were installed, a placard or label is required. Verify the following:

- The text on the placard reads: "ENGINE".
- The font is at least 0.125 inches high and easily readable with sufficient contrast from the surroundings.
- The text must be displayed in a conspicuous place so that it cannot be obscured to the pilot by the glareshield or any other component and remains visible in all flight control positions.
- The text is legible in all ambient light conditions, particularly with ambient floodlighting in darkness.

6.7 Electromagnetic Interference (EMI) Check

An EMC check must be conducted once the GI 275 system is installed and all interfaces to external equipment are verified to be working correctly. The EMC check verifies that the GI 275 is not producing unacceptable interference in other avionics systems and other avionics systems are not producing unacceptable interference in the unit.

1. Enter equipment installed in the aircraft into the Source row and Victim column of the form.
2. Apply power to all avionics systems except for the components that are considered to be part of the GI 275 system.
3. Verify all existing avionics systems are functioning properly.
4. Apply power to the GI 275 system components.
5. Remove power from all other avionics systems.
6. Before applying power to the next system, wait for the current system start-up sequence to finish.
7. Apply power and/or operate the systems listed on the fillable form, one system at a time.
8. Verify the GI 275 system functions properly. Verify there are no related messages displayed.
9. Verify each radio is functioning properly by completing the following:
   a. For each VHF COM radio, monitor one local frequency, one remote (far field) frequency, and one unused frequency.
   a. Verify no unintended squelch breaks or audio tones interfere with communications.
   b. For each VHF NAV radio, monitor one local frequency, one remote (far field) frequency, and one unused frequency.
   c. Verify there are no guidance errors.
   d. Verify no audio tones interfere with the station ID.
10. If an EI FT-60 or an EI FT-90 fuel flow sensor is installed, verify the fuel flow indication is accurate and the indication does not fluctuate or invalidate the display.
    a. Transmit various modulating tones on each COM radio (e.g., whistling).
    b. Refer to Section 4.6.5.1 for details if the fuel flow indication fluctuates.
11. Verify all other avionic systems are functioning properly.

	VICTIM																																			
SOURCE	Attitude Indicator	Airspeed Indicator	Altimeter	Vertical Speed Indicator	Turn and Bank Indicator	Heading Indicator	Magnetic Compass	Clock	OAT Indicator	Power Plant Instruments	Autopilot / SAS	Navigation Radio(s)	Communication Radio(s)	Engine Relight	Fuel Valve	Pitot Heat	Pulse Light	Generator	Pos Lt	Anti Coll Lt	Ldg Lts	Gov RPM Incr / Decr	Eng Deicing	Hyd System	Radar Altimeter	TAS/TCAS	Transponder	Audio Panel	GI 275							
Attitude Indicator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Airspeed Indicator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Altimeter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vertical Speed Indicator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Turn and Bank Indicator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Heading Indicator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Magnetic Compass	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Clock	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
OAT Indicator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Power Plant Instruments	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Autopilot / SAS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Navigation Radio(s)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Communication Radio(s)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Engine Relight	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel Valve	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pitot Heat	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pulse Light	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Generator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pos Lt	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Anti Coll Lt	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ldg Lts	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gov RPM Incr / Decr	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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Hyd System	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Radar Altimeter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
TAS/TCAS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Transponder	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Audio Panel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
GI 275	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Figure 6-1 EMI Victim/Source Matrix

6.8 Flight Checks

All checks contained in the previous sections must be completed prior to performing the following flight checks.

6.8.1 MFD Flight Checks

The following items (applicable to the installation) must be verified during flight:

- Navigation using each GPS and VLOC source on the MFD CDI. For navigation receivers, both VOR and ILS must be verified.
- Display of radar altitude. The radar altitude display must be verified at several heights AGL throughout the operating range of the radar altimeter.
- Display of traffic from any interfaced traffic system.
- Display of weather from the GDL 69/69A SXM or FIS-B source.
- All applicable EIS flight checks in Section 6.8.2.

6.8.2 EIS Flight Checks

The following items (applicable to the installation) must be verified during flight:

- All gauges/markings clearly convey the respective engine parameters.
- All EIS gauges are within their normal operating range.
- No “Caution” or “Warning” indications are present.
- Gauge indications are appropriate for all flight regimes.
- Values on the ***Fuel*** page populate when a GPS destination is active.
- Post-flight check of installed sensors and fittings for leaks.

If the AFM/POH has an operating limitation based only on fuel flow, the fuel flow must be accurate within 10% to ensure the limitation is maintained. If the recorded fuel flow and measured fuel flow are out of tolerance, the K-factor must be adjusted in Configuration mode. Perform the following:

1. Ensure the fuel lines are purged of air.
2. Record the displayed fuel flow and the measured fuel flow at the same engine settings.
   - Example: Displayed value is 20 GPH, measured value is 24 GPH
3. Determine the offset ratio: Measured / Displayed.
   - Example: Measured / Displayed = 24 / 20 = 1.2
4. Inverse the ratio.
   - Example: 1 / 1.2 = 0.8333
5. Multiply the inverse by the currently used K-factor in Configuration mode.
   - Example: Current K-factor 68000, adjusted K-factor is 68000 * 0.8333 = 56667
6. Enter the adjusted K-factor and reload the sensor.

6.9 Documentation Checks

All checks contained in the previous sections must be completed prior to performing the following checks.

6.9.1 Airplane Flight Manual Supplement

Ensure that the AFMS is completed and inserted in the AFM or POH.

1. Fill in the specific airplane information on the AFMS cover sheet.
2. In the AFMS Section 1.7, fill in all applicable check boxes. More than one box may be checked, depending upon the installation.

6.9.2 Instructions for Continued Airworthiness

Ensure that the appropriate aircraft information in Appendix A of *GI 275 Part 23 AML STC Maintenance Manual/ICA* (P/N 190-02246-11) is filled in completely and inserted into the aircraft permanent records.

6.9.3 Return to Service

Complete the return-to-service in a means acceptable to the cognizant aviation authority. An example would be compliance with 14 CFR 43.9, 14 CFR 91.417 and submission of an FAA Form 337 "Major Repair and Alteration Airframe, Powerplant, Propeller, or Appliance" completed in accordance with advisory circular AC43.9-1F, *Instructions for Completion of FAA Form 337*.

If a GEA 24 P/N 011-02848-01 is connected to resistive fuel quantity probe(s), verify the interface is installed in accordance with revision 7 or later of this installation manual (refer to Section 3.4.2, Figure B-6, and Appendix Section C.12). If the interface does not comply, refer to Garmin Service Bulletin SB2135 for additional information. Once complete, make the following entry in the aircraft maintenance record (i.e. airframe logbook):

> The GI 275 installation in this aircraft complies with Garmin Service Bulletin SB2135, Modification of GEA 24 Resistive Fuel Probe Interface.

7 TROUBLESHOOTING

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.

7.1 Troubleshooting Flowcharts

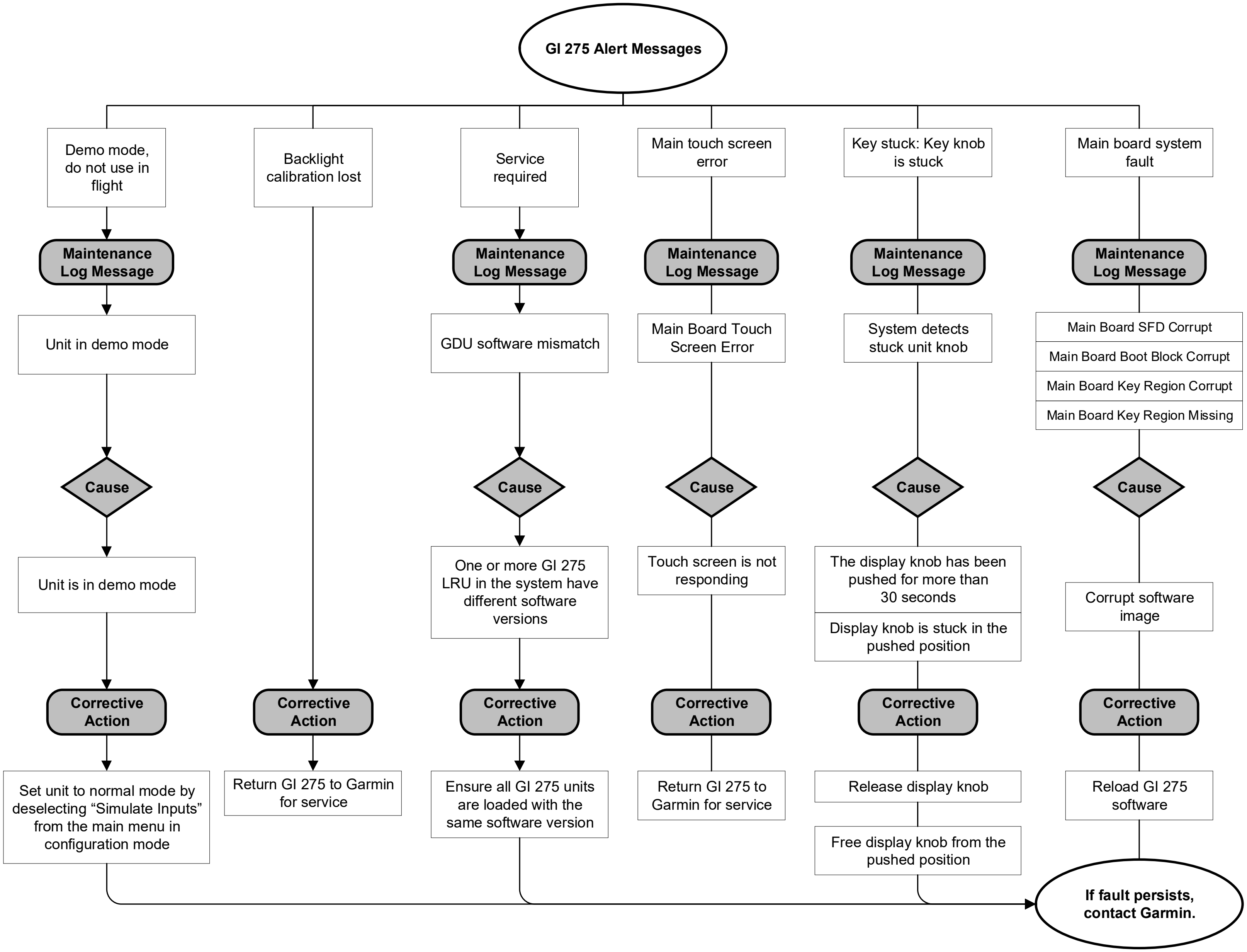


Figure 7-1 GI 275 Alert Message Troubleshooting Sheet 1 of 2

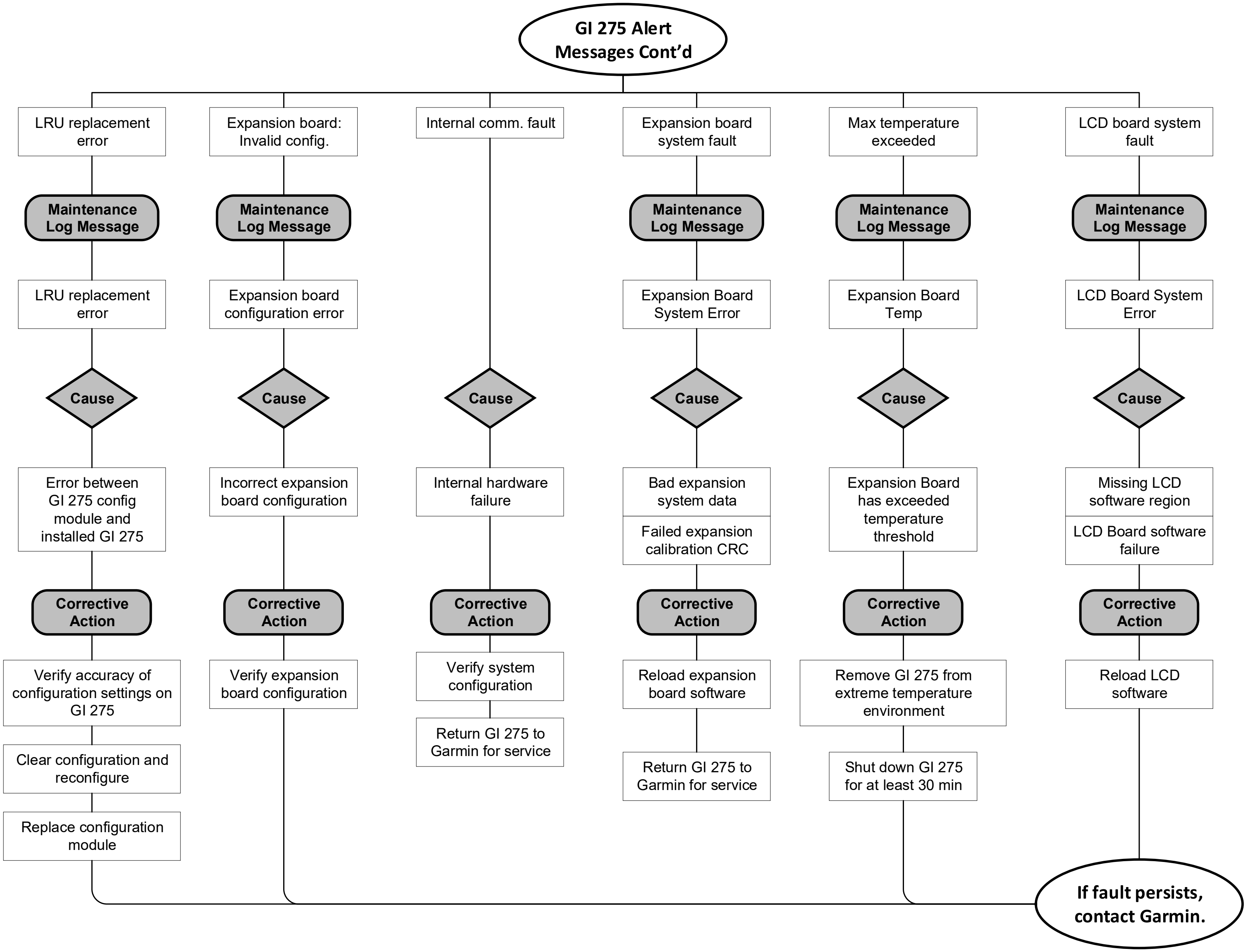


Figure 7-1 GI 275 Alert Message Troubleshooting
Sheet 2 of 2

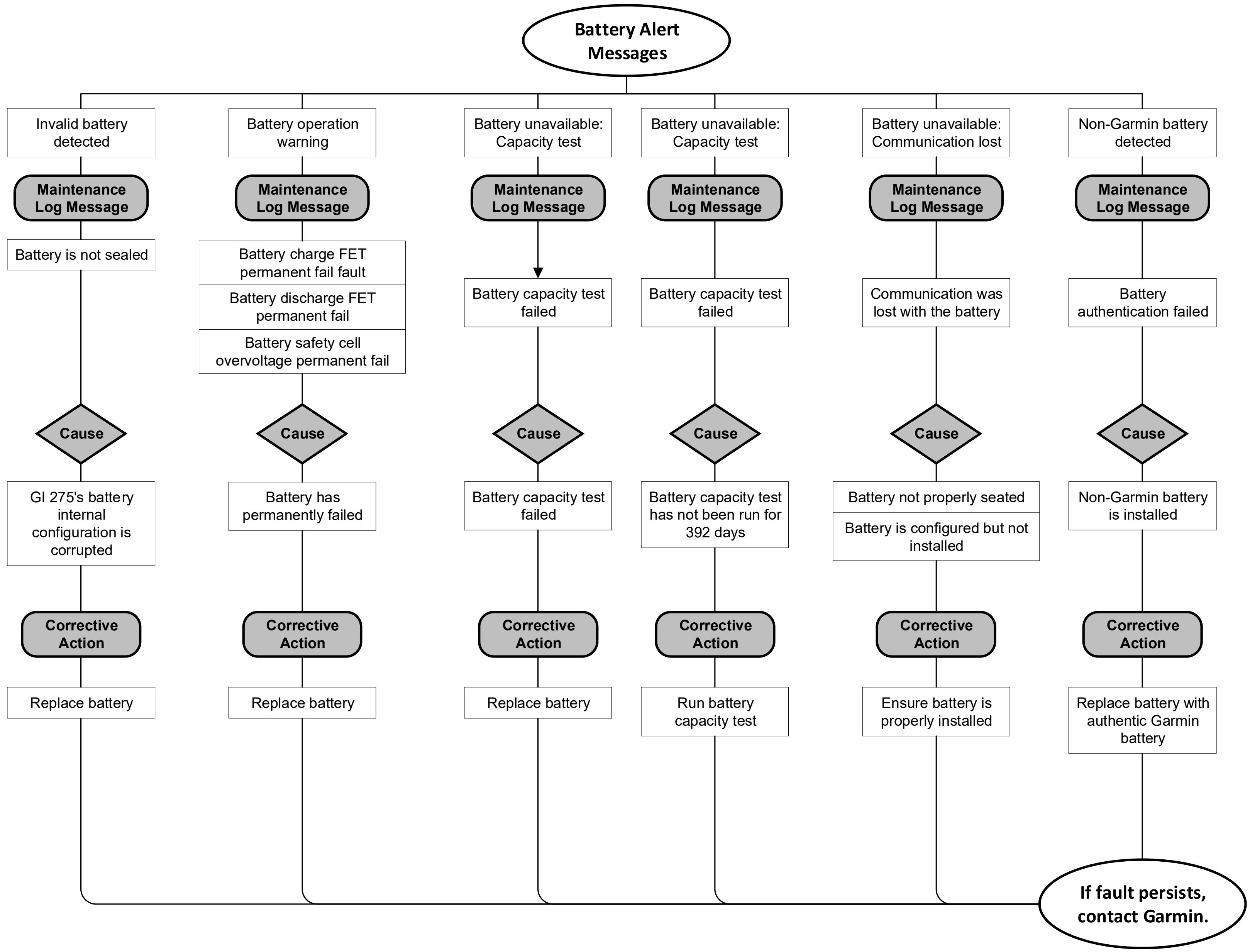


Figure 7-2 Battery Alert Message Troubleshooting
Sheet 1 of 4

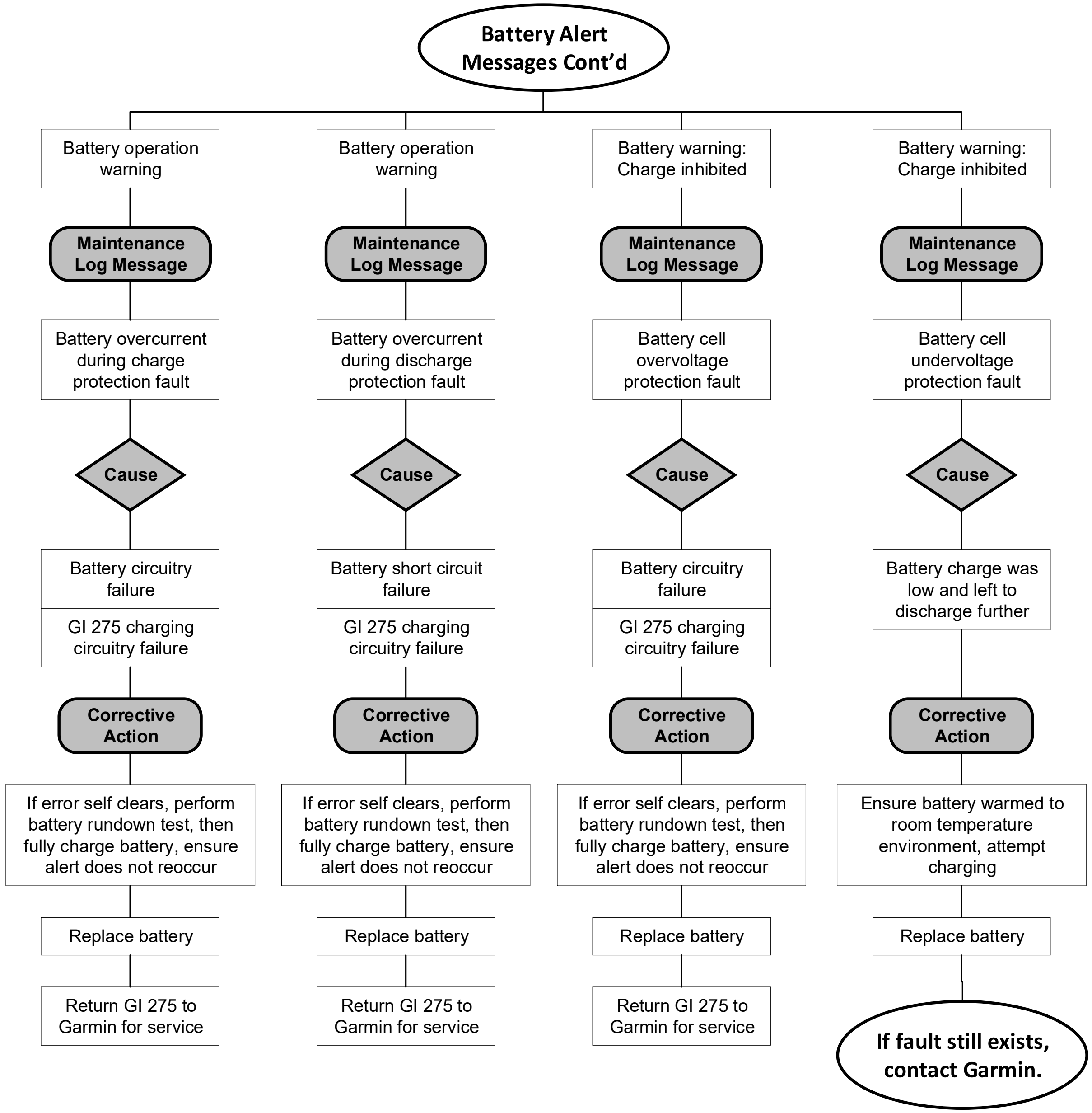


Figure 7-2 Battery Alert Message Troubleshooting
Sheet 2 of 4

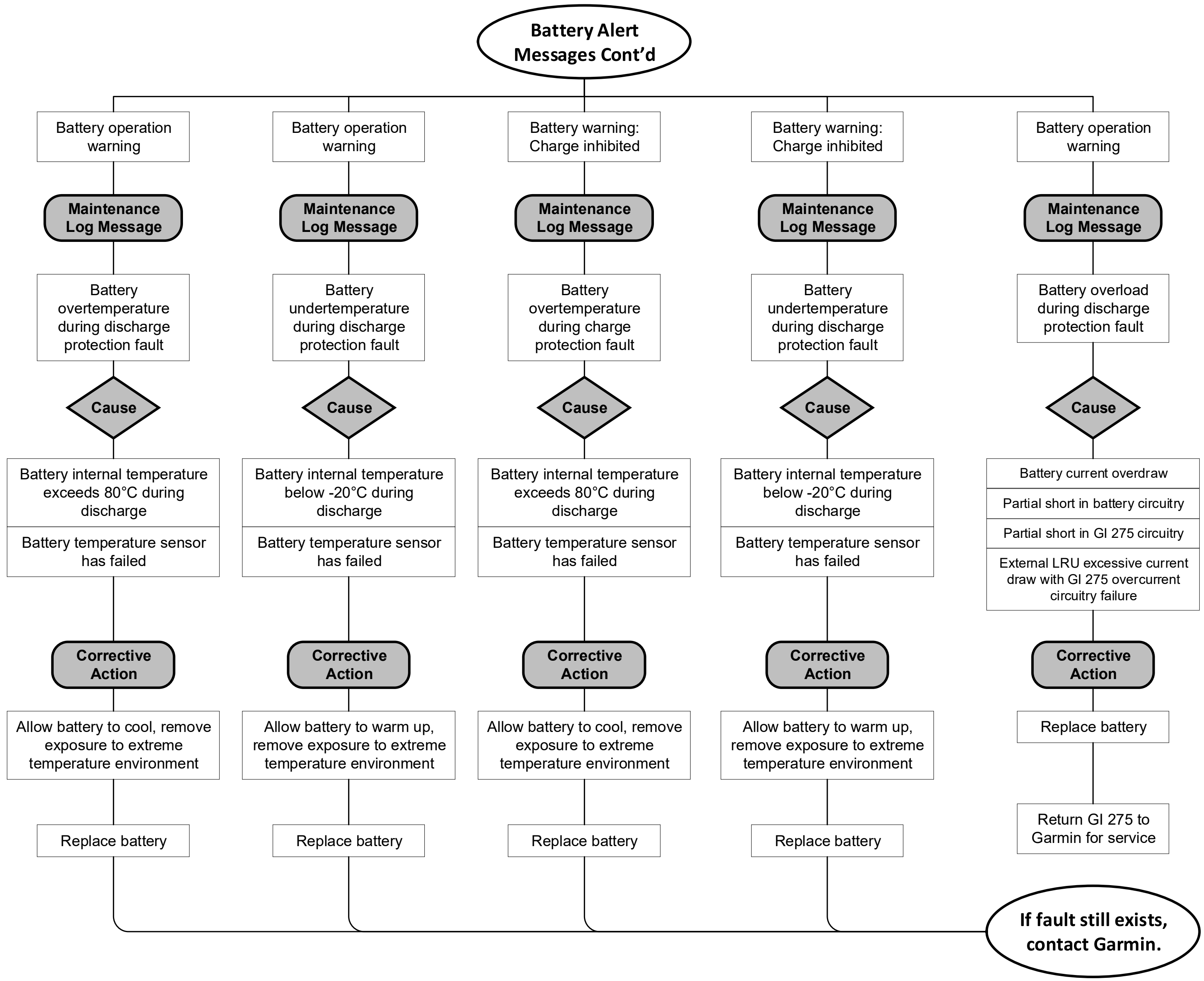


Figure 7-2 Battery Alert Message Troubleshooting Sheet 3 of 4

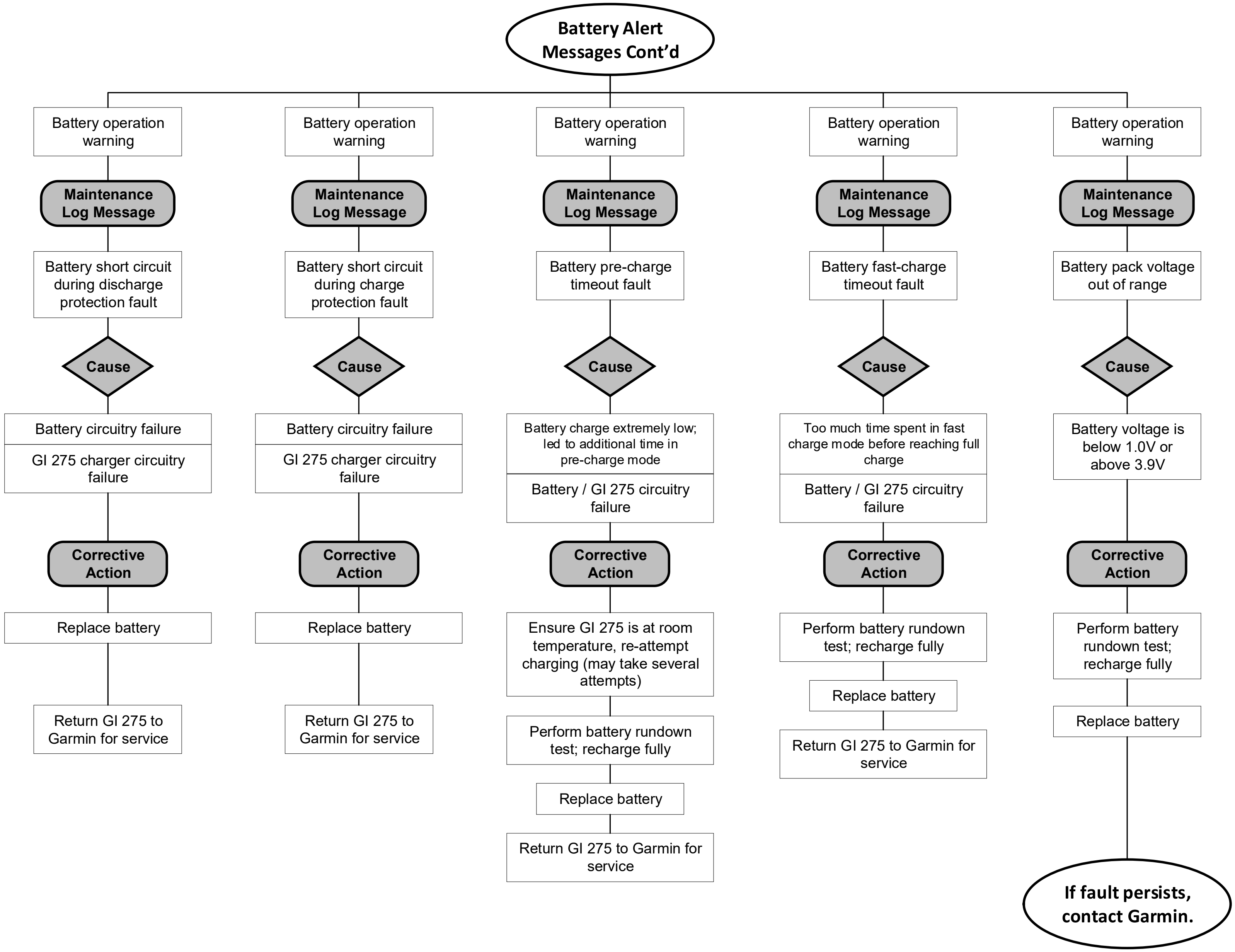


Figure 7-2 Battery Alert Message Troubleshooting Sheet 4 of 4

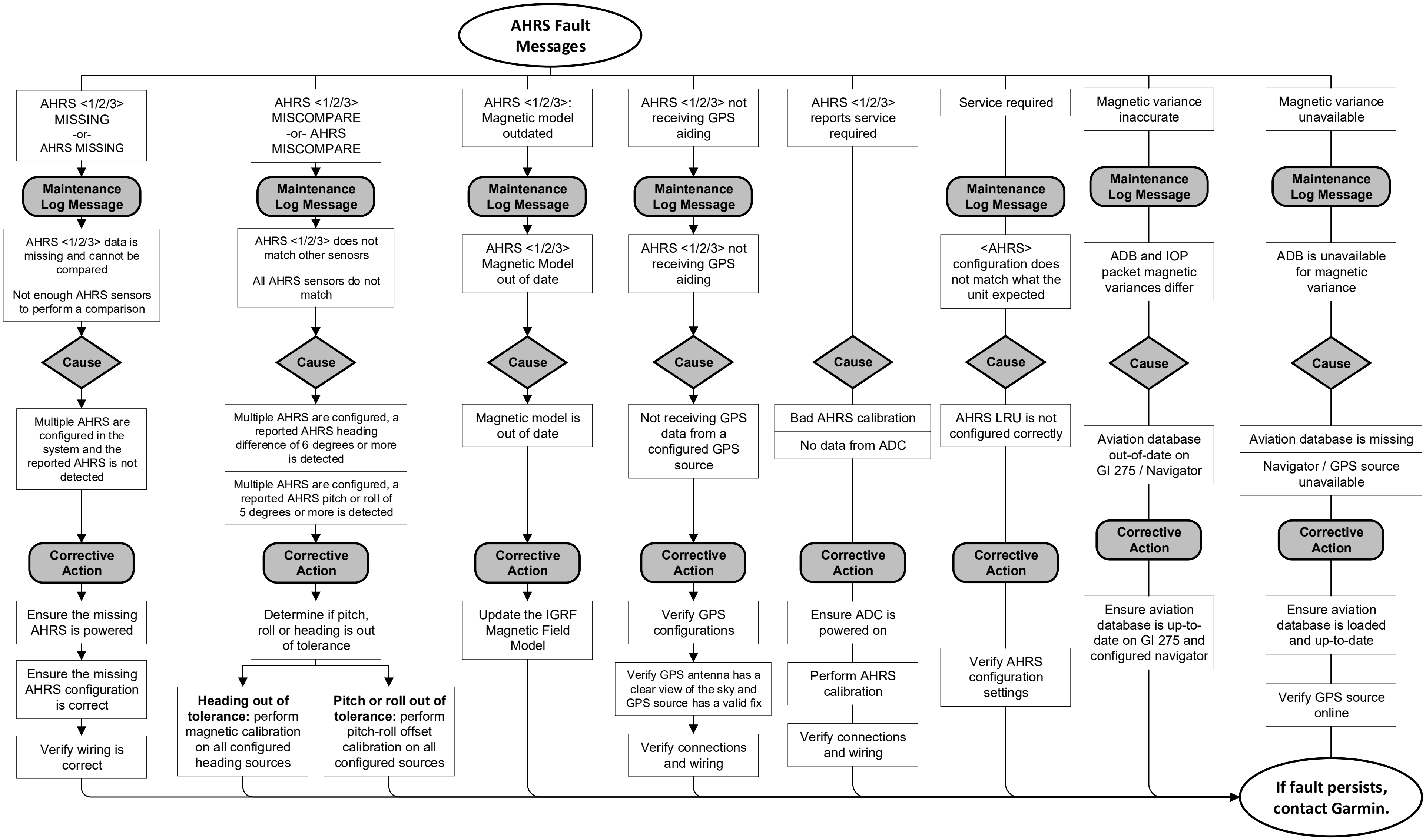


Figure 7-3 AHRS Alert Message Troubleshooting

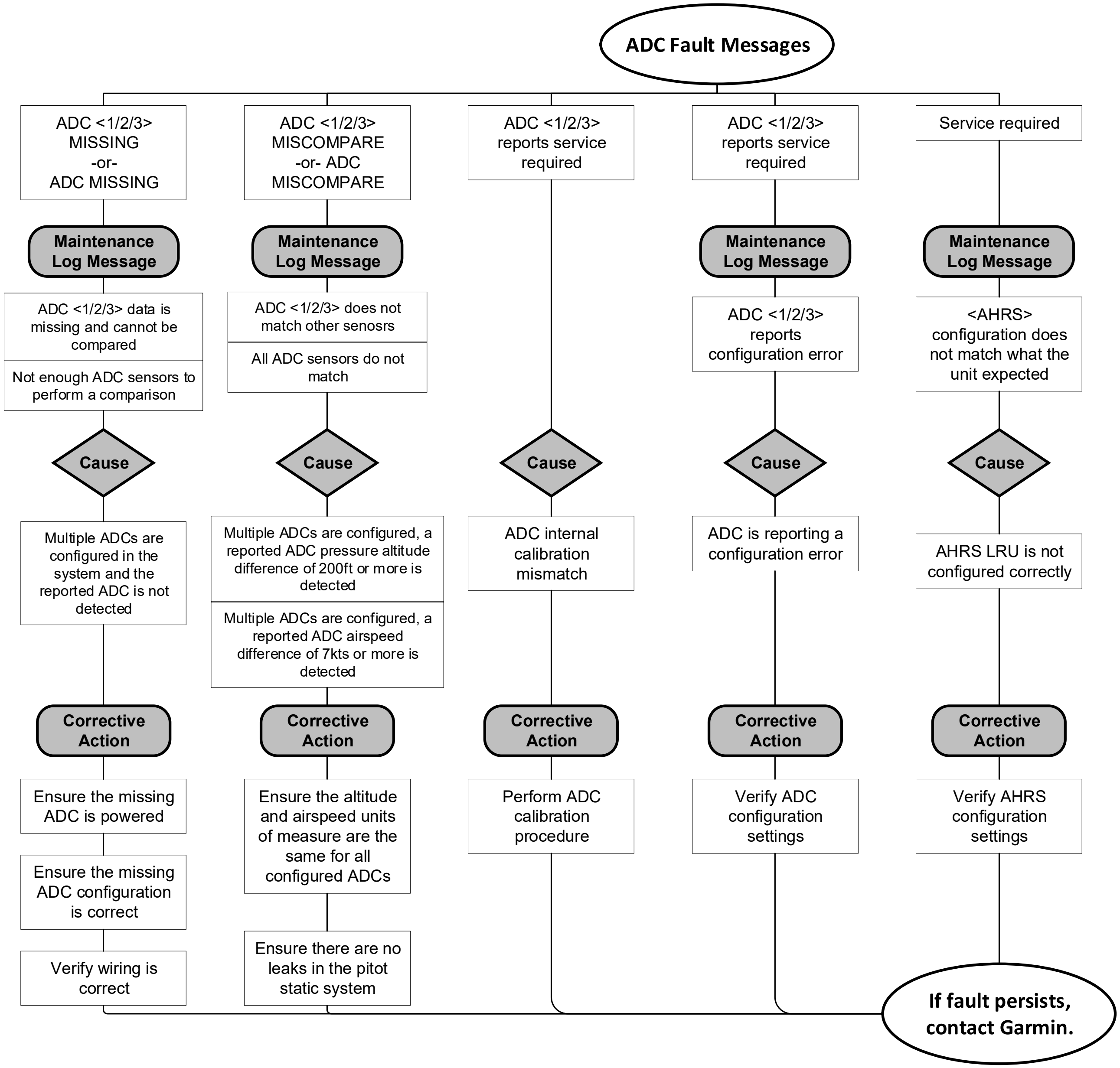


Figure 7-4 ADC Alert Message Troubleshooting

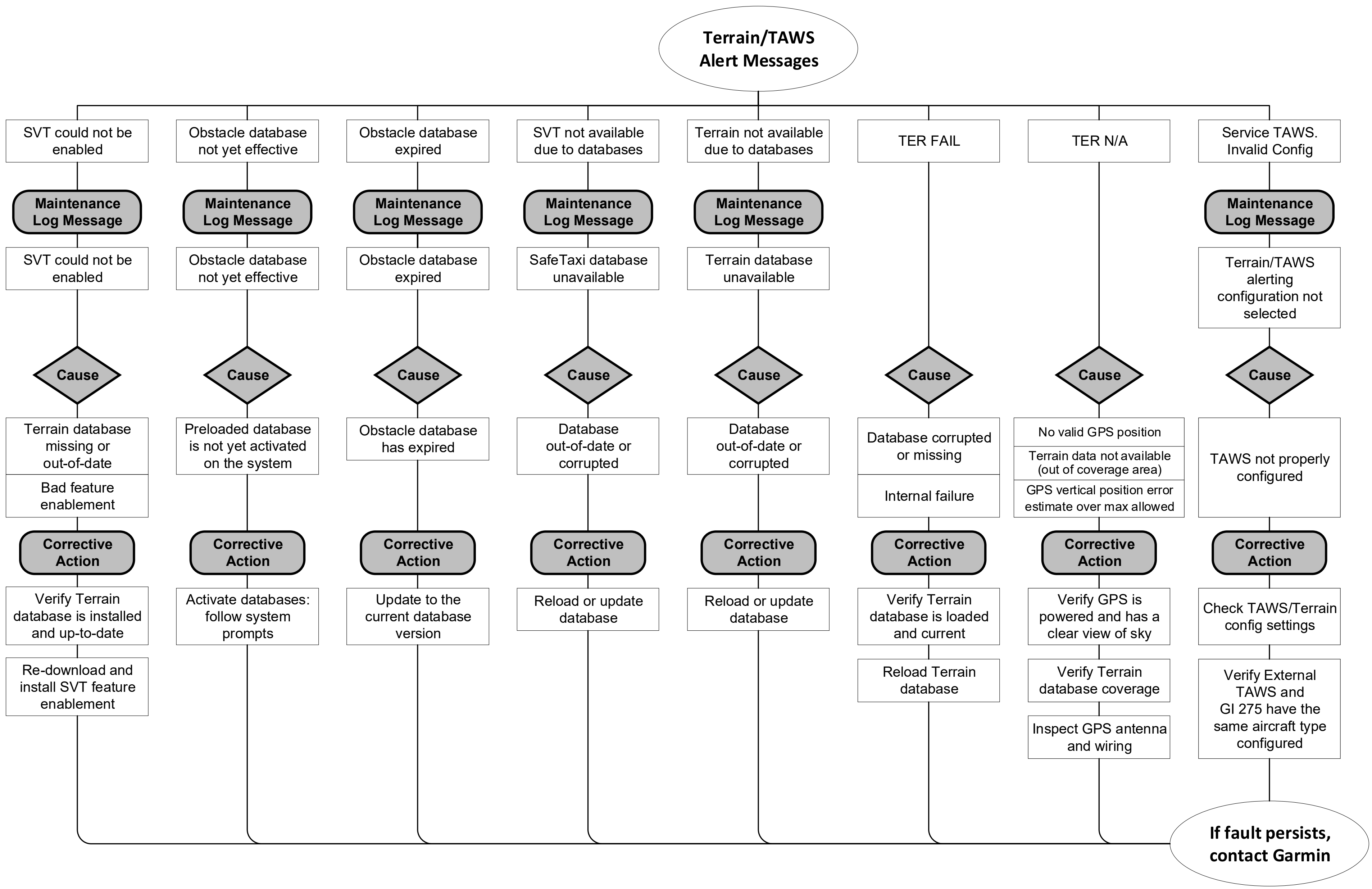


Figure 7-5 Terrain/TAWS Alert Message Troubleshooting

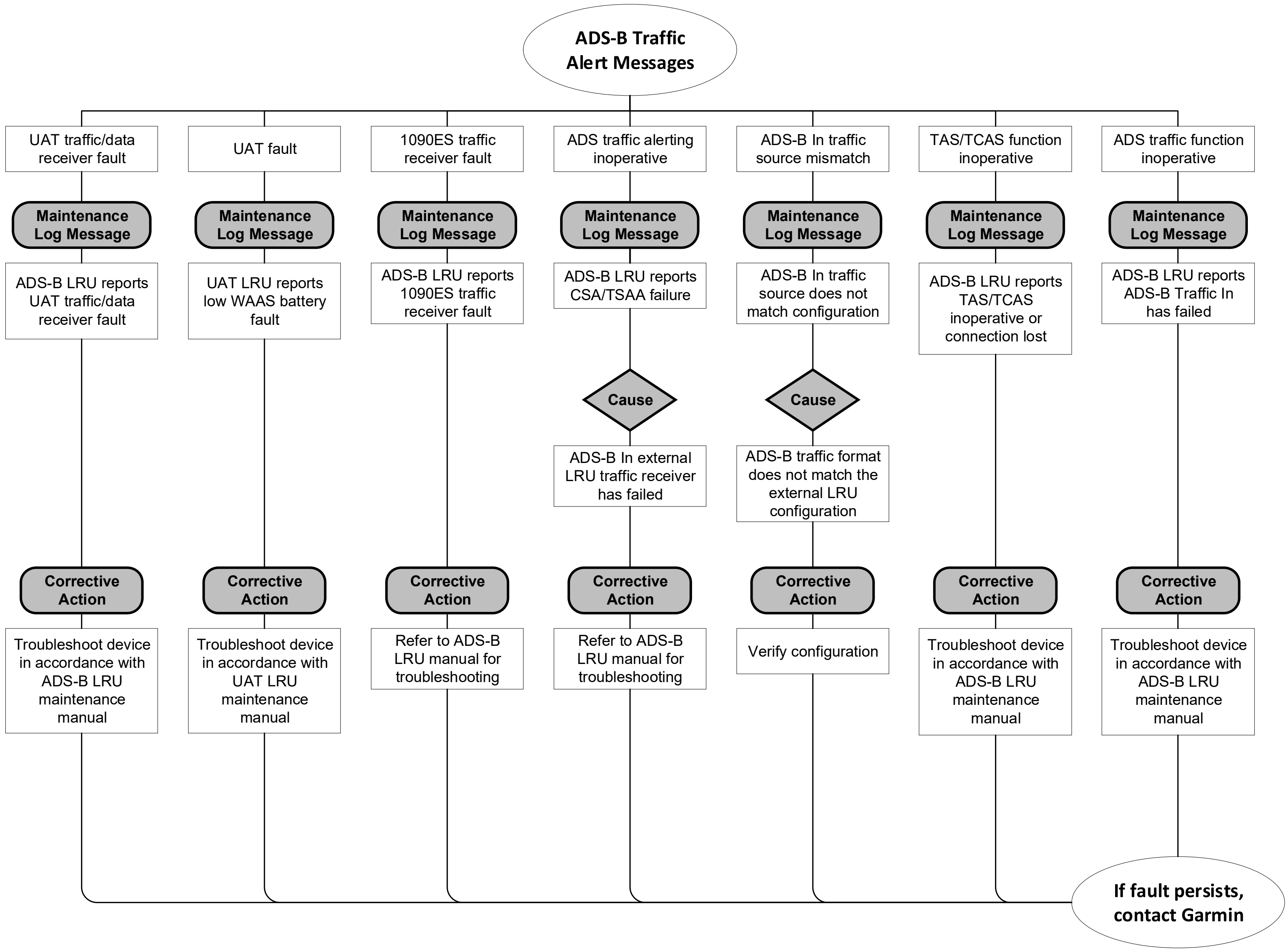


Figure 7-6 Traffic Alert Message Troubleshooting
Sheet 1 of 2

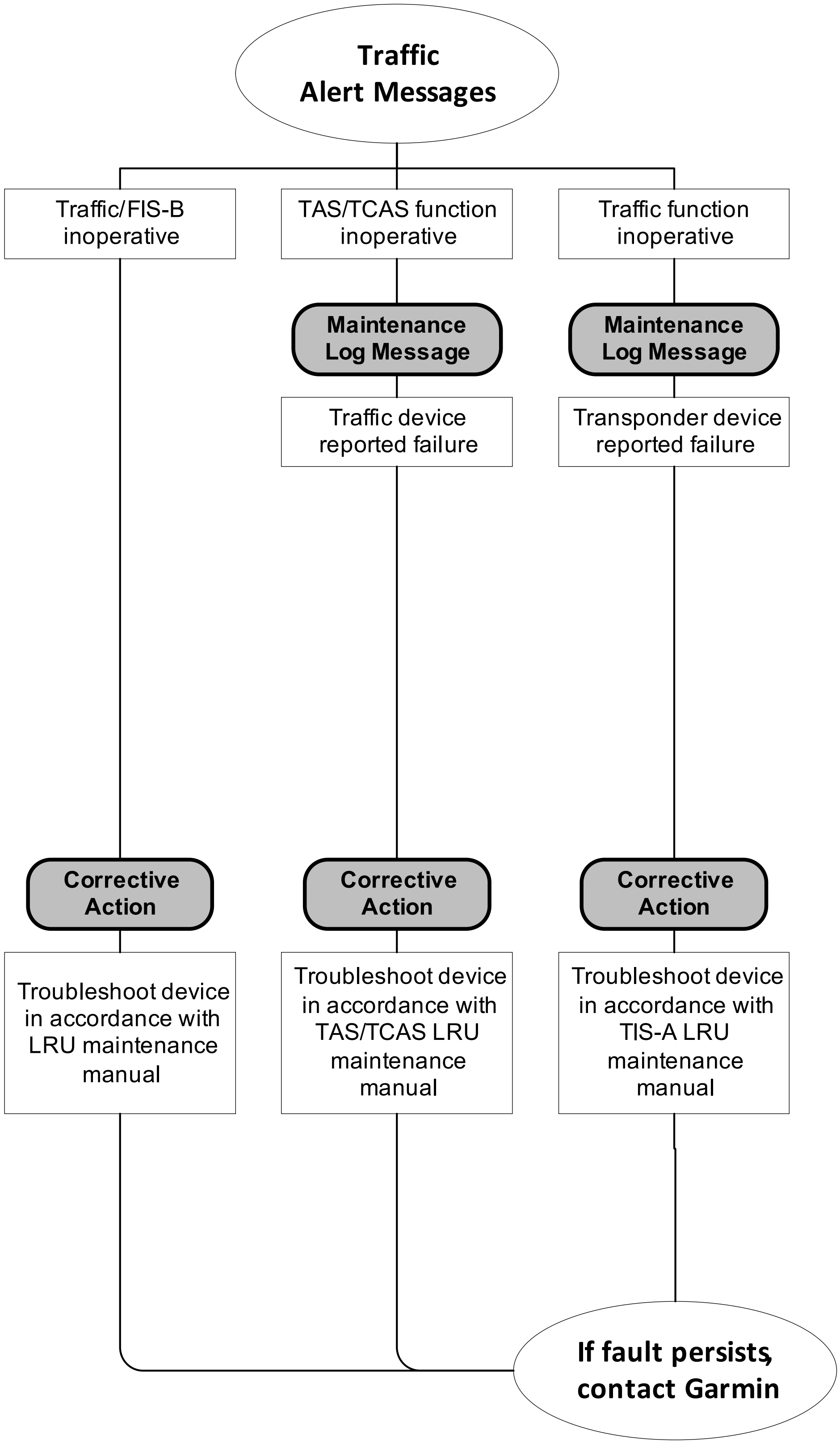


Figure 7-6 Traffic Alert Message Troubleshooting
Sheet 2 of 2

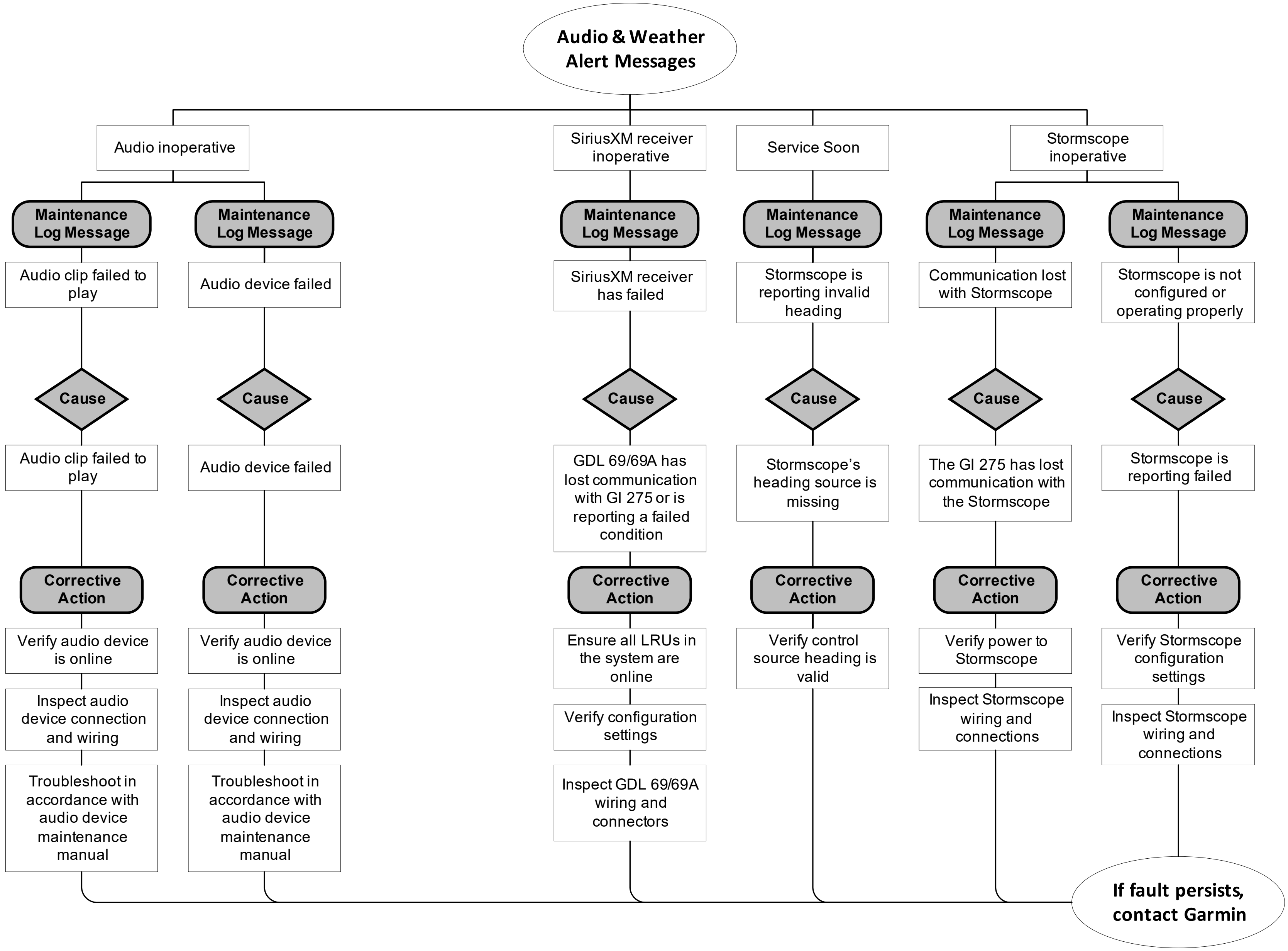


Figure 7-7 Audio and Weather Alert Message Troubleshooting

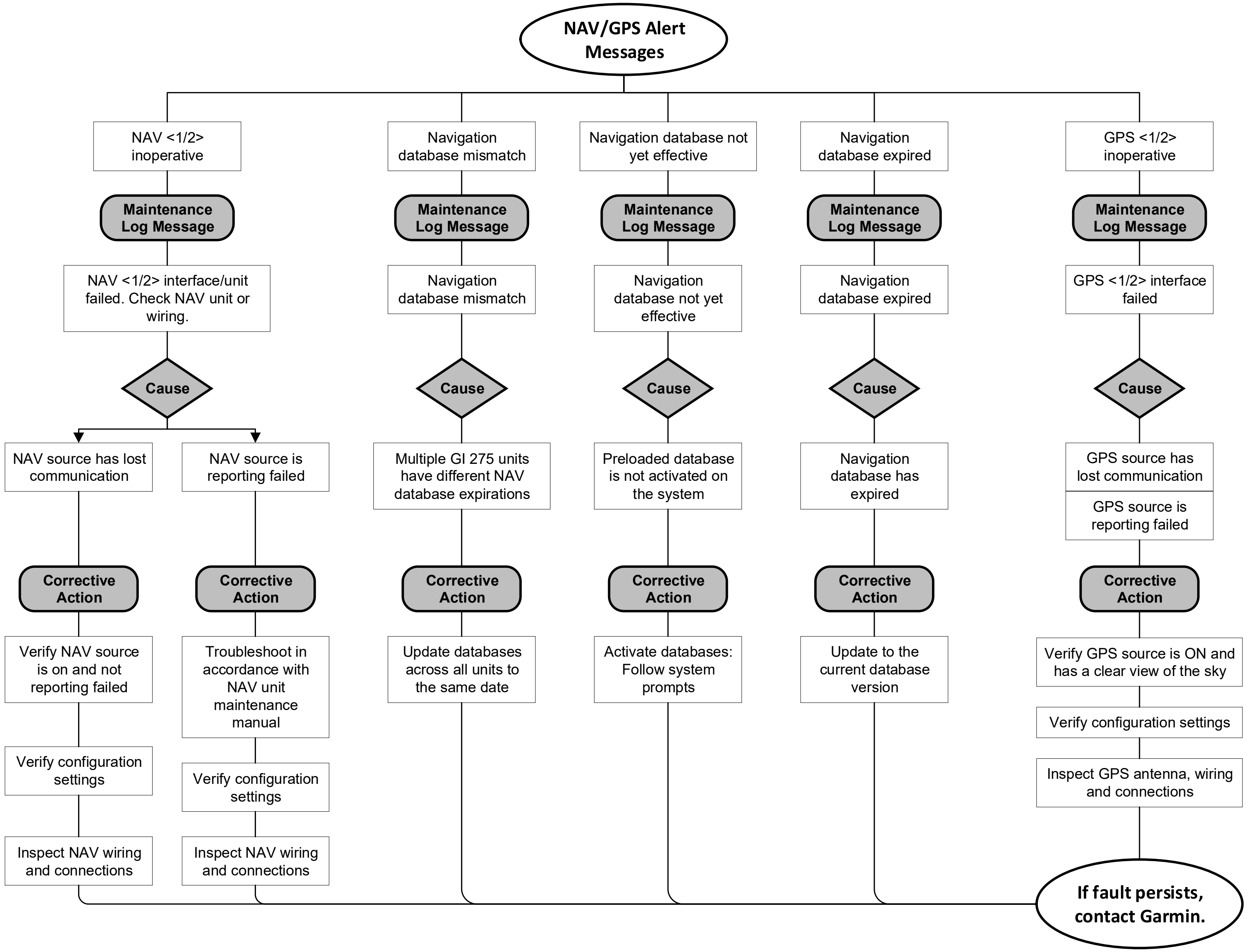


Figure 7-8 NAV Alert Message Troubleshooting

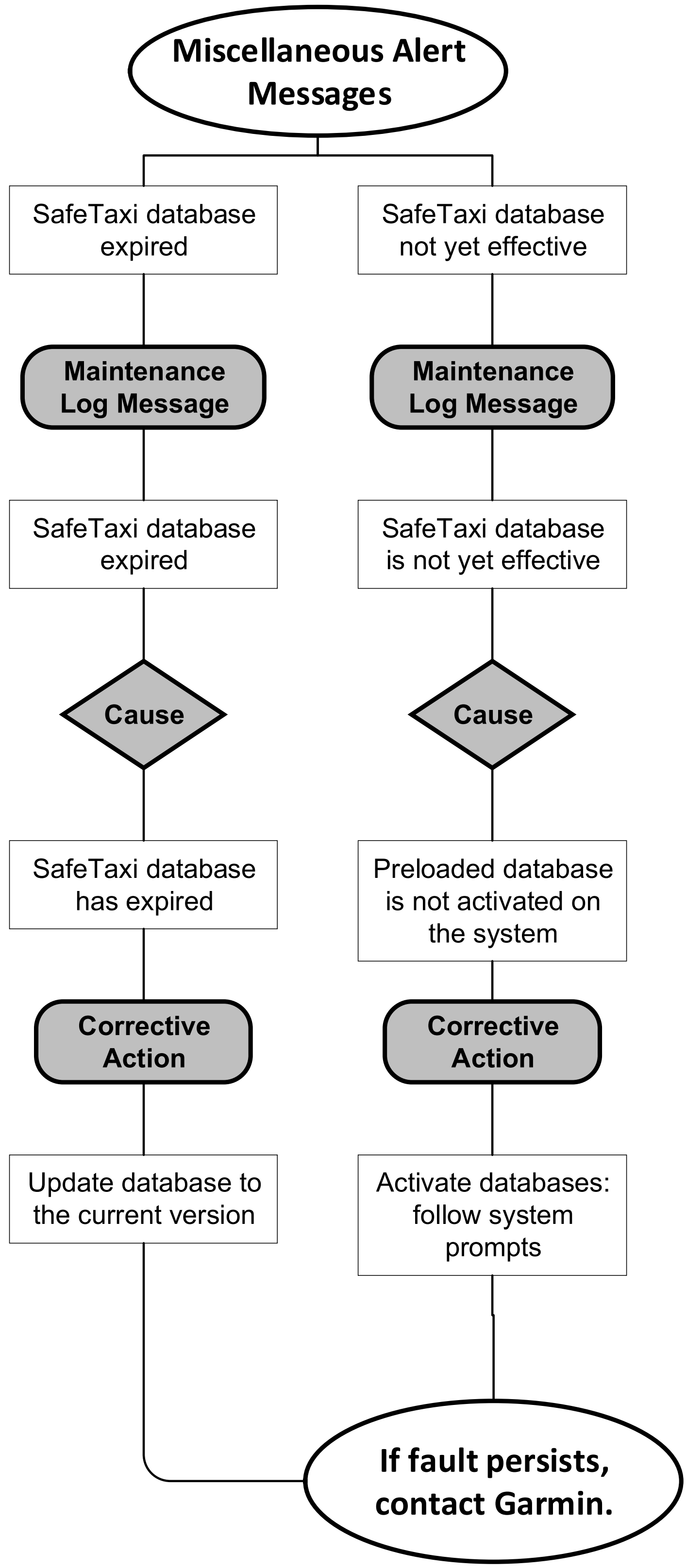


Figure 7-9 Miscellaneous GI 275 Alert Message Troubleshooting

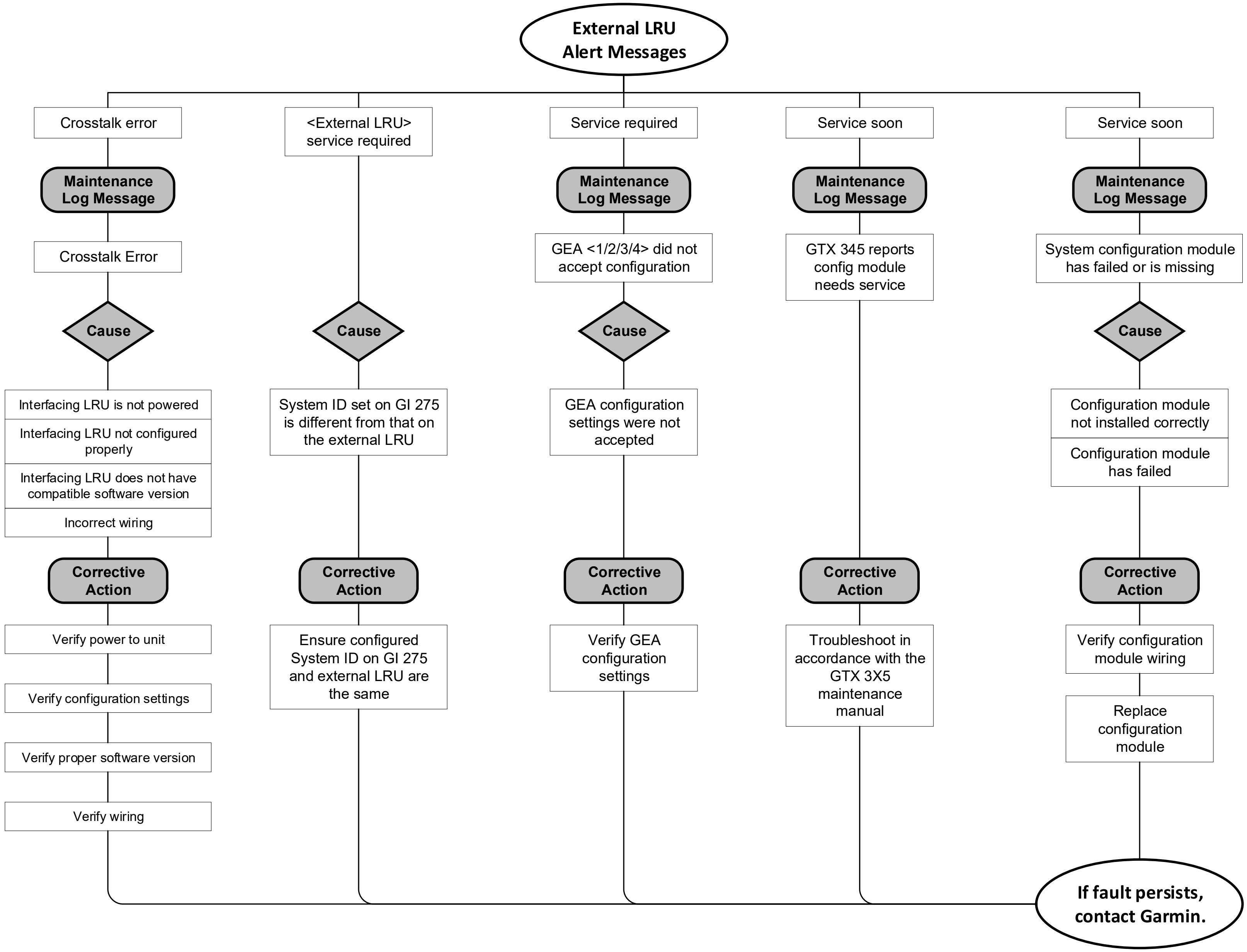


Figure 7-10 External LRU Alert Message Troubleshooting

7.2 Additional Troubleshooting

If necessary, perform the following troubleshooting steps:

1. The GI 275 air/ground logic must be on-ground when making any configuration changes or attempting to load software. If the system is in-air while attempting system configuration changes or software loads, system failures will occur. For example, an air data test set can trigger an unexpected in-air state. Ensure:
    a. GPS ground speed must be less than 30kts. Using a GPS repeater can create issues with the GPS system switching between satellite acquisition from an outside signal and the repeater signal causing false GPS ground speed readings.
    b. For units with EIS, the RPM readings must be 0 RPM while entering Configuration mode.
2. Ensure every GI 275 is in Configuration mode prior to making any configuration change.
3. Ensure every unit in the system has matching software.

7.3 Interpreting Flight Data Logs

Flight data and engine logs can be uploaded and graphed on FlyGarmin.com.

Table 7-1 Flight Data Log Descriptions

Parameter	Logged Name	Units	Definition
Local Date	Lcl Date	#yyy-mm-dd	
Local Time	Lcl Time	hh:mm:ss	
UTC Offset	UTCOfst	hh:mm	UTC Offset (Lcl Time = UTC Time + UTC Offset)
Active Waypoint	AtvWpt	ident	Text identifier for FMS waypoint
Latitude Position	Latitude	DEG	From selected GPS source or backup GPS (backup is used if 1 and 2 are invalid)
Longitude Position	Longitude	DEG	From selected GPS source or backup GPS (backup is used if 1 and 2 are invalid)
Indicated Barometric Altitude	AltB	ft	Displayed value
Selected Barometric Pressure Setting	BaroA	inHg	Displayed value
GPS Altitude Relative To Mean Sea Level	AltMSL	ft	Selected GPS
Outside Air Temperature	OAT	C	Selected ADC
Indicated Airspeed	IAS	kts	Selected ADC
Ground Speed	GndSpd	kts	From selected GPS source or backup GPS (backup is used if 1 and 2 are invalid)
Vertical Speed	VSpd	ft/min	Selected ADC
Attitude Pitch Angle	Pitch	DEG	Selected AHRS
Attitude Roll Angle	Roll	DEG	Selected AHRS
Lateral (Y) Acceleration	LatAc	g's	Selected AHRS, relative to aircraft body, right is positive
Vertical (Z) Acceleration	NormAc	g's	Selected AHRS, relative to aircraft body, up is positive
Heading	HDG	DEG	Magnetic or True Heading depending on pilot selection
Track	TRK	DEG	Magnetic or True Track depending on pilot selection
Battery #1 Volts	volt1	V	Measurement taken from GEA
Battery #2 Volts	volt2	V	Measurement taken from GEA
Battery #1 Amps	amp1	A	Measurement taken from GEA
Battery #2 Amps	amp2	A	Measurement taken from GEA
DC Bus #1 Volts	bus1volts	V	Measurement taken from GEA
DC Bus #2 Volts	bus2volts	V	Measurement taken from GEA
Alternator #1 Amps	alt1amps	A	Measurement taken from GEA
Alternator #2 Amps	alt2amps	A	Measurement taken from GEA

Left Fuel Quantity	FQtyL	gl	Fuel quantity in gallons. Measurement taken from GEA
Center Fuel Quantity	FQtyC	gl	Fuel quantity in gallons. Measurement taken from GEA
Right Fuel Quantity	FQtyR	gl	Fuel quantity in gallons. Measurement taken from GEA
Left Fuel Quantity	FQtyLlbs	lb	Measurement taken from GEA
Center Fuel Quantity	FQtyClbs	lb	Measurement taken from GEA
Right Fuel Quantity	FQtyRlbs	lb	Measurement taken from GEA
Aux #1 Fuel Quantity	FQtyAux1	gl	Fuel quantity in gallons. Measurement taken from GEA
Aux #2 Fuel Quantity	FQtyAux2	gl	Fuel quantity in gallons. Measurement taken from GEA
Aux #1 Fuel Quantity	FQtyA1lbs	lbs	Measurement taken from GEA
Aux #2 Fuel Quantity	FQtyA2lbs	lbs	Measurement taken from GEA
Engine #1 Fuel Flow	E1 FFlow	gl/h	Measurement taken from GEA
Engine #1 Fuel Pressure	E1 FPres	PSI	Measurement taken from GEA
Engine #1 Oil Temperature	E1 OilT	DEG F	Measurement taken from GEA
Engine #1 Oil Pressure	E1 OilP	PSI	Measurement taken from GEA
Engine #1 Manifold Pressure	E1 MAP	inHg	Measurement taken from GEA
Engine #1 Revolutions Per Minute	E1 RPM	RPM	Measurement taken from GEA
Engine #1 Power Percent	E1 %Pwr	%	May be calculated depending on aircraft configuration
Engine #1, Cylinder Head Temperature #1	E1 CHT1	DEG F	Measurement taken from GEA
Engine #1, Cylinder Head Temperature #2	E1 CHT2	DEG F	Measurement taken from GEA
Engine #1, Cylinder Head Temperature #3	E1 CHT3	DEG F	Measurement taken from GEA
Engine #1, Cylinder Head Temperature #4	E1 CHT4	DEG F	Measurement taken from GEA
Engine #1, Cylinder Head Temperature #5	E1 CHT5	DEG F	Measurement taken from GEA
Engine #1, Cylinder Head Temperature #6	E1 CHT6	DEG F	Measurement taken from GEA
Engine #1, Cylinder Head Temperature Cooling Rate	E1 CHT CLD	DEG F/min	Measurement taken from GEA
Engine #1, Exhaust Gas Temperature #1	E1 EGT1	DEG F	Measurement taken from GEA
Engine #1, Exhaust Gas Temperature #2	E1 EGT2	DEG F	Measurement taken from GEA
Engine #1, Exhaust Gas Temperature #3	E1 EGT3	DEG F	Measurement taken from GEA
Engine #1, Exhaust Gas Temperature #4	E1 EGT4	DEG F	Measurement taken from GEA

Engine #1, Exhaust Gas Temperature #5	E1 EGT5	DEG F	Measurement taken from GEA
Engine #1, Exhaust Gas Temperature #6	E1 EGT6	DEG F	Measurement taken from GEA
Engine #1 Carburetor Temperature	E1 CarbT	DEG F	Measurement taken from GEA
Engine #2 Carburetor Temperature	E2 CarbT	DEG F	Measurement taken from GEA
Engine #1 Turbine #1 Inlet Temperature	E1 TIT1	DEG F	Measurement taken from GEA
Engine #2 Turbine #1 Inlet Temperature	E2 TIT1	DEG F	Measurement taken from GEA
Engine #1 Compressor Inlet Air Temperature	E1 IAT	DEG F	Measurement taken from GEA
Engine #1 Compressor Discharge Temperature	E1 CDT	DEG F	Measurement taken from GEA
Engine #1 Primary Exhaust Gas Temperature	E1 PEGT	DEG F	Measurement taken from GEA
Engine #1 Torque	E1 Torq	PSI	Measurement taken from GEA
Engine #1 RPM Power Turbine	E1 NP	RPM	Measurement taken from GEA
Engine #1 RPM % Generator Turbine (Compressor Turbine)	E1 NG RPM	RPM	Measurement taken from GEA
Engine #1 Inter Turbine Temperature	E1 ITT	DEG C	Measurement taken from GEA
Engine #1 Outside Air Temperature	E1 OAT	DEG C	Engine #1 Outside Air Temperature. Measurement from GEA
Engine #2 Outside Air Temperature	E2 OAT	DEG C	Engine #2 Outside Air Temperature. Measurement from GEA
Engine #2 Fuel Flow	E2 FFlow	gl/h	Measurement taken from GEA
Engine #2 Fuel Pressure	E2 FPres	PSI	Measurement taken from GEA
Engine #2 Oil Temperature	E2 OilT	DEG F	Measurement taken from GEA
Engine #2 Oil Pressure	E2 OilP	PSI	Measurement taken from GEA
Engine #2 Manifold Pressure	E2 MAP	inHg	Measurement taken from GEA
Engine #2 Revolutions Per Minute	E2 RPM	RPM	Measurement taken from GEA
Engine #2 Power Percent	E2 %Pwr	%	May be calculated depending on aircraft configuration
Engine #2, Cylinder Head Temperature #1	E2 CHT1	DEG F	Measurement taken from GEA
Engine #2, Cylinder Head Temperature #2	E2 CHT2	DEG F	Measurement taken from GEA
Engine #2, Cylinder Head Temperature #3	E2 CHT3	DEG F	Measurement taken from GEA
Engine #2, Cylinder Head Temperature #4	E2 CHT4	DEG F	Measurement taken from GEA

Engine #2, Cylinder Head Temperature #5	E2 CHT5	DEG F	Measurement taken from GEA
Engine #2, Cylinder Head Temperature #6	E2 CHT6	DEG F	Measurement taken from GEA
Engine #2, Cylinder Head Temperature Cooling Rate	E2 CHT CLD	DEG F/min	Measurement taken from GEA
Engine #2, Exhaust Gas Temperature #1	E2 EGT1	DEG F	Measurement taken from GEA
Engine #2, Exhaust Gas Temperature #2	E2 EGT2	DEG F	Measurement taken from GEA
Engine #2, Exhaust Gas Temperature #3	E2 EGT3	DEG F	Measurement taken from GEA
Engine #2, Exhaust Gas Temperature #4	E2 EGT4	DEG F	Measurement taken from GEA
Engine #2, Exhaust Gas Temperature #5	E2 EGT5	DEG F	Measurement taken from GEA
Engine #2, Exhaust Gas Temperature #6	E2 EGT6	DEG F	Measurement taken from GEA
Engine #2 Compressor Inlet Air Temperature	E2 IAT	DEG F	Measurement taken from GEA
Engine #2 Compressor Discharge Temperature	E2 CDT	DEG F	Measurement taken from GEA
Engine #2 Primary Exhaust Gas Temperature	E2 PEGT	DEG F	Measurement taken from GEA
Engine #2 Torque	E2 Torq	PSI	Measurement taken from GEA
Engine #2 RPM Power Turbine	E2 NP	RPM	Measurement taken from GEA
Engine #2 RPM % Generator Turbine (Compressor Turbine)	E2 NG RPM	RPM	Measurement taken from GEA
Engine #2 Inter Turbine Temperature	E2 ITT	DEG C	Measurement taken from GEA
WGS84 GPS Altitude	AltGPS	ft	Selected GPS source
True Airspeed	TAS	kts	Selected ADC
HSI Source	HSIS	enum	Active navigation source on the HSI page: NAV1, NAV2, GPS1, GPS2
Selected Course	CRS	DEG	Magnetic or True Selected Course depending on pilot selection
#1 Navigation Radio Frequency	NAV1	MHz	
#2 Navigation Radio Frequency	NAV2	MHz	
Horizontal CDI	HCDI	fsd	Active VOR/LOC full scale deflection
Vertical CDI	VCDI	fsd	GS vertical full scale deflection
Wind Speed	WndSpd	kts	
Wind Direction	WndDr	DEG	Relative to true north
Distance to Next Waypoint	WptDst	nm	

Bearing to Next Waypoint	WptBrg	DEG	Magnetic or True Bearing to Next Waypoint depending on pilot selection
Magnetic Variation	MagVar	DEG	
Autopilot is engaged?	AfcsOn	boolean	**0**: Autopilot not engaged **1**: Autopilot engaged
Autopilot Roll Mode	RollM	enum	Abbreviated text of autopilot roll mode
Autopilot Pitch Mode	PitchM	enum	Abbreviated text of autopilot pitch mode
Autopilot Flight Director Roll Command	FDRollC	DEG	Relative or absolute based on autopilot mode
Autopilot Flight Director Pitch Command	FDPitchC	DEG	Relative or absolute based on autopilot mode
GPS Vertical Speed	VSpdG	ft/min	Selected GPS
GPS Fix	GPSfix	enum	Selected GPS **ForcNO**: Selected GPS must be re-initialized **NoSoln**: No GPS solution **2D**: 2D solution **3D**: 3D solution **2DDiff**: 2D differential solution **3DDiff**: 3D differential solution **DRGPS**: Dead Reckoning based on last known GPS position **DRWAAS**: Dead Reckoning based on last known WAAS position
GPS Horizontal Alert Limit	HAL	mt	Selected GPS
GPS Vertical Alert Limit	VAL	mt	Selected GPS
WAAS GPS Horizontal Protection Level	HPLwas	mt	Selected GPS
GPS Horizontal Protection Level	HPLfd	mt	Selected GPS
WAAS GPS Vertical Protection Level	VPLwas	mt	Selected GPS
Pressure Altitude	AltPress	ft	Selected ADC
GPS Sattelites Used	GPSSat	#	Configured GPS 1
GPS Vertical Dilution of Precision	GPSVdop	#	Configured GPS 1
GPS Velocity (East)	GPSVelE	ft/min	Configured GPS 1
GPS Velocity (North)	GPSVelN	ft/min	Configured GPS 1
GPS Velocity (Up)	GPSVelU	ft/min	Configured GPS 1
GPS Horizontal Dilution of Precision	GPSHdop	#	Configured GPS 1
Turn Rate	TurnRate	DEG/second	
Slip Skid	SlipSkid	DEG	Positive is right of center

Selected Heading	SelHDG	DEG	Magnetic or True Selected Heading depending on pilot selection
Selected Track	SelTrk	DEG	Magnetic or True Selected Track depending on pilot selection
Selected Altitude	SelAlt	ft	
Selected Vertical Speed	SelVspd	ft/min	
Selected Airspeed	SelAspd	kt	
Navigation Source	NavSource	enum	Activenavigation source on the CDI: GPS1, GPS2, VLOC1, VLOC2, INVLD
Vertical Navigation Deviation	VnavDev	ft	Deviation from VNAV path
Vertical Navigation Path Angle	VnavPAng	DEG	
Vertical Navigation Altitude	VnavAlt	ft	
Autopilot State	ApState	enum	**AP_off**: Autopilot is off **AP_eng**: Autopilot is engaged **AP_fail**: Autopilot is failed **AP_inv**: Autopilot is unknown state
Yaw Damper State	YdState	enum	**YD_off**: Yaw Damper is off **YD_eng**: Yaw Damper is engaged **YD_fail**: Yaw Damper is failed **YD_inv**: Yaw Damper is unknown state
Flight Director Target Altitude	FdTrgtAlt	ft	
Autopilot Roll Command	ApRollCmd	DEG	Relative or absolute based on autopilot mode
Autopilot Pitch Command	ApPitCmd	DEG	Relative or absolute based on autopilot mode
Autopilot Vertical Speed Command	ApVsCmd	ft/min	
Autopilot Roll Torque	ApRollTrq	%	Autopilot Roll Torque where 100% is 60 in-lb for a GFC 500 system
Autopilot Pitch Torque	ApPitTrq	%	Autopilot Pitch Torque where 100% is 60 in-lb for a GFC 500 system
Autopilot Roll Trim Torque	ApRollTrimTrq	%	Autopilot Roll Trim Torque where 100% is 60 in-lb for a GFC 500 system
Autopilot Pitch Trim Torque	ApPitTrimTrq	%	Autopilot Pitch Trim Torque where 100% is 60 in-lb for a GFC 500 system
Autopilot Yaw Torque	ApYawTrq	%	Autopilot Yaw Torque where 100% is 60 in-lb for a GFC 500 system
LCD Temperature	LCDTemp	DEG C	LCD Temperature
Aircraft Power	AcftPower	V	Aircraft Power measured at GI 275
Battery Status	BattStatus	enum	Internal Garmin use
Battery Charge	BattCharge	%	GI 275 Battery Charge

Autopilot Monitor and Fault Flags	ApFlags	#	Internal Garmin use
Autopilot Disengage Cause	ApDisCause	enum	Various
Yaw Damper Monitor and Fault Flags	YdFlags	#	Internal Garmin use
Yaw Damper Disengage Cause	YdDisCause	enum	Various
Flight Director Lat Mode	FdLatMode	enum	See Pilot’s Guide Section 6.5 AFCS System Architecture
Flight Director Vert Mode	FdVertMode	enum	See Pilot’s Guide Section 6.5 AFCS System Architecture
Autopilot Altitude Command	ApAltCmd	ft	Internal Garmin use
Envelope Protection Status	EpStatus	enum	**Roll**, **Pitch**, **IAS**, **Mach**
CAN Status	CanStatus	#	Internal Garmin use

APPENDIX A CONNECTORS AND PIN FUNCTION

This appendix contains connector information and a description of pin functions for all LRUs installed as part of this manual and the GI 275 STC, with exception of the EIS sensors.

Refer to the LRU TSO installation manuals listed in Table 1-1 for more detailed signal information on each LRU and manufacturer documentation for EIS sensor information.

All D-sub connectors follow a similar pin numbering scheme. Numbered layouts (as seen while looking at the LRU) are provided for each connector in the orientation that it appears on the unit. Because installations can vary, ensure the correct orientation of the connector and pins.

A.1 GI 275

The GI 275 Base has a D-sub connector and a BNC connector. The mating designators, part numbers, and associated connector kits are listed in Table A-1.

Table A-1 GI 275 Unit Connectors

Ref. Des.	Description	Connector P/N	Kit P/N
J2751	Conn, Female, HD D-Sub, 78 Ckt	330-00366-78	011-04809-00
GPS	BNC, Male	Supplied with antenna	

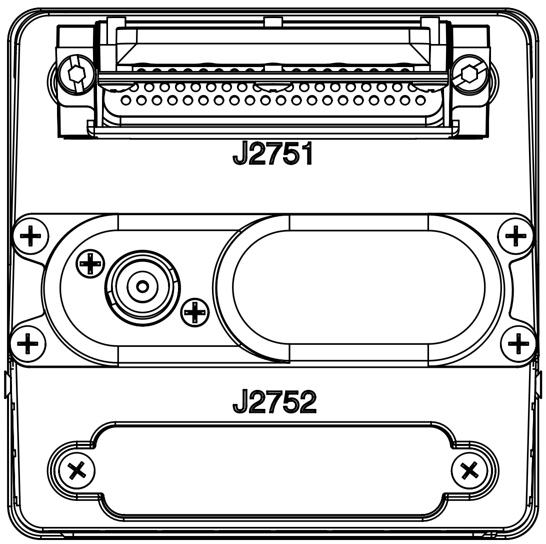


Figure A-1 GI 275 Connector

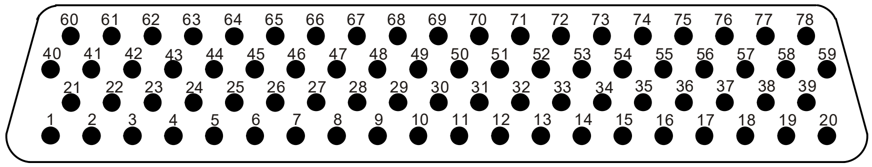


Figure A-2 GI 275 J2751/P2751 Connector (Looking at Unit)

Table A-2 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

A.2 GEA 24/GEA 24B

The GEA 24(B) has four connectors. The mating designators, part numbers, and associated connector kits are listed in Table A-3.

Table A-3 GI 275 - GEA 24/GEA 24B

Ref. Des.	Description	Connector P/N	Kit P/N
J241	Conn, Male, D-Sub, 9 Ckt	330-00625-09	011-01855-00
J242	Conn, Female, D-Sub, 25 Ckt	330-00624-25	011-01855-02
J243	Conn, Male, D-Sub, 37 Ckt	330-00625-37	011-01855-03
J244	Conn, Male, D-Sub, 50 Ckt	330-00625-50	011-01855-04

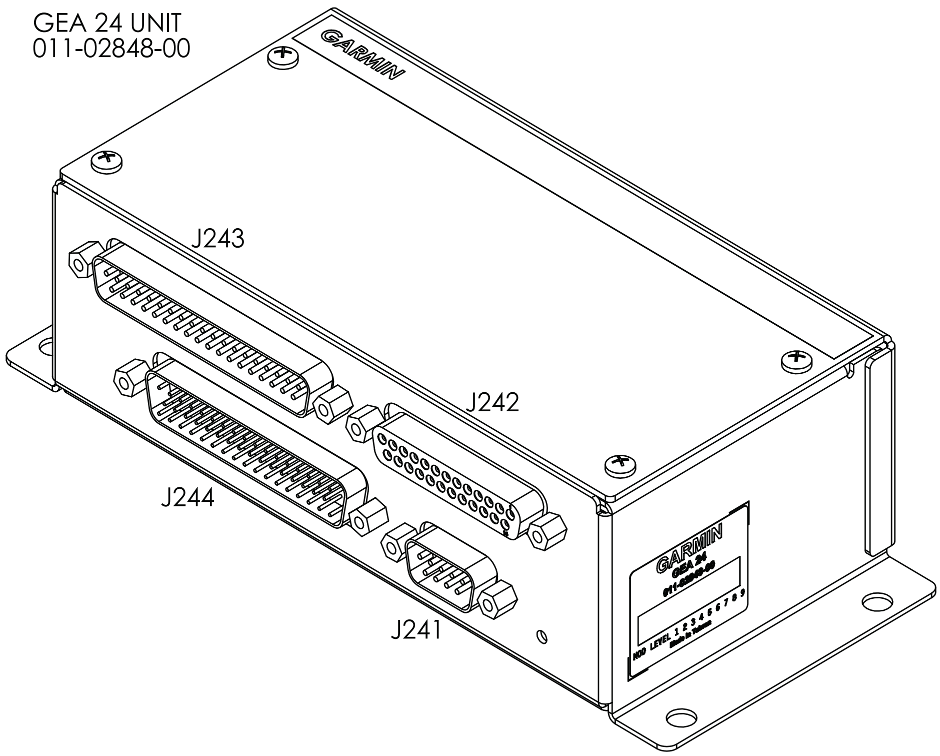


Figure A-3 GEA 24/GEA 24B Connectors

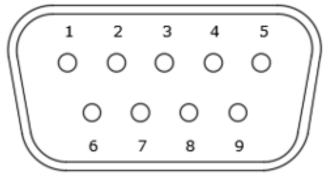


Figure A-4 GEA 24/GEA 24B J241/P241 Connector (Looking at Unit)

Table A-4 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	--

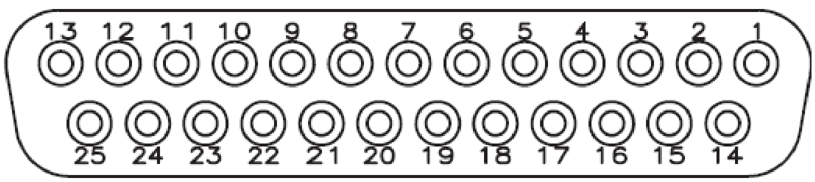


Figure A-5 GEA 24/GEA 24B J242/P242 Connector (Looking at Unit)

Table A-5 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

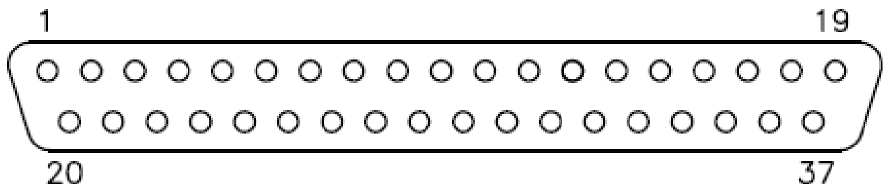


Figure A-6 GEA 24/GEA 24B J243/P243 Connector (Looking at Unit)

Table A-6 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 / MISC TEMP 2 LO	IN
29	POS 7 / MISC TEMP 2 HI	IN
30	POS 6 / MISC TEMP 1 LO	IN
31	POS 6 / 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

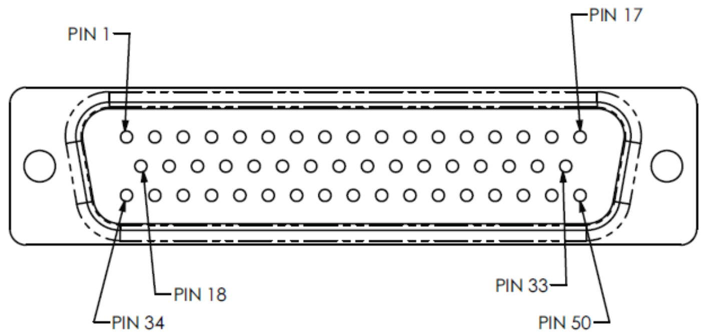


Figure A-7 GEA 24/GEA 24B J244/P244 Connector (Looking at Unit)

Table A-7 J244/P244 Connector

Pin	Function	I/O	Pin	Function	I/O
1	SYSTEM ID 1A*	IN	26	GP GROUND_2	--
2	SYSTEM ID 1B / GROUND	--	27	GP +5V_3	OUT
3	RESERVED	--	28	VOLTS 2	IN
4	RESERVED	--	29	GP GROUND 3	--
5	FUEL QTY +5V_1	OUT	30	POS 5 HI / +5V	OUT
6	FUEL QTY 1	IN	31	POS 5 / MISC PRESS	IN
7	FUEL QTY 1 GROUND	--	32	POS 5 LO / GROUND	--
8	FUEL QTY +5V_2	OUT	33	CAN2_L	I/O
9	FUEL QTY 2	IN	34	FUEL QTY +12V 1	OUT
10	FUEL QTY 2 GROUND	--	35	FUEL QTY +12V 2	OUT
11	POS 3 HI / +5V_3	OUT	36	RESERVED	IN
12	POS 3 / GP 3 / FUEL QTY 3	IN	37	RESERVED	IN
13	POS 3 LO / GROUND	--	38	RESERVED	--
14	POS 4 HI / +5V_4	OUT	39	RESERVED	--
15	POS 4 / GP 4 / FUEL QTY 4	IN	40	DISCRETE IN 1**	IN
16	POS 4 LO / GROUND	--	41	DISCRETE IN 2**	IN
17	CAN2_H	I/O	42	DISCRETE IN 3**	IN
18	GP1 HI / +5V	OUT	43	DISCRETE IN 4**	IN
19	GP1 / POS 1	IN	44	DISCRETE OUT 1* / MASTER WARNING	IN
20	GP1 LO / GROUND	--	45	DISCRETE OUT 2* / MASTER CAUTION	IN
21	GP2 HI / +5V	OUT	46	SHUNT 2 HI (shared w/Pin 35, J243 connector)	IN
22	GP2 / POS 2	IN	47	SHUNT 2 LO (shared w/Pin 34, J243 connector)	IN
23	GP2 LO / GOURND	--	48	RESERVED / SPARE 1	IN
24	GP +5V_2	OUT	49	RESERVED / SPARE 2	IN
25	VOLTS 1	IN	50	GP +12V	OUT

*Indicates Active-Low

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

A.3 GTP 59

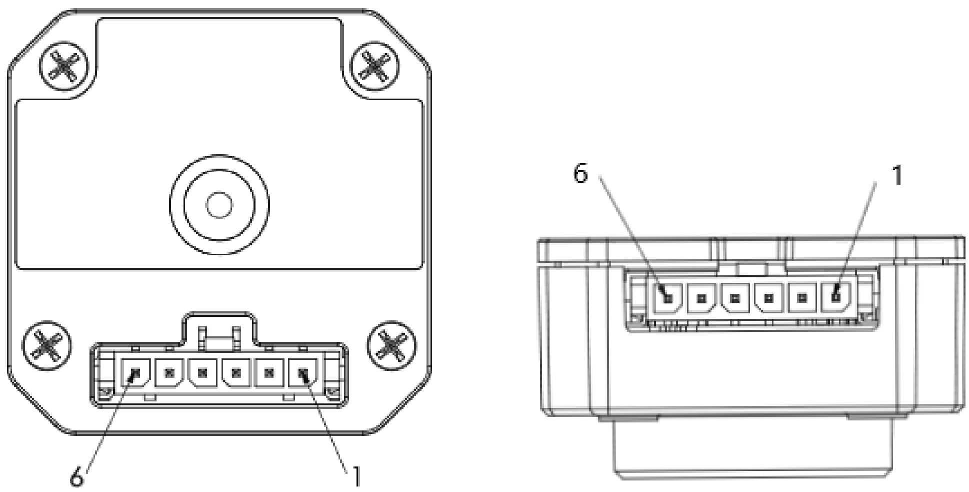
The GTP 59 Temperature Probe does not have a connector. Rather, a 3-conductor shielded cable extends from the sensor for interface with the GEA.

Table A-8 3-Conductor Shielded Cable

Conductor Color	Name	I/O
WHITE	PROBE POWER LEAD	IN
BLUE	RESISTIVE ELEMENT HI	OUT
ORANGE	RESISTIVE ELEMENT LO	OUT

A.4 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 (refer to Table A-9).



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 A-8 GSB 15 Connectors

Table A-9 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	--

APPENDIX B INTERCONNECT DIAGRAMS

GENERAL NOTES

[1] ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.

[2] AT GI 275, CONNECT SHIELD GROUNDS TO THE CONNECTOR BACKSHELL. THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. OTHER SHIELD GROUNDS GOING TO AIRCRAFT GROUND MUST BE LESS THAN 3.0 INCHES UNLESS OTHERWISE SPECIFIED.

[3] USE APPROVED ETHERNET CABLES LISTED IN SECTION 3.1.2 FOR ALL HSDB CONNECTIONS.

[4] PINS OR PORTS THAT ARE MARKED WITH “x” OR “X” INDICATE THERE IS NO SINGLE RECOMMENDED CONNECTION, FIND AN AVAILABLE PORT/PIN TO USE. PIN/PORT CONNECTIONS WILL VARY DEPENDING ON INSTALLATION.

[5] THE UNSHIELDED PORTION OF ALL SHIELDED WIRES AT THE CONNECTORS MUST BE 2.5 INCHES OR LESS IN TOTAL LENGTH, UNLESS OTHERWISE NOTED.

LEGEND

~ REPRESENTS INTERCHANGEABLE PIN OR PORT WITH SIMILAR FUNCTIONING PIN OR PORT. SEE APPENDIX A FOR PIN DESCRIPTION. PINS OR PORTS WITHOUT ~ MUST BE CONNECTED AS SHOWN.

EXAMPLES INCLUDE:

~ DISCRETE IN 7* → INDICATES ANY AVAILABLE ‘DISCRETE IN’ CAN BE USED.

~ RS-232 6 → INDICATES ANY AVAILABLE RS-232 PORT CAN BE USED.

~ GEN PURP → INDICATES ANY AVAILABLE GENERAL PURPOSE PORT CAN BE USED.

* REPRESENTS ACTIVE-LOW PIN.

SHIELD GROUND BLOCK DESIGNATOR.

AIRFRAME GROUND DESIGNATOR.

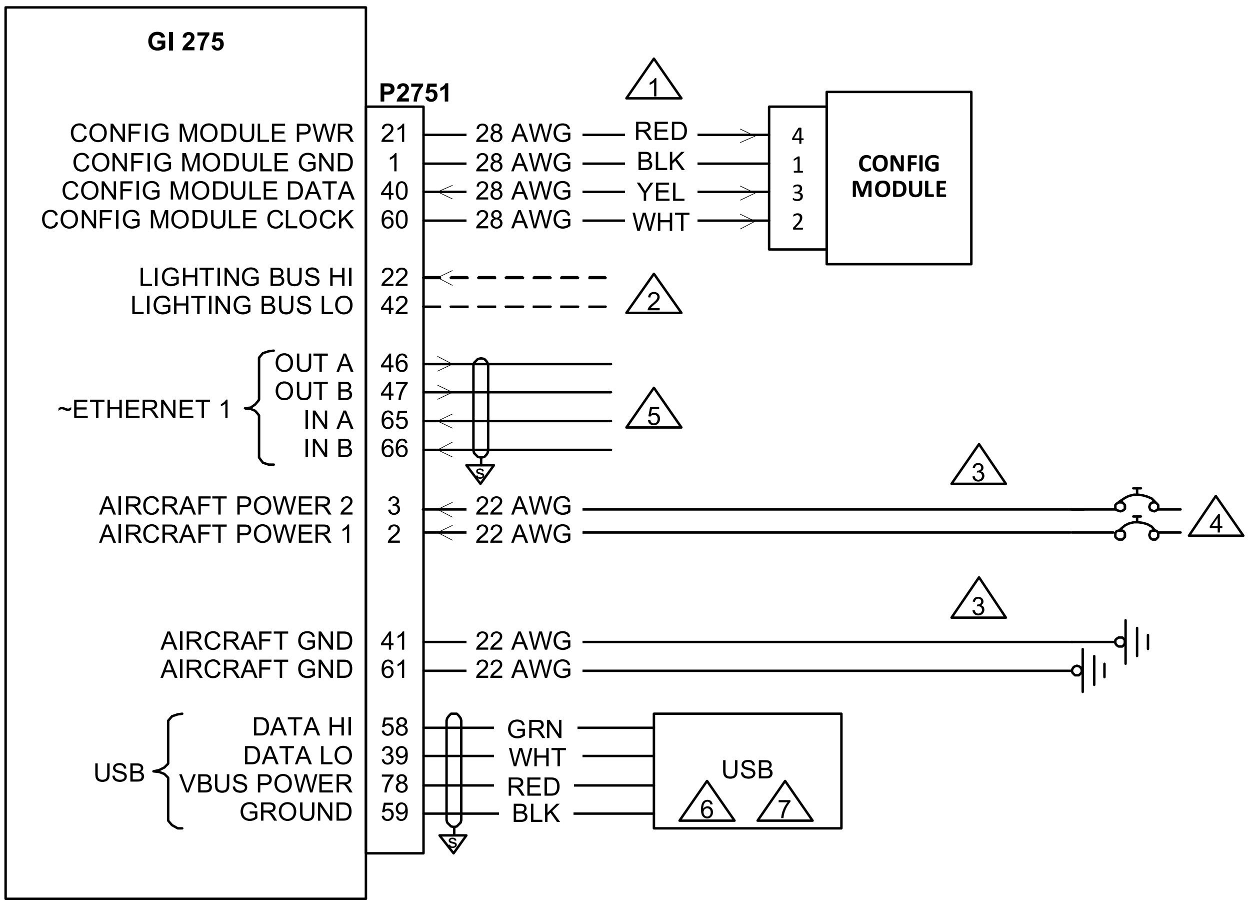


Figure B-1 GI 275 - Power, Lighting, Configuration Module, HSDB, USB Interconnect Sheet 1 of 2

NOTES

1. CONFIGURATION MODULE IS MOUNTED IN THE BACKSHELL OF THE P1 CONNECTOR USING 28 AWG WIRES. CONTACTS SUPPLIED WITH THE CONFIGURATION MODULE MUST BE USED FOR CONNECTING CONFIGURATION MODULE HARNESS TO P1.

2. OPTIONAL LIGHTING BUS CONNECTION (28 VDC, 14 VDC, 5 VDC, OR 5 VAC).

3. WIRE GAUGE SHOWN FOR POWER AND GROUND LENGTH LESS THAN 20 FEET. FOR POWER AND GROUNDS GREATER THAN 20 FEET, REFER TO AC 43.13-1B, CHAPTER 11 TO DETERMINE THE APPROPRIATE WIRE GAUGE.

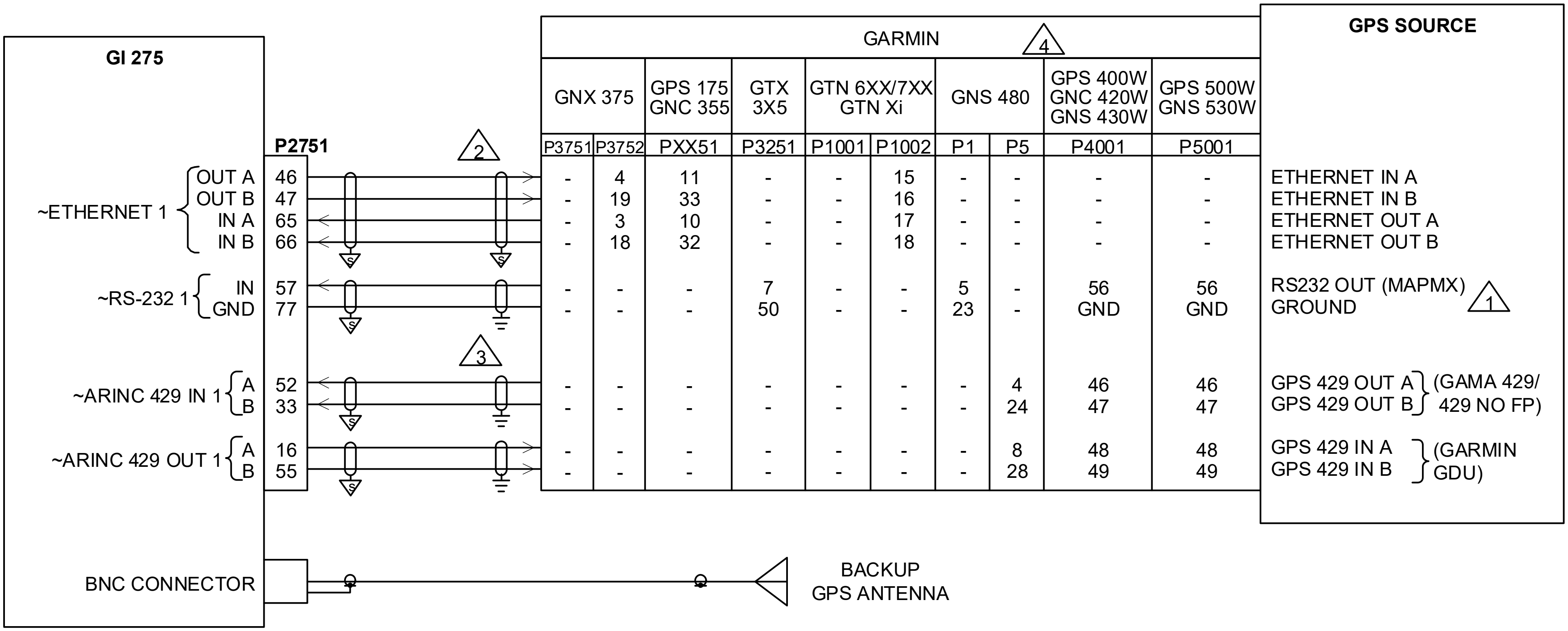
4. AIRCRAFT POWER 2 IS FOR WIRING WITH INDEPENDENT POWER BUSSES AND IS NOT REQUIRED. REFER TO SECTION 3.2.1 FOR BREAKER SIZING, BUSSING, AND LABELING.

5. REFER TO SECTION 3.2.5 FOR HSDB ARCHITECTURE.

6. P/N 325-00238-02 CABLE ASSY, USB-A RECPT TO PIGTAIL, 48” INCLUDED WITH GI 275 CONNECTOR KIT. THE USB CONNECTOR IS FOR MAINTENANCE PURPOSES ONLY AND MUST BE CAPPED AND STOWED PRIOR TO RETURNING THE AIRCRAFT TO SERVICE. PROTECT THE USB CONNECTOR SUCH THAT THE USB CONNECTOR OPENING IS COMPLETELY COVERED. THEN SECURE THE USB CONNECTOR FOR FUTURE MAINTENANCE ACCESS.

7. A GSB 15 USB DATABASE AND CHARGING HUB CAN BE INSTALLED IN PLACE OF THE USB PIGTAIL. REFER TO FIGURE B-13.

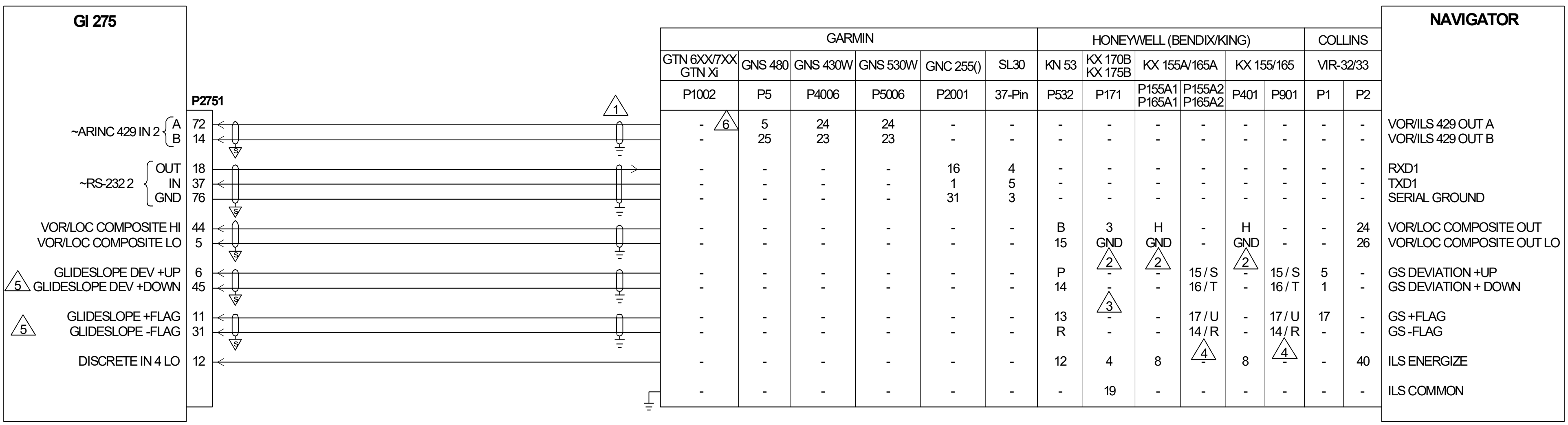
Figure B-1 GI 275 - Power, Lighting, Configuration Module, HSDB, USB Interconnect Sheet 2 of 2



NOTES

1. FOR PINS IDENTIFIED WITH “GND”, CONNECT WIRE TO GROUND AT THE REAR OF THE UNIT.
2. REFER TO SECTION 3.2.5 FOR HSDB ARCHITECTURE.
3. SPLICES AT THE NAVIGATOR MAY BE REQUIRED FOR RS-232 AND ARINC 429 LINES.
4. IF NOT ENOUGH ARINC 429 CONNECTIONS ARE AVAILABLE IN THE SYSTEM, THE GENERIC MAPMX FORMAT MAY BE USED WITH ONLY THE RS-232 CONNECTION FROM THE GNS 4XXW/5XXW OR GNS 480. REFER TO SECTION 5.5.5.

Figure B-2 GPS Interconnect



GI 275 P2751	GARMIN GTN 6XX/7XX GTN Xi P1002	GARMIN GNS 480 P5	GARMIN GNS 430W P4006	GARMIN GNS 530W P5006	GARMIN GNC 255() P2001	GARMIN SL30 37-Pin	HONEYWELL (BENDIX/KING) KN 53 P532	HONEYWELL KX 170B KX 175B P171	HONEYWELL KX 155A/165A P155A1 P165A1	HONEYWELL KX 155A/165A P155A2 P165A2	HONEYWELL KX 155/165 P401	HONEYWELL KX 155/165 P901	COLLINS VIR-32/33 P1	COLLINS VIR-32/33 P2	NAVIGATOR
72	- △6	5	24	24	-	-	-	-	-	-	-	-	-	-	VOR/ILS 429 OUT A
14	-	25	23	23	-	-	-	-	-	-	-	-	-	-	VOR/ILS 429 OUT B
18	-	-	-	-	16	4	-	-	-	-	-	-	-	-	RXD1
37	-	-	-	-	1	5	-	-	-	-	-	-	-	-	TXD1
76	-	-	-	-	31	3	-	-	-	-	-	-	-	-	SERIAL GROUND
44	-	-	-	-	-	-	B	3	H	-	H	-	-	24	VOR/LOC COMPOSITE OUT
5	-	-	-	-	-	-	15	GND △2	GND △2	-	GND △2	-	-	26	VOR/LOC COMPOSITE OUT LO
6	-	-	-	-	-	-	P	-	-	15 / S	-	15 / S	5	-	GS DEVIATION +UP
45	-	-	-	-	-	-	14	- △3	-	16 / T	-	16 / T	1	-	GS DEVIATION + DOWN
11	-	-	-	-	-	-	13	-	-	17 / U	-	17 / U	17	-	GS +FLAG
31	-	-	-	-	-	-	R	-	-	14 / R	-	14 / R	-	-	GS -FLAG
12	-	-	-	-	-	-	12	4	8	△4 -	8	△4 -	-	40	ILS ENERGIZE
	-	-	-	-	-	-	-	19	-	-	-	-	-	-	ILS COMMON

Figure B-3 NAV Interconnect
Sheet 1 of 2

NOTES

1 FOR GNC NAVIGATORS, CONNECT ALL SHIELDS TO SHIELD BLOCK GROUND, NOT AIRFRAME GROUND.

2 THE NAV RECEIVER DOES NOT PROVIDE A VLOC COMPOSITE LO PIN. CONNECT THE VLOC COMPOSITE LO WIRE FROM THE GDU TO GROUND AT THE NAV RECEIVER.

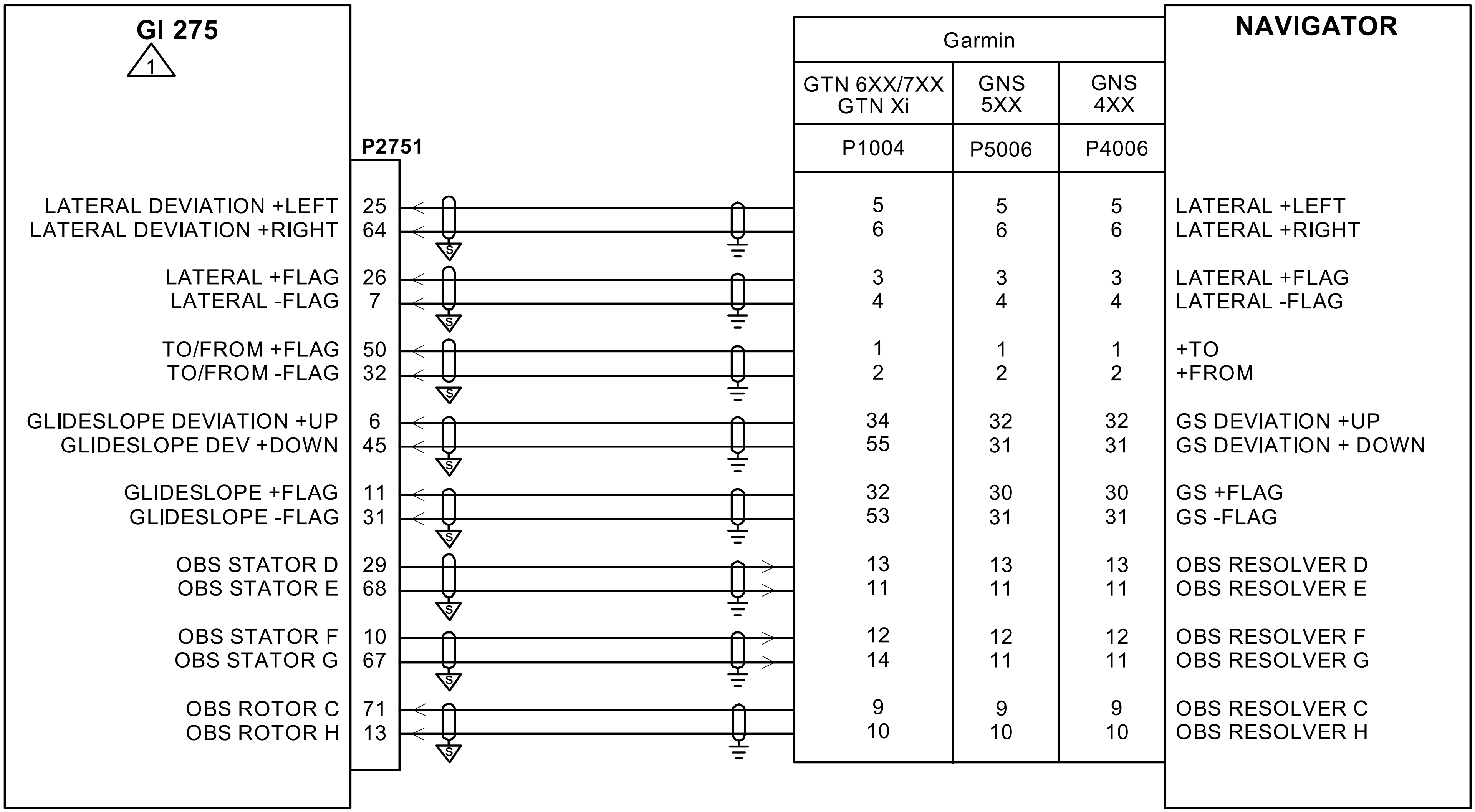
3 KX 170B / KX 175B DO NOT HAVE A GLIDESLOPE OUTPUT. USE A SEPARATE GLIDESLOPE RECEIVER TO DRIVE THESE INPUTS ON THE GDU.

4 KX155/165 NAV UNITS HAVE DUAL GLIDESLOPE OUTPUTS. USE “NUMBERED” OR LETTERED PINS, NOT BOTH. WHENEVER POSSIBLE, USE AN UNUSED SET OF PINS.

5 GLIDESLOPE CONNECTIONS ARE ONLY REQUIRED IF THE NAV RECEIVER CONTAINS THE OPTIONAL GLIDESLOPE RECEIVER.

6 THE GTN 6XX/7XX AND GTN Xi UTILIZE THE SAME INTERFACE SHOWN IN THE GPS INTERCONNECT; THEREFORE, NOT SHOWN IN THE NAV INTERCONNECT.

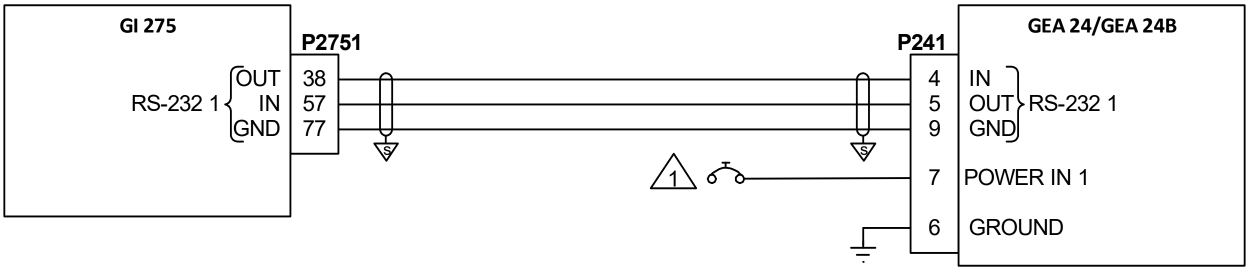
Figure B-3 NAV Interconnect
Sheet 2 of 2



NOTES

1. THIS INTERCONNECT SHOWS ANALOG NAVIGATION CONNECTIONS. THIS ANALOG INTERCONNECT IS NOT USED IF THE NAVIGATOR IS WIRED USING COMPOSITE OR DIGITAL NAV AS SHOWN IN FIGURE B-3.

Figure B-4 Analog CDI Interconnect



NOTES

1. REFER TO SECTION 3.2.1 FOR BREAKER SIZING, BUSSING, AND LABELING.

Figure B-5 GEA 24(B) Power Interconnect

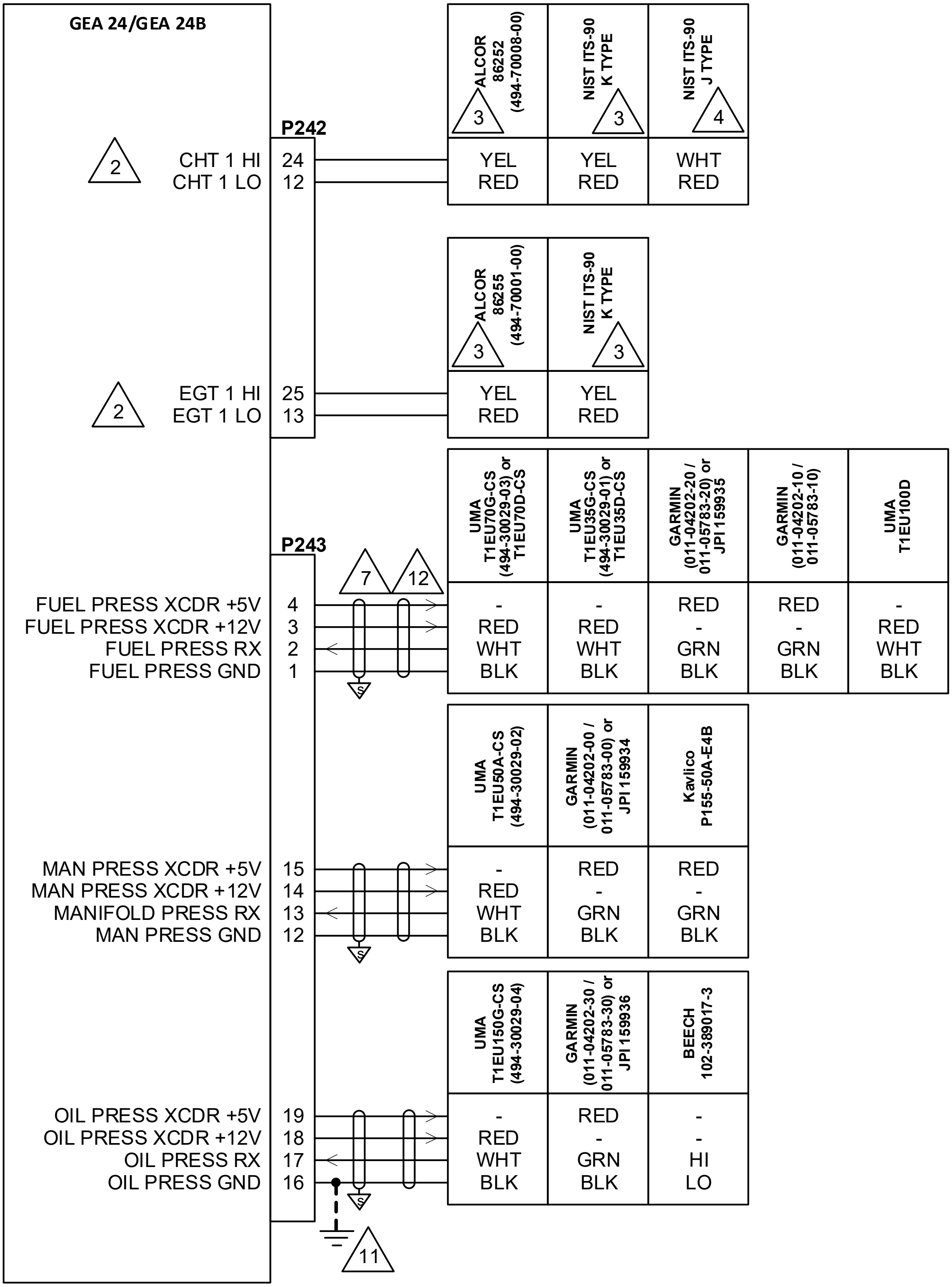


Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 1 of 9

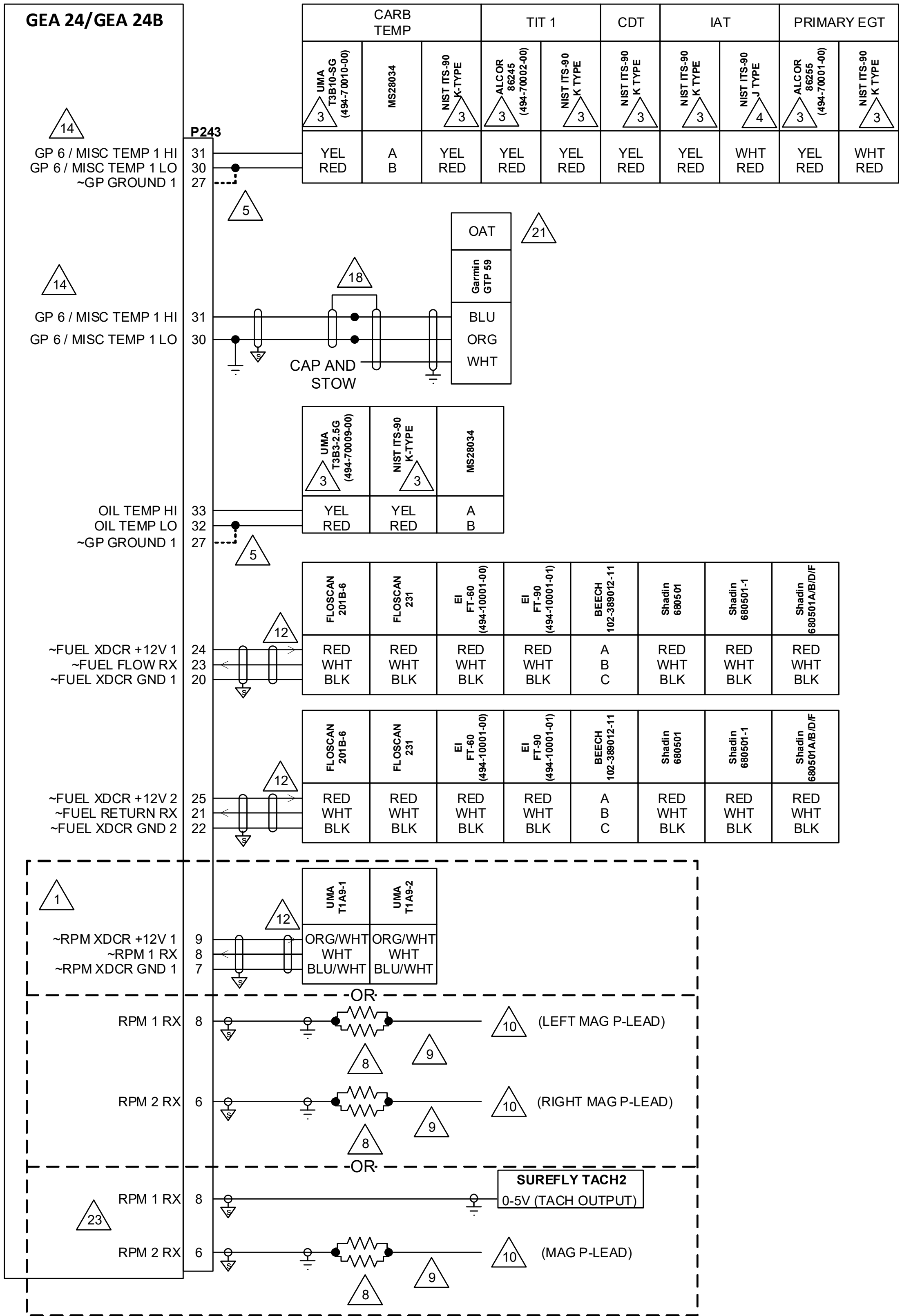


Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 2 of 9

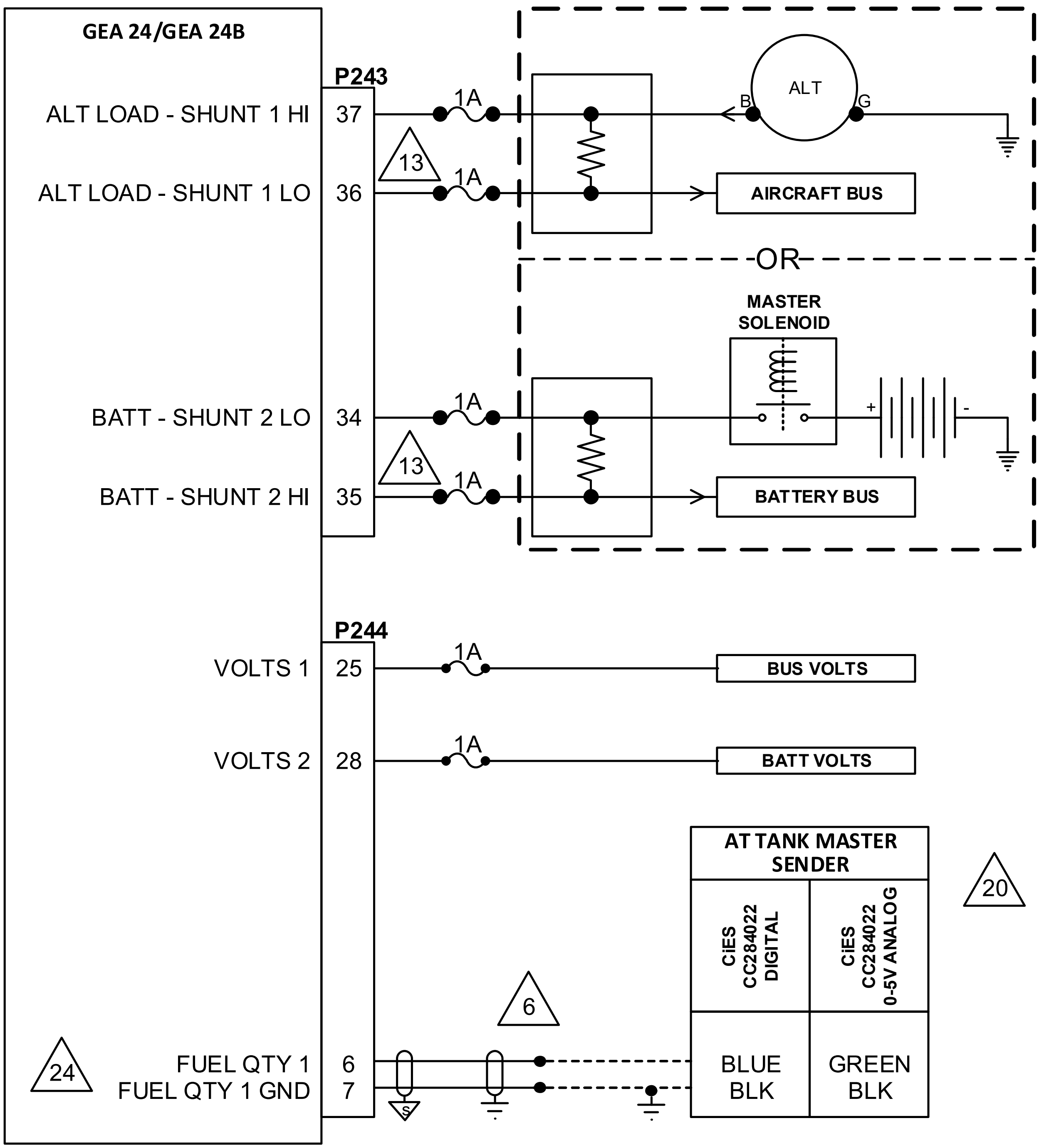


Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 3 of 9

GEA 24 AND GEA 24B USING EXISTING WIRING (REPLACING A GEA 24)

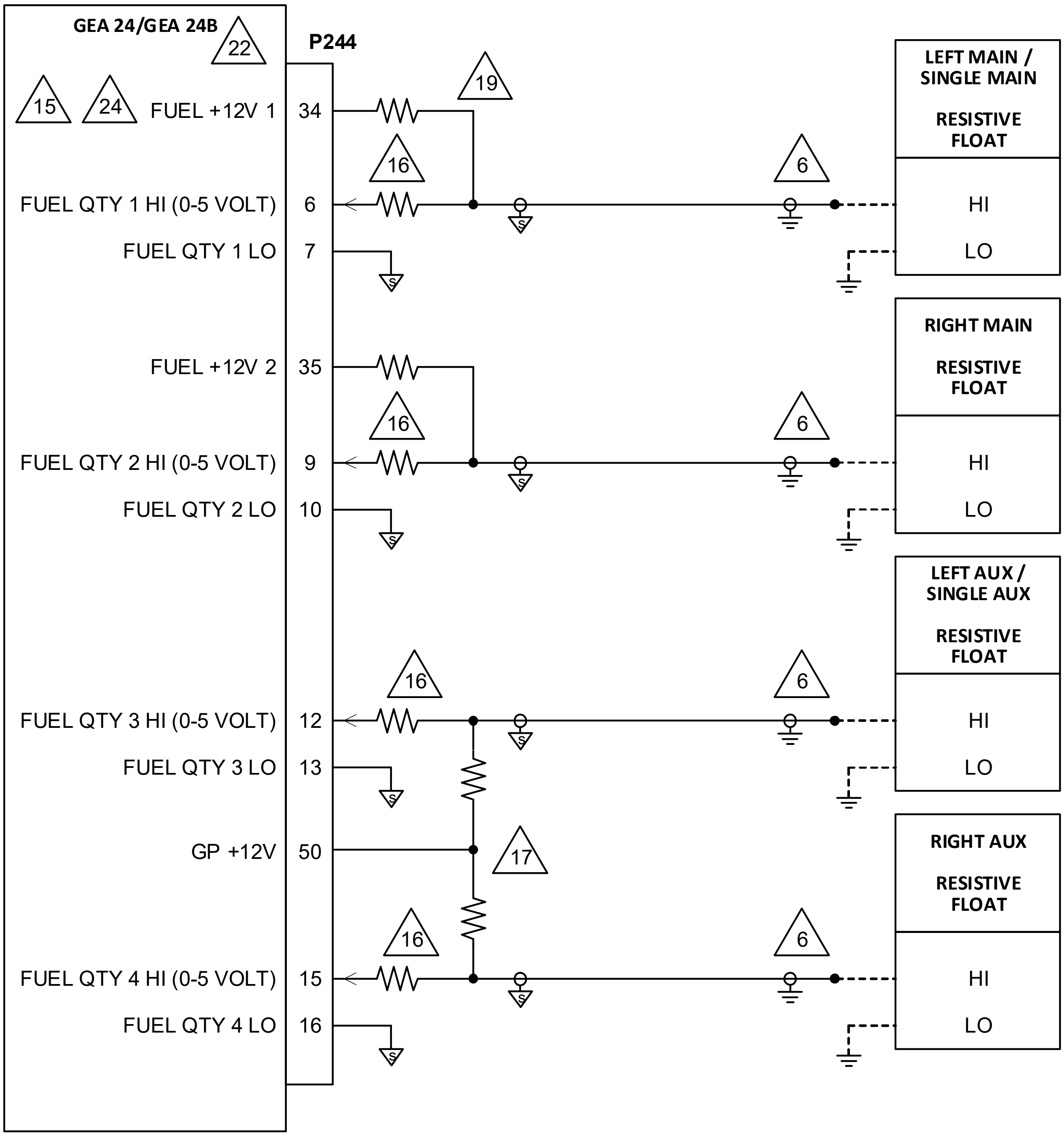


Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 4 of 9

GEA 24B NEW INSTALLATIONS

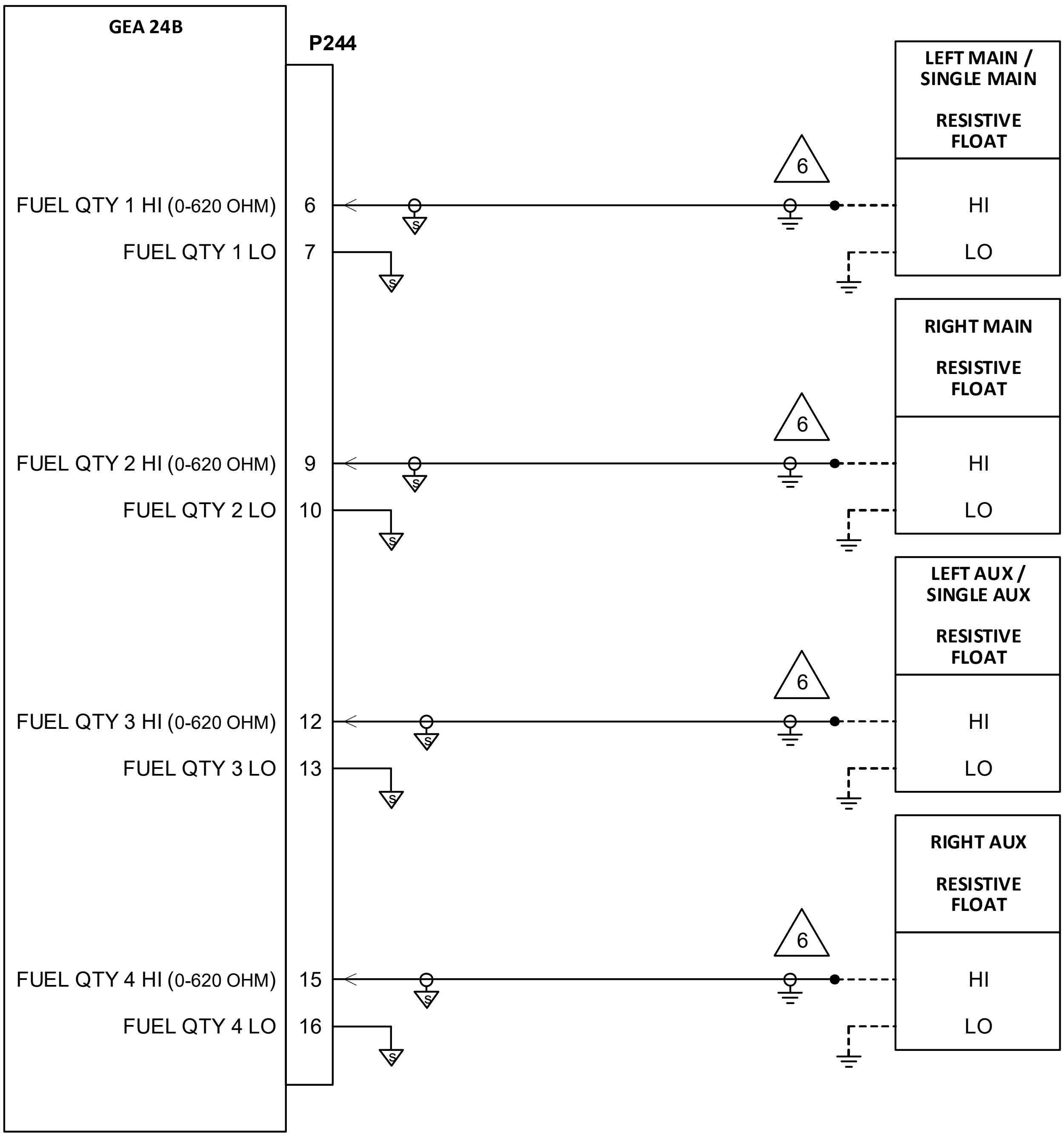


Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 5 of 9

NOTES

1. THERE ARE LIMITED PINS AVAILABLE FOR +5V, +10V, AND +12V TRANSDUCER EXCITATION. DEPENDING ON HOW MANY SENSORS ARE CONNECTED TO THE GEA, SPLICING SENSORS TO THE SAME EXCITATION VOLTAGE PIN MAY BE REQUIRED. USE ALL IDENTICAL FUNCTIONING PINS BEFORE SPLICING.

2. SINGLE CHANNEL SHOWN. IDENTICAL WIRING FOR CHANNELS 2-6. USE CHANNELS 1-4 FOR 4-CYLINDER CONFIGURATION, CHANNELS 1-6 FOR 6-CYLINDER CONFIGURATION, AND ONLY CHANNEL 1 FOR SINGLE CHT/EGT CONFIGURATION.

3. USE K-TYPE THERMOCOUPLE WIRE FOR EXTENSIONS.

4. USE J-TYPE THERMOCOUPLE WIRE FOR EXTENSIONS.

5. GEA GROUND PIN ONLY REQUIRED FOR MS28034 TEMP SENSOR..

6. EXISTING FUEL QTY WIRING MAY BE RE-USED. USE A STANDARD ENVIRONMENTAL CRIMP SPLICE TO EXTEND THE SIGNAL TO THE GEA, IF REQUIRED. ALL ADDITIONAL WIRING MUST BE SHEILDED AND BOTH SHEILD ENDS TERMINATED. THE SHEILD DRAIN LENGTH MUST BE AS SHORT AS PRACTICAL.

7. MATCH SHIELDING AS SHOWN. SELECT WIRE BASED ON CONDUCTORS REQUIRED AT TRANSDUCER.

8. USE TWO 820 KΩ, 1/4 WATT, -55 C TO +125 C RESISTORS. TWIST PARALLEL RESISTOR LEADS TOGETHER, SPLICE TO WIRES WITH ENVIRONMENTAL SPLICES, AND ENCAPSULATE SPLICES AND RESISTORS WITH ADHESIVE LINED POLYOLEFIN HEAT-SHRINKABLE TUBING.

9. DO NOT EXCEED 6-INCH LENGTH BETWEEN END OF RESISTOR AND CONNECTION TO MAGNETO OR IGNITION SWITCH.

10. CONNECT TO THE MAGNETO P-LEAD LUG. PERMISSIBLE TO USE IGNITION SWITCH INPUTS IF MAGNETO USES COMPRESSION TYPE CONNECTORS.

11. AIRCRAFT GROUND --- PIN ONLY REQUIRED FOR BEECH 102-389017-3.

12. DO NOT EXCEED 6-INCH LENGTH OF EXPOSED CORE WIRES BETWEEN END OF SHIELD AND TRANSDUCER. THE LENGTH OF NON-METALLIC TRANSDUCER DISCONNECTS, IF INSTALLED, MUST BE INCLUDED IN THIS LENGTH.

13. BOTH FUSES MUST BE THE SAME TYPE AND RATING.

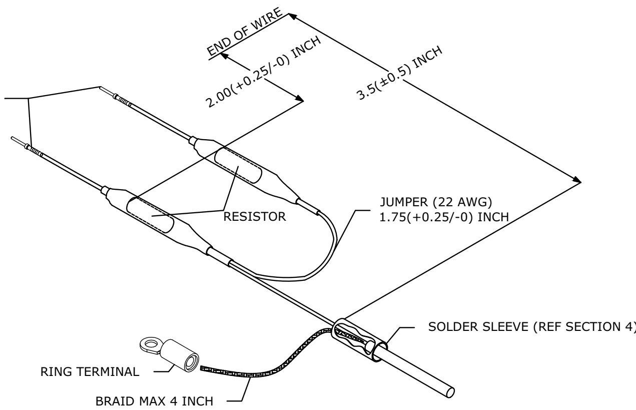
14. USE EITHER GP 6/MISC TEMP 1 OR GP 7/MISC TEMP 2 PORTS FOR TIT, CDT, IAT, OAT, AND PRIMARY EGT SENSORS. CARB TEMP SENSOR MUST BE CONNECTED TO GP 6/MISC TEMP 1.

15. WHEN USING THE DUAL 2.2K RESISTOR WIRING CONFIGURATION SHOWN IN THIS FIGURE, THE RESISTIVE FUEL PROBE MUST BE CONFIGURED AS A 0-5 VOLT SENSOR. THE RESISTIVE SENSOR CONFIGURATION MUST NOT BE USED FOR GEA 24. REFER TO APPENDIX C.

Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 6 of 9

NOTES CONTINUED

16

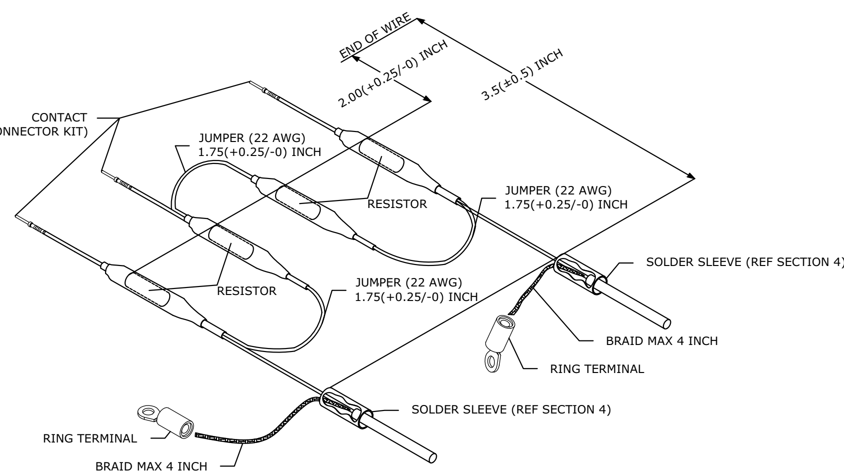


HARNESS BUILDUP PROCEDURE

1. BUILD RESISTOR ASSEMBLIES AS SHOWN IN NOTE 18.
2. COMPLETE RESISTOR ASSEMBLY AS SHOWN IN ABOVE FIGURE (I.E. CRIMP CONTACTS TO WIRES, TERMINATE SHIELD, ETC.).
   2.1. REFERENCE FIGURE B-8 SHEET 4 FOR COMPLETE FUEL QUANTITY WIRING CONNECTIONS.
3. SEE NOTE 18 FOR CABLE TIE PLACEMENT TO AVOID COMPONENT STRAIN.

SPLICE OF THE +12V OUTPUT IS ONLY REQUIRED FOR INSTALLATIONS INTERFACING TO TWO AUX TANKS WITH RESISTIVE PROBES.

17



HARNESS BUILDUP PROCEDURE

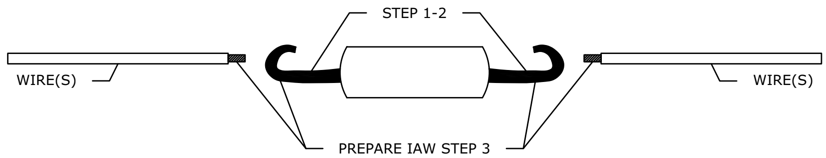
1. BUILD RESISTOR ASSEMBLIES AS SHOWN IN NOTE 18.
2. COMPLETE RESISTOR ASSEMBLY AS SHOWN IN ABOVE FIGURE (I.E. CRIMP CONTACTS TO WIRES, TERMINATE SHIELD, ETC.).
   2.1. REFERENCE FIGURE B-8 SHEET 4 FOR COMPLETE FUEL QUANTITY WIRING CONNECTIONS.
3. SEE NOTE 18 FOR CABLE TIE PLACEMENT TO AVOID COMPONENT STRAIN.

18 THE WIRING SUPPLIED WITH THE GTP 59 MAY BE EXTENDED IF THE SUPPLIED WIRE LENGTH IS NOT SUFFICIENT FOR A PARTICULAR INSTALLATION.

Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 7 of 9

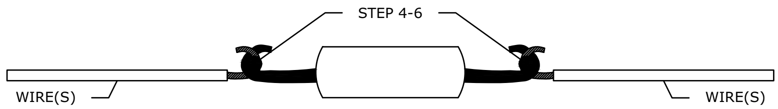
NOTES CONTINUED

FUEL QUANTITY RESISTOR BUILDUP PROCEDURE

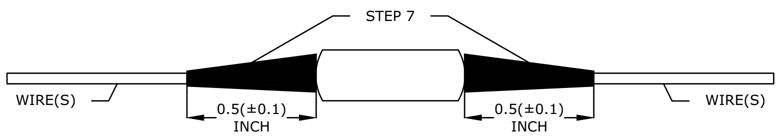


NOTE 1: FOR POTENTIAL FUEL QUANTITY RESISTORS P/N REFERENCE SECTION 3.1.2. ALL RESISTORS ARE REQUIRED TO BE THE SAME PART NUMBER.
NOTE 2: SAE AS4461 REVISION C OR A LATER APPROVED VERSION IS TO BE USED IN THIS PROCEDURE.

1. TRIM RESISTOR LEADS TO 0.25±(0.063) INCH.
2. CREATE A HOOK IN THE REMAINING LEAD ON THE RESISTOR. REFERENCE FIGURE 9 IN AS4461 FOR HOOK CREATION.
3. PREPARE RESISTOR LEAD AND STRANDED WIRE IAW AS4461 SECTION 4.8.



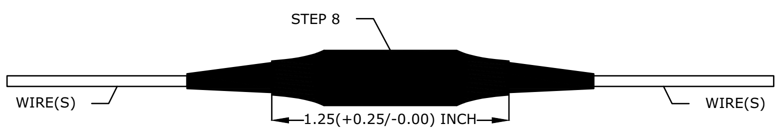
4. USE PROCEDURE IN AS4461 SECTION 5.1.6.1 ALONG WITH FIGURE 8 AND 9 GUIDANCE TO SOLDER RESISTOR LEAD TO STRANDED WIRE(S) AS SHOWN ABOVE. ACCEPTABLE SOLDER TYPES ARE Sn60 OR Sn63.
5. CLEAN FLUX RESIDUES IAW AS4461 SECTION 4.11.2.
6. INSPECT SOLDER JOINT IAW AS4461 SECTION 5.1, JOINT CAN BE REWORKED IAW AS4461 SECTION 4.11.1. IF REWORK IS REQUIRED, INSPECT JOINT AGAIN IAW AS4461 SECTION 5.1.



19

NOTE: DURING THE HEAT SHRINKING PROCESS ENSURE THE RESISTOR IS MINIMALLY EXPOSED TO DIRECT HEAT.

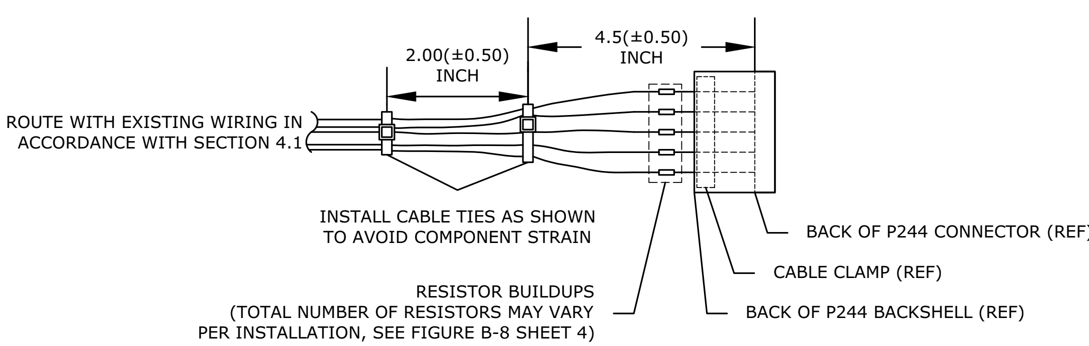
7. COVER SOLDER JOINTS IN 0.5(±0.1) INCH STANDARD HEAT SHRINK, REFERENCE SECTION 3.1.2 FOR P/N OF HEAT SHRINK. ENSURE THE HEAT SHRINK CONSTRICTS AROUND THE SOLDER JOINT AND CONNECTING WIRE.



NOTE: DURING THE HEAT SHRINKING PROCESS ENSURE THE RESISTOR IS MINIMALLY EXPOSED TO DIRECT HEAT.

8. COVER ASSEMBLY IN 1.25(+0.25/-0.00) INCH STANDARD HEAT SHRINK, CENTER HEAT SHRINK ON RESISTOR PRIOR TO SHRINKING. REFERENCE SECTION 3.1.2 FOR P/N OF STANDARD HEAT SHRINK. ENSURE THE HEAT SHRINK CONSTRICTS AROUND THE HEAT SHRINK INSTALLED ON THE SOLDER JOINTS.

GEA24 P244 CABLE TIE PLACEMENT



20

IN TANKS WHERE TWO OR MORE SENSORS ARE REQUIRED, THE MOST INBOARD SENSOR IS THE MASTER, AND THE OTHER SENDERS ARE SLAVES. SEE APPLICABLE CiES STC FOR MULTI-PROBE AND PWR/GND WIRING.

Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 8 of 9

NOTES CONTINUED

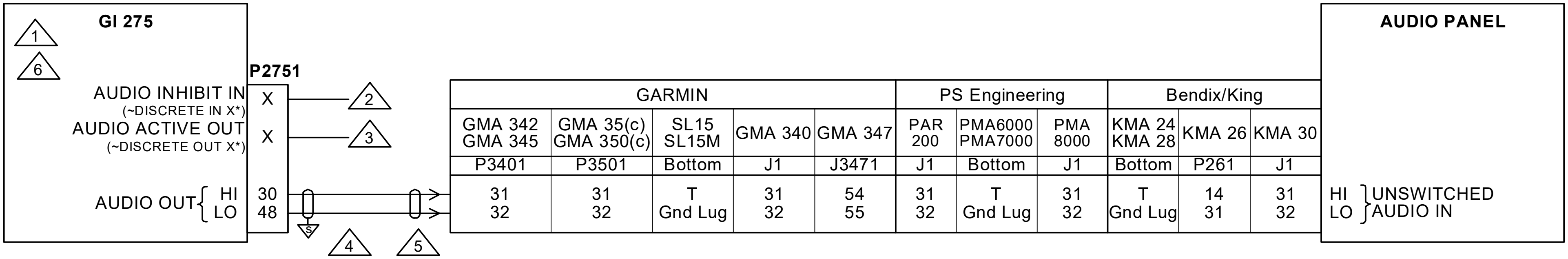
21 RESERVED.

22 FUEL QUANTITY WIRING USING THE DUAL 2.2K RESISTORS SHOWN ON SHEET 4 IS OPTIONAL FOR GEA 24B AND REQUIRED FOR GEA 24. FUEL QUANTITY WIRING SHOWN ON SHEET 5 IS ONLY APPROVED FOR GEA 24B. REFER TO SECTION 3.2.2 FOR MORE INFORMATION ON FUEL QUANTITY SENSOR INTERFACE WITH THE GEA 24 AND GEA 24B.

23 CONNECT SUREFLY TACH2 AND MAGNETO P-LEAD TO RPM RX 1 AND RPM RX 2 AS APPLICABLE DEPENDING ON WHICH SIDE THEY ARE INSTALLED ON.

24 SINGLE CHANNEL SHOWN. IDENTICAL WIRING FOR OTHER CHANNELS. USE THE DESIGNATED GEA INPUT DEPENDING ON THE FUEL TANK. USE FUEL QTY 1 FOR LEFT MAIN, FUEL QTY 2 FOR RIGHT MAIN, FUEL QTY 3 FOR LEFT AUX, AND FUEL QTY 4 FOR RIGHT AUX.

Figure B-6 GEA 24(B) Sensor Interconnect
Sheet 9 of 9



GARMIN					PS Engineering			Bendix/King		
GMA 342 GMA 345	GMA 35(c) GMA 350(c)	SL15 SL15M	GMA 340	GMA 347	PAR 200	PMA6000 PMA7000	PMA 8000	KMA 24 KMA 28	KMA 26	KMA 30
P3401	P3501	Bottom	J1	J3471	J1	Bottom	J1	Bottom	P261	J1
31	31	T	31	54	31	T	31	T	14	31
32	32	Gnd Lug	32	55	32	Gnd Lug	32	Gnd Lug	31	32

NOTES

1. FOR MULTIPLE GI 275 INSTALLATIONS, ONLY CONNECT THE AUDIO OUTPUT AND ASSOCIATED DISCRETE FROM ONE GI 275. LEAVE THE AUDIO OUTPUT AND DISCRETES FROM OTHER GI UNITS UNCONNECTED.

2. USE THE AUDIO INHIBIT IN DISCRETE INPUT TO INHIBIT GDU GI 275 AURAL ALERTS WHEN A HIGHER PRIORITY SYSTEM IS PLAYING AUDIO MESSAGES.

3. USE THE AUDIO ACTIVE OUT DISCRETE OUTPUT TO INHIBIT AURAL ALERTS FROM LOWER PRIORITY SYSTEMS WHENEVER THE GI 275 IS PLAYING AUDIO MESSAGES.

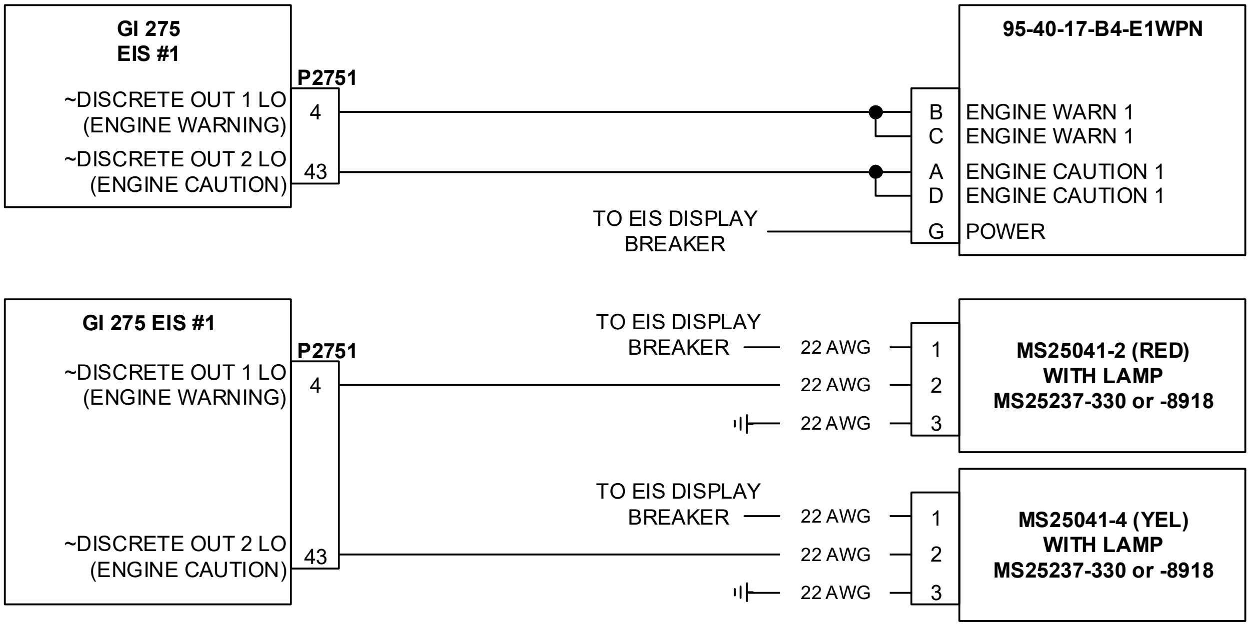
4. IT IS ACCEPTABLE TO USE OTHER AVAILABLE UNSWITCHED, UNMUTED PORTS. IF AUDIO PANEL DOES NOT HAVE AN AVAILABLE UNSWITCHED INPUT, AUDIO FROM GI 275 MUST BE MIXED WITH AN EXISTING AUDIO SOURCE USING RESISTORS TO ISOLATE THE AUDIO OUTPUT FROM EACH LRU. A TYPICAL VALUE FOR MIXING RESISTORS IS 390Ω 1/4 W. THE AUDIO LEVELS OF EXISTING AUDIO SOURCES WILL HAVE TO BE RE-EVALUATED AFTER MIXING RESISTORS ARE INSTALLED.

5. SHIELDING BETWEEN THE GI 275 AND AUDIO PANEL SHOULD ONLY BE GROUNDED AT THE GI 275. DO NOT GROUND THE SHIELD AT THE AUDIO PANEL.

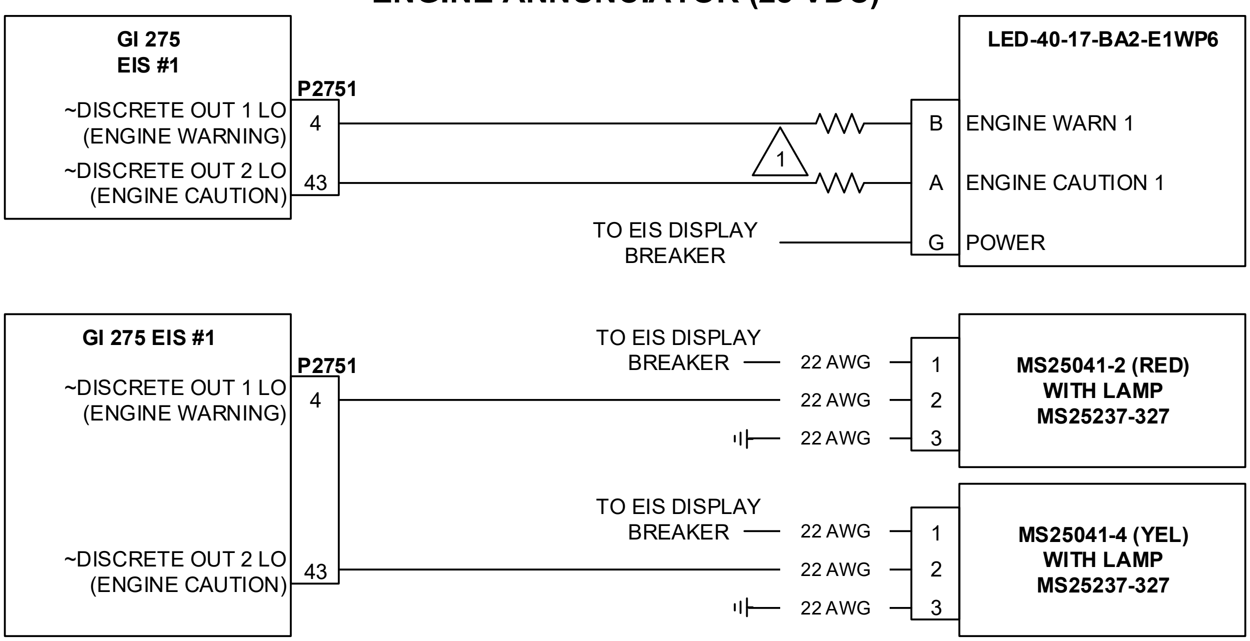
6. NOT USED.

Figure B-7 Audio Interconnect

ENGINE ANNUNCIATOR (14 VDC)



ENGINE ANNUNCIATOR (28 VDC)

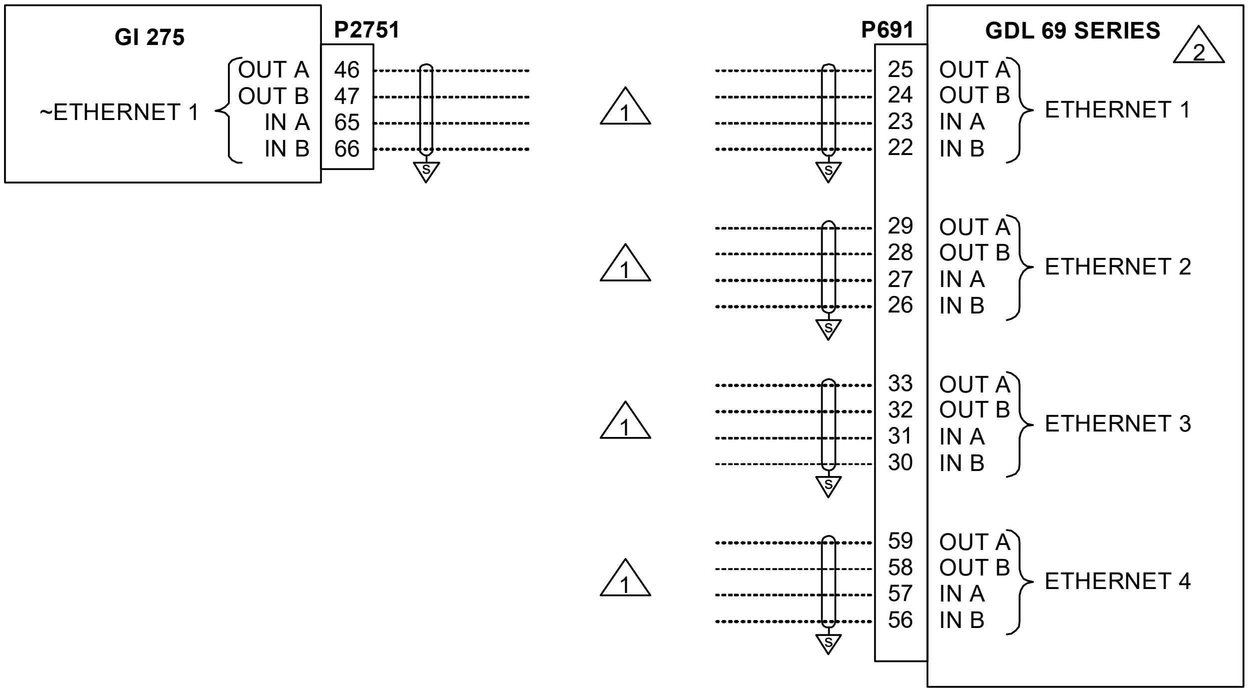


NOTES

1. USE 47Ω, 1/4 WATT RESISTOR.

2. IF AN ENGINE ANNUNCIATOR IS REQUIRED FOR INSTALLATION IN A MULTI-ENGINE AIRCRAFT, MAKE THE CONNECTIONS TO EIS #1 ONLY. THE LEFT-MOST ENGINE (FROM THE PILOT'S POINT-OF-VIEW) SHOULD BE CONFIGURED AS EIS #1.

Figure B-8 Annunciators

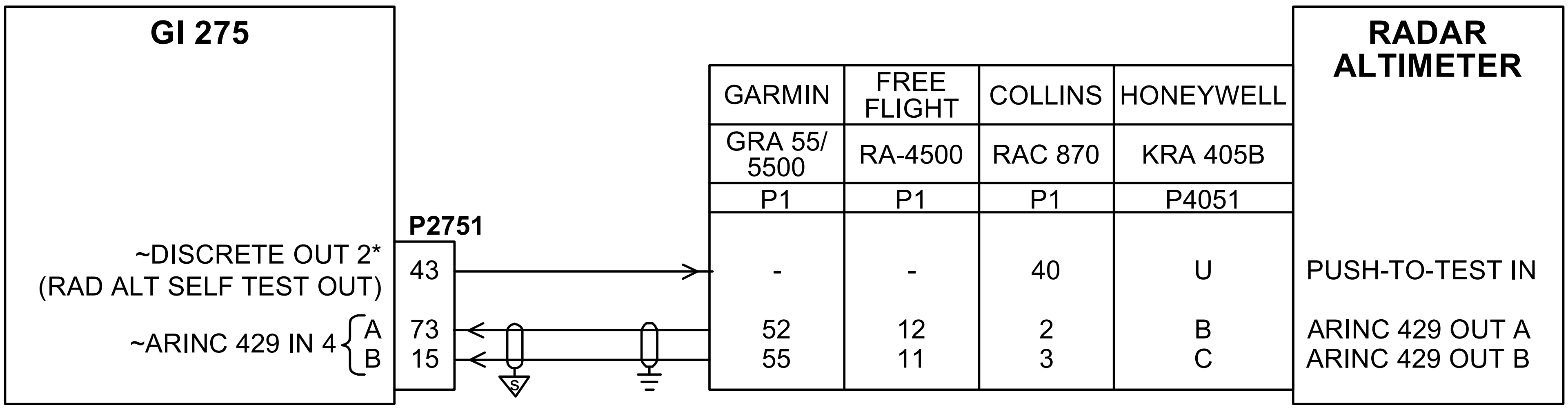


NOTES

1. REFERENCE SECTION 3.2.5 FOR HSDB ARCHITECTURE.

2. ONLY THE SECOND GENERATION GDL 69/69A SXM MODELS ARE COMPATIBLE WITH THE GI 275.

Figure B-9 GDL 69 Series Interconnect



GARMIN	FREE FLIGHT	COLLINS	HONEYWELL
GRA 55/ 5500	RA-4500	RAC 870	KRA 405B
P1	P1	P1	P4051
-	-	40	U
52	12	2	B
55	11	3	C

Figure B-10 Radar Altimeter Interconnect

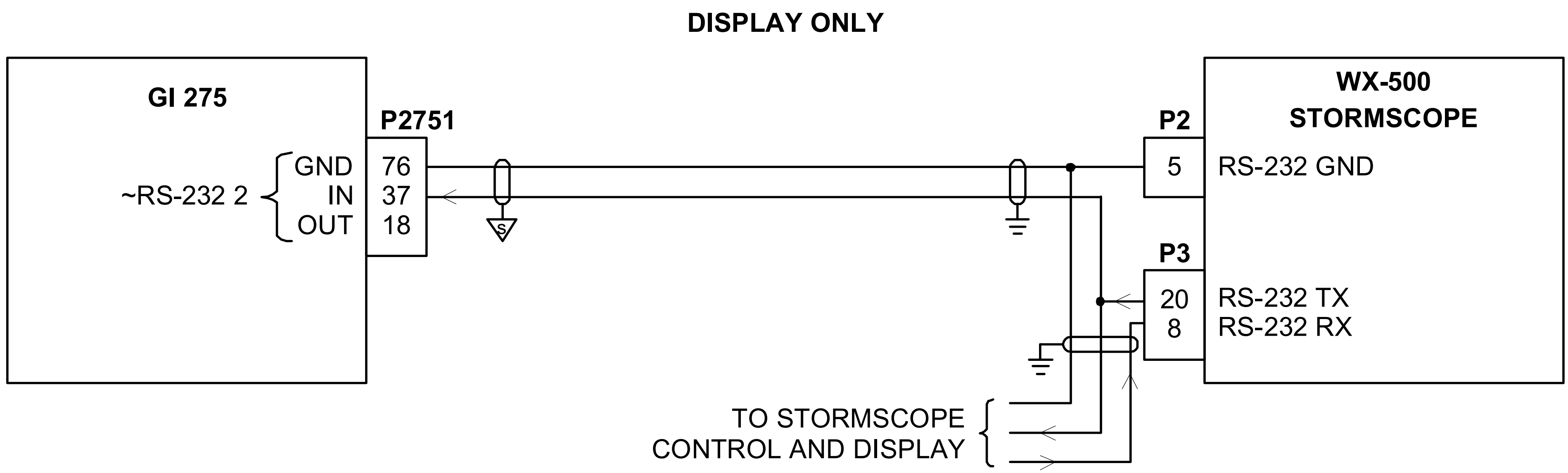


Figure B-11 Stormscope Interconnect

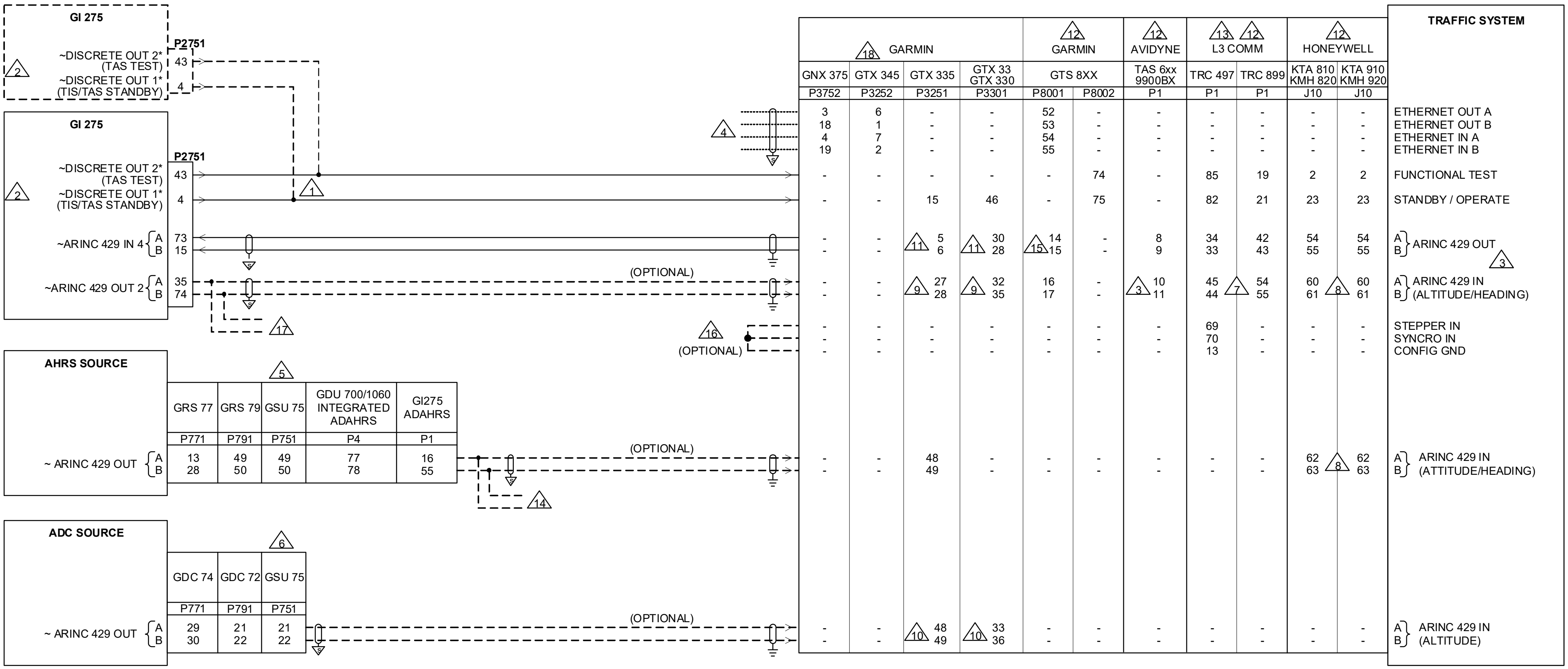


Figure B-12 Traffic Advisory System Interconnect
Sheet 1 of 3

NOTES

1. FOR HONEYWELL TRAFFIC SYSTEMS, DO NOT SPLICE “TAS TEST” OR “TIS/TAS STANDBY”.

2. TAS TEST AND TIS/TAS STANDBY DISCRETE CONNECTIONS ARE ONLY REQUIRED IF THE GI 275 IS INTERFACED USING ARINC 429 AND CONFIGURED FOR “CONTROL TRAFFIC”. DISCRETE CONNECTIONS ARE NOT REQUIRED FOR HSDB CONNECTION.

3. FOR THE TCAD TO ACCEPT ARINC 429 HEADING AND ALTITUDE, PROCESSOR P/N 70-2420-5 OR LATER IS REQUIRED. THE BUS SPEED MUST BE THE SAME FOR ARINC 429 RX 1 AND RX 2.

4. REFER TO SECTION 3.2.5 FOR HSDB ARCHITECTURE.

5. USE ONLY AHRS OR ADAHRS OUTPUT OF GSU 75.

6. USE ONLY ADC OUTPUT OF THE GSU 75.

7. IF DESIRED, ALTITUDE AND HEADING MAY BE PROVIDED BY THE GI 275 TO THE SKYWATCH SYSTEM. ANY AVAILABLE ARINC 429 INPUTS ON THE TRAFFIC COMPUTER MAY BE USED IF THOSE SHOWN ARE ALREADY USED. THE TRAFFIC SYSTEM MAY HAVE TO BE CONFIGURED TO ACCEPT ALTITUDE AND HEADING VIA ARINC 429 (LOW-SPEED). REFER TO THE MANUFACTURER’S INSTALLATION MANUAL FOR ADDITIONAL INFORMATION.

8. IF DESIRED, ALTITUDE, ATTITUDE, AND HEADING MAY BE PROVIDED BY THE GI 275 TO THE HONEYWELL TRAFFIC SYSTEM. THE HONEYWELL TRAFFIC SYSTEM WILL NOT ACCEPT HEADING/ATTITUDE AND ALTITUDE ON A SINGLE ARINC 429 INPUT. CONSEQUENTLY, HEADING/ATTITUDE (HIGH-SPEED) AND ALTITUDE (LOW-SPEED) MUST BE PROVIDED TO SEPARATE INPUTS. THE TRAFFIC SYSTEM MUST BE CONFIGURED TO ACCEPT ARINC 429 ALTITUDE, HEADING, AND ATTITUDE. REFER TO THE MANUFACTURER’S INSTALLATION MANUAL FOR ADDITIONAL INFORMATION.

9. IF DESIRED, ALTITUDE, TEMPERATURE, HEADING, SPEED, AND SELECTED COURSE INFORMATION MAY BE PROVIDED BY THE GI 275 TO THE TRANSPONDER.

10. IF THE GI 275 IS THE ONLY ALTITUDE SOURCE FOR THE GTX, IT IS RECOMMENDED THAT THE GTX ALSO BE CONNECTED DIRECTLY TO AN EXTERNAL AIR DATA SOURCE SO THAT THE TRANSPONDER WILL CONTINUE REPORTING ALTITUDE IN THE EVENT OF A GI 275 FAILURE.

11. IF ANOTHER TRAFFIC SOURCE IS WIRED TO THE GI 275, DO NOT WIRE THE GTX ARINC OUTPUT TO THE GI 275.

12. DO NOT WIRE TO THE GI 275 IF A GTX 345 IS INSTALLED. THESE TRAFFIC SYSTEMS MUST BE WIRED IN ACCORDANCE WITH THE GTX 345 INSTALLATION MANUAL FOR PROPER CORRELATION AND DISPLAY.

13. TRC 497 SOFTWARE v1.6 OR HIGHER IS REQUIRED.

Figure B-12 Traffic Advisory System Interconnect
Sheet 2 of 3

NOTES CONTINUED

14 SPLICE WITH WEATHER RADAR STABILIZATION OUTPUT (IF INSTALLED) IS ALLOWED.

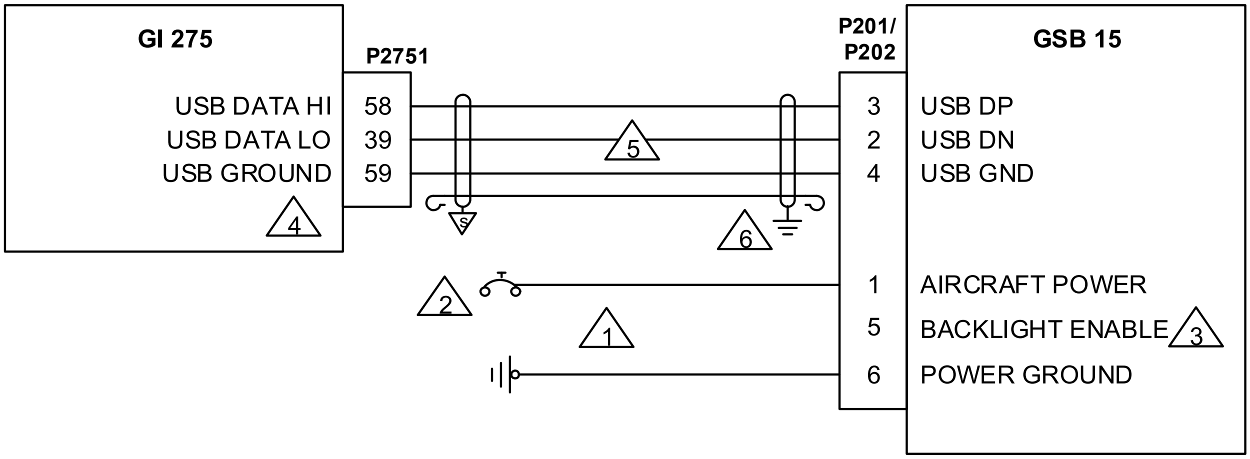
15 ARINC OUT TO THE GI 275 IS NOT USED IF CONNECTED VIA ETHERNET.

16 THESE STRAPS SET THE HEADING INPUT SOURCE TO ARINC 429. REFER TO THE MANUFACTURER'S INSTALLATION MANUAL FOR ADDITIONAL STRAPPING INFORMATION.

17 SPLICE WITH GPS NAVIGATOR ARINC OUTPUT (IF INSTALLED) IS ALLOWED.

18 THE HSDB CONNECTION TO THE GTX 345 SHOWN HERE ALSO PROVIDES THE TRANSPONDER CONTROL INTERFACE, IF APPLICABLE.

Figure B-12 Traffic Advisory System Interconnect
Sheet 3 of 3



NOTES

1
- GSB 15 DUAL TYPE-A UNITS (P/NS 011-04937-00, -01) USE 20 OR 22 AWG FOR POWER AND POWER GROUND WIRES, 25 FT MAX.
- GSB 15 TYPE-A & TYPE-C (P/NS 011-04937-20, -30) AND GSB 15 DUAL TYPE-C (P/NS 011-04937-40, -50) UNITS INSTALLED IN 28V AIRCRAFT, USE 20 OR 22 AWG FOR AIRCRAFT POWER AND POWER GROUND WIRES, 25FT MAX.
- GSB 15 TYPE-A & TYPE-C (P/NS 011-04937-20, -30) AND GSB 15 DUAL TYPE-C (P/NS 011-04937-40, -50) UNITS INSTALLED IN 14V AIRCRAFT, USE 20 AWG FOR AIRCRAFT POWER AND POWER GROUND WIRES, 8FT MAX. IF LONGER WIRE LENGTH IS NEEDED, USE 16 AWG FOR AIRCRAFT POWER AND GROUND WIRES, 13FT MAX, SPLICED TO 2FT MAX 20 AWG POWER AND GROUND WIRES AT GSB 15 CONNECTOR.

2 THE GSB 15 IS APPROVED TO UTILIZE A 5 AMP FUSE OR CIRCUIT BREAKER OR A 7.5 AMP FUSE OR CIRCUIT BREAKER. REFER TO SECTION 3.2.1 FOR BREAKER AND FUSE SIZING, BUSSING, AND LABELING.

3 TO DISABLE BACKLIGHT, GROUND THE BACKLIGHT ENABLE PIN. USE 22 AWG WIRE.

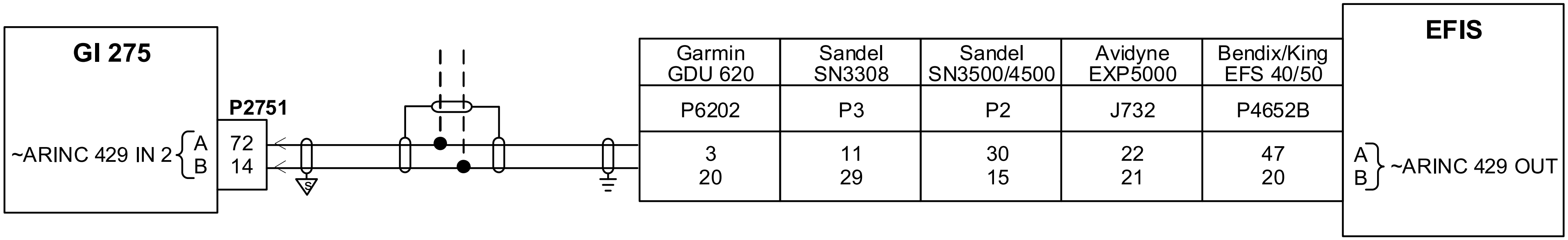
4 PIN 78 ON CONNECTOR P2751 SHOULD NOT BE CONNECTED. WHEN REPLACING A USB PIGTAIL WITH THE GSB 15, LEAVE THE PIN NOT CONNECTED.

5 MUST USE ETHERNET CABLE. REFER TO TABLE 3-5 FOR APPROVED CABLES.

6 TERMINATE SHIELDING 2.5 INCHES FROM THE GSB 15 CONNECTOR. GROUND GSB 15 SIDE TO RING TERMINAL PER SECTION 4.4.2.

7 USB DATA CABLES MUST BE 10 FEET LONG OR LESS.

Figure B-13 GSB 15 Interconnect



NOTES

1 ARINC 429 COURSE SELECT INTERFACE ALLOWS THE GI 275 TO SLAVE THE SELECTED COURSE FROM AN EXTERNAL SOURCE WHEN COURSE SELECTION IS DISABLED. REFER TO SECTION 5.5.7 FOR CONFIGURING COURSE SELECTION.

Figure B-14 ARINC 429 Course Select Interconnect

Fuel Quantity Probe Relay Options – Remote Aircraft Status (RAS)

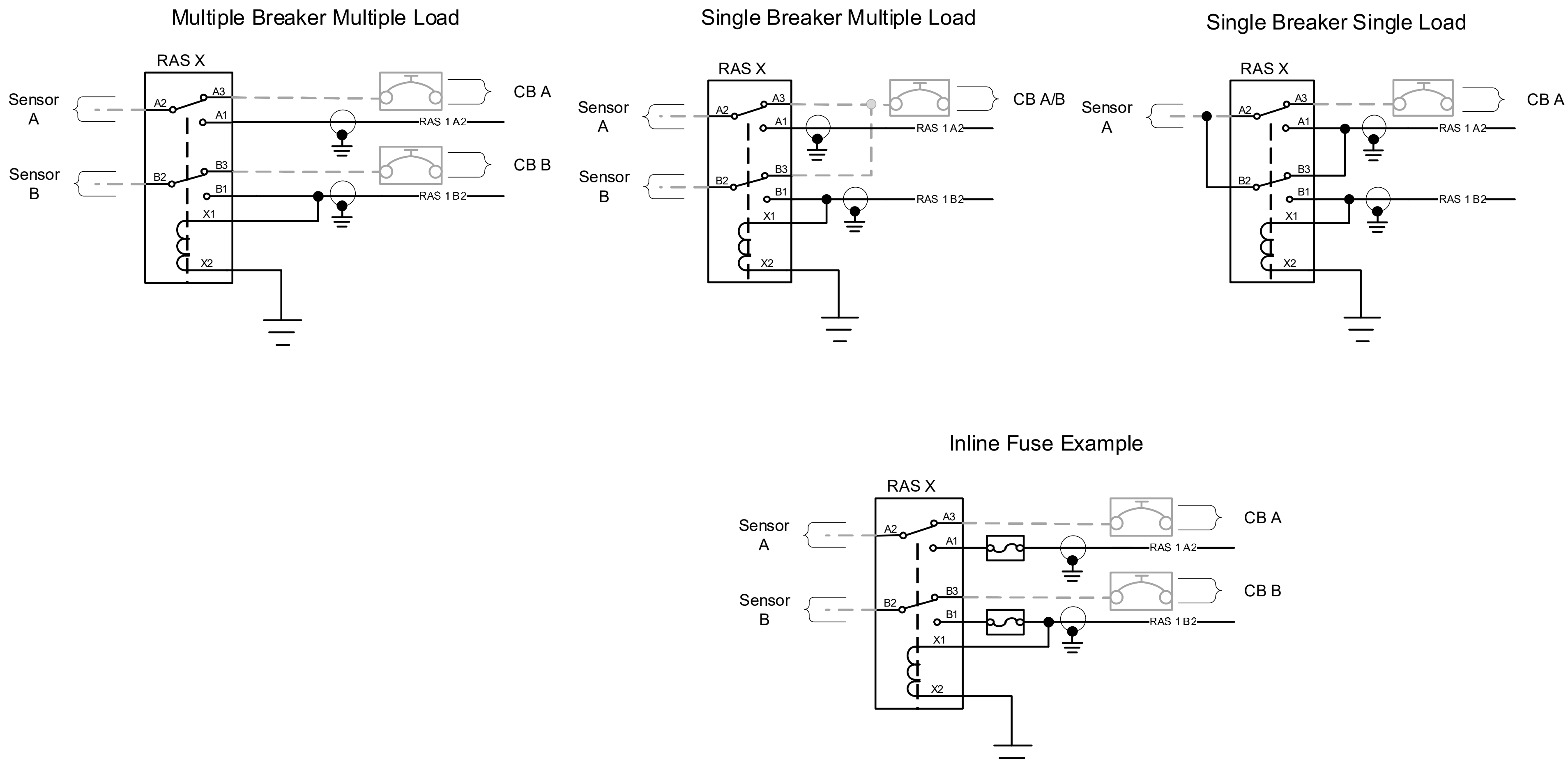


Figure B-15 GDL 60 Remote Aircraft Status Interconnect
Sheet 1 of 3

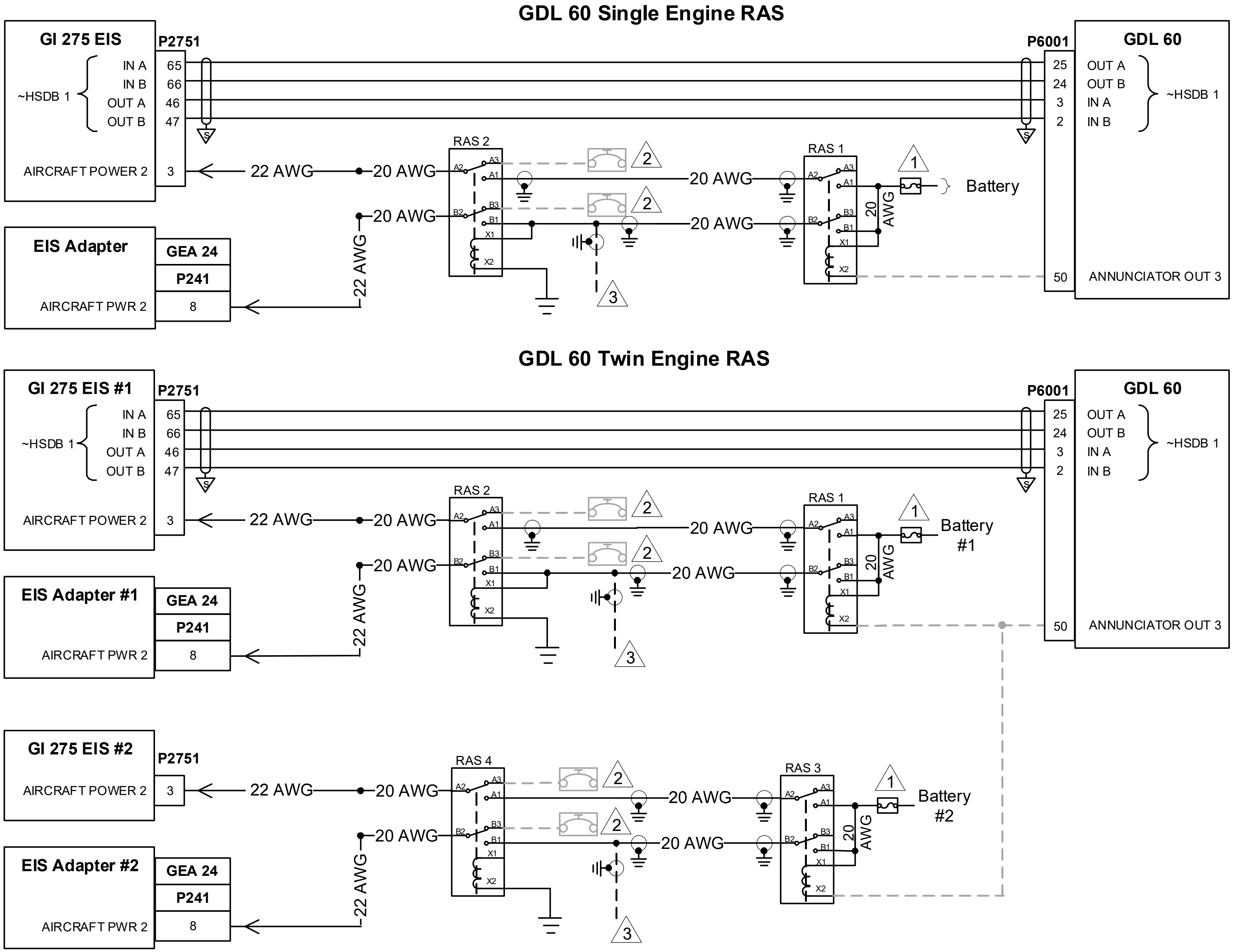


Figure B-15 GDL 60 Remote Aircraft Status Interconnect
Sheet 2 of 3

NOTES

1 INSTALL 5 AMP FUSE AS CLOSE AS PRACTICAL TO THE BATTERY.

2 EXISTING POWER IN 2 WIRING MAY BE RE-USED. IF NO POWER IN 2 WIRING EXISTS FOR THE GI 275 OR THE GEA, CONNECT TO THE UNITS EXISTING POWER IN 1 CIRCUIT BREAKER.

3 ADDITIONAL LOADS FOR FUEL QUANTITY SENSORS MAY BE ADDED USING THE SECOND TIER RELAY WIRING SHOWN ON SHEET 1.

4 SPLICES WITHIN 6 INCHES OF RELAY/LRU PIN.

5 THE GDL 60 MUST BE DIRECTLY CONNECTED TO A GI 275 EIS UNIT VIA HSDB FOR REMOTE AIRCRAFT STATUS FUNCTIONALITY.

6 EXISTING SENSOR WIRING SHOWN IN GRAY DASHED LINES.

7 SENSOR A/B AND CB A/B REPRESENT ANY GIVEN CIRCUIT FROM BREAKER TO THE FUEL QUANTITY SENSOR. THE LOAD CAN BE ANY FUEL QUANTITY PROBE THAT IS NOT POWERED DIRECTLY FROM THE GEA.

8 UNLESS OTHERWISE SPECIFIED, USE A MINIMUM OF 22 AWG WIRE GAUGE FOR NEW WIRING. FOR WIRE LENGTHS LONGER THAN 20 FEET, REFER TO AC 43.13-1B CHAPTER 11 TO DETERMINE APPROPRIATE WIRE GAUGE.

9 WHEN UTILIZING EXISTING SENSOR/LRU WIRING OF LESS THAN 22 AWG, PLACE AN INLINE FUSE UPSTREAM OF THE RELAY THAT IS THE SAME RATING AS THE ORIGINAL CIRCUIT. SEE INLINE FUSE EXAMPLE.

Figure B-15 GDL 60 Remote Aircraft Status Interconnect
Sheet 3 of 3

APPENDIX C EQUIPMENT COMPATIBILITY AND CONFIGURATION

CAUTION

This manual only approves the installation of the GI 275 Base (including backup battery and backup GPS antenna), GSB 15, and GEA 24(B) (including EIS annunciator(s) and engine sensors). Other compatible LRUs listed in Appendix C must use other installation approvals and may require installation and/or configuration by an authorized Garmin dealer.

The equipment listed in this appendix is compatible with the GI 275 system when configured as described in the following sections. For GI 275 configuration information, refer to Section 5.5.

Table C-1 LRU Interface Summary

Interfaced LRU	Min. Software Needed	Primary Functions
GDL 69/69A SXM	v5.51	• Weather data
GPS 175	v2.02	• ADS-B GPS position • GPS NAV source
GNX 375	v2.02	• ADS-B GPS position • Traffic and weather data • GPS NAV source
GNC 355	v3.01	• ADS-B GPS position • GPS NAV source
GTN 6XX/7XX	v6.70	• ADS-B GPS position • GPS/VHF NAV source
GTN Xi	v20.10 [2]	• ADS-B GPS position • GPS/VHF NAV source
GTS 8X5	v3.13	• ADS-B GPS position • TAS traffic source
GTS 8X0	v4.13	• ADS-B GPS position • TAS traffic source
GTX 33X	v2.52	• TIS-A traffic source
GTX 3X5	Main: v2.52 ADS-B: v3.12	• ADS-B GPS position • Serial altitude • ADS-B traffic source • Weather data (GTX 345 only) • Mode 3 transponder control (GTX 345 only) [1]
L-3 Communications SKY 497	v1.6	• TAS traffic source
GEA 24	v3.60	• EIS
GEA 24B	v2.10	• EIS

Notes:

[1] GTX 345 Main v2.60 and ADS-B v3.21 software versions are required for Transponder Control functionality.

[2] GI 275 software v2.60 or later requires GTN Xi software v20.30 or later.

C.1 GPS Source

The GPS position sources listed in Table C-2 are compatible with the GI 275.

Table C-2 Compatible GPS Position Source

Mfr	Model	Data Format	Interfacing Equipment Configuration Information		Notes
Garmin	Other GI 275	HSDB			Crossfills data from a different GI 275 interfaced to a GPS source.
	Internal VFR GPS		***Interfaces*** page	VFR GPS: Internal	Internal VFR GPS must install antenna per Section 4.5.1. [1]
	GNS 4XXW GNS 5XXW	ARINC 429 RS-232	***Main ARINC 429 Config*** page	IN 1: Low, Garmin GDU OUT: High, GAMA 429 SDI: LNAV 1 (for GPS 1) LNAV 2 (for GPS 2) VNAV: Enable Labels	If a GNS 500W TAWS unit is installed, it must be connected as GPS 1. ***Main CDI/OBS Config*** page is only available on GNS 430W/430AW and GNS 530W/530AW. Main software v3.30 or later is required.
			Main RS-232 Config page	CHNL 1: INPUT: Off OUTPUT: MapMX	
			Main CDI/OBS Config page	**Menu** key > Ignore CDI Key? > Yes	
	GNS 480	ARINC 429 RS-232	***Serial Setup*** page	CH 1: RX: MapMX TX: MapMX	GNS 480 can only be connected to RS-232 ports 1 or 2 on the GI 275.
			ARINC 429 Setup page	CH 2 IN: SEL: Garmin GDU SPEED: Low SDI: Sys 1 (for GPS 1) Sys 2 (for GPS 2) CH 1 OUT: SEL: GAMA 429	
			Miscellaneous Setup page	CDI SELECT: IGNORE	
	GTN 6XX GTN 7XX	HSDB	***Interfaced Equipment*** page	Set GDU to *Present*. Set the format to *GI 275* for each installed GI 275.	Software v6.70 or later required. For GI 275 software v2.60 or later, Database Sync is only supported with GTN 6XX/7XX software v6.73 or later.
			Main Indicator (Analog) Configuration page	CDI Key: Disabled or Enabled [2]	
	GTN Xi	HSDB	***Interfaced Equipment*** page	Set GDU to *Present*. Set the format to *GI 275* for each installed GI 275.	Software v20.10 or later required.
			Main Indicator (Analog) Configuration page	CDI Key: Disabled or Enabled [2]	

Mfr	Model	Data Format	Interfacing Equipment Configuration Information		Notes
Garmin	GTX 3X5	RS-232	***RS-232 Interface*** page	ADS-B + FORMAT2	Main SW v2.52 or later required. ADS-B SW v3.12 or later required. [1]
	GPS 175	HSDB	***Interfaced Equipment*** page	Set GDU to *Present*.	Software v2.02 or later required.
	GNX 375	HSDB	***Interfaced Equipment*** page	Set GDU to *Present*.	Software v2.02 or later required.
	GNC 355	HSDB	***Interfaced Equipment*** page	Set GDU to *Present*.	Software v3.01 or later required.

Notes:

[1] Does not provide precision GPS approach guidance.

[2] Enabling the CDI Key on a GTN Xi requires GI 275 software v3.00 or later.

C.2 VHF Navigation Receiver

The VHF navigation receivers listed in Table C-3 are compatible with the GI 275. For a list of analog navigation receivers compatible with the GI 275, refer to Appendix Section C.3.

Table C-3 Compatible VHF Navigation Receiver

Mfr	Model	Data Format	Interfacing Equipment Configuration Information		Notes
Garmin	Other GI 275	HSDB			Crossfills data from a different GI 275 interfaced to a NAV source.
	GNC 255	RS-232	***Serial Port*** page	IO MODE: NMEA	Can be NAV 1, NAV 2, or both.
			CDI Indicator page	When GI 275 NAV CDI is desired to be driven by a “standard CDI” connected to the GNC 255, set TYPE: RESOLVER.	
				When GI 275 NAV CDI is desired to be set via the GI 275 interface, set TYPE: SERIAL.	
				When GI 275 NAV CDI is desired to be set via the GI 275 interface and/or the GNC 255 display, set TYPE: NONE.	
	GNS 430W/430AW GNS 530W/530AW	ARINC 429	***VOR/LOC/GS ARINC 429 Config*** page	SPEED: TX: Low SDI: VOR/ILS 1 (for NAV 1) VOR/ILS 2 (for NAV 2)	Can be NAV 1, NAV 2, or both.
	GNS 480 (CNX80)	ARINC 429	***ARINC 429 Setup*** page	CH OUT 2: SEL: VOR/ILS SPEED: Low SDI: Sys 1 (for NAV 1) Sys 2 (for NAV 2)	Can be NAV 1, NAV 2, or both.
	GTN 650 GTN 750	HSDB	***HSDB Port Utilization*** page	Ethernet Port ( ): Connected	Software v6.70 or later required. Can be NAV 1, NAV 2, or both.
	GTN Xi	HSDB	***HSDB Port Utilization*** page	Ethernet Port ( ): Connected	Software v20.10 or later required. Can be NAV 1, NAV 2, or both.

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Garmin	SL30	RS-232	With no external CDI connected to SL30, set INDICATOR HEAD TYPE: SERIAL.	Can be NAV 1, NAV 2, or both. Software v1.3 or later required.
			With external “standard CDI” connected to SL30, set INDICATOR HEAD TYPE: RESOLVER.	
			With external “composite CDI” connected to SL30, set INDICATOR HEAD TYPE: SERIAL.	

C.3 Analog Navigation Receiver

Interface to analog navigation receivers not listed in Table C-4 can still be approved under the GI 275 if **all** of the following conditions are met:

- The navigation receiver is approved to TSO C36( ) (Localizer), TSO C40( ) (VOR), and optionally TSO C34( ) (Glideslope) if the glideslope is used.
- If the glideslope is being used, the navigation receiver has a glideslope low-level flag output.
- The installation of the navigation receiver was previously FAA-approved.
- The calibration procedure for the analog navigation receiver described in Section 5.8.1 and the ground check in Section 6.4.2.2 have successfully been completed.

NOTE

The GI 275 is an EZ zeroed resolver at 0 degrees.

Table C-4 Compatible Analog Navigation Receiver

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Collins	VIR-32/33	Composite Analog		Can be NAV 1, NAV 2, or both.
Garmin	GNS 4XX/5XX GNS 4XXW/5XXW	Composite Analog		Can be NAV 1, NAV 2, or both. This interface only supports NAV, not GPS. It is recommended to connect and configure per Table C-3.
	GTN 6XX/7XX	Composite Analog		
	GTN Xi	Composite Analog		
Honeywell (Bendix/King)	KX 155/155A/165/165A	Composite Analog		Can be NAV 1, NAV 2, or both.
	KN 53	Composite Analog		
	KX 170B/175B	Composite Analog		

C.4 Radar Altimeter

The radar altimeter transceivers listed in Table C-5 are compatible with the GI 275.

Table C-5 Compatible Radar Altimeter

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Collins	RAC-870	ARINC 429		This is an analog to digital converter specifically for use with the ALT-55B rad-alt.
FreeFlight	RA-4500	ARINC 429		
Garmin	Other GI 275	HSDB		Crossfills data from a different GI 275 interfaced to a radar altimeter.
	GRA 55/5500	ARINC 429		
Honeywell (Bendix/King)	KRA 405B	ARINC 429		

C.5 EIS

The engine adapters listed in Table C-6 are compatible with the GI 275.

Table C-6 Compatible Engine Adapters

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Garmin	GEA 24(B)	RS-232		[1]
	Other GI 275	HSDB	For twin-engine aircraft, configure EIS 2 as *Other GI 275*.	Crossfills data from a different GI 275 interfaced to a GEA 24(B). [1]

Notes:

[1] An external annunciator(s) is required to be configured if the GI 275 EIS is installed outside of 35° of the centerline and is installed as a Primary EIS display. Refer to Section 4.3.3.

C.6 Transponder Control

The transponders listed in Table C-7 are compatible with the GI 275 for remote transponder control.

Table C-7 Compatible Transponders

Mfr	Model	Data Format	Interfacing Equipment Configuration Information		Notes
Garmin	GTX 345 GTX 345R GTX 345D GTX 345DR	HSDB	***HSDB Interface*** page	HSDB INTERFACE: SFD PRESENT: YES	Main software v2.60 or later required. ADS-B software v3.21 or later required.

C.7 Traffic Source

The traffic sources listed in Table C-8 are compatible with the GI 275.

Table C-8 Compatible Traffic Source

Mfr	Model	Data Format	Interfacing Equipment Configuration Information		Notes
Avidyne (Ryan)	TAS 6XX / TCAD	ARINC 429			TAS
Garmin	Other GI 275	HSDB			Crossfills data from a different GI 275 interfaced to a traffic source.
	GTS 800/820/825/ 850/855 (GTS 8XX)	HSDB			TCAS I, ADS-B
		ARINC 429	The GTS 8XX can receive heading and altitude from the display or directly from the AHRS and ADC.		TAS/TCAS I This interface only displays TAS/TCAS targets. [5]
	GTX 33X	ARINC 429	GTX 33/330 ***ARINC 429 Output*** page	CHANNEL 2: GARMIN W/TIS	TIS-A GTX 3X5 Main software v2.52 or later required. The display can control the TIS state; however, it does not provide control of the GTX 33. [1]
			GTX 33/330 ***ARINC 429 Input*** page	If GTX 33/330 will receive ARINC 429 data from the GI 275: SEL: EFIS w/ALT SPEED: LOW	
			GTX 335 ***A429 Output*** page	A429 OUTPUT: FORMAT 8	
Garmin	GTX 345	HSDB	***HSDB Interface*** page	HSDB INTERFACE: SFD PRESENT: YES	ADS-B/TIS-B Main software v2.52 or later required. ADS-B software v3.12 or later required. The GTX 345 can provide TAS/TCAS. [3] [4]
	GNX 375	HSDB			ADS-B Software v2.02 or later required. [3] [4]

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Honeywell (Bendix/King)	KTA870 / KMH820	ARINC 429	Intruder File Protocol: ARINC 735 Controller Type: Discrete	TAS [2]
	KTA970 / KMH920	ARINC 429	Intruder File Protocol: ARINC 735 Controller Type: Discrete	TCAS I [2]
L-3 Communications (Goodrich)	SKY497	ARINC 429	For SKY 497, ARINC 735 Alternate Display type must be set to “ARINC735 Type 1” (P1-80 must be grounded).	TAS SKY 497 software v1.6 or later required.
	SKY899	ARINC 429		TAS/TCAS I

Notes:

[1] The GI 275 provides altitude as part of the data transmitted to the GTX 33( )/330( ); however, it is recommended that a direct connection from the ADC also be provided so that the GTX 33( )/330( ) will still receive altitude in the event of a GI 275 failure.

[2] Controller type is only required if GI 275 is used to control the traffic system.

[3] Only one ADS-B In source can be configured at a time.

[4] This interface will provide FIS-B weather as well as SXM weather if a GDL 69/69A is also installed.

[5] If the GTS is connected via HSDB, the ARINC 429 interface is not required.

C.8 Weather Source

The weather transceivers listed in Table C-9 are compatible with the GI 275.

Table C-9 Compatible Weather Radar Sources

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Garmin	GDL 69A SXM	HSDB	Ethernet port that is connected to GI 275 must be enabled.	GDL 69/69A SXM requires minimum software v5.51. [2]
	GTX 345	HSDB	Refer to the GTX 345 configuration information in Table C-8.	[1]
	GNX 375	HSDB	Refer to the GNX 375 configuration information in Table C-8.	[1]

Notes:

[1] Configuring the Traffic Type to *ADS-B* on the GI 275 automatically enables weather information.

[2] Only the second generation GDL 69/69A SXM models are compatible with the GI 275.

C.9 Lightning/Electrical Discharge Source

The lightning/electrical discharge system listed in Table C-10 is compatible with the GI 275.

Table C-10 Compatible Lightning/Electrical Discharge Source

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
L-3 Communications	WX-500	RS-232		The GI 275 cannot control the WX-500 Stormscope. A controlling unit (e.g., GDU 620, GDU 700/1060, GTN 6XX/7XX) must be present in the system for the GI 275 to display Stormscope data.
Garmin	Other GI 275	HSDB		Crossfills data from a different GI 275 interfaced to a Stormscope.

C.10 External TAWS

The External TAWS sources listed in Table C-11 are compatible with the GI 275. Refer to Section 3.3.9 for additional details regarding the external TAWS options and configuration.

Table C-11 Compatible External TAWS Sources

Mfr	Model	Data Format	Interfacing Equipment Configuration Information		Notes
Garmin	GTN 6XX/7XX	HSDB	***HSDB Port Configuration*** page	Ethernet Port ( ): Connected	Software v6.70 or later required.
			Terrain Configuration page	Enable Terrain Alerting	
	GTN Xi	HSDB	***HSDB Port Configuration*** page	Ethernet Port ( ): Connected	Software v20.10 or later required.
			Terrain Configuration page	Enable Terrain Alerting	
	GNS 400W/500W	RS-232	***Main RS-232 Config*** page	Out: MapMX	
			Main System Config page	Configure: *Terrain* Terrain Type: *TAWS*	

C.11 Audio Panel

Interfacing the GI 275 to an audio panel is recommended but not required unless TAWS B is enabled.

The audio panels listed in Table C-12 are compatible with the GI 275. However, audio panels not listed below can still be approved under the GI 275 AML STC if **all** of the following conditions are met:

- The installation of the audio panel was previously FAA-approved
- The GI 275 audio must be verified as described in Section 5.6.3

NOTE

Audio alerts must be loud, attention-getting, and clearly intelligible under all cockpit noise conditions. Audio alerts should be slightly louder than the normal volume of COM and intercom transmissions.

Table C-12 Compatible Audio Panels

Mfr	Model	Data Format	Interfacing Equipment Configuration Information	Notes
Garmin	GMA 340 GMA 342 GMA 345 GMA 347 GMA 35(c) GMA 350(c) SL 15 SL 15M	Analog	GMA 35(c) requires a control panel, such as a GTN 7XX.	
Honeywell (Bendix/King)	KMA 24 KMA 26 KMA 28 KMA 30	Analog		
PS Engineering	PMA 6000 PMA 7000 Series PMA 8000 Series PAR 200	Analog		

C.12 EIS Sensors

GI 275 EIS gauges display data from the GEA 24(B) when approved sensors are configured in accordance with Table C-13. EIS sensors that are authorized as "Interface only" require a separate installation approval.

Table C-13 Compatible EIS Sensors

Function	Mfr	Garmin P/N	Description	Sensor Configuration	Authorization
RPM	N/A	N/A	P-lead (w/resistors)	Mag P-Lead (v1) **or** Dual Mag P-Lead (v1) **or** Geared 0.642:1 P-Lead (v1) **or** Geared 0.667:1 P-Lead (v1) **or** Geared 0.750:1 P-Lead (v1) **or** Geared 16:25 P-Lead (v1) **or** Geared 77:120 P-Lead (v1) [3]	Interface and installation
	UMA	N/A	T1A9-1	UMA T1A9-1 Slick (v1)	Interface only
	UMA	N/A	T1A9-2	UMA T1A9-2 Bendix (v1)	
	Surefly	N/A	Surefly Tach2	Mag P-Lead (v2)	
Manifold Press	Garmin	011-04202-00	Garmin 30 PSIA (Brass)	Garmin 011-04202-00 (v1) **or** Garmin 011-04202-00 Hi (v2) [5]	Interface and installation
	Garmin	011-05783-00	GPT 30PSIA (SS)	Garmin 011-05783-00 (v2)	
	UMA	N/A	T1EU50A (Absolute)	UMA T1EU50A (v1)	Interface only
	UMA	N/A	T1EU50A-CS (Absolute)	UMA T1EU50A (v1)	
	JPI	N/A	159934 30PSIA (Brass)	JPI 159934 (v1)	
	Kavlico	N/A	P155-50A-E4B 50PSIA (Brass)	Kavlico P155-50A-E4B (v1) **or** Kavlico P155-50A-E4B Hi (v1) [5]	
Oil Press	Garmin	011-04202-30	150 PSIG (Brass)	Garmin 011-04202-30 (v1)	Interface and installation
	Garmin	011-05783-30	GPT 150PSIG (SS)	Garmin 011-05783-30 (v1)	
	Beech	N/A	102-389017-1	Beech 102-389017 (v1) [1]	Interface only
	Beech	N/A	102-389017-3	Beech 102-389017 (v1) [1]	
	UMA	N/A	T1EU150G (Gauge)	UMA T1EU150G (v1)	
	UMA	N/A	T1EU150G-CS (Gauge)	UMA T1EU150G (v1)	
	JPI	N/A	159936 150PSIG (Brass)	JPI 159936 (v1)	

Function	Mfr	Garmin P/N	Description	Sensor Configuration	Authorization
Oil Temp	UMA	494-70009-00	T3B3-2.5G (K Type)	UMA T3B3 (v1)	Interface and installation
	UMA	N/A	T3B3	UMA T3B3 (v1)	Interface only
	UMA	N/A	T3B3A	UMA T3B3 (v1)	
	UMA	N/A	T3B3-2.5	UMA T3B3 (v1)	
	Mil-Spec	N/A	MS28034	MilSpec MS28034 (v1)	
	Varies	N/A	K Type	NIST ITS-90 K Type (v1)	
CHT	Alcor	494-70008-00	Alcor 86252 (K Type)	Alcor 86252 (v1) **or** Garmin 494-70008-00 (v1)	Interface only
	Varies	N/A	K Type	NIST ITS-90 K Type (v1)	
	Varies	N/A	J Type	NIST ITS-90 J Type (v1)	
EGT	Alcor	494-70001-00	Alcor 86255 (K Type)	Alcor 86255 (v1) **or** Garmin 494-70001-00 (v1)	Interface only
	Varies	N/A	K Type	NIST ITS-90 K Type (v1)	
Primary EGT	Alcor	494-70001-00	86255 (K Type)	Alcor 86255 (v1) [1] **or** Garmin 494-70001-00 (v1) [1]	Interface only
	Varies	N/A	K Type	NIST ITS-90 K Type (v1) [1]	
TIT & TIT 2	Alcor	494-70002-00	Alcor 86245 (K Type)	Alcor 86245 (v1) [1] **or** Garmin 494-70002-00 (v1) [1]	Interface only
	Varies	N/A	K Type	NIST ITS-90 K Type (v1) [1]	
Carb Temp	UMA	494-70010-00	T3B10-SG (K Type)	UMA T3B10-SG (v1) [1] **or** Garmin 494-70010-00 (v1) [1]	Interface and installation
	Mil-Spec	N/A	MS28034	Mil-Spec MS28034 (v1)	Interface only
	Varies	N/A	K Type	NIST ITS-90 K Type (v1)	

Function	Mfr	Garmin P/N	Description	Sensor Configuration	Authorization
Fuel Press	Garmin	011-04202-20	75 PSIG (Brass)	Garmin 011-04202-20 (v1) **or** Garmin 011-04202-20 Hi (v2) [5]	Interface and installation
	Garmin	011-04202-10	15 PSIG (Brass)	Garmin 011-04202-10 (v1) **or** Garmin 011-04202-10 Hi (v2) [5]	
	Garmin	011-05783-20	GPT 75PSIG (SS)	Garmin 011-05783-20 (v1)	
	Garmin	011-05783-10	GPT 15PSIG (SS)	Garmin 011-05783-10 (v1)	
	UMA	N/A	T1EU70G (Gauge)	UMA T1EU70G (v1)	Interface only
	UMA	N/A	T1EU70G-CS (Gauge)	UMA T1EU70G (v1)	
	UMA	N/A	T1EU35G (Gauge)	UMA T1EU35G (v1)	
	UMA	N/A	T1EU35G-CS (Gauge)	UMA T1EU35G (v1)	
	UMA	N/A	T1EU70D (Differential)	UMA T1EU70D (v1)	
	UMA	N/A	T1EU70D-CS (Differential)	UMA T1EU70D (v1)	
	UMA	N/A	T1EU100D (Differential)	UMA T1EU100D (v1)	
	UMA	N/A	T1EU100D-CS (Differential)	UMA T1EU100D (v1)	
	UMA	N/A	T1EU35D (Differential)	UMA T1EU35D (v1)	
	UMA	N/A	T1EU35D-CS (Differential)	UMA T1EU35D (v1)	
	JPI	N/A	159935 50PSIG (Brass)	JPI 159935 (v1)	

Function	Mfr	Garmin P/N	Description	Sensor Configuration	Authorization
Fuel Flow & Return Fuel Flow	Electronics Intl	494-10001-00	EI FT-60	EI FT-60 Hi (v1) **or** Garmin 494-10001-00 Hi (v1) [2]	Interface and installation
				EI FT-60 Low (v1) **or** Garmin 494-10001-00 Low (v1) [2]	
	Electronics Intl	494-10001-01	EI FT-90	EI FT-90 Hi (v1) **or** Garmin 494-10001-01 Hi (v1) [2]	
				EI FT-90 Low (v1) **or** Garmin 494-10001-01 Low (v1) [2]	
	Beech	N/A	102-389012-11	Beech 102-389012-11 Low (v1) **or** Beech 103-389012-11 Hi (v1) [2] [6]	Interface only
	Floscan	N/A	201 B-6	Floscan 201 B-6 Low (v1) **or** Floscan 201B-6 Hi (v1) [2] [7]	
	Floscan	N/A	231	Floscan 231 Low (v1) **or** Floscan 231 Hi (v1) [2]	
	JPI	N/A	700900-1 (201)	Floscan 201 B-6 Low (v1) **or** Floscan 201B-6 Hi (v1) [2]	
	JPI	N/A	700900-2 (231)	Floscan 231 Low (v1) **or** Floscan 231 Hi (v1) [2]	
Shunt - Alternator Load & Battery Charge/ Discharge	Varies	N/A	30Amps 50mV	30Amps 50mV (v1)	Interface only
	Varies	N/A	50Amps 50mV	50Amps 50mV (v1)	
	Varies	N/A	50Amps 100mV	50Amps 100mV (v1)	
	Varies	N/A	60Amps 50mV	60Amps 50mV (v1)	
	Varies	N/A	60Amps 100mV	60Amps 100mV (v1)	
	Varies	N/A	75Amps 50mV	75Amps 50mV (v1)	
	Varies	N/A	75Amps 100mV	75Amps 100mV (v1)	
	Varies	N/A	80Amps 50mV	80Amps 50mV (v1)	
	Varies	N/A	85Amps 50mV	85Amps 50mV (v1)	
	Varies	N/A	100Amps 50mV	100Amps 50mV (v1)	
	Varies	N/A	100Amps 100mV	100Amps 100mV (v1)	
	Varies	N/A	120Amps 50mV	120Amps 50mV (v1)	
	Varies	N/A	125Amps 50mV	125Amps 50mV (v1)	
	Varies	N/A	150Amps 50mV	150Amps 50mV (v1)	
Bus Volts	Varies	N/A	Aircraft Bus (80V Max)	Bus Max 80 Volts DC (v1)	Interface only
Batt Volts	Varies	N/A	Aircraft Battery (80V Max)	Batt Max 80 Volts DC (v1)	Interface only

Function	Mfr	Garmin P/N	Description	Sensor Configuration	Authorization
Fuel Quantity (Main & Aux)	Resistive Floats [4]	N/A	Left/Single Tank	0-5 Volt Left Main (v1) **or** 0-5 Volt Single Main (v1)	Interface only
	Resistive Floats [4] (GEA 24B Only)	N/A		0-620Ohm Left Main (v1) **or** 0-620Ohm Single Main (v1)	
	CiES CC284022-XXXX-XXX	N/A		Digital **or** 0-5Volt (v1)	
	Resistive Floats [4]	N/A	Right Tank	0-5 Volt Right Main (v1)	
	Resistive Floats [4] (GEA 24B Only)	N/A		0-620Ohm Right Main (v1)	
	CiES CC284022-XXXX-XXX	N/A		Digital **or** 0-5Volt (v1)	
	Resistive Floats [4]	N/A	AUX Left/Single Tank	0-5 Volt Left Aux (v1) **or** 0-5 Volt Single Aux (v1)	
	Resistive Floats [4] (GEA 24B Only)	N/A		0-620Ohm Left Aux (v1) **or** 0-620Ohm Single Aux (v1)	
	CiES CC284022-XXXX-XXX	N/A		Digital **or** 0-5Volt (v1)	
	Resistive Floats [4]	N/A	AUX Right Tank	0-5 Volt Right Aux (v1)	
	Resistive Floats [4] (GEA 24B Only)	N/A		0-620Ohm Right Aux (v1)	
	CiES CC284022-XXXX-XXX	N/A		Digital **or** 0-5Volt (v1)	
CDT	Varies	N/A	K Type	NIST ITS-90 K Type (v1) [1]	Interface only
IAT	Varies	N/A	K Type	NIST ITS-90 K Type (v1) [1]	Interface only
	Varies	N/A	J Type	NIST ITS-90 J Type (v1) [1]	
OAT	Garmin	011-00978-00	GTP 59	Garmin GTP 59 (v1) [1]	Interface and installation

Notes:

[1] Select the GEA 24(B) port that the sensor is connected to in order to access the sensor configuration.

[2] Refer to Section 5.7.2 for fuel flow gauge smoothing filter and K-factor selection.

[3] Refer to Section 5.7.2 for P-lead magneto type and propeller-to-engine gear ratio selection.

[4] Resistive fuel probes interfaced to a GEA 24 or a GEA 24B that is wired **with** parallel resistors must have the sensor configuration set to *0-5 Volt*. Resistive fuel probes interfaced to a GEA 24B that is wired **without** parallel resistors must have the sensor configuration set to *0-620 Ohm*.

[5] For pressure sensors, the “Hi” configuration provides additional signal filtering to provide a smoother gauge indication. Select “Hi” filter configurations if the EIS gauges exhibit excessive jitter/noisiness.

[6] The Beech 102-389012-11 configurations are compatible with Shadin 680501 fuel flow sensor interfaces.

[7] The Floscan 201 B-6 configurations are compatible with Shadin 680501-1 and 680501X fuel flow sensor interfaces.

APPENDIX D MODEL-SPECIFIC DATA

This appendix provides the following information for every model listed on the AML:

- **Fuel Pressure Check Required:** An “X” in this column necessitates a Fuel Pressure Check be performed per Section 3.4.2, item 7. The Fuel Pressure Check only applies to piston aircraft with fuel flow transducers installed per this STC.
- **Lightning Zone Wing, Fuselage, and Empennage:** Each column references the lightning zoning figures from Appendix F that are applicable to a particular aircraft model.
- **GTP 59:** Each column references the suitable lightning zones for installation of the GTP 59 Temperature Probe in a particular aircraft model. For additional information, refer to Section 4.5.2.
- **Notes:** This column includes any notes related to a particular aircraft model.

NOTE

Any aircraft model listed in Table D-1 and not explicitly called out as nonmetallic by an end note should be considered an all-metal aircraft.

Table D-1 Aircraft Model-Specific Data

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A10EU	AERMACCHI S.p.A (AERMACCHI S.p.A)	F.260, F.260B, F.260C, F.260D, F.260E, F.260F		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A9EU	AERMACCHI S.p.A (AERMACCHI S.p.A)	S.205-18/F, S.205-18/R, S.205-20/F, S.205-20/R, S.205-22/R, S.208, S.208A		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
1A21	AERO COMMANDER (Dynac Aerospace Corp) [Volaire]	10, 10A, 100, 100A, 100-180		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A17WE	Aerostar (Aerostar Aircraft Corporation)	PA-60-600 (Aerostar 600), PA-60-601 (Aerostar 601), PA-60-601P (Aerostar 601P), PA-60-602P (Aerostar 602P), PA-60-700P (Aerostar 700P)		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Ensure compliance with AD 74-25-02 if applicable.
A17SW	Air Tractor (Air Tractor, Inc.)	AT-401		Figure F-3, Figure F-4, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2] Aircraft may be IFR or limited to VFR per prior certification. For IFR aircraft, use Wing Figure F-3. For VFR only aircraft, use Wing Figure F-4.
A18CE	ALEXANDRIA AIRCRAFT (Alexandria Aircraft LLC) [Bellanca, Inc.]	17-30A, 17-31A, 17-31ATC		Not Allowed	Figure F-6	Figure F-18	Zone 2A	[1] [3] [8]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
1A3	ALEXANDRIA AIRCRAFT (Alexandria Aircraft LLC) [Bellanca, Inc.]	14-19, 14-19-2, 14-19-3, 14-19-3A, 17-30, 17-31, 17-31TC		Not Allowed	Figure F-6	Figure F-18	Zone 2A	[1] [3] [8]
A48EU	ALPHA AVIATION CONCEPT LTD (Alpha Aviation Concept Limited) [Alpha Aviation Design Limited]	R2160	X	Figure F-4, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A3CE	American Champion (American Champion Aircraft Corp.) [Champion]	402	X	Figure F-3	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [3] [8] [12]
A21CE	American Champion (American Champion Aircraft Corp.) [FRA Enterprises, Inc.]	8KCAB, 8GCBC		Figure F-3	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8] [12]
A-759	American Champion (American Champion Aircraft Corp.) [FRA Enterprises, Inc.]	7EC, 7ECA, 7FC, 7GC, 7GCA, 7GCAA, 7GCB, 7GCBA, 7GCBC, 7KCAB		Figure F-3	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8] [12]
A66EU	APEX Aircraft (APEX Aircraft) [AVIONS PIERRE ROBIN]	R 3000/160	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A22NM	Aviat Aircraft, Inc. (Aviat Aircraft Inc.) [Sky International, Inc.]	A-1, A-1A, A-1B, A-1C-180, A-1C-200		Figure F-3	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A8SO	Aviat Aircraft, Inc. (Aviat Aircraft, Inc.) [Sky International, Inc.]	S-1S, S-1T, S-2A, S-2S, S-2B, S-2C		Not Allowed	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
A-773	Bellanca (Bellanca Aircraft Corporation)	14-13, 14-13-2, 14-13-3		Not Allowed	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
A17EU	B-N GROUP LTD. (B-N Group Ltd.) [Pilatus Britten-Norman Limited]	BN-2, BN-2A, BN-2A-2, BN-2A-3, BN-2A-6, BN-2A-8, BN-2A-9, BN-2A-20, BN-2A-21, BN-2A-26, BN-2A-27, BN-2B-20, BN-2B-21, BN-2B-26, BN-2B-27		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-2-575	BOEING (The Boeing Company) [Rockwell International]	BC-1A, AT-6 (SNJ-2), AT-6A (SNJ-3), AT-6B, AT-6C (SNJ-4), AT-6D (SNJ-5), AT-6F (SNJ-6), SNJ-7, T-6G		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-722	CESSNA (Cessna Aircraft Company)	T-50 (Army AT-17, and UC-78 series, and Navy JRC-1)	N/A	Not Allowed	Figure F-10	Not Allowed	Zone 2A	[1] [3] [8] Installation using Figure F-10 only allowed for tube and fabric; otherwise, Not Allowed
5A5	CESSNA (Regal Air, Inc.)	305A (USAF 0-1A), 305C (USAF 0-1E), 305D (USAF 0-1G), 305F		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A14	CESSNA (Regal Air, Inc.)	305B, 305E (Military TO-1D, 0-1D or 0-1F)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A00009CH	Cirrus Design Corporation (Cirrus Design Corporation)	SR20, SR22, SR22T		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8] [11] [13]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A12SO	COMMANDER (Commander Aircraft Corporation) [CPAC, Inc.]	112, 112TC, 112B, 112TCA, 114, 114A, 114B, 114TC		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A62CE	Costruzioni Aeronautiche Tecnam S.P.A. (Costruzioni Aeronautiche Tecnam S.P.A.) [Costruzioni Aeronautiche Tecnam srl]	P2006T	N/A	Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A17SO	Cougar (Cougar Aircraft Corporation) [SOCATA, S.A.]	GA-7		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.
A00053SE	CUB CRAFTERS (Cub Crafters, Inc.)	CC19-180		Figure F-4, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
A22EU	De Havilland Support Limited (De Havilland Support Limited) [British Aerospace, Aircraft Group Scottish Division]	Beagle B.121 Series 1, Beagle B.121 Series 2, Beagle B.121 Series 3		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
TA4CH	DIAMOND (Diamond Aircraft Industries Inc.)	DA20-A1, DA20-C1		Figure F-4, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8] [11] Installation approved for VFR operation only. Interface to resistive fuel quantity sensors is not approved in this aircraft.
A47CE	DIAMOND (Diamond Aircraft Industries Inc.) [Diamond Aircraft Industries GmbH]	DA 40, DA 40 F		Figure F-3, Figure F-4, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8] [11] [13] Diamond SB OSB 40-004/3 incorporated: use Figure F-3 Absent Diamond SB OSB 40-004/3: use Figure F-4; install limited to VFR ONLY; CANNOT interface to resistive fuel quantity sensors
A47CE	DIAMOND (Diamond Aircraft Industries Inc.) [Diamond Aircraft Industries GmbH]	DA 40 NG	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8] [11] [13] Must have Diamond SB OSB 40-004/3 incorporated.
A00008DE	DISCOVERY (Discovery Aviation, Inc.) [Liberty Holdings, LLC]	XL-2	X	Figure F-3, Figure F-5	Not Allowed	Figure F-18	Zone 3	[4] [8] [11]
A55EU	EADS-PZL "Warszawa-Okecie" (EADS-PZL "Warszawa-Okecie" S.A.) [Panstwowe Zaklady Lotnicze]	PZL-104 WILGA 80, PZL-104M WILGA 2000, PZL-104MA WILGA 2000	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A69EU	EADS-PZL "Warszawa-Okecie" (EADS-PZL "Warszawa-Okecie" S.A.) [Panstwowe Zaklady Lotnicze]	PZL-KOLIBER 150A, PZL-KOLIBER 160A	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A67EU	EXTRA (Extra Flugzeugproduktions- und Vertriebs - GmbH) [Extra Flugzeugbau GmbH]	EA 300, EA 300/L, EA 300/S, EA 300/200		Not Allowed	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8] Interface to resistive fuel quantity sensors is not approved in this aircraft.
A67EU	Extra (Extra Flugzeugproduktions- und Vertriebs - GmbH) [Extra Flugzeugbau GmbH]	EA 300/LC	X	Not Allowed	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8] Interface to resistive fuel quantity sensors is not approved in this aircraft.
A58EU	FFT-GmbH (FFT Gesellschaft fur Flugzeug - & Faserverbund-Technologie mbH)	SC01 B-160 Gyroflug Speed Canard	X	Figure F-4, Figure F-5	Figure F-7	Not Allowed	Zone 3	[4] Installation approved for VFR operation only. Interface to resistive fuel quantity sensors is not approved in this aircraft.
A13EA	FOUND BROTHERS (Found Brothers Aviation Limited)	FBA Centennial "100"	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A-734	Frakes Aviation (Frakes Aviation) [Gulfstream American Corporation]	F-44 (Army OA-14 Navy J4F-2), F-44A, SCAN Type 30		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-780	FS2003 Corp. (FS 2003 Corporation) [The New Piper Aircraft, Inc]	PA-12, PA-12S		Not Allowed	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
A4PC	FUJI (Fuji Heavy Industries, Ltd.)	FA-200-160 , FA-200-180 , FA-200-180AO		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A00011LA	GA8 Airvan (Pty) Ltd (GA 8 Airvan (Pty) Ltd) [Gippsland Aeronautics Pty. Ltd.]	GA8, GA8-TC320		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A34EU	Gomolzig FlugzeuF- und Maschinenbau GmbH (Gomolzig FlugzeuF- und Maschinenbau GmbH) [FFA Aircraft Bravo AG]	AS 202/15 "BRAVO" , AS 202/18A "BRAVO" , AS 202/18A4 "BRAVO"	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A57EU	GROB Aircraft AG (GROB Aircraft AG) [GROB Aerospace GmbH i.I.]	G115, G115A, G115B, G115C, G115C2, G115D, G115D2		Figure F-4, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8] [11] Installation approved for VFR operation only. Interface to resistive fuel quantity sensors is not approved in this aircraft.

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
3A3	Helio (Helio Aircraft Corporation) [Taylorcraft]	15A , 20		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3]
1A8	HELIO (Helio Aircraft, LLC) [Alliance Aircraft Group, LLC]	H-250, H-295 (USAF U-10D), HT-295, H-391 (USAF YL-24), H-391B, H-395 (USAF L-28A or U-10B), H-395A, H-700		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
1A8	HELIO (Helio Aircraft, LLC) [Alliance Aircraft Group, LLC]	H-800		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2] GTP 59 cannot be mounted on aircraft wing.
A4EA	HELIO (Helio Aircraft, LLC) [Alliance Aircraft Group, LLC]	HST-550, HST-550A (USAF AU-24A)	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-717	HOWARD (Howard Aircraft Foundation) [Jobmaster Co.]	DGA-15P (Army UC-70, Navy GH-1, GH-2, GH-3, NH-1), DGA-15J (Army UC-70B), DGA-15W		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
3A18	Interceptor (Interceptor Aviation Inc.) [Interceptor Aircraft Corporation]	200, 200A, 200B, 200C, 200D		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A18	Interceptor (Interceptor Aviation Inc.) [Interceptor Aircraft Corporation]	400	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
7A3	JET SET AVIATION HOLDINGS (Jet Set Aviation Holdings SAS) [SOCATA]	M.S. 760, M.S. 760 A, M.S. 760 B	N/A	Figure F-3, Figure F-5	Figure F-14	Figure F-18	Zone 2A, Zone 3	[1] [2]
A17CE	King's Engineering Fellowship (The King's Engineering Fellowship) [Evangel-Air]	4500-300 , 4500-300 Series II	X	Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A6EA	Legend Aviation & Marine (Legend Aviation & Marine, LLC) [STOL Aircraft Corporation]	UC-1 (Twin-Bee)		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A64EU	Lovaux Ltd (FLS Aerospace (Lovaux) Ltd.)	OA7 Optica Series 300	X	Figure F-3, Figure F-5	Not Allowed	Not Allowed	Zone 2A, Zone 3	[1] [2]
A-694	LUSCOMBE (Good Earthkeeping Organization, Inc.) [Team Luscombe, LLC]	8, 8A, 8B, 8C, 8D, 8E, 8F, T-8F		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
3A23	Maule (Maule Aerospace Technology, Inc.) [Maule Aircraft Corporation]	Bee Dee M-4, M-4, M-4C, M-4S, M-4T, M-4-210, M-4-210C, M-4-210S, M-4-210T, M-4-220, M-4-220C, M-4-220S, M-4-220T, M-4-180C, M-4-180S, M-4-180T, M-5-210C, M-5-220C, M-5-235C, M-5-180C, M-5-210TC, M-6-235, M-6-180, M-5-200, M-7-235, MX-7-235, MX-7-180, MXT-7-180, MT-7-235, M-8-235, MX-7-160, MXT-7-160, MX-7-180A, MXT-7-180A, MX-7-180B, M-7-235B, M-7-235A, M-7-235C, MX-7-180C, M-7-260, MT-7-260, M-7-260C, MX-7-160C, MX-7-180AC, M-4-180V, M-9-235		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
3A23	Maule (Maule Aerospace Technology, Inc.) [Maule Aircraft Corporation]	MX-7-420, M-7-420AC, M-7-420A, MT-7-420	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
3A1	MICCO Aircraft Co., Inc. (MICCO Aircraft Company, Inc.) [Aero Acquisitions, LLC]	MAC-125C, MAC-145, MAC-145A, MAC-145B	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A6SW	Mooney (Mooney Aircraft Corporation)	M22		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
2A3	Mooney (Mooney International Corporation) [Mooney Aviation Company, Inc.]	M20, M20A, M20B, M20C, M20D, M20E, M20F, M20G, M20J, M20K, M20L, M20M, M20R, M20S, M20TN		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
7A5	Nardi (Nardi S.A.)	FN-333	X	Figure F-3, Figure F-5	Figure F-8	Not Allowed	Zone 2A, Zone 3	[1] [2]
A-782	Navion (Sierra Hotel Aero, Inc.) [Navion Aircraft LLC]	Navion (L-17A), Navion A (L-17B, L-17C), Navion B, Navion D, Navion E, Navion F, Navion G, Navion H		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A7EA	Pacific Aerospace Limited. (Pacific Aerospace Ltd.) [Found Aircraft Canada, Inc.]	FBA-2C, FBA-2C1, FBA-2C2, FBA-2C3	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-813	Piaggio (Piaggio & C.)	P.136-L, P.136-L1, P.136-L2		Figure F-3, Figure F-5	Figure F-11	Figure F-18	Zone 2A, Zone 3	[1] [2]
7A15	Pilatus (Pilatus Aircraft Ltd.)	PC-6, PC-6-H1, PC-6-H2, PC-6/350, PC-6/350-H1, PC-6/350-H2		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
7A15	PILATUS (Pilatus Aircraft Ltd.)	PC-6/A, PC-6/A-H1, PC-6/A-H2, PC-6/B-H2, PC-6/B1-H2, PC-6/B2-H2, PC-6/B2-H4, PC-6/C-H2, PC-6/C1-H2	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A50EU	PILATUS (PILATUS Aircraft Ltd.)	PC-7	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
1A2	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-18, PA-18S, PA-18 "105" (Special), PA-18S "105" (Special), PA-18A, PA-18 "125" (Army L-21A), PA-18S "125", PA-18AS "125", PA-18 "135" (Army L-21B), PA-18A "135", PA-18S "135", PA-18 "150", PA-18A "150", PA-18S "150", PA-19 (Army L-18C)		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
1A4	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-20, PA-20 "135"		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
1A6	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-22, PA-22-108, PA-22-135, PA-22S-135, PA-22-150, PA-22S-150, PA-22-160		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [3] [8]
1A10	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-23, PA-23-160, PA-23-235, PA-23-250, PA-23-250 (Navy UO-1), PA-E23-250		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
1A15	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-24, PA-24-250, PA-24-260, PA-24-400		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
2A13	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-28-160 (Cherokee), PA-28-150 (Cherokee), PA-28-180 (Cherokee), PA-28S-160 (Cherokee), PA-28S-180 (Cherokee), PA-28-235 (Cherokee Pathfinder), PA-28-140 (Cherokee Cruiser), PA-28R-180 (Arrow), PA-28R-200 (Arrow), PA-28R-200 (Arrow II), PA-28S-180 (Archer), PA-28-235 (Cherokee Pathfinder), PA-28-151 (Cherokee Warrior), PA-28-181 (Archer II), PA-28-181 (Archer III), PA-28-161 (Warrior II), PA-28-161 (Warrior III), PA-28R-201 (Arrow III), PA-28R-201T (Turbo Arrow III), PA-28-236 (Dakota), PA-28RT-201 (Arrow IV), PA-28RT-201T (Turbo Arrow IV), PA-28-201T (Turbo Dakota)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A18SO	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-38-112 (Tomahawk)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A19SO	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-44-180 (Seminole), PA-44-180T		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.
A1EA	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-30, PA-39, PA-40		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A3SO	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-32-260 (Cherokee Six 260), PA-32-300 (Cherokee Six 300), PA-32S-300 (Cherokee Six Seaplane), PA-32R-300 (Lance), PA-32RT-300 (Lance II), PA-32RT-300T (Turbo Lance II), PA-32R-301 (Saratoga SP), PA-32R-301 (Saratoga II HP), PA-32R-301T (Turbo Saratoga SP), PA-32-301 (Saratoga), PA-32-301T (Turbo Saratoga), PA-32R-301T (Saratoga II TC), PA-32-301FT (Piper 6X), PA-32-301XTC (Piper 6XT)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A7SO	Piper Aircraft, Inc. (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-34-200 (Seneca), PA-34-200T (Seneca II), PA-34-220T (Seneca III, IV, V)		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A25SO	Piper (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-46-310P (Malibu), PA-46-350P (Malibu Mirage), PA-46R-350T (Malibu Matrix)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A25SO	Piper (Piper Aircraft, Inc.) [The New Piper Aircraft, Inc]	PA-46-500TP (Malibu Meridian), PA-46-600TP (M600)	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A44CE	Polskie Zaklady Lotnicze Spolka zo.o (Polskie Zaklady Lotnicze Spolka zo.o) [PZL MIELEC]	PZL M26 01	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
1A13	Revo, Inc. (Revo, Incorporated) [Global Amphibians LLC]	Lake LA-4, Lake LA-4-200, Lake Model 250		Figure F-3	Figure F-9	Figure F-18	Zone 2A, Zone 3	[1] [2]
7A13	RUAG Aerospace Services GmbH (RUAG Aerospace Services GmbH) [Fairchild Dornier GmbH]	Do 28 A-1, Do 28 B-1		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A8IN	RUAG Aerospace Services GmbH (RUAG Aerospace Services GmbH) [Fairchild Dornier GmbH] DORNIER LUFTFAHRT GmbH]	Do 27 Q-6		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A44EU	Rust (de Havilland) (Robert E. Rust, Jr.) [Robert E. Rust]	DHC-1 Chipmunk Mk 21, DHC-1 Chipmunk Mk 22, DHC-1 Chipmunk Mk 22A		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A73EU	Slingsby Aviation Ltd. (Slingsby Aviation Ltd.)	T67M260	X	Figure F-4	Figure F-6	Figure F-18	Zone 3	[4] [8] [11] Installation approved for VFR operation only. Interface to resistive fuel quantity sensors is not approved in this aircraft.

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
7A14	SOCATA (SOCATA) [S O C A T A - Groupe AEROSPATIALE]	MS 880B (Rallye, Ralley Club), MS 885 (Super Rallye), MS 894A, MS 894E (Rallye Minerva 220), MS 892A-150 (Commodore), MS 892E-150 (Rallye 150GT), MS 893A (Rallye Commodore), MS 893E (Rallye 180 GT), Rallye 100S, Rallye 150 ST, Rallye 150 T, Rallye 235 E, Rallye 235C		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A51EU	SOCATA (SOCATA) [S O C A T A - Groupe AEROSPATIALE]	TB 9, TB 10, TB 20, TB 21, TB 200		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-769	STOL (Sky Enterprises, Inc.)	RC-3 (Sea-Bee)		Figure F-3, Figure F-5	Figure F-8	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-766	SWIFT (Swift Museum Foundation, Inc) [Univair Aircraft Corporation]	GC-1A, GC-1B		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A46CE	SYMPHONY AIRCRAFT INDUSTRIES INC. (Symphony Aircraft Industries Inc.) [Ostmecklenburgische Flugzeugbau GmbH]	OMF-100-160, SA 160	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2] [8] [11]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A4EU	Textron Aviation Inc (Textron Aviation Inc.) [Cessna Aircraft Company]	F172D, F172E, F172F, F172G, F172H, F172K, F172L, F172M, F172N, F172P, FP172D	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A21	Textron Aviation Inc (Textron Aviation Inc.) [Cessna Aircraft Company]	210, 210A, 210B, 210C, 210D, 210E, 210F, T210F, 210G, T210G, 210H, T210H, 210J, T210J, 210K, T210K, 210L, T210L, 210M, T210M, 210N, P210N, T210N, 210R, P210R, T210R, 210-5 (205), 210-5A (205A)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-768	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	120, 140		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
5A2	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	140A	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A19	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	150, 150A, 150B, 150C, 150D, 150E, 150F, 150G, 150H, 150J, 150K, 150L, 150M, A150K, A150L, A150M, 152, A152		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-799	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	170, 170A, 170B		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
3A12	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	172, 172A, 172B, 172C, 172D, 172E, 172F (USAF T-41A), 172G, 172H (USAF T-41A), 172I, 172K, 172L, 172M, 172N, 172P, 172Q, 172R, 172S		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A17	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	175, 175A, 175B, 175C, P172D, R172E (USAF T-41B,C,D), R172G (USAF T-41C,D), R172J, R172K, 172RG		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A13CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	177, 177A, 177B		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A20CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	177RG		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
5A6	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	180, 180A, 180B, 180C, 180D, 180E, 180F, 180G, 180H, 180J, 180K		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A13	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	182, 182A, 182B, 182C, 182D, 182E, 182F, 182G, 182H, 182J, 182K, 182L, 182M, 182N, 182P, 182Q, 182R, 182S, 182T, R182, T182, TR182, T182T		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A24	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	185, 185A, 185B, 185C, 185D, 185E, A185E, A185F		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A-790	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	190, 195 (LC-126A,B,C), 195A, 195B		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A4CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	206, P206, P206A, P206B, P206C, P206D, P206E, U206, U206A, U206B, U206C, U206D, U206E, U206F, U206G, TP206A, TP206B, TP206C, TP206D, TP206E, TU206A, TU206B, TU206C, TU206D, TU206E, TU206F, TU206G, 206H, T206H		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A16CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	207, 207A, T207, T207A		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A34CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	T303 (Crusader)		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.
3A10	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	310, 310A (USAF U-3A), 310B, 310C, 310D, 310E (USAF U-3B), 310F, 310G, 310H, E310H, 310I, 310J, 310J-1, E310J, 310K, 310L, 310N, 310P, T310P, 310Q, T310Q, 310R, T310R		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A25	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	320, 320-1, 320A, 320B, 320C, 320D, 320E, 320F, 335, 340, 340A		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A2CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	336		Figure F-3, Figure F-5	Figure F-12	Not Allowed	Zone 2A, Zone 3	[1] [2]
A6CE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	337, 337A (USAF 02B), 337B, T337B, M337B (USAF 02A), 337C, T337C, 337D, T337D, 337E, T337E, 337F, T337F, 337G, T337G, 337H, P337H, T337H, T337H-SP		Figure F-3, Figure F-5	Figure F-12	Not Allowed	Zone 2A, Zone 3	[1] [2]
A00003SE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	LC40-550FG, LC41-550FG, LC42-550FG		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8]
A00003SE	Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	T240	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 3	[4] [8]
5A3	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	45 (YT-34), A45 (T-34A, B-45), D45 (T-34B)		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
5A4	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	50 (L-23A), B50 (L-23B), C50, D50 (L-23E), D50A, D50B, D50C, D50E, D50E-5990, E50 (L-23D, RL-23D), F50, G50, H50, J50		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A23CE	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	58P, 58PA, 58TC, 58TCA		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.
TC 779	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	G17S		Figure F-3, Figure F-5	Figure F-16	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
A1CE	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	19A, B19, M19A, 23, A23, A23A, A23-19, A23-24, B23, C23, A24, A24R, B24R, C24R		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A29CE	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	76		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.
A30CE	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	77		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-649	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	D17S (Army UC-43, UC*43B, Navy GB-1, GB-2), SD17S		Figure F-3, Figure F-5	Figure F-16	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
A-777	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	35, A35, B35, C35, D35, E35, F35, G35, 35R		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A26CE	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	T-34C (T-34C-1) (34C)	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A15	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	35-33, 35-A33, 35-B33, 35-C33, 35-C33A, E33, E33A, E33C, F33, F33A, F33C, G33, G36, 36, A36, A36TC, B36TC		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
3A15	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	H35, J35, K35, M35, N35, P35, S35, V35, V35A, V35B		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [2]
3A16	Textron Aviation (Textron Aviation Inc.) [Beechcraft Corporation]	D55, D55A, E55, E55A, 56TC, A56TC, 58, 58A, G58, 95, B95, B95A, D95A, E95, 95-55, 95-A55, 95-B55, 95-B55A, 95-B55B (T-42), 95-C55, 95-C55A		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A13EU	Textron Aviation (Textron Aviation Inc.) [Cessna Aircraft Company]	F150F, F150G, F150H, F150J, F150K, F150L, F150M, F152, FA150K, FA150L, FA150M, FA152, FRA150L, FRA150M		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A18EU	Textron Aviation (Textron Aviation Inc.) [Cessna Aircraft Company]	FR172E, FR172G, FR172H, FR172J, FR172K		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A26EU	Textron Aviation (Textron Aviation Inc.) [Cessna Aircraft Company]	F177RG		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A42EU	Textron Aviation (Textron Aviation Inc.) [Cessna Aircraft Company]	F182P, F182Q, FR182		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A23EU	Textron Aviation (Textron Aviation Inc.) [Cessna Aircraft Company]	F337E, FT337E, F337F, FT337F, F337G, FT337GP, F337H, FT337HP		Figure F-3, Figure F-5	Figure F-12	Not Allowed	Zone 2A, Zone 3	[1] [2]
A3SW	THRUSH AIRCRAFT, INC. (Thrush Aircraft, Inc.) [Quality Aerospace]	600 S-2D, S2R, S2R-R3S, S2R-R1340		Figure F-4	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A3SW	THRUSH AIRCRAFT, INC. (Thrush Aircraft, Inc.) [Quality Aerospace]	S2R-T34, S2R-T15, S2R-T11	N/A	Figure F-4	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A4SW	THRUSH AIRCRAFT, INC. (Thrush Aircraft, Inc.) [Quality Aerospace]	600 S-2D, S2R-R1340, S2R, S2R-R1820, S2R-R3S		Figure F-4	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A4SW	THRUSH AIRCRAFT, INC. (Thrush Aircraft, Inc.) [Quality Aerospace]	S2R-G10, S2R-G5, S2R-T34, S2R-T65, S2R-G1, S2R-T15, S2R-T45, S2R-T11, S2R-G6	N/A	Figure F-4	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A2WI	TKEF (The King's Engineering Fellowship (TKEF))	44		Figure F-3, Figure F-5	Figure F-11	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A00006SE	TOPCUB AIRCRAFT, INC. (Topcub Aircraft, Inc.)	CC18-180, CC18-180A		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
A19EA	TRIDENT (Viking Air, Ltd)	TR-1	X	Figure F-3, Figure F-5	Figure F-8	Figure F-18	Zone 2A, Zone 3	[1] [2]
A11EA	True Flight Holdings LLC (True Flight Holdings LLC) [Tiger Aircraft LLC]	AA-1, AA-1A, AA-1B, AA-1C		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A16EA	True Flight Holdings LLC (True Flight Holdings LLC) [Tiger Aircraft LLC]	AA-5, AA-5A, AA-5B, AF-5B		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
6A1	Twin Commander (Twin Commander Aircraft LLC) [Twin Commander Aircraft Corporation]	500, 500A, 520, 560, 560A		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-787	Univair (Univair Aircraft Corporation)	415-D, 415-E, 415-G, F-1, F-1A, A-2, A2-A, M10		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [2]
A-718	Univair (Univair Aircraft Corporation) [Mooney]	415-C, 415-CD		Figure F-3, Figure F-5	Figure F-6	Not Allowed	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A-767	Univair (Univair Aircraft Corporation) [Stinson]	108, 108-1, 108-2, 108-3		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
A-806	Viking Air Limited (Viking Air Limited) [Bombardier Inc.]	DHC-2 Mark I, DHC-2 Mark II		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-806	Viking Air Limited (Viking Air Limited) [Bombardier Inc.]	DHC-2 Mark III	N/A	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A00075C E	Vulcanair S.p.A. (Vulcanair S.p.A.)	Vulcanair V1.0	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2] [3] [8] For main cabin tube structure, [3] applies; for other areas, [2] applies.
A31EU	Vulcanair S.p.A. (Vulcanair S.p.A.) [Partenavia Costruzioni Aeronautiche S.p.A]	P.68, P.68B, P.68C, P.68C-TC, P.68 "OBSERVER", P.68TC "OBSERVER", P.68 "OBSERVER 2", P.68R		Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2] Requires GEA 110 for interface to resistive fuel quantity sensors.
A31EU	Vulcanair S.p.A. (Vulcanair S.p.A.) [Partenavia Costruzioni Aeronautiche S.p.A]	AP68TP-300 "SPARTACUS"	N/A	Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
A-804	W.Z.D Enterprises Inc. (W.Z.D Enterprises Inc.) [JGS Properties, LLC]	11A, 11E	X	Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]

Type Certificate Number	Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model Designation	Fuel Pressure Check Required	Lightning Zone Type (Ref. Appendix F) Wing	Lightning Zone Type (Ref. Appendix F) Fuselage	Lightning Zone Type (Ref. Appendix F) Empennage	GTP 59 Location	Notes
A18EA	WACO Classic Aircraft Corporation (WACO Classic Aircraft Corporation) [Great Lakes Aircraft Company]	2T-1A , 2T-1A-1 , 2T-1A-2		Figure F-4, Figure F-5	Figure F-6, Figure F-16	Figure F-18	Zone 2A, Zone 3	[1] [3]
ATC 542	WACO (The WACO Aircraft Company)	YMF	N/A	Figure F-3, Figure F-5	Figure F-16	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]
A68EU	WSK "PZL-MIELEC" OBR (WSK PZL MIELEC and OBR SK MIELEC) [PZL]	PZL M20 03	X	Figure F-3, Figure F-5	Figure F-10	Figure F-18	Zone 2A, Zone 3	[1] [2]
TA5CH	Zenair (Zenair Ltd.)	CH2000		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A76EU	ZLIN Aircraft a.s. (ZLIN Aircraft a.s.) [MORAVAN a.s.]	Z-242L, Z-143L		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [2]
A30EU	ZLIN Aircraft a.s. (ZLIN Aircraft a.s.) [Moravan National Corporation]	ZLIN 526L		Figure F-3, Figure F-5	Figure F-6	Figure F-18	Zone 2A, Zone 3	[1] [3] [8]

Notes:

[1] The GTP 59 cannot be installed on Zone 2A composite areas.
[2] The GTP 59 must be bonded to the aluminum skin. For details, refer to Section 4.5.2.
[3] The GTP 59 must be bonded to the metallic tube structure. For details, refer to Section 4.5.2.
[4] The GTP 59 must be isolated from the aircraft ground plane. For details, refer to Section 4.5.2.
[5] Reserved.
[6] Reserved.

[7] Reserved.
[8] Nonmetallic aircraft.
[9] Reserved.
[10] Reserved.
[11] Remote LRUs must be installed on existing structure designated by aircraft manufacturer for avionics installation.
[12] For wing lightning zones, equipment installation only allowed in aluminum wings. Equipment installation is NOT allowed in wooden wings.
[13] Wires must be routed behind metallic substructure (i.e., routed behind instrument panel/pedestal/circuit breaker panel, along lightning ground bar/strip, inside lightning ground tube, or along other airframe ground plane).

APPENDIX E EIS GAUGE LAYOUT

This appendix provides guidance for configuring EIS gauge layouts for the GI 275 EIS display. Any deviation from the requirements contained within will require the installer to obtain additional approval. The gauge layout of the GI 275 may differ between installations due to various factors. Gauge layouts are generated automatically by the GI 275 depending on the selected engine sensors, specific gauge configuration and markings, and the number of EIS displays installed. Guidelines for how the EIS gauge layout is generated are given in the following sections.

Not all aircraft and the engine indications are compatible with the GI 275 EIS due to the installed engine gauges and the associated markings. For incompatibility cases, the original gauge must be retained. Refer to Section 2 for limitations.

The GI 275 EIS provides up to five different pages depending on the system configuration: ***Main EIS*** page, ***AUX EIS*** page, ***CHT/EGT*** page, ***Fuel*** page, and ***Summary*** page. Each page has three distinct display sections: top, middle, and bottom.

NOTE

The gauge minimum and maximum limits may be adjusted to optimize pilot interpretation of the gauge; however, all limitations in the POH/AFM or other approved aircraft data must be displayed on the gauge.

E.1 Main EIS Page

The ***Main EIS*** page is divided into four sections: top, bottom, middle-left, which contains a CHT/EGT Graph, and middle-right, which contains strip gauges.

The following is an example of the GI 275 ***Main EIS*** page.

Figure E-1 Example Main EIS Page

Top Full-Time Gauges

The GI 275 EIS provides a section at the top to display specific gauge information on all pages. This includes RPM and Manifold Pressure (if applicable). Additionally, a Prop Sync Wheel (conventional twin-engine only) or Percent Power can be configured to be displayed.

Percent Power requires the following gauge inputs: RPM, Manifold Pressure, Fuel Flow, and OAT, as well as inputting the Max Rated Horsepower, Max MAP, RPM at Max HP, and the Minimum Brake Specific Fuel Consumption (BSFC). Refer to Section 5.7.1 for engine configuration settings.

The Manifold Pressure gauge can be configured to show on the left side or on the right side of the RPM gauge. Refer to Figure E-2 for examples.

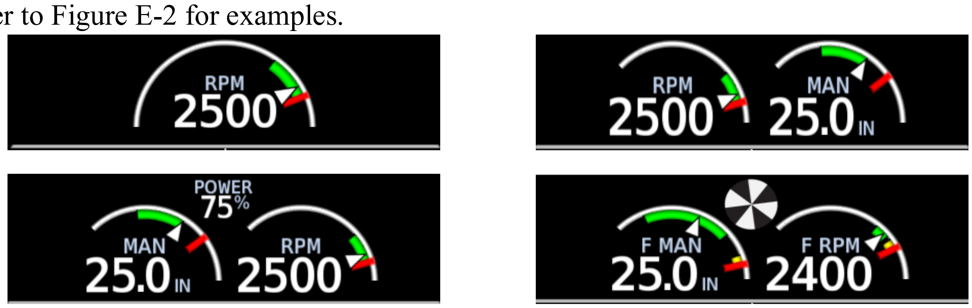


Figure E-2 Top Full-Time Gauge Examples

Bottom Full-Time Fuel Gauges

The GI 275 EIS provides a section at the bottom to display specific gauge information on all pages. If Main Fuel is configured, the Main Fuel Quantity beakers will be shown on every page in the bottom center (single or left/right). If Fuel Quantity is not configured, Outside Air Temperature will be displayed in this location. If Fuel Quantity and OAT are not configured, Time (UTC) will be displayed full-time in the bottom center position.

For twin-engine aircraft, the Fuel Quantity gauge must only be shown on one EIS unit. Toggle the Show button in the EIS Gauges menu on one of the two EIS displays so that the Fuel Quantity gauge is only shown on one unit.

Bottom Full-time AUX/Tip Fuel Quantity and Electrical Gauges

If AUX/Tip tanks are configured, AUX/Tip Fuel beaker gauges will be displayed to the left and right of the Main Fuel Quantity beaker gauges. If AUX/Tip tanks are not configured but digital gauges (e.g., Alternator, Battery, Bus - Volts/AMPS) are configured, up to two digital gauges will be displayed in the bottom left and right corners. If a single AUX gauge is configured, its fuel beaker gauge will be displayed in the lower left corner. Additionally, if a single AUX gauge and only one digital gauge are configured, the digital gauge will also populate next to the AUX gauge in the lower right position. Refer to Figure E-3 for examples.

The priority for populating bottom left and bottom right full-time gauges is as follows:

(With Red or Yellow Markings)

1. AUX/Tip Fuel (left/right center) – always highest priority over any digital gauge
2. Alternator Amps
3. Battery Volts
4. Bus Volts
5. Battery Amps

(Without Red or Yellow Markings)

6. Alternator Amps
7. Battery Volts
8. Bus Volts
9. Battery Amps IAT

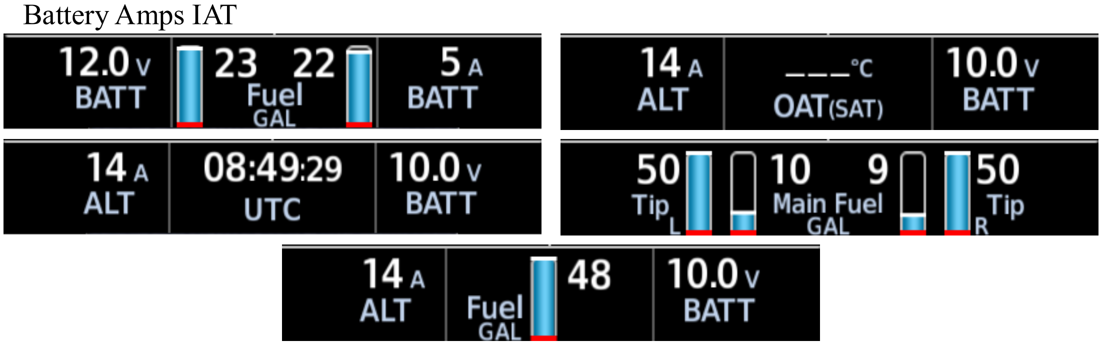


Figure E-3 Bottom Full-Time Gauge Examples

For twin-engine aircraft, the Fuel Quantity gauge must only be shown on one EIS unit. Toggle the **Show** button in the EIS Gauges menu on one of the two EIS displays so that the Fuel Quantity gauge is only shown on one unit.

Middle Left CHT/EGT Graph

The GI 275 EIS provides a 4 or 6-cylinder CHT/EGT graph in the middle left of the ***Main EIS*** page, unless configured for Single CHT/EGT, in which the GI 275 displays a strip gauge for each similar to the middle right strip gauges. This section displays CHT, EGT, and if configured, Primary EGT or TIT (single or dual) in a bar graph layout with digital readouts above the graph for the hottest cylinder or the user-selected cylinder. Refer to Figure E-4 for examples.

Figure E-4 CHT/EGT Graph Examples

Middle Right Strip Gauges

The GI 275 EIS provides a section in the middle right of the display that arranges up to four strip gauges or up to three strip gauges with two digital gauges. This section layout will differ depending on the displayed gauges and the alerting lines configured with the corresponding gauge. Refer to Figure E-5 for layout examples.

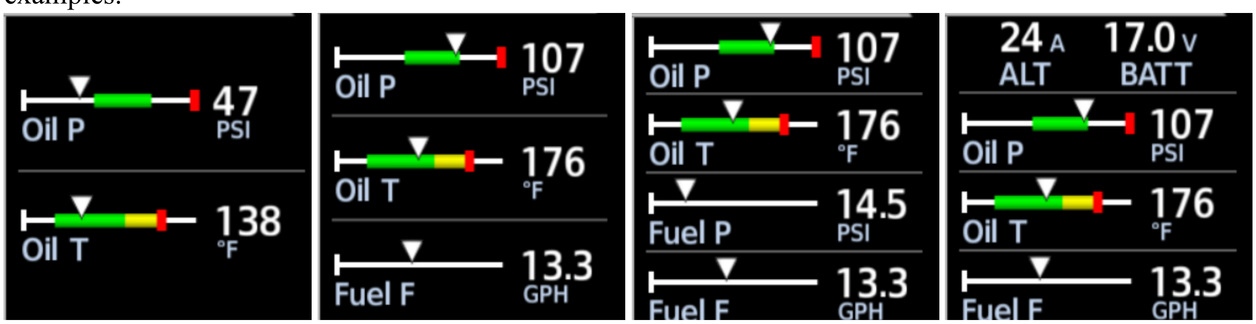


Figure E-5 Strip Gauge Examples

The gauges in the middle right of the ***Main EIS*** page follow a gauge priority scheme as shown below. Number 1 is the highest priority gauge and number 17 is the lowest priority gauge. The section populates the gauge layout from top to bottom following the prioritization scheme listed below.

The following are exceptions to the priority list:

- If AUX/Tip tanks are configured and at least one digital gauge is configured with a red/yellow alert, this gauge will take the top slot
- The Fuel Flow gauge will always be placed in the fourth slot (near the fuel quantity) unless it is unmarked with an alert and four other gauges are marked with a red/yellow alert

(With Red or Yellow Markings)

1. Oil Pressure
2. Oil Temperature
3. Fuel Flow
4. Fuel Pressure
5. Carb Temp
6. CDT
7. IAT

8. CDT/IAT Diff
9. Digital
    a. ALT AMPS
    b. BATT Volts
    c. BUS Volts
    d. BATT AMPS

(Without Red or Yellow Markings)

10. Oil Pressure
11. Oil Temperature
12. Fuel Flow
13. Fuel Pressure
14. Carb Temp
15. CDT
16. IAT
17. CDT/IAT Diff

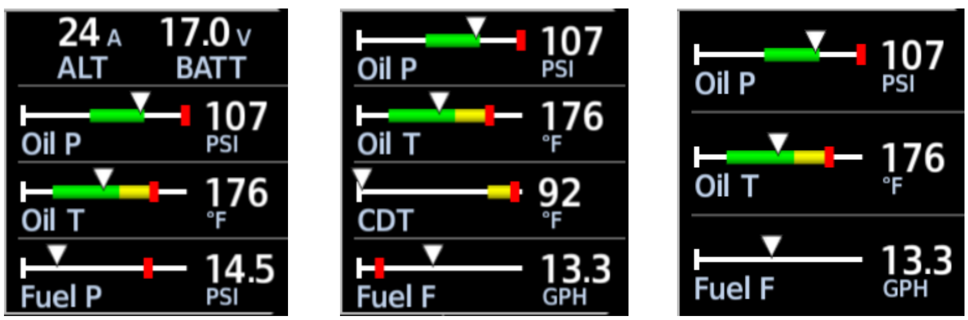


Figure E-6 Strip Gauge Priority Examples

The nomenclature with examples shown below can be used to determine EIS gauge placement:

[S1] Oil Press, unless Aux Fuel and alerting digital gauges are configured; if so, shift this and the subsequent gauges down.

[S2] Oil Temp.

[S3] 1. Highest priority marked gauge.
2. Fuel Pressure.
3. Highest priority unmarked gauge.

[S4] 1. Next highest priority marked gauge.
2. Fuel Flow.
3. Next highest priority unmarked gauge.

Refer to Figure E-7 for more information.

Figure E-7 Strip Gauge Diagram

All alerting (i.e., red or yellow markings) gauges must be shown on the ***Main EIS*** page of the EIS display. Some aircraft may have more alerting gauges than the GI 275 can display on a single EIS unit. If not all alerting gauges can be configured for display on the ***Main EIS*** page, the original gauges must be retained.

E.2 AUX EIS Page

The ***AUX EIS*** page is divided into four sections: top, bottom, middle left, and middle right. This page provides supplemental EIS gauges and information. The top arc segment as well as the bottom segment with Fuel Quantity are unchanged from the ***Main EIS*** page. No red/yellow alerting gauges can be configured on the ***AUX EIS*** page without being displayed on the ***Main EIS*** page as well.

The middle left section of the ***AUX EIS*** page provides two miscellaneous fields that may be populated differently depending on the EIS sensors displayed and gauge markings configured. The top field is a user-selectable field for miscellaneous information.

The bottom field is reserved for digital gauges or another user-selectable field for miscellaneous information. If AUX/Tip tanks are configured, as well as digital gauges, this space will display the digital gauges (up to four). If more than two digital gauges are configured with or without AUX/Tip tanks, the digital gauges will all be displayed in this field (up to four), even if the information is repeated from the ***Main EIS*** page. Refer to Figure E-8 for examples.

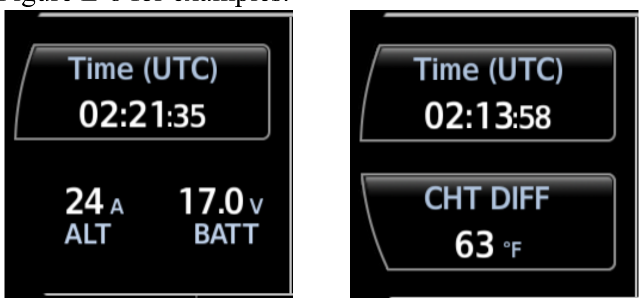


Figure E-8 Left Side Aux Gauges Examples

The middle right section of the ***AUX EIS*** page provides two user-selectable fields for miscellaneous information if no unmarked strip gauges are displayed on the ***AUX EIS*** page. If there are unmarked strip gauges that do not fit onto the ***Main EIS*** page due to other priorities, these gauges will populate the middle right of the ***AUX EIS*** page. Up to four strip gauges can be displayed on the ***AUX EIS*** page. One strip gauge will replace the lower user-selectable field. Two or more strip gauges will replace both user-selectable fields and will populate the gauges from the top down based on the strip gauge priorities. Refer to Figure E-9 for examples.

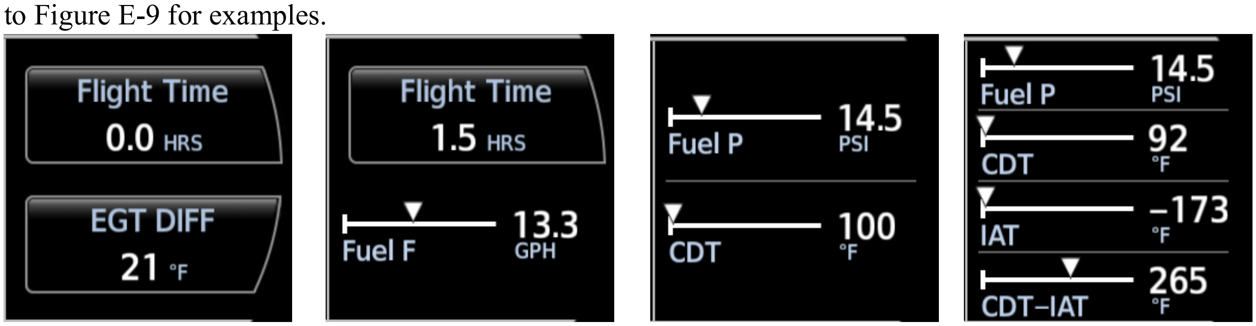


Figure E-9 Right Side Aux Gauges Examples

The bottom of the ***AUX EIS*** page has the full-time center position for Fuel Qty, OAT, or Time, with spaces for digital gauges on the left and right. If unmarked digital gauges cannot be displayed on the ***Main EIS*** page due to other gauge priorities (such as AUX Fuel), they will be displayed on the bottom-left and bottom-right, beginning with the higher priority digital gauge on the left. Refer to Figure E-10 for examples.

Figure E-10 Bottom AUX Gauges Examples

E.3 CHT/EGT Page

NOTE

This page is not available when GI 275 EIS is configured for Single CHT/EGT per Section 5.7.1.

The ***CHT/EGT*** page is dedicated to CHT and EGT information, as well as Primary EGT or TIT, if applicable. Similarly to the ***Main EIS*** and ***AUX EIS*** pages, the top section displays full-time gauges and the bottom center area displays fuel quantity.

The bar graph on the ***CHT/EGT*** page will populate with 4 or 6 pairs (depending on engine configuration) of CHT and EGT bars for each cylinder. If TIT sensors are installed and configured on the GI 275, then one or two (depending on configuration) bars for TIT will be displayed on the right-hand side of the ***CHT/EGT*** page. Alternatively, if a Primary EGT sensor is installed and configured, a bar for Primary EGT will be displayed on the right-hand side of the ***CHT/EGT*** page. There is also a space below the CHT/EGT bar graph where Fuel Flow is displayed, if installed and configured.

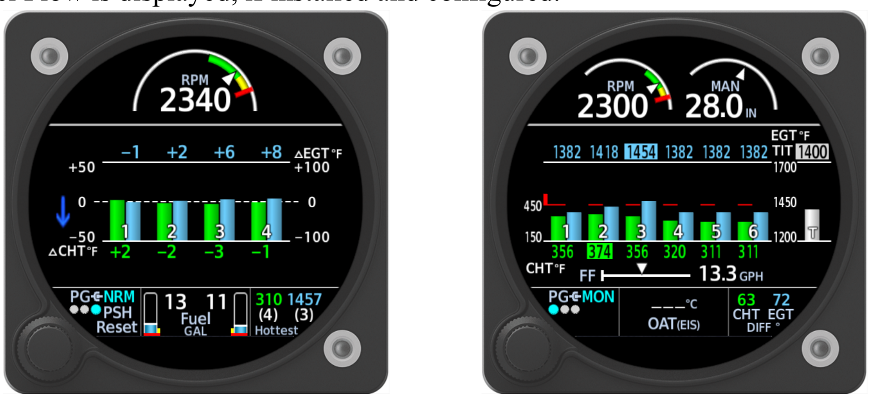


Figure E-11 CHT/EGT Page Examples

The ***CHT/EGT*** page can be cycled through three different modes that change display aspects of the CHT/EGT bar graph for different pilot operations, such as Lean Assist or viewing cylinders in Normalized layout during cruise.

E.4 Fuel Page

If a Fuel Flow sensor is installed and configured, a ***Fuel*** page is available on the GI 275 EIS. Similar to the ***AUX EIS*** and ***CHT/EGT*** pages, the top and bottom of the ***Fuel*** page retains the same full-time gauges and fuel quantity gauges. The ***Fuel*** page will show Estimated Fuel and Endurance based on the Fuel Flow sensor data. It will also show the Fuel Flow gauge with the fuel computer "fuel used" value.

Figure E-12 Fuel Page without GPS Source

Additionally, if a GPS source is interfaced with the GI 275 EIS, the ***Fuel*** page will display estimated range and efficiency based on fuel flow sensor data and will give fuel and endurance estimates for a flight plan waypoint if one is loaded on the interfaced GPS.

Figure E-13 Fuel Page with GPS Source

E.5 Summary Page

The ***Summary*** page provides supplemental flight summary information. Similarly to the ***Main EIS*** and ***AUX EIS*** pages, the top and bottom of the ***Summary*** page retain the full-time gauges and Fuel Quantity gauges. The ***Summary*** page will additionally show Aircraft Timer information, RPM, and Temperature data, as well as Fuel and Lean data.

Figure E-14 Summary Page – Aircraft Timers

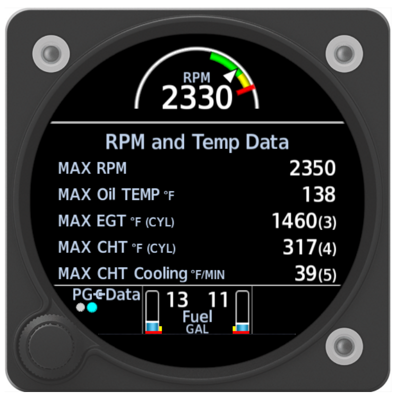


Figure E-15 Summary Page – RPM and Temp Data

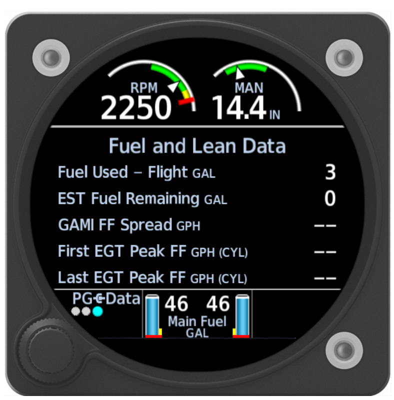


Figure E-16 Summary Page – Fuel and Lean Data

E.6 Gauge Markings

E.6.1 Caution and Warning Alerts

The GI 275 EIS will generate alerts for gauges with configured red or yellow markings by highlighting the numerical value in a red or yellow background, respectively. For strip and digital readout gauges, a flashing alert triangle is generated in the top left of the display in addition to highlighting the numerical gauge value. This alert triangle will persist on all EIS pages. Touching the triangle will stop the flashing and return the display to the ***Main EIS*** page. The full-time arc gauges do not generate alert banners.

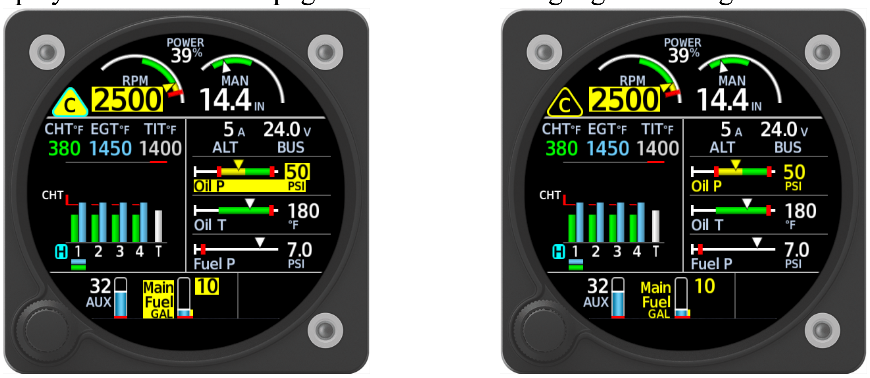


Figure E-17 Caution Alert (Flashing and Acknowledged)

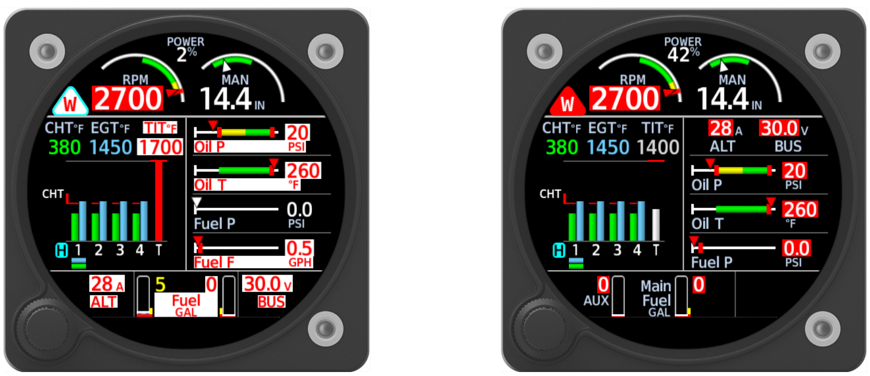


Figure E-18 Warning Alert (Flashing and Acknowledged)

If both a Caution and a Warning alert have triggered, the flashing Warning alert triangle will be displayed, and each numerical gauge value will flash the appropriate color (yellow for Caution and red for Warning). Touching the flashing Warning alert triangle will acknowledge both the Caution and Warning alerts. The non-flashing Warning alert triangle will persist until the alert condition is no longer true, in which case the non-flashing Caution alert triangle will be displayed as long as that alert condition is true.

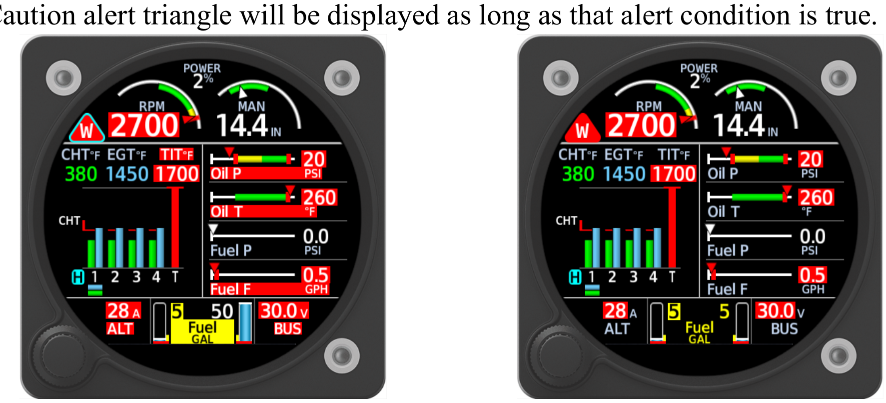


Figure E-19 Caution and Warning Alerts (Flashing and Acknowledged)

If an acknowledged Warning alert triangle is currently displayed and a new Caution alert triggers, a flashing Caution alert triangle will display in place of the Warning alert triangle. Once the Caution alert is acknowledged, the alert triangle will default to the higher priority non-flashing Warning alert triangle.

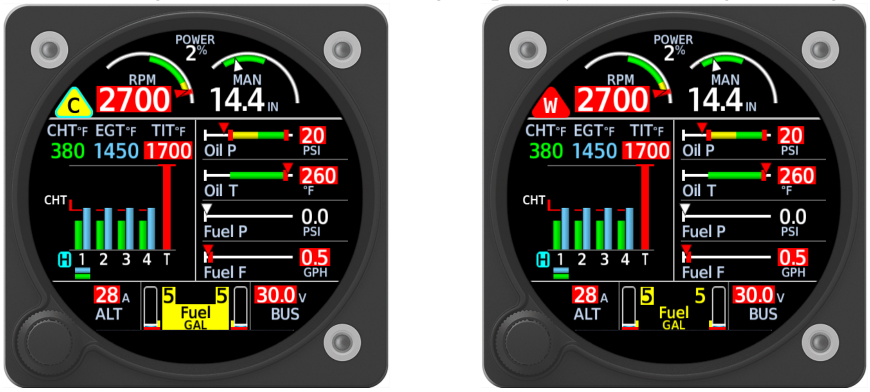


Figure E-20 New Caution Alert with Ongoing Warning Alert

Certain gauges (Oil Pressure, Manifold Pressure, and Fuel Pressure) do not trigger alerts until the engine is started. Gauges with red or yellow markings must be displayed on the ***Main EIS*** page. Green, blue, and white markings do not produce alerts or affect gauge prioritization, and may be shown on the ***AUX EIS*** page.

E.6.2 Gauge with Varying Arc Width

The GI 275 EIS display does not provide varying gauge arc width configuration options, as seen in Figure E-21. If a gauge that contains a varying arc width is being replaced, it must be configured so that the arc length is continuous for the intended length of the colored arc. Refer to Figure E-21 as an example.

Varying Gauge Arc Width Example

Continuous Gauge Arc Width Example

Figure E-21 Varying Gauge Arc

APPENDIX F HIRF AND LIGHTNING PROTECTION

F.1 Shielded Wire

When extending existing sensor wiring, it is required to maintain continuity of the wire shield.

For the shielded wire(s), the shield on both sides of the open segment must be reconnected after the splice is complete with a spacing of approximately 3 inches or less in total length.

1. Use solder sleeves with an insulated shield drain to jumper the shield ends together.
2. Protect the open segment of wire with fusion tape.
3. Start the wrap by making a complete turn of the tape around the cable approximately 0.5 inches from the repair area.
4. Overlap the preceding wrap by 50%.
5. Extend the tape over the repair area by approximately 0.5 inches.
6. Use lacing tape to spot tie the end of the fusion tape.

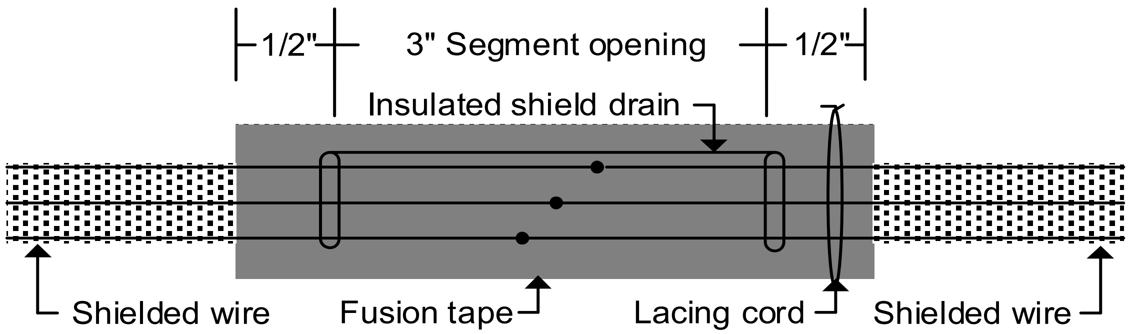


Figure F-1 Shielded Wire Splice

F.2 Lightning Zones for GTP 59

This section provides lightning zoning diagrams for various types of aircraft to facilitate correct placement of the GTP 59. Additional restrictions related to the placement of the GTP 59 can be found in Section 4.5.2.

The zoning levels correspond to the severity of lightning strikes and probability of occurrence on the aircraft. The order of severity starting with the safest zone is Zone 3, 2A, 2B, 1C, and 1A/1B. The GTP 59 cannot be installed in Zones 1A, 1B, 1C, or 2B.

All diagrams in this appendix use the legend shown in Figure F-2. The zoning described is split into the following: wings, fuselage, and empennage. For the particular airframe, the applicable wings, fuselage, and empennage zoning should be merged to get a complete zonal definition. The zoning figures applicable to any particular model are found in Table D-1. If there is a region of overlapping zones, the more severe zone should always be applied (e.g., if Zone 2A and 1A overlap in a region, then the overlapping region should be considered Zone 1A). Examples of complete lightning zoning diagrams can be found in Appendix Section F.3.

Shading	Zone		Shading	Zone
	Zone 1A			Zone 2A
	Zone 1B			Zone 2B
	Zone 1C			Zone 3

Figure F-2 Lightning Zoning Legend

F.2.1 Wings

The different zoning for wingtips and wings are contained in the following subsections.

F.2.1.1 Wingtips

F.2.1.1.1 Aircraft Not Limited to VFR Operation

NOTE

This zoning section is applicable to those aircraft models that are not limited to VFR operation only in Table D-1. For zoning of models limited to VFR operation only, refer to Appendix Section F.2.1.1.2.

Zoning of various types of wingtips is shown in Figure F-3. Figure F-3A shows zoning for straight wingtips.

Figure F-3B shows zoning for curved wingtips. The zones are similar to those of straight wingtips. The main difference is that Zone 1 extends from the outboard edge of the wing past the tangent point of the chord and 0.5 meters inboard.

Figure F-3C shows zoning for winglets. Note that the winglet figure shows a flattened winglet. Winglet classifications are very similar to those of curved wingtips. The main difference is that Zone 1 extends from the outboard edge of the wing past the tangent point of the winglet and 0.5 meters inboard.

Figure F-3D shows zoning for tip tanks. The rule that applies to tip tanks is very similar to that of the curved wing. The main difference is that Zone 1 extends 0.5 meters past the inboard edge of the tip tank.

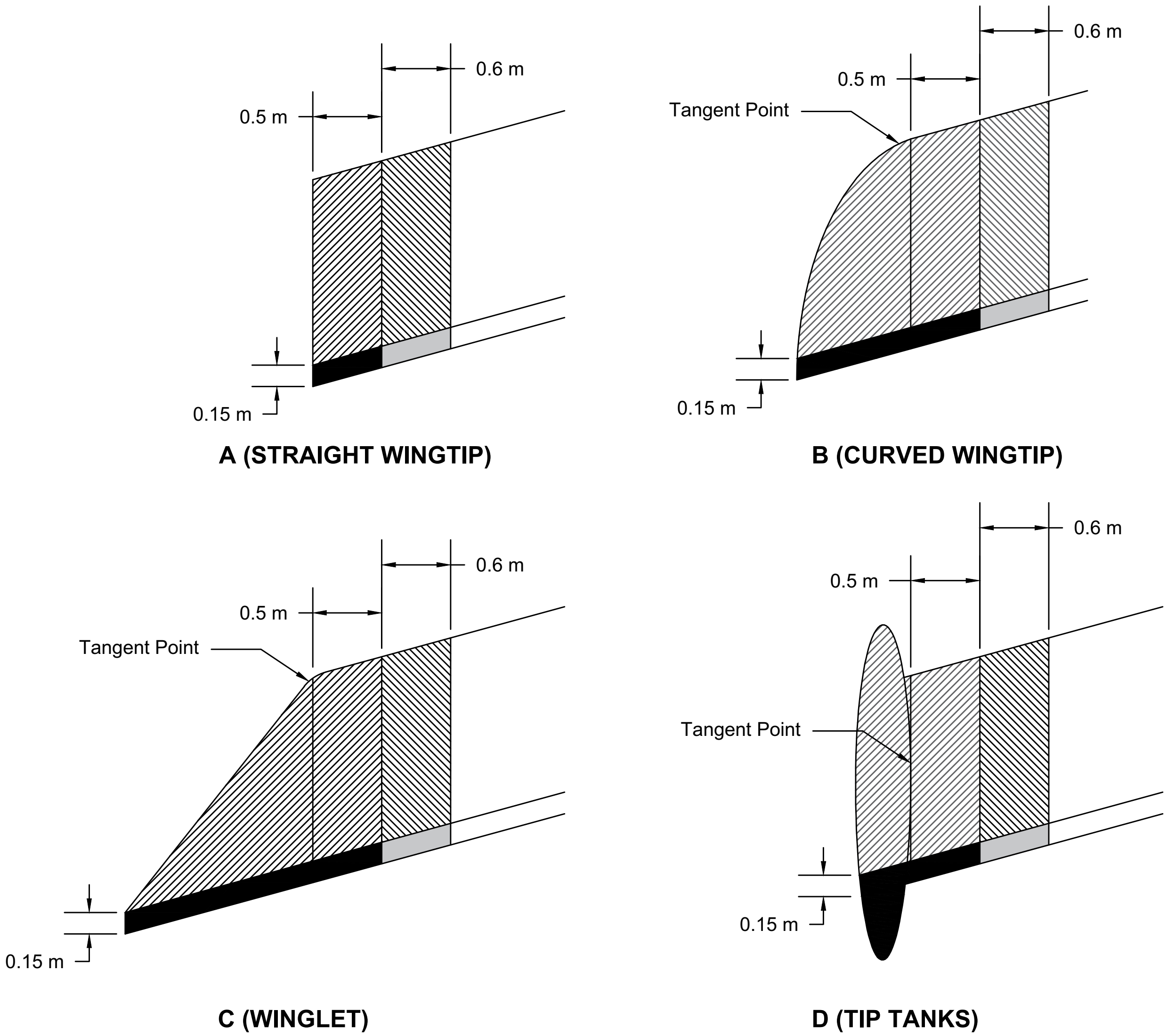


Figure F-3 Zoning for Wingtips on Aircraft Not Limited to VFR Operation

F.2.1.1.2 Aircraft Limited to VFR Operation

This zoning section is applicable to those aircraft models that are limited to VFR operation only in Appendix D. For zoning of models that are not limited to VFR operation only, refer to Appendix Section F.2.1.1.1.

NOTE

The aircraft must have a position light in the wing tip area as a prerequisite for this STC.

If there is no position light on the wing, then no Zone 3 exists and the GTP 59 cannot be installed on this particular aircraft. For those aircraft identified as VFR only in Appendix D, the following criteria is used to determine the Zone 3 area:

- Zone 1A/1B finishes as shown in Figure F-3 **or** 0.5 meters inboard from the inboard edge of the position light, whichever is the greater distance from the outboard edge of the wing tip, as shown in Figure F-4.
- Zone 2A/2B extends a total of 2.1 meters inboard of Zone 1A/1B.
- Zone 3 extends inboard of Zone 2A/2B from the wing tip and stops at another Zone 1A/1B or 2A/2B determined from other areas of Appendix Section F.2.2.

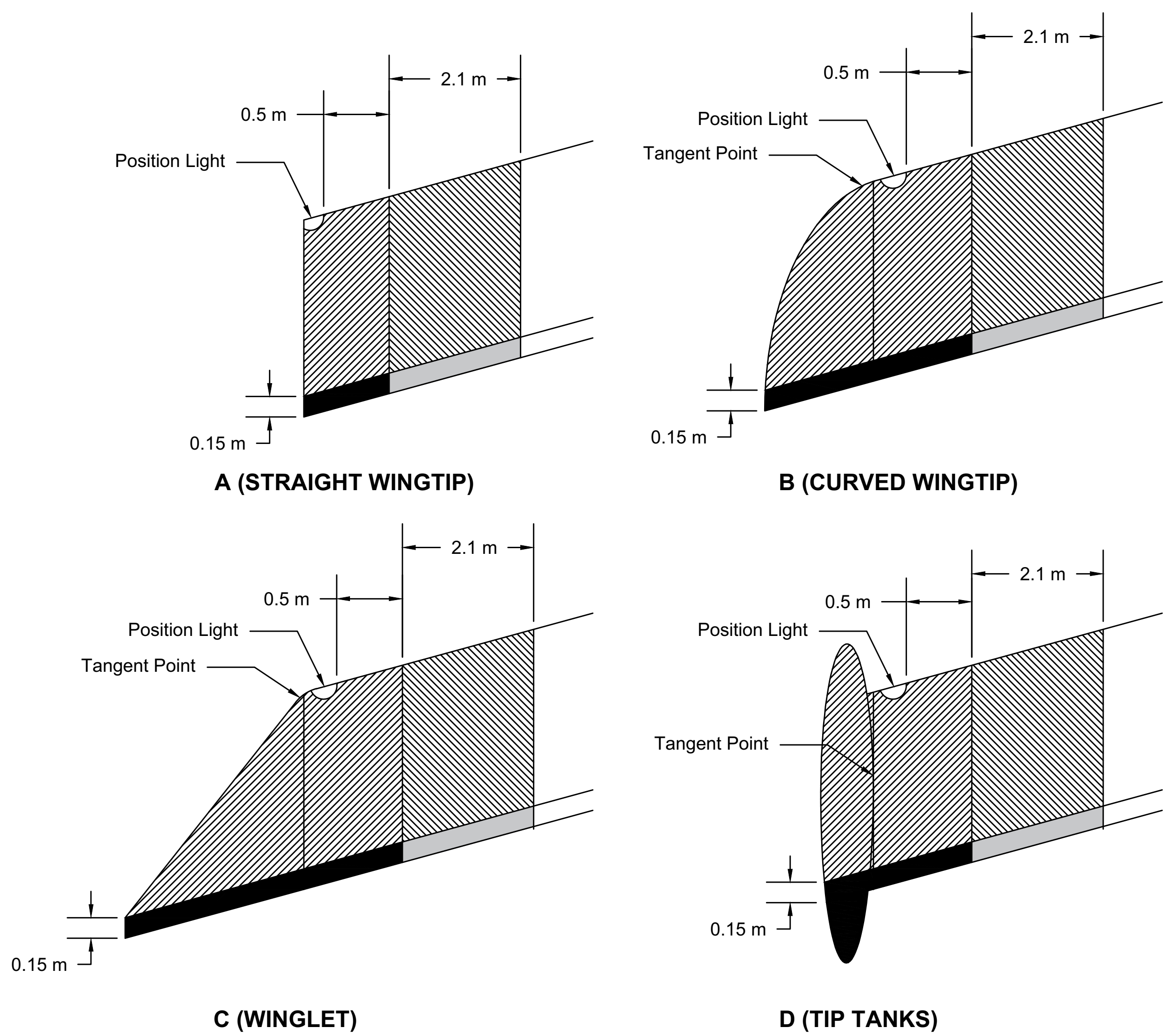


Figure F-4 Zoning for Wingtips on Aircraft Limited to VFR Operation

F.2.1.2 Landing Gear

The landing gear is considered Zone 1A. The struts that connect the landing gear to the wings are Zone 2A. Each side of landing gear is zoned individually. If there is a single strut connecting the landing gear to the wing, then the inboard and outboard edges of the landing gear should be used for zoning instead of using the connection point of the wing and the strut. In addition to the zoning shown in Figure F-5, the zoning described for the fuselage and wings also applies. The floats for a float-mounted fuselage have not been zoned because they do not influence the zoning of the bottom of the fuselage. The GTP 59 cannot be mounted on landing gear, including floats, or its struts.

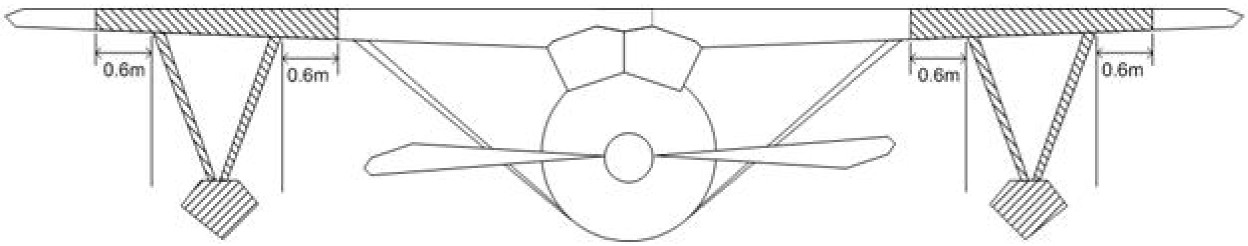


Figure F-5 Zoning for Wings Affected by Landing Gear

F.2.2 Fuselage

This section describes the zoning for several different types of fuselages. The empennage is zoned in Appendix Section F.2.3. Aft of every Zone 2A is a 0.15 meter Zone 2B (i.e., Zone 2A is followed by a 0.15 meter Zone 2B). Although Zone 2B areas are marked on the diagrams, sometimes their widths are not defined (0.15 meters should be used in these cases). The horizontal stabilizer of the tail is **not** zoned because the GTP 59 cannot be mounted there. In addition, the GTP 59 cannot be mounted within 0.5 meters of the rear-most point of the fuselage. Appendix Section F.2.3 explains the conditions under which the GTP 59 can be mounted on the vertical stabilizer. Although all diagrams show low-wing aircraft, the same zoning can be applied to high-wing aircraft. The values d_1 and d_2 are defined as follows:

d_1 = 1.3 m (51.2 in)

d_2 = 2.6 m (102.4 in)

F.2.2.1 Single-Propeller Aircraft

Zoning of low- or high-wing aircraft with single propellers is shown in Figure F-6. The area of the nose immediately aft of the propeller is Zone 3. The 0.6-meter distance should be measured from the outboard-most edge of the fuselage or the tip of the propeller, whichever is longer. Figure F-8 shows the case of an aircraft with a curved fuselage. The portion of the fuselage that extends 1.3 meters aft of the propeller blades is Zone 1C. However, the bottom centerline is Zone 2A, and it is acceptable to mount the GTP 59 there.

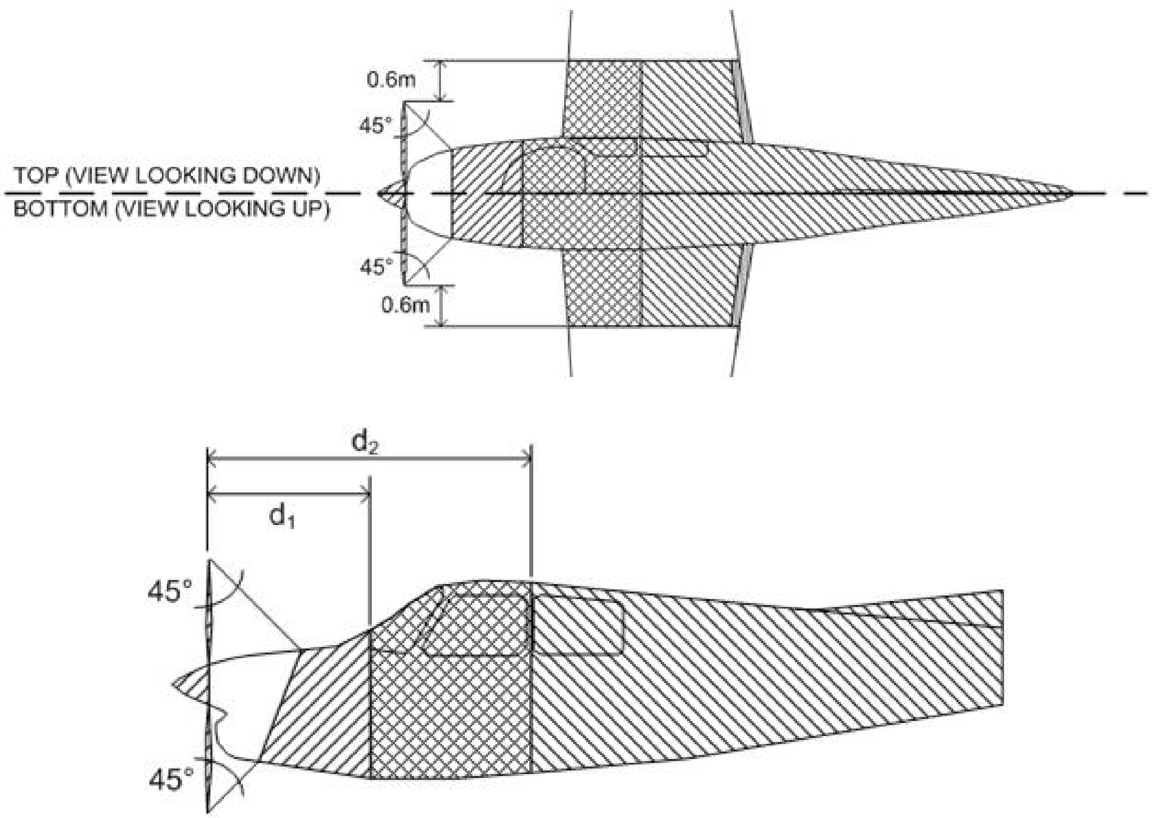
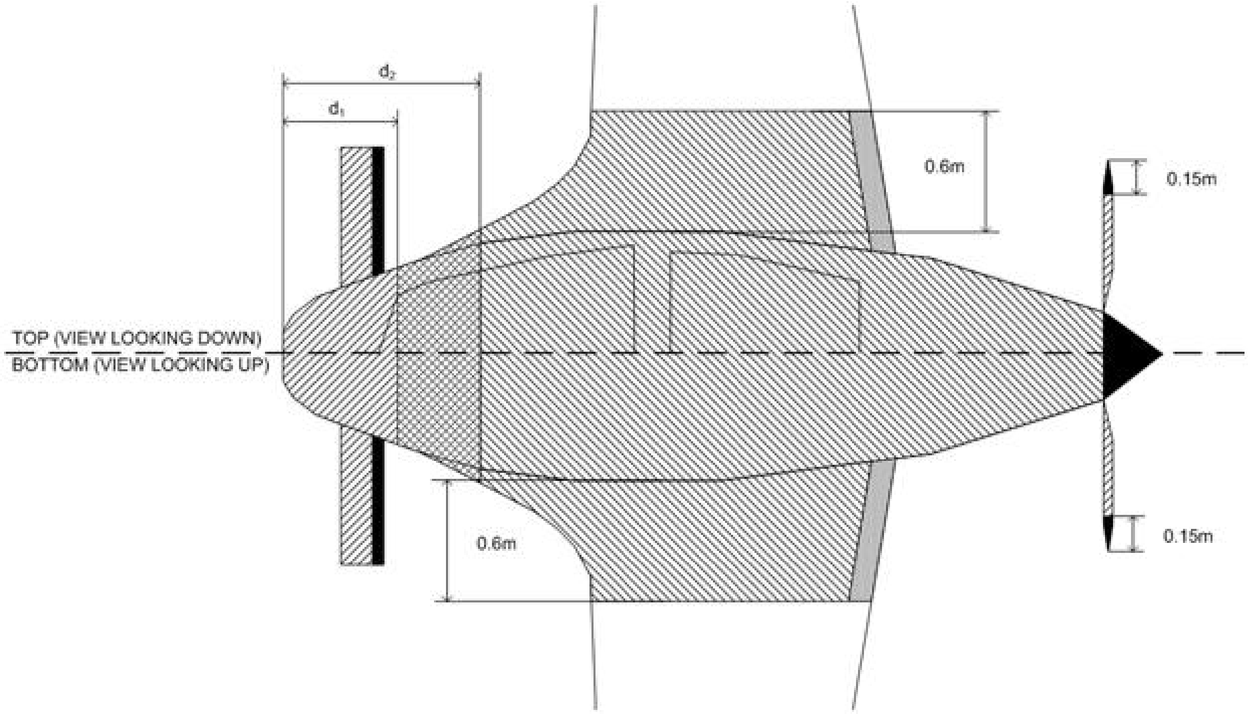
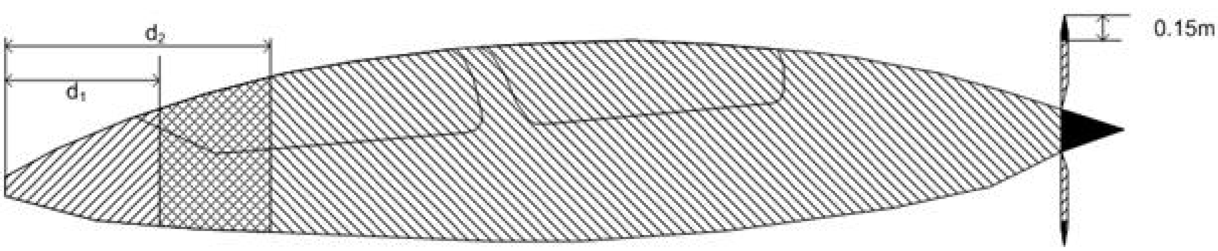


Figure F-6 Zoning for a Single Propeller (Low- or High-Wing)

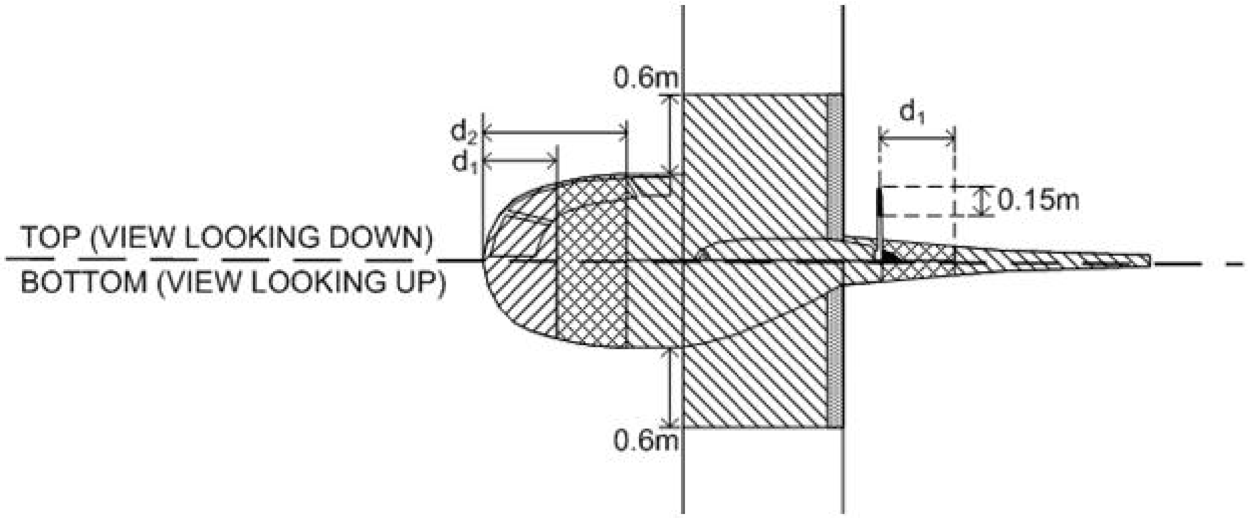


A

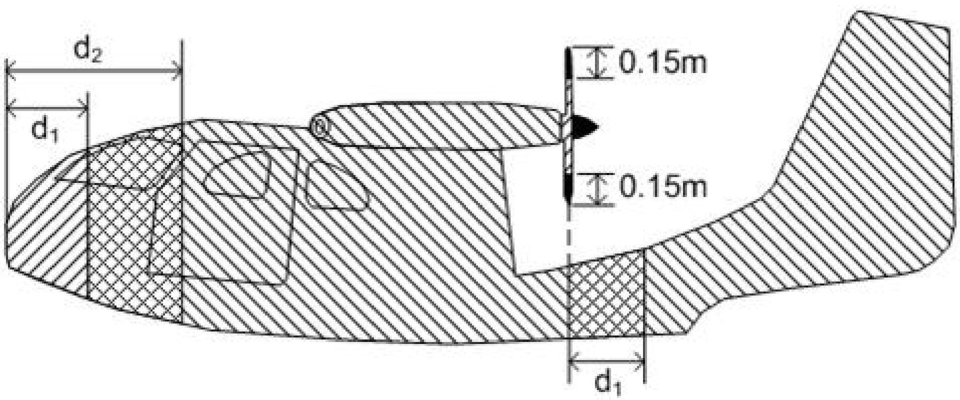


B

Figure F-7 Zoning for a Low- or High-Wing Canard with a Rear-Mounted Propeller



A



B

NOTE

The bottom centerline is Zone 2A, and it is acceptable to mount the GTP 59 there.

Figure F-8 Zoning for a Low- or High-Wing Aircraft with a Curved Lower Fuselage

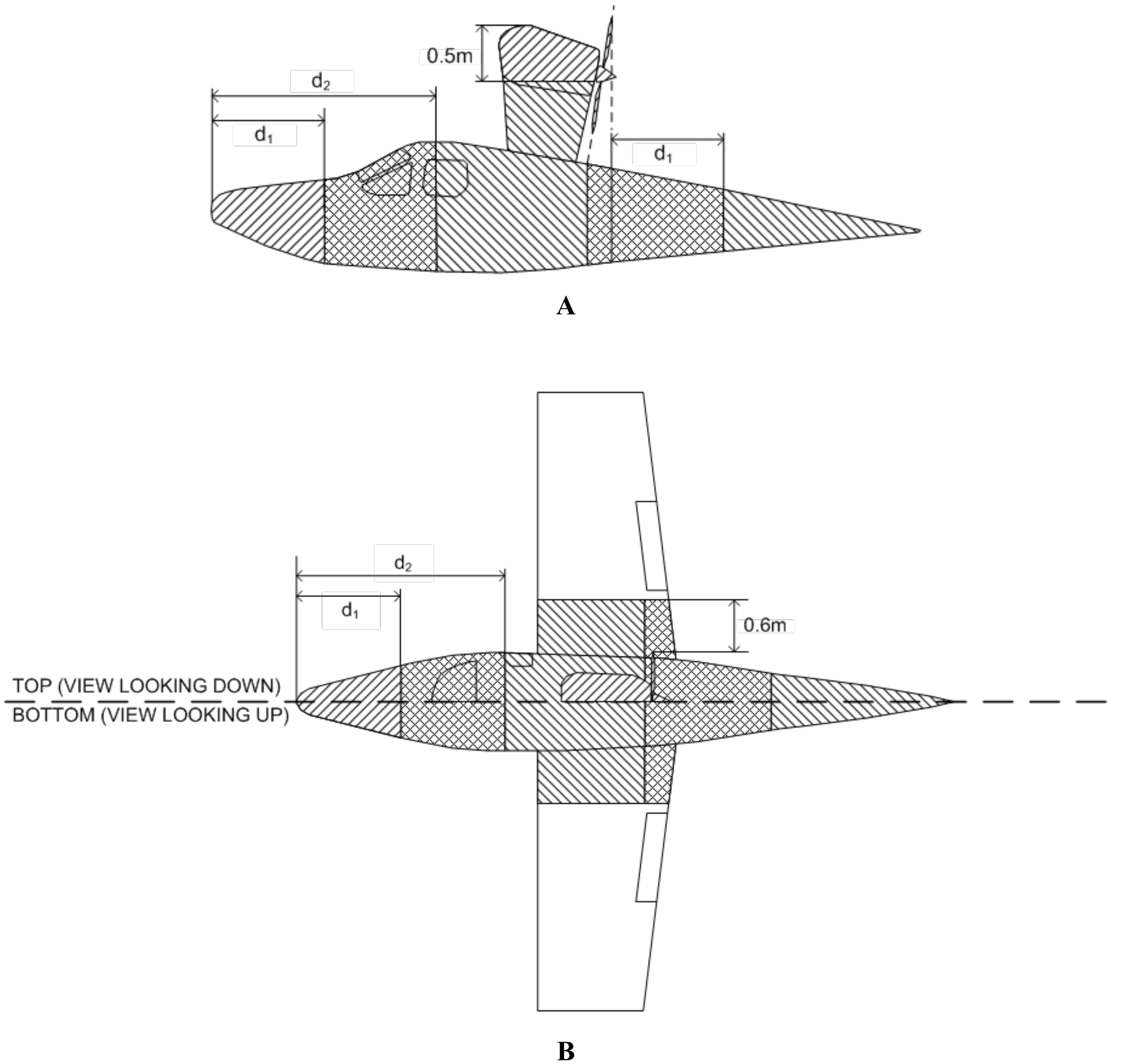


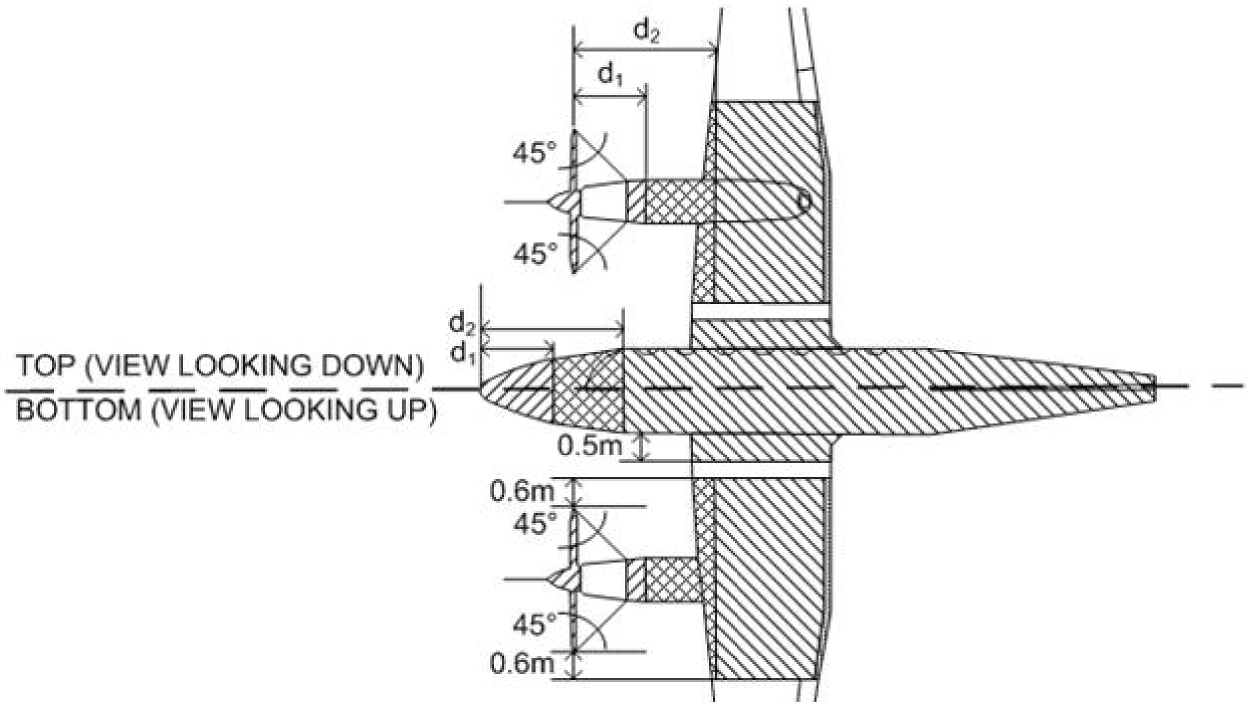
Figure F-9 Zoning for a Single, Rear-Mounted Prop above Fuselage

F.2.2.2 Aircraft with Multiple Propellers

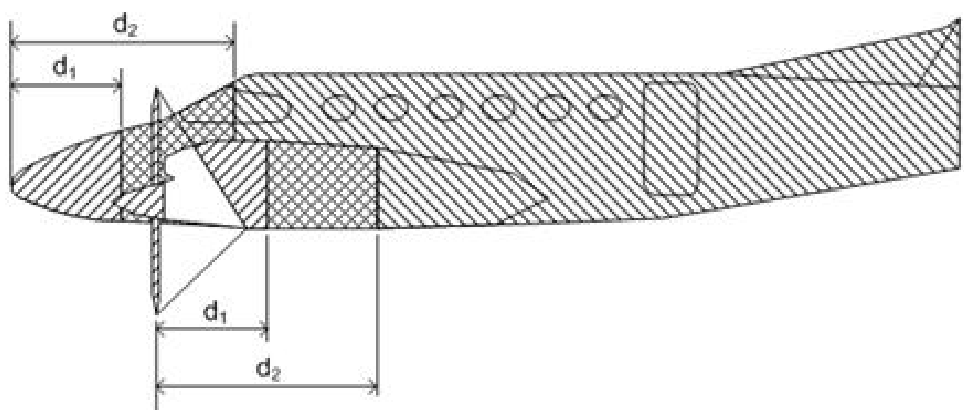
Zoning of low- or high-wing aircraft with twin front-mounted propellers is shown in Figure F-10. The text below assumes the aircraft fuselage and wing are constructed of metal. Note that Zone 2A can overlap onto the nacelles if they are within 0.6 meters outboard of the fuselage.

Zoning of low- or high-wing aircraft with rear-mounted twin propellers is shown in Figure F-11. The text below assumes the aircraft fuselage and wing are constructed of metal.

For an empennage with a third engine, the GTP 59 cannot be located in the empennage. Therefore, the zoning for this third engine area has been omitted from the diagrams below. The GTP 59 for this aircraft should be located in Zone 3 or Zone 2A on the bottom of the fuselage and wings.

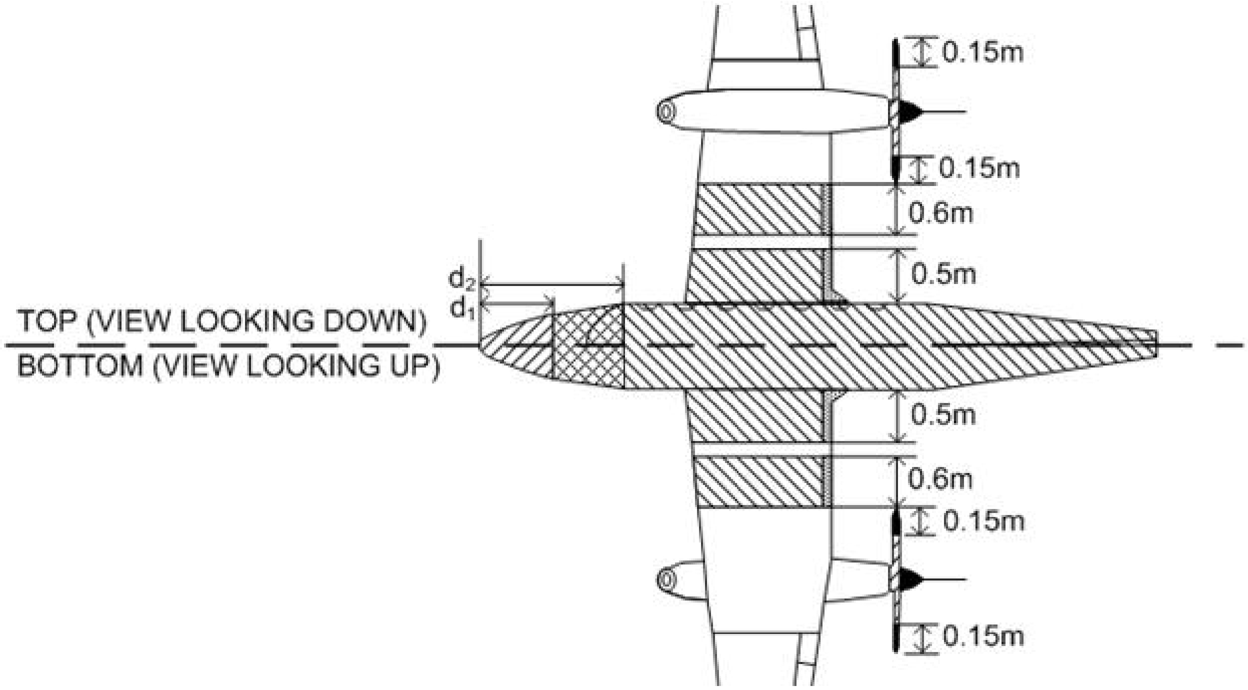


A

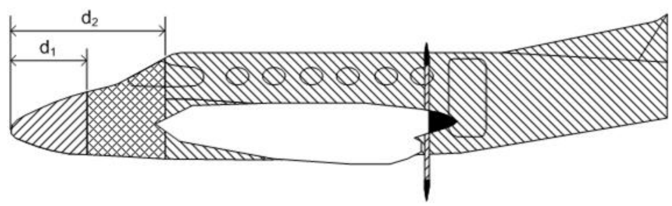


B

Figure F-10 Zoning for Front-Mounted Twin Propellers (Low- or High-Wing)



A

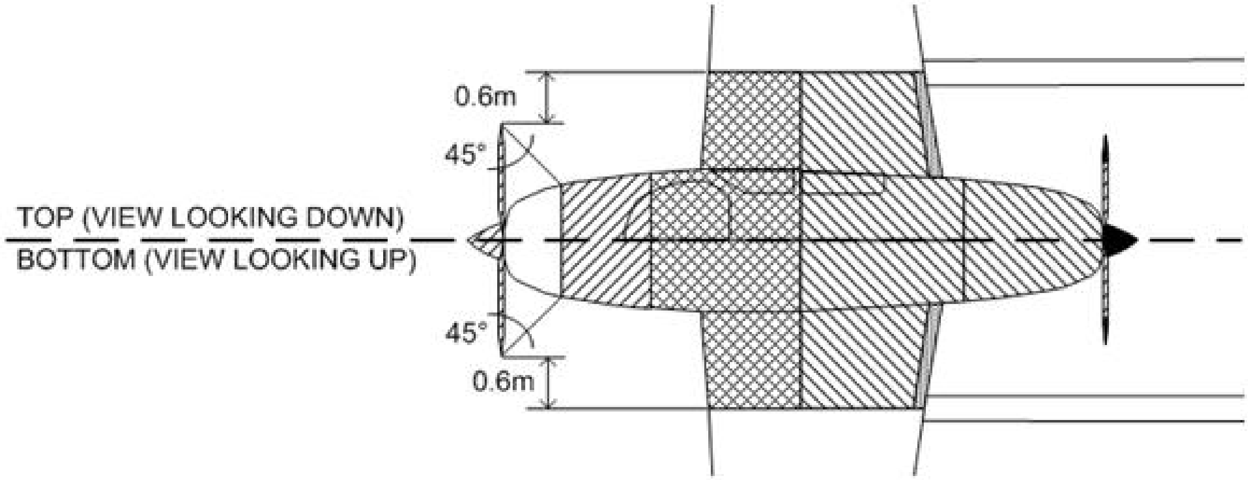


B

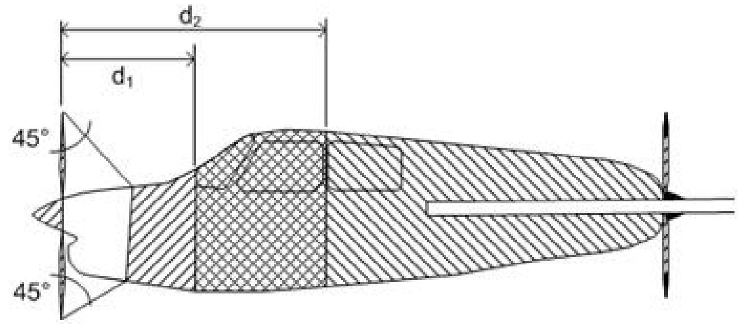
NOTE

Although the engine nacelles are shown as Zone 3, they may be Zone 2A if the engine falls within the Zone 2 area of the wing (within 0.6 meters outboard from fuselage edge).

Figure F-11 Zoning for Rear-Mounted Twin Propellers (Low- or High-Wing)



A

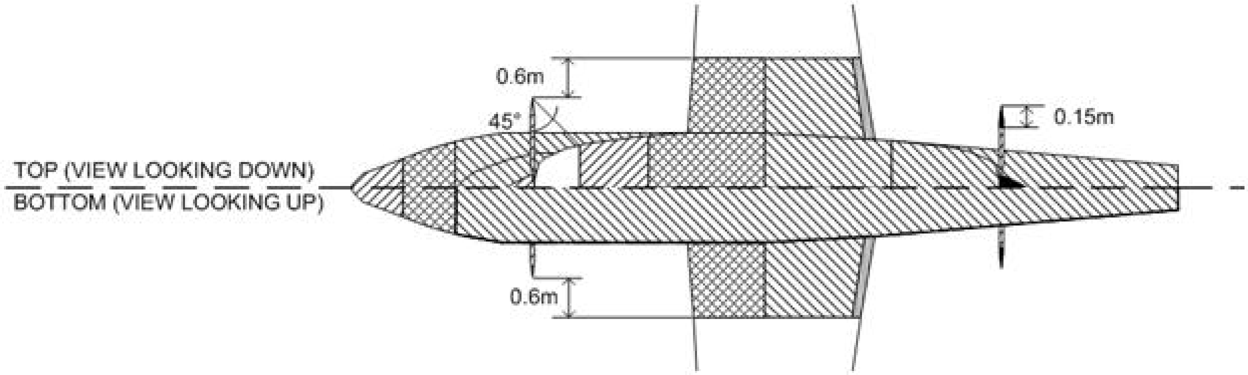


B

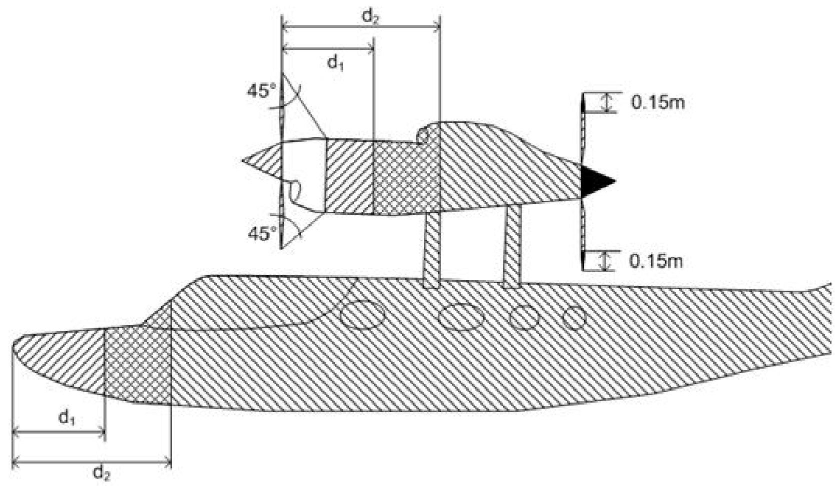
NOTE

Nothing can be mounted in the tail boom of the aircraft.

Figure F-12 Zoning for Front- and Rear-Mounted Propellers (Low- or High-Wing)



A



B

Figure F-13 Zoning for High-Wing with Front and Rear Propellers Mounted Above Fuselage

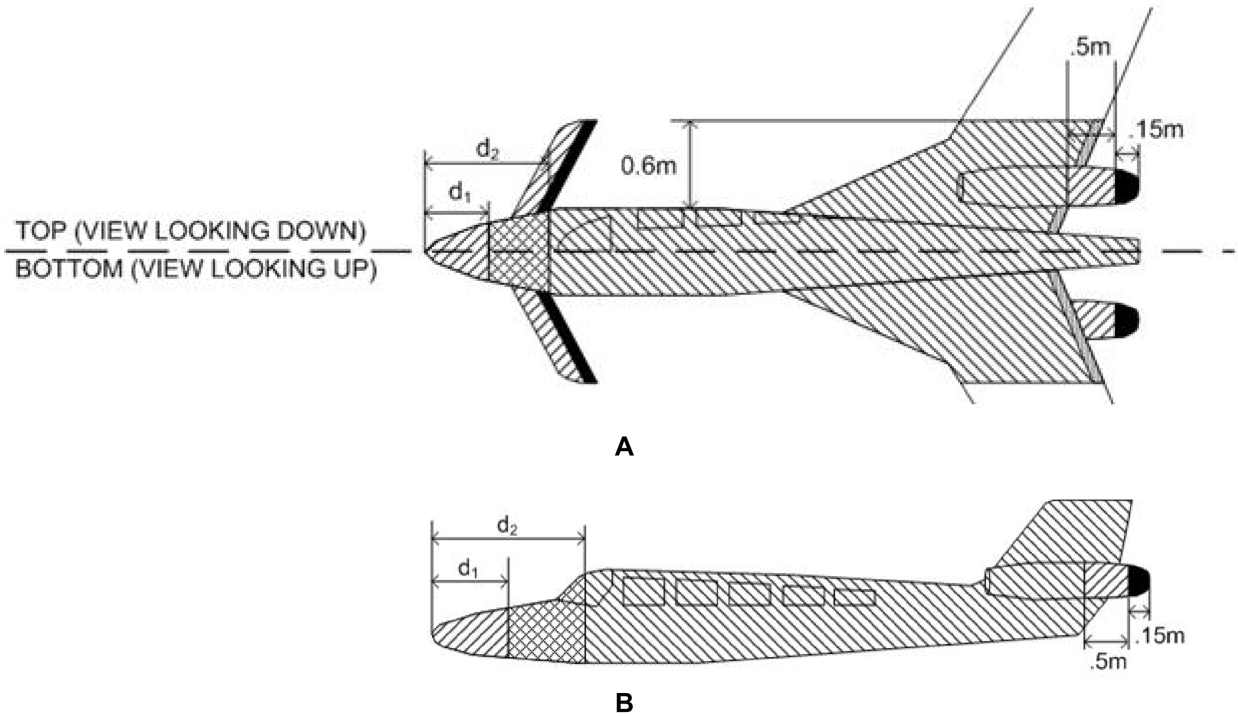


Figure F-14 Zoning for Low- or High-Wing Canard with Twin Jet Engines

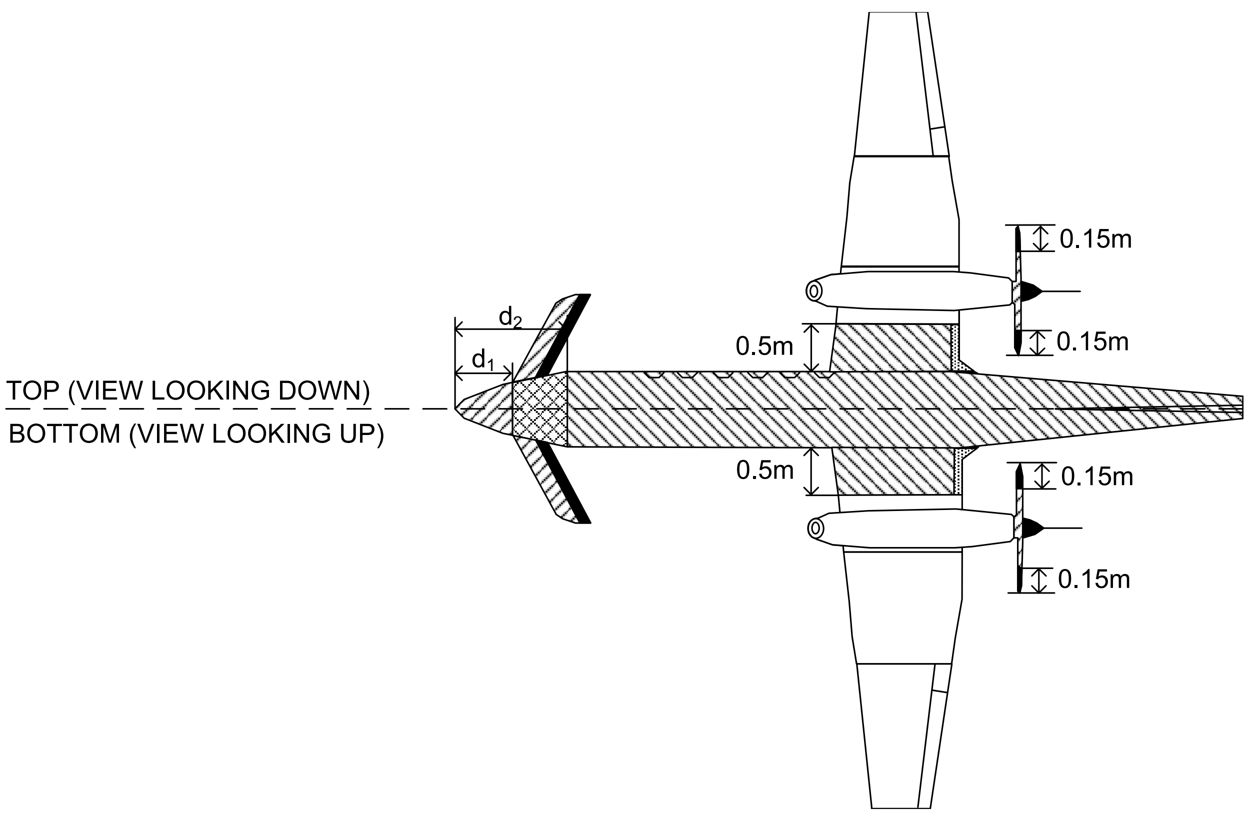


Figure F-15 Zoning for Low or High Wing Canard with Twin Rear-Facing Props

F.2.2.3 Biplanes

Figure F-16 shows how biplanes can be classified using previous figures. The top and bottom of both wings will be zoned using Figure F-4, while the fuselage and the mid-sections of the wing can be zoned using Figure F-6.

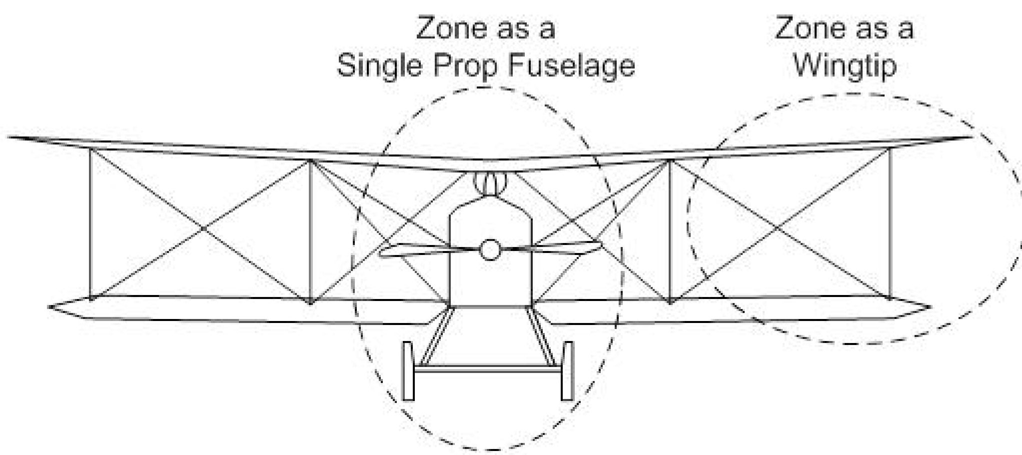


Figure F-16 Zoning for Single-Propeller Biplane

F.2.2.4 Aircraft with Jet Engines

Zoning of low- or high-wing twin jet engine aircraft is shown in Figure F-17.

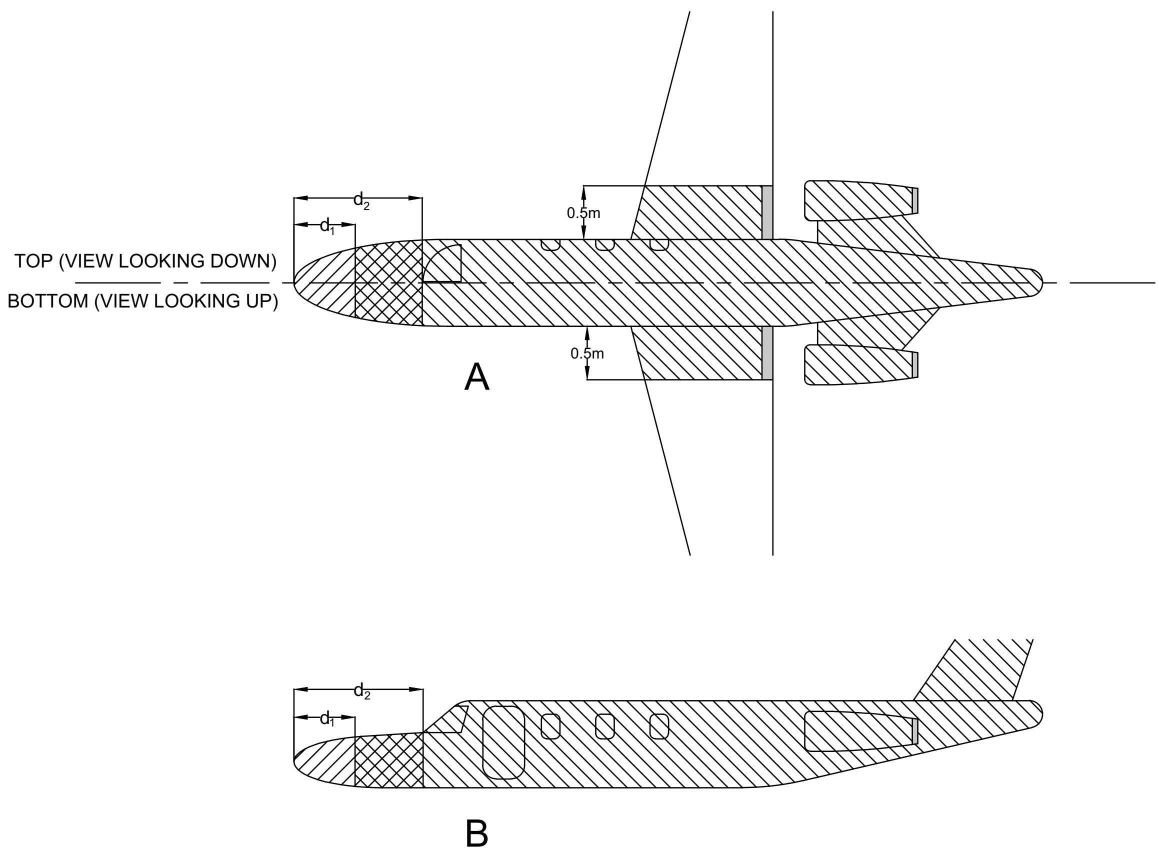


Figure F-17 Single Jet Engines with Two Inlets Zoning, Low or High Wing

F.2.3 Empennage

If the GTP 59 cannot be mounted in other areas of the aircraft that are Zone 3 locations, it is acceptable for metal aircraft with one of the three traditional empennages shown in Figure F-18 to mount the GTP 59 in the Zone 2A area of the tail. However, the GTP 59 cannot be mounted on/under any non-conducting surfaces. If the **complete** empennage of the aircraft being considered does not match those shown in Figure F-18, then it should be mounted in allowed areas defined for the fuselage and wings. If only portions of the empennage shown below match, then the same rule applies and the GTP 59 cannot be installed in the empennage. Note that it is allowable for only the horizontal stabilizer tips to differ from those shown in Figure F-18. The GTP 59 cannot be located in the horizontal stabilizer of the empennage. The GTP 59 cannot be mounted in the tail of a composite empennage.

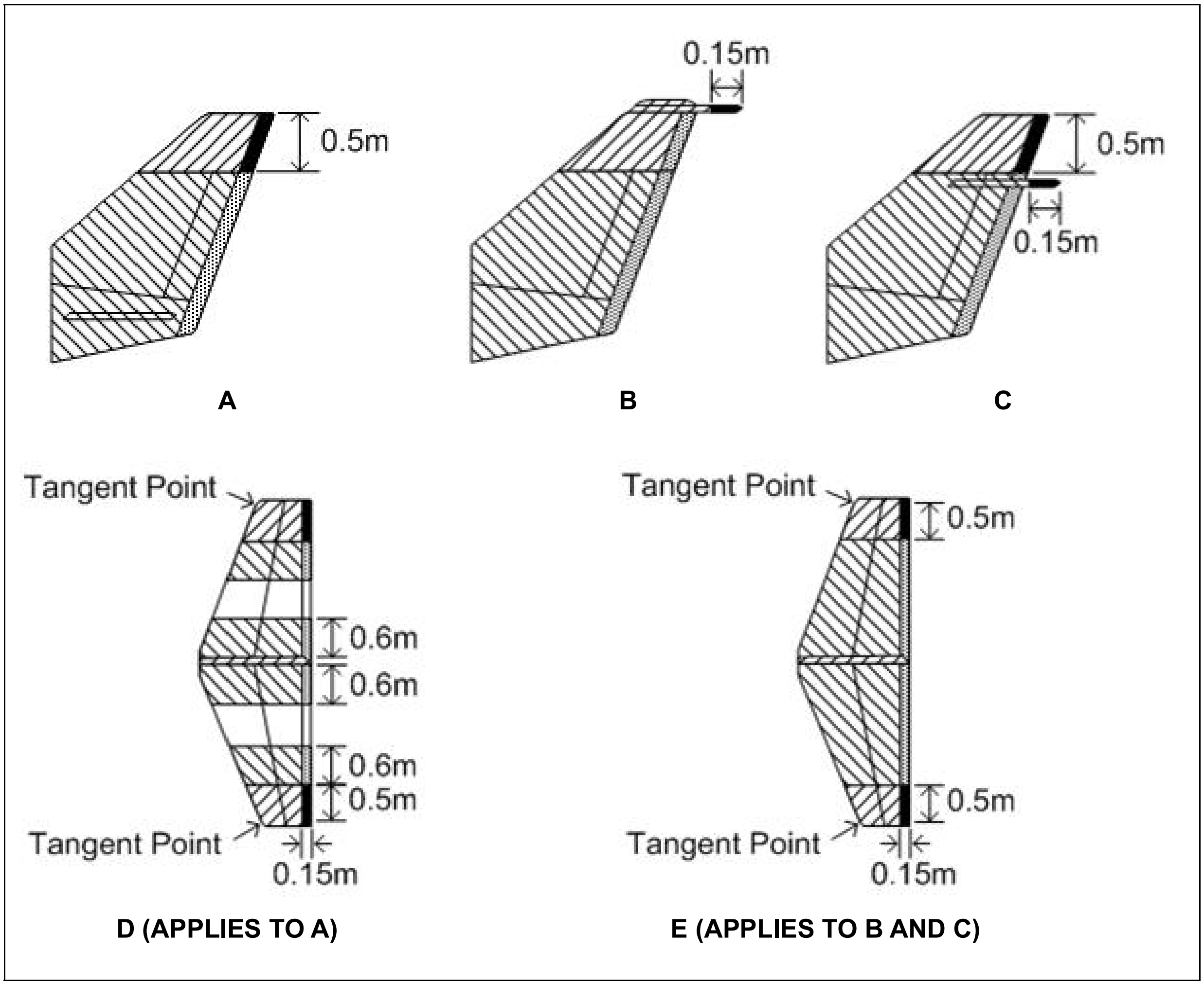


Figure F-18 Zoning for Empennage

F.3 Example Lightning Zoning Diagrams

This section contains sample lightning zoning diagrams for typical aircraft.

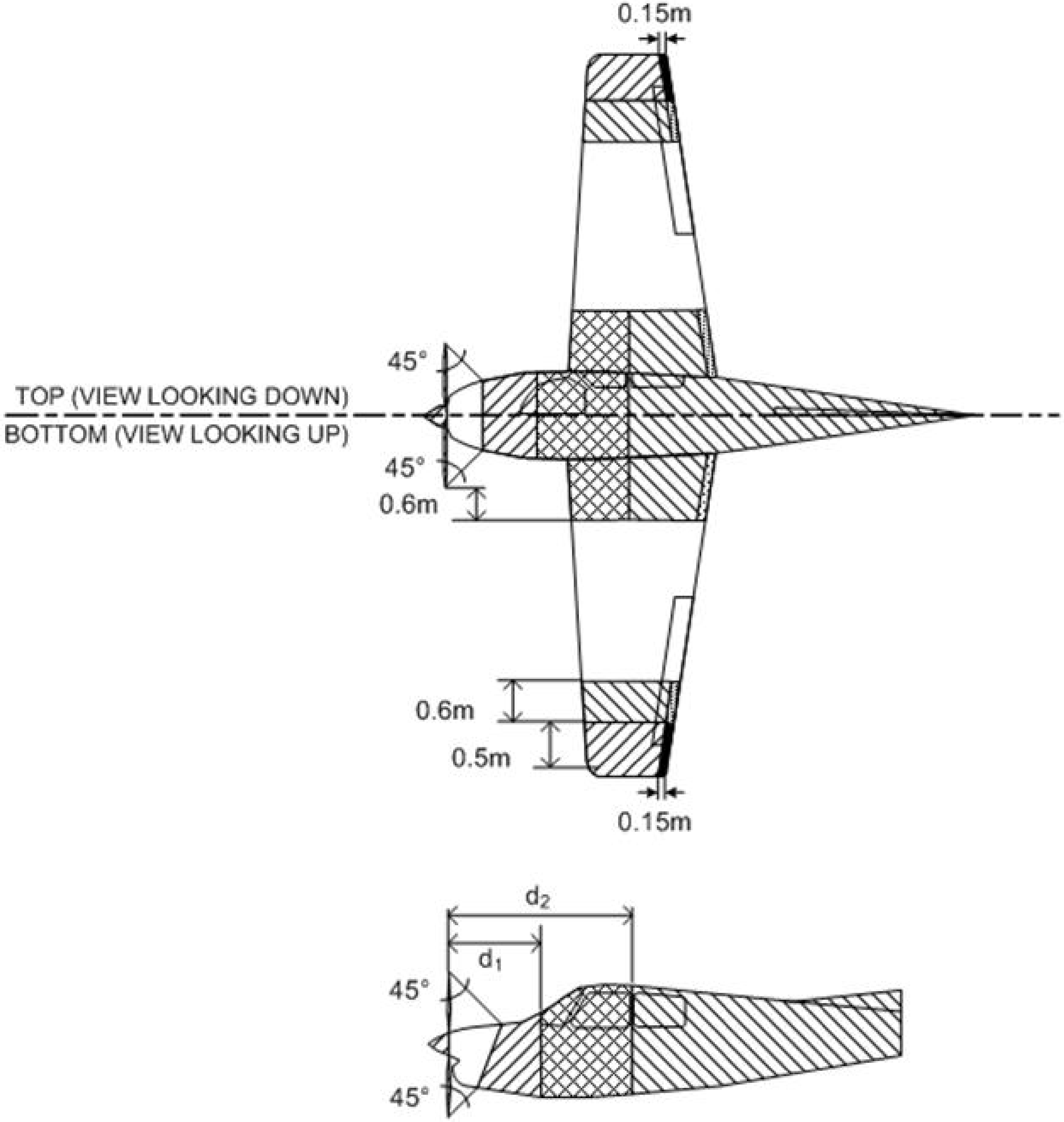


Figure F-19 Example Lightning Zoning for Single-Engine Aircraft

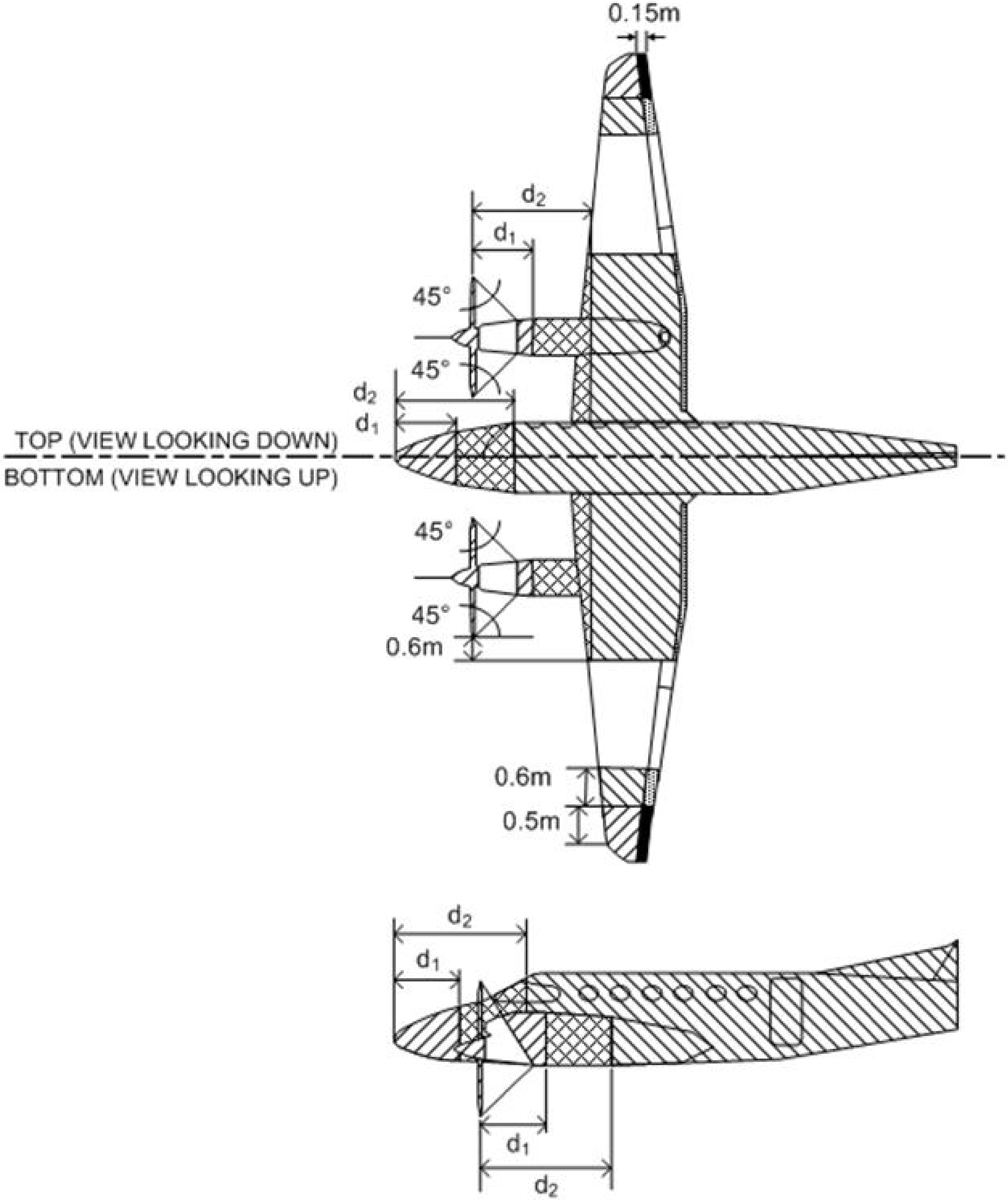


Figure F-20 Example Lightning Zoning for Twin-Engine Aircraft

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