

SECTION 9

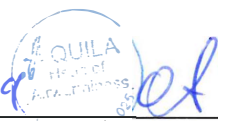
Pilot's Operating Handbook Supplement AS-23

(Dual) Garmin G5 Attitude Indicator and Horizontal Situation Indicator



This supplement is applicable and must be inserted into Section 9 of the Pilot's Operating Handbook when a Garmin G5 Attitude Indicator in combination with a Garmin G5 Horizontal Situation Indicator is installed in the AQUILA AT01-100. The information in this supplement adds to or replaces information in the basic Pilot's Operating Handbook.

Revision A.01 of AFM Supplement AS-23 ref. FM-AT01-1010-262 is approved under the authority of DOA ref. EASA.21J.025.

25.01.2019 
Date, Signature Office of Airworthiness

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0.1 RECORD OF REVISIONS

Issue	Reason for Change	Effected Pages	Date of Issue
A.01	Initial Issue	All	25.01.2019

0.2 LIST OF CURRENT PAGES

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1. GENERAL

The aircraft is equipped with two Garmin G5 flight instrument displays, one configured as an Attitude Indicator and the other one configured as a Horizontal Situation Indicator (HSI).

For a detailed description and full operating instructions please refer to the current issue of the GARMIN G5 Pilot's Guide.

NOTE

The current issue of the GARMIN G5 Pilot's Guide must be kept on board the aircraft and be available to the crew at all times.

2. OPERATING LIMITATIONS

System Requirements

- The G5 Attitude Indicator / Horizontal Situation Indicator must utilize the following or later software versions:

Component	Software Version
G5 Attitude Indicator G5 Horizontal Situation Indicator	5.00

- The backup battery is required for the G5 used as a Attitude Indicator and HSI.

Use of Secondary Instruments

The original type design approved instruments for airspeed, altitude and vertical speed remain the primary indications for these parameters.

The G5 Electronic Flight Instrument is installed as a Attitude Indicator and HSI only.

Kinds of Operation Limits / Minimum Equipment

There is no change regarding the information in the basic Pilot's Operating Handbook.

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3. EMERGENCY PROCEDURES

If necessary, the respective G5 can be isolated from the aircraft power supply system by pulling the **G5 ATT** or **Attitude Indicator** as well as the **Directional Gyro** circuit breaker.

G5 Failure Indications

If a G5 function fails, a large red 'X' is typically displayed over the instrument(s) or data experiencing the failure. Upon G5 power-up, certain instruments remain invalid as equipment begins to initialize. All instruments should be operational within one minute of power-up. If any instrument remains flagged, the G5 should be serviced by a Garmin-authorized repair facility.



Attitude Failure

Attitude failure is indicated by removal of the sky/ground presentation, a red X, and a yellow "ATTITUDE FAIL" on the display. Rate-of-turn and slip information will not be available. The remaining G5 HSI switches automatically to the Attitude Indicator mode.

1. Continue flight using remaining instruments at D/VFR
2. Carry out a precautionary landing at the nearest airfield at N/VFR

WARNING

Before returning the aircraft to service, the problem must be resolved.

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Magnetometer Failure (Heading Failure, Loss of Mag. Data or Magnetic Field Error)

Magnetometer failure is indicated by removal of the digital heading readout, a red X, and a yellow “HDG” on the display. If the G5 HSI has a valid GPS signal it will display the GPS track information in magenta.

1. Continue flight using magnetic compass

WARNING

Before returning the aircraft to service, the problem must be resolved.

Attitude Aligning / Keep Wings Level

If the “ALIGNING KEEP WINGS LEVEL” indication occurs during flight, the G5 has detected an invalid attitude solution and will not display any attitude information.

1. Use remaining instruments to maintain wings level flight. The system will display attitude when internal accuracy tolerances have been met.
2. If attitude does not return at N/VFR, carry out a precautionary landing at the nearest airfield.

WARNING

Before returning the aircraft to service, the problem must be resolved.

Attitude Aligning

If the “ALIGNING” indication occurs during flight and attitude remains displayed, the attitude display is acceptable for use for flight. The message will clear when the attitude solution is within the systems internal accuracy tolerances. It is recommended to maintain wings level to reduce the time for the system to align.

Loss of Electrical Power to any G5

In the event of a loss of aircraft electrical power to any G5, the attitude indicator and the HSI will continue to function on its internal battery. Internal battery endurance is indicated on the respective G5 display in hours and minutes. The charging symbol will be removed and the internal battery will not be charged.

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Loss of Electrical Power to the GAD 29B

In the event of a loss of aircraft electrical power to the GAD 29B, the heading and course datum will be unavailable to an optional autopilot and the autopilot may deviate from the intended path or may disconnect. GPS flight plan course information may be displayed on the HSI and "VFR" will be displayed in amber text on the HSI.

GPS Failure

The G5 attitude indicator calculates aircraft attitude using information from its built-in inertial sensors. GPS and airspeed data are used to provide the most accurate attitude information. If none of these additional sources of information are available, attitude calculations will still be valid but accuracy may be slightly affected.

The G5 HSI will display Dead Reckoning mode (DR) or Loss of Integrity mode (LOI) in the lower left corner. GPS NAV will not be available.

Airspeed / Altitude Fail

Use primary or remaining instruments (basic POH 3.13.4) for airspeed, altitude and vertical speed.

4. NORMAL PROCEDURES

G5 Power Button and Knob

Both G5 Flight Instrument displays will power on with the application of aircraft power. The G5 power button can be used to turn the displays on and off. Press and hold the power button to turn the display off.

The knob of both units performs the following functions:

PRESS	Press to access the menu. From the menu, press to select the desired menu item. Press to accept the displayed value when editing numeric data or selecting from a list.
TURN	From the Menu, turn the Knob to move the cursor to the desired menu item. Rotate to adjust the baro setting and altitude pre-select. Turn to select the desired value when editing numeric data or selecting from a list.

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Backlight Intensity Adjustment

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2. Avionics and flight instruments SET

Pressing the power button brings up the backlight controls as well as the current battery status. The backlight level adjusts automatically via a photocell. Temporary adjustments to the backlight level can be made by turning the knob on the lower right corner of the unit to adjust. When power is cycled to the unit, the backlight level is reset to use the photocell.

For a detailed description and full operating instructions, please refer to the current issue of the GARMIN G5 Pilot's Guide.

NOTE

Use of polarized eyewear may cause the display to appear dim or blank.

5. PERFORMANCE

There is no change regarding the information in the basic Pilot's Operating Handbook.

6. WEIGHT AND BALANCE

There is no change regarding the information in the basic Pilot's Operating Handbook.

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7. SYSTEMS DESCRIPTION

Functions and Operation

The aircraft is equipped with two Garmin G5 flight instrument displays, one configured as an Attitude Indicator and the other one configured as a Horizontal Situation Indicator (HSI). Both units feature a bright, sunlight readable, 3.5-inch color display which is sized to fit in a standard 3-1/8-inch instrument cutout. Both G5 contain integrated attitude and air data sensors that provide display of attitude and secondary air data information.

The G5 attitude indicator receives a GPS input for attitude aiding via an additional GPS antenna on top of the fuselage and is connected to the aircraft Pitot / Static system for secondary air data information.

Both G5 have an internal lithium-ion battery that provides up to 4 hours of emergency power.

Both G5 have the capability to display system messages to the crew along the bottom of the display. A system message is indicated through a white indication on the G5. Messages can be displayed by pressing the G5 knob, and selecting the Message menu item.



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Message	Meaning
External Power Lost	Aircraft power has been removed from the G5.
Critical battery fault! Powering off	Battery has critical fault condition and the unit is about to power off to avoid damage to the battery.
Battery fault	Battery has a fault condition – unit needs service.
Battery charger fault	Battery charger has a fault condition – unit needs service.
Low battery	Battery charge level is low.
Hardware fault	Unit has a hardware fault – unit needs service.
Power supply fault	Unit power supply fault detected – unit needs service.
Unit temperature limit exceeded	Unit is too hot or too cold.
Factory calibration data invalid	Unit calibration data not valid – unit needs service.
Network address conflict	Another G5 with the same address is detected on the network (most commonly a wiring error on one of the units).
Communication error	General communication error (most commonly appears in conjunction with Network Address Conflict message).
Magnetic field model database out of date	Internal magnetic field database is out of date - software update required.
Magnetometer Hardware fault	The magnetometer has detected a fault – unit needs service. Heading data may not be available.
Using external GPS data	GPS data from another network LRU is being used. The unit's internal GPS receiver is enabled, but unable to establish a GPS fix.
Not receiving RS-232 data	The G5 is not receiving RS-232 data from the GPS navigator – system needs service.
Not receiving ARINC 429 data	The G5 is not receiving ARINC 429 data from the navigation source – system needs service.
ARINC 429 interface configuration error	The G5 ARINC 429 port is receiving information from an incorrect source – system needs service.
Software version mismatch	The G5 attitude indicator and the G5 HSI units have different software. Cross fill of baro, heading and altitude bugs is disabled.
GPS receiver fault	The G5 on-board GPS receiver has a fault.

For a detailed description and full operating instructions please refer to the current issue of the GARMIN G5 Pilot's Guide.

Electrical protection for the G5 AI / HSI

The **G5 ATT** or **Attitude Indicator** as well as the **Directional Gyro** circuit breaker supplies power to the respective G5 instrument for normal operation and to charge the internal battery. The **G5 GAD** circuit breaker supplies power to the GAD 29B adapter for normal operation.

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8. HANDLING, SERVICE AND MAINTENANCE

Display Cleaning

The display uses a lens with a special coating that may be sensitive to skin oils, waxes, and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTIREFLECTIVE COATING.

It is very important to clean the lens using a clean, lint-free cloth and a cleaner that is specified as safe for anti-reflective coatings. Avoid any chemical cleaners or solvents that can damage plastic components.

Battery Handling:

- Do not leave the batteries exposed to a heat source or in a high temperature environment.
- To help prevent damage, store the batteries out of direct sunlight.
- For maximum battery longevity, store within a temperature range of 32° to 77°F (0° to 25°C).
- Do not use a sharp object to remove the batteries.
- Do not disassemble, puncture, damage, or incinerate the device or batteries.
- Keep the batteries away from children.
- Only replace the batteries with the approved replacement from Garmin. Using other batteries presents a risk of fire or explosion.
- Contact your local waste disposal department to dispose of the device and batteries in accordance with applicable local laws and regulations.

WARNING

If these guidelines are not followed, the lithium-ion batteries may experience a shortened life span or may present a risk of damage to the device, fire, chemical burn, electrolyte leak, and/or injury.

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