



**** MANDATORY ****
SERVICE BULLETIN

NO.: 0735

TO: All Garmin Aviation Service Centers

DATE: 7 September 2007

SUBJECT: GRS 77 AHRS (Attitude and Heading Reference System) Mod 1

PURPOSE

This modification improves the reliability of certain GRS 77 LRUs.

DESCRIPTION

This modification consist of a hardware change to the GRS 77.

APPROVAL

TSO-C3d, ETSO-C3d

TSO-C4c, ETSO-C4c

TSO-C6d, ETSO-C6d

The change described in this service bulletin is minor and does not alter the previous approval basis for the GRS 77.

AFMS AND PILOT'S GUIDE CONSIDERATIONS

There are no recommended AFMS changes.

PRODUCT AFFECTED

GRS 77 AHRS Garmin part number 011-00868-10; serial number range 42006310 through 42006821 that do not already have Mod 1 completed.

NOTE

Serial numbers can be verified on the AUX – System Status page.

GRS 77 AHRS Garmin part number 011-00868-00 are not affected.

COMPLIANCE

Mandatory. This service bulletin must be complied with within 6 months or 100 flight hours, whichever occurs first.

REFERENCES

Refer to the applicable airframe specific maintenance manual for removal, replacement, and testing instructions.

MANPOWER

This service bulletin requires a maximum of four (4) hours labor for single GRS 77 installations and six (6) hours labor for dual GRS 77 installations, including inspection, replacement, configuration and testing.

WARRANTY INFORMATION

This modification is warranty reimbursable for manpower required.

MODIFICATION INSTRUCTIONS

This is a factory only modification. Affected units must be returned to Garmin. Contact Garmin for an RMA number before returning the unit to Garmin.

Upon completion of the factory modification, Mod Status 1 will be marked on the unit's serial tag to indicate compliance with this service bulletin.

TESTING PROCEDURE

Garmin requires the following calibrations and tests to be performed when a Mod 1 GRS 77 is installed:

- Magnetometer Calibration
- Engine Run-Up Vibration Test
- Magnetometer Interference Test

Refer to the applicable airframe specific maintenance manual for instructions on how to perform these calibrations/tests.

NOTE

When performing the Magnetometer Interference Test it is permissible to only test the devices that are in close proximity to the magnetometer.

MATERIAL INFORMATION

N/A

Service Bulletin

November 19, 2007

SB07-34-06

TITLE

GARMIN G1000 GRS-77 ATTITUDE AND HEADING REFERENCE SYSTEM (AHRS)
INSPECTION/REPLACEMENT

EFFECTIVITY

Group A Airplanes:

The following airplanes equipped with the Garmin G1000 Nav III avionics option were delivered from Cessna and are affected by Garmin Mandatory Service Bulletin No.: 0735 Revision A GRS-77 AHRS (Attitude and Heading Reference System) Mod 1 (or latest revision).

Model	Serial Numbers
172R	17281241 thru 17281406
172S	172S9810 thru 172S10505, 172S10507 thru 172S10533, 172S10535 thru 172S10545, 172S10547, 172S10550, 172S10552, 172S10553, 172S10556 thru 172S10559, 172S10562, 172S10566, and 172S10572 thru 172S10574
182T	18281228, 18281318 thru 18281868, 18281870 thru 18281940, 18281942 thru 18281945, 18281947, 18281948, 18281950, 18281953, and 18281955
T182T	T18208232 thru T18208664, T18208666 thru T18208726, T18208728 thru T18208741, T18208743 thru T18208745, T18208748, T18208750, T18208751, T18208753, T18208755, T18208757 thru T18208759, T18208763, and T18208765
206H	20608215 thru 20608278, 20608280 thru 20608293
T206H	T20608450 thru T20608681, T20608683 thru T20608746, T20608750, T20608753, and T20608755

Group B Airplanes:

Also affected are the following airplanes equipped with the Garmin G1000 Nav III avionics option that have had a part number 011-00868-10 or 011-N0868-10 GRS-77 AHRS unit installed that is affected by Garmin Mandatory Service Bulletin No.: 0735 Revision A GRS-77 AHRS (attitude and Heading Reference System) Mod 1 (or latest revision) that was shipped from Cessna Parts Distribution on August 1, 2006 through August 1, 2007.

Model	Serial Numbers
172R	17281241 thru 17281495
172S	172S9810 thru 172S10654
182T	18281228, 18281318 thru 18282049
T182T	T18208232 thru T18208810
206H	20608215 thru 20608303
T206H	T20608450 thru T20608805

REASON

To transmit Garmin Mandatory Service Bulletin No.: 0735 Revision A GRS 77 AHRS (Attitude and Heading Reference System) MOD 1 (or latest revision).

It has been determined that some airplanes may have been delivered with a GRS-77 AHRS unit or had a replacement GRS-77 unit installed that could potentially fail within a low operational time in service.

DESCRIPTION

The GRS-77 AHRS unit installed in the airplane shall be inspected to determine if it is affected and if necessary, replaced as described in this Service Bulletin.

An AHRS failure may be indicated by either an immediate Red-X of the attitude display, or by a short duration (approximately two to seven seconds) of high rate roll and/or pitch indication that is followed by the Red-X of the attitude indication on the PFD.

Failure of the AHRS will disconnect the GFC-700 autopilot (on airplanes equipped with the GFC-700 autopilot) and cause loss of the stabilized magnetic heading information on the PFD. This condition does not affect the availability of the independent mechanical Standby Attitude Indicator.

Pilots should refer to the applicable airplane Pilot's Operating Handbook/Approved Airplane Flight Manual (POH/AFM) for detailed information about the AHRS system and for the necessary pilot actions related to an Attitude and Heading Reference System (AHRS) Failure.

This condition currently seems to occur within the first few hours of operating time of a new or newly installed AHRS unit.

Non-compliance with this Service Bulletin could result in an unexpected failure of a GRS-77 AHRS unit.

COMPLIANCE

Mandatory: shall be accomplished at the next scheduled 100 hour or annual/12 month type inspection, not to exceed 6 months, whichever occurs first.

NOTE: For airplanes within the affected serial range of a GRS-77 unit without "Mod 1": If an AHRS unit has been in service for less than 25 hours of operation, it is strongly recommended to fly day VFR only until a replacement GRS-77 with "Mod 1" (or later mod level) is installed.

APPROVAL

FAA approval has been obtained on technical data in this publication that affects airplane type design.

MANPOWER

Man-hours are based on the inspection being accomplished during a scheduled 100 hour / 12 month (annual) type inspection.

Man-hours for inspection is negligible.

If necessary, see the **Credit Information** section of this Service Bulletin for removal and replacement of an affected GRS-77 AHRS unit.

REFERENCES

Garmin Mandatory Service Bulletin No.: 0735 Revision A (or latest revision)

Cessna Service Newsletter SNL07-11: Garmin G1000 GRS-77 Attitude and Heading Reference System (AHRS) Failure

Model 172 Series 1996 and On Maintenance Manual

Model 182/T182 Series 1997 and On Maintenance Manual

Model 206/T206 Series 1998 and On Maintenance Manual

The following documents can be viewed by Cessna Service Stations by going to www.garmin.com:

Garmin G1000 System Installation Manual, Part Number 190-00303-00, Revision F (or latest revision)

Garmin GRS 77/GMU 44 Installation Manual, Part Number 190-00303-10, Revision F (or latest revision)

Garmin G1000 NAV III Line Maintenance Manual, Part Number 190-00352-00, Revision J (or latest revision)

Garmin G1000 Line Maintenance Manual and Configuration Manual, Part Number 190-00303-04, Revision D (or latest revision)

NOTE: Make sure all publications used are complete and current.

NOTE: This information shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual or Instructions for continued airworthiness and must be accomplished for ongoing airworthiness compliance as required per 14 CFR Part 43.13.

OTHER PUBLICATIONS AFFECTED

Model 172 Illustrated Parts Catalog

Model 182S/182T/T182T Illustrated Parts Catalog

Model 206H & Model T206H Illustrated Parts Catalog

NOTE: Make sure all publications used are complete and current.

MATERIAL PRICE AND AVAILABILITY

The part below is available from Cessna Parts Distribution through an appropriate Cessna Service Station for the suggested list price shown.

<u>Part Number</u>	<u>Description</u>	<u>Qty/Airplane</u>	<u>Price</u>
011-N0868-10	GRS-77 AHRS unit	1 (if required)	\$ 1,403.43 (N) ea
		Plus Core Deposit	\$ 3,915.00

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

All 172 Model Airplanes With and Without Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.5 man-hour per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

All 182 Model Airplanes With and Without Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.5 man-hour per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

All 206 Model Airplanes Without Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.5 man-hour per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

All 206 Model Airplanes With Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.9 man-hour per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

Freight will be credited at the most economical method unless pre-approved by Cessna. For pre-approval, contact Cessna Parts Distribution Warranty Administration at Telephone: 316-831-4296, Fax: 316-831-4296, or E-Mail: cpd2claims@cessna.textron.com.

To receive credit, the work must be completed and a Warranty Claim submitted by a Cessna Single Engine Service Station within 30 calendar days of Service Bulletin compliance before the credit expiration dates shown below. The removed GRS-77 AHRS unit must be returned with the Warranty Claim.

Domestic November 19, 2008
International November 19, 2008

Special Note to Service Stations:

When you complete the Warranty Claim, the labor allowance claimed shall be itemized for each above action completed.

ACCOMPLISHMENT INSTRUCTIONS

Weight And Balance Information

Negligible

Material Information

Not applicable

Accomplishment Instructions

1. Identify the serial number of the Garmin G1000 GRS-77 AHRS unit installed in your airplane:
 - A. Put the BAT MASTER switch to the ON position
 - B. Put the AVIONICS MASTER switches to the ON position.
 - C. Turn the large FMS knob on the MFD to go to the AUX page.
 - D. Turn the small FMS knob to the AUX-SYSTEM STATUS page.
 - E. Put the cursor in position to highlight the GRS1 in the LRU window to show the GRS1 serial number in the DATA window.
 - F. Record the serial number.

- G. Turn the AVIONICS and BAT MASTER switches to the off position.
2. See if the serial number of the GRS-77 AHRS unit installed in your airplane is one of the affected serial numbers (Refer to the attached Garmin Mandatory Service Bulletin No.: 0735 Revision A (or latest revision):
- A. If your GRS-77 AHRS unit does not have a serial number from 42006310 through 42006821, go to Step 9.

NOTE: If the GRS-77 AHRS unit is not in the affected serial range, it does not have to be at MOD 1 to operate correctly.
 - B. If your GRS-77 AHRS unit has a serial number from 42006310 through 42006821, you must do a visual inspection of the inspection plate on the GRS-77 AHRS unit. Go to Step 3.
3. Prepare the airplane for maintenance.
- A. Make sure that all switches are in the OFF/NORM position.
 - B. Disconnect electrical power from the airplane.
 - (1) Disconnect the airplane battery.
 - (2) Disconnect external electrical power.
 - C. Attach maintenance warning tags to the battery and external power receptacle that have **"DO NOT CONNECT ELECTRICAL POWER - MAINTENANCE IN PROGRESS"** written on them.
4. Get access to the GRS-77 AHRS unit as follows:
- A. (Model 172 airplanes) Remove the equipment that follows:
 - (1) Remove the carpet from the aft baggage compartment. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 25, Interior Upholstery - Maintenance Practices.)
 - (2) Remove the lower avionics curtain from the aft baggage compartment. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 25, Interior Upholstery - Maintenance Practices.)
 - (3) Remove the aft baggage compartment floorboard as necessary.
 - B. (Model 182 airplanes) Remove the equipment that follows:
 - (1) Remove the aft baggage compartment carpet. (Refer to the Model 182/T182 Series 1997 and On Maintenance Manual, Chapter 25, Interior Upholstery - Maintenance Practices.)
 - (2) Remove the aft baggage compartment curtain. (Refer to the Model 182/T182 Series 1997 and On Maintenance Manual, Chapter 25, Interior Upholstery - Maintenance Practices.)
 - C. (Model 206 airplanes) Remove the equipment that follows:
 - (1) Remove the curtain in the aft baggage compartment. (Refer to the Model 206/T206 Series 1998 and On Maintenance Manual, Chapter 25, Interior Upholstery - Maintenance Practices.)
 - (2) If the airplane is equipped with an air conditioning system, remove air conditioning ducts as necessary.

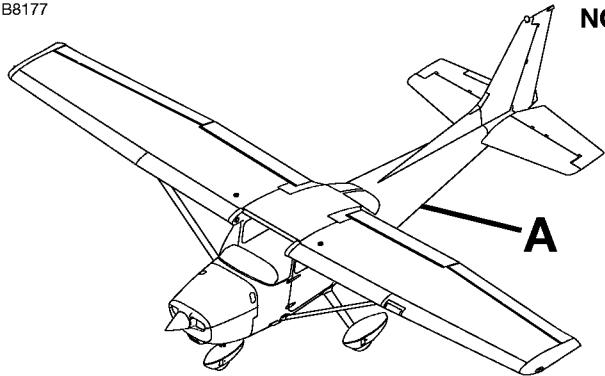
CAUTION: DO NOT LOOSEN OR REMOVE THE SCREWS THAT ATTACH THE MOUNTING TRAY TO THE AIRPLANE STRUCTURE WHEN YOU ACCOMPLISH THIS SERVICE BULLETIN. IF YOU LOOSEN OR REMOVE THE SCREWS THAT ATTACH THE MOUNTING TRAY TO THE AIRPLANE STRUCTURE, YOU MUST DO THE CALIBRATION OF THE AHRS UNIT OR IT WILL NOT SEND CORRECT INFORMATION TO THE GARMIN G1000 NAV III AVIONICS SYSTEM. REFER TO THE TESTING PROCEDURE SECTION OF THE GARMIN MANDATORY SERVICE BULLETIN NO.: 0735 REVISION A, FOR CALIBRATIONS AND TESTS THAT WILL BE REQUIRED.

5. See if you can read what is written on the identification plate on the top front of the GRS-77 AHRS unit.
 - A. If you cannot identify the mod level, go to Step 6.
 - B. If you can identify the mod level, do as follows:
 - (1) if the mod level of the GRS-77 AHRS unit installed in your airplane is MOD 1 or a later mod level, go to Step 8.
 - (2) If the mod level shown on the identification plate is MOD 0, complete Step 6 and then go to Step 7B(2).
 - C. If you cannot identify the mod level, go to Step 6.
6. (Refer to Figure 1, Detail A.) Remove the GRS-77 AHRS unit from the airplane. (Refer to the applicable maintenance manual, Chapter 34, Attitude Heading Reference System (AHRS) - Maintenance Practices.)
 - A. Disconnect the electrical connector from the GRS-77 AHRS unit.
 - B. Loosen the four screws that attach the GRS-77 AHRS unit to the mounting tray.
 - C. Remove the GRS-77 AHRS unit from the airplane.
7. (Refer to Figure 1, View A-A.) Identify the mod level of the GRS-77 AHRS unit installed in your airplane:
 - A. Find the identification plate on the top front of the GRS-77 AHRS unit.
 - B. See if the mod level of the GRS-77 AHRS unit installed in your airplane is MOD 1:
 - (1) If the mod level shown on the identification plate is MOD 1 or a later mod level, no replacement of the GRS-77 AHRS unit is necessary. Install the GRS-77 AHRS unit as follows: (Refer to the applicable maintenance manual, Chapter 34, Attitude Heading Reference System (AHRS) - Maintenance Practices.)
 - (a) Put the kept GRS-77 AHRS unit in position in the mounting tray.
 - (b) Tighten the four screws that attach the GRS-77 AHRS unit to the mounting tray.
 - (c) Connect the electrical connector to the GRS-77 AHRS unit.
 - (d) Do a check to make sure that the GRS-77 AHRS unit operates correctly. (Refer to the Garmin G1000 Line Maintenance Manual.)
 - (2) If the mod level shown on the identification plate is MOD 0, you must replace the AHRS unit with a serviceable 011-00868-10 GRS-77 AHRS Unit with MOD 1 or a later mod level as follows: (Refer to the applicable maintenance manual, Chapter 34, Attitude Heading Reference System (AHRS) - Maintenance Practices.)
 - (a) Put the new 011-00868-10 GRS-77 AHRS Unit in position in the mounting tray.
 - (b) Tighten the four screws that attach the 011-00868-10 GRS-77 AHRS Unit to the mounting tray.
 - (c) Connect the electrical connector to the 011-00868-10 GRS-77 AHRS Unit.
 - (d) Load the software for the 011-00868-10 GRS-77 AHRS Unit. (Refer to the Garmin G1000 Line Maintenance Manual.)

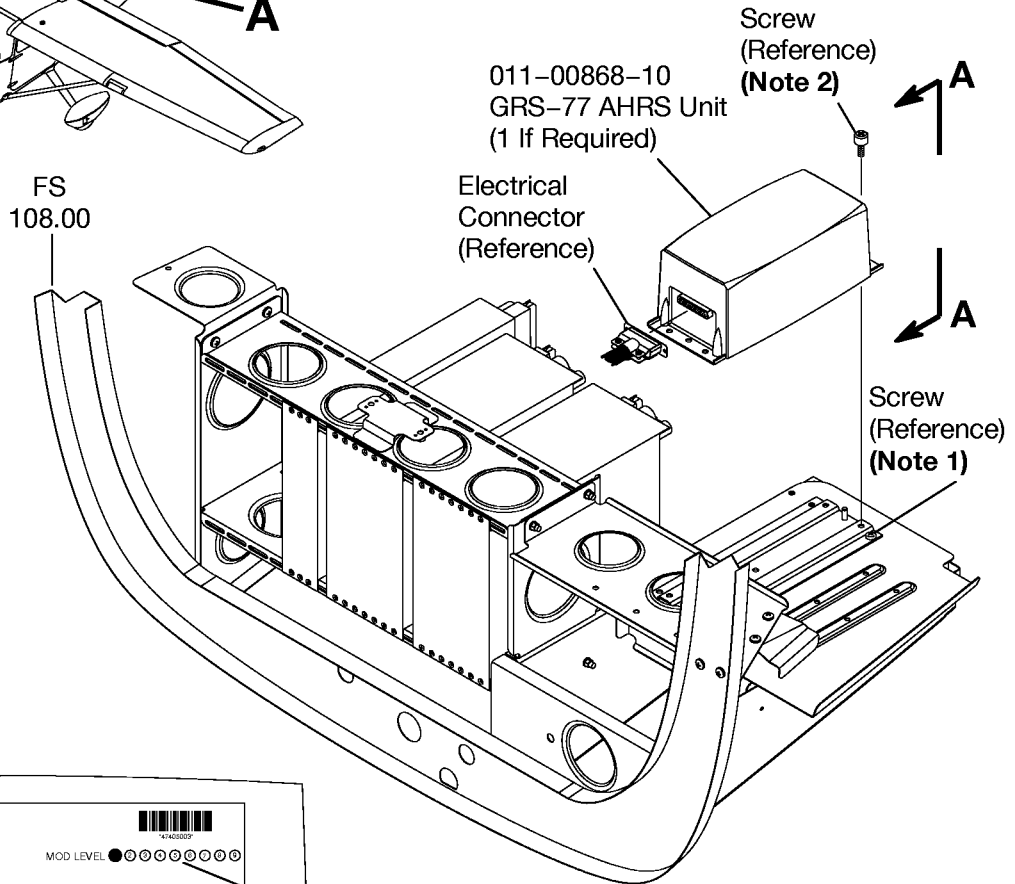
- (e) Do a check to make sure that the 011-00868-10 GRS-77 AHRS Unit operates correctly. (Refer to the Garmin G1000 Line Maintenance Manual.)

NOTE: The **Testing Procedure** section of the Garmin Mandatory Service Bulletin No.: 0735 Revision A, is only required if the screws are loosened or removed that attach the mounting tray to the airplane structure.

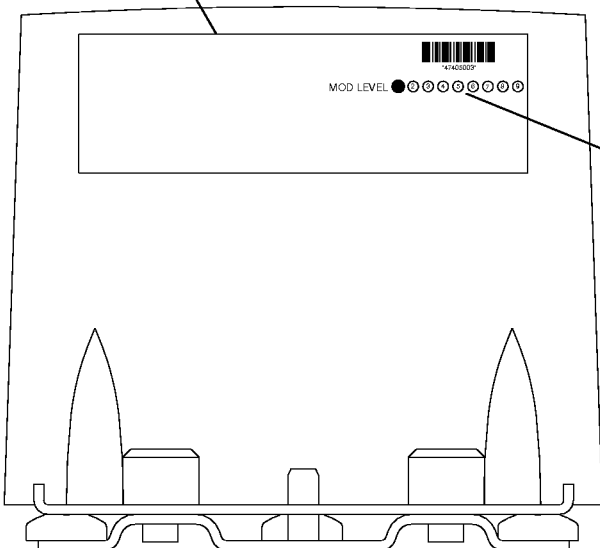
- 8. Install the equipment that you removed for access. (Refer to the applicable maintenance manual, Chapter 25, Interior Upholstery - Maintenance Practices.)
- 9. Remove maintenance warning tags from battery and external power receptacle and connect the battery.
- 10. Make an entry in the airplane logbook that states compliance and method of compliance with this Service Bulletin.



NOTE 1: Do not loosen or remove the screws that attach the mounting tray to the airplane structure. It is not necessary. If you do loosen or remove these screws, you must do a calibration of the AHRS unit or it will not send correct information to the avionics system.



Identification Plate



(Note 3)

DETAIL A

172 Installation Shown
182/206 Similar

NOTE 2: Loosen these screws to remove the GRS-77 AHRS unit.

NOTE 3: If the mod level shown on the identification plate is MOD 1 or later, no GRS-77 AHRS unit replacement is necessary.

VIEW A-A

GRS-77 AHRS Unit Inspection Plate

Figure 1. AHRS Inspection/Replacement (Sheet 1)

0510T1007
A0518T1127
AA0714T1044

OWNER NOTIFICATION

On November 19, 2007 the following Owner Advisory message will be sent to applicable owners of record in SB07-34-06A.

Dear Cessna Owner:

This Owner Advisory is to inform you that Service Bulletin SB07-34-06: Garmin G1000 GRS-77 Attitude and Heading Reference System (AHRS) Inspection/Replacement has been issued.

The following airplanes are affected as shown below:

Group A Airplanes:

The following airplanes equipped with the Garmin G1000 Nav III avionics option were delivered from Cessna and are affected by Garmin Mandatory Service Bulletin No.: 0735 Revision A GRS-77 AHRS (Attitude and Heading Reference System) Mod 1 (or latest revision).

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T206H	T20608450 thru T20608681, T20608683 thru T20608746 , T20608750, T20608753, and T20608755

Group B Airplanes:

Also affected are the following airplanes equipped with the Garmin G1000 Nav III avionics option that have had a part number 011-00868-10 or 011-N0868-10 GRS-77 AHRS unit installed that is affected by Garmin Mandatory Service Bulletin No.: 0735 Revision A GRS-77 AHRS (attitude and Heading Reference System) Mod 1 (or latest revision) that was shipped from Cessna Parts Distribution on August 1, 2006 through August 1, 2007.

<u>Model</u>	<u>Serial Number</u>
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It has been determined that some airplanes may have been delivered with GRS-77 AHRS unit or had a replacement GRS-77 AHRS unit installed that could potentially fail within a low operational time in service.

The GRS-77 AHRS unit installed in the airplane shall be inspected to determine if it is affected and if necessary, replaced as described in Service Bulletin SB07-34-06.

An AHRS failure may be indicated by either an immediate Red-X of the attitude display, or by a short duration (approximately two to seven seconds) of high rate roll and/or pitch indication that is followed by the Red-X of the attitude indication on the PFD.

Failure of the AHRS will disconnect the GFC-700 autopilot (on airplanes equipped with the GFC-700 autopilot) and cause loss of the stabilized magnetic heading information on the PFD. This condition does not affect the availability of the independent mechanical Standby Attitude Indicator.

Pilots should refer to the applicable airplane Pilot's Operating Handbook/Approved Airplane Flight Manual (POH/AFM) for detailed information about the AHRS system and for the necessary pilot actions related to an Attitude and Heading Reference System (AHRS) Failure.

This condition currently seems to occur within the first few hours of operating time of a new or newly installed AHRS unit.

Non-compliance with Service Bulletin SB07-34-06 could result in an unexpected failure of a GRS-77 AHRS unit.

Compliance is mandatory: shall be accomplished at the next scheduled 100 hour or annual/12 month type inspection, not to exceed 6 months, whichever occurs first

NOTE: For airplanes within the affected serial range of a GRS-77 unit without "Mod 1": If an AHRS unit has been in service for less than 25 hours of operation, it is strongly recommended to fly day VFR only until a replacement GRS-77 with "Mod 1" (or later mod level) is installed.

This information shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual or Instructions for continued airworthiness and must be accomplished for ongoing airworthiness compliance as required per 14 CFR Part 43.13.

All 172 Model Airplanes With and Without Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.5 man-hours per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

All 182 Model Airplanes With and Without Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.5 man-hours per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

All 206 Model Airplanes Without Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.5 man-hours per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

All 206 Model Airplanes With Air Conditioning:

Applicable parts credit and a labor allowance credit of 0.9 man-hours per airplane will be provided to remove and replace an affected GRS-77 AHRS unit.

To receive credit, the work must be completed and a Warranty Claim submitted by a Cessna Single Engine Service Station within 30 calendar days of Service Bulletin compliance before the credit expiration dates shown below. The removed GRS-77 AHRS unit must be returned with the Warranty Claim.

Domestic November 19, 2008
International November 19, 2008

Please contact a Cessna Single Engine Service Station for detailed information and arrange to have Cessna Service Bulletin SB07-34-06 accomplished on your airplane.

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