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REPORT NO. PR-407LS-900M

INSTALLATION INSTRUCTIONS

FOR

COMPASS INSTALLATION

BELL 407 HELICOPTERS

REVISIONS

<u>REV.</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>BY</u>
N/C	03/14/02	Original	GP
A	01/10/03	Added note to section 1 regarding throttle/collective clearance	GP

REFERENCES

1. Paravion Drawing 407LS-100 System Configuration.
2. Paravion Drawing 407LS-200 Compass Installation.
3. Precision Aircraft Inc. Bulletin IC-102, April 23, 1990

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1.0 INTRODUCTION

- 1.1. This document provides a step-by-step procedure for installation of the 407LS-200-1 Compass/Placard Installation on the Bell Model 407 Helicopter. The instructions contained herein are intended to supplement the information contained on the installation drawings.

NOTE: FOR ADEQUATE COLLECTIVE AND THROTTLE CLEARANCE (LEFT SEAT PILOT OPERATION), ENSURE THAT NOTHING IS INSTALLED ON THE LOWER INTERIOR PORTION OF THE LEFT CREW SEAT DOOR.

2.0 407LS-200-1 COMPASS/PLACARD INSTALLATION INSTRUCTIONS

- 2.1. Reference drawings 407LS-200 Compass/Placard Installation.
- 2.2. Gain access to the instrument console, overhead breakers, and 8TB3 Terminal Block located in the forward left side of the center console.
 - 2.2.1. Insure that the power is off to the Instrument Panel Breaker.
 - 2.2.2. Install the compass and compass bracket per drawing 407LS-200.
 - 2.2.3. Run wire(s) inside the center console to the 8TB3 Terminal Block and complete wiring per drawing 407LS-200.
- 2.3. Install Placard, using adhesive backing, in a location that is clearly visible to the pilot and crew.
- 2.4. Once the compass has been installed refer to sections 3.0 Compass Compensation Information and 4.0 Compass Compensation Procedure of this report.
- 2.5. The total weight of the 407LS-200-1 Compass Installation is 0.6 lbs. Therefore, the affects on the weight and balance are negligible.

3.0 COMPASS COMPENSATION INFORMATION

- 3.1. Each aircraft has its own inherent magnetic pattern and no two are alike, even of the same assembly line. The inherent magnetic pattern of an aircraft is a product of magnetic influences, physical presence in ferrous metal used in structure or components, induced, by electrical circuits of varying strength and location, and the earth's magnetic field.
- 3.2. From the above, one realizes that it is highly desirable to have the aircraft as close to flying configuration as possible, or flying, as the compensation procedure is followed. Known magnetic headings may be obtained for ground compensation by the use of a compass rose, master compass, or transit-pylorus. For taking each reading, the engine rpm should be at normal cruise and electrical and radio equipment should be in the flying norm. A directional gyro is a convenient azimuth reference with frequent rechecks of the original known magnetic heading to check possible drift. It is a good policy to confirm all ground compensations in flight.
- 3.3. On a smooth air day the compensation procedure may be followed in flight using the directional gyro azimuth with frequent rechecks of the original known magnetic heading to check possible drift. A known magnetic heading may be from a runway, section lines (with magnetic variation figured), or a railroad.
- 3.4. **IMPORTANT:** *The compensator is in neutral when the dots on the adjusting screws are aligned with the dots on the compensator face – NINE O'CLOCK. MAXIMUM compensator correction is attained when the adjusting screw is rotated – clockwise or counter-clockwise - 180°, or to THREE O'CLOCK. DAMAGE to the compensator mechanism will occur if the adjusting screws are forced beyond 180° in either direction.*

4.0 COMPASS COMPENSATION PROCEDURE

- 4.1. The poly-plane compensator used on the ES59153 Magnetic Compass has a deviation correction range of approximately plus or minus twenty degrees on the cardinal headings. The readings in quadrants between cardinal headings are products of the adjacent cardinal headings corrective adjustments.
- 4.2. Use a non-magnetic screwdriver for making adjustments.
 - 4.2.1. Starting with the aircraft on a known magnetic heading of North, use the N-S adjusting screw to remove all deviation so the compass indicates North. The N-S adjusting screw is the LH screw on the compensator.
 - 4.2.2. Rotate the aircraft to a known magnetic heading of East, use the E-W adjusting screw to remove all deviation so the compass indicates East. The E-W adjusting screw is the RH screw on the compensator.
 - 4.2.3. Rotate the aircraft to a known magnetic heading of South. Note the degrees of deviation. Using the N-S adjusting screw, remove one half of the deviation.
 - 4.2.4. Rotate the aircraft to a known magnetic heading of West. Note the degrees of deviation. Using the E-W adjusting screw, remove one half of the deviation.

- 4.2.5. Return the aircraft to the known magnetic heading of North to confirm its relation to South. The deviation should be the same. In some aircraft "fine tuning" adjustments and rechecks are necessary.
 - 4.2.6. Return the aircraft to the known magnetic heading of East to confirm its relation to West. The deviation should be the same. In some aircraft "fine tuning" adjustments and rechecks are necessary.
 - 4.2.7. On completion of the preceding procedure, the aircraft is rotated to each 30 degree known magnetic heading thru 360 degrees and the deviation is recorded on the compass correction card.
 - 4.2.8. The compass correction card should be installed close to the compass and convenient for the pilot to read.
- 4.3. Should the preceding procedure fail to produce satisfactory results, here are some suggestions:
- 4.3.1. Use a magnet to check hardware in the proximity of the compass. Steel screws and nuts can be replaced with brass or aluminum in some uses. Steel shake proof lock washers will hold magnetism.
 - 4.3.2. Some radio navigational instruments with meter movements have been the problem when they have no magnetic shield. This is a physical problem and not an electrical problem.
 - 4.3.3. If the problem is electrical, manipulation of the switches should point out the site. On some rare occasions, it has been necessary to reroute some wiring.