

SUBJECT: MAGNETIC COMPASS INTERFERENCE

MODELS/S/N AFFECTED: ALL M20 SERIES AIRCRAFT

TIME OF COMPLIANCE: AT EACH ANNUAL OR 100 HOUR INSPECTION WHEN COMPASS WILL NOT COMPENSATE WITH  $\pm 10^{\circ}$  OF ANY HEADING.

INTRODUCTION:

A compass is essentially a magnetized pointer suspended so it will align with the magnetic medians of the earth. Aircraft compasses have compensating magnets that may be adjusted to offset local magnetic attraction. When an improperly reading compass cannot be compensated by adjusting its magnets, one or more of the following magnetic attractions may exist:

1. Cabin tubular structure has been magnetized as a result of current flow within wiring harnesses.
2. Airframe may have been used as a ground path for some electrical components.
3. Aircraft has been exposed to an unwanted magnetic field (example: vacuum cleaner, electric buffer, electric cord draped over fuselage, etc.; transformers in a battery charger, magnaflux machine, etc.).
4. Aircraft equipment has been removed, installed or replaced, thereby disrupting previous compensation settings.

INSTRUCTIONS:

CABIN DEMAGNETIZING PROCEDURES - COMPASS SWINGING .

1. Check aircraft (with all radio and electric equipment OFF) for magnetized structure as follows:
  - A. Center (or remove) compensating magnets from magnetic compass.
  - B. Position aircraft on compass rose; run engine at 1500 to 2000 RPM. Check the four cardinal headings starting at NORTH heading. If an error greater than  $\pm 30^{\circ}$  is found at any cardinal heading, proceed to demagnetize cockpit as outlined in Step 2 below. If error is less than  $\pm 30^{\circ}$  at any cardinal heading, proceed to swing compass per Step 3 below.
2. Demagnetize Cockpit/Cabin Area:

**CAUTION**

**Improper use of an armature growler can induce more magnetism into cabin structure; more extensive degaussing will then be necessary.**

- A. Remove compass from aircraft. Move aircraft away from any metal structure.
- B. Position aircraft at a heading of either  $90^{\circ}$  or  $270^{\circ}$ .
- C. Make sure armature growler is turned OFF. Place growler in cockpit, position seats AFT and support growler power cord so it does not touch or pass within six (6) inches of any structural member.
- D. Hold growler inside cockpit in a low position. Turn growler ON. On manual gear aircraft, place growler close to landing gear handle, slowly move it up toward and along windshield center post and along overhead structure. On electric gear aircraft, start at bottom of windshield post and slowly move growler along overhead structure toward rear of cabin and down in a circular motion from behind shoulders to waist or mid-chest height before turning it OFF.
- E. Hold compass in place to see if headings now match aircraft heading. If too much heading error (more than  $\pm 15^{\circ}$ ) still exists, remove compass from aircraft.
- F. Turn growler ON; move it along windshield bow, overhead from one side of cockpit/cabin to the other. Position growler away from structure and turn growler OFF.
- G. Hold compass in place and compare headings. If heading error has not reduced sufficiently (less than  $\pm 15^{\circ}$ ) then repeat Steps D, E, F and G.
- H. When heading error is reduced to less than  $\pm 15^{\circ}$ , re-install compass and proceed with Step 3 (Swinging Compass).

SERVICE INSTRUCTION M20-95  
Date: July 10, 1992

**NOTE**

**M20C, M20E, M20F and M20G aircraft (S/N's 670001 and ON) and all M20J, M20K, M20L and M20M aircraft have a stainless steel (non-magnetic) windshield center post insert. This post area will require no demagnetizing. Concentrate demagnetizing effort on other tubular structure areas.**

3. Swinging Compass

A. Re-install compensating magnetics (if removed) on compass. Run engine at 1500 to 2000 RPM. Turn rotating beacon, strobe lights and normal electrical loads ON. Turn normal selection of Radios/Navigation equipment ON.

B. Position aircraft on compass rose to **North** heading; adjust N-S compass compensating screw for 0° indication (use non-ferrous tools).

C. Turn aircraft to **East** heading; adjust compass E-W compensating screw for 90° indication.

D. Turn aircraft to **South** heading; compass should read approximately 180°. Adjust N-S compensating screw to reduce indicating error by 50% (example: If compass reads 184°, adjust compensating screw so it reads 182°).

E. Turn aircraft to **West** heading; compass should read approximately 270°. Adjust E-W compensating screw to reduce indicating error by 50%.

F. Return aircraft to **North** heading; verify 0° indication still exists. Reset directional gyro (DG); use DG to check and record compass error at every 30° heading through 360°.

**NOTE**

**Check and record compass deviations with only minimum electrical systems ON and various high current draw systems ON while other systems are OFF. Vary these systems ON and OFF to see how compass deviations change.**

G. Adjust compensating screws to make compass read within +/-10° at any heading; proceed with Step 4. If compass does not read within +/-10° at all headings, repeat steps to demagnetize cockpit/cabin as outlined in Step 2.

4. Fill out compass correction card(s) giving "Radio ON" and "Radio OFF" corrections at each 30° heading throughout 360°. Install card(s) on or in close proximity to compass in full view of pilot.

WARRANTY: N/A

REFERENCE DATA: MOONEY SI # M20-23

PARTS LIST: N/A

FIGURES/ TABLES: N/A