

**SUBJECT:** Backup drag brace microswitch installation on the G-III nose gear

**APPLICATION:** All Glasair-III kits prior to kit # 3238 using the original emergency gear down system. This service bulletin does not apply to Glasair IIIs that have installed the new Emergency Gear Extension Retrofit Kit, stock # 353-5800-502.

**DESCRIPTION:** Glasair IIIs with the original emergency gear down system have a condition where by a possible microswitch failure could lead to severe engine, propeller and airframe damage. If a short were to occur between the common and normally open contacts of the nose gear drag brace microswitch (activated by one of the drag links) or its wiring, it would send an indication to the PC board that the nose gear is in a down and lock condition, when in fact it may not be fully down. If this shorted condition were to exist, the gear could appear to operate normal, both during retraction and extension.

The nose gear hydraulic actuator microswitch will turn off the green (gear down) light as the gear retraction begins. The gear would retract and the red transit indicator lights would extinguish as normal.

The problem with the shorted drag brace microswitch arises during the in-flight nose gear extension cycle. As the gear is extended, the hydraulic actuator microswitch will activate as the actuator begins to work against the in-flight air forces and the gear drag brace geometry. The actuation of the hydraulic actuator microswitch will result in the nose gear stopping at about 2/3 of its complete extension. The geometry of the nose gear at this point is such that the nose gear over-center springs (SB-103) are not yet able to exert significant down action and the greatest force from the hydraulic actuator is required. The activation of the hydraulic actuator microswitch coupled with a shorted drag brace microswitch will give a cockpit nose gear safe indication (green light) and will stop gear extension (hydraulic pump) operation once the mains are down. Because of in-flight air forces on the nose gear and the geometry of the drag brace when the nose gear is about in the 2/3rds extended position, the hydraulic pressure gauge will indicate approximately 400- 500 psi., giving the pilot a false indication that the gear is completely down.

**SOLUTION:** Install a second, backup, microswitch on the opposite, side of the existing nose gear drag brace microswitch to provide protection against the previously described possible microswitch failure condition. The likelihood of both microswitches shorting out at the same time and in the same way would be very rare. Obtain the Stoddard-Hamilton Glasair III Nose Gear Backup Microswitch Installation Kit # 213-0100-501, and use the following installation instructions.



MODEL GLASAIR	ASSEMBLY NAME SERVICE BULLETIN 119	REVISION	DATE 11/9/93	VOLUME	PAGE 1 of 5
------------------	---------------------------------------	----------	-----------------	--------	----------------

## INSTALLATION OF THE BACKUP MICROSWITCH:

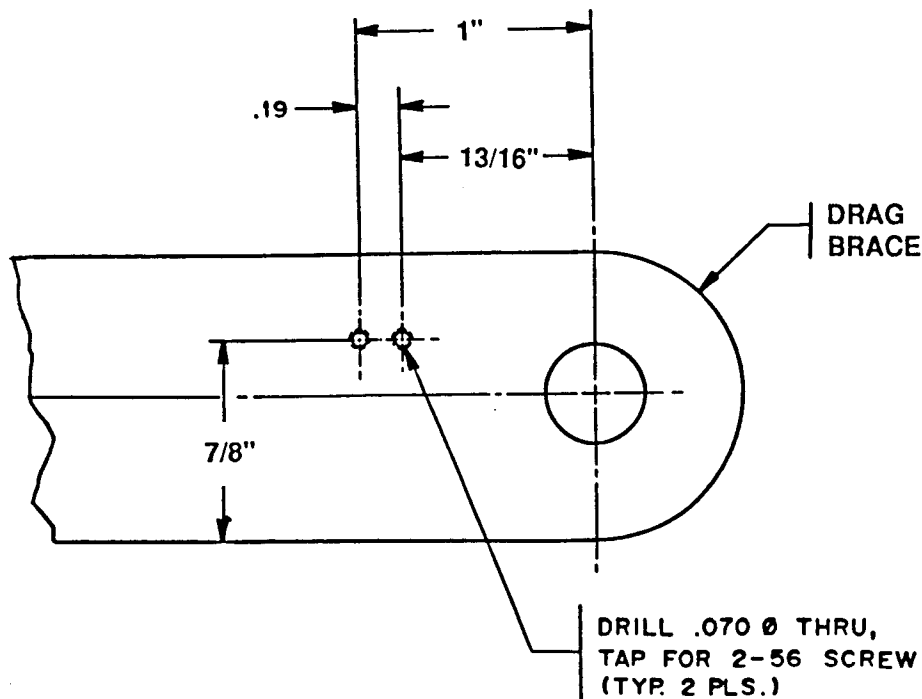


FIGURE (1)

The "backup" nose gear drag brace microswitch will be installed in a mirror image fashion opposite the existing drag brace microswitch. Before the second microswitch can be installed, a second set of microswitch mounting holes may need to be drilled in the opposite side of the nose gear drag brace. The opposite side drag link may also need to be drilled and tapped to allow installation of a backup microswitch actuating tab.

NOTE: The drag brace need not be removed from the aircraft to accomplish the installation of the backup microswitch holes. Also some of the G-III drag braces and drag links may have been delivered with the second set of holes already drilled and tapped, ready to accept the second switch and actuating tab.

The location of the backup microswitch mounting holes with drill and tap specifications are shown in FIGURE (1). The location of the holes to be drilled and tapped in the drag link are shown in FIGURE (2).

CAUTION: The drag brace is steel and has been stress relieved. When drilling the drag brace use a relatively low speed drill motor with sufficient lubricating oil. The microswitch mounting hole spacing (.19") must be maintained accurately. The holes in the drag brace must match the

**STODDARD-HAMILTON**  
AIRCRAFT, INCORPORATED

MODEL GLASAIR	ASSEMBLY NAME SERVICE BULLETIN 119	REVISION	DATE 11/9/93	VOLUME	PAGE 2 of 5
------------------	---------------------------------------	----------	-----------------	--------	----------------

holes in the microswitch. For accurate spacing of the holes, use the microswitch body its self as a drill jig to drill two small dimples from which to start drilling from. However any elongation of the microswitch holes or severe binding of the mounting screws will damage the microswitch.

Use plenty of lubricating oil when taping the drag brace microswitch holes, also remove the tap often during the thread cutting operation to clean away chips. Use only a new "sharp" tap and do not over torque to avoid breaking the tap.

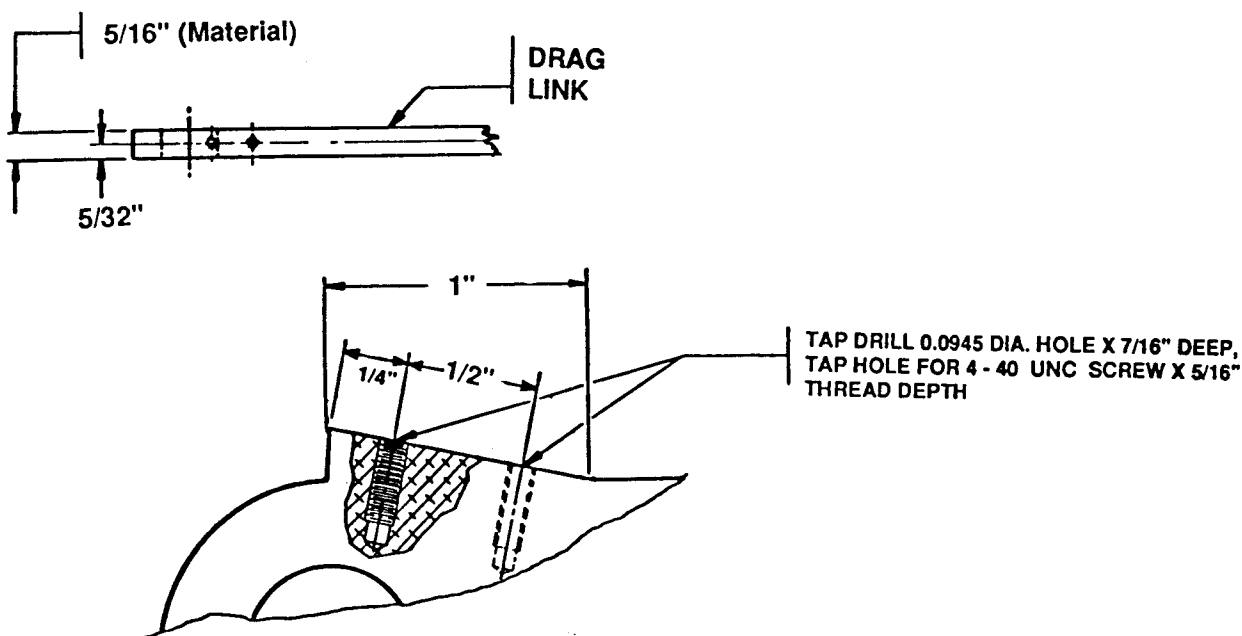


FIGURE (2)

Remove the appropriate drag link from the aircraft. Then drill and tap two actuating tab mounting holes, using the dimensions and specifications given in FIGURE (2), to allow installation of a backup microswitch actuating tab.

**CAUTION:** When tapping the holes in the drag link use extreme care to avoid breaking the tap off in the holes. Use lubricating oil when cutting threads, and avoid any accumulation of chips in the holes during the tapping operation.

Fabricate an additional nose gear drag brace microswitch actuator tab, as shown on page G-288 of the Final Assembly section of the G-III Instruction Manual.

Reassemble the drag link to the nose gear installation. Install the backup microswitch on the drag brace using the instructions given on pages G-288 and G-289 of Final Assembly in the G-III Instruction Manual. Mount the actuator tab to the drag link also using the instructions given on pages G- 288 and G-289.

**H**  
**STODDARD-HAMILTON**  
 AIRCRAFT, INCORPORATED

MODEL GLASAIR	ASSEMBLY NAME SERVICE BULLETIN 119	REVISION	DATE 11/9/93	VOLUME	PAGE 3 of 5
------------------	---------------------------------------	----------	-----------------	--------	----------------

WIRING OF NOSE GEAR MICROSWITCHES:

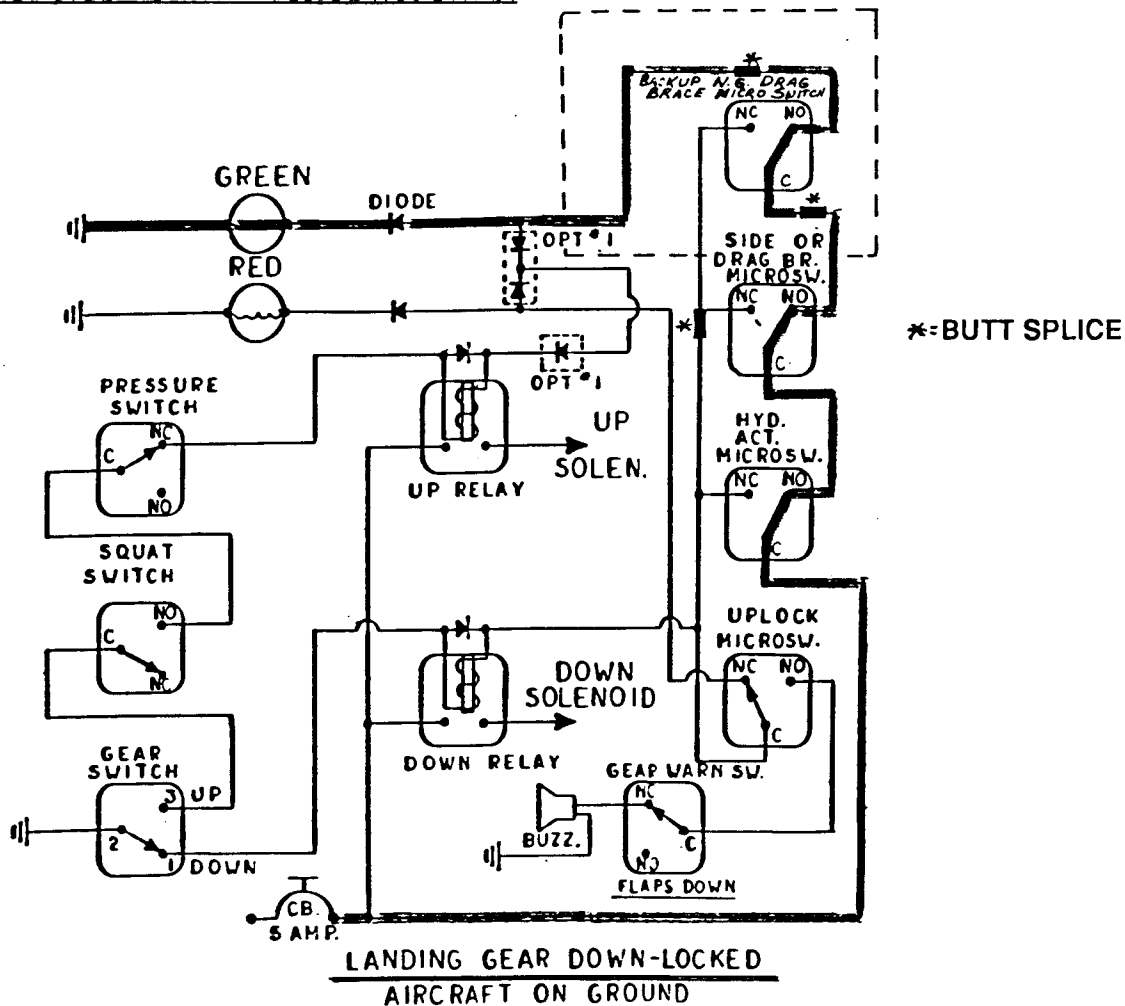


FIGURE (3)

Butt splices connectors have been supplied with this kit to form the wiring joints between the microswitch wires and the aircraft wiring that exists on the drag brace. Use FIGURE (3) as a guide to install the backup microswitch into the aircraft wiring system.

**CAUTION:** It is vitally important that the wires from the nose gear microswitches be accurately marked and correctly spliced. If the wiring were to be connected incorrectly or a short occurs with the drag brace wiring, the same gear unsafe condition can exist as described above. Route and secure the wires traveling along the drag brace using the directions listed on pages G-288 and G-289 of the Final Assembly Section of the Instruction Manual.

**PREFLIGHT TEST:** To protect against a possible short or mis-wired installation, a simple test can be performed on each preflight to confirm the correct operation of the nose gear drag brace

**STODDARD-HAMILTON**  
AIRCRAFT, INCORPORATED

MODEL GLASAIR	ASSEMBLY NAME SERVICE BULLETIN 119	REVISION	DATE 11/9/93	VOLUME	PAGE 4 of 5
------------------	---------------------------------------	----------	-----------------	--------	----------------

microswitches.

1. Turn on the master switch.
2. With the palm of your hand, push up on the drag brace/drag link pivot point (the point the drag brace micro-switch is located) and listen for the hydraulic pump to momentarily turn on.
3. Repeat this test with the back-up micro-switch.

**NOTE:** This test becomes more difficult to perform as down system pressure increases. It is recommended this test be done before the first flight of the day when pressure is typically at its lowest point or when it has had a chance to bleed off slightly.

**ADDITIONAL TEST:** An additional test should be performed whenever the aircraft is on jacks for landing gear servicing. During the landing gear extension cycle, have a helper physically hold pressure against the nose gear tire, to simulate air forces encountered while in flight. As the nose gear extends to about the 45° position the leverage of the system is at its weakest point. With the nose gear in this position a force of about 25 to 30 pounds held against the tire will be sufficient to stop the strut from further extension. In this position the landing gear hydraulic motor should continue to run with a down system pressure of approximately 800 psi., indicated on the aircraft hydraulic pressure gauge. The pump is internally bypassing fluid at this point which would indicate normal system operation. If however, the hydraulic pump were to stop running when held in the intermediate position, a landing gear wiring fault would be indicated.

**NOTE:** The latest Glasair III emergency down system uses pressure switches to control landing gear operation on both the up and down sides. This in conjunction with secondary hydraulic actuators eliminates these unsafe modes and was designed to provide a more fail-safe system throughout. Refer to Newsletter #50, page 1009, or call for more information. To order refer to: EMERGENCY GEAR EXTENSION RETROFIT KIT III, stock # 353-5800-502

Also as additional protection we highly recommend the use of our Wing Tip Mirror Kit stock # 621-7038-501, to visually see the gear in flight and verify its position prior to landing. Please call our order desk at 206-435-8533 to place your order.

  
**STODDARD-HAMILTON**  
AIRCRAFT, INCORPORATED

MODEL	GLASAIR	ASSEMBLY NAME	SERVICE BULLETIN 119	REVISION	DATE	VOLUME	PAGE
					11/9/93		5 of 5