

This Service Bulletin is FAA approved.

S. B. M20-194

Date: 12-6-76

**SUBJECT:** LANDING GEAR ACTUATOR REPLACEMENT  
(Dukes P/N 1057-00-5 \* S/N's prior to & including -0047)

**MODELS**

**AFFECTED:** M20J Aircraft S/N's 24-0002 thru 24-0041 inclusive.

**TIME OF**

**COMPLIANCE:** At next scheduled inspection or sooner at owner's discretion but in any case not to exceed 250 hours total time in service.

**INTRODUCTION:**

It has been determined that due to improper machining of the steel worm drive of the actuator, excessive and premature wear of the bronze worm gear teeth will occur. Ultimately this wear and subsequent tooth breakage could result in an inability to extend or retract the landing gear either manually or electrically. Therefore, it is mandatory that these early actuators on aircraft as noted above be replaced with actuators bearing the same part number but which incorporate properly machined worm drives. (S/N -0047 & later)

**INSTRUCTIONS:**

1. Raise aircraft on jacks (refer to Mooney M20 Series Service and Maintenance Manual No. 106 revised 7/15/76 - paragraph 2.9) and remove belly access panels.
2. Verify that cockpit master switch is in the off position. Disconnect the two actuator electrical wires at the knife disconnects between the actuator motor and the relay.
3. Using "manual" system, retract gear only enough to release the over-center, gear down locks of all three gears.
4. Disconnect "manual disengage" spring and cable end from actuator assembly. Remove two screws which attach cable housing support bracket to end of motor.
5. Remove hex cap and extract manual drive cable from disengage unit of actuator assembly.

\* Letter designation may be "E", "F" or "G".

Instructions cont...

6. Remove actuator assembly from aircraft as follows:
  - a) Remove nut, bolt and washers attaching forward rod end to torque tube bellcrank. (Note particularly the arrangement of the larger, thin washer, AN 960-716L, installed adjacent to rod end bearing.)
  - b) Remove nut, bolt, bushing and washers attaching aft end of actuator assembly to aircraft.
7. Place old actuator along side new actuator, remove disengage unit from old actuator and install on new actuator. Re-safety.
8. On the old actuator measure distance from jam nut end of the Heim rod end to the far end of the screw ball housing (should be  $7.50'' + .125''$ ). Remove set screw, remove Heim rod end and jam nut - install on new actuator and adjust to obtain same distance as on old actuator. Align slot in actuator stud with set screw. Loctite set screw and secure.
9. Install new actuator assembly in aircraft.

**CAUTION:** When attaching forward rod end of actuator, insure that the larger, thin washer (AN 960-716L) is installed adjacent to rod end bearing. Remaining washers (AN 960-616) are to be installed on either side of the combination of rod end and -716L washer as required to restrict lateral movement. Washer installation should not displace rod end laterally from its free position.
10. Re-install manual emergency cable support bracket, cable end fitting, spring and gear manual drive cable. Safety wire manual drive hex cap.

Instructions cont...

11. Re-connect electrical wire knife disconnects (wire no. 21EG33E12 to grey; wire no. 21EG37E12 to red).
12. Check disengage rigging per Mooney M20 Series Service and Maintenance Manual (Page 5-4).
13. If components of gear system other than actuator assembly have been undisturbed, only a check of the downlock torque values as specified below need be made.

NOTE: For the Model M20J, down and locked over-center torques are slightly different from other M20 Series aircraft. Limits for M20J are as follows:

Preload torque on main gear link  
Manual extension: 230-280 in-lbs.  
Electrical extension: 325 max.

Nose gear bungee spring deflection  
Manual extension: .010" - .030"  
Electrical extension: .125" max.

Refer to Mooney Service and Maintenance Manual for procedures on checking preload to the above values.

14. Make appropriate log book entry. Return old, undamaged actuator along with completed compliance card to Mooney Aircraft Corporation.

**SERVICE BULLETIN**  
Kit No. M20-194:

1 ea. Actuator Assy - Dukes P/N 1057-00-5G