

SERVICE BULLETIN M20-190B
ISSUE DATE: 9 - 1 - 02

SUBJECT: INSPECTION AND LUBRICATION OF DUKES & ITT ELECTRIC LANDING GEAR ACTUATORS (DUKES P/N 4196-00-1C) (ITT P/N LA11C2110) AND BALL JOINT INSPECTION.

REVISION B: Added specific lubricant required for servicing and new information placard.

MODELS/S/N

AFFECTED: All Mooney M20 series aircraft with subject actuator installed.

TIME OF COMPLIANCE: **Part I: Within next 25 hours of operation and every 200 hours thereafter.**
Part II: Every 100 hours.
Part III: Within next 25 hours in conjunction with Part I

INTRODUCTION: In order to check gear teeth wear, assure proper lubrication and prevent Heim bearing seizure, comply with Instructions below. Access to the actuator is gained by removal of the fuselage belly plate, P/N 310124. In lubricating the actuator gear housing use only Dukes Astronautics Co.; special purpose grease P/N 2196-74-1, **Aeroshell Grease # 7**, or MIL-PRF-23827 (with a minimum of 10% (by vol.) **Molybdenum Disulfide** added to any of the grease used).

INSTRUCTIONS:

PART I:

1. Place the aircraft on jacks.
2. Remove the actuator from the aircraft.
3. Remove the six end cap bolts and flush actuator thoroughly with solvent. Air dry.
4. Visually inspect gears for wear as illustrated in Figure 1.
5. With open end of actuator toward you, rotate jack screw shaft counter clockwise to remove all slack from ring and worm gears. Make an index mark on one gear tooth and on the inside of housing. Turn jack screw shaft clockwise until ring gear contacts worm gear and check index marks.
6. Visible wear or backlash of ½ tooth or more requires immediate replacement of gears. S.B. Kit M20-190-1 contains necessary gears.
7. If replacement of gears is necessary be sure when installing to re-secure the nut by applying Loctite #242 to the back side and restake with a center punch.
The worm gear cap must also be staked to lock it in place.
8. Before installing end cap, fill gear housing with lubricant specified in Introduction.
9. Install end cap making sure the two shorter bolts are installed on the worm gear side of the housing. Safety wire the bolts in pairs.
10. Reinstall actuator into aircraft following instruction in PART III. Check preload per Mooney Service & Maintenance Manual and Service Instruction M20-32.

PART II:

1. Remove belly plate P/N 310124 for access to actuator and remove top end cap bolt and lubricap (see Fig. 2).
2. Using clean hand grease gun serviced with the grease specified in Introduction, fill actuator through the lubrication fitting until grease comes out of the top bolt hole.
3. Reinstall the end cap bolt and resafety. Replace lubricap and belly plate.

PART III:

When installing Heim bearing end into the bellcrank, position it freely so there will be no lateral bind on the jack screw. Place one AN960-716L washer next to the ball joint, (can be placed on either side) and shim remaining space with AN960-616 washers). (See sample illustration Fig. 3). This installation will prevent Heim bearing from twisting too far, yet provide adequate movement.

NOTE: Previous installation may have contained one large AN960-916 washer next to the ball joint. This washer must not be reinstalled, the AN960-716L smaller and thinner washer described above is used as a replacement. Materials are available through your nearest Mooney Service Center.

WARRANTY: No warranty work is covered for Revision B.

REFERENCE

DATA: MAC SB-M20-189, AD 75-23-04

PARTS LIST:

M20-190-1 Kit:

- 1 ea. 4196-1000 Dukes gear kit (alternate MAC P/N: 940024-501 for Dukes or -503 for ITT)
- 1 ea. 2196-86-1 Placard (Replaced by MAC P/N 940024-011)
- 1 ea. AN960-716L Washer

FIGURES/TABLES:

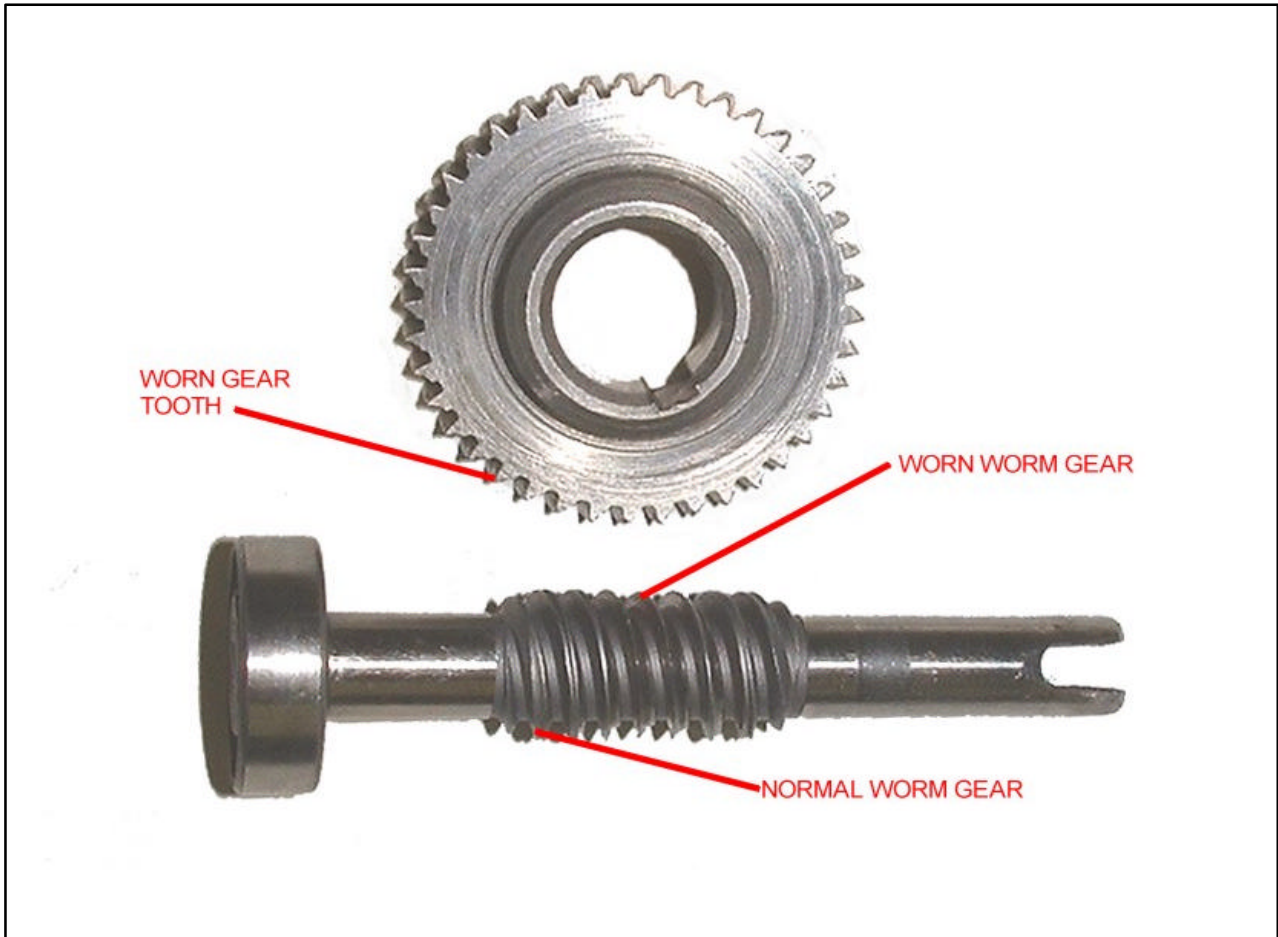


FIGURE 1

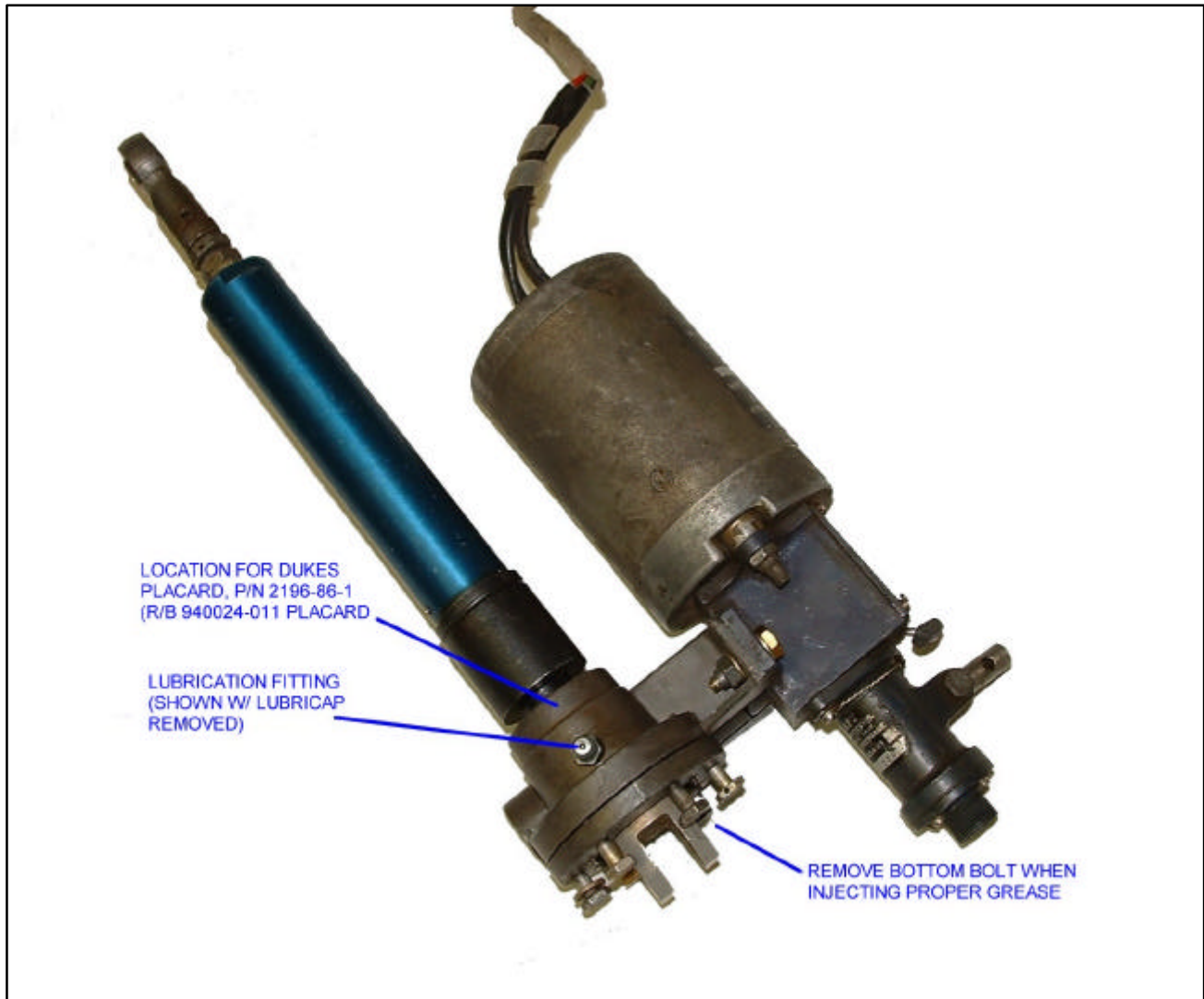


FIGURE 2

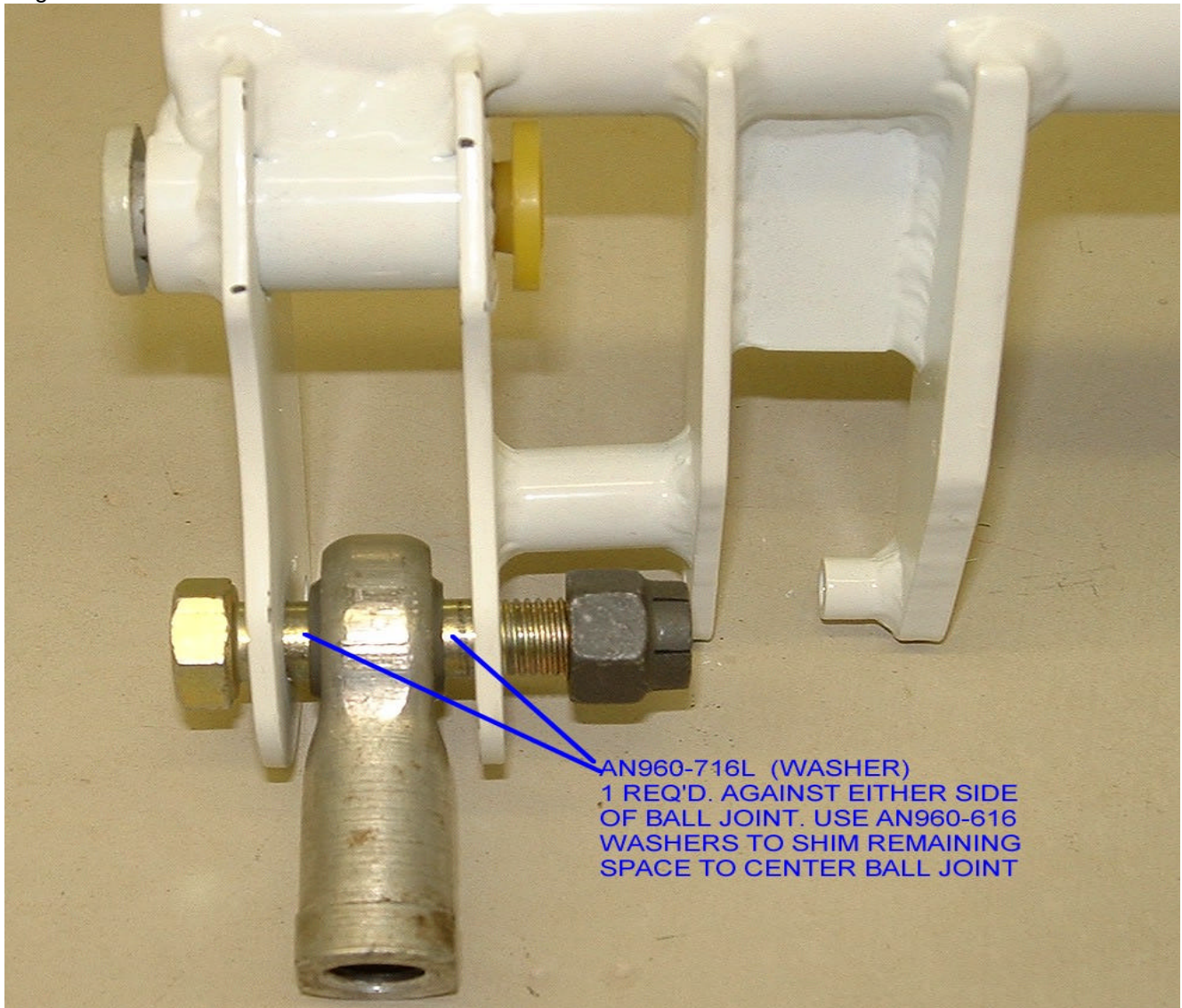


FIGURE 3