SERVICE INSTRUCTION M20-52
REVISION B
DATE: OCTOBER 15, 1998

SUBJECT: INSTALLATION OF NO-BACK CLUTCH SPRING, P/N A10-85, IN AVIONICS PRODUCTS (EATON) * LANDING GEAR ACTUATOR , P/N 102000 (X)

REV. B IS PREPARED TO ADD SHIMMING INFORMATION WHEN NEW CLUTCH (NO-BACK) SPRING CHATTERS DURING ACTUATOR CYCLES, AND TO ADD M20S APPLICATION TO REQUIREMENT

MODELS/S/N AFFECTED:
M20J, 24-0378 & ON **
M20K, 25-0001 & ON **
M20L, 26-0001 & ON **
M20M, 27-0001 & ON **
M20R, 29-0001 & ON **
M20S, 30-0001 & ON **
AND ALL AIRCRAFT WITH 940007-SERIES RETROFIT KIT INSTALLED.

* OR SUBSEQUENT MANUFACTURER OF SAME CONFIGURATION OR PART NUMBER ACTUATOR WITH (X) BEING LATER DASH NUMBERS AS MANUFACTURER'S CHANGES ARE MADE.
** ALL S/N AIRCRAFT MAY NOT HAVE P/N 102000(X) ACTUATOR INSTALLED. SEE SI M20-92 FOR PLESSEY ACTUATOR MAINTENANCE ACTION.

TIME OF COMPLIANCE: AT EACH 1000 HOUR INTERVAL OF AIRCRAFT OPERATION.

INTRODUCTION: To maintain high reliability of actuating system it is recommended that the no-back clutch spring be replaced every 1000 hours.

INSTRUCTIONS:

1. Remove the first two belly panels behind the nose wheelwell to gain access to actuator and bell-crank fittings. NOTE: Later aircraft have fiberglass belly skins and will require either the entire belly skin to be removed, M20J, M20K, or the forward piece to be removed, M20L, M20M, M20R,M20S to gain access.
2. Remove actuator from aircraft, disconnecting electrical connections, Heim bearing linkage and fuselage attach point bolt.
3. Remove the two (2) nuts, (Item 1) that retain the cable support bracket (Item 2) and remove the bracket and disengage cable intact from actuator body and disengage arm.

DISASSEMBLY OF ACTUATOR:

4. To avoid stripping screw heads, use impact screwdriver to break loctite thread seals and remove two (2) long screws (Item 3) and two (2) short screws (Item 4).
5. With razor or similar tool, slice through identification plate and remove recoiler assembly (Item 5) and Clutch Housing Mount Assembly (Item 5A).

NOTE: Care should be taken not to allow bearings or shims to drop out of clutch housing mount assembly.

6. Remove input gear assembly (Item 6) from clutch housing (Item 8) by pulling with slight force.
7. Remove two (2) screws (Item 7) and remove clutch housing (Item 8), clutch (no-back) spring (Item 9), and output gear assembly (Item 10) from actuator body.
8. Remove clutch (no-back) spring (Item 9) from clutch housing using input gear assembly (Item 6) as removal tool. Insert Item 6 into clutch spring from flanged end of housing (item 8), and remove clutch (no-back) spring by rotating gear CCW and pulling slightly.

NOTE: DO NOT TURN CW. Spring can be damaged.

GENERAL:

After disassembly, clean clutch, gears, and housing thoroughly. Discard screws (Item 3 & Item 4). Fill out tag with information requested. Discard old clutch (no-back) spring.

REASSEMBLY:

1. Lubricate clutch housing I/D and new clutch (no-back) spring with lubricant supplied.

2. Using gear assembly (Item 6) as insertion tool, place new clutch spring on cam end of assembly and turning CCW, install spring into clutch housing to about mid-point. Do not force spring. While turning CCW, gently push into housing.

3. Withdraw gear assembly (Item 6).

4. Insert clutch gear assembly (Item 10) into clutch spring and housing from cylindrical end of housing, insuring that spring tangs fit into recesses in cam.

NOTE: When clutch spring is properly seated, large input gear (Item 6) can be rotated in either direction and small output gear (Item 10) will follow rotation direction.

5. Lubricate output gear teeth (Item 10) (lubricate supplied in kit) and install clutch housing, gear and spring assembly into actuator body by mating (Item 10) gear to the output gear train assembly. To engage gear teeth and fully seat hub into bearing, rotation of gear assembly may be required.

6. Reinstall screws (Item 7) to secure clutch housing into actuator body. Use Loctite Grade A on threads.

7. Reinsert input gear assembly (Item 6) into clutch housing and clutch spring assembly until fully seated. Lubricate (Item 6) gear teeth with lubricant supplied in kit.

NOTE: Clutch assembly can now be verified for proper installation by rotating input gear (Item 6) both CW & CCW. Gears should turn with moderate friction to hand torque. Observe that output screw jack rotates in both directions.

NOTE: In some instances, the new clutch (no-back) spring chatters during electrical extension or retraction cycle. Proper shimming of the no-back clutch housing assembly, items 6, 7, 8, 9, & 10, and bearing (item 11) with shims (item 12) is necessary according to EATON personnel to eliminate the chatter.

8. Disassemble Clutch Housing Mount Assy, (item 5A) from Recoiler Assembly (item 5) Do not allow bearing or shims to drop out of clutch housing mount assy.

9. Normally the existing shims (item 12) already installed behind bearing (item 11) will be correct for the new clutch spring. However, due to manufacturing tolerances, it may be necessary to change shim thickness for proper spring adjustment.

10. Three different thickness of shims are available through MAC Service Centers: EATON; P/N 110117-1 (.003 in. Thk), 110117-2 (.005 in. Thk), & 110117-3 (.010 in. Thk). Any combination of these shim thickness are allowed to obtain correct rotational torque (inch pounds of torque) of input gear shaft after clutch housing mount assembly is installed and torqued. See NOTE in Kit list.

11. The rotational torque used by EATON for new actuators is 5.0 to 5.5 inch pounds of consistent running rotational torque in both the CW & CCW directions. If this recommended rotational torque is not obtained on the first assembly attempt, the clutch housing mount assembly will require removal and shims must be added or removed until the proper rotational torque is obtained. A special “socket” can be made to properly fit the flats on the input gear shaft to use on the Torque Driver.

12. When the correct rotational torque has been obtained, reinstall recoiler assembly (Item 5).

NOTE: Flats on (Item 6) gear shaft must line up with the Brass manual drive clutch for proper assembly. Pull manual drive cable slightly to position brass clutch to align with flats on gear shaft (item 6).

13. Install four (4) new bolts (Item 3 [ADS145-10-43] & Item 4 [ADS145-10-38]) supplied in kit and torque bolts to 20 - 25 inch pounds.

14. Reinstall cable support bracket and lock nuts on -43 bolts. Torque lock nuts to 20 - 25 inch pounds.

15. Install modification plate as shown (at first 1000 hrs. only). Mark the first block of mod. Plate with the figure "1" using metal stamp or etching tool. Mark each succeeding clutch spring replacement with the next consecutive number.

16. Reinstall actuator in aircraft and verify rigging per Service and Maintenance Manuals, M20J, No. 106, SECTION 5-6A, and M20K, No. 231, SECTION 5-7, M20L, M20M, M20R, and M20S, and in later M20J & M20K S & M manuals, SECTION 32-30-02,).
Caution should be observed during installation for proper placement of washers and bushings on the retraction system.

17. Reinstall aircraft belly panels.

18. Enter compliance note in aircraft log book and return aircraft to service.

REFERENCE DATA: N/A

PARTS LIST: Kit P/N SI M20-52 (A10-85) Clutch Spring Kit

Item	Part Number	Description	Qty
1.	102053	SPRING, CLUTCH (NO-BACK)	1
2.	102052	MAINTENANCE RECORD METALCAL	1
3.	MIL-G-81322	GREASE (POLY-LUBE)	1
4.	ADS145-10-43	BOLT.	2
5.	ADS145-10-38	BOLT.	2
6.	MS20365-1032	LOCKNUT	***4

NOTE: Shims are available from MAC Service Parts Department. Order as needed.

*** Only 2 MS20365-1032 LOCKNUTS are required when using two ADS145-10-38 BOLTS. Older version of kit contained four ADS145-10-43 BOLTS for all four locations.

TOOLS REQUIRED: 3/8" WRENCH
SCREWDRIVER, COMMON
MACHINIST HAMMER
**** K-D1141 IMPACT SCREWDRIVER or EQUIVALENT
TORQUE DRIVER, ¼ INCH DRIVE, 0 TO 15 (APPROXIMATELY) INCH POUNDS (SPECIAL MADE "SOCKET" TO FIT TORQUE DRIVER AND FLATS ON INPUT GEAR SHAFT (ITEM 6).

**** KD TOOLS, Lancaster, PA. 17604

EATON CORPORATION, EL SEGUNDO , CA -- TELE. (310) 725-3050

FIGURES/ TABLES: SEE ILLUSTRATION ON FOLLOWING PAGE

FIGURES/
TABLES: (con't.) FIGURE SI M20-52-1

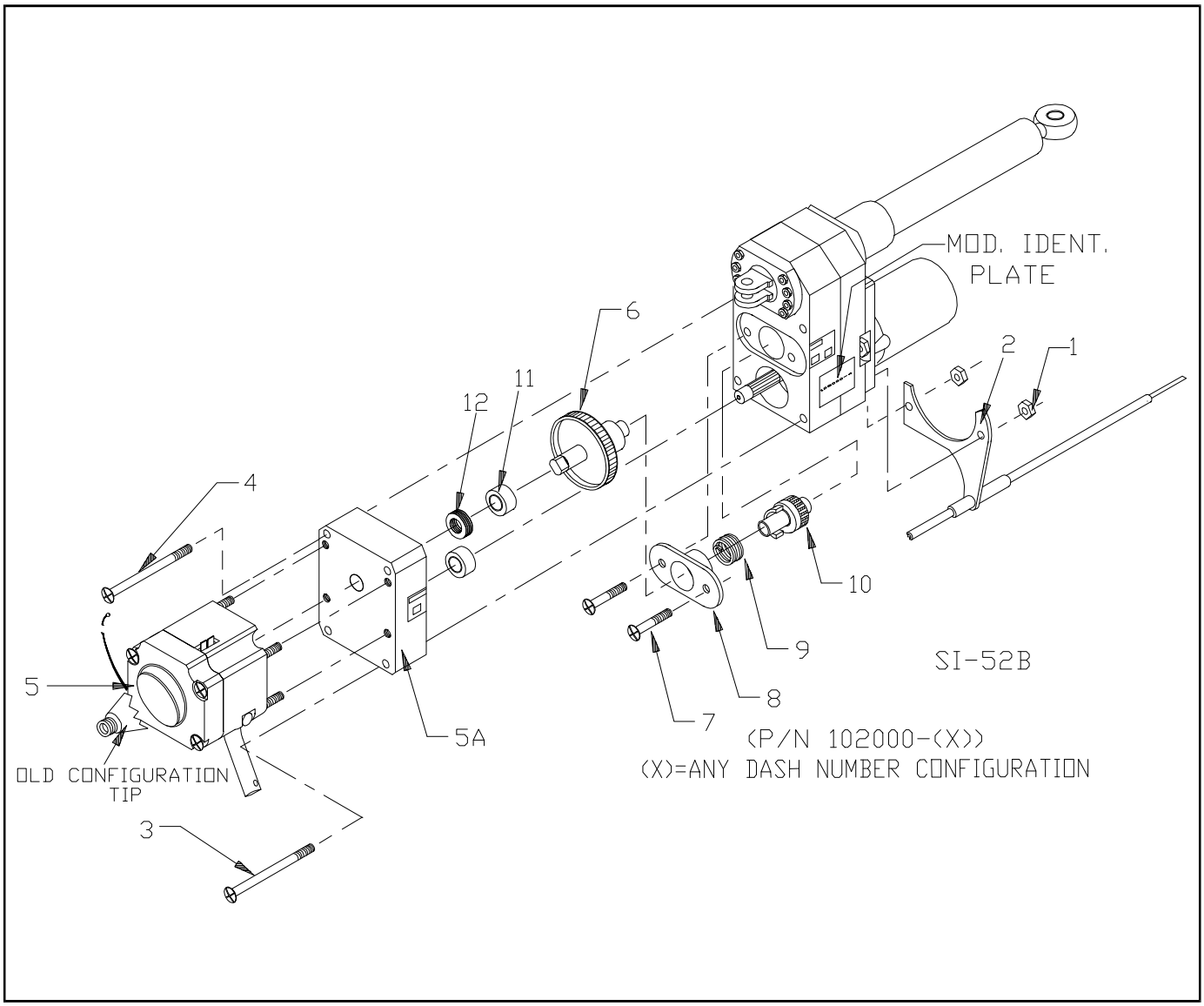

FIGURE SI M20-52-1