

RECORD-REPRODUCE MECHANISM

KS-19124 L2

PIECE-PART DATA AND REPLACEMENT PROCEDURES

1. GENERAL

1.01 This section provides information for ordering parts to be used in maintenance of KS-19124 L2 record-reproduce mechanism. The section also describes approved procedures for replacing these parts.

1.02 This section is reissued to change the title and to include additional and changed maintenance information for the KS-19124 L2 record-reproduce mechanism. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 Piece parts, other than mounting hardware, which can be replaced in the field are listed in the index at the end of Part 2. These parts are identified in Part 3 on illustrations which show the different parts together with their piece-part numbers and corresponding names. No text references are listed in the index for replacement procedures that are obvious and simple. Such procedures are adequately covered by the illustrations on which the parts are identified.

1.04 Part 3 covers the approved procedures for the replacement of the piece parts designated in Part 2. No attempt shall be made in the field to replace parts not designated.

1.05 One drop of oil, as referred to in this section, is the amount of oil discharged from the nozzle of a 486A oil can or of a KS-14796 oil can when the sides are depressed once or when the pump is operated until a drop is released from the nozzle.

2. PIECE-PART DATA

2.01 The illustrations to which references are made in this part show the various piece parts in their proper relation to other parts of the record-reproduce mechanism.

2.02 When ordering replacement parts, give both the Ampex piece-part number and the piece-part name as shown in the following example:

No. 4100123-10 button, Ampex Corp.

Do not refer to the BSP number or to any information shown in parentheses in the illustrations.

2.03 Information enclosed by parentheses is not ordering information. This information may be references to notes, information pertaining to parts not considered replaceable, or part names generally used in the field if the names differ from those assigned by the manufacturer.

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3. REPLACEMENT PROCEDURES

3.01 *List of Tools and Materials*

CODE OR SPEC. NO.	DESCRIPTION
TOOLS	
43	1/4-Inch Open Double-End Wrench
245	3/8-Inch Open Double-End Wrench
418A	5/16-Inch Open Double-End Wrench
486A	Oil Can
AT-6267	P Long-Nose Pliers
AT-7739	B Screwdriver, Sizes 3, 4, and 6 inches
AT-7825	3-Inch D Screwdriver

CODE OR SPEC. NO.	DESCRIPTION
KS-14440	Soldering Gun
KS-14796	Oil Can
R-2670	3/32-Inch Allen Wrench
R-2958	5/64-Inch Allen Wrench
R-2959	1/16-Inch Allen Wrench
R-2975	Snap-Ring Pliers
R-3415	7/64-Inch Allen Wrench
—	Torqometer, Model TQ-1, Snap-On Tool Co. (or equivalent)
—	5/16-Inch Hex Socket, Model TM-10 Snap-On Tool Co. (or equivalent)

MATERIALS

KS-2423	Twill Cloth
KS-16326	Oil
KS-16729	Oil

3.02 Before performing any replacement procedures, remove power from the record-reproduce mechanism. Any recording tape on the machine must be removed, identified, and stored.

3.03 No procedure is given for removal or replacement of the record-reproduce mechanism (Fig. 1) from the cabinet frame members.

3.04 The screen (Fig. 2) covering drive motor and capstan assemblies must be in place at all times except when removal is necessary for the performance of maintenance operations. Make sure, upon completion of maintenance operations, that the screen is reinstalled before record-reproduce mechanism is put in operation.

Caution: Take care to prevent damage to the drive motor fan. A damaged fan will adversely affect operation of the equipment.

3.05 No instructions are given for replacement of screws or other parts where the procedure is obvious and consists of a simple operation.

3.06 After replacement of any parts, the record-reproduce mechanism (tape transport) shall meet the requirements as specified in Section 034-355-701. Replacement operations may affect the adjustment of other parts. Therefore such parts should be checked against requirements and adjusted if necessary.

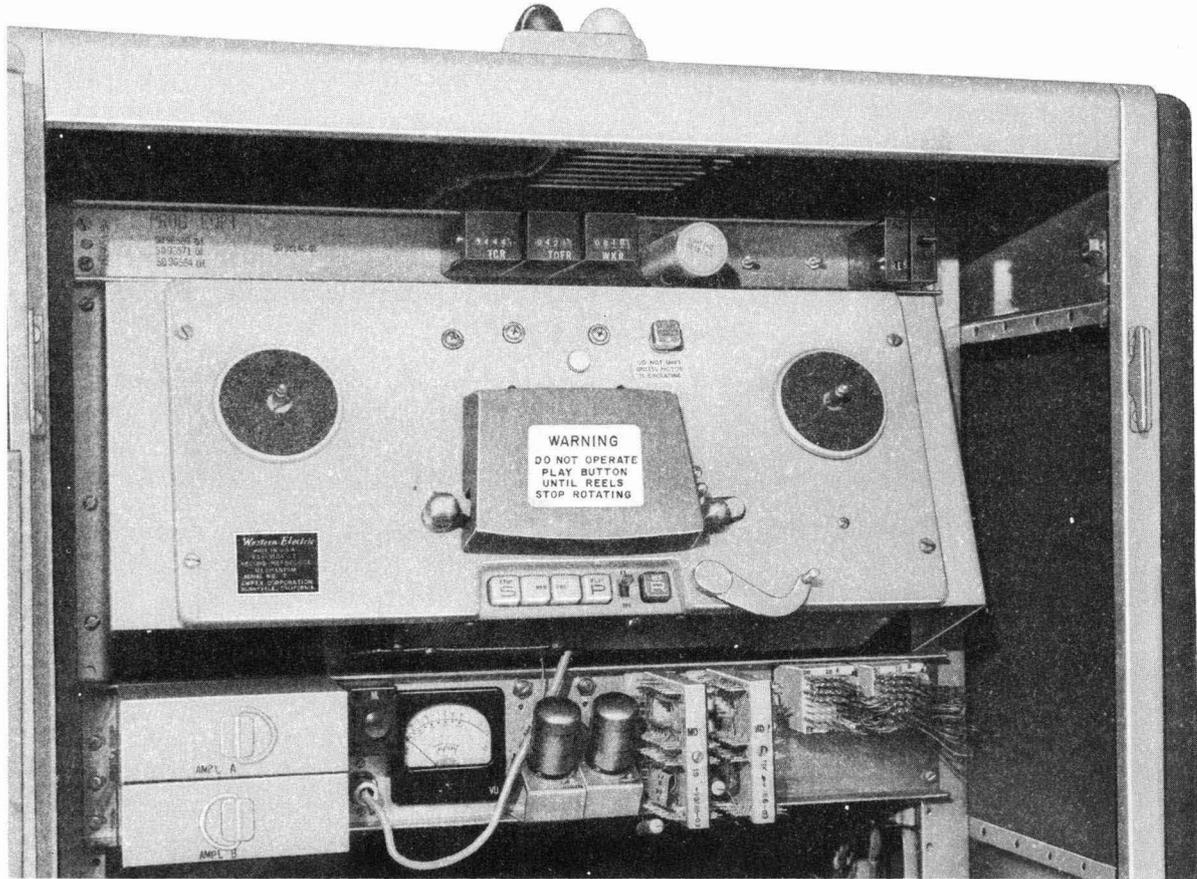


Fig. 1 — KS-19124 L2 Record-Reproduce Mechanism — Cabinet Mounted

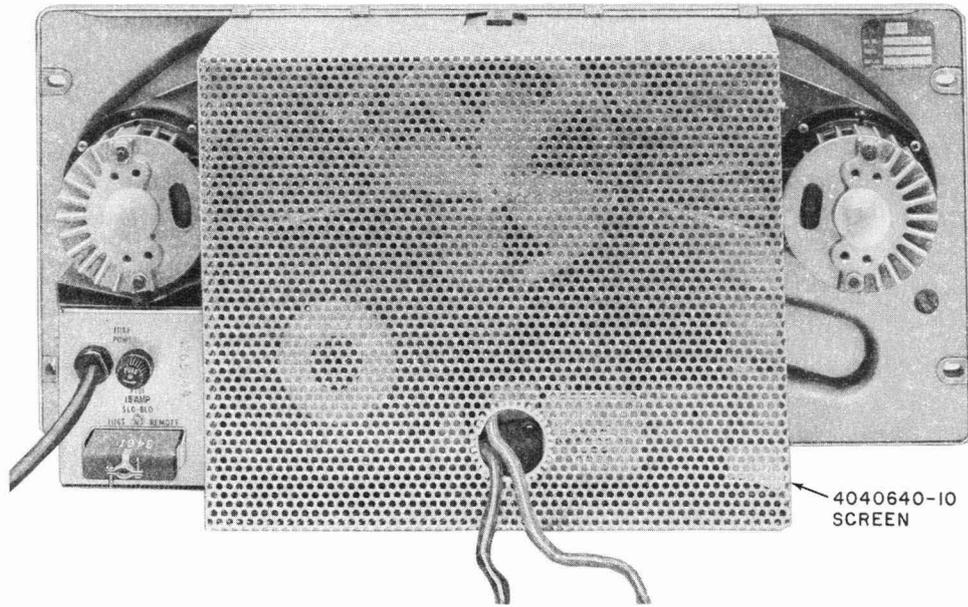


Fig. 2 — KS-19124 L2 Record-Reproduce Mechanism — Rear View

TAPE TRANSPORT

3.07 Drive Motor Assembly: The drive motor assembly is replaced as follows.

- (1) Use the 1/16-inch Allen wrench to loosen setscrew securing speed change button (Fig. 3) and slide button off shaft of speed change assembly.
- (2) Use the 1/16-inch Allen wrench to loosen setscrew securing fan (Fig. 4) on drive motor shaft and slide fan off motor shaft.
- (3) Use the 5/16-inch open double-end wrench to remove hex nut, flat washer, and lockwasher which hold speed change assembly in place.
- (4) Carefully holding speed change assembly, use the P long-nose pliers to remove retaining bushing. Remove speed change assembly from tape transport.
- (5) Remove capstan drive belt (Fig. 5) and both clutch belts (Fig. 4 and 6) from drive motor.
- (6) Use a B screwdriver to remove head cover assembly (Fig. 3) by removing two motor mounting screws and two lockwashers.
- (7) Disconnect drive motor cable J109P connector from J101S receptacle on the control box assembly (Fig. 5).
- (8) Carefully holding drive motor assembly, use the B screwdriver to remove two motor mounting screws and two lockwashers (Fig. 3). The drive motor is now free of tape transport except for electrical leads to C107 and C112 capacitors.
- (9) If drive motor assembly is to be replaced, tag and unsolder leads to C107 and C112 capacitors (Fig. 5 and 7).
- (10) Connect and solder the tagged leads from C107 and C112 capacitors to the proper terminals on the new drive motor assembly and remove tags.
- (11) Mount drive motor assembly on tape transport using the two lockwashers and the two motor mounting screws (Fig. 3) removed in (8).

- (12) Connect drive motor cable J109P connector removed in (7) to J101S receptacle on the control box assembly (Fig. 5).
- (13) Install head cover assembly (Fig. 3) using the two motor mounting screws and the two lockwashers removed in (6).
- (14) Install both clutch belts (Fig. 6) and capstan drive belt (Fig. 5) removed in (5).
- (15) Install speed change assembly using retaining bushing (Fig. 4) removed in (4) and using hex nut, flat washer, and lockwasher removed in (3).
- (16) Install fan on drive motor shaft (Fig. 4) and tighten setscrew loosened in (2).
- (17) Install speed change button (Fig. 3) on shaft of speed change assembly and tighten setscrew loosened in (1).
- (18) Check requirements of speed change assembly as described in Section 034-355-701 and adjust if necessary.

3.08 Speed Change Assembly: To replace speed change assembly (Fig. 8), proceed as follows.

- (1) Remove speed change assembly from tape transport (Fig. 4) by performing 3.07(1), (3), and (4).

Caution: During disassembly of speed change assembly, do not remove the guide bushing (Fig. 8) from speed change housing. If guide bushing becomes defective, replace complete speed change assembly.

- (2) Using the P long-nose pliers, grasp the roller (Fig. 8) and pull away from the slot in speed shift arm and turn roller so that it and the roller spring can come free of the assembly. Remove the drive pin and slide speed shift arm from housing.
- (3) Use the 7/64-inch Allen wrench to remove two hex socket head cap screws holding shift fork, and remove shift fork from speed shift arm.
- (4) Use the P long-nose pliers to remove cotter pin retaining the clevis pin; remove clevis pin, two snap-in bearings, and two flat washers.

Caution: The two flat washers removed in (4) are of different thicknesses. Before re-assembling speed change assembly refer to Fig. 8 assembly to ascertain correct placement of each flat washer.

- (5) Reassemble and install speed change assembly in reverse order of removal.
- (6) Check speed change assembly requirements as described in Section 034-355-701 and adjust if necessary.

3.09 Clutch Assembly: To replace the supply or take-up clutch assembly (Fig. 4 or 5), proceed as follows.

- (1) Use the B screwdriver to remove turntable pad (Fig. 9), three screws, and turntable plate.
- (2) Disconnect clutch cable connector and brake cable connector from their respective receptacles on control box assembly (Fig. 5).
- (3) Remove capstan drive belt (Fig. 5) and clutch drive belt (Fig. 6) from drive motor flywheel.
- (4) Use the B screwdriver to remove three screws and three flat washers (Fig. 5 and 9) securing both clutch assembly and brake assembly. Remove clutch assembly and brake assembly from tape transport. Place brake assembly aside until needed for reassembly.
- (5) Remount clutch assembly and brake assembly removed in (4) in reverse order of removal.
- (6) Check supply or take-up clutch tension requirements as described in Section 034-355-701 and adjust if necessary.

3.10 Clutch Belt: To replace clutch belt, proceed as follows.

- (1) Use the 5/16-inch open double-end wrench to remove two hex nuts (Fig. 6) and two lockwashers which secure the lower end shield of clutch assembly.

- (2) Remove lower end shield.
- (3) Remove clutch belt.
- (4) Install new clutch belt in reverse order of removal.

3.11 Lubrication of Clutch Assembly: To lubricate clutch bearing (Fig. 6), proceed as follows.

- (1) Remove clutch assembly by performing 3.09(1) through (4).
- (2) Use the 5/16-inch open double-end wrench to remove three hex nuts securing upper end shield. (Fig. 6).
- (3) Slide the upper end shield off shaft, thus exposing front bearing.
- (4) The clutch front bearing is of the spherical type and should be tilted so that oil can be placed on its outer surface. Use the KS-14796 oil can to apply one drop of KS-16729 oil to bearing. Rotate bearing to distribute oil.
- (5) Reassemble and remount clutch assembly in reverse order of removal.

3.12 Clutch Belt Separator Assembly: To replace clutch belt separator assembly (Fig. 4), proceed as follows.

- (1) Use the 5/16-inch open double-end wrench to remove hex nut, flat washer, and lockwasher which hold separator assembly in place.
- (2) Carefully holding separator assembly, use the B screwdriver to remove screw, finishing washer (Fig. 9), external tooth lockwasher (Fig. 4), and separator assembly from tape transport.
- (3) Use the snap-ring pliers to remove retainer ring from the end of belt separator shaft.
- (4) Remove one retaining washer, three idler thrust washers, and the belt separator pulley.
- (5) Use the B screwdriver to remove screw, flat washer, two bushings and belt separator shaft from belt separator bracket.

(6) Refer to Fig. 4 to ascertain correct placement of each component part. Reassemble and install belt separator assembly in reverse order of removal.

3.13 Lubrication of Clutch Belt Separator Assembly: To lubricate clutch belt separator assembly (Fig. 4), proceed as follows.

- (1) Remove separator assembly by performing 3.12(1) through (4).
- (2) Lubricate belt separator shaft with one drop of KS-16326 oil applied with a 486A oil can. *Overlubrication* will cause pulley to throw oil during operation.
- (3) Remove excess oil using a KS-2423 twill cloth.
- (4) Reassemble and remount separator assembly in reverse order of removal.

3.14 Brake Assembly: To replace supply or take-up brake assembly (Fig. 4 or 5), proceed as follows.

- (1) Remove brake assembly by performing 3.09(1) through (4).
- (2) Reinstall replacement brake assembly in reverse order of removal.
- (3) Check clearance requirements as described in Section 034-355-701 and adjust if necessary.

3.15 Brake Arm Assembly (with Lining): To replace brake arm and lining (Fig. 10), proceed as follows.

- (1) Remove brake assembly by performing 3.09(1) through (4).
- (2) Use the P long-nose pliers to remove high and low torque springs (Fig. 10).
- (3) Use the 3/8-inch open double-end wrench to remove hex locknut, spring anchor, thrust washer, brake arm assembly, and chafing sleeve.
- (4) Reinstall brake arm assembly and lining in reverse order of removal. When tightening the hex locknut, tighten until snug; then back off 1/4 turn.

(5) Adjust clearance requirements as described in Section 034-355-701.

3.16 Brake Solenoid: To replace the brake solenoid (Fig. 10), proceed as follows.

- (1) Remove brake assembly by performing 3.09(1) through (4).
- (2) Use the 1/4-inch open double-end wrench to remove screw, flat washer, hex nut, brake actuator, and solenoid return spring.
- (3) Use the B screwdriver to remove two screws, two lockwashers, two flat washers, and brake solenoid.
- (4) Install brake solenoid and remount brake assembly in reverse order of removal.
- (5) Adjust brake assembly in accordance with requirements described in Section 034-355-701.

3.17 Capstan Assembly: To replace capstan assembly (Fig. 11), proceed as follows.

Caution: *Disassembly of the capstan assembly should not be attempted except for removal of the capstan solenoid.*

- (1) Disconnect all connectors from the control box assembly (Fig. 5).
- (2) Use the 5/16-inch open double-end wrench and a B screwdriver to remove all screws, hex nuts, flat washers, and lockwashers holding the control box in place. Do not remove leads to C107 and C112 capacitors.
- (3) Remove capstan drive belt.
- (4) Carefully holding capstan assembly, use the B screwdriver to remove three screws and flat washers (Fig. 3) holding capstan assembly in place. Remove capstan assembly from tape transport.
- (5) Remount capstan assembly in reverse order of removal.
- (6) Adjust capstan assembly in accordance with requirements described in Section 034-355-701.

3.18 Capstan Solenoid: To replace capstan solenoid (Fig. 11), proceed as follows.

- (1) Remove capstan assembly by performing 3.17(1) through (4).
- (2) Remove cotter pin and clevis pin (Fig. 11). Use the B screwdriver to remove two screws, two lockwashers, and solenoid stop.
- (3) Use the B screwdriver to remove two screws, two lockwashers, two flat washers, capstan solenoid, felt washer, and solenoid return spring.
- (4) Install capstan solenoid and reassemble parts in reverse order of removal.
- (5) Adjust capstan assembly in accordance with requirements described in Section 034-355-701.

3.19 Head Unit: Replace head unit (Fig. 12) as follows.

Note: When replacing a head unit on head assembly, it is not necessary to completely remove head assembly from tape transport.

- (1) Disconnect head cable from electronic assembly.
- (2) Use the B screwdriver to loosen head assembly by partially removing mounting screw (Fig. 9).
- (3) Use the 5/16-inch open-end wrench to loosen acorn nut that is holding head unit (Fig. 12) on head mounting. Carefully slide head unit off head mounting and withdraw head cable through hole in tape transport.
- (4) Remove acorn nut and flat washer from head unit removed in (3) and install acorn nut and flat washer on new head unit.
- (5) Insert head cable through hole in tape transport.
- (6) Carefully slide head unit on head mounting. Ensure that both acorn nut and flat washer are on the opposite side of head mounting from head unit.

(7) Push head unit on head mounting to its limit. Make sure that head unit is touching back surface of head mounting on both sides and all the top surface.

Caution: To prevent irreparable damage to the head unit, do not tighten acorn nut with more than 6 inch-pounds of torque.

- (8) Use the torque tool with 5/16-inch hex. socket to tighten acorn nut on head unit until a reading of 6 inch-pound torque is indicated on torque wrench.
- (9) Use the B screwdriver to tighten mounting screw (Fig. 9) loosened in (2) and connect head cable disconnected in (1) to electronic assembly.
- (10) Align the head unit in accordance with requirements of Section 034-355-701.

3.20 Head Assembly: To replace complete head assembly, proceed as follows.

- (1) Disconnect head cable from electronic assembly.
- (2) Use the B screwdriver to remove screw (Fig. 9) holding head assembly in place on front of tape transport. Carefully lift head assembly while passing head cable through hole in tape transport, and remove complete head assembly. The head shield base will come free when head assembly is removed. Take precaution not to bend or scratch head shield base because this causes its shielding properties to be impaired.
- (3) Use the 5/16-inch open double-end wrench to loosen acorn nut that secures head unit (Fig. 12), and carefully slide head unit off head mounting. If head unit that is being removed is to be used again, ensure protection from damage while head unit is being stored.
- (4) Replace head unit on head assembly by performing 3.19(6), (7), and (8).
- (5) Reinstall head assembly in reverse order of removal.
- (6) Adjust azimuth alignment of head unit in accordance with requirements of Section 034-355-701.

3.21 Head Mounting: To replace head mounting (Fig. 12), proceed as follows.

- (1) Remove complete head assembly as described in 3.20(1) through (3).
- (2) Use the 5/64-inch Allen wrench to remove the hex socket head cap screw used to adjust head azimuth.
- (3) Use the 3/32-inch Allen wrench to remove the hex socket setscrew used to adjust height of head unit.
- (4) Use the 3-inch D screwdriver to remove flat head screw, spring retainer plate, and two head mounting springs.
- (5) Use the 3/8-inch open double-end wrench to remove head mounting nut, double coil lockwasher, flat washer, and head mounting.
- (6) Install head mounting by using head mounting nut, double coil lockwasher, and flat washer. Tighten head mounting nut so

that head mounting will slide up and down freely but will not tilt away from the head base.

- (7) Insert two head mounting springs in head mounting base and secure in place with spring retainer plate and flat head screw tightened with the 3-inch D screwdriver.
- (8) Partially install the hex socket setscrew removed in (3) and the hex socket head cap screw removed in (2). Gauging by eye, tighten both screws simultaneously so that head mounting flange is not tilted.
- (9) Reinstall head unit as described in 3.19(6), (7), and (8).
- (10) Reinstall head assembly in reverse order of removal and reconnect head cable to electronic assembly.
- (11) Align the head unit in accordance with requirements of Section 034-355-701.

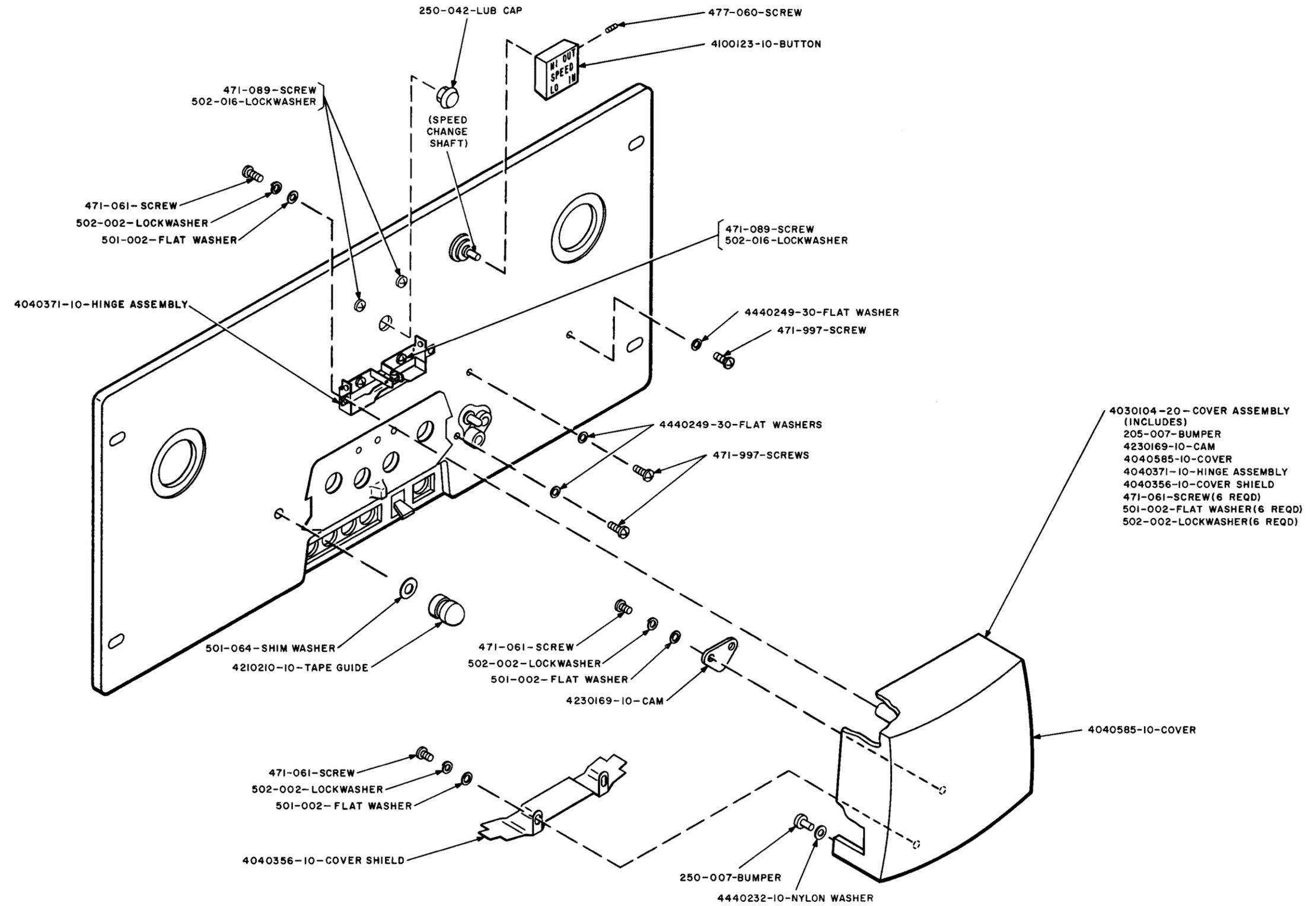


Fig. 3 — Record-Reproduce Mechanism—Removal of Cover Assembly and Miscellaneous Parts

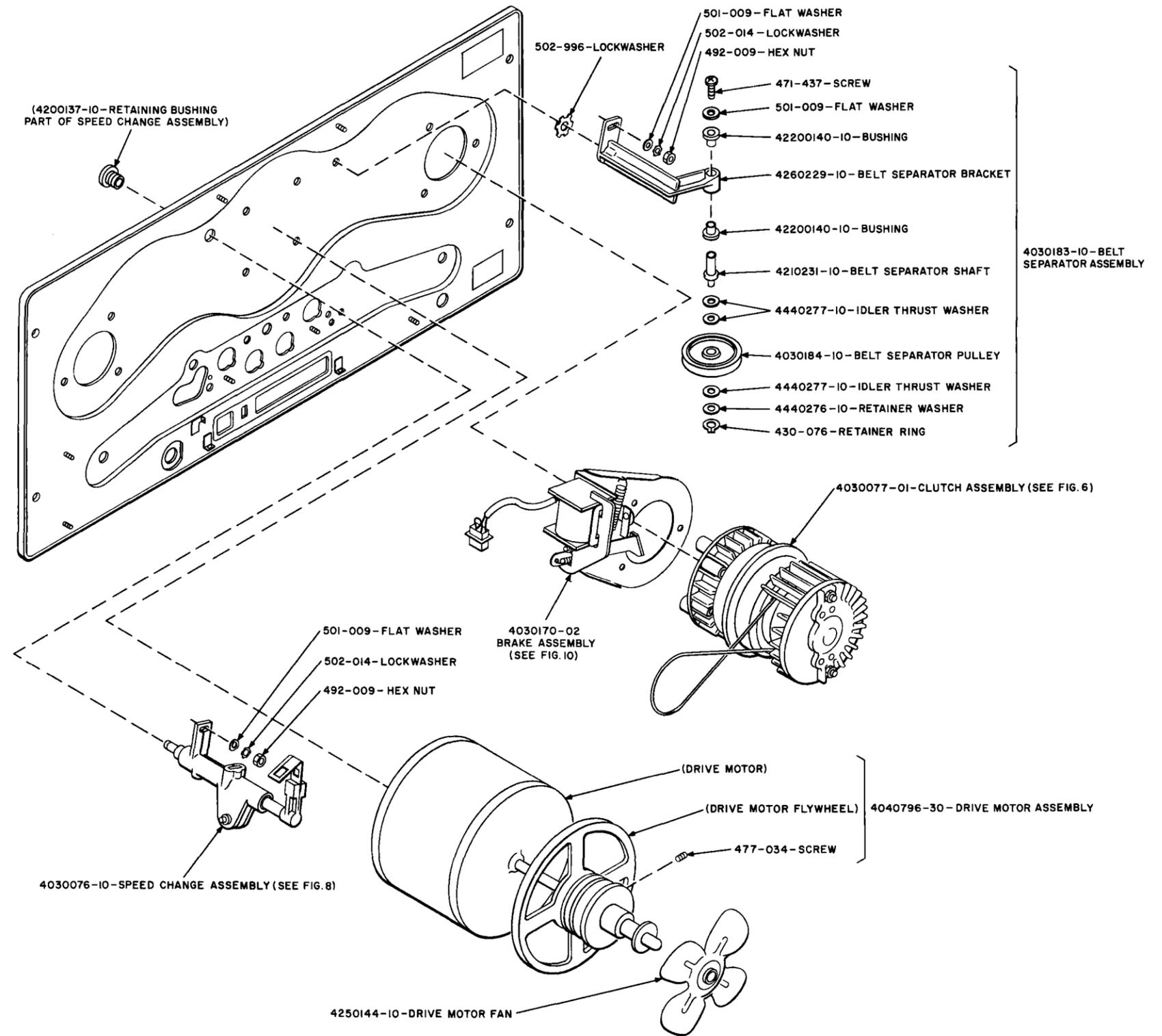


Fig. 4 — Record-Reproduce Mechanism—Removal of Drive Motor, Clutch, Brake, and Speed Change Assembly

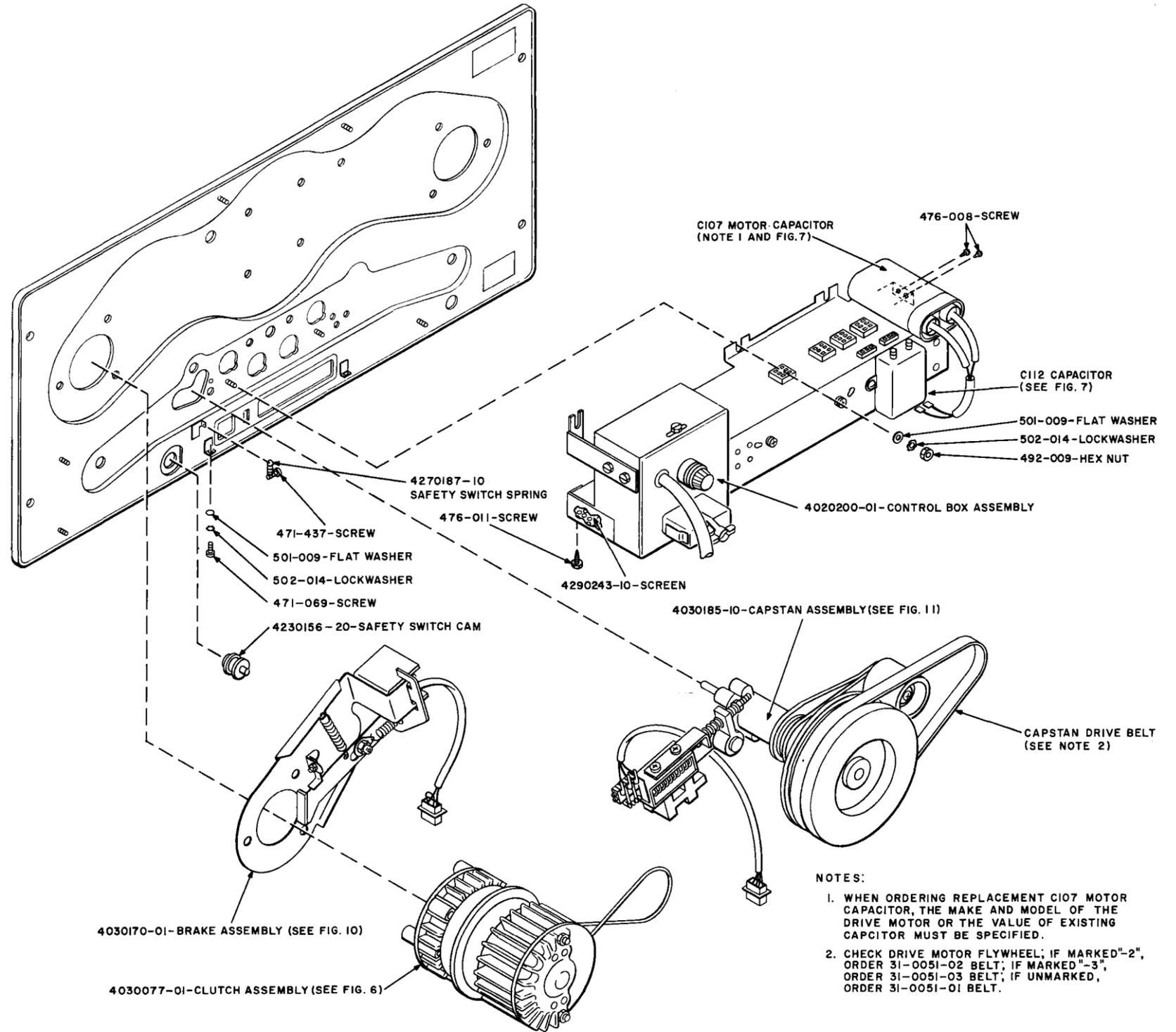


Fig. 5 — Record-Reproduce Mechanism—Removal of Capstan Assembly, Control Box Assembly, and Miscellaneous Parts

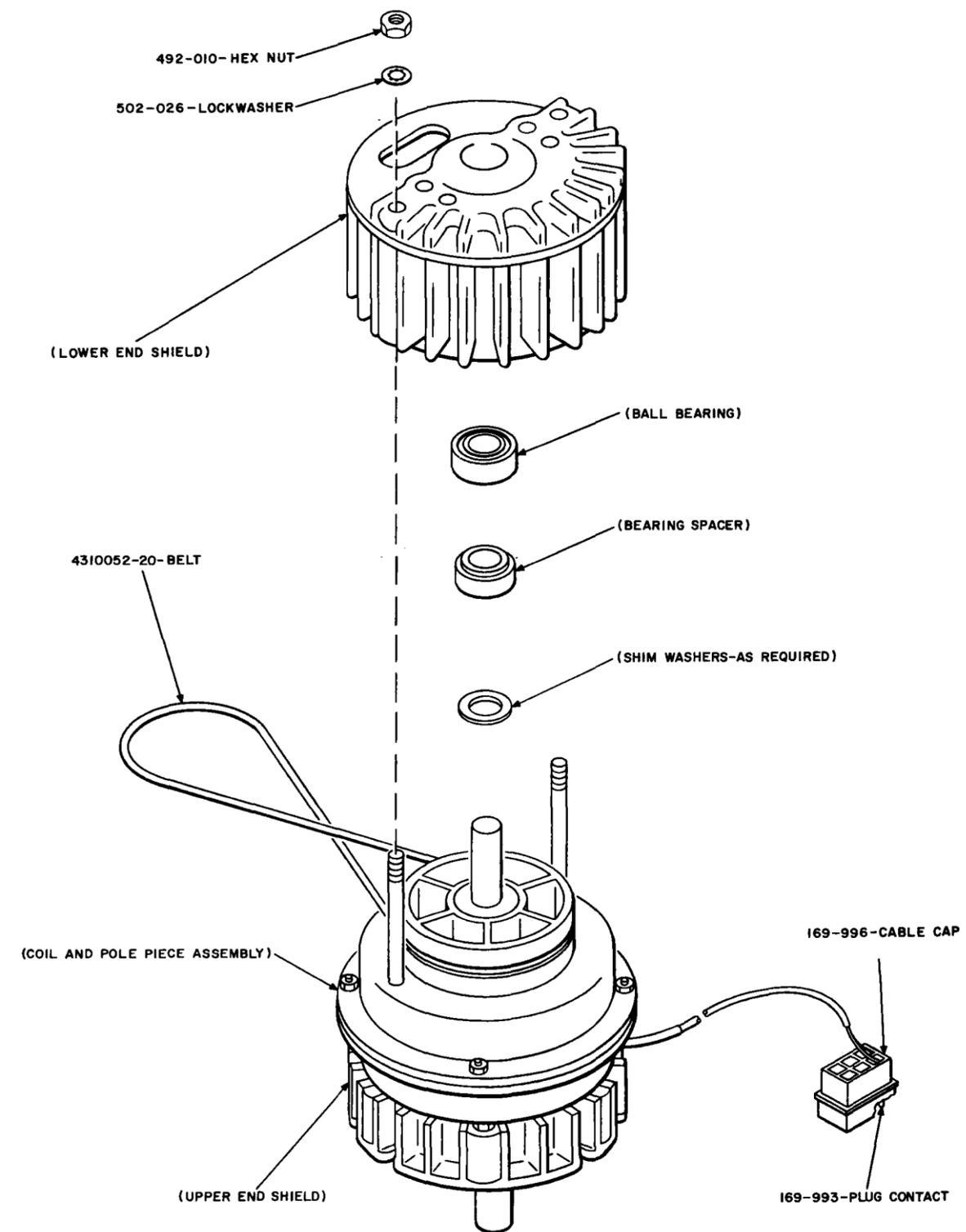
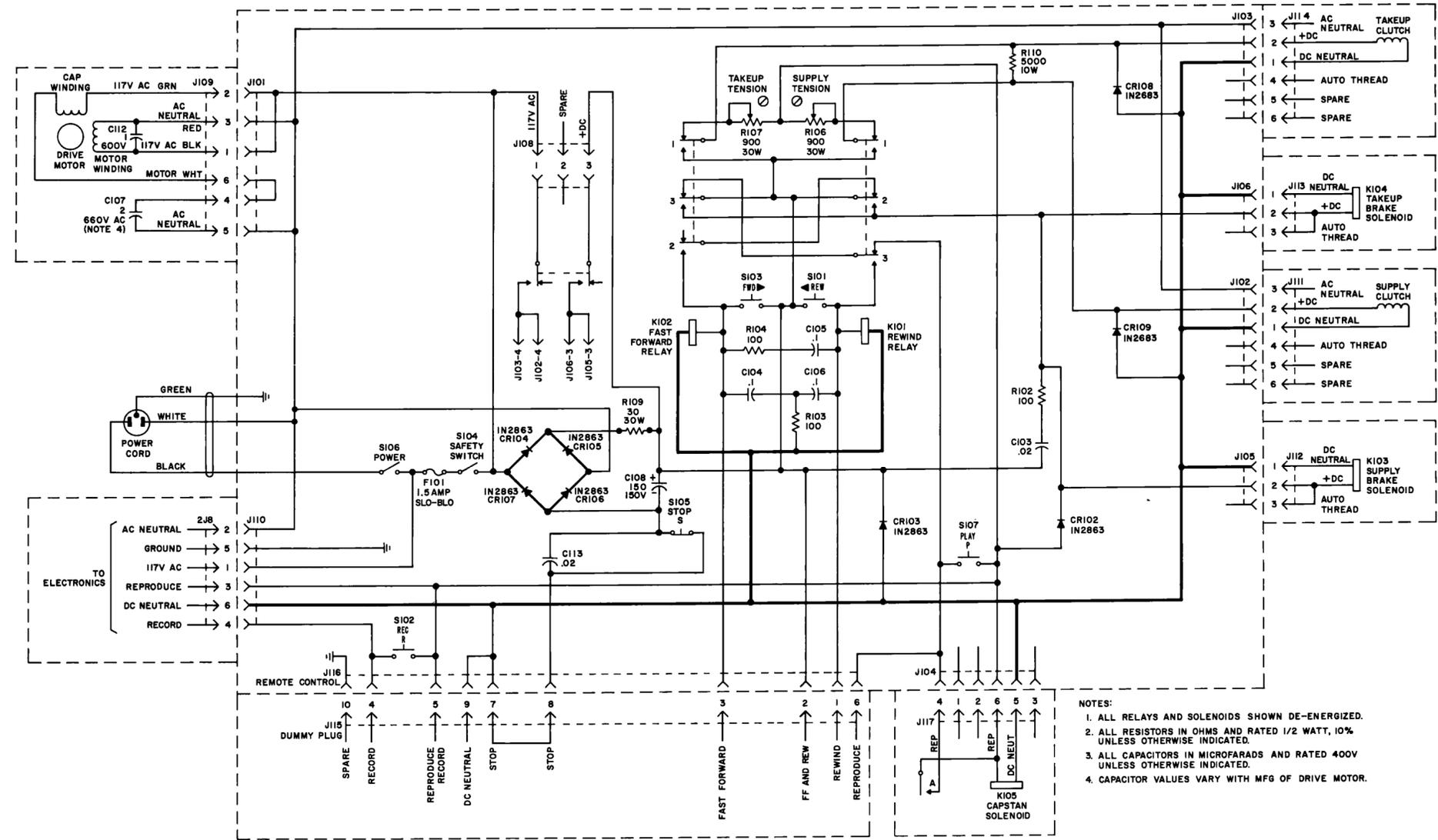


Fig. 6 — Clutch Assembly

REF NO.	PART DESCRIPTION	AMPEX PART NO.
	TRANSPORT ELECTRICAL SYSTEM	
C101*	Not used	--
C102*	Not used	--
C103*	CAPACITOR, Ceramic: 0.02 mfd; 500 vdcw; GMV; Centralab Part No. DD-203	030-001
C104*	CAPACITOR, Paper: 0.1 mfd; 400 vdcw; ±10%; C-D Part No. WMF4P1E	035-999
C105*	(Same as C104)	035-999
C106*	(Same as C104)	035-999
C107	CAPACITOR, Motor	**
C108*	CAPACITOR, Electrolytic: 150 mfd; 150 vdcw; +150% -10%; C-D Part No. BRM-15015	031-624
C109*	Not used	--
C110*	Not used	--
C111*	Not used	--
C112	CAPACITOR, Paper: 1 mfd; 600 vdcw; +20% -10%; Sangamo Part No. 5006-1	036-023
C113	(Same as C103)	030-001
CR101*	Not used	--
CR102*	DIODE, Crystal: diffused silicon; 400 PIV: Type 1N2863	580-027
CR103*	(Same as CR102)	580-027
CR104*	(Same as CR102)	580-027
CR105*	(Same as CR102)	580-027
CR106*	(Same as CR102)	580-027
CR107*	(Same as CR102)	580-027
CR108*	(Same as CR102)	580-027
CR109*	(Same as CR102)	580-027
F101*	FUSE, Cartridge: 1.5 amps; slo-blo: Littlefuse Part No. 3130-2	070-994
J101S*	PLUG, Chassis: 6 way; orange; less connectors: Amp Part No. 480159-3	169-998
J102S*	PLUG, Chassis: 6 way; white; less connectors: Amp Part No. 480153-1	169-999
J103S*	(Same as J102S)	169-999
J104S*	PLUG, Chassis: 6 way; blue; less connectors: Amp Part No. 480159-6	169-997
J105S*	PLUG, Chassis: 3 way; white; less connectors: Amp Part No. 480177-1	169-987
J106S*	PLUG, Chassis: 3 way; red; less connectors: Amp Part No. 480181-2	169-990
J107	Not used	--
J108S*	(Same as J105S)	169-987
J109P	CAP, Cable: 6 way; orange; less connectors: Amp Part No. 480160-3	169-995
J110S*	CONNECTOR, Receptacle: female; 6 contact; Cinch-Jones type S-306-CCE (with side mounted cable clamp)	148-996
J111P	CAP, Cable: 6 way; white; less connectors: Amp Part No. 480154-1	169-996
J112P	CAP, Cable: 3 way; white; less connectors: Amp Part No. 480178-1	169-988
J113P	CAP, Cable: 3 way; red; less connectors: Amp Part No. 480182-2	169-989
J114P	(Same as J111P)	169-996
J115P*	PLUG, Dummy	4050101-10
J116S*	CONNECTOR, Receptacle: female; 10 contacts: Cinch-Jones type S-310-AB	146-018
J117P	CAP, Cable: 6 way; blue; less connectors: Amp Part No. 480160-6	169-994
-	CONNECTOR, Solderless: (for use with J101S thru J108S, J111P thru J114P, and J117P) Amp Part No. 42859-1	169-993
K101*	RELAY	4590050-10
K102*	(Same as K101)	4590050-10
K103	SOLENOID	4590018-10
K104	(Same as K103)	4590018-10
K105	SOLENOID, Capstan idler (with relay contacts)	4590090-10
R101*	Not used	--
R102*	RESISTOR, Fixed: composition; 100 ohms; ±10%; 1/2 watt: MIL-R-11 RC20GF101K	041-038
R103*	(Same as R102)	041-038
R104*	(Same as R102)	041-038
R105*	Not used	--
R106*	RESISTOR, Adjustable: wire wound; 900 ohms; ±5%; 30 watt: IRC type FRWA-20B	040-045
R107*	(Same as R106)	040-045
R108*	Not used	--
R109*	RESISTOR, Fixed: 30 ohms; 30 watts	047-360
R110*	RESISTOR, Fixed: 5000 ohms; 10 watts	043-084
S101*	SWITCH, Pushbutton	4620144-10
S102*	SWITCH, Pushbutton	4620144-03
S103*	(Same as S101)	4620144-10
S104*	SWITCH, Toggle: snap-action; normally closed; Cherry Electric Part No. E15-00A	120-138
S105*	SWITCH, Pushbutton	4620144-20
S106*	SWITCH, Toggle: paddle-handle; single-pole single-throw; Circle F Part No. 1887-L4P	120-999
S107*	(Same as S101)	4620144-10

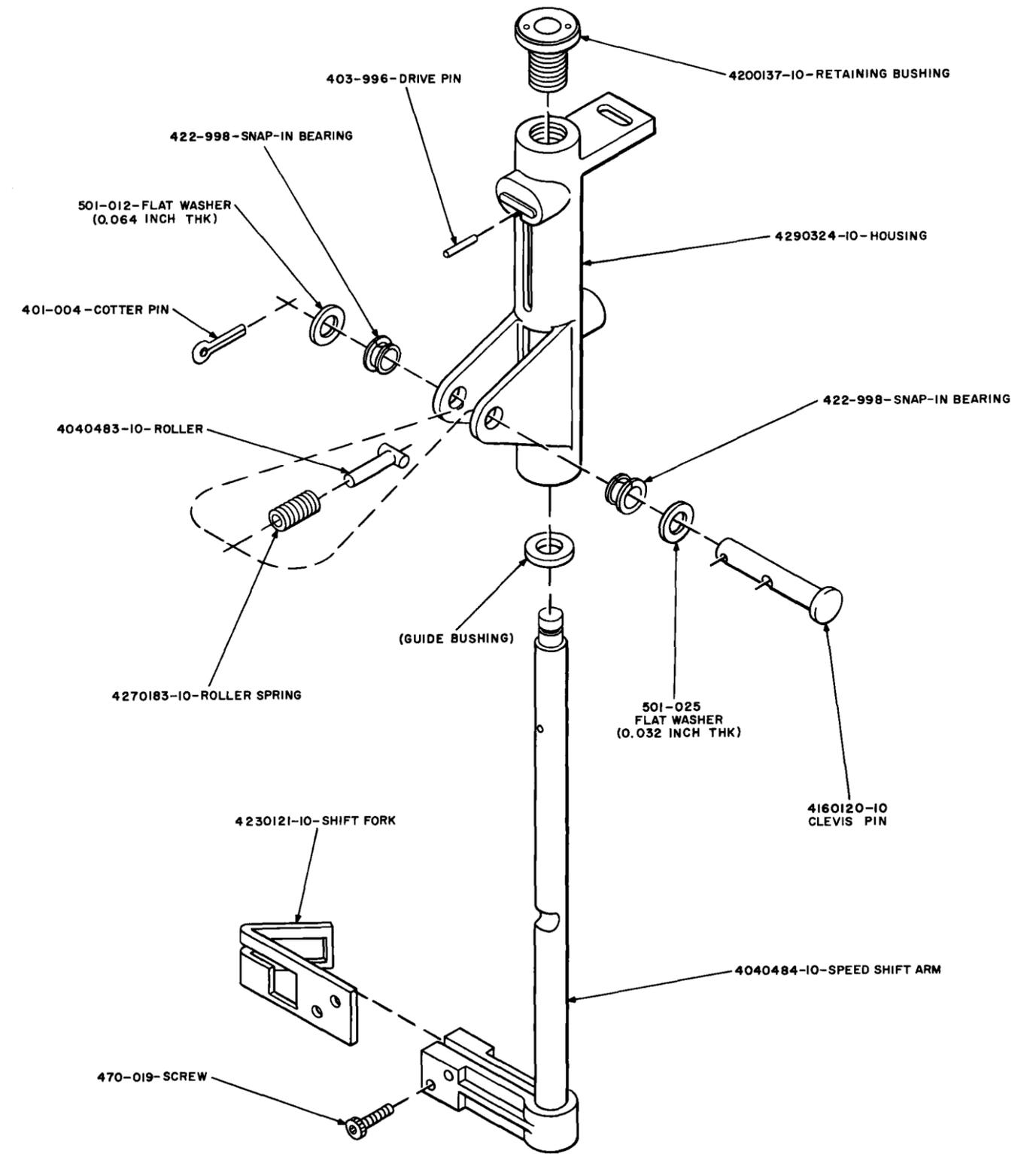
*Part of Control Box Assembly 96350-01.

**Because motors from different manufacturers require different capacitors, the make and model of the drive motor must be specified or the value of the existing capacitor must be specified.



- NOTES:
1. ALL RELAYS AND SOLENOIDS SHOWN DE-ENERGIZED.
 2. ALL RESISTORS IN OHMS AND RATED 1/2 WATT, 10% UNLESS OTHERWISE INDICATED.
 3. ALL CAPACITORS IN MICROFARADS AND RATED 400V UNLESS OTHERWISE INDICATED.
 4. CAPACITOR VALUES VARY WITH MFG OF DRIVE MOTOR.

Fig. 7 — Record-Reproduce Mechanism — Schematic Diagram



d — Speed Change Assembly

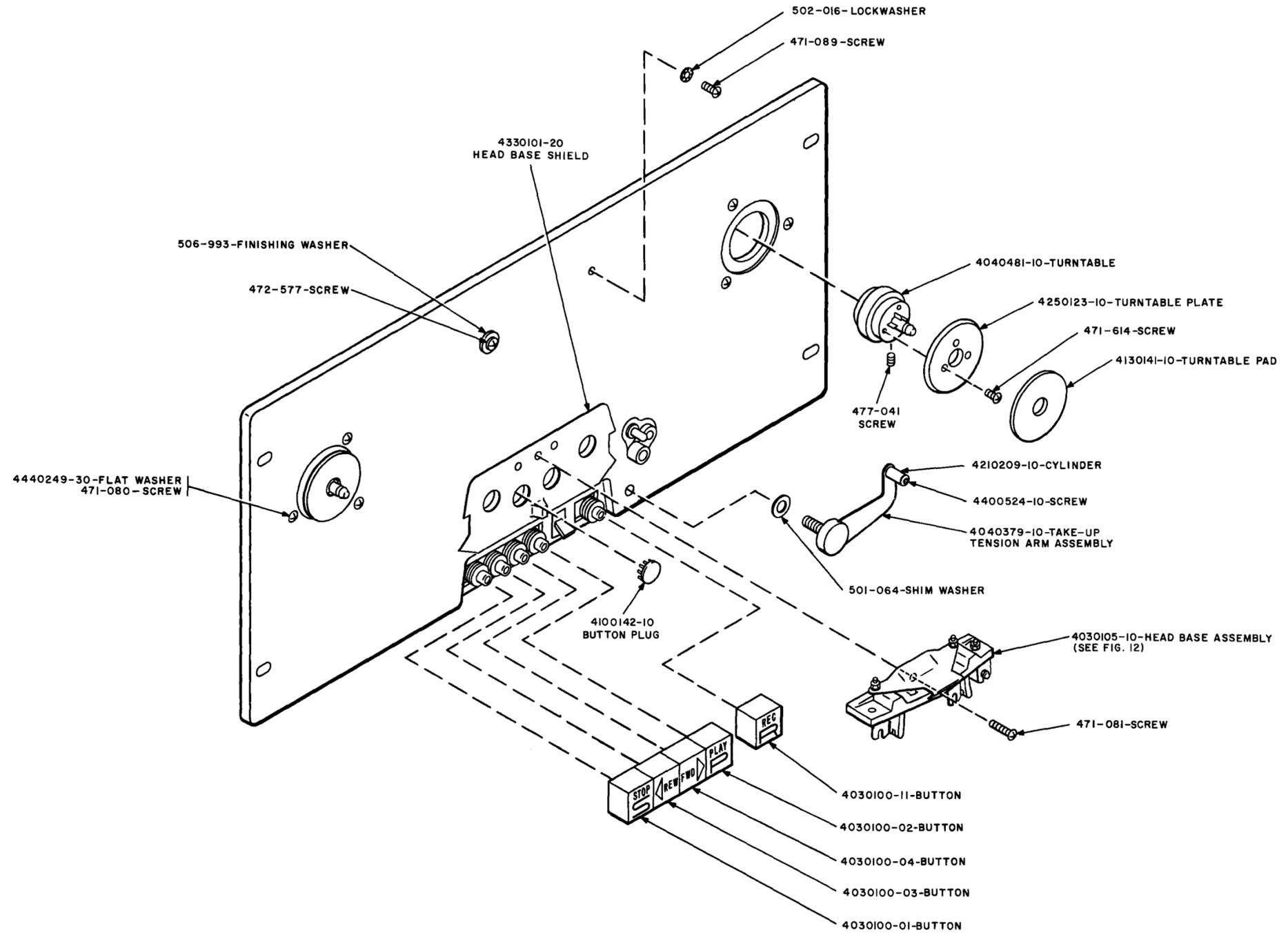


Fig. 9 — Record-Reproduce Mechanism—Removal of Head Assembly, Turntable, and Miscellaneous Parts

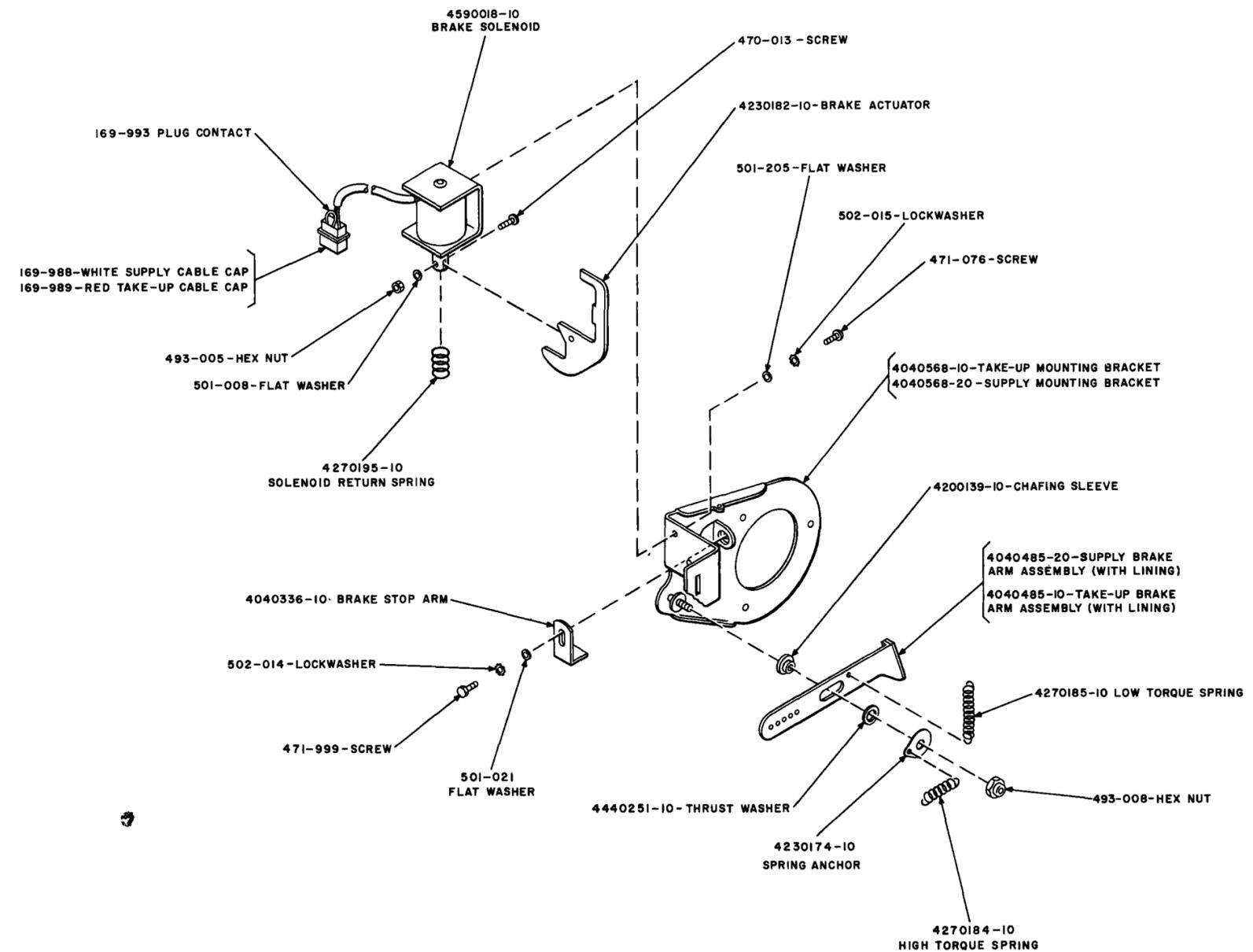


Fig. 10 — Brake Assembly

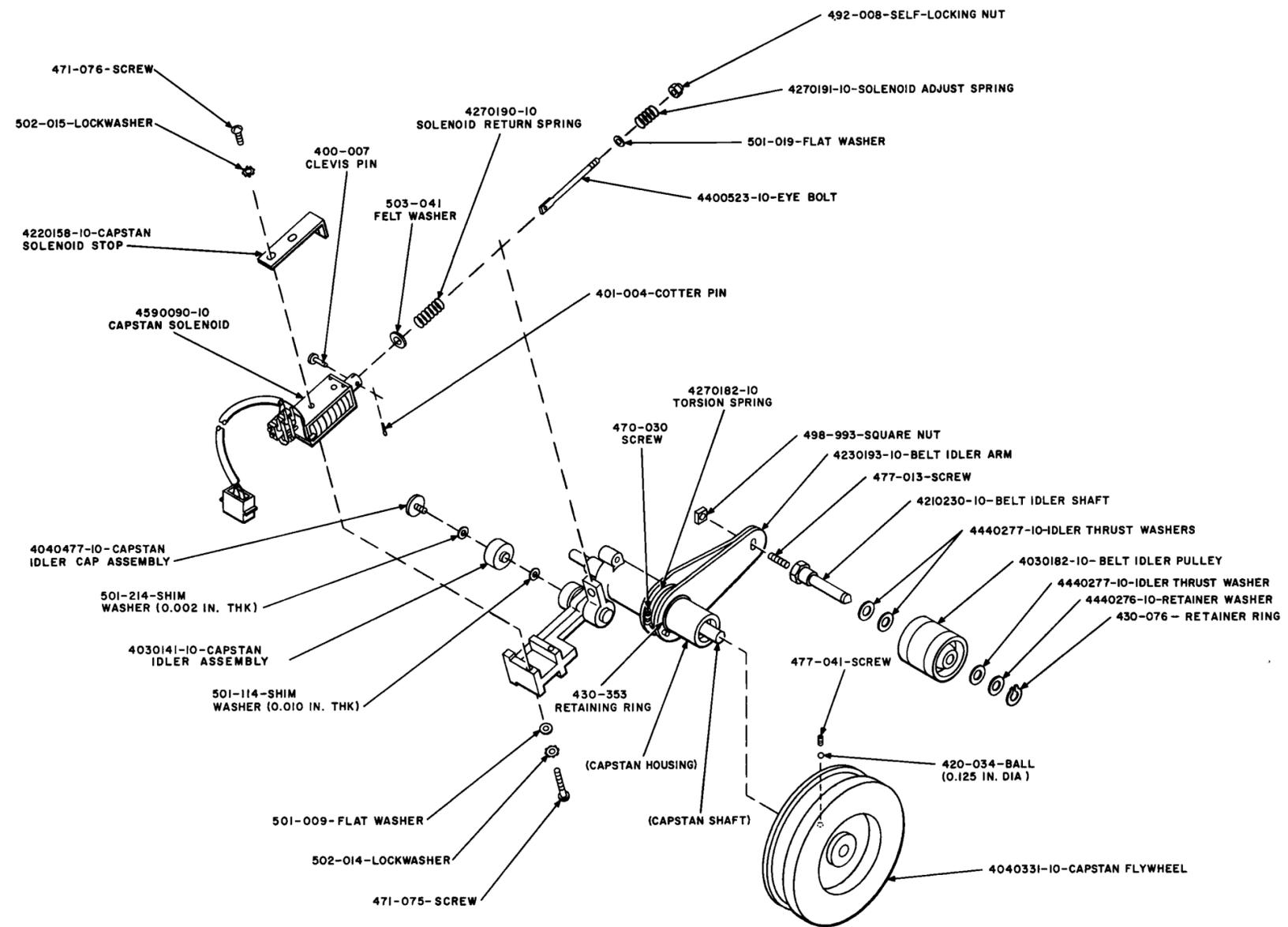
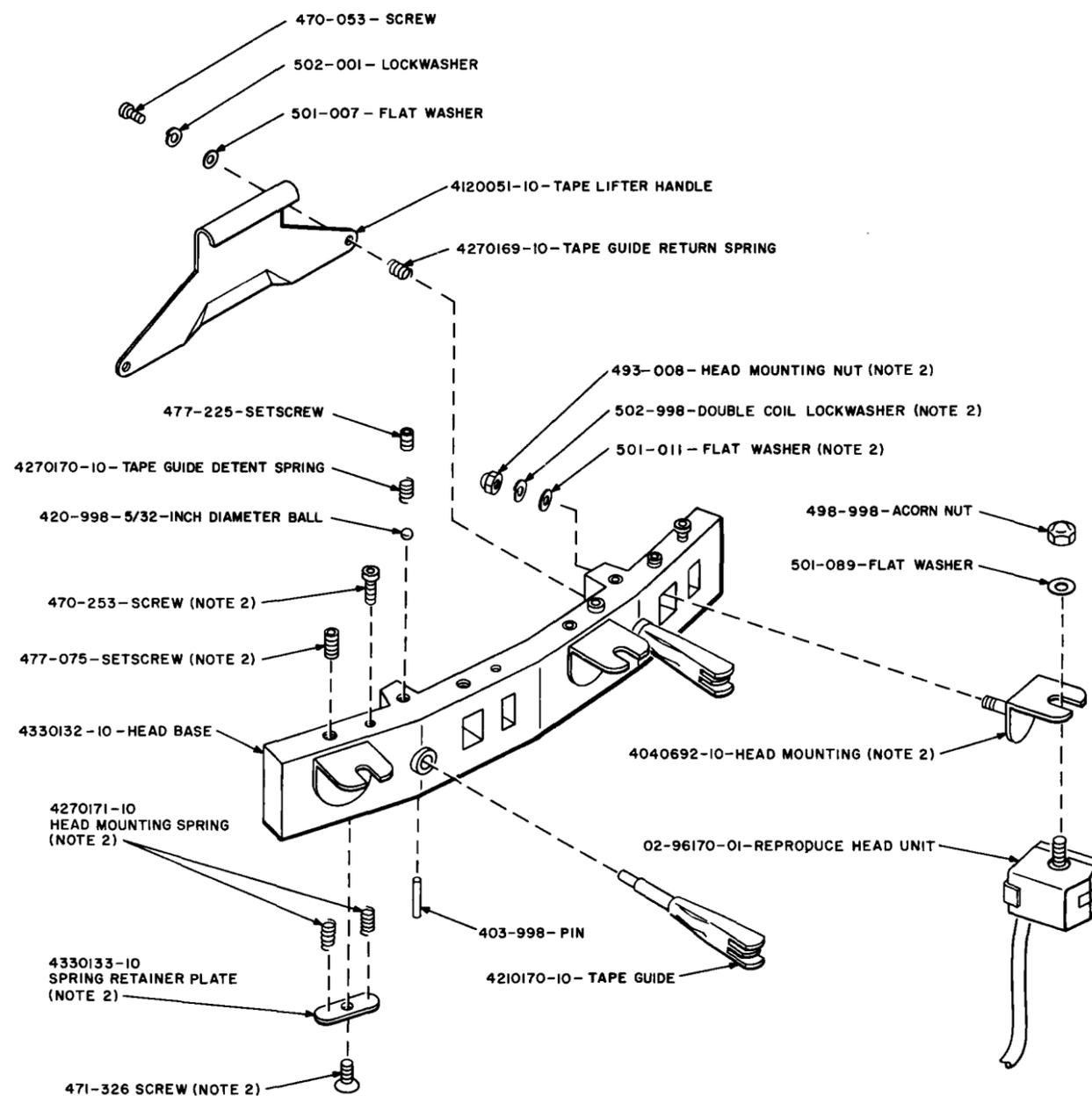


Fig. 11 — Capstan Assembly



NOTE:
 1. ALL COMPONENTS ARE PART OF HEAD ASSEMBLY BASE
 03-0105-01 EXCEPT
 REPRODUCE HEAD UNIT - 02-96170-01
 FLAT WASHER - 501-089
 ACORN NUT - 498-998
 2. HEAD MOUNTING AND ASSOCIATED PARTS ARE AVAILABLE
 IN A KIT IDENTIFIED AS KIT-85-0062-01.

Fig. 12 — Head Assembly