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Copies*

## KS-16534, L1 RECORDER-REPRODUCER PIECE-PART DATA AND REPLACEMENT PROCEDURES

### 1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of the KS-16534, L1 recorder-reproducer. It also covers approved procedures for replacing these parts. The KS-16534, L1 recorder-reproducer consists of two major components, the control unit and the recorder-reproducer mechanism.

1.02 Part 2 of this section covers the piece-part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of the recorder-reproducer. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called Piece-Part Data.

1.03 Part 3 of this section covers the approved procedures for the replacement of the parts covered in Part 2. This information is called Replacement Procedures.

1.04 **Make-Busy Information:** Before performing any work on the recorder-reproducer remove the equipment from service in accordance with approved procedures.

### 2. PIECE-PART DATA

2.01 The figures included in this part show the piece-part numbers of the various parts together with their corresponding names. Numbers prefixed by P are WECO piece-part numbers. All other numbers are Automatic Electric Company (AECO) part numbers except those specifically identified by the manufacturer's name.

2.02 When ordering parts for replacement purposes, give both the piece-part number and the name of the piece-part; for example, "P-290746 Screw". If a part identified by other than a piece-part number is required, order the part by the number and part name and specify for KS-16534, L1 recorder-reproducer. If the manufacturer's name is given in connection with the ordering information, include this when ordering the part. If the part is an AECO part, the order should so state; for example, "AECO D-83148-A Cam for KS-16534, L1 recorder-reproducer". Do not refer to the section number nor to any information shown in parentheses following the piece-part number.

2.03 Information enclosed by parentheses ( ) is not ordering information. This information may be references to notes, parts referred to in other portions of the section and not considered replaceable, or part names in general use in the field if these names differ from those assigned by the manufacturer.

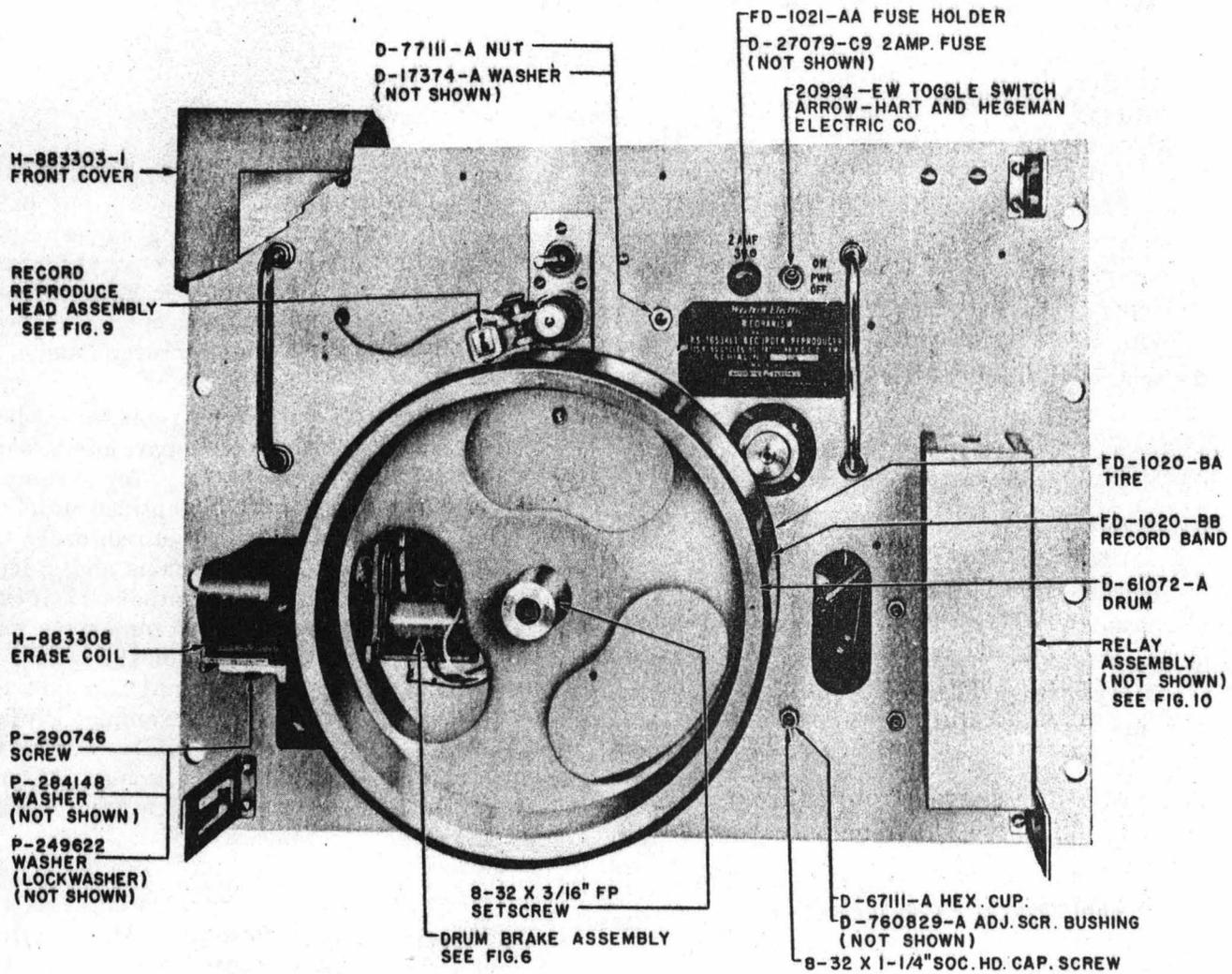


Fig. 1 - Recorder-Reproducer Mechanism - Front View

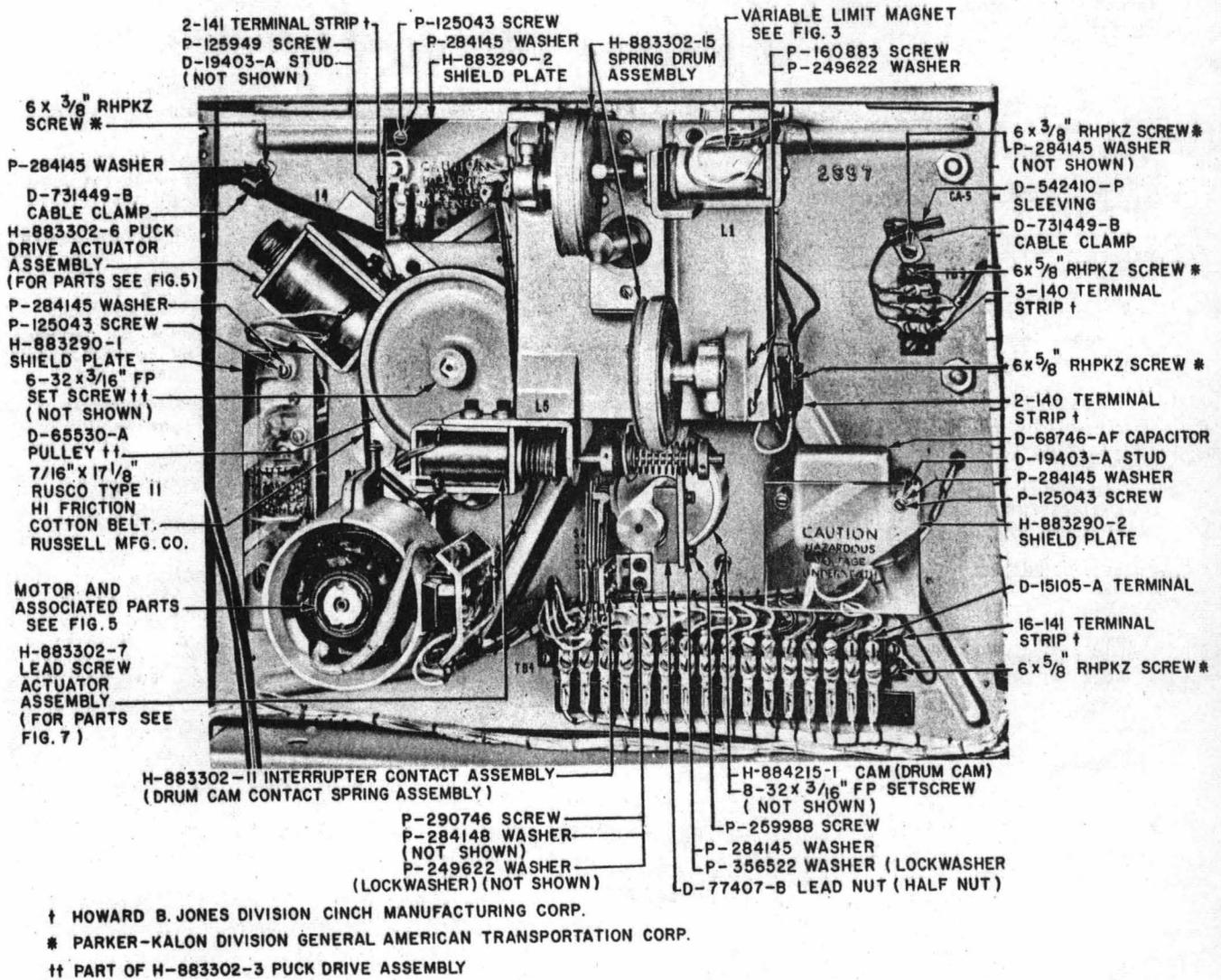
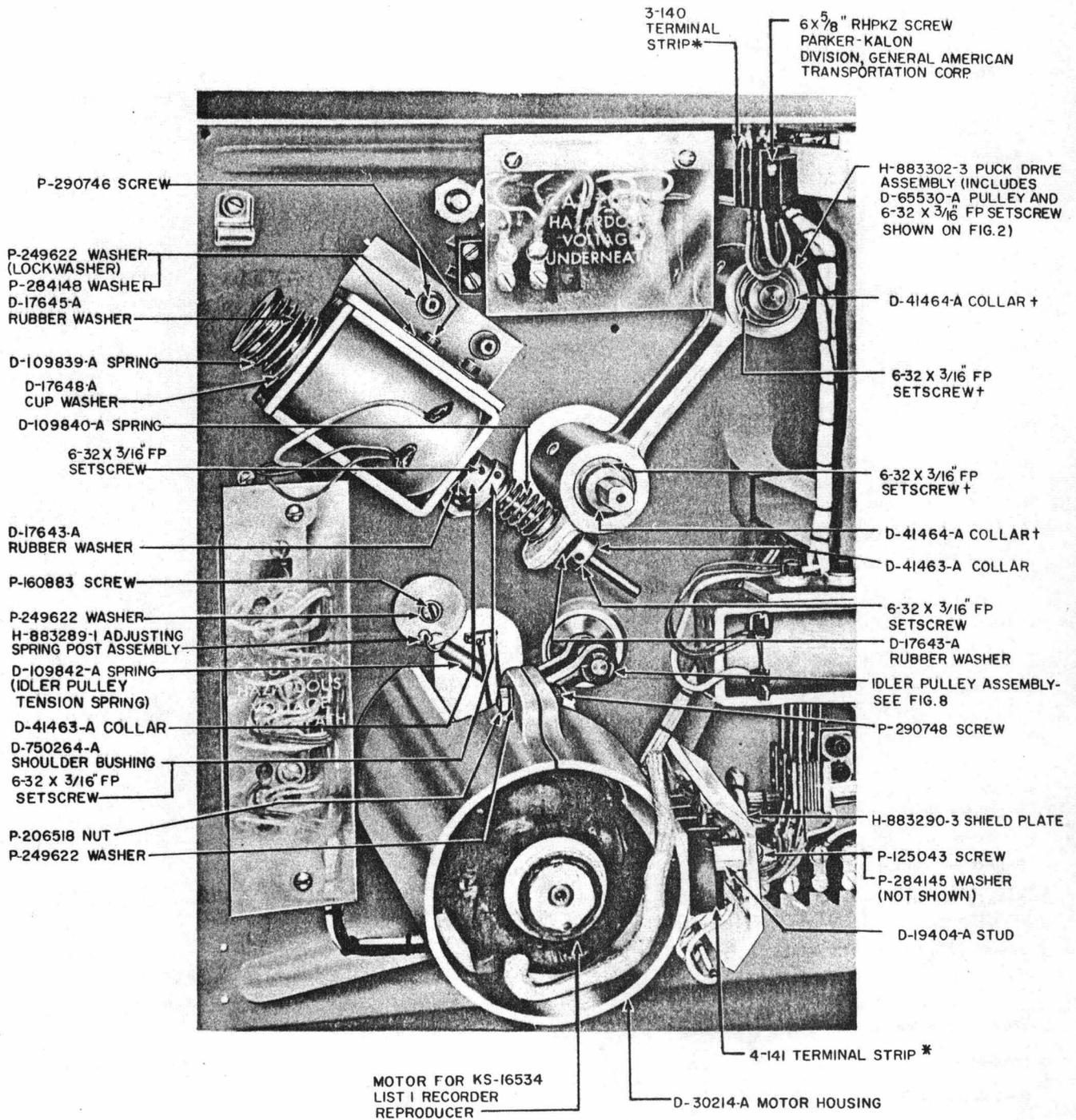


Fig. 2 - Recorder-Reproducer Mechanism - Rear View (Cover Removed)





† PART OF H-883302-3  
PUCK DRIVE ASSEMBLY

\* HOWARD B. JONES DIVISION  
CINCH MANUFACTURING CORP

Fig. 5 - Puck Drive and Motor (Driven Pulley and Belt Removed)

SECTION 034-353-801

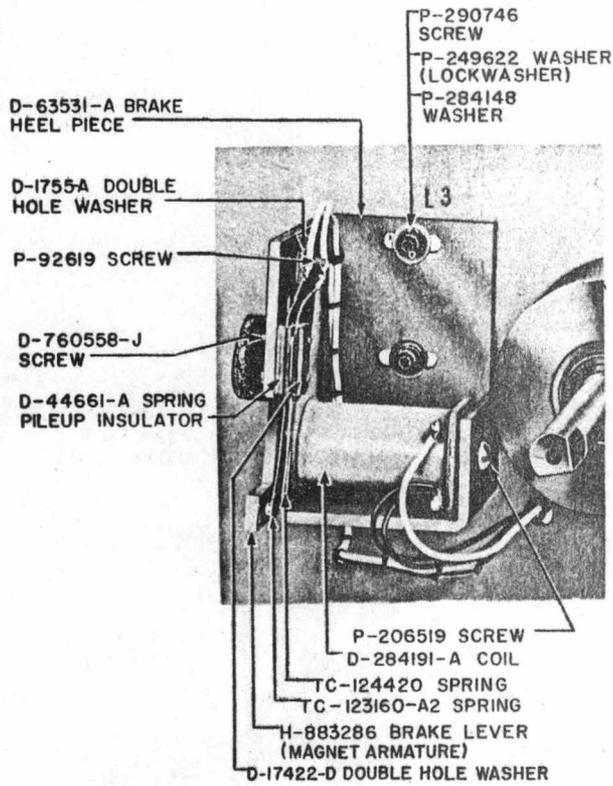


Fig. 6 - Drum Brake Release Magnet (Drum Removed)

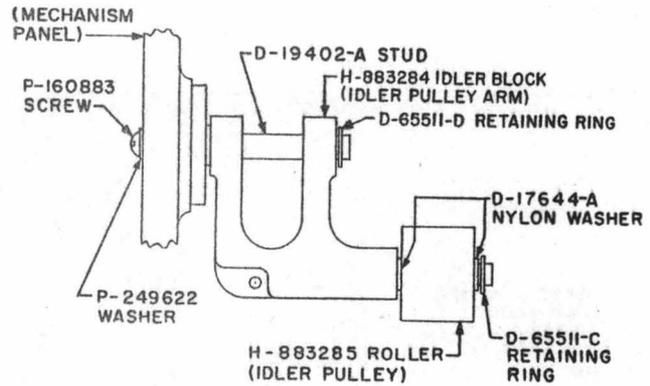


Fig. 8 - Idler Pulley Assembly

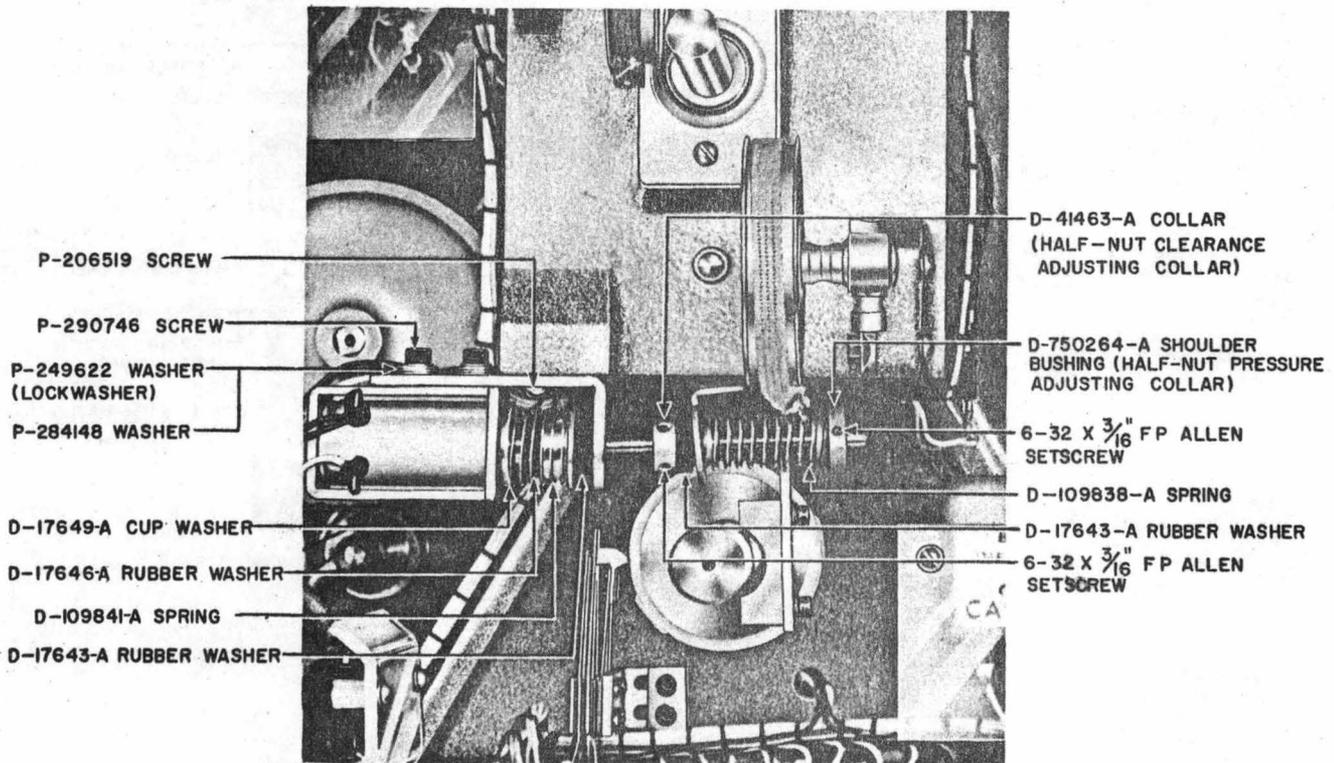


Fig. 7 - Lead Screw Actuator Assembly

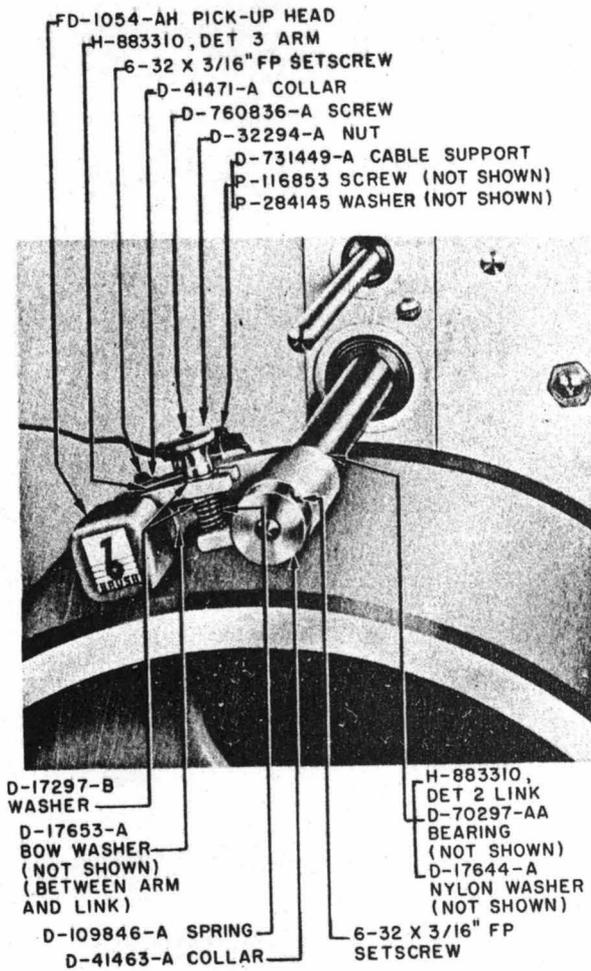


Fig. 9 - Record-Reproduce Head Assembly

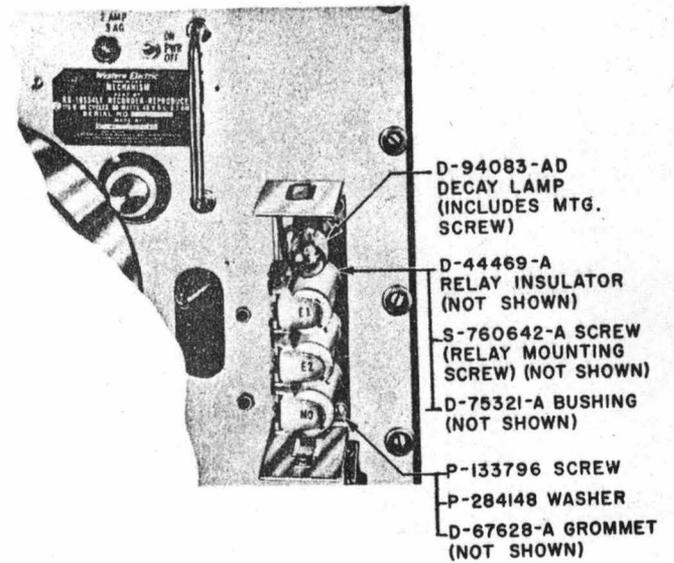


Fig. 10 - Decay Lamp and Relays Mounted on Recorder-Reproducer Mechanism (Cover Removed)

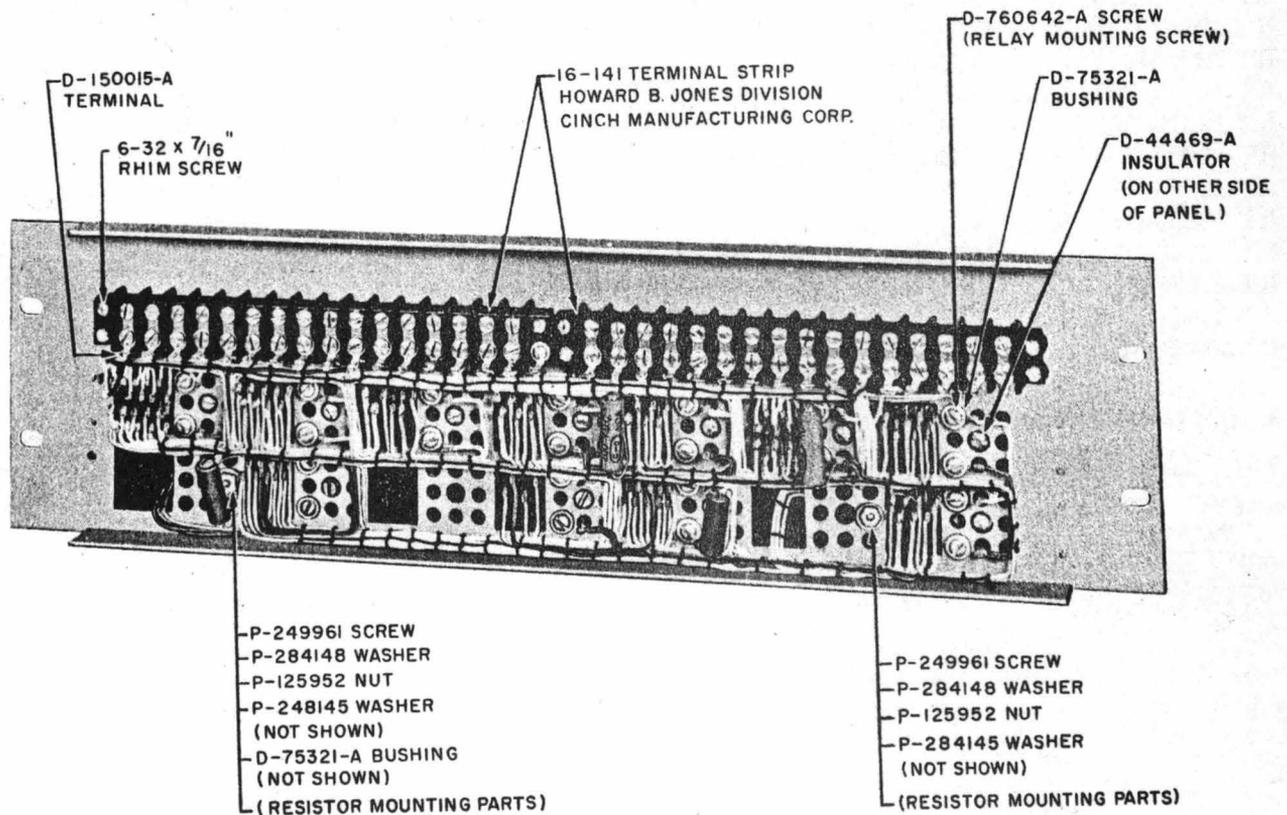


Fig. 11 - Control Unit - Rear View

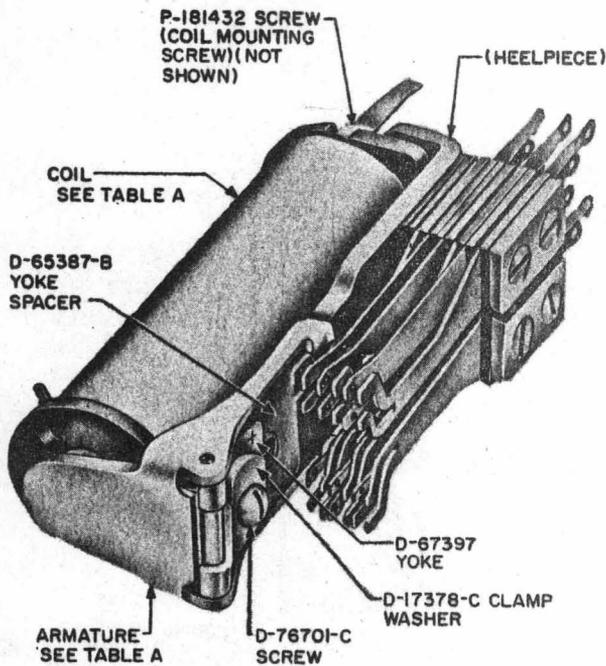


Fig. 12 - Relay Parts

TABLE A  
(For Fig. 12)

AEC <sub>0</sub> RELAY	ARMATURE	COIL
RT-12005-E59	D-71590-F	D-283545-A
RT-12037-C21	D-71590-D	D-283545-A
RT-12046-C44	D-71590-D	D-283545-A
RT-12053-C22	D-71590-D	D-283545-A
RT-12072-C25	D-71590-D	D-283545-A
RT-12082-B26	D-71590-B	D-282372-A
RT-12206-C15	D-71590-D	D-283545-A
RT-12206-C16	D-71590-D	D-283711-A
RT-12236-C11A	D-71590-D	D-283711-A
RT-21036-C15	D-71558-D	D-283545-A
RT-21357-C11A	D-71558-D	D-283545-A
D-550028-ACH	D-71559-D	D-283545-A

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
206	30-degree Offset Screwdriver
236	9/16-inch Hex. Open Single-end Offset Wrench
245	3/8- and 7/16-inch Hex. Open Double-end Flat Wrench

CODE OR SPEC NO.	DESCRIPTION
344	Offset Screwdriver
417A	1/4- and 3/8-inch Hex. Open Double-end Flat Wrench
418A	5/16- and 7/32-inch Hex. Open Double-end Flat Wrench
490A	Underlining Remover
563A	90-degree Offset Screwdriver
564A	45-degree Offset Screwdriver
R-1102	Fiber Spudger
R-2670	3/32-inch Allen Socket Screw Wrench
R-2671	1/8-inch Allen Socket Screw Wrench
R-2958	5/64-inch Allen Socket Screw Wrench
R-2959	1/16-inch Allen Socket Screw Wrench
R-2961	0.050-inch Allen Socket Screw Wrench
R-3193	9/32- and 11/32-inch Open Double-end Flat Wrench
—	3-inch C Screwdriver
—	4-inch E Screwdriver
—	5-inch E Screwdriver
<b>MATERIALS</b>	
KS-2423	Cloth
KS-6824	Sealing Compound
KS-8372	Trichloroethylene
KS-13148, L1	Abrasive Paper
KS-7860	Petroleum Spirits
—	No. 6 Cable Lacing Cord
—	Duco Household Cement
—	Pliobond No. 30, Goodyear Tire Co
—	Hardwood Toothpicks, Flat at One End and Pointed at the Other. (obtain locally)
—	5- by 6-inch Cellulose Acetate Sheet, 0.005 to 0.010 inch thick (obtain locally)

**3.02** In order to gain access to the parts to be replaced, remove the covers from the recorder-reproducer as required.

**3.03** Before making any replacement of parts, remove power from the recorder-reproducer.

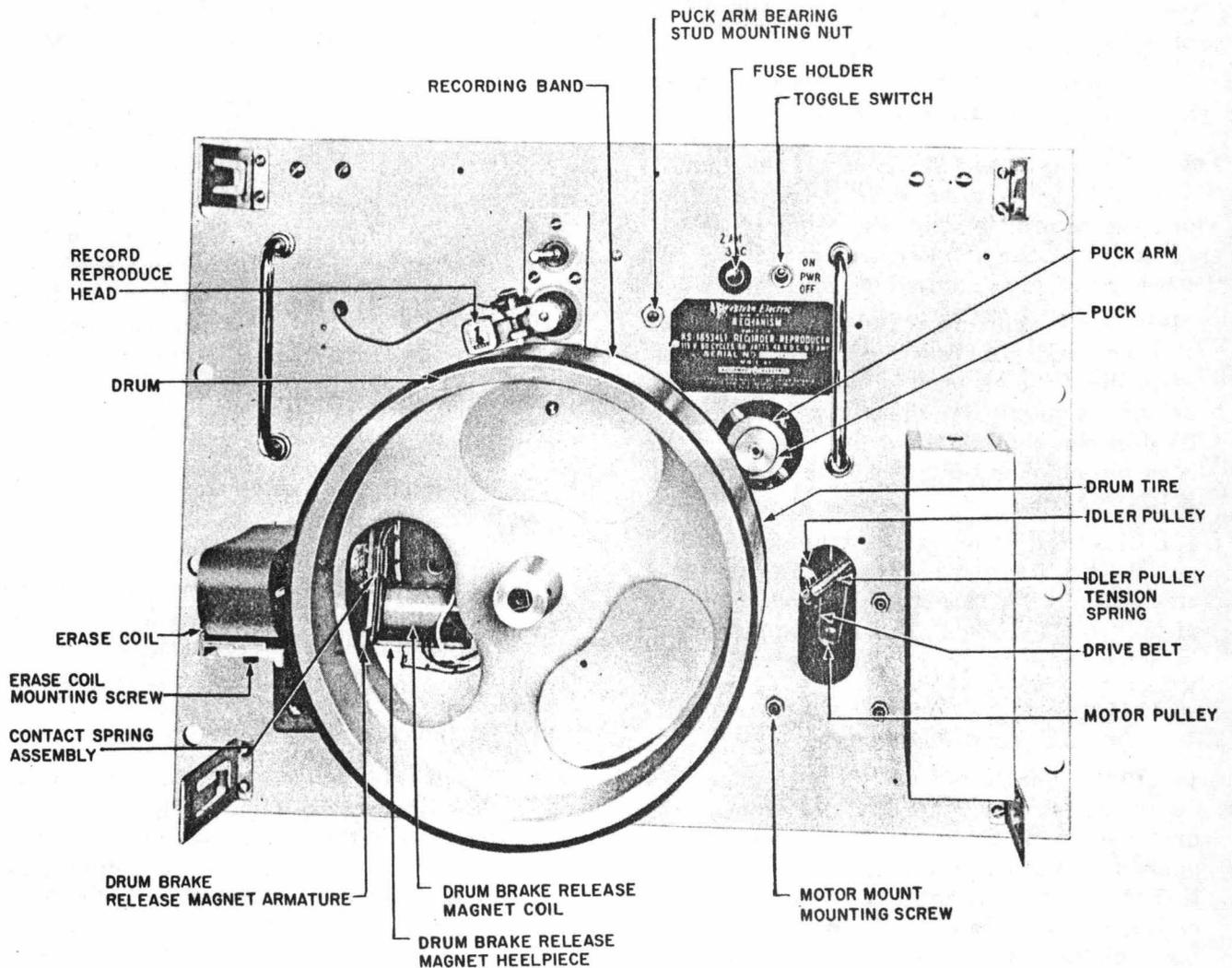
**3.04** No replacement procedures are specified for screws or other parts where the procedure consists of a simple operation.

**3.05** After making any replacement of parts of the recorder-reproducer, the part or parts replaced shall meet the requirements involved as specified in Sections 034-352-702 and

034-352-703. Other parts whose adjustments may have been directly disturbed by the replacement operation shall be checked to applicable requirements.

#### Recording Band, Drum Tire, and Drum (Fig. 13)

**3.06 Removing Drum:** Loosen the setscrews in the drum hub using the R-2958 wrench. If it is necessary to rotate the drum in order to gain access to the setscrews, manually operate the drum brake release magnet while turning the drum. Secure the record-reproduce head in a raised position with a loop of No. 6 cable lacing cord. Hold the drum brake operated and remove the drum. Place it on a clean surface.



**Fig. 13 – Recorder-Reproducer Mechanism — Front View (Cover Removed)**

**3.07 Removing Recording Band**

(1) If the recording band is to be replaced, or if the drum is to be replaced but the band is not, remove the band from the drum as covered in (2).

(2) Insert the R-1102 spudger between the band and the front edge of the drum and push the spudger as far as possible under the width of the band. Work the band across the surface of the drum toward the front edge, moving the spudger around the drum as required, until the band can be pulled from the drum.

**3.08 Removing Drum Tire**

(1) The tire is cemented on the drum and in removing the tire, it may be damaged. Therefore, if the tire is removed from the drum, it is recommended that the tire be replaced.

(2) To remove the drum tire, pry the tire out of its groove using the R-1102 spudger.

**3.09 Cleaning Drum Surface:** If the drum is not to be replaced, clean the surface from which the recording band was removed as covered in (1). Clean the surface from which the tire was removed as covered in (2).

(1) Clean the surface of the drum from which the band was removed using a KS-2423 cloth slightly moistened with KS-7860 petroleum spirits taking care that the petroleum spirits does not contact the drum tire if the tire is in place. Wipe the drum with a clean, dry KS-2423 cloth.

(2) Clean the groove in the drum from which the tire was removed by rubbing it with a clean, dry KS-2423 cloth folded over the end of the R-1102 spudger. This may be facilitated in some cases by moistening the cloth with KS-8872 trichloroethylene.  
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**3.10 Mounting Recording Band**

(1) Place the drum near the front edge of a clean table or bench with the front of the drum uppermost. Place approximately one quarter of the width of the band on the portion of the rim adjacent to the edge of the table or bench. Then draw the drum to the edge of the table or bench and, using the body as a support, stretch the band around the drum working simultaneously on both sides of the

starting point. After the entire periphery of the band has been partially mounted on the drum, turn the drum over. Press downward sharply and firmly on the hub of the drum to force the drum fully into the band. If necessary, work the band to its final position by pressing on the front edge of the band.

(2) To equalize tensions in the band after it has been mounted on the drum, insert the spudger between the band and the drum and work it around the periphery of the drum.

**3.11 Mounting Drum Tire**

(1) Using a toothpick, apply a small amount of the Pliobond cement to the bottom of the tire groove at eight places spaced equally around the drum. Mount the tire in the groove on the drum, exercising care to keep the outer surface of the tire free of Pliobond cement. Immediately mount the drum on the mechanism as covered in 3.12 and run the mechanism for at least 1 minute so that the puck will press the tire into the groove uniformly around the entire periphery of the drum.

**3.12 Mounting Drum:** Hold the drum brake operated and mount the drum so that when the setscrews in the hub are tightened they will bear squarely against the flats on the drum shaft. Securely tighten the setscrews using the R-2958 wrench. Remove the loop of cord securing the head.

**Erase Coil (Fig. 13)**

**3.13** To replace the erase coil proceed as follows.

(1) Move the insulating sleeving back on the erase coil leads to gain access to the soldered connections. Unsolder and disconnect the leads from the coil terminals. Remove the coil mounting screws using the R-2671 wrench taking care not to lose the associated washers. Remove the erase coil.

(2) Mount the new erase coil and tighten the mounting screws friction tight. Position the coil so that the requirement covering the gap between erase coil core and recording band in Section 034-352-703 is met. Securely tighten the mounting screws. Reconnect the leads to the coil terminals making sure that the terminals and the bare portions of the leads are covered with insulating sleeving.

**Drum Brake Release Magnet Parts (Fig. 13)**

**3.14** Loosen the setscrews in the recording drum hub using the R-2958 wrench. If it is necessary to rotate the drum in order to gain access to the setscrews, manually operate the drum brake release magnet while turning the drum. Secure the record-reproduce head in a raised position with a loop of No. 6 cable lacing cord. Hold the drum brake operated and remove the drum. After replacing parts as covered below, remount the drum in reverse order of removal. Remove the loop of cord securing the head.

**3.15 Armature:** Remove the armature mounting screws using the 4-inch E screwdriver and remove the armature. Substitute the new armature and remount the parts. With the drum removed there should be a gap of approximately 1/8 inch between the magnet heelpiece and the armature. If necessary, bend the hinge spring by manually adjusting the position of the armature to obtain this gap.

**3.16 Coil**

(1) Tag and unsolder the leads to the coil. Remove the magnet mounting screws with the R-2671 wrench and remove the magnet assembly. Remove the coil mounting screw using the 4-inch E screwdriver and remove the coil.

(2) Mount the new coil on the heelpiece and securely tighten the mounting screw. Remount the magnet assembly and reconnect the leads to the coil terminals.

**3.17 Contact Spring Assembly**

(1) Tag and unsolder the leads to the contact springs. Remove the magnet mounting screws with the R-2671 wrench and remove the magnet assembly. Remove the contact spring assembly mounting screws with the 3-inch C screwdriver and remove the assembly.

(2) Substitute new parts as required and remount the spring assembly taking care that the contacts are in alignment. Remount the magnet and reconnect the leads to the spring terminals.

**3.18 Heelpiece**

(1) Remove the magnet mounting screws with the R-2671 wrench and remove the magnet assembly. Remove the armature, coil, and con-

tact spring assembly from the heelpiece as covered in 3.15, 3.16, and 3.17.

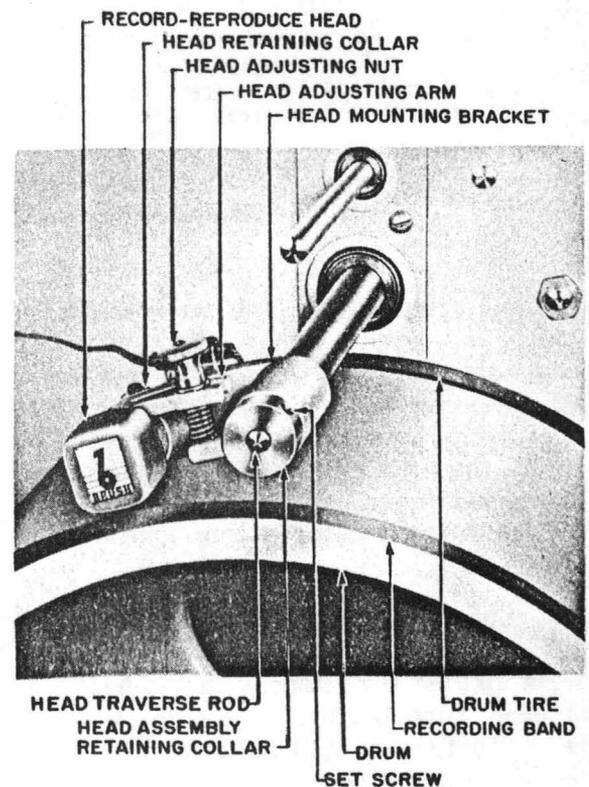
(2) Mount the parts on the new heelpiece. Remount the magnet assembly.

**Record-Reproduce Head and Associated Parts (Fig. 14 and 15)**

**3.19** Remove the head and associated parts as follows.

(1) Disconnect the leads to the head at the terminal strip at the rear of the mechanism using the 3-inch C screwdriver. Remove the cable clamp screw and remove the clamp from the leads. Push the leads through the panel to the front of the mechanism.

(2) At the front of the mechanism, loosen the setscrews in the head assembly retaining collar using the R-2959 wrench and remove the collar. Remove the head assembly from the head traverse rod taking care not to lose the nonmetallic washers at the front and rear of the head mounting bracket. Remove the cable clamp mounting screw on the head as-



**Fig. 14 – Record-Reproduce Head Assembly**

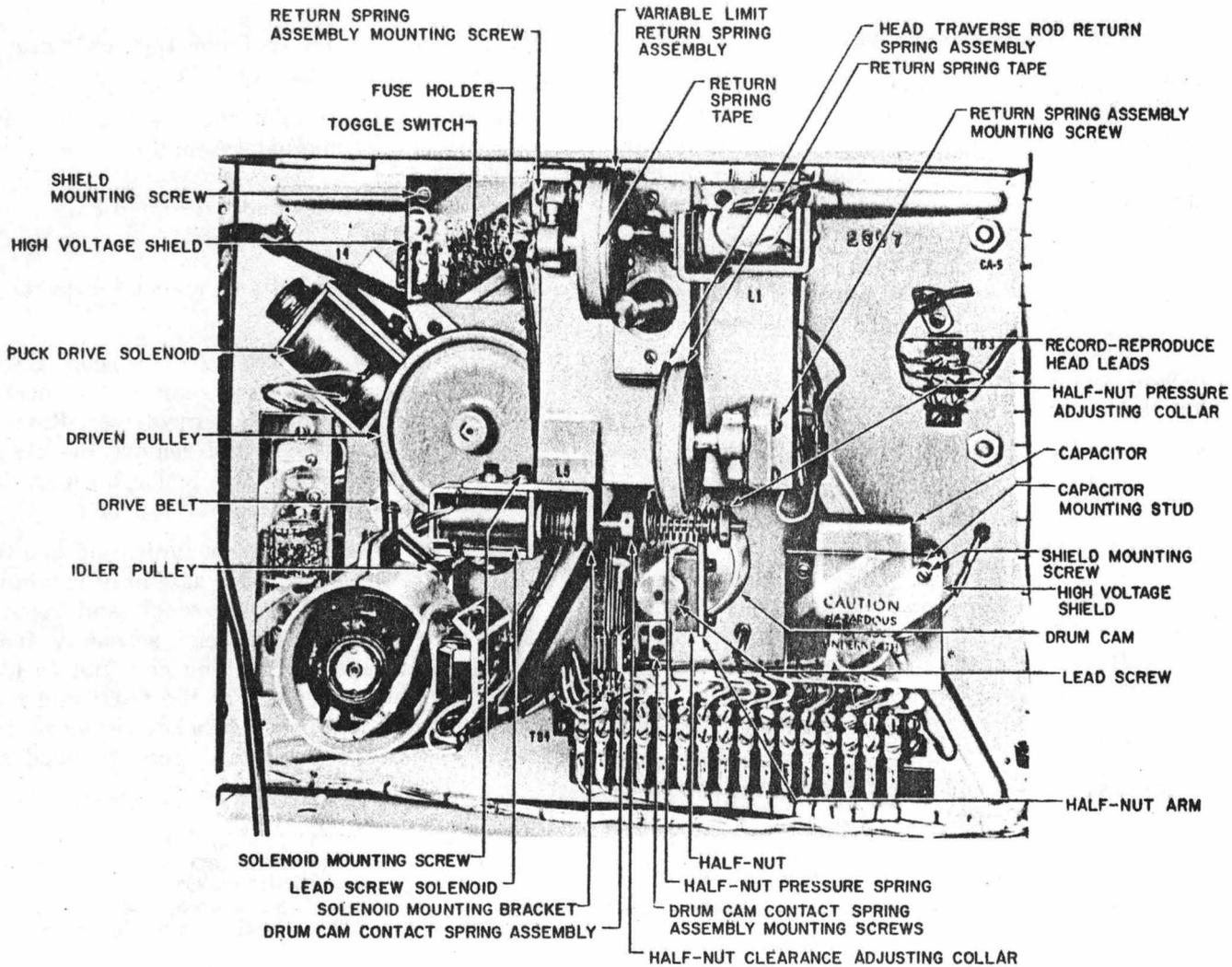


Fig. 15 - Recorder-Reproducer Mechanism — Rear View (Cover Removed)

sembly using the 4-inch E screwdriver and remove the clamp. Remove the head adjusting nut taking care not to lose the spring. Loosen the setscrew in the head retaining collar with the R-2959 wrench and remove the collar. Remove the head and head adjusting arm from the head mounting bracket. Loosen the setscrew in the head adjusting arm and remove the head.

**3.20** Substitute new parts as required. Remount the parts in reverse order of removal, but do not tighten the setscrew in the head adjusting arm. Turn the head adjusting nut so that the top surface of the head adjusting arm is in line with the top surface of the head mounting bracket. Then adjust the position of the head so that it touches the recording band at the mag-

netic gap in the pole piece of the head. Hold the head in this position and securely tighten the setscrew in the head adjusting arm. Adjust the tangency of the head as covered in Section 034-353-701.

**3.21** Polish the pole pieces of the new head as follows. In order to protect the recording band and to provide a smooth base for the polishing operation, place the 5- by 6-inch sheet of cellulose acetate between the head and the recording band. Place the KS-13148, L1 abrasive paper, with the abrasive side up, between the head and the acetate sheet. Press the head lightly against the abrasive paper and withdraw the paper from between the head and acetate sheet, pulling it in the direction of rotation of the drum. Repeat this procedure ten times. Remove the acetate sheet.

**Lead Screw Actuator Assembly and Parts**  
(Fig. 7 and 15)

**3.22 General:** To replace any of the parts of the lead screw actuator assembly, except the half-nut pressure adjusting collar and pressure spring which are covered in 3.23, remove the assembly from the solenoid mounting bracket as covered in 3.24. If the complete assembly is to be replaced, it is also necessary to disconnect the leads to the lead screw solenoid and remove the solenoid mounting bracket as covered in 3.25.

**3.23 Half-Nut Pressure Spring and Pressure Adjusting Collar**

- (1) Loosen one of the setscrews in the half-nut pressure adjusting collar with the R-2959 wrench. While holding the collar in position loosen the other setscrew. Relieve the tension of the pressure spring and remove the collar and spring.
- (2) Substitute new parts as required and re-mount the parts in reverse order of removal. Position the collar so that the pressure of half-nut on lead screw requirement in Section 034-352-703 is met.

**3.24 Other Parts**

- (1) While holding the solenoid in place, remove the solenoid mounting screws using the R-2671 wrench, taking care not to lose the lockwasher and three plain washers under each screw head. Remove the solenoid, cup washer, spring, and rubber washer from the solenoid plunger. Place the solenoid on the motor mount taking care not to damage the leads. Remove the half-nut pressure adjusting collar and pressure spring as covered in 3.23(1). Loosen the setscrews in the half-nut clearance adjusting collar with the R-2959 wrench and remove the collar, two rubber washers, and the solenoid plunger.
- (2) Substitute new parts as required and re-mount the parts in reverse order of removal.

**3.25 Complete Lead Screw Actuator Assembly**

- (1) Tag and disconnect the leads to the solenoid. Remove the solenoid and other parts as covered in 3.24(1). Remove the solenoid bracket mounting screws using the 4-inch E screwdriver and remove the bracket.

- (2) If the new lead screw actuator assembly is furnished as a unit, disassemble it as follows. Remove the half-nut pressure adjusting collar, pressure spring, and half-nut clearance adjusting collar from the solenoid plunger. Remove the solenoid from the mounting bracket.

- (3) Mount the parts of the new assembly on the mechanism, reversing the order in which the parts of the old assembly were removed. Reconnect the solenoid leads.

**Half-Nut (Fig. 15)**

**3.26** Remove the half-nut mounting screws using the R-2670 wrench and remove the half-nut. Mount the new half-nut and position it to meet the engagement of half-nut with lead screw requirement in Section 034-352-703. Securely tighten the mounting screws. Apply a small amount of KS-6824 sealing compound around the head of each mounting screw and the adjacent surface of the half-nut arm.

**Drum Cam (Fig. 15)**

**3.27** To replace the drum cam proceed as follows.

- (1) At the front of the mechanism, loosen the setscrews in the drum hub using the R-2958 wrench. If it is necessary to rotate the drum in order to gain access to the setscrews, manually operate the brake release magnet while turning the drum. Secure the record-reproduce head in a raised position with a loop of No. 6 cable lacing cord. Hold the drum brake operated and remove the drum. Provide a support for the lead screw and bearing assembly by tying a length of No. 6 cable lacing cord to the drum shaft and to the two upper front mechanism cover brackets.

- (2) At the rear of the mechanism, loosen the setscrews in the drum cam using the R-2958 wrench. Move the cam away from the panel. Remove the three screws which mount the lead screw and bearing assembly using the 5-inch E and No. 344 offset screwdrivers. Push the lead screw and bearing assembly through the panel toward the front of the mechanism far enough so that the cam can be removed from the lead screw. Remove the cam.

(3) Substitute the new cam and mount the parts in reverse order of removal. Position the cam so that the engagement of half-nut with lead screw requirement in Section 034-352-703 is met, and securely tighten the setscrews.

**Variable Limit and Head Traverse Rod Return Spring Assemblies (Fig. 15)**

**3.28 Variable Limit Return Spring Assembly**

(1) While holding the variable limit return spring tape, remove the screw which secures the tape to the variable limit switch using the 3-inch C screwdriver. Gradually relieve the tension of the spring. Using the 4-inch E screwdriver, remove the return spring assembly mounting screws and remove the assembly.

(2) Substitute the new spring assembly and remount the parts in reverse order of removal. Adjust the tension of the return spring to meet the variable limit return spring requirement in Section 034-352-703.

**3.29 Head Traverse Rod Return Spring Assembly**

(1) Using the No. 418A wrench, remove the locknut from the screw holding the head traverse rod return spring tape to the half-nut arm. While holding the tape, remove the screw with the 3-inch C screwdriver and then gradually relieve the spring tension. Using the 4-inch E screwdriver, remove the return spring assembly mounting screws and remove the assembly.

(2) Substitute the new spring assembly and remount the parts in reverse order of removal. Adjust the tension of the return spring to meet the tension of head traverse rod return spring requirement in Section 034-352-703.

**Puck Drive Actuator Assembly and Parts (Fig. 15 and 16)**

**3.30 General:** Move the idler pulley away from the drive belt and remove the belt from the pulleys. Loosen the setscrews in the driven pulley with the R-2959 wrench and remove the pulley from the shaft. To replace any of the parts of the puck drive actuator assembly except the puck clearance adjusting collar and associated rubber washer which are covered in 3.31, remove the assembly from the mounting bracket

as covered in 3.32. If the complete assembly is to be replaced, proceed as covered in 3.33.

**3.31 Puck Clearance Adjusting Collar and Associated Rubber Washer**

(1) Loosen one of the setscrews in the puck clearance adjusting collar with the R-2959 wrench. Hold the collar, loosen the other set-screw, and remove the collar and associated rubber washer.

(2) Substitute new parts as required and remount the parts in reverse order of removal. Position the collar so that the puck clearance requirement in Section 034-352-703 is met. Remount the driven pulley and drive belt.

**3.32 Other Parts**

(1) Remove the puck clearance adjusting collar and associated rubber washer as covered in 3.31(1).

(2) While holding the solenoid in place, remove the solenoid mounting screws using the R-2671 wrench. Disengage the solenoid plunger from the puck arm, and remove the pressure spring. Remove other parts from the assembly as required using the R-2959 wrench to loosen the setscrews in the collars on the solenoid plunger.

(3) Substitute new parts as required and remount the parts in reverse order of removal. Check all puck drive requirements covered in Section 034-352-703. Remount the drive pulley, making sure the setscrews in the hub squarely engage the flats on the shaft. Remount the drive belt.

**3.33 Complete Puck Drive Actuator Assembly**

(1) Remove the puck clearance adjusting collar and associated rubber washer as covered in 3.31(1).

(2) Tag and disconnect the solenoid leads. Remove the solenoid bracket mounting screws using the R-2671 wrench, disengage the solenoid plunger from the puck arm, and remove the actuator assembly.

(3) If the new puck drive actuator assembly is furnished as a unit, remove the puck clearance adjusting collar and associated rubber washer.

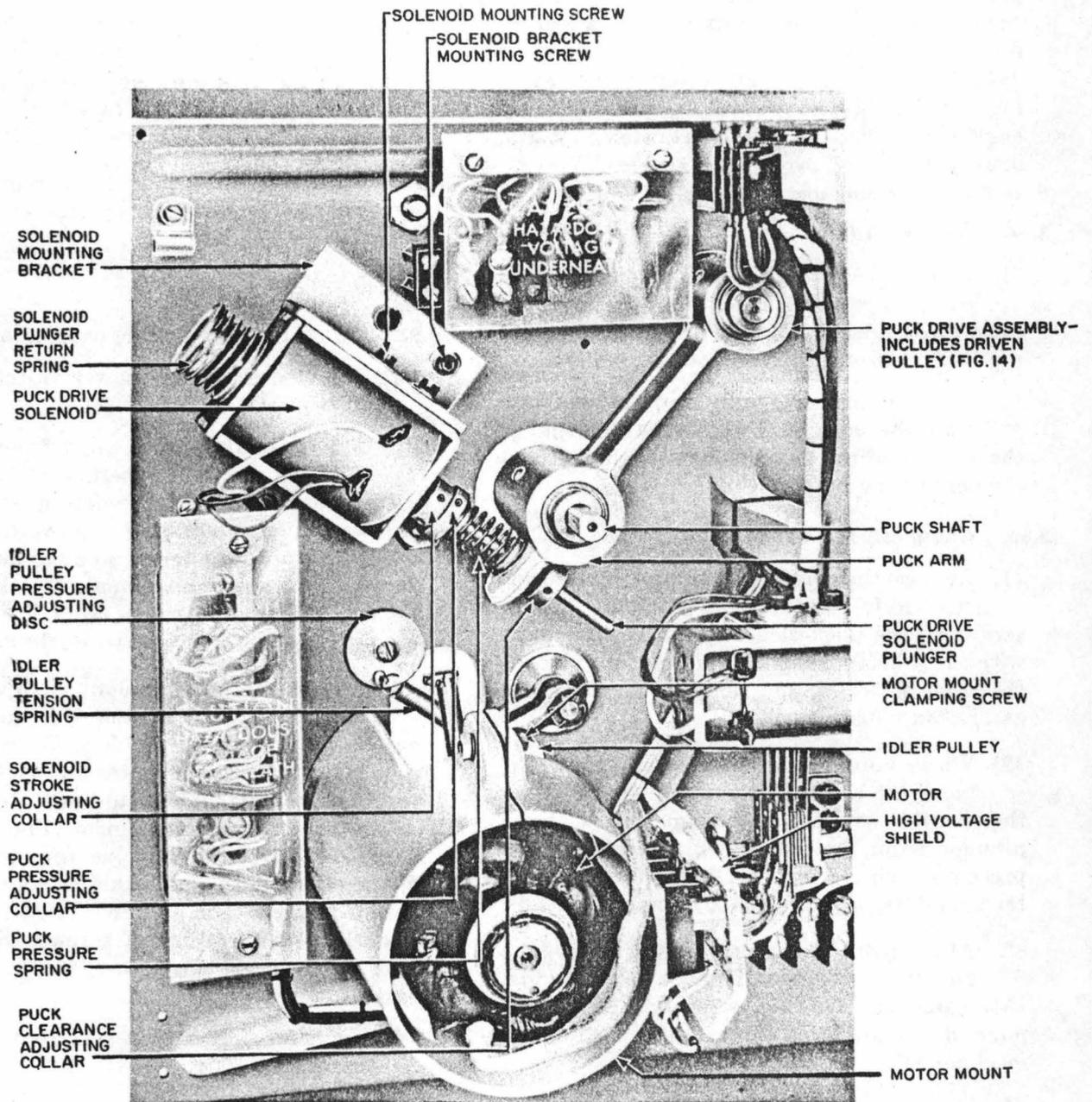


Fig. 16 – Puck Drive and Motor (Driven Pulley and Belt Removed)

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(4) Mount the parts of the new actuator assembly reversing the order in which the parts of the old assembly were removed. Reconnect the solenoid leads. Check all puck drive requirements covered in Section 034-352-703. Remount the driven pulley, making sure the setscrews in the hub squarely engage the flats on the shaft. Remount the drive belt.

### **Puck Drive Assembly and Parts (Fig. 15 and 16)**

#### **3.34 Driven Pulley**

- (1) Move the idler pulley away from the drive belt and remove the belt from the pulleys. Loosen the setscrews in the driven pulley with the R-2959 wrench and remove the pulley.
- (2) Position the new pulley on the shaft so that the setscrews will squarely engage the flats. Tighten the setscrews and remount the belt on the pulleys.

#### **3.35 Complete Puck Drive Assembly**

- (1) Remove the drive belt and driven pulley as covered in 3.34(1). Loosen one of the setscrews in the puck clearance adjusting collar with the R-2959 wrench. Hold the collar, loosen the other setscrew, and remove the collar and associated rubber washer.
- (2) While holding the solenoid in place, remove the solenoid mounting screws using the R-2671 wrench. Disengage the solenoid plunger from the puck arm, and remove the pressure spring. Place the solenoid on the motor mount, taking care not to damage the leads.
- (3) At the front of the mechanism, remove the puck arm bearing stud mounting nut (Fig. 13), using the No. 245 wrench. Remove the puck drive assembly from the rear of the mechanism.
- (4) If the new puck drive assembly is furnished as a unit, remove the driven pulley. Mount the assembly. Remount the other parts which were removed in reverse order of removal.

### **Idler Pulley and Idler Pulley Arm (Fig. 8 and 16)**

**3.36** To replace the idler pulley and idler pulley arm, proceed as follows.

- (1) Move the idler pulley away from the drive belt and remove the belt from the pulleys.

Unhook the idler pulley tension spring from the idler pulley arm. Using the 3-inch C screwdriver, carefully pry the retaining ring from the stud on which the idler block is mounted and remove the block and pulley. Pry the retaining ring from the stud of the block and remove the pulley, taking care not to lose the nonmetallic washer at each side of the pulley.

- (2) Substitute new parts as required and mount the parts in reverse order of removal.

### **Motor (Fig. 15 and 16)**

**3.37** To replace the motor, proceed as follows.

- (1) Make sure that the power switch is in the OFF position.
- (2) Move the idler pulley away from the drive belt and remove the belt from the pulleys. Using the 4-inch E screwdriver, remove the screws which mount the high-voltage shield associated with the terminal strip mounted on the motor mount and remove the shield. Disconnect the motor leads from the terminal strip using the 3-inch C screwdriver.
- (3) Loosen the motor mount clamping screw with the R-2671 wrench while holding the nut on the screw with the R-3193 wrench. Provide a support for the motor and motor mount and remove the motor mount mounting screws at the front of the mechanism (Fig. 13) using the R-2671 wrench. Remove the motor from the motor mount. To do this, it may be necessary to spread the slot in the motor mount slightly with the 4-inch E screwdriver, taking care not to exert any more force than necessary.
- (4) Remount the parts in reverse order of removal.

### **Capacitor (Fig. 15)**

**3.38** To replace the capacitor, proceed as follows.

- (1) Make sure the power switch is in its OFF position.
- (2) Using the 3-inch C screwdriver, remove the screws which mount the high-voltage shield and remove the shield. In order to eliminate any residual charge on the capacitor, short the capacitor terminals with the screw-

driver. Tag and disconnect the leads from the capacitor. Remove the capacitor mounting studs using the No. 417A wrench and remove the capacitor.

(3) Mount the new capacitor and connect the leads to its terminals. Remount the high-voltage shield.

#### **Mercury Switch and Mounting Bracket (Fig. 17)**

**3.39** To replace the parts, proceed as follows.

(1) Disconnect the mercury switch leads at the terminal strip using the 3-inch C screwdriver. Note the location of the mercury switch bracket on its mounting strip. Using the R-2671 wrench, remove the mounting strip mounting screws and remove the mounting strip. Remove the bracket mounting screws with the wrench and remove the bracket and clamp plate from the mounting strip.

(2) Break the cement bond between the switch and metal clamps and remove the switch. Scrape the cement from the clamps with the No. 490A underlining remover.

(3) Mount the new switch in the clamps so that its armature is away from the switch bracket. The armature is the metallic part attached to the movable contact wire in the switch. Remount the bracket on the mounting strip at approximately the location from which it was removed as noted above. Remount the mounting strip on the mechanism and connect the mercury switch leads.

(4) Manually operate the variable limit release magnet and position the variable limit switch by means of the variable limit rod so that the magnet on the switch is adjacent to the mercury switch. Release the variable limit magnet. Adjust the position of the mercury switch vertically so that its armature spans the gap in the magnet. Using a toothpick, apply a small amount of Duco household cement to the switch and clamps at the top of each clamp.

(5) After allowing the cement to dry, position the switch to meet the operation of mercury switch requirement in Section 034-352-703 and securely tighten all mounting screws.

#### **Variable Limit Release Magnet Parts (Fig. 17)**

##### **3.40 Armature**

(1) Using the No. 564A offset screwdriver, remove the armature mounting screws and remove the armature.

(2) Mount the new armature and check the requirements covering release of variable limit rod and variable limit armature stud pressure in Section 034-352-703.

##### **3.41 Coil**

(1) Tag, unsolder, and disconnect the leads from the coil. Using the 4-inch E screwdriver, remove the coil mounting screw and remove the coil.

(2) Mount the new coil and connect the leads. Check the requirement covering release of variable limit rod in Section 034-352-703.

##### **3.42 Heelpiece**

(1) Remove the magnet mounting screws using the R-2671 wrench. Using the 4-inch E screwdriver, remove the armature and coil mounting screws. Remove the armature and coil.

(2) Substitute the new heelpiece and remount the parts in reverse order of removal. Check the requirements covering release of variable limit rod and variable limit armature stud pressure in Section 034-352-703.

#### **Head Traverse Rod Index Switch (Fig. 17)**

**3.43** To replace parts of the switch, proceed as follows.

(1) Unsolder and disconnect the leads from the contact spring terminals. Using the No. 417A wrench, remove the switch assembly mounting nuts and remove the switch assembly. Remove the spring pile-up assembly screws using the 3-inch C screwdriver.

(2) Substitute new parts as required. Remount the parts in reverse order of removal, taking care that the contacts are in alignment. Connect the leads.

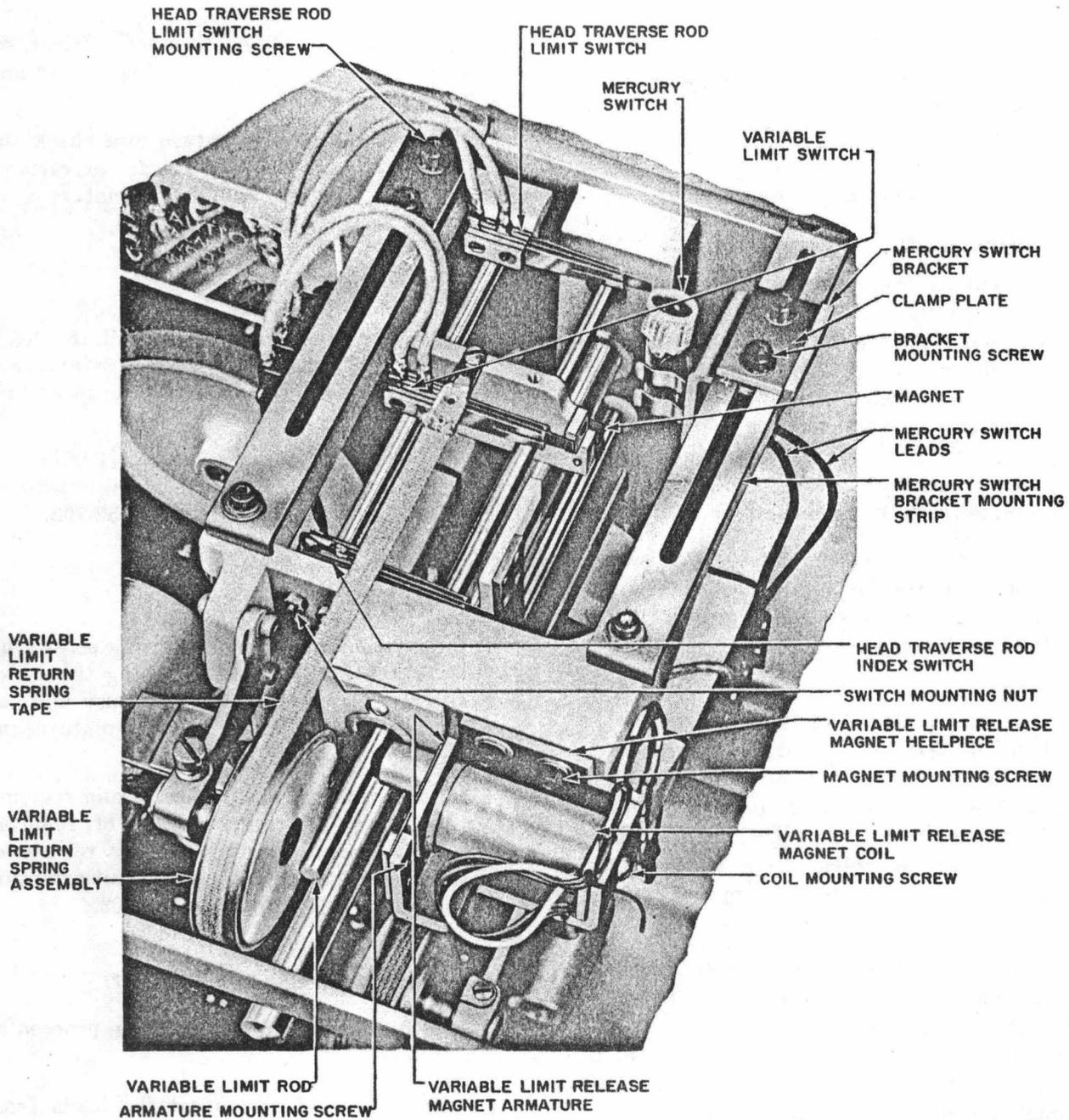


Fig. 17 - Recorder-Replicator Mechanism — Partial Top View

**Variable Limit Switch (Fig. 17)**

**3.44** To replace parts of the switch, proceed as follows.

(1) Disconnect the leads from the contact spring terminals. If necessary to gain access to the spring pile-up assembly screws, manually operate the variable limit release magnet, move the switch to a position where the screws are accessible, and release the magnet. In some cases, it may be necessary to loosen the head traverse rod limit switch mounting screws with the R-2671 wrench and move the limit switch. Remove the spring pile-up assembly screws using the No. 206 offset screwdriver and remove the pile-up.

(2) Substitute new parts as required. Remount the parts in reverse order of removal, making sure that the contacts are in alignment. Connect the leads. If the head traverse rod limit switch was moved, reposition it in accordance with Section 034-353-701.

**Head Traverse Rod Limit Switch (Fig. 17)**

**3.45** To replace parts of the switch, proceed as follows.

(1) Disconnect the leads from the contact spring terminals. If necessary to gain access to the spring pile-up assembly screws, loosen the switch mounting screws with the R-2671 wrench and move the switch as required. Remove the spring pile-up assembly screws using the No. 206 offset screwdriver and remove the pile-up.

(2) Substitute new parts as required. Remount the parts in reverse order of removal, taking care that the contacts are in alignment. Connect the leads. If the switch was moved, reposition it in accordance with Section 034-353-701.

**Drum Cam Contact Spring Assembly (Fig. 15)**

**3.46** To replace the contact spring assembly, proceed as follows.

(1) Tag and disconnect the leads from the contact spring terminals. Remove the mounting screws with the R-2671 wrench. Remove the clamp plate and the spring assembly.

(2) Substitute the new assembly. Mount the assembly in reverse order of removal. Position the assembly so that the requirements covering the cut-through, drum index, and flashing switches in Section 034-352-703 are met.

**Fuse Holder and Toggle Switch (Fig. 13 and 15)**

**3.47 General:** To replace these parts proceed as follows. Make sure that the ac power cord is disconnected from the supply. Remove the high-voltage shield over the fuse holder and toggle switch by removing its mounting screws using the 4-inch E screwdriver. After replacing parts, remount the high-voltage shield.

**3.48 Fuse Holder**

(1) Disconnect the leads. Remove the fuse holder retaining nut using the combination pliers. Remove the fuse holder from the front of the mechanism.

(2) Substitute the new fuse holder and mount in reverse order of removal. Remove the fuse from the old fuse holder and, if it is good, mount it in the new fuse holder.

**3.49 Toggle Switch**

(1) To gain access to the switch, dismount the adjacent terminal strip using the 4-inch E screwdriver. Disconnect the leads from the switch. Loosen the switch mounting nut using the No. 236 wrench. Remove the knurled ring at the front of the mechanism and remove the switch from the rear.

(2) Substitute the new switch and mount the parts in reverse order of removal.

**Relay Parts (Fig. 12)****3.50 Armature, Yoke, Yoke Spacer, and Clamp Washer**

(1) Remove the yoke clamping screw using the No. 563A and No. 564A offset screwdrivers and remove the parts.

(2) Substitute new parts as required. Mount the parts in the reverse order of removal. Make sure that the bent portion at one end of the yoke spacer is adjacent to the armature end of the heelpiece and is inclined toward the heelpiece. Position the armature and yoke so that the heelpiece air-gap requirement in Sec-

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tion 034-352-702 is met and check the relay for the other requirements in the section.

**3.51 Coil**

(1) Tag and disconnect the leads to the coil terminals. Remove the armature, yoke, yoke spacer, and clamp washer as covered in

3.50(1). Provide a support for the coil and remove the coil mounting screw using the 4-inch E screwdriver.

(2) Mount the new coil. Remount the other parts as covered in 3.50(2). Check the relay for the requirements covered in Section 034-352-702.