

METHOD OF MOUNTING SHOCK ABSORBERS
ON U-TYPE FA- AND FB- RELAYS
TRUNK LINK AND CONNECTOR CIRCUITS
NO. 5 CROSSBAR

1. GENERAL

1.01 This section covers procedures for mounting P-19A300 tubes (shock absorbers) and P-19A299 relay mounting screws (including phenol fiber washers and resilient grommets) on U-type FA- and FB- relays in trunk link and connector circuits of No. 5 crossbar offices.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 The purpose of the shock absorbers and the resilient grommets furnished on the mounting screws is to minimize frame vibration transmitted to the relays. Vibration transmitted to FA- and FB- relays having contaminating films on their contacts may cause changes in contact resistance which result in transmission noises in the circuit similar to banjo tones.

1.04 The shock absorbers are inserted between the top of the relay and the upper flange of the mounting plate and the bottom of the relay and the lower flange of the mounting plate. The mounting screws with the washers and grommets replace the mounting screws ordinarily used with U-type relays.

1.05 Make-busy Information: Before performing any of the operations covered by this section, the circuits associated with the relays being worked on shall be made busy in accordance with approved procedures.

2. APPARATUS

2.01 List of Tools, Gauges, and Materials

<u>Code or Spec. No.</u>	<u>Description</u>
<u>Tools</u>	
419A	Test Connector
KS-16334	Stretcher
R-2671	1/8 inch Allen Socket Screw Wrench (an equivalent wrench is furnished with the PM-5 Roto-Torq Screwdriver)
-	4-inch Regular Screwdriver
-	Model PM-5 Roto-Torq Screwdriver, Richmond, Inc. (or equivalent); order screwdriver set for 5 ounce-inches torque

<u>Code or Spec. No.</u>	<u>Description</u>
-	326-3 Standard 1/4 inch Hexagon Drive Shank Apex Screwdriver Bit; Apex Machine and Tool Co. (or equivalent)
-	Screwdriver, Kedman Co, Quick Wedge, No. 1736 (or equivalent)
<u>Gauges</u>	
70J	0-150 gram Tension Gauge
<u>Materials</u>	
KS-2423	Cloth
KS-6824	Sealing Compound
-	P-19A299 Mounting Screws (each screw furnished with washer and resilient grommet) Packaged in Quantities of 200 screws
-	P-19A300 Tubes (Shock Absorbers) Packaged in Quantities of 100 tubes
-	Electrician's Tape

3. CHECK OF ROTO-TORQ SCREWDRIVER

3.01 While the roto-torq screwdriver is ordered set for a torque of approximately 5 ounce-inches, this setting should be checked upon receipt of the screwdriver and periodically during its use. It is recommended that the screwdriver be checked for torque setting after tightening mounting screws on all relays on one frame. The screwdrivers should be checked as covered in 3.02 to 3.05.

3.02 Wrap about two turns of a strip of electrician's tape 1/4 inch wide around the blade of the bit inserted in the roto-torq screwdriver as shown in Fig. 1. Then attach the No. 419A test connector to the blade with one jaw between the tape and one side of the blade, and the other jaw outside the tape on the other side of the blade. The test connector should be at right angles to the blade.

3.03 Hold the screwdriver in one hand and apply the No. 70J gauge to the right side of the test connector terminal as shown

in Fig. 1. Make sure that the hand does not touch the screwdriver shank. Hold the gauge against the test connector, turn the screwdriver handle clockwise, and note the gauge reading when the screwdriver clicks. The click indicates the torque setting of the screwdriver. The click should occur between gauge readings of 45 and 65 grams, which correspond to torques of 4.3 and 6.3 ounce-inches respectively.

3.04 If the torque setting of the screwdriver is not within the required limits, increase or reduce the setting as necessary by turning the adjusting screw in the end of the handle clockwise or counter-clockwise. Use the R-2671 wrench to turn the screw.

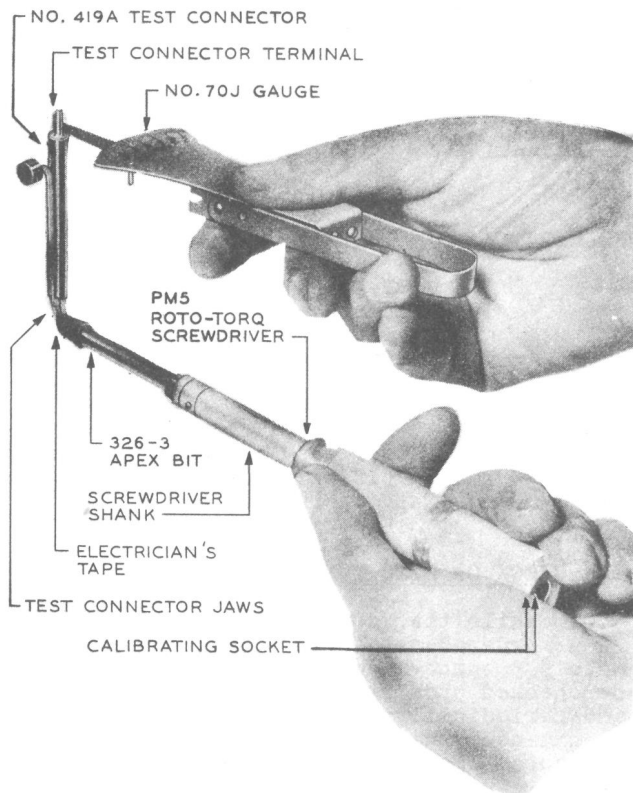


Fig. 1 - Method of Checking Roto-Torq Screwdriver

4. METHOD OF MOUNTING SHOCK ABSORBERS AND RELAY MOUNTING SCREWS

General

4.01 In mounting shock absorbers on FA- and FB- relays, the relay mounting screws are first loosened. Shock absorbers are then inserted between the top and bottom of the relay and the flanges of the mounting plate. After insertion of the shock

absorbers, the relay mounting screws are replaced with longer screws furnished with a washer and a resilient grommet. In order to prevent loosening of these screws, the ends of the screws are dipped in sealing compound. Starting the new screws in the relay mounting holes is facilitated by using the screw-holding screwdriver. The screws are then tightened with the required torque by using the torque screwdriver.

Loosening Relay Mounting Screws

4.02' Before inserting shock absorbers above and below the relay, loosen by one turn the relay mounting screws at the rear of the frame using the 4-inch regular screwdriver.

Mounting Shock Absorbers on Relay

4.03 General: After loosening the relay mounting screws as covered in 4.02, insert shock absorbers first between the bottom of the relay and lower flange of the mounting plate and then between the top of the relay and upper flange as follows.

4.04 Placing Shock Absorber on KS-16334 Stretcher: Retract the jaws of the stretcher by moving the stretcher lever to a position at right angles to the handle. Fig. 3 shows the lever in this position. Slip the shock absorber over the jaws of the stretcher as far as possible. Then pull the stretcher lever toward the handle until it locks in position with the stretcher jaws fully extended.

4.05 Inserting Shock Absorbers Between Relay and Mounting Plate Flanges: With the shock absorber placed on the stretcher as covered in 4.04, hold the stretcher with the stretcher lever at the right. Starting with the relay at the left end of the mounting plate, insert the shock absorber between the bottom of the relay and the lower flange of the mounting plate. In doing this tilt the stretcher downward slightly to clear the relay, and push the stretcher toward the mounting plate until the shock absorber is against the inner surface of the mounting plate between the flange and the bottom of the relay. A shock absorber about to be inserted between the top of the relay and the upper flange of the mounting plate at the right end of the mounting plate is shown in Fig. 2, since a better view of the operation is obtained in this position. Fig. 3 shows this shock absorber fully inserted above the relay.

4.06 Withdrawing Stretcher: While exerting pressure on the stretcher toward the mounting plate, withdraw the stretcher as follows. Retract the stretcher jaws by moving the lever to a position at right angles to the handle as shown in Fig. 3. Slowly and carefully swing the handle of the stretcher from side to side with the

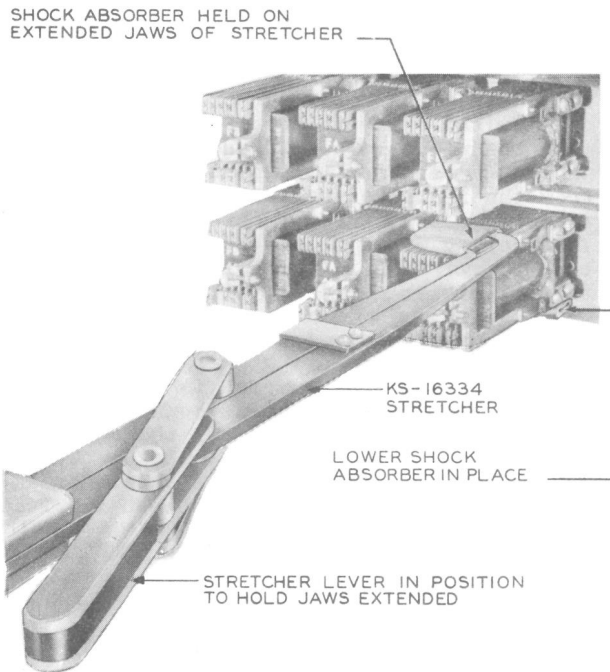


Fig. 2 - Inserting Shock Absorber Between Top of Relay and Mounting Plate Flange

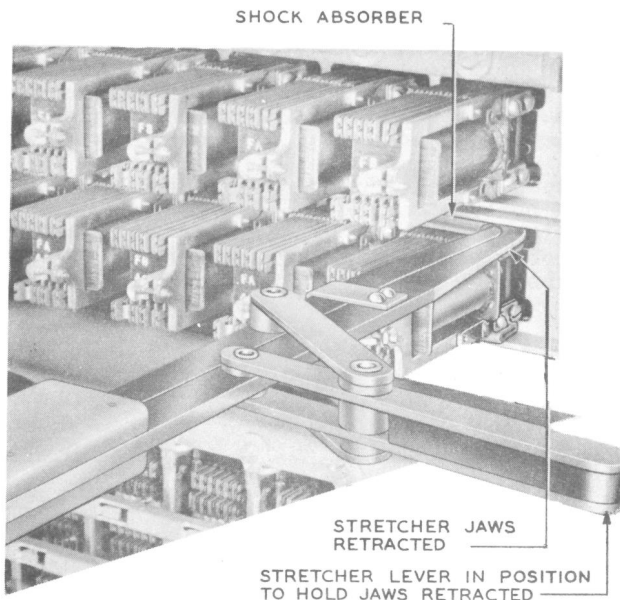


Fig. 3 - Shock Absorber Inserted Between Top of Relay and Mounting Plate Flange - Stretcher About To Be Removed

right hand and at the same time move the retracted jaws of the stretcher out of the shock absorber by exerting a slight pressure to the right at the middle of the stretcher with the left hand. Take care to avoid touching adjacent relays with the stretcher.

When the jaws are clear of the shock absorber, remove the stretcher.

4.07 Similarly insert a shock absorber between the top of the relay and the upper flange of the mounting plate. When inserting the shock absorber at the top of the relay hold the stretcher in a horizontal position.

Replacing Relay Mounting Screws

4.08 After mounting shock absorbers at the bottom and top of all relays on a mounting plate as covered in 4.03 to 4.07, replace the mounting screws of the relays as covered in 4.09 and 4.10.

4.09 Removing Relay Mounting Screws: Position the sliding collar on the No. 1736 screw-holding screwdriver toward the handle of the screwdriver. Then insert the blades of the screwdriver in the slot of the screw to be replaced. Push the screwdriver collar toward the screw to hold the blades firmly in the screw slot. Remove the screw from the relay. Release the screw from the screwdriver blades by moving the collar toward the handle. Discard the screw.

Caution: Exercise care to avoid breaking wires when inserting the screwdriver into a relay mounting screw slot on frames having surface wiring.

4.10 Mounting Replacement Screws Having Washers and Grommets

(1) After stirring the KS-6824 sealing compound, transfer a quantity of it to a small container. The use of a small container is advisable to facilitate dipping the screw as covered in (2) and to limit the quantity of sealing compound exposed to the air. Always keep the can in which the sealing compound is furnished tightly sealed except when transferring the compound to the container.

(2) Position the sliding collar on the screwdriver toward the handle of the screwdriver. Insert the blades into the slot of a replacement screw and push the collar toward the screw to hold the screw firmly on the blades. Dip the screw into the sealing compound until the lower quarter of the exposed threaded portion is covered. Wipe the screw on the edge of the container to remove excess sealing compound. Then, roll the screw through a complete revolution against a piece of KS-2423 cloth to remove any compound which may still extend beyond the threads. This should leave the spaces between the three or four threads adjacent to the end of the screw filled with sealing compound. Insert the screw in the mounting hole of the relay and turn it in two or three turns. Release the screwdriver by moving the collar toward the handle.

(3) Then similarly replace the other mounting screw of the relay. Tighten

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both screws to a torque of approximately 5 ounce-inches using the Roto-Torq screwdriver. Refer to 3.01 for information on checking and adjusting the screwdriver.

(4) In replacing the relay mounting screws it will probably be desirable to mount and partially tighten the replacement screws on a number of relays before tightening these screws to the required torque. Since the sealing compound hardens in a relatively short time, screws should not be left partially tightened for more than 20 minutes.

5. ELIMINATION OF POSSIBLE BOND BETWEEN RELAY AND MOUNTING PLATE

5.01 In some cases, the sealing compound on the replacement mounting screws may run between the relay and the mounting plate, causing the relay to become bonded to the mounting plate. This is undesirable since it provides means for transmission of vibration from the frame to the relay and reduces the effectiveness of the shock absorbers and grommets. In order to avoid this condition, the procedure covered in 5.02 should be applied to all relays on which shock absorbers have been mounted.

5.02 Approximately 1 week after tightening the relay mounting screws with the Roto-Torq screwdriver as covered in 4.10(3), manually move the relay on its mounting as follows. Grasp the outer end of the relay core and carefully move the relay up, down, and sideways several times. This should break any bond which may have formed between the relay and mounting plate.