

MANUALLY OPERATED RHEOSTATS STEEL-PLATE AND CARBON-PILE TYPES REPLACEMENT PARTS AND PROCEDURES

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of steel-plate and carbon-pile type manually operated rheostats. It also covers approved procedures for replacing these parts.

1.02 Part 2 of this section covers the parts which it is practicable to replace in the field in the maintenance of the rheostats. No attempt should be made in the field to replace parts not designated. Part 2 also contains explanatory figures showing the parts. This information is called Replacement Parts.

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

1.04 **Caution:** *If practicable, disconnect power from the rheostat before starting work on it. If this is not practicable, exercise extreme care to avoid touching or shorting live parts of the rheostat.*

2. REPLACEMENT PARTS

2.01 The figures included in this part show the various replacement parts in their proper relation to other parts of the apparatus and the names of the replacement parts.

2.02 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.

2.03 When ordering a replacement part, give the name of the part and the complete nameplate data of the rheostat including the KS number and the name of the manufacturer, for example, Terminal Block Assembly for KS-5661, L2 Rheostat, Ward-Leonard Electric Co, Type CC, Cat. No. 5140821X E.D. No. 9802, 32 Ohms, 11.8-2.4 Amperes.

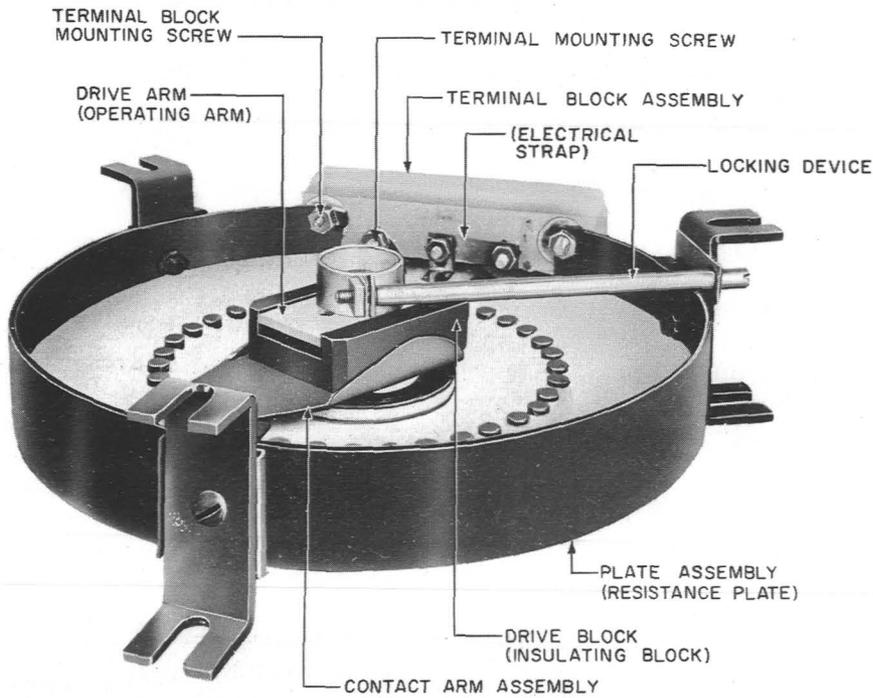


Fig. 1 - 6-, 8-, and 13-Inch Rheostat — Balanced Contact Arm Construction — KS-5661 Rheostat Illustrated

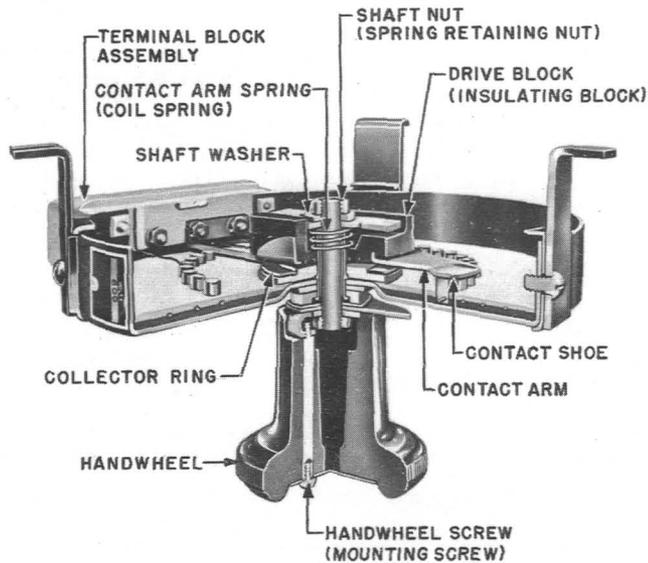


Fig. 2 - 6-, 8-, and 13-Inch Rheostat — Balanced Contact Arm Construction — Cutaway Section — KS-5661 Rheostat Illustrated

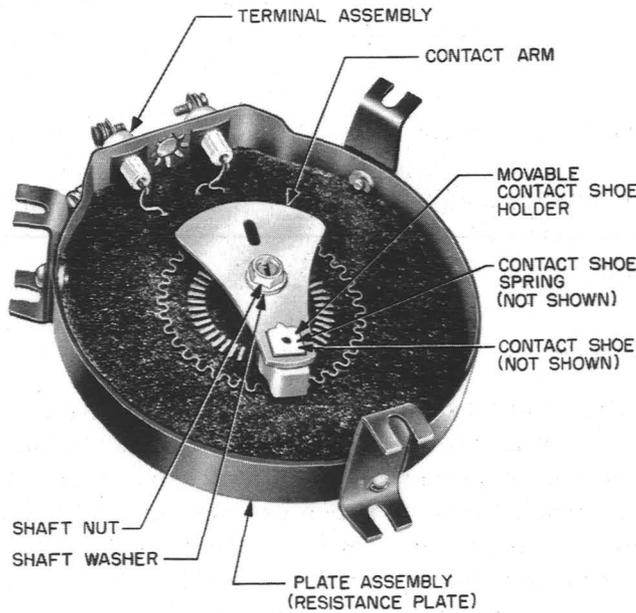


Fig. 3 — KS-15672 Rheostat — Balanced Contact Shoe Construction

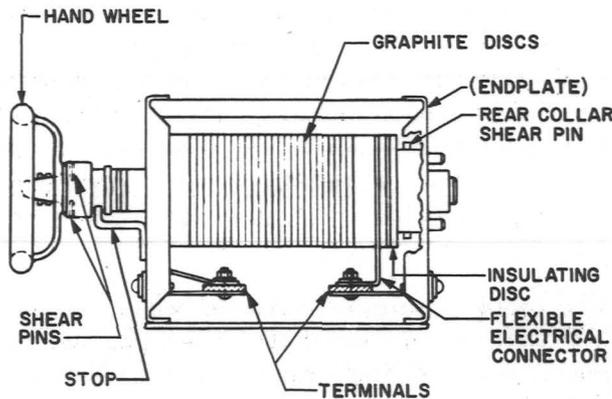


Fig. 4 — KS-15669 Rheostat — Carbon-Pile Type

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
R-1542	3/4-inch Adjustable Wrench
—	1/16-inch Drive Pin Punch
—	3-inch C Screwdriver
—	4-inch E Screwdriver

CODE OR SPEC NO.

DESCRIPTION

TOOLS

- 5-inch E Screwdriver
- 1-pound Ball Peen Hammer

MATERIALS

Block of Wood

3.02 After making any replacement of parts, the part or parts replaced shall meet the requirements specified in Section 028-721-701. Other parts whose adjustment may have been directly disturbed by the replacement operation shall be checked to applicable requirements.

3.03 No replacement procedures are specified for screws or other parts if the replacement procedure consists of a simple operation.

3.04 If the parts covered in 3.05 through 3.09 are not readily accessible for replacement, it may be necessary to dismount one or more resistance plates and associated parts. To do this, remove resistance plate mounting screws and the electrical strap between plates, as required, using the 4-inch E screwdriver and R-1542 adjustable wrench. If the shaft of the resistance plate to be dismounted is connected to the shaft of the adjacent resistance plate by a collar, loosen the collar setscrew to uncouple the shafts.

Steel-Plate Type Rheostats

3.05 Contact Arm and Associated Parts

Balanced Contact Arm Construction

(1) Rheostats having this type of contact arm are shown in Fig. 1 and 2. In these rheostats, the contact arm is held against the contacts by a coil spring acting between the contact arm and operating arm. The operating arm is insulated from the contact arm by an insulating block. Most KS-5031, KS-5125-01, KS-5244, KS-5661, KS-5711, and KS-5712 rheostats are of balanced contact arm construction.

(2) Remove the spring retaining nut using the R-1542 adjustable wrench and remove the shaft washer, coil spring, and insulating block. Substitute new parts as necessary and mount the parts in reverse order of removal.

Balanced Contact Shoe Construction

(3) The KS-15672 rheostat shown in Fig. 3 has this type of shoe. In this rheostat the contact shoe, mounted in the contact arm, is held against the contact buttons and collector ring by a spring acting between the shoe and arm. Other rheostats using this type of shoe are the KS-5084, KS-5125-01, and KS-5711 faceplate rheostats. In the latter rheostats, the contact shoe engages only the contact buttons. A separate contact is provided for the collector ring.

(4) Remove the shaft nut using the R-1542 adjustable wrench and remove the shaft washer. Substitute new parts as necessary and mount the parts in reverse order of removal.

3.06 Terminal Block Assembly: Fig. 1 and 2 —

- (1) Remove the terminal mounting screws, washers, and nuts using the R-1542 adjustable wrench and 4-inch E screwdriver.
- (2) Remove the screws, washers, and nuts which connect the collector ring and resistance elements to the terminal block, using the 3-inch C screwdriver and adjustable wrench. If an electrical strap is used to connect the collector ring to one of the terminals, remove the strap.
- (3) Remove the terminal block mounting screws, washers, and nuts.
- (4) Replace the terminal block assembly and remount the parts in reverse order of removal. Take care to avoid overtightening the terminal mounting nuts to prevent cracking the terminal block.

3.07 Locking Device: Fig. 1 —

- (1) Unscrew the rod using the 3-inch C screwdriver, and remove the locking device.
- (2) Position the replacement bushing and clamp around the shaft and mount the rod on the clamp as shown in Fig. 1.
- (3) Hold the operating arm in the required position and securely tighten the clamp, using the 3-inch C screwdriver to turn the rod.

3.08 Handwheel: (Fig. 2) — Loosen the handwheel setscrew or mounting screws and remove the handwheel from the shaft. Position

the replacement handwheel on the shaft and securely tighten the setscrew or mounting screws.

3.09 Resistance Plate: Remove parts associated with the resistance plate as covered in 3.05 through 3.08. Replace the resistance plate and remount the parts in reverse order of removal.

Carbon-Pile Type Rheostats

3.10 Carbon-Pile Construction: A rheostat of this type is shown in Fig. 4. This rheostat consists of graphite discs mounted on a stationary insulated shaft which extends through holes in the discs, an operating handwheel, and a frame for supporting the assembly. The resistance is varied by turning the handwheel to vary the pressure.

3.11 Rear Collar Shear Pin and Graphite Discs: Fig. 4 —

- (1) In some cases, it may be necessary to remove the rheostat from its mounting. To replace the rear collar shear pin or graphite discs, first remove the end plate at the rear of the rheostat frame. To do this, remove the screws, nuts, lockwashers, and insulating bushings which mount the plate, using the 5-inch E screwdriver.
- (2) Using a suitable block of wood, support the end of the shaft. Then remove the shear pin from the collar and shaft by carefully tapping the pin with the drive pin punch and ball peen hammer. If necessary, manually rotate the shaft to make the nonheaded end of the shear pin accessible.
- (3) If the rear collar shear pin is being replaced, substitute the replacement pin and mount the parts in reverse order of removal.
- (4) If graphite discs are being replaced, remove the collar, insulating disc, and electrical connector from the shaft taking care not to damage the flexible portion of the connector.
- (5) Replace graphite discs and other parts as required.

- (6) Remount the parts in reverse order of removal.

3.12 Handwheel Shear Pins

- (1) Remove the two handwheel stop mounting nuts or screws and remove the stop.
- (2) Remove the two nuts from the outer end of the shaft.

- (3) Remove the handwheel and remove the bushing from the shaft.

- (4) Using the drive pin punch and ball peen hammer, remove parts of the shear pin from the shaft and bushing.

- (5) Replace the shear pins and remount all parts in reverse order of removal.