

INTERRUPTERS
KS-15634 AND KS-15757 TYPE
REPLACEMENT PARTS AND PROCEDURES

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of the KS-15634- and KS-15757-type interrupters. It also covers approved procedures for replacing these parts.

1.02 This section is reissued to add ordering information and replacement procedures for the motor bearings. Detailed reasons for reissue will be found at the end of the section.

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

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

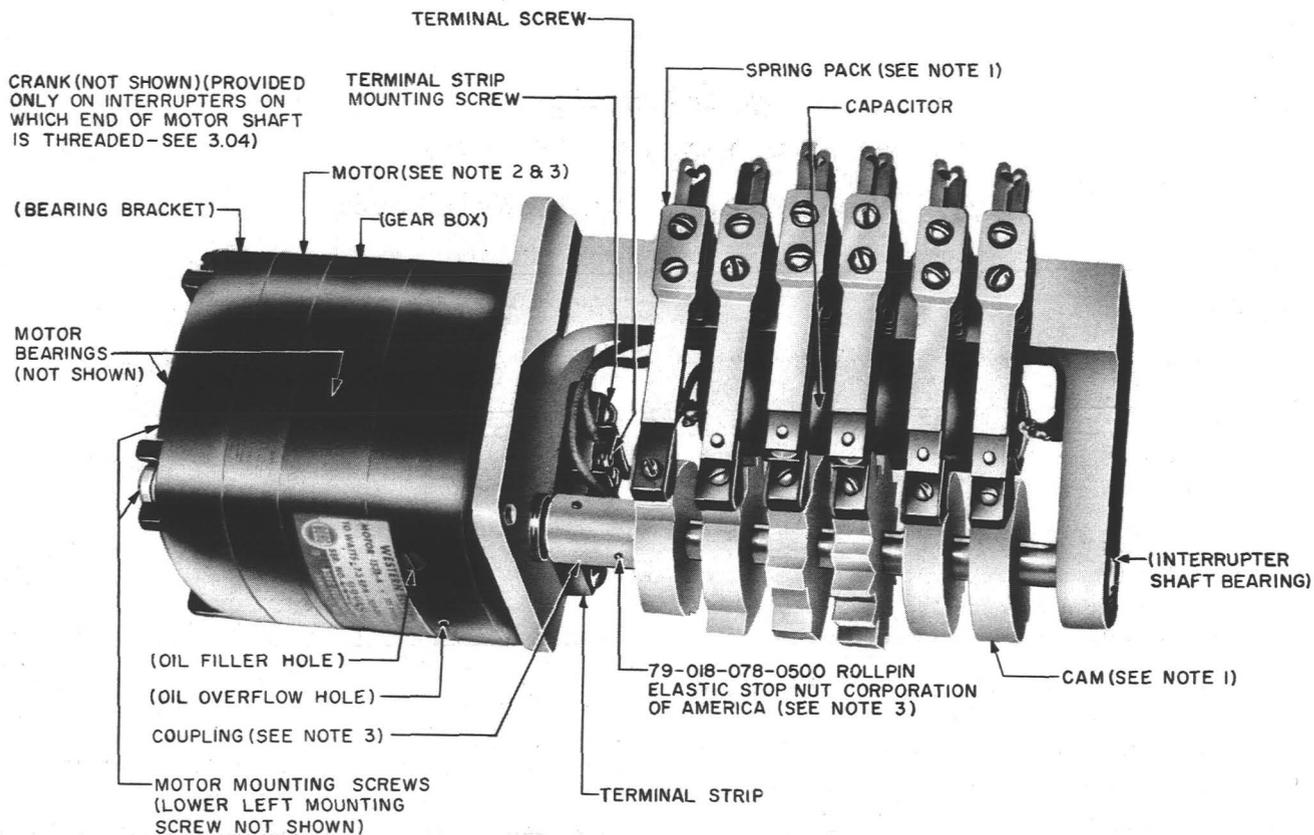
1.05 Before making any replacement on the apparatus covered herein, remove it from service in accordance with approved procedures.

2. REPLACEMENT PARTS

2.01 The figure included in this part of the section shows the various parts in their proper relation to other parts of the interrupter, together with the names of the parts which it is practicable to replace in the field.

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 parts for replacement purposes, give the name of the parts and the complete nameplate data of the interrupter including the KS- number and the name of the manufacturer. For example, Interrupter Spring Pack No. 1 for KS-15634, List 1 Interrupter — Holtzer-Cabot Co. — AC Motor — Type RBC-2505 — Volts 115 — Cycles 60 — RPM 10 — Watts 15 — Torque 20 Oz-In. — Serial No. 172417.



NOTE 1. WHEN ORDERING CAMS AND SPRING PACKS, SPECIFY THE POSITION NUMBER OF THE PART. THESE PARTS ARE NUMBERED 1 UP STARTING AT THE MOTOR END.
 2. WHEN ORDERING MOTOR, ALSO ORDER CAPACITOR.
 3. IF A MOTOR, ASSOCIATED WITH A COUPLING HAVING SETSCREWS IS TO BE REPLACED, ALSO ORDER A REPLACEMENT COUPLING AND TWO ROLLPINS [SEE 3.10 (2)].

Fig. 1 — KS-15634 and KS-15757 Interrupters (KS-15757 interrupter shown)

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

CODE OR SPEC. NO.	DESCRIPTION	CODE OR SPEC. NO.	DESCRIPTION
TOOLS			
→D-160806	Bearing Puller	—	3-Inch C Screwdriver (or the replaced 3-inch cabinet screwdriver)
→KS-16998, L1	Bearing Puller	—	4-Inch E Screwdriver (or the replaced 4-inch regular screwdriver)
R-1005	Jewelers Screwdriver	—	1/16-Inch Drive-Pin Punch, L. S. Starrett Co. No. 565 (or equivalent)
R-1619	2-inch "C" Clamp	—	4-Ounce Riveting Hammer
R-2559	Power Test Lamp	—	Combination Pliers (2 reqd)
R-2958	5/64-Inch Allen Wrench	—	No. 47 Gauge Twist Drill
R-2959	1/16-Inch Allen Wrench	—	All-Angle Drill, Albertson and Co, No. 1495 — WE, or equivalent
→R-2966	Brush	—	
—	Long-Nose Pliers	—	

CODE OR SPEC. NO.	DESCRIPTION
MATERIALS	
KS-6232	Light Mineral Oil
KS-7860	Petroleum Spirits
KS-14666	Cloth
—	260-300P Grease
—	Brass or Copper Tubing [see 3.11(8)]
—	Heavy Piece of Paper of Suitable Dimensions for Inserting Between All Cam Followers and Cams

3.02 Care should be exercised when using petroleum spirits in power rooms where there are dc machines, since commutation may be adversely affected by softening of commutator film by the fumes. To avoid the need for burnishing the commutators of dc machines, after doing any cleaning called for in this section, provide adequate ventilation, use the absolute minimum amount of petroleum spirits required for the cleaning operation, and keep the container closed when not in use.

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

3.04 *Caution: Before making replacements, disconnect the power from the interrupter in accordance with approved procedures. Check that the power is removed from the interrupter using the R-2559 power test lamp. Apply the test lamp leads to the terminals of the terminal strip to which the motor leads are connected.*

3.05 In some cases it will be necessary to remove the interrupter from its mounting for replacement of parts. To remove the interrupter, proceed as follows. First remove the power from the interrupter as covered in 3.04. Remove the external leads from the terminal strip. Tag and unsolder the spring pack leads. Remove the interrupter mounting screws using the 4-inch E screwdriver and remove the interrupter.

3.06 Initially, these interrupters were provided with a crank consisting of a disc having a threaded hub and a finger insertion hole for turning the disc. On these interrupters, the end

of the motor shaft may have either a left- or right-hand thread for mounting the crank. The end of the shaft on later interrupters has a hexagonal hole into which is inserted a 1/16-inch Allen wrench to serve as a crank.

3.07 After making any replacement of parts, the part or parts shall meet the requirements specified in Section 163-220-701. Other parts whose adjustment may have been directly disturbed by the replacement operation shall be checked to the applicable requirements.

3.08 *Spring Pack*

- (1) If an individual part of the spring pack is defective, replace the entire spring pack.
- (2) To replace a spring pack, first tag and unsolder the leads. Then proceed as covered in (3) through (5).
- (3) Remove the spring pack mounting screws using the 3-inch C screwdriver and then remove the spring pack from the interrupter frame.
- (4) The new spring pack is furnished with nuts on the mounting screws to hold the assembly together during shipment. Remove the nuts, taking care to hold the spring pack as a unit. Mount the spring pack on the interrupter so that the springs are in alignment and the cam follower of the spring pack is centered on its associated cam. Then securely tighten the mounting screws.
- (5) After mounting the spring pack, connect and solder the leads.

3.09 *Cams*

- (1) Insert between the cams and the cam followers of all spring packs, a strip of heavy paper of suitable dimensions to engage all cams.
- (2) Using the crank or proper size Allen wrench, rotate the motor shaft until the setscrews or Rollpin in the camshaft end of the coupling and the setscrews in the cams are accessible.
- (3) Using the R-1005 jewelers screwdriver or proper size Allen wrench, loosen the setscrews of the cam to be replaced and other cams which are between this cam and the motor end of the camshaft. Also loosen the

setscrews of all cams within 2 inches of the camshaft bearing and slide these cams toward the coupling.

(4) Disengage the camshaft from the coupling as follows. If the coupling is provided with setscrews, loosen the two setscrews holding the coupling to the camshaft, using the proper size Allen wrench. If the coupling is secured to the camshaft with a Rollpin, remove the pin as follows. Place the 1/16-inch drive-pin punch on the pin and lightly tap the punch with the 4-ounce riveting hammer until the pin extends approximately 3/8-inch beyond the coupling. Remove the pin using the long-nose pliers.

(5) Slide cam No. 1 (cam nearest coupling) as far as possible away from the coupling. Manually work the camshaft free of the coupling. If the camshaft is tight in the coupling, grasp the round portion of the camshaft adjacent to the coupling with the combination pliers and work the shaft free while holding the coupling with a second pair of pliers. Do not apply the pliers to the flat or "V" groove portion of the shaft. Slide the camshaft sufficiently away from the coupling to permit removal of the cams.

(6) Before removing the cam to be replaced and all preceding cams from the shaft, mark the side of these cams facing the motor with a pencil. Slide these cams off the shaft, noting the order in which the cams are removed. Hold the cam being replaced against the new cam so that the cam lobes are in alignment. Mark the side of the new cam corresponding to the marked side of the cam being replaced.

(7) Mount the new cam on the shaft, taking care that the marking on the side of the cam faces the motor. Similarly mount the other cams, which were removed, in their proper order.

(8) Carefully insert the end of the camshaft into the coupling. If the coupling is provided with setscrews, securely tighten the setscrews taking care that one of the setscrews engages the flat or "V" groove in the shaft. If the coupling is provided with a Rollpin, align the hole in the camshaft end of the coupling with the corresponding hole in the

camshaft. Insert the Rollpin in the coupling hole and lightly tap it into place using the drive-pin punch and the riveting hammer.

(9) Center the cams on their associated cam followers and securely tighten the cam setscrews on the flat or in the "V" groove of the shaft.

3.10 Motor

General

- (1) When replacing the motor, also replace the capacitor.
- (2) On interrupters manufactured initially, the coupling was secured to the motor and camshaft by setscrews. On later interrupters, Rollpins are used instead of setscrews and the shaft on replacement motors is drilled for a Rollpin. Therefore, when replacing a motor associated with a coupling having setscrews, it is necessary to drill the camshaft for a Rollpin as covered in (6) (d) and to use a replacement coupling.

Interrupter Having Coupling With Rollpins

(3) Removing Motor and Capacitor

- (a) Using the crank or the proper size Allen wrench, rotate the motor shaft until the motor coupling Rollpin is accessible. Place the 1/16-inch drive-pin punch on the pin and lightly tap the punch with the 4-ounce riveting hammer until the pin extends approximately 3/8-inch beyond the coupling. Remove the pin with the long-nose pliers.
- (b) Clamp the interrupter camshaft as follows to hold the shaft in position. Loosen the setscrews of the cam nearest the camshaft bearing, using the R-1005 jewelers screwdriver or the proper size Allen wrench as required. Slide the cam against the bearing bracket and securely tighten the cam setscrew. Clamp the cam to the bearing bracket, using the R-1619 "C" clamp. Insert a thin piece of wood between the outer end of the bearing and the clamp to obtain a better clamping surface and to prevent damage to the bearing.
- (c) Remove the motor leads at the terminal strip, using the 3-inch C screwdriver, and tag these terminals according to the color

of the motor leads. Unsolder the lead from the motor to the capacitor at the capacitor terminal.

(d) Unsolder the lead from the terminal strip to the capacitor at the capacitor terminal. Tag the lead to indicate the capacitor terminal to which it was connected. Remove the capacitor mounting screw with the 4-inch E screwdriver and remove the capacitor.

(e) Remove the motor mounting screws (upper right and lower left screws on the motor as viewed from the outer end of the motor), using the 4-inch E screwdriver and remove the motor.

(4) *Mounting New Motor and Capacitor*

(a) Mount new motor on the interrupter frame, inserting the end of the motor shaft into the coupling. Securely tighten the motor mounting screws.

(b) Mount the capacitor and securely tighten its mounting screw. Connect and solder the lead from the terminal strip to the proper terminal of the capacitor.

(c) Connect the motor leads to the proper terminals of the terminal strip and capacitor.

(d) Remove the "C" clamp from the bearing bracket.

(e) Align the Rollpin hole in the motor end of the coupling with the corresponding hole in the motor shaft. Insert the Rollpin and lightly tap it into place, using the drive-pin punch and the riveting hammer.

(f) Center the end cam and other cams, if necessary, on their associated cam followers. Securely tighten the cam setscrews on the flat or in the "V" groove of the shaft.

Interrupter Having Coupling With Setscrews

(5) *Removing Motor and Capacitor*

(a) Using the crank or proper size Allen wrench, rotate the motor shaft to gain access to the coupling and cam setscrews. Loosen all coupling setscrews, using the proper size Allen wrench. Also loosen the setscrews of cam No. 1 and of all cams within 2 inches of the camshaft bearing.

(b) Insert between the cams and cam followers a strip of heavy paper of suitable dimensions to engage all cams.

(c) Slide cam No. 1 as far as possible away from the coupling. Manually work the camshaft free of the coupling. If the camshaft is tight in the coupling, grasp the round portion of the shaft adjacent to the coupling with the combination pliers and work the shaft free while holding the coupling with a second pair of pliers. Do not apply the pliers to the flat or "V" groove of the shaft. Slide the camshaft toward the camshaft bearing and remove the coupling from the motor shaft.

(d) Clamp the interrupter camshaft as follows to hold the shaft in position. Slide the cam adjacent to the camshaft bearing against the bearing bracket and securely tighten the cam setscrew on the flat or in the "V" groove of the shaft. Clamp the cam to the bearing bracket using the R-1619 "C" clamp. Insert a thin piece of wood between the outer end of the bearing and the clamp to obtain a better clamping surface and to prevent damage to the bearing.

(e) Unsolder the lead from the terminal strip to the capacitor at the capacitor terminal. Tag the lead to indicate the capacitor terminal to which it was connected. Remove the capacitor mounting screw with the 4-inch E screwdriver and remove the capacitor.

(f) Remove the motor leads at the terminal strip, using the 3-inch C screwdriver, and tag these terminals according to the color of the motor leads. Unsolder the lead from the motor to the capacitor at the capacitor terminal.

(g) Remove the motor mounting screws (upper right and lower left screws on the motor as viewed from the outer end of the motor), using the 4-inch E screwdriver and remove the motor.

(6) *Mounting Motor and Capacitor*

(a) Mount the new motor and capacitor on the interrupter frame and securely tighten the mounting screws, using the 4-inch E screwdriver. Connect the motor leads to the proper terminals of the ter-

minal strip and capacitor. Connect and solder the leads from the terminal strip to the proper terminal of the capacitor.

(b) Slide the new coupling drilled for Rollpins on the camshaft as far as possible. If the coupling is a tight fit, work it on the shaft using two pairs of combination pliers as covered in (5) (c). Loosen the setscrew of the cam clamped to the bearing bracket and slide the camshaft and coupling toward the motor, inserting the end of the motor shaft into the coupling.

(c) Align the Rollpin hole in the motor end of the coupling with the corresponding hole in the motor shaft. Insert the Rollpin and lightly tap it into place using the drive-pin punch and the riveting hammer. The camshaft should engage the full length of the camshaft bearing. If it does not, slide the camshaft outward sufficiently to meet this condition.

(d) Drill a hole for the Rollpin in the camshaft as follows. Using the crank or proper size Allen wrench, rotate the motor shaft until the Rollpin hole in the camshaft end of the coupling is vertical. Securely tighten the setscrew in the cam clamped to the bearing bracket to prevent the camshaft from moving during the drilling operation. Using the Rollpin hole in the camshaft end of the coupling as a guide, carefully drill a hole through the camshaft using the all-angle drill, or equivalent, with the No. 47 twist drill. While drilling, take care to keep the drill in line with the guide hole in the coupling.

(e) Insert Rollpin in the coupling hole and lightly tap it into place, using the drive-pin punch and the riveting hammer.

(f) Remove the "C" clamp from the bearing bracket. Remove the strip of paper between the cams and cam followers. Center the cams on their associated cam followers and securely tighten the cam setscrews on the flat or in the "V" groove of the camshaft.

Γ to replace one. To replace a bearing, proceed as follows.

(2) On interrupters where the coupling is secured with Rollpins, remove the motor as covered in 3.10 (3) (a), (b), (c), and (e). If the coupling is secured with setscrews, rotate the motor shaft to gain access to the coupling and cam setscrews using the crank or proper size Allen wrench. Loosen the setscrew which secures the coupling to the motor shaft with the proper size Allen wrench. Also loosen the setscrew of cam No. 1 and all cams within 2 inches of the camshaft bearing. Then, remove the motor as covered in 3.10 (5) (b), (c), (d), (f), and (g).

(3) Drain the oil from the gear box as follows. Remove the oil hole screw, using the 3-inch C screwdriver, and drain the oil into a receptacle by tilting the motor and gear box. Replace the oil hole screw.

(4) Remove the motor rotor as follows. Mark the position of the bearing bracket and the gear box with respect to the motor frame to insure proper alignment when remounting the parts. Remove the motor assembly screws using the 4-inch E screwdriver. Carefully pry both the bearing bracket and the gear box from the motor frame using the blade of the screwdriver. Remove the rotor from the motor frame. Remove the end play washers from the bearing housings and lay them out for remounting in their proper order.

(5) Using the KS-16998, L1 or D-160806 bearing puller, remove the defective bearing, or both bearings if both are being replaced.

(6) The replacement bearing may be either a single- or double-shielded type ball bearing. The double-shielded type bearing need not be lubricated. Before mounting the single-shielded type bearing, clean and relubricate it as follows. Remove as much grease as possible from the exposed face of the bearing using the R-2966 brush moistened with KS-7860 petroleum spirits. Wipe the bearing with a clean, dry KS-14666 cloth. Apply fresh 260-300P grease around the balls, filling the space between the inner and outer race approximately one-third full of grease.

(7) Wash the grease from the bearing housings with KS-7860 petroleum spirits and wipe the housings with a clean KS-14666 cloth moistened with KS-6232 light mineral oil.

Γ 3.11 *Motor Bearings*

(1) If the motor has been in service for several years, it is recommended that both bearings be replaced whenever it is necessary

(8) Wipe the rotor shaft with a clean KS-14666 cloth. Start the new bearing on the shaft. The shielded side of single-shielded type ball bearings should face outward. Then, position the tube which just fits over the shaft so that it engages the inner race of the bearing. Using the 4-ounce riveting hammer, gently tap the tube to position the bearing on the shaft.

(9) Remount the motor parts in reverse order of removal and securely tighten the motor assembly screws.

(10) If the coupling is secured with Rollpins, remount the motor as covered in 3.10 (4) (a) and (c) through (f).

(11) If the coupling is secured with setscrews, remount the motor as covered in 3.10 (4) (a) and (c) and 3.10 (6) (f). Line up the setscrew with the flat on the motor shaft and securely tighten the setscrew.

(12) Lubricate the gear box as covered in Section 163-220-701.

3.12 Capacitor: To replace the capacitor, tag and unsolder the leads at the capacitor. Then proceed as follows.

(1) Remove the capacitor mounting screw, using the 4-inch E screwdriver and then remove the capacitor.

(2) Mount the new capacitor on the interrupter and securely tighten the mounting screw.

(3) Connect and solder the leads at the capacitor.

REASONS FOR REISSUE

1. To revise Fig. 1.
2. To revise the list of Tools and Materials (3.01)
3. To add procedures for the use of petroleum spirits in power rooms (3.02).
4. To add replacement procedures for the motor bearings (3.11).