VOLTAGE REGULATORS
KS-5016, KS-5117 AND KS-5468
AC-DC AUTOMATIC ROTATING CAM TYPES
REPLACEMENT PARTS AND PROCEDURES

1. GENERAL

1.01 This section together with Section 024-350-801 covers the a-c and d-c automatic rotating cam type voltage regulators KS-5016, KS-5117 and KS-5468. It is reissued to place information on the voltage controllers in Section 024-350-801 and to bring the section up to date.

1.02 Part 2 of this section is called "Replacement Parts" and covers the parts which are replaceable in the field. Aside from screws, nuts, bolts and other small parts which can be obtained locally, the parts not designated herein are of a character which should ordinarily not be replaced by the regular maintenance forces.

1.03 Part 3 of this section is called "Replacement Procedures" and covers the approved procedures for the replacement of the parts listed under Part 2.

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 with their corresponding names.

2.02 When ordering parts for replacement purposes all parts shall be ordered by giving the name, describing the part fully, and giving nameplate data including the voltage regulator rating, type and manufacturer. For example: Motor Driven Rheostat Assembly for General Electric A-C Automatic Rotating Cam Type Voltage Regulator; Regulated Circuit Voltage, 49.5 Volts; List No. 2 Resistance; M-3 Generator; 115 Volt, 60 Cycle A-C Power Service; KS-5117.

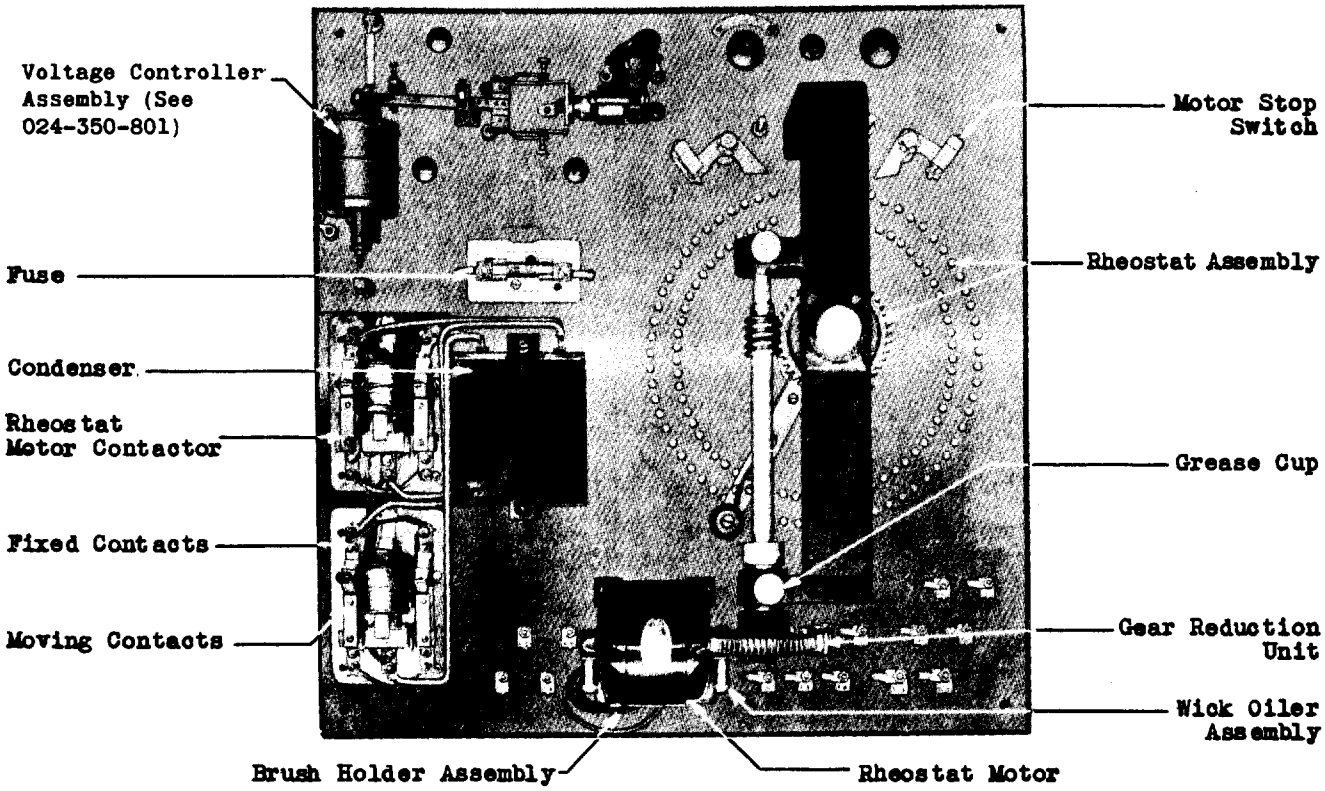

Fig. 1 - AC Rotating Cam Type Regulator KS-5117

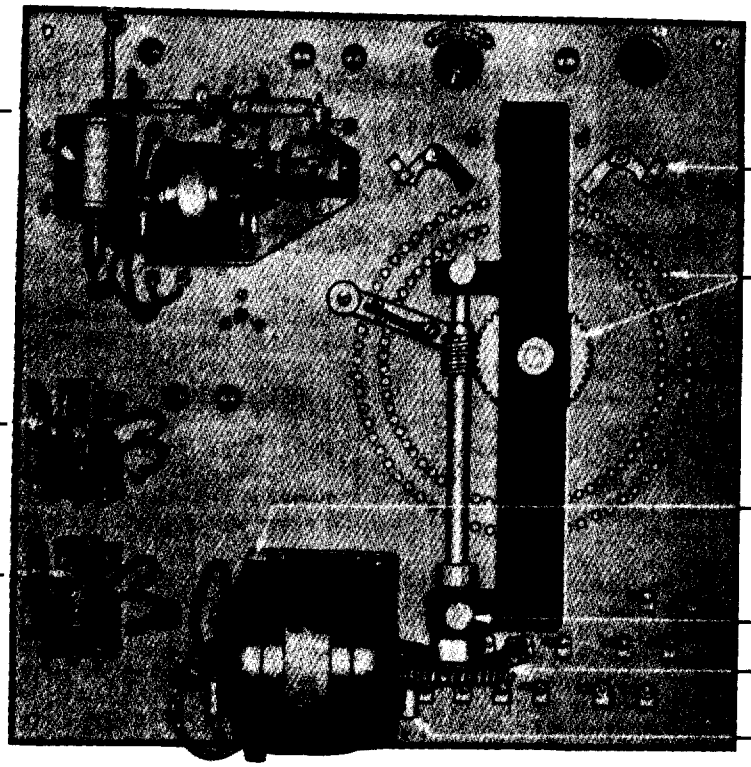

Fig. 2 - DC Rotating Cam Type Voltage Regulator KS-5117

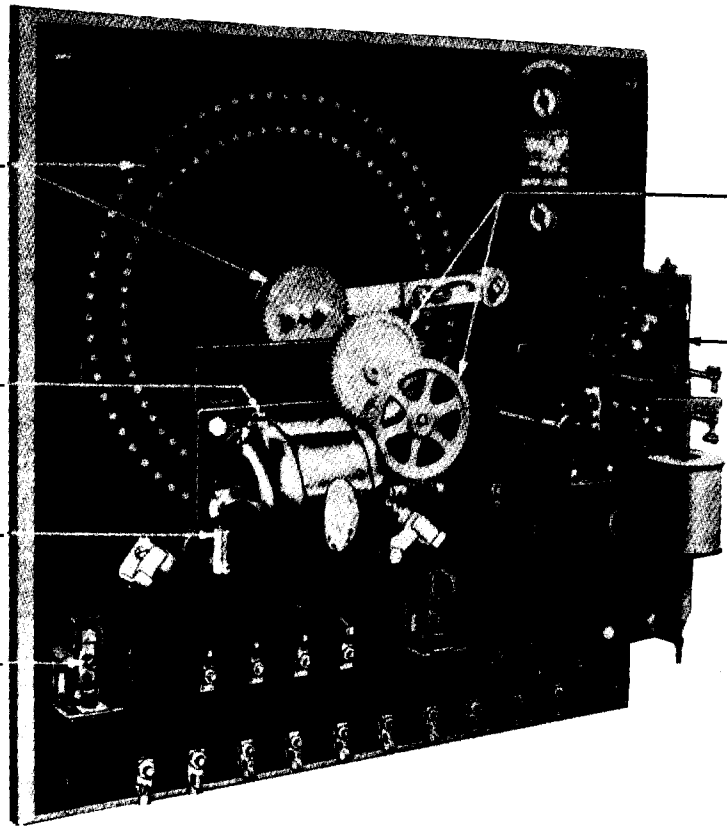

Fig. 3 - AC Rotating Cam Type Voltage Regulator KS-5468

3. REPLACEMENT PROCEDURES

3.001 List of Tools and Materials (Equivalents may be substituted if desired).

Tools

Pliers, Duck-bill, 6 inch, KS-6015 or 5 inch No. 50620 Tool
Screwdriver, Cabinet 3 inch
Tool for adjusting compensating rheostats (furnished by manufacturer)
Wrench, Adjustable, Single End, 6 inch, R-1452
Wrench, Socket, No. 46 Tool

Materials

Cloth, Cleaning, Twill Jean, D-98063
Grease Power Plant Ball Bearing
Petrolatum
Petroleum Spirits KS-7860

3.002 Always open the voltage control coil and motor switches on the control panel associated with the automatic rotating cam type voltage regulator when cleaning, lubricating, adjusting or making replacements on the regulator unless the contrary is specified. Where one regulator is associated with only one generator, the double-pole regulator REG. RHEO. switch shall be thrown to the HAND REG. position and where associated with two generators the double-pole REG. RHEO. switch shall be placed in the open-circuit position.

3.003 Repairing the automatic cam type voltage regulator or one of its parts is a matter of expediency, balancing the total cost of repairing the regulator or its parts against the cost of replacing the whole regulator or the whole part taking into consideration the age and condition of the regulator.

3.004 After making any replacement of parts the apparatus shall be checked and where necessary readjusted to meet the requirements specified in Section 024-460-701.

3.005 No replacement procedures are specified for screws or other small parts when the procedure consists of a simple operation.

3.01 Motor Brushes (See Brush Replacement Section)

(1) To replace a brush remove the screw cap which holds the brush and spring in place, withdraw the old brush and spring, insert a new brush and spring and replace the screw cap.

3.02 Motor for Driving Rheostat

(1) To replace an armature first loosen the motor mounting screws noting the position of any shims under the feet of the motor so that the correct alignment may be obtained when reassembling. Remove the pinion or worm from the motor shaft. Remove the brushes and wick oilers with bearing wicks. Mark the brushes so that the same brush may be inserted in the same position and in the same brush holder when reassembled. Remove the acorn nuts from the end shield using the proper socket wrench. Remove the end shield. If it sticks, pry it off by inserting a screwdriver in the small opening on the side between the frame and the end shield. Note the location of all parts which may be removed so that they may be replaced in their proper position. Slide the armature out, taking care not to lose any spacing washers which may be on the shaft.

(2) Wipe off any grease and clean the end shields, bearings and bearing housings with cloth wet with petroleum spirits. Wipe the motor frame and field windings with dry cloth.

(3) Replace the old armature with a new or reconditioned one. Reassemble the parts in the reverse order from that in which they were taken down, making certain that all associated parts are assembled in their same relative positions. See that the armature turns freely in its bearings. Refill the wick oilers with petrolatum and place the motor back into service.

(4) To replace a bearing lining in the end shield on the pinion end first remove the wick oiler with bearing wick and then remove the end shield as outlined in (1). After removal place the end shield inner face down, on two pieces of wood sufficiently high and so arranged as not to block the bearing bushing when pressed or driven out. Place a piece of hard wood on the outer end of the bearing bushing and tap with a hammer until the bushing is driven out of the bearing housing. Turn the end shield over and drive the new bushing into the bearing housing in a similar manner until the bearing lining rests firmly against the shoulder on the inside of the end shield. Care should be taken not to injure the new lining bushing in putting it in and to see that the oil hole and hole for the bearing wick line up with the corresponding openings in the bearing housing. Reassemble the motor and make certain that the armature rotates without binding and that there is adequate lubrication for the shaft.

(5) To replace the bearing lining in the housing on the commutator end it will be necessary to first remove the armature as outlined in paragraph (1). Drive out the bushing lining as outlined in (4) being careful not to injure the motor

windings. Put in the replacing bushing, observing the precautions noted in (4) and reassemble the motor.

(6) A wick oiler may be removed without disturbing the motor by unscrewing it in a counter-clockwise direction. Replace by turning in a clockwise direction.

(7) To replace a bearing wick remove the wick oiler as outlined in (6). Release the pressure from that part of the coil spring which holds the wick firmly. Replace the new wick and compress that portion of the spring that comes in contact with the wick. Replace the wick and cup, making sure that the wick does not bind and that it presses against the motor shaft.

3.03 Motor Contactors

(1) To replace the main contacts, turn the locking key one quarter turn or withdraw the cotter pin and remove the contacts. Replace old contacts with new contacts.

(2) To replace a complete contactor disconnect the leads, remove the mounting bolts, withdraw the contactor and replace with a new contactor, remount and reconnect the leads.

(3) Contactors of the type formerly used with KS-5016 and older KS-5117 regulators are now out of production and should be replaced with new low wattage contactors of the type furnished with KS-5468 regulators, except 110 volt a-c coils should be specified instead of low wattage d-c coils. The change from the old to the new contactor can readily be made by drilling new holes in the front of the panel for the mounting screws.

(4) Contacts are still available for KS-5016 and the older KS-5117 contactors and where only new contacts are required will prove more economical. Where a complete new contactor is required they should be replaced with the later design as furnished with KS-5468 units.

(5) Two exceptions to the above should however, be followed. Old type contactors (type 1282) should continue to be used on 25 and 50 cycle applications of KS-5016 and KS-5117 and on KS-5117 regulators having large motors in frame 325.

3.04 Reduction Gear Unit for Rheostat Motor

(1) To replace the open reduction gear unit, loosen the tapered pins that hold the pinion and gear to their respective shafts and remove the old pinion and gear. Replace the old pinion and gear with new parts making sure to align them properly when reassembling the unit. Make sure the tapered pins are driven in correctly and are tight.