

## KS-5639 DOUBLE COIL, MULTICONTACT CONTROL RELAY 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-5639 double coil, multicontact control relay. It also covers the approved procedures for replacing these parts.

1.02 Part 2 of this section covers the various parts which it is practicable to replace in the field in the maintenance of the control relay. 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.

### 2. PIECE-PART DATA

2.01 The figures included in this part show the various replacement parts in their

proper relation to other parts of the apparatus together with their corresponding names.

2.02 When ordering parts for replacement purposes, give the name of the part as shown in the figures of this section and also the nameplate data of the control relay for which the part is ordered including the manufacturer's name, and the KS specification and list number, voltage range of the coils and type of current, rating of contacts in volts (ac or dc) and amperes. For example, one contact spring for Struthers-Dunn double coil multicontact control relay KS-5639L1, coil voltage range 120-155 volts dc, contact rating 115 volts ac, 10 amperes. Do not refer to the section number.

2.03 Miscellaneous parts, such as nuts, washers, etc., which are not named in the figures and which cannot be obtained locally should be ordered by describing the part.

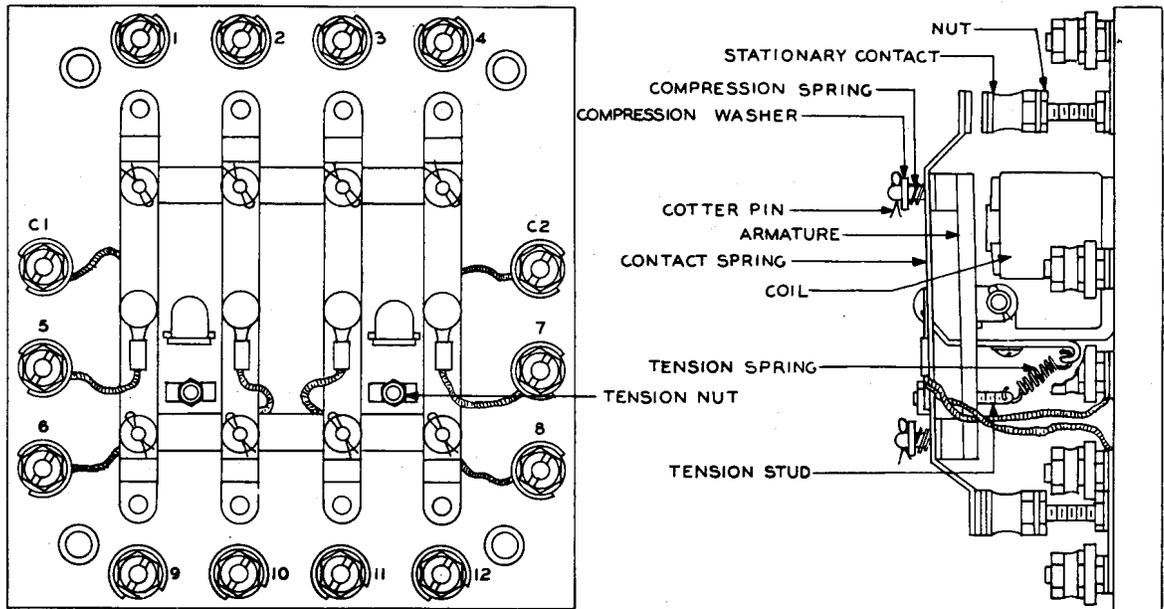


Fig. 1 - Control Relay (STRUTHERS-DUNN)

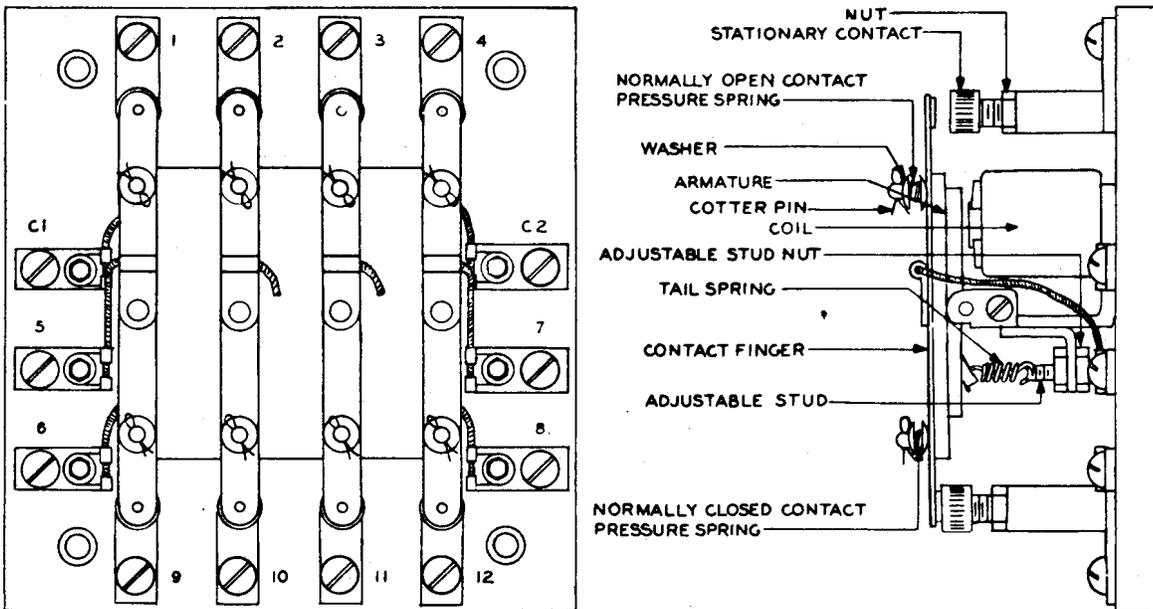


Fig. 2 - Control Relay (WARD LEONARD)

**3. REPLACEMENT PROCEDURES****3.01 List of Tools and Material**  
(Equivalents may be substituted)

Code or Spec No.	Description
<b>Tools</b>	
417A	1/4-inch and 3/8-inch Hex. Open Double-end Flat Wrench (2required)
-	4-inch Regular Screw-driver
-	6-1/2-inch P-long-nose Pliers
<b>Material</b>	
KS-7187	Bond Paper

**3.02 Caution: Use care when working in close quarters with live parts.**

Do not touch at the same time, live terminals or parts which are at different potentials, or otherwise short circuit them. Before making any replacements, be sure that service will be maintained by means of temporary wiring, making connections at the most convenient points in the circuit, or in some other suitable manner. Disconnect all power supply from the relay winding and contact circuits by opening switches, if provided, or by removing the fuse or fuses. Where it is not possible to remove the relay from the working circuit, bridge around con-

tacts, insulate between contacts with a strip of bond paper and disconnect leads, as necessary, in order to maintain circuit conditions unchanged.

3.03 After making any replacement of parts of a control relay, the part or parts replaced and other parts whose adjustments may have been directly disturbed by the replacing operations shall be checked and where necessary readjusted to meet the requirements outlined in Section 040-641-701 covering this apparatus.

3.04 No replacement procedures are specified for screws, nuts, and other parts where the replacement consists of a simple operation.

**Struthers-Dunn**

3.05 **Contact Spring - Moving Contacts:** (See Fig. 1 and 3.) To replace a moving contact, it is necessary to replace the complete contact spring which includes the moving contacts and the pigtail. To replace a contact spring, remove the cotter pins using the pliers, lift off the compression washers and the compression springs. Disconnect the pigtail from the terminal stud and remove the contact spring complete with the pigtail. Substitute the new contact spring and reassemble in the reverse order.

3.06 **Tension Spring:** (See Fig. 1 and 3) To replace the tension spring, remove the tension nut by raising the tension stud so the nut clears the stops and remove the nut. This will free the stud. Unhook the tension spring from the armature stop and the stud, using the pliers. Substitute the new tension spring and reassemble in the reverse order.

3.07 Stationary Contact: (See Fig. 1.) To replace a stationary contact, use the No. 417A wrench to turn the stationary contact in a counterclockwise direction and with another No. 417A wrench, hold the nut under the stationary contact. Remove the stationary contact. Install the new contact in the reverse order.

3.08 Coils: (See Fig. 1 and 3.) Mark and disconnect the coil leads from the terminal studs. With a screwdriver, dig out the sealing compound which covers the coil mounting screws in the rear of the base. Remove both coil mounting screws. This will free the armature, frame, armature stop, and the four contact springs as a unit. The coils will also be free. Remove the coil. Disconnect the coils from each other. Lift out the center core from the old coil. Insert the core in the new coil and reassemble in the reverse order.

3.09 Armature: (See Fig. 1 and 3.) To replace the armature, remove all contact springs as outlined in 3.05 except it may not be necessary to remove the pigtailed from the terminal studs. Release the tension spring at the end nearest the armature as outlined in 3.06. Remove or release the armature pivot pin or screw. Substitute the new armature and reassemble in the reverse order.

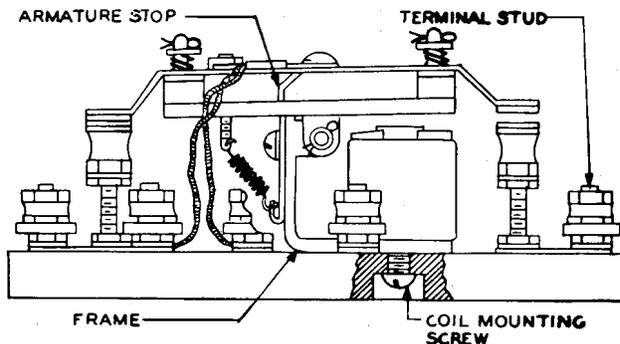


Fig. 3 - Control Relay (STRUTHERS-DUNN)

#### Ward Leonard

3.10 Contact Finger - Moving Contacts: (See Fig. 2.) To replace a moving contact, it is necessary to replace the complete contact finger which includes the moving contacts and the pigtail. To replace a contact finger, remove the cotter pins using the pliers, lift off the washers and the contact pressure springs, disconnect the pigtail from the terminal, and remove the contact finger complete with the pigtail. Substitute the new contact finger and reassemble in the reverse order.

3.11 Tail Spring: (See Fig. 2.) To replace the tail spring, unscrew the adjustable stud nut from the adjustable stud. This will release the adjustable stud. Unhook the tail spring at both ends, using the pliers. Substitute the new tail spring and reassemble in the reverse order.

3.12 Stationary Contact: (See Fig. 2.) To replace a stationary contact, loosen the nut with the No. 417A wrench and unscrew the stationary contact. Substitute new part.

3.13 Coils: (See Fig. 2.) Mark and disconnect the coil leads from the terminals. Remove the bottom tail spring adjustable stud nuts. Disconnect all pigtail leads from the terminals. Remove the armature pivot pins. Armature and contact finger assembly can now be removed from the relay. Remove the cotter pins and core washers from the cores. Slip coils out. Replace the new coil (or coils) and reassemble in the reverse order.

3.14 Armature: (See Fig. 2.) To replace the armature remove all contact fingers as outlined in 3.10 except it may not be necessary to remove the pigtailed from the terminals. Release the tail spring at the end nearest the armature as outlined in 3.11. Remove or release the armature pin or screw. Substitute the new armature and reassemble in the reverse order.