KS-15519
CONTROL RELAYS
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-15519 control relays. This section also covers procedures for replacing these parts.

1.02 This section is reissued to add information on replacing pigtails associated with movable contacts; to remove the procedure for maintaining service; to add a definition of information enclosed in parentheses; to remove the procedure for replacing the relay armature and frame assembly; and to revise Fig. 1 and the list of tools and materials.

1.03 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 an explanatory figure showing the different parts. This information is called Replacement Parts.

1.04 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.

1.05 Abbreviation NO contact signifies normally open contact. Abbreviation NC contact signifies normally closed contact.

2. REPLACEMENT PARTS

2.01 The figure included in this part shows 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 figure of this section and also the nameplate data of the control relay for which the part is ordered, including the manufacturer's name, the KS- specification and list number, voltage range of the coil and type of current, and rating of contacts in volts (ac or dc) and amperes. For example, one NO movable contact finger for the Auomatic Switch Company KS-15519, List 1 control relay, coil voltage range 180-253 volts ac, 60 cycles, contact rating 230 volts, 60 cycles ac, 5 amperes. Do not refer to the BSP number or to any information in parentheses following the name of the part.

2.03 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.

2.04 Miscellaneous parts, for example, screws, nuts, etc, which are not named in the illustrations and which cannot be obtained locally should be ordered by describing the part and giving the complete nameplate data as referred to in 2.02.

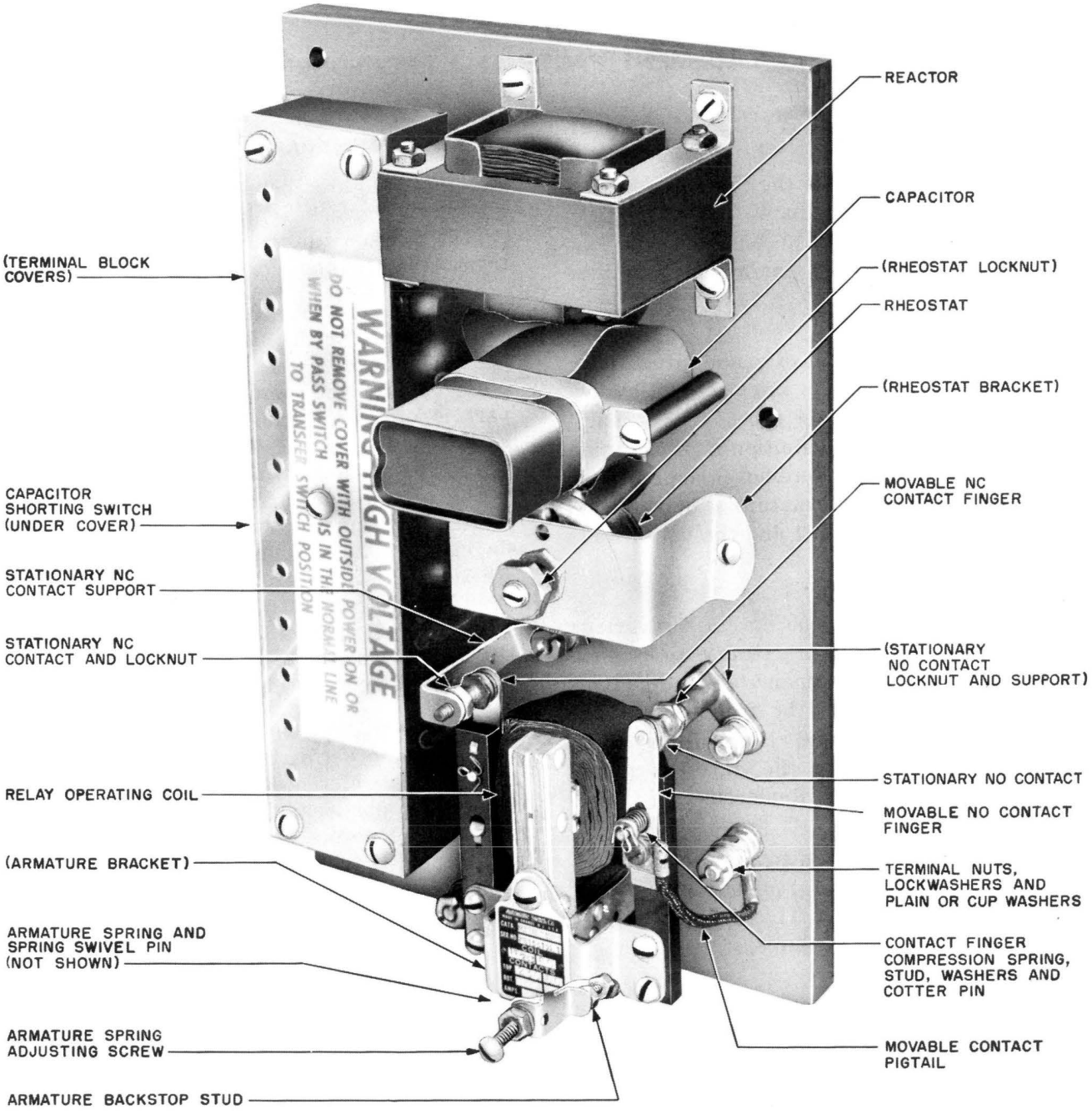

Fig. 1 – KS-15519 Relay

3. REPLACEMENT PROCEDURES

3.01 *List of Tools and Materials*

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
417A	1/4- and 3/8-Inch Hex. Open Double-End Flat Wrench
418A	7/32- and 5/16-Inch Hex. Open Double-End Flat Wrench
KS-7139	Diagonal Pliers
R-1542	Adjustable Wrench
—	Long-Nose Pliers
—	3-Inch C Screwdriver
—	4-Inch E Screwdriver (or the replaced 4-inch regular screwdriver)
MATERIALS	
KS-2423	Cotton Twill Cloth
KS-14090	Gray Plastic Adhesive Tape

3.02 ***Caution: Before making any replacement of parts, the high voltage should be removed from the contact terminals when present. To shut off high voltages, refer to the sections covering the associated control equipment. After replacing any of the parts, restore the circuit to service.***

3.03 After making any replacement of parts of a control relay, the part or parts replaced shall meet the readjust requirements involved, as specified in Section 040-669-701. Other parts whose adjustments may have been directly disturbed by the replacing operations shall be checked. The readjust requirements and an overall operation check shall be made of the relay before restoring the circuit to service.

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

3.05 Whenever it is necessary to disconnect leads, care should be taken to mark or record the position of the leads to facilitate their correct replacement.

3.06 ***Relay Movable Contacts and NC and NO Relay Contact Fingers:*** To replace a relay movable contact, it is necessary to replace the relay contact finger, which includes the contact. To replace a NO relay contact finger, remove the screw and washer which fastens the pigtail terminal to the contact finger using the 3-inch C screwdriver. With the long-nose pliers, remove the cotter pin including the washers, compression spring, and stud and remove the contact finger. If the NC relay contact finger is to be replaced, the finger must be removed from its mounting block and turned over before the screw which fastens the pigtail terminal to it can be removed. Replace the finger and reassemble in the reverse order. When replacing a contact finger, replace the associated pigtail using the 417A wrench to disconnect the pigtail from the terminal nut.

3.07 ***Relay Stationary Contacts:*** Note the amount the stationary contact to be replaced projects beyond the contact support. With the 417A wrench, loosen the nut. Remove the contact with the 417A wrench. Assemble the nut on a new contact with the lockwasher, and insert the contact in the contact support so that an amount approximately equal to the amount noted above projects beyond the contact support. While holding the contact with one 417A wrench, securely tighten the nut with another 417A wrench.

3.08 ***Relay Operating Coils:*** To replace a relay operating coil, remove the terminal block covers and disconnect the coil leads using the 4-inch E screwdriver. To gain access to the armature pivot pin, remove the screw and lockwasher which fastens the armature bracket to the armature. Remove the pivot pin by pulling it out. If it resists being pulled out, its removal can be aided by tapping it lightly with the side of the long-nose pliers. Allow the armature to be held by the armature spring. Bend the coil clamp strip outward with the pliers, holding the coil to the frame. Remove the coil, taking care not to lose the fish-paper insulator and the bakelite wedge. Replace the coil and reassemble in the reverse order. Do not change any adjustments.

3.09 ***Relay:*** To replace the relay, remove the terminal block covers and disconnect the relay operating coil leads using the 4-inch E screwdriver. With the 417A wrench, discon-

nect the movable contact pigtails from their respective terminal stud in the base. The mounting screws which fasten the relay part to the base are located on the underside of the base. With the blade of the screwdriver, dig out the compound in the mounting screw holes and remove the mounting screws. Save the pieces of compound which were removed, as they can be pressed back in the holes after the replacement operation is finished. Replace the relay and reassemble in the reverse order. Reconnect all leads to their respective terminals.

3.10 ***Reactor:*** To replace a reactor, remove the terminal block covers using the 4-inch E screwdriver to remove the mounting screws. Note the color of each reactor lead and the designation of the terminal to which it is connected and disconnect them from the terminal block. If the leads of the replacement reactor are not equipped with terminal lugs, it will be necessary to unsolder the terminal lugs from the leads of the reactor to be replaced and solder them on the leads of the replacement reactor. Use the KS-7139 pliers to skin the leads for soldering. Remove the reactor mounting screws and washers, using the screwdriver. Replace the reactor and mount it to the base with the mounting screws and washers. Connect the reactor leads to their respective terminals on the terminal block. Reassemble the terminal block covers in the reverse order.

3.11 ***Rheostat:*** To replace a rheostat, remove the terminal block covers and rheostat bracket mounting screws using the 4-inch E screwdriver. Note and disconnect the rheostat and capacitor leads from the terminal block terminals. Remove the capacitor mounting strap and mounting screws using the screwdriver and →the 418A wrench, and disconnect the rheostat lead from the capacitor terminals using the 417A wrench. If the replacement rheostat is not equipped with leads or terminal lugs, unsolder the leads or terminal lugs from the rheostat to be replaced and solder them to the replacement rheostat. Use the KS-7139 pliers to skin the leads for soldering and insulate soldered connections →with KS-14090 adhesive tape. If the replacement rheostat is not equipped with a mounting bracket, remove the bracket from the rheostat to be replaced using the R-1542 wrench to remove the locking nut and mounting nut and assemble the replacement rheostat to the bracket. Connect the rheostat lead to the capacitor and connect the rheostat leads and capacitor lead to the terminal block as previously wired. Fasten the rheostat assembly and capacitor to the base and reassemble the terminal block covers using the 4-inch E screwdriver.

3.12 ***Capacitor:*** To replace a capacitor, remove the capacitor mounting strap and mounting screws using the 4-inch E screwdriver →and the 418A wrench. Remove the insulating material which is wrapped around the capacitor and lift up the capacitor to gain access to its terminals. Note the position of the leads and disconnect them from the capacitor using the 417A wrench. Connect the leads to the new capacitor and reassemble all parts in the reverse order.

3.13 ***Capacitor Shorting Switch:*** With the 4-inch E screwdriver, remove the terminal block covers and remove the fixed and movable contact spring of the switch. Reassemble the new springs and terminal block covers in the reverse order.