

INSTRUCTIONS

CR9503 SOLENOIDS FOR A-C AND D-C SERVICE

CR9503 SOLENOID CAT. _____ AGREES WITH FIG. _____ OF THESE INSTRUCTIONS. WHEN THIS SOLENOID IS USED ON _____ VOLTS D-C THE SOLENOID COIL MUST BE CONNECTED IN SERIES WITH A RESISTOR FOR _____ OHMS.

INTRODUCTION

These solenoids are usually mounted on the apparatus which they operate. The end of the solenoid in which the plunger operates is always the bottom of the solenoid regardless of how the solenoid is mounted, and the opposite end is the top.

Cutout switches are mounted on the solenoids for d-c service to insert resistance in the coil circuit and for an external relay circuit, when required for a-c service.

The following instructions should be followed if it is necessary to assemble or disassemble the solenoid.

ASSEMBLING AND DISASSEMBLING

In order to present the instructions for assembling CR9503 solenoids, the solenoids are divided into five classes, as follows:

Class 1 consists of the CR9503-207E and -208D solenoids, Fig. 1.

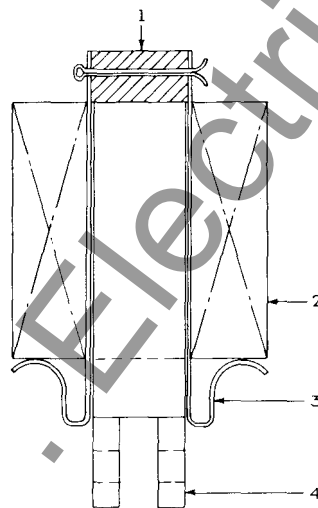


Fig. 1. CR9503-207E and -208D solenoids

Class 2 consists of the CR9503-209C solenoid, Fig. 2.

Class 3 consists of CR9503-210B, -210C and -211E solenoids, Fig. 3.

Class 4 consists of the CR9503-206B and -211E solenoids with cutout switch, Fig. 4.

Class 5 consists of the CR9503-212A, -213A, -214A and -215A solenoids, as shown in Fig. 5.

CLASS 1 (SEE FIG. 1)

Solenoids in Class 1 consist of a frame (1), a plunger (4), a coil (2), and two combined guide and coil spring clips (3). To disassemble, remove the plunger, cotter key, and spring guides in the order named; the coil may then be removed.

To assemble, first place the coil in the frame; then insert the two spring guides and fasten with the cotter key.

CLASS 2 (SEE FIG. 2)

Solenoids in Class 2 consist of a frame (2), a plunger (6), a coil (3), two springs (4), two plunger guides

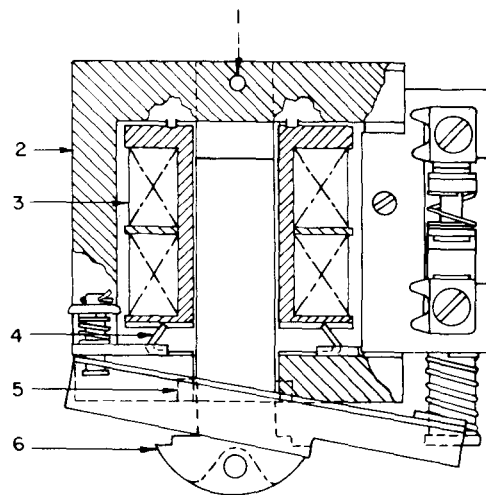


Fig. 2. CR9503-209C solenoid with cutout switch

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

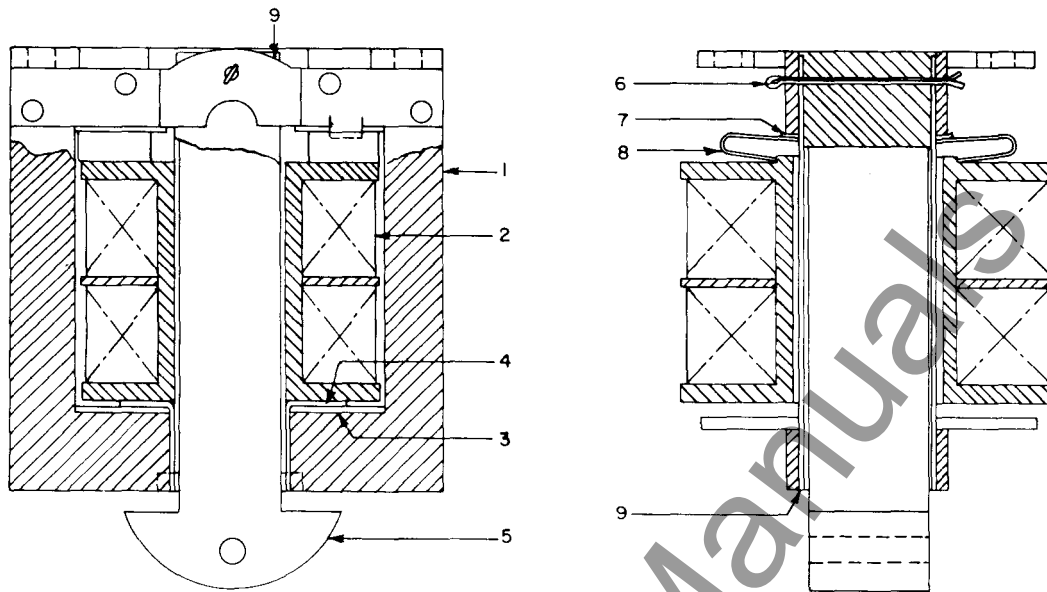


Fig. 3. All forms of CR9503-210B, -210C and -211E solenoids

(5), a cotter key (1), and, if required, a cutout switch. To disassemble, remove the plunger, cotter key, plunger guides and coil springs, in the order named.

To assemble, put the coil in the frame, assemble the coil springs, and then the plunger guides. Fasten the guides with the cotter key. If the solenoid is of the push-pull type, guides (5) and cotter key (1) are omitted.

CLASS 3 (SEE FIG. 3)

Solenoids in Class 3 consist of a frame (1), a plunger (5), a coil (2), two plunger guides (9), two angle

guides (4), insulation (3), two springs (8), two coil-spring insulating pieces (7) and a cotter key (6).

To disassemble, remove the plunger, the cotter key, the plunger guides, and the angle guides.

To assemble, invert the solenoid and assemble the insulating pieces (7) and springs (8) as shown in Fig. 3. Locate the coil on top of the springs, and assemble angle guides (4) and plunger guides (9) in the slots provided. Fasten the assembly with the cotter key (6). If the solenoid is of the push-pull type, guides (9) and cotter key (6) are omitted. If cutout switch is used, assemble it as shown in Fig. 4.

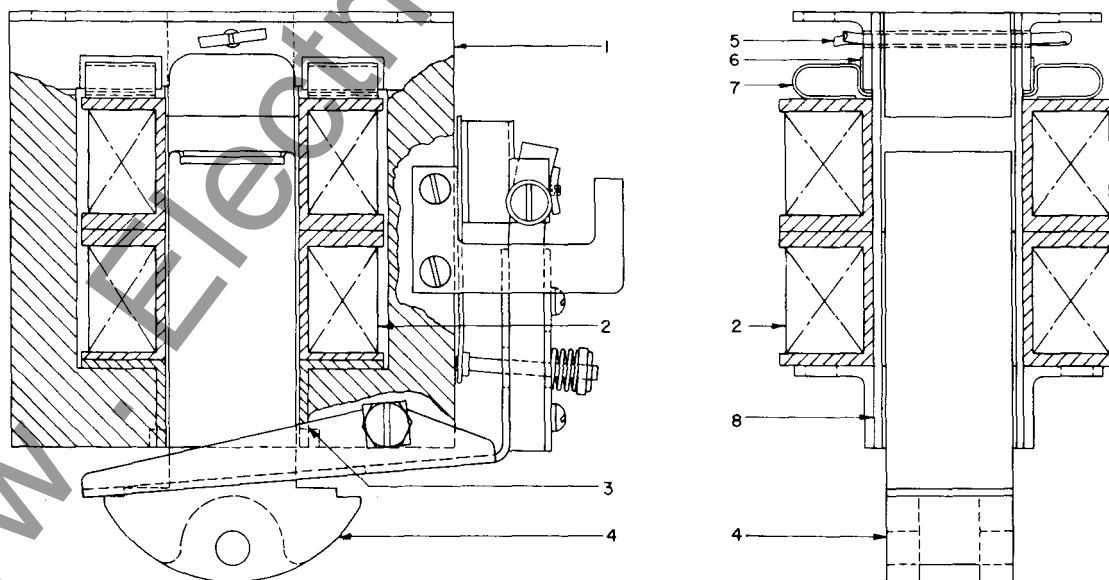


Fig. 4. CR9503-206B and -211E solenoids with cutout switch

CLASS 4 (SEE FIG. 4)

Solenoids in Class 4 consist of a frame (1), a plunger (4), a coil (2), two insulation pieces (6), two springs (7), two plunger guides (8), two angle guides (3), and a cotter key (5).

To disassemble, remove the plunger, cotter key, plunger guides, and angle guides in the order named.

To assemble, invert the solenoid and locate insulation pieces (6) and springs (7) as shown in Fig. 4. Place the coil on top of the springs and assemble the angle guides (3) and plunger guides (8). Fasten with cotter key (5). If the plunger is of the push-pull type, guides (8) and cotter key (5) are omitted.

CLASS 5 (SEE FIG. 5)

Solenoids in Class 5 consist of a frame (4), a plunger (8), two coils (5), two insulation pieces (2), two springs (3), two angle guides (6), two plunger guides (7), and cotter key (1).

To disassemble, remove the plunger, cotter key, plunger guides, and angle guides in the order named.

To assemble, invert the solenoid frame and locate the insulation pieces (2) and springs (3) as shown in Fig. 5. Place the two coils with the projections interlocked on top of the springs. Assemble the angle guides and plunger guides and fasten with the cotter key. If the solenoid is of the push-pull type, guides (7) and cotter key (1) are omitted. If a cutout switch is used, assemble it as shown in Fig. 5.

COILS

Fig. 1 to 5 show the normal position of the solenoids. When installing coils, make sure that the

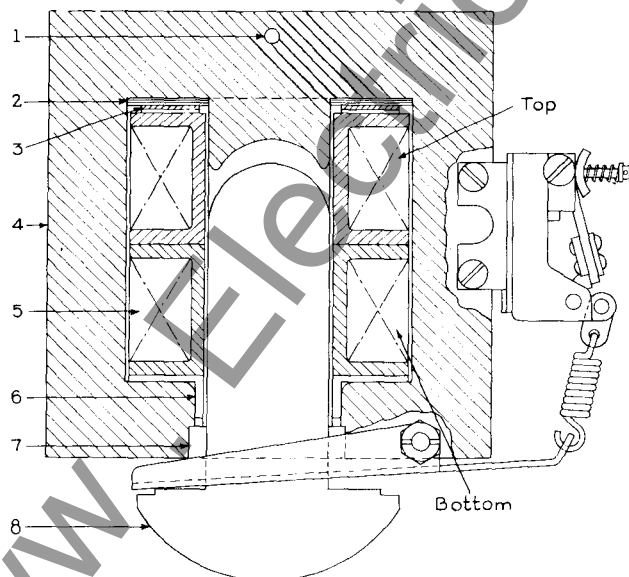


Fig. 5. CR9503-212A, -213A, -214A and -215A solenoids with cutout switch

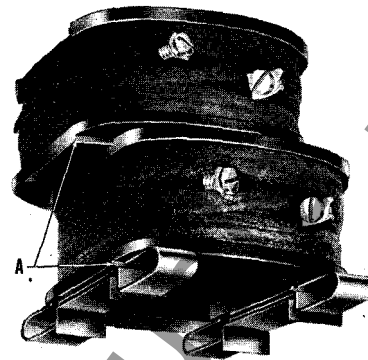


Fig. 6. Coil assembly for CR9503 solenoids

projections A, Fig. 6, are on top. These projections are used for centering the coil.

When two coils are used, as shown in Fig. 6, the specification numbers stamped on the solenoid nameplate indicate which is the top and which is the bottom coil. The end in which the plunger operates is always the bottom of the solenoid. It is very important that these coils are properly installed, especially when two coils are used and when a single coil having a terminal in the center is used. They have different windings, and if the coils are reversed in position one section may burn out or the pull curve may be affected.

Coil connections are shown as follows:

SOLENOID	FIG. NO.
CR9503-206	9 a, 10 a, b, and c
CR9503-207	7 a
CR9503-208	7 a
CR9503-209	7 a, b, c, and d
CR9503-210	7 a
CR9503-211	7 a, 8 a, b, and c
CR9503-212	9 a, b, c, d, and e
CR9503-213	9 a, b, c, d, and e
CR9503-214	9 a, b, c, d, and e
CR9503-215	9 a, b, c, d, and e

OPERATION

On a-c circuits the plunger picks up and seals when the coil is energized. The coil will burn out unless the plunger properly seals.

On d-c circuits the pick-up coil picks up the plunger and, just before it seals, the switch opens and inserts the holding coil in series with the pick-up coil. In

single-coil solenoids for d-c, the coil may be divided into two sections functioning as though they were two coils or if a single-section coil is used a resistor is inserted in series with the coil after the plunger seals.

CARE OF A-C SOLENOIDS

The noise level on a-c solenoids can, in many cases, be improved by a periodic cleaning of the sealing surfaces (that is, the surface of the end of the plunger

and the surface of the seat against which the end of the plunger comes in contact).

RENEWAL PARTS

When ordering renewal parts refer to the nearest Sales Office of the General Electric Company, giving the complete nameplate rating of the solenoid. Coils can be ordered by the specification number stamped on the end of the spool.

CONNECTIONS OF CR9503-207, -208, -209, -210 AND -211 SOLENOIDS

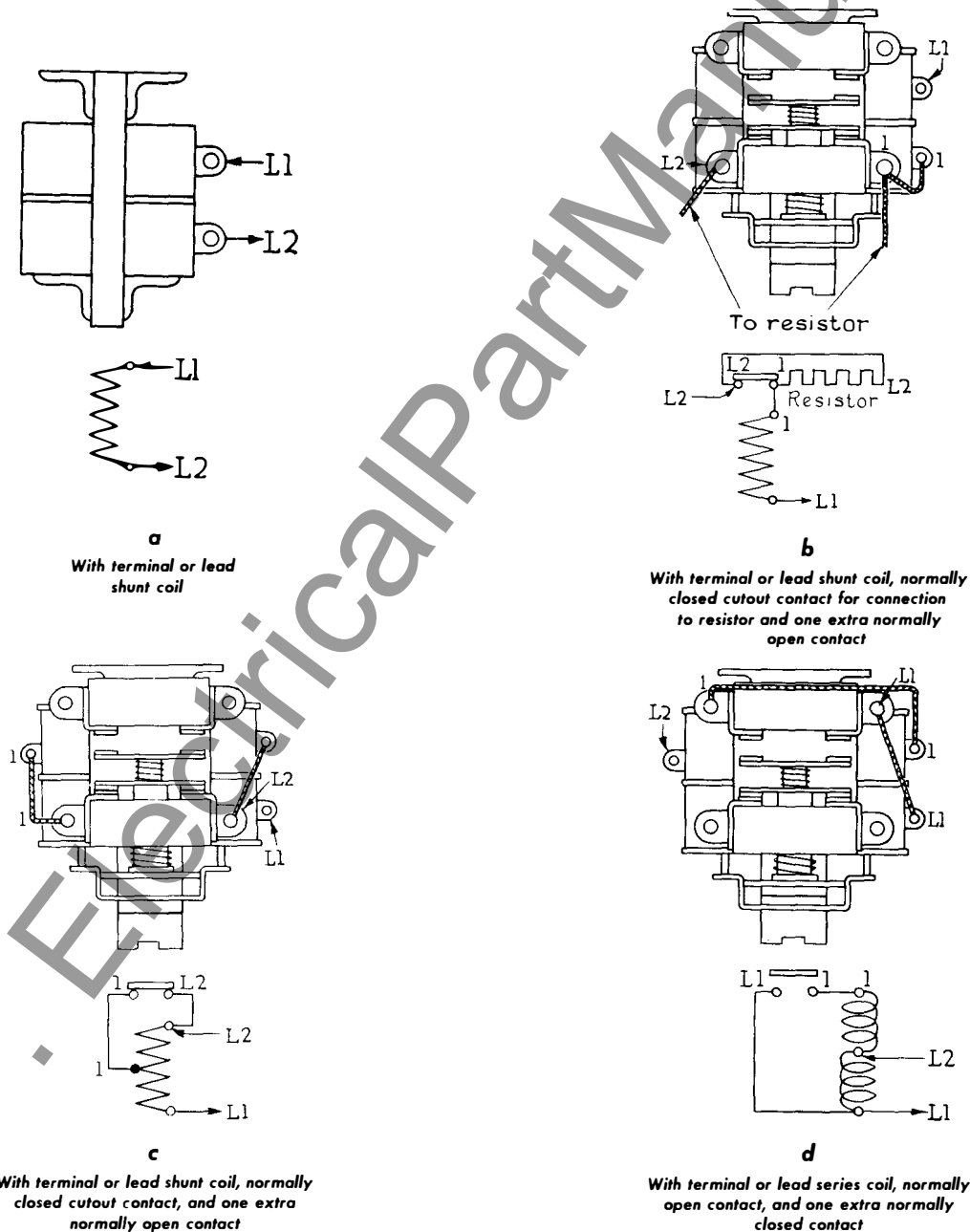
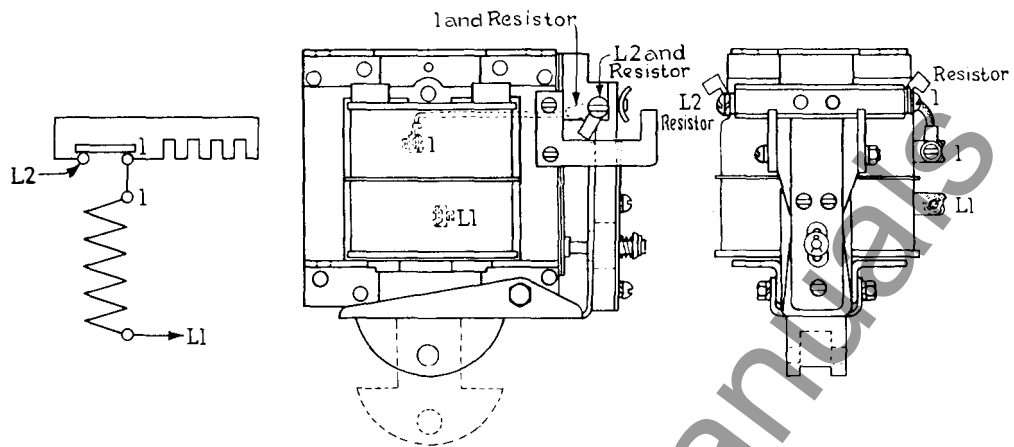


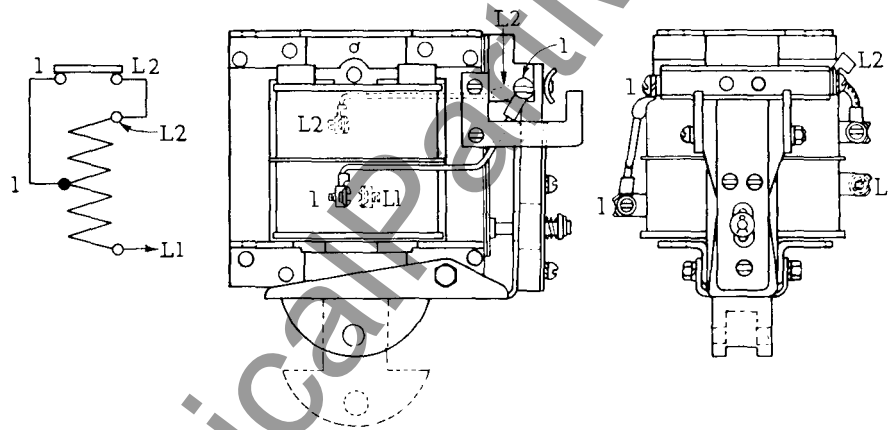
Fig. 7

CONNECTIONS OF CR9503-211 SOLENOIDS



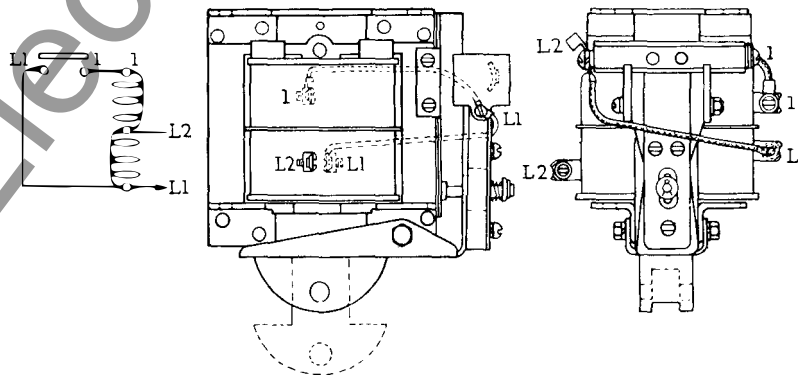
a

With terminal or lead shunt coil and normally closed cutout switch for connection to resistor



b

With terminal or lead shunt coil and normally closed cutout switch



c

With terminal or lead series coil and normally open switch

Fig. 8

CONNECTIONS OF CR9503-206, -212, -213, -214, AND -215 SOLENOIDS

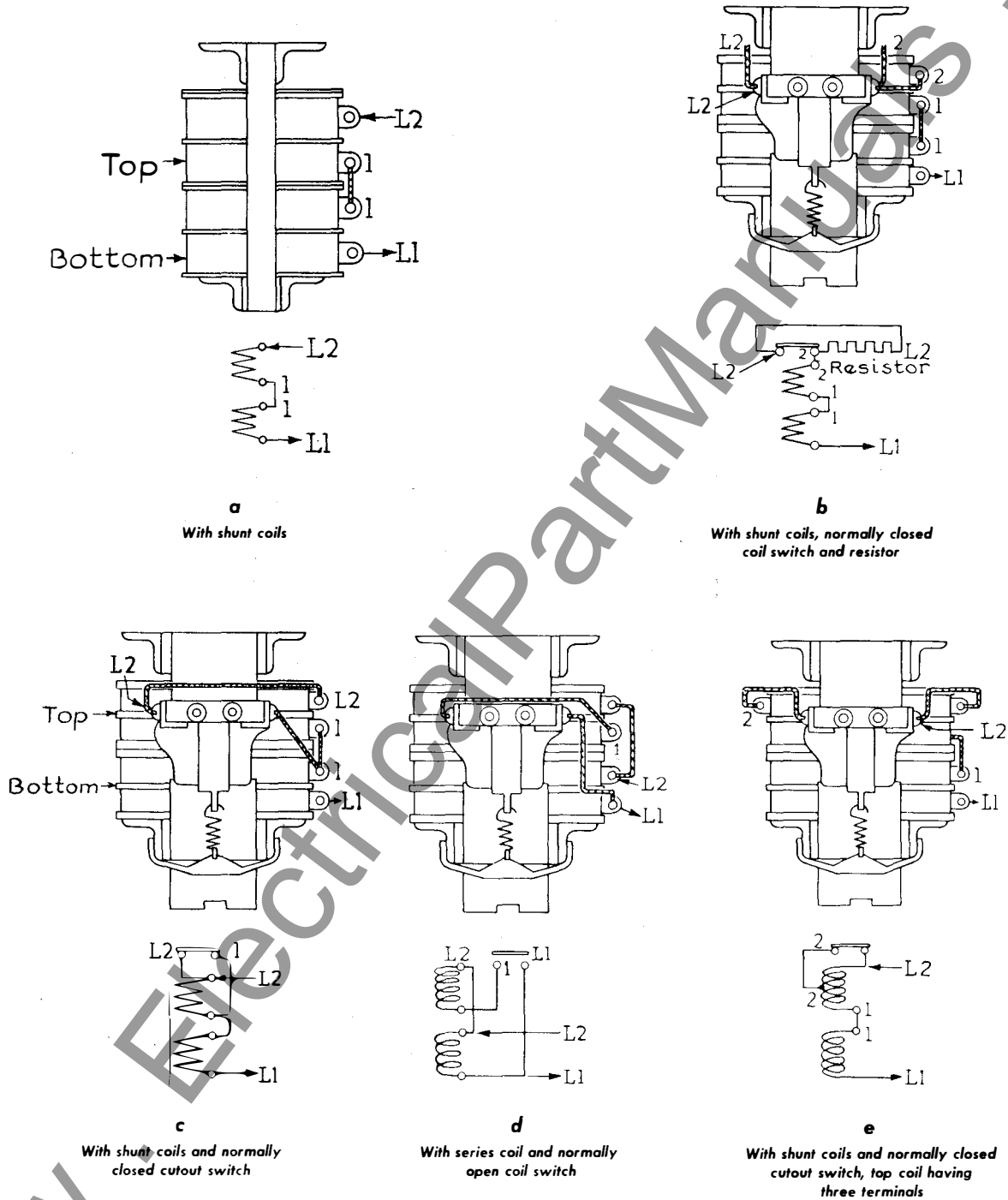
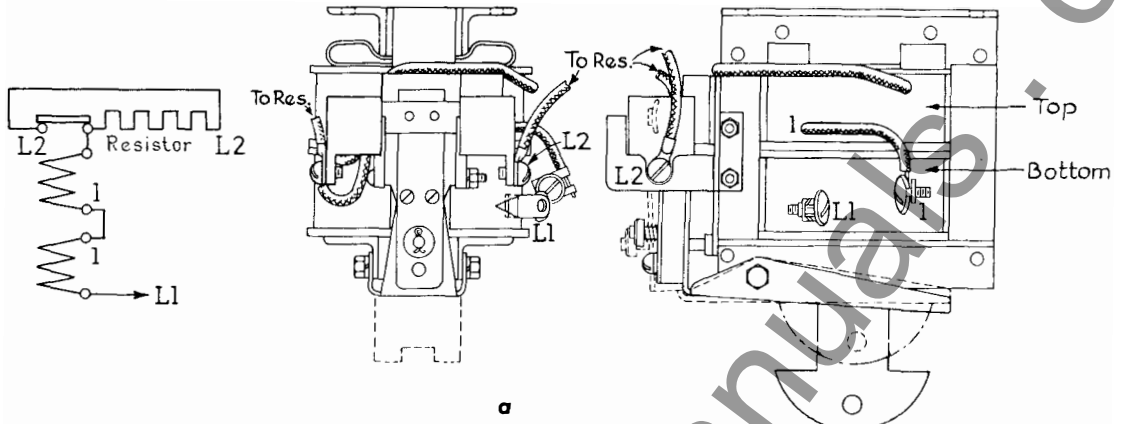
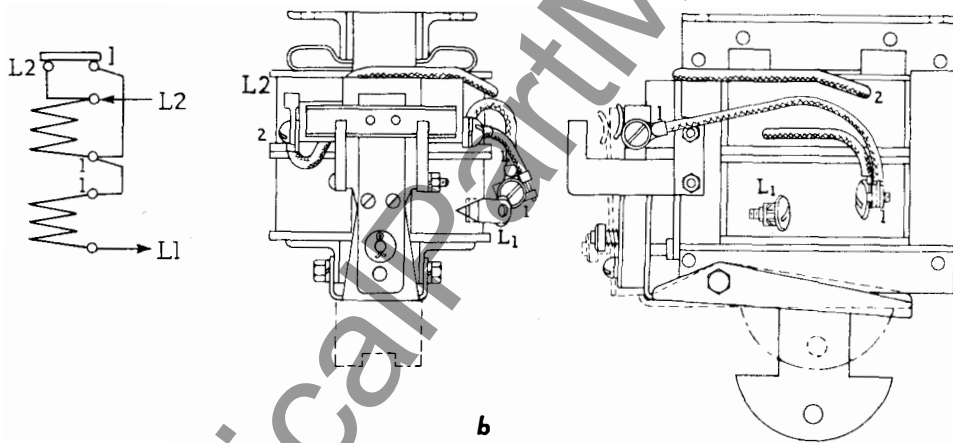


Fig. 9

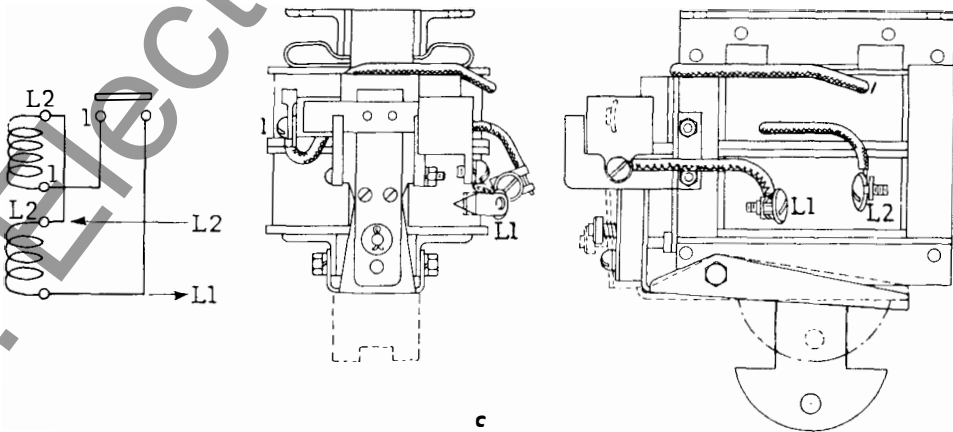
CONNECTIONS OF CR9503-206 SOLENOIDS



a
 With terminal or lead coil, and normally closed cutout switch for connection to resistor



b
 With terminal or lead shunt coil and normally closed cutout switch



c
 With terminal or lead series coil and normally open switch

Fig. 10

GENERAL PURPOSE CONTROL DEPARTMENT

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