Instructions for Type MW-31 and 41 Side Mounting 3rd Overload Relay Kit for Starters --- Sizes 3 and 4

I.L. 13077

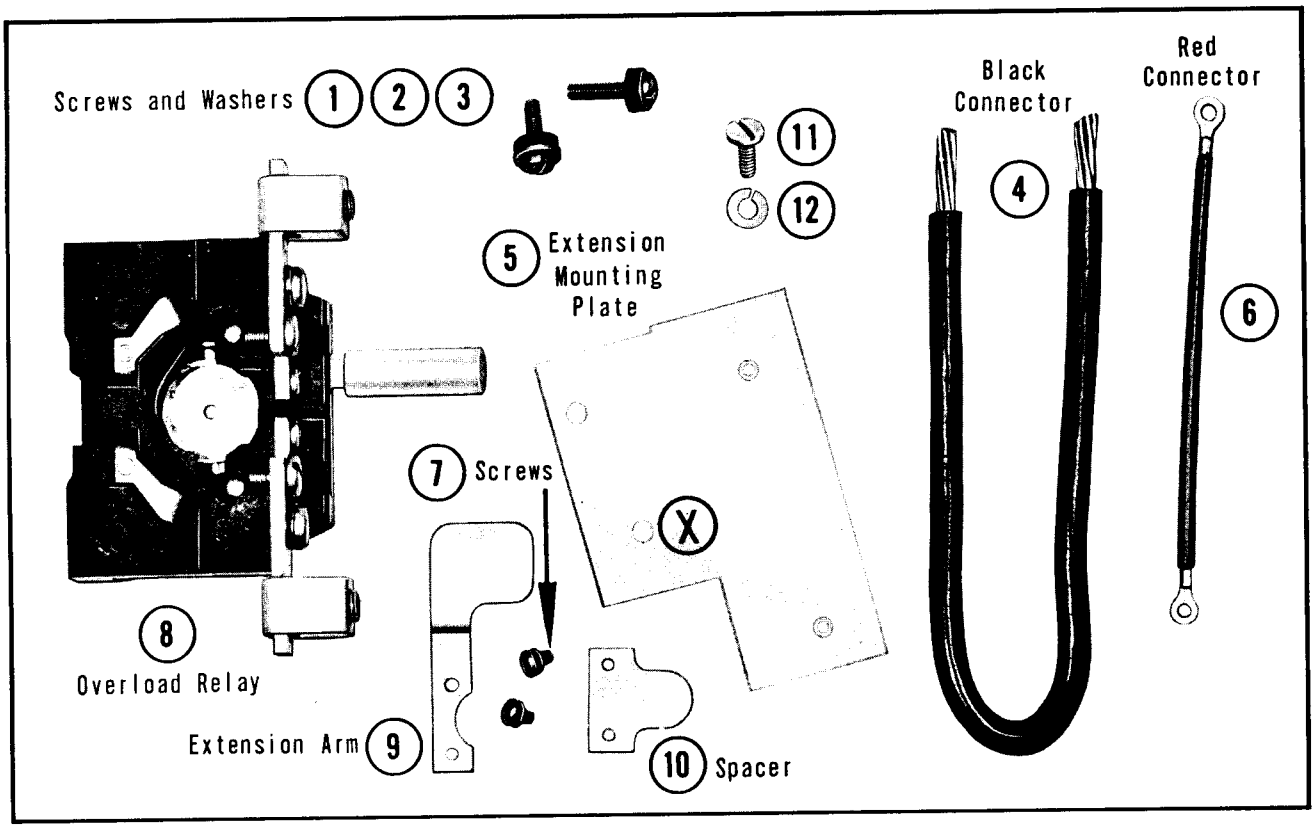

Figure 1. Component Parts of 3rd Overload Relay Kit

MATERIAL

(1) Pan Screw
(2) Washer
(3) Washer (Neoprene)
(4) Connector (Black)
(5) Extension Mounting Plate
(6) Connector
(7) Pan Screw and Washer
(8) Overload Relay MW-31 or MW-41
(9) Extension Arm
(10) Spacer
(11) Screw
(12) Lockwasher

Installation

1. Remove starter from enclosure.
2. Referring to Figs. 2 and 3, disconnect wires to right hand overload relay as follows:
   a. Disconnect strap at point "A".
   b. Disconnect wire "H" at point "K" and wire "C" at point "L".
3. Remove right hand overload relay from starter by removing two mounting screws. Cut away insulation plate to first score mark. Using screw and lockwasher (11) and (12) place screw (11) thru clearance hole ("X" in Fig. 1) in extension mounting plate (5) and screw into middle tapped hole in main base.
4. Using the overload relay removed in Step 3, mount relay on starter and extension mounting place using original screws. These screws will go thru the clearance holes in the overload relay, thru the clearance hole in the extension mounting plate and into the tapped holes in the main base.
5. Mount overload relay (8) with screws (1), (2) and (3) following the same procedure as outlined in Step 4. See Figure 4. Note: This relay is connected in load lead T2 so

Effective June, 1963 Supersedes I.L. 12633, dated September, 1960

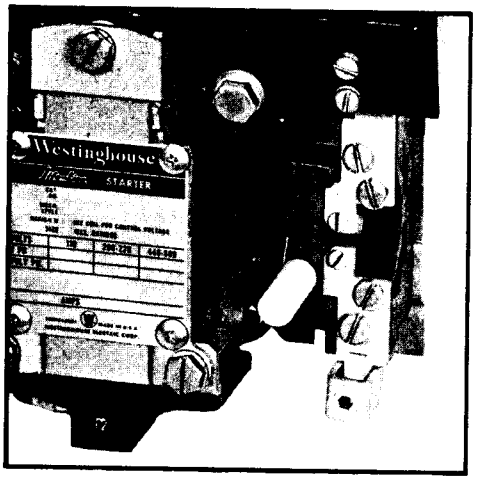

Figure 2. Starter Before Conversion

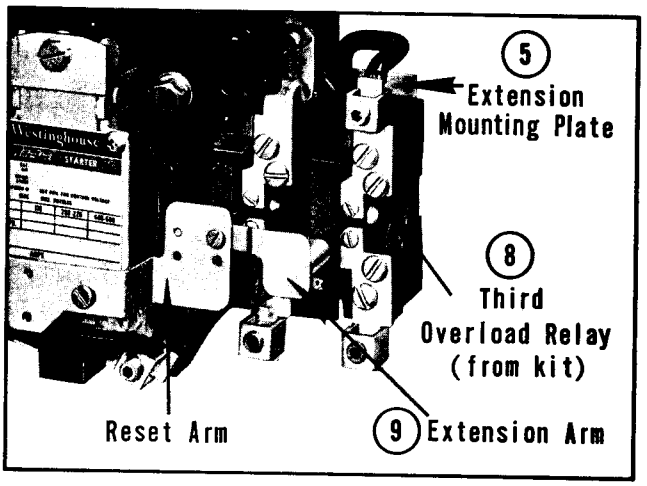

Figure 4. Relays Mounted on Extension Mounting Plate. Extension Arm in Place.

that line sequence is now T1, T3, T2 instead of T1, T2 and T3.

6. Reconnect strap at point "A". Reform wire "C" and connect to point "D". Reconnect wire "H" to point "K". See Figure 3.

7. Using the connectors (4) and (6) from kit (see Figure 1), connect 4 from point "E" to "F". Connect 6 from point "L" to "G" as shown in Figs. 3 and 5.

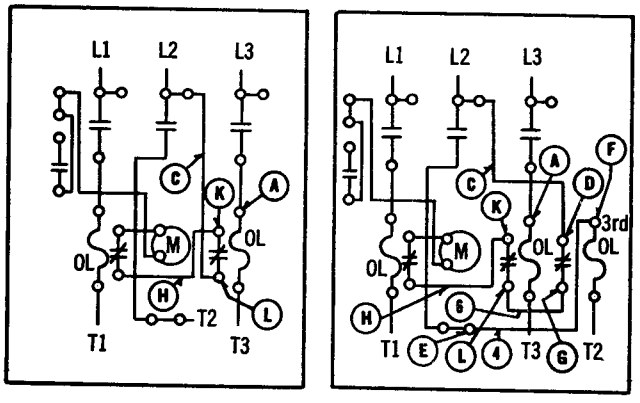

Figure 3. Wiring Diagram-Before Conversion
Wiring Diagram-After Conversion

8. Take extension arm (9) from kit (see Figure 1) and mount on reset arm as shown in Figure 4 using screw (7) from kit. Add spacer (10) under reset arm on left hand side with screw (7) as shown in Figure 5.

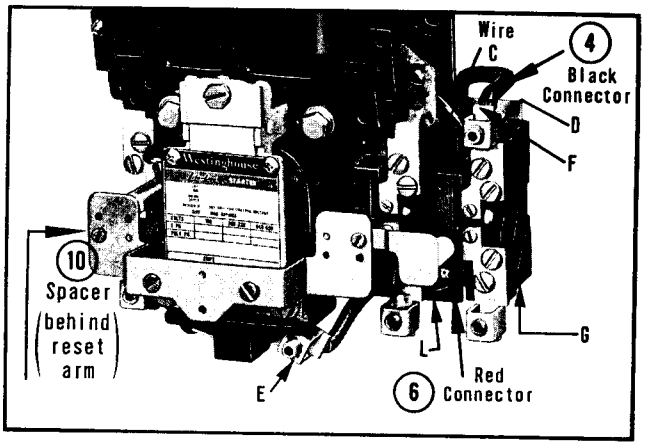

Figure 5. Completed Conversion

Heaters

Each heater is identified by a code marking stamped on one terminal near the mounting hole. The Heater Application Table indicates the range of full load current to which a given heater may be applied. This range is so selected that the current to produce ultimate tripping of the relay will be approximately 115% to 125% of the rated motor current.

The current rating of the relay (see Heater Application Tables K and N) is based on an ambient temperature of 40°C. For protection of the motor when it and the relay are operated in a common ambient

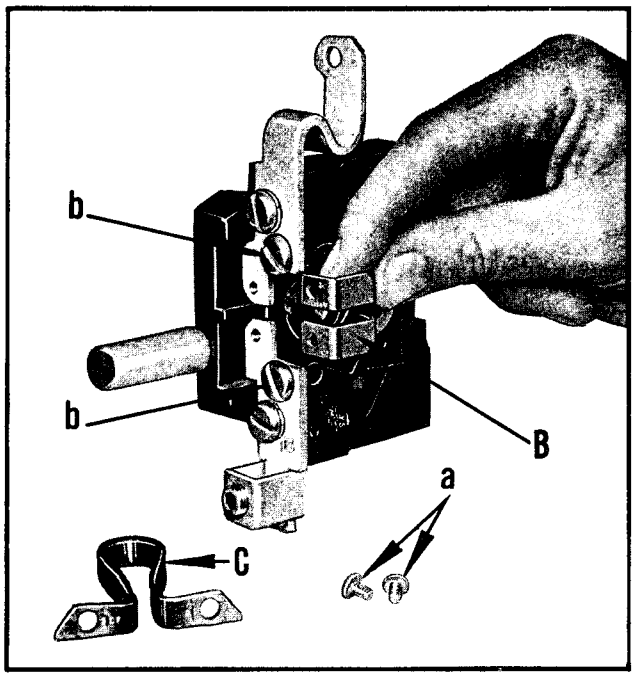

Figure 6. Install Heater "B" in the Relay, Using Small Screws "a" Threaded Into Holes or Install Heater "C" Using Larger Screws "b". Be sure the Looped Portion Enters the Recess in the Relay.

temperature, heaters should be applied according to Heater Table for average applications. When the room temperature surrounding the motor exceeds that at the starter, assume a decreased motor current of 1% for each degree C. difference in temperature and select heaters accordingly. When the room temperature at the starter exceeds that at the motor, assume an increased motor current of 1% for each degree C. difference in temperature and select heaters accordingly.

Confining the relay in a small space, such as a starter cabinet, with other apparatus which produces heat will raise its ambient temperature, affecting its tripping value. Heater Application Tables P and S are for use with enclosed starters when the ambient temperature within the cabinet and immediately surrounding the relay is above the ambient temperature in which the motor operates.

Description

Type MW Thermal Overload Relays are used in linestarters and control panels to provide overload protection for motors. Overload protection is obtained by a bi-metallic, snap-action disc consisting of two dissimilar metals laminated together and pressed into a concave disc. When heated to a predetermined temperature by a heating element, the disc snaps to its convex position, opening the contacts and stopping the motor. When the disc cools, it snaps back to its original position. Attempted reset during this cooling period will not damage the relay. With a proper choice of heaters, the relay may be used on a-c or d-c circuits of from 14.2 to 173 amperes at not more than 600 volts. The relay contacts will carry and break currents in the contactor coil up to 2 amperes in an a-c circuit and 50 volt-amperes at a maximum of 1 ampere in a d-c circuit.

The relay will provide protection against abnormal load conditions to current values exceeding locked rotor current. In accordance with the National Electric Code the relay should be protected against short circuits by fuses rated at not more than four times the rated motor current, or by a time limit circuit breaker set at not more than four times the rated motor cur-

Operation

The relay is designed to operate the contacts in any one of three positions, "Auto", "Hand" and "No Stop". The position of the control spring in the notched push-rod controls the action of the push-rod.

When the spring is in the "Hand" position at the time the bi-metal snaps open the contacts, the "Reset-Stop" push-rod moves to engage and retain the contacts in the open position. After the disc has cooled, the push-rod may be depressed to reset the contacts to the closed position. The push-rod may also serve as a stop button by depressing it further to open the contacts.

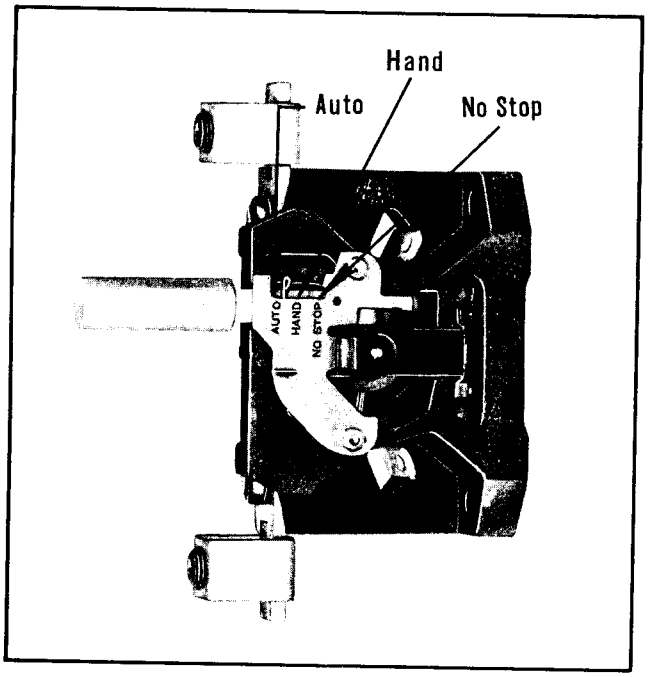

Figure 7. Control Spring Positions

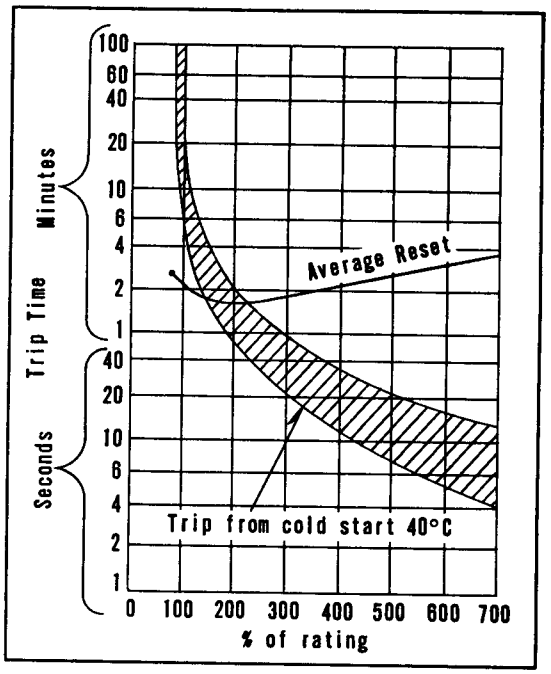

Figure 8. Average Time Current Curve

The "No Stop" position of the spring is similar to the "Hand" position except that the push-rod cannot be depressed as a stop button. When the spring is in the "Auto" (Automatic) position, the push-rod is prevented from holding the contacts in the open position, hence, when the disc cools off, the contacts will automatically close and re-energize the circuits. The push-rod again may serve as a stop button.

HEATER APPLICATION TABLE

HEATERS		OPEN				LARGE ENCLOSURES				UNIT ENCLOSURES			
CODE MARKING	STYLE NUMBER	MW-31 Table K I.S. 12819	FULL LOAD CURRENT OF MOTOR 125% Overload Protection AMPERES	CURRENT RATING AT 40°C ROOM TEMP. AMPERES	MW-41 Table N I.S. 12822	MW-31 Table L I.S. 12820	FULL LOAD CURRENT OF MOTOR 125% Overload Protection AMPERES	CURRENT RATING AT 40°C ROOM TEMP. AMPERES	MW-41 Table P I.S. 12823	MW-31 Table M I.S. 12821	FULL LOAD CURRENT OF MOTOR 125% Overload Protection AMPERES	CURRENT RATING AT 40°C ROOM TEMP. AMPERES	MW-41 Table S I.S. 12824
BF 18	966 493	X	14.2 to 15.7	17.7	X	X	13.2 to 14.6	16.5	X	X	12.6 to 14.2	16.0	X
BG 18	966 494	X	15.8 to 17.2	19.7	X	X	14.7 to 16.0	18.3	X	X	14.3 to 15.5	17.6	X
BH 19	966 495	X	17.3 to 18.7	21.6	X	X	16.1 to 17.4	20.1	X	X	15.6 to 16.9	19.5	X
BI 21	966 496	X	18.8 to 20.5	23.4	X	X	17.5 to 19.1	21.8	X	X	17.0 to 18.5	21.2	X
BK 23	966 497	X	20.6 to 22.0	25.7	X	X	19.2 to 20.5	23.9	X	X	18.8 to 19.9	23.2	X
BL 25	966 498	X	22.1 to 23.9	27.6	X	X	20.6 to 22.3	25.7	X	X	20.0 to 21.5	24.9	X
BM 27	966 499	X	24.0 to 26.3	30	X	X	22.4 to 24.7	28	X	X	21.6 to 23.9	27	X
BO 31	974 084	X	26.4 to 30.3	33	X	X	24.6 to 27.9	31	X	X	24.0 to 27.1	30	X
BP 32	301P138G01	X	30.4 to 33.5	38	X	X	28.0 to 31.1	35	X	X	27.2 to 30.3	34	X
BQ 35	301P139G01	X	33.6 to 36.7	42	X	X	31.2 to 34.3	39	X	X	30.4 to 32.7	38	X
CR	1780 725	X	36.8 to 41.5	46	X	X	34.4 to 38.3	43	X	X	32.8 to 36.7	41	X
CS	1780 726	X	41.6 to 47.9	52	X	X	38.4 to 44.7	48	X	X	36.8 to 42.3	46	X
BU 54	1265 537	X	48.0 to 55.9	60	X	X	44.8 to 51.9	56	X	X	42.4 to 48.5	53	X
BX 61	1265 538	X	56.0 to 64.7	70	X	X	52.0 to 59.9	65	X	X	49.8 to 57.5	62	X
BY 65	1265 539	X	64.8 to 75.1	81	X	X	60.0 to 69.5	75	X	X	57.6 to 66.3	72	X
CA	1597 771	X	75.2 to 83.1	94	X	X	69.6 to 78.7	87	X	X	66.4 to 73.5	83	X
CB	1597 772	X	83.2 to 91.9	104	X	X	76.8 to 84.7	96	X	X	73.6 to 80.7	92	X
CC	1597 773	X	92 to 103	115	X	X	84.8 to 94.3	106	X	X	80.8 to 90.3	101	X
CD	1597 774		104 to 115	129	X	X	94.4 to 106	118	X	X	90.4 to 101	113	X
CE	1597 775		116 to 121	145	X		107 to 111	133	X		102 to 108	127	X
CF	1597 776		122 to 128	152	X		112 to 118	139	X		107 to 112	133	X
CG	1597 777		129 to 137	161	X		119 to 126	148	X		113 to 119	141	X
CH	1597 778		138 to 150	172	X		127 to 134	158	X		120 to 127	150	X
CI	1597 779						135 to 150	168	X		128 to 138	160	X
CJ	1597 780										139 to 150	173	X

X Indicates heater is used on this relay size

Westinghouse Electric Corporation
Standard Control Division, Beaver, Pa.

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