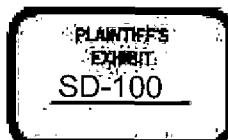


INDUSTRIAL CONTROLLER DIVISION
MILWAUKEE, WISCONSIN, U. S. A.

Service Instructions

Caution! Always be sure that the controller is completely disconnected from the power source before attempting any maintenance or servicing of the controller.

Servicing — The controller should be inspected before installation and at regular intervals thereafter. Do not wait for trouble to develop before inspecting. At the time of initial inspection and installation, care should be taken that no diagrams, instruction sheets, etc. are removed from the enclosure and destroyed. All controllers are adjusted and tested for perfect operation before they leave the factory and only minor adjustments, if any, should be necessary before the controller may be put in service. However, some damage may have occurred during transit and it is, therefore, best to see that all devices operate freely without binding before the controller is connected to the source of power.

The controller should be cleaned regularly by using a stream of compressed air or a blower. The collection of abrasive dust on moving parts may shorten the life of those parts by causing excessive wear.

The magnet surfaces should be kept clean at all times so that they may seal properly. If the magnet surfaces become sticky, the contacts may remain closed after deenergization of the device. If the magnet surfaces do not close properly, the device may also fail to close its contacts.

Do not oil any parts of the controller except the disconnect switch, which may need occasional lubrication to insure ease of operation. All contactor bearing surfaces are designed for a maximum life with no lubrication necessary for satisfactory operation. Oily surfaces become the collectors of dust and eventually cause an accumulation, which may result in faulty operation of the device.

Before dismantling any device for servicing, it is wise to note the positions of all nuts, screws, springs, pins, etc. since the positions of these items are the approximate positions which will insure proper operation of the device. It is also wise to check the voltage being applied to the device and at the same time make sure that the device "picks up" and seals without hesitation. The proper aligning of all moving parts will afford smoother operation and longer life for the parts

themselves. An investigation should also be made to make sure that the insulation has not been broken down by vibration, flashing, or some other abnormal condition.

All permanent connections should be tight. Overheating will develop rather quickly if any loose connections are present. Excessive heating or flashing should be investigated carefully since the cause is probably an overloaded circuit. An ammeter placed in the circuit will quickly indicate whether or not an overload is present.

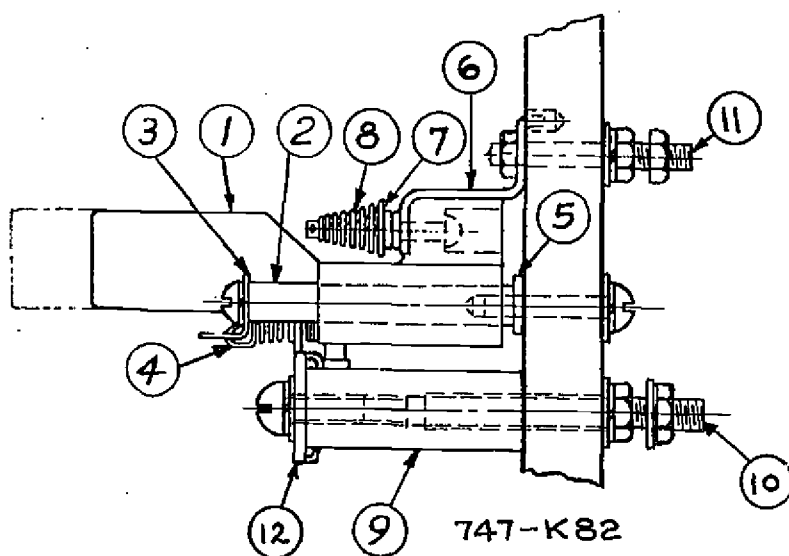
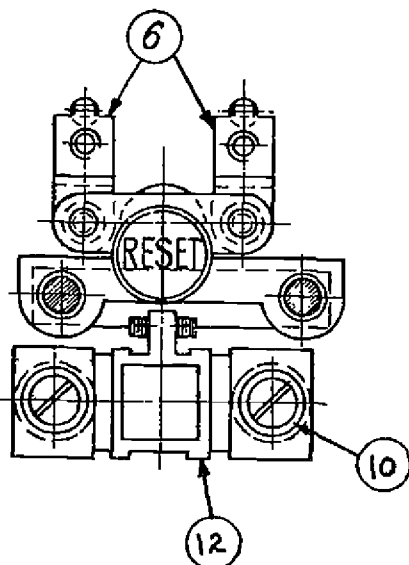
Contact Surfaces—Neither the silver nor copper contact tips should be dressed unless they have become burned and very rough. Particular care should be taken to avoid dressing the silver contact tips for two reasons. First, the silver tip is designed for a minimum thickness and the wasting of too much contact material shortens the contact tip life materially. Secondly, the silver contact tip may become oxidized and its appearance would indicate that a good contact could not be made, but actually the oxidizing has little effect on the contact made. All contact tips should be replaced only when tips have worn thin, but should be replaced before being worn to the point that overheating will develop. Overload, evidenced by excessive heating and arcing at the tips, is one of the more common factors contributing to a short contact tip life and should be eliminated as quickly as possible. When it is time to replace contact tips, it is generally advisable to replace all tips at one time since the contactor may be more easily adjusted and, also, to insure more satisfactory operation of the device. If the contact finger spring pressure is not great enough to give proper follow-up after contact has been made, it may be wise to replace the finger spring since the spring may have become weakened by overheating or flashing.

All contact surfaces should be kept clean and free from any film of dust, oil or other coating of foreign matter. If these surfaces are not kept clean, the film will act as an insulator and poor contact will result.

External Conditions — Of course, the controller as well as the individual devices should be protected from external conditions such as weather, vibration, abuse, overvoltage, overload, etc. The elimination of any difficulties of this nature will tend to provide more satisfactory operation and a longer troublefree life of the device.

INDUSTRIAL CONTROLLER DIVISION
MILWAUKEE, WISCONSIN, U. S. A.SPARE PARTS FOR
50 AMPERE OVERLOAD RELAY

22



Item No.	Description	Part No.	Item No.	Description	Part No.
1	Reset Slider Assembly	1139-M4-G1	8	Contact Finger Spring	1151-X12
2	Guide Pin	1151-X7	9	Terminal Post	749-X59
3	Tie Bar and Stop	1151-X9	10	Brass Stud	297-D3-X15
4	Latch Spring	1025-X3	11	Brass Stud	297-D3-X8
5	Spacer Plate	1151-X8	12	Thermal Unit	Specify rating Stamped on Relay or Give Full Load Current of Motor
6	Stationary Contact	1151-G3			
7	Movable Contact	1151-G1			

MAINTENANCE INSTRUCTIONS

OVERLOAD RELAY - To remove and inspect the overload relay, Item 12, it is necessary only to remove the two machine screws which hold the relay to the terminal post, Item 9, and the relay can then be slipped off the mounting studs, Item 10. When the relays are tripped due to an overload, the relays may be manually reset after allowing a few moments for cooling. No replacement of parts is needed, and no deterioration follows repeated tripping.

LATCH SPRING - To replace the latch spring, Item 4, first remove the overload relay as above and loosen the screws holding the tie bar and stop, Item 3. The reset slider assembly, Item 1, together with the tie bar and stop may then be removed from the panel where the latch spring may be easily removed from the slider assembly and the tie bar.

CONTACT FINGER AND SPRING - To replace the movable contact, Item 7, and contact finger spring, Item 8, remove the reset slider as above. Upon removing the cotter pin holding the contact finger spring in place, these items are free for inspection.

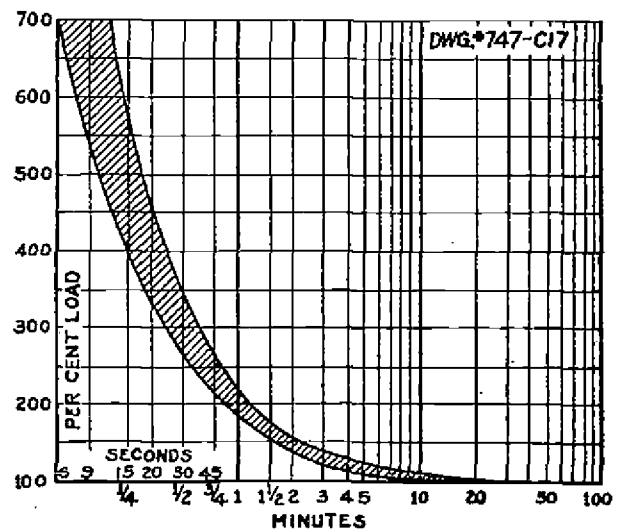
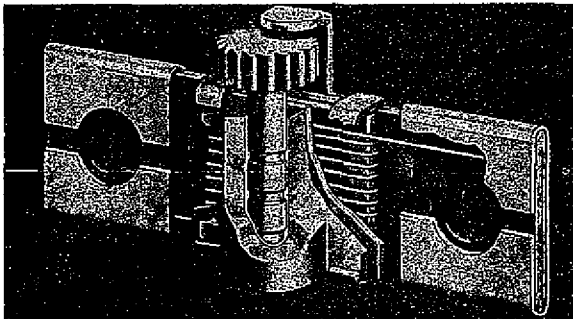
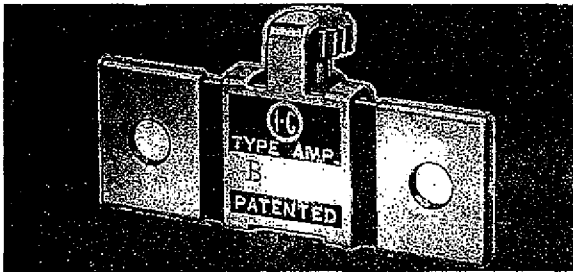
STATIONARY CONTACT - To remove the stationary contacts, Item 6, the relay should be tripped by moving the slider latch away from the ratchet wheel on the overload relay. Remove the hexagonal nut holding the stationary contact and unscrew the brass stud, Item 11, from the rear of the panel. The stationary contacts will then be free for inspection.

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ORDERING INSTRUCTIONS - Specify quantity, part number and description of part, giving complete nameplate data of the device. For example, cns #1025-X3 latch spring for overload relay used on Class 7904-TL-2, bearing serial number 2184-S11-B10,863343.



TRIP CHARACTERISTICS OF MELTING ALLOY TYPE THERMAL OVERLOAD RELAY



TRIP CHARACTERISTICS OF MELTING ALLOY
TYPE THERMAL OVERLOAD RELAY

Type : Service C
 Reset : Manual
 Reset Time : Wait one minute before resetting relay
 Range of Adjustment: Non-adjustable

INDUSTRIAL CONTROLLER DIVISION
MILWAUKEE, WISCONSIN, U. S. A.

24

D. C. Magnetic Relay

15 Ampere — Single Pole with Blowout

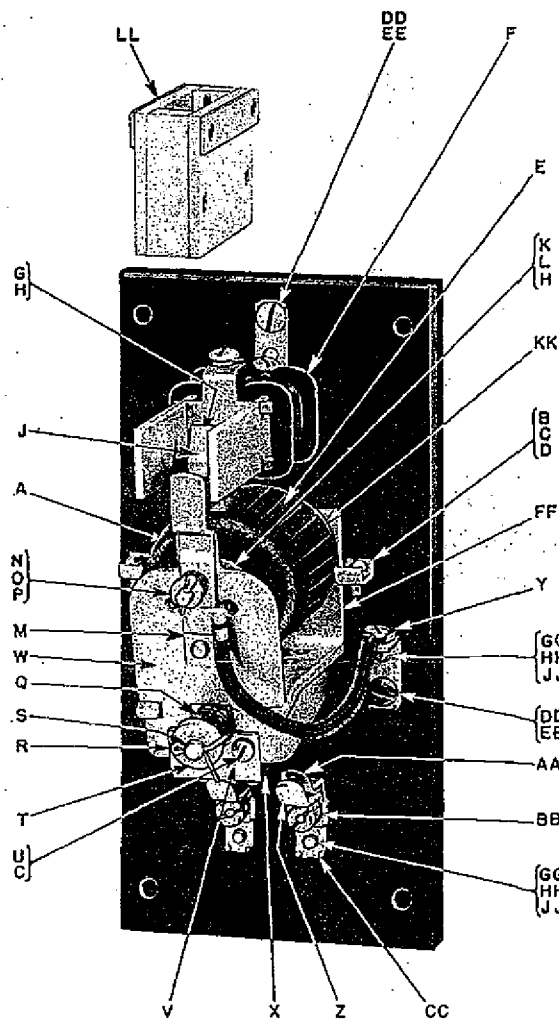


Photo Identification	Description	Part Number
A	Felt Washer.....	147S-X17
B	Round Head Iron Machine Screw.....	6-32 x 3/8"
C	Lock Washer.....	PM20-6
D	Coil Terminal Clamp.....	281-D18-X2
E	Magnet Coil (115 Volts).....	147S-S1-W3
E	Magnet Coil (230 Volts).....	147S-S1-W37
F	Blowout Coil Assembly.....	1931-D5-G1
G	Round Head Iron Machine Screw.....	8-32 x 5/16"
H	Lock Washer.....	PM20-8
I	Contact Tip Assembly.....	1931-G4
K	Pole Face.....	147S-X15
L	Round Iron Machine Screw.....	8-32 x 3/8"
M	Contact Finger Assembly (Lead on Left Side).....	1931-G7
M	Contact Finger Assembly (Lead on Right Side).....	1931-G8
N	Finger Spring Cup Washer.....	306-D1-X9
O	Finger Spring Cotter Pin.....	1/16" x 1/4"
P	Finger Spring.....	1323-X3
Q	Tail Spring.....	374-D10-X1
R	Tail Spring Cotter Pin.....	5/64" x 1/2"
S	Tail Spring Post.....	147S-X49
T	Tail Spring Cup Washer.....	306-D1-X1
U	Round Head Iron Machine Screw.....	6-32 x 1/4"
V	Interlock Support.....	147S-X30
W	Armature Lever Assembly.....	1931-D35-G1
X	Interlock Bar Assembly.....	147S-G9
Y	Terminal Post Cup Washer.....	306-D2-X1
Z	Interlock Contact Finger Guard.....	185S-X21
AA	Interlock Contact Finger Assembly.....	185S-G2
BB	Cap Nut.....	214-X24
CC	Interlock Finger Support.....	147S-X19
DD	Terminal Post.....	1931-X12
EE	Terminal Screw.....	214-X4
FF	Magnet Frame Assembly.....	147S-G1
GG	Iron Stud.....	8-32 x 2"
HH	Hexagon Iron Nut.....	PM21-8-32
II	Iron Washer.....	1W8A
KK	Magnet Core.....	147S-X16
LL	Arc Shield Assembly.....	1931-D21-G1

MAINTENANCE INSTRUCTIONS

Contact Tips — All contacts are silver and are not harmed by discoloration and slight pitting. DO NOT FILE THEM as dressing wastes contact material. Replacement is necessary only when silver has worn thin. To change stationary contact I remove arc shield assembly LL and round head iron machine screw G. To change movable contact finger assembly M, release the flexible lead from terminal post DD and remove cotter pin O, cup washer N, and finger spring P.

Armature Assembly — To remove armature assembly W release flexible lead of movable contact finger M from terminal post DD and remove cotter pin R, cup washer T and tail spring Q. The armature lever assembly can then be lifted free of the contactor.

Magnet Coil — To remove magnet coil E remove armature assembly W as described above. Then disconnect coil leads and remove screw L holding pole face K to magnet core KK. The coil will then slide off of the magnet core.

Ordering Instructions — Specify quantity, part number, and description of part giving complete nameplate data of device. For example 2—1931-G4 contact tip assemblies for undervoltage relay used on Class 7906 Type UO2 controller with serial number 2275-S1-A10, 893101.

INDUSTRIAL CONTROLLER DIVISION, MILWAUKEE, WIS., U. S. A.

25

2283-D11

DATE	2-24-44								DRAWING No. 2283-D11
REVISION	R.O.								

INDUSTRIAL CREDIT

DRAWN 
CHECKED 
APPROVED

TYPE	301	RL2
CLASS	7002	7904
FILE		

(WALL MTG.) 2184-E42



1/4" THICK CABLE
PLATE TOP & BOTTOM.

DATE	2-24-44							DRAWING NO.	2184-D61
REVISION	R.O.								