



# MAINTENANCE INSTRUCTION

## AUXILIARY RELAYS—14 POLE

### DESCRIPTION

The relays covered by this Maintenance Instruction are all of the same basic construction and are used in a wide variety of applications, see Fig. 1. They differ only in number, and contact arrangement.

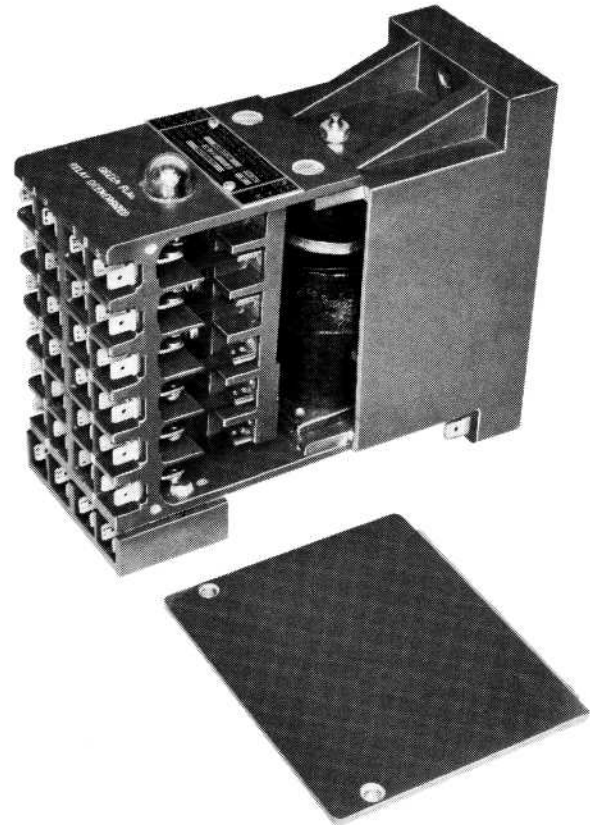
The coils of these auxiliary relays operate off 74 volt control circuits in most cases. The contact arrangements are designed to set up a variety of control circuits for product operation. The individual wiring diagrams will indicate relay function.

### MAINTENANCE

Due to simplicity of construction employing a minimum of moving parts together with silver alloy contacts and dust free enclosure, these auxiliary relays will provide satisfactory service over a long period of time. Maintenance requirements center primarily around occasional inspections to qualify the relays for continued service.

### INSPECTION

At the time of inspection, the relay covers should be removed and the contacts checked for pitting or burning. Use a



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Fig. 1 — Typical Auxiliary Relay

low pressure stream of dry compressed air and blow out any dust or dirt accumulation. In the event that badly burned or pitted contacts are apparent, the relay must be removed from the installation for overhauling. Do not file or dress relay contacts. Relay contacts will turn black (tarnish) in time with normal operation. This will not impair relay operation or indicate a need for servicing.

NOTE: Information contained herein is applicable to equipment being produced as of the date of publication.

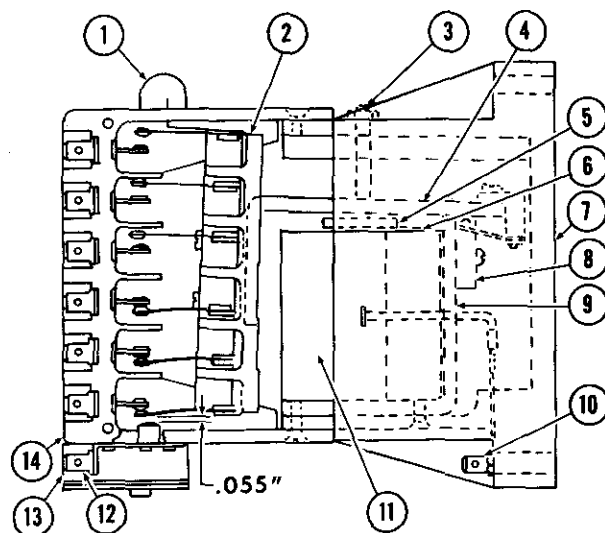
Inspect the electrical connection for tightness and electrical contact. Inspect the operating coil for burns or discoloration. Check resistance of the coil according to values given in the Maintenance Data. Electrically inspect the relay for pickup and dropout using the values tabulated in the Maintenance Data.

Check the movable mechanical parts of the relay for proper function. Do not apply lubrication of any type to these relays.

## DISASSEMBLY PROCEDURE

For identification of parts see side cutaway view in Fig. 2. Remove four screws and lockwashers holding side covers to contact housing. Remove two screws and lockwashers holding contact housing assembly to coil frame and coil housing, also two shorter screws and lockwashers holding contact housing assembly to coil housing. The contact housing assembly can now be removed by carefully lifting the housing up and away from the coil and frame housing while at the same time holding the armature against the core. Be careful not to damage the indicating tab which protrudes into the lens while performing this operation. The four attached terminal and contact assemblies can be replaced by removing the cover which is held on by two screws and lockwashers, then each individual terminal and contact can be removed. The terminals and contacts are held in place by two screws.

To disassemble the coil and frame assembly from the coil housing remove the two screws holding coil frame to coil housing. Hold the armature against the core and lift the assembly out of the housing. The coil lead connectors can be disconnected from their terminals



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- |                             |                                 |
|-----------------------------|---------------------------------|
| 1. Lens                     | 8. Spring Assembly              |
| 2. Contact Carrier Assembly | 9. Coil & Frame Assembly        |
| 3. Set Screw                | 10. Coil Terminal               |
| 4. Relay Armature           | 11. Relay Coil                  |
| 5. Coil Core                | 12. Terminal & Contact Assembly |
| 6. Cup Washer               | 13. Contact Barrier             |
| 7. Coil & Frame Housing     | 14. Contact Housing Assembly    |

Fig. 2 — Cutaway View Of Relay

using long nose pliers. The adjusting screw should not be turned unless it has been damaged or is defective, then it should be replaced.

To disassemble the relay coil, remove the screw and lockwasher holding the coil, core and cup washer to the coil frame.

## REASSEMBLY PROCEDURE

To reassemble the relay, follow a reverse order to that of disassembly. Make certain all parts are cleaned thoroughly before reassembly.

When a new coil is installed, check that the .008" to .010" gap exists between the relay armature and the relay frame when the armature is held against the coil core, see Fig. 3. To properly set this gap, the two round head screws holding the spring assembly will have to be loosened and the assembly repositioned. Tighten these two screws while holding

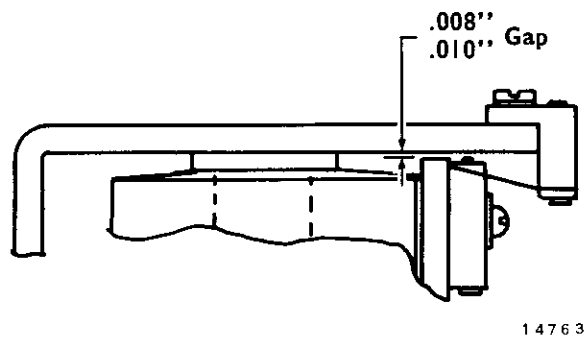


Fig. 3 — Armature Spacing With Relay Energized

the armature against the core and with the feeler gauge in place. Check the gap between the armature and the center of the core when the relay is de-energized. This distance should be at least  $1/16''$  gap. This gap can be obtained by adjusting the set screw. When tightening the locknut after adjusting the set screw, hold the screw in position so as not to change the adjustment. Check that the armature seats squarely against the core when the relay is energized.

Care should be taken when replacing the contact housing assembly not to bend the contact brush assemblies which protrude from the carrier assembly. This assembly should be held in an energized position as the contact housing assembly is carefully set in place. Observe the indicating tab so as not to damage it when placing it in the lens. This tab may have to be positioned slightly with a long nose pliers after the housing is secured. The tab should be flush with the housing when the relay is energized.

### CHECKING AND ADJUSTING RELAY CONTACT PRESSURE

Check the pressure required to open all normally closed contacts with a gram gauge (5 to 150 range). This check can be made by connecting the normally closed

contacts in series with a simple low voltage (6 volt) lamp circuit. The reading should be taken at the position the lamp is de-energized. Place the probe of the gauge over the small hole located between each set of contacts on the contact brush assembly, see Fig. 4. A minimum reading of 80 grams pressure and a maximum of 130 grams pressure is acceptable before contact opening.

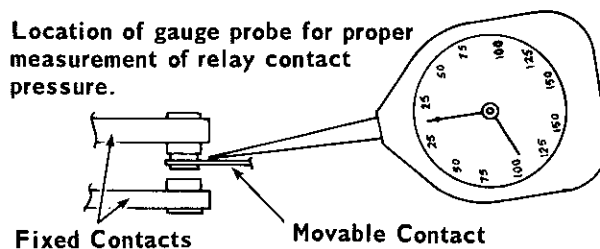


Fig. 4 — Location Of Gauge Probe

With a DC voltage of approximately 2 to 3 volts above the rated pick up voltage energize the relay coil. Check the pressure required to open all contacts which close when coil is energized. A minimum reading of 80 grams should be obtained on this test.

If the minimum reading of 80 grams is not obtained, the contact brush assembly will have to be adjusted. Using a bending tool described in Fig. 5 make gradual adjustments along the length of the contact brush assembly. Do not make any sharp creases or bends in the assembly. Since each brush assembly has two contacts, each contact should be checked to be sure that they are on the same plane

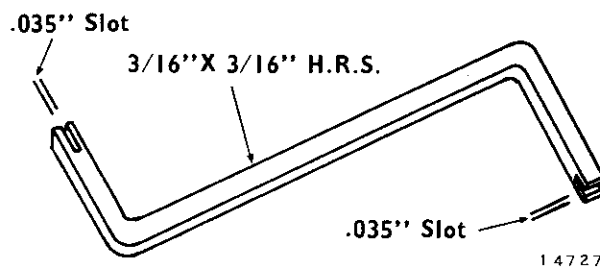


Fig. 5 — Example Of Relay Adjusting Tool

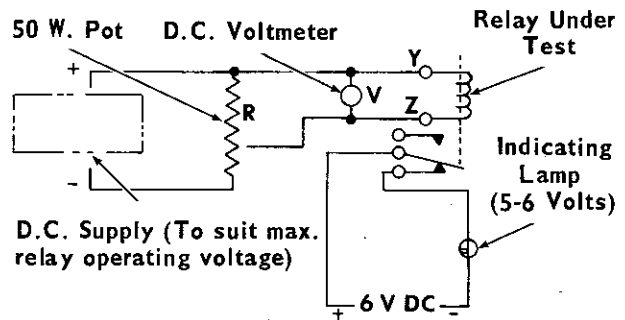
and make contact with the fixed contacts at the same time. If they do not, twist the assembly very slightly with the adjusting tool, then readjust the assembly for proper pressure. After making any adjustments recheck the contact pressures to be sure they are within the minimum or maximum.

All normally open contacts when the relay is energized should have a minimum of .0937" (3/32") air gap. Contacts L, M, N & P should have .055" air gap.

### PICKUP AND DROPOUT VOLTAGE TEST

In order to make the pickup and dropout checks, a variable DC voltage supply should be connected to the relay coil. See Fig. 6 for a schematic wiring of a test setup. Proper readings for various operating voltages will be found in the Maintenance Data.

Set the 50 watt potentiometer as shown in Fig. 6 to maximum resistance then gradually increase the voltage applied to the coil. An indicating lamp connected across the contacts will mark the pickup or dropout points. Slowly reduce the



1 47 28

Fig. 6 — Suggested Test Set-up

applied voltage to determine the dropout point; the indicating lamp will go out when the dropout point is reached.

If the pickup and dropout points are not obtained as outlined in the Maintenance Data, check lead arrangement, contact pressure and carrier travel gap. Re-adjust if necessary.

Replace the side covers with their respective two screws and lockwashers. After adjustments have been completed the relay should be cycled 25 to 50 times with a 5 to 5-1/3 volt, 1/2 amp load (test lamp) connected across each set of contacts. Positive contact should be accomplished on each cycle or the relay must be reworked.

## MAINTENANCE DATA

	<u>8363130</u>	<u>8364908</u>	<u>8364294</u>	<u>8367084</u>
Contacts: (5 Amp.)	8N.O.-6N.C.	9N.O.-5N.C.	10N.O.-4N.C.	7N.O.-7N.C.
Operating Coil				
Resistance-Ohms				
@20° C. (68° F.)	373 <sup>+</sup> -6%	373 <sup>+</sup> -6%	373 <sup>+</sup> -6%	373 <sup>+</sup> -6%
Operation @20° C.				
Working	74VDC	74VDC	74VDC	74VDC
Max. Pickup	48VDC	48VDC	48VDC	48VDC
Dropout	5-28VDC	5-28VDC	5-28VDC	5-28VDC
Hi-Pot Data: (60 Cycles)				
Coil to Ground	600 V.RMS	600 V.RMS	600 V.RMS	600 V.RMS
Coil to Contacts	2400 V.RMS	2400 V.RMS	2400 V.RMS	2400 V.RMS
Contacts to Contacts	2400 V.RMS	2400 V.RMS	2400 V.RMS	2400 V.RMS
Contacts to Ground	2400 V.RMS	2400 V.RMS	2400 V.RMS	2400 V.RMS

The following items are applicable to all above listed relays.

Contact Pressure	80 Grams Min. 130 Grams Max.
Contact Air Gap	.0937" (3/32") Min.
Contacts L, M, N & P Air Gap	.055"
Core & Armature Travel Gap	1/16" Min.
Armature & Coil Frame Gap	.008" to .010"