

## 235-TYPE RELAYS

### REQUIREMENTS AND ADJUSTING PROCEDURES

#### 1. GENERAL

**1.01** This section covers the requirements and adjusting procedures for 235-type relays.

**1.02** This section is reissued to incorporate a guideline for the manual adjustment of the cover spring.

**1.03** Reference shall be made to Section 020-010-711 covering general requirements and definitions, for additional information necessary for the proper application of requirements listed herein.

**1.04** The 235-type relay consists of one or more pairs of bimetallic contact springs mounted on an E-type relay frame. A heater unit winding is mounted on one of the bimetallic springs in each pileup. When current is connected to the heater winding, the associated spring is heated; the spring deflects toward the mating contact spring; and the contacts close.

**1.05 *Operate:*** A relay is said to *operate* if, when current is connected to the heater unit winding, the associated spring moves sufficiently to close the normally open contacts.

**1.06** In testing or adjusting a relay, the minimum time between operations shall be 4 minutes unless otherwise specified on the circuit requirements table.

#### 2. REQUIREMENTS

**2.01 *Cleaning:*** The contacts and other parts of the relay shall be cleaned when necessary in accordance with Section 069-306-801.

**2.02 *Relay Mounting:*** Relays shall be fastened securely to the mounting plate.

Gauge by feel by grasping the core between the thumb and forefinger and attempting to move the relay.

**2.03 *Vertical Clearance:*** There shall be a clearance between the springs of the relay and apparatus mounted directly above or below

Min 1/4 inch

Gauge by eye.

**Note:** This clearance is satisfactory if it can be obtained by removing the covers of the apparatus directly above or below, provided such covers are readily removable.

#### 2.04 *Cover Guide and Spring*

(a) Fig. 1 (A): The spring shall have sufficient bend in the spring to ensure that the cover is held securely in place.

Gauge by feel.

(b) Fig. 1 (B): The feet of the cover guide shall rest securely in place on the core when the cover is off.

Gauge by eye and feel.

#### 2.05 *Contact Alignment*

(a) ***Point and Disc Contacts***—Fig. 2 (A): The contact point shall fall wholly within the boundary of the opposing contact.

Gauge by eye.

(b) ***Bar Contacts***—Fig. 3 (A): The contacts shall line up so that the width of the contact surface of each contact bar falls wholly within the length of its mating bar.

Gauge by eye.

**2.06 *Contact Separation:*** The separation between any pair of contacts normally open shall be

Min 0.005 inch

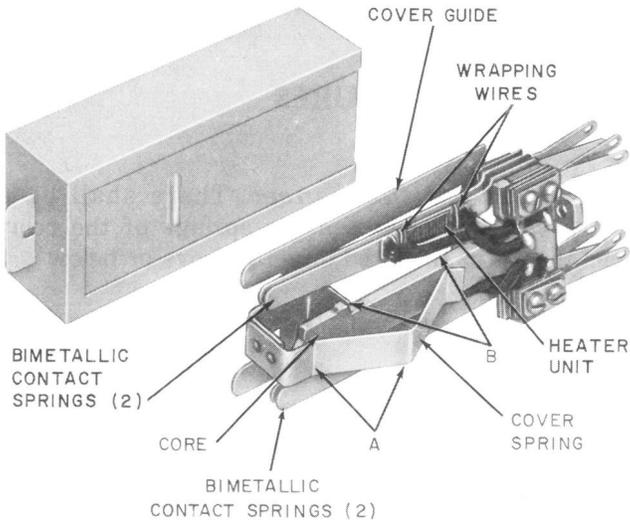


Fig. 1—235-Type Relay (235-D Relay Illustrated)



Fig. 2—Alignment of Point and Disc Contacts

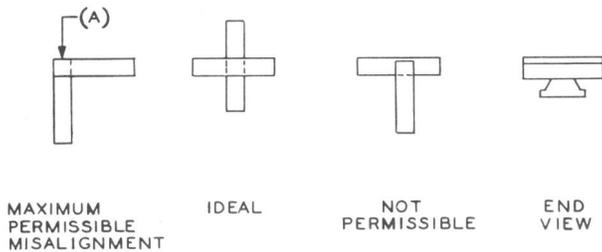


Fig. 3—Alignment of Standard Bar-Type Contacts

Use the 74D gauge. When the gauge is inserted between the contacts, there should not be any deflection of the springs.

**2.07 Clearance Between Heater Unit Wrapping Wires and Adjacent Spring:** There shall

be a clearance between the heater unit wrapping wire and the adjacent spring of

Min 1/32 inch

Gauge by eye.

**2.08 Timing Requirements**

- (a) The relay shall meet the timing requirements specified on the circuit requirements table.
- (b) These requirements shall be met with the cover on the relay where so equipped.

**3. ADJUSTING PROCEDURES**

**3.001 List of Tools and Gauges**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
259	Spring adjuster
—	B long-nose pliers
—	4-inch E screwdriver

**GAUGE**

74D	Thickness gauge nest
-----	----------------------

**3.01 Cleaning** (Reqt 2.01): Clean the contacts and other parts in accordance with Section 069-306-801.

**3.02 Relay Mounting** (Reqt 2.02)

**3.03 Vertical Clearance** (Reqt 2.03): To tighten loose mounting screws, use the 4-inch E screwdriver. To position the relay on the mounting plate, slightly loosen the mounting screws of the relay affected with the 4-inch E screwdriver and shift the relay as required. Retighten the mounting screws securely, taking care that the relay is in proper alignment and that there is the specified clearance both above and below the relay.

**3.04 Cover Guide and Spring** (Reqt 2.04)

- (1) If the cover spring does not have sufficient bend to hold cover securely in place, adjust the spring with the 259 spring adjuster to provide

proper holding pressure. If impossible to correct in this manner, remove the cover guide and adjust the spring manually to approximately the contour shown in Fig. 4.◀

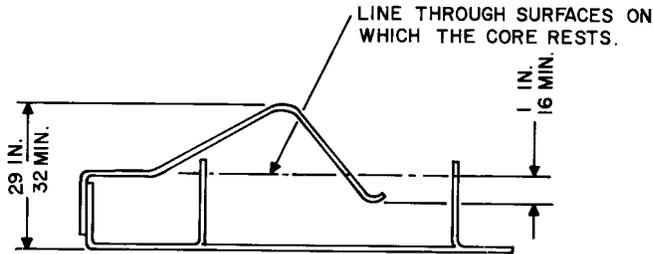


Fig. 4—▶Guideline for Adjustment of Cover Spring◀

(2) If the feet of the cover guide do not rest securely astride the core, adjust the tabs using the B long-nose pliers. Bend the tabs forward or backward so that the feet will fit tightly against the shoulders on the core.

**3.05 Contact Alignment** (Reqt 2.05): If contacts do not line up properly, refer the matter to the supervisor.

**3.06 Contact Separation** (Reqt 2.06): If the contact separation is not satisfactory, proceed as follows. Place the 259 spring adjuster on the contact spring that does not have the heater unit mounted on it; then slide adjuster back to the base of the spring. Adjust the spring to the right or left as required.

**3.07 Clearance Between Heater Unit Wrapping Wires and Adjacent Spring** (Reqt 2.07):

If the clearance is not satisfactory, it may be due to wrapping wires coming loose or to a distorted spring. If the wires are loose, refer the matter to the supervisor. If the spring is distorted, adjust as required as covered in 3.06.

**3.08 Timing Requirements** (Reqt 2.08): To increase the operate time of normally open contacts, increase the contact separation, or to decrease the operate time, decrease the contact separation as covered in 3.06. Take care in making this adjustment that requirement 2.06 is met.