

**RELAY DRIVERS**  
**METHOD OF ATTACHMENT TO DEFECTIVE**  
**U-, AF-, AJ-, AK-, 286-, 287-, AND 288-TYPE RELAYS**  
**TO MAINTAIN SERVICE**

1. GENERAL . . . . .	1
2. APPARATUS . . . . .	2
3. MOUNTING RELAY DRIVERS . . . . .	2

**Figures**

1. Relay Driver Mounted on U-Type Relay . . . . .	2
2. Relay and Relay-Driver Variations . . . . .	3
3. Relay Driver Mounted on AJ-Type Relay . . . . .	4
4. Relay Driver Mounted on AK-Type Relay . . . . .	5
5. Relay Driver Mounted on 287-Type Relay . . . . .	5

**1. GENERAL**

1.01 This section covers procedures for attaching relay drivers to U-, AF-, AJ-, AK-, 286-, 287-, and 288-type relays having defective coils.

1.02 This section is reissued for the following reasons:

1. To revise paragraph 3.01
2. To change reference in subparagraph 3.03(3)

3. To add Relay C to Fig. 2.

This issue does not affect the Equipment Test List.

1.03 Relay drivers are essentially relay units without contacts which can be quickly attached to the relays covered herein to keep the relays in service pending a convenient time for replacing either the defective coil or relay.

1.04 Covers of U-type relays must be removed to permit mounting a relay driver. These covers cannot be remounted until the relay driver is removed. However, the contact covers of AF-, AJ-, AK-, 286-, 287-, and 288-type relays should not be removed when mounting a relay driver.

1.05 When mounted, the relay driver extends beyond the apparatus mounted on the frame. Precautions should be taken to avoid injury to personnel. The relay driver should be used only until the defective coil or the relay can be replaced.

1.06 Relay drivers are intended for use in 45- to 50-volt circuits. They should not be used where they will adversely affect circuit operation due to marginal current or timing conditions or time races between relays. Their use is satisfactory on fast operating or releasing relays when the speed characteristic is intended merely to reduce circuit holding time.

1.07 The five relay drivers provided and the relays on which they are used are shown in the following table:

**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

RELAY DRIVER	COIL (OHMS)	USE
D-179812	275	286-, 287-, and 288-Type Relays Having 275- or 120-Ohm Coil
D-179813	500	U-Type Relays
D-179814	500	AF- and AJ-Type Relays
D-179835	180	286-, 287-, and 288-Type Relays Having 180-Ohm Coils
D-180296	640	AK-Type Relays

**1.08** Before attaching the relay driver on the relays covered herein, remove the circuit from service.

## 2. APPARATUS

### 2.01 List of Tools and Material

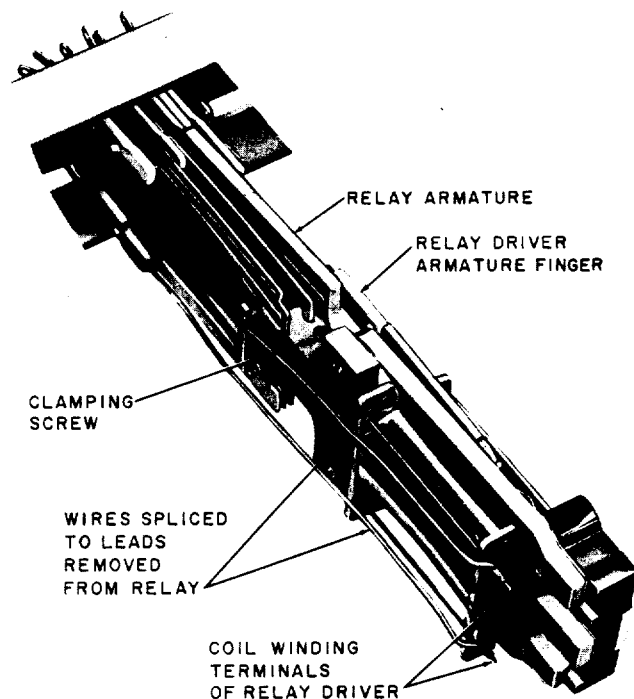
CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
KS-6320	Orange Stick
—	3-Inch C Screwdriver
AT-8420—	B Combination Pliers
AT-7860—	B Long-Nose Pliers
R-2961—	Wrench (Hex Socket Setscrew)
<b>MATERIAL</b>	
—	24-Gauge Insulated Wire (as required)

## 3. MOUNTING RELAY DRIVERS

**3.01 U-Type Relays:** Figure 1 illustrates a relay driver mounted on the core of a U-type relay. This position is similar for all variation of U-type relays and drivers in current use. These variations are shown in Fig. 2. Relay drivers with clamping block B can be used with all variations of A, B, or C relays, although some early B-type

clamping blocks have a cross-groove which will be a tight fit on the C-type relays. Drivers with clamping block A can be used only on relay style A. The mounting procedure varies somewhat for the various combinations of relays and drivers. These procedures are covered separately below.

**Note:** Drivers with clamping block B which have tight cross-grooves can be modified locally to increase the groove width to approximately 1/16 inch or the block can be replaced with a current block (piece part P12F485 ordered as Comcode 811264852).



**Fig. 1—Relay Driver Mounted on U-Type Relay**

**3.02** U-type relays of variation A with drivers having clamping block A.

- (1) Using the 3-inch C screwdriver, back off the relay driver clamping screw so it is underflush with the mounting surface of the driver.
- (2) Hold the relay driver with the mounting end forward and the armature to the right. Engage the relay core with the cylindrical mounting

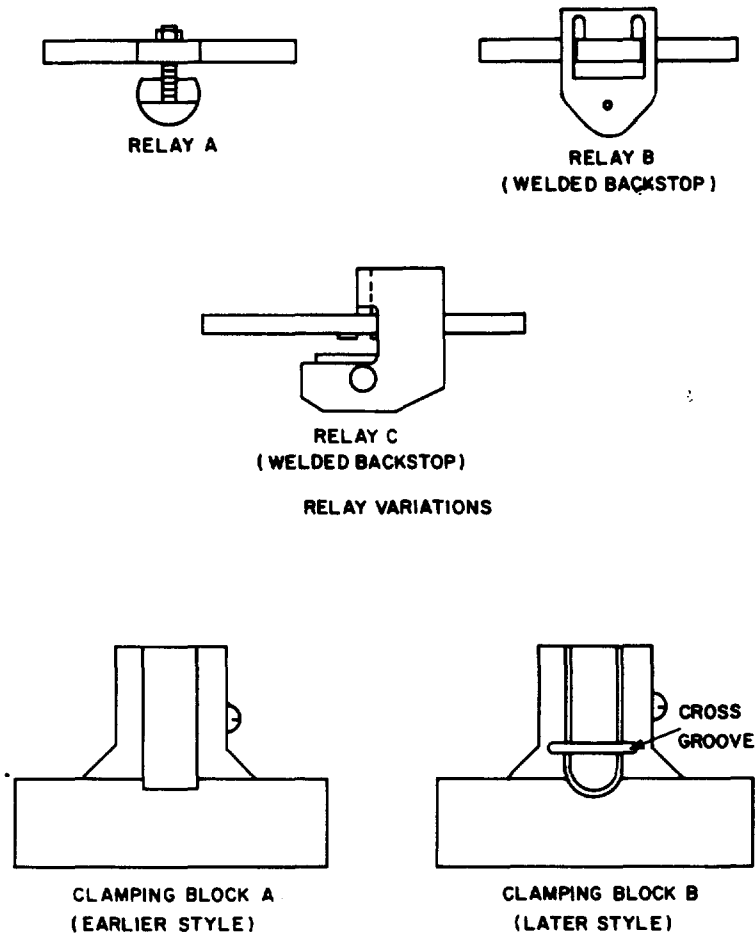


Fig. 2—Relay and Relay-Driver Variations

surface of the driver. Manually operate the relay armature and slide the driver on the relay core as far as possible, with the two fingers on the armature of the driver to the right of the relay armature. Release the relay armature. Securely tighten the driver clamping screw.

(3) Connect the coil winding terminals of the driver to the relay leads as covered in paragraph 3.08.

### 3.03 U-type relays of variation A with drivers having clamping block B.

(1) Using the 3-inch C screwdriver, back off the relay driver clamping screw so it is underflush with the mounting surface of the driver.

(2) Hold the relay driver in the position shown in Fig. 1 with the thumb and fingers pressing the armature of the driver against its backstop. Align the groove of the clamping block with the relay core and guiding the armature fingers of the driver to the right of the relay armature, slide the driver onto the relay as far as possible. Holding the driver in this position, press the fingers of the driver evenly against the relay armature with sufficient force to seat the relay armature against its core. With the fingers of the driver held in this position, securely tighten the clamping screw and release the fingers of the relay driver.

(3) Connect the coil winding terminals of the driver to the relay leads as covered in paragraph 3.08.

### 3.04 U-type relays of variation B or C with drivers having clamping block B.

(1) Using the 3-inch C screwdriver, back off the relay driver clamping screw so it is underflush with the mounting surface of the driver.

(2) Hold the relay driver in the position shown in Fig. 1 with the thumb and fingers pressing the armature of the driver against its backstop. With the clamping block held at an angle with and resting against the left side of the relay core, slide the clamping block along the core until the backstop of the relay drops into the cross groove of the clamping block. Rotate the driver into alignment with the relay so that the backstop of the relay slides into the cross groove of the clamping block and the two fingers of the driver lie to the right of the relay armature. Holding the driver in this position, press the armature fingers of the driver evenly against the relay armature with sufficient force to seat the relay armature against its core. With the fingers of the driver held in this position, securely tighten the clamping screw and release the fingers of the relay driver.

### 3.05 AF- and AJ-Type (Wire-Spring Type)

**Relays:** The relay driver clamps on the core plate of the relay with the mounting surface of the driver against the front and right edges of the core plate and the clamping blocks behind the core plate. Figure 3 shows the relay driver mounted on an AJ-type relay. To mount the driver, proceed as follows:

(1) Hold the relay driver with the mounting end forward and the armature to the left. Using the 3-inch C screwdriver, loosen the clamping screws just enough to permit movement of the clamping blocks. Raise the upper clamping block as far as possible and securely tighten the clamping screw.

(2) While holding the driver in the left hand as covered in (1), move the armature of the driver to the left with the fingers and position the driver in front of the relay so the upper core legs of the driver and relay are in line. Place the driver on the relay so the core plate of the relay is between the clamping blocks, with the armature of the driver to the left of the relay armature. Move the driver so the driver

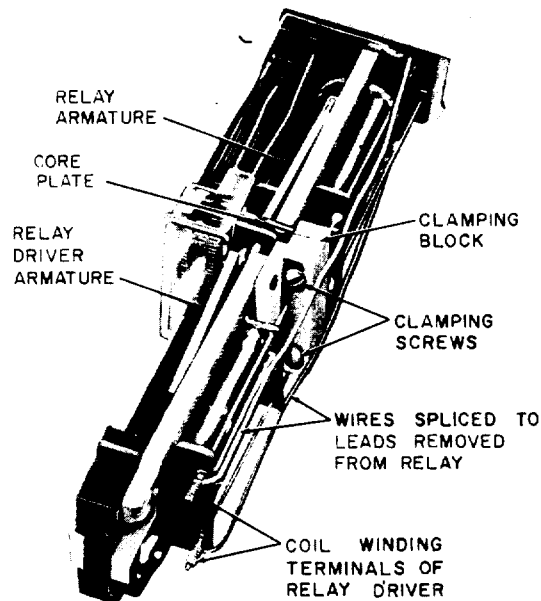


Fig. 3—Relay Driver Mounted on AJ-Type Relay

mounting surfaces are against the front and right edges of the core plate and release the driver armature.

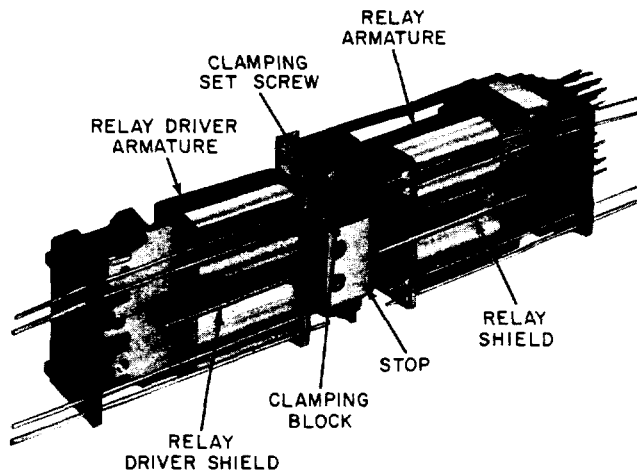
(3) Loosen the upper clamping block screw and allow the block to slide down and engage the rear of the core plate. Position the driver so the top of the upper clamping block is approximately in line with the top of the driver and securely tighten the clamping screw.

(4) Using a KS-6320 orange stick, raise the lower clamping block as far as possible and securely tighten the clamping screw.

(5) Connect the coil winding terminals of the driver to the relay leads as covered in paragraph 3.08.

**3.06** The D-180296 relay driver provides for the operation of either or both armatures of AK-type relays. Figure 4 illustrates this driver mounted on the shield of an AK-type relay.

(1) Using the R-2961 wrench, back off the setscrew so it is underflush with the slot in the clamping block of the relay driver.



**Fig. 4—Relay Driver Mounted on AK-Type Relay**

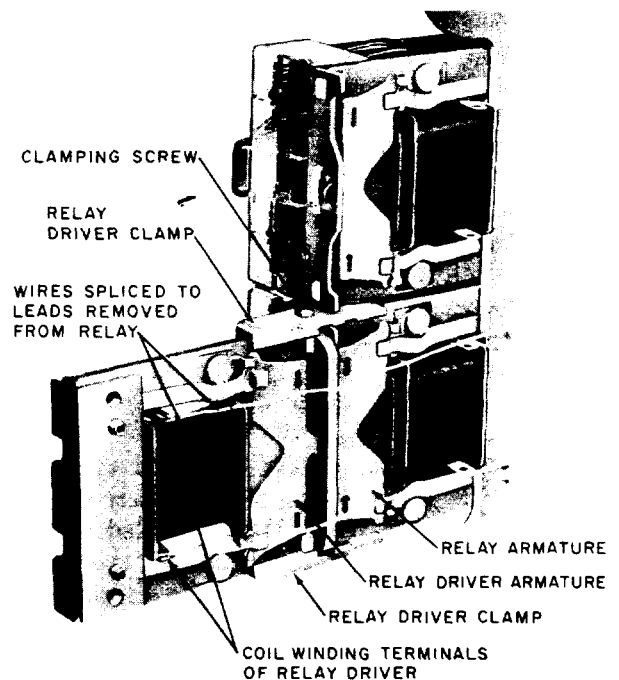
(2) Position the relay driver with the clamping block toward the relay and the armatures to the left of the core. Hold both armatures of the driver against their backstops and install the driver on the relay so the shield of the relay enters the slot in the clamping block and the stops of the driver rest against the core plate of the relay. Hold the driver in this position and tighten the setscrew securely against the shield of the relay with the R-2961 wrench. Release both armatures of the driver.

(3) Connect the appropriate coil winding terminals of the driver to the relay leads as covered in paragraph 3.08.

**3.07 286-, 287-, and 288-Type (Wire-Spring Type) Relays:** The relay driver clamps on the upper and lower core legs of the relay with the mounting surface of the driver against the core plate and the outer ends of the relay core legs in the slot in the mounting surface. Figure 5 shows the relay driver mounted on a 287-type relay. To mount the driver, proceed as follows:

(1) Using the 3-inch C screwdriver, loosen both relay clamp screws approximately one full turn.

(2) Hold the relay driver in the left hand, with the mounting end forward and the armature to the right. Place the driver on the relay so the grooves in the clamps engage the associated core legs. Then, using a KS-6320 orange stick,



**Fig. 5—Relay Driver Mounted on 287-Type Relay**

swing the driver armature to the right and slide the driver forward as far as possible with the armature of the driver to the right of the relay armature. Release the driver armature. Hold the driver in this position and securely tighten the driver clamp screws.

(3) Connect the coil winding terminals of the driver to the relay leads as covered in paragraph 3.08.

**Note:** Before attaching a relay driver to a 286-, 287-, or 288-type relay, the relay shall meet the readjust contact make requirement as covered in Section 040-272-701. This requirement may be met with the relay operated manually by applying a KS-6320 orange stick along the center line of the armature. If the requirement is not met, readjust the relay as covered in Section 040-272-701. Failure to meet this requirement can result in loss of contact continuity.

**3.08 Connecting Relay Driver Terminals:** Connect the external leads of the relay to

the coil winding terminals of the relay driver as follows:

- (1) Disconnect the external leads from the coil winding terminals of the relay.
- (2) Cut suitable lengths of 24-gauge wire to connect the coil winding terminals at the front of the driver to the leads removed from the relay.
- (3) From the terminal side of the relay, insert the wires through openings in the relay mounting bracket on the side nearest the coil winding terminals of the relay driver. In the case of AF- and AJ-type relays, insert the wires through terminal holes in the molded mounting bracket of the relay. In the case of the AK-type relays, unsolder the coil winding terminals and, using long-nose pliers, withdraw the terminal wires from relay. This will permit the relay

leads to be run through the terminal holes in the molded mounting bracket of the relay and through the vacated holes to the terminal wires of the relay driver.

- (4) In the approved manner, first connect a wire to each coil winding terminal of the driver and then splice the free ends to the leads removed from the relay. In cases where more than one wire was removed from a relay terminal, these wires must be spliced together and to the length of 24-gauge wire connected to the relay driver terminal. Solder and tape all splices.
- (5) Dress the wires along the relay driver, making sure that they will not interfere with the operation of adjacent apparatus.

**3.09 Final Procedures:** Return the circuit to service.