

**302-, 303-, AND 305-TYPE CONNECTORS**  
**PROTECTOR UNIT TESTS**  
**USING KS-20100 L1 OR L2 TEST SET AND 182A TEST SET**

**1. GENERAL**

**1.01** This section describes the method for testing protector units used on 302-, 303-, and 305-type connectors using the KS-20100 L1 or L2 test set and the 182A test set.

**1.02** This section is reissued to add the 182A test set and the 4A11C protector unit (mini-bridge lifter). Due to extensive changes and additions to this issue, arrows ordinarily used to indicate changes have been omitted. This section title is revised to include the 182A test set.

**1.03** This issue affects the Equipment Test List.

**1.04** This test checks the protectors for:

- (a) Tip and ring continuity
- (b) Shorted carbon blocks
- (c) Defective semiconductor switches in the 4A11C protector unit.

**1.05** A provision is made for clearing out the air gap between carbon blocks with the KS-20100-L1 or L2 test set when shorted by carbon dust or particles.

**1.06** The circuitry of the KS-20100 L1 and L2 test sets is identical (Fig. 1). The L1 test set is an integral component of modular protector frames (Fig. 2). The L2 test set is housed in a conduit box for wall mounting (Fig. 3).

**1.07** The 182A test set is also housed in a conduit box for wall mounting (Fig. 4). A block diagram of the 182A test set is shown in Figure 5.

**1.08** Internal connections of protector units for 302-, 303-, and 305-type connectors are shown in Figure 6.

**TESTING 4A11C PROTECTOR UNITS**

**1.09** The 182A test set is first used to test for tip and ring continuity and for shorted carbon protector blocks on 4A11C protector units. It also tests the function of the 410A switch. The 182A test set does not differentiate between failures of these components.

**1.10** Protector units which "pass" the test on the 182A test set may be returned to service without further testing.

**1.11** The 4A11C protector units which fail the test on the 182A test set must also be tested with the KS-20100 L1 or L2 test set.

**1.12** Protector units with shorts which "burnout" successfully when tested on the KS-20100 L1 or L2 test set must be retested using the 182A test set.

**TESTING 3-, 4-, AND 5-TYPE PROTECTOR UNITS**

**1.13** The 429F reversing plug and protector units other than the 4A11C are tested using the KS-20100 L1 or L2 test set only.

**1.14 *Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 3 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

**NOTICE**

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Bell System except under written agreement

**SECTION 201-208-501**

1.15 Discard defective protector units except for the 4A11C protector unit (mini-bridge lifter). Return defective 4A11C protector units to the appropriate Western Electric Company repair facility for repair or replacement.

**2. APPARATUS**

2.01 KS-20100 L1 or L2 test set and 182A test set.

**3. PROTECTOR UNIT TESTS**

3.01 When testing 4A11C protector units, perform Steps 1 through 15. When testing 3-, 4-, or 5-type protector units or the 429F reversing plug, perform Steps 5 through 13.

STEP	ACTION	VERIFICATION
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**4A11C PROTECTOR UNITS (MINI-BRIDGE LIFTER) ONLY**

1	Insert 4A11C protector unit or reversing plug to be tested into protector jack on 182A test set.	
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**Warning:** Do not attempt to test protector unit while disassembled. Hazardous voltages are present in the protector unit during tests.

2	Depress TEST pushbutton.	
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**Warning:** Do no attempt to test protector unit while disassembled. Hazardous voltages are present in the protector unit during tests.

**Note 1:** A momentary flash of the red FAIL indicator that may occur at the instant the TEST pushbutton is depressed should be ignored.

**Note 2:** If neither indicator lights when the pushbutton is depressed, check the 1/4 AMP fuse. If fuse is good, determine if ac supply to test set is present. If ac supply is present and the 1/4 AMP fuse is good, then test set is defective.

3a	If green PASS indicator lighted, go to Step 15.	
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4b	If red FAIL indicator lighted, go to Step 5.	
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**ALL PROTECTOR UNITS (INCLUDING 4A11C MINI-BRIDGE LIFTER)**

5	Observe the KS-20100 L1 or L2 test set.	No pushbuttons lighted.
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6	Momentarily depress CONTINUITY R pushbutton.	CONTINUITY R pushbutton lighted while depressed. (See note in Step 8).
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7	Momentarily depress CONTINUITY T pushbutton.	CONTINUITY T pushbutton lighted while depressed. (See note in Step 8.)
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8	Momentarily depress GROUND pushbutton.	GROUND pushbutton lighted while depressed.
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STEP	ACTION	VERIFICATION
	<p><b>Note:</b> If, in the above steps, none of the pushbuttons light, check 1/4 AMP fuse. If fuse is good, determine if ac supply to test set is present.</p>	
9	<p>Insert protector unit or reversing plug to be tested into protector jack on test set.</p>	<p>CONTINUITY T and R pushbuttons lighted. GROUND pushbutton extinguished.</p> <p><b>Note:</b> If either or both CONTINUITY pushbuttons do not light, protector unit is defective. Refer to paragraphs 1.08 and 1.15.</p> <p><b>Note:</b> If GROUND pushbutton is lighted, proceed to Step 11b.</p>
10a	<p>If requirements of Step 9 are met— Remove protector unit from protector jack on test set and go to Step 1 or 5 (see paragraph 3.01.)</p>	
11b	<p>If GROUND pushbutton is lighted in Step 9— Momentarily depress BURN OUT pushbutton for 2 or 3 seconds.</p>	<p>GROUND pushbutton extinguished.</p>
12c	<p>If GROUND pushbutton does not extinguish— Repeat Step 11b several times.</p>	<p><b>Note:</b> If GROUND pushbutton does not extinguish, protector carbons are defective or heat coils have operated. Refer to paragraph 1.15.</p>
13	<p>Remove protector unit from protector jack on the KS-20100 L1 or L2 test set.</p>	
<p><b>4A11C PROTECTOR UNIT (MINI-BRIDGE LIFTER) ONLY</b></p>		
14	<p>Repeat Steps 1 and 2.</p>	
15	<p>Remove protector unit from protector jack on 182A test set.</p>	

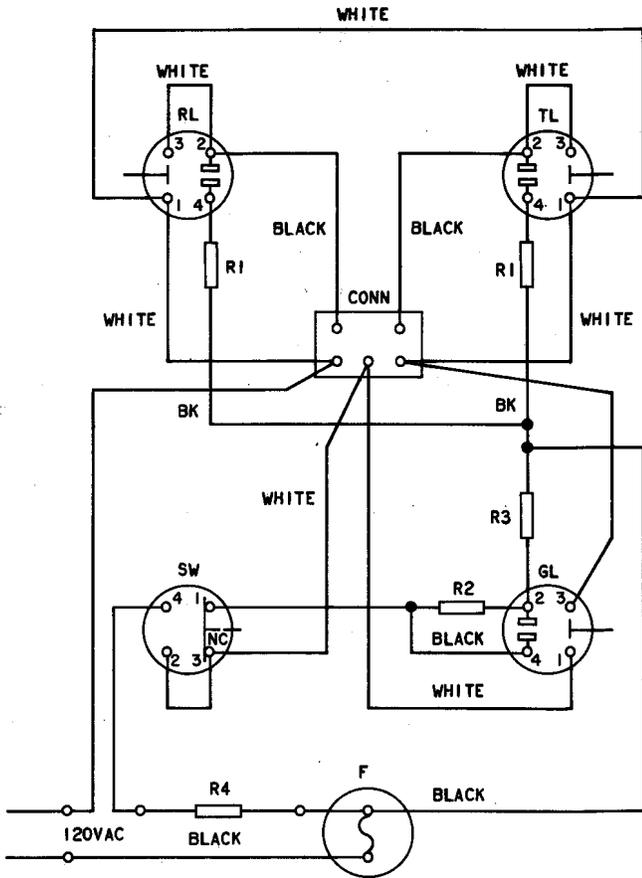


Fig. 1—KS-20100 L1 and L2 Test Set Schematic Diagram

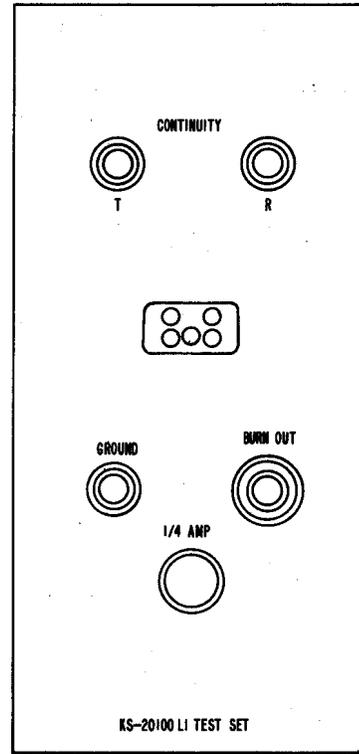


Fig. 2—KS-20100 L1 Test Set

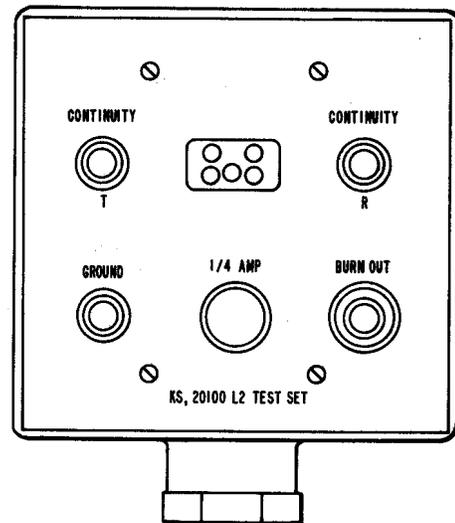


Fig. 3—KS-20100 L2 Test Set

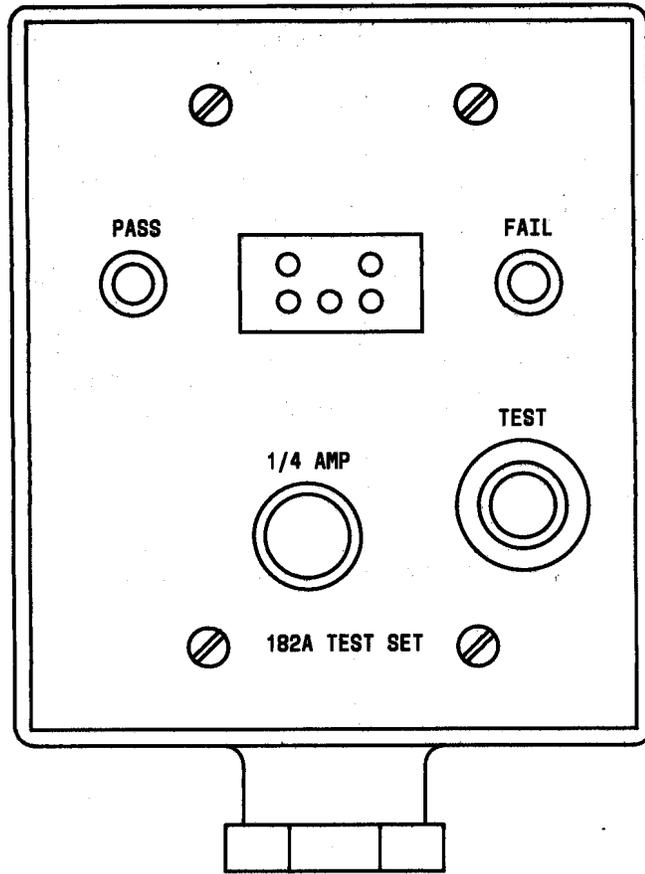


Fig. 4—182A Test Set

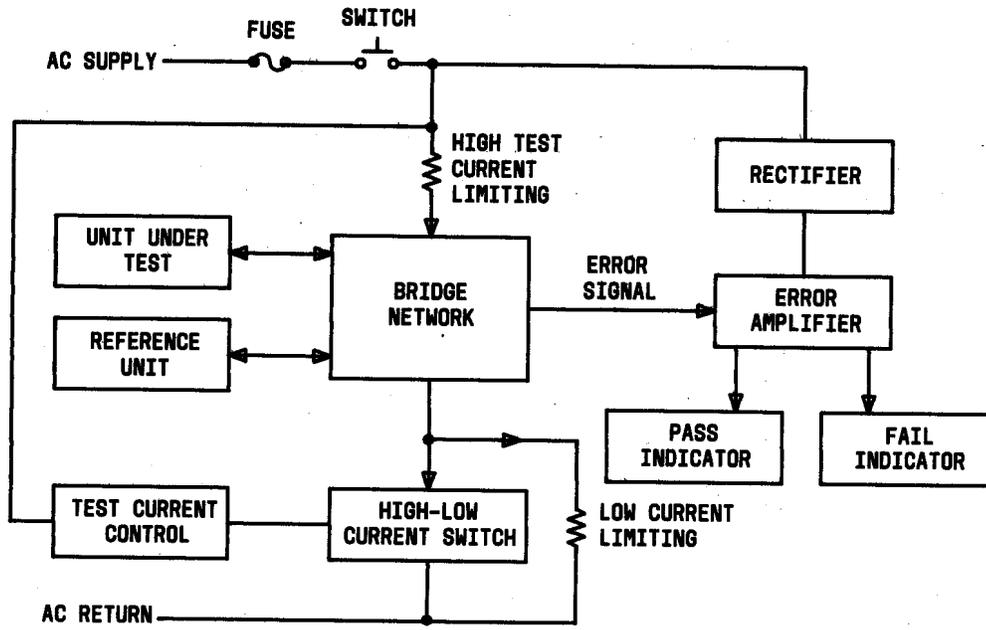


Fig. 5—182A Test Set Block Diagram

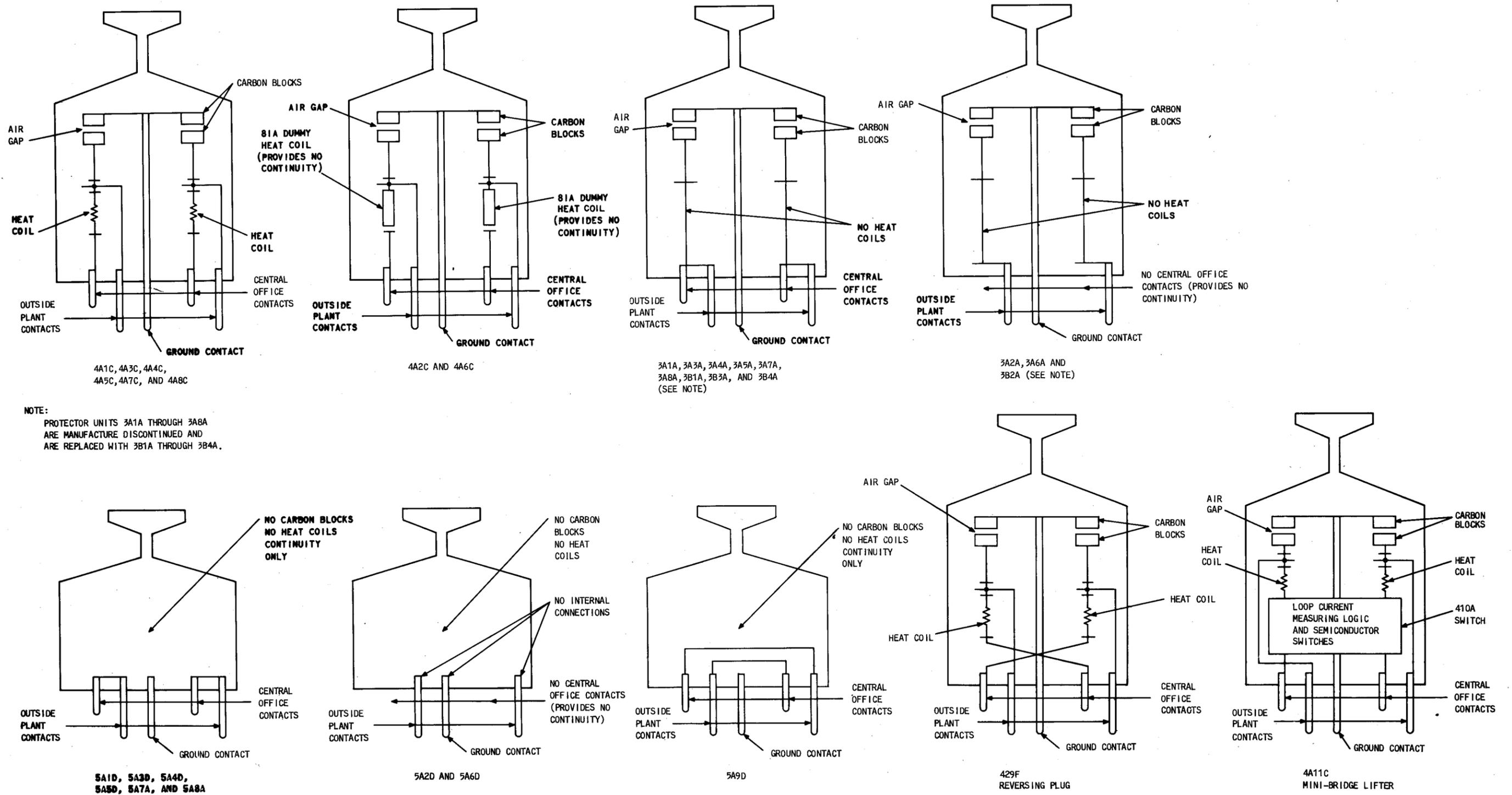


Fig. 6—Internal Connections 3A-, 3B-, 4A-, 5A-Protector Units, 429F Reversing Plug, and 4A11C (Mini-Bridge Lifter)