

**SELECTOR REPEATERS**  
**ROTARY AND C RELAY TIMING TESTS**  
**USING RELAY TIMING TEST SET SD-90418-01 (J94713A)**  
**STEP-BY-STEP SYSTEMS**

**1. GENERAL**

**1.01** This section describes a method of applying timing tests for the rotary hunting and the C relay release of selector repeaters.

**1.02** This section is reissued to include No. 1 step-by-step offices and to generally revise the section. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** The tests covered are:

**A. Rotary Speed Test:** This test checks the rotary speed of the switch and the release of the C relay.

**B. C Relay Release Test:** This test is for use in clearing troubles encountered in performing Test A. The method checks that the C relay releases within the required interval.

**1.04** Whenever the C relay is mentioned in this section, it is intended to mean the relay which performs the functions corresponding to those of the C relay in a regular selector. In some selector repeaters this relay is designated the F relay, in others the C relay and in still others the J relay. One of the functions of this relay is to transfer the stepping path from vertical to rotary.

**1.05** When these tests are being performed, the variable make period of the 0.375 point of the timing test set should be within the limits of 0.365 second minimum and 0.385 second maximum. Where the test set is equipped with the VA and VB potentiometers, which permit adjustments to  $\pm 0.005$  second, the make period shall be within 0.375 to 0.385 second. This is accom-

plished by using the V position of the B dial and calibrating to 0.380 second. The method of calibrating the test set is described in Plant Series Section 100-137-501.

**1.06** The test equipment specified in this section is designed to apply proper marginal tests (simulated critical circuit conditions) when the circuit under test and the test equipment have an applied voltage of 48.5 to 50. In those offices where power plants are normally operated at more than 50 volts, the battery voltage should be reduced and maintained within the required limits while the tests are being made.

**1.07 Lettered Steps:** A letter a, b, c, etc, added to a step number in Parts 3 and 4 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.

**2. APPARATUS**

**All Tests**

**2.01** Relay timing test set J94713A (SD-90418-01).

**2.02** Patching cord, P2J cord, 6 feet long, equipped with two 310 plugs (2P9B cord), used where a battery supply jack is used to provide battery and ground to test set.

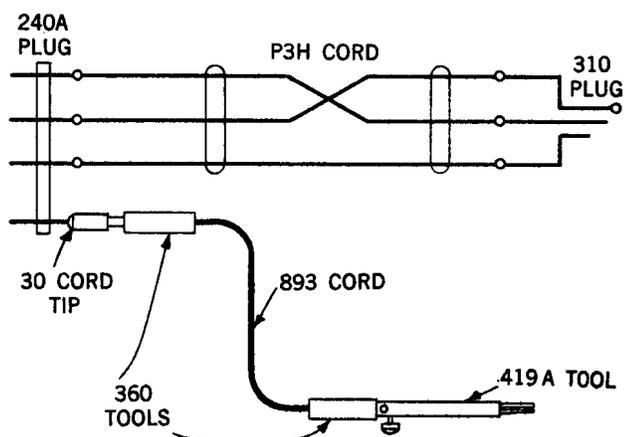
**SECTION 226-330-501**

**2.03** Testing cord, W2M cord, 9 feet long, equipped with one 310 plug and two 59 cord tips (2W12A cord), used where battery and ground for test set are obtained from a 35-type fuse (not to exceed 5 amperes) and frame ground or a battery and ground block.

**2.04** One 32A or 32C test set.

**2.05** Patching cord, P3H cord, 10 feet long, equipped with one 310 plug and one 240A plug (3P2A cord), the 240A plug to be equipped with a 30 cord tip.

**2.06** Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord) and one 419A tool, to be connected as shown in Fig. 1.



**Fig. 1**

**3. PREPARATION**

STEP	ACTION	VERIFICATION
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**Tests A and B**

- 1 Connect battery and ground to BAT-G jack of test set.

*Note 1:* If using 2W12A cord assembly, connect tip (white) conductor to battery and sleeve (red) conductor to ground.

*Note 2:* To avoid possible grounding of battery supply lead, connect cord to test set first and, when disconnecting, remove cord from test set last.

- 2 Insert 310 plug of 3P2A cord into V-M jack of test set.

- 3 Insert plug of 32A test set into BR jack of test set or, if using 32C test set, insert red shell plug into BR jack and gray shell plug into AW jack of test set.

- 4a If test set is not provided with VA and VB potentiometers —  
Set A switch to timing requirement for release of C relay as shown on circuit requirement table or Section 040-013-711. Set B switch to 0.375.

STEP	ACTION	VERIFICATION
5b	If test set is provided with VA and VB potentiometers — Set A switch to timing requirement for release of C relay as shown on circuit requirement table or Section 040-013-711. Set B switch to V position and calibrate variable make value to 0.380.	
6	Operate A-B key to A position.	Timing circuit in test set operates.
7	After test set has operated for at least 15 minutes (to reach constant temperature) — Restore A-B key to normal.	Timing circuit in test set stops.

#### 4. METHOD

STEP	ACTION	VERIFICATION
<b>A. Rotary Speed Test</b>		
8	Insert 240A plug of 3P2A cord into switch test jack.	
9c	If switch under test has digit-absorbing feature — Using 419A tool of 893 cord — Touch terminal 10 of commutator momentarily.	
10	Connect 419A tool of 893 cord to sleeve wiper cord terminal at switch test jack.	
11	Depress and hold red key of remote control set.	Switch steps to first level and rotates to ninth terminal or beyond before next pulse of test set.  <i>Note 1:</i> If switch is being tested after readjustment of C relay, it should rotate to the tenth terminal or beyond before next pulse of test set.  <i>Note 2:</i> Next pulse of test set is indicated by momentary hesitation of rotary action and vertical kick of shaft.
12	Release red key of remote control set.	Switch releases.  <i>Note:</i> If switch failed to rotate to the ninth terminal before next pulse of test set, apply Test B to determine if C relay is releasing within required interval.
13	Disconnect 419A tool from sleeve wiper cord terminal.	
14	Remove 240A plug from switch test jack.	

STEP	ACTION	VERIFICATION
15	Unless further tests are to be made — Remove all cords and restore all keys.	
<b>B. C Relay Release Test</b>		
8	Insert 240A plug of 3P2A cord into switch test jack.	
9c	If switch under test has digit-absorbing feature — Using 419A tool of 893 cord — Touch terminal 10 of commutator momentarily.	
10	Connect 419A tool of 893 cord to sleeve wiper cord terminal at switch test jack.	
11	Depress and hold white key of remote control set.	Switch steps to first level and rotates to second terminal or beyond before next pulse of test set.  <b>Note:</b> Next pulse of test set is indicated by momentary hesitation of rotary action and vertical kick of shaft.
12	Release white key of remote control set.	Switch releases.
13	Disconnect 419A tool from sleeve wiper cord terminal.	
14	Remove 240A plug from switch test jack.	
15	Unless further tests are to be made — Remove all cords and restore all keys.	