

**SELECTORS**  
**B 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 to B and C relays of local, incoming, toll, toll transmission, A-B toll transmission and 2- and 4-party reverting call selectors.

**1.02** This section is reissued to expand the section to include 355A and 35-E-97 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. B Relay Release Test:** This test checks that the selector B relay releases within the time limit specified for the particular circuit.

**B. C Relay Release Test:** This test checks that the selector C relay releases within the time limit specified for the particular circuit.

**1.04** In offices where the selectors are being maintained in accordance with the section covering the combined rotary speed and C relay release test, the separate C relay release test covered by Test B would not ordinarily be scheduled on a routine basis.

**1.05** The timing requirements given on the circuit requirement table for the particular circuit under test shall be employed or, if not covered thereon, the timing requirement given in Section 040-013-711 shall be used.

**1.06** 8- and 10-party reverting call selectors are covered in the section which describes the timing tests for connectors.

**1.07** When testing a first selector in a line switch office, the master switch having direct access to it shall be rotated to pick up disengaged plungers.

**1.08** When testing an incoming selector, the trunk shall be made busy in the approved manner during the test.

**1.09** When testing selectors that absorb digit 1 once or twice only, proceed in same manner as for a regular selector except that the first pulse or pulses will be absorbed.

**1.10** Failure of the B or C relay to meet the release test may be due to the presence of a sticky substance between the armature and core or it may indicate that the relay is out of timing adjustment, in which case it should be readjusted in accordance with the timing requirement given on the circuit requirement table or in Section 040-013-711.

**1.11** The tests described in this section should be made with the switch covers on insofar as practical, however, when testing selectors on which the banks and wipers are concealed by the switch cover, it will be necessary to remove it while tests are being made. Examples of this type switch are SD-31831-01 in the 355A and SD-30970-01 in the 35-E-97 community dial offices.

**1.12** 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.

**1.13 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, P3H cord, 10 feet long, equipped with a 310 plug and a 240A plug (3P2A cord).

**2.03** Patching cord, P2J cord, 9 feet long, equipped with two 310 plugs (2P9A cord), used to supply battery and ground to test set when battery and ground jack is available.

**2.04** Testing cord, W2M cord, 9 feet long, equipped with a 310 plug and two 59 cord tips (2W12A cord) and two 108 cord tips, used when battery and ground block or 35-type fuse (not to exceed 5 amperes) and frame ground is used to supply battery and ground to test set.

**2.05** 136B (relay blocking) tools (or W1U cords), used in disabling digit-absorbing feature of selectors.

**2.06** Hardwood toothpicks, as required.

**2.07** Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord) and two 364 (spade terminal) tools, used to strap S and G binding posts of test set when testing toll intermediate selectors.

**2.08** 477A (or 375A) (make-busy) tools, as required.

**Test B**

**2.09** 32A (or 32C) (remote control) test set.

**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.  <i>Note 1:</i> If using 2W12A cord assembly, connect white (tip) conductor to battery and red (sleeve) conductor to ground.  <i>Note 2:</i> To avoid possible grounding of battery supply lead, connect cord to test set first and, when disconnecting, remove cord from test set last.	
2	Operate test set start key to B position.	Test set pulses.  <i>Note:</i> Allow timing test set to operate for at least 15 minutes (to reach a constant temperature) before making tests.
3	Restore test set start key to normal.	Test set stops pulsing.

STEP	ACTION	VERIFICATION
4a	<p>If testing digit-absorbing selectors which absorb digit 1 repeatedly — Disable digit-absorbing feature in one of the following ways:</p> <p>(a) For selectors such as SD-31915-01, SD-30869-01 and SD-31933-01, first insulate contacts 2L and 3L of normal post springs (use toothpick or equivalent), then short-circuit contacts 1L and 2L (use 136B tool inserted between springs or strap spring terminals with W1U cord).</p> <p>(b) For selectors such as SD-30976-01, proceed as in (a) above and, in addition, insulate 3R and 2R and short-circuit 1R and 2R.</p> <p>(c) For selectors such as SD-30997-01, proceed as in (a) above and, in addition, insulate contacts 1R and 2R and short-circuit contacts 2R and 3R.</p> <p>(d) On selectors SD-31522-01, using Fig. J, and SD-31723-01, using Fig. B, insulate contacts 1L and 2L of normal post springs.</p> <p>(e) On selectors SD-31723-01, using Fig. K, insulate contacts 1L and 2L and 1R and 2R of normal post springs.</p>	
5b	<p>If testing selectors such as SD-31783-01 or SD-31841-01 which restrict service to first level — Insulate make contacts 1 and 2 of normal post springs.</p>	
6c	<p>If testing selectors such as SD-32183-01 which restrict service to first level — Insulate make contacts 2LF and 3LF, 2RF and 3RF and short-circuit 1LF and 2LF, 1RF and 2RF of normal post springs.</p>	
7d	<p>If testing toll intermediate selectors, strap S and G binding posts on test set together, using 893 cord.</p> <p><b>Note:</b> While this strap is in place it will be necessary to remove 240H plug to release switch.</p>	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
<b>Test A</b>		
8	Connect 310 plug of P3H cord to V-BR jack of test set.	
9	Operate B key to position corresponding to release requirement of relay under test.	
<b>Test B</b>		
10e	If using 32A remote control set — Connect plug to BR jack of test set.	
11f	If using 32C remote control set — Connect red shell plug to BR jack and connect gray shell plug to AW jack of test set.	
12	Connect 310 plug of P3H cord to V-M jack of test set.	
13g	If using test set not equipped with VA and VB potentiometers — Set A dial to prescribed requirement (see 1.05).	
14h	If using test set equipped with VA and VB potentiometers — Set A dial to V position and calibrate to prescribed requirement (see 1.05).	

**4. METHOD**

<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
<b>A. B Relay Release Test</b>		
10	Operate test set start key to B position.	Test set pulses.

**Reverting Call Selectors**

11e	If testing selectors such as SD-31831-01 or SD-30970-01 on which banks and wipers are concealed by switch cover — Remove switch cover in order to observe that switch is idle and also action of switch while under test.	
12	Insert 240A plug of P3H cord into switch test jack.	Switch takes one rotary step and stops. After second pulse from test set — Switch may or may not release.
13	Remove 240A plug from switch test jack.	
14f	If switch did not release (Step 12) — Short-circuit test jacks springs 1 and 2 (T and R) of switch under test long enough to trip ring.	Switch releases.
15e	Replace switch cover.	

STEP	ACTION	VERIFICATION
<b>Other Than Reverting Call Selectors</b>		
16	Insert 240A plug of P3H cord into switch test jack.	Switch under test takes one vertical step and releases.
17	After switch under test has taken one vertical step and released, three times — Remove 240A plug from switch test jack.	Switch released.
18	Unless further tests are to be made, remove all cords and restore all keys.	

#### B. C Relay Release Test

##### Reverting Call Selectors

15i	If testing selectors such as SD-31831-01 or SD-30970-01 on which banks and wipers are concealed by switch cover — Remove switch cover in order to observe that switch is idle and also action of switch while under test.	
16	Insert 240A plug of P3H cord into switch test jack.	
17	Depress white button of remote control set.	Switch under test takes one rotary step and stops. After second pulse from test set — Switch may or may not release.
18	After second pulse from test set — Remove 240A plug from switch test jack. Release white button of remote control set.	
19j	If switch did not release (Step 17) — Short-circuit test jack springs 1 and 2 (T and R) long enough to trip ring.	Switch releases.
20i	Replace switch cover.	

##### Other Than Reverting Call Selectors

21	Insert 240H plug of P3H cord into switch test jack.	
22	Depress white button of remote control set.	Switch under test steps to first level and cuts in.
23	Immediately after switch cuts in — Remove 240A plug from switch test jack. Release white button of remote control set.	Switch releases.
24	Unless further tests are to be made — Remove all cords and restore all keys.	