

**SELECTOR OPERATION TEST**  
**USING DIAL HAND TEST SET OR NO. 40C TEST SET**  
**NOS. 1 AND 350A STEP-BY-STEP OFFICES**  
**AND NOS. 355A AND 35-E-97 COMMUNITY DIAL OFFICES**

**1. GENERAL**

**1.01** This section describes a method of testing local and incoming selectors, other than reverting call selectors, and toll intermediate selectors in Nos. 1 and 350A step-by-step offices and Nos. 355A and 35-E-97 community dial offices. In tests A and C a dial hand test set or a No. 40C test set is used; in test B a dial hand test set only is used.

**1.02** This section is reissued to include in tests A and B a check for no-such-number tone or paths busy tone on selectors arranged to "block," to include information on insulating auxiliary test jack springs 5 and 6 when testing SD-32183-01 selectors; to revise the information on the modification of the No. 240H plug used with the No. 40C test set and to bring the section generally up to date. With this issue the section is triply numbered A217.122, A218.220, and A252.001. The title is expanded to include No. 350A step-by-step and Nos. 355A and 35-E-97 community dial offices. Prior to this issue Sections A217.122 and A218.220 were not issued. Since this issue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** The tests covered are:

**A. Local and Incoming Selector Operation:**

This test checks that a selector steps vertically to the proper level and rotates to an idle terminal. It also checks for presence of dial tone on first selectors; in the case of "blocking" selectors for no-such-number tone on "blocked" levels; for digit absorbing on levels so arranged; and for cut-through and proper release of selectors.

**B. Toll Intermediate Selector Operation:**

This test checks that a selector steps vertically to the proper level and rotates to an

idle terminal. In case of "blocking" selector for no-such-number tone or "paths busy" tone; for digit absorbing on levels so arranged; and for cut-through and proper release of the selector.

**C. Restricted Service for Selectors other than "Blocking," and Class of Service Indication Features:** This test checks that a selector will rotate past any terminal on levels arranged for restricted service. It also checks that a selector can receive restricted service or class of service condition from a preceding switch or extend restricted service or class of service condition to a succeeding switch.

**1.04** The term "blocking" is applied to switches that do not cut in when the level dialed is reached and return no-such-number tone or paths busy tone; or, if arranged to cut in, will rotate to the eleventh rotary position and return paths busy tone.

**1.05** When testing local selectors associated with line finder circuits in which the AB lead is normally extended through contacts of the VON assembly to the RLS lead, make the associated line finder busy by operating the MB (make-busy) key. When operating MB keys care should be exercised in determining the number made busy at one time so that service to this group will not be adversely affected.

**1.06** When testing an incoming selector, the trunk should be made busy at the originating end in the approved manner for the duration of the test. It will also be necessary to insert a make-busy plug into the test jack of the associated trunk circuit.

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

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**1.08** On alternate test cycles the first trunk should be made busy on the level under test when making test A or B. On the other test cycles the trunk should be left idle to test that the switch does not overstep during rotary hunting.

**1.09** A different level should be used each time the tests are performed so that eventually every selector will have been tested on each working level, except levels with trunks to switchboard positions.

**1.10** In order to avoid the effects of clicks when performing tests with the No. 40C test set, the receiver should not be held directly over the ear. (On No. 40C test sets using the No. 716E receiver, this caution will not be necessary.)

**1.11** Wherever the method calls for connecting to a switch, first observe that the switch is in the normal position and then monitor on the circuit. If there is an indication that the switch has been seized by another call disconnect from the switch. Otherwise proceed immediately with the test. The dial hand test set is in the monitoring condition with the switch in the MON position. The No. 40C test set is in a monitoring condition with the No. 1 key normal.

**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 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.

**1.14** Local instructions should be followed for recording and reporting any register operations caused by performing these tests.

## **2. APPARATUS**

### **TESTS A, B, AND C**

**2.01** No. 377A dialing tool.

**2.02** No. 477A or No. 375A (make-busy) tools as required.

### **TESTS A AND C**

**2.03** No. 1011G dial hand test set, equipped with a W2CL cord, one No. 471A jack and one No. 240A plug (No. 2W39A cord), modified by replacing the No. 240A plug with a No. 240F plug and bridging a No. 2T lamp from the tip to the ground terminals of the plug (or an equivalent dial hand test set). Operate the cord switch to the ON position.

**2.04** No. 40C test set with the No. 240H plug modified as in Fig. 1 by adding one pair of lamp springs obtained from a No. 240F plug and connecting the top spring to the tip plug terminal and the bottom spring to the ground plug terminal. Insert a No. 2T lamp in the lamp jack. Leave the No. 360B tool of the test cord disconnected from the W terminal of the No. 240H plug.

*Note:* The No. 366A plug furnished with the No. 40C test set is not used in making these tests.

### **TEST A**

**2.05** Toothpicks as required for insulating auxiliary test jack springs 5 and 6 when testing SD-32183-01 selectors.

### **TEST B**

**2.06** No. 1011G dial hand test set equipped with a W2CL cord, one No. 471A jack and one No. 240A plug (No. 2W39A cord) modified by replacing the No. 240A plug with a No. 240K plug arranged as shown in Fig. 2 (or an equivalent dial hand test set). Equip the lamp jacks with No. 2T lamps. Solder a No. 30 cord tip to the soldering terminal on the C lead test lamp spring and place straps as shown.

*Note:* Leave the switch of the W2CL cord in the ON position.

**2.07** Testing cord, W1AF cord 8 feet 6 inches long and a No. 310 plug modified as follows. Remove the No. 360A tool from one end of the cord and connect the cord to the ring of the No. 310 plug. Connect the remaining No. 360A tool of this cord to the No. 30 cord tip of the modified No. 240K plug.

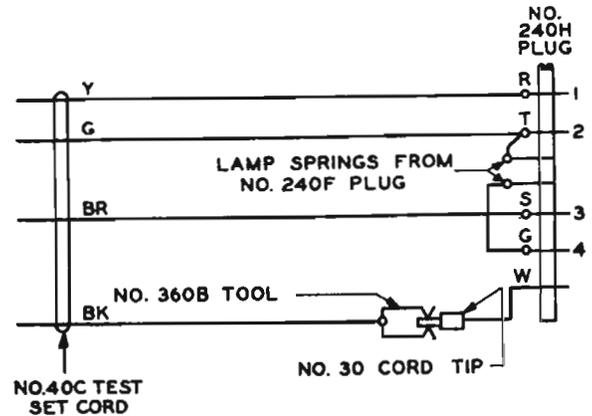
**Notes**

1. The W1AF cord 8 feet 6 inches long has a 188-ohm resistor built in and where this length is insufficient to permit all the switches to be tested, insert a No. 1W13B cord 6 feet long between the No. 30 cord tip on the No. 240K plug and the W1AF cord using a No. 141 cord tip to connect the two No. 360A tools together.
2. A suitable cord may be made up locally by placing a 180- to 200-ohm resistor in series with a cord of the required length and terminated as described above.

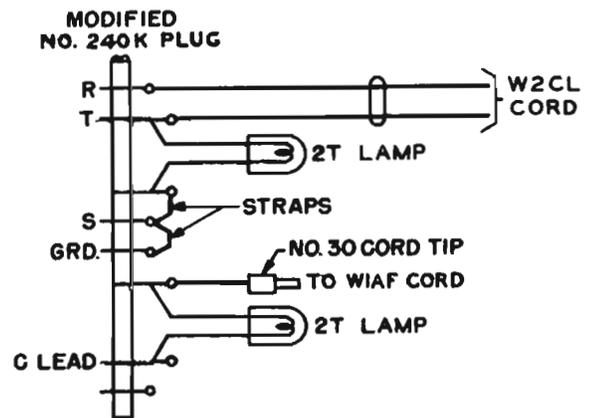
**2.08** KS-6320 orange stick.

**TEST C**

**2.09** No. 893 cord equipped with two No. 360A tools (No. 1W13A cord), with a No. 365 tool and a No. 419A tool attached to the No. 360A tools.



**Fig. 1 – Modification at the No. 240H Plug**



**Fig. 2 – Modification at the No. 240K Plug**

**3. METHOD**

| STEP  | ACTION   | VERIFICATION  |
|---|--|---|
| <b>A. Local and Incoming Selector Operation</b> |  |   |
| 1a  | If test cycle is one where the first trunk is to be made busy proceed as follows: Invert the plug of the test set and insert it into test jack of an idle selector in the same shelf as the selector under test so that the tip and ring of the plug make contact with the ring and tip of the test jack. Operate the switch of the dial hand test set to the TALK position or operate the No. 1 key of the No. 40C test set —<br>Dial the level under test. | Selector steps to level dialed, rotates to first terminal and cuts through. |
| 2a  | Insert a make-busy tool between sleeve and ground springs of test jack (3 and 4).  |   |
| 3a  | Remove No. 240A test plug from test jack.  | Selector holds in operated position.  |

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| <b>STEP</b> | <b>ACTION</b>   | <b>VERIFICATION</b>  |
|-------------|---|--|
| 4b          | If testing SD-32183-01 selectors —<br>Place a toothpick between auxiliary test jack springs 5 and 6.  |  |
| 5           | Insert No. 240H plug of test set into test jack of selector under test.   | On SD-32183-01 selectors check that toothpick in auxiliary test jack springs 5 and 6 prevents closure.   |
| 6c          | If using dial hand test set —<br>Operate switch to TALK position.   | Test lamp lights dimly.  |
| 7d          | If using No. 40C test set —<br>Hold No. 1 key operated.   | Test lamp lights dimly.  |
| 8e          | If selector is arranged to absorb first series of pulses on certain levels —<br>Dial level so arranged.                                       | Selector steps to level dialed and restores properly.  |
| 9f          | If selector is arranged to absorb the first two series of pulses on certain levels —<br>Dial the levels so arranged in their proper sequence. | Selector steps to each level dialed and restores properly after each series of pulses.   |
| 10g         | If selector is arranged to absorb on certain levels repeatedly —<br>Dial a level so arranged at least twice.                                  | Selector steps to level dialed and restores properly after both series of pulses.  |
| 11h         | If selector is arranged to “block” on certain levels —<br>Dial level so arranged.   | Selector steps to level dialed, “blocks” and returns tone.   |
| 12h         | Momentarily operate hand test set switch to MON position or release No. 1 key of No. 40C test set.  | Selector restores properly.  |
| 13i         | If selector is arranged to absorb the first digit and “block” on the second digit on certain levels —<br>Dial the level arranged to absorb.   | Selector steps to level dialed and restores properly.  |
| 14i         | Dial the level arranged to “block.”   | Selector steps to level dialed, “blocks” and returns tone.   |
| 15i         | Momentarily operate hand test set switch to MON position or release No. 1 key of No. 40C test set.  | Selector restores properly.  |
| 16          | Dial level under test.  | Selector steps smoothly to proper level and rotates past first terminal if made busy, and stops on an idle terminal. Listen in receiver of test set for excessively loud clicks as selector cuts through. Observe that test lamp is of the same brilliancy after selector cuts through as it was before dialing. |

| STEP | ACTION   | VERIFICATION   |
|------|--|--|
| 17j  | With TALK or No. 1 key still operated, dial another digit.<br><br><i>Note:</i> On selectors immediately preceding level hunting connectors arranged for hunting after dialing the first digit, a connector level which is not assigned for subscribers' service should be dialed if available; otherwise the dialing of this additional digit should be omitted unless it has been determined locally that the resultant ringing on the trunk is not objectionable at the time the test is being made. | Observe that there is no vertical kick of the shaft and that no relay chattering is heard within the switch. |
| 18c  | If using dial hand test set —<br>Operate switch to MON position.   | Selector releases properly.  |
| 19d  | If using No. 40C test set —<br>Release No. 1 key.  | Selector releases properly.  |
| 20   | Remove test plug from test jack.   |  |
| 21b  | If testing SD-32183-01 selectors —<br>Remove toothpick from auxiliary test jack springs.   |  |
| 22   | Repeat Steps 4(b) through 21(b) as required, on other selectors to be tested.<br><br><i>Note:</i> If test cycle is one where the first trunk is to be made busy substitute another selector previously tested for the one to hold the first trunk busy.  |  |
| 23a  | If test cycle is one where first trunk is made busy —<br>Remove make-busy tool.  |  |

**B. Toll Intermediate Selector Operation**

|    |   |  |
|----|---|--|
| 1a | If test cycle is one where the first trunk is to be made busy proceed as follows:<br>Insert a make-busy tool between 3 and 4 springs of the test jack on one of the idle selectors on the same shelf as the one being tested. Insert another make-busy tool between springs 1 and 2. Pulse the selector to the test level by removing and reinserting the latter tool as required to simulate dialing.<br><br><i>Caution: To avoid personal contact with the make-busy tool used to pulse a selector, one end of the tool should be insulated with tape or suitable sleeving.</i> | Selector steps to level (by simulated dialing) and cuts through on first terminal. |
|----|---|--|

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| STEP | ACTION  | VERIFICATION  |
|------|---|---|
| 2a   | When the selector reaches level under test leave both make-busy tools in test jacks.  | Selector holds in this operated position.   |
| 3    | Insert No. 310 plug of W1AF cord into test battery supply jack.   |   |
| 4    | Insert modified No. 240K test plug into test jack of selector under test.   |   |
| 5    | Operate switch on dial hand test set to TALK position.  | Tip conductor test lamp lights.<br>C lead test lamp lights.   |
| 6b   | If selector is arranged to absorb the first series of pulses on certain levels —<br>Dial level so arranged.   | Selector steps to level dialed and restores properly.   |
| 7c   | If selector is arranged to absorb on certain levels repeatedly —<br>Dial a level so arranged at least twice.  | Selector steps to level dialed and restores properly after both series of pulses.   |
| 8    | Dial level under test.  | Selector steps to level dialed, rotates past the first trunk if made busy and stops on first idle terminal. Listen in receiver of hand test set for excessively loud clicks as selector cuts through. Observe that test lamps are of the same brilliancy after selector cuts through as before dialing, except that when testing on a level serving combination connectors a decrease in the brilliancy of the tip test lamp is normal. |
| 9    | Using an orange stick, raise the C wiper tip sufficiently to open the contact but not permitting the wiper to come in contact with the terminal above.  | C test lamp is extinguished.  |
| 10   | Remove orange stick.  | C lead test lamp relights.  |
| 11   | Dial another digit.   | Observe that there is no vertical kick of the shaft and that no relay chattering is heard within the switch.<br>Observe that test lamps are of the same brilliancy as before this step.   |
| 12   | Remove test plug from test jack.  | Selector releases and restores properly.  |
| 13   | Repeat Steps 1a through 12 as required for other selectors to be tested.<br><br><i>Note:</i> If test cycle is one where first trunk is made busy, substitute another selector previously tested for the one to hold the first trunk busy. |   |
| 14a  | If test cycle is one where first trunk is made busy —<br>Remove make-busy tools.  |   |
| 15   | Remove connection to battery supply.  |   |

| STEP   | ACTION  | VERIFICATION   |
|--|---|--|
| <b>C. Restricted Service for Selectors other than "Blocking," and Class of Service Indication Features</b> |   |  |
| 1  | Insert No. 240H plug of test set into test jack of selector under test.   |  |
| 2  | Operate handset switch to TALK position or No. 1 key of No. 40C test set.   | Test lamp lighted.   |
| 3a   | If selectors are arranged to absorb first digit on level selected for test —<br>Dial digit so arranged.   | Selector steps to level dialed and releases properly.  |
| 4b   | If selectors are arranged for restricted service on individual levels and not dependent on indication from preceding circuit —<br>Dial level so arranged.   | Selector steps to level dialed and rotates to 11th rotary position.<br>Paths busy tone is heard. |
| 5c   | If selectors are arranged for restricted service until a digit is absorbed —<br>Dial level so arranged.   | Selector steps to level dialed and rotates to 11th rotary position.<br>Paths busy tone is heard. |
| 6d   | If selectors are arranged to receive restricted service or class of service condition over a fourth wire (A lead) from preceding selector —<br>Connect No. 365 tool of No. 893 cord to switch frame ground and No. 419A tool to shelf jack spring of selector under test as follows:<br>No. 6 spring for Western Electric Company shelves.<br>No. 13 spring for Automatic Electric Company shelves. |  |
| 7d   | Dial level so arranged.   | Selector steps to level dialed and rotates to 11th rotary position.<br>Paths busy tone is heard. |
| 8e   | If selectors are arranged to extend restricted service or class of service condition over a fourth wire (A lead) to succeeding switch —<br>Connect No. 893 cord as in Step 6d.  |  |
| 9e   | Dial the code ( ) which will direct the selector to proper level or trunk.  | Selector steps to proper level.<br>Proper indication is received.                                |

**Note:** In some cases it may be necessary to check with the operator as the indication may not always be received by the tester.

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| <b>STEP</b> | <b>ACTION</b>  | <b>VERIFICATION</b> |
|-------------|--|---------------------|
| 10          | Repeat Steps 1 through 9e as required for all other selectors to be tested.                                    |                     |
| 11f         | If using No. 893 cord —<br>Disconnect No. 365 tool from shelf ground and No. 419A tool from shelf jack spring. |                     |
| 12g         | Unless no other tests are to be performed —<br>Remove test plug from selector.                                 | Selector releases.  |