

SELECTORS - OPERATION TESTS 740E PBX

1. GENERAL

- 1.01 This section describes a method of testing the operating features of selectors in a No. 740E P B X. It also covers the purpose of each test.
- 1.02 The tests covered are:
- (A) Cut-In and Release
 - (B) Selector Trunk Continuity
 - (C) Local Selector Operation
 - (D) Incoming Selector Operation
 - (E) Selector Rotary Action
- 1.03 A different level should be used each cycle so that all switches will eventually be tested on all levels. In the case of an incoming selector do not test the zero level.
- 1.04 When testing incoming selectors, make the associated tie trunks busy in the approved manner for the duration of the test.
- 1.05 When test (C) or test (D) is scheduled test (A) may be omitted on the levels involved.

2. APPARATUS

All Tests

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

Tests (A), (B), (C) and (D)

- 2.02 No. 1011G dial hand test set equipped with a 2W39A cord assembly consisting of a W2CL cord, a No. 471-A jack, and a No. 240A plug (or equivalent).

Tests (C) and (D)

- 2.03 Test set (P.B.X.), J54701B (SD-66073-01).
- 2.04 Test telephone set (part of test set).
- 2.05 Testing cord—W2M cord, 9 feet long, equipped with one No. 310 plug (2W12A cord) (for use in establishing test circuit battery and ground connections).
- 2.06 Patching cord—P3C cord, 10 feet long equipped with one No. 310 plug and one No. 240A plug (3P2A cord).

Tests (C) and (E)

- 2.07 Testing cord—W1U cord, 1 foot 8 inches long (for use in establishing a battery or ground test connection).

Test (E)

- 2.08 No. 40-C test set.

3. PREPARATION

All Tests

- 3.01 Operate the MS (motor start) key on the line frame when testing local selectors. Leave the MS key normal when testing incoming selectors.

Tests (A) and (B)

- 3.02 Operate the switch of the cord assembly of the dial hand test set to the ON position.

Tests (C) and (D)

- 3.03 Locate the P B X test set at the side of the selector frame. Operate the 740E key in the P B X test set.
- 3.04 Connect the testing cord to the BAT jack of the P B X test set. Then connect the No. 59 cord tip on the sleeve conductor (red) to ground and connect the No. 59 cord tip on the tip conductor (white) to the equipment end of a fuse on the fuse panel.

- 3.05 Connect the test telephone set to the TEL jacks of the P.B.X. test set, or connect the dial hand test set to the HS jack of the P B X test set.

Note 1: When using a dial hand test set, operate the TRS (transmitter) key on the P B X test set. Operate the switch of the cord assembly of the dial hand test set to the ON position. Operate the switch of the dial hand test set to the TALK position and use the dial hand test set dial instead of the P B X test set dial in making tests.

Note 2: When using the test telephone set, leave the TRS key in the normal position except when found necessary to talk over the test line.

- 3.06 Connect the patching cord to the T jack of the P B X test set.

Test (E)

- 3.07 Connect the No. 360B tool associated with the black conductor of the test set cord to the W terminal of the No. 240-H plug.
- 3.08 Using the testing cord connect the tip of the No. 336A plug to the 48V terminal of the 27-A connecting block on the line frame.

4. METHOD

(A) Cut-In and Release

- 4.01 This test checks the cut-in and release features of the selector. It also checks for dial tone.
- 4.02 With the switch of the dial hand test set in the MON position connect to the test jack of an idle selector.
- 4.03 Operate the switch on the dial hand test set to the TALK position. Observe that dial tone is heard in the receiver.

Note: In the case of incoming selectors no dial tone will be heard.

- 4.04 Dial the number of the level to be tested and immediately dial the digit one. Note that dial tone is removed. Observe that the selector steps to the level dialed and rotates to the first idle trunk. Observe that there is no extra vertical step or vertical kick of the shaft.

Note: An extra vertical step or vertical kick of the shaft usually indicates that the C relay is too slow to release.

- 4.05 Operate the switch of the dial hand test set to the MON position and observe that the selector releases.
- 4.06 Disconnect the dial hand test set from the test jack.
- 4.07 When testing is completed restore the MS key to normal.

(B) Selector Trunk Continuity

- 4.08 This test checks the continuity of trunks from the selector levels. It also checks for busy tone.
- 4.09 Connect the dial hand test set to the test jack of an idle selector. Remove the switch cover.
- 4.10 Operate the switch on the dial hand test set to the TALK position. Dial the switch to the level to be tested and observe that it stops on the first idle trunk.
- 4.11 Step the switch to the last rotary position by rapidly opening and closing the vertical off normal springs. Observe that the selector advances and stops on each idle trunk without chattering. Observe that the switch rotates automatically over busy trunks and over unused trunk terminals in cases where the level is not completely equipped with working trunks.

SECTION 546-404-656

- 4.12 Observe that busy tone is heard in the receiver when the switch reaches the 11th rotary position.
- 4.13 Operate the switch of the dial hand test set to the MON position and observe that the selector releases.
- 4.14 Disconnect the dial hand test set from the test jack. Replace the switch cover and restore the MS key to normal.

(C) Local Selector Operation

- 4.15 This test checks the operating features of the local selector. It also checks for dial tone, busy tone, and restriction.
- 4.16 Using the patching cord, connect the T jack of the P B X test set to the test jack of an idle local selector. Observe that the BSY (busy) lamp on the P B X test set is not lighted.
- 4.17 Operate the LP (loop) key of the P B X test set. Observe that the BSY lamp lights and that dial tone is heard in the receiver.
- 4.18 Dial the number of the level to be tested. Observe that dial tone is removed, and that the switch steps smoothly to the proper level and rotates to an idle terminal.
Note: When a switch is dialed to a central office trunk or tie trunk level where the trunks terminate before an operator or attendant, an incoming call is indicated at the distant end. In such cases, if a test telephone set is used for testing, operate the TRS key, and when the operator or attendant answers, advise that the line is being tested.

- 4.19 Restore the LP key and observe that the selector releases and that the BSY lamp is extinguished when the switch is normal.
- 4.20 Operate the LK (leak) key and proceed as outlined in 4.17 to 4.19 inclusive using the LK key instead of the LP key.
- 4.21 Operate the LP key and check that the BSY lamp lights. Remove the switch cover. Using the testing cord connect ground to the No. 2 contact of the normal post spring.
- 4.22 Dial the number of the restricted level. Observe that the switch steps to the proper level and rotates to the eleventh rotary step. Observe that busy tone is heard in the receiver.
- 4.23 Restore the LP key and observe that the switch releases.
- 4.24 Disconnect the testing cord. Replace the switch cover. Disconnect the P B X test set from the test jack of the switch.
- 4.25 When testing is completed, restore all the P B X test set keys to normal, disconnect all testing apparatus and restore the MS key to normal.

(D) Incoming Selector Operation

- 4.26 This test checks the operating features of the incoming selector. It also checks for motor starting and busy tone.
- 4.27 Using the patching cord connect the T jack of the P B X test set to the test jack of an idle incoming selector. Observe that the BSY lamp is not lighted.
- 4.28 Operate the LP key of the P B X test set. Observe that the BSY lamp lights and that dial tone is not heard.
- 4.29 Dial the number of the level to be tested. Check that the ringing machine starts on the first vertical step of the selector shaft. Observe that the switch steps smoothly to the proper level and rotates to an idle terminal.
Note: When all terminals on a level are busy observe that the switch rotates to the 11th rotary position. Observe that busy tone is heard in the receiver.

- 4.30 Restore the LP key and observe that the switch releases and that the BSY lamp is extinguished when the switch is normal.
- 4.31 Operate the LK key and proceed as outlined in 4.28 to 4.30 inclusive using the LK key instead of the LP key.
- 4.32 Disconnect the P B X test set from the jack of the switch.
- 4.33 When testing is completed, restore all the P B X test set keys to normal, disconnect all testing apparatus.

(E) Selector Rotary Action

- 4.34 This test checks the rotary action of the selector. It also checks for the ability of the selector to pass a busy trunk and to stop on an idle trunk.
- 4.35 Connect the No. 40-C test set to the test jack of an idle selector. Adjust the auxiliary spring, associated with the W terminal of the No. 240H plug, to make firm contact with the sleeve wiper cord terminal. Monitor on the circuit to insure that the switch has not been seized.
- 4.36 Operate key 1 of the test set and dial the number of the level to be tested. Observe that the selector steps to the level dialed and rotates with positive and smooth action at uniform speed to the 11th rotary position. Observe that busy tone is heard in the receiver.
Note: This is a test for the "operate" of the E relay and the "non-operate" of the D relay. The rotary action in this test is usually slower than is normally experienced in service, but if the action is positive, smooth and uniform, the slow speed is not an indication of trouble.
- 4.37 Listen in the receiver during the rotary action of the selector. A clicking noise in the receiver usually indicates faulty cam spring adjustment or faulty back contact pressure on the D relay.

Caution: To avoid the effects of resultant clicks when performing these tests, do not place the receiver directly over the ear.

- 4.38 As soon as the selector reaches the 11th rotary position, release key 1 to avoid excessive vibration of the rotary magnet. Observe that the switch releases.
- 4.39 Operate key 1 of the test set and dial the number of the level to be tested. While the selector is rotary hunting, operate key 2 before the selector reaches the 8th rotary position. Observe that the selector stops on an idle trunk.
Note: This is a test for the "operate" of the D relay and the "non-operate" of the E relay and checks the ability of the selector to stop on an idle trunk.
- 4.40 After the selector has stopped on an idle trunk maintain key 1 operated and release key 2. Dial another digit and observe that there is no vertical kick of the shaft and that no relay chattering is heard within the switch.

Note: A vertical kick of the shaft or relay chattering indicates that the selector D relay is not operating properly.

- 4.41 Release key 1 and observe that the switch releases.
Note: If the switch stops falsely on a busy trunk the switch will not release on releasing key 1.
- 4.42 When testing is completed disconnect the test set from the selector test jack.
- 4.43 Restore the MS key to normal. Disconnect battery from the tip of the No. 336A plug.

5. REPORTS

- 5.01 The required record of these tests should be entered on the proper form.