

SELECTOR-CONNECTORS - OPERATION TESTS
740A, 740B, 740C AND 740AX PBX

1. GENERAL

1.01 This section describes methods of testing the operating features of selector-connectors in No. 740-A, No. 740-B, No. 740-C and No. 740-AX P B X's.

1.02 This section has been revised to include ringing, non-tripping and tripping tests at private branch exchanges having the test line equipped with the No. 384A (six spring) test jack instead of the No. 328 (four spring) test jack.

1.03 The features covered are as follows:

- (A) Selector Operation Test Using Test Set
- (B) Selector Operation Test Using Dial Hand Test Set
- (C) Ringing, Non-Tripping, Tripping and Busy Test Using Test Set
- (D) Ringing, Non-Tripping, Tripping and Busy Test Using Dial Hand Test Set
- (E) Trunk Originated Calls
- (F) Night Connections
- (G) Rotary Test

1.04 Each time test (A) or (B) is made on No. 740-A P B X's a different selector level should be used when more than one level is used for selector levels, so that the selector-connectors will eventually be tested on all selector levels.

1.05 Tests (A) and (C) are alternatives to tests (B) and (D) respectively except that tests (A) and (C) provide loop and leak marginal tests that are not obtained when using the dial hand test set.

1.06 When tests (A) and (C) are scheduled together it is not necessary to make the loop test under test (A).

1.07 Test (G) should ordinarily be made at times of light traffic.

1.08 Any selector-connector on which a failure is encountered should be made busy until the trouble is cleared.

2. APPARATUS

2.01 The apparatus required for each test is shown in the following list. The details for each item are covered in the indicated paragraphs.

Apparatus	Tests						
	A	B	C	D	E	F	G
Test Set(2.02)	1	—	1	—	1	1	—
W2M Cord(2.03)	1	—	1	—	1	1	—
P3C Cord(2.04)	1	—	1	—	1	1	—
Dial Hand Test Set... (2.05)	1*	1	1*	1	—	—	—
Dial Hand Test Set... (2.06)	—	—	—	—	—	—	1
375A Tool(2.07)	—	—	1	1	—	—	—
P3E Cord(2.08)	—	—	—	—	1	2	—
No. 893 Cord(2.09)	—	—	—	—	—	—	1

* Or Attendant's telephone set.

- 2.02 Test Set J54701A (SD-66073-01) or J94704A (SD-90416-01).
- 2.03 W2M Cord equipped at one end with a No. 110 Plug and at the other end with two No. 59 Cord Tips.
- 2.04 P3C Cord equipped with a No. 110 Plug and a No. 240A Plug.
- 2.05 Dial Hand Test Set equipped with a No. 4CB Dial and a No. 240A Plug.
- 2.06 Dial Hand Test Set equipped with a No. 4CB Dial and either a No. 240A or a No. 240H Plug.
- 2.07 No. 375A (Make-Busy) Tool.

- 2.08 P3E Cord equipped with No. 110 Plugs at both ends.
- 2.09 No. 893 Cord equipped with two No. 360A Tools and supplied with one of the following arrangements, any of which is satisfactory.
 - (a) Two KS-6278 Tools (Test Clips) each equipped with a No. 108 Cord Tip (Rubber Sleeve).
 - (b) One No. 365 Tool (Test Clip) equipped with a No. 90 Cord Tip (Rubber Sleeve) and one KS-6278 Tool equipped with a No. 108 Cord Tip.
 - (c) One KS-6278 Tool equipped with a No. 108 Cord Tip and one No. 419A Tool (Test Connector).
 - (d) One No. 365 Tool equipped with a No. 90 Cord Tip and one No. 419A Tool.

3. PREPARATION

Tests (A), (C), (E) and (F) Using Test Set J54701A or J94704A

3.01 Locate the test set at the selector-connector side of the switch frame. Connect the W2M cord to the BAT-G (or BAT) jack of the test set and then connect the No. 59 cord tip on the (red) sleeve conductor of the cord to ground and the other No. 59 cord tip on the (white) tip conductor to the equipment and of a fuse on the fuse panel.

3.02 Connect an attendant's telephone set to the TEL jacks of the test set or a dial hand test set to the HS jack of the test set for tests (A), (C) or (E). Connect a dial hand test set to the HS jack of the test set for test (F).

Note 1: When using a dial hand test set with test set J54701A operate the TRS key or if using it with test set J94704A operate the HS key. Also operate the C button of the dial hand test set and use the hand set dial instead of the test set dial in making tests.

Note 2: When using an attendant's telephone set with either test set J54701A or J94704A the TRS key should be left in the normal position except when it may be found necessary to talk over the test line.

3.03 For tests (E) and (F) only, in addition to the above, connect the C jack of the test set to the TL jack of the test set using a P3E cord.

3.04 Connect the No. 110 plug of a P3C cord to the T jack of the test set.

4. METHOD

(A) Selector Operation Test Using Test Set

4.01 Insert the No. 240A plug of the P3E cord into the test jack of the selector-connector under test. Observe that the BSY lamp is not lighted indicating that the switch is idle.

4.02 Operate the P B X key (if provided) and the LK key and note that the BSY lamp lights and that dial tone is heard in the receiver.

4.03 Dial the number of the selector level to be used and as soon as possible thereafter dial the digit one. Observe that the switch steps to the level dialed and rotates to the first idle trunk. Should the dialing of the digit one cause an extra vertical kick of the shaft it usually indicates that the C relay is too slow in releasing.

Note: On No. 740-B P B X's where central office trunks and tie trunks terminate on the 5th level, it will be necessary to dial 5 and then dial the second digit of the trunk or tie trunk cord. This second digit should be dialed to follow the digit 5 as rapidly as possible. The switch should step to the fifth level and then rotate to the first idle trunk or tie trunk. Should the dialing of the second digit cause an extra vertical kick of the

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shaft, it usually indicates that the C relay is too slow in releasing.

- 4.04 Restore the LK key and note that the selector-connector releases and that the BSY lamp is extinguished.
- 4.05 Operate the LP key and repeat the operations described in 4.03 and 4.04 employing the LP key instead of the LK key.
- 4.06 Restore all keys to normal and disconnect the testing apparatus.

(B) Selector Operation Test Using Dial Hand Test Set

4.07 Note that the selector-connector on which the test is to be made is idle. Connect the dial hand test set to the selector-connector test jack and operate the C button. Note that dial tone is heard in the receiver.

4.08 Holding the C button operated, dial the number of the selector level to be used and as soon as possible thereafter dial the digit one. Observe that the switch steps to the level dialed and rotates to the first idle trunk. Should the dialing of the digit one cause an extra vertical kick of the shaft, it usually indicates that the C relay is too slow in releasing.

Note: On No. 740-B P B X's when central office trunks and tie trunks terminate on the 5th level, it will be necessary to dial 5 and then dial the second digit of the trunk or tie trunk code. This second digit should be dialed to follow the digit 5 as rapidly as possible. The switch should step to the 5th level and then rotate to the first idle trunk or tie trunk. Should the dialing of the second digit cause an extra vertical kick of the shaft, it usually indicates that the C relay is too slow in releasing.

- 4.09 Release the C button and observe that the selector-connector releases properly.
- 4.10 Disconnect the dial hand test set.

(C) Ringing, Non-Tripping, Tripping and Busy Test Using Test Set

4.11 Operate the P B X key (if provided) and the LP key and note that the BSY lamp lights and that dial tone is heard in the receiver.

4.12 Dial the test line number and observe that the selector-connector follows the impulses from the dial and stops on the test line terminals. Note that the test line bell rings and that audible ringing is heard in the receiver and continues at regular intervals indicating that the trip relay in the selector-connector has not operated. Where the No. 328 (four spring) test jack is provided the test line circuit automatically applies the non-trip test at this time.

Caution: Should the selector-connector fail to reach the test line terminals release the C button immediately to avoid ringing an extension.

4.13 When the test line is equipped with a No. 384A (six spring) test jack momentarily short circuit springs 5 and 6 to complete the non-trip test as indicated below.

- (a) Where ringing current is obtained from the central office and is either a-c.—d-c. of 95 to 103 volts a-c. and 16 to 19 volts d-c. or straight a-c. (i.e., test line has "X" wiring) apply the short circuit during a silent interval. Ringing should continue, indicating that the trip relay has not operated improperly.
- (b) For all other ringing current supply conditions apply the momentary short circuit to springs 5 and 6 during a ringing interval and note that ringing does not stop.

4.14 Short-circuit the 1 and 2 springs of the test line jack during a silent interval. Note that the ringing is tripped and that a click is heard in the receiver.

4.15 Remove the short circuit from the test line jack and note that a click is heard in the receiver indicating that the talking circuit through the selector-connector is satisfactory.

4.16 Restore the LP key and note that the selector-connector releases properly and that the BSY lamp is extinguished.

4.17 Make the test line busy by placing a No. 375A tool between the 3 and 4 springs of the test line jack.

4.18 Operate the LK key and note that the BSY lamp lights and that dial tone is heard in the receiver.

4.19 Dial the test line number and observe that the selector-connector follows the impulses from the dial and stops on the test line terminals. Note that the busy tone is heard in the receiver and that the test line bell does not ring.

4.20 Restore the LK key (and P B X key) and note that the selector-connector releases and that the BSY lamp is extinguished.

4.21 Remove the No. 375A tool from the test line jack, restore all keys to normal and disconnect the testing apparatus.

(D) Ringing, Non-Tripping, Tripping and Busy Test Using Dial Hand Test Set

4.22 Note that the selector-connector on which the test is to be made is idle. Connect the dial hand test set to the selector-connector test jack and operate the C button. Note that dial tone is heard in the receiver.

4.23 Holding the C button operated, dial the test line number and observe that the selector-connector follows the impulses from the dial and stops on the test line terminals. Note that the test line bell rings and that audible ringing is heard in the receiver and continues at regular intervals indicating that the trip relay in the selector-connector has not operated. Where the No. 328 (four spring) test jack is provided the test line circuit automatically applies the non-trip test at this time.

Caution: Should the selector-connector fail to reach the test line terminals, release the C button immediately to avoid ringing an extension.

4.24 When the test line is equipped with a No. 384A (six spring) test jack proceed as in 4.13.

4.25 Short-circuit the 1 and 2 springs of the test line jack during a silent interval. Note that the ringing is tripped and that a click is heard in the receiver.

4.26 Remove the short-circuit from the test line jack and note that a click is heard in the receiver, indicating that the talking circuit through the selector-connector is satisfactory.

4.27 Release the C button and observe that the selector-connector releases properly.

4.28 Make the test line busy by placing a No. 375A tool between the 3 and 4 springs of the test line jack.

4.29 Operate the C button and dial the test line number. Observe that the selector-connector follows the impulses from the dial and stops on the test line terminals. Note that the busy tone is heard in the receiver and that the test line bell does not ring.

4.30 Disconnect the dial hand test set and observe that the switch releases properly. Remove the No. 375A tool from the test line jack.

(E) Trunk Originated Calls

4.31 Operate the T key and note that the BSY lamp lights, indicating that a ground has been placed on the sleeve of the selector-connector.

4.32 Operate the P B X key (if provided) and the LP key and note that dial tone is heard in the receiver. Dial the test line number and observe that the selector-connector stops on the test line terminals. Note that the test line bell rings and that audible ringing is heard in the receiver.

4.33 When the test line is equipped with a No. 384A (six spring) test jack proceed as in 4.13.

4.34 Short-circuit the 1 and 2 springs of the test line jack during a silent interval. Note that the ringing stops.

4.35 Remove the short-circuit and note that no click is heard in the receiver. This indicates the absence of battery and ground on the test line.

4.36 Restore the LP key and note that the selector-connector does not restore. Restore the T key and note that the BSY lamp is extinguished and that the switch restores.

4.37 Restore all test set keys to normal.

(F) Night Connections

4.38 Proceed as described for a trunk originated call in 4.31 and 4.32 using the dial hand test set. Release the C button of the dial hand test set and note that the switch does not restore. The test line bell may or may not continue to ring while the C button is released. Reoperate the C button.

4.39 At the line finder side of the switch frame insert the No. 110 plug on one end of a P3E cord into the test jack of the associated line finder switch. Touch the sleeve of the No. 110 plug at the other end to ground during a silent interval and note that ringing on the test line is no longer heard. After about five seconds remove the P3E cord from the test jack of the line finder switch and note that ringing is resumed.

4.40 Restore the LP key and note that the selector-connector does not restore. Restore the T key and note that the BSY lamp is extinguished and that the switch restores. Disconnect the testing apparatus.

(G) Rotary Test

4.41 Connect one end of the No. 893 cord to ground using the No. 365 or KS-6278 tool.

4.42 Note that the selector-connector on which the test is to be made is idle. Connect either the No. 240A or No. 240H plug to the test jack of the selector-connector to be tested and operate the C button.

Note: When using the No. 240H plug adjust the auxiliary contact spring so that it makes contact with the sleeve wiper terminal on the test jack.

4.43 Connect the No. 419A or KS-6278 tool on the other end of the No. 893 cord to the sleeve wiper cord terminal of the test jack assembly of the selector-connector under test

or if using a No. 240H plug connect the tool to the auxiliary sleeve contact spring of the plug. This places a ground on the sleeve wiper of the switch.

4.44 With the C button of the hand set operated, dial the number of the selector level to be tested. On No. 740-B P.B.X.'s that are equipped with selector-connectors arranged to function with central office trunks and tie trunks on the 5th level, it will be necessary to dial 5 and then a second digit corresponding to the trunk or tie trunk code. Place the receiver to the ear immediately after dialing. Observe that the selector-connector steps to the level dialed and rotates with a positive and smooth action and at a uniform rate of speed to the eleventh rotary position or in the case of selector-connectors arranged for trunks and tie trunks on the 5th level, the switch should step to the last terminal of the group dialed. A clicking noise in the receiver during the rotary movement of the switch may indicate faulty cam spring adjustment.

Note: Failure of a switch arranged for trunks and tie trunks on the 5th level to step to the last terminal of the group dialed may indicate an open strap between the H and S terminals on the switch terminal strip instead of trouble in the switch.

4.45 As soon as the selector-connector reaches the eleventh rotary position, remove the No. 893 cord from ground in order to avoid excessive vibration of the rotary magnet. Observe that the busy tone is heard in the receiver. Release the C button and note that the selector-connector releases properly.

Note: In case of selector-connectors arranged to function with central office trunks and tie trunks on the 5th level it is not necessary to remove the No. 893 cord from ground.

4.46 Disconnect the hand test set from the test jack.

5. REPORTS

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