

NO. 49 AND NO. 92 TYPE SWITCHBOARD MULTIPLE JACK TESTS

USING POSITION TEST CIRCUIT

NO. 1 AND NO. 1B TOLL SWITCHBOARDS

1. GENERAL

1.01 This section describes the methods of making tests of switchboard multiple jacks associated with intertoll trunks, switching trunks, completing trunks, etc. in No. 1 and No. 1B toll switchboards and in combined Toll and DSA boards, using test circuit SD-62140-01, SD-62140-02, SD-62148-01, SD-62148-02, SD-62218-01, SD-62359-01, SD-62646-01 or SD-64468-01. The tests are as follows.

(A) Cutout and Series Unbalance Tests on Busy or Idle Circuits

(B) Cutout and Series Unbalance Tests on Idle Circuits

(C) Short Circuit Test on Idle Circuits

1.02 Tests (A) and (B) are described as one-man tests, although, where a quantity of jacks is to be tested the aid of an assistant may be desirable to facilitate the testing.

1.03 Test (A) covers the use of test circuits arranged so that there is no interference with talking or signaling (except dialing) on the circuit under test. This test can be made whether the circuit under test is busy or idle. When testing busy dialing trunks, this method of testing may cause interference with dial pulses, when putting up or taking down patching cords.

1.04 Tests (B) and (C) cover the use of test circuits arranged to apply battery to the sleeve, to place a 150 ohm bridge across the tip and ring and to apply tone across the tip and ring. If the test circuit is connected to a working circuit, the tone will interfere with service on that circuit, therefore, it is important that the tests be made only at periods of light traffic and on circuits that are not busy. Test (B) applies only to the multiple jacks of ringdown intertoll trunks and intertoll dialing trunks. Intertoll dialing trunks should be removed from service before making this test.

1.05 Test (C) will ordinarily be required only in connection with reconditioning or readjustment work on jacks which have been found defective under tests (A) or (B).

1.06 While making tests on jacks, note any jack mountings that are loose, cracked or broken and any jacks that are loose in the mounting.

1.07 Before using a No. 113A or No. 123A gauge check to see that it is within its proper requirements by inserting the gauge into the No. 106A or the No. 111A gauge, respectively, and turning it to the position where the needle of the gauge is farthest to the right. No portion of the needle should then be to the right of the green line. If during tests, defective jacks are indicated check the No. 113A or the No. 123A gauge often enough to ensure that it is within its requirements.

2. APPARATUS

2.01 The apparatus required is shown in the following table.

Apparatus	Tests		
	(A)	(B)	(C)
Test Circuit (2.02)	1	-	-
Test Circuit (2.02 or 2.03)	-	1	1
Control Set (2.04)	1	-	-
Control Set (2.04 or 2.05)	-	1	1
Screwdriver (2.06)	1	1	-

For No. 49 Jacks

P3E Cord Regular (2.07)	3	*2	*2
P2B Cord (2.08)	-	*1	*1
P3E Cord, with Gauge (2.09)	1	1	-
P3E Cord, with Gauge (2.10)	-	-	1
No. 111A Gauge (2.11)	1	1	-

For No. 92 Jacks

P3D Cord, Regular (2.12)	1	*1	*1
P2 Cord (2.13)	-	*1	*1
P3F Cord, Regular (2.14)	2	1	1
P3D Cord, with Gauge (2.15)	1	1	-
P3D Cord, with Gauge (2.16)	-	-	1
No. 106A Gauge (2.17)	1	1	-

*When testing ringdown intertoll trunks, use a regular 3 conductor patching cord for patching to the TRK or T jack. When testing other trunks use a 2 conductor patching cord for patching to this jack.

2.02 One of the following test circuits equipped with MT jack: SD-62140-01, SD-62140-02, SD-62148-01, SD-62148-02, SD-62218-01 or SD-62359-01.

2.03 One of the following Test Circuits: SD-62140-01, SD-62140-02, SD-62148-01, SD-62148-02, SD-62218-01, SD-62359-01, SD-62646-01 or SD-64468-01.

- 2.04 Control Set (Potentiometer and Receiver) per J64703B.
- 2.05 Control Set (Potentiometer and Receiver) per J64703A.
- 2.06 H Cabinet Screwdriver.
- 2.07 P3E Cord equipped with No. 110 or 310 Plugs (3P6B) or (3P7A).
- 2.08 P2B Cord equipped with No. 110 or 310 Plugs (2P4C).
- 2.09 P3E Cord equipped with a No. 123A Gauge and No. 110 or 310 Plug with a No. 121A Cord Weight attached to the cord about 2 inches from the gauge (3P8A).
- 2.10 P3E Cord equipped with a No. 125A Gauge and No. 110 or 310 Plug (3P9A).
- 2.11 No. 111A Gauge with a scale having a green line for checking the No. 123A Gauge.
- 2.12 P3D Cord equipped with No. 109 or 309 Plugs (3P3A).
- 2.13 P2AN Cord equipped with No. 309 Plugs (2P23A).
- 2.14 P3F Cord equipped with a No. 110 or 310 Plug at one end and a No. 109 or 309 Plug at the other (3P12E).
- 2.15 P3D Cord equipped with a No. 109 or 309 Plug and a No. 113A Gauge with a No. 121A Cord Weight attached to the Cord about 2 inches from the gauge (3P4A).
- 2.16 P3D Cord equipped with a No. 109 or 309 Plug and a No. 115A Gauge (3P5A).
- 2.17 No. 106A Gauge with a scale having a green line for checking the No. 113A Gauge.

3. METHOD

(A) Cutout and Series Unbalance Tests on Busy or Idle Circuits

- 3.01 Connect the CKT and MT jacks of the control set (potentiometer and receiver) to the REC and MT jacks, respectively, of the test circuit, using two P3E or P3F cords. (See Fig. 1.)
- 3.02 Connect the jack to be tested to the Toll or T1 jack of the test circuit using a P3D or P3E cord equipped with a plug and a No. 113A or No. 123A gauge. The gauge should be inserted into the jack to be tested. Connect a multiple appearance of the jack under test to the TRK or T jack of the test circuit, using a P3D or P3E cord. (See Fig. 1.)
- 3.03 Operate the MT key of the control set and check that the tone circuit is functioning properly. This may be done by listening in the test receiver and operating momentarily the T or R key of the control set. If appreciable tone is heard proceed with the test. If no tone is heard, it indicates a short circuit in the multiple or lack of tone in the test circuit.
- 3.04 Turn the knob of the potentiometer until the minimum tone is heard in the test receiver. This condition should exist when the pointer is approximately on "0." If minimum tone is heard at some other point, an unbalance condition exists in the jack circuit under test. Experience with this test will determine the degree of unbalance which should be investigated. If an appreciable tone is heard at all positions of the pointer, it is an indication of an unbalance which should be investigated.
- 3.05 If an unbalanced condition exists, which is caused by an open circuit, operate successively the T and R keys of the control set to determine which conductor is in trouble. The operation of one of the T and R keys will result in the tone disappearing, while the operation of the other key will cause no change in the tone volume. The open circuit is in the conductor associated with the key which, when depressed, produces no change in tone.
- 3.06 Listen in the test receiver during the following operations.
- 3.07 With the No. 113A or 123A gauge in its normal position in the jack, that is, with no pressure other than that exerted by the cord and cord weight applied to the gauge, slowly rotate the gauge one complete revolution so as to cause the jack springs to make contact at all possible points of the tip and ring of the gauge. While turning the gauge, no attempt should be made to exert any vertical or horizontal pressure as the proper pressure is exerted by the cord weight. A cutout will be indicated by a change in volume of tone.
- 3.08 If a change in tone is heard in the test receiver during these operations it indicates that one of the springs of the jack under test is not making continuous contact with the gauge. With the gauge held so that the tone is produced, operate the T and R keys of the control set in turn. The open circuit is in the conductor, associated with the key which, when depressed, produces no change in tone.
- 3.09 While holding the gauge firmly in the jack, tap the jack strip lightly with

3.09 (Continued)

the handle of the H cabinet screwdriver. A change in volume of tone indicates trouble on the jack at which the tapping takes place. If an appreciable tone is heard continuously it is an indication of trouble on the jack under test or its multiple.

3.10 Restore the MT key of the control set to normal, disconnect from the jack under test and proceed with the test on other jacks within the multiple appearance. When the test has been completed on all jacks within the multiple appearance, transfer the test cords to each succeeding multiple appearance as may be necessary. Upon completion of the test, restore the MT key to normal and then disconnect the cords used during the test.

3.11 The answering jack multiple should be tested in the same manner as described in 3.02 to 3.09. In this test, the jack in the regular multiple, which is a multiple of the answering jack, should be connected to the TRK or T jack of the test circuit as a return path for tone and the answering jack should be connected to the Toll or TI jack in the same manner as given in 3.02.

(B) Cutout and Series Unbalance Tests on Idle Circuits

3.12 This test applies only to the multiple of ringdown intertoll trunks and intertoll dialing trunks. Intertoll dialing trunks should be removed from service before applying this test.

3.13 Operate the JK key on the test circuit at the control cabinet and connect the CKT or T jack of the control set

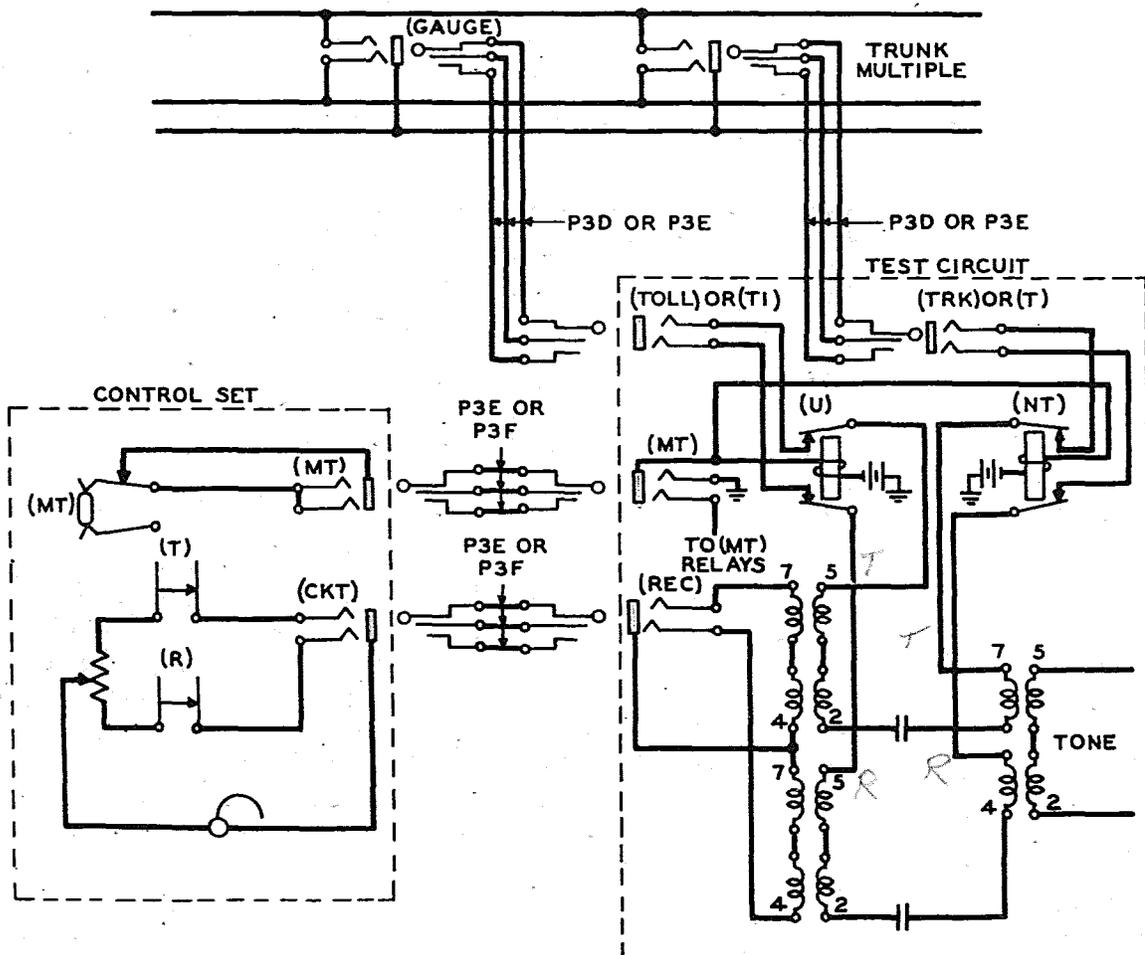


Fig. 1 - Test Connections for Cutout and Series Unbalance Tests on Busy or Idle Circuits

3.13 (Continued)

(potentiometer and receiver) to the REC jack of the test circuit, using a P3E or P3F cord. (See Fig. 2).

3.14 When testing a ringdown intertoll trunk multiple, note that the trunk is not busy. When testing intertoll dialing trunks, note that they have been removed from service. Connect the jack to be tested to the TOLL or T1 jack of the test circuit using a P3D or P3E cord equipped with a plug and a No. 113A or 123A gauge. (See Fig. 2). The gauge should be inserted in the jack to be tested. When a ringdown intertoll trunk multiple is to be tested, patch a multiple of the jack under test to the TRK or T jack of the test circuit, using a P3D or P3E cord. When an intertoll dialing trunk multiple is to be tested, patch a multiple of the jack under test to the TRK or T jack of the test circuit, using a P2AN or a P2B cord.

3.15 Check the operation of the tone circuit as follows: If the control set is not equipped with T and R keys, listen

in the receiver and turn the knob of the potentiometer until a maximum tone is heard. If appreciable tone is heard proceed with the test. If the control set is equipped with T and R keys, listen in the test receiver and momentarily operate the T or R key. If appreciable tone is heard proceed with the test. If no tone is heard, it indicates a short circuit in the multiple or lack of tone in the test circuit.

3.16 Turn the knob of the potentiometer until a minimum tone is heard in the test receiver. This condition should exist when the pointer is approximately on "0". If minimum tone is heard at some other point, an unbalance condition exists in the jack circuit under test. Experience with this test will determine the degree of unbalance which should be investigated. If an appreciable tone is heard at all positions of the pointer, it is an indication of an unbalance which should be investigated. If a control set equipped with T and R keys is used and an unbalanced condition exists, which is caused by an open circuit, the operation of the T and R keys successively will determine which conductor is in trouble.

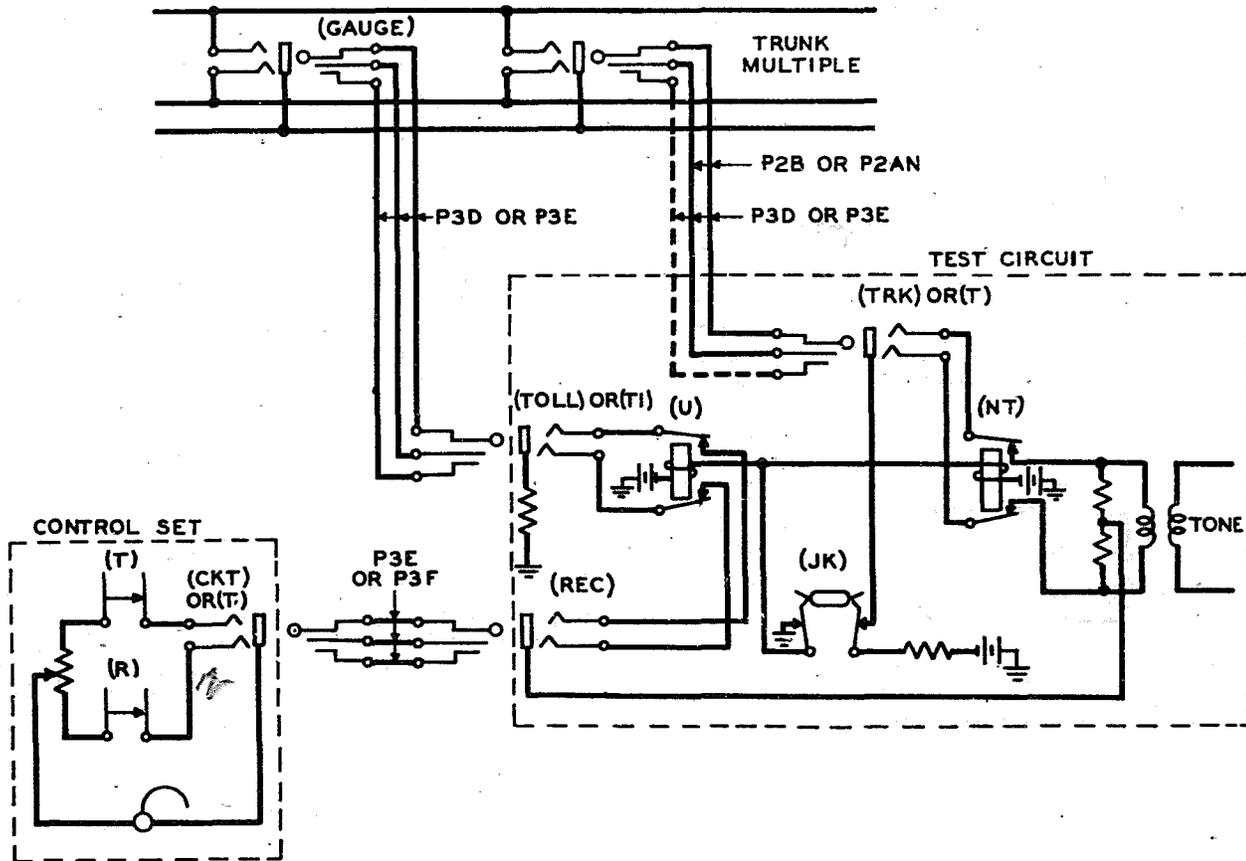


Fig. 2 - Test Connections for Cutout, Series Unbalance and Short Circuiting Tests on Idle Circuits

3.16 (Continued)

The open circuit is in the conductor associated with the key which, when depressed, produces no change in tone.

3.17 Listen in the test receiver during the following operations.

3.18 With the gauge in its normal position in the jack, that is, with no pressure other than exerted by the cord and cord weight applied to the gauge, slowly rotate the gauge one complete revolution so as to cause the jack springs to make contact at all possible points of the tip and ring of the gauge. While turning the gauge, no attempt should be made to exert any vertical or horizontal pressure as the proper pressure is exerted by the cord weight. A cut-out will be indicated by a click or change in volume of tone.

3.19 If a control set, equipped with T and R keys, is used and a change in tone is heard in the test receiver during these operations it indicates that one of the springs of the jack under test is not making continuous contact with the gauge. With the gauge held so that the tone is produced, operate the T and R keys of the control set successively. The operation of one of the T and R keys will result in the tone disappearing, while the operation of the other key will cause no change in the tone value. The open circuit is in the side of the circuit associated with the key which, when depressed produces no change in tone.

3.20 While holding the gauge firmly in the jack, tap the jack strip lightly with the handle of an H cabinet screwdriver. Clicks or a change in the volume of tone indicates trouble on the jack at which the tapping takes place. If an appreciable tone is heard continuously it is an indication of trouble on the jack under test or its multiple.

3.21 Disconnect from the jack under test and proceed with the test on other jacks within the multiple appearance. When the test has been completed on all jacks within the multiple appearance, transfer the test cords to each succeeding multiple appearance as may be necessary. Upon completion of the test disconnect the cords

used during the test and restore the JK key to normal at the control cabinet.

3.22 The answering jack multiple should be tested in the same manner as described in paragraphs 3.13 to 3.20. In this test, the jack in the regular multiple, which is a multiple of the answering jack, should be connected to the TRK or T jack of the test circuit as a return path for tone and the answering jack should be connected to the TOLL or T1 jack in the same manner as given in 3.14.

Note: Where separate answering multiple jacks are used at inward positions and no busy signals or busy lamps are provided, it will be necessary to make a busy test.

(C) Short-Circuit Test on Idle Circuits

3.23 Operate the JK key on the test circuit at the control cabinet and connect the CKT or T jack of the control set (potentiometer and receiver) to the REC jack of the test circuit, using a P3E or P3F cord. (See Fig. 2).

3.24 When testing ringdown intertoll trunks, note that the trunk to be tested is not busy. When testing other trunks, note that they have been removed from service. Connect a multiple of the jack to be tested to the TRK or T jack of the test circuit, using a P3D or P3E cord.

3.25 Insert the plug of the P3D or P3E cord, equipped with a No. 115A or 125A gauge, into the TOLL or T1 jack of the test circuit and turn the knob of the potentiometer to the right or left to give the maximum tone. (See Fig. 2).

3.26 Insert the gauge into the jack to be tested, slowly, with a rotary motion and note that tone is heard in the test receiver when the gauge is fully inserted in the jack. Lift the gauge just sufficiently to take up the play in the jack sleeve. If tone is not heard continuously in the test receiver, it is an indication that the tip and ring springs of the jack under test are touching each other and require adjustment.

3.27 Upon completion of the test, restore the JK key to normal, take down the connections to the jack under test and disconnect the cords from the test circuit.

4. REPORTS

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