

49- AND 92-TYPE SWITCHBOARD MULTIPLE JACKS LOCAL SWITCHBOARDS TESTS AND INSPECTIONS

1. GENERAL

1.01 This section describes the methods of making the following tests of switchboard jacks associated with subscriber lines and O.G.T. multiple in local manual switchboards and multiple jacks in DSA boards.

(A) Test for Cutouts Using Test Circuit SD-15090-01 or SD-96086-01 ←

(B) Test for Short-Circuiting of Tip and Ring Springs Using Test Circuit SD-15090-01 or SD-96086-01 ←

(C) Test for Cutouts Using A-C Continuity Test Circuit

(D) Test for Short-Circuiting of Tip and Ring Springs Using A-C Continuity Test Circuit

(E) Test for Cutouts Without Test Circuit

(F) Test for Short-Circuiting of Tip and Ring Springs Without Test Circuit

(G) Test for Jack Sleeve Wear ←

1.02 This section has been reissued to include the test circuit SD-96086-01, to add a test for jack sleeve wear, and to revise 2.01 to list additional gauges.

1.03 Tests (A) and (C) are described as two-man tests and two jacks are tested at once, as this method is the more practical where a quantity of jacks is to be tested. However, the test procedures outlined can be followed satisfactorily by one tester, if only a few jacks are to be tested. ←

1.04 Tests (B), (D), (E), (F), and (G) can be conducted by one man. ←

1.05 Since Test (A) causes no interference with talking or signaling on a line, it is not necessary to note whether a line is busy before proceeding with the test. ←

1.06 When making Tests (B), (C), (D), (E), and (F) on subscriber lines the tester should listen for any sounds that would indicate the attempt of a subscriber to make a call and, if heard, immediately remove all test connections from the line in order that the call can be completed.

1.07 Tests (B), (D), and (F) ordinarily are required only in connection with reconditioning or readjustment work on jacks which have been found defective under Test (A), (C), or (E).

1.08 Test (G) is required only to determine the sleeve wear of jacks which have been found defective under Test (A), (C), or (E). This test may also be used to determine the extent of a condition of jack sleeve wear within a switchboard. ←

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

1.10 Before using a No. 113B gauge or No. 123B gauge, check to see that it is within its proper requirements by inserting the gauge into the No. 106A gauge or No. 111A gauge, respectively, and turning it to the position where the needle of the No. 106A or No. 111A 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. 113B or No. 123B gauge often enough to ensure that it is within its requirements. ←

SECTION 032-350-501

2. APPARATUS

2.01 The apparatus required is shown in the table below.

2.02 The Jack Test Patching Set per J13007B or J93008B is equipped as follows:

(a) For 92 Jacks, with two S3A Cords, one with a No. 309 Plug, the other with a No. 113B Gauge and a No. 121A Cord Weight.

(b) For 49 Jacks, with two S3B Cords, one with a No. 310 Plug, the other with a No. 123B Gauge and a No. 121A Cord Weight.

2.03 Use the No. 106A or No. 111A Gauge with a scale having a green line for checking the No. 113B or No. 123B Gauge.

2.04 The test line required for Test (C) consists of two spare multiple jack circuits connected, as shown in Fig. 3, with the tip and ring of one circuit strapped together and connected to the tip of the other circuit and with the sleeves of both circuits connected together.

2.05 The Operator's Telephone Sets are required for Tests (A) and (C) when the testers are not working within speaking distance of each other.

APPARATUS	TESTS						
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Jack Test Patching Set per J13007B or J93008B (See 2.02)	1	-	-	-	-	-	-
Operator's Telephone Set (See 2.05)	2	-	2	-	1	1	-
Test Line (See 2.04)	-	-	1	-	-	-	-
<u>For No. 92 Jacks</u>							
No. 716E or No. 528 Receiver with R2CU Cord and No. 309 Plug (2W29A)	2	1	2	1	-	-	-
No. 716E or No. 528 Receiver with R2CU Cord and No. 113B Gauge	-	-	-	-	*1	-	-
P3D Cord with No. 309 Plug, No. 121A Cord Weight, and No. 113B Gauge (3P4A)	*1	-	*2	-	-	-	-
P3D Cord with No. 309 Plug and No. 115B Gauge (3P5A)	-	1	-	1	-	-	-
No. 115B Gauge	-	-	-	-	-	1	-
No. 106A Gauge (See 2.03)	1	-	1	-	1	-	-
No. 32B Test Set	-	-	1	1	-	-	-
No. 39 Gauge	-	-	-	-	-	-	1
<u>For No. 49 Jacks</u>							
No. 716E or No. 528 Receiver with R2CF Cord and No. 310 Plug (2W4A)	2	1	2	1	-	-	-
No. 716E or No. 528 Receiver with R2CF Cord and No. 123B Gauge	-	-	-	-	*1	-	-
P3E Cord with No. 310 Plug, No. 121A Cord Weight, and No. 123B Gauge (3P8A)	*1	-	*2	-	-	-	-
P3E Cord with No. 310 Plug and No. 125B Gauge (3P9A)	-	1	-	1	-	-	-
No. 32A Test Set	-	-	1	1	-	-	-
No. 125B Gauge	-	-	-	-	-	1	-
No. 111A Gauge (See 2.03)	1	-	1	-	1	-	-
No. 33 Gauge	-	-	-	-	-	-	1

* A No. 121A Cord Weight should be placed about 2 inches from the gauge.

Note: The Nos. 113A, 115A, 123A, and 125A gauges may be used in place of the Nos. 113B, 115B, 123B, and 125B gauges, respectively.

3. METHOD

(A) Test for Cutouts Using Test Circuit
SD-15090-01 or SD-96086-01

Tester's Stations

3.01 When testing subscriber or outgoing trunk multiple jacks, two testers should be stationed at successive appearances of the multiple.

3.02 When testing answering jacks in switchboards where multiple answering jacks are provided, one tester should be stationed before the primary answering jacks and the other tester before a multiple answering jack.

3.03 When testing answering jacks in switchboards where multiple answering jacks are not used, a tester with the jack test patching set should be stationed before the answering jack. The other tester should be stationed before a multiple appearance of the line at the same switchboard, such as the "A" switchboard in a No. 1 office or, if there is no multiple of the line equipped in this switchboard, he should be stationed before a multiple of the line appearing at another line of board such as the "B" switchboard.

3.04 In cases where one tester is at the "A" switchboard and the other at the "B" switchboard, a talking connection should be

established between the two testers by means of an "A" cord, local trunk, and the supervisor's circuit at the "B" switchboard. The tester before the answering jack should use both the test receiver and an operator's telephone set. The tester before the multiple should, however, use only a telephone set because when testing answering jacks, a simultaneous test of the associated multiple jacks is not practicable since no orderly sequence of multiple jack testing can be followed.

Preliminary Connections for a Series of Tests

3.05 With the two testers located at their respective stations, each tester should connect a test receiver to the nearest REC jack of the test circuit. See Fig. 1. The tester with the jack test patching set should insert the No. 309 or No. 310 plug associated therewith into the T jack of the test circuit. The other tester, who has the patching cord, should insert the associated No. 309 or No. 310 plug into the T1 jack of the test circuit.

Test Operations (See 1.10)

3.06 The tester with the patching cord should insert the No. 113B or No. 123B gauge into a multiple jack to be tested or into a jack which is multiplied with the answering jack to be tested. The tester with the jack test patching set should, while holding the

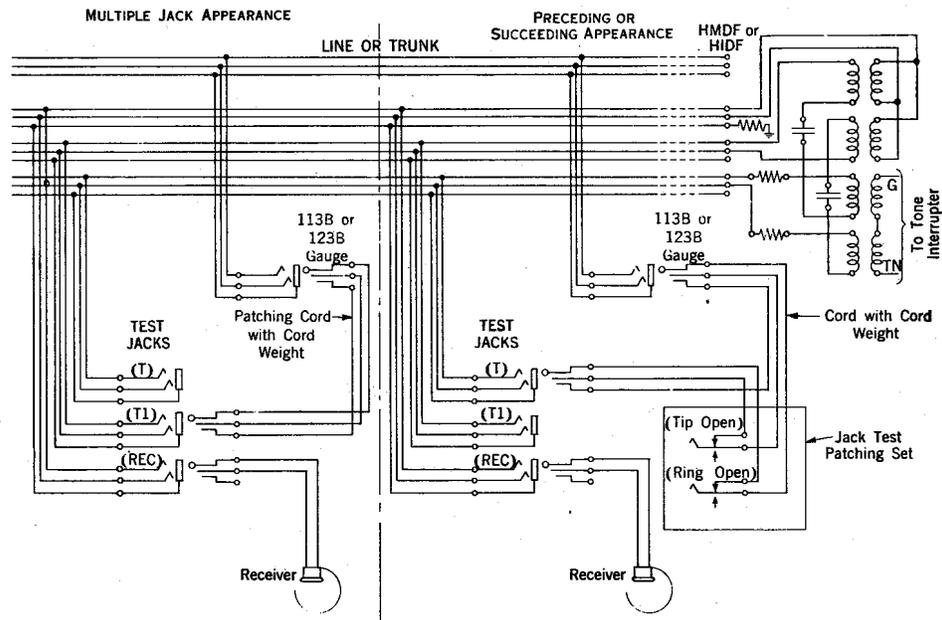


Fig. 1 - Schematic Showing Test Connections for Cutout Test Using SD-15090-01 or SD-96086-01

SECTION 032-350-501

RING OPEN key operated, insert the associated No. 113B or No. 123B gauge into a preceding or succeeding appearance of the multiple jack, or into the answering jack to be tested. Care should be taken not to release the key until the gauges at both testers' stations have been fully inserted, at which time tone should be heard.

Note: Care should be taken that the two gauges are always inserted into jacks of the same circuit in order that possible interference with service may be avoided and the proper testing conditions secured.

3.07 Upon receipt of the tone, the RING OPEN key should be released and the tone should disappear. If the tone is still heard after the release of the RING OPEN key, it is an indication that in one or both of the jacks under test a tip spring is not making contact with the gauge.

3.08 If, in 3.06, tone is not heard, release the RING OPEN key. If tone is then heard, it indicates that a ring spring of one or both of the jacks under test is not making contact with the gauge. If, however, tone is still not heard, there may be trouble involving both the tip and ring, or the sleeve circuit may be open.

3.09 Each tester using a test receiver should turn the gauge around in the jack through 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.

3.10 If tone is heard in the test receivers during these operations, it indicates that a spring of one of the jacks is not making continuous contact with the gauge. With the gauge held so that tone is produced, the tester with the jack test patching set should operate and release the RING OPEN and TIP OPEN keys, one at a time. If the tone signal stops when the RING OPEN key is operated, it indicates that the trouble is in the ring side of the circuit and, if the tone signal stops when the TIP OPEN key is operated, it indicates that the trouble is in the tip side of the circuit.

3.11 While holding the gauge firmly in the jack, each tester should tap the jack strip lightly with the handle of a small screwdriver. Loose connections in the multiple jack wiring will cause "clicks" or a change in the

volume of tone. If an appreciable volume of tone is heard continuously, check for open multiple wiring on the jack under test and its multiple.

3.12 When trouble is encountered, the test set keys should be left normal and one tester at a time should check to determine which jack is in trouble. The disappearance of the tone indicates the jack in trouble.

3.13 When the test of a pair of jacks is completed, the tester with the jack test patching set should operate the RING OPEN key and hold it operated while the testers disconnect from the jacks under test. Proceed with the test on consecutive jacks in the jack strip. When the test has been completed on all jacks to be tested within the multiple appearance, take down the connections to the REC jacks of the test circuit and, if talking connections have been established, take down these connections.

→ (B) Test for Short-Circuiting of Tip and Ring Springs Using Test Circuit SD-15090-01 or SD-96086-01 (See 1.07)

3.14 Connect a test receiver to the REC jack and insert the No. 309 plug of a P3D cord equipped with a No. 115B gauge or the No. 310 plug of a P3E cord equipped with a No. 125B gauge into the SC jack of the test circuit. See Fig. 2.

3.15 When testing a line or a trunk which has not been previously taken out of service, make a busy test by touching the tip of the gauge to the sleeve of the jack.

3.16 If the line or trunk is not busy, insert the gauge into the jack with a rotary motion and lift it just sufficiently to take up the play in the jack sleeve. If momentary spurts of tone are heard in the receiver while the gauge is being inserted or withdrawn from the jack, or if steady tone is heard while the gauge is fully inserted in the jack, it is an indication that the tip and ring springs of the jack touch each other.

Note: In the case of a subscriber line, if the receiver is removed from the switchhook it will have the same effect as a short-circuit between the tip and ring springs of the jack under test and will, therefore, cause the tone to be heard in the test receiver.

3.17 Upon completion of the test, take down the connection to the line or trunk jack and also disconnect the cords from the test circuit.

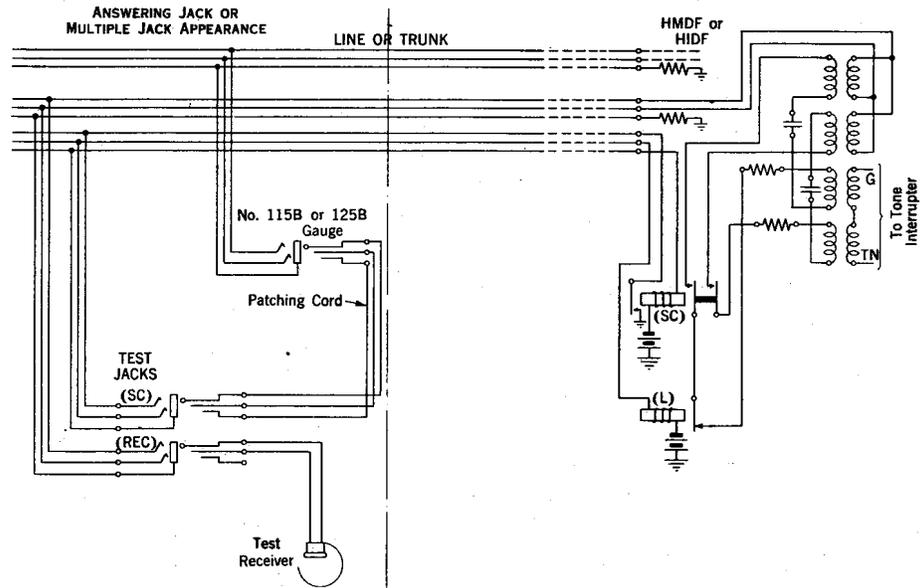


Fig. 2 - Schematic Showing Test Connections for Short-Circuit Test Using SD-15090-01 or SD-96086-01

(C) Test for Cutouts Using A-C Continuity Test Circuit

3.18 If the two testers are not within speaking distance, a talking line should be set up. If the a-c continuity circuit is arranged to trip machine ringing (such as SD-12424-01), block operated the CS relay to omit the tripping function.

3.19 One tester should connect a test receiver to the REC jack of the test circuit and insert the plug of one of the patching cords into jack No. 1 of the test line. See Fig. 3 and 2.04. Connect a subscriber or trunk cord to jack No. 2 of the test line. (The trunk, if used, should be made busy at the outgoing end, except in the case of call circuit trunks. At a common key ringing position, depress the TRK key.)

3.20 Before proceeding with the test, partially insert the No. 113B or No. 123B gauge on the patching test circuit so that the tip of the gauge makes contact with the ring spring of the jack and the sleeve of the gauge makes contact with the sleeve of the jack. Tone should be heard as an indication that the interrupter is functioning properly. Upon receiving tone, complete the insertion of the gauge into the jack in order to make an a-c continuity test of the cord or trunk. No tone,

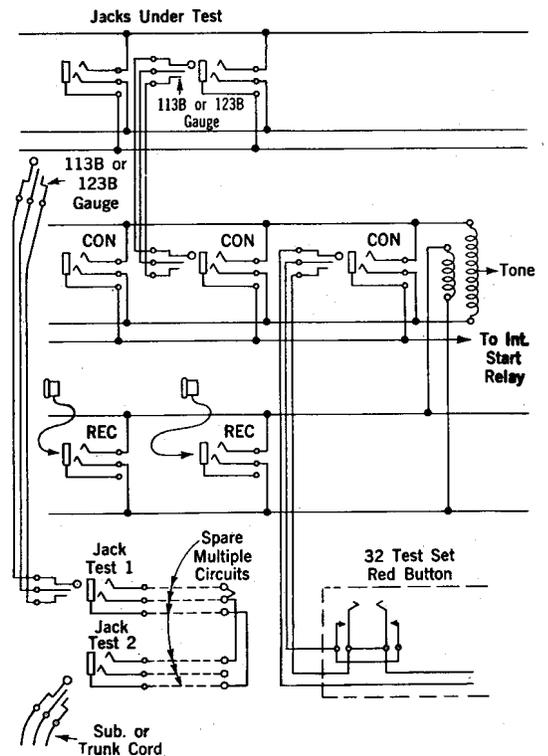


Fig. 3 - Test for Cutouts Using A-C Continuity Test Circuit

SECTION 032-350-501

or only a slight tone, should be heard. If a satisfactory test is not obtained, another cord or trunk should be tried until a cord giving a satisfactory test is obtained. Remove the gauge on the patching cord from the CON jack.

3.21 The other tester should connect a test receiver to the REC jack of the test circuit and insert the plug of the other patching cord into the CON jack of the test circuit and the plug of the 32-type test set into another appearance of the CON jack. The tester should make a busy test on the jack to be tested by touching the tip of the gauge to the sleeve of the jack while holding the RED key of the 32-type test set operated. If the line is not busy, insert the No. 113B or 123B gauge into the jack.

3.22 The first tester should insert the gauge on the patching cord into a multiple of the jack in which the other gauge is inserted.

3.23 When the two gauges are seated in the jacks, each tester should rotate the gauge through one complete revolution without exerting any appreciable up and down or side pressure as the proper pressure is applied by the cord weight. A cutout will be indicated by a "click" or change in the volume of tone.

3.24 While holding the gauge firmly in the jack, each tester should tap the jack strip lightly with the handle of a small screwdriver. Loose connections in the multiple jack wiring will cause "clicks" or a change in the volume of tone. If an appreciable volume of tone is heard continuously, it probably indicates open multiple wiring.

3.25 When a click or a change in the volume of tone is received, the tests should be applied to one jack at a time to determine in which jack the trouble exists.

Note: At the completion of testing, if the a-c continuity circuit relay was blocked operated, release the relay.

(D) Test for Short-Circuiting of Tip and Ring Springs Using A-C Continuity Test Circuit (See 1.07)

3.26 If the a-c continuity circuit is arranged to trip machine ringing (SD-12424-01), block operated the CS relay to omit the tripping function.

3.27 Connect a test receiver to the REC jack of the test circuit. Insert the plug of the patching cord into the CON jack of the test circuit and the plug of the 32-type test set into another appearance of the CON jack.

3.28 Make a busy test at a multiple appearance of the jack to be tested by touching the tip of the gauge to the sleeve of the jack while holding the RED key of the 32-type test set operated. If the line is not busy, insert a subscriber or trunk cord into the multiple jack so that the tip of the plug engages the ring spring of the jack but does not touch the tip spring.

3.29 Insert the No. 115B or No. 125B gauge into the jack to be tested slowly with a rotary motion and note that tone is heard as the tip of the gauge touches the ring spring of the jack. Then complete the insertion of the gauge and lift it 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 with the gauge in it are touching each other.

Note: At the completion of testing, if the a-c continuity circuit relay was blocked operated, release the relay.

(E) Test for Cutouts Without Test Circuit

3.30 At an idle position not in front of the jack to be tested, connect the operator's telephone set and with an idle cord make a busy test on the circuit to be tested. If not busy, insert the plug into the jack.

Note: If the cord of an incoming trunk is being used, the trunk should be made busy at the originating office except in the case of call circuit trunks. At a common key ringing position, depress the TRK key.

3.31 When jacks of outgoing trunks are being tested, arrangements should be made to clear the incoming end of the trunk as follows: On trunks terminating at a manual switchboard, request the operator to connect to a busy-back jack for a moment, then disconnect. On trunks terminating in a panel office, obtain a connection to a local station, to the supervisor or to a number known to be intercepted and, when answered, request a disconnect. As an alternative method of clearing trunks to either a manual or panel office, the heat coils in the circuit at the testing office may be removed during the tests. On trunks terminating in a step-by-step office, it is not necessary to clear the trunk.

3.32 While listening in the receiver, insert the No. 113B or No. 123B gauge on the cord of the test receiver into the jack and note that a click is heard as an indication of the continuity of the circuit through to the cord in the multiple jack.

3.33 Rotate the gauge in the jack one complete revolution without exerting any appreciable up and down or side pressure. The proper pressure is applied by the cord weight. Any clicks heard in the receiver indicate that the jack springs are not making continuous contact with the gauge.

3.34 While holding the gauge firmly in the jack, tap the jack strip lightly with the handle of a small screwdriver. Clicks heard indicate a loose connection in the multiple jack wiring.

(F) Test for Short-Circuiting of Tip and Ring Springs - Without Test Circuit (See 1.07)

3.35 Follow the procedure in 3.30 and 3.31. Then insert the No. 115B or the No. 125B gauge into the jack. Lift the end of the gauge just sufficiently to take up the play in the jack sleeve. Observe the supervisory lamp of the cord connected to the multiple jack. If the lamp is extinguished, it is usually an indication that the tip and ring springs touch each other.

(G) Test for Jack Sleeve Wear (See 1.08)

3.36 Gauge the sleeves of the No. 49 and No. 92 jacks with the No. 33 or No. 39 gauge, respectively, to locate any sleeve that has reached the limit of wear.

3.37 To make the check, attempt to insert the gauge into the jack, rotating it approximately one-half turn and using a very slight pressure. In performing this operation, the gauge should not be forced.

3.38 If the gauge enters the jack to the shoulder of the gauge, the sleeve is outside the limit of wear.

3.39 Any sleeve found outside the limit of wear, as determined above, should be considered for possible replacement. Normally, this check is in the nature of a readjust requirement and is applied only when jacks are readjusted.

4. REPORTS

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