

LOCAL AND COMBINATION CONNECTORS

LOCAL OPERATION TESTS

USING TRUNK TEST SET SD-90469-01

OR SD-90469-02

350A COMMUNITY DIAL OFFICES

1. GENERAL

1.01 This section describes a method of testing the operating features of local connectors and local operating features of combination connectors by means of trunk test set SD-90469-01 or SD-90469-02 (J94710A). Also included is the key operation required in superimposed ringing offices in order to apply the adjust values of resistance to the trip relay in connectors which serve lines equipped with relay-type subscriber sets or a mixture of relay and tube subscriber sets, or in 8-party semiselective connectors in ac-dc ringing offices.

1.02 This section is reissued to revise Tests B, D, and E to include the method of testing the connector timed-release feature and to generally update the section. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. Busy Line Test — Leak: This test checks the presence of leakage paths in the relay coil circuits.

B. Idle Line Test — Loop (Except in AC-DC Ringing Offices Equipped With Test Line SD-31261-01): This test checks: (1) line seizure and ringing, (2) pretrip, (3) tripping during ringing interval, (4) tripping during silent interval, (5) transmission, (6) release, and (7) adjusting method.

C. Reverting Call Tests — 10-Party Terminal-per-Station Connectors: This test checks: (1) line seizure, (2) ringing and pretrip, (3) tripping, and (4) release.

D. Ringing Polarity Test — 8-Party Semiselective Connectors: This test applies an operate test to the H relay and an operate and nonoperate test to the J relay where 8-party semiselective connectors are used.

E. Idle Line Test — Loop (in AC-DC Ringing Offices Using Test Line SD-31261-01 Only): This test checks ringing and pretrip simultaneously. Checks are also made for: (1) line seizure, (2) ringing and pretrip, (3) tripping, (4) transmission, and (5) release.

1.04 The test line used in making this test is connected to terminal 99, except in the case of rotary hunting and level hunting connectors. In rotary hunting groups, terminal 99 is made busy and the test line is connected to terminal 90. The hunting feature of the connector is checked by directing the switch to terminal 99 and having it step to terminal 90. In the case of level hunting connectors, terminal 91 is ordinarily used as the test line number. In order to reach this terminal, it is necessary to dial the digit which will direct the switch to the ninth level. When the connectors are wired to hunt over a group of one hundred trunks regardless of the digit dialed, terminal 11 is used as the test number. In order to reach this terminal, it is necessary to ground the commutator of the lowest level and dial any digit.

1.05 The connectors are automatically released in the time specified as follows:

(a) Regular connectors — within 12 to 30 seconds.

(b) Rotary hunting connectors — within 25 to 37 seconds.

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- (c) Level hunting connectors — within 23 to 37 seconds.

1.06 When testing 10-party terminal-per-line connectors, it is necessary to dial an additional digit to set the ringing. A different digit should be dialed each time the test is made so that eventually all codes will have been tested. Also alternate code ringing interrupters should be used on each test cycle.

1.07 When Test C is made, it is not necessary to make Test A on 10-party terminal-per-station connectors.

1.08 In ac-dc ringing offices equipped with test line SD-31261-01, Test E should be used in place of Test B.

1.09 When Test D is scheduled it will not be necessary to make Test B on 8-party semi-selective connectors.

1.10 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.

1.11 When testing connectors arranged for 1400- or 1500-ohm maximum external subscriber loop, any ring-trip relays which fail on the pretrip or trip test (test line test resistance values) shall be readjusted mechanically and electrically to meet the requirements specified in Sections 040-803-701 and 040-236-701 and in the circuit requirements tables. Repeat the test, and if the relay continues to fail, operate the test set keys as described in Part 4 to apply the test line readjust resistance values and change the tension in the No. 1 spring as required.

1.12 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Parts 3 and 4 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.

1.13 Local instructions should be followed for recording and reporting any register operation caused by performing these tests.

2. APPARATUS

All Tests

2.01 Trunk test set J94710A (SD-90469-01 or SD-90469-02).

2.02 Operator telephone set.

2.03 Patching cord, P3H cord, 10 feet long, equipped with a 310 plug and a 240A plug (3P2A).

2.04 Patching cord, P2J cord, 9 feet long, equipped with two 310 plugs (2P9A).

Note: If a P2J cord is not available, use a P3E cord as specified in 2.05.

2.05 Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A) (two required for Test C).

Test A

2.06 240A plug (for testing level hunting connectors).

3. PREPARATION

STEP	ACTION	VERIFICATION
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All Tests

Caution: To avoid possible grounding of the battery supply lead, connect cord to test set first. When disconnecting, remove cord from test set last.

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| 1 | Using P2J cord, connect test set BAT-G jack to 48-volt battery jack on connector frame. | |
| 2 | Using P3E cord, connect test set TL jack to TL (or TL1) jack on connector frame. | |
| 3 | Insert 310 plug of P3H cord into T jack of test set. | |
| 4 | Connect operator telephone set to TEL jacks of test set. | |

Test B

- | | | |
|----|--|--|
| 5a | If office has superimposed ringing with 4-party selective and 8-party semiselective connectors serving lines equipped with relay subscriber sets or a mixture of relay and tube subscriber sets —
Operate D REL TST key in test line circuit. | |
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Note: To ensure operation of the tripping relay when making this test, the dc component of the ringing voltage should be near its maximum value.

Test C

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| 6 | Using P3E cord, connect test set C jack to 10-P jack of test line. | |
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4. METHOD

STEP	ACTION	VERIFICATION
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A. Busy Line Test — Leak

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|---|---|---|
| 5 | Insert 240A plug of P3H cord into test jack of local connector or local test jack of combination connector. | If connector is busy —
BSY lamp lighted. |
|---|---|---|

Note: If busy, plug may be removed to proceed with other tests or left in test jack and test deferred until lamps are extinguished.

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STEP	ACTION	VERIFICATION
6	At test set — Operate LK, DL-ST keys.	SL lamp lighted.
7	Restore DL-ST key.	SL lamp remains lighted.
8b	If testing connectors other than level hunting type — Dial test line number. (Refer to 1.04.)	At connector — Switch steps to test line terminal. At test set — Busy tone is heard in receiver as soon as test line terminal is seized.
		<i>Caution: If connector stops on any other terminal, immediately release by operating and holding the FL key in order to avoid ringing on a customer line.</i>
9c	If testing level hunting connectors — Insert 240A plug into sleeve cut-off jack of the connector switch.	
10c	Dial digit required to direct switch to test line terminal. (Refer to 1.04.)	At connector — Connector hunts until completed. At test set — Busy tone is heard.
11	Operate and hold FL key.	At connector — Switch released. At test set — SL lamp extinguished.
12	Restore FL, LK keys.	
13c	If testing level hunting connectors — Remove 240A plug from sleeve cut-off jack of connector.	
14d	If no further tests are to be made — Remove 240A plug from test jack.	

B. Idle Line Test — Loop (Except in AC-DC Ringing Offices Equipped With Test Line SD-31261-01)

6b	If READJ key is provided — At connector test line — Restore READJ key.	
7	Insert 240A plug of P3H cord into test jack of local connector or local test jack of combination connector.	If connector is busy — BSY lamp lighted.
		<i>Note: If busy, plug may be removed to proceed with other tests or left in test jack and test deferred until lamps are extinguished.</i>

STEP	ACTION	VERIFICATION
8	Operate LP, ID keys.	
9	Operate DL-ST key.	SL lamp lighted.
10	Restore DL-ST key.	SL lamp remains lighted.
	<i>Note:</i> When testing level hunting connectors, proceed immediately with Step 11 to minimize the possibility of the test line being seized by another connector.	
11	At test set — Dial test line number. (Refer to 1.04.)	At connector — Switch steps to test line terminal. At test set — Audible ringing heard in receiver.
	<i>Note:</i> First ring of 2-ring or code ringing connectors is full code ring to check pickup features.	
12c	If testing 8-party semiselective ringing connectors — Operate ringing polarity key to NO-J or OP-H position.	At test line — R— lamp lighted.
13c	Operate ringing polarity key to OP-J position.	A test set — Audible ringing heard. At test line — R+ lamp lighted.
14	Restore, reoperate ID key at least twice during ringing interval.	At test line — Bell rings when ID key is operated.
15a	If office has superimposed ringing with 4-party selective and 8-party semiselective connectors serving lines equipped with relay subscriber sets or mixture of relay and tube subscriber sets — During ringing interval — At test set — Momentarily operate TP-BT key; reoperate key to ID position.	At test set — REV lamp lighted while TP-BT is operated (switch under test is arranged to reverse battery). At test line — Bell does not ring indicating ringing was tripped.
16e	For all offices not covered in 15a including 4-party selective and 8-party semiselective connectors serving lines equipped with tube sets only — During silent interval — At test set — Momentarily operate TP-BT key; reoperate to ID position.	At test set — REV lamp lighted while TP-BT key is operated (switch under test is arranged to reverse battery). At test line — Bell does not ring indicating ringing was tripped.

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STEP	ACTION	VERIFICATION
17	At test set — Operate T key.	Proper transmission tone heard in receiver. REV lamp lighted (switch is arranged to reverse battery).
	<i>Note:</i> In superimposed offices equipped with test line SD-31261-01, restore ID key to normal position in addition to operating T key.	
18f	If connector under test is arranged for calling party control without timed disconnect — Operate FL key.	At connector — Switch released. At test set — SL, REV lamps extinguished. Tone removed from receiver.
19f	Restore FL, T keys; proceed to Step 24.	
20g	If connector under test is arranged for calling party control with timed disconnect — Restore T key; proceed to Step 24.	At test set — Within timed interval, SL, REV lamps extinguished. Tone removed from receiver. At connector — Switch released. (Refer to 1.05.)
21h	If connector under test is arranged for joint control — Operate and hold operated FL key for at least 2 seconds.	At connector — Switch does not release. At test set — SL, REV lamps extinguished. BSY lamp lighted. Tone removed from receiver.
22h	Release FL key; operate ID key if not already operated.	
23h	Restore T key.	At connector — Switch released. At test set — BSY lamp extinguished.
24	Restore ID key to normal position.	
25	Restore LP key to normal position.	
26i	If no further tests are to be made — Remove all test connections.	
27j	Where necessary to apply trip and pretrip adjust values of resistances to trip relay in superimposed ringing connectors which serve lines equipped with relay-type subscriber sets or a mixture of relay and tube subscriber sets, or in 8-party semiselective connectors in ac-dc ringing offices — Operate READJ key in connector test line. Repeat Steps 7 through 15a.	

STEP	ACTION	VERIFICATION
C. Reverting Call Test — 10-Party Terminal-per-Station Connectors		
7	Insert 240A plug of P3H cord into test jack of local connector or local test jack of combination connector.	If connector is busy — BSY lamp lighted. <i>Note:</i> If busy, plug may be removed to proceed with other tests or left in test jack and test deferred until lamps are extinguished.
8	Operate ID, LP keys.	
9	Operate DL-ST key.	SL lamp lighted.
10	Restore DL-ST key.	SL lamp remains lighted.
11	At test set — Momentarily operate T key.	
12	Dial test line number. (Refer to 1.04.)	At connector — Switch steps to test line terminal. At test set — Busy tone is heard in receiver as soon as test line terminal is seized. <i>Caution: If the connector stops on any other terminal, immediately release by operating and holding the FL key in order to avoid ringing on a customer line.</i>
13	Operate and hold FL key at least 2 seconds.	At connector — Switch does not release. SL lamp extinguished. BSY lamp lighted. Busy tone is removed from receiver. At test line — Ring side bell follows regular test line bell ringing code. Tip side bell gives reverting call signal.
14	Momentarily operate TP-BT key; reoperate key to ID position.	At connector — Switch released. BSY lamp extinguished.
15	Restore ID key.	
16	Restore LP key.	
17b	If no further tests are to be made — Remove all test connections.	

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STEP	ACTION	VERIFICATION
D. Ringing Polarity Test — 8-Party Semiselective Connectors		
5	At test line circuit — Operate ringing polarity key to OP-H position.	
6	Insert 240A plug of P3H cord into test jack of local connector or local test jack of combination connector.	If connector is busy — BSY lamp lighted. <i>Note:</i> If busy, plug may be removed to proceed with other tests or left in test jack and test deferred until lamps are extinguished.
7	Operate LP, ID keys.	
8	Operate DL-ST key.	SL lamp lighted.
9	Restore DL-ST key.	SL lamp remains lighted.
	<i>Note:</i> When testing level hunting connectors, proceed immediately with Step 10 to minimize the possibility of the test line being seized by another connector.	
10	At test set — Dial test line number. (Refer to 1.04.) <i>Note:</i> First ring of 2-ring or code ringing connectors is full code ring to check pickup feature.	At connector — Switch steps to test line terminal. At test set — Audible ringing heard in receiver. At test line — R— lamp lighted.
11	Restore, then reoperate ID key at least twice during ringing interval.	At test line — Bell rings when ID key is operated.
12b	If office has superimposed ringing with 4-party selective and 8-party semiselective connectors serving lines equipped with relay subscriber sets or mixture of relay and tube subscriber sets — During ringing interval — At test set — Momentarily operate TP-BT key; reoperate key to ID position.	REV lamp lighted while TP-BT key is operated (switch under test arranged to reverse battery). At test line — Bell does not ring indicating ringing was tripped.
13c	For all offices not covered in 12b including 4-party selective and 8-party semiselective connectors serving lines equipped with tube sets only — At test set — Momentarily operate TP-BT key; reoperate to ID position.	REV lamp lighted while TP-BT key is operated (switch under test arranged to reverse battery). At test line — Bell does not ring indicating ringing was tripped.

STEP	ACTION	VERIFICATION
14	At test set — Operate T key.	Proper transmission tone heard in receiver. REV lamp lighted (switch under test arranged to reverse battery).
	<i>Note:</i> In superimposed offices equipped with test line SD-31261-01, restore ID key to normal position in addition to operating T key.	
15d	If connector under test is arranged for calling party control without timed disconnect — Operate FL key.	At connector — Switch released. At test set — SL, REV lamps extinguished. Tone removed from receiver.
16d	Restore FL, T keys; proceed to Step 21.	
17e	If connector under test is arranged for calling party control with timed disconnect — Restore T key; proceed to Step 21.	At test set — Within timed interval, SL, REV lamps extinguished. Tone removed from receiver. At connector — Switch released. (Refer to 1.05.)
18f	If connector under test is arranged for joint control — Operate and hold operated FL key for at least 2 seconds.	At connector — Switch does not release. At test set — SL, REV lamps extinguished. BSY lamp lighted. Tone removed from receiver.
19f	Release FL key; operate ID key if not already operated.	
20f	Restore T key.	At connector — Switch released. At test set — BSY lamp extinguished.
21	Restore ID key to normal position.	
22	Restore LP key to normal position.	
23	At test set — Operate ringing polarity key to NO-J position; repeat Steps 6 through 22.	
24	Operate ringing polarity key to OP-J position; repeat Steps 6 through 22.	At test line — When test line number is dialed, R+ lamp lighted.
25g	If no further tests are to be made — Remove all test connections.	

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STEP	ACTION	VERIFICATION
E. Idle Line Test — Loop (in AC-DC Ringing Offices Using Test Line SD-31261-01 Only)		
5	Insert 240A plug of P3H cord into test jack of local connector or local test jack of combination connector.	If connector is busy — BSY lamp lighted. <i>Note:</i> If busy, plug may be removed to proceed with other tests or left in test jack and test deferred until lamp is extinguished.
6	Operate LP, ID keys. <i>Note:</i> When testing level hunting connectors, proceed immediately with Step 7 to minimize the possibility of test line being seized by another connector.	SL lamp lighted and remains lighted.
7	At test set — Dial test line number. (Refer to 1.04.)	At connector — Switch steps to test line terminal. At test set — Audible ringing heard in receiver. <i>Note:</i> First ring in the case of 2-ring or code ringing connectors is a full code ring in order to check the pickup feature.
8	Restore ID key during a ringing interval.	At test line — Bell rings for at least two intervals.
9	During silent interval — Momentarily operate TP-BT key; restore key to normal.	At test line — Bell does not ring. At test set — REV lamp lighted while TP-BT key is operated (switch under test arranged to reverse battery).
10	Operate T key.	Tone is heard in receiver. REV lamp lighted (switch under test arranged to reverse battery).
11b	If connector under test is arranged for calling party control without timed release — Operate FL key.	At connector — Switch released. At test set — SL, REV lamps extinguished. Tone is removed from receiver.
12b	Restore FL, T keys; proceed to Step 17.	

STEP	ACTION	VERIFICATION
13c	If connector under test is arranged for calling party control with timed disconnect — Restore T key ; proceed to Step 17.	At test set — Within timed interval, SL, REV lamps extinguished. Tone removed from receiver. At connector — Switch released. (Refer to 1.05.)
14d	If connector under test is arranged for joint control — Operate and hold operated FL key for at least 2 seconds.	At connector — Switch does not release. At test set — SL lamp extinguished. BSY lamp lighted. Tone removed from receiver. REV lamp extinguished.
15d	Release FL key ; operate ID key.	
16d	Restore T key.	At connector — Switch released. At test set — BSY lamp extinguished.
17	Restore ID key to normal position.	
18	Restore LP key to normal position.	
19e	If no further tests are to be made — Remove all test connections.	