

LOCAL CONNECTORS
OPERATION TESTS
USING TEST SET SD-31858-01 (J34701A)
AND TEST LINE SD-31857-01
STEP-BY-STEP 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 of the 100-and 200-point type in No. 355A and 35-E-97 offices by means of test set SD-31858-01 and test line SD-31857-01.
- 1.02** This section is reissued to add a method of testing the ringing control features of 200-point rotary hunting connectors in Tests B and C.
- 1.03** The tests covered are:
- A. Busy Line Test—Leak:** This test checks the stepping features of a connector under a leak condition and its ability to return busy tone, busy flash if provided, and release.
 - B. Idle Line Test—Loop—Other Than 8-Party Semiselective Connectors:** This test checks the stepping features of a connector under a loop condition and its ability to ring, trip, reverse battery, provide a proper transmission path, and release, including timed release of a connector, when the calling party fails to hang up. A false ground test is also made on the timed-release feature. Connector ringing is indicated by a relay buzzer in the test set. On 200-point connectors, cut-through to machine intercept is tested.
 - C. Idle Line Test—Loop—8-Party Semiselective Connectors:** This test checks the stepping features of a connector under a loop condition and its ability to ring, trip, reverse battery, provide a proper transmission path, and release, including the timed release of a connector, when the calling party fails to hang up. A false ground test is also made on the timed-release feature. It also makes a complete check of the ringing control relays such as local connector H and J relays or combination connector K and N, or their equivalent, when testing terminal-per-station connectors. Connector ringing polarity is checked either by means of test line bells or by lamps on the test set. On 200-point connectors, cut-through to machine intercept is tested.
 - D. Reverting Call Test:** This test checks the reverting call feature of both 10-party terminal-per-station and 10- or 20-party terminal-per-line connectors.
 - E. Free Service Feature, Rotary Hunting Connectors:** This test checks that rotary hunting connectors arranged for free service on certain levels will not reverse the battery on the calling line.
- 1.04 100-Point Connectors:** The test line employed in making these tests is connected to terminal 99, except in the case of rotary hunting connectors and, in some cases, 20-code ringing connectors as described in 1.06. In rotary hunting groups, terminal 99 is made busy and the test line connected to terminal 90. The hunting feature is checked by directing the switch to terminal 99 and having it step to 90 (see 1.07).
- 1.05 200-Point Connectors:** The test line for nonrotary hunting connectors is connected to terminal 99 of the upper and lower banks. The test line for rotary hunting connectors is connected to terminal 99 of the upper banks

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and to terminal 90 of the lower banks, terminal 99 of the lower banks being made busy. The rotary hunting feature of the switch is tested, with the LO-UP key in normal position, by directing the switch to terminal 99 and having it step to 90 (see 1.07).

Caution: If the connector stops on any other terminal, immediately release the connector so as to avoid ringing on a subscriber line.

1.06 When testing 20-code ringing connectors, codes 11 to 20 must be used to make a complete check of the ringing. If the ninth level is arranged to close the normal post springs, codes 11 to 20 will be tested by dialing 99. If the ninth level is not so arranged, cross connect the test line circuit to a nonworking terminal on a level which is arranged to close the normal post springs, and use this nonworking terminal as the test terminal.

1.07 For regular connectors, the disconnect time is within 12 to 30 seconds; for rotary hunting connectors, the disconnect time is 25 to 37 seconds.

1.08 Action and verification will be required at the operator position when making the connector timed-release test in conjunction with the associated intercept trunk.

1.09 Where required, the steps provide space for writing in the interval during which the pretrip and trip tests are to be made, as indicated in Table A or B.

1.10 When testing connectors which have a 60- to 75-volt silent interval tripping battery and for which ac requirements are specified, any ring-trip relays which fail on the pretrip or trip test (test set or test line test resistance values) shall be readjusted to meet the requirements specified in Sections 040-803-701 and 040-236-701 and the readjust ringing current values provided by the test line. These values are obtained, as indicated for READJUST in Tables A and B, by connecting the TL jack of the test set to the AC jack of the test line.

1.11 When testing connectors arranged for 1400- or 1500-ohm maximum external subscriber loop, any ring-trip relay which fails on the pretrip or trip test (test set 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 table. Repeat the tests. If the relay continues to fail, operate the test keys as indicated for READJUST in Table B to apply the test set readjust resistance values and again repeat the tests, changing the tension of the No. 1 spring as required.

TABLE A
TEST SET PROVIDED WITH PTR KEY

KIND OF RING	MAX EXT SUB LOOP (OHMS)	TRIP BAT. VOLTS	CONNECT TL JACK TO		PRETRIP (INTERVAL)	TRIP (INTERVAL)
			TST SET JK	TST LINE JK		
			TEST	READJUST		
SUPER-IMPOSED	750-900	60-75	TR1	AC	RINGING	RINGING
	1000-1115		TR2			
AC-DC		1000-1115	45-52	TR3		—
	45-52		TR4	—		

TABLE B

TEST SET PROVIDED WITH NTR KEY

KIND OF RING	MAX EXT SUB LOOP (OHMS)	TRIP BAT. VOLTS	CONNECT TL JACK TO TEST LINE JACK FOR		KEYS OPERATED		PRETRIP (INTERVAL)	TRIP (INTERVAL)
			TEST	READJUST	TEST	READJUST		
SUPER-IMPOSED	750-900	60-75	SUP	AC	S	S	RINGING	RINGING
	1000-1115							
AC-DC	1400-1500	48.5 to 50.0	—	—	L TR2-L TR3-R	L TR2-R TR3-R	SILENT	SILENT
SUPER-IMPOSED		66-75	—	—	L TR2-L TR4-L	L TR2-R TR4-L		

1.12 When performing Test B or C on connectors arranged to reverse battery on the ninth level, the C lamp may light at the same time as the REV lamp lights, but should be disregarded.

1.13 Test E is intended as a means for making a check of the free service feature of rotary hunting connectors. The method involves the removal of the switch cover, but it is expected that the test will be made at rather infrequent intervals or in connection with checking the performance of individual switches on which trouble may have been encountered.

1.14 When testing connectors arranged for busy flash over a fourth wire and also when testing the operation of the D relay on switches arranged for free service on the ninth level, it is necessary for the connector F lead to be wired to No. 5 spring of the switch test jack, and the test set must be equipped with a TR1 key.

1.15 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.

1.16 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Part 3 or 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.

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

2. APPARATUS

All Tests

2.01 Test set J34701A (SD-31858-01).

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- 2.02** Connector test line circuit SD-31857-01.
- 2.03** Head telephone set (associated with test set).
- 2.04** Patching cord, P3E cord, 6 feet long, equipped with two 310 black shell plugs (3P6D cord).
- 2.05** Patching cord, P3E cord, 6 feet long, equipped with two 310 red shell plugs (3P7A cord).

Tests A, B, and C

Offices Equipped With 100-Point Connectors Only

- 2.06** Patching cord, P3H cord, 10 feet long, equipped with one 310 plug, and one 240A plug (3P2A cord) (for use with local connectors, or the local side of combination connectors, except as noted in 2.07).
- 2.07** Patching cord, P4K cord, 12 feet long, equipped with a 289B plug and a 240B plug (4P4A cord) (for use when connectors are arranged for busy flash or for testing operation of the D relay when free service is provided on the ninth level).

Offices Equipped With Both 100- and 200-Point Connectors

- 2.08** Patching cord, P3H cord, 10 feet long, equipped with one 310 plug and one 240A plug (3P2A cord) (for use with 100-point local connectors or local side of combination connectors).
- 2.09** Patching cord, consisting of two 10-foot P3H cords, each equipped with a 310 plug, one with red shell and one with black shell, both cords connected to a 240B plug (5P3B cord) (for use with 200-point local connectors or the local side of 200-point combination connectors).

3. PREPARATION

STEP	ACTION	VERIFICATION
All Tests		
1	Using P3E cord with black shell plugs, connect test set B jack to connector test line B jack.	

Tests B and C

- 2.10** Patching cord, P3E cord, 1 foot long, equipped with two 310 plugs (3P6A cord) (for use when test set is provided with PTR key).
- 2.11** Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord) (for use when test set is provided with NTR key or when readjusting relays having ac readjust requirements).
- 2.12** 1011G handset (dial hand test set), equipped with a 2W39A cord, consisting of a W2CL cord, a 471A jack, and a 240A plug.
- **2.13** Insulating tools, as required. Use tools and apply, as covered in Section 069-020-801.

Test C

- 2.14** Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord) (for use when test set is arranged for visual ringing).

Tests D and E

- 2.15** Patching cord, P3H cord, 10 feet long, equipped with one 310 plug and one 240A plug (3P2A cord).

Test E

- 2.16** KS-6780 connecting clip, or equivalent.
- 2.17** Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord) and two 419A tools.
- 2.18** Blocking tools, as required. Use tools and apply, as covered in Section 069-020-801.

STEP	ACTION	VERIFICATION
2	Using P3E cord with red shell plugs, connect test set R jack to connector test line R jack. <i>Note:</i> To avoid possible grounding of the battery supply lead, connect the cord to the test set first and, when disconnecting, remove the cord from the test set last.	
3	Connect head telephone set to TEL jack of test set.	
Tests B and C		
4	Determine from office records proper connector and level to dial to seize intercepting trunk which provides timed-release ground to connector under test; make tests as described herein.	
→ 5a	If testing ringing control features of 200-point rotary hunting connectors — Remove covers and insulate 1L and 2L of normal post spring.	
Test B		
6b	If test set is provided with PTR key — Using 1-foot P3E cord, connect test set TL jack to proper test jack shown in Table A.	
7b	Operate S key.	
8c	If test set is provided with NTR key — Using 6-foot P3E cord and/or operate keys in test set, connect test set TL jack to jack of test line as shown in Table B.	
Test C		
9d	If test set is arranged for visual ringing — Using 6-foot P3E cord, connect test set 8R jack to test line T jack.	
10e	If testing terminal-per-station connectors — Using a different position on each test cycle, operate test line OP, NOR, NO key to one of the three positions.	

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STEP	ACTION	VERIFICATION
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Note: By using position NO, an operate test of the local connector H relay, or the combination connector K relays is applied; by using position OP, an operate test of local connector J relay, or the combination connector N relay is applied; and by using position NOR, a nonoperate test is applied to the marginal J, N, or equivalent relay. It may be desired to impose all three conditions on each connector tested. In any case, this complete test should be made when clearing specific cases of trouble.

4. METHOD

STEP	ACTION	VERIFICATION
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A. Busy Line Test—Leak

Offices Equipped With 100-Point Connectors Only

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|----|--|--|
| 4 | Using P3H cord, connect test set T jack to test jack of connector under test (except as noted in Step 5f). | BSY lamp does not light.

<i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested. |
| 5f | If testing connectors arranged for busy flash, or for testing operation of D relay when free service is provided on ninth level —
Using P4K cord, insert 289B plug with stay cord down into test set TT jack, 240B plug into test jack of connector under test. | BSY lamp does not light (see note, Step 4). |
| 6f | Operate TR1 key to L (left) position. | |

Offices Equipped With Both 100- and 200-Point Connectors

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|----|--|--|
| 7g | If testing 100-point connectors —
Using P3H cord, connect test set T jack to test jack of connector under test (except as noted in Step 8h). | BSY lamp does not light.

<i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested. |
| 8h | If testing 200-point connectors, or 100-point connectors arranged for busy flash or for testing operation of D relay with free service is provided on ninth level —
Using 5P3B cord, connect red shell plug to T jack, black shell plug to FR jack, 240B plug to test jack of connector under test. | BSY lamp does not light (see note, Step 7g). |

STEP	ACTION	VERIFICATION
9i	If testing 200-point connectors — Operate LO-UP key to UP position.	
10	Operate LK key.	
11	Operate DL ST key momentarily.	SL lamp lighted.
12	Operate BUSY key.	
13	Dial 99. <i>Note:</i> Dial an extra digit if testing terminal-per-line code ringing connectors.	Connector steps to ninth level, rotates smoothly to test line terminal. Busy tone heard in receiver. Where connector arranged for busy flash, C lamp flashes at 60 ipm.
14	Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished. C lamp extinguished, if lighted.
15	Restore LK, BSY keys, LO-UP key, if operated.	
16j	Unless other tests are to be made on this switch — Remove all test connections.	

B. Idle Line Test—Loop—Other Than 8-Party Semiselective Connectors

Offices Equipped With 100-Point Connectors Only

9	Using P3H cord, connect test set T jack to test jack of connector under test (except as noted in Step 10f).	BSY lamp does not light. <i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested.
10f	If testing connectors arranged for busy flash, or for testing operation of D relay when free service is provided on ninth level — Using P4K cord, insert 289B plug with stay cord down into test set TT jack, 240B plug into test jack of connector under test.	BSY lamp does not light (see note, Step 9).
11f	Operate TR1 key to L (left) position.	

Offices Equipped With Both 100- and 200-Point Connectors

12g	If testing 100-point connections — Using P3H cord, connect test set T jack to test jack of connector under test (except as noted in Step 13h).	BSY lamp does not light. <i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested.
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STEP	ACTION	VERIFICATION
13h	<p>If testing 200-point connectors, or 100-point connectors arranged for busy flash or for testing operation of D relay when free service is provided on ninth level — Using 5P3B cord, connect red shell plug to T jack, black shell plug to FR jack, 240B plug to test jack of connector under test.</p>	
14	Operate LP key.	
15	Operate DL ST key momentarily.	SL lamp lighted.
16i	<p>If testing other than code ringing terminal-per-line connectors — Dial 99.</p>	<p>Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. Buzzer relay sounds, follows ringing code.</p> <p><i>Note:</i> When testing 2-ring or code ringing connectors, check that first audible ring is a full code ring in order to check pickup feature.</p>
17j	<p>If testing code ringing terminal-per-line connectors — Operate REV L key.</p>	
18j	Dial 99, then dial a code digit for ringing over tip.	<p>Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. Buzzer relay sounds, follows ringing code.</p>
19j	Operate, hold operated FL key for at least 2 seconds.	<p>Connector releases. SL lamp extinguished.</p>
20j	Operate DL ST key momentarily.	SL lamp lighted.
21j	Restore REV L key.	
22j	<p>Dial 99, then dial a code digit for ringing over ring.</p> <p><i>Note:</i> Different code digits should be dialed on each test cycle so that eventually all codes will have been tested on each switch.</p>	<p>Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. Buzzer relay sounds, follows ringing code.</p> <p><i>Note:</i> Check that first audible ring is a full code ring in order to check pickup feature.</p>
23k	<p>If testing connectors in offices in which generator is connected to ground — Operate REV L key.</p> <p><i>Note:</i> Steps 23k through 25k should be made during one () interval.</p>	

STEP	ACTION	VERIFICATION
24k	Operate PTR or NTR key momentarily.	
25k	Restore REV L key.	Buzzer relay responds to next ringing period.
26l	If testing connectors in offices in which generator is connected to superimposing battery — Operate PTR or NTR key momentarily at start of () interval.	Audible ringing continues to be heard in receiver. Buzzer relay responds to next ringing period.
27	Operate TR key at start of () interval.	<p data-bbox="998 600 1419 630"><i>Test Applied in Silent Interval</i></p> <p data-bbox="998 663 1576 726">Audible ringing, buzzer relay not heard again.</p> <p data-bbox="998 758 1435 787"><i>Test Applied in Ringing Interval</i></p> <p data-bbox="998 821 1576 884">Audible ringing, buzzer relay silenced immediately.</p> <p data-bbox="998 915 1576 978"><i>Connectors Arranged to Reverse Battery on Ninth Level</i></p> <p data-bbox="998 1010 1243 1039">REV lamp lighted.</p> <p data-bbox="998 1073 1576 1167"><i>Connector Arranged to Test Operation of D Relay When Free Service Is Provided on Ninth Level</i></p> <p data-bbox="998 1199 1382 1228">C lamp lighted momentarily.</p>
28m	If REV or C lamp did not light in Step 27 when testing connectors in superimposed ringing offices using 66- to 75-volt silent period tripping battery — Operate TR3 key momentarily to R position.	REV or C lamp lighted.
29n	If testing connectors not arranged to test operation of D relay when free service is provided on the ninth level — Remove switch cover.	D relay operates.
30o	If D relay did not operate in Step 29n when testing connectors in superimposed ringing offices using 66- to 75-volt silent period tripping battery — Operate TR3 key momentarily to R position.	D relay operates.
31o	Replace switch cover.	

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STEP	ACTION	VERIFICATION
32	Restore TR key.	REV or Clamp extinguished, if lighted.
33	Operate ANS key. <i>Note 1:</i> It may be necessary to restore to ANS key momentarily to start the tone. <i>Note 2:</i> If testing in No. 35-E-97 office, it will be necessary to operate the TOLL key to hear tone.	Tone heard in receiver. REV lamp lighted when testing connectors arranged to reverse battery on ninth level. C lamp lighted when testing connectors arranged to test D relay when free service is provided on ninth level.
34p	If testing connectors arranged for calling party control without timed-release feature — Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished. REV or C lamp extinguished, if lighted.
35q	If testing connectors arranged for joint control — Operate, hold operated FL key for at least 2 seconds.	Connector does not release. REV lamp extinguished, if lighted. SL lamp extinguished.
36q	Restore ANS key.	Connector releases. C lamp extinguishes, if lighted.
37r	If testing connectors arranged for calling party control with timed-release feature — Restore ANS key.	Within timed interval SL lamp extinguished, indicating that timed-release functioned (see 1.07). REV lamp extinguished, if lighted.
38r	Operate, hold operated FL key for at least 2 seconds. <i>Note:</i> If Steps 37r and 39s both apply, select one connector per shelf and perform Steps 39s through 44s instead of Step 38r. Perform Step 37r on the remaining connectors on the shelf.	Connector releases.
39s	If testing connectors arranged for timed release from ground supplied by an intercepting trunk — Insert plug of second handset into test jack of a second connector having access to intercept trunk associated with connector to be tested.	
40s	Dial terminal connected to intercept trunk.	Connector stops on proper terminal. Audible ringing heard. At operator position — Call answered, ringing silenced.

STEP	ACTION	VERIFICATION
41s	At operator position — Disconnect when disconnect signal received.	
42s	At test set — Restore ANS key.	SL lamp not extinguished within timed interval (see 1.07).
43s	Disconnect second handset from connector used in test.	Connector releases.
44s	Operate test set FL key momentarily.	Connector under test releases. SL lamp extinguished. REV lamp extinguished, if lighted.

200-Point Connectors Only

45	Operate DL ST key momentarily.	SL lamp lighted.
46	Operate MI key.	
47	Dial 99, listen in receiver.	Connector steps to ninth level, rotates smoothly to terminal 99. Recorded message heard in receiver.
48	Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished.
49	Restore MI key.	

All Connectors

50	Restore LP key, TOLL key, if operated.	
→ 51a	If testing ringing control features of 200-point rotary hunting connectors — Remove insulators from 1L and 2L of normal post spring. Replace covers.	
52t	Unless other tests are to be made on this switch — Remove all test connections.	

C. Idle Line Test—Loop—8-Party Semiselective Connectors

Offices Equipped With 100-Point Connectors Only

11	Using P3H cord, connect test set T jack to test jack of connector under test (except as noted in Step 12f).	BSY lamp does not light. <i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested.
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STEP	ACTION	VERIFICATION
12f	If testing connectors arranged for busy flash, or for testing operation of D relay when free service is provided on ninth level — Using P4K cord, insert 289B plug with stay cord down into test set TT jack, 240B plug into test jack of connector under test.	BSY lamp does not light (see note, Step 11).
13f	Operate TR1 key to L (left) position.	

Offices Equipped With Both 100- and 200-Point Connectors

14g	If testing 100-point connectors — Using P3H cord, connect test set T jack to test jack of connector under test (except as noted in Step 15h).	BSY lamp does not light. <i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested.
15h	If testing 200-point connectors, or 100-point connectors arranged for busy flash or for testing operation of D relay when free service is provided on ninth level — Using 5P3B cord, connect red shell plug to T jack, black shell plug to FR jack, 240B plug to test jack of connector under test.	BSY lamp does not light (see note, Step 14g).
16	Operate LP key.	
17	Operate DL ST key momentarily.	SL lamp lighted.

8-Party Semiselective Terminal-per-line Connectors

18i	If test set is arranged for audible ringing — Operate REV L key.	
19i	Operate connector test line BELL T key.	
20i	Dial 99, then dial a code digit for ringing over tip.	Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. R+ or R- bell rings. Buzzer relay sounds, follows ringing code.
21i	Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished.
22i	Operate DL ST key momentarily.	SL lamp lighted.
23i	Restore REV L key.	
24i	Operate BELL R key.	

STEP	ACTION	VERIFICATION
25i	Dial 99, then dial a code digit for ringing over ring. <i>Note:</i> Different code digits should be dialed on each test cycle so that eventually all codes will have been tested on each switch.	Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. R+ or R- bell rings. Buzzer relay sounds, follows ringing code. <i>Note:</i> Check that first audible ring of 2-ring code is a full ring in order to check pickup feature.
26d	If test set is arranged for visual ringing — Operate REV L key.	
27d	Dial 99, then operate BSY key before dialing a code digit for ringing over tip.	Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. CC or CR lamp lights. Buzzer relay sounds, follows ringing code.
28d	Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished.
29d	Restore BSY, REV L keys.	
30d	Operate DL ST key momentarily.	SL lamp lighted.
31d	Dial 99, then operate BSY key and PTR or NTR key before dialing a code digit for ringing over ring. <i>Note:</i> Different code digits should be dialed on each test cycle so that eventually all codes will have been tested on each switch.	Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. CC or CR lamp lights, follows ringing code. <i>Note:</i> Check that first audible ring of 2-ring code is a full ring in order to check pickup feature.
8-Party Semiselective Terminal-per-Station Connectors		
32i	If test set is arranged for audible ringing — Operate BELL R key.	
33i	Dial 99.	Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. R- bell rings during ringing interval when OP-, NOR, NO- key is in either NO or NOR position. R+ bell rings during ringing interval when OP-, NOR, NO- key is in OP- position. Buzzer relay sounds during ringing interval.

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STEP	ACTION	VERIFICATION
		<i>Note:</i> Check that first audible ring of 2-ring code is a full ring in order to check pickup feature.
34d	If test set is arranged for visual ringing — Dial 99, then operate BSY key and PTR or NTR key.	Connector steps to ninth level, rotates smoothly to test line terminal. Audible ringing heard in receiver. CR lamp lights during ringing interval when OP-, NOR, NO- key is in either NO-MG or NOR position. CC lamp lights during ringing interval when OP-, NOR, NO- key is in OP- position.
		<i>Note:</i> Check that first audible ring of 2-ring code is a full code ring in order to check pickup feature.
35i	If test set is arranged for audible ringing — Restore BELL R key.	R+ or R- bell stops ringing. Buzzer relay continues to sound during ringing interval.
36d	If test set is arranged for visual ringing — Restore BSY and PTR or NTR key.	CC or CR lamp extinguished. Buzzer relay sounds during ringing interval.
37b	If test set is provided with PTR key — Using 1-foot P3E cord, connect TL jack of test set to proper test jack as shown in Table A.	
38b	Operate S key.	
39c	If test set is provided with NTR key — Using 6-foot P3E cord and/or operate keys in test set, connect TL jack of test set to jack of test line as shown in Table B.	
40	Operate PTR or NTR key momentarily at start of () interval.	Audible ringing continues to be heard in receiver. Buzzer relay does not sound while key is operated.
41	Operate TR key at start of () interval.	<p data-bbox="794 1493 1195 1514"><i>Test Applied in Silent Interval</i></p> <p data-bbox="794 1556 1365 1619">Audible ringing, buzzer relay not heard again.</p> <p data-bbox="794 1650 1222 1671"><i>Test Applied in Ringing Interval</i></p> <p data-bbox="794 1713 1365 1766">Audible ringing, buzzer relay silenced immediately.</p>
		<i>Connector Arranged to Reverse Battery on Ninth Level</i>

STEP	ACTION	VERIFICATION
		REV lamp lighted.
		<i>Connectors Arranged to Test Operation of D Relay When Free Service Is Provided on Ninth Level</i>
		C lamp lighted momentarily.
42j	If REV or C lamp did not light in Step 40 when testing connectors in superimposed ringing offices using 66- to 75-volt silent period tripping battery — Operate TR3 key momentarily to R position.	REV or C lamp lighted.
43k	If testing connectors not arranged to test operation of D relay when free service is provided on ninth level — Remove switch cover.	Check that D relay operated.
44l	If D relay operated in Step 43k when testing connectors in superimposed ringing offices using 66- to 75-volt silent period tripping battery — Operate TR3 key momentarily to R position.	D relay operated.
45k	If testing connectors not arranged to test operation of D relay when free service is provided on ninth level — Replace switch cover.	
46	Restore TR key.	REV or C lamp extinguished.
47	Operate ANS key.	Tone heard in receiver.
	Note 1: It may be necessary to restore the ANS key momentarily to start the tone.	<i>Connectors Arranged to Reverse Battery on Ninth Level</i>
	Note 2: If testing in No. 35-E-97 offices, it will be necessary to operate TOLL key to hear tone.	REV lamp lighted.
		<i>Connectors Arranged to Test Operation of D Relay When Service is Provided on Ninth Level</i>
		C lamp lighted.
48m	If testing connectors arranged for calling party control without timed-release feature — Restore ANS key.	REV or C lamp extinguished, if lighted.

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STEP	ACTION	VERIFICATION
49m	Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished.
50n	If testing connectors arranged for joint control — Operate, hold operated FL key for at least 2 seconds.	Connector does not release. REV lamp extinguished, if lighted. SL lamp extinguished.
51n	Restore ANS key.	Connector releases. C lamp extinguished, if lighted.
52o	If testing connectors arranged for calling party control with timed-release feature — Restore ANS key. <i>Note:</i> If Steps 52o and 53p both apply, select one connector per shelf and perform Steps 53p through 58p instead of Step 52o. Perform Step 52o on the remaining connectors on the shelf.	Within timed interval SL lamp extinguished, indicating that timed-release functioned (see 1.07).
53p	If testing connectors arranged for timed release from ground supplies through an intercepting trunk — Using a second handset with switch in TALK position, insert plug of handset into test jack of a second connector having access to the intercept trunk associated with the connector to be tested.	
54p	Dial terminal connected to intercept trunk.	Connector stops on proper terminal. Audible ringing heard. At operator position — Call answered, ringing silenced.
55p	At operator position — Disconnect when disconnect signal is received.	
56p	At test set — Restore ANS key.	SL lamp not extinguished within timed interval (see 1.07).
57p	Disconnect handset from connector used in test.	Connector releases.
58p	Operate test set FL key momentarily.	Connector under test releases.
59	Restore S key, TOLL key, if operated.	
200-Point Connectors Only		
60	Operate DL ST key momentarily.	SL lamp lighted.

STEP	ACTION	VERIFICATION
61	Operate MI key.	
62	Dial 99, listen in receiver.	Connector steps to ninth level, rotates smoothly to terminal 99. Recorded message heard in receiver.
63	Operate, hold operated FL key for at least 2 seconds.	Connector releases. SL lamp extinguished.
64	Restore MI key.	
All Connectors		
65	Restore all keys.	
→ 66a	If testing ringing control features of 200-point rotary hunting connectors — Remove insulators from 1L and 2L of normal post spring. Replace covers.	
67q	Unless other tests are to be made on this switch — Remove all test connections.	

D. Reverting Call Test

4f	If testing 100-point connectors — Using P3H cord, connect test set T jack to test jack of connector under test.	BSY lamp does not light. <i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested.
5g	If testing 200-point connectors — Using 5P3B cord, connect 310 red shell plug to T jack, black shell plug to FR jack, 240B plug to test jack of connector to be tested.	BSY lamp does not light (see note, Step 4f).
6	Operate LK, BSY keys.	
7	Operate DL ST key momentarily.	SL lamp lighted.
8	Dial 99. <i>Note:</i> Dial an extra code digit if testing terminal-per-line code ringing connectors.	Connector steps to ninth level, rotates smoothly to test line terminal. Busy tone heard in receiver.
9	Restore BSY key.	
10	Operate 10-PTY-TPS-RC key momentarily.	

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STEP	ACTION	VERIFICATION
11	Operate, hold operated FL key for at least 2 seconds.	SL lamp extinguished. BSY lamp lighted. Busy tone not heard in receiver. Buzzer relay sounds, follows test line code.
12	Operate REV L key.	Buzzer relay sounds, follows reverting call code.
13	Operate ANS key.	Buzzer relay stops.
14	Restore ANS key.	Connector releases. BSY lamp extinguished.
15	Restore LK, REV L keys.	
16h	Unless other tests are to be made on this switch — Remove all test connections.	

E. Free Service Feature, Rotary Hunting Connectors

4f	If testing 100-point connectors — Using P3H cord, connect test set T jack to test jack of connector under test.	BSY lamp does not light. <i>Note:</i> If BSY lamp lights, transfer plug to test jack of next idle connector to be tested.
5g	If testing 200-point connectors — Using 5P3B cord, connect 310 red shell plug T jack, black shell plug to FR jack, 240B plug to test jack of connector to be tested.	BSY lamp does not light (see note, Step 4f).
6	Operate LP key.	
7	Operate DL ST key momentarily.	SL lamp lighted.
8	Remove cover of switch under test.	
9h	If testing connectors in which locking ground of cut-through relay (such as M or K) is open when switch is normal — Connect ground to No. 1 (or 4) VON spring.	
10h	Block nonoperated L relay.	
11	Operate cut-through relay manually.	Relay locks in operated position.
12	Using KS-6780 clip, short-circuit tip and ring wiper at point near hub.	F, D relays operate. REV lamp lighted.
13	Block operated C relay.	

STEP	ACTION	VERIFICATION
14	Dial digit 1.	<p>Connector steps to first level.</p> <p><i>Connector Arranged to Reverse Battery on This Level</i></p> <p>REV lamp remains lighted.</p> <p><i>Connector Arranged for Free Service on This Level</i></p> <p>REV lamp extinguished.</p>
15	Dial another digit 1 to step connector to next level.	Check REV lamp as in Step 14.
16	Repeat Step 15 until all levels tested.	<p><i>When Tenth Level Is Dialed and Connector Is Arranged for Joint Control and Free Service</i></p> <p>REV lamp extinguished.</p> <p>Relay A in connector remains operated.</p>
17	Remove block from C relay.	
18	Remove clip from tip and ring wiper.	
19	Operate, hold operated FL key for at least 2 seconds.	<p>Connector releases.</p> <p>REV lamp extinguished, if lighted.</p> <p>SL lamp extinguished.</p>
20	Restore LP key.	
21	Remove blocking tool from L relay.	
22i	<p>Unless other tests are to be made on this switch —</p> <p>Remove all test connections.</p>	
23i	Replace switch cover.	