

LOCAL AND COMBINATION CONNECTORS
RAPID OPERATION TEST
USING CONNECTOR TEST SET SD-31637-01 OR SD-31637-02 (J34719A) AND
PULSING TEST SET SD-31481-01 (J34717A)
STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes a method of performing a rapid operation test of local connectors and of combination connectors (local side only), by means of connector test set SD-31637-01 or SD-31637-02, pulsing test set SD-31481-01 and connector test line SD-31653-01.

1.02 This section is reissued to add information in Test B, covering the testing of level hunting connectors arranged to wait for the units digit before starting level hunting and to bring the section generally up to date. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. Nonlevel Hunting Connectors: This test checks the stepping features of a connector without margins. It also checks the supervisory, transmission, and release features.

B. Level Hunting Connectors: This test checks the trunk hunting features of a connector. It also checks the supervisory, transmission, and release features.

1.04 These tests are intended as a means for testing the fundamental features at more frequent intervals, where desired, to supplement the complete operation tests covered in Sections 226-415-500 and 226-410-500.

1.05 Wherever the preparation or method calls for the operation of the STP, PLS, or RLS keys, or the dial, it is understood that either the STP, PLS, or RLS keys, or the dial, of the connector test set, or the STP (No. 1), PLS (No. 2), or RLS (No. 3) keys, or the dial, of the remote-control test set is meant, depending upon whether or not the remote-control test set is being used.

1.06 From all positions, except the BSY-L and IDLE-L positions, the test circuit can be returned to normal by operating and holding the RLS key until none of the progress lamps are lighted. If the test is in the BSY-L or IDLE-L position, it is necessary to advance the test circuit beyond these positions by means of the STP key, where the RLS key may be used.

1.07 100-point Connectors: In Test A, the test line for these connectors is connected to terminal 99, except in the case of rotary hunting connectors. In rotary hunting connector groups, terminal 99 is made busy and the test line is connected to terminal 90. The hunting feature is checked by directing the switch to terminal 99 and having it step to terminal 90. The pulsing test set, the dial on the connector test set, or the dial on the remote-control test set may be used to direct the connectors to the test line.

1.08 200-point Connectors: In Test A, 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 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 test set LO-UP key in normal position, by directing the switch to terminal 99 and having it step to 90. The dial on the connector test set, the dial on the remote-control test set, or the pulsing test set may be used to direct the connectors to the test line.

Caution: When dialing or pulsing the test line number, if the connector stops on any other terminal, immediately release the connector so as to avoid ringing on a subscriber line.

1.09 When testing 10-party terminal-per-line connectors arranged for cut-through to the called line following the completion of code selector pulsing, it will be necessary to dial or pulse an extra digit following the test number.

1.10 *In Test B:* The test line employed is ordinarily connected to terminal 91, except when the connectors are wired so as to hunt over a group of 100 trunks, in which case terminal 11 is used as the test line number. The pulsing test set is not used when making this test, the dial on the connector test set or the dial on the remote-control test set being used to direct the connector to the test line. However, if the pulsing set is connected to the connector test set for making Test A, it is not necessary to disconnect it in order to make this test.

1.11 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.

1.12 Precautions should be taken to perform these tests so as not to affect normal traffic adversely.

1.13 *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.

1.14 Local instructions should be followed with reference to recording the peg count register operations caused by performing these tests.

2. APPARATUS

All Tests

2.01 Connector test set, J34719A (SD-31637-01) or (SD-31637-02).

2.02 Connector test line circuit, SD-31653-01.

2.03 40B (remote control) test set. Required for making Tests A and B on local and combination connectors arranged for free service in lettered steps (d) using test set SD-31637-02, otherwise, optional for all other tests.

2.04 Test receiver, 723A receiver, attached to a R2DB cord equipped with a 347A plug (2W32A cord).

2.05 Patching cord, P3H cord, 10 feet long, equipped with a 310 plug and a 240A plug (3P2A cord) (for use with 100-point connectors).

2.06 Patching cord, consisting of two 10-foot P3E cords equipped with 310 plugs and both cords connected to a 240B plug (5P3B cord) (for use with 200-point connectors).

Test A

2.07 Patching cords, two P3E cords, 6 feet long, each equipped with 310 plugs (3P6D cords).

When Using Pulsing Test Set

2.08 Pulsing test set, J34717A (SD-31481-01).

2.09 Patching cord, P2J cord, 6 feet long, equipped with 310 red shell plugs (2P9B cord) (used where battery supply jack is available).

2.10 Testing cord, W2M cord, 9 feet long, equipped with a 310 plug and two 59 cord tips (2W12A cord) and two 108 cord tips (used where battery supply jack is not available).

2.11 Patching cord, P3E cord, 6 feet long, equipped with 310 plugs (3P7A cord).

2.12 Patching cord, P4N cord, 6 feet long, equipped with two 289B plugs (4P8B cord).

Test B

2.13 Patching cord, P3E cord, 6 feet long, equipped with 310 plugs (3P7A cord).

2.14 Special test cord, consisting of a W2W cord, equipped with a 310 plug, a 360B tool, and a 360C tool (2W17A cord); W2CF cord, equipped with a 310 plug (replace red shell with black shell), 360B tool, and a 360C tool (2W17D cord); two W1C cords, each 12 feet long (1W6A cords); two 360C tools; 240A plug and three 141 cord tips. Connect as shown in Fig. 1.

2.15 Special insulator, 1/2 inch by 2-1/2 inches (the KS-7187 Bell seal bond No. 20 relay cleaning paper may be used).

When Connector Test Line Terminal is 11

2.16 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord) and two KS-6278 connecting clips.

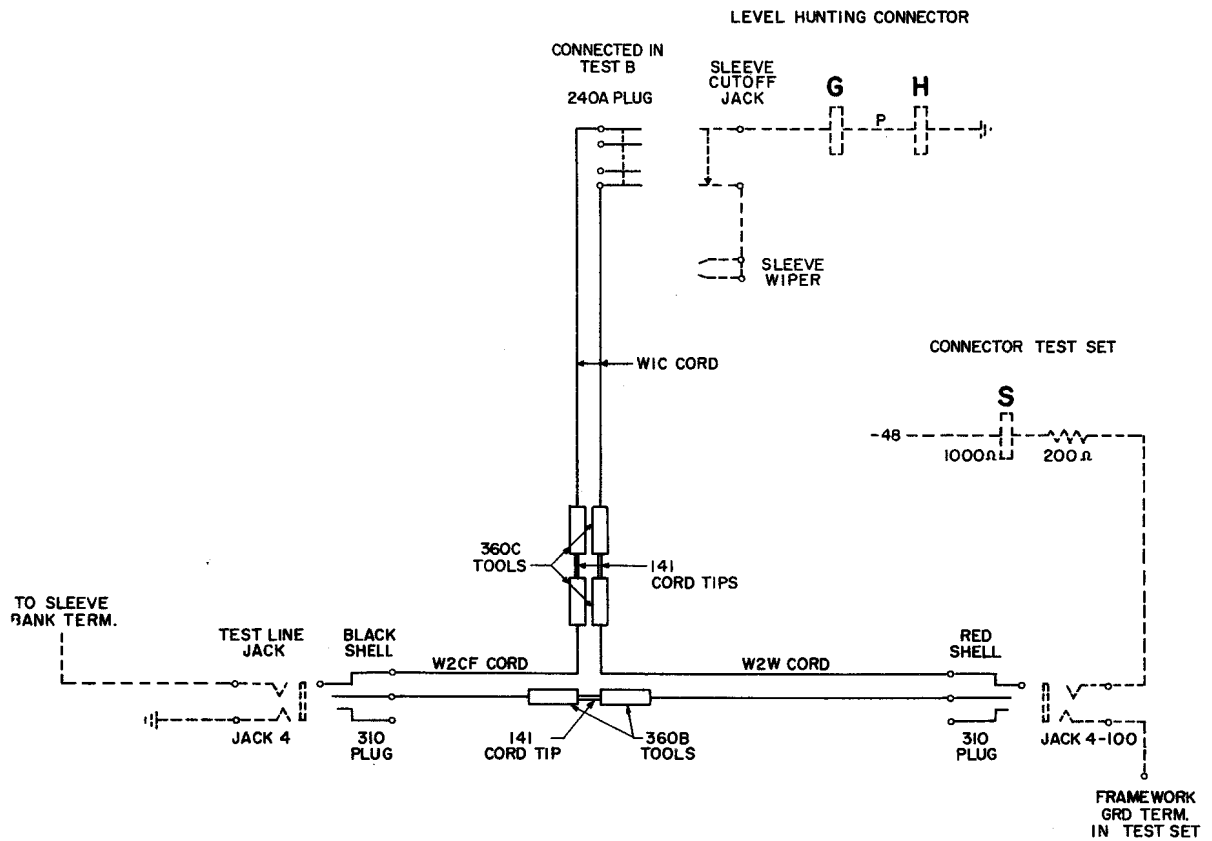


Fig. 1 - Test Cord

TABLE A
TEST SET PER SD-31637-01

KIND OF RING	MAX EXT SUB LOOP (OHMS)	TRIP BAT VOLTS	KEYS OPERATED		
			NOT USING FIG. C		USING FIG. C
			SUP TST	SS	TST
AC-DC	1000-1115	46-50		X	X
SUPER-IMPOSED	1000-1115	46-50	X		X
		60-75	X		

TABLE B
TEST SET PER SD-31637-02

KIND OF RING	MAX EXT SUB LOOP (OHMS)	TRIP BAT VOLTS	KEYS OPERATED			
			1000A	1000B	1400A	1400B
AC-DC and/or SUPER-IMPOSED	1000-1115	48.5-50	X			
		60-75		X		
	1400-1500	48.5-50			X	
		66-75				X

3. PREPARATION

STEP	ACTION	VERIFICATION
All Tests		
1a	If remote-control set is used — Insert remote-control set plugs, red, gray, and black, into test set jacks, R, G, and B, respectively (see 2.03).	
2	Connect receiver to test set TEL jack.	
3	Connect test set jack 3 to correspondingly numbered test line jack on connector frame, using 6-foot P3E cord.	
For Offices Equipped With 100-point Connectors Only		
4b	If testing nonlevel hunting connectors — Connect test set jack 4 (or 4-100) to test line jack 4 on connector frame, using 6-foot P3E cord.	
5c	If testing level hunting connectors — Connect test set jack 4 (or 4-100) to test line jack 4 on connector frame, using special test cord, Fig. 1.	
6	Operate test set keys as indicated in Table A or B to set up proper test condition in the test set. Operate 10P-TPL key, if provided, when testing 10P-TPL connectors.	
7	Operate, hold RLS key long enough to extinguish any progress lamps that may be lighted, or if necessary operate, release STP key required number of times.	All lamps extinguished.
8	Operate ROT key.	
9	Using P3H cord, connect test set T jack to test jack of connector under test.	GD lamp does not light. <i>Note:</i> If GD lamp lights, disconnect and proceed to test another switch.
10d	If testing connectors arranged for free service, using test set SD-31637-02 — Operate NON-REV key.	
11e	If test set is arranged for monitoring and it is desired to monitor on an off-normal connector — Insert 240A plug of P3H cord into test jack of off-normal connector and listen in receiver.	GD lamp lighted. Conversation heard. <i>Note:</i> When monitoring on a combination connector, if no conversation is heard, it may indicate that the connector is being held over the toll train.

STEP	ACTION	VERIFICATION
For Offices Equipped With Both 100- and 200-point Connectors		
12b	If testing nonlevel hunting connectors — Connect test set jack 4-200 to test line jack 4, using 6-foot P3E cord.	
13f	If testing 100-point level hunting connectors — Connect test set jack 4-100 to test line jack 4 on connector frame using special test cord, Fig. 1.	
14	Operate test set keys as indicated in Table A or B, to set up proper test condition in test set. Operate 10P-TPL key, if provided, when testing 10P-TPL connectors.	
15	Operate and hold RLS key long enough to extinguish any progress lamps that may be lighted, or if necessary operate and release STP key required number of times.	All lamps extinguished.
16	Operate ROT key.	
17	Using 5P3B cord, connect 310 red and black shell plugs to test set T and RU jacks, respectively, and the 240B plug to test jack springs of connector under test.	GD lamp does not light. <i>Note:</i> If GD lamp lights, disconnect and proceed to test another switch.
18d	If testing connectors arranged for free service, using test set SD-31637-02 — Operate NON-REV key.	
19e	If test set is arranged for monitoring and it is desired to monitor on an off-normal connector — Insert 240B plug of 5P3B cord into test jack of off-normal connector and listen in receiver.	GD lamp lighted. Conversation heard. <i>Note:</i> When monitoring on a combination connector, if no conversation is heard, it may indicate that the connector is being held over the toll train.

Test A**Using Pulsing Test Set**

- 20 Connect battery and ground to BAT G jack of pulsing test set.
- Note 1:* If using W2M cord, connect white (tip) conductor to battery and red (sleeve) conductor to ground (not to exceed 5 amperes in any case).
- Note 2:* To avoid possible grounding of battery supply lead, connect cords to the test set first and, when disconnecting, remove cords from test set last.

SECTION 226-415-504

STEP	ACTION	VERIFICATION
21	Connect pulsing test set TL jack to connector test set A jack, using 6-foot P3E cord.	
22	Connect pulsing test set A and B jacks to connector test set LK and LP jacks, using P4N cord.	
23	Restore all pulsing test set keys to normal.	

Test B

24 Operate test set LH key.

4. METHOD

STEP	ACTION	VERIFICATION
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A. Nonlevel Hunting Connectors

For Offices Having Only 100-point Connectors

24	Dial or pulse 99.	GD lamp lighted. Connector steps to ninth level, rotates smoothly to test line terminal. BSY lamp lighted.
25g	If testing connectors arranged to reverse battery, using test set SD-31637-01 or SD-31637-02 — (1400B key normal)	Proper transmission tone heard in receiver. <i>Note:</i> Should the REV-C lamp light, it usually indicates a reversal in the wiper cords or similar reversal in wiring.
26h	If testing connectors arranged to reverse battery, using test set SD-31637-02 — (1400B key operated)	Proper transmission tone heard in receiver. (See note, Step 25g.)
27i	If transmission tone was not heard in Step 26h — Momentarily operate PLS key.	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
28j	If testing connectors arranged for free service, using test set SD-31637-01 — Operate and restore NON-REV key.	Proper transmission tone heard in receiver.
29d	If testing connectors arranged for free service, using test set SD-31637-02 — Operate PLS key of 40B test set momentarily. (See 2.03.)	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
30k	If testing connectors arranged for calling party control — Remove 240A plug from test jack of connector.	Connector releases. BSY lamp extinguished. GD lamp extinguished.
31k	Operate RLS key momentarily.	Tone removed.

STEP	ACTION	VERIFICATION
32l	If testing connectors arranged for joint control — Remove 240A plug from test jack of connector.	Connector does not release. BSY lamp remains lighted. GD lamp extinguished.
33l	Operate RLS key momentarily.	Connector releases. Tone removed. BSY lamp extinguished.
34d	If testing connectors arranged for free service, using test set SD-31637-02 — Restore NON-REV key.	
For Offices Having Both 100- and 200-point Connectors		
35	Operate LO-UP key to UP position.	
36	Dial or pulse 99.	GD lamp lighted. Connector steps to ninth level, rotates smoothly to terminal 99. BSY lamp lighted.
37g	If testing connectors arranged to reverse battery, using test set SD-31637-01 or SD-31637-02 — (1400B key normal)	Proper transmission tone heard in receiver. <i>Note:</i> Should the REV-C lamp light, it usually indicates a reversal in the wiper cords or a similar reversal in wiring.
38h	If testing connectors arranged to reverse battery, using test set SD-31637-02 — (1400B key operated)	Proper transmission tone heard in receiver. (See note, Step 37g.)
39m	If transmission tone was not heard in Step 38h — Operate PLS key momentarily.	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
40j	If testing connectors arranged for free service, using test set SD-31637-01 — Operate and restore NON-REV key.	Proper transmission tone heard in receiver.
41d	If testing connectors arranged for free service, using test set SD-31637-02 — Operate PLS key of 40B test set momentarily. (See 2.03.)	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
42k	If testing connectors arranged for calling party control — Remove 240A plug from test jack of connector.	Connector releases. BSY lamp extinguished. GD lamp extinguished.
43	Operate RLS key momentarily.	Tone removed.
44l	If testing connectors arranged for joint control — Remove 240A plug from test jack of connector.	Connector does not release. BSY lamp remains lighted. GD lamp extinguished.

STEP	ACTION	VERIFICATION
45l	Operate RLS key momentarily.	Connector releases. Tone removed. BSY lamp extinguished.
46d	If testing connectors arranged for free service, using test set SD-31637-02 — Restore NON-REV key.	
47	Unless other tests are to be made on this switch — Restore all keys, remove all cords.	
B. Level Hunting Connectors		
25	Insert 240A plug (stay cord to right) of special test cord, Fig. 1, into sleeve cut-off jack of connector. <i>Note:</i> If sleeve cutoff jack wiring is reversed, reverse 240A plug.	
26	Insert special insulator between sleeve cut-off jack guard plate and front end of 240A plug flanges. Proceed immediately with Steps 27g or 28h, as required. <i>Caution: If the connector is seized by regular traffic before dialing is started, immediately remove the 240A plug from the sleeve cutoff jack.</i>	
27g	If using test line 91 — Dial digit which will direct connector to ninth level. <i>Note:</i> It will be necessary to dial an additional digit if the connector is arranged to hunt after the units digit is received.	GD lamp lighted. Connector hunts smoothly, stops on test line terminal. BSY lamp lighted.
28h	If using test line 11 — Connect ground to commutator terminal for level 1, using 893 cord.	
29h	Dial any digit. (See note, Step 27g.)	GD lamp lighted. Connector hunts smoothly, stops on test line terminal. BSY lamp lighted.
30i	If testing connectors arranged to reverse battery, using test set SD-31637-01, or SD-31637-02 — (1400B key normal).	Proper transmission tone heard in receiver. <i>Note:</i> Should the REV-C lamp light, it usually indicates a reversal in the wiper cords, or a similar reversal.
31j	If testing connectors arranged to reverse battery, using test set SD-31637-02 — (1400B key operated).	Proper transmission tone heard in receiver. (See note, Step 30i.)

STEP	ACTION	VERIFICATION
32k	If transmission tone was not heard in Step 31j — Operate PLS key momentarily.	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
33l	If testing connectors arranged for free service, using test set SD-31637-01 — Operate and restore NON-REV key.	Proper transmission tone heard in receiver
34d	If testing connectors arranged for free service, using test set SD-31637-02 — Operate PLS key of 40B test set momentarily. (See 2.03.)	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
35h	If using test line 11 — Remove ground from commutator terminal for 1 level.	
36m	If testing connectors arranged for calling party control — Remove 240A plug from test jack of connector.	Connector releases. BSY lamp extinguished. GD lamp extinguished.
37m	Operate RLS key momentarily.	Tone removed.
38n	If testing connectors arranged for joint control — Remove 240A plug from test jack of connector.	Connector does not release. BSY lamp remains lighted. GD lamp extinguished.
39n	Operate RLS key momentarily.	Connector releases. Tone removed. BSY lamp extinguished.
40	Immediately remove plug and special insulator from sleeve cutoff jack of connector.	
41d	If testing connectors arranged for free service, using test set SD-31637-02 — Restore NON-REV key.	
42	Unless other tests are to be made on this switch — Restore all keys, remove all cords.	