LOCAL LEVEL HUNTING CONNECTORS

OPERATION TESTS

USING CONNECTOR TEST SET SD-31637-01 OR SD-31637-02

(J34719A)

STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section is reissued to add in Test B a method of testing the connector timed-release feature, where the connector releases automatically if the calling party fails to hang up after the called party disconnects; also a test is made to check that the timed-release feature is discontinued when the intercepting circuits are in use.

1.02 The tests and the features tested are:

A. Busy Line and Level Hunting Test — Leak: This test checks the level hunting features of a connector under a leak condition. It also checks the ability of the connector to return busy tone and to release.

B. Idle Line Test — Loop: This test checks the trunk hunting features of a connector under a loop condition. It also checks the ringing, pretrip, trip, transmission, and release features, including a method of testing the connector timed-release feature if the calling party fails to hang up after called party disconnects. Also a false-ground test is made on the timed-release feature.

C. Marginal Test of Connector Supervisory Relay — Test Set SD-31637-01 Only: This test checks the supervisory relay of connectors arranged for 1000-ohm or 1115-ohm maximum external subscriber loop and 60- to 75-volt silent interval tripping battery. As the tripping resistance of the test set does not provide an adequate test of this relay under these conditions, this test provides a method for making an occasional test independent of the tripping relay test.

1.03 The P lamp is connected to a common alarm circuit serving a group of connectors and may flash occasionally due to normal operation of other connectors in the group, or may be lighted steadily if a permanent signal condition exists in one or more of the connectors in the group. The lighting of this lamp may be disregarded except when supervisory tests are being made, in which case it will be necessary to retire any permanent signal conditions of other connectors in the group before it can be determined that the connector under test is functioning properly with respect to the P lamp indication.

1.04 The test line employed in making Tests B and C is ordinarily connected to terminal 91. When the connectors are wired so as to hunt over a single group of 100 trunks, terminal 11 is used as the test line number.

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

1.06 The testing methods require that the test circuit be advanced through the various positions in which the proper conditions for the tests are applied. This is accomplished by momentarily operating the STP key. The progress lamps designated BSY-L, IDLE-L, PRE-TRIP, RING, T-TRIP, T-CO, and CLD-HLD indicate the particular test which is applied at the time the lamp is lighted.

1.07 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 circuit 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.

1.08 The parentheses in Test B, Steps 18, 20, etc, provide spaces for writing in the interval during which the pretrip and trip tests are to be made, as indicated in Table A or B.

1.09 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 set 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 Requirement Table. Repeat the test and, if the relay continues to fail, operate the test set keys as indicated for READJ in Table B to apply the test set readjust resistance values and change the tension in the No. 1 spring, as required.

1.10 When testing connectors arranged for 1000- or 1115-ohm maximum external subscriber loop, 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 test resistance values) shall be readjusted mechanically to meet the requirements specified in Sections 040-803-701 and 040-236-701, and the readjust ringing current values provided by the test set. These values are obtained by operating the test set keys as indicated for READJ in Table A or B.

→ **1.11** For level hunting connectors, the disconnect time is within 25 to 37 seconds. →

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 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.

2. APPARATUS

All Tests

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

2.02 One 40B (or 40A) remote control test set required for making tripping tests in Test B on local level hunting connectors arranged for free service in lettered steps (d) using test set SD-31637-02, otherwise, optional for all other tests.

2.03 One 723A receiver attached to an R2DB cord equipped with a 347A plug (or equivalent).

2.04 Patching cord — P3H cord equipped with 240A plug and 310 plug (3P2A cord).

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

2.06 Testing cord — W2W cord equipped with 310 plug, 360B tool, and 360C tool (2W17A cord); W2CF cord equipped with 310 plug (replace red shell with black shell), 360B tool, and 360C tool (2W17D cord), two W1C cords, each 12 feet long; two 360C tools; 240A plug; and three 141 cord tips. Connect to form special cord as shown in Fig. 1.

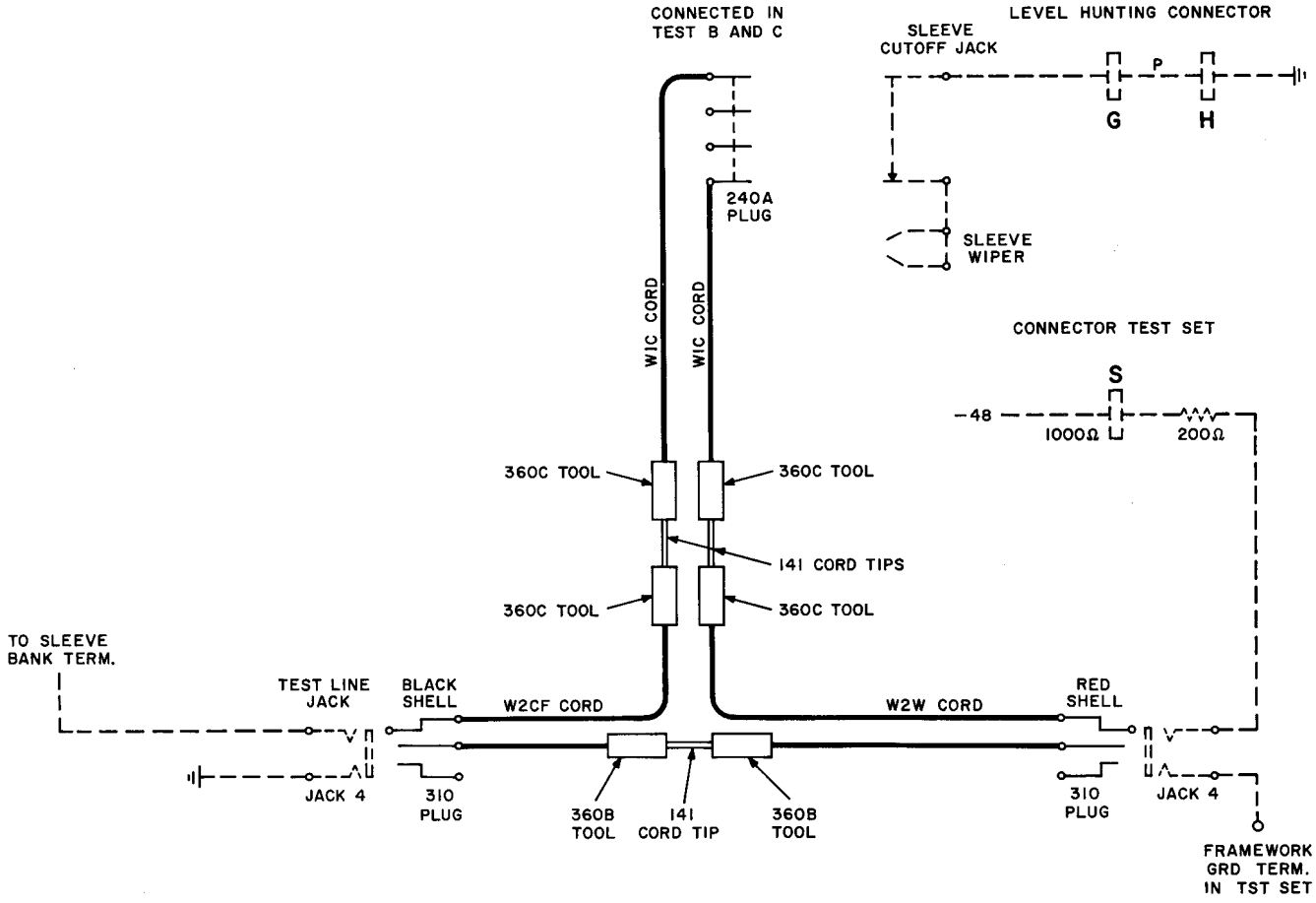

Fig. 1 — Testing Cord

Test A

2.07 One 240A plug.

Test B

2.08 Patching cord — P3E cord, 10 feet long, equipped with two 310 plugs (3P6F cord).

Tests B and C

2.09 Special insulator 1/2 by 2-1/2 inches (the KS-7187 bell seal bond 20 relay cleaning paper may be used).

When Connector Test Line Terminal Is 11

2.10 Testing cord — 893 cord equipped with two 360A tools (1W13B cord) and two KS-6278 clips.

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.	
2	Connect receiver to test set TEL jack.	
3	Connect test set jack 3 to test line jack 3 (level hunting) on connector frame, using 6-foot P3E cord.	
4	Connect test set jack 4 to test line jack 4 (level hunting) on connector frame, using special test cord, Fig. 1.	
5	Operate, hold RLS key long enough to extinguished any progress lamps that may be lit or, if necessary, operate and release STP key the required number of times.	All lamps extinguished.
6	Using P3H cord, connect test set T jack to test jack of normal connector under test.	GD lamp does not light.
7b	Where test set is arranged for monitoring — If it is desired to monitor on an off-normal connector, insert 240A plug of P3H cord into test jack of off-normal connector, listen in receiver.	GD lamp lighted. Conversation heard.
8	Operate LH key.	
Test B		
9c	In offices equipped with permanent signal testing equipment — Connect PS (or PERM-T) jack on connector frame to test set P jack, using 10-foot P3E cord.	
10d	If testing connectors arranged for free service using test set SD-31637-02 — Operate NON-REV key.	
11	Operate test set keys as indicated for Test in Table A or B to provide the proper pretrip and trip conditions in test set. *Note:* For tests during silent interval, the silent interval tripping battery shall be within the voltage limits shown in the tables.	

TABLE A

TEST SET PER SD-31637-01

KIND OF RING	MAX EXT SUB LOOP ohms	TRIP BAT. volts	FOR		KEYS OPERATED					PRETRIP	TRIP
					NOT USING FIG. C		USING FIG. C				
			TEST	READJ	SUP TST	SUP ADJ	SS	TST	ADJ		
AC-DC	1000-1115	46-50	X				X	X		Ringing period	Silent period
			X		X			X			
Super-imposed	1000-1115	60-75	X		X					Ringing period	Ringing period
				X		X			X		

TABLE B

TEST SET PER SD-31637-02

KIND OF RING	MAX EXT SUB LOOP ohms	TRIP BAT. volts	FOR		KEYS OPERATED					PRETRIP	TRIP
			TEST	READJ	1000A	1000B	1400A	1400B	ADJ		
AC-DC and/or Super-imposed	1000-1115	48.5-50	X		X					Silent period	Silent period
			X			X					
		60-75				X				Ringing period	Ringing period
				X					X		
	1400-1500	48.5-50	X				X			Silent period	Silent period
				X			X		X		
		66-75	X					X			
				X				X	X		

STEP	ACTION	VERIFICATION
Test C		
9	Check that silent interval tripping battery is a least 67 volts before making this test.	
10e	Operate TST key, if provided.	

4. METHOD

STEP	ACTION	VERIFICATION
	A. Busy Line and Level Hunting Test — Leak	
9	Operate, release STP key to advance test circuit to BSY-L position.	BSY-L lamp lighted. GD lamp lighted.
10	Insert 240A plug into sleeve cutoff jack of connector.	

STEP	ACTION	VERIFICATION
11	Dial any digit which will cause connector to hunt over at least two levels. *Note:* It will be necessary to dial an additional digit if the connector is arranged to hunt after the units digit is received.	BSY lamp lights when dial is moved off-normal. Connector hunts smoothly, stops on tenth terminal of last level in group of trunks selected. Busy tone heard in receiver.
12	Momentarily operate RLS key.	BSY lamp extinguished. Connector releases. GD lamp extinguished momentarily. Busy tone removed.
13	Remove 240A plug from sleeve cutoff jack of connector.	
14	Remove 240A plug from test jack of connector, unless other tests are to be made on this switch.	

B. Idle Line Test — Loop

12	Operate, release STP key to advance test circuit to IDLE-L position.	IDLE-L lamp lighted. GD lamp lighted.
13	Insert 240A plug (stay cord to the right) of special test cord (Fig. 1) into sleeve cutoff jack of connector. *Note:* If sleeve cutoff jack wiring is reversed, reverse 240A plug.	
14	Insert special insulator between sleeve cutoff jack guard plate and front end of 240A plug flanges.	

Line Seizure and Ringing Test

15g	If using test line 91 — Dial digit which will direct connector to ninth level. *Note:* It will be necessary to dial an additional digit if the connector is arranged to hunt after the units digit is received.	Connector hunts smoothly, stops on test line terminal. BSY lamp lighted. RS lamp lights during ringing intervals. Audible ring heard in receiver.
16h	If using test line 11 — Using 893 cord, connect ground to commutator terminal for level 1.	
17h	Dial any digit. *Note:* It will be necessary to dial an additional digit if the connector is arranged to hunt after the units digit is received.	Connector hunts smoothly, stops on test line terminal. BSY lamp lighted. RS lamp lights during ringing intervals. Audible ring heard in receiver.

STEP	ACTION	VERIFICATION
Pretrip Test		
18	Momentarily operate STP key at start of ( ) interval. This test shall be completed within same interval by performing Step 19.	PRE-TRIP lamp lighted. IDLE-L lamp extinguished.
19	Operate, release STP key.	RING lamp lighted. PRE-TRIP lamp extinguished. RS lamp lighted during ringing intervals. Audible ring continues to be heard in receiver.
Tripping Test		
20i	If testing connectors arranged to reverse battery, using test set SD-31637-01 or SD-31637-02 with 1400B key normal — Operate, release STP key at start of ( ) interval.	T-TRIP lamp lighted, RING lamp extinguished. If this test was applied in the silent interval, check that the audible ringing signal is not heard again in the receiver, or, if applied in the ringing interval, check that the audible ringing signal is immediately stopped upon the application of the test. The RS lamp is disconnected when this test is applied and cannot be considered as an indication that the ringing has tripped. Proper transmission tone heard in receiver.
21j	If testing connectors arranged to reverse battery, using test set SD-31637-02 with 1400B key operated — Operate, release STP key at start of silent interval.	T-TRIP lamp lighted. RING lamp extinguished. Ringing tone not heard again in receiver. Proper transmission tone heard in receiver. *Note:* If transmission tone is not heard, perform Step 22j.
22j	If transmission tone is not heard, momentarily operate PLS key.	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
23k	If testing connectors aranged for free service, using test set SD-31637-01 — Operate, release STP key at start of ( ) interval.	T-TRIP lamp lighted. RING lamp extinguished. If this test was applied in the silent interval, check that the audible ringing signal is not heard again in the receiver, or, if applied in the ringing interval, check that the audible ringing signal is immediately stopped upon the application of the test. The RS lamp is disconnected when this test is applied and cannot be considered as an indication that the ringing has tripped.
24k	Operate, restore NON-REV key.	Proper transmission tone heard in receiver.

STEP	ACTION	VERIFICATION
25d	If testing connectors arranged for free service, using test set SD-31637-02 — Operate, release STP key at start of ( ) interval.	T-TRIP lamp lighted. RING lamp extinguished. If this test was applied in the silent interval, check that the audible ringing signal is not heard again in the receiver, or, if applied in the ringing interval, check that the audible ringing signal is immediately stopped upon the application of the test. The RS lamp is disconnected when this test is applied and cannot be considered as an indication that the ringing has tripped.
26d	Momentarily operate PLS key.	Proper transmission tone heard in receiver. (Disregard lighting of CT lamp.)
	Supervisory Test	
27m	If testing "SUPV 1" permanent signal alarm — Test set SD-31637-01 (option T) or SD-31637-02. Operate, release STP key.	T-CO lamp lighted. T-TRIP lamp extinguished. P lamp lighted. Tone removed.
28n	If testing wiper cords — Test set SD-31637-01 (option W). Operate, release STP key.	T-CO lamp lighted. T-TRIP lamp extinguished. Tone removed.
29n	Move wiper cords slightly while listening in receiver.	No noise heard in receiver. BSY lamp does not flash.
30o	If connector under test is arranged for calling party control with timed-release feature — Operate, release STP key. ***Note:*** Timed release feature will not operate with option W of SD-31637-01 test set.	T-CO lamp lighted. T-TRIP lamp extinguished. P lamp lighted. Tone removed. After timed interval, GD lamp extinguished, indicating timed disconnect functioned (See 1.11).
31o	Operate, release STP key. ***Note:*** If performing this test, perform Steps 32p through 36p on one connector per shelf, where applicable.	Connector releases.
32p	If connector is arranged for timed-release from ground supplied under control of intercepting trunk — Insert plug of handset into test jack of any connector having access to the intercept trunk associated with the connector under test.	

STEP	ACTION	VERIFICATION
33p	Dial terminal connected to intercept trunk.	Connector stops on proper terminal. Audible ringing heard. At operator position — Call answered, ringing silenced.
34p	At operator position — Disconnect when disconnect signal is received.	
35p	Operate, release STP key.	T-CO lamp lighted. T-TRIP lamp extinguished. P lamp lighted. Tone removed. GD lamp does not extinguish at end of timed interval (See 1.11).
36p	Disconnect handset plug from test jack of connector used in test.	Connector releases.
37p	Operate, release STP key.	CLD-HOLD lamp lighted. T-CO lamp extinguished. Connector releases. BSY, P, GD lamps extinguished.
38p	Momentarily operate RLS key.	CLD-HLD lamp extinguished.
39h	If using test line 11 — Remove ground from commutator terminal for level 1.	
40q	If testing connectors arranged for calling party control — Operate, release STP key.	CLD-HLD lamp lighted. T-CO lamp extinguished. Connector releases. BSY, GD, P lamps extinguished.
41q	Momentarily operate RLS key.	CLD-HLD lamp extinguished.
42r	If testing connectors arranged for joint control — Operate, release STP key.	CLD-HLD lamp lighted. T-CO lamp extinguished. Connector does not release. BSY lamp remains lighted. GD lamp flashes once. P lamp lighted.
43r	Momentarily operate RLS key.	CLD-HLD lamp extinguished. Connector releases. BSY, GD, P lamps extinguished.
44	Immediately remove 240A plug and special insulator from sleeve cutoff jack of connector.	

STEP	ACTION	VERIFICATION
45d	If testing connector arranged for free service, using test set SD-31632-02 — Restore NON-REV key.	
46	Remove 240A plug from test jack of connector, unless other tests are to be made on this switch.	

C. Marginal Test of Connector Supervisory Relay — Test Set SD-31637-01 Only

11	Operate, release STP key to advance test circuit to RING position.	RING lamp lighted. GD lamp lighted.
12	Insert 240A plug (stay cord to the right) of special test cord (Fig. 1) into sleeve cutoff jack of connector. *Note:* If sleeve cutoff jack wiring is reversed, reverse 240A plug.	
13	Insert special insulator between sleeve cutoff jack guard plate and front end of 240A plug flanges.	

Line Seizure and Ringing Test

14g	If using test line 91 — Dial digit which will direct connector to ninth level. *Note:* It will be necessary to dial an additional digit if the connector is arranged to hunt after the units digit is received.	Connector hunts smoothly, stops on test line terminal. BSY lamp lighted. RS lamp lights during ringing intervals. Audible ring heard in receiver.
15h	If using test line 11 — Using 893 cord, connect ground to commutator terminal for level 1.	
16h	Dial any digit. *Note:* It will be necessary to dial an additional digit if the connector is arranged to hunt after the units digit is received.	Connector hunts smoothly, stops on test line terminal. BSY lamp lighted. RS lamp lights during ringing intervals. Audible ring heard in receiver.

Tripping Test

17g	If testing connectors arranged to reverse battery — Operate, release STP key at start of silent interval.	T-TRIP lamp lighted. RING lamp extinguished. Proper transmission tone immediately heard in receiver.

STEP	ACTION	VERIFICATION
18k	If testing connectors arranged for free service — Operate, release STP key at start of silent interval.	T-TRIP lamp lighted. RING lamp extinguished.
19k	Operate, restore NON-REV key.	Proper transmission tone heard in receiver.
20	Momentarily operate RLS key.	T-TRIP lamp extinguished. Connector releases. BSY, GD lamp extinguished.
21h	If using test line 11 — Remove ground from commutator terminal for level 1.	
22	Immediately remove 240A plug and special insulator from sleeve cutoff jack of connector.	
23	Remove 240A plug from test jack of connector unless other tests are to be made on this switch.	
24e	Restore TST key, if provided.	