

LOCAL AND COMBINATION CONNECTORS
OPERATION AND PULSING TESTS
USING CONNECTOR TEST SET SD-30502-01 (J34711A)
AND PULSING TEST SET SD-31481-01 (J34717A)
STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes a method of performing operation tests, or combined operation and pulsing tests, on local connectors (except the level hunting type) and on combination connectors (local side only) by means of the wagon-type connector test set SD-30502-01 and the pulsing test set SD-31481-01. It also indicates the key operation required in order to apply the readjust value of resistance to the ring-trip relays of connectors.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 The tests and the features tested are:

(A) Busy Line Test - Leak: This test checks the stepping features of a connector. This feature is checked under a leak condition except when the pulsing test set is used as a dialing device without margins. It also checks the ability of the connector to return the proper busy signal and to release.

(B) Idle Line Test - Loop - Other than 10-Party Terminal per Line Connectors: This test checks the stepping features of a connector. This feature is checked under a loop condition except when the pulsing test set is used as a dialing device without margins. It also checks the ringing, pretrip, trip, transmission, and release features. 8-party semiselective connector ringing is indicated either by test line bells or visual signals on the test set.

(C) Idle Line Test - Loop - 10-Party Terminal per Line Connectors: This test checks the stepping features of a connector under a loop condition except where the pulsing test

set is used as a dialing device without margins. It also checks the ringing, pretrip, trip, transmission, and release features.

(D) Ringling Polarity Test - 8-Party Semiselective Ringing Connectors: This test is intended for use only when it is desired to make a complete check of the local connector H and J relays, or the combination connector K and N relays, when testing a connector in the process of clearing a specific case of trouble. On a routine basis, the 8-party connectors should be tested as outlined under Tests (A) and (B).

(E) Reverting Call Test - 10-Party Connectors: This test checks the reverting call features of 10-party terminal per line and 10-party terminal per station connectors.

(F) Marginal Test of Connector Supervisory Relay, Using Test Set Not Equipped for Testing Connectors Arranged for 1400-ohm or 1500-ohm Maximum External Subscriber Loop: This test provides a method for testing connector supervisory relays in offices 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 the relay under these conditions, this test provides a method for making an occasional test independently of the tripping relay test.

1.04 Lettered Steps: The letters a, b, c, etc, are added to a step to indicate that the step covers an action which may or may not be required, depending upon local conditions. The condition under which a lettered step or series of steps should be made is given in the ACTION column and all steps governed by the same condition are designated by the same letter. When a condition does not apply, the associated steps should be omitted.

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1.05 The dial on the connector test set, the dial on the remote control set, or, where the connector test set is so arranged, the pulsing test set may be used to direct the connector to the test line. When using the pulsing test set, the loop and leak conditions in the connector test set are ineffective. The pulsing test set can be used either with or without pulsing margins depending upon whether or not the pulsing tests are to be combined with the operation tests.

1.06 The pulsing test may be scheduled as a separate routine in accordance with Section 226-400-500, in which case, Tests (A), (B), and (C) would ordinarily be made without pulsing margins. Section 226-400-500 also covers an E relay hold test which is not covered in this section.

1.07 When the pulsing test is combined with Test (A), a magnet pulsing test should be performed on any switch on which a pulsing failure is encountered in order to determine if the trouble indicated by Test (A) is due to the switch mechanism. The method for making the magnet test is described in Section 226-400-500 covering pulsing tests of connectors.

1.08 The general procedure for the analysis and correction of pulsing failures encountered in making pulsing tests of connectors is covered in Section 226-170-700.

1.09 The test line employed in making these tests 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 of rotary hunting connectors is checked by directing the switch to terminal 99 and having it step to terminal 90.

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.

1.10 The P-1 (PERM NO. 1) 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 connectors in the group. When testing 10-party terminal per line connectors arranged for immediate supervisory signal, this lamp will light upon seizure of the switch. 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 regard to the P-1 (PERM NO. 1) lamp indication. If the test set is equipped with a P-2 (PERM NO. 2) lamp, this lamp will give the same indications as the P-1 (PERM NO. 1) lamp.

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

1.12 The testing method requires 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 or BUSY LINE, WT-R or WAIT RING, PRETRIP, RING, T-TRIP or TONE TRIP, T-CO or TONE-CO and CLD-HLD indicate the particular test which is applied at the time the lamp is lighted.

1.13 From all positions except the BSY-L (BUSY LINE), WT-R (WAIT RING), and PRETRIP positions, the test circuit can be returned to normal by holding the RLS key operated until none of the progress lamps is lighted. If the test circuit is in one of the above positions, it is necessary to advance the test circuit beyond these positions by means of the STP key, where the RLS key may be used.

1.14 The parentheses in Tests (B) and (C) provide space to insert the interval during which the pretrip and trip tests are to be made as indicated in Table 1 or 2.

1.15 When testing connectors arranged for 1400-ohm or 1500-ohm maximum external subscriber loop, any ring-trip relay which fails 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 2 to apply the test set readjust resistance values and change the tension in the No. 1 spring, as required.

1.16 When testing connectors arranged for 1000-ohm 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 relay which fails on the pretrip or trip test (test set 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 set. These values are obtained by operating the test set keys as indicated for READJ in Table 1 or 2.

1.17 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 J34711A (SD-30502-01).
- 2.02 No. 40B Test Set (Remote Control) (Optional).
- 2.03 No. 723A Receiver attached to an R2DB Cord equipped with a No. 347A (or No. 47A) Plug.
- 2.04 P3H (or P3C) Cord, equipped with a No. 240A Plug, and a No. 310 Plug (3P2A).
- 2.05 Two P3E Cords, each equipped with two No. 310 Plugs (3P7A).

When Using Pulsing Test Set

- 2.06 Pulsing Test Set J34717A (SD-31481-01).
- 2.07 P2J Cord, equipped with two No. 310 Plugs (2P9B) - used where a battery supply jack is available.

3. PREPARATION

ALL TESTS

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
1	Connect test set jacks 3 and 4 to the correspondingly numbered test line jacks on the connector frame, using two 6-foot P3E cords.	
2a	If remote control set is used - Insert remote control set plugs, red, gray, and black, into test set jacks R, G, and B, respectively.	
3	Connect receiver to test set jack TEL.	
4	Insert No. 310 plug of P3H cord into TST jack of test set.	
5	Operate and hold RLS key long enough to extinguish any progress lamps that may be lit or, if necessary, operate and release STP key required number of times.	All lamps extinguished.

2.08 W2M Cord, equipped with No. 310 Plug, tip and sleeve connections, and two No. 59 Cord Tips (2W12A), and two No. 108 Cord Tips - used where battery supply jack is not available.

- 2.09 P3E Cord, 6 feet long, equipped with two No. 310 Plugs (3P7A).
- 2.10 P4N Cord equipped with two No. 289B Plugs (4P8B).

TEST (B) FOR 8-PARTY CONNECTORS AND TEST (D)

When Audible Ringing Signal Is Provided

- 2.11 No. 310 Plug, designated "A," with tip, ring and sleeve open.
- 2.12 No. 184B Plug, designated "B."
- 2.13 No. 310 Plug, designated "C," with tip and ring strapped.

Note: The designation "A," "B," or "C," as required, should be stamped locally on the shells of the above plugs.

When Visual Ringing Signal Is Provided

- 2.14 P3E Cord, 10 feet long, equipped with two No. 310 Plugs (3P6F).
- TEST (B)
- 2.15 P3E Cord, 10 feet long, equipped with two No. 310 Plugs (3P6F).

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
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With Pulsing Test Set

6b If battery supply jack is available -
Connect 48-volt battery and ground to BAT-G
jack of pulsing test set, using P2J cord.

Note: To avoid possible grounding of bat-
tery supply lead, connect cord to test set
first and, when disconnecting, remove cord
from test set last.

7c If battery supply jack is not available -
Insert No. 310 plug of W2M cord into BAT-G
jack of pulsing test set.

8c Connect No. 59 cord tip of white (tip) con-
ductor to equipment side of 48-volt battery
fuse, and red (sleeve) conductor to ground.

Note: In no case should fuse selected ex-
ceed 5 amperes.

9 Connect TL jack of pulsing test set to A
jack of connector test set, using 6-foot
P3E cord.

10 Connect A and B jacks of pulsing test set
to LK and LP jacks of connector test set,
using P4N cord.

11d If using pulsing test set without margins -
Restore all pulsing test set keys to nor-
mal.

12e If using pulsing test set with margins -
Operate pulsing test set keys as indicated
below to establish proper loop and leak
conditions:

<u>Loop Resistance</u>	<u>Keys Operated</u>
1000 ohms	200 and 800
1200 ohms	400 and 800
1400 ohms	200, 400, and 800

<u>Leak Condition</u>	<u>Key Operated</u>
Leak B	LK B
Leak A	LK A

Note: Pulsing tests should be made with a
1400-ohm loop and leak A condition in of-
fices where all connector "B" functional
relays are of the 248-type, or 222-type
modified with 1:1 ratio armature. Other-
wise pulsing tests should be made with a
1200-ohm loop and leak A condition. Local
instructions, however, may specify the use
of other loop and leak conditions.

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
13	Operate PLS key momentarily.	
<u>With or Without Pulsing Test Set</u>		
14	Holding RLS key operated, insert No. 240A plug of P3H cord into test jack of normal connector under test.	GD (GUARD) lamp does not light.
15	Restore RLS key.	GD (GUARD) lamp lights.
16f	Where test set is arranged for monitoring - If it is desired to monitor on an off-normal connector, hold RLS key operated and insert No. 240A plug of P3H cord into test jack of off-normal connector and listen in receiver.	GD (GUARD) lamp lights. Conversation is heard in receiver.
<u>Note:</u> When monitoring a combination connector, if no conversation is heard it may indicate that the connector is being held over the toll train.		
TEST (A) FOR 10-PARTY CONNECTORS		
17	Operate LOP-TPS key when testing 10-party terminal per station connectors, or 10-party terminal per line connectors arranged for reverting calls.	
TEST (B) FOR 8-PARTY CONNECTORS AND TEST (D)		
17g	If audible ringing signal is provided - Insert the "A," "B," or "C" plug into 8-PTY jack of test line when applying Test (B) to 8-party connectors. Use a different plug on each routine test cycle. When performing Test (D), use plugs as outlined thereunder.	
<u>Note:</u> By using the "A" plug, an operate test of local connector H relay or combination connector K relay is applied; by using the "B" plug, an operate test of the local connector J relay or combination connector N relay is applied, and by using the "C" plug, a nonoperate test of the J or N relay is applied.		
18h	If visual ringing signal is provided - Connect 8-PTY jack of test set to 8-PTY jack of test line, using 10-foot P3E cord.	
19h	Operate H-OP, J-NO, J-OP (552E) key to one of the three positions when applying Test (B) to 8-party connectors. Use a different position on each routine test cycle. When performing Test (D), operate keys as outlined thereunder.	
<u>Note:</u> When H-OP, J-NO, J-OP (552E) key is in H-OP position, an operate test of the local connector H relay or combination connector K relay is applied; when in J-NO position, a nonoperate test of the local connector J relay or combination connector N relay is applied; when in J-O position, an operate test of the J or N relay is applied.		

TABLE 1

TEST SET NOT EQUIPPED TO TEST CONNECTORS ARRANGED FOR 1400 -1500 OHM LOOP

KIND OF RING	MAX. EXT. SUB. LOOP (OHMS)	TRIP BATT VOLTS	FOR			KEYS OPERATED						PRE TRIP	TRIP	
			TEST	READJ.	SUPV-RELAY TEST	NOT USING FIG. G *			USING FIG. G					
						ADJ	8P TST	8P ADJ.	SS	TST	ADJ.			
AC-DC	1000-1115	46-50	X						X	X		RINGING PERIOD	SILENT PERIOD	
SUPER-IMPOSED	1000-1115	46-50	X			X				X			RINGING PERIOD	RINGING PERIOD
		60-75	X				X					X		RINGING PERIOD
				X			X		X					
					X	X				X				

*Also operate 10P TPS key when testing 10-PTY TPS connectors in a superimposed ringing office.

SS and TEST keys ineffective when testing 10-PTY TPL connectors.

8P TST and 8P ADJ keys are provided only for testing 8-PTY semi-selective ringing connectors in an ac-dc office.

TABLE 2

TEST SET EQUIPPED TO TEST CONNECTORS ARRANGED FOR 1400-1500 OHM LOOP

KIND OF RING	MAX. EXT. SUB. LOOP (OHMS)	TRIP BATT. VOLTS	FOR		KEYS OPERATED					PRE TRIP	TRIP	
			TEST	READJ.	1000A	1000B	1400A	1400B	ADJ			
AC-DC and/or	1000-1115	48.5-50	X		X						SILENT PERIOD	SILENT PERIOD
		60-75	X			X					RINGING PERIOD	RINGING PERIOD
SUPER-IMPOSED	1400-1500	48.5-50	X				X				SILENT PERIOD	SILENT PERIOD
				X			X		X			
		66-75	X					X				
				X				X	X			

4. METHOD

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>(A) Busy Line Test - Leak</u>		
18	Operate and restore STP key to advance test circuit to BSY-L (BUSY LINE) position.	BSY-L (BUSY LINE) lamp lights.
19	Dial or pulse 99. <u>Note:</u> When testing 10-party terminal per line connectors arranged for busy test of the called line following completion of code selector pulsing, dial or pulse an extra digit following test number. If extra digit is to be dialed, and test set is not arranged to permit use of dial while pulsing test set is connected, remove plug from A jack of test set before dialing.	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. Busy tone heard in receiver.
20	Operate RLS key momentarily.	BSY (BUSY) lamp extinguished. Connector releases. GD (GUARD) lamp extinguished momentarily. Busy tone not heard in receiver.
21i	Remove plug from connector test jack, unless other tests are to be made on this switch.	GD (GUARD) lamp extinguished.
<u>(B) Idle Line Test - Loop - Other than 10-Party Terminal per Line Connectors</u>		
20j	In offices equipped with permanent signal testing equipment - Connect PS (PERM-T) jack on connector frame to P jack of test set, using 10-foot P3E cord.	
21k	If testing connectors arranged for free service, with 1400B key provided - Operate NON-REV key.	
22	Operate test set keys as indicated for TEST in Table 1 or 2 to provide proper pretrip and trip conditions in test set. <u>Note:</u> For tests during silent interval, the tripping battery shall be within voltage limits shown in tables.	
23	Operate and restore STP key to advance test circuit to WT-R (WAIT RING) position.	WT-R (WAIT RING) lamp lights.
<u>Line Seizure and Ringing Test</u>		
24	Dial or pulse 99.	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. Audible ring heard in receiver. Test set bell rings if test set is equipped to test connectors arranged for 1400-ohm or 1500-ohm maximum external subscriber loop. <u>Note:</u> When testing 2-ring or code ringing connectors, check that first audible ring is a full code ring in order to check pick-up feature.

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
25g	If testing 8-party connectors and audible ringing signal is provided.	R- bell rings when "A" or "C" plug is used. R+ bell rings when "B" plug is used.
26g	Remove "A," "B," or "C" plug from 8-PTY jack of test line before performing Step 29.	R- or R+ bell silenced.
27h	If testing 8-party connectors and visual ringing signal is provided.	CLD-HLD lamp lights when H-OP, J-NO, J-OP (552E) key is in H-OP or J-NO position. T-CO (TONE-CO) lamp lights when H-OP, J-NO, J-OP (552E) key is in J-OP position.
28h	Remove plug of P3E cord from 8-PTY jack of test line before performing Step 29.	CLD-HLD or T-CO (TONE-CO) lamp is extinguished.

Pretrip Test

29	Operate and restore STP key at start of () interval. This test shall be completed within the same interval by performing Step 30.	PRETRIP lamp lights. WT-R (WAIT RING) lamp extinguished.
30	Operate and restore STP key.	RING lamp lights. PRETRIP lamp extinguished. Test set bell rings (or continues to ring). Audible ring continues to be heard in receiver.

Trip Test

31m	If testing connectors arranged to reverse battery, with 1400B key normal or not provided - Operate and restore STP key at start of () interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. If this test was applied in silent interval, check that audible ring is not heard again in receiver; or if applied in ringing interval, check that audible ring is immediately stopped upon application of test. The test set bell is disconnected when trip test is applied and can not be considered as an indication that ringing has tripped. Proper transmission tone heard in receiver.
32n	If testing connectors arranged for free service, with 1400B key not provided - Operate and restore STP key at start of () interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. If this test was applied in silent interval check that audible ring is not heard again in receiver, or if applied in ringing interval check that audible ring is immediately stopped upon application of this test. The test set bell is disconnected when trip test is applied and can not be considered as an indication that ringing has tripped. Transmission tone not heard in receiver.
33n	Operate and restore NON-REV key.	Proper transmission tone heard in receiver.

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
34o	If testing connectors arranged to reverse battery with 1400B key operated - Operate and restore STP key at start of silent interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. Audible ring not heard in receiver. Proper transmission tone heard in receiver. Note: If transmission tone is not heard in receiver, perform Step 35.
35o	If transmission tone is not heard, operate PLS key momentarily.	Proper transmission tone heard in receiver.
36k	If testing connectors arranged for free service, with 1400B key provided - Operate and restore STP key at start of silent interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. Audible ring not heard in receiver. Transmission tone not heard in receiver.
37k	Operate PLS key momentarily.	Proper transmission tone heard in receiver.
<u>Supervisory Test</u>		
38p	If test set is arranged to test "SUPV-1" permanent signal alarm - Operate and restore STP key.	T-CO (TONE-CO) lamp lights. T-TRIP (TONE TRIP) lamp extinguished. Transmission tone removed. P-1 (PERM NO. 1) lamp lights if connection made in Step 20.
39q	If test set is arranged to test wiper cords - Operate and restore STP key.	T-CO (TONE-CO) lamp lights. T-TRIP (TONE TRIP) lamp extinguished. Transmission tone removed.
40q	Move wiper cords slightly while listening in receiver.	No noise heard in receiver. BSY (BUSY) lamp does not flash.
41r	If testing connectors arranged for calling party control - Operate and restore STP key.	CLD-HLD lamp lights. T-CO (TONE-CO) lamp extinguished. Connector releases. BSY (BUSY) lamp extinguished. GD (GUARD) lamp extinguished. P-1 (PERM NO. 1) lamp extinguished, if lighted in Step 38.
42r	Operate RLS key momentarily.	CLD-HLD lamp extinguished. GD (GUARD) lamp lights.
43s	If testing connectors arranged for joint control - Operate and restore STP key.	CLD-HLD lamp lights. T-CO (TONE-CO) lamp extinguished. Connector does not release. BSY (BUSY) lamp remains lighted. GD (GUARD) lamp flashes once. P-1 (PERM NO. 1) lamp lights if connection made in Step 20.

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STEP	ACTION	VERIFICATION
44s	Operate RLS key momentarily.	CLD-HLD lamp extinguished. Connector releases. P-1 (PERM NO. 1) lamp extinguished if lighted in Step 43. BSY (BUSY) lamp extinguished. GD (GUARD) lamp extinguished momentarily.
45i	Remove plug from connector test jack, unless other tests are to be made on this switch.	GD (GUARD) lamp extinguished.
<u>(C) Idle Line Test - Loop - 10-Party Terminal per Line Connectors</u>		
17j	In offices equipped with permanent signal testing equipment - Connect PS (PERM-T) jack on connector frame to P jack of test set, using 10-foot P3E cord.	
18	Operate test set keys as indicated for TEST in Table 1 or 2 to provide proper pretrip and trip conditions in test set.	
	<u>Note:</u> For tests during silent interval, the tripping battery shall be within the voltage limits shown in the tables.	
19	Operate and restore STP key to advance test circuit to WT-R (WAIT RING) position.	WT-R (WAIT RING) lamp lights.
20	Operate RT key.	
21	Dial or pulse 99, then dial a code digit for ringing over the <u>tip</u> .	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. Audible ring heard in receiver. Test set bell rings.
	<u>Note:</u> If test set is not arranged to permit use of dial while pulsing test set is connected, remove plug from A jack of test set before dialing. <u>Note:</u> Check that first audible ring is a <u>full</u> code ring in order to check pickup feature.	
22	Operate RLS key momentarily.	Connector releases. BSY (BUSY) lamp extinguished. GD (GUARD) lamp extinguished momentarily. Audible ring is not heard and test line bell stops ringing.
23	Restore RT key and operate RR key.	
24	Dial or pulse 99, then dial a code digit for ringing over the <u>ring</u> .	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. Audible ring heard in receiver. Test set bell rings if test set is equipped to test connectors arranged for 1400-ohm or 1500-ohm maximum external subscriber loop.
	<u>Note:</u> Different code digits should be used on each routine test cycle so that eventually all codes will have been tested on each switch.	

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>Pretrip Test</u>		
25	Operate and restore STP key at start of () interval. This test shall be completed within the same interval by performing Step 26.	(PRETRIP) lamp lights. WT-R (WAIT RING) lamp extinguished.
26	Operate and restore STP key.	RING lamp lights. PRETRIP lamp extinguished. Test set bell rings (or continues to ring). Audible ring continues to be heard in receiver.
<u>Trip Test</u>		
27	Operate and restore STP key at start of () interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. If this test was applied in the silent interval, check that audible ring is not heard again in receiver; or, if applied in the ringing interval, check that audible ring is immediately stopped. The test set bell is disconnected when trip test is applied and can not be considered as an indication that ringing has tripped. Proper transmission tone heard in receiver.
28p	If test set is arranged to test "SUPV-1" permanent signal alarm - Operate and restore STP key.	T-CO (TONE-CO) lamp lights. T-TRIP (TONE TRIP) lamp extinguished. Transmission tone removed. P-1 (PERM NO. 1) lamp lights if connection made in Step 17.
29q	If test set is arranged to test wiper cords - Operate and restore STP key.	T-CO (TONE-CO) lamp lights. T-TRIP (TONE TRIP) lamp extinguished. Transmission tone removed.
30q	Move wiper cords slightly while listening in receiver.	No noise heard in receiver. BSY (BUSY) lamp does not flash.
31r	If testing connectors arranged for calling party control - Operate and restore STP key.	CLD-HLD lamp lights. T-CO (TONE-CO) lamp extinguished. Connector releases. BSY (BUSY) lamp extinguished. GD (GUARD) lamp extinguished. P-1 (PERM NO. 1) lamp extinguished if lighted in Step 28.
35r	Operate RLS key momentarily.	CLD-HLD lamp extinguished. GD-GUARD lamp lights.

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
36s	If testing connectors arranged for joint control - Operate and restore STP key.	CLD-HLD lamp lights. T-CO (TONE-CO) lamp extinguished. Connector does not release. BSY (BUSY) lamp remains lighted. GD (GUARD) lamp flashes once. P-1 (PERM NO. 1) lamp lights if connection made in Step 17.
37s	Operate release key momentarily.	CLD-HLD lamp extinguished. Connector releases. P-1 (PERM NO. 1) lamp extinguished if lighted in Step 36. BSY (BUSY) lamp extinguished. GD (GUARD) lamp extinguished momentarily.
38i	Remove plug from connector test jack, unless other tests are to be made on this switch.	GD (GUARD) lamp extinguished.
<u>(D) Ringing Polarity Test - 8-Party Semiselective Ringing Connectors</u>		
20	Operate and restore STP key to advance test circuit to WT-R (WAIT RING) position.	WT-R (WAIT RING) lamp lights.
21g	If audible ringing signal is provided - Insert "A" plug into 8-PTY jack of test line.	
22g	Dial or pulse 99.	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. R- bell of test line rings.
23g	Remove "A" plug and insert "C" plug into 8-PTY jack.	R- bell continues to ring.
24g	Remove "C" plug and insert "B" plug into 8-PTY jack.	R- bell is silenced. R+ bell of test line rings.
25g	Operate RLS key momentarily.	R+ bell is silenced. BSY (BUSY) lamp extinguished. Connector releases. GD (GUARD) lamp extinguished momentarily.
26g	Remove "B" plug from 8-PTY jack.	
27h	If visual ringing signal is provided - Operate H-OP, J-NO, J-OP (552E) key to H-OP position.	
28h	Dial or pulse 99.	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. CLD-HLD lamp flashes, follows ringing code.
29h	Operate H-OP, J-NO, J-OP (552E) key to J-NO position.	CLD-HLD lamp continues to follow ringing code.

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
30h	Operate H-OP, J-NO, J-OP (552E) key to J-OP position.	CLD-HLD lamp extinguished. T-CO (TONE-CO) lamp flashes, follows ringing code.
31h	Operate RLS key momentarily.	T-CO (TONE-CO) lamp extinguished. BSY (BUSY) lamp extinguished. Connector releases. GD (GUARD) lamp extinguished momentarily.
32h	Remove P3E cord from 8-PTY jack of test line and test set.	
33i	Remove plug from connector test jack, unless other tests are to be made on this switch.	GD (GUARD) lamp extinguished.

(E) Reverting Call Test - 10-Party Connectors

17	Operate test set keys as indicated for TEST in Table 1 or 2 to provide proper trip condition in test set.	
18	Operate and restore STP key to advance test circuit to RING position.	RING lamp lights.
19	Operate SLB key momentarily.	BSY (BUSY) lamp lights.
20	Dial or pulse 99.	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. Busy tone heard in receiver.
	<u>Note 1:</u> When testing 10-party terminal per line connectors arranged to set the ringing code following completion of code selector pulsing, dial or pulse an extra digit following test number. If extra digit is to be dialed, and test set is not arranged to permit use of dial while pulsing test set is connected, remove plug from A jack of test set before dialing.	
	<u>Note 2:</u> When testing 10-party terminal per line connectors, operate RR or RT key, depending upon whether code to be dialed is on ring or tip side of line.	
21t	If testing 10-party terminal per line connectors - Operate OLP key.	Connector does not release. GD (GUARD) lamp extinguished. Test set bell rings code corresponding to digit dialed.
22t	Restore RR key if ring party code was dialed, and operate RT key; or if tip party code was dialed, restore RT key and operate RR key.	Test set bell rings short reverting call code only.
23u	If testing 10-party terminal per station connectors - Operate OLP key.	Connector does not release. GD (GUARD) lamp extinguished. Test set bell rings a combination of short reverting call code and ringing code assigned to test line.

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
24u	Operate SSG key.	Test set bell rings short reverting call code only.
25	Operate and restore STP key during silent interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. Test set bell silenced.
26	Operate RLS key momentarily.	T-TRIP (TONE TRIP) lamp extinguished. Connector releases. BSY (BUSY) lamp extinguished.
27	Restore SSG, or RR or RT key.	
28	Restore OLP key.	GD (GUARD) lamp lights.
29	Remove plug from connector test jack, unless other tests are to be made on the switch.	GD (GUARD) lamp extinguished.

(F) Marginal Test of Connector Supervisory Relay,
Using Test Set Not Equipped for Testing Connectors
Arranged for 1400-Ohm or 1500-Ohm Maximum External
Subscriber Loop

17j	In offices equipped with permanent signal testing equipment - Connect PS (PERM-T) jack on connector frame to P jack of test set, using 10-foot P3E Cord.	
18	Operate test set keys as indicated for SUPV RELAY TEST in Table 1 to provide proper trip resistance in test set. <u>Note:</u> Check that silent interval tripping battery is at least 67 volts.	
19	Operate and restore STP key to advance test circuit to RING position.	RING lamp lights.

Line Seizure and Ringing Test

20	Dial or pulse 99. <u>Note 1:</u> When testing 10-party terminal per line connectors arranged to set the ringing code following completion of code selector pulsing, dial or pulse an extra digit following test number. If extra digit is to be dialed, and test set is not arranged to permit use of dial while pulsing test set is connected, remove plug from A jack of test set before dialing. <u>Note 2:</u> When testing 10-party terminal per line connectors, operate RR or RT key, depending upon whether code to be dialed is on ring or tip side of line.	Connector steps smoothly to ninth level and rotates smoothly to test line terminal. BSY (BUSY) lamp lights. Audible ring heard in receiver. Test set bell rings.
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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>Tripping Test.</u>		
21v	If testing connectors arranged to reverse battery - Operate and restore STP key at start of silent interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. Proper transmission tone immediately heard in receiver.
22w	If testing connectors arranged for free service - Operate and restore STP key at start of silent interval.	T-TRIP (TONE TRIP) lamp lights. RING lamp extinguished. Transmission tone not heard in receiver. P-1 (PERM NO. 1) lamp does not light.
23w	Operate and restore NON-REV key.	Proper transmission tone heard in receiver.
24	Operate RLS key momentarily.	T-TRIP (TONE TRIP) lamp extinguished. Connector releases. BSY (BUSY) lamp extinguished. GD (GUARD) lamp extinguished momentarily.
25i	Remove plug from connector test jack, unless other tests are to be made on this switch.	GD (GUARD) lamp extinguished.