

LINE CONCENTRATOR-IDENTIFIER SYSTEM
APPLIED TO TELEPHONE SECRETARIAL ANSWERING SERVICE
CIRCUIT TESTS

1. GENERAL

1.01 This section describes a method of testing the line concentrator-identifier circuits SD-95739-01, SD-95748-01, SD-95962-01, and SD-95964-01 applied to telephone secretarial answering service.

1.02 This section is reissued for the following reasons:

- (a) To renumber the ringup circuits from 0-99 to 1-100 in Tables B, C, and D.
- (b) To include Step 11 in Tests I and J to provide for testing B controller circuit.
- (c) To include the operation of the CB key and Step 17 in Test K for testing B controller circuit.
- (d) To provide for blocking the PC1 relays nonoperated in both controller circuits in Test N.

1.03 The tests covered are:

A. Call Through and Pretripping: The following features are checked. (1) Identification of called subscriber auxiliary line equipment. (2) Start circuit seizure. (3) Alternate use of controllers in originating and terminating equipment. (4) Pulse generator in originating equipment and pulse receiver in terminating equipment. (5) Use of trunk allotter and trunk seizure. (6) Seizure of indicator and indicator timer. (7) Lighting of subscriber lamps at switchboard. (8) Ringing tripping relay in central office does not pretrip.

B. Trunk Make-Busy and Trunk Allotter Sequence: This test checks the ability of the trunk allotter to assign the remaining trunks in sequence when one or more trunks are made busy.

C. Alternate Allotter: The following features are checked. (1) The alternate trunk allotter is used when a trouble occurs in the regular trunk allotter. (2) The alternate trunk allotter is used when the AA key is operated. (3) The regular trunk allotter is released when the AR key is operated or when the alarm release telephone number is dialed.

D. Pulsing Path Transfer: The following features are checked. (1) The pulsing path is transferred to an alternate path when the circuit times out. (2) The pulses are transmitted over the alternate route. (3) The primary pulsing path is restored when the AR key is operated or when the alarm release telephone number is dialed.

E. Indicator Make-Busy: This test checks the ability of the indicator timer to assign the remaining indicator or indicators in sequence when one or more indicators are made busy.

F. Talking Path Seizure: The following features are checked. (1) The secretarial bureau attendant seizes a talking path during the period that the line is rung. (2) The trunk is held under the control of the secretarial bureau attendant. (3) A talking path can be verified over each equipped trunk.

G. Alternate Use of Controllers: The following features are checked. (1) Alternate use of controllers in originating and terminating equipment. (2) Make-busy of controllers when either CA or CB key is operated. (3) Lamp indication of controller in use at originating equipment.

H. Timed Lockout Circuit: This test checks the operation of the two timed lockout circuits associated with unmodified equipment, and the five circuits associated with modified equipment.

- I. Units Timing:** This test checks the units timing circuits.
- J. Tens Timing:** This test checks the tens timing circuits.
- K. Alarm Cutoff:** This test checks the alarm cutoff circuits.
- L. Hold Magnet Check Relay:** This test checks the hold magnet check relay for operations on either winding.
- M. Fuse Alarms:** The following features are checked. (1) The ability of the fuse alarm circuits in the originating and terminating equipment to function when a fuse has operated. (2) Alarm functions in case of charging failure.
- N. Measurement of Line Current:** This test checks the circuits over which the pulses are transmitted.
- O. All-Trunks-Busy (Calls Waiting), Calls Display, and Traffic Registers:** The following features are checked. (1) All-trunks-busy (calls waiting) and traffic register circuit at the originating equipment. (2) ATB (calls waiting) lamp and traffic register at the terminating equipment. (3) Calls are pulsed through and displayed when all trunks are busy. (4) Tone spurt, when provided, and inoperative talking path when all trunks are busy.
- P. Battery Charging Rate:** This test checks the charging current of the battery charger at the terminating equipment.
- Q. Controller Time-Out:** This test checks that a terminating equipment controller will time out in 4 to 6 seconds, if PC1 or PC2 relays are held operated due to controller relay failure.
- R. Trunk Capacity Discharge:** This test checks the composite trunk capacity discharge circuit.
- S. Units and Tens Digits and Select and Hold Magnet Operation:** This test checks that the appropriate units and tens digit relays and the appropriate select and hold magnets will be operated at the originating equipment in response to the operation of a particular RU-relay at the originating equipment.

T. Originating Tens Digit Association and Lockout: This test checks the operation of tens group RU- relays associated with corresponding T- relays. The preference feature of the T- relays is also checked.

1.04 Performance of the tests in this section requires simultaneous action and verification at the central office originating equipment, the telephone answering bureau terminating equipment cabinet, and the telephone answering bureau switchboard. Provisions for establishing a talking connection between the originating equipment and the terminating equipment have been provided.

1.05 Where a reference is made to an SD number in a step in Part 4, that particular phase of the test applies only to the equipment corresponding to the SD number. Where no reference is made to an SD number, that phase of the test applies to all equipment.

1.06 Ringup circuits will function with three different ringing arrangements. The proper ringing current polarity should be determined before performing Tests A through E, G through L, Q, S, and T.

1.07 Performance of Tests N, O, and S will result in all service being interrupted. These tests should be performed only during periods of light traffic.

1.08 Performance of Test O will cause the all-trunks-busy register at the originating equipment and the calls-waiting register at the terminating equipment to score. Local instructions should be followed for recording and reporting these register operations.

1.09 The instruction "activate ringup circuit" in the ACTION column of Part 4 may be performed in accordance with Steps 5a, 6b, 7, 8, and 9 of Test A when the equipment is in service. If the equipment is not in service, the instruction "activate ringup circuit" may be performed by manually operating the RU- relay associated with the ringup circuit selected for test. It may be necessary to manually release the LO relay of the selected ringup circuit to operate the UI and TI lamps at the jack and lamp panel.

1.10 To test the alarm circuit (Test M) when 70-type fuses are mounted in a modular fuse

block (such as the 22- or 23-type block), insert the tip of the 411B tool into the aperture provided in the fuse block cover for the alarm to be tested, and touch the alarm bar.

1.11 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 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.

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses.

2.02 1011G Handset (dial hand test set) equipped with a W2DB cord, 4 feet long, one 471A jack, and two KS-6780 connecting clips (2W37A cord) (used to establish test talk path at originating equipment).

2.03 1011B Handset (dial hand test set) or equivalent (used to establish test talk path at terminating equipment).

2.04 Testing cord, 893 cord, 6 feet long, with two 360A tools (1W13B cord), one KS-6278 connecting clip, one 411A (test pick) tool (for applying battery, ringing current, or ground to test points), or one 419A (test connector) tool (for connecting to relay springs).

2.05 Weston model 280 volt-ammeter, or equivalent, having voltage scales of 60, 30, and 3 volts, and current scales of 15, 3, and 0.3 amperes, equipped with test leads.

2.06 Testing cord, W2BS cord, 5 feet long, equipped with one 310 plug and two No. 35 cord tips (2W33A cord), or equivalent, (for measuring line current and battery charging current).

2.07 KS-14510, L1 volt-ohm-milliammeter (ohmmeter), or equivalent, equipped with KS-14510, L2 test leads, or equivalent.

2.08 Standard Time Corp S1 Timer, or equivalent, for timing controller time-out.

2.09 Blocking and insulating tools, as required. Use tools and apply, as covered in Section 069-020-801.

TABLE A

APPARATUS	TESTS										
	A to E	F	G to L	M	N	O	P	Q	R	S	T
Handset (2.02)	1	1	1	1	-	1	-	1	-	1	1
Handset (2.03)	1	1	1	1	-	1	-	1	-	1	1
Testing cord (2.04)	1	-	1	2	-	-	-	2	-	1	1
Weston volt-ammeter (2.05)	-	-	-	-	1	-	1	-	-	-	-
Testing cord (2.06)	-	-	-	-	1	-	-	-	-	-	-
Volt-ohm-milliammeter (2.07)	-	-	-	-	-	-	-	-	1	-	-
Standard Time Corp S1 Timer (2.08)	-	-	-	-	-	-	-	1	-	-	-
Tool (2.09)	√	-	√	-	√	-	-	√	-	√	√

√ As required.

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3. PREPARATION

STEP	ACTION	VERIFICATION
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All Tests

- | | | |
|---|--|--|
| 1 | At originating equipment—
Restore all keys. | At originating equipment—
All lamps extinguished. |
| 2 | At terminating equipment—
Restore all keys. | At terminating equipment—
All lamps extinguished. |

Tests A through M; O, R, S, T

- | | | |
|---|--|--|
| 3 | At originating equipment—
Determine which lines will be used in test
and inform the switchboard attendant. | |
| 4 | Establish a talking connection between
originating equipment in the central office
and terminating equipment in the answering
bureau. | |

Tests B, C, D, E, G, I, J, K, L, M, T

- | | | |
|---|---|--|
| 5 | Select for test a vacant ringup circuit, if
available, and inform terminating equipment
end which line was selected for test. | |
|---|---|--|

4. METHOD

STEP	ACTION	VERIFICATION
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A. Call Through and Pretripping

- | | | |
|----|---|---|
| 5a | If R resistor is 1470 ohms—
At originating equipment SD-95739-01—
At ringup circuit—
Momentarily apply ground to terminal 2B of
RU- relays in sequence. | At terminating equipment—
At trunk unit—
T- lamps associated with selected ringup circuit
lighted for approximately 3.2 seconds.
At switchboard—
Line lamp associated with selected ringup
circuit lighted for approximately 2 seconds. |
| 6b | If R resistor is 20,500 ohms—
At originating equipment SD-95739-01—
At ringup circuit—
Momentarily apply battery to terminal 2B of
RU- relays in sequence. | Same as Step 5a. |
| 7 | At originating equipment SD-95739-01—
At lockout circuit—
Insulate in turn contacts of LG-0 through
LO-9 relays listed in Table B associated with
RU- relays selected for test. | |

STEP

ACTION

VERIFICATION

TABLE B

LO- RELAY CONTACTS	LO- RELAYS*									
	LO-1	LO-2	LO-3	LO-4	LO-5	LO-6	LO-7	LO-8	LO-9	LO-10
	RU- RELAYS**									
Lower 1-2	01	02	03	04	05	06	07	08	09	10
Lower 3-4	11	12	13	14	15	16	17	18	19	20
Lower 5-6	21	22	23	24	25	26	27	28	29	30
Lower 7-8	31	32	33	34	35	36	37	38	39	40
Lower 9-10	41	42	43	44	45	46	47	48	49	50
Upper 1-2	51	52	53	54	55	56	57	58	59	60
Upper 3-4	61	62	63	64	65	66	67	68	69	70
Upper 5-6	71	72	73	74	75	76	77	78	79	80
Upper 7-8	81	82	83	84	85	86	87	88	89	90
Upper 9-10	91	92	93	94	95	96	97	98	99	100

* LO- relays may be 0-9.

** RU- relays may be 00-99.

- 8 At originating equipment—
 At ringup circuit—
 Momentarily apply ringing current to M lead
 of RU- relays in sequence.
- At terminating equipment—
 At trunk unit—
 T- lamps associated with selected ringup circuit
 lighted for approximately 3.2 seconds.
 At switchboard—
 Line lamp associated with selected ringup
 circuit lighted for approximately 2 seconds.
- 9 At lockout circuit—
 Remove insulating tool from LO- relay.
- 10 At main distributing frame—
 Connect handset to auxiliary line circuit
 associated with vacant ringup circuit.
- Note:** If vacant ringup circuit is not available,
 obtain permission to use a working or assigned
 ringup circuit.
- 11 At main distributing frame—
 Originate a test call.
- Audible ringing tone heard.
 At originating equipment—
 Ring-tripping relay in central office does not
 operate.
 At terminating equipment—
 Switchboard lamp associated with ringup circuit

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STEP	ACTION	VERIFICATION
12	At main distributing frame— Disconnect handset from auxiliary line circuit under test.	lighted for approximately 2 seconds during each ringing interval. At terminating equipment— Switchboard lamp associated with ringup circuit extinguished. At main distributing frame— Audible ringing tone silenced.
B. Trunk Make-Busy and Trunk Allotter Sequence		
6	At originating equipment— At jack and lamp panel— Operate TB1 key.	
7	Activate ringup circuit (1.09) to momentarily make busy all trunks in sequence.	At originating equipment— At jack and lamp panel— TK1 lamp does not light. Remaining TK- lamps lighted and extinguished in sequence. At terminating equipment— T1 lamp does not light. Remaining T- lamps lighted and extinguished in sequence.
8	At originating equipment— At jack and lamp panel— Restore TB1 key.	
9	At originating equipment— At jack and lamp panel— Operate TB2 key.	
10	Activate ringup circuit (1.09) to momentarily make busy all trunks in sequence.	At originating equipment— At jack and lamp panel— TK2 lamp does not light. Remaining TK- lamps lighted and extinguished in sequence. At terminating equipment— T2 lamp does not light. Remaining T- lamps lighted and extinguished in sequence.
11	At originating equipment— At jack and lamp panel— Restore TB2 key.	
12	At originating equipment— Operate each next higher numbered TB- key and repeat Step 10 until all TB- keys have been operated and restored.	At originating equipment— At jack and lamp panel— TK- lamp associated with operated TB- key does not light. Remaining TK- lamps lighted and extinguished

STEP	ACTION	VERIFICATION
		<p>in sequence. At terminating equipment— T- lamp associated with operated TB- key does not light. Remaining T- lamps lighted and extinguished in sequence.</p>
C. Alternate Allotter		
6	<p>At originating equipment— At jack and lamp panel— Operate AA key.</p>	<p>At jack and lamp panel— AA lamp lighted.</p>
7	<p>Activate ringup circuit (1.09) for each equipped trunk.</p>	<p>At originating equipment— At jack and lamp panel— TK1 lamp lighted for each ringup circuit operation. At terminating equipment— T1 lamp lighted for each ringup circuit operation.</p>
8	<p>At originating equipment— At jack and lamp panel— Restore AA key.</p>	<p>At jack and lamp panel— AA lamp extinguished.</p>
9	<p>At originating equipment— At trunk allotter circuit— Manually release TA1 through TA6 relays if operated.</p>	<p>TA0 relay operated.</p>
10	<p>Block nonoperated TA0 relay.</p>	
11	<p>Activate ringup circuit (1.09) for each equipped trunk.</p>	<p>At jack and lamp panel— AA, AL lamps lighted. Audible alarm sounds. TK1 lamp lighted for each ringup circuit operation. At terminating equipment— T1 lamp lighted for each ringup circuit operation.</p>
12	<p>At originating equipment— At jack and lamp panel— Momentarily operate AR key.</p>	<p>At jack and lamp panel— AA, AL lamps extinguished. Audible alarm silenced.</p>
13	<p>At trunk allotter circuit— Remove blocking tool from TA0 relay.</p>	<p>TA0 relay operates if no TA- relays are operated.</p>
14	<p>Activate ringup circuit (1.09) for each equipped trunk.</p>	<p>At originating equipment— At jack and lamp panel— TK- lamps lighted in sequence.</p>

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STEP	ACTION	VERIFICATION
		At terminating equipment— T- lamps lighted in sequence.
D. Pulsing Path Transfer		
6	At originating equipment— At controller connector circuit— Insulate 6T of SS relay.	
7	Activate ringup circuit (1.09).	At originating equipment— AL lamp lighted. Audible alarm sounds. At terminating equipment— TO lamp lighted. At switchboard— Line lamp associated with activated ringup circuit lighted for approximately 2 seconds.
8	At originating equipment— Momentarily operate AR key.	At originating equipment— AL lamp extinguished. Audible alarm silenced. At terminating equipment— TO lamp extinguished. TRK lamp lighted.
9	At originating equipment— At controller connector circuit— Remove insulating tool from 6T of SS relay.	
E. Indicator Make-Busy		
6	At terminating equipment— Operate I1 key.	
7	At originating equipment— Activate ringup circuit (1.09) three times.	At terminating equipment— I1 lamp does not light. I2 lamp lighted and extinguished each time ringup circuit is activated.
8	At terminating equipment— Restore I1 key.	
9	At terminating equipment— Operate I2 key.	
10	At originating equipment— Activate ringup circuit (1.09) three times.	At terminating equipment— I2 lamp does not light. I1 lamp lighted and extinguished each time ringup circuit is activated.
11	At terminating equipment— Restore I2 key.	

STEP	ACTION	VERIFICATION
F. Talking Path Seizure		
5	At main distributing frame— Connect handset to auxiliary line circuit associated with vacant ringup circuit.	
	<i>Note:</i> If vacant ringup circuit is not available, obtain permission to use a working or assigned ringup circuit.	
6	At originating equipment— At jack and lamp panel— Leave TB1 key normal and operate remaining TB- keys.	
7	At main distributing frame— Originate a test call.	Audible ringing tone heard. At originating equipment— TK1 lamp lighted and extinguished during each ringing interval. At terminating equipment— T1 lamp lighted and extinguished during each ringing interval. At switchboard— Line lamp associated with ringup circuit lighted for approximately 2 seconds during each ringing interval.
8	At terminating equipment— At switchboard— Operate TALK key of idle cord circuit.	
9	At switchboard— At next ringing interval while switchboard line lamp is steadily lighted— Insert idle cord plug into jack associated with lighted lamp.	At switchboard— Line lamp extinguished. Tone spurt heard, if provided. At main distributing frame— Audible ringing tone silenced. Talking circuit satisfactory between handset and switchboard.
10	At switchboard— Remove cord from jack.	
11	Restore TALK key.	
12	Repeat Steps 5 through 11 in turn until all TB- keys have been operated and restored.	
13	At main distributing frame— Disconnect handset from auxiliary line circuit.	

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STEP	ACTION	VERIFICATION
G. Alternate Use of Controllers		
6	At originating equipment— At jack and lamp panel— Operate CB or EA key.	
7	Activate ringup circuit (1.09) six times.	At originating equipment— At jack and lamp panel— CB lamp does not light. CA lamp lighted and extinguished for each ringup circuit operation. At terminating equipment— Controllers A and B operated alternately for each ringup circuit operation.
8	At originating equipment— At jack and lamp panel— Restore CB or EA key.	
9	At jack and lamp panel— Operate CA or EB key.	
10	At originating equipment— Activate ringup circuit (1.09) six times.	At originating equipment— At jack and lamp panel— CA lamp does not light. CB lamp lighted and extinguished for each ringup circuit operation. At terminating equipment— Controllers A and B operated alternately for each ringup circuit operation.
11	At originating equipment— At jack and lamp panel— Restore CA or EB key.	
12	At terminating equipment— Operate CB or EA key.	
13	At originating equipment— Activate ringup circuit (1.09) six times.	At originating equipment— CA, CB lamps lighted and extinguished alternately for each ringup circuit operation. At terminating equipment— Controller B does not operate. Controller A operated for each ringup circuit operation.
14	At terminating equipment— Restore CB or EA key.	
15	At terminating equipment— Operate CA or EB key.	

STEP	ACTION	VERIFICATION
16	At originating equipment— Activate ringup circuit (1.09) six times.	At originating equipment— CA, CB lamps lighted and extinguished alternately for each ringup circuit operation. At terminating equipment— Controller A does not operate. Controller B operated for each ringup circuit operation.
17	At terminating equipment— Restore CA or EB key.	

H. Timed Lockout Circuit

5	At originating equipment— At jack and lamp panel— Operate LA key.	
6	At originating equipment— Activate ringup circuit (1.09) within the 0 through 4 units group.	At originating equipment— At timed lockout circuit— MA, MB, MC relays operated and released.
7	Activate ringup circuit (1.09) within the 5 through 9 units group.	Same as Step 6.
8	At jack and lamp panel— Restore LA key.	
9	Operate LB key.	
10	Activate ringup circuit (1.09) within the 0 through 4 units group.	At originating equipment— At timed lockout circuit— MA, MB, MC relays operated and released.
11	Activate ringup circuit (1.09) within the 5 through 9 units group.	Same as Step 10.
12	At jack and lamp panel— Restore LB key.	
13	At lockout circuit— Insulate contacts of LO- relay listed in Table B associated with RU-1 relay.	
14	At originating equipment— Activate ringup circuit (1.09) associated with RU-1 relay three times.	At timed lockout circuit A— MA, MB, MC relays operated and released.
15	At jack and lamp panel— Operate LA key.	
16	Activate ringup circuit (1.09) associated with RU-1 relay two times.	At timed lockout circuit B— MA, MB, MC relays operated and released.

STEP	ACTION	VERIFICATION
17	At jack and lamp panel— Restore LA key.	
18	At lockout circuit— Remove insulating tool from LO- relay associated with RU-1 relay.	
19	Repeat Steps 13 through 18 to test remaining timed lockout circuits as shown in Table C.	

TABLE C

TIMED LOCKOUT CIRCUIT	TRANSFER KEY	RINGUP RELAY
1	LA	RU-1
2	LB	RU-2
3	LC	RU-3
4	LD	RU-4
5	LE	RU-5*

Note: Operation of L- key transfers to next higher numbered timed lockout circuit, except LE key which transfers to timed lockout circuit 1.

* May be RU-0.

I. Units Timing

6	At terminating equipment— At controller A circuit— Insulate 3T of SM relay.	
7	At originating equipment— Activate ringup circuit (1.09).	At jack and lamp panel— AL, UI- lamps lighted. Audible alarm sounds. At terminating equipment— TO lamp lighted.
8	At terminating equipment— At controller A circuit— Remove insulating tool from 3T of SM relay.	
9	At originating equipment— At jack and lamp panel— Momentarily operate AR key.	AL, UI- lamps extinguished. Audible alarm silenced. At terminating equipment— TO lamp extinguished.

STEP	ACTION	VERIFICATION
10a	If remote release alarm circuit is provided— Dial telephone number assigned for alarm release.	At originating equipment— At jack and lamp panel— AL, UI- lamps extinguished. Audible alarm silenced. At terminating equipment— TO lamp extinguished.
11	◆Repeat Steps 6 through 10a for controller B.◆	

J. Tens Timing

6	At originating equipment— At controller A circuit— Block nonoperated DC1 relay.	
7	Activate ringup circuit (1.09).	At jack and lamp panel— AL, TI- lamps lighted. Audible alarm sounds. At terminating equipment— TO lamp lighted.
8	At originating equipment— At jack and lamp panel— Momentarily operate AR key.	AL, TI- lamps extinguished. Audible alarm silenced. At terminating equipment— TO lamp extinguished.
9a	If remote release alarm circuit is provided— Dial telephone number assigned for alarm release.	Same as Step 8.
10	At originating equipment— At controller A circuit— Remove blocking tool from DC1 relay.	
11	◆Repeat Steps 6 through 10 for controller B circuit.◆	

K. Alarm Cutoff

6	At originating equipment— At controller A circuit— Block nonoperated DC3 relay.	
7	◆Operate CB key.◆	
8	Activate ringup circuit (1.09).	AL lamp lighted. Audible alarm sounds.
9a	If ACO key is locking-type— Operate ACO key.	ACO lamp lighted. AL lamp lighted. Audible alarm silenced.

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STEP	ACTION	VERIFICATION
10b	If ACO key is nonlocking-type— Momentarily operate ACO key.	ACO lamp lighted. AL lamp lighted. Audible alarm silenced.
11	Activate ringup circuit (1.09).	If ACO key is nonlocking-type— ACO lamp extinguished. AL lamp remains lighted. Audible alarm sounds. If ACO key is locking-type— ACO, AL lamps remain lighted. Audible alarm does not sound.
12	Momentarily operate AR key.	If ACO key is nonlocking-type— AL lamp extinguished. Audible alarm silenced. If ACO key is locking-type— AL lamp extinguished. Audible alarm sounds.
13a	If ACO key is locking-type— Restore ACO key.	ACO lamp extinguished. Audible alarm silenced.
14c	If remote release alarm circuit is provided— Dial telephone number assigned for alarm release.	AL lamp extinguished. Audible alarm silenced.
15	Remove blocking tool from DC3 relay.	
16	◆ Restore CB key.	
17	Repeat Steps 6 through 16 for controller B.◆	
L. Hold Magnet Check Relay		
6	At originating equipment— At fuse panel— Remove CA or DA fuse.	
7	Activate ringup circuit (1.09).	At start timing and alarm circuit— H, HA relays operated and released.
8	At fuse panel— Replace CA or DA fuse.	
9	At fuse panel— Remove CB or DB fuse.	
10	Activate ringup circuit (1.09).	Same as Step 7.
11a	If circuit is not equipped with HS or HP resistors— At originating equipment SD-95739-01—	DA fuse does not operate.

STEP	ACTION	VERIFICATION
	At start circuit— Momentarily connect ground to equipment side of DB fuse holder.	
12	At fuse panel— Replace CB or DB fuse.	

M. Fuse Alarms

6	At originating equipment— At fuse panel— Connect battery to fuse alarm bus bar.	At jack and lamp panel— FA lamp lighted. Audible alarm sounds.
7	Disconnect battery from fuse alarm bus bar.	FA lamp extinguished. Audible alarm silenced.
8	At fuse panel— Connect battery to frame fuse alarm by inserting 411A test pick into hole in fuse mounting.	At jack and lamp panel— 20A lamp lighted. Audible alarm sounds.
9	Remove 411A test pick from fuse mounting.	20A lamp extinguished. Audible alarm silenced.
10	At terminating equipment— At fuse panel— Connect battery to fuse alarm bus bar.	At terminating equipment— At equipment cabinet— FA lamp lighted. At switchboard— FA lamp lighted. Audible alarm sounds.
11	At terminating equipment— Disconnect battery from fuse alarm bus bar.	At equipment cabinet— FA lamp extinguished. At switchboard— FA lamp extinguished. Audible alarm silenced.
12	At terminating equipment— At fuse panel— Connect battery to fuse alarm bus bar.	At switchboard— FA lamp lighted. Audible alarm sounds.
13	At switchboard— Operate ACO or AS key.	Audible alarm silenced. FA lamp remains lighted.
14	At terminating equipment— Disconnect battery from fuse alarm bus bar.	At switchboard— FA lamp extinguished. Audible alarm sounds.
15	At switchboard— Restore ACO or AS key.	Audible alarm silenced.

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STEP	ACTION	VERIFICATION
16a	If charge failure alarm is provided— At terminating equipment— Disconnect rectifier by removing ac power plug from power receptacle.	At terminating equipment— At equipment cabinet— FA lamp lighted. At switchboard— FA lamp lighted. Audible alarm sounds.
17a	Reconnect rectifier by plugging ac power plug into power receptacle.	At terminating equipment— At equipment cabinet— FA lamp extinguished. At switchboard— FA lamp extinguished. Audible alarm silenced.

N. Measurement of Line Current

Caution: This test will result in all service being interrupted. It should be performed only during periods of light traffic.

- 3 ♦At terminating equipment—
Block nonoperated PC1 relays in both controllers.♦
- 4 At volt-ammeter—
Using W2BS cord, connect sleeve conductor to (+) terminal.
- 5 Connect tip conductor of W2BS cord to (-) terminal.
- 6 Set range switch to 0.3 ampere scale.
- 7 At originating equipment—
At jack and lamp panel—
Operate CB or EA key.
- 8 Insert plug of W2BS cord into LC jack associated with controller A.
- 9 At originating equipment—
At controller connector circuit—
Block operated STA1 relay.
- 10 At originating equipment—
At jack and lamp panel—
Remove W2BS cord plug from LC jack.
- 11 At originating equipment—
At controller connector circuit—
Remove blocking tool from STA1 relay.

At volt-ammeter—
Meter reads between 0.025 and 0.035 ampere.

Note: If meter reading is incorrect, see Section 473-501-201 for line current adjustment.

STEP	ACTION	VERIFICATION
12	At originating equipment— At jack and lamp panel— Restore CB or EA key.	
13	At jack and lamp panel— Operate CA or EB key.	
14	At jack and lamp panel— Insert plug of W2BS cord into LC jack associated with controller B.	
15	At originating equipment— At controller connector circuit— Block operated STB1 relay.	At volt-ammeter— Meter reads between 0.025 and 0.035 ampere. <i>Note:</i> If meter reading is incorrect, see Section 473-501-201 for line current adjustment.
16	At originating equipment— At jack and lamp panel— Remove W2BS cord plug from LC jack.	
17	At originating equipment— At controller connector circuit— Remove blocking tool from STB1 relay.	
18	At originating equipment— At jack and lamp panel— Restore CA or EB key.	
19	At terminating equipment— Remove blocking tools from PC1 relays in both controllers.	
<i>OK</i> O. All-Trunks-Busy (Calls Waiting), Calls Display, and Traffic Registers		
5	At main distributing frame— Connect handset to auxiliary line circuit associated with vacant ringup circuit. <i>Note:</i> If vacant ringup circuit is not available, obtain permission to use a working or assigned ringup circuit.	
6	At originating equipment— At jack and lamp panel— Leaving TB1 key normal, operate remaining TB- keys.	
7	At main distributing frame— Originate a test call.	At terminating equipment— Switchboard lamp associated with selected

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STEP	ACTION	VERIFICATION
8	At terminating equipment— At switchboard— Operate TALK key of idle cord circuit.	ringup circuit lighted for approximately 2 seconds.
9	At terminating equipment— At switchboard— During next ringing interval of test call— Insert cord plug of idle cord circuit into jack associated with lighted lamp.	At switchboard— Talking path completed between handset and switchboard. Spurt of tone not heard. ATB (calls waiting) lamp lighted. If composite signaling path has been removed (wiring circuit change)— ATB lamp does not light.
10	At switchboard— Remove cord plug from switchboard jack.	At originating equipment— ATB (calls waiting) register operated. At terminating equipment— At switchboard— ATB (calls waiting) lamp extinguished.
11	At switchboard— Restore TALK key of idle cord circuit.	
12	Repeat Steps 6 through 10 with next higher numbered TB- key normal and all other TB- keys operated, until all TB- keys have been operated and restored.	
13	At originating equipment— At jack and lamp panel— Operate all TB- keys.	
14	At main distributing frame— Originate a test call.	At switchboard— Line lamp associated with test call lighted and extinguished during each ringing interval. ATB lamp lighted.
15	At switchboard— Operate TALK key of idle cord circuit.	
16	At switchboard— During next ringing interval of test call— Insert cord plug of idle cord circuit into jack associated with lighted test call lamp.	At switchboard— Talking path not completed between handset and switchboard Spurt of tone not heard. ATB lamp steadily lighted.
17	At switchboard— Remove cord plug from switchboard jack.	At switchboard— ATB lamp steadily lighted.

STEP	ACTION	VERIFICATION
18	At switchboard— Restore TALK key of idle cord circuit.	
19	At originating equipment— At jack and lamp panel— Restore all TB- keys.	
20	At main distributing frame— Disconnect handset from auxiliary line circuit under test.	

NO
P. Battery Charging Rate

3	At volt-ammeter— Set range switch to 3-ampere scale.	
4	At terminating equipment— At battery control and charge failure alarm circuit— Connect (-) terminal of volt-ammeter to middle terminal (load) of charge fuse holder.	
5	Connect (+) terminal of volt-ammeter to bottom bus terminal of charge fuse holder.	
6	At battery control and charge failure alarm circuit— Remove CHG fuse.	At terminating equipment— At battery control and charge failure alarm circuit— If a call is being served (CT relay operated and CC relay released)— Meter reads 0.600 ampere. If a call is not being served (CT relay released and CC relay operated)— Meter reads 0.350 ampere.
7	Repeat Step 6 to obtain meter reading for a call being served and for a call not being served.	
8	At terminating equipment— At battery control and charge failure alarm circuit— Replace CHG fuse.	
9	At battery control and charge failure alarm circuit— Disconnect volt-ammeter from charge fuse holder.	

Note: If meter readings are incorrect, see Section 473-501-201 for adjustment.

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DOESN'T WORK

STEP	ACTION	VERIFICATION
Q. Controller Time-Out		
3	At terminating equipment SD-95962-01— At controller A— Block nonoperated PC1 relay.	
4	At originating equipment— Activate ringup circuit (1.09) three times.	At terminating equipment— TO lamp lighted. Controller B operated for each ringup circuit operation. At originating equipment— At jack and lamp panel— AL lamp lighted. Audible alarm sounds.
5	At jack and lamp panel— Momentarily operate AR key.	AL lamp extinguished. Audible alarm silenced. At terminating equipment— TO lamp extinguished.
6	At terminating equipment— At controller A— Remove blocking tool from PC1 relay.	
7	At terminating equipment— At controller B— Block nonoperated PC1 relay.	
8	At originating equipment— Activate ringup circuit (1.09) three times.	At terminating equipment— TO lamp lighted. Controller A operated for each ringup circuit operation. At originating equipment— At jack and lamp panel— AL lamp lighted. Audible alarm sounds.
9	At jack and lamp panel— Momentarily operate AR key.	AL lamp extinguished. Audible alarm silenced. At terminating equipment— TO lamp extinguished.
10	At controller B— Remove blocking tool from PC1 relay.	

R. Trunk Capacity Discharge

Note: This test is to be performed when composite signaling is provided.

STEP	ACTION	VERIFICATION
5	At originating equipment— At controller A circuit— Operate CA key.	At originating equipment— At jack and lamp panel— CA lamp lighted.
6	At ohmmeter— Set range switch to RX1 position.	
7	At originating equipment— At controller A circuit— Connect one test lead of ohmmeter to terminal 2 of P relay.	
8	Connect other test lead of ohmmeter to terminal 2T of W relay.	Meter reads infinite resistance.
9	Manually hold ST2 relay operated.	Meter reads 300 ohms. W relay operated.
10	Release ST2 relay.	Meter reads infinite resistance. W relay released.
11	Restore CA key.	
12	At controller B circuit— Operate CB key.	
13	Repeat Steps 6 through 10.	
14	Disconnect meter leads.	
15	Restore CB key.	
S. Units and Tens Digits and Select and Hold Magnet Operation		
5	At originating equipment— At jack and lamp panel— Operate all TB- keys except TB- key associated with trunk unit selected for test.	
6a	If R resistor is 1470 ohms— At originating equipment SD-95739-01— At ringup circuit— Momentarily apply ground to terminal 2B of RU- relay selected for test as shown in Table D.	At terminating equipment— At switchboard— Switchboard lamp associated with operated RU- relay lighted for approximately 2 seconds as shown in Table D. At originating equipment— At jack and lamp panel— UI-, TI- lamps associated with operated RU- relay lighted for approximately 2 seconds.
7b	If R resistor is 20,500 ohms— At originating equipment SD-95739-01—	Same as Step 6a.

STEP	ACTION	VERIFICATION
10	At lockout circuit— Remove insulating tool from RU- relay.	
11	At terminating equipment— At switchboard— Operate TALK key of idle cord circuit.	
12	At switchboard— Insert cord plug into jack associated with lamp lighted in Steps 6a, 7b, or 8 and 9.	At terminating equipment— At trunk connector circuit— Observe that appropriate select and hold magnets associated with operated RU- relay are operated as shown in Table D.
13	At switchboard— Remove cord plug from jack.	
14	At switchboard— Restore TALK key.	
15	At originating equipment— At jack and lamp panel— Restore all TB- keys.	At originating equipment— At jack and lamp panel— TB- lamps extinguished.
16	Repeat Steps 5 through 15 until all RU- relays and trunks listed in Table D have been listed.	
T. Originating Tens Digit Association and Lockout		
6a	If R resistor is 1470 ohms— At originating equipment SD-95739-01— At ringup circuit— Momentarily apply ground to terminal 2B of an idle RU0- relay.	At originating equipment— At jack and lamp panel— TI0 lamp lighted. At terminating equipment— At switchboard— Switchboard lamp associated with operated RU0- relay lighted for approximately 2 seconds.
7b	If R resistor is 20,5000 ohms— At originating equipment SD-95739-01— At ringup circuit— Momentarily apply battery to terminal 2B of an idle RU0- relay.	Same as Step 6a.
8	At originating equipment SD-95739-01 or SD-95964-01— At lockout circuit— Insulate contacts of LO- relay listed in Table B associated with RU0- relay selected for test.	
9	At originating equipment— At ringup circuit— Momentarily apply ringing current to M lead of RU0- relay selected for test.	At originating equipment— At jack and lamp panel— TI0 lamp lighted. At terminating equipment—

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STEP	ACTION	VERIFICATION
10	At lockout circuit— Remove insulating tool from LO- relay.	At switchboard— Switchboard lamp associated with operated RU0- relay lighted for approximately 2 seconds.
11	At originating equipment— Operate an idle RU- relay for remaining tens group of RU1- through RU9- relays as described in Steps 6a, 7b, 8, 9, and 10.	At originating equipment— At jack and lamp panel— TI- lamp associated with operated tens group RU- relay lighted.
12	At originating equipment— Operate idle RU0- and RU1- relays simultaneously as described in Steps 6a, 7b, or 8 through 10.	At originating equipment— TI0, TI1 lamps lighted. <i>Note:</i> TI0 lamp will extinguish before TI1 lamp extinguishes.
13	At originating equipment— At ringup circuit— Select other pairs of higher and lower tens group RU- relays, and test as described in Step 12.	At terminating equipment— At switchboard— Switchboard lamp associated with RU0- relay lighted before lamp associated with RU1- relay lighted. At originating equipment— Lower numbered TI- lamp lighted before higher numbered TI- lamp lighted. At terminating equipment— Switchboard lamp associated with lower numbered RU- relay lighted before lamp associated with higher numbered RU- relay lighted.

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