

AUTOMATIC TRUNK TEST CIRCUIT SD-95889-01
FOR TESTING ANI TRUNKS
MISCELLANEOUS TESTS
NO. 1 CROSSBAR OFFICES

1. GENERAL		PAGE
1.01	This section is reissued for the following reasons:	
(a)	To add test of marginal TPK1 relay.	
(b)	To change the timing requirements of ETM2 relay in Test F.	
(c)	To change the timing requirements of ETM4 relay in Test H.	
1.02	The tests covered are:	
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A. Cross Test:	This test checks the operation of the cross detecting features of the test circuit.	3
B. Trunk Busy and Pass Busy:	This test checks the ability to detect a trunk busy in service and also to pass by the busy trunk if the pass-busy (PB) key is operated.	4
C. Selector Switch Blocking:	This test checks the ability to block the progress of a test when a test failure occurs.	5
D. BLK and AL Relays Verification.	This test checks the integrity of the various operate paths of the BLK and AL relays to ensure that the test circuit will recognize failures and time-outs.	6
E. TM1 Timer:	This test checks the timing intervals required for trunk busy timing and overall timing.	8
F. TM2 Timer:	This test checks the work timing intervals required for trunk testing.	8
G. TM3 Timer:	This test checks the work timing intervals required for trunk testing.	9
H. TM4 Timer:	This test checks the work timing intervals required for trunk testing.	9
I. TO-RO Circuit — Resistance Verification:	This test checks the resistance of the loop applied to the terminating end of a trunk under test.	10
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M. TTO Relay Verification:	This test checks the integrity of the operate and locking paths of the TTO relay to ensure that the test circuit will block and indicate blocking on trunk time-out.	13
N. Tip Party Resistance Verification — Trunks Arranged for 2-Party Operation:	This test checks the resistance in the S1 lead to No. 1 crossbar trunks on a call simulating a tip party customer.	14
O. SL Relay Verification:	This test checks the ability to delay repeat tests until the trunk has restored properly from the previous test.	14

P. FR Relay Circuit — Resistance Verification: This test checks the resistance in the FR relay operate path. 15

Q. CA5 Relay Verification: This test checks the ability to open the originating and terminating ends of the trunk when the control advance feature is used. 15

R. CT and RST Registers Check: This test checks the operation of the CT and RST registers. 16

→ **S. TPK1 Relay Verification:** This test checks the marginal relay of the trunk busy test circuit. 16

1.03 Caution: When testing on the movable contacts of wire-spring type relays in Tests A, C, M, and Q, use care to avoid dislodging the movable springs from the comb.

1.04 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.

1.05 During Test B, the pass-busy (PB) register will score. The reporting of this register operation should be in accordance with local instructions.

1.06 During Test R, the circuit tested (CT) and repeat single test (RST) registers will score. The reporting of these register operations should be in accordance with local instructions.

1.07 The resistance values and tolerances specified in Tests I, K, L, N, and P are circuit requirements and the accuracy or tolerance of the ohmmeter used should be considered when checking these circuits.

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 Test circuit, outputer-identifier, SD-95815-01.

2.03 The 35-type test set with one W2W cord, 6 feet long, equipped with one 310 plug, one 360B tool, one 360C tool (2W17A cord), one KS-6278 connecting clip, and one 419A tool (for connecting to nonwire-spring type relays), or one 624A terminal connector (for connecting to wire-spring type relays).

2.04 Test receiver, 716C receiver, attached to a W2AB cord, equipped with two 360A tools (2W21A cord), a 411A (test pick) tool, and a KS-6278 connecting clip (for use in checking for presence and absence of ground).

2.05 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), and one KS-6278 connecting clip (for connecting to ground or to ohmmeter test pick), and one 624A (terminal connector) tool (for connecting to the winding terminals of wire-spring relays), or one 624B (terminal connector) tool (for connecting to terminals on terminal strips).

2.06 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), and one KS-6278 connecting clip (for connecting to ground or to ohmmeter test pick), one 639A (relay contact connector) tool, and one 651D (relay contact connector holder) tool (for connecting to the fixed contacts of wire-spring type relays).

2.07 KS-3008 stopwatch (or watch with second hand).

2.08 Test set J24753A (SD-25707-01) (for timing tests) with one P3K cord, 6 feet long, equipped with two 310 plugs (3P15A cord), and one W3M cord, 6 feet long, equipped with one 310 plug, one 360A tool, one 360B tool, one 360C tool (3W4A cord), one KS-6278 connecting clip, one 639A (relay contact connector) tool, one 651D (relay contact connector holder) tool, and one 624A (terminal connector) tool. Calibrate and use in accordance with Section 100-130-101.

TABLE A

APPARATUS	TESTS																		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Test Circuit (2.02)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
35-Type Test Set (2.03)	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Test Receiver (2.04)	1	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-
Cord (2.05)	-	-	-	-	-	-	-	-	1	-	1	1	1	1	-	1	-	-	-
Cord (2.06)	1	1	-	1	-	-	-	-	2	-	2	2	-	1	1	1	1	-	-
Stopwatch (2.07)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Test Set for Timing Tests (2.08)	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-
Volt-Ohm-Milliammeter (2.09)	-	-	-	-	-	-	-	-	1	-	1	1	-	1	-	1	-	-	-
Tool (2.10)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	√	√

↳ √As required

2.09 KS-14510 L1, volt-ohm-milliammeter and one pair of L2 test leads equipped with KS-14530 connectors and test picks.

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

3. PREPARATION

STEP	ACTION	VERIFICATION
All Tests		
1	Restore all lever-type keys.	
2	Operate RN key in outpulser-identifier test circuit.	N lamp lighted. All other lamps extinguished.
3	Restore RN key in outpulser-identifier test circuit.	N lamp extinguished.

4. METHOD

STEP	ACTION	VERIFICATION
A. Cross Test		
4	Make current flow tests of CLX, XTT relays using 35-type test set and circuit requirements tables.	Circuit requirements are met.
5	Disconnect 35-type test set.	

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STEP	ACTION	VERIFICATION
6	Check that ground is present at 1M of STA relay.	
7	Block operated XTT relay.	XTT lamp lighted. Ground is absent from 1M of STA relay.
8	Remove blocking tool from XTT relay.	XTT lamp extinguished.
9	Connect ground to 1F of HE3 relay.	X, HO lamps lighted.
10	Disconnect ground from 1F of HE3 relay.	X, HO lamps extinguished.
11	Block operated S relay.	X lamp lighted.
12	Remove blocking tool from S relay.	X lamp extinguished.
13	Block operated CK1 relay.	X lamp lighted.
14	Remove blocking tool from CK1 relay.	X lamp extinguished.
15	Block operated ON1 relay.	
16	Momentarily operate manually CLX relay.	CLX, BLK lamps lighted.
17	Remove blocking tool from ON1 relay.	CLX, BLK lamps extinguished.

B. Trunk Busy and Pass Busy

4	Block nonoperated S, XCO relays.	
5	Block operated STA relay.	SO lamp lighted.
6	Check that ground is present at 7F of BT1 relay.	
7	Block operated RV relay.	Ground is absent from 7F of BT1 relay.
8	Block operated CA5 relay.	Ground is present at 7F of BT1 relay.
9	Remove blocking tools from RV, CA5 relays.	
10	Connect ground to 5F of CLXB relay.	FR relay operated.
11	Block operated HA relay.	FR relay released. SR1 relay operated. Ground is absent from 7F of BT1 relay.
12	Disconnect ground from 5F of CLXB relay.	
13	Block nonoperated BT1 relay.	
14	Block operated H relay.	

STEP	ACTION	VERIFICATION
15	Block operated CLXB relay.	Ground is present at 6F of CA5 relay.
16	Block operated CA5 relay.	Ground is absent from 6F of CA5 relay.
17	Remove blocking tools from CA5, CLXB relays.	
18	Connect ground to 6F of BT1 relay.	
19	Remove blocking tool from BT1 relay.	BT1 relay operated.
20	Remove blocking tool from HA relay.	BY lamp lighted. SR1 relay remains operated. Ground is absent from 7F of BT1 relay.
21	Block operated FR relay.	
22	Operate PB key.	PB relay operated.
23	Disconnect ground from 6F of BT1 relay.	
24	Record reading of PB register.	
25	Remove blocking tool from H relay.	PB register scores once. BY lamp extinguished. BT1 relay released.
26	Restore PB key.	
27	Remove blocking tools from FR, STA relays, then from S, XCO relays.	SO lamp extinguished.

C. Selector Switch Blocking

4	Insulate 2M of ON1 relay.	
5	Block operated any CL- relay.	CL- lamp lighted.
6	Block operated ON1 relay.	
7	Momentarily operate manually BLK relay.	BLK lamp lighted.
8	Remove blocking tool from CL- relay.	CL- lamp extinguished. Selector switch A, B, E, or F advances through all positions to position 1. Selector switch corresponds to operated CL- relay as follows:

CL-RELAY

CL1 or 2
CL3 or 4
CL9 or 10
CL11

SELECTOR SWITCH

A
B
E
F

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STEP	ACTION	VERIFICATION
9	Remove blocking tool from ON1 relay.	BLK lamp extinguished.
10	Repeat Steps 5 through 9 for other CL- relays.	
11	Remove insulation from 2M of ON1 relay.	
D. BLK and AL Relays Verification		
4a	If 2-party trunks are served — Connect ground to 4F of TPK relay.	
5a	Momentarily operate manually TPK relay.	BLK, TPK lamps lighted momentarily.
6a	Disconnect ground from 4F of TPK relay.	
7	Connect ground to 4F of CT1 relay.	
8	Momentarily operate manually CT1 relay.	BLK lamp lighted momentarily.
9	Disconnect ground from 4F of CT1 relay.	
10	Connect ground to 6F of CT1 relay.	
11	Momentarily operate manually CT1 relay.	BLK lamp lighted momentarily.
12	Disconnect ground from 6F of CT1 relay.	
13	Connect ground to 6F of EP relay.	BLK lamp lighted.
14	Momentarily operate manually EP relay.	BLK lamp extinguished momentarily.
15	Disconnect ground from 6F of EP relay.	BLK lamp extinguished.
16	Connect ground to 8F of EP relay.	
17	Momentarily operate manually EP relay.	BLK lamp lighted momentarily.
18	Disconnect ground from 8F of EP relay.	
19	Connect ground to 12F of CS relay.	
20	Momentarily operate manually CS relay.	BLK lamp lighted momentarily.
21	Disconnect ground from 12F of CS relay.	
22	Connect ground to 7F of CS relay.	BLK lamp lighted.
23	Disconnect ground from 7F of CS relay.	BLK lamp extinguished.
24	Connect ground to 8F of ONCK relay.	BLK lamp lighted.

STEP	ACTION	VERIFICATION
25	Disconnect ground from 8F of ONCK relay.	BLK lamp extinguished.
26	Connect ground to 6F of MG relay.	
27	Momentarily operate manually MG relay.	BLK lamp lighted momentarily.
28	Disconnect ground from 6F of MG relay.	
29	Connect ground to 8F of SIK1 relay.	BLK lamp lighted.
30	Disconnect ground from 8F of SIK1 relay.	BLK lamp extinguished.
31	Block operated ETM2 relay.	
32	Block operated REC relay.	BLK, IF lamps lighted.
33	Momentarily operate manually 10K relay.	BLK, IF lamps extinguished momentarily.
34	Remove blocking tools from ETM2, REC relays.	BLK, IF lamps extinguished.
35	Block nonoperated STA relay.	
36	Operate ACO key.	
37	Block operated ST relay.	STM1 relay operated.
38	Momentarily operate manually ETM1 relay three times.	BLK lamp lighted. AL relay operated; STM1 relay released.
39	Remove blocking tool from ST relay.	BLK lamp extinguished. AL relay released.
40	Block operated BT1 relay.	
41	Block operated ST relay.	STM1 relay operated.
42	Momentarily operate manually ETM1 relay twice.	AL relay operated; STM1 relay released.
43	Block operated CA3 relay.	AL relay released; TM1 selector switch restored to normal.
44	Remove blocking tools from ST, BT1, CA3 relays; then from STA relay.	
45b	If testing features for special toll and operator assistance trunks are provided — Connect ground to 4F of R relay.	
46b	Block operated R relay.	BLK lamp lighted.

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STEP	ACTION	VERIFICATION
47b	Remove blocking tool from R relay.	BLK lamp extinguished.
48b	Disconnect ground from 4F of R relay.	
49b	Connect ground to 9F of CN1 relay.	
50b	Block operated CN1 relay.	BLK, CN1 lamps lighted.
51b	Remove blocking tool from CN1 relay.	BLK, CN1 lamps extinguished.
52b	Disconnect ground from 9F of CN1 relay.	
53b	Block operated R, NOT relays.	BLK, NOT lamps lighted.
54b	Remove blocking tools from R, NOT relays.	BLK, NOT lamps extinguished.
55b	Block operated CN1, NOT relays.	BLK, CN1, NOT lamps lighted.
56b	Remove blocking tools from CN1, NOT relays.	BLK, CN1, NOT lamps extinguished.
57b	Block operated CCK, ET4A relays.	BLK lamp lighted.
58b	Remove blocking tool from CCK relay.	BLK lamp extinguished.
59b	Block operated CRK relay.	BLK lamp lighted.
60b	Remove blocking tools from CRK, ET4A relays.	BLK lamp extinguished.
61	Restore ACO key.	

E. TM1 Timer

4	Block operated STM1 relay.	ETM1 relay operated in 55 to 65 seconds.
5	Remove blocking tool from STM1 relay.	ETM1 relay released.

F. TM2 Timer

↗ 4	Establish test set connections in accordance with Table B.	
5	Operate STM2 relay in accordance with Table B.	ETM2 relay operated in 960 to 2200 milliseconds.
6a	If ONH relay is provided — Block ONH relay operated.	
↘ 7a	Operate STM2 relay in accordance with Table B.	ETM2 relay operated in 1900 to 4200 milliseconds.

STEP ACTION VERIFICATION

TABLE B

TEST	CIRCUIT PREPARATION			TEST SET PREPARATION		
	CONNECT TEST LEADS			SEND KEY	REC SWITCH	
	BLACK	RED	WHITE		START	STOP
F (6)	GRD	U (STM2)	1F (ETM2)	MK	48V	GRD
G	GRD	U (STM3)	13F (ETM3)	MK	OC	GRD
H	GRD	U (STM4)	13F (ETM4)	MK	OC	GRD

- Γ 8a Remove blocking tool from ONH relay.
- 9b If long timing interval is measured —
Block REC relay operated.
- 10b Operate STM2 relay in accordance with Table B. *OPR WHEN REC Relay OPR cont 12 REC Relay* ETM2 relay operated in 7.5 to 16 seconds.
- 11b Remove blocking tool from REC relay.
- L 12 Disconnect test set. ETM2 relay released.

G. TM3 Timer

- 4 Connect timing test set as indicated in Table B.
- 5 At timing test set —
Operate TST key to OPR and hold until meter indicator pointer stabilizes. Meter indicates 80 to 85 milliseconds.
- 6 Disconnect timing test set.

H. TM4 Timer

- Γ 4 Establish test connections in accordance with Table B.
- 5 Operate STM4 in accordance with Table B. ETM4 relay operated in 86 to 90 milliseconds.
- 6a If CB relay is provided —
Insulate 5B of CB relay.
- 7a Operate STM4 relay in accordance with Table B. ETM4 relay operated in 410 to 460 milliseconds.
- L 8a Remove insulating tool from 5B of CB relay.

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STEP	ACTION	VERIFICATION
Γ 9b	If AB2 relay is furnished — Insulate 11B of AB2 relay.	
10b	Operate STM4 in accordance with Table B.	ETM4 relay operates in 2200 to 2600 milli-seconds.
11b	Remove insulation from 11B of AB2 relay.	
L 12	Disconnect test set.	ETM4 relay releases.

I. TO-RO Circuit — Resistance Verification

4	Remove N, Z, A-A fuses.	
5	Connect ohmmeter to L terminal of CSSX relay, 6F of SIK1 relay.	Indicates 11,583 to 11,817 ohms.
6	Connect ohmmeter to L terminal of CSSX relay, 7F of CSR relay.	Indicates 2330 to 2376 ohms.
7	Connect ohmmeter to L terminal of CSSX relay, 12F of SOA relay.	
8	Block operated SOA relay.	Indicates 461 to 471 ohms.
9	Block operated CSR relay.	Indicates 0.48 to 0.53 megohm.
10a	If testing features for special toll and operator assistance trunks are not provided — Connect ohmmeter to L terminal of CSSX relay, 12F of ET3B relay.	Indicates 6352 to 6480 ohms.
11	Connect ohmmeter to 5F of CSO relay, 7F of EP relay.	Indicates 32,920 to 33,586 ohms.
12	Remove blocking tool from SOA relay.	
13	Block operated WK relay.	
14	Connect ohmmeter to 10F of SOA, WK relays.	Indicates 112 to 114 ohms.
15	Disconnect ohmmeter.	
16	Remove blocking tools from WK, CSR relays.	
17b	If testing features for special toll and operator assistance trunks are provided — Connect ohmmeter to L terminal of CSSX relay, 12F of SOA relay.	

AA 7.1.1.1.1

STEP	ACTION	VERIFICATION
18b	Block operated SOA, XBP, CSR relays.	Indicates 69,260 to 76,550 ohms.
18c *		
19b	Connect ohmmeter to L terminal of CSSX relay, 12F of ET3B relay. <i>2 F of ET3B</i>	Indicates 16,252 to 16,580 ohms.
20b	Remove blocking tools from SOA, XBP, CSR relays.	
21b	Connect ohmmeter to L terminal of CSSX relay, 8F of WK relay. <i>2 F of WK</i>	
22b	Block operated RC relay. <i>2 PC1</i>	Indicates 1317 to 1343 ohms.
23b	Block operated RCO relay.	Indicates 686 to 700 ohms.
24b	Remove blocking tools from RC, RCO relays. <i>2 PC1</i>	
25b	Connect ohmmeter to L terminal of CSSX relay, 8F of SOA relay.	Indicates 257 to 283 ohms.
26b	Block operated XBP relay. <i>Test leads to 12F of SOA</i>	Indicates 1110 to 1152 ohms.
27b	Remove blocking tool from XBP relay.	
28	Disconnect ohmmeter.	
29	Replace N, Z, A-A fuses.	
18c	<i>CONNECT ohmmeter to L Term CSSX & 12 F of SOA line. BLOCK off CSR!</i>	<i>IND 505 + THOUSAND Ohms</i>
J. MG Relay Verification		
4	Perform current flow test of MG relay using 35-type test set and circuit requirements tables.	Circuit requirements are met.
5	Disconnect test set.	
6	Block operated SOA, CSX, HBR relays.	MG relay operated.
7	Block operated SIK relay.	MG relay released.
8	Remove blocking tools from SOA, CSX, HBR, SIK relays.	
9a	If testing features for special toll and operator assistance trunks are provided — Block operated AOP1, SOA, CSX relays.	MG relay operated.
10a	Remove blocking tools from AOP1, SOA, CSX relays.	MG relay released.

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STEP	ACTION	VERIFICATION
K. TI-RI Circuit — Resistance Verification		
4	Remove R fuse.	
5	Block operated AT2 relay.	
6	Connect ohmmeter to 2F of AT1 relay, 4F of AT2 relay.	Indicates 475 to 525 ohms.
7	Block operated ACS relay.	Indicates 7837 to 7995 ohms.
8	Remove blocking tool from AT2 relay.	
9	Connect ohmmeter to 4F of AT2 relay, 6F of WK1 relay.	Indicates 28,785 to 31,815 ohms.
10	Block operated WK1 relay.	Indicates 1211 to 1339 ohms.
11	Remove blocking tool from WK1 relay.	
12	Block operated AOP relay.	Indicates 2623 to 2677 ohms.
13	Remove blocking tools from OAP, ACS relays.	
14	Connect ohmmeter to 8F of EP0 relay, L terminal of EP relay.	
15	Block operated EP2 relay.	Indicates 7093 to 7239 ohms.
16	Block operated EP0 relay.	Indicates 4438 to 4528 ohms.
17	Connect ohmmeter to 6F of EP0 relay, L terminal of EP relay.	
18	Remove blocking tools from EP0, EP2 relays.	Indicates 1059 to 1081 ohms.
19	Connect ohmmeter to 9F, 11F of CA5 relay.	
20	Block nonoperated CA5 relay.	
21	Block operated S1MW, CA relays.	Indicates 950 to 1050 ohms.
22	Remove blocking tool from CA5 relay.	Indicates infinity.
23	Remove blocking tools from S1MW, CA relays.	
24a	If sleeve check option <u>ZD is provided</u> — Block operated CLMF, CSX relays.	Indicates 475 to 520 ohms.

STEP	ACTION	VERIFICATION
25a	Remove blocking tools from CLMF, CSX relays.	
26b	If testing features for special toll and operator assistance trunks are provided — Block operated OPX, RC, CLMF relays.	Indicates 1330 to 1470 ohms.
27b	Remove blocking tool from RC relay.	
28b	Block operated CL11, ACS, AT2 relays. <i>DON'T HAVE CL 11 Relay</i>	Indicates 4590 to 4682 ohms.
29b	Connect ohmmeter to 6F, 8F of WK1 relay.	
30b	Block operated AOP relay. — <i>only</i>	Indicates 1930 to 1970 ohms. <i>2000</i>
31b	Remove blocking tools from CLMF, OPX, ACS, AT2, CL11, AOP relays.	
32	Disconnect ohmmeter.	
33	Replace R fuse.	

L. Cut-Through Test — Resistance Verification

4	Remove S fuse.	
5	Connect ohmmeter to 4F of CT0 relay, L terminal of CT1 relay.	Indicates 911 to 929 ohms.
6	Block operated CT0 relay.	Indicates 562 to 574 ohms.
7	Remove blocking tool from CT0 relay.	
8	Disconnect ohmmeter.	
9	Replace S fuse.	

M. TTO Relay Verification

4	Block nonoperated STM2 relay.	
5	Block operated ON1 relay, then SPO relay.	REC relay operated. SP1 lamp lighted. Ground is present at 1M of CT1 relay.
6	Momentarily operate manually TTO relay.	TTO lamp lighted. Ground is absent from 1M of CT1 relay.
7	Remove blocking tool from ON1 relay.	TTO lamp extinguished. REC relay released.

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STEP	ACTION	VERIFICATION
8	Remove blocking tool from SPO relay.	SP1 lamp extinguished.
9	Connect ground to terminal 44 of A terminal strip.	
10	Block operated ON1 relay.	
11	Block operated IDY relay.	TTO, IDY lamps lighted.
12	Momentarily operate manually SPO relay.	SP1 lamp lighted.
13	Remove blocking tool from ON1 relay.	TTO lamp extinguished.
14a	If features are provided for non-ANI indication — Momentarily operate FR relay.	NANI lamp lighted momentarily.
15	Disconnect ground from terminal 44 of A terminal strip.	
16	Remove blocking tools from IDY, STM2 relays.	SP1, IDY lamps extinguished.

N. Tip Party Resistance Verification — Trunks Arranged for 2-Party Operation

4	Remove +130 volt A fuse.	
5	Connect ohmmeter to terminal 19 of MISC terminal strip, 8F of TPO relay.	Indicates 1604 to 1636 ohms.
6	Block operated TPO relay.	Indicates 911 to 929 ohms.
7	Disconnect ohmmeter.	
8	Remove blocking tool from TPO relay.	
9	Replace +130 volt A fuse.	

O. SL Relay Verification

4	Block operated REP relay.	
5	Block operated CLXB, CA5 relays.	
6	Connect ground to 6F of CA5 relay.	BY lamp lighted.
7	Remove blocking tool from CA5 relay.	CA5 relay operated.
8	Remove blocking tool from CLXB relay.	BY lamp extinguished. CA5 relay released.

STEP	ACTION	VERIFICATION
9	Disconnect ground from 6F of CA5 relay.	
10	Remove blocking tool from REP relay.	
11	Block nonoperated STTA relay.	
12	Block operated TCI relay.	
13	Connect ground to 2F of CK1 relay.	STT relay operated.
14	Momentarily operate manually SL relay.	STT relay released momentarily. BL lamp lighted momentarily.
15	Momentarily operate manually AL relay.	^{BY} STT relay released momentarily.
16	Disconnect ground from 2F of CK1 relay.	STT relay released.
17	Remove blocking tools from TC1, STTA relays.	

P. FR Relay Circuit — Resistance Verification

4	Remove G fuse.	
5	Connect ohmmeter to L terminal of PB relay, 10F of HA relay.	Indicates 100 to 112 ohms.
6	Disconnect ohmmeter.	
7	Replace G fuse.	

Q. CA5 Relay Verification

4	Block nonoperated CA5 relay.	
5	Connect ground to 5F of TMDA relay.	
6	Block operated TMDA relay.	Ground is present at 10F, 12F of CA5 relay.
7	Remove blocking tool from CA5 relay.	CA5 relay operated. Ground is absent from 10F, 12F of CA5 relay.
8	Remove blocking tool from TMDA relay.	CA5 relay released.
9	Disconnect ground from 5F of TMDA relay.	
10a	If sleeve check option ZD is not provided — Block operated CSX relay.	Ground is present at 7F of CA5 relay.
11b	If sleeve check option ZD is provided — Block operated SOA, CSX relays.	Ground is present at 7F of CA5 relay.

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STEP	ACTION	VERIFICATION
12	Block operated CA5 relay.	Ground is absent from 7F of CA5 relay.
13	Remove blocking tool from CA5 relay.	
14a	If sleeve check option ZD is not provided — Remove blocking tool from CSX relay.	
15b	If sleeve check option ZD is provided — Remove blocking tools from SOA, CSX relays.	
16	Block operated CA2 relay.	
17	Momentarily operate manually CA relay.	CA4, CA5, OK relays operated.
18	Block nonoperated STTA relay.	
19	Block operated STT relay.	OK relay released.
20	Remove blocking tool from CA2 relay.	CA4, CA5 relays released.
21	Remove blocking tool from STT relay, then from STTA relay.	

R. CT and RST Registers Check

4	Record readings of RST, CT registers.	
5	Block operated OK1, REP relays, then CA4 relay.	
6	Block operated STT relay.	RST register scores once.
7	Remove blocking tool from REP relay.	
8	Block operated REP relay.	CT register scores once.
9	Remove blocking tools from OK1, CA4 relays, then from REP, STT relays.	

S. TPK1 Relay Verification

4	Perform current flow test of TPK1 relay using 35-type test set and circuit requirement table.	Circuit requirements are met.
5	Remove test set cord from 1L of TPK1 relay and connect to 6F of CA5 relay.	
6	Block operated TPK, TPO, TP relays.	
7	Block operated CLXB relay.	

STEP	ACTION	VERIFICATION
Γ 8	Operate test set key adjusted to the operate value of TPK1 relay.	TPK1 relay operated.
9	Remove blocking tool from TP relay.	TPK1 relay released.
10	Disconnect test set.	
L 11	Remove blocking tools from CLXB, TPK, TPO relays.	

