

TERMINATING TROUBLE INDICATOR  
TESTS

NO. 1 CROSSBAR OFFICES

1. GENERAL

PAGE

1.01 This section describes a method of testing the terminating trouble indicator SD-25284-01 in No. 1 crossbar offices. The tests covered are intended to detect trouble that is not evident in the normal use of the terminating trouble indicator circuit.

**E. CON Relay—Resistance Test:**  
This test checks the resistances which are applied in testing the terminating marker continuity features. . . . .

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1.02 This section is reissued to add information to paragraph 2.05, add paragraph 2.06, and to revise all tests (except Test B) for offices equipped with automatic trouble analysis (ATA).

**F. GT Relay—Resistance Test:**  
This test checks the resistances used in applying the operate and release conditions to the terminating marker GT relay. . . . .

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This reissue does not affect the Equipment Test List.

**G. PU Relay—Resistance Test:**  
This test checks the resistances used in applying the operate test condition to the terminating marker PU relay. . . . .

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1.03 The tests covered are:

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**A. Preference Chain Lockout Circuit Feature:** This test checks that the trouble indicator prefers a particular marker and that only one marker at a time will connect to the indicator. . . . .

2

**B. Make-Busy Feature:** This test checks that the terminating trouble indicator can be made busy to markers on an individual basis. . . . .

3

**C. MT Key Chain Circuit Test:**  
This test checks the chain circuit through the MT keys. . . . .

4

**D. FCG Relay—Resistance Test:**  
This test checks the resistances used in applying operate tests of the terminating marker FCG relay. . . . .

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**H. Lamp Check:** This test checks that the terminating trouble indicator lamps light when their associated relays are operated. . . . .

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1.04 Test B requires verification at the terminating marker frames.

1.05 During these tests, markers may be unable to connect to the trouble indicator or if connected, false indications may be received on the trouble indicator display lamps.

1.06 **Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 3 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.

NOTICE

Not for use or disclosure outside the  
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**2. APPARATUS**

**Test A**

**2.01** 716C receiver attached to a W2AB cord equipped with two 360A tools (2W21A cord), a 411A test pick, and a KS-6278 connecting clip (for use in checking for the presence or absence of ground).

**2.02** Two 893 cords, 6 feet long, equipped with two 360A tools (1W13B cord), a KS-6278 connecting clip, and a 607A relay winding connector (for use in applying battery to winding of DS relays).

**Tests A, E, F, G, and H**

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

**Test B**

**2.04** 322A (make-busy) plug.

**Tests D, E, F, and G**

**2.05** KS-14510, L1 volt-ohm-milliammeter and one pair of L2 test prod leads. This instrument is referred to throughout the section as an ohmmeter. The accuracy of the ohmmeter, as covered in Section 100-520-101, is  $\pm 2.0$  percent at one-half the pointer travel or at 20 on the ohms scale.

**Tests A, C, D, E, F, G, and H**

**2.06** 329A (short-circuiting) plug.

**3. METHOD**

STEP	ACTION	VERIFICATION
<b>A. Preference Chain Lockout Circuit Feature</b>		
1a	If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Insert 329A plug into CATA jack.	CATA lamp lighted.
2	At terminating trouble indicator frame— Block all DR relays nonoperated.	
3	Insulate 1, 2T of all DS relays.	
4	Connect battery to 4B of the DS relay with first operating preference.	DS relay operated.
<b>Note:</b> Disregard trouble indicator alarms.		
5	Momentarily apply battery to 4B of the DS relays with lower operating preference.	DS relays do not operate.
6	Remove battery from DS relay.	DS relay released.
7	Connect battery to 4B of the DS relay with next lower operating preference.	DS relay operated.
8	Momentarily apply battery to 4B of the DS relays with lower operating preference.	DS relays do not operate.

STEP	ACTION	VERIFICATION
9	Remove battery from DS relay.	DS relay released.
10	Repeat Steps 7, 8, and 9 for remaining DS relays.	
11	Block operated the DS relay with the last operating preference.	
12	Block operated the DS relay with first operating preference.	
13	Momentarily apply battery to 4B of intermediate DS relays.	DS relays operated and released.
14	Remove blocking tool from DS relay with first operating preference.	DS relay released.
15	Remove blocking tool from DS relay with last operating preference.	DS relay released.
16	Remove insulators from all DS relays.	
17	Momentarily operate last preferred DS relay and check for ground on 1T of DS relay operated.	Ground present.
18	Momentarily operate, one at a time, each of the other DS relays and check for the presence of ground on 1T contact.	Ground present.
19	Remove blocking tools from DR relays.	
20	Retire any alarms caused by this test.	
21a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆

#### B. Make-Busy Feature

1	At terminating trouble indicator frame— Insert a 322A plug into the TIB jack associated with marker 0.	At terminating marker 0— TTIB relay operated.
2	Remove 322A plug.	At terminating marker 0— TTIB relay released.
3	Repeat Steps 1 and 2 for remaining markers.	

STEP	ACTION	VERIFICATION
<b>C. MT Key Chain Circuit Test</b>		
1a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Insert 329A plug into CATA jack.	CATA lamp lighted.◆
2	At terminating trouble indicator frame— Originate a test call using the MTO key and a higher numbered MT key.	Test call completed to marker 0.
3	Originate a test call using the MT1 key and a higher numbered MT key.	Test call completed to marker 1.
4	Repeat Step 3 for remaining MT keys for which higher numbered keys can be operated.	Test call completed for lower numbered operated MT key.
5a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆
<b>D. FCG Relay—Resistance Test</b>		
1a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Insert 329A plug into CATA jack.	CATA lamp lighted.◆
2	Restore all keys to normal.	
3	Operate FCG key.	
4	Connect ohmmeter to 2B and 2T of GC relay.	Observe meter reading of 58,410 to 59,590 ohms.
5	Disconnect ohmmeter.	
6	Restore FCG key.	
7a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆
<b>E. CON Relay—Resistance Test</b>		
1a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator or frame— Insert 329A plug into CATA jack.	CATA lamp lighted.◆

STEP	ACTION	VERIFICATION
2	Restore all keys to normal.	
3	Block operated GC and GLH relays.	
4	Connect ohmmeter to 2B and 5T of GC relay.	Observe meter reading of 59,851 to 61,061 ohms.
5	Change ohmmeter connection to 2T and 5T of GC relay.	
6	Operate RV and TVT keys.	Observe meter reading of 99,451 to 101,461 ohms.
7	Block operated TC1, TC2, TC3, and TC4 relays.	Observe meter reading of 171,270 to 174,730 ohms.
8	Remove blocking tools from GC, GLH, TC1, TC2, TC3, and TC4 relays.	
9	Restore RV and TVT keys.	
10	Change ohmmeter connections to 5B and 1B of the PU relay.	Observe meter reading of 3,968 to 4,048 ohms.
11	Disconnect ohmmeter.	
12a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆

#### F. GT Relay—Resistance Test

1a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Insert 329A plug into CATA jack.	CATA lamp lighted.◆
2	Restore all keys to normal.	
3	Block operated GC and CON relays.	
4	Connect ohmmeter to 2T and 5T of GC relay.	Observe meter reading of 9,890 to 10,090 ohms.
5	Operate GT key.	Observe meter reading of 7,492 to 7,648 ohms.
6	Change ohmmeter connections to 2B and 2T of GC relay.	

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STEP	ACTION	VERIFICATION
7	Block operated the CN relay.	Observe meter reading of 7,492 to 7,648 ohms.
8	Disconnect ohmmeter.	
9	Remove blocking tools from GC, CON, and CN relays.	
10	Restore GT key.	
11a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆

**G. PU Relay—Resistance Test**

1a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Insert 329A plug into CATA jack.	CATA lamp lighted.◆
2	Restore all keys to normal.	
3	Operate PU key.	
4	Block operated GC and CON relays.	
5	Connect ohmmeter to 2B of GC relay and 5BF of GLH relay.	Observe meter reading of 156 to 172 ohms.
6	Disconnect ohmmeter.	
7	Remove blocking tools from GC and CON relays.	
8	Restore PU key.	
9a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆

**H. Lamp Check**

1a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Insert 329A plug into CATA jack.	CATA lamp lighted.◆
2	Restore all keys to normal.	

STEP	ACTION	VERIFICATION
3	Operate LP key.	
4	Block operated HD relay. If XP relay is provided— XP lamp lighted. If 2nd trial failure to overflow feature is provided in terminating marker— F0 lamp lighted.	
5	Manually operate and release, where provided, the relays listed in Tables A and B.  <i>Note:</i> Relays specified in Table A are located in terminating trouble indicator frame. Relays specified in Table B are located on miscellaneous relay rack.	Observe that lamps listed in Tables A and B are lighted when associated relays are operated.
6	Remove blocking tool from HD relay.	All lamps extinguished.
7a	◆If office is equipped with automatic trouble analysis and a printout is not required— At terminating trouble indicator frame— Remove 329A plug from CATA jack.	CATA lamp extinguished.◆

TABLE A

RELAY OPERATED	MTG. PLATE LOCATION	LAMP LIGHTED	RELAY OPERATED	MTG. PLATE LOCATION	LAMP LIGHTED
DR 0-9	AG	DR 0-9	TF	M	TF
DL 0-9	AF	DL 0-9	A 0,1,3	M	A 0,1,3
GS	AF	GS	B 0,1,3	M	B 0,1,3
TRL	AD	TRL	AIS	M	AIS
XIK	AC 1	XIK	IK	M	IK
CLD	AC 1	CLI	CA 0-9	L	CA 0-9
TTB 0,1,2	AC 1	TTB 0,1,2	CB 0-9	L	CB 0-9
CF 0-4	AA	CF 0-4	IF 0-19	K	IF 0-19
CN 0-3	AA	CN 0-3	LC 0-9	J	LC 0-9
SN 0-4	AA	SN 0-4	M 0-9	J	M 0-9
TR2	AA	TR2	CH 0-9	H	CH 0-9
RO	AA	RO	LJ 0-9	H	LJ 0-9
OAB	AA	OAB	JPN	G	JPN
TH1,2,4,8	Y	TH1,2,4,8	JP 0-8	G	JP 0-8
H1,2,4,5	Y	H1,2,4,5	JGA-E	G	JGA-E
T1,2,4,5	Y	T1,2,4,5	FS	G	FS
U1,2,4,5	Y	U1,2,4,5	MAN	G	MAN
F1,2,4,5,10	Y	F1,2,4,5,10	TOL	G	TOL
NGC 0-19	W	NGC 0-19	RC	F	RC
NGC 20-24	U	NGC 20-24	RV	F	RV
HB 0-14	U	HB 0-14	RP	F	RP
HB 15-2	T	HB 15-24	TC	F	TC
HP 0-8	T	HP 0-8	LIN	F	LIN
L0-19	S	L0-19	LTI	F	LTI
JF 0-4	R	JF 0-4	TIN	F	TIN
JC0,2,4,6,8,10 12,14,16,18	R	JC0,2,4,6,8,10 12,14,16,18	TTI	F	TTI
AL1	R	AL1	OF	F	OF
AL2	R	AL2	BB	F	BB
ALG	R	ALG	SPL	F	SPL
LCF 0-19	N	LCF 0-19	NC	F	NC
LLGA,B,C,D	M	LLGA,B,C,D	NT	F	NT
LOG	M	LOG	NTX	F	NTX
HF	M	HF	NH	F	NH
RF	M	RF	NHX	F	NHX
OPR (YL Option)	M	OPR	NN	F	NN

TABLE A (Contd)

RELAY OPERATED	MTG. PLATE LOCATION	LAMP LIGHTED	RELAY OPERATED	MTG. PLATE LOCATION	LAMP LIGHTED
NNX	F	NNX	FL	B	FL
NTT	F	NTT	NFL	B	NFL
SDT	F	SDT	AL	B	AL
IP	E	IP	NAL	B	NAL
IT	E	IT	LTR	B	LTR
IPT	E	IPT	HTR	B	HTR
PN	E	PN	GC	B	GC
TN	E	TN	GLH	B	GLH
PTN	E	PTN	CN	B	CN
CKG	D	CKG	TC3,CON	B,C	TCT,CON
K1,K2	D	K1,K2,TO,UO,THO	XALG	A	XALG
K3	D	K3,HO,FO	XOS	A	XOS
TBK	D	TBK	X	A	X
LE	D	LE	XFC	A	XFC
FC	D	FC	XC	A	XC
AK	D	AK	XHG	A	XHG
TK	D	TK	XIN	A	XIN
LIL	D	LIL	XOB	A	XOB
RIL	D	RIL	XR	A	XR
TE	D	TE	XRL	A	XRL
BC	D	BC	XS	A	XS
GJ	D	GJ	XSM	A	XSM
SL	D	SL	XTI	A	XTI
PG	D	PG	XTB	A	XTB
FCG	D	FCG	XTL	A	XTL
GT2	D	GT2	XL	A	XL
RL	D	RL	XF	A	XF
EX	D	EX	XHB	A	XHB
MK0	B	MK0	XPS	A	XPS
MK1	B	MK1	XTMB	A	XTMB

TABLE B

RELAY OPERATED	MTG. PLATE LOCATION	LAMP LIGHTED	RELAY OPERATED	MTG. PLATE LOCATION	LAMP LIGHTED
DLT0,1,2,3,4	K	DLT0,1,2,3,4	TN0,1	E	TN0,1
CL0,1,2,3,4,5	K	CL0,1,2,3,4,5	OST	E	OST
35,9	K	35,9	ORK	E	ORK
TRSL	K	TRSL	SON	E	SON
SAT	K	SAT	LLP	E	LLP
AR0,1,2,4,7	J	AR0,1,2,4,7	TKN	E	TKN
BR0,1,2,4,7	J	BR0,1,2,4,7	XT1	E	XT1
AR'0,1,2,4,7	J	AR'0,1,2,4,7	XLF	E	XLF
BR'0,1,2,4,7	J	BR'0,1,2,4,7	XSS	E	XSS
CLC0,1,3	H	CLC0,1,3	XSC	E	XSC
ART	H	ART	DA0,1,2	D	DA0,1,2
RVK	H	RVK	ESS	D	ESS
CR0,1,2,4,7	G	CR0,1,2,4,7	PMO	D	PMO
OS 0-4	G	OS 0-4	PTM	D	PTM
			TLT	D	TLT
SIA, SIB	G	SIA, SIB	THC0,1,2,4,8	D	THC0,1,2,4,8
SSA, SSB	G	SSA, SSB	HC0,1,2,4,5	D	HC0,1,2,4,5
OSK	G	OSK	TC0,1,2,4,5	D	TC0,1,2,4,5
CR'0,1,2,4,7	G	CR'0,1,2,4,7	UC0,1,2,4,5	D	UC0,1,2,4,5
A'0,1,2,4,7	F	A'0,1,2,4,7	A, B	C	A, B
B'0,1,2,4,7	F	B'0,1,2,4,7	BLK, CHG	C	BLK, CHG
C'0,1,2,4,7	F	C'0,1,2,4,7	TRK, TST	C	TRK, TST
D'0,1,2,4,7	F	D'0,1,2,4,7	TRU0,1	C	TRU0,1
LFK	E	LFK	TLK	C	TLK
OSE, OSE1	E	OSE, OSE1	TLKA	C	TLKA
SLK1,2	E	SLK1,2	A0,1,2,4,7	B	A0,1,2,4,7
AVK	E	AVK	B0,1,2,4,7	B	B0,1,2,4,7
RSC	E	RSC	C0,1,2,4,7	B	C0,1,2,4,7
KI	E	KI	D0,1,2,4,7	B	D0,1,2,4,7
			NSS0,1,2,4	A	NSS0,1,2,4