TERMINATING MARKER CONNECTORS
TESTS
NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of making tests of the terminating marker connector circuits in No. 1 crossbar offices.

1.02 This section is reissued to provide for testing terminating marker connector circuits equipped with wire-spring-type multicontact relays and to specify the use of the No. 1A fault locator test set in Test H, for detecting crosses. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests and features covered are:

A. Marker Busy to Connector: This test checks the make-busy features of the circuit by plugging into the GB- and CB- jacks associated with each terminating marker connector circuit and the DB- jack associated with each terminating marker circuit. A check is made that when an S- relay, associated with a terminating sender is operated, all operated CB- relays in the connector will hold operated until the S- relay releases or until all CB- relays of the connector have operated.

B. Sender Preference and Lockout Features: This test checks the order of preference of the SS- relays and also checks that only one sender at a time can be served by a connector.

C. Marker Preference and Lockout Features — Access to All Markers from One Connector, CB- Relay Chain: This test checks that an operated CB- relay will transfer the preference to the next DS- relay of the connector and that the connector will connect to only one terminating marker at a time.

D. Marker Preference and Lockout Features — Access to One Marker from All Connectors, DS- Relay Chain: This test checks that not more than one connector at a time may seize a marker. It checks that when the TM- relay is operated the GRA relay opens the GR (ground) alarm and that ground is placed on the TM, DB, and CL leads from each TM- relay.

E. Time-Out Features: This test checks that the terminating marker connector circuit will time out, seize the terminating trouble indicator and give a visual and audible alarm within a measured time, if a terminating sender fails to connect to a marker or if the sender or marker fails to release.

F. False Ground Features: This test checks that if the TRL or RL leads are falsely grounded, a visual and audible alarm is given.

G. Marker Sequence Feature: If this feature is provided, this test checks the holding path of the DS- relays after the GT relay operates. The marker sequence feature is checked to insure that a connector will not serve a second call until all other connectors having nonspecial calls, waiting for a marker, have each served a call. A check is also made that this feature is cancelled and an audible and visual alarm given, within a measured time, if a connector is locked out of service while any marker is idle.

H. Test for False Continuity and Crosses on S- and TM- Relay Contacts: This test checks for false continuity and crosses of contacts on the sender and marker multicontact relays not readily detected during normal operation of the equipment.

I. Availability of Special Markers to All Senders: This test checks that all senders have access to all special markers and that all regular markers are made busy to this connector by the operation of their CB- relays. Where the senders are tested without the test frame, a check is also made that the operation of the SPL relay grounds the SPL lead going to the marker.

J. Trouble Release Feature: This test checks the first and second trial and trouble release feature of the connector.

1.04 Actions and verifications are required at locations other than at the terminating marker connector for tests as listed.

(a) Test A — at terminating trouble indicator and at sender selector circuit located on the miscellaneous frame.

(b) Tests B, C, and E through H — at terminating trouble indicator.

(c) Test D — at terminating trouble indicator and at other terminating marker connector frames.

(d) Tests I and J — at terminating trouble indicator and at terminating sender test frame.

1.05 When performing Tests A, H, and J, a terminating marker connector with associated senders and a terminating marker will be out of service.

1.06 When performing Tests B, C, D, F, G, and I, a terminating marker connector with associated senders will be out of service.

1.07 When performing Test D, two terminating marker connectors with associated senders and a terminating marker will be out of service.

1.08 In this section, "stationary spring" and "operating spring" refer to springs of nonwire-spring-type multicontact relays; "fixed contact" and "movable contact" refer to contacts of wire-spring-type multicontact relays.

1.09 *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 the test. Where a condition does not apply, all steps designated by the 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.

TABLE A

APPARATUS	TESTS									
	A	B	C	D	E	F	G	H	I	J
Test Circuit (2.02)									1	1
Test Set (2.03)								1		
Headset (2.04)		1		1	1				1	
Cord (2.05)		2	1		1		1		2	1
Cord (2.06)				2	1		1			
Cord (2.07)						1				1
Tool (2.08)										1
Tool (2.09)	√	√	√	√	√		√			√
No. 322A (make-busy) Plug	√	√	√	√	√	√	√	√	√	√

√ As required.

2.02 Test circuit, terminating sender test frame, SD-25159-01.

2.03 No. 1A fault locator test set, J94730A (for use in checking for false continuity and crosses). Section 100-150-301 covers the method for using this test set.

2.04 Headset, No. 716C receiver attached to a W2AB cord equipped with two No. 360A tools (No. 2W21A cord) and one KS-6278 connecting clip and one No. 411A (test pick) tool (used for testing for presence of battery or ground).

2.05 Testing cord, No. 893 cord, 6 feet long, equipped with two No. 360A tools (No. 1W13B cord), a KS-6278 connecting clip and a No. 419A (test connector) tool (used for connecting battery or ground to relay contacts).

2.06 Testing cord, No. 893 cord, 6 feet long, equipped with two No. 360A tools (No. 1W13B cord), a KS-6278 connecting clip and a No. 607A (winding connector) tool (used for connecting battery or ground to relay windings).

2.07 Testing cord, No. 893 cord, 6 feet long, equipped with two No. 360A tools (No. 1W13B cord), a KS-6278 connecting clip, and a No. 624B (terminal connector) tool or another KS-6278 connecting clip with a No. 108 cord tip (insulating tubing), as required (used for connecting battery or ground to terminal strip punchings).

2.08 Tool, No. 38B lamp socket, consists of a No. 38A lamp socket equipped with an M2CP cord. Equip lamp socket with a No. 2Y lamp.

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

3. METHOD

STEP	ACTION	VERIFICATION
	A. Marker Busy to Connector	
1	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	At sender selector circuit located on miscellaneous frame — SB- relays of senders in subgroup associated with connector made busy operate.
2	Make terminating marker busy to connector under test by inserting No. 322A plug into associated CB- jack.	At terminating marker connector — CB- relay associated with marker operates.
3	Remove plug from CB- jack.	CB- relay releases.
4	Repeat Steps 2 and 3 for other terminating markers.	
5	Insert No. 322A plug into DB- jack of terminating marker.	CB- relay associated with marker operates.
6	Remove plug from DB- jack.	CB- relay releases.
7	Repeat Steps 5 and 6 for other terminating markers.	
8	At terminating marker connector — Block operated upper half of first S- relay.	
9	Operate CB- relay.	CB- relay locks operated.
10	Remove blocking tool from S- relay.	CB- relay releases.
11	Repeat Steps 8 through 10 for all S- relays except last one.	
12	Repeat Steps 8 and 9 for last S- relay.	
13	Operate other CB- relays except one.	CB- relays lock operated.
14	Operate last CB- relay.	Other CB- relays release. Last CB- relay locks operated. *Note:* A CB- relay may be held operated by a call in another connector or by a marker made busy.
15	Remove blocking tool from S- relay.	Last CB- relay releases.
16	At terminating trouble indicator — Remove plug from GB- jack.	

STEP	ACTION	VERIFICATION
	B. Sender Preference and Lockout Features	
1	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	At terminating marker connector — MB relay operates.
2	Insert No. 322A plugs into CB- jacks of all markers on selected connector.	
3a	If TLO key is provided — Operate TLO key.	
4a	At terminating marker connector — Check for presence of ground on 4T contact of GT relay.	Ground not present.
5	At terminating marker connector — Block CA1 and CA2 relays nonoperated.	
6b	If connector has S- relays associated with dial pulse senders — Insulate No. 17 contacts of these S- relays.	
7	Connect battery to spring of TR relay associated with lowest numbered SS- relay.	Associated SS- and S- relays operate.
8	Connect battery to spring of TR relay associated with next higher numbered SS- relay.	Associated SS- relay does not operate.
9	Remove battery from spring of TR relay associated with lowest numbered SS- relay.	Associated SS- and S- relays release. Next higher numbered SS- and S- relays operate.
10	Reconnect battery to spring of TR relay associated with lowest numbered SS- relay.	Lowest numbered SS- relay operates. Lowest numbered S- relay does not operate.
11	Remove battery from spring of TR relay associated with lowest numbered SS- relay.	Lowest numbered SS- relay releases.
12	Connect battery to spring of TR relay associated with next higher numbered SS- relay.	Associated SS- relay does not operate.
13	Remove battery from spring of TR relay associated with lower numbered SS- relay.	Associated lower numbered SS- and S- relays release. Higher numbered SS- and S- relays operate.
14	Reconnect battery to spring of TR relay associated with lower numbered SS- relay.	Associated SS- relay operates. Associated S- relay does not operate.
15	Remove battery from spring of TR relay associated with lower numbered SS- relay.	Associated SS- relay releases.
16	Repeat Steps 12 through 15 for remaining SS- relays in connector.	
17	Remove battery from spring of TR relay associated with highest numbered SS- relay.	
18b	If connector has S- relays associated with dial pulse senders — Remove insulating tools from No. 17 contacts of S- relays.	

STEP	ACTION	VERIFICATION
19	Remove blocking tools from CA1 and CA2 relays.	
20	At terminating trouble indicator — Remove plugs from GB- and CB- jacks.	
21a	If TLO key is provided — Restore TLO key.	

C. Marker Preference and Lockout Features — Access to All Markers from One Connector, CB- Relay Chain

Note: While making this test, the operation of a DS- relay causes the marker to time out, seize the terminating trouble indicator, and sound the minor alarm. If the DS- relay is held operated for approximately 4 to 5 seconds, the major alarm sounds and the TA lamp at the marker frame lights. After the DS- relay is released, momentarily operate the AR (alarm release) key at the marker frame to silence the major alarm and extinguish the TA lamp. Momentarily operate the RL (release) key at the terminating trouble indicator frame to silence the minor alarm.

1	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	
2	At terminating marker connector — Block nonoperated all TM- relays of connector under test.	
3	Block nonoperated CB- relay associated with lowest numbered DS- relay.	
4	Connect battery to 1T spring of highest numbered CB- relay in chain.	Lowest numbered DS- relay operates and associated TM- relay is energized.
5	Block nonoperated CB- relay associated with next higher numbered DS- relay.	
6	Block operated CB- relay associated with operated DS- relay.	Next higher numbered DS- relay operates and associated TM- relay is energized. Lower numbered DS- relay releases and associated TM- relay is no longer energized.
7	Repeat Steps 5 and 6 for all other CB- and DS- relays in the connector.	
8	Remove battery from 1T spring of highest numbered CB- relay.	Highest numbered DS- relay releases and associated TM- relay is no longer energized.
9	Block operated highest numbered CB- relay.	

STEP	ACTION	VERIFICATION
10	Block nonoperated lowest numbered CB- relay.	
11	Connect battery to 2T spring of highest numbered CB- relay.	Lowest numbered DS- relay operates.
12	Remove battery from 2T spring of highest numbered CB- relay.	Lowest numbered DS- relay releases.
13	Remove blocking tools from CB- and TM- relays.	
14	At terminating trouble indicator — Remove plug from GB- jack.	

D. Marker Preference and Lockout Features — Access to One Marker from All Connectors, DS- Relay Chain

Note: While making this test, the operation of a DS- relay causes the marker to time out and operate the minor alarm. The operation of the TM- relay will cause the connector to time out within 5 to 12 seconds and cause a major alarm to sound. If the DS- relay is held operated for approximately 4 to 5 seconds, the TA lamp at the marker frame lights. After the DS- relay is released, momentarily operate the AR key at the marker frame to silence the major alarm and extinguish the TA lamp. Momentarily operate the RL key at the terminating trouble indicator frame to silence the minor alarm.

1	At terminating trouble indicator — Insert No. 322A plug into DB- jack of lowest numbered marker.	At terminating marker connector containing first preferred DS- relay associated with marker made busy — CB- relay, associated with marker made busy, operates.
2	At terminating marker connector containing first preferred DS- relay associated with marker made busy — Block operated MB relay.	
3	Connect battery to B winding terminal of first preferred DS- relay.	DS- relay operates. Associated CB- relay releases. GRA and CA5 relays operate.
4	Check for presence of ground on TM relay terminal strip punchings 27 and 29.	Ground present.
5	At terminating marker connector containing second preferred DS- relay associated with marker made busy — Block MB relay operated.	

STEP	ACTION	VERIFICATION
6	Connect battery to B winding terminal of second preferred DS- relay.	DS- relay does not operate.
7	At first preferred connector — Remove battery from DS- relay and immediately remove blocking tool from MB relay.	DS- relay releases. Associated CB- relay operates. GRA and CA5 relays release. At second preferred connector — DS- relay operates. Associated CB- relay releases. GRA and CA5 relays operate.
8	At second preferred connector — Check for presence of ground on TM relay terminal strip punchings 27 and 29.	Ground present.
9	At first preferred connector — Reconnect battery to B winding terminal of DS- relay.	DS- relay operates. Associated TM- relay does not operate.
10	Remove battery from DS- relay winding terminal.	DS- relay releases.
11	Repeat Steps 5 through 10 for other DS- relays in the chain. Consider reference to first and second preferred DS- relays as two consecutive relays associated with any two consecutive connectors in the preference chain.	
12	At last preferred connector — Remove battery from DS- relay winding terminal.	
13	Remove blocking tool from MB relay.	
14	At terminating trouble indicator — Remove plug from DB- jack.	
	E. Time-Out Features	
1	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	
2	Operate BAT (battery) key.	
3	Insert No. 322A plugs into CB- jacks of all markers on selected connector.	
4	At terminating marker connector — Block nonoperated lowest numbered SS- relay.	
5	Connect battery to spring of TR relay associated with SS- relay blocked nonoperated.	After 5 to 12 seconds — At terminating trouble indicator — CT lamp and proper C- lamp lights. Major alarm sounds. Associated S- lamp does not light. If provided, TFA lamp lights and minor alarm sounds.

STEP	ACTION	VERIFICATION
5	Connect ground to punching 14 of SDR terminal strip.	GR, CT, and C- lamps light. Major alarm sounds.
6	Remove ground from punching 14 of SDR terminal strip.	GR, CT, and C- lamps extinguished. Major alarm silenced.
7	At terminating trouble indicator — Remove plug from GB- jack.	

G. Marker Sequence Feature

Note: While making this test, the operation of a DS- or TM- relay causes the marker to time out, seize the terminating trouble indicator and operate a minor alarm. If the DS- or TM- relays are held operated for approximately 4 to 5 seconds, the major alarm sounds and the TA lamp on the terminating marker frame lights. After the DS- and TM- relays are released, momentarily operate the AR key at the terminating marker frame to silence the major alarm and extinguish the TA lamps. Momentarily operate the RL key at the trouble indicator to silence the minor alarm.

1	At terminating trouble indicator — Restore TLO key, if operated.	
2	Insert No. 322A plug into GB- jack of connector under test.	
3	At terminating marker connector — Block CA4 and CA5 relays operated.	
4	Block nonoperated CB- relay associated with first preferred DS- relay.	
5	Block operated GT relay.	
6	Connect battery to 2B spring of GT relay.	DS- relay does not operate.
7	Remove blocking tool from GT relay.	First preferred DS- and TM- relays operate. GT relay operates. DS- relay holds operated.
8	Block operated CB- relay associated with DS- relay operated.	DS- and TM- relays release. GT relay releases. Another DS- relay and associated TM- relay operate. GT relay operates. DS- relay holds operated.
9	Repeat Step 8 until all remaining DS- relays in this connector have been tested.	
10	Remove battery from 2B spring of GT relay.	

STEP	ACTION	VERIFICATION
11	Remove blocking tools from CA4, CA5 and all CB- relays.	
12	Connect ground to TF winding terminal of GT relay.	GT and GT1 relays operate. After 2 to 5 seconds — GT and GT1 relays release. At terminating trouble indicator — TFA lamp lights. Minor alarm sounds.
13	Remove ground from winding terminal of GT relay.	
14	At terminating trouble indicator — Momentarily operate TLO key.	TFA lamp extinguished. Minor alarm silenced.
15	At terminating marker connector — Block CA5 relay operated.	
16	Connect ground to TF winding terminal of GT relay.	GT and GT1 relays operate. Minor alarm does not sound.
17	Connect ground to 2T spring of GT relay (CP lead). ***Note:*** Do not ground the CP lead any longer than necessary to perform the test outlined in the following steps since if each of the other nonbusy marker connectors in the group serve a call during the time the lead is grounded their GT and GT1 relays will be unable to release, thereby causing a traffic delay.	
18	Remove ground from winding terminal of GT relay.	GT and GT1 relays remain operated.
19	Remove ground from 2T spring of GT relay.	GT and GT1 relays release (may hold up for a short time if a call is being served in another connector).
20	Remove blocking tool from CA5 relay.	
21	At terminating trouble indicator — Remove plug from GB jack.	

H. Test for False Continuity and Crosses on S- and TM- Relay Contacts

Caution: When performing this test on wire-spring-type multicontact relays, use extreme care not to dislodge the movable contact springs from the comb grooves.

1	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	

STEP	ACTION	VERIFICATION
2	At terminating marker connector — Using No. 1A fault locator test set, test terminals for crosses and falsely made contacts as shown in Table B.	

TABLE B

Terminal Strip MKR
0 - 3, 5 - 8, 10 - 13, 15, 16, 20 - 24, 26, 28, 30 - 33, *34 - 37, 40, 42 - 44
* Terminals 34 - 37 may have contact protection networks connected

3 Using No. 1A fault locator test set, test springs or contacts, as shown in Table C, of all S- and TM- relays in connector.

Note: Springs or contacts normally grounded are shown in the table. The remainder should test open.

TABLE C

S- Relay			TM- Relay		
NUMBER	STATIONARY SPRING OR MOVABLE CONTACT	OPERATING SPRING OR FIXED CONTACT	NUMBER	STATIONARY SPRING OR MOVABLE CONTACT	OPERATING SPRING OR FIXED CONTACT
17		Grd	19	Grd	
18	Grd		27		Grd
25		Grd	29		Grd
29	Grd		38	Grd	
38	Grd		39		Grd
39	Grd		49		*Grd
49		*Grd			
* If wiring option is provided					

4 At terminating trouble indicator —
Remove plug from GB- jack.

STEP	ACTION	VERIFICATION
	I. Availability of Special Markers to All Senders	
	Where Terminating Sender Test Circuit Is Arranged to Test All Senders Associated with the Marker Connector	
1	At terminating trouble indicator — Insert No. 322A plugs into MB- jacks of senders associated with connector under test.	
2	Insert No. 322A plugs into CB- jacks of both special markers of connector under test.	
3	At terminating sender test frame — Start a "special call test" on first sender associated with connector under test. For method of setting up test frame see appropriate Division 216 Section.	Test circuit will not advance due to sender being made busy.
4	At terminating trouble indicator — Remove plug from MB- jack of first sender.	At terminating sender test frame — Test advances to point where marker is required (TC lamp lights).
5	Before sender times out (28 to 58 seconds) remove plug from CB- jack of one of the special markers.	At terminating sender test frame — Test call completes.
6	At terminating trouble indicator — Reinsert No. 322A plug into CB- jack of special marker just used.	
7	At terminating sender test frame — Start a "special call test" on first sender.	Test advances to point where marker is required (TC lamp).
8	At terminating trouble indicator — Remove plug from CB- jack associated with other special marker.	At terminating sender test frame — Test call completes.
9	Insert No. 322A plug into MB- jack associated with sender just tested.	
10	Repeat Steps 3 through 9 for each sender associated with connector under test.	
11	Remove plugs from CB- jacks of special markers and MB- jacks of senders.	
	Where Terminating Sender Test Circuit Is Not Arranged to Test All Senders Associated with the Marker Connector	
	Note: If the TM- relay is held operated approximately 2 to 4 seconds the terminating marker will time out, seize the terminating trouble indicator and sound the minor alarm. If the TM- relay is held operated 28 to 58 seconds the TA lamp at the terminating marker will light and the major	

STEP	ACTION	VERIFICATION
	alarm will sound. The operation of the TM-relay will cause the connector to time out in approximately 2 to 5 seconds and cause a major alarm to sound and light the TFA lamp, if provided, at the terminating trouble indicator frame. When the test is completed, silence the major alarm and retire the TA lamp by momentarily operating the AR key at the terminating marker frame. Silence the minor alarm by momentarily operating the TLO, if provided, and RL keys at the terminating trouble indicator frame.	
12	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	
13	Insert No. 322A plug into CB- jack of one special marker of connector under test.	
14	At terminating marker connector — Connect ground to 4B spring of SS- relay.	
15	Connect battery to TR relay spring associated with SS- relay of Step 14.	Associated SS- relay operates. CB- relays of regular markers and the made busy special marker operate. SPL relay operates.
16	Check for presence of ground on punching 9 of TM terminal strip.	Ground present.
17	Remove ground from 4B spring of SS- relay.	CB- relays release. SPL relay releases.
18	Check for presence of ground on punching 9 of TM terminal strip.	Ground not present.
19	Remove battery from TR relay spring associated with SS- relay.	Associated SS- relay releases.
20	At terminating trouble indicator — Remove plug from CB- jack of special marker.	
21	Insert plug into CB- jack of other special marker of connector under test.	
22	Repeat Steps 14 through 21 using another SS- relay.	
23	Repeat Steps 14, 15, 17 and 19 for remaining SS- relays.	
24	Remove plug from CB- jack of special marker.	
25	Remove plug from GB- jack of connector under test.	

STEP	ACTION	VERIFICATION
	J. Trouble Release Feature	
	Where the Terminating Sender Test Circuit Is Arranged to Test All Senders Associated with the Marker Connector	
1	At terminating trouble indicator — Insert No. 322A plugs into MB- jacks of all but first sender associated with connector under test.	
2	Insert No. 322A plugs into CB- jacks of all but one marker associated with connector under test.	
3	At terminating sender test frame — Start a "trouble release by marker" test call on first sender associated with connector under test. For method of setting up test frame see appropriate Division 216 Section.	Test call completes.
4	Repeat Step 3 for all terminating markers associated with connector under test by inserting and removing plugs in CB- jacks.	
5	At terminating trouble indicator — Remove plugs from CB- and MB- jacks.	
6	Repeat Steps 1 through 5 for all other senders associated with connector under test.	
	Where the Terminating Sender Test Circuit Is Not Arranged to Test All Senders Associated with the Marker Connector	
	Note: If the TM- relay is held operated approximately 2 to 4 seconds the terminating marker will time out, seize the terminating trouble indicator and sound the minor alarm. If the TM- relay is held operated 28 to 58 seconds the TA lamp at the terminating marker will light and the major alarm will sound. The operation of the TM- relay will cause the connector to time out in approximately 2 to 5 seconds and cause the major alarm to sound and light the TFA lamp, if provided, at the terminating trouble indicator frame. When the test is completed, silence the major alarm and retire the TA lamp by momentarily operating the AR key at the terminating marker frame. Silence the minor alarm by momentarily operating the TLO, if provided, and RL keys at the terminating trouble indicator frame.	
7	At terminating marker connector — Block CA4 relay nonoperated.	

STEP	ACTION	VERIFICATION
8	At terminating trouble indicator — Insert No. 322A plug into GB- jack of connector under test.	
9	Insert No. 322A plugs into CB- jacks of all but one marker of connector under test.	
10	Insert No. 322A plugs into CB- jacks associated with selected marker in all other connectors.	
11	At terminating marker connector — Connect one cord of No. 38B lamp socket to punching 17 of TM terminal strip and other cord to battery.	
12	Connect cord to punching 4 (TRL) of TM terminal strip. This cord will be connected momentarily to ground in Step 14.	
	Note: The next two steps should be done in rapid succession.	
13	Connect battery to TR relay spring associated with selected SS- relay.	TM- relay associated with selected marker operates.
14	Immediately after TM- relay operates, connect cord of Step 12 momentarily to ground.	TM- relay releases, then immediately reoperates. Lamp connected in Step 11 lights.
15	Remove battery from TR relay spring.	TM- relay releases. Lamp extinguished.
16	At terminating trouble indicator — Remove plugs from CB- jacks.	
17	Repeat Steps 9, 10 and 13 through 16 for all other senders and markers associated with connector.	
18	At terminating marker connector — Remove cord connected to punching 4 of TM terminal strip.	
19	Remove connections of No. 38B lamp socket from TM terminal strip and battery.	
20	Remove blocking tool from CA4 relay.	
21	At terminating trouble indicator — Remove plug from GB- jack.	