

## NUMBER GROUP CONNECTOR TESTS NO. 1 CROSSBAR OFFICES

### 1. GENERAL

**1.01** This section describes a method of making tests of number group connector circuits in No. 1 crossbar offices. These tests check leads which are not checked during normal operation of the circuit.

**1.02** This section is reissued to combine former Test G with Test A, to include wire-spring-type multicontact relays in Tests C and E, and to present the method of testing in a tabular form. 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 Preference Chain Transfer and Alarm Features:** This test checks the ability of the marker preference chain to recognize an open in the chain, to cause the transfer from one marker preference chain to the other and give an audible and visual alarm signal.

**B. Make-Busy Feature:** This test checks that a make-busy plug, inserted into the TMB jack, lights a guard lamp signal and that all calls to this number group are routed to overflow immediately.

**C. False Continuity and Crosses on MCA- and MCC- Relays:** On the MCA- relay this test checks for continuity of the TB leads, for false continuity of the CN contacts and for a grounded CN lead. On the MCC- relay this test checks for crosses on the XG lead.

**D. Operation of the XG- Relays:** This test checks the continuity of the XG lead. It is required only when the number group connector is equipped with one or more XG- relays for use on number checking calls to combine two or more terminal hunting groups serving the same PBX.

**E. False Grounds on 20 Block Relays:** This test checks TB- relay contacts for false grounds not readily detected during normal operation of the equipment.

**F. HB- Relay Winding:** This test is required only when the HB- relays are equipped with two windings. The test checks that the spare winding will operate the relay.

**1.04** Tests A through D require actions and verifications at the terminating trouble indicator.

**1.05** Tests E and F require actions and verifications at the block relay frame.

**1.06** *Caution: These tests should not be made during periods of normal traffic because removing a number group connector from service stops all incoming calls to subscribers in the number group. A number group connector will be out of service while performing Tests B, C, E, and F.*

**1.07** The letters a, b, c, etc, added to a step number in Part 3 of this section indicate an action which may or may not be required, depending on local conditions. The conditions under which a step or series of steps should be made are 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.

**1.08** Local instructions should be followed for recording and reporting any register operations caused by performing these tests.

### 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
Trouble Indicator (2.02)	1	1	1	1		
Test Receiver. (2.03)			1		1	1
Cord (2.04)			1			
No. 349A (make-busy) Plug		1	1		1	1
No. 322A (make-busy) Plug			2	1		
Tool (2.05)	√					

√As required.

**2.02** Terminating trouble indicator circuit SD-25284-01.

**2.03** Test receiver, No. 716C receiver attached to a W2AB cord equipped with two No. 360A tools (No. 2W21A cord) and KS-6278 connecting clip and one No. 411A (test pick) tool (for use in checking the presence or absence of battery or ground, continuity, and crosses on connector relays).

**2.04** 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. 411A (test pick) tool (for applying battery or ground to relay springs or relay windings).

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

### 3. METHOD

STEP	ACTION	VERIFICATION
<b>A. Marker Preference Chain Transfer and Alarm Features</b>		
<b>Connector Provided with MTR and SA Keys</b>		
1a	If SA key is in operated (vertical) position — Momentarily operate MTR (manual transfer) key and then restore SA key to normal (horizontal) position.	
2	Momentarily operate MTR key.	CH lamp lights. Minor alarm sounds. TR- relays operate. Green aisle pilot and main aisle pilot lamps light. (This check need be made only once for all circuits in same aisle.)
3	Operate SA key.	CH lamp extinguished. Minor alarm silenced. Green aisle pilot and main aisle pilot lamps extinguished.
4	At terminating trouble indicator — Operate BAT key. Route test calls through connector under test using a different marker for each test call.	At terminating trouble indicator — Proper NG- (number group connector busy) lamp lights on each test call.
5	At number group connector frame — Momentarily operate MTR key.	At number group connector frame — CH lamp lights. Minor alarm sounds. TR- relays release.
6	Restore SA key.	CH lamp extinguished. Minor alarm silenced.

STEP	ACTION	VERIFICATION
<b>Connector Provided with TR and AR Keys</b>		
7b	If TR key is in operated (vertical) position — Restore TR key to normal (horizontal) position.	
8	Momentarily insulate 3T contact of AL relay long enough to operate CH relay.	CH lamp lights. Minor alarm sounds. TR- relays operate. Green aisle pilot and main aisle pilot lamps light. (This check need be made only once for all circuits in same aisle.)
9	Momentarily operate AR key.	CH lamp extinguished. Minor alarm silenced. TR- relays release. Green aisle pilot and main aisle pilot lamps extinguished.
10	Operate TR key.	TR- relays operate.
11	At terminating trouble indicator — Operate BAT key. Route test calls through connector under test using a different marker for each test call.	At terminating trouble indicator — Proper NG- (number group connector busy) lamp lights on each test call.
12	At number group connector frame — Momentarily insulate 3T contact of AL relay long enough to operate CH relay.	At number group connector frame — CH lamp lights. Minor alarm sounds. TR- relays release.
13	Momentarily operate AR key.	CH lamp extinguished. Minor alarm silenced. TR- relays operate.
14	Restore TR key.	TR- relays release.
<b>B. Make-Busy Feature</b>		
1	At number group connector frame — Insert No. 349A plug into TMB jack of connector under test.	At number group connector frame — TMB lamp lights. At floor alarm cabinet — NG-CFB lamp lights.
2	At terminating trouble indicator — Route test calls to number group connector under test, using a different marker for each test call, until all terminating markers have been used.	At terminating trouble indicator — RC, RV, TC, CON, GT2, and RL lamps, followed by TRL lamp, light on each test call.
3	At number group connector frame — Remove No. 349A plug from TMB jack.	At number group connector frame — TMB lamp extinguished. At floor alarm cabinet — NG-CFB lamp extinguished.

STEP	ACTION	VERIFICATION
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**C. False Continuity and Crosses on MCA- and MCC- Relays**

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|---|--|------------------|
| 1 | At terminating trouble indicator —<br>Insert No. 322A plugs into DB- jack and TIB- jack of a terminating marker.   |                  |
| 2 | At number group connector frame —<br>Insert No. 349A plug into TMB jack of connector under test.   |                  |
| 3 | Check for presence of battery on the following stationary springs of nonwire-spring-type MCA- relays or movable contacts of wire-spring-type MCA- relays: 25 to 29 and 40 to 44 inclusive. | Battery present. |
| 4 | Check MCA- and MCC- relays associated with marker made busy as listed in Table B.  |                  |

**TABLE B**

RELAY DESIGNATION	APPLY GROUND TO STATIONARY SPRING OR MOVABLE CONTACT	GROUND PRESENT ON STATIONARY SPRING OR MOVABLE CONTACT	GROUND NOT PRESENT ON STATIONARY SPRING OR MOVABLE CONTACT
MCA-	25	40	
MCA-	26	41	
MCA-	27	42	
MCA-	28	43	
MCA-	29	44	
MCC-	31		41
MCC-	32		42
MCC-	33		43
MCC-	34		44
MCC-	51		41
MCC-	52		42
MCC-	53		43
MCC-	54		44

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| 5 | Apply ground, in turn, to each of operating springs or fixed contacts 45 to 49 inclusive of MCA- relay. | Ground not present on associated stationary spring or movable contact. |
| 6 | Apply ground, in turn, to each of operating springs or fixed contacts 41 to 44 inclusive of MCC- relay. | Ground not present on associated stationary spring or movable contact. |
| 7 | Remove No. 349A plug from TMB jack.   |  |
| 8 | At terminating trouble indicator —<br>Remove No. 322A plugs from TIB- and DB-jacks.                     |  |
| 9 | Repeat Steps 1 through 8 to check MCA- and MCC- relays of other markers to be tested.                   |  |

STEP	ACTION	VERIFICATION
10	At number group connector frame — Insert No. 349A plug into TMB jack of connector under test.	
11	Check MCC- relay terminal strip as listed in Table C.	

TABLE C

RELAY TERMINAL STRIP	APPLY GROUND TO TERMINAL	GROUND NOT PRESENT ON TERMINAL
MCC	41	31 or 51
MCC	42	32 or 52
MCC	43	33 or 53
MCC	44	34 or 54

12	Remove No. 349A plug from TMB jack.	
13a	If number group connector HB- relay is equipped with CN wiring — At number group connector frame — Insert No. 349A plug into TMB jack of connector under test.	
14a	Check terminal 50 of MCA- relay terminal strip for presence of battery or ground.	Battery or ground not present.
15a	Remove No. 349A plug from TMB jack.	
16a	At terminating trouble indicator — Route test calls through HB- relay equipped with CN wiring.	At terminating trouble indicator — CN and associated NG and NGC lamps light.
17a	Repeat Step 16a until each HB- relay and each marker have been tested.	
18	At terminating trouble indicator — Route test calls through HB- relays not equipped with CN wiring.	At terminating trouble indicator — Associated NG and NGC lamps light. CN lamp does not light.
19	Repeat Step 18 until each HB- relay and each marker have been tested.	

#### D. Operation of the XG- Relays

1	At terminating trouble indicator — Using special marker, route regular test call in number group to be tested to a PBX line number connected to XF punching in one of line choices 0 or 1.	RF lamp lights.
2a	If XG1 relay is provided — Repeat Step 1 using a PBX line number connected to XF punching in one of line choices 2 to 7.	RF lamp lights.
3b	If XG2 relay is provided — Repeat Step 1 using a PBX line number connected to XF punching in one of line choices 8 to 13.	RF lamp lights.

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STEP	ACTION	VERIFICATION
4c	If XG3 relay is provided — Repeat Step 1 using a PBX line number connected to XF punching in one of line choices 14 to 19.	RF lamp lights.
5	Repeat Steps 1 through 4c, as required, substituting a no-test call for a regular call.	For each step — HF lamp lights instead of RF lamp.
6	Repeat Steps 1 through 5, as required, for the other special marker.	

**E. False Grounds on 20 Block Relays**

**For Nonwire-Spring-Type Relays**

1	At number group connector frame — Insert No. 349A plug into TMB jack of number group to be tested.	
2	At block relay frame — Check for presence of ground on stationary springs 20 to 39 inclusive of each TB- relay.	Ground not present. <i>Note:</i> Ground present may indicate a line busy condition; retest when line is known to be idle.
3	At number group connector frame — Remove No. 349A plug from TMB jack.	

**For Wire-Spring-Type Relays**

4	At number group connector frame — Insert No. 349A plug into TMB jack of number group to be tested.	
5	At block relay frame — Check for presence of ground on movable contact 20 to 39 inclusive of each TB- relay.	Ground not present. <i>Note:</i> Ground present may indicate a line busy condition; retest when line is known to be idle.
6	At number group connector frame — Remove No. 349A plug from TMB jack.	

**F. HB- Relay Winding**

1	At number group connector frame — Insert No. 349A plug into TMB jack of connector under test.	
2	At block relay frame — Connect ground through a receiver to spare winding terminal of HB- relay.	Associated HB- relay operates.
3	Repeat Step 2 for all HB- relays in number group connector being tested.	
4	At number group connector frame — Remove No. 349A plug from TMB jack.	