

OFFICE LINK AND CONNECTOR CIRCUITS NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of making tests of office link and connector circuits in No. 1 crossbar offices.

1.02 This section is reissued to bring it in conformity with other material in the Plant Series. In this process marginal arrows have been omitted.

1.03 The tests and features covered are:

A. Marker Preference Chain Transfer and Alarm Features: This test checks that the operation of a CH relay in a connector causes a transfer to an alternate set of preference relays and causes an audible alarm with a visual indication. It also verifies that test calls are completed using the alternate or regular preference chain and that a transfer can be effected from either of a pair of office frames.

B. Frame Make-busy Features: This test verifies that inserting a plug in an OMB jack effectively removes an office link and connector frame from service.

C. Primary Switch Select Magnet Winding Leads: This test checks that the proper select magnets operate when ground is connected to the proper terminal. The PMB- jack control of the secondary select magnet leads is also verified.

D. Secondary Switch Hold Magnet Winding Leads: This test checks that the proper secondary switch hold magnets operate when ground is connected to the proper terminal.

The PMB- jack control of the secondary hold magnet leads is also verified.

E. Secondary Switch Select Magnet Winding Leads and Trunk Sleeve Leads: This test checks that the proper secondary switch select magnets operate when ground is connected to the proper terminal. The SMB- jack control of the secondary select magnets is also verified.

F. Check for False Continuities, Battery, Ground, and Crosses: This test checks for false continuities, battery, ground, and crosses not readily detected during the normal operation of the equipment.

G. Marker Preference and Lock Out Features of MP Relays: This test checks the integrity of the various contact chains of the marker preference (MP) relays.

1.04 When connecting to wire-spring relay contact terminals, do not apply test connections over a solderless wrapped connection nor in any manner disturb such a connection.

1.05 Tests B and F require verification at the originating marker. Tests B, C, D, E, and F require that an office frame be made busy. Test F requires that a marker be made busy.

1.06 The office link and connector frame is referred to in the testing methods as an office frame.

STEP	ACTION	VERIFICATION
2a	Restore SA key to unoperated positions.	CH lamp extinguished. Minor alarm silenced. Green aisle pilot and main aisle pilot lamps extinguished.
3	At even office frame — Operate MTR key momentarily.	CH lamp lighted. Minor alarm sounded. Green aisle pilot and main aisle pilot lamps lighted.
4	Operate SA key.	CH lamp extinguished. Minor alarm silenced. Green aisle pilot and main aisle pilot lamps extinguished. At even and odd office frames — All TR relays operated.
5	At originating trouble indicator frame — Route simulated service calls through office frame using a different marker for each test call until all markers have been selected.	Test calls completed and proper OF- displayed or recorded.
6	At odd office frame — Operate MTR key momentarily.	
7	At even office frame — Restore SA key to unoperated position.	CH lamp lighted.
8	Repeat Step 5.	CH lamp extinguished. At odd and even office frames — All TR relays released.
9	At odd office frame — Momentarily operate MTR key.	Same as Step 5.
10	At even office frame — Operate SA key.	CH lamp lighted.
11	At even office frame — Momentarily operate MTR key.	CH lamp extinguished.
12	Restore SA key to unoperated position.	CH lamp lighted.
When TR and AR Keys Are Provided		CH lamp extinguished. At odd and even office frames — All TR relays released.
13b	At even office frame — If TR key associated with office frame to be tested is operated — Restore TR key to normal.	

STEP	ACTION	VERIFICATION
14	Momentarily open 5B, 6B contacts of TR2 relay.	CH lamp lighted. Minor alarm sounded. Green aisle pilot and main aisle pilot lamps lighted. All TR- relays operated on odd and even office frames. <i>Note:</i> Functioning of audible alarm, aisle pilot lamp and main aisle pilot lamp need be checked only once during this test.
15	Momentarily operate AR key.	CH lamp extinguished. Minor alarm silenced. Green aisle pilot and main aisle pilot lamps extinguished. All TR- relays released on odd and even office frames.
16	Operate TR key.	All TR- relays operated on odd and even office frames.
17	At originating trouble indicator frame — Route simulated service calls through office frame using a different marker for each test call until all markers have been tested.	Test calls completed and proper OF- displayed or recorded.
18	Momentarily open contacts 2T, 3T of AL relay.	CH lamp lighted. At even and odd office frames — All TR- relays released.
19	Momentarily operate AR key, then restore TR key.	CH lamp extinguished. At even and odd office frames — All TR- relays released.
20	Repeat Step 17.	Same as Step 17.

B. Frame Make-busy Features

1	At even office frame — Check for absence of ground on terminal 7 of MCA relay terminal strip.	
2	At odd office frame — Check for absence of ground on terminal 7 of MCA relay terminal strip.	
3	At even office frame — Insert make-busy plug in OMB jack.	At even office frame and maintenance control center — FB lamps lighted.
4	At maintenance center — Make busy marker 0.	

STEP	ACTION	VERIFICATION
5	At even office frame — Connect battery to terminal, associated with marker made busy, on miscellaneous terminal strip as shown in Table B.	MCA- relay, associated with marker made busy, operated on odd office frame only. At marker made busy — BE relay operated.

TABLE B

MARKER	MISC. TERMINAL
0	220
2	221
4	222
6	223

6	Remove battery from terminal.	
7	At maintenance center — Restore marker to service.	
8	Make busy next even marker.	
9	Repeat Steps 5 thru 8 until all even markers are tested.	Same as Steps 5 through 8.
10	At maintenance center — Make busy marker 1.	
11	At odd office frame — Connect battery to terminal, associated with marker made busy, on miscellaneous terminal strip as shown in Table C.	MCA- relay, associated with marker made busy, operated on odd office frame only. At marker made busy — BE relay operated.

TABLE C

MARKER	MISC. TERMINAL
1	220
3	221
5	222
7	223

12	Remove battery from terminal.	
13	At maintenance center — Restore marker to service.	
14	Make busy next odd marker.	
15	Repeat Steps 11 thru 14 until all odd markers are tested.	Same as Steps 11 thru 14.
16	At even office frame — Remove make-busy plug from OMB jack.	At even office frame and maintenance control center — FB lamps extinguished.
17	At odd office frame — Insert make-busy plug in OMB jack.	At odd office frame and maintenance control center — FB lamps lighted.

STEP	ACTION	VERIFICATION
18	Repeat Steps 4 thru 15.	Same as Steps 4 thru 15 except MCA- relay, associated with marker made busy, operated on even frame. At marker made busy — BO relay operated.
19	At odd office frame — Remove plug from OMB jack.	At odd office frame and maintenance control center — FB lamps extinguished.
C. Primary Switch Select Magnet Winding Leads		
1	At office frame to be tested — Insert make-busy plug in OMB jack.	FB lamp lighted.
2	At office frame — Block operated LC0 relay.	
3	Connect ground to terminal 6 of MCB terminal strip.	Select magnets 0 on primary switches 0-4 operated.
4	Connect ground to terminal 7 of MCB terminal strip.	Select magnets 0 on primary switches 5-9 operated.
5	Insert make-busy plug in PMB0 jack.	Select magnet 0 on primary switch 0 released.
6	Remove block from LC0 relay.	Select magnets 0 on primary switches 1-9 released.
7	Check for presence of ground on terminals 10 and 20 at MCB terminal strip.	
8	Remove ground from terminals 6 and 7 of MCB terminal strip.	
9	Remove plug from PMB0 jack.	
10	At office frame — Block operated LC1 relay.	
11	Connect ground to terminal 6 of MCB terminal strip.	Select magnets 1 on primary switches 0-4 operated.
12	Connect ground to terminal 7 of MCB terminal strip.	Select magnets 1 on primary switches 5-9 operated.
13	Insert make-busy plug in PMB1 jack.	Select magnet 1 on primary switch 1 released.
14	Release LC1 relay.	Select magnets 1 on primary switches 1-9 released.
15	Check for presence of ground on terminals 11 and 21 at MCB terminal strip.	
16	Remove ground from terminals 6 and 7 of MCB terminal strip.	
17	Remove plug from PMB1 jack.	

STEP	ACTION	VERIFICATION
18	Repeat Steps 10 thru 17 using LC2-9 relays, PMB2-9 jacks, and MCB terminals 12-19, and 22-29.	Select magnets associated with LC- relay operated. Select magnet associated with PMB- jack released.
19	Remove plug from OMB jack.	FB lamp extinguished.
D. Secondary Switch Hold Magnet Winding Leads		
1	At office frame under test — Insert make-busy plug in OMB jack.	FB lamp lighted.
2	Block operated LC0 relay.	
3	Connect ground to terminal 10 of MCB terminal strip.	Hold magnet 0R on secondary switch 0 operated on office frame and first and/or second extension office frames if provided.
4	Connect ground to terminal 20 of MCB terminal strip.	Hold magnet 0L on secondary switch 0 operated on office frame and first and/or second extension office frames if provided.
5	Insert make-busy plug in PMB0 jack.	Hold magnets 0L and 0R released.
6	Remove ground from terminals 10 and 20 of MCB terminal strip.	
7	Remove plug from PMB0 jack.	
8	Connect ground to terminal 11 of MCB terminal strip.	Hold magnet 1R on secondary switch 0 operated on office frame and first and/or second extension office frames if provided.
9	Connect ground to terminal 21 of MCB terminal strip.	Hold magnet 1L on secondary switch 0 operated on office frame and first and/or second extension office frames if provided.
10	Insert make-busy plug in PMB1 jack.	Hold magnets 1R and 1L on secondary switch 0 released.
11	Remove ground from terminals 11 and 21 of MCB terminal strip.	
12	Remove plug from PMB1 jack.	
13	Repeat Steps 8 thru 11 using MCB terminals 12-19, 22-29 and PMB2-9 jacks.	Hold magnets 2R thru 9R and 2L thru 9L operated and released on secondary switch 0 on office frame and first and/or second extension office frames if provided.
14	Remove block from LC- relay.	
15	Block operated next higher numbered LC-relay.	
16	Repeat Steps 3 thru 15 until all LC- relays are tested.	Hold magnets corresponding to LC- relay number operated and released on office frame and first and/or second extension frames if provided.
17	Remove plug from OMB jack.	FB lamp extinguished.

STEP	ACTION	VERIFICATION
E. Secondary Switch Select Magnet Winding Leads and Trunk Sleeve Leads		
1	At office frame to be tested — Insert make-busy plug in OMB jack.	FB lamp lighted.
2	Block operated SS0 relay associated with regular secondary switch.	
3	Connect ground to terminal 8 of MCB terminal strip.	Select magnets 0 operated on secondary switches 0-4 of regular office frame.
4	Connect ground to terminal 9 of MCB terminal strip.	Select magnets 0 operated on secondary switches 5-9 of regular office frame.
5	Insert plug in SMB0 jack associated with regular secondary switch.	Select magnet 0 on secondary switch 0 released on regular office frame.
6	Check for presence of ground on terminals 10 and 20 of MCA terminal strip.	
7	Remove block from SS0 relay.	Select magnets 0 on secondary switches 1-9 released on regular office frame.
8	Remove plug from SMB0 jack.	
9	Block operated SS1 relay associated with regular secondary switch.	Select magnets 1 on secondary switches 0-9 operate on regular office frame.
10	Insert make-busy plug in SMB1 jack associated with regular secondary switch.	Select magnet 1 on secondary switch 1 releases on regular office frame.
11	Check for presence of ground at terminals 11 and 21 of MCA terminal strip.	
12	Remove block from SS1 relay.	Select magnets 1 on secondary switches 1-9 release on regular office frame.
13	Remove plug from SMB1 jack.	
14	Repeat Steps 9 thru 13 using SS2-9 relays, SMB2-9 jacks associated with regular secondary switches and MCA terminals 12-19 and 22-29.	Proper select magnets operate and release on regular office frame.
15	Remove ground from terminals 8 and 9 of MCB terminal strip.	
16a	If office frame is equipped with first and/or second extension frames — Repeat Steps 2 thru 15 for all extension secondary switches using SS- relays and SMB- jacks associated with extension switches.	Same as Steps 2 thru 15 except select magnets on extension frame or frames operate and release.
17	Remove plug from OMB jack.	FB lamp extinguished.

STEP	ACTION	VERIFICATION
6	<p>Check for false continuity between pairs of contacts on multicontact relays using test receiver connected to battery and test cord connected to ground as follows:</p> <p>Nonwire-spring-type relays: Operating and associated stationary springs as shown in Table F.</p> <p>Wire-spring-type relays: Fixed and associated movable contact terminals as shown in Table F.</p> <p><i>Note:</i> The office frame should be free of any service calls when performing these tests.</p>	

TABLE F

RELAY DESIGNATION	SPRING OR TERMINAL PAIRS
MCA-	3 thru 6
MCB-	5
LC-	4, 5
TL-	1
TR-	6

7	<p>Test for crosses on the "S" and "S1" leads using the 1A fault locator as follows:</p> <p>At MCA terminal strip — Connect test pick of 1A fault locator in turn to terminals 10 thru 29.</p> <p>At MCB terminal strip — Connect test pick of 1A fault locator in turn to terminals 40 thru 59.</p>	Uniform tone heard.
8	<p>Check for continuity on MCA-relay as follows:</p> <p>Nonwire-spring-type relays: Between stationary spring 5 and operating spring 4.</p> <p>Wire-spring-type relays: Between movable contact terminal 5 and fixed contact terminal 4.</p>	Click is heard.
9a	<p>If condenser timed time-out option (M wiring) is provided — At marker — Observe OCB relay.</p>	OCB relay not operated.
10	<p>At office frame — Block operated MCA-relay of marker made busy.</p>	

STEP	ACTION	VERIFICATION
11	Connect ground to operated MCA- relay as follows: Nonwire-spring relay: Stationary spring 1. Wire-spring relay: Movable contact terminal 1.	Associated MCB- relay operated.
12	At maintenance center — Battery key must be in its operated position.	O- lamp, associated with office frame, lighted.
13a	If condenser timed time-out option (M wiring) is provided — At marker — Observe OCB relay.	OCB relay operated.
14	At office frame — Block operated LC0 relay.	At marker — XX2 relay not operated.
15	At marker — Connect ground to 1B spring of HMT1 relay.	
16	Operate and release, in turn, CHL0 to CHL9 and CHR0 to CHR9 relays.	XX2 relay not operated.
17	Remove ground from HMT1 relay.	
18	Operate and release, in turn, all marker TL- relays.	XX2 relay not operated.
19	Block operated HMT1 relay.	
20b	Connect ground to 11T of ST1 relay.	
21c	If odd office frame is under test — Operate and release, in turn, all KOL- and KOR- relays.	XX2 relay not operated.
22d	If even office frame is under test — Operate and release, in turn, all KEL- and KER- relays.	XX2 relay not operated.
23	At office frame — Remove block from LC0.	
24	Repeat Steps 14 thru 23 substituting LC1-9 relays, in turn, for LC0 relay.	Same as Steps 14 through 23.
25	Remove block from MCA- relay.	MCB- relay released.
26	Remove ground from MCA- relay.	

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STEP	ACTION	VERIFICATION
27	At marker — Remove block from HMT1 relay.	
28	Restore marker to service.	
29	Make busy next higher numbered marker.	
30	Repeat Steps 5 thru 29 until all MCA- and MCB- relays have been tested.	
31	At office frame — Remove plug from OMB jack.	FB lamp extinguished.

G. Marker Preference and Lock Out Features of MP Relays

1	At office frame to be tested — Insert make-busy plug in OMB jack.	
2	Block operated highest numbered MP- relay.	
3	At 3B of highest numbered MP- relay and 1B of next lower numbered MP- relay — Check for absence of ground.	No click heard.
4	Remove block from highest numbered MP- relay.	
5	Block operated next lower numbered MP- relay.	
6	At 3B of MP- relay blocked operated and 1B of next lower numbered MP- relay — Check for absence of ground.	No click heard.
7	Remove block from MP- relay.	
8	Repeat Steps 5 thru 7 substituting next lower numbered MP- relays until all MP- relays have been tested.	Same as Steps 5 thru 7.
9	Block operated lowest numbered MP- relay.	
10	At 3T, 6T of MP- relay blocked operated and 2T, 5T of next higher numbered MP- relay — Check for absence of ground.	No click heard.
11	At 6B of MP- relay blocked operated and 5B of next higher numbered MP- relay — Check for absence of battery.	No click heard.
12	Remove block from MP- relay.	
13	Repeat Steps 10 thru 12 substituting next higher numbered MP- relays, in the same manner, until all MP- relays have been tested.	Same as Steps 10 thru 12.
14	Remove make-busy plug from OMB jack.	