

SWITCH TROUBLE, FUSE AND PERMANENT ALARMS

OPERATION TESTS

355A COMMUNITY DIAL OFFICES

1. GENERAL

1.01 This section describes methods of testing the visual and audible alarms associated with the various types of switches.

1.02 This section is reissued to revise Tests C and D, to cover the call blocked minor and major alarms feature, and to bring the section generally up to date. Since this reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. Line Finder or Trunk Finder (100 and 200 Point), Selector, Coin Control Selector, Reverting Call Selector (197-type Switch), Test Distributor, Coin Control Connector, and Connector Release Alarm: This test checks the operation of the alarms when a line finder, selector, distributor, or a connector fails to restore to normal.

B. Reverting Call Selector Release Alarm (204-type Selector): This test checks the operation of visual and time-delay alarm resulting from a receiver off-hook condition.

C. Line Finder or Trunk Finder (100 and 200 Point) Call Block Alarm: This test checks the operation of visual and time-delay alarm resulting from all finders busy condition or a call blocked condition due to failure of finder to find a calling line.

D. Trunk Finder (22 Point) Call Block Alarm: This test checks the operation of visual and time-delay alarm resulting from all finders busy or calls blocked due to failure to find a trunk.

E. Switch Frame Fuse Alarm: This test checks that the alarm circuit functions properly on either battery actuated or ground actuated fuse alarms associated with switch frames.

F. Selector Permanent Alarm (Except Line Lock-out Permanents): This test checks the operation of the visual and time-delay alarm resulting from a receiver off-hook condition.

G. Connector Permanent Alarm: This test checks the operation of the visual and time-delay alarms resulting from a receiver off-hook condition.

H. Verification of Alarm Transfer to Operator Office: This test checks that alarms will be received at the distant office when the alarm sender key is normal.

1.04 Tests of the line lock-out permanent alarms are covered in Section 226-205-500.

1.05 In Tests A, F, and G a different switch in each group should be used each time the test is made so that eventually all switches will have been tested.

1.06 Test H provides a means of verifying that the alarms have been transferred to the operator office. It is not intended that this test be performed on a routine basis, but as a means of determining that the alarm equipment is functioning to transmit the alarm to the operator office if the AS or ACO key has been operated, or the alarm signaling feature has been disabled, while performing the various tests.

1.07 Lettered Steps: A letter a, b, c, etc, added to a step number in Parts 3 or 4 of this section, indicates an action which may or may not be required depending upon 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.

1.08 These tests should preferably be made during periods of light traffic to minimize interference with normal operations of the alarms, and to reduce the possibility of dial tone delays to subscribers as in Test C.

2. APPARATUS

Test B

2.01 Two WLY cords.

Tests B and F

2.02 No. 477A (or No. 375A) (make busy) tools, as required.

Tests C, D, and E

2.03 WIAF cord, 8 feet, 6 inches long, equipped with a KS-6278 clip at one end and a No. 411A tool at the other end.

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Test E

2.04 No. 509 receiver, 1100 ohms (or equivalent), connected to a W2AB cord, 6 feet long, equipped with two No. 360A tools (2W21A cord), a No. 365 tool, and a No. 411A tool.

Test G

2.05 Two No. 184B plugs, for use when testing permanents associated with connectors that are equipped with permanent signal testing equipment.

2.06 No. 509 receiver, 1100 ohms (or equivalent), connected to a W2AB cord, equipped with two No. 360A tools (2W21A cord) and two No. 411A tools, for use when testing permanents associated with connectors that are not equipped with permanent signal testing equipment.

Test H

2.07 KS-6320 orange stick.

3. PREPARATION

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
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All Tests

- | | | |
|----|--|-------------------------------|
| 1a | If alarm sender cutoff AS or ACO key is provided -
Operate AS key or momentarily depress ACO key | SDR GD or SDR CO lamp lighted |
| 2b | If AS or ACO key is not provided -
Block operated the A and C relays of the alarm sender circuit for offices arranged to transmit alarms over an operator office trunk or block nonoperated the A and B relays of the extension alarm circuit for offices arranged to transmit alarms over an extension alarm circuit, or follow local instructions relative to disabling the signaling feature | |

4. METHOD

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
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A. Line Finder or Trunk Finder (100 and 200 Point), Selector, Coin Control Selector, Reverting Call Selector (197-type Switch), Test Distributor, Coin Control Connector, and Connector Release Alarm

Selector and Connector Shelves Arranged for Odd and Even Switch Release Alarm Operation

- | | | |
|---|--|---|
| 3 | Manually raise and hold shaft of an idle odd-numbered switch on top shelf of group to be tested far enough to allow vertical off-normal springs to close | Within proper time -
Audible alarm sounds
Shelf alarm lamp and aisle pilot lamp (if provided) light |
| 4 | Raise shaft of idle even-numbered switch on same shelf and restore odd-numbered switch to normal

<u>Note:</u> To avoid waiting each time for the timing circuit to function, hold switch on last shelf tested in off-normal position until shaft of switch on next shelf has been raised. | Audible alarm continues to sound
Shelf alarm lamp and aisle pilot lamp (if provided) remain lighted |
| 5 | Repeat Steps 3 and 4 on each succeeding shelf in the alarm group | Alarm lamp associated with shelf previously tested extinguished
Alarm lamp on next shelf lighted
Audible alarm continues to sound |
| 6 | When alarm equipment of last shelf has been tested -
Restore switch to normal | Alarm lamps extinguished
Audible alarm silenced |

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
7	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled— Proceed with Test H (see 1.06)	
<u>Selector Shelves Arranged for Mounting Ten Selectors and Equipped With a Release Alarm Relay for the First Five Selectors and One for the Second Five Selectors</u>		
8	Manually raise and hold shaft of idle selector in first group of five on top shelf of group to be tested far enough to allow vertical off-normal springs to close	Within proper time - Audible alarm sounds Shelf alarm lamp and aisle pilot lamp (if provided) lighted
9	Raise shaft of idle selector in second group of five on same shelf and restore first selector to normal <u>Note:</u> To avoid waiting each time for the timing circuit to function, hold switch on last shelf tested in off-normal position until shaft of switch on next shelf has been raised.	Audible alarm continues to sound Shelf alarm lamp and aisle pilot lamp (if provided) remain lighted
10	Repeat Steps 8 and 9 on each succeeding shelf in the alarm group	Alarm lamp associated with shelf previously tested extinguished Alarm lamp on next shelf lighted Audible alarm continues to sound
11	When alarm equipment of last shelf has been tested - Restore last switch to normal	Alarm lamps extinguished Audible alarm silenced
12	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	
<u>Shelves Provided With One Release Alarm Relay (Includes Selector Shelves with Twenty Switches per Shelf With More Than One Release Relay)</u>		
13	Manually raise and hold shaft of idle switch on top shelf of group to be tested far enough to allow vertical off-normal springs to close <u>Note:</u> In the case of selector shelves there may be more than one release alarm relay depending on traffic peg count requirements. It will be necessary to test each alarm relay by raising a selector shaft in each group of switches associated with an alarm relay and restoring the selector shaft previously raised, noting that the alarm indications continue.	Within proper time - Audible alarm sounds Associated shelf alarm lamp and aisle pilot lamp (if provided) lighted
14	Repeat Step 13 on each succeeding shelf in the alarm group (see note, Step 9)	Alarm lamp associated with shelf previously tested extinguished Alarm lamp on next shelf lighted Audible alarm continues to sound
15	When alarm equipment of last shelf has been tested - Restore last switch to normal	Alarm lamps extinguished Audible alarm silenced
16	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>B. Reverting Call Selector Release Alarm (204-type Selector)</u>		
<u>Selectors Equipped With One 204-type Selector</u>		
3	Make busy a selector on shelf to be tested by inserting No. 477A tool between test jack springs 3 and 4	
4	Short-circuit 1 and 2 off-normal springs of the 204-type selector of switch using WLY cord	Within proper time - Audible alarm sounds Associated shelf alarm lamp and aisle pilot lamp (if provided) lighted
5	Disconnect WLY cord from off-normal springs	Audible alarm silenced Shelf alarm lamp and aisle pilot lamp (if provided) extinguished
6	Remove No. 477A tool from selector test jack springs	
	<u>Note:</u> When shelves are equipped with odd and even switch release alarm equipment, proceed as in Steps 3 to 6, inclusive, on an odd-numbered switch and an even-numbered switch. To avoid waiting each time for the timing circuit to function, short-circuit the off-normal springs of the second switch before disconnecting from the off-normal springs of the first switch.	
7	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	
<u>Selectors Equipped With Two 204-type Selectors</u>		
8	Make busy a selector on shelf to be tested by inserting No. 477A tool between test jack springs 3 and 4	
9	Short-circuit 1 and 2 off-normal springs of the A code 204-type selector of switch using WLY cord	Within proper time - Audible alarm sounds Associated shelf alarm lamp and aisle pilot lamp (if provided) lighted
10	Short-circuit 3 and 4 off-normal springs of the B code 204-type selector using WLY cord	
11	Disconnect WLY cord from 1 and 2 off-normal springs of A code 204-type selector	Audible alarm continues to sound Associated shelf alarm lamp and aisle pilot lamp (if provided) remain lighted
12	Disconnect WLY cord from 3 and 4 off-normal springs of B code 204-type selector	Audible alarm silenced Associated shelf alarm lamp and aisle pilot lamp (if provided) extinguished
13	Remove No. 477A tool from selector test jack springs	

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
14c	If shelves are equipped with odd and even switch release alarm equipment - Repeat Steps 8 through 13 on an odd-numbered switch and an even-numbered switch	
	<u>Note:</u> To avoid waiting for the time circuit to function, short-circuit 1 and 2 off-normal springs of the A code 204-type selector of second switch before disconnecting 3 and 4 springs of 204-type selector of first switch.	
15	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	
<u>C. Line Finder or Trunk Finder (100 and 200 Point) Call Block Alarm</u>		
<u>Circuit Arranged for Major Alarm Only</u>		
3	Operate TST key of group under test	Line finders start hunting Within proper time - CB or C BLK (red) lamp lighted Aisle pilot lamps (if provided) lighted Audible alarm sounds
4	Operate TST key of next group under test and restore TST key of first group tested	CB or C BLK lamp of first group extinguished CB or C BLK lamp of second group lighted Audible alarm continues to sound Aisle pilot lamps (if provided) remain lighted
5	Repeat Steps 3 and 4 for each succeeding group, in turn	
6	When alarm equipment in last group has been tested - Restore its TST key to normal	CB, C BLK, and aisle pilot lamps extinguished Audible alarm silenced
<u>Circuit Arranged for Major or Minor Alarms</u>		
7	Operate TST key of group under test	Each idle finder in turn operates and releases After last finder releases, the first finder reoperates
8	After first finder reoperates - Restore TST key to normal	Line finders cease test operation
9	Using WIAF cord, connect ground to 1T of OB relay of group and alarm relay circuit	Within proper time - AFB lamp lighted Audible alarm sounds
10	Remove ground from 1T of OB relay	AFB lamp extinguished Audible alarm silenced
11	Connect ground to 2T of OB relay	Within proper time - C BLK lamp lighted Audible alarm sounds
12	Remove ground from 2T of OB relay	C BLK lamp extinguished Audible alarm silenced

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>D. Trunk Finder (22 Point) Call Block Alarm</u>		
<u>Circuit Arranged for Major Alarm Only</u>		
3	Connect ground to 1B of A relay of trunk finder in group to be tested using WIAF cord	Within proper time - CB or C BLK lamp lighted Audible alarm sounds Aisle pilot lamp (if provided) lighted
4	Remove ground from relay spring	Audible alarm silenced CB or C BLK lamp extinguished Aisle pilot lamp (if provided) extinguished
5	Repeat Steps 3 and 4 on other groups to be tested	

Circuit Arranged for Major or Minor Alarms

6	To test the major alarm feature - Repeat Steps 3 through 5	
7	To test the minor alarm feature - Connect ground to 3B of D relay of last trunk finder circuit in group using WIAF cord	AFB lamp lighted Within proper time audible alarm sounds Aisle pilot lamp (if provided) lighted
8	Remove ground from relay spring	AFB lamp extinguished Audible alarm silenced Aisle pilot lamp (if provided) extinguished
9	Repeat Steps 7 and 8 on other groups to be tested	
10	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	

E. Switch Frame Fuse Alarm

3	Momentarily apply 48-volt battery to the alarm strip of the fuse to be tested using WIAF cord	Associated FA alarm lamp lighted Aisle pilot lamp (if provided) lighted Audible alarm sounds
4c	If testing connector shelf ringing fuse alarms that have a 35R (0.180 amp) fuse associated with fuse alarm - Apply ground through No.509 test receiver to alarm stud of fuse to be tested <u>Caution: The battery supply provided by a 35R (0.180 amp) fuse should not be used for making any of the fuse alarm tests.</u>	Click heard in receiver
5	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling was disabled - Proceed with Test H (see 1.06)	

F. Selector Permanent Alarm (Except Line Lock-out Permanents)

Selector Shelves Arranged for Odd and Even Switch Permanent Alarm Operation

3c	If PSL key is provided - Operate PSL key	
4	Insert No. 477A tool between test jack springs 1 and 2 of an odd-numbered idle selector on top shelf of group to be tested	Associated shelf permanent lamp lighted Within proper time - Audible alarm (if provided) sounds Aisle pilot lamp (if provided) lighted

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
5	Insert another No. 477A tool between test jack springs 1 and 2 of an even-numbered idle selector on same shelf	
6	Remove No. 477A tool from odd-numbered selector jack	Associated shelf permanent lamp remains lighted Audible alarm (if provided) continues to sound Aisle pilot lamp (if provided) remains lighted
7	Proceed as in Steps 4 through 6 for each succeeding shelf in the alarm group <u>Note:</u> To avoid waiting each time for the timing circuit to function (if the office is provided with either an audible alarm for permanents, or aisle pilot lamps, or both) insert the No. 477A tool into the odd-numbered selector on next shelf to be tested before removing the No. 477A tool from selector on last shelf tested.	Associated shelf permanent lamp previously tested is extinguished Corresponding shelf permanent lamp on next shelf lighted Audible alarm (if provided) continues to sound Aisle pilot lamp (if provided) remains lighted
8	When alarm equipment of last shelf in alarm group has been tested - Remove No.477A tool from selector jack	Associated shelf permanent lamp extinguished Audible alarm (if provided) silenced Aisle pilot lamp (if provided) extinguished
9c	If PSL key is provided - Restore PSL key	
10	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	
<u>Selector Shelves Where Permanent Lamp Is Controlled by One Relay</u>		
11c	If PSL key is provided - Operate PSL key	
12	Insert No. 477A tool between test jack springs 1 and 2 of any idle selector on the top shelf of group to be tested	Associated shelf permanent lamp lighted Within proper time audible alarm (if provided) sounds Aisle pilot lamp (if provided) lighted <u>Note:</u> If testing intertoll selectors the audible alarm associated with the switch release equipment should sound within proper time. The aisle pilot lamp should light (if provided).
13	Insert No. 477A tool between test jack springs 1 and 2 of an idle selector on next shelf of group under test	
14	Remove No. 477A tool from selector test jack on first shelf	Permanent lamp on first shelf extinguished Lamp on second shelf lighted Audible alarm (if provided) continues to sound Aisle pilot lamp remains lighted

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
15	Proceed as in Steps 13 and 14 for each succeeding shelf in alarm group <u>Note:</u> To avoid waiting each time for the timing circuit to function (if the office is provided with either an audible alarm for permanent signals, or aisle pilot lamps, or both) insert the No. 477A tool into the selector test jack on the next shelf to be tested before removing the No. 477A tool from the selector on the last shelf tested.	Associated shelf permanent lamp previously tested extinguished Corresponding shelf permanent lamp on next shelf lighted
16	When alarm equipment of last shelf in alarm group has been tested - Remove No. 477A tool from selector	Associated shelf permanent lamp extinguished Audible alarm (if provided) silenced Aisle pilot lamp (if provided) extinguished
17c	If PSL key is provided - Restore PSL key	
18	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm signaling equipment was disabled - Proceed with Test H (see 1.06)	

G. Connector Permanent Alarm

Offices Equipped With Connector Permanent Signal Testing Equipment

3	Insert No. 184B plug into PS jack associated with top shelf of a particular group of connectors	Shelf permanent lamp lighted Within proper time audible alarm (if provided) sounds Aisle pilot lamp (if provided) lighted
4	Insert No. 184B plug into PS jack associated with second shelf of connectors Remove plug from first shelf PS jack	Permanent lamp associated with first shelf extinguished Second shelf permanent lamp lighted Audible alarm (if provided) continues to sound Aisle pilot lamp (if provided) remains lighted
5	Proceed as in Steps 3 and 4 for each succeeding shelf in alarm group <u>Note:</u> To avoid waiting each time for the timing circuit to function (if the office is provided with either an audible alarm for permanents, or aisle pilot lamps, or both) insert the No. 184B plug into PS jack of next shelf to be tested before removing plug from PS jack of last shelf tested.	Permanent lamp on shelf previously tested extinguished and corresponding lamp on next shelf lighted
6	When alarm equipment on last shelf in alarm group has been tested - Remove No. 184B plug from jack	Shelf permanent lamp extinguished Audible alarm (if provided) silenced Aisle pilot lamp (if provided) extinguished
7	If no further tests are to be performed at this time and the AS or ACO key was operated or the alarm equipment was disabled - Proceed with Test H (see 1.06)	

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>Offices Not Equipped With Permanent Testing Equipment</u>		
8	Step an idle connector on the top shelf of the group to be tested, to the first level by inserting, removing, and rapidly reinserting a No. 477A tool between test jack springs 1 and 2 <u>Caution: The 477A tool should be used with care, to prevent connector from cutting on this level and ringing a subscriber.</u>	
9	Momentarily apply battery through No. 509 receiver to the sleeve wiper	
10	Momentarily short the tip and ring wipers using a test pick (411A tool)	Ringing tripped Shelf permanent lamp lighted Within proper time - Audible alarm (if provided) sounds Aisle pilot lamp (if provided) lighted
11	Repeat Steps 8 through 10 with a connector on the second shelf in group	Ringing tripped Permanent lamp on second shelf lighted Audible alarm and aisle pilot lamp (if provided) remain operated
12	Remove No. 477A tool from connector on first shelf	Permanent lamp on first shelf extinguished Permanent lamp on second shelf remains lighted
13	Repeat Steps 11 and 12 for each succeeding shelf in the alarm group	
14	When alarm equipment of last shelf has been tested - Remove No. 477A tool from connector	Shelf permanent lamp extinguished Audible alarm (if provided) silenced Aisle pilot lamp (if provided) extinguished
15	If no further tests are to be made at this time, and the AS or ACO key has been operated, or the alarm signaling equipment has been disabled - Proceed with Test H (see 1.06)	

H. Verification of Alarm Transfer to Operator Office

3c	If AS key or RA key is provided - Restore AS key or where provided momentarily depress RA key	SDR GD or SDR CO lamp extinguished
4d	If AS or ACO key is not provided and the alarm signaling feature was disabled - Remove blocking tools from A and C relays or A and B relays	
5	Manually raise shaft of an idle selector far enough to insert KS-6320 orange stick between hub of sleeve wiper and upper sleeve bank plates	Within proper time - Audible alarm sounds
6	Verify with operator office that alarm indication was received in usual manner	
7	Restore selector to normal by removing orange stick from shaft	Within proper time - Audible alarm silenced
8	Verify with operator office that alarm indication is retired	