

EMERGENCY ALARM CIRCUIT SD-90437-01
ARRANGED FOR CODE SIGNALING
AND AUTOMATIC FIRE DETECTION
TESTS

1. GENERAL

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1.01 This section describes a method of testing the emergency alarm circuit arranged for code signaling and automatic fire detection per SD-90437-01.

light an associated lamp and operate the auxiliary alarm signals. **5**

1.02 This section is reissued to add Tests B.1 and B.2 for circuits equipped with commercial fire detection equipment. Test F is revised to include a check to ensure the shutdown of the ventilating fans. This reissue affects the Equipment Test List.

B.2 Maintenance Alarm Circuit: This test checks that the alarm lamp lights and the emergency alarms operate when the maintenance alarm loop to commercial fire detecting equipment is opened or crossed with battery or ground. **5**

1.03 The tests covered are.

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A. Code Signal Sending Device: This test checks that when a station box is operated, the MC relay operates and releases the proper number of times for the code of the zone involved and that the proper lamps light. It also checks that when two zones operate at the same time the code for the first zone is completed before the code for the second zone is started. **4**

C. Incoming Alarm Circuit from Distant Office: This test checks that when the tip and ring conductors become short-circuited the DO lamp lights. **6**

B. FT and FR Relays (When Provided): This test checks that when the fire detection loop becomes open or crossed with either battery or ground the FT or FR relay will release and originate an alarm. **5**

D. Outgoing Alarm Circuit to Distant Office: This test checks that when battery or ground is connected to the tip and ring conductors the proper alarm lamps light and the signal is received at the distant office. **6**

B.1 Station Zone Loop: This test checks that a cross with battery or ground in the station zone loop (including the connecting loop to commercial fire detecting equipment when provided) will

E. Manual Control of Incoming Alarm Signal from Distant Office: This test checks that when the D1 relay releases, the proper lamps light and the code signal device operates. **7**

F. Ventilating Fan Control Circuit: This test checks that when any R relay in chain circuit releases, the associated lamp lights and ground is removed to the cut-off relay. A check is made to ensure the shutdown of the ventilating fans when any R relay in the chain releases. **7**

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G. *Horns, Gongs and Signal Supervisory Alarms:*

This test checks that the proper indications are received for fuse alarms and grounded contacts of MC relay in control circuit.

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H. *Final Check:* This test checks that all audible alarms sound and all visual lamps light when the recall signal is sounded.

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1.04 Before testing the emergency alarm circuit arranged for code signaling and automatic fire detection, notify the proper persons before beginning tests and again at completion of these tests.

Caution: If during these tests a regular alarm should originate, the tests should be discontinued immediately so that alarm will sound in the normal manner. Notify the proper persons that a regular alarm is sounding.

1.05 When making tests A, B, B.1, F, and H connect ground to contact 1T of last R relay in chain circuit to prevent fans from stopping. In test F, the ground is temporarily removed to ensure the actual shutdown of the fans.

2. INSPECTIONS

Station Box, Code Signal Sending Device and Relay Box

2.01 Inspect the station boxes, and all boxes which contain the code signal sending devices, and relays associated with each individual zone for the following conditions:

- (1) Firm mounting
- (2) Proper color
- (3) Designations plainly marked
- (4) Finish in good condition
- (5) Ease in opening door of box containing the code signal sending device and the firm mounting of the code signal sending device inside the box.

2.02 Inspect the bulletin holders associated with the station boxes, when provided, to see that they are securely mounted and that the bulletins are easily readable and up to date.

Fire Detection Loops (When Provided)

Caution: These inspections are to be made visually. The fire detection wire should not be handled except when absolutely necessary.

2.03 Inspect the red braid covered fire detection wire to see that it is held in place. Make sure that the wire has not become bent at a sharp angle or kinked excessively since, under some conditions, the wire may become broken due to vibration or slight movements as the result of maintenance effort. Conditions with respect to bends and kinks can be considered satisfactory if the radius of each bend is not less than approximately 1/2 inch. No attempt should be made to straighten bends or kinks. Ordinarily, pieces of wire with bends or kinks of too short a radius should be replaced.

2.04 Check to see that the fire detection wire is dressed approximately 1-1/2 inches in from the cable form in cases where it lies horizontally on skimmers. If the wire has been displaced it should be carefully redressed to its proper position. Check also to see that where the wire is sewed to cable runs or to the underside of distributing frame shelves, the sag between the stitches which hold the wire in place is not greater than approximately 1/4 inch at any point.

2.05 See that the wire does not come closer than approximately 1/2 inch to exposed iron framework except where additional insulation is provided. See also that the pieces of impregnated varnished tubing used to insulate the wire from metal framework are not loose and that they extend at least approximately 1/4 inch beyond the metal at each side.

2.06 Inspect the connecting blocks provided at the end of frame line-ups, at the end of distributing frames, etc, to see that the connecting wire is held firmly under the heads of the screws of the connecting blocks, and that the wire does not touch the framework or the block cover.

3. APPARATUS

3.01 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	B.1	B.2	C	D	E	F	G
Contact Insulator as shown in Fig. 1 (3.02)	1	1	1		1	1	1	1	
Tool (3.03)	1	1	1			1		1	
Key (3.04)	1								
Cords (3.05)		1	1	1	1	1			1
Tools (3.05)		1	1	1	1	1			1
Test Receiver (3.06)								1	

3.02 Contact insulator, fiber, used to insulate contacts of MC relay in control cabinet. See Fig. 1.

3.03 Blocking tools, three 136B tools, as required. Use tools and apply, as covered in Section 069-020-801.

3.04 Station box key used to open and lock the individual station boxes.

3.05 Testing cords, two 893 cords, 6 feet long, each equipped with two KS-6278 tools, for making connections, as required.

3.06 Test receiver, 716C receiver attached to a W2AB cord equipped with two 360 tools (2W21A cord), one KS-6278 connecting clip and one 624B (terminal connector) tool.

3.07 To clean the fiber insulator, use a KS-2423 cloth dampened with KS-7860 petroleum spirits.

4. PREPARATION

STEP	ACTION	VERIFICATION
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Tests A Through F

- 1 Place fiber insulator on upper half of multicontact relay between the fixed contacts on panel and the movable contacts on armature.

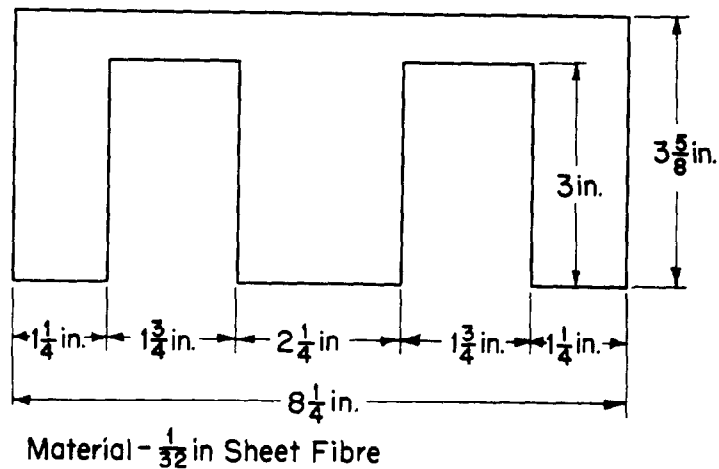


Fig. 1

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STEP	ACTION	VERIFICATION
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Tests A, B, B.1, D, F, and G

2	Block operated DO relay of outgoing alarm circuit.
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Tests A, B, B.1, F, and H

3	Connect ground to contact 1T of last R relay in chain circuit for ventilating fan cutoff relay.
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5. METHOD

A. Code Signaling Sending Device

4	Operate station box— Pull down slide on station box as far as it will go.
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MC relay at control panel operates and releases corresponding to code of zone involved. The code should be repeated four times. LA and LS lamps flash. R lamp for reset alarm and aisle pilot lamp lighted. DC bell at control panel sounds.

5	Restore station box— Open cover and push slide up as far as it will go, close and lock box.
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MC relay releases. LA and LS lamps extinguished.

6	Reset code signal sending device by operating RESET dial in a clockwise direction as far as it will go.
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R lamp and aisle pilot lamp extinguished. DC bell at control panel silenced.

Note: If RESET dial does not lock in, it indicates that zone loop circuit is open.

7	Repeat Steps 4 through 6 until all zones are tested.
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Noninterfering and Successive Features

8	First zone— Pull down slide on station box as far as it will go.
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Same as Step 4.

9	Second zone— Pull down slide on station box as far as it will go while the alarm for first zone is sounding.
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Check operation of MC relay to be sure that four complete sets of signals are received from first zone without interference from second zone, followed by four complete sets of signals from second zone.

10	Repeat Step 5 for both zones.
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11	Repeat Step 6 for both zones.
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STEP	ACTION	VERIFICATION
B. FT and FR Relays (When Provided)		
4	Connect ground to screw terminal of connecting block in fire detection loop— FT relay releases.	MC relay operates and releases according to code for zone involved. LA and LS lamps flash. R lamp and aisle pilot lamp lighted. DC bell at control panel sounds.
5	Remove ground from screw terminal of connecting block— FT relay operates.	MC relay releases. LA and LS lamps extinguished.
6	Reset code signal sending device.	R lamp and aisle pilot lamp extinguished. DC bell at control panel silenced.
7	Connect 48-volt test battery to screw terminal of connecting block in fire detection loop— FR relay releases.	Same as Step 4.
8	Remove battery from screw terminal of connecting block— FR relay operates.	Same as Step 5.
9	Reset code signal sending device.	Same as Step 6.
B.1 Station Zone Loop		
4	At automatic code sending device— Connect ground to SHUNT 2 terminal.	LS lamp lighted. Auxiliary signal bell sounds. Central office alarms and signals activated.
5	Remove ground from SHUNT 2 terminal.	All lamps extinguished. All alarms silenced.
6	Connect battery to SHUNT 1 terminal.	LA lamp lighted. MC relay operates and releases. Auxiliary signal bell sounds. Central office alarms and signals activated.
7	Remove battery from SHUNT 1 terminal.	All lamps extinguished. All alarms silenced.
B.2 Maintenance Alarm Circuit		
1	Connect ground to 6 punching at terminal strip on unit.	M lamp lighted. Emergency alarm bells sound. <i>Note:</i> In some panel type offices, AP lamp is also lighted.
2	Remove ground from 6 punching.	All lamps extinguished. Emergency alarm bells silenced.

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STEP	ACTION	VERIFICATION
3	Connect battery to 5 punching at terminal strip on unit. <i>Note:</i> Connect 24 volts with SD 90641-01 or 48 volts with SD 96052-01 obtained from test battery supply or from circuit side of 1 1/3 ampere fuse.	M lamp lighted. Emergency alarm bells sound. <i>Note:</i> In some panel type offices, AP lamp is also lighted.
4	Remove battery from 5 punching.	All lamps extinguished. Emergency bells silenced.⚡
C. Incoming Alarm Circuit to Distant Office		
2	At MDF— Short-circuit tip and ring conductors from distant office.	DO lamp lighted. MC relay operates and releases at control panel. LA and LS lamps flash. R lamp and aisle pilot lamp lighted. DC bell at control panel sounds.
3	Remove short-circuit from tip and ring conductors.	DO lamp extinguished. MC relay releases. LA and LS lamps extinguished.
4	Rewind and reset code signal sending device.	R lamp and aisle pilot lamp extinguished. DC bell at control panel silenced.
D. Outgoing Alarm Circuit to Distant Office		
3	At MDF— Momentarily connect ground to tip conductor of cable pair outgoing to distant office.	ODO lamp lighted. Subset bell NB at the control cabinet sounds. Major alarm sounds.
4	Momentarily connect 48 or +130 volt battery to ring conductor of cable pair to distant office. <i>Note:</i> Before proceeding with next step, notify distant office that a test is to be made on alarm circuit and request assistant to block operated DP relay in incoming alarm circuit.	Same as Step 3.
5	At MDF— Momentarily connect 48 or +130 volt battery to tip conductor of cable pair outgoing to distant office.	ODO lamp lighted. Subset bell NB at central control panel sounds. Major alarm sounds. <i>Note:</i> Check with assistant at distant office to see if D1 relay released, indicating alarm was received.
6	Momentarily connect ground to ring conductor of cable pair outgoing to distant office.	Same as Step 5.

STEP	ACTION	VERIFICATION
7	At distant office— Remove blocking tool from DP relay and notify assistant that test is completed.	
E. Manual Control of Incoming Alarm Signal from Distant Office		
2	Block nonoperated D1 relay of incoming alarm circuit from distant office.	DO lamp lighted. MC relay at control panel operates and releases. LA and LS lamps flash. R lamp and aisle pilot lamp lighted. DC bell at control panel sounds.
3	Momentarily operate CO key associated with an incoming alarm circuit from a distant office.	GD lamp lighted.
4	Remove blocking tool from D1 relay.	DO and GD lamps extinguished. MC relay releases. LA and LS lamps extinguished.
5	Reset code signal sending device.	R lamp and aisle pilot lamp extinguished. DC bell at control panel silenced.
6	Repeat Steps 2 through 5 for all other incoming alarm circuits.	
7	Remove blocking tool from D1 relay.	
F. Ventilating Fan Control Circuit		
4	Block nonoperated R relay whose order of appearance is last in chain circuit.	R lamp lighted.
5	Remove ground to contact 1T of last R relay in chain circuit.	Ventilating fans shut down.
6	Reconnect ground to contact 1T of last R relay in chain circuit.	Ventilating fans running.
7	Block nonoperated preceding R relay.	R lamp lighted. Ground removed from contact 1T.
8	Remove blocking tool from R relay.	R lamp extinguished. Ground present on contact 1T of R relay.
9	Repeat Steps 7 and 8 for remaining R relays.	
10	Remove blocking tool from last R relay.	R lamp extinguished.

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STEP	ACTION	VERIFICATION
G. Horns, Gongs and Signal Supervisory Alarms		
3	Momentarily connect ground to each contact of MC relay.	Corresponding horn or gong sounds. Refer to office records for proper indications. SS lamp lighted. DC bell at control panel operated.
Supervisory Alarm Circuit		
4	Connect alarm bar of fuse panel to terminal of a fuse.	FA lamp and aisle pilot lamp lighted. Subset bell at control panel sounds.
5	Remove connection from alarm bar and terminal of fuse.	FA lamp and aisle pilot lamp extinguished. Subset bell silenced.
H. Final Check		
4	Remove contact insulator from MC relay.	
5	Remove blocking tool from DO relay in outgoing alarm circuit.	
6	Remove ground from contact 1T of last R relay in chain circuit for ventilating fans.	
7	Operate MAN SIG key.	MC relay operates, horns and gongs sound, alarm lamp lighted.
8	Release MAN SIG key.	MC relay releases. All visual lamps extinguished. All audible alarms silenced.