

**EMERGENCY ALARM CIRCUIT SD-90560-01 OR SD-96049-01**  
**ARRANGED FOR ZONE INDICATING LAMPS**  
**AND AUTOMATIC FIRE DETECTION**  
**MULTI-ZONE**  
**TESTS**

**1. GENERAL**

**PAGE**

**1.01** This section describes tests and inspections of the multi-zone emergency alarm circuit arranged for zone indicating lamps and automatic fire detection per SD-90560-01 and SD-96049-01.

that when the tip and ring conductors are short circuited, the alarm lamp and the zone indicating lamps light. . . . .

**6**

**1.02** This section is reissued for the following reasons.

- (a) Delete Test B.1
- (b) Revise Test H
- (c) Revise Part 3 and Table A
- (d) Make minor changes as required.

**D. Horns, Gongs, and Signal Supervisory Alarms:** This test checks that the proper indications are received when the contacts of the MC relay in the control circuit become grounded. . . . .

**7**

**E. Operating Room Signal Silencing Circuit:** This test checks that the emergency alarm bell in the operating room is silenced when the key in the silencing circuit is depressed. . . . .

**7**

This reissue affects Equipment Test Lists.

**F. Supervisory Alarm Circuits:** This test checks that the proper central office alarms and lamp indications are received when the MAN SIG key is operated or when a fuse is operated. . . . .

**7**

**1.03** The tests covered are:

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**A. Station Box and Zone Indicating Lamps:** This test checks that when the station box slide is operated, the zone indicating lamp lights for that particular zone. . . . .

**5**

**B. Zone Relays:** This test checks that the zone relay releases and activates an alarm if the fire detection loop or loop to commercial fire detection equipment is opened or crossed with battery or ground. . . . .

**5**

**B1. Deleted.** . . . . .

**6**

**C. Incoming Alarm Circuit from Distant Office:** This test checks

**G. Outgoing Alarm Circuit to Distant Office:** This test checks that the alarm lamp lights and the subset bell NB operates when the cable conductors become crossed with battery or ground. . . . .

**8**

**H. Ventilating Fan Control Circuit:** This test checks that when the fire detection loop or loop to commercial fire detecting equipment is opened or ground is removed from ventilating fan control circuit, the fans will automatically stop. . . . .

**9**

*should not be handled except when absolutely necessary.*

**I. Final Check:** This test checks that all audible alarms sound and all visual lamps operate after completing previous tests. . . . . **10**

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

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

**1.05** When performing Tests A, B, C, and H, the contacts of last ZR or ZT relay in chain circuit for ventilating fans must be grounded. This prevents the ventilating fan cutoff relay from releasing except for a part of Test H which checks the actual release of the cutoff relay.

**2. INSPECTIONS**

**Station Boxes, Zone Indicating Lamp Cabinets and Central Control Cabinet**

**2.01** Inspect the station boxes, the zone indicating lamp cabinets and the central control cabinet for the following conditions:

- (a) Firm mounting
- (b) Proper color
- (c) Designations plainly marked
- (d) Finish in good condition
- (e) Ease in opening doors of control cabinet

**2.02** Inspect bulletin holders, 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:** *Inspections of the fire detection wire are to be made visually. This wire*

**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 such conditions, the wire may become broken due to vibration or slight movements. Conditions with respect to kinks and bends 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 kinks or bends. Ordinarily, pieces of fire detection wire with kinks or bends of too short a radius should be replaced.

**2.04** Check to see that the fire detection wire is depressed approximately 1-1/2 inches in from the cable form in cases where it lies horizontally on skinners. If the wire has been appreciably 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 fiber clips or varnished tubing is provided as additional insulation. See also that the pieces of impregnated varnished tubing used to insulate the wire from metal framework are not loose and that they extend approximately 1/4 inch or more beyond the metal at each side.

**2.06** Inspect the connecting blocks provided at the end of frame lineups, 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.

**2.07 Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 5 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 a test. Where a condition does not apply, all steps designated by that letter should be omitted.

**3. APPARATUS**

are covered in the paragraph indicated by the number in parentheses.

**3.01** The apparatus required for each test is shown in Table A. The details of each item

→TABLE A←

APPARATUS	TESTS							
	A	B	C	D	E	F	G	H
Contact insulator as shown in Fig. 1 (3.02)	1	1	1		1	1	1	1
136B tool (3.03)	2	2	2	1	1	1		1
Key (3.04)	1							1
Test cord (3.05)	2	2	2	1		1	1	1
Connecting clip (3.06)	4	4	4	2		2	2	3
624B tool (3.07)								1
Test receiver (3.08)								1
Contact insulator (3.09)								√

√ As required

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

*Note:* The fiber contact insulator is cleaned with the KS-2423 cloth, dampened with KS-7860 petroleum spirits.

**3.03** Blocking tool, 136B tool. Use tool 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 cord, one 893 cord, 6 feet long, equipped with 360A tools (1W13B cord).

**3.06** KS-6278 connecting clip. For use with 1W13B cord and 716C test receiver.

**3.07** 624B (terminal connector) tool. For use with 716C test receiver.

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

**3.09** Contact insulators, as required. Use tools and apply as covered in Section 069-020-801.

**4. PREPARATION**

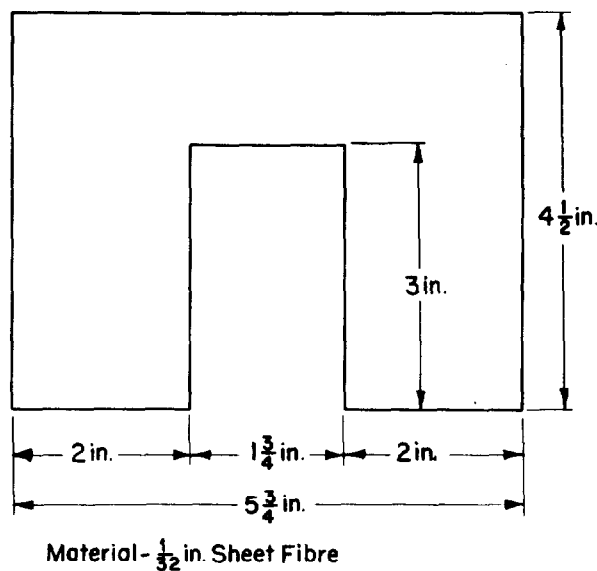
STEP	ACTION	VERIFICATION
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**Tests A, B, C, and E through H**

1	Insulate contacts of MC relays in control cabinet by inserting a fiber contact insulator. See Fig. 1.	
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**Tests A, B, and C through F**

2	Block operated DO relay in outgoing alarm circuit.	
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**Fig. 1**

STEP	ACTION	VERIFICATION
<b>Tests A, B, C, and H</b>		
3	Block operated MA relay.	
<b>5. METHOD</b>		
<b>A. Station Box and Zone Indicating Lamps</b>		
4	Ground the following contacts depending on the SD and figure used. See 1.05. SD-90560-01— Fig. 12, N option, 2T of ZT relay. Fig. 12, Q option, 2T of ZR relay. SD-96049-01— Fig. 13, 2T of ZR relay. Fig. 15, 7T of ZT relay and 7T of ZR relay.	
5	To operate station box— Pull down slide as far as it will go.	Zone signal lamp lighted. MC relay in signal control circuit operated.
6	Operate STOP key.	MC relay releases. Auxiliary bell and major alarm sound.
7	Restore STOP key.	
8	To restore station box— Open cover, push slide up, close and lock.	Zone signal lamp extinguished. Auxiliary bell and major alarm silenced.
9	Repeat Steps 4 through 8 until all station boxes have been tested.	Same as Steps 4 through 8.
10	Remove ground from contact of ZT or ZR relay, unless other tests are to be performed.	
11	Remove blocking tools from DO and MA relays.	
<b>B. Zone Relays</b>		
4	Ground the following contacts depending on SD and figure used. See 1.05. SD-90560-01— Fig. 12, N option, 2T of ZT relay. Fig. 12, Q option, 2T of ZR relay. SD-96049-01— Fig. 13, 2T of ZR relay. Fig. 15, 7T of ZT relay and 7T of ZR relay.	
5a	If zone relays are connected to fire detection loop— Connect ground to screw terminal of one of the connecting blocks in fire detection loop.	Zone signal lamp lighted. MC relay in signal control circuit operated.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
6b	If zone relays are connected to loop to commercial fire detecting equipment— Connect ground to ZR punching of terminal strip on central bay.	Zone signal lamp lighted. MC relay in signal control circuit operated.
7	Operate STOP key.	MC relay releases. Auxiliary bell and major alarm sound.
8	Restore STOP key.	
9	Remove ground connected in Step 5a or 6b.	Zone signal lamp extinguished. Auxiliary bell and major alarm silenced.
10a	If zone relays are connected to fire detection loop— Connect battery to screw terminal of one of the connecting blocks in fire detection loop.  <i>Note:</i> Connect 24 volts with SD-90560-01 or 48 volts with SD-96049-01 obtained from test battery supply or from circuit side of 1-1/3 ampere fuse.	Zone signal lamp lighted. MC relay in signal control circuit operated.
11b	If zone relays are connected to loop to commercial fire detecting equipment— Connect battery to ZT punching of terminal strip on central bay.	Zone signal lamp lighted. MC relay in signal control circuit operated.
12	Operate STOP key.	MC relay releases.
13	Restore STOP key.	MC relay does not operate.
14	Remove battery connected in Step 10a or 11b.	Zone signal lamp extinguished.
15	Remove ground from contact of ZT or ZR relay unless other tests are to be performed.	
16	Remove blocking tools from DO and MA relays.	

**B1. Deleted**

**C. Incoming Alarm Circuit from Distant Office**

- 4 Ground the following contacts, depending on the SD and figure used. See 1.05.
- SD-90560-01—  
Fig. 12, N option, 2T of ZT relay.  
Fig. 12, Q option, 2T of ZR relay.  
SD-96049-01—  
Fig. 13, 2T of ZR relay.  
Fig. 15, 7T of ZT relay and 7T of ZR relay.

STEP	ACTION	VERIFICATION
5	At MDF— Short circuit tip and ring conductors from distant office.	DO <b>incoming</b> pilot lamp lighted at central control cabinet. Zone signal lamp lighted. MC relay in signal control circuit operates.
6	Remove short circuit from tip and ring conductors.	DO <b>incoming</b> pilot lamp and zone signal lamp extinguished. MC relay releases.
7	Remove ground from contact of ZT or ZR relay unless other tests are to be performed.	
8	Remove blocking tools from DO (in outgoing alarm circuit) and MA relays.	

#### D. Horns, Gongs, and Signal Supervisory Alarms

3	Momentarily ground contact of MC relay.	Corresponding signal supervisory SS lamp lighted momentarily. Auxiliary bell and major alarm momentarily sound.
4	Remove blocking tool from DO relay.	

#### E. Operating Room Signal Silencing Circuit

3	In operating room— Depress operating room silencing key.	SS lamp lighted in signal supervisory circuit. <b>AUX</b> bell at control cabinet sounds. Major alarm sounds.
		<i>Note:</i> Where an outgoing alarm circuit to a distant office is provided, the <b>AUX</b> bell and central office major alarm will not function since the DO relay is blocked operated.
4	Release silencing key.	SS lamp extinguished. <b>AUX</b> bell silenced. Major alarm silenced.
5	Remove blocking tool from DO relay.	

#### F. Supervisory Alarm Circuits

##### No Battery and Fuse Alarm

3	Connect alarm bar of fuse panel to circuit terminal of fuse.	Fuse alarm FA lamp lighted. Subset bell NB operates. Major alarm sounds.
4	Remove connection from panel.	FA lamp extinguished. Subset bell NB silenced. Major alarm silenced.

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STEP	ACTION	VERIFICATION
<b>Signal Control Relay Supervisory Alarm</b>		
5	Operate MAN SIG key.	MC lamp lighted. MC relay in signal control circuit operates. ◆AUX◆ bell at control cabinet sounds and aisle pilot lamps light on the various alarm boards, trouble desk, or annunciator cabinets, as provided.
6	Release MAN SIG key.	All lamps extinguished. All audible alarms silenced.
7	Remove blocking tool from DO ◆outgoing alarm circuit◆ relay.	
<b>G. Outgoing Alarm Circuit to Distant Office</b>		
2	At MDF— Connect ground to tip conductor of pair to distant office.	Subset bell NB sounded. Major alarm sounded. ODO lamp lighted.
3	Remove ground from tip conductor.	Subset bell NB silenced. Major alarm silenced. ODO lamp extinguished.
4	Connect 24-volt battery with SD-90560-01 or 48-volt battery with SD-96049-01 to ring conductor of same pair.  <i>Note:</i> Where SD-90560-01 and SD-96049-01 have been modified for long range operation to a distant office, use +130 volt battery in making this test.	Subset bell NB sounded. Major alarm sounded. ODO lamp lighted.
5	Remove battery from ring conductor.	Subset bell NB silenced. Major alarm silenced. ODO lamp extinguished.
6	Notify distant office that a test of the outgoing alarm circuit is to be made.	
7	At distant office incoming alarm circuit— Manually operate DP relay.  <i>Note:</i> DP relay should be held operated until test is complete.	
8	Instruct distant office to observe associated DI relay.  <i>Note:</i> Release of DI relay indicates receipt of an alarm signal from outgoing office.	



STEP	ACTION	VERIFICATION
9	Connect 24-volt battery with SD-90560-01 or 48-volt battery with SD-96049-01 to tip conductor of same pair.  <i>Note:</i> Where SD-90560-01 and SD-96049-01 have been modified for long-range operation to a distant office, use +130 volt battery in making this test.	Subset bell NB sounded. Major alarm sounded. ODO lamp lighted.  <i>Note:</i> Check distant office to verify that alarm was received.
10	Remove battery from tip conductor.	Subset bell NB silenced. Major alarm silenced. ODO lamp extinguished.
11	Connect ground to ring conductor of same pair.	Subset bell NB sounded. Major alarm sounded. ODO lamp lighted.  <i>Note:</i> Check distant office to verify that alarm was received.
12	Remove ground from ring conductor.	Subset bell NB silenced. Major alarm silenced. ODO lamp extinguished.
13	Notify distant office that test has been completed.	

#### H. Ventilating Fan Control Circuit

- 4 Connect ground to the following contacts, depending on the SD and figure used. See 1.05.

SD-90560-01—  
Fig. 12, N option, 2T of ZT relay.  
Fig. 12, Q option, 2T of ZR relay.  
SD-96049-01—  
Fig. 13, 2T of ZR relay.  
Fig. 15, 7T of ZT relay.

- 5 Insulate contacts as follows—  
SD-90560-01—  
If equipped with Fig. 3—  
1, 2, 3T of last ZT relay.  
If equipped with Fig. 12—  
3, 4, 5T of last ZR relay.  
1, 2, 3T of last ZT relay (Option Q).  
3, 4, 5T of last ZT relay (Option N).  
SD-96049-01—  
If equipped with Fig. 13—  
3, 4, 5T of last ZR relay.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
	If equipped with Fig. 15— 4, 5, 6T of ZR and ZT relays.◆	
6	Operate station box in zone where ZR relay is last in order of appearance in chain circuit.	
7	Operate station box in first zone.	Zone lamp lighted. Ground missing on the following contacts of the last ZR or ZT relay.  SD-90560-01— ◆Fig. 12, contacts 1T and 3T of ZR relay.◆  SD-96049-01— Fig. 13, contacts 1T and 3T of ZR relay. Fig. 15, contacts 8T and 6B of ZR and ZT relays.
8	Remove ground which was connected to contact of ZT or ZR relay in Step 4.	Ventilating fans shut down.
9	Reconnect ground to contact of ZT or ZR relay.	Ventilating fans running.
10	Open cover, push slide up, close and lock station box in first zone.	Zone lamp extinguished. Ground returned to contacts in Step ◆7.◆
11	Repeat Steps 7 and 10 until each zone has been tested.	
12	Remove ground from last ZR or ZT relay.	
13	Remove insulating tool from last ZR or ZT relay.	
14	◆Remove blocking tool from MA relay.◆	
<b>I. Final Check</b>		
1	Notify distant office that signal from emergency alarm circuit should be received.	
2	Remove all blocking and insulating tools and all test cords from circuits.	
3	Operate MAN SIG key.	All audible alarms sound. All visual lamps lighted.
4	Restore MAN SIG key.	All audible alarms silenced. All visual lamps extinguished.