

## EMERGENCY LIGHTING EQUIPMENT TESTS AND INSPECTIONS

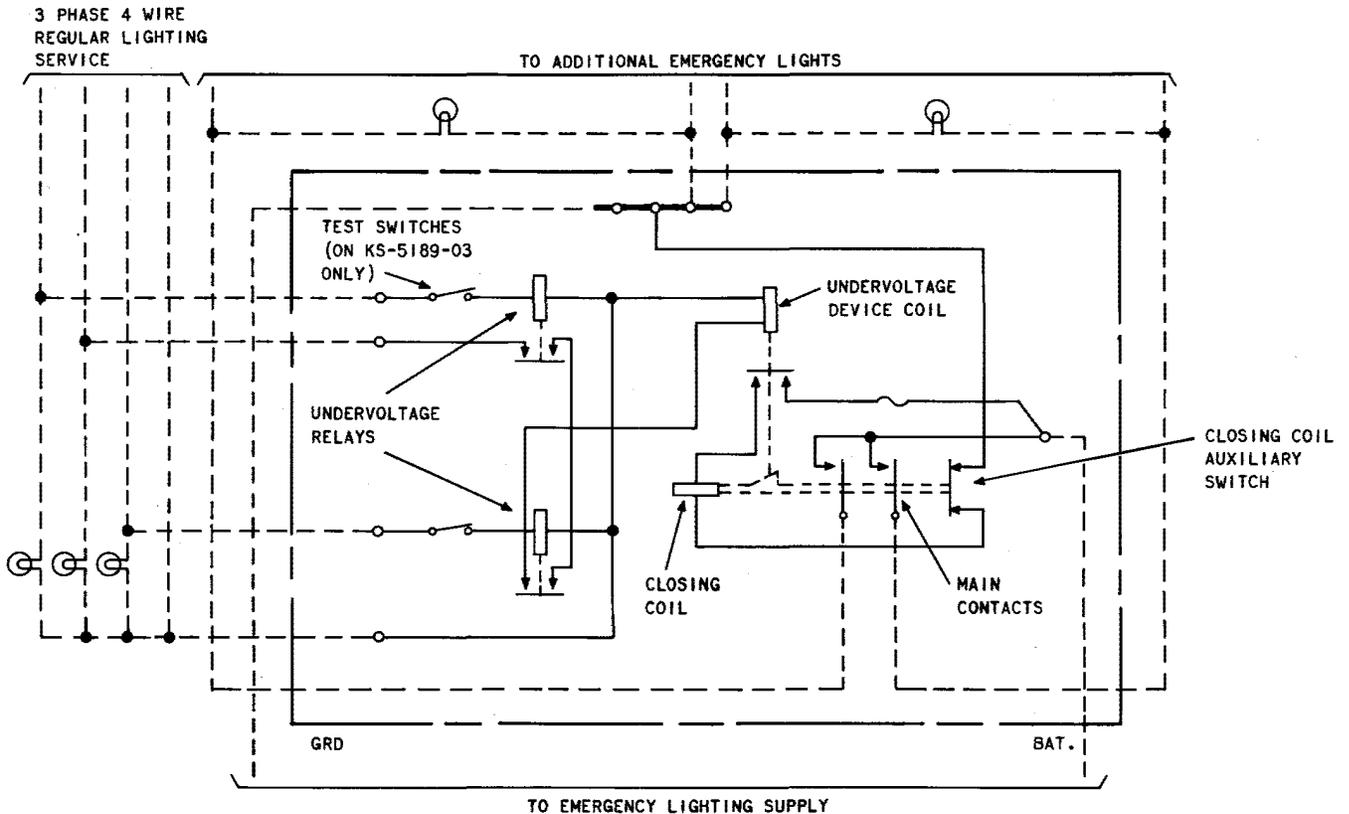
### 1. GENERAL

**1.01** This section covers a general procedure for testing and inspecting the emergency lighting system which is arranged to close a circuit from the central office battery to emergency DC lighting during periods of failure, or of low voltage, of the commercial AC lighting circuit.

**1.02** This section is reissued to revise the format of the section and to reference Section 155-002-300. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted. This issue does affect the Equipment Test List.

**1.03 *Circuit Operation:*** An automatic relay switch, such as the KS-5189, KS-5189-01,

KS-5189-02, or KS-5189-03, is arranged to close a circuit from the central office battery to the emergency DC lighting in the event of the failure, or of low voltage, of the commercial AC lighting circuit. The emergency lighting relay switch, for single-phase service, consists essentially of a contactor and undervoltage device. For operation on multiphase service, an undervoltage relay is connected across each additional phase as shown in Fig. 1. The contacts of the undervoltage relays are connected in series with undervoltage device. The contacts of the undervoltage relays are closed when the voltage of the commercial AC service is satisfactory. The contacts open when the voltage is too low and release the undervoltage device which completes the circuit to operate the contactor and connect the emergency DC lights. The contactor locks closed mechanically which de-energizes the closing



TPA 551054

**Fig. 1—Emergency Lighting Relay Switch Circuit Schematic**

**SECTION 171-140-501**

coil. When the voltage of the commercial AC service rises sufficiently, the undervoltage device is again energized and opens the contactor. On early circuits, both the battery and ground were fed through the contactor. On later circuits only the battery of the undervoltage relays are closed when the voltage of the commercial AC service is satisfactory. The contacts open when the voltage is too low and release the undervoltage device which completes the circuit to operate the contactor and connect the emergency DC lights. The contactor locks closed mechanically which de-energizes the closing coil. When the voltage of the commercial AC service rises sufficiently, the undervoltage device is again energized and opens the contactor. On early circuits, both the battery and ground were fed through the contactor. On later circuits only the battery circuit is broken as shown in Fig. 1.

**1.04** The voltage level, at which the automatic relay switch closes the emergency lighting circuit and similarly the level at which the emergency lighting circuit is cut off, is determined by the characteristics of the undervoltage relay coils which control the contactor. These characteristics are fixed at the factory and are not adjustable in the field. For this reason additional procedures to determine whether the switch will function satisfactorily in case of low voltage conditions of the AC lighting circuits are not checked in this procedure.

**2. LIST OF TOOLS**

CODE OR SPEC NO.	DESCRIPTION
TOOL	
—	Fuse Puller

**3. REQUIREMENTS**

**3.01** The Emergency Lighting Equipment Tests and Inspections should be made annually at all attended or unattended offices. These tests and inspections should be performed in conjunction with the Power Plant Emergency Operation Tests as covered in Section 155-002-300.

**3.02** If, during the course of these tests and inspections, defects or improper adjustments are found which might render the system inoperative, they should be corrected at once. Refer to the appropriate Bell System Practice which applies.

SECTION	EQUIPMENT
030-742-701	KS-5189, KS-5189-01
030-742-701	KS-5189-02, KS-5189-01

**3.03** These procedures require the services of only one person.

**4. METHOD OF PROCEDURE**

**4.01** Depending on local conditions, such as the reliability of the regular lighting service, the length of time the emergency lighting relay switch is to be out of service, and whether at night, it is suggested that consideration be given to providing emergency lights during the time the switch is out of service. This may be accomplished by connecting the DC leads through a fuse to bypass the switch.

**4.02** Before proceeding with the inspection in 4.03 and 4.04, be sure the emergency lighting equipment is removed from service by opening the DC supply at the fuse board (the small fuse on the switch is in the circuit through the closing coil and its removal does not take the voltage from the main contacts) and opening the AC supply directly ahead of the switch.

**Caution:** Always use a fuse puller when removing or replacing fuses. Avoid touching metallic parts of the fuse, fuse mounting, or leads as well as grounded metalwork of cabinets, conduit systems, frames, racks, etc.

**4.03** Remove the DC fuses and then the AC fuses from the emergency lighting equipment to remove the switch from service. Inspect the automatic relay switch to see that the contacts appear to have proper separation, that they are in good condition, and that neither contacts or coils show evidence of overheating. Contacts which are burned or discolored from overheating should be replaced. If there is evidence of overheating of coils or contacts, the temperature of these parts should be checked in accordance with the section which applies.

**4.04** Close and then release the main DC contacts of the switch by moving the carrier arm manually, and note that these contacts appear to have proper pressure and follow. Note also, in the case of switches equipped with carbon contacts, that the carbon contacts close first and break last.

**4.05** Install the AC and DC fuses in the emergency lighting equipment. Simulate a power failure by operating the test switch in the lead which normally supplies current from the AC lighting circuit to the holding coil of the automatic relay switch, to the OFF position. Where a test switch is not provided, open this circuit by removing the AC fuse. In this manner open and close the AC circuit to the holding coil three or four times and note that each operation and release of the switch is definite and positive without any hesitating, chattering, or excessive noise.

**4.06** Where undervoltage relays are associated with the automatic relay switch, open the AC lead to each undervoltage coil by opening the test switch or removing the AC fuse. Note that the contacts of each undervoltage relay are opened.

**4.07** While the automatic relay switch is operated, inspect the emergency lights and note that all of them are lighted. Any burned out lamps should be immediately replaced.

**4.08** Install all DC and AC fuses to restore the emergency lighting system to service. Note that the fuse or fuses in all leads are of the proper type and rating as stenciled on the switch panel.

**Note:** 3-ampere fuses are used in the AC supply to the holding coils of the emergency lighting relay switches on 48-volt emergency lighting systems, and 5-ampere fuses are used for this purpose when switches of this type are used with 24-volt emergency lighting systems.

## **5. REPORTS**

**5.01** The required record of these tests and inspections should be entered on the proper form in accordance with local instructions.

**5.02** Items found to be unsatisfactory during the course of these tests and inspections should be entered on the POWER PLANT EMERGENCY TEST, OFFICE SUMMARY REPORT as covered in Section 155-002-300.