



INSTRUCTIONS

GEK-65696

**STATIC AUXILIARY TRIPPING RELAY
TYPE SLAT52E**

GENERAL  ELECTRIC

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STATIC AUXILIARY TRIPPING RELAY

TYPE SLAT52E

DESCRIPTION

The Type SLAT52E relay is a static auxiliary tripping unit which provides extra output circuits when used with a compatible Type SLAT tripping unit.

The SLAT52E relay is packaged in a two-rack unit (one rack unit equals 1-3/4 inches) enclosed metal case suitable for mounting on a 19-inch rack. The outline and mounting dimensions are shown in Fig. 1. The internal connections for the relay are shown in Fig. 2. The component and card locations are shown in Fig. 3.

The following functions are provided on the SLAT52E relay:

1. Six electrically separate, silicon controlled rectifier (SCR) tripping circuits; each containing a series hand-set mechanical target. This information is also listed on the nameplate.
2. One contact converter for disabling all SCR output circuits.

APPLICATION

The SLAT52E is an auxiliary relay unit for applications of solid state transmission line protective equipment which require additional output circuits. The relay provides six additional SCR trip outputs with hand-reset electromechanical targets.

These output functions are the same as those provided in the standard SLAT relays and are directly cabled into the associated SLA via the C171, C551 cable. The SCR output leads must be connected directly to the standard surge filter (0.1 microfarad capacitors to ground and bifilar-wound, three millihenry choke) before making connections to the external breaker control circuits.

RATINGS

The Type SLAT52E relay is designed for use in an environment where the air temperature outside the relay case does not exceed 65°C.

The unit requires a regulated plus or minus 15 volt DC power source which can be obtained from a Type SSA power supply.

The SCR tripping circuits are rated for 48/125 or 250 volts DC. Each has a 1.0 ampere series target. The tripping circuits are designed to carry 30 amperes for one second.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

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The contact converter is designed to work with inputs of 48, 125 or 250 volts DC (tapped inputs on the A121 card, position S, are used to determine pickup voltage).

BURDENS

The burden is only a few milliamperes in the standby mode of operation, and less than 100 milliamperes in the trip mode.

TARGETS

Six electromechanical target coils are included; one in series with each SCR. These targets operate on one ampere of trip current when the associated SCR passes current. The trip circuit resistance in the relay is 0.40 ohm.

LOGIC CIRCUITS

The functions of the Type SLAT52E relay involve basic logic (AND, OR and NOT) where the presence or absence of signals, rather than their magnitude, controls the operation. Signals are measured with respect to a reference bus accessible at TP1. In general, a signal below one volt DC represents an OFF or LOGIC ZERO condition, an ON or LOGIC ONE state is represented by a signal of approximately plus 15 volts DC.

The symbols used on the internal connection diagram (Fig. 2) are explained by the legend shown in Fig. 5.

CONSTRUCTION

The SLAT52E relay is packaged in an enclosed metal case with hinged front cover and removable top cover. The outline and mounting dimensions of the case and the physical location of the components are shown in Fig. 1 and 3, respectively.

The SLAT52E relay may contain two printed circuit cards identified by code numbers such as L137 and A121, where A designates an auxiliary function, and L designates a logic function. The printed circuit cards plug in from the front of the unit. The sockets are marked with letter designations or "addresses," which appear on the guide strips in front of each socket, on the component location drawing, on the unit internal connection diagram, and on the printed circuit card. The test points (TP1, TP2, etc.) shown on the internal connections diagram are connected to instrument jacks on a test card in position T with TP1 at the top of the T card. TP1 is tied to reference; TP10 is tied to plus 15 volts DC through a 1.5K resistor. The resistor limits the current when TP10 is used to supply a logic signal to a card. TP2 is connected to minus 15 volts.

The SLAT52E relay receives its inputs from the associated Type SLA relay via the C171 and C551 ten-conductor shielded cables. The sockets for these cables and the six-conductor power supply cable are located on the rear panel of the unit. The SLAT52E output functions are connected to 12-point terminal strips, which are also located on the rear of the unit.

A window is provided in the hinged cover of the relay to allow target lamps and the mechanical targets to be seen. Push buttons are also provided to reset the targets and lamps without opening the cover.

RECEIVING, HANDLING AND STORAGE

These relays will normally be supplied as part of a static relay equipment, mounted in a rack or cabinet with other static relays and test equipment. Immediately upon receipt of a static relay equipment, it should be unpacked and examined for any damage sustained in transit. If injury or damage resulting from rough handling is evident, file a damage claim at once with the transportation company and promptly notify the nearest General Electric Sales Office.

Reasonable care should be exercised in unpacking the equipment. If the equipment is not to be installed immediately, it should be stored indoors in a location that is free from moisture, dust, metallic chips, and severe atmospheric contaminants.

Just prior to final installation, the shipping support bolt should be removed from each side of all relay units, to facilitate possible future unit removal for maintenance. These shipping support bolts are approximately eight inches back from the relay front panel. STATIC RELAY EQUIPMENT, WHEN SUPPLIED IN SWING RACK CABINETS, SHOULD BE SECURELY ANCHORED TO THE FLOOR OR TO THE SHIPPING PALLET TO PREVENT THE EQUIPMENT FROM TIPPING OVER WHEN THE SWING RACK IS OPENED.

TEST INSTRUCTIONS

CAUTION

IF THE SLAT52E RELAY THAT IS TO BE TESTED IS INSTALLED IN AN EQUIPMENT WHICH HAS ALREADY BEEN CONNECTED TO THE POWER SYSTEM, DISCONNECT THE OUTPUTS TO THE SYSTEM DURING TEST.

GENERAL

The SLAT52E relay is supplied from the factory either as a separate unit, or mounted in a static relay equipment associated with measuring relays, a Type SSA power supply, and some form of channel equipment. All relay units for a given terminal of static relaying equipment are tested together at the factory, and each unit will have the same summary number stamped on its nameplate.

OPERATIONAL CHECKS

Operation of the SLAT52E unit can be checked by observing the signals at the test points (TP1 to TP10) in the unit, or by observing the output functions. The test points are located on test cards in position T, and are numbered 1 to 10 from top to bottom. TP1 is the reference bus for the logic circuit, TP10 is at plus 15 volts DC. The remaining points are located at various strategic points throughout the logic as shown in the internal connection diagram (Fig. 2). Test point voltages can be monitored with a portable high impedance voltmeter, the voltmeter on the test panel of the associated equipment, or an oscilloscope.

TEST CARD ADAPTER

The test card adapter provides a convenient means of gaining access to any pin of a particular card. Detailed information on the use of the test adapter card is included in the card instruction book GEK-34158.

TRIP CIRCUIT TESTS

The trip circuits and series mechanical targets may be checked by connecting an auxiliary lock-out relay, such as the Type HEA relay, in series with the SCR circuit. A typical circuit is shown in Fig. 6. The HEA relay should have the same DC rating as the SCR trip circuit of the SLAT52E. If an auxiliary lock-out relay is not available, it can be replaced by a resistive load which limits the trip circuit current to three amperes. In most equipments, the SCR can be gated by operating a test push button in the associated units, or by connecting TP3, TP4 or TP5 to TP10.

Prior to final installation, a check of the overall trip circuit should be made with the SCR outputs connected to trip the circuit breakers.

OVERALL EQUIPMENT TESTS

After the SLAT52E relay and the associated static relay units have been individually calibrated and tested for the desired settings, a series of overall operating circuit checks is advisable.

The elementary, overall logic, and logic description for the specific job will be useful for determining the overall operation of the scheme.

An overall equipment test can be performed by applying alternating current and voltages to the measuring units as specified in the instruction book for the measuring units and checking that proper outputs are obtained when the measuring units operate.

MAINTENANCEPERIODIC TESTS

It should be sufficient to check the outputs produced at test points in the SLAT52E when periodic calibration tests are made on the associated measuring units, for example, the phase and ground relays in line relaying scheme. No separate periodic tests on the relay itself should be required.

TROUBLESHOOTING

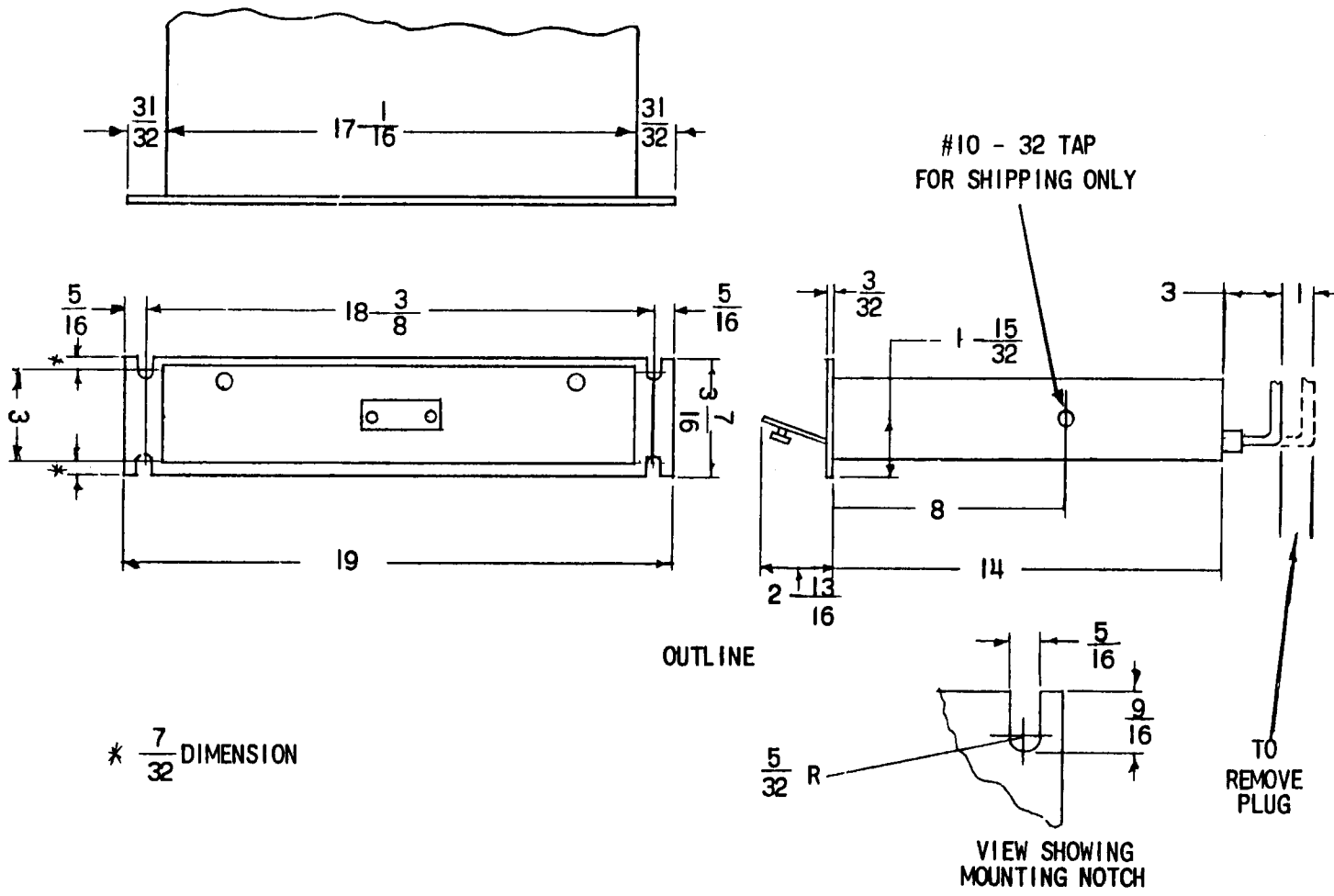
In any troubleshooting of equipment, it should first be established which unit is functioning incorrectly. The overall logic diagram supplied with the equipment shows the combined logic of the complete equipment and the various test points in each unit. By signal tracing, using the overall logic diagram and the various test points, it should be possible to quickly isolate the trouble.

A test adapter card is supplied with each static relay equipment to supplement the prewired test points on the test cards. Use of the adapter card is described in the card instruction book GEK-34158.

A dual-trace oscilloscope is a valuable aid to detailed troubleshooting, since it can be used to determine phase shift, operate and reset times as well as input and output levels. A portable dual-trace oscilloscope with a calibrated sweep and trigger facility is recommended.

SPARE PARTS

To minimize possible outage time, it is recommended that a complete maintenance program should include the stocking of at least one spare card of each type. It is possible to replace damaged or defective components on the printed circuit cards, but great care should be taken in soldering, so as not to damage or bridge-over the printed circuit buses, or overheat the semiconductor components. The repaired areas should be recovered with a suitable hi-dielectric plastic coating to prevent possible breakdowns across the printed buses due to moisture and dust. The wiring diagrams for the cards in the SLAT52E relay are included in the card instruction book GEK-34158.



* $\frac{7}{32}$ DIMENSION

Fig. 1 (0227A2036-0) Outline and Mounting Dimensions

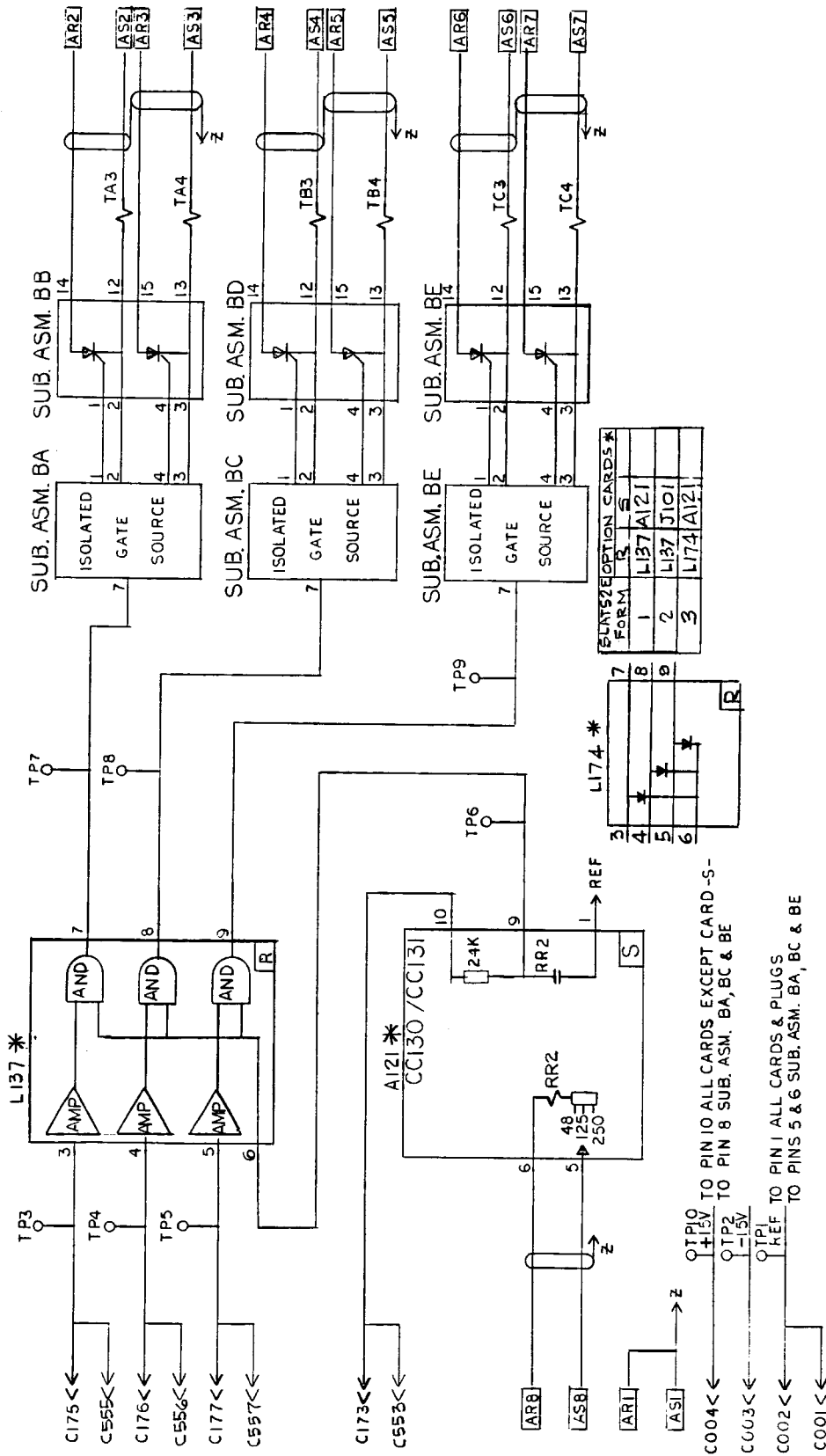
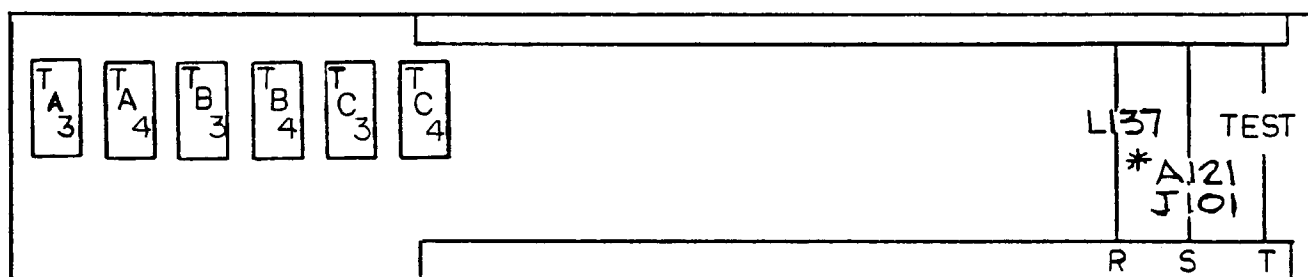
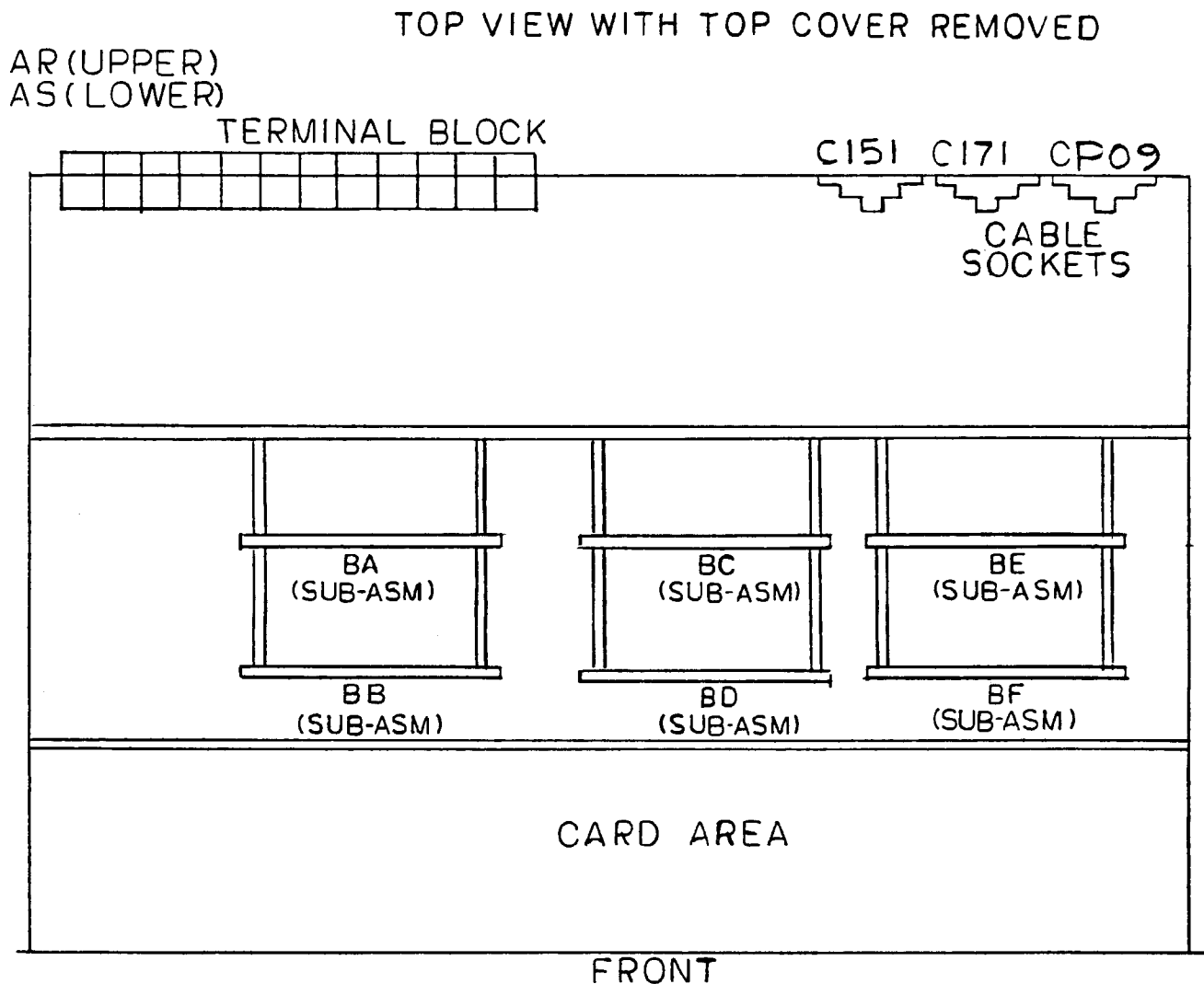
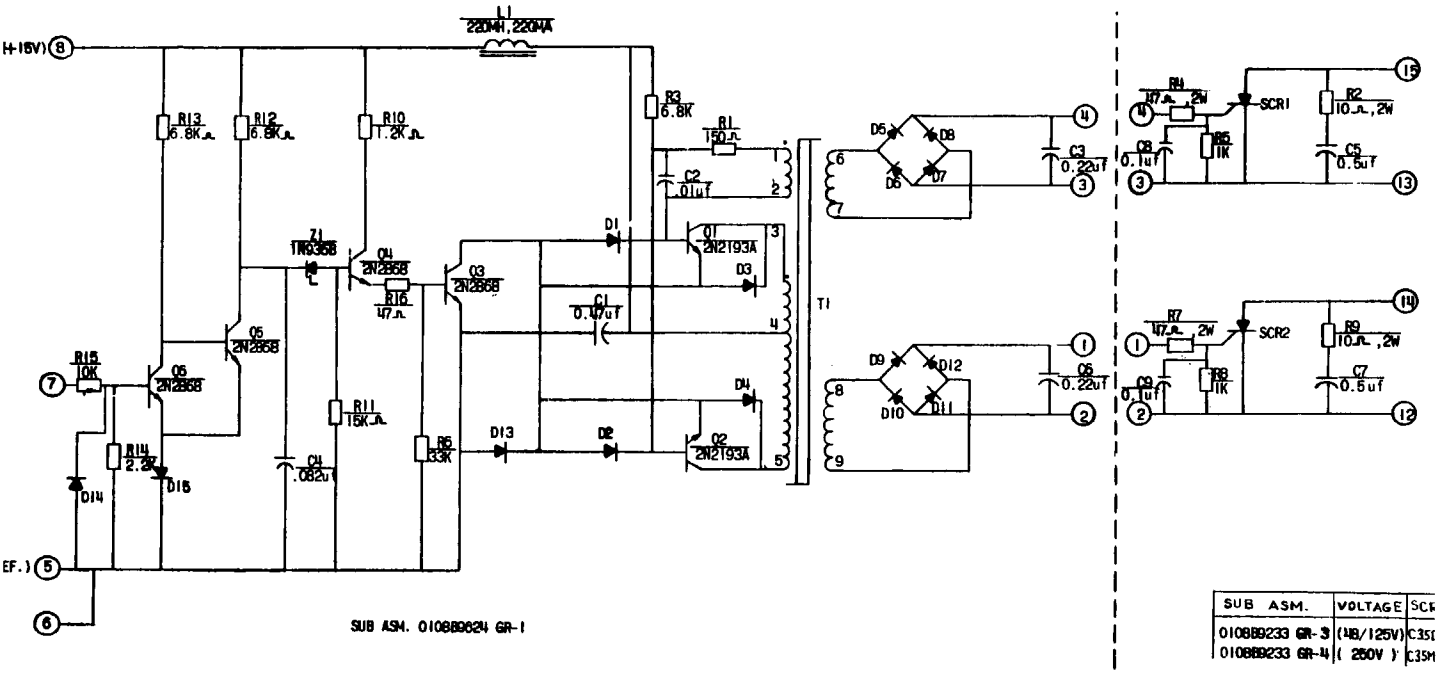


Fig. 2 (0138B7502-3) Internal Connections for the Type SLAT52E Relay



*SEE UNIT
INTERNAL FOR
OPTION CARD
DESCRIPTION

Fig. 3 (0285A5876-0) Component Location Diagram



ALL DIODES IN4148 UNLESS NOTED
 ALL RES. 1/2 WATT ±5% UNLESS NOTED
 (2) = TERM. POST ON BOARD ASM
 IN936B = 9.1V ±5%

SUB ASM.	VOLTAGE	SCR
0108B9233 GR-3	(110/125V)	C351
0108B9233 GR-4	(250V)	C351

Fig. 4 (0108B9610-0) Internal Connections for the SCR Trip and Isolator Subassemblies

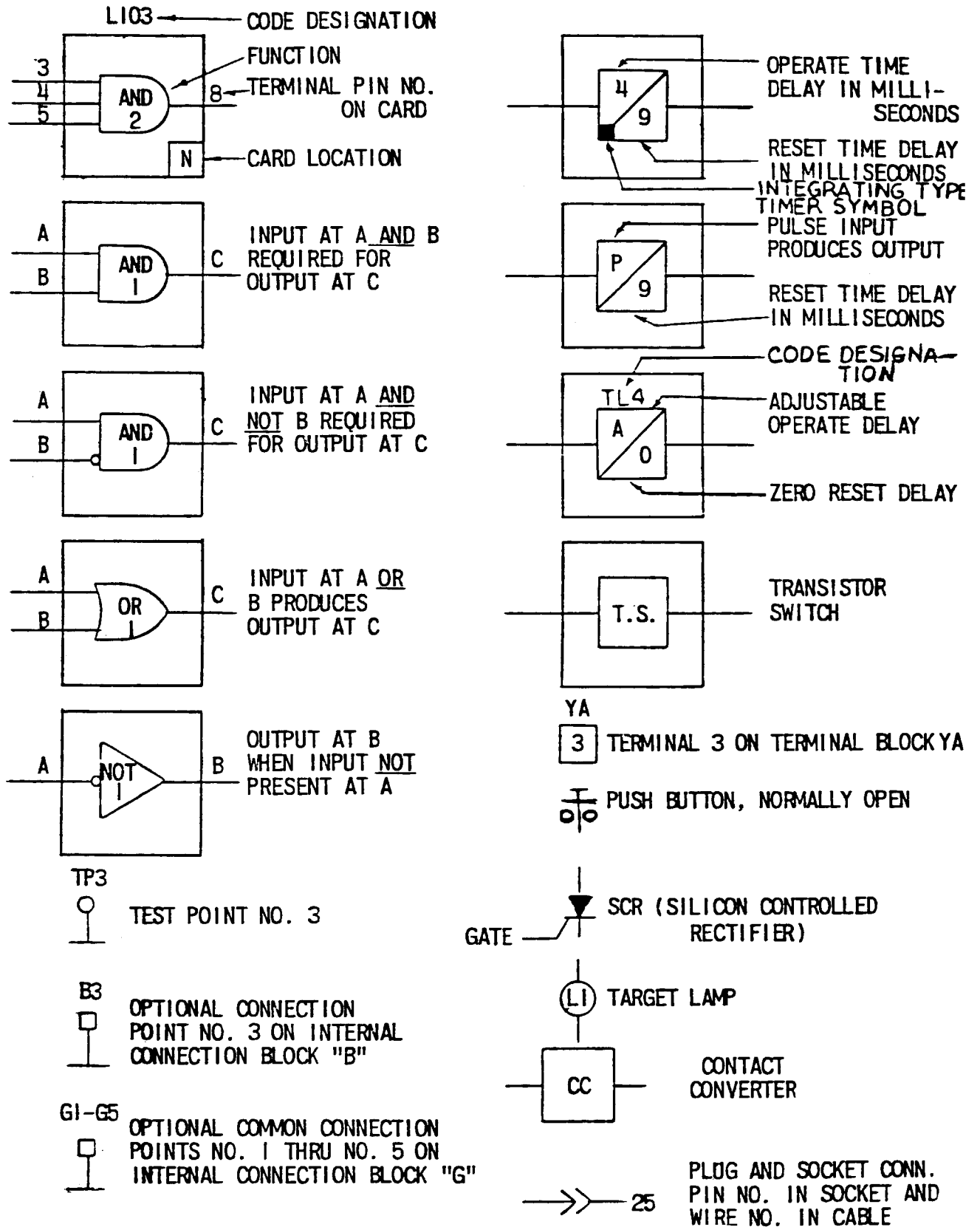
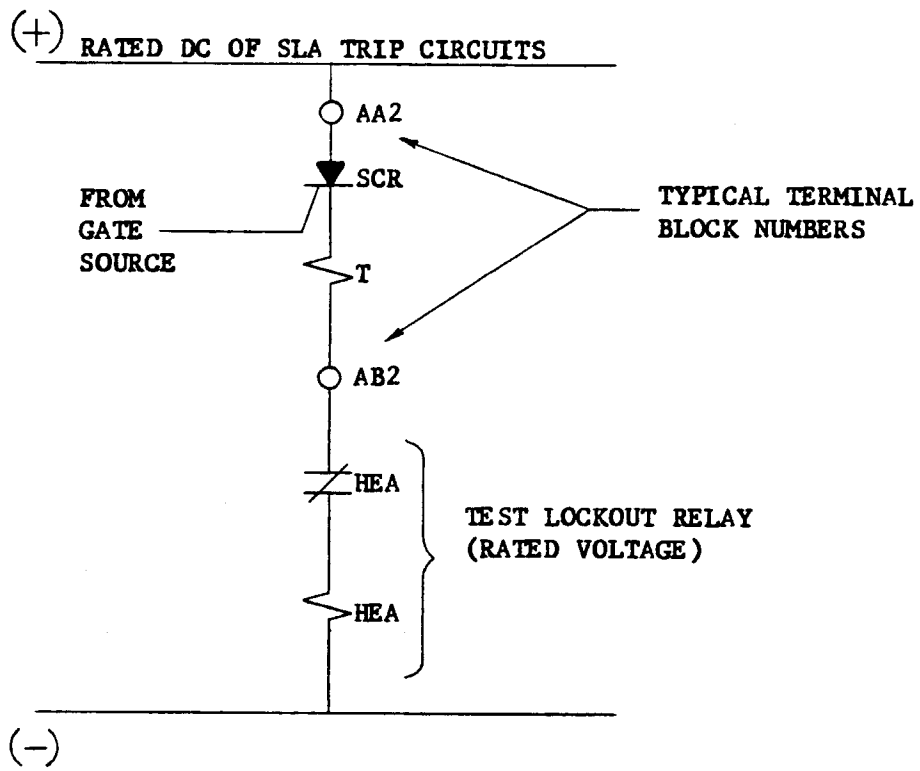


Fig. 5 (0227A2047-1) Logic and Internal Connection Diagram Legend



TYPICAL SCR TEST CIRCUIT FOR TYPE SLA RELAYS

Fig. 6 (0208A2365-0) Typical SCR Test Circuit for Type SLAT Relays

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