



**INSTRUCTIONS**

**GEK-49860**

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**STATIC AUXILIARY TRIPPING RELAY**  
**TYPE SLAT52B**

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**GENERAL  ELECTRIC**

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STATIC AUXILIARY TRIPPING RELAY

TYPE SLAT52B

DESCRIPTION

The type SLAT52B relay is a static auxiliary tripping unit which provides extra output circuits when used with a compatible type SLAT tripping unit. The table below shows the forms available of the type SLAT52B relay.

TABLE I  
SLAT52B(-)

FORM	1	2	3	4	5	6
RELAY VOLTAGE	125	125	125	125	48	48
TRI	X	X	X	X	X	X
BFI	X	X	-	-	X	-
RI	X	-	X	-	X	-

The type SLAT52B 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 this unit are shown in Fig. 2. The component and card locations are shown in Fig. 3.

Depending on the form number, the following functions are provided on the SLAT52B relay.

1. Two electrically separate contact tripping circuits, each containing a series hand-reset mechanical target. Refer to Table I for voltage rating of a particular form number. This information is also listed on the nameplate.
2. Breaker failure initiation (BFI) auxiliary outputs are provided for breaker failure protection. Refer to Table I for availability on a given form number. The nameplate of a unit will indicate the form number.
3. Reclose initiation (RI) auxiliary outputs are provided to initiate automatic reclosing after a high speed trip-out. Refer to Table I for availability on a given form number. The nameplate of a unit will indicate the form number.

APPLICATION

The SLAT52B is an auxiliary relay unit for applications of solid state transmission line protective equipment which require additional output circuits. The relay provides two additional trip contact outputs with hand-reset electromechanical targets, and optional RI and BFI auxiliary relays with two normally open contacts.

*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.*

These output functions are the same as those provided in the standard SLAT54 relays and are directly cabled into the associated SLAT via the C171 cable.

#### RATINGS

The type SLA52B 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  $\pm 15$  volt DC power source which is normally obtained from a type SSA power supply.

The contacts of the telephone-type relays that are used for the tripping circuits will carry three amperes; they have a maximum intermittent rating of 30 amperes and they will interrupt up to 180 volt-amperes (resistive) or 60 volt-amperes (inductive). These tripping circuits are rated for 48 or 125 VDC. Each circuit has a 1.0 ampere series target.

The contacts of the telephone-type relays that are used for RI will make and carry three amperes continuously and will interrupt up to 180 volt-amperes (resistive) or 60 volt-amperes (inductive).

The contacts of the reed relay that is used for BFI will make and carry three amperes continuously and will interrupt up to 100 volt-amperes (resistive) or 35 volt-amperes (inductive).

Refer to the unit nameplate for the ratings of a particular relay.

#### BURDENS

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

#### TARGETS

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

#### LOGIC CIRCUITS

The functions of the Type SLAT52B relay involve basic logic (AND, OR, and NOT) where the presence or absence of signals controls the operation rather than the magnitude. Signals are measured with respect to a reference bus accessible at TP1. In general a signal below one VDC represents an OFF or LOGIC ZERO condition, an ON or LOGIC ONE state is represented by a signal of approximately +15 VDC.

The symbols used on the internal connection diagram (Fig. 2) are explained by the legend shown in Fig. 4.

#### CONSTRUCTION

The SLAT52B 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 Figs. 1 and 3 respectively.

The SLAT52B relay contains printed circuit cards identified by a code number such as A104, A137, A106, where A designates an auxiliary 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 connection diagram are connected to instrument jacks on a test card position T with TP1 at the top of the T card. TP1 is tied to reference; TP10 is tied to +15 VDC through a 1.5K resistor. This resistor limits the current when TP10 is used to supply a logic signal to a card. TP2 is connected to -15V.

The SLAT52B relay receives its inputs from the associated Type SLAT relay via the C171 ten-conductor shielded cable. The sockets for this cable and the six-conductor power supply cable are located on the rear panel of the unit. The SLAT52B 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 a 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 SLAT52B RELAY THAT IS TO BE TESTED IS INSTALLED IN AN EQUIPMENT CONNECTED TO THE POWER SYSTEM, BE CERTAIN TO DISCONNECT THE OUTPUTS FROM THE SYSTEM.

##### GENERAL

The SLAT52B relay is supplied from the factory either mounted in a static relay equipment or as a separate unit 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 SLAT52B unit can be checked by observing the signals at the test points (TP1 to TP20) in the unit, or by observing the output functions. The test points are located on test cards in position T, and are numbered one to ten from top to bottom. TP1 is the reference bus for the logic circuit, TP10 is at +15 VDC. 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 gain 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 circuit contacts and series mechanical targets may be checked by connecting an auxiliary lock-out relay, such as the Type HEA relay, in series with the trip circuit. 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.

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

If supplied, the BFI should be checked prior to final installation. The BFI will operate in parallel with the trip circuits. The output of the two (2) normally open contacts of the BFI are located on terminals AF6, AG6, and AF7, AG7. In testing, do not exceed contact rating.

Test point TP3 may be energized from test point TP10 to initiate the BFI element as well as the trip circuits.

If furnished, the RI should be checked prior to final installation. The RI may be initiated by energizing test point TP4 from TP10. The two (2) normally open contacts of the RI are located on AF4, AG4, and AF5, AG5. In testing, do not exceed contact rating.

#### OVERALL EQUIPMENT TESTS

After the SLAT52B 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.

Overall equipment tests 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.

#### MAINTENANCE

##### PERIODIC TESTS

It should be sufficient to check the outputs produced at test points in the SLA52B where 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 necessary.

##### TROUBLE SHOOTING

In any trouble shooting 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 trouble shooting, 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 busses, or overheat the semi-conductor components. The repaired area should be recovered with a suitable high-dielectric plastic coating to prevent possible breakdowns across the printed busses due to moisture and dust. The wiring diagrams for the cards in the SLAT52B relay are included in the card book GEK-34158.

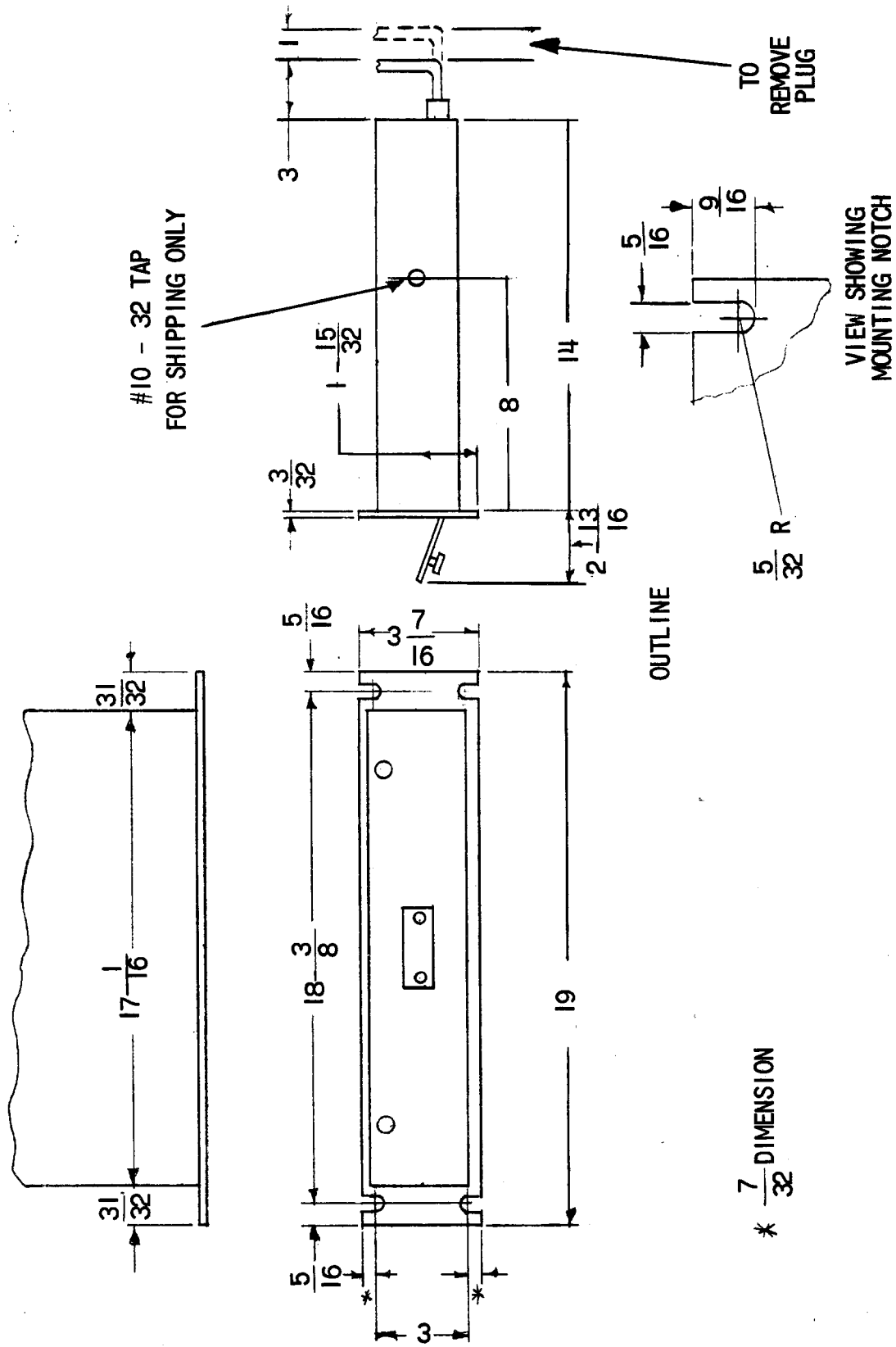
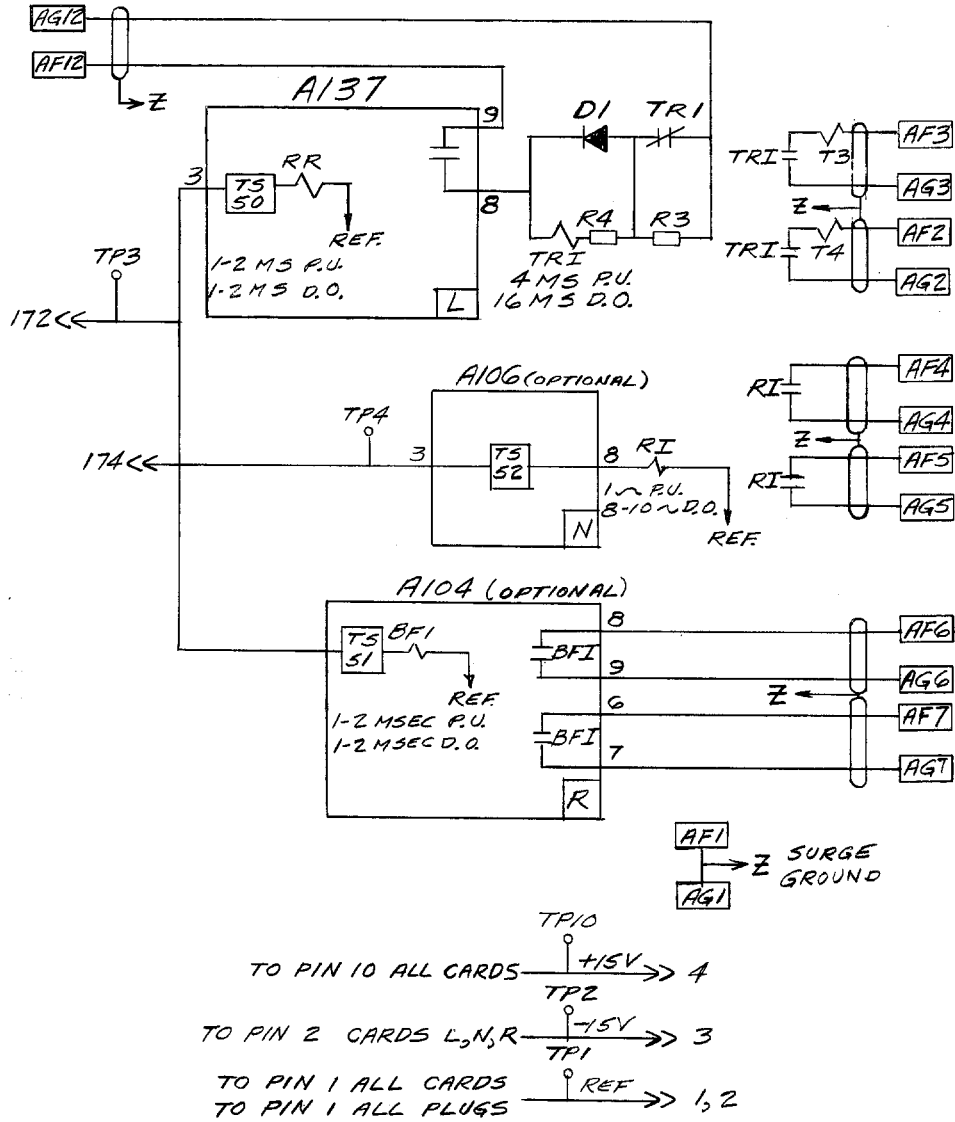


Fig. 1 (0227A2036-0) OUTLINE AND MOUNTING DIMENSIONS FOR THE SLAT52B RELAY



FORM	1	2	3	4	5	6
RELAY VOLTAGE	125	125	125	125	48	48
TRI	X	X	X	X	X	X
BFI	X	X	-	-	X	-
RI	X	-	X	-	X	-

D1	-1N50G1	1AMP	600V
R3	48VDC	50Ω	20W
R3	125VDC	850Ω	17W
R4	48VDC	200Ω	17W
R4	125VDC	1.7K	17W

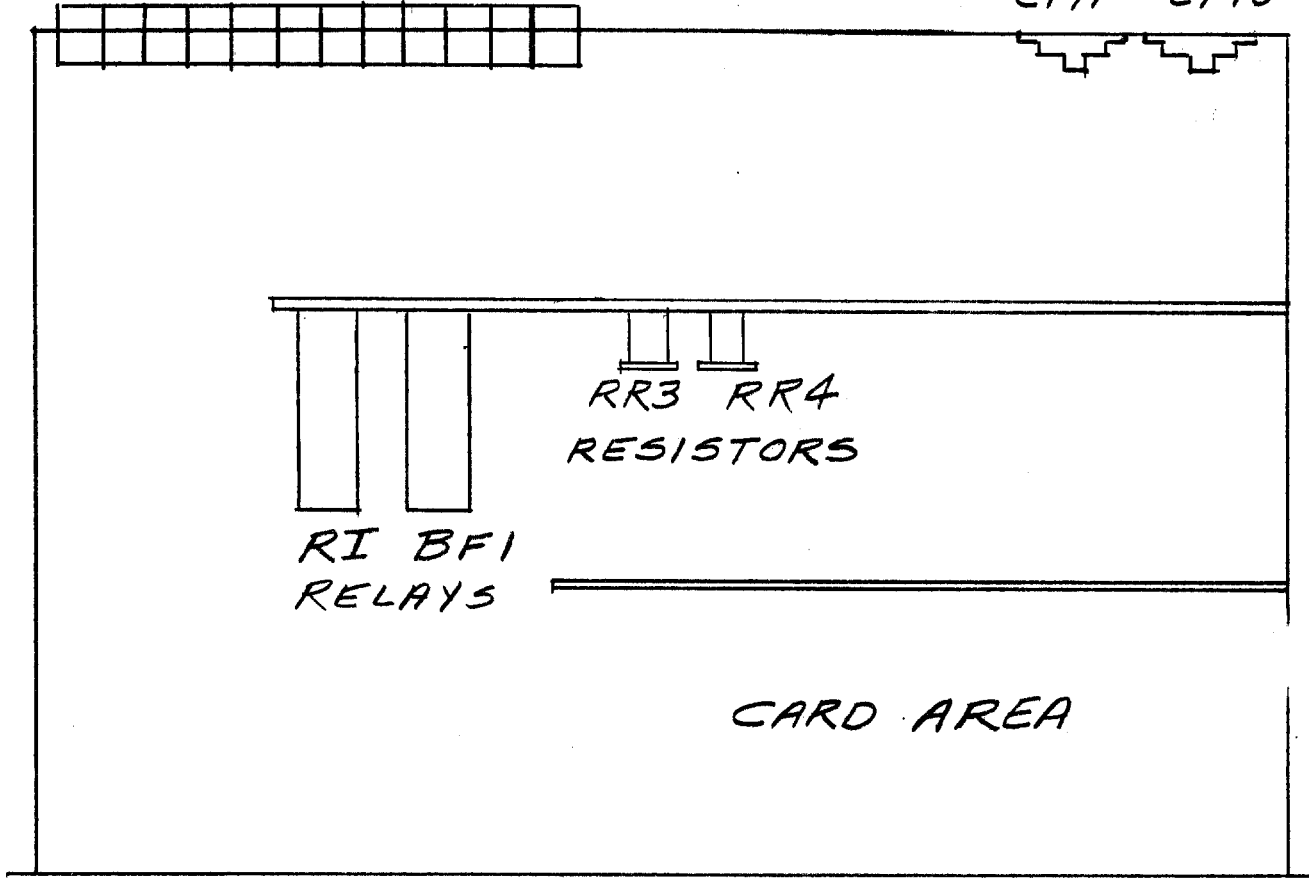
Fig. 2 (0165B2485-0) INTERNAL CONNECTION DIAGRAM FOR THE SLAT52B RELAY



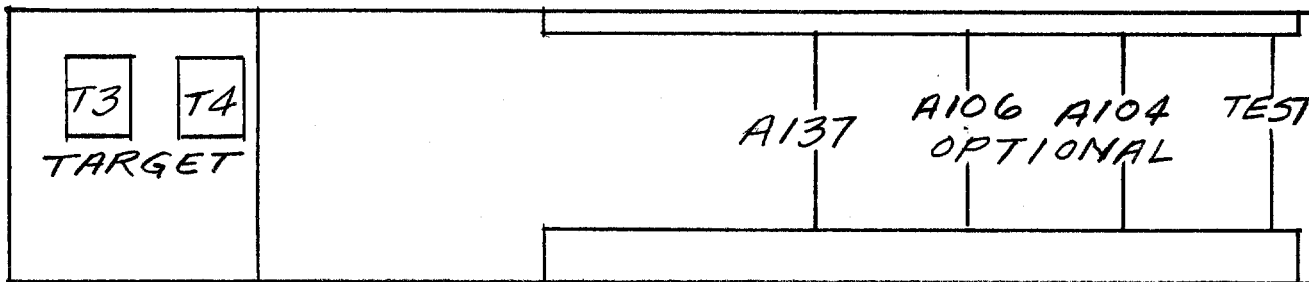
AF (UPPER)  
AG (LOWER)  
TERMINAL BLOCK

TOP VIEW WITH COVER REMOVED

C171 CP10



FRONT



FRONT VIEW (COVER REMOVED)

Fig. 3 (0275A1932-0) COMPONENT LOCATIONS DIAGRAM FOR THE SLAT52B RELAY

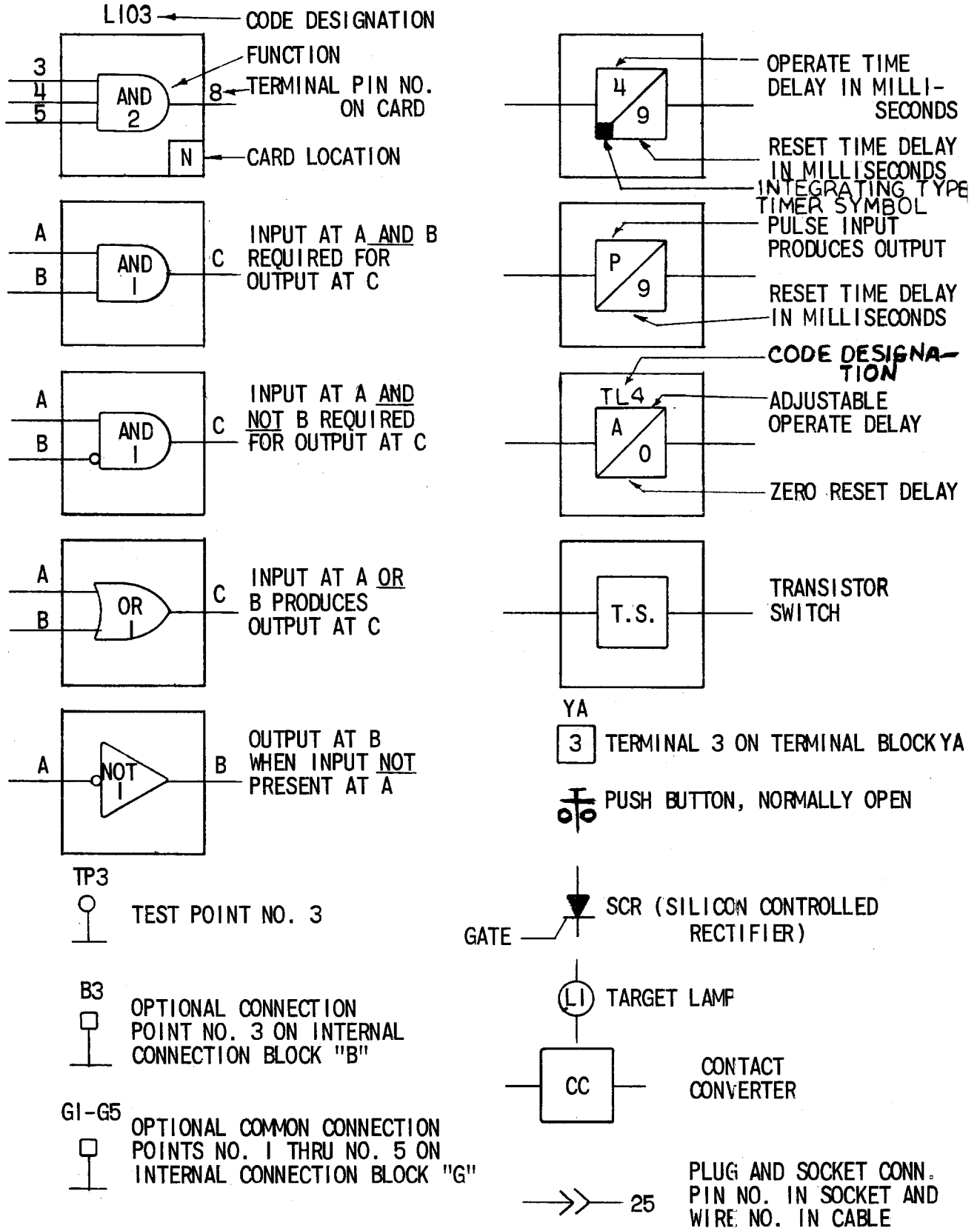


Fig. 4 (0227A2047-1) LOGIC AND INTERNAL CONNECTION DIAGRAM LEGEND

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