GEI-100004
(Supersedes GEK-36539)

Instructions

STATIC VOLTAGE BALANCE RELAY 3S7932MA350

INTRODUCTION

The circuit is designed to detect a voltage change in an excitation system sensing circuit. The circuit functions by comparing the signal potential transformer (p.t.) voltage with the pilot potential transformer voltage. A change of approximately 15% or the loss of one or more phase voltage will energize the output relay circuit.

If the excitation system is in the automatic mode of control and there is a change or loss of signal p.t. voltage, the regulator would increase excitation. This would cause the generator to go over excited. In time, other protective circuits would operate to correct this condition. However, the static voltage balance relay would immediately transfer control of the excitation system to the manual regulator. This would prevent the generator from going overexcited.

If the excitation system was in the manual mode of control and there was a change or loss in signal p.t. voltage, there would be an alarm only. If there was a change or loss of pilot p.t. voltage there would be an indication only. The primary function of this circuit is to monitor the integrity of the signal p.t. voltage and the signal p.t. fuses. A transfer of control would occur only if the excitation system was in the automatic mode of control.

RECEIVING AND HANDLING

Immediately upon receipt, the equipment should be carefully unpacked and examined for any damage that might have been sustained in transit. If injury or rough handling is evident, a damage claim should be filed immediately with the transportation company and the nearest General Electric Sales Office should be notified promptly

DESCRIPTION

The voltage balance circuit consists of four parts; the sensing circuit, the power supply and voltage regulation circuit, the detector circuit, and the output relay circuit (see Figure 1).

The sensing circuit applies power (signal and pilot p.t. 115 VAC 3 phase) to the voltage balance circuit. The power supply and voltage regulation circuit rectifies and maintains an 18 volt positive bus and an 18 volt negative bus. The detector circuit detects a voltage unbalance from either source and turns on the output relay circuit. If the regulator is in the automatic mode of control, the voltage balance circuit would transfer control to the manual regulator. If the regulator is in the manual mode of control, no transfer action would occur. Contacts are available for the annunciator, to indicate which voltage source changed.

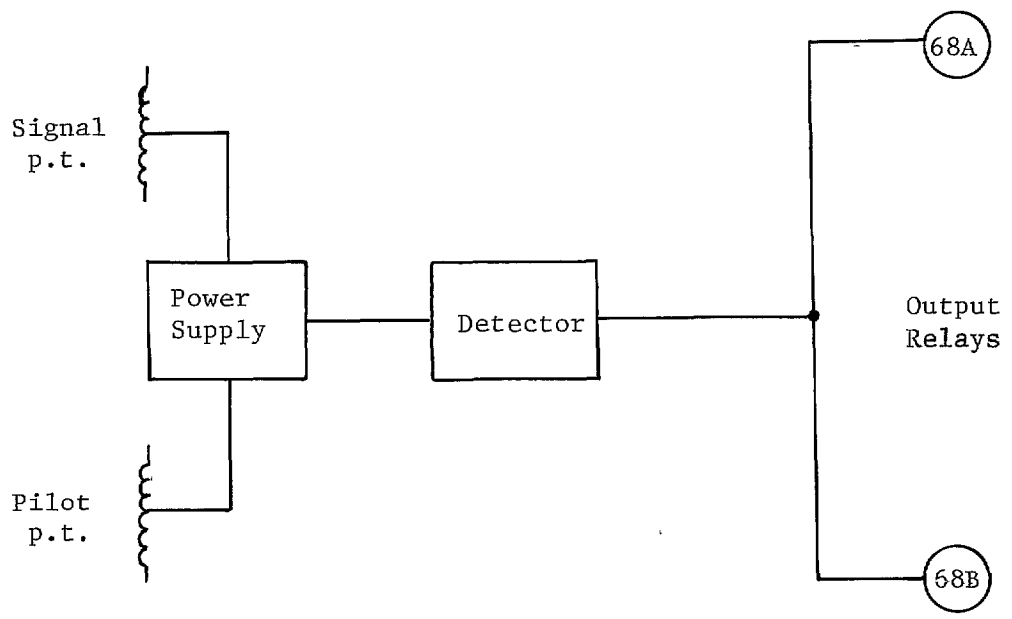

Figure 1. Voltage Balance Circuit

Refer to elementary diagram Figure 2.

DESCRIPTION (continued)

Under normal conditions, both relays are de-energized. Test point 4 will be zero volts with respect to 1TP. Z1Q, Z5Q would be biased off, Z2Q, Z6Q would be on, Z3Q, Z7Q would be on, Z4Q, Z8Q would be off. If there was a drop in the signal p.t. voltage of 15% or greater, Z1Q would become biased on, Z2Q, Z3Q would turn off, Z4Q would turn on energizing relay 68A. Relay 68A would, if in automatic regulator, transfer control to the manual regulator. Contacts are also available for annunciation. There would be no transfer if the regulator was in the manual mode.

If there was a drop in the Pilot p.t. voltage of 15% or greater, Z5Q would be biased on, Z6Q, Z7Q would be off, Z8Q would be on energizing relay 68B. There would be no transfer action, only annunciation.

WARNING

HAZARD OF ELECTRICAL SHOCK OR BURN.
ONLY PERSONNEL WHO ARE ADEQUATELY TRAINED AND ARE THOROUGHLY FAMILIAR WITH THE EQUIPMENT AND THESE INSTRUCTIONS SHOULD INSTALL, OPERATE AND MAINTAIN THIS EQUIPMENT.

ADJUSTMENT

To test the panel, apply 3-phase 115 VAC to terminal points Z1, 2, 3. Jumper Z1 to Z4, Z2 to Z5, Z3 to Z6. Close both Z1SW and Z2SW. Look from 1TP to 4TP with an oscilloscope or digital voltmeter. Adjust 1P for 0 volts at 4TP. Check 5TP for a positive 0.8 volts. Check 6TP for a negative 0.8 volts. Place the oscilloscope probe on 4TP. Open one blade of Z2SW; 4TP should read a positive 1.8 volts. Relay 68A should energize. Close the blade and open one blade of Z1SW; 4TP should read -0.2 volts. Relay 68B should energize.

MAINTENANCE

The equipment should be kept relatively clean and dry. If vibration is present, all screw type connections should be checked regularly to determine that they are properly tight. Normally, the static components should require no further attention; however, since the equipment is not activated in normal operation, the adjustment tests should be repeated periodically to insure the equipment is in operating condition.

RENEWAL PARTS

When ordering renewal parts, the following information should be given:

1. Catalog number stamped on the part, with a complete description, including use and location.

2. Complete nameplate data appearing on the assembly of which the part is a component.

3. If possible, data on original order on which equipment was first supplied, including all numerical references.

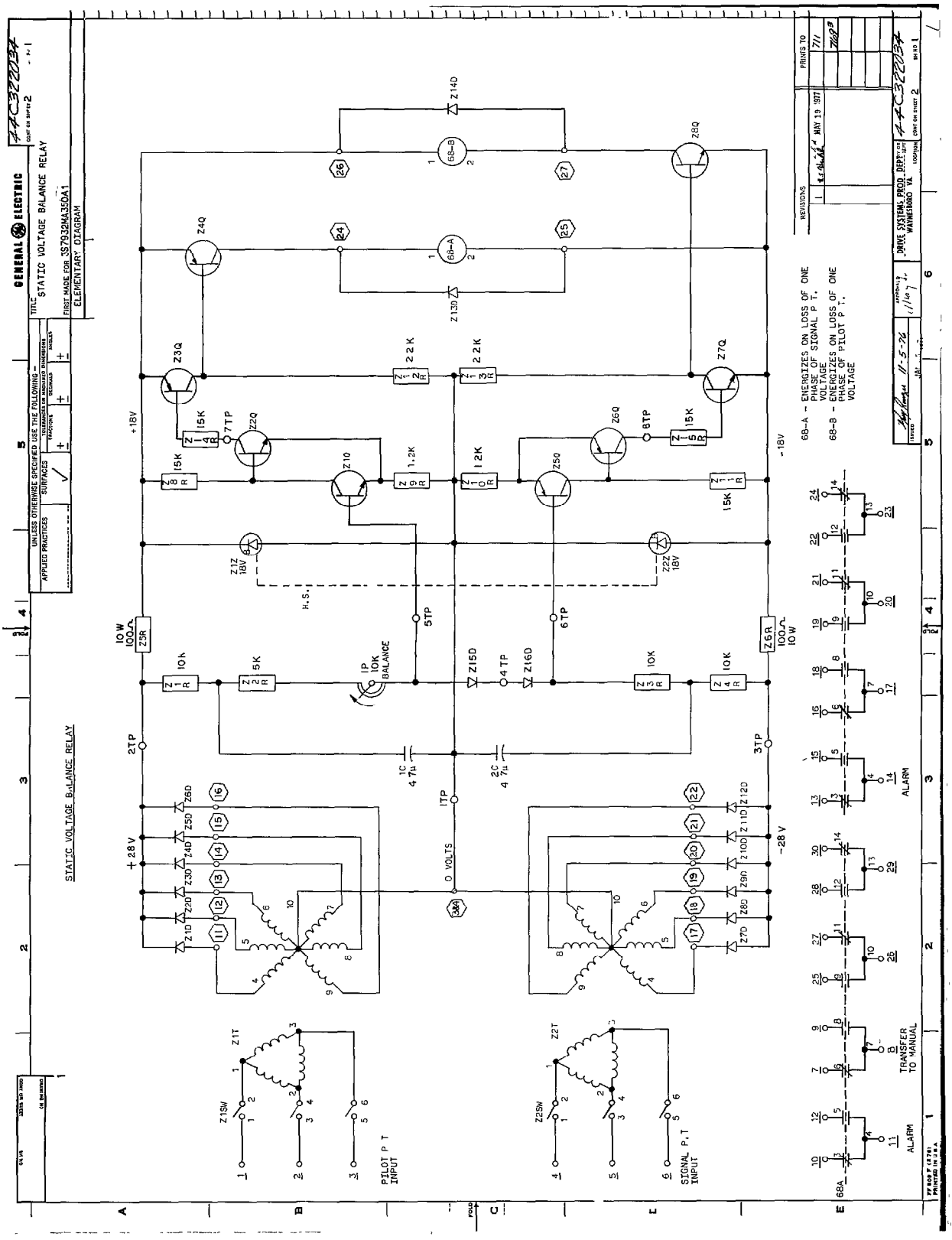
GENERAL ELECTRIC
STATIC VOLTAGE BALANCE RELAY
FIRST MADE FOR 3S79328MA350A1
ELEMENTARY DIAGRAM
STATIC VOLTAGE BALANCE RELAY
68-A - ENERGIZES ON LOSS OF ONE PHASE OF SIGNAL P.T. VOLTAGE
68-B - ENERGIZES ON LOSS OF ONE PHASE OF PILOT P.T. VOLTAGE
+18V
-18V
+28 V
-28 V
0 VOLTS
PILOT P.T INPUT
SIGNAL P.T INPUT
TRANSFER TO MANUAL
ALARM

Figure 2