ZENER REFERENCE AND POWER SUPPLY

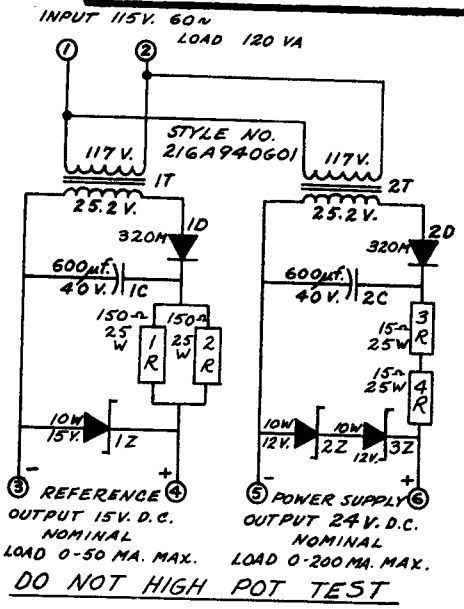

Figure 1 - Reference & Power Supply Schematic Diagram

GENERAL

The Zener reference and power supply package consists of two separate supply circuits. The reference supply provides regulated 15 volts D.C. which is used primarily as the reference source of a ramp function generator described in I.L. 16-800-13. The power supply provides a regulated 24 volts D.C. for application to the same ramp function generator, as the power source. The two supply circuits are isolated from each other by means of isolation transformers and each uses Zener Diodes for regulation of their rectified secondary outputs. The required package input is 117 volt, 60 cycle A.C. The reference voltage supply is rated at 50 milliamperes, and the power supply at 200 milliamperes.

OPERATION

The 25.2 volt A.C. output of the secondary of the reference supply transformer 1T, shown in Figure 1, is half wave rectified by diode 1D, to place approximately 32 volts D.C. across the capacitor 1C. With no load across terminals 3 and 4, the capacitor voltage is applied across the 1R, 2R resistor network and Zener diode breaks down when current flows thru it, and maintains a constant voltage of approximately 15 volts D.C. When a 50 milliampere load is connected, some current is shunted away from the Zener diode, but the reference voltage is maintained at approximately the same level.

The power supply operates on the same principle with two 12 volt Zener diodes series connected to provide approximately 24 volts across terminals 5 and 6 with up to a maximum load of 200 milliamperes.

MAINTENANCE

It is recommended that the package be removed from the drive for separate testing. However, no repair should be undertaken without adequate equipment for testing, and a previous understanding of semiconductors. If doubt exists, substitute a spare unit and return the malfunctioning unit thru the nearest Westinghouse Office to the Buffalo Division.

Never high-pot test these units. When testing the rest of the control, first disconnect all leads from the reference and power supply package.

Test Procedure

1. Check the wiring carefully before proceeding with testing.
2. Connect the 115 volt, 60 cycle Variac output to terminals 1 and 2.
3. Energize the 115 volt supply and set Variac output to 115 volts. Allow 5 minutes warm-up. Check and record voltage on terminals 3 and 4. This should be 15 volts D.C. ± 10%. Check and record voltage on terminals 5 and 6. This should be 24 volts D.C. ± 10%.

4. Check voltages across capacitors 1C and 2C inside the package. Each should be 32 volts ± 10%.

5. Connect a milliammeter through a 300 ohm resistor to terminals 3 and 4. Current should be approximately 50 milliamperes. Voltage should have decreased approximately 2% from step 3.

6. Connect a milliammeter through a 120 ohm resistor to terminals 5 and 6. Current should be approximately 200 milliamperes. Voltage should have decreased approximately 8%.

7. With loads still connected per steps 5 and 6, change the Variac output to 100 volts A.C. The voltage on terminals 3 and 4 should reduce about 2%. The voltage on terminals 5 and 6 should reduce about 6%, but not go below 20 volts D.C.

8. Increase the supply voltage to 130 volts A.C. and repeat step 7. Regulation should be the same as stated in step 7 except in the increasing direction.

TEST EQUIPMENT REQUIRED

A. Variac or variable transformer having a 120 volt input and 0 - 140 volt output, 60 cycle. Minimum rating 120 VA.

B. Vacuum tube voltmeter with suitable ranges for reading the following:

0 - 150 volts A.C.
0 - 50 volts D.C.

C. Multiple scale milliammeter or separate milliammeters with suitable ranges for reading the following:

0 - 100 milliamperes D.C.
0 - 500 milliamperes D.C.