

**J86277A RECTIFIER**  
**METALLIC TYPE — MANUAL REGULATION**  
**OPERATING METHODS**

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**1. GENERAL**

**1.01** This section covers the operation of a manually regulated rectifier. It is designed to operate from a 230-volt, 60-cycle ac source and provides 11 volts dc at 2 amperes.

*Caution: Voltages inside the rectifier are higher than those usually encountered in telephone power plants. Avoid all contact with terminals, as high voltages are present. Do not allow a test pick to touch two metal parts at the same time or destructive and dangerous short circuits may occur. Disconnect the ac supply before working on the rectifier, except as necessary to make tests.*

**1.02** Routine checks are intended to guard against circuit failures liable to interfere with service. Checks and adjustments, other than those required by trouble conditions, should be made during a period when they will not interfere with service.

**1.03** The instructions are based on drawing SD-81342-01 and associated circuit description.

**2. TOOLS AND GAUGES**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
—	3-inch Cabinet Screwdriver
<b>GAUGES</b>	
KS-14510, List 1	Volt-ohm-milliammeter

**3. OPERATION**

**How the Rectifier Works (See Fig. 1)**

**3.01** A 60-cycle voltage is applied through the T1 variable autotransformer to the primary winding of the T2 transformer which steps down the voltage. This voltage is applied to the center tapped full wave CR1 and CR2 rectifier which converts it to a pulsating dc voltage. This pulsating dc voltage is filtered by C1 through C6 capacitors and appears at the negative (-) and positive (+) output leads. R1 resistor, which is connected across the output of the filter, discharges the filter capacitors in case the rectifier is disconnected from both the load and the power source.

**Preparing to Start Initially**

**3.02** When putting the rectifier into service initially, check to see that:

- (a) The ungrounded ac input lead is protected by a KS-15815, List 6 circuit breaker. (See note 101 shown on SD-81342-01.)
- (b) Turn the ADJ VOLTS control, located on the front of the rectifier, fully counterclockwise.

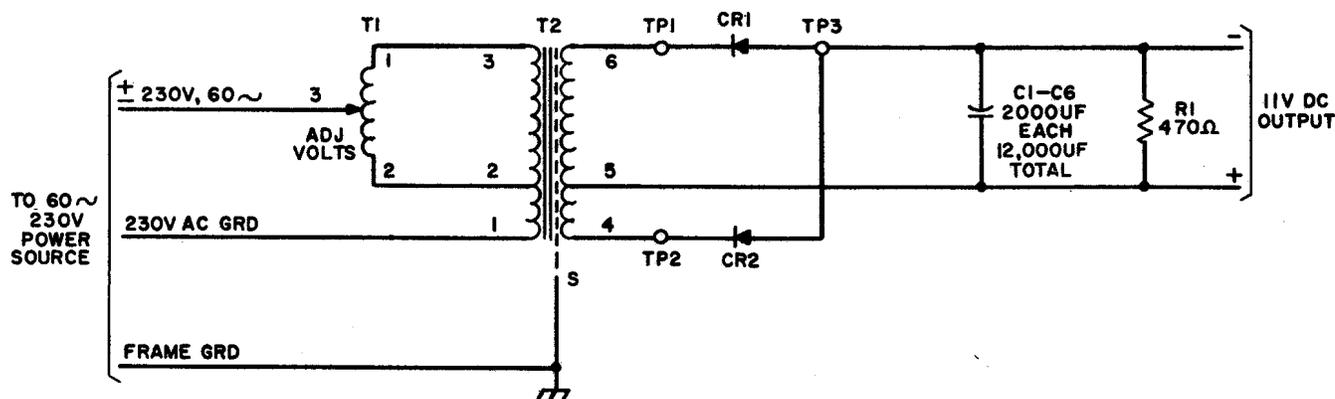


Fig. 1 - J86277A Rectifier — Simplified Schematic

### Initial Adjustments

3.03 Proceed as follows:

- (a) See that the external loads are connected.
- (b) Connect the ac power.
- (c) Adjust the ADJ VOLTS control, located on the front of the rectifier, until the required output voltage, as measured across the filter capacitors inside the rectifier, is obtained.

### 4. ROUTINE CHECKS

4.01 The following should be performed.

- (a) The output voltage should be checked, from time to time, with the KS-14510, List 1 volt-ohm-milliammeter to make certain that the proper voltage, as measured across the filter capacitors inside the rectifier, is being maintained.
- (b) Electrolytic capacitors should be maintained in accordance with Section 032-110-701.

### 5. TROUBLES

5.01 In general, the only items likely to become defective with use are the electrolytic capacitors.

5.02 Should any of the following troubles develop, it is suggested that the possible causes, listed below, be checked. If the trouble

is not found, look for loose or open connections or short circuits due to foreign matter lying across wiring terminals.

TROUBLE	POSSIBLE CAUSE
No dc output voltage	Circuit breaker connected in ungrounded ac input lead open [See 3.02(a).] Input power failure Defective T1 autotransformer or T2 transformer
Low dc output voltage	Defective CR1 and CR2 rectifier Low line voltage T1 autotransformer out of adjustment Shorted capacitors Defective CR1 or CR2 rectifier Excessive load
High dc output voltage	High line voltage T1 autotransformer out of adjustment

### 6. POINT-TO-POINT VOLTAGES

6.01 As long as the rectifier operates satisfactorily, point-to-point voltage values are not needed and are not operating require-

ments to be checked in routine. In case the rectifier output cannot be obtained, they may be useful in locating defective conditions.

**6.02** High voltages are present within the rectifier and every precaution should be observed to avoid any bodily contact with terminals when the rectifier is in operation, or when not in operation but connected to the ac power source.

*Caution: When using any portable instrument, the leads should be carefully examined to make sure the insulation is undamaged. The leads should be connected at the instrument before making contact with the circuit to be tested. If connections are to be changed from one instrument range to another, the power should first be disconnected*

*from the equipment being tested, or if test picks are being used, they should be removed from equipment under test.*

**6.03** Readings should be made with a KS-14510, List 1 volt-ohm-milliammeter. The output of the rectifier will not be appreciably affected by connecting the meter leads to the circuit elements.

**Table of Point-to-Point Voltages**

**6.04** The readings given in the following table shall be made with the ADJ VOLTS control of the T1 autotransformer turned fully counterclockwise, and with a 2-ampere load connected across the output of the rectifier.

INPUT VOLTAGE	VOLTAGE ACROSS	MEASUREMENTS MADE				SCALE AC OR DC	KS-14510, LIST 1 VOLT-OHM-MILLIAMMETER	
		FROM		TO			RANGE (VOLTS)	READING (VOLTS)
		APP	TERM	APP	TERM			
*	Filter Capacitors	—	—	—	—	DC	12	9.6 ±1
*	T2 Sec	—	TP1	—	TP2	AC	60	16.5 ±1**
*	T2 Pri	T2	1	T2	3	AC	300	230 ±5

\*Connect 230 ±2.5 volts, 60-cycle ac power to terminal 1 of T2 transformer and terminal 3 of T1 autotransformer.

\*\* Each half of winding should yield a reading of 8.3 ±0.5 volts on the 12-volt range AC scale.