

RECTIFIER

J-87233A

48 VOLTS, 30 AMPERES

OPERATING METHODS

1. GENERAL

1.01 This section covers the operation of the J-87233A rectifier in conjunction with the regulated rectifier control circuit J-87214B. This rectifier is intended to automatically charge and float storage batteries of the 111A power plant.

1.02 The rectifier is rated at 48 volts ± 1 percent for operation between 1 and 30 amperes direct current. The input power requirement is single-phase, 60-cycle ± 3 cycles alternating current. Taps are provided on the T1 input transformer to match the *nominal* ac line voltage. The rectifier operates within the absolute limits of 200 and 250 volts ac with a permissible change from the nominal input voltage of ± 10 percent. The rectifier utilizes PNP devices for single-phase full-wave rectification and a self-contained transistorized regulating circuit which controls the PNP devices and automatically limits the output current. In addition, an alarm circuit is provided to shut down the rectifier when the A control fuse blows or when the rectifier is putting out current at higher than normal voltages.

Caution: Voltages inside the rectifier case are over 150 volts to ground. Avoid all contact with terminals. 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 alternating current supply before working on the rectifier except when necessary to make tests.

1.03 This rectifier is designed to mount on a 23-inch relay rack and can be serviced and maintained from the front. Access to the rear is made possible by a removable rear cover. Terminal strips for ac input and dc output are provided at the top of the unit.

1.04 Options are provided for operation as follows:

- (a) For use in a 48-volt positive plant (negative ground).
- (b) For use in a 48-volt negative plant (positive ground).

1.05 Routine checks should be made during a period when they will not interfere with service.

1.06 The instructions are based on drawings SD-81597-01 for the J87233A rectifier and SD-81543-02 for the J87214B regulated rectifier control circuit. For detailed description of operation, see the corresponding circuit description.

1.07 For more detailed information on the operation and maintenance of related equipment or apparatus, refer to the appropriate Bell System Practices.

1.08 The abbreviations cw and ccw, used herein, refer to clockwise and counterclockwise rotation, respectively.

2. TOOLS AND TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
—	3-inch Screwdriver
TEST APPARATUS	
KS-14510, L1	Volt-Ohm-Milliammeter

3. OPERATION**Preparing to Start Initially**

3.01 When placing the rectifier into service initially, check that:

- (a) The OUTPUT circuit breaker is in OFF position.
- (b) The proper size fuses are provided and removed from the rectifier.
- (c) All external connections are made in accordance with the schematic drawing covering the associated circuit of which the rectifier is a part.
- (d) The option wiring is correct for the service to be used.
- (e) The T1 and T2 input transformer taps used are correct for the power supply voltages as measured with a KS-14510, L1 meter.

Caution: When using portable instrument, the leads should be carefully examined to make sure the insulation is undamaged. The leads should be properly connected to the instrument before making any 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 equipment being tested or, if test picks are being used, they should be removed from the equipment under test.

- (f) The ADJ VOLTS potentiometer is in the maximum ccw position.

Initial Adjustments

3.02 Proceed as follows:

- (1) Install control fuse A.
- (2) Set OUTPUT circuit breaker to ON.

Note: The CC (R9) potentiometer is factory adjusted and should not be readjusted unless the rectifier fails to limit the output current to 30 amperes.

- (3) Check the adjustment of the CC (R9) potentiometer as follows:

STEP	PROCEDURE
1	Rotate ADJ VOLTS (R11) potentiometer fully cw and observe the OUTPUT meter. <i>Requirement:</i> The OUTPUT meter will indicate a maximum of 32 amperes. <i>Note:</i> If the requirement is met in step 1 proceed to step 6. If the requirement is not met proceed with step 2.
2	Rotate the ADJ VOLTS (R11) potentiometer to the maximum ccw position.
3	Rotate the CC (R9) potentiometer fully cw.
4	Slowly rotate ADJ VOLTS (R11) potentiometer cw until the OUTPUT meter indicates approximately 35 amperes.
5	Rotate the CC (R9) potentiometer ccw until the OUTPUT meter indicates 30 amperes.
6	Rotate the ADJ VOLTS (R11) potentiometer fully ccw; then, cw until the voltage output of the rectifier is equal to the battery float requirement of the associated power plant.

4. ROUTINE CHECKS

4.01 As often as local experience demands, the relays should be inspected for condition of contacts, making sure that they are in accordance with the circuit requirements table and Bell System Practices which apply.

4.02 The dc output should be checked frequently to make certain that it is correct.

4.03 Electrolytic capacitors should be maintained in accordance with Section 032-110-701.

5. TROUBLES

5.01 Should a diode or PNP device in the rectifier stack become defective, replace the complete rectifier stack.

5.02 Should any component of the regulator unit become defective, replace the complete regulator.

Trouble Chart

5.03 Should any of the following troubles develop, check the possible causes listed. 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
(a) No dc current	Failure or disconnection of the input power Blown ac supply fuses or other fuses in the rectifier
(b) Low dc voltage (with output less than 30 amperes)	Low input voltage Shorted capacitors Incorrect transformer taps used Defective diode or PNP device in rectifying element Potentiometer out of adjustment
(c) High dc voltage	Potentiometer out of adjustment Defective diode or PNP device in rectifying element
(d) Erratic dc current or voltage	Loose connections at potentiometers or resistors Intermittent open or short in any component