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GREG

J86298A RECTIFIER

SEMICONDUCTOR TYPE—AUTOMATIC REGULATION

OPERATING METHODS

1. GENERAL

1.01 This section covers the operation of the J86298A automatically regulated semiconductor-type rectifier. This rectifier is initially intended for charging and floating the emergency cells in the 303A power plant.

1.02 This section is reissued to revise the initial adjustments, to add an output voltage check, a current check, and a cleaning routine to Part 4. This reissue does affect the Equipment Test List.

1.03 This rectifier is adaptable for connection to a 196- to 245-volt ± 10 percent, 60-hertz ± 2 percent single-phase power source and has a rated filtered output of 0 to 3 amperes at 4 to 5 volts dc. Diodes are used for full-wave rectification. The rectified output is provided with protective fusing in both leads. Jacks for measuring the output voltage are accessible without removal of the front cover.

Warning: *The voltages in this unit exceed 200 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. Remove the ac power supply fuses and F1, F2, F3, and F4 fuses before removing any protective guards behind the cover to work on the inside of the unit.*

1.04 Keeping the ventilating passages and rectifier cells clean is especially important to avoid excessive heating.

1.05 Routine checks are intended to detect defects, particularly in infrequently operated parts of the equipment, and insofar as possible to guard against circuit failures which 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.

1.06 This issue of the section is based on the following drawing:

SD-81412-01, Issue 7

If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

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

2. TOOLS AND TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
—	3-inch C Screwdriver
TEST APPARATUS	
KS-8039	Volt-milliammeter
KS-14510,L1	Volt-ohm-milliammeter

3. OPERATION

Preparing to Start Initially

3.01 When preparing to put the rectifier into service initially, check that:

(a) All external connections are made in accordance with the SD drawing covering the associated circuit of which the rectifier is a part.

(b) The proper size power supply fuses and F1, F2, F3, and F4 fuses are provided in the circuit.

SECTION 169-633-301

- (c) The T1 transformer taps are connected to correspond with the ac power supply as measured with a KS-14510 meter.

Caution: *When using any 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 the equipment being tested, or, if test picks are being used, they should be removed from the equipment under test.*

- (d) The CON CUR potentiometer is in the maximum clockwise (cw) position.
- (e) The ADJ VOLTS COARSE potentiometer is in the maximum counterclockwise (ccw) position.

Note: To adjust the above potentiometer, it will be necessary to remove the front cover of the rectifier.

- (f) The ADJ VOLTS FINE rheostat is in the approximate midpoint position.

Note: The LOAD REG potentiometer and the LINE REG rheostat are set for optimum performance at the factory and should *not* be adjusted in the field.

Initial Adjustments

3.02 Proceed as follows.

- (a) Apply the power by inserting the proper size AC1 (F5) and (F6) fuses in place.
- (b) **Voltage Adjustment**
- (1) Connect a KS-8039 voltmeter or equivalent across the positive (+) and negative (-) jacks of the rectifier.
- (2) Rotate the ADJ VOLTS COARSE potentiometer clockwise and monitor voltmeter.

Requirement: The voltmeter indicates approximate battery float voltage.

- (3) Adjust the ADJ VOLTS FINE rheostat and monitor voltmeter.

Requirement: The voltage output of the rectifier is equal to the battery float voltage requirement (see Section 157-601-301).

Note: The float voltage adjustment must be made with the battery at least in its nearly fully charged condition.

(c) Current Adjustment

- (1) Operate the emergency cell switch to the A position (25-cell position) as covered in Section 167-623-301 for the 303A power plant.
- (2) As the output current of the rectifier increases and when the output voltage has decreased to 4.2 volts as indicated on the KS-8039 voltmeter, proceed as follows.

- Adjust the CON CUR potentiometer ccw to obtain an output current of 3 amperes.
- Restore the emergency cell switch to the NOR position.

- (d) Remove the KS-8039 voltmeter.

- (e) Replace the front cover on the rectifier after the adjustments have been completed.

Routine Adjustments (Normal Operation)

3.03 The unit has no disconnecting switches and is connected to both ac power and the load when the associated fuses are in place. If it is necessary to take a unit out of service, remove the fuses. To restart, replace the fuses.

4. ROUTINE CHECKS

The following checks should be performed.

Output Voltage Check

4.01 Connect the KS-8039 voltmeter across the positive (+) and negative (-) jacks of the rectifier.

Requirement: The voltmeter indicates approximately $4.34 \pm .04V$.

Note: If requirement is *not* met, adjust output voltage as in 3.02.

Output Current Check

4.02 Operate the emergency cell switch to the A position (25-cell position) as covered in Section 167-623-301 for the 303A power plant.

Requirement: The plant ammeter indicates 3 amps.

Note: If requirement is *not* met, adjust current output as in 3.02.

Ventilating Passages Check

4.03 Periodically, or as often as local experience dictates, clean the ventilating passages to avoid excessive heating.

4.04 Electrolytic Capacitors Check Electrolytic capacitors should be maintained in accordance with Section 032-110-701.

5. TROUBLES

5.01 In general, the components most likely to become defective with use are the electrolytic capacitors, the semiconductor diodes, and transistors.

5.02 The control potentiometers and adjusting rheostats are totally enclosed. If they become defective in any respect, the CON CUR and ADJ VOLTS COARSE potentiometers and ADJ VOLTS FINE rheostat can be replaced in the field. Any replacements of the LOAD REG potentiometer and the LINE REG rheostat should be made at the factory.

5.03 To avoid unbalance, any replacements of the Q1 and Q2 transistors should be made with a matched pair.

5.04 Any replacements of the CR6 and CR9 diodes should be made with a selected pair in accordance with the information specified on the SD drawing of the rectifier.

Trouble Chart

5.05 Should any of the following troubles develop, it is suggested that the possible causes listed 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. A loose connection generally causes heating. Any one of the following troubles may be caused by an open or short circuit.

TROUBLE	POSSIBLE CAUSE
No dc current	Failure or disconnection of the input power Blown as supply fuses or other fuses in the rectifier
Low dc current	Low input voltage Incorrect transformer taps used
High dc current	High input voltage Incorrect transformer taps used Defective transistors
Erratic dc current or voltage	Loose connections at any component Intermittent open or short in any component