RECTIFIERS

J87207A L1 AND J87207B L1

OPERATING METHODS

1. GENERAL

1.01 The J87207A L1 and the J87207B L1 rectifiers are semiconductor type, using ferroresonant transformer control regulation.

1.02 This section is reissued to delete the KS-14510 meter, to add the Weston 1240 or suitable digital voltmeter, and to update the section. This issue does not affect the Equipment Test List.

1.03 The J87207A L1 and J87207B L1 rectifiers are intended for use in the protection switching test sets of the TH and TD-3 radio systems. The rectifiers have an ac input of 117 volts, 60 cycle, single phase, alternating current. The dc output of the J87207A L1 is 24 $\pm$0.5 volts, 1.5 amperes. The 87207B L1 has a dc output of 23-to 25-volts, 1.5 amperes. The dc output regulation of both rectifiers is 24 volts $\pm$1 percent from no load to 1.5 amperes for an ac input voltage of 117 volts $\pm$10 percent and an input frequency of 60 $\pm$.5 cycles.

1.04 Protective fusing is provided in the rectifiers. Jacks for measuring the dc output voltage are accessible on the front panel without removal of the cover.

1.05 The J87207B L1 rectifier is designed so that either polarity of the output may be grounded.

1.06 This issue of this section is based on the following drawings.

SD-81510-01, Iss 4—J87207A L1 Rectifier

SD-81510-02, Iss 4—J87207B L1 Rectifier

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

Warning: ***The voltages inside the rectifier case are higher than 300 volts to ground. Avoid all contact with terminals as high voltages may be present. Do not allow a test pick to touch two metal parts at the same time or destructive and dangerous short circuits may occur. Any open or reversed windings on the ferroresonant transformer may cause dangerously high voltages on the other windings. Disconnect the alternating current supply before working on the unit except when necessary to make tests.***

2. LIST OF TOOLS AND TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
—	3-inch C Screwdriver
TEST APPARATUS	
—	▶Weston Model 1240, Digital Multimeter or any suitable Digital Multimeter◀

3. OPERATION

3.01 ***Preparing to Start:*** When preparing to put the rectifier into service, check the following.

(1) All external connections are made in accordance with the SD covering the associated circuitry.

(2) An adequate office load or an adjustable load capable of carrying 1.5 amperes at 25 volts is available.

(3) The proper fuses are available.

(4) The ADJ VOLTS potentiometer, on the front panel, is in maximum ccw position.

(5) The load is connected across the output terminals.

3.02 ***Starting:*** To start the rectifier, proceed as follows.

(a) ***J87207A L1 Rectifier***

(1) Install the SH CKT PROT fuse.

(2) Install the AC INPUT fuse.

Note: Allow the rectifier 5 minutes warmup time.

(3) Connect the digital multimeter to the (+) and (−) dc output voltage test jacks.

(4) Adjust the ADJ VOLTS potentiometer cw to obtain the desired output voltage.

Requirement: The voltmeter should indicate a potential between 23.5 and 24.5 volts.

(5) If the requirement is met, proceed to (8). If the requirement is not met, continue with (6).

(6) Remove the front panel cover and adjust the COARSE ADJ VOLTS potentiometer until the requirement in (4) is met.

(7) Replace front panel cover.

(8) Disconnect the voltmeter.

(b) ***J87207 B L1 Rectifier***

(1) Install the AC INPUT fuse.

Note: Allow the rectifier 5 minutes warmup time.

(2) Connect the digital multimeter to the (+) and (−) dc output voltage test jacks.

(3) Adjust the ADJ VOLTS potentiometer cw to obtain the desired output voltage between 23 and 25 volts.

(4) Disconnect the voltmeter.

3.03 ***Stopping:*** To take the rectifier out of service, remove the AC INPUT fuse.

4. ROUTINE CHECKS

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

4.02 Circuit packs and semiconductor devices should be maintained in accordance with Section 032-173-301.

4.03 Keep the ventilating passages of the rectifier unobstructed to ensure proper cooling during operation.

4.04 ***Output Voltage Check:*** The output voltage should be checked as follows.

(1) Connect the digital voltmeter to the (+) and (−) dc output test jacks.

Requirement: The voltmeter should indicate between 23.5 and 24.5 volts for the J87207A L1 Rectifier and between 23 and 25 volts for the J87207B L1 Rectifier.

(2) If the requirement is met, proceed to (4). If the requirement is not met, continue with (3).

(3) Adjust the output voltage of the J87207A L1 rectifier in accordance with 3.02 (a) steps (4) through (7). Adjust the output voltage of the J87207B L1 rectifier in accordance with 3.02 (b)(3).

(4) Disconnect the voltmeter.

5. TROUBLES

Trouble Chart

5.01 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 or by aging or drift in the constants of some faulty component.

Warning: The ac voltage across the terminals of the C1 tuning capacitor exceeds 300 volts. When making tests inside the unit, take care to avoid any contact with the leads and terminals of this capacitor.

TROUBLE	POSSIBLE CAUSE
(a) No output voltage	Failure or disconnection of the input power
	Blown or missing AC INPUT fuse
	Blown or missing SH CKT PROT fuse (J87207A, L1)
	Open rectifying diodes
	Open Q3 series transistor in regulator
	Shorted filter capacitors
	Shorted D1 reference diode (J87207A, L1)
	Shorted CR5 reference diode (J87207B, L1)
	Shorted R1 bleeder resistor
	Defective T1 transformer
(b) Low output voltage	Excessive load on output
	No dc output from regulator circuit due to defective diodes and/or shorted capacitor
	Defective filter capacitors
	Defective transistors in regulator
	Partially shorted T1 transformer secondary
(c) High output voltage	Defective T1 transformer
	Open R1 bleeder resistor
	Open filter capacitors
	Open D1 reference diode (J87207A, L1)
	Open CR5 reference diode (J87207B, L1)
	Shorted Q3 series transistor
(d) Erratic output voltage	Loose connections at any component
	High leakage filter capacitors
	Defective ADJ VOLTS control
(e) High ripple output voltage	One defective rectifying diode
	Open filter capacitor
	Defective transistors in regulator circuit