

*BJM#850B*  
**AC LINE VOLTAGE REGULATOR**  
**KS-15908 TYPE**  
**MOTOR-DRIVEN AUTOTRANSFORMER TYPE**  
**OPERATING METHODS**

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**1. GENERAL**

**1.01** This section covers the operation of the KS-15908 L1 and L2 motor-driven autotransformer type, ac line voltage regulators. These regulators are designed to provide 230 volt  $\pm 1$  per cent ac power from a 208 or 230 volt, 55/65 cycle ac power source subject to voltage variations of  $\pm 10$  per cent.

**1.02** The first use of these regulators is in the test facilities of the TH radio system.

**1.03** Requirements and adjusting procedures for the motor-driven autotransformer are covered in Section 028-706-701. For more detailed information on the operation and maintenance of other individual equipment and apparatus such as relays, refer to the appropriate BSP section.

**1.04** *Caution: Voltages in the regulator circuit may be over 230 volts to ground and between terminals. 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. When practicable, disconnect the ac supply before working on the regulator.*

**2. LIST OF TOOLS AND TEST APPARATUS**

| CODE OR SPEC. NO.     | DESCRIPTION                     |
|-----------------------|---------------------------------|
| <b>TOOLS</b>          |                                 |
| —                     | 3-Inch C Screwdriver            |
| <b>TEST APPARATUS</b> |                                 |
| —                     | Voltmeter, AC, Weston Model 904 |
| —                     | Cord, Test, D-79650, Weston     |
| (2 reqd)              | Electrical Instrument Co        |

**3. DESCRIPTION**

**3.01** The KS-15908 type regulator consists essentially of a motor driven autotransformer, an auxiliary transformer, and a line isolation output transformer to which the load is connected. The autotransformer and the auxiliary transformer control the voltage applied to the output transformer to correct the output voltage for variations in input voltage and load. The magnitude of the voltage correction is determined by the position of the brush on the autotransformer, the motor of which is controlled from a voltmeter relay.

**3.02** Four indicating and three nonindicating fuses are provided for circuit protection. A green pilot light indicates that the regulator is on. The light may dim or be extinguished if any of the nonindicating fuses are blown.

**3.03** The regulator may be used with either 208 volt  $\pm 10$  per cent or 230 volt  $\pm 10$  per cent input power. As shipped, the autotransformer in the regulator is connected for use with the 230-volt input. If the regulator is to be used with the 208-volt input, the orange lead to terminal 6 of the autotransformer is transferred to terminal 2.

**3.04** The nominal output voltage of the regulator is 230 volts and should vary less than  $\pm 1$  per cent. An ADJUST OUTPUT rheo-

stat is provided for adjusting the nominal output voltage over a range of  $\pm 2$  per cent.

**4. OPERATION**

**Preparing to Start Initially**

**4.01** Before connecting the regulator to the input power line, check that:

- (a) Correct size fuses are in place and spare fuses are available.
- (b) The orange lead to the autotransformer is connected to terminal 6 on the autotransformer if the regulator is to be connected to 230-volt input power or to terminal 2 if the regulator is to be connected to 208-volt input power.
- (c) An external ground is connected to terminal C of the input-output terminal strip.

**4.02** Connect the A and B IN terminals of the regulator to the input power and check that the pilot light is lighted.

**Initial Adjustments**

**4.03** After the regulator has been connected to the input power, check the output voltage across the TEST OUTPUT jacks at the front using the 300-volt scale of the Weston 904 voltmeter. If necessary, adjust the ADJUST OUTPUT rheostat using the 3-inch C screwdriver to bring the output voltage within the limits of 230 volts  $\pm 1$  per cent.

*Caution: To avoid electrical shock when using the voltmeter, connect the leads to the voltmeter before connecting them to the test jacks on the regulator. When disconnecting the meter, disconnect the leads from the test jacks before disconnecting them from the meter.*

**4.04** After the regulator has been connected to its normal load for at least 30 minutes, recheck the output voltage and, if necessary, readjust the ADJUST OUTPUT rheostat as covered in 4.03.

**Operation of Regulator**

**4.05** The regulator will operate automatically to maintain the output voltage within the specified limits. For routine starting or stopping, it is only necessary to connect or disconnect the input power.

**5. ROUTINE CHECKS**

**5.01** Observe the glow-type lamp associated with each indicating fuse (F4 through F7). A lighted lamp indicates that the associated fuse is blown. Observe whether the pilot light is dim or unlighted. A dim or unlighted pilot light may be an indication that one or more of the nonindicating fuses (F1 through F3) is blown.

**5.02** Periodically check and adjust, if necessary, the output voltage of the regulator during normal operation as covered in 4.04.

**6. TROUBLES**

**6.01** The troubles and possible causes listed below are not necessarily all-inclusive, but are merely indicative of some of the difficulties that may be encountered when the regulator is not operating normally. When checking the output voltage of the regulator, the Weston 904 voltmeter should be connected across the TEST OUTPUT jacks.

| TROUBLE                                   | POSSIBLE CAUSE  |
|---|---|
| No output voltage (pilot light unlighted) | No input voltage.<br>Operated F6 or F7 fuse. (Observe glow-type indicator lamp associated with fuse.)   |
| High or low output voltage                | Operated input power supply F1, F2, or F3 fuse.<br><br>Operated control circuit F4 or F5 fuse. (Observe glow-type indicator lamp associated with fuse.)<br><br>Operated F6 or F7 fuse. (Observe glow-type indicator lamp associated with fuse.) |
|   | ADJUST OUTPUT control out of adjustment.  |
|   | Input line voltage outside limits.  |
|   | Failure of motor or autotransformer.  |
|   | Voltmeter relay (RL3) out of adjustment.  |

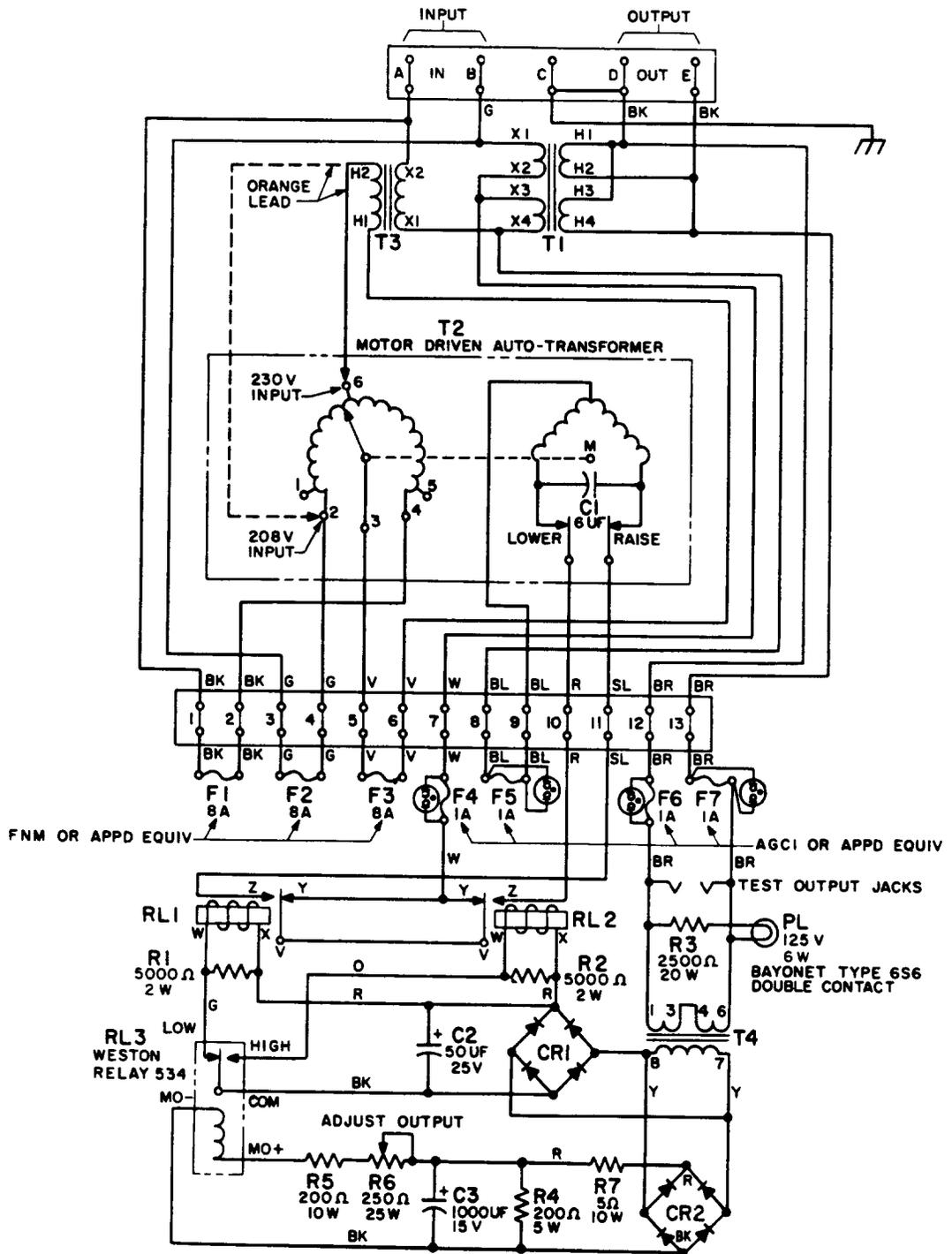


Fig. 1 - KS-15908 L1 and L2 Regulator — Circuit Schematic