HITACHI REGULATORS

Isuzu
LUV
Subaru

DESCRIPTION

Regulator system consist of a voltage regulator and a charge relay. The voltage regulator has 2 sets of contact points to control alternator voltage. An armature plate placed between the 2 sets of contacts moves upward, downward, or vibrates. The lower contacts, when closed, complete the field circuit direct to ground. The upper contacts complete the field circuit to ground when closed, through a resistance (field coil), causing the alternator to charge. The charge relay is similar in construction to the voltage regulator. When upper contacts are closed, the ignition warning light goes on.

APPLICATION

Model	Hitachi No.
I-Mark	
LUV & P'UP	TLIZ-87
Subaru	TLIZ-94E

TESTING

VOLTAGE REGULATOR

I-Mark – 1) Connect a voltmeter between condensor lead and ground with all electrical loads disconnected including blower relay connector. See *Fig. 1*. The voltage relay is working properly when lower side points are closed when engine is off and when upper points are closed when engine is running at idle.

2) If points are not working properly, check coil resistance. If normal, adjust relay. Start engine and increase speed gradually. Voltage should increase with engine speed up to 1400-1850 RPM. Normal condition of regulator is indicated when voltage is 13.8-14.8 volts.

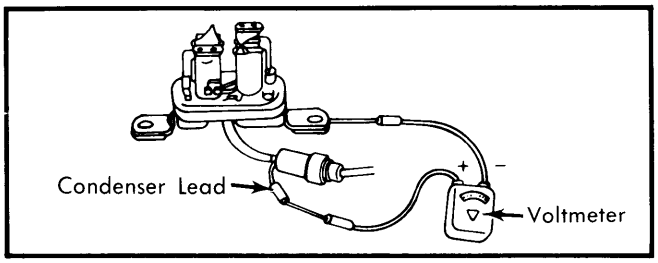

Fig. 1 Regulator Test Connection for I-Mark

LUV, P'UP & Subaru – 1) Connect voltmeter and ammeter as shown in *Fig. 2*. Start and maintain engine speed at 2500 RPM for a few minutes. Check that ammeter reading is 5 amps or less. If reading remains higher than 5 amps, remove battery and substitute with battery known to be fully charged. Recheck to ensure ammeter reading is less than 5 amps.

2) Lower engine speed to idle and again increase it gradually to 2500 RPM, then note voltmeter reading. Function of regulator is normal if measured value is within specified regulating voltage. If voltmeter reading deviates from specified range, regulator is in need of adjustment.

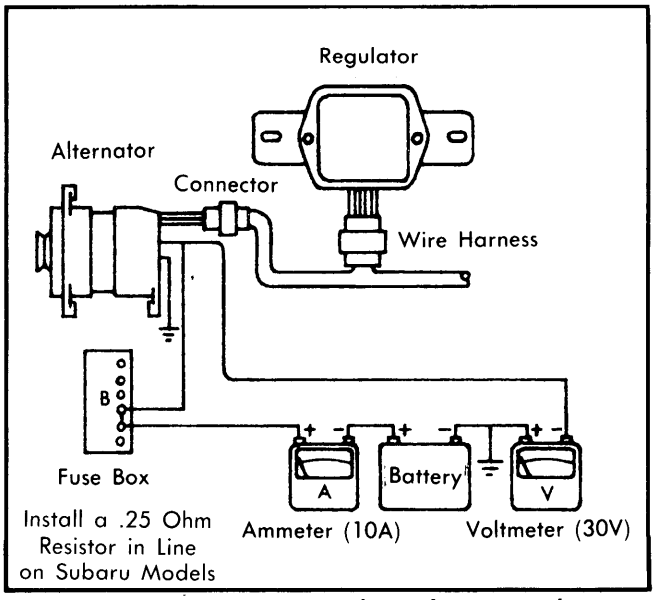

Fig. 2 Test Connections for Voltage Regulator (LUV, P'UP & Subaru)

RELAY

I-Mark – 1) Connect voltmeter between negative terminal and ground and increase engine speed gradually. Voltmeter reading should be 4.0-5.8 volts. If cut-in voltage is too high, adjust by bending coil arm "A" down. Bend up if voltage is too low, See *Fig. 3*.

2) If adjustment of core arm does not correct cut-in voltage, proceed with point gap adjustment. Disconnect battery. Check armature core gap with armature depressed until moving point is in contact with "B" side point.

3) Adjust core gap to .012" (.30 mm) by bending point arm "B". Release armature and adjust gap between "B" side point and moving point to .016-.047" (.40-1.2 mm) by bending point arm "C". After point adjustment, recheck cut-in voltage. If not within 4.0-5.8 volts, repeat cut-in voltage adjustment.

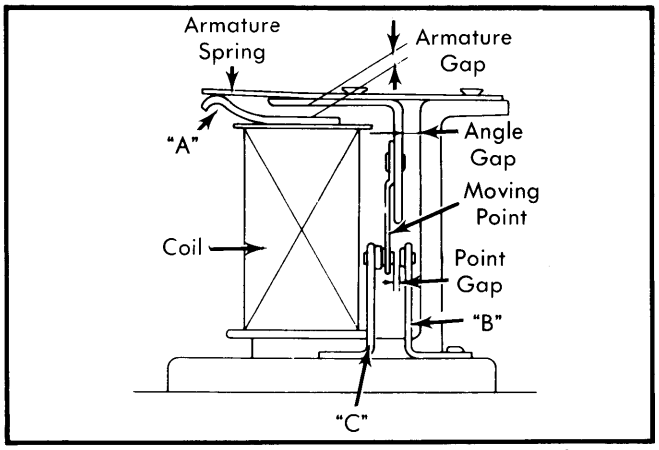

Fig. 3 Voltage Relay Adjustment (I-Mark)

ADJUSTMENT

NOTE – *Charge relay is adjusted in same manner as voltage regulator.*

HITACHI REGULATORS (Cont.)

LUV, P'UP & Subaru – 1) Disconnect and remove voltage regulator from vehicle. If contact points are roughened, smooth with fine sandpaper. Check and adjust core gap first, then point gap. Yoke gap adjustment may be unnecessary on some models.

2) Adjust core gap by loosening screws attaching contact set to yoke. Move contact set upward or downward as required. Adjust point gap by loosening screw attaching upper contact. Move upper contact up or down as required to set gap to specification.

3) Adjust regulated voltage by means of adjusting screw. Turn screw in to increase regulated voltage or out to decrease voltage. When correct voltage adjustment is obtained, secure with lock nut. When adjustment procedure is complete, reinstall regulator and perform on car check.

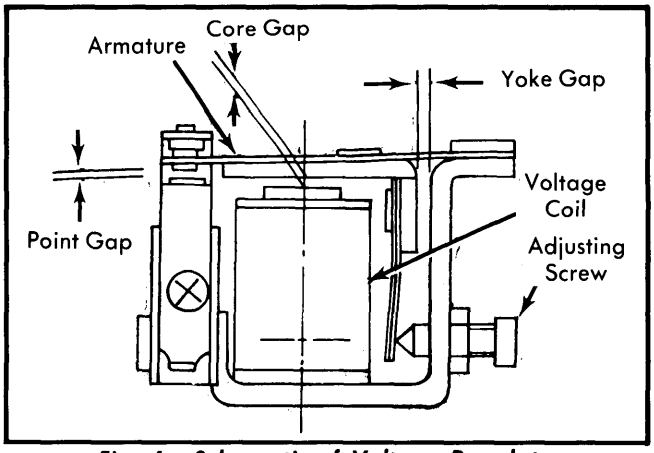

Fig. 4 Schematic of Voltage Regulator (LUV, P'UP & Subaru) Charge Relay Similar

VOLTAGE REGULATOR SPECIFICATIONS

Regulator	Battery Voltage	Regulated Voltage	Voltage Coil① Resistance (Ohms)	Yoke Gap In. (mm)	Core Gap In. (mm)	Point Gap In. (mm)
TLIZ-87	12	13.8-14.8	10.3	②	.024-.039(.6-1.0)	.012-.016 (.30-.40)
TLIZ-94E	12	14.0-15.0	10.3	.035(.9)	.024-.039(.6-1.0)	.014-.018 (.35-.45)

① – I-Mark resistance 102 ohms.
② – No yoke adjustment required.

VOLTAGE RELAY SPECIFICATIONS

Regulator	Released Voltage	Voltage Coil② Resistance (Ohms)	Yoke Gap In. (mm)	Core Gap In. (mm)	Point Gap In. (mm)
TLIZ-87	5①	31.9	③	.032-.039(.8-1.0)	.016-.024(.41-.61)
TLIZ-94E	8-10	32.1	.035 (.9)	.032-.039(.8-1.0)	.016-.024(.41-.61)

① – Measured at "A" terminal.
② – I-Mark resistance 24 ohms.
③ – No yoke adjustment required.