

# Instructions for Installing "Z-Unit" Voltage Regulator

This Regulator has been **ACCURATELY SET** and **CAREFULLY TESTED** for Cars and Trucks listed on Reverse Side of this sheet.

## INSTALLING A VOLTAGE REGULATOR IS EASY . . .

Just **READ** these simple **Instructions**, and follow them **EXACTLY**, (Checking with illustration).

### THE IMPORTANT THINGS ARE:

- To be sure Regulator is **RIGHT** one for your Car or Truck — (Check listing on Reverse Side).
- To Connect **EACH** Terminal of the Regulator to the **CORRECT** Wire. Wrong Connections will ruin Regulator.
- To properly "Ground" the Regulator Base.

## INSTALLATION REQUIRES ONLY 4 SIMPLE STEPS

- Before Removing Old Regulator, Disconnect Wires leading to it.

**NOTE:** As you Disconnect each Wire, Identify it by noting the Marking of the Terminal to which it was connected. These Markings may be stamped on Terminals, or on Base, or on Cover above each Terminal.

### DISCONNECT WIRES AS FOLLOWS:

- First, Generator **Field Wire**, (Usually smallest Wire), from "**FLD**" Terminal. BEND End of Wire to identify it later.
- Second, **Battery Wire**, from "**BAT**" Terminal. (This is a "Hot" Wire, which will spark if touched to any part of frame.) Temporarily cover Bare End of this Wire with tape, cloth, etc., for Safety and Identification.
- Third, **Generator Armature Wire**, from "**GEN**" Terminal, (sometimes marked "**A**").
- If old Regulator had a wire connected to Terminal grounded on Base, disconnect and identify it.

**NOTE:** If old Regulator has a Terminal marked "**IGN**," **DO NOT USE** wire previously attached to it; leave this wire **DISCONNECTED**, but tape any exposed part for safety.

- Remove Old Regulator, saving Mounting Screws to mount New Regulator.

- Now, take Rubber Grommets and Brass Eyelets furnished, (in Envelope). Insert Grommets in holes in Regulator Base most convenient for Mounting; then insert Brass Eyelets, from Top, with Flat Flanges of Eyelets on Top side. (See illustration).

The Regulator Base is "Grounded" by means of a "Grounding Clip" furnished. Slip slotted end of clip between UPPER part of Base and Rubber Grommets, with rounded part over the top of Eyelet to provide electrical contact between Head of Mounting Screw and Base. (See Illustration). Be sure head of screw used is clean to give a good metal-to-metal contact between screw and Base.

**THIS IS VERY IMPORTANT** as Regulator cannot work unless this ground connection is **RIGHT**.

Mount Regulator on Dash in same place as old one. If old Regulator was mounted on Generator **DO NOT** mount new one there; but drill holes in Dash and mount Regulator on Dash.

The delicate setting of this Regulator will be ruined if the Base is Bent, cut, or strained in any way, or if Regulator is not mounted on a flat surface.

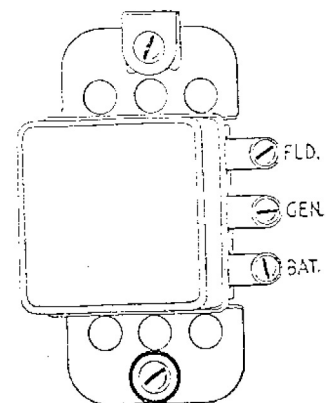
- WARNING: REGULATOR WILL BE RUINED IF TERMINALS ARE CONNECTED TO WRONG WIRES.**

Arrangement of Terminals on this Regulator is identical with most Original Regulators; but to be safe, note particularly positions of Terminals on Old and New Regulator. (See Illustration).

**CONNECT WIRES TO NEW REGULATOR**, using Screws and Lock Washers provided.

- Generator **Field Wire**, to "**FLD**" Terminal.
- Generator Armature Wire**, to "**GEN**" Terminal.
- Battery Wire**, to "**BAT**" Terminal.

- If old Regulator had a wire to ground—reconnect this wire to the Ground Screw, on the Base of New Regulator. Otherwise leave this screw disconnected as Regulator is already grounded through Base—done in 3.



**NOTE:** See Reverse Side of Sheet for **IMPORTANT** Additional Information.

This Regulator has been **ACCURATELY SET** and **CAREFULLY TESTED** for the following Cars and Trucks:

BUICK (Original Regulators 5858, 1118203) .....	1938-39	PONTIAC 6 cyl. ....	1938
CHEVROLET .....	1937-39, 1940-52	PONTIAC .....	1939
CHEVROLET TRUCK .....	1938	REO TRUCK (GCJ Generators) .....	1937-39
OLDSMOBILE .....	1936-39	WILLYS .....	1939-42
OVERLAND .....	1939	WILLYS TRUCK (GCJ Generators) .....	1941

It Replaces Original Nos. 5814, 5835, 5858, VRD4004A, VRR4004A, 1118203.

## IMPORTANT

Please understand that a Voltage Regulator can only Regulate the Output of the Generator. It cannot correct defective conditions in the Generator, Battery, or the Electrical Equipment.

If satisfactory results are not obtained do not assume the Regulator is at fault. Trouble is certain to be due to other causes. Check all Connections, all Wiring, and all the Electrical System.

### BEFORE STARTING MOTOR CHECK THE FOLLOWING:

- (a) **BATTERY:** Battery should be fairly well charged. If it has recently been removed from car, or if new Battery has just been installed, make sure it has not been put in backwards. Correct installation can be checked by turning lights on, with motor NOT running: if Ammeter shows "Discharge" the Battery is installed correctly. If Ammeter shows "Charge" Battery is reversed, and, for this particular application, should be taken out and installed with Negative (—) Post connected to frame of car. Check the Battery Cables and their Terminals for clean tight connections to Battery Posts, Frame of car, and Starter Switch. Install new Battery Bolts if necessary.
- (b) **GENERATOR:** Make sure Generator Drive Belt does not slip. Tighten sufficiently or replace Belt if necessary. Generator Brushes should seat well on Commutator, and have proper tension. Commutator should be clean and in good condition.

If Generator has recently been repaired, or if new Generator has just been installed, its magnetic polarity might have become accidentally reversed: this would immediately "burn" the Regulator Contact Points. To make sure Generator has proper polarity, before starting, "Polarize" Generator by making a momentary connection between "BAT" Terminal and "GEN" Terminal on the Regulator, by means of a wire jumper, pliers' handle, etc., but for **NOT OVER 1 SECOND**.

- (c) **CONNECTIONS:** Clean and Tighten all connections in the Generator-Battery Circuit, especially the Ammeter Leads, Generator Connections, Starter Switch Connections, etc.

NOTE: The Voltage Regulator will NOT cause a HIGH CURRENT to show on Ammeter, except temporarily after starting motor, or when Battery is LOW.

Ammeter may show fluctuations, at times under certain conditions. This is not objectionable, and does not interfere with the Charging of the Battery.

This Regulator has been **PROPERLY HEAT TREATED, ACCURATELY SET, AND CAREFULLY TESTED** to give best results on Cars listed. **SETTING MUST NOT BE CHANGED.**

**CAUTION:** Base of Regulator must not be bent, cut, or otherwise mutilated, as this will change delicate settings of the Regulator and cause it to fail.

Regulator Cover is riveted to Base. Our **GUARANTEE** is **VOID** if Rivets have been Tampered with or if cover has been removed.

venting damage to the generator due to overload.

The circuit breaker (cut-out relay) unit of the regulator is an automatic switch in the charging circuit between the generator and the battery. When the generator voltage exceeds the voltage for which the circuit breaker is set (slightly above battery voltage) the circuit breaker points close

and the generator begins to supply electrical energy to operate electrical units and charge the battery. When the generator voltage drops below that of the battery the current starts to flow from the battery to the generator which opens the circuit breaker points and breaks the circuit.

## CONSTRUCTION

### GENERATOR

The generator housing (field frame) has the two pole shoes attached to it 180° apart. The field coils are around the pole shoes. The armature is centered between the pole shoes and is held in place by bearings in the frames (end plates); the end plates have openings for circulation of air for cooling. Air is circulated through the generator by the combined pulley and fan that are mounted on the front end of armature shaft. The commutator end frame (end plate) is fitted with the brush holders that hold the brushes in correct position under spring tension against the armature commutator. One brush is grounded to the frame while the other is insulated from the frame.

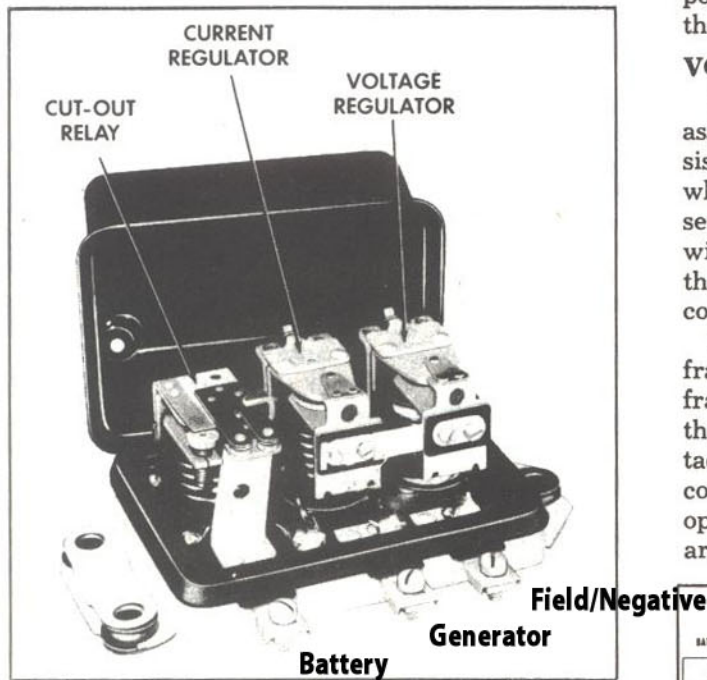


Fig. 13—Current and Voltage Regulator

The insulated (positive brush) is connected to the positive "A" terminal of the generator and to one terminal of the field coils. The other end of the field coils is connected to the insulated field "F" terminal of the generator.

### CIRCUIT BREAKER (CUTOUT RELAY)

The cutout relay (fig. 14) has two windings

assembled on one core, a series winding of a few turns of heavy wire (solid line) and a shunt winding of many turns of fine wire (dashed line). The shunt winding is shunted across the generator so that the generator voltage is impressed upon it at all times. The series winding is connected in series with the charging circuit so that the generator output passes through it.

The relay core and windings are assembled into a frame. A flat steel armature is attached to the frame by a flexible hinge so that it is centered just above the end of the core. The armature has two contact points which are located just above a similar number of stationary contact points. When the generator is not operating, the armature contact points are held away from the stationary points by the tension of a flat spring riveted on the side of the armature.

### VOLTAGE REGULATOR

The voltage regulator (fig. 14) has two windings assembled on a single core, a shunt winding consisting of many turns of fine wire (dashed line) which is shunted across the generator; and a series winding of a few turns of relatively heavy wire (solid line) which is connected in series with the generator field circuit when the regulator contact points are closed.

The windings and core are assembled into a frame. A flat steel armature is attached to the frame by a flexible hinge so that it is just above the end of the core. The armature contains a contact point which is just beneath a stationary contact point. When the voltage regulator is not operating, the tension of a spiral spring holds the armature away from the core so that the points

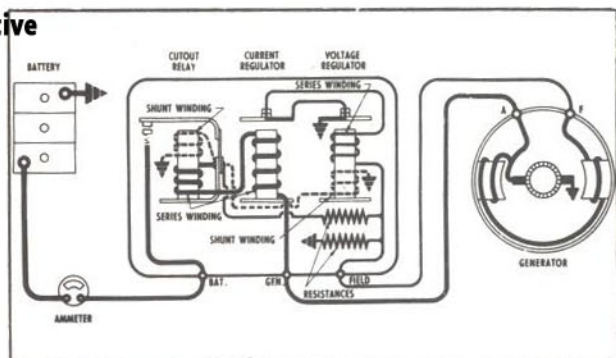


Fig. 14—Circuit Diagram