

Instructions for the Precision Electronic Instrument Voltage Regulator Part # 39533

Congratulations on purchasing the most advanced precision electronic instrument voltage regulator ever produced. Every PEIVR is factory tested to ensure correct operation. When used and connected properly, you're PEIVR will provide state-of-the-art performance in DC to DC voltage regulation.

Listed below you will find the year, model and application for your specific vehicle. **If you do not see your specific application listed, do not attempt installation before calling your authorized dealer or our technical support line for assistance.**

FORD TRUCKS & VAN

<u>Part #</u>	<u>Years</u>	<u>Make</u>	<u>Model</u>	<u>Application</u>	<u>OEM #</u>
39533	1967-70	Ford	Truck, B-F-100 thru 750		C6DZ-10804-A
39533	1969	Ford	Van, E-100 thru 300		C6DZ-10804-A
39533	1970	Ford	Truck, F-350		C6DZ-10804-A
39533	1970	Ford	Truck, L-LT-LTS-800 thru 900 & LN-LNT-500 thru 800	With City Delivery Instrument Panel	C6DZ-10804-A
39533	1973-75	Ford	Truck, F-350 thru 500		C6DZ-10804-A

FORD CARS

<u>Part #</u>	<u>Years</u>	<u>Make</u>	<u>Model</u>	<u>Application</u>	<u>OEM #</u>
39533	1966-68	Ford	Fairlane, Falcon & Torino		C6DZ-10804-A
39533	1967-68	Ford	Mustang, LTD, Galaxie 500, Custom. Country Squire & Sedan		C6DZ-10804-A
39533	1969	Ford	Fairlaine & Torino	With Tachometer	C6DZ-10804-A

Many, more applications for Ford, Chrysler, AMC and Jeeps are on the way. Please check with your local authorized dealer for further information.

The PEIVR includes these 13 outstanding features:

- 1) Factory cans and brackets give a stock appearance and ensure an easy installation.
- 2) Polarity protected in case battery cables were to get reversed.
- 3) Over voltage (surge) protected. Prevents potential damage to the PEIVR or gauges caused by a damaged charging system, wiring problems or high amp battery chargers.
- 4) No heat is generated by the PEIVR. Heat typically causes damage to gauges or flexible circuit boards on instrument clusters. Heat related failures are a common problem with aftermarket conversions of factory mechanical units due to chips that need heat sinking.
- 5) Gauge needles will hold steady at all times with no random fluctuations, deflections or jerking movements from rough terrain, mechanical regulator warm up periods or changing voltages in the electrical system.
- 6) Completely eliminates gauge damage caused by sticky mechanical type instrument voltage regulators.
- 7) Eliminates pegging of gauge needles on start-up, which will eventually lead to gauge failure.
- 8) Continuously provides 100% steady voltage/current output at temperatures from -40 F to +185 F, and is not affected by external temperatures within the stated temperature range.
- 9) Functions with factory Radio Frequency Interference filters (capacitors) for radio noise suppression.
- 10) The PEIVR itself does not generate any Radio Frequency Interference.
- 11) Provides steady voltage/current to gauges without regard to battery voltage. Will perform with as little as 5.8 volts DC input.
- 12) Unlike original mechanical units where voltage output was set via a screw, the PEIVR comes pre-set from the factory and never requires adjustment.
- 13) The PEIVR can continuously drive up to five factory gauges at 100% duty cycle.

The following information will help you with the installation of your new PEIVR and provide answers to frequently asked questions

A: Mechanical Instrument Voltage Regulators: Your factory gauges and mechanical regulators are of the thermo type and operate on the constant voltage principle. The factory accomplished this through the use of a mechanical (Bi-Metal) type instrument voltage regulator. The mechanical units thermally oscillate the Bi-Metal rapidly, using resistance wire to create heat, in order to switch between off and on to accomplish the reduction of voltage necessary to drive the gauges.

The factory tolerance of the overall system is approximately $\pm 10\%$ to 15% . Due to this wide tolerance no two gauges or mechanical regulators are alike. This process is crude, but effective for technology first developed in the 1950's. There are many side effects of using mechanical regulators as indicated above in the list of outstanding features. Many factory gauges are damaged by sticking regulators which stop oscillating. The gauges can also degrade to where they no longer read accurately because of simple warm up periods where the gauge is forced to peg the needle as the mechanical regulator warms up the Bi-Metal inside. This is a wide spread problem that many owners are unaware of.

The PEIVR oscillates immensely faster, accurately providing a 99% increase in efficiency. None of the inherent side effects of the mechanical units exist when using the PEIVR providing for increased gauge reliability and functionality. The PEIVR functions with a near military grade tolerance of $\pm 1\%$ to maintain a high level of accuracy.

B: Factory Gauges: Your factory gauges use an internal resistance wire with a tolerance of $\pm 10\%$ to 15% . In lieu of this wide tolerance, the gauges will read differently every time a different mechanical instrument voltage regulator is installed. No two mechanical regulators will read the same on the same set of gauges. The PEIVR will eliminate this side effect as it is a precision device. ***In almost all cases the proper installation of the PEIVR will cause your gauges to read differently than a mechanical instrument voltage regulator, this is normal.*** It is possible that gauges like the fuel gauge, temp gauge or oil gauge will change by up to a needles width or slightly more in extreme cases. Again, this is normal and if uncomfortable with the change it may be corrected by slightly bending the needle on your gauge in one direction or the other. **Choosing to calibrate will require disassembly of the instrument cluster. Let's discuss an example:** the mechanical unit may cause your fuel gauge to read exactly on the empty mark when the vehicle runs out of fuel. The PEIVR may cause the fuel gauge to now read approximately a needle's worth past (less than) the empty mark. Conversely, the fuel gauge may read slightly past (above) full when the tank is topped off with the mechanical regulator, but with the PEIVR it will now read a needle's worth slightly below the full mark on the gauge. This may be corrected using the calibration process described above if necessary. In most cases, the change is no different than replacing your old mechanical regulator which causes a negligible change in the gauge display.

If your gauge pointers sit way below the first hash mark there is a good chance that the band inside the gauge has been warped badly or is possibly even burnt due to excessive heat or ground problems on your circuit board if so equipped. If your gauges are already damaged, they will more than likely be very inaccurate and if the resistance wire is burnt the gauges may not function at all. We would recommend that prior to completing the installation of the PEIVR, you send your gauges for repair and calibration to a qualified instrument repair shop such as Redline Gauge Works in Newhall CA (661) 259-8891 Redline Gauge Works specializes in early muscle car, hotrod gauge repairs and instrument restorations. They can evaluate your gauges and make recommendations for repair. Their web page is www.redlinegaugeworks.com

C: Grounding of the PEIVR: When installing your new PEIVR use caution to insure the unit is well grounded to the instrument cluster. The outer metal can requires a good ground to insure proper gauge operation. In turn, it is important to ensure the instrument cluster is also well grounded. Gauges will generally indicate random readings when the instrument cluster has a bad (high resistance) ground.

Another symptom of bad ground(s) is indicator lamps illuminating out of turn or dim. Double check the ground path to the instrument cluster and to the can/mounting bracket of your PEIVR before you complete the installation.

D: Installing the power connections: On applications that use separate wires to the PEIVR for power and feed circuits; install the ignition feed wire from the vehicles instrument panel (dash wiring) harness to the terminal on the PEIVR that is marked **IGN**. This is the input terminal on the PEIVR. The remaining terminal is the output terminal and should be connected to the gauges. In general, vehicles without the Rally clusters use two gauges and those with the Rally clusters use three gauges. Your PEIVR can tolerate up to five gauges connected in parallel.

On vehicles using flexible Mylar printed circuit boards or hard printed circuit boards, simply push the regulator into the factory position on the circuit board.

Note: it may be necessary to clean the copper tracings on the circuit boards by using an eraser from a pencil and slightly rubbing (**in one direction only**) the tracing to clean the surface of the copper. If your vehicle is equipped with the factory capacitor used for noise suppression, you may reconnect the capacitor if you like. Technically there is no need for the suppression capacitor as the PEIVR does not generate RFI noise therefore eliminating the need.

E: Expectations once the PEIVR is installed: You will notice when ignition power is engaged, that the needles now have a nice, smooth transition to their respective positions within the gauge. It will take approximately 20 to 30 seconds to reach their respective positions on power up. This period is due to the gauges still needing warm up time in lieu of the internal thermo resistance wire within the gauge.

- The needles on the gauges will never jump to the extreme clockwise positions during regulator warm up; unlike most vehicles equipped with mechanical instrument voltage regulators.
- No more random fluctuations of gauge readings based on temperature within the vehicle, rough terrain or any of the inherent side effects with the mechanical regulators. Even the fuel gauge will remain relatively stable during high slosh periods of the fuel within the fuel tank.
- Voltage surges from various sources will no longer cause the gauges to spike, or be damaged from spikes.
- The polarity protection in the PEIVR isolates the gauges therefore any accidental reversal of the battery cables (or jump starts made to the vehicle) will not damage the gauges or the PEIVR.
- The PEIVR will operate down to a battery voltage of 5.8 volts input and still generate the 5.01 volts necessary to drive the gauges appropriately. This means the PEIVR is not affected by low battery conditions.

We would like to thank you for your continued commitment to our products and encourage you to call your authorized dealer with sales or technical questions if necessary. Please see separate warranty sheet if included for further assistance.