ModTiger Engineering LLC

TECHNICAL TIPS

ON THE SUNBEAM TIGER

October 2009

Solid State Instrument Regulator

After several years of discussion and development, Theo Smit and I finally think we have an instrument voltage regulator developed that will meet and exceed all your requirements. Shown below, this simple package will end many of the problems associated with the OEM vibratating regulator which leads to many of the incorrect readings on the water temperature and fuel level gages.

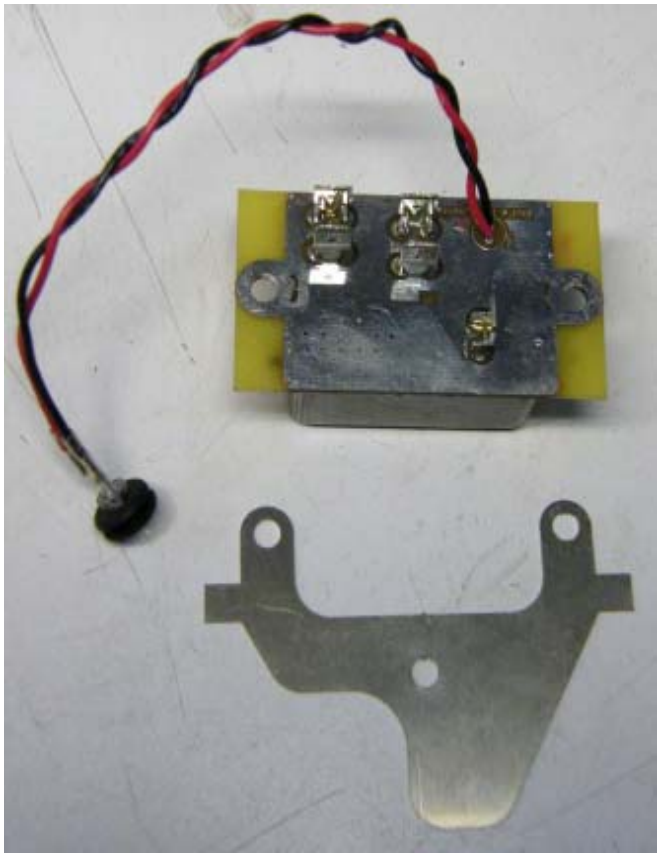

Figure 1. Here's the new 10 Volt Solid State Instrument Voltage Regulator and the proposed mounting plate.

While it's not a "cure all" for bad instruments, sending units, or wiring problems, It will give you a dependable 10 volt source to run these instruments and frequently end problems associated with high and irregular readings.

We have also added a new feature that can aid you in monitoring your Generator or Alternator operation. Since this regulator gets voltage from the ignition switch when it is turned on, it "reads"system battery voltage with out any connections to the charging system. By installing voltage sensing circuit and a remote red LED bulb, this regulator indicates the proper operation of your charging system. When the battery voltage drops below 12.8 volts, the red LED lights up. This is the case when your engine is not running or your charging system has problems. As your charging system brings the voltage above 12.8 volts, the light goes out and you know you are getting enough voltage to charge your battery.

This feature is especially handy when you are converting to an Alternator with a one wire, built-in regulator. It eliminates the wiring that is needed to make the OEM bulb warning light operate.

The mounting plate was developed to allow this regulator to sit in the same location under the dash, behind the ignition switch and be attached with the same OEM screw in the same hole.

The following pages have the simple instructions and photographs to guide you through the installation process which should take about 10 to 15 minutes. A couple of #2 Phillips screwdrivers and a small flat blade screwdriver is all you need to get this project done.

Let's begin by identifying the OEM Regulator. You can see it below in *Figure 2* attached to the dash support with a #10 Phillips head screw. After 40 years and previous owners , you may find this piece located in other places.

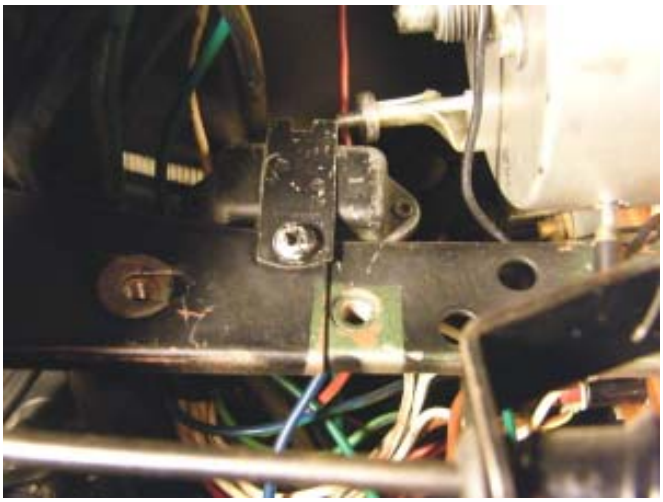

Figure 2. Here's the OEM Regulator as found in my Stock 67 Tiger. The single screw mounting is typical.

I had to use a very stubby Phillips head screwdriver to get this screw loose. The space to the steering column is too close for a standard length screwdriver.

Figure 3. Here's a shot from the other side showing the three connections on the OEM Regulator.

After removing the mounting screw, the leads are long enough to allow you to pull the regulator and the attached wiring about 6 inches below the dashboard for easy access. You will find three connectors on this regulator, two with dark green wires, which is the fused "key-on 12 volt" power, and one dark green with the light green stripe. This is the 10 volt supply to the fuel and temperature gages.

Figure 4. Here's the OEM Regulator pulled down for easy access.

With the wiring pulled down, it's easy to pull the spade connectors off the OEM regulator. The new regulator is clealy marked as "IGN" for the dark green wires, and "10V" for the dark green/Light green wires. The regulator has four spade terminals just like the OED unit. Simply insert the wires over the spade terminals and your all set. If you find wiring faults, bare wires, modifications (?) or worn insulation, this is the proper time to repair such damage. Quarter inch to 5\16 shrink tubing is a good replacement for the OEM insulation.

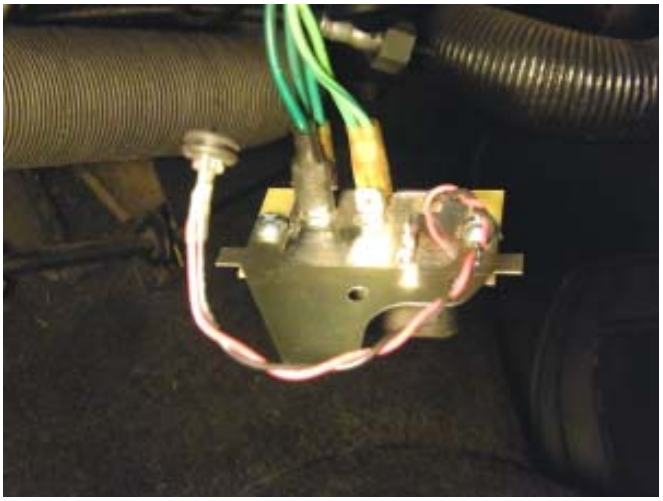

Figure 5. All re-connected.

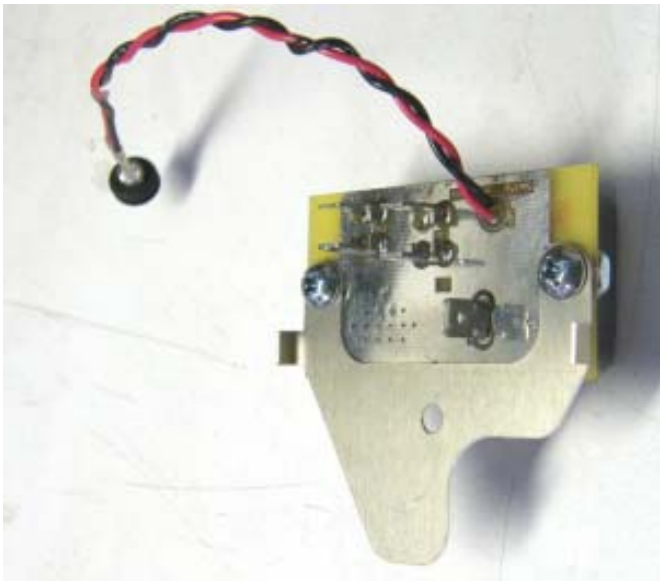

Figure 6. These bent "ears" will keep the regulator from twisting on the frame and possibly shorting out.

I designed the mount with two tabs, one on each side. Carefully bend these tabs up as shown above to prevent the mounting from twisting on the dash bracket. There is plenty of clearance, but we don't want "hot" things touching ground if they work a little loose with vibration over the years. thes tabs will prevent that. Be careful when bending and do it with a radius. The material is 6061 T6 and it doesn't like sharp bends.

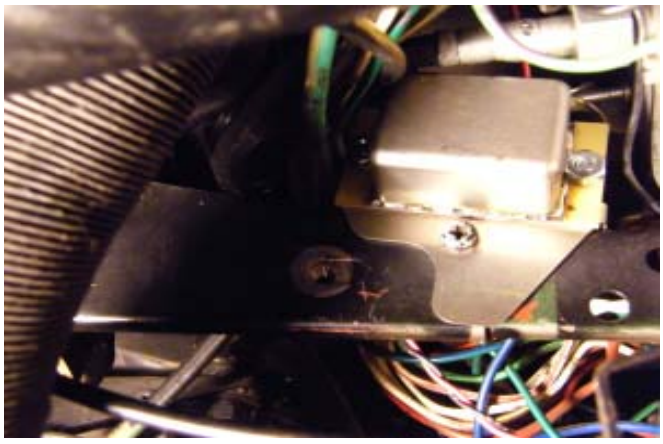

Figure 7. This is the completed installation back in the same location.

You see the installed regulator in *Figure 7* above. It also shows the way the tabs work and why the bracket has the odd shape to miss the missing 1/4-28 screw and washer. If you want to be super safe in this installation, you can add a "star" washer under the screw head and a short lead from one of the other #10 mounting screws to a second ground location.

Our final operation is to install the red LED into the red warning light tube. Here you have a choice between using the Terminal marked "warn" on the regulator and the Red LED. If you cut the Brown/ Yellow stripe wire running between the Generator/ Alternator regulator and the OEM Warning light and add a spade terminal to the wire from the light end, you can use this to connect to the "warn" terminal and the system will work as usual. The Red LED replaces this wiring change and you can simply remove the bulb from the socket and the LED will replace it in the indicator tube. It's a tight fit so I like to use a small flat blade screwdriver to work around the supplied grommet to push it into the end of the black tube. The farther in you place the LED in this tube , the brighter the glow will be. The LED also goes out somewhat gradually as voltage increases so it's also more likely to indicate problems with charging voltage on a system that is "working" but not working at full capacity.

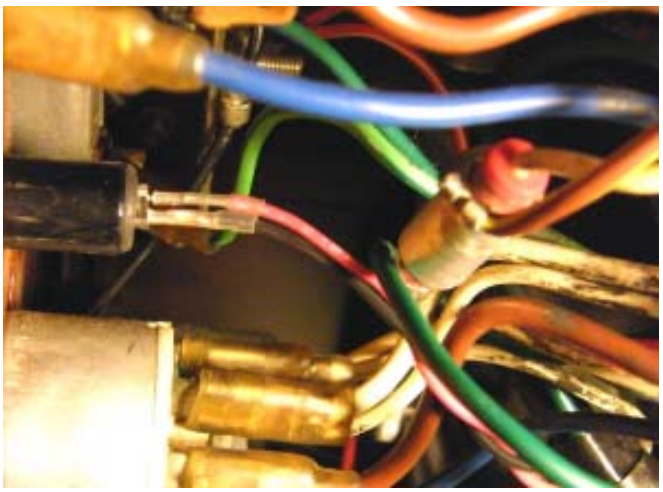

Figure 8. This photo shows the Red LED inserted into the rear of the red warning light housing.

Please direct any questions or problems with this regulator to either Theo Smit or myself at the e-mail addresses shown.

"Theo Smit" <theo.smit@dynastream.com>
"Tom Hall" <modtiger@Comcast.net>