

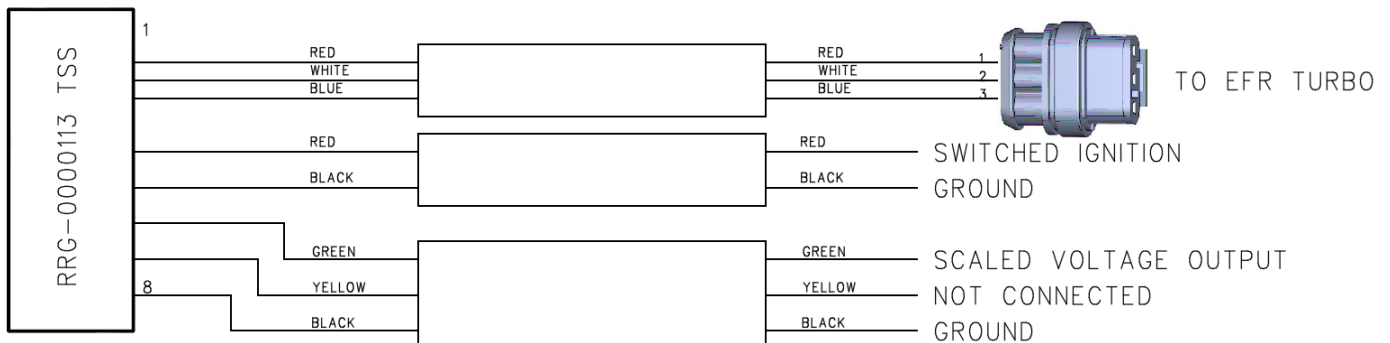
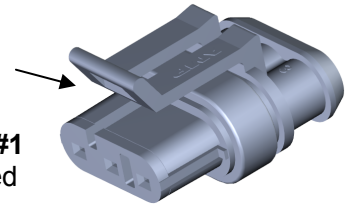


## TSS (Turbo Speed Scaler) Mounting Instructions RevB

PART NUMBER: RRG-0000113

### Installation:

1. Remove negative terminal of your vehicle battery.
2. Find a good spot to mount the TSS enclosure where it will not be exposed to excessive heat or moisture. Note: The TSS is water resistant – but not water tight. Its max temp is 105 degrees C so keep it away from the headers. (Small Wire Ties work well).
3. Plug in the 3 pin **Black connector with yellow seal** on TSS to the speed sensor of a Borg Warner Turbo.
4. Find a ground near your Data Acquisition system. Ground the **Black wire #1** (in the Yellow / Green / Black bundle) of the TSS to a bolt or screw anchored into the metal frame of the vehicle.
5. Connect the **Red wire** (in the red/black bundle) to switched ignition. **Note** if you tie it directly to the battery – you may run down your battery as it will be always on. **\*\*\*Note – the TSS is not internally fused – so tie to switched ignition on the other side of a fuse or use an inline fuse holder.**
6. Tie the **Black wire #2** (in the Red / Black) bundle to a convenient ground point near Switched Ignition Hot.
7. Connect the **Green wire** to an Analog to Digital input on your Data Acquisition system. This is the analog voltage that varies linearly with Turbo Speed. It is buffered and puts out a 0-5v signal (see back of instructions).
8. The **Yellow wire** is a 50% duty cycle square wave that is proportional to Turbo speed. Normally you would leave this wire unconnected as it is only there if your Data Acquisition system accepts a frequency. Note it is a mirror signal of what comes out of the Borg Warner Turbo.
9. Reconnect the negative terminal of your vehicle battery.
10. Start vehicle – look for LED to blink slowly when turbo is building low boost (>1 psi) and blink faster going solid when the turbo turns faster. Configure your data acquisition package for 0-5V input and load the calibration curve on the back of this guide.



**(OVER FOR TROUBLESHOOTING AND CALIBRATION CURVE)**

## Troubleshooting:

1. LED doesn't blink when the turbo builds at least 1psi: You have a bad black wire ground, or the red wire you think is connected to switched ignition actually is not Hot when key is on, or there is no frequency in from the sensor. If you have a scope or meter, read the frequency on the yellow wire (it mirrors the Turbo sensor output). If no frequency, you have no sensor input (which means the sensor is likely not positioned at the right height from the turbo blades).
2. LED doesn't go out when the key is turned off: You have a battery connection instead of switched ignition.

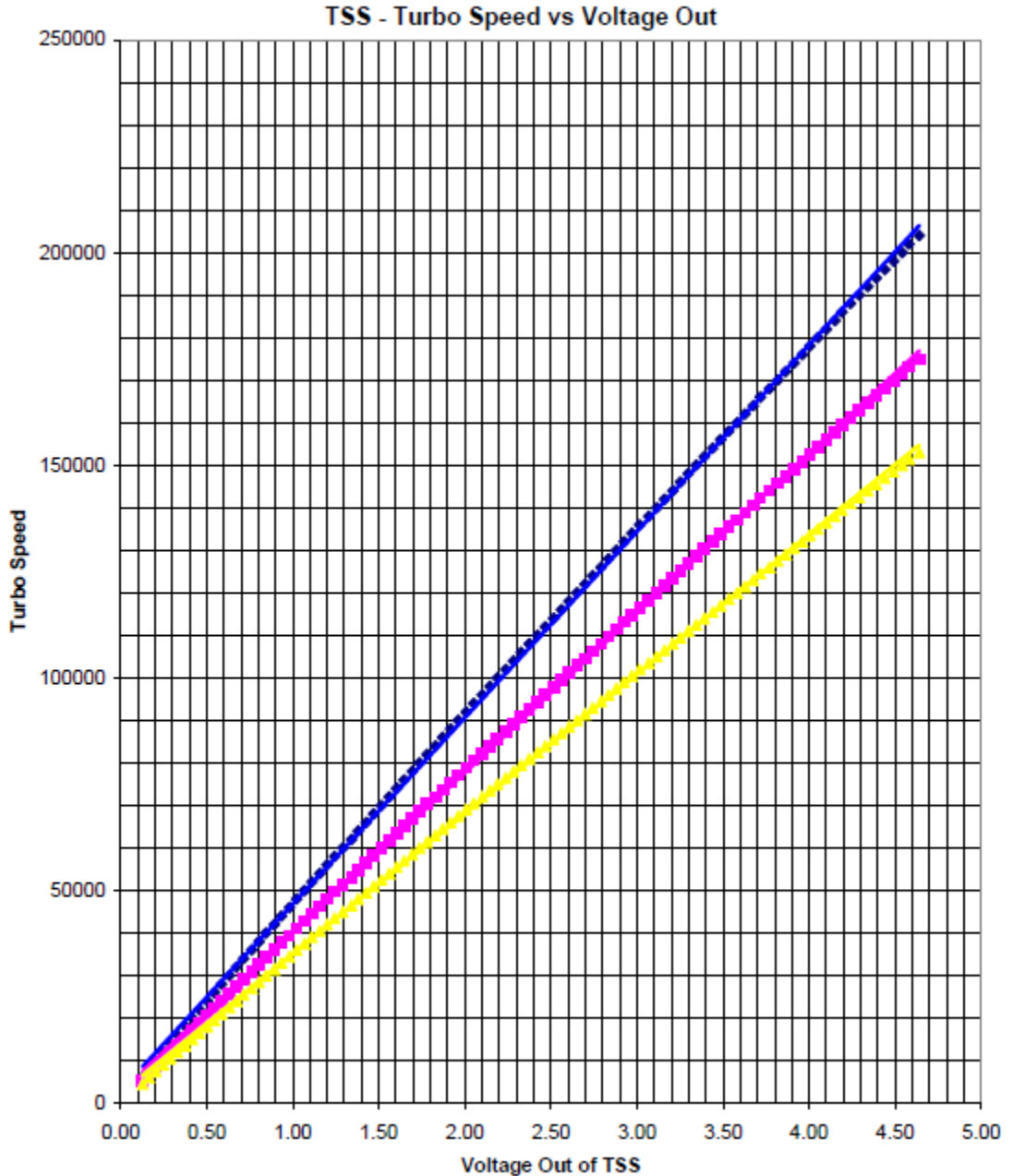
Refer to [www.roadragegages.com](http://www.roadragegages.com) for Excel spreadsheet version

Calibration Formulas:

$$12 \text{ vane Turbo RPM} = 43829 \times (\text{TSS Voltage Out}) + 2981$$

$$14 \text{ vane Turbo RPM} = 37568 \times (\text{TSS Voltage Out}) + 2555$$

$$16 \text{ vane Turbo RPM} = 32872 \times (\text{TSS Voltage Out}) + 2236$$



◆ 12 Blade    ■ 14 Blade    ▲ 16 Blade    — Linear (12 Blade)    — Linear (14 Blade)    — Linear (16 Blade)

For further Problems or Questions: Call 888-907-GAGE or email: [tech@roadragegages.com](mailto:tech@roadragegages.com)