

TSG-1

Turbo Speed Gauge



Gauge style instrument for displaying turbocharger shaft speed.

The TSG is a portable instrument designed to monitor turbocharger shaft speed data that is detected by a shaft speed sensor.

Features

- **Data Monitoring**
 - Monitor turbo speed data in real time.
- **Turbo over-speed warning**
 - During periods of over-speed the units screen flashes.
 - An over-speed warning output is provided to illuminate a warning light or relay
- **Peak Capture**
 - The peak shaft speed and elapsed time above the turbocharger's critical speed are captured for review.
- **Analog input for Pressure or Boost monitoring**
 - A pressure or MAP sensor can be connected for display on the screen along with the turbo speed information.

Kit Contents

1. TSG-1 unit
2. Speed sensor connection cable
3. Mounting bracket

Available accessories

1. Sensor cable extension

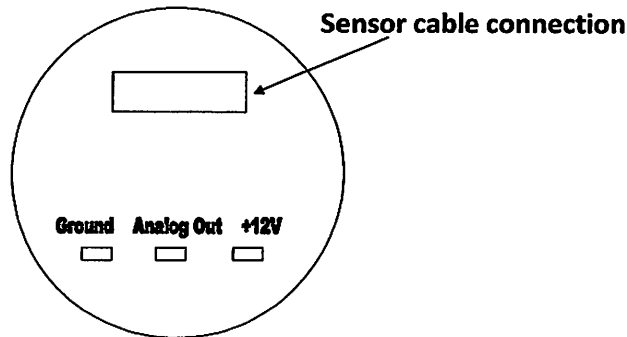
For Support

On the web use the contact form on borgwarnerboosted.com.

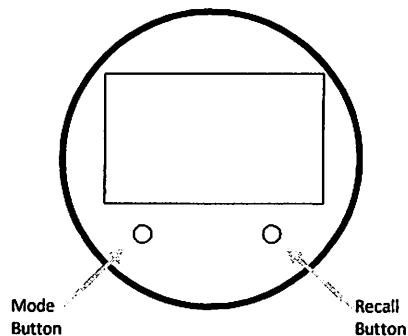
Installing the TSG1

1. Disconnect the battery negative cable under the hood.
2. Mount the TSG1 inside the car using a gauge pod or similar mounting method.
3. Route the included cable from the TSG1 to the turbocharger, being careful to avoid hot components.
4. Plug the connector into the turbo speed sensor installed in the turbo compressor housing.
5. Route a source of "12 volt" power, and ground to the terminals on the rear of the TSG1. Refer to the figure below for details.
6. Route the analog turbo speed signal to a datalogger or ECU if desired.
7. Route a wire from the warning output to a small lamp or relay if desired.
8. Connect a MAP or pressure sensor (or other input signal) to the Aux Sensor input
9. Reconnect the battery.
10. Power up the unit and configure the turbo type and aux type

Rear View



Front View



The manufacturers and sellers of the TSG cannot be held responsible for any damages resulting from the use or misuse of the TSG or information in this document.

Operating Instructions

Power Up

On initial key-on, the TSG version number will be displayed. Once a few seconds have passed the unit will begin normal operation with the main display screen displayed.

Configuration Mode

Before using the TSG-1 the unit must be configured for the turbo type as well as other options. The following functions are configurable:

1. Turbo Type: configurable for many types of turbos. Specific Borg Warner turbo types are selectable and will preset the proper critical speed. For generic turbo types the blade count is selected and the critical speed menu is manually set.
2. Max Speed: When a generic turbo type is selected, the critical speed must be set here.
3. Analog Input: Select the type of pressure sensor for display.
4. Analog Output Trim: The analog output scaling can be adjusted in small increments to correct for errors. This is preset at time of manufacture and should not need adjustment.

To enter Configuration Mode, with the TSG-1 powered up, hold the Mode button for 10 seconds. Once in Configuration mode, pressing the Mode button will scroll through the list of configurable items. Use the Recall button to change parameter. Press Mode for 5 seconds to save the parameters and leave configuration mode. Note that the parameters are not saved until Configuration mode is exited using the Mode button.

Operating Mode

When in Operating mode, the TSG-1 will display Turbo Speed in either Numerical or Graphical form. If an analog sensor is configured then a numeric screen for it is also selectable. When displaying the Analog Numeric screen, the Turbo Speed is displayed at the bottom of the screen as well. Pressing the Mode button will step thru the various style display screens. The selected screen is stored so that it will stay selected even after the unit is turned off.

Recall Mode

Pressing the Recall button will display the peak turbo speed detected above the critical speed, as well as the amount of time the critical speed has been exceeded. These values will accumulate even between sessions. While holding the recall button, also holding the mode button will clear these values. The turbocharger's critical speed is displayed at the top of the screen for reference.

Sensor cable connector pin numbering, as viewed from the rear of the unit.

7 6 5 4 3 2 1

The Sensor Cable connector has the following signal connections.

- 1 - (red) +5V power for the Turbo Speed Sensor. This can also be used to power a pressure sensor.
- 2- (white) Turbo Speed Sensor signal
- 3- (black) sensor Ground
- 4- (violet) Analog sensor input (0 .. +5v) for pressure sensors
- 5- (gray) Warning output. +12 volt output that activates when the turbo is operating above its critical speed.
- 6- (no wire) Aux communication. For future options. Also used when reprogramming the unit.
- 7- (no wire) Ground. For future options.