TSG – Turbo Speed Gauge

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 period of over-speed, the unit 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 to 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

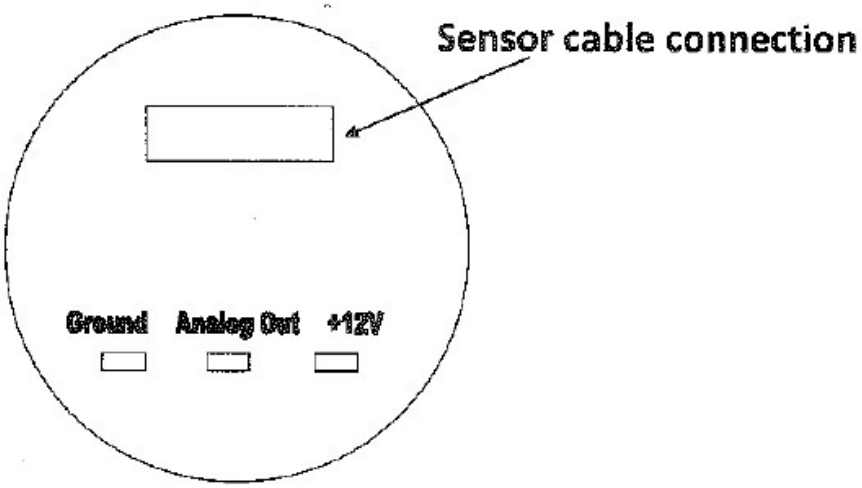
KIT CONTENTS

- TSG-1 Unit
- Speed Sensor Connection Harness
  Mounting Bracket

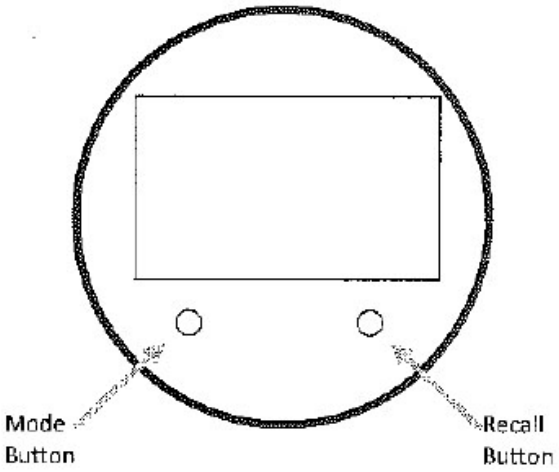
INSTALLING THE TSG1

1. Disconnect the batter negative cable
2. Mount the TSG1 inside the car using a gauge pod of similar mounting method
3. Route the included cable from the TSG1 to the Turbocharger, being careful to avoid high heat areas.
4. Plug the connector into the Turbo Speed Signal to a datalogger or ECU if desired
5. Route a 12 Volt power source and ground to the terminals on the rear of the TSG1. Refer to the figure below
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



OPERATING INSTRUCTONS

Power Up

On intial key-on, the TSG verison 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 tyres are selectable and will pre-set 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 pre-set at the time of manufacture and should not need adjustment.

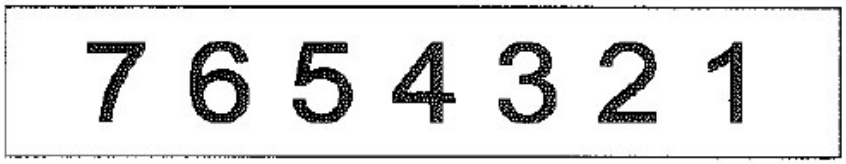
Operating Mode

When in operating mode, the TSG-1 will display Turbo Speed in either a Numerical or Graphical form. If an Analog sensor is configured than 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 through the various styles of display screens. The selected screen is store so that it will stay selected even after the unit is turned off.

Recall Mode

Pressing the Recall button will display 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.



The Sensor Cable connector has the following signal connections:

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