VEI Systems Instrument Troubleshooting Guide

Rev 10, 11/12/2016

If all isn't going as expected with your VEI Systems gauge, this guide will walk you through some basic troubleshooting and offer some diagnostic tests to help you get it resolved. If your issues persist after trying the steps listed here, feel free to contact us for further assistance.

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Symptom:

Gauge Not powering up

Products affected:

Any gauge

Possible causes:

(1) Fuse blown
(2) Power-source wiring issue
(3) Power connections reversed

Tests & Fixes:

Using a voltmeter, measure voltage across the red and black wires at the gauge, with the key on. It is important to measure on the wires coming right out of the gauge, before any connections, to eliminate the chance that there may be a connection issue. With the positive probe on the red wire, and negative probe on the black wire, the multimeter should measure around 12 Volts. The gauge can operate with as low as 9V or even lower. If you get below this, then there's a wiring or fuse issue with the wires supplying power to the gauge.

If you do get around 12V, then that's not an indicator of good power yet, as a wire supplying power to the dash lights can indicate around 12V, though may toggle on an off rapidly. If your power is not coming straight from the fuse panel, or other **known** good source, the best test to eliminate that as a possibility is to connect the red and black wires of the gauge directly to the battery terminal. Be careful with this as the gauge has a metal body and if it touches the battery terminals, terrible things can occur. Also measure the voltage across the battery terminals to ensure that the battery is good.

If this still does not get you anything on the gauge display, then contact us for assistance.

Symptom:
Only icons coming on the gauge, with no numeric digits or bargraph display.
Products affected:
Any gauge
Possible causes:
Inadequate power source
Tests & Fixes:
Check power as indicated above, and try connecting the gauge directly to the battery, taking care to not let the metal body of the gauge touch the battery terminals. If the gauge powers up, then there an issue with the power source. If the issue persists, contact us for assistance.

Symptom:
Gauge display flickers
Products affected:
Any gauge
Possible causes:
(1) Lights wire not connected (2) Lights wire connected to dimmable dash lights
Tests & Fixes:
If you've chosen not to use the lights dimming feature and not connected the green lights-dimming sense wire, connect it to ground, as it's possible it may be picking up radiated EMI (electro-magnetic interference) from other nearby signals. On most newer cars, dash-lights dimming is done by rapidly pulsing the lights on an off as it's more efficient than older resistive dimming methods. The gauge rapidly samples the level of this wire, and does have some hysteresis/filtering to ensure it samples a series of **off**s as being completely off, and a series of **on**s as being completely on. However, as the frequency and duty-cycle of this signal varies considerably from car to car, it's possible some pulsing lights signals may not be accurately interpreted. To resolve this, connect the green lights-dimming sense wire to one of the wires going directly to a park-light bulb.

Symptom:

"Err" of "FAil" showing on gauge display.

Products affected:

Oil, fuel, nitrous, and air active pressure sensors. Model #'s SEN-P101B, SEN-P101C, SEN-F151B, SEN-F151C, SEN-F250.

Possible causes:

(1) Sensor not connected
(2) Sensor wired incorrectly
(3) Incorrect power to sensor

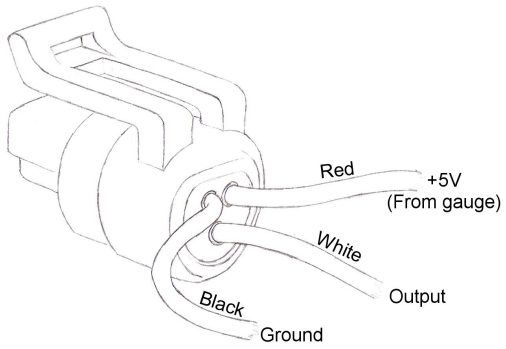
Tests & Fixes:

These sensors have the ability to indicate a failure or missing sensor. "Err" or "Fail" indicates that the sensor is not signal a signal output/voltage level within it's operating range.

First, ensure that the sensor is plugged in properly.

The active pressure sensors require 5V power, which is provided by the purple wire on the gauge. It's important to supply this power from the same gauge that uses that sensor (so don't use the 5V purple wire to power a sensor for another gauge).

You can measure the voltage between the white (or green) and black wires at the sensor. With no pressure you should see around 0.5V with an allowable error, so say 0.45V to 0.55V is fine. Then measure the voltage between the purple and black wires at the gauge. You should see 5.0V, but anywhere from 4.9 to 5.1V is fine. Note that the negative probe of the voltmeter goes to ground in each of these tests. With this arrangement, your voltage readings should be positive. Negative indicates the sensor is wired incorrectly. The wire connections/colors should be as shown here:



If the voltages at the sensor check out, check the same voltages at the gauge end. If there's a discrepancy there, it indicates a wiring issue. If the voltages are the same, contact us for further assistance.

If you measure higher than 5V to the sensor (say 12V), then the power source is incorrect. 12V can damage the sensor, so correcting this to use the 5V source from the gauge may result in the gauge not working properly still.

Symptom:

Water, oil, transmission or differential temperature reading incorrect value.

Products affected:

Temperature sensor SEN-T320D

Possible cause(s):

(1) Bad sensor grounding
(2) Sensor wired incorrectly

Test(s) & fix(es):

By far, this is the most common issue we see. This sensor works by varying its resistance with temperature seen at the tip (flat end, opposite the end with the threaded stud). The circuit path is from the gauge to the sensor tip (the 10-32 threaded stud), through the sensor, to the sensor body, and then grounded to the engine. That last part is where the issue occurs, as the ground path from the sensor body to the engine block is usually compromised. A quick test for this is to check the continuity from the battery negative to the body of the sensor. It should be zero or very close to zero ohms. If not, there's some poor connection with the sensor or even the ground strap. Before anything else, verify that the engine ground strap is very well connected.

Some other common examples and fixes are below…

- If teflon tape or teflon paste is used, this can electrically insulate the sensor body from the engine block. Try using minimal teflon tape on only the back half of the threads, so some threads still connect to the block. Make sure the threads are cleaned properly to be free of grease or oils for proper electrical contact.

- It's also possible that the sensor is making good connection with the block, but the block may not be grounded properly. This is more common on older cars or if the sensor is mounted in a tube adapter in the middle of a radiator hose, where the tube adapter has no metal-to-metal contact to anything grounded. This can be worked around by connecting a ground wire to the tube, then grounding that wire. Most likely welding would be involved here as you probably don't want to drill a radiator hose adapter, unless you can seal it properly (remember it will be under pressure).

- Another possibility is mounting the sensor on a common oil filter "sandwich" adapter. These are anodized aluminum, and anodizing insulates the aluminum. If the threads were cut after anodizing, you may get away with it, but usually anodizing is done last. Note that the threads where the sandwich adapter screws into the oil filter area also needs to conduct properly. The best option here is to drill and tap a blank area of the sandwich adapter for a screw, then connect a wire to that screw and ground the other side of the wire.

Symptom:
Ambient outside temperature gauge changing value as vehicle moves
Products affected:
Ambient temperature gauges with sensor SEN-AT130
Possible causes:
This is caused by air moving across the sensor as the vehicle starts moving.
Tests & Fixes:
Relocate the sensor to an area that will not experience air fluctuations as the vehicle moves, yet will be exposed to external air. A good location is inside one of the door jambs.

Symptom:
Boost sensor not responding (stays fixed) as manifold pressure changes.
Products affected:
Vacuum-boost pressure sensor SEN-P70B
Possible causes:
Kinked or clogged vacuum hose.
Tests & Fixes:
Assuming the gauge shows a non-zero value, unplug the hose and see if the value changes. If it does, then the hose is at fault. Find the kink along the hose and straighten it, or if there is no kink, there possibly a clog. Disconnect both ends of the hose and try blowing through it to verify. If the clog is not easily visible near one end, you can try blowing it out with a pressure gun, otherwise replace the hose.

Symptom:
Vacuum-boost gauge not showing zero with no manifold pressure
Products affected:
V1-BHB-Mxy, V1K-BHEB-Mxy, V1-BHP-Mxy, V1K-BHEP-Mxy, V1-BOB-Mxy, V1K-BOEB-Mxy, V1-BOP-M*xy*, V1K-BOEP-Mxy gauges with vacuum-boost sensor SEN-P70B
Possible causes:
Gauge not calibrated, or vehicle is at a location with a noticeably different ambient pressure level.
Tests & Fixes:
Perform an ambient pressure re-calibration as shown in the instruction manual.