



ONEGAUGE TACHOMETER SETUP AND TROUBLESHOOTING

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The tachometer is likely our most troublesome sensor. First of all, *please don't expect the tachometer to work right out of the box*. Due to the huge variety of types of tachometers, there's not really a one-size-fits-all solution. For many customers, it takes a few adjustments to get the signal to work correctly with the OneGauge hub. However, we want to help make the process as easy as possible, so the instructions below should help you get a working setup.

1. What is the source of your tachometer?

You'll first need to determine where your tach signal will come from. These differ for gasoline and diesel engines.

Gasoline engines:

- Coil driven tachometer
- Low-voltage signal from a distributor box (MSD, etc) or the ECU itself (LS engines often include a tach signal wire)
- HEI distributor signal
- Coil on Plug

Diesel Engines

- Stock flywheel, balancer, or other tachometer sensor
- Alternator terminal connection (often the "W" terminal, if available)
- Aftermarket alternator tachometer pickup
- Custom magnetic or optical sensor, often mounted on your flywheel, balancer, or other part that rotates predictable with the crankshaft

2. What voltage is your tach signal?

- a. You'll need to measure the voltage of your signal. This is critical and determines what modules or other components you need to ensure that the tach signal does not destroy your OneGauge hub.

3. What is the ratio of your tach signal?

- a. You'll need to determine how many 'pulses' will come through the tach signal to the OneGauge for each revolution of the crankshaft.
 - i. Most Gasoline engines use predictable ratios; often 3 pulses/rev for a 6 cylinder engine, 4 for an 8 cylinder, etc. 3 pulses/rev would be a 3:1 ratio, 4 pulses/rev a 4:1 ratio.
 - ii. Diesel engines can vary widely. Flywheel or balancer sensors can send hundreds of pulses per revolution. An alternator pickup or "W" terminal connection is usually somewhere around 3 pulses/rev but varies depending on pulley sizes.



4. What products do I need for my tachometer?

a. Gasoline engines:

- i. If you have a low voltage tach signal, you **may** not need any additional products. Often the tach wire can be plugged straight into the OneGauge hub (screw terminal F1) as long as you are certain the voltage will not exceed 15 volts. However, we cannot test this on every vehicle, so you may need to visit the Troubleshooting section below to dial in your tach and remove any noise from the signal.
- ii. Coil driven signals work best with the Universal Tach Adapter listed below.
- iii. HEI tachometers work like low level voltage tach signals. Always test the voltage though! Most HEI's output a 12-14 volt signal that **may** not need an additional adapter, but signal conditioning could be required. HEI's can also be very 'noisy', so it may take some experimenting with resistors to remove noise from the system.

b. Diesel Engines

- i. Most diesels, due to the wide variance in ratios, usually require a module to reduce the ratio and control the voltage. Stock balancer/flywheel/or other sensors need a way to convert hundreds of pulses a revolution to just a few. The Dakota Digital module or the Alternator Tach Corrector will both control the voltage of the signal as well as change the ratio.
- ii. Custom magnetic or optical sensors may not require an additional module; please reach out to us to confirm so we can check the sensor's characteristics!

OneGauge Recommends –

These are the products that work well with most setups.

Tach adapters sold by GKGoodCheapParts on Ebay offers three main solutions: the Universal Tach Adapter, the Tachometer Corrector, and the COP (Coil on Plug) adapter. Gene, who runs the ebay store, is also excellent with his customer support and will be happy to make a recommendation if you reach out to him through his ebay store. Most products are around \$50 or less.

- The Universal tach adapter is ideal for gasoline engines with standard ratios
 - <https://www.ebay.com/itm/UNIVERSAL-TACH-ADAPTER-CONVERTER-COP-1-2-3-4-5-6-8-10-cyl-to-any-4-6-8-Tach/141931549970?hash=item210bc79512:g:U60AAOSw8zNepIrlQ>
- The Tachometer corrector is best for diesel engines with very high ratios (from a flywheel or balancer sensor) or where you need a very specific ratio (alternator "W" pickups")
 - <https://www.ebay.com/itm/UNIVERSAL-SPEEDO-SPEEDOMETER-CORRECTOR-CALIBRATOR-1-5-to-6000-2-BUTTON-SETUP/143554785386?hash=item216c88306a:g:8KUAOSwV7ZeqOOA>
- The COP tach adapter for coil-on-plug type setups
 - <https://www.ebay.com/itm/COP-DIS-TACH-ADAPTER-convert-COP-or-DIS-pack-ignition-to-any-4-8-cyl-Tach/142495590237?hash=item212d66275d:g:RQ4AAOSwpPlepmZq>
- Gene also sells various other adapters, including tachometer signal boosters, custom programmed tach adapters, Cummins/Fummins adapters for stock diesel sensors, and more.



Dakota Digital SGI-BT100

- The Dakota Digital unit is as close to a one-size-fits-all setup as we can find. It works well for both diesel and gasoline setups and allows a variety of calibration and filter options. While it's more expensive (usually around \$100), it works for most setups.
 - https://www.dakotadigital.com/index.cfm/page/ptype=product/product_id=1192/category_id=287/mode=prod/prd1192.htm

Autometer Diesel Tach Adapter #9111-

- A good solution to add a tachometer pickup to a diesel engine. These clip to your alternator and provide a signal as the alternator spins. They are easy to calibrate as well. The tough part can be hitting the 'sweet spot' with the location of the sensor on the alternator to get a consistent and clean reading, but I've personally had good luck testing them. **When you purchase one of these units we cannot guarantee you'll be able to calibrate it perfectly; it's a trial and error system, but as we said, we have had good luck with them.** They are listed online for around \$120 or so. They do require a 10k ohm pull-up resistor between the 12v terminal on the Hub and the F1 tach signal screw terminal.
 - <https://www.autometer.com/diesel-tach-adapter.html>

ZF Electronics GS100701 Sensor

- This is a 'hall effect' sensor, which means it detects magnets as they spin past the sensor. This type of sensor would require a magnet, tooth wheel, or some other magnetic object that rotates close to the sensor so the sensor can measure how quickly the magnet rotates. This unit requires no additional adapter but does need a 10k 'pullup' resistor between terminal F1 and the 12v power to the sensor.
- These are DIY type sensors- you have to find a way to mount it on your engine (often nearby the flywheel or harmonic balancer). They work well though and are inexpensive (around \$30).
 - <https://www.digikey.com/product-detail/en/zf-electronics/GS100701/CH398-ND/280932>



For troubleshooting, please first follow the instructions of the product you purchased. Here are some other common issues:

- Always test for voltage at your tach signal wire. No voltage = no signal.
- Check that your tach module, whichever you are using, is getting power. Most need at least 12 volts, and they need to share a ground with the OneGauge hub, so I always ground the unit tach adapter through the OneGauge hub ground terminals.
- If your ratio is incorrect and you're getting readings that are consistently much higher or lower than expected (often double or half), there are multiple ways to adjust the ratio. Your tach adapter likely has ratio adjustments, but if you prefer you can use the ratio adjustment built into all OneGauge systems that use a OneGauge LCD screen. Just navigate to the settings menu and find the tach adjustment screen. The tach adjust number is the number that the tachometer signal is divided by.
 - For example, a V8 outputs 4 pulses per revolution. Setting the tach adjust number to '4' would divide the signal by 4 and give you the correct reading.
 - If your tach reading is double what it should be, setting the tach adjust number to '2' will divide the reading in half. Setting it to '.5' would double the reading.
- The Universal Tach Adapter requires about 5 volts for the tach signal, and many tach signals from an ECU or MSD style ignition are less than this. If you test your signal voltage and it's less than 15v, try to bypass the tach adapter and use the F1 screw terminal on the OneGauge Hub.
- If you're getting 'noise', or random jumps in your tachometer reading or readings when the engine is off, you'll need to try a filtering solution. These involve using basic 'thru hole' resistors, which can be purchased online or at a local electronics shop like Radio Shack (if you can find one).
 - Both the Universal Tach Adapter and the Dakota Digital adapter include filter options, so try those first.
 - You can put a resistor "in-line" with the wire, which means one end of your tach signal wire would attach to one end of the resistor and the other end of the resistor goes into the F1 screw terminal. Try it with different resistances (10k ohms, 100k ohms, 200k ohms, etc) and see if helps reduce the noise.
 - You can use a "pullup" resistor, which means the resistor runs from the F1 screw terminal to the 12v screw terminal used to power your tach module. ***This resistor is required for many sensors, such as the Autometer Alternator tach adapter.*** A 10k ohm resistor is usually sufficient.
- If you plug it in and everything *should* be working but it isn't, don't hesitate to reach out to us at OneGauge. It is possible to turn the tachometer on and off by programming, so if you didn't originally order a tachometer it may not be enabled.