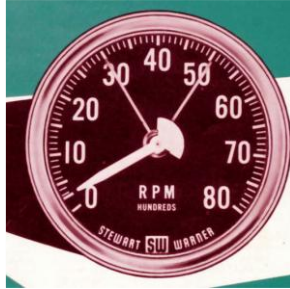


SW760 Tachometer Transmitter Installation Guide

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www.accutach.com

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Thank you for purchasing the Accutach Co. SW760 v4 Transmitter. It is designed to interface vintage Stewart Warner 760 Series tachometers with 4, 6, 8 or 12 cylinder engines with either vintage or modern ignition systems. For modern EFI engines without a tachometer signal, a Tach Adapter such as a Autometer 9117 (not included) may be required. This transmitter replaces the original Stewart Warner "puck" style transmitter that attached to the distributor. This transmitter will not work in positive ground vehicles.



WARNINGS and DISCLAIMERS:

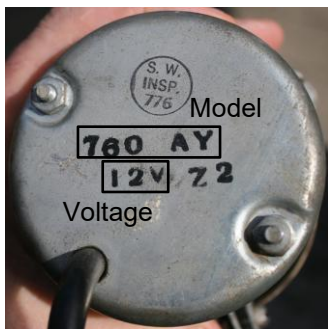
You use this product at your own risk. Accutach Company is not responsible for personal injury or property damage resulting from the use of this product. This transmitter only works with a 760 Series tachometer. It does not support any other Stewart Warner tachometer model.

Box dimensions:

2-3/8" x 4-3/8" x 7/8"

Identifying Your Tachometer:

The 760 Series Tachometer can be identified by a model number marked on the back of the case. If the model number is gone, if the tachometer looks like two cases bolted together and the three prong plug looks like the one below, then you have a 760 Series tachometer. You will also need to know if you have a 6V, 12V or 24V tachometer. This is also marked on the back of the tachometer, but if the marks are gone you can use an ohmmeter to determine the voltage of your tachometer. See page 3 for the process to use.



Rear Case Front Case



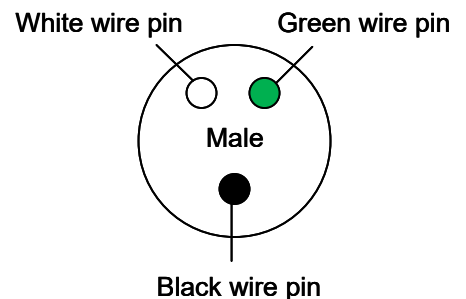
3-Pin Plug

Some Stewart Warner 760 Series Tachometer Model Voltages:

760-AH	6V	760-G	6V	760-X	12V
760-AL	12V	760-J	6V	760-Y	12V
760-AS	12V	760-L	12V		
760-AT	12V	760-M	6V		
760-C	6V	760-N	12V		
760-E	6V	760-P	6V		
760-F	12V	760-S	6V		

This may not be a complete list of models.

OEM Connector (pins facing



Planning Your Installation:

You will need to plan your installation by ensuring that your tachometer is lubricated and in good working condition. You will need to determine where to get an ignition/tachometer signal from to drive this transmitter. You will need to plan how to power and ground the system depending on the type of electrical system in your vehicle and the voltage of the tachometer. You will also need to determine how to mount your tachometer in your vehicle.

Tachometer:

This product assumes that your vintage Stewart Warner 760 Series tachometer is in good working condition. If your tachometer is not healthy, this product will not fix it. Virtually all of these tachometers are in need of lubrication and wire repair. If you would like your tachometer lubricated, tested and wires repaired prior to purchasing this product, please contact Accutach Co. (molson@accutach.com). If you want to oil the tachometer and repair the wires yourself, read the following pages and Appendix 1 at the back of this document. Appendix 2 covers system troubleshooting

Ignition/Tachometer Signal:

You will need to be aware that this transmitter was designed to read the ignition/tachometer signal from a wide range of different engine ignition systems. But it may not be able to detect the ignition/tachometer signal of all engines. Some engines, such as those from 99+ Mustangs, do not generate an ignition/tachometer signal at all in those cases a tach adapter such as the Autometer 9117 Tach Adapter must be used (not included). Positive ground vehicles are not compatible with this product.

- This transmitter has been tested using:
- Vintage Ignition (Points/Condenser)
 - Electronic Ignition (HEI)
 - 12V Square Wave Tachometer Signals

Any engine computer or aftermarket ignition system such as MSD that generates a 12V square wave tachometer signal should work with this transmitter.

Vehicle/Tachometer Power:

This transmitter is designed to drive any of Stewart Warner’s 1950s vintage 760 Series tachometers: 6V, 12V and 24V versions. It will not drive any other models of Stewart Warner tachometers. It is designed to work with 12V power. 6V tachometers will need an additional 12 to 6 V DC-DC Buck converter to power the 6V tachometer in a 12V vehicle. A 6V to 12V DC-DC Boost converter will be needed to use this transmitter and/or a 12V tachometer in a 6V vehicle. Please Contact Accutach Co. (molson@accutach.com) if you have a 24V vehicle or tachometer.

You should disconnect the battery prior to doing the installation of this unit into your vehicle. Locate a switched power source that can handle up to 2A. The transmitter draws only about 50mA when in operation, but the tachometer draws the rest of the current. The tachometer is turned off by the transmitter when the key is on and the engine is off to prevent unnecessary battery draw. We strongly recommend making wire connections with solder & shrink tubing, although properly made crimp splices can also be reliable. We do not recommend using “Scotch Lock” style connections for our products. Do not use the “twist & tape” or wire nut methods of connecting wires.

You will also need to locate a suitable place to install the unit (and the DC-DC converter if it is needed) inside of the vehicle’s cabin, most likely in a cavity behind the instrument cluster. It is not intended for use in the engine compartment or anywhere outside of the vehicle. If you wish to create a custom mounting bracket out of ABS plastic you can cement it to the ABS box with standard ABS cement from a hardware store.

Cylinder Select Wires:

Select the number of cylinders of you engine by grounding none, one or two of the transmitter’s Gray and Yellow wires. NC = No Connect.

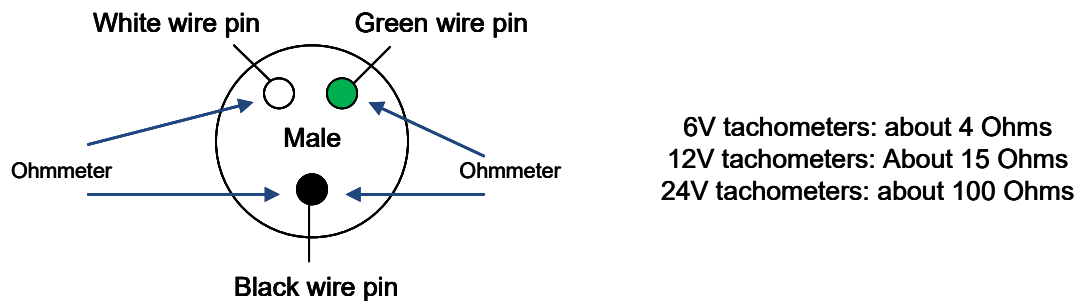
	Gray	Yellow		Gray	Yellow
4 Cyl.	NC	GND	8 Cyl.	GND	GND
6 Cyl.	NC	NC	12 Cyl.	GND	NC

Checking Your Tachometer:

You will need to ensure that your tachometer is in good enough condition to be safely used in your vehicle. Remove the two nuts on the back of the tachometer and slide the rear cover up on the wiring cable. This will expose the motor's stator, the flywheel/squirrel cage and the wiring on the rear of the tachometer shaft.

You must not use 12 volt battery power directly with a 6 volt tachometer, so you must know what type of tachometer you have. If the model number is no longer visible on the back of the tachometer, you can determine if you have a 6, 12 or a 24 volt tachometer with an ohmmeter. Connect one test lead of the ohmmeter to the black lead and connect the other test lead to the green and then the white wire. The resistances will tell you the tachometer's working voltage. If the wire insulation is crumbling, make sure the wires are not shorting against each other or the case. If the insulation is crumbling, see Appendix 1 for information on repairing insulation damage.

Note: Stewart Warner uses a black wire to supply battery power to the tachometer. The tachometer's black power wire must be connected to one of the transmitter's orange wires and the other transmitter orange wire must be connected to the 6v or 12V tachometer power supply.



If you don't read close to these resistances, then see Appendix 1 at the end of this document to learn how to repair the tachometer wiring. **Warning: If the insulation on your tachometer's wires have disintegrated, there is a risk of a short circuit which could result in fire or damage to the tachometer, transmitter and optional DC-DC converter. It is strongly advised that you read Appendix 1 and ensure you have good wiring in your tachometer. We are not responsible for any damage to you or your vehicle due to your use of this .**

The bushing in these old tachometers will be in need of lubrication. The tachometer may not operate up to the maximum scale or may not operate at all without proper bushing lubrication.. A frequent symptom of this condition is that the tachometer will work up to a certain RPM at which point it will drop back to 0 RPMs. After the engine RPMs fall back to 0, the tachometer will start working again. The threshold RPM will go up with increasing temperatures. If you are experiencing these types of issues, it is not caused by the transmitter, it is the result of bushing resistance. If someone has used an improper lubricant such as WD-40, the bushing can get gunked-up and difficult to spin. They may need to be cleaned. Acetone can be used to clean the bushing. Acetone is dangerous. **Please use appropriate care when using acetone to clean the bushing.**

To lubricate the bushing, you will need some light machine oil in a squeeze bottle with a tube dispenser that is at least 2-1/2" long. A sewing machine store should have what you need:



Lubricating Your Tachometer:

There is an oil cup in the top of the bushing with a wick below it. The cup is accessible from the rear of the tachometer when the rear cover has been removed. Orient the tachometer so that the top of the face is up. With a bright light behind you, look into the back of the rear of the tachometer to locate the oil cup on the top of the bushing where it goes into the front case of the tachometer. You may need to rotate the squirrel cage to expose the cup. You have to get the light just right to see it. Carefully get the oiling tube on top of the oiling hole and squeeze 2-3 drops of light machine oil into the hole. Spin the flywheel with your fingers for a while to work the oil fully into the bushing. Repeat many times as needed until the flywheel spins freely. Be patient.

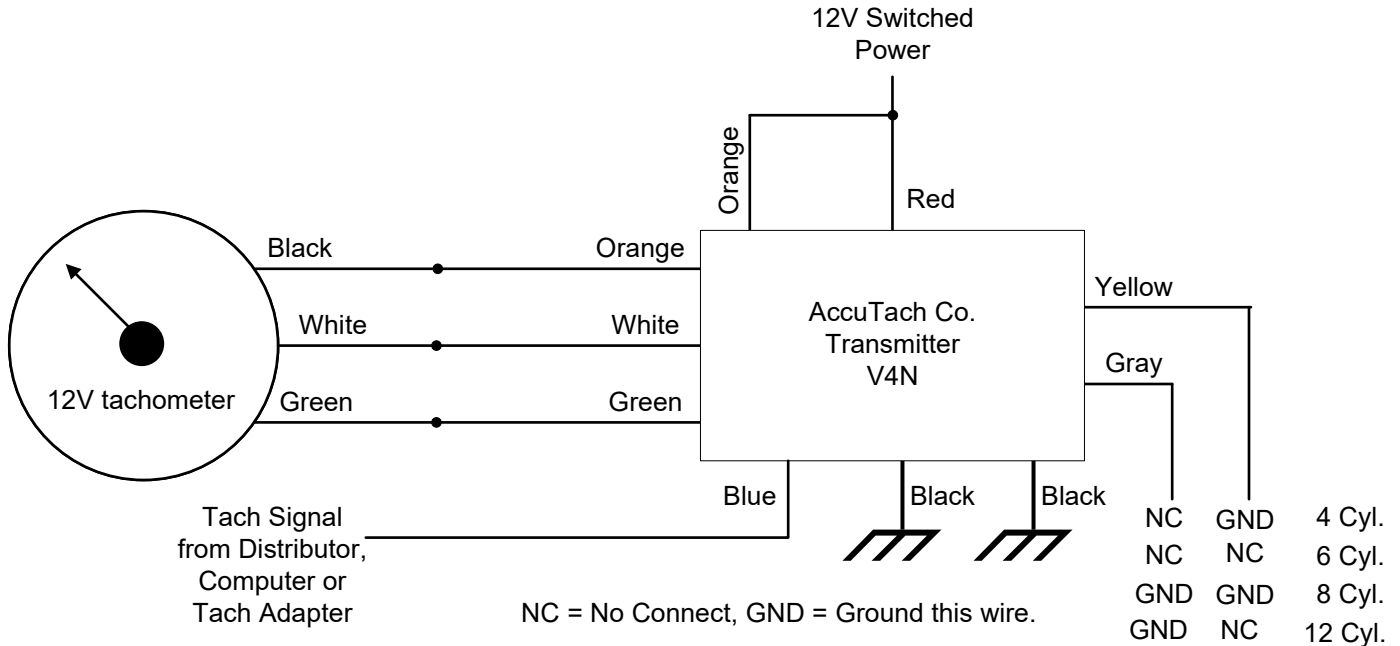


Here is a photo of the oil cup in the bushing so you can get a better idea of what you are looking for. It is for illustration purposes only. You don't need to take the flywheel/squirrel cage to oil it.

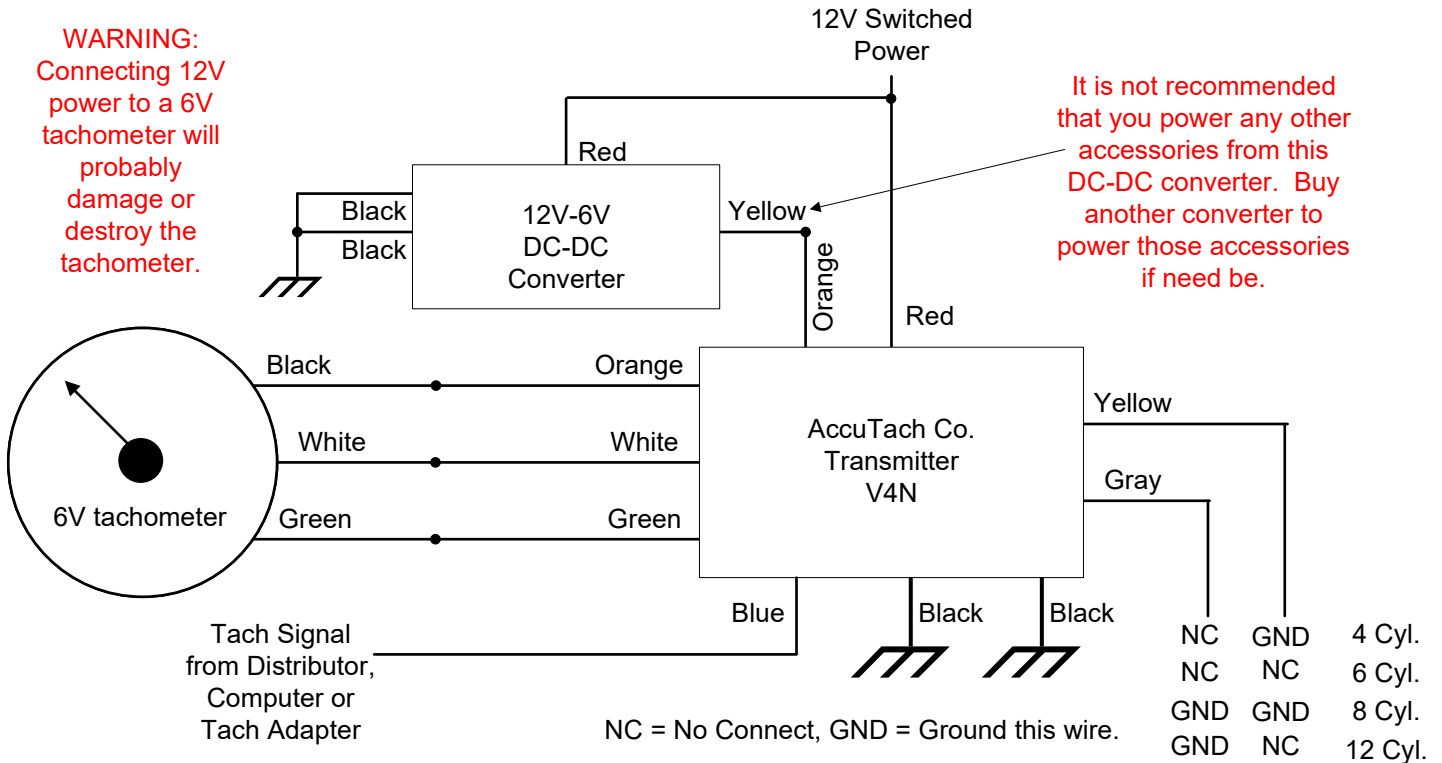


Note the rust on the shaft. It is often impossible to get the flywheel/squirrel cage off of the shaft. This then makes it impossible to more fully disassemble the tachometer. **Do not pry on the flywheel or you will destroy the floating flywheel and squirrel cage.**

12V Stewart Warner 760 Series tachometer Wiring in a 12V Negative Ground Car:

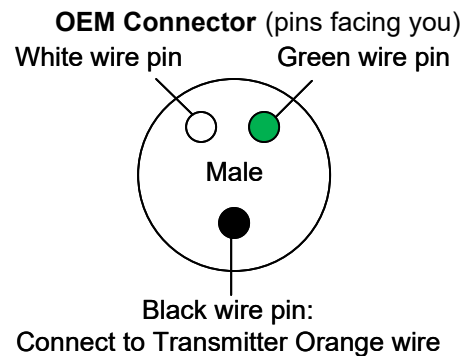


6V Stewart Warner 760 series tachometer Wiring in a 12V Negative Ground Car:

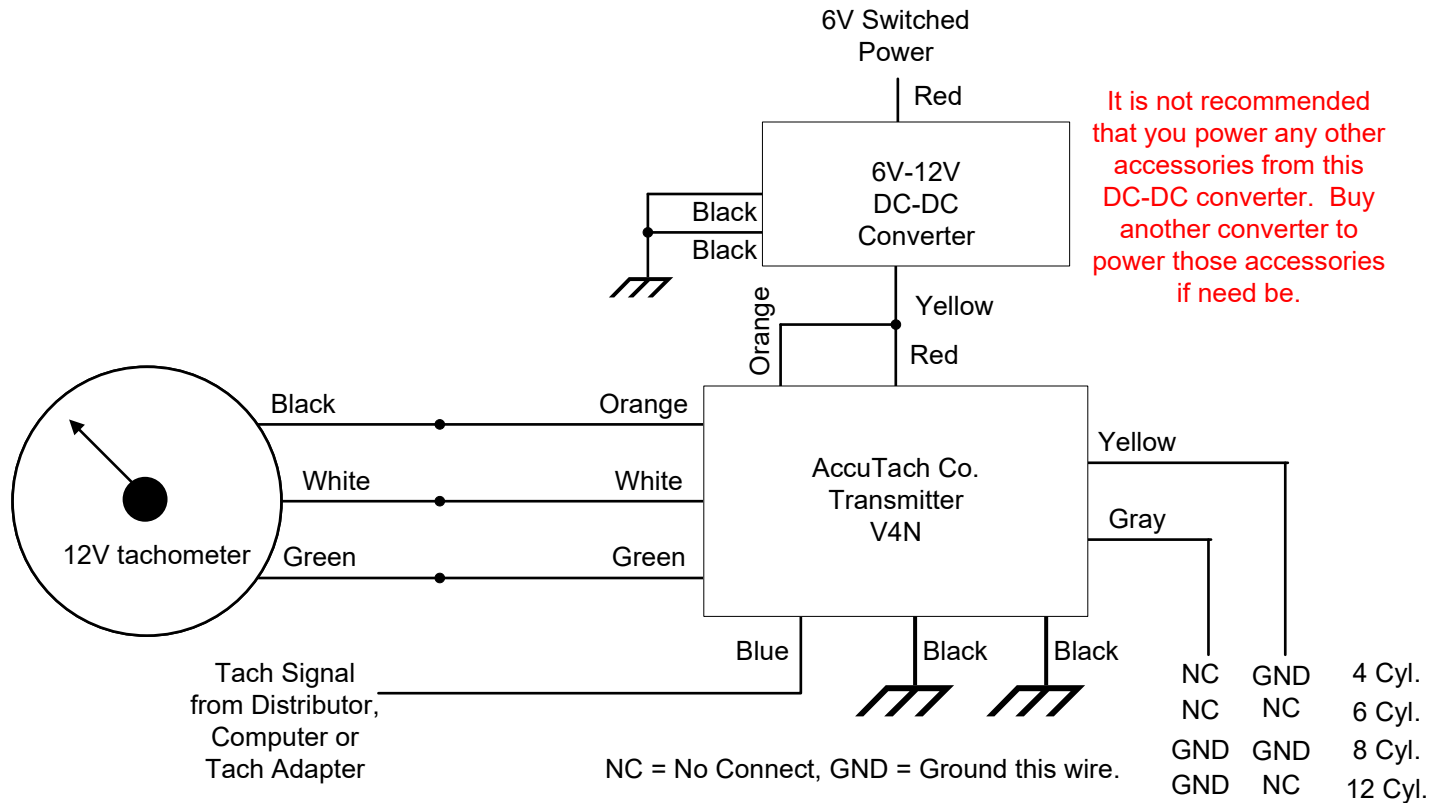


Stewart Warner 760 Series tachometer Model Voltages:

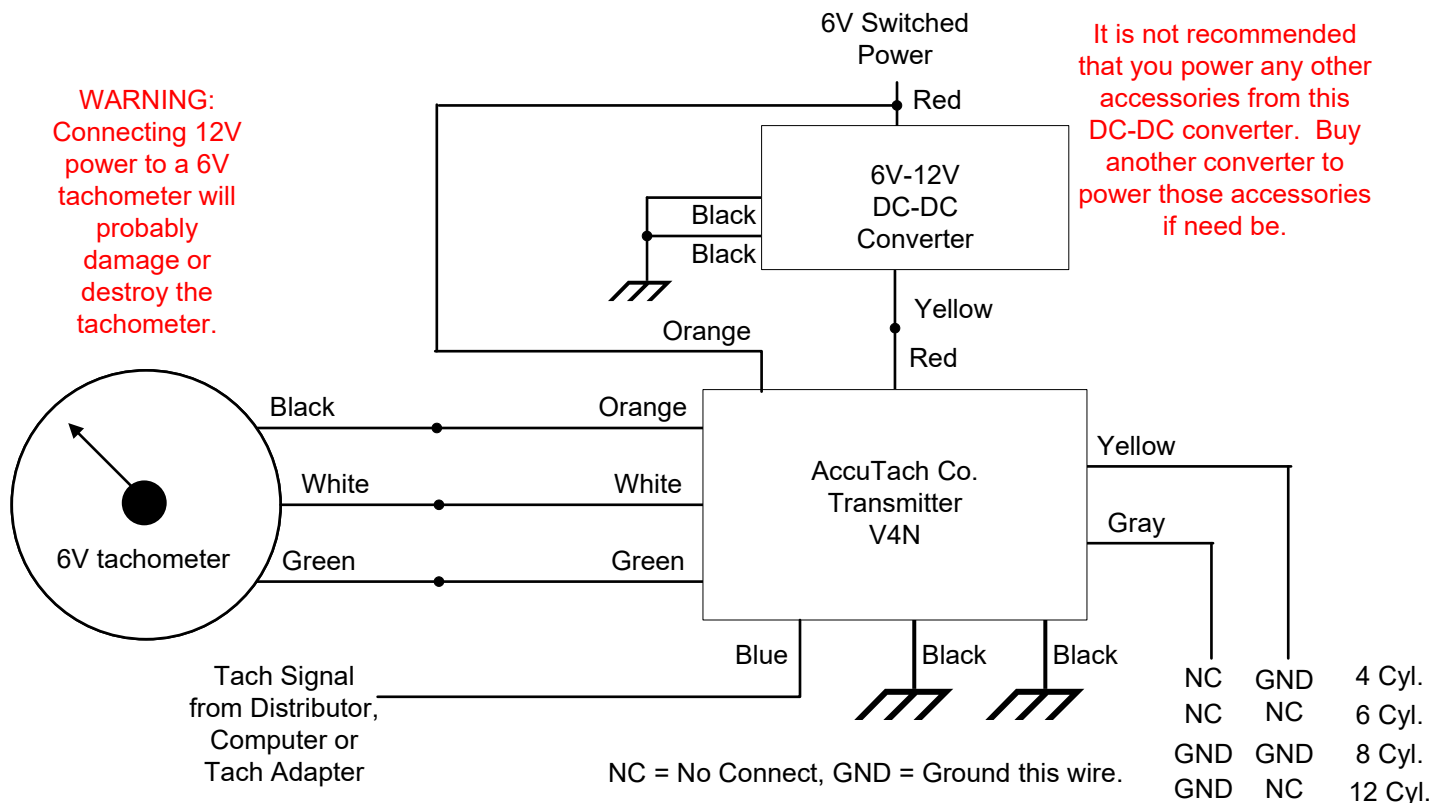
760-AS	12V	760-L	12V
760-AT	12V	760-M	6V
760-C	6V	760-N	12V
760-E	6V	760-P	6V
760-F	12V	760-S	6V
760-G	6V	760-X	12V
760-J	6V	760-Y	12V



12V Stewart Warner 760 Series tachometer Wiring in a 6V Negative Ground Car:



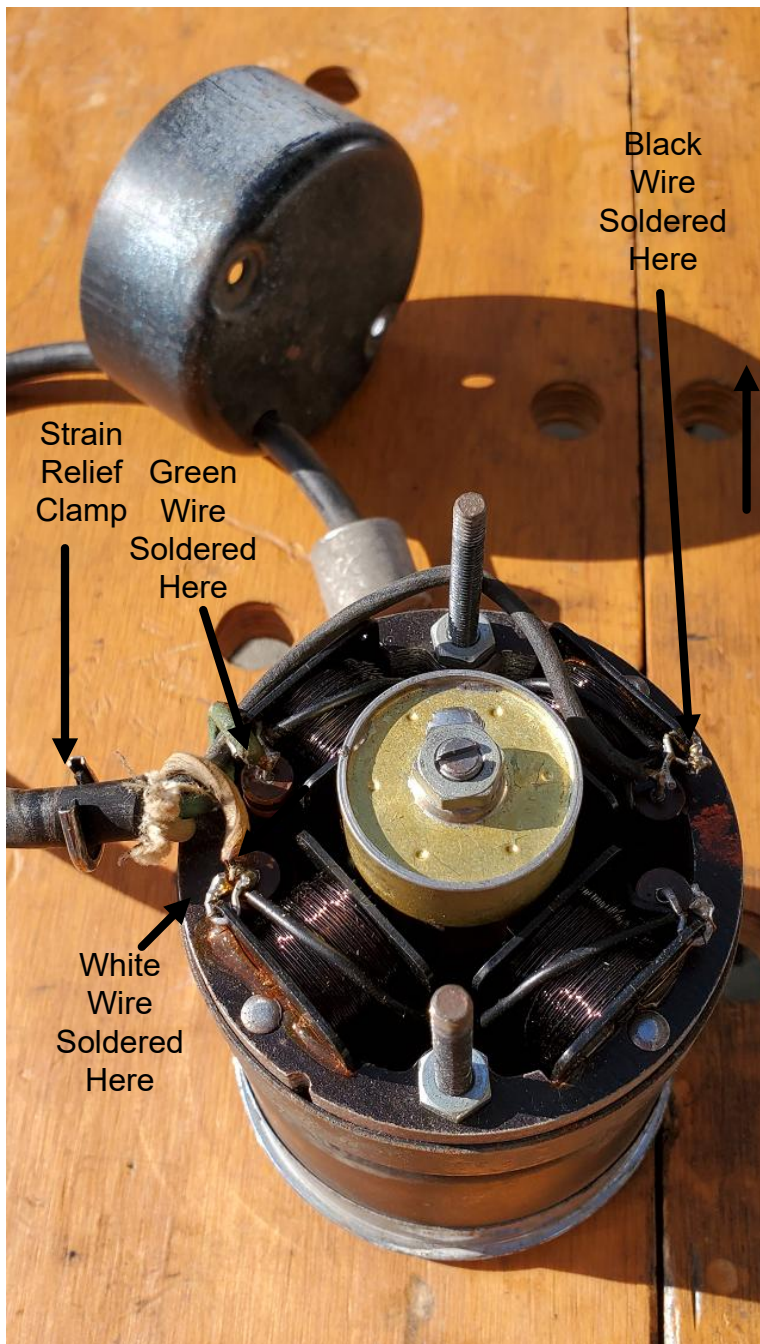
6V Stewart Warner 760 series tachometer Wiring in a 6V Negative Ground Car:



Appendix 1: tachometer Wiring Considerations.

Remove the nuts that hold the back of the case to the tachometer with a 3/8" wrench and remove the back of the case from the tachometer. You will see where the strain relief is clamped to the OEM cable and where the white, green and black wires are soldered inside of the motor.

These tachometers are now over 50 years old. The wiring in a few of these tachometers is still in good shape. In that case, the wiring is useable as is. If the wire insulation is in bad shape, the cable will need to be repaired or replaced. It is possible to unsolder each damaged wire and cover the crumbling insulation with shrink tubing, or the cable can be shortened if the wires inside of the cable sheath are still in good shape. If the wire inside of the cable sheath is also in bad shape, the cable will need to be replaced. The OEM cable is very similar to those used in heavy duty stranded-wire 3-prong power extension cords, including the wire colors, white, green and black. Solid wire cable, such as Romex is not appropriate. Find a 3-prong extension cord with a round cable (not flat) about 1/3" in diameter so it will fit through the hole in the back of the case. Cut the ends off of the extension cord and cut the cable to the length you want.



If you need to replace the cable completely, strip enough of the cable casing off of the new cable to have a long enough black wire to reach from the strain reliever to the black wire solder point. Cut the white and green wires to be about the same lengths as the OEM wires are. Note the white, green and black wire solder points and remove the bad OEM cable.

Slide the new cable through the hole in the case. Bend the strain relief clamp open and then clamp it onto the new cable with a pair of pliers at about the same distance from the sheath end as with the OEM cable. Strip and solder the white, green and black wires to the points on the motor where the OEM wires were soldered.

If you can re-use the OEM connector, feel free to swap it to the end of the new cable, but that does not have to be done.

If your connector is not in good condition, you can just cut the connectors off of the Accutach Co. transmitter and solder the wires directly to the wires in the tachometer cable.

The Accutach Co. transmitter is supplied with pins that connect to the male OEM connector pins. If you use them, cover the exposed parts of the male pins with the supplied shrink tubing to prevent short circuits.

At this point, you are ready to begin the installation of the new transmitter.

Appendix 2: Troubleshooting:

If you have oiled your tachometer and the flywheel spins freely, the tachometer wires are good and you have verified that you have wired the system according to your car's power and ground type, then you can follow these troubleshooting recommendations to try to fix a non-functional tachometer.

While Accutach Co. has made every effort to ensure that the transmitter can detect the ignition signal in most vehicles, it is possible that this transmitter will not work with your ignition signal. To try to identify if this is the situation with a non functional installation in your car, you can use a known good alternate signal source to test the transmitter and the tachometer.

You can use an audio function generator to test your installation if you have access to one. Disconnect the transmitter's Blue input wire from your ignition system. Connect the signal lead from the function generator to the blue transmitter input wire. Connect the negative lead from the signal generator to battery negative. Set the function generator output to square wave and turn the frequency down all the way. Set the function generator amplitude to about 12V.

Power up the tachometer, transmitter and function generator. Slowly increase the frequency of the function generator from 0 HZ to a few hundred HZ. The tachometer needle should rise with rising frequency and fall with falling frequency. If it does, you know that the problem is in detecting the ignition signal.

The frequency to RPM equations are as follows:

4 Cyl: RPMs = 30 x Hz

6 Cyl: RPMs = 20 x Hz

8 Cyl: RPMs = 15 x Hz

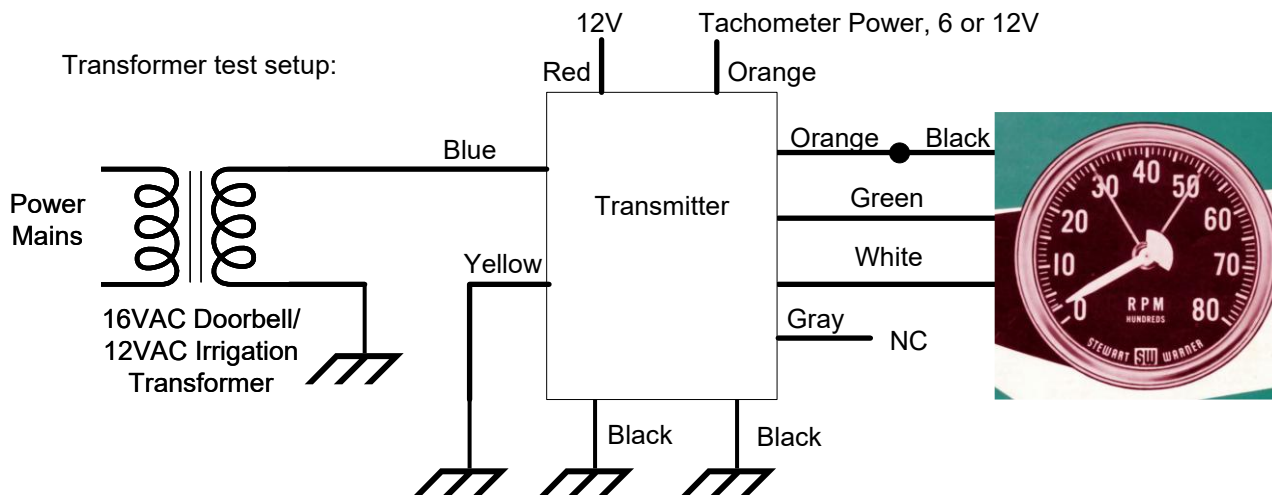
12 Cyl: RPMs = 10 x Hz

If you don't have access to an audio function generator, a 16VAC doorbell transformer or a 24VAC irrigation system transformer can work as a substitute.

Connect one side of the transformer output to the transmitter's blue input wire and the other to battery negative. Power up the tachometer and transmitter. Plug the transformer into a power outlet and the tachometer needle should move.

The transformer will be putting out a 60Hz signal in the US. That represents an 1800 RPM signal from a 4 cylinder engine, a 1200 RPM signal from a 6 cylinder engine, a 900 RPM signal from an 8 cylinder engine and a 600 RPM signal from a 12 cylinder engine. Some tachometers I have seen do not read that low, so you may need to rewire the system to select 4 cylinder mode to see the needle move.

With 50Hz mains outside of the US, the transformer will be putting out 50Hz. That represents an 1500 RPM signal from a 4 cylinder engine, a 1000 RPM signal from a 6 cylinder engine, a 750 RPM signal from an 8 cylinder engine and a 500 RPM signal from a 12 cylinder engine.



If you are unable to get the transmitter to work with your ignition system, please contact Accutach Co. (molson@accutach.com) to figure out what possibly can be done.