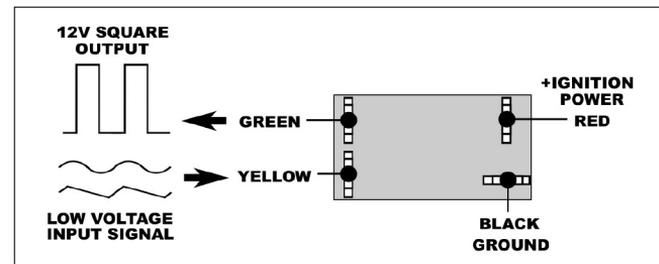


DIESEL TACH ADAPTER | SUITS MECHANICAL INJECTION PUMPS | MODEL SSCv01



INSTALLATION INSTRUCTIONS



HOW IT WORKS

The SSC uses a high-precision analog comparator in order to "see" sine or sawtooth signals that are too small to be detected by conventional tach circuitry. It will trigger with as little as 280 millivolts (0.028V), well below the 700-800 mV needed by most transistors. This makes it ideal for GM/Stanadyne, Isuzu and Mercedes diesel pumps with very low signal amplitudes, as well as the weak crankshaft sensors on many Motronic engines. The output is a clean, 12V square wave that will trigger almost any modern tachometer. For older tachos needing high voltage, the SSC output is fully compatible with Widget Man's BTAC2 Tachometer Booster.

MOUNTING

The SSC can be mounted anywhere with double-stick tape or adhesive, or taped back and wrapped into or onto a wiring harness. It can operate at temperatures up to 225 degF and all circuitry is double-sealed with epoxy and urethane, so it can live comfortably in your engine box or anyplace else on your vehicle.

WIRING

The SSC uses standard 0.110" faston connectors which can be obtained at any parts store. The pins are color coded for reference to the diagram above.

POWER CONNECTIONS:

The SSC will function well on any DC voltage from 5-20V. Ground can be wired to the chassis, block, or any convenient ground wire. Power should be connected to a "switched" source that is off with the ignition. The SSC draws around 4 milliamps even in standby, so it can draw the battery down when out of use if wired to an unswitched supply. The maximum current draw is around 10 mA, so virtually any switched circuit on the vehicle can be used without additional fusing.

IMPORTANT: The SSC is internally fused and protected against reverse hookup, but it is NOT protected against sparks or static discharge. Sparks at the 12V or Ground pins from "hot plugging" can cause catastrophic failure. NEVER "HOT PLUG" THE POWER TO ANY WIDGET MAN PRODUCT. MAKE ALL POWER CONNECTIONS WITH THE POWER OFF. IF CONNECTING TO BATTERY+ IS NECESSARY, DISCONNECT THE BATTERY GROUND, MAKE THE POWER CONTACTS AT THE DEVICE, THEN RECONNECT THE BATTERY GROUND.

TRIGGER CONNECTION:

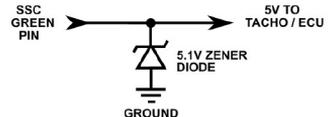
Normally the SSC's low voltage trigger pin will simply connect to one lead of a 2-wire inductive sensor. On most inductives it doesn't matter which lead is used, and the unused lead can generally be left open or grounded as desired. The SSC is "capacitively coupled" and will not care about sensor bias.

OUTPUT CONNECTION:

Generally all modern aftermarket tachometers will accept the 12V square wave outputted by the SSC, so the green pin can simply be connected to the signal input. This is also true for most ECU's and aftermarket devices like shift lights or variable-speed fuel pumps, etc. However, many older OEM tachos are "back-EMF" types that expect a high-voltage "spike" from a spark coil. These will need a voltage-booster like Widget Man's BTAC2 added to the SSC's output. Some ECU's

WIRING cont'd

and tachos also insist on a 5V signal and may "hibernate" from the SSC's 12V output. In this case, if a 5V supply is available from the ECU, a model SSC2 Step-Converter can be used to reduce the signal voltage. If no 5V supply is available then a "DIY" step-down can be implemented using a 5.1V zener diode as shown here. Since the SSC's output is "open collector", no series resistor is needed.

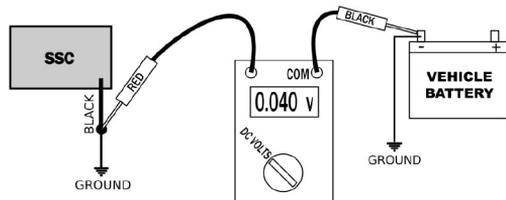


IMPORTANT: The SSC output is not current-limited or fused! CONTACT WITH LIVE 12V POWER DURING INSTALLATION CAN DESTROY THE OUTPUT. Use caution and do not hot-plug any connections.

TROUBLESHOOTING

GROUNDING:

Like any digital circuitry, the SSC depends on a solid ground connection. Checking the integrity of your ground wire is easy using a voltmeter (VOM). Set your meter for the lowest voltage scale so you can read millivolts (mV) and test as shown below, with the SSC powered and the engine running. You should read 40 mV (0.04V) or less. If the reading is higher, there is a problem with either your SSC ground or the chassis/engine ground in general. You can determine which by using the same test to measure between battery-minus and the engine block and chassis. If those readings are high then check the vehicle's ground cabling, if only the SSC ground reads high then the problem is in your hookup.



VOLTAGE DROP TEST FOR GROUND INTEGRITY

POWER:

Of course the SSC needs solid power. It's best to check the supply voltage at the SSC wire connections, not from battery or chassis ground. You should see near battery voltage between the SSC power/ground wires with the unit powered. If you see a voltage significantly different at the unit +/- than at battery +/-, there is probably a wiring issue.

TRIGGERING and OUTPUT:

If the SSC is triggering correctly, you should see a "middle voltage" on the green pin with the engine running. The SSC doesn't produce a 50-50 output like many other Widget Man adaptors, so the output voltage will vary to some extent depending on the input. Sine waves will generally approximate 50%, but sawtooths like those from many Stanadyne diesel pumps will produce higher or lower output voltages. If you see near 0V then the SSC isn't seeing your trigger signal. If you see a middle voltage but your tach isn't triggering, measure the SSC output with the SSC both connected and disconnected from it. If there's a substantial change then your tach or device may have a problem that's "loading" the SSC output. If there's no change then you may have either a high-voltage or 5V tach that will need either a booster or zener.

NOISE: Noise problems are almost always characterized by inconsistent needle behavior, although they may be indirectly related to an RPM issue like alternator brushes "bouncing" above a certain engine speed. Most noise issues can be solved either with shielding or capacitance, depending on the noise source. "Induced" noise will respond to shielding, which doesn't need to be fancy or expensive. Tinfoil grounded at one end will work well. If shielding doesn't help, you probably have noise in your power bus, also called "common mode" interference. This can be fixed using an old school condenser (as in points-and-condenser) applied to the SSC's power line. Most Widget Man distributors carry condensers as a customer courtesy.