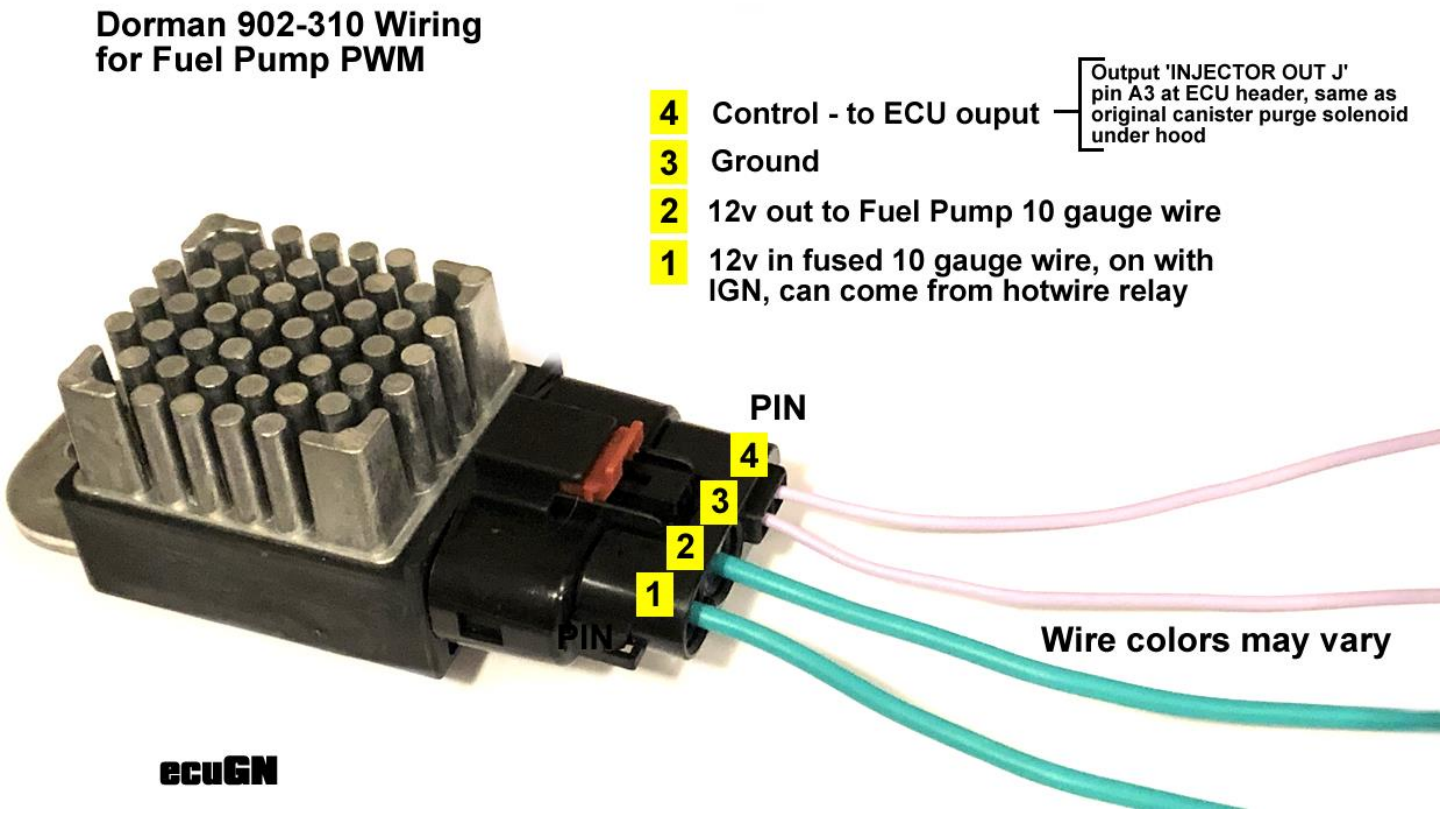
Fuel Pump Pulse Width Modulation in the ecuGN

For very large fuel pumps, where pressure cannot be controlled adequately at idle, the fuel pump can be pulse width modulated (PWM) to slow it down at low rpm or load.

You will need to install a solid state relay (SSR) to control the fuel pump. Do not attempt to connect the pump directly to the ECU, as it will damage the ECU. It needs to be controlled through an SSR. One example is the **Dorman 902-310.**



The power to pin 1 can come from an existing hotwire relay if desired. The power wire that originally went from the hotwire relay to the pump, will now go to pin 1, then pin 2 will go to the pump. The ECU will still turn the original relay on and off as normal. The new SSR will also turn on and off, but also control speed. Make sure the wire size for the pump is appropriate for the current draw. It will need to be 10 gauge normally. The 2 smaller control wires on the SSR (pin 3 and 4) do not carry much current and can be smaller.

The SSR can be controlled by the original canister purge solenoid output under the hood (near the air filter), which is called “Injector Out J” in the software. This will be the green/yellow wire in that connector, which will connect to pin 4 on the SSR. The other wire in that purge connector will not be used (pink/black). There are other outputs that could be used if you are already using the purge output (Injector out I (normally used for boost control), and High Current 3. Don’t use any outputs labelled PWM).

Software Setup

Go to the Fuel Pump and Pressure settings. You will see the dialog below. Set up everything like in the picture below as a starting point.

The numbers in the big table are pump duty cycle, 100% is full speed. The vertical Y axis is MAP KPA and X is RPM. You may need to experiment with these duty cycles depending on the pump used. Around the idle area (30-50kpa and 800-1200rpm) you will need to slow the pump down just enough so that you have 43psi fuel pressure line off (or lower if your tune requires it), and it drops approximately 8psi with the line on (depends on vacuum). You slow the speed by decreasing the duty cycle number.

These settings show the use of “Injector Out J” which is the old canister purge output. If using a different output, you’ll need to change that.

Also, this setup is not using fuel pressure correction (automatic compensation of fuel, if the fuel pressure changes). Some of the settings will be different for that and will be covered in a separate article.