AshSPEC
Dual Fuel pump control module
Installation & users manual

Thank you for your purchase of the AshSPEC Dual Fuel Pump Control Module! This document will assist you in the installation and configuration of the unit.

TOOLS NEEDED:

- Philips Screwdriver #2
- 10mm Socket & Ratchet Driver
- 3mm Allen Wrench

There are several interior panels that will need to be removed in order to access the fuel pump control module. The module is located directly behind the driver's seat back panel.

Disconnect the wiring harness to the right.

Remove two 10mm nuts retaining controller to body.

Install new controller as shown – note relay mounting and connect body harness.

**** Leave interior panels out of the car until controller operation has been tested and configured. ****

Controllers are pre-configured for you in advance to simplify installation but for more advanced users, the pump duty cycles can be adjusted to accommodate for situations where factory settings are not producing desired results.

Remove the top four 3mm Allen screws holding the top cover place in place. Once open, please familiarize yourself with the configuration section on the left of the controller.

10-segment bar graph: This graph indicates pump duty cycle in percentages – each bar represents 10% intervals from 0 to 100%.

2spd jumper: This configuration jumper is used to setup the controller for use with native NA setups or native TT setups. The native TT setup uses 3 different pump speeds and the NA uses only two speeds. If your vehicle is a native twin turbo you will leave this jumper open (no connection between the pins). If your vehicle was originally an NA that has been converted, you MUST install the jumper over the two pins to complete the circuit.

Mid Spd: This is the mid-speed control potentiometer. This adjustment allows configuration of the pump duty cycle during mid-load throttle conditions. This adjustment is ONLY used when in 3-speed mode. For 2-speed setups, turn this adjustment pot full counterclockwise. Do NOT force the adjustment; simply turn it until the knob reaches its seated position.

Low Spd: This is the low-speed control potentiometer. This adjustment allows configuration of the pump duty cycle during low load throttle conditions. This adjustment is used for both 2speed and 3speed setups.

Mid-Spd Trigger: This pushbutton switch is used to aid in setting up the controller. When depressed, it will force the controller into mid-speed operation. This allows the user to determine what the current pump duty cycle is for the mid speed control.

Pump: This LED is an indicator for pump operation. It will turn on any time the fuel pump(s) are running and its brightness will vary dependent on pump speed.

Ext: This pin header is available for use to install a remote mounted LED. The LED will indicate when
the pump is running and will vary in brightness dependent on pump speed. This header is an extension of the on-board PUMP LED. Only a 40ma load maximum can be applied to this output. If exceeded, it will shut down pump operation.

The primary purpose for adjustable pump duty and speed switching is to prevent regulator overrun. Regulator overrun results in excessively high fuel pressures. This is caused simply by a fuel pressure regulator's inability to bypass enough fuel back to the tank when large volumes of fuel are being delivered by the pump(s).

In the stock configuration from Nissan, the single twinturbo pump is actually capable of producing regulator overrun. This is why Nissan employed the fuel pump control module to vary the speed of the pump. By slowing the pump speed when fuel demand from the engine is low, fuel pressure can be properly maintained.

In the 3-speed twin turbo fuel system setup the pump is controlled as such:

Condition	Pump
1 second after keys turn to ON position Engine Cranking 30 seconds after engine start (above 122F) Engine Temp below 50F Boost is above ~5psi	FULL SPEED (100%)
Middle load, non-idle condition	MID SPEED
Except the above	LOW SPEED

For the 2-speed NA setups, LOW SPEED is only used for and idle condition. Any other throttle position results in full speed operation.

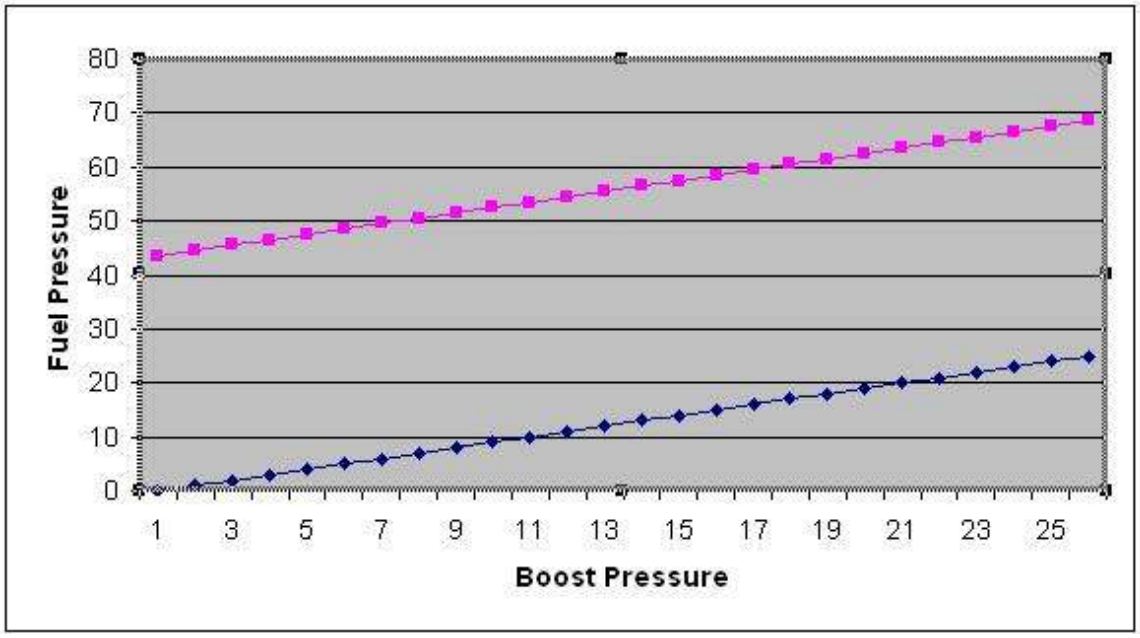
SETTING THE DUTY SPEEDS:

You will need to have an aftermarket fuel pressure gauge installed into the vehicle in order to perform the configuration steps outlined below.

With the cover plate removed, start the vehicle and allow it to idle for a moment until it switches into low speed operation. If the controller never switches to low speed operation after fully warmed up, be sure to check your throttle position sensor's closed throttle position switch.

Once the controller switches to low speed, note the fuel pressure. Fuel pressure in an idle condition should be ~38psi +/-2psi. Adjust the low speed adjustment until this fuel pressure is achieved. Typical duty cycles for this are around 40%.

For 3-speed users:
Once the low speed is set, depress the mid speed trigger button. This forces the controller into its mid speed operation. Typical pump duty for this load condition is 70%. Set to this value and perform a road test to monitor fuel pressures. When driving the vehicle you should note a smooth transition of fuel pressure as throttle opening is increased and boost pressure builds. The increase in fuel pressure should be linear to the increase in boost pressure. The table below reflects the relationship between boost pressure and fuel pressure.



Carefully monitor fuel pressure over the boost range and adjust the pump duty accordingly for the speed levels to produce a smooth 1:1 boost to fuel pressure relationship.

****NOTE:**
It is highly recommended to use an aftermarket fuel pressure regulator when running with a dual fuel pump configuration, or any other high output fuel system. The factory regulator unfortunately does not have the bypass volume necessary to produce a smooth consistent boost vs. fuel pressure dynamic and will result in a "shaky" fuel pressure response as the controller switches through its various speeds.