VaporWorx

We Give You Gas

WARNING

Working with fuel is dangerous. If fuel is handled improperly it can lead to fires and death. It is imperative above anything else that all appropriate safety measures be used to control the fuel and any ignition sources, including static electricity, heat, sparks, and any other sources. Proper high-pressure fuel lines and connections must be used in accordance to the manufacturer's specifications and routed away from any potential sources of heat, ignition, and protected from mechanical damage. If you are unsure about your work or safety, stop work immediately and consult with a qualified automotive technician and/or safety official.

VaporWorx Ally Auto-On Control System for Dual/Triple Fuel Pump Applications.

Thank you for your purchase of the VaporWorx fuel pump speed control system. This kit is intended for use with the OEM Fuel System Control Module / Fuel Pump Pressure Module when used with dual high-power fuel pumps The GM FSCM will act as the master system controlling the primary pump. The VaporWorx controller will act as an "Ally", or piggyback, taking its commands from the GM FSCM. This allows the power burden to be shared by both controllers, hence reducing the chances of overpowering the FSCM if operating both pumps alone.

The purpose of the Ally system is to allow the GM FSCM to control one pump while the VaporWorx controller powers the other. When used in this manner the power output of the FSCM remains within factory thresholds, meaning that no reprogramming or special adders are usually needed.

The Ally works by using the FSCM positive output to the pump as a guide for function. Both pumps, powered by separate sources, are thus under the single control of the GM system. Hence, all of the factory feedback and diagnostics remain in place. The VaporWorx controller turns on/off via the MAP sensor voltage signal. The VaporWorx controller provides true PWM control once turned on, not just a simple on/off switching function.

VaporWorx was founded on Customer Satisfaction and Service. We strive to treat people and our products the way we would want others to treat us and the products we purchase. That is why our electronics products are tested thoroughly before they are packaged and shipped. VaporWorx stands behind our products for one full year after purchase with a well-stocked repair facility and quick turnaround times. VaporWorx does not want to be the reason you cannot enjoy your car. The Terms of Warranty and Service are as follows:

Limited Warranty

VaporWorx warrants its products to be free from defects in material and workmanship under normal use and if properly installed for a period of one year from date of purchase. If found to be defective as mentioned above, it will be replaced or repaired if returned along with proof of date of purchase. This shall constitute the sole remedy of the purchaser and the sole liability of VaporWorx to the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall VaporWorx be liable for special or consequential damages. This warranty is only valid on products purchased from VaporWorx or their Authorized Dealers.

Service

In case of malfunction, your VaporWorx component will be repaired free of charges according to the terms of the warranty. When returning VaporWorx components for warranty service, Proof of Purchase must be supplied for warranty verification. After the warranty period has expired, repair service is charged based on a minimum and maximum charge rate. (Contact VaporWorx for current rates).

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The following steps will help to ensure good fuel pump operation and long life. Careful attention to wire routing, protection, strain relief, connectors, crimps, etc. will lead to a longer lasting and more reliable installation. Appropriate safety equipment and procedures should also be worn and utilized at all times. A minimum BC rated fire extinguisher must be within reach at all times. Wear protective gloves when handling fuels and do not smoke or have any sources of ignition anywhere in the working area. Support the vehicle using jackstands and appropriate lifting methods.

1) NOTE: The OEM fuel pressure sensor must remain in the pressurized fuel line near the outlet of the pumps, similar to the way the OEM system is laid out.
2) Disconnect the battery from the vehicle.
3) For fuel pumps under PWM to function properly a small amount of fuel needs to move through the pump during operation. This amount of fuel is more than what is used during idle/cruise. The bypass fuel can be done several different ways. Following are guidelines that will help ensure smooth pump operation.
   a) TI450 F90000267 and 274: A 0.041" x 1/8" long bypass hole. For Fore Innovations applications, a simple modification to the underside of the fuel hat can be done. Please inquire with VaporWorx for instructions. An external bypass fitting also available on the VaporWorx website. For Rick's tank applications, request from them the proper jet to install into the pump assembly.
   b) TI525 F90000285: Same as above but with a 0.051" x 1/8" long bypass.
   c) Stealth 340. Using the Aeromotive instructions, drill the pipe plug on the underside of the hat to 0.025". If using another type of pump hanger, a 0.025" hole can be drilled into the pressurized hardline tube that extends into the fuel tank to support the pump.

4) Note that all of the braid included in the kit is much easier to work with if the ends are sealed with a soldering iron immediately after cutting. The braid can also be cut with a soldering iron.

5) Find a suitable **flat** surface to mount the VaporWorx pulse width modulation controller (black box) near the vehicle battery. It is imperative that the box be mounted as close and directly to the battery as practical. If not connected directly to the battery controller malfunction will result. Do not mount the controller near sources of heat such as exhaust systems, radiators, etc. The cooler the electronics are during operation, the longer their expected life will be. #8 x ¾" screws are provided for mounting. Confirm that the screws will not penetrate fuel tanks, lines, electrical, or any other systems during installation.

6) See Diagram 1 for Steps 7-18.

7) Connect the supplied black 10ga 4' long wire from the controller BAT/PUMP- to the battery negative terminal. Do not chassis ground or controller malfunction will result. Excess wire length should be trimmed but allow for easy access, strain relief, routing, etc. Ring terminals are included in the kit and must be securely installed. Heat shrink tubing is provided to insulate the ring terminal crimp similar to that of the one already installed on the wire. Attach, but to not tighten the nut on the VaporWorx controller. The negative wire to the secondary pump will be attached later.

8) Perform the same for the 10ga orange BAT+ fused wire included in the kit. The wire is installed into the fuse holder in a loop. Cut to the lengths needed and terminate the ends using the provided ring terminals and heat shrink like that in Step 4. Tighten the brass nut on the VaporWorx controller to 10inlbs. *Do not over-tighten the brass terminal nuts on the controller.*

9) Plug the three-cavity GT150 connector attached to the grey, orange/black, and light green wiring harness into the similar connector on the VaporWorx controller.

10) Route the 20ga grey wire to the FSCM/pump area. This wire will need to have protective braid installed, so loosely determine the length of the braid/wire install onto the grey wire. Slide two short pieces of heat shrink over the braid. Heat them to seal the ends after attaching the grey wire as noted in Step 8.

11) The 20ga grey wire in Step 8 ties in to the FSCM fuel pump + wire. The FSCM pump + is typically a heavy gauge grey wire that goes to the fuel pump but this must be verified. This connection can be made anywhere along the heavy gauge wire, including the ring terminal at the pump if used.

12) Cut and strip the 20ga grey wire to the appropriate lengths, slip 2pcs ½" long shrink tubing onto the braid, then secure the wire to the FSCM grey wire by soldering. Seal the connection with heat shrink tubing provided. Heat the ½ long heat shrink pieces to the ends of the braid to keep them from fraying.

13) Route the orange/black and light green wires to the engine MAP sensor. This is the sensor on the pressurized side of the manifold. The orange/black needs to tie into the MAP wiring like that shown below Diagram 1. These connections can be made anywhere between the MAP sensor and the ECM. It is recommended to remove a small amount of the OE harness insulation (not cutting the OE wire), and then solder the VaporWorx wire to it. Re-seal the connection to protect it from weather and shorting. Be sure to install the protective braid and heat shrink before attaching the VaporWorx wires to the OE harness wires. Another option is to install a short pigtail to the OEM harness and install a two-pin connector in order to make servicing easier.

14) Using the six-pin GT280 connector, attach the male terminals and seals to the fuel pump and, if applicable, fuel level sensor wiring. The fuel level sensor wiring can also be used with the connector, but it is not needed for controller function. Install the wiring into the connector as shown in Diagram 1. Install the grey terminal positioning clip over the back of the connector to secure the wiring.

15) De-pin the wiring from the OEM white fuel module plug. These wires will then plug into the GT280 connector as shown in Diagram 1 for Pump 1. Confirm that the polarity is correct.

16) Route the supplied red and black 10ga wires to the GT280 connector. Similar to that in Step 13, attach the female terminals and seals. Insert the wires into the GT280 connector Pump 2 cavities as shown in Diagram 1. Confirm that the polarity is correct. Next, route these wires to the VaporWorx controller. Cut to length and install the supplied wire braid. Install heat shrink tubing to seal the ends of the braid to the wiring. **Install grommets where the wiring passes through sheet metal or any sharp edged hole. Protect all wiring from sharp edges, moving equipment, and heat sources. Take care not to pinch the wire between the tank and trunk floor.**

17) Attach the 10ga red wire from Pump 2+ to the Pump+ output on the VaporWorx controller. Ring terminals are provided. Tighten the brass nut to 10inlbs. *Do not over-tighten the brass terminal nuts on the controller.*

18) Attach the 10ga black wire from the Pump 2- to the BAT/PUMP- terminal on the VaporWorx controller / sharing it with the battery negative wire. Tighten the brass nut to 10inlbs. *Do not over-tighten the brass terminal nuts on the controller.*

Preparation Required Prior to Engine Startup

1) The VaporWorx controller is tuned to work with the OE FSCM. No further tuning is needed. The VaporWorx controller will activate the secondary pump at approximately 3psi of boost pressure (120kpa.)

2) Add fuel to the tank.

3) Insert the 25A fuse into the WeatherPack fuse link. A small spark may be noted and is normal during fuse insertion.

4) Confirm that all wiring is connected per the Diagram and that the fuel lines are properly attached and sealed.

5) Connect a pressure gauge to the engine fuel rail or monitor via the vehicle OBDII port.

6) Turn on the ignition switch. The fuel system should turn on for 1-2 seconds during the prime cycle. Turn off the ignition.

7) Check for leaks and repair as needed. Repeat ignition cycling until all leaks are repaired.

8) If no leaks are found, start the engine and confirm the fuel pressure.

9) Depending on a variety of factors, some injectors may create very large pulses as they open/close. These pulses may cause a fluctuating fuel pressure noted in the OBDII fuel pressure log and/or pressure gauge. A fuel pressure damper by Radium Engineering has shown to be effective in these unusual cases and have cured idle difficulties in many traditional fuel systems as well.

VaporWorx Ally Auto-On Fuel Pump Controller wiring layout. MAP sensor connection required.

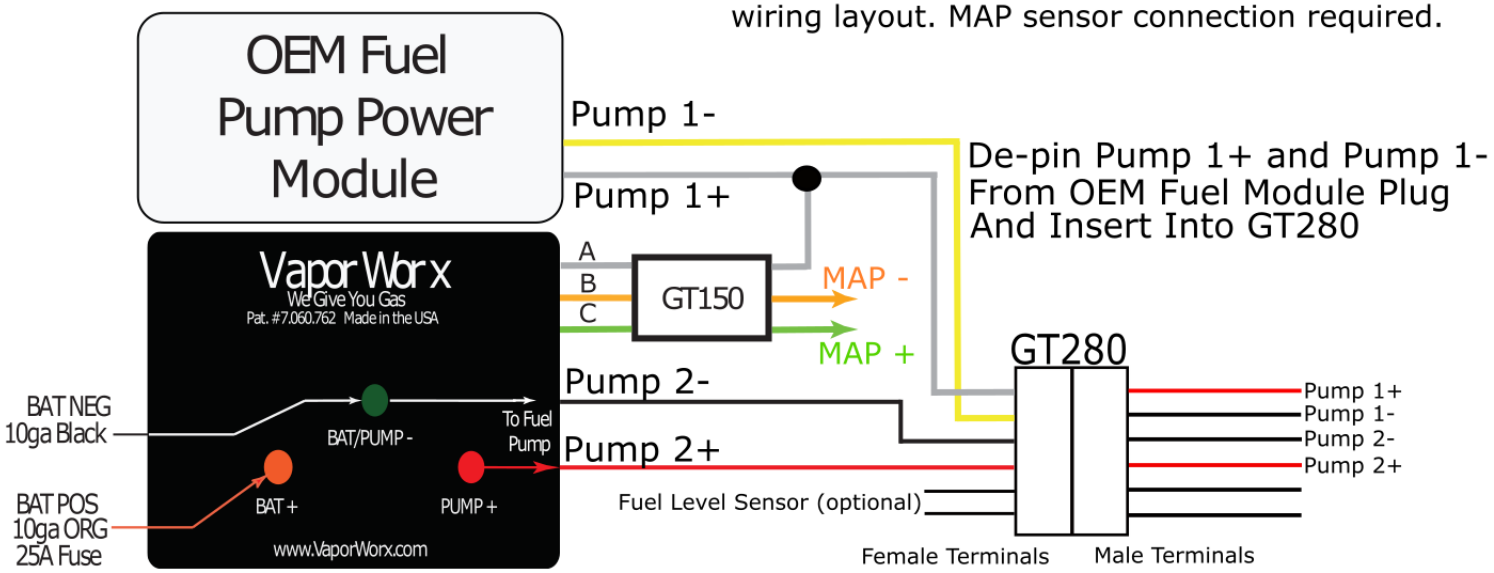
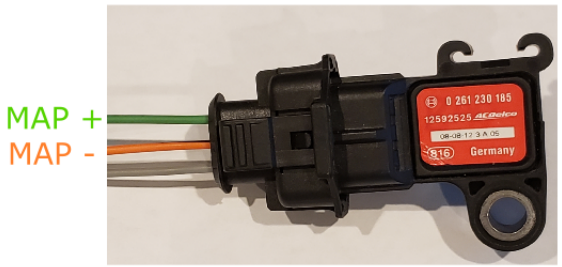
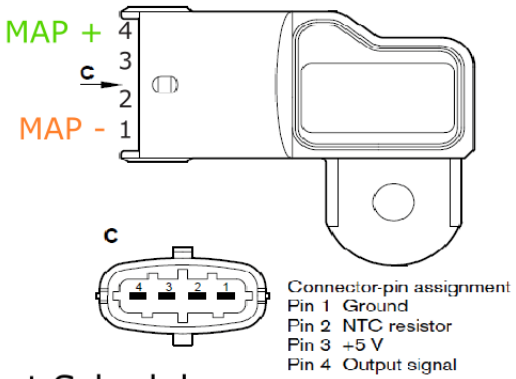


Diagram 1. Wiring schematic for the VaporWorx Ally Auto-On control system.

ACDELCO 12592525
LSA/LS9 3bar Map Sensor



LT-Series 3bar Map Sensor



MAP Sensor Pinout Schedules.