Kit Packing 2010+ Camaro OEM washer tank kit

12 foot pump cable _____
12 foot split loom _____
2 Long Wire ties _____
PAC wiring _____
Double Sided Tape _____
3 foot Cat5 extension _____
Methanol Filter _____
5.5 inch -6-6 hose ___
26 inch -4-4 hose ___
28 inch -4-4 hose ___
Low Level Sender, w/wiring, and LED ___
tank plug and grommet(C5 style) ___
tank 90 degree fitting w/grommet(C6 style) ___
90 3/8-4 fitting _____
90 3/8-6 fitting _____
Cap with Breather _____
Relay Pack assembly _____
6.5 inch steel for pump mount _____
Mini OVF and 6 feet of washer tubing _____
Fuse tap _____
Pump/tank hardware kit _____
Green wire assy _____
M15 nozzle assembly _____
2bar MAP + regulator or MAF converter _____
T fitting for 2 bar _____
PAC document _____
Install Doc's _____

2010 Camaro kit installation instructions

General guidelines for installing kit into vehicle. The three following rules should be followed to assure correct performance.

1. Nozzle must be highest point of system. If not, siphoning can occur.
2. Pump is the lowest point of system. This way it's always gravity fed.
3. Tank is mid-point of system. In some cases hose can be routed to nozzle making the hose the highest point of system.

Now let's start the install.

1) Pump mounting

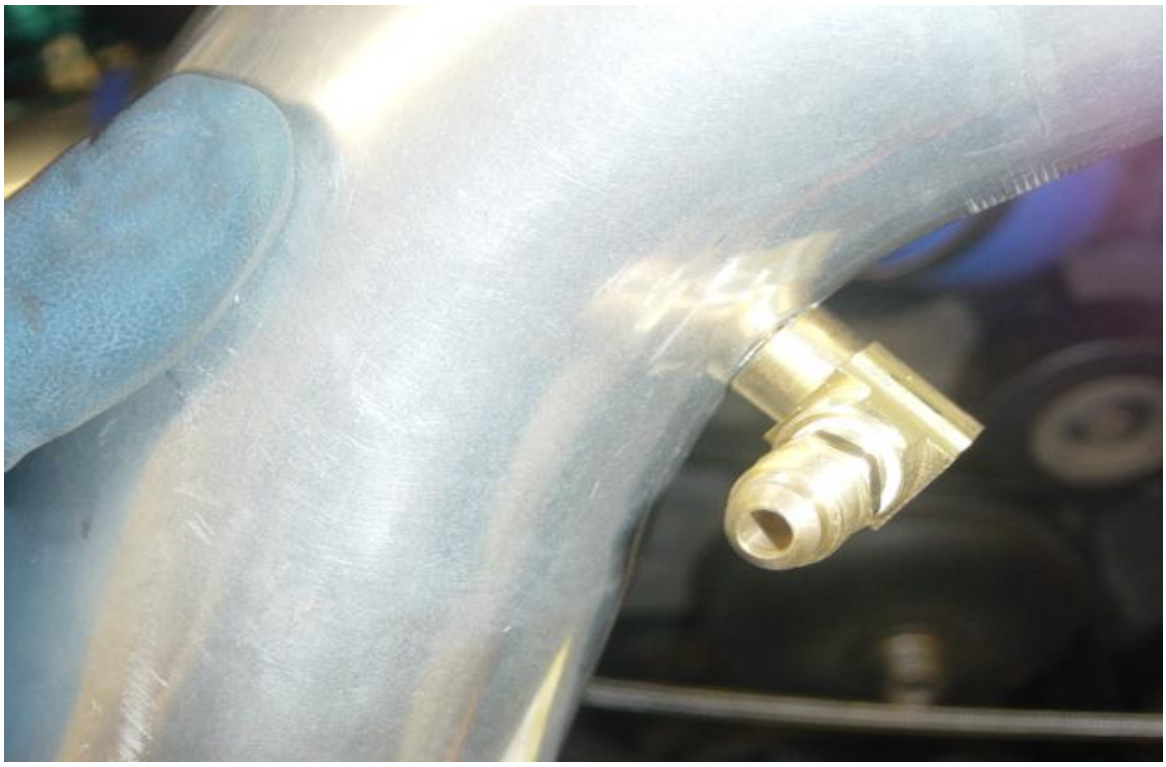
Before mounting the pump, install the brass fittings onto its inlet and outlets. The larger fitting goes on the inlet. When tightening these fittings, do so by hand, then one full turn. Do not over-tighten as this can lead to cracking the upper pump assembly. Rule of thumb, just enough so they don't leak.

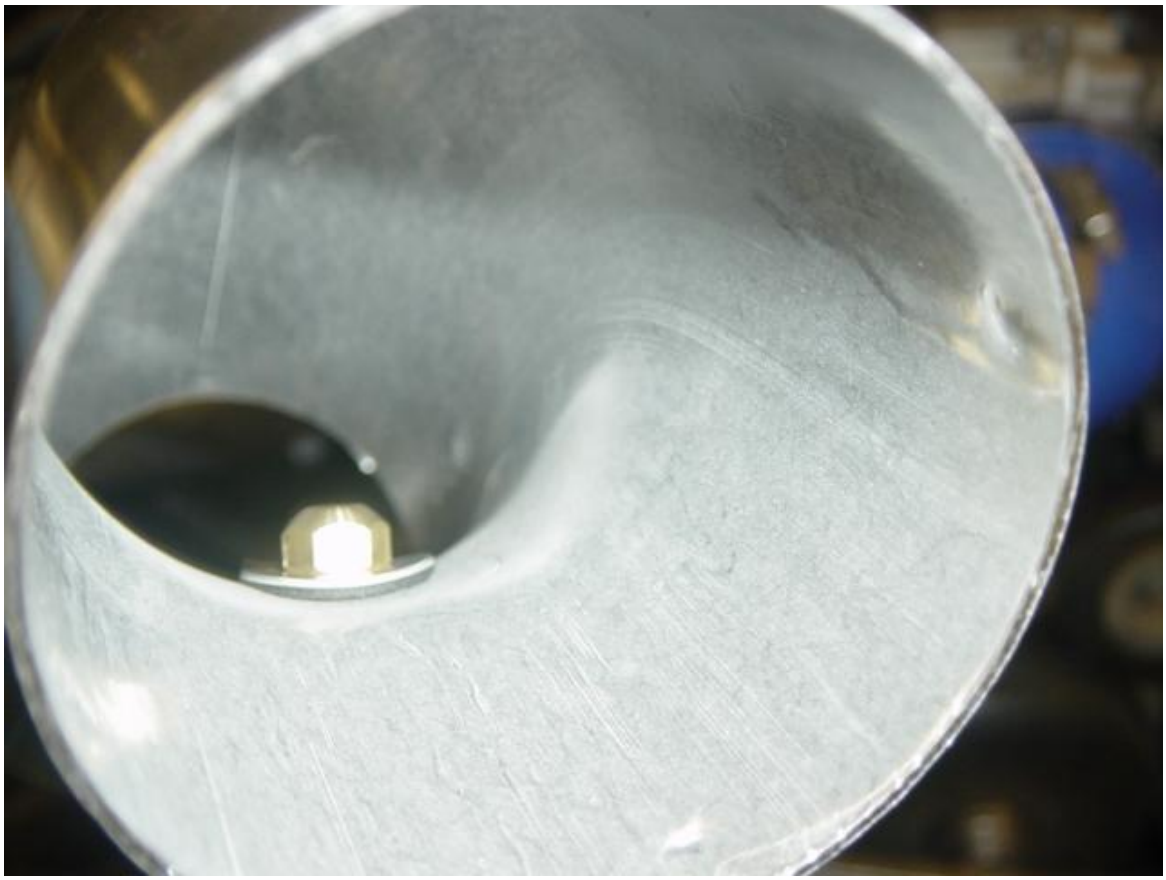
The preferred method is to mount the pump with its line connections facing down. Attach white wire on pump to ground. Using supplied metal make a bracket and use existing hole on core support in front of washer tank. Horn bracket bolt.

2) Nozzle mounting

The nozzle will require drilling a hole into the pipe leading to the throttle body. Before it and after any sensors like a MAF(mass air flow). The size of hole is 13/32. Slightly larger than 3/8. In the case of thick aluminum flanges, a 1/8 NPT tap can be used. The only tip's are,

1) Make sure tip of screen on nozzle does not bottom out into 90 degree elbow,
2) Make sure you have at least 4 threads into elbow. Fittings are brass and can break easy.
3) Once final assembly are done, go back unloosen elbow and apply loc-tite to the threads so the nozzle cannot loosen.





3) Tank assembly

The factory washer reservoir will be used for the methanol. You will need to unmounts it from car to drill the holes for the outlet and the low level float. The drill size for these fittings is 7/8. TIP.. use a Unibit that max size is 7/8. To locate the placement, simply hang the pump on the horn bolt and install by the hand the 5.5 inch feed hose. Now this will let you know where to mark the hole for the outlet fitting.

The low level will mount on the side of the tank below the frame rail. It will also require a 7/8 hole to be drilled. Its electrical connections will face the ground. Drill hole 1 inch from bottom to allow float to pivot.

Simply insert rubber grommet into hole, lube with WD 40 and push fitting in. This applies to both the low level and outlet fittings.

Remember to wash out tank of any debris. Install plug into factory hole. And install cap with breather.

Remount tank and connect feed hose and low level electrical plug.

4) MAP/MAF

The system requires attaching to a voltage based source to know when to activate and have the ability to increase pressure as the air flow/boost increases into an engine. If the vehicle already has a positive displacement MAP(2 bar/3bar) simply tie into its signal wire. On GM sensors it will be the center pin on the sensor. Easily verified by using a voltmeter and applying power to it. A 2 bar will read ~2.3 ignition on, a 3 bar will read ~1.6 ignition on engine not running. Typically if the vehicle has a boost gauge, T into gauge using supplied T fitting and MAP sensor can be mounted under the dash of the car.

5) Under-hood wiring

Power to the system will come via the supplied relay. Mount it next to fuse box by the core support and attach Red wire with O-ring to power post by the fuse box. Gray wire will be attached to the IGN fuse in the box using supplied tap. Black will need to be grounded. The long red wire will be routed into the vehicle. At this point start routing the pump and low level wiring through the rear of the engine compartment using supplied loom.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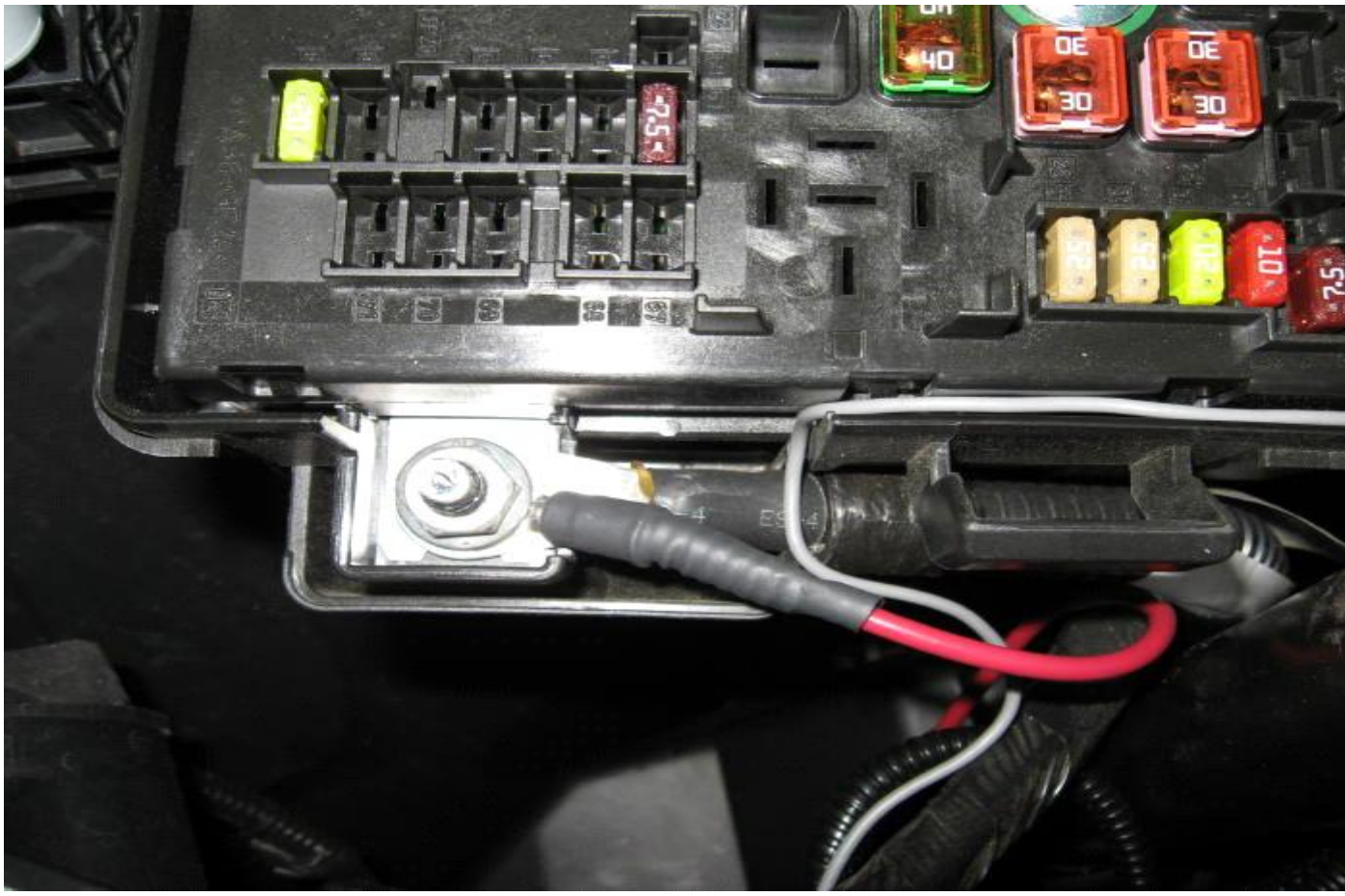
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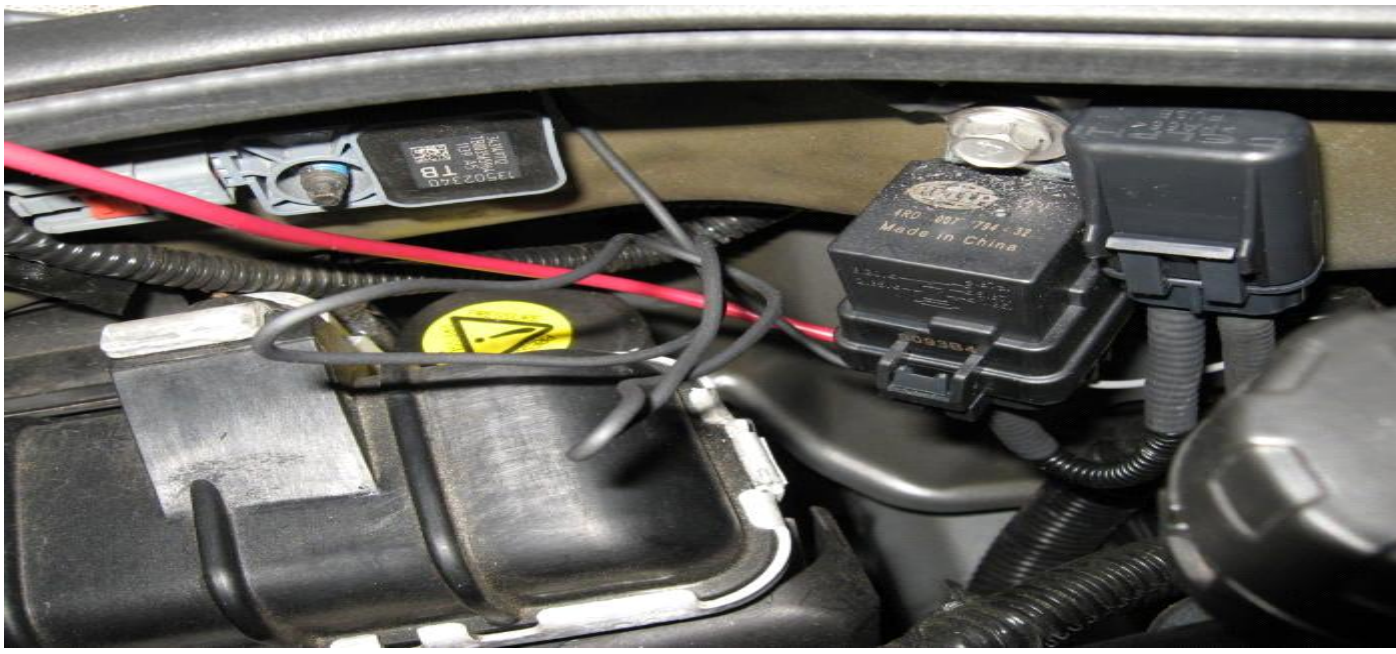
Made in China

6) Hose connections

Three hoses will be used on the system. And there will be an inline filter marked with an arrow indicating system flow.

A simple test using water can be performed at this point. Pour a glass of water into the container and verify there are no leaks from fittings surrounding the pump area. Water is used since leaks can be easily seen. At this point take a break, wash hands, in-car wiring is next.

7) In-car wiring

The following can be used as a guideline from the numerous installations I have performed. The sky is the limit on creativity, and this should only be used as reference for what I have done, has been easy, and has worked. On the install I performed a small hole was drilled under the brake assembly on the firewall to run wires into the cockpit.

The first thing I always do is visually place where the location of the "turn-on"

LED will be located. Typically this will be near your boost gauge. So as the needle sweeps up, the LED will illuminate letting you know the system has activated. Next is the decision of the placement of the low level LED for the tank. On the Camaro I installed my LED's above the steering column.

At this point drill holes for LED's, and run their wiring to the lower portion of the dash.

Locate a suitable spot for the PAC controller. On the Camaro I used the center console. I drilled a small hole through the bottom of the console and ran the cable using the supplied extension cable. The side of the console on the 2010 Camaro simply un-snaps. I mounted the Main PAC controller underneath the dash. On the install I performed, I also mounted my 2 bar sensor under the dash.

The PAC controller has main connector with a Red/Black wire plug. These are the Ignition and Ground to the unit. Red goes to the red coming from the relay under the hood. Black goes to chassis ground. A very solid ground is imperative for proper system operation

Next to this connector on the PAC are three wires. Red/Black/White. These are the pump connection wires. When doing the connection to the Red pump wire attach it to the Red. Attach Black from the pump cable to the Black from the PAC. And Silver/bare wire from pump cable to the White from the PAC. Now using supplied wire tie, attach PAC box to steering column or other suitable spot.

On the PAC there will now be six wires, gray, purple, orange/brown, red, and green. The gray is used as an auxillary output. It will not be connected to anything.
The green goes to the green MAP sensor signal wire. The purple, do not connect to anything at this point.
The orange/brown twisted will go to the turn-on LED.

The MAP sensor has three wires coming from it. Red, green, and black. Red from MAP sensor can go to red on 6 pin connector. Green on MAP sensor goes to green on 6 pin. Black goes to chassis ground.

There is a low level LED which has a Tan and Red wire. Tan goes to tan from the tank. Red goes to switched +12. You can use the red on the 6 pin for this source

as well.

8) The purple wire

Be careful on how this wire is to be used, most applications will not benefit from it being connected. The following illustrates its operation.

When the purple wire sees a ground signal, it will not allow the MAP sensor signal within the controller to increase. The purpose is to limit injection in the process of spooling up a larger turbo with a less than adequate torque converter. In other words, grounded purple wire=no injection system. Simple test is to use a pushbutton switch temporarily mounted. One leg to ground, and the other the purple wire.

Another tip that can be done is to use it to control how fast the alcohol ramps up by placing a capacitor from it to ground. When the ground is released, the time it takes the capacitor to charge varies the time for the system to resume normal tracking. The larger the value, the longer it takes. Typical values to experiment with are 220, 330, 470, 1000 UF at 16volt electrolytic. I would leave this type of experimenting to be done when the system is up and fully functional. Most vehicles will never see benefit from using this procedure, it was added to increase the flexibility of the controller. Again, may not see a benefit from its use, and can cause more harm than good. Use accordingly with caution.

9) Final

At this point you've concluded the installation, first thing to do is before putting alcohol into the tank, is turn the ignition on the vehicle "ON" and set the blue gain knob to the middle position. Next depress the black test button and observe the "turn-on" LED illuminates RED. At this point also observe the low level LED illuminates. If these checks are passed, next is put some liquid into the tank and observe low level LED shuts off.

Start engine and assure everything checks ok. Idles fine, etc. Next is start engine, place Gain knob in the "8" position.. and hold down the "Test" button and watch the turn-on LED change from Red to Green. This will indicate pressure has been developed. On the first time this is done, it may take a little longer since air needs to be displaced. The motor will also bog down after a few seconds. If the pressure setting on the switch is set higher than the pressure developed when the test button is depressed, due to voltage/settings on PAC, etc.. The LED will NOT change color. And an adjustment to the pressure setting on top of the pump may be required. It would be a good time now to recheck all

the fittings and connections and assure there are no leaks.

Now on the maiden voyage with the system, place the gain knob at "4", put vehicle into second gear and bring the boost up slowly, as the needle passes 4-5 PSI you'll note the turn-on LED illuminates. This is a good sign. Next is roll into the throttle bringing boost up and assure the motor feels smooth at all boost levels. If there is any surging at lower boost levels then reduction of alcohol or fueling may be needed.

If it doesn't run clean at low boost, it has no business going to higher boost. If it runs smooth proceed to increase boost level while observing knock activity on a scantool. If no knock is registered, keep increasing boost to desired level. Most vehicles respond to the preset I set the controller at. If you require to turn-on the controller latter, do so by increasing the turn-on knob "clockwise". If more alcohol were needed to be injected into the motor, increasing the Initial control clockwise will make the pump more aggressive. Small changes make huge changes.

Also note the LED changes to Green. Turn-on controls where the PAC starts to send signal. Initial controls the slope on how fast the pressure increase from the pump is desired. Small changes to the Initial, make huge changes in output. This Initial takes off from the point Turn-on has been reached.

In layman terms, if you set the turn-on at 3 PSI and run 12 PSI boost, you have a 9 PSI voltage swing on your MAP sensor. So if you leave the initial control alone, and raise the turn-on to let's say 8 PSI. Now at 17 PSI you will have the alcohol you had at 12 PSI before. So… If you need to turn-on at 8 PSI and have the old amount you had at 12 PSI, then increase the "initial" to increase the slope so now it delivers what it use to at 12 PSI.

10) Contact

If any part of this procedure is unclear, or an issue arises, please contact me for assistance. Also there are installation pictures to assist on the website www.alkycontrol.com. It would be my pleasure in making your vehicle increase its performance and stay together. Please use responsibly, obey all traffic laws, and the best tip I can offer is do things with common sense in mind.

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PAC- Progressive Alcohol Controller

Introduction

The PAC is a versatile electronic motor controller using pulse width modulation technology. It allows the user to custom tailor voltage output to the injection pump being used so that it increases pressure with the increase in voltage output coming from the vehicle MAP sensor. Recommended that vehicle have a 3 bar map sensor for better voltage control. Will support any injection pump rated up to 15 amps.

Features

Added flexibility to the control of an injection pump to overcome boost pressure in intake tract, ability to run higher pressures from an injection pump without inducing flooding or transitional knock, input terminal for pressure reduction(brake input), ability to custom tailor installation, ease of use, and flexibility. Built in fuse.

Unpacking

Included in the kit should be enough wiring and connectors to do a full install. This is a list of what is included. Controller, 12 feet 16 gauge shielded cable, 12 feet ¼ inch loom, 4 red splices, 8 wire ties, 3 spade terminals, one LED, solder, and some heat shrink tubing.

Tools Required/Recommended

Connector crimper.. Klein, Blue point, etc. , soldering iron or gun with 60/40 solder, drill with unibit drill bit, 12V test lite, heat gun, basic hand tools, and a digital voltmeter.

Installation

These are general guidelines for component installation. The kit comprises of two individual modules. They are the main controller, and the remote controller. A RED and a Black weather pack connector is used to supply power to the main controller. The Red goes to a switched ignition source capable of handling 15 amps. I use the IGN terminal on a GM fuse block. Or this can be routed from a relay activated by the ignition switch. Black goes to chassis ground. The connections to the injection pump are the Red/Black/White wires coming from the main controller. Connections to these using the supplied spade connectors. Red wire to from the pump to Red wire from main controller. Black wire from pump to Black wire from main controller. There is a “drain/silver/bare” wire for the pressure sensing, this will be connected to the White terminal. It is highly recommended that these connections be soldered to assure reliable connections.

IMPORTANT NOTE: The “Black Pump Wire” on the main controller is not a ground.

Main controller wiring, green-violet-gray-orange-brown.

Green is connected to the MAP sensor signal wire. On in the case of Ford vehicles.. MAF

Gray is an auxillary output that will switch + voltage when system activates. Examples to run a solenoid driver relay module, input to external boost controller, etc.. typically not used

Orange/Brown twisted go to the Turn-on LED. These wires will flip polarity when pressure is developed. Suggestion is to place turn-on LED near boost gauge to indicate system has activated.

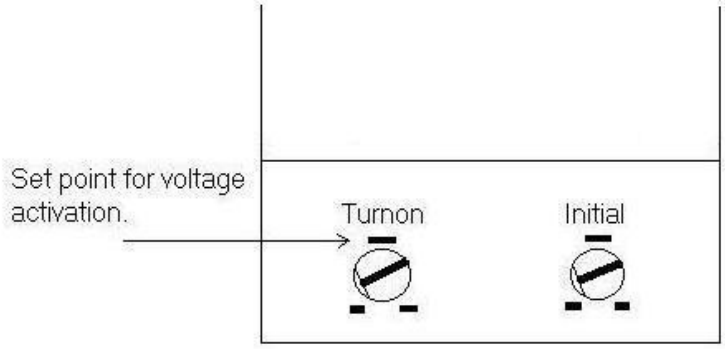
Violet wire is the negative trigger input terminal for pump speed reduction. Grounding this wire reduces injection pump speed to initial pump pressure for staging applications while drag racing. Intended application are E-brake switches.

The remote controller affords the user the flexibility of custom installing controls with dash panels of vehicles or attaching control box as is. For custom installation, simply remove screws from box and relocate controls and LED. A small jewelers screwdriver will be required to remove knob assembly. Unibit drill bit makes graduated drilling holes a snap.

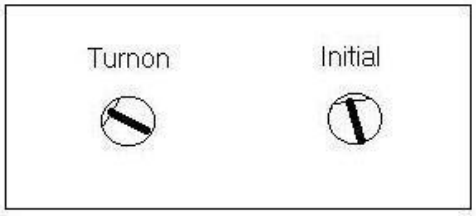
Setup and Use

The remote controller features a knob that controls ON/OFF and GAIN. The LED next to it indicates system is armed and the push button applies “initial” pump speed to the pump for testing operation.

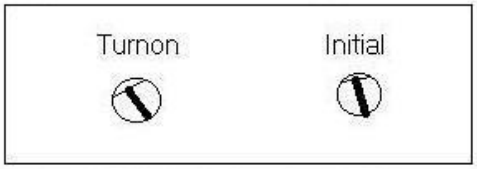
On the main controller is an access door. Opening the access door reveals two controls internally labeled “TURN-ON” and “INITIAL”. The turn-on control allows the user to set a turn-on voltage from 1.7volts to 5volts. Clockwise rotation increases the voltage needed to trigger system. The “INITIAL” control determines how much voltage is sent to the pump when the system is triggered. Typical settings are factory preset for 4 PSI turn-on with a 2 volt output to the pump. These can be recalibrated by the user by simply turning the controls clockwise to increase, counter clockwise to reduce. A LITTLE AT A TIME. Use fingers or small flat screwdriver. An electronic voltmeter can be used for initial pump setup as well. Procedure involves placing voltmeter across terminals on power distribution block and pressing the push button on remote controller. Typical setting is 1-3 volts. Next is the “Pump Gain Control” on the remote controller. This control interacts with the initial pump speed control. Usual and typical settings place this knob in the 12-2 o’clock position. It is used to ramp the voltage gain to the pump as the signal from the MAP sensor increases. Turning this knob clockwise will increase output voltage multiplication and slightly increase the initial pump speed. Only way to know what is best suited for your particular application is trial and error.



Turnon control will adjust from 1.7 volts DC to 4.9 volts DC. Full CCW is 1.7. Full CW is 4.9. Voltage can be adjusted by probing center terminal on Turnon control and adjusting to desired level.
3 bar GM sensor 5 PSI ~2.15 volts DC, 2 bar 4 PSI is 2.9 volts DC



This is typical factory preset for a GM 3 bar application. IE, Turbo Buick 2.2 volts DC



This is typical factory preset for a GM 2 bar application. IE Corvette 2.7 volts DC

Tuning suggestions

First, best place to tune an alcohol system is the race track under closed track conditions. I do not recommend hi-speed testing of products on public roadways where you or others may be in-danger. Also no expressed liability is expressed with the use of this product. USE AT YOUR OWN RISK.

Ok, we're ready. Set pump gain knob to 6 and bring turbo up to your initial PSI setting(recommend ½ half of factory boost setting) see if LED illuminates, if not re-calibrate setting in main controller. Once this is done, monitoring engine knock, race car…. If knock retard is encountered, ascertain if the knock is occurring as the boost increases(transitional) or is occurring at due to high boost levels.

Adding gain to the knob(clockwise) increases pump pressure output. If the knock is occurring due to transitional, increasing initial pump speed or decreasing turn-on point will aid these conditions. Again every vehicle is different, the initial and turn-on will more than likely never be recalibrated once system is setup. They will not correct a tuning problem and/or engine fault.

Timing suggestions, Low timing and high boost. Setting up the fueling, timing, coupled with the alcohol output requires time and patience. Do small steps at a time and enjoy the product and its technology.

The pump features an allen screw to adjust pressure activation. Every vehicle is different, as will be the setting of this screw. Suggestion is to have it sense pressure early on. If there ever is an issue with the system(empty tank, tank leak, clogged feed line, etc) this will advise of a problem. Although it can be set to activate under higher pressures. This is a personal preference. And the brown wire can be used for triggering boost controllers as well. No pressure=no Hi Boost

TIPS

On applications like the Buick Grand National, I wire a 12 volt bulb across the pump output terminals (+, -) . This allows me to see the bulb brightness increase as the boost level increases. And light dimly when the initial pushbutton is depressed. Other options are the use of an electric pressure gauge (optional) or mechanical pressure gauge (optional) to setup pressure. It is not needed, but can be handy for initially setting up controls. Other options are the use of a voltmeter across those terminals.
Most if not all street applications, once the knobs are set, they rarely get changed. Minor changes to the gain knob is all that will usually be required. Keep an eye on the road at all times…and if an unreasonable amount of knock is encountered, take your foot of the pedal and diagnose problem.

www.alkycontrol.com