



Universal Stage 2
Ver 2b controller

How the DevilsOwn™ Alcohol Injection System works:

The DevilsOwn™ Alcohol Injection System begins with a connection to a supply tank containing a methanol/water mixture. We recommend DevilsOwn Brew for use with our products. This mixture is pumped at high pressure through the tubing to the nozzle holder. The amount of alcohol and water that is injected through the nozzle is easily adjusted by means of metering the nozzle.

The DevilsOwn™ Alcohol Injection System is designed to work as a bolt-on kit for stock or mildly modified vehicles. A mildly modified vehicle includes those header upgrades, exhaust upgrades, air filter kits, etc. If major engine modifications have been performed a dual nozzle upgrade may be required for safe alcohol system operation. Major engine modifications would include larger turbochargers, superchargers, aftermarket cylinder heads, head porting, camshafts, intake manifolds, etc.

Kit Contents

Parts

- 1 Progressive Controller
- 1 250PSI Pump
- 6ft Wire Loom
- 15ft Nylon Hose
- 1 Sticker

Mechanical Bag

- 1 Brass Check Valve
- 1 Black Nozzle Holder
- 2 Nozzles
- 4 #10 x 1-1/2", Screws

Electrical Bag

- 3 Blue Posi-Tap™
- 1 Red Posi-Tap™
- 1 Fuse Holder
- 4 6" Long Zip Tie

Tools Needed

- Drill with 7/8" and 11/32" bits
- 1/8 NPT tap
- 18mm, 7/16", and 9/16wrench
- 1/4" socket with ratchet
- Marker
- Wire cutters
- Electrical tape
(Recommended)
- Multi-meter (Optional)

Read this pre-installation guide before installing kit.

Not doing so can cause damage to this product or your vehicle.

Work safely. Always wear eye protection and gloves when working with lines or hoses that contain pressurized alcohol or fuel. Never transport alcohol tanks loose in a trunk, in the back of a pick-up truck, or especially NOT within a vehicle's interior whether the tank is full OR empty. Always disconnect the GROUND side of the battery when working on any electrical components.

Alcohol Injection won't fix problems you already have. Before you install your alcohol system, be sure your engine is in good mechanical condition. Intermittent wiring problems, etc., can lead to erratic system performance and possible engine damage.

DO NOT use Teflon sealing tape on any fittings in a DevilsOwn™ Alcohol Injection System. It is easy for Teflon tape to get pulled into the system causing blockages that can ultimately lead to incorrect alcohol system performance and potentially engine damage. Only use liquid thread sealer for all NPT type fittings if not already applied.

DO NOT attempt to start your engine if alcohol has been accidentally injected into the engine while it was not running. If this occurs, disable all of the ignition coils by unplugging the leads going to them. Push the accelerator pedal to widely open throttle and hold it there. While engaging the starter, turn over the engine for several seconds to clear the alcohol from the engine, and then reconnect the coils. Failure to do this before attempting to restart the engine could lead to a dangerous intake system backfire.

Never defeat operation of the pump's pressure switch: It is required for proper pump pressure output. Never bypass, drill, machine, shim, deform, scratch, drop, or modify a pump's pressure switch in ANY way whatsoever!

DO NOT PUMP FLAMMABLE LIQUIDS

DO NOT PUMP MORE THAN 50/50 MIX OF ALCOHOL AND WATER

MORE THAN 50% ALCOHOL IS A FLAMMABLE LIQUID

Quick Start Guide and Checklist

DISCONNECT THE BATTERY BEFORE INSTALLING CONTROLLER!

Fluid Tank

- Remove factory washer fluid tank
- Drill 7/8" hole in tank and install supplied self sealing bulkhead
- Reinstall fluid tank

Pump

- Mount pump using supplied screws (as near the tank as possible)
- Attach red wire to 12v battery power

Nozzles

- Remove engine component where nozzle will be installed
- Drill 11/32" hole in component
- Install filter in nozzle
- Install nozzle into engine component
- Reinstall engine component

Tubing

- Run tubing from tank to pump, leaving slack (avoid hot & moving parts)
- Find a place in line for check valve, cut tubing, and install
- Attach holders to nozzles

Progressive Controller

- Disconnect battery
- Mount progressive controller
- Black connects wire to chassis ground
- Pink wire connects to ignition on power
- Blue wire connects to pump's negative wire (black)
- Orange wire connects to 12v battery power
- Yellow wire connects to a float sensor (if being used)
- Green wire connects to MAP sensor signal wire

Optional Fluid Level Switch

- Drill 7/8" hole in fluid tank, 1" from bottom of tank
- Place switch inside tank and screw in place
- Run one wire to chassis ground
- Run other wire to yellow wire of controller

Section 1: Fluid Bottle



Figure 1: Tank Placement

Remove the factory washer fluid tank from the car, if possible, for ease of access. On a flat side of the tank, locate a place for the self sealing bulkhead fitting that is free of obstructions. (The best and recommended spot is either the side or the front of the tank.) Using a 7/8" drill bit, drill a hole in a flat location and simply place it in and **hand** tighten. In order to maintain a leak-free seal, this must be done on a **flat** area. **DO NOT** place the tank tap in the seam line of the tank. Doing so can cause leaks.

Turn the tank tap fitting clockwise until it is flush with the washer fluid tank. **NO** tools are needed to install. **DO NOT** use any tools to tighten.

Regardless of where the tank is mounted (under hood, in trunk, etc.), we recommend mounting the pump near the tank. DevilsOwn pumps are pusher type pumps and they work best when placed as close to the tank as possible.

Section 2: Pump Installation



Figure 2: Pump placement

The DevilsOwn pump should be mounted below and as close to the reservoir (tank) as possible using four of the #10 x 1½" screws. Make sure to mount the pump away from heat, moisture and road debris. Because the pump will work at any angle, installation angle does not matter. Notice on top of the black pump housing, there are two arrows indicating the direction of fluid flow to and from the pump. The port with an arrow pointing towards the pump housing is the pump inlet (suction). This is the line coming from the reservoir tank. The port with an arrow pointing away from the pump housing is the pump outlet (pressure). This is the line going to the check valve or optional solenoid.

The pump must be primed to remove air from the lines. This can be done by applying a ground and power to turn the pump on.

Run the red wire from the pump directly to the battery. The fuse is installed between the red wire of the pump and the battery.

Section 3: Nozzle Selection

Start with the lowest nozzle setting and work your way up. This ensures if you have any tuning issues to work out on your vehicle, they will get sorted out using a smaller amount of alcohol and will therefore be less likely to cause engine damage. Once the car works well on the small amount, then it will be safer to try a larger nozzle.

It is possible that while during driving, the vehicle will experience engine bucking. This bucking is caused by either too much fluid being injected or not enough air to accommodate what is being injected. To remedy the problem, do one of the following.

1. Adjust the controller **start** knob to inject at a higher boost level.
2. Adjust the controller **full** knob to inject at a higher boost level.
3. Use a smaller injection nozzle.

Correctly Installed



Incorrectly Installed



Figure 3: Nozzle mounted into nozzle holder

Section 4: Nozzle Installation

DevilsOwn strongly advises placing the nozzle **AFTER** the Mass Air sensor and/or an air-to-air intercooler if equipped.

On most turbocharged or CSC applications, DevilsOwn users place the nozzle in the outlet of the intercooler. If an intercooler is not present, the nozzle can be placed in any accessible location before the throttle body. This will not damage supercharged applications with a liquid heat exchanger in the manifold. On these applications, it is recommended to put the nozzle a few inches in front of the throttle body or after it in a spacer. Remember, every car is different!

If possible, remove the component where the nozzle is to be installed from the engine. Be careful not to damage your engine during parts removal. Using an 11/32" drill bit, drill a hole at the selected location. If drilling through thicker metal like a throttle body or an intake manifold, use a 1/8" NPT tap. If going through thinner material, the nozzle can sometimes just thread right into it. Alternatively, you can have a 1/8" NPT bung welded in at any exhaust shop. If running dual nozzles this step will need to be repeated.

Before placing the nozzle into the intake, be sure to tighten the filter. Do not over tighten this filter screen to the nozzle housing as this will cause reduced flow from the nozzle. The filter side is the inlet side of the nozzle and the side with the small hole is the spraying side. Like before, the nozzle should turn by hand 1/2 way, then only need another 1-2 turns with a wrench to achieve a leak free seal. It is normal for the nozzle not to always seat the O-ring the first time it is put in. Every time it is loosened and tightened it will naturally tighten further.

Section 5: Tubing

Run the tubing from the tank to the pump, leaving the excess at the tank. Be sure to keep the tubing clear of hot areas and moving parts that could damage the hose. Mark the hose at the desired length with a few inches of slack and cut the hose, making sure the ends are cut squarely. If the ends are burred you can clean them up with a file or sharp blade.

Slide the tubing into the push-to-connect on the pump and then into the tank. With the push-to-connect used on the DevilsOwn pumps, the tubing can be easily removed by pressing in on the sleeve and lightly pulling on the tubing.

Run the tubing from the pump to the nozzle leaving the excess at the nozzle. Attach the check valve to the black 90° nozzle holder using the 9/16" wrench. Attach the nozzle holder assembly to the nozzle. Finally, cut the tubing with a few inches of slack and slide the tubing into the check valve.

Section 6: DevilsOwn Progressive Controller

The DevilsOwn Progressive Controller injects water/methanol according to either 0-5 Volt sensor signal or by directing hooking it up to your boost pressure source.

DISCONNECT THE BATTERY BEFORE INSTALLING CONTROLLER!

Electrical connection

- **Black** wire goes to chassis (body) ground (Be sure to get a metal on metal connection!)
- **Pink** wire goes to Ignition on
- **Blue** wire goes to the pump's Negative (black) wire.
- **Yellow** wire is for hooking any ground signal input to it such as our fluid level sensor.
- **Orange** wire goes to 12v battery
- **Green** wire goes to the sensor output (0-5 volts). Verify output wire with multi-meter. At idle the proper wire should be aprox 0.8-1.2 volts. With the ignition on and with the car not running 1.8-2.8.

Important: If there is no yellow or orange wire please contact us for the proper instructions. These instructions are not correct for controllers with no yellow wire.

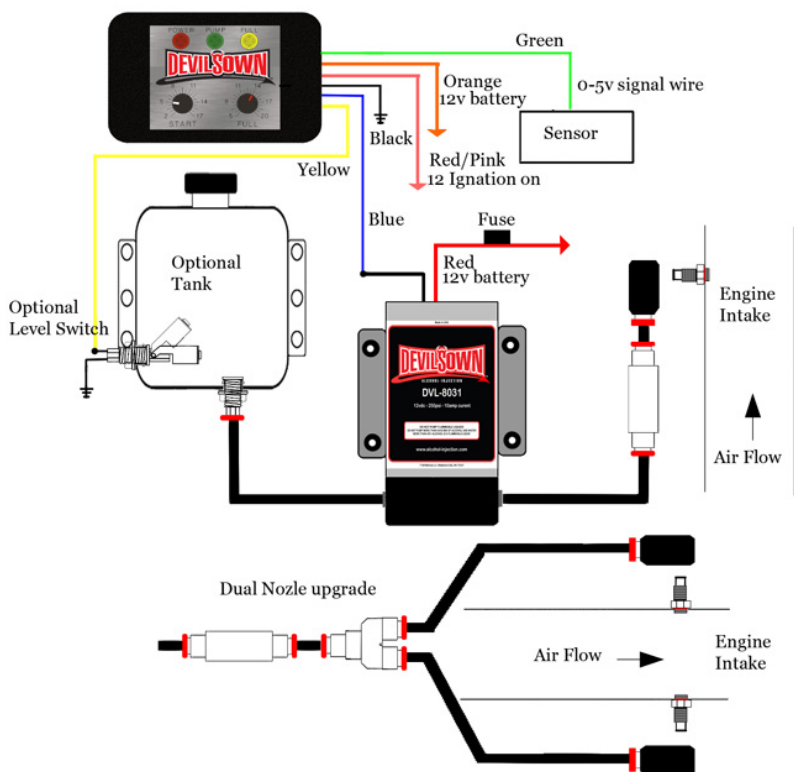


Figure 4: Kit Wiring Diagram

Wire Connections:

Figure 5: (courtesy Posi-Tap) Shows instructions on how to use the Posi-Tap connectors that are included with this system.

Posi-Tap™ Instructions

- 1. Insert**
 Insérer / Inserre
- 2. Tap**
 Joindre / Empalme
- 3. Strip**
 Dénuder / Pelar
- 4. Tighten**
 Visser / Aprete

Patent# 5,228,875 5,695,369 5,868,589 6,692,313 Jap 2881414,
 Aus 708700, Tia 103534 Can 2204826 Mex 200626 Korea 477279,
 China Z197105562.9 & others pending.

What the LED Lights mean

RED – Power LED - This will be illuminated anytime there is power to the pink wire and the black wire is grounded.

GREEN – PWM Output LED - This led will light up proportional to amount of PMW the controller is commanding the pump to run at. When the controller starts out at 15% PWM the led is at its dimmest, and as it ramps up to 100% PMW the led will be at it brightest.

YELLOW – Multipurpose LED – There are 3 conditions that can make this led light up.

- When power is first applied to this Progressive controller, it does a self test and then it will blink the BAR value the unit is set to: 3 blinks for 3 BAR.
- Any time a ground signal is applied to the yellow wire it will light up the yellow led.
- When the controller is commanding 95-100% PWM

Recommended fluid to be used with our alcohol injection system:

Methanol M100, Grain alcohol
Ethanol E100, Denatured alcohol
-20 to -30 windshield washer fluid
Rubbing alcohol
Distilled water

DO NOT use the following at anytime in the system

VP brand M3 and M5 methanol
Gasoline
Any type of windshield washer fluid containing glycol. “De-Icer”
Tap water

Section 7: Optional Parts

Self Sealing Float Switch (optional)

On the side of the tank, drill a 7/8" hole a minimum of 1" from the bottom of tank. Place the self sealing float switch inside the opening. Make sure the arrow on the side of the switch is pointing down. Tighten slightly past hand tight. Do not over tighten. Note the 2 wires coming out of the switch. Take one wire and run it directly to ground. Take the other wire and hook up to the ground of an LED or a yellow wire of the controller.



Dual nozzle (optional)

With this option the check valve is removed from the nozzle holder. It is placed before the Y fitting. Then you take the straight 1/8"npt fittings and screw them into the black 90 nozzle holders. We recommend placing both nozzles at 180 degs. of each other.



Solenoid (optional)

Attach the red wire directly to 12v power. Attach the black wire to the blue wire of our controller. If you are not using a controller, attach the red wire to the red wire of the pump, the black wire to a ground. Place the 1/8" fittings into the solenoid. Cut your tubing and place it inline. Fluid can travel thru it in any direction.



Nozzle Mounting Adapter (optional)

Drill a 9/16" hole in your intake tube. Pop it in and tighten. Has an integrated O ring to eliminate boost leaks.



Important: When system is activated, if something doesn't feel or sound right, BACK OFF! If you hear any detonation or feel anything unusual; get off the throttle. It is substantially easier to stop and check everything over than it is to just try to drive through it and damage expensive parts. Do not activate or have the system activated when you hit the stock rev limiter. The stock rev limiter is a fuel cutoff. If you cut fuel while you're injecting alcohol, the engine instantly becomes very lean. This momentary lean condition has the potential of causing engine damage.

Avoid detonation at all times. Although alcohol reduces the possibility of detonation, adding more boost and timing associated with adding an alcohol injection kit makes detonation a factor again. Proper tuning techniques should eliminate this.

Initial Start-up:

Hook the vehicle's batteries back up. Plug the fuse into the harness. Fill the tank with your choice of water or water/methanol mixture. Turn the key to the vehicle to the on position. The controller's red LED light will light up.

Adjusting the Controller: The DevilsOwn™ Progressive Controller has 2 adjustments: a turn-on adjustment knob on the left and a max knob on the right. DevilsOwn suggests starting off with the turn-on point around 1/4 of your max PSI and the max knob adjusted at 3/4 of your max psi.

How to adjust spray levels: The DevilsOwn™ Universal Progressive Alcohol System is designed for multiple power levels. Changing nozzle sizes control these power levels. To change the spray output, simply install the appropriate nozzle size. There is an allen screw on the top of the pump that can be adjusted clockwise or counter clockwise to raise or lower the line pressure.

The pumps come pre-set at 200PSI. To increase pump pressure to 250PSI, turn the allen screw a quarter of a turn to the right. To decrease pressure to 150PSI, turn the allen screw a quarter of a turn to the left.

Special Notice

DevilsOwn reserves the right to, at any time or without prior notification or liability, change or improve the design of any product, add products or discontinue products.

Any such acts will not give rise to an obligation to accept returns of (except those returns specifically provided for herein) or to update the design of any such prior products.

DevilsOwn Limited Warranty

DevilsOwn warrants our products 365 days from the original date of purchase to be free from defects in materials and workmanship. If, during this period, the product fails under normal use due to manufacturing defect, then DevilsOwn will replace or repair the item.

To obtain repair or replacement under the terms of this warranty, notify us by email support@alcohol-injection.com or by phone (405) 470-4356 For an (RMA) Returned Material Authorization. No products will be considered for warranty without a copy of the purchase receipt showing the sellers name, address, and date of purchase provided you are the original purchaser,

RMA number must be labeled on all boxes as Returned Goods.

All implied warranties, including the warranty of merchantability, are limited to the same 365-day period from the date of original purchase. DevilsOwn is not liable for any direct or consequential loss or property damage arising from any use of this product. This warranty gives you specific legal rights; you may also have other rights which vary from state to state.

Products returned due to misuse/neglect and products tested with no problems found are subject to a handling/testing charge.

Getting Help with your Install

If you have any questions, concerns or comments on the Devils Own Alky/Water Injection Kit and/or the installation instructions, please visit the DevilsOwn Web site at www.alcohol-injection.com and click on the forum link. Please browse the FAQs (Frequently Asked Questions) section for additional information that may be helpful prior to contacting us. Otherwise, you can always contact us at: support@alcohol-injection.com

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