

DEVIL SOWN
ALCOHOL-INJECTION
Stage 1

How the DevilsOwn™ Base 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 vehicle. A mildly modified vehicle includes those with 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 Pressure Switch
- 1 Vacuum Tee
- 1 Brass Nipple
- 1 250psi Pump
- 6ft Wire Loom
- 15ft Nylon Hose
- 1 30 Amp Relay
- 1 Relay Socket
- 10 ft Red and Black 16GA wire

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, 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, 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

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 ground wire to chassis ground

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

Optional Fluid Level Switch

- Drill 7/8" hole in fluid tank, 1-3/4" from bottom of tank
- Place switch inside tank and screw in place
- Run one wire to chassis ground
- Run other wire to LED or buzzer

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.

Screw in 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) from the reservoir. The port with an arrow pointing away from the pump housing is the pump outlet (pressure).

Find a good place on the chassis to attach the pump's ground wire. Any good chassis ground or any solid metal place that is free from paint or coatings will suffice. (Note the position of the ground bolt in Figure 2, directly to the right of the pump.) Firmly crimp the ring terminal to the black wire and fasten the ring terminal to the ground location chosen.

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 smaller amount, then it will be safer to step up your alcohol kit horsepower.

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 start position to inject at a higher boost level.
2. Adjust the full position 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 so equipped and if possible.

On most turbocharged or CSC applications, DevilsOwn users place the nozzle in the outlet of the intercooler. If no intercooler is 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.

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 Stage 1Kit

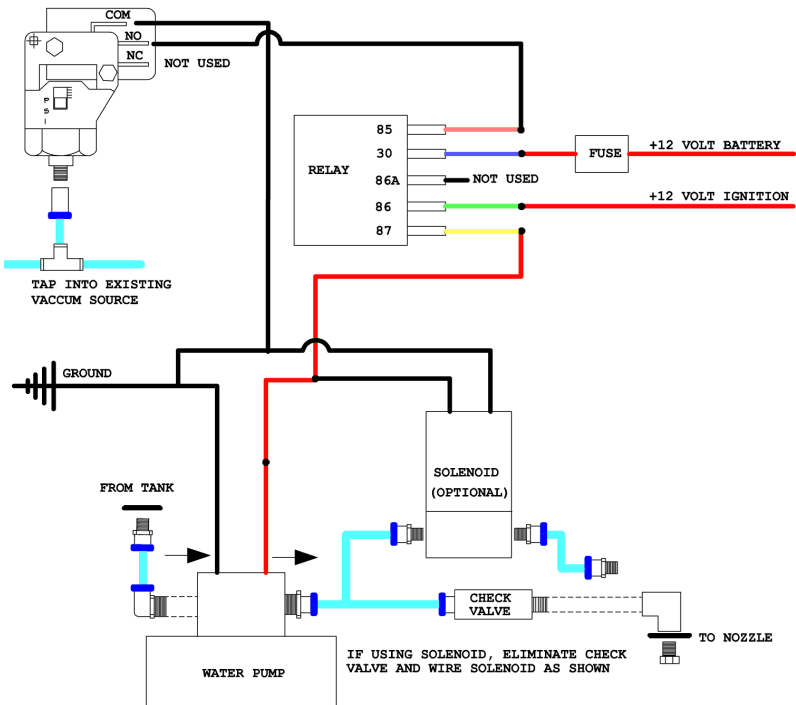
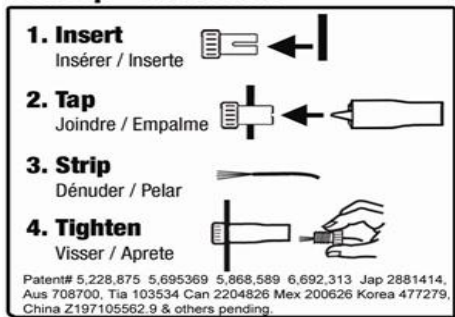


Figure 4: Kit Wiring Diagram

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



Connection to Pressure Switch

- Black wire goes from chassis ground (*be sure to get a metal on metal connection,*) to the *top pin* labeled COM on the pressure switch.
- Pin 1 *middle pin* labeled NO of the pressure switch goes to pin 85 on the relay. This is the brown wire.
- Pin 2 *bottom pin* labeled NC is not used.
- Find an accessible vacuum line and cut it in 1/2. We supplied a tee for 1/4" hose. Your vacuum lines maybe another size, if so will need to supply your own tee. These can be purchased at any local hardware store.

Electrical connection to Relay

**Refer to pin number not color*

- Pin 85 connects to the top pin *O* on the pressure switch.
- Pin 86 connects to the ignition 12v source in your vehicle
- Pin 87 connects to the Pumps Red wire.
- Pin 30 connects to the fuse and then to the other end of the fuse to the +12v source of the battery.
- Pin 87a connects to nothing.

Adjusting Pressure Switch

Using your finger, turn the adjuster to adjust the turn on PSI. To raise the turn on PSI, turn to the right. To lower the turn on PSI, turn to the left.

As a general starting point, start off with the top of the wheel adjusted to 1/2 of your max boost. Lower or rise as necessary.

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.

How to adjust spray levels: Metering nozzles installed in the alcohol nozzle control these power levels. To change the spray output, simply install the appropriate nozzle size. There is also an allen screw on the top of the pump that can be adjusted clockwise or counter clockwise to raise and lower the line pressure for fine tuning. 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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