DVS-4 Controller

Contents

Why our Alcohol Injection system is better

- Full Wiring Harness
    - Colour coded for easy installation.
    - Signal and ground wires run together.
    - Pre-wired relay.
- Fully adjustable for any horsepower level.
- Safe enough for stock engines, powerful enough for racing use.
- Easily adjusted turn-on point.
- 300psi Heavy duty pump.
- Run fluid from straight distilled water to methanol/alcohol.
- Run Two Systems side by side Independent of each other (Module 1 & 2).
    - Module 1
        - Pump 1 Control
        - Valve 1 Control
        - Tank 1
            - Level Indicator 1
                - Float Switch
                - Active Level Sensor
        - Failsafe 1
            - Switch
            - Pressure
    - Module 2 (Valve Only)
        - Valve 2 Control
        - Failsafe 2
            - Switch
    - Module 2 (Full Control)
        - Pump 2 Control
        - Valve 2 Control
        - Tank 2
            - Level Indicator 2
                - Float Switch
                - Active Level Sensor
        - Failsafe 2
            - Switch
            - Pressure

How Injection Systems works

The DevilsOwn™ DVC-4 Methanol/Alcohol Injection System begins with a connection to a supply tank containing a water or methanol/alcohol water mixture. A 50/50 mix is recommended, but the system is designed to be compatible with 100% methanol. 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 methanol or alcohol water mixture that is injected through the nozzle is easily adjusted by means of different sized nozzles and settings within the controller.

Kit Contents

Standard Kit Contents

- 300psi pump with EPDM seals
- Allen key can be used to adjust water pump pressure
- DVS4 progressive controller with LCD screen
- Power, aux and remote on/off button Harness
- Module Full Harness.
- 15' of High-Pressure Black Tubing
- 1m Silicon vacuum hose
- Silicon Hose T-Piece
- Injector (please supply engine cc & max boost + rpm so we can supply appropriate sizes).
- Nozzle Holder
- ProMeth Pulse Fast Acting Valve (FAV) valve
- Metal filtered self-sealing tank tap
- All fittings needed for installation
- Inline Fuse Holder with 15-amp fuse
- Zip ties and wire splices and connectors
- Alcohol/water injection install Instructions with stickers.

Vehicle Kit Options

Parts that must be chosen depending on specific vehicle installation

- Nozzle of the appropriate size for engine and modifications
- Tank depending on fitting and application.

Optional Kit

- External On/Off Switch (Required if Display Disconnected).
- Level Indicator
    - Passive.
    - Active.
- Module 2 Valve only Harness
    - Allows Valve 2 to be added and controlled with failsafe
- Module 2 Full harness
    - Allows another pump, valve, tank, level indicator and failsafe to be added to the system

Installing Kit

Tools Needed

- Drill Bits (Metric – Imperial)
  - 3mm - 1/8”
  - 10mm - 11/32”
  - 22mm - 7/8”
- Spanner/Wrenches (Metric – Imperial)
  - 11mm - 7/16”
  - 14mm - 9/16”
  - 18mm - 23/32
- Ratchet and Socket Set
- 1/8 NPT tap
- Marker
- Wire cutters
- Nylon Tube Cutter or Stanley Blade
- File
- Crimp Tool
- Electrical tape (Recommended)
- Multi-meter (Optional)

Pre-installation Guide

Its beneficial to read this pre-installation guide fully before installing to get an understanding on working safety and any pitfalls that can occur. 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.

Current Engine Issues

Methanol/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.

Pump Pressure Switch

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

Line Pressures

Excessive line pressures, over 200 psi, are dangerous to your alcohol/water system. Your DevilsOwn™ Alcohol/Water Injection system is calibrated and optimized to operate from 40-160 psi. Exceeding this will not improve performance. Over 250 psi also runs the danger of parts failing.

Detonation/Knock

Always avoid detonation. Although alcohol reduces the possibility of detonation. The act of adding more boost and timing on top of adding an alcohol injection kit makes detonation a factor again. This has a lot to do depending on your tune.

Spark Plugs

The factory spark plugs that come in the new vehicles are not suitable for use with any alcohol setting above 5gph. The factory spark plugs have a particularly hot heat range and tend to overheat at higher horsepower levels. The solution to the problem is to install spark plugs that have a colder heat range and proper ground strap design for alcohol use. Consult your preferred spark plug manufacturer to ensure you install the correct spark plugs for the alcohol level you choose to run. Also, due to the cooler and denser inlet air charge that alcohol creates, it may be necessary to close-up your spark plug gaps to eliminate any misfiring. In our experience, closing the gap .005 to .015 in. typically will ensure proper ignition. You may be able to run a wider gap, or you may have to close them up, just be aware of this if you start to experience an ignition misfire when you are using your alcohol system.

Engine modifications:

The DevilsOwn™ Alcohol System, out of the box, is designed to work as a bolt-on kit for stock or mildly modified vehicles. Mildly modified vehicles would include 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. Failure to upgrade highly modified applications may cause serious lean conditions that can result in severe engine damage.

Teflon Sealing Tape

DO NOT use Teflon sealing tape on any fittings in a DevilsOwn™ Methanol/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.

Check Valve/Solenoid

This eliminates the possibility that alcohol could inadvertently accumulate in the intake manifold while the alcohol system is not being used. It's a one-way check valve or solenoid that blocks engine vacuum from siphoning your methanol mixture.

Lowest Nozzle

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 with a smaller shot of alcohol that will be less likely to damage your engine. Once you have the car working well on the smaller shot, you can then safely start to step up your alcohol kit horsepower.

Accidental Injection

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 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.

Important

When system is activated, if you hear any detonation or feel anything unusual; get off the throttle. It's a lot easier to check everything over, than it is to just try to drive through it and damage expensive parts.

Don't activate or have the system activated when you hit the stock rev limiter. The stock rev limiter can be a fuel cutoff. If you cut fuel while you're injecting alcohol, you're instantly very lean. This momentary lean condition has the potential of causing engine damage.

Technical Summary

The DevilsOwn™ DVS4 was designed and built to pack as much usability and customisability int a package as possible but keep it affordable. It's designed for users who either want to start with the simplest of systems but have the potential to upgrade with as little hassle as possible or have a full-blown system adding cooling and fuelling with progressive maps and failsafe's all rolled into one.

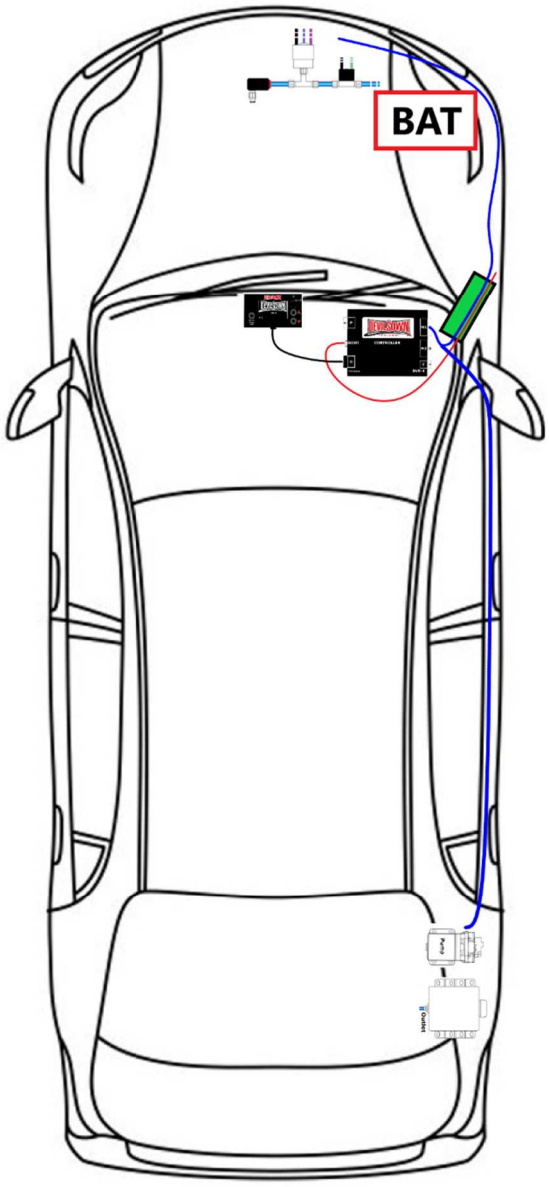
We listened to feedback from users, tuners, and distributors to find a system that would work for everyone.

- Wide Ranging Input Voltage 10v to 30v.
- Short Circuit Protection.
- Inbuilt Power Filter.
- Stable 5v output.
- Intelligent Processor Control.
- Supports 0 to 60psi (0 to 4bar)
- Can use AFM or TPS as Signal Voltage input.
- Can use External Map sensor.
- Supports 2 Valves
    - Check Valve
    - Solenoid
    - Pulse Solenoid
    - Race Valve
- Supports 2 Tanks with Different Methanol Mixes
- Supports 2 Pumps
- Supports 2 Failsafe's
    - Pressure Switch
    - Pressure Sensor
- Detects: -
    - Low Pressure: -
        - Running Out of Fluid.
        - Popped Off Pipe.
        - Significant Leaks.
        - Block/Failed Check valve, Solenoid, Pusle Solenoid or Race Valve.
        - Kinked Line.
        - Pump Issue.
        - Blocked Filter.
        - Blocked Nozzle.
- Internal Relay
    - Common, Normal Open and Normally Closed Connections.

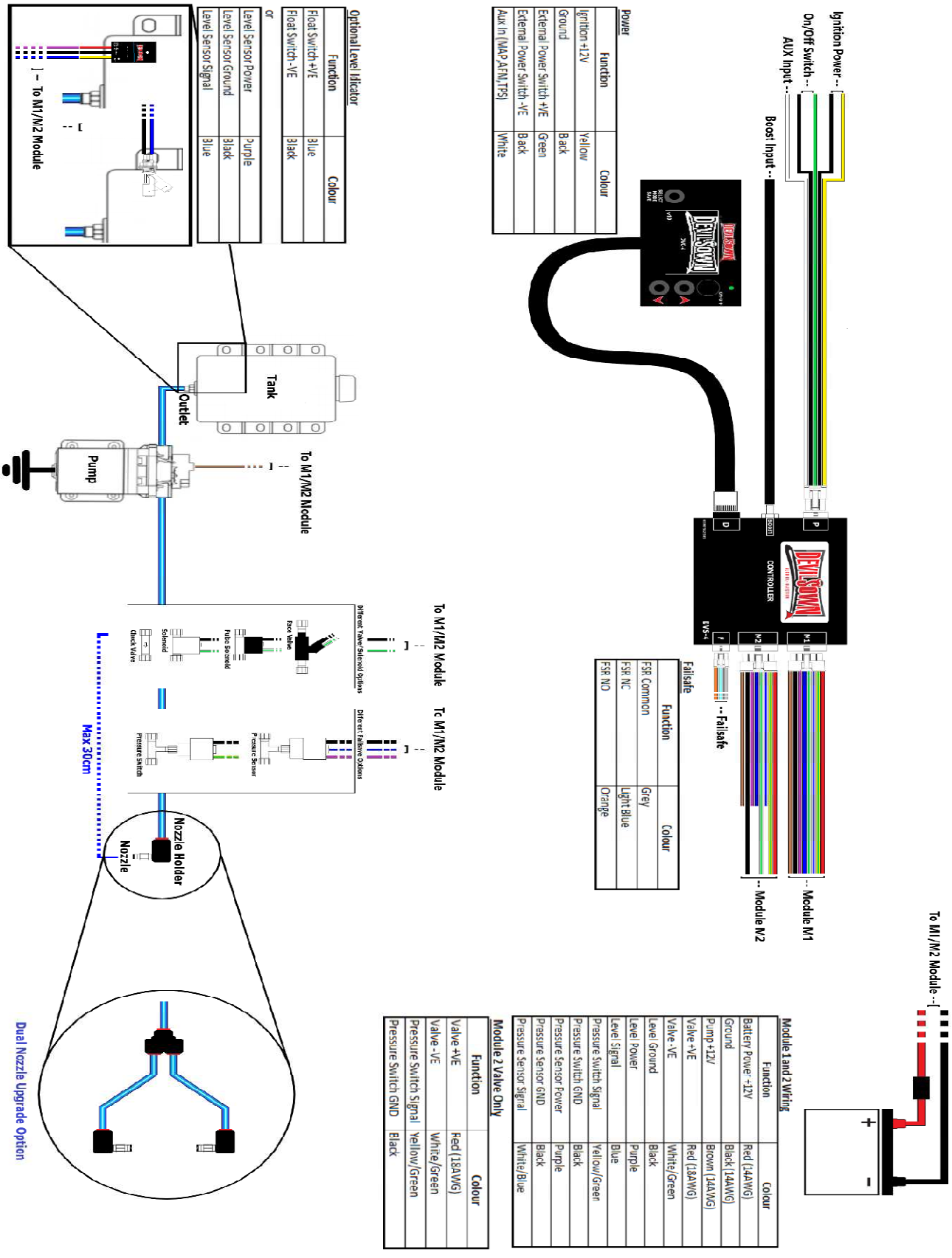
Harness Layout

The harness has been designed and manufactured to fit a standard model with plenty of cable to make it so that that cable may be cut rather than extended and reduce the number of connections required. This is to minimise points of failure as most faults caused within DevilsOwn™ Methanol/Alcohol Injection Systems are caused by electrical/wiring faults and are outside of our control.

Here is a vehicle layout design example of hardware locations as well as cable runs.



Circuit Diagram



Installation

There are four parts to the installation, location, electrical, boost and fluid. The following sections describe each installation process in detail.

Location

It is good practice to understand the vehicles layout and where items are to be located. Installations may differ from the standard model Please see the index for a blank car layout which can be printed and the installation planned accordingly.

Tank Pump, Level Sensor

Common place is to locate these together within the truck/boot, but they can be placed in the engine bay especially if the washer bottle tank is be repurposed.

Nozzle, Nozzle Holder, Check Valve/Solenoid, Failsafe Pressure Switch.

These will be located near the intercooling piping and inlet manifold.

Fuse and Power Cable

Run the large AWG14 Red cable to the main battery

Ignition Feed

The ignition feed can connect to a location behind the dashboard.

Display

This can be mounted in view of the user or tucked away in the glove box and used to setup boost activation, monitor and fault find.

Electrical

Fuse and Power Cable

The main power feed is an AWG14 Red cable. Connect the fuse to the main battery as close to the battery as possible and then connect the fuse and power cable.

Ignition Feed

An ignition feed is required to power the controller and display. Connect the ignition feed to the yellow wire and attach the black wire to the vehicle ground. An optional switch can be placed in series on the cable to provide the ability to switch the system on and off.

Display

The connector is prewired so it's just a case of plugging in the display to the controller "D" connector.

Pump

Connect the pump positive to the larger AWG14 Brown cable. Locate a good place to attach the ground wire for the pump. An ideal location would be any other chassis ground location, or you can screw the connector to any metal place that is free from paint or coatings.

Solenoid

The solenoid is an upgrade option that replaces the default check valve. Connect 1 side to Black (-ve) and the other side to Red/White (+ve). It usually does not matter which way round the connections are made, but please check the solenoids manufacturer instructions beforehand.

Failsafe

The failsafe relay connections are as follows: -

Relay		
FRS NORMALLY CLOSED	**SIGNAL OUTPUT**	**Light Blue**
FSR COMMON	**SIGNAL INPUT**	**Grey**
FSR NORMALLY OPEN	**AUX OUTPUT**	**Orange**

Failsafe Pressure Switch

The pressure switch needs to fitted in-between the nozzle and the check valve/solenoid. The system requires a pressure switch to only monitor a small piece of pipework and keep the system accurate. Not having a check valve/solenoid would increase time for low pressure monitoring and increase time for blocked nozzle detection. This would produce many false negatives and make the system unusable. Connect one side of the pressure switch Black (-ve) and the other side to Yellow/Green (+ve). It usually does not matter which way round the connections are made, but please check the pressure switch manufacturer instructions beforehand.

Fluid Level

There are two sensors that work with the system a passive float switch or active level sensor.

Float Switch

Connect one connection to Black cable and the other to the blue cable.

Level Sensor

Connect Cable Black to Level Sensor Black, Cable Yellow to Level Sensor Red and Cable Blue to Level Sensor Yellow
Level Sensor Wiring

- RED – Positive Power
- BLACK – Ground
- Yellow – Signal

Whereas the cable wiring is

- Purple– Positive Power (+5v)
- BLACK – Ground
- Blue – Signal

INCORRECT WIRING OF THE ACTIVE LEVEL SENSOR CAN CAUSE IRREPARABLE DAMAGED TO THE LEVEL SENSOR

Boost

Controller Boost Feed

The controller has an in built 4 bar MAP sensor. Find an accessible vacuum line that and cut it in 1/2. The supplied Tee for ¼" hose, your vacuum lines maybe another size and you will need to supply your own Tee. These can be purchases at any local hardware store. Route the silicon hose so that it is free from any sharp edges and connect to the controller boost input and secure with a cable tie.

External Map Sensor

The system can use an External map sensor, and the signal wire is connected to the white cable on the controller power harness. To use this sensor the System settings must be modified to the following: -

- System Settings
    - Input Type
        - AUX
    - Aux In Type
        - MAP
    - Max Values (select appropriate)
        - 1Bar/15PSI
        - 1.5Bar/22PSI
        - 2Bar/29PSI
        - 2.5Bar/37PSI
        - 3Bar/44PSI
        - 4Bar/58PSI
        - 4.5Bar/65PSI (External Only)
        - 5Bar/73PSI (External Only)
        - 5.5Bar/80PSI (External Only)

The external map sensor must be calibrated to the system using the following values

- System Settings
    - Aux V Offset (Auxiliary Voltage Offset)
    - Aux B Offset (Auxiliary Boost Offset)
    - Aux Gain (Gain / Ramp Rate)

There is a calibration tool within the system settings where the onboard map sensor can be used in comparison to generate the correct values

- System Settings
    - Calibrate

There will be separate videos and tutorials on how setup external AUX feed MAF/AFM, TPS and external MAP calibration.

Water/Alcohol /Methanol Fluid

Washer Bottle or Custom Tank

If using your vehicles washer bottle you may have to fully remove it to gain full access to the bottom.

- At the bottom of the washer bottle/tank, locate suitable a placement for the tank tap.
    - A flat side of the tank that is free of obstructions.
    - **DO NOT** place the tank tap in the seam line of the tank. Doing so can cause leaks.
    - At the rear of your washer bottle/tank to stop fluid starvation during acceleration.
        - This placement is for the hose that you will install later.
- Using a 11/32 " drill bit, drill a hole at this location.
- Take the supplied washer and place it over the tank tap.
    - The rubber portion should face the tank, leaving the metal side facing the tank tap.
- Place a dab of silicon on the washer. (Optional).
    - Hand tighten the tank tap fitting (clockwise) until it is flush with your washer bottle.
    - **DO NOT** use any tools to tighten.

Pump

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.
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.

- If applicable tighten the pump connecters, 1/4 tube x 3/8” NPT fittings, with an 18mm wrench. Fittings either have sealant pre-applied or an O-ring already installed.
- Locate a placement for the pump. We suggest placing it below the washer bottle/tank, to aid in priming the pump later. Note: Flow goes in the direction of the arrows.
    - Tank >> Pump >> Check Valve or Solenoid.
    - It’s noted on the top of the pump.
- Mark the 4 mounting holes with the marker at the desired location.
- Using a 1/8" drill bit, drill a hole at these locations.
- Attach the pump securely, using a 1/4” socket/nut driver and the 4 supplied silver screws.

Check Valve or Solenoid

The check valve or solenoid must be placed within 30cm of the nozzle. Note the direction of the arrow on the check valve/solenoid.

Nozzle and Nozzle Holder

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.

Nylon Hose

Our fittings are all "push-to-connect," so they take less than a second to connect. Simply insert the hose and apply a small amount of pressure on both the hose and the fitting. They should slide together.

Please see below for the nylon fluid hose fluid runs.

Standard Installation

Washer Bottle/Tank >> Pump >> Check Valve >> Nozzle Holder

Solenoid Upgrade Installation

Washer Bottle/Tank >> Pump >> Solenoid >> Nozzle Holder

Failsafe Pressure Switch Upgrade Installation

Washer Bottle/Tank >> Pump >> Check Valve/Solenoid >> Pressure Switch >> Nozzle Holder

Nylon Hose Installation

1. Run the hose from one item to the next leaving the excess at the either end.
2. Be sure to keep the hose clear of hot areas and moving parts.
3. Attach the hose into the first item fitting, applying a small amount of pressure on the hose and on the fitting.
4. On the other end mark the hose at the desired length.
5. Cut the hose - be sure the ends are cut squarely.
    - if the ends are burred you can clean them up with a file.

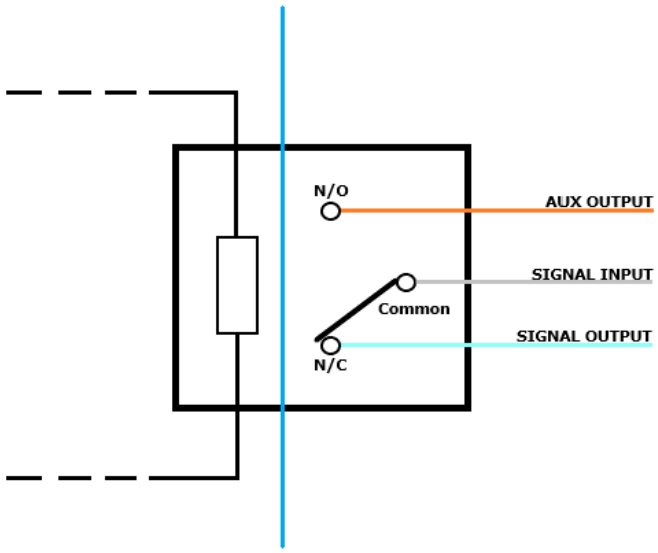
Repeat the process until all the nylon fluid hose is connected.

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.

Failsafe

Failsafe Relay Contacts

The system contains an internal relay that separates the failsafe hardware from the car/lorry electrical system and as such can be used in a variety of different ways. For ease and to accommodate the most common failsafe configuration the internal relay is wired as follows: -



For the system to act as a failsafe the vehicle needs to be inhibited by some method to protect the engine.

Note: When interrupting any solenoid or sensor is best practice to use the ground rather than the power supply or signal to not introduce interference into the system due to extending the cable lengths.

Example 1: Boost Cut

The easiest and most common way is to interrupt the signal to the boost solenoid/mac valve. Once this signal has interrupted the vehicle will only be able to generate boost up to the preset wastegate spring pressure, this should be well below the max boost level and easily be noted by the user.

Example 2: Sensor

Some modern cars do not have a Boost Solenoid/MAC valve to control boost so another method must be found.

Any sensor that can inhibit the cars operation can be used. This may put the car into limp mode or throw an engine warning light and should be cleared after a system reset and the vehicles power has been cycled.

The three most common sensors to use, but are not limited to, are: -

- MAP
- TPS
- AFM

Failsafe Operation

Initial startup

After the first power on when methanol system is not active, and pressure switch is high then a blocked nozzle has been detected. It is rare this will ever happen if a methanol system has not been active for some time as even a blocked nozzle will allow the pressure to decrease eventually.

First Activation

When the methanol system activates and after a preset time for the pressure to build and the pressure switch is switched on. If the Pressure switch fails to become on, then the system fails with low pressure.

Continued Activation

The system continues to monitor the pressure switch and if it even switches off then the system fails with low pressure.

Deactivation

When the system deactivates it waits a predefined time to check the pressure switch. If it fails to switch off, then the system fails with a blocked nozzle fault.

Failsafe Troubleshooting

Failsafe returns faults although methanol injection system is switched off.

On/Off Switches that contain LED's can cause issues where they allow the activation signal to route through the switch LED diode.

Remove the ground from the switch.

Unable to run methanol system as failsafe always activates.

This can result from several issues.

Using a nozzle below size 2. Increase Nozzle size.

System not yet primed and thus air in the system. Remove hose from nozzle holder and force pump to run until fluid comes out of pipe. Reattached hose.

The system always fails once with low pressure when the methanol injection system first switches on.

This can be caused by pump pre-pressurisation. The installed controller primes the fluid up to, but not past the valve where the failsafe pressure switch is located, to not inject fluid when not required.

This is normal operation and will stop this will only occur once.

After the methanol injection system has run out of fluid the system will no longer run, and the failsafe keeps generating low pressure faults.

This is simply caused by air and a lack of fluid in the system. The failsafe keeps going into fault mode due to no fluid and the system can't fill the fluid as the failsafe keeps going into fault.

The system will have to be primed via the controller's instructions, or the failsafe can be unplugged for a few gentle pulls to allow the system to refill all the pipe work.

Note: The gentle pulls will start by spraying no fluid and increase to normal function once primed.

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.

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. 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.

Active Level Indicator (optional)

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 degrees. 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.

Attach the one wire directly to a chassis ground and connect the other wire to the pumps red wire. Cut your tubing and place it inline as close as possible to the nozzle.

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.

Operation

Pump Priming

The pump must be primed to remove air from the lines. This can be done within the System settings using the test function. Refer to Menu Items – System Settings – Test System for details instructions on how this function operates.

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 Boost Switch knob to inject at a higher boost level.
2 Use a smaller injection nozzle.

Display

LED Operation

- Green – System On
- Blue – Activation (Brightness Depending on Duty Cycle)
- Red – Off or Warning
    - Waring Low Fluid Level
        - Screen Will Show
        - Fluid Low Warning
        - Which Module.
    - Warning Pressure Fault
        - Screen Will Show
            - Low Pressure
            - Blocked Nozzle
            - Which Module

Refer to the Menu section on all the displays functionalities.

Recommended

Fluids 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

Not Recommended

DO NOT use the following at any time in the system:

- VP brand M3 and M5 methanol.
- Gasoline.
- Windshield washer fluid containing glycol.
- “De-Icer”.
- Tap water.

Menus

Standard

The system will only run and activate when in Standard mode unless switched off, it can also run under System mode – Test System. This is so that any changes currently being modified within configuration and system do not affect the system until they are saved and returned to the standard menu.

Input Gauge

This displays the current input value.
If Input Type is set to boost or aux – map, then gauge values can be set from Max Values: -

- 0 to 20ps
- 0 to 40psi
- 0 to 60psi
- 0 to 80psi (External Map Only)

If the input type is set to aux MAF or TPS, then the input gauge defaults to voltage -

- 0 to 5 v

Duty Cycle

This shows you duty cycle of the valve on module 1 and module 2. It is only available when the valves are set to pulse solenoid or race valve.

Diagnostics

This is a visual representation of what pumps, valves, level sensors are doing at any moment

- P1 – Pump on Module 1
- V1—Valve on Module 1
- L1 – Level Sensor on Module 1
- 0 – Duty Cycle on Module 1
- P2 – Pump on Module 2
- V2—Valve on Module 2
- L2 – Level Sensor on Module 2
- 0 – Duty Cycle on Module 2

When active they are highlighted with a box surround the text.

Configuration

To enter configuration mode, hold the mode button for 2 seconds.
To exit configuration back to standard mode and save and settings hold the mode button for 5 seconds, 5 beeps will signify the changes have been saved.
Then end boost values for either valve is set first as these will be the default activation points for check valve and solenoid. Start values will be unavailable. Start and End points are only available for Pulse Solenoid and Race valve as these items support progressive nozzle methanol flow.
Shows Boost Values When “Input Type” is set to Boost or “Input Type” set to Aux and “Aux Input Type” set to MAP.
Shows Voltage Values When “Input Type” set to Aux and “Aux Input Type” set to MAF or TPS.

End 1 Input Value

- End activation point for module 1 **check valve** or **solenoid**.
- End activation point (100 duty cycle) for module 1 **pulse solenoid** or **race valve**.

Range From “Start 1 Input Value” to “Max Values”

- 10psi/0.83v (Default)

Start 1 Input Value

Not available for check valve or solenoid

- Start activation point (20% duty cycle) for module 1 **pulse solenoid** or **race valve**.

Range From 1 to “End 1 Input Value”

- 1psi/0.08v (Default)

End 2 Input Value

- End activation point for module 2 check valve or solenoid.
- End activation point (100 duty cycle) for module 2 **pulse solenoid** or **race valve**.

Range From “Start 2 Input Value” to “Max Values”

- 10psi/0.83v (Default)

Start 2 Input Value

Not available for check valve or solenoid

- Start activation point (20% duty cycle) for module 2 **pulse solenoid** or **race valve**.

Range From 1 to “End 2 Input Value”

- 1psi/0.8v (Default)

System

To enter system mode, hold the mode button for 5 seconds.

To exit system back to standard mode and save and settings hold the mode button for 5 seconds, a long beep will signify the changes have been saved.

Number of Valves

- 1 (Default)
- 2 – Module 2 valve enabled – Module 2 valve harness or full harness required.

Number or Pumps

- 1 (Default)
- 2 – Module 2 pump enabled – Module 2 full harness required.

Number of Tanks

- 1 (Default)
- 2 – Module 2 tank enabled – Module 2 full harness required.

Valve Type 1

- Check Valve (Default)
- Solenoid
- Pulse Solenoid
- Race Valve

Level Indicator 1

- No (Default)
- Yes

Failsafe 1

- None (Default)
- Switch – Requires a Pressure Switch Fitted.
- Pressure – Requires a Pressure Sensor Fitted.

Valve Type 2

Module 2 valve harness or full harness required.
Not Available if “Number of Valves” is set to 1. If Number of Valves set to 2: -

- Check Valve (Default)
- Solenoid
- Pulse Solenoid
- Race Valve

Level Indicator 2

Module 2 full harness required.
Not Available if “Number of Tanks” is set to 1. If Number of Valves set to 2: -

- No (Default)
- Yes

Failsafe 2

Module 2 valve harness or full harness required.
Not Available if “Number of Valves” is set to 1. If Number of Valves set to 2: -

- None (Default)
- Switch – Requires a Pressure Switch Fitted.
- Pressure – Requires a Pressure Sensor Fitted

Pre-Pressurise 1

Not Available if “Number of Pumps” set to 1 and “Number of Valves” Set to 1” and “Valve Type 1” is set to Check Valve.
Not Available if “Number of Pumps” is set to 1 “Number of Valves Set to 2” and “Valve Type 1” or Valve Type 2 is set to Check Valve.

- Disabled (default)
- Enabled

Pre-Pressurise 2

Not Available if “Number of Pumps” is set to 1.
Not Available if “Number of Pumps” is set to 2 and “Valve Type 1” or Valve Type 2 is set to Check Valve.

- Disabled (default)
- Enabled

Input Type

- Boost (Default) – Uses Onboard 4Bar Map Sensor
- Aux – Uses Aux Input (white Cable on Power Harness)

Aux Input Type

Not Available if “Input Type” set to Boost

- MAP
- MAF
- TPS

Aux V Offset

The voltage offset when system not running

Range 0 to 4.5 volts

- 2.00 (Default)

Aux B Offset

Not Available when “Aux Input Type” set to MAF or TPS
A boost offset when an offset is required at top or bottom limit.
Range -10 to 10 psi

- 0 (Default)

Aux Gain

The Ramp Rate or Gain required depending on MAP sensor used.
Range 0 to 20

- 8.00 (Default)

Max Values

Only Shows “5V Only” When Input Type is set to Aux and Aux Type is set to MAF or TPS.

- 1Bar/15PSI
- 1.5Bar/22PSI
- 2Bar/30PSI (Default)
- 2.5Bar/37PSI
- 3Bar/45PSI
- 3.5Bar/51PSI
- 4Bar/60PSI
- 4.5Bar/65PSI ***External Map Sensor Only***
- 5Bar/73PSI ***External Map Sensor Only***
- 5.5Bar/80PSI ***External Map Sensor Only***

Low Press 1

Not Available if Failsafe 1 is set to None or Switch.
The lowest pressure that the system should experience whilst active.
Range -10 to 10 psi

- 130 (Default)

Nozz Press 1

Not Available if Failsafe 1 is set to None or Switch.
The highest pressure that the system should experience during deactivation.

- 20 (Default)

Auto Learn 1

Not Available if Failsafe 1 is set to None or Switch.

When enabled the system will monitor the next 5 system activations. It will then save the values to “Low Press 1” and “Nozz Press 1” with % adjustments to minimise false positives. The above values can still be edited from these new values to fine tune.

- Disabled (Default)
- Enabled

Low Press 2

Not Available if Failsafe 2 is set to None or Switch
The lowest pressure that the system should experience whilst active
Range -10 to 10 psi

- 130 (Default)

Nozz Press 2

Not Available if Failsafe 2 is set to None or Switch
The highest pressure that the system should experience during deactivation.

- 20 (Default)

Auto Learn 2

Not Available if Failsafe 2 is set to None or Switch

When enabled the system will monitor the next 5 system activations. It will then save the values to “Low Press 1” and “Nozz Press 1” with % adjustments to minimise false positives. The above values can still be edited from these new values to fine tune.

- Disabled (Default)
- Enabled

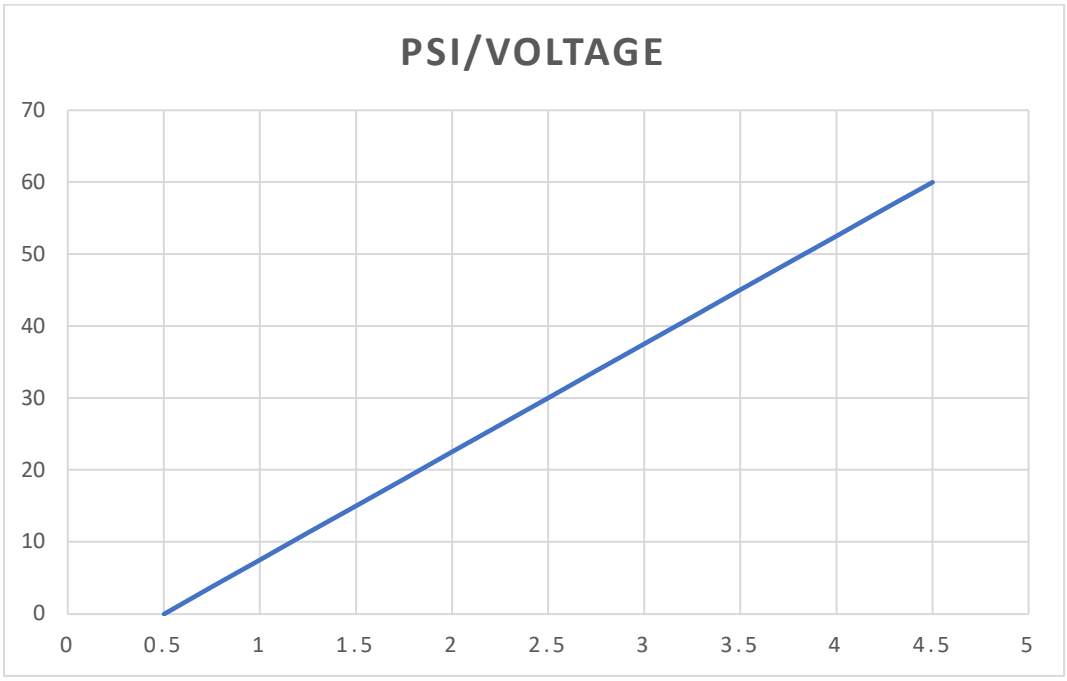
Calibration

This screen is only available if the “Input Type” is set to AUX.

If the AUX Type is set to MAP, then the top of the screen shows the generated inputs from the onboard map sensor and the bottom the external map sensor.

There is a calculated boost graph. Then under that, Input voltage value, calculated voltage value after voltage offset applied and calculated boost value.

Below is the response graph of the internal map sensor.



Note that the onboard map sensor has an offset voltage of 0.5v at 0 PSI. this is considered during the calculations. It then has a gain of 15psi/volt.

Boost = (Voltage – 0.5) * 15.

If using the same boost reference, then changing the Aux Voltage/Boost Offset and Aux Gain a direct comparison and thus calibration data can be calculated.

If the AUX Type is set to MAF or TPS a voltage gauge is shown with the AUX voltage reading, AUX offset reading and the Int generated value. There are then two static values set voltage and in settings. The Aux Voltage, Boost offset, and gain are used so the AUX voltage and int settings meet those static points at the same time.

Test System

This test screen allows the user to use the up and down buttons to switch on various functionality and monitor level sensors.

Values and their operation

- Step 0 – Off
- Step 1 – Pump 1 On (**Prime**). Pump 2 Off
- Step 2 – Pump 1 Off. Pump 2 On (**Prime**).
- Step 3 – Pump 1 On, Valve 1 0 % Duty Cycle
- Step 4 – Pump 1 On, Valve 1 25 % Duty Cycle
- Step 5 – Pump 1 On, Valve 1 50 % Duty Cycle
- Step 6 – Pump 1 On, Valve 1 75 % Duty Cycle
- Step 7 – Pump 1 On, Valve 1 100 % Duty Cycle
- Step 8 – Pump 1 On, Valve 1 100 % Duty Cycle, Pump 2 On Valve 2 0% Duty Cycle
- Step 9 – Pump 1 On, Valve 1 100 % Duty Cycle, Pump 2 On Valve 2 25% Duty Cycle
- Step 10 – Pump 1 On, Valve 1 100 % Duty Cycle, Pump 2 On Valve 2 50% Duty Cycle
- Step 11 – Pump 1 On, Valve 1 100 % Duty Cycle, Pump 2 On Valve 2 75% Duty Cycle
- Step 12 – Pump 1 On, Valve 1 100 % Duty Cycle, Pump 2 On Valve 2 100% Duty Cycle

Depending on the system configuration the system will bypass certain functionality.

The system can be used to prime the system and test valves.

WARNING: this is used for test purposes only and should not be used on a fully fitted system, unless switching on pumps for priming only. Remove or Disconnect Nozzles before running tests. Failure to do this may result in catastrophic engine damage.

Restore Defaults

This is used to restore the system back to factory defaults.

- No (Default)
- Yes

When you save out of the system menu then the system will run the factory defaults program and return all current and flash storage settings back to default.

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@methanol-injection.co.uk
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 labelled 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 direst 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.

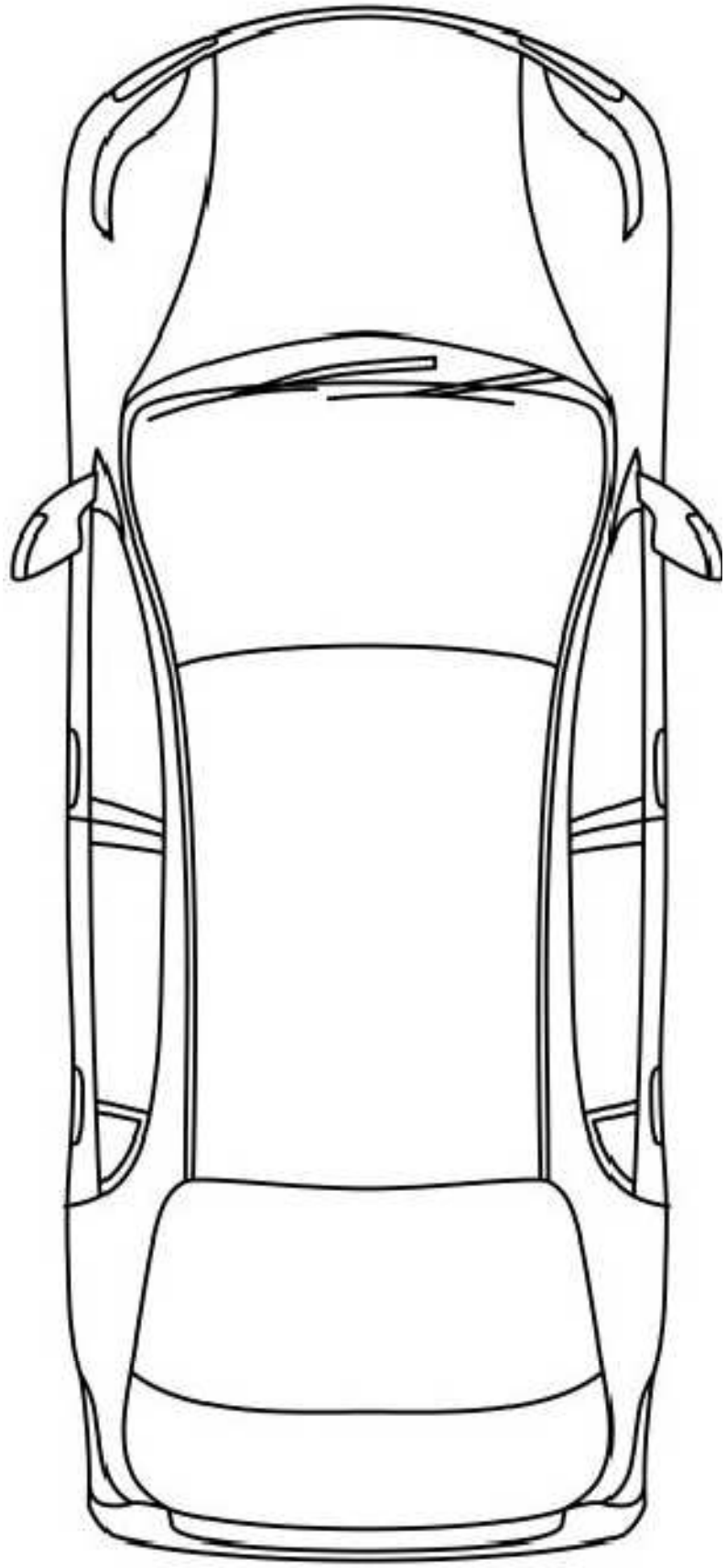
Getting Help with your Install

If you have any questions, concerns or comments on the DevilsOwn™ Stage 1 Methanol/Alcohol Injection System, please visit the DevilsOwn Web site at https://www.methanol-injection.co.uk

Browse the Instructions, Articles, Information and FAQs (Frequently Asked Questions) section for additional information that may be helpful prior to contacting us.
Otherwise, you can always contact us at: support@methanol-injection.co.uk.

Index

Vehicle Layout



Common Map Sensor

Calibration Data

Map Sensor	Description	Calibration Style	Voltage Offset	Boost Offset	Gain

Default Settings

Setting	Description	Value
Configuration		
Input 1 End	Valve Module 1 Ending Boost/Voltage	**10 psi**
Input 1 Start	Valve Module 1 Starting Boost/Voltage	**Not Available**
Input 2 End	Valve Module 2 Ending Boost/Voltage	**Not Available**
Input 2 Start	Valve Module 2 Starting Boost/Voltage	**Not Available**
System		
# Valves	Number of Valves	**1**
# Pumps	Number if Pumps	**1**
# Tanks	Number of Tanks	**1**
Valve Type 1	Valve Type Module 1	**Check**
Level Ind. 1	Level Indicator Module 1	**No**
Failsafe 1	Failsafe Module 1	**None**
Valve Type 2	Valve Type Module 2	**Not Available**
Level Ind. 2	Level Indicator Module 2	**Not Available**
Failsafe 2	Failsafe Module 2	**None**
Pre.Press 1	Pump 1 Pre-Pressurisation	**Not Available**
Pre.Press 2	Pump 2 Pre-Pressurisation	**Not Available**
Input Type	System Input Type	**Boost**
Aux In Type	Auxiliary Input Type	**Not Available**
Aux V Offset	Auxiliary Voltage Offset	**Not Available**
Aux B Offset	Auxiliary Boost Offset	**Not Available**
Aux Gain	Auxiliary Gain	**Not Available**
Max Values	Maximum Boost/Voltage Levels	**2bar/29 PSI**
Low Press 1	Low Pressure Warning Level Module 1	**Not Available**
Nozz Press 1	Nozzle Blocked Warning Level Module 1	**Not Available**
Low Press 2	Low Pressure Warning Level Module 1	**Not Available**
Nozz Press 2	Nozzle Blocked Warning Level Module 1	**Not Available**

Settings

Recorded Settings table

Setting	Description	Value
Configuration		
Input 1 End	Valve Module 1 Ending Boost/Voltage	
Input 1 Start	Valve Module 1 Starting Boost/Voltage	
Input 2 End	Valve Module 2 Ending Boost/Voltage	
Input 2 Start	Valve Module 2 Starting Boost/Voltage	
System		
# Valves	Number of Valves	1 / 2
# Pumps	Number if Pumps	1 / 2
# Tanks	Number of Tanks	1 / 2
Valve Type 1	Valve Type Module 1	Check / Solenoid / Pulse / Race
Level Ind. 1	Level Indicator Module 1	No / Yes
Failsafe 1	Failsafe Module 1	None / Switch / Pressure
Valve Type 2	Valve Type Module 2	Check / Solenoid / Pulse / Race
Level Ind. 2	Level Indicator Module 2	No / Yes
Failsafe 2	Failsafe Module 2	None / Switch / Pressure
Pre.Press 1	Pump 1 Pre-Pressurisation	Enabled / Disabled
Pre.Press 2	Pump 2 Pre-Pressurisation	Enabled / Disabled
Input Type	System Input Type	Boost / AUX
Aux In Type	Auxiliary Input Type	MAP / AFM / TPS
Aux V Offset	Auxiliary Voltage Offset	
Aux B Offset	Auxiliary Boost Offset	
Aux Gain	Auxiliary Gain	
Max Values	Maximum Boost/Voltage Levels	
Low Press 1	Low Pressure Warning Level Module 1	
Nozz Press 1	Nozzle Blocked Warning Level Module 1	
Low Press 2	Low Pressure Warning Level Module 1	
Nozz Press 2	Nozzle Blocked Warning Level Module 1	

Issue Form

Name	
Company	
Email	
Mobile	
Make/Model	
Firmware Version	

Fault / Symptoms

Fault / Sympton Conditions

Please send with a copy of the current controller settings

Document Revision History

Version	Date	Description	User
1.0	11/3/2025	First Release	DO Admin

Firmware Revision History

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1.0	11/3/2025	First Release	DO Admin