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Installation Instructions for 30-3000 / 30-3001

Universal Water/Methanol Injection Kit

WARNING:



This installation is not for the electrically or mechanically challenged! Use this system with **EXTREME** caution! If you are uncomfortable with anything about this, please refer the installation to an AEM trained tuning shop or call 800-423-0046 for technical assistance. You should also visit the AEM Performance Electronics Forum at <http://www.aempower.com>

NOTE: AEM holds no responsibility for any engine damage that results from the misuse of this product!

This product is legal in California for racing vehicles only and should never be used on public highways.

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Instruction Part Number: 10-3000
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Specifications

- Ground output(optional).
- 1 Gallon reservoir (optional 5 Gallon) with integral level sensor.
- 150 PSI methanol compatible pump with integral check valve.
- Progressive pump controller.
- 20-amp pump driver with over-current, over-voltage and under-voltage protection.
- Error protection output with over-current, over-voltage and over-temperature protection.
- Cockpit status LED for errors and low fluid.
- Pump open and short detection and indication. Works even if the pump is off.
- "Test" function that includes manual pump triggering.
- Two dial pump speed control.
- Battery voltage compensation.

Parts List:

Quantity	Description
20 ft	High Pressure 1/4" Nylon Hose
1	1 Gallon Tank With Integral Fluid Level Sensor 10"h x 8.5"w x 4.25"d
1	150 PSI Pump With Hose Adapters
1	Progressive Injection Module
1	Check Valve

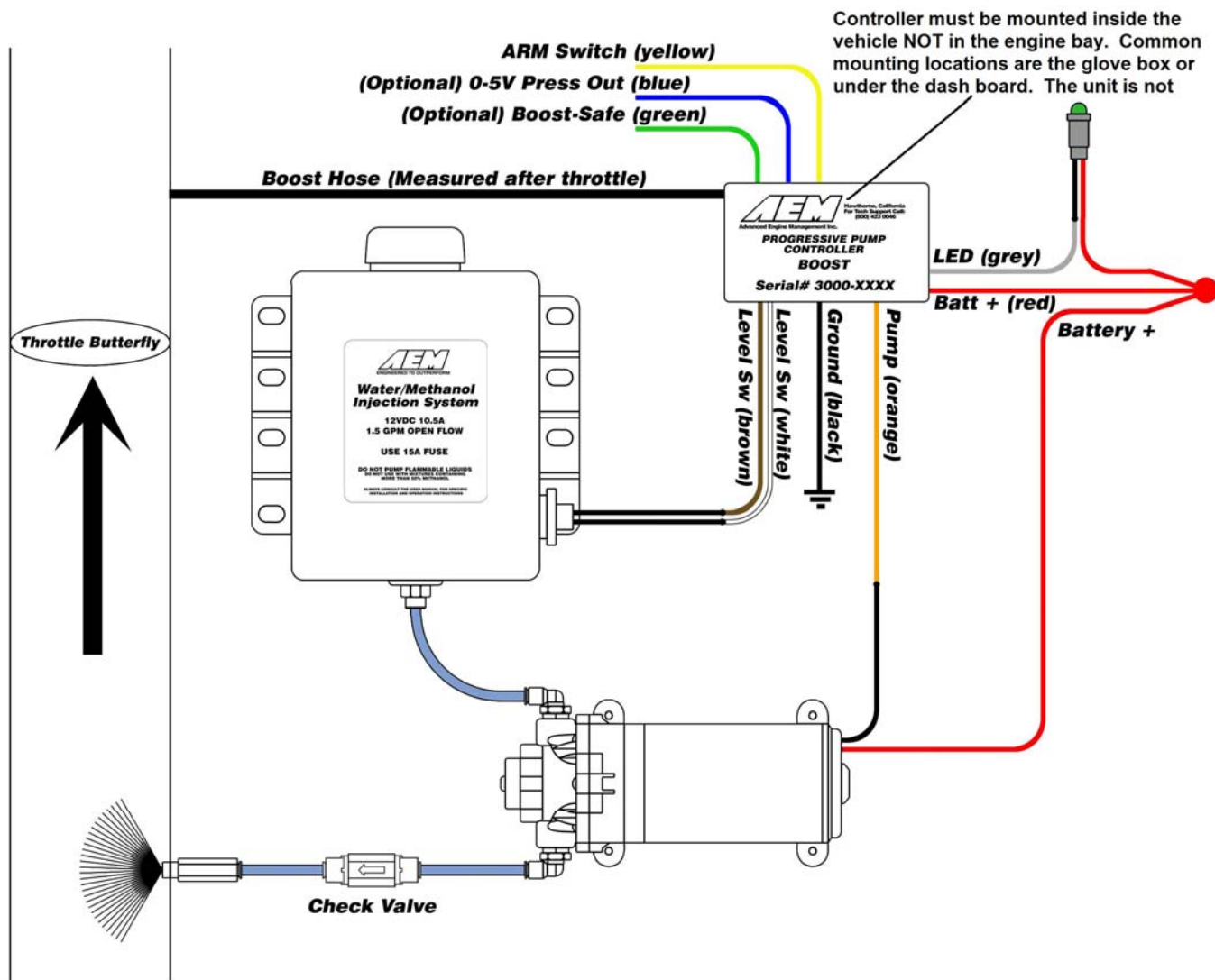
Mechanical Kit:

Quantity	Description
60 in	Vacuum Hose (7/64")
36 in	1/4" High Temp Wire Wrap
1	3/16" Tee Fitting
10	6" Zip Tie
8	Screw, Pan Head #8 x 1.0"
4	Screw, Pan Head #6 x 0.5"
4	Washer, #8 x 3/4"
4	Washer, #8 x 7/16"
1	5mm Cockpit LED
2	Butt Connector, 14-16 AWG (blue)
9	Butt Connector, 18-22 AWG (red)
1	1/4" Hose Routing Strip

Injector Nozzle Kit:

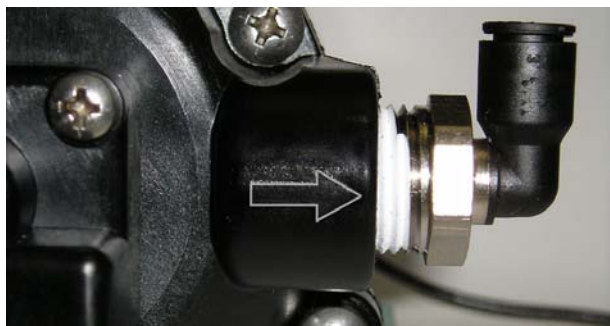
Quantity	Description
1	Stainless Injector Assy with Small (130ml/min) Jet
1	Stainless Jet, Medium (315ml/min)
1	Stainless Jet, Large (550ml/min)
2	Nylon Washer

System Diagram



Pump and Tank Install

Find a suitable location to mount the tank and pump. See page 8 for the 5 gallon tank mounting instructions. The pump should be mounted so the top of the tank is lower than the final injection location. The pump should be mounted at or below the level of the tank. Use 4 of the 8 supplied #8 sheet metal screws along with the 4 large washers to mount the 1-gallon tank.



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On the pump, note the directional arrows indicating fluid flow direction. Use the other 4 #8 sheet metal screws along with the 4 small washers to mount the pump. The orientation of the pump is not important, it will work regardless of position. Measure the distance between the fluid outlet on the bottom of the tank and the fluid inlet on the pump. Make sure there are no sharp bends in the hose. Cut the hose to length with a clean perpendicular slice, making sure the ends are clean and flush. Push in the hose at the tank and pump to install. Make sure they are pushed in all the way and check with a light tug on the hose. There is no need to tighten the preinstalled pump fittings as they have been installed and leak checked at the factory. Secure the hose to the chassis using sections of the supplied hose routing strip or with zip-ties.

Controller Install

Find a convenient location for the controller. The adjustment settings should remain in an accessible location but still be **protected from possible water incursion**. If you need to extend the wires to mount the controller use at least 14 AWG wire for the pump and controller ground circuits and 18 AWG for the remainder. Use the 2 supplied #6 screws to mount the controller.

LED Install

Find a suitable location in the drivers line of sight to mount the status LED. Mount the LED and run the wires to the controller. The LED indicates the operation of the controller. If the pump is off and there are no errors the LED will be off. If there are no errors and the pump is on the LED's intensity will vary with the pump speed. If there are any errors they will be indicated by flashing the LED.

Nozzle Selection and Assembly

Three jets are supplied with the kit. This ensures that regardless of your desired horsepower you will not need to purchase additional jet sizes.

- 1 (Small, 130 cc/min) is recommended for 150-250 HP
- 2 (Med, 315 cc/min) is recommended for 250-400 HP
- 3 (Large, 550 cc/min) is recommended for 400-650 HP



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The nozzle will come pre-assembled with the smallest jet. Regardless of your eventual horsepower settings it is recommended that you start with this jet for your initial testing. The nozzles are interchangeable and you can disassemble them for cleaning. If you find excessive debris in the screen check your tank for contamination. When installing the screen it is only necessary to be slightly tighter than finger tight. Do not over-tighten. The nylon washer included is reusable but a spare is included for future servicing.

Select the location where the nozzle will be installed. It must be **before** (upstream of) the throttle plate. If a MAF sensor is present, it must be placed between the MAF sensor and the throttle plate. If an intercooler is present place the jet between the intercooler outlet and the throttle plate. For the maximum cooling effect mount the nozzle toward the filter or turbo discharge. Either weld on a 1/8" NPT bung or drill and tap a hole for the nozzle mounting. Measure the length for the hose and cut. The Check Valve should be installed between the nozzle and the pump. The closer to the nozzle the better. **IMPORTANT:** make sure the arrow on the valve body is pointing towards the nozzle. Before installing the nozzle for the final time proceed to the "Pump/System Check" stage to confirm proper operation.

Boost Pressure Hose

Find a location after the throttle plate to tap into your manifold pressure (boost). DO NOT hook it up to the pressure at the turbocharger or at your boost controller. It must be after (downstream of) the throttle plate. Use the supplied hose and "tee" if needed.

Variable Controller Installation

Fluid Level Switch (The switch has 2 black wires, the polarity is unimportant)

Black wire connects to Controller - Brown wire

Black wire connects to Controller - White wire

LED

Red wire connects to Battery Positive

Black wire connects to Controller - Gray Wire

Pump

Black wire connects to Controller - Orange wire.

Red wire connects to Battery Positive

Variable Pump Controller

Black wire connects to Battery Ground

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Red wire connects to Battery Positive

Yellow wire connects to Arm switch (+12V power to turn on the system)

Green wire(optional), Boost-Safe output for timing retard or boost dump solenoid. 1.7a Max

Blue wire (optional) 0-5vdc pressure signal. (.328v = 0psig, 5vdc = 38psig)

Pump/System Check

The "TEST" push button on the controller module can be used to test the system. Press and hold the button to activate the pump. The pump speed will gradually increase from zero to full speed over 6 seconds and then stop. When the button is released the controller will return to normal operation.

After all wires are hooked up, add water to the tank and with the nozzle pointed into a container, press and hold the test button. The flow will start gradually and increase to a steady amount. If this happens then your system is connected properly. Check and repair any leaks. Drain the water out of the tank and install the nozzle.

System Error Checking

Whenever a system error is encountered, the Boost-Safe output is enabled. All errors are indicated by a flashing sequence of the status LED which can be determined by counting flashes. Only one error can be counted with the higher priority at the top of this list:

Pump Driver Shorted

Trigger Condition: Current exceeding 15A on the driver output.

The status LED will flash a count of three and repeat. The pump driver will turn off to protect itself and automatically retry every second. If the short is removed the controller will function normally. Fluid flow is lost in this condition.

Pump Driver Open

Trigger Condition: Open circuit between pump drive and battery voltage.

The status LED will flash a count of two and repeat. The pump driver will continue to drive the pump. If the open is repaired the controller will function normally. Fluid flow may be lost in this condition.

Battery Voltage Out Of Range

Trigger Condition: Battery voltage is below 8.5V or above 16V.

The status LED will flash a count of four and repeat. The pump driver will turn off to protect itself and automatically restart when the voltage returns to the normal range. Fluid flow is lost in this condition.

Controller Tuning

The controller will monitor the manifold pressure, battery voltage, potentiometer settings, push button and error conditions. Two potentiometers are used to set the pump PWM rate. The "Start PSI" dial has a range from .5PSI_g (full counterclockwise rotation) to 11PSI_g(full clockwise rotation). This is the pressure that the pump will start to operate. The "Full PSI" dial has a range of 6PSI_g (full counterclockwise rotation) to 38PSI_g (full clockwise rotation). This is the pressure that the pump will be running at full speed. Additionally, the controller will automatically correct for battery voltage variations to give the same flow.

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Adjust the “Start PSI” value by setting the dial to approx 25% of the vehicles maximum boost. Adjust the full-in value to your maximum boost (up to 38 PSI of boost).

Error LED

The controller has an “ERROR” LED. This will mimic the operation of the cockpit LED. It will flash out error codes as well as illuminate with varying intensity as a function of flow.

Short circuit testing

There are two modes of pump-driver short circuit protection available. One can detect a short at any time but produces a slight buzzing in the pump. This should not be noticeable under most conditions, but can be turned off if it is objectionable. If the less functional mode is chosen, then a short can only be detected when the pump is running. Pressing and holding the “Test” button while applying power toggles the mode. The change is acknowledged by a fast flashing (6 flashes and then repeats) of the status LED output and the on-board status LED. Once the button is released the controller will continue to function normally. You can also tell what mode has been selected by listening for the buzzing sound in the pump. Repeating this operation will toggle between the two modes.

Boost-Safe Output (optional)

The progressive controller includes a Boost-Safe output (grounded when active) that activates whenever the system is armed and runs out of fluid or an error code is flashing. The green wire on the controller is the 1.7 amp switched ground. This wire can be hooked up to a solenoid that will vent waste gate pressure when activated. Apply 12v to the other side of the solenoid (AEM P/N 30-2400 or equivalent). This output can also be used to trigger a timing retard function in a stand alone ECU or a CDI whenever the system runs out of fluid, thus protecting your engine.

Engine Tuning

A Water/Methanol mix will increase the charge density of your mixture. A significant amount of the power gain available when using a water/methanol injection system is due to the fact that the ignition timing may be increased due to the reduction in the tendency to knock. If the timing is not advanced to take advantage of this benefit then the power gains available will be substantially reduced. As always when tuning ignition advance, use small increments.

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Maintenance

The injector nozzle should be cleaned periodically. Disassemble the nozzle and clean it with a suitable cleaner until all debris is removed. If excessive contamination is found check the rest of the system for the source.

Optional 5 Gallon Tank (30-3001)

Parts List:

Quantity	Description
1	5 Gallon Tank With Integral Fluid Level Sensor
4	Bolt, Hex Head, 5/16-18 x 2" long
4	Nut, Ny-Lock, 5/16-18
8	Washer, 5/16

Mount the tank in an upright level position. Use the supplied 5/16-18 bolts, nuts, and large OD flat washers for mounting the tank into your vehicle. **IMPORTANT:** Use the supplied large OD washer to spread the load on the plastic mounting ears of the tank. **DO NOT OVERTIGHTEN!** Nuts should just be snug, they are locking nuts and will not back out. Over-tightening will crack the plastic and cause leaks and void the warranty.



AEM Electronics warranty

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Advanced Engine Management Inc. warrants to the consumer that all AEM High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at AEM's option, when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM part. In no event shall this warranty exceed the original purchase price of the AEM part nor shall AEM be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to AEM must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. AEM disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by AEM. Warranty returns will only be accepted by AEM when accompanied by a valid Return Merchandise Authorization (RMA number. Product must be received by AEM within 30 days of the date the RMA is issued.

Please note that before AEM can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the EMS tech line at 1-800-423-0046 to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned or a RMA requested before the above process transpires.

AEM will not be responsible for electronic products that are installed incorrectly, installed in a non approved application, misused, or tampered with.

Any AEM electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of \$50.00 for inspection and diagnosis of AEM electronic parts. Parts used in the repair of AEM electronic components will be extra. AEM will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.

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