



Throttle Body EFI

Frequently Asked Questions

What is the operating fuel pressure of the TBI?

It depends on your fuel system. When using a returnless (Pulse Width Modulate) system, the fuel pressure will vary between 30-75psi. If you are using a regulated return system the pressure required will depend on horsepower. Most vehicles will require 45psi while engines pushing 600hp will need closer to 70psi.

If I already have a fuel system what pressure do I set?

Dependent on horsepower, most cars will require 45psi unless you are putting out very high horsepower. There is a DTC (diagnostic trouble code) that indicates 100% injector duty cycle. If this condition is hit, you will need to increase your fuel pressure by a slight amount (5-10psi) and try again. Please see instruction page 6 for more information.

What's the CFM of the throttle body?

The Atomic EFI throttle body can flow approximately 930 CFM. The horsepower is not limited by airflow, rather it is limited by injector size.

What size injectors are used in the throttle body?

The Atomic Throttle Body uses four 80lb/hr @ 60psi injectors.

Can injectors be replaced to accommodate smaller or larger engines and power?

Injector size cannot be changed. Fuel pressure is adjustable when running a return system with an adjustable regulator.

What's the smallest and largest engine displacement that can be selected?

The Atomic EFI will support engines with a minimum of 100ci to a maximum of 800ci.

What are the horsepower capabilities of the system and what are the limiting factors?

With a large fuel pump the maximum output of the Atomic is 625 HP. This will go down when using boost due to a richer A/F requirement. The limiting factor is the injector size.

Can I run boost or Nitrous with the system?

Yes. The Atomic TBI will support both nitrous and boost up to 2-bar and is compatible with blow-through and draw-through systems.

How much current will the fuel pump and fan drivers support?

The fuel pump output can support 18 amps continually without the need for a relay. The fan drivers only support 1-2 amps meaning they will only drive the low current side of a relay.

Can a 16-24 volt system be used?

No. The Atomic is designed to run on 12 – 16 volts. Voltage should not exceed 16 volts.

What RPM inputs are accepted?

A magnetic pickup, breaker points or standard coil negative signal will trigger the Atomic. The tach signal out of any MSD ignition control or Pro-Billet Ready-to-Run distributor is acceptable. Note that a Hall-effect 5 volt signal pickup is NOT compatible.

What sensors are onboard and can I replace them?

The Atomic TBI was designed with integral sensors to help reduce wiring. There is a 2-bar MAP (Manifold Absolute Pressure) sensor, Fuel Pressure sensor, Inlet Air Temperature (IAT) sensor, Throttle Position sensor and Idle Air Controller (IAC). The Fuel Pressure, MAP, and IAC may be replaced. The TPS is a proprietary non-contact sensor that should not need to be replaced.

What does the A/C RPM step up do and is it adjustable?

The Atomic has an activation wire that connects to the air compressor 12 volt wire. When activated, the ECU opens the IAC so the rpm doesn't drop with the extra load of the compressor. It is factory pre-set and is non-adjustable. When activated, this circuit will also turn on the number one electric fan.

Does the Atomic TBI have a rev limiter?

Yes, there is an adjustable rev limiter that can be set. When the engine reaches the set rpm level, fuel delivery will be interrupted to keep the rpm from exceeding the limit.

Is the Atomic TBI CARB approved for use on emission controlled applications?

Yes, at the Atomic was granted Executive Order Number D-722. This allows the Atomic TBI, PN 2900 and PN 2910, to be installed on 1987 and older model year General Motors passenger cars and pickups with a V8 gasoline engine and originally equipped with a carburetor. For more information, go to www.atomicefi.com.

Is the Atomic EFI UL approved for marine use?

No. The Atomic EFI is not UL approved at this time.



Does the unit increase idle speed and fuel for cold starting and warm up?

Yes. Cold start conditions are automatically compensated for and will decrease as the engine warms up. By the time the coolant reaches 145°F, the cold idle speed and fuel compensation are completely removed.

What can be selected or adjusted via the hand held controller?

There are a number of adjustable features that can be set and adjusted from the handheld controller. Following are just a few:

Basic setup: Engine displacement, number of cylinders, fuel pump type (return or PWM with regulator), idle RPM, Rev-limit, timing control, three camshaft type selections (street, mild, performance), air pump equipped

Advanced setup: Fans (separate on temp for both fans), AFR targets (idle, part throttle, wide open, power adders), Ignition Timing (curve settings), Pump Squirt (0-100%)

Will it hurt the unit to keep the key in the on position with 0 rpm for an extended period of time?

No, it will not hurt the system. However, the WBO2 sensor will be drawing current. (NOTE: The O2 sensor will be hot if the key is left in the on position. Care should be taken to avoid burns).

How many pulses per crankshaft revolution are needed for the RPM input?

The Atomic must receive one pulse per combustion event (4ppr on a V8).

How much current will the system draw?

Normal operation will be approximately 14-18 amps. If the fuel pump is at full capacity, the IAC is moving and the injectors are at their maximum, the unit can draw as much as 30 amps with a minimum of 10 volts supplied.

Will the system work on a 6 volt system?

No, the Atomic EFI is not compatible with 6 volt systems.

Can the unit drive the coil directly?

No, the Atomic EFI does not have a built-in ignition driver. However it can accept the trigger signal from breaker points, an HEI, DuraSpark, a CD ignition control or a Ready-to-Run style distributor. When setting the Atomic up to control ignition timing, an MSD ignition control is required.

Do the annular rings work the same as a carburetor?

No. The annular rings are not in a venturi and at no time does the fuel get pulled out because of low pressure. They are designed to help spread and atomize the fuel out and have been shown to improve fuel distribution.

Is the pump supplied with the Atomic EFI Master Kit a puller / pusher or just a pusher style fuel pump?

The fuel pump is a "pusher" pump only. This is why the pump must be mounted low and close to the tank.

How far can the pump be mounted from the tank?

The Atomic's fuel pump should always be mounted as close to the fuel tank as possible. This aids in keeping the pump cool. If using a returnless style fuel system it is vital that the pump be as close as possible. With this system the pump MUST be within a couple of feet from the tank – preferably two feet or less. The pump should always be at or below the bottom of the tank. The pump should be plumbed with high pressure 3/8" ID fuel line from the tank.

Is there a limitation to how long the CAN extensions can be?

The CAN extensions cannot exceed six feet in total length. Never cut or modify the CAN Harness. MSD offers extension harnesses if needed.

What about EMI or RFI 'noise' from other electronics or the ignition system?

The Atomic EFI utilizes shielded CAN and magnetic pickup wires which help reduce the chance of electronic interference. Still, the wiring from the Atomic EFI should not be routed in close proximity of the spark plug wires.

What are the temperature limitations (hot and cold) for the system?

The Atomic EFI can withstand under hood temperatures in excess of 200°F and as low as 0°F.

Are the TBI, Power Module, and components water resistant or water proof in wet/ humid environments (or when washing the motor)?

The units are potted and are resistant to water intrusion although should not be immersed. Normal engine washing should be fine but never point a high pressure water source directly at electrical items.

Where is the unit made?

All research, design, programming, assembly, and final testing are done by our skilled technicians in El Paso, Texas, where MSD was launched over 40 years ago.

Can it run an LS motor?

Yes, as a throttle body and with the addition of an MSD 6LS Ignition Control (LS1/6 is PN 6010, LS2/3/7 is PN 6012). The Atomic will control all fuel delivery aspects while the 6LS box controls the ignition timing.

Does the unit have a ported vacuum outlet?

Yes, there are ported vacuum outlets on the throttle body. There is also a boost reference outlet and manifold vacuum outlet.

What happens if the WBO2 sensor fails?

The handheld will display a DTC (Diagnostic Trouble Code) for the sensor. The engine will be allowed to continue running, but will use only the existing fuel tables. Fuel table adjustments or self-tuning will be deactivated until the WBO2 can be replaced.

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What is AFR (Air/Fuel Ratio)?

An Air/Fuel Ratio is the volume of air per each unit of fuel put into the engine. 14.7 units of air per 1 unit of fuel is "stoichiometric" meaning there is the exact right amount of air available to burn all of the present fuel. A lower AFR number means there is less air to match the fuel, and therefore the engine will run "Richer". Conversely, a higher AFR number means that there is more air to match the fuel and the engine will run "Leaner".

Air Fuel Ratio scale -

EXTREMELY RICH	RICH	STOICH	LEAN	EXTREMELY LEAN
9.0	12.0	14.7	15.0	18.0

Does a target AFR (Air/ Fuel Ratio) need to be set before start up or is there a base target AFR?

The Atomic comes with default Air Fuel Ratios that are sufficient for most street based engines. However, if a change in AFR is desired the settings can be found in the "Advanced Setup" on the handheld controller.

Can it be set up as a dual quad?

No not at this time.

Ignition Timing Control

The Atomic TBI provides the ability to control the ignition timing. In order to take advantage of this feature and MSD Ignition Control is required, the distributor must be locked out and fit with a 'phaseable' or adjustable rotor. Several common questions are answered below.

What timing settings are allowed?

Once timing control is enabled, you will be able to set the Idle timing and rpm, total advance and rpm, and a vacuum advance value.

What other timing capabilities does the system have?

If running a power adder, there is also a timing retard for nitrous and a boost retard value for forced induction systems.

Where do I set base timing when using the unit to control timing?

Under the "Initial Setup" screen on the Atomic EFI handheld, you need to select "ENABLED" for Timing Control. Next, under "Advanced Setup", find parameters to set a timing curve. The Atomic is limited to 44° of total timing (including vacuum advance) due to the limits of a distributor. For complete details and instructions on this, please see the installation instructions at www.atomicefi.com

Does it require a phaseable rotor if I run timing control?

Yes. If you are running ignition timing control through the Atomic a number of other small items are required including an adjustable rotor. The distributor must be locked out and an MSD Ignition Control is required.

Can I plot a custom timing curve, and can I lock the timing out in the software?

You cannot map or plot a curve on a laptop or 3D timing table however you can control the idle and total timing values. The idle timing (minimum 500 rpm), along with any total timing (minimum 1500 rpm), can be set through the handheld monitor. In addition to this, you would be able to set a start RPM where the idle timing starts to advance towards total timing. You will also set the RPM at which timing reaches total timing. This will act like one of our distributor spring/bushing kits with more accuracy. You cannot do a custom 3D timing table.

Is there a start retard?

There is no start retard setting however this can be compensated during the timing setup. For example, if the engine needs a lower timing for cranking, you can set your idle timing lower 5° and then start the timing ramp at 500 rpm (lower than the idle speed) with Total Timing at 35 degrees at 2000 rpm. This will create a retarded start with 2 degrees of advance 100 rpm through 2000. At an 800 rpm idle, ignition timing will be 11°.

Is there vacuum advance?

There is a selectable vacuum advance from 0-15°. It maxes out below 16" Hg manifold vacuum and is completely gone by 7" Hg manifold vacuum so it acts like a normal vacuum pot, only the total amount of vacuum advance is user adjustable, where as the rate of advance is non-adjustable. By setting the vacuum advance to 0°, the vacuum advance is disabled.