



AEROMOTIVE
Part # 11191/11192/11195/11196
Product Description
INSTALLATION INSTRUCTIONS

This product is not legal for sale or use on emission-controlled vehicles except when used as a direct replacement part matching OEM specification.

WARNING!



Always be aware of flammable situations. Drilling and grinding can be potential ignition sources. Extinguish all open flames, prohibit smoking and eliminate all sources of ignition in the area of the vehicle and workspace before proceeding with the installation. Ensure you are working in a well ventilated area with an approved fire extinguisher nearby.

WARNING!



etc.

Installation of this product requires modification to a fuel tank/ the fuel system, failure to satisfy all safety considerations will result in fire, explosion, injury and/or loss of life to yourself and/or others. All fuel system components **MUST** be located as far from heat sources as possible, like exhaust, engine block,

WARNING!



Mechanical and hydraulic lifting devices can tip over or lower accidentally due to incorrect maneuvering or technical errors. A falling object can cause injury and/or loss of life to yourself and/or others. When working under the vehicle, always use stands, and ensure that the ground or floor is stable and level. Never crawl under a vehicle which is only supported by a jack.

WARNING!



The fuel system is under pressure. Do not open the fuel system until the pressure has been relieved. Refer to the appropriate vehicle service manual for the procedure and precautions for relieving the fuel system pressure.

CAUTION!



When installing this product always wear safety glasses and other appropriate safety apparel. A drilling operation will cause flying metal chips. Flying metal chips can cause eye injury.

CAUTION:



Installation of this product requires detailed knowledge of automotive systems and repair procedures. We recommend that this installation be carried out by a qualified automotive technician. Careless installation of this product can result in damage to the product, injury or loss of life to yourself and/or others.

Compatible Fuels:

Pump Gas
Race Gas
E85
Alcohol/Ethanol

To use this pump in your vehicle's fuel system, **you must do the following:**

- Utilize a by-pass style fuel pressure regulator in the system.
- Utilize AN-12 size high pressure fuel lines, fittings and o-rings for all connections from the fuel tank pickup to the fuel pump.
- Mount pump level with or lower than the bottom, and as close to the tank, as possible to ensure proper fuel pump performance and longevity.
- Install an Aeromotive P/N 12302 pre-filter and P/N 12350 post filter.
- Install a reservoir sump in the bottom-rear of your fuel tank if you are using a stock fuel tank. Exercise extreme caution and follow all manufacturers' recommendations when installing a reservoir sump.
- Tank/Fuel cell must have at least a ½" tank vent.
- Install a high flow capacity fuel tank pickup (3/4" inner tube diameter) if you choose not to install a reservoir sump. Installing a pickup tube instead of a reservoir sump may shorten the fuel pump life and cause drivability problems. When using a fuel pickup, you should maintain at least ½ tank of fuel to avoid possible engine lean-out and/or fuel pump damage.
- For any street driving or continuous use, Aeromotive recommends maintaining at least ½ tank of fuel.
- Maximum *continuous* operating pressure should not exceed 90 psi. Life expectancy may be reduced for continuous operation above 90 psi.
- Maximum intermittent operating pressure should not exceed 125 psi.

Failure to follow the above may result in fuel leakage, bursting of the fuel lines, poor vehicle performance and/or decreased fuel pump life! Improper installation will void all warranties for this product!

The following steps are typical of most installations:

1. Once the engine has been allowed to cool, relieve the fuel system pressure and disconnect the negative battery cable.
2. Raise the vehicle and support it with jack stands.
3. Referring to the appropriate vehicle service manual for instructions, remove the OEM fuel pump.
4. Install an after-market sumped high flow capacity fuel tank or fuel cell, per the manufacturer's instructions.

Note: Failure to mount the pump lower than and close to the fuel tank may cause the pump to run dry, resulting in extreme pump wear! Make sure the pump is located lower than and as close as possible to the fuel tank, so that the pump is always supplied with fuel!

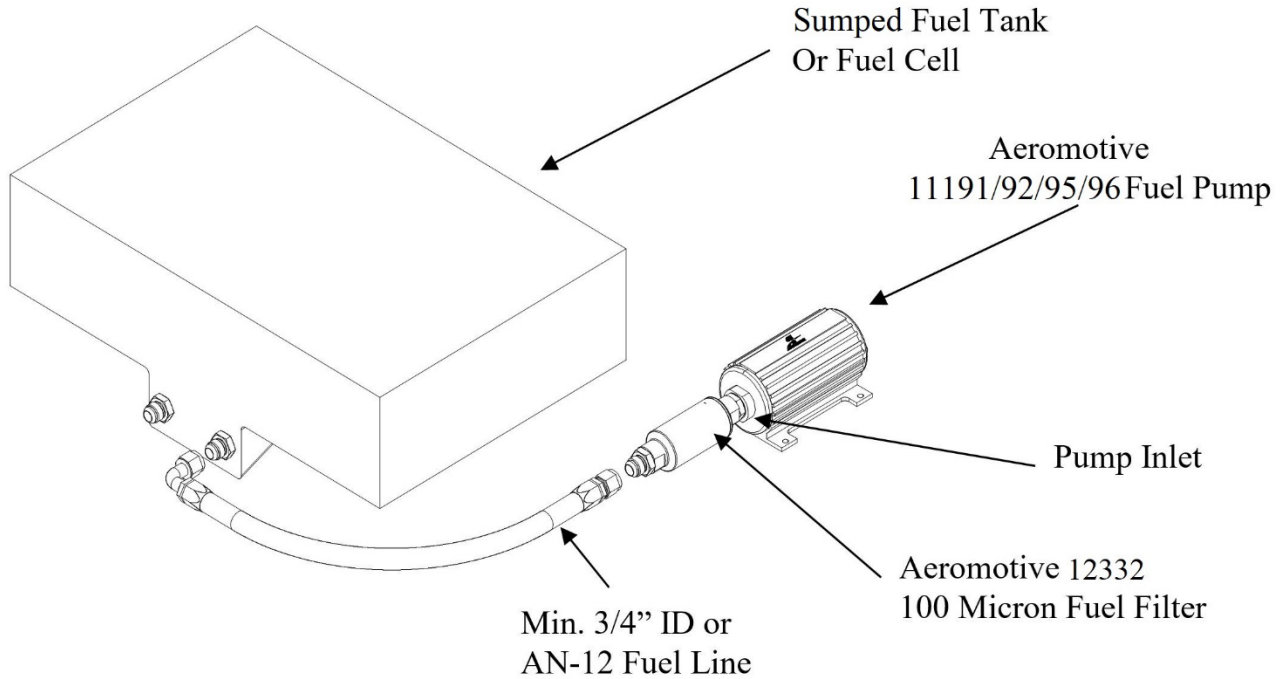
5. Find a suitable place on the vehicle chassis to mount the fuel pump. Make sure the location will accommodate the pump mounting bolts. Make sure to position the pump at or below the bottom of the tank. Make sure that the pump is clear of the exhaust, is clear of any moving suspension or drivetrain components, and will keep the pump clear of road obstructions or debris.

Note: Be sure to route all fuel lines clear of any moving suspension or drive train components, and any exhaust components! Protect fuel lines from abrasion and road obstructions or debris.

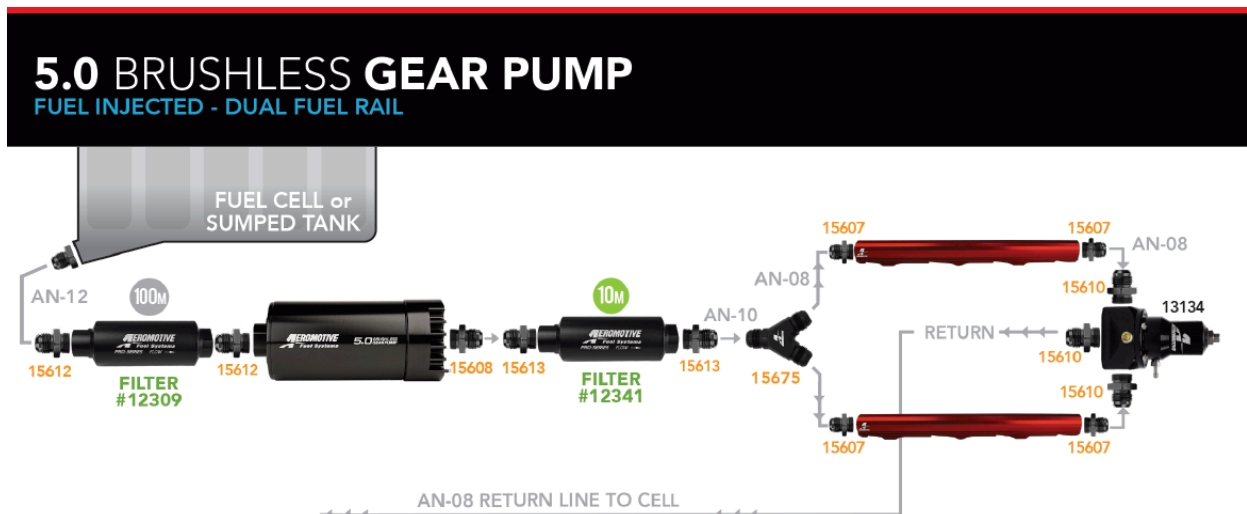
6. Using minimum of 3/4" ID or AN-12 fuel line, connect the fuel tank sump outlet to a 100-micron fuel strainer (Aeromotive P/N 12302). Using the same size fuel line connect the fuel filter outlet to the fuel pump inlet or, if you are

using an Aeromotive fuel filter, you can attach the filter directly to the fuel pump utilizing an AN-12 fitting (Aeromotive P/N 15612) and 2 sealing o-rings (AN-12 o-ring pack Aeromotive P/N 15624).

Note: It is recommended that a fuel shut off valve be installed between the fuel tank outlet and the fuel pump. You may accomplish this with one component using Aeromotive P/N 12332 shutoff valve fuel filter and 15680 swivel fitting to make the connection to the pump.

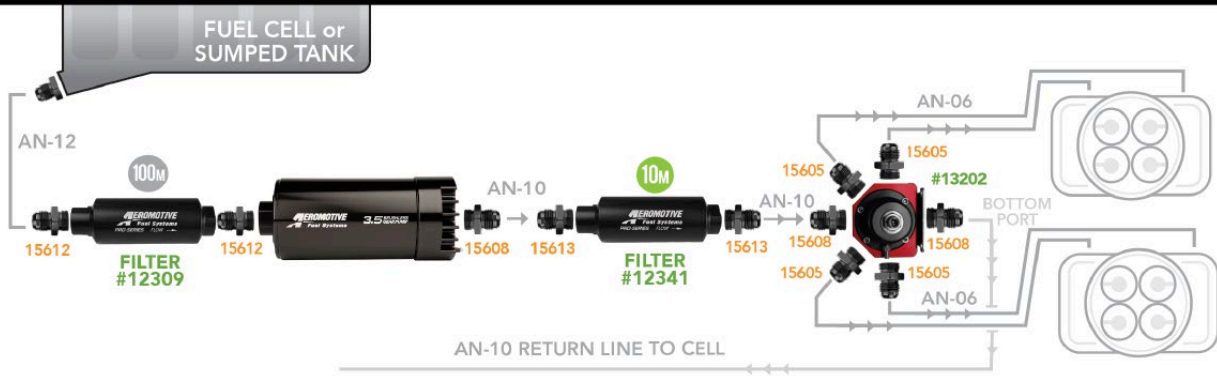


- Using AN-12 fuel line, connect the fuel pump outlet to a 10 micron post fuel filter (Aeromotive P/N 12339). You can attach the filter directly to the fuel pump utilizing an ORB-10 to AN-12 fitting (Aeromotive P/N 15642) and 2 sealing o-rings (AN-10 o-ring pack Aeromotive P/N 15623, AN-12 o-ring pack Aeromotive P/N 15624). **Make sure you use high pressure (150 psi minimum) fuel line for this connection!**
- Connect the outlet filter to the vehicle's fuel rails or pressure regulator depending on application as shown in the following diagrams. For optimum fuel system performance in EFI applications, Aeromotive recommends a balanced system with the fuel pressure regulator as the last component in the system. **Make sure you use high pressure (150 psi minimum) fuel line for this connection!**



3.5 BRUSHLESS GEAR PUMP

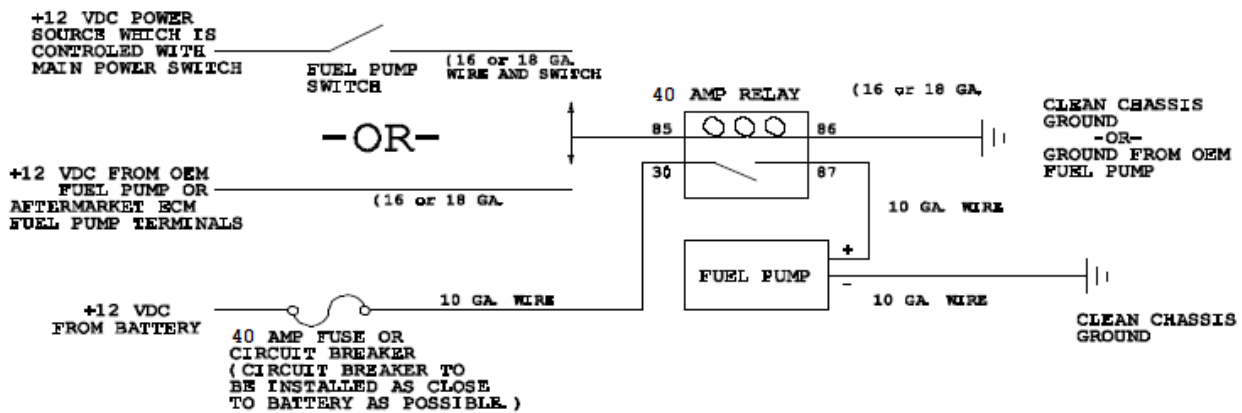
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Note: Be sure to route all electrical wires clear of any moving suspension or drivetrain components and any exhaust components! Protect wires from abrasion and road obstructions or debris.

9. Make sure you use stranded, insulated copper wire, in the sizes shown, with matching crimp-type connectors for all connections.
10. Attach the OEM fuel pump wires, the aftermarket ECM fuel pump wires or your fuel pump switch wires as shown in the following diagram, +12VDC to the red lead, Ground to the black lead. **NOTE: POWER TO THE PUMP MUST BE FLAT DC, NOT PULSE WIDTH MODULATED!**

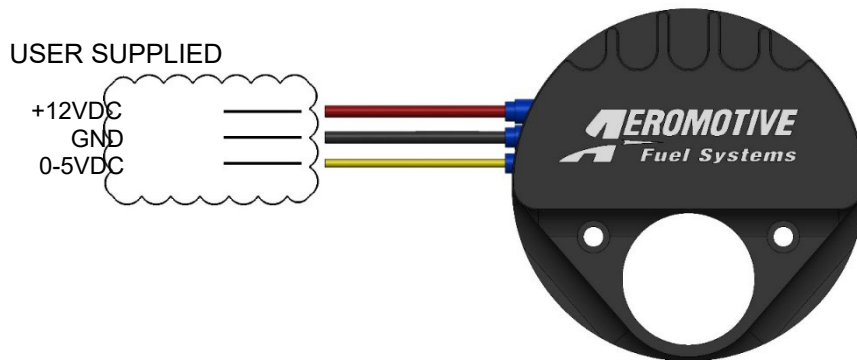
CAUTION: DO NOT REVERSE THE POLARITY-CONNECT AS STATED ABOVE. Reversing the polarity will render the controller inoperable and will void all warranties for this product!



11. This pump controller allows the ability to change the speed of the pump via a 0-5VDC analog input to the yellow signal wire. **THE CONTROL SIGNAL MUST BE A TRUE ANALOG INPUT, NOT PWM.** A PWM signal can only be used if filtered sufficiently for smooth operation. The signal wire used to control the speed of the pump may be connected in ONE of multiple configuration examples as shown in the following illustrations to control the speed of the pump.
12. This pump controller has a minimum floor for pump speed of 25-30% depending on the pump. This means that fuel pump speed will not fall below 25-30% of full speed with zero input voltage on the yellow control signal wire.
13. This pump controller has a minimum voltage threshold of approximately 0.5VDC, above which, the minimum floor pump speed will begin to be exceeded. Signal input of voltage below 0.5VDC will have no effect on pump speed. This ensures allowance for minimum, closed throttle TPS settings of up to 0.5VDC are allowed and will not affect fuel pump speed at idle.

14. This pump controller has a full pump speed voltage threshold of approximately 3.7VDC, where the full pump speed will be achieved with signal input voltage at or above 3.7VDC and above which no further change in pump speed will occur. This ensures that when a TPS signal is used to drive pump speed that typical throttle openings of 70-75% and higher will ensure full fuel pump volume to the fuel rail or carburetor.

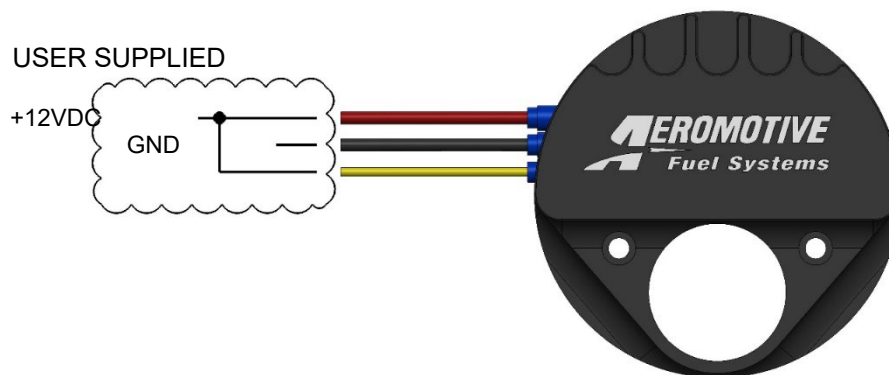
CONTROL CONFIGURATIONS:



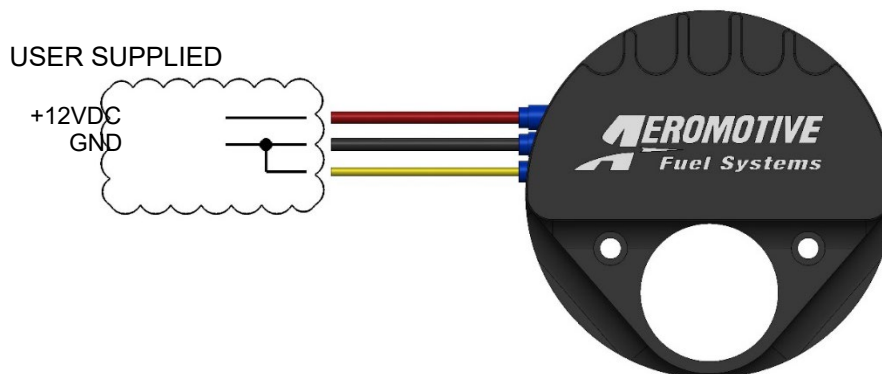
MODE 1 – TPS or Other 0-5VDC Input Control

Aeromotive recommends the "Mode 1" control method where the 0-5VDC signal input is tied to a Throttle Position Sensor using the output wire to the ECU. The intent for this control is to reduce the fuel pump output (and thus the amount of returned fuel flow) during low throttle opening (low engine demand) to reduce excess recycling of fuel to help keep fuel tank temperatures low. Alternatively, other 0-5VDC analog output sensors (some MAF sensors, boost pressure sensor, etc.) or voltage dividing/regulating/switching components may be used. It is the customer's responsibility to ensure a signal supply and control strategy where the fuel flow is sufficient.

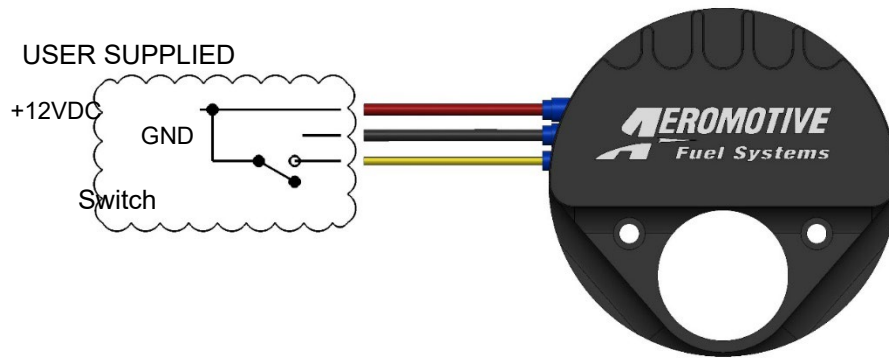
If no signal supply is suitable or desired, the controller can still be wired for use as in Modes 2 – 4, as shown below, to allow different fuel pump speed and flow outputs from the pump.



MODE 2 – Constant Full Speed



MODE 3 – Constant Low Speed



MODE 4 – Switched Speed On - Demand from Low to High

Mode 4 can be activated by any relay or switch providing 5VDC or higher to the control wire. A relay for this purpose could be activated using the programmable output from a tunable ECU, or via a boost or WOT switch connected to 12VDC to name a few examples.

15. After all wire connections are made, attach a suitable fuel pressure gauge to the fuel system schrader valve, fuel rail, or fuel pressure regulator (Aeromotive P/N 15633 for EFI or 15632 for Carbureted applications, respectively).
16. **Ensure that any spilled fuel and any fuel soaked shop towels are cleaned up and removed from the vicinity of the vehicle.**

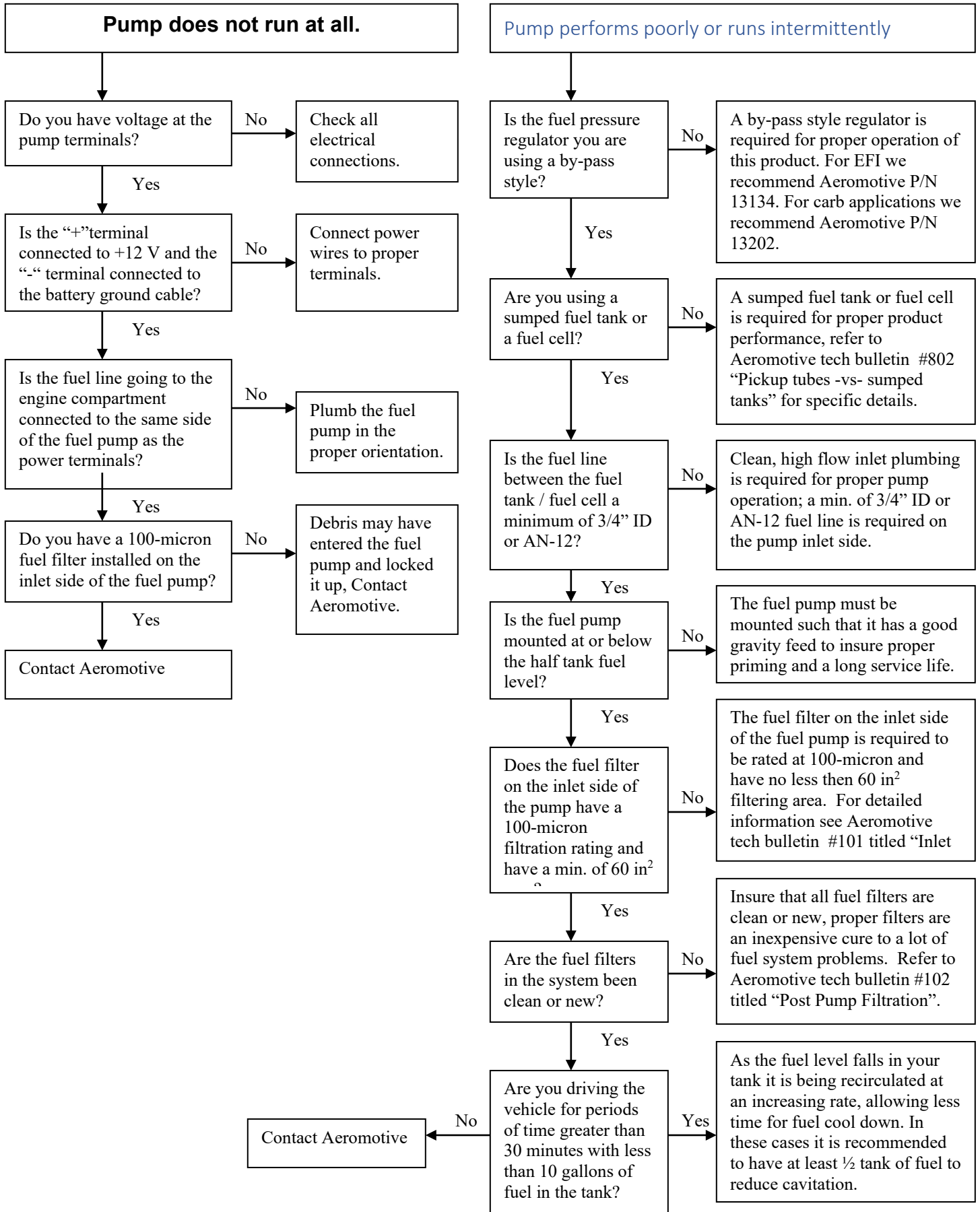
CAUTION: While performing the following steps, if any fuel leaks are detected, immediately turn the ignition to OFF, remove any spilled fuel, and repair the leak(s) before proceeding!

17. Turn the ignition to ON **without starting the engine**, allow the pump to run for several seconds and check the fuel pressure. If there is no pressure, turn the ignition to OFF, wait one minute, then turn the ignition to ON and recheck the pressure. Repeat this ignition OFF and ON procedure until the gauge registers pressure or you detect a fuel leak. If no pressure is registered on the gauge after running the pump for several seconds and you have found no leaks, check all fuel and electrical connections to determine the cause.
18. Once the fuel pressure gauge registers pressure, start the engine. The fuel pressure gauge should register between 40 and 90 psi for EFI applications or 5-15 psi for carbureted applications. If you have installed an adjustable fuel pressure regulator, adjust it to the desired setting. (For maximum fuel system performance, we recommend using an Aeromotive adjustable fuel pressure regulator; call us for info.)
19. Shut the engine off. Using suitable clips and other mounting hardware, secure the newly installed fuel lines and electrical wires by attaching them to the vehicle chassis.
20. Carefully lower the vehicle to the ground.
21. Test-drive the vehicle to insure proper operation and re-check the fuel system for leaks. **If any leaks are found, immediately discontinue use of the vehicle and repair the leak(s)!**

NOTE: When installing a new fuel system, the system will be contaminated from manufacturing and assembly. This contamination will be stopped by the Aeromotive P/N 12339 post filter. Change the post filter element after 100 miles to insure pump/system life (filter element part # 12639).

Aeromotive system components are not legal for sale or use on emission controlled motor vehicles.

Fuel System Troubleshooting



Aeromotive, Inc. Technical Bulletin #101

From: Aeromotive Technical Department

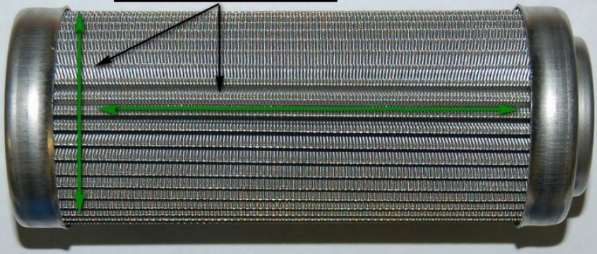
Date: 10/10/2011

Re: Fuel Filtration: Selecting the correct filter to prevent lean-out and pump failure.

STOP!! If you are selling or installing a fuel filter *on the inlet* of an Aeromotive fuel pump, be certain you do not use a filter that causes more problems than it solves. For pump inlet filtration, use *only* Aeromotive 100-micron P/N #12304, #12302 or an acceptable equivalent (see specifications below). Do not install the Aeromotive P/N #12301 or 12310 filter with 10-micron fabric element *on the inlet* of any Aeromotive fuel pump, they are however perfect for use on the outlet of the pump, and this is the only location for which they are recommended.

All 100-micron Fuel Filters are "NOT created equal"!

Aeromotive 100-micron filter cartridge
Stainless Steel, pleated construction
Over 60-square inches of surface area



1-square inch of surface area.

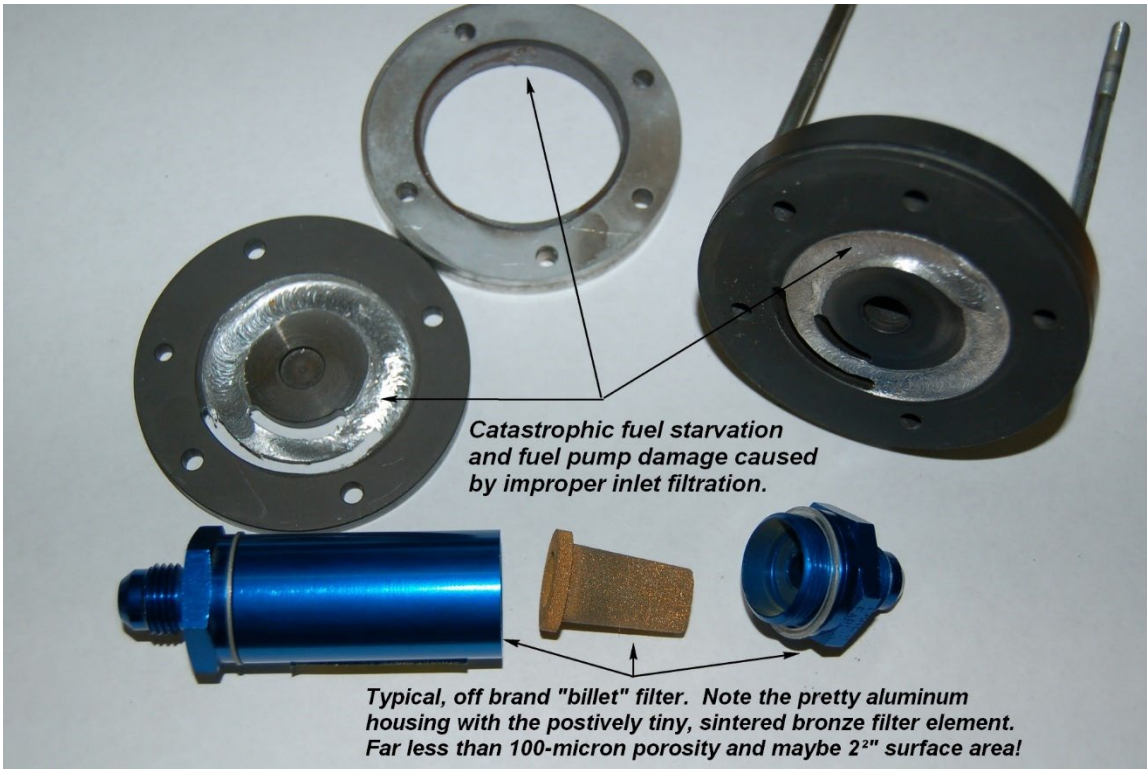


Off-brand "100-micron filter", returned with an A1000 pump the customer claimed was defective... is it any mystery why the pump failed to perform? Nope!!

You may run any brand of filter you choose on your car, just be certain that it meets the following requirements: ***The filter element used on the inlet side of any Aeromotive fuel pump may be no finer than 100-micron (no number smaller than 100), with a surface area of 60 square inches or more.***

Any filter element not meeting these criteria may fail to flow the full volume of the pump, resulting in both vehicle drivability and pump reliability problems. Aeromotive fuel pumps are engineered to be efficient, and can create both high outlet pressure *and* high inlet vacuum. The boiling temperature of any liquid varies with pressure. For example, the engine' cooling system is purposely designed to pressurize the coolant in order to raise the boiling point. So how does this apply to fuel delivery? When a fuel pump has to pull through a restriction to get fuel from the tank a vacuum develops which lowers the fuel's boiling temperature, cavitating

the fuel and turning it from liquid into vapor. **Bottom line: Inlet restrictions create vacuum, which causes cavitation, which in turn causes vapor-lock and fuel pump damage. Of course, drivability problems and even engine damage can result! Lesson: Don't combine high flow, efficient fuel pumps with poor flowing inlet filters. Don't use fuel lines smaller than the pump ports. Don't use fuel tank pick-ups or tank outlets smaller than the line.**



What about a fine filter? They are also necessary, but must be installed on the outlet side of your Aeromotive fuel pump, never on the inlet. Options include the Aeromotive 10-micron (replaceable element) fabric filter assemblies P/N #12301 and P/N #12310, and the new, high-flow 40-micron (cleanable element) stainless steel filter assembly P/N #12335. Given the alcohol content found in today's pump gas, it is now necessary to frequently monitor and service any downstream fuel filters in use. Because they cannot be cleaned, keep a spare 10-micron element on hand for immediate service to eliminate engine fuel starvation and drivability problems when they become heavy clogged.

All Aeromotive pumps except the Pro Series EFI pump may use the Aeromotive filter #12304 with -10 inlet and outlet fittings and 100-micron stainless steel element. The Pro Series EFI pump #11102 requires filter #12302 with larger stainless steel element and -12 inlet and outlet fittings. The #12302 is also recommended for the #11104 EFI Eliminator pump and our new #11105 belt drive pump (try 400gph or 2700lb/hr of fuel delivery at 100psi!!). Though Genuine Aeromotive Filters may be somewhat more expensive than the off-brand options, you simply must "compare apples to apples". They say "a picture is worth a thousand words..."



Above are various versions of “100-micron” fuel filters/elements. Note: the top element is the Aeromotive 100-micron element P/N #12604, as found the fuel filter assembly P/N #12304. Note the various filters all have “billet” housing, with AN connections, and can be disassembled for inspection and cleaning. Also, note that all are sold and recommended as appropriate pre-filters.

Of course, it’s obvious by this comparison image that there’s more to a filter than the micron rating, a billet housing or even AN Connections. It should be equally clear that surface area, the amount of filter material available for fuel flow, is not at all related to micron rating, but a major key to a filters flow capacity. All these filters may be fine, well made assemblies, and perhaps they are suitable for use with various fuel pumps on various engines; **However, excepting the very top element which is there for comparison, none of the above belong in any system featuring an Aeromotive fuel pump and certainly not any car, boat, truck, etc. that features an engine worthy of such a pump.**

Contact US

RGA NUMBER REQUIRED FOR ALL RETURNS TO AEROMOTIVE.

To obtain an RGA number, please call (913) 647-7300 and ask for the Returns and Repairs department.

- **Shipping & Returns**
Aeromotive Inc.
10955 Mill Creek Road
Lenexa, KS 66219

General Inquiries and Tech Line: (913) 647-7300

General Email: info@aeromotiveinc.com

Tech Email: tech@aeromotiveinc.com

The Aeromotive Tech Lines are open Monday through Friday from 9:30AM to 5:00PM Central Standard Time.



WARNING: This product can expose you to chemicals, including chromium, which is known to the State of California to cause cancer or birth defects or other reproductive harm. For more information, visit: www.p65Warnings.ca.gov

AEROMOTIVE, INC. LIMITED WARRANTY

This Aeromotive Product, with proof of purchase dated on or after January 1, 2003, is warranted to be free from defects in materials and workmanship for a period of one year from the original date of purchase. No warranty claim will be valid without authentic, dated proof of purchase.

This warranty is to the original retail purchaser and none other and is available directly from Aeromotive and not through any point of distribution or purchase.

If a defect is suspected, the retail purchaser must contact Aeromotive directly to discuss the problem, possible solutions and obtain a Return Goods Authorization (RGA), if deemed necessary by the company. Please call 913-647-7300 and dial option 3 for the technical service dept. All returns must be shipped freight pre-paid to the company and with valid RGA before they will be processed.

Aeromotive will examine any product returned with the proper authorization to determine if the failure resulted from a defect or from abuse, improper installation, misapplication or alteration. Aeromotive will then, at it's sole discretion, return, repair or replace the product.

If any Aeromotive product is determined defective, buyer's exclusive remedy is limited in value to the sale price of the good. In no event shall Aeromotive be liable for incidental or consequential damages.

Aeromotive expressly retains the right to make changes and improvements in any product it manufactures and sells at any time. These changes and improvements may be made without notice at any time and without any obligation to change the catalogs or printed materials.

Aeromotive expressly retains the right to discontinue at any time and without notice any Aeromotive product that it manufactures or sells.

This warranty is limited and expressly limits any implied warranty to one year from the date of the original retail purchase on all Aeromotive products.

No person, party or corporate entity other than Aeromotive shall have the right to: determine whether or not this Limited Warranty is applicable to any Aeromotive product, authorize any action whatsoever under the terms and conditions of this Limited Warranty, assume any obligation or liability of any nature whatsoever on behalf of Aeromotive under the terms and conditions of this Limited Warranty.

This Limited Warranty covers only the product itself and not the cost of installation or removal.

This Limited Warranty is in lieu of and expressly excludes any and all other warranties, expressed or implied. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.