



AEROMOTIVE
Part # 17147 & 17148
86-93 Mustang 5.0L Stealth Fuel System Kit
INSTALLATION INSTRUCTIONS

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.

Installation of this product requires handling of gasoline. Ensure you are working in a well ventilated area with an approved fire extinguisher nearby. Extinguish all open flames, prohibit smoking and eliminate all sources of ignition in the area of the vehicle before proceeding with the installation.

When installing this product, wear eye goggles and other safety apparel as needed to protect yourself from debris and sprayed gasoline.

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.

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

Maximum continuous operating pressure should not exceed 70 psi.

Warning – The included Aeromotive fuel pump is not compatible with alcohol based fuels or fuel additives!

The following steps are typical of most installations:

Section 1 - Fuel Tank Installation

Section 2 – Fuel Rail Installation

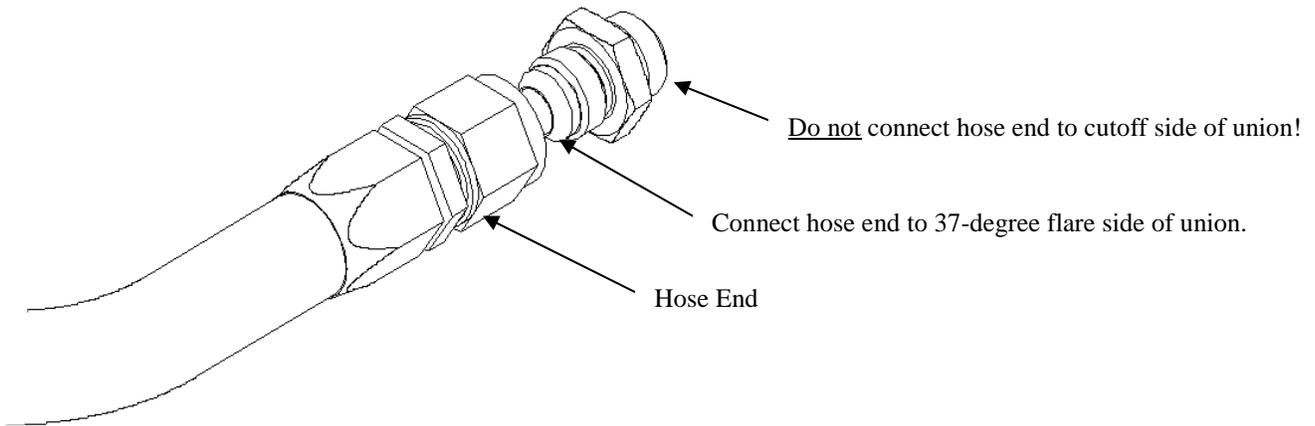
Section 3 – Fuel Regulator Installation and Fuel Line Plumbing

Section 4 – Fuel Line Hose End Installation

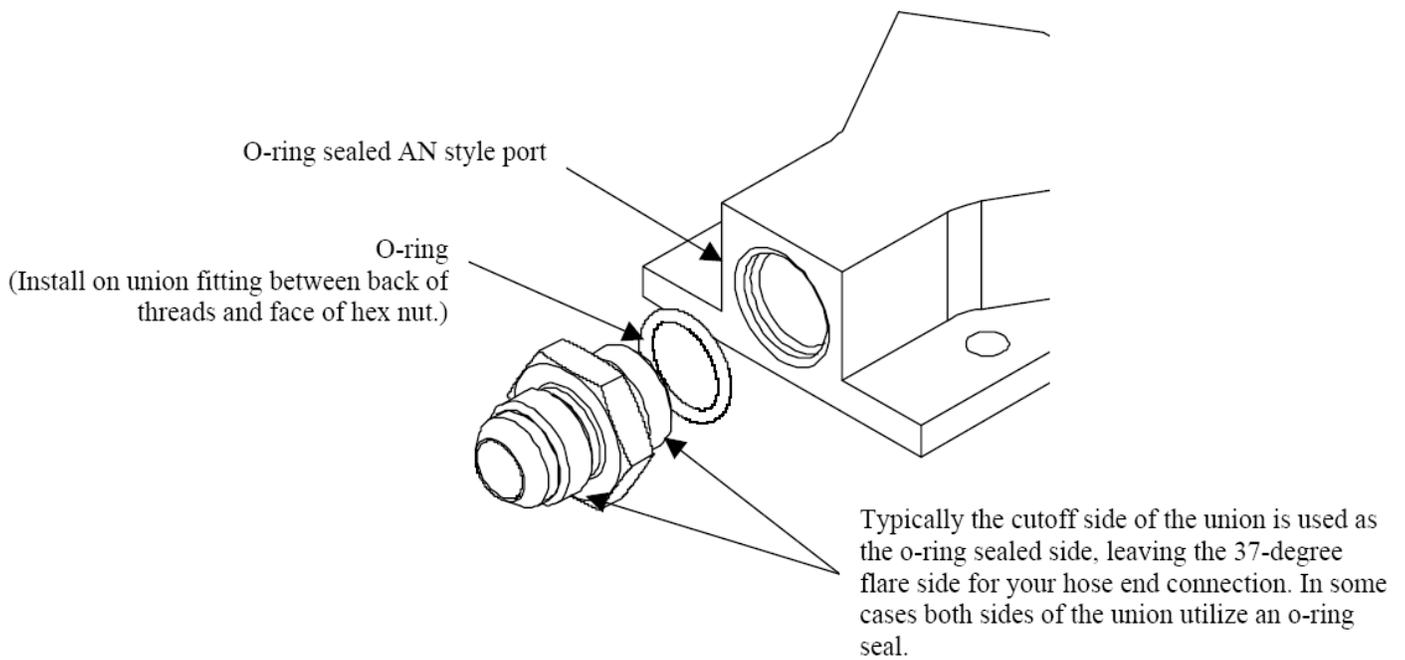
Section 5 – Electrical Installation

Section 6 – Final Checks and System Start-up

Typical hose end to fitting connection:



Typical o-ring sealed port connection:



For example, in some systems an ORB to Flare fitting is used to connect the fuel pump and filter together, in which case you always install the ORB side into the fuel pump and the flare side with O-ring added into the filter.

Section 1 - Fuel Tank Installation:

- 1-1. Once the engine has been allowed to cool, disconnect the negative battery cable and relieve the fuel system pressure.
- 1-2. Raise the vehicle and support it with jack stands.
- 1-3. Referring to the appropriate vehicle service manual for instructions, drain, disconnect any electrical and fuel component connections and remove the OEM fuel tank. The removal of the vehicles exhaust system may be necessary for fuel tank removal.
- 1-4. Once the OEM fuel tank has been removed, remove the plastic fuel tank shield from the bottom of the tank.
- 1-5. Measure the position of the sump on the supplied Aeromotive fuel tank and mark the plastic fuel tank shield accordingly. Using a ½" drill bit, drill the four corners of the sump cutout in the plastic fuel tank shield. Using a small hand saw or reciprocating saw, cut out the remaining area from the plastic fuel tank shield. Once you have completed this step your plastic fuel tank shield should look similar to Figure 1-1.



Figure 1-1

- 1-6. Position the filter bracket on the side of the plastic fuel tank shield opposite the sump cutout. Center the bracket in all directions on the flat. Using the bracket as a guide, mark the two mounting holes. Insure there are no obstructions behind the plastic fuel tank shield and drill two ¼" mounting holes.
- 1-7. The fuel filter should be installed such that when the plastic fuel tank shield is installed the fuel filter outlet is on the driver side of the vehicle. Secure the fuel filter to the plastic fuel tank shield by installing each of the two ¼" socket head cap screws thru the bracket holes and the holes drilled in the fuel tank shield. Install each of the two provided flat washers and nuts on the bolts and tighten. Slide the filter into the bracket and tighten the clamping screw.
- 1-8. Inspect the inside of the plastic fuel tank shield for any sharp edges that could puncture the fuel tank. If any sharp edges are found, correct before proceeding.
- 1-9. Position the plastic fuel tank shield on the Aeromotive fuel tank.
- 1-10. Install one of the supplied AN-10 o-rings on each of two AN-10 cutoff fittings and install one fitting in the pump outlet port located on the driver (left) side of the fuel tank sump and the other in the filter inlet.
- 1-11. Using the two supplied 90-degree AN-10 hose ends as a guide, measure the length of AN-10 steel braided line needed to connect the fuel pump outlet to the fuel filter inlet.
- 1-12. Cut and assemble the steel braided hose and hose ends as shown in Section 4.
- 1-13. Using the above steel braided hose assembly, connect one end to the pump outlet and the other end to the fuel filter inlet and tighten.

- 1-14. Using any type of household tape, secure the plastic fuel tank shield to the Aeromotive fuel tank along each of the fuel tank strap indentations.
- 1-15. Carefully flip the fuel tank / plastic fuel tank shield assembly over.
- 1-16. From the old OEM fuel tank, remove the filler neck rubber grommet, fuel level sender, vent and vent grommet, and wiring harness. Reinstall each of these components in the new Aeromotive fuel tank while inspecting them for any damage. If any of the OEM components are damaged replacement parts are available through your local Ford dealer or auto parts store. See figure 1-2.
- 1-17. Remove the OEM fuel pick up from the OEM fuel tank, inspect the gasket for any damage. Using the OEM gasket install the Aeromotive provided return pick-up block off plate in the new Aeromotive fuel tank.



Figure 1-2

- 1-18. Install the supplied AN-10 o-ring on the AN-10 side of the AN-10 cutoff to AN-06 reducer union, if not already installed, and install this fitting in the AN-10 return port on the sump.
- 1-19. Position the fuel tank under the vehicle, insuring that the retaining rings on the return and fuel level sender are secure. Apply a light weight oil to the filler neck grommet to ease installation.
- 1-20. In vehicles engine compartment, locate a suitable mounting location for the supplied fuel pressure regulator
- 1-21. Starting from the decided regulator mounting location in the engine compartment, plan a route to run an AN-06 return line back to the Aeromotive fuel tank sump return port and measure the required length. Cut the return line to the determined length and install one AN-06 90-degree hose end and one AN-06 straight hose end, as detailed in Section 4.

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

- 1-22. Thread the 90-degree hose end side of the AN-06 return line onto the AN-06 return port fitting located on the Aeromotive sump, and tighten.
- 1-23. As the Aeromotive fuel tank is lifted into position reattach the vent line to the top of the fuel tank and work the filler neck in to the grommet on the side of the fuel tank. Once the Aeromotive fuel tank is in position, align tank straps, ensure that there are not any hoses or wiring pinched and tighten the strap bolts.
- 1-24. Make any line or electrical adjustments necessary to clear the vehicles exhaust, suspension, and drivetrain components.

Section 2 – Fuel Rail Installation

Note: Please note, due to the wide range of applications and varying OEM and after market component tolerances it has been found in a few isolated cases it is necessary to install a 3/8" thick spacer between the upper and lower intake manifolds. This will allow you to gain clearance between the top of the fuel rails and the bottom of the upper intake manifold. These spacers are readily available from your local speed shop or mail order warehouse.

- 2-1. Remove the air intake ducting from the throttle body and position it out of the way.
- 2-2. Note the location of and remove any vacuum lines connected to the upper intake manifold and position them out of the way.
- 2-3. Remove the throttle cable from the throttle body; referring to the appropriate vehicle service manual for the procedure for doing so.
- 2-4. Unplug the TPS sensor, which is typically located on top of the throttle body.
- 2-5. Remove the nameplate on the top of the upper intake manifold by removing 4 screws.
- 2-6. Remove the upper intake manifold bolts (Typically there are 6 of them).
- 2-7. Gently remove the upper intake from the engine. Place clean shop towels into or tape up the lower intake ports to prevent any material from entering the intake.
- 2-8. Carefully clean the old gasket material from both manifolds, while preventing any debris from entering the intake manifold ports.
- 2-9. Check for any dirt or debris around the fuel injectors. If any is evident, wash it off with some solvent parts cleaner or wipe it off with a clean shop towel.
- 2-10. Disconnect the electrical connector at each injector, making note of the location of each.
- 2-11. Disconnect both the supply and return fuel lines from the OEM fuel rails. These lines are attached by a special quick disconnect fitting which requires a special tool for removal. Place clean shop towels around the open fuel lines to catch any gasoline that may drip out and to prevent any dirt from entering the fuel lines.
- 2-12. Remove the vacuum line from the fuel pressure regulator.
- 2-13. Remove the bolts that attach the fuel rail to the lower intake (Typically there are 4 of them).
- 2-14. Place clean shop towels around the injectors to catch any gasoline that may be spilled during their removal. Remove the injectors from the manifold by gently pulling upward on the fuel rail / injector assembly. Keep all injectors connected to the fuel rails. If an injector does pull out of the fuel rail, it may spill a large amount of fuel.
- 2-15. Carefully remove the fuel injectors from the fuel rail.
- 2-16. Inspect the injector o-rings for any sign of damage or cracking. Replace o-rings, if necessary, with OEM replacement parts available from most auto parts stores.
- 2-17. Carefully install the new fuel injector o-rings on the injectors.
- 2-18. Place a thin coat of light oil or petroleum jelly in the fuel rail fuel injector bores and in the lower intake manifold injector bores to help prevent cutting the o-rings during installation.
- 2-19. Carefully place the fuel injectors in the fuel rails. Position the electrical connector on each fuel injector to the opposite side of the fuel rail as the mounting bracket.

- 2-20. Install the fuel rail that has an AN-08 port plug in one of the ends and the center of the bottom on the driver side, with the port plug facing the front of the vehicle. This kit comes with 2 aluminum spacers which get installed between the lower intake manifold and the fuel rail brackets. After insuring that the injectors are properly seated in the intake manifold injector bores, install the driver side fuel rail mounting bolts, insuring that the fuel rail spacers are captured between the fuel rail bracket and the lower intake manifold. In some instances you will need to shim the fuel rail out further to gain clearance between it and the distributor, this can be accomplished by using ¼" flat washers.
- 2-21. Install the passenger side fuel rail, being careful not to cut any of the o-rings during installation (This fuel rail does not require any spacers between the fuel rail bracket and the lower intake).

Section 3 – Fuel Regulator Installation and Fuel Line Plumbing

- 3-1. In the vehicle's engine compartment, mount the supplied fuel pressure regulator in the location established in step 1-26. Using the supplied mounting bracket as a template, mark the bracket mounting holes and drill to accept a #10 screw.
- 3-2. With the bracket attached to the regulator, mount the bracket and regulator to the vehicle using two #10 screws, nuts and lock washers.
- 3-3. Install two of the supplied AN-10 o-rings on the cutoff side of two AN-10 cutoff to AN-08 reducer union fittings, if not already installed, and install in each of the AN-10 ports located on the sides of the supplied fuel pressure regulator.
- 3-4. Install one of the supplied AN-06 o-rings on the cutoff side of the AN-06 cutoff union fitting, if not already installed, and install in the AN-06 port located on the bottom of the supplied fuel pressure regulator.
- 3-5. Install two of the supplied AN-08 o-rings on the cutoff side of two AN-08 cutoff union fittings, if not already installed.
- 3-6. Install one of these AN-08 fittings on the front side of the passenger side fuel rail. On the driver side fuel rail, if there is adequate clearance between the distributor and the fuel rail, install the second fitting on the front side as well, if there is not clearance install the second fitting in the AN-08 port located on the bottom center of the fuel rail.
- 3-7. Starting from the fuel rails, plan a route to run an AN-08 supply line from each fuel rail to each side of the regulator, see figure 3-1. Cut the two supply lines to the determined length and install the AN-08 hose ends, as detailed in Section 4.

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

- 3-8. Using the above steel braided hose assemblies, connect one end to the side of the fuel pressure regulator and the other end to the fuel rails, as shown in figure 3-1, and tighten.

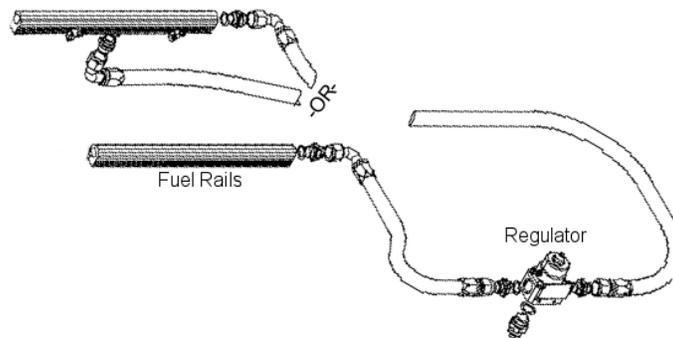


Figure 3-1

- 3-9. In the vehicle's engine compartment, find a suitable mounting location near the fuel rails for the supplied Y-Block, using the Y-block as a template, mark the mounting holes and drill to accept a #10 screw.
- 3-10. Attach the Y-block to the vehicle using two #10 screws, nuts and lock washers.
- 3-11. Install two of the supplied AN-08 o-rings on the cutoff side of two AN-08 cutoff union fittings, if not already installed, and install in each of the AN-08 ports located on the supplied Y-Block. Install one of the supplied AN-10 o-rings on the cutoff side of the AN-10 to AN-08 reducer union fitting, if not already installed, and install in the AN-10 port located on the supplied Y-Block.
- 3-12. Starting from the fuel rails, plan a route to run an AN-08 supply line from each fuel rail to each side of the Y-block, see figure 3-2. Cut the two supply lines to the determined length and install the AN-08 hose ends, as detailed in Section 4.

- 3-13. Using the above steel braided hose assemblies, connect one end to the Y-block and the other end to the fuel rails, as shown in figure 3-1, and tighten.

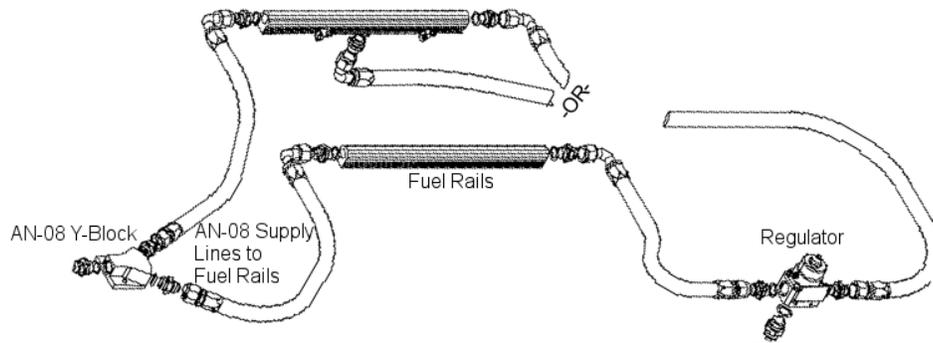


Figure 3-2

- 3-14. Starting from the outlet of the fuel filter, plan a route to run an AN-08 supply line from fuel filter to the Y-block, see figure 3-3, this line should be run along the same route you planned to run the return line in step 1.27. Cut the supply line to the determined length and install the AN-08 hose ends, as detailed in Section 4.

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

- 3-15. Using the above steel braided hose assembly, connect one end to the outlet of the fuel filter. Keeping both the supply line and return line from the Aeromotive fuel tank together, secure both lines to the vehicle along the predetermined route using the supplied tie-wraps. Once both lines are routed, the supply line to the Y-block and the return line to the bottom of the regulator, as shown in figure 3-3, tighten all fittings.

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

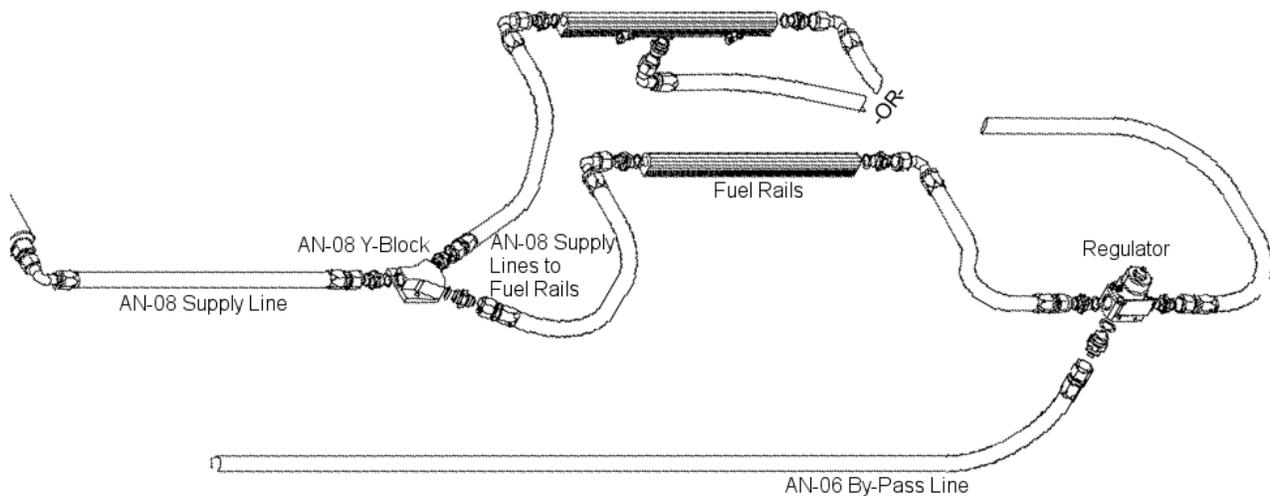


Figure 3-3

- 3-16. Once the regulator is installed, attach the supplied fuel pressure gauge to the 1/8 NPT port on the fuel pressure regulator. Use teflon tape on this connection.

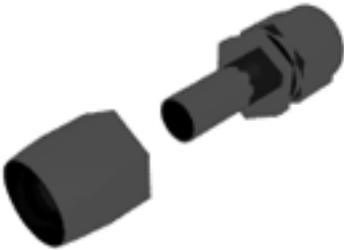
Section 4 - Fuel Line Hose End Installation:

CAUTION:

When assembling this product, wear eye goggles and other safety apparel as needed to protect yourself from debris and sharp edges.

4-1. Wrap hose with masking tape at desired cutoff length. Cut hose through masking tape squarely to desired length using a cut-off machine or a fine tooth hacksaw. Remove the masking tape.

4-2. Unthread the hose socket from the rest of the hose end fitting.



4-3. Insert hose in the socket with a twisting and pushing motion until the hose is fully seated in the socket.



4-4. Using a grease pencil, marker or tape, mark the location of the hose in relation to the hose socket that you just installed.

4-5. Using a light oil, lubricate the inside of the hose and hose end mating parts.

4-6. Carefully thread the hose end onto the hose socket, making sure that the hose does not push out of socket, by observing the mark you placed on the hose in step 3-4.



4-7. Using a properly sized wrench, complete threading the two components together (The maximum allowable gap between the two fitting components is .030 inches).



4-8. Inspect the hose for push out by comparing the mark you made on the hose in step D to the hose end socket location.

4-9. Clean all debris from exterior and interior of hose.

4-10. All lines should be tested to twice their operation pressure prior to use.

Section 5 - Electrical Installation:

5-1. Find a suitable place to mount the supplied relay, the relay is typically mounted by the OEM fuel pump wiring connector (**Never mount the relay inside of the fuel tank or next to fuel tank vents!**). Insure the relay and any associated parts are clear of the exhaust, any moving suspension or drivetrain components and any possible road obstructions or debris.

5-2. Attach the OEM fuel pump wires (These typically are the red and black wires from the OEM wiring harness going to the fuel tank) to relay terminals 85 and 86 using two of the supplied blue female blade connectors (See Figure 5-1 Below).

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.

5-3. Find a suitable location for mounting the supplied circuit breaker. For optimal circuit protection, the circuit breaker needs to be mounted as close to the battery as possible.

5-4. Connect terminal number 30 on the relay to the circuit breaker by using the supplied red 10 ga. wire, one of the yellow female blade connectors on the relay end of the wire and one of the yellow #10 ring connectors on the circuit breaker side of the wire.

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.

5-5. Connect terminal number 87 on the relay to the positive terminal on the fuel pump. This is accomplished by using the supplied red 10 ga wire, one of the yellow female blade connectors on the relay side of the wire and one of the yellow #10 ring connectors (or appropriate connector for the installation) on the fuel pump side of the wire.

5-6. Connect the negative terminal on the fuel pump to a clean chassis ground using the supplied black 10 ga wire and two yellow #10 ring connectors.

5-7. Connect 12VDC to the circuit breaker using the supplied red wire and one of the yellow #10 ring connectors and the supplied yellow 3/8" ring connector.

5-8. Ensure that electrical components and wires are connected properly (See Figure 5-1) and are clear of any moving suspension or drivetrain components and any exhaust components! Protect wires from abrasion and road obstructions or debris.

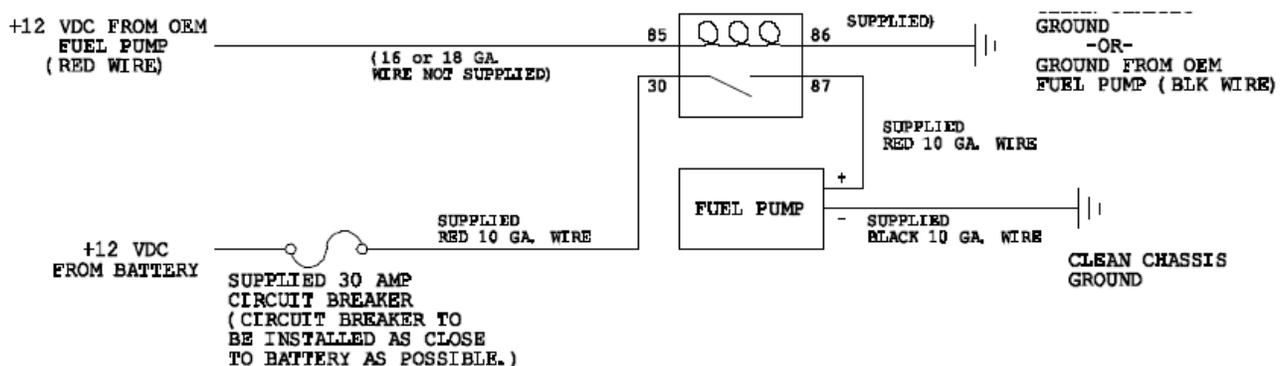


Figure 5-1

Section 6 – Final Checks and System Start-up

6-1. **Ensure that any spilled gasoline and any gasoline soaked shop towels are cleaned up and removed from the vicinity of the vehicle!**

6-2. Carefully lower the car onto the ground.

6-3. Fill the fuel tank with gasoline and check for any leaks in the system, if any leaks are found repair immediately.

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

6-4. Reconnect the battery and turn the ignition to the ON position **WITHOUT** starting the car. After several seconds, check the fuel pressure. If there is no fuel pressure, turn the ignition key to the OFF position, wait one minute, return the ignition to the ON position, and recheck the fuel pressure. Repeat this ignition OFF and ON procedure until the fuel pressure gauge registers fuel pressure.

6-5. With the fuel pressure gauge registering fuel system pressure, check for fuel leaks throughout the entire fuel system! If any fuel leaks are found, turn the ignition key to the OFF position, remove any spilled fuel and repair the leak before proceeding!

6-6. Once the fuel pressure gauge registers fuel system pressure and there are no fuel leaks, start the engine and adjust the regulator to the desired fuel pressure. Turning the adjustment screw clockwise will increase fuel pressure. OEM regulators are typically set at approximately 43 psi, without the vacuum line attached. The fuel pressure adjustment range for this regulator is 35-80 psi.

6-7. Once the desired fuel pressure is achieved, tighten the regulator adjustment jam nut and attach the vacuum line.

6-8. Test drive the car 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)!



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.