



Operating and Installation Instructions

CAUTION!

This product is to be installed only by persons knowledgeable in the repair and modification of vehicle fuel systems and general vehicle systems modification. Only a qualified technician or mechanic who is aware of applicable safety procedures should perform the installation of this product.

GASOLINE AND OTHER FUELS ARE FLAMMABLE AND CAN BE EXPLOSIVE!

Perform the installation in a well ventilated location only to minimize the build up of fuel vapors. **NO** open flames, smoking or other sources of ignition are to be present during installation, to prevent fire or explosion that can cause serious injury or death. Grinding, cutting, and drilling must be performed with care to prevent ignition. Draining and removal of all fuel and ventilation of vapors in vehicle and fuel system is recommended when performing such procedures. Proper eye and personal protection is required at all times during installation.

WARNING!

The Vehicle's fuel system may be under pressure! Do not loosen any fuel connections until relieving all fuel system pressure. Consult an applicable service manual for instructions to relieve fuel system pressure safely.

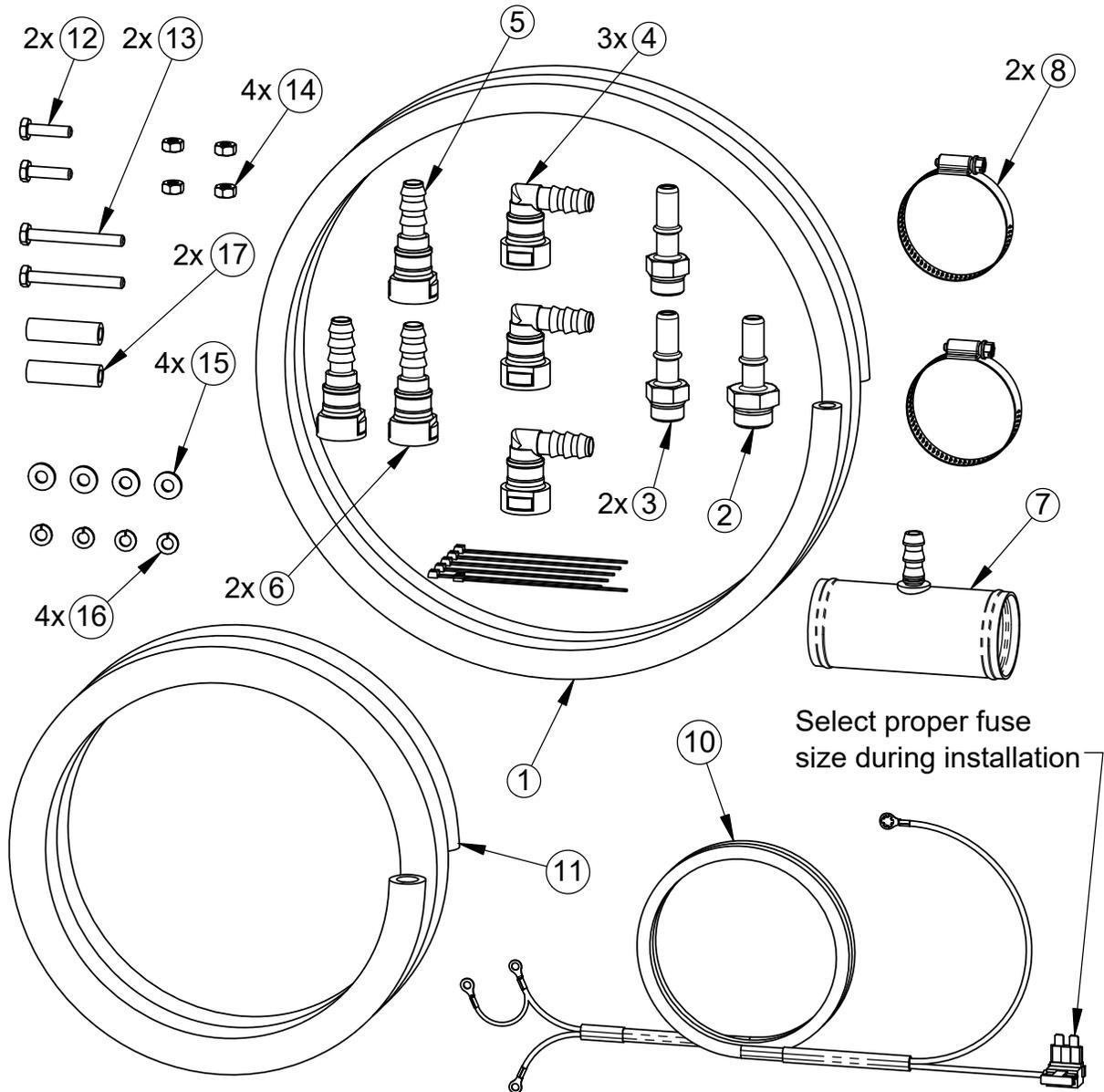
Application:

This Installation Kit is intended to work with Fuelab® Velocity Series 200 Fuel System, Model 30304. Consult instructions included with Fuelab® Velocity Series 200 Fuel System, to complete this set of instructions pertaining to the use of this Installation Kit. This Installation Kit is also intended to be used for replacement of OEM lift pump systems that are originally installed on vehicle. This kit applies to GM Duramax® Diesel Vehicles, between and including the years of 2011-2016. If this Kit is not correct, please contact your Fuelab® distributor immediately for replacement or selection of an appropriate Installation Kit.

Product Contents:

Verify the contents of this box, against list of components below and on the next sheet, to ensure that nothing is missing. Contact your Fuelab® distributor immediately for replacement. You may have extra parts left over after installation since Fuelab® has included extra parts for all years of the application described. While this kit is designed for designated vehicles, vehicle manufacturers routinely change production components, even during the same production year. Please contact Fuelab® if the particular vehicle has different descriptions or components that are incompatible as described within these instructions.

ITEM	P/N	Description	Qty
1	39708	Fuel Line, 1/2" , Superflex	19'
2	10ORB8QC	10 ORB x 08 MQC	1
3	8ORB8QC	08 ORB x 08 MQC	2
4	FQC890PL	1/2" Push-lok® 90°	3
5	FQC118PL	11.8 MM x 1/2" Push-lok® Strait	1
6	FQC8PL	08 FQC x 1/2" Push-lok® Strait	2
7	FNR24	Filler Neck Return 1-1/2" with 1/2" MQC	1
8	CL32	Filler Neck Clamp	2
9	CBT6	Cable Ties, Nylon 5"	6
10	EPH17-3-2	Extended Pump Harness, with two fuse adapters	1
11	CBLW	Optional Use Convuluted Cable Wrap	11'
12	92865A008	Short Mounting Bracket Bolt (1/4"-28)	2
13	91247A018	Long Mounting Bracket Bolt (1/4"-28)	2
14	95462A505	Mounting Bracket Nut (1/4"-28)	4
15	90126A029	Flat Washer (1/4")	4
16	91102A750	Locking Washer (1/4")	4
17	STC	Bracket Standoff	2



Check above photo and list shown on previous page, to ensure no components are missing or damaged. Contact your Fuelab® distributor immediately for replacement.

Some items listed in these instructions are included in Lift Pump / Filtration System, sold separately (reference sheet 1, under Application).

FOLLOW ALL INSTRUCTIONS HEREIN AS WELL AS INSTRUCTIONS INCLUDED WITH THE LIFT PUMP / FILTRATION SYSTEM. BOTH SETS OF INSTRUCTIONS CONTAIN IMPORTANT INFORMATION!

The most difficult step of the installation procedure is removing the vehicle's fuel tank (this step may not be required for all vehicles). With very little room between the top of the fuel tank and the Bed of the vehicle, it may be difficult to get the fuel lines disconnected. Make sure that the fuel tank is as empty as possible. Even at approximately 1/8th of a tank of fuel, a substantial amount of fuel is still inside. Drain as much as possible! The installation may also be performed with the Bed of the vehicle removed, without the requirement of tank removal. If the tank requires drilling during modification however, the fuel tank **MUST** be removed from the vehicle and completely drained of **ALL FUEL**. For fuel connections using pipe threaded fasteners (tapered threads or non o-ring or flare connections), use Teflon® tape. On connections using Tapered Ends, or Fittings using O-rings, **DO NOT** use Teflon® tape.

In addition to typical professional automotive tools, items you may want to ease the installation, that are not included with this Installation Kit are:

Heat gun or hair dryer and a small amount of oil, to lube the fittings and soften the fuel line for the Push-lok® fittings. Additional items that would be helpful include box cutter or shears for the fuel lines and an air source to blow out all the fittings and hoses. A few extra small to medium size hose clamps can also help (**DO NOT** over-tighten worm gear style clamps) as well as additional Cable Ties.

Step 1: Inventory all of your parts with the included packing list. Lay out the parts to verify that everything is included (see diagram on previous sheet as well as Contents List on the first sheet). Also inventory and lay out all parts of the Lift Pump / Filtration System (sold separately, shown below – Reference Model 30304).

The System Bracket (item S2) attaches to the Lift Pump / Filtration System (item S1) as shown below. Fuelab® recommends attaching the System Bracket to Lift Pump / Filtration System after System Bracket is installed. Front Rail Bracket (item S3), Rear Rail Bracket (item S4) and Mounting Hardware (items S6, S7, S8 and S9) are not used from the Model 30304 System. Dry-fitting your system with System Bracket (explosion view available in companion instructions) is recommended first, to ensure desired system location against crossmember, prior to final assembly.

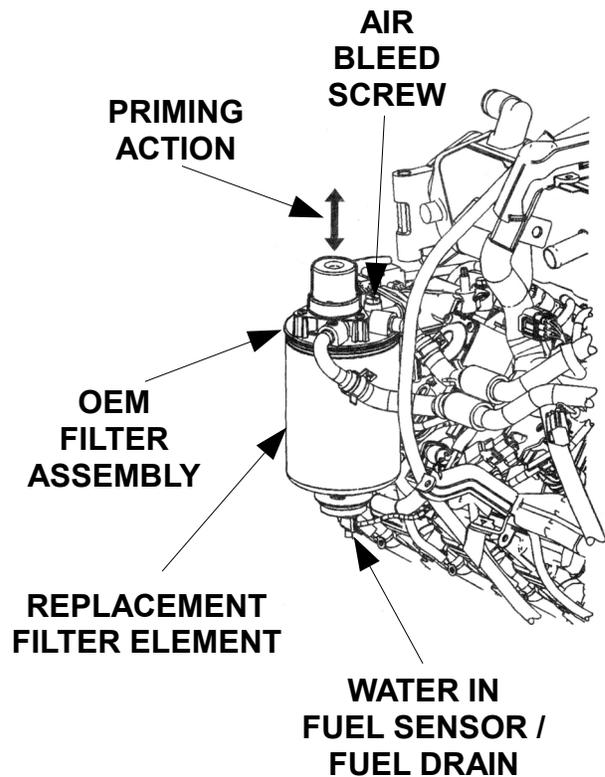
Loctite® 242 thread adhesive (item S14) can be used on the Bracket Mounting Hardware (items S5, S10 and S13). The thread adhesive is supplied with Lift Pump / Filtration System.



Getting to Know the Vehicle

Most Duramax Trucks originally were not equipped with lift pumps. The CP3 Injection Pump draws fuel through the OEM Filter Assembly. The OEM Filter Assembly is along the side of the engine, towards the rear. The figure to the right shows the OEM Filter Assembly and its features. Maintenance of the filter system includes occasionally draining of water (contaminated fuel) at the drain, located at the bottom of the Filter Assembly as well as Filter Element replacement. The Filter Assembly includes a hand pump on top of the assembly that allows a "manual priming" of the fuel system after Filter Assembly maintenance.

Some vehicle's fuel systems have had modifications that include the addition of an aftermarket fuel lift pump as well as additional Filters added. Inspect the engine compartment for additional filters, fuel lines as well as inspect for the presence of the OEM Filter Assembly. Under the vehicle, along both Frame Rails, inspect for an aftermarket lift pump assembly or additional aftermarket fuel filter assemblies.



OEM FUEL FILTER ASSEMBLY FEATURES

Plan for Build

ANY aftermarket lift pump assembly that has been installed MUST be removed from the vehicle. The OEM Filter Assembly can be retained for use; however the following procedure (filter replacement) will have to be performed during installation:

- Unplug the Water in Fuel (WIF) Sensor Electrical Connector.
- Remove the lower, outer casing of the Filter Element using a filter or strap wrench, loosening the Filter Element from the Filter Assembly.
- Loosen and remove Air Bleed Screw from Filter Assembly.
- Loosen the Water in Fuel (WIF) from the Filter Element.
- Use ONLY a new replacement Filter Element.
- Using new o-ring, re-install the Water in Fuel (WIF) Sensor into the new Replacement Filter Element.
- Re-Install the Replacement Filter Element to the rest of the Filter Assembly.
- Re-Plug the Water in Fuel (WIF) Sensor Electrical Connector.
- Use hand pump in Filter Assembly to draw fuel from the rest of the fuel system until the fuel comes out of the Air Bleed Screw Port. Re-Install Air Bleed Screw.

The installation of the Fuelab Lift Pump / Filtration System can also be performed retaining the Fuel Line from underneath of the vehicle leading to the OEM Filter Assembly (on installations retaining the OEM Filter Assembly).

While retaining the use of the Filter Assembly can be a convenience for plumbing, Fuelab does not recommend the use of additional aftermarket filter assemblies due to possible performance shortcomings.

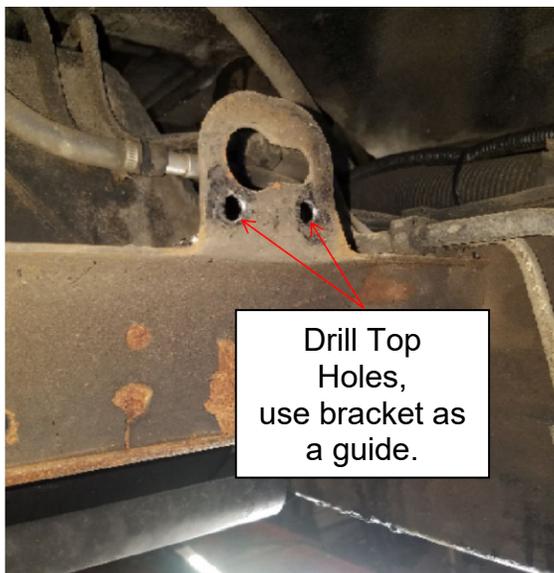
Inspect Fuel Module (on top of fuel tank) for signs of troublesome corrosion or rust. Replace module if rusted fuel connections are noted, especially during installation of this lift pump system. Rusted fuel connections may cause leakage of fuel from vehicle, as well as cause air leakage into the inlet circuit of the fuel system preventing fuel starvation, poor priming capabilities and possible main injection pump or engine damage.

Step 2: Disconnect the Vehicle's Battery (or batteries, as diesel trucks typically have more than one) by disconnecting the Negative or Ground Terminal(s) of each Battery to disable the Vehicle's Electrical System.

Step 3: Loosely attach the System Bracket (item S2) to Lift Pump / Filtration System (item S1) using Cap Screws (items S5). Follow the companion instructions for proper assembly orientation. For convenience, the Wiring Harness (item 10) can be attached to the Lift Pump / Filtration System, prior to final installation (reference Step 11, of these instructions). Be sure to note proper wiring polarity, otherwise permanent damage to Lift Pump will result.

Step 4: Locate area for mounting the Lift Pump / Filtration System. The Lift Pump / Filtration System normally mounts on the crossmember from the vehicle's frame, in front of the Fuel Tank. Placing the Lift Pump / Filtration System into position as a dry-fit (such that the thread adhesive is not being used, and the fasteners are loose) can be helpful, to determine the desired adjustment position of the bracket system as well as determining the desired placement along the vehicle's frame. Multiple height positions are possible by attaching the System Bracket through using the different hardware positions of the Front Rail Bracket. **DO NOT** position to where the Lift Pump / Filtration System can rub against the vehicle's body. Use grease pen or other marking methods to indicate the desired bracket position on the crossmember with bracket. Remove System off of vehicle and remove System Bracket from Lift Pump.

Drill two holes in the crossmember as shown using the System Bracket (item S2) as a guide. Install hardware after first two holes drilled, then use the System Bracket as a guide locating the next two holes. Install Hardware (items S10, S11, S12 and S13) using Stand Offs (items 14) as shown in the pictures, below.



Install Male Quick Connects (Items 2 and 3) onto Lift Pump / Filtration System. **Special Note:** Each fitting being attached to the Lift Pump / Filtration System MUST use an O-ring to seal the connection against the Pump. Use small amount of oil or diesel fuel on O-rings prior to installation of fittings into pump.

Install the Lift Pump / Filtration System (item S1) onto the System Bracket (item S2) using Screws (items S5) with using Thread Adhesive (item S14) on the threads. Tighten Screws.



Disconnect the QD fitting at the top of the tank, this may require a special quick disconnect tool. Remove line. Attach the 11.8 MM quick connect (item 5) to one end of the supplied fuel line (item 1) and attach to the tank connection routing the fuel line to the front of the tank. Route the fuel line from the tank to the inlet side of the Straining Filter (item 13) and use a another small segment of fuel line from the outlet of the straining filter to the inlet of the Lift Pump / Filtration System (item S1) inlet leaving enough slack for installation and cut to length, a loop

around the pump is recommended for smooth transition. The printed arrow **MUST** point toward the Lift Pump / Filtration System noting the proper flow direction through the Straining Filter. Two Worm Drive Clamps (items 12) may be used to secure the Fuel Line to the Straining Filter. Install a 1/2" 90° quick connect (item 4) onto hose and attach to pump inlet.

Remove the OE fuel line from the tank to frame exposing the male quick connect fitting. Measure from the fitting to the pump outlet. This may require a gentle loop in the line for a smooth kink free transition. Cut and install two QC 90's (items 3) on to the hose and attach.



Cut filler neck line (shown left) and install filler neck adapter and clamps (shown below). Measure Distance between the filler neck QC and the pump return QC leaving enough for a smooth transition. Install one 90° QC fitting (item 4) and one straight QC fitting (item 6) and install return line section of fuel line.



Pump inlet (top),
return line
(bottom).

Step 5: Secure the wiring harness and fuse (Item 10) in the engine bay. **DO NOT** make the final connection of the power lines at this time. This will be your last step before starting the vehicle.

Route the wiring harness (Item 10) along the driver side frame rail and secure with Cable Ties (Items 8).

Connect the supplied wiring harness (Items 8) to the Lift Pump / Filtration System as described.

Connect the two black connectors to the speed control center yellow terminal of Lift Pump and black negative (-) terminal of Lift Pump. Connect the red wire to the Red (+) terminal of the pump.



Connect the three harness wires to pump as shown, right. Route harness up to the fuse box and install the fuse tap. Install the ground wire.

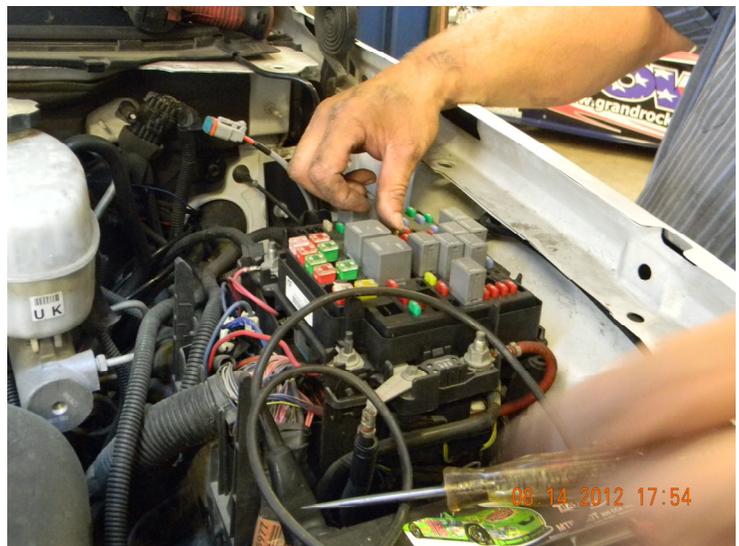
SPECIAL NOTE: Attach the thinner *pig-tail* black wire to center yellow terminal as shown. Also note that two different Fuse System Taps are provided. Choose the proper size for your application and plug into harness.

Tighten snugly, but do not over tighten the ring terminals with the supplied washers and nuts.

DOUBLE CHECK! Reverse polarity can result in a permanently damaged fuel pump, be sure to correctly attach the harness per the color coded scheme.



Proper Fusebox Tapping Consult the next sheet to determine the proper position, tapping of the fuse and determination of the proper fuse location. Use the next sheet of instructions to determine which fuse to use and how to determine the proper fuse tap position.

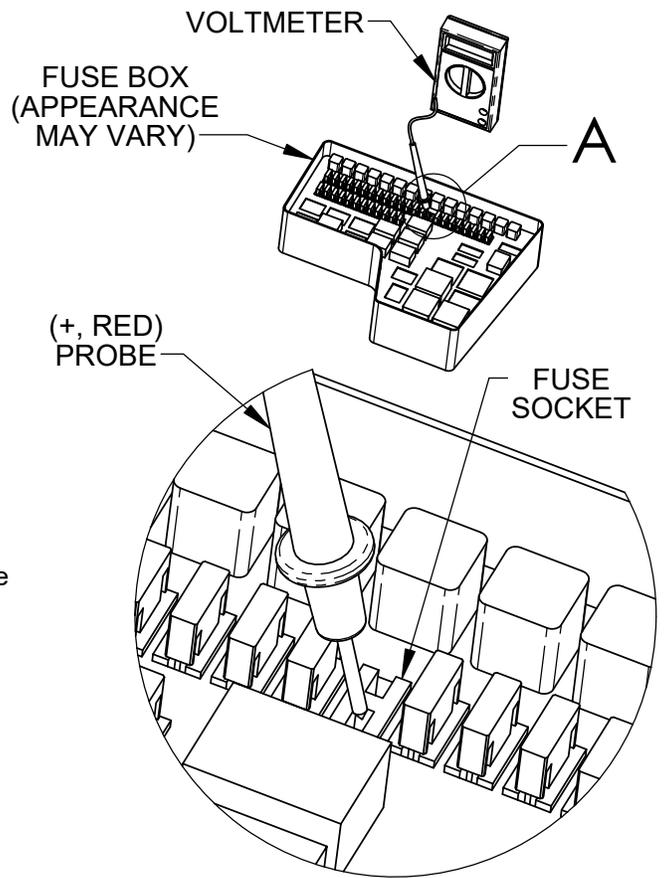


Topic: Finding proper Fuse Position, Socket Power Side and Fuse Tap Orientation

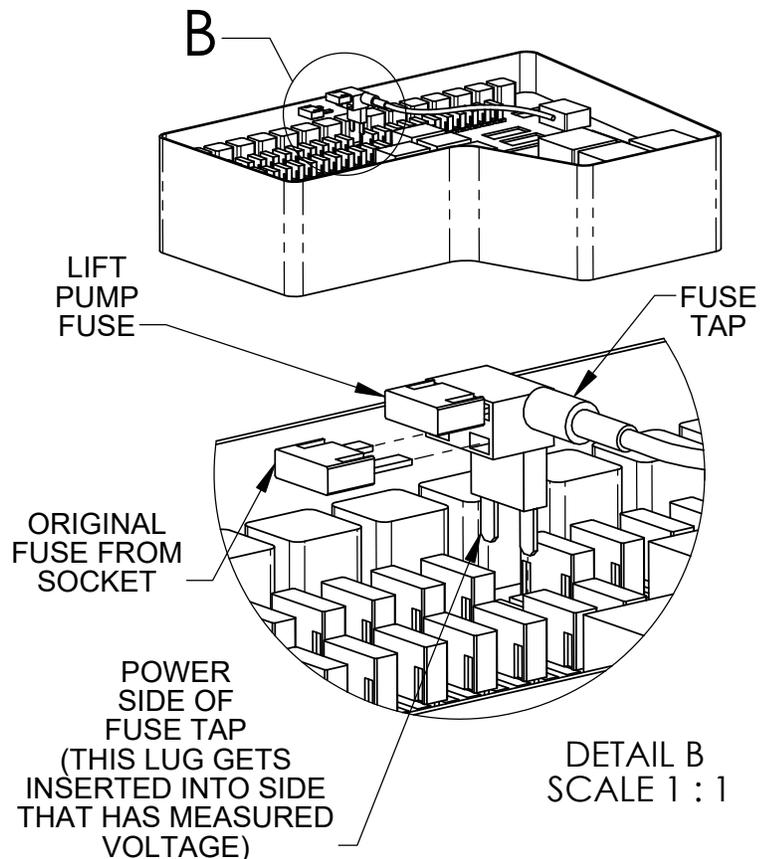
This kit uses a Fuse Tap Assembly in the wiring harness, to allow a power tap from the Under-Hood Fuse Box to power the Lift Pump / Filtration System.

A Test Light or Voltmeter is required to determine the proper orientation of the Fuse Tap. Use the (Positive - Red) probe of the Test Light or Voltmeter to determine the "Power Side" of the Fuse Socket. For the proper leg of the Fuse Tap to be referenced, place probe into one side of the Fuse Socket, while the other Probe (Negative – Black) is placed firmly against a good grounded metal surface. If the probe size is too large, a small straitened paperclip can be used to help establish readings. Check the following conditions before installing the Fuse Tap:

- Check Door or Lid Label for Fuse Block, to verify the correct location of the Fuse (see list above).
- Remove Original Fuse from the Socket, using Fuse Pulling Tool or Needle Nose Pliers.
- With Ignition Key in the "OFF" position, does either side of the Fuse Socket have voltage? If voltage is measured, then look for alternate location, as voltage indicates the wrong operating behavior and therefore is a wrong Fuse Position.
- With Ignition Key in the "ON" position, does either side of the socket have voltage? If no voltage is detected, then re-inspect test equipment and proper Fuse Position. If voltage is measured, then note which side (of the two positions) had measured voltage. This side will be considered to be the "Socket Power Side". When inserting the Fuse Tap, note that the "Power Side" of the Fuse Tap must be inserted into the Socket Power Side to have the proper Fuse Tap Orientation. **SPECIAL NOTE:** Ignition Key may have to be cycled (OFF-ON-OFF) while observing the Voltmeter or Test Light, as power may be intermittent (depending on the actual circuit being tested).
- Note the Fuse and position of the fuses within the Fuse Tap (bottom fuse is the original fuse removed from the socket, while the "upper" fuse is the fuse for the Lift Pump).



DETAIL A
SCALE 1 : 1



DETAIL B
SCALE 1 : 1

Step 6: The Fuel Line (Items 1 and 2) and Push-lok® fittings (PO188 and PO166) are very tight. Use a small amount of oil on the fittings and use a heat gun to soften the fuel lines slightly, to fully seat them.

Additional hose clamps (not supplied) at the Push-lok® connection points can be used, however is not necessary. Additional Cable Ties (items 8) may be helpful in securing wire harness or fuel line as needed.

The Lift Pump / Filtration System has its plumbing ports labeled, as well as these parts are shown in supplied instructions from the Lift Pump / Filtration System. If routed efficiently, approximately 1' of fuel line will remain after installation.

Run the fuel supply line (Item 1) along the frame rail and up to the injection pump. Use Cable Ties (Items 8) or line clamps (not supplied) as necessary; make sure the lines are secured away from the steering shaft.

Step 7: Disconnect the factory fuel supply line and install the Push-lok® fitting, Push-lok® adaptor and fuel supply line.

Step 8: DOUBLE CHECK the fuel lines, to make sure the tank straps are tight, the fill tube and overflow tubes are reconnected.

Step 9: Connect the power/ground wire to the battery and the bulk of the installation should be complete.

Be sure to fill the fuel tank of the vehicle with at least two gallons of fuel. If fuel system is operating (during starting) but Lift Pump / Filtration System does not build pressure, then additional fuel may be required to add to the fuel tank.

Before the first crank, cycle the key to run 3 times to attempt to prime the Lift Pump / Filtration System. When attempting to start, the engine may operate momentarily and die. This is due to the fuel left in the fuel rail and injection pump. Several attempts may be required to successfully start the engine (driving out initial air in the system). Filling the filter with diesel can make the priming process quicker, in order to start the engine faster.

Check for leaks after running for five minutes at all connections and pump, if no leaks are found, Road test the vehicle for proper performance.

The pressure adjustment screw is factory preset. The pressure adjustment screw can be adjusted for a slight variation in pressure. The Lift Pump / Filtration System has an 1/8"-27 NPT gauge port for auxiliary gauge or auxiliary pressure switch use (not supplied, a plug is already installed in this port).

For racing applications **ONLY** (exceeding 600 Horsepower), higher flow rates from this Lift Pump / Filtration System are possible. At the higher pump speed, the Fuelab® Vortex Manifold may not regulate the fuel pressure adequately, requiring an external bypass style regulator such as the Fuelab® Model 50101 Adjustable Bypass Regulator. Additional modification of the OEM fuel tank and additional wiring requirements (including aftermarket electrical relay) is **REQUIRED** for this mode of operation. Contact your Fuelab® Dealer for more information pertaining to higher horsepower support using this product.

LIMITED LIFETIME WARRANTY

FUELAB, a division of FCP, Inc., having its principal place of business at **1605 Eastport Plaza Drive, Suite 125, Collinsville, IL 62234, USA** ("Manufacturer") warrants its **FUELAB** products (the "Products") as follows:

1. Limited Lifetime Warranty

Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship from the date of purchase for so long as the original purchaser owns the Products. This Limited Lifetime Warranty does not extend to any subsequent owner or transferee of the Products. If the Products do not conform to this Limited Lifetime Warranty during the warranty period (as herein above specified), Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer's satisfaction that said defects are covered by this Limited Lifetime Warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this Limited Lifetime Warranty, Manufacturer shall, at its option and own expense, furnish replacement Products or replacement parts for the defective Products or refund the purchase price. Removal of Products from vehicle, shipping to Manufacturer and installation of the replacement Products or replacement parts shall be at purchaser's expense. (*Vehicle means any automotive, bike or marine transportation device powered by an internal combustion engine to which the Product is attached. This Product is **NOT** intended or designed for use on aircraft, experimental or otherwise.*)

2. Other Limits

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. This Limited Lifetime Warranty does not cover any damage due to: (a) transportation; (b) storage; (c) improper use; (d) failure to follow instructions for the Products or to perform any preventive maintenance; (e) modification; (f) unauthorized repair; (g) normal wear and tear; or (h) external causes such as accidents, abuse, or other actions beyond Manufacturer's reasonable control. This Limited Lifetime Warranty also does not apply to Products upon which repairs have been effected or attempted by persons other than pursuant to written authorization by Manufacturer. This Limited Lifetime Warranty is not extended if we repair or replace the Products.

3. Exclusive Obligation

THIS LIMITED LIFETIME WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall at its option be to repair or replace the defective Products in the manner and for the period provided above or to refund the purchase price. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise.

4. Other Statements

ORAL OR OTHER WRITTEN STATEMENTS BY MANUFACTURER'S EMPLOYEES, REPRESENTATIVES AND/OR RESELLERS DO NOT CONSTITUTE WARRANTIES, SHALL NOT BE RELIED UPON BY BUYER, AND ARE NOT A PART OF THE CONTRACT FOR SALE OR THIS LIMITED LIFETIME WARRANTY.

5. Entire Obligation

This Limited Lifetime Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Lifetime Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

6. Warranty Service

How Do You Get Service?

If something goes wrong with your Product, contact FUELAB at 618-344-3300, or send an e-mail with proof of purchase to: info@fuelab.com for a Return Authorization Number (RMA). After receiving your RMA send the product postage paid, fully insured, with a brief written description of the problem to:

FUELAB Warranty Department, 1605 Eastport Plaza Drive, Suite 125, Collinsville, IL 62234

We will inspect your Product and contact you within three business days of receipt to give the results of our inspection and an estimate of the labor and/or parts charges required to fix the Product, if applicable. If covered under this Limited Lifetime Warranty, Manufacturer will repair or replace the Product and return it to you at no cost or refund the purchase price. If the Product is NOT covered under this warranty and if you authorize repairs, we will return the repaired Product to you COD, or prepaid via credit card, within three business days. If we find no issues with the returned product and it meets all performance specifications, there will be a \$25 charge to cover technician labor and inspection time. Additional return shipping charges will apply. We will return the repaired Product to you COD, or prepaid via credit card, within three business days.

Limitation of Liability

THE REMEDIES DESCRIBED ABOVE ARE YOUR SOLE AND EXCLUSIVE REMEDIES AND OUR ENTIRE LIABILITY FOR ANY BREACH OF THIS LIMITED LIFETIME WARRANTY, OUR LIABILITY SHALL UNDER NO CIRCUMSTANCES EXCEED THE ACTUAL AMOUNT PAID BY YOU FOR THE DEFECTIVE PRODUCT, NOR SHALL WE UNDER ANY CIRCUMSTANCES BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL OR PUNITIVE DAMAGES OR LOSSES, WHETHER DIRECT OR INDIRECT.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.