

# BOE Fabrication

## “Surge Tank”

### Installation Notes

**Note to Installer/User:**

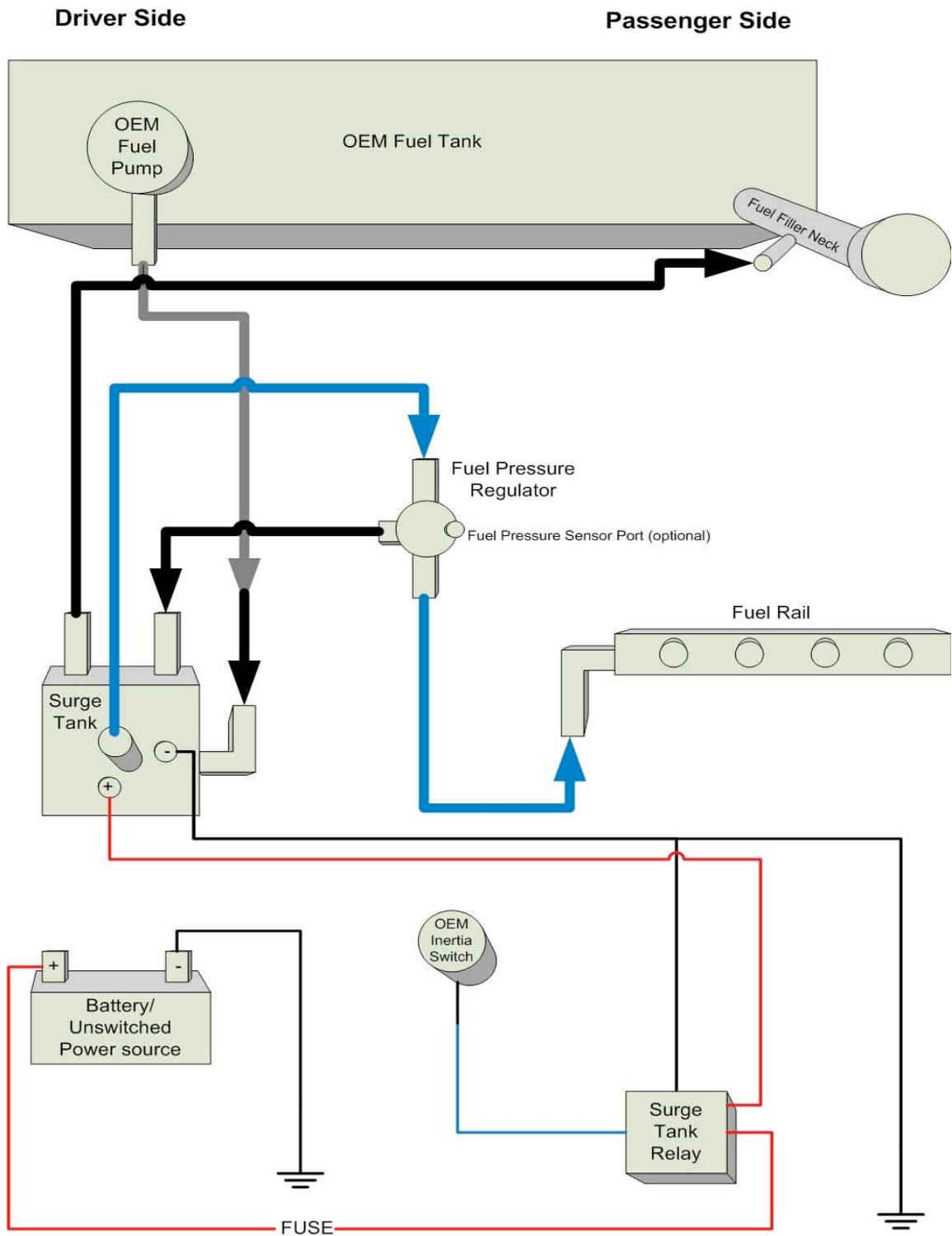
Examine this product before and after installation. If at any point you're not satisfied that this product will live up to the intended purpose, then please return the product to us for a full refund.

Given the above, upon installation and use of this product, you're acknowledging that you accept responsibility for the design, manufacturing, and use of this Surge Tank and absolve BOE Fabrication, LLC and its affiliates of any implied liability associated with use of this Surge Tank. Please contact us with any questions prior to use.

This set of instructions is broken up in to 6 parts:

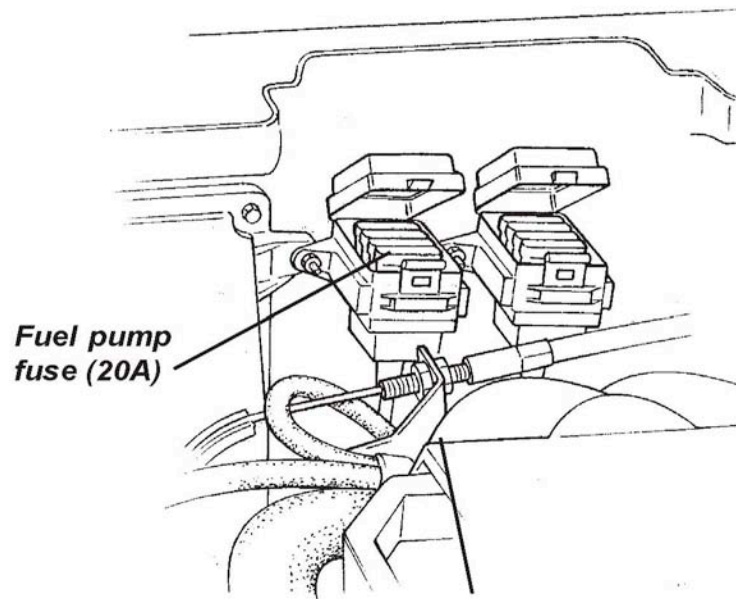
- I. Vehicle Preparation- 20 minutes
- II. OEM Fuel Line- 10 Minutes
- III. Install Overflow Tap and Line-1 Hour
- IV. Installing the Electrical Relay-20 minutes
- V. Installing the Surge Tank-15 minutes
- VI. Connecting the final fuel Lines-30 minutes

First- Take a moment to study the diagram below to garner a better understanding of how the system is plumbed and hoses/wires are routed. The blue and black in the illustration is an accurate representation of the blue and black plumbing that came with your kit.



## I. Vehicle Preparation

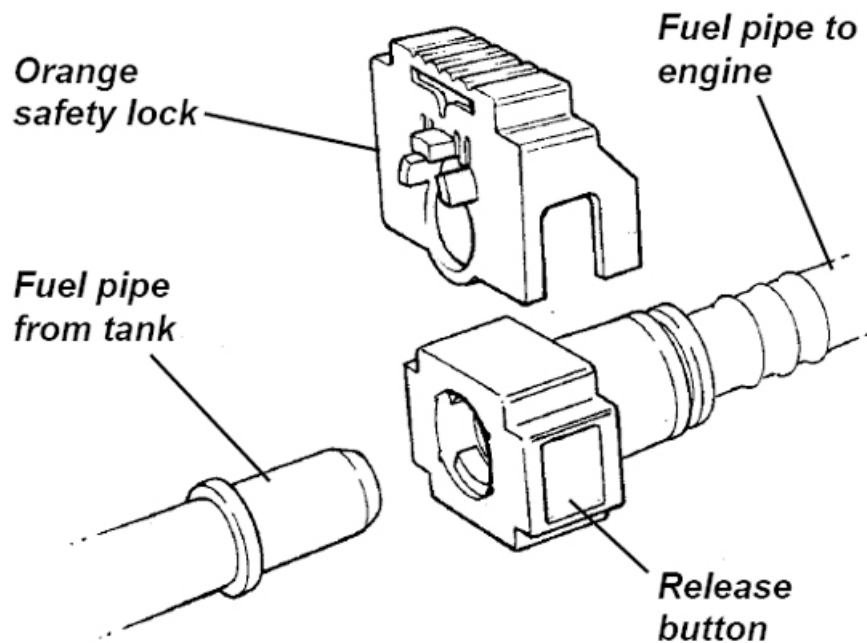
- a. Jack up car and remove both rear tires/wheels and fender liners.
- b. Place stands under the car for support
- c. Remove the only 20amp fuse in one the engine compartment fuse boxes (on the firewall to the right of the ECU). This will disable the fuel pump circuit.



- i.
- d. Start car and let it die on its own. This will take some of the pressure out of the fuel system.

## II. Removal of OEM Fuel Lines

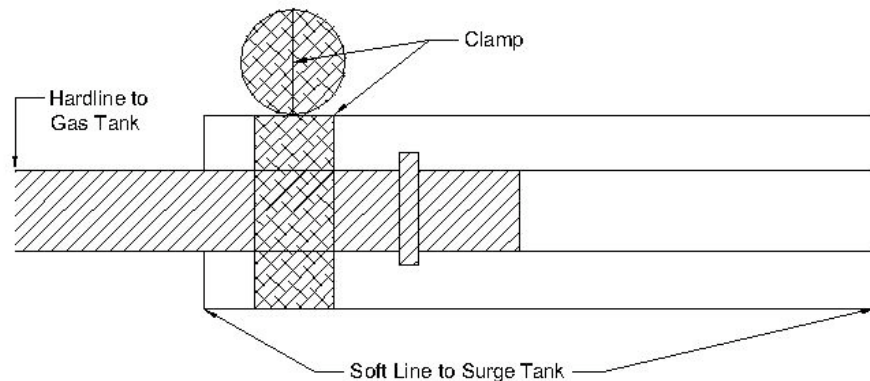
- a. First Remove the OEM fuel line at the frame rail. The quick connect here only requires you pushing in the thumb tab on the fitting to release the lock. **BESURE** to wrap a rag around this fitting as you're removing it as there will be a fair amount fuel that will drain out and it will be initially under pressure!!



- b.
- c. Now remove the line at the Fuel rail. This is a simple operation that requires a special tool available at most auto parts stores for a few dollars.



- d.
- e. Use the above special tool to remove the quick connect fuel line at the fuel rail. Again, have a rag handy to keep fuel drainage to a minimum...
- f. Locate the short BLACK fuel hose with an open end and a 90 degree AN fitting on the other.
- g. Install this line on the now open frame side plastic line. You may need to apply a bit of grease on the line for easier installation. Use a supplied worm-drive clamp to secure the soft line onto the hard line. It is **VERY IMPORTANT** that the clamp and soft line go on the hard line **PAST** the rib in the line. That rib in conjunction with the worm-drive clamp will ensure that the soft line will not dislodge over time.
- h. Use illustration for reference:



### III. Installation of the Over-Flow "T" and Over-Flow Line

- i.
  - a. Note- This will be one of the more difficult steps on the Elise if the clam is in place. It IS DOABLE, just be patient. The Exige has more room to work.
  - b. Access the filler neck soft line. To do this, tilt the clam up, remove the clam, or access through the wheel opening. If the latter, remove passenger side rear wheel/tire and fender liner. You'll need to disconnect and remove the EVAP solenoid from the rollbar support to make adequate workroom. You may need to temporarily zip-tie other lines out of the way as well while you're working.

- c. Remove the filler neck. There are several ways to do this. One way is to simply remove the M8 bolt that retains it. The preferred tool for this is a ratcheting wrench. The securing bolt is high up on the roll bar hoop and faces the firewall. Once that bolt is removed, simply loosen the worm-drive clamp that is holding the filler neck to the soft filler line and pry the filler neck out of the fuel door opening... Again, this step is difficult but very doable if you take your time.
- d. Now, with the filler neck out of the way, bend the soft line out and mark your spot to cut as shown. You're going to cut a couple inches down from where the worm drive clam was. See pic...



- e.
- f. Then cut the section off.



- g.
- h. Be sure you have removed the OEM worm-drive clamp, as we'll use it in a bit.

- i. Slide on one of the large supplied worm-drive clamps and then insert the BOE T- fitting with the fitting facing the Driver's side of the car, parallel to the firewall.



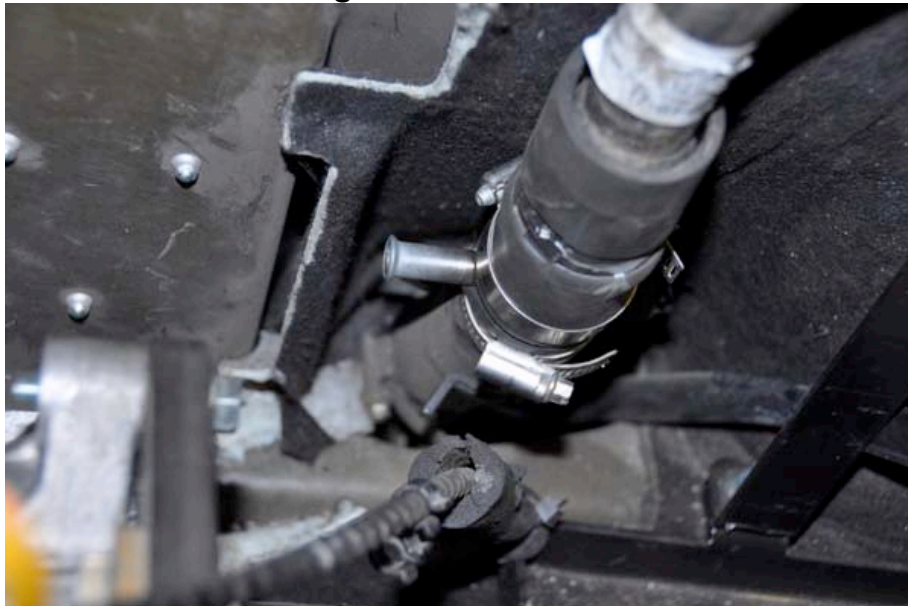
j.



- k.
- l. (The Fitting above may differ if appearance slightly from the one in your kit)
- m. With the fitting seated as far down in the soft line as possible, tighten the worm-drive clamp fully.
- n. Cut about one half inch out of the bit of softline that you cut off earlier as shown.



- o.**
- p.** Fit the now trimmed soft line over the T fitting and attach securely with a supplied worm drive clamp.
- q.** You should now have fully reconstructed filler neck so you can reinstall the assembly using the OEM worm-drive clamp to clamp the soft line back on the metal filler neck.
- r.** Once reassembled, double check that all clamps are tight. It should look something like this.



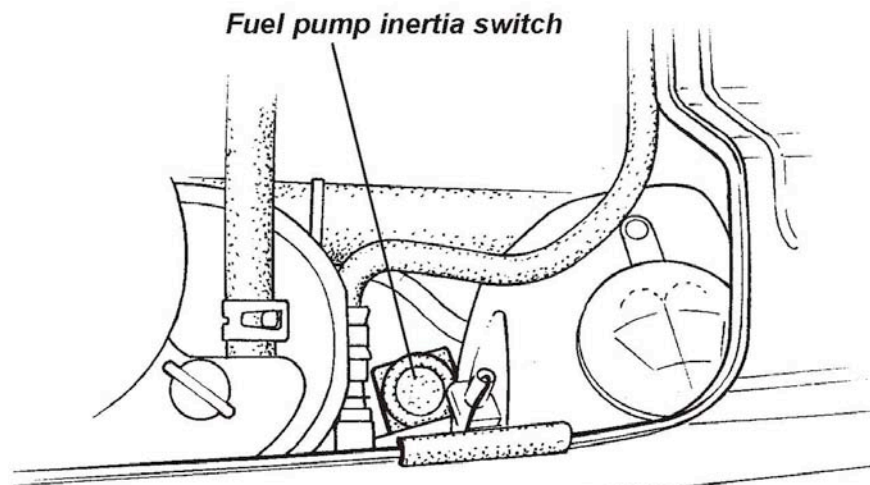
- s.**
- t.** Use the long BLACK over-flow line supplied in the kit and the small worm drive clamp to fix the line to the T. Run the line against the fire wall and route it to the area that the surge tank will be mounted (driver's side roll bar support)



u.

#### **IV. Install the Electrical Relay**

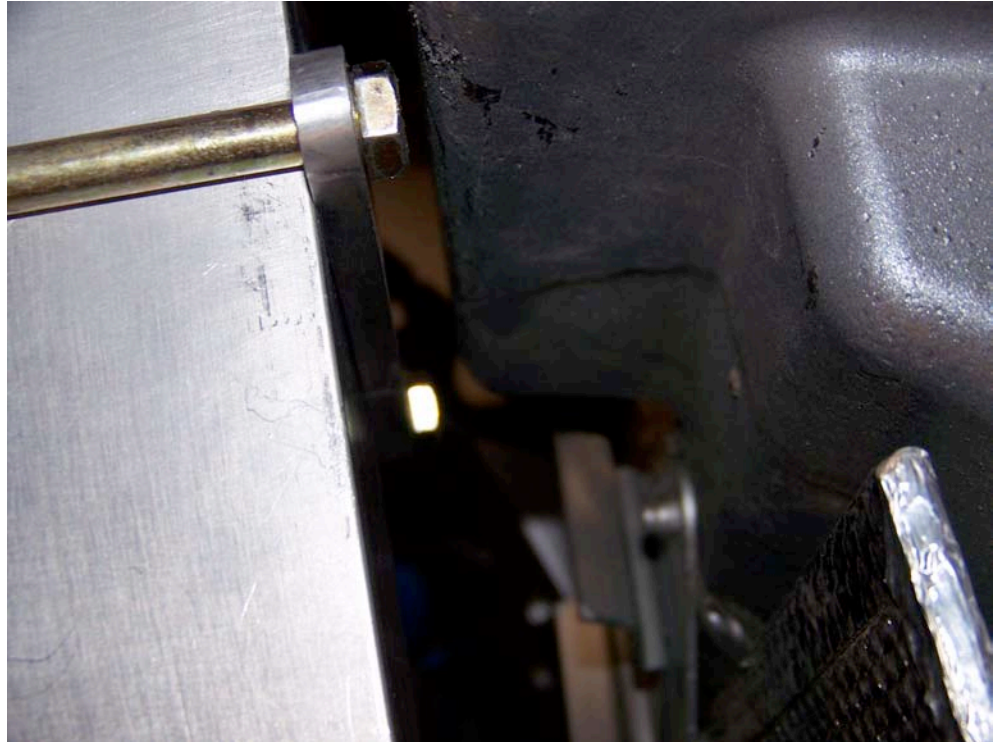
- a. Most of your work will be done through the driver's side wheel opening.
- b. Pay attention to how your wires are routed for a clean install. You will ultimately use a zip tie to secure the relay to a place of your choosing.
- c. You'll find the relay is an ultra heavy duty, industrial quality unit, that is weather tight and shock resistant. The relay is disassembled as shipped. Leave it this way until all wiring is complete so you can easily check your circuits. Once the relay is assembled/closed, it's difficult open back up.
- d. The supplied relay should be pretty well marked. The relay's BLUE wire has a flying lead that needs to be SPLICED into the inertia fuel pump kill switch. The switch is a little black button that is located on the inside of driver's side frame rail-- Approximately under the washer fluid tank. Using a method of your choice, you need to TAP into the BLACK wire. This step will ensure that if you're in a car wreck, your surge tank fuel pump will shut off just as the stock pump will. This is an important safety measure.



- i.
- e. Next, connect the fused wire to the Battery or other NON – SWITCHED hot location such as the junction block below the ECU, back of the alternator, etc. It is important that this hot wire go to a non-switched location as it will draw a large amount of power and needs a dedicated feed.
- f. Attach the black wire with the larger eyelet terminal (marked chassis ground) to one of the M8 chassis bolts located near the base of the roll bar support.
- g. The remaining two wires WILL go to the surge tank. They will not be connected until later in the installation.
- h. Check your connections for continuity. If all looks good, fix the relay to the connector, clean up your wire routing and fix the relay to a secure location with zip-ties.

## V. Install the Surge Tank

- a. Locate the Surge tank mount. Loosen the bolt in the mount so that the two offset halves can move freely against each other and so that they can form a perfect cylinder.
- b. Now slide the assembly into the top of the vertical rollbar support tube so that the flat of the mount is facing the rear of the car. Slide it all the way down so that the mount is flush.
- c. Tighten the mount with the bolt on top of the mount snugly for now.
- d. Slide the surge tank into the mounting area as a test fit so that you can see how things will look. It will be close quarters with the rear of the clam. The surge tank is oriented with the two side-mounted fittings facing the FRONT of the car. The single fitting on the side should be facing the engine.
  - i. Notice the bolt orientation. To clear the clam:



ii.

- e. Locate the BLUE pressure side hose. It has 2, 90 degree fittings and should be marked as such.
- f. Remove the tank from the mounting area and fix the pressure side hose to the tank. Tighten fully while making sure that the hose is pointing forward as it sits in the car.
- g. Attach the both electrical leads to the tank from the relay. **Positive RED, goes to BRASS**, and Negative BLACK goes to the silver terminal. Tighten the terminals snug, but do not over-tighten them. They are small bolts and will strip or break if you're not careful. Be sure that your RED wire is not in a position to touch anything grounded/metal. It is VERY VERY important that RED→BRASS, BLACK→SILVER.
- h. Now fit the tank back up into its mounting area.
- i. Using the two bolts/nuts and the mounting bar, fix the tank in place with it sitting as low as possible with fitting bungs nearly resting on the mount. It should look something like this:



j.



k.

- l. Tighten the nuts fully. It's OK for backing strap to deflect a bit when tight.
- m. Now tighten the top mounting bolt fully. Don't over-tighten it, just good and snug. The tank should feel secure not turn from side to side

**VI. Complete Fuel Line Installation: IMPORTANT: Tight fittings are paramount to avoid leaking or vibrating loose. HOWEVER, you should always hold the contra fitting to the one you're tightening to avoid stripping out the soft aluminum!**

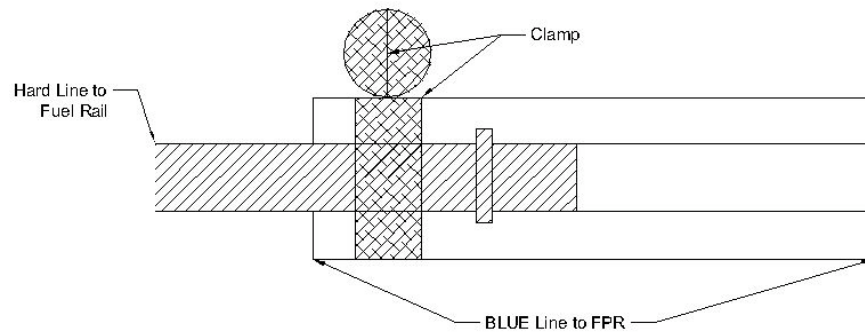
- a. The High Pressure lines are all BLUE (The installation pictures lack the BLUE lines, so please keep that in mind).
- b. At this point you should have a small supply line attached to the hard line on the frame rail. Attach the fitting to the surge tank securely just as you see in the picture above. Be sure your hose clamp is tight and the hard line is not kinked. You may need to trim the soft line to a shorter line to ensure that

the hard line is not getting kinked. It is important that fuel can flow freely!

- c. Attach the BLACK FPR (Fuel Pressure Regulator) return line to the surge tank. The fitting to use in the inboard most fitting. Attach the straight fitting to the surge tank and route the line with 90 degree fitting to just inboard of the coolant tank.
- d. Route the BLUE Pressure line coming from the top of the surge tank over to just inboard of the coolant tank as well.
- e. Fetch your FPR and attach those two lines with the return line fixing to the bottom of the regulator and the High pressure BLUE line going to the fitting facing the front of the car- similar to as shown below (Remember the pics have all black lines, where you have blue high pressure and black low pressure lines):



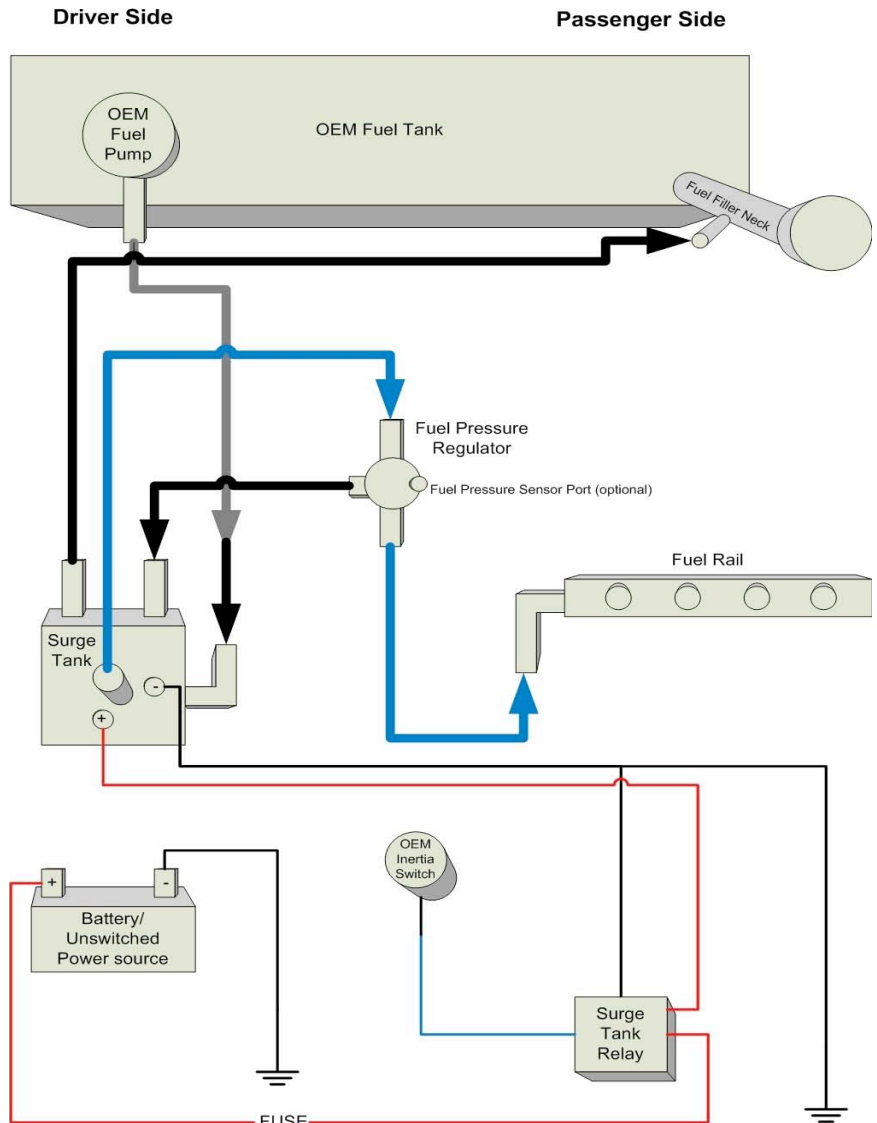
- f.
- g. Now ensure that all of your fittings are directionally oriented in a natural way and that the fitting are tight. **Tight fitting are IMPORTANT. It is IMPORTANT that you hold the opposing fitting with a wrench while tightening the contra fitting.**
- h. Mount the FPR using the existing bolt as seen above.
- i. Locate the short BLUE line with a straight AN fitting and an open end.
- j. Slide a worm drive clamp onto the open end of the line.
- k. Grease the fuel rail fitting.
- l. Use a heat gun or hair dryer to warm the blue line to the point that it is hot.
- m. Slide the BLUE line onto the rail connector **PASSED** the rib on the hard line and place the clamp passed the rib as well. The fit is **TIGHT**, so grease and a warm/hot fuel line are important for easier fitment. **ONLY APPLY HEAT to the soft line NOT THE FUEL RAIL!!!!**



- n.
- o. Now, attach the Blue soft line to the rear facing (and only remaining) AN fitting on the FPR. Tighten the fitting as you have before.
- p. Finally, attach the Over-Flow Line to the outboard side fitting on the surge tank.

**At this point you're basically done. You need to do the following in the order below:**

- i. Double Check all fittings for being tight!
- ii. Recall that this diagram summarizes the install



- 1.
- iii. Double check that your relay is install and there's a good fuse in the fuse holder supplied
- iv. Double Check your Wires are tight on the surge tank
- v. Install the 20AMP fuse your removed earlier
- vi. Cycle the key 5 times, listening for your fuel pumps to cycle each time. You should hear the tone of the new pump slow down as the system pressurizes.
- vii. Check for leaks.
- viii. Check for leaks again.
- ix. Start the car.
- x. Adjust your Fuel Pressure by tightening or loosening the hex bolt on top of the regulator. The nut is to lock your pressure in, so be sure to loosen the nut first and then tighten the nut when complete. Most will NOT USE the vacuum reference, so leave it open or capped off. Your base FP should be about 47 psi at an idle. Always adjust the FP while the car is idling- IMPORTANT. (NOTE- Due the nature of the Adjustable FPR, your pressure will bleed down upon shutting the car off, so

**the system will have to prime every time you start the car. To ensure fast starting, you should pause for 1-2 seconds after turning the key to the on position before cranking to ensure the system has primed for the best results a starting.**

- xi. If everything looks good, Put your car back together and go for a drive to bring everything up to temperature. 15 minutes should do.**
- xii. Return to your garage and recheck ALL fittings, clamps, and wires. You're dealing with your fuel system, so it pays to be double and triple check everything.**
- xiii. Enjoy!**