“Ghetto Turbo Install Manual”

Installing the Ghetto Kit for the Suzuki Hayabusa

Parts in included in Kit…

Polish alum intake/silicon hose
Air cleaner
Stainless header
38mmTial Waste Gate
FMU BEGI
3 Billet fuel rail inserts
Oil feed Line
Charge tube (Polished)
Oil drain line
Vac hose
Boost & Fuel Gauges (Carbon Fiber Look by Auto meter)
Check valves
Fuel pump
EFI fuel hose
Dump Pipe & Wastegate Pipe
Manifold straps
Mits turbo custom made

Special Tools Required:

1.) 23/32 drill bit – for fitting in oil pan
2.) ball end 6mm allen wrench – for exhaust header
3.) silicone for fittings (Permatex Ultra Black or equal)
4.) 15amp fuse (should already have extra one in fuse box)
5.) 6mm tap for blocking Pair (Air Supply) System
   ~ i.e. emission system and 4 - 6mm x ½ long bolts
6.) 2" box hole drill bit for gauge holes

Optional parts not supplied:

1.) Mobil Synthetic 15W-50 Motor Oil (Red Cap) or equal recommended.
2.) Oil Filter
3.) Anti-Freeze

if you do not want to re-use your existing gaskets...

4.) oil pan gasket
5.) exhaust gaskets
6.) clutch cover gasket
7.) fuel rail rubber gaskets (6)

1.) Preparing bike for install, remove the following...

a.) Bodywork
   side panels, underbelly fairing, gas tank, upper inner fairings
b.) Pair (Air Supply) System and disregard.
   tap and use 6mm bolts to block openings
c.) air box and disregard (remove air sensor first)
d.) exhaust system and disregard
e.) remove oil cooler, brackets and oil lines and disregard
f.) remove radiator
g.) remove clutch line support bracket (leave line connected)
h.) remove oil pan
i.) remove throttle bodies

2.) Replace 10amp fuse for "FUEL" with 15amp fuse.

3.) Install Heavy Duty Clutch Springs.

4.) Modify Oil Pan for oil return line from Turbo by drilling a 23/32 hole on the left front side. Remove any metal shavings and install fitting facing front of bike. Apply silicone to threads of fitting first (typical for all threaded fittings). Re-install Oil Pan.

5.) Remove Oil Plug (reducer) behind Oil Filter using 8mm allen. Re-install new oil filter.

6.) Remove Oil Sending Unit and install tee fitting for oil feed to Turbo. Re-install Oil Sending Unit on end of tee fitting.

7.) Install Oil block off plates (2).

8.) Re-Route 5/16" radiator hose from top of thermostat housing to the right side of bike.

9.) Install Exhaust Header.

10.) Install Turbo with supplied gasket.

11.) Install fittings on Turbo and oil pan (from step #4). Install 1/2" (black) oil return line (cut length to fit without any kinks/bends). No clamps needed with these fittings.

12.) Install steel-braided oil feed line from tee (from step #6) to Turbo.

13.) Install flange for wastegate. No gasket.

14.) Install dump pipe. No gasket.

15.) Install Tail wastegate. No gasket.

16.) Install wastegate pipe. No gasket.

17.) Re-install radiator.

18.) Remove inner fairing brackets (2) that are attached to inside of frame.

19.) Install Up-Pipe. Start with Plenum (intake manifold) side and snake up between engine and frame. Install rubber boot with clamps between Turbo and Up-Pipe.

20.) On throttle Bodies, remove 4 screws holding Fuel Rail. Install rubber gaskets on supplied Fuel Rail inserts (tees). Replace Fuel Rail inserts (3) with these. Re-install Fuel Rail. Note: on 99-00 models, remove fuel pump and bracket. Cut power wires with connector (to be used with new fuel pump).

21.) Re-install Throttle Bodies. Loosely place supplied clamps on intake boots first. Tighten clamps. Note: on 99-00 models, Remove TPS & flip it over for clearance of up-pipe.

22.) Re-connect throttle & choke cables.

23.) Install wastegate vacuum line from back of compressor wheel to the back (closer to header) of Tial wastegate. Other fitting on wastegate not used.

24.) Install air filter on Turbo.

25.) Install brass fittings (3) to fuel rail inserts (from step #20).

26.) Install rubber boots on Plenum with clamps.

27.) Install Plenum. Do not tighten clamps yet.

28.) Re-install right inner fairing bracket. Disregard left bracket since up-pipe is in the way.

29.) Install Plenum tie-down straps (4). Using the lower left tie-down bolt to also fasten Barometric Sensor & Map Sensor to inner frame.

30.) Tighten clamps on Plenum and Up-Pipe.

31.) Install check valve (blows outward towards atmosphere) by inserting tee in Map Sensor line.

32.) On 01 & up models only. Remove sending unit from gas tank. Remove wires. Remove Fuel Pump. Remove Fuel Pressure Regulator on top of sending unit.

33.) Connect power wires to new Fuel Pump. Connect Fuel line from new Fuel Pump to right Fuel Rail insert tee (from step #20). Clamp Fuel Pump to lower right tie-down strap.

34.) Install Fuel Line from left Fuel Rail insert tee (from step #20) to supplied Fuel Gauge. Mount where desired.

35.) Install Fuel Line from middle Fuel Rail insert tee (from step #20) to supplied Fuel Pressure Regulator. Fittings need to be installed on Fuel Pressure Regulator.

36.) Install check valve from throttle bodies to Fuel Pressure Regulator.

37.) Mount Fuel Pressure Regulator to frame.

38.) Install gas tank and re-connect fuel lines.

39.) Re-connect clutch line support bracket.

Before starting bike...

- **check oil level**
- **check radiator fluid level**
- **use only 91 octane or higher gasoline**

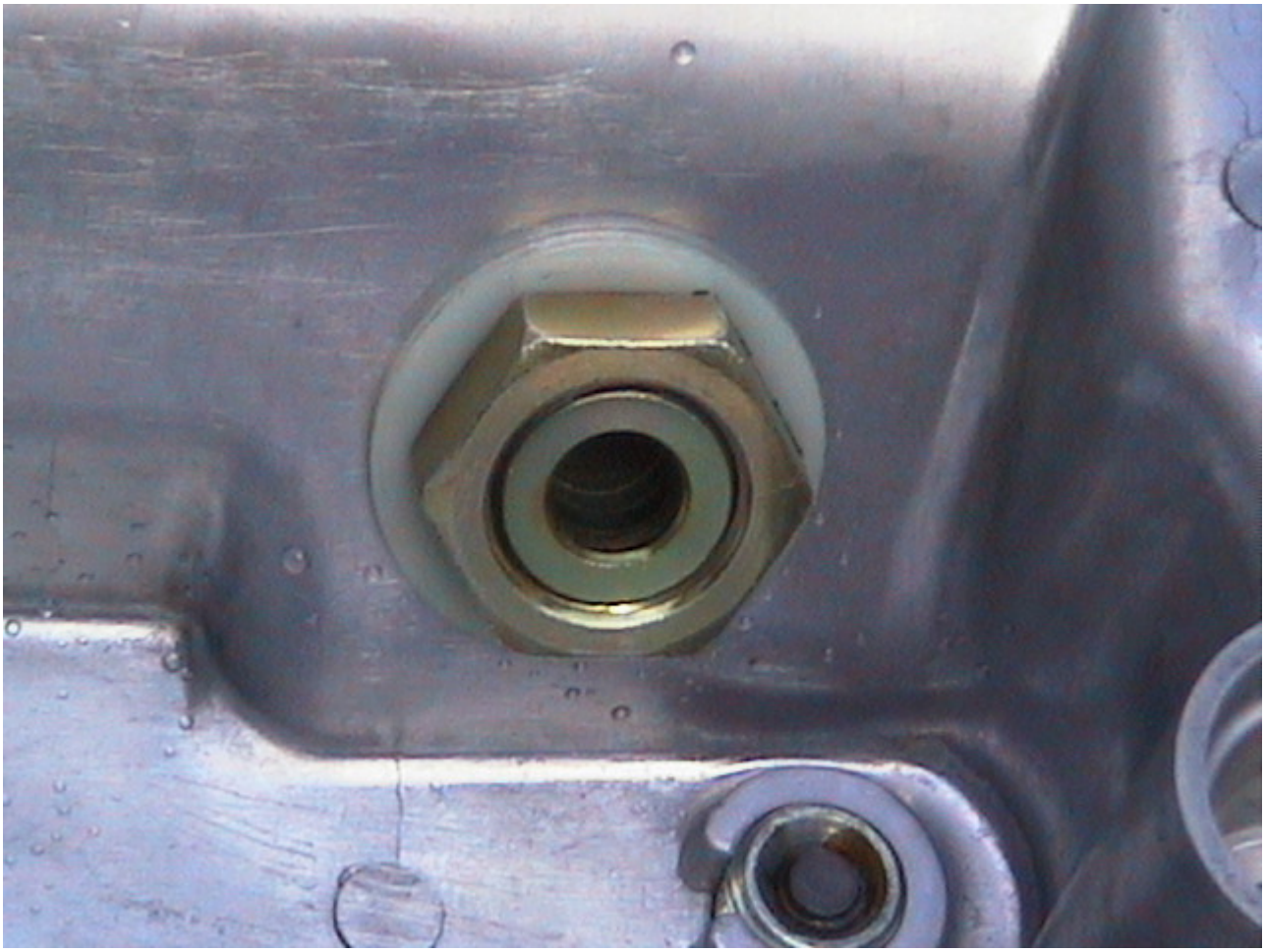
*** Disconnect battery ***

1. Remove the bodywork side fairings, underbelly fairing, upper inner fairings, and gas tank (which requires removing the front seat)
2. Remove the PAIR system if still equipped, and install either blockoff plates, or tap the holes in the head and screw in 6mm bolts. PAIR is gone for good, discard.
3. Remove entire airbox from throttle bodies, but take the map sensor off of it-we need that still.
4. Remove the complete exhaust system, it will not be used.
5. Remove the oil cooler, both lines for it, and the brackets-they will not be used.
6. Drain and remove the radiator
7. Remove the clutch line support bracket, but leave the hydraulics connected. The line will need to be moved for up pipe fitment.
8. Drain oil and remove the oil pan.
9. Remove the throttle bodies off of the head, leaving the intake boots in place.
10. Replace the stock 10amp fuse for the fuel pump with the spare 15 amp which is in the fuse box, located to the left of the gauges, under the trim panel.

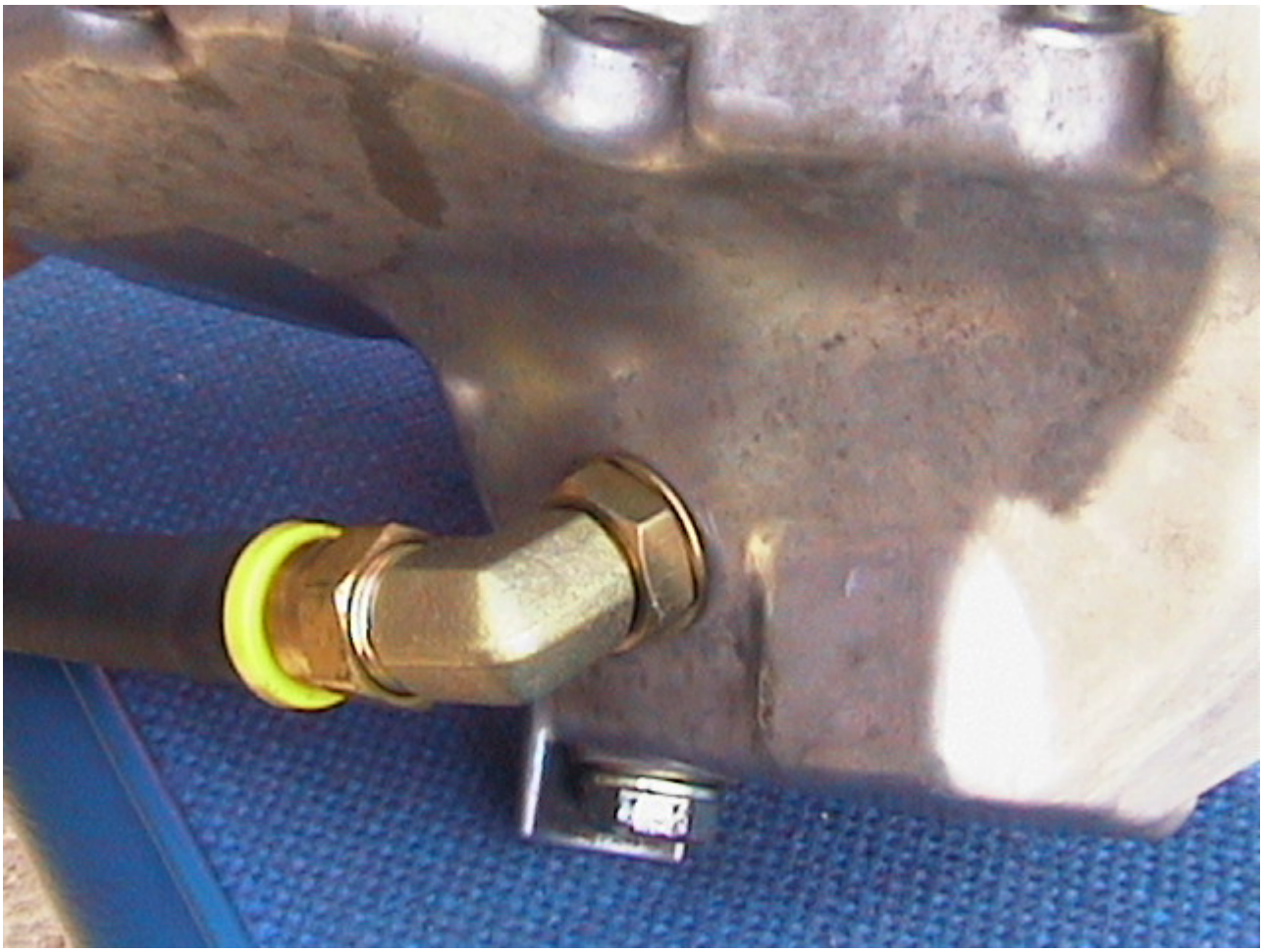
* Install heavy duty clutch springs, sold separately.

NOTE: This is for a 02 Busa; the procedures for the fuel pump mods are different for the 99 and 00 models. Sorry, but I have no info for those models.

* Ok, here we go. The first thing to do is modify the oil pan. Drill a 23/32 hole in the left side of the oil pan (left as in sitting on the bike), making sure to get it in the right position. The fitting should have a flat surface to seal on, inside and out. Refer to pics. I think I actually used a 3/4 bit. Just make sure it's not too big. This will not be a tapped or threaded hole; the fitting should slide right into the pan. In the first pic, you're looking at the inside of the pan. There is a large plastic washer sealing the fitting. Also, put some silicone gasket maker on the threads, lightly, to seal the threads.



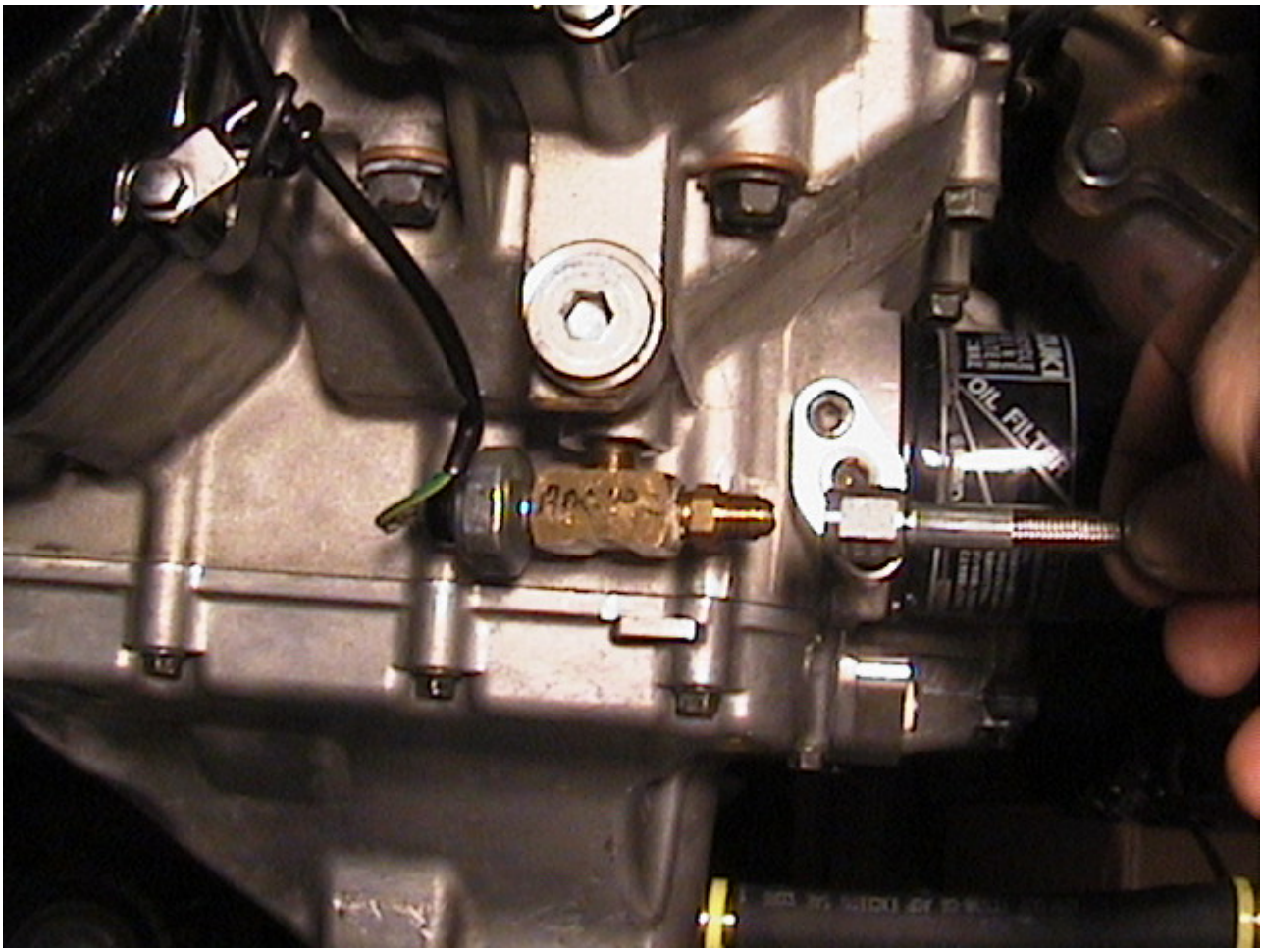
* In the second pic, you'll see the fittings you need for the outside. They are rather large, as the oil return line from the turbo is big. There is an o-ring sandwiched between the fitting and the oil pan. Once the pieces are in place, tighten it pretty tight. You should be able to grab it, and not turn it easily by hand. The male end should be level and pointing toward the turbo. Don't worry about the hose yet, it'll go on later. Reinstall the oil pan.



IMPORTANT!!!!

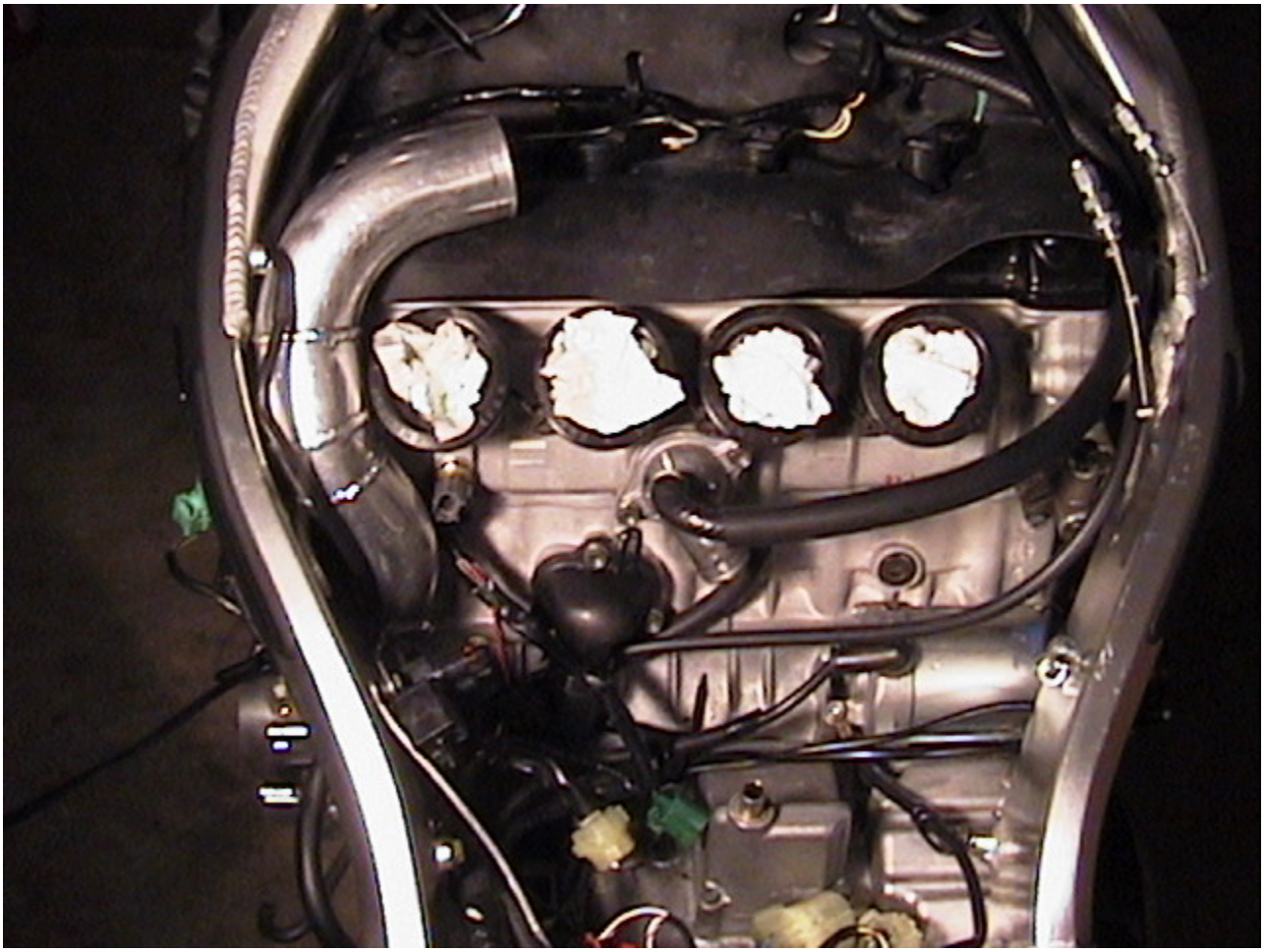
* Remove the oil plug (reducer) located behind the oil filter, with an 8mm allen. With the oil cooler gone, you must remove this, or the engine will starve for oil! Install new oil filter.

* Remove the oil sending unit and install the "T" fitting for the oil feed line to the turbo. The oil sending unit will screw on one end of the "T", and the other end will accommodate the oil feed line to the turbo. Use a thread sealer or loc-tite, or Teflon tape on the threads. I used Loc-tite's thread sealer (different than thread locker), but either method should work.

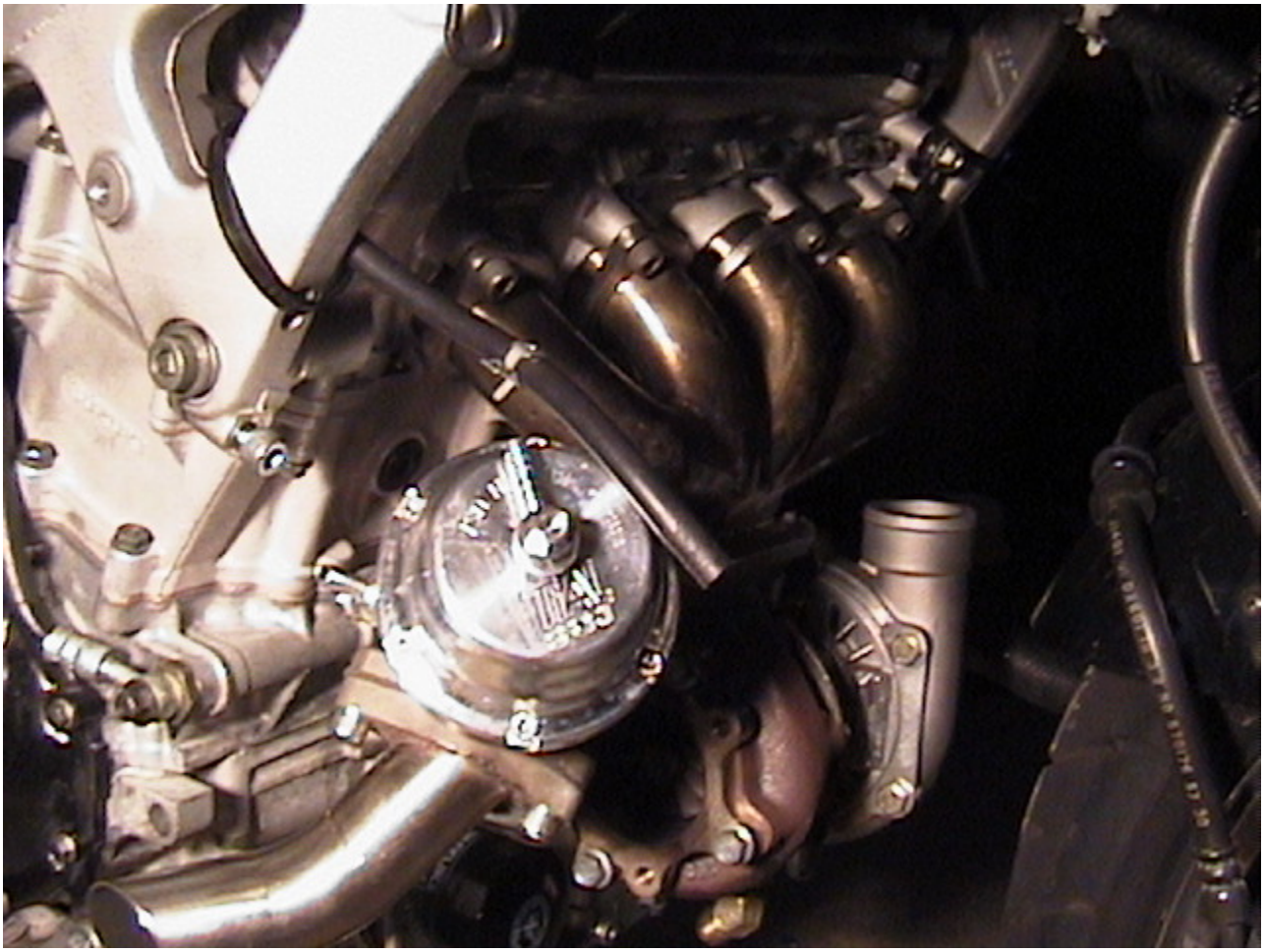


- Install the oil block-off plates (2), where the oil lines originally were. Seal the threads on these as well.

* Re-route the 5/16 radiator hose from the top of the thermostat housing to the right side of the bike. (Ignore the up pipe for the moment)



* Install the Exhaust header/turbo/wastegate assembly. It's a bit heavy, so don't drop it! If you're by yourself, sit on the floor, and support it with your knee. You'll need a ball end allen, 6mm. I tightened the bottom first, simply because they go in easy if they go in first. The top bolts are much easier to tighten down. Once it's tightened down, install the metal braided feed line to the "T" fitting from the previous step. Thread sealer is NOT needed here, because of the flare fitting, but it won't hurt to use it-I didn't.

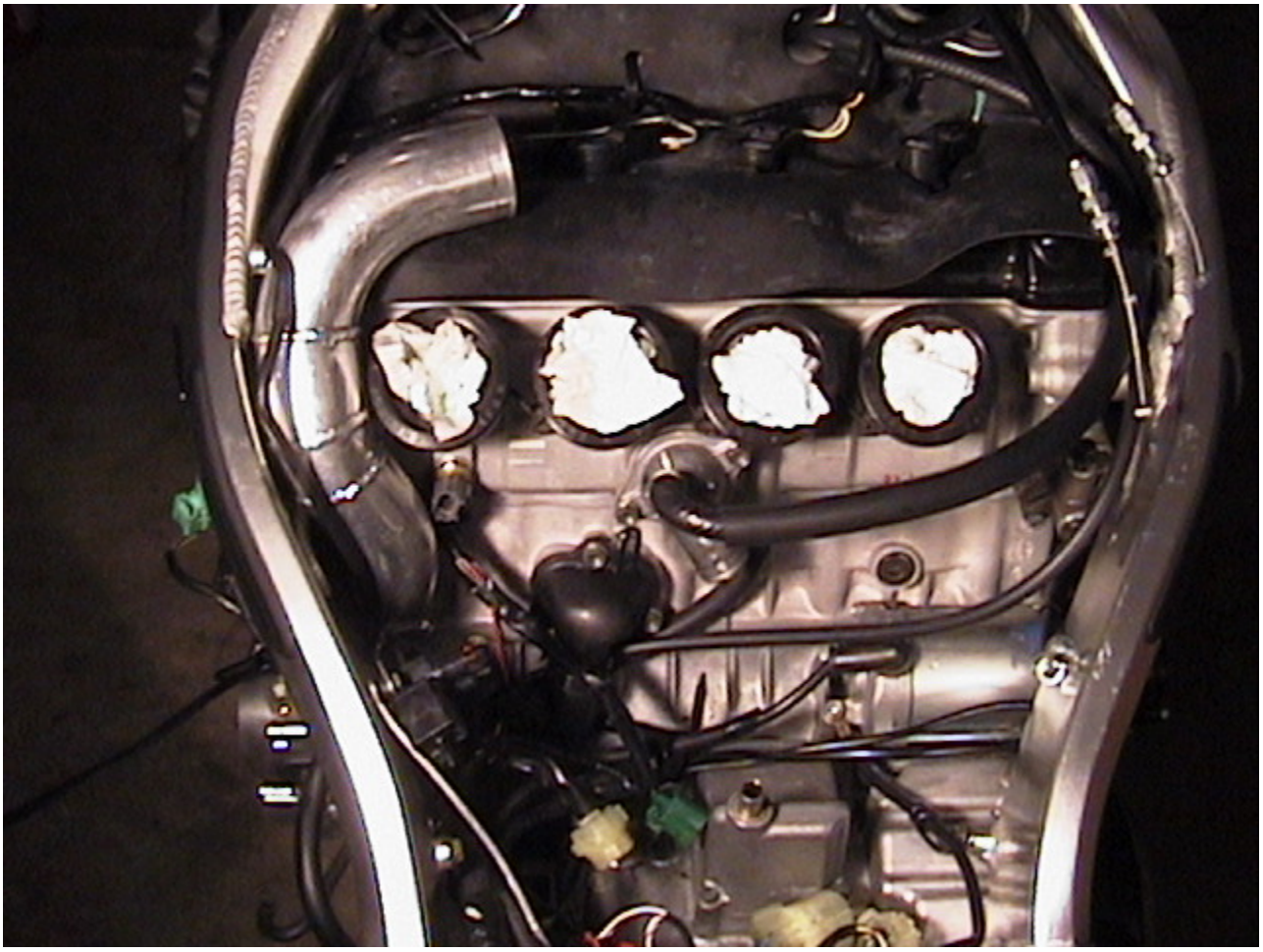


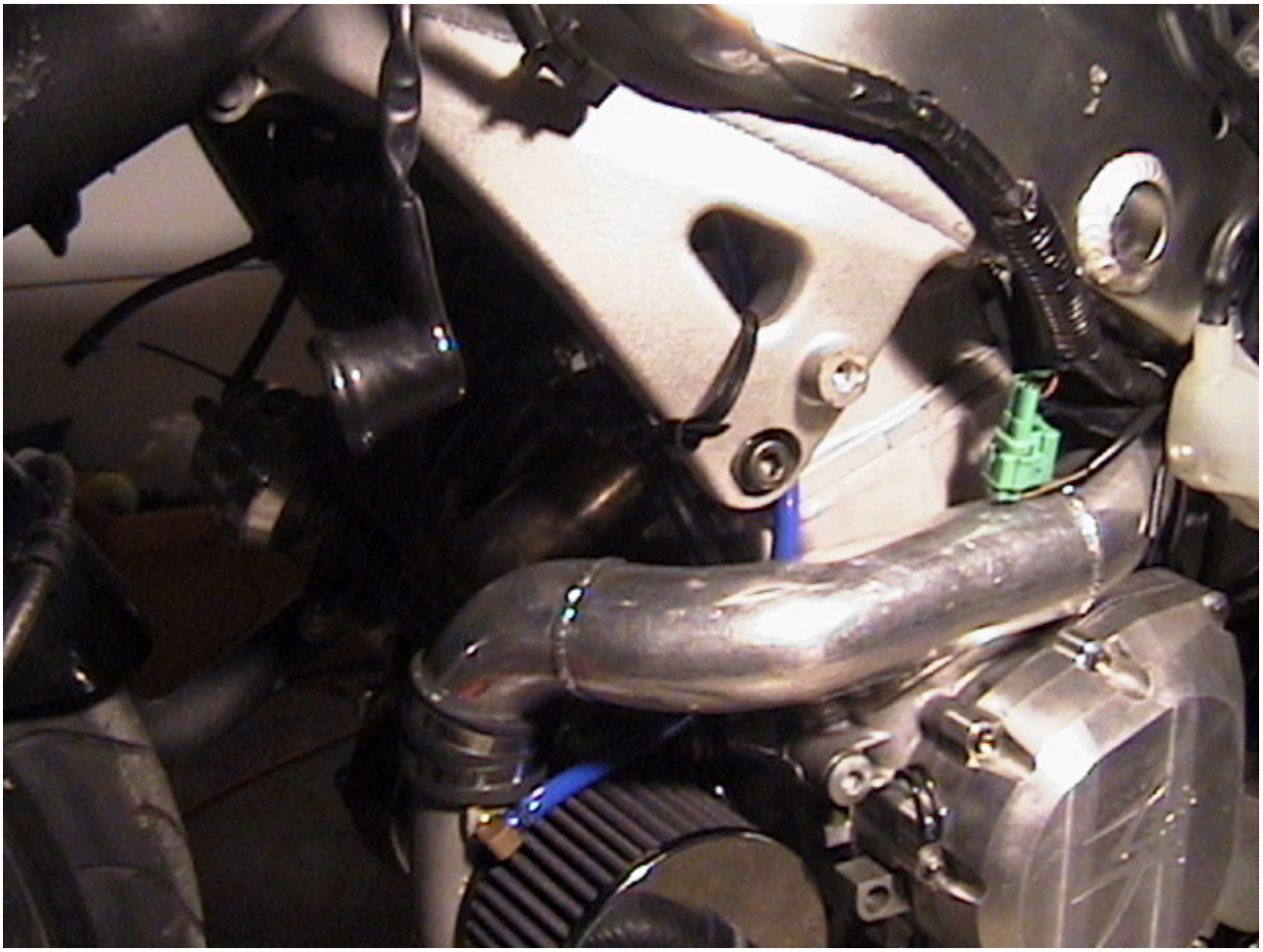
* Now install the oil return hose from the bottom of the turbo to the oil pan fitting. Use the supplied fittings to screw to the bottom of the turbo. Do not cut the hose too short, I nearly did.....

* I choose to leave the radiator off at this point, but it can go back on. Your choice. I leave it off to allow easier fitment of the up pipe.

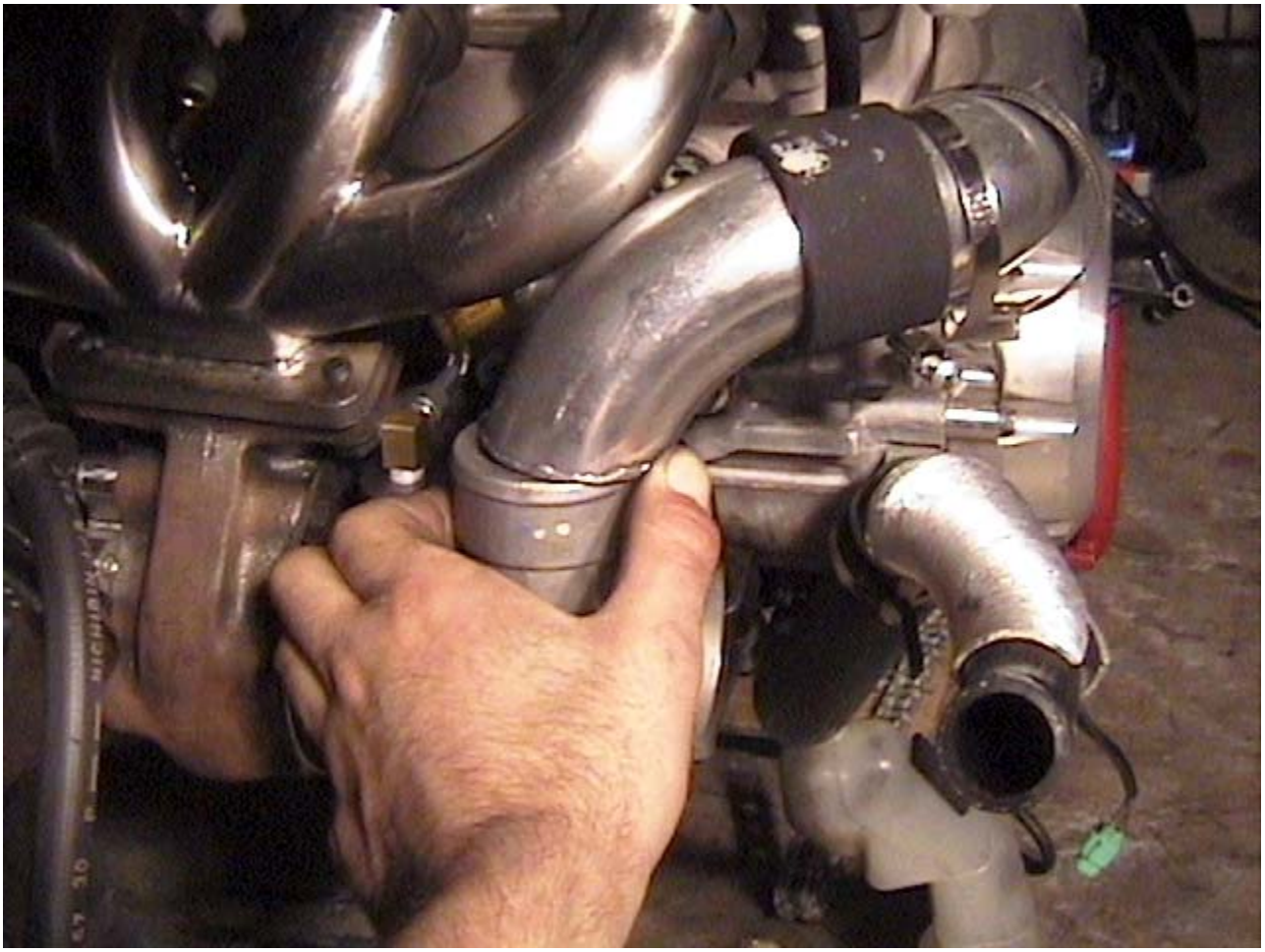
* Remove the inner fairing brackets that are attached to the inside of the frame-they hold the rubber grommet for fitting the inner fairing panels. A 10mm bolt holds each of them on. The one on the left will not be re-used, as the up pipe fitment won't allow it.

* Now we'll install the Up-Pipe from the turbo. It will need to be fitted between the engine and the frame. I started it in from the top. Just snake it in until it fits in the correct position. See the below pics.



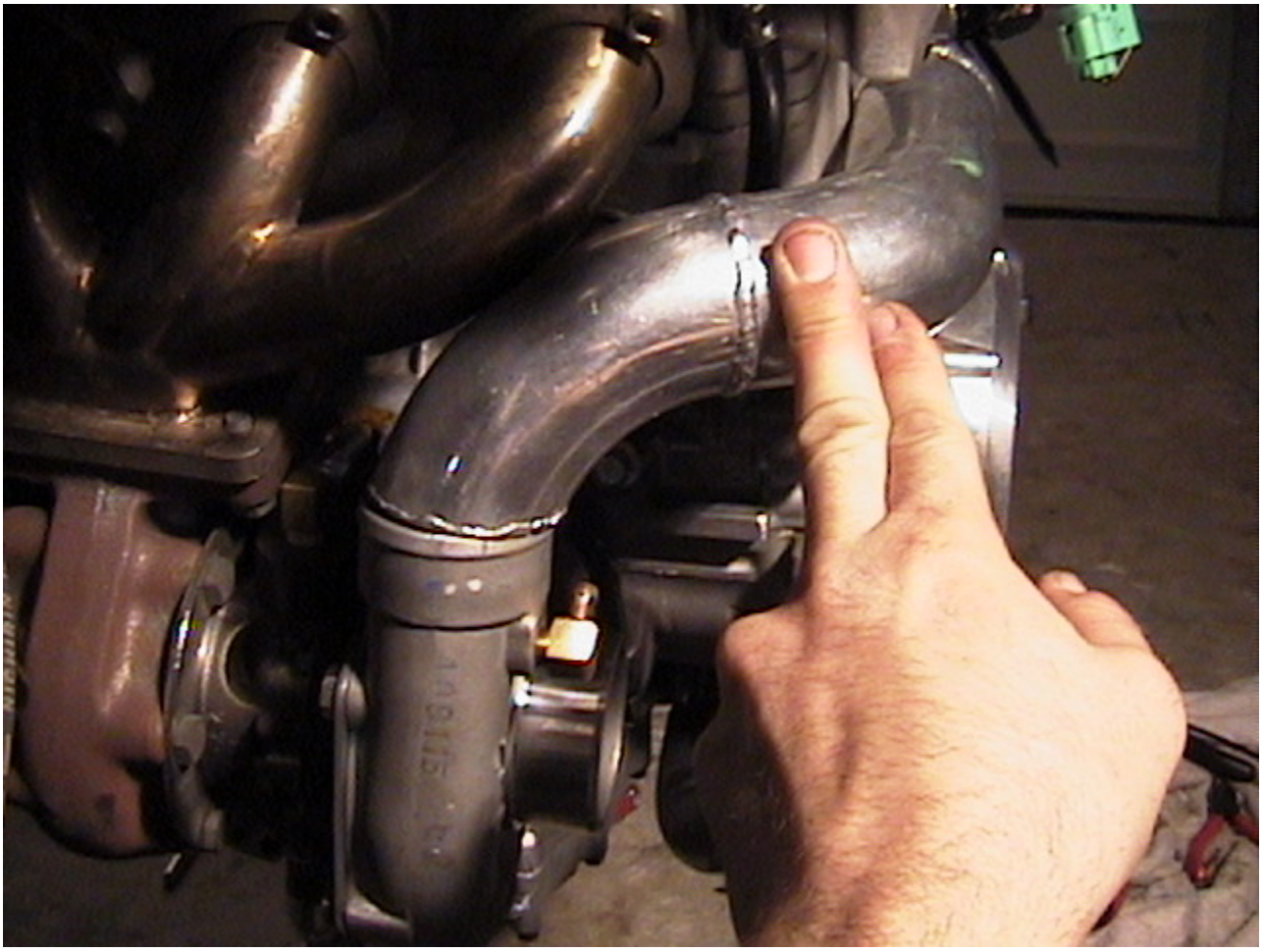


* Notice that the Up-Pipe will contact the header, and that the alignment of the Up-Pipe and compressor outlet isn't optimal. See below pics.

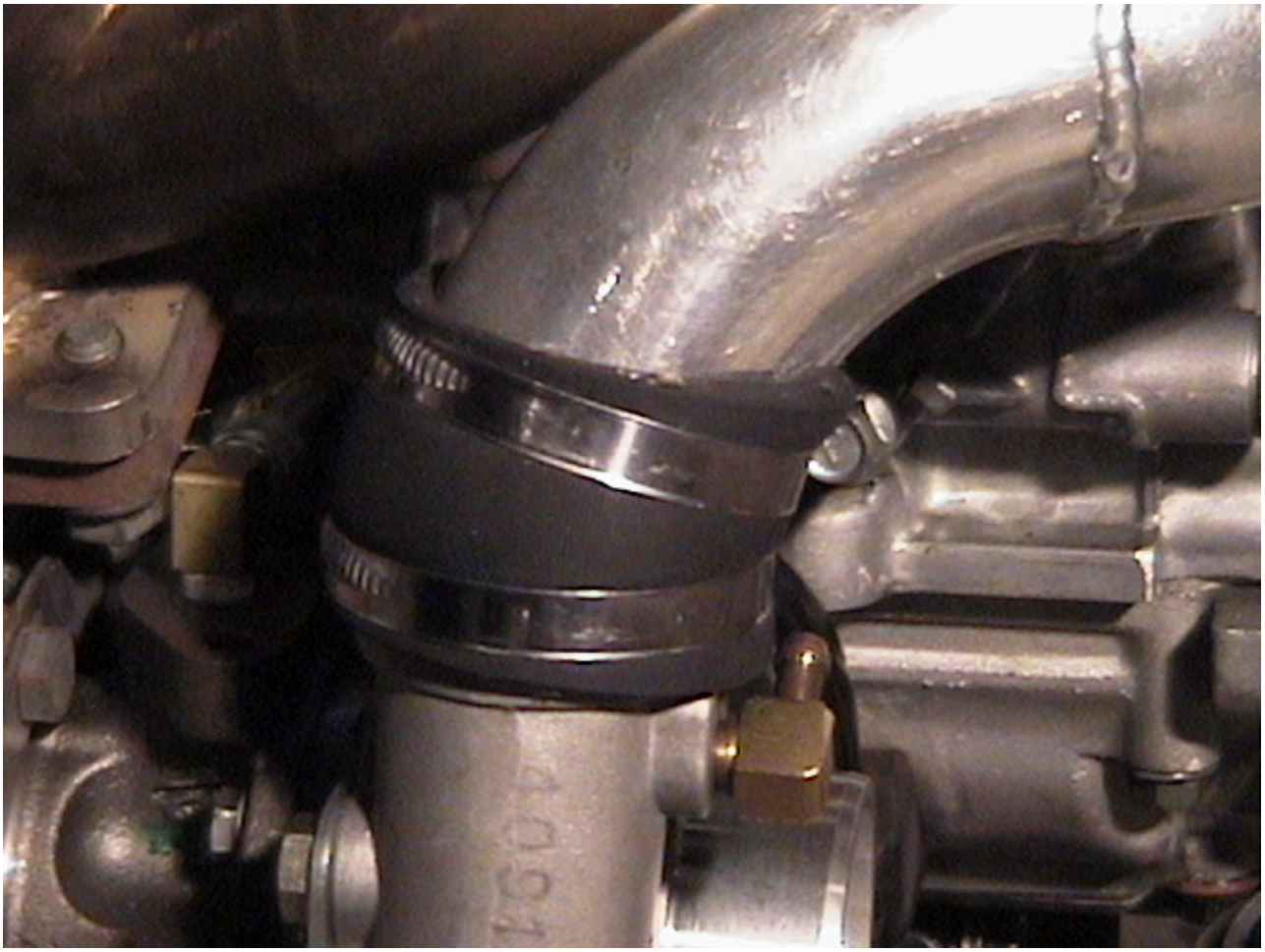


* I don't want the heat transfer of direct contact with the header, so per Dennis's direction, I proceeded to modify the Up-Pipe. Get the Up-pipe into the position that it should be in, and scribe a mark right where the pipe contacts the header. Remove the pipe, lay it onto a wood table with a towel under it, and using a small hammer, tap a ding into the Up-Pipe where the mark is-tap a small area as flat as you can. When done, you'll have near perfect alignment of the pipe to the turbo, and about 1/8 inch of clearance between it and the header. When I first did it, I thought that it still touched the header, but once it was in it's final place, clamped to the plenum, it came away about 1/8 inch. It'll take a little patience to get it done, but it's worth it to me. Remember, TAP, don't hammer the hell out of it! See below pics.

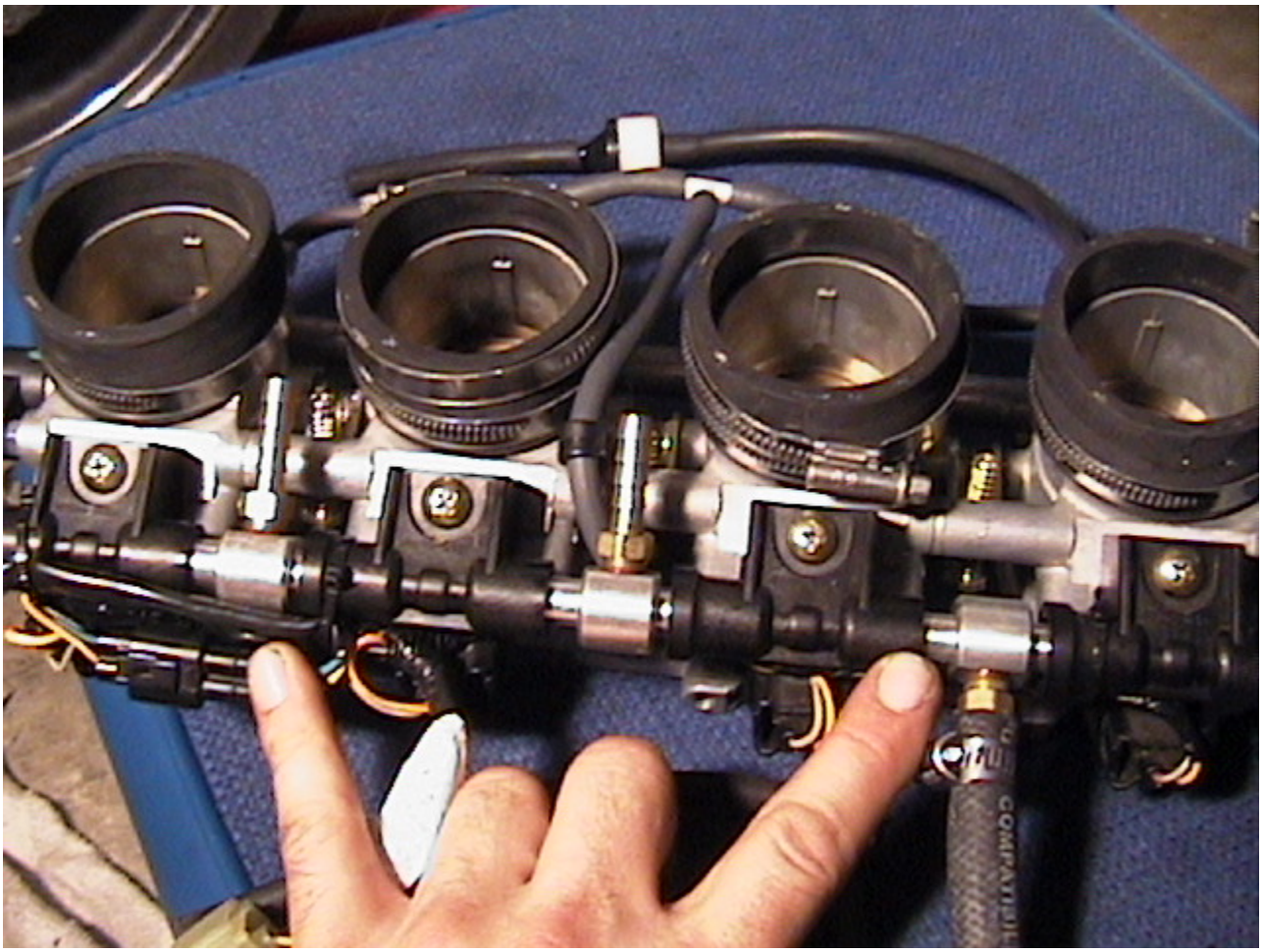
* Notice the much better fit. This will make the rubber sleeve a LOT easier to get on.
You're likely to throw wrenches unless it's aligned close to this.....



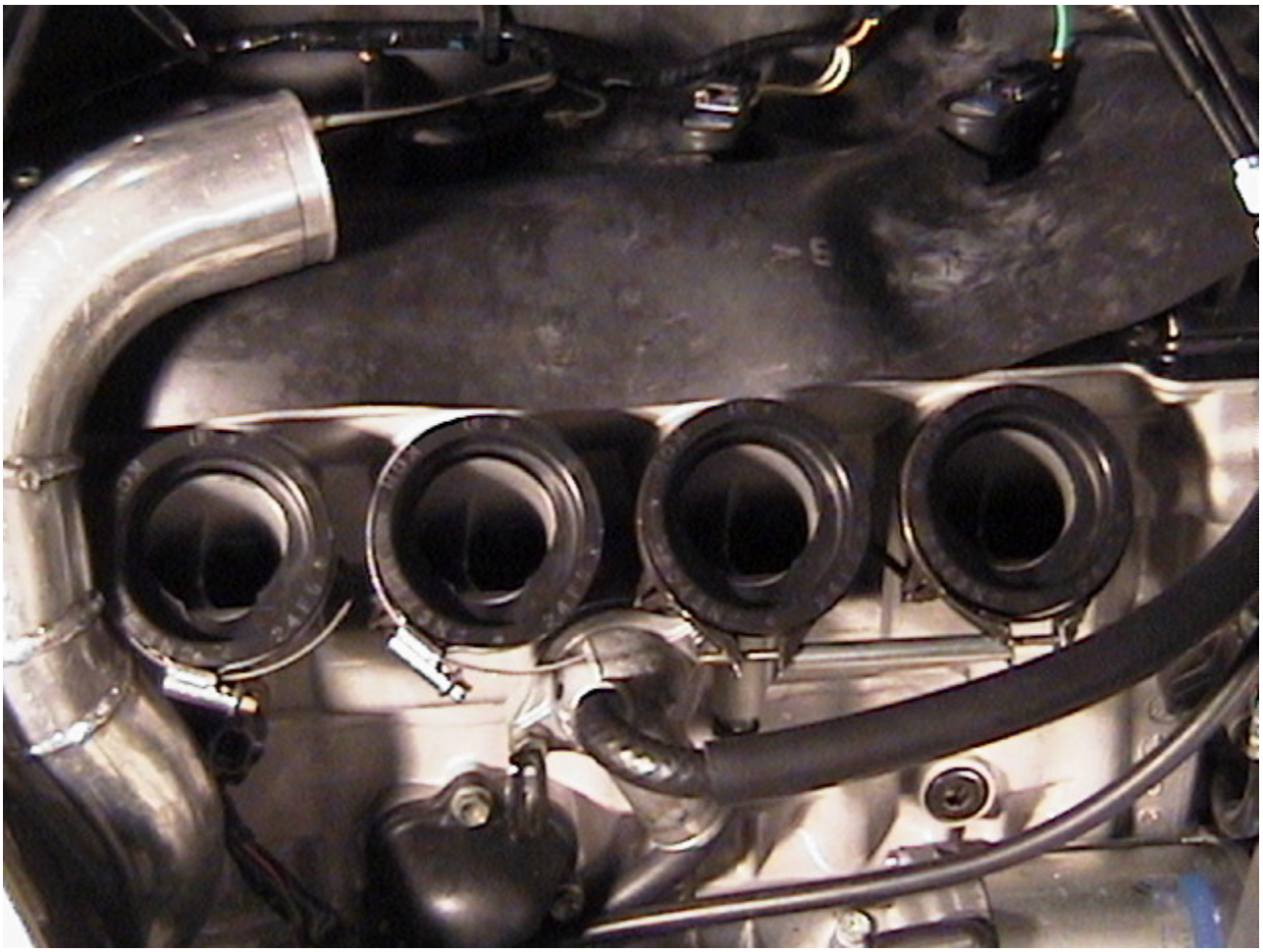
* I used some silicone spray to lube the Up-Pipe. Slide the rubber boot onto the Up-Pipe, align the pipe to the compressor outlet, and slide the boot down over the compressor outlet. Holding the pipe down to the turbo, clamp the boot in place. Due to the shape of the pipe, the upper clamp will probably not clamp on square, but it doesn't need to. As long as the clamp is squeezing all around the pipe, it'll be fine. You can feel where the pipe is in relation to the clamp after you tighten it down. Situate it until you are happy with it, and move on to the next step.....

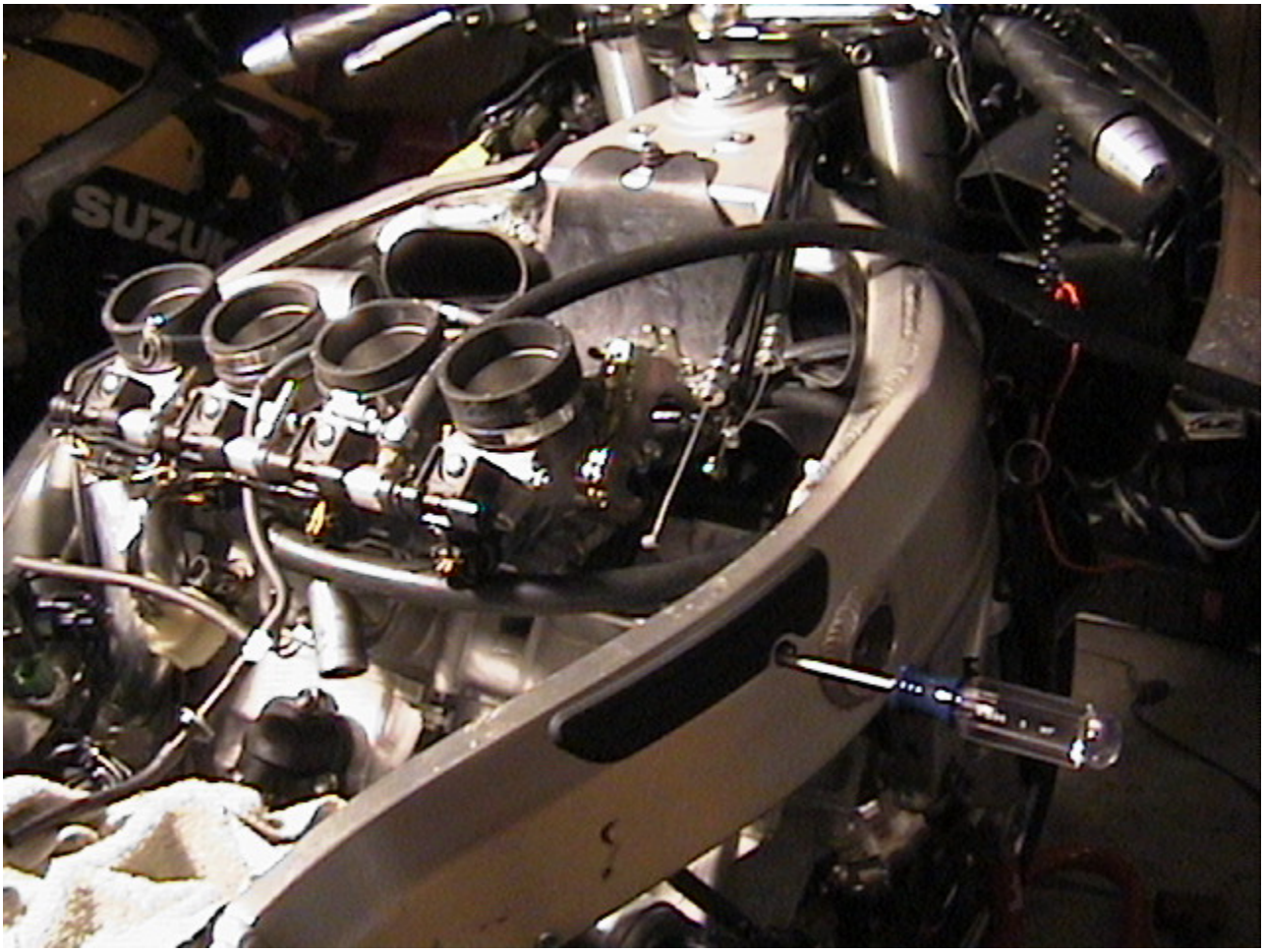


* Moving along to the fuel system...On the throttle bodies, remove the 3 screws that hold the fuel rail in place. Remove the fuel rail and disassemble it. Remove the O-Rings from the stock inserts, and install them onto the billet fuel rail inserts included with the kit. Reassemble the fuel rail using the billet inserts, and reinstall the rail to the throttle bodies. Install the barb fittings into each of the 3 inserts, using lock-tite thread locker to seal the threads. Leave the first thread clean, and apply a small amount to about 3 threads, and tighten down. Don't get them too tight, you don't want to crack the rail. These could be installed before the rail is assembled if so desired. I'd advise against Teflon tape to seal the barbs, as it may contaminate the FMU (Fuel management unit-pressure regulator). See below pic.

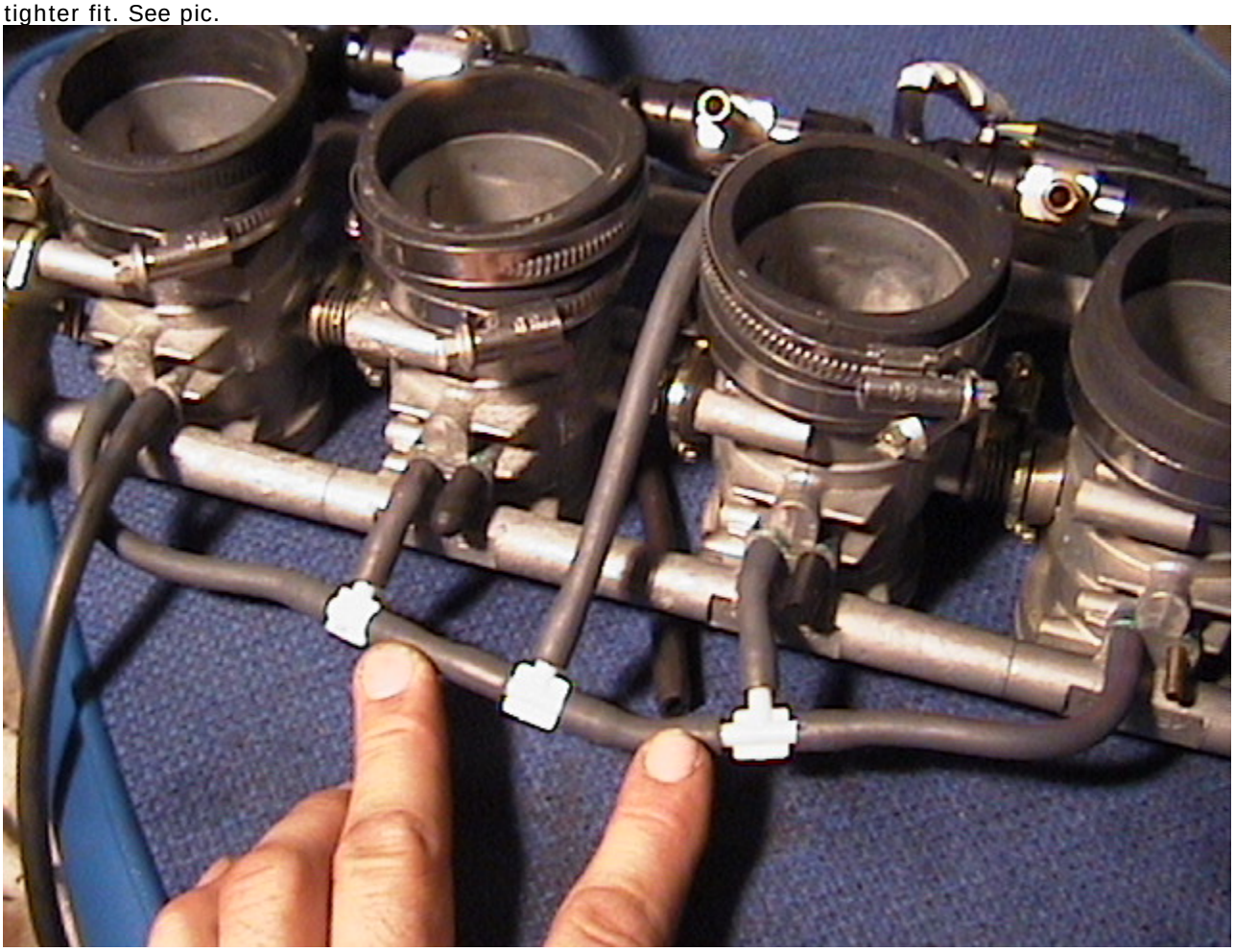


Install supplied hose clamps loosely to the intake boots on the cylinder head. I used to separate clamps on cylinders 1 and 2, but used the stock dual clamp on cylinders 3 and 4. Install the throttle bodies back on the intake boots, and tighten the hose clamps. Push down good on the left side, as the Up-Pipe will likely hinder it a bit. Note the clamp positions in the pic...and the access hole in the side of the frame for the clamp....

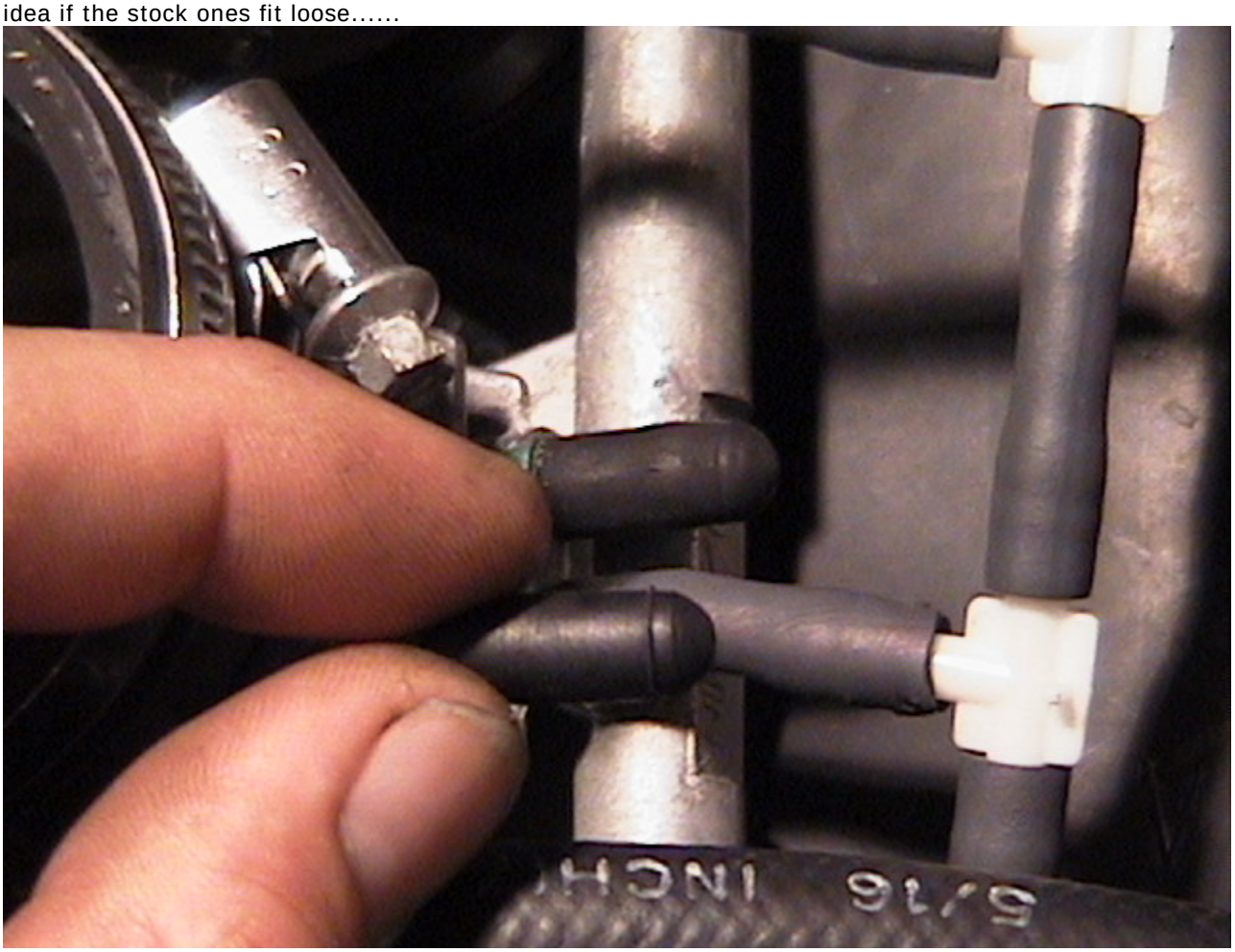



SUZU

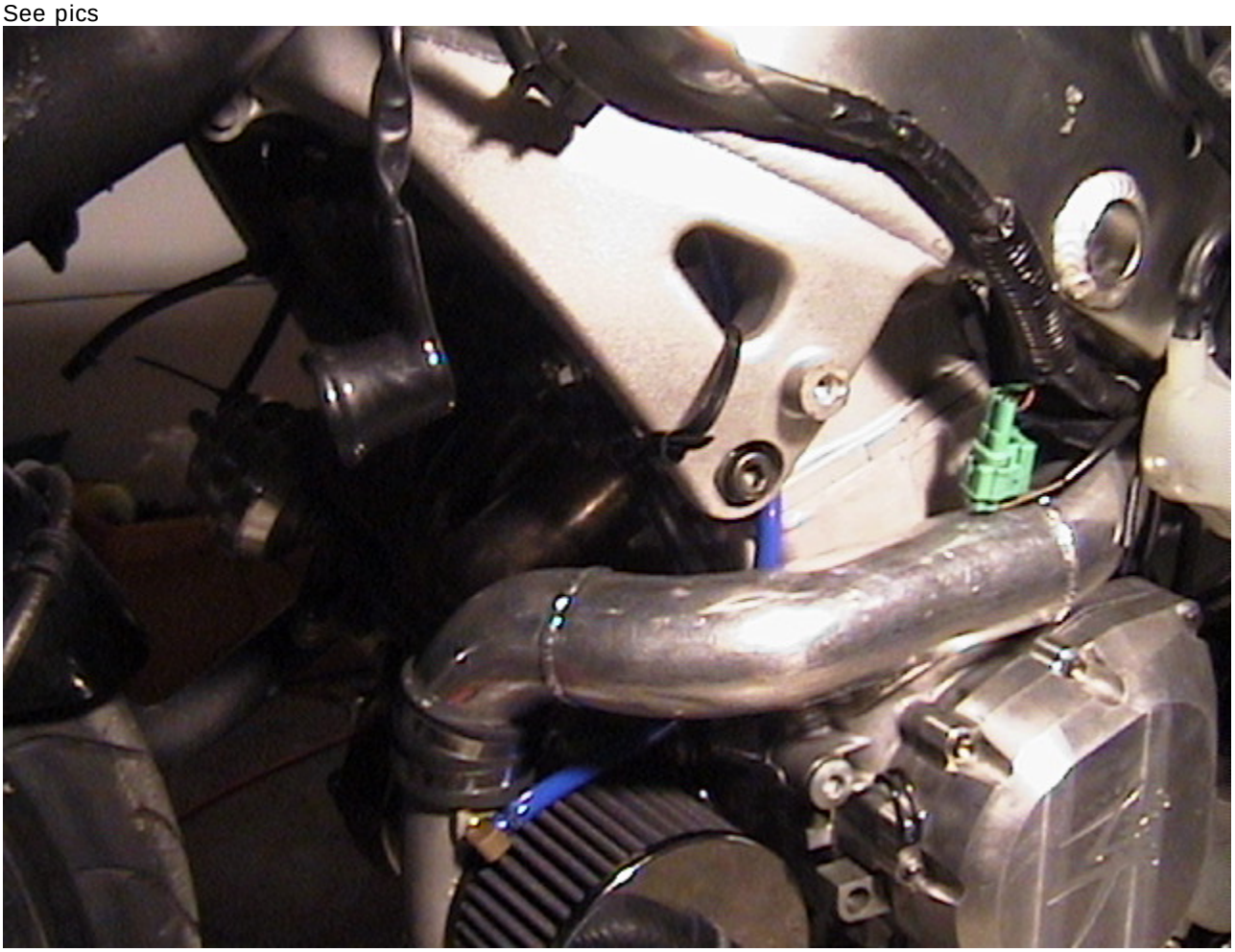
The "T" fittings for the vacuum lines on the throttle bodies need to be replaced. The stock T's don't hold the vacuum hose very well, and under boost, the hoses could get blown off....so, we are going to swap them. Simply remove the stock T's and install the white ones included in the kit. If you prefer, as I did, you can use the new hose as well-it's a tighter fit. See pic.

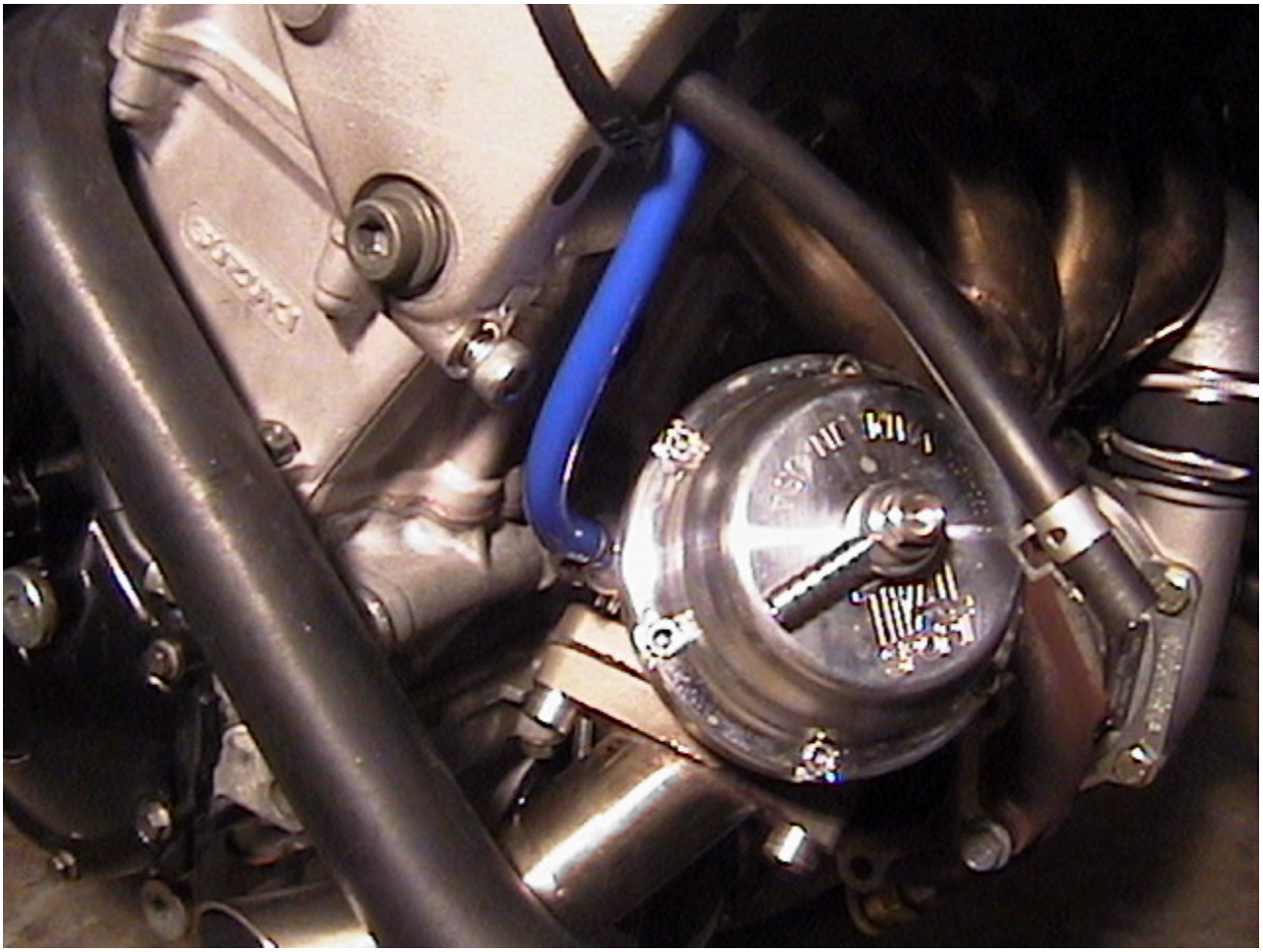


For any vacuum ports not used in this installation, some new plug caps might be a good idea if the stock ones fit loose.....

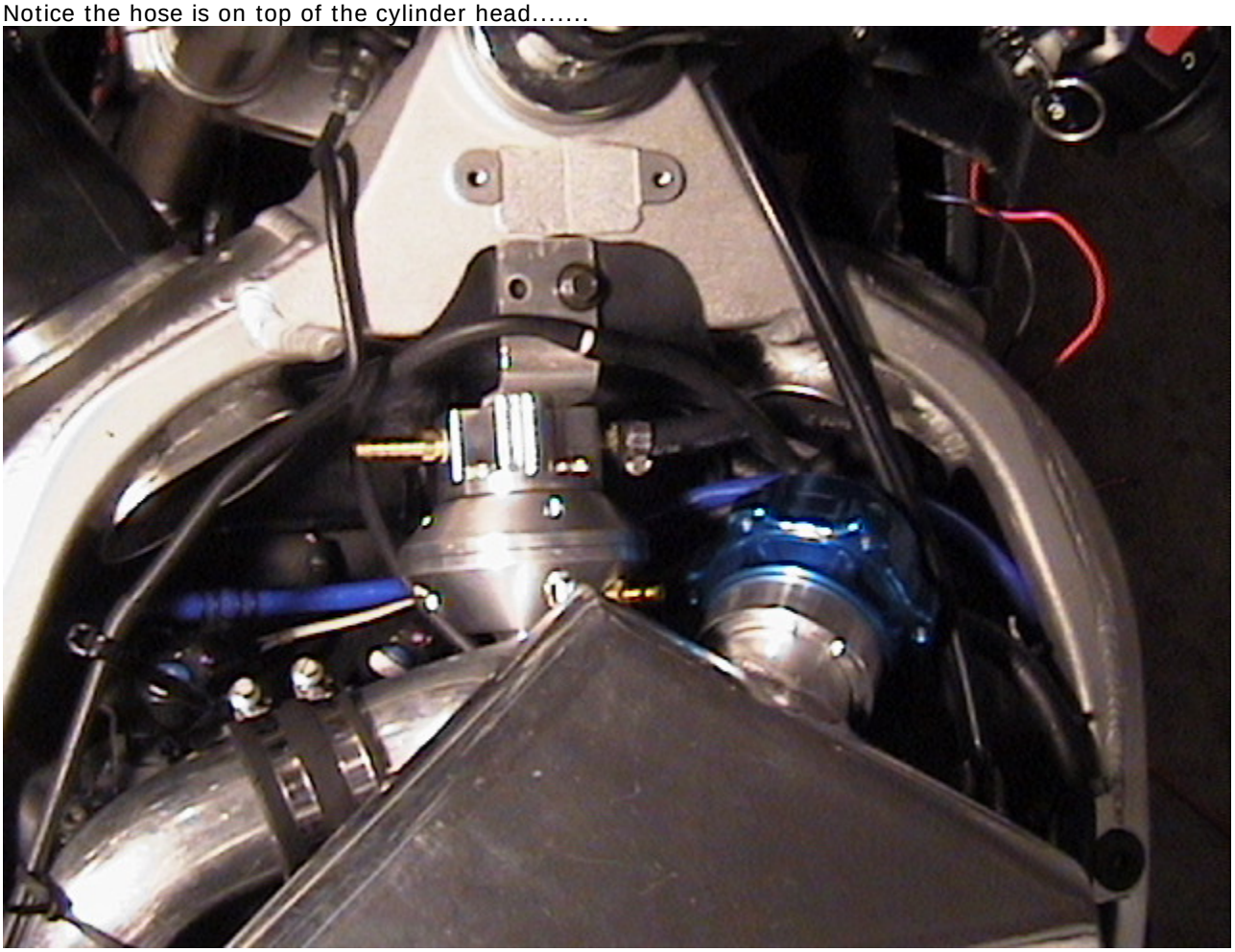


Now's a good time to install the wastegate hose from the turbo compressor outlet to the BOTTOM port on the wastegate. The top port is not used. The top port will keep the gate shut, which will not allow the gate to control the boost. Use the BOTTOM PORT ONLY! Route the blue silicone hose from the port on the turbo compressor outlet, OVER the top of the cylinder head, and back down to the BOTTOM port on the wastegate. Secure he hose, but do not pinch it closed. Make sure the port is positioned away from the exhaust manifold. If the bolt that secures the port is touching he header, as mine was, then the hose will melt and fall off of the gate, which mine did. Not good. Reposition if necessary. See pics

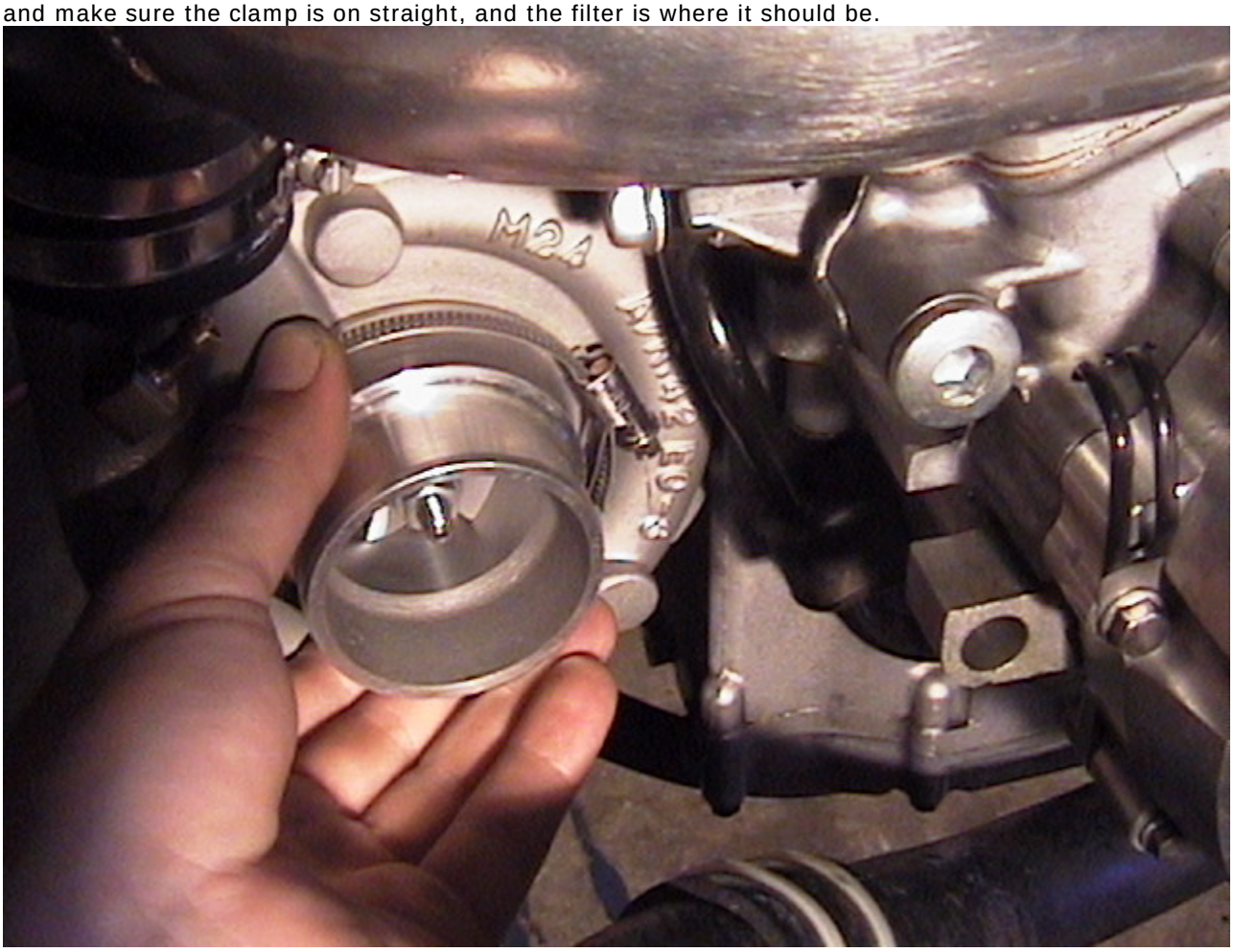


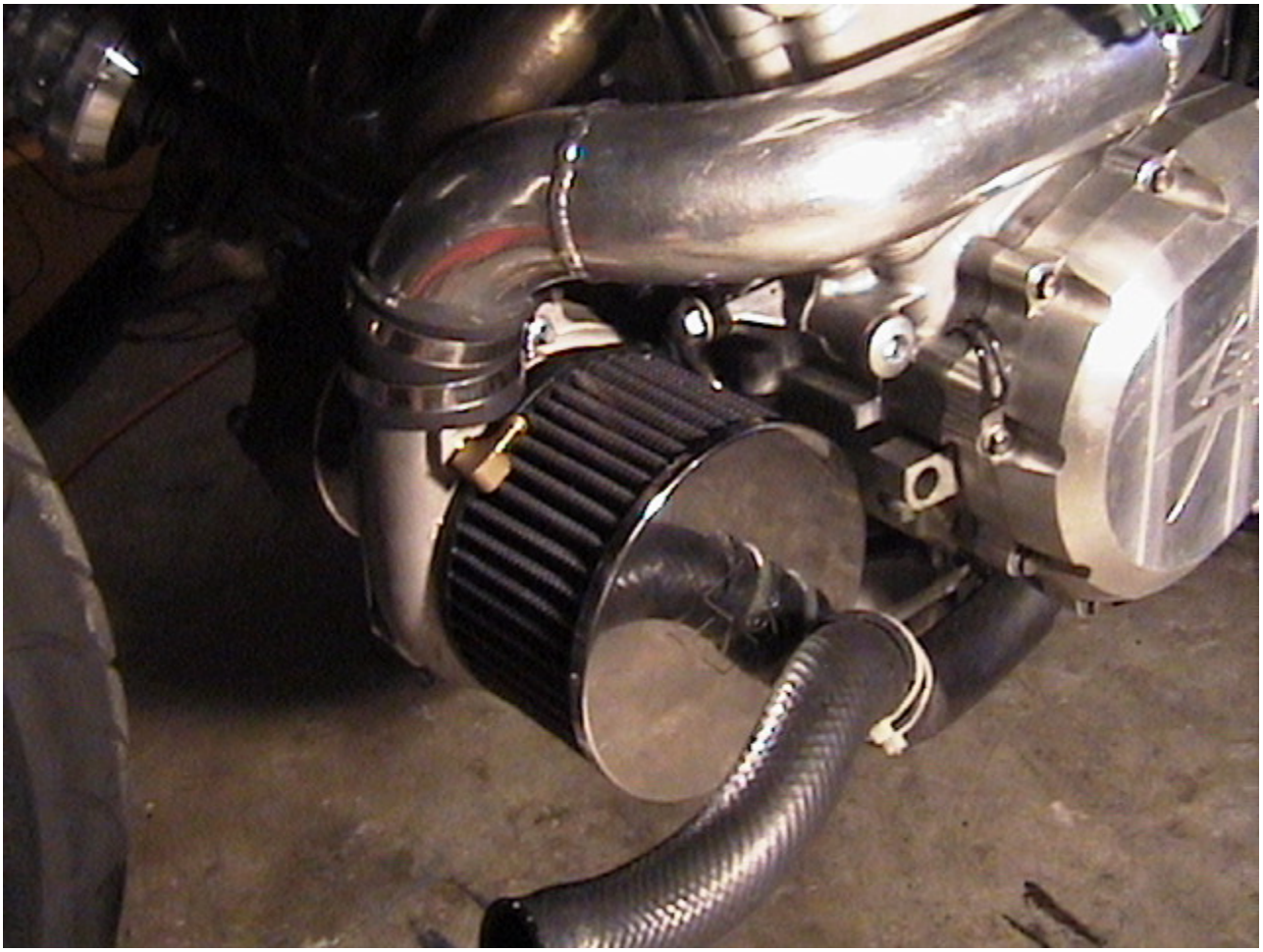


Notice the hose is on top of the cylinder head.....



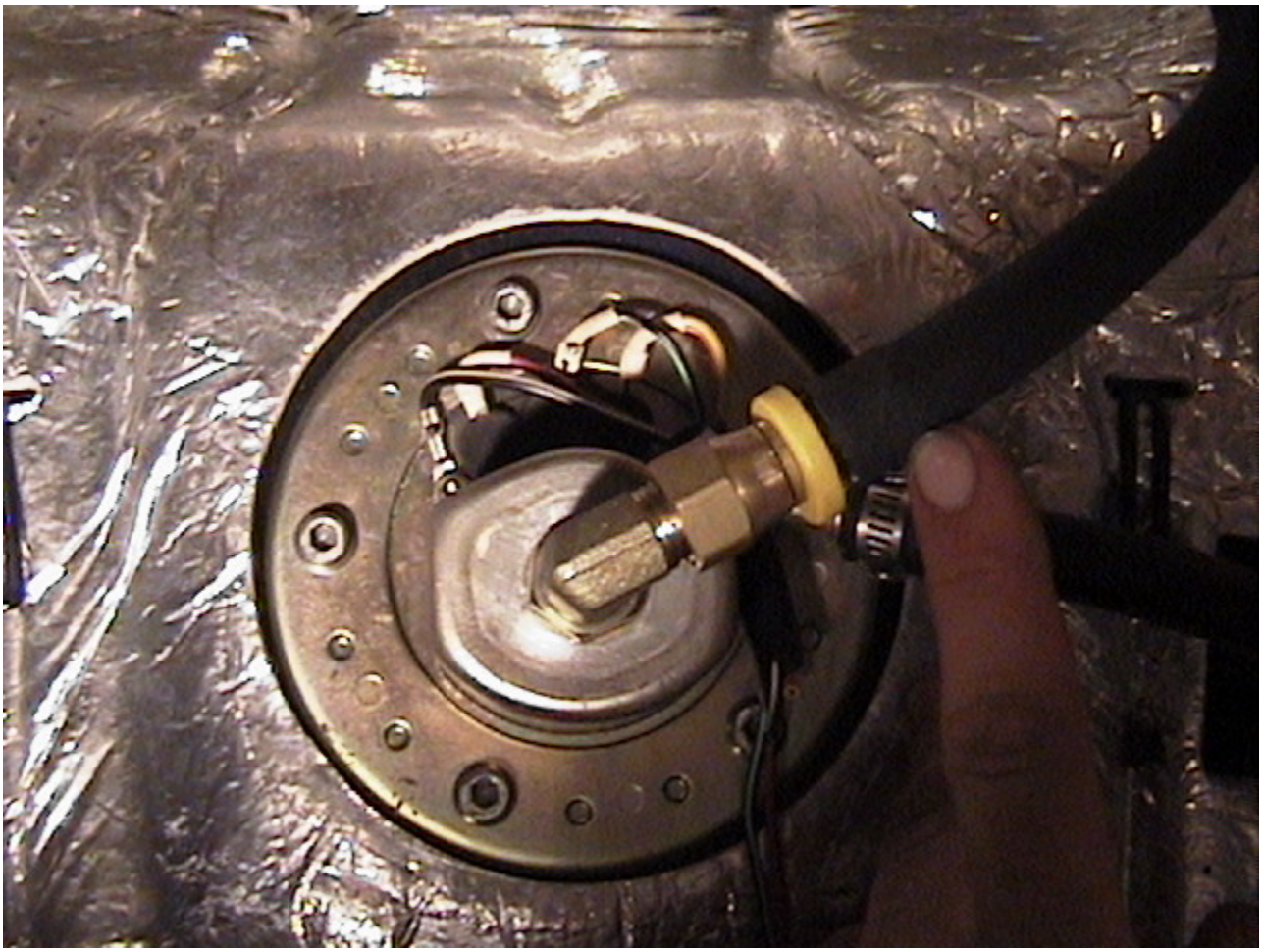
Now go ahead and install the filter to the turbo. It's a bit tricky, so listen up. The filter will need to be pushed on PAST the smaller machined surface of the inlet, and onto the larger diameter portion of the turbo. See where the clamp is in the pic below. When on correctly, there's no way you'll see the clamp that holds it on. There's a trick to getting at the clamp to tighten it up without pulling the filter away from the turbo too much. You'll notice that at the BACK of the turbo, the "snail" housing is smaller. Get a thin screwdriver at the hose clamp in that area of the turbo for easiest access to the clamp, without having to pull the filter off the sealing surface. The clamp head is in about the right position in the pic, for easiest access. Install filter with clamp on it, get skinny flat blade in there on the clamp, push the filter as far as it'll go, and snug the clamp with the driver. The filter should be up against the turbo body. Pull the driver out, and get you a 1/4 nut driver. Get the nut driver on the hose clamp and tighten it down the rest of the way. If you got it snug enough with the skinny flat blade, then the filter shouldn't move when you wedge the nut driver in there to tighten it the rest of the way down. Pull gently on the filter all around, and make sure the clamp is on straight, and the filter is where it should be.

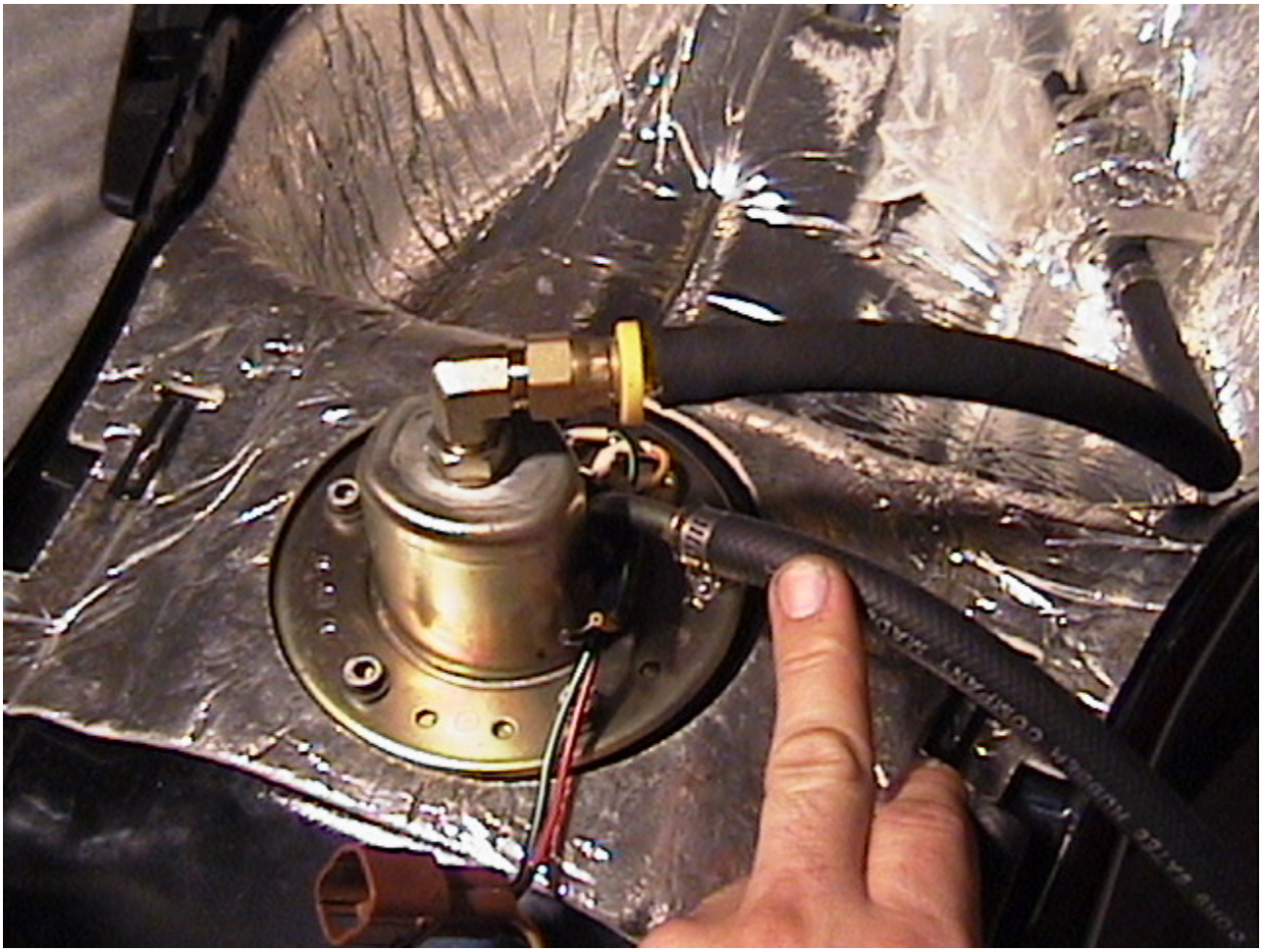




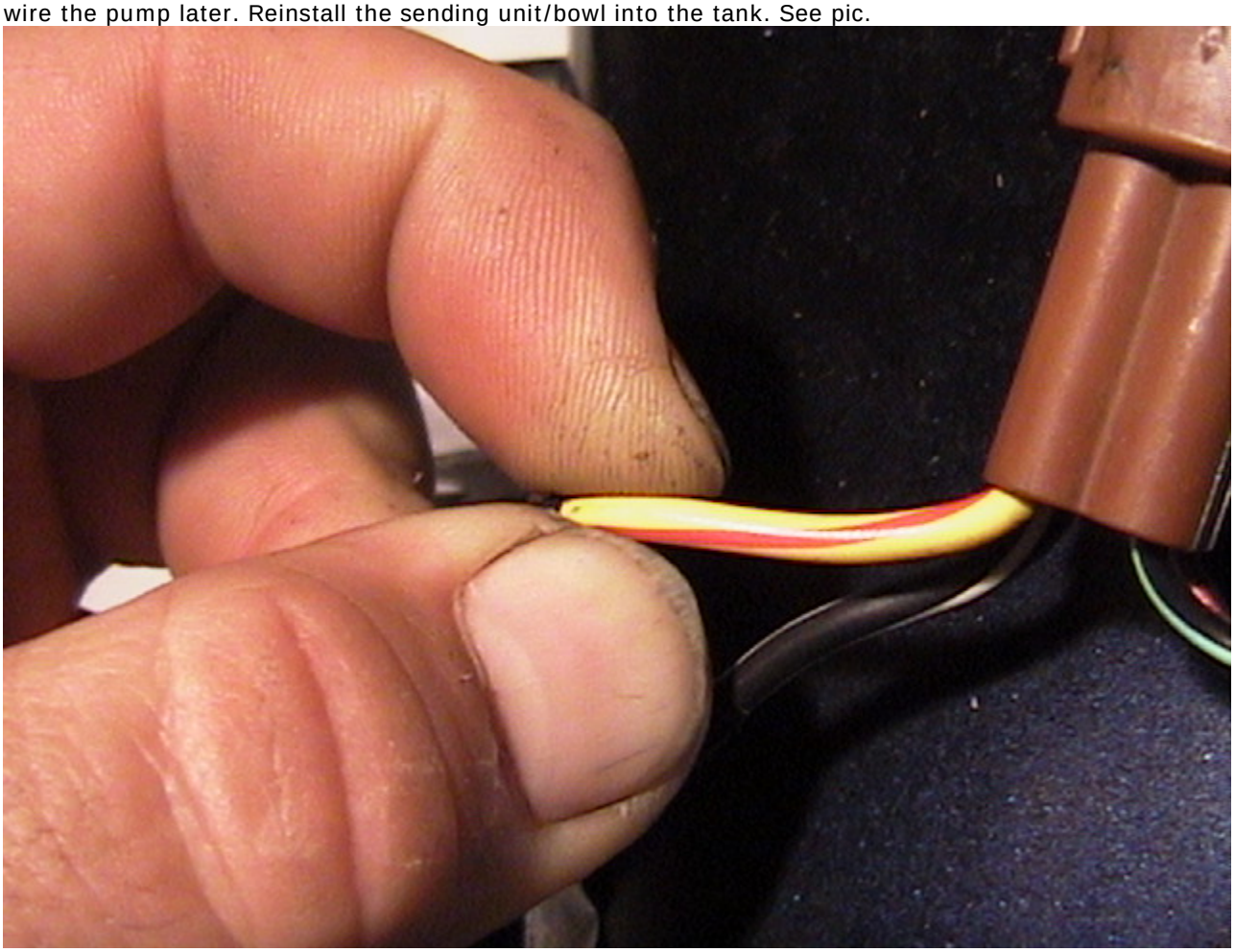
Remove the fuel pump from the bottom of the fuel tank. The stock pump and regulator is not going to be used, but we need to get them out of the tank. Remove the fuel pump, fuel pressure regulator which is on top of the sending unit and the grommets, etc. Basically, gut the thing. All that we are leaving is the fuel level sending unit, and it's mounting fixture. Sorry, but I have no pics of this procedure. It's fairly simple.
Leave the sending unit assembly off of the tank, as it needs to be modded...

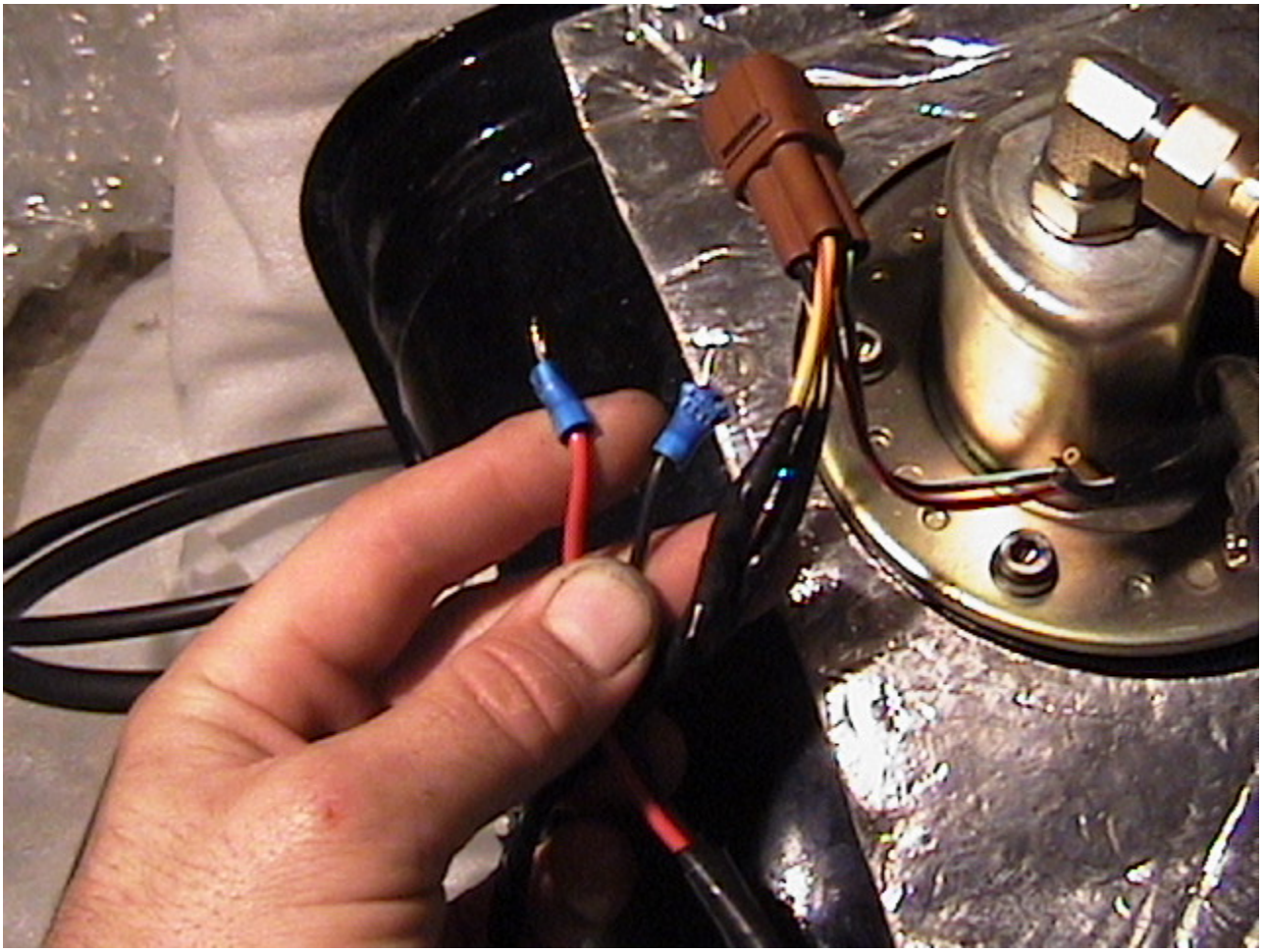
The fuel feed for the external, aftermarket fuel pump we are going to use, requires the bottom of the sending unit housing to be tapped. To do this, drill a hole straight into the middle of the "bowl"....sorry, I'm not sure of the size you need. I start small, and get progressively bigger until it's just big enough. Too big a hole will leak. Install the "L" fitting, O-ring, and backing nut to the "bowl" with the O-ring on the outside, between the bowl and the fitting-just like the oil tap for the oil pan. When tightened down, it should be in about the 2 o'clock position from an UNDER the tank view. Tighten it down fairly tight, and use lock-tite on the inside threads with the nut-we don't need this thing loosening up! See pics.





Now, the fuel pump wiring harness needs to be modified. Power is no longer needed to go into the tank, but we do need it to power the external fuel pump. So, cut the fuel pump wires just before they go into the "bowl", or sending unit housing. The pump wires are the 2 larger wires out of the 4-the other 2 smaller wires are for the sending unit-DO NOT CUT THEM! You want the fuel gauge to work don't you?
The Yellow/Red wire is the positive, and the black/white is ground. Remember that. We'll wire the pump later. Reinstall the sending unit/bowl into the tank. See pic.

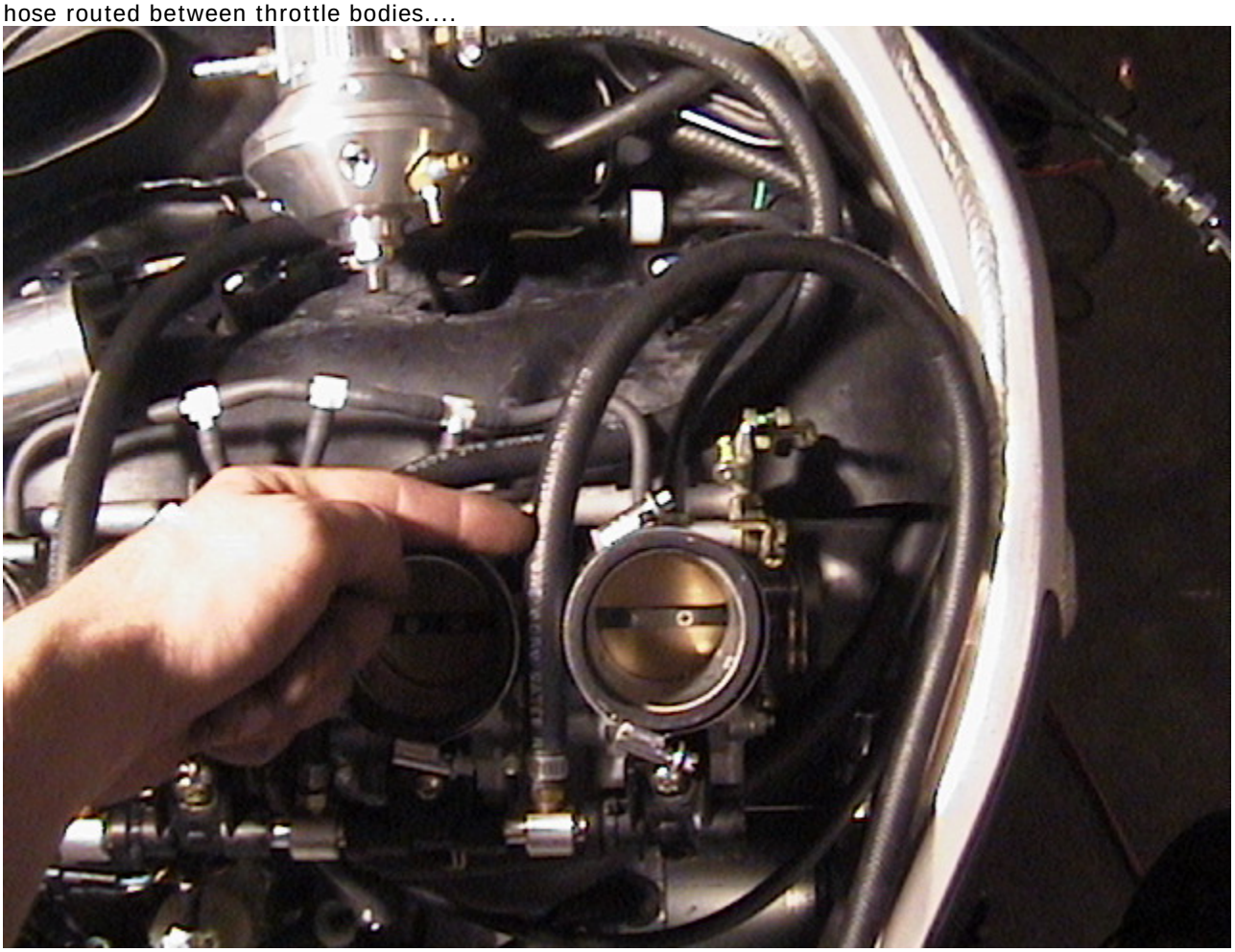




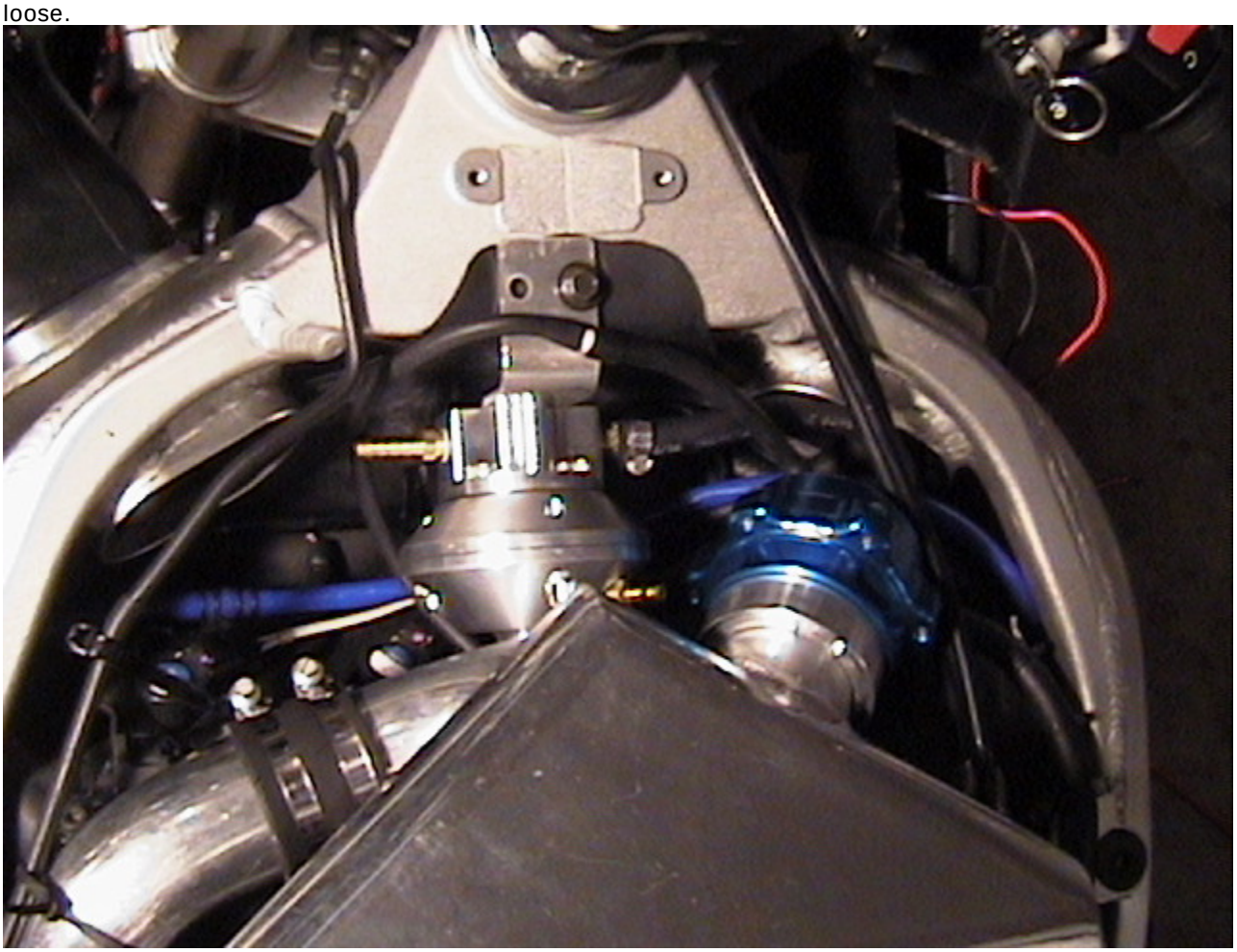
Ok, now this next section is dealing with installing the FMU (fuel pressure regulator), pump, the fuel hoses, vacuum hoses, etc. Dennis instructs us to install the plenum first, before many of the fuel hoses go on. This is so you don't pinch hoses and have things in the way if you were to put the plenum on last. BUT, seeing as how I'd already had my kit together once before, I took the liberty of installing the hoses FIRST, so that you could better see where in the hell they go. It's hard to see that stuff with the plenum on, so I'm going to describe the procedure as it normally is, but the plenum won't be on, and the pics will show the hoses better.

For the first time install, you'd be best to put the plenum on, so the hoses will be long enough, and go to the right places. Savvy?

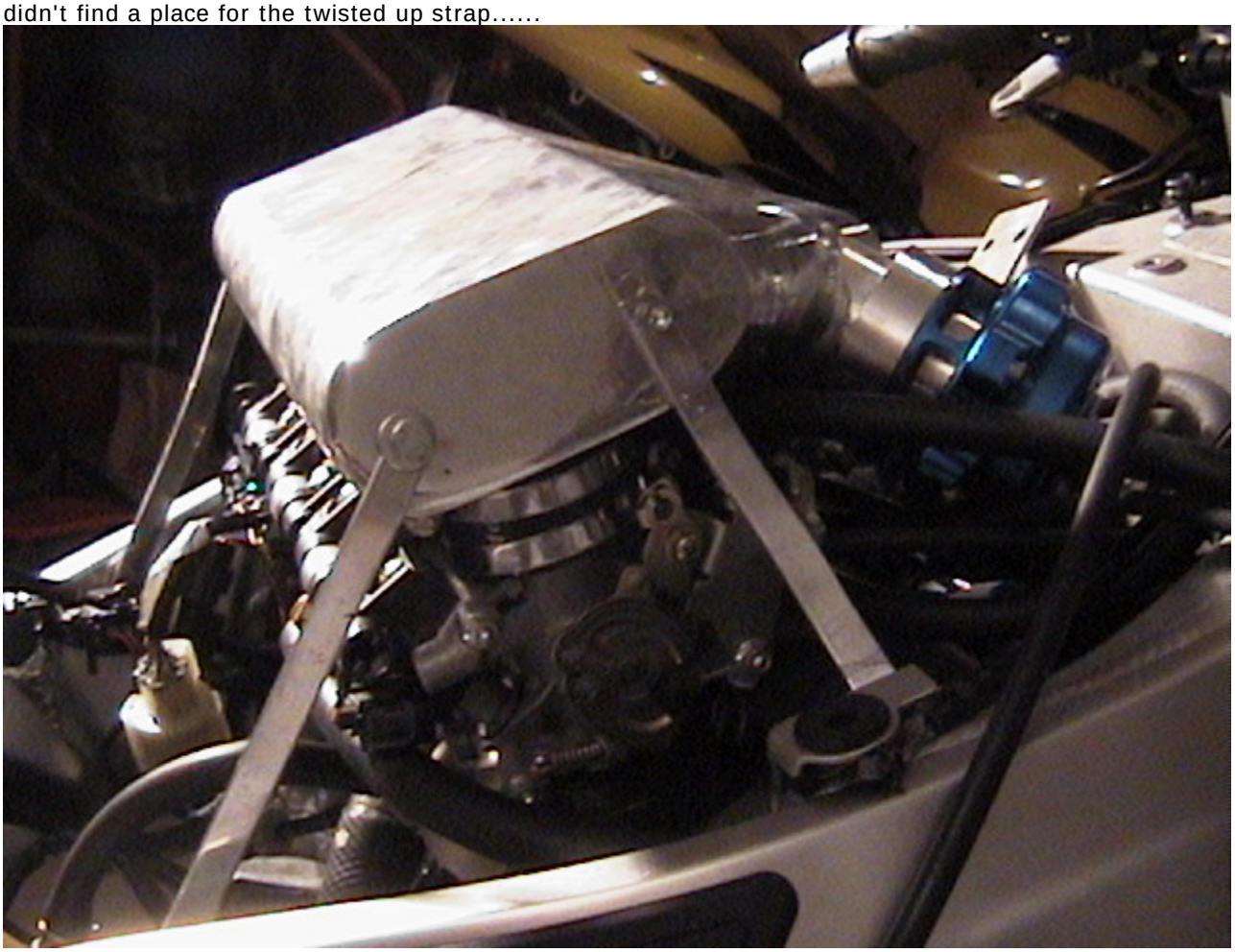
Install the rubber boots onto the throttle bodies and tighten down the clamps. It might be easier to install the to the plenum first, and that's fine, whichever you choose to do. Keep in mind that the position of the head of the clamp should be in a positon that it will not be right between the intake runner. The fuel hoses will be routed in between the runners, and you don't want the hoses to rub on any of the clamp heads. You can see in the below pic that for the bottom clamps, I put the heads to the front of the bike, and for the top clamps, I put the heads to the rear of the bike. At this point, I'd tighten down the bottom clamps, if you choose to put the boots onto the throttle bodies first-I did. Note the fuel hose routed between throttle bodies....

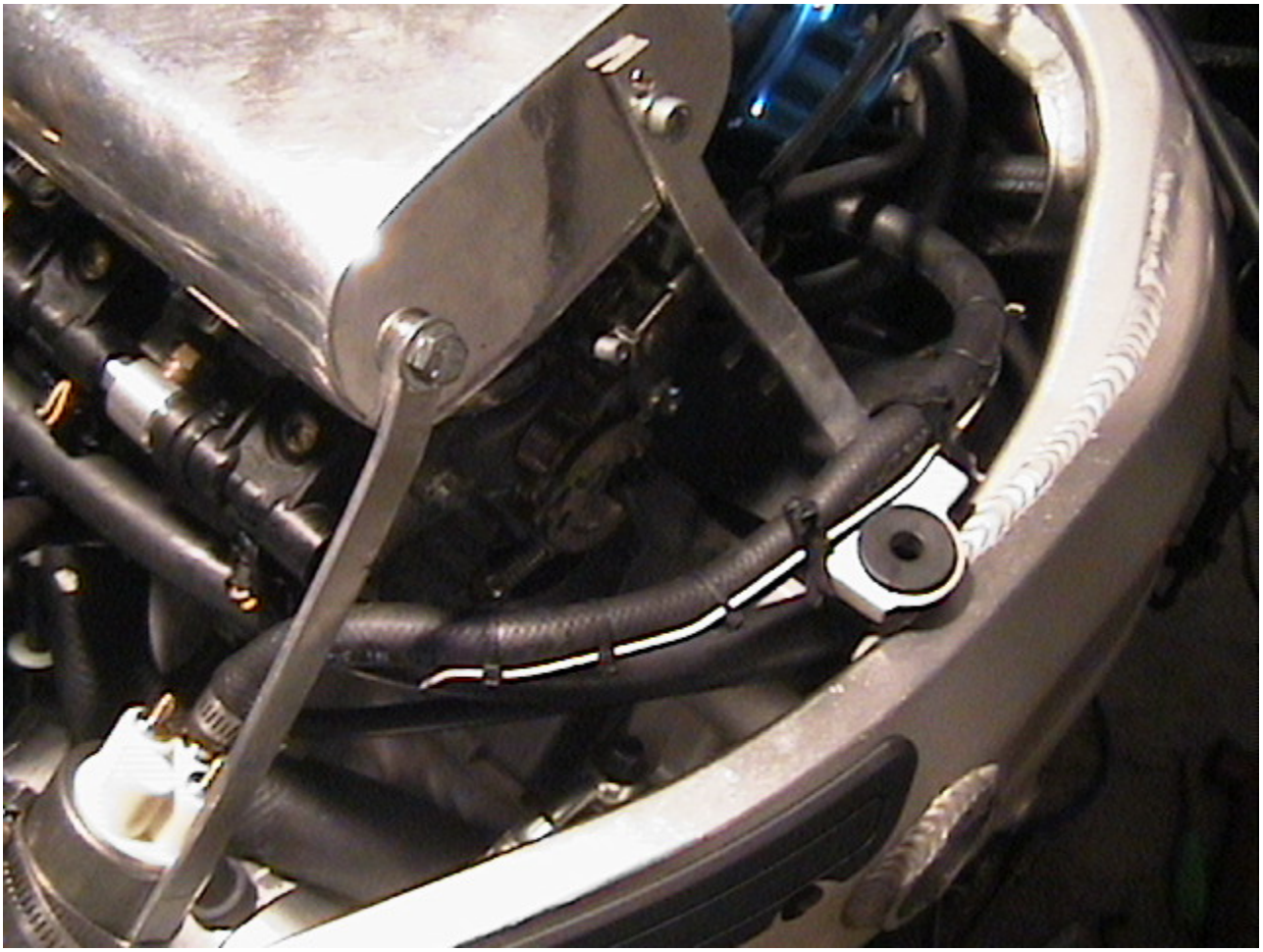


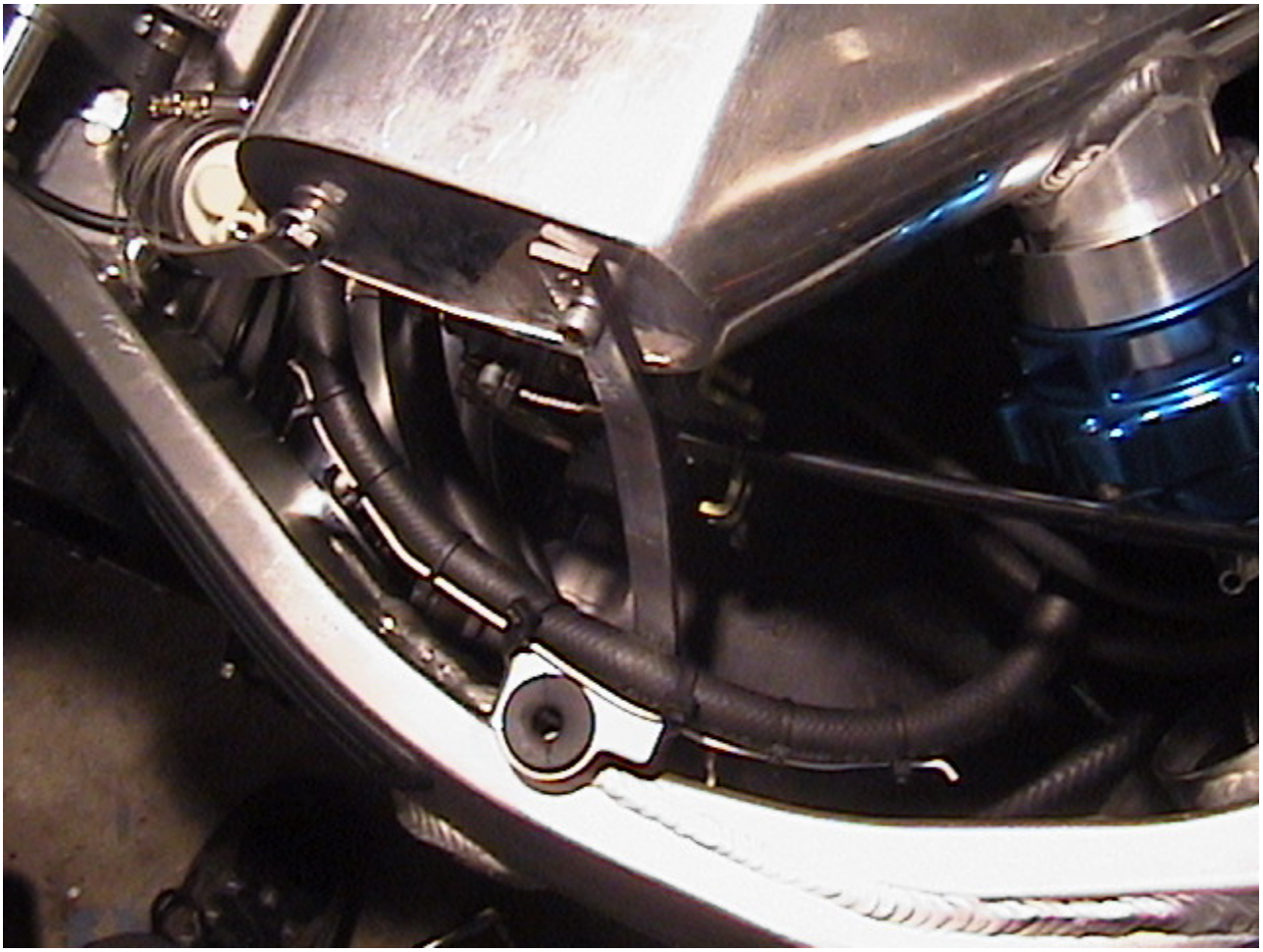
Ok, now fit the other rubber boot onto the intake pipe of the plenum along with 2 clamps to clamp it down with. Install the plenum onto the throttle bodies, making sure you have all the clamps in place, but do not tighten them yet.
Slide the rubber boot on the plenum over to mate with the Up-Pipe, but leave the clamps loose.



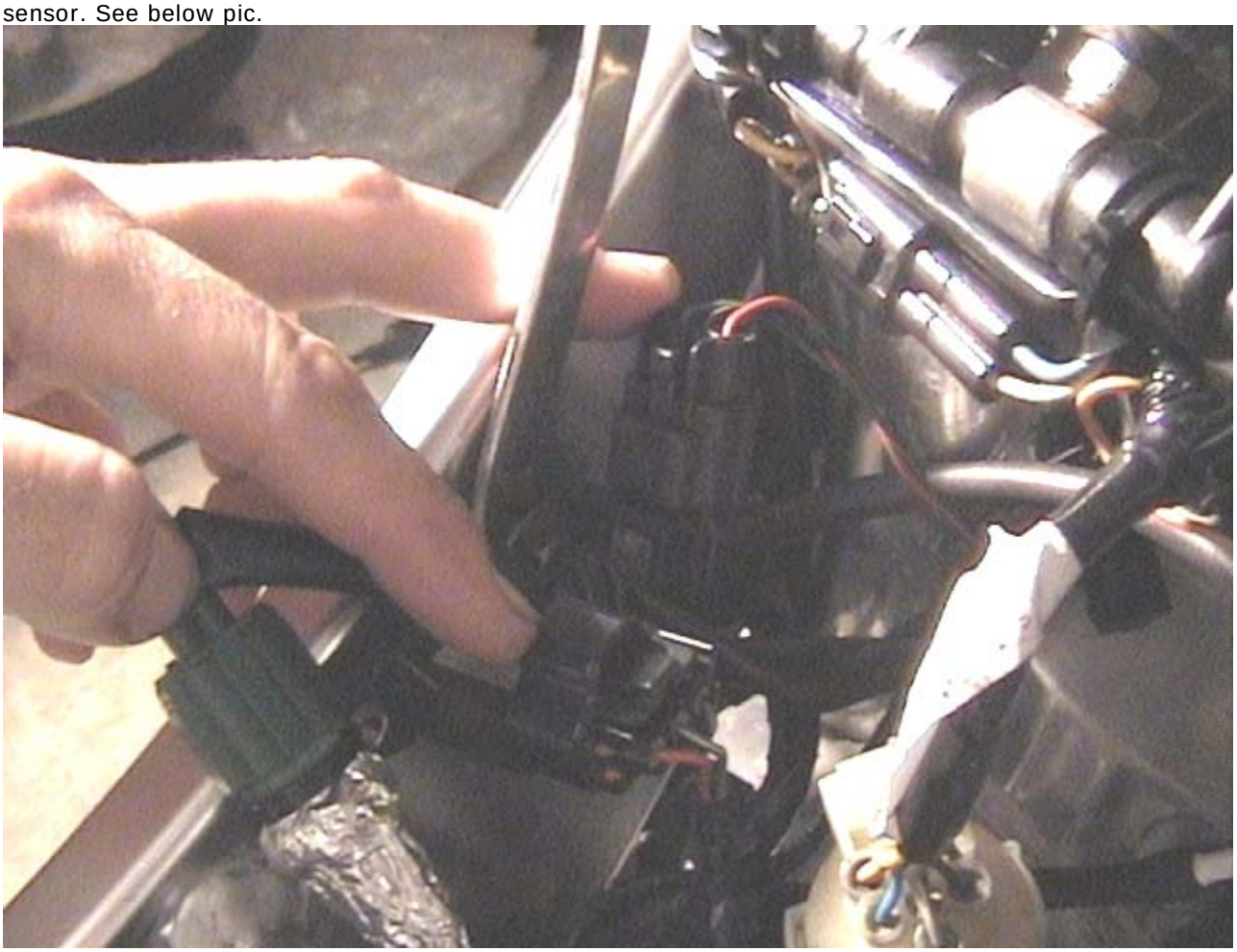
Install the plenum tie down aluminum straps. There were 4 supplied with my kit, but I only managed using 3, one of those being modded to fit. I may have done this part a bit wrong, but for the life of me, it's all I could figure out.....
The rear ones are straight forward enough. The long one goes on the right side, from the right rear corner of the plenum down to the bolt that holds the battery "-" cable to the frame. The tie-down for the left rear is the next longest one, and it mounts in the same fashion-there is a bolt on the inside of the frame where the vacuum controls mount-you know, the controls for the flapper valve on the airbox that we no longer need.....remove that junk, btw...we don't need those valves, that vacuum reservoir, or the vacuum lines for it. Yank it, if you haven't already, and install your tie-down strap. With the bolt that holds the bottom of this strap, you'll need to also screw down the barometric sensor and the map sensor (removed from the airbox earlier). Position them level, and don't forget that the map needs a vacuum line to it....more on that later.....For the right front strap, I cut one of them to fit in this area. It's all I could figure.....Reinstall the inner fairing bracket, which was removed earlier, and using the bolt for that, fasten the right front strap in that area. Cut and drill a hole to match the plenum if need be. I did. The left front didn't get a strap on my kit. If it needs one, I'll be ding donged if I know where it goes. I didn't find a place for the twisted up strap.....







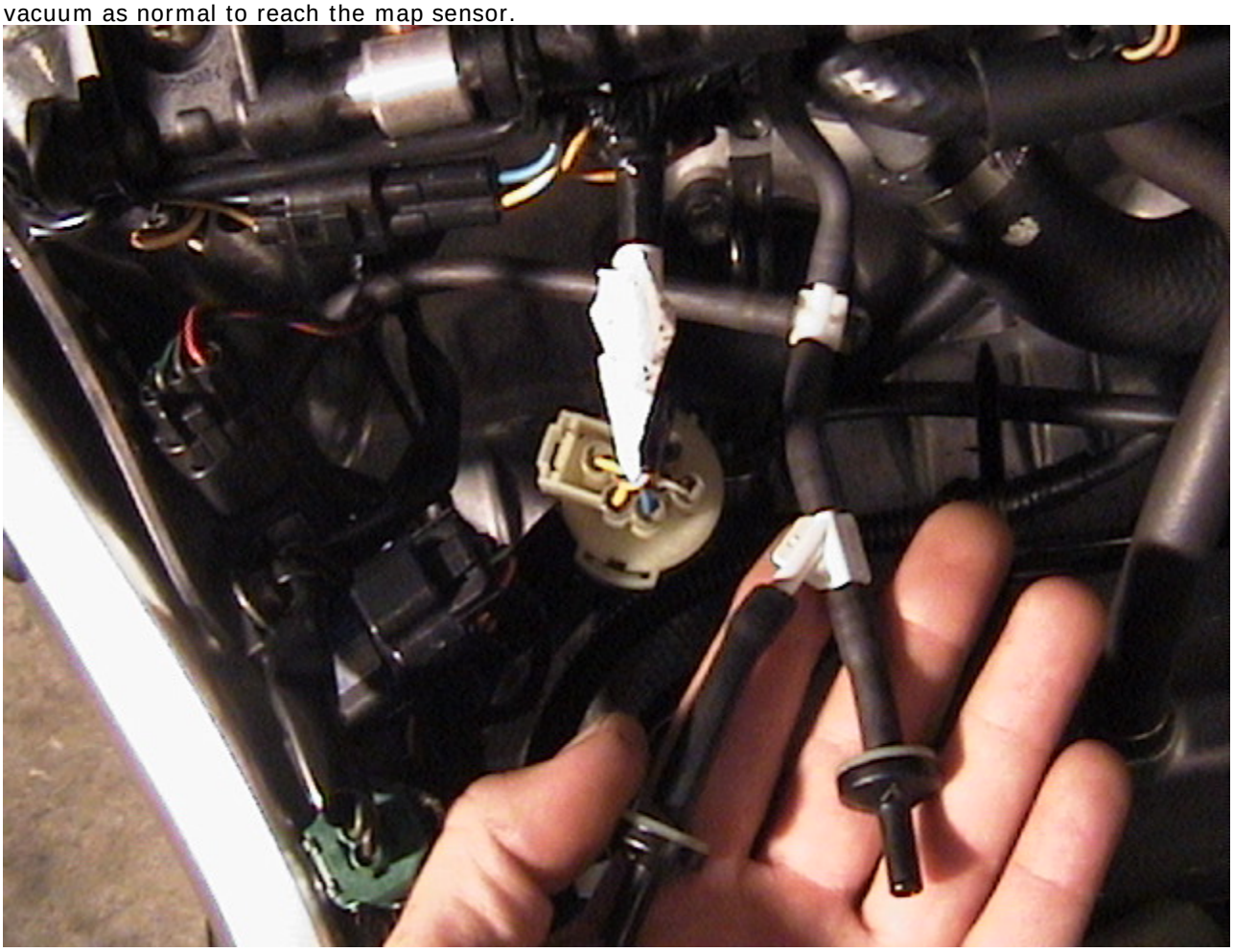
Here's the pic of the map sensor, barometric pressure sensor, and the air intake temp sensor mounted to the left rear tie-down bolt. I insulated the temp sensor to keep it on the cooler side, as if it really mattered. It's tie wrapped to the other sensors. My thumb is on the air temp sensor, the index finger is on the baro sensor, and the bird is on the map sensor. See below pic.



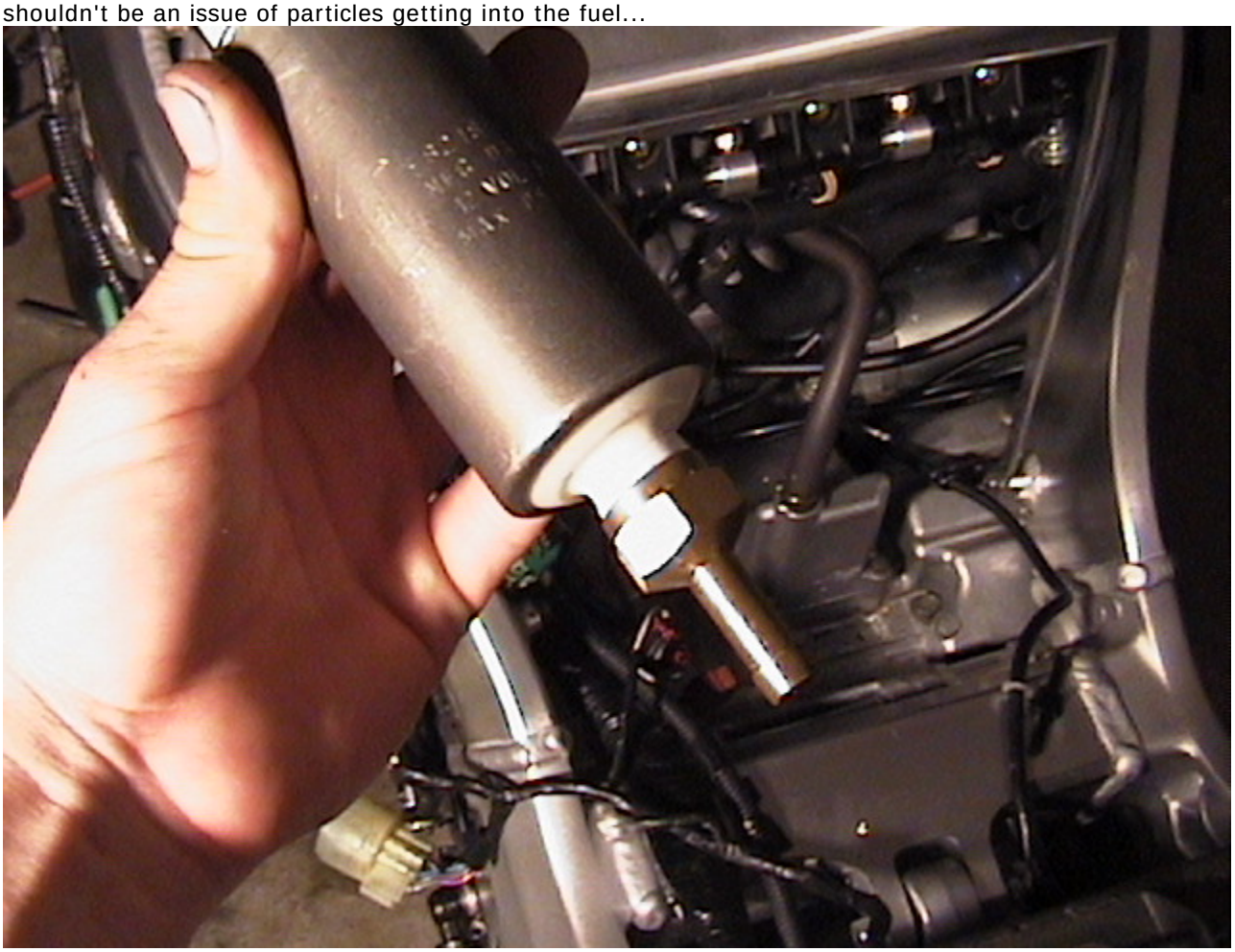
Notice also that the tie-downs are not straight like they come. You'll need to push and bend them inwards once installed, so they won't interfere with the gas tank closing.....ask me how I know, go ahead ask.....It may prevent you from taking the tank back off and wondering why the hinge wouldn't go down.....har har.....grrrrr.....
On a side note, I had to lengthen some of the bolt holes on the some of the straps, due to my engine having a spacer plate in it. The holes wouldn't line up quite right....no biggie.

* With the plenum secured, tighten all the clamps on the plenum and Up-Pipe. Get 'em on there good, we don't want any leaks.

* Now, we need to hook up the map sensor with a little modification to the line. Install a "T" fitting into the map sensor vacuum line, having the map sensor T to the side, and install the checkvalve on the straight through path from the T. The valve must be position so that boost pressure coming through the line can be vented to the atmosphere. Notice in the pic (I've installed an additional Y, and another checkvalve in mine) how the checkvalve is positioned-the black end is facing out. Also note that the line to the map sensor is run off to the left. The purpose of this modification is to prevent the map sensor from seeing boost, as this will trip the FI light. It doesn't hurt anything, but it makes the light blink. I know, mine has always done it. Maybe my setup is wrong, but I've tried it with one, and now 2 checkvalves, and it still don't work right. Oh, well....that's what I got.
The map is only used by the ECU at low engine
speed and throttle openings, so when under vacuum conditions, the checkvalves will allow vacuum as normal to reach the map sensor.

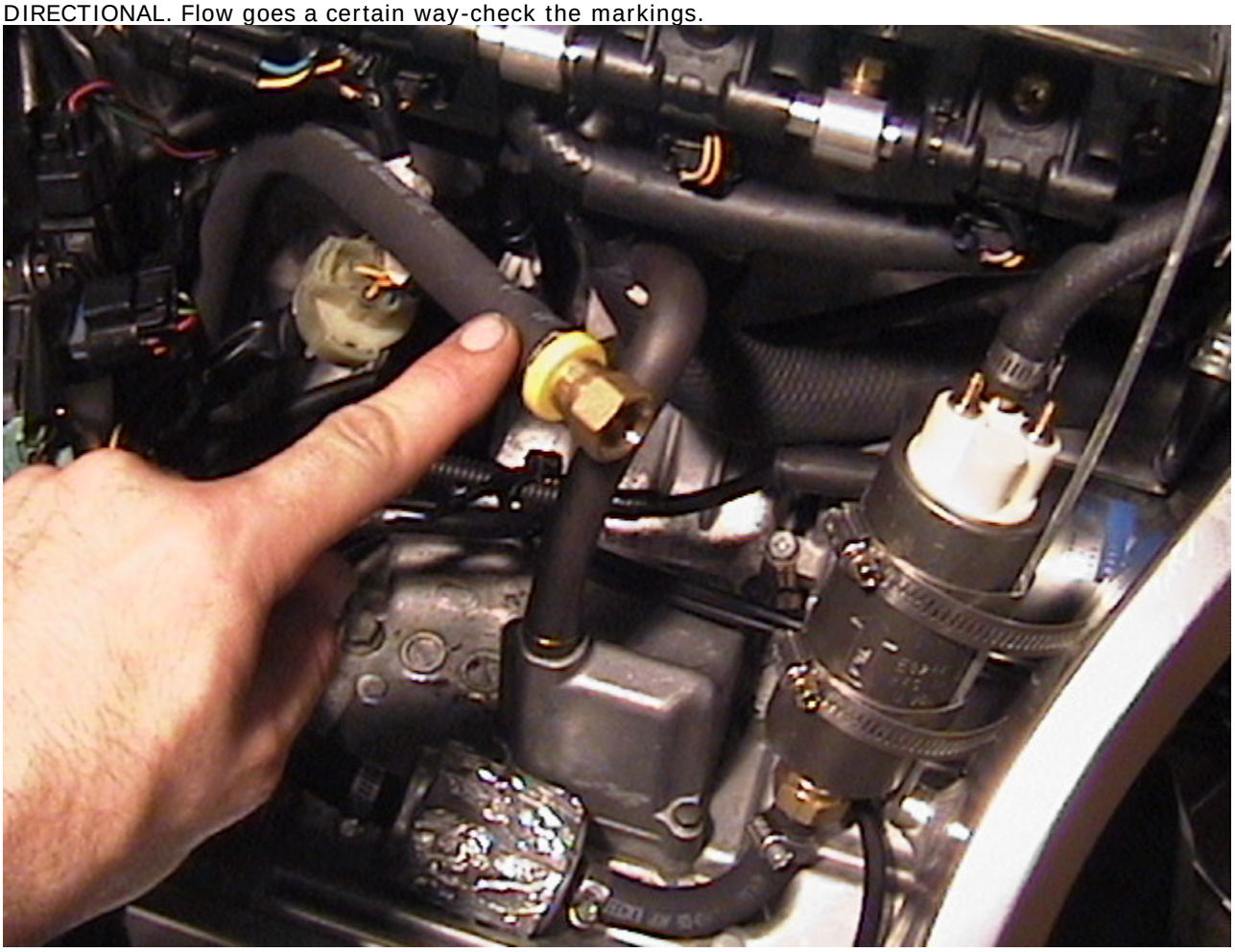


Fuel pump:
The fuel pump will be mounted onto the right rear plenum tie-down strap, now that it's installed. First, the pump must be fitted with the nipple on the intake end of it. You'll have an o-ring to go inside the nipple, and then just screw it down and tighten it up-I did use a bit of teflon tape on the threads, just not the first few of them....I really don't think it's necessary, but I used it anyway. By not wrapping it around the first few threads, there shouldn't be an issue of particles getting into the fuel...

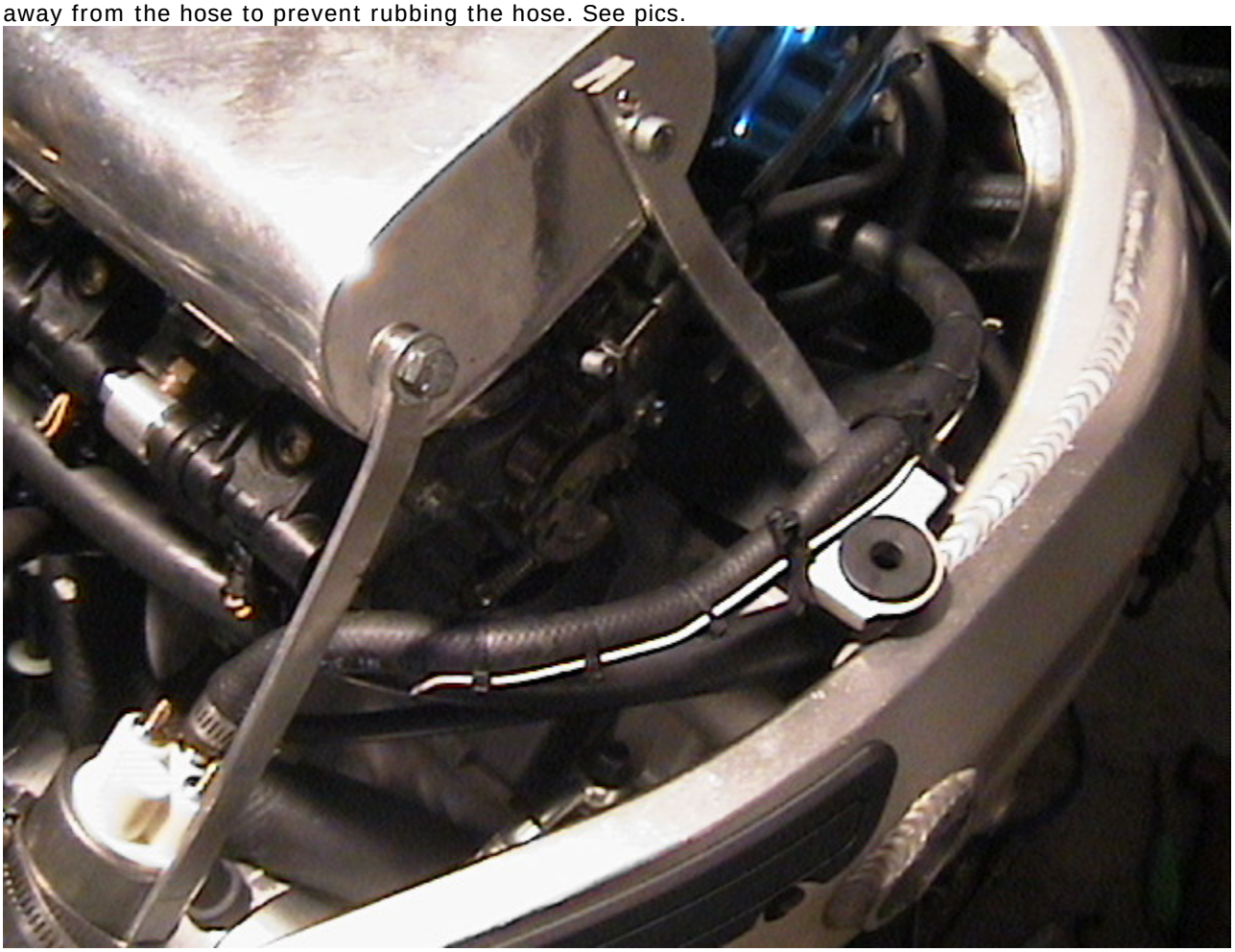


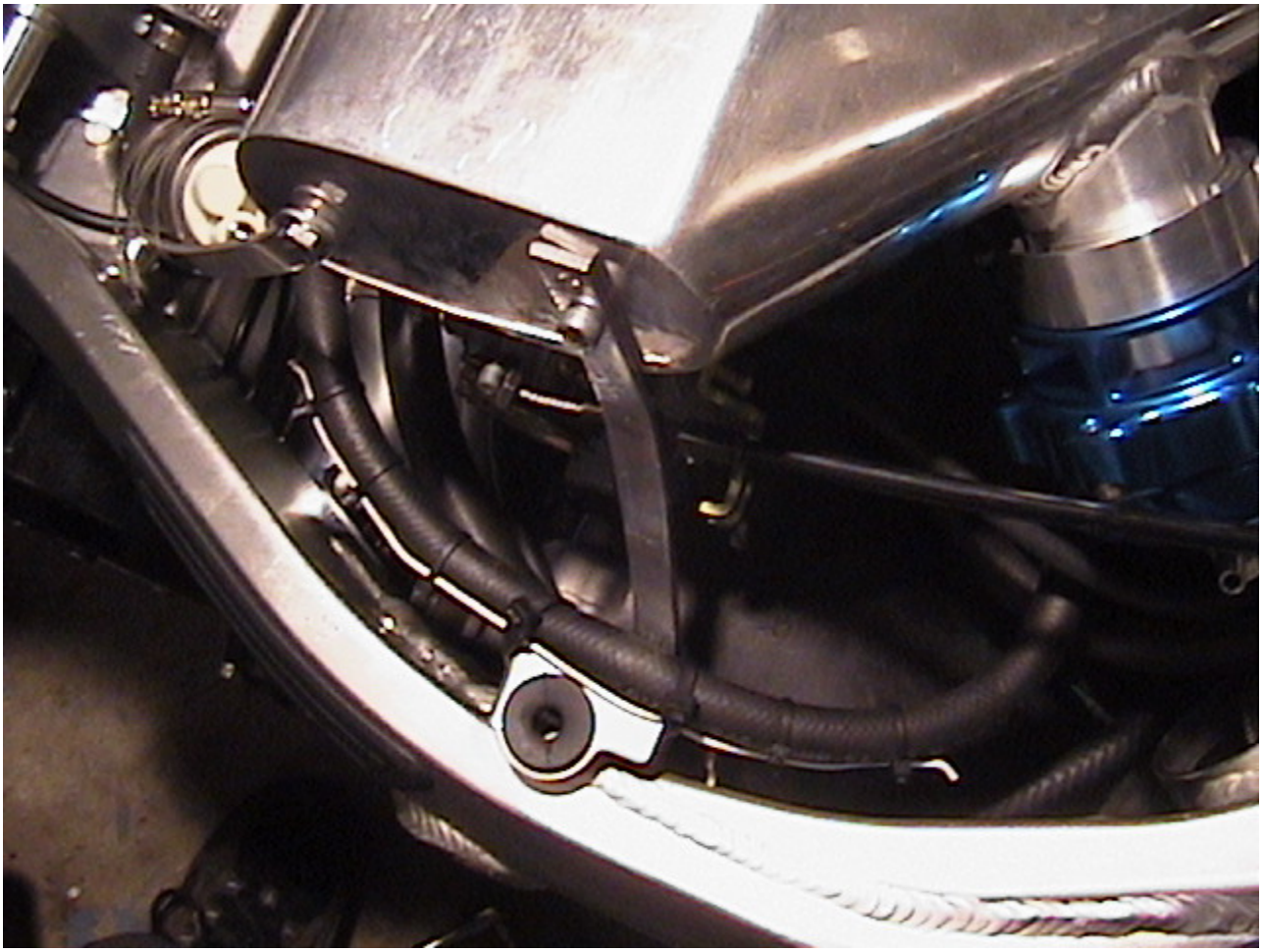
Before mounting the pump, install the inlet fuel hose (big hose) onto the inlet of the pump. Now, take your fuel filter, and test fit the pump and filter onto the bike to estimate the length of hose needed to install the fuel filter. The pump should be low on the strap, just high enough to prevent kinking of the fuel hose. The filter should rest at the base of the engine.

Use the supplied hose clamp to clamp the pump onto the right rear strap. I used 2 clamps, to prevent the thing from moving, as I don't want the fuel hoses to move. When done, it should look like the pic below...note the positon of the terminal contacts on the pump-away from the metal strap! I insulated the filter to keep the fuel cooler. NOTE: the filter is DIRECTIONAL. Flow goes a certain way-check the markings.



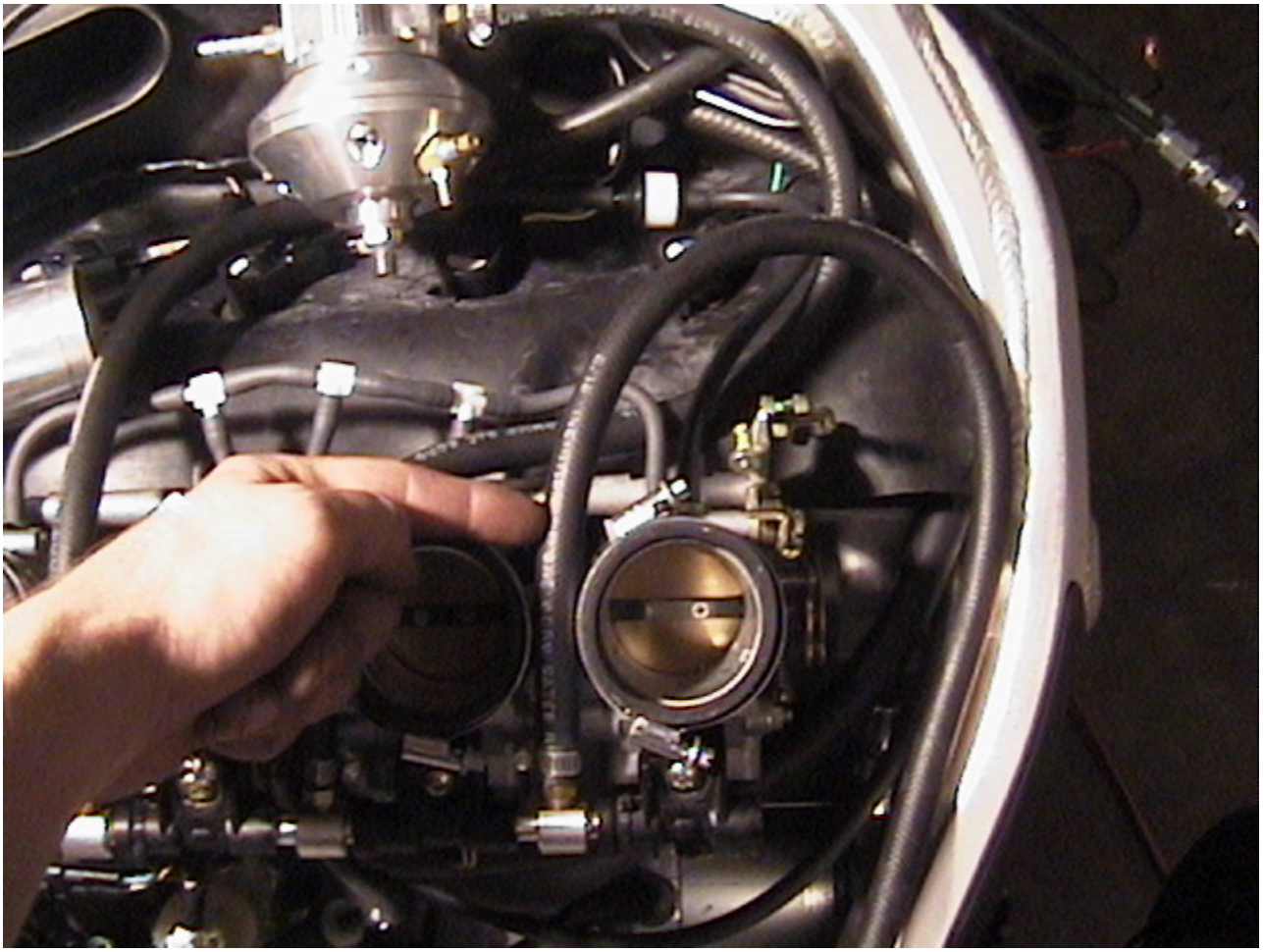
Now it's time to install the fuel line from the outlet of the fuel pump to the far right side rail barb on the billet rail insert installed earlier. I know that the way I did it is a bit different than what most others have done. I routed it the way I did because I didn't really see an easier way to route it up to the front, without making it a lot longer hose....if anyone has other suggestions, feel free to say so, but the way I have it works for me.....
Clamp the fuel hose onto the outlet of the fuel pump, and route the hose along the outside of the right front plenum strap, securing it with tie wraps in a cross fashion at the fairing bracket. Leave enough length from the pump to the ties so that the hose will naturally be held AWAY from the throttle bodies. You don't want the hose to rub on the right rear strap, or the throttle bodies, or the throttle cables.
I then used a small section of coat hanger wire, bent it to shape, and tie wrapped it to the hose so it will definitely hold it's position away from said areas. Curl the tips of the wire away from the hose to prevent rubbing the hose. See pics.



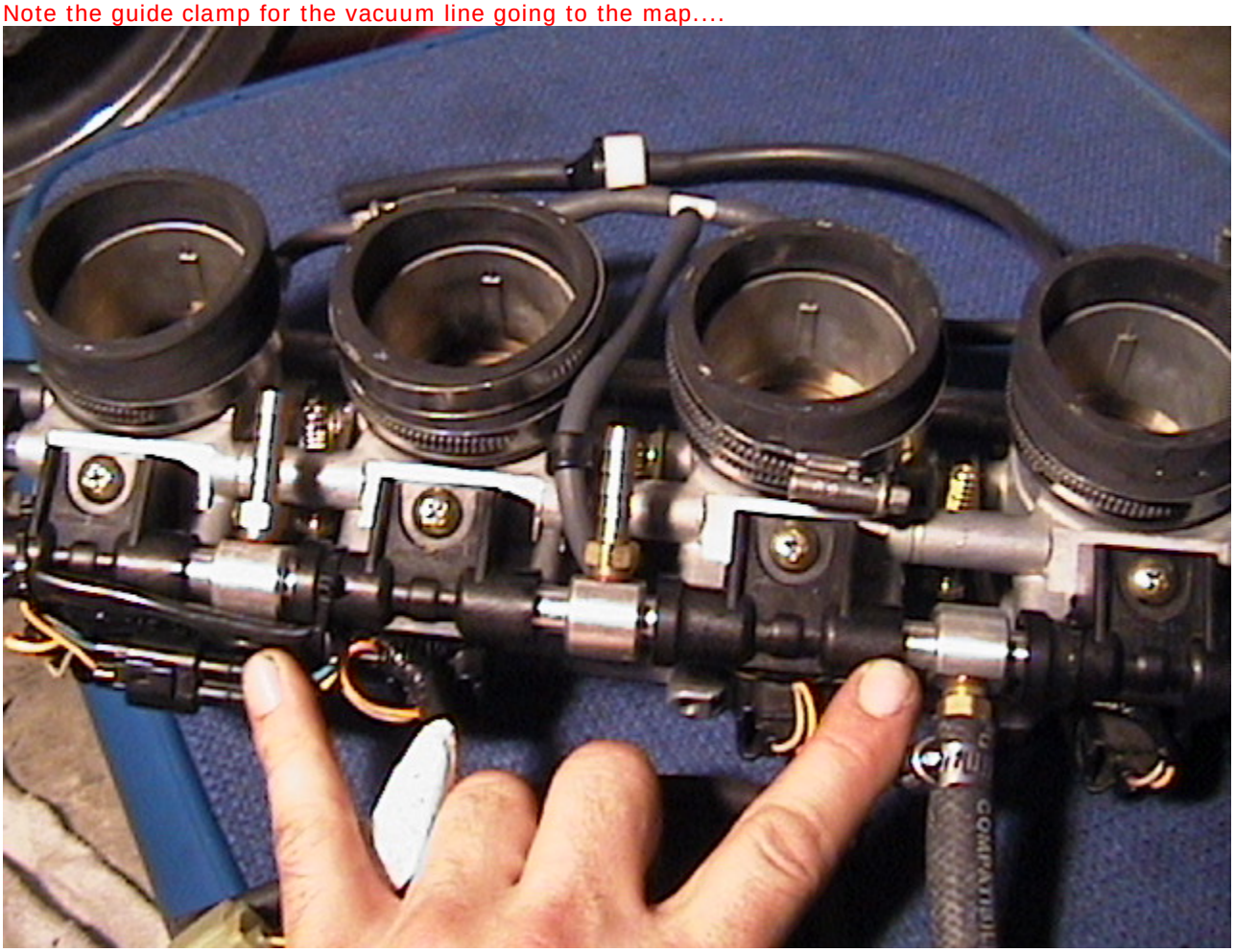


Curl the hose up and around and back down in between the throttle bodies and the plenum to the right side barb on the fuel rail. Leave the hose long enough to make an easy loop on top of the engine, we don't want ANY KINKS! A kinked hose can limit the fuel supply to the hungry engine under boost, and we do not need it to run lean.....bad things happen.

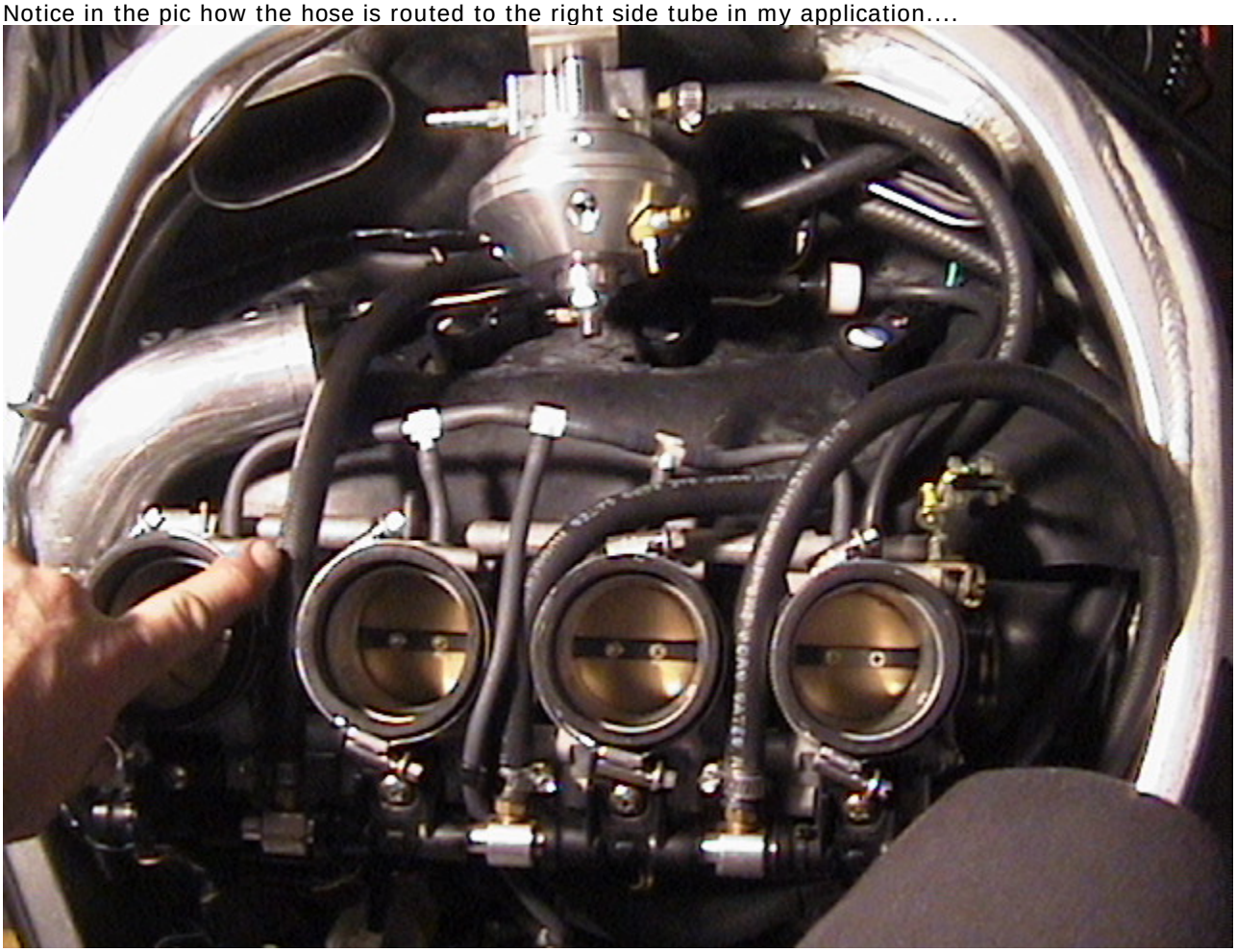
When clamping the hose, position it so that the head of the clamp is actually to the side and down a bit, so that when you tighten the hose, the clamp is actually supporting the fuel hose up a little bit. This aids in keeping the fuel hose propped up over the throttle body butterflies. While it'll clear no matter which way you put the clamp, it gives a bit more clearance. Look and make sure that the fuel hose is clear of the throttle butterfly operation mechanisms, as it should be the same with all vacuum lines. Remember that the map sensor vacuum line has a small clamp guide of it's own to route through there. Also remember that the following pics are made without the plenum on so you can see it. See pics.



Note the guide clamp for the vacuum line going to the map....

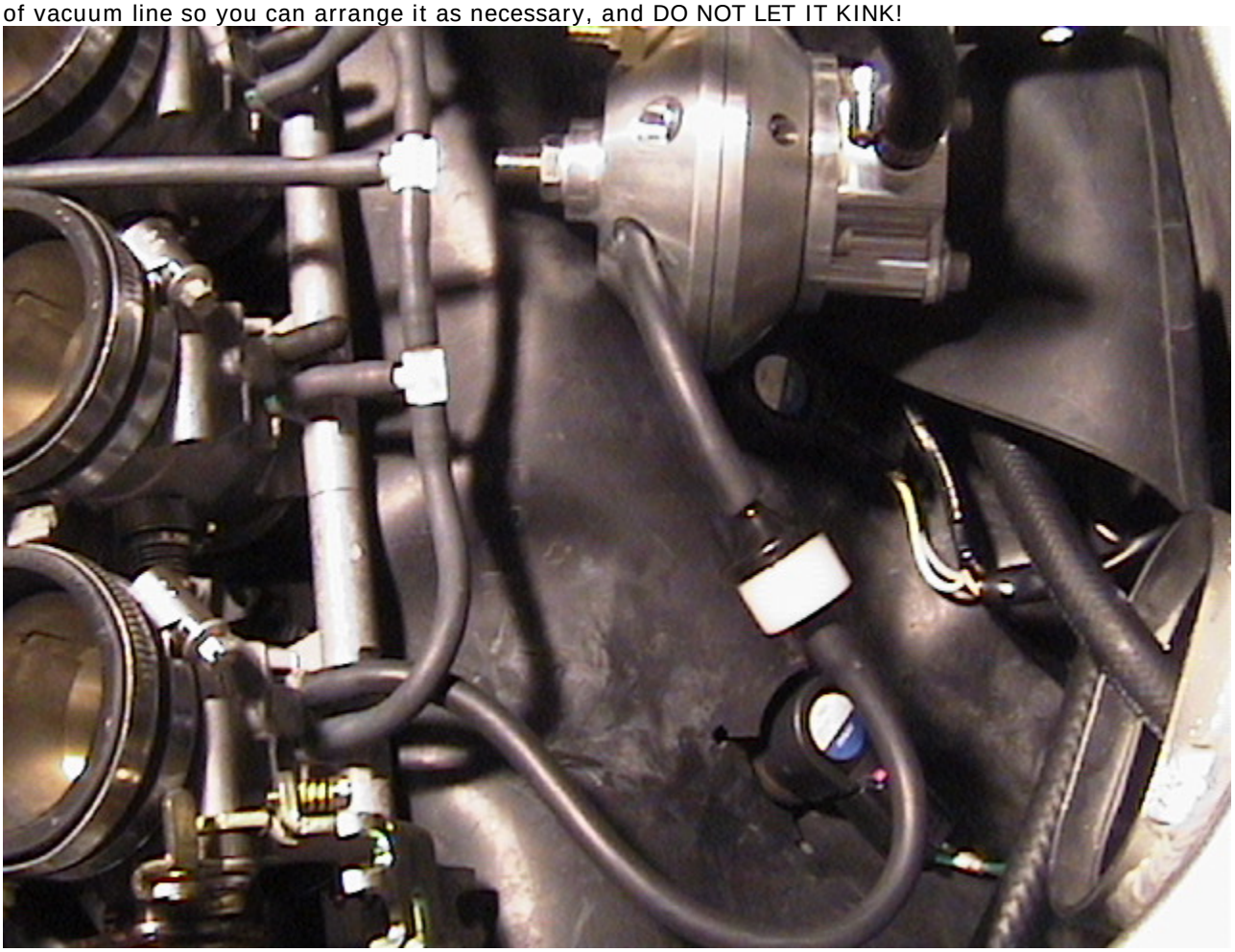


Now, you need to install the fuel line supply to the fuel pressure gauge. The left side barb on the fuel rail is the one we'll use for the gauge. Run the hose down on top of the Up-Pipe tube and down between the plenum and throttle bodies the same as with the fuel supply hose. Clamp the hose to the Left side barb the same way as before. Now, you can mount the fuel pressure gauge wherever you choose to, either on the left side or the right side. Leave yourself enough hose to put it where you desire. For me, I put BOTH of my gauges on the right side of the bike, with the fuel gauge at the top right. The hose goes into the right ram air tube, and you'll need to make an exit hole for the hose at some point, depending on where you put the gauge. I might do a more detailed write-up later on for the gauges, but for now, I don't have any pics of it. Sorry.
Notice in the pic how the hose is routed to the right side tube in my application....

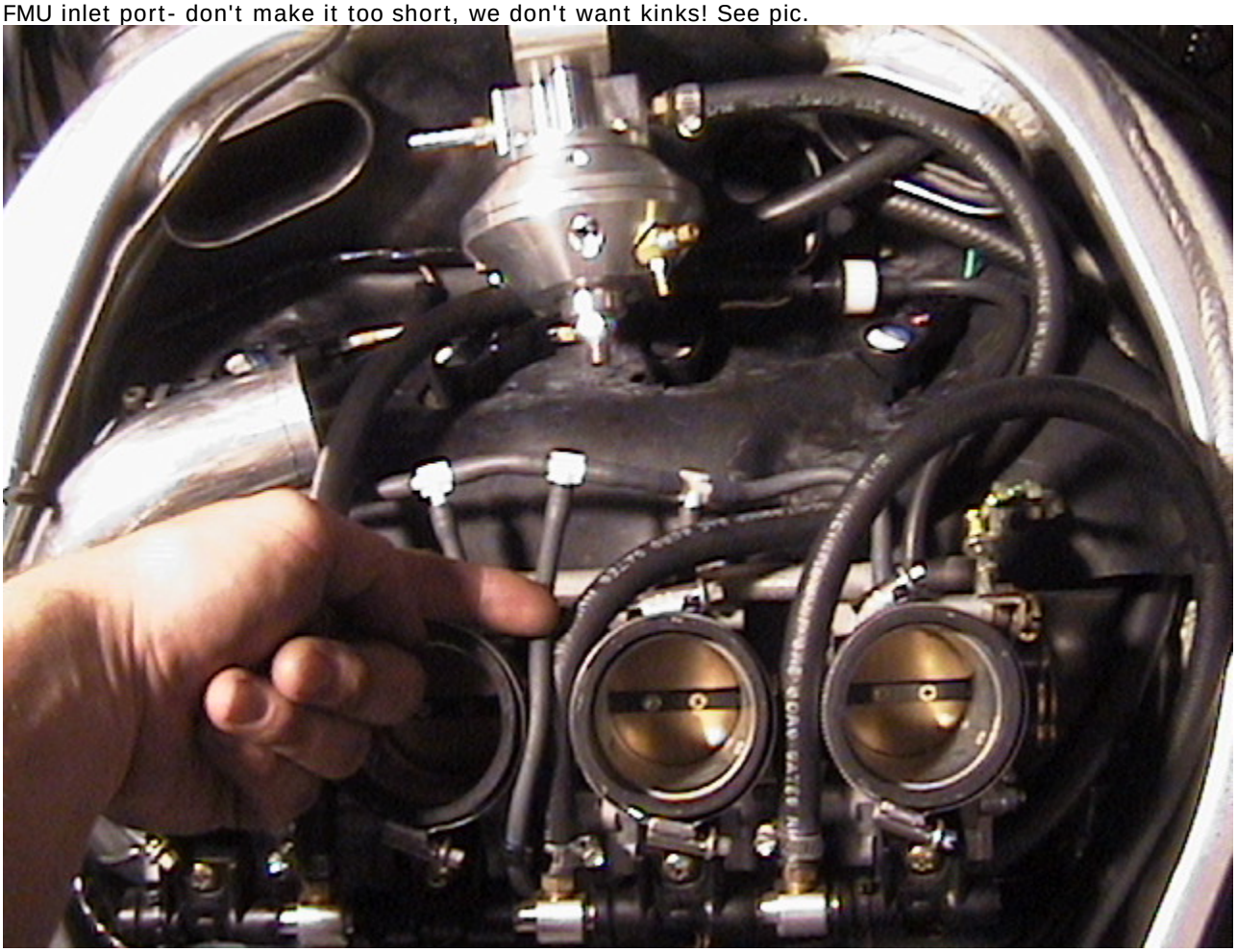


Now we need to prep the fuel pressure regulator/FMU (Fuel Management Unit). What this thing does is it varies the fuel pressure to the injectors based on the pressure in the intake, after the throttle butterfly. As boost goes up, so does the fuel pressure. If it's not set up correctly, you could starve the engine of the fuel it needs. Pay attention.
First, assemble the FMU, you'll need to screw in the inlet and outlet barbs on the sides. Use a little lock-tite thread locker, or sealer on the threads to prevent leakage, leaving the first thread clean to prevent contamination inside the FMU. The instructions supplied from the FMU manufacturer advises against using Teflon tape.... I believe there is a bracket to install as well, no big deal.
Ok, as for adjustments, we'll have to wait until it's ready to fire up, so don't bolt down the FMU yet, just screw it in place and leave it loose....

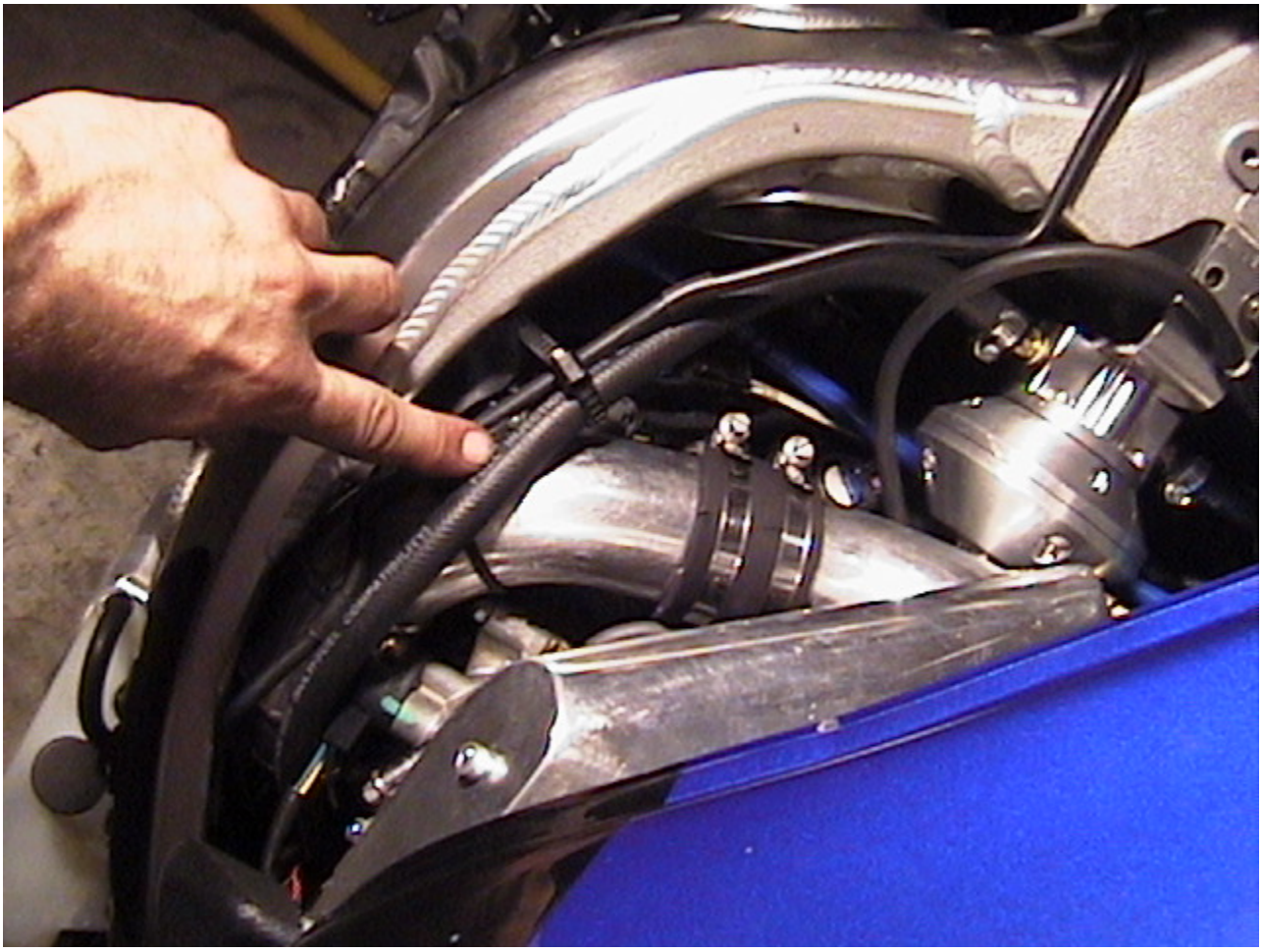
The FMU needs a pressure feed signal to operate, and to do this, we need to install a vacuum line from a port on the throttle bodies up to the FMU port on the side. This port is all by itself on the side of the FMU, DO NOT hook it up to the little barb with the turn screw adjuster on it.
For our application, we don't want the FMU to see vacuum, only boost, so install the supplied checkvalve inline of the hose. The black end of the valve goes toward the FMU. Double check by blowing through the valve. Air should be able to pass toward the FMU. If possible, use a T fitting to utilize 2 vacuum ports to supply the FMU. Use adequate length of vacuum line so you can arrange it as necessary, and DO NOT LET IT KINK!



Now, run the fuel line from the middle barb on the fuel rail to the RIGHT side inlet of the FMU-it's marked with "IN", so there's no excuse for getting confused. There is no "out" marked on the outlet, so by process of elimination, you should be able to figure it out....haha. Note that the hose is long enough to make a smooth curl and straight into the FMU inlet port- don't make it too short, we don't want kinks! See pic.

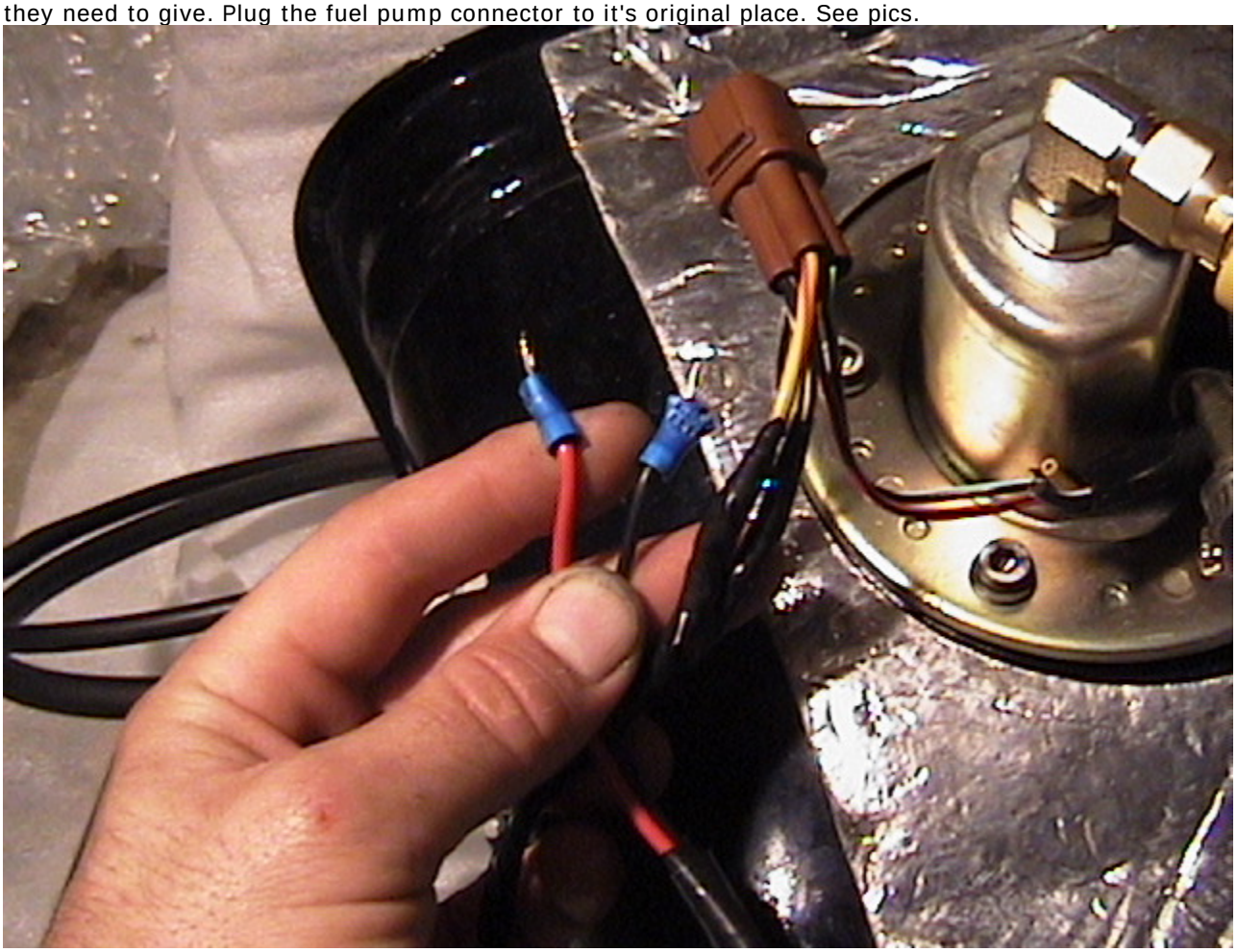


The last fuel line is for the fuel return out of the FMU. This is the left side port, the only one left. Clamp the fuel hose onto the FMU, and leave the hose long for the moment. It'll be trimmed later when the tank goes back on...

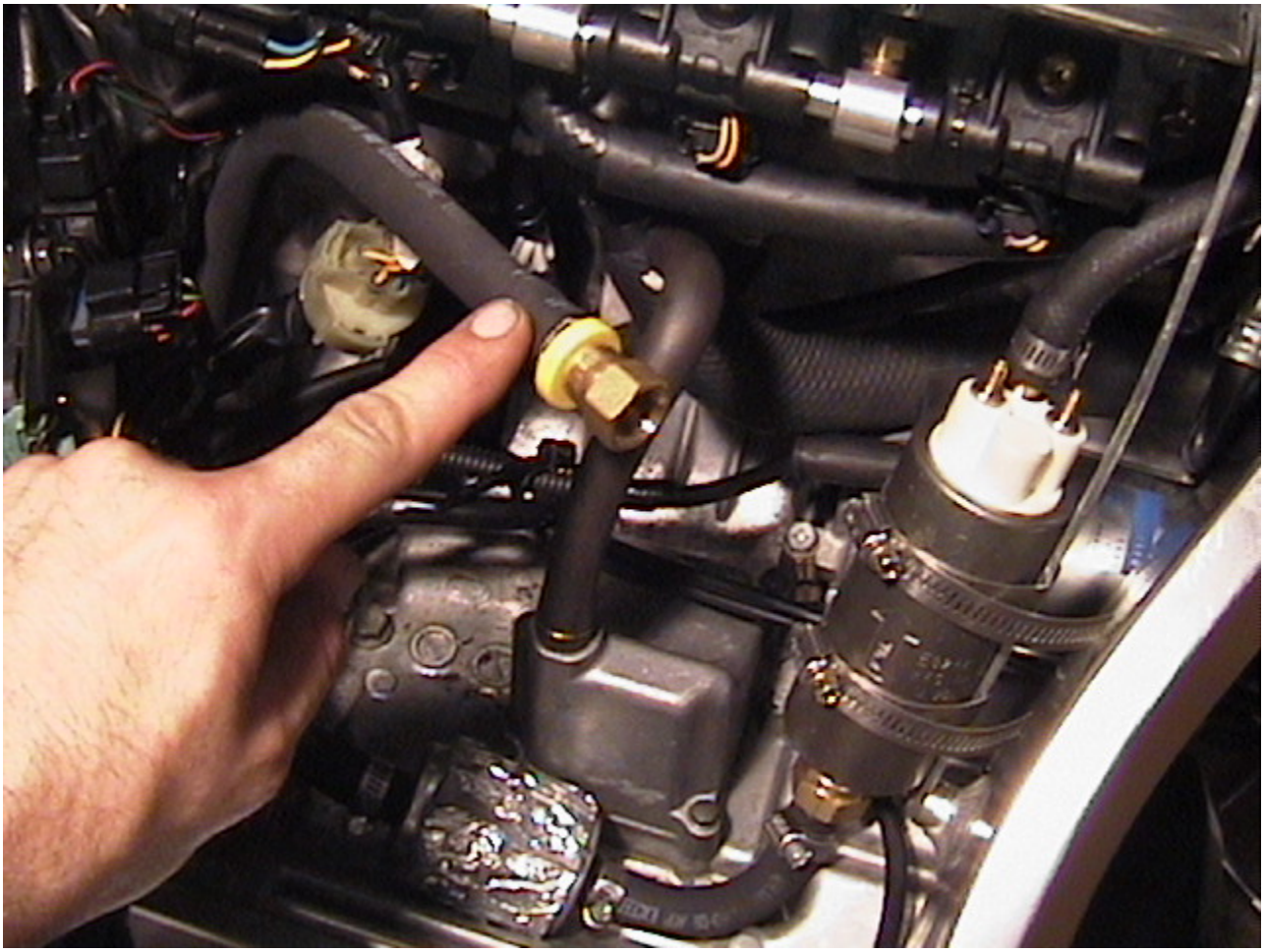


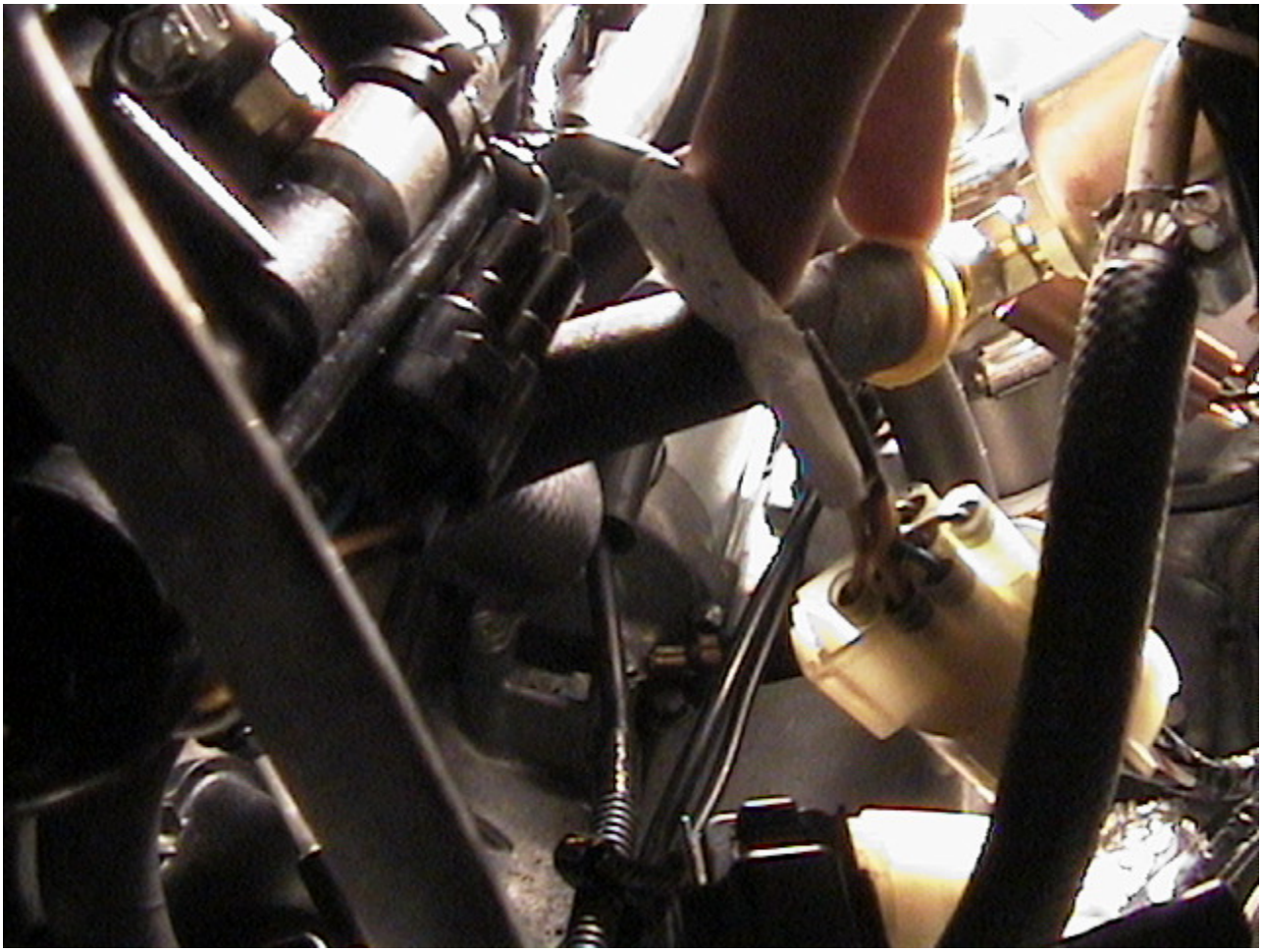
* Now, you'll have to estimate the length of hose going from the inlet of the fuel filter to the supply fitting on the bottom of the tank- the one we tapped into in the "bowl". Install the large fuel hose to the inlet of the filter, clamp it down.

* Re-install the gas tank and prop it up. Now, you can wire the pump. Get some wire of the proper gauge, 14 should work, and extend the wires that you cut earlier at the fuel pump connector. The Yellow/Orange is hot, the black/white is ground. The pump is marked + and - ... Use the supplied connectors to wire the fuel pump. Tape and tie the wires in a safe location, making sure they won't rub on anything, and be sure that the wires are plenty long. There may be other stuff laying on or around them in the future, so they need to give. Plug the fuel pump connector to it's original place. See pics.

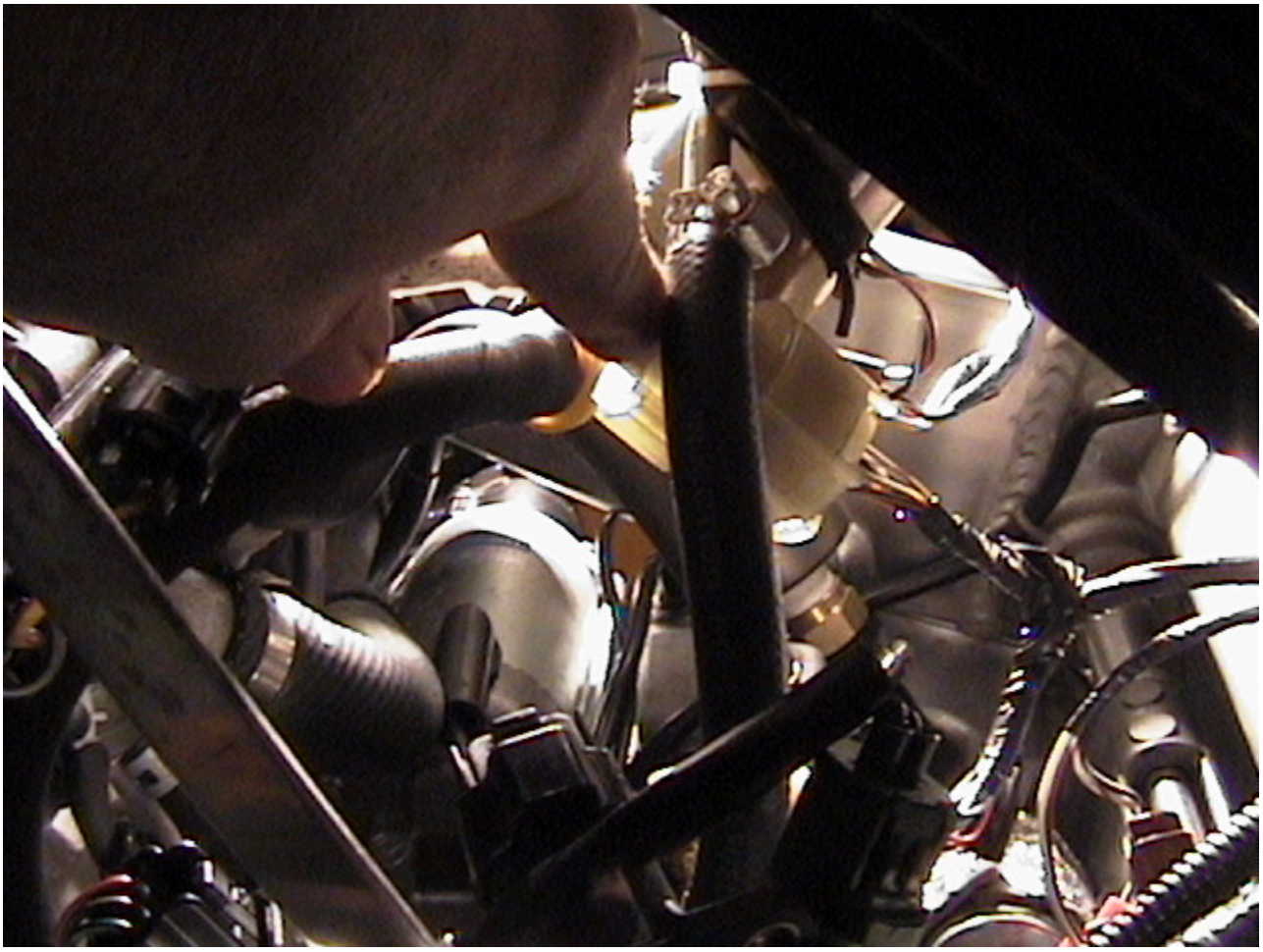


Attach the supplied barb to the feed at the bottom tank, and tighten it up good. Estimate the length of the hose and install the fuel supply hose to the tank. What I did was lower the tank and look under it as I closed it, to get the length of hose to my satisfaction. Note where the hose folds as the tank goes down. I routed the hose to curl all the way to the left side of the bike, under, over, or between certain wires that get in the way. This allows the hose to NOT KINK when you lower the tank.

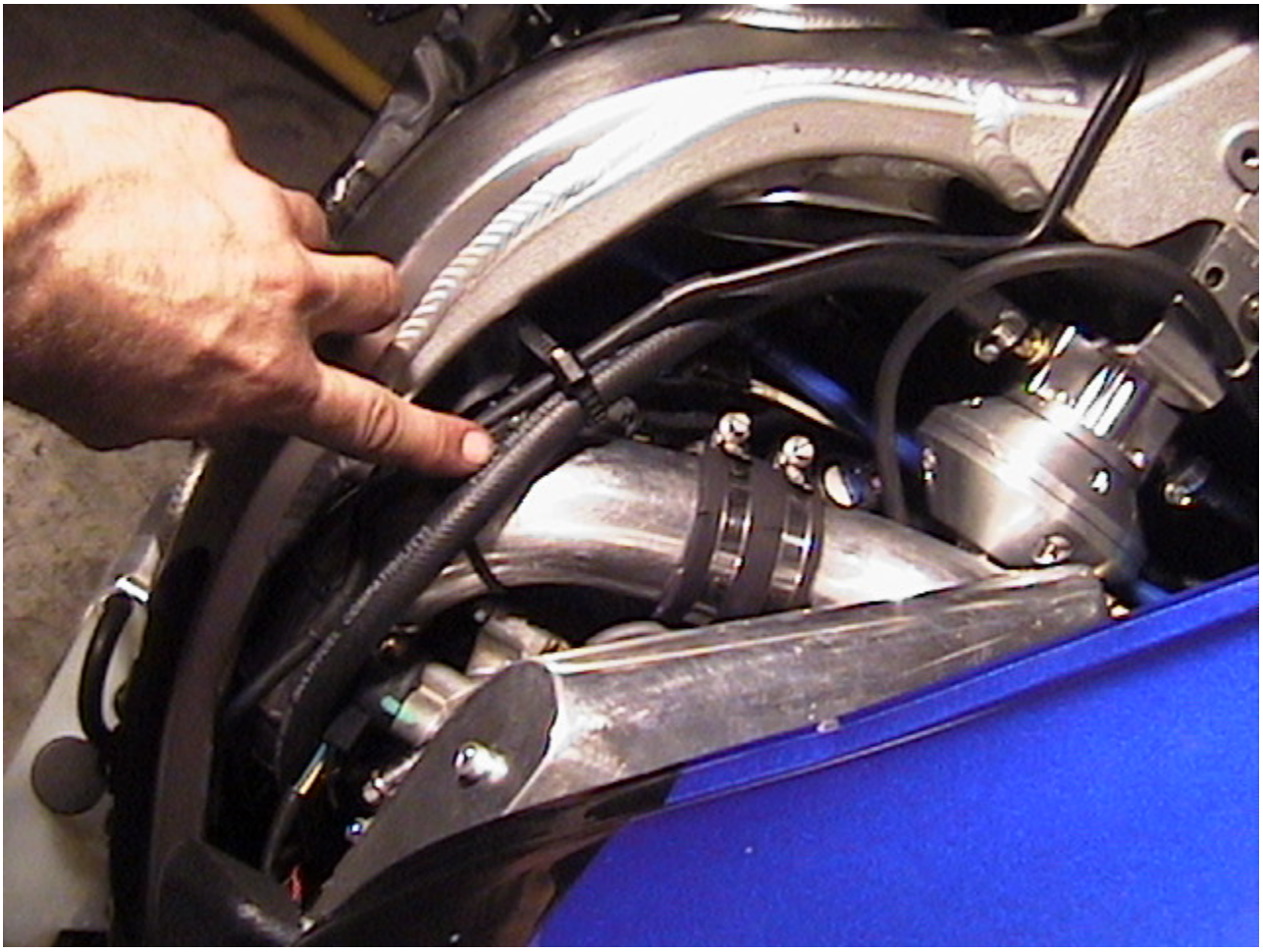




Note that when the tank goes down, observe the action of the harness for your power commander.....I routed one harness connection above the line, and one below, so the hose doesn't bind on anything.



Now the fuel return line needs to be routed to the port that was originally the outlet for the in-tank pump. It's now a return port. This is another area where my routing is probably different than others... I routed the hose on the outside left, on top of the Up-Pipe, and snug to the throttle bodies. I tied them in place to prevent the tank from pinching it.

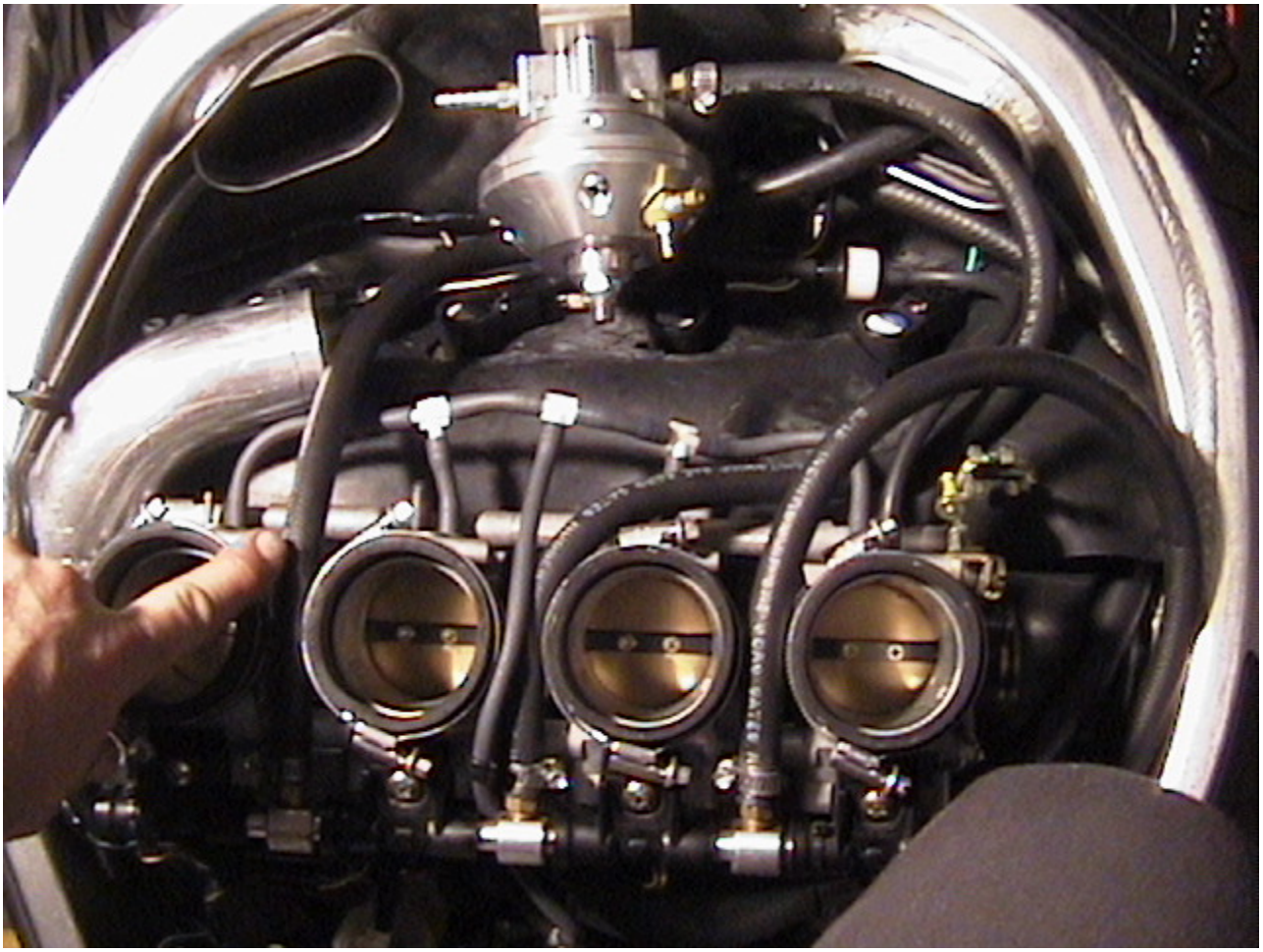


Route the line along the left side and up to the return port in the tank. Be sure to use the same precautions with this line as with the other line concerning kinks and the wiring. Clamp it down. Secure the line close to the throttle bodies so it doesn't get pinched by the tank when it comes down.

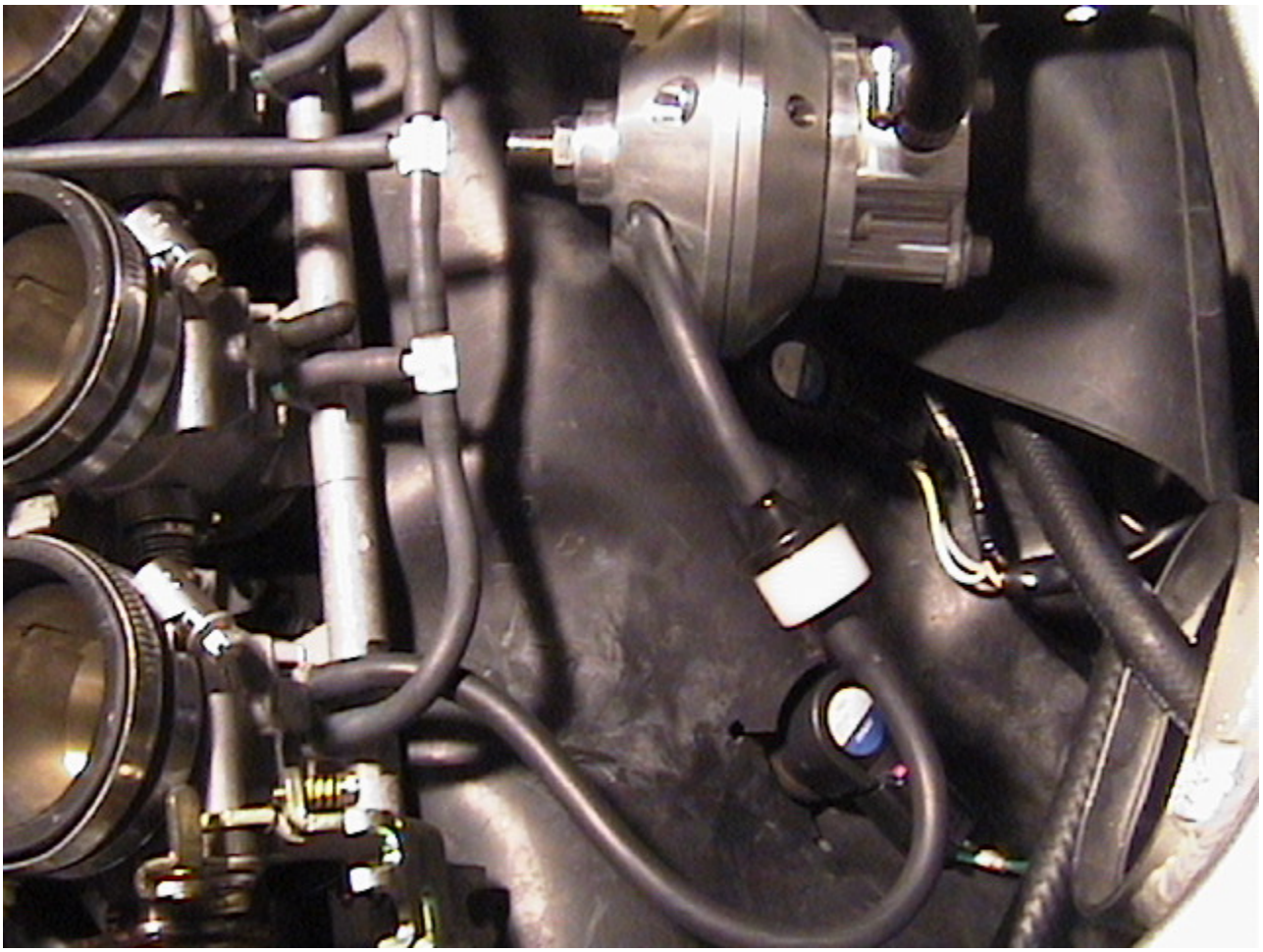
* Mount boost gauge where desired. Use a vacuum line to attach to the port, and slide the boost line into that. Be careful not to kink the boost line. If possible, use 2 ports T'd together to supply the boost gauge. Don't tap into the map sensor lines, as the boost pressure is bled off of this circuit!

* Reinstall the radiator, fill with coolant, and fill the engine with oil, preferably a good synthetic since the turbo operates very hot, and the oil needs to hold up. Put some gas in the gas tank. Check for leaks.

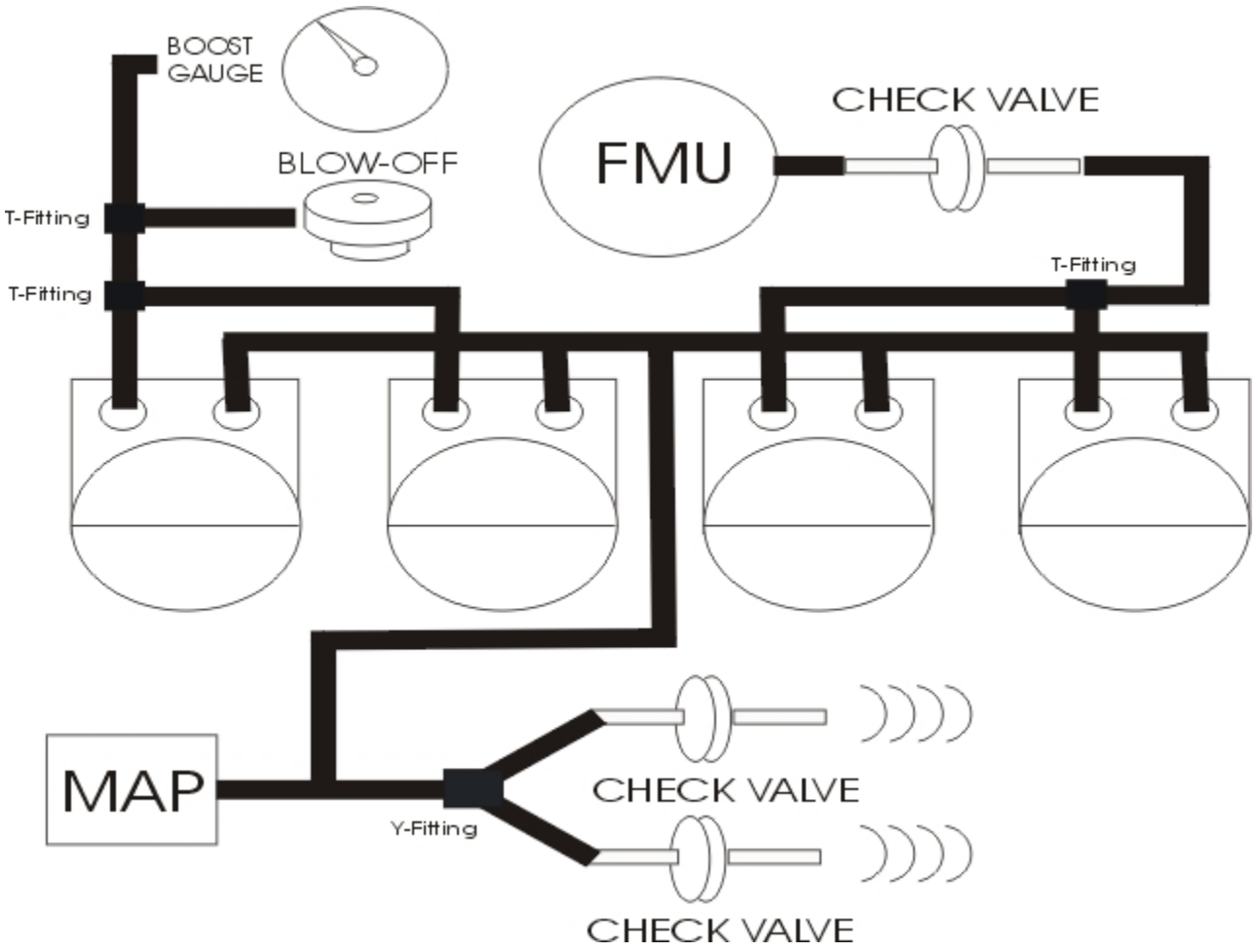
* Now we need to adjust the fuel FMU. The small turn knob next to the small barb is what adjusts the "rate of fuel pressure gain" Turn it all the way in until it stops, and back it out a half turn. That's that for that adjustment. Leave that small barb NAKED, do not hook it up to anything, per Dennis.....I put a small hose on it simply to keep dirt out of it, but nothing more. In the below pic, you see the turn knob adjuster with the small barb right with it. That's our boy.



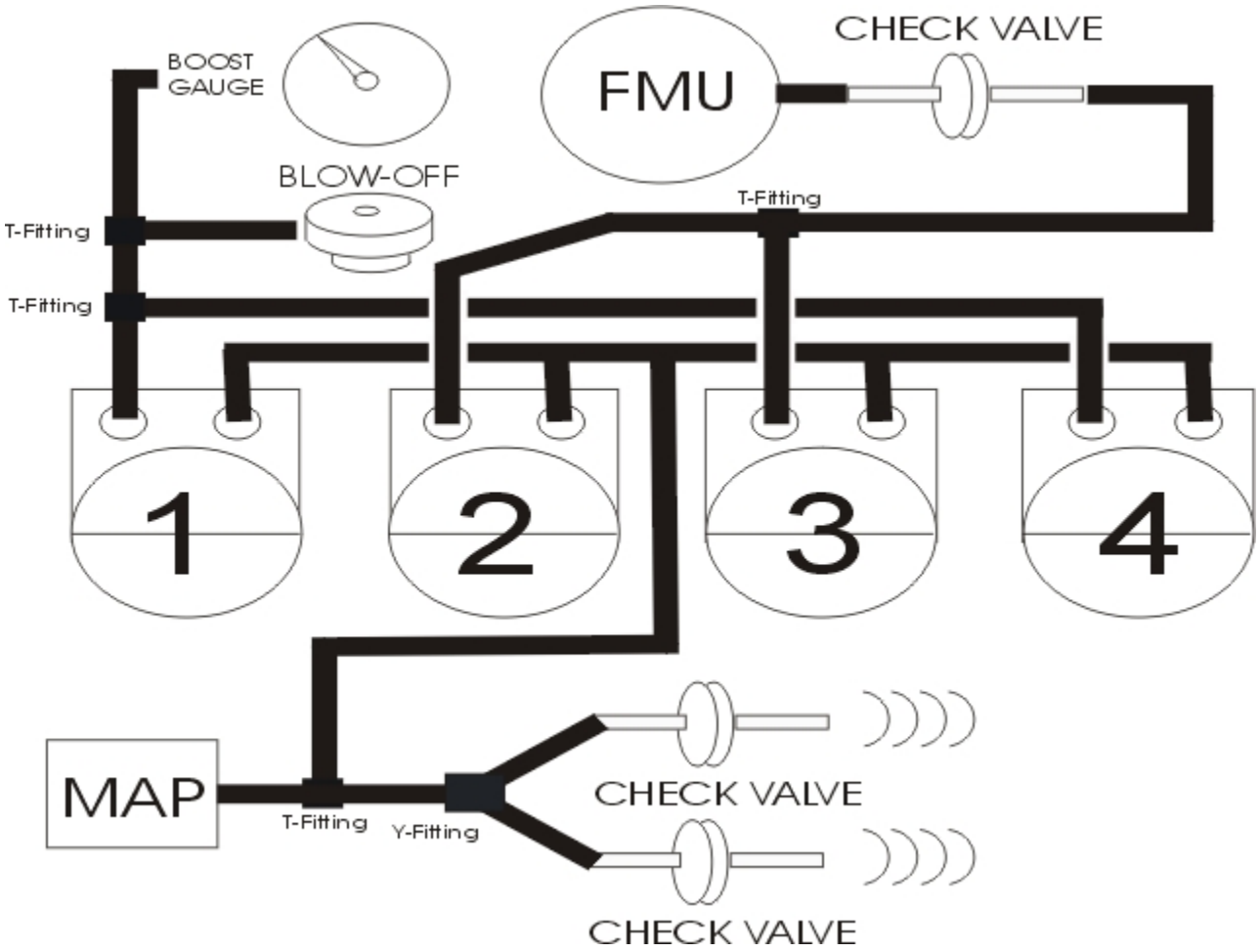
After giving everything a once over, turn the ignition on, and let the pump prime up. You may have to cycle the key a few times to build pressure-watch your gauge. Start the bike and let it idle. The fuel pressure should be at 43lbs. If it's not, then the FMU needs adjusting. For this adjustment, locate the allen screw on the end of it, the one that has the locknut holding it in place. Loosen the lock nut, and turn the allen to achieve the desired base fuel pressure. Lock it back down.
In the below pic, the far left is the adjustment for the base pressure.



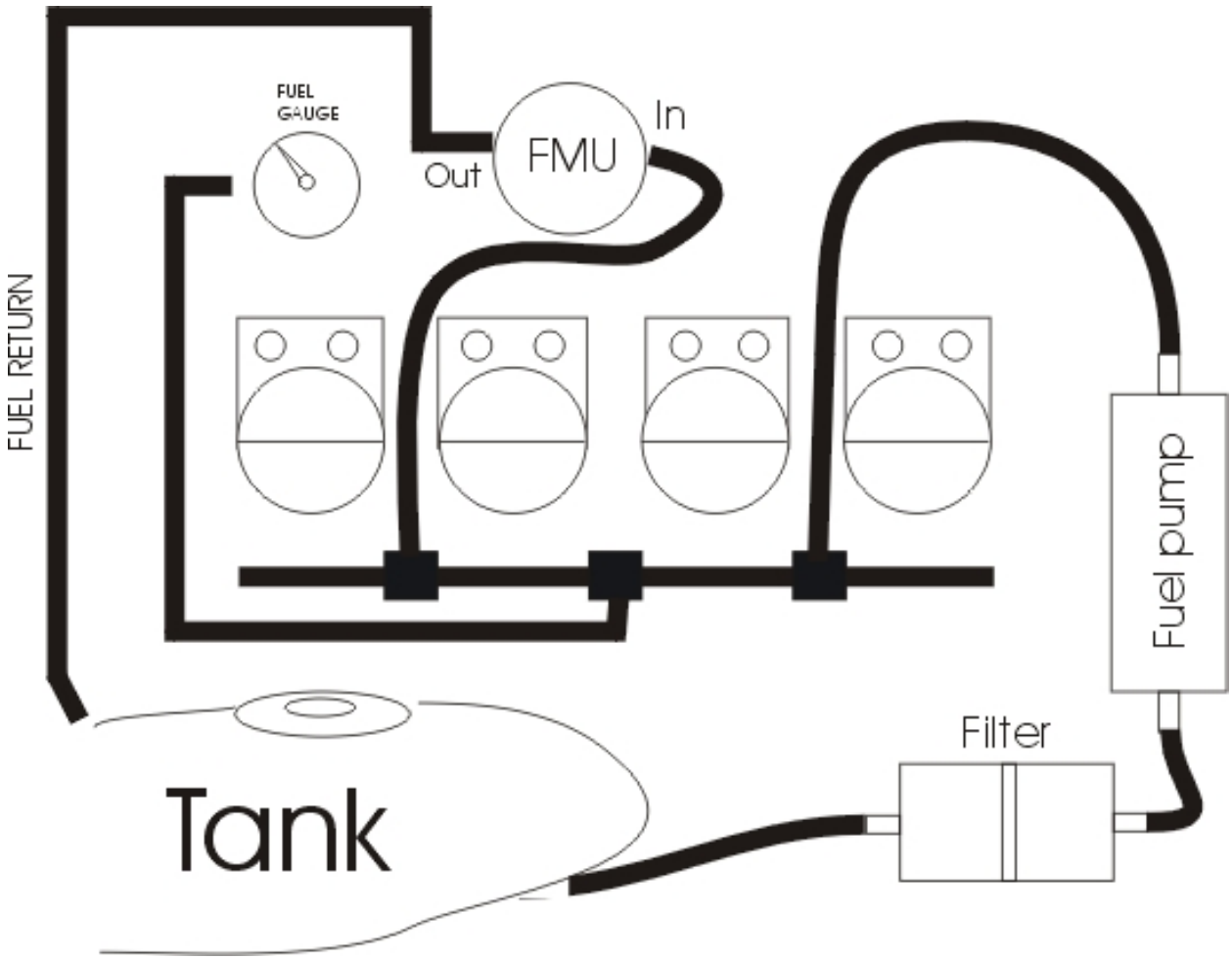
Here is the vacuum diagram



Here is another option for routing the vacuum lines if you have trouble with the first one or if you are receiving FI error lights



Fuel Line layout:



* LOAD THE MAP TO THE POWERCOMMANDER THAT IS GIVEN BY DENNIS!

Well folks, that's the jest of it. Putting the bodywork back on is about all that's left. Ride it around for a while and check for any leaks before buttoning it up.

ENJOY THE RIDE!