



Shotgun Double Barrel HPFP install guide



**Thank you for your purchase of the VTT
Shotgun Double Barrel HPFP upgrade! First
thing to do when you open your box is to make
sure all parts are in their respective bags and
nothing has been left out or lost during
shipping. Here is a breakdown of what you
should have.**

- 1 Assembled Shotgun housing
- 1 Mounting Bracket
- 1 High Pressure Check valve
- 1 Coolant pipe adapter
- 1 HPFP plug and play wiring harness
- 2 HPFP High Pressure fuel lines
- 1 LPFP Quick connect Y hose adaptor
- 2 Fuel fitting adaptors
- 3 Allen HPFP pump bolts
- 3 HPFP bolt washers
- 2 Mounting bracket bolts
- 1 HPFP Controller (optional)
- 2 Mounting bracket Star washers
- 3 Longer AC compressor mounting bolt
- 2 Hose clamps
- 4 large zip ties
- 4 small zip ties



Once all parts are accounted for you can proceed with the Shotgun Installation. We suggest this only be done by a qualified technician and recommend using a VTT certified install center. They can be found on our Website. If something was missing for your upgrade, please contact us immediately so we can remedy this. Contact info is on the page 8 of this guide.

READ THE ENTIRE GUIDE BEFORE BEGINNING INSTALLATION!



ANY QUESTIONS, OR FITMENT PROBLEMS, PLEASE EMAIL SALES@VARGASTURBO.COM BEFORE TRYING

**TO FORCE OR MODIFY ANYTHING. THIS UPGRADE IS
PLUG AND PLAY IF THESE INSTRUCTIONS ARE
FOLLOWED, ANY ISSUES NEED TO BE ADDRESSED TO
AVOID PROBLEMS**

INSTALL GUIDE

1. Following factory procedures remove the air intake box, charge pipe, radiator fan, intake manifold, and serpentine belt from the vehicle.
2. From the top remove the two bolts holding the plastic water pipe to the sub frame, these can be seen now that the fan is removed.
3. **Make sure the vehicle is not hot & be ready with a pan or bucket to catch the coolant!** This will evacuate all the coolant from the system cooling system. Remove the cap from the coolant tank. Follow the pipe from step 2 up towards the firewall and locate the push to connect fitting that connects it to a heater hose. Remove the locking clip, and separate the two fittings.
4. Once the connection is removed and coolant is drained. Refer to Figure 1-3 for where to cut the pipe. The pipe can easily be cut with a cut off wheel, PCV tube cutter, hack saw, etc. It will need to be cut in two spots. Once cut remove all leftover burrs and plastic residue.
5. Take provided coolant pipe adaptor, and using supplied clamps assemble as shown in fig 4.
 - For automatic / DCT Transmissions you cut the stock pipe in a slightly different location, this allows you to leave the stock 90 fitting in place, and connect the hose after it. (hose may need to be trimmed, as it is left long for MT fitment as well)
6. Install assembled coolant pipe adaptor onto coolant pipe as shown in fig 5. To ensure proper seal if labels are present on the pipe remove prior to assembly. Make sure you have proper penetration of the pipe into the hoses, and the clamps are tightened properly.
7. Route new coolant hose under oil pan (fig 6) and reconnect to the quick connect fitting and secure with locking clip. Reinstall the bolt in remaining bracket, secure adaptor, and hose with zip ties to ensure it does not interfere with engine function. This completes coolant pipe modifications
8. Using a jack and a wooden block, carefully raise the engine on the driver side for clearance and remove the bolts securing the AC compressor to the block. You should be able to loosen all but the top bolt without raising the motor, but most likely the top one just won't clear the the unibody, so slightly jacking up the engine will allow it to come out. **CAUTION! BE VERY CAREFUL WHERE YOU CHOOSE TO JACK AS YOU CAN CAUSE DAMAGE IF THE BLOCK IS PUT IN THE WRONG SPOT!**
9. Now access the three 13MM bolts holding the AC compressor to the block. Remove the all 3 bolts. Using the 3 longer bolts, and no washers, install bracket around AC compressor and retighten bolts to factory specs. Fig 10-12 (Please note, pump assembly will NOT be installed on bracket yet as seen in the pictures, this is the next step)
10. **There are two power steering hoses that MAY need to be slightly bent out of the way, to provide proper clearance for the pump housing. Every vehicle will be slightly**

different on how these need to be bent. These lines are very easily bent, but use caution when bending them not to cause any damage, see Fig 14 for example of hose bent to clear. Once the hoses are positioned to provide enough access (this may be a trial and error process to get it right), you may also need to loosen and reclock the power steering fittings going into the steering rack, and or block to clear, it depends on what position they are in from the factory. Once everything is clear, coming in from the front, maneuver the assembled pump housing into place, and secure with the two supplied bolts, using the supplied star washers. These 2 steps can be tricky, as space is at a minimum, things may need to be slightly moved to fit, but with a little patience, and rearrangement, everything will fit right into place. Once both bolts are started, tighten them to the bracket, the best tool we have found to do this is a long 17mm or 11/16" open end wrench as its flat shape will easily get into the opening.

11. Lower engine, install new serpentine belt (the factory belt will fit over the new assembly with just a little more deflection of the tensioner). Use care when engaging the tensioner as it is aluminum and they strip out VERY easily.
12. Remove the fuel rail from the vehicle. Install supplied modified fuel rail. Send stock rail back for core refund
13. HPFP can now be installed to the Shotgun housing, **NOTE: IF THE SMALL SCREEN IN THE INLET OF THE HPFP IS STILL PRESENT REMOVE IT USING A SMALL SCREWDRIVER OR PICK BEFORE INSTALLATION. ALSO REMOVE IT FROM THE STOCK LOCATION PUMP.** Look Inside the housing, note the orientation of the shaft, rotate the pump to match the shaft, and using caution install the pump until it snaps into place. DO NOT tighten the pump until it is snapped in, and flat against the housing. Then you can tighten the 3 bolts in an alternating pattern to factory specs. **ALSO IF YOUR HPFP HAS MORE THAN 50,000 MILES ON IT, IT SHOULD BE REPLACED. A WORN OR WEARING OUT HPFP WILL NOT PERFORM AS IT SHOULD, EVEN IN THE SHOTGUN SYSTEM**
14. Once pump is installed, you can install one of the supplied fuel fitting adaptors, the 45 fitting, and the Bundy Adaptor. See Fig 13 for proper assembly. The best way is to install the bundy adaptor on the 45 fitting on the bench, then install the assembled fitting to the pump. Leave the assembled fitting loose as it will be tightened in the next step
15. Now install the LPFP quick disconnect Y hose (N55 just a single hose, no Y adapter), N55: Remove the stock feed line, from the frame rail connection, and snap the female quick disconnect it. N54: Remove the factory feed line, and snap the short female end to the factory fuel pipe, and the long end will now come around and connect to the feed of the shotgun HPFP. You must use the fuel adapter (a little grease helps hold it in place). Snap the shorter end to the factory fuel feed line to supply the sensor with fuel pressure (N55: there will be no short end, as there is no LPFP sensor fuel needs to be routed to. You will just have a single line from the factory line, to the new pump location.) Once threaded onto the feed with the adapter in place. Rotate the 45 fitting to gain maximum clearance from the steering shaft Fig 15, and tighten. This fitting need to be tight to ensure no leaks, but use caution to not over tighten. Fig 15. Now using supplied zip ties, secure LPFP fuel line out of the way so does not interfere with
16. Install the Double barrel Check valve assembly onto the stock location HPFP using the supplied internal fuel adapter. Now take the short High pressure line, and thread onto the fitting on the check valve, but leave loose (fig 8)
17. Plug the HPFP controller plug into the HPFP, and route the line over to the DME box where the controller is going to be kept.
18. Take intake manifold and place it back over its studs so it is loosely in place, but do not tighten.

19. Now feed short High pressure line through manifold, and thread onto the -6 fitting on the fuel rail. You can now tighten both of these fittings, and the fitting to the outlet of the HPFP. (fig 9) See fig 21 for reference.
20. Install the 90 degree end of the High pressure line to the fuel rail do not tighten. Referring to figures 16-20, route the high pressure hose down to the HPFP. Now with everything loose, and referring to fig 16-20, make sure the hose is routed as shown in the picture. If done properly the intake manifold will seat perfectly, and the hose will be tucked nicely out of the way. Thread the fitting onto the HPFP outlet tighten the 90 at the fuel rail first then the straight fitting on the pump.
21. Take the plug and play wiring harness and plug the male end into the factory HPFP plug. This plug is a VERY VERY tight fit, it may require pliers to snap together. The male plug has to be fully seated into the female plug to ensure proper connection. BMW does not offer a male plug separately so the locking mechanisms will not engage but the very tight fit ensures the male plug will not come unseated. The female end is factory, and simply snaps into the pump. Zip tie the harness out of the way and the installation is complete.
22. Reassemble the vehicle, fill coolant, and perform the coolant bleed procedure.
23. CAREFULLY inspect the area around the Shotgun pulley, and Power steering pulley for any hoses or lines that may be touching or close. Using Zip ties secure ALL lines or hoses out of the way to ensure nothing is rubbing on the pulleys
24. BEFORE the vehicle is started using the push to start button with your foot OFF the brake or clutch so the engine will not start, cycle the ignition FULLY off and on at least 5-6 times. This will prime the fuel system and help remove all air from the system, and ensure the HPFP does not run dry.
25. Following the HPFP controller directions, wire the HPFP controller, and using the R4 software, load the supplied starter map for the secondary
26. Start the Vehicle and immediately check for leaks, if any leaks are present immediately turn off vehicle, identify and fix any leaks.
27. We suggest resetting all adaptations except the learned variants with an INPA cable. This will allow the DME to start fresh with the new pump system, and create proper pressure ratios. If you do not have an INPA, you may experience high HPFP on initial startup. This is normal as the DME will need to learn down as the new pump provides more fuel.
28. If the vehicle will not start, or starts and immediately goes into limp mode, the issue will most likely lie in the male plug for the belt driven shotgun, it must be fully seated into the factory plug. Double check this first.
29. Take the vehicle for a test drive, and ensure fuel pressure, and other systems are working properly.
30. This HPFP upgrade needs proper tuning to take advantage of its capabilities, 91 octane fuels and higher should always be used.
31. Enjoy your new VTT Shotgun HPFP upgrade :)

Troubleshooting and tips Page 13

Fig 1



Fig 2-3

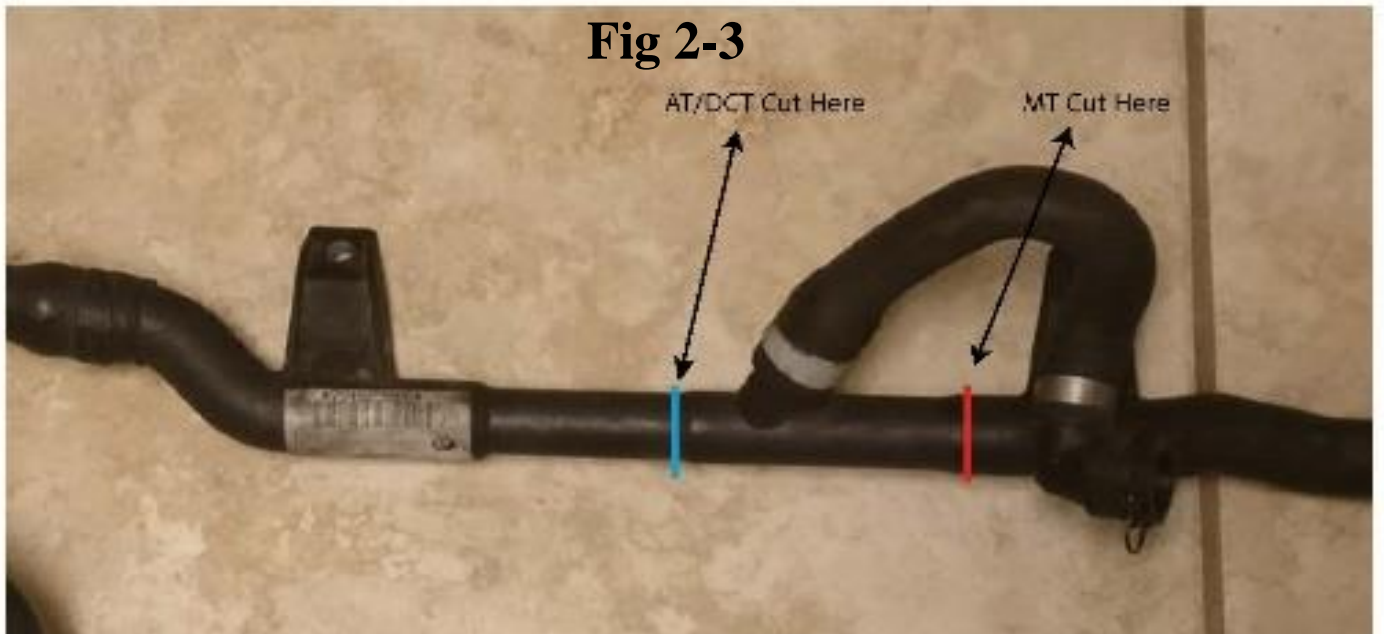


Fig 4

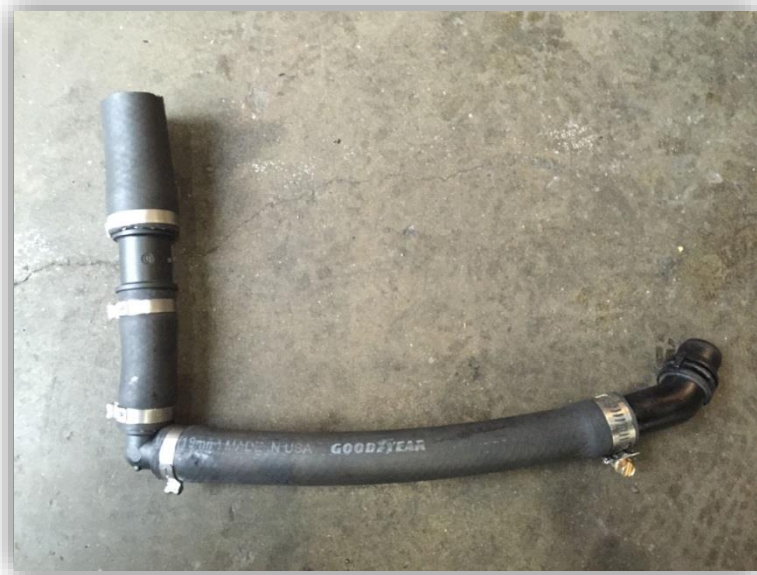


Fig 5



Fig 6



Fig 7



Fig 8

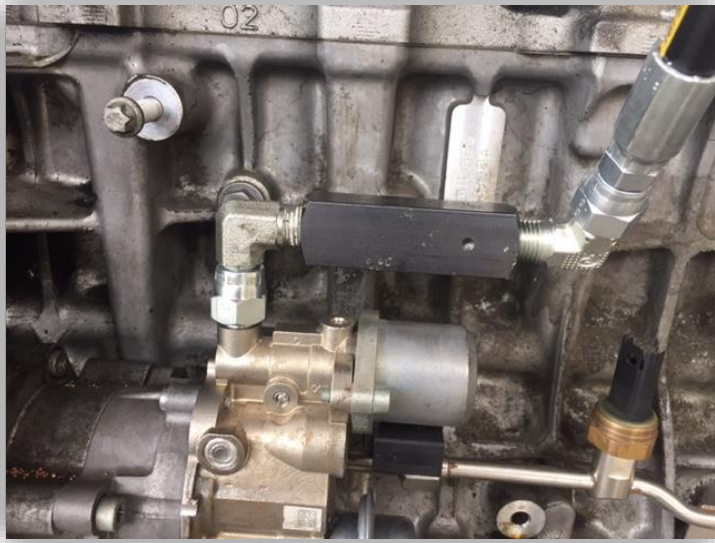


Fig 9



Fig 10



Fig 11



Fig 12



Fig 14



Fig 15



Fig 16

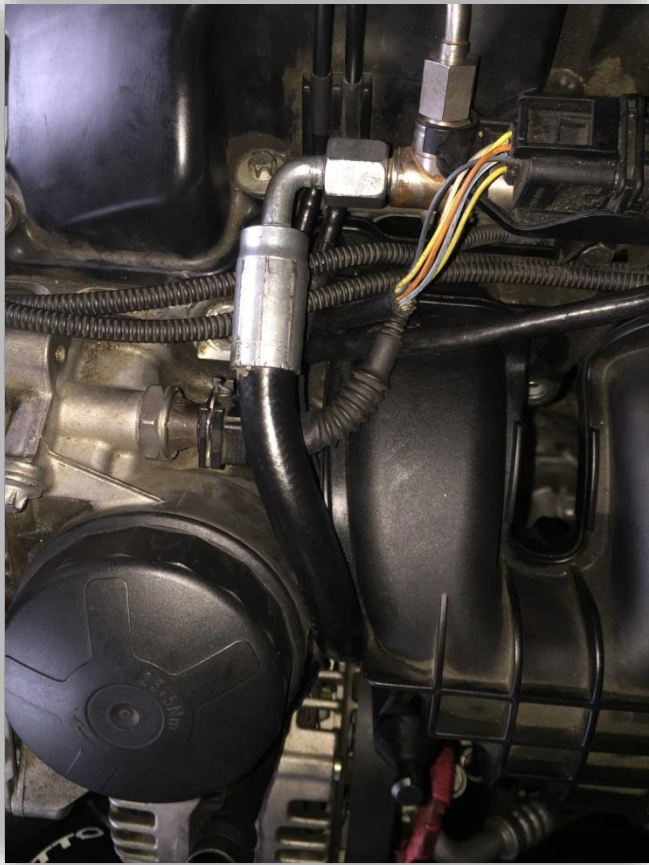


Fig 17



Fig 18

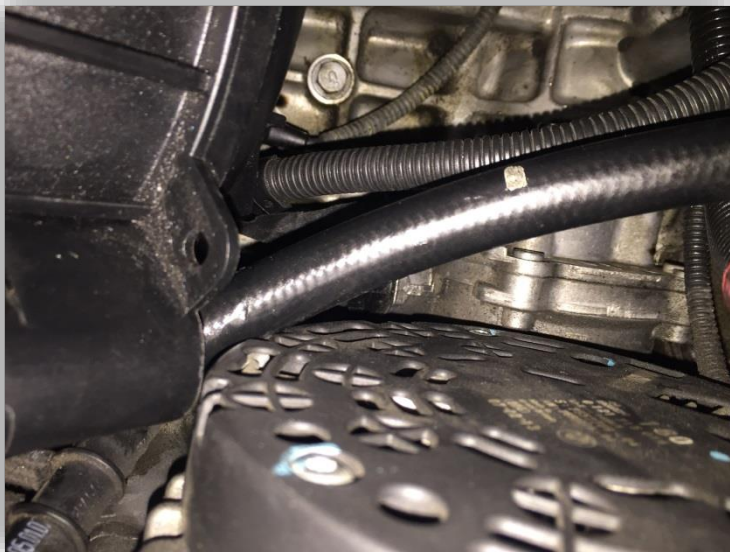


Fig 19



Fig 20

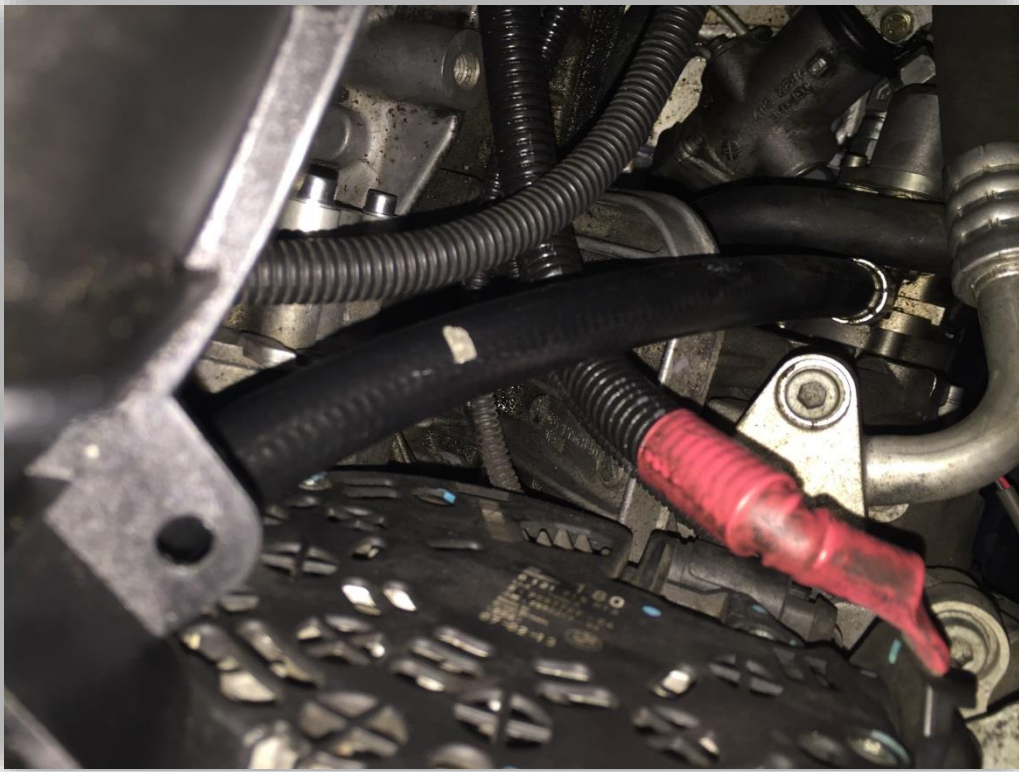


Fig 21



Troubleshooting tips!

Issue: I can't get the top bolt out of the AC compressor to get the bracket on.

Answer: You need to slightly jack up the motor and this will fix the problem of the bolt not coming out.

Issue: I cannot get the assembled pump housing into the space needed for it to fit, it keeps hitting lines, etc.

Answer: The TOUGHEST part of the install is getting the pump housing in place, there is very good chance we will need to maneuver, bend, reclock the power steer lines to get the housing, and HPFP in place. With a little patience it WILL fit.

Issue: I cannot get the high pressure line to route properly the intake manifold wont seat.

Answer: The high pressure line can be a little tricky but if you follow the figures, it will route nicely, and tuck under the intake manifold allowing it to seat properly

Issue: I just got finished and the car won't start, or has no HPFP pressure.

Answer: You most likely do not have the plug seated fully, recheck the plug and make sure it is ALL the way in.

Issue: I have some other issues and I cannot figure them out.

Answer: Drop us an email at Sales@vargasturbo.com and we will do our best to get them solved for you!

Wiring Instructions for Double Barrel Secondary fuel controller

Directions for wiring up the AIC6:

To program it you'll need a generic USB to RS232 data cable. Once wired up you can use the R4 software to monitor "live data" and ensure RPM is moving as engine idles. If it doesn't then something is likely wired wrong.

I suggest locating the unit in the DME box.. While you are in there I'd suggest removing tape that holds bundles together which may have already fallen off over the years and replacing it with small black zip ties to keep the wires in the DME area tied together and easier to work with.

For those running the AIC6 as basically a standalone controller without the new JB4 integration:

The RED +12v power wire piggybacks power wire at the green connector. If not equipped with a JB4 just splice it in there.

The BLACK ground can go to any chassis ground.

The GREEN boost signal connects to the yellow wire going in to the large black sub connector on pin #10. Use the supplied Posi-tap

The YELLOW rpm signal connects to #21 on the gray subconnector. Use the Supplied Posi-Tap

Load the "Shotgun DI Starter Map" map to the AIC6.

Basic R4 software directions:

Download the fuel maps

Select open customer. NEVER SELECT NEW CUSTOMER AS THIS WILL RESULT IN AN EMPTY FUEL MAP. If you've done this in the past download the fuel map again.

Select database you downloaded, I.E. Shotgun Starter map sent

Select com port under "connect to ECU". Vehicle ignition must be on.

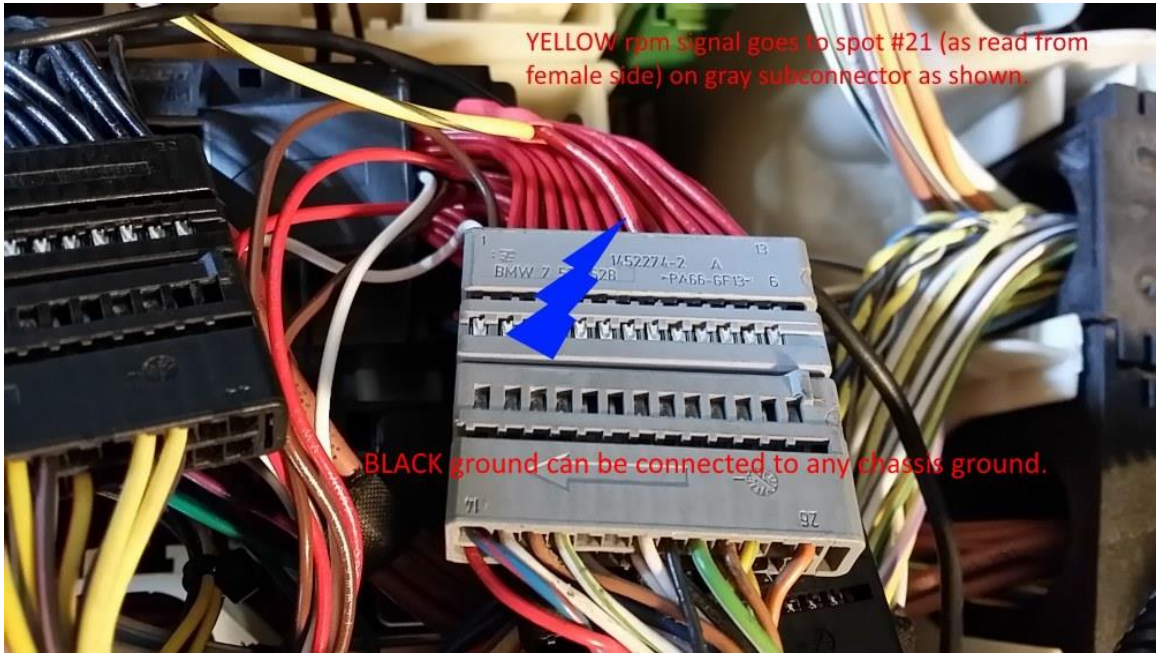
Select button to right of com port to connect

Select maps-fuel maps

If using the starter map then values will be filled in as you scroll along. If they are all zero you corrupted the file by selecting new customer. Download the file again.

Click the button in the upper left that says write to device

Once done start the car, and make sure the blue box moves with RPM, and boost / vacuum. You can also watch this by going to live values, under the real time tab



YELLOW rpm signal goes to spot #21 (as read from female side) on gray subconnector as shown.

BLACK ground can be connected to any chassis ground.