



# Installation Manual

Compatible with : 622-0284 / 622-0277

Stage 2.5 G-Series hybrid fuel pump with fuel lines



This installation is not recommended for a novice or the “new guy” in the shop. Use caution when installing, as not to damage any factory components or components included in this kit. If you are not experienced in working on cars we recommend taking this kit to your local performance shop for installation.

**NOTE: Precision Raceworks, LLC holds no responsibility for any damage that occurs or laws that are broken in the installation or use of this kit. This kit is intended for off-road purposes only.**

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## Kit Contents

QTY	Description	QTY	Description
1	Pump activation harness	1	Fuel line with quick connects on both ends
1	Fuel pump w/ bracket and fitting	1	Pinch clamp
1	Fuel pump sock	1	Electrical bulkhead with wires and connector
1	Sheet metal bracket	1	Fuel pass through bulkhead set
2	Metal rivets		
2	Plastic Rivets		
1	Fuel line with single quick connect		

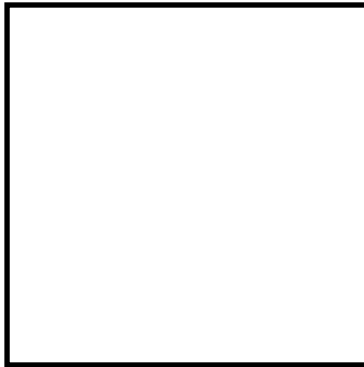
**Verify all components needed to perform install are in your kit using the list above. Additionally read through all pages of the instructions to ensure full understanding before starting installation.**

## Tools Necessary

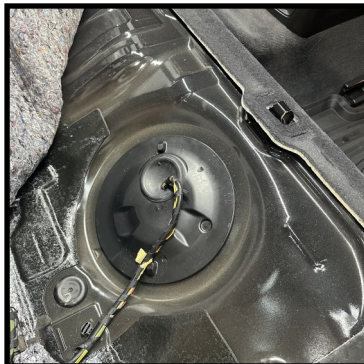
QTY	Description	QTY	Description
1	Lock Ring Tool (or hammer and extension)	1	Ratchet and Extension
1	Razor Blade	1	8mm Socket
1	Small Flat Head Screwdriver	1	10mm Socket
1	Drill	1	13mm Socket
1	1/8" Drill Bit	1	Step Bit to 1/2"
1	1/4" Drill Bit	1	Dremmel with cut-off wheel
1	Pop Rivet Gun	1	Sandpaper 120-180 grit
1	22mm Wrench	1	24mm Wrench
1	21mm Wrench	1	21mm Deep Socket

This section of the manual is intended to show the assembly of the **Precision Raceworks (description and part number here)** and final assembly. For instructions of the removal or installation of factory components, please refer to your service manual

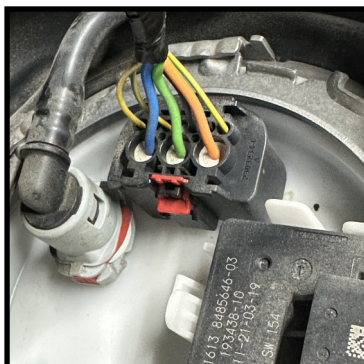
1. Ensure fuel tank is 1/4 tank or less full before starting, tanks that have more than 1/4 tank of fuel can be very difficult and messy to perform install. It is preferred to do at 1/8 of tank or less but 1/4 tank of fuel is the max you want to have.
2. Remove the rear seat of the car by pulling up quickly on the front of the seat on both sides of the car. The best place to lift is under where your leg closest to that side of the car would be if sitting in the seat. Then remove seat from car.



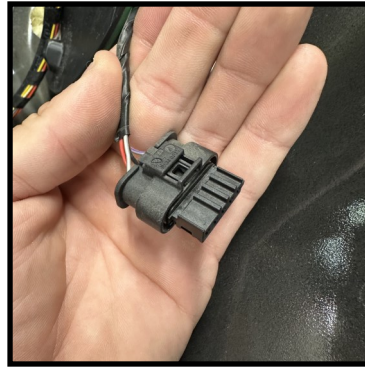
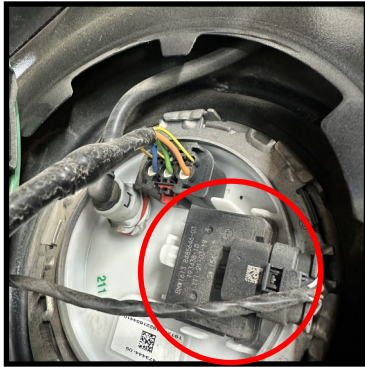
3. With the seat removed locate the pump cover in the chassis and remove by twisting the cover to unlock it and then pulling up to remove the cover.



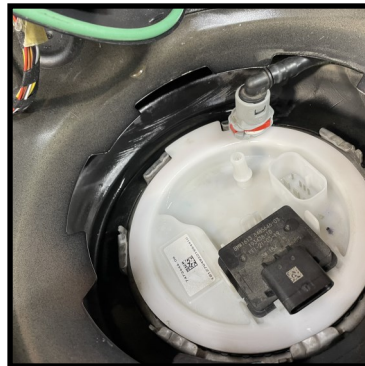
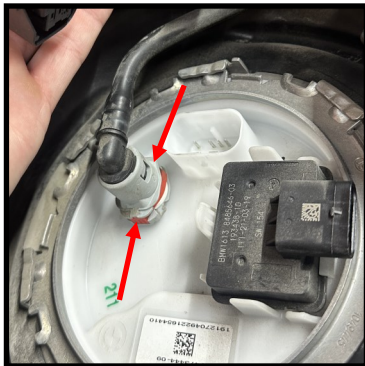
4. Disconnect the electrical wiring from the fuel pump by pulling up on the red locking tab, and then press on the release for the electrical connector while pushing down. While still pressing the release pull up to remove the connector from the pump.



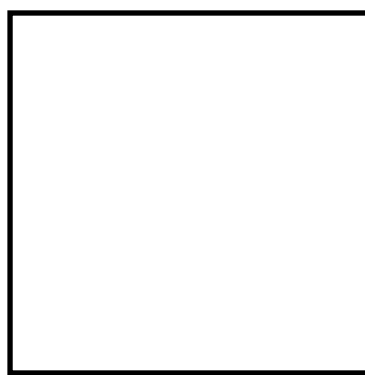
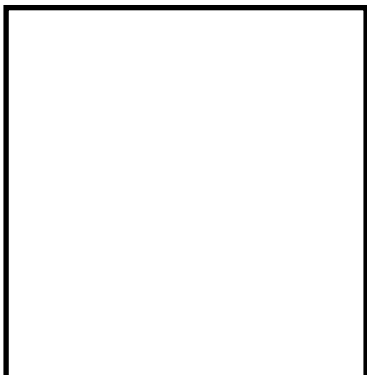
5. Some vehicles have a sensor which sits on top of the fuel pump. If your car is equipped with this sensor remove the electrical connector from the sensor at this time by pressing the latch while pushing the connector further on. Then continue pressing the latch while pulling off to remove the connector from the sensor.



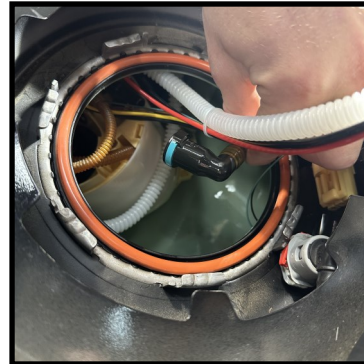
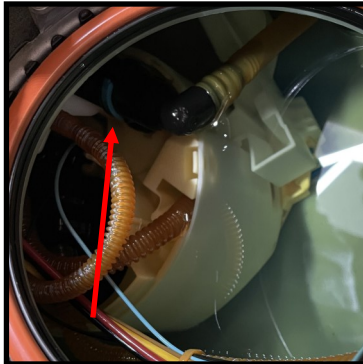
6. Removing the line can be a little difficult for some people but take your time and you will be able to get the line disconnected. To remove the fuel line you will push down on the fitting (like you are trying to install it). While pushing the fitting further on push firmly on the back of the white and red clips and continue pushing the clips inwards while pulling up on the fitting to remove the fitting from the fuel pump.



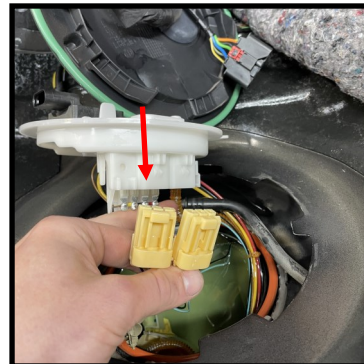
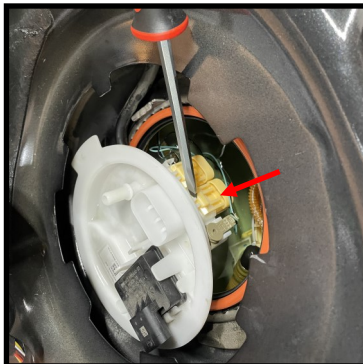
7. If you purchased a lock ring removal tool this step is a breeze, simply align the tool with the tabs on the outside of the lock ring and turn counter clockwise (using a large ratchet) to remove the lock ring. If you do not have a lock ring tool, we recommend using a socket wrench extension placing the female end against the edge of the tab and hitting with a hammer until unlocked. Once unlocked remove the lockring and set to the side.



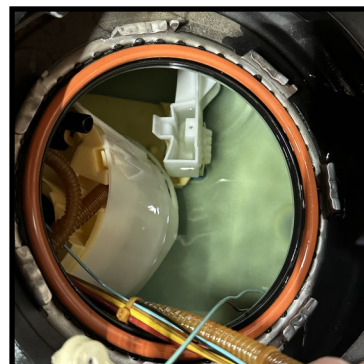
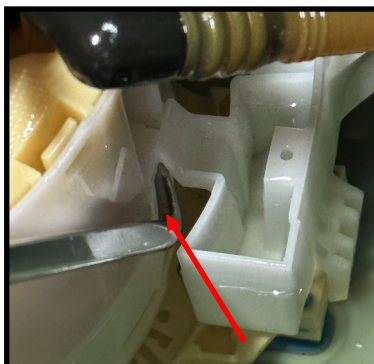
8. On the top of the fuel pump bucket locate a fuel quick connect fitting. Push the fitting further on and press in the release tabs on the fitting. With both tabs pressed in pull the fitting off to disconnect the fuel line for the transfer venturi.



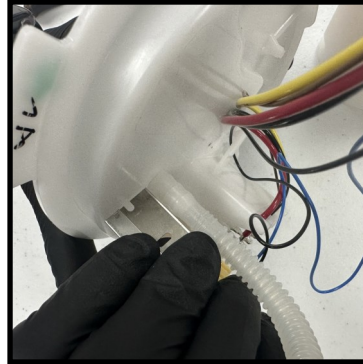
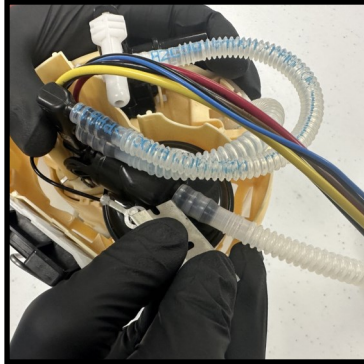
9. The left side of the car has a fuel level sensor which has wires that run to the driver's side of the car and attach to the fuel pump top hat. Follow these wires and disconnect the connector associated with them by sticking a small flat head screwdriver in the notch on the top side near the latch and prying up carefully to release the connector from the top hat. With the connector released pull the connector off the top hat.



10. With all wiring and hoses disconnected it is now time to remove the fuel pump assembly. To do this locate the latch which is visible and runs vertical up the center of the bucket. Pull up on this latch until released (often times the whole bucket will pop free at this step). If the bucket does not pop free pull up more on the latch until the whole bucket comes up on that side then slide the bucket assembly over to the opening and remove the fuel pump assembly from the car. (Discard plastic piece if equipped)



11. With the fuel pump removed from the car, cut and remove the factory output line at both the pump and the tophat.



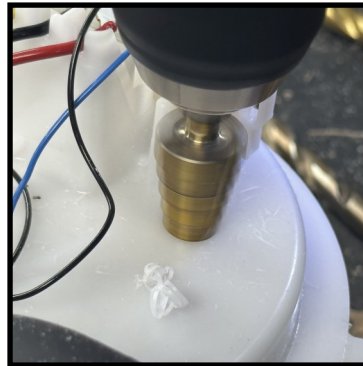
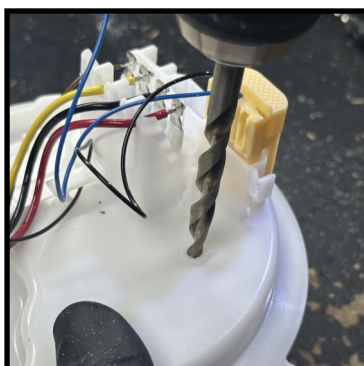
12. Once the line is removed, cut the barbed fitting on the top hat off using a rotary tool or other tool that can make clean cut.

**Note: Do not cut into the underside of the top hat as the surface will need to be able to seal against o-ring later.**

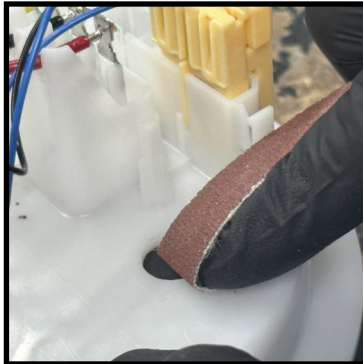


13. With the barbed fitting cut off, start with a drill bit slightly larger than the hole drilling through the top hat. Keep stepping up one bit size at a time until you reach 1/2" for the final size. Be careful of the wires while drilling so they do not get damaged.

**Note: Using a large bit and not working up in size will crack plastic**



14. After drilling to 1/2" deburr the edge of the hole drilled (on both sides of the top hat). Using sand paper sand the edges from the plastic injection molding process to smooth out the transition. Do not use aggressive sand paper as deep scratches can cause issues sealing (120 grit recommended).

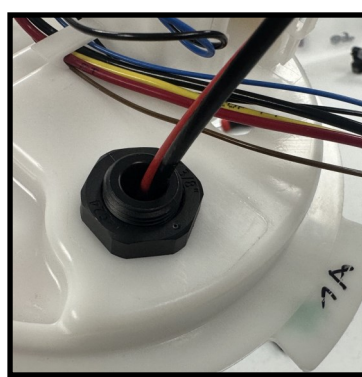
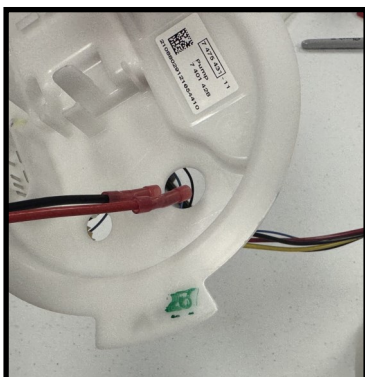


15. Make a mark in the center of the area shown below (center of slightly raised area). Start with a small drill bit and work up one size at a time until you reach the final size of 11/16". Using a razor or other tool deburr the drilled hole as needed.

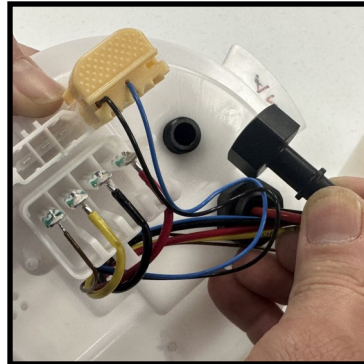
**Note: Be careful not to catch wires under the tophat with drill bit (holding them out of the way is recommended).**



16. Proceed by installing the wire pass through bulkhead. To do this remove the nut found on the bottom of the bulkhead and feed the wires through the top of the top hat. Install the nut so that the side with writing is visible. Tighten using wrench until snug (**do not overtighten**).

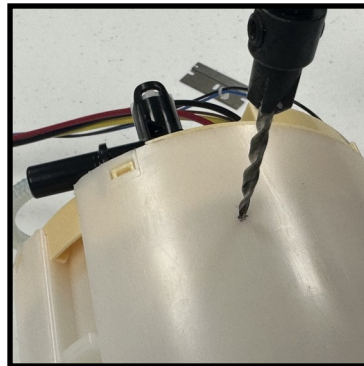
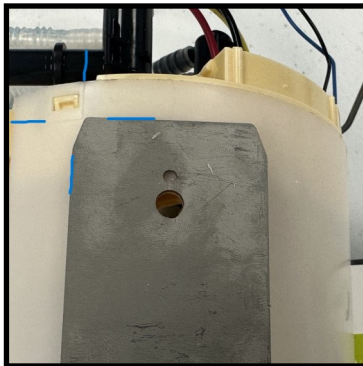


17. With the wire bulkhead already installed, install the fuel pass through bulk head fittings inserting the male threaded side from the top and screwing on the female side on the bottom. Tighten using wrench or deep socket until snug (**do not overtighten**).



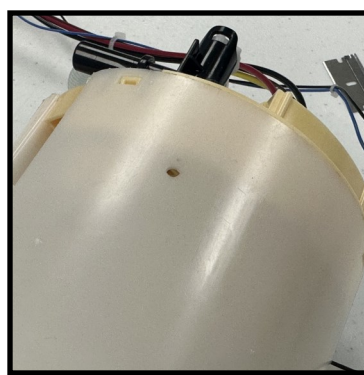
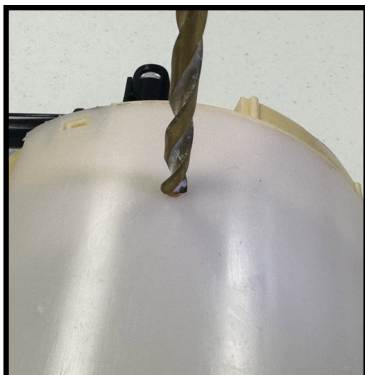
18. Place the sheet metal bracket on the outside of the bucket, aligning the left edge and top edge of the bracket in straight line with the marks from molding process outside of the clip as shown below. With bracket lined up mark the top rivet hole.

**Note: Metal and plastic rivets are included , if you do not have a rivet gun use plastic, however metal rivets are preferred.**



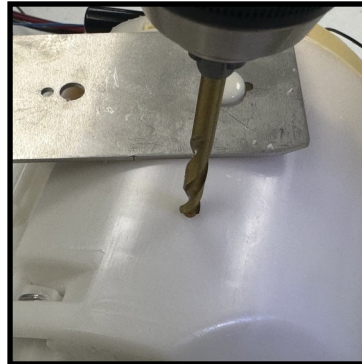
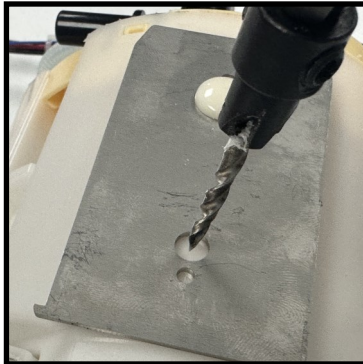
19. Drill the hole marked in step 9, for metal rivets you can start and finish with 1/8" drill bit. For plastic rivets you will start with 1/8" working up in size until you reach the final size of 1/4".

**Note: Using a large bit and not working up in size will crack plastic**

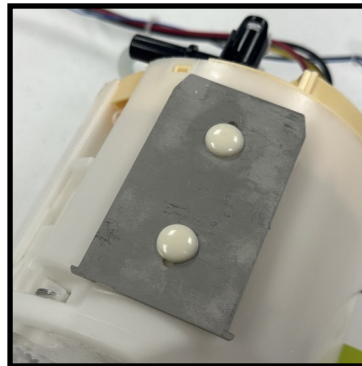
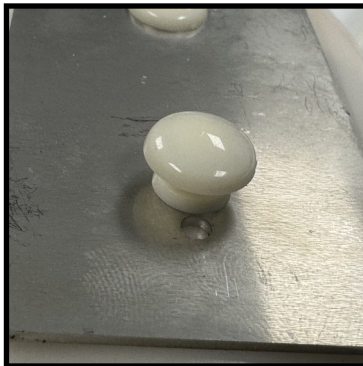




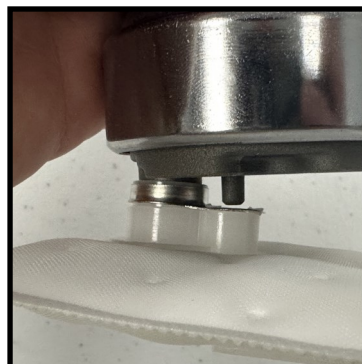
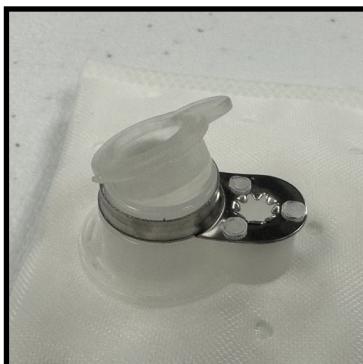
20. With the top hole drilled place the metal bracket on top of bucket. If using metal rivets insert rivet but do not compress rivet. If using plastic rivet install plastic rivet at this time. Rotate the bracket so it is in intended location, then mark the center of the hole. Once marked rotate bracket out of the way and proceed to drill repeating the process from the previous step.



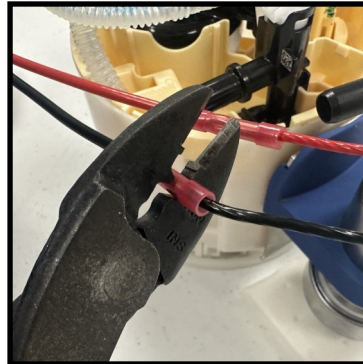
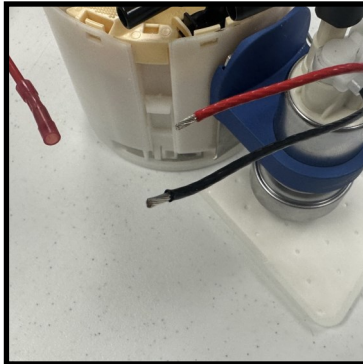
21. With the second hole drilled secure the sheet metal bracket to the outside of the bucket using either the metal rivets or the plastic rivets provided in the kit.



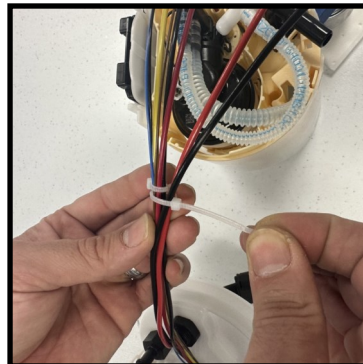
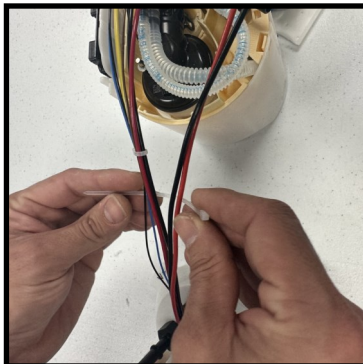
22. Ensure the pump is rotated in the bracket as shown in the image below. With the pump in the correct location install the fuel sock on the bottom of the pump (remove the plastic plug from the sock before installing). Ensure sock is sufficiently seated on the pump input and the peg offset from the inlet.



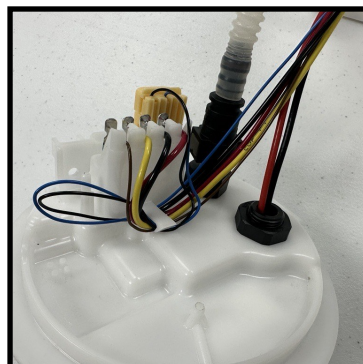
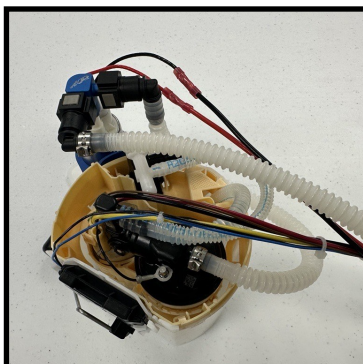
23. Place the fuel pump on the sheet metal hanger (note it will not sit all the way down at the bottom of the hanger). Then attach the pump wires to the bulkhead wires using the supplied spades or butt connectors by crimping the connectors to the wires.



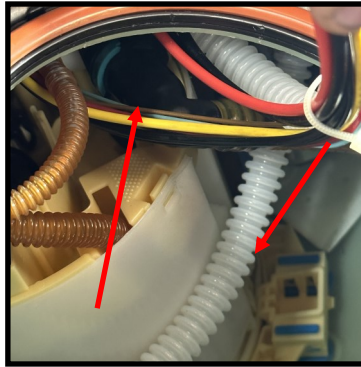
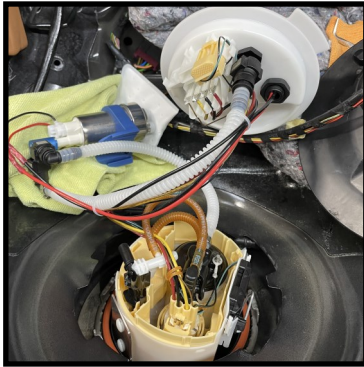
24. Using a zip tie, secure the wiring from the secondary pump to the factory wiring near the center of the factory wiring. This step is not required but provides clean install while reducing possibility of wiring getting in the way of the fuel float.



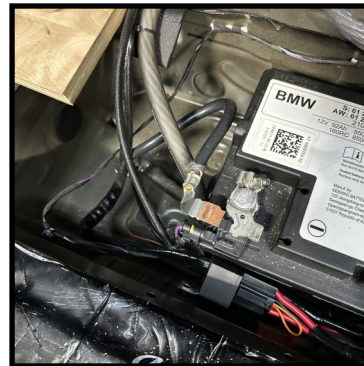
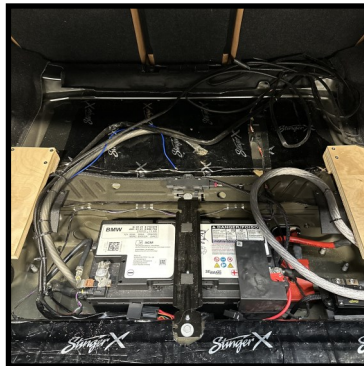
25. Connect the supplied Y-Line to the secondary fuel pump and the fuel bulkhead fitting on the bottom of the top hat. With these fittings connected and the supplied pinch clamp on the remaining line, push the line onto the factory pump outlet. After the line is fully seated using a crimp tool or a pair of cutters crimp the pinch clamp. **Note: If using cutters be careful**



26. To reinstall the pump in the car simply slide the secondary pump off the side of the bucket. Slide the bucket into the tank. Then with the bucket near the opening slide the second pump onto the bucket. Then snap the bucket back in place and latch as if you were reinstalling a factory pump. Once the pump is in the tank, align the top hat and reinstall the lock ring.



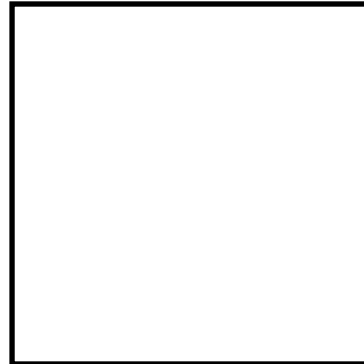
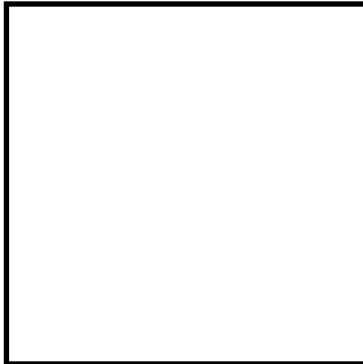
27. With the pump installed locate the battery at the rear of the car. With the battery located attached the negative and positive terminals to the battery (the wire with the fuse is positive). Route the wiring towards the fuel tank, tucking wiring and relay out of the way so that it is concealed once install is complete. Before covering the wiring ensure the extension harness is connected to the main harness and also routed towards the fuel pump (do not leave excess in trunk).



28. Remove the rubber grommet in the fuel access cover and cut a straight slit from the outside edge towards the middle being careful not to cut any wiring. With the grommet cut pass the main harness connector and extension harness through the fuel access cover. Slide the wire into the cut in the grommet and reinstall the grommet in the access cover.



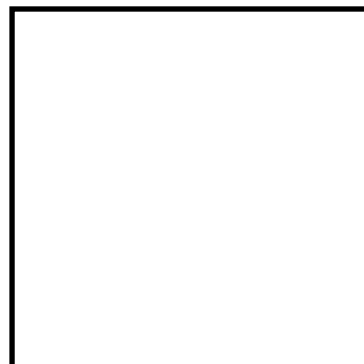
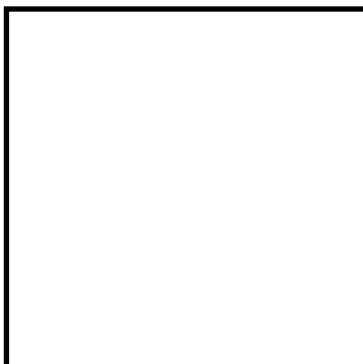
29. Raise car with lift or using jack stands, then remove the under panel along the entire left side of the car. And also the under panels on both the drivers and passenger side of car under the fuel tank. Additionally some vehicles may have braces that need to be removed before panels can come off. Remove those as well at this time.



30. Make sure the fuel tank is low (ideally 1/4 tank or less, drain tank as necessary). With fuel tank low or empty remove the bolts securing the two straps which run under the fuel tank holding the fuel tank up. Then let the fuel tank rest on the driveshaft.



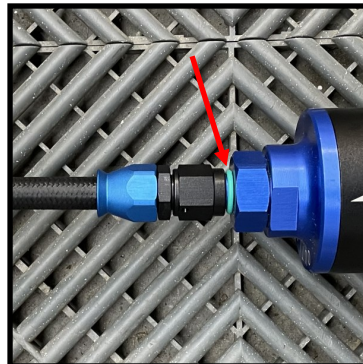
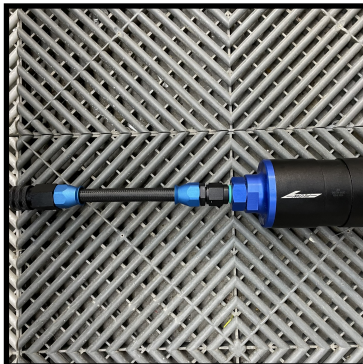
31. With all panels removed and the tank lowered, disconnect the stock plastic fuel line from the metal line located near the front left vehicle lift point. With the line disconnected start removing the line from each clip working towards the back. Continue removing the line from the clips in front of the fuel tank by moving the fuel tank for access as needed.



32. Feed the long fuel line (90 degree quick connect first) over the driveshaft from the left side of the car towards the pump on the right side of the car. Connect fuel line to the top of the fuel pump. Using the factory mounting clips secure the fuel line in the same location the factory fuel line was installed.



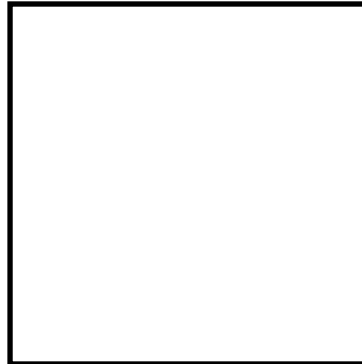
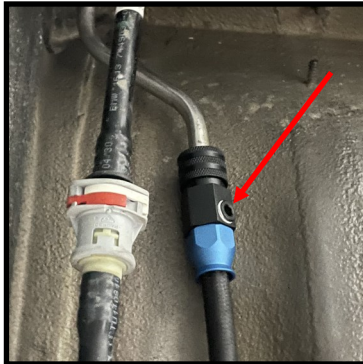
33. Install the short section of fuel line supplied with the kit to the fuel filter on the side of the filter labeled "Flow". With the short line attached to the fuel filter now attach the AN6 female fitting to the input side of the fuel filter (note flow direction should be pointed towards front of car). Exposed O-rings on the filter fittings are ok they can even be removed before install as they do not provide a purpose in this filter application (they are used when the same filter is used with other products).



34. With both lines attached to the fuel filter, locate the supplied fuel filter bracket. Install the bracket on the 2 studs coming down from the bottom of the car using the supplied nuts. The filter body has a groove which will interlock with the filter bracket when aligned properly. Nuts should be tightened snugly but do not require excessive torque.

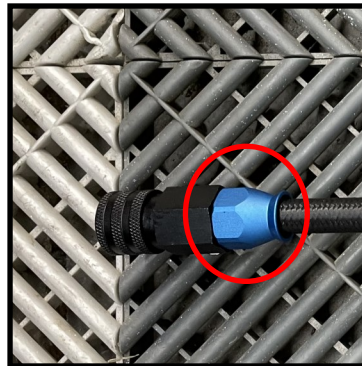


35. If you plan to add a low pressure fuel sensor to the car this can be done by locating the 1/8" NPT port on the side of the fitting which secures to the factory metal hard line. If you do not wish to use this port ensure PTFE tape is installed on the 1/8" NPT plug and the plug is tightened. **Caution: Do not over tighten 1/8" npt plug damage to fitting and plug can occur!**



36. With the fuel line fully installed, connect the factory wiring to the fuel pump and add gas to the tank if necessary. With all fuel lines and wiring connected start the vehicle and let idle checking for any fuel leaks in the line set, fittings, connections, or fuel filter. If any leaks are found try to identify the cause of the leak.

**Caution: Do not loosen ore remove the nut securing the fitting to the fuel line, this will cause a fuel leak and is not covered under warranty. Additionally the line will need to be shipped back for repair!**



37. With the pump re-installed, it is now time to follow the instructions for the **BMW Boost Reference Harness** to provide power to the second pump.
38. Reassemble the car complete putting all covers, panels, seats, and anything else removed to perform install back in their proper places. With that complete the only thing left to do now is crank up the power and enjoy your new fuel system!