

AMS PERFORMANCE R8/HURACAN ALPHA FUEL SYSTEM - TWIN PUMP KIT

INSTALL INSTRUCTIONS

Audi R8 2017+
Lamborghini Huracan 2015+

Introduction ///

The goal of AMS Performance is to provide the highest quality, best performing products available. By utilizing research and development, and rigorous testing programs AMS Performance will never compromise the quality or performance of our products. In addition, AMS Performance will only provide the finest customer service offering only parts and advice that are in the best interests of the customer. AMS Performance was built on a foundation of integrity. This is who we are. This is what you can count on.

A vehicle modified by the use of performance parts and tuning may not meet the legal requirements for use on public roads. AMS Performance makes no claims of compliance unless otherwise stated on a per-product basis. Use or installation of performance parts and tuning may adversely affect the drivability and reliability of your vehicle, and may also affect or eliminate your insurance coverage, factory warranty and new OEM part warranty. There is no stated or implied guarantee by AMS of continued OEM vehicle warranty, insurance coverage, or emissions compliance, due to the stress placed on your vehicle by performance parts and our inability to monitor its use, tuning or modification.

These instructions are not intended to be a comprehensive guide for installation as there are many variables that may affect your particular vehicle, including but not limited to model year differences, sub-model/trim/optional equipment differences, the presence of non-OEM parts, or other modifications that may have previously been completed. A basic understanding of automotive parts and systems and novice mechanical skills should be all that is necessary for installation, but certain circumstances may necessitate professional installation.

AMS Performance is committed to providing quality support for our products. If you are in need of technical support, installation help, or a replacement component, our Customer Service Team is available directly via telephone at 847-709-0530, or digitally via the contact form linked here: amsperformance.com/support

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Note : Fuel system tuning will be required following installation of the Alpha Fuel System.

Specialty tools : Fuel sending unit locking ring removal tool - recommended but not required (Step 13), Oetiker clamp pliers

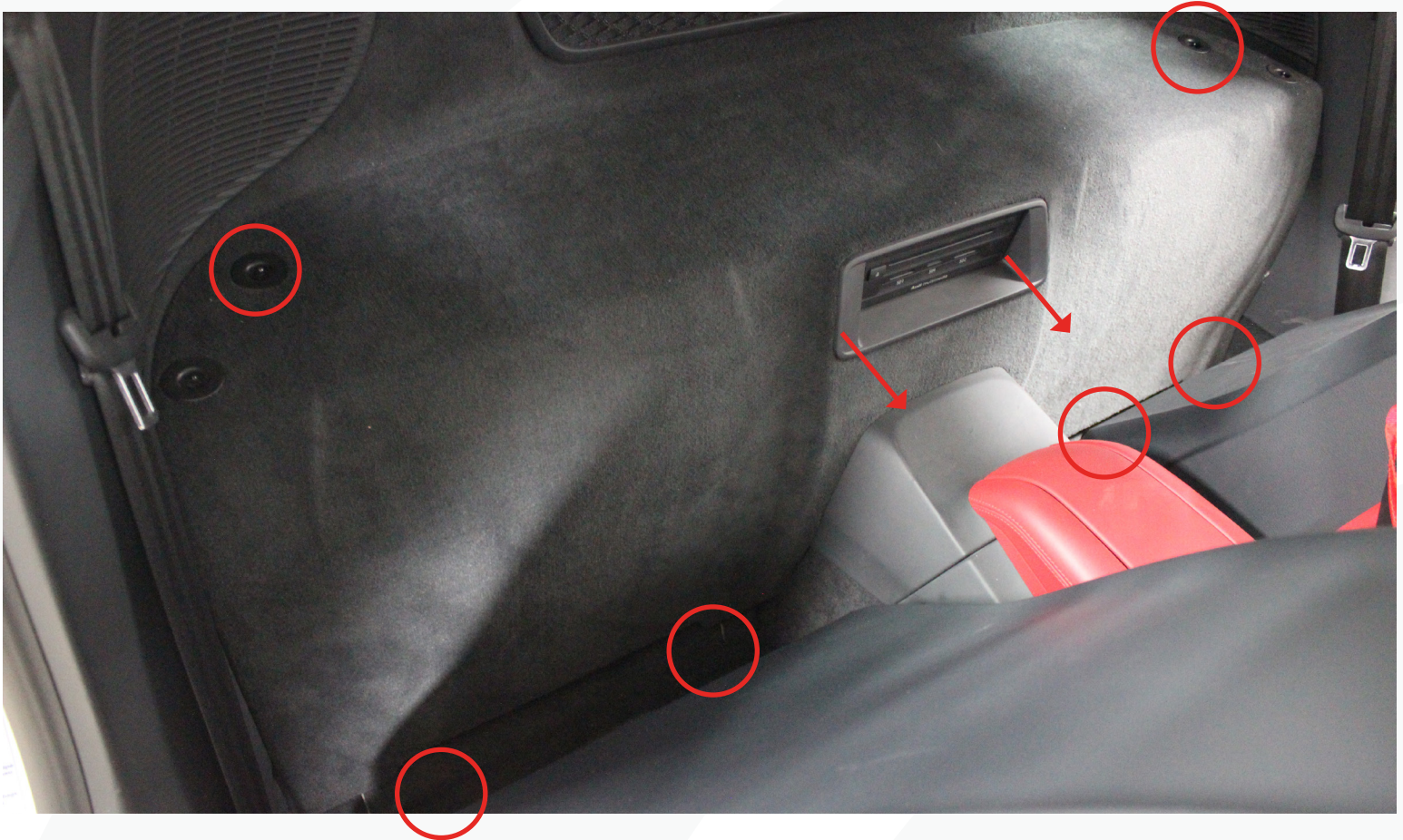
DISASSEMBLY ///

R8 follow steps 1-6, Huracan skip to step 7.

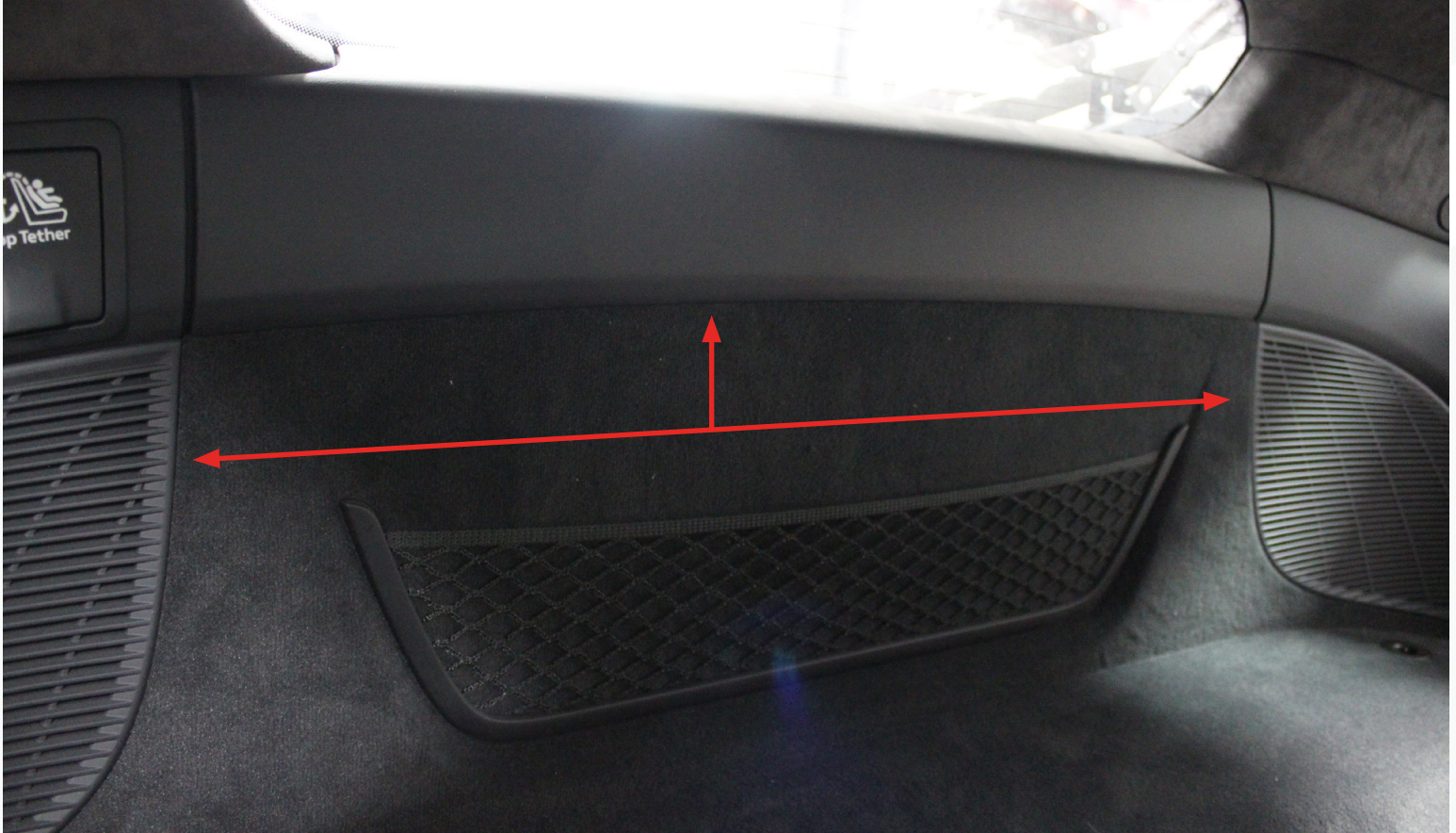
1) Move the seats all the way forward and pull the cable to fold the seat back forward to gain access behind the seats.

2) Disconnect the battery

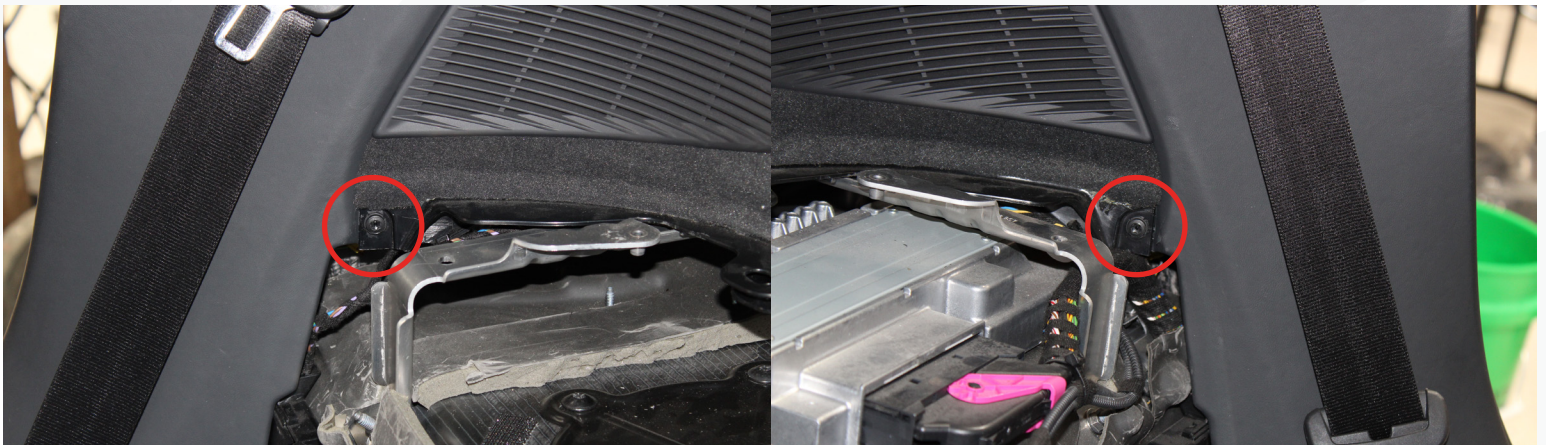
3) Remove two 9mm hex bolts, four T30 bolts and radio bezel.



4) With a plastic trim tool, remove both speaker grills and upper trim panel, they are held in very tight with plastic clips.



5) Remove the plastic screw under the speaker grill on each side.



6) Remove the four nuts along the top of the rear trim panel.

Tech Note: I recommend using hand tools for the nuts in these steps and future steps as the studs are attached using epoxy and easily pop off.



Steps 7-10 for Huracan Only

7. Remove the large cover. It is only held on by rubber grommets, pull up slightly to release the six grommets and then out around the audio unit



8. Remove the panel between the headliner and window trim.



9. Remove the plastic cover to reveal the bolt holding the child seat hook. Then remove the window trim plastic.



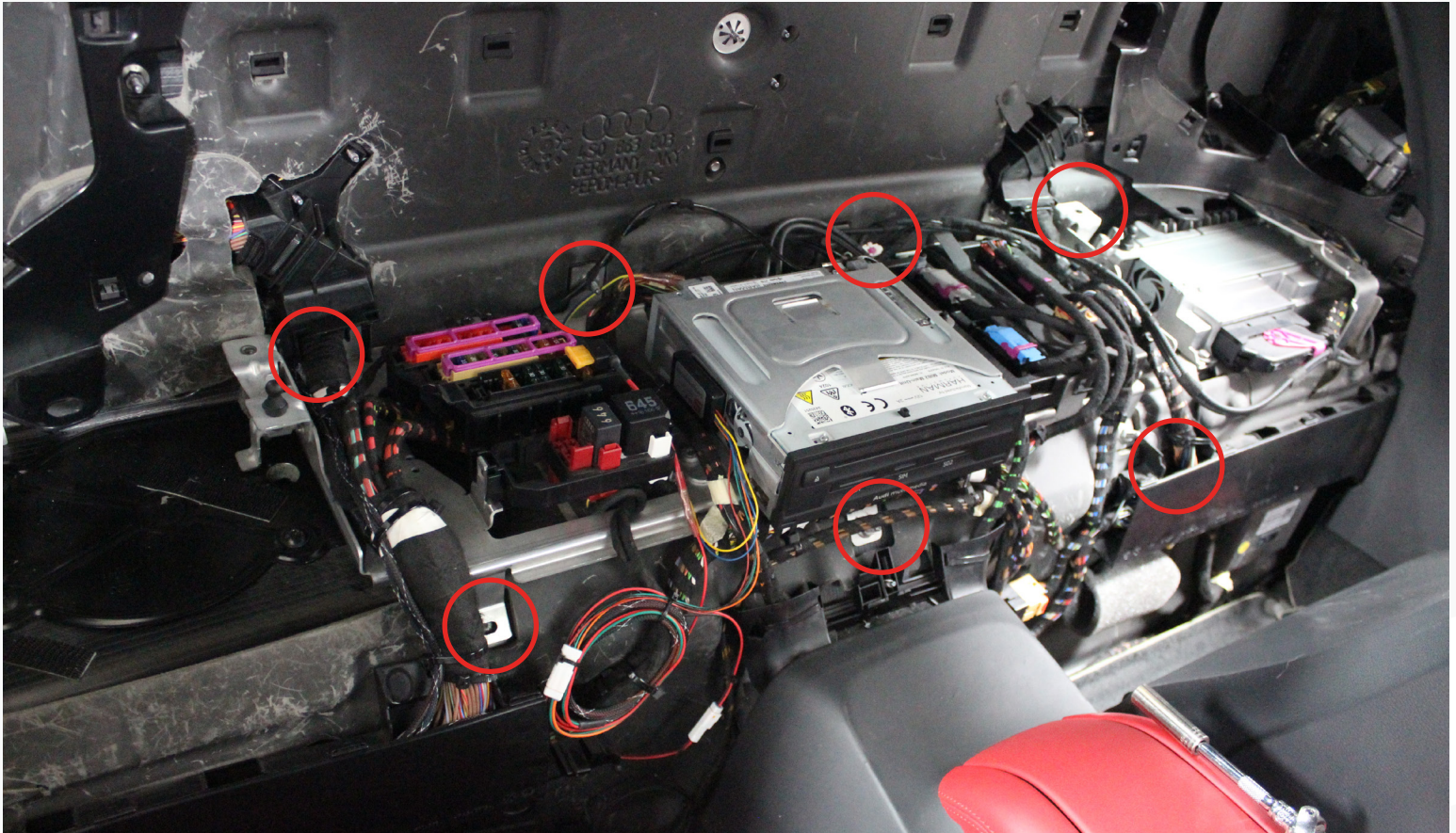
10. Remove the four nuts holding the lower panel and remove the panel.

Tech Note : I recommend using hand tools on the fasteners in these steps and future steps as the studs are attached using epoxy and can easily pop off

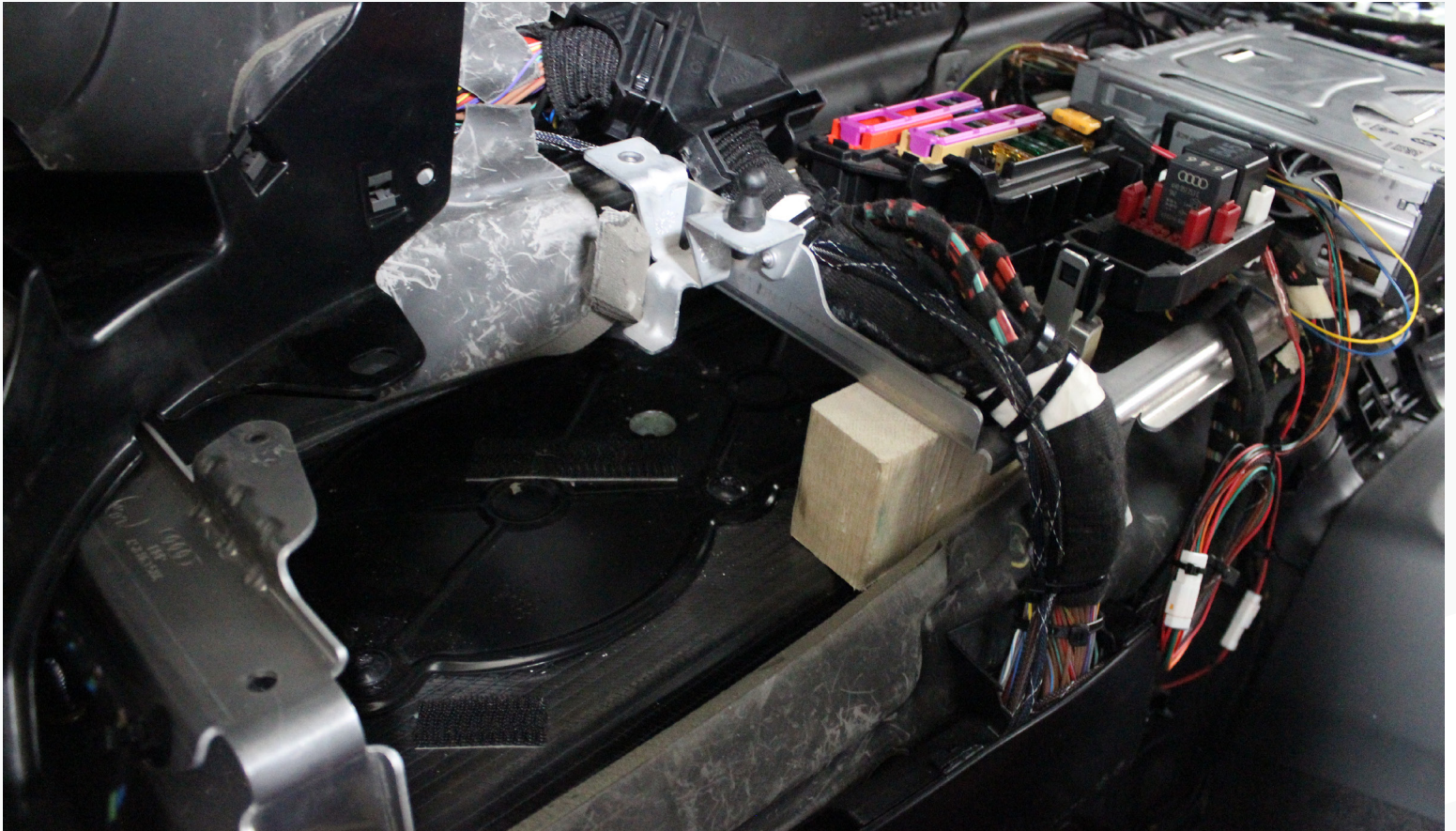


11) Remove the seven nuts from the control unit bracket assembly to gain access to the fuel tank access panel bolts.

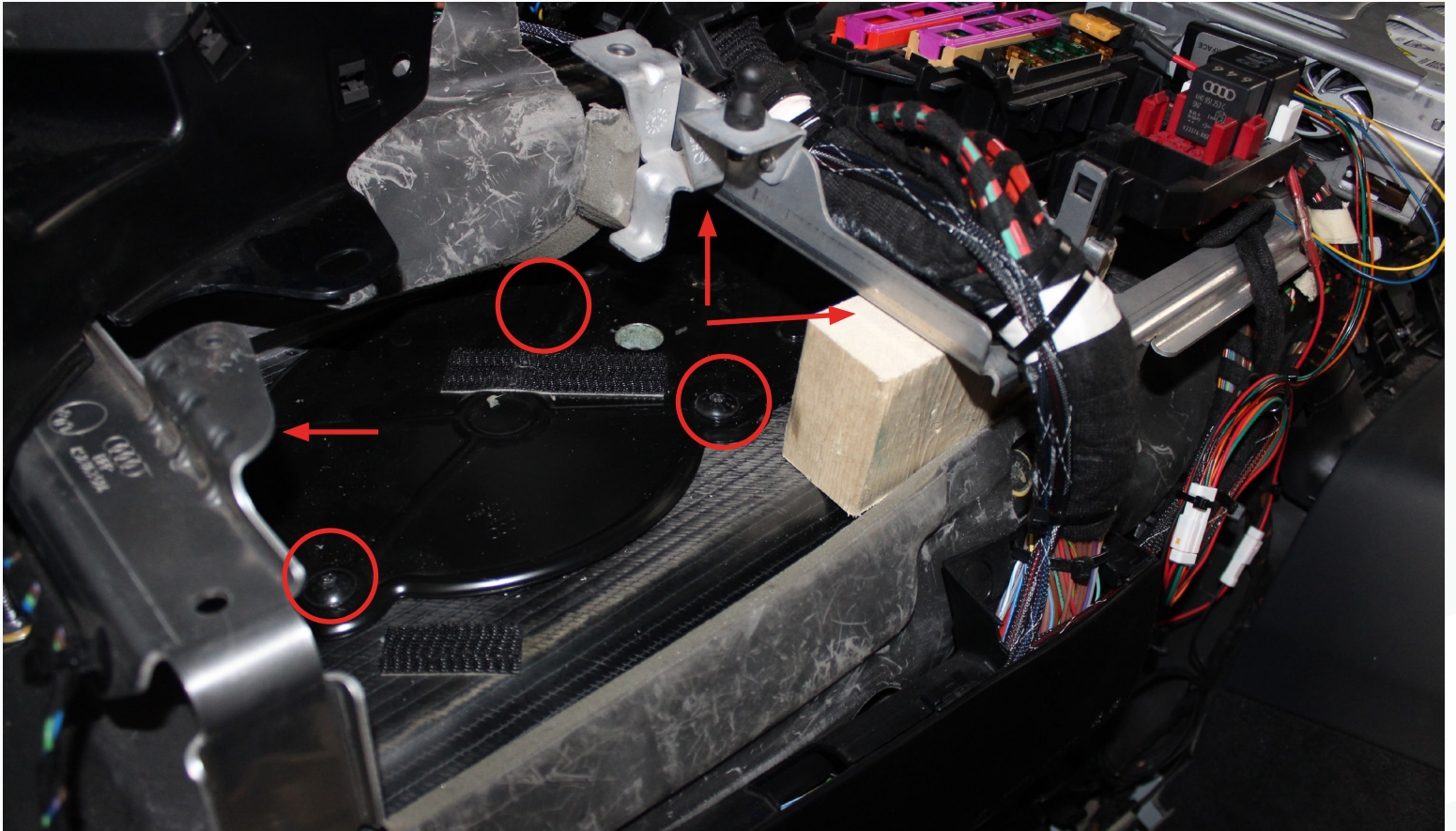
Note: We removed a few additional components for photo purposes. This is optional.



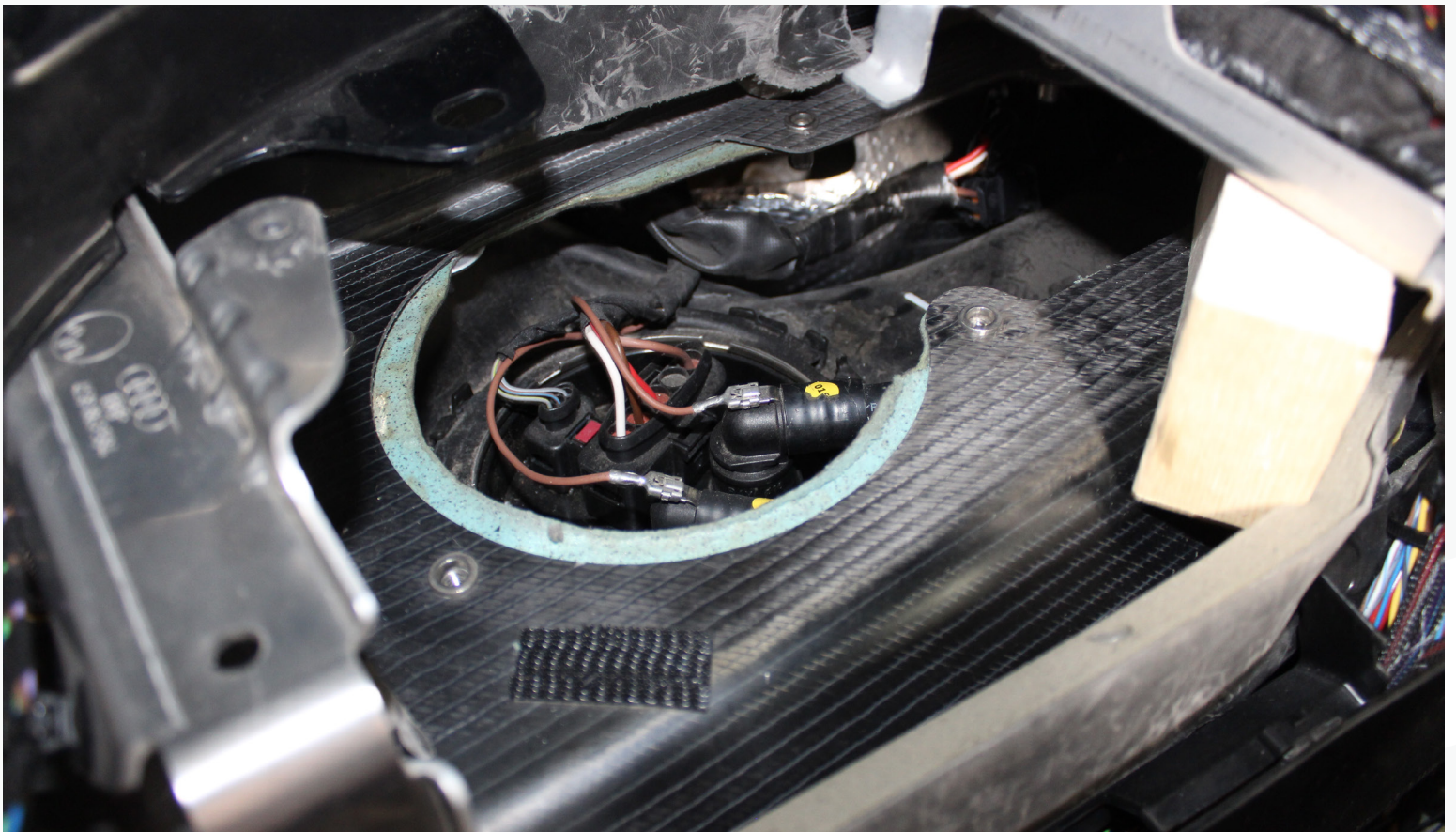
12. Pull the bracket assembly towards the front of the car to release it off the studs. I found propping it up with a block of wood to be helpful to remove the access panel.



13. Remove the six bolts from the access panel.

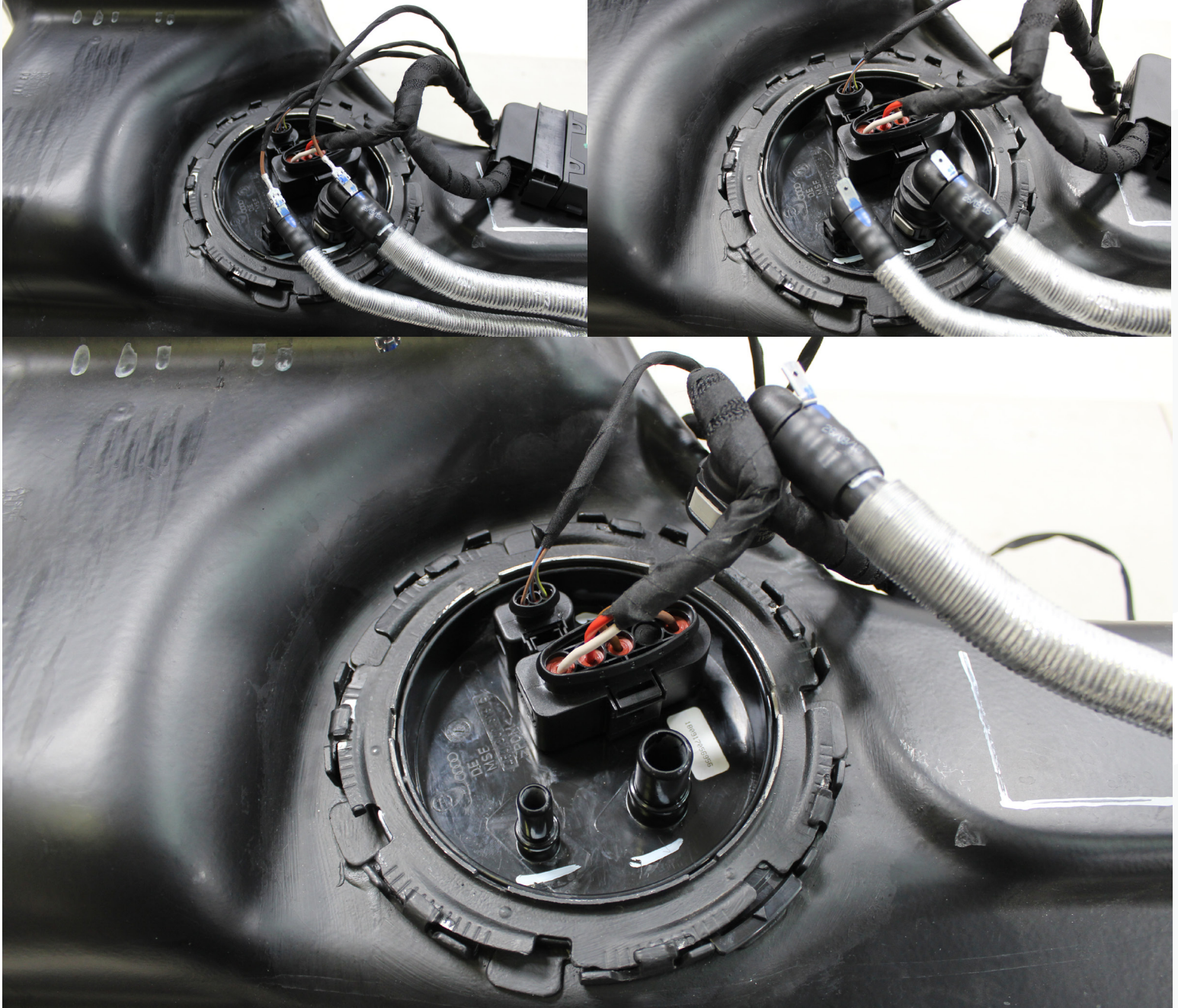


14. Carefully lift up the access panel, disconnect the fuel pump controller then fully remove the access panel.

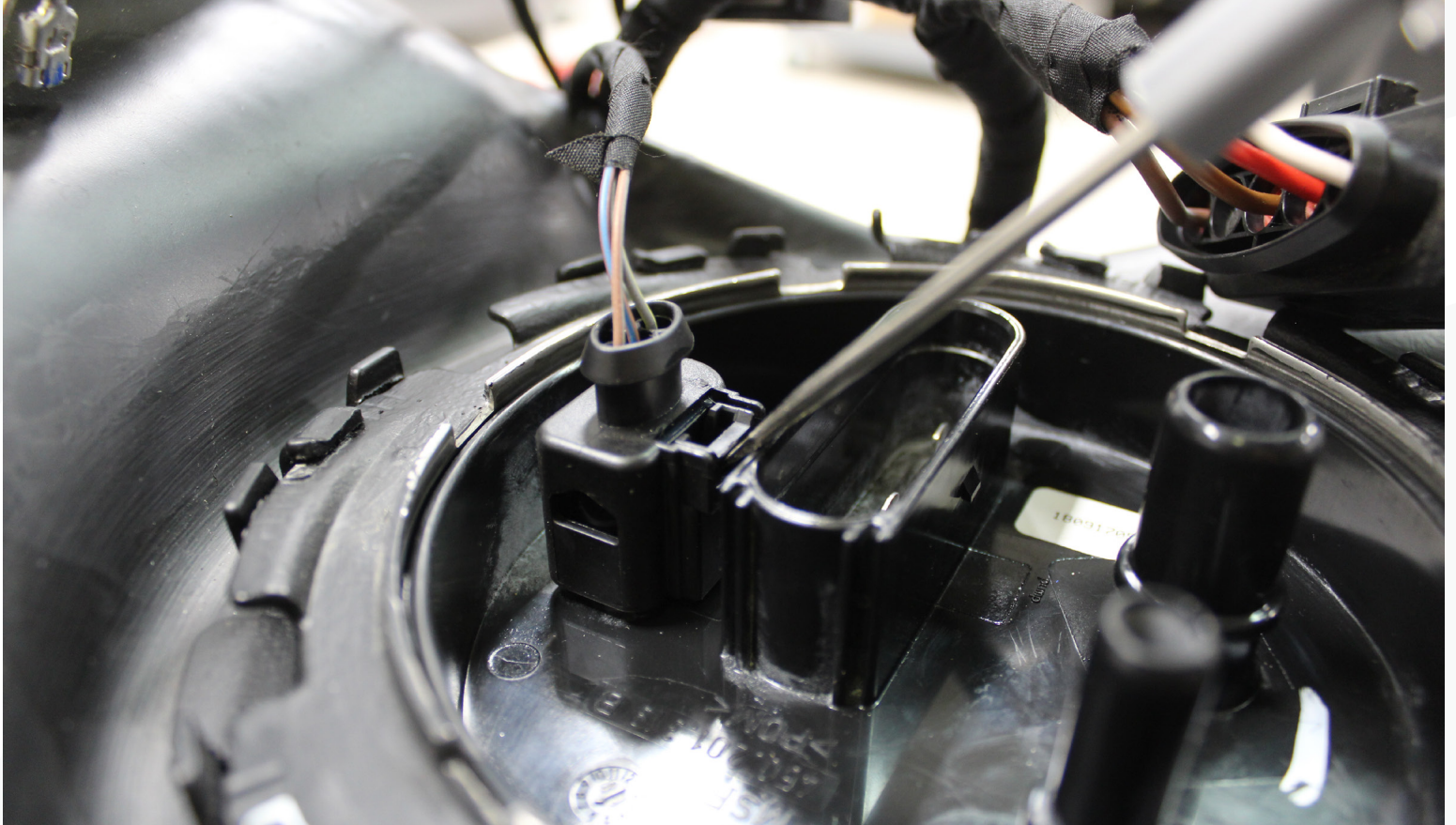
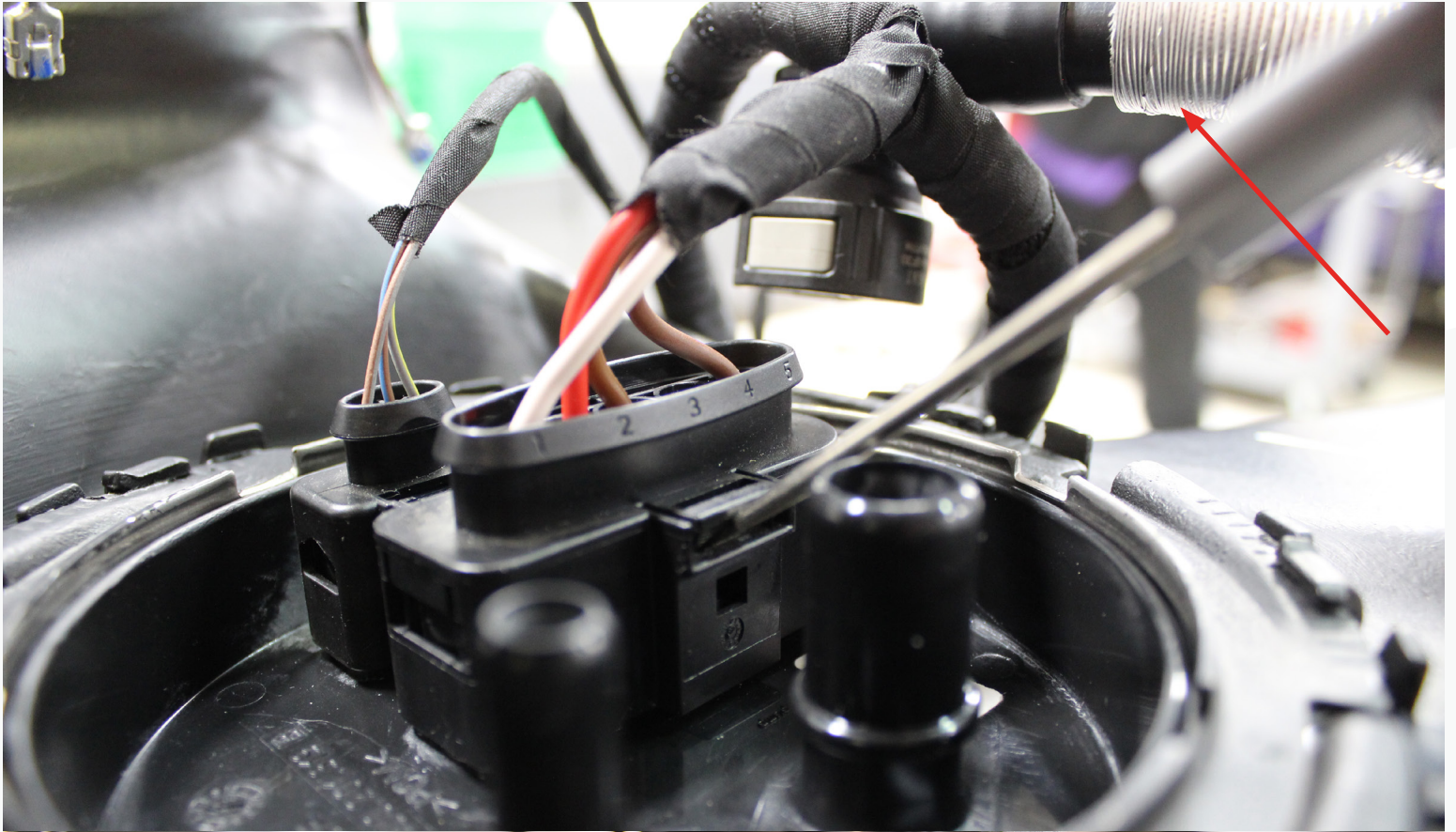


Note: For instructional purposes the next few steps are shown with the fuel tank out.

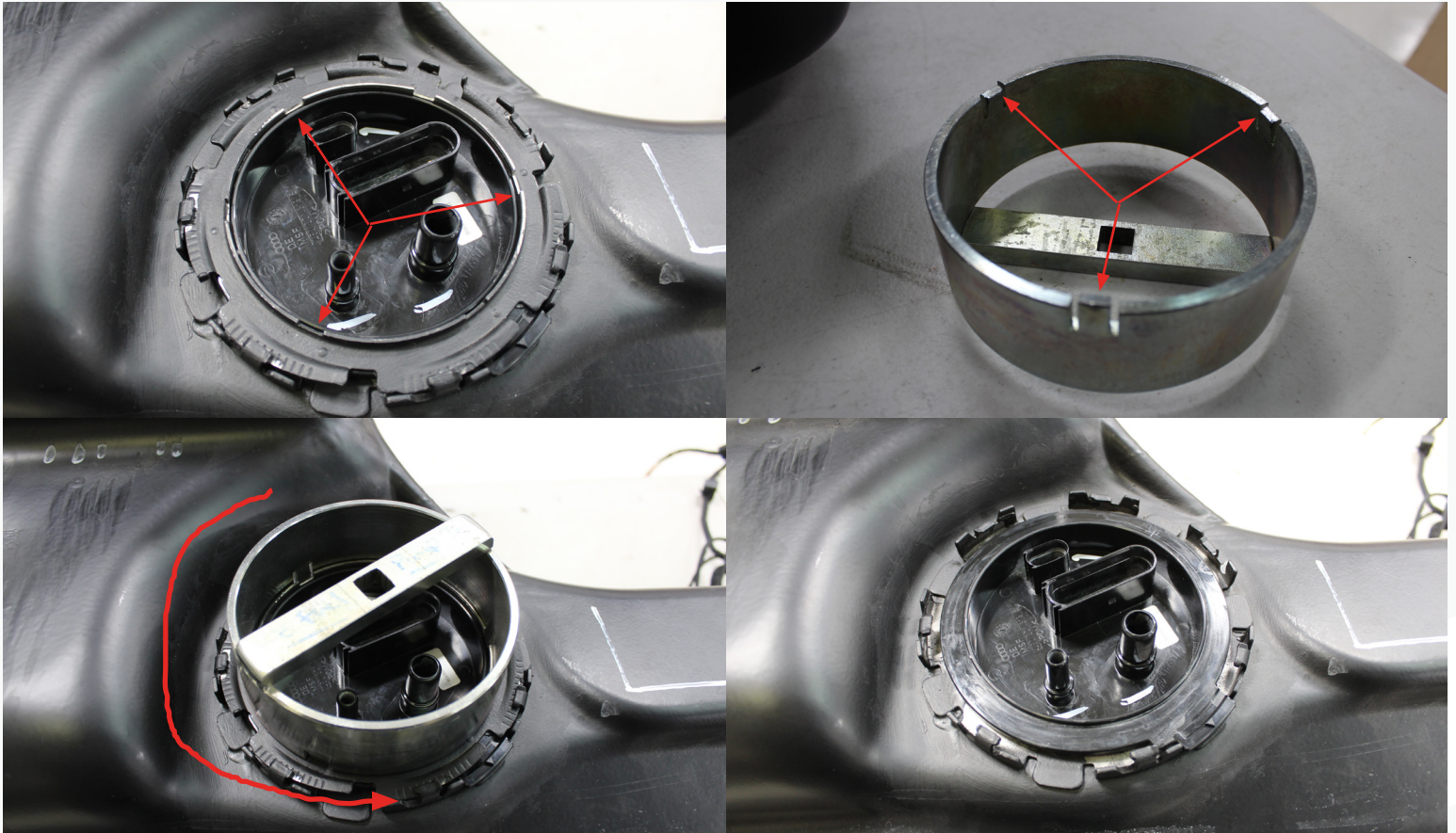
15. Disconnect the two brown static ground wires. Then disconnect fuel line quick connect fittings.



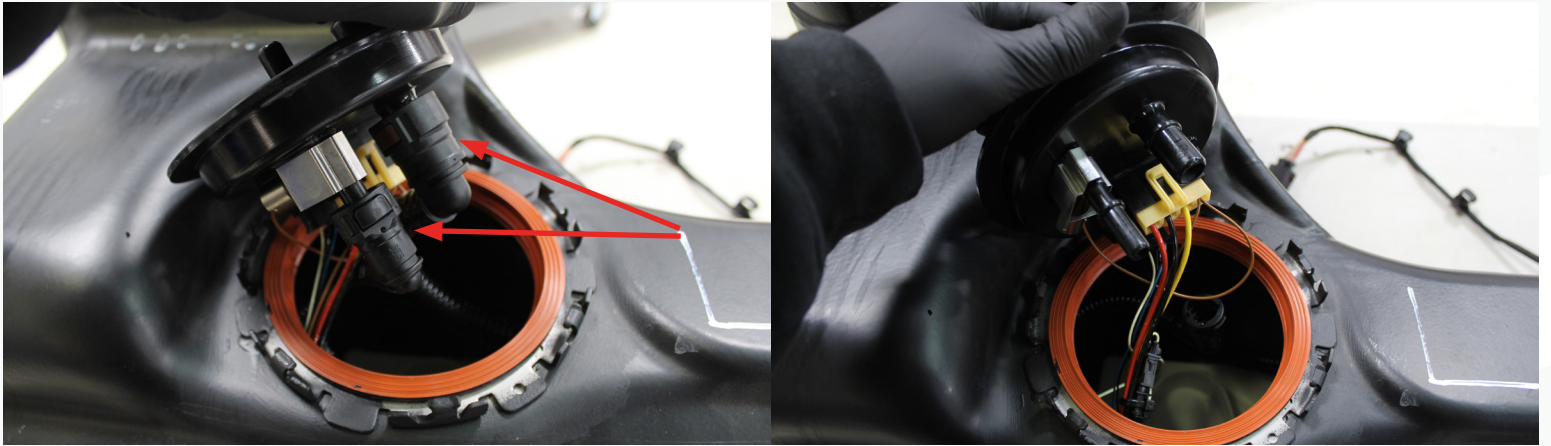
16. Disconnect the two electrical connectors using a small screwdriver to release the lock as shown. Insert the screwdriver into the connector and pry slightly upward.



17. Using the locking ring removal tool (Audi Part Number: T10202) and a ½" ratchet wrench, align the notches in the lock ring with the notches on the tool. Remove the lock ring and pull the top.



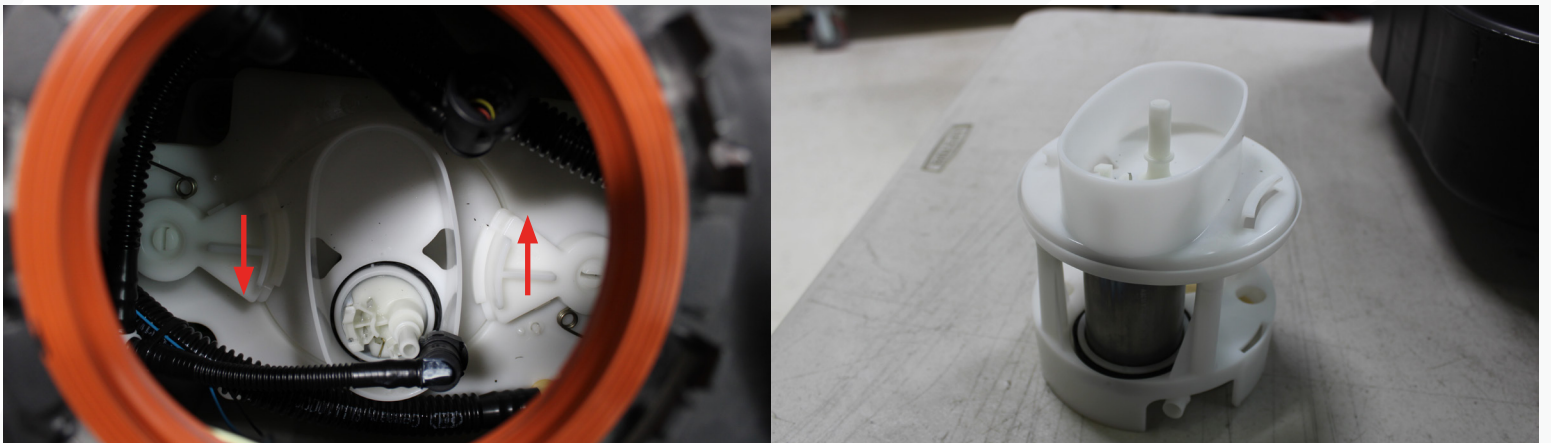
18. Pull the top hat up and disconnect the connectors and quick connect fittings on the backside.



19. In the tank, disconnect the fuel line off the pump and the electrical connector.



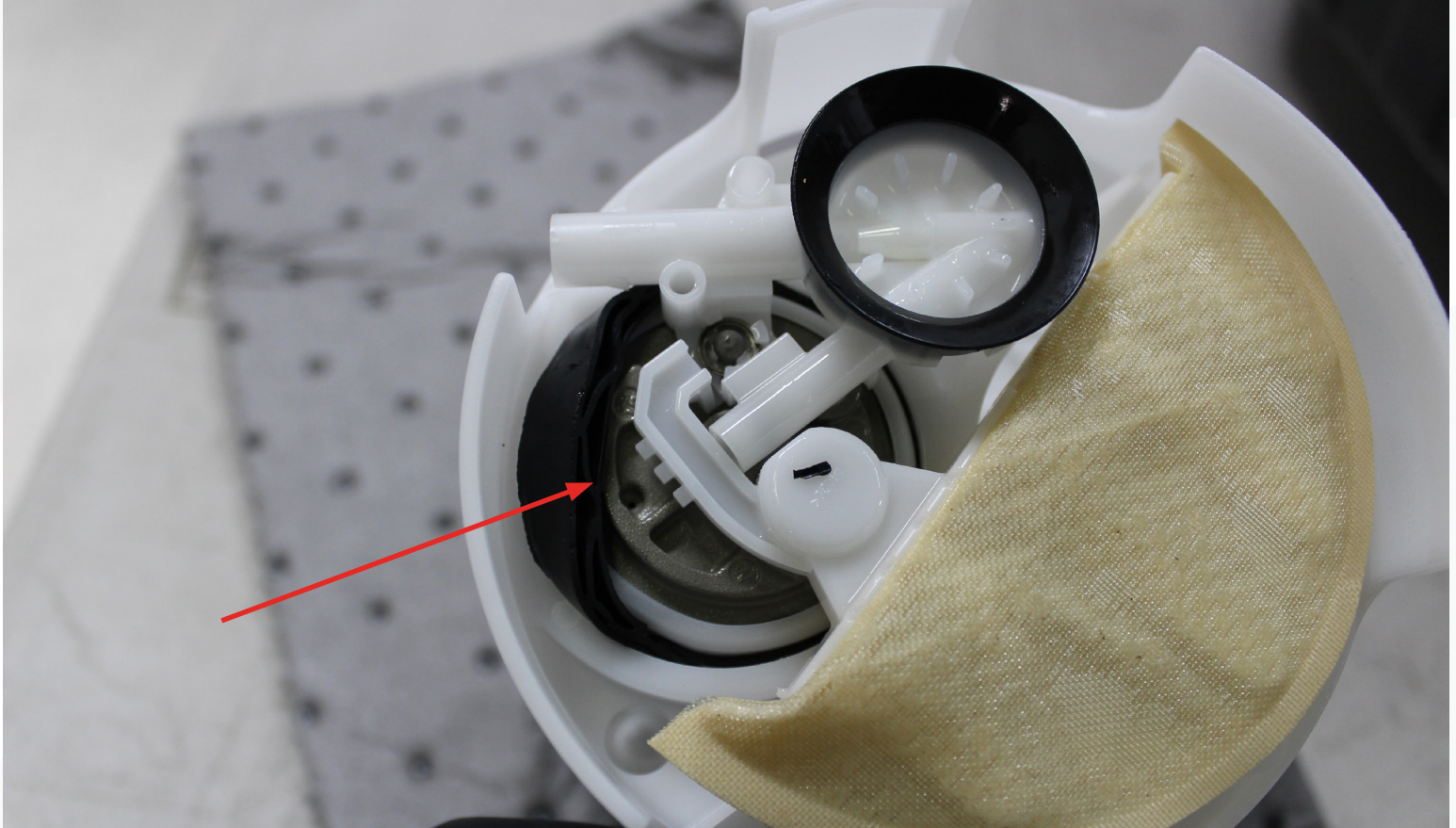
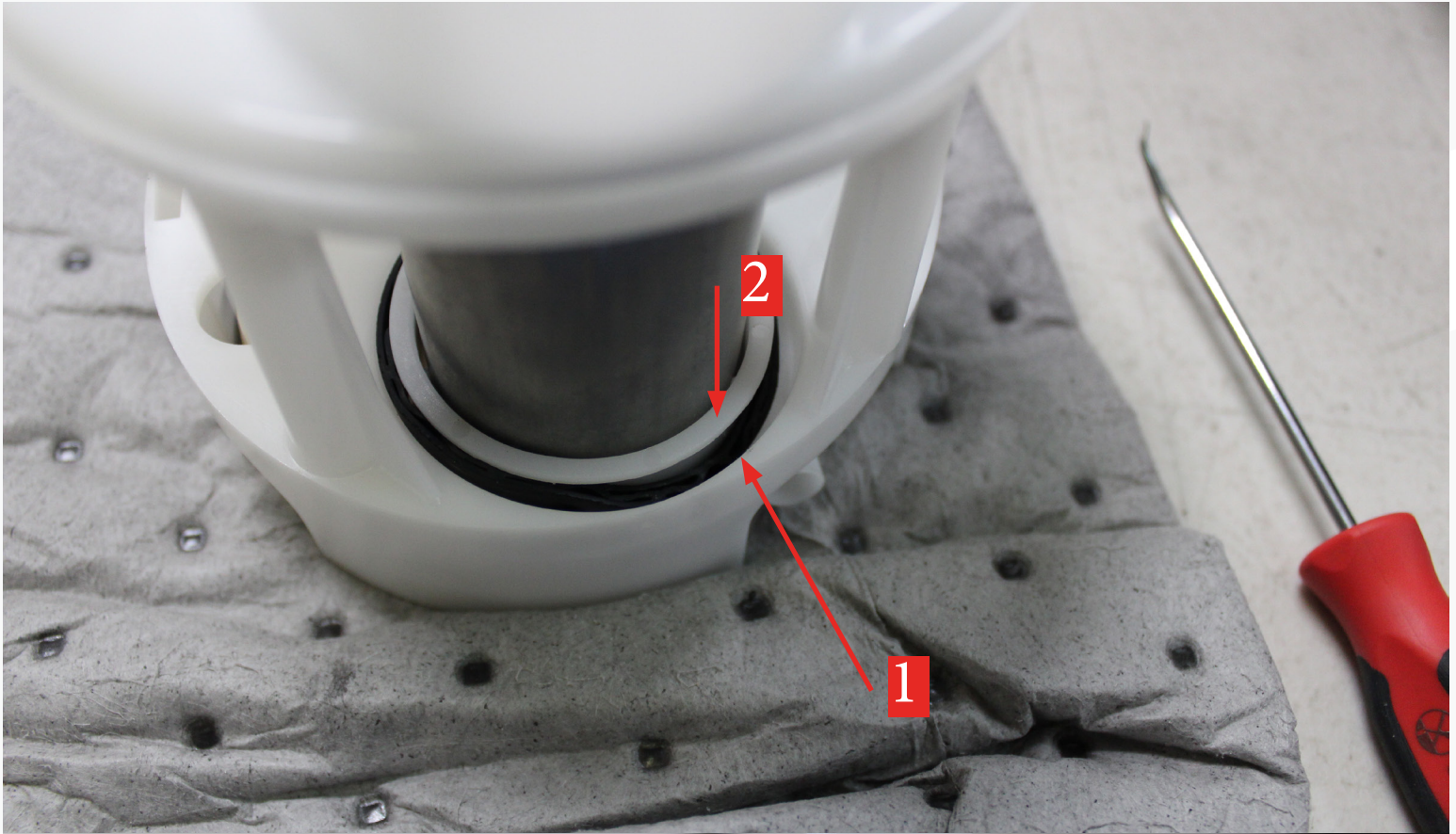
20. Flip the two levers shown remove the fuel sending unit and place it on your workbench.



21. Flip the sending unit over and remove the fuel pump filter assembly by removing the round retaining clip.



22. Using a small flat screwdriver or similar, push the rubber to the side and then through the bottom as shown.



23. Flip the two levers shown remove the fuel sending unit and place it on your workbench.



24. Using the empty basket, locate the 3D printed drill jig and set it in the top of the basket in such a way it covers the open hole. This will locate the holes to be drilled. Using a 2" hole saw and a 14mm (or similar) drill bit, drill the two holes as shown below. Remove any burrs or debris.



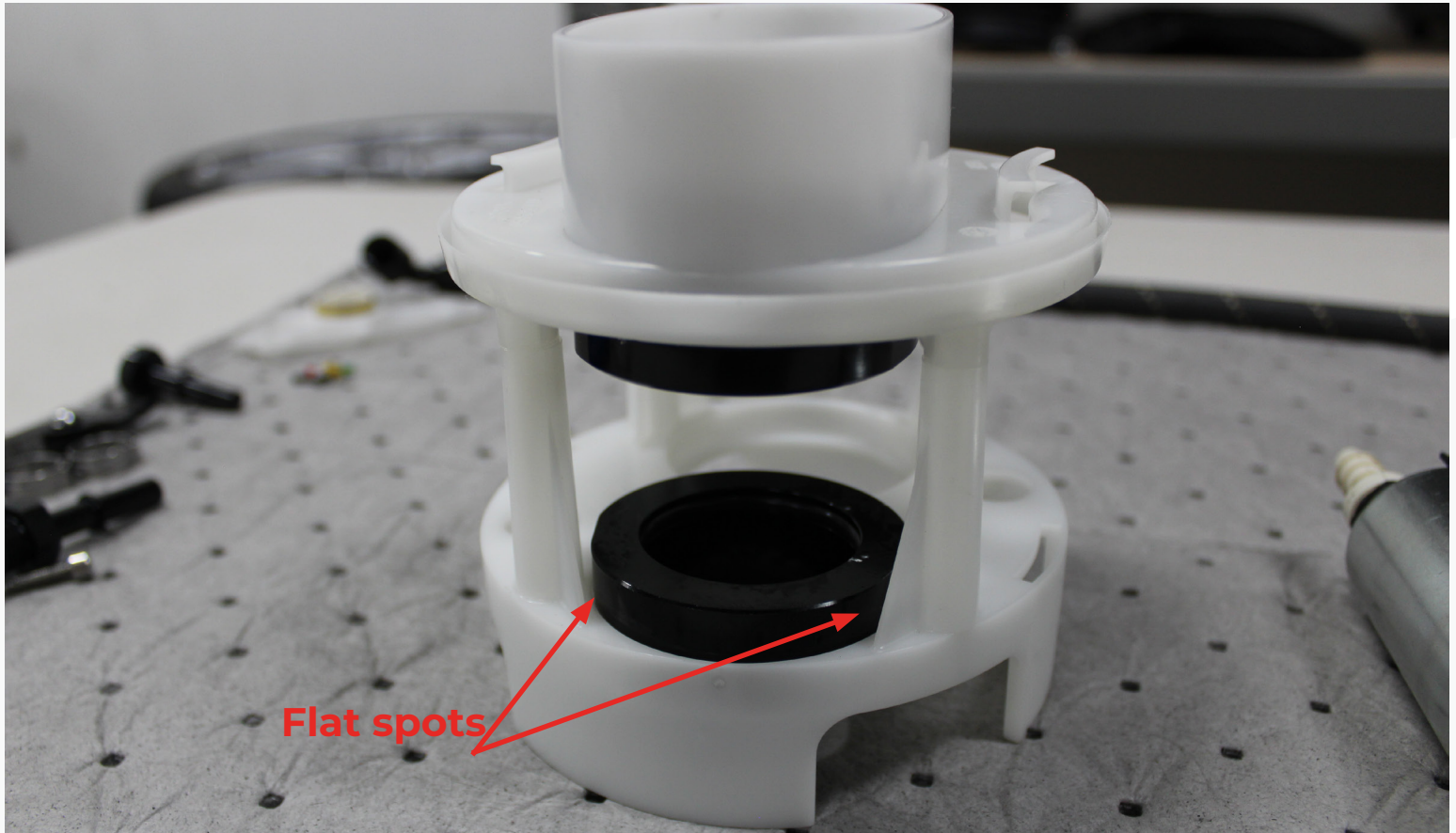
Step 24 Continued ...



25. Gather the following parts – fuel pumps, filter pickups, O-rings and top & bottom caps. Starting with the top & bottom caps, notice two have a section machined out to create a light cinch feature (top cap) while two do not (bottom cap). Grab one of each and place an O-ring inside the groove as shown. This will be for the first pump.



26. Place the top and bottom cap into the basket as shown below. Position the machined flats along the two "supports." Repeat step for second pump.



27. Lubricate the O-rings with a silicone spray or similar. Place the pumps into the basket until they sit all the way down while keeping the upper cap in position. Check that the machined flats are also in correct position. See photos for correct clocking of the pump outlet barb.



28. Install the pre-filters.



29. Locate the following items in the photo below.



30. Place the collars onto the pump barbs.



31. Prepare the hardware and position as shown below.



32. Lubricate the grommets in the fuel pump manifold and install onto the pump bars. Notice the orientation of the manifold in reference to the basket. Then tighten the allen bolts.

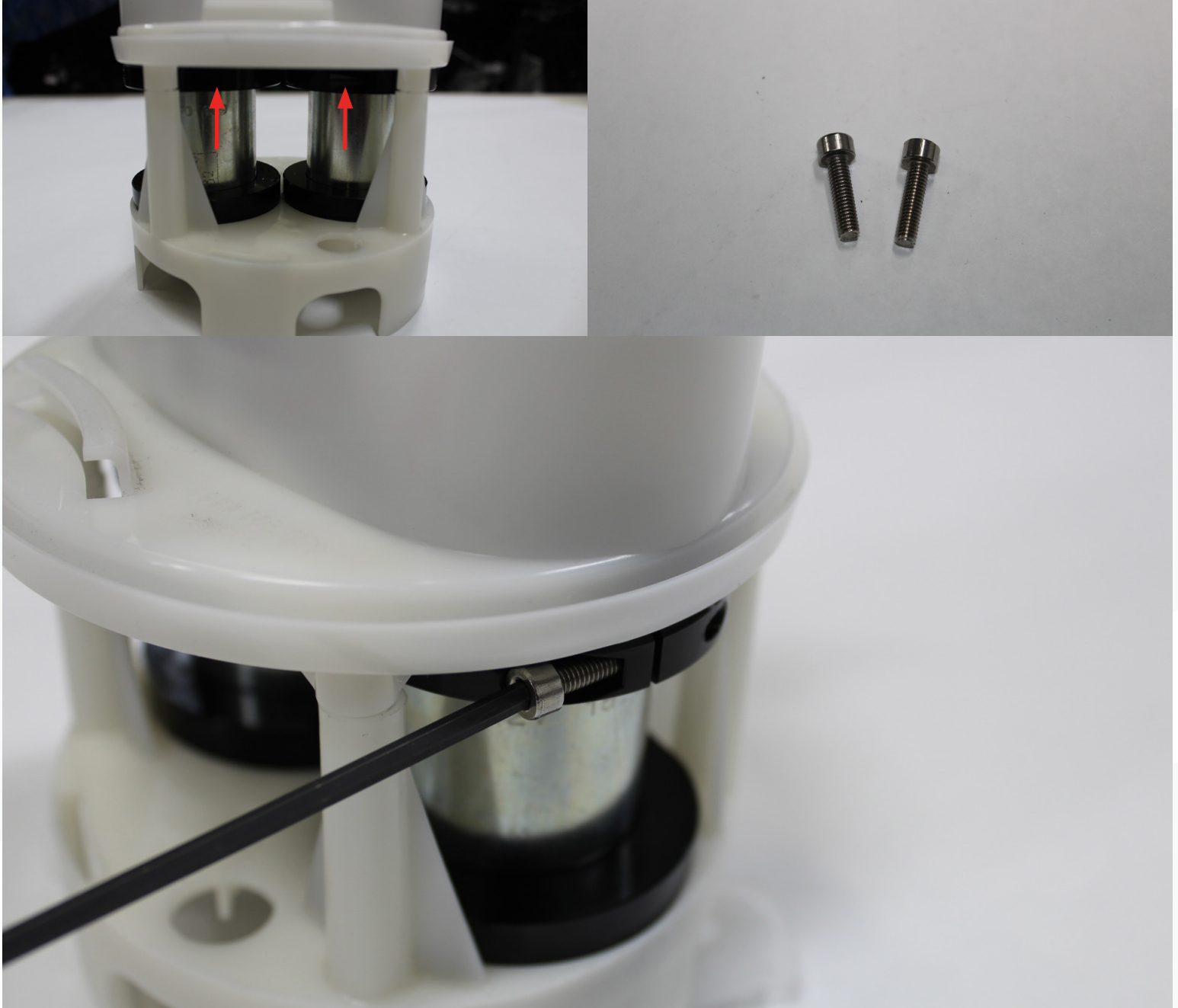


33. Locate the black fuel return fitting and retaining clip. Install the fitting into the hole drilled in step 24. Install the retaining clip on the backside.

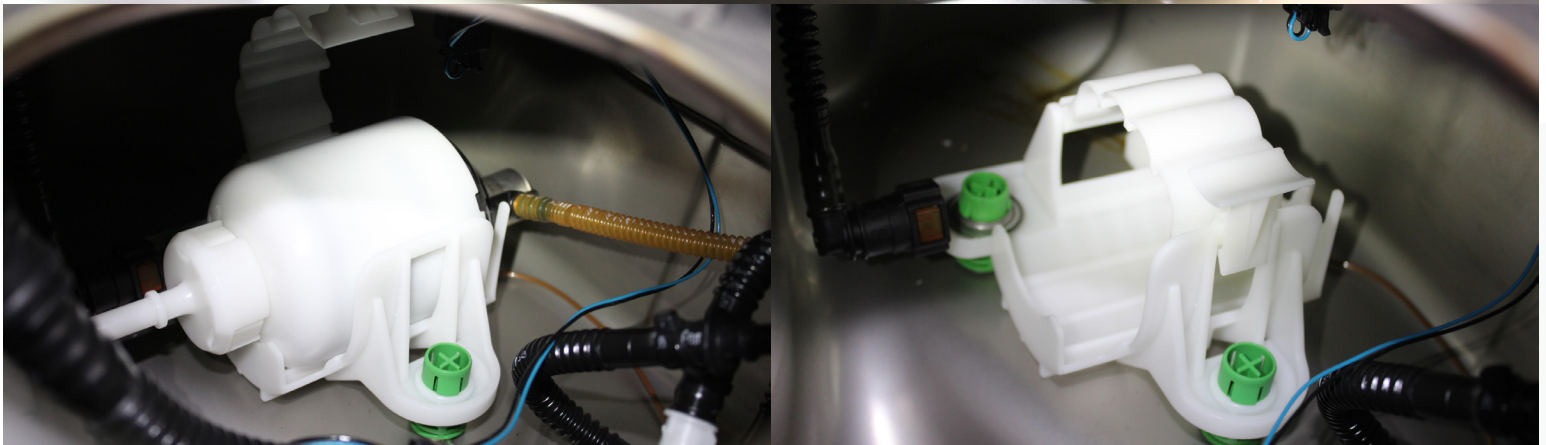
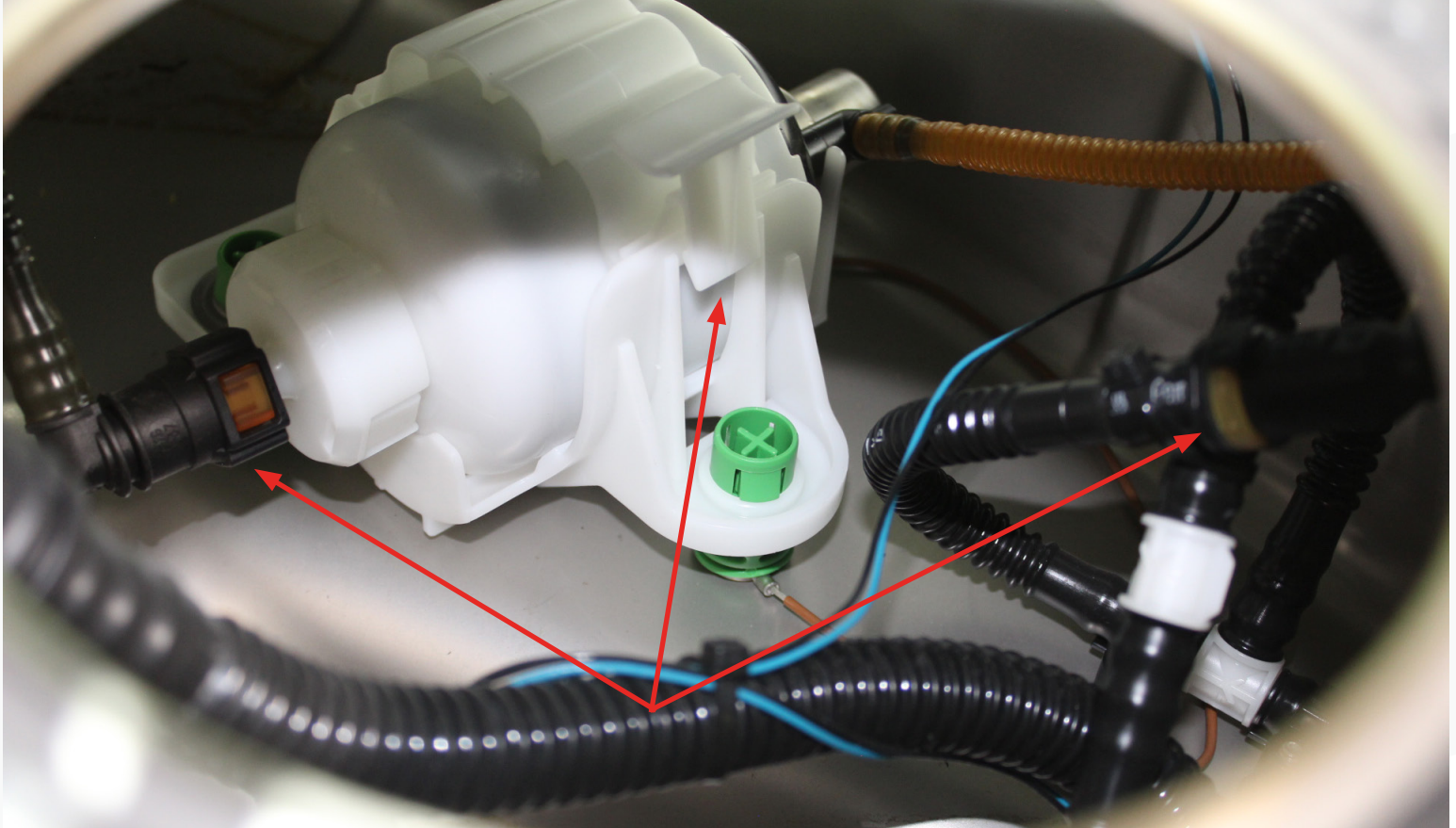


34. Using the provided M4 bolts, Snuggly fasten them into the top cap to hold the pumps in place. Do not overtighten them as you may damage the pumps. Then set it aside for now.

Note: Be sure top cap is pushed up into the basket properly.

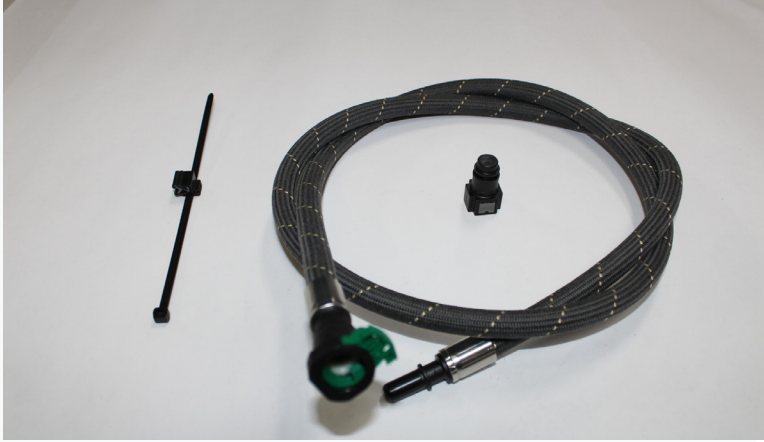


35. Next, we need to make a few changes to the driver's side tank for the Alpha Dual Brushless Fuel System. Start by removing the access panel and fuel tank retaining nut as you did before. Locate the fuel filter/fuel pressure regulator assembly near the back of the tank. Release the quick connect fitting and the strap holding the assembly. Then remove the assembly.

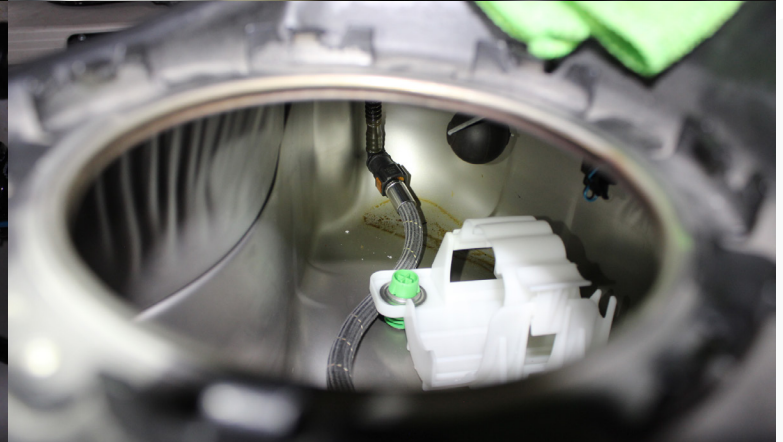
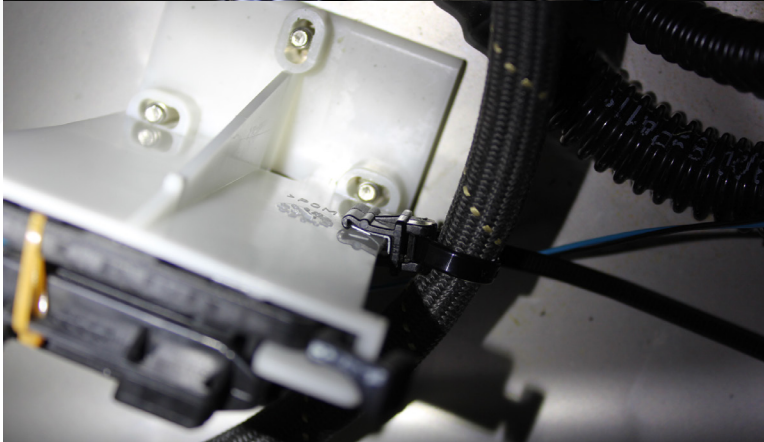
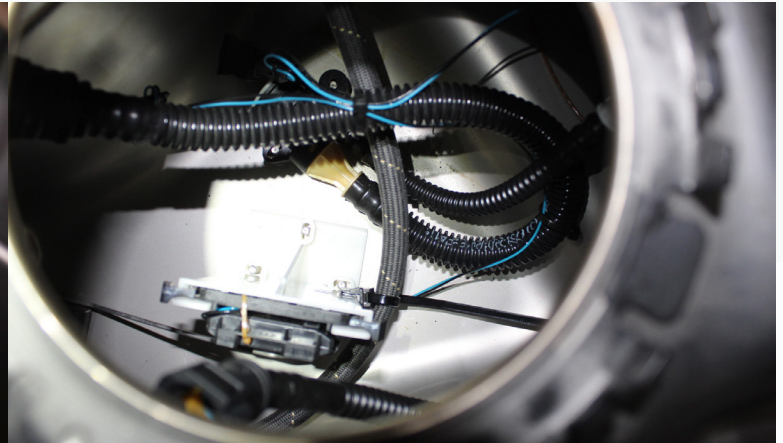


INSTALLATION **///**

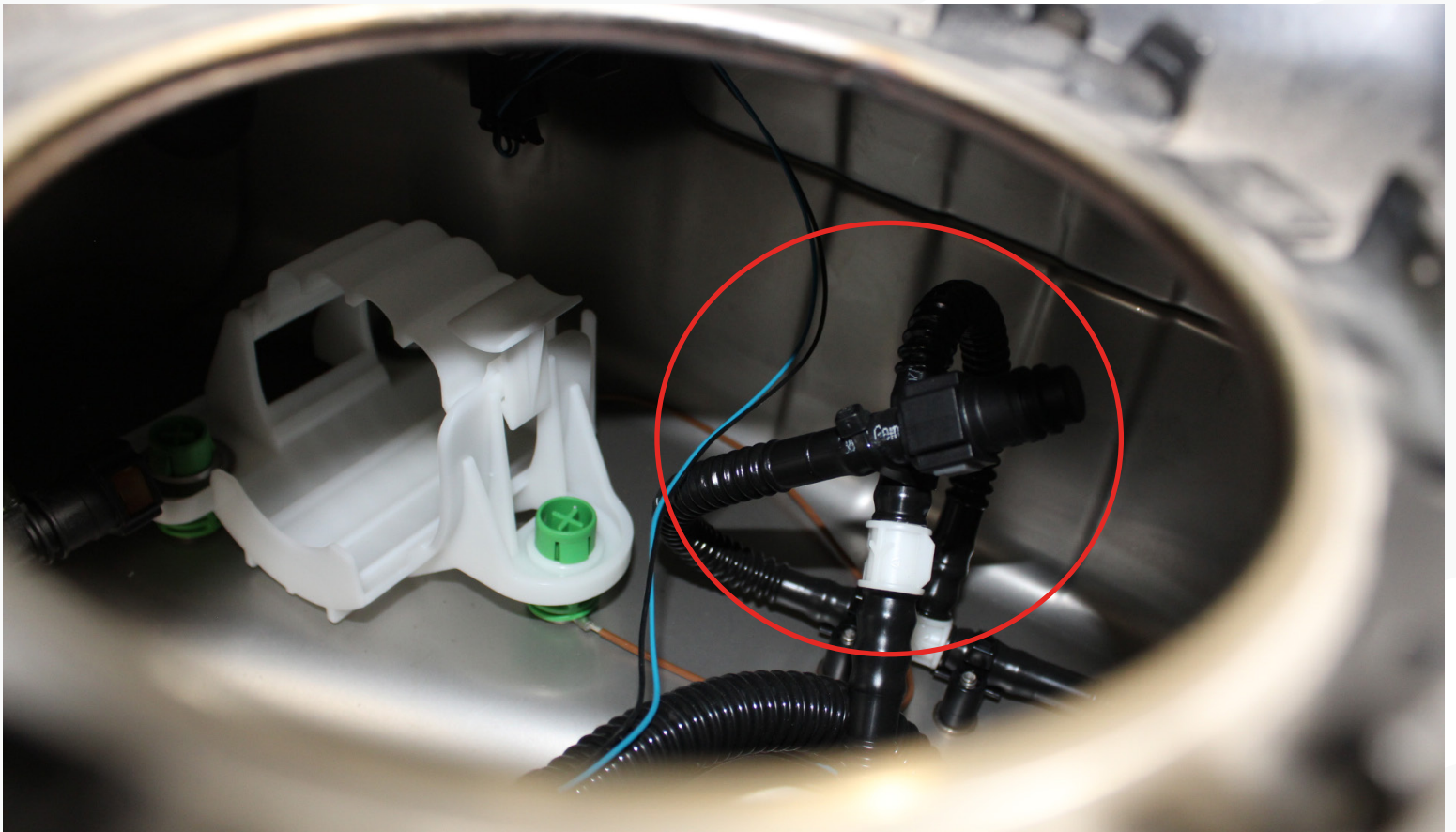
36. Locate the fuel line, fuel line cap and zip tie w/mounting clip. The fuel line needs to run from tank to tank. I found it was easier to feed the male fitting from the passenger tank through the crossover tube to the driver side tank. See photos below.



37. On the driver side tank, route the line away from the level sensor by leaving a little slack in the line and wrapping around the backside of the sensor with the zip tie mount. Then make the connection as shown in the last photo below.



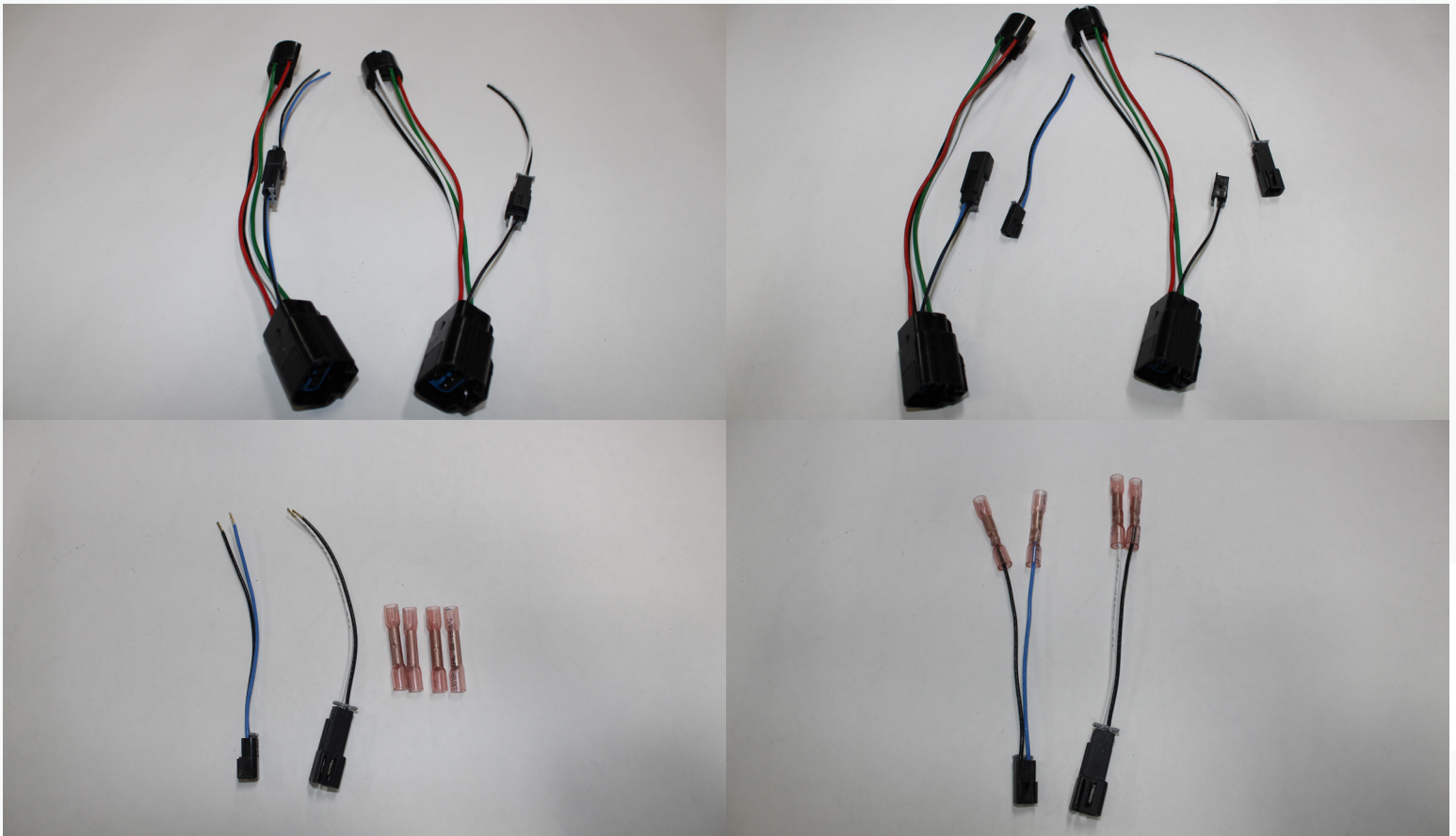
38. Install the cap to the remaining open fitting.



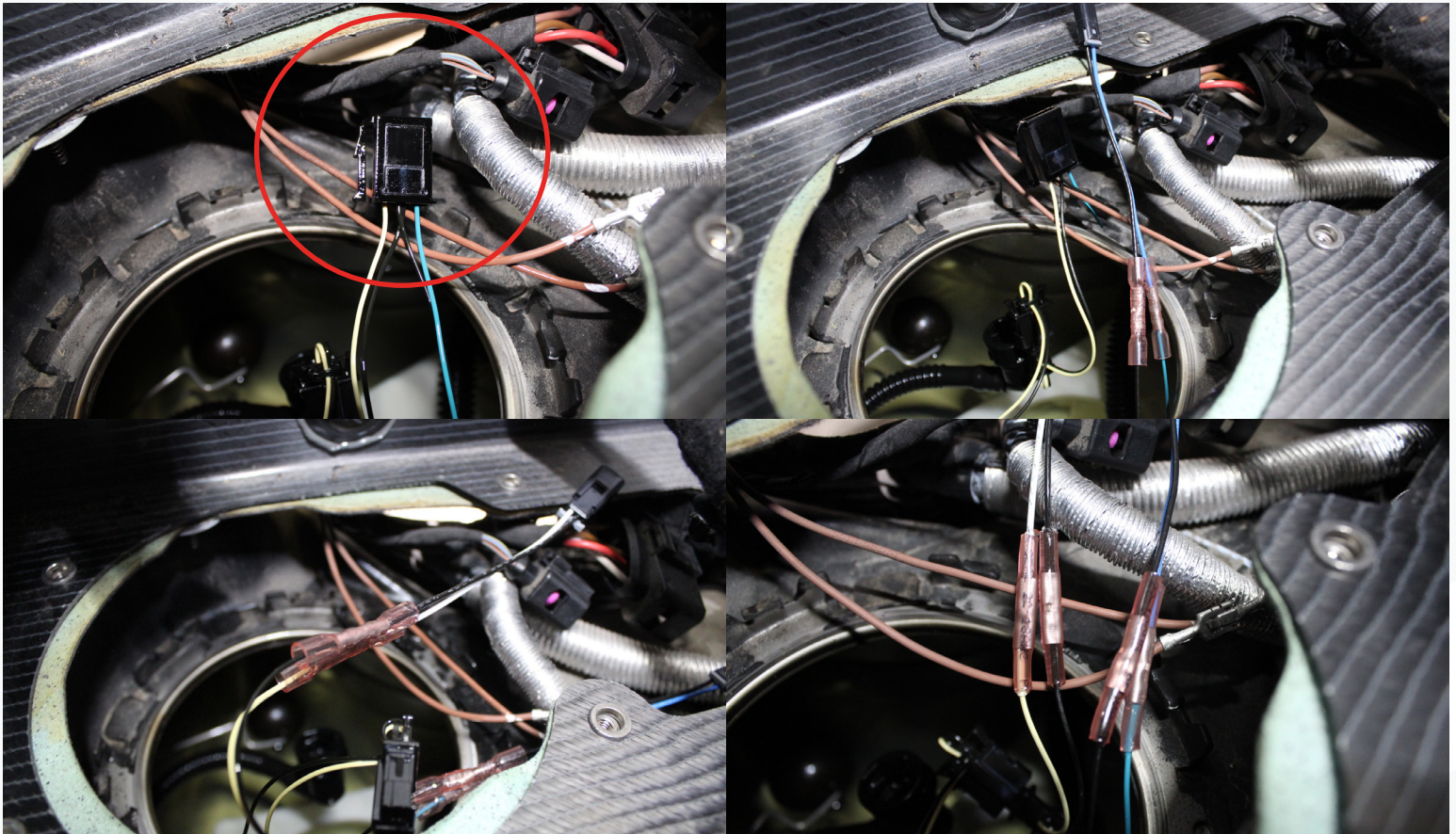
39. Gather the red top hat and fittings shown below. Lubricate the O-rings on the three fittings. Also, apply red loctite to the threads of the AN fitting and install them in the locations shown below.



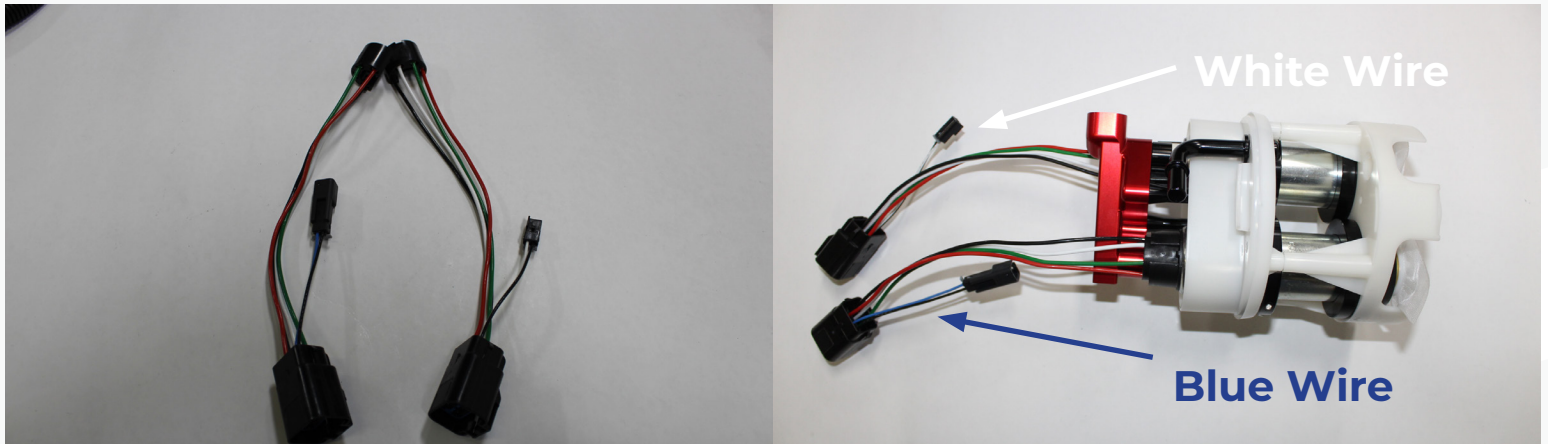
40. Gather the two harness' shown below. Disconnect the 2-pin connectors on both harness'. Then using four of the provided red/pink shrink butt connectors, crimp the unterminated ends.



41. Locate the factory in tank level sensor bulkhead connector. There are two black wires, a blue wire and a white wire. Cut the blue wire and the associated black wire. Strip the wires back and match them with the prepared blue and black wire jumper harness. Make the connection. Repeat for the white and black wires.

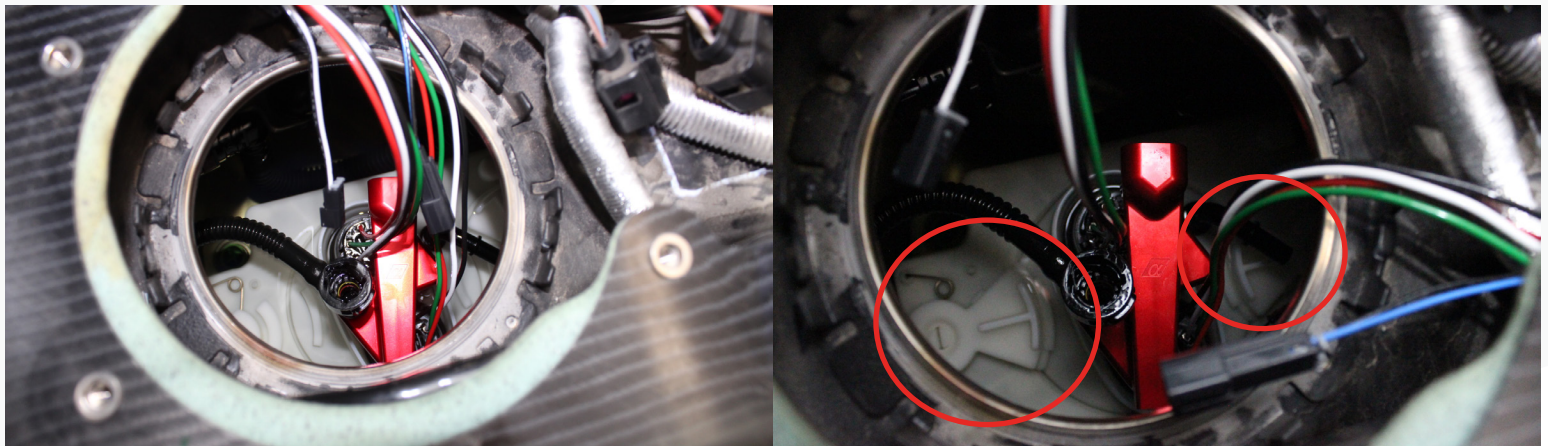


42. Grab the two harness' from step 40. Plug them into each of the pumps. Notice which harness is plugged into which pump. This orientation is ideal to avoid tangling once installed in the tank.

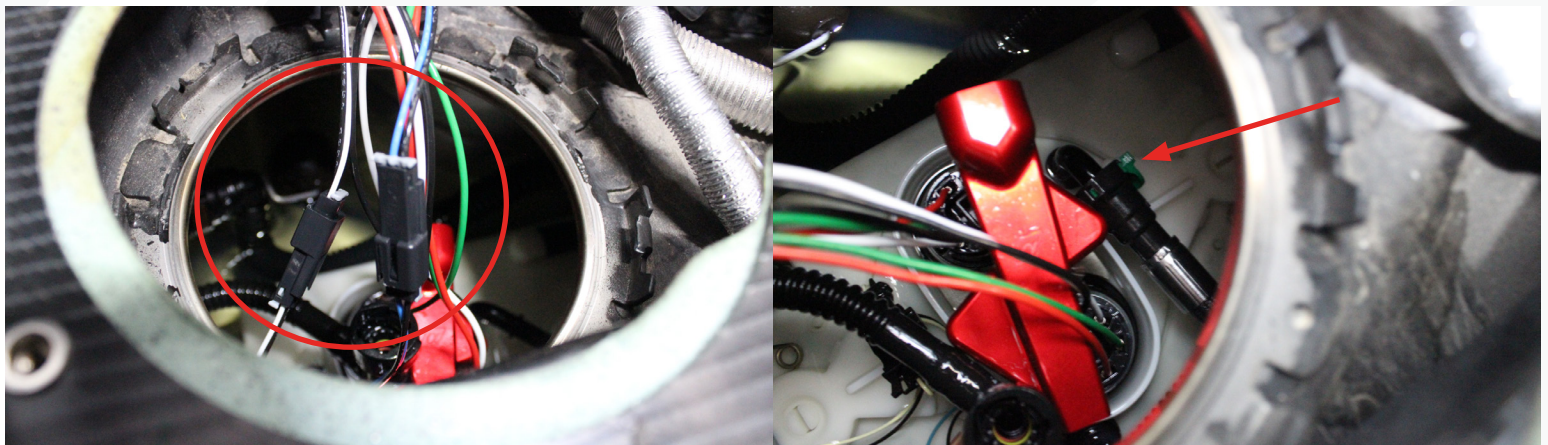


43. Carefully reinstall the basket into the tank and rotate the two tabs to lock it in position.

Note: The fittings go in after the basket is installed because the assembly will not fit through the opening. Also, the basket only goes in one way. The larger manifold outlet should face the rear of the car.

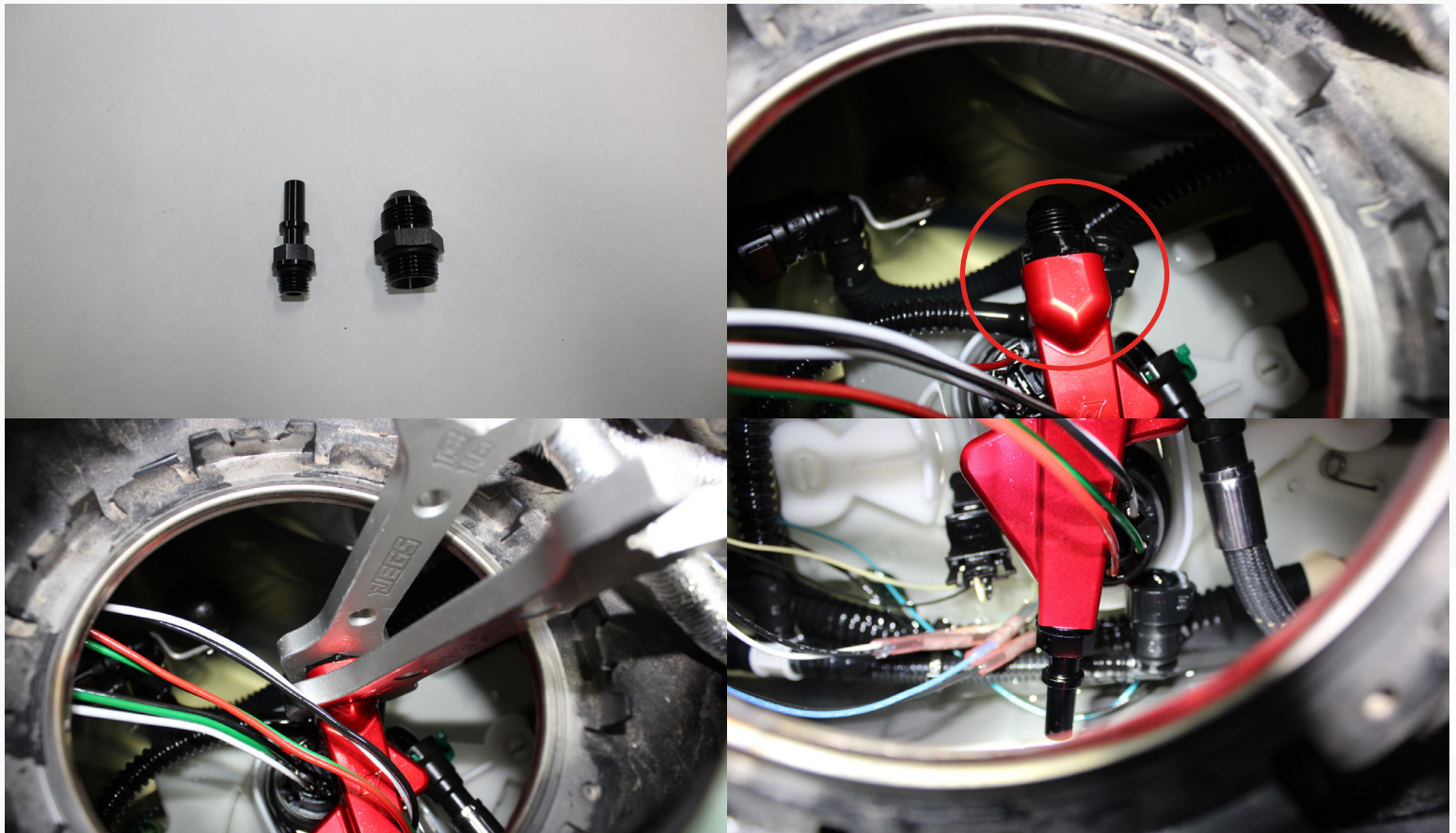


44. Connect the new level sensor connectors to the appropriate fuel pump connectors. Then connect the fuel line that was ran in step 37 to the fitting that was added to the basket as shown below.

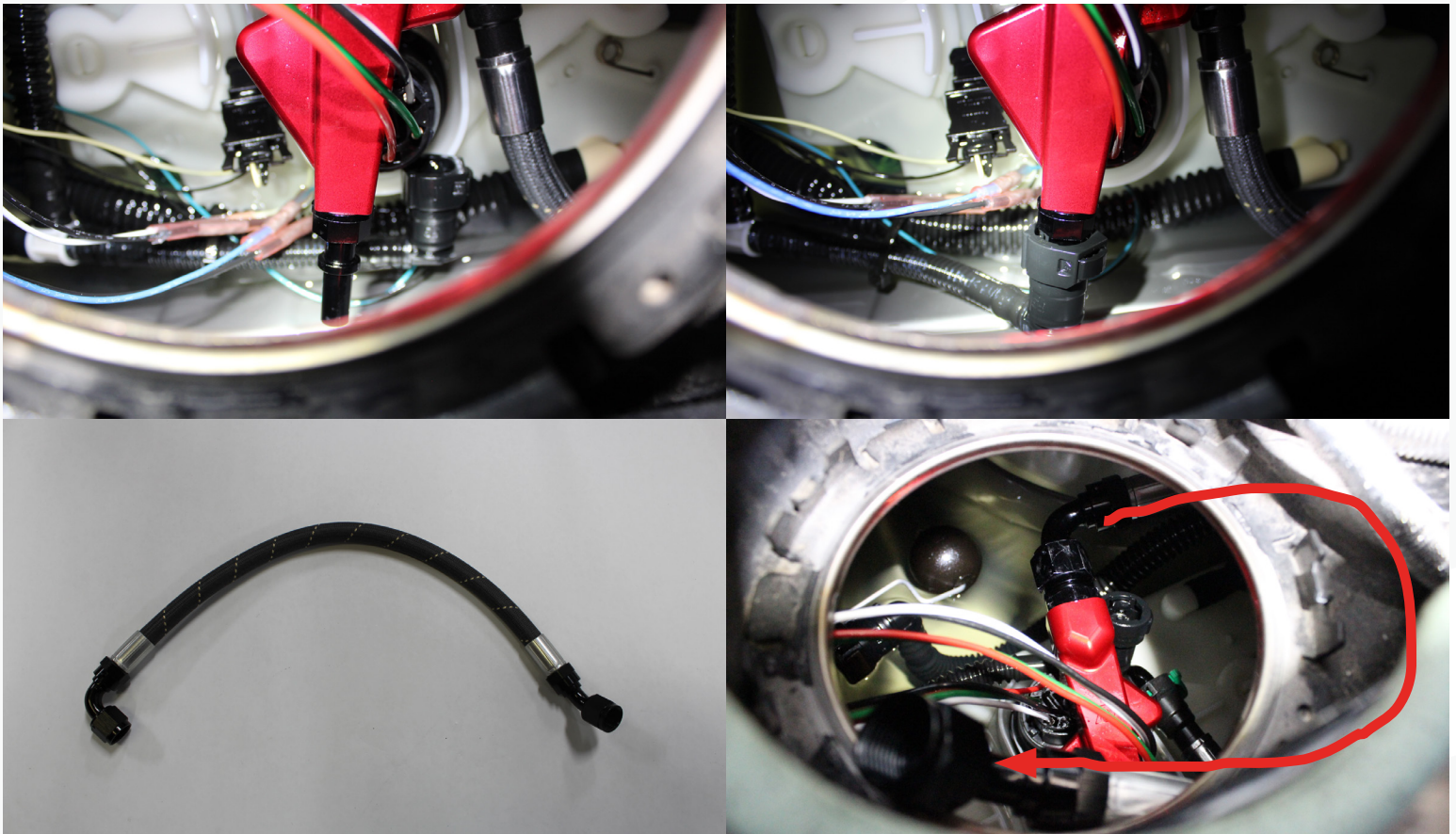


45. Locate the provided -8 and quick connect fitting and connect them to the red fuel pump manifold. Lubricate the O-rings and tighten them down.

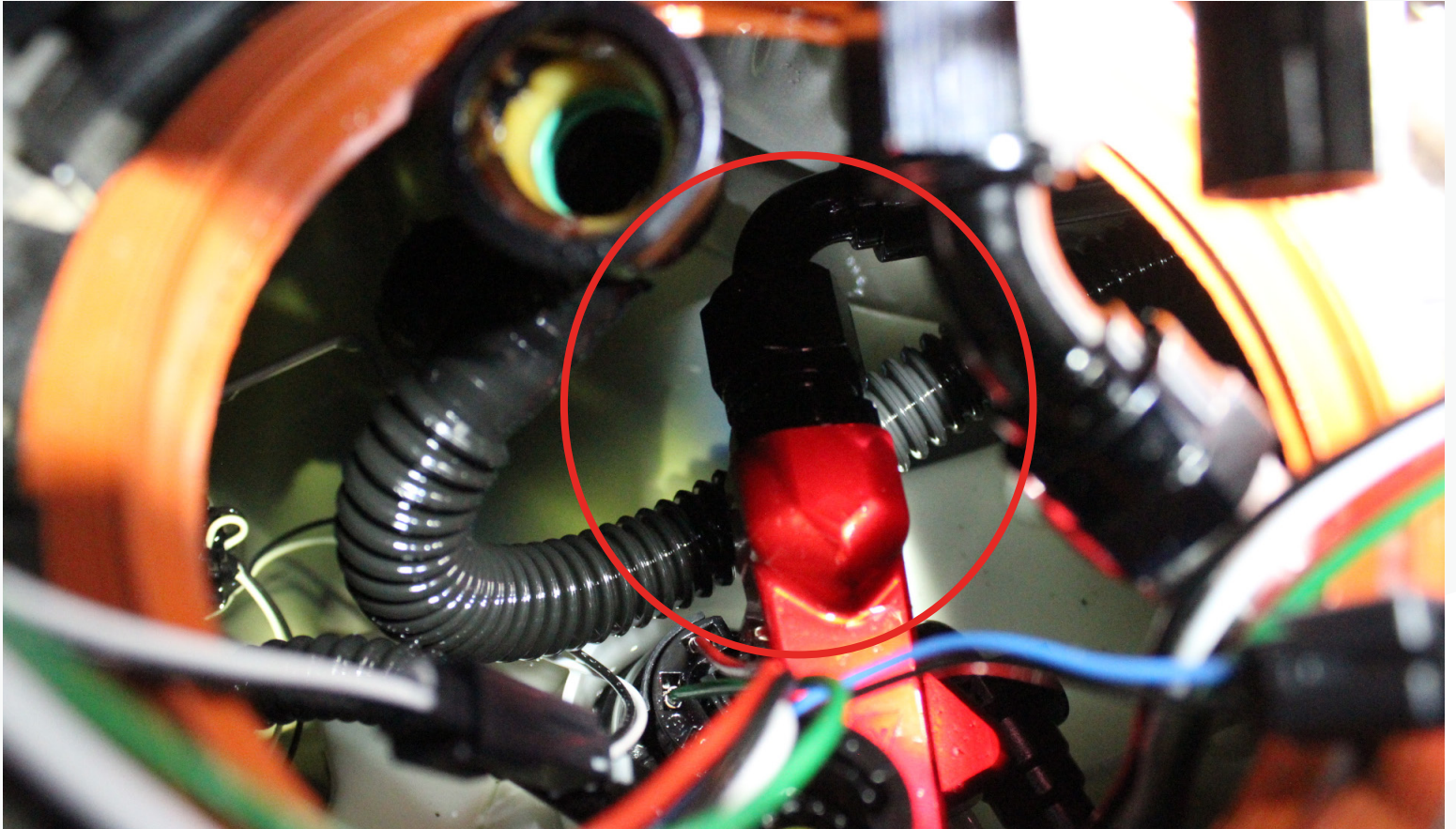
Note: The manifold was designed with two flats on the larger end for a -10AN (1") wrench.



46. Connect the quick connect fitting that was removed from the factory pump back in step 19 to the quick connect fitting on the fuel pump manifold. Then locate the provided -8AN fuel pump outlet line and connect it to the fuel manifold as shown below. Route the line to the right and loop it back towards the fuel tank opening.

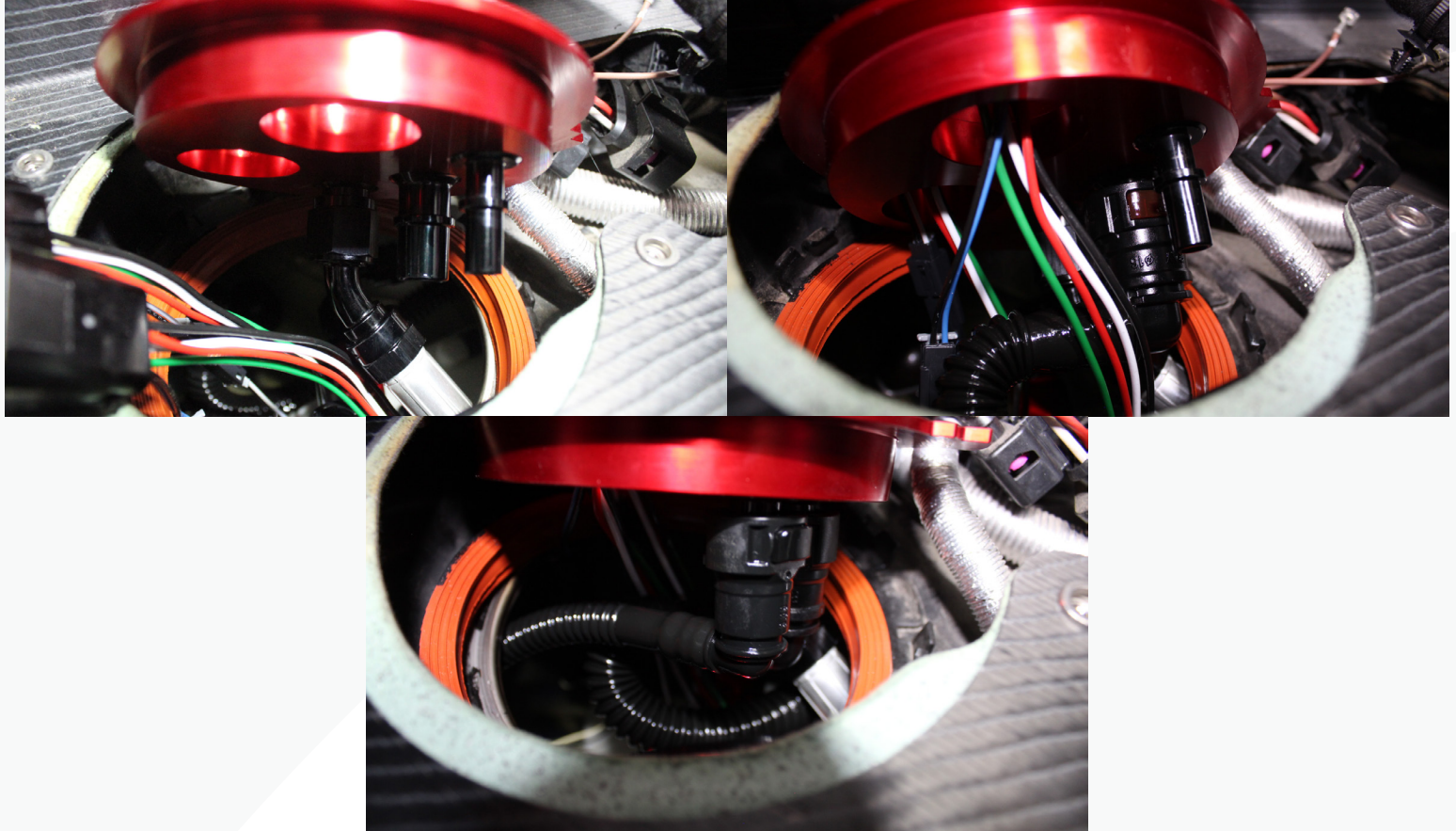


47. Before installing the top hat, we need to make sure the large quick connect line in the tank runs below the fuel pump manifold and up towards the top hat. This step is very important for proper fitment. See photo below.



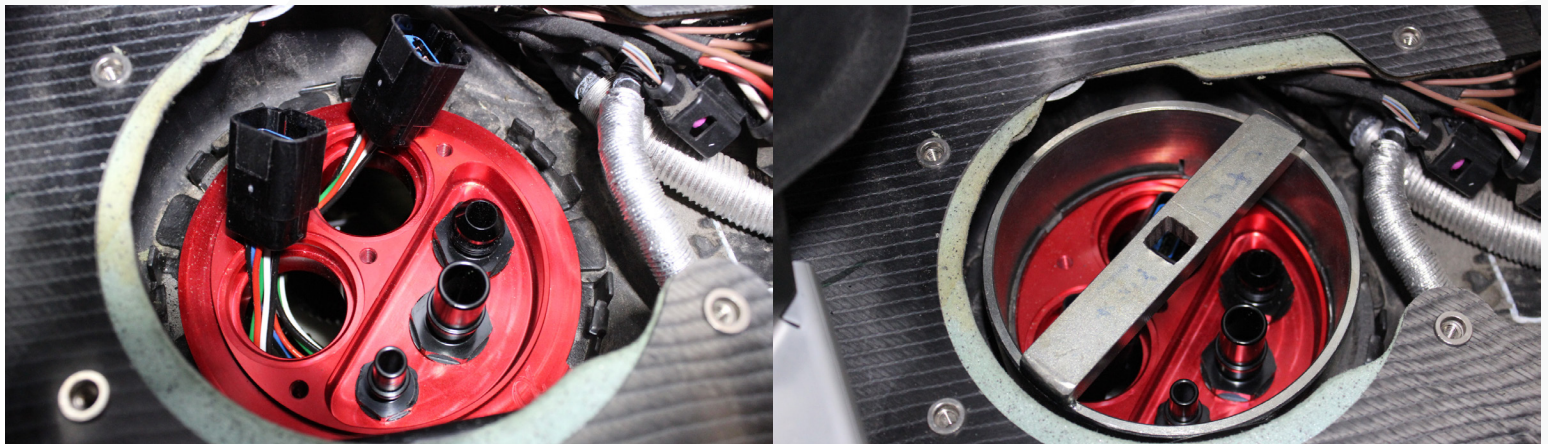
48. Install a new seal (provided) to the fuel tank. Using the top hat prepared in step 39, install the -8 AN fuel line to the top hat. You may need to hold other side while tightening to prevent it from backing out. Once that is tight proceed with the other two quick connect fittings.

Tech Note: Be sure the quick connect fittings are properly seated and cannot be removed with a simple tug.



49. Pass the fuel pump harnesses through the opening before placing the top hat in place. Once the top hat is in place, it is a good opportunity to verify all internal lines and wires are not kinked or obstructing level sensor operation. Once verified, reinstall the top hat nut.

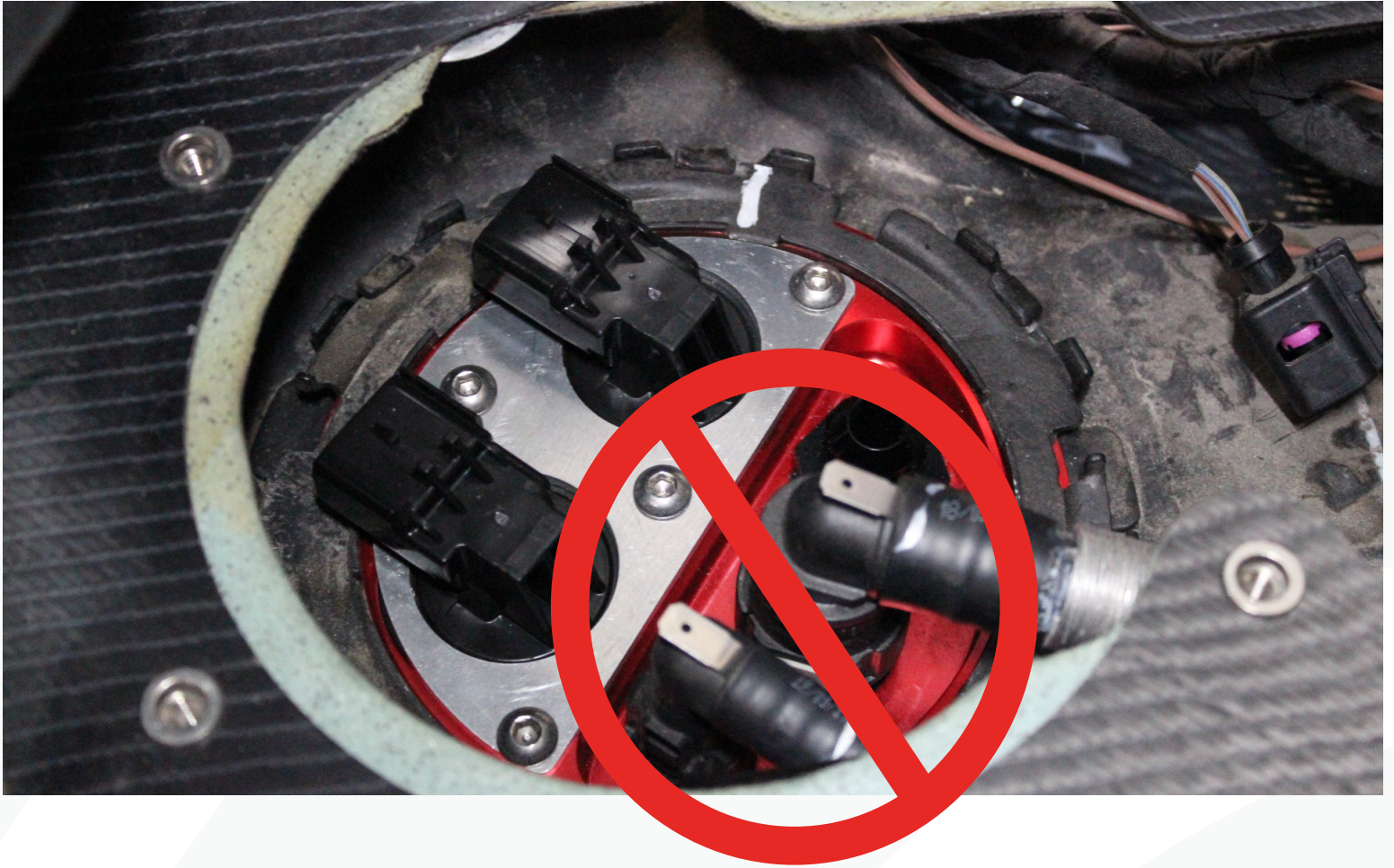
Make note of the locations of the blue and white level sensor wires.



50. Gather the following parts – bulkhead connectors, O-rings, connector plate and button head hardware. Lubricate the O-rings and then install them onto each connector. Connect the bulkhead connectors to the pump harnesses. Place the connector plate onto the connectors and walk it into place. Press firmly on each connector to seat them in the top hat. Fasten the top plate with the button head bolts.



51. Do not reconnect the factory out of tank lines. You will need them off for a later step.

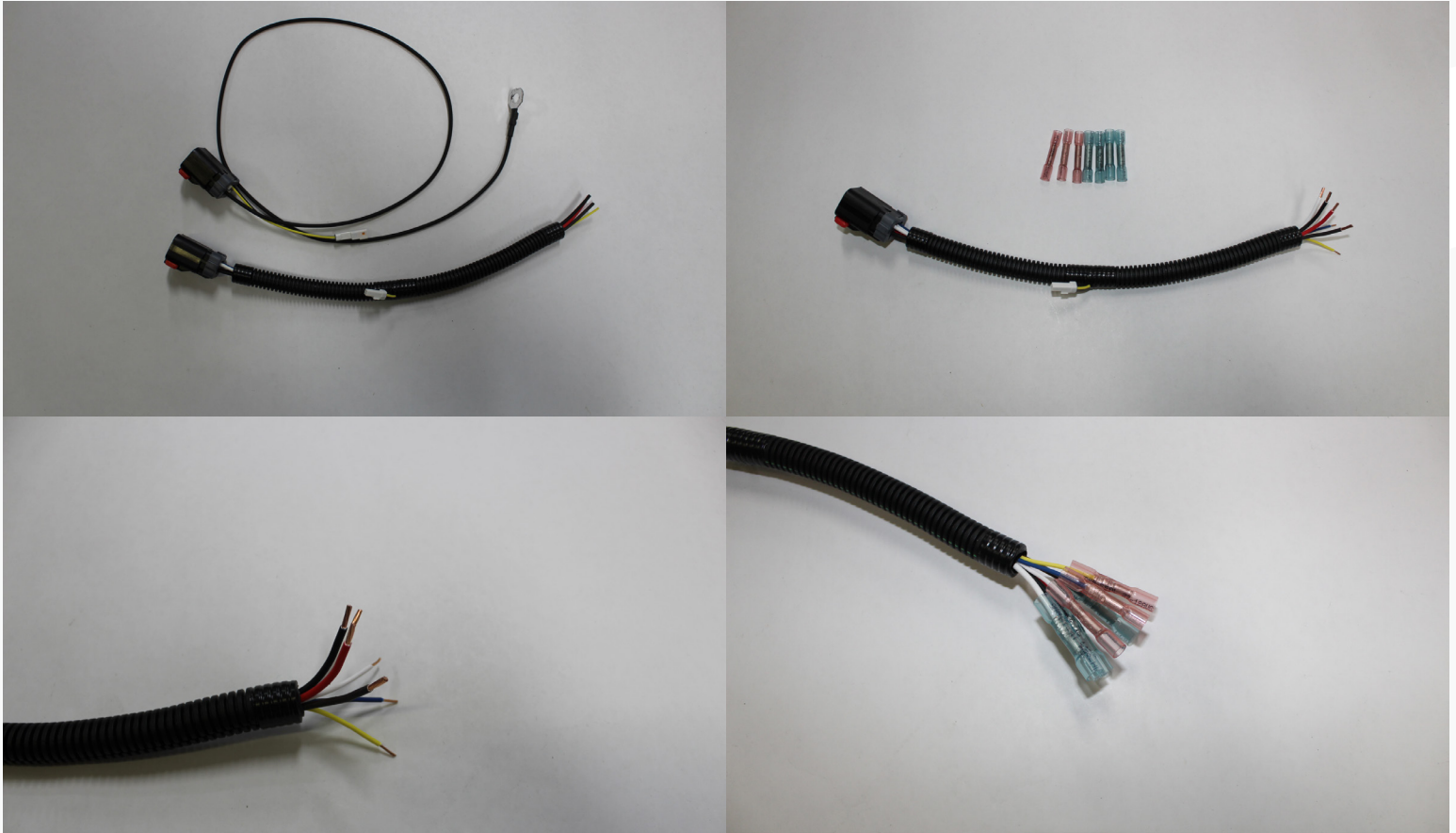


53. Install your fuel feed line of choice. If you purchased the Alpha Engine Bay Fuel Line Kit, then it will be the long heat wrapped line. Route the line through to the engine bay while staying behind the heat paneling on the fuel tank to protect it from the exhaust manifolds. More detailed photos of the engine bay routing will be in the next chapter.

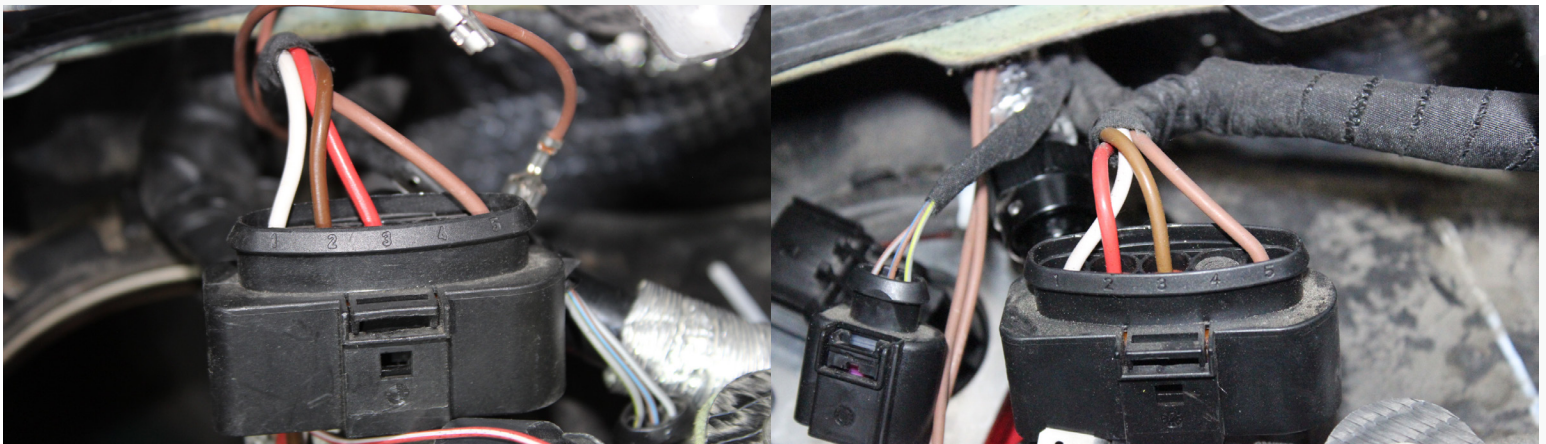
Note: It's always a good idea to flush lines out before installing.



54. Locate the two harnesses, three red heat shrink butt connectors, and four blue heat shrink butt connectors. Make the crimp connections shown below.



55. The next step is very important. Depending on your vehicle the brown and red wire are switched. Match your vehicle to the photo and proceed to the appropriate step.



Typically Found on Audi R8, Continue to step 56

Typically Found on Lamborghini, Continue to step 57

56. Audi R8 Only: Peel back some of the wire wrap, then cut the lonely light brown wire from location 5 and crimp it to the black wire of the harness prepared in step 54. Then match the rest of the wire colors to the blue heat shrink butt connectors. Continue to step 58.

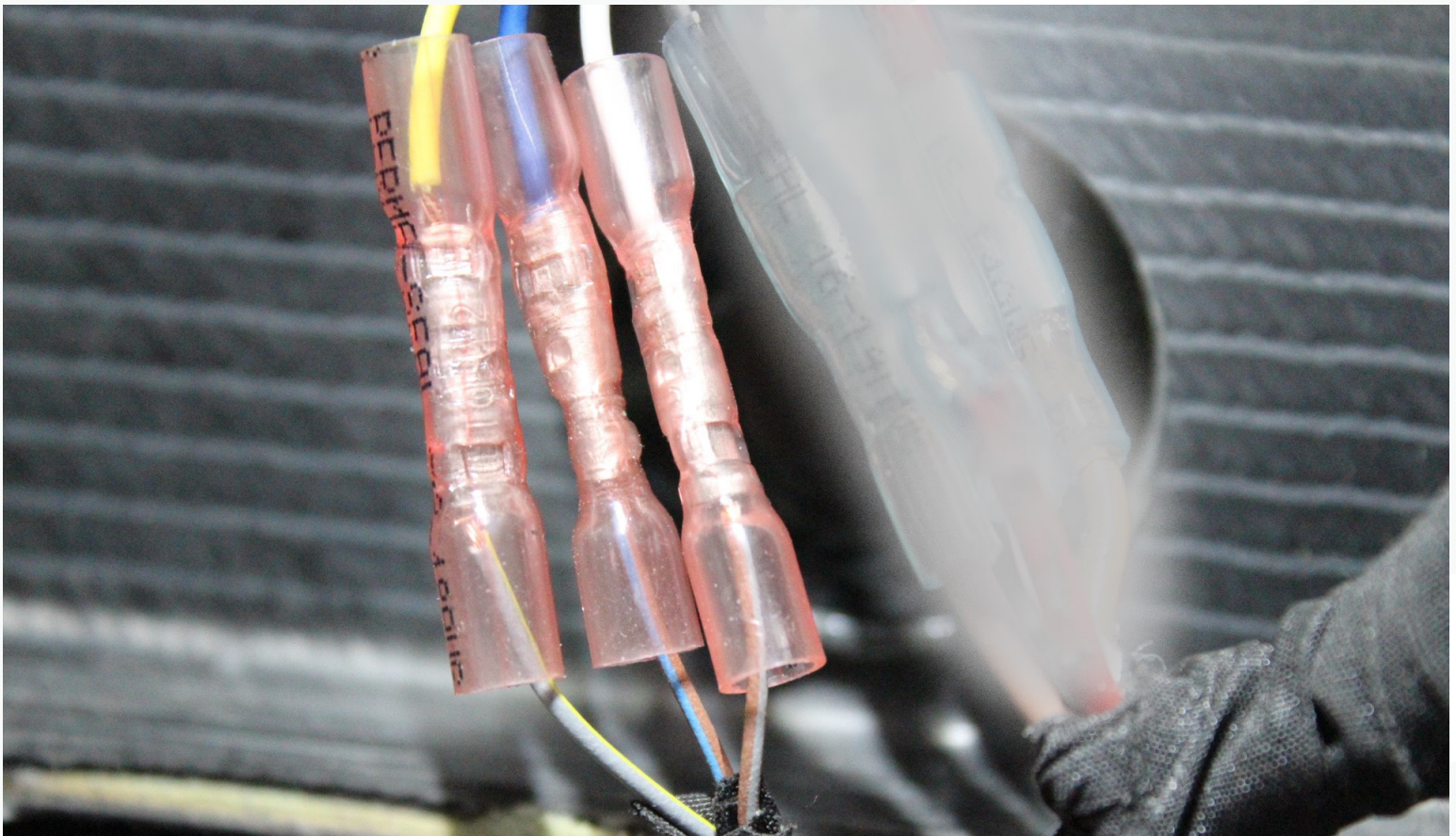


57. Lamborghini only: Peel back the wire wrap, then cut the lonely light brown wire from location 5 and crimp it to the black wire of the harness prepared in step 54. Next cut the other brown wire from location 3 of the factory connector and connect it to the red wire of the AMS harness. Now continue with factory red wire and connect it to the dark brown of the AMS harness. Last connect the white wire to white wire of the AMS harness. See photo below. Continue to step 58.



58. All models continue from here: Locate the level sensor connector. Match the three wire colors from the AMS harness to the tracer wire of the factor harness.

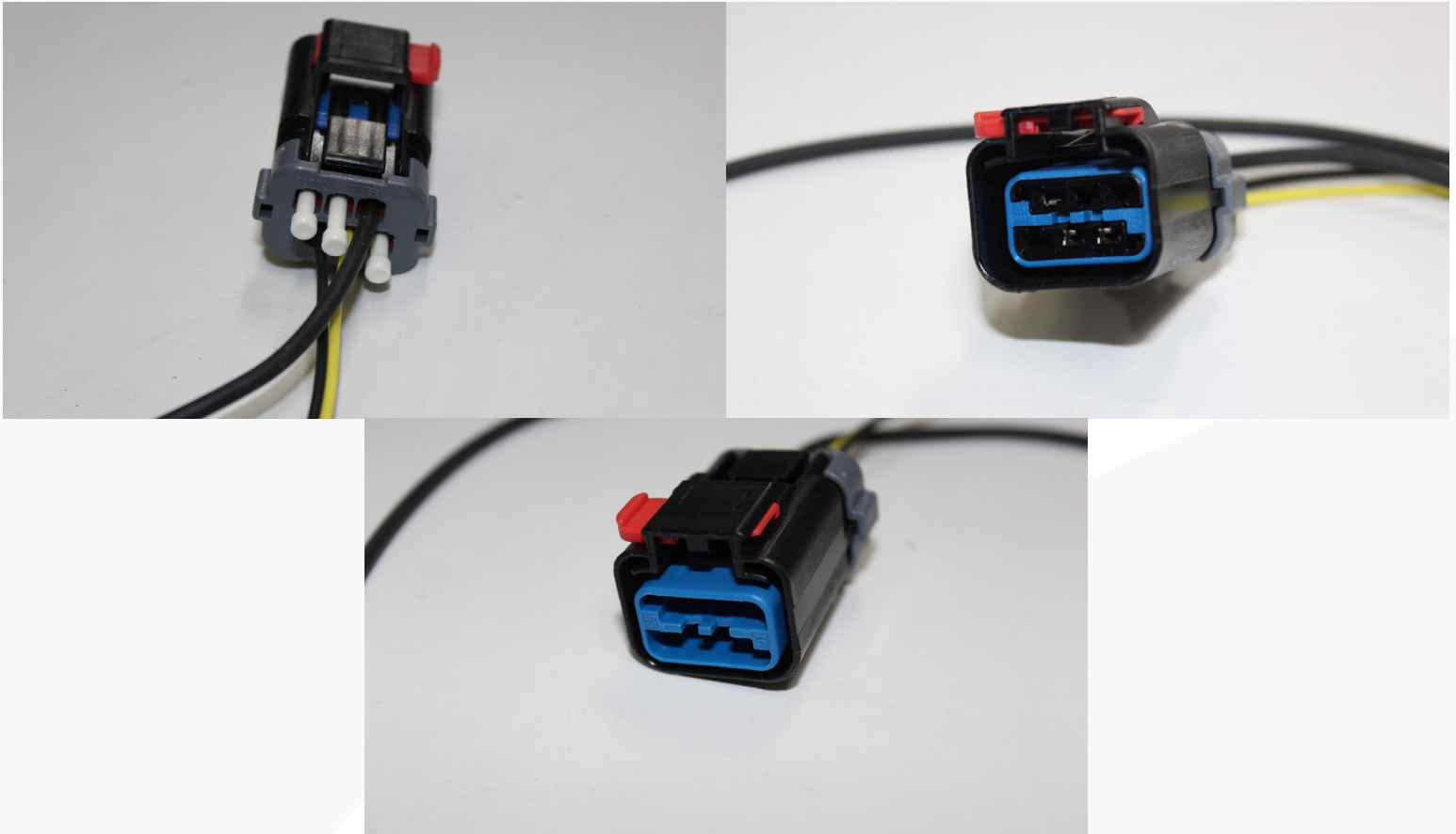
Yellow wire to gray wire with yellow tracer, blue wire to brown wire with blue tracer and white wire to brown wire with gray tracer.



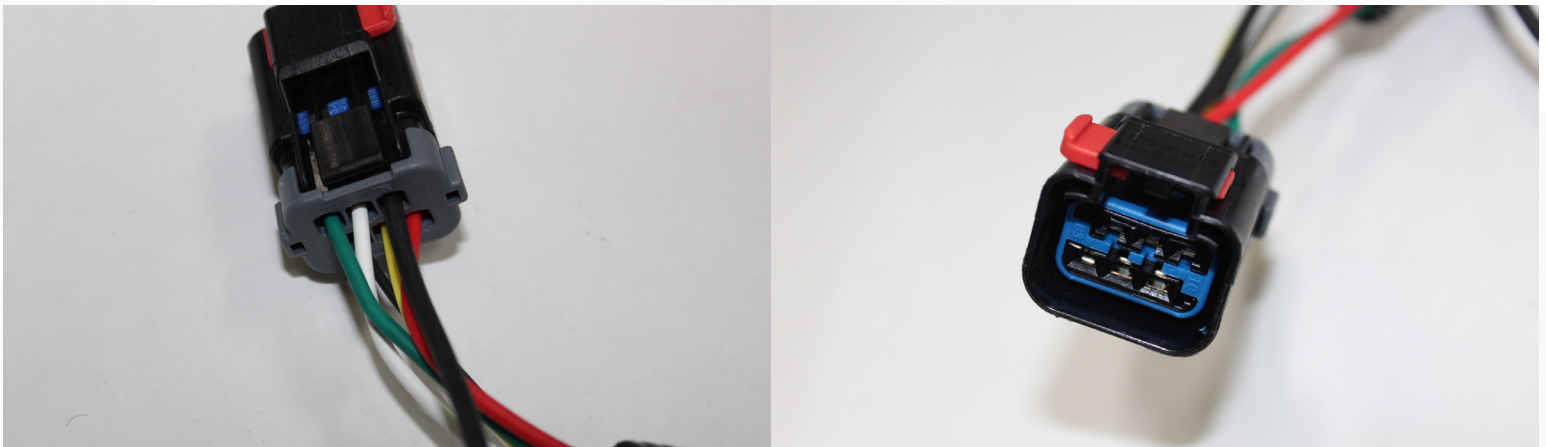
59. Locate the factory fuel tank access panel and provided panel grommet. Mark the spot shown below and drill a $\frac{3}{4}$ " hole. Then insert the grommet.



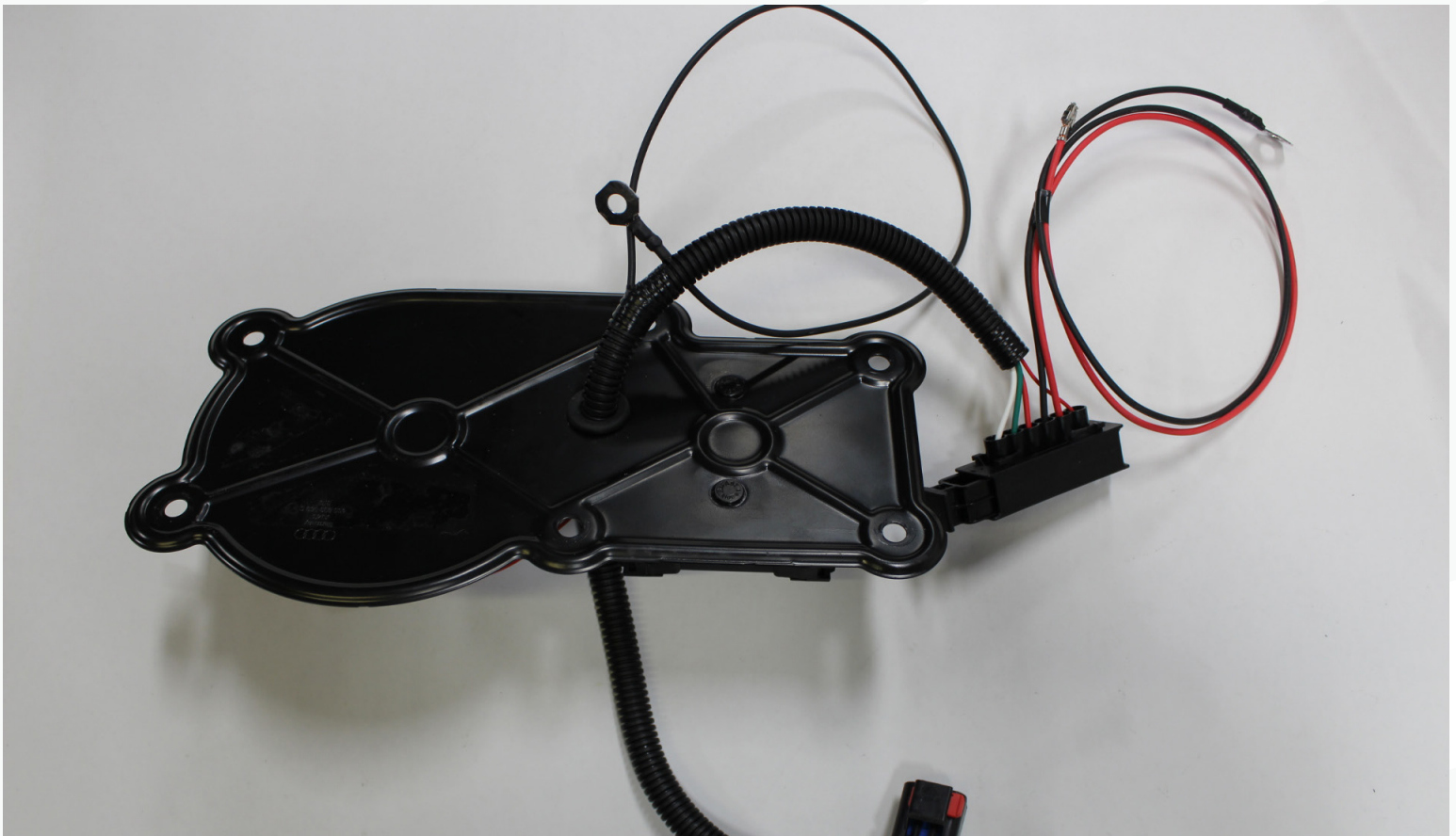
61. Using the remaining fuel system harness, remove the three plugs and place the secondary pin lock in the open position as shown.



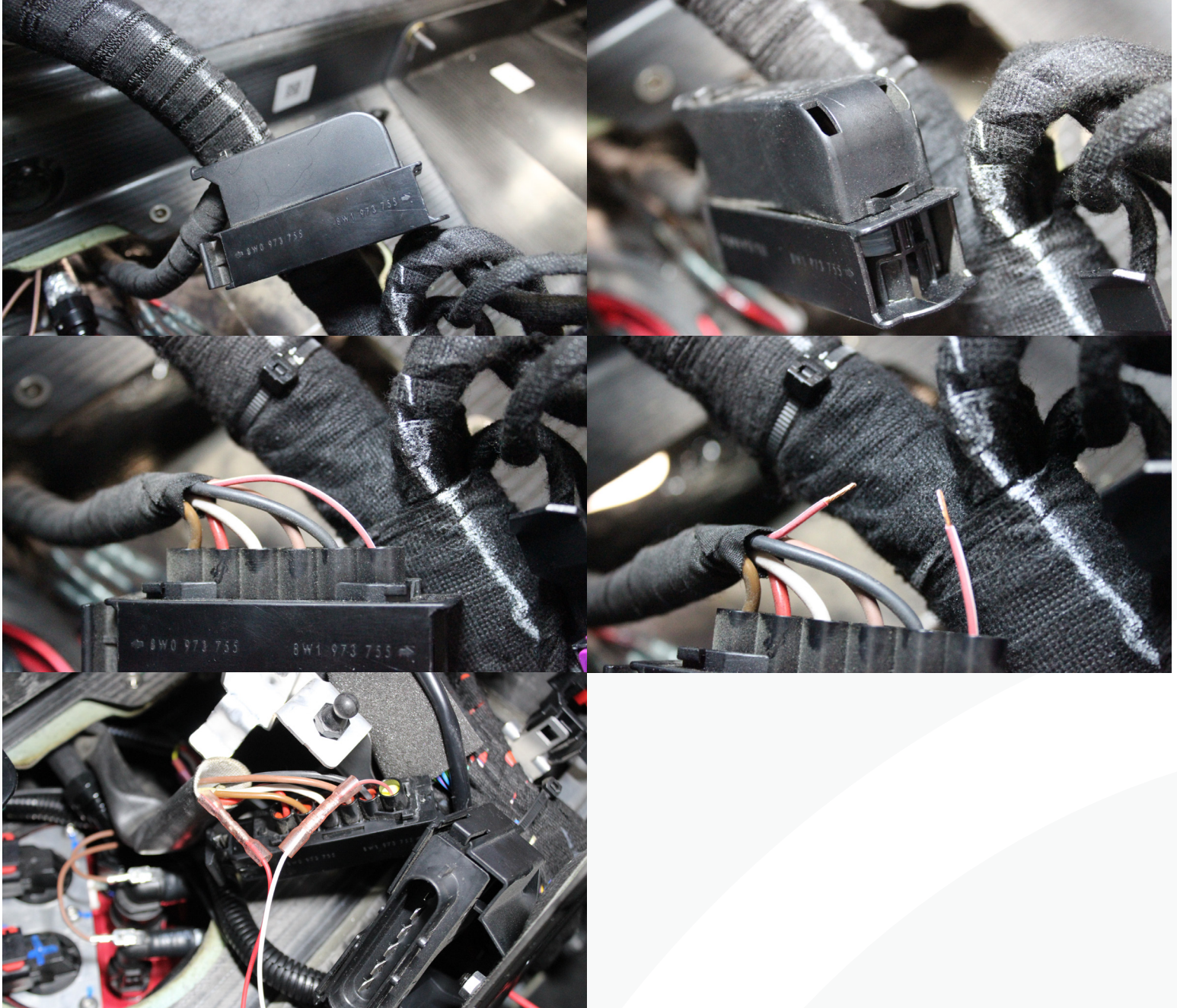
62. With the loomed harness through the grommet, insert the terminals in the orientation shown below. Then reset the secondary pin lock.



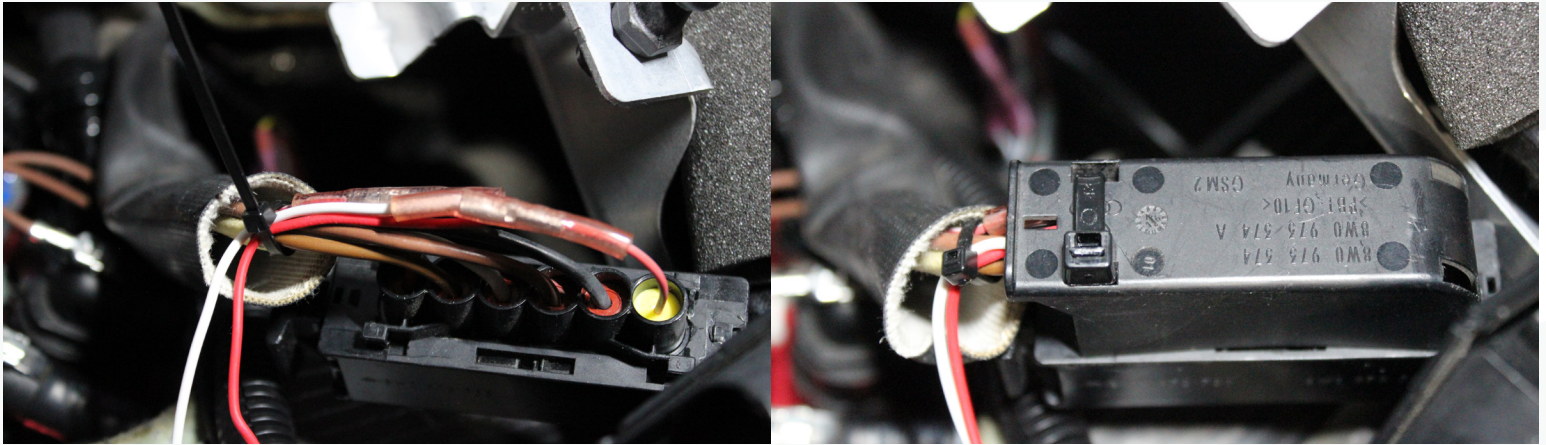
63. Feed the black ground wire from the connector on the underside of the plate through to the topside as shown. Also, feed the smaller red wire through the grommet to the underside.



64. Locate the factory fuel pump controller connector. Remove the small zip tie and release the connector cover. Cut the red wire with white racer roughly 2" from the connector and strip both ends of the wire. Using two heat-shrink butt connectors, connect the white wire from the AMS Fuel System Harness to the connector side of the red/white wire. Then connect the red wire from the AMS Fuel System Harness to the harness side of the red/white wire.

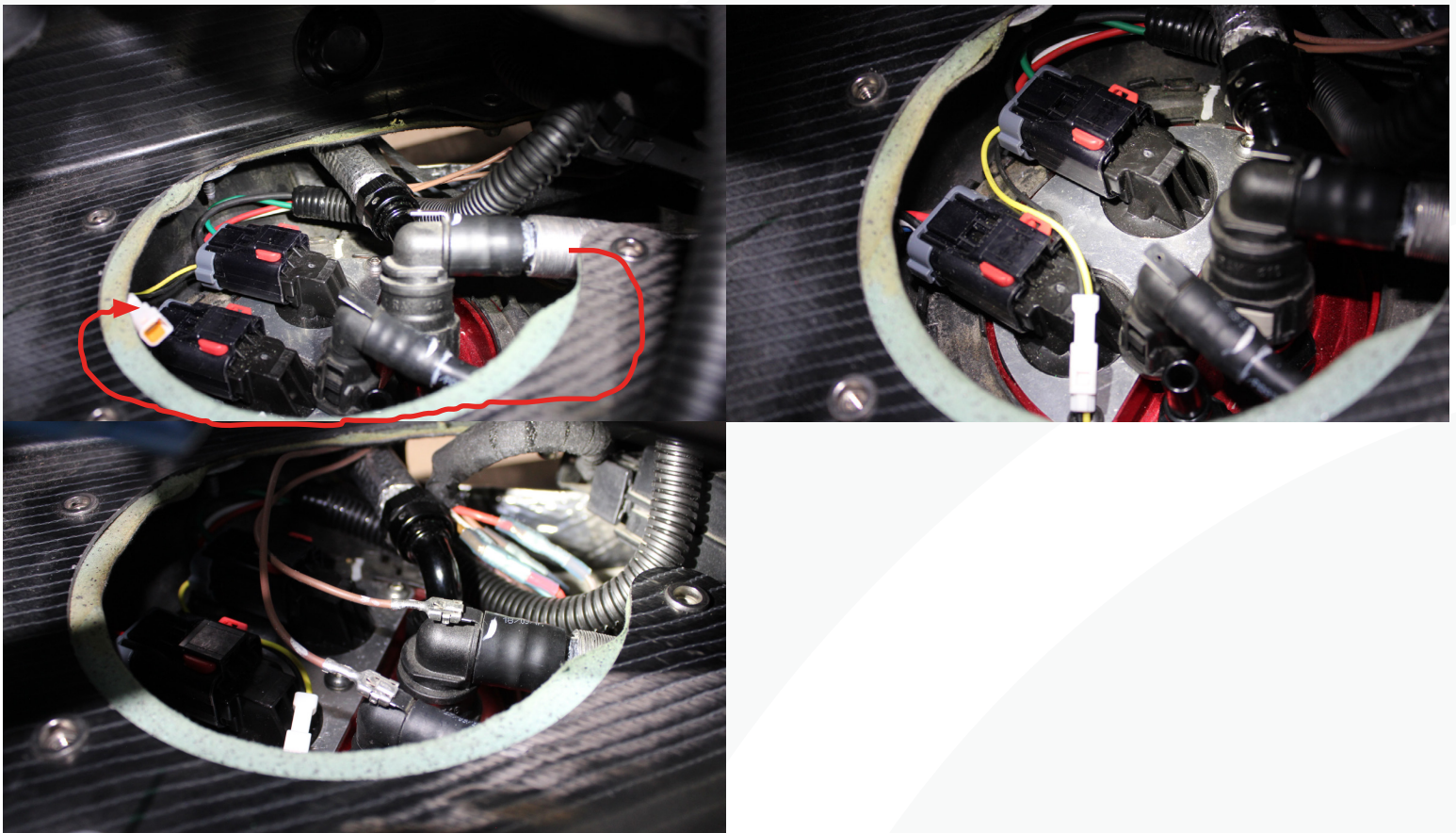


a. Heat shrink both butt connectors and use a small zip tie to secure the wires. Reinstall the connector cover and feed another zip tie through the cover to retain the wires.

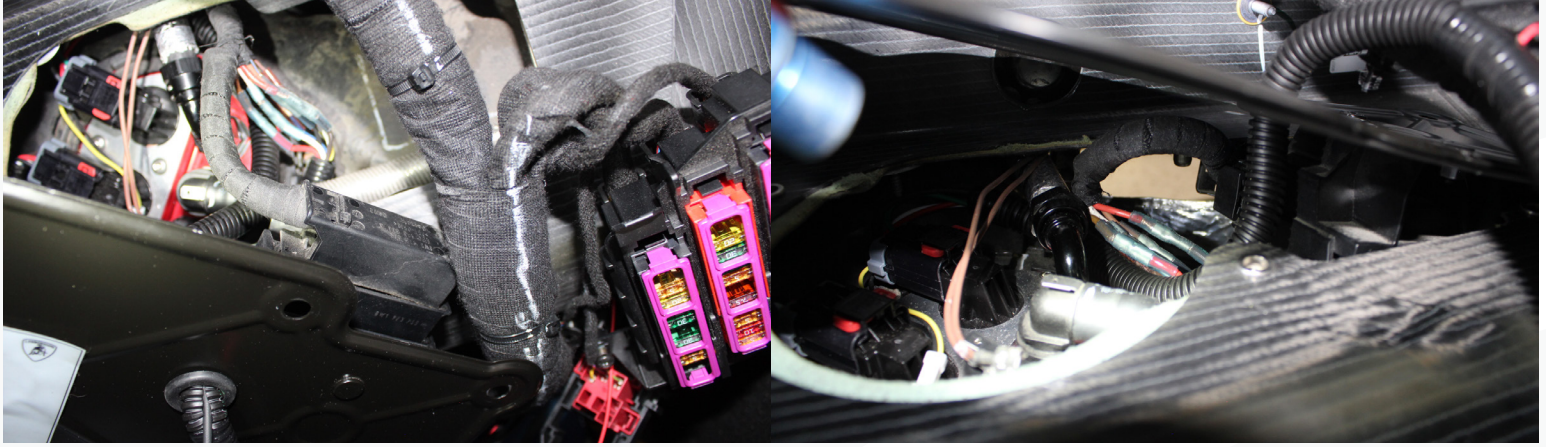


65. With the locations of the blue and white level sensor wires in mind, plug in the Alpha fuel system connector with the yellow wire into the further most top hat bulkhead connector. Route the other connector wired to the factory wiring underneath the factory quick connect lines and plug it into the remaining bulkhead connector (Indicated by red arrows). Then connect the white 2 pin connector from the two harnesses together. Now you can reconnect the factory quick connect lines and static ground wires.

Tech Note: Be sure the quick connect fittings are properly seated and cannot be removed with a simple tug.



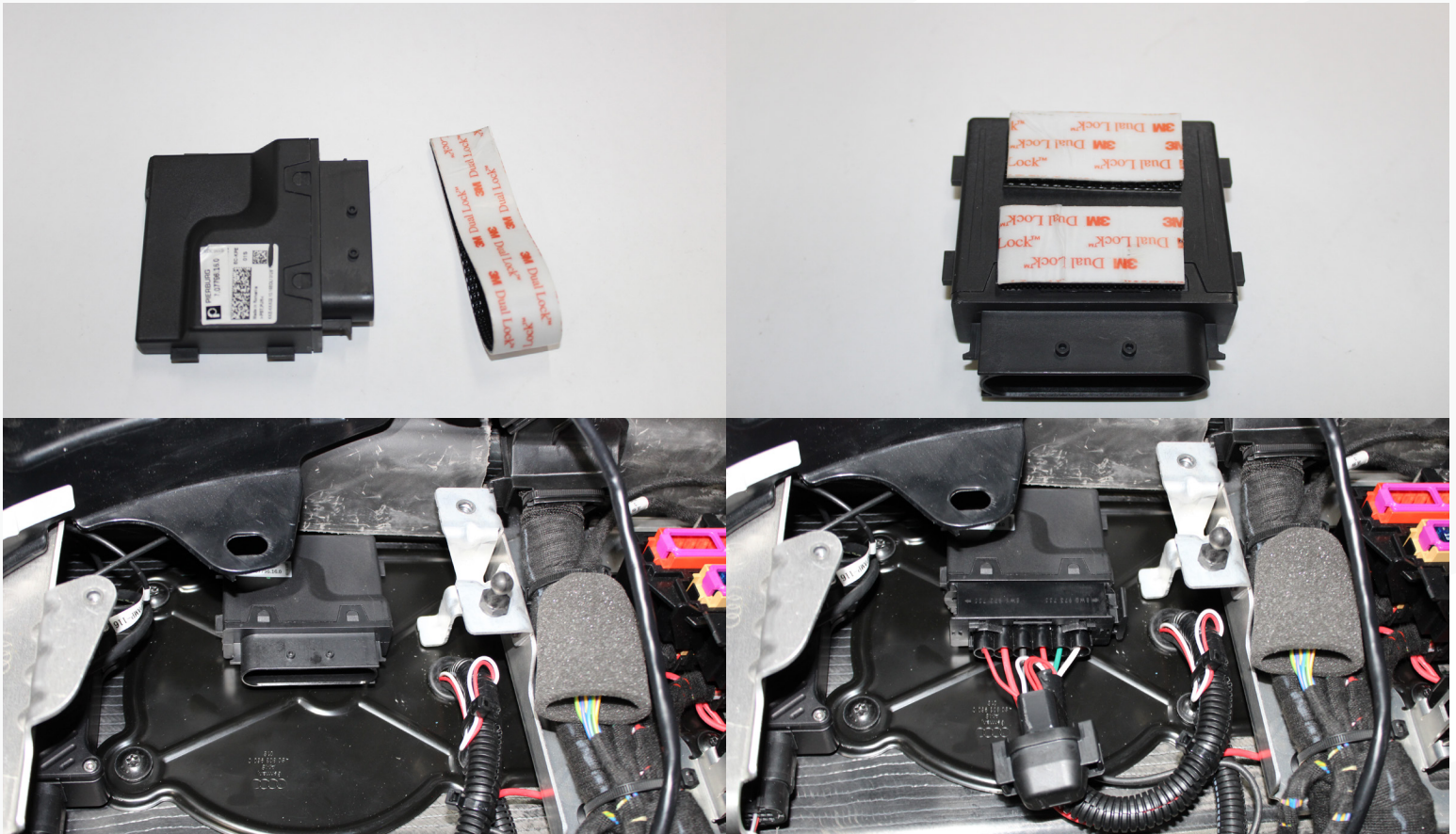
66. Now you can plug in the factory fuel pump controller and carefully place the access panel into position. The panel should fit nicely, be sure nothing is being pinched before attaching panel.



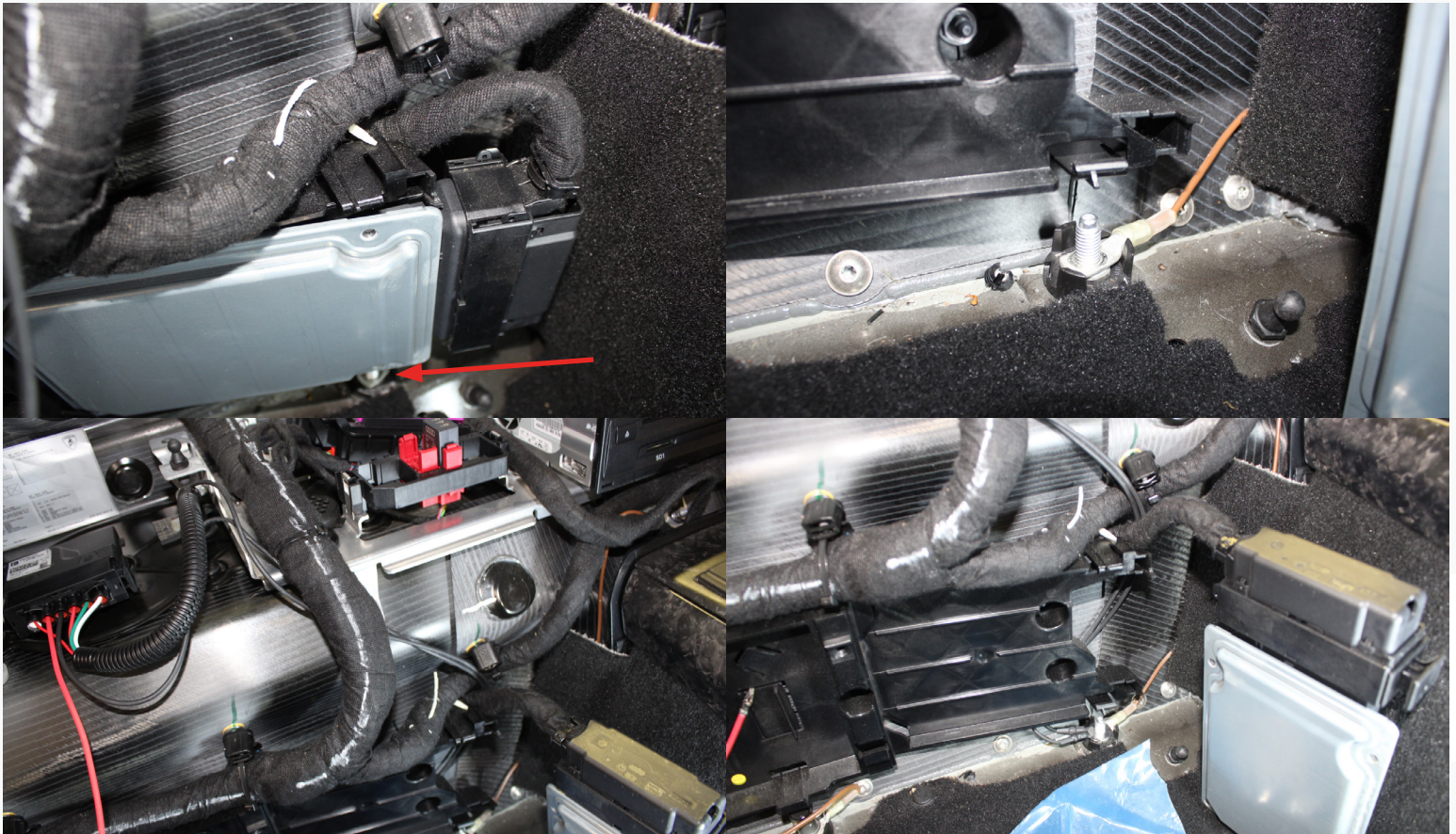
67. Reinstall both rear access panels, then reinstall the rear panel frame and components. If you opted to remove the fuse panel you can leave that out for now. Otherwise, if you did not, you will need to remove it for the next steps.



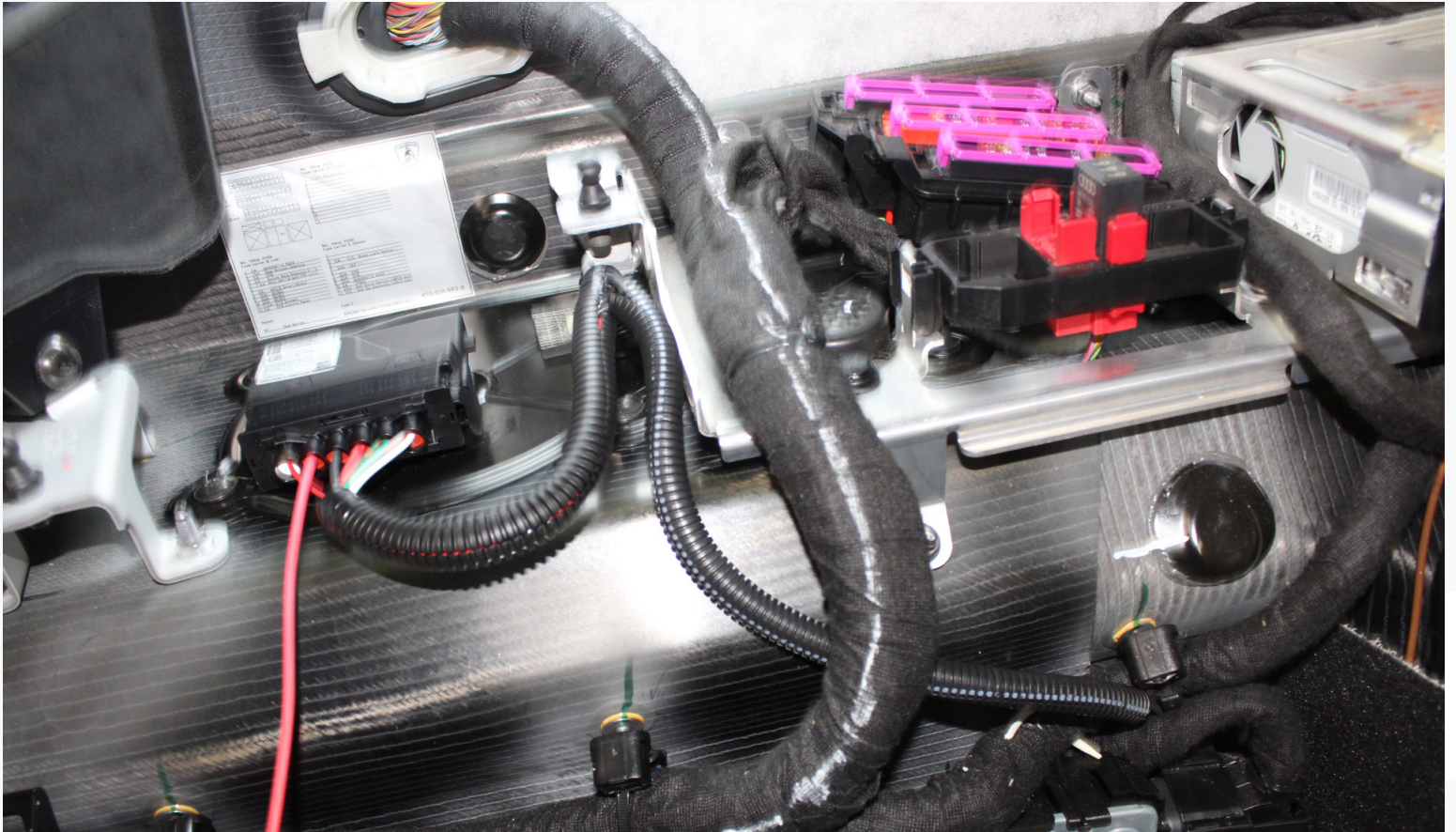
68. Locate the provided fuel pump controller and 3M dual lock. Cut the dual lock in half twice and place it on the back of the controller. Install the controller onto the access panel. We recommend moving the fuse reference sticker if applicable.



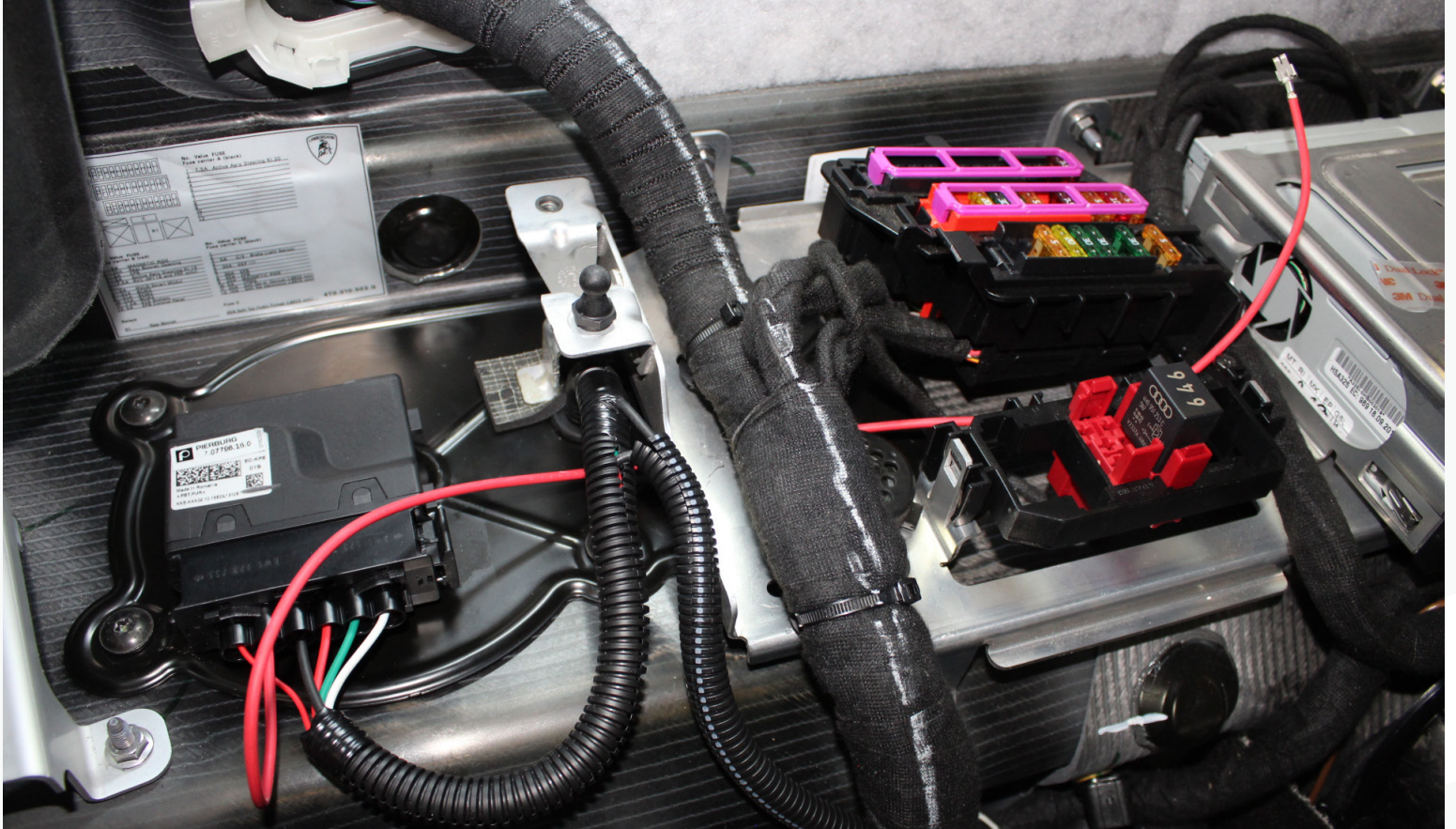
69. Remove the control unit (if applicable) to gain access to ground nut. Remove the nut and route both ground wires from the fuel system harness to the ground location and attach. If you removed the control unit you can reinstall it now.



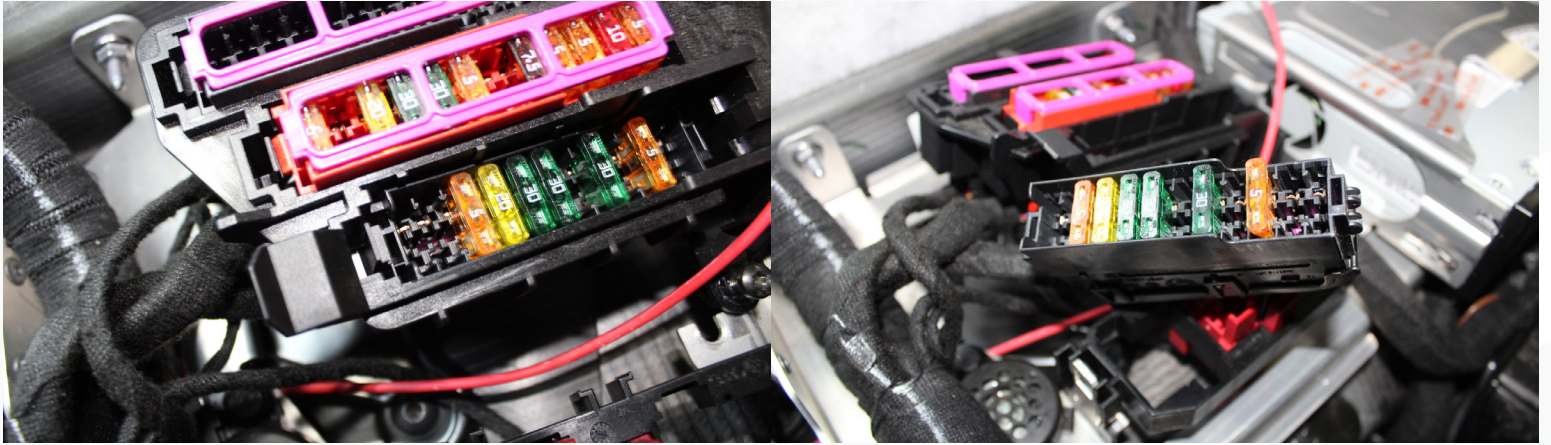
70. Install a short section of the split loom provided to the ground wires.



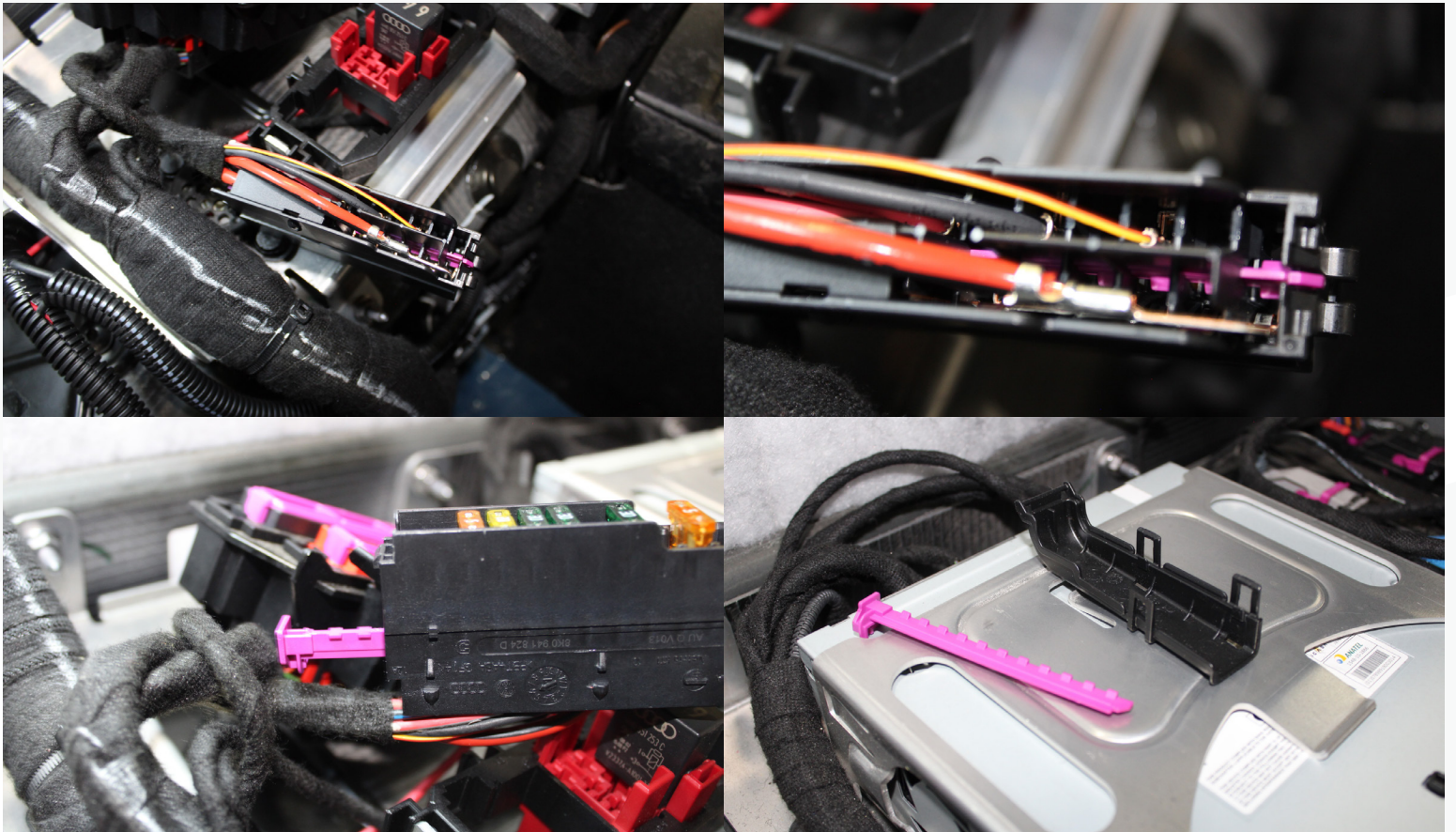
71. Route the remaining red wire towards the fuse panel underneath the aluminum bracket.



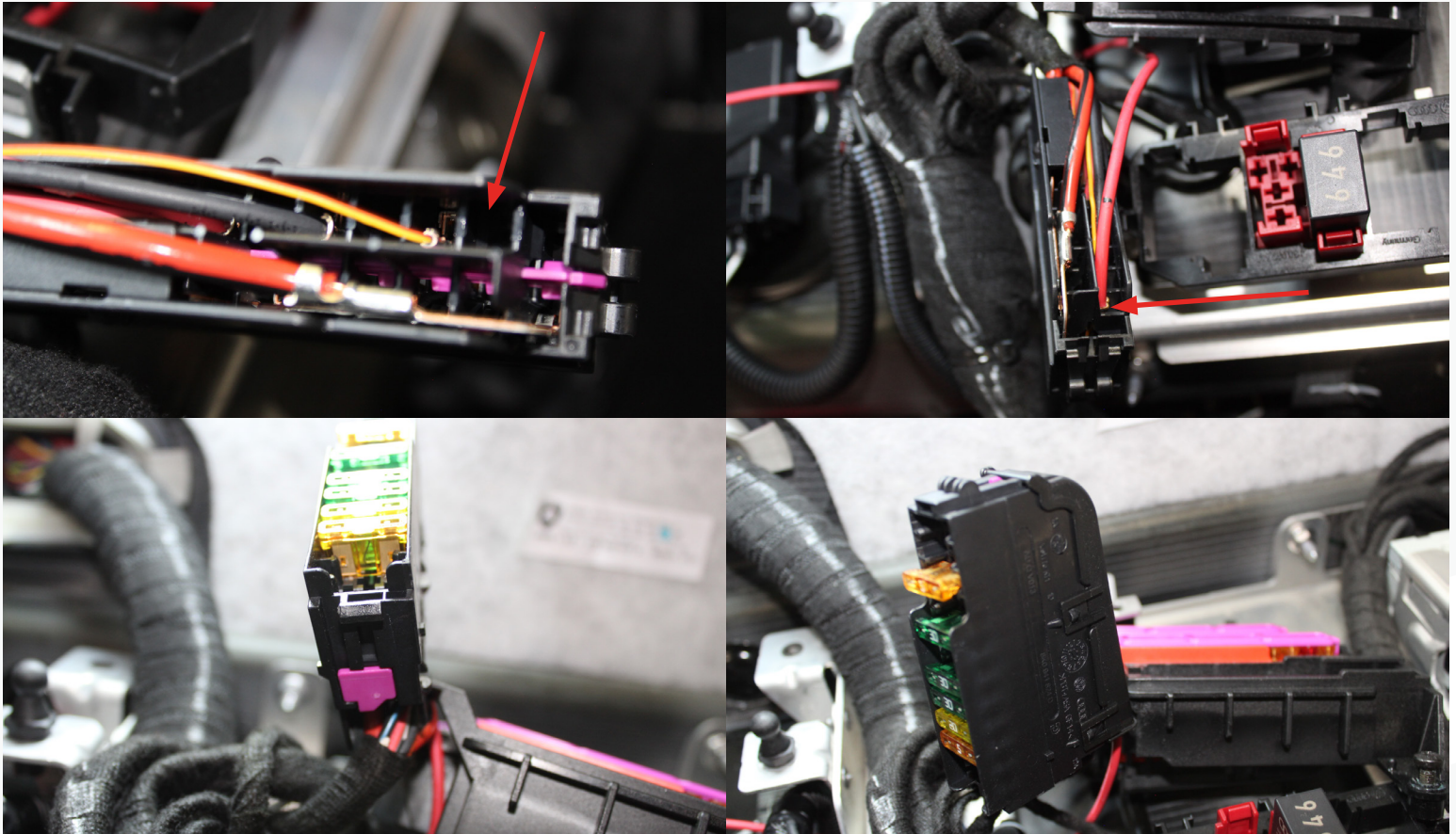
72. Remove the purple fuse cover. Release the tabs and drop the fuse rail out of the holder.



73. Flip the fuse rail over and remove the cover. Notice the purple terminal lock, this needs to be removed in order to insert the new pin. Using a small flat blade screw driver, you can push it out from the backside.



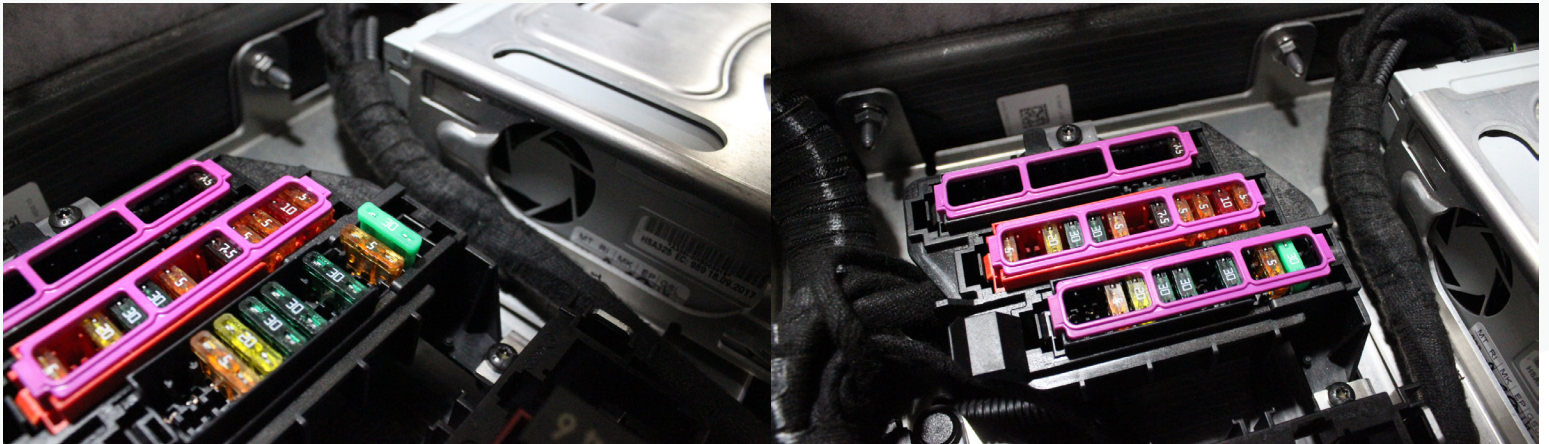
74. Insert the red wire in the location shown below. Reinstall the purple lock and rear cover.



75. Reinstall the fuse rail back into the fuse panel. Then reattach the fuse panel to the aluminum frame. Install the remaining split loom onto the red wire.



76. Locate the provided 30A fuse. Install it into the location where the wire was added. Reinstall the purple fuse cover.



77. The Alpha Dual Brushless In-tank installation is Complete. Thanks for purchasing the Alpha Dual Brushless Fuel System. Enjoy!

Reminder – Fuel system tuning will be required for proper operation.

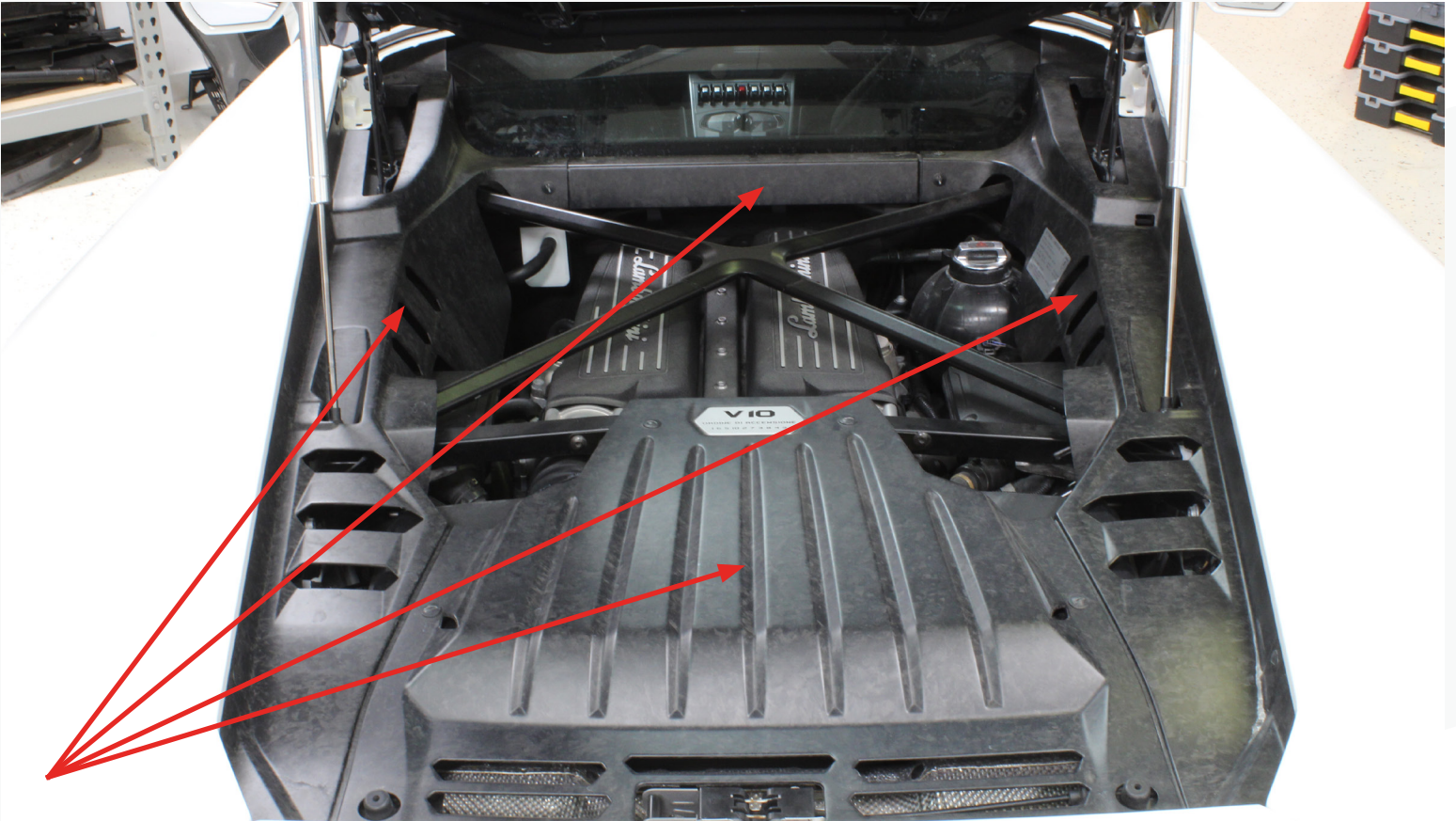
V10 HURACAN/R8 DUAL BRUSHLESS ENGINE BAY KIT ///

Note: Fuel system tuning will be required following installation of the Alpha Fuel System.

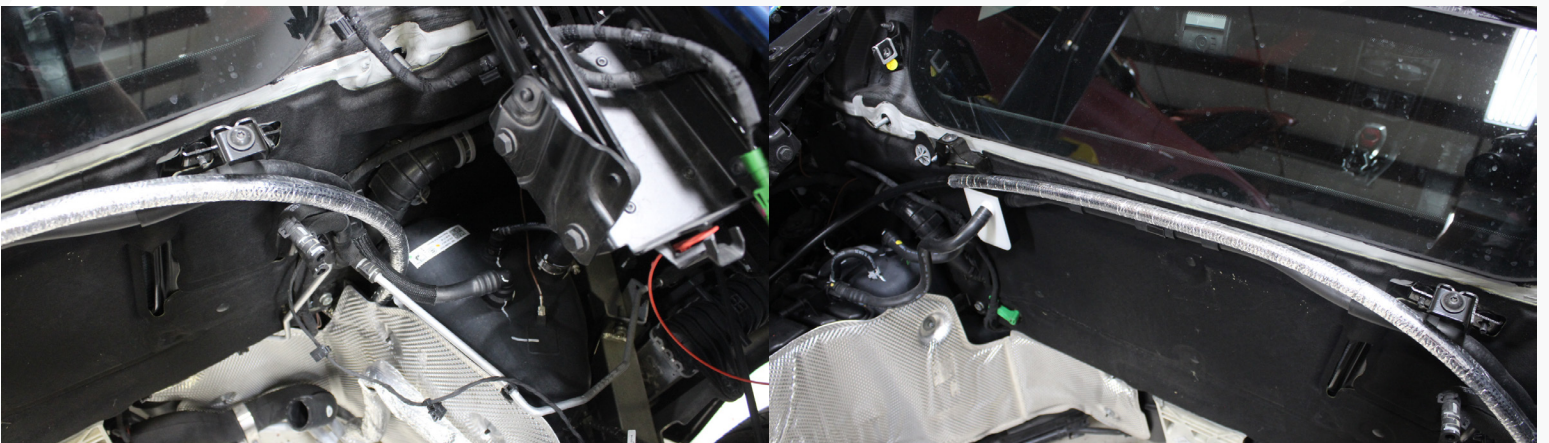
Specialty tools: Drill, 3/8 drill bit and Rivet nut tool.

DISASSEMBLY ///

1. Remove the engine bay panels shown below, Huracan and R8 are similar.



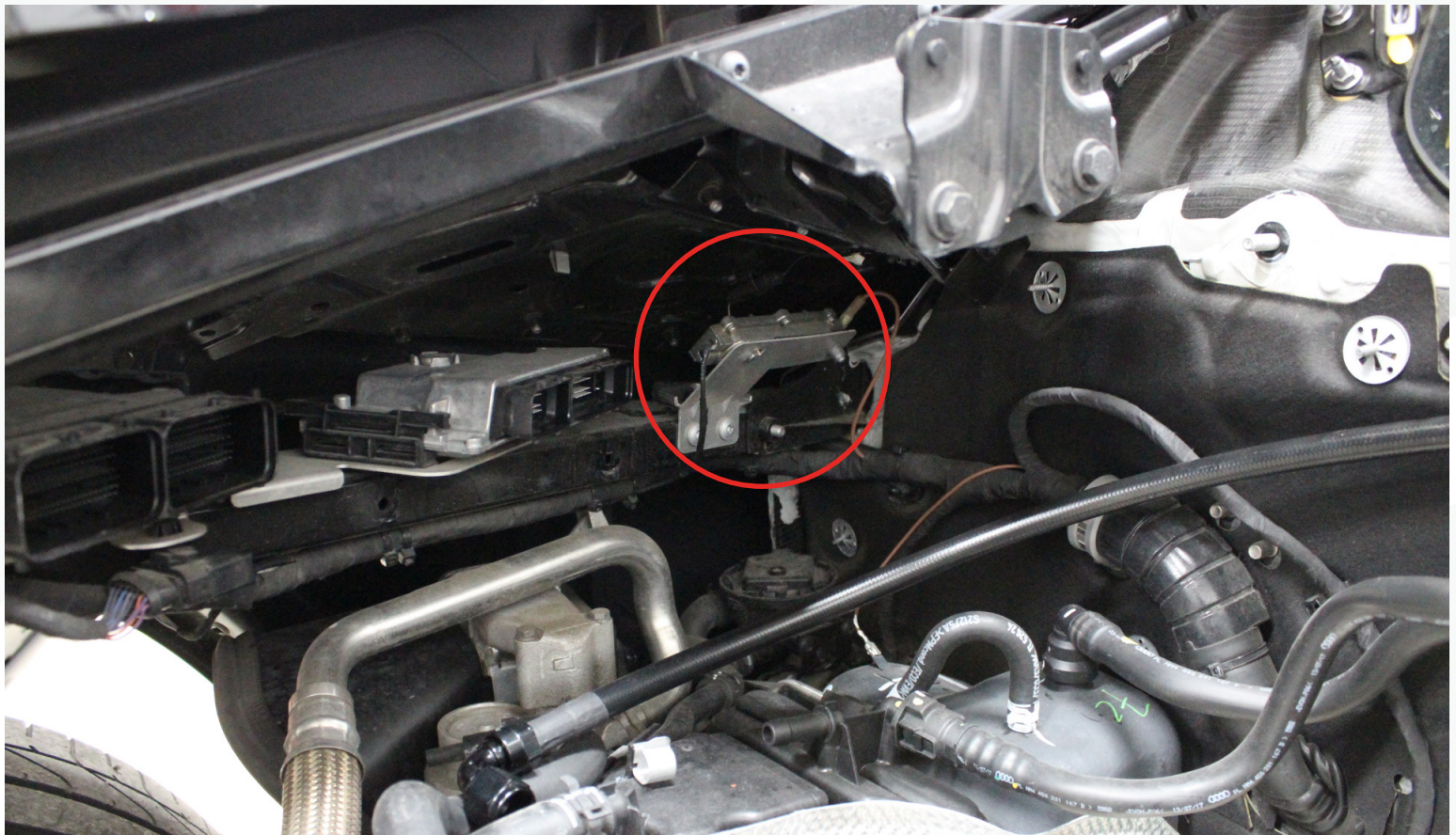
2. Route the hose installed in step 53 of the Alpha Dual Brushless in-tank instructions up behind the fuel tank heat shield past the coolant reservoir and to the driver's side engine bay area as show below.



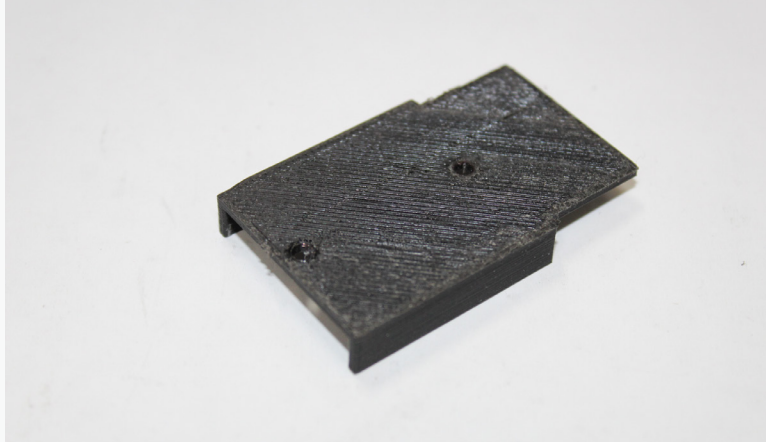
3. Locate the bracket assembly, fuel filter and hardware. Assemble it as shown.



4. The following step depends on what the vehicle came equipped with. Vehicles with the antenna mounted on the brace, remove the bolts holding the antenna then skip to step 7. If it does not, continue with step 5



5. With no antenna present, use the 3D printed jig to mark the holes for the rivet nuts.



6. Center punch the marks and drill the holes with a pilot bit and finish with a 10mm or equivalent drill bit. Then install the rivet nuts with a rivet nut tool.



7. Using the two m6 bolts and washers, install the bracket on frame. If the vehicle had the antenna mounted there, mount both brackets on the frame sandwiching the new bracket as shown below.



8. Locate the other remaining bracket and isolators. Install the isolators onto the bracket.



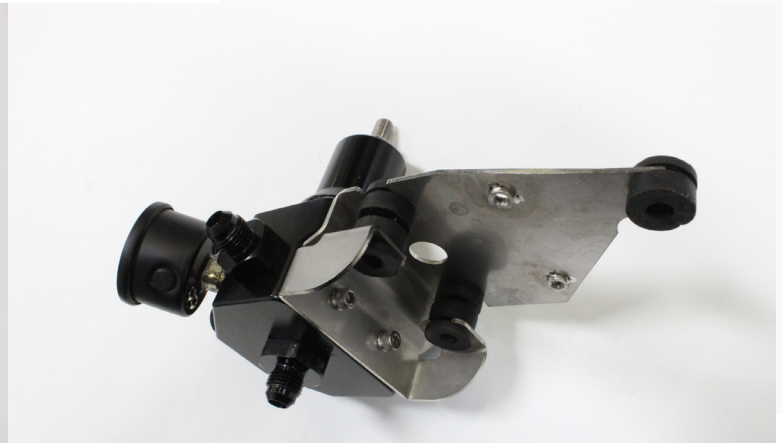
9. Setup the provided fuel pressure regulator with the fittings & gauge in the kit as shown below. Install the #10 orb to #8 fitting in the middle as shown in photo 2.



10. Install the barb fitting with thread paste.

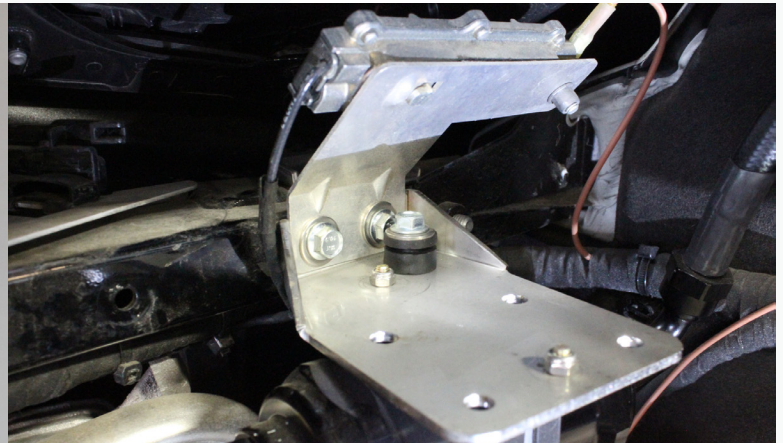


11. Mount the FPR to the bracket using the provided bolts and lock washers.

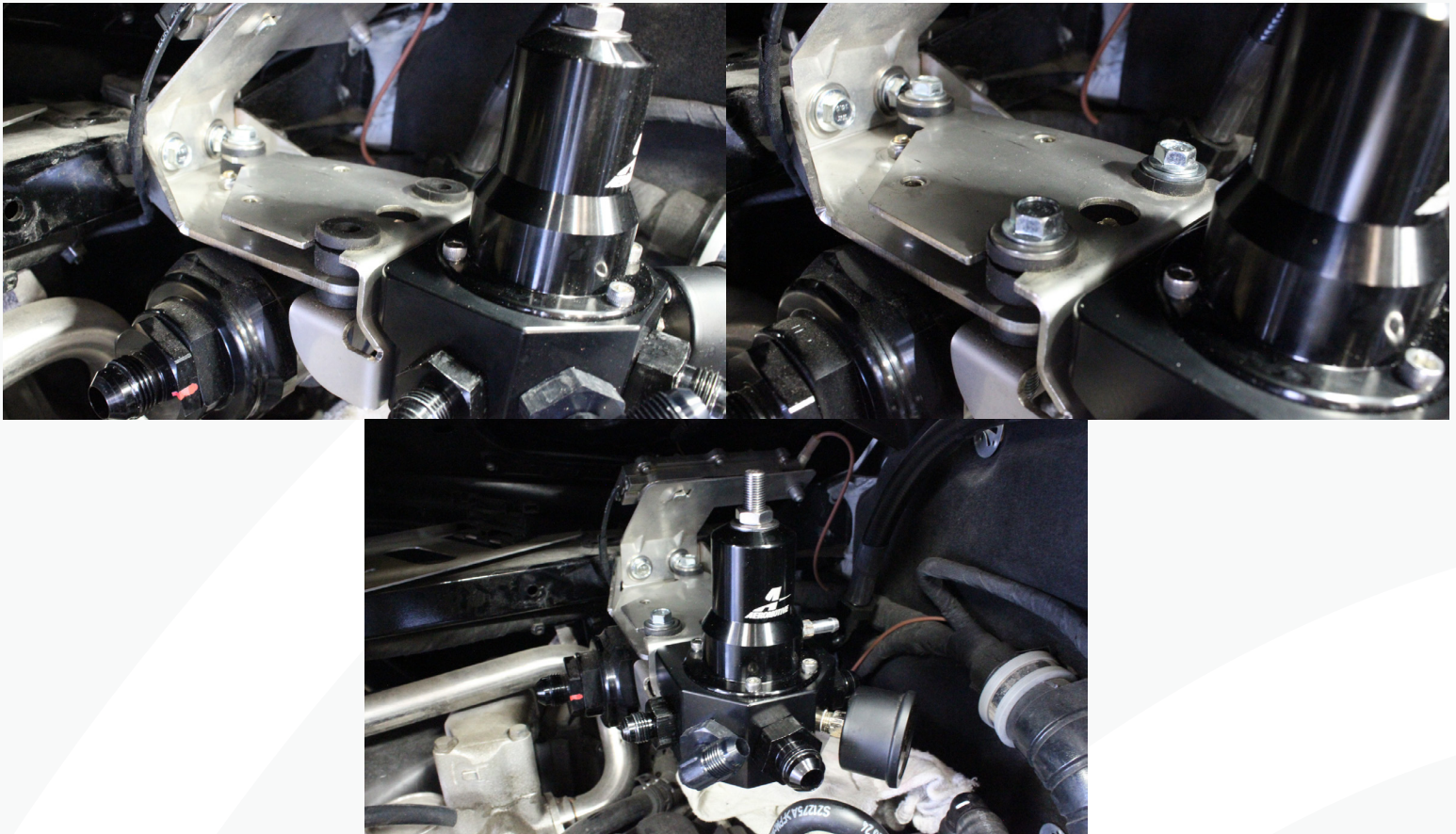


INSTALLATION **///**

12. Install the short bolt with rubber bushing and washers onto the bracket. Just snug the bolt as to not over squish the rubber bushing.



13. Slide the FPR and bracket onto the mounted bracket in the car. Snug bolts to apply light pressure on isolators. Do not crush.



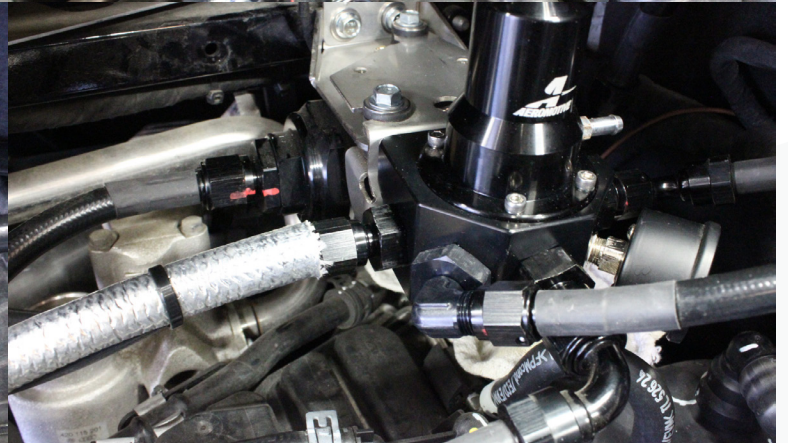
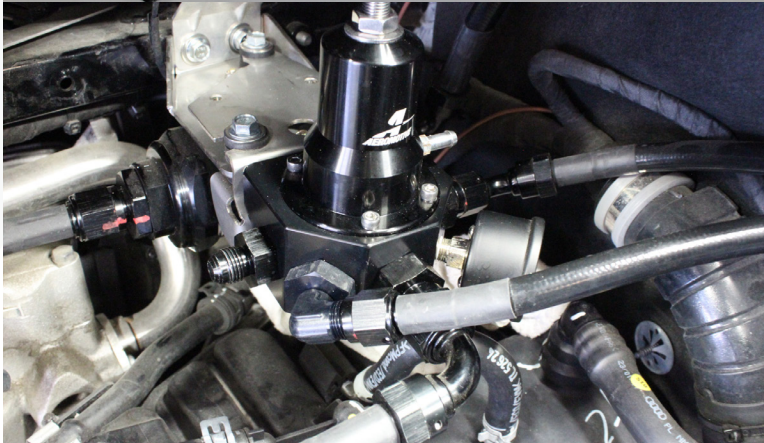
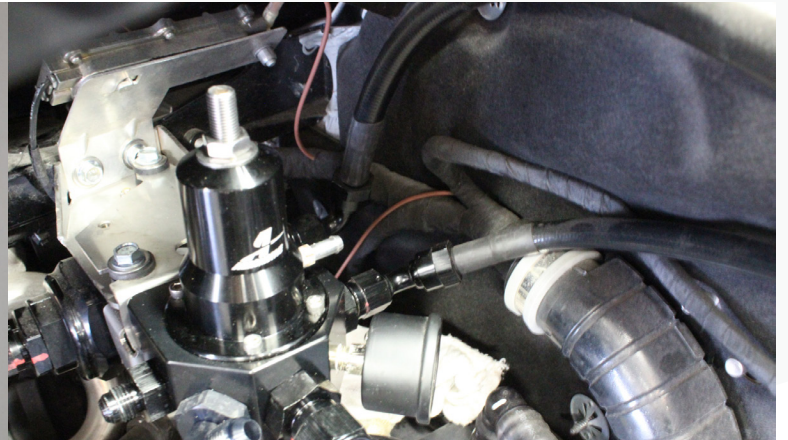
14. Connect the fuel feed line from step 2 to the fuel filter.



15. Locate the fuel filter to regulator line. It has #8 90 degree fitting and a straight fitting at either end.



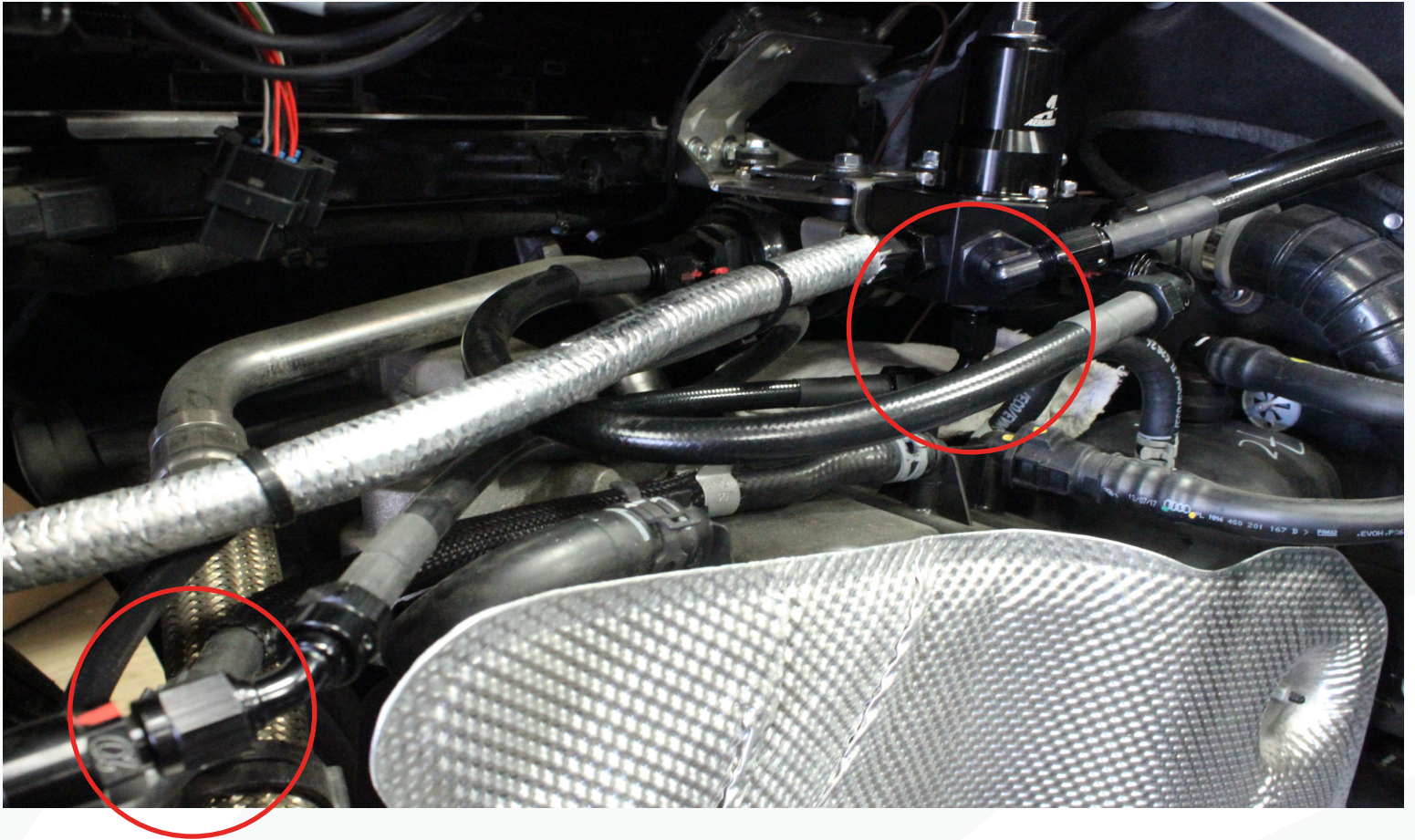
16. Locate the three fuel lines. The longest one goes from the further most #6 port to the passenger fuel rail. The next line (middle) is the next fitting on the regulator and connects to the driver's side rail. The last line (heat wrapped) connects to the last port and the fitting on the intake manifold.



17. Locate the quick connect fitting and then install it in place of the factory fitting on the driver side of the engine bay shown below.



18. For standard Fuel system (non-flex fuel), connect the remaining line to the regulator and the fitting from the previous step.



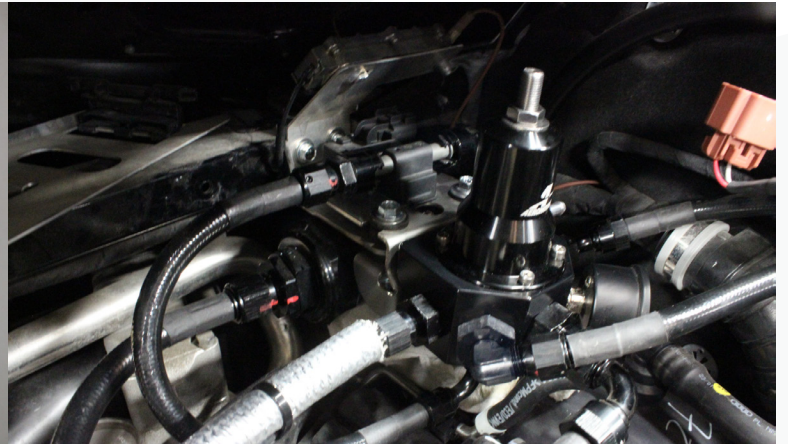
19. For flex fuel, locate the flex fuel kit add on. Install the quick connect fittings onto the flex fuel sensor.



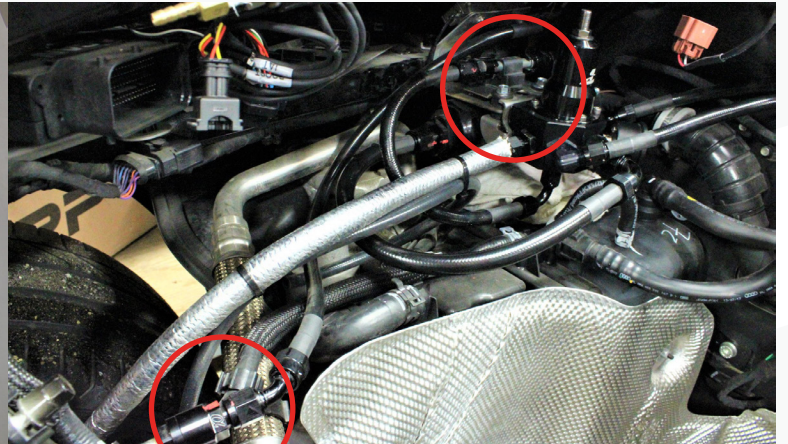
20. Using the small bracket and hardware, mount the flex fuel sensor on the same FPR bracket from previous steps.



21. Locate the shorter of the two lines and hook it to the bottom of the FPR and rear most connection on the flex fuel sensor.



22. Install the longer of the two lines from the flex fuel connection over to the quick connect fitting installed in step 17.



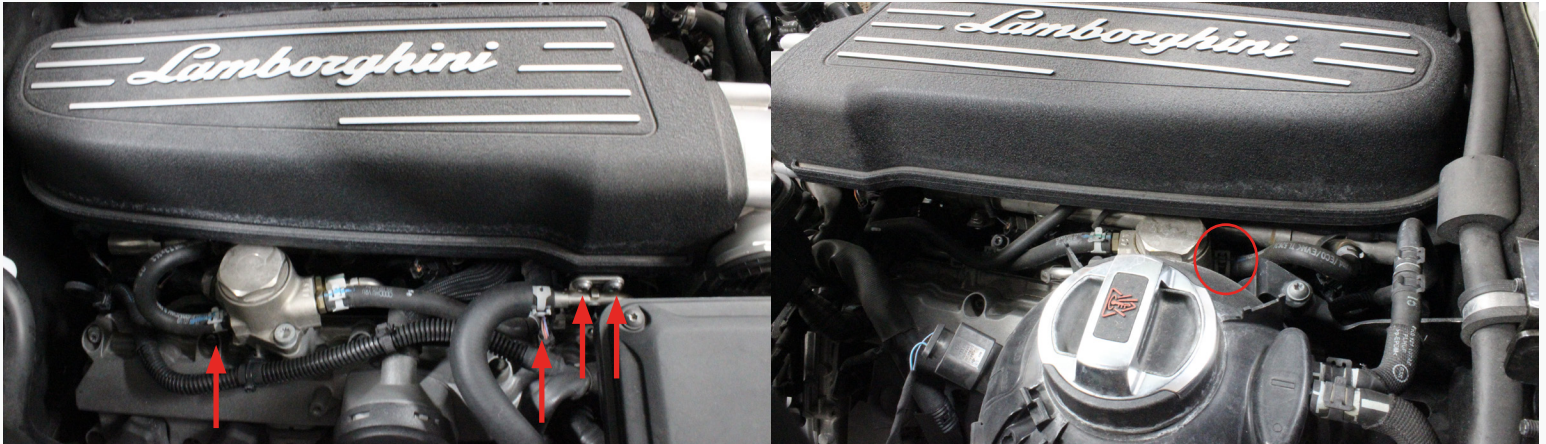
ALPHA FUEL RAIL KIT INSTALLATION

REMOVING THE STOCK INTAKE MANIFOLD

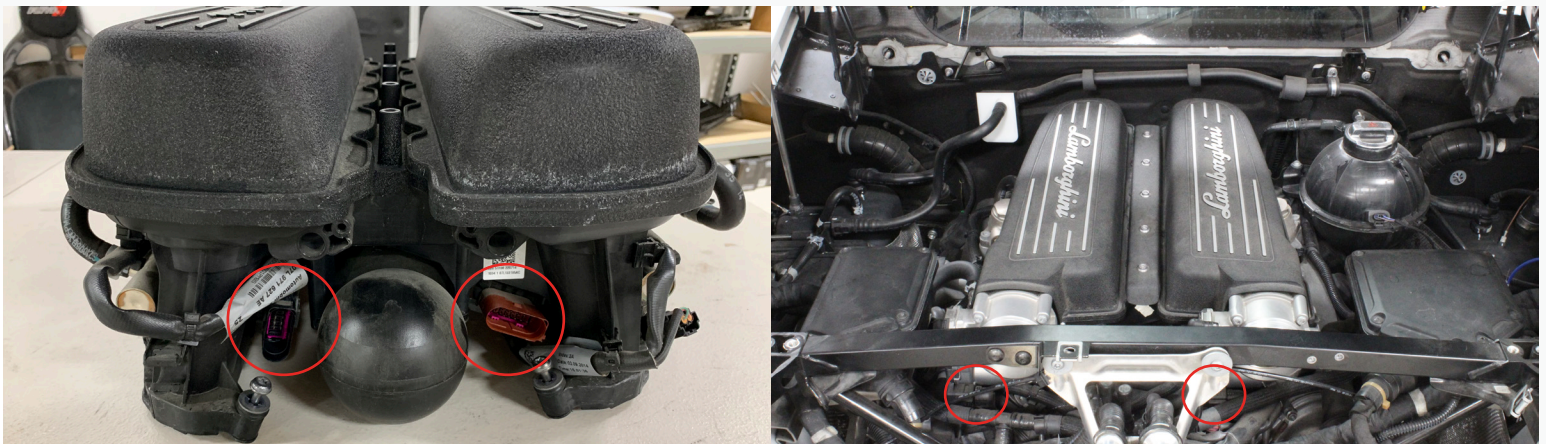
Note: The Alpha Fuel Rail Kit is designed to work with both the stock manifold and billet manifold, then paired with our Alpha Fuel System as well as other configurations using the optional fittings that are included in the Fuel Rail Kit.

1. Disconnect fuel line on both sides of the manifold and remove bolts holding the hose bracket. Once the bracket is removed you will notice a pressure sensor, disconnect this also.

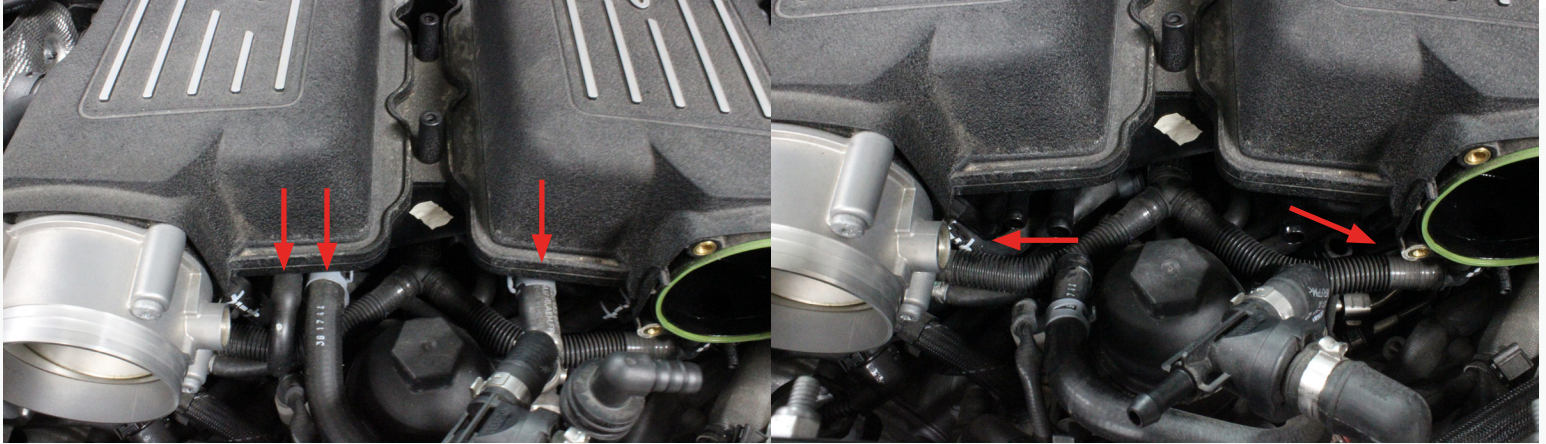
NOTE: On the passenger side it may be easier to move the coolant reservoir aside to access the fuel line clamp.



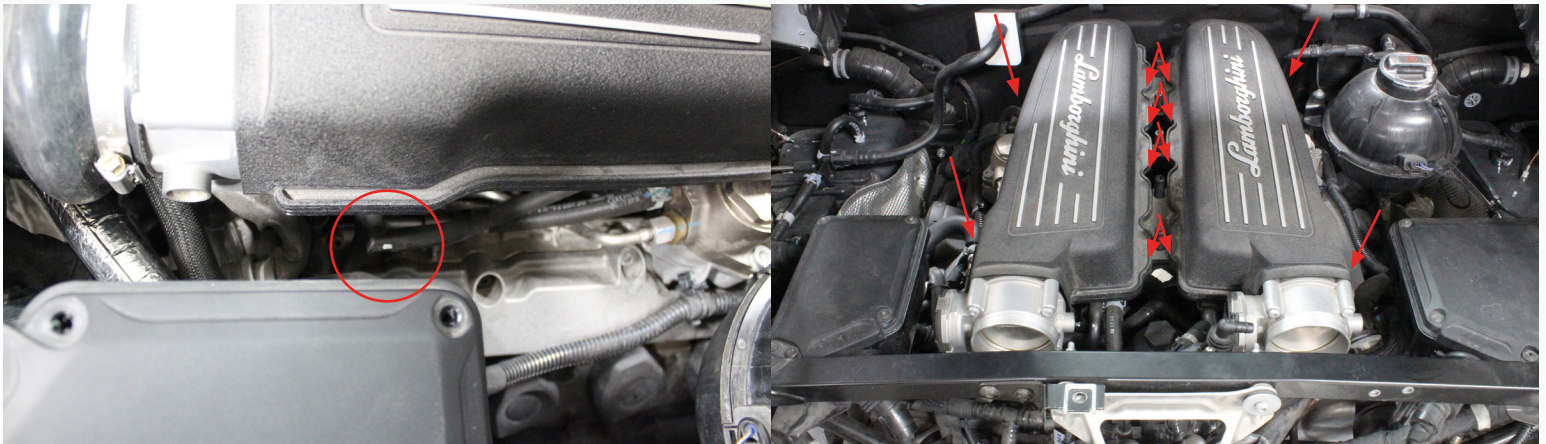
2. Disconnect the 2 connectors on the backside of the manifold near the firewall and the two throttle body connectors. We have shown a manifold off the car to help locate exactly where they are.



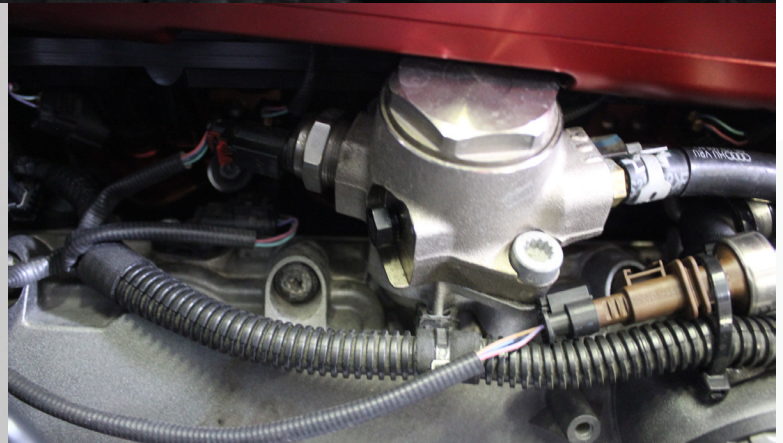
3. Disconnect the five hoses between the throttle bodies. Once you remove the first three you will see two more behind them. **NOTE:** It may be easier to access the clamps by removing the passenger throttle body.



4. Disconnect the 90° vacuum connection below the passenger side fuse box. Then remove the 5 bolts holding on the center intake cover and remove the twelve T30 intake manifold mounting bolts. Remove the manifold.



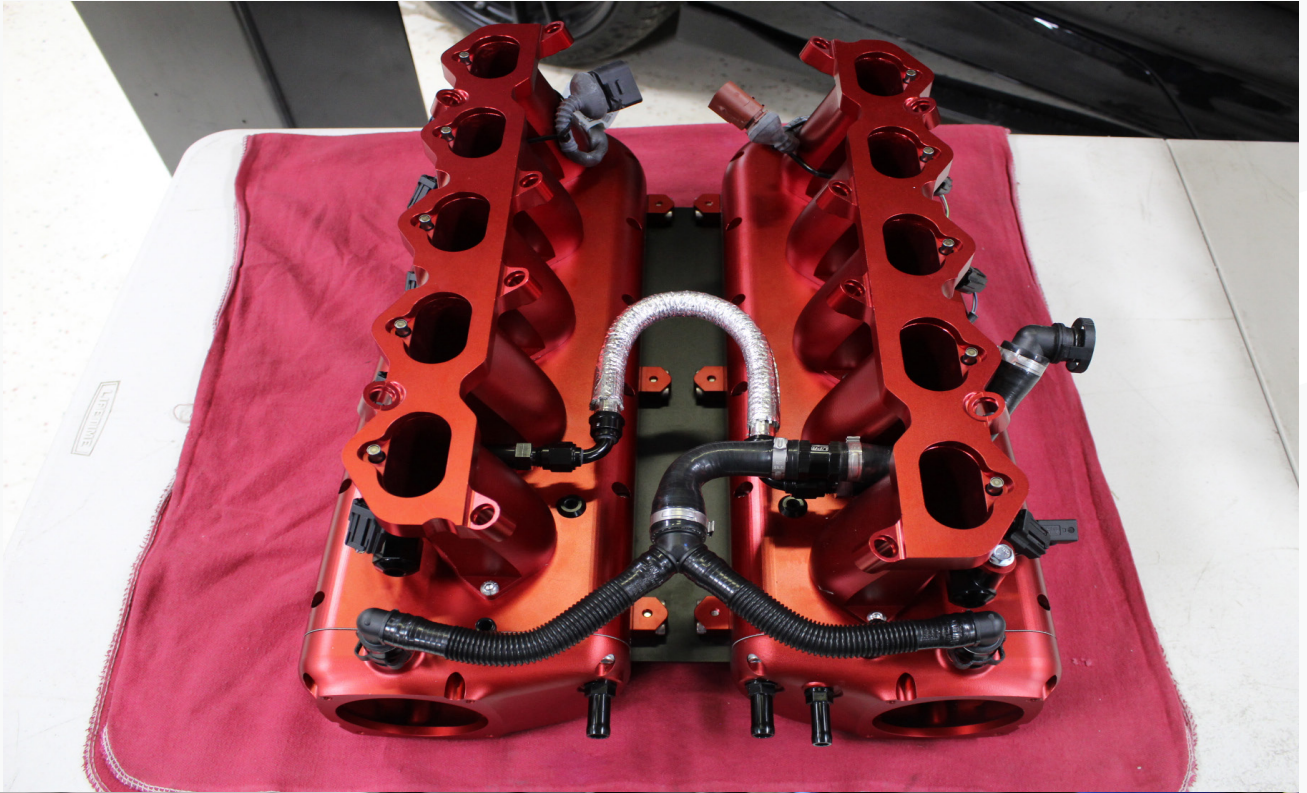
5. Locate the fitting on the high-pressure fuel pumps. Remove the fittings and install the alpha plugs included in the fuel rail kit.



6. To setup the fuel rails using our system. Locate the fittings shown in the photo below and install them into the locations show below. The two extended #6 male fittings should be installed once the rails are installed to the manifold. Be sure to lubricate the O-rings before installing.



7. Install the injectors into either the stock manifold or Alpha Billet Manifold then install the rails onto the injectors. Fasten the rails using the provided hardware. Then install the extended #6 male fittings. See photos below.



8. If installing the Alpha twin turbo kit or Alpha Billet Manifold for the first time, please refer to the appropriate instructions before reinstalling the manifold. Once the manifold is installed hook up the three fuel lines to the rails.

9. Enjoy your Alpha Fuel System! Don't forget tuning!