

# Z1 VHR FUEL RETURN KIT - STOCK RAILS INSTALLATION MANUAL



This Installation Manual is intended for the following models:	
2009-2020	Nissan 370Z
2008-2015	Infiniti G37/Q60 Coupe
2009-2015	Infiniti G37/Q40 Sedan

## PROLOGUE:

Study these instructions completely before proceeding to assembly. The installer must have a thorough knowledge of automotive systems operation. If unfamiliar with any of the concepts outlined in this instruction, we recommend the installation be completed by a qualified professional.

## WARNING!

Extreme caution should be taken when performing maintenance or performance upgrades to your vehicle. Please observe and abide by any Warning or Caution labels placed on the various components and tools used when servicing your vehicle. If you have any questions regarding installation or the various components included with the Z1 Motorsports VHR Fuel Return Kit, consult with a Professional Mechanic or contact Z1 Motorsports for more information.

## **PARTS INCLUDED:**

Item	Quantity	Description
1	1	Optional: Assembled Top Hat Kit
2	2	Optional: Z1 Top Hat Rods
3	6	Optional: M5 x 6mm Socket Head Bolts – Top Hat to Gas Tank
4	1	Optional: Red Loctite 0.5ml
5	1	Optional: Fuel Pump Bulk Head Connector and Terminal Set
6	24"	Submersible Fuel Hose
7	4	Screw Clamp
8	1	Fuel Pressure Regulator Delete - Main Body
9	1	Fuel Pressure Regulator Delete - Retainer
10	2	M3 x 20mm Screw - Regular Delete
11	1	Z1 Fuel Pressure Regulator
12	1	Fuel Pressure Regulator Bracket
13	2	M6 Nylon Lock Nut – Regulator Bracket to Firewall
14	1	Z1 In-Line External Fuel Filter
15	1	Fuel Filter Mounting Clamp
16	1	Fuel Filter Mounting Bracket
17	2	M5 x 12mm Screw - Fuel Filter Bracket to Clamp
18	1	M5 x 16mm Screw - Fuel Filter Clamp
19	1	Z1 Fuel Return Line Kit Stock Rails - 4 Lines
20	1	5/16" Quick Disconnect Threaded Adapter 6AN Male
21	1	3/8" Quick Disconnect Threaded adapter 6AN Male
22	1	Foam Sleeve Insulation
23	1	6AN ORB Slim Plug w/ O-Ring
24	2	6AN ORB Fitting w/ O-Ring
25	1	0-100psi 1/8" NPT Mini Fuel Pressure Gauge
26	1	90* 1/8" NPT Female to NPT Male
27	1	VACUUM TUBE - 5.0 MM - BLACK - 1 Inch
28	1	3/8 – 1/4 Reduction Tee Fitting
29	2	Small Spring Clamp
30	2	Large Spring Clamp
31	2	Bonded Sealing Washer
32	1	Cushion Loop P-Clamp
33	1	Selected Fuel Pump (with relay kit depending on pump size)
34	6	Selected Fuel Injectors
35	1	OE Fuel Pulse Damper

## TOOLS REQUIRED:

- Hydraulic Jack
- (2) 2-Ton (or greater) Jack Stands
- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- 2.5mm Allen/Hex Key
- 4mm Allen/Hex Key
- Flat Head Screwdriver
- Torque Wrench
- Channel Lock Pliers
- File
- Snips
- Dremel or Body Saw
- Wire Strippers
- Wire Crimp Tool

## SAFETY REQUIREMENTS:

- Always wear safety glasses and any necessary protective garments. If using any fluids, chemicals, or solvents, a respirator is recommended.
- Always turn the ignition to the OFF position and disconnect the NEGATIVE battery terminal.
- Always use properly rated jack stands when working under your vehicle.
- Always keep limbs and parts away from moving drivetrain parts.
- Only operate drivetrain in safe space and well-ventilated areas.
- **NO FIRES, SPARKS, OR SMOKING.**
- **WORK IN A WELL VENTILATED AREA.**

## BEFORE YOU BEGIN:

Remove contents from the Z1 Motorsports VHR Fuel Return Kit and verify that ALL necessary hardware is present.

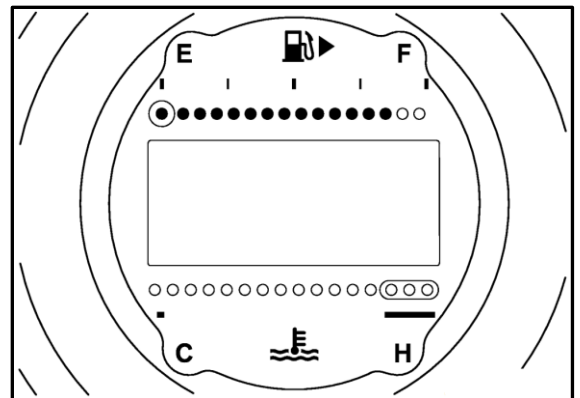
The full Z1 VHR Fuel Return Kit is made up of several different Z1 products. The procedures below will be broken up into various sections specific to each product. Depending on the configuration of products you chose for your fuel system, it may require jumping around to different sections of this guide. Many of the components and modifications required will depend on what options you choose, pay attention to the bold and underlined notes regarding specific steps. It is highly recommended to read through this entire manual to get an idea of what needs to be done before proceeding with the work.

All provided fittings are AN, ORB, or include sealing washers. DO NOT add your own thread sealant or PTFE sealant tape unless instructed. Aluminum fittings like AN lines and the ones included in this kit do not need to be torqued crazy high like many steel bolts. Over torquing AN fittings will create a leak.

## PROCEDURE:

### **Fuel Pump Upgrade and Top Hat Kit:**

1. Place the transmission in Park position (or in Reverse gear if equipped with a manual transmission). Apply the parking brake.
2. Locate proper jacking points on vehicle's chassis (refer to vehicle's Owner Manual). Raise and support vehicle using jack & jack stands.
3. It is recommended to install this kit with the gas tank NOT full. Nissan recommends at least 2 dots on the gas gauge to be unlit, see picture at right.

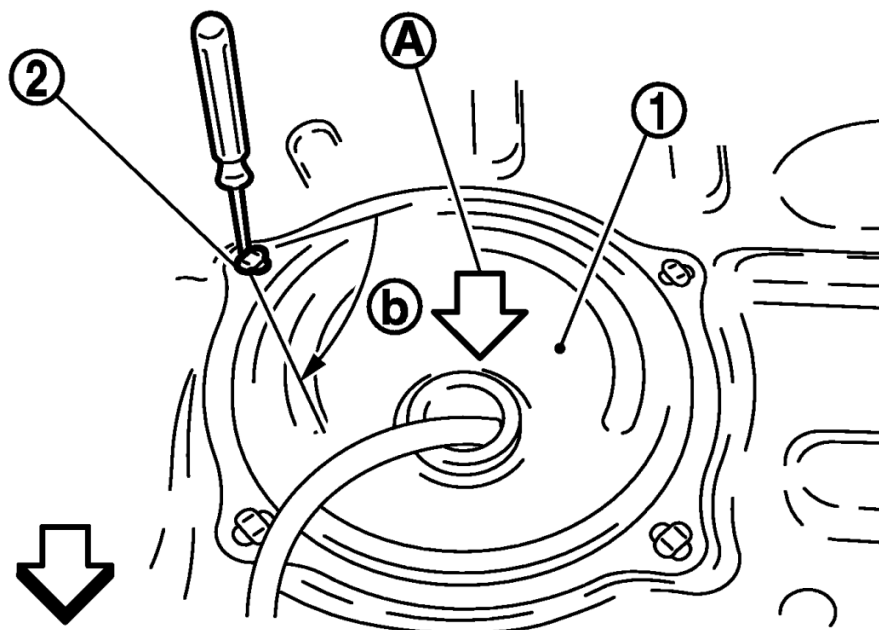
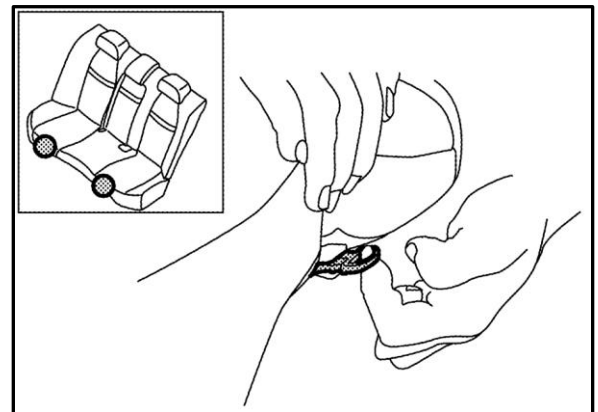


4. 370Z Owners: Remove the carpeted shelf floor behind the passenger seat (shown below).



G37 Coupe Owners: Lift up on the rear seat cushion to remove it. Then remove the floor carpet. Then remove the metal cover by rotating the clips 90 degrees clockwise

G37 Sedan Owners: There will be hook levers to pull to release it. Pull on the levers and at the same time pull upwards on the front of the seat cushion (shown in the diagram at right) to unseat the clips.

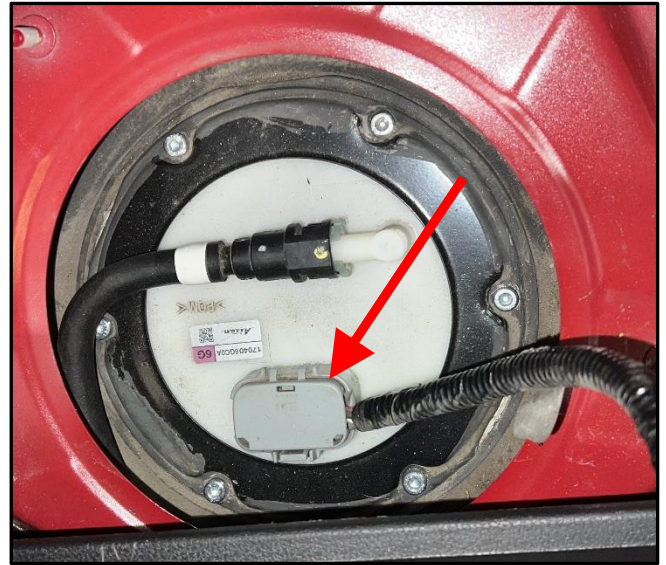


5. 370Z Owners: Remove the nuts securing the inspection cover to the chassis (shown below). Then remove the cover and set aside. The wiring harness will remain attached through the grommet, just rotate the cover out of the way.



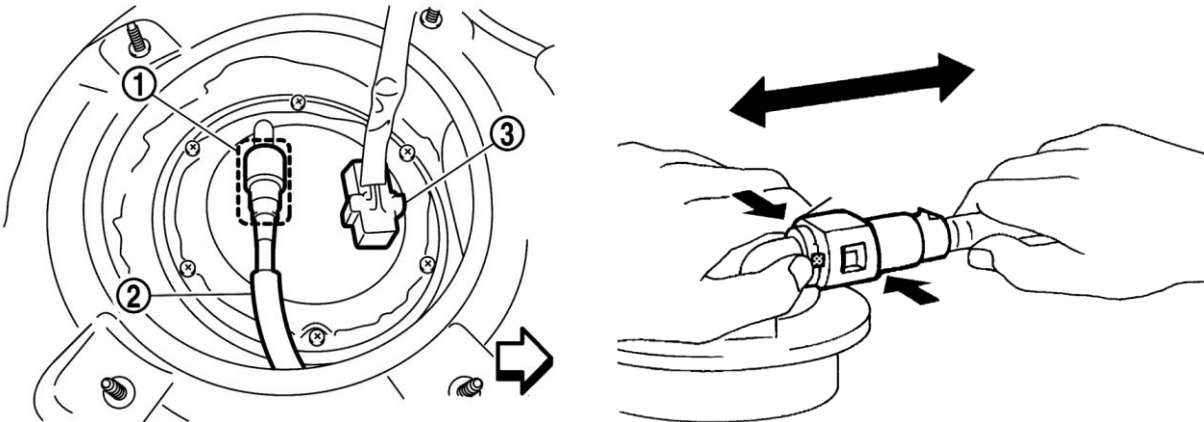
6. It is now time to release the fuel system pressure. There are a couple ways to do this:
- a. If you have access to CONSULT:
    - i. Turn ignition switch ON.
    - ii. Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode with CONSULT.
    - iii. Start engine.
    - iv. Wait for engine to run out of fuel and stall.
    - v. Crank engine over two or three times to release remaining fuel pressure.
    - vi. Turn ignition switch OFF.

- b. If you do not have access to CONSULT:
  - i. Disconnect the electrical connector on the top of the fuel tank (shown at right).
  - ii. Start engine.
  - iii. Wait for engine to run out of fuel and stall.
  - iv. Crank engine over two or three times to release remaining fuel pressure.
  - v. Turn ignition switch OFF.



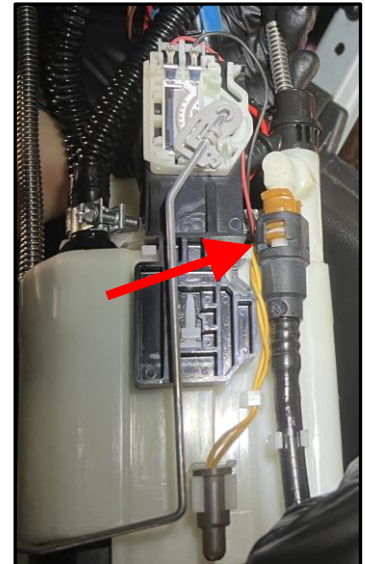
7. Remove the gas filler cap to release any pressure left in the tank.
8. Assure the ignition is in the OFF position and disconnect the NEGATIVE battery terminal.
9. It is recommended to clean the top of the OE fuel top hat and surrounding areas of the tank to prevent dirt or contaminants from falling in when you remove it.

10. Place a rag around the OE fuel supply hose (2) on the OE fuel top hat, and then disconnect the hose by pressing the sides of the retaining clip (1) in and pulling the hose away. If the clip comes off with the hose that is fine, it can be put back on later.



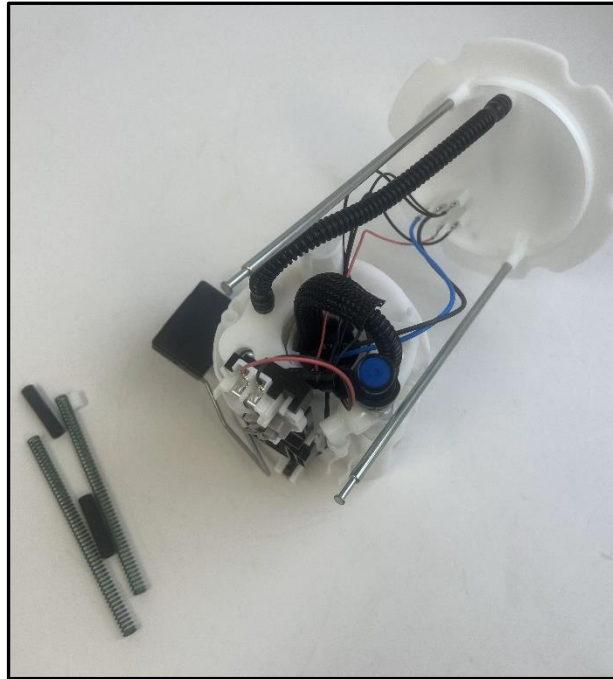
11. Using an 8mm socket, remove the (6) M5 bolts securing the OE fuel top hat to the fuel tank.
12. Carefully lift upwards to begin removing the fuel pump basket assembly. There is an internal siphon hose connected to the basket that needs to be removed. Once the basket is about halfway out, disconnect the siphon hose similar to how the fuel supply hose was disconnected in step #9 (shown at right).

Note: The image at right shows a modified 370Z basket assembly that is fully removed from the car to better show the siphon hose. It is recommended to disconnect the siphon hose prior to fully removing the basket assembly.



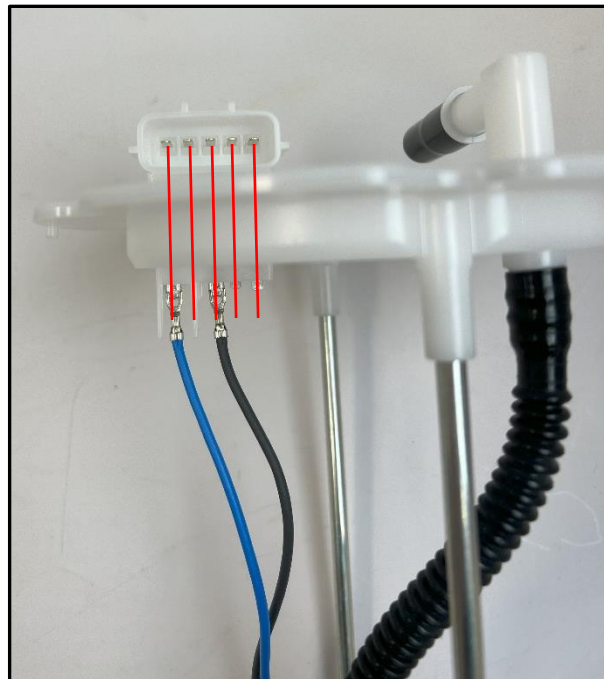
13. Once the siphon hose is disconnected, fully remove the fuel pump basket assembly. Be careful not to bend or damage the floater on its way out.
14. Depending on how much fuel was in your tank, the basket assembly will likely be full of fuel, drain any fuel into an appropriate container.
15. Move to a clean work table to begin disassembly of the OE fuel basket.

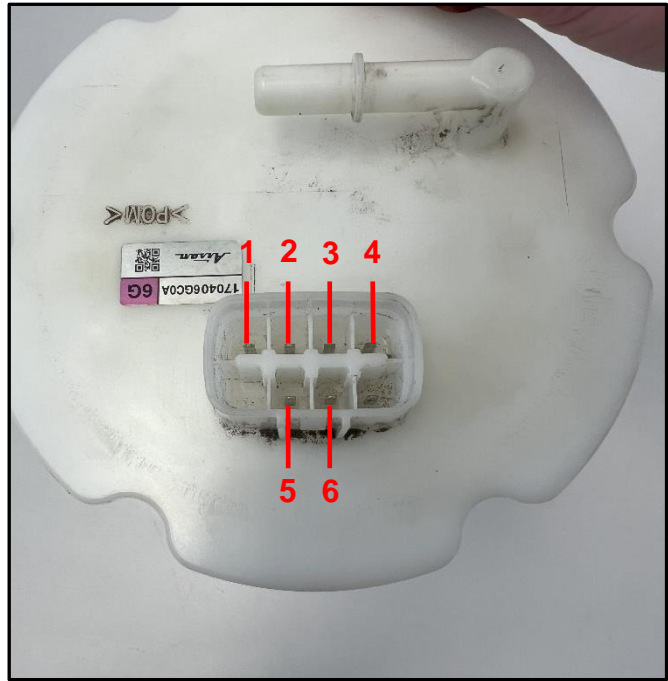
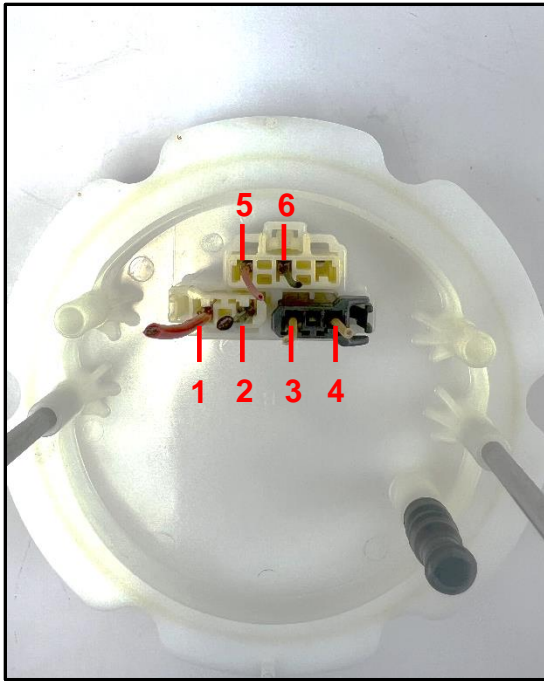
16. Compress the top hat/springs and using a pick or flathead screwdriver, remove the locking retainer on one of the top hat rods (shown below).
17. Once the locking collar is removed, separate the top hat from the lower basket assembly (shown below).



18. There are 2 different styles of the VHR top hat and they have different style connectors on both the top and underside of the top hat, early model years up to 2015 (production date before 02/2015) and late model years 2015+ (produced after 02/2015). Pictured below is the early style, pictured on the next page is the late style.

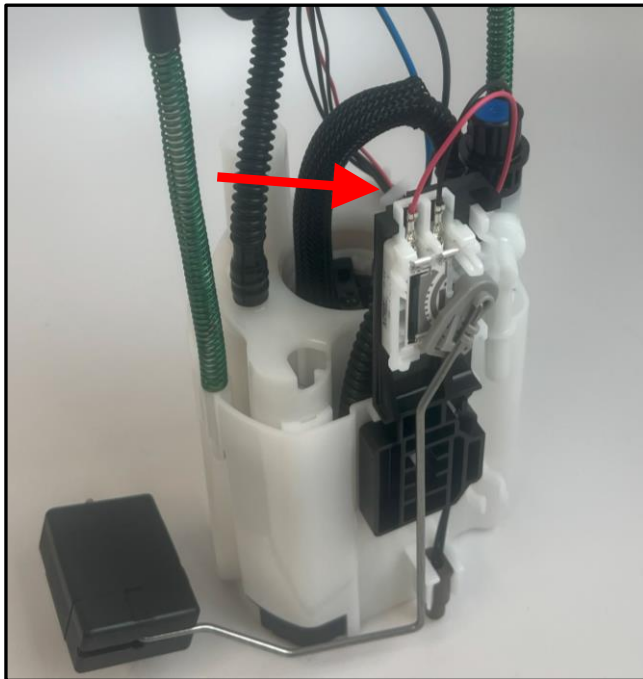
Take a picture or note where all the connectors on the underside of the top hat go to AND their position in the connector. For example, in our image/test vehicle below, the thick blue wire goes to the positive side of the fuel pump and is in the top left corner of the connector on the underside, and far left on the top side. The colors and orientation changed over the years. It would be best to use tape or a label of some kind to denote what each wire connects to, but a picture or note at a minimum will work.





**Steps # 19-21 are only for customers who purchased a Z1 Top Hat Kit. If you just purchased an upgraded fuel pump or the return system without a top hat, skip to step # 22.**

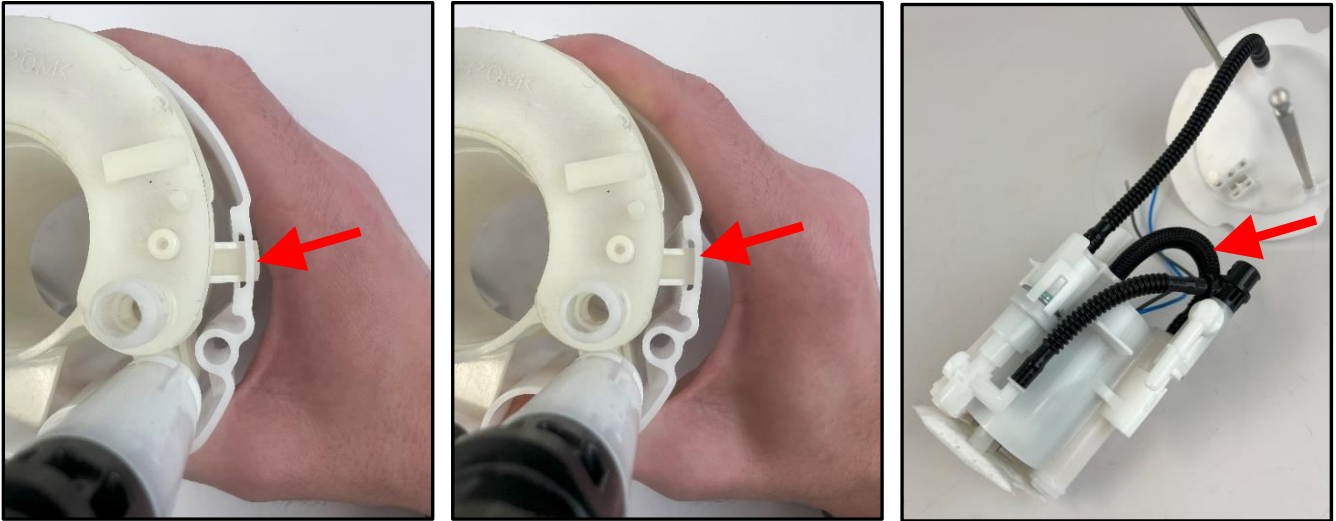
19. Once you have taken a picture/note/labeled the wires and are confident in where each one goes to, cut all (6) wires on the underside of the top hat as close to the connectors/terminals as possible.
20. Remove the wires for the fuel level sensor and fuel temperature sensor from the clip on the top of the fuel pump housing (shown with arrow below).
21. Cut the black corrugated fuel tube connecting the top hat to the lower inner fuel pump housing (fuel filter), the OEM top hat should now be fully disconnected from the lower basket assembly.



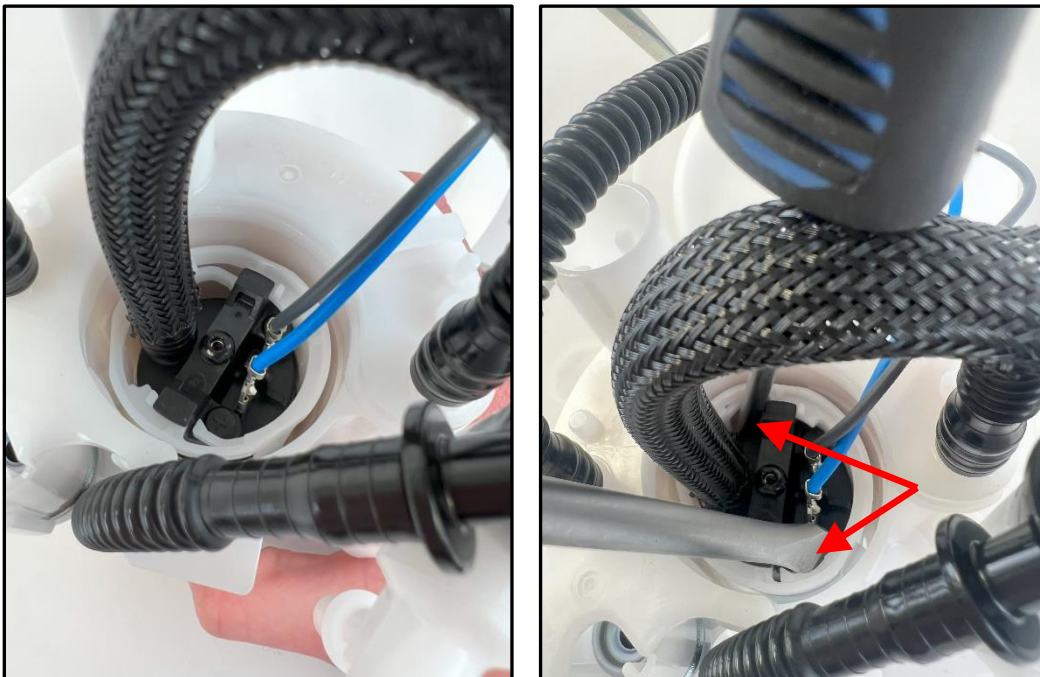


**Steps # 22-24 are only for customers who purchased a return system AND upgraded fuel pump but without a Z1 Top Hat.**

22. Disconnect or cut the (2) wires on the OE fuel pump as close to the connector/terminals at the fuel pump end.
23. Disconnect but DO NOT cut the fuel level sensor and temp sensor wires from the OE top hat.
24. Remove the fuel level sensor and fuel temp sensor from the lower basket.
25. Remove the fuel pump housing from the lower basket that contains the fuel pump by squeezing/wiggling the lower basket to unclip it. Once unclipped, firmly pull up to remove the fuel pump housing.



26. Cut the black corrugated fuel tube connecting the OE fuel pump to the OE fuel filter (shown with arrow in picture above at right). Then fully remove the corrugated tubes from the top of the fuel filter by cutting down the side of the remaining tube with a razor.
27. Using (2) screwdrivers or picks, unclip the fuel pump and rotate it counterclockwise to remove it from the housing.

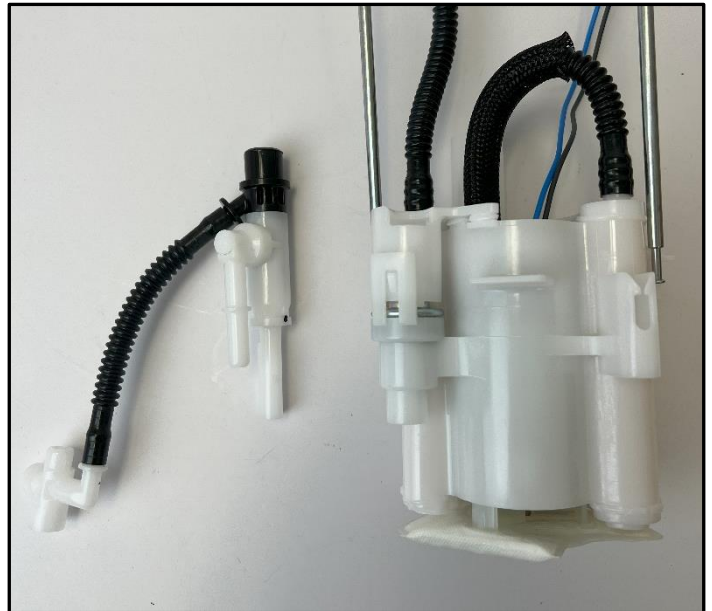


28. You should now be left with just the fuel pump housing/fuel filter and a few components of the venturi system.

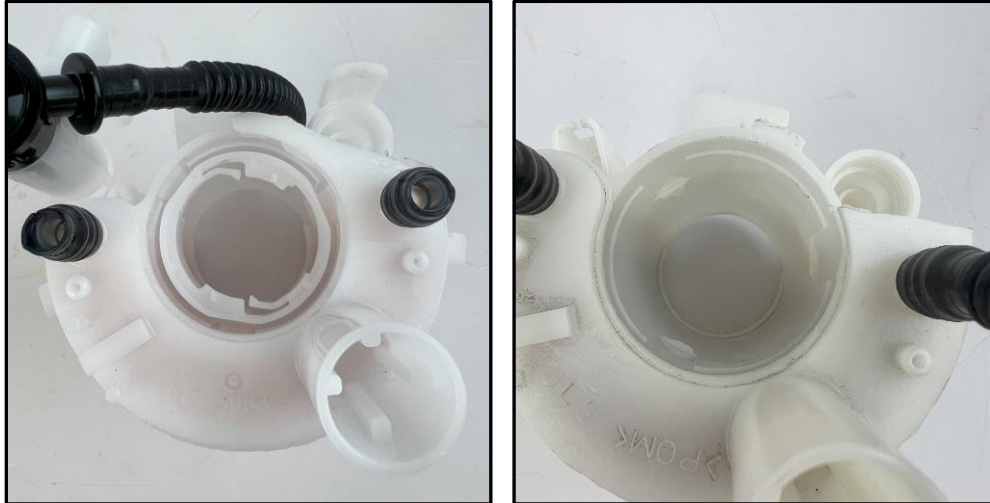


29. Rotate and pull down on the corrugated black hose connecting to the bottom of the OE fuel pressure regulator.

30. Using a pick, separate the plastic clip and pull up to remove the valve and hose (as shown below).

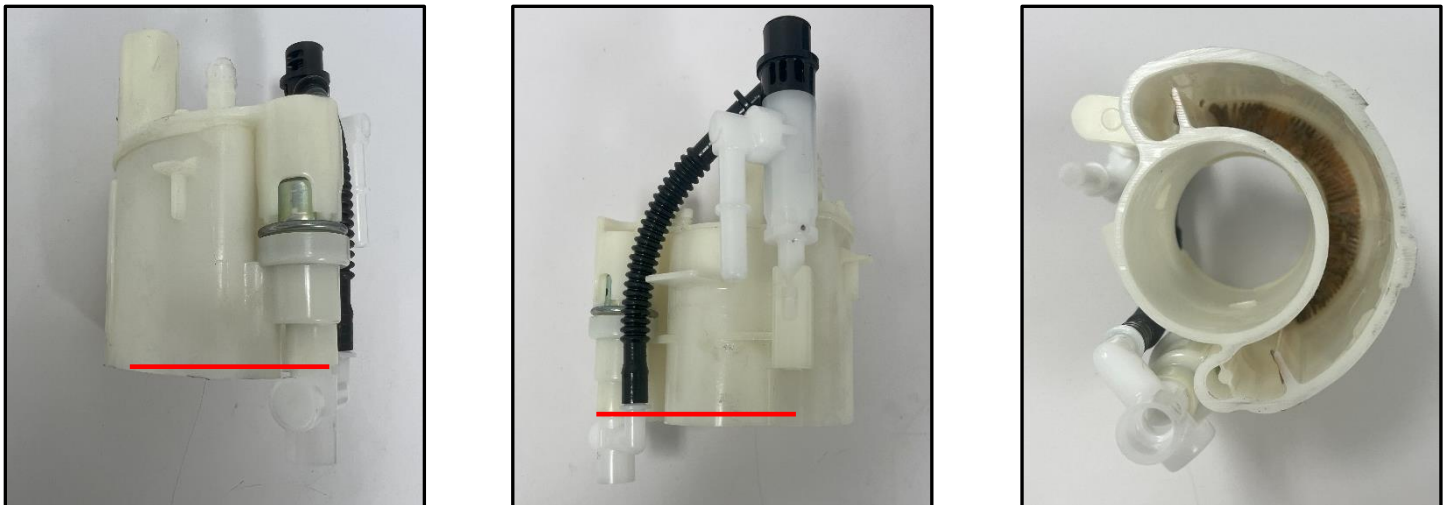


31. For all upgraded fuel pumps: Using snips/Dremel/body saw, cut the retaining clip out of the interior of the fuel pump housing. Using a file or Dremel, smooth out the bore to remove any burrs until it is relatively smooth.



32. For 485/525 fuel pumps:

Due to the increased diameter of the bottom of the fuel pump, you will need to cut off much more of the fuel pump housing and clean/scrape out the interior OE fuel filter. The housing will need to be cut off up to roughly where the outlet of the OE fuel pressure regulator housing is. Below are some pictures showing an example, with the red line showing where the OE fuel pressure regulator housing ends.



33. At the bottom of the lower basket there is a small black plastic piece that is part of the venturi refill system. This piece directs the output of the fuel that is bled off by the fuel pressure regulator. When you upgrade your fuel pump and increase the amount of fuel the regulator has to relieve at low idle situations, this venturi component can become a restriction causing high fuel pressure at idle. To increase the amount this piece can flow, you must slightly drill out the orifice on the bottom. The orifice is roughly 0.050" when unmodified.

From the inside of the lower basket, push this venturi refill piece out. You do not need to remove it, pushing it from the inside will push it about halfway out, just enough to access the orifice on the side (as shown below).



34. This is not an exact science, as many components affect how well the venturi system will function. If your fuel pressure regulator is unable to maintain low enough fuel pressure at idle, this step will need to be repeated with a slightly larger drill bit. It is better to start small and have to redrill, then to drill too much.

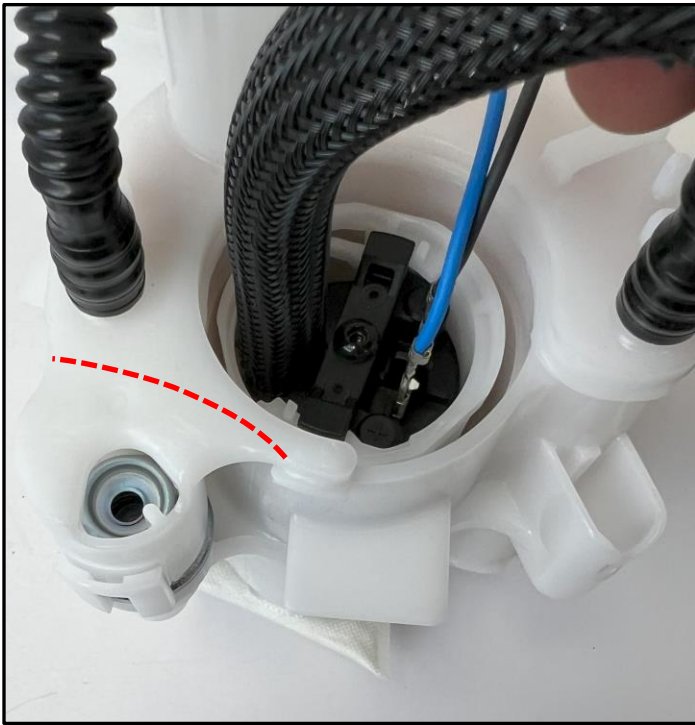
Be careful when drilling as this component is not sold separately and if damaged, will require the purchase of an entire new sending unit/fuel basket. Be careful to make sure the drill bit does not quickly thread into the orifice but is actually drilling. Do not drill through the backside of the piece.

Depending on the size of the upgraded pump you are installing, drill out the orifice to the recommended size shown below:

Pump Size	Recommended Orifice Size	Recommended Drill Bit Size
255lph or 340lph	~0.075"	#49 drill bit = 0.0730", #48 drill bit = 0.076", 5/64 drill bit = 0.0781", 2mm drill bit = 0.0787"
525lph	~0.125"	1/8 drill bit = 0.125", 3.2mm drill bit = 0.126"

Once drilled, reinstall the venturi orifice piece into the lower fuel basket.

35. The OE fuel pressure regulator will need to be removed when using the Z1 regulator. Using a body saw or die grinder, trim the corner of the fuel pump housing where the OE fuel regulator is (shown below).



36. Once trimmed, remove the OE regulator (as shown above). Retain the o-rings as they will be reused.

37. Locate the Z1 regulator delete piece, remove regulator delete from bag and separate the two pieces. Install the o-rings onto the Z1 regulator delete (as shown below).

38. Install the larger delete piece into the fuel pump housing where the OE regulator was removed from.

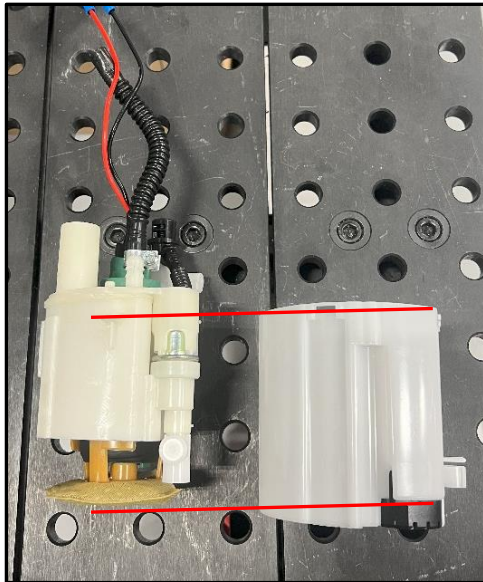
39. Place the retainer on the bottom of the housing and secure the pieces together with the provided M3 bolts (as shown below).



40. Once the lower baskets have been modified for you fuel pump/regulator, locate your new fuel pump.

41. Transfer the OE fuel strainer from the OE pump onto the new pump.

42. With either the foam sleeve included with the fuel pump, or the other provided foam sleeve installed onto the new pump, install the fuel pump into the bore of the fuel pump housing. Use of silicone spray is recommended.
43. 525 LPH Fuel Pump: The fuel pump and strainer will need to be at a certain height and clocking to allow the fuel pump housing to be reinstalled into the lower basket. Reference the pictures below to adjust the height and clocking of your fuel pump and strainer.

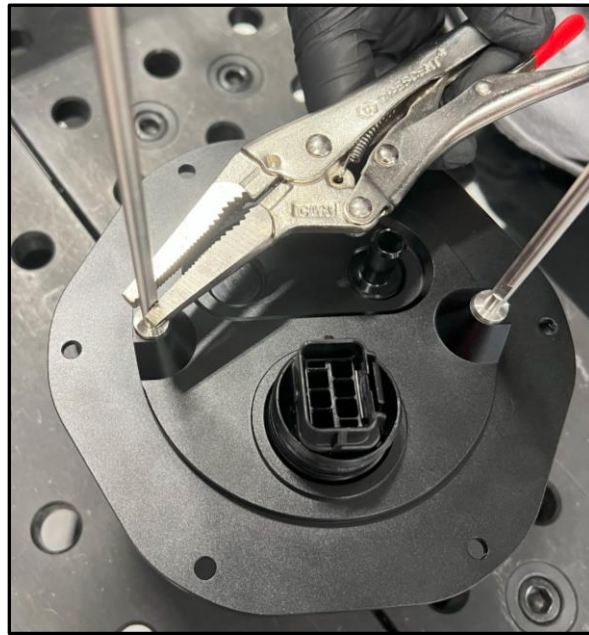


44. Install the fuel pump housing assembly with the new fuel pump into the lower basket making sure the locking tabs on the side are seated.
45. Reinstall the fuel level sensor, fuel temp sensor, and venturi components that were removed earlier back onto the lower basket.

**Steps # 46-63 are only for customers who purchased a Z1 Top Hat.**

46. Locate the Z1 Top Hat kit. The top hat will be partially pre-assembled.
47. Install the 3/8 (larger) quick disconnect threaded adapter fitting onto the pump side 90° barb fitting.
48. Using a 8mm hex key, install the loose 90° barb fitting into the return port of the top hat just like the preinstalled pump side.

49. Using a 4mm wrench or pliers on the flat spots and with a dab of the supplied Loctite, install the long threaded rods into mounting bosses on the underside of the top hat.



50. Using the provided wire terminals, crimp a terminal onto each wire that was cut in step # 19 and onto the new fuel pump power and ground wires. You will not need the full length of the new fuel pump wires. Hold the top hat next to the basket roughly where it will sit and cut the new fuel pump wires at an appropriate length to reach the bulkhead connector.
51. There are two connectors supplied with the kit, one for inside the tank and one for outside. The outside connector will have red seals on the backside of the connector and a grey locking piece. The in-tank one may have the grey locking piece but WILL NOT have the seals. Both connectors should come with the blue locking tab, in the unlocked position. You can tell if it is unlocked if the blue piece is flush with the top of the connector housing. If it is not unlocked using a pick or small pliers, pull the tab into the unlocked position.



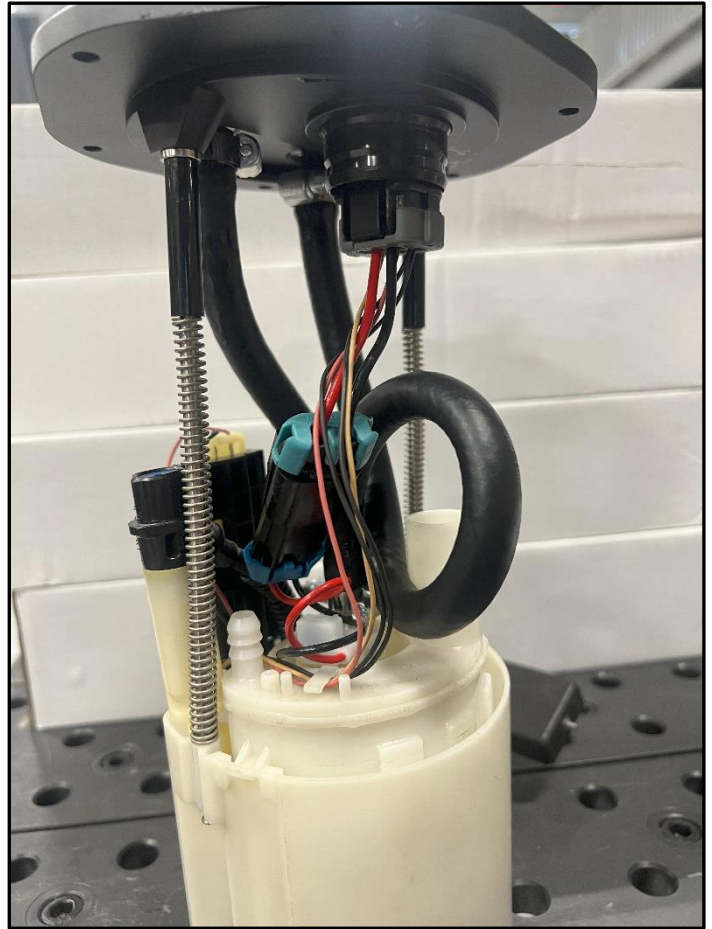
In-tank  
connector



Outside tank  
connector

52. Install the crimped terminals through the backside of the in-tank connector, the backside is the one without the blue locking tab. It does not matter which pin in the connector the wires go through as long as the outside connector is wired the same way. The outside connector will have a flipped pinout as it shifts when going through the bulkhead. Make sure to take a note or picture of what wire is connected to what pinout in the diagram above so you can properly wire up the outside connector. This is where the note/picture taken in step # 18 comes into play. Once all wires are installed, press the blue locking tab to lock them in place.
53. Install the OE fuel pump basket springs and collars that came off the OE rods, onto the Z1 rods with the collar first then springs. Then install the Z1 rods with the top hat into the lower basket. Secure with the OE locking collar that was removed in step # 17.
54. Connect the new in-tank connector to the bulkhead on the bottom side of the Z1 tophat.
55. Locate the provided submersible fuel hose and (4) small clamps.

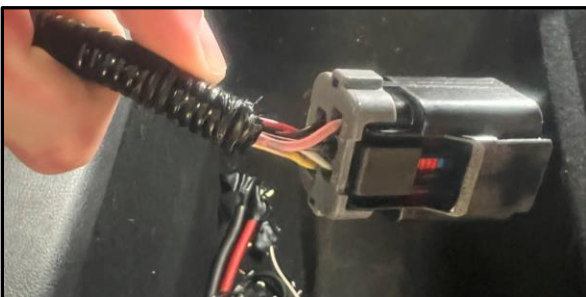
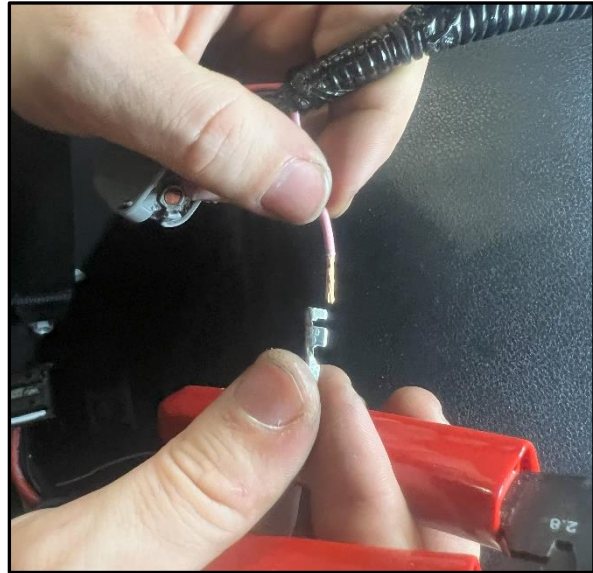
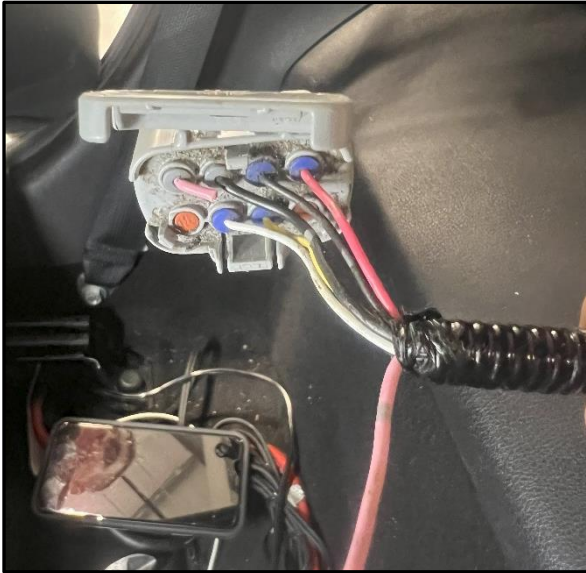
56. Cut a ~14" section of hose that will connect from the fuel pump outlet to the bottom side pump barb on the tophat. The hose is long so it can make a loop between the pump outlet and tophat barb to prevent it from kinking. Secure with a clamp.
57. Cut another ~7" section of hose to connect the bottom side return barb on the tophat to the top barb of the regulator delete that was installed in step # 38. Secure with a clamp.



58. Take the assembled fuel basket over to the vehicle.
59. Cut the wires on the OE chassis side fuel pump connector that was removed from the OE fuel top hat in step # 6b one at a time.



60. Crimp a terminal onto the OE wire. Then, install the terminal into the outside connector through the red seal according to the pinout on page 15. Refer back to your note/picture from steps # 19 and 51 to ensure each wire is connected properly.



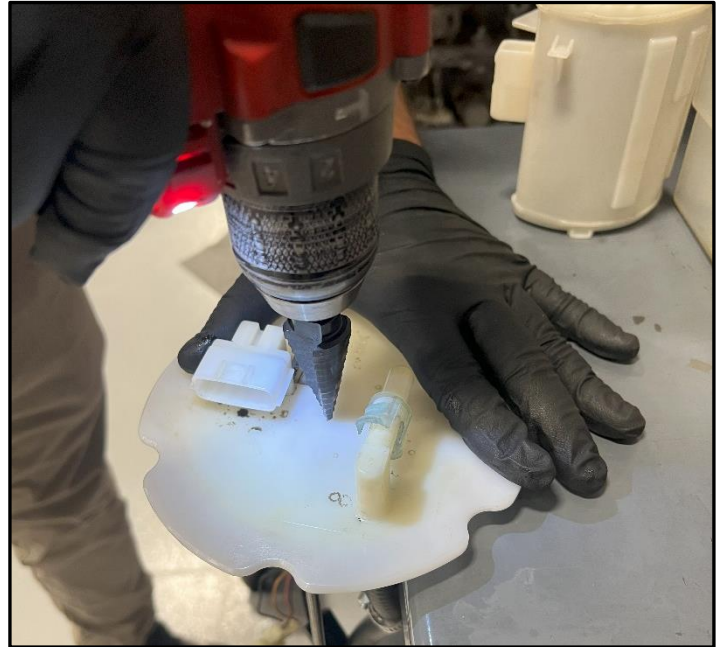
61. Once all wires are connected properly to match the connector on the bottom side of the top hat, carefully install the fuel basket assembly into the fuel tank. Be careful not to bend the fuel level sensor or pinch/cut the submersible fuel hose on the fuel tank opening. Make sure to also reconnect the siphon hose from inside the tank.

62. The fuel basket should rest on the bottom of the tank and will need to be compressed a small amount, roughly 5mm, to secure the top hat. Secure the top hat to the fuel tank with the (6) provided M5 x 6mm socket head bolts. Connect the new chassis side harness connector to the Z1 top hat.

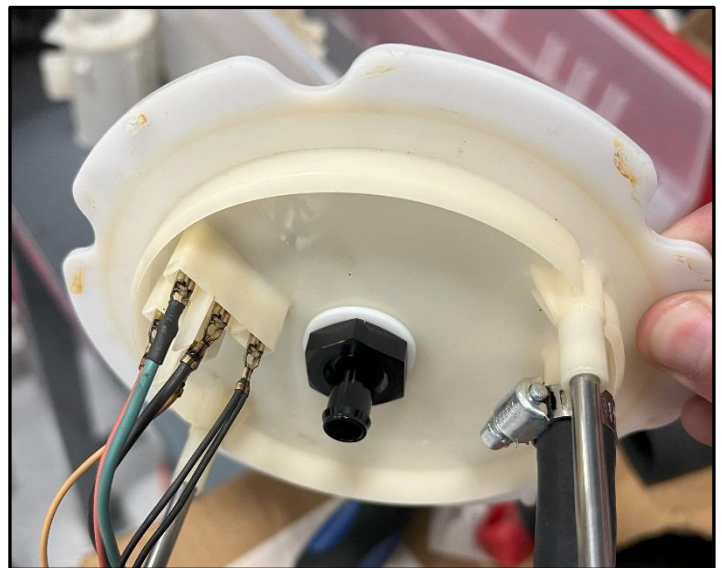
63. For 525 pumps you will need to install the included fuel pump relay kit. Refer to the instructions provided with that relay kit.

**Steps # 64-73 are only for customers who are using the stock top hat.**

64. Using a 9/16 drill bit or step drill bit, drill a hole in the center of the stock top hat (shown below).

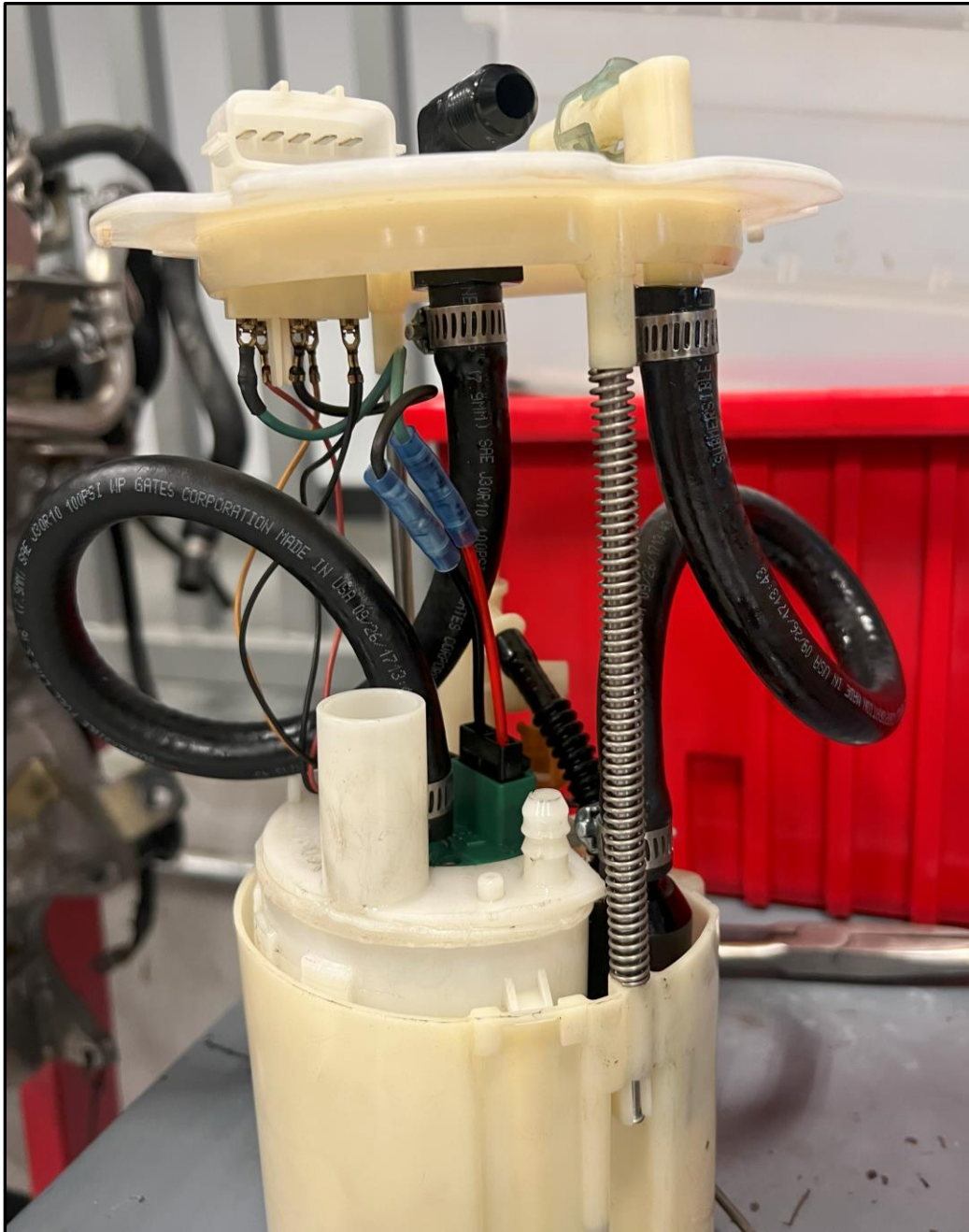


65. With a supplied PTFE washer on each end, install the 90° 6AN bulkhead fitting into the hole. Secure with the supplied 6AN bulkhead nut (shown below).



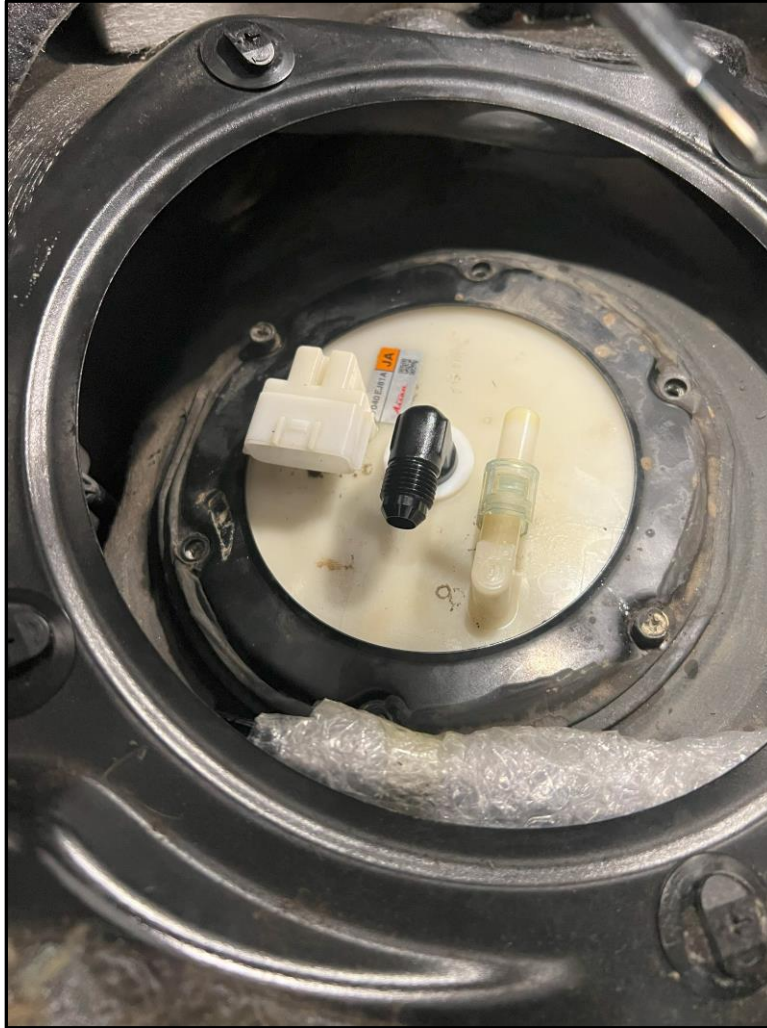
66. Install the plastic collars and springs onto the top hat rods that were removed earlier, then install the stock top hat with the new bulkhead fitting onto the lower basket, secure with the locking collar that was removed in step # 17.

67. With a screw clamp on each end, install one 14" section of submersible rubber fuel hose onto the fuel pump outlet and other end onto the new bulk head fitting (shown below).
68. With a screw clamp on each end, install the other 14" section of submersible rubber fuel hose onto the fuel regulator delete barb and other end onto the stock barb on the top hat (shown below).



69. Using (2) provided butt-connectors, wire up the new fuel pump to the fuel pump wiring on the stock top hat (shown above).
70. Take the assembled fuel basket over to the vehicle.

71. Carefully install the fuel basket assembly into the fuel tank. Be careful not to bend the fuel level sensor or pinch/cut the submersible fuel hose on the fuel tank opening. Make sure to also reconnect the siphon hose from inside the tank.

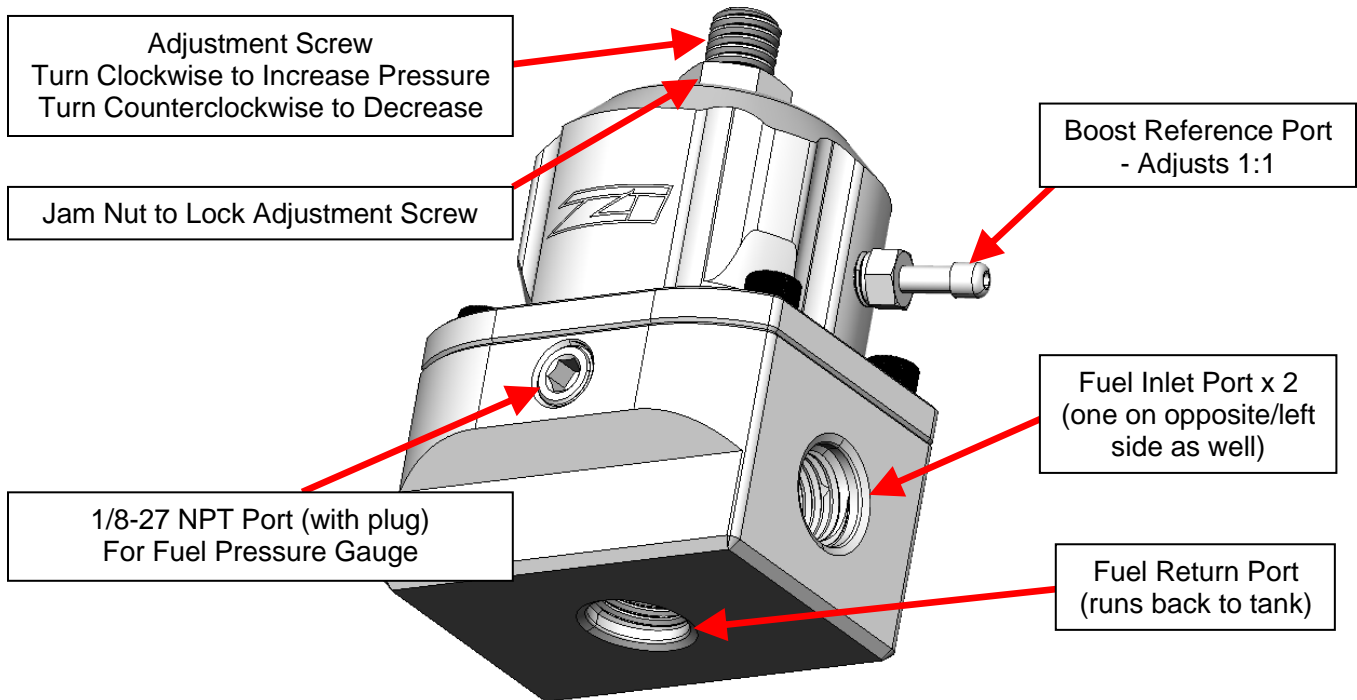


72. The fuel basket should rest on the bottom of the tank and will need to be compressed a small amount, roughly 5mm, to secure the top hat. Secure the top hat to the fuel tank with the (6) provided M5 x 6mm socket head bolts. Connect the new chassis side harness connector to the Z1 top hat.
73. For 525 pumps you will need to install the included fuel pump relay kit. Refer to the instructions provided with that relay kit.

### **Fuel Pressure Regulator:**

1. Your Z1 Fuel Pressure Regulator will arrive mostly assembled with the exception of orb fittings/plugs for the fuel lines.

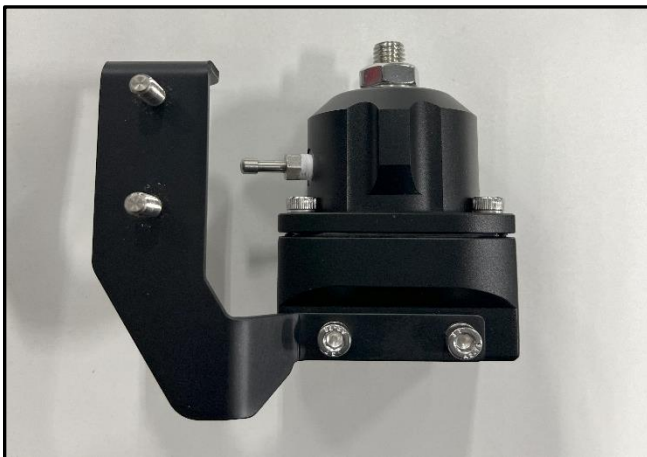
2. Below shows the regulator and what each component/port is used for:



3. Install the (2) 6AN ORB fittings on the bottom and left side of the regulator. Install the 6AN plug on the right side of the regulator. Remove the plug on the front and with thread sealant install the fuel pressure gauge.
4. Remove the passenger side plastic battery cover and cowl trim piece.
5. Remove the universal bracket that comes on the regulator. Retain the hardware.
6. Attach the other provided L-shaped bracket onto the rear of the regulator with the bolts removed in the previous step.

**It is recommended to skip to the fuel line section on page 23 before continuing. Your fuel return line will connect to the bottom of the regulator and will be easier to install if the regulator is not mounted yet.**

7. Install the (2) rubber bonded washers onto the PEM studs on the L-shaped bracket.
8. Attach the regulator and bracket to the two holes on the false firewall, secure with the provided nuts.



9. Consult your tuner on whether or not they would like to use boost reference for the regulator.
10. If you need boost reference, locate the 5mm silicone vacuum hose, 3/8 to 1/4 reduction tee fitting, (2) small spring clamps, and (2) large spring clamps.

We recommend plumbing the supplied reduction tee fitting into the brake booster vacuum hose that runs to the rear of the upper intake plenum. There are several different spots you can tee into; a couple options are shown below.

- a. Below shows the easiest spot right off the back of the intake plenum.



- i. Remove the brake booster hose. (You can trim it shorter if you'd like but it is not necessary)
  - ii. Cut the brake booster hose in the longest straight part of the hose.
  - iii. Install the reduction tee into the brake booster hose.
  - iv. Install the 5mm vacuum line onto the 1/4" barb of the tee fitting.
  - v. Make sure all connection points are secured with a clamp.
- b. You can also tee into the brake booster hose after it routes behind the firewall and towards the brake booster compartment for a cleaner looking installation.
    - i. The brake booster hose has a check valve in the line near the brake booster. Feel/squeeze the hose to locate the check valve.
    - ii. Cut the hose anywhere between the check valve and the upper plenum (shown below).



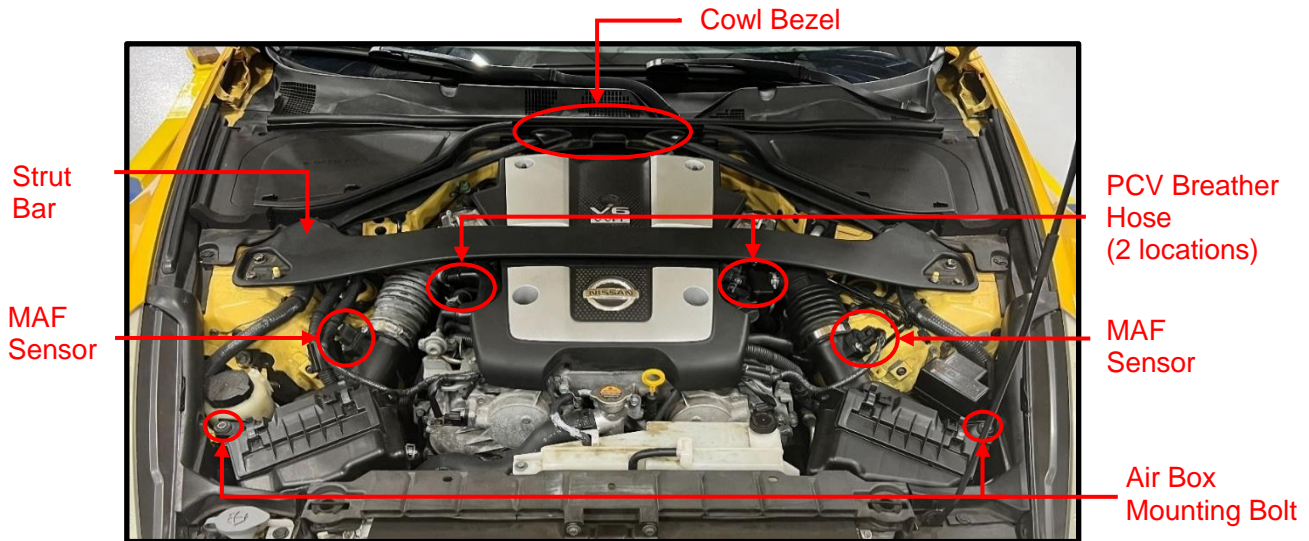
- iii. Install the reduction tee in between the cut brake booster hose.

- iv. Install the 5mm vacuum line onto the 1/4" barb of the tee fitting.
- 11. Once the vacuum line is tee'd into the brake booster hose, route the line to the barb fitting on the regulator. Secure with small spring clamp.
- 12. Make sure all connection points are secured with a clamp.
- 13. Follow the rest of the instructions for the fuel lines to properly plumb the Z1 regulator.

**Fuel Lines, Fuel Port, and Fuel Filter:**

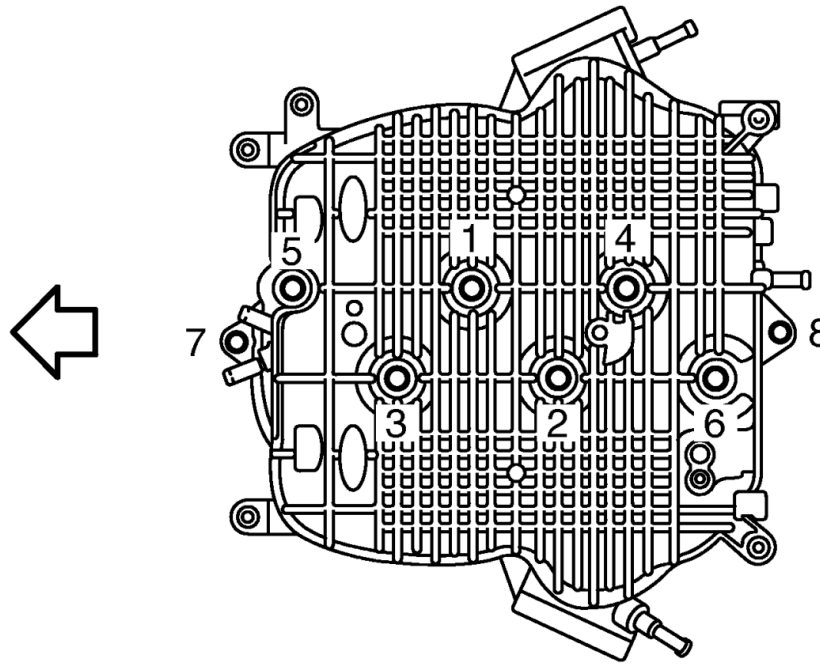
Use the diagram below as reference for the following steps:

*G37 owners should follow the same steps but ignore the steps about removing the cowl bezel and strut bar.*



1. Remove the (2) plastic clips which attach the cowl bezel to the cowl assembly.
2. Carefully pry loose backside of cowl bezel. Firmly pull cowl bezel and set aside.
3. Remove (4) bolts and (2) hex nuts which attach strut bar to chassis. Remove strut bar and set aside.
4. Remove nuts and bolts which attach engine cover to engine. Remove cover and set aside.
5. Locate and unplug (2) MAF sensor connectors as well as any plastic harness clips that may be attached to the air box.
6. Remove (1) bolt which attaches passenger side intake canister to plenum (near passenger side PCV hose).
7. Loosen hose clamps and remove OEM PCV Breather hoses at each valve cover end.
8. Loosen large hose clamp at each throttle body.
9. Remove air box mounting bolt which attaches each OEM air box to chassis.
10. Using a light pull motion, remove OEM air boxes and intake tube assemblies.

11. Remove (8) nuts and bolts securing intake plenum to engine in reverse order as shown in figure below.

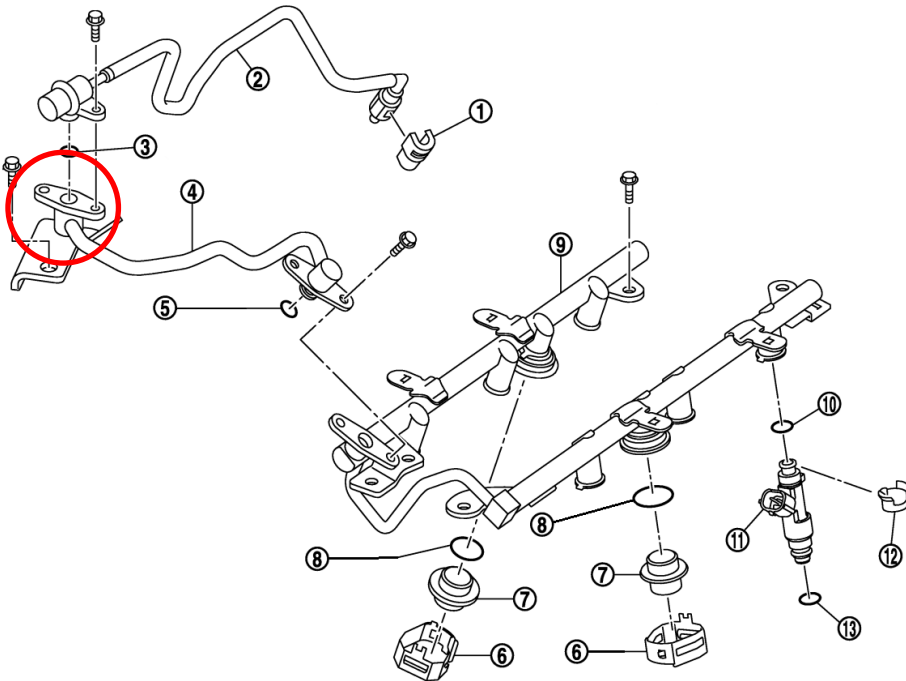


12. Remove the protection panel on the underside of the vehicle that covers up the OE fuel and brake lines (shown below).

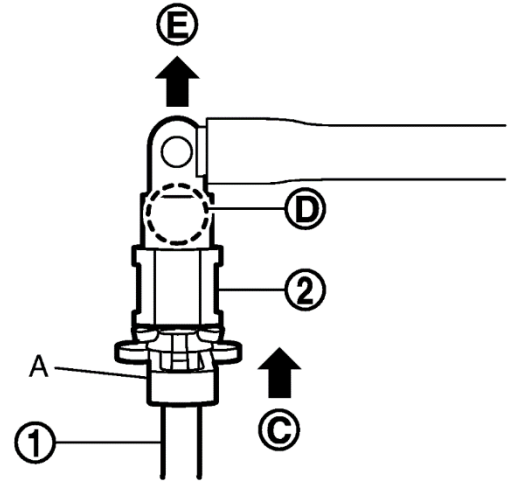
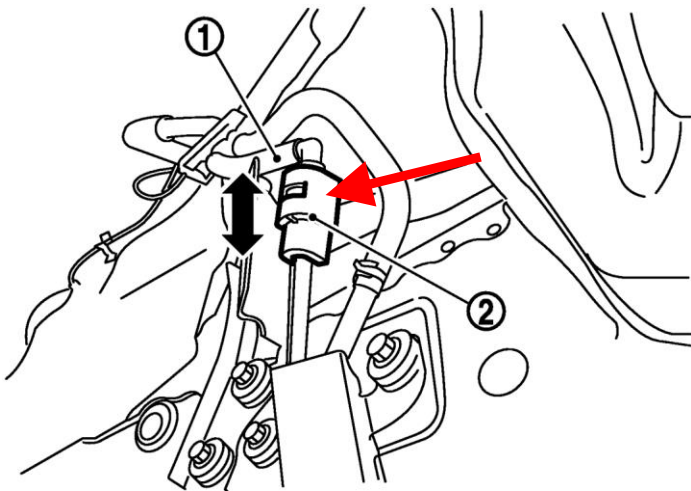




13. With the Z1 fuel return kit, the factory fuel feed line will function as the return line back to the tank. The feed hardline will need to be disconnected from the rubber feed hose connected to the damper at the front of the engine. Place a rag around the fuel damper at the front of the fuel rail (circled below). While applying light pressure to the damper, loosen the (2) bolts on the fuel damper.



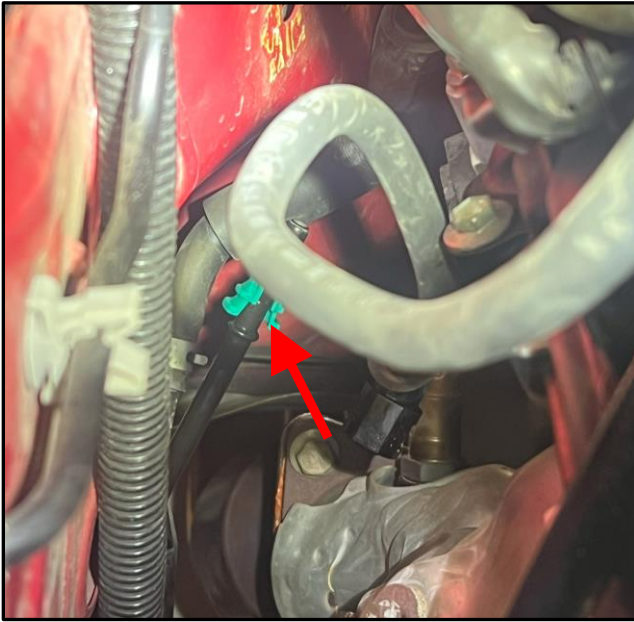
14. The OE rubber hose connects to the OE hardline on the inside of the passenger side frame rail with a quick connector. Remove the plastic cover shown with a red arrow below. Then separate the lines just like the one from step 10 on page # 6.



15. Remove the OE fuel feed line and o-ring from the fuel hardline that runs to the OE fuel rails.

16. Remove the release piece from the OE hardline if it did not come off with the rubber hose (shown below).

17. Install the provided 5/16 (smaller) billet quick disconnect 6AN threaded adapter onto the OE hardline.



18. Locate the Z1 fuel port kit, fuel pressure gauge, and Nissan fuel damper. Tighten all (4) fittings/plugs on the fuel port.

19. Remove the (2) M5 button head screws holding the damper retainer to the fuel port, then remove the retainer.

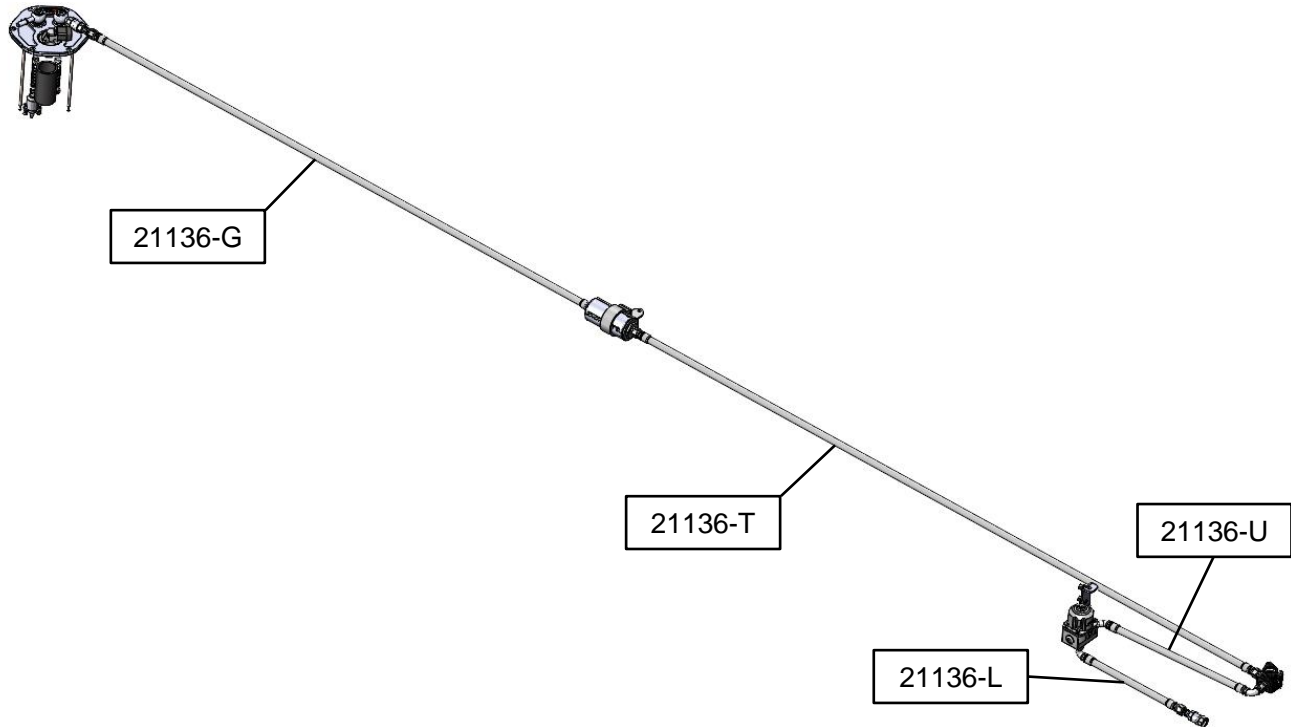
20. Install the Nissan fuel damper into the fuel port with the provided o-ring between the two. Reattach the retainer with the (2) M5 screws (shown below).

21. Apply some silicon spray on the small o-ring on the bottom of the fuel port, then install the fuel port and damper assembly onto the stock fuel tube with the (2) provided M6 x 35mm bolts (shown below). Torque bolts to 74in-lbs.



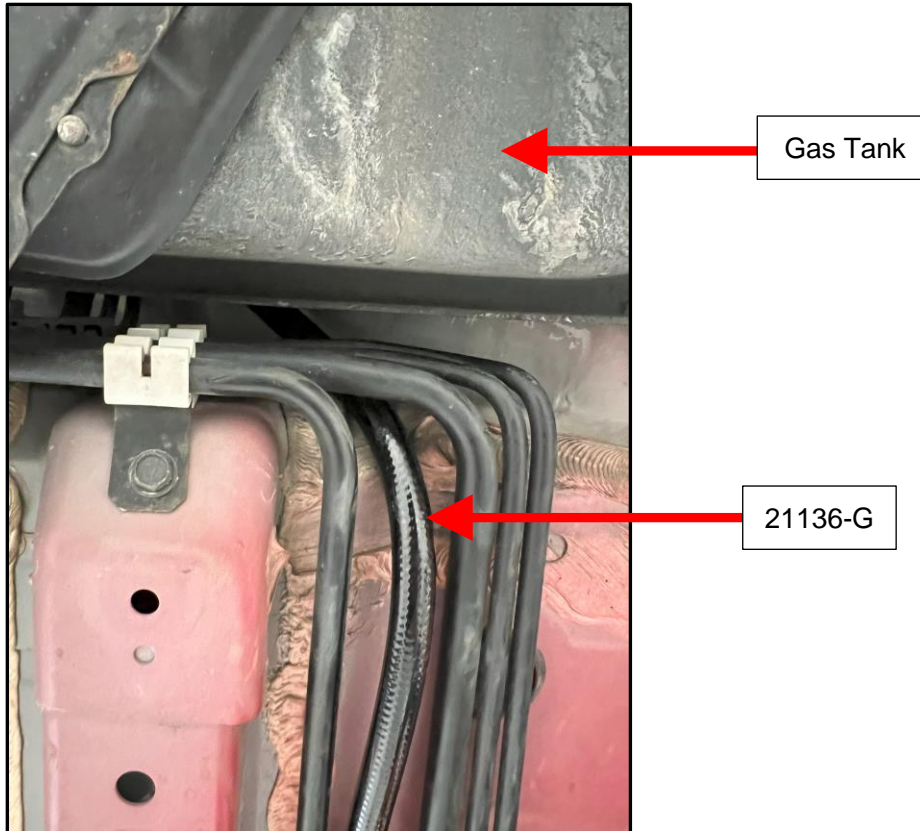
22. Locate the fuel line kit. The line kit contains 4 different lines. Each line will be bagged individually with a part number on the bag, do not separate the line from its bag until you are ready to install it. These lines have a PTFE core that if kinked cannot be un-kinked. Be careful when routing and maneuvering these lines, if you kink one you will need to order a replacement. DO NOT overtighten the fuel line fittings or use any additional sealant on the lines. Refer to the diagram below as reference to how each one will be run.

The chart below details all (4) provided fuel lines and what each fitting connects to.



PN	Desc.	Fitting #1	Fitting #2
21136-G	Top Hat Outlet -> Fuel Filter Inlet	Straight – Top Hat Outlet	Straight – Fuel Filter Inlet
21136-T	Fuel Filter Outlet -> Side of Fuel Port	Straight – Fuel Filter Outlet	90° - Side of Fuel Port
21136-U	Side of Fuel Port -> Side of FPR	90° - Side of Fuel Port	90° - Side of FPR
21136-L	Bottom of FPR -> OE Feed Line	90° - Bottom of FPR	Straight – Fitting on OE Feed Line

23. From the underside of the car, push the pump feed line (21136-G) up between the chassis and the front of the fuel tank towards the fuel pump top hat.



24. Inside the vehicle, grab the feed line pull it towards the top hat, do not install it yet.

25. Route the rest of the feed line along the factory hard fuel line against the passenger side frame rail. There is open spot on the hardline retaining clips, route the Z1 lines in that spot.

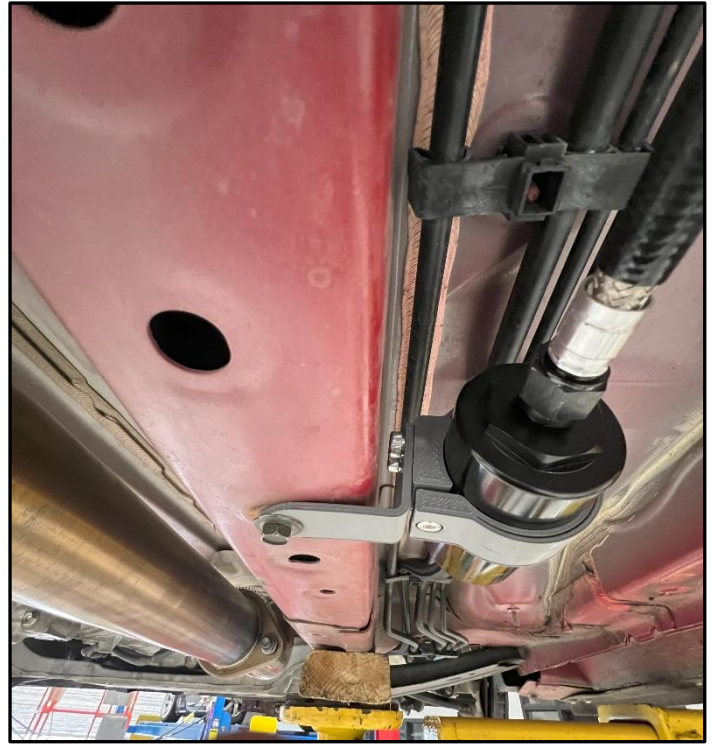
26. Locate the fuel filter and bracket.

27. Install the L-shaped bracket onto the clamp with (2) shorter bolts and then assemble the fuel filter inside the bracket clamp and tighten clamp with the longer bolt.



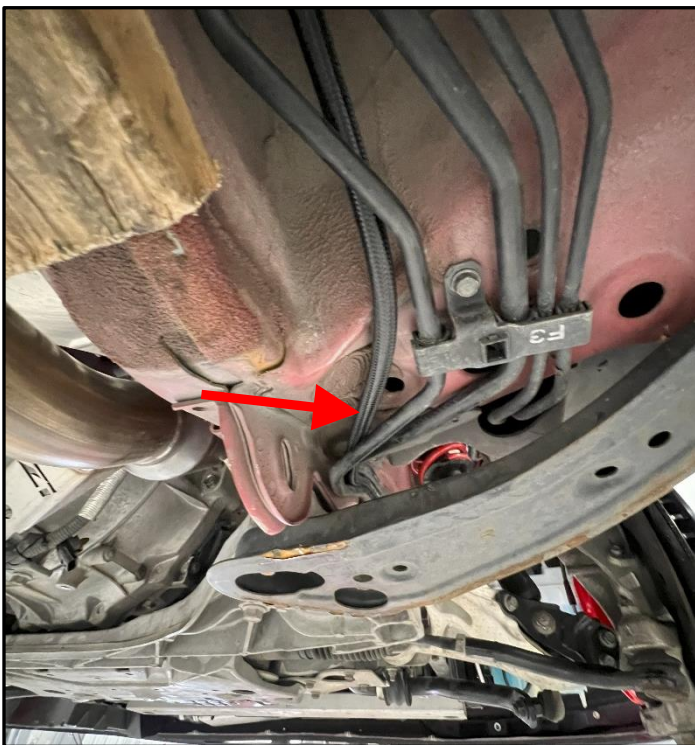
28. On the underside of the vehicle, secure the pump feed line to the inlet of the fuel filter. The filter is marked with "IN" and "OUT" on each fitting.

29. Loosely install the fuel filter bracket into the threaded hole on the bottom side of the passenger frame rail with the OE bolt removed in step # 1 (as shown below).

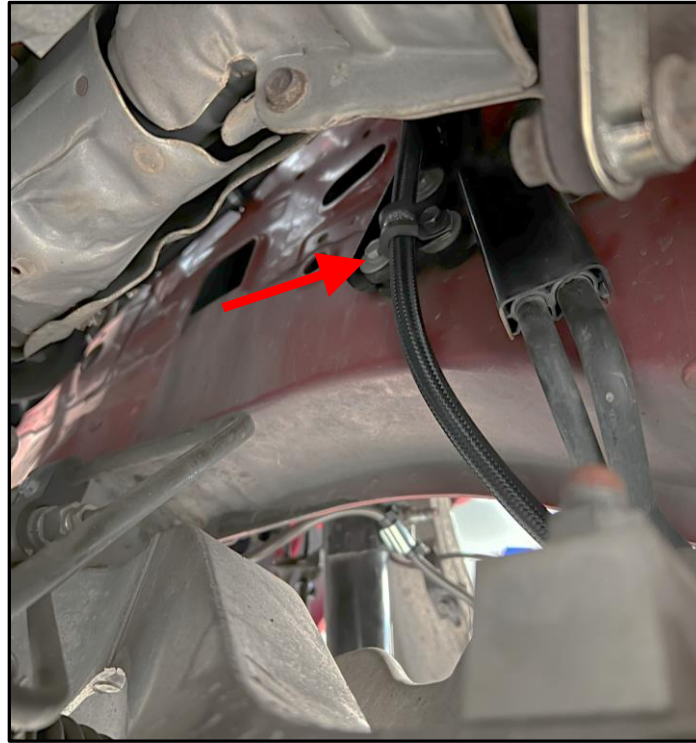


30. Install the straight fitting on the filter outlet fuel line (21136-T) onto the outlet of the fuel filter and route the rest of the line along the factory hard fuel lines against the passenger side frame rail towards the engine bay.

31. Once passed the frame rail, route the feed line over the suspension arm and up towards the engine (shown below).



32. Using the supplied cushion loop clamp, on the inside of the passenger side frame rail, secure the feed line to the bolt on the OE hard line bracket (shown below).

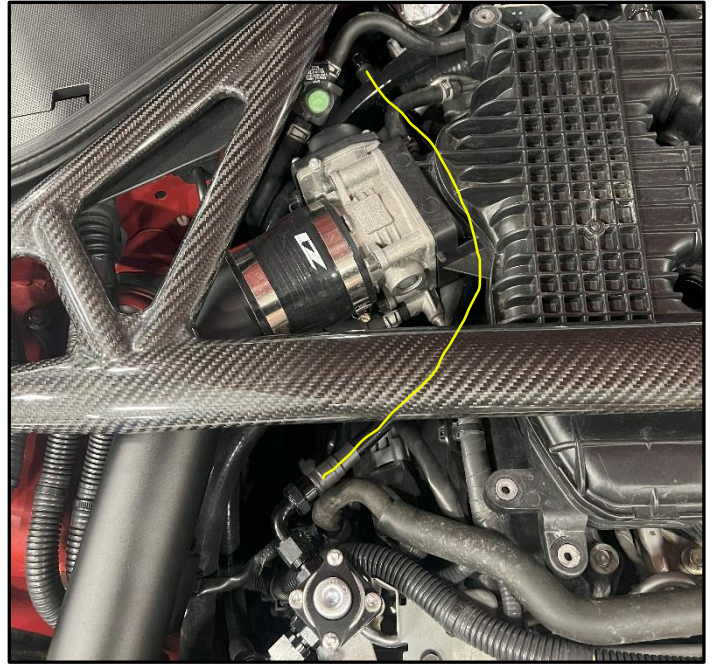
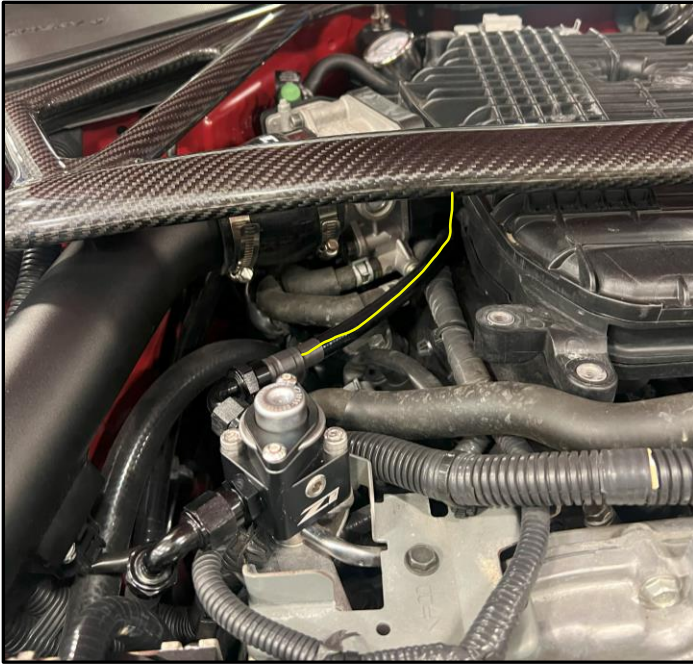


33. Route the rest of the feed line towards the front of the engine bay and using a cushion loop clamp secure the line to the threaded hole in the chassis below the passenger front brake line (shown below).



**Reference the diagram at the top of page 27 for steps 34-:**

34. Attach the 90° fitting on the feed line (21136-T) to the forwardmost 6AN fitting on the fuel port.
35. Lift up the upper intake manifold and position the fuel port to fuel pressure regulator line (21136-U) behind the passenger side throttle body. The line path is drawn below in yellow. It does not matter which fitting is in front, as they are both 90° fittings.



36. Attach the front fitting on (21136-U) to the rearward 6AN fitting on the fuel port.
37. Attach the rear fitting on (21136-U) to the left (passenger) side 6AN fitting on the fuel pressure regulator.
38. Attach the 90° fitting on (21136-L) to the bottom of the Z1 fuel pressure regulator.
39. Attach the straight fitting on (21136-L) to the quick disconnect AN adapter fitting on the factory feed line that was installed in step # 17.
40. Make sure all connection points are tight.

*If you jumped to this fuel line section while installing the fuel pressure regulator, make sure to go back to step # 7 on page 21 to finish installing the regulator.*

41. Go back inside the vehicle and thread the new Z1 AN feed line onto the adapter fitting on the top hat. If using the Z1 top hat connect to the **PUMP** fitting on the top hat. If using the OE top hat connect to the bulkhead fitting installed earlier.
42. Reinstall the (8) nuts and bolts securing the upper intake manifold in the order shown in the image at the top of page 24. Torque to 14ft-lbs.

43. Connect the OE hard fuel line (what used to be the stock feed line) to the return side of the Z1 top hat or to the OE port on the OE top hat.



Z1 Top Hat



OE Top Hat



44. Reinstall the protection panel on the underside of the vehicle that was removed in step #12. You will need to remove the bolt holding the fuel filter in place, sandwich the fuel filter brackets, then reinstall the bolt.
45. Reinstall all other components removed in the previous steps (intakes, cowl panel, trim pieces, etc.).
46. Check the vehicle for loose tools/items.
47. Reconnect the negative battery cable.
48. Prime the fuel system by turning the key to the on position, but do not start the vehicle.
49. Check the fuel pressure gauge to see if you have fuel pressure and check for leaks. This may take several priming sequences for pressure to build up (key on and off several times).
50. Start vehicle.
51. Check for leaks again.
52. Quickly monitor the fuel pressure gauge and adjust the Z1 regulator to the desired fuel pressure. Rotating the adjustment screw clockwise will increase pressure, while rotating it counterclockwise will decrease pressure. Most OEM Nissan fuel systems are set to 52 PSI. The Z1 regulator can adjust pressure from 40-75psi.
53. Once you confirm the base fuel pressure is correct, tighten the jam nut on the adjustment screw.

**END**

**Additional Technial Support:**

Contact Z1 Motorsports at [info@z1motorsports.com](mailto:info@z1motorsports.com)

Or call 770-838-7777 between 9am and 6pm ET