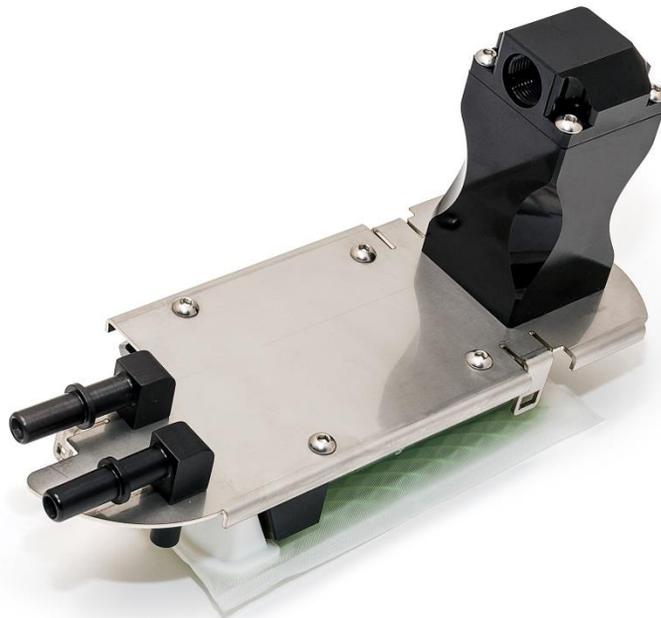




**Alpha Performance**  
**GTR Dual**  
**Omega Brushless Fuel Pump**  
**System**



These instructions are provided as a guide only as there are many variables that cannot be accounted for concerning your particular vehicle, including but not limited to model year differences, model differences, the presence of non-OEM parts, and modifications that may already be or were previously installed. A basic knowledge of automotive parts and systems is helpful but a better understanding of the parts and systems on your particular vehicle may be required.

A vehicle modified by the use of performance parts may not meet the legal requirements for use on public roads. Federal and state laws prohibit the removal, modification, or rendering inoperative of any part or element of design affecting emissions or safety on motor vehicles used for transporting persons or property on public streets or highways. Use or installation of performance parts may adversely affect the drivability and reliability of your vehicle, and may also affect or eliminate your insurance coverage, factory warranty, and/or new OEM part warranty. Performance parts are sold as-is without any warranty of any type. There is no warranty stated or implied due to the stresses placed on your vehicle by performance parts and our inability to monitor their use, tuning, or modification.

If you have any questions or issues at any time during the installation of your Omega Fuel System product(s) please call us for technical assistance. The Omega Fuel System tech line can be reached during business hours at 847-709-0530 for Alpha Performance products only.

## **Why Is A Brushless Motor Is Better?**

Brushed motor fuel pumps create heat due to the brushes rubbing the commutator. This rubbing also wears away the brushes and the commutator making the fuel pump a wear item quite similar to brake pads and rotors. Brushless motors do not have this friction, do not wear, and do not create the heat of a brushed motor. Additional heat is generated by the pumping / pressurizing of fuel. Brushed fuel pump output is usually static because it is based off of input voltage (battery voltage). This means the pump is running at 100% all the time adding the maximum amount of heat. Because a brushless pump uses a controller to determine speed and output, you have the ability lower output when you don't need it which further reduces heat generated. The AMS Omega Fuel Pumps use OE quality brushless motors and automotive spec brushless controllers.

## **Lower Fuel Temperature To Save Your VR38 Engine**

One of the biggest problems your R35 GT-R has is overheating the fuel inside your tank. The fuel tank sits above the heat-soaked GR6 transmission and exhaust. Having 2 or 3 inefficient brushed pumps in the tank just adds to this problem. We have seen fuel boil inside the GTR fuel tank at as little as 140° F (60° C). When fuel boils, the pump output drops dramatically reducing the fuel supply to the engine. Not enough fuel will cause a lean condition that will cause detonation or extreme combustion temperatures that can melt your engine components.

## **Screw Style Pump For Maximum Fuel Output In The Worst Conditions**

Opposite the electrical motor, you have the mechanical side of the fuel pump. This is what actually pumps / pressurizes the fuel. During testing, we found that the style of pump makes a huge difference in pumping efficiency especially when fuel temperature gets elevated. Traditionally, a vane style or impeller style pump is used. We found that with these style of pumps fuel output can drop as much as 50% at higher fuel temps. The AMS Omega Fuel Pump uses a screw style pumping mechanism which is almost immune to this phenomenon.

## **Super High Flow And Consistent Fuel Pressure**

All too often standard fuel pumps suffer from pressure drop at higher fuel pressures. The superior screw style Omega Pump maintains much higher pressure despite these harsh operating conditions.

## **Whisper Quiet Operation**

Modified fuel systems are always louder than stock taking away from your driving pleasure with their deafening whine. With the great horsepower capabilities of the VR38 engine 2-3 aftermarket pumps are often needed which compounds the problem. Not only is the Omega Pump quieter than your typical aftermarket pump, just a single pump can supply enough fuel for 1200HP.

## **Small, Easy To Install Pump That Leaves All The Others In The Dust**

Traditional high output fuel pumps are bulky and almost always require multiple pumps to meet fuel requirements making installation inside your fuel tank difficult sometimes requiring dangerous external mounting. The Omega Pump however fits neatly in the stock fuel tank and location. Also the Omega Pumps high capacity allows just one pump to do the work of 2 conventional high performance fuel pumps.

## **User Interface Makes Custom Tuning A Breeze**

Unlike most aftermarket fuel systems, our controller allows you to tailor the fuel output to your needs. Our easy to navigate Graphic User Interface (GUI) makes programming the pump easy.

## **One Fuel System To Buy**

While the initial investment of a low cost pump might be attractive the long term damage to the pump or even engine can cost much more making the OMEGA brushless system quite cost effective. Our system also allows room for growth with one pump able to support 1200whp on normal gasoline. Simple programing by the end user can alter its output.

## **Tested And Proven On The World's Fastest GT-R**

The Omega Fuel System has been thoroughly test and proven on some of the fastest Alpha powered GT-R's. For over a year we have conducted long term testing on the brushless technology. Most importantly, these pumps supply all the fuel that the world's quickest and Fastest GT-R needs for well over 2000HP.

## **Exclusive Benefits**

Produces less heat lowering fuel temperature and prevent engine damage  
Smaller for easy installation  
Quieter for driving comfort  
High flow rate with no pressure drop  
1200HP capable with room to expand the system  
Simple user interface  
Tested and proven on the world's fastest R35 GT-R

## **Disassembly**

- 1) Remove the rear right rear seat to access the fuel pump sending unit cover. Remove the cover to expose the sending unit.



*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

- 2) Make sure to drain all the fuel from the car before removing the sending unit. We offer a drain hose specific for GTRs to make draining simple and easy.

[http://www.amsperformance.com/cart/alpha\\_performance-nissan-gt-r-fuel-feed-drain-line.html](http://www.amsperformance.com/cart/alpha_performance-nissan-gt-r-fuel-feed-drain-line.html)

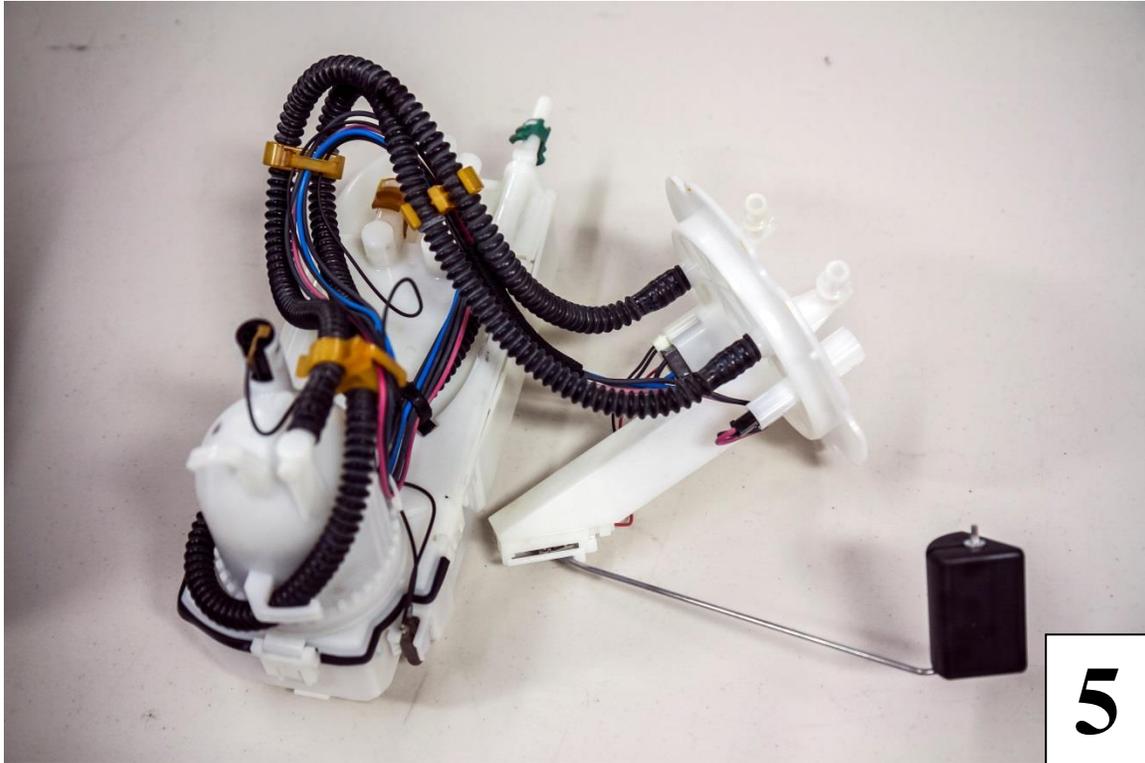
- 3) If you do not have the ability to drain the fuel, make sure the fuel level is below ½ tank. If not, fuel will pour out of the tank when the sending unit top hat is removed
- 4) Remove the top hat and pull it out and away. Take caution with the level sensor and all the wiring. The fuel tank opening edge is very sharp.

**Note:** Pictures are taken with the tank out of the car to get better views and pictures for instructions. The tank does not need to be removed.

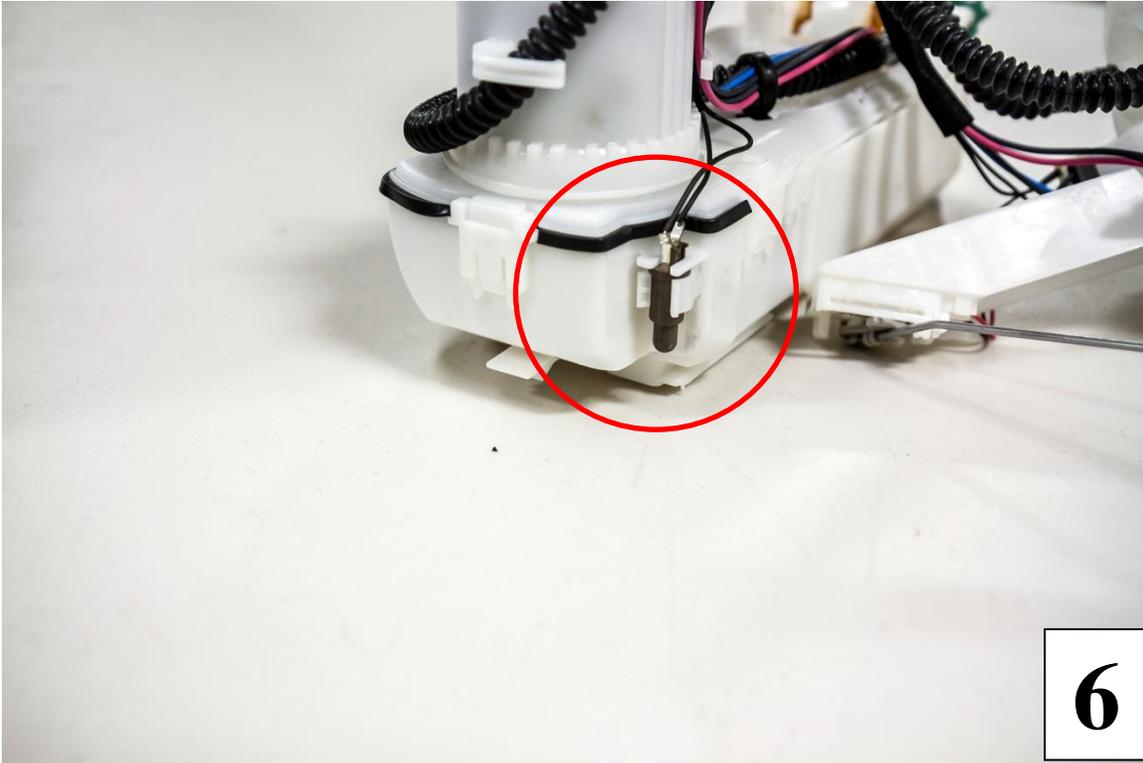


 **OMEGA**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

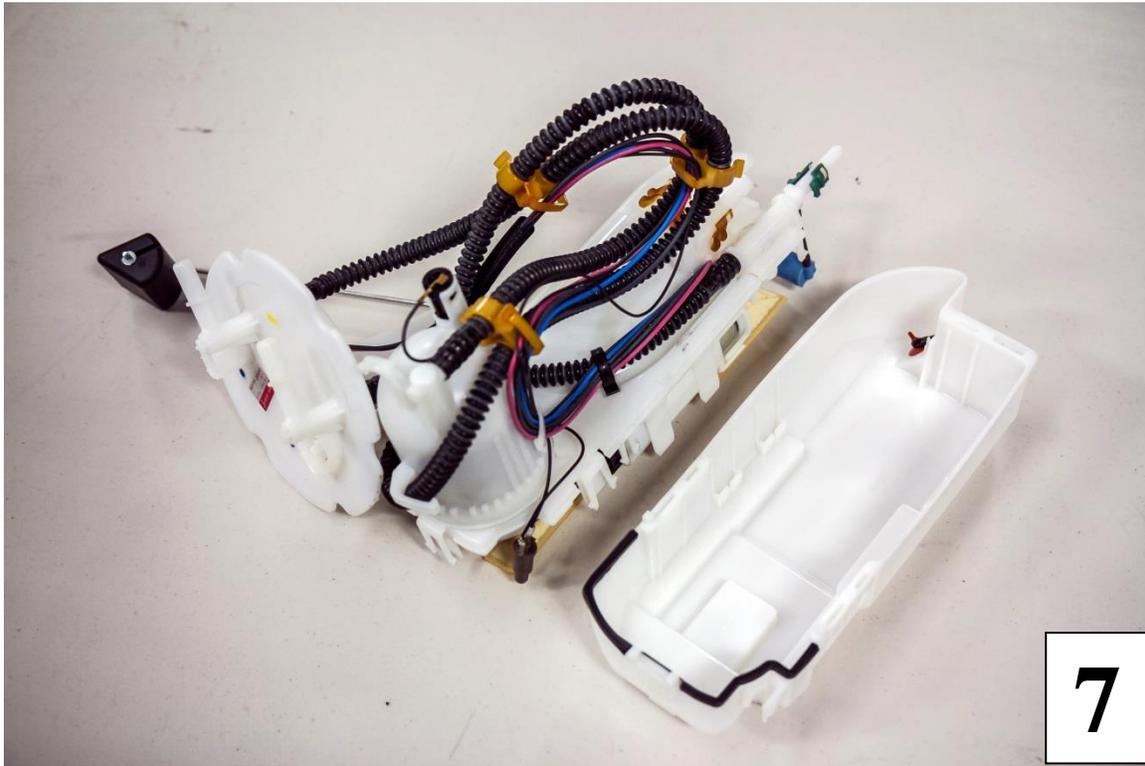
- 5) To remove the pump assembly basket, reach down to the front of the sending unit and release the clip. The clip located at the base of the basket. The top hat and sending unit pump basket will all be removed as one assembly. Once outside the tank, disconnect the 3 inside tank syphon hoses.



- 6) Once the sending unit is removed from the vehicle, removed the lower basket from the pump assembly. There are 7 clips that need to be released. Two small pocket screw drivers are usually best. You will also need to carefully remove the fuel temperature sensor.



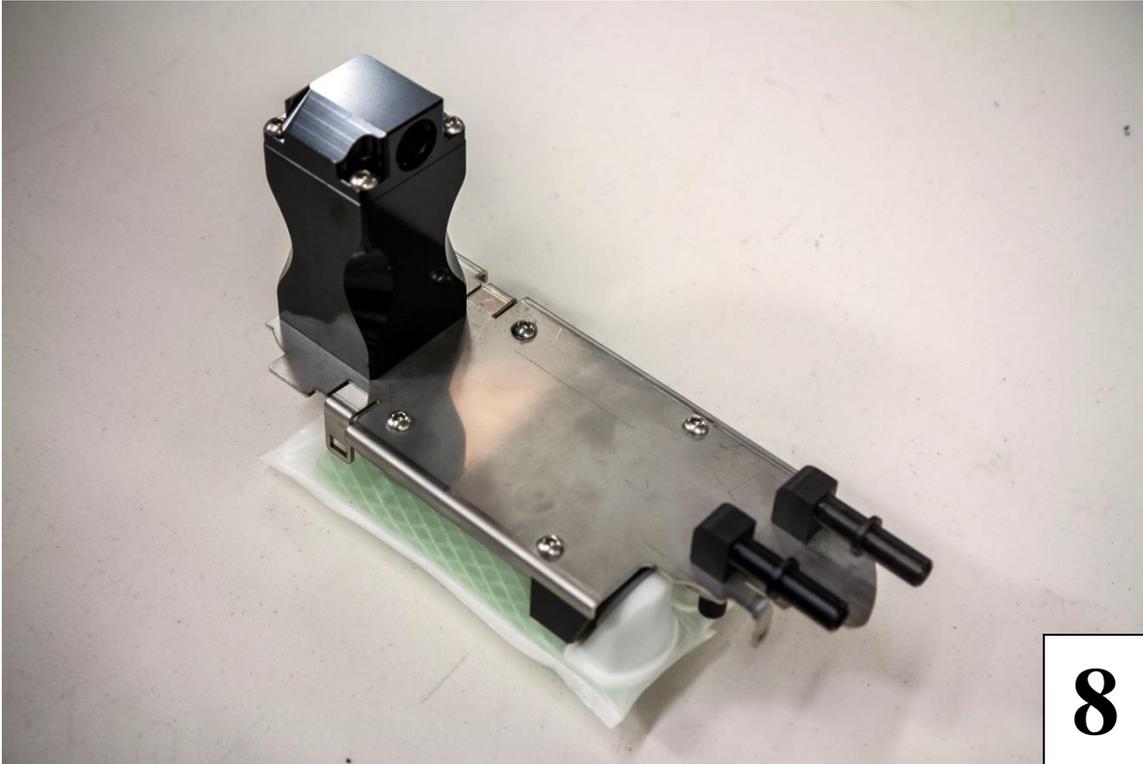
- 7) Set the factory pump and top hat assembly off to the side. You will need to remove some parts from it later steps.



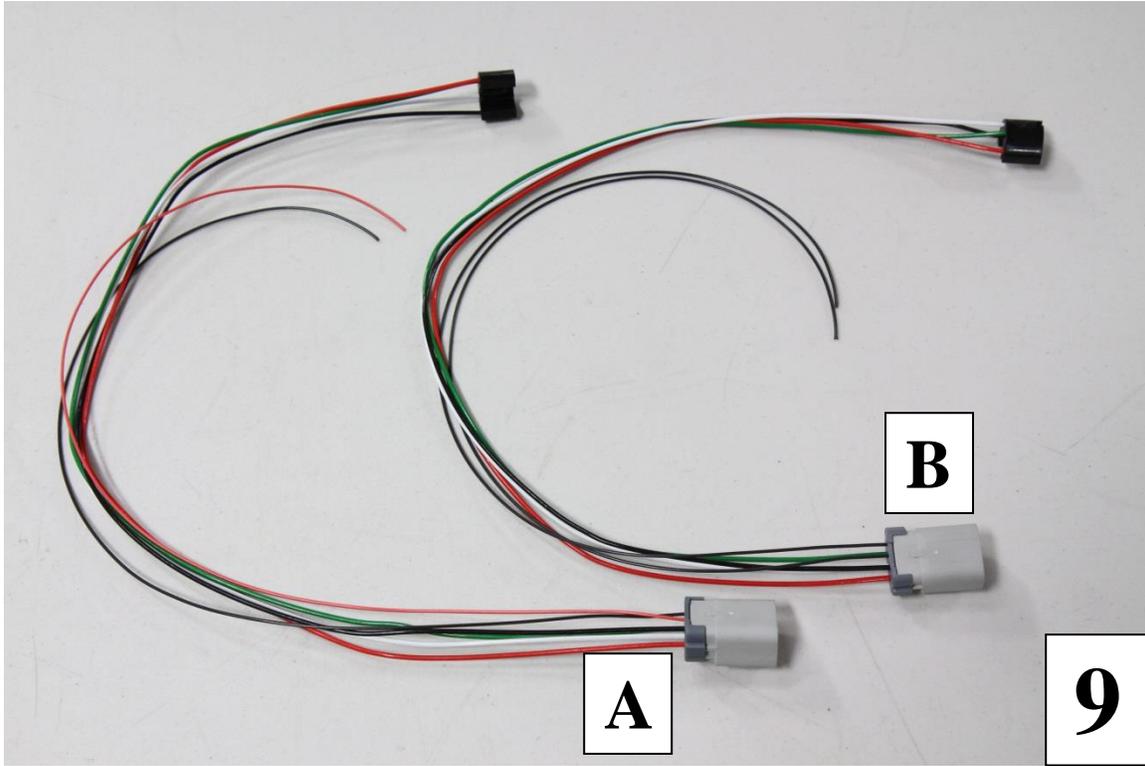
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

## **Dual GTR Brushless Pump Assembly and Install**

- 8) The Alpha pump filter housing and plate has already been assembled for you. If you need to disassemble the housing or pump mounts for any reason, make sure to apply blue Loctite® to all the hardware. We recommend using gel type because it is easier to apply and work with.

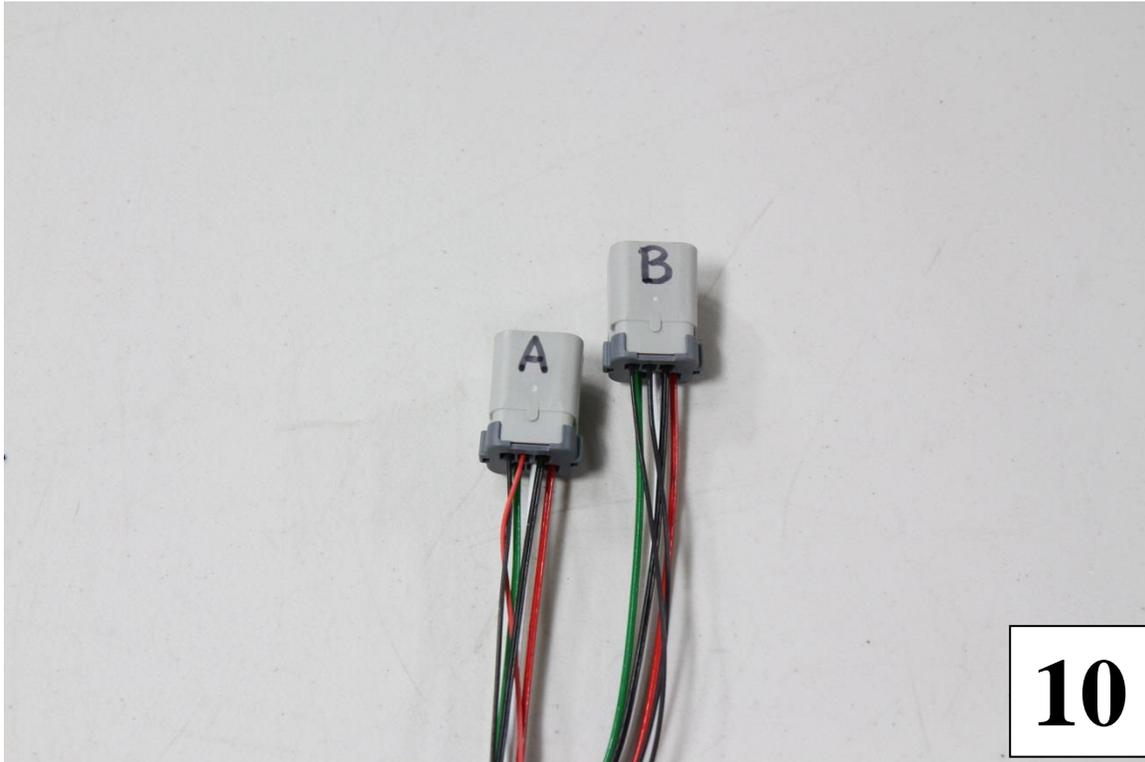


- 9) Locate the 2 inside tank wire harnesses. Both harnesses will have 6 pin bulkhead connectors on one end and 4 pin pump connectors on the other. There will also be 2 unterminated wires on each the 6 pin connectors.



*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

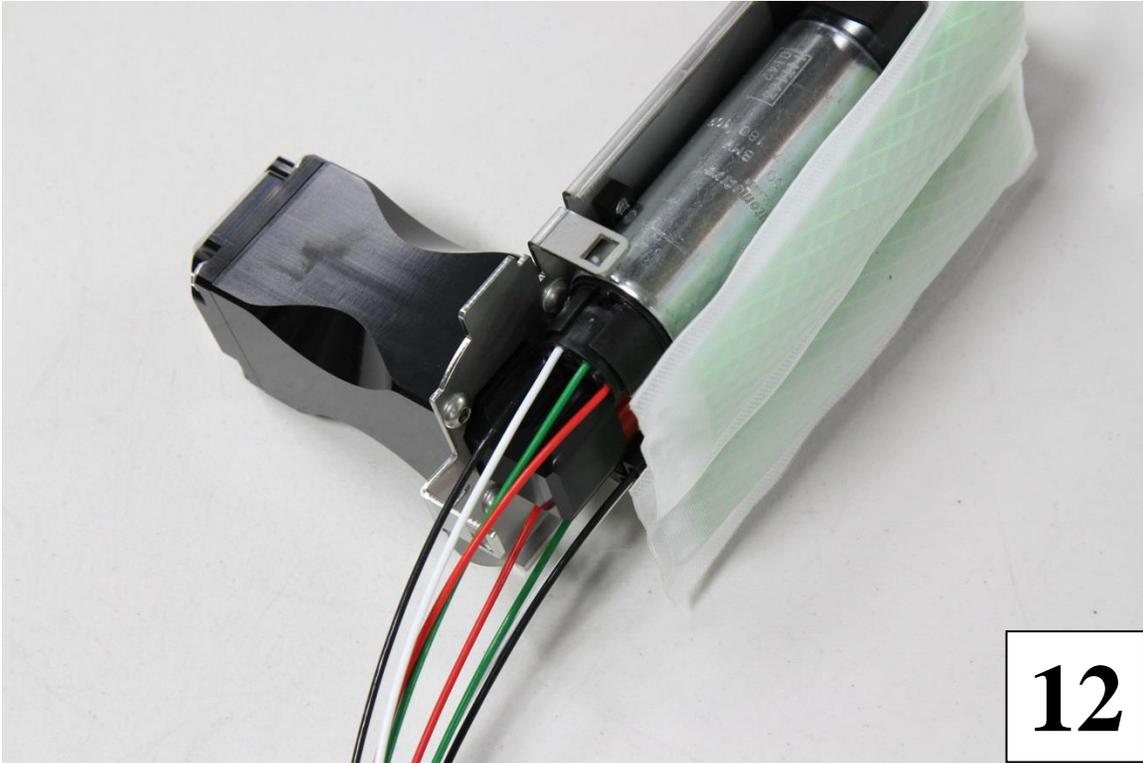
- 10)** Both harnesses are very similar. The best way to keep everything in order is too label the harnesses.
- a.** One of the harnesses will have one **Pink** and one **Black** unterminated wire. Label this **Connector A**.
  - b.** The other harness will have two **Black** unterminated wires. Label this **Connector B**.



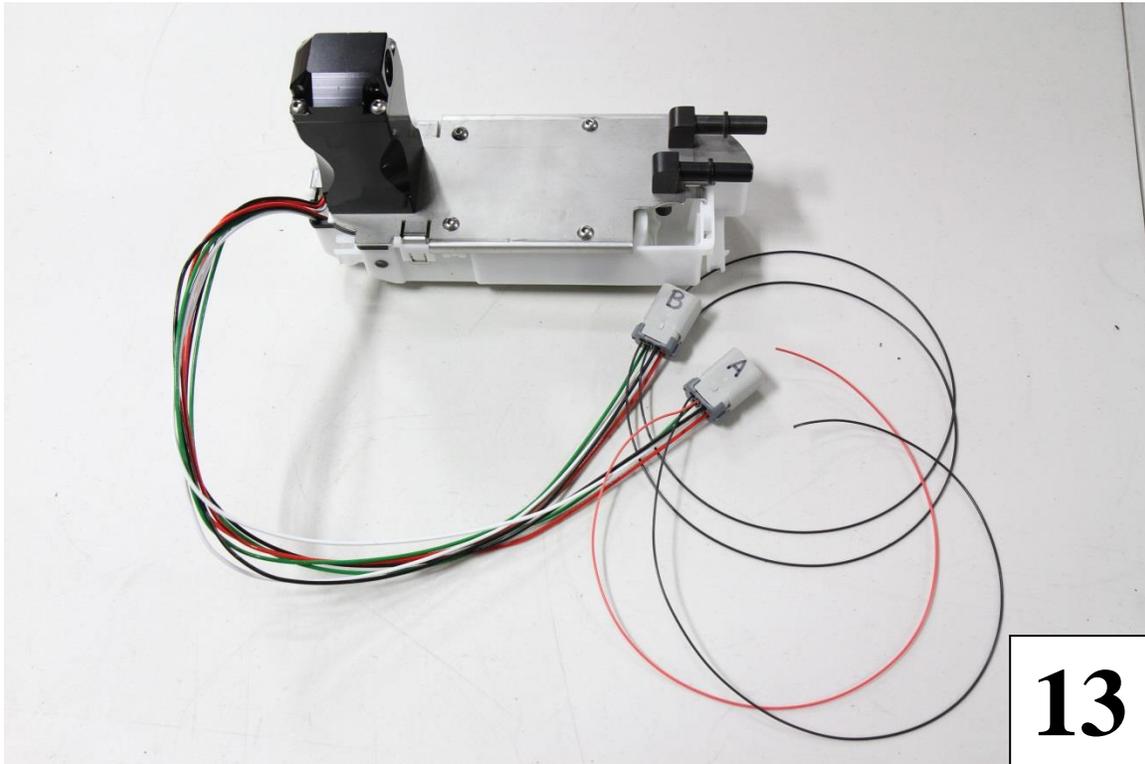
- 11)** When assembling the fuel system, always keep **Connector A** on the **Right** side of the car and **Connector B** on the **Left** side of the car. This will aid in assembly, disassembly, and diagnosing if there ever is a problem.

**Note:** Right is the passenger side of the car and Left is the driver's side.

- 12) Install both Alpha brushless fuel pump harnesses onto the fuel pumps. Installing **Connector A** on the **Right** and **Connector B** on the **Left**. Make sure the connector fully seats into place and the release clip is secure. The connector fit is snug so it may require a little bit of force to get it to clip in.



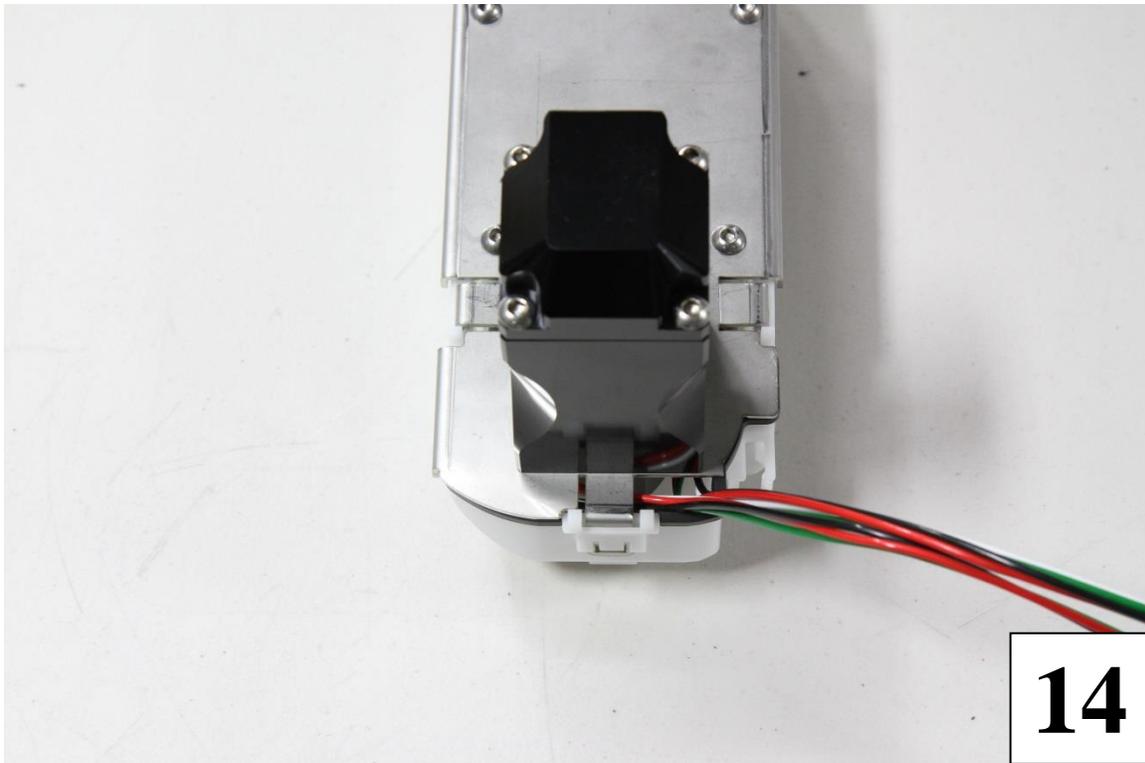
- 13) The Alpha brushless fuel pump assembly is designed to clip into the factory basket.  
Line up the tabs and make sure they fully clip into place.



13

*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

- 14) Route the Alpha brushless fuel pump wire harness out of the opening in the top plate near the filter housing.



*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

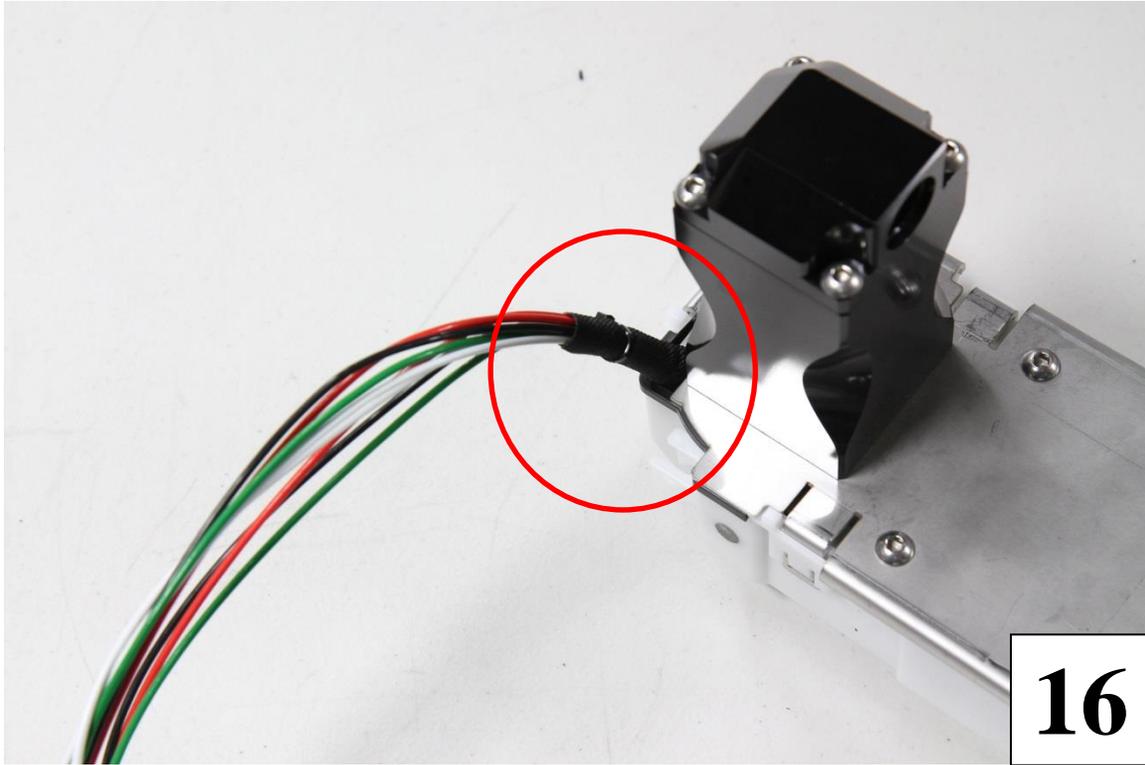
- 15) On the factory pump and top hat assembly, locate the wire protection wrap on the wires near the top hat. Remove this protective wrap.



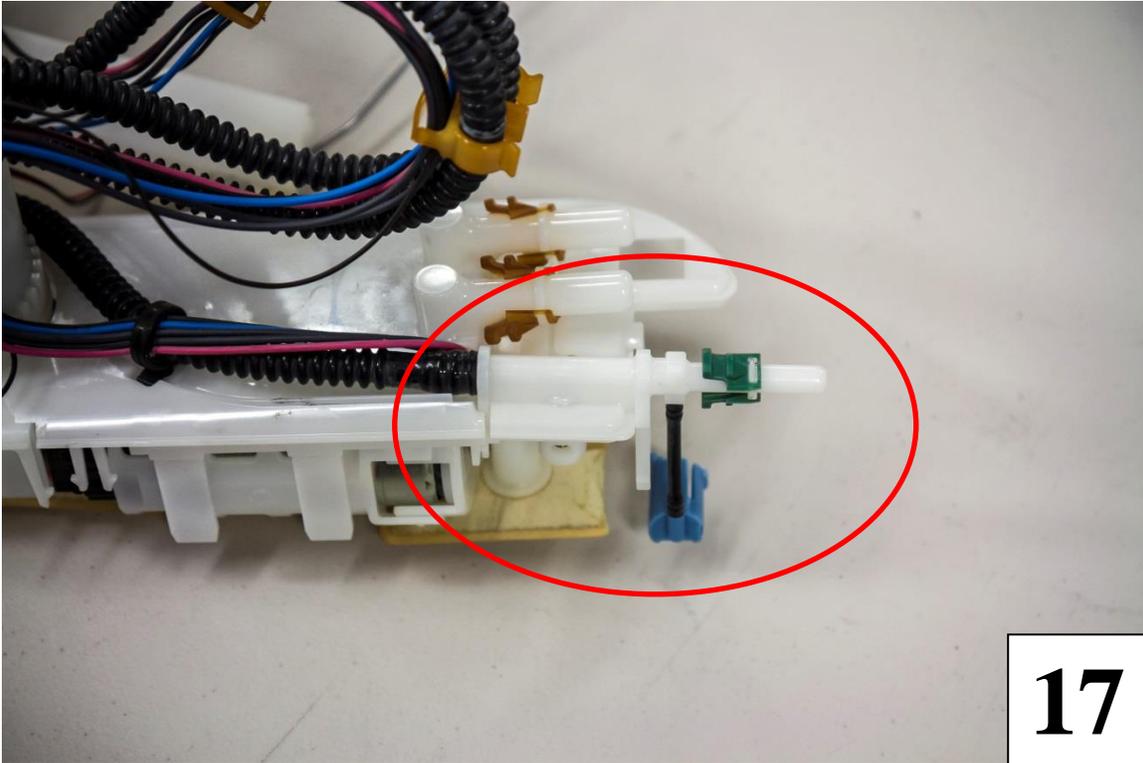
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*



- 16) Apply the wrap to the new Alpha brushless pump harness and slide it down into the opening of the top plate. Use a supplied zip tie to secure the wrap in place. This will protect the harness from any chaffing.



17) Set the new Alpha brushless pump sending unit aside. Grab the factory fuel pump assembly and remove the syphon system pressure regulator from the assembly. It is the part with the smaller quick connect fitting.



**17**

**18)** You will need to remove this part by carefully cutting the black hose off. Be mindful not to cut the barb as this part will be reused in the new Alpha brushless fuel pump system. Start by cutting off the black hose. A new sharp razor blade is best.



19) To remove the rest of the hose, cut straight down the length of the hose all the way through until it splits open. Remove the leftover hose and discard.



*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

- 20) Locate the return hose and the #15.7 oetiker clamp. It is the 16-1/2" open ended #6 grey Nomex braider hose to -6AN 45 degree hose end. The oetiker clamps require a special set of crimpers.



*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

- 21) Making sure the hose is free of debris; install it on to the syphon regulator as shown. Remove the tape and slide the oetiker clamp on. Clamp the hose into place.

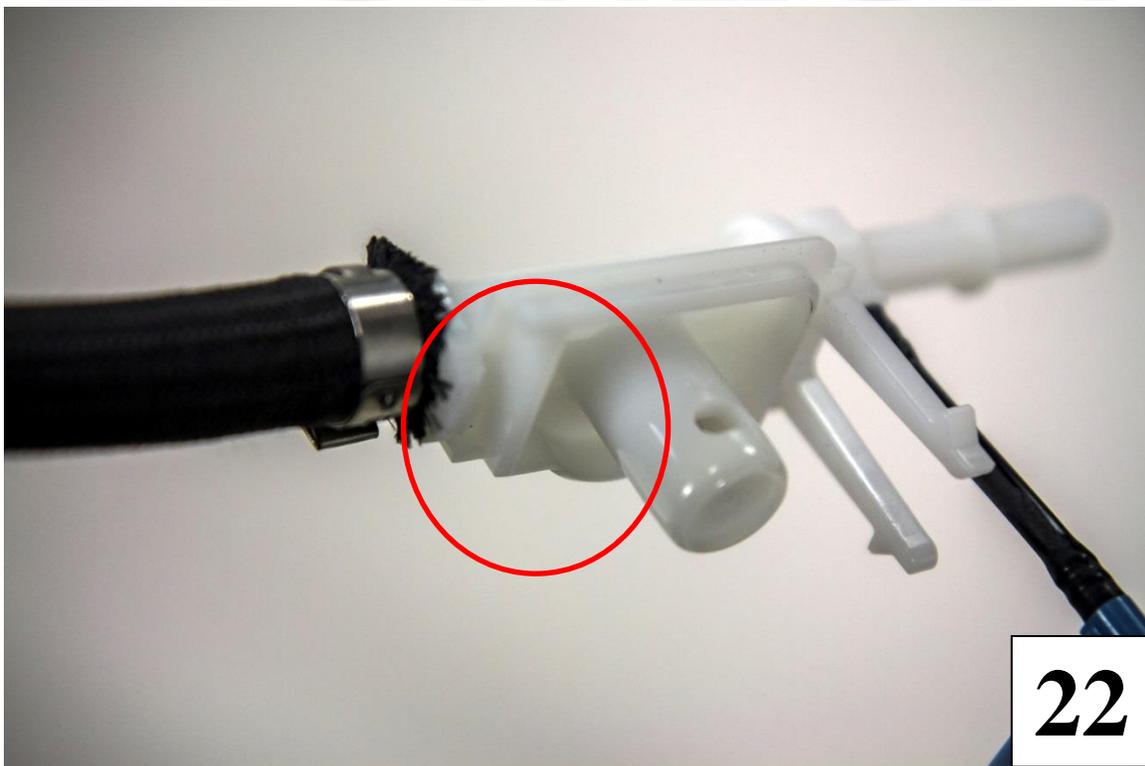
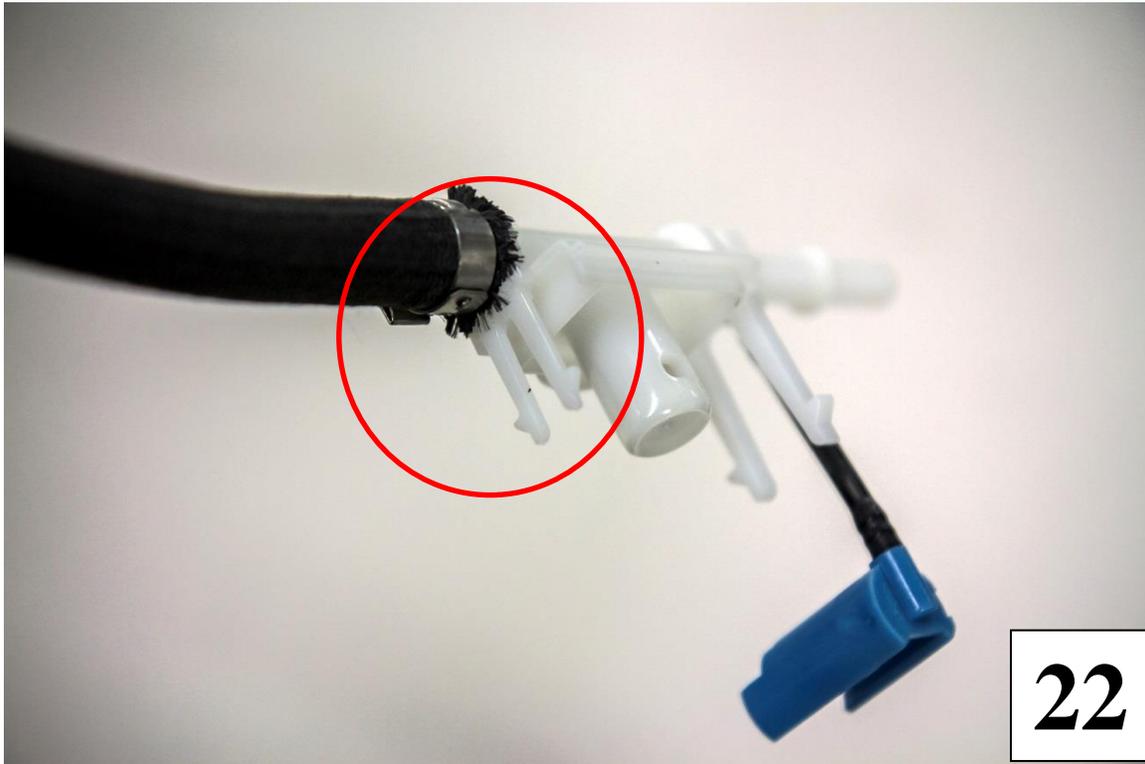


**21**

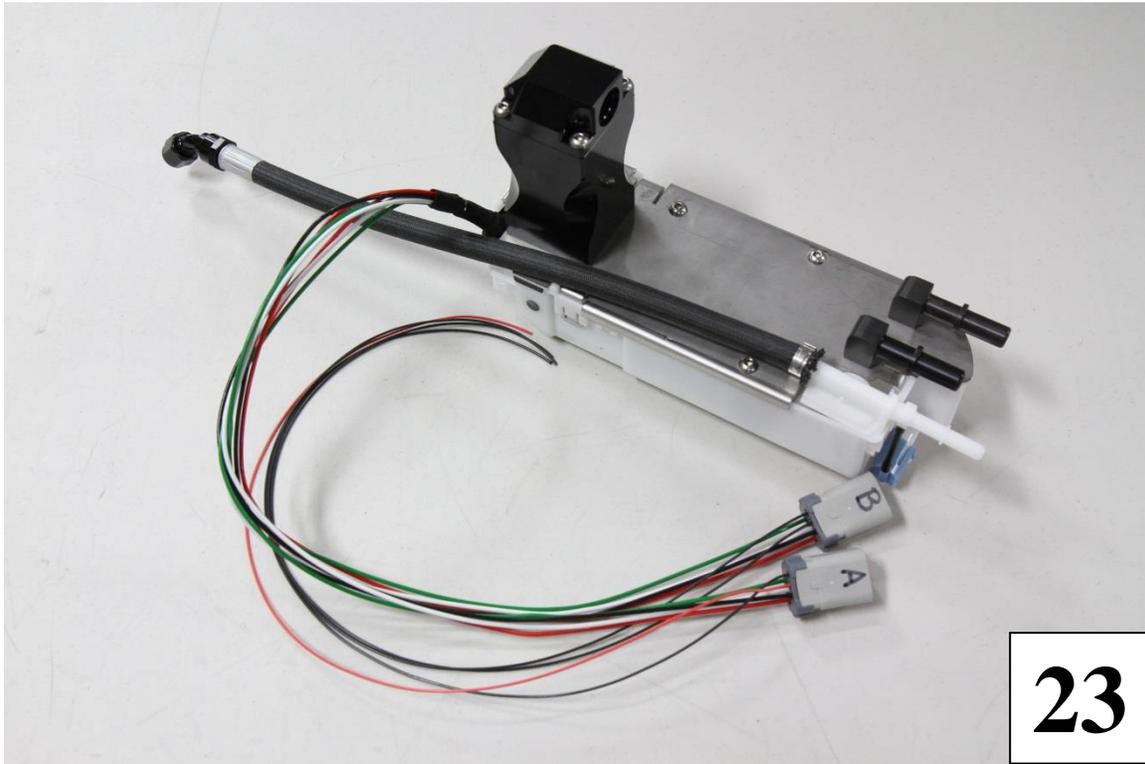


**21**

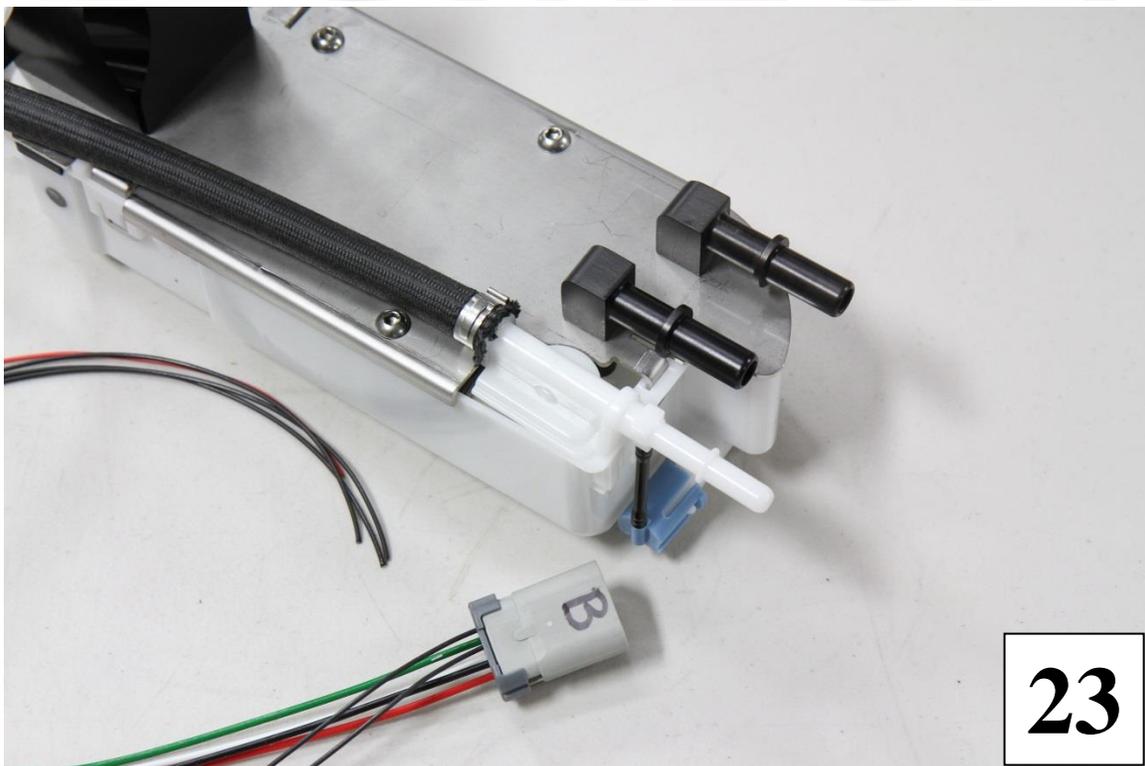
22) On the bottom of the syphon regulator, there are 2 sets of clips. Remove the rear clips in the pictures shown by using a sharp razor blade or sharp side cutters.



23) Clip the syphon regulator and hose into place on the factory basket with the Alpha brushless fuel pump assembly.

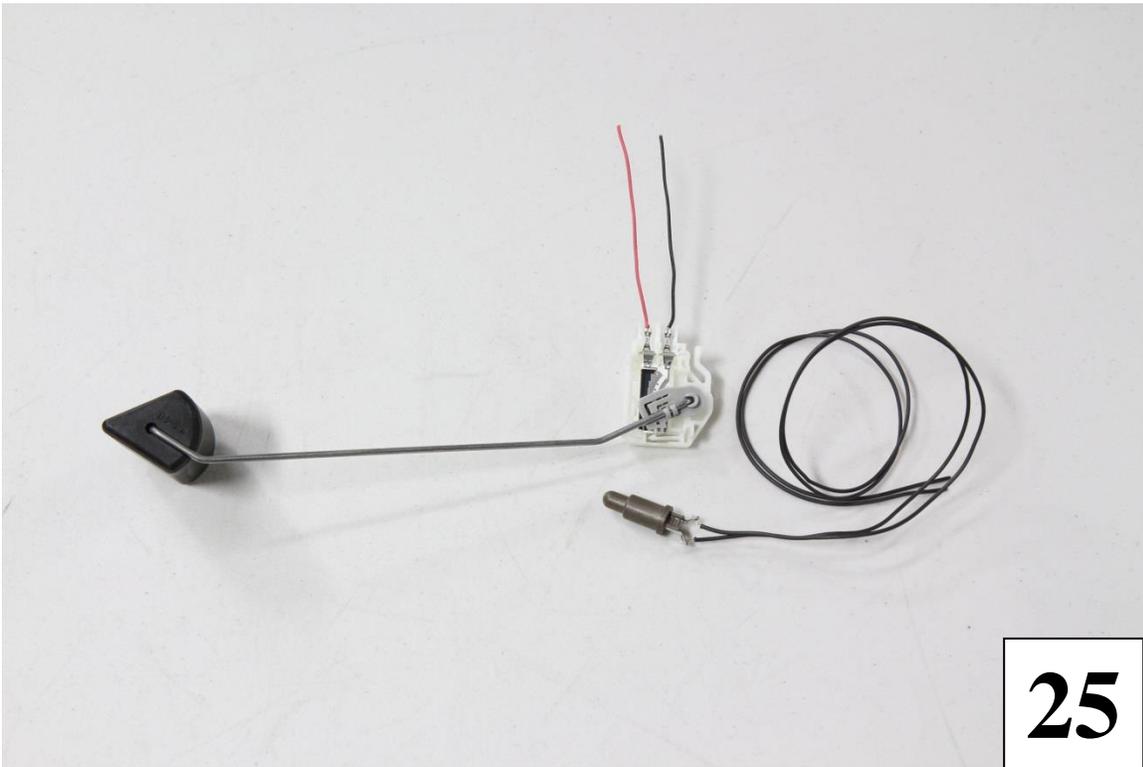


23



23

- 24) Set the Alpha brushless fuel pump assembly off to the side and grab the factory sending unit. The fuel temp sensor and fuel level sensor will need to be removed from the factory sending unit top.
- 25) Start by cutting the wires approximately 1" away from the connector at the top hat. The 4 wires all lead to one 3 pin connector in the top hat. The final result is pictured below.

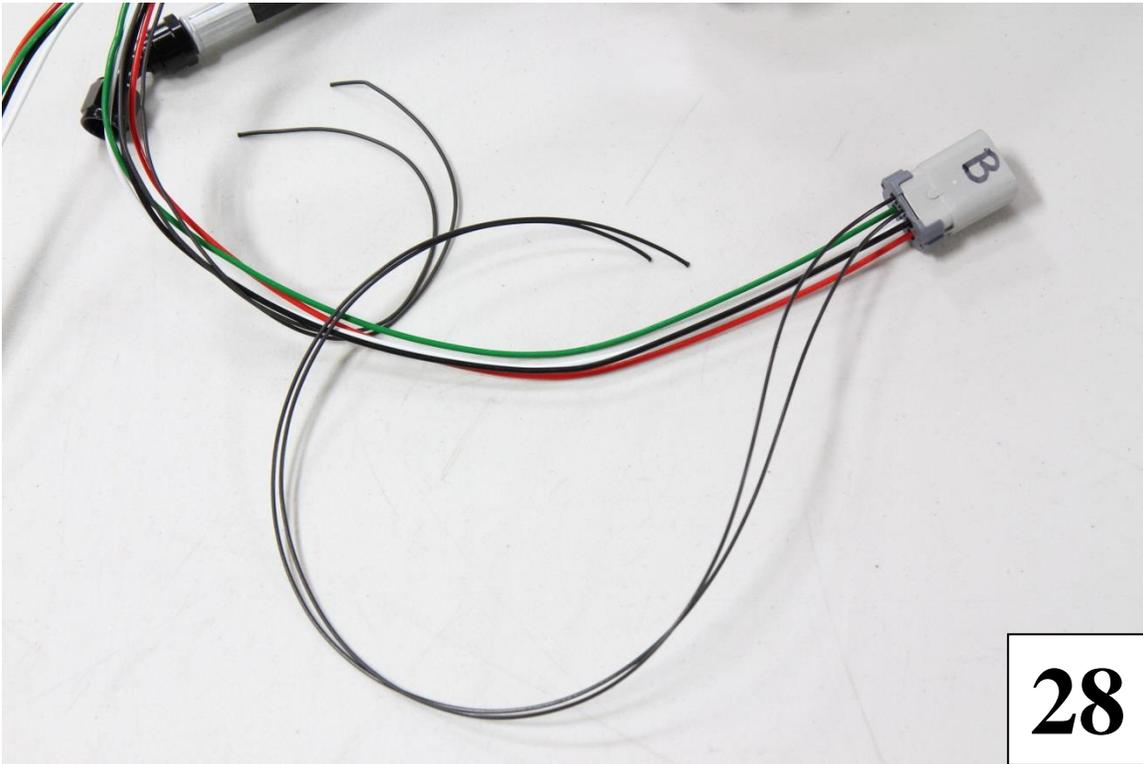


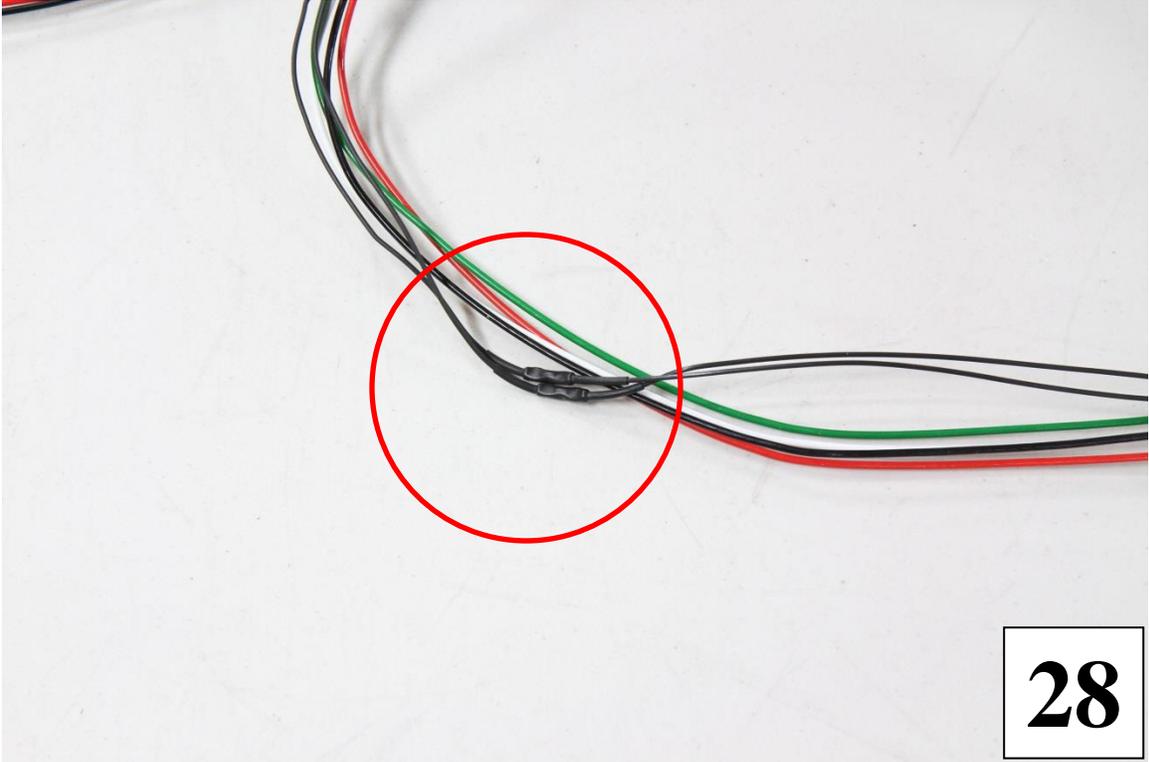
- 26) Clip in the fuel temperature sensor into its original location. Route the fuel pump and fuel temperature sensor wiring together with a 2 zip ties about 4" apart. Add a little bit of slack in the fuel temperature sensor wiring to prevent the harness from pulling the wires out of the sensor. Zip tie both brushless fuel pump harnesses and the fuel temp sensor wiring together but not **Pink** and **Black** wires from **Connector A**. They will be wired in a latter step.



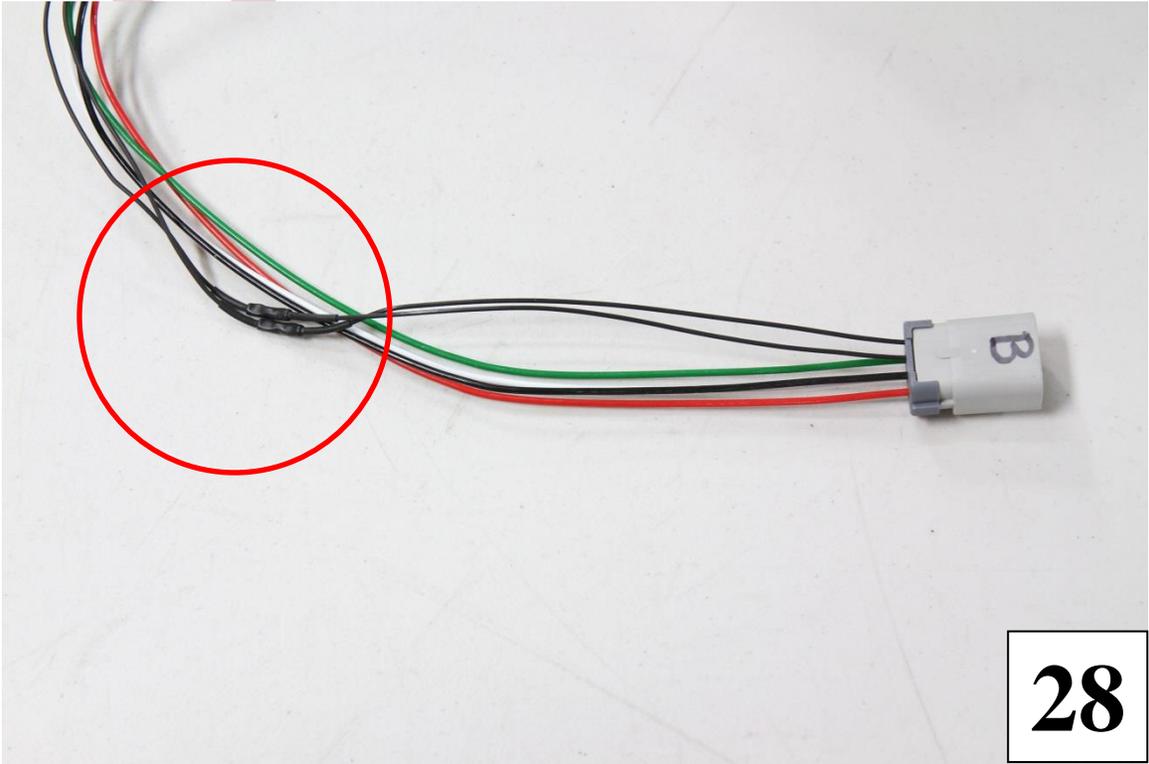
27) Route the fuel temp sensor wiring up to **Connector B**. The 2 **Black** wires of the fuel temperature sensor will need to be connected to the 2 **Black** unterminated wires on the 6 pin **Connector B**. Polarity does not matter; you can connect the black wires either way.

28) The 2 unterminated wires are extra-long in case the sensor was cut previously. Cut the wires so when they are connected, they follow the brushless fuel pump harness with **Connector B**. Locate two 18-22ga barrel crimps and the 1/8" shrink wrap tubing. Cut two 1-1/2" pieces of 1/8" shrink wrap tubing. Use the barrel crimps and shrink wrap tubing to make the connection.



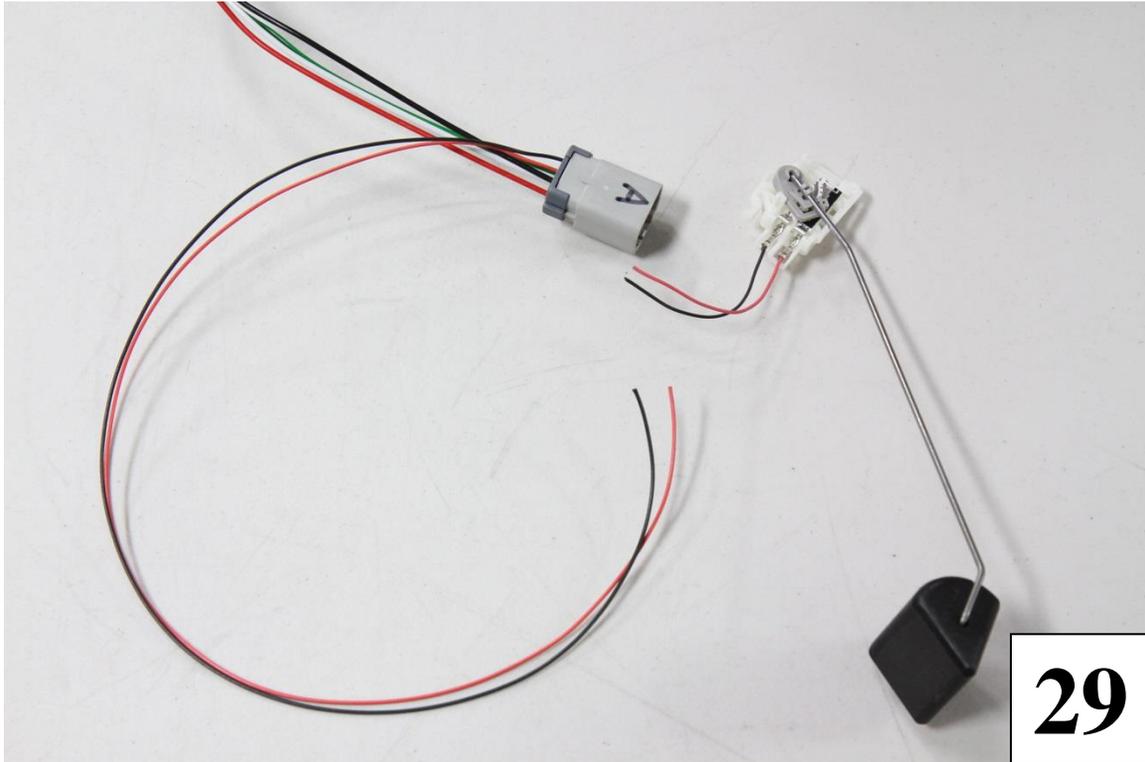


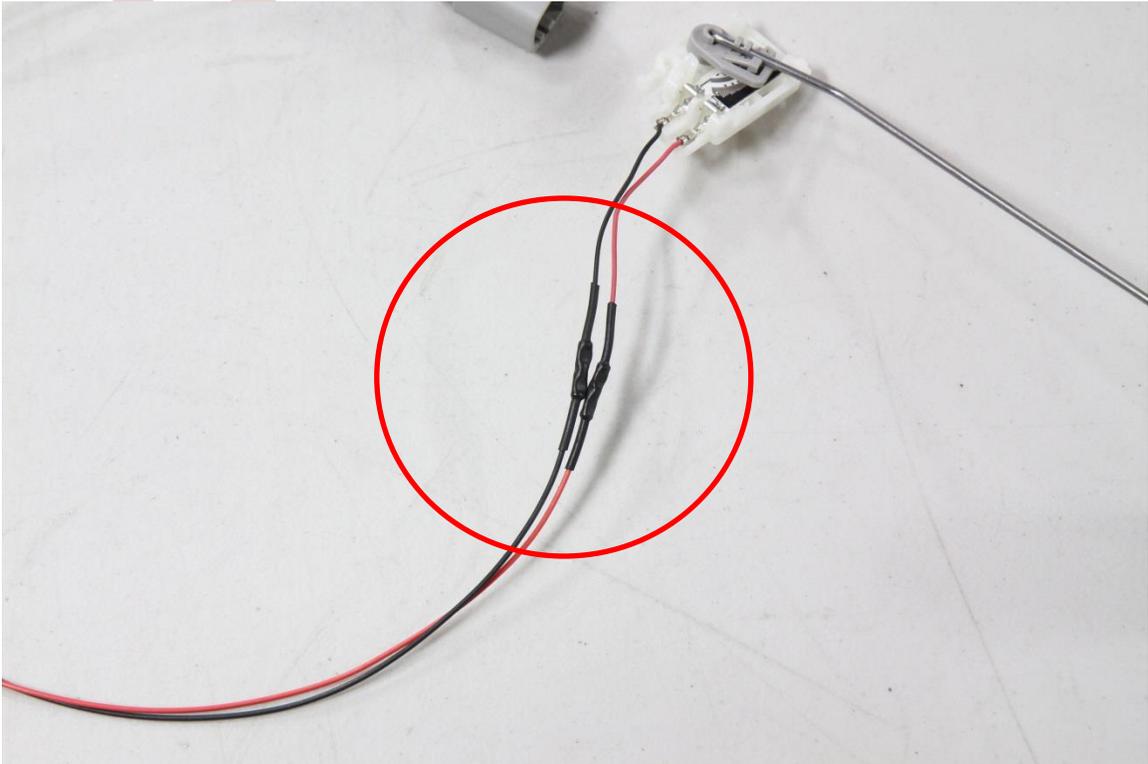
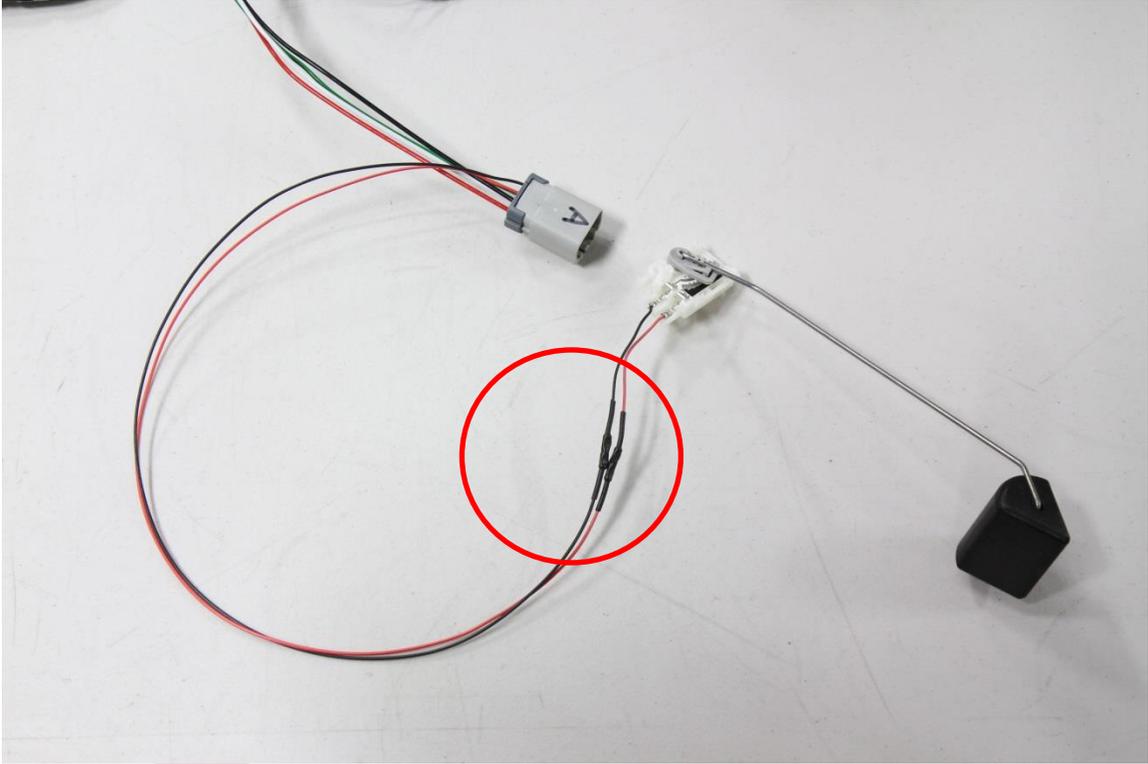
**28**



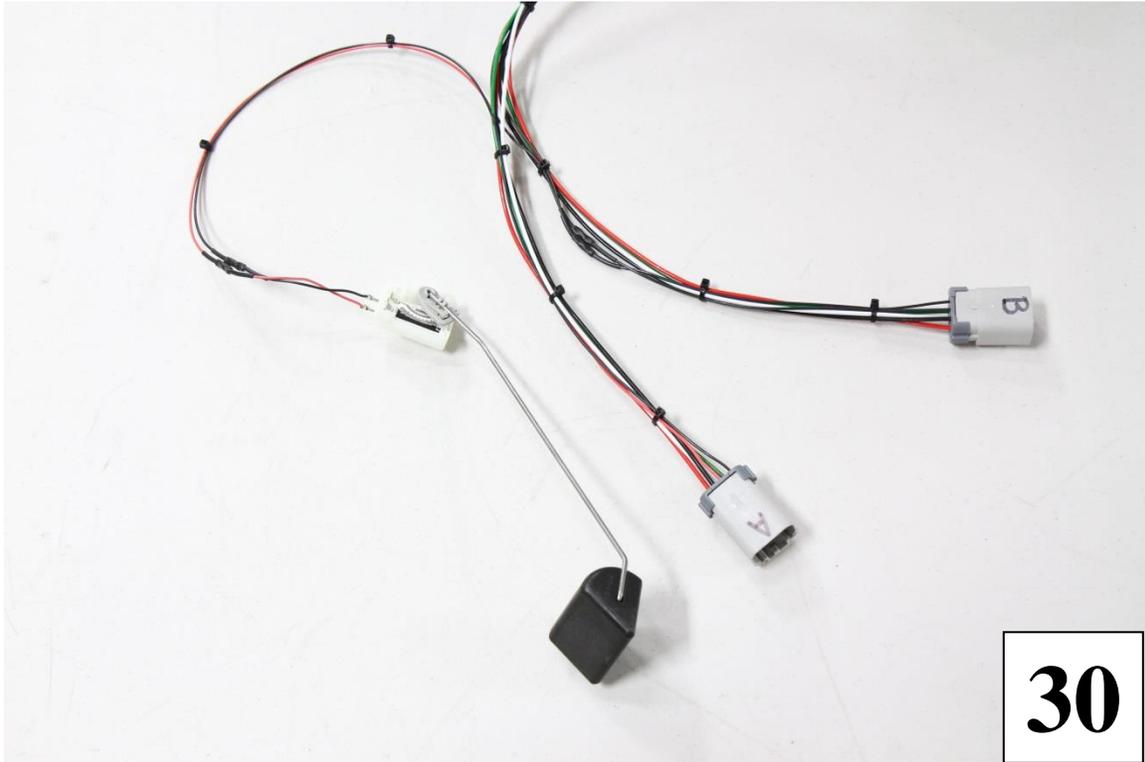
**28**

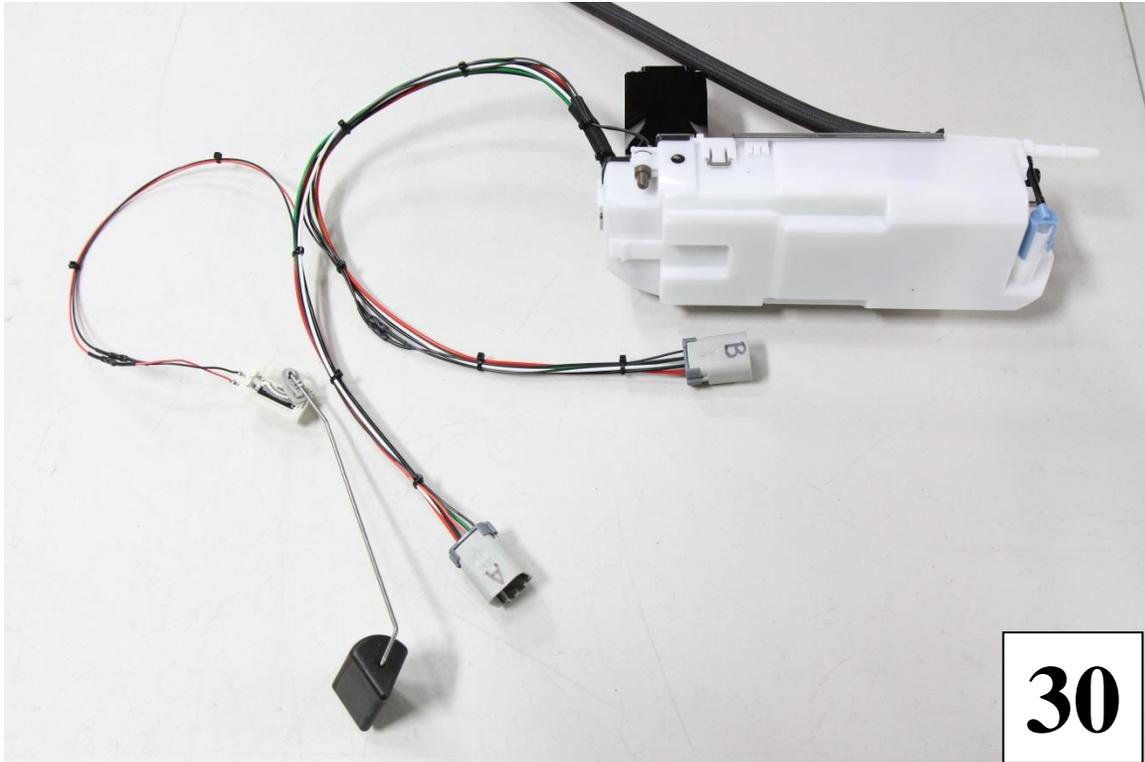
29) Next step is to wire the fuel level sensor to **Connector A**. Locate two 18-22ga barrel crimps and the 1/8" shrink wrap tubing. Cut two 1-1/2" pieces of 1/8" shrink wrap tubing. Leave the **Pink** and **Black** wires full length from **Connector A** and use the barrel crimps with shrink wrap tubing to make the connection at the fuel level sensor. Match the colors and connect the **Pink** to the **Pink** wire and the **Black** to the **Black** wire.





30) Use a couple zip ties to tie the fuel level sensor wiring together about half way to the 6 pin connectors. Place one zip tie approximately half way between the 6 pin connectors and the fuel sending unit assembly tying all the wires together on both harnesses. From that point, use zip ties to tie together the separate harnesses of **Connector A** and **B**. Do not tie everything together. Each connector will need about 12" of independence for installing the top hat in a later step.





31) On the inside of the fuel tank, reinstall the retaining clips on the 3 syphon lines.

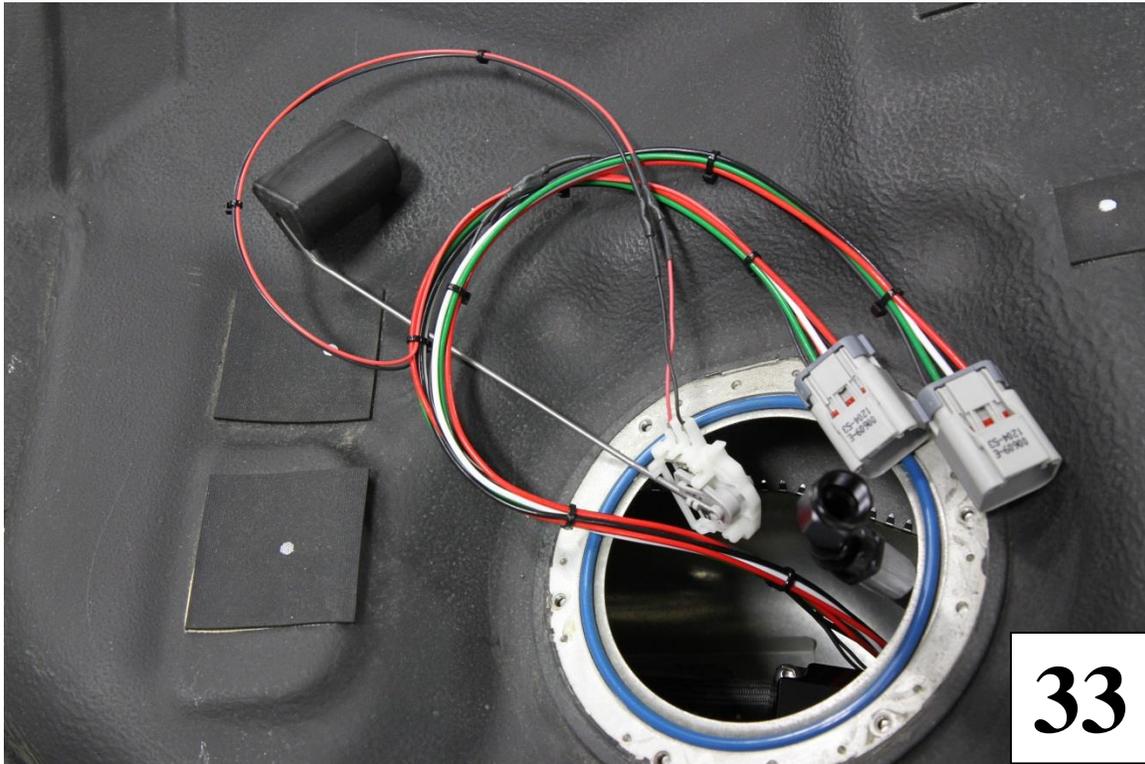


32) Locate the 2 strips of Spring Fast metal edge protector. Install the protector on the edges inside the fuel tank as shown.





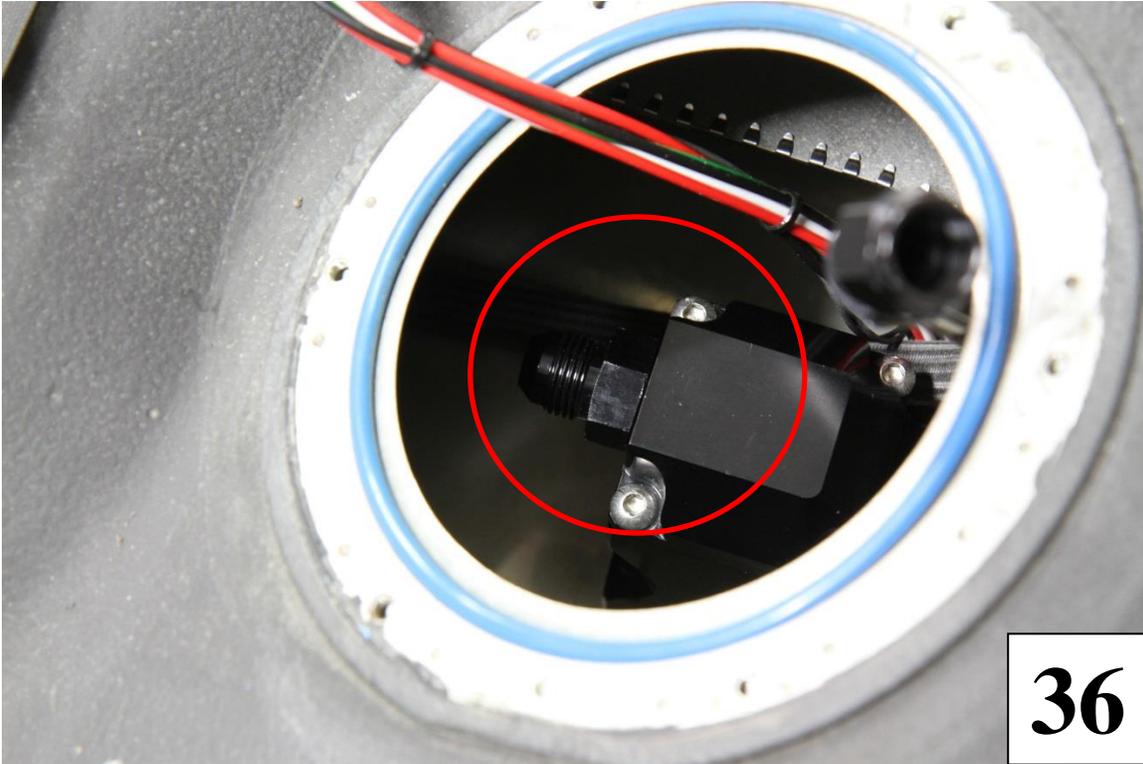
**33)** Install the Alpha brushless pump assembly into the tank.



**34)** Once installed, slide the sending unit towards the front of the car and connect the syphon system connections. These are the 2 large and 1 smaller hose inside the tank. They need to be reinstalled after installing the sending unit otherwise they will interfere with installation.

**35)** Position the sending unit on to the mounting rails inside the tank. Slide the sending unit towards the rear of the car until it locks into place. Confirm it is locked into place by lightly trying to move it forward.

- 36) Locate and install the #8 O-ring to -8AN port fitting into the filter housing outlet. Apply a little bit of lube to the O-ring before installation.



*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

**37)** Locate the 21” feed hose with a straight -8AN hose end and a straight-8AN hose end on the other end. Install the straight fitting inside the tank on the # 8 filter outlet port. Leave one end outside the tank.



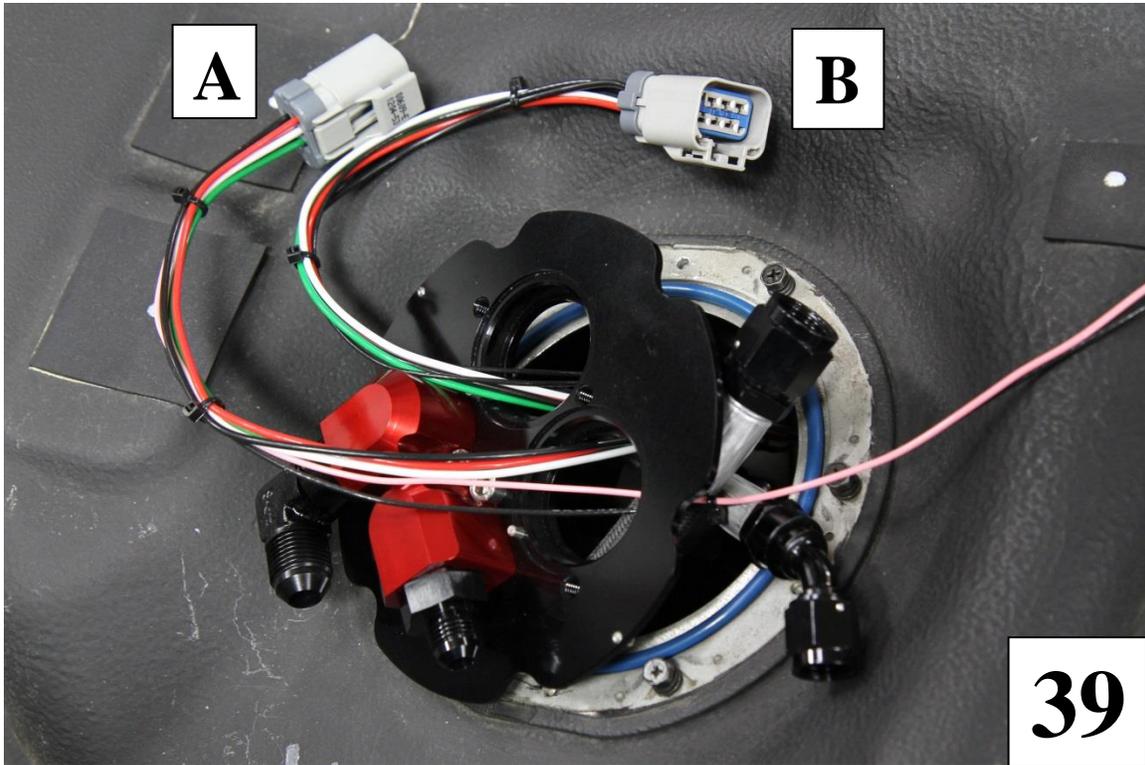


**38)** Locate the billet top hat. The Red bulkheads and fittings have already been installed for you. The electrical bulkheads are left out for now. They are the last piece to be install once the billet top hat is final installed.

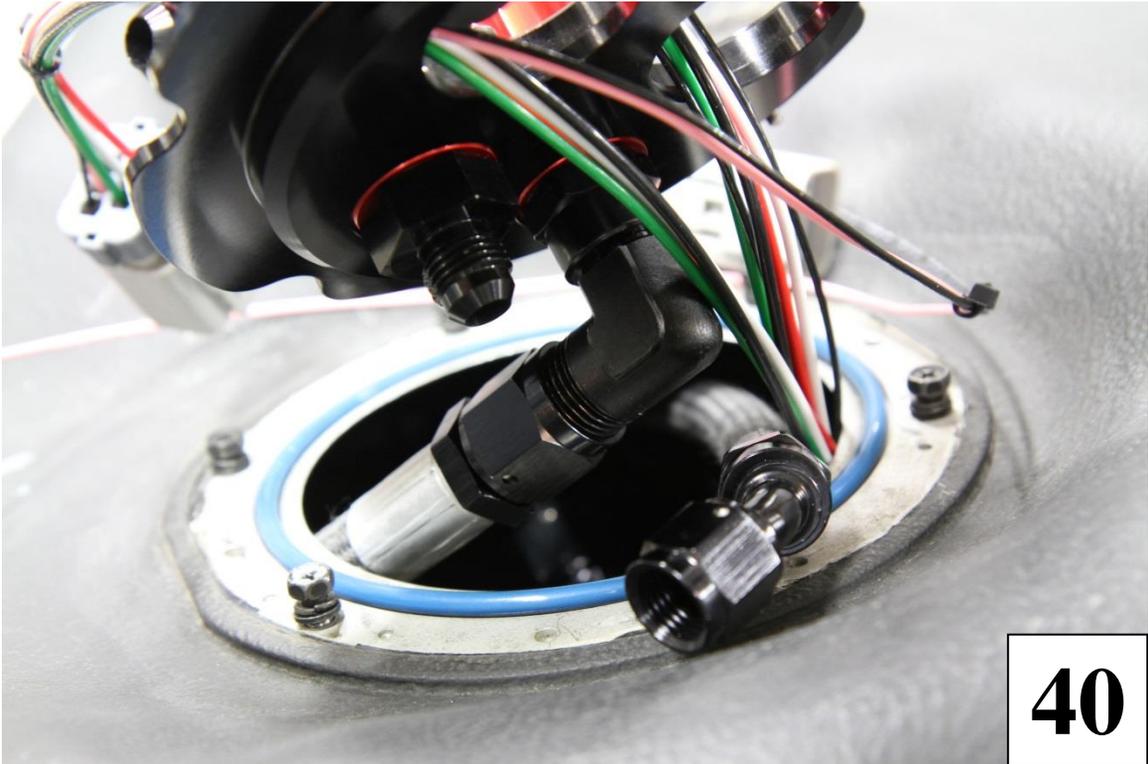
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*



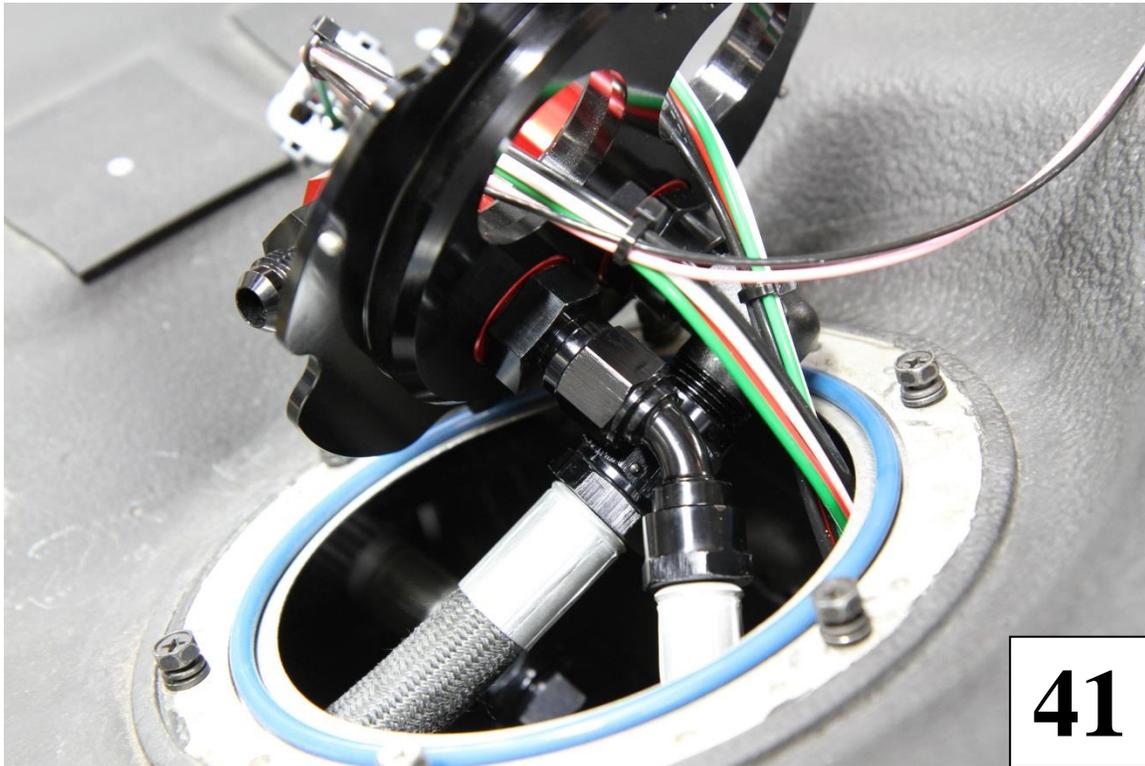
39) The next steps are to install the billet top hat. Start by slipping the inside tank harnesses **A** and **B** through the open ports. Connector **A** gets installed in the right side open port or Passenger side. Connector **B** gets install in the left side open port or Driver's side. The fuel level sensor is left outside the tank for now.



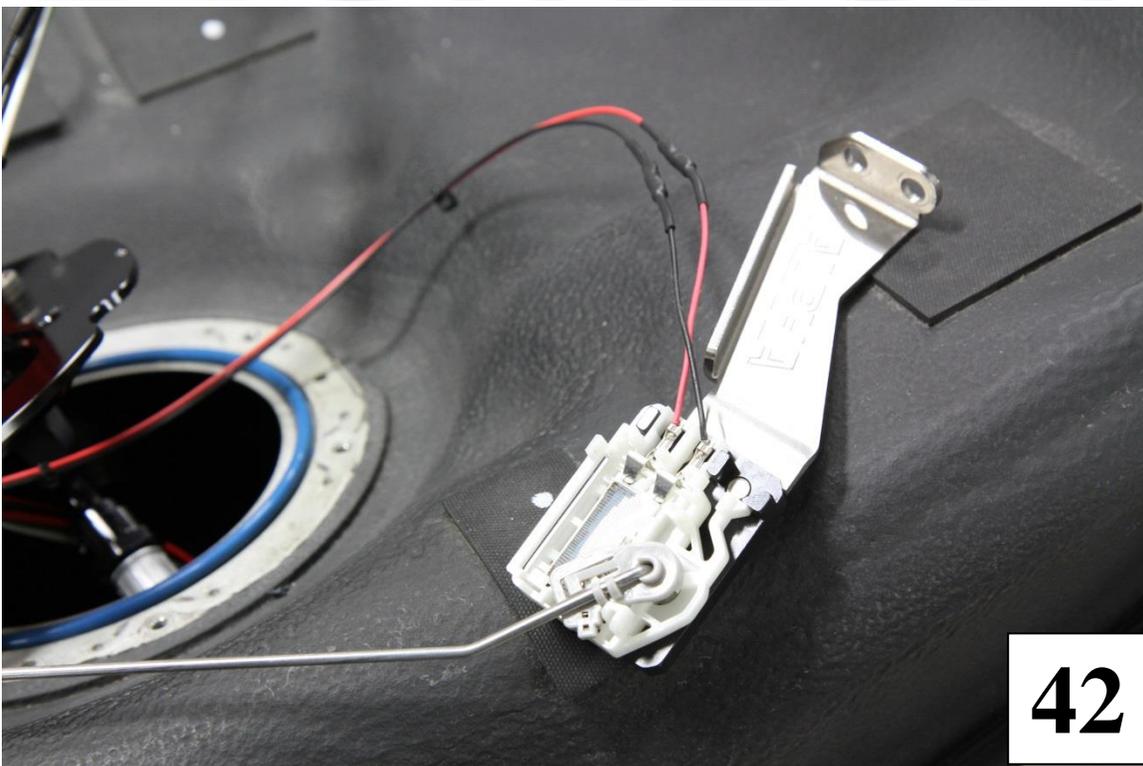
**40)** Install the feed hose straight -8AN fitting on to the top hat. It will need to be tightened so the fitting is pointing slightly to the right, passenger side. Level the top hat sending unit as it would sit on the tank to tighten the -8AN fitting. The straight fittings do not swivel so the orientation of where it is tighten is important to make sure the line does not twist when final installing the hat. Pictures # **45** will show the inside tank hose and wire harness routing.



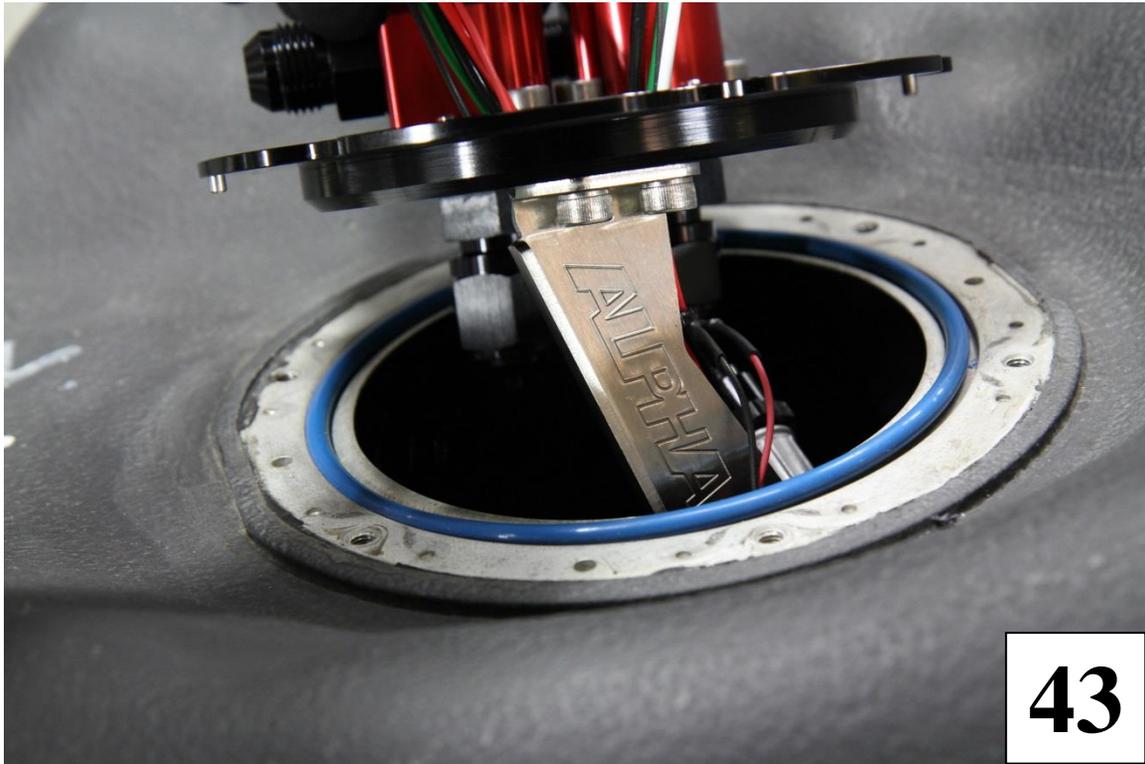
**41)** Install the return hose 45 degree -6AN fitting on to the top hat. Route the hose under the outlet fitting and hose of the filter housing. The fitting will be facing the right, passenger side of the tank when installed on the top hat. Make sure the hose does not point to the front in the tank. It may interfere with the level sensor. Pictures # **45**, will show the inside tank hose and wire harness routing.



42) Locate the fuel level sensor bracket and two M6 x 1.0 x 8mm cap strews. Slide the fuel level sensor into the bracket until it clips into place.



- 43)** Install the level sensor and bracket into the tank and use the 2 cap screw in bolt the level sensor onto the billet top hat.



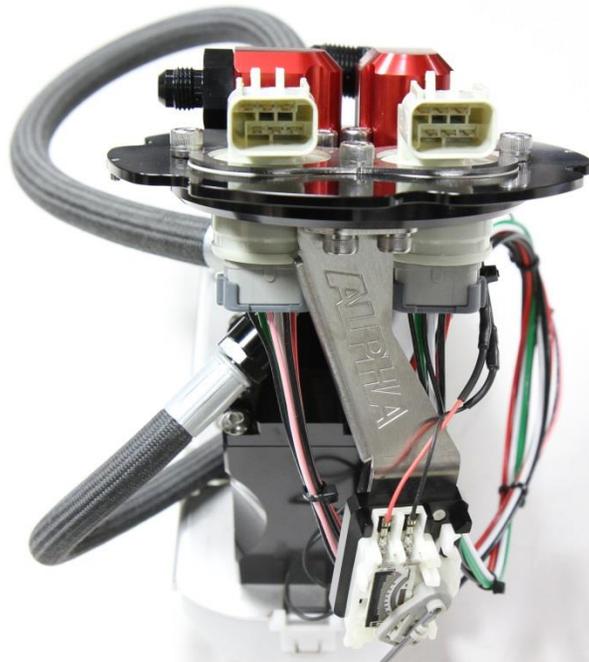
- 44)** Slide the top hat into position and align the dowel pin in the tank. Take a look through the open ports and make sure the fuel lines clear everything and the wire harnesses are not in the way of the level sensor.
- 45)** Push the wire harnesses into the tank through the open ports until the connector is close to the top hat. Confirm the harnesses sit in the rear of the tank on the right side or Driver's side of the filter housing. If they fall forward, they could interfere with the level sensor. The sending unit should look like the next few pictures when installed inside the tank.



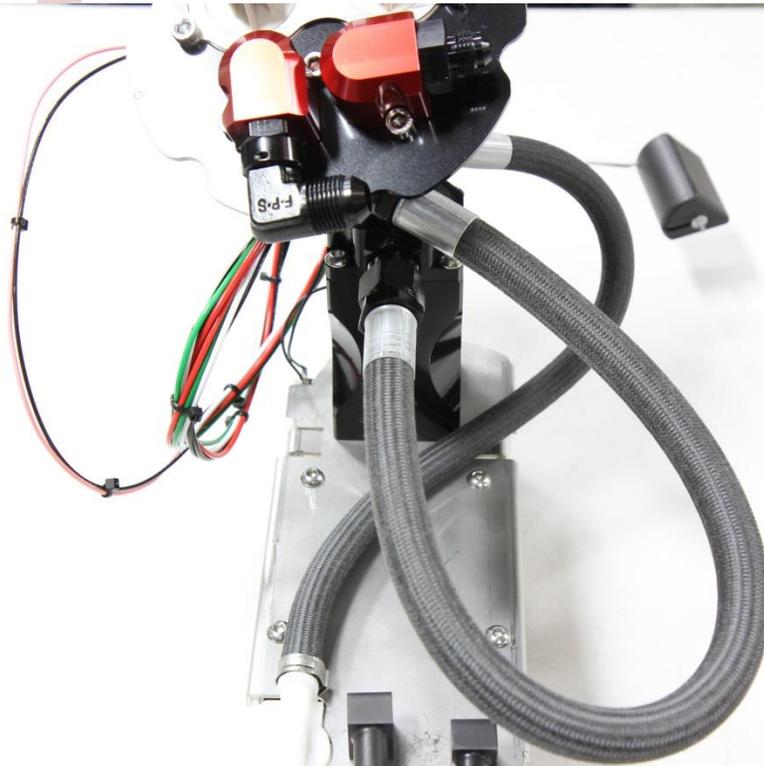
45



45



45

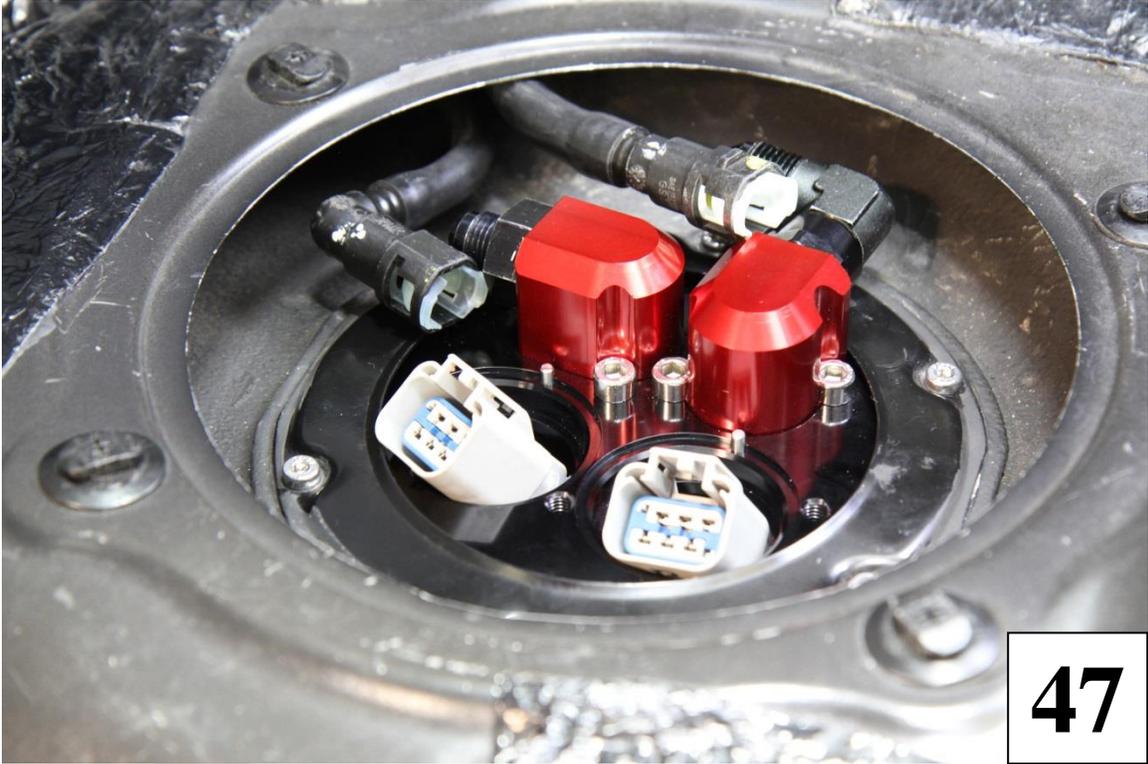


45

**46)** Replace the fuel sending unit top hat O-ring if necessary. One has been provided for you.

**47)** Locate the six M5 x 0.8 x 6mm low profile cap screws. Use these screw to install the factory sending unit retaining ring.





### Using Factory Lines

48) If you are not using the factory fuel lines in the car, skip to step # 54.

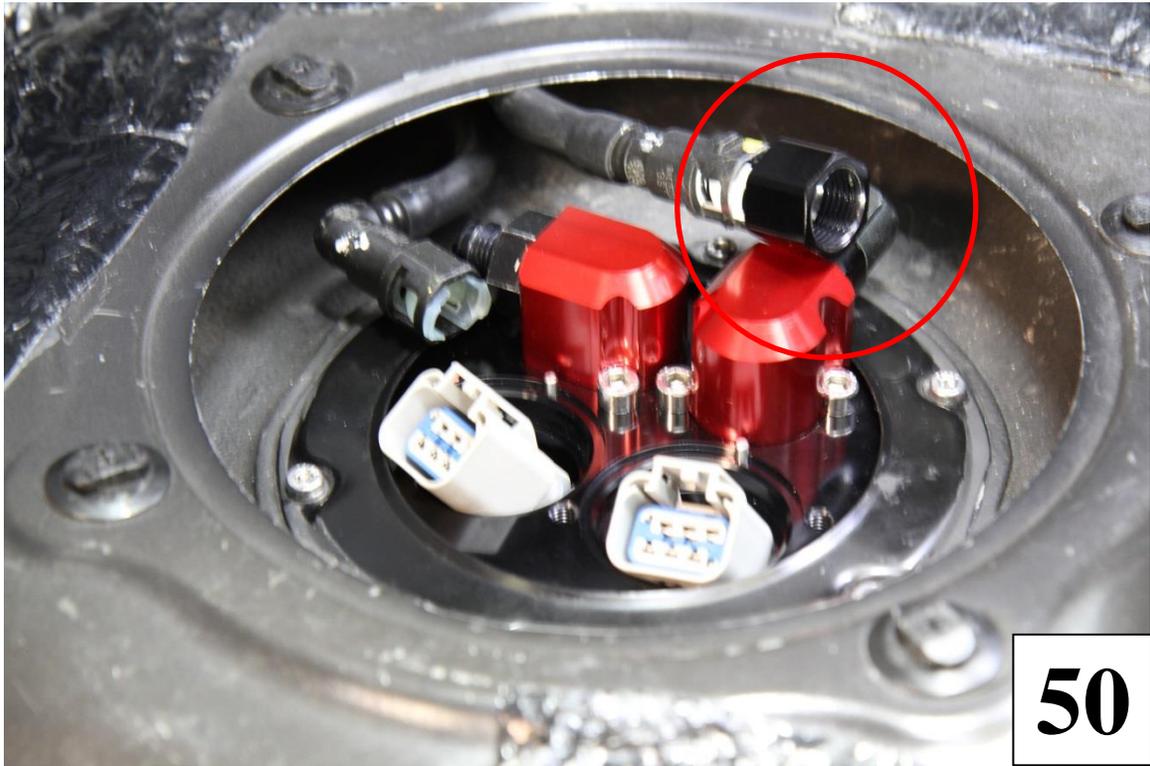
49) Locate the female JIC quick connect fittings. One of the fittings will be a female - 8AN to 3/8" quick connect. The other will be a female -6AN to 3/8" quick connect.



49

**Ω** OMEGA  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

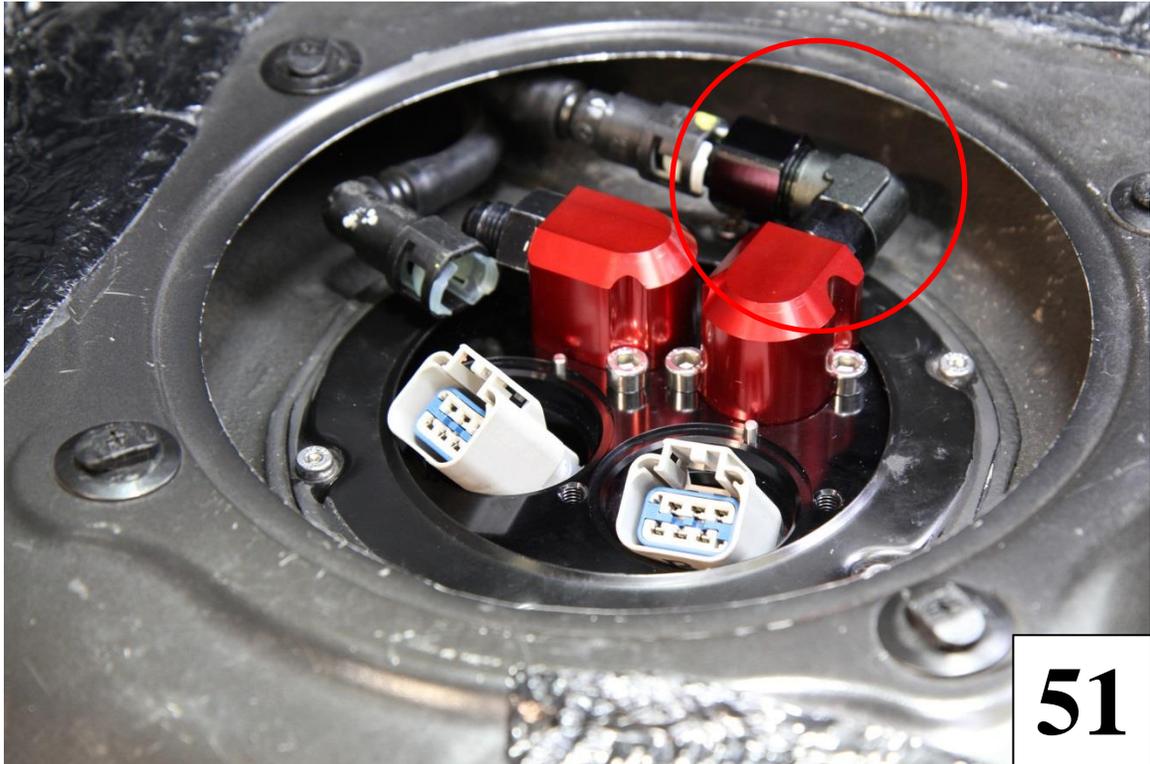
50) First install the female -8AN quick connect fitting into the factory feed line. Use a little bit of silicone spray so not to damage the O-ring seal inside the factory fitting.



**50**

**WORLDSTAR**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

51) Install the female -8AN fitting onto the -8AN outlet port. Carefully tighten the fitting.



**51**

**JZOMEGA**  
GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER

52) Install the female -6AN quick connect fitting into the factory return line. Use a little bit of silicone spray so not to damage the O-ring seal inside the factory fitting.



**Ω** **OMEGA**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

**53)** Install the female -6AN fitting onto the -6AN inlet port. Carefully tighten the fitting.



 **OMEGA**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

- 54)** Locate the two electrical bulkheads. Make sure the O-rings are in the proper place. See the pictures for the location. Apply lube to the O-rings.



55) Clip the harnesses in to the bulkheads and mark which one is connector **A** and connector **B**. Connector **A** gets installed in the right side open port or Passenger side. Connector **B** gets install in the left side open port or Driver's side.



 **OMEGA**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

**56)** Locate the bulkhead retaining plate and three M6 x 1.0 x 10mm cap screws. Slide the retaining plate over the bulkheads. The plate must be around the bulkheads first before installing them into the top hat.



 **OMEGA**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*

**57)** Push the bulkheads into place on the top hat while aligning the pins. Make sure the O-rings are fully seated. Use the three cap screws and bolt the retaining plate into place.



**57**

**Ω** **OMEGA**  
*GRAPHIC USER INTERFACE FUEL SYSTEM CONTROLLER*