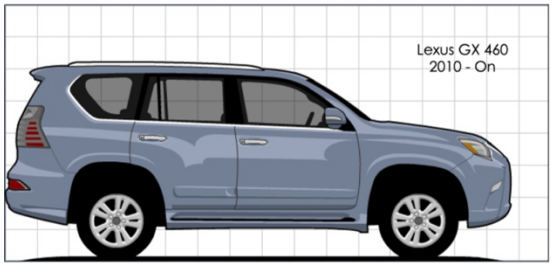
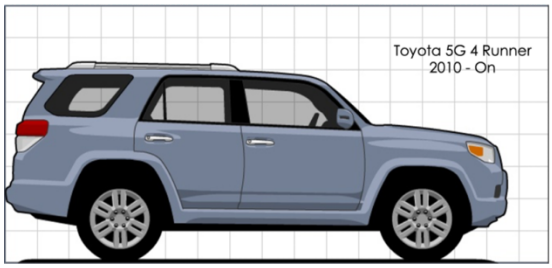




Product Information
Installation Guide
User Instructions

Product Information

Long Range Automotive offers direct-fit extended range fuel tank to serve expedition, long-distance travel and hauling needs...buy fuel when the price is right and be prepared for the long haul. These tank kits from Melbourne, Australia were developed to meet the needs of North American light truck and SUV owners. We provide additional fuel capacity from a high-quality aluminized steel auxiliary or replacement tank that integrates seamlessly with factory fuel systems and emission controls in North American vehicles. These tanks are built by specialists with three decades of experience, serving customers around the world.

This kit requires skill and experience in fuel systems, electrical wiring, and interior panel modifications. **WE STRONGLY RECOMMEND INSTALLATION BY A DEALER WITH DIRECT EXPERIENCE IN AFTERMARKET FUEL TANK INSTALLATION AND SERVICE.** This product is manufactured in Australia by Long Range Automotive. **IT IS NOT INTENDED FOR SALE OR USE FOR CALIFORNIA REGISTERED VEHICLES.**

This product **may** be installed by a general automotive shop or mechanically competent vehicle owner, given adequate tools, skills and the help of a friend. **We strongly recommend that, to avoid potential injury and property damage, the tank be installed by a trained professional.**

If you have pre-install or post-install questions, you can contact us in any of the following ways. We staff the help desk from 8am to 5pm (Mountain Time) Monday to Friday.

- Voice / text to Tank Tec 208-906-2411
- Email to aidan@longrangeamerica.com

This Guide provides information necessary to install this LRA product in your vehicle. We strive to be detailed and accurate with this information...however, errors and omissions can occur. Changes to install instructions can occur without notice. These Guides are constant works in progress...we are constantly working to make them as user-friendly, detailed and accurate as possible, and we welcome install feedback notes, photos, comments and suggestions to make them so. If you see an error or omission, or need additional information not provided in this manual, please contact Long Range America.

This product is designed to suit vehicles as delivered when new. Modifications such as suspension, skid plates, bumpers, hitches and other aftermarket additions may impact or prevent installation.

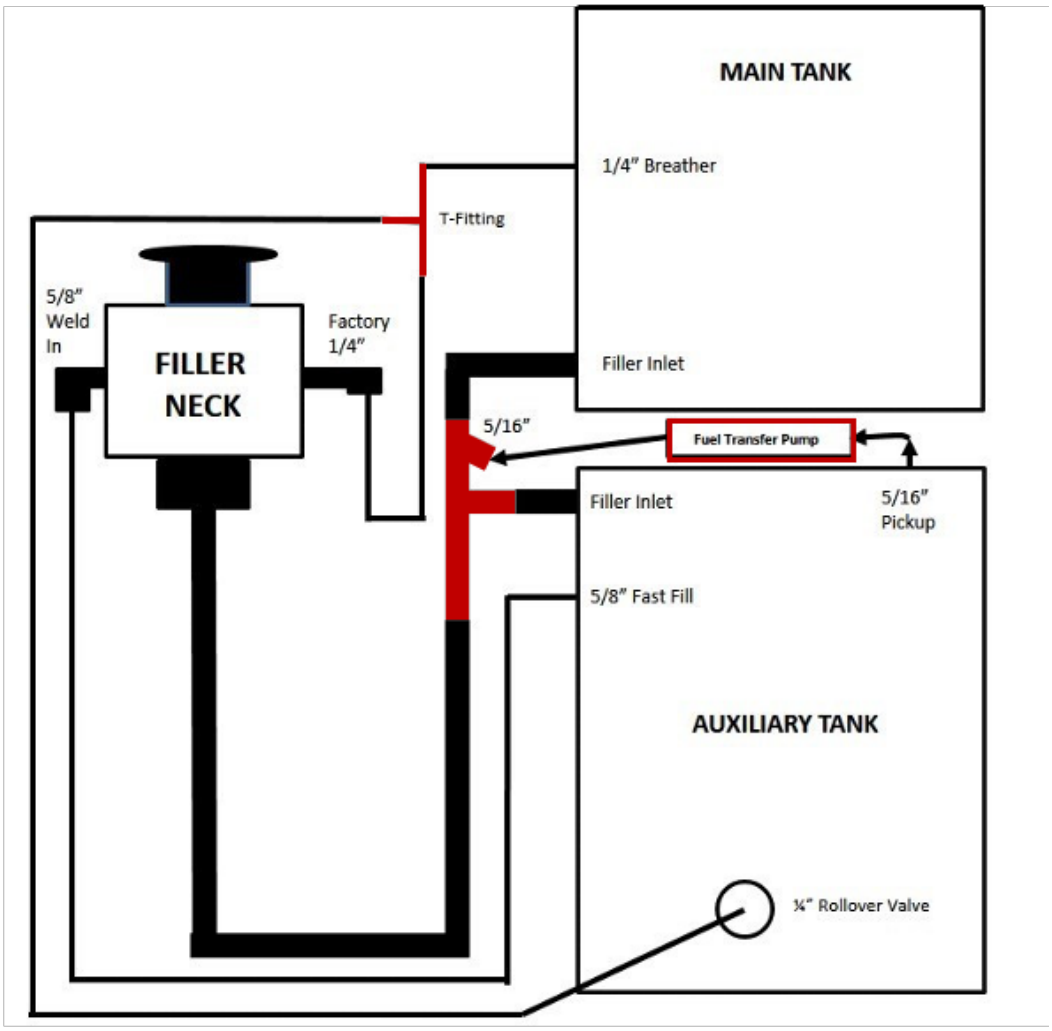
A BEFORE YOU BEGIN

1. KIT COMPONENTS

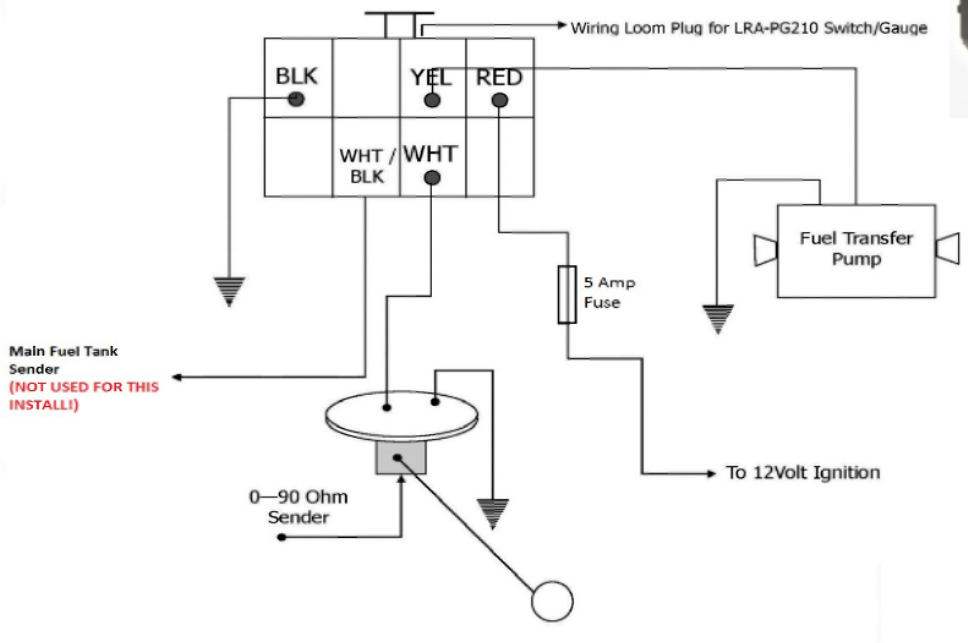
HARDWARE	HOSES & CLAMPS	MISC PARTS
1 x M8 x 30mm Bolt	1 x 6mm Fuel Hose @ 39.4" Long	1 x 28mm x 28mm x 25mm Tee Filler
2 x M8 x 20 Washer	1 x 8mm Fuel Hose @ 39.4" Long	1 x 1/4" Weld-on Half Cut Socket
1 x M8 Nyloc Nut	1 x 12mm Fuel Hose @ 23.6" Long	1 x Roll Over Valve J5360058
4 x M10 x 25 Washer	1 x 25mm Fuel Hose @ 5.5" Long	1 x Roll Over Valve Grommet LRA-FTG
4 x M10 Nyloc Nut	1 x 28mm Hose @ 5.5" Long	1 x Fuel Transfer Pump & Filter
4 x M12 Plain Nut	1 x 28mm Hose @ 3.15" Long	1 x Fuel Transfer Pump Mounting Bracket
2 x M12 Nyloc Nut	8 x 1/4" Hose Clamp	1 x Rear Mounting Bar
2 x M12 x 30mm Bolt	2 x 1/2" Hose Clamp	2 x M10 U-Bolt 70mm x 100mm
4 x M12 Spring Washer	6 x 1" Hose Clamp	4 x M12 x 30mm Bolt with 300mm Strap
8 x M12 Heavy Duty Washer		8 x 7" Cable Tie
2 x TEK Screw		Magnet (for use inside the auxiliary tank)
2 x TEK Screw 30mm		Breather Line Extension Kit

BRASS	ELECTRICAL	MUST SOURCE SEPARATELY
1 x P3 5/16" x 1/8" Straight	1 x LRA-PG210 Switch/Gauge	1 x 5/8” to 1/2” Reducer
1 x P6 5/16" x 1/4" Elbow	1 x 3mm Two Core Wire @ 197" Long	
1 x P3 1/2" x 1/4" Straight	1 x 4mm Single Core Blue Wire@11.8" Long	
1 x P6 1/2" x 1/4" Elbow	1 x 5 Amp Fuse	
1 x P14 1/4" Tee	1 x Fuse Holder 2 x Fuse Holder Terminal 2 x Red Ground Eye 1 x Red Insulated Terminal 1 x Blue 6mm Eye Terminal 3 x 3mm Heat Shrink Tube @ 1.2" Long 1 x 0-90 Ohm Fuel Tank Gauge Sender with 27.6" Long Ground Wire (setup and installed in aux tank)	

2. HOSE SCHEMATICS



3. ELECTRICAL SCHEMATICS



4. DOS & DON'TS

DOS

- WE HIGHLY RECOMMEND ALL WORK TO BE COMPLETED BY A PROFESSIONAL INSTALLER.
- Review these install instructions and plan your installation - tools, helpers and questions - ask ahead of time.
- Powerwash the vehicle underside, especially if there is a lot of mud or debris underneath.
- Unpack the tank and installation kit and review the packing list and kit.
- Call 208 906-2411 with any questions - he will get you the right answer from the right source.
- Use fuel rated thread sealer or Teflon tape on all fittings.
- Keep all fuel lines away from the exhaust system and any sharp edges.
- Use Long Range Automotive fuel systems and parts in conjunction with original manufacturer's equipment or other Long Range Automotive systems and components.

DON'TS

- DO NOT have any open flames or heat sources in the installation area.
- DO NOT CUT any of the existing fuel pipes while in the vehicle or while attached to the fuel tank.
- DO NOT USE Long Range Automotive fuel systems and components with other aftermarket fuel systems. This type of use can result in malfunction and will void the Limited Warranty.

5. SAFETY PRECAUTIONS

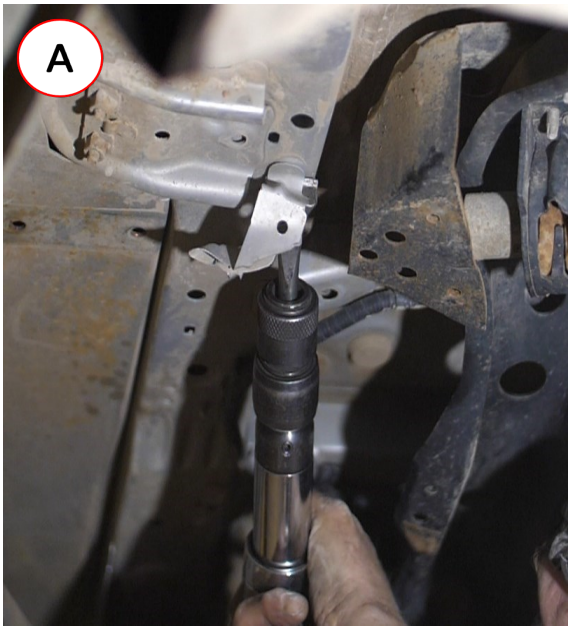
- BEFORE BEGINNING INSTALLATION, TURN OFF THE KEY AND DISCONNECT THE VEHICLE BATTERY.
- ALWAYS WEAR THE PROPER SAFETY EQUIPMENT (SAFETY GLASSES, HEARING PROTECTION, GLOVES, ETC. AS APPROPRIATE).
- BE SURE TO KEEP HEAT, SPARKS AND OPEN FLAME AWAY FROM THE INSTALLATION AREA.

6. TOOLS NEEDED

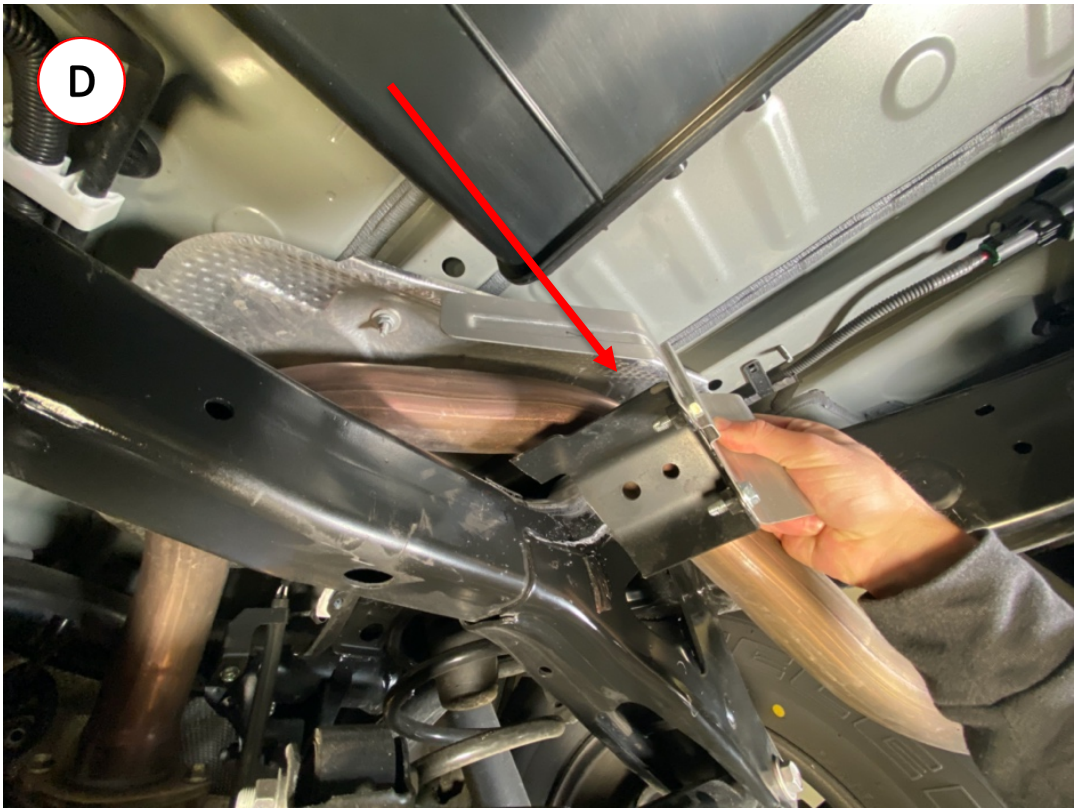
- Safety Glasses
- Hearing Protection
- Gloves
- Ratchet Wrench
- Metric Socket Set
- Socket Extensions
- Drill
- Metric Drill Bit Set
- Uni-Bit (stepped drill bit)
- Catch Pan/Spill Mats
- Vehicle Owner's Manual
- Mallet
- Hydraulic Jack
- Flat Screwdriver
- Chain Pipe Cutter
- Digital Multimeter
- Fuel Rated Thread Sealer 12. Circuit Test Light
- Metric Measuring Device
- Welder (to weld the threaded socket to the original filler neck)

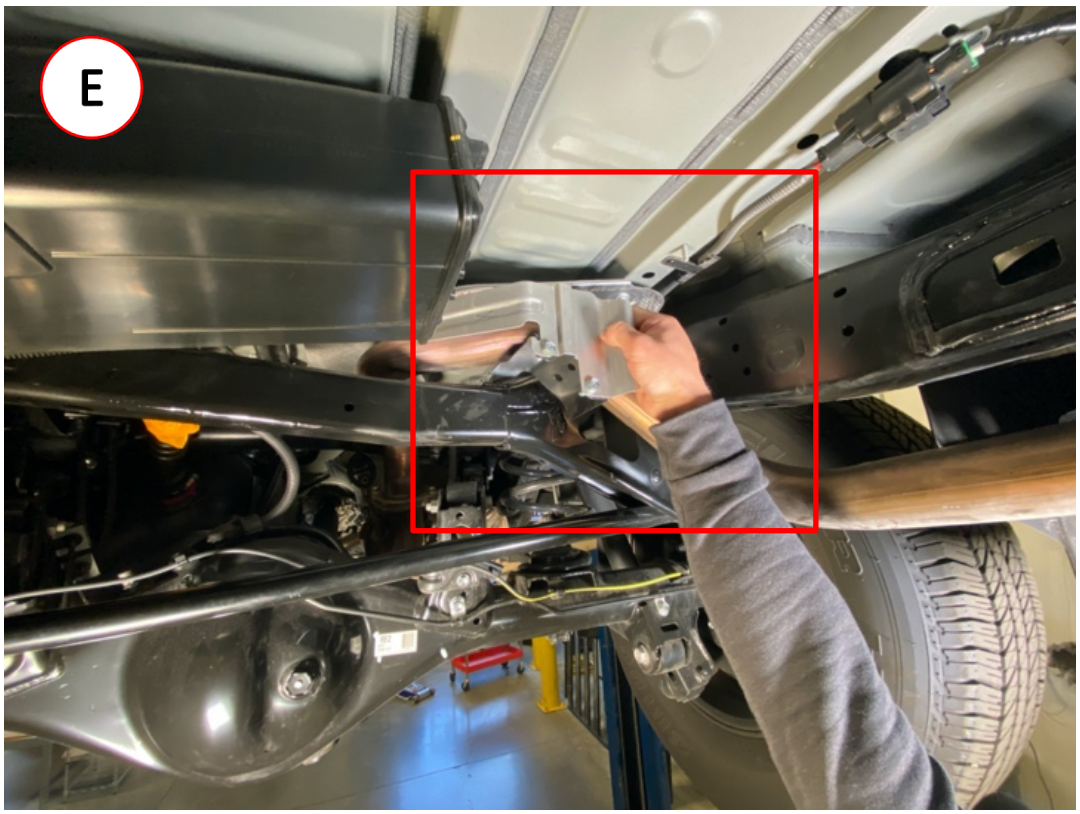
B. VEHICLE PREPARATION

1. Unpack tank and installation kit. Review packing list and kit.
2. We recommend power washing the underside of the vehicle, to remove mud and debris.
3. Remove the spare wheel. This tank takes the place of the spare wheel, the wheel will not be reinstalled.
4. Remove spare wheel carrier. Perform the following steps before factory fuel system is breached, to avoid spark and open flame contact with fuel and vapors:
   a) Lower and remove the spare tire.
   b) Cut/Chisel off the guide for the spare tire crank (Figure A).
   c) Cut the spare tire carrier out as well as the support on the cross member. Be careful not to gouge or damage the chassis rail (Figure B &C).

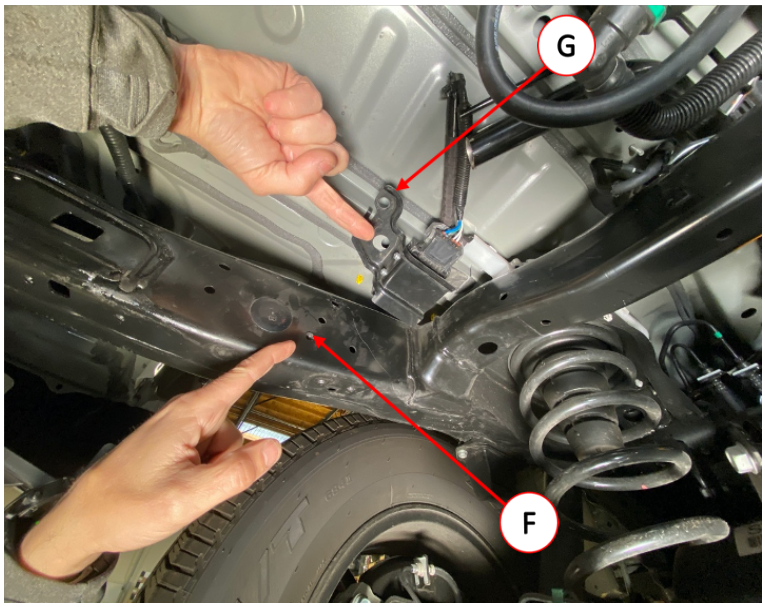


d) Remove the exhaust heat shield and heat shield bracket (Figures D & E):

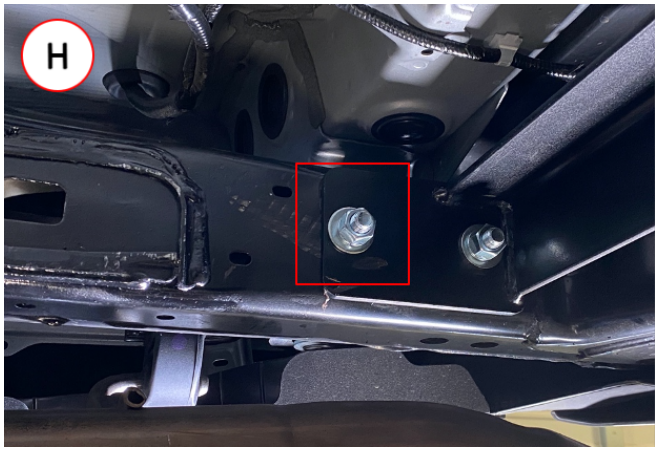




5. Relocate fuel pump control module
   a) Detach the Fuel Pump Control Module (Figure F).
   b) Move the Module to the body rail directly above factory body mount on outside of frame, using factory threaded hole (Figure G).



6. Install mounting bar
   a) Install the rear mounting bar using supplied M12 x 30mm bolts with 300mm straps attached. Note that the lip on the mounting bar will face toward the front of the vehicle (Figures H & I).
   b) Drilling may be required on newer/select model vehicles please see below highlighted in red. (H)
   c) The hole will need to be drilled out to ½ inch or 12mm.

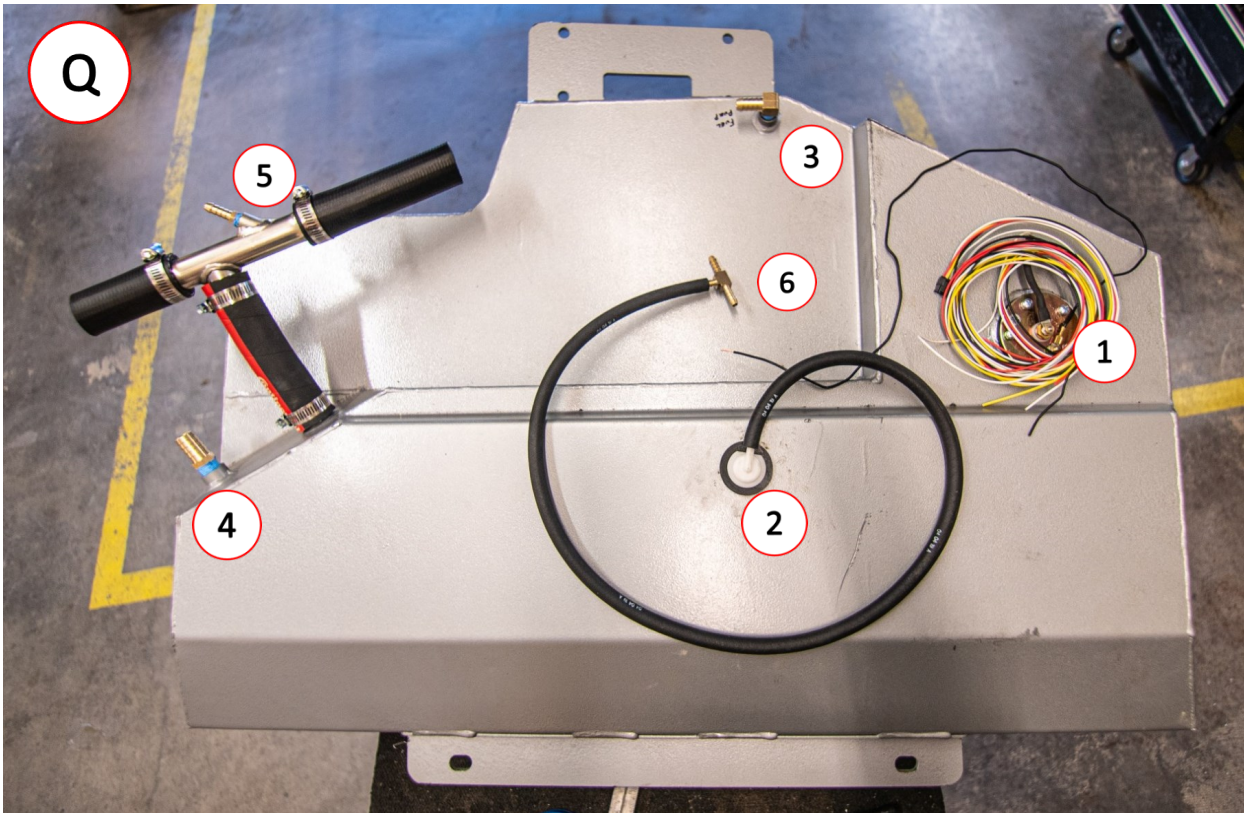


7. Move the charcoal canister during installation
   a) The charcoal canister will remain in its factory location but needs to be removed and hung out of the way temporarily for hose fit-up.

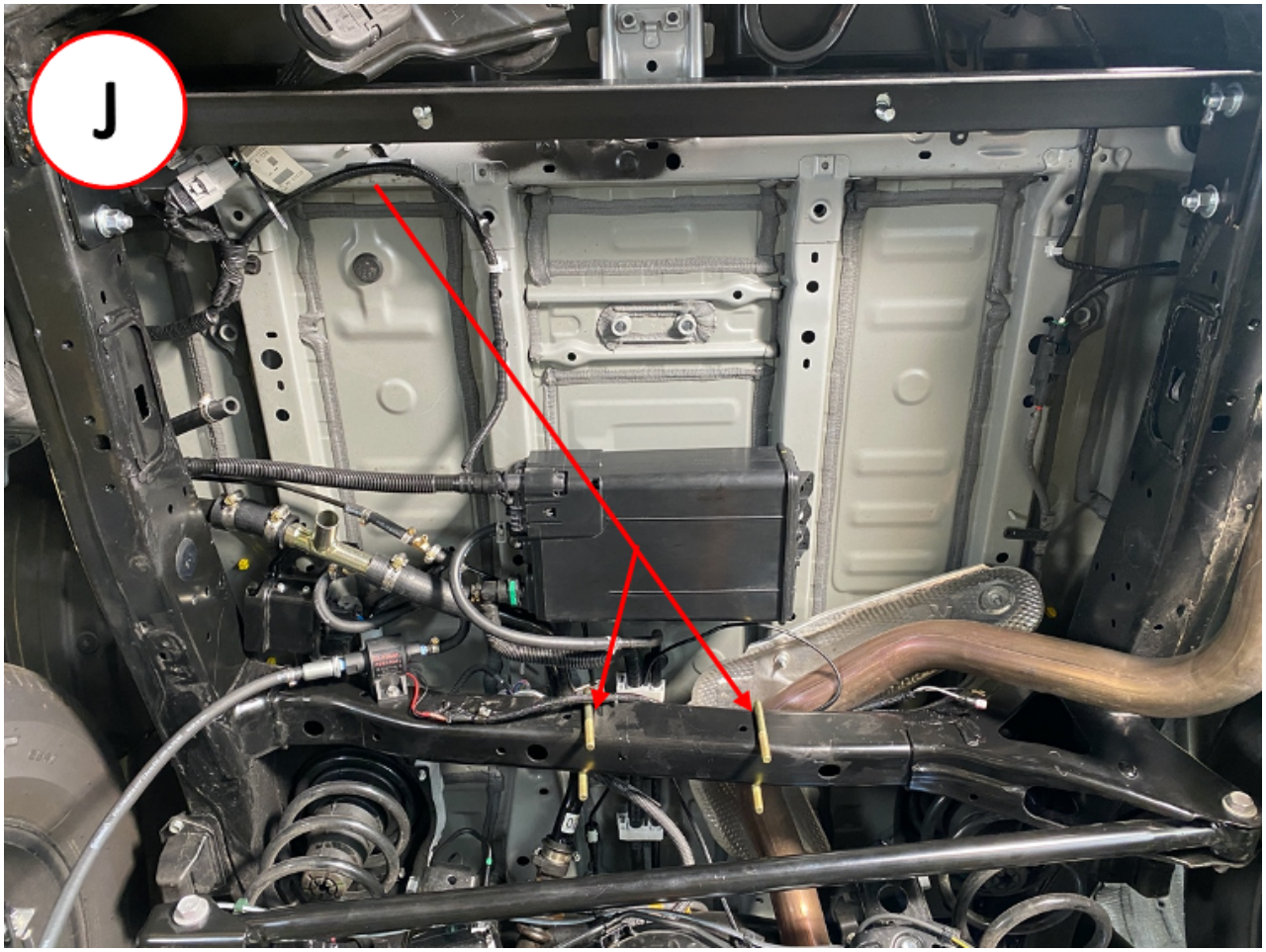
C. FILLER & TANK PREPARATION

NOTE: A SMALL WELD IS REQUIRED TO MODIFY THE ORIGINAL FILLER NECK, TO INSTALL A THREADED SOCKET THAT WILL ACCEPT A 90 DEGREE BRASS FITTING. DO NOT CUT OR WELD THE FILLER NECK IN THE VEHICLE, OR WHILE ATTACHED TO THE FUEL TANK.

1. Modify Filler Pipe & Neck
   a) Fit the new "T" pipe with the new rubber hoses and connect to the fill port of the auxiliary tank for initial mock up. (Point 5)

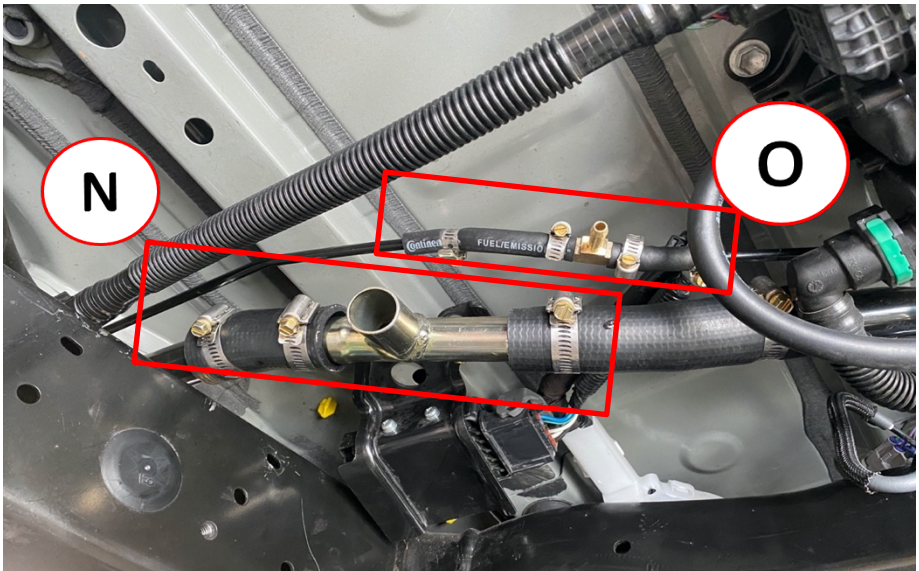


   b) Raise the tank into position and mark the location of the "T" pipe on factory fill line
   c) Slide the U-bolts over top of the frame cross member (Figure J)

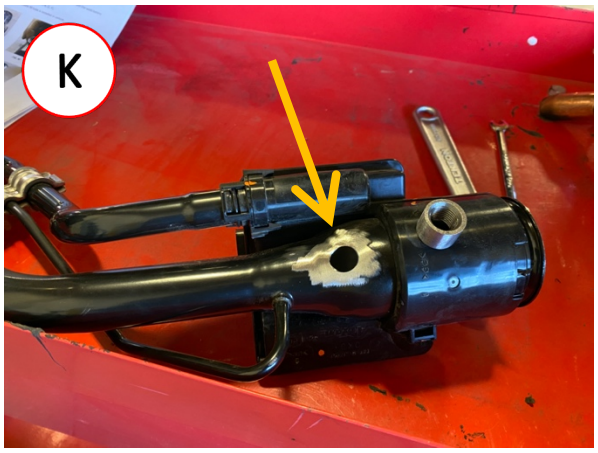


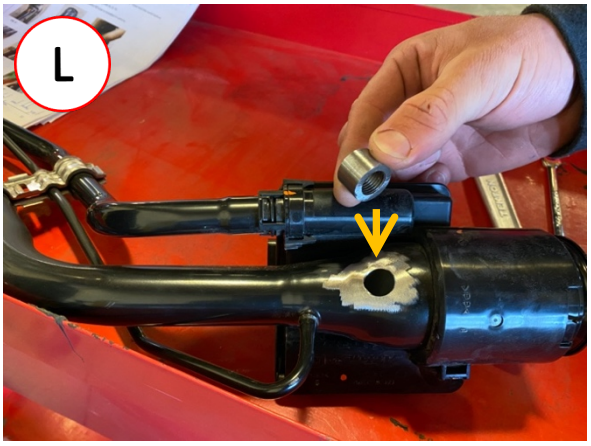
d) Remove the tank and completely remove the filler pipe from tank and veicle.

2. Cut and deburr the filler pipe at the marked lines. **CAUTION: Do not cut pipe while installed, a non-sparking cutter is recommended.**
3. Cut the 1/4-inch steel line about 3 inches before the "T" pipe.
4. Cut the Vent line and install the brass "T" fitting supplied with supplied ¼ hose. (Figure O)



5. Reinstall the section of the fill pipe onto the main tank.
6. Drill suitable hole in factory fill tube to match the Weld in Bung supplied (Figure K).
7. Weld the 1/4-inch fitting into the top of the factory filler (Figure L). Leak test the weld before proceeding.



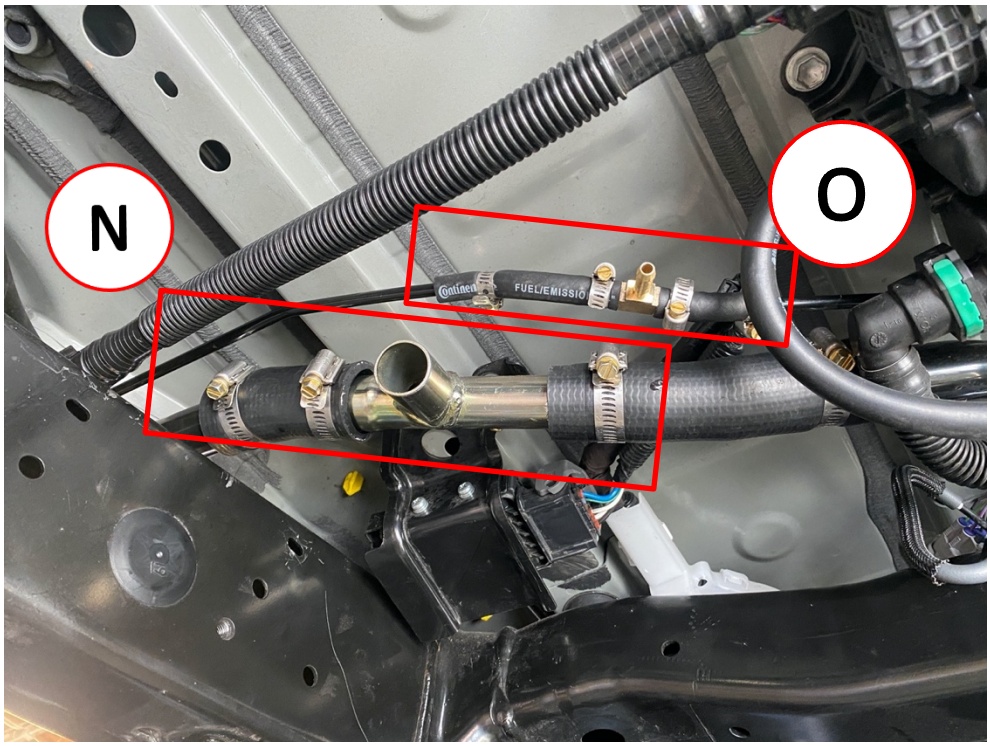


8. Install the 90-degree 1/2-inch fitting into the new fitting on filler (Figure M). Attach the hose to brass 90-degree fitting before fill tube is installed in vehicle.

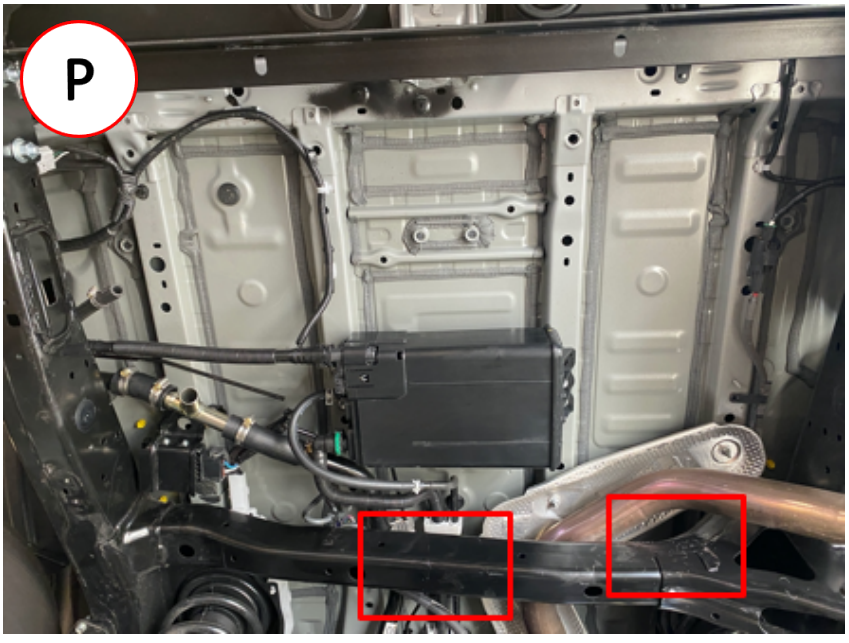
9. Reinstall upper filler pipe with "T" pipe (Figure N).

10. Install 1/2" hose and clamps (Figure O).

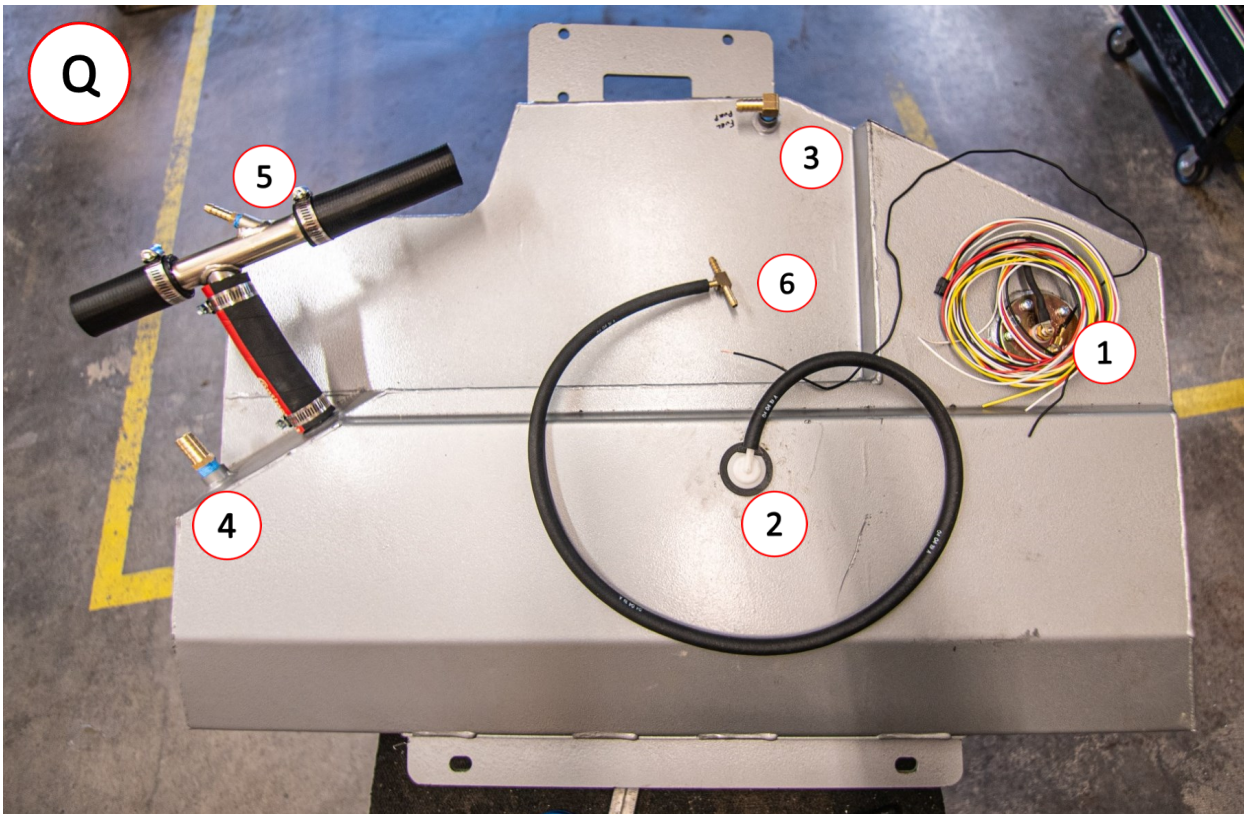
11. Be sure to position all hose clamps so they can be tightened once the tank is installed.



12. We recommend you paint any bare metal or welds (Figure N, highlighted in red) before proceeding with tank installation, to prevent corrosion.



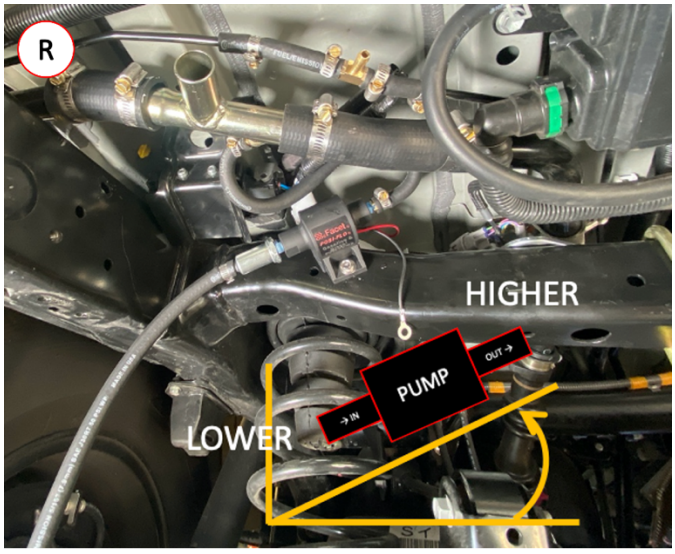
D. SET UP AUXILIARY TANK (Numbered steps below refer to highlighted items in Figure Q)



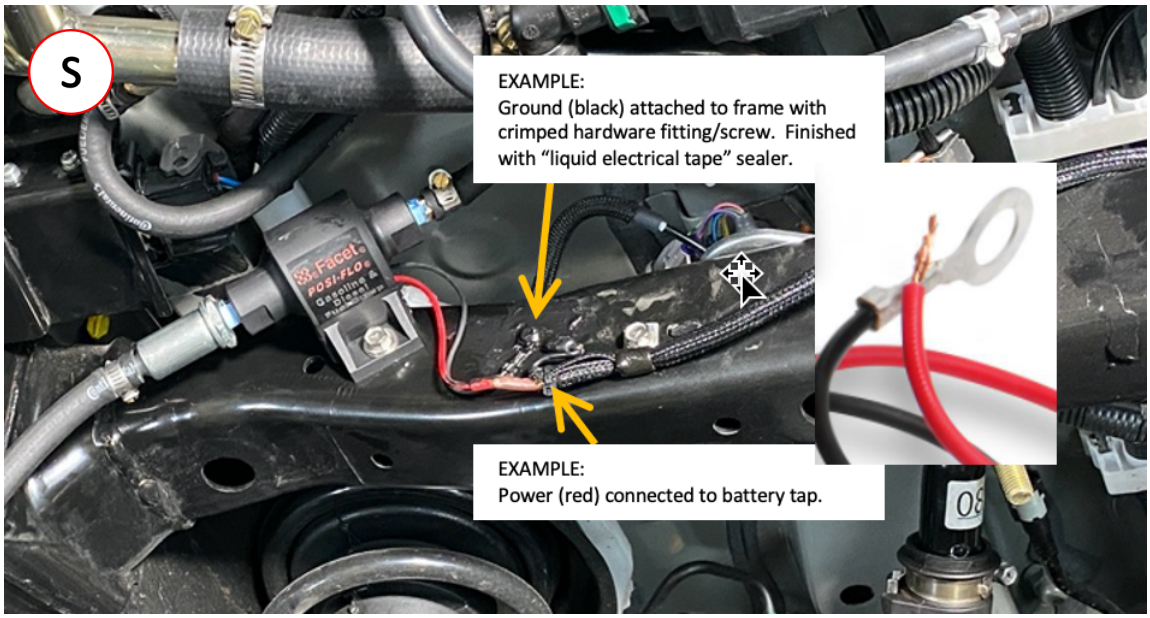
1. The brass rollover valve housing is pre-installed at the factory.
2. The plastic roll over valve goes in the top of the tank with the grommet (dish soap will ease installation).
3. The 5/16" elbow also goes in the top of the tank near the fuel gauge sending unit, pointing to the left-hand side.
4. The 1/2" ID x 3/8" MIP Brass Hose Barb in the left-hand side of the tank.
5. The 5/16" straight barb connects to the "T" in the filler neck.
6. The T-Piece is connected to the factory metal vent line with the hose supplied.

E. INSTALL FUEL TRANSFER PUMP

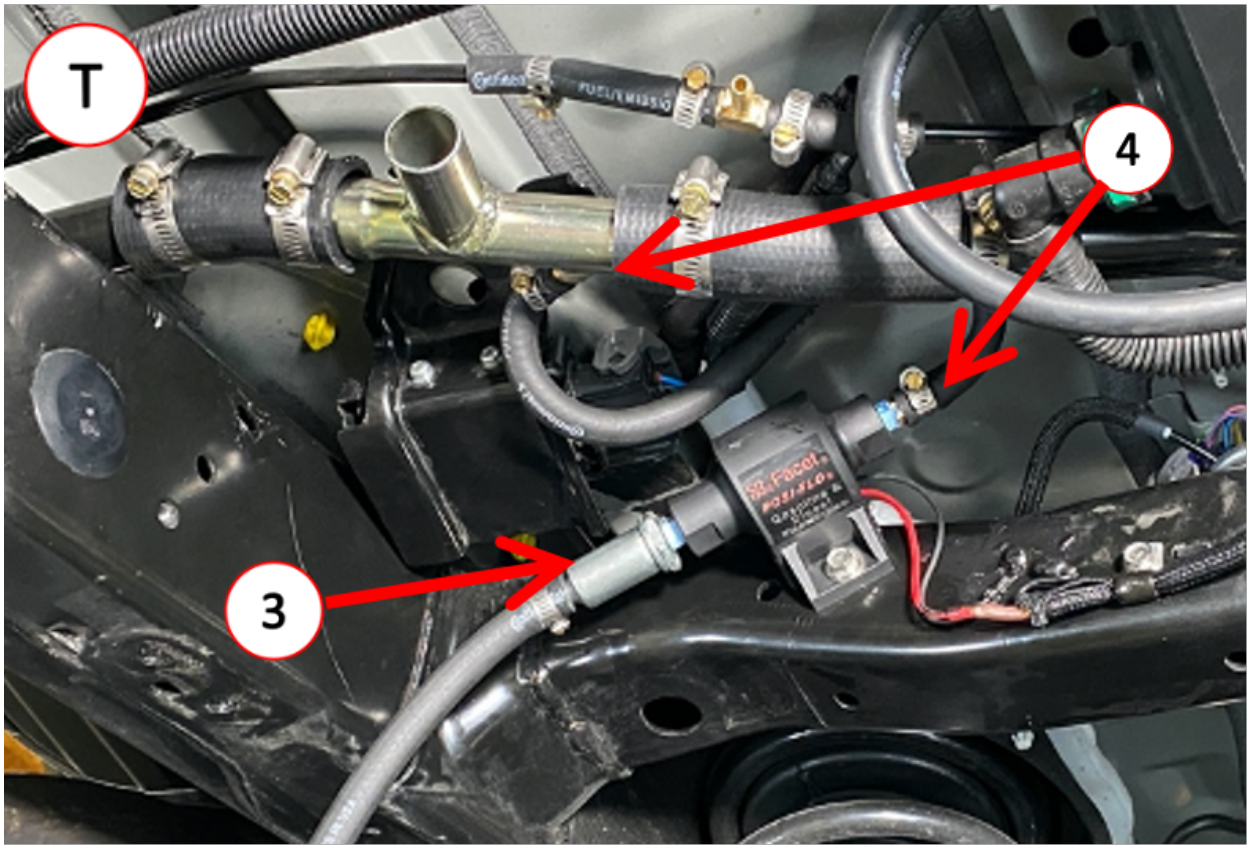
1. Mount the fuel transfer pump securely in a suitable location, making sure to avoid excessive heat and moving parts (Figure R).
   a) **THE PUMP MUST BE INSTALLED ABOVE THE FUEL LEVEL OF THE NEW TANK, AND WITHIN 12 VERTICAL INCHES OF THE NEW TANK BOTTOM.**
   b) **THE FUEL PUMP SHOULD BE MOUNTED WITH THE OUTLET HORIZONTAL OR ABOVE THE INLET.**
   c) **THIS WILL HELP TO PREVENT LOCATIONRELATED GRAVITY FEED, CHECK ENGINE LIGHTS (CELs), AND VAPOR LOCK ISSUES.**
   d) **DO NOT INSTALL PUMP IN A POSITION WHERE IT CAN BE DAMAGED FROM COMPRESSION OF SUSPENSION.**



2. Complete pump wiring. Attach the yellow wire to the positive side of the fuel pump. **DO NOT** ground the pump to the mounting bracket, instead, drill a hole in the body or frame and clear an area for the ground terminal to be firmly connected to bare metal. The transfer pump is sensitive to power interruption when on and a good ground is **imperative**.



3. Attach the 5/16” fuel line coming from the top of the auxiliary tank to the provided fuel filter, then to the inlet side of the pump (Figure T, 3).
4. Route the pump outlet to the 5/16” barb on the “T” pipe (Figure T, 4).



F. SWITCH/GAUGE UNIT WIRING & INSTALLATION

1. Install the transfer switch/gauge unit:
   a) Select a suitable location in the dash to mount the switch/gauge unit. We recommend using one of the switch blanks (Figure U), or you can install in the dash face (Figure V).

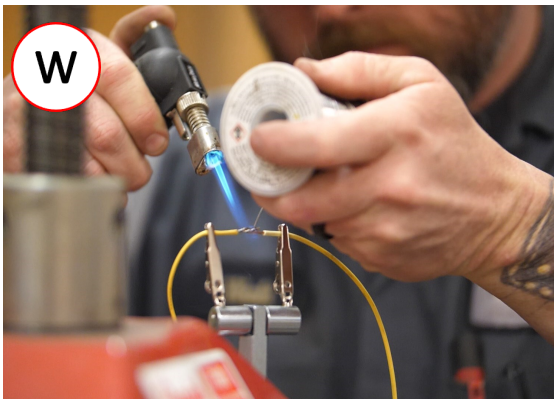
FIG.

FIG. U

b) Drill a 20mm (.78") hole where you wish to mount the switch/gauge, using a **METRIC** Uni-Bit (stepped drill bit) as shown at right. A 7/8" drill is too small and will damage your switch.

c) The switch is very sensitive to installation. The hole diameter needs to be just the right size (20mm or .78"). If it is too small, and the switch is forced into place, the switch may be damaged or not function properly. You will need to test-fit and carefully file or cut out more material if needed. **DO NOT FORCE SWITCH INTO PLACE WHILE TEST-FITTING.**

d) Connections should be soldered (Figure W), and heat shrunk (Figure X), not just crimped.



e) Check all connections when done.

2. Wire the Transfer Switch / Gauge
   a) A 12-volt ignition source can be found at the cigarette lighter circuit. Carry out wiring as per the wiring diagram, below. The 5-amp fuse goes in the red wire between the ignition power source and the switch.
   b) Run the twin core sheath cable under the scuff plates and behind the quarter panel trim and out through the grommet in the jack storage area.
   c) Leave enough wire to reach the fuel gauge sending unit.
   d) The white and black striped wire will not be used.
   e) Refer to the "USER GUIDE" in the Appendix of this installation document.

G. TANK INSTALLATION

1. Connect Hoses to Top of Tank
   a) Install the 1/4" hose to the plastic valve with clamp.
   b) Install the 5/16" hose to the barb on the top of the tank with clamp.
   c) Install the 1/2" hose onto the left-hand side of the tank with clamp.
   d) Once all new hoses are in place, reinstall the charcoal canister.
2. Jack the Tank Into Position and Secure
   a) Jack the auxiliary tank into position, feeding the hoses over the cross member and frame rail.
   b) Fit the fill hose on as the tank goes into position. Be sure to connect the fuel gauge sender wires at this point.

c) Using supplied hardware, bolt the tank into final position. NOTE: The rear bolt holes may need to be elongated for installation.

d) Attach the 1/4" hose from the top of the tank to the "T" fitting installed earlier.

e) Tighten all clamps.

H. FINISH

1. Checklist
   a) Are all hose clamps tight and secure?
   b) Are all nuts and bolts secured?
   c) Are mounting brackets and straps secure?
   d) Are Fuel Gauge Sending Unit bolts secured?
   e) Are all fuel lines secure with no kinks?
   f) Does tank interfere with, or rub on, other vehicle components?
   g) Is tank calibration accurate?
   h) Are all clearances adequate?
   i) Are all hoses and wires properly secured with straps, zip ties, etc?
   j) Check over all hoses and connections.
   k) Reconnect vehicle battery.
2. First Fill
   a) Fill main and auxiliary tanks full.
   b) Check for leaks.
   c) Drive the vehicle until the fuel level in the main tank goes to 3/4 full, then transfer some fuel from the auxiliary tank to the main tank.
   d) Test transfer pump operation and make sure the gauge is working properly, the level lights are correct and listen for undue noise (a "tic-tock" noise is normal when the pump is running).
   e) Check again for leaks.

APEXUS PG 210 CONTROL MODULE

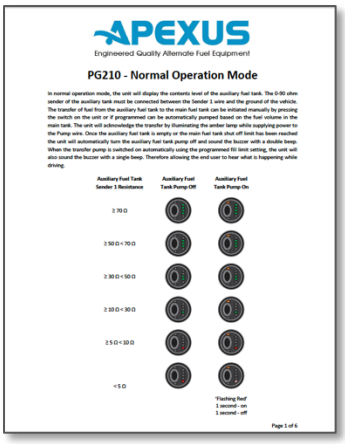
Auxiliary Tank Fuel Monitor:

Your installation included the addition of a combination control module, the computer-controlled Apexus PG 210 as seen here.

1. There are a series of LEDs that combine to display the contents of the auxiliary tank as follows:
2. The RED and GREEN lights display the contents of the auxiliary tank.
3. All GREEN shows FULL as shown at right. As fuel is transferred, the LEDs will go dark from top to bottom, indicating ¾ tank, ½ tank, ¼ tank of fuel remaining.
4. When all of the fuel has been transferred, the RED flashing light will indicate the tank's status as EMPTY.

Auxiliary Tank Fuel Transfer:

1. When it is time to transfer fuel, simply press the button at the left side of the module to activate the transfer pump.
2. The transfer tank is self-priming and will make a clicking sound until it fills with fuel and begins pumping. That sound will reduce somewhat when fuel is flowing.
3. When the switch is turned ON and the ORANGE light is displayed, this indicates that fuel is being transferred.
4. The pump transfers fuel at around two quarts per minute, or a gallon every four minutes. Normal practice is to transfer while driving.
5. Fuel is transferred from the auxiliary tank into the main tank until the auxiliary gauge shows a RED flashing light at which point the pump will continue to run for 2 minutes and then the buzzer will sound, and the pump will automatically shut off.
6. You can restart the pump by simply pushing the switch button again, the pump will run again for another 2 minutes before automatically shutting off.
7. It isn't possible to overfill the main tank, it will simply drain into the auxiliary tank via the "T" in the filler line.


APEXUS
Engineered Quality Alternate Fuel Equipment
PG210 - Normal Operation Mode

POSSIBLE OPERATING ISSUES – 5G 4Runner and GX 460 Tank Kits

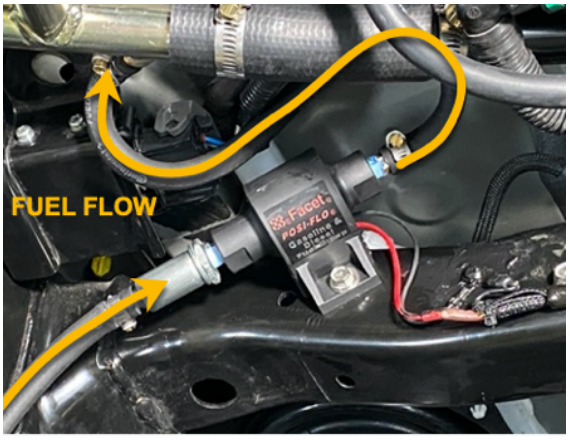
Under certain circumstances tied to installation practices and design details, owners may experience operating anomalies. This supplement is designed to help owners and installers understand what behaviors may mean and how to troubleshoot and resolve certain issues.

ISSUE #1 – Fuel Transfer Pump Does Not Move Fuel

The transfer pump is designed to move fuel at over 20 gallons per hour while traveling down the road. The transfer process is initiated when the operator presses the pump control button on the control module. Under normal operation, the pump will operate for 10-15 seconds while it "primes" itself – filling the pump body with fuel. Once filled, the pump quiets down and full fuel flow is accomplished.

It is possible that the transfer pump may not operate, or at less than full capacity. If the pump does not make nose when activated, then you likely have an electrical issue that requires testing of connections, fuse, etc.

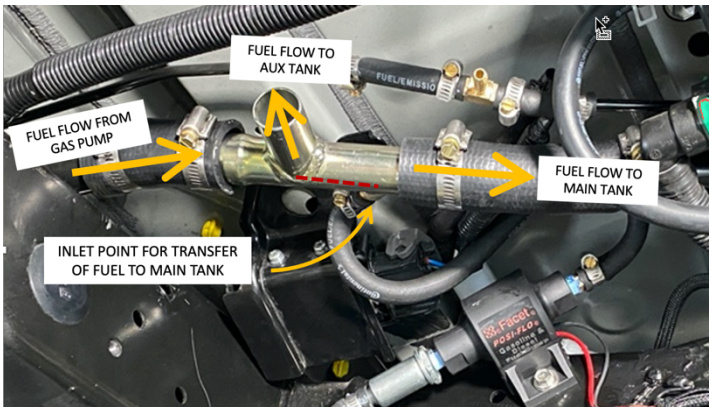
If the pump does make noise, it will either be loud (no fuel supply or failure to prime) after the first 10-15 seconds and no transfer or slow transfer of fuel. If the pump does not quiet down, then you likely have a "weak" pump or poor fuel supply. You or your installer will need to assess condition of pump and supply of fuel, including proper install configuration and hose routing (no kinks). Pump replacement or hose restoration may be needed.



ISSUE #2 – Pump Operates Properly / Slow Fuel Transfer

If the transfer pump activates and quiets down (which means it is moving fuel) but the transfer rate is slow (something less than 24 gallons per hour or more) then a different problem is likely the cause.

This kit includes a tee that feeds both main and auxiliary tank. When transferring fuel from aux tank to main, the transfer pump moves fuel to a fitting on that tee.



On level ground, without load, this configuration works well; but when the vehicle is heavily loaded (lowering the rear of the vehicle) the flow from the transfer pump may (to some degree) flow back into the auxiliary tank, which means that the transfer pump may need to operate for significantly longer periods of time in order to accomplish full transfer of fuel. See dashed red line at right.

If you experience this behavior, one way to confirm the issue (and transfer your fuel faster) is to back your vehicle up onto a curb, block or ramp with a height of 6" – enough to change the angle of the "tee" and redirect the transfer flow into its intended destination – your main tank.

We are working on a redesign of the transfer point, but please let us know if you experience this issue and if this resolves the issue as a temporary fix.

OWNER / USER GUIDE

Congratulations on your new auxiliary tank. This valuable addition to your rig ……..