



CNG CONVERSION SYSTEM INSTALLATION MANUAL

2014-2018 FORD TRANSIT CONNECT 2.5L BI-FUEL
SINGLE CYLINDER (8.9 GGE) SHORT WHEEL BASE -
CARGO VERSION

Updated: 10/12/17

PRINT TO SIZE

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NOTE: Disconnect the vehicle battery before install. This includes partial install, servicing, and or maintenance.

- All owner information supplied by Ford must remain with the unit. The incomplete vehicle manual is not owner information and is excluded from this requirement.
- Compressed natural gas is a combustible fuel, flammable and highly explosive.
- CNG is stored under high pressure (maximum of 3,600psi) at 70°F (21°C).
- Tampering with or improperly maintaining the high pressure fuel system can result in fatality or serious injury.
- Never attempt to modify the fuel system and always have the fuel system maintenance performed at an authorized dealership by qualified technicians.
- Exercise extreme caution and follow all related safety guidelines.
- Always leave 1/4 tank of gasoline in the tank as not to damage the OEM fuel pump.

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!! WARNING !! Follow instructions as directed in the installation manual and do not attempt shortcuts. Follow proper safety procedures. Failure to do so can lead to bodily harm or fatality. Tampering with or improperly maintaining the high pressure fuel system can also result in bodily harm or fatality.

!! WARNING !! Batteries normally produce explosive gas. Therefore, do not allow flames, sparks or lighted substances to come near the battery. When charging or working near a battery, always shield your face and protect your eyes. Always provide ventilation. Failure to follow these instructions may result in personal injury.

!! CAUTION !! Be aware that this installation requires the use of High Pressure, Flammable, and Highly Explosive compressed natural gas. CNG is stored under at maximum of 3,600psi and at 70°F (21°C).

!! CAUTION !! Failure to complete the pre-installation checklist may result in severe engine damage after installation is complete.

!! CAUTION !! This installation is intended for unmodified vehicles. If the vehicle has been modified, consult Altech-Eco before the beginning install.

DISCLAIMER

Altech-Eco assumes no responsibility for damages occurring from accident, misuse, abuse, improper installation, improper operation, and lack of reasonable care or all previously stated reasons resulting in incompatibility with other manufacturer's products.

Chemicals and Lubricants

1. Silicone lubricant spray is required on all o-rings on fittings.
2. Epoxy primer or equivalent to rust proof any exposed metal.
3. Ford approved coolant liquid to top off the reservoir.

On Bi-Fuel systems gasoline shall not remain uncirculated for extended periods of time (over 60 days).

THIS DOCUMENT CONTAINS PROPRIETARY DATA OF ALTECH-ECO AND SHALL NOT BE USED OR DISCLOSED IN WHOLE OR IN PART TO DESIGN OR FABRICATE ANY PRODUCT FOR ANY PURPOSE, NOR REPRODUCED OR TRANSMITTED TO ANY OTHER ORGANIZATION WITHOUT THE EXPRESS PERMISSION OF ALTECH-ECO.

Check list:

1. Confirm packing slip to insure that you have received all components, assemblies and sub-assemblies.
2. Make sure none of the components and assemblies have been damaged in shipping.
3. Pre-inspect the vehicle following the QVM, Q185, and NFPA 52 regulations (Contact ALTECH-ECO for the inspection check list).
4. Begin your conversion process.
 - Cylinder Installation
 - Regulator assembly installation
 - Fuel fill installation
 - High pressure line installation and routing
 - Low pressure and coolant line installation and routing
 - Underhood installation
 - Wiring (Including Switch and gauge) Installation
 - Decal placement
 - Fill and leak test
 - Begin your QC Process
5. Check Tire Pressure before test driving.
6. Check and fill coolant fluid before starting and test driving.
7. Be sure the rear harness is routed properly and is not loose under vehicle.
8. Be sure all provided parts are installed.
9. Final test drive.

Disconnect the negative terminal on the battery and place a plastic cap on it to protect from accidental contact.



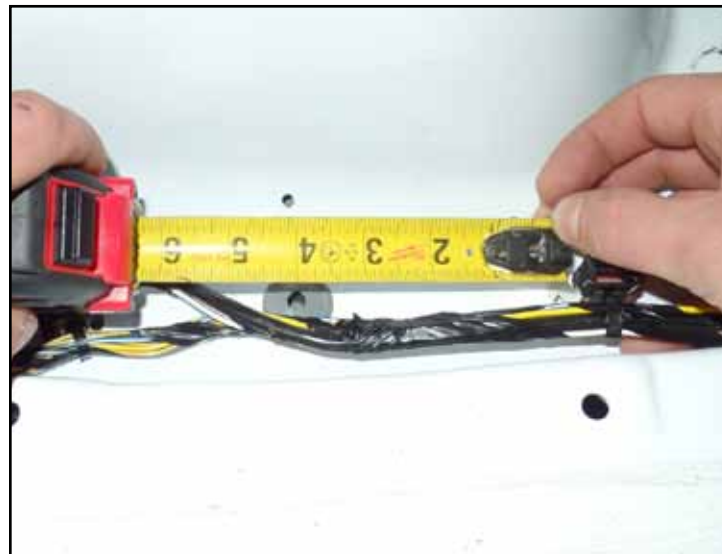
Not an actual Transit Connect battery

Remember to remove spare tire first and set aside.

Remember to always lubricate ALL o-rings right before component installation.

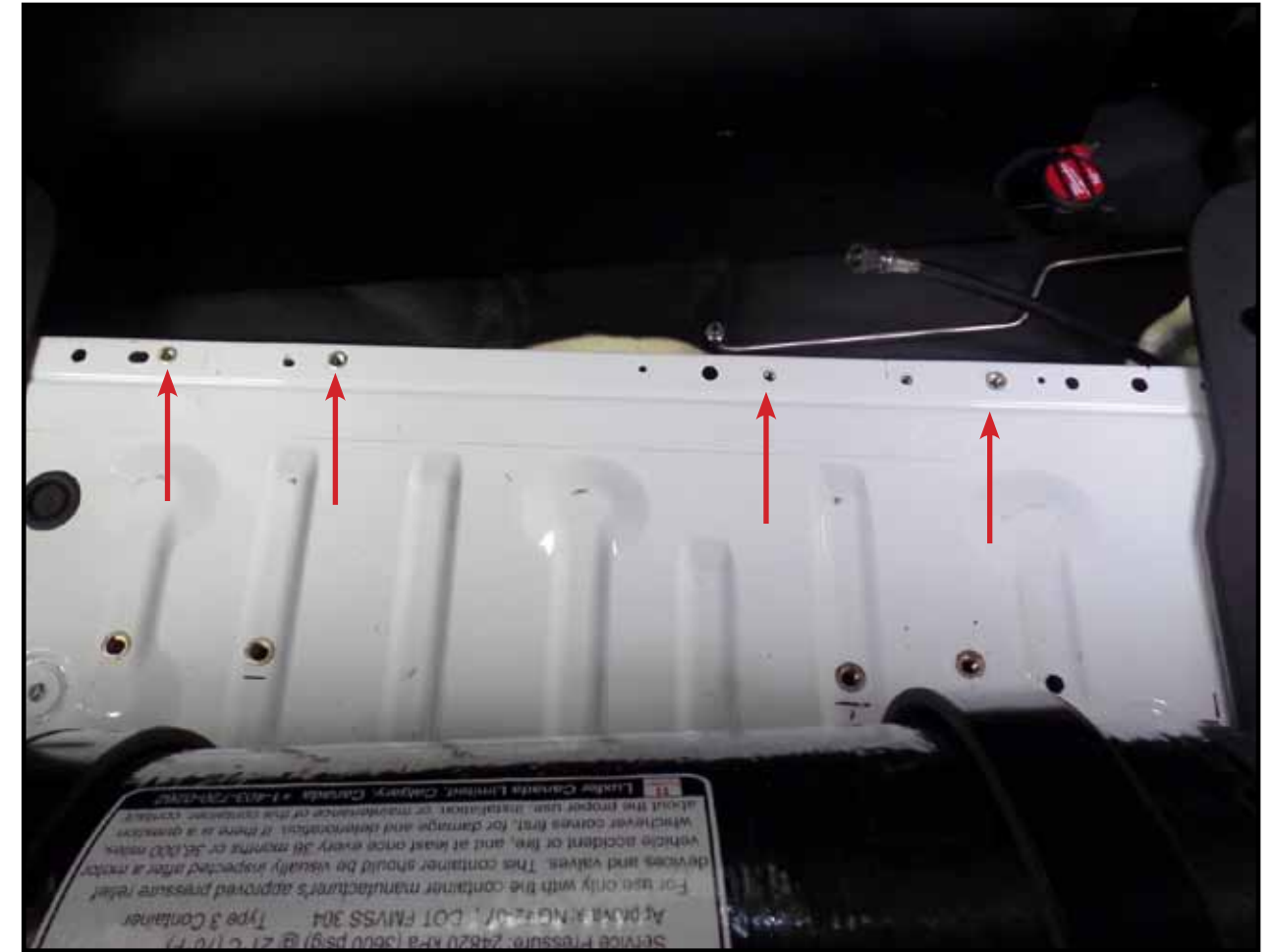
HIGH PRESSURE INSTALL

1. Wiring Hole
Drill a 7/8" hole for wiring.
Measure 4" from stud to the right.
Measure 1" from location shown.
Deburr and rust proof.
2. PRD Hole
Measure 1 1/8" from corner.
Measure 1 1/8" from side wall.
Drill 7/8" hole.
Deburr and rust proof.



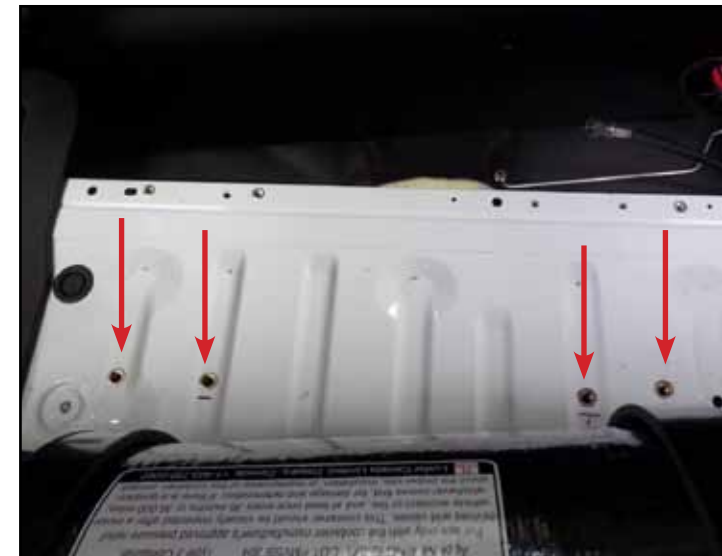
HIGH PRESSURE INSTALL

3. High Pressure Hole
Measure 3 3/4" from wall.
Measure 1 1/8" from side.
Drill a 1 1/2" hole.
Deburr and rust proof.
4. Use cylinder plate as a template. Place plate between 2 step plastic trims.
Mark which OEM bolts will be used for the plate front holes.
Remove plate.
Install four M10 rivet nuts.



HIGH PRESSURE INSTALL

5. Re-install plate to be used as a template. Secure with bolts. Hand tighten to avoid movement.
Mark four rear drill points.
Remove plate.
Drill 11/16" hole. **USE A STOPPER. NO DEEPER THAN 1 1/4"**
CAUTION: Fuel tank underneath!
Install four 1/2-13 rivet nuts in location shown.



HIGH PRESSURE INSTALL

6. Install bottom part of the cylinder base brackets.
Secure with 1 1/4" bolts.
Verify correct spacing. 7/8" on both sides.
Tighten all four bolts on the base brackets.
7. Attache and secure two cylinder base plate support brackets. Ensure the brackets are secured on the outside of the cylinder base brackets.
Secure with 1 1/4" bolts. Leave brackets loose.
8. Install cylinder base plate and use it as a template. Hand start four bolts into OEM holes to hold plate in place.
Mark drill points for the cylinder plate support brackets on each side.
Remove cylinder plate.
Drill 17/32" holes.
Deburr and rust proof.
Install M10-1.5 rivet nuts.

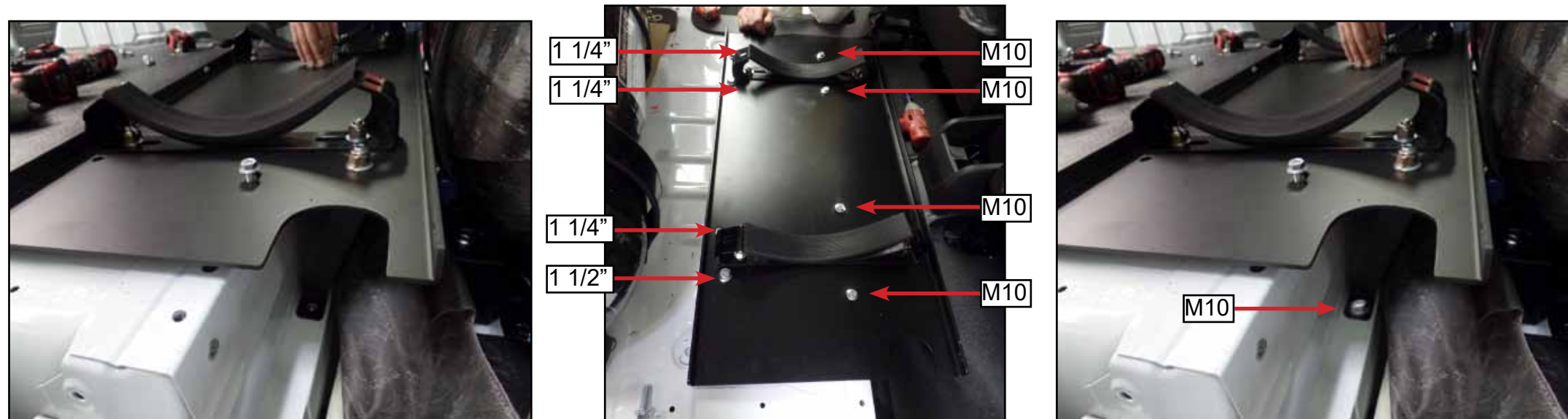


7/8" spacing



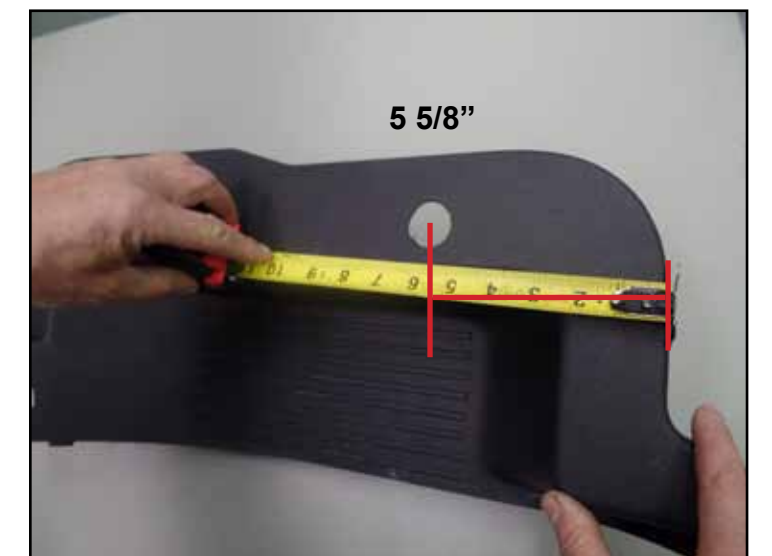
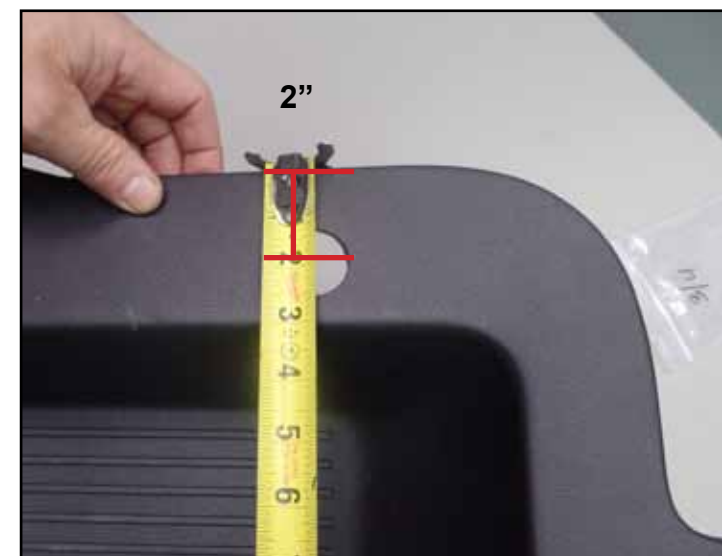
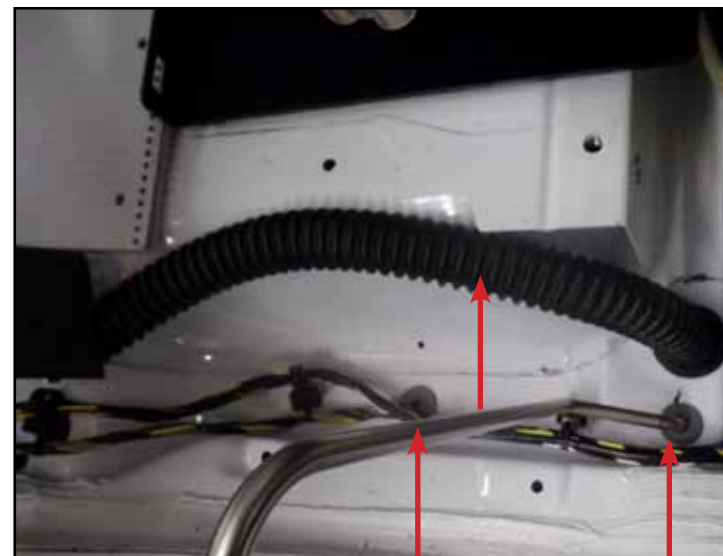
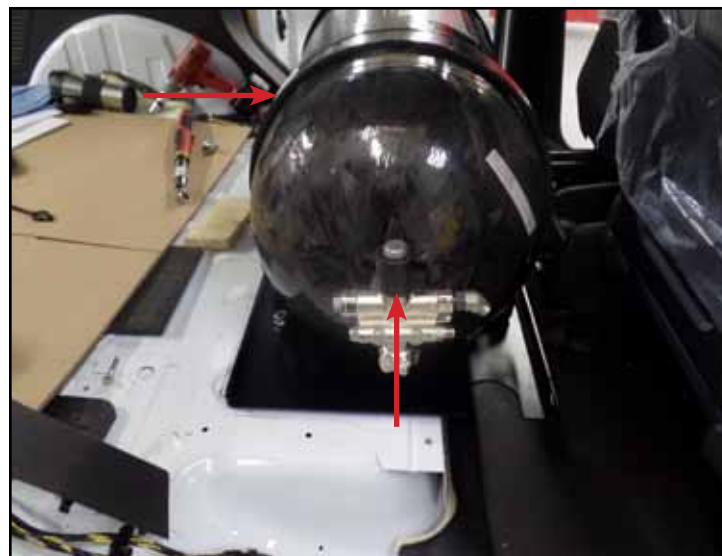
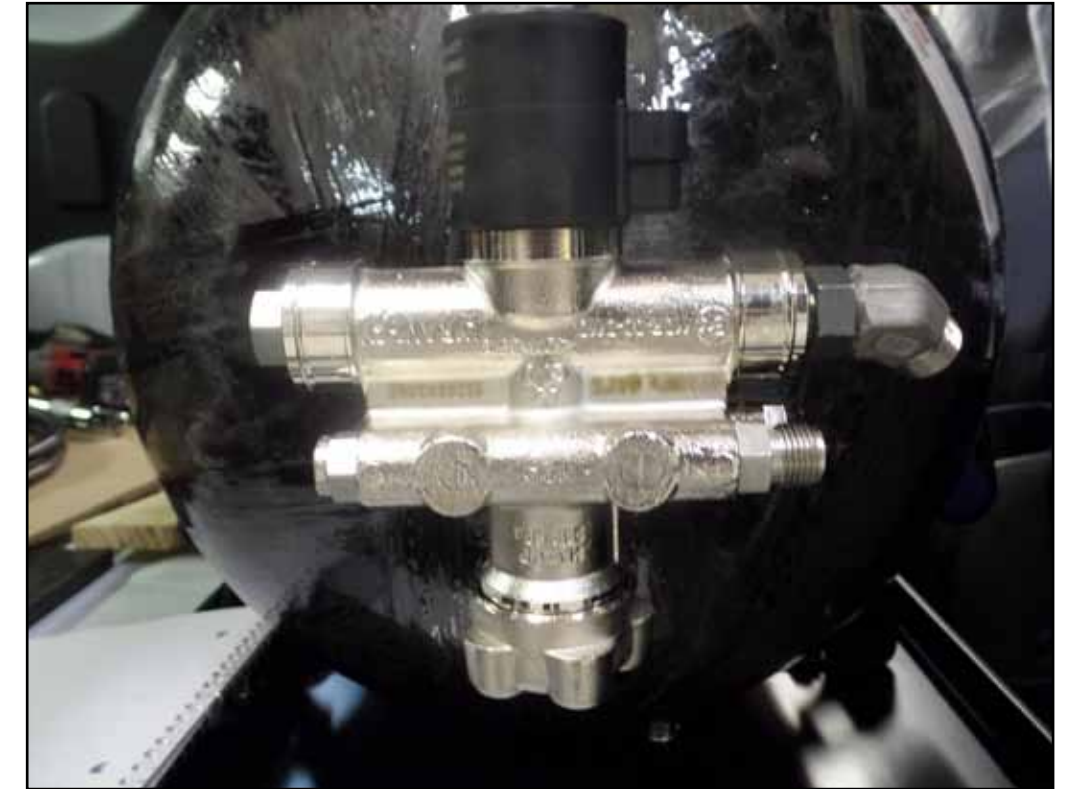
HIGH PRESSURE INSTALL

9. Install cylinder plate.
Hand start all bolts to hold plate in place.
Secure the plate with three 1 1/4" and one 1 1/2" bolts. Rear of the plate.
Secure the plate with four M10 bolts and two M10 bolts for the cylinder plate support brackets.
Tighten M10 bolts to 50-55 ft-lbs.
Tighten 1/2-13 to 65-70 ft-lbs.



HIGH PRESSURE INSTALL

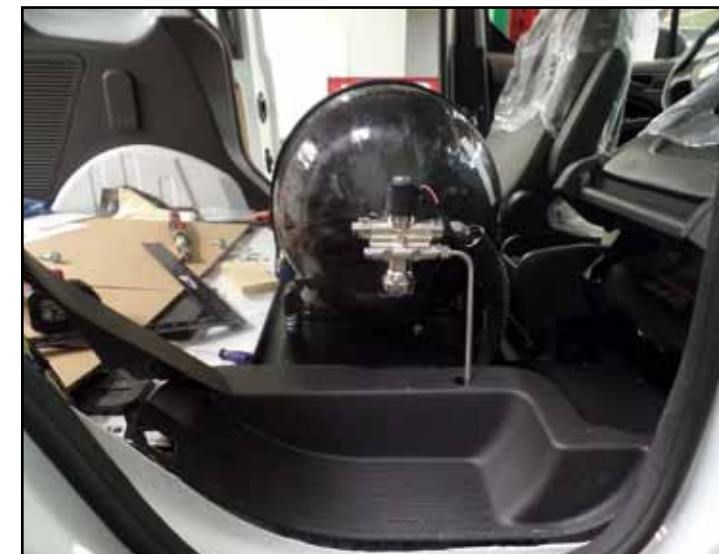
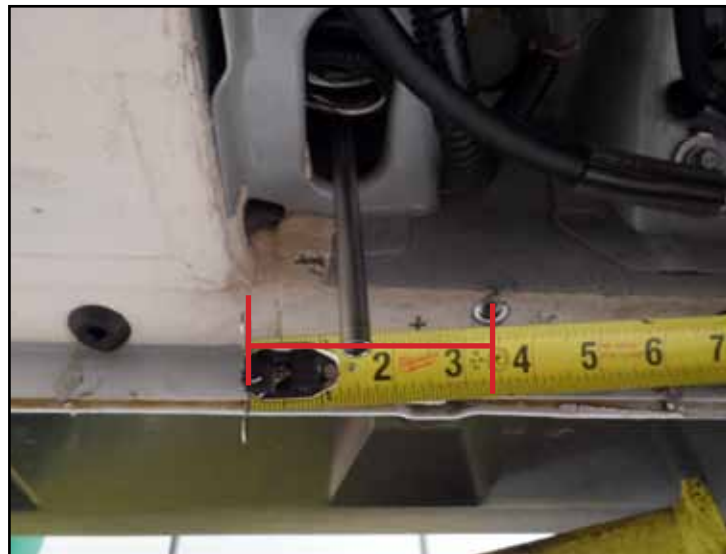
10. Place cylinder. Solenoid facing up.
11. Place strap brackets. Secure them.
12. Install two grommets.
13. Install PRD tube.
14. Install vent tube.
15. Run rear harness.
16. Modify the passenger step panel. Measure and mark.
Drill 1 1/4" hole. Deburr.
17. Re-install step panel.



HIGH PRESSURE INSTALL

18. Secure high pressure hose to valve assembly. Tighten to 30-35 ft-lbs.
First measure and mark hole.
Drill 25/64" hole.
Install 1/4-20 rivet nut.
19. Secure PRD tube. Hand tighten first, then full turn plus 1/4 turn.
20. Use a right angle and make cylinder flush with driver side step panel.
Secure the straps. 40-45 ft-lbs.

3 1/2"



HIGH PRESSURE INSTALL

21. Fit 2ft heat shield over high pressure hose. Secure other end to 30-35 ft-lbs.
Connect to cross assembly if previously installed (Refer to CROSS ASSEMBLY INSTALL).
22. Fit 10" loom on high pressure hose. Ensure loom goes inside to prevent rubbing.
Use OEM anchor point, loosen, and fit a 3/4" p-clamp. Tighten.
Zip tie loose sections of the high pressure hose when necessary.
23. Fit PRD cap onto PRD tube.

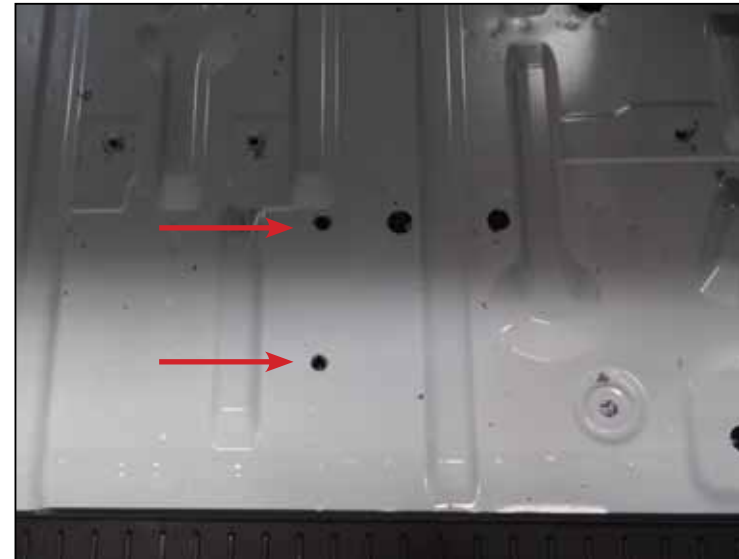


REGULATOR INSTALL

1. Use the regulator assembly as a template and mark the drill points.
Drill pilot holes first from underneath.
Drill 9/16" holes from the top.
Deburr and rust proof.
2. Retrieve regulator assembly.
For the 2018 model year, the bleeder valve is located on the coalescing filter, which is part of the regulator assembly.
Secure with two M10-1.5 Nylock nut (090) and 3/8 flat washers (025).
Tighten to 55-65 ft-lbs.

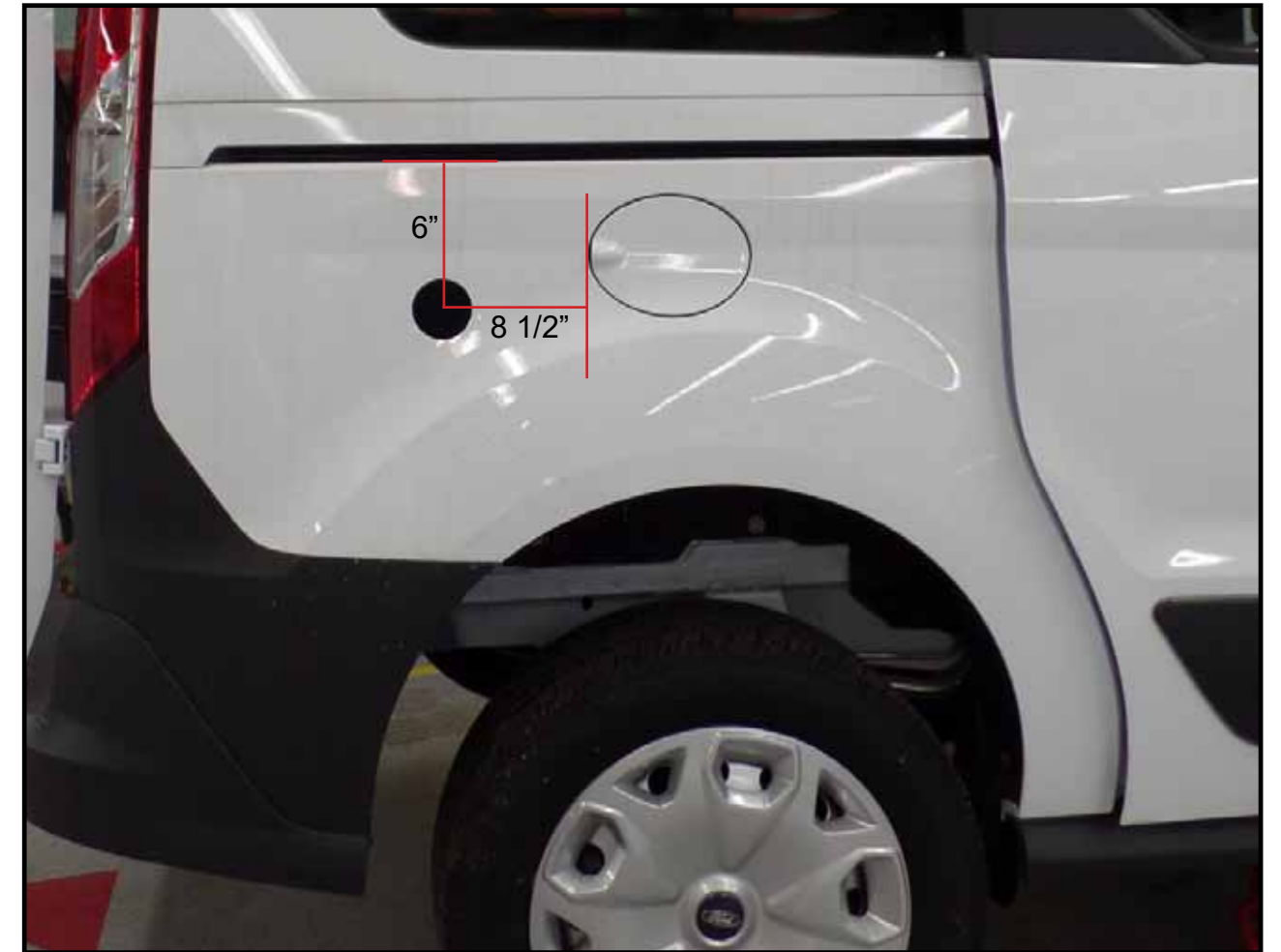
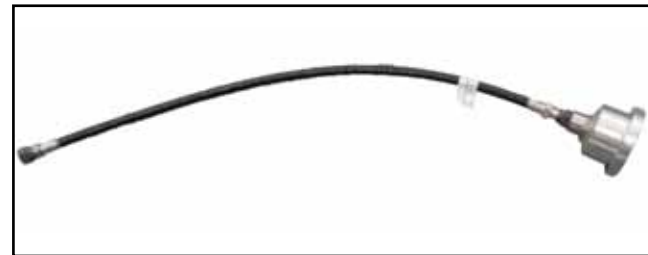


NOTE: For the 2018 model year, the bleeder valve plug is located on the coalescing filter.



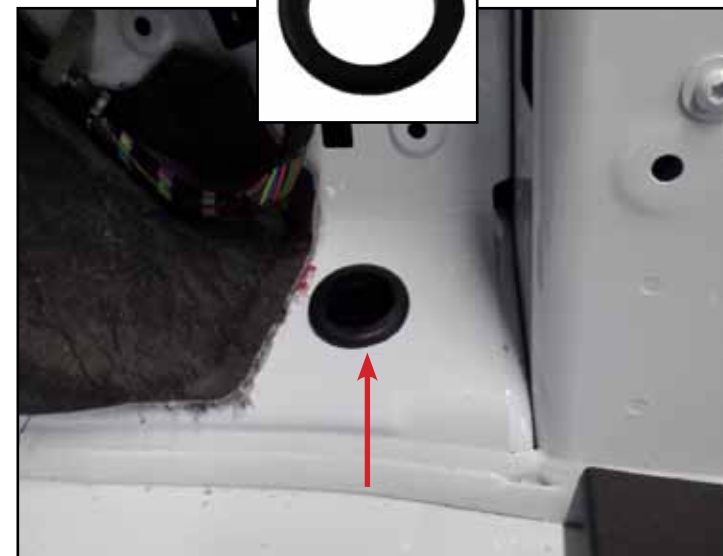
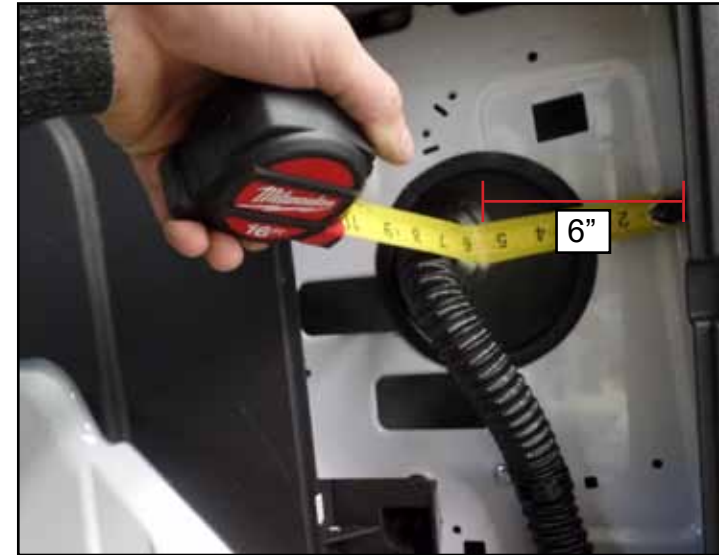
FUEL FILL INSTALL

1. Measure and mark the drill point.
Drill a 2 1/2" hole for the fuel fill housing install. Recommended to drill a pilot hole and verify the dimensions.
Deburr and rust proof.
2. Use the fuel fill ring as a template and mark 6 points. Ensure the fuel fill ring is positioned as shown.
Drill six 13/64" holes.
Deburr and rust proof.
3. Sub assembly the fuel fill housing.
Discard receptacle nut that is included and use the one included with kit.
Lubricate o-ring.
Tighten to 30-35 ft-lbs.



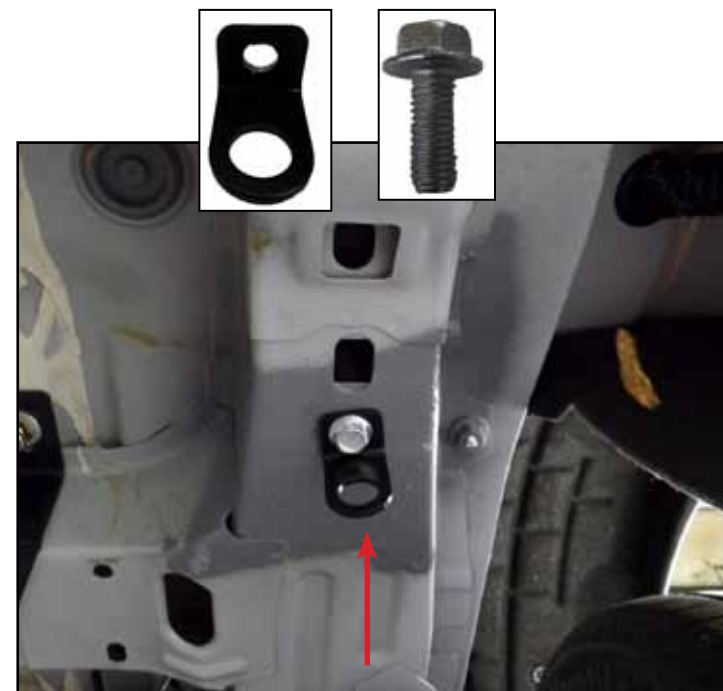
FUEL FILL INSTALL

4. Install assembly into place and secure with six screws (182) with fuel fill ring on the outside of the vehicle.
Place rubber cap back onto the receptacle.
5. Install 1 3/4" grommet (1 3/4GR).
6. Fit 30" vent hose (VT) over the high pressure hose.
Ensure 1 1/2" hose clamps (HC1 1/2-H) is on the vent hose. Leave clamp loose until a leak test has been performed.
7. Remove and discard OEM grommet.
8. Measure and drill a 5" hole.
Deburr.
- Line the hole with trim (AUTO TRIM).
9. Use OEM hole and enlarge to 25/64".
10. Secure vent tube to wall with 1 1/4" p-clamp and 3/4" bolt (175-H).



CROSS ASSEMBLY AND INSTALL

11. For bulkhead connector bracket (TC4BHC-BRK), measure 1" where shown and mark.
Drill a pilot hole first.
Drill a 9/16" hole. Deburr and rust proof.
12. Install rivet nut M10-1.5 (RNM10-1.5).
13. Install bulkhead connector bracket and secure with M10-1.5x25 bolt (172).
Tighten to 50-60 ft-lbs.
14. Assemble the cross assembly. Tighten to 30-35 ft-lbs. Leave the 45 degree fitting loose.
Install as shown.



Note: For 2018 model year, the cross assembly will not contain the bleeder valve.



CROSS ASSEMBLY AND INSTALL

15. Connect 11" high pressure hose from cross assembly to regulator. Tighten the 45 degree fitting to 30-35 ft-lbs.
16. Connect fuel fill hose to cross assembly. Tighten to 30-35 ft-lbs.



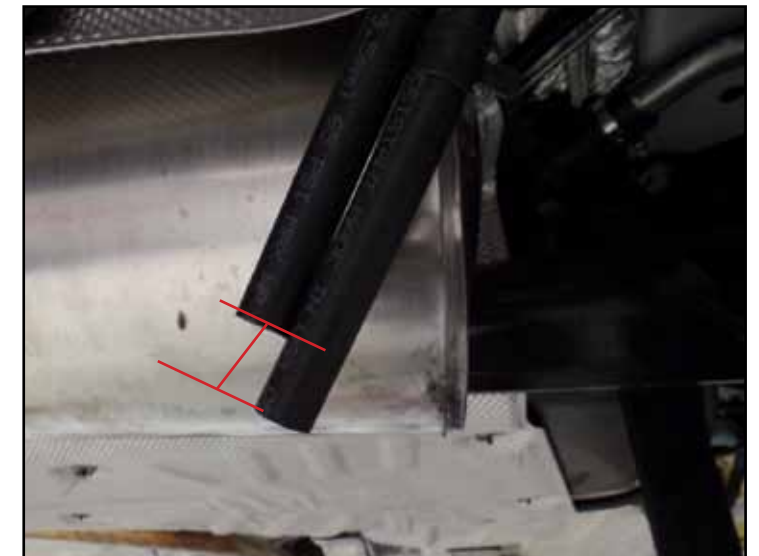
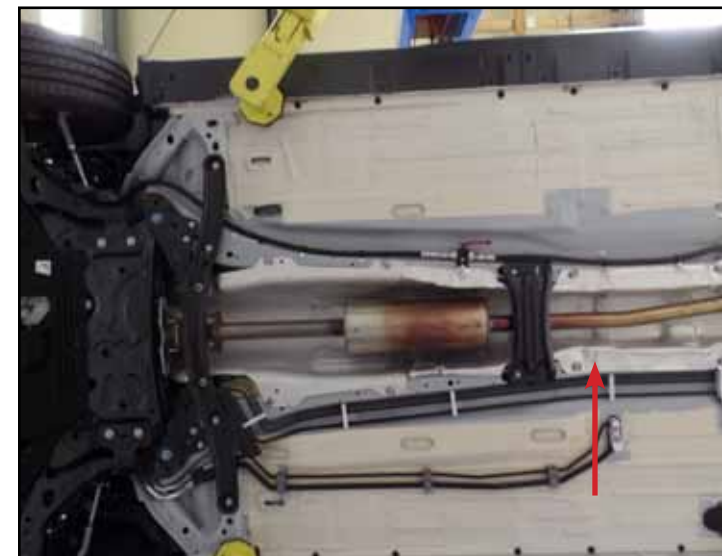
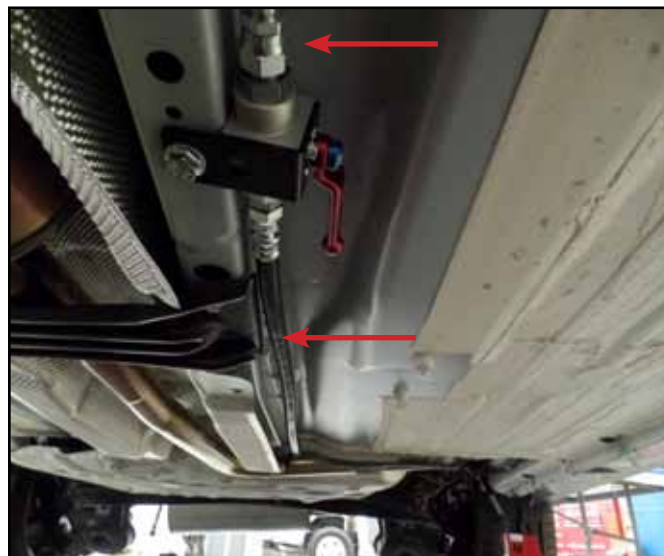
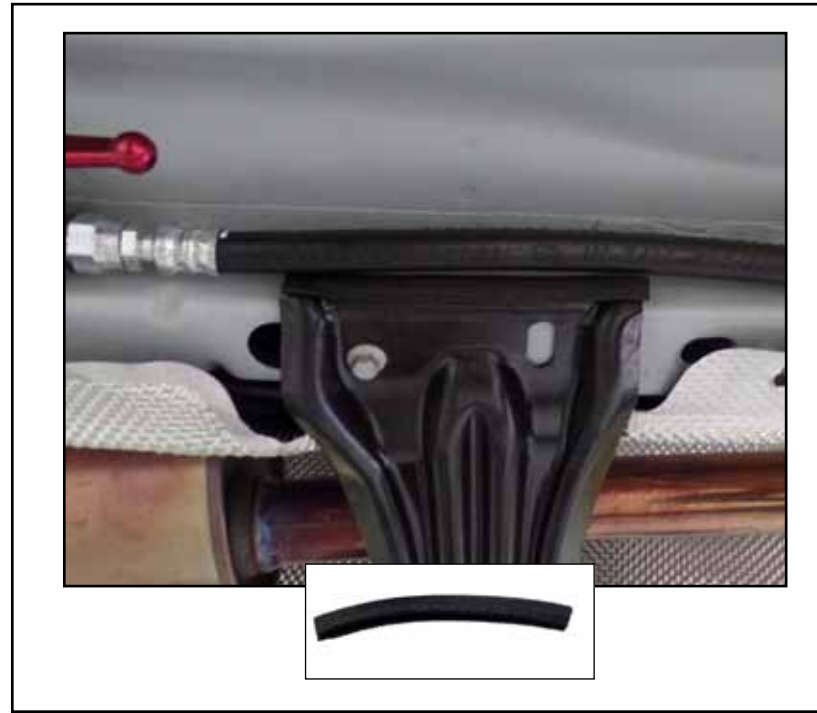
ROUTING

1. Loosen the OEM heat shield.
2. Driver side - from second OEM stud, measure 9" and mark.
3. Retrieve 1/4 turn valve and use it as a template. Mark drill point.
Drill a 9/16" hole.
Deburr and rust proof.
4. Install M10x1.5 poly nut (POLYNUT M10). Rivet gun required.
5. Install 1/4 turn valve and secure with M10x1.5x25 bolt (172).
Tighten to 50-60 ft-lbs.



ROUTING

6. Run 85" low pressure hose (LPH85-6-EX) from 1/4 turn valve to front of the vehicle.
Lubricate all o-rings.
Connect other end to CNG fuel rail assembly if it has been previously installed.)
Tighten to 30-35 ft-lbs on both ends.
7. Run 113" low pressure hose (LPH113-6-EX) to the regulator.
Fit end with 1 1/4" heat shield (HS1 1/4).
Connect and tighten to 30-35 ft-lbs.
Fit insulator between OEM reinforcement and hose to avoid rubbing.
8. From high pressure, fit the 36" high pressure hose with heat shield and connect to cross assembly.
Tighten to 30-35 ft-lbs.
9. Run coolant hoses under OEM heat shields.
Cut 1/2" off the hose facing inward on the rear of the vehicle.
10. Connect the coolant hoses to the regulator.



ROUTING

11. Run rear harness along side coolant hoses. Connect rear harness to low pressure sensor (if previously installed).
12. Do not secure the lines and rear harness until both ends are connected and coolant hoses tapped into OEM coolant hoses.

TAP INTO OEM COOLANT HOSES

13. Loosen and put aside OEM plate holding OEM wires.
14. Ensure kit coolant hoses are not rubbing against OEM vacuum lines. Cut away kit lines if necessary. Secure both hoses with zip tie.
15. Re-install OEM plate holding OEM wires.
16. Re-install any components removed prior to coolant connection under the hood.



SECURING LOW PRESSURE LINE

1. Install six poly nuts (RN2520165SLR) for the low pressure hose. Secure with 3/4" p-clamp (PC3/4) and 3/4" bolts (175-H). Connect low pressure hose to the CNG fuel rail assembly (if previously installed, refer to low pressure installation instructions).



AFCM INSTALLATION

*Do not use power tools.
Exercise safety when installing.*

1. Remove the two tabs. Make the cut flush with the plastic panel. Do not cut into the panel. Deburr the edges.
2. Remove two OEM bolts. These will be reused.
3. Below the previous bolts and on the wall, remove OEM nut. This nut will be reused.
4. Retrieve AFCM bracket (TC4AFCM-BRK). Install as shown. Slide the bracket between both OEM panels.
5. Secure the panel from the top using the two OEM bolts removed previously. Tighten to 20 in-lbs.



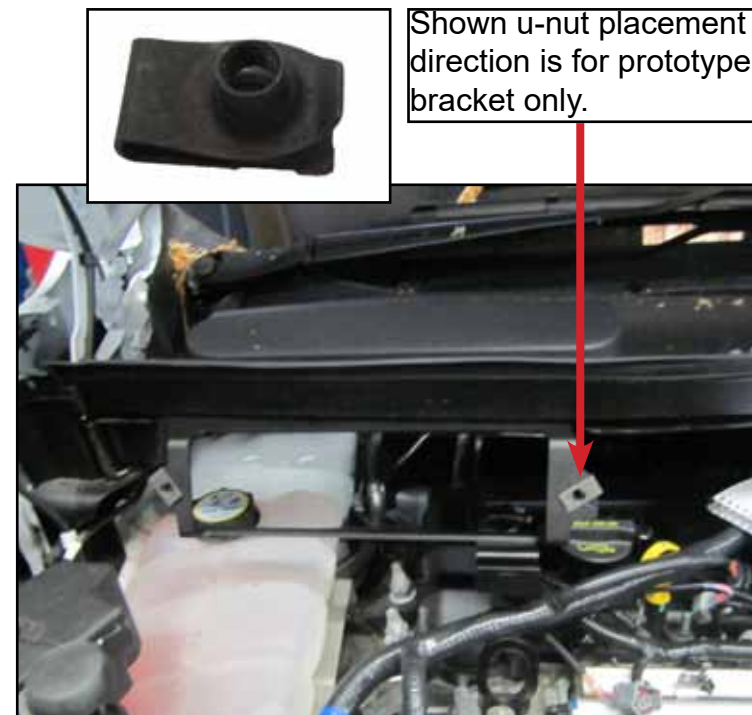
Remove these two tabs. Make a clean cut and flush with the plastic panel. Note: Picture displayed is for driver side, this must **ONLY** be done for the passenger side. **Do not touch the driver side tabs.**



AFCM INSTALLATION

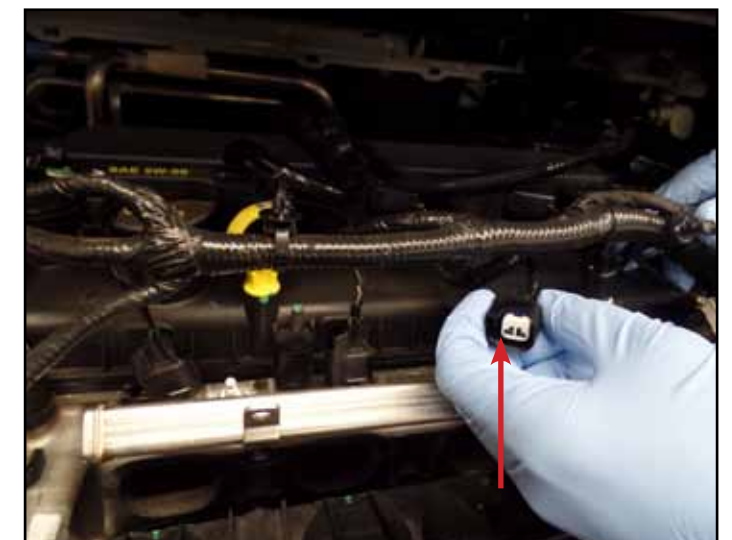
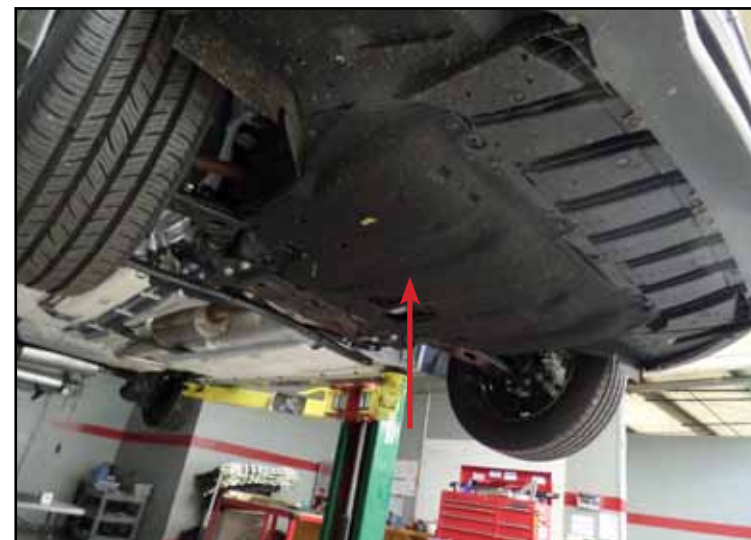
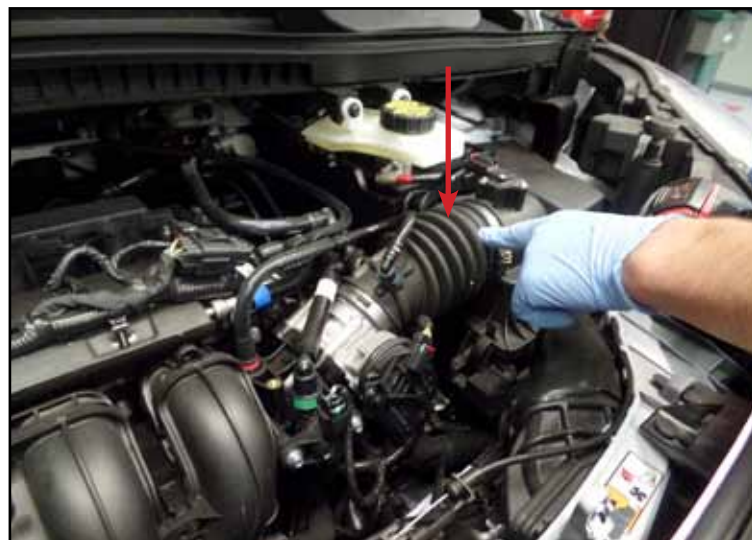
6. Secure the extended arm of the AFCM bracket to the OEM stud and secure with previously removed OEM nut. Tighten to factory specification.
7. Place two u-nuts (111) into place. Note, the position of nut should be completely vertical (production version), with the open end facing up.
8. Install AFCM. Secure with two 3/4" bolts (175-H). Tighten to 90 in-lbs.

If the main harness is already installed, connect the plugs into AFCM and attach fuse box to the extended tab located on the AFCM bracket. Ensure a tight fit.



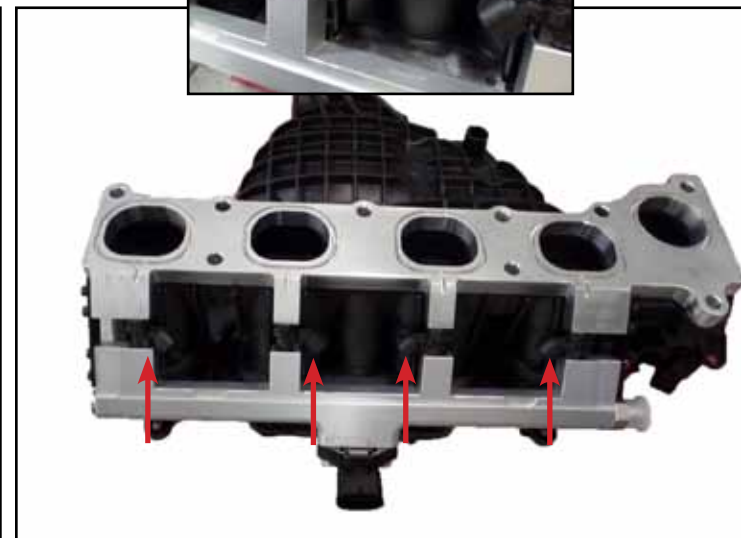
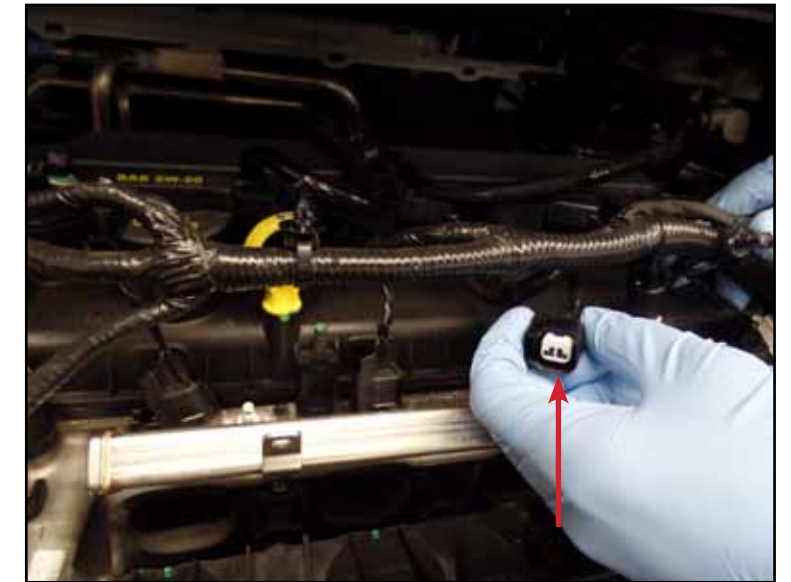
LOW PRESSURE INSTALLATION

1. Disconnect OEM vacuum lines and wiring from air box boot and throttle body and set aside.
Remove air box boot.
2. Remove splash guard from underneath.
3. Beginning at the bottom, remove all intake manifold bolts. Discard the bolts.
4. Remove gasoline fuel rail insulation.
5. Disconnect OEM injector plugs.
6. Detach gasoline fuel rail and set aside. **Do not disconnect from gasoline line!**



LOW PRESSURE INSTALLATION

7. Remove throttle body.
8. Remove intake manifold. Ensure to carefully detach vacuum hose attached to the manifold before removing the manifold.
9. Use the CNG fuel rail assembly as a template and mark points where a modification will be made to give CNG injectors a comfortable fit.
Modify and deburr.



LOW PRESSURE INSTALLATION

10. Install gaskets onto CNG fuel rail assembly.
11. Install manifold with CNG fuel rail assembly.
12. Secure manifold with 2" bolts (193). Use a spacer with a bolt at the bottom of the manifold. Tighten to factory specification.
13. Connect CNG main harness to CNG injectors.
14. Re-install OEM gasoline fuel rail. Tighten to 75-80 in-lbs.
15. Reconnect harness to manifold. Connect CNG harness to CNG fuel rail.
16. Re-install throttle body, vacuum hoses, air box boot, and harnesses previously removed.
17. Re-install splash guard underneath.

NOTE: the air box boot may need to be removed for wiring instructions. If so, re-install later. The low pressure hose may be connected if not done so previously. Lubricate o-ring fitting and tighten to 30-35 ft-lbs.



MAIN HARNESS INSTALL AND CONNECTION

1. The main harness should already be attached to the CNG injectors (refer to low pressure install instructions).
2. Make all the necessary connections to AFCM, battery, rear harness, can bus, and switch/gauge harness.
3. Zip tie areas where there is slack in the harness. Secure to OEM harness.



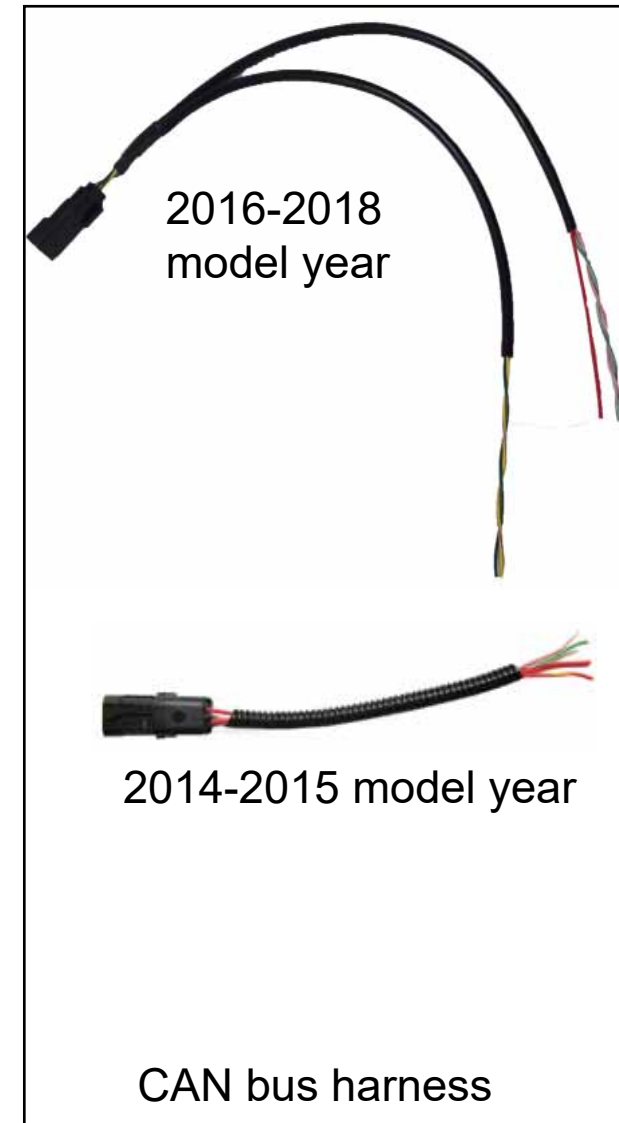
CAN BUS HARNESS

Note: It is recommended to de-pin the wire that you are working on for a cleaner installation. Also, de-pin the four wires one at a time to prevent cross-wiring or incorrect connections.

Locate the "Rear harness and Pin out" sheet for your kit (located on Altech-Eco website).

Note: 2016-2018 model year will contain 5 wires. Follow Pin-Out for connection instructions.

1. Remove driver side wheel.
2. Remove wheel well liner to expose the PCM location.
3. Remove PCM cover and set aside.
4. Remove PCM plug.
5. Retrieve CAN bus harness.
Fit the harness through OEM rubber sleeve until harness wires are fully exposed.



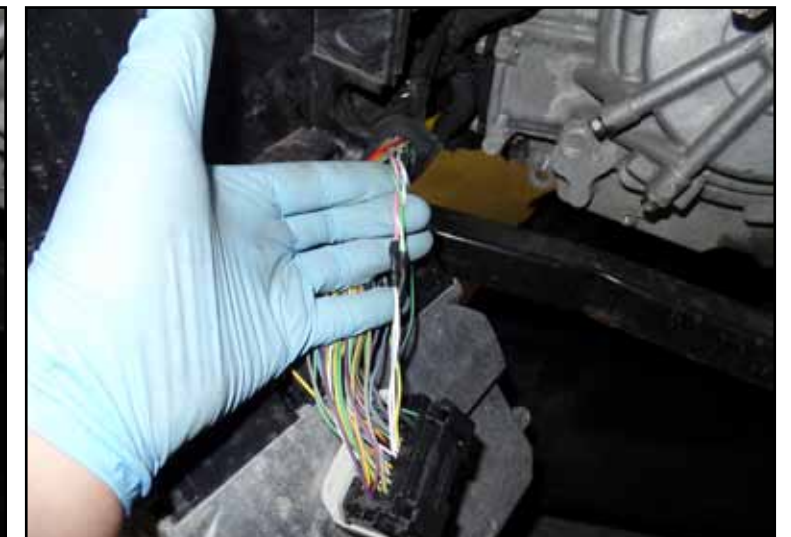
CAN BUS HARNESS

6. Remove some OEM electrical tape to expose the wires.
Remove plug cap and de-pin appropriate OEM wires (refer to CAN bus Pin-Out). Re-install plug cap once complete.

Solder the 3 (5 for the 2016-2018 model year) Can bus wires to the OEM plug (OEM plug located closest to the fender).

Refer to Pin-Out for connection instructions (located on Altech-Eco website).

7. Tape the connection points with electrical tape.
8. Route the other CAN bus end upwards to the battery housing.
9. Zip tie where needed and connect to main harness. Zip tie to OEM harness.



CAN BUS HARNESS

10. Re-install PCM, secure the cover.
11. Re-install wheel well liner.
12. If air box was removed prior to install, re-install air box and reconnect any OEM wires and vacuum hoses removed prior.
13. Re-install the wheel.



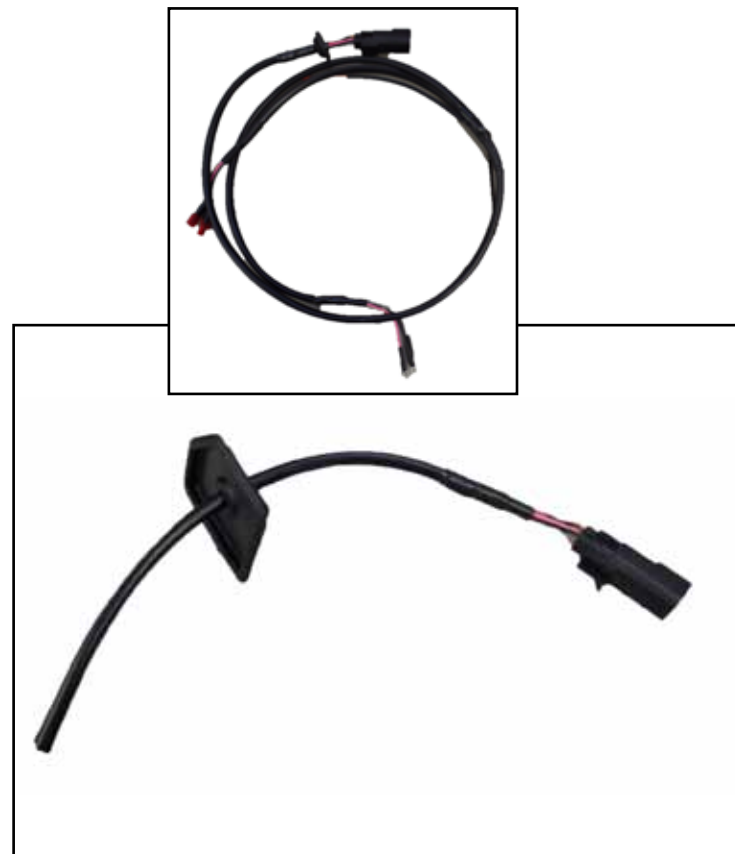
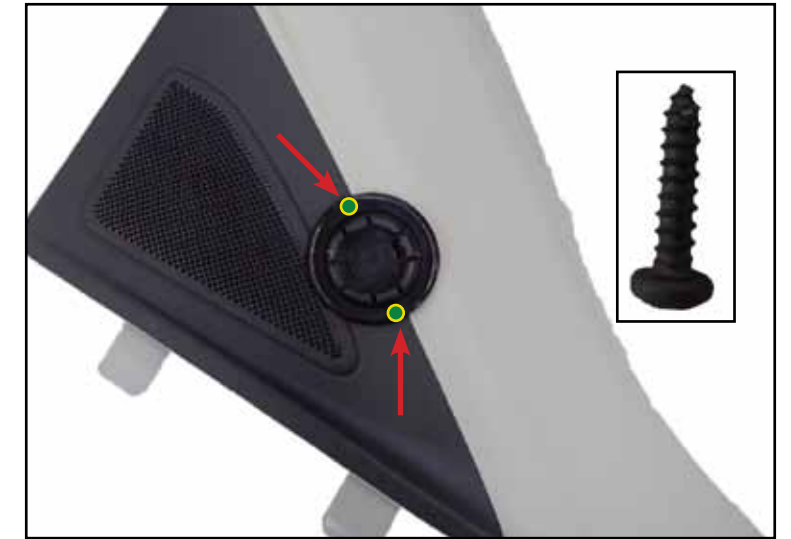
FUEL SWITCH / GAUGE INSTALL

1. Loosen the trim and set aside.
2. Remove column panel.
3. Remove side dash panel.
4. Remove this part of the insulation underneath the steering column. Expose plastic cap.



FUEL SWITCH / GAUGE INSTALL

5. Remove plastic cap. Modify by creating a 3/4" hole through the center.
6. Insert switch gauge harness through. Ensure the plug side will be facing the engine after running the harness through. Secure the grommet onto the plastic cap.
Run the gauge harness up to the battery compartment and attach to main harness if previously installed.
7. Retrieve the gauge assembly. Apply adhesive sticker onto gauge pod base.
8. Position the base as shown onto the column and secure with two screws (232).



FUEL SWITCH / GAUGE INSTALL

9. Modify the column with a hole big enough to fit gauge part of the harness through. Deburr.
10. Re-install side dash panel and trim.
11. Fit gauge with movement resistant band.
12. Slide the gauge harness through the pod and connect to the gauge as shown. Secure the connections. **HAND TIGHTEN ONLY!** Over tightening will sever internal connections.
13. Install gauge with pod into base.



FUEL SWITCH / GAUGE INSTALL

14. Using a flat head screw driver, remove OBD II port.
15. Insert gauge connector into pin 13 and re-install OBD port back into place.
16. Remove panel beneath the steering wheel.
Use provided template and cut out area for the switch. Deburr.
Connect and install switch. Refer to diagram provided for connections.
17. Re-install panel back into place.

DEDICATED ONLY

Dedicated Systems will not require a switch install. A light will be installed indicating CNG operation.

1. Drill a 9/16" hole to fit the indicator. Deburr.
2. Use a mini jumper wire to connect Black and Black/green wires.
3. Install indicator.



CYLINDER COVER INSTALL

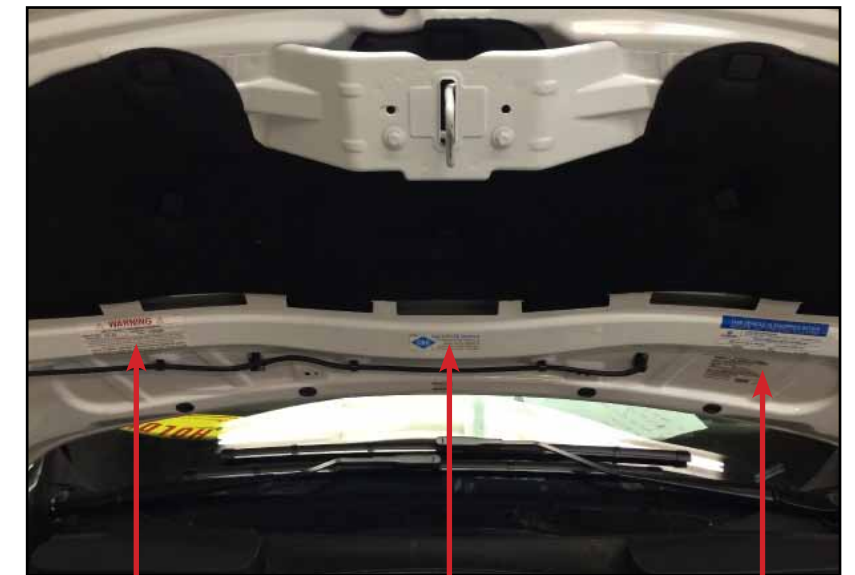
Same installation process as the long wheel base. Cover sits slightly higher in a short wheel base versus the long wheel base.

Pictures to be added in the future....

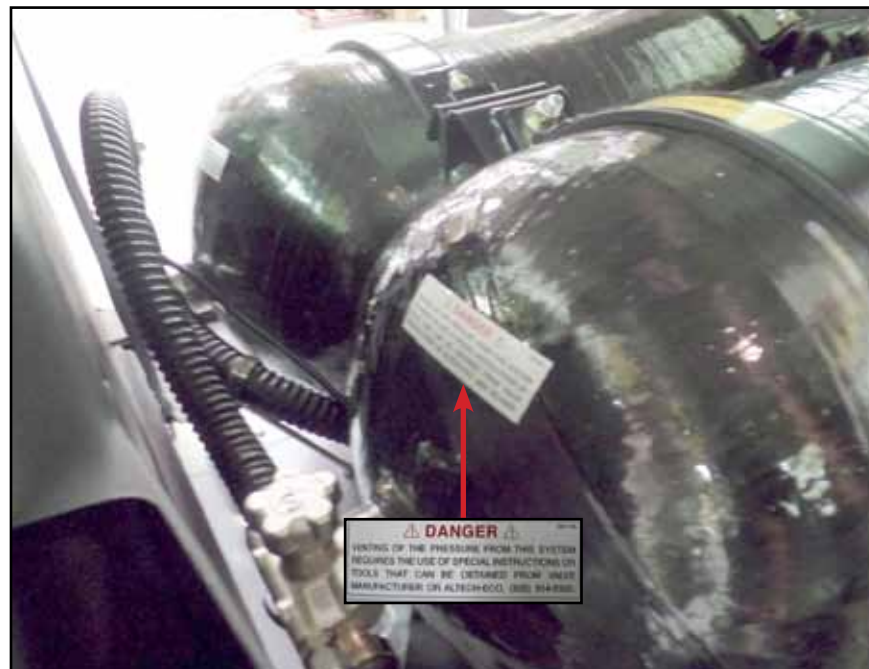
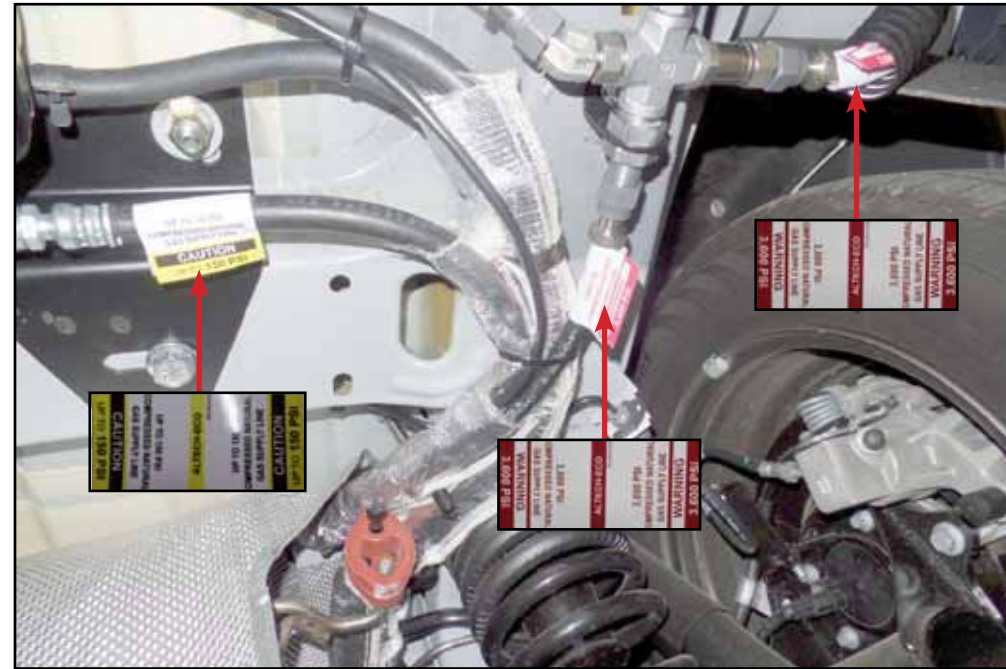


Sample long wheel base single cylinder cover

DECALS



DECALS



LEAK CHECKING THE SYSTEM

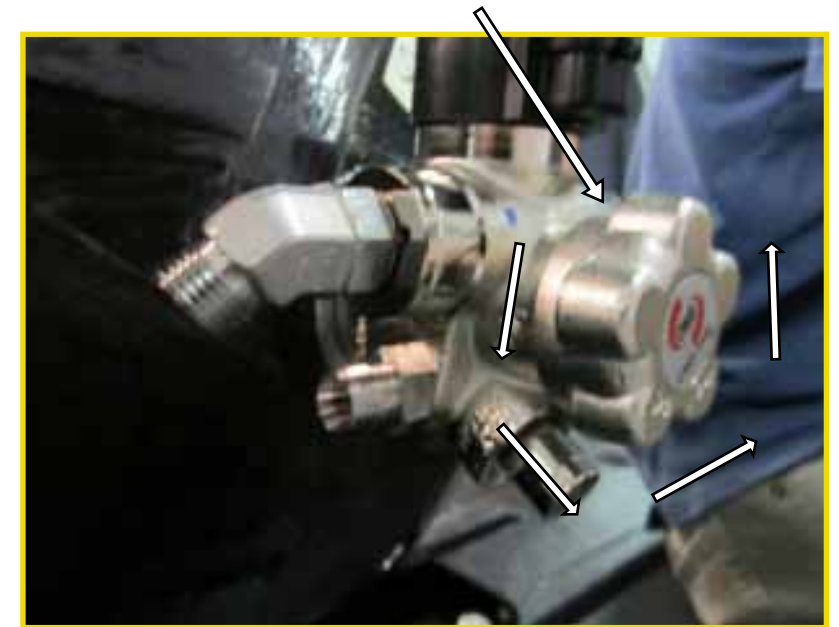
After the Altech-Eco CNG system has been installed on the vehicle, all fuel connections, fuel rails and injectors must be checked for leaks. Also check the overall installation of wiring, zip ties and components to make sure they are not loose or hanging.

Tools:

- Soapy Water Solution or Liquid Leak Check Solution
- Combustible Gas Leak Detector TPI 721 (Davis Instruments)
- Basic Hand Tools

1. Close the valve by turning clockwise and pressurize the system.
2. Leak test using bubble soap and or a methane detector.
 - a. PASS: Continue to step 3.
 - b. FAIL: Depressurize the system and correct the issue before continuing.
3. Open the manual valve on the fuel tank. Using your hand, rotate the manual valve counter clockwise until fully open.
4. Fill the tank with CNG.
5. Check and verify that all installed hoses and fittings are not loose and are secure per torque specifications.
6. Double check and verify wiring is correct and secure with nothing hanging loose. Check that zip ties are snipped properly to avoid potential injury.
7. Pressurize the system by turning the ignition on but do not start the vehicle. This opens the solenoid and fills the lines.
8. Shut off the CNG at the cylinder (tank) manually (manual shut-off valve is located on the tank).
9. Use a methane detector, bubble soap, or other approved means to leak test all hoses, lines and fittings at connection points.
 - a. PASS: Continue to step 8.
 - b. FAIL: Turn off the vehicle ignition and double check that you have performed the manual shut-off on the cylinder (tank) valve. Locate any leak(s). Then, depressurize the system and correct the issue before continuing the leak test. Correcting a leak may simply require tightening (re-tightening) the hoses, lines or fittings. If a leak cannot be corrected, notify the appropriate personnel for further instructions.
10. Turn the ignition off, then back on and start the engine. This is to pressurize the lines again. While the engine is running, perform a leak test by using a methane detector, bubble soap, or other appropriate means.
 - a. PASS: Complete required paper work and notify your supervisor.
 - b. FAIL: Turn off the ignition and manually shut-off on the cylinder (tank) valve. Depressurize the system and correct any issues. After all corrections have been made, open the manual shut-off valve and start the engine. Run the leak test again. For un-repairable issues, notify appropriate personnel for further instructions.
11. Third party installers: After completing the final checklist, it is required that an original or a copy of the entire completed checklist be sent to Altech-Eco. Failure to do so will void the warranty and may result in suspension of installer's license. For additional information, contact your supervisor.

Open manual valve counter-clockwise until fully open.



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