



R22BX

FINAL NOTICE

NHTSA Recall Number: 22V-579 (School Bus)
NHTSA Recall Number: 22V-578 (Non-School Bus)

DATE: October 24, 2023
TO: Blue Bird Owners
Subject: R22BX: Roush Zinc Plated Return Line Fittings

According to our records, we have not received confirmation the above referenced recall, dated May 24, 2023, has been completed. A copy of Recall R22BX is attached. Your buses affected by Recall R22BX are identified by Blue Bird body number and VIN under Section 2 on the enclosed cover sheet.

If this is the first time you received notification of Recall R22BX, please read the enclosed notification carefully. Recall R22BX must be completed, as soon as possible.

Corrective Action:

To correct this condition, affected vehicles will need to be repaired, per R22BX Recall Instructions. ROUSH will provide the redesigned fuel line for the customer's vehicle at no cost. ROUSH will reimburse labor per the stated SLT. Please contact an authorized ROUSH CleanTech Service Center to schedule an appointment to bring your vehicle in for repair or your local Blue Bird Dealer to arrange to have the Recall performed. To locate an authorized dealer, search online at www.blue-bird.com/find-a-dealer

What You Should Do:

Blue Bird Dealer, Authorized ROUSH CleanTech Service Center or Owner authorized to complete their own ROUSH CleanTech repairs:

Using the vehicle information, open a case with ROUSH CleanTech requesting parts for the repair. This can be done in two ways:

1. After obtaining the customer's vehicle information, log into the ROUSH CleanTech Service portal and open a warranty case (<https://rctws.force.com/rct/s/technical-support>). This will need to include the VIN and mileage for each vehicle and will allow ROUSH CleanTech to schedule a remedy for your concerns.
 - a. **For customers with multiple vehicles, please include a complete list of the vehicle VINs and mileage in the case.**
2. Perform the procedure in the work instructions provided by Blue Bird and ROUSH CleanTech.
 - a. When the repairs are complete, upload a copy of your labor invoice to the case.

Non Blue Bird Dealer, Authorized ROUSH CleanTech Service Center or Owner authorized to complete their own ROUSH CleanTech repairs:

1. Contact your local Blue Bird Dealer or Authorized ROUSH CleanTech Service Center.

For any questions or concerns with this recall please contact ROUSH CleanTech via phone at 1-800-59-ROUSH (Option 2) or via email at support@roushcleantech.com

Thank you for your prompt attention to this matter.

BLUE BIRD BODY COMPANY
3920 Arkwright Road, Suite 200, Macon, GA 31210 – (478) 825-2021



R22BX

IMPORTANT SAFETY RECALL

NHTSA Recall Number: 22V-579 (School Bus)
NHTSA Recall Number: 22V-578 (Non-School Bus)

DATE: May 24, 2023

SUBJECT: R22BX: Roush Zinc Plated Return Line Fittings

Dear Blue Bird Owner:

This notice applies to your bus(es) identified by both Blue Bird Body Number and Vehicle Identification Number (VIN) on the enclosed yellow cover sheet.

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Blue Bird Body Company has decided that a defect, which relates to motor vehicle safety, exists in certain:

- Certain model year 2017-2023 Blue Bird Vision School Buses
 - manufactured from June 11, 2016 through July 27, 2022
- Certain model year 2018-2023 Blue Bird Vision Non-School Buses
 - manufactured from November 30, 2016 through July 6, 2022

Per the Blue Bird's Interim Notification letter issued September 20, 2022, **parts are now available in limited quantities**. Due to continued material availability issues, ROUSH CleanTech continues to receive parts shipment to fulfill the requests.

Certain Blue Bird Propane Vision School and Non-School Buses equipped with Ford 6.8L and 7.3L engines have been modified by the addition of a ROUSH CleanTech ("ROUSH") Gen 4 or Gen 5 LPG fuel system. The zinc plated carbon steel fitting on the fuel return line on some of these vehicles may corrode over time due to exposure to salt spray, particularly where impacts from road debris have damaged the protective coating that had been applied to the fitting. Such corrosion could lead to a failure of the fuel return line fitting, which would result in a leak of liquid propane fuel, increasing the risk of a fire with the affected units.

The corrosion at issue occurs only in the presence of significant amounts of road salt. This notice applies only to vehicles registered in the following states: Connecticut, Delaware, District of Columbia, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, and Wisconsin. According to our records, an LPG system covered by this recall was installed on the referenced vehicle.



Corrective Action:

ROUSH will provide the redesigned fuel line for the customer’s vehicle at no cost. ROUSH will reimburse labor per the stated SLT. Please contact an authorized ROUSH CleanTech Service Center to schedule an appointment to bring your vehicle in for repair or your local Blue Bird Dealer to arrange to have the Recall performed. To locate an authorized dealer, search online at www.blue-bird.com/find-a-dealer

What You Should Do:

Blue Bird Dealer, Authorized ROUSH CleanTech Service Center or Owner authorized to complete their own ROUSH CleanTech repairs:

Using the vehicle information, open a case with ROUSH CleanTech requesting parts for the repair. This can be done in two ways:

1. After obtaining the customer’s vehicle information, log into the ROUSH CleanTech Service portal and open a warranty case (<https://rctws.force.com/rct/s/technical-support>). This will need to include the VIN and mileage for each vehicle and will allow ROUSH CleanTech to schedule a remedy for your concerns.
 - a. **For customers with multiple vehicles, please include a complete list of the vehicle VINs and mileage in the case.**
2. Perform the procedure in the work instructions provided by Blue Bird and ROUSH CleanTech.
 - a. When the repairs are complete, upload a copy of your labor invoice to the case.

Non Blue Bird Dealer, Authorized ROUSH CleanTech Service Center or Owner authorized to complete their own ROUSH CleanTech repairs:

1. Contact your local Blue Bird Dealer or Authorized ROUSH CleanTech Service Center.

For any questions or concerns with this recall please contact ROUSH CleanTech via phone at 1-800-59-ROUSH (Option 2) or via email at support@roushcleantech.com

To access the instructions for the recall repair please visit the ROUSH CleanTech portal at <https://rctws.force.com/rct/s/article/Recall-Gen-4-and-5-Blue-Bird-Vision>

Return Line Kit Numbers - Gen 4 Return Line Kit Numbers:

Wheelbase	Kit Number
Standard Range	
P22BB-RLSTDKIT-AA	BB G4 STD RANGE RLINE KIT (169WB)
P22BB-RLSTDKIT-BA	BB G4 STD RANGE RLINE KIT (189WB)
P22BB-RLSTDKIT-CA	BB G4 STD RANGE RLINE KIT (217WB)
P22BB-RLSTDKIT-DA	BB G4 STD RANGE RLINE KIT (238WB)
P22BB-RLSTDKIT-EA	BB G4 STD RANGE RLINE KIT (252WB)
P22BB-RLSTDKIT-FA	BB G4 STD RANGE RLINE KIT (273WB)
P22BB-RLSTDKIT-GA	BB G4 STD RANGE RLINE KIT (280WB)



Return Line Kit Numbers - Gen 4 Return Line Kit Numbers: (continued)

Wheelbase	Kit Number
Extended Range	
P22BB-RLEXTKIT-AA	BB G4 EXT RANGE RLINE KIT (169WB)
P22BB-RLEXTKIT-BA	BB G4 EXT RANGE RLINE KIT (189WB)
P22BB-RLEXTKIT-CA	BB G4 EXT RANGE RLINE KIT (217WB)
P22BB-RLEXTKIT-DA	BB G4 EXT RANGE RLINE KIT (238WB)
P22BB-RLEXTKIT-EA	BB G4 EXT RANGE RLINE KIT (252WB)
P22BB-RLEXTKIT-FA	BB G4 EXT RANGE RLINE KIT (273WB)
P22BB-RLEXTKIT-GA	BB G4 EXT RANGE RLINE KIT (280WB)
53" Tank	
P22BB-RL53KIT-AA	BB G4 53IN TANK RLINE KIT (169WB)
P22BB-RL53KIT-BA	BB G4 53IN TANK RLINE KIT (189WB)
P22BB-RL53KIT-CA	BB G4 53IN TANK RLINE KIT (217WB)
P22BB-RL53KIT-DA	BB G4 53IN TANK RLINE KIT (238WB)
P22BB-RL53KIT-EA	BB G4 53IN TANK RLINE KIT (252WB)
P22BB-RL53KIT-FA	BB G4 53IN TANK RLINE KIT (273WB)
P22BB-RL53KIT-GA	BB G4 53IN TANK RLINE KIT (280WB)

Gen 5 Return Line Part Numbers:

Wheelbase	Kit Number
Standard Range	
P22BK-RLSTDKIT-AA	BB G5 STD RANGE RLINE KIT (169WB)
P22BK-RLSTDKIT-BA	BB G5 STD RANGE RLINE KIT (189WB)
P22BK-RLSTDKIT-CA	BB G5 STD RANGE RLINE KIT (217WB)
P22BK-RLSTDKIT-DA	BB G5 STD RANGE RLINE KIT (238WB)
P22BK-RLSTDKIT-EA	BB G5 STD RANGE RLINE KIT (252WB)
P22BK-RLSTDKIT-FA	BB G5 STD RANGE RLINE KIT (273WB)
P22BK-RLSTDKIT-GA	BB G5 STD RANGE RLINE KIT (280WB)
Extended Range	
P22BK-RLEXTKIT-AA	BB G5 EXT RANGE RLINE KIT (169WB)
P22BK-RLEXTKIT-BA	BB G5 EXT RANGE RLINE KIT (189WB)
P22BK-RLEXTKIT-CA	BB G5 EXT RANGE RLINE KIT (217WB)
P22BK-RLEXTKIT-DA	BB G5 EXT RANGE RLINE KIT (238WB)
P22BK-RLEXTKIT-EA	BB G5 EXT RANGE RLINE KIT (252WB)
P22BK-RLEXTKIT-FA	BB G5 EXT RANGE RLINE KIT (273WB)
P22BK-RLEXTKIT-GA	BB G5 EXT RANGE RLINE KIT (280WB)



Gen 5 Return Line Part Numbers: *(continued)*

Wheelbase	Kit Number
53" Tank	
P22BK-RL53KIT-AA	BB G5 53IN RANGE RLINE KIT (169WB)
P22BK-RL53KIT-BA	BB G5 53IN RANGE RLINE KIT (189WB)
P22BK-RL53KIT-CA	BB G5 53IN RANGE RLINE KIT (217WB)
P22BK-RL53KIT-DA	BB G5 53IN RANGE RLINE KIT (238WB)
P22BK-RL53KIT-EA	BB G5 53IN RANGE RLINE KIT (252WB)
P22BK-RL53KIT-FA	BB G5 53IN RANGE RLINE KIT (273WB)
P22BK-RL53KIT-GA	BB G5 53IN RANGE RLINE KIT (280WB)

Standard Labor Times:

Labor Code	Wheelbase	Approved Time
RCTL22A	Replace Return Line for Gen 4	1.5 hours
RCTL22B	Replace Return Line for Gen 5	1 hour

Federal law requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

If you no longer own the subject bus(es), please complete the appropriate section of the yellow cover sheet and return to Blue Bird in the enclosed pink postage prepaid envelope.

If the modifications directed by this notification were performed on your bus prior to the receipt of this recall notification, please follow the instructions outlined above in the section "What You Should Do" and open a case with ROUSH CleanTech.

Reimbursements will be made in accordance with the requirements of the National Highway Transportation Safety Act, Title 49 Code of Federal Regulations, Parts 573 and 577.

For any questions or concerns regarding this recall, please contact ROUSH CleanTech via phone at 1-800-59-ROUSH (Option 2) or via e-mail at support@roushcleantech.com

If you believe that ROUSH or Blue Bird Body Company have failed or are unable to remedy the defect without charge within a reasonable time, please contact ROUSH at the telephone number shown above. You may also contact:

**ADMINISTRATOR
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
1200 NEW JERSEY AVENUE, SE
WASHINGTON, D.C. 20590**

Or, you may call The National Highway Traffic Safety Administration toll free at:
1-888-327-4236 TTY 1-800-424-9153 or go to: <http://www.safercar.gov>

Blue Bird Return Fuel Line Replacement (R22BX)

Gen 4 and 5 Blue Bird Vision - Return Fuel Line Removal and Replacement Instructions

Applicable Model(s)/VINs:

Gen 4-5 Blue Bird Vision Propane Buses

- Gen 4 – MY 2016-2019 With 6.8L V10 Engine
- Gen 5 – MY 2020-2022 With 7.3L V8 Engine

Description:

Procedure for removal and replacement of the Return Fuel Line on Gen 4 and Gen 5 Blue Bird Vision LPG buses.

Tools/Parts Required:

- WD- 40 or other penetration fluid
- Ratchet 3/8 drive
- Torque Wrench 3/8 Drive
- 3/8" Drive Crows Foot Wrenches
 - 11/16"
 - 5/8"
- Bolt Cutters
- Wrenches
 - 9/16" Short
 - 5/8" Short
 - 11/16" Short
 - 10mm
 - 8mm
 - 6mm Hex Drive (Allen)
- Marine-grade Anti-Seize
- Zip Tie Cutters large ("Snips")
- Electrical Tape
- Fir Tree Tool

For any questions or concerns regarding this procedure, please contact ROUSH CleanTech via phone at 1-800-59-ROUSH (Option 2) or via e-mail at support@roushcleantech.com

Blue Bird Return Fuel Line Replacement (R22BX)

Warnings and Advisories



NFPA 58 Guidelines

Always follow all NFPA 58 guidelines. When working on the propane fuel system or refueling a vehicle, **you must be in a well-ventilated area at least 35 ft away from heat, sparks, flames, static electricity, lighted smoking materials, or other sources of ignition.** Failure to heed this danger may result in severe personal injury or death.

Training

Only technicians trained on the ROUSH Clean Tech fuel systems should complete this procedure or any other procedure on a ROUSH Clean Tech propane vehicle. Technicians working with or around any fuel system should be properly trained to always utilize extreme care and caution. Failure to exercise extreme caution and care may lead to serious accidents which can result in property damage, personal injury, and/or death.

FRPCM

The Fuel Rail Pressure Control Module (FRPCM) is brass. Use care when removing any components from the FRPCM. When installing new fuel line to the FRPCM, first, hand-tighten the line and then torque to the correct torque spec found in these instructions. Do not over torque the lines as this may damage the FRPCM and require replacement.



FRPCM

Blue Bird Return Fuel Line Replacement (R22BX)

Warnings and Advisories Continued

GEN 4

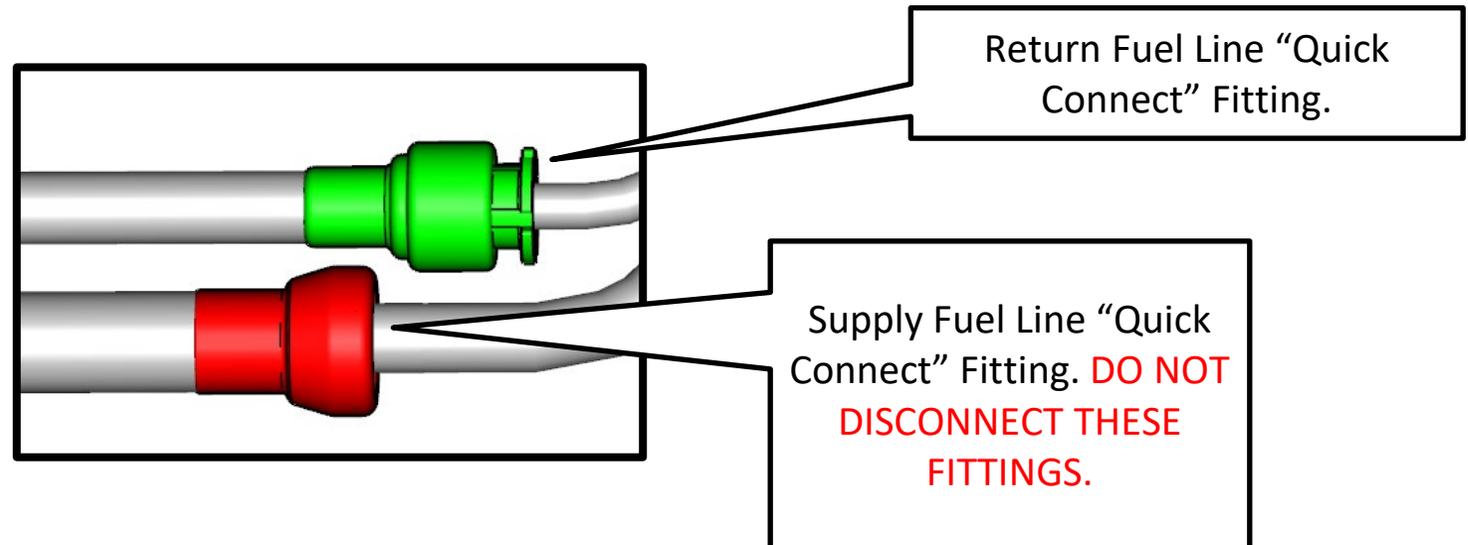
GEN 5



Tip: look at the top right corner of each page to verify if that page applies to the vehicle you are working on.

Fuel Line “Quick Connect” Fittings

This instruction manual covers the removal and replacement of the *Return* Fuel Line on **Gen 4** and **Gen 5** Blue Bird Vision Propane Buses. For ease of removing the *original* Return Fuel Line, it is acceptable to disconnect this fuel line at the quick connect joints (see **green** fitting in the image below). The procedure for disconnecting these “quick connect” fittings from the Return Fuel Line is covered in this manual. **Only disconnect the Return Fuel line “quick connect” fittings after the fuel line has been de-pressurized** (see next page for de-pressurization instructions). **DO NOT attempt to disconnect any “quick connects” on the Supply Fuel Line at any time.**



Blue Bird Return Fuel Line Replacement (R22BX)

Fuel Line Depressurization

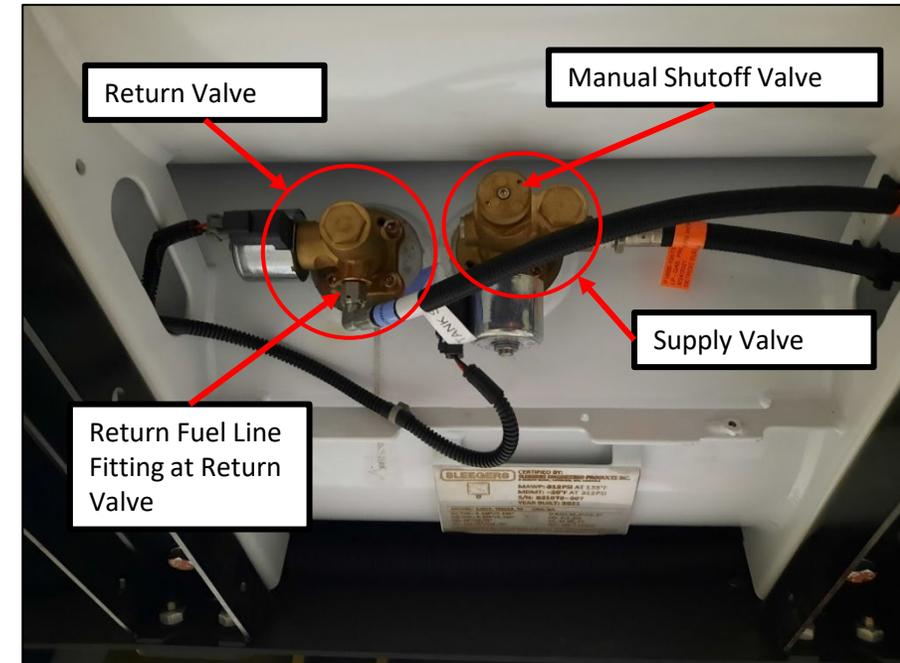
GEN 4

GEN 5

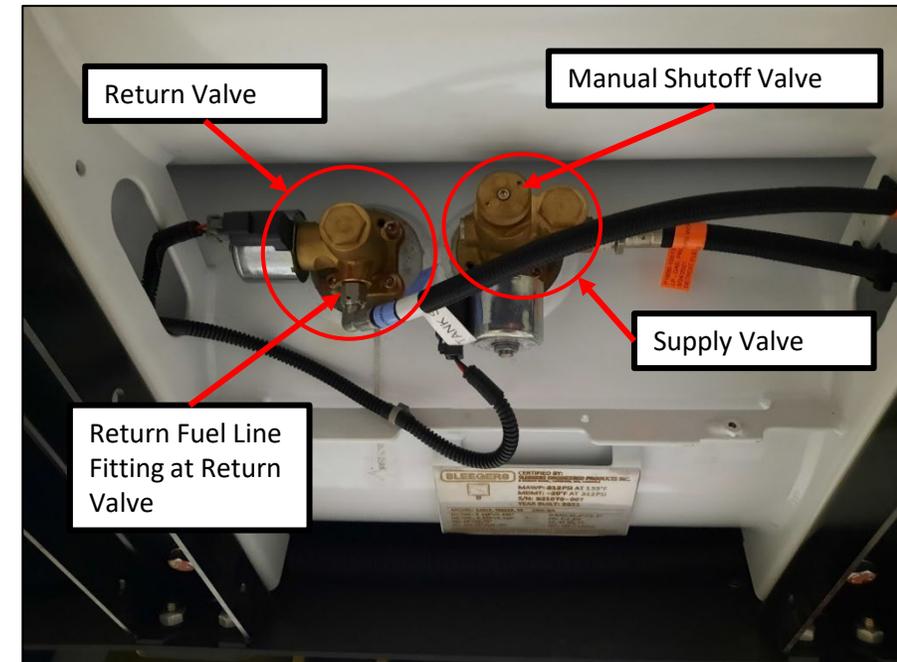
At the underside of the fuel tank, apply WD-40 or other penetrating fluid to the four fasteners that retain the Fuel Tank Valve Cover Plate. Allow the penetrating fluid time to soak.

Move the vehicle to a well-ventilated outside area at least 35ft away from any potential ignition source.

1. Remove the four fasteners that retain the Valve Cover Plate to the fuel tank (see image on the right).
 - a) **If the fastener threads are damaged upon removal, see Appendix A at the end of this instruction document. NOTE: Some vehicles may have a variant of the Valve Cover Plate without center access cutout.**
2. On the Supply Valve, turn the Manual Shutoff Valve clockwise to shut. Turn the dial by hand to close.



3. To purge fuel in the lines, start the engine and run until it stalls. Remove keys from the ignition and set aside.
4. Disconnect the negative battery terminal.
5. Wearing propane safe gloves and eye protection, **slowly** loosen the Return Fuel Line fitting at the Return Valve using a 9/16" open-end wrench. There will be a hissing sound with odor from propane escaping. **Do not completely unthread the fitting until the hissing sound completely stops.** NOTE: Watch for liquid propane dripping as contact with liquid propane can cause injury.
6. When the hissing sound stops, completely disconnect the Return Fuel Line from the Return Valve. NOTE: **Do Not Disconnect the Supply Fuel Line from the Supply Valve.**
7. Inspect the O-ring mating surface on the Return Valve for damage.

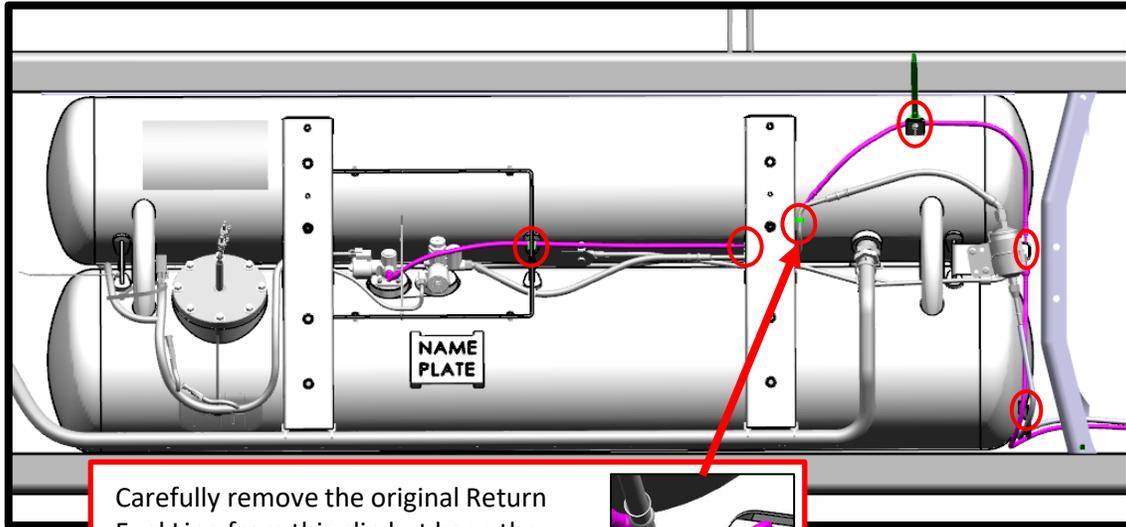


Blue Bird Return Fuel Line Replacement (R22BX)

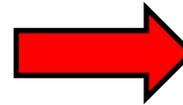
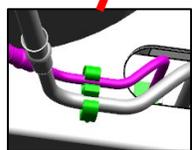
Removal of the Original Return Fuel Line

1. Remove all retention pieces (zip ties, clips, and fasteners) that retain the original Return Fuel Line to the vehicle. The Return Fuel Line is the **purple** fuel line in images below. The retention pieces are circled in **red**. **NOTE: Be careful when removing retention pieces as to not damage adjacent fuel lines or components.**
2. After all retention pieces are disconnected from the original Return Fuel Line, begin to remove it from the vehicle.

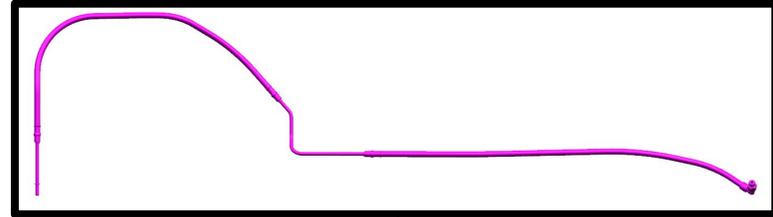
Original Return Fuel Line at Fuel Tank from vehicle underside:



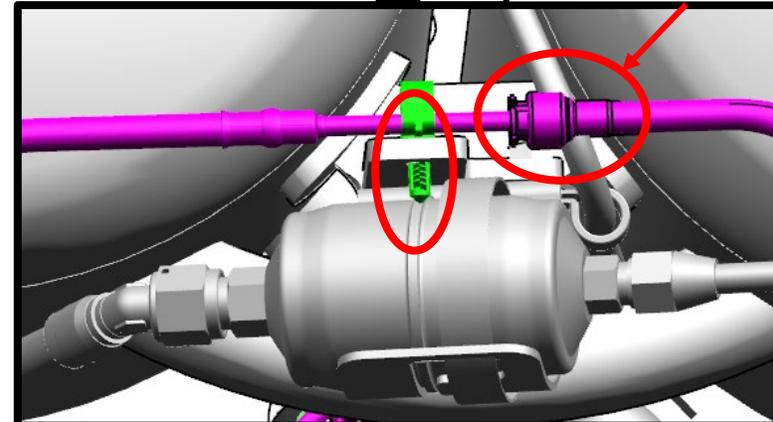
Carefully remove the original Return Fuel Line from this clip but keep the clip in place to retain the existing Supply Fuel Line.



Remove the Fuel Tank Return Fuel Line from the rear of the vehicle.



Quick Disconnect Fitting

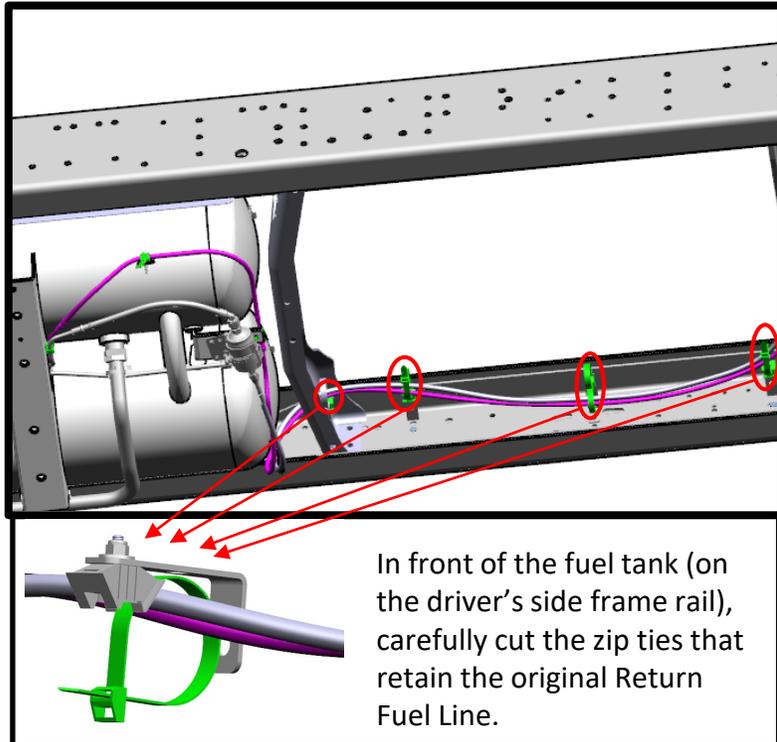


Disconnect the original Return Fuel Line at front of Fuel Tank. Press plastic tab on the quick disconnect fitting and pull the fuel line sections apart from each other. It may be necessary to snip the Fuel Line to the right of Quick Disconnect fitting if line separation is not possible due to corrosion. **DO NOT USE ANY CUTTING TOOLS THAT EMIT SPARKS**

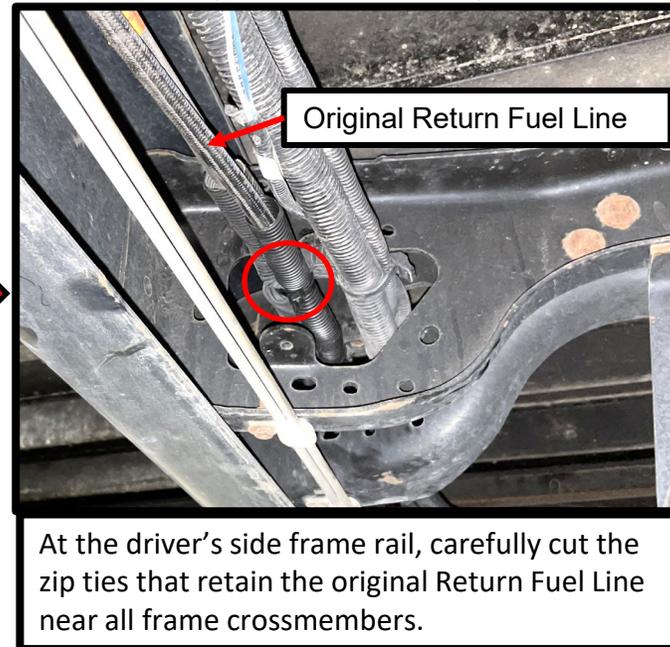
Removal of the Original Return Fuel Line **Continued**

1. Remove all retention pieces (zip ties, clips, and fasteners) that retain the original Return Fuel Line to the vehicle. The Return Fuel Line is the **purple** fuel line in images below. The retention pieces are circled in **red**. **NOTE: Be careful when removing retention pieces as to not damage adjacent fuel lines or components.**
2. After all retention pieces are disconnected from the original Return Fuel Line, begin to remove it from the vehicle.

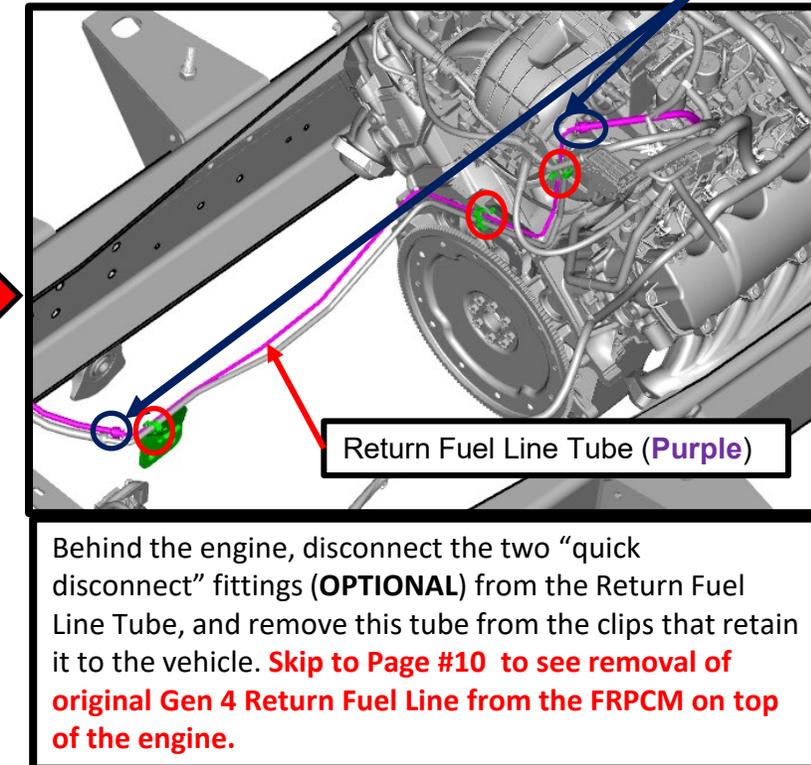
Return Fuel Line at Front of Fuel Tank



Return Fuel Line at Driver's Side Frame Rail (near crossmembers)



Quick Disconnect Fitting



Blue Bird Return Fuel Line Replacement (R22BX)

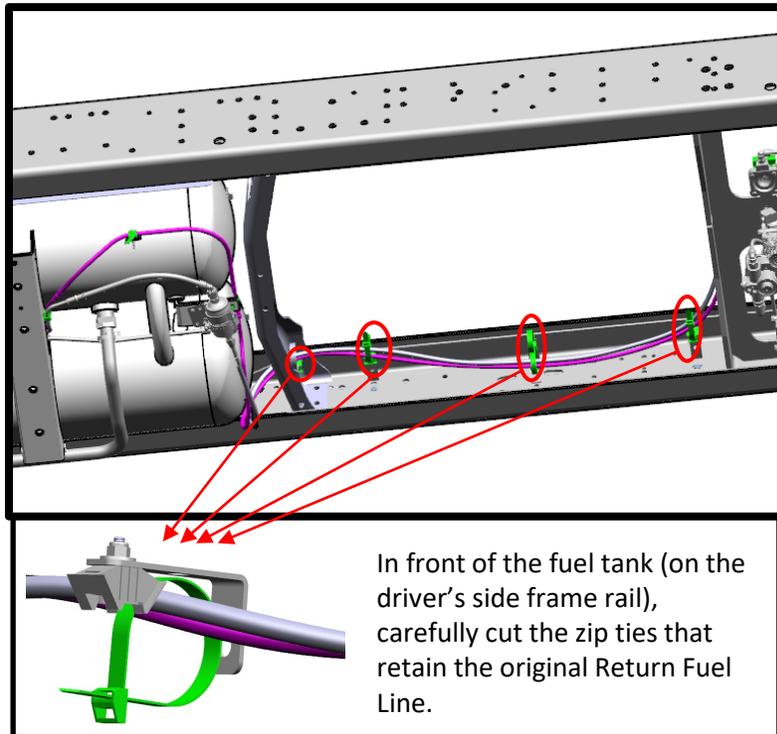
Removal of the Original Return Fuel Line

GEN 5

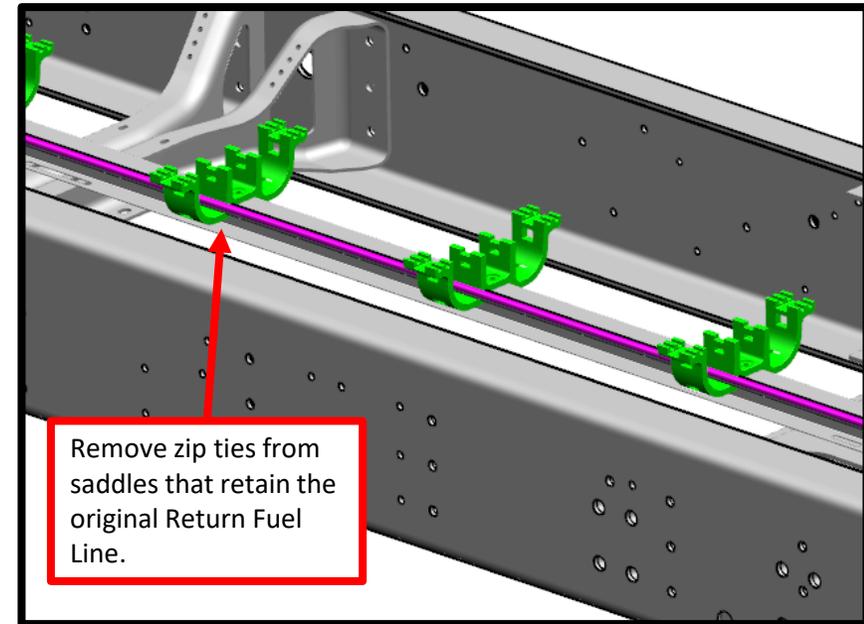
This page applies to ONLY Gen 5 vehicles.

1. Remove all retention pieces (zip ties, clips, and fasteners) that retain the original Return Fuel Line to the vehicle. The Return Fuel Line is the **purple** fuel line in images below. The retention pieces are circled in **red**. **NOTE: Be careful when removing retention pieces as to not damage adjacent fuel lines or components.**
2. After all retention pieces are disconnected from the original Return Fuel Line, begin to remove it from the vehicle.

Return Fuel Line at Front of Fuel Tank



Return Fuel Line Along "Center Spine" (Gen 5)

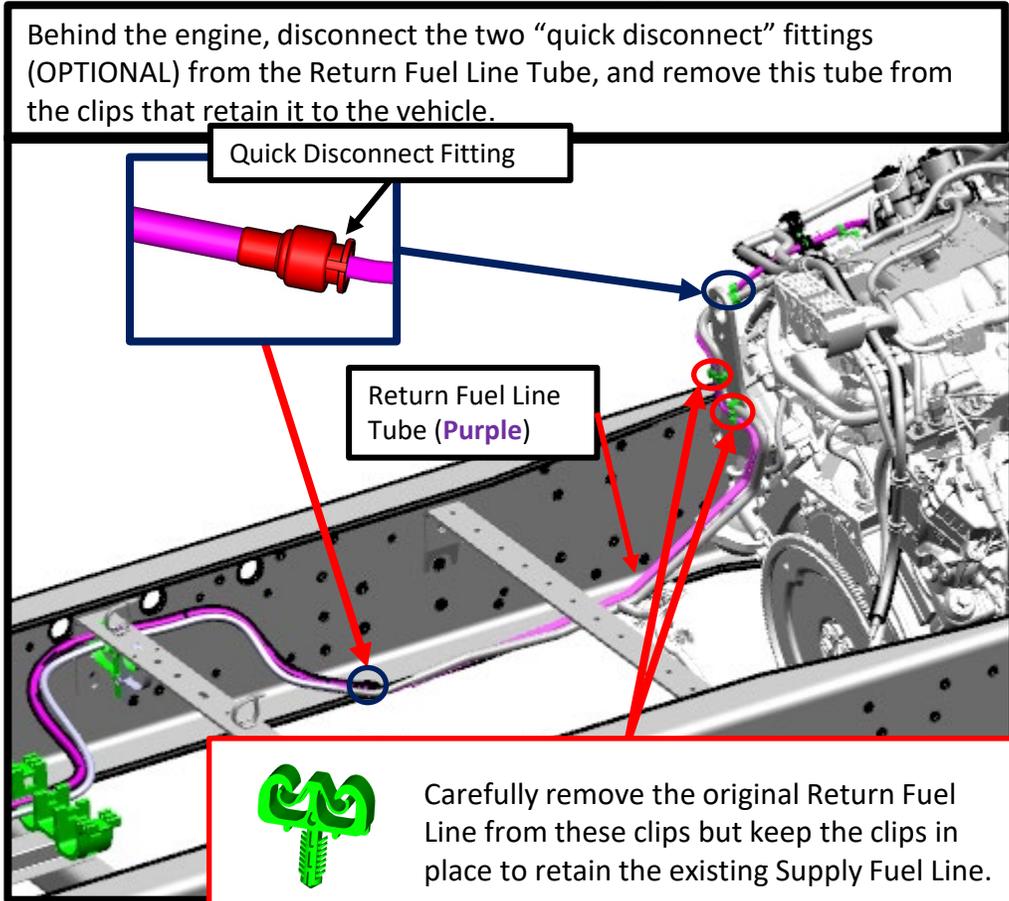


Blue Bird Return Fuel Line Replacement (R22BX)

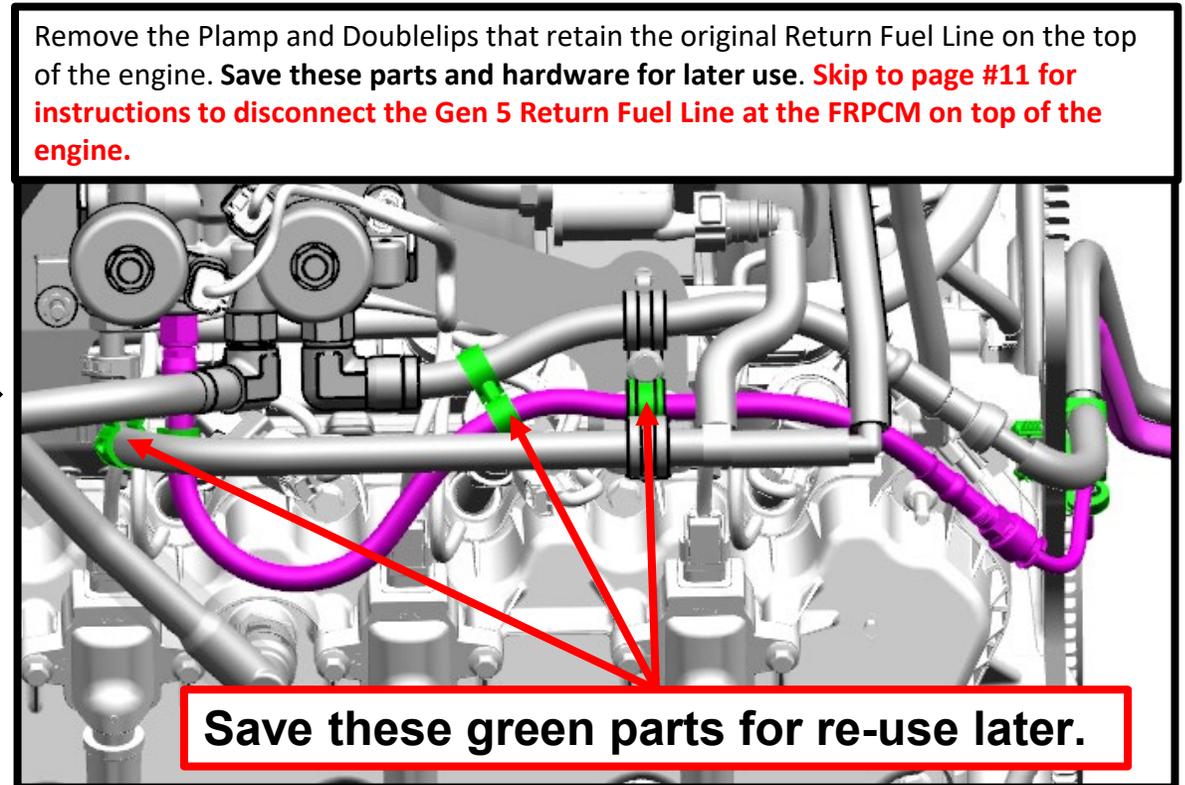
Removal of the Original Return Fuel Line **Continued**

1. Remove all retention pieces (zip ties, clips, and fasteners) that retain the original Return Fuel Line to the vehicle. The Return Fuel Line is the **purple** fuel line in images below. The retention pieces are circled in **red**. **NOTE: Be careful when removing retention pieces as to not damage adjacent fuel lines or components.**
2. After all retention pieces are disconnected from the original Return Fuel Line, begin to remove it from the vehicle.

Return Fuel Line Behind Engine



Return Fuel Line at Top of Engine



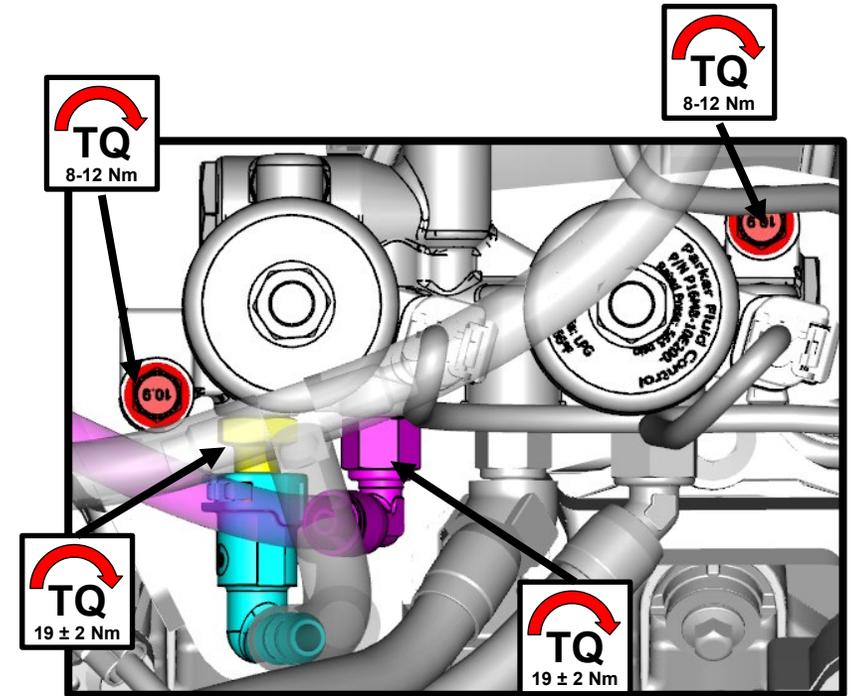
Removal and Installation of the Original and New Return Fuel Line at the FRPCM

Removal of Original Return Fuel Line at FRPCM (top of engine)

1. Loosen the FRPCM mounting bolts (**red**) using a 10mm wrench, but do not remove completely. This is to prevent the FRPCM from being damaged during the removal and installation of the Return Fuel Lines. If issues arise with accessibility to the indicated components, it is acceptable to completely remove the FRPCM mounting bolts to better manipulate the FRPCM.
2. Remove the EVAP hose from the Bleed Port by pressing the locking tab on the connector (**light blue**) and carefully pulling. Then remove the Bleed Port (**yellow**) from the FRPCM using a 5/8" wrench.
3. Remove the Return Fuel Line (**purple**) from the FRPCM using a 9/16" wrench.

Installation of New Return Fuel Line at FRPCM (top of engine). **Read pages #12 and #14 before performing this procedure.**

1. Ensure that the new return fuel line is routed properly on top of engine. See **Page #16** to verify routing.
2. Attach new Return Fuel Line at the FRPCM (**purple**). Slowly **hand tighten** to not damage the FRPCM.
3. Torque the new Return Fuel Line to the FRPCM to 19Nm ± 2Nm using an 11/16" crows' foot and torque wrench.
4. Re-install the Bleed port (**yellow**) and torque to 19 ± 2Nm using a 5/8" crows' foot and torque wrench, or a 5/8" deep-well socket and torque wrench.
5. Then push the EVAP hose (**light blue**) back onto the Bleed Port and listen for an audible "click" sound. Give the connector a light pull to verify that it has properly engaged with the Bleed Port Fitting.
6. Torque the FRPCM mounting bolts (**red**) to 8-12 Nm.



Description	Torque
Fuel Vapor Outlet (Bleed Port- Yellow)	19 ± 2Nm
Fuel Rail Return Outlet (Purple)	19 ± 2Nm
FRPCM Mounting Bolts (Red)	8-12 Nm

Blue Bird Return Fuel Line Replacement (R22BX)

Removal and Installation of the Original and New Return Fuel Line at the FRPCM

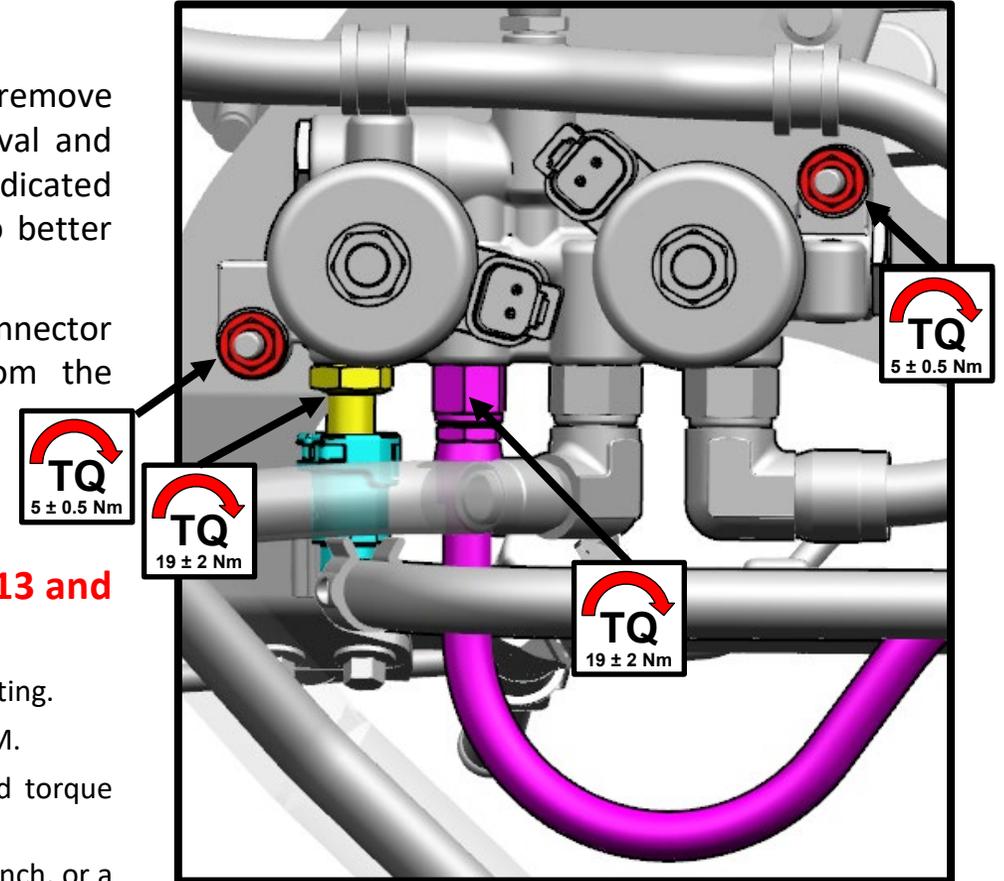
GEN 5

Removal of Original Return Fuel Line at FRPCM (top of engine)

1. Loosen the FRPCM mounting bolts (**red**) using a 10mm wrench, but do not remove completely. This is to prevent the FRPCM from being damaged during the removal and installation of the Return Fuel Lines. If issues arise with accessibility to the indicated components, it is acceptable to completely remove the FRPCM mounting bolts to better manipulate the FRPCM.
2. Remove the EVAP hose from the Bleed Port by pressing the locking tab on the connector (**light blue**) and carefully pulling. Then remove the Bleed Port (**yellow**) from the FRPCM using a 5/8" wrench.
3. Remove the Return Fuel Line (**purple**) from the FRPCM using a 9/16" wrench.

Installation of New Return Fuel Line at FRPCM (top of engine). **Read pages #13 and #14 before performing this procedure.**

1. Ensure that the new return fuel line is routed properly on top of engine. See **Page #18** to verify routing.
2. Attach new Return Fuel Line at the FRPCM (**purple**). Slowly **hand tighten** to not damage the FRPCM.
3. Torque the new Return Fuel Line to the FRPCM to $19 \pm 2\text{Nm}$ using an 11/16" crows' foot and torque wrench.
4. Re-install the Bleed port (**yellow**) and torque to $19 \pm 2\text{Nm}$ using a 5/8" crows' foot and torque wrench, or a 5/8" deep-well socket and torque wrench.
5. Then push the EVAP hose (**light blue**) back onto the Bleed Port and listen for an audible "click" sound. Give the connector a light pull to verify that it has properly engaged with the Bleed Port Fitting.
6. Torque the FRPCM mounting bolts (**red**) to $5 \pm 0.5\text{ Nm}$.

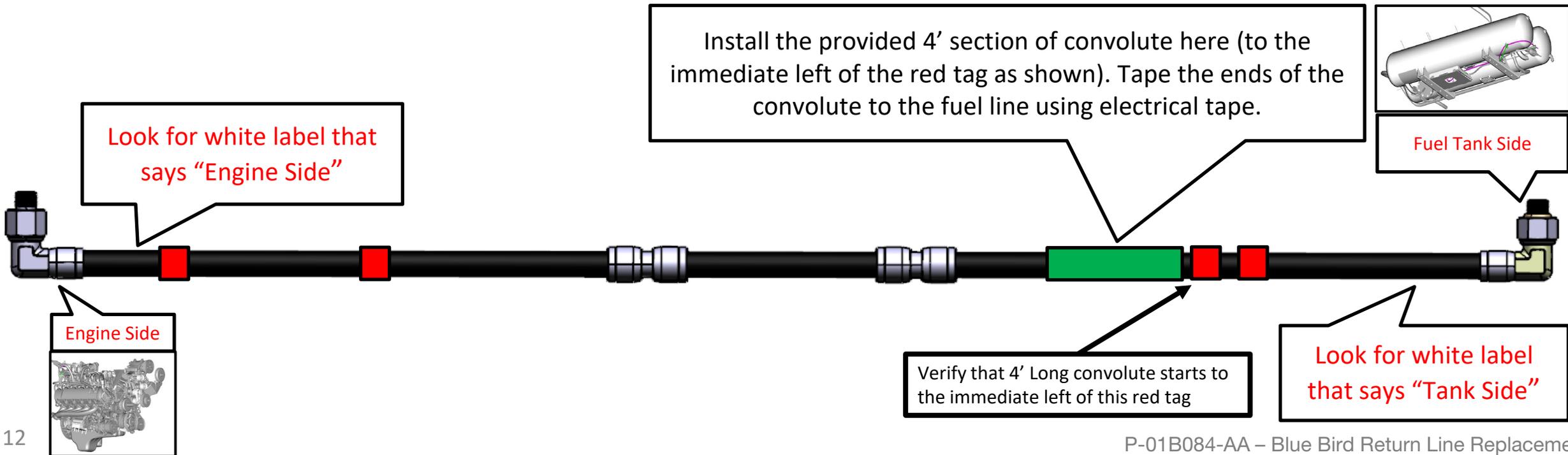


Description	Torque
Fuel Vapor Outlet (Bleed Port- Yellow)	$19 \pm 2\text{Nm}$
Fuel Rail Return Outlet (Purple)	$19 \pm 2\text{Nm}$
FRPCM Mounting Bolts (Red)	$5 \pm 0.5\text{ Nm}$

Blue Bird Return Fuel Line Replacement (R22BX)

Preparing New Return Fuel Line for Installation

1. Verify that the new Return Fuel Line appears as shown in the image below (**Gen 4 only**).
2. **Do not** remove the plastic coverings from the end fittings until the time comes to install these fittings into their designated locations on the vehicle (as described in this manual). These coverings protect the fuel line from internal contamination during the installation process.
3. Pre-install provided 4' Long Convolute (P/N PLS-34-100-B-1219) to the fuel line at the indicated location. Retain the ends of it in place with electrical tape. The tape will ensure that the convolute stays in position during fuel line installation.

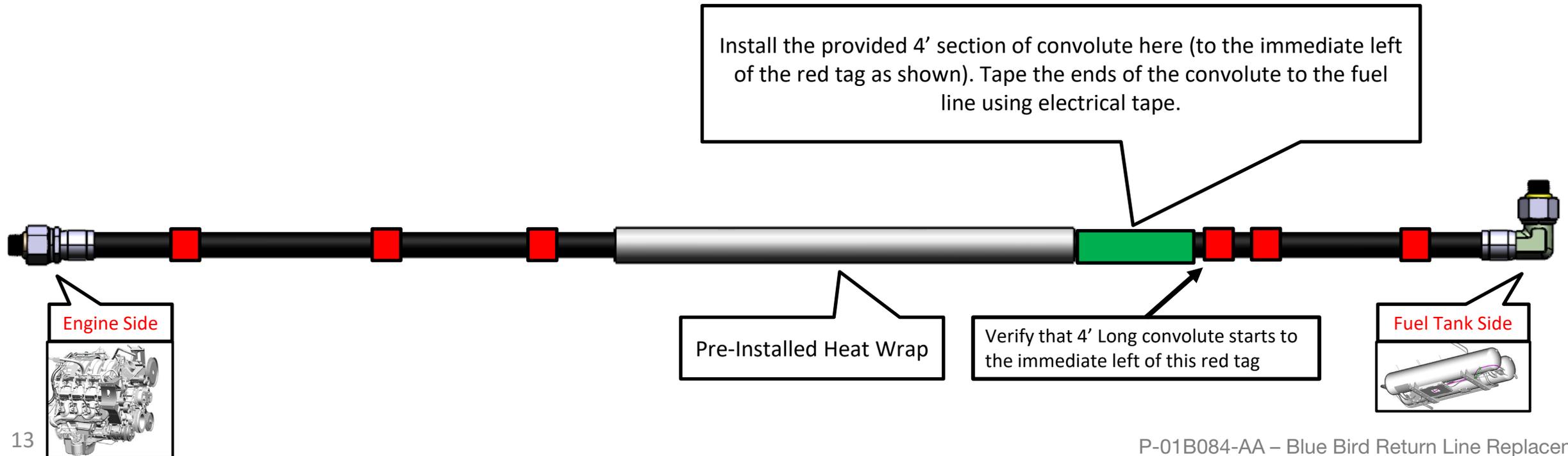


Blue Bird Return Fuel Line Replacement (R22BX)

Preparing New Return Fuel Line for Installation

GEN 5

1. Verify that the new Return Fuel Line appears as shown in the image below (**Gen 5 only**).
2. **Do not** remove the plastic coverings from the end fittings until the time comes to install these fittings into their designated locations on the vehicle (as described in this manual). These coverings protect the fuel line from internal contamination during the installation process.
3. Pre-install provided 4' Long Convolute (P/N PLS-34-100-B-1219) to the fuel line at the indicated location. Retain the ends of it in place with electrical tape. The tape will ensure that the convolute stays in position during fuel line installation.



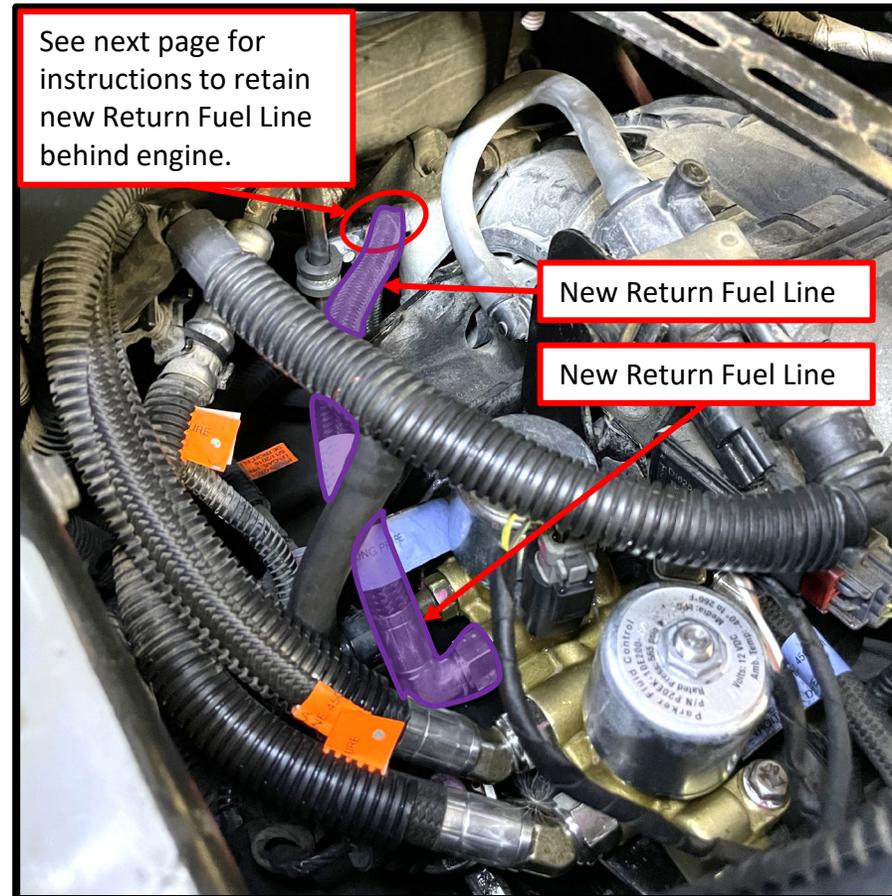
1. Route the new Return Fuel line under the vehicle and up towards the engine (same general routing as the old Return Fuel Line).
2. Torque the new Return Fuel line onto the FRPCM per instructions on pages 10 (Gen 4) & 11 (Gen 5).

1. Begin routing the new Return Fuel Line from the front of the vehicle (engine) to the back (fuel tank). The general routing locations will be the same as the original Return Fuel Line. See upcoming pages for more information regarding the exact retention and routing requirements for the new Return Fuel Line.

Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the New Return Fuel Line at the Engine

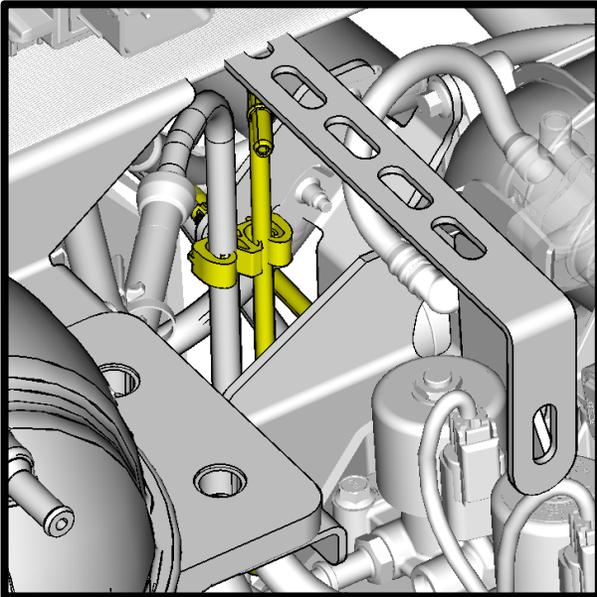
1. Verify that the new Return Fuel Line is routed on top of the engine as pictured:



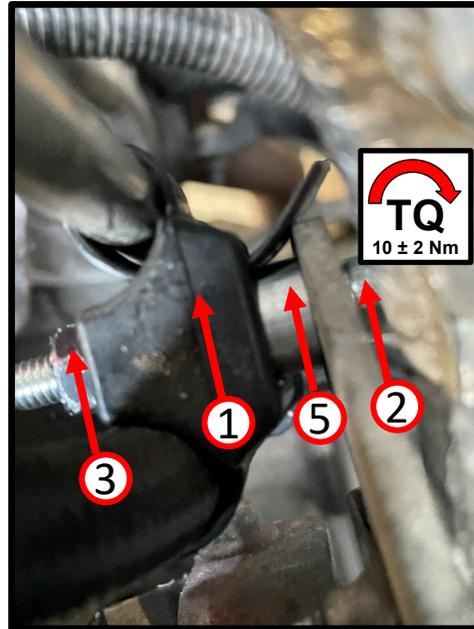
Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the New Return Fuel Line at the Engine

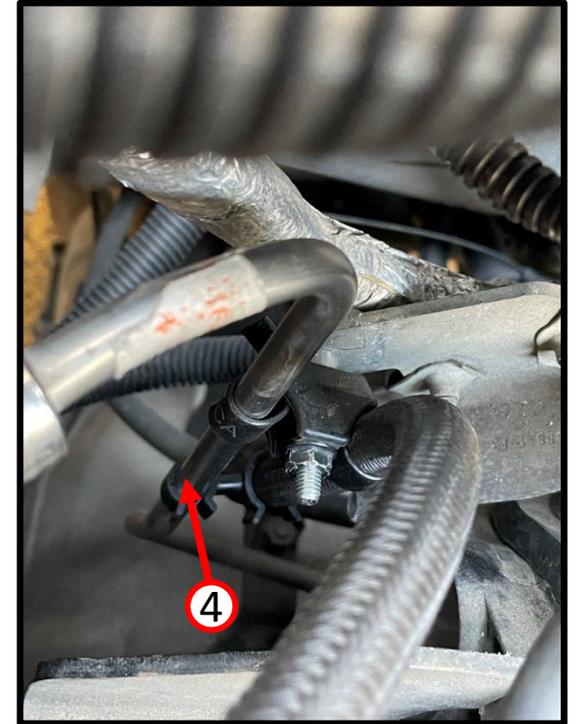
#	P/N	Description	QTY	Torque (Nm)
1	20-403-0004	Dual Clamp Zip Tie	1	N/A
2	11-357-0315	Bolt - M6 X 1.0 X 40 mm (Allen)	1	10 +/- 2 Nm
3	11-278-0274	M6 X 1.0 Nut	1	N/A
4	W713776-S300	Double Clip	1	N/A
5	11-373-0014	6mm Aluminum Spacer	1	N/A



1. Behind the engine, remove Snail Clip and original Return Fuel Line tube (yellow).



2. Install Dual Clamp Zip Tie and secure the new Return Fuel Line together with the Supply Fuel Line. Ensure that the 6mm Aluminum spacer is installed as pictured. **NOTE: A red tag on the new Return Fuel Line will indicate the proper location to clamp the new fuel line in place.**

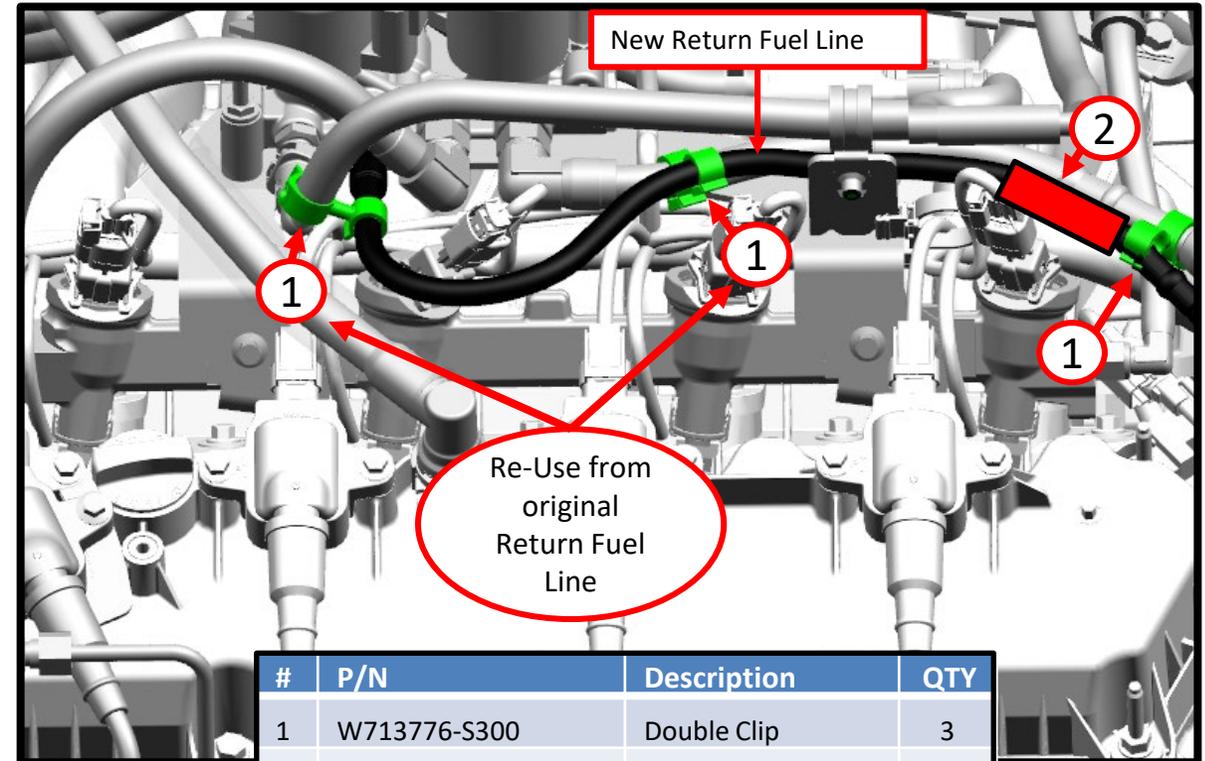
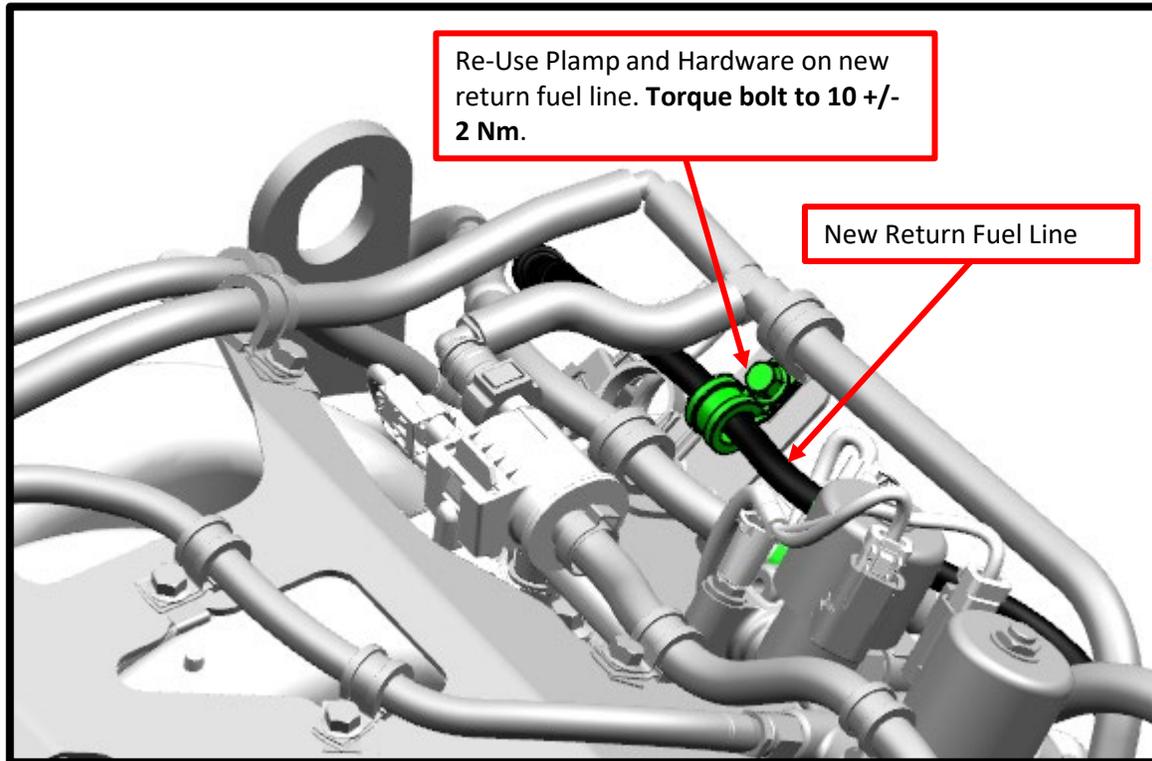


3. Install a Double Clip 5 inches below the Dual Clamp Zip Tie.

Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the New Return Fuel Line at the Engine

1. On top of the engine, re-use the same Plamp that held the original return fuel line in place. **NOTE: A red tag on the new Return Fuel Line will indicate the proper location to clamp the new fuel line in place with the Plamp pictured below.**
2. Secure the new Return Fuel Line to the existing supply fuel line using Doublelips. Reference the image on the right.
3. Install the provided 4" piece of convolute (Item #2) to the immediate left of the Double Clip on the new return hose.

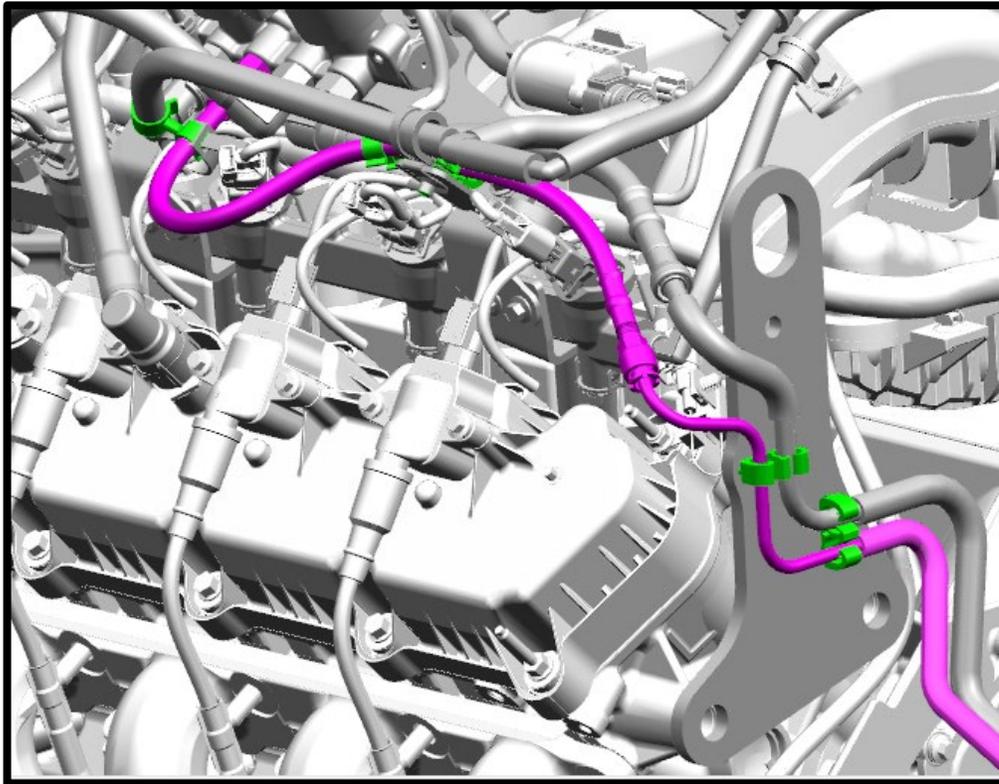


#	P/N	Description	QTY
1	W713776-S300	Double Clip	3
2	PLS-34-100-B-100	4" Long Convolute	1

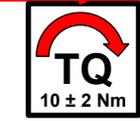
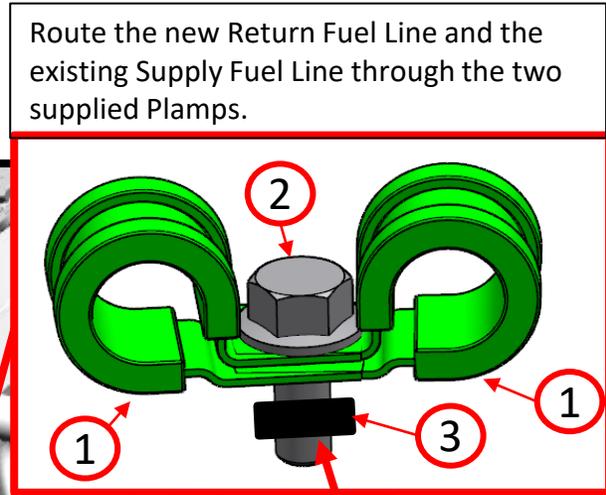
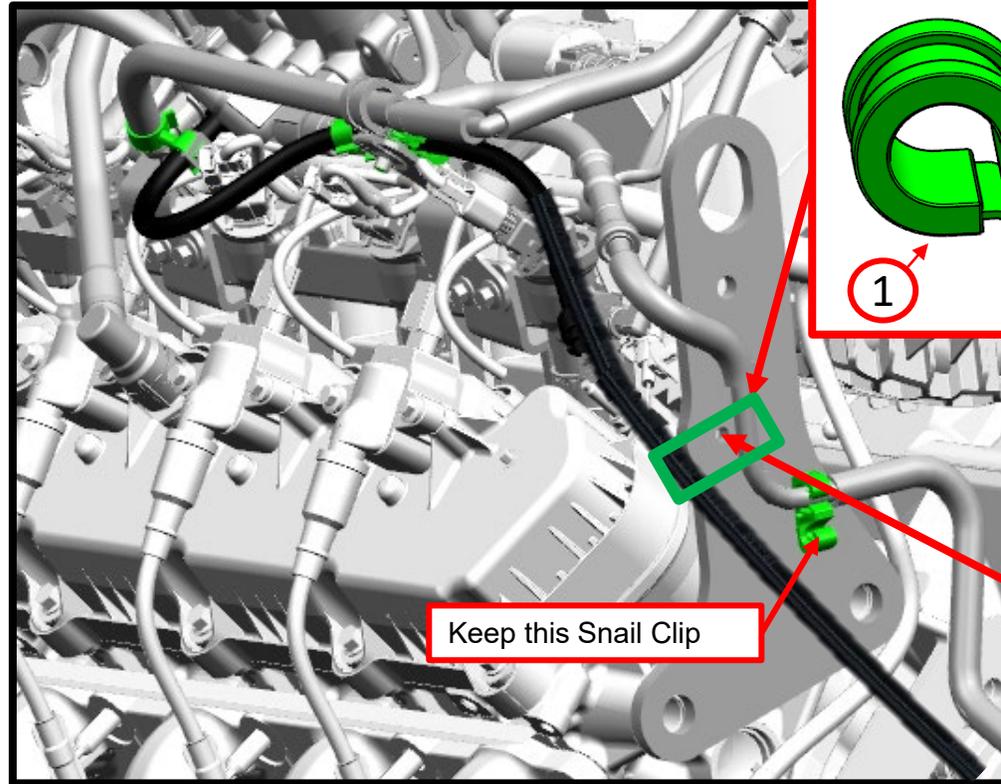
Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Fuel Line at the Engine

BEFORE NEW RETURN FUEL LINE



AFTER NEW RETURN FUEL LINE



Remove the original snail clip that was positioned here. Mount Plamps to the engine lifting bracket using the indicated hole.

Keep this Snail Clip

#	P/N	Description	QTY	Torque (Nm)
1	11-056-0048	Plamp	2	N/A
2	W500215-S439	Bolt M6 X 1.0 X 25mm	1	10 +/- 2 Nm
3	11-278-0274	M6 X 1.0 Nut	1	N/A

Just behind the engine, remove the existing snail clip and use two Plamps to retain the existing Supply Fuel Line and the new Return Fuel Line. **A red tag on the return fuel line will indicate the proper location to clamp the new fuel line in place.**



Snail Clip

Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Line Near the Transmission

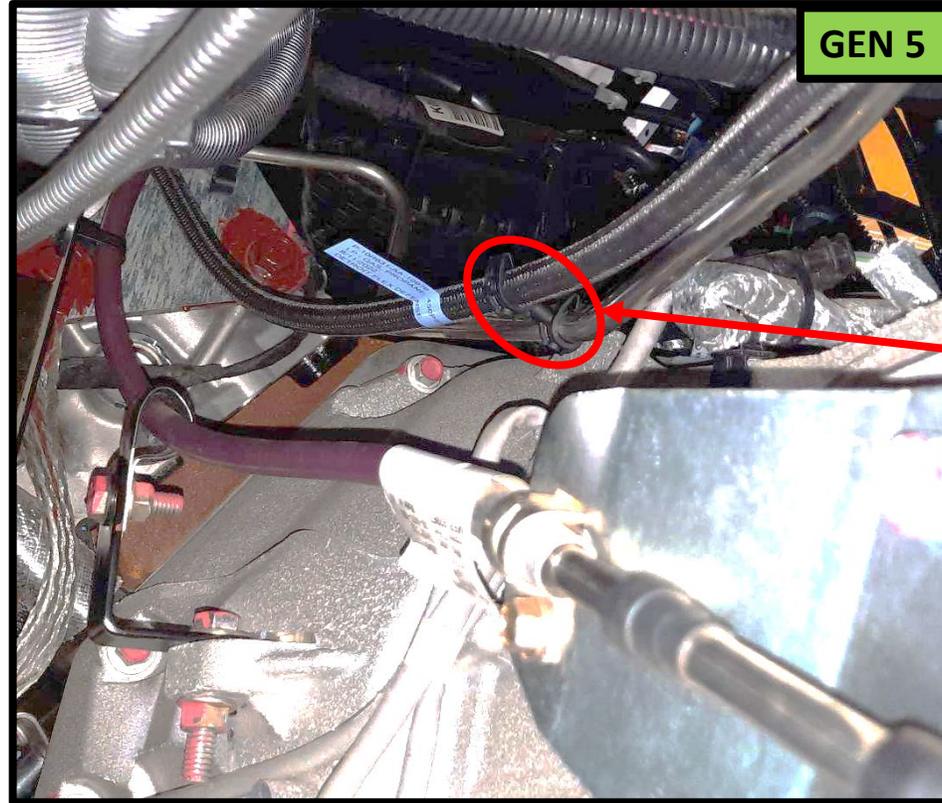
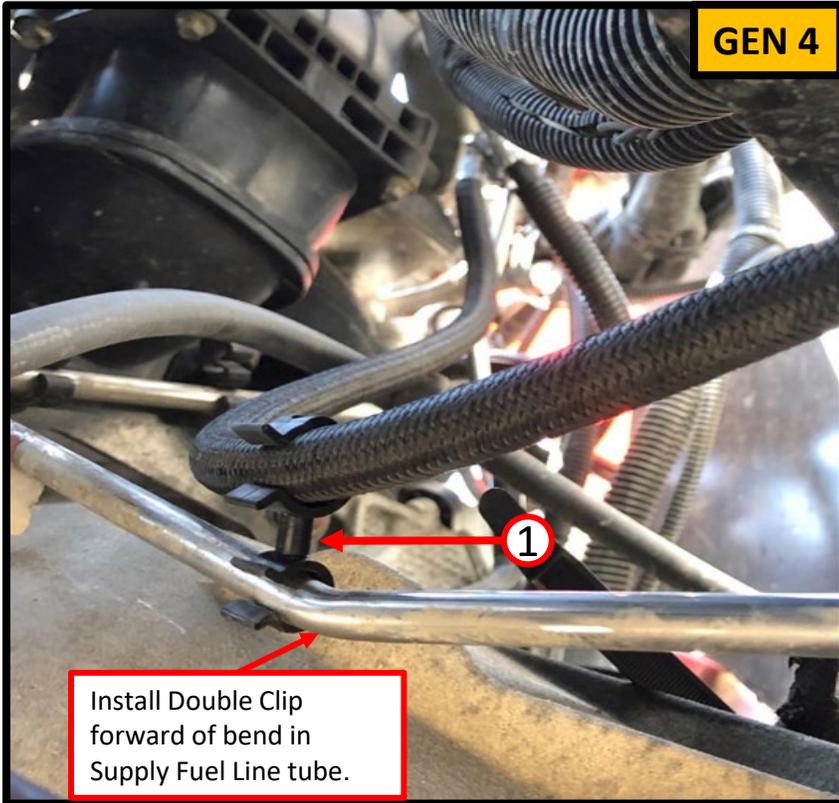
GEN 4

GEN 5



Double Clip

#	P/N	Description	QTY
1	W713776-S300	Double Clip	1



Install Double Clip forward of bend in Supply Fuel Line tube.

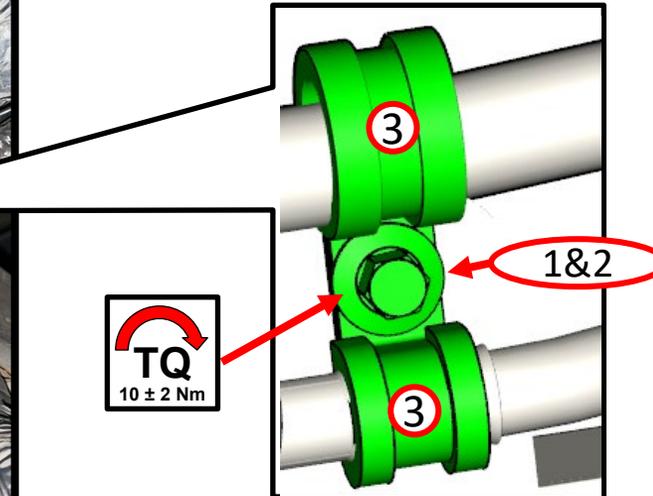
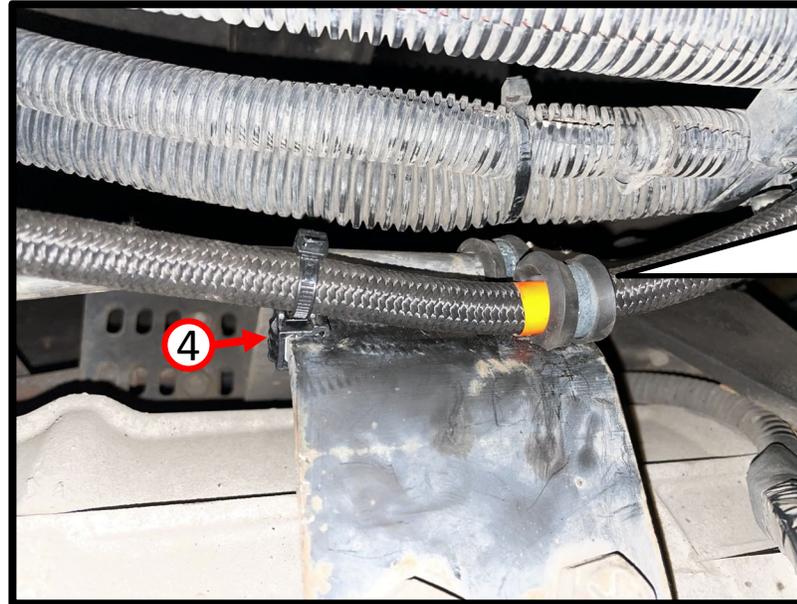
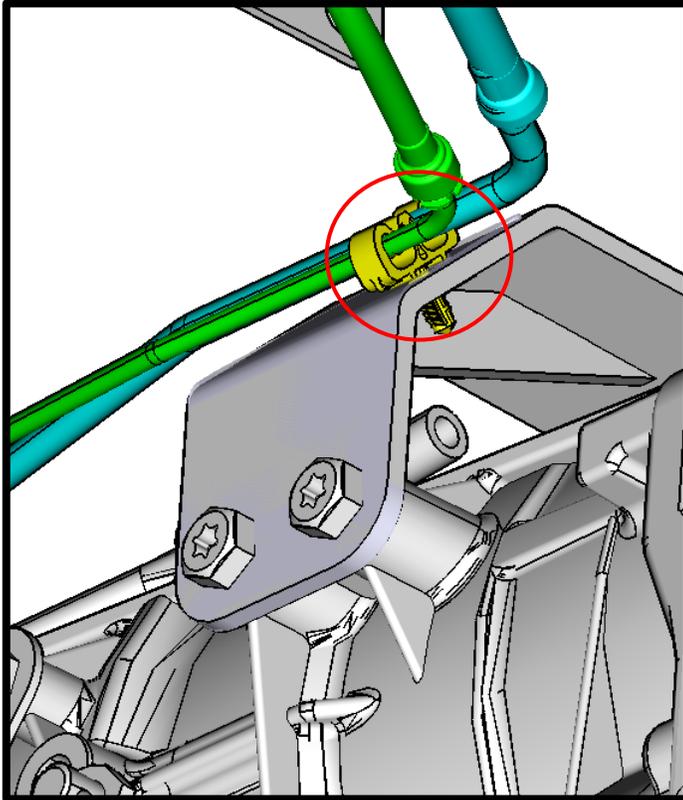
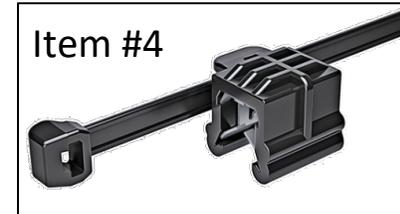
Near the top of the transmission, secure the flex hose (of new Return Fuel Line) to Supply Fuel Line with Double Clip.

NOTE: install the Double Clip immediately forward of the bend in the Supply Fuel Line Tube

Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Line Near the Transmission

#	P/N	Description	QTY	Torque (Nm)
1	11-278-0274	M6 Nut	1	N/A
2	W500215-S439	Bolt - M6 X 1.0 X 25mm	1	10 +/- 2 Nm
3	11-056-0048	Plamp	2	N/A
4	20-403-0015	Edge Clip Cable Tie (Side Mount)	1	N/A



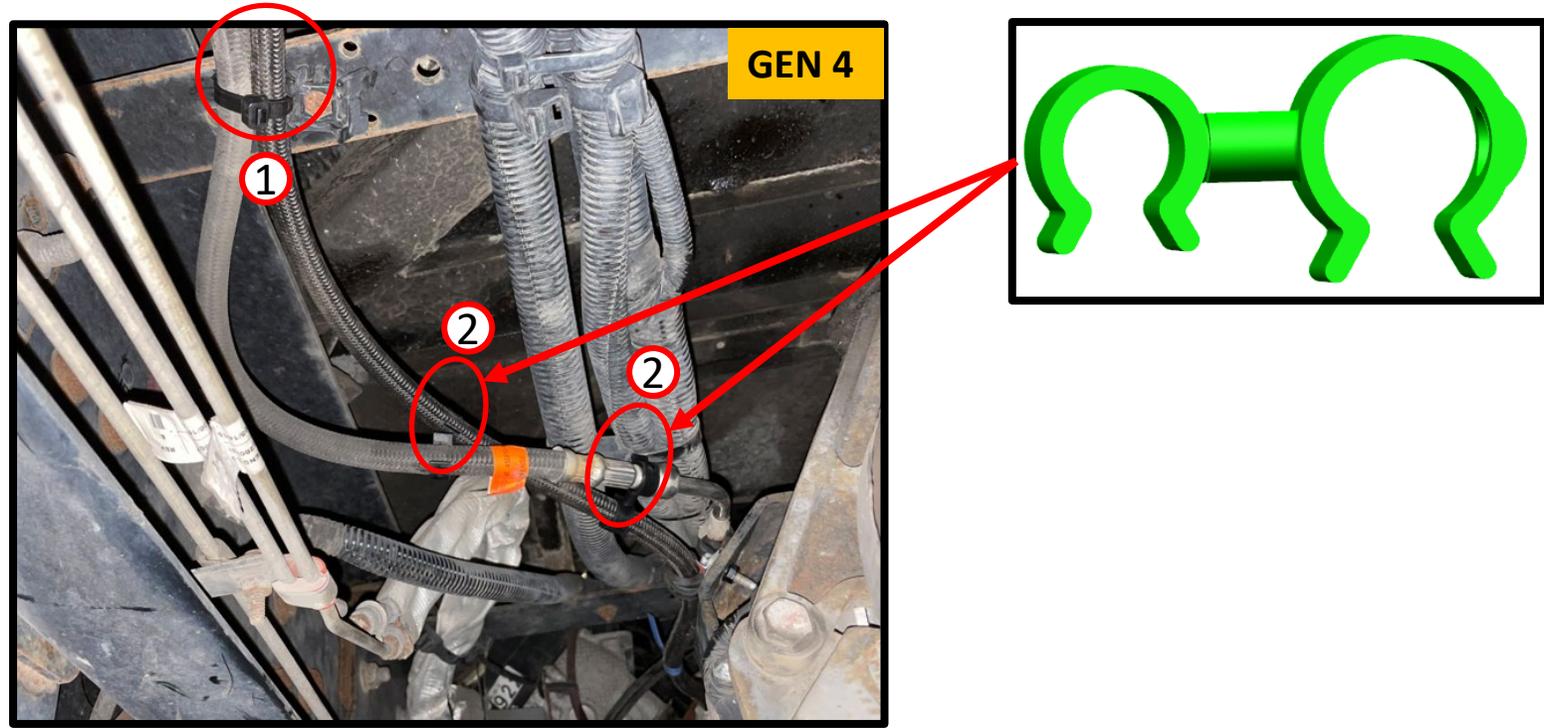
1. On top of the transmission, remove the snail clip (**yellow**) from the pictured bracket and discard.

2. Secure both the existing Supply Fuel Line and new Return Fuel line with two Plamps adjacent to each other at the transmission mounting point. Use an edge clip cable tie on the left side of the bracket to secure the new return fuel line. **A red tag on the new return fuel line will indicate the proper location to clamp the new fuel line in place with the Plamp.**

Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Line Near the Transmission

Towards the transmission, where the fuel line is routed away from the frame rail, the fuel lines are secured to the pictured crossmember saddle using a large zip tie. Two Double Clips should be used as pictured to separate the supply and return fuel lines just before the transmission bracket:



#	P/N	Description	QTY
1	11-469-0003	ZIP TIE 9mm x 15IN LONG	TBD
2	W713776-S300	Double Clip	2

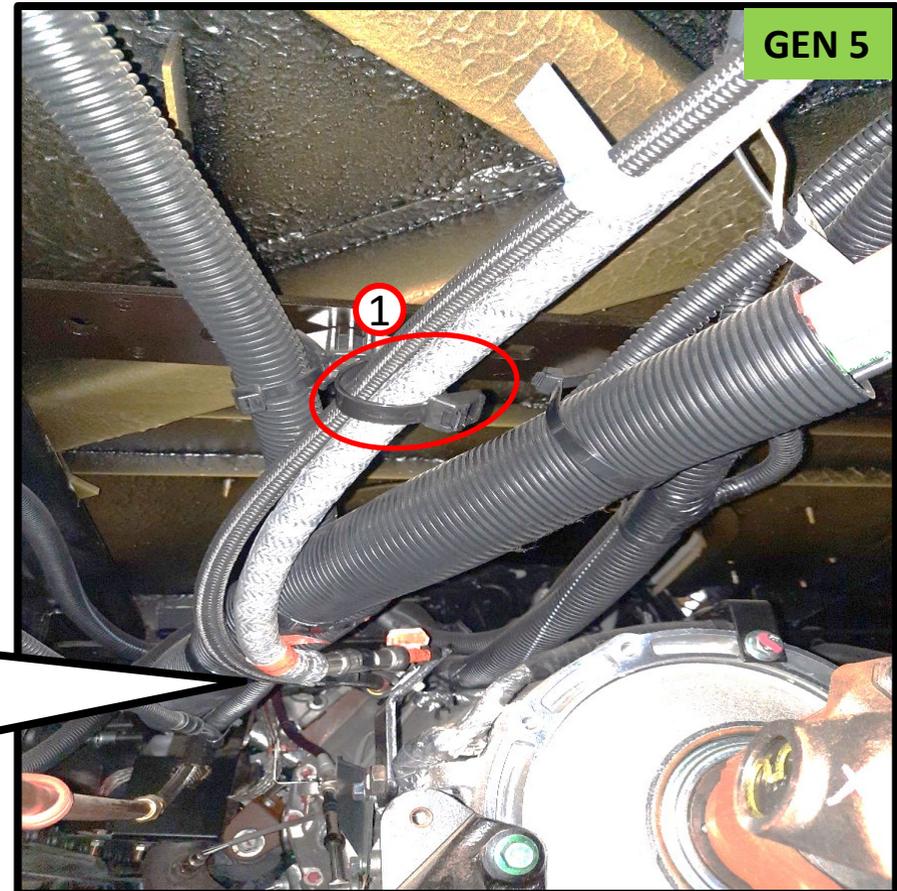
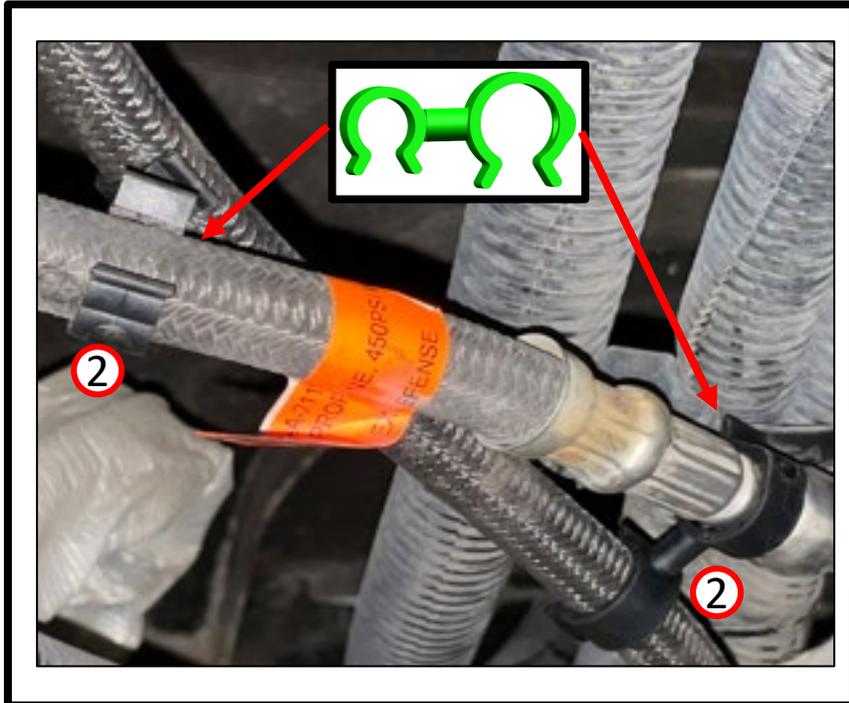
Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Line Near the Transmission

1. Towards the rear of the transmission, where the fuel line is routed away from the center spine, the fuel lines are secured to the pictured crossmember saddle using a large zip tie.

NOTE: Two Double Clips should be used as pictured to separate the supply and return fuel lines just before the transmission bracket.

#	P/N	Description	QTY
1	11-403-0029	ZIP TIE XL 20.3 INCH LONG	1
2	W713776-S300	Double Clip	2



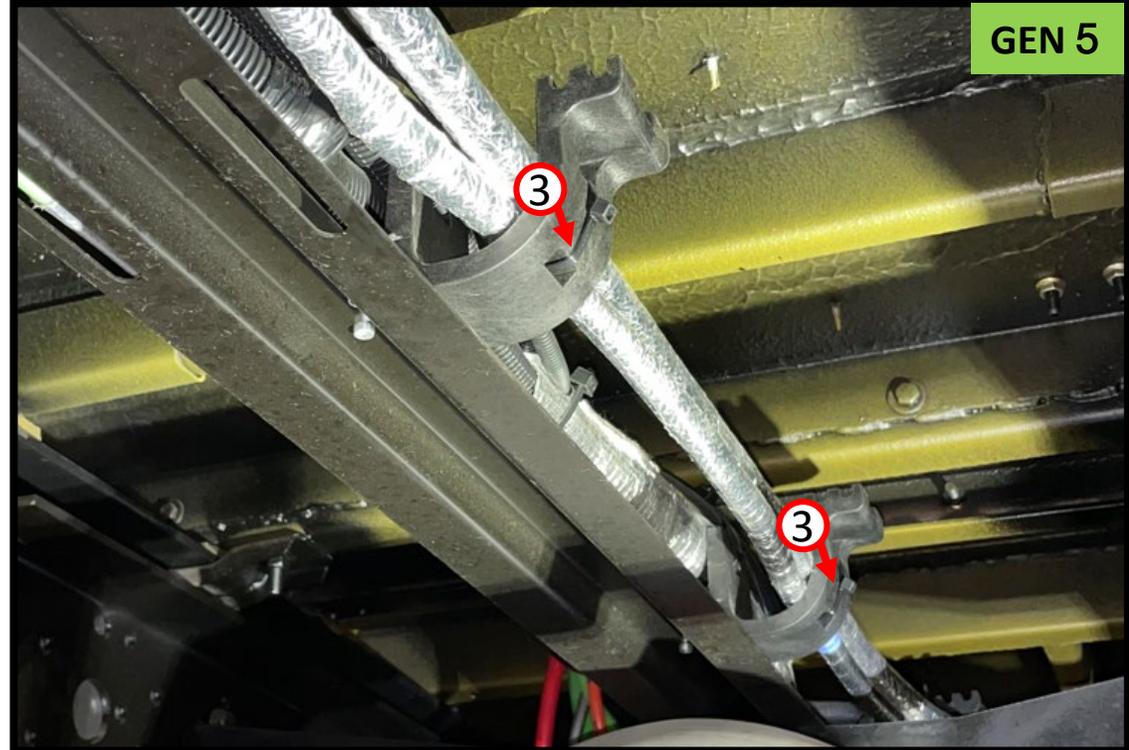
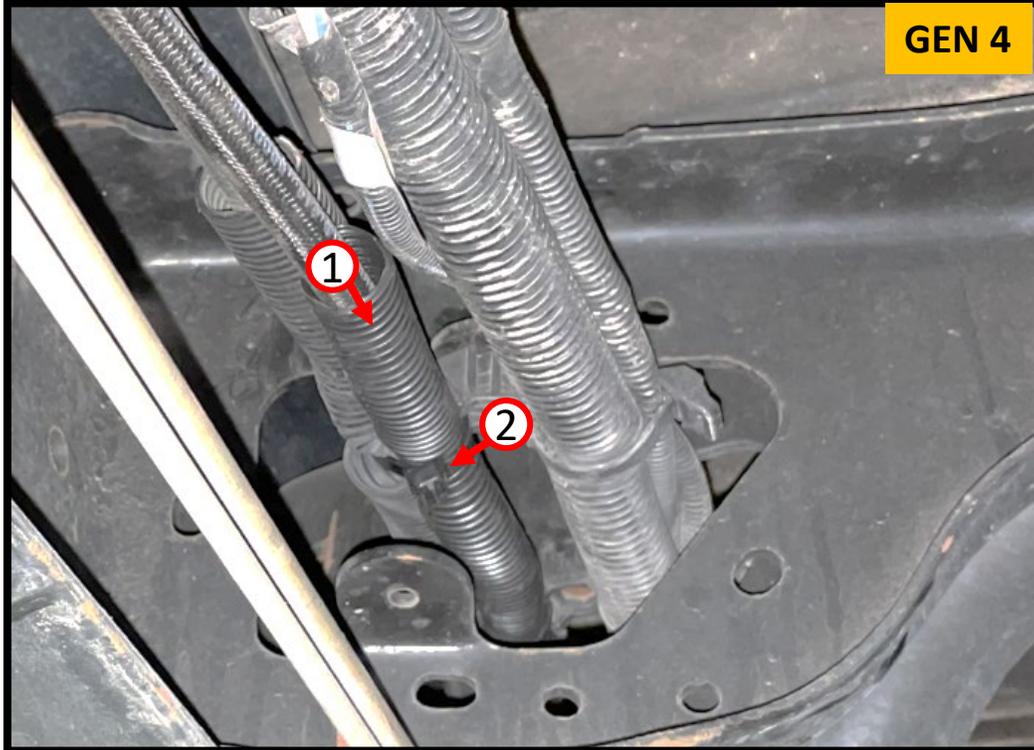
Blue Bird Return Fuel Line Replacement (R22BX)

GEN 4

GEN 5

Installation of Return Line – Along Frame Rail and Center

1. Route the Return Fuel Line down the mid-section of the vehicle as shown below.
 - a) *For Gen 4 vehicles, the provided 12” sections of convolute will need to be placed on the new return line at every crossmember location (see circle below). Re-use original convolute on the Supply Line only.



#	P/N	Description	QTY
1	PLS-34-100-B-305	Convolute- 12”	5 (there may be extras depending on wheelbase)
2	11-469-0003	ZIP TIE 9mm x 15IN LONG	Varies by Wheelbase
3	11-469-0001	ZIP TIE - 8 INCH LONG - BLACK	Varies by Wheelbase

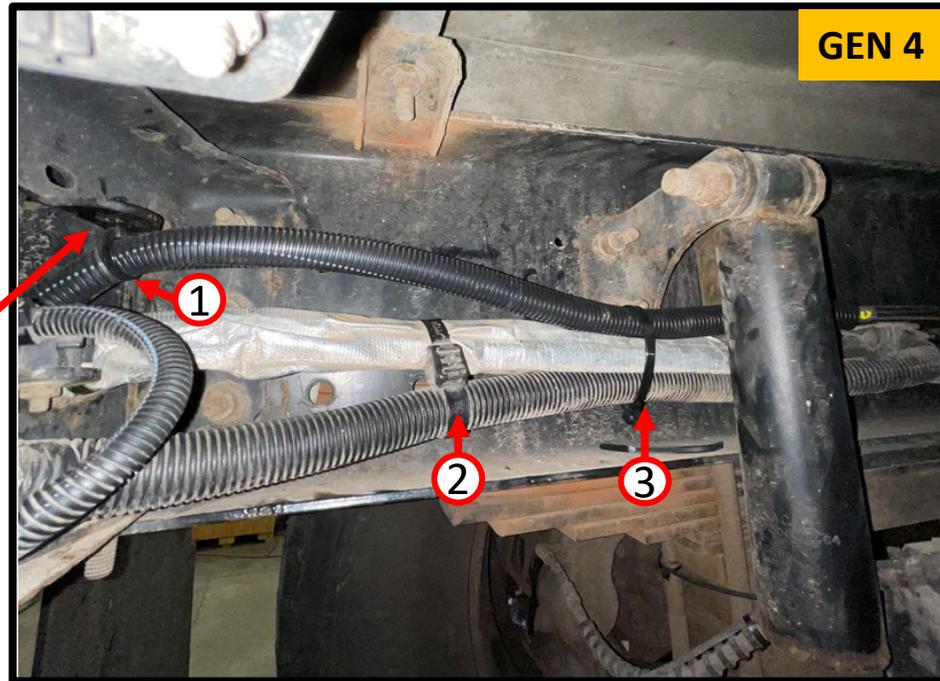
Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Line Near the Rear Axle

#	P/N	Description	QTY
1	157-00052	Fir Tree Zip Tie	1
2	20-403-0004	Dual Clamp Zip Tie	2
3	11-403-0029	ZIP TIE XL 20.3 INCH LONG	1



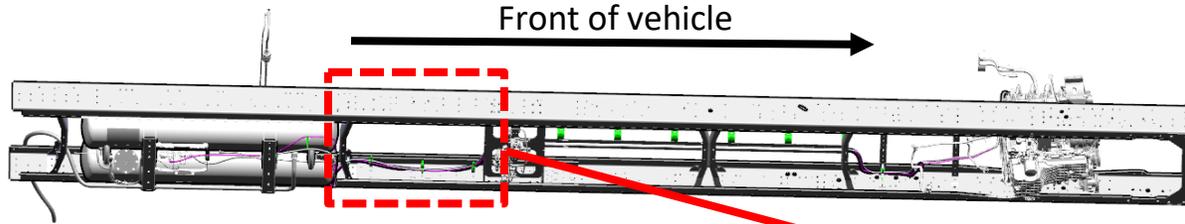
Secure Item #1 to the crossmember tab as shown.



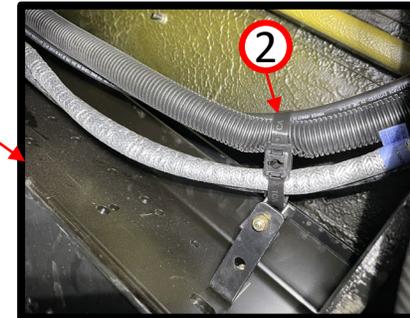
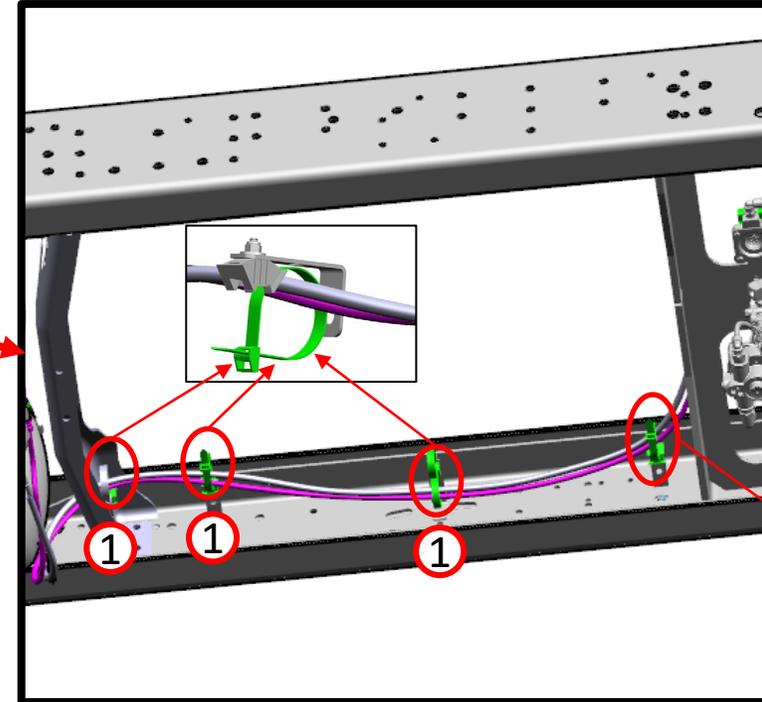
Near the front of the fuel tank, ensure that the new Return Fuel Line is routed up to the frame rail and is secured to the retention tab indicated using a fir tree cable tie. Secure the new Return Fuel Line to the existing Supply Fuel Line and wiring harness just before the shock using a large cable tie. An additional Dual Clamp Zip Tie (Item #2) will be supplied in case the existing one was removed during removal of original fuel line. Place second dual clamp zip tie on the opposite side of the shock (not pictured).

Blue Bird Return Fuel Line Replacement (R22BX)

Installation of the Return Line Near the Rear Axle



#	P/N	Description	QTY
1	11-	ZIP TIE XL 20.3 INCH LONG	3
2	20-403-0004	Dual Clamp Zip Tie	1



1. On the driver's side frame rail near the rear axle, retain the supply and return fuel lines to the existing saddles using supplied 20" Zip Ties (Item #1).
2. Forward of the rear axle, the fuel lines depart from the frame rail and are routed towards the center "spine" section of the bus. At this final frame mounting location, secure the fuel lines using a dual clamp zip tie (Item #2) as shown. Verify that this double saddle zip tie retains the same hoses and wiring harnesses as it did originally.
3. Ensure that there is 2" minimum of clearance between the fuel lines and all electronic modules near the rear of the vehicle.

#	P/N	Description	QTY
1	156-00537	Edge Clip Zip Tie	7
2	15-003824	Fir Tree Clip	1
3	W713776-S300	Double Clip	1

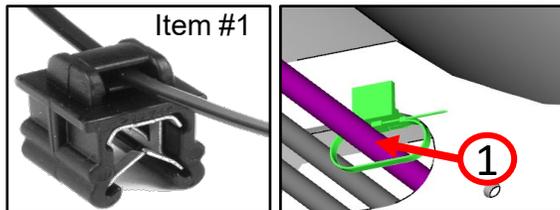
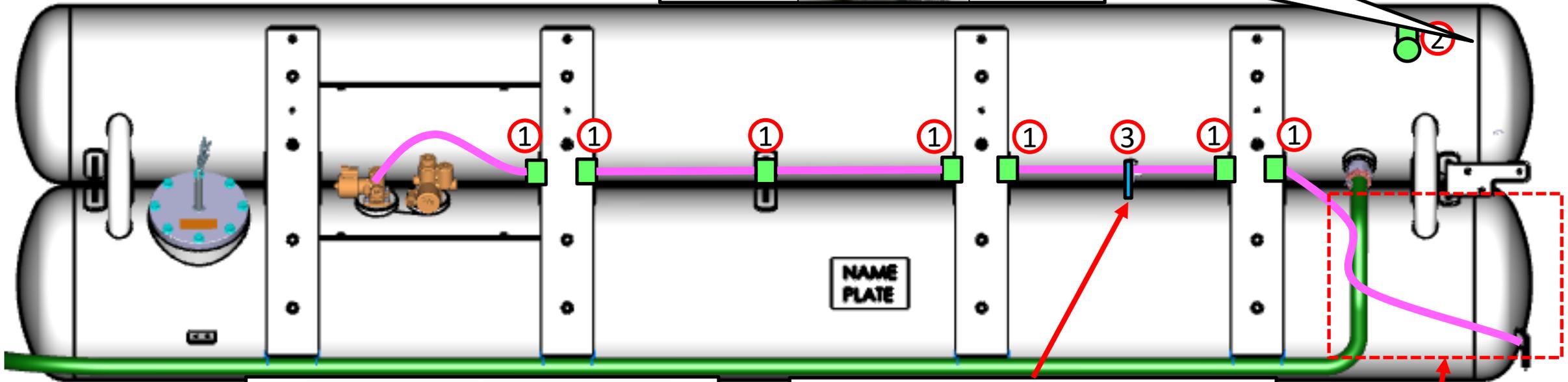
If the supply fuel line was originally retained at this location, retain it to the same tab using the provided Fir Tree Clip (Item #2).



GEN 4 With Extended Range Fuel Tank

GEN 5 With Extended Range Fuel Tank

Bottom view of fuel tank



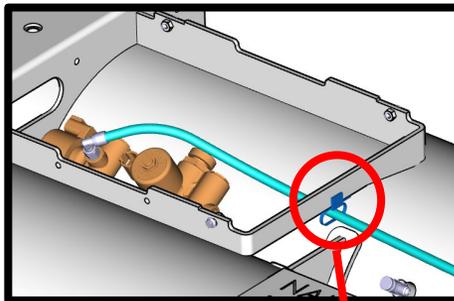
Use Edge Clip Zip Ties (Item #1) on the underside of fuel tank at indicated areas. Secure edge clip to the fuel tank and secure the zip tie firmly around the new Return Fuel Line.



Use a Double Clip (Item #3) to maintain clearance between new Return Fuel Line and Supply Fuel Line tube.

See page 30 for retention instructions in this area.

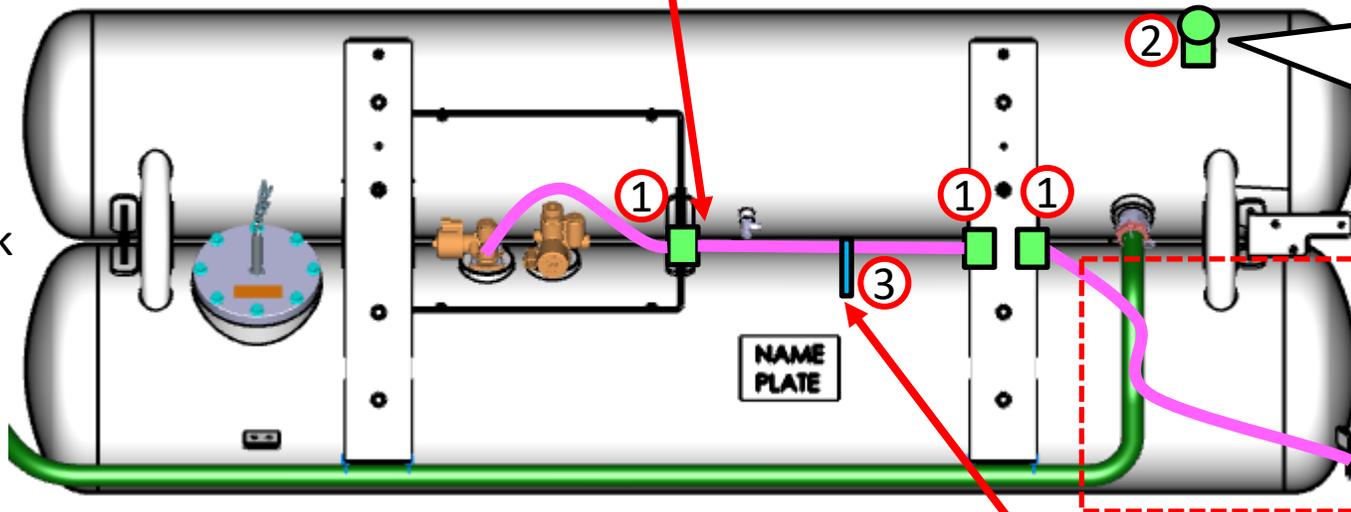
#	P/N	Description	QTY
1	156-00537	Edge Clip Zip Tie	3
2	15-003824	Fir Tree Clip	1
3	W713776-S300	Double Clip	1

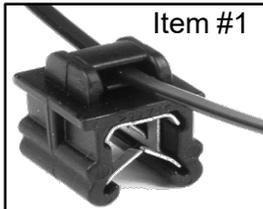
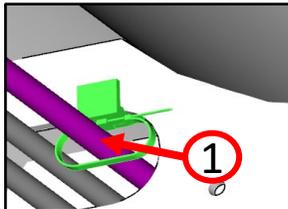


If the supply fuel line was originally retained at this location, retain it to the same tab using the provided Fir Tree Clip (Item #2).

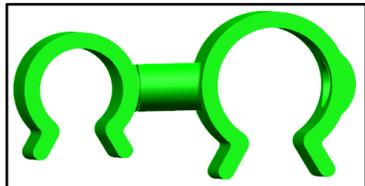


Bottom view of fuel tank



Use Edge Clip Zip Ties (Item #1) on the underside of fuel tank at indicated areas. Secure edge clip to the fuel tank and secure the zip tie firmly around the new Return Fuel Line.

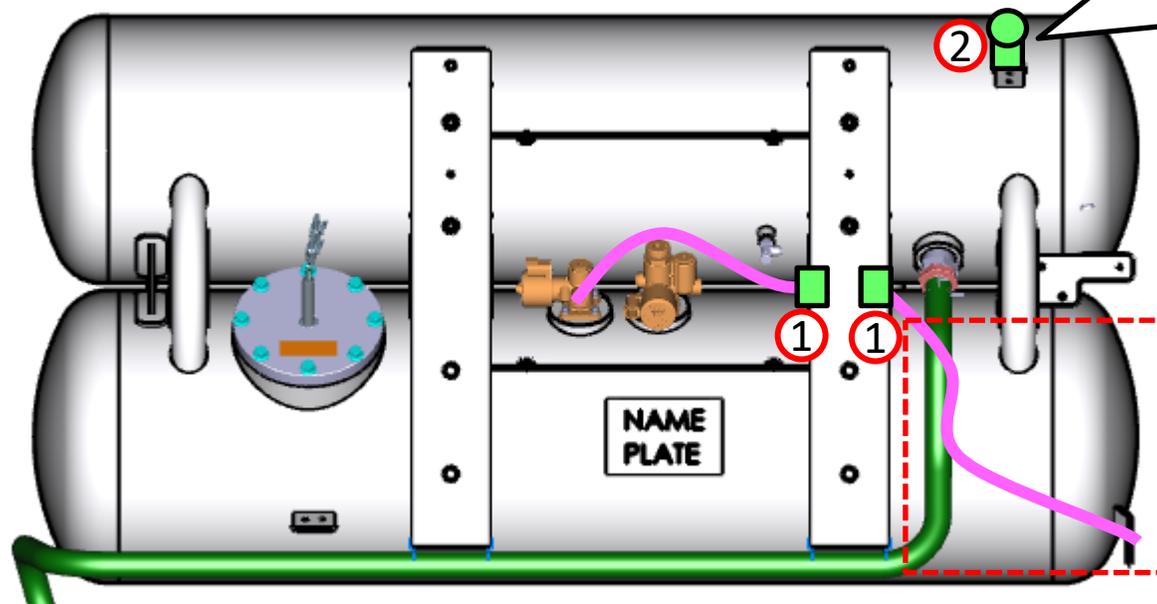



Use a Double Clip (Item #3) to maintain clearance between new Return Fuel Line and Supply Fuel Line tube.

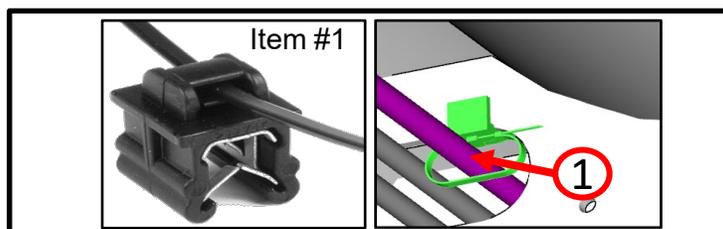
See page 30 for retention instructions in this area.

#	P/N	Description	QTY
1	156-00537	Edge Clip Zip Tie	2
2	15-003824	Fir Tree Clip	1

Bottom view of fuel tank



If the supply fuel line was originally retained at this location, retain it to the same tab using the provided Fir Tree Clip (Item #2).

Use Edge Clip Zip Ties (Item #1) on the underside of fuel tank at indicated areas. Secure edge clip to the fuel tank and secure the zip tie firmly around the new Return Fuel Line.

See page 30 for retention instructions in this area.

Return Fuel Line Retention Under Fuel Tank (Near Front) (R22BX)

All Fuel Tank Variants

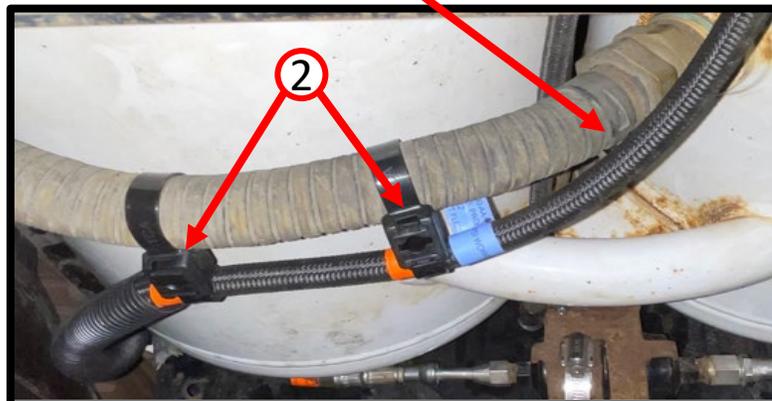
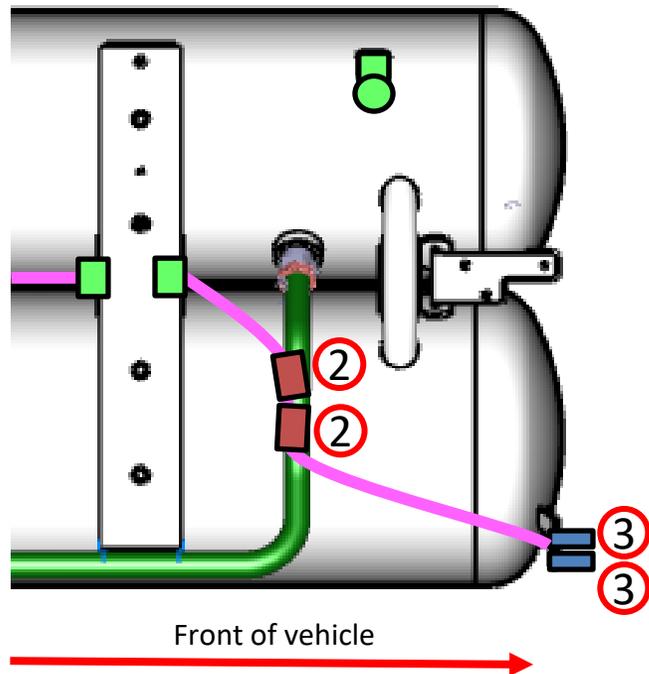
GEN 4 – All Fuel Tank Variants

GEN 5 - All Fuel Tank Variants

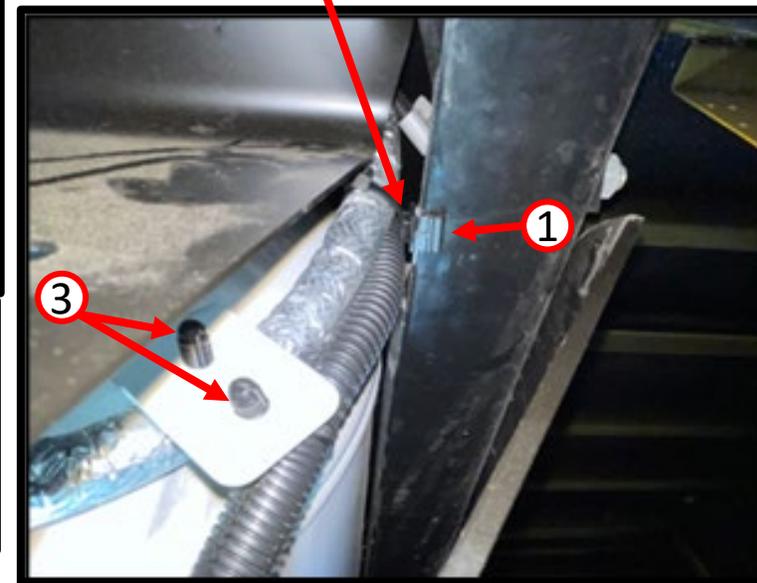
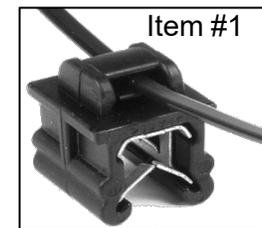
#	P/N	Description	QTY
1	156-00537	Edge Clip Zip Tie	1
2	20-403-0004	Dual Clamp Zip Tie	2
3	157-00052	Circular Fir Tree Cable Tie	2

Maintain 2" of clearance between the new Return Fuel Line and the clamp used on the pressure relief hose. If necessary, compress the clamp and rotate the tabs away from the new Return Fuel Line.

Bottom view of fuel tank



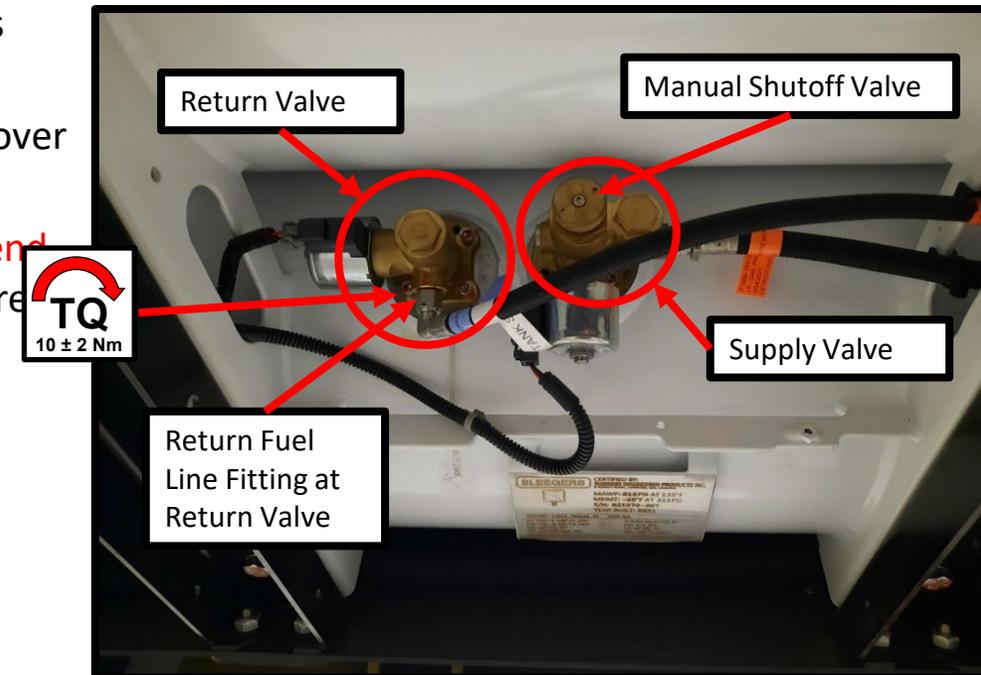
Retain the Return Fuel Line to the pressure relief valve hose using two Dual Clamp Zip Ties as pictured. **Maintain a minimum of 2" of clearance between the fuel line and clamp used on the pressure relief valve hose.** The red tape on the Return Fuel Line indicates the proper retention locations.



Ensure that the convoluted Return Fuel Line and original Supply Fuel Line are routed up towards the frame rail as shown. Use two fir tree cable ties (Item #1) to secure the supply and return fuel lines to the indicated retention tab. **Then secure both the Supply and Return Fuel Line to the frame edge as shown using Item #1.**

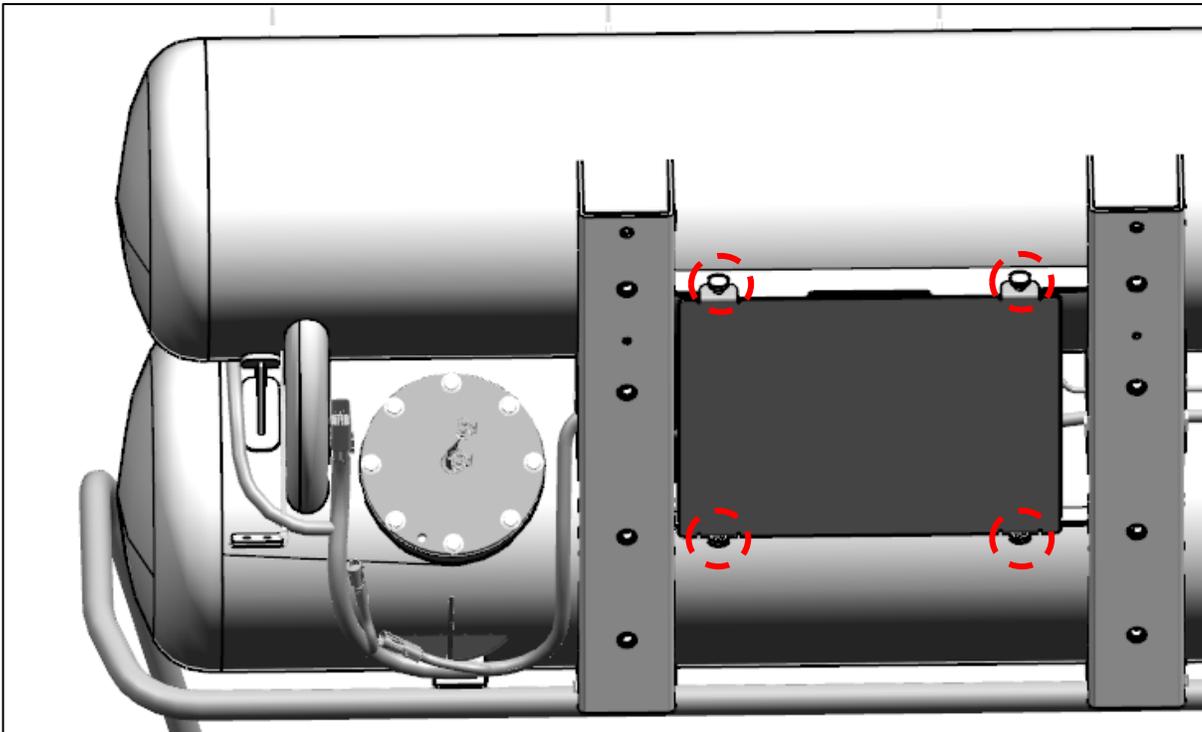
1. Carefully reconnect the Return Fuel Line to the return valve. Begin threading the fitting into the return valve by hand, and then torque the fuel line to 19 ± 2 Nm using an 11/16" crow's foot and torque wrench.
2. On the Supply Valve, turn the Manual Shutoff Valve counterlockwise to open. Turn the dial by hand to open.
3. Inspect the new Return Fuel Line and verify that it is not in contact with any sharp objects anywhere on the vehicle.
4. After confirming that the new Return Fuel Line is routed and retained per the requirements in this manual, start the vehicle's engine and inspect for any leaks (propane vapor) throughout the entire length of the new fuel line.
5. Apply marine-grade anti-seize and re-attach the fasteners that hold the tank cover plate. Torque the fasteners to 10Nm.
 - a) If the fastener threads are damaged upon removal, see Appendix A at the end of this instruction document Start vehicle to ensure normal operation before returning to service.

For any questions or concerns regarding this procedure, please contact ROUSH CleanTech via phone at 1-800-59-ROUSH (Option 2) or via e-mail at support@roushcleantech.com



Issue Description

When removing the four thumb screws that retain the valve guard on Gen 4 Bluebird busses, it is possible for the thumb screws (circled in the picture below) to shear if they are corroded and seized onto the fuel tank. This procedure provides a corrective action if this happens.

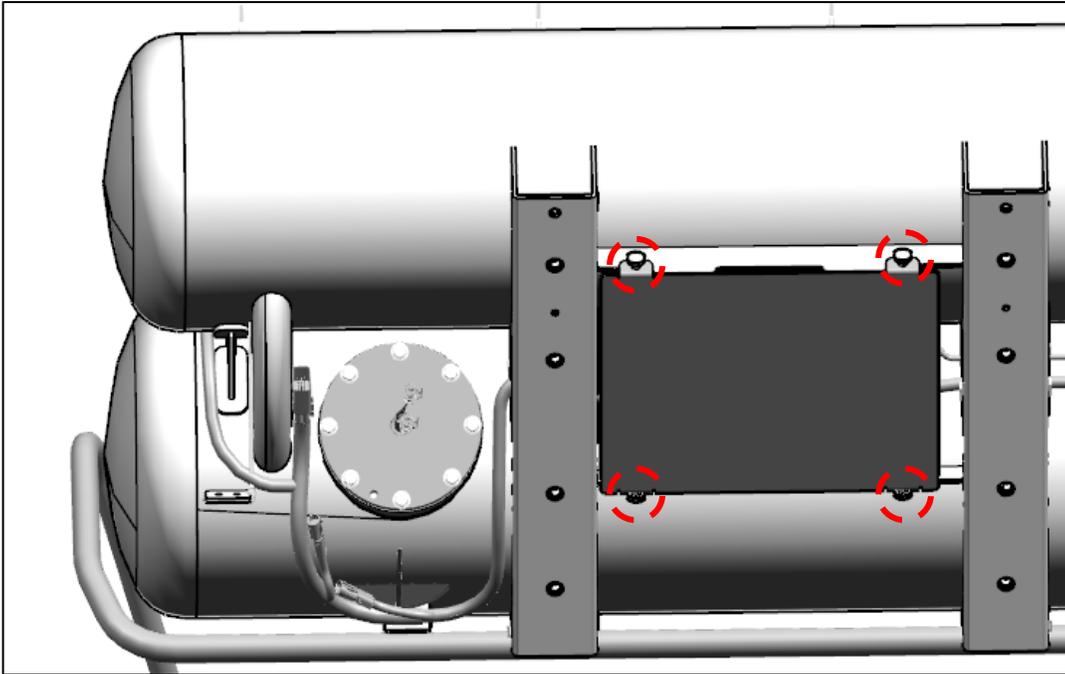
**Tools Required:**

- Electric drill
- ¼" drill bit
- Center punch
- Hammer
- Acetone
- White automotive paint
- Pliers
- Anti-Seize
- Vernier calipers or other measuring tool
- Rags

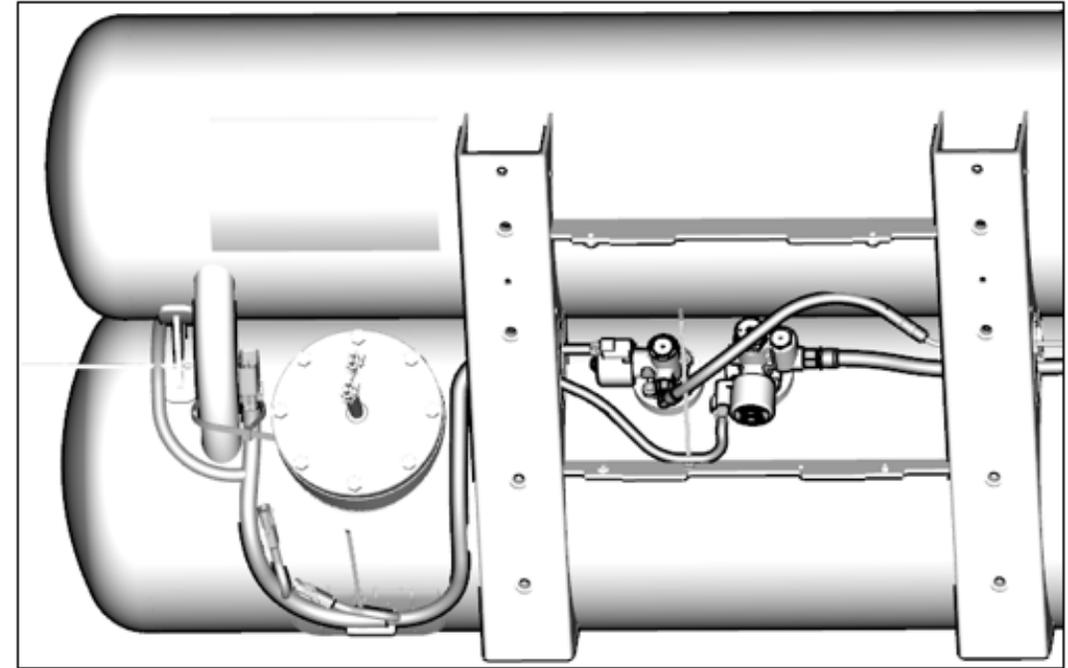
Corrective Action

1. Remove the four thumb screws that retain the fuel tank valve guard. It may be necessary to use pliers and firmly grip the thumb screws while loosening them. The screws may shear off inside the weld nut.
2. Remove the valve guard from the fuel tank.

Step #1



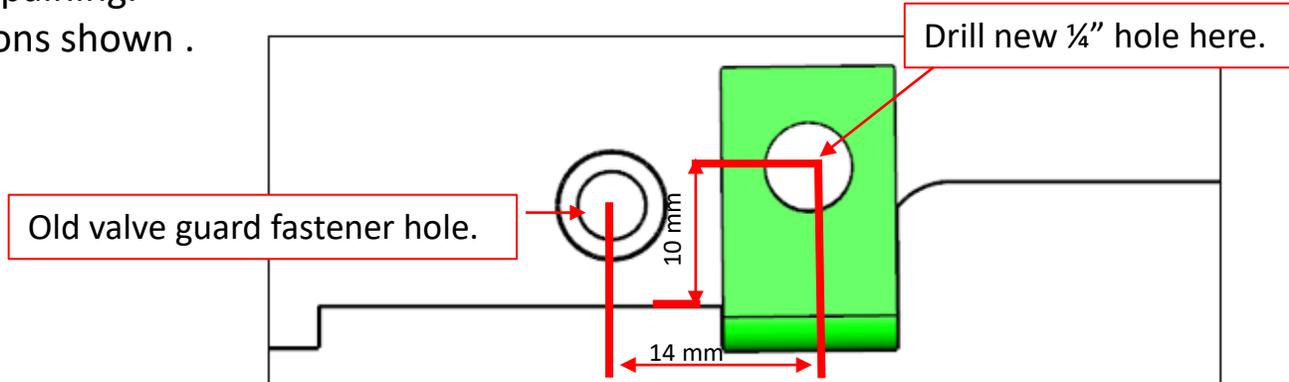
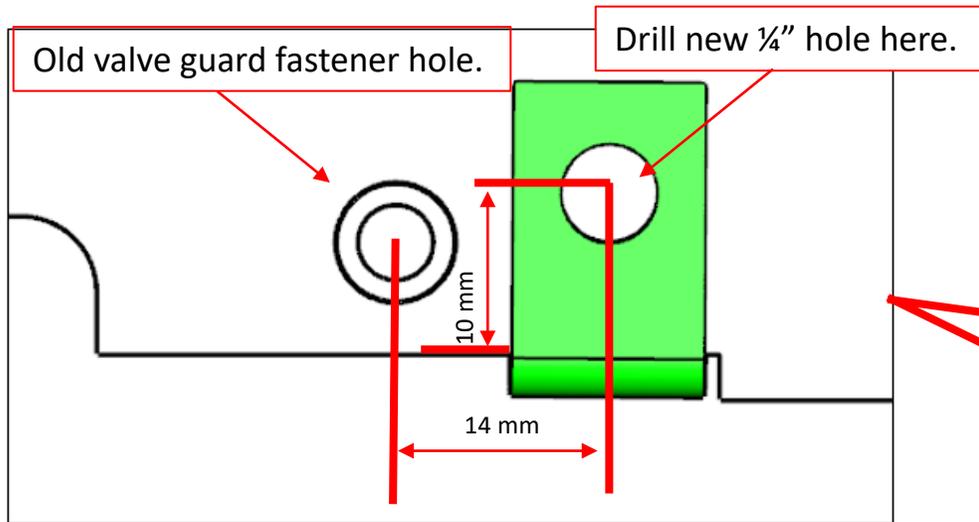
Step #2



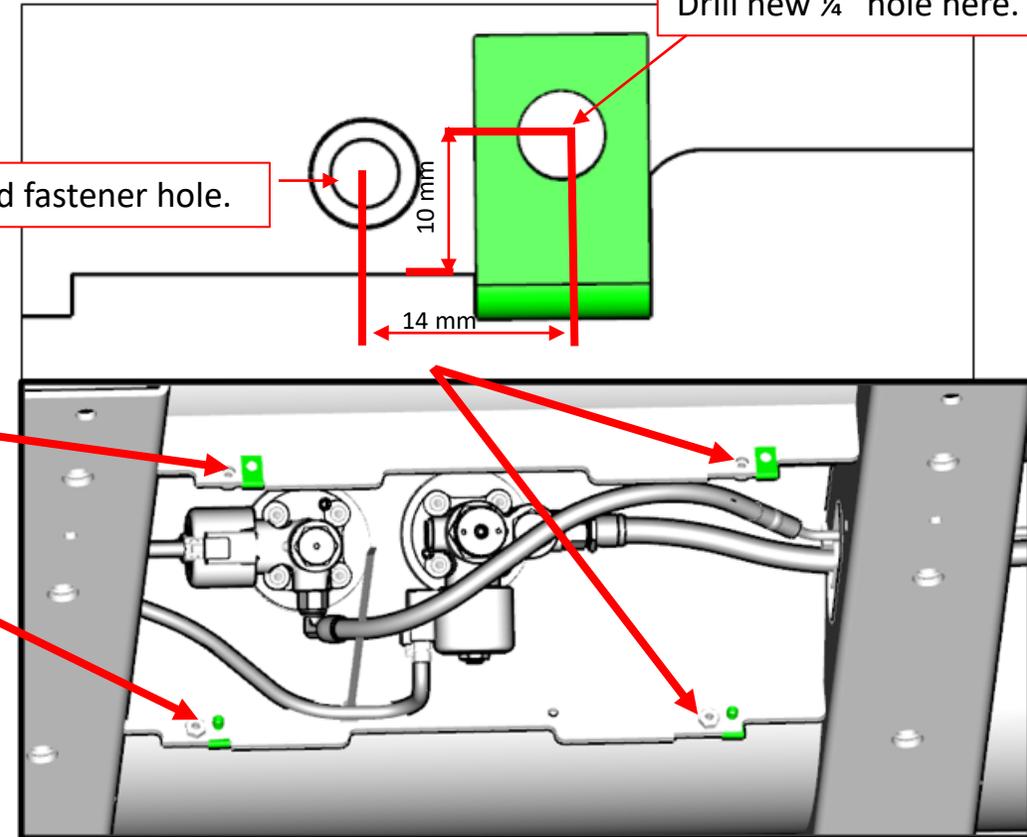
G4 Bluebird Fuel Tank Valve Guard– Thumb Screw Service Procedure

Corrective Action

3. With a ¼" drill bit, drill four holes in the pictured vertical brackets before installing the pictured Jlips (green). Before drilling, use a center punch to dimple the metal where you intend to drill. While drilling, be careful not to damage any fuel lines, wiring, etc.. **Do NOT drill into any curved and/or cylindrical shaped pieces of metal.**
4. Before installing the Jlips, **add white automotive paint to all bare metal on the newly drilled holes to prevent future corrosion.** Thoroughly clean the bare metal with acetone before painting.
5. Add four M5 Jlips (Roush part number N623331-S2) to the locations shown .



Roush Part Number: N623331-S2



Corrective Action

6. Re-install the fuel tank valve guard plate and secure it to firmly to the fuel tank using new thumb screws and anti-seize on the threads.
NOTE: Failure to apply anti-seize each time the thumb screws are removed and re-installed may lead to the thumb screws breaking in the future.

