

Part 573 Safety Recall Report

22E-049

Manufacturer Name : Roush CleanTech, LLC

Submission Date : APR 19, 2023

NHTSA Recall No. : 22E-049

Manufacturer Recall No. : EQ-J2044



Manufacturer Information :

Manufacturer Name : Roush CleanTech, LLC

Address : 12170 Globe Street
Livonia MI 48150

Company phone : 800-597-6874

Population :

Number of potentially involved : 8,385

Estimated percentage with defect : NR

Equipment Information :

Brand / Trade 1 : Roush CleanTech

Model : Fuel Return Lines in GEN 4/5 LPG Conversion Systems

Part No. : Pls see Mfr Comments

Size : NR

Function : Fuel Return

Descriptive Information : The items of original equipment covered by this report do not include LPG systems manufactured prior to July 2015 because that date is when Roush began to use zinc-plated fittings on the fuel return lines in its LPG conversion kits.

The population does not include LPG systems shipped after June 30, 2022 because LPG systems shipped after that date had fuel return lines with additional protection that prevents the corrosion at issue here.

Because the corrosion at issue here occurs only in the presence of significant amounts of road salt, this notice applies only to the fuel return lines in LPG conversion kits installed in vehicles originally or currently 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 (which are referred to in this Report as the "Salt Belt States").

Roush sold 12,886 LPG conversion kits as original equipment. 8,385 of those kits were installed on vehicles originally or currently registered in the Salt Belt States. Roush installed 1,812 of the above 8,385 kits and Roush separately reported those 1,812 kits on its Vehicle Alterer Report NHTSA ID: 22V408. The remaining 6,573 kits on this Equipment Report were installed by Blue Bird and the alterers (identified in the Purchaser Information section below) that purchased the kits as original equipment.

Production Dates : JUL 30, 2015 - JUN 30, 2022

Description of Defect :

Description of the Defect : Some zinc-plated carbon steel fuel return line fittings on Gen 4 and Gen 5 Roush Cleantech LPG fuel conversion kits installed on vehicles operated in the Salt Belt States have exhibited galvanic-reaction-caused corrosion where the stainless-steel crimp collar on the fuel return line contacts the zinc-plated carbon steel fitting, if the zinc-plating has been compromised by road debris pecking. If this occurs, there is a risk that the fuel line fitting could corrode to the point where LPG fuel will leak.

FMVSS 1 : NR

FMVSS 2 : NR

Description of the Safety Risk : If the fuel return line leaks, it could increase the risk of a fire.

Description of the Cause : Roush believes that a galvanic reaction can occur under certain road conditions (i.e., a combination of road debris pecking on the zinc-plated carbon steel fitting, and road salt and moisture from snow/ice/water). This galvanic reaction can create the potential for compromised zinc plating to corrode the carbon steel LPG fuel return line fittings where the stainless-steel crimp collar contacts the fitting.

Roush has concluded that this problem is limited to vehicles operated in the Salt Belt States. Roush inspected (and rated for degree of corrosion on a scale of 1 (like new) to 6 (leaking)) the fittings on 166 representative vehicles (altered Ford E/F Series vehicles and Blue Bird school buses) in multiple regions of the country. Of the 70 vehicles inspected and rated in the non-Salt Belt States, 55 were rated #1 (still looking new with the zinc plating intact), and the remaining 15 were rated #2 (little to no rust showing on the fittings). Conversely, of the 96 vehicles inspected in the Salt Belt States, only 8 received a #1 rating, 45 were rated #2, and 43 rated either #3 (red rust greater than/ equal to 50% of the inspected part) or higher.

Identification of Any Warning that can Occur : It may be possible to observe a significant amount of red rust on the fuel return line connector fitting prior to any fuel leak.

Involved Components :

Component Name : ¼” fuel return line

Component Description : Fuel return line assembly that includes a zinc-plated carbon steel fitting and stainless-steel crimp collar.

Component Part Number : See MFR Comments

Supplier Identification :

Component Manufacturer

Name : Detroit Flex Defense

Address : 2921 Industrial Row

Troy Michigan 48084

Country : United States

Chronology :

In Oct 2020, Roush was informed that two Blue Bird school buses in Pennsylvania had experienced apparent corrosion-caused fuel return line fitting failures about 3 weeks apart. Roush started to investigate service history, engineering, and supplier quality. Several additional similar warranty claims were reported in 2021. By Spring 2022, Roush had received a total of 19 corrosion warranty claims, with no fires. These claims arose solely in Salt Belt states and involved vehicles with various mileage and manufacturing dates.

Roush began its Salt Belt and non-Salt Belt geographic field and laboratory investigation in 2021. In total, Roush inspected (and rated for degree of corrosion) the fittings on more than 166 representative vehicles, as described in the "Describe the Cause" section above. The inspections identified the vehicle make, model, part number, part location, orientation, mileage, alteration date, geographic location, and route characteristics. Some non-leaking fittings observed with exterior corrosion were dissected to ascertain the extent of any internal compromised metal.

Roush also conducted two types of laboratory salt spray testing. The ASTM B117 salt spray testing varied the orientation of the fittings in the salt test chamber (parallel to ground, perpendicular, 45 degrees, reversed male tube directions). Roush's modified salt spray testing included a road debris pecking simulation. Roush then tested fittings equipped with additional spiral wrap protection, with braided loom protection, and with a combination of the two protections.

Based on the results of its investigation, in late May 2022, Roush decided to submit this report.

Description of Remedy :

Description of Remedy Program : Roush is working with Blue Bird and the alterers who purchased the defective LPG conversion kits as original equipment (and their applicable servicing dealers) to replace the fuel return lines in the recalled vehicles. Roush is supplying all parts and material and covering all labor costs.

Roush has been working with its supplier, Detroit Flex Defense (DFD), to prioritize the manufacture and supply of newly designed fuel return lines which vary based upon Roush's customers' vehicle wheel base lengths and tank range configurations (collectively, "Vehicle Configuration"). Due to limited supply, first priority is to replace lines sold to Blue Bird for school bus passenger use (in descending order based on Blue Bird's Vehicle Configuration volumes) and then to commercial (non-passenger) vehicle alterers in descending order of the alterers' Vehicle Configuration volumes. There are 4,830 Blue Bird buses in different Vehicle Configurations requiring remedy components. As of April 19, 2023, Roush is prepared to start shipping replacement Gen 4 fuel return line kits for the Blue Bird Bus 273 Wheel Base extended range tank configuration (new fuel line part number P-10R600-BA-10560) (Roush Kit part number P22BB-RLEXTKIT-FA) that are currently being manufactured by DFD. Roush will work with Blue Bird to replace the defective fuel return lines on these configured buses. Subsequent replacement fuel return line kits are scheduled to be available from DFD for the remaining 13 Blue Bird Vehicle Configurations and then the alterers' Vehicle Configurations in descending order based on volumes.

How Remedy Component Differs
from Recalled Component :

The remedy components from DFD will all have stainless steel fittings.

Identify How/When Recall Condition
was Corrected in Production :

Roush initially corrected the "recall condition" for most of its equipment items sold to independent alterers in late November 2021 by using a new 5" spiral wrap covered with a 9" braided loom zip tied at each end of the spiral wrap (the "Wrap & Loom protection"). Due to the current limited available quantities of stainless steel remedy components from DFD, Roush anticipates continuing production with the Wrap & Loom protection until after the recall remedy is completed.

Recall Schedule :

Description of Recall Schedule : With respect to the items of original equipment covered by this report, Roush is not conducting a recall. Rather, recalls will be conducted – with Roush's cooperation – by the purchasers of the LPG conversion kits covered by this report.

Planned Dealer Notification Date : NR - NR

Planned Owner Notification Date : NR - NR

Purchaser Information :

The following manufacturers purchased this defective/noncompliant equipment for possible use or installation in new motor vehicles or new items of motor vehicle equipment:

Name : A1 Alternate Fuels

Address : 3608 Cooper Dr.

Elkhart IN 46514

Country : US

Company Phone : 5596966340

Name : Blue Bird Body Company

Address : 402 Blue Bird Boulevard

Fort Valley GA 31030

Country : US

Company Phone : 4783026410

Name : Coach & Equipment
Address : 130 Horizon Park Dr.
Penn Yan NY 14527

Country : US
Company Phone : 3155362321

Name : Creative Bus Sales - Chino
Address : 14740 Ramona Ave.
Chino CA 91710

Country : US
Company Phone : 9094655528

Name : Creative Bus Sales - Elkhart
Address : 57457 County Rd. 3
Elkhart IN 46517

Country : US
Company Phone : 8889260620

Name : Rush Truck Center - Dallas
Address : 4000 Irving Blvd
Dallas TX 75247

Country : US
Company Phone : 8669054466

Name : Hoekstra
Address : 3701 Roger B. Chaffee Blvd.
Grand Rapids MI 49548

Country : US
Company Phone : 8004444104

Name : Manning Equipment - Ohio
Address : 5200 Oster Rd.
Sheffield OH 44054

Country : US
Company Phone : 4409491337

Name : Microbird, Inc.
Address : 3600 Rue Girardin
Drummondville 00 J2E0A1

Country : CA
Company Phone : 8194772012

Name : National Fleet Services - Detroit

Address : 10100 Grinnell Ave
Detroit MI 48213

Country : US

Company Phone : 4409375177

Name : Creative Bus Sales - Mukilteo

Address : 1161 Cyrus Way #101
Mukilteo WA 98275

Country : US

Company Phone : 4256091500

* NR - Not Reported