



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: PE 15-006
Date Opened: 02/27/2015
Investigator: Kyle Bowker
Approver: Stephen Ridella
Subject: CNG Fuel Container Burst During A Fire
Date Closed: 01/08/2016
Reviewer: Bruce York-B

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: Autocar, LLC, Autocar Industries, LLC, HEIL ENVIRONMENTAL
Products: 2014 Autocar ACX/Heil Half/Pack Freedom CNG Refuse Truck
Population: Confidential
Problem Description: Compressed natural gas (CNG) fuel container(s) burst during a fire incident.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	0	1	1
Crashes/Fires:	1	1	1**
Injury Incidents:	1	1	1**
Number of Injuries:	1	1	1**
Fatality Incidents:	0	0	0
Other*:	1	0	1

***Description of Other:** The subject incident was widely reported by numerous news media outlets.

** Total eliminates duplicates received by ODI and manufacturer.

ACTION / SUMMARY INFORMATION

Action: This Preliminary Evaluation has been closed.

Summary:

On January 27, 2015 in Indianapolis, Indiana, a model year 2014 Autocar ACX / Heil "Half/Pack Freedom" refuse collection truck caught fire and experienced a catastrophic CNG fuel container burst. Office of Defects Investigation (ODI) personnel conducted a field examination of the incident vehicle, an exemplar vehicle and the incident scene, and subsequently sent information request letters to Autocar LLC, The Heil Company, Agility Fuel Systems Inc. and Hexagon Lincoln Inc.

After a review of all available information, it appears that this was an isolated incident. The vehicle fire originated in the refuse storage bay and was caused by a "hot load," which is a quantity of solid waste that catches fire, smolders or spontaneously combusts as a result of incompatible waste materials mixing together. Drivers are trained to eject the hot load in an empty lot, when feasible. In this instance, the driver did not eject the hot load. After expending a hand-held fire extinguisher into the hopper area of the refuse storage bay, the driver retreated from the vehicle. Fire fighters arrived at the incident scene within minutes. During firefighting efforts, two CNG fuel containers burst, sending materials into the air and across a large debris field.

One fire fighter was struck in the head and shoulder area by falling debris and sustained minor injury. He was examined at the scene and did not require transport but was later transported post-incident to a medical clinic where he was diagnosed with a muscle strain to his left shoulder. Multiple structures suffered property damage and the subject vehicle was a total loss. The fire was brought under control and was extinguished 1 hour and 38 minutes after fire fighters first arrived.

Post-incident analysis, including a review of the fire department's after action report, identified several contributing factors. The truck driver was unable or unwilling to eject the hot load. Fire fighters initially misidentified the subject fuel system as liquefied petroleum gas (LPG) and believed cooling was necessary to prevent a boiling liquid expanding vapor explosion (BLEVE). Fire fighters were unfamiliar with natural gas vehicle fires, associated risks and best practices for firefighting techniques and tactics. The CNG fuel containers were located directly above the origin of the fire and were impinged by flame, thus weakening their structural integrity. The CNG fuel containers were mounted transversely with thermally-activated pressure relief devices (PRDs) mounted in each end, away from where the fire was localized. The CNG fuel containers were of Type 4 construction and thus were not good conductors of heat away from where the fire was localized and towards the PRDs. The CNG fuel containers were covered by a steel enclosure with small, circular openings providing access to the manual fuel container isolation valves equipped with integrated PRDs. Water applied to the fire likely cooled the PRDs but did not reach the area of the fuel containers where the fire was localized, thus keeping the PRDs below the activation temperature threshold as the fire progressed.

ODI is aware of at least one other incident in which a substantially similar CNG refuse truck caught fire due to a hot load. In that case, the PRDs activated as intended. There was no fire suppression effort prior to the PRDs activating.

The National Fire Protection Association (NFPA) Alternative Fuel Vehicle (AFV) Safety Training project (<http://www.evsaftytraining.org>) provides training for first responders who face emergency situations involving motor vehicles. NFPA training advises that attempts to extinguish a significant CNG fire could prevent PRD activation.

A safety-related defect has not been identified at this time and further use of agency resources does not appear to be warranted. Accordingly, this investigation is closed.