



**Field Service Bulletin**  
**CNG Flex Hose Visual Inspection and Leak Detection**

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December 4, 2014

## 1 Introduction

Flexible fuel hoses, as applied in Agility's CNG and LNG fuel systems, provide reliable and safe operation over the lifetime of the fuel system if they are properly cared for. However, their integrity can be compromised if exposed to some aggressively corrosive chemicals, such as chlorides used for road de-icing, or if they are altered to become improperly routed or secured after going into service.

Agility has investigated several recent hose failures and has issued a recall of high pressure, stainless steel braided hoses manufactured by Motion Industries in certain Agility CNG fuel system applications. See NHTSA recall website at: <http://www-odi.nhtsa.dot.gov/owners/SearchSafetyIssues> and search for information on recall ID number 14E056 for additional information.

In addition to this recall, as a further precautionary measure, Agility is releasing this inspection guideline to all Agility customers and requests that all customers inspect their hoses during their normal pre-operation walk-around check as well as part of their routine maintenance checks (every three months or 36,000 miles, whichever comes first) and alert Agility if any of the below conditions are observed.

If any clarifications are needed, please contact Agility Fuel Systems Product Support Department at 949-267-7745 and reference this bulletin for further assistance.

Customers should inspect their hoses for:

- Evidence of corrosion
- Broken wire braid strands
- Improper routing or attachment (clipping)
- Leaks

Guidelines for each inspection are provided in this document.



### NOTE

**Agility Fuel Systems recently revised CNG fuel system inspection intervals, which includes a daily walk-around inspection of fuel system components. See Field Service Bulletin ENP-196, "CNG Fuel System Inspection Interval Recommendations for High Mileage, Heavy Duty Vehicles" attached to this bulletin.**

## 2 Affected Units

All high pressure, flexible stainless steel braided CNG fuel hoses. Low pressure lines – such as vent pipe-away lines and PRD vent lines are not affected by this bulletin.

## 3 Tools and Materials

- Electronic methane detector
- Natural gas leak detector fluid
- Flashlight
- Inspection mirror

- Camera to document inspections
- Inspection log book

#### 4 Visual Inspection – Evidence of Corrosion

Look for signs of corrosion near the ends of the hose, where the rubber protective jacket is cut short of the crimped collet. Corrosion is indicated by *reddish, brownish* or *yellowish* discoloration of the stainless steel braid material, see Figures 2 and 3.

- In cases where the hose end is covered in dirt or road grime, the hose end should be cleaned with water and mild soap (such as dish soap) and a soft bristled brush to expose the stainless braid.
- If the hose end is covered by fire sleeve, it may be temporarily moved to expose the hose end for inspection. The fire sleeve must also be inspected for damage.



*Figure 1 If the hose is covered with an additional sleeve, move it to enable inspection of the braid and ferrule. Remember to inspect the sleeve for damage, too.*



*Figure 2 Corrosion on CNG hose braid and fitting.*



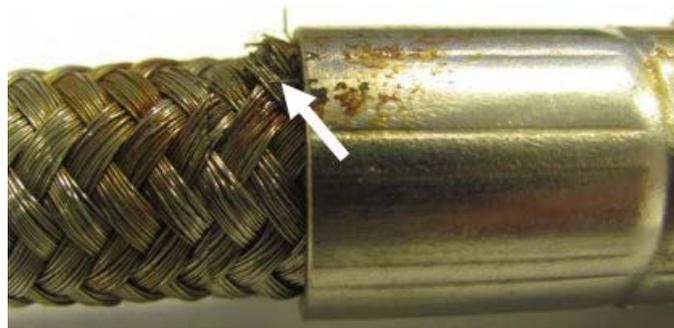
*Figure 3 Corrosion at the braid and fitting. A pen shows where a leak is located.*

## 5 Visual Inspection – Broken Wire Braid Strands

If the hose has been compromised, there may be evidence of broken wire braid strands in addition to evidence of corrosion.



*Figure 4 Broken wire strands in the braid are also evidence of compromised hoses.*



*Figure 5 This hose failed between the crimped collet and the outer braid.*

## 6 Inspection: Improper Routing or Support

As part of the hose visual inspection process, look for excessive wear, stress or pulling on the hose (typically caused by a broken clip or support), and kinks or collapsed hoses. Hose routing may be inadvertently altered or securement may degrade over time while the

vehicle is in service, so periodic inspection should be used to identify potential issues before hoses can become damaged.

For example, repair procedures may dictate that hoses be temporarily moved for access and those hoses may not be re-secured properly after the repair, or the installation or removal of vehicle equipment may have disturbed proper hose routing.

Refer to ENP-118, "Routing and Clipping Manual" for routing and supporting guidelines.

**Ensure that all hoses continuously meet these installation guidelines over the life of the fuel system:**

1. Secure hoses away from points of chafing or wear
2. Do not exceed the minimum bend radius of the hose. If hoses of various diameters are bundled together, the largest diameter hose will dictate the minimum bend radius. (For 3/8-inch hose, the minimum bend is 2-1/2 inches.)
3. If the hose pivots, rotates, flexes or reciprocates during operation, be sure to allow enough length for free movement at all points in the cycle. Even in a stationary application, be sure to allow adequate length for clearance changes during pressure cycles.
4. Hoses installed within approximately 8 inches of a heat source, such as the engine exhaust, should be protected by heat shielding or fire sleeve.



*Figure 6 The outer covering of this hose has been worn away due to abrasion. It should be replaced and secured properly away from any other surfaces or components.*

## 7 Leak Detection

Use an electronic methane detector and your sense of smell to locate the general area for leaks, then switch to leak detection fluid to pin-point the leaking component or line.



*Figure 9 When looking for hose leaks, check the hose-to-fitting junctions as well as fittings as indicated by the arrows. Move additional protection (fire sleeve) if necessary for access.*

## 8 What to Do If a Hose is Leaking



### WARNING

**Maintenance and repair must be performed by trained and qualified personnel. Attempting to repair the CNG fuel system without proper training is dangerous.**

If a leak is found, take the vehicle out of service, depressurize the system, and contact Agility Fuel Systems Product Support at 949-267-7745 to obtain new hoses.

## 9 Supplemental Information

Attached to this document for your convenience.

1. ENP-196, "CNG Fuel System Inspection Interval Recommendations for High Mileage, Heavy Duty Vehicles"

## 2. ENP-118, "Routing and Clipping Manual"

If you have any questions, contact Agility Fuel Systems Product Support at 949-267-7745 or support@agilityfs.com.

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