	VT-0027	000	01/20	BBK
	Fuel Gauge Capacitance Wire Field Repair			

Purpose

This document will give a repairing technician significant information, specifications and procedures to follow when repairing a fuel gauge capacitance wire that has become too short to connect to a new or reused capacitance feed through cable wiring.

Overview

When repairing or replacing a fuel gauge capacitance feed through cable or solder joint, it is critical to have the correct length of wire coming from the tank when making the solder connection to the solid feed through wire. The capacitance wire coming out of the tank is a stranded wire and the feed through wire is a solid wire. If a feed through cable needs to be replaced or capacitance testing warrants you to do so, the solder joint should always be heated up with a solder gun and the wires separated. **Never cut off the solder joint or capacitance wire unless absolutely necessary.** This ensures the capacitance wire always has the appropriate length to make a good connection and solder joint. If the capacitance wire is not long enough to make a good connection and solder joint with the feed through wire, extra wire may be able to be pulled from inside the tank to allow for an appropriate length. Follow the below information for the correct procedures and specifications.

Procedure


If extra wire is needed to allow you to make a good solder joint the extra wire may be able to be pulled out from inside the tank. The tank will need to be de-fueled completely and vented to 0 psi prior to attempting any such repairs. Refer to TSB VT-0017 (link below) for de-fueling procedures if needed.

<http://files.chartindustries.com/VT-0017-000-Manually-Defueling-a-Chart-LNG-Vehicle-Tank.pdf>

Once the tank is de-fueled and vented to 0 psi the solder joint tee cap and nut can be safely removed.

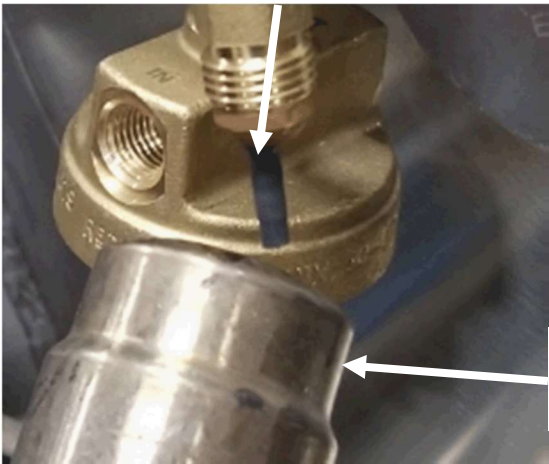


This procedure is intended for use by trained technicians with experience on systems using LNG. Review all applicable safety documents before beginning this procedure.

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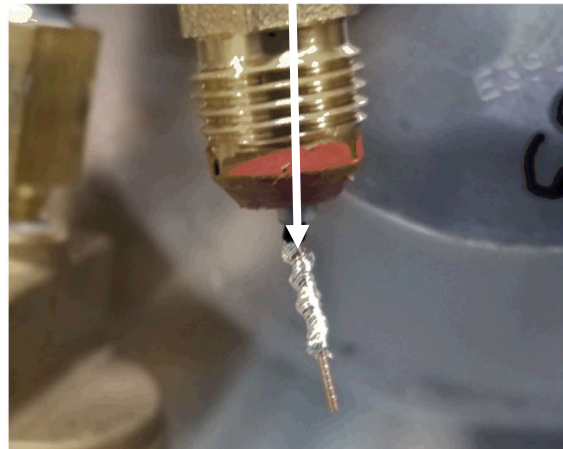
Use a heat gun to warm the small piece of heat shrink covering the solder joint and remove it. Use a solder gun to heat up the solder joint to a point where the solder melts. Separate the wires and while wearing welding gloves, safety glasses and proper PPE, use a shop towel to wipe the excess solder off the capacitance wire. Loosen the flare nut and remove the feedthrough cable assembly. Loosen/remove the flared tee being careful not to damage or twist the capacitance wire. Pull the tee off the wire, clean the female threads of the coupling making sure all debris is removed. Leave the wire hanging out of the coupling, do not trim or cut the wire.

Warming and removing heat shrink



Tip of Heat Gun

Solder Joint




The tank capacitance wire and the vent tube must be warmed above 70 degrees Fahrenheit in order to give the wiring enough flexibility to move freely through the bends in the tank knuckle and interior tubing. To warm the tank up warm nitrogen gas will be used to flow through the vent tube and out of the tank through the liquid circuit.

Push the exposed length of wire through a 4"X1/4" MPT nipple and thread the nipple into the coupling threads hand tight. Use any necessary fittings to connect the open end of the nipple to a high-pressure nitrogen gas bottle. The use of an inline regulator set to 100 psi max is desirable.



Pipe Nipple 4" X 1/4" male pipe threads

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Note: In order to warm up the capacitance wire and tube, warm nitrogen gas will need to flow into the tank through the vent tube. Cold nitrogen gas will exit the tank through the red (liquid) shut off valve. Remove any plumbing necessary to allow the cold nitrogen gas to flow through the red hand valve and allow it to vent to atmosphere. It is necessary to follow all relevant safety procedures for de-fueling, as some methane will be present when venting.


Tooling Note: If the repairing shop has access to the Chart Economizer Test Tool this would be an excellent tool to use as the control and measurement method for nitrogen flow. The tool is designed to mount directly onto a high-pressure gas nitrogen cylinder, it has a built-in regulator, and a built-in flow meter. When using this tool, the flow meter outlet fitting will need to be hoses or plumbed to the nipple.

<https://www.chartparts.com/catalogs/item-content/20837106/economizer-adjustment>



Open the shut off valve on the top of the nitrogen cylinder and adjust the regulator tee handle to achieve approximately 20 SCFH flow of nitrogen into the tank. Open the red (liquid) hand valve on the LNG tank. The nitrogen will flow into the tank through the 4"X1/4"MPT nipple and out of the tank through the red hand valve, it is normal for the red valve and associated piping to frost up while the nitrogen is flowing. Allow the nitrogen to flow for about 8 hours. Close the shut off valve on the nitrogen cylinder.

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Remove the 4"X1/4" MPT nipple. Use a pair of lineman's pliers to grip about a 1/4" up from the end of the outer shield on the capacitance wire. Do not pull directly on the wire as this could break or damage the wire. Slowly pull wire/shielding out of the tank until about 3 inches of shielding and wire are protruding past the stainless tank knuckle nipple. The wire is now ready to reinstall into the tee. Install thread sealant tape only on the male pipe threads on the tee. Feed the wire through the tee. Then turn the tee counterclockwise three turns before threading it into the stainless coupling. Thread the tee into the coupling (clockwise) and tighten, this will ensure the wire is in a relaxed position (not twisted) when the tee is fully tightened.

Refer to TSB VT-0054 (link below) for feed through cable installation.

<http://files.chartindustries.com/VT-0054-000-Feed-Through-Cable-Replacement.pdf>

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