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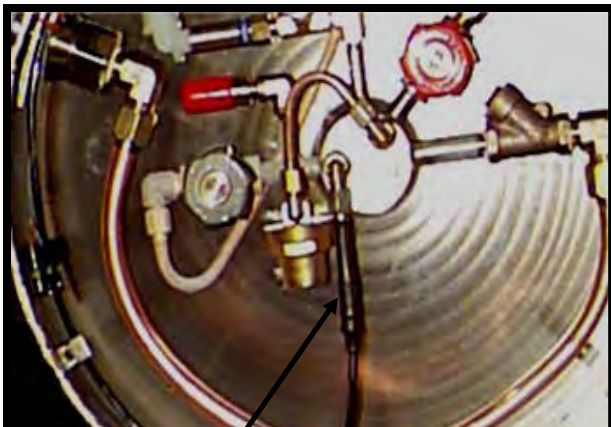
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## Changing a BNC Type Sender to a Continuous Wire Sender

### Purpose

Older LNG vehicle tanks manufactured by Chart (Formerly NexGen Fueling) used a fuel gauge system which contained a BNC type feed through connector. The connector is located at what is called the feed through.



**BNC Feed Through and Connector**

The feed through is a ceramic seal which seals the natural gas inside the tank. It is located at the front of the tank knuckle (See photo above). Where the capacitance tube wire passes through the ceramic seal there was previously a connector located on (inside and outside) the feed through, the connector is called a BNC connector. Newer tanks use a solid capacitance wire which eliminates the connector. Removing the connector from the system will eliminate the likelihood of loose or intermittent connections. This service bulletin will describe how to change a BNC type sender to a newer continuous wire sender.

### Parts

The majority of tanks affected by this bulletin are VDO type systems where the fuel contents gauge is a VDO type. If other types of systems need to be converted please contact a Chart field service representative for details.

Parts may be obtained through the Chart Inc. parts website. <http://www.chartparts.com/>

Qty	Part Number	Description
1	13992061	Feed through orifice tee and kit
1	14706805	Sender Single calibrated soldered
1	14712236	Economizer tube inverted
2	1111632	Elbow
2	11751555	Flaretite Seals

### Installation Instructions

1. Ensure LNG tank has been completely de fueled of all liquid and pressure. Tank pressure gauge must read 0 PSI. Install female QDV (Macro Tech fitting) and open the vent valve to confirm.
2. Purge flammable methane vapors from tank. Fill tank with 30 PSI of nitrogen gas, then open vent valve to exhaust nitrogen gas pressure to 0 PSI. Repeat nitrogen purge again.
3. Use a razor knife to pierce a vertical incision into the entire length of the BNC heat shrink.

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Do not press so hard with the razor knife as to cut completely through the heat shrink, as this could damage the underlying components. Use a heat gun to heat the heat shrink equally on both sides of the incision at 90 degrees either side of the incision. The heat shrink will start to split at the incision and peel away from the BNC. Use a shop towel to remove the heat shrink and discard, use caution as the heat shrink and its glue will be hot.

4. Remove BNC Cable connector from BNC nipple. Twist it a  $\frac{1}{4}$  turn counterclockwise to unlock and pull it away from the nipple to disconnect.
5. Un-plug the three pin weather pack connector from the sender box wiring.
6. Remove the two stainless sender mounting clips from either side of the sender mounting flange and retain.
7. If equipped remove the  $\frac{1}{4}$ " lock nut and P clamp that secures the sender wiring and secure it, this part will be reused.
8. Use a thin blade screw driver or small wood chisel to push in behind the sender box to remove the box. Be very careful not to use too much prying force behind the sender box as it will easily break the box. In applications where a sender mounting plate is used, the

plate may be removed and heat applied to the backside to make the removal of the sender from the plate easier. This will also make it easier to remove the old adhesive tape and glue. Use a razor blade scraper and then evaporative type solvent (such as isopropyl alcohol) to clean the old glue from the sender mounting surface.

9. Remove the BNC Nipple and pull the wire connector off of the inner contact pin. The capacitance wire will be protruding out of the elbow.
10. Make an incision in the heat shrink that covers the connector and shielding on the end of the capacitance wire. Use a heat gun on the heat shrink and when softened remove the heat shrink and discard.
11. Use a pair of wire strippers/cutters to clip the contact off the end of the wire.
12. Remove the elbow from the knuckle making sure not to damage the wire as you turn the elbow. (See photo below)

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13. Clean the threads of the knuckle using an internal wire brush. (See photo below)



14. Remove the economizer U tube and elbows, clean both female thread surfaces with a wire brush.

15. Install nickel tape to the male pipe thread portion of the Tee (If necessary refer to TSB VT-0030 for proper installation of thread sealant tape). Do not install thread sealant tape to the flared threaded portion of the tee.

### Important Notice:

The tee will have a small orifice installed into one end of the flared portion. The other flared portion will be open. Feed the exposed section of capacitance wire into the male pipe threaded end of the fitting and out of the open (non orifice) flared end. Screw the MPT end into the knuckle and tighten to approx 1:00 position.

16. Locate the 2 new elbows (PN 111632) and install nickel thread sealant tape onto the MPT threads only. Install both new elbows, the final tightening sequence should result in the elbows flared ends pointing in approximately the 6 O clock direction.
17. Locate 2 Flaretite seals. Install one on each flare surface of each elbow.
18. Install the new economizer U tube. The U should be positioned in a downward direction. The elbows may need to be moved slightly to properly align the flared surfaces. Tighten both nuts

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### Important Notice:

The open end of the tee (with wire) should point directly to the center of the bend in the economizer U tube in a downward direction. (See photo below for proper orientation of tee and economizer tube)



19. Locate the new sender and remove the backing from the adhesive tape on the sender. Install the sender onto the same clean/dry mounting surface as the old one was removed from in step 8 above.
20. Reinstall the two sender mounting clips previously removed in step 6 above.
21. Reinstall the sender cables securing "P" clamp if removed in step 7 above.

22. Reconnect the three pin weather pack connector of the new sender to the existing vehicle harness three pin connector. (Step 5 above)
23. Install a Flaretite seal to the top flare on the knuckle tee.
24. Locate the sender cable end with the fitting attached and white wire protruding from end. Feed the white wire into the tee (on the knuckle) from the top and thread the fitting nut onto the tee.



25. Tighten the stainless fitting onto the top side of the tee flare; use two wrenches on the stainless fitting when tightening. (See photo below)

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26. Cut the wiring to the proper length so that about  $\frac{3}{4}$ " of the wiring is protruding from the end of the Tee. Strip the ends of both wires so that about a  $\frac{1}{2}$ " of wire strands are exposed.

27. Twist the two ends of the wires together in a uniform fashion. (See photo below)



28. Solder the twisted wires together. Make sure solder flows uniformly into the entire exposed length of the wire, and then allow the assembly to cool completely. (See photo below)



29. Measure the length of wire protruding from the tee. The overall wire length (including soldered portion) should be  $\frac{1}{2}$ ". If the wiring is longer than  $\frac{1}{2}$ " trim the soldered end of the wire.

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30. Install a 1" piece of 3/32" encapsulating heat shrink over the end of the solder joint. It needs to cover the entire portion of exposed wire from the flared opening of the tee to about a 1/2" past the end of the soldered wires.

31. Heat the heat shrink using a heat gun and a uniform heating method. The encapsulating glue needs to flow from both ends of the heat shrink. No evidence of the solder joint or wire can protrude out of or be seen at the open end of the heat shrink. It is very important to allow heat shrink to cool completely.




32. Install the remaining Flaretite seal onto the flared (bottom) end of the tee.

33. Install the wiring cap and flare nut. The wiring cap should not contact or come within 1/4" of contacting the economizer U tube.



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34. Pressurize tank and plumbing with nitrogen and perform a leak test on all connections.
  
35. Turn on the vehicles ignition switch, the gauge should read empty. Fill the tank and recheck the gauge reading, it should be at or nearly full.

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