

**FIELD TEST  
CHECK VALVE AND ECONOMIZER**

1. Purpose: This procedure gives systematic instructions how to quickly check if economizer and check valves are in working order. No disassembly of piping is required for this procedure.
2. Equipment required
  - Dwyer FVB-53 Flow Meter, rated from 10 to 150 SCFH at 150 PSIG
  - High-pressure cylinder regulator
  - High-pressure cylinder of Nitrogen: Nitrogen is a contaminant to LNG. Excessive amounts of gas used during this test will decrease LNG purity.
  - Minimum ¼" interconnecting piping or tubing
3. Principle of the test.
 

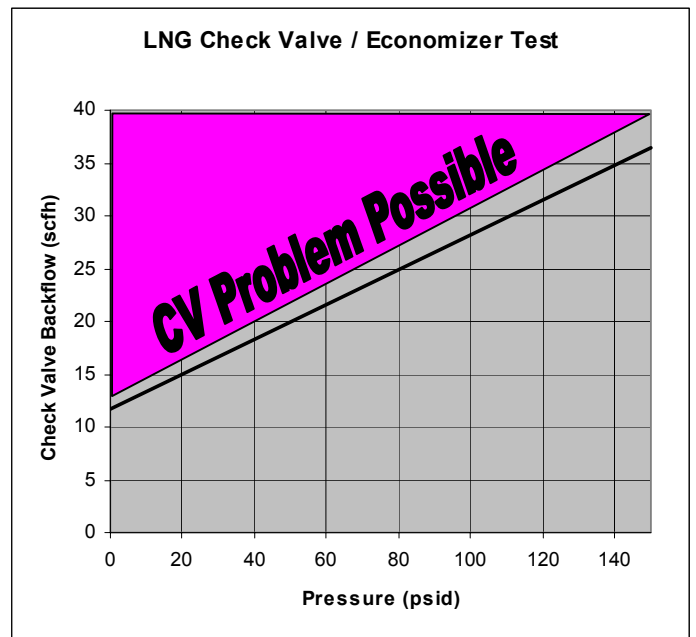
The check valve will not allow gas to flow back into the vehicle tank if check valve operates properly. The only flow possible is through the relief orifice. The approximate flow rate through the orifice is given on the LNG Check Valve/Economizer Test table. Flow through the economizer is not possible until the economizer set point has been reached, at which point it opens, and allows gas to pass.

If the check valve is stuck open, there will be a much higher flow at a given pressure differential than is indicated on the graph.

If the economizer is set at the wrong set point, free flow will occur at a different pressure than expected.
4. Connect high-pressure cylinder to the regulator.
5. Connect flow meter and the adapter to the tank
6. Vent Vehicle tank to 20 PSI below the expected economizer set point.
7. Close liquid outlet valve to close flow from vehicle tank to vaporizer
8. Disconnect fuel outlet line located between tank and vaporizer.
9. Connect flow meter outlet to vehicle tank fuel outlet.
10. Open fuel valve.
11. Adjust pressure of gas going into flow meter 20 to 40 PSI above tank pressure.
12. If flow rate is approximately 15-SCFH the check valve is operating properly.

13. Increase pressure until flow rate is 50 to 60 SCFH.
14. Slowly decrease pressure while watching the flow meter.
15. Economizer set point has been reached when the flow stops decreasing rapidly with decreasing pressure.
16. The LNG Check Valve/Economizer Test table below shows the approximate flow through the orifice in the check valve vs. pressure difference between the gas source and the vehicle tank pressure.

**Warning:**  
The flow meter is rated for a maximum pressure of 150 PSIG. It may rupture at higher pressures.



This procedure is for use by trained mechanics experienced with using Liquefied Natural Gas systems and vacuum technology. Review all pertinent safety documents before starting this procedure.