



VT-0031

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08-11

SJB/BBK

LNG Fuel System - Overpressure Regulator Check or Setting Procedure

This procedure will enable the installation technician to perform the necessary steps to properly set up an LNG Fuel System overpressure regulator.

- 1) Ensure vehicle tank has enough fuel to operate the engine (either check fuel gauge, or fill tank to verify the fuel level).

Determine the normal operating range for the system.

- 2) Look for the setting pressure scribed or marked on the top housing of the tank economizer regulator. All economizer pressure settings should be the same if the system has more than one tank.

- 3) Add 25 to 30 psi to the economizer set pressure. The range between economizer set pressure and overpressure regulator maximum desired pressure would be the normal expected operating range at the overpressure regulator outlet port.

Example: Economizer set pressure= 110 psi

Maximum desired regulator setting=(economizer setting + 30 psi)=140 psi

Normal operating range=110 - 140 psi

Note: The tank operating pressure must currently be higher than the maximum desired setting to perform an on vehicle overpressure regulator setting.

Install a pressure gauge at the overpressure regulator.

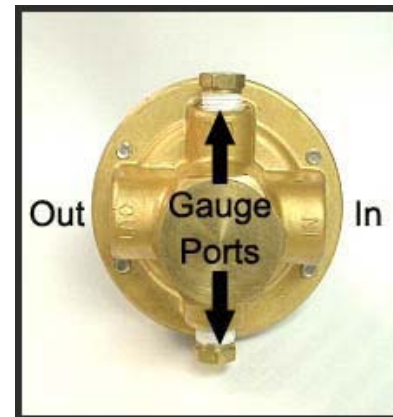
- 4) Close the vehicle tank liquid (use) hand valve.
- 5) Start engine. Allow engine to run until all fuel in the downstream piping is gone and engine stops.

Caution

Use caution when removing the ¼" plug in step 6. There may be residual pressure in the regulator housing.

- 6) Remove a ¼" plug from either side of the overpressure regulator. Refer to Photograph 1 for locations ¼" plugs.
- 7) Install a pressure gauge (PSIG) into the port from where the plug was removed in the previous step.

Note: A suitable gauge (P/N 10801741) is available from Chart customer service or <http://www.chartparts.com/>



Photograph 1

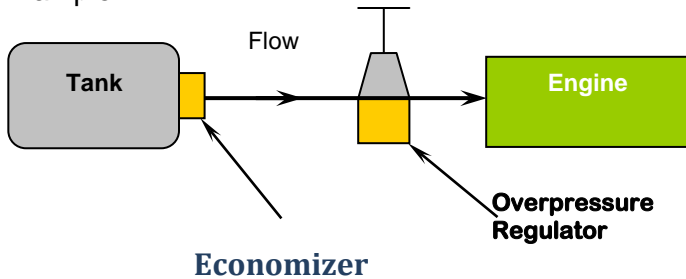
- 8) Slowly open the vehicle tank liquid (use) valve.
- 9) Start engine and allow it to idle. Regardless of current tank pressure, pressure at the overpressure regulator should be equal to or greater than the economizer setting pressure, up to 25-30 psi above the tank economizer regulator setting once the OPR is set.

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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Example



The examples in Table 1 are various working pressures (pressure within the LNG fuel tank) that may be encountered on a normally operating tank. Economizer pressure setting and overpressure regulator setting should always be constant. The pressure to the engine can vary by 25 to 30 psi. The following factors influence the final pressure (psi) at the overpressure regulator outlet: the economizer set pressure, the overpressure regulator setting, and the tank pressure.

	Tank Pressure	Economizer Setting	OP Regulator Setting	PSI at OP Regulator Outlet
A	200	120	145	145
B	140	120	145	140
C	120	120	145	120

Table 1

- A. Tank pressure is at 200 psi (above the economizer setting so the economizer valve is open). Since the overpressure regulator setting is set at 145 psi, the pressure at the overpressure regulator outlet should never be more than 145 psi.
- B. The engine has run for a period, the economizer is open (because the tank pressure is above the economizer set pressure) allowing the tank pressure to gradually drop to 120 psi. Tank pressure is

below the maximum allowed setting for the overpressure regulator (145 psi). The pressure at the overpressure regulator outlet should be equal to tank pressure (in this case 140 psi).

- C. If the engine is allowed to continue running, the tank pressure will gradually drop to 120 psi (this is the economizer set pressure). The economizer valve should now be closed. LNG will flow out of the tank through the knuckle check valve. The pressure at the overpressure regulator outlet should be equal to the tank pressure (120 psi).

Adjust the overpressure regulator to achieve the correct pressure if the pressure is above or below the normal range with the engine idling. Refer to Photograph 2 for locations of jam nut and adjusting handle on the overpressure regulator.

NOTE: Cummins engines can not accept pressure above 145 PSI, they will set an over pressure fault code if pressure at the engine inlet sensor exceeds 150 PSI. For this reason all Cummins OP regulators need to be set at 145 PSI.

- 10. Loosen the jam nut on the overpressure regulator.
- 11. Turn the adjusting handle until the desired pressure is achieved. Turn the handle clockwise to increase pressure, counterclockwise to decrease the pressure. Allow pressure gauge to stabilize when making adjustments.

Hold the adjusting handle in place with a wrench while tightening the jam nut when through adjusting pressure.

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12. Recheck the gauge pressure. Note: Skip Steps 14 through 18 and proceed to Step 19 if leaving the gauge on the overpressure regulator.
13. Close the vehicle tank liquid (use) hand valve.
14. Start engine. Allow engine to run until all fuel in the downstream piping is gone and engine stops.
15. Remove gauge from overpressure regulator.
16. Re-install $\frac{1}{4}$ " plug removed in Step 6 back into the overpressure regulator.
17. Slowly open the vehicle tank liquid (use) valve.
18. Inspect regulator installation for leaks.

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