ITT Conoflow

Engineered for life

Technical Bulletin - ITT Conoflow HPNGV Series Regulator Imperatives and Gas Delivery System Recommendations

Imperatives are those conditions, when violated, can cause regulator or system failure and an increased risk of gas release. The following imperatives are listed with potential risks to assist the fuel system integrator with system design failure modes and effects analysis.

1. Upstream Coalescing Filter

Although the regulator is equipped with an internal filter, a suitable coalescing filter must be installed immediately upstream of the regulator. This filter should be sized for suitable flow and condensate capacity. The purpose of this filter is to prevent excessive moisture and compressor oil or particulate contaminants from entering the regulator and flowing downstream to the fuel management system. A one (1) micron filter will sufficiently protect the regulator from particulate contamination damage.

This filter must be located as close to the regulator as possible to prevent any particulate in the connection between the filter and regulator from accelerating upon system pressurization, and piercing the regulator's internal filter.

2. Upstream Lockoff (solenoid) Valve

A normally closed solenoid valve must be installed upstream of the regulator. This is a safety requirement to prevent gas from freely flowing during vehicle shutdown. Although the regulator is capable of bubble tight shutoff, the upstream lockoff valve is the correct safety device for this function.

3. Inlet / Outlet Lines

To prevent excessive pressure drop at flow, the inlet and outlet fuel lines should be of suitable size. The regulator has been designed for SAE o-ring boss fittings which correspond to 3/8 inch OD tubing (SAE-6) for the inlet, and 1/2 inch OD tubing (SAE-8) for the outlet. These are the minimum recommended line sizes. The minimum bore of the fittings must be 0.27 inch (6.8 mm) for the SAE-6 inlet fitting and 0.37 inch (9.4 mm) for the SAE-8 outlet fitting. Fittings may be of type SAE J1926/2 or SAE J1926/3.

Tubing must be clean and free of burrs, which could contaminate the regulator or system. The outlet line should not be run upward from the regulator outlet port, due to the potential for excessive oil and condensate collection (see technical bulletin HPNGV-1-2). A level or downward run is preferred to prevent oil collection at the regulator outlet. A downstream filter can be utilized to collect condensate.

4. Downstream Relief Valve

Although the regulator is equipped with a pressure relief device (PRD), a high flow relief valve or other protective strategy must be installed between the regulator outlet and the remainder of the fuel system. The regulator PRD is not a high flow device and may not protect the system in case of failure.

ITT Conoflow

Engineered for life

Technical Bulletin - ITT Conoflow HPNGV Series Regulator Imperatives and Gas Delivery System Recommendations

5. Engine Coolant

The expansion of high pressure gas to low pressure creates a significant temperature drop. To prevent moisture from freezing inside the regulator and creating a blockage, heated engine coolant must be circulated within the regulator. The regulator is equipped with a coolant bowl for this purpose.

Engine coolant must be maintained for at least –40 degree antifreeze protection. If the coolant were to freeze in the regulator, for any reason, the coolant containment integrity may be compromised.

6. Excessive Temperature

The regulator is designed for safe and reliable operation within an ambient temperature range of –40 to 257 °F. Temperatures beyond 275 °F can cause permanent damage to internal seals and must be avoided. If the regulator is located in an area with the potential for high temperature (such as radiated energy from exhaust system components, etc), suitable heat shields must be employed.

7. Fitting Torque

The correct assembly torque for the inlet (SAE-6) fitting is 27 ft-lb.
The correct assembly torque for the outlet (SAE-8) fitting is 42 ft-lb.

Inadequate torque could allow the fitting to loosen in service and leak. Excessive torque could weaken or shear the threads in the inlet and / or outlet port of the regulator. A suitable lubricant (oil, synthetic grease, etc) should be applied to the o-ring of the fitting, prior to installation, to help the o-ring seat and seal. Do not use silicon grease – silicon may poison the oxygen sensor in some vehicles.
The inlet and outlet fitting is sealed with an o-ring. Thread sealant is not required, nor recommended.

8. Submergence in water

Except for bonnet bias models, the regulator uses an atmospheric reference hole in the bonnet to sense ambient pressure. This hole is "filled" with a porous hydrophobic plastic plug to prevent water intrusion from splashing, washdown, etc. This plug may not prevent water intrusion if the regulator were to be submerged in water. For this reason, the regulator should not be mounted low in a vehicle which would have to cross flooded roads, etc.

9. Chemicals in Fuel

Any cleaners or abnormal additives, drying agents, etc in the fuel could cause damage to the regulator's internal seals. The regulator is tolerant to substances that occur in compressed natural gas, including compressor oils, however ITT Conoflow should be contacted regarding other materials.