



VT-0038

001

08/06

BBK

Vehicle Tank Preventive Maintenance Procedures

OEM or customer to determine preventive maintenance interval based on current customer operating conditions. Chart Industries engineering or field service department should be contacted for assistance in determining correct intervals if needed.

Overview

This LNG vehicle fuel system inspection should be performed as a supplement to the vehicles normally scheduled preventive maintenance inspection. All tank components should be allowed to defrost before performing the inspection. The tank and all components of the fuel system should be cleaned prior to the inspection. The tanks outer shell may be cleaned with normal vehicle washing equipment however the plumbing components should be cleaned using a mild non-chlorinated soap. Do not use a high-pressure washer or steam cleaner on plumbing components as this can introduce moisture and contaminants into the threads of the fittings and damage sealants.

Safety: Always wear appropriate safety equipment, appropriate clothing and eye protection when performing any of the following steps.

All steps of this PM Procedure should be checked in sequence and recorded on the PM checklist. After all checks are completed a follow up/repair items list can be created to

ensure sufficient communication between inspecting and repairing technicians.

Vacuum Test

Check tank data plate for build date. If tanks age is greater than 36 months, perform vacuum integrity test per Chart Industries bulletin VT-0019. To minimize vehicle equipment down time, begin pressure rise test as soon as possible during PM procedure. Outcome of pressure rise test (8 hours total) to be determined after completion of the following PM inspection steps.

LNG Vehicle Tank Visual Inspection

- Inspect outer shell and both ends for dents or evidence of damage, check underside of tank for deep scratches, flat spots or gouges. Refer to VT-0006 Damage Criteria to determine severity.
- Inspect pump out port or cap for evidence of damage or tampering, half round cap must be intact and secured to the tank using a plastic rivet.
- Inspect tank straps for damage and the presence of strap insulating rubber
- Inspect tank and straps for evidence movement, loose straps, or tank rolling.

Decals

Check for presence and condition of the following decals on the vehicle or outside of the tank

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- Blue LNG triangle decal – Should be affixed to the right rear and left front of the vehicle
- Yellow LNG 230 psi or 16 bar MAX – Should be affixed in plain sight near the fill connector
- Data plate - Should be permanently affixed to the tanks shroud (on shrouded tanks) or on the head ring support (non-shrouded tanks).
- Black UN1972 – Optional decal should be affixed on or near the fill connector.

The following decals should be visible and affixed to the tanks head on the plumbing end.

- Fill decal – Should be affixed to the tanks head near the fill tube
- Liquid decal – Should be affixed to the tanks head near the fuel supply tube
- Vent decal – Should be affixed to the tanks head near the vent tube
- Read Instruction Manual decal – Should be affixed to the tanks head approximately 3 inches/76mm directly below the tanks knuckle.

Shrouded Tanks Only

- Inspect shroud cover or door for evidence of damage and operation
- Check for presence of shroud cover rubber securing straps and latches (if equipped)

- Check for presence and condition of cover retainer lanyard (if equipped)
- Check condition of rubber weather strip on inside of one-piece shroud end cover (if equipped)

Plumbing Components Inspection

NOTE: The system must be under normal operating pressure to perform leak testing.

- While shroud door is removed, use a methane detector and/or bubble leak tester to check for evidence of plumbing or component leaks while performing the following visual inspections. Note leaks as you progress through the inspection and later determine what course of action will need to be taken as a follow-up procedure.
- Check economizer, U-tube and both elbows for evidence of damage, frosting and leaks.
- Check vent service valve and use (liquid) service valve for leaks, signs of damage.
- Check service valves for ease of operation and leaks while operating.
- Inspect primary relief valve and threaded connections for evidence of leaks, check relief valve pipe away tubing and elbows for signs of damage, kinks, chafing, loose connectors, and correct routing.
- On shrouded type tanks check the orientation and cleanliness of the low

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point moisture drain hole in the pipe away tubing.

- Inspect the secondary relief valve, check for evidence of leaks and correct orientation.
- Check for the presence of the red cap on secondary relief valve, if the cap is missing/damaged an inspection of the primary relief system will need to be performed in a follow up procedure.
- Inspect pressure gauge(s), check for cracks in the gauge sight glass and any other damage, check for presence of indicator needle and condition. Check face of gauge to ensure that it is legible and appears to be accurate, and secure.
- On vehicles equipped with remote mounted gauges check the entire length of tubing leading to the gauge, look for evidence of kinked, crushed or damaged tubing and leaks, if the gauge is liquid filled check for evidence of liquid leaks around the face and rear body of the gauge.
- Check excess flow valve and tubing for evidence of leaks, damage, correct orientation, and frosting while vehicle is parked.
- Check fill coupler for cleanliness, damage, leaks, and secure mounting. Check for presence of and condition of cap and security cable.

- Inspect fill tubing for signs of damage, kinked, crushed tubing or chafing.
- Inspect fill check valve for condition, leaks, and correct positioning.
- Follow entire length of vent tubing, look for evidence of leaks, kinked, crushed, damaged, or chafed tubing.
- Inspect vent connector for leaks, security and evidence of cracked or damaged fittings.

Fuel Gauge Components Inspection

- Check feed through cable for evidence of leaks and damage, check for the presence of BNC heat shrink (where used) and look for cracking or evidence of moisture intrusion or LNG leaks.
- Check sender cable and wiring for chafing, cracking or loose connections.
- Inspect sender box for damage and security; ensure retainer clips are installed on mounting ears. Inspect 3 pin weatherpack connection for loose damaged or chafed wiring.
- Check for the presence of wire loom to protect the OEM harness. On shrouded type tanks inspect the wiring at the shroud for chafing and security, the shroud hole should be protected with a rubber grommet. Inspect gauge for security and evidence of damage.
- Turn vehicle ignition switch to run position and check for gauge response.

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On instrument panel mounted gauges turn on instrument panel lamps to check for gauge lamp operation.

Relief Valve Pipe Away Inspection

- Inspect relief valve pipe away tubing; look for evidence of cracked, kinked or pinched tubing. Follow the tubing from the shroud outlet through the frame rail, or to its destination as you inspect it.
- Look at the tubing outlet to ensure that it is not damaged, kinked or pinched off. Check to ensure that the tubing has a moisture drain and ensure that the drain is operable and free of debris or obstructions.

Heat Exchanger Inspection

- Follow liquid line tubing from tank to heat exchanger, check tubing for evidence of damage, kinks in tubing and proper support. Inspect heat exchanger for mounting and condition, check clamps for security, and check inlet and outlet connections for leaks. Check coolant hoses for proper size and routing.
- Check coolant hoses for evidence of chafing, kinks, or leaks. Check coolant clamps for condition and proper positioning and torque.
- Check the heat exchanger mounting clamps and bolts for security and evidence of tightness.

- If equipped, check the fuel shut off solenoid, look for signs of damage and leaks, wiring and electrical connections must not have any evidence of chafing, cuts or exposed wiring. Check solenoid bracket for loose mounting.
- Follow and check tubing and supports from heat exchanger outlet to overpressure regulator inlet.

Overpressure Regulator Inspection

- Check the overpressure regulator and mounting, look for dents or damage to regulator.
- Check regulator and fittings for leaks using liquid leak checker, check mounting brackets and bolts for looseness.
- Check locking nut at adjustment handle to ensure it is tight.
- If the regulator is equipped with a pressure gauge check the gauge for damage or incorrect reading. Ensure gauge sight glass is clear and gauge pressure scale is not faded or damaged, gauge scale must be legible.
- If liquid filled gauge is used check for signs of liquid leaks around the gauge.

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