



Pressure Test (P)

Typical interval of pressure test (P) is every five years

The pressure test includes the pressure relief device test or replacement and also includes testing the heating system, refrigeration or heating coils for carbon dioxide and nitrous oxide if equipped. Pressure tests are required for 306,307,312,331,338,341,406,407,412 and TC portable tanks.

Note the following items in the test:

- The tank must successfully pass External and Internal visual inspections prior to performing this test.
- Do not pressurize the tank Past MAWP.
- While the tank is under pressure, tank shall have signs that reads “TANK UNDER PRESSURE” hanging at both ends of vessel.
- The tank tester shall read the pressure from a protected location or from a safe distance.
- Adequately support the tank. If tank is equipped with upper coupler, remove the coupler.
- Where relief devices are contained in Manway assembly, test as follows or replace relief devices and return Manway assembly to tank prior to performing pressure test.
 - i) Remove re-closing relief devices for bench testing to ensure they open at the correct set to discharge pressure for the tank MAWP.
 - ii) Reset to leak tight condition at 90% of opening pressure. Replace any re-closing relief device that fails the testing.
 - iii) Remove to render inoperative all other relief devices and close internal valve.
- The tank insulation and its jacket, if any, need not be removed from isolated tanks, unless it is found to be impossible to reach test pressure or maintain a condition of pressure equilibrium after the test pressure is reached.
- Ensure all remaining closures rated at or above the test pressure are in place and adequately secured.
- **All piping and accessories shall be pressure tested at not less than 80% of MAWP.**
- In a multi-compartment tank configuration:
 - i) Ensure all adjacent compartments and void spaces are empty and open to atmosphere.
 - ii) All compartments are to be tested individually.

Test procedure for pneumatic pressure test:

- 1) Install pressurization line and manometer gauge at the top of tank from remote test location.
- 2) Slowly increase pressure in tank to the proper test pressure for that tank type, indicated in the attached **Table 7.3** of CSA B620.
- 3) Upon reaching test pressure, shut off source of supply and disconnect it from tank and gauging device.
- 4) After the pressure has held for a minimum of 10 minutes, reduce test pressure to the MAWP than check all weld seams with soap and water mix and visually inspect exterior of tank for indications of leak, defects or distortion.
- 5) Relieve pressure in tank.
- 6) Close first valve in discharge system and open internal valve, leaving all other valves in discharge line open. Adjust the pressure to 80% of the test pressure for the tank being tested and shut off the supply. The piping and the first valve in discharge system will now be pressurized in addition to the tank shell. Test pressure must hold with a 0 psig drop and hold pressure for 10 minutes.
- 7) Repeat above mentioned item for each valve in discharge line, until all valves have been tested.
- 8) Relieve pressure in tank.
- 9) Reinstall or return to working condition all relief devices.
- 10) Indicate all defects found and methods used to repair on Form No.: NEE-FRM-007.

Table 7.3 of CSA B620 Test pressures (for pressure test)

Tank specification	Pressure, kPa (psi)
TC 306 or MC	21 kPa (3 psi) or design pressure, whichever is greater
TC 307 or MC 307	275 kPa (40 psi) or $1.5 \times$ design pressure, whichever is greater
TC 312 or MC 312	21 kPa (3 psi) or $1.5 \times$ design pressure, whichever is greater
TC 331, MC 330, or MC 331	$1.5 \times$ design pressure
TC 406	34.5 kPa (5 psi) or $1.5 \times$ MAWP, whichever is greater
TC 407	275.8 kPa (40 psi) or $1.5 \times$ MAWP, whichever is greater
TC 412	$1.5 \times$ MAWP
TC 423	$1.5 \times$ MAWP
TC 338	According to calculation in Clause 5.2.5
TC 341	According to calculation in Clause 5.5.2.4
TC 350	155 kPa (22.5 psi) or $1.5 \times$ MAWP, whichever is greater
TC 11	According to calculation in Clause 6.4.11(c)
TC 44	27 kPa (4 psi) or $1.5 \times$ MAWP, whichever is greater
TC 51 or DOT 51	$1.5 \times$ design pressure
TC 60 or DOT 60	415 kPa (60 psi)
TC Type 1, 2, and 3	$1.5 \times$ MAWP

Maintenance and testing for PAF surge relief valve 406-96 & 98

- A. Regulations Requirements:** This portion of the manual refers to the regulations and is intended to serve as an interface to relate the manual to the code. *This manual does not take the place of the Code of Transport Canada (TC) Regulations.* A current copy of the Code of TC Regulations should be reviewed and followed to insure the requirements are met for each individual case.

There are three basic tests/inspections mandated by 49CFR Part 180 for TC306 and TC406 tanks.

Test/Inspection	Interval Period	B620 Related Section
External Visual Inspection	1 year	7.2.1
Leakage Test	1 year	7.2.5
Pressure Retest	5 year	7.2.7

- 1. External Visual Inspection:** As part of the annual external visual inspection, CSA-B620 requires that all pressure relief valves, be visually inspected for any corrosion or damage which might prevent the valve from functioning. If the cargo tank is used to haul product that is corrosive to the relief valve, the valve must be removed from the cargo tank for inspection and bench testing.

- 1.1. Visually inspect all external surfaces of the manhole and PAF, which includes opening the *Latch (1)* and *Strongback (5)*.

NOTE: If any corrosion or damage to the PAF or manhole is observed, it must be repaired and successfully bench tested prior to returning to service. Refer to 3.5 for PAF bench test procedure.

- 1.1.1. Clean and inspect the bottom side of the PAF for signs of damage, corrosion, or product gumming that could effect the operation of the Relief Valve.
- 1.1.2. Closely inspect the *Cylinder (10)* for any damage or dents. Also, insure *Cylinder (10)* is threaded tightly to the *Cover (9)*. See figure 1.
- 1.1.3. Inspect and clean the *Normal Vent (8)*.
- 1.1.4. Inspect the *10" Seat (25)* for damage or corrosion. Build-up or grim on the seat should be removed. Nicks on the 10" seat may cause the gasket not to seal.
- 1.1.5. Inspect the *10" Fill Gasket (24)* for signs of wear or degradation. Replace gasket if required.
- 1.1.6. Inspect the *Clamp Ring Gasket (26)* for evidence of product seepage. Replace any gaskets where seepage is detected.

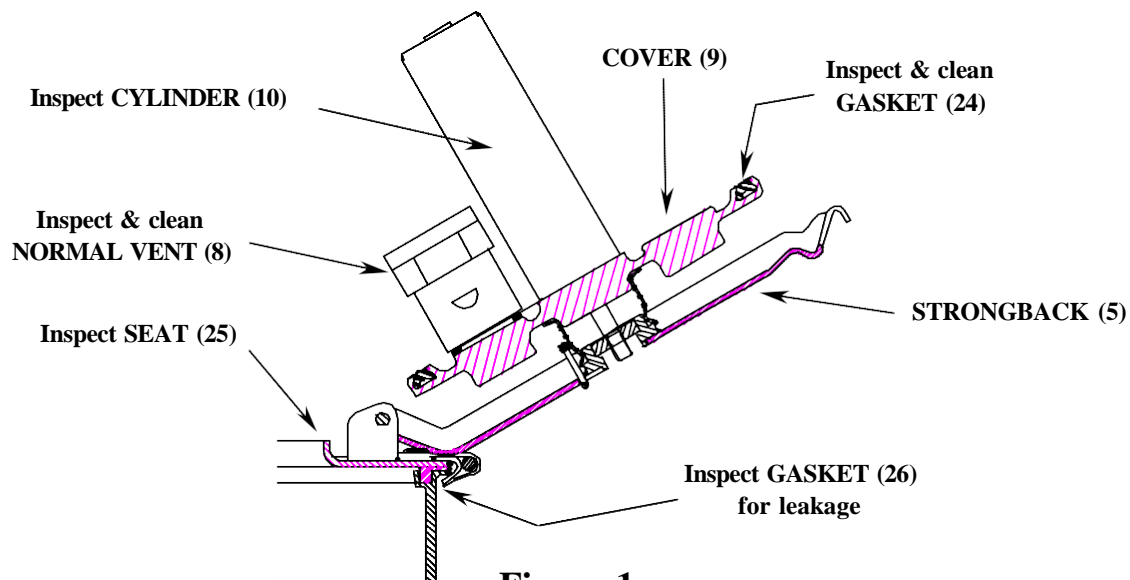


Figure 1

2. **Leakage Test:** CSA-B620 requires tanks to be tested annually at 80 % of the tank design pressure or MAWP, whichever is marked on the tank certification or specification plate. All tank components must remain in place during this test, except any re-closing pressure relief valve with a set pressure less than the leakage test pressure must be removed or rendered inoperative during the test. Betts Normal Vents, therefore, must be removed during the leakage test.

- 2.1. Remove Normal Vent from manhole cover and plug opening with Betts Plug No. 3013.
- 2.2. Apply test pressure in accordance with the QC manual
- 2.3. Inspect all gasket joints on PAF and manhole for leaks. If PAF leaks, adjust in accordance with Set Pressure Adjustment instructions (Section 3 of this manual) and retest the unit. Replace damaged or worn gaskets as required.

3. **Pressure Retest:** As part of the pressure retest, CSA-B620 requires that all re-closing pressure relief valves be removed from the tank for inspection and bench tested to verify that the relief valve is functioning properly. The pressure retest and the relief valve bench test must be performed at least every five years.

3.1. **Pressure Retest Procedures:**

- 3.1.1. CSA-B620 requires that all closures except pressure relief devices must be in place during the test
- 3.1.2. Manholes must remain in place during pressure test.
- 3.1.3. Open 10" PAF Relief Valve.
- 3.1.4. Install Betts Retest Fixture (part no. 6556LCB) to seal the 10" opening. See figure 2.
- 3.2. Betts Push and Air Operated Vapor Recovery Valves remain in place during the test.
NOTE: If vapor recovery valves from other manufactures are installed, refer to the manufacturers' instructions to see if they should be removed.
- 3.3. After preparing the rest of the tank, perform the pressure test in accordance with the regulations. Inspect all parts of manhole assembly for leakage. Repair or replace parts as required.
- 3.4. Remove all clamps or plugs from relief valve immediately after test is completed.

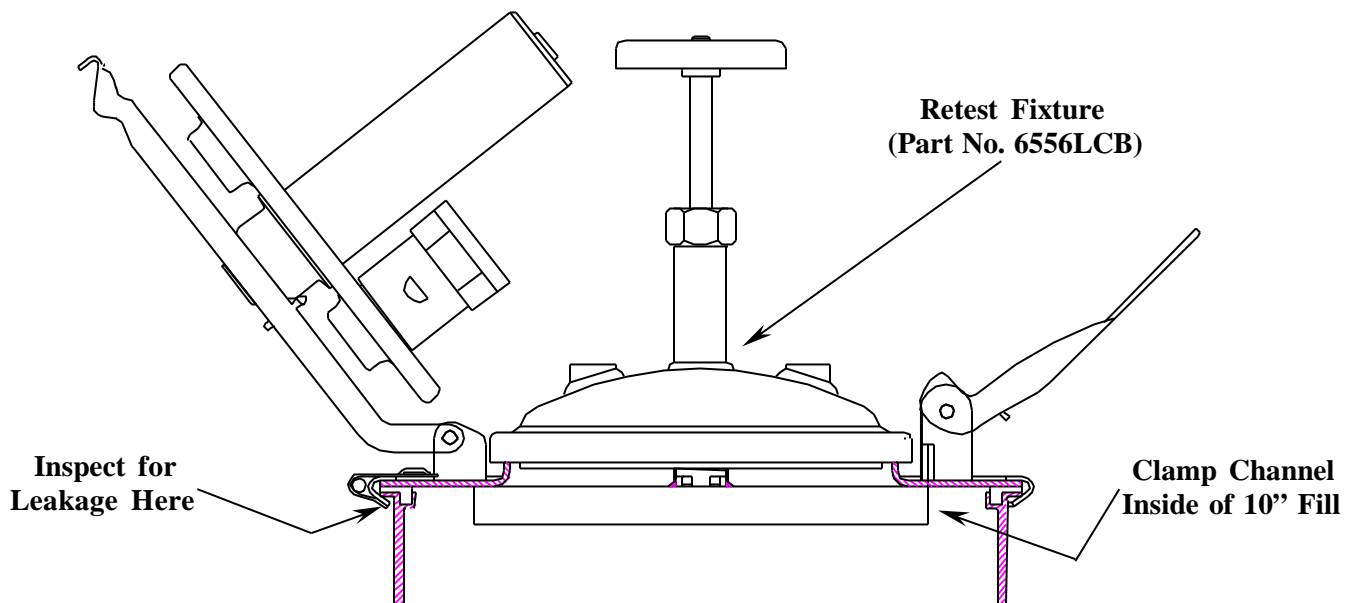


Figure 2

3.5. Bench Test Procedure for PAF Surge 406-96 & 98

- 3.5.1. Remove manhole assembly from tank by removing the clamp ring bolt and clamp ring.
- 3.5.2. Remove *Normal Vent* (8) and plug port with Betts Plug (No. 3013)
- 3.5.3. Attach manhole assembly to appropriate Betts PAF 406-96 Test Fixture (No. 6685SL.)
- 3.5.4. Apply a soap solution around the perimeter of the DoveTail 10" Gasket.
- 3.5.5. Gradually apply pressure to the tank and observe the pressure at which bubbles first appear.
- 3.5.6. Per CSA-B620 the set pressure must not be less than 3.63 psig and not more than 4.55 psig for a tank with a MAWP of 3.3 psig.
- 3.5.7. Slowly release the pressure from the test fixture and verify the PAF reseals not less than the MAWP of the tank.
- 3.5.8. Replace or adjust any relief valve that fails the set pressure test requirements. Refer to instructions for Set Pressure Adjustment (Section 3 of this document) to adjust the set pressure, and retest the unit.

4. Model 6496AL (Normal vent for TC 406) Test Procedure:

A Normal Vent Test Tank (Part No. 6687AL) must be used to test the Normal Vents.

Note: A regulator must be used to slowly apply pressure to the tank.

- 4.1. Pressure Test: CSA-B620 states that the normal vent for a TC 406 must be set to open at not less than 1 psig.
 - 4.1.1. Screw the Normal Vent into the lid of the test tank as shown in figure 3 A. In order to detect leakage, attach the reducer bushing, compression fitting, and tubing. Place the end of the tubing in a water jar. The water jar is not included with the test tank.
 - 4.1.2. Slowly apply pressure to the tank. Bubbles will indicate the opening pressure of the vent.
 - 4.1.3. A properly functioning 6496AL Normal Vent should open between 1.0 to 1.5 psig, but in no case open less than 1 psig.
- 4.2. Vacuum Test: CSA-B620 states that the normal vent for a TC 406 must be set to open at no more than 6 ounces vacuum (.375 psig).
 - 4.2.1. Screw the Normal Vent into the lid of the test tank as shown in figure 3 B.
 - 4.2.2. Slowly apply pressure to the tank and inspect the top opening for pressure release. Apply soapy water to the top of the vent in order to detect the point at which the vent opens.
 - 4.2.3. A properly functioning 6496AL Normal Vent should vacuum relieve between 0.25 to 0.375 psig, but in no case more than 0.375 psig.
- 4.3. Repair or replace any Normal Vent that does not meet the specifications.

