BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 4.22

PRODUCTION PROCESS STANDARD

Pressure Testing Learjet Model 45 Integral Fuel Tanks

Issue 10
- This standard supersedes PPS 4.22, Issue 9.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS 4.22 related questions to michael.wright@aero.bombardier.com.
- This PPS is effective as of the distribution date.

Signed original on file. Validation of paper prints is the responsibility of the user.

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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for pressure testing Learjet Model 45 integral fuel tanks.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS must be followed to ensure compliance with all applicable specifications. In general, if this PPS conflicts with the engineering drawing, follow the engineering drawing. The requirements specified in this PPS are necessary to fulfil the engineering design and reliability objectives.

1.1.2 Alternatively, it is acceptable to leak test Learjet Model 45 Integral Fuel Tanks according to PPS 4.24 in place of pressure testing as specified herein.

1.1.3 Refer to PPS 13.26 for the subcontractor provisions applicable to this PPS.

1.1.4 Procedure or requirements specified in a Bombardier BAPS, MPS, LES or P. Spec. **do not** supersede the procedure or requirements specified in this PPS.

2 Hazardous Materials

2.1 Before receipt at Bombardier Toronto (de Havilland), all materials must be approved and assigned Material Safety Data Sheet (MSDS) numbers by the Bombardier Toronto (de Havilland) Environment, Health and Safety Department. Refer to the manufacturer's MSDS for specific safety data on any of the materials specified in this PPS. If the MSDS is not available, contact the Bombardier Toronto (de Havilland) Environment, Health and Safety Department.

3 References

3.1 PPS 4.24 - Leak Testing Learjet Model 45 Integral Fuel Tanks.

3.2 PPS 6.03 - Installation of Aircraft Fluid Lines and Fittings.

3.3 PPS 13.26 - General Subcontractor Provisions.

3.4 PPS 21.03 - Priming, Sealing and Repair of Integral Fuel Tanks.

4 Materials and Equipment

4.1 Materials

4.1.1 Leak detector solution (e.g., Turco Leak Detector, Sigma-Aldrich Leak-Tec, MIL-L-25567, etc.). When using Turco Leak Detector solution, mix 5 oz. with water to make up 1 imp. gallon of solution. Use Leak-Tec leak detector solution as received (i.e., do not thin with water).

4.1.2 Clean wiping cloths (e.g., DSC 378-2).

4.2 Equipment

4.2.1 Pressure test rig, tool #4557000001-003-141, capable of pressurizing to 3 psig (see Figure 1).

4.2.2 Fuel tank blanking kit (e.g., tool #4557000001-001-216).

4.2.3 Coveralls, lint-free cotton or 65/35 polyester/cotton blend. Use of 100% cotton coveralls which are not qualified as lint-free is **not** acceptable.

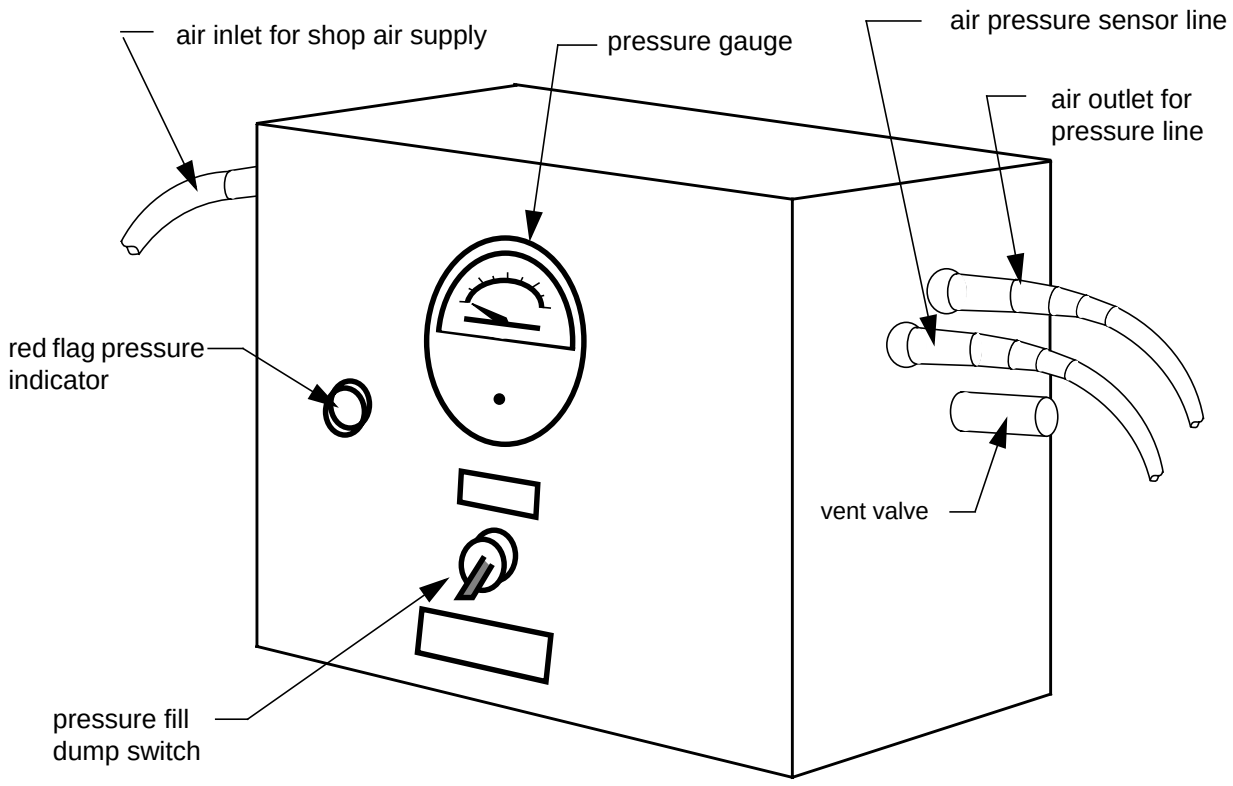

Figure 1 - Pressure Test Rig

5 Procedure

5.1 General

5.1.1 Pressure testing of integral fuel tanks is performed after all parts and assemblies that penetrate the fuel tanks have been installed and when the fuel tanks are structurally complete. The test procedure consists of pressurizing the fuel tank to 3 psig and isolating the tank for at least 30 minutes while checking for a pressure drop.

5.1.2 Pressure test after all sealant is fully cured as specified in PPS 21.03.

5.1.3 Unless otherwise specified, pressure test the port and starboard fuel tanks separately.

5.1.4 Cover fuel tank access openings when no work or testing is being done.

5.1.5 Ensure that fuel system components are installed according to PPS 6.03 and the engineering drawing.

5.1.6 Verify the status of pressure test rig calibration before use. Only equipment identified with a valid calibration label (or equivalent) is acceptable for use.

5.2 Pressure Testing

5.2.1 Pressure test the main fuel tank as follows (see Figure 2):

Step 1. Cap, blank off or plug all fuel tank openings and fuel system components (e.g., using the fuel tank blanking kit). Material that may leave a residue (e.g., putty) must not be used to plug holes or other openings.

Step 2. Connect the pressure test rig to a shop air supply.

Step 3. Attach the blanking kit adapters for the refuel and vent lines at Station XW 5.8.

Step 4. Attach the test rig pressure and pressure sensor lines to the adapters on the refuel and vent lines.

Step 5. Close all drain line valves and close the fuel line valve at Station XW 30.

Step 6. Turn the fill switch on the pressure test rig to pressurize the fuel tank to a pressure of **3.0 - 3.5 psig** (the red flag indicator will indicate when the fuel tank has reached 3.0 psig). If 3 psig cannot be achieved, switch off the fill switch and check all preparations performed in Step 1 through Step 5.

Step 7. Disconnect the shop air supply line to the test rig.

Step 8. Apply leak detection solution to fastener heads (including rivet lines), access panels and any other potential leak area over the **entire** wing tank surface structure (even when re-testing), including the inboard and outboard ribs.

Step 9. Carefully inspect the tank surface and note the locations of any leak points as indicated by bubbling of the solution.

Step 10. Remove **all** traces of leak detector solution from the wing surface using clean cloths dampened, and re-dampened, with clean water before drying the surface with clean dry cloths. Do not release the pressure at any time before the removal of all trace of leak detector solution.

Step 11. If no leaks are detected, allow at least 30 minutes with no observed pressure drop before releasing the tank pressure by turning the fill switch to “dump”. If leaks were detected, release the tank pressure as soon as all leaks have been noted. If a pressure drop is observed, even though no leaks were detected, re-pressure test from Step 6.

Step 12. Repair any leaks by re-sealing according to PPS 21.03 or by re-torquing fasteners or replacing parts, as necessary. Allow any applied sealant to cure according to PPS 21.03. All personnel working within the fuel tank must wear clean coveralls (see Equipment section, paragraph 4.2.3).

Step 13. If leaks were repaired, re-pressure test from Step 6. If no leaks were detected, remove all blanking caps, plugs and adapters installed to facilitate testing and re-cap all of the lines and fittings.

Step 14. Torque all re-connected joints according to PPS 6.03.

6 Requirements

6.1 Pressure test according to this PPS before filling the tanks with fuel.

6.2 The fuel tanks must maintain the test pressure (3 psi +0.5/-0.0) with **no** pressure drop for a minimum of 30 minutes with no evidence of leakage.

7 Safety Precautions

7.1 The safety precautions specified herein are specific to Bombardier Toronto to meet Canadian Federal and Provincial government environmental, health and safety regulations. It is recommended that other facilities consider these safety precautions; however, suppliers, subcontractors and partners are responsible for ensuring that their own environmental, health and safety precautions satisfy the appropriate local government regulations.

7.2 Observe general shop safety precautions when performing the procedure specified herein.

7.3 Take extreme care when pressurizing the fuel tanks to ensure that the test rig lines are kept clear of structures, stands, etc. and are free of kinks or loops that may restrict the air flow.

7.4 Never leave the pressure test rig unattended while it is connected to the shop air supply.

8 Personnel Requirements

8.1 Personnel must have a good working knowledge of the applicable procedure and requirements as specified herein and must have exhibited their competency to their supervisor.

9 Maintenance

9.1 Ensure that the pressure test rig is calibrated at least once every 6 months. Check the pressure test rig system for leaks and joint integrity. Check gauges and pressure relief valves for accuracy.

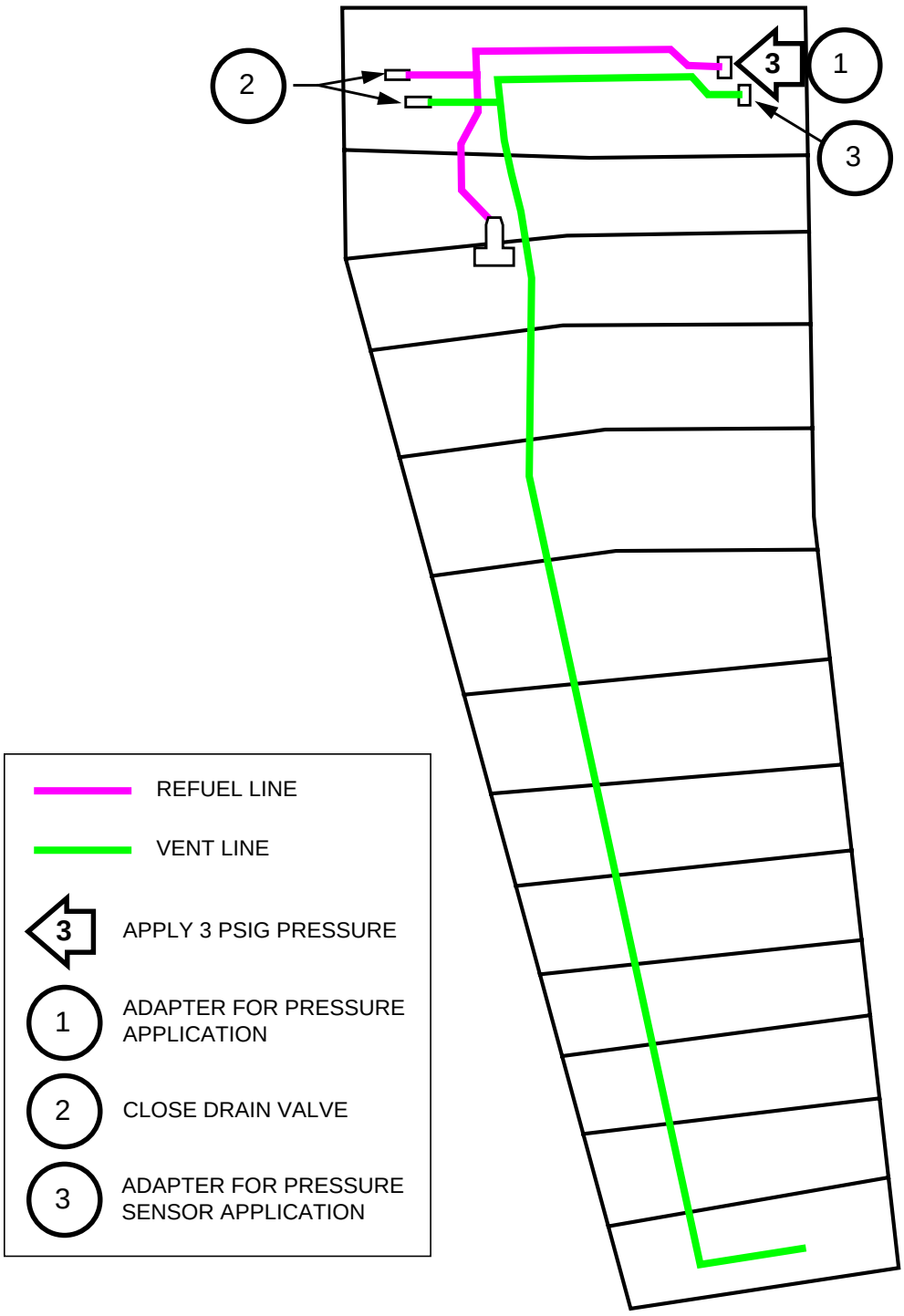

Figure 2 - Fuel Tank Pressure Application