BOMBARDIER

Toronto (de Havilland)

PROPRIETARY INFORMATION

PPS 4.15

PRODUCTION PROCESS STANDARD

Pressure Testing the DASH 8 Extended Range Fuel System

Issue 13
- This standard supersedes PPS 4.15, Issue 12.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to PPS.Group@aero.bombardier.com or (416) 375-4365.
- 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 the complete fuel system of DASH 8 aircraft equipped with the extended range fuel system.

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

1.1.3 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 6.03 - Installation of Aircraft Fluid Lines and Fittings.

3.2 PPS 13.26 - General Subcontractor Provisions.

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).

4.2 Equipment

4.2.1 High pressure test rig (e.g., tool #85000001-001-141).

4.2.2 Fuel function test kit (e.g., tool #82820005-001-141B).

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.

4.2.4 Plastic dust covers for long range aircraft (e.g., SD6202).

4.2.5 DSC 378-3 lint free wiping cloths.

5 Procedure

5.1 General

5.1.1 Before pressure testing, ensure pressure test rig gauge and relief valve calibration stickers are valid and have not expired. Do not use a pressure test rig if the gauge and/or relief valve calibration stickers are not valid or have expired.

5.1.2 All personnel working within the fuel tank must wear clean coveralls (see Equipment section, paragraph 4.2.3).

5.1.3 Keep fuel tank access openings covered at all times using the plastic dust covers when no work is being performed.

5.1.4 Perform pressure testing only on completely installed fuel systems. Install fluid system components according to PPS 6.03 and the engineering drawing.

5.1.5 Blank off all fuel lines, valves, vents, etc. using the blanks and adapters from the blanking kit for the specific system being tested.

5.1.6 The test procedure consists of pressurizing the system lines to the pressure shown in Table 1, isolating the system for a period of 30 minutes and then checking the pressure drop. If there is a pressure drop, re-pressurize the system to the level specified in Table 1 and check for leaks using leak detector solution. Do not release the pressure in the fuel system at any time before removing the leak test solution. Remove residual leak detector solution using a clean DSC 378-3 lint free wiping cloth dampened with clean water and then wipe dry with another clean DSC 378-3 lint free wiping cloth.

5.1.7 Repair leaks by re-torquing or replacing components as necessary. Re-test repaired systems according to this section.

5.1.8 On completion of leak testing the fuel system, remove all blanking plugs, caps and adapters that were installed to facilitate testing and re-connect all lines and fittings that were removed. Torque all re-connected joints according to PPS 6.03.

5.2 Set-Up and Operation of the Pressure Test Rig

5.2.1 Before operating the pressure test rig, ensure that both control levers are in the HOLD position (see Figure 1). The pressure test rig may be used to test two fuel line systems simultaneously, using both the #1 and #2 high pressure test systems.

5.2.2 Prepare and operate the test rig for the pressure test as follows:

Step 1. Connect the test rig to a shop air supply and ensure that the external air pressure regulator is set to 55 psig.

Step 2. Set the high pressure gauge to the test pressure specified in Table 1 by turning the high pressure adjust dial.

Step 3. Connect the test rig pressure line to the system that is to be tested.

Step 4. Switch the control lever to the FILL position.

Step 5. When the pressure gauge indicates the correct test pressure, switch the control lever to the HOLD position.

Step 6. After completion of the leak detection procedures specified in section 5.1, switch the control lever to the DUMP position.

5.2.3 Before disconnecting the pressure test rig line, switch the control lever to the HOLD position.

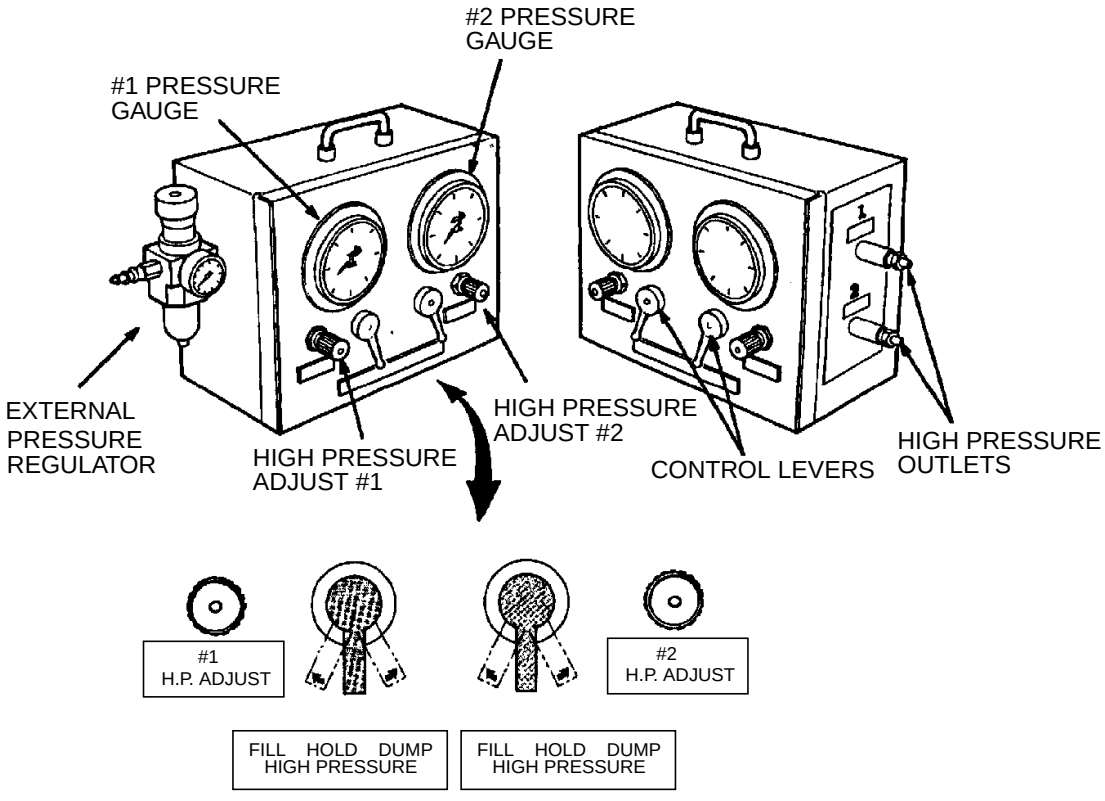


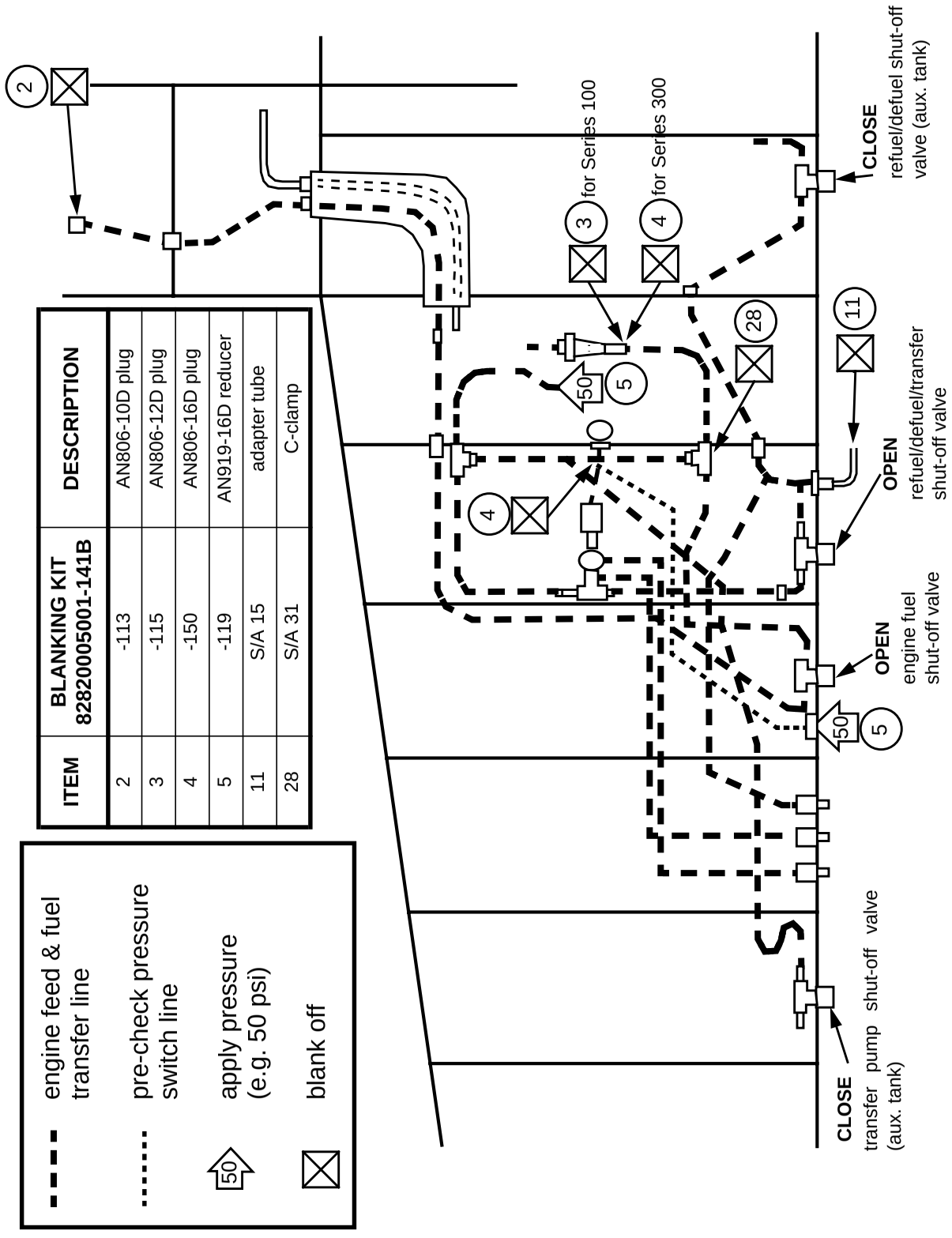
Figure 1 - Pressure Test Rig

Table 1 - DASH 8 Extended Range Fuel System Pressure Test

SUB-SYSTEM	PRESSURE TEST DETAILS	TEST PRESSURE	REF FIG
Engine feed & fuel transfer line (in tank)	Step 1. Disconnect and plug the engine feed line at the engine with an AN806-10D plug. Step 2. Open the engine feed shut-off valve. Step 3. Open the refuel/defuel/transfer shut-off valve. Step 4. Close the refuel/defuel shut-off valve (auxiliary tank). Step 5. Close the transfer pump shut-off valve (auxiliary tank). Step 6. Blank off the refuel/defuel/transfer line at the flexible coupling outside the rear spar using an S/A 15 adapter tube. Step 7. Blank off the fuel inlet (without removing the elbow) with an AN806-16D plug. Step 8. Disconnect and blank off the engine feed line at the outlet side of the ejector boost pump using an AN806-12D plug. Step 9. Blank off the bleed hole on the modified T-fitting (rear spar, STN YW189) outboard of the collector bay using an S/A 31 clamp. Step 10. Disconnect the engine feed line at the electric pump outlet and connect the pressure test rig to the line using an AN 919-16D reducer.	50 psi	2
Pre-check pressure switch line	Step 1. Disconnect the pre-check pressure switch line at the rear spar and connect the pressure test rig to the line. Step 2. On completion of the test, continue on with the auxiliary tank refuel/defuel line and auxiliary tank fuel transfer test as specified below before removal of the blanking plates.	50 psi	2
Auxiliary tank refuel/defuel line	Step 1. Ensure that the pressures in the engine feed and fuel transfer lines are zero. Step 2. Open the refuel/defuel shut-off valve. Step 3. Replace the fuel inlet elbow with an S/A 11 casting. Step 4. Pressurize the engine feed and transfer lines. Step 5. Open the pilot solenoid valve for 5 minutes to allow the pilot line and pressure switch to become pressurized. Step 6. Close the pilot solenoid valve when all of the lines have been pressurized.	50 psi	3
Auxiliary tank fuel transfer line	Step 1. Ensure that the pressures in the engine feed and fuel transfer lines are zero. Step 2. Open the transfer pump shut-off valve. Step 3. Disconnect and plug the fuel transfer tube at STA 171 with an AN929-10 cap. Step 4. Disconnect the flexible coupling at STA 367 and blank it off using an S/A 21 adapter tube. Step 5. Apply pressure to the engine feed and transfer lines.	50 psi	3
Note: All motorized valves shall be opened manually.			

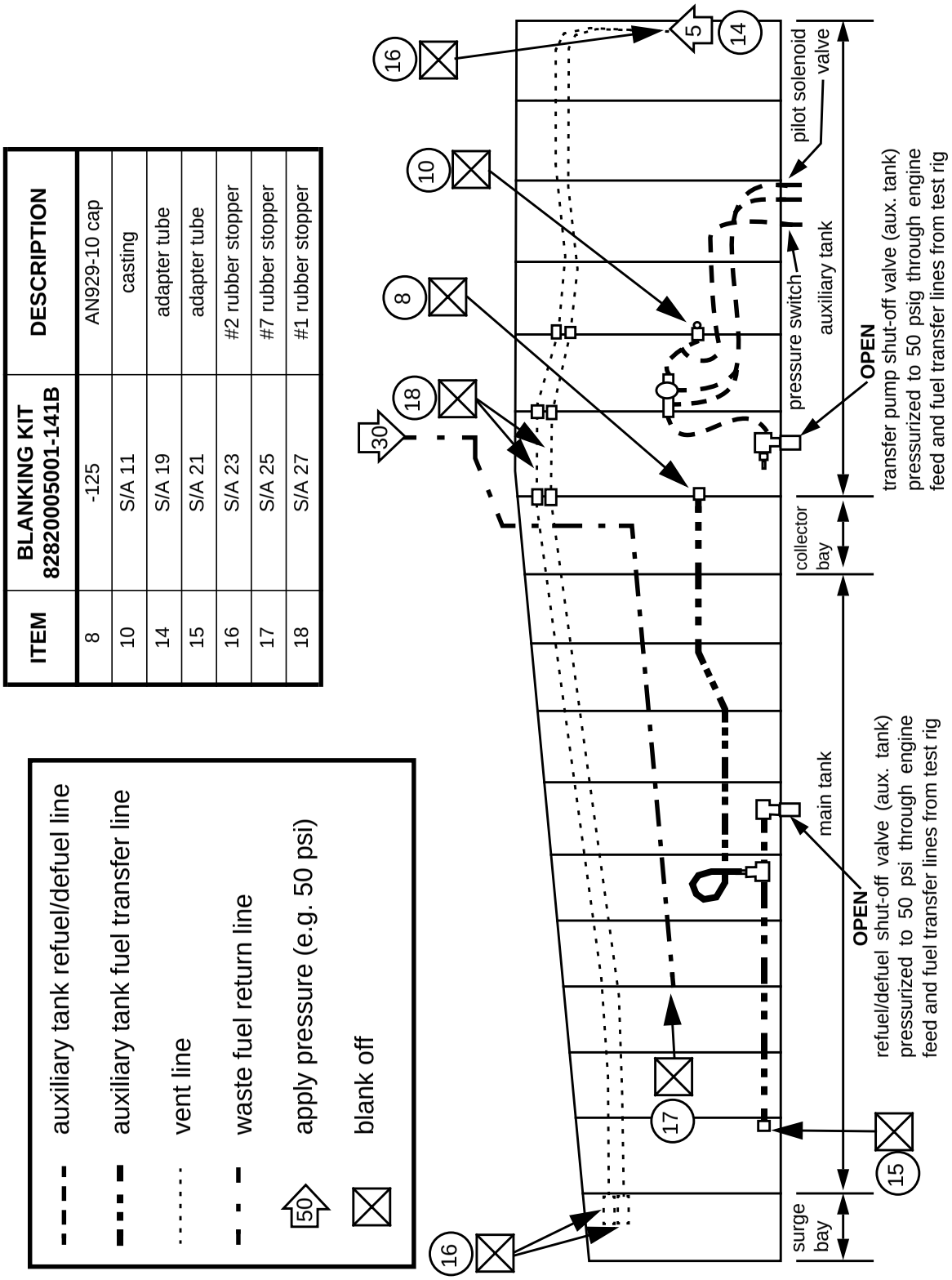
Table 1 - DASH 8 Extended Range Fuel System Pressure Test

SUB-SYSTEM	PRESSURE TEST DETAILS	TEST PRESSURE	REF FIG
Waste fuel return line	Step 1. Disconnect and blank off the waste fuel return line using a #7 rubber stopper. Step 2. Disconnect the waste fuel return line at the fitting on the engine and connect the pressure test rig to the line.	30 psi	3
Vent Line	Step 1. Plug the holes in the two vent valves using #1 rubber stoppers. Step 2. Plug the outboard end of the two vent lines (in the surge bay) using #2 rubber stoppers. Step 3. Plug the outboard end of one vent line using a #1 rubber stopper. Step 4. Blank off the inboard end of the other vent line using an S/A 19 adapter tube and connect the pressure test rig to the adapter.	5 psi	3
Pilot and pre-check line	Step 1. Disconnect the pilot and pre-check lines at the pilot valve. Step 2. Connect the pressure test rig to each line using an AN804-D4 “Y” connector. The pilot line requires an AN919-6D reducer.	30 psi	4
Electric boost pump low pressure line	Step 1. Disconnect the line at the electric pump. Step 2. Connect the pressure test rig to the line.	30 psi	4
High pressure motive line	Step 1. Disconnect and blank off the high pressure motive lines at the scavenge ejector pump and at the ejector boost pump using AN806-6D plugs. Step 2. Disconnect the engine line at the fitting on the engine and connect the pressure test rig to the line using an AN919-6D reducer.	50 psi	4
Pressure relief valve line	Step 1. Disconnect the line at the pressure relief valve. Step 2. Connect the pressure test rig.	30 psi	5
Ejector return line (outboard)	Step 1. Disconnect the high pressure motive line at the outboard fuel scavenge ejector pump and blank off the ejector using an AN929-6 cap. Step 2. Plug the outboard end of the ejector return line using a #2 rubber stopper. Step 3. Connect the pressure test rig to the inboard end of the return line in the collector bay using an S/A 17 adapter tube.	5 psi	5
Refuel/defuel/ transfer line	Step 1. Close the left and right hand refuel/defuel/transfer shut-off valves. Step 2. Close the left and right hand refuel/defuel shut-off valves (auxiliary tank). Step 3. Open the master refuel shut-off valve (ensure that the selector switch is set to DEFUEL). Step 4. Disconnect the pressure relief valve line at the refuel/defuel tap-off connection and connect the pressure test rig to the tap-off connection.	50 psi	6
Suction line auxiliary tank fuel transfer	Step 1. Plug the inboard end of the suction line using a #0 rubber stopper. Step 2. Using an AN919-13D reducer, connect the pressure test rig to the outboard end of the suction line at STA 171.	5 psi	7
Note: All motorized valves shall be opened manually.			



ITEM	BLANKING KIT 82820005001-141B	DESCRIPTION
2	-113	AN806-10D plug
3	-115	AN806-12D plug
4	-150	AN806-16D plug
5	-119	AN919-16D reducer
11	S/A 15	adapter tube
28	S/A 31	C-clamp

Figure 2 - Pressure Test of Engine Feed & Fuel Transfer Lines



ITEM	BLANKING KIT 8282000500 1-141B	DESCRIPTION
8	-125	AN929-10 cap
10	S/A 11	casting
14	S/A 19	adapter tube
15	S/A 21	adapter tube
16	S/A 23	#2 rubber stopper
17	S/A 25	#7 rubber stopper
18	S/A 27	#1 rubber stopper

Figure 3 - Pressure Test of Waste Fuel Return Line, Vent Line, Auxiliary Tank Refuel/Defuel Line & Auxiliary Tank Fuel Transfer Line

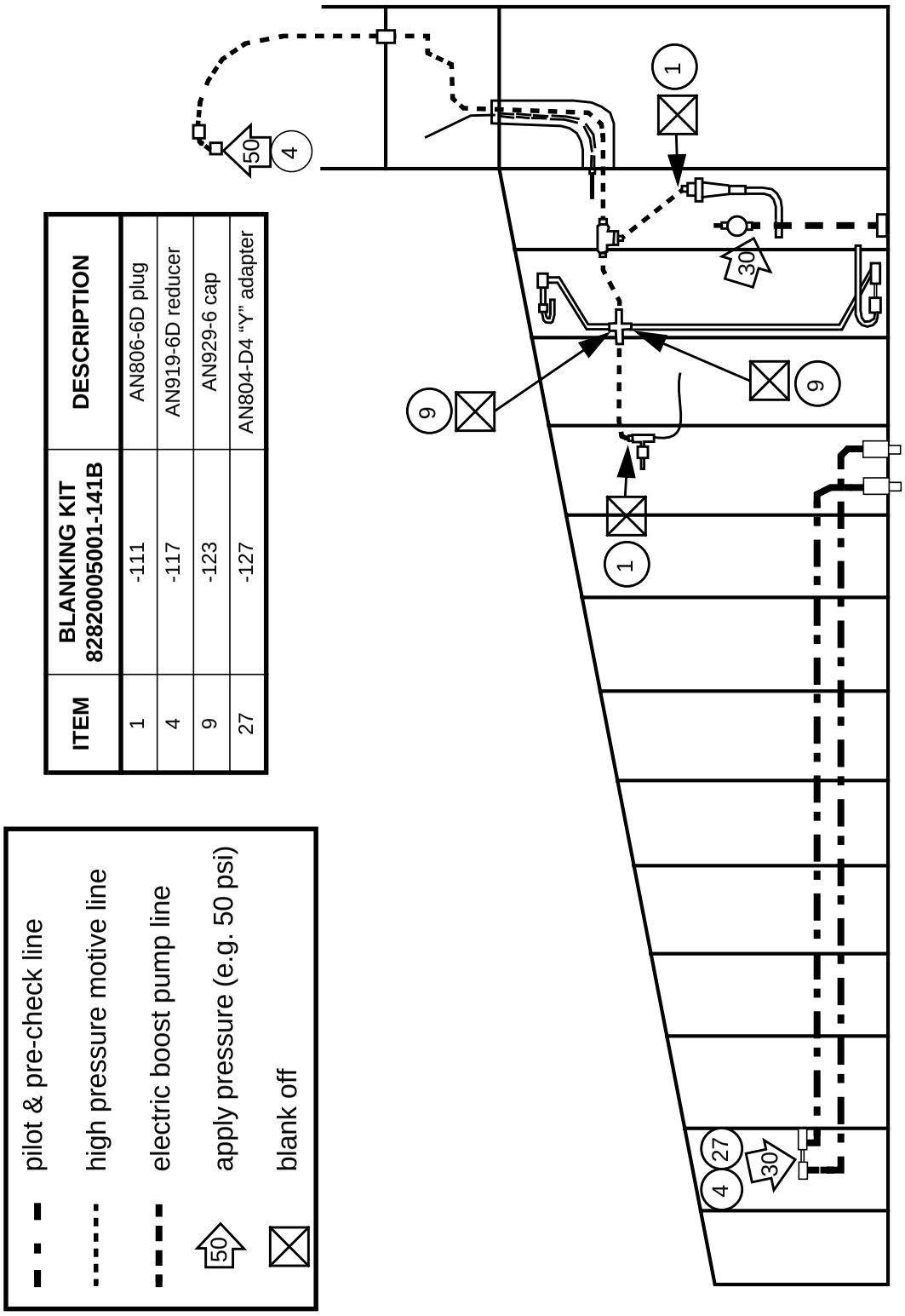


Figure 4 - Pressure Test of Pilot & Pre-Check Lines, Electric Boost Pump Low Pressure Warning Line & High Pressure Motive Line

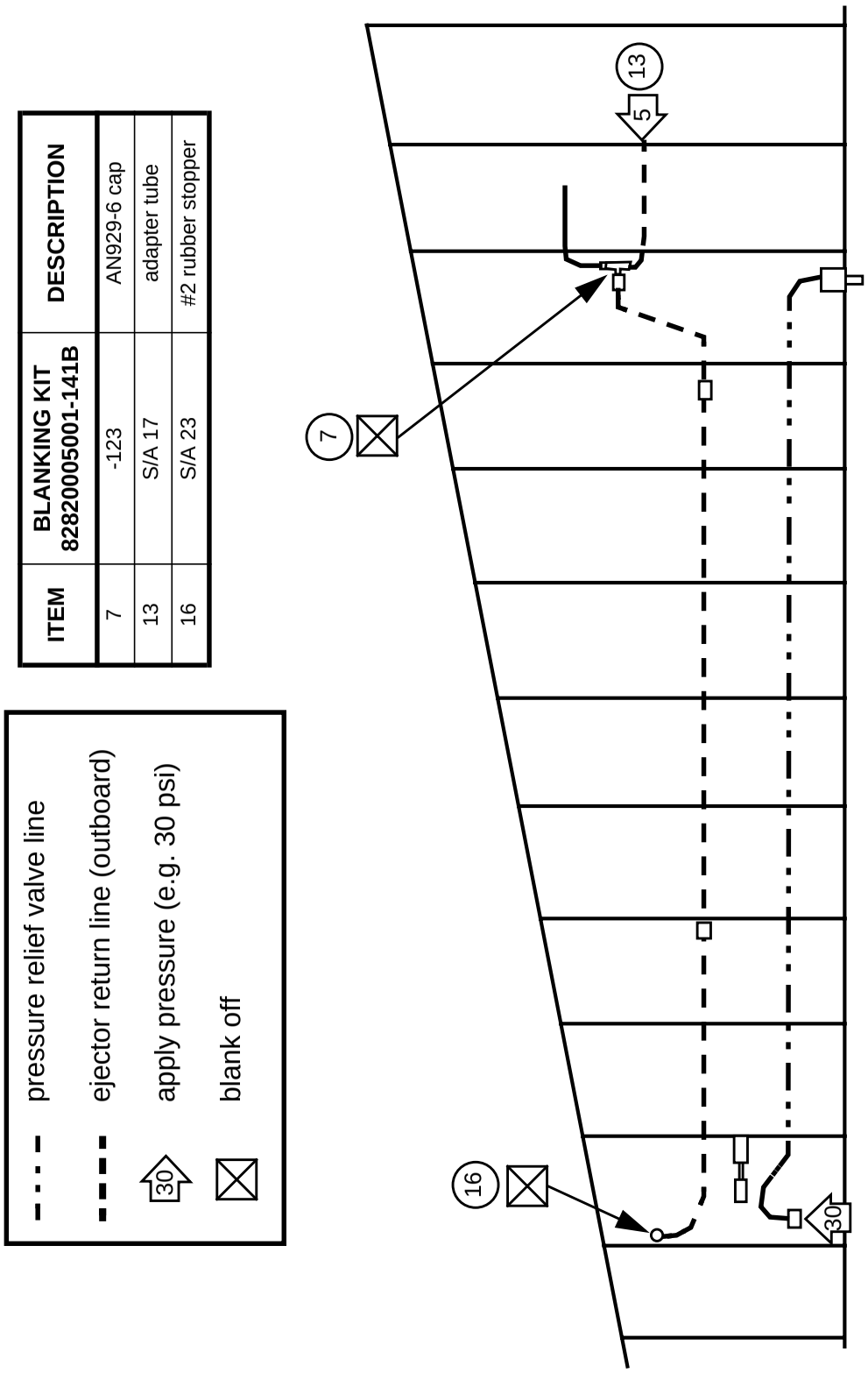


Figure 5 - Pressure Test of Pressure Relief Valve & Ejector Return Line

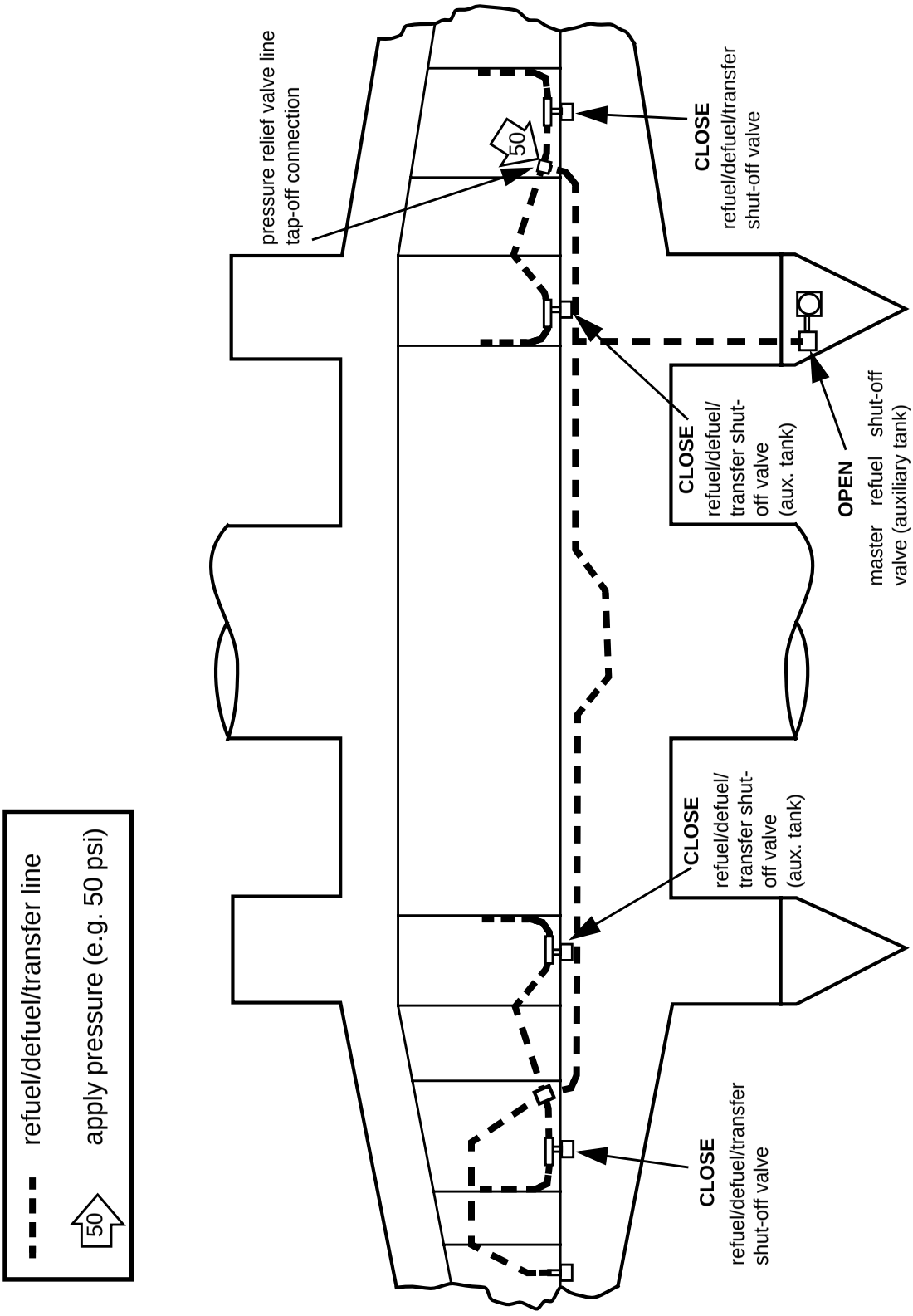


Figure 6 - Pressure Test of Refuel/Defuel/Transfer Line

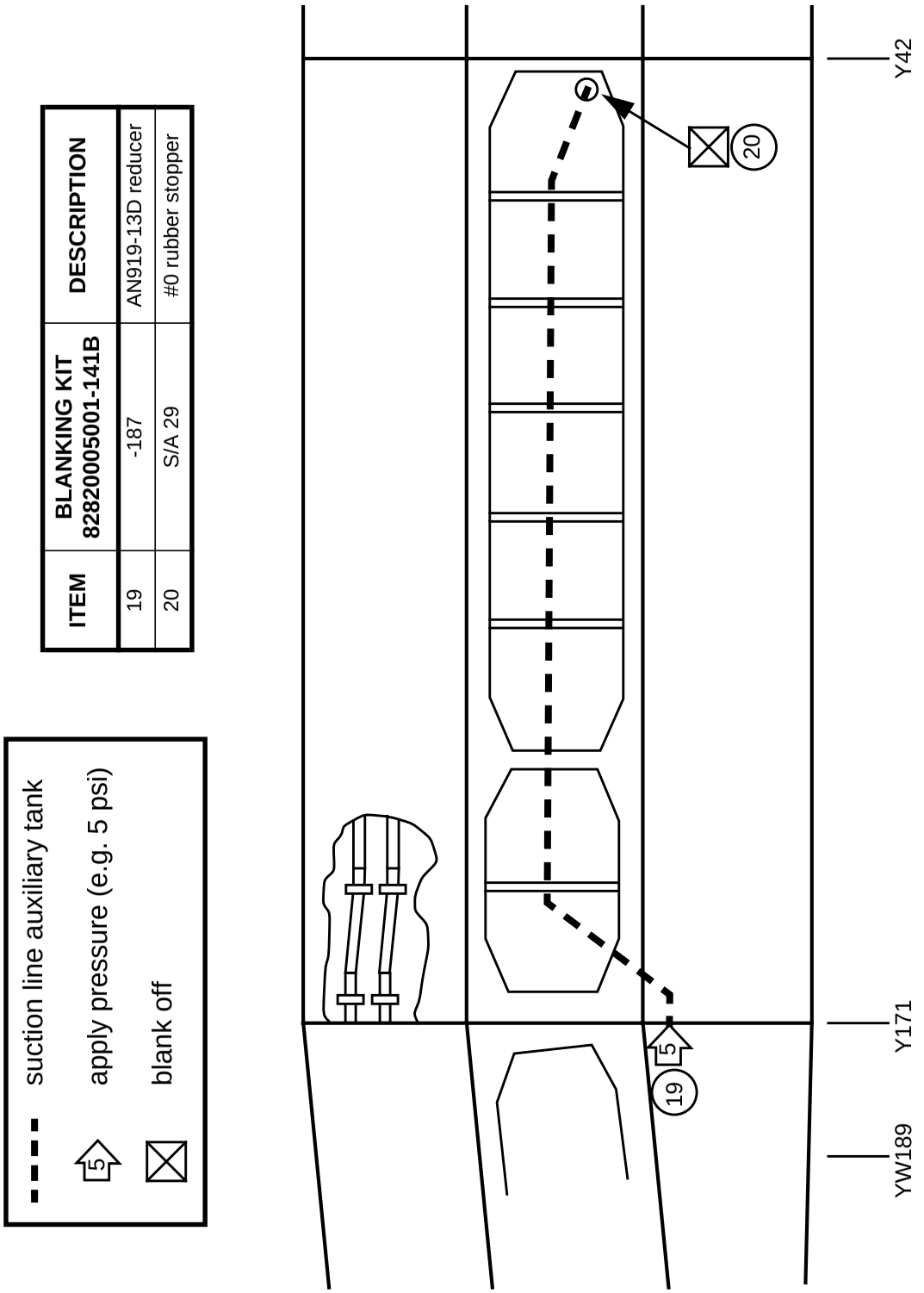


Figure 7 - Pressure Test of Suction Line & Auxiliary Tank Fuel Transfer Line

6 Requirements

6.1 All of the fuel system lines in the integral fuel tanks must be pressure tested to the pressure specified in Table 1 before filling the tanks with fuel.

6.2 No pressure drop is allowed during the 30 minute isolation test.

7 Safety Precautions

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

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

7.3 Do not leave the pressure test rig unattended while 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 At least once every 4 months: (a) calibrate the pressure test rig; (b) check the test rig system for leaks and security of joints; and (c) check gauges and pressure relief valves for accuracy.