BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 4.20

PRODUCTION PROCESS STANDARD

Cleaning of DASH 8 Fuel Tanks - Fueled Aircraft

Issue 7
- This standard supersedes PPS 4.20, Issue 6.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS 4.20 related questions to michael.wright@aero.bombardier.com.
- This PPS is effective as of the distribution date.

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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for cleaning DASH 8 fuel tanks on fueled aircraft.

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 13.04 - De-fuming of Aircraft Fuel Tanks and Fuel Containers.

3.2 PPS 13.26 - General Subcontractor Provisions.

3.3 PPS 13.13 - Personal Protective Respiratory Equipment.

3.4 PPS 31.17 - Solvent Usage.

4 Materials and Equipment

4.1 Materials

4.1.1 DSC 378-3 wiping cloths.

4.1.2 DSC 375-1 tack cloth.

4.2 Equipment

4.2.1 Coveralls, chemical resistant, anti-static and lint free.

4.2.2 Explosion proof vacuum cleaner, suitable for hazardous environments, utilizing non-sparking, conductive attachments (e.g., vacuum and attachments meeting the requirements of the National Fire Protection Association (NFPA)).

4.2.3 Fresh air ventilating units fitted with air inlet filters and 8" diameter flexible hoses.

5 Procedure

5.1 General

5.1.1 Do not re-open fuel tanks that have been closed and sealed unless specifically authorized. If re-opening has been authorized, perform only those cleaning operations in the areas of the tank which have been specified. For example, although this PPS covers removal of contaminants ranging from large objects to very small particles, if only one section of the wing was opened and received very little contamination, it may simply be specified to tack rag in that one section.

5.1.2 All personnel working within the fuel tank must wear clean coveralls (see Equipment section, para. 4.2.1).

5.1.3 Use only the materials and equipment listed in section 4 for cleaning fuel tanks according to this PPS. The use of unauthorized materials is strictly forbidden.

5.1.4 Store materials and equipment used for fuel tank cleaning in a designated lock-up area.

5.1.5 Perform cleaning operations in the sequence given in this PPS.

5.1.6 Whenever solvent cleaning according to PPS 31.17 is specified in this PPS, use **only** DSC 378-3 lint free wiping cloths instead of the wiping cloth specified in PPS 31.17 as other types of wiping cloths may contaminate the fuel tank with lint.

5.2 Defueling and De-Fuming (Purging)

5.2.1 Defuel and de-fume (purge) the aircraft fuel tanks according to PPS 13.04.

5.3 Removal of Large Objects

5.3.1 Starting at the outboard end of the area to be cleaned, systematically work towards the inboard end and pick up all foreign objects, such as Cleco fasteners, cable ties (Ty-Wraps), tools, etc.

5.4 Removal of Medium Particles

5.4.1 The following operations (solvent washing and vacuuming) are intended to remove medium sized particles, such as drill swarf, pieces of sealant and chips of primer.

5.4.2 Except as noted in para. 5.4.3, thoroughly solvent wash one bay at a time with the solvent specified in PPS 31.17. Perform solvent washing as follows:

Step 1. Fold each of two cleaning cloths so that the edges of each cloth are rolled up inside.

Step 2. Apply the solvent specified in PPS 31.17 to one of the cloths (the cloth should be as wet as possible without dripping).

Step 3. Starting at the top and working towards the bottom, solvent clean all surfaces including the fuel system pipes and components according to PPS 31.17 even if they appear to be clean. Wash a small area (approximately 1 ft^2) at a time. Turn the cloth over frequently to expose a new, clean surface of the cloth. Take particular care when washing difficult-to-reach areas, such as those shown in Figure 1. In some areas, it may be necessary to flush out contaminants with solvent from a squeeze bottle. Exercise care at sharp edges, bolts, etc. so as not to rip the cleaning cloth and thus deposit fibres.

Step 4. Before the solvent on the washed surface evaporates, wipe the surface dry using fresh (dry) DSC 378-3 wiping cloths. Turn the cloth over frequently to expose a new, clean surface. Ensure that the drying cloth removes all of the contaminated solvent before it dries on the surface.

Step 5. Discard used cloths in the containers provided.

5.4.3 If the tank was not de-fumed (purged) and the surfaces are still wet with fuel, wipe the surfaces with a dry DSC 378-3 wiping cloth as specified in Step 4 and Step 5 above. It is not necessary to wipe the surface with a solvent wetted cloth since the surface is already wet with fuel.

5.4.4 Thoroughly vacuum each bay using an explosion proof vacuum (ref. para. 4.2.2) as follows:

Step 1. Starting at the top and working towards the bottom, vacuum all surfaces, even if they appear clean. Much of the contamination is not visible to the naked eye. Take particular care in areas such as return angles on upper skin stringers, C-channels of fabricated ribs, small gaps between ribs and stringers, behind/under fuel system components, and corners.

Step 2. Vacuum the access cover landing and the immediate area around the tank opening (see Figure 1).

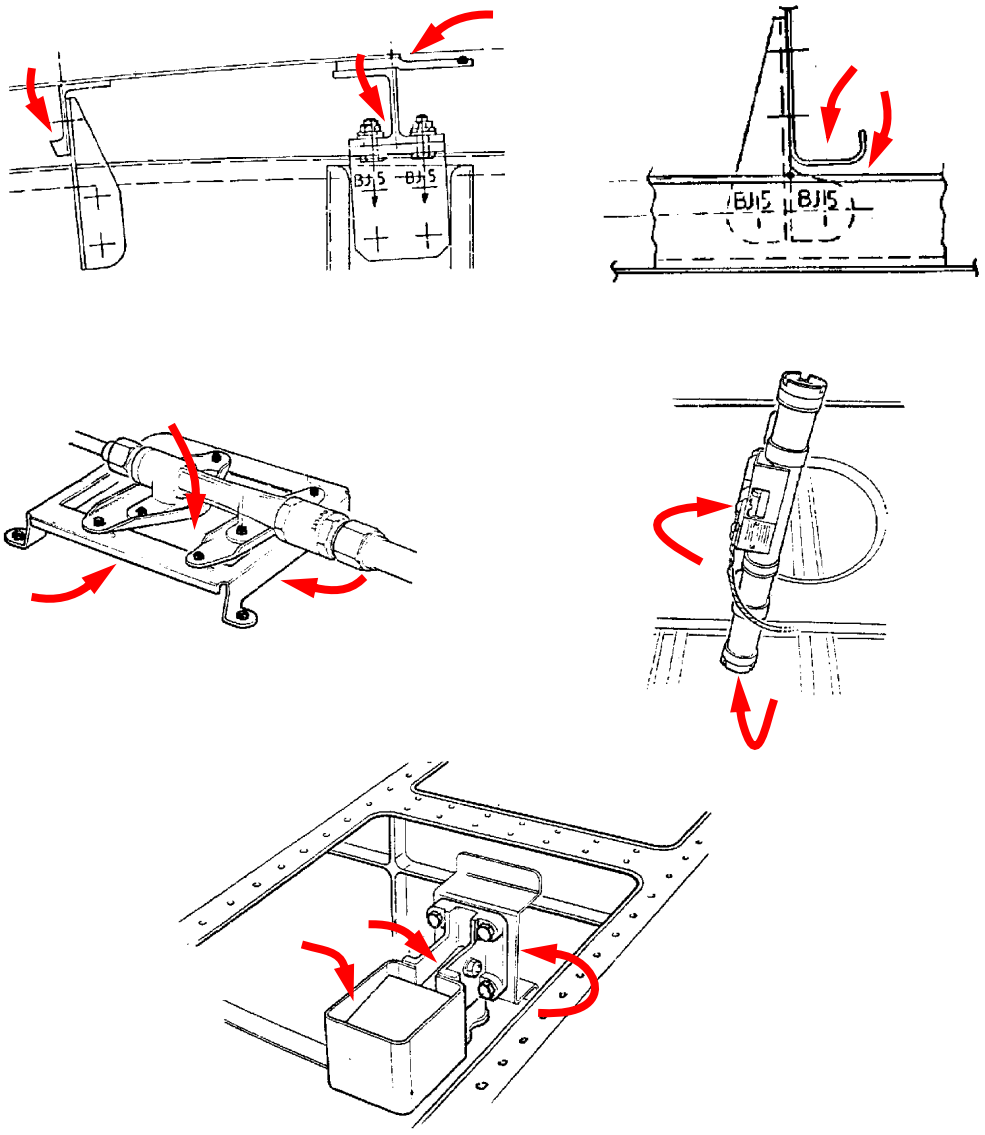

Figure 1 - Cleaning of Typical Difficult-to-Reach Areas

5.5 Removal of Fine Particles

5.5.1 The following tack ragging procedure is intended to remove fine particles, such as lint, dust, metal filings and fibres, many of which are invisible to the naked eye:

Step 1. Starting at the top (i.e., upper skin) and working down to the lower skin, tack rag all surfaces of each bay, including the fuel system pipes and components, even if they appear clean. Take particular care when wiping difficult-to-reach areas, such as those shown in Figure 1. Exercise care at sharp edges, bolts, etc. so as not to rip the tack rag and deposit rag fibres.

Step 2. After completing several bays that are covered by one access cover section, place the cover over the tank opening to prevent ingress of new contamination.

5.6 Closing the Fuel Tank

5.6.1 Install, fasten and torque the fuel tank access covers according to the engineering drawing. Once the fuel tank has been closed, do not re-open without authorization.

6 Requirements

6.1 Cleaned areas shall be free of contamination.

7 Safety Precautions

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

7.2 Use only explosion proof safety lamps and explosion proof vacuums when working inside fuel tanks.

7.3 Use fresh air ventilating units to provide a fresh air stream when working inside fuel tanks.

7.4 Wear protective respiratory equipment according to PPS 13.13 and chemical resistant, anti-static, lint free coveralls when inside fuel tanks. Refer to PPS 31.17 for the safety precautions and personal protective equipment relating to the use of solvents.

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 of Equipment

9.1 At the beginning of each shift empty the vacuum cleaner canister and shake the filter bag clean.

9.2 Replace the filter on the fresh air ventilating unit when dirty.