BOMBARDIER
Toronto Site
PROPRIETARY INFORMATION

PPS 16.23

PRODUCTION PROCESS STANDARD

HANDLING AND PROTECTION OF AIRCRAFT PARTS

Issue 5
- This standard supersedes PPS 16.23, Issue 4.
- Vertical lines in the left hand margin indicate changes over the previous issue.
- Direct PPS related questions to PPS.Group@aero.bombardier.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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TABLE OF CONTENTS

Sections **Page**

1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for handling and protecting propellers and sheet metal, machined and tubular aircraft parts during all stages of manufacture and fabrication at Bombardier Toronto in order to prevent damage to such parts.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS shall 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 Subcontractors shall use suitable means of protecting such parts during manufacture and shipping to ensure receipt of undamaged parts at Bombardier Toronto. Refer to PPS 13.26 for other 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. Similarly, the procedure and requirements specified in this PPS are not applicable when use of a BAPS, MPS, LES or P. Spec. is specified.

1.2 Refer to PPS 16.15 for the handling and protection requirements for aircraft interior decorative parts.

1.3 Refer to PPS 16.03 for the handling and protection of aircraft skin panels.

2 HAZARDOUS MATERIALS

2.1 Before receipt at Bombardier Toronto, all materials shall be approved and assigned Material Safety Data Sheet (MSDS) numbers by the Bombardier Toronto 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 Environment, Health and Safety Department.

3 REFERENCES

3.1 DHMS M2.21 - Tubing, Aluminum Alloy, Drawn Seamless, Special Surface Quality.

3.2 PPS 6.05 - Closure of Fluid Lines and Fluid System Components.

3.3 PPS 13.26 - General Subcontractor Provisions.

3.4 PPS 15.01 - Part Marking.

3.5 PPS 16.03 - Handling and Protection of Aircraft Skins.

3.6 PPS 16.15 - Handling and Protection of Aircraft Interior Decorative Parts.

4 MATERIALS AND EQUIPMENT

4.1 Materials

4.1.1 Plastic wrapping/tying material (e.g., Band-It Wrap 3" wide rolls).

4.1.2 Kraft paper.

4.1.3 Polyethylene sleeving - 4 mil gauge, length and width as required.

4.1.4 Polyethylene bags - 3 mil gauge, size as required.

4.1.5 Propeller protective covers:

- DASH 8 Series 100, 200 & 300 - use 86100001-001-224 covers
- DASH 8 Series 400 - use covers marked “DASH 8-400”

4.2 Equipment

4.2.1 Thermal impulse heat sealing machine (e.g., Vertrod Corp. Model 72PCS-3/16).

4.2.2 Cardboard transport boxes.

4.2.3 Wooden transport boxes.

4.2.4 Specially designed transport and storage fixtures (SD Tools) as specified on the Process Sheet or Assembly Manual.

5 PROCEDURE

5.1 General Handling Practices

5.1.1 Ensure part surfaces are clean, thoroughly dried and free of all contaminants before wrapping or bagging.

5.1.2 Handle parts carefully to avoid surface damage resulting from striking parts against tools, fixtures, workbenches, etc., or from sliding against one another or over metallic surfaces.

5.1.3 Keep work benches clean and, if possible, cover with clean Kraft paper. Vacuum or sweep benches as necessary to remove metal shavings, cuttings, shop swarf, etc.

5.1.4 Place parts carefully onto benches, machines, storage racks or boxes during handling in fabrication shops. Under no circumstances are parts to be slid over one another, dropped into boxes or benches or otherwise be subjected to impact damage.

5.2 General Protection of Parts Before Priming or Painting

5.2.1 In general, protection consists of protective wrapping and boxing of parts to prevent surface damage from parts striking one another, or other objects, during transport and storage.

5.2.2 If protective wrapping of parts is specified on the Process Sheet or Assembly Manual, ensure that parts are properly wrapped according to this PPS.

5.2.3 If protective wrapped or bagged parts are received in a fabrication shop, retain such wrapping or bags for re-use on completion of the particular fabrication operation. If wrapping material cannot be re-used, or parts are received with inferior or improper protective wrapping, re-wrap such parts according to this standard.

5.2.4 If possible, issue and transport parts in wooden or cardboard boxes.

5.2.5 Bundling of parts using wire or masking tape is prohibited. If bundling of parts is necessary, use plastic wrapping/tying material to prevent scuffing damage between parts in the bundle.

5.2.6 If specified on the Process Sheet or Assembly Manual, parts shall be transported between manufacturing shops and stored on specially designed transport and storage fixtures (SD tools).

5.3 General Protection of Parts After Priming or Painting

5.3.1 After priming or painting in the Detail Paint Shop, unless SD transport or storage fixtures are specified on the Process Sheet or Assembly Manual, place parts in polyethylene sleeving or polyethylene bags which shall be sealed using the Vertrod heat sealing machine.

5.3.2 Wrap and heat seal large, heavy machined or sheet metal parts individually, while smaller, lighter parts may be wrapped and heat sealed in batches. Wherever possible, bundle parts sealed in batches together using plastic wrapping/tying material before wrapping and heat sealing.

5.3.3 Store parts in the protective wrapping until installation in the next assembly or on the aircraft.

5.3.4 If protective wrapped parts cannot be readily identified, either because the part markings are masked by the wrapping or the identification paper work no longer accompanies the parts, attach a suitable label to the wrapping indicating the part marking information specified in PPS 15.01.

5.4 Handling and Protection of Torque Tubes and Control Rods

5.4.1 Handle and protect 2024 and 6061 aluminum alloy tubing, supplied and protected by the manufacturer according to DHMS M2.21, as follows:

- Following receipt inspection, return tubing received in wooden boxes to the boxes and protect or preserve in the same manner in which it was packed.
- Individually place tubing removed from boxes for storage on cushioned storage racks to prevent scuffing damage between parts.
- After being cut to the required length, cap torque tubes and control rods' ends according to PPS 6.05 and individually wrap in neutral Kraft paper for transport between fabrication operations.
- After priming in the Detail Paint Shop, individually wrap and seal torque tubes and control rods according to section 5.3.

5.5 Handling and Protection of Fluid Lines

5.5.1 After being cut to the required length, cap fluid lines' ends according to PPS 6.05.

5.5.2 Bundle batches of fluid lines together using plastic wrapping/tying material secured at both ends of the tubing.

5.5.3 After priming in the Detail Paint Shop, wrap and seal fluid lines according to section 5.3.

5.6 Handling and Protection of Sheet Metal Parts

5.6.1 Unless SD transport or storage fixtures are specified on the Process Sheet or Assembly Manual, bundle sheet metal parts together, wherever possible, using plastic wrapping/tying material for transport between fabrication operations.

5.6.2 After priming in the Detail Paint Shop, wrap and seal sheet metal parts according to section 5.3.

5.7 Handling and Protection of Machined Parts

5.7.1 Unless SD transport or storage fixtures are specified on the Process Sheet or Assembly Manual, individually wrap machined parts in neutral Kraft paper and place in boxes for transport between fabrication operations.

5.7.2 After priming in the Detail Paint Shop, wrap and seal machined parts according to section 5.3.

5.8 Handling and Protection of Propellers

5.8.1 For protection of propellers, install the appropriate propeller protective covers as shown below. Remove propeller protective covers before engine runs and flight; at all other times ensure propeller protective covers are in place during aircraft assembly.

5.8.2 Keep work stands, scissor lifts, ladders, ground support equipment and other tools away from propellers.

5.8.3 Take care when lifting or lowering engine intake cowls to ensure that the cowl does not contact the propeller.

5.8.4 Take care when dismantling hubs to avoid damage to the propeller.

5.8.5 Examine propellers for damage before and after engine runs. Report any defects or damage immediately.

6 REQUIREMENTS

6.1 Ensure part surfaces are clean, thoroughly dried and free of all contaminants before wrapping or bagging.

6.2 Parts shall be handled and protected according to the procedure specified herein at all times during fabrication and transport. Ensure that parts are properly wrapped according to this PPS.

7 SAFETY PRECAUTIONS

7.1 Observe standard plant safety precautions when performing the procedure specified herein.

7.2 The materials specified herein present no specific health or safety hazard when used for the intended purpose.

8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for the handling and protection of aircraft parts shall have a good working knowledge of the applicable procedure and requirements as specified herein and shall have exhibited their competency to their supervisor.