BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 27.11

PRODUCTION PROCESS STANDARD

Automatic Belt and Rotary Disc Deburring

Issue 6
- This standard supersedes PPS 27.11, Issue 5.
- 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) 375-4365.
- 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 standard specifies the procedure and requirements for automatic belt and rotary disc deburring of aircraft parts.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction and the procedure specified 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. Similarly, the procedure and requirements specified in this PPS are not applicable when use of a BAPS, MPS, LES or P. Spec. is specified.

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 13.26 - General Subcontractor Provisions.

3.2 PPS 27.02 - Edge Finishing of Aluminum Alloy Parts.

3.3 PPS 27.05 - Manual Edge Finishing Equipment.

3.4 PPS 27.07 - Vibratory Tumble Deburring.

3.5 PPS 27.10 - Edge Finishing of Steel, Nickel and Copper Alloy Parts.

4 Materials and Equipment

4.1 Materials

4.1.1 Abrasive belts or discs, coarse, medium, fine or very fine. Do not use abrasive belts or discs used to deburr steel parts to deburr aluminum alloy parts.

4.2 Equipment

4.2.1 Single head automatic rotary disc deburring machine (e.g., A.E.M. CS-240 or CS-360 rotary disc deburring machine).

4.2.2 Double head automatic rotary disc deburring machine (e.g., A.E.M. CS-2400 or CS-3600 rotary disc deburring machine).

4.2.3 Single head automatic abrasive belt/rotary disc deburring machine (e.g., Timesavers Inc. Series 2200 - in use at Bombardier Toronto (de Havilland)).

4.2.4 Double head automatic abrasive belt deburring machine.

4.2.5 Leather gloves (e.g., DSC 422-3).

5 Procedure

5.1 General

5.1.1 Automatic belt and rotary disc machine deburring consists of the removal of upset metal (burrs) from the perimeter edges and from drilled or punched holes on flat part surfaces.

5.1.2 The deburring requirements applicable to particular materials shall be as specified in PPS 27.02 or PPS 27.10, as applicable.

5.1.3 Refer to Table 1 for a listing of the Timesaver Inc. Series 2200 deburring machine capacity. Refer to the manufacturers technical data sheets and/or instructions for the machine capacity of deburring machines other than the Timesavers Inc. Series 2200 used at Bombardier Toronto (de Havilland). For parts which cannot be deburred via machine deburring due to part size limitations or machine unavailability, deburr parts by vibratory tumble deburring according to PPS 27.07 or manually deburr according to PPS 27.05.

Table 1 - Timesavers Inc. Series 2200 Deburring Machine Capacity

THICKNESS LIMITS	WIDTH LIMITS	MINIMUM SURFACE AREA
0.020"- 0.125"	0.75" - 36"	0.6 sq. in.

5.2 Set-Up of Machines

5.2.1 General

5.2.1.1 Do not use abrasive discs and/or belts which have been used to deburr steel parts to deburr aluminum alloy parts. Also, clean the machine and dust collector thoroughly if making a material change from aluminum to steel or steel to aluminum. The metallic dust from deburring operations can present a fire hazard when aluminum and steel dust is combined. Ensure to shut off and lock out power to the deburring machine and dust collector when changing abrasive discs and/or belts and cleaning.

5.2.2 Single Head Deburring Machine

5.2.2.1 Set up single head automatic deburring machines as follows:

Step 1. Adjust the distance between the deburring head and the conveyor belt of the deburring machine to the thickness of the particular material to be deburred according to the automatic deburring machine manufacturers instructions.

Step 2. Check the set-up by deburring one side of one of the parts while observing the load meter. If the indicated load exceeds the maximum recommended by the automatic deburring machine manufacturers instructions, increase the distance between the deburring head and the conveyor belt of the deburring machine 0.001" - 0.003". Ideally, one pass through the machine should remove all standing burrs on the deburred face while leaving mill markings on the surface of the part. If all standing burrs have not been removed, reduce the distance between the deburring head and the conveyor belt of the deburring machine 0.001" - 0.003". Ideally, adjust the machine so that burrs will be removed with only a minimum amount of surface material also removed.

Step 3. If adjustment is required, repeat the check on the set-up until the machine removes all standing burrs without the indicated load exceeding the maximum recommended by the automatic deburring machine manufacturers instructions.

5.2.3 Double Head Deburring Machine

5.2.3.1 Set up double head automatic deburring machines as follows:

Step 1. Adjust the distance between each of the deburring heads and the respective conveyor belts of the deburring machine to the thickness of the particular material to be deburred according to the automatic deburring machine manufacturers instructions.

Step 2. Check the set-up by deburring one of the parts while observing the load meters. If the indicated load exceeds the maximum recommended by the automatic deburring machine manufacturer's instructions, increase the distance between the deburring head(s) and the conveyor belt(s) of the deburring machine 0.001" - 0.003". One pass through the machine should remove all standing burrs on the deburred faces while leaving mill markings on the surface of the part. If all standing burrs have not been removed, decrease the distance between the deburring head and the conveyor belt of the deburring machine 0.001" - 0.003". Ideally, adjust the machine so that burrs will be removed with only a minimum amount of surface material also removed.

Step 3. If adjustment is required, repeat the check on the set-up until the machine removes all standing burrs without the indicated load exceeding the maximum recommended by the automatic deburring machine manufacturers instructions.

5.3 Preparation of Parts

5.3.1 Before deburring, place all parts having "dished holes" as a result of poor drilling techniques on a flat, hard surface and flatten by tapping with a hide mallet.

5.4 Deburring of Parts

5.4.1 With the machine set-up and running, feed parts into the machine by placing them, one at a time, onto the conveyor feed belt. Take care when placing parts on the conveyor feed belt to ensure that parts are separated from one another and do not overlap.

5.4.2 If deburring parts on a single head deburring machine, on completion of deburring on one side, turn the parts over and feed them through the machine a second time.

5.4.3 Parts having excessive burrs may require two passes to completely remove standing burrs. If standing burrs have not been removed after two passes through the machine, hand deburr the part according to PPS 27.05.

5.4.4 Refer to the automatic deburring machine manufacturers instructions for specific details on machine operation.

6 Requirements

6.1 Ensure deburred parts are completely free from standing burrs.

7 Safety Precautions

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

7.2 Wear protective leather gloves when operating automatic belt and rotary disc deburring machines.

7.3 Before retrieving parts displaced within the machine, ensure that all power switches are in the OFF position.

7.4 Do not use abrasive discs or belts which have been used to deburr steel parts to deburr aluminum alloy parts. Also, clean the machine and dust collector thoroughly if making a material change from aluminum to steel or steel to aluminum. The metallic dust from deburring operations can present a fire hazard when aluminum and steel dust is combined. Ensure to shut off and lock out power to the deburring machine and dust collector when changing abrasive discs and/or belts and cleaning.

7.5 When using the Timesavers Inc. Series 2200 deburring machine, the purpose of water in the dust collector is to neutralize the fire hazard presented by aluminum dust. Every 1 - 2 hours while in operation, top up the water level using the hose provided (with the power off) to within 1 inch of the yellow line on the indicator marked on the inside wall of the open water reservoir; do not fill above the yellow line. The water level is also indicated on the side of the dust collector.

7.6 Refer to the automatic deburring machine manufacturers instructions for specific safety precautions applicable to machine maintenance and operation.

8 Personnel Requirements

8.1 Personnel responsible for automatic belt and rotary disc deburring must have a good working knowledge of the procedure and requirements as specified herein and must have exhibited their competency to their supervisor.

9 Maintenance of Equipment

9.1 It is recommended that repairs and maintenance of automatic belt and rotary disc deburring machines be carried out according to the manufacturer's instructions.