BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 12.05

PRODUCTION PROCESS STANDARD

Installation of CSP314 Bearing Retention Bushings

Issue 4
- This standard supersedes PPS 12.05, Issue 3.
- 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.

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	Quality	

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 installation of CSP 314 bearing retaining bushings in component 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 16.01 - Application of Hard and Soft Film (F13) Corrosion Preventive Compound

3.3 PPS 21.21 - General Sealing Practices.

3.4 PPS 31.17 - Solvent Usage.

3.5 PPS 32.02 - Manual Application of Chemical Conversion Coatings.

4 Materials and Equipment

4.1 Materials

4.1.1 CSP 314 bushings and washers as specified on the engineering drawing. Refer to Figure 1 for a general description of a CSP 314 bushing and washer.

4.1.2 Self aligning bearings as specified on the engineering drawing.

4.1.3 DHMS S3.01 Type II Grade B sealant.

4.2 Equipment

4.2.1 SD8783 flaring tools, support blocks and collars as listed in Table 1. Flaring tools may be lubricated with a thin coat of light machine oil, if necessary. Keep flaring tools, support blocks and anvils clean and free from dirt, grease, shop swarf, etc.

4.2.2 Suitable arbour press, either hand or hydraulic operated, as required to flare the bushing.

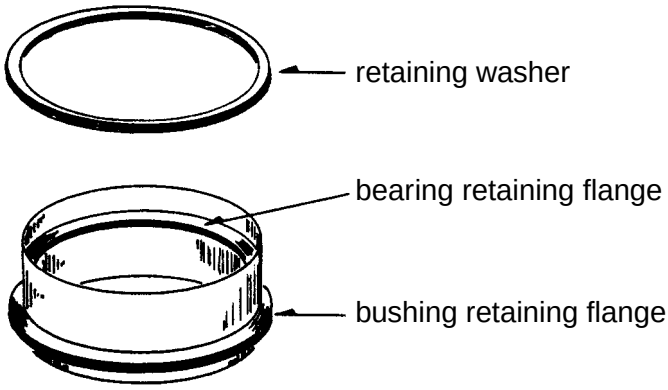

Figure 1 - General Description of a CSP 314 Bushing and Washer

Table 1 - CSP 314 Bushing Installation Tools

CSP 314 Dash No.	SD 8783 Mark No.
-101	1
-102	2
-103	3
-104	4
-105	5
-106	6
-107	7
-108	8
-109	9

CSP 314 Dash No.	SD 8783 Mark No.
-110	10
-111	11
-112	12
-113	13
-114	14
-115	15
-116	16
-117	17
-118	18

5 Procedure

5.1 General

5.1.1 CSP 314 bushings are designed to provide positive mechanical retention of a bearing by means of flared in place flanges to hold the bushing in the part housing and to retain the bearing in the bushing.

5.2 Preparation of Parts

5.2.1 Prepare parts for installation of CSP 314 bushings as follows:

Step 1. Machine the housing bore sizes to the full size specified on the engineering drawing.

Step 2. After machining to full size, break the edges of the housing bore approximately as shown in Figure 2.

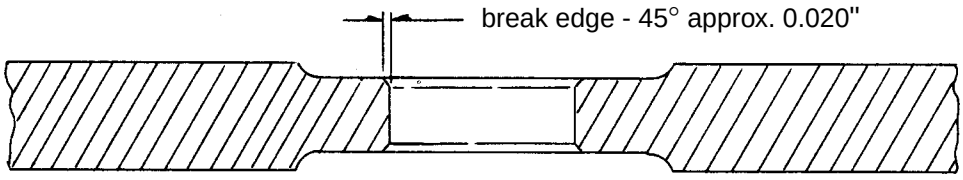

Figure 2 - Breaking of Housing Bore Edge

Step 3. Except for parts which have been anodized after machining, apply chemical conversion coating to the bore of the housing (including edges broken according to paragraph 2) according to PPS 32.02.

Step 4. Immediately before inserting the bushing, brush coat the bore of the housing with a thin coat of F13 Grade I corrosion preventive compound according to PPS 16.01.

5.3 Installation of Bushing

5.3.1 Install CSP 314 bushings as follows. Take care at all times when press flaring flanges to avoid damaging the bushing or the part housing by overpressing.

Step 1. Support the part on the bed of the arbour press and press the bushing into the housing, using the applicable SD8783 support block and collar, until the external bushing flange seats fully against the part surface.

Step 2. Remove surplus corrosion preventive compound from bushing and part surfaces by solvent cleaning according to PPS 31.17.

Step 3. Press the bearing into the bushing until it is fully seated against the internal bearing flange of the bushing. Check that the bearing ball can be moved through its full misalignment angle without undue force or evidence of binding at any point.

Step 4. Install the bushing retaining washer on the bushing with the radiused inside edge facing upwards, as shown in Figure 3-A.

Step 5. Support the bushing on the support block collar and set the flaring tool in place to form the outward flared flange.

Step 6. Apply pressure to form the initial outward flare on the bushing as shown in Figure 3-A.

Step 7. Reverse the flaring tool and apply pressure to finish form the outward flared flange as shown in Figure 3-B.

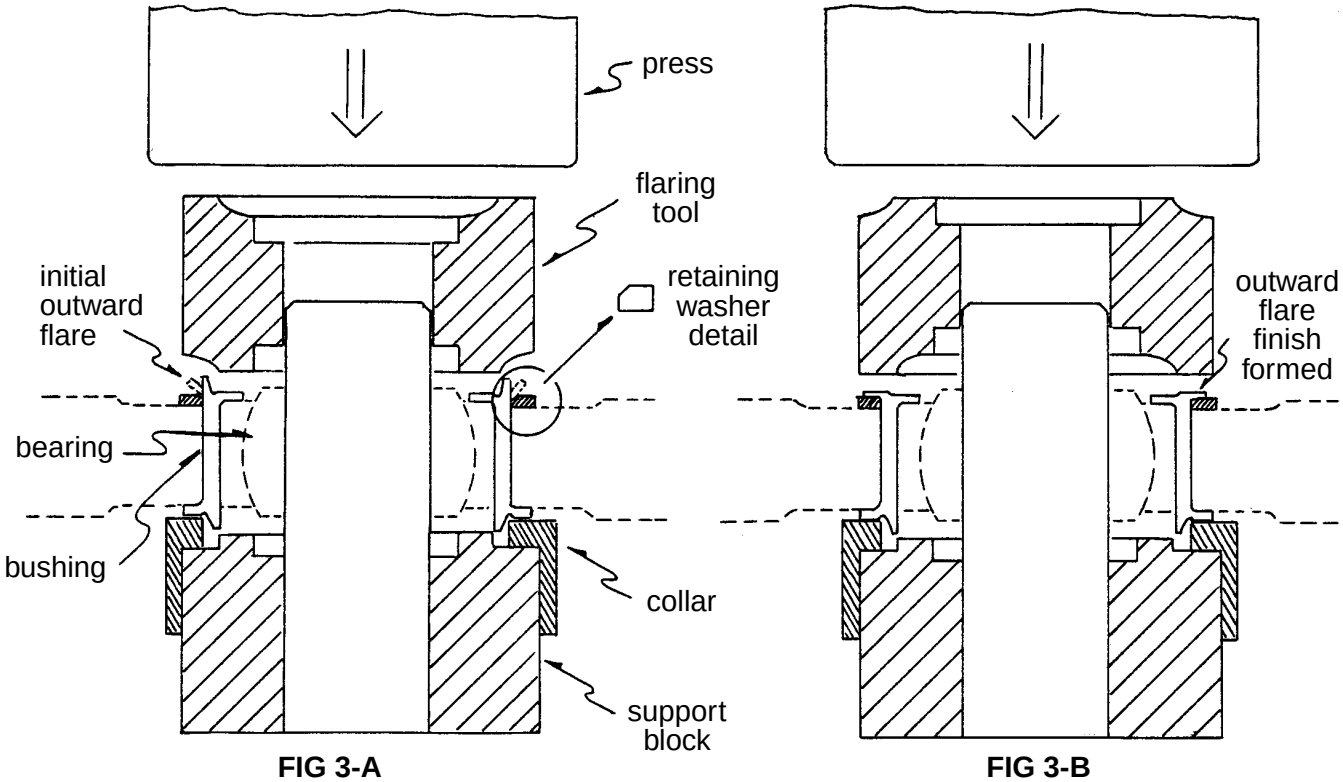

Figure 3 - CSP 314 Bushing Outward Flare

Step 8. Remove the support block collar, turn the part over and support the bushing directly on the support block.

Step 9. Set the flaring tool in place to form the inward flared flange and apply pressure to form the initial inward flare on the bushing as shown in Figure 4-A.

Step 10. Reverse the flaring tool and apply pressure to finish form the inward flared flange as shown in Figure 4-B.

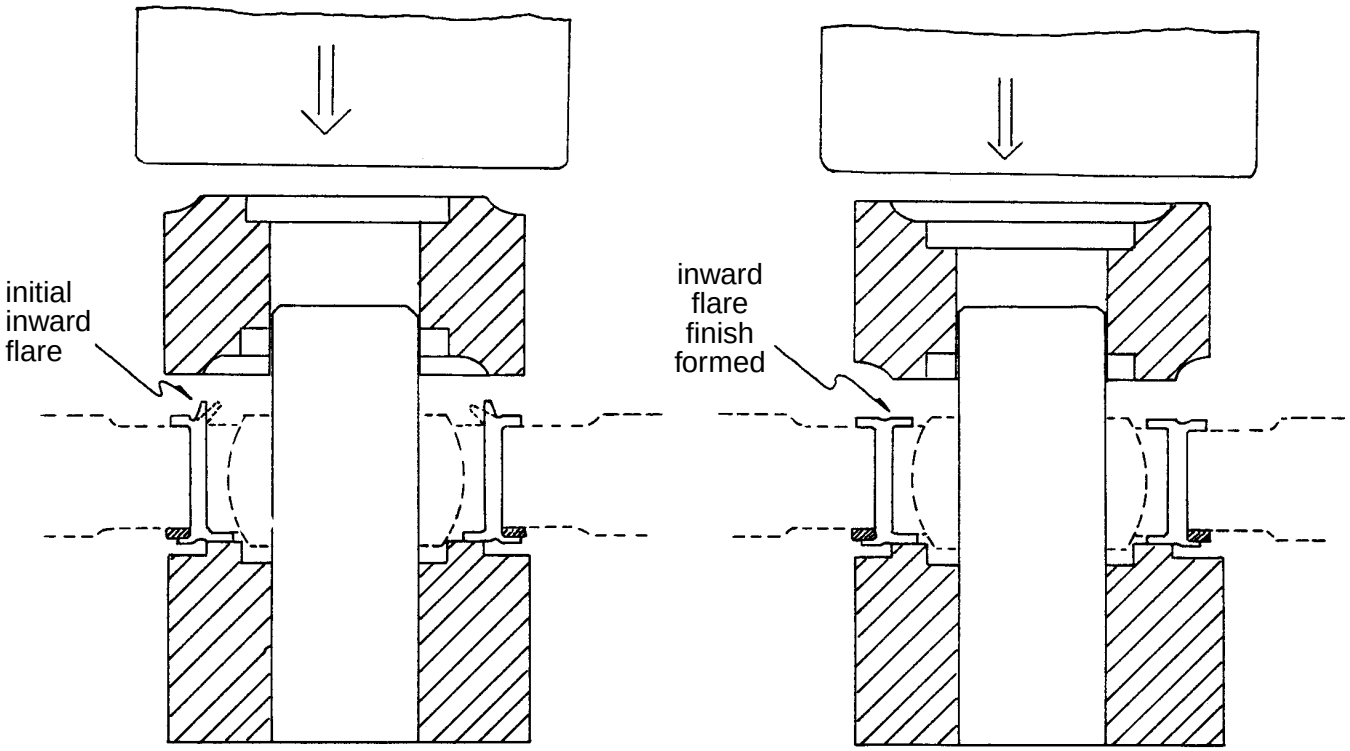

FIG 4-A **FIG 4-B**

Figure 4 - CSP 314 Bushing Inward Flare

5.4 Sealing

5.4.1 After installation, seal all bushings with a fillet of DHMS S3.01 Type II Grade B sealant as shown in Figure 5. Refer to PPS 21.21 for general sealing practices. Take care to avoid getting any sealant on the bearing shell or ball.

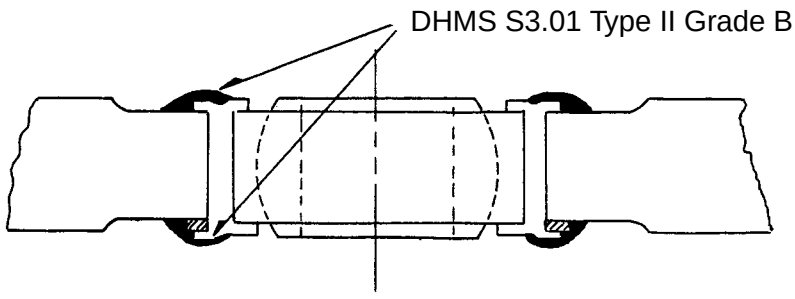

Figure 5 - Sealing of Installed Bushing

5.5 Removal of Bushings

5.5.1 If necessary, remove CSP 314 bushings as follows:

Step 1. Cut through the outward flared flange which has been flared over the retaining washer, using a piloted fly cutter in a drill press (see Figure 6).

Step 2. Remove the retaining washer and press the bushing and bearing out of the part housing. Take care to avoid deforming the part housing during removal of the bushing.

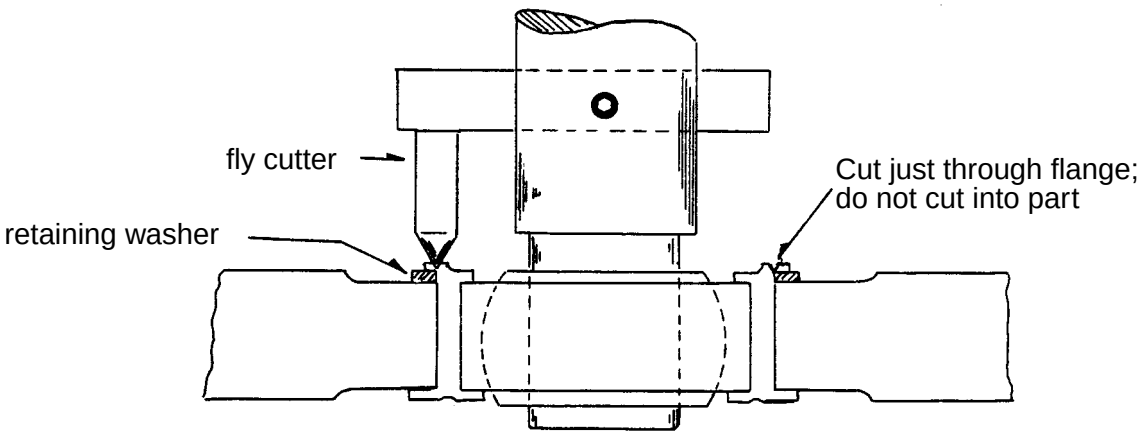

Figure 6 - Removal of Installed Bushing

6 Requirements

6.1 Parts which fail to meet any of the following requirements are not acceptable:

- The machined and flared flanges of the bushing must be in close contact with the part and the bearing all the way round.
- Flared flanges must be free of evidence of cracks.
- There must be no evidence of looseness or rotation of the bushing or the bearing shell.
- The bearing ball must be capable of movement through its full misalignment angle without undue force or evidence of binding at any point.

7 Safety Precautions

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

8 Personnel Requirements

8.1 Personnel responsible for installation of CSP 314 bearing retaining bushings in component parts must have a good working knowledge of the procedure and requirements as specified herein and must have exhibited their competency to their supervisor.