BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 13.02

PRODUCTION PROCESS STANDARD

Fabrication of Flexible Drive Assemblies

Issue 5
- This standard supersedes PPS 13.02, 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) 375-4365.
- 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 the assembly of flexible drives (Mechanical Linkage type A.R.C. 16 158).

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. 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 15.01 - Part Marking.

4 Materials and Equipment

4.1 Materials

4.1.1 Flexible drive assemblies are made up from the following parts (see also Figure 1):

Casing - A.R.C. 8601 - stock length
Nut - A.R.C. 11035 - two required
Sleeve - A.R.C. 11036 - two required
Shaft - A.R.C. 1174 - stock length
Spline Assembly - A.R.C. 6788 - two required
Coding Sleeve - CSP-101-13 - two required

4.1.2 Oil to MIL-PRF-7870.

4.2 Equipment

4.2.1 Assembly tool SD 1816 mounted on impact hammer CE 5249.

4.2.2 Alternative assembly tools are either A-7660A modified with conversion kit A.R.C. 16267 or W-10. Only use these hand operated tools for field repair, etc.

4.2.3 Hacksaw, side cutters and file.

4.2.4 Two pound hammer (only required when using the manually operated assembly tool).

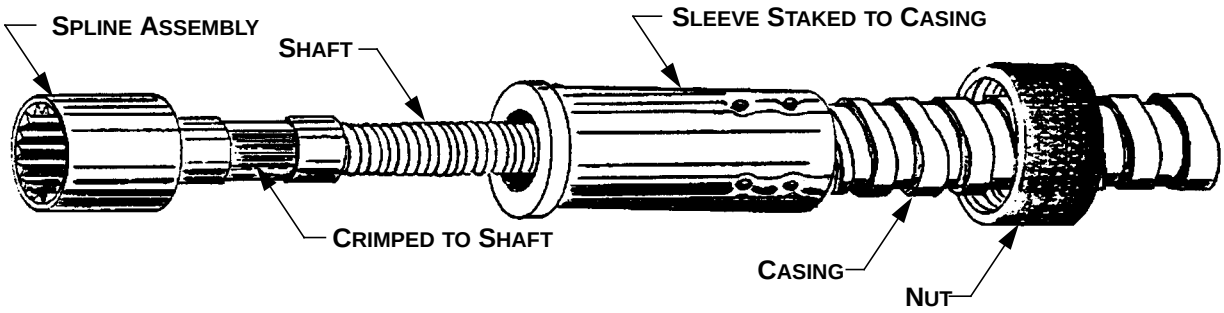

Figure 1 - Flexible Drive Assembly

5 Procedure

5.1 Assembly of the Casing

5.1.1 Establish the length of casing as follows:

Step 1. Stretch the casing by applying a load of 15 pounds.

Step 2. In the stretched state, the casing length required is equal to the length of the shaft plus 1/4" per foot minus 1" (e.g., If length of shaft is 12 feet, the casing is to be 12 feet plus 12/4" minus 1". Therefore, the length of the casing should be 12’2").

5.1.2 Assemble casing as follows:

Step 1. Establish the length of casing according to paragraph 5.1.1.

Step 2. Cut the casing with a hacksaw using the guide provided with the assembly tool in order to assure that the cut is normal to the axis of the casing.

Step 3. Deburr the ends of the casing using side cutters and file.

Step 4. Slide identification sleeve (CSP-101-13) bearing the correct code number over the casing.

Step 5. Fit nut (A.R.C. 11035) over the casing, unthreaded side first.

Step 6. Insert end of the casing into the sleeve (A.R.C. 11036) pushing it well home.

Step 7. Place sleeve and casing over the pilot of the staking attachment of the assembly tool so that the sleeve butt against the stop.

Step 8. Align the sleeve with the groove of the staking tool and operate foot pedal to stake the sleeve to the casing or, when using the hand tool, strike the punch with sufficient force to close the gap between punch and dolly.

Step 9. Repeat Step 8 three times, each time rotating the assembly approximately 90°.

Step 10. Remove assembly and repeat Step 4 through Step 9 on the other end of the casing.

5.2 Assembly of Shaft

5.2.1 Assemble shaft as follows:

Step 1. Mark the required length of shaft and centre the cut-off point in the swaging die of the assembly tool. Operate the foot pedal to swage the shaft over a length of approximately 1 1/2" (i.e., 3.4" in each direction from the predetermined trim line). When using the hand tool, strike the punch of the swaging attachment with a hammer. Repeat striking as required to obtain a proper swage.

Step 2. Place a swaged portion of the shaft between the blades of the cutting attachment of the assembly tool and operate foot pedal to trim the shaft to its predetermined length. With the hand tool, trimming is to be done by striking the punch with a force only sufficient to cut the shaft.

Step 3. Normally, swaging is only necessary at one end of the shaft as the other end has already been swaged when preparing the previous assembly. If this does not apply, swage that end over a length of 3/4".

Step 4. Push the swaged end of the shaft into the spline assembly as far as it will go and, placing the hub of the spline assembly into the crimpling attachment of the tool, push the spline assembly firmly into the bore of the stop.

Step 5. Rotate the assembly so as to align the flats of shaft and crimping tool and, depending upon the type of tool employed, operate foot pedal or strike the punch with a hammer to crimp the spline assembly to the shaft.

Step 6. Apply a light coat of MIL-PRF-7870 oil to the shaft and insert it completely into the casing assembly. Oiling may be omitted if the shaft has already been oiled by the manufacturer.

Step 7. Push the spiral joints of the casing together so as to render possible the crimping of the second spline assembly to the shaft.

Step 8. Repeat operations of Step 4 through Step 6.

Step 9. Mark the assembly according to PPS 15.01.

5.3 Storage

5.3.1 Assemblies must be loosely coiled (18" minimum diameter) and stored in covered containers.

6 Requirements

6.1 Flexible drive assemblies must operate freely. They must not be kinked or damaged.

6.2 The length of the assembly may deviate ± 1/8" from the nominal length specified on the engineering drawing.

6.3 The ends of each assembly must be identified with the correct code numbers.

6.4 Each assembly must be marked according to PPS 15.01.

7 Safety Precautions

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

8 Personnel Requirements

8.1 Personnel responsible for the assembly of flexible drives (Mechanical Linkage type A.R.C. 16 158) 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 Any alterations of the assembly tool requires the appropriate authorization (e.g., at Bombardier Toronto (de Havilland) refer to Bombardier Toronto (de Havilland) Tool Design) for such authorization).