BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 3.07

PRODUCTION PROCESS STANDARD

Installation of Ferrules on Elastic Cord

Issue 7
- This standard supersedes PPS 3.07, Issue 6.
- 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.

Table of Contents

Sections **Page**

Tables

Figures

1 Scope

1.1 This standard specifies the procedure and requirements for the installation of wire ferrule terminals to elastic shock cord (bungee cord) and exerciser cord assemblies.

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 15.01 - Part Marking.

3.3 PPS 25.53 - Bonding using EC-2262 Adhesive.

4 Materials and Equipment

4.1 Materials

4.1.1 Elastic cord, as specified on the engineering drawing.

4.1.2 CSP 194 ferrules and locking rings, as specified on the engineering drawing.

4.1.3 Annealed stainless steel lockwire to QQ-W-423 Cond A or MS 20995C. Refer to Table 1 for a listing of required lockwire gauges against the applicable CSP 194 locking ring dash number.

4.2 Equipment

4.2.1 Suitable bench mounted vise and hand operated winch.

4.2.2 Suitable ice-pick or awl for unravelling cord braid.

5 Procedure

5.1 General

5.1.1 Wire ferrule terminals are hooks attached to the ends of elastic shock cord (bungee cord) and exerciser cord. The wire ferrule terminal and cord assembly is used in general light duty shock-absorbing applications.

5.1.2 Refer to Table 1 for a listing of the ferrule, locking ring, and elastic cord diameter for each CSP 194 assembly part number.

5.2 Preparation of Elastic Cord

5.2.1 Prepare elastic cord for the installation of wire ferrule terminals as follows:

Step 1. Using an ice-pick or awl, unravel approximately 2 inches of the cotton braid from one end of the cord.

Step 2. Fold the unravelled braid back on the cord and cut off the exposed elastic strands.

Step 3. Dip the unravelled cotton braiding into water, to simplify threading ferrules onto cord.

5.3 Preparation of Locking Rings

5.3.1 Prepare locking rings from stainless steel lockwire by wrapping the wire around a suitable mandrel. Refer to Table 1 for the locking ring wire gauge and inside diameter required for the corresponding size elastic cord and ferrule. Refer to Figure 1 for a general description of the locking ring. Ensure that the direction of the spiral of the locking ring will be the same as the spiral of the ferrule.

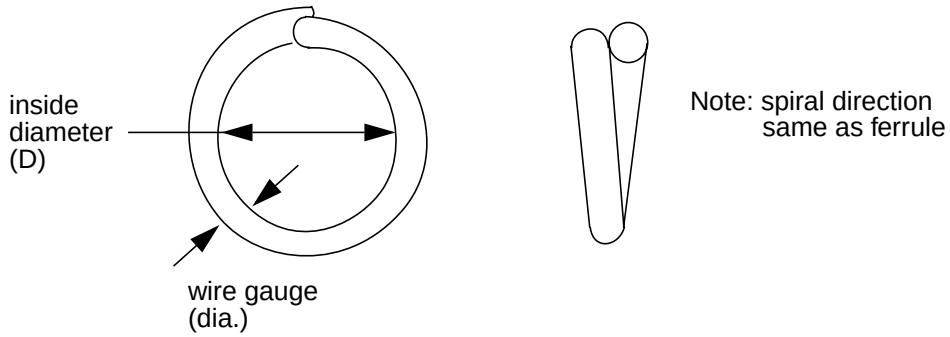

Figure 1 - General Description of Locking Rings

Table 1 - CSP 194 Assembly Listing and Locking Ring Data

ASSEMBLY PART NO.	FERRULE PART NO.	LOCKING RING			ELASTIC CORD DIA.
		PART NO.	WIRE GAUGE (SWG - DIA)	INSIDE DIA. (D)	
CSP 194-1	CSP 194 -11	CSP 194 -21	17 (0.054")	0.19"	3/16"
CSP 194-3	CSP 194 -13	CSP 194 -23	16 (0.063")	0.26"	1/4"
CSP 194-5	CSP 194 -15	CSP 194 -25	14 (0.072")	0.32"	5/16"
CSP 194-7	CSP 194 -17	CSP 194 -27	14 (0.072")	0.38"	3/8"
CSP 194-9	CSP 194 -19	CSP 194 -29	12 (0.092")	0.52"	1/2"
CSP 194-10	CSP 194 -20	CSP 194 -23	16 (0.063")	0.26"	1/4"
CSP 194-33	CSP 194 -31	CSP 194 -27	14 (0.072")	0.38"	3/8"

5.4 Installation of Ferrule

5.4.1 Install ferrules as follows:

Step 1. Thread the ferrule and locking ring over the unravelled cotton braiding (see Figure 2).

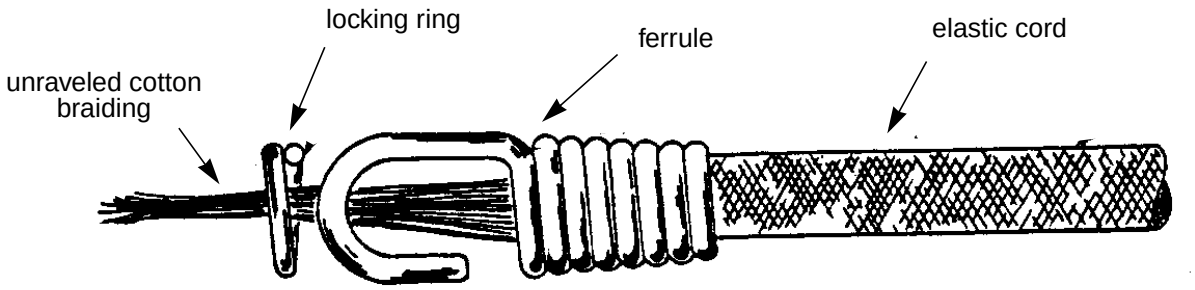

Figure 2 - Assembly of Ring/Ferrule on Elastic Cord

Step 2. Clamp the loose cotton strands in a vise.

Step 3. Using a winch and rope, stretch the elastic cord until the ferrule and locking ring slide easily on the cord (see Figure 3). If considered practical, both ferrules may be slid onto the cord from one end.

Step 4. Using pliers, clamp the locking ring on the cord so as to correctly position the ferrule and bend tightly around the cord to form approximately 1 1/4 turns (see Figure 3).

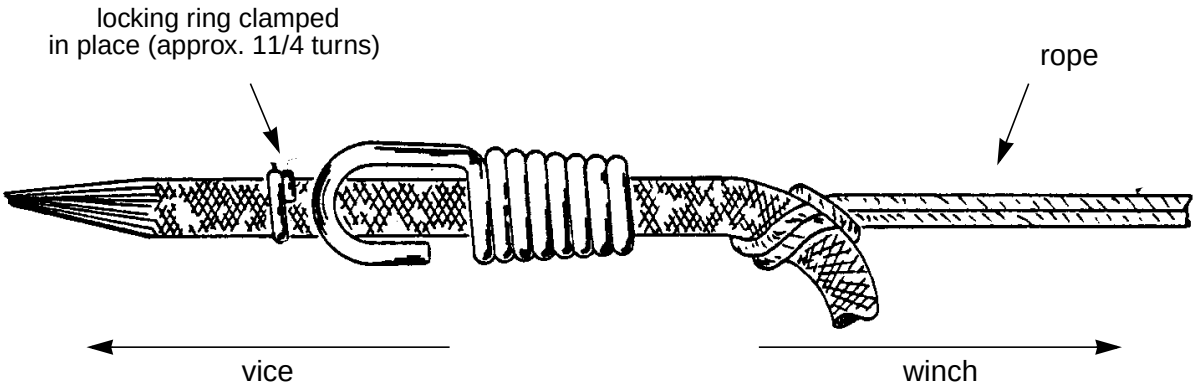

Figure 3 - Locking Ring Installation

Step 5. Thread the ferrule tightly onto the locking ring. The locking ring should tightly engage the ferrule approximately halfway along the ferrule coils.

Step 6. Release the tension from the cord and cut the surplus braiding and elastic flush with the ferrule (see Figure 4).

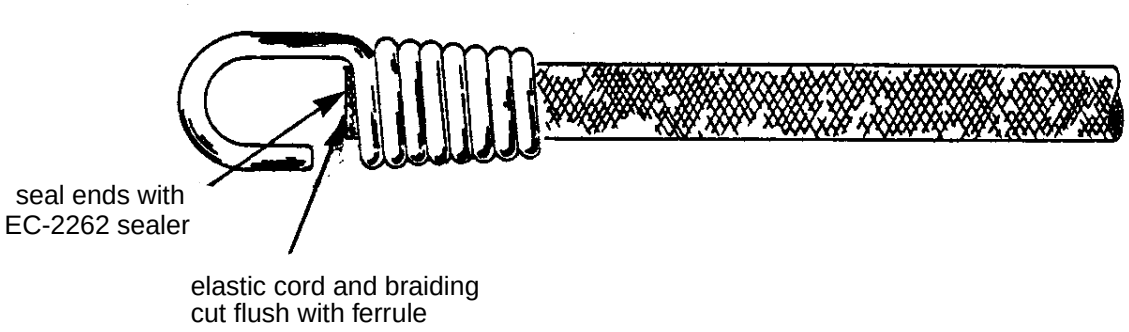

Figure 4 - Completed Assembly

Step 7. Apply a first coat of EC-2262 sealer to the free end of the cord.

Step 8. Allow the first coat of EC-2262 sealer to air dry for 2 hours at room temperature (65° minimum).

Step 9. Apply a second coat of EC-2262 sealer to the free end of the cord.

Step 10. Allow the second coat of EC-2262 to cure for 24 hours at room temperature (65° minimum) before further working or installation.

5.5 Part Marking

5.5.1 Part mark completed elastic cord assemblies according to PPS 15.01.

6 Requirements

6.1 Elastic cord and ferrules shall be as specified on the engineering drawing.

6.2 Ensure that the cotton braid covering of the elastic cord is not abraded or other-wise damaged.

6.3 The installed ferrule must fit tightly on the assembly and engage the locking ring approximately halfway along the tapered portion of the ferrule.

6.4 Proof load all assemblies at an extension equal to 75% of the length of elastic cord included between the ferrules. There must be no evidence of slippage of the ferrules on the assembly during proof loading. Check the length of the elastic cord assembly after proof loading.

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 wire ferrule terminals to elastic shock cord (bungee cord) and exerciser cord assemblies must have a good working knowledge of the procedure and requirements as specified herein and must have exhibited their familiarity to their supervisor.