BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 2.24

PRODUCTION PROCESS STANDARD

Tinnerman Speed Type Nuts

Issue 4
- This standard supersedes PPS 2.24, 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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	Production Process Standards (PPS)	
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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 installing Tinnerman type speed nuts.

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 1.01 - Dimpling Aluminum Alloys.

3.2 PPS 1.09 - Drilling and Reaming

3.3 PPS 2.01 - Aircraft Solid Riveting.

3.4 PPS 2.20 - Bolts and Screws.

3.5 PPS 13.26 - General Subcontractor Provisions.

3.6 PPS 27.05 - Manual Edge Finishing.

4 Materials and Equipment

4.1 Material

4.1.1 Speed nuts and, as applicable, washers and rivets as specified on the Engineering drawing. See Figure 1 for designations of part numbers.

4.1.2 Screws as specified, with thread sizes according to Table 1.

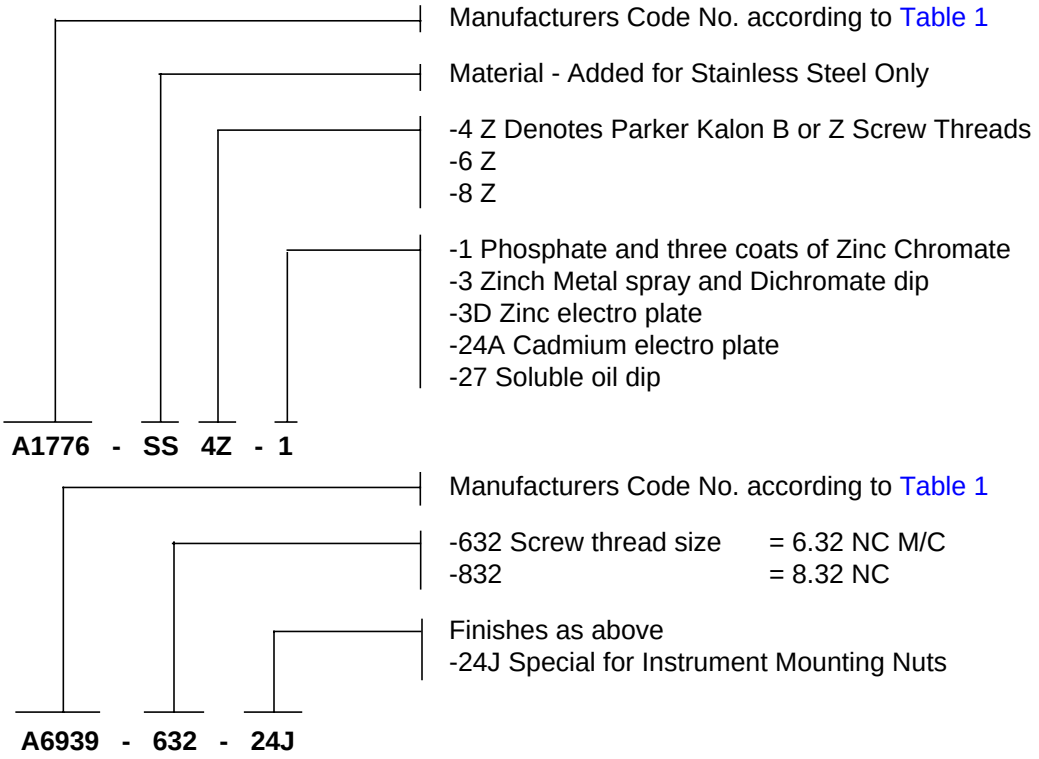


Figure 1 - Designation of Part Numbers

4.2 Equipment

4.2.1 Drill jigs (e.g., as specified in Table 2).

5 Procedure

5.1 General

5.1.1 Tinnerman speed nuts are designed to be used with Parker Kalon, type B or Z, and AN 530 self tapping screws and, in the case of instrument mounting nuts and twin type nuts, standard machine screws.

5.1.2 Perform all drilling according to PPS 1.09.

5.1.3 Except as noted, for the purposes of this PPS the part of the assembly to which the speed nut is assembled, or, in the case of the anchor type, is riveted, is referred to as the support and the part adjacent to the screw is termed the panel. An exception to this is the special twin type speed nut which is riveted to the panel.

5.1.4 The instructions in this PPS apply only to the types and sizes listed in Table 1. When other types than are listed herein are called up on the engineering drawing, refer to Liaison Engineering.

Table 1 - Corresponding NAS Nuts and General Information

PART N0.	THREAD SIZE	TYPE (see Figure 2)	NAS PART NO.	TYPE AND SIZE OF SCREW	
				MFG. SPEC.	AN SPEC.
A1776	4Z	Flat	446-1	PK4B or Z	530-4
A1777	6Z		---	PK6B or Z	530-6
A1778	8Z		446-4	PK8B or Z	530-8
A1779	10Z		446-5	PK10B or Z	530-10
A6191	4Z	Standard Anchor	None	PK4B or Z	530-4
A6195†	6Z			PK6B or Z	530-6
A8589	8Z			PK8B or Z	530-8
A8584†	10Z			PK10B or Z	530-10
A6194 A6196	4Z	Offset Anchor	None	PK4B or Z	530-4
	6Z			PK6B or Z	530-6
	8Z			PK8B or Z	530-8
	10Z			PK10B or Z	530-10
A6201†	4Z 6Z 8Z 10Z	Corner Anchor	None	PK4B or Z PK6B or Z PK8B or Z PK10B or Z	530-4 530-6 530-8 530-10
A1804	6Z	"J"	488-6	PK6B or Z	530-6
	8Z			PK8B or Z	530-8
A880	6Z	"U"	395-2	PK6B or Z	530-6
A1348	8Z		395-17	PK8B or Z	530-8
A1784	6Z		395-6	PK6B or Z	530-6
A1786	8Z		395-12	PK8B or Z	530-8
A1791	10Z		---	PK10B or Z	530-10
A1792	10Z		395-26	PK10B or Z	530-10
A1932	8Z		396-4	PK8B or Z	530-8
A6052	6Z		395-3	PK6B or Z	530-6
	8Z		395-11	PK8B or Z	530-8
	10Z		395-21	PK10B or Z	530-10
A8862	8Z		---	PK8B or Z	530-8
A6939	632	Instrument Mount	487-15	6-32 M/C or PK6B or Z	515-6 or 530-6
A8940	632		487-16		
A8941	632		487-17		
A8942	632		487-18		
A8943	632		487-20		
A8944	632		487-21		
A6085	832	Special Twin	---	8-32 M/C	-832

Note 1. † indicates rivet holes to be dimpled.

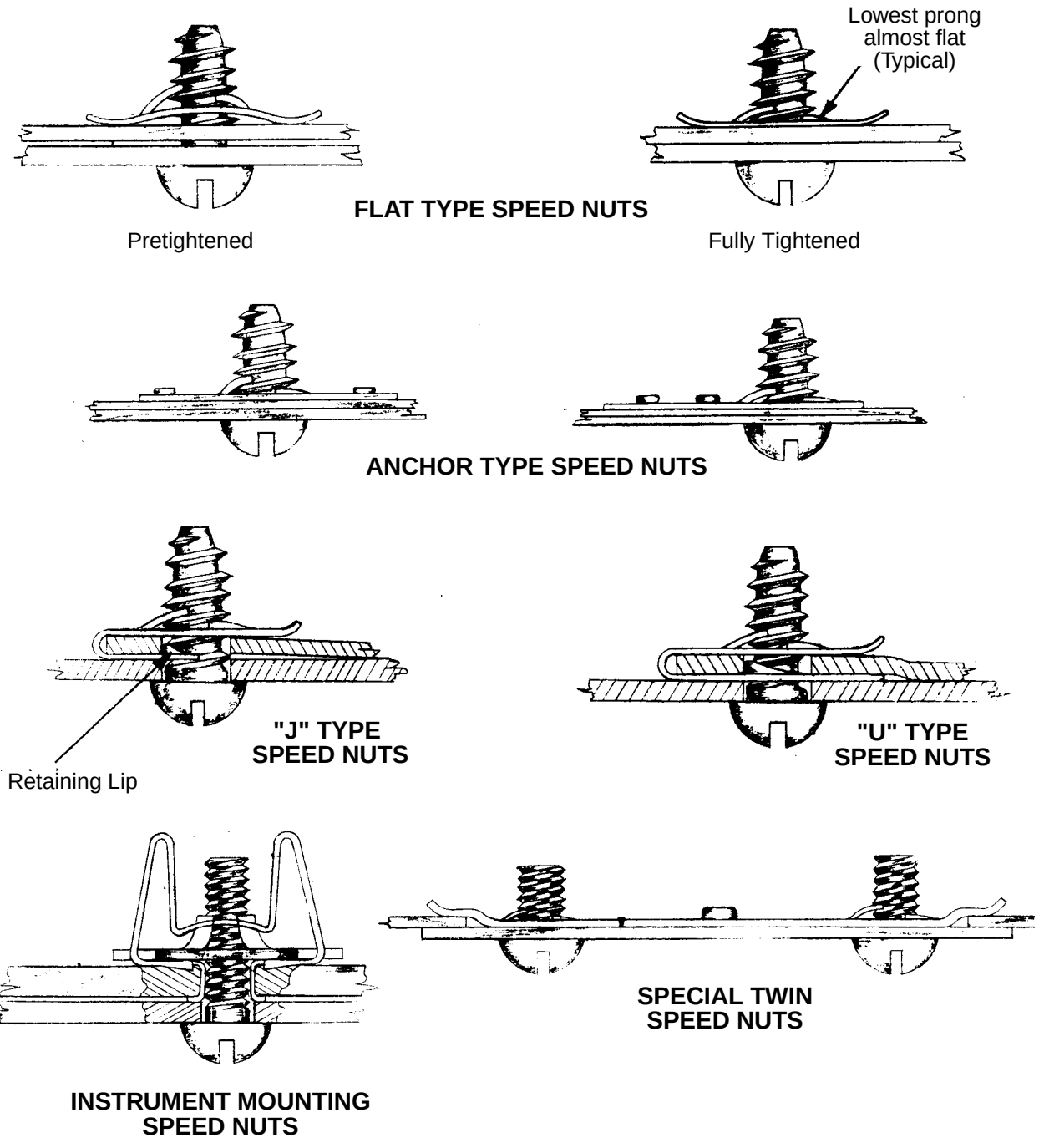


Figure 2 - Speed Nuts

5.2 Preparation of Support

5.2.1 Prepare supports for installation of anchor type speed nuts as follows:

Step 1. Drill the pilot hole for the screw hole to the size specified in Table 2.

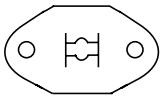
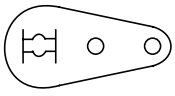
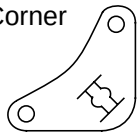
Step 2. Open up the screw hole to the size specified on the engineering drawing or, when not specified on the engineering drawing, to the size specified in Table 2.

Step 3. Deburr the screw hole according to PPS 27.05.

Step 4. Drill the rivet holes. If drill jigs (e.g., as specified in Table 2) are not available, either mark out carefully to the dimensions shown on the drawing or secure the speed nut to the support using a Parker Kalon screw of appropriate size, and determine the rivet holes from the nut through the support.

Step 5. Unless otherwise specified on the engineering drawing, for anchor type speed nuts ram coin dimple the rivet holes according to PPS 1.01; if countersinking of the rivet holes is specified on the engineering drawing, countersink the rivet holes according to PPS 2.01. For special twin type speed nuts, countersink the rivet holes according to PPS 2.01.

Table 2 - Drilling Data for Anchor and Twin Type Speed Nuts

ANCHOR NUT TYPE AND THREAD SIZE			PILOT FOR SCREW	FINAL DRILL FOR SCREW	DRILL FOR RIVETS	DRILL JIG NUMBER
Standard 	A6191 A6195 A8580 A8584	4Z	#30	#30	#40	TS91-2-20 MK 6
		6Z		#23		
		8Z		#15		
		10Z		#5		
Offset 	A6194 A6196	4Z	#40	#30	#40	TS91-2-22 MK 4
		6Z		#23		
		8Z		#15		
		10Z		#5		
Corner 	A6201	4Z	#40	#30	#40	TS91-2-21 MK 7
		6Z		#23		
		8Z		#15		
		10Z		#5		
Special Twin	A6085	832	#40	#15	#30	None

5.2.2 Prepare supports for installation of speed nuts other than anchor or special twin type speed nuts by drilling the screw hole in the location specified on the engineering drawing. If the engineering drawing does not specify the hole size, drill such holes to the size specified in Table 3.

Table 3 - Screw Hole Requirements for Speed Nuts other than Anchor or Special Twin Type

PART N0.	THREAD SIZE	SCREW HOLE
A880	6Z	7/32"
A1348	8Z	11/64"
A1776	4Z	#31
A1777	6Z	#27
A1778	8Z	11/64"
A1779	10Z	#10
A1784	6Z	1/4"
A1786	8Z	1/4"
A1791	10Z	9/32"
A1792	10Z	9/32"

PART N0.	THREAD SIZE	SCREW HOLE
A1804	6Z or 8Z	7/32"
A1932	8Z	11/32"
A6052	6Z, 8Z or 10Z	1/4"
A6939	632	11/64"
A8862	8Z	7/32"
A8940	632	11/64"
A8941	632	11/64"
A8942	632	11/64"
A8943	632	11/64"
A8944	632	11/64"

5.3 Preparation of Panel

5.3.1 Except for special twin type speed nuts, prepare panels for installation of speed nuts by drilling matching screw holes in the panel to the size specified in Table 1 or Table 2, as applicable.

5.4 Assembly

5.4.1 Assemble speed nuts as follows:

Step 1. Install the speed nuts with the screw engaging prongs on the side away from the support (see Figures 2 to 7). Slip "J" and~ 'U" type nuts over the support until the lip on the bottom leg snaps into the screw clearance hole. Rivet anchor and twin type nuts shall be riveted to the support, or in the case of the special twin type, to the panel, according to PPS 2.01. To install the instrument mounting type, compress the cage with finger pressure and insert the legs of the nut fully into the prepared hole.

Step 2. Position the panel, start the screw by hand and tighten fully using a suitable screw driver. If necessary, it is acceptable to hold the nut with the fingers to prevent it turning; no other method for holding the nut is acceptable. If the screw length is not specified on the engineering drawing, use the screw length specified in Table 4. Do not use a screw which is shorter than the calculated length.

Table 4 - Length Determination for Screws

SCREW TYPE	SCREW SIZE	SCREW LENGTH
Self Tapping	4B or Z 6B or Z	Material thickness plus 1/4"
	8Bor Z 10B or Z	Material thickness plus 5/16"
Machine Screws	6 - 32	Material thickness plus 1/4"
	8 - 32	Material thickness plus 5/16"

6 Requirements

6.1 The layout of speed nuts must conform to the engineering drawing.

6.2 The screw must be tightened such that the bottom prong is almost flush with the base of the nut. At least two full threads must protrude beyond the top prong of the nut.

6.3 Cracks in any part of the speed nut are not acceptable.

7 Safety Precautions

7.1 The procedure as specified herein presents no specific safety hazards when performed according to accepted plant safety regulations.

8 Personnel Requirements

8.1 Personnel responsible for assembly of Tinnerman type speed nuts must have a good working knowledge of the procedure and requirements as specified herein and must have exhibited their familiarity to their supervisor.