BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 2.15

PRODUCTION PROCESS STANDARD

Installation of Panel Fasteners

Issue 7
- This standard supersedes PPS 2.15, 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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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for installation of panel fasteners (e.g., B0209011).

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 1.09 - Drilling and Reaming.

3.2 PPS 1.33 - Countersinking for Flush Head Fasteners.

3.3 PPS 2.01 - Installation of Solid Rivets.

3.4 PPS 13.26 - General Subcontractor Provisions.

3.5 PPS 18.01 - Limitations on Shearing, Blanking, and Piercing Aluminum and Magnesium Alloy Sheet.

3.6 PPS 27.05 - Manual Edge Finishing Tools.

4 Materials and Equipment

4.1 Materials

4.1.1 Panel fasteners as specified on the engineering drawing. Refer to Figure 1 for a general description and dimensional configuration of the panel fastener receptacles. Refer to Figure 2 for a general description of the panel fastener stud assembly. If the engineering drawing specifies use of a non-pre-assembled stud assembly, it is acceptable to substitute the appropriate size B0209011 pre-assembled stud assembly.

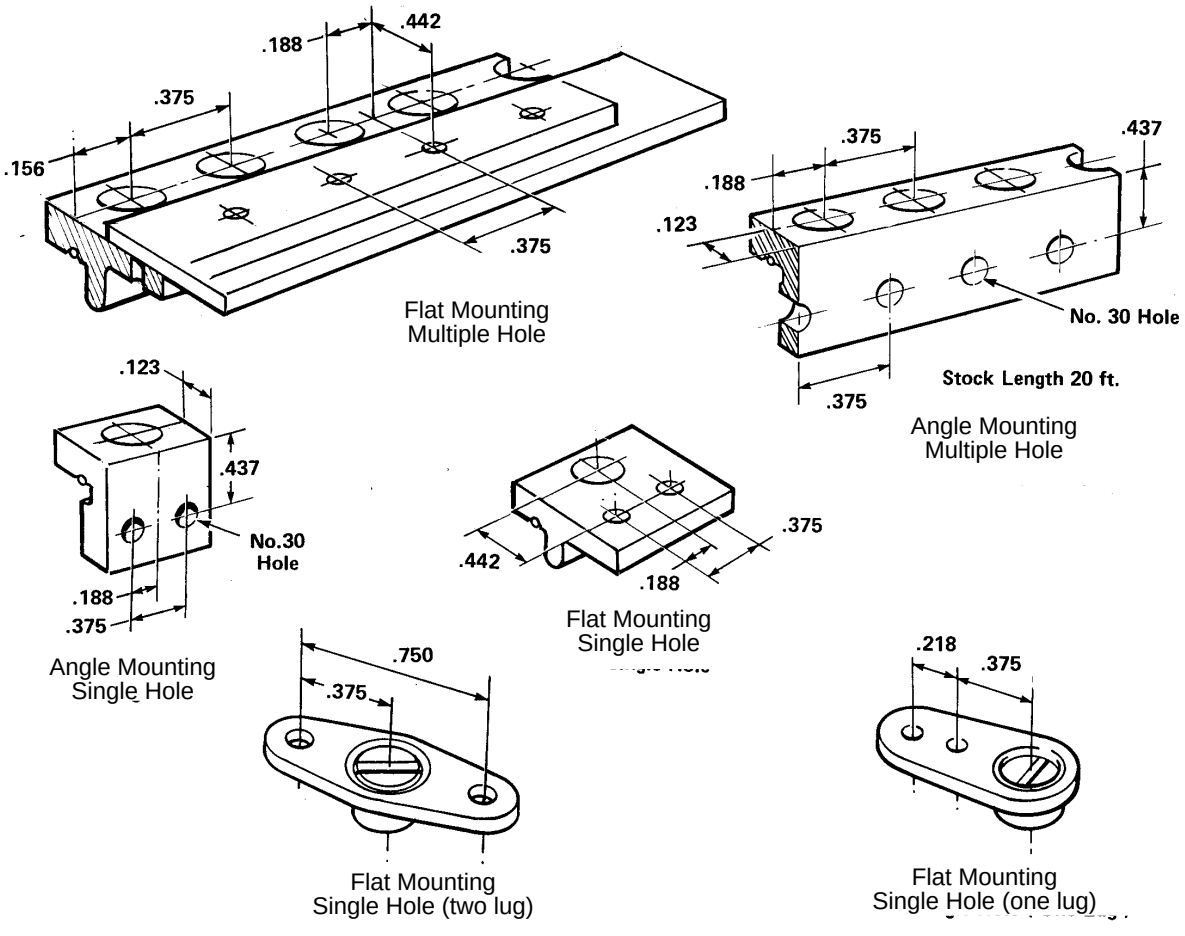

Figure 1 - General Description and Dimensional Configuration of Receptacles

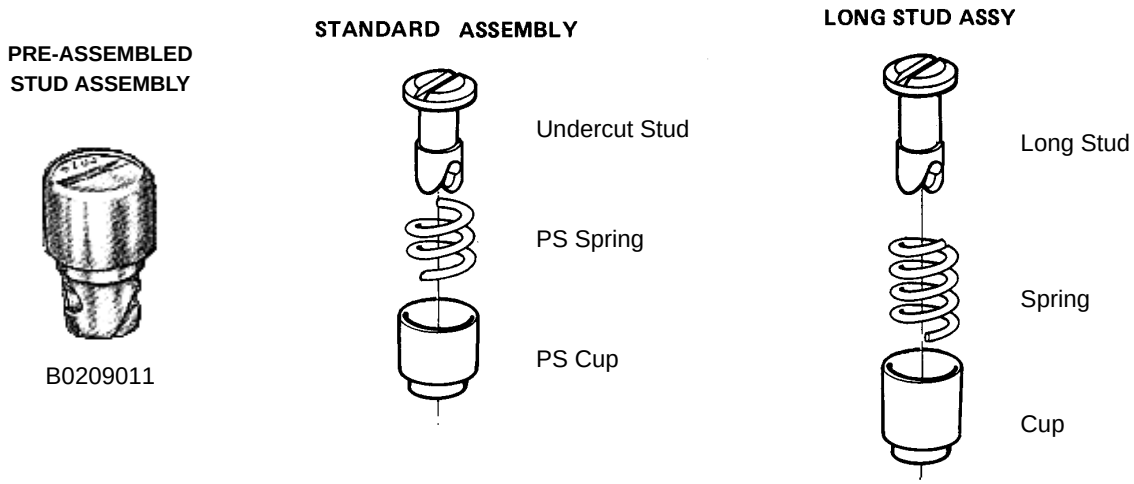

Figure 2 - General Description of Stud Assemblies

4.2 Equipment

4.2.1 Hand tool installation set, Dzus PT35 or PT 3 1/2, for installing stud assemblies which have not been pre-assembled.

4.2.2 Power driven installation tool set, Dzus TTPT35A or DFCI Solutions Inc. 9920-1620-35-1, for installing pre-assembled stud assemblies.

4.2.3 Hand squeeze installation tool, Dzus TP35AHT or DFCI Solutions Inc. 9916-35-AHT, for installing stud assemblies which have been pre-assembled.

5 Procedure

5.1 General

5.1.1 Panel fasteners are spring loaded, quick release fasteners used to attach panels and covers to console units, instrument panels, etc.

5.1.2 Stud assemblies consist of a locking stud, ejecting spring and retaining cup, which are affixed to the panel or cover by flaring the crimped end of the cup into a countersunk hole.

5.1.3 Receptacles are extruded aluminum section, either right angle or flat mounting, available in multi-hole strips or single hole mount and are attached to the unit or support by rivets.

5.2 Preparation of Parts

5.2.1 Preparation of Stud Holes

5.2.1.1 Drill or punch stud holes to the size specified in Table 1. Drill holes according to PPS 1.09. For the limitations on punching of aluminum alloys refer to PPS 18.01.

5.2.1.2 Countersink the stud hole from the reverse side of the panel (i.e., the side opposite that which the stud assembly will project from) to the diameter specified in Table 1 according to PPS 1.33.

5.2.1.3 After drilling or punching and countersinking, deburr the hole according to PPS 27.05.

Table 1 - Hole Preparation Data for Stud Assemblies

RECOMMENDED DRILL SIZE	HOLE LIMITS	COUNTERSINK DATA	
		DIAMETER	ANGLE
F (0.257")	0.257" - 0.260"	0.325" - 0.335"	100°

5.2.2 Preparation for Receptacles

5.2.2.1 Lay out the locations of rivet holes and, if necessary, stud clearance holes for receptacles, on the part according to the dimensions shown on the engineering drawing. If the engineering drawing does not define the location of holes for receptacle installation, refer to the dimensions shown in Figure 1 for the particular type of receptacle to be installed.

5.2.2.2 Drill rivet holes for lug type receptacles using the appropriate drill jig. Refer to Table 2 for drill jig fixtures available at Bombardier Toronto (de Havilland). When using drill jigs, locate the stud clearance hole according to the engineering drawing and drill to size before drilling rivet holes. Drill or punch stud clearance holes to 0.250" in diameter. Drill holes according to PPS 1.09. For limitations on punching of aluminum alloys refer to PPS 18.01. After drilling or punching, deburr the stud clearance hole according to PPS 27.05.

5.2.2.3 Prepare holes for the installation of solid rivets according to PPS 2.01.

Table 2 - Receptacle Drill Jigs

RECEPTACLE	DRILL JIG
PRF35	TS.519.11.10 MK19
PRG35	TS.519.11.20 MK10

5.3 Installation of the Stud Assemblies

5.3.1 Install stud assemblies which have **not** been purchased pre-assembled using a Dzus PT35 or PT 3 1/2 hand tool installation set as follows (see Figure 3):

Step 1. Insert the portion of the retaining cup to be crimped into the stud assembly hole from the top side of the panel.

Step 2. Position the retaining cup over the Block #1 stud.

Step 3. Flare the cup into the countersink by striking the flaring tool (Tool #1) with a suitable hammer or mallet.

Step 4. Turn the panel over and insert the spring and the stud into the retaining cup.

Step 5. Support the panel on side A of Block #2 and set the clinching tool (Tool #2) over the retaining cup.

Step 6. Holding the clinching tool squarely on the top cup, strike the tool with a suitable hammer or mallet to crimp the cup end. Take to avoid damaging the panel surface with the clinching tool.

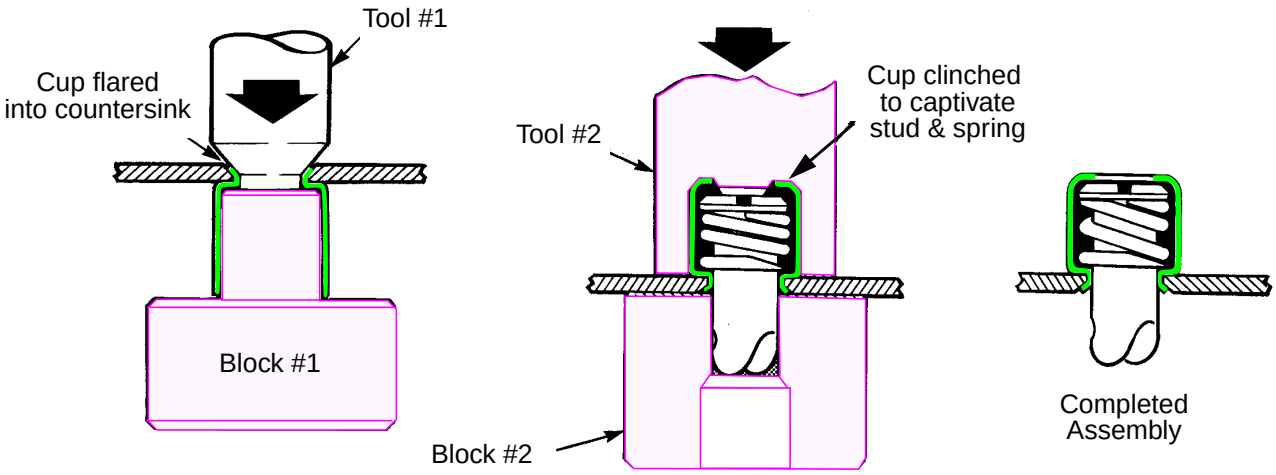

Figure 3 - Installation of Stud Assembly

5.3.2 Install pre-assembled stud assemblies using a Dzus TTPT35A or DFCI Solutions Inc. 9920-1620-35-1 power driven tool installation set as follows (see Figure 4):

Step 1. Insert the pre-assembled stud assembly in the tool block.

Step 2. Place the panel over the pre-assembled stud assembly, ensuring that the cup shoulder is pressed firmly against the panel.

Step 3. Flare the cup using the flaring tool.

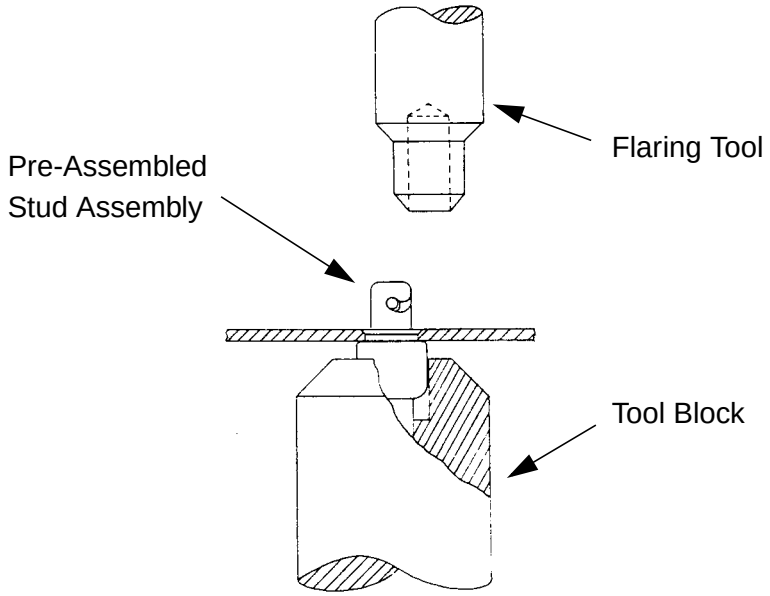

Figure 4 - Installation of Pre-Assembled Stud Assemblies using a Power Driven Installation Tool

5.3.3 Install **pre-assembled** stud assemblies using a Dzus TP35AHT or DFCI Solutions Inc. 9916-35-AHT hand squeeze installation tool as follows (see Figure 5):

Step 1. Adjust the cup nest height so that the space between it and the end of the flaring rod is equal to the panel thickness with the tool in the closed position.

Step 2. Insert the pre-assembled stud assembly into the tool cup nest.

Step 3. Place the panel over the pre-assembled stud assembly, ensuring that the cup shoulder is pressed firmly against the panel.

Step 4. Squeeze the tool handles to flare the cup.

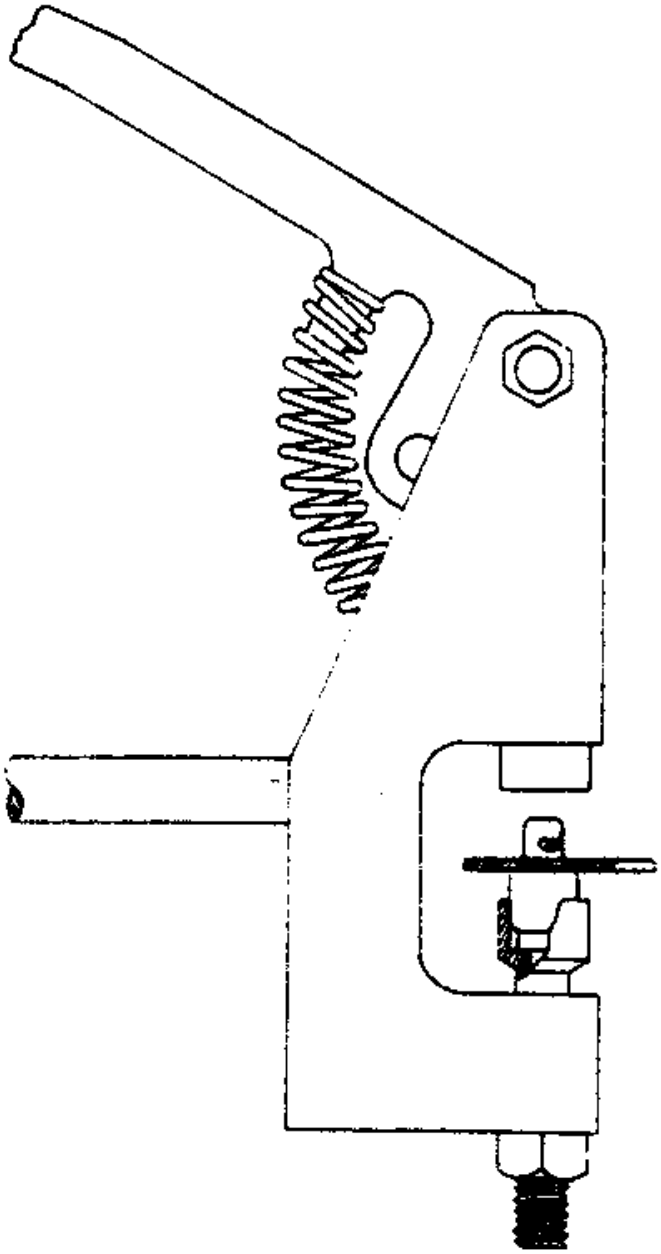

Figure 5 - Installation of Pre-Assembled Stud Assemblies using a Hand Squeeze Installation Tool

5.4 Installation of Receptacles

5.4.1 Rivet receptacles or receptacle strips to the unit or support according to PPS 2.01 using the rivets specified on the engineering drawing.

5.5 Removal of Stud Assemblies

5.5.1 If necessary, remove stud assemblies as follows (see Figure 6):

Step 1. Place the panel upside down on a suitable support block (e.g., Dzus PT35 or PT 3 1/2 hand tool installation set, side B of block #2) and drive the stud out using a suitable punch (e.g., Dzus PT35 or PT 3 1/2 hand tool installation set, Tool #3).

Step 2. Drill out the cup using a 0.257" or size 'F' drill.

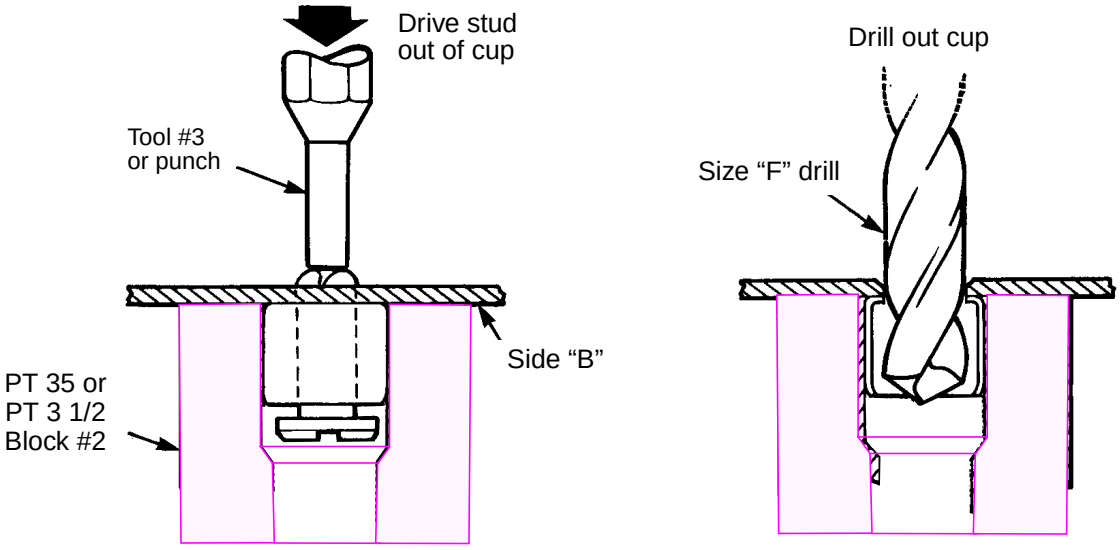

Figure 6 - Removal of Stud Assemblies

6 Requirements

6.1 In the locked position, panel fasteners must be seated tightly with no radial or axial play of the stud.

6.2 In the unlocked position, the spring shall push the fastener head against the clinched portion of the cup.

6.3 Up to three hairline cracks are permissible in the clinched portion of the cup provided they do not extend into the cylindrical part and do not run in such a direction that they may cause a part of the clinched portion to break away.

6.4 Cracks in the flared portion of the cup are acceptable provided the cup is tightly seated.

6.5 Fastener locations shall be as specified on the engineering drawing.

7 Safety Precautions

7.1 The procedures specified herein present no specific safety hazards when performed according to accepted plant safety regulations.

8 Personnel Requirements

8.1 Personnel responsible for installation of panel fasteners must have a good working knowledge of the procedure and requirements as specified herein and shall have exhibited their competency to their supervisor.

9 Maintenance of Equipment

9.1 Do not modify installation tools without proper authorization.