

BOMBARDIER

Toronto (de Havilland)

PROPRIETARY INFORMATION

PPS 2.28

PRODUCTION PROCESS STANDARD

Installation of Dzus Fasteners

- Issue 5
- This standard supersedes PPS 2.28, 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.

Prepared By: _____ (Michael Wright) _____ September 24, 2012

Production Process Standards (PPS)

Approved By: _____ (L.K. John) _____ September 25, 2012

Materials Technology

_____ (B. DeVreede) _____ September 27, 2012

Quality

The information, technical data and designs disclosed in this document (the "information") are either the exclusive property of Bombardier Inc. or are subject to the proprietary rights of others. The information is not to be used for design or manufacture or disclosed to others without the express prior written consent of Bombardier Inc. The holder of this document, by its retention and use, agrees to hold the information in confidence. These restrictions do not apply to persons having proprietary rights in the information, to the extent of those rights.

Signed original on file. Validation of paper prints is the responsibility of the user.

Table of Contents

Sections	Page
1 Scope.....	3
2 Hazardous Materials	3
3 References.....	3
4 Materials and Equipment.....	4
4.1 Materials	4
4.2 Equipment.....	7
5 Procedure	7
5.1 General.....	7
5.2 Preparation of Parts	7
5.3 Installation of Studs.....	8
5.4 Installation of Receptacle	10
6 Requirements.....	11
7 Safety Precautions.....	11
8 Personnel Requirements	12
9 Maintenance of Equipment	12
Figures	
Figure 1 - Exploded View of Dzus Fastener Assembly.....	4
Figure 2 - General Description of Dzus Studs	5
Figure 3 - Part Number Breakdown of Dzus Studs.....	5
Figure 4 - Part Number Breakdown of Dzus Grommets.....	6
Figure 5 - Part Number Breakdown of Dzus Receptacles	6
Figure 6 - Installation of Flush Head Stud.....	8
Figure 7 - installation of Oval Head Studs	9
Figure 8 - installation of Hexagon Head Studs	9
Figure 9 - Receptacle Installation Using Flush Head Rivets.....	10
Figure 10 - Receptacle Installation Using Protruding Head Rivets.....	11
Tables	
Table 1 - Hole Preparation Data	8
Table 2 - Spacers for Floating Receptacles	11

1 Scope

- 1.1 This Production Process Standard (PPS) specifies the procedure and requirements for installing Dzus Universal fasteners.
 - 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 of Aluminum Alloys.
- 3.2 [PPS 1.05](#) - Ram Coin Dimpling Equipment.
- 3.3 [PPS 1.07](#) - Dimpling Ferrous, Nickel, and Titanium Alloys.
- 3.4 [PPS 1.09](#) - Drilling and Reaming.
- 3.5 [PPS 1.33](#) - Countersinking for Flush Head Fasteners.
- 3.6 [PPS 1.48](#) - Set-Up and Operation of Rivet Shavers.
- 3.7 [PPS 2.01](#) - Installation of Solid Rivets.
- 3.8 [PPS 13.26](#) - General Subcontractor Provisions.
- 3.9 [PPS 18.01](#) - Limitations on Shearing, Blanking, and Piercing Aluminum and Magnesium Alloy Sheet.
- 3.10 [PPS 18.04](#) - Limitations on Shearing and Punching Titanium Alloys.

3.11 [PPS 27.05](#) - Manual Edge Finishing Equipment.

4 Materials and Equipment

4.1 Materials

4.1.1 Dzus Universal fasteners as specified on the relevant engineering drawing.

- Refer to [Figure 2](#) for a general description of Dzus studs.
- Refer to [Figure 1](#) for an exploded view of the Dzus fastener assembly.
- Refer to [Figure 3](#), for part number breakdowns of Dzus studs.
- Refer to [Figure 4](#) for the general description and part number breakdown of the Dzus grommet.
- Refer to [Figure 5](#) for the general description and part number breakdown of the Dzus receptacles.
- Refer to [Table 2](#) for the spacers needed for each Dzus floating receptacle.

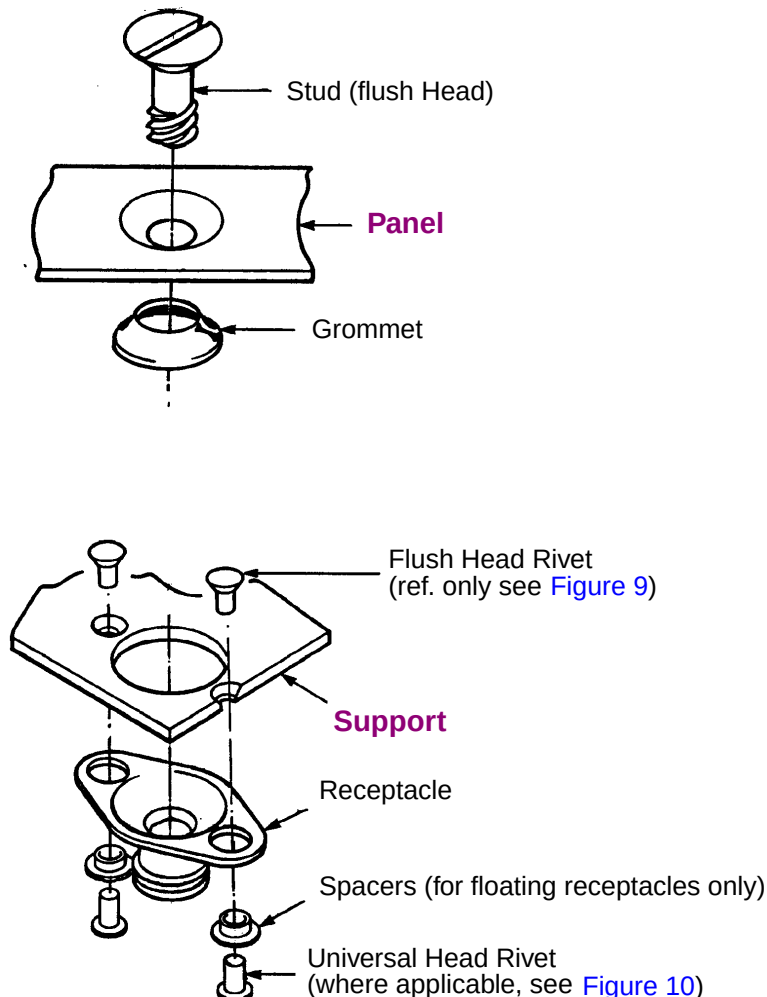


Figure 1 - Exploded View of Dzus Fastener Assembly

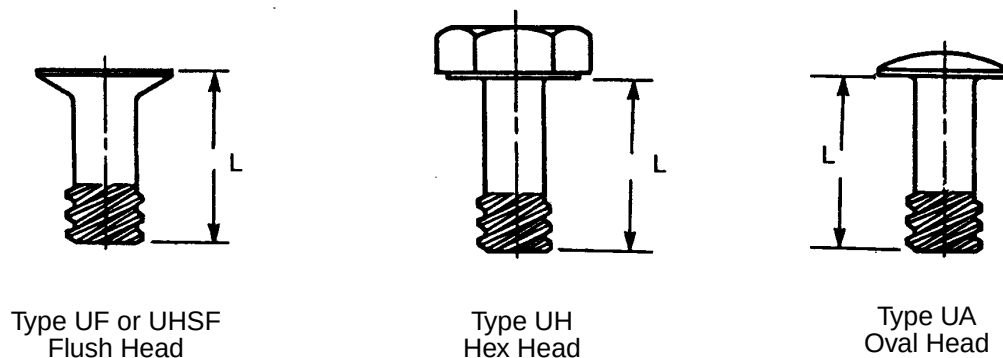


Figure 2 - General Description of Dzus Studs

U - UNIVERSAL						
HEAD STYLE						
A - Oval Head H - Hex Head UFSH - Flush Head (3/16") F - Flush Head (1/4" & 5/16")						
NOMINAL DIAMETER						
3 = 3/16" 4 = 1/4" 5 = 5/16"						
	3/16"		1/4"		5/16"	
	GRIP RANGE	LENGTH	GRIP RANGE	LENGTH	GRIP RANGE	LENGTH
T5	0.000" - 0.050"	0.420"	n/a		n/a	
T10	0.051" - 0.100"	0.470"	0.000" - 0.100"	0.565"	0.000" - 0.100"	0.700"
T15	0.101" - 0.150"	0.520"	n/a		n/a	
T20	0.151" - 0.200"	0.570"	0.101" - 0.200"	0.665"	0.101" - 0.200"	0.800"
T25	0.201" - 0.250"	0.620"	n/a		n/a	
T30	0.251" - 0.300"	0.670"	0.201" - 0.300"	0.765"	0.201" - 0.300"	0.900"
T35	0.301" - 0.350"	0.720"	n/a		n/a	
T40	0.351" - 0.400"	0.770"	0.301" - 0.400"	0.865"	0.301" - 0.400"	1.000"
T50	n/a		0.401" - 0.500"	0.965"	0.401" - 0.500"	1.100"
T60	n/a		0.501" - 0.600"	1.065"	0.501" - 0.600"	1.200"
T70	n/a		0.601" - 0.700"	1.165"	0.601" - 0.700"	1.300"
T80	n/a		0.701" - 0.800"	1.265"	0.701" - 0.800"	1.400"

U A 3 T20

Figure 3 - Part Number Breakdown of Dzus Studs

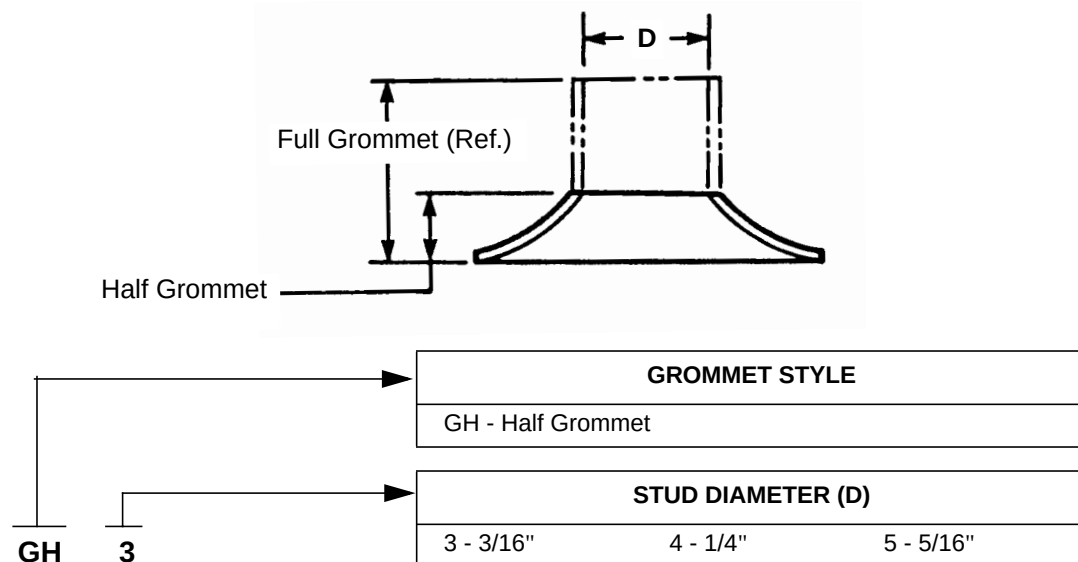


Figure 4 - Part Number Breakdown of Dzus Grommets

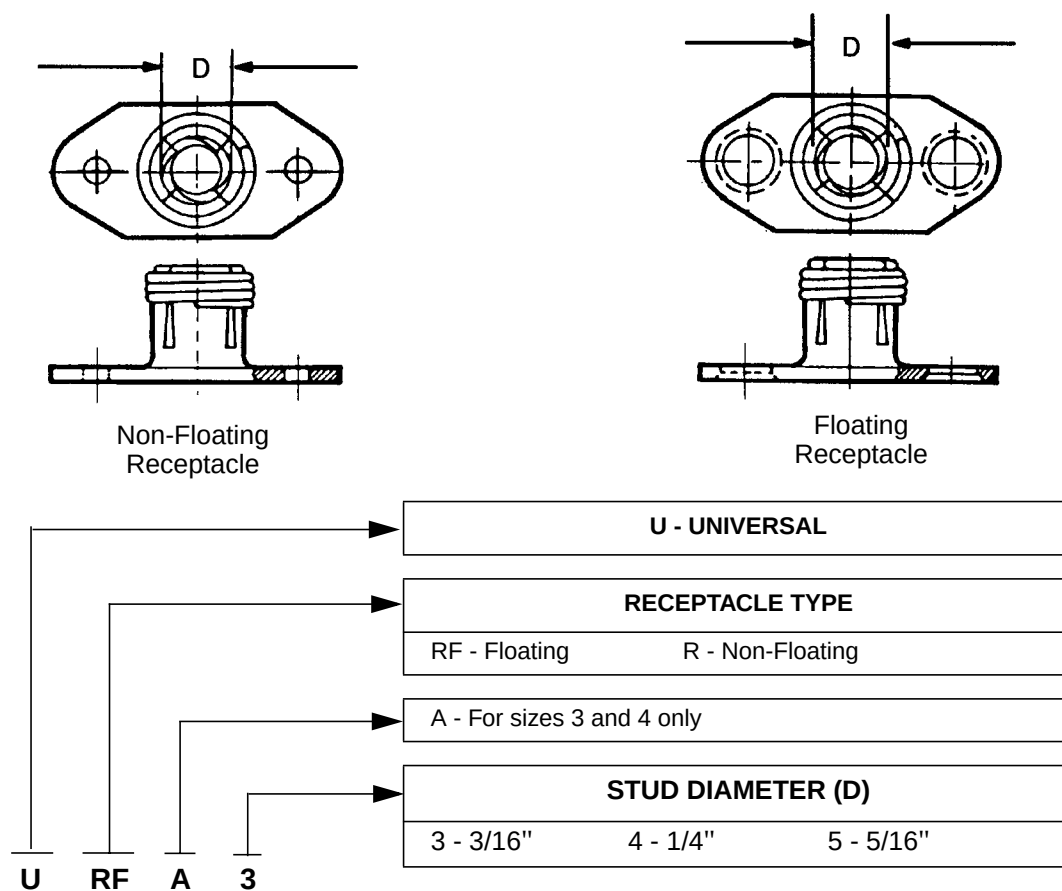


Figure 5 - Part Number Breakdown of Dzus Receptacles

4.2 Equipment

4.2.1 Drill jigs (e.g., TS.519.11.20 as specified in [Table 1](#)).

4.2.2 Dzus fastener installation tools (* = stud size):

- TP1H* flush head stud installation tool
- TB1A* oval head stud support block
- TP5A* hex or oval head stud installation tool

5 Procedure

5.1 General

5.1.1 Dzus Universal fasteners are spring loaded, quick release fasteners used to attach internal panels, external panels, and quick detachable plates which do not carry primary structural stress.

5.1.2 For the purposes of this standard, the part of the assembly in which the fastener stud is installed is termed the **panel** and the part to which the receptacle is riveted is termed the **support**.

5.1.3 Perform all drilling according to [PPS 1.09](#).

5.2 Preparation of Parts

5.2.1 Prepare stud and receptacle rivet holes in the **panel** and **support** as follows

Step 1. Except when installing flush head studs, pre-drill the stud pilot hole through the **panel** and the **support** simultaneously using a #40 (0.098") drill. Alternatively, it is acceptable to punch the pilot hole in the panel and support separately to according to [PPS 18.01](#) or [PPS 18.04](#), as applicable.

For installation of flush head studs, pre-drill the stud pilot hole **in the panel only** to 19/64" for dimpling. Pre-drill the stud pilot hole in the **support** using a #40 (0.098") drill. After drilling the stud pilot hole, dimple the **panel** according to [PPS 1.01](#) or [PPS 1.07](#), as applicable.

Step 2. Drill the stud hole in the **panel** to final size as specified in [Table 1](#).

Step 3. After final drilling, deburr the stud hole in the **panel** according to [PPS 27.05](#).

Step 4. Use a #40 (0.098") drill and the drill jig specified in [Table 1](#) to pre-drill receptacle rivet holes in the **support**.

Step 5. Drill the stud hole in the **support** to final size as specified in the following table.

Step 6. Deburr the stud hole in the **support** according to [PPS 27.05](#).

Table 1 - Hole Preparation Data

STUD SIZE	PANEL STUD HOLE FINAL SIZE	DRILL JIG NUMBER	SUPPORT STUD HOLE FINAL SIZE
3	3/16"	Use the receptacle to locate rivet holes.	11/32"
4	1/4"	TS.519.11.20 MK 27	15/32"
5	5/16"	TS.519.11.20 MK 31	45/64"
Note. In place of the TS.519.11.20 drill jigs specified herein it is acceptable for subcontractors to use equivalent non-TS drill jigs.			

5.3 Installation of Studs

5.3.1 Install flush head studs in **panels** as follows:

- Step 1. Insert the stud into the hole prepared in the **panel**.
- Step 2. Support the head of the stud with a flat surface plate.
- Step 3. Place the appropriate grommet over the cam end of the stud.
- Step 4. Place a TP1FH* stud installation tool over the stud and the grommet as shown in [Figure 6](#).
- Step 5. Firmly push the installation tool against the panel and strike the plunger with a soft faced mallet, applying sufficient force to clinch the grommet.

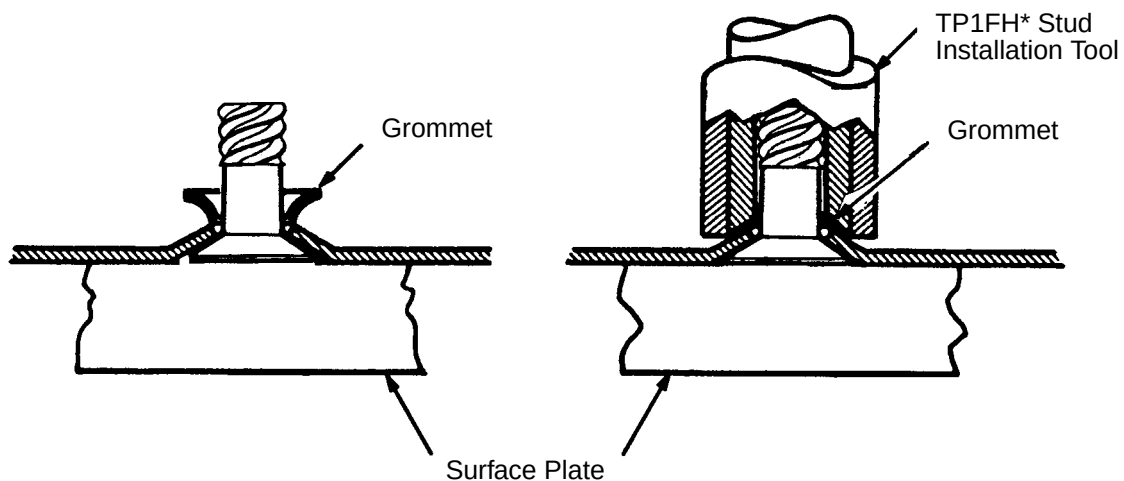


Figure 6 - Installation of Flush Head Stud

5.3.2 Install oval head and hexagon head studs as follows:

- Step 1. Insert the stud into the prepared hole in the panel.
- Step 2. For oval head studs, support the head of the stud with side 'C' of a TB1A* tool block (see Figure 7). For hexagon head studs, support the head of the stud with a surface plate (see Figure 8).
- Step 3. Place the correct diameter grommet over the cam end of the stud.
- Step 4. Place a TP5A* installation tool over the stud and grommet.
- Step 5. Firmly push the installation tool against the panel and strike the tool end with a soft faced mallet, applying sufficient force to flatten the grommet.

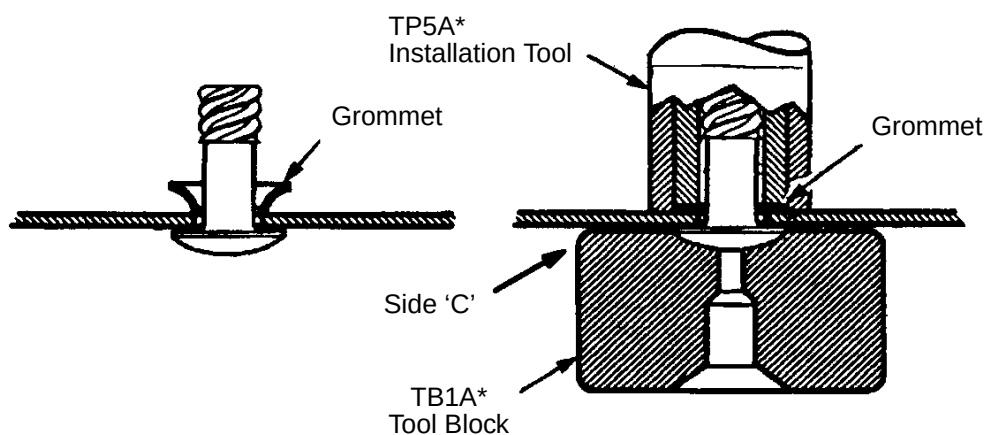


Figure 7 - installation of Oval Head Studs

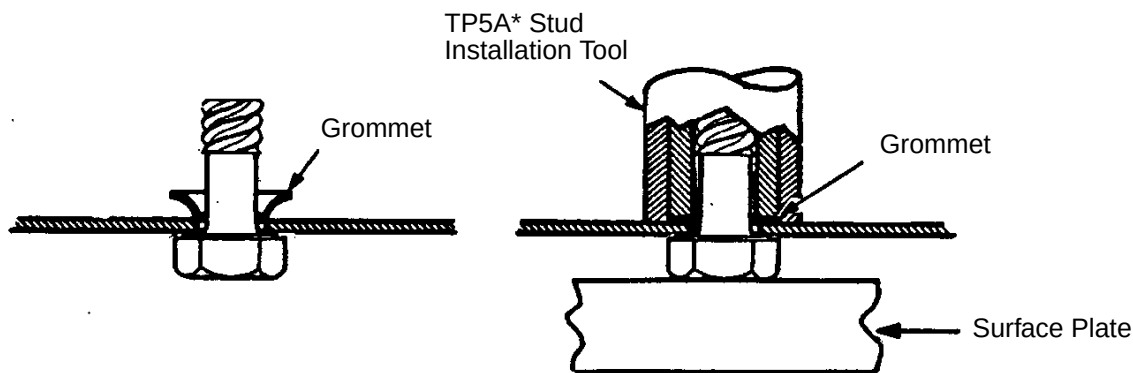


Figure 8 - installation of Hexagon Head Studs

5.4 Installation of Receptacle

5.4.1 Install receptacles as follows:

- Step 1. Countersink the rivet pilot holes on the side of the support which is to mate with the panel according to [PPS 2.01](#).
- Step 2. Open the rivet pilot holes to the final size according to [PPS 2.01](#)
- Step 3. Position the receptacle on the support.
- Step 4. Install rivets according to [PPS 2.01](#) as shown in [Figure 9](#) (flush head rivets) or [Figure 10](#) (protruding head rivets). For floating type receptacles, use spacers as specified in [Table 2](#).
- Step 5. For installed flush head rivets, shave the **manufactured** head of the rivet according to requirements of [PPS 2.01](#), if necessary. For installed protruding head rivets, shave the **shop** head flush according to the requirements of [PPS 2.01](#).

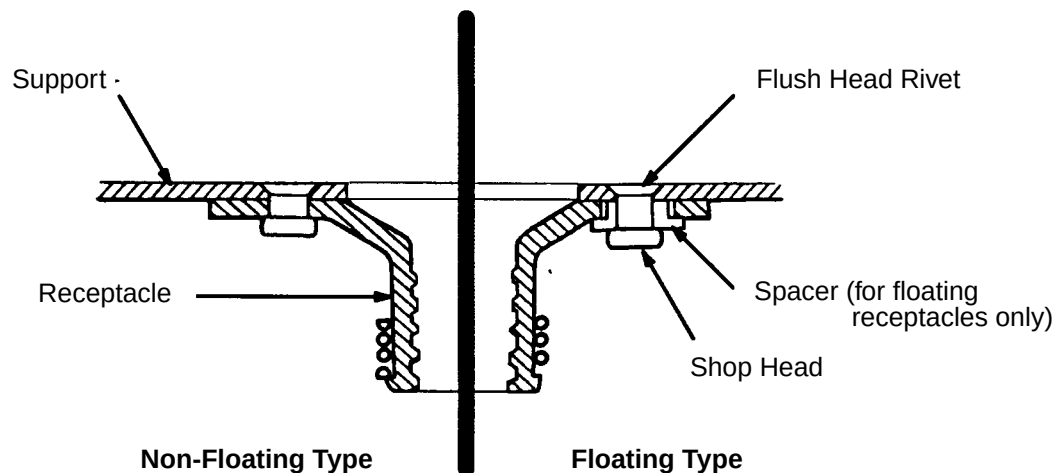


Figure 9 - Receptacle Installation Using Flush Head Rivets

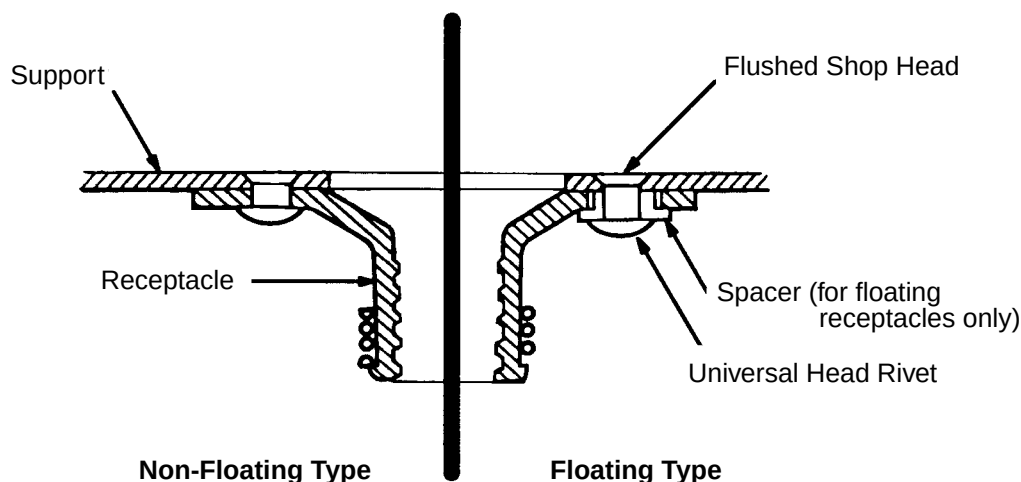


Figure 10 - Receptacle Installation Using Protruding Head Rivets

Table 2 - Spacers for Floating Receptacles

RECEPTACLE	SPACER
URFA3	URF3-3
URFA4	URF4-3
URFA5	URF5-3

6 Requirements

- 6.1 Fastener locations shall be as specified on the engineering drawing.
- 6.2 In the locked position, Dzus Universal fasteners shall be seated tightly without radial or axial movement.
- 6.3 The head of the flush head studs shall be flush with the panel within $\pm 0.015"$.
- 6.4 Ensure locking and unlocking of the fasteners is possible without undue force.

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 Dzus 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 make changes to Dzus tools.