BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 2.13

PRODUCTION PROCESS STANDARD

Installation of Standard Dzus Fasteners

Issue 7
- This standard supersedes PPS 2.13, 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	

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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for installing standard Dzus fasteners.

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 1.01 - Dimpling Aluminum Alloys.

3.2 PPS 1.07 - Dimpling Ferrous, Nickel, and Titanium Alloys.

3.3 PPS 1.09 - Drilling and Reaming.

3.4 PPS 1.33 - Countersinking for Flush Head Fasteners.

3.5 PPS 2.01 - Installation of Solid Rivets.

3.6 PPS 13.26 - General Subcontractor Provisions.

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

3.8 PPS 18.04 - Limitations on Shearing and Punching Titanium Alloys.

3.9 PPS 27.05 - Manual Edge Finishing Tools.

4 Materials and Equipment

4.1 Materials

4.1.1 Standard Dzus fasteners as specified on the engineering drawing. Refer to Figure 1 and Figure 2 for a general description and part number breakdown of the standard Dzus springs. Refer to Figure 3 and Figure 4 for a general description and part number breakdown of the standard Dzus studs. Refer to Figure 5 and Figure 6 for a general description and part number breakdown of the standard Dzus grommets.

S # A Type

S # Type

Figure 1 - General Description of Dzus Springs

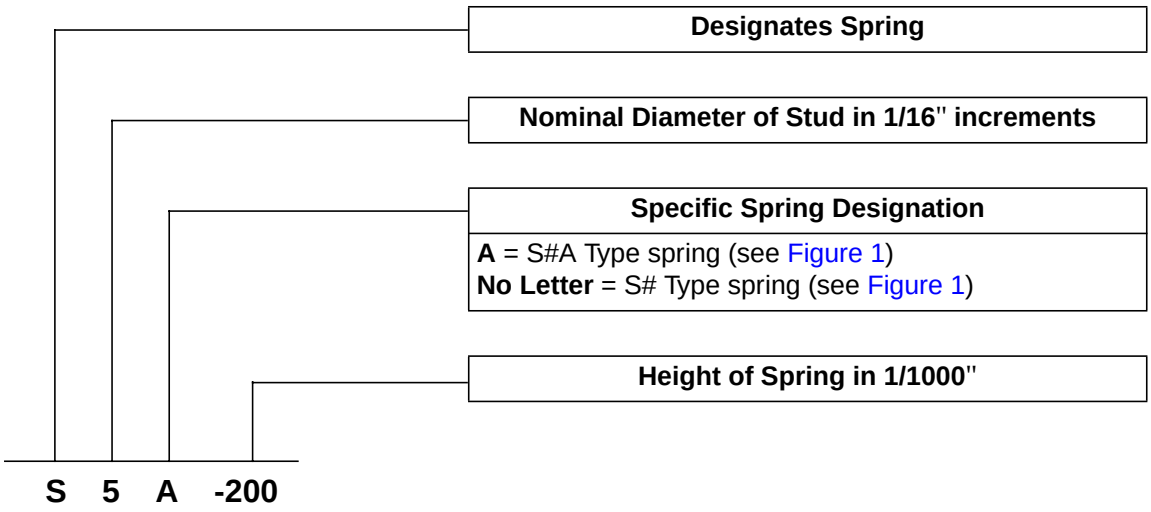
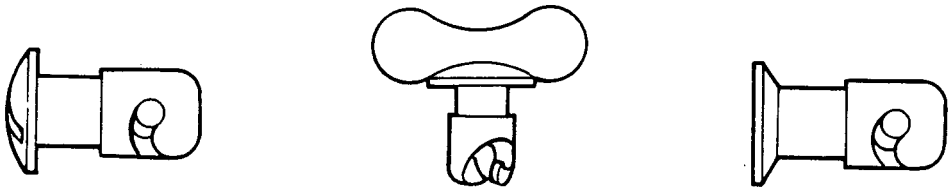


Figure 2 - Part Number Breakdown of Dzus Springs



A or AJ Type | AW or AWJ Type | F or FJ Type

Figure 3 - General Description of Dzus Studs

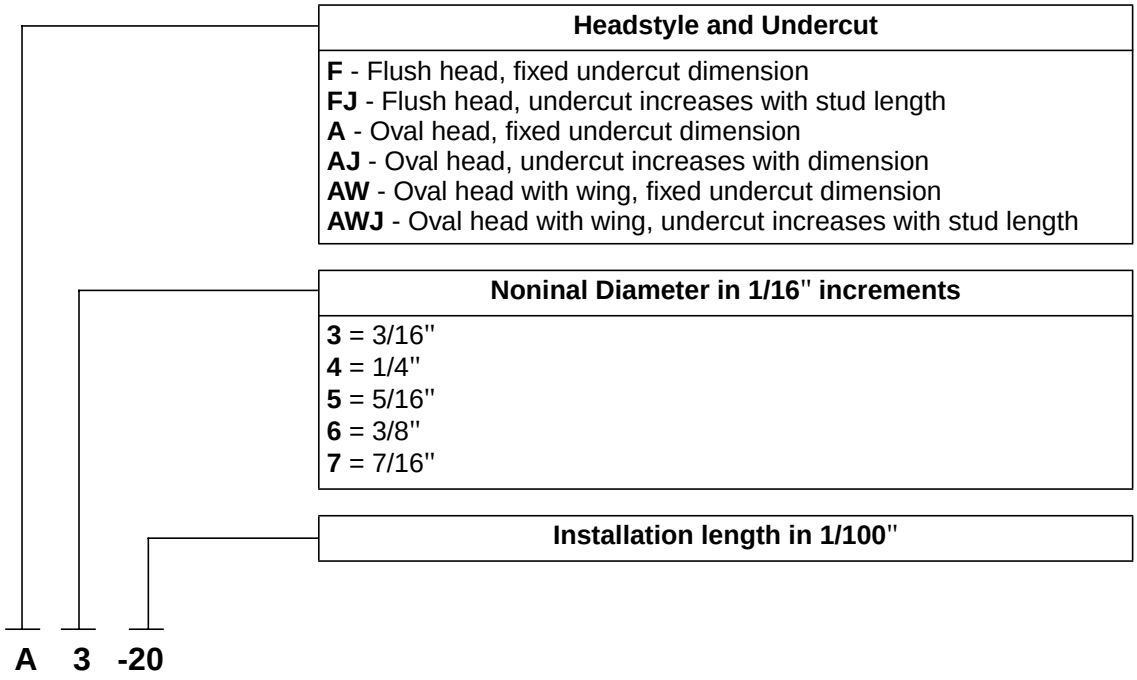
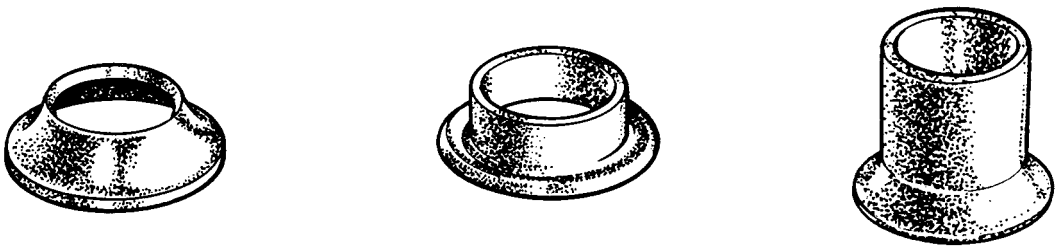


Figure 4 - Part Number Breakdown of Dzus Studs



GH Type | GF Type | GA Type

Figure 5 - General Description of Dzus Grommets

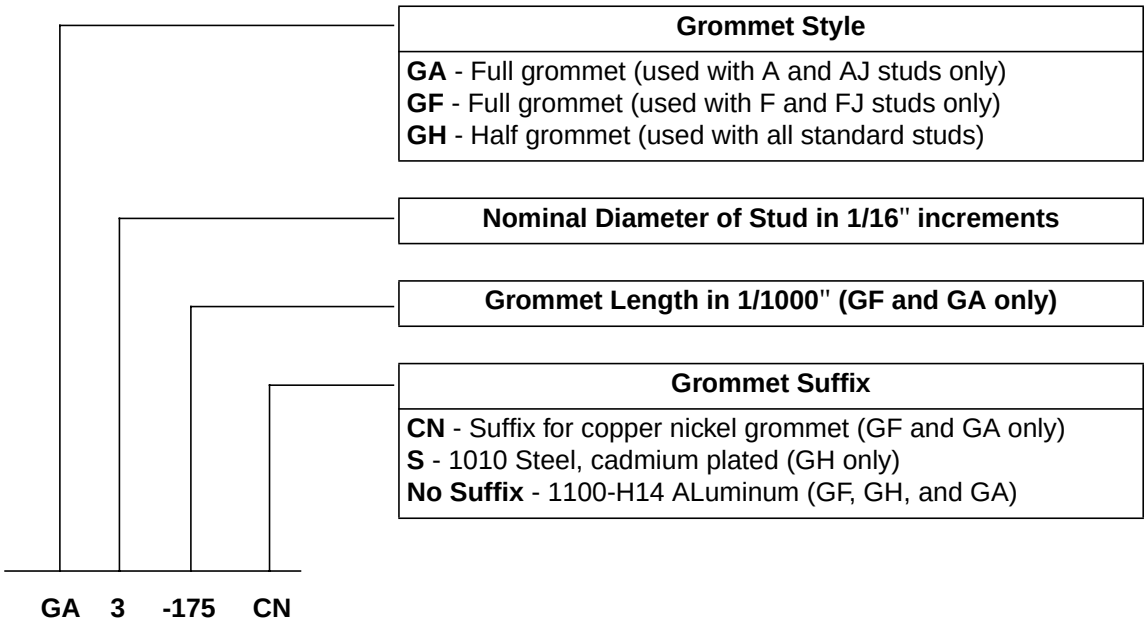


Figure 6 - Part Number Breakdown of Dzus Grommets

4.2 Equipment

4.2.1 Stud and grommet installation tools according to Table I.

4.2.2 Counterboring tools as specified in Table II.

4.2.3 Drill jigs as specified in Table III.

Table I - Dzus Tools for Installing Standard Dzus Fasteners

STUD SIZE	TOOL SET SELECTION		
	OVAL HEAD STUD	FLUSH HEAD STUD	
		WITH GROMMET	WITHOUT GROMMET
-3 (3/16")	A3		FO3
-4 (1/4")	A4	F4	FO4
-5 (5/16")	A5	F5	FO5
-6 (3/8")	A6	F6	FO6
-7 (7/16")	A7	F7	FO7

Table II - Hole Preparation Data for Dzus Studs

STUD SIZE	DRILL SIZE FOR DISHING	COUNTERBORING (Note 1)				PRE-DRILL FOR DIMPLING	STUD HOLE FINAL DRILL			
		MARK NO. (Note 2)	PRE DRILL FOR C'BORE	C'BORE DIA.	C'BORE DEPTH ±0.005"		OVAL HEAD STUD		FLUSH HEAD STUD	
							WITH GH GROMMET	WITH GA GROMMET	WITH GF GROMMET	WITHOUT GROMMET
3	3/16"	3	3/32"	3/8"	0.020"	---	3/16"	7/32"	---	---
4	1/4"	6	3/16"	15/32"	0.030"	#6	1/4"	5/16"	5/16"	1/4"
5	5/16"	10	1/4"	19/32"	0.035"	---	5/16"	3/8"	---	---
6	3/8"	12	1/4"	21/32"	0.035"	---	3/8"	7/16"	---	---
7	7/16"	16	3/8"	25/32"	0.045"	---	7/16"	17/32"	---	---

Note 1: Counterbore dimensions also apply to hole preparation data for spring.
Note 2: Applies to double ended, back spot facet toots as listed in TS.561.51.10.

Table III - Hole Preparation Data for Dzus Springs

STUD SIZE	RIVET HOLE			STUD HOLE		
	TS.519.11.20 DRILL JIG	DRILL SIZE FOR RIVETS	COUNTERSINK DIAMETER	DRILL SIZE FOR DISHING	PRE-DRILL FOR DIMPLING	STUD FINAL DRILL SIZE
3	---	#40	0.165" - 0.175"	3/16"	---	7/32"
4	MK 27	#40		1/4"	1/4"	9/32"
5	MK 31	#30	0.211" - 0.221"	5/16"	---	11/32"
6	MK 32	#30		3/8"	---	13/32"
7	---	#30		7/16"	---	15/32"

5 Procedure

5.1 General

5.1.1 Standard Dzus fasteners are spring loaded, quick release, fasteners used to attach panels and covers to console units, cowlings, etc.

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 spring is riveted is termed the support.

5.2 Preparation of Parts

5.2.1 General

5.2.1.1 If possible, before preparing the panel and support, drill a 0.098" pilot hole at the location for the stud hole through the panel and support simultaneously in order to ensure correct hole alignment.

5.2.1.2 Perform all drilling of holes according to PPS 1.09.

5.2.1.3 After final drilling, deburr holes according to PPS 27.05.

5.2.2 Preparation of Panels for Installation of Oval Head Studs

5.2.2.1 If dishing of the panel is specified on the engineering drawing, prepare the stud hole in the panel as follows.

Step 1. Drill the stud hole for dishing according to Table II.

Step 2. Select the appropriate tool set from Table I.

Step 3. Position the panel on block #2, side D, with the block on the side of the panel in which the stud is inserted (see Figure 7).

Step 4. Place the dishing punch (tool #2) in the block as shown in Figure 7 and strike the punch with a soft faced mallet so as to completely form the panel into the dished recess in the block.

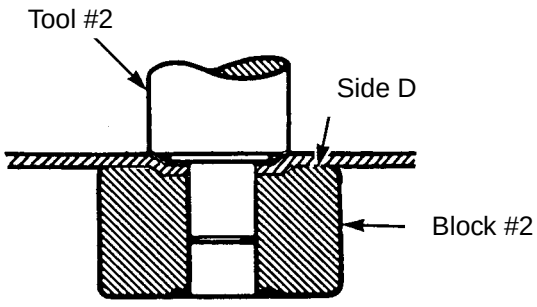


Figure 7 - Dishing of Panels or Supports

5.2.2.1.1 If counterboring of the panel is specified, prepare the stud hole in the panel as follows.

Step 1. Pre-drill the stud hole for counterboring according to Table II.

Step 2. Select the appropriate diameter counterbore tool from Table II.

Step 3. Counterbore the panel on the side which mates with the support to the depth specified in Table II.

Step 4. Drill the stud hole to final size according to Table II.

5.2.2.1.2 If neither counterboring or dishing of the panel is specified, drill the stud hole in the panel to final size according to Table II.

5.2.2.2 Preparation of Panels for Installation of Flush Head Studs

5.2.2.2.1 Prepare panels for installation of flush head studs as follows:

Step 1. Pre-drill the stud hole for dimpling according to Table II.

Step 2. Ram coin dimple the stud hole in the panel according to PPS 1.01 or PPS 1.07, as applicable.

Step 3. Drill the stud hole to final size according to Table II.

5.2.3 Preparation of Supports

5.2.3.1 Prepare rivet holes as follows:

Step 1. If not already prepared, pre-drill the stud hole to 0.098".

Step 2. Locate and drill rivet holes for the spring. If available, use of the appropriate drill jig, according to Table III, is recommended.

Step 3. Countersink the rivet holes to the size specified in Table III on the side of the support which is to mate with the panel according to PPS 1.33.

5.2.3.2 If dishing of the support is specified, prepare the hole in the support as follows.

Step 1. Prepare the stud hole to size for dishing according to Table III.

Step 2. Select the appropriate tool set from Table I.

Step 3. Position the support on block #2, side D, with the block on the side of the support to which the spring shall be attached.

Step 4. Place dishing punch (tool #2) in the block as shown in Figure 7 and strike the punch with a soft faced mallet so as to completely form the support into the dished recess in the block.

5.2.3.3 If counterboring of the support is specified on the engineering drawing, prepare the hole in the support as follows.

Step 1. Pre-drill the hole for counterboring according to Table II.

Step 2. Select the appropriate diameter counterbore tool from Table II.

Step 3. Counterbore the support on the side which mates with the panel to the depth specified in Table II.

Step 4. Drill the stud hole to final size according to Table III.

5.2.3.4 If dimpling of the support is specified, prepare the hole as follows.

Step 1. Pre-drill the stud hole for dimpling according to Table III.

Step 2. Select the appropriate tool set from Table I.

Step 3. Position the support on block #2, with the block on the side of the support to which the spring shall be attached.

Step 4. Place the dimpling punch (tool #2) in the block as shown in Figure 8 and strike the punch with a soft faced mallet so as to completely form the panel into the dimple recess in the block.

5.2.3.5 If neither countersinking, counterboring nor dishing of the support is specified, drill the hole in the support to final size according to Table III.

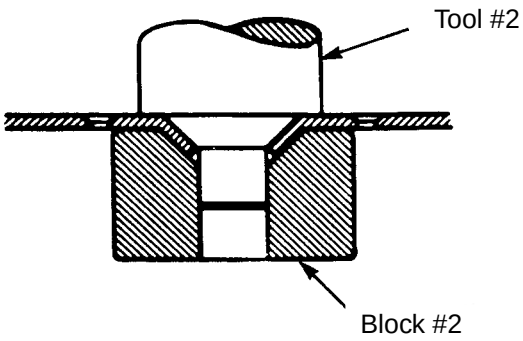


Figure 8 - Dimpling of Supports

5.3 Installation of Studs

5.3.1 Installation of Oval Head Studs with GA Grommets

5.3.1.1 Install oval head studs with GA grommets as follows (see Figure 9):

Step 1. Select the appropriate tool set from Table I.

Step 2. Insert the grommet in the prepared hole in the panel. Support the grommet on block #2, side A.

Step 3. Insert tool #1 into the grommet and partially clinch the grommet by lightly striking tool #1 with a soft faced mallet.

Step 4. Insert the stud into the grommet. Use a soft faced mallet to strike the head of the stud.

Step 5. Place tool #3 over the stud and grommet. Using a soft faced mallet, strike the tool with sufficient force to fully clinch the grommet.

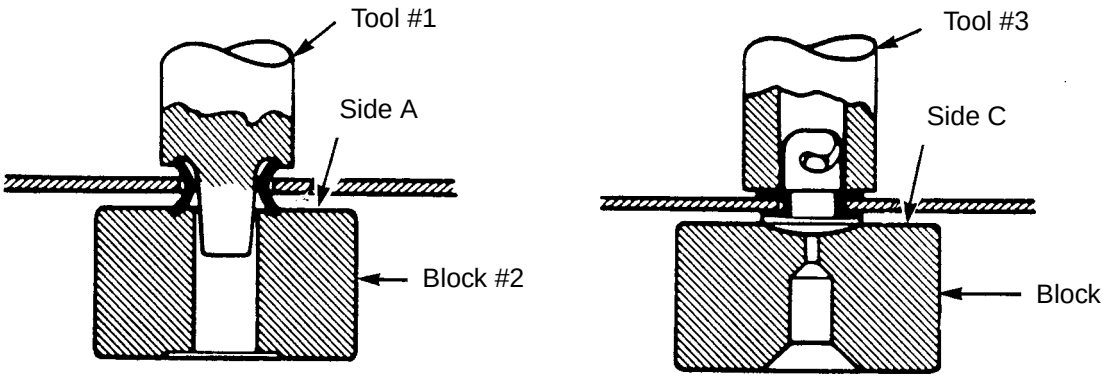


Figure 9 - Installation of Oval Head Studs with GA Grommets

5.3.2 Installation of Oval Head Studs with GH Grommets

5.3.2.1 Install oval head studs with GH grommets as follows (see Figure 10):

Step 1. Select the appropriate type A tool set from Table I.

Step 2. Insert the stud into the prepared hole in the panel. Turn the panel over and support the head of the stud on block #1, side C.

Step 3. Place the correct size grommet over the cam end of the stud.

Step 4. Place tool #5 over the stud and the grommet. Using a soft faced mallet, strike the tool with sufficient force to flatten the grommet.

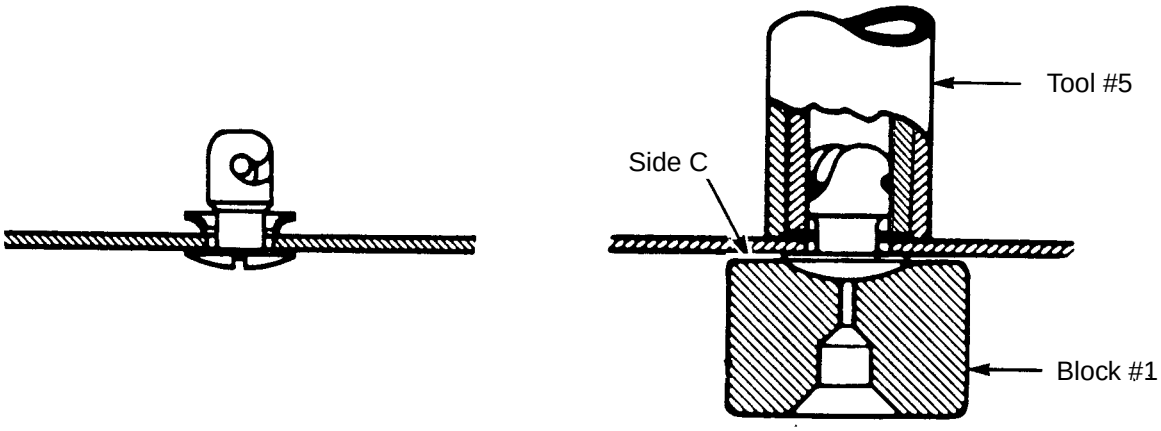


Figure 10 - Installation of Oval Head Studs with GH Grommets

5.3.3 Installation of Flush Head Studs with GF Grommets

5.3.3.1 Install flush head studs with GF grommets as follows (see Figure 11):

Step 1. Select the appropriate tool set from Table I.

Step 2. Insert the grommet into the prepared hole from the protruding side of the dimple. Support the grommet on block #3.

Step 3. Insert tool #3 onto the grommet and fully clinch the grommet by striking tool #3 with a soft faced mallet.

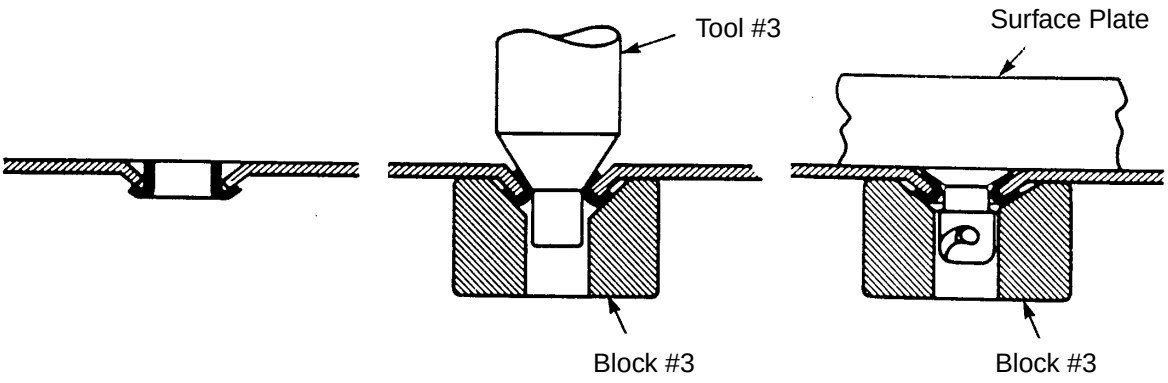


Figure 11 - Installation of Flush Head Studs with GF Grommets

Step 4. Insert the stud into the grommet.

Step 5. Place the flat surface plate over the head of the stud and clinch the stud by striking the surface plate with a soft faced mallet.

5.3.4 Installation of Flush Head Studs without Grommets

5.3.4.1 Install flush head studs without grommets as follows (see Figure 12):

Step 1. Select the appropriate tool set from Table I.

Step 2. Insert the stud into the prepared hole of the panel.

Step 3. Place the stud and panel on block #3 with the cam on the stud inserted into the block.

Step 4. Place the flat surface plate over the head of the stud and clinch the stud by striking the surface plate with a soft faced mallet.

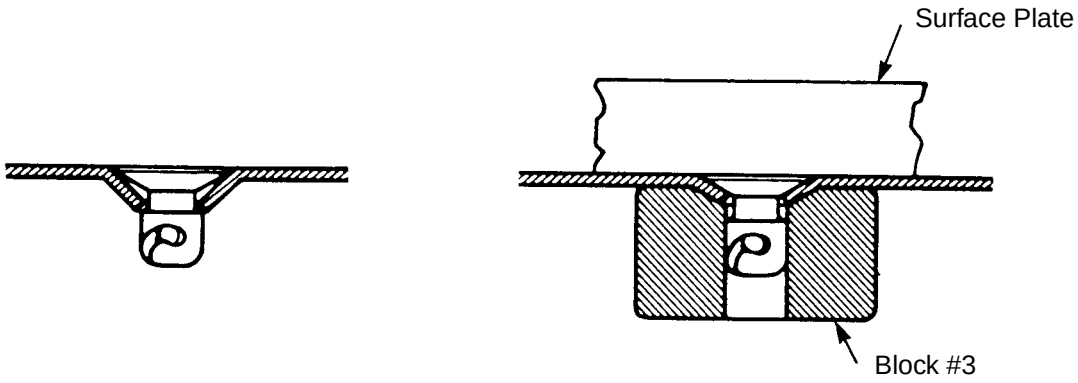


Figure 12 - Installation of Flush Head Studs without Grommets

5.4 Installation of Springs

5.4.1 Install springs as follows (see Figure 13):

Step 1. Rivet springs to the support with the manufactured head of the rivet on the spring side of the support according to PPS 2.01.

Step 2. Shave countersunk shop heads of solid rivets flush with the support to ensure proper mating of the panel.

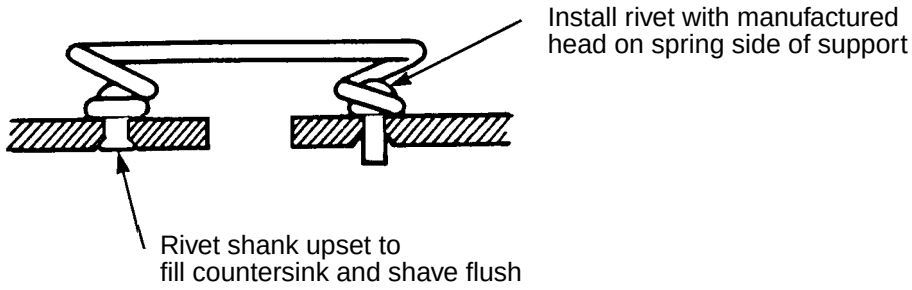


Figure 13 - Installation of Springs

6 Requirements

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

6.2 In the locked position, standard Dzus fasteners shall be seated tightly without radial or axial play.

6.3 Heads of F type fasteners must be flush with the panel within 0.015".

6.4 Locking or unlocking of slotted head fasteners shall be possible without excessive force. Winged fasteners shall be readily locked and unlocked by hand without the use of any tool.

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 standard Dzus fasteners 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 Do not make any changes to Dzus fastener installation tools without proper authorization.