BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 2.08

PRODUCTION PROCESS STANDARD

Installation of Blind Type, Electrical Bonding and Grounding Terminal Studs

Issue 7
- This standard supersedes PPS 2.08, 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 PPS (Production Process Standard) specifies the procedure and requirements for installation of blind type, electrical bonding and ground terminal studs in aircraft parts and assemblies.

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 13.26 - General Subcontractor Provisions.

3.3 PPS 27.05 - Manual Edge Finishing Equipment.

4 Materials and Equipment

4.1 Materials

4.1.1 Blind type, electrical bonding and ground terminal studs as specified on the engineering drawing. Refer to Figure 1 for a general description of a blind type, electrical bonding and ground terminal stud. Refer to Figure 2 for a breakdown of the Voi-Shan E-M stud part number. Refer to Figure 3 for a breakdown of the Military Standard part number. Refer to Figure 4 and Figure 5 for a breakdown of B0807006 and B0807007 part numbers, respectively.

4.1.2 Temporary protective caps (e.g., E-Z tab vinyl closures or Cap Plugs Division J5-1544-5500 plastic caps).

4.2 Equipment

4.2.1 Pneumatic power tools, pulling heads, and pulling head adapters as listed in Table 2.

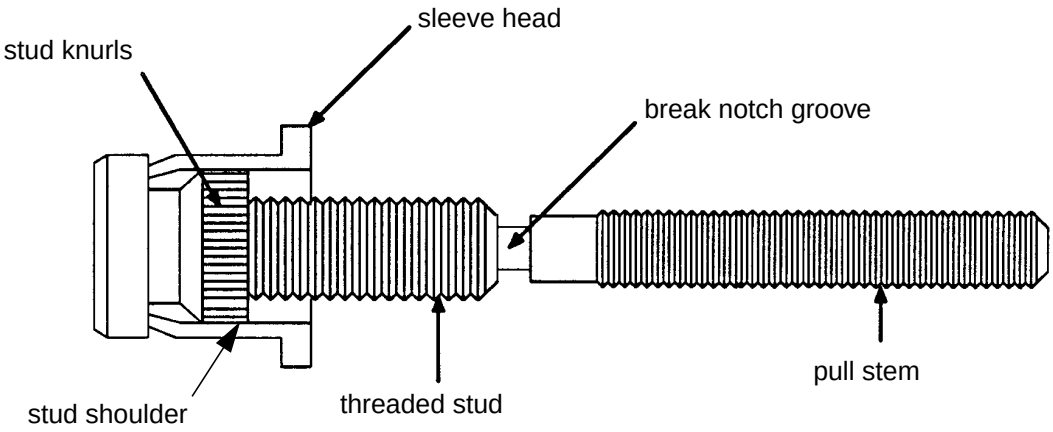


Figure 1 - General Description of Blind Type Terminal Stud

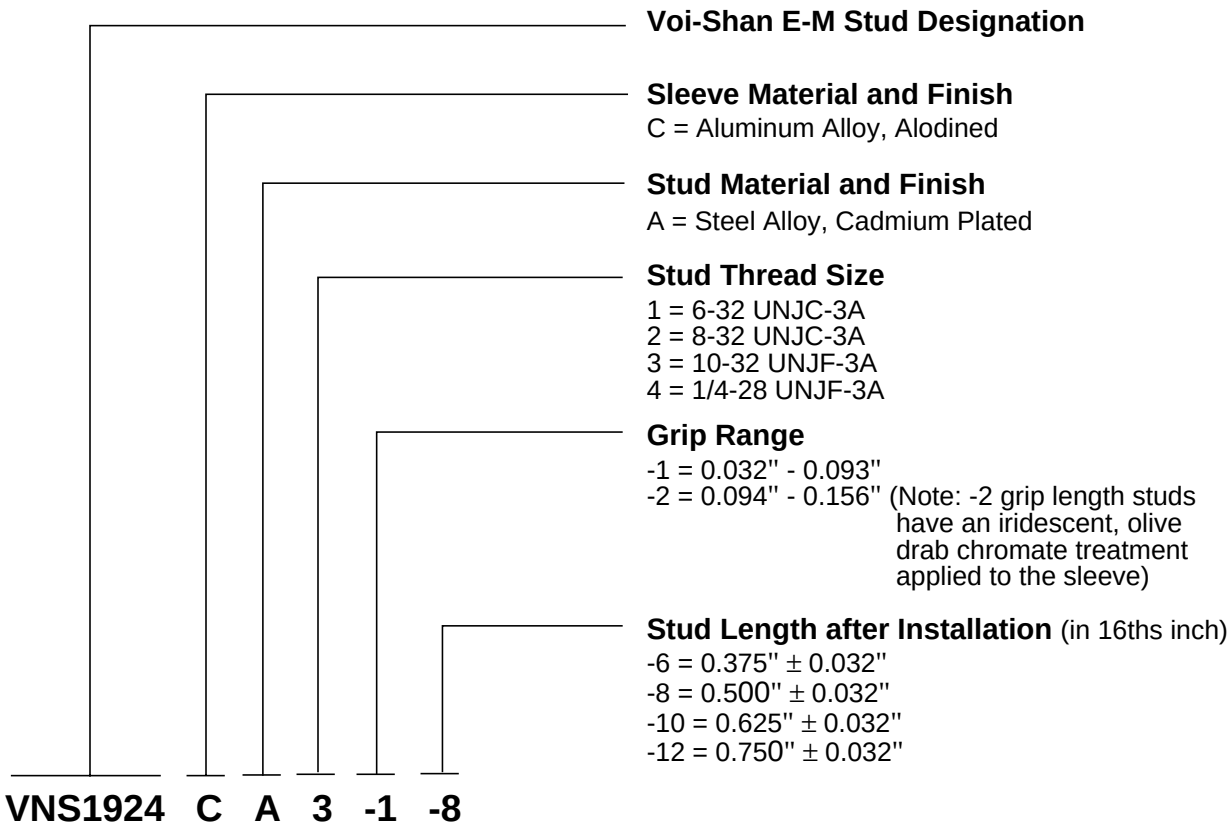


Figure 2 - Voi-Shan E-M Stud Part Number Breakdown

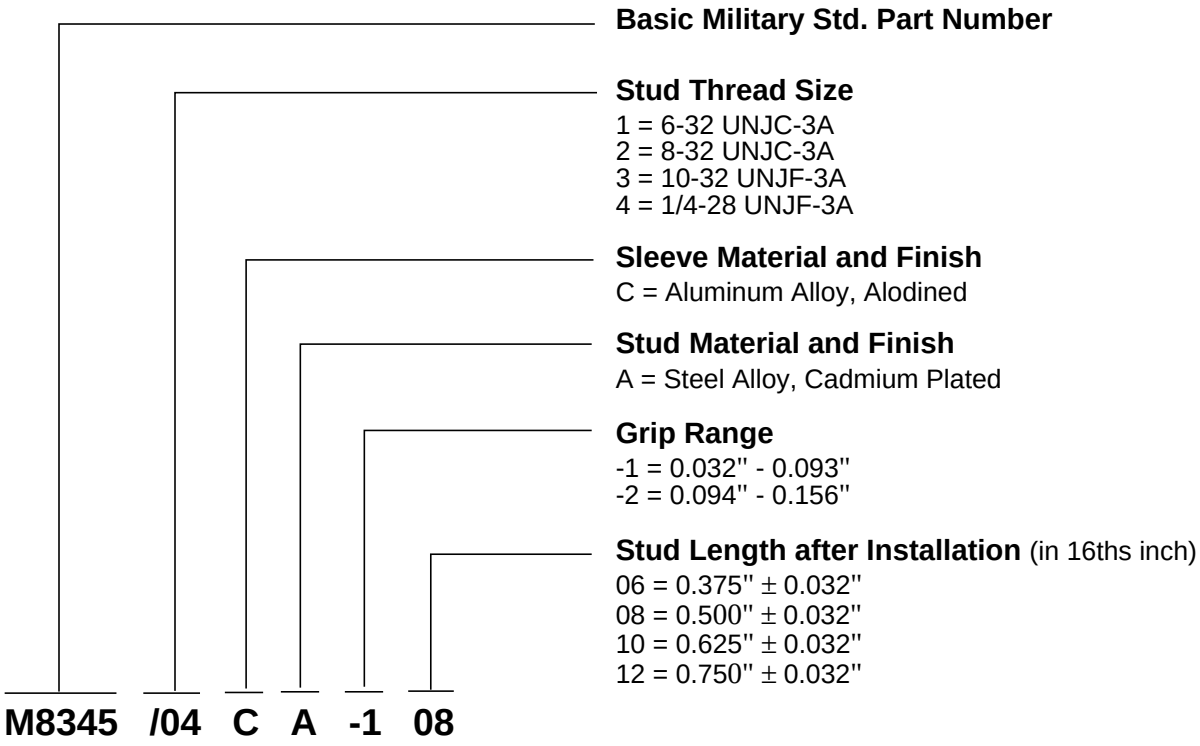


Figure 3 - Military Standard Part Number Breakdown

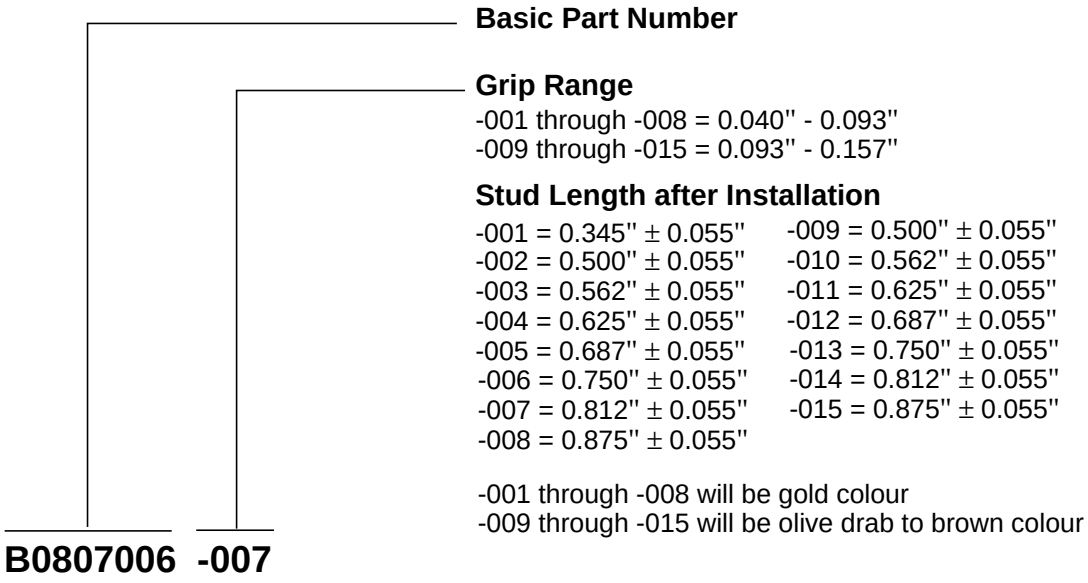


Figure 4 - B0807006 Part Number Breakdown

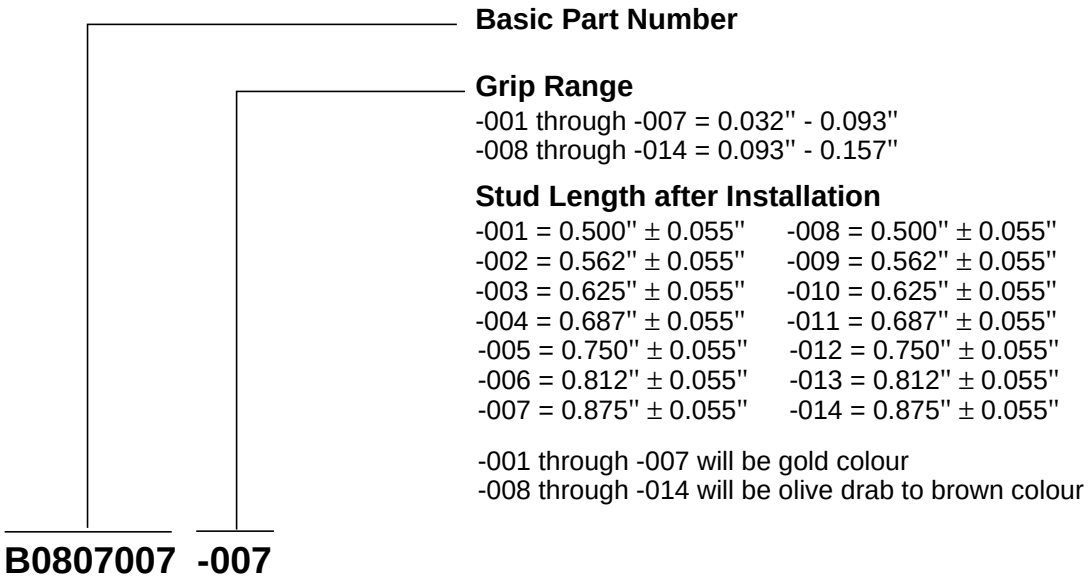


Figure 5 - B0807007 Part Number Breakdown

5 Procedure

5.1 General

5.1.1 Blind type, electrical bonding and ground terminal studs are blind fasteners used for attachment of electrical bonding jumpers and mechanical attachments.

5.1.2 The stud is set in the prepared hole by means of a single action pulling tool which pulls the stem to form the blind head and then breaks the stem from the shank at a predetermined load. To ensure satisfactory electrical bonding, it is imperative that the stud hole be completely free of non-conductive treatments or coatings (anodic coating, primer, etc.) before installing the E-M stud.

5.1.3 Blind type, electrical bonding and ground terminal studs utilize the fastener hole to establish the electrical conductivity. Therefore, the electrical bond contact area is limited to the fastener hole and it is necessary to ensure only that the hole is free of non-conductive coatings; do not remove non-conductive coatings from other surfaces in the area in which the ground stud is to be installed.

5.2 Preparation of Parts

5.2.1 After application of all protective treatments to the part, drill stud holes according to PPS 1.09 and to the final hole size specified in Table 1.

5.2.2 After drilling, remove the standing burr from the exit side of the rivet hole according to PPS 27.05.

Table 1 - Hole Preparation Data

STUD THREAD SIZE	RECOMMENDED DRILL SIZE	HOLE SIZE LIMITS
6-32 UNJC-3A	7/32"	0.219" - 0.223"
8-32 UNJC-3A	1/4"	0.250" - 0.254"
10-32 UNJF-3A or .190-32 UNJF-3A	5/16"	0.3125" - 0.3165"
1/4-28 UNJF-3A	3/8"	0.375" - 0.379"

5.3 Assembly of Pulling Head to Gun

5.3.1 Assemble the pulling head on the installation gun as follows (see Figure 6):

Step 1. Select the appropriate pulling head from Table 2 for the size of stud to be installed. Right angle pulling heads are used only in limited access applications.

Step 2. When using a Cherry G-784 installation gun, thread a 680B46 adapter fully onto the nosepiece and piston rod before installing the pulling head.

Step 3. Engage the threads of the pulling head drawbolt onto the piston rod and rotate the pulling head clockwise, simultaneously engaging the pulling head sleeve threads.

Step 4. Thread the pulling head fully onto the gun and back-off as required to position the pulling head in the required alignment and hand tighten the jam nut to secure.

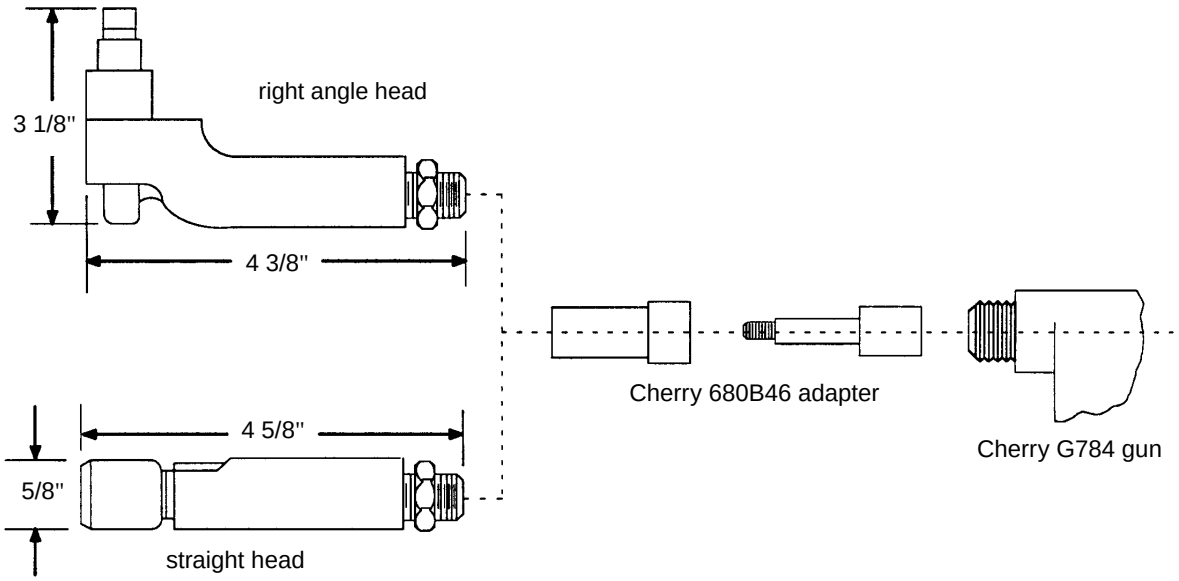


Figure 6 - Installing Pulling Head onto Power Tool

Table 2 - Installation Tools

STUD THREAD SIZE	INSTALLATION TOOLING		
	VOI-SHAN PULLING HEAD		PNEUMATIC POWER TOOL
	STRAIGHT	RIGHT ANGLE	
6-32 UNJC-3A	VST 1116-06	VST 1049-06	Cherry G-784 (Note 1)
8-32 UNJC-3A	VST 1116-08	VST 1049-08	
10-32 UNJF-3Aor .190-32 UNJF-3A	VST 1116-10	VST 1049-10	
1/4-28 UNJF-3A	VST 1091-4	VST 1049-4	Cherry G-88

Note 1. Use a Cherry 680B46 pulling head adapter to attach Voi-Shan pulling heads to the pneumatic power tool.

5.4 Fastener Installation

5.4.1 Install fasteners as follows (see Figure 7):

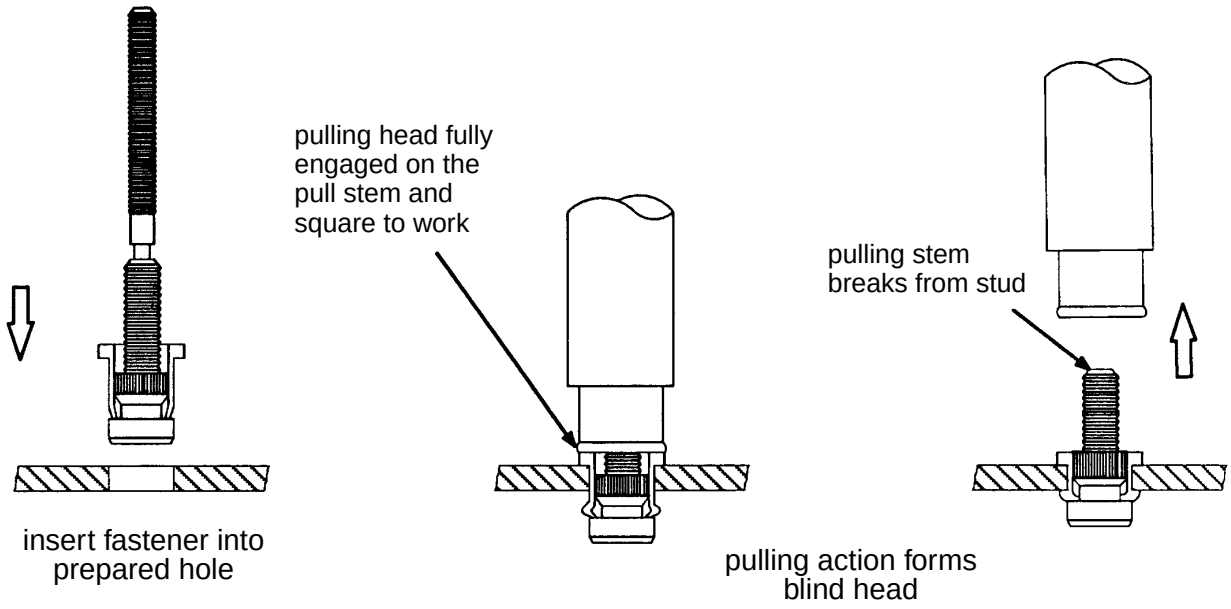


Figure 7 - Fastener Installation

Step 1. Insert the sleeve of the fastener into the prepared hole. When installing terminal studs in minimum grip applications (i.e., 0.032" gauge material), place one AN960D-L washer between the stud and the sheet.

Step 2. Place the pulling head fully onto the pull stem so that the pulling head rests against the sleeve head.

Step 3. Holding the gun square to the surface of the work, push the pulling head of the gun firmly against the sleeve head.

Step 4. Squeeze the trigger of the gun to set the stud and break off the pull stem. Release the trigger to eject the pull stem.

Step 5. Protect the threaded portion of the installed fastener from paint, primer or damage using masking tape, E-Z tab caps or J5-1544-5500 plastic caps.

5.5 Removal of Installed Fastener

5.5.1 As necessary, remove installed fasteners as follows:

Step 1. To prevent damage to thin gauge material, support the structure from the reverse side using a suitable support block and strike the threaded end of the stud sharply with a hammer to disengage the stud from the sleeve.

Step 2. Ream or drill through the fastener sleeve to remove it from the hole, using a reamer or drill of the same diameter as the drill size specified in Table 1 for the applicable fastener.

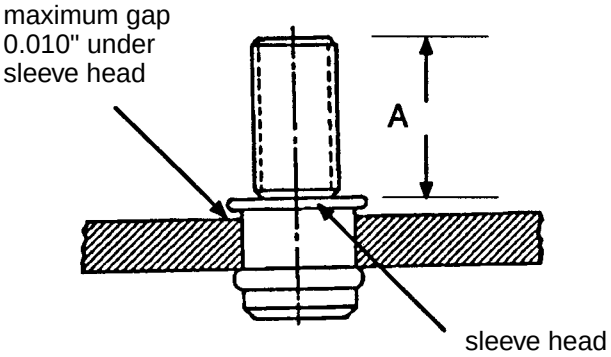
6 Requirements

6.1 Cracked, loose or damaged fasteners are not acceptable.

6.2 A gap under one side of the sleeve head is acceptable provided that a 0.010" feeler gauge does not touch the fastener shank.

6.3 Use of one AN960D-L washer between the stud and the sheet is acceptable for terminal studs installed in minimum grip applications (i.e., 0.032" gauge material).

6.4 Visually check that the stud shoulder (see Figure 1) is flush to approximately 1/16" below flush with the sleeve head. If doubt exists, check the stud length according to Figure 8.



STUD LENGTH DASH NUMBER	A	
	MIN.	MAX.
6	.343″	.407″
8	.478″	.532″
10	.593″	.657″
12	.718″	.782″

Figure 8 - Stud Length

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 blind type, electrical bonding and grounding terminal studs must have a good working knowledge of the procedure and requirements as specified herein and must have exhibited their competency to their supervisor.

9 Recommended Maintenance of Equipment

9.1 Keep installation tools clean and oil or grease all moving parts regularly. Inject a few drops of light machine oil into the air inlet of air tools daily.

9.2 Check installation tools and accessories periodically according to the schedule established. Replace damaged or badly worn parts independently from the periodic check-up.

9.3 Any rework or alternation of installation tools is prohibited unless appropriately authorized.