BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 9.51

PRODUCTION PROCESS STANDARD

Assembly of Terminal Lugs to Terminal Boards, Strain Relief Clamps and Components

Issue 1
- This is a new standard.
- This PPS is effective as of the distribution date.
- Validation of issue status is the responsibility of the user. Signed original on file.

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	Core Methods - PPS		

Issue 1 – Summary of Changes.

This is a new PPS based upon information previously specified in PPS 9.04 Issue 48.

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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for assembly of terminal lugs to terminal boards.

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.

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 General

3.1.1 Unless a specific issue is indicated, the issue of the reference documents specified in this section in effect at the time of manufacture shall form a part of this specification to the extent indicated herein.

3.2 Bombardier Toronto (de Havilland) Process Specifications

3.2.1 PPS 9.39 - Installation and Termination of Braided Shields for EMI & HIRF Protection of Wire Harnesses on DASH 8 Series 400 Aircraft.

3.2.2 PPS 13.26 - General Subcontractor Provisions.

3.2.3 PPS 14.01 – Torquing & Tightening.

4 Materials

4.1 Unless otherwise specified in this section, use only the materials specified; use of superseding or alternative materials is not allowed.

4.2 NAS43 spacers, 2024 aluminum alloy with a FC (chemical film) finish (i.e., Finish Code FC).

4.3 NAS1149DN332J washers, 2024-T3 aluminum alloy, 0.250” dia., 0.032” thick, chemical film finish.

5 Procedure

5.1 General

5.1.1 Install wire assemblies so that they are not under any tension.

5.1.2 Torquing of nuts, bolts and screws, where specified on the engineering drawing or wiring list, must be according to PPS 14.01.

5.2 Assembly of Terminal Lugs to MS27212 Terminal Boards

5.2.1 Install terminal lugs and attachment hardware on MS terminal boards as specified on the engineering drawing, DS 41, and as follows.

5.2.1.1 Except when securing terminal lugs to MS or AN terminal board covers, attach no more than 4 terminal lugs to any stud. Attach no more than 2 lugs to a stud used to secure MS or AN terminal board covers.

5.2.1.2 Position terminal lugs against the adjacent terminal board guide post so as to prevent rotation or movement of the lug in a counter clockwise direction, which would cause loosening of the terminal stud hardware (see Figure 1). If 2 terminal lugs are to be assembled onto a terminal stud, install the lugs in either a “V” arrangement or from both sides of the board so as to eliminate interference between the crimped barrels (see Figure 1). If it is necessary to assemble 3 or 4 lugs on one stud from the same side of the terminal board, use the arrangement shown in Figure 1.

5.2.1.3 If a torque value is **not** specified by the engineering drawing, use a suitable wrench to tighten the nut until the base of the nut rests firmly against the terminal lugs being secured and resistance increases sharply, then tighten a further 1/4 turn.

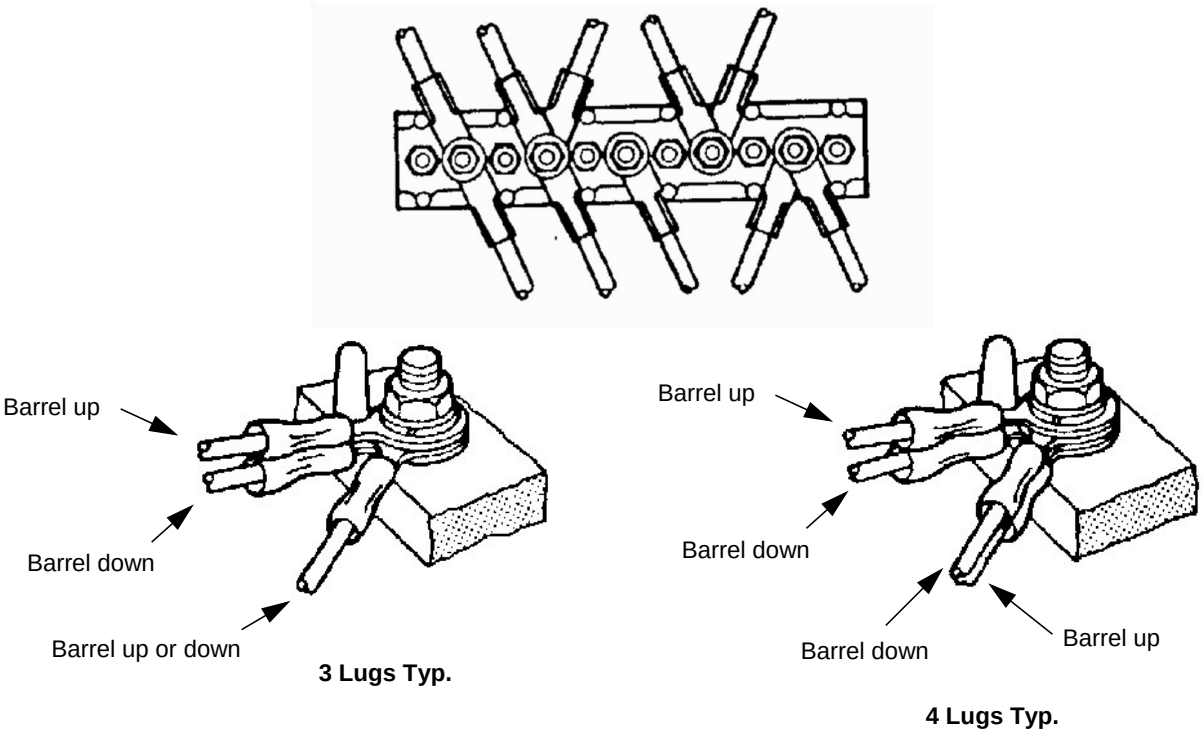

Figure 1. Assembly of Terminal Lugs to MS27212 Terminal Boards

5.3 **Assembly of Terminal Lugs to Ward Brooke Terminal Boards**

5.3.1 Install terminal lugs on Ward Brooke terminal boards as specified on the engineering drawing and as follows.

5.3.1.1 If assembling 2 terminal lugs to a terminal stud, place the first lug barrel down and the second lug barrel up. This eliminates interference between the crimped barrels (see Figure 2). If assembling 3 or 4 terminal lugs to a terminal stud, separate each pair of lugs by means of a spacer. This eliminates interference between crimped barrels (see Figure 2).

5.3.1.2 Take care when tightening the self-locking nut and washer assembly on Ward Brooke terminal studs to ensure that the nut is secure without over tightening. If a torque value is **not** specified by the engineering drawing, use a suitable wrench to tighten the nut until the base of the nut rests firmly against the terminal lugs being secured and resistance increases sharply, then tighten a further 1/4 turn.

5.3.1.3 Do not attach lugs to the cover studs of Ward Brooke 1114, 1146 and 1177 terminal blocks

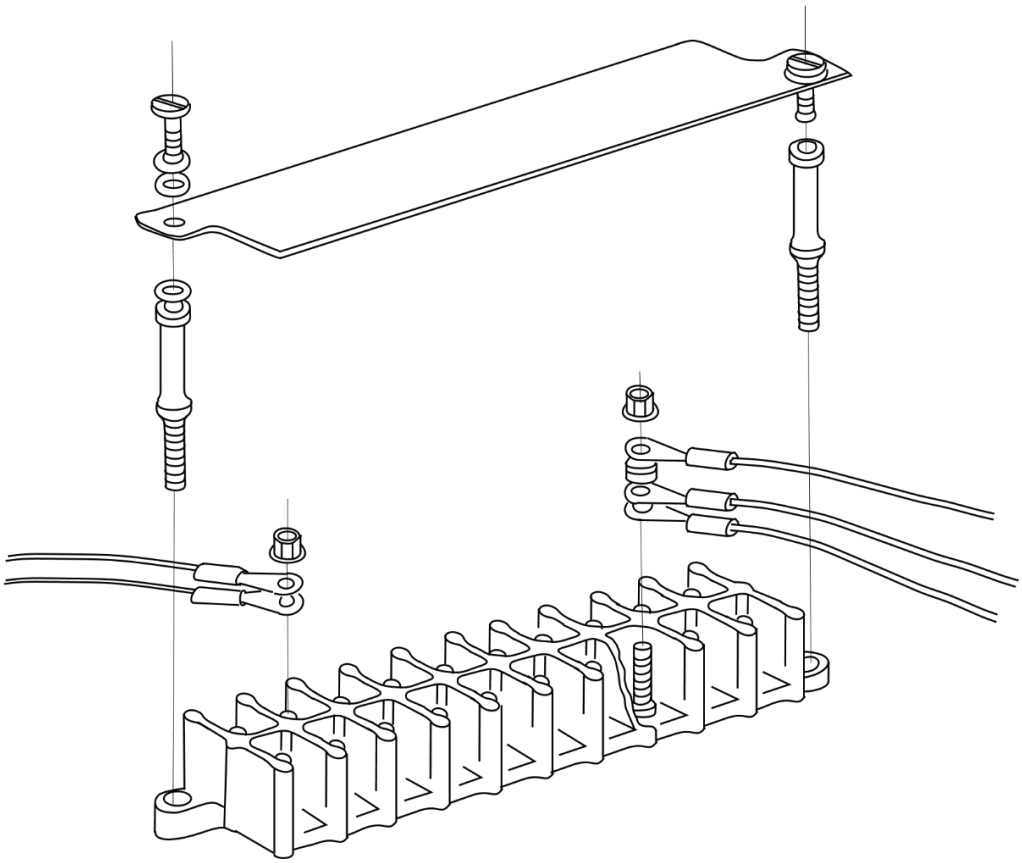

Figure 2. Assembly of Terminal Lugs to Ward Brooke Terminal Boards

5.4 Termination of Terminal Lugs at Strain Relief Clamps

5.4.1 For Dash 8 Series 400 aircraft, terminate terminal lugs at strain relief clamps according to PPS 9.39. For Dash 8 Series 100, 200 and 300 aircraft, terminate terminal lugs at strain relief clamps as follows.

- If terminating terminal lugs at a strain relief clamp, distribute the lugs as evenly as possible between the two strain relief screws to ensure that the clamp is reasonably balanced.
- Do not terminate more than 5 terminal lugs at either strain relief screw.
- Unless otherwise specified, position the terminal lugs as shown in Figure 3.
- For instances where the wire bundle size is such that firm contact is not made between the strain relief clamps, terminal lugs and the strain relief support, include NAS1149DN332J washers or an NAS43 spacer with a FC (chemical film) finish to ensure metal to metal contact between the screws, clamps, terminal lugs, washers (or spacer) and the clamp support.

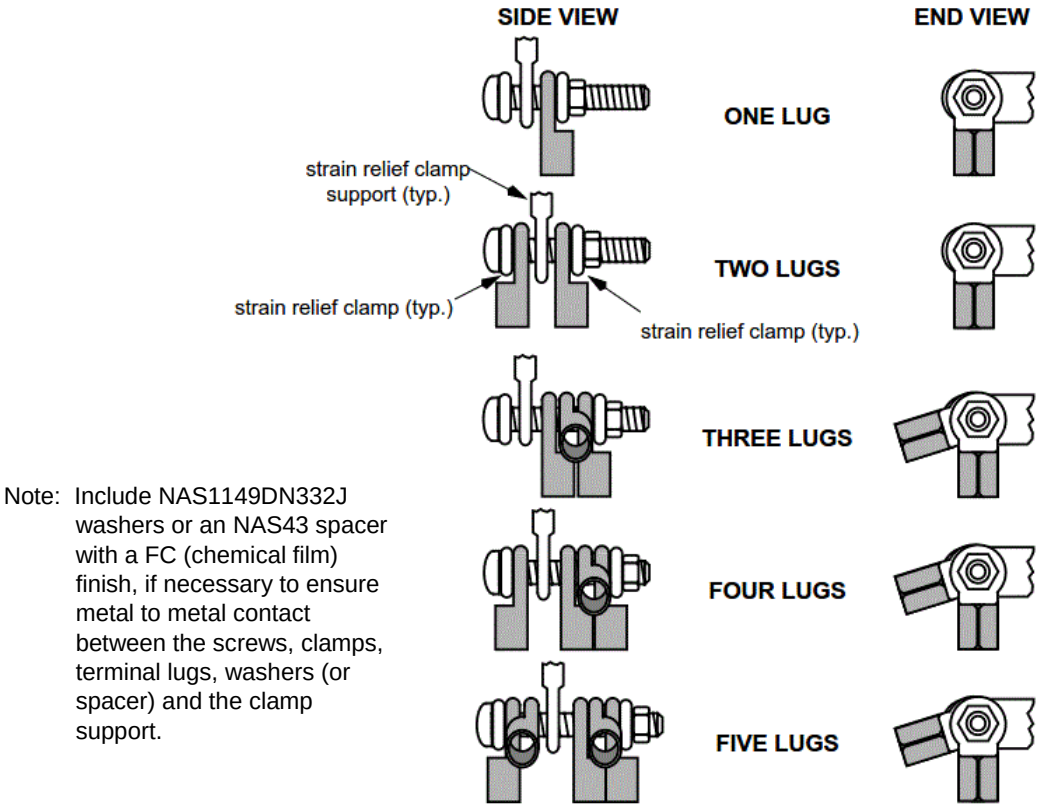

Figure 3. Assembly of Terminal Lugs to Strain Relief Clamps

5.5 Attachment of Terminal Lugs to Components (Circuit Breakers, Relays, etc.)

5.5.1 To make attachment of terminal lugs to component terminal lugs easier, bend terminal lugs at the barrel and tongue junction as follows:

- Keep the bend radius as large as possible.
- Do not bend terminal lugs to an angle greater than 90°.
- Do not bend terminal lugs more than once.
- Bent terminals showing evidence of marks from pliers or vice jaws used in the bending operation are not acceptable.

5.5.2 For attachment of terminal lugs to components, use the attachment screws and lock washers supplied with the component. After tightening or torquing, ensure that the screw thread protrudes through the lug mounting bracket on the component by at least 1/64"; if the screw thread protrusion is less than 1/64", obtain Liaison Engineering approval to use a longer attachment screw.

5.5.2.1 For MS3320 circuit breakers, torque the attachment screws to the values specified below according to PPS 14.01. Identification of torqued screws by torque stripe marking is not required:

- Torque attachment screws used to secure terminal lugs to circuit breaker lugs to 18 in. lbs (nominal).
- Torque attachment screws used to secure circuit breakers to bus bars to 30 in. lbs (nominal).

6 Requirements

6.1 Ensure metal to metal contact between the nuts, screws, clamps, terminal lugs, washers and/or spacers, as applicable.

6.2 All torquing must be according to PPS 14.01.

6.3 Screw thread protrusion through the lug mounting brackets on circuit breakers or relays must be at least 1/64".

7 Safety Precautions

7.1 **The safety precautions specified herein are specific to Bombardier Toronto (de Havilland) to meet Canadian Federal and Provincial government environmental, health and safety regulations. It is recommended that other facilities consider these safety precautions; however, suppliers, subcontractors and partners are responsible for ensuring that their own environmental, health and safety precautions satisfy the appropriate local government regulations.**

7.2 **Observe general shop safety precautions when performing the procedure specified herein.**

8 Personnel Requirements

8.1 Personnel must have a good working knowledge of the applicable procedure and requirements as specified herein and must have exhibited their competency to their supervisor.