

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

The following Defect Descriptions are to assist the Supplier in providing the needed information on the SQIS-MR or MAC861MRB form submittals.

In order to provide an efficient review cycle and create a stand-alone nonconformance document, the information defined below must be provided in the defect description “Should Be” and “Actual” described in IR 0451.

Submittal of a complete defect description will allow engineering to quickly evaluate and develop a disposition. The following matrix was created by engineering to define the information they need to perform the analytical evaluation task.

How to use the Defect Matrix:

1. Find the “Defect Name” or “Defect Definition” that best describes the condition to be submitted.
2. Find the minimum additional required data needed to describe the condition in “Data Needed to Define Condition”.
3. Examples of discrepancy text are shown following the defect name.
4. Provide data listed in “Data Needed to Define Condition” in the nonconformance description submitted MAC 861MRB form.

Note: Most entries in the discrepancy examples have “(PART NO., PART NO.)” text included. Please update this text to include the actual part number (with blue print dash number) of the discrepant part. When a condition affects multiple parts (such as a hole passing through two or more parts), include the part/dash number of each part affected.

Include any other information that will better describe the condition under the “ADDITIONAL INFORMATION” banner. For example, when multiple parts are affected, assign a serial number to each part and document the actual data for each serial numbered part.

When known, enter the causal information, as this may impact evaluation requirements.

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Defect Name	Defect Definition	Data Needed to Define Condition
ASSEMBLY DEFECTS		
EXCESS GAP:	Excess or insufficient space between mating and / or butting surfaces or parts. Note: to be used only when Structure Gap, Panel Gap, Butt Gap do not apply.	List all parts involved. Maximum width of gap. B/P gap allowable. Length of defect. Location of defect. Orientation of defect.
OVERLAP:	Parts that extend over another.	List all parts involved. Amount of overlap. B/P overlap allowable (typical. s/b zero) Length of overlap. Location of Defect. Orientation of Defect Direction of defect w/respect to airstream and water flow
DISTORTION:	Ply filament crooked pulled, wavy, separated, etc. to filament weave direction exceeding requirements. (Do not use for Transparencies)	List all parts involved. B/P part thickness in this area. Actual part thickness in this area. Area (length x width) with condition. NDT performed. Location on assembly If Composite materials: multiple plies or surface ply only?
ALIGNMENT / MISMATCH:	Parts not aligning or matching with mating surfaces and/or offset between butt welded surfaces. (Do not use for machining mismatch)	List all parts involved. How far from B/P alignment. B/P allowable alignment/spline deviation. Length and Direction of Misalignment. Location of Defect. Direction of defect w/respect to airstream and water flow
CLEARANCE:	Improper distance between movable or stationary parts creating riding and/or chafing conditions. Having less than min b/p clearance requirements. (do not use for electrical or tubing clearance)	List all parts involved. B/P clearance tolerance. Riding by how much. Length of riding cond. Direction of riding condition. Location on assy. Direction of defect w/respect to airstream and water flow
PRELOAD:	Excess force required to align or spline parts.	List all parts involved. B/P force allowed. (Typical. Ref. PS19000) Actual force required to align/spline part. Location where force is applied.
OIL CAN:	Wavy or buckled surface which when finger pressure is applied will move distorted area away from original location but will pop or spring back when finger pressure is released.	List all parts involved. Location of Defect.
MAGNETISM:	Excess residual magnetism in part(s)	List all parts involved. B/P magnetic reading. Actual reading. Location on assy.

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MISSING:	Part or component was not installed in assembly.	List all parts involved. B/P location with missing part.
MISS-LOCATION:	Miss-located part(s).	List all parts involved. How far from B/P location. Direction of miss-location.
AXIAL OR RADIAL MOVEMENT:	Excess movement (includes bearings).	List all parts involved. B/P allowable movement Actual movement. Location on assy.
PROOF LOAD:	Failed proof load (includes bearings).	List all parts involved. B/P proof load s/b. Actual load reading.
STRUCTURE GAP:	Structure to structure gaps.	List all parts involved. B/P allowable gap. Max/min width of gap. Length of gap. Specific location on assembly Denote if engineering allows a shim - has the allowable been tried?
PANEL GAP:	Panel/skin/door(s) to structure gaps.	List all parts involved. B/P allowable gap. Max/min width of gap. Length of gap. Location on assy. Denote if engineering allows a shim - has the allowable been tried?
BUTT GAP:	Butt gaps between panels/skins/doors.	List all parts involved. Maximum width of gap. B/P gap allowable. Length of defect. Location of defect.
BONDING / COMPOSITE DEFECTS		
SURFACE CONDITIONS	Conditions such as resin rich, resin poor, protrusions, inclusions, discoloration (does not include damage)	Visual description Location of condition Size of condition Is condition in resin only or impacting fibers Identify inclusion material
UNBOND / DISBOND	Separation between parts along an adhesive bondline.	Part numbers for all bonded details Location of unbond. Perform NDI appropriate to detect and record the following Size of unbond. Total thickness of detail parts at unbond. Depth of unbond.
DELAMINATION	Separation between plies within fiber reinforced composite laminate structures.	Perform NDI appropriate to detect and record the following: Size and shape of delamination (provide graphic representation). Depth of delamination. Multi-layer or single layer? Location of delamination relative to known features. Open to edge?
CORE	Core damage such as: blown, condensed, crushed, cut, separated, distorted, short/ missing core etc.	Type of defect (i.e. blown, crushed, distorted, contaminated, etc.) Size of defect (length x width may be by cell count). Specific location of defect. Depth of defect (if applicable). Include a photo or graphic representation of the radiographic image

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TIME TO TEMP	Material not meeting ambient or cured requirements.	Graph of Cure Temperatures by thermocouple readings. How long into cure cycle did temp deviate from required temp How long was temp above or below required temp. Include results of any process control specimen testing that is representative of defective part
VOIDS	Area of missing or insufficient adhesive along an assembly bondline.	Specific location on part. Size of void (length x width). Identify which bondline is affected.
K-FACTOR VOIDS	Multiple small voids that are individually acceptable, though collectively reject able due to proximity (i.e., combined they cannot be contained in the envelope of the applicable class)	Specific location on part. Size of combined void area (length x width). Include a scaled copy of the radiographic image.
THICKNESS VARIATION	Improper Modification or Alteration of thickness.	Actual thickness Size of area that is outside engineering thickness. Cause of defect (i.e. missing plies, cure operation, etc.)
IMPACT DAMAGE	Known impact to composite part or assembly which may have no visible indications of damage.	Perform appropriate NDI to identify any resulting defect. Submit data as required per identified condition(s).
SPLINTERING	Fibers bent back causing local detaching or completely missing from the surface of the part.	Location of defect on part, use photo as needed. State if fibers are still present and only lifted, or if splinters are missing Width and Length of splinters Depth of splinter condition i.e. depth of void or thickness of fiber.
CONTAMINATION DEFECTS		
DIRT, GREASE, OR CHIPS IN SEALER	Dust, mud, soil, metal chips in sealer, etc. found on material and/or parts.	Number of parts affected (mating parts) List part numbers of affected parts. Location on parts. Describe contaminating material
FUEL	Water, Freon, etc. exceeding maximum limits per PPM	Number of parts affected (mating parts) Tank or fuel line contamination found. Location on parts. Describe contaminating material Input B/P and actual PPM readings.
HYDRAULIC	Water, Freon, metal chips etc. exceeding maximum limits per PPM	Number of parts affected (mating parts) Hydraulic line/reservoir contamination found. Location on parts. Describe contaminating material Input B/P and actual PPM readings.
OXYGEN	Foreign material found in oxygen lines and/or systems	Number of parts affected (mating parts) Line or system contamination found. Location on parts. Describe contaminating material
DAMAGE DEFECTS		
BENT	Curve, crooked, angular shape or form exceeding blueprint requirements	Nature of the bend (smooth radius, creased, etc.) Does the bent area cut across or pass through other features of the part (joggles, beads, etc.). How wide is the bent area? How far is the material bent (inches or degrees) Will condition affect operations such as pressure check or trial fit? Has NDT been performed? Probable cause of damage Denote fasteners in area of damage
BROKEN	Fractured into two (2) or more pieces, shattered.	Type of defect causing break: (crack, tear, abrasion, other) Feature affected: (flange, web, stiffener, radius) Location and size of defect on part. Probable cause of damage

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DENT	Depression in part and/or material.	Nature of the dent (sharp edges, creased, etc.). Surface condition of dent (is it galled, checked, or dimpled). Will the condition affect operations such as pressure check or trial fit? Does the dented area cut across or pass through other features of the part (joggles, beads, etc.) Probable cause of damage
SCRATCH, NICK, OR CHIP CORROSION & GOUGES	Shallow cut, mark, notch or indentation on a surface (incl. tool marks in part). Do not use for transparencies - See Cat. P Corrosion and gouges due to service usage damage	Type of defect: (Scratch, nick, chip, other) Feature affected: (flange, web, stiffener, radius) Location and size of defect on part, minimum thickness in the defect area and the surrounding b/p area Is the defect through the thickness of anodize, coating, or cladding? Actual thickness measurements adjacent to damaged area, Pictures or sketches of damage
ELECTRICAL DEFECTS		
Circuit Conductors	Scratches, ruptures, Gouges, burns	Describe damage. Length and Width. Ref: Boeing SRP1751-R1, Supplier is to recommend a repair procedure: "Repair per IPC7721A Para 3.5.2" or specify other.
Circuit Conductors	Defective plated thru hole	Describe damage Ref: Boeing SRP1752-R1, Supplier is to recommend a repair procedure: "Repair per IPC7721A Para 3.3.1" or specify other.
Circuit Conductors	Missing or Severely Damaged Plated through holes.	Describe as missing or extent of damage. Ref: Boeing SRP1752-R2, Supplier is to recommend a repair procedure: "Repair per IPC7721A Para 3.3.2" or specify other.
Circuit Conductors	Eyelet Defect	Describe damage Ref: Boeing SRP1752-R3 Supplier is to recommend a repair procedure: "Repair per IPC7721A Para 5.1, 5.2, and 5.3" or specify other.
Circuit Conductors	Lifted Pad/Damaged Pad <i>Note: IPC 7721A refers to a pad as a land</i>	Describe damage. Ref: Boeing SRP1753-R1 Supplier is to recommend a repair procedure Repair per IPC 7721A Para 4.4.1 or 4.4.2 or specify other.
Circuit Conductors	Lifted Circuit	Length of lifted portion. Ref: Boeing SRP1753-R2 Supplier is to recommend a repair procedure Repair per IPC 7721A Para 4.1.1 or 4.1.2 or specify other.
Circuit Conductors	Minor scratches and nicks	Describe damage. Recommend a repair procedure same as or similar to Boeing SRP1754-R2.
Circuit Conductors	Circuit Pad Missing or Badly Damaged <i>Note: IPC 7721A refers to a pad as a land</i>	Describe damage Ref: Boeing SRP1754-R3 Supplier is to recommend a repair procedure: "Repair per IPC7721A Para 4.5.1 or 4.5.2" or specify other.

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Circuit Conductors	Conductor missing a section or is Badly Damaged Between circuit pads. <i>Note: IPC 7721A refers to a pad as a land.</i>	Describe Length of damage. Ref: Boeing SRP1754-R4 Supplier is to recommend a repair procedure: "Repair per IPC 7721A Para 4.2.1 or 4.2.2" or specify other.
Circuit Conductors	Open Circuit path	Describe length of damage Ref: Boeing SRP1754-R5 Supplier is to recommend a repair procedure: "Repair per IPC 7721A Para 4.2.4 or 4.2.5" or specify other. Supplier is to specify endpoints for circuit attachment.
Circuit Conductors	Edge Damage	Describe damage with dimensions Ref: Boeing SRP1751-R3 Supplier is to recommend a repair procedure: "Repair per IPC 7721A Para 3.5.3".
Circuit Conductors	Cracks or Separations in Conductor	Describe Length of damage. Ref: Boeing SRP1754-R1 Supplier is to recommend a repair procedure Repair per IPC 7721A Para 4.2.3 or specify other
Circuit Conductors	Lifted surface mount pad	Give dimensions of lift. Ref: SRP1753-R3 Supplier is to recommend a repair procedure: "Repair per IPC 7721A Para 4.7.1, 4.7.2" or specify other
FASTENER DEFECTS		
COTTER PINS / SAFETY WIRE MISSING	Missing cotter pin(s) or safety wire	B/P type cotter pin /safety wire. Number pins missing.
COTTER PINS / SAFETY WIRE INSTL. IMPROPER	Improper installation of Cotter Pin or Safety Wire.	Describe installation relative to PS.
MISSING FASTENER	Absence of fastener	No. of fasteners missing. Locations on assembly. Type of fastener. Size of fastener b/p countersink depth, if applicable
BLIND BOLT; CRACKED / DAMAGED	Blind Bolt CRACKED / DAMAGED during Installation	No. of Fasteners with Condition. Location of Crack/Damage on Fastener. Size of Fastener
BLIND RIVET; CRACKED / DAMAGED	Blind rivet CRACKED / DAMAGED during installation.	No. of Fasteners with Condition. Location of Crack/Damage on Fastener. Size of Fastener
BOLT / SCREW; CRACKED / DAMAGED	Bolt/Screw CRACKED / DAMAGED during installation.	No. of Fasteners with Condition. Location of Crack/Damage on Fastener. Size of Fastener
HI-LOK; CRACKED / DAMAGED	Hi-Lok CRACKED / DAMAGED during Installation	No. of Fasteners with Condition. Location of Crack/Damage on Fastener. Size of Fastener

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LOCKBOLT; CRACKED / DAMAGED	Lockbolt CRACKED / DAMAGED during Installation	No. of Fasteners with Condition. Location of Crack / Damage on Fastener. Size of Fastener
MILSON; CRACKED / DAMAGED	Milson CRACKED / DAMAGED during Installation	No. of Fasteners with Condition. Location of Crack / Damage on Fastener. Size of Fastener
PLATENUT; CRACKED / DAMAGED	Platenut CRACKED / DAMAGED during Installation	No. of Platenuts with Condition. Location of Crack / Damage on Platenuts. Size of Platenuts
SOLID RIVET; CRACKED / DAMAGED	Solid Rivet CRACKED / DAMAGED during Installation (set mark on head, etc.)	No. of Fasteners with Condition. Location of Crack / Damage on Fastener. Size of Fastener
TAPER LOCK; CRACKED / DAMAGED	Taper Lock CRACKED / DAMAGED during Installation	No. of Fasteners with Condition. Location of Crack / Damage on Fastener. Size of Fastener
BLIND BOLT; DEFECTIVE	Blind bolt itself is defective, not the installation of the blind bolt.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
BLIND RIVET; DAMAGED	Blind rivet itself is defective, not the installation of the blind rivet.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
BOLT / SCREW; DEFECTIVE	Bolt/Screw itself is defective, not the installation of the blind rivet.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
HI-LOK; DEFECTIVE	Hi-Lok itself is defective, not the installation.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
LOCKBOLT; DEFECTIVE	Lockbolt itself is defective, not the installation.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
MILSON; DEFECTIVE	Milson itself is defective, not the installation.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
PLATENUT; DEFECTIVE	Platenut itself is defective, not the installation.	No. of Platenuts with condition. Nature of Defect. Size of Platenuts
SOLID RIVET; DEFECTIVE	Solid Rivet itself is defective, not the installation.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
TAPER LOCK; DEFECTIVE	Taper Lock itself is defective, not the installation.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
BLIND BOLT; FLUSHNESS	Flushness Condition (subflush or high fastener) on a blind bolt.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within (max allowable per b/p).

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Defect Name	Defect Definition	Data Needed to Define Condition
BOLT/SCREW; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Bolt/Screw.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within_____(max allowable per b/p).
HI-LOK; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Hi-Lok.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within_____(max allowable per b/p).
LOCKBOLT; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Lockbolt.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within_____(max allowable per b/p).
MILSON; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Milson.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline. Record Should Be flush within_____(max allowable per b/p).
SOLID RIVET; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Solid Rivet.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within_____(max allowable per b/p).
TAPER LOCK; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Taper Lock.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within_____(max allowable per b/p).
BLIND BOLT; HEAD GAP	Head gap condition on a blind bolt	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
BLIND RIVET; HEAD GAP	Head gap condition on a blind rivet.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
BOLT/SCREW; HEAD GAP	Head gap condition on a Bolt/Screw.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
HI-LOK; HEAD / COLLAR / WASHER GAP	Head/Collar/washer gap condition on a Hi- Lok.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.

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LOCKBOLT; HEAD / COLLAR GAP	Head/Collar gap condition on a Lockbolt.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Condition of hole. Record Max gap allowable as "Should Be" condition.
SOLID RIVET; HEAD GAP	Head gap condition on a Solid Rivet.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
TAPER LOCK; HEAD GAP	Head gap condition on a Taper Lock.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
SIZE OF FASTENER	Fastener is the wrong size or grip length	No. of fasteners wrong size or grip. Locations on assembly. Type of fastener. B/P size of fastener
HI-LOK; WRONG COLLAR	Hi-Lok installed with wrong collar.	No. of Fasteners with condition. Collar type installed. Size of Fastener
LOCKBOLT; WRONG COLLAR	Lockbolt installed with wrong collar.	No. of Fasteners with condition. Collar type installed. Size of Fastener
WRONG FASTENER	wrong fastener installed or provided	No. of fasteners wrong. Locations on assembly. Type and size of fastener provided/installed. B/P size and type of fastener
BLIND BOLT; INSTL. DEFECTIVE	Installation of a blind bolt is defective (short/long stem)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
BLIND BOLT; INSTL. INCOMPLETE	Incomplete installation of a blind bolt (corrosion protection missing, etc.)	No. of Fasteners with condition. Step/process not performed during installation. Size of Fastener
BLIND RIVET; INSTL. DEFECTIVE	Installation of a blind rivet is defective (short/long stem)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
BOLT/SCREW; INSTL. DEFECTIVE	Installation of a Bolt/Screw is defective (short/long stem)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
BOLT/SCREW; INSTL. INCOMPLETE	Incomplete installation of a Bolt/Screw (corrosion protection missing, etc.)	No. of Fasteners with condition. Step/process not performed during installation. Size of Fastener
HI-LOK; INSTL DEFECTIVE	Installation of a Hi-Lok is defective (short/long pin, thread protrusion)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
HI-LOK; INSTL INCOMPLETE	Incomplete installation of a Hi-Lok (wrong no. of washers, not torqued, etc.)	No. of Fasteners with condition. Step/process not performed during installation. Size of Fastener

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LOCKBOLT; INSTL DEFECTIVE	Installation of a Lockbolt is defective (short/long pin, thread protrusion)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
PLATENUT; INSTL. DEFECTIVE	Installation of platenut is defective (clocked wrong, etc.)	No. of Platenuts with condition. Nature of installation defect. Size of Platenuts
SOLID RIVET; INSTL DEFECTIVE	Installation of a Solid Rivet is defective (under/over driven, rivet head: high, flat, bent, etc.)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
TAPER LOCK; INSTL DEFECTIVE	Installation of a Taper Lock is defective (thread protrusion, etc.)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
FASTENER INACCESSIBILITY	Unable to install fastener due to inaccessibility	No. of fasteners inaccessible. Locations on assembly. Type of fastener. Size of fastener
INSTALLATION REVERSED	fastener installed on wrong side of assembly	No. of Fasteners with condition. Correct orientation. Size of Fastener
EDDIE-BOLT 2; CRACKED / DAMAGE	Eddie-bolt CRACKED / DAMAGED during installation.	No. of Fasteners with Condition. Location of Crack/Damage on Fastener. Size of Fastener
EDDIE-BOLT 2; DEFECTIVE	Eddie-bolt itself is defective, not the installation of the blind rivet.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
EDDIE-BOLT 2; FLUSHNESS	Flushness Condition (subflush or high fastener) on an Eddie-bolt.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within (max allowable per b/p).
EDDIE-BOLT 2; HEAD / COLLAR GAP	Head/collar gap condition on an Eddie-bolt.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
EDDIE-BOLT 2; INSTL. DEFECTIVE	Installation of a Eddie-bolt is defective (short/long stem)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
EDDIE-BOLT 2; INSTL. INCOMPLETE	Incomplete installation of an Eddie-bolt (corrosion protection missing, collar lobes not fully swaged, etc.)	No. of Fasteners with condition. Step/process not performed during installation. Size of Fastener
EDDIE-BOLT 2; WRONG COLLAR	Eddie-bolt installed with wrong collar.	No. of Fasteners with condition. Collar type installed. Size of Fastener
HI-SET; INSTL DEFECTIVE	Defective installation (improper upset dia or height, clinched, etc.)	No. of Fasteners with condition. Nature of installation defect. Size of Fastener
HI-SET; CRACKED / DAMAGED	Hi-set CRACKED / DAMAGED during Installation	No. of Fasteners with Condition. Location of Crack/Damage on Fastener. Size of Fastener

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HI-SET; DEFECTIVE	Hi-set itself is defective, not the installation.	No. of Fasteners with condition. Nature of Defect. Size of Fastener
HI-SET; FLUSHNESS	Flushness Condition (subflush or high fastener) on a Hi-set.	No. of fasteners with Condition. Location of subflush fasteners on part. Amount of Deviation from Flush. Is fastener high or low to moldline? Record Should Be flush within _____ (max allowable per b/p).
HI-SET; HEAD GAP	Head gap condition on a Hi-set.	No. of Fasteners with Condition. Location of fasteners with Head/Collar/Washer gap on part(s). Size of Fastener. Condition of hole. Record Max gap allowable as "Should Be" condition.
GD&T DEFECTS		
GD&T defects	Defect and/or out of tolerance conditions on B/P GD&T items.	Number of parts affected Feature description (i.e. flange, web, hole, etc.) B/P GD&T requirement including geometric characteristic involved (i.e. flatness, perpendicularity, position, profile, etc.) Actual GD&T reading (IS condition) Size of area out of tolerance as applicable Sufficient measurement data relative to datum systems to determine where the features are at or properly characterize the defect
HOLE DEFECTS		
CLOGGED HOLES	Hole obstruction due to foreign material.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx) Material clogging hole (if known). B/P fastener type
DEPTH OF HOLE	Defects pertaining to the depth of a hole	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia. x xxx deep) Present actual hole size (xxx dia. x xxx deep) Installed fastener type (if known)
EDGE DISTANCE	Insufficient distance from the CENTER of a hole to the edge of a part. Not to be used for GD&T issues.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) B/P Edge Distance (xxx +/- .xxx) Actual Edge Distance (xxx +/- .xxx) Installed fastener type (if known) Thickness of part
ELONGATED HOLE	Egg-shaped or out of round hole. Not to be used for GD&T issues.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) Present actual hole size (xxx Major dia. x xxx Minor dia.) (note: Orientation of elongation. (i.e. along length of part, across flange, etc.) Installed fastener type (if known) Thickness of part

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Defect Name	Defect Definition	Data Needed to Define Condition
LOCATION OF HOLE	Hole not placed in B/P or proper location. Use for location of any hole type incl. GD&T.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) Actual hole size (xxx) Edge Distance for misplaced hole(s) (xxx) Center to center spacing to nearest B/P hole (xxx) Installed fastener type (if known)
MISSING HOLE	Hole is missing from B/P location of pattern.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx) B/P hole location B/P fastener type
OVERSIZED HOLE	Hole is too large. Not for GD&T circularity	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx) Actual hole size (xxx +/- .xxx) B/P fastener type Part thickness
COUNTERSINK	Countersink of holes are too deep (knife edge), too shallow, elongated, or has damage (chatter, nicks, etc.) that prevents fasteners to lie flush.	Number of csks affected Number of parts affected (mating parts) List part numbers of affected parts. B/P csk size (xxx +/- .xxx Dia. x xxx deep) Present actual csk size Damage present (chatter, nicks, etc.) Location of CSK on part(s) Thickness of part
DOUBLE DRILLED HOLE	Hole or holes contacting or intersecting each other.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) Present actual hole size (xxx Major dia. x xxx Minor dia.) (note: Tear out between holes (if any) Orientation of double drill (i.e. along length of part, across flange, etc.) Installed fastener type (if known) Location of hole on part(s) Part thickness
ALIGNMENT OF HOLES	Holes through multi-layers of materials not aligning (incl. misalignment of holes in mating parts)	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx) Amount of misalignment B/P fastener type
INSIDE OF HOLE DAMAGE	Spiral cuts (rifling) and/or galled condition on edges of inside of holes, wedge like damage. CORROSION AND/OR GOUGES FROM SERVICE USAGE.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) Depth of damage (xxx) Nature of damage Installed fastener type (if known)

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Defect Name	Defect Definition	Data Needed to Define Condition
TAPERED HOLE	Hole(s) taper from larger to smaller circumference throughout length.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) Actual Large Dia. Actual small Dia. Side of part with large dia. Installed fastener type (if known)
EXTRA HOLE	Hole(s) incorporated not defined by Engineering requirements	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. Extra hole size (xxx +/- .xxx Dia.) Edge Distance for Extra hole(s) (xxx) Center to center spacing to nearest hole (xxx) Installed fastener type (if known)
HOLE SPACING	Incorrect hole spacing in a pattern.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) B/P hole location B/P center to center spacing (xxx) Actual center to center spacing to nearest B/P hole (xxx) Installed fastener type (if known)
COUNTERBORE / SPOTFACE	Diameter or depth of c'bore / spot face exceeds allowable tolerance.	Number of c'bore / spot face affected Number of parts affected (mating parts) List part numbers of affected parts. B/P c'bore /spot face size (xxx +/- .xxx Dia. x xxx deep) Present actual c'bore / spot face size Damage present (chatter, nicks, etc.) Part thickness
COLDWORKING	Cold work process not performed correctly or completed.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx) Present actual hole size B/P fastener type Cold work steps completed.
DEEP DEBURR	Holes were deburred too deep.	Number of holes affected Number of parts affected (mating parts) List part numbers of affected parts. B/P hole size (xxx +/- .xxx Dia.) Present actual debur size (xxx dia. X xxx deep) Actual part thickness in area of deep deburs.
MATERIAL DEFECTS		
OVER AGED	PART(S) AND/OR MATERIAL EXCEEDING SHELF-LIFE REQUIREMENTS. UNITS UNUSABLE (CANS, PARTS, ETC.)	Provide details on material in question, certification, test specimen results Note any coordination with Boeing engineers (names, phone)
MATERIAL TYPE	INCORRECT MATERIAL WAS USED, SUPPLIED, OR RECEIVED.	Provide details on material in question, certification, test specimen results, heat treat data Note any coordination with Boeing engineers (names, phone)

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Defect Name	Defect Definition	Data Needed to Define Condition
PART OR ASSEMBLY PACKAGING	COMPLETED PART(S) AND/OR ASSEMBLY IMPROPERLY PROTECTED AND/OR PACKAGED. DO NOT USE FOR ESD, CONNECTORS, OR PERISHABLE RAW MATERIALS	Note the condition of the parts
TEST FAILURE	TEST RESULTS (WITH OR WITHOUT QALTR) DO NOT MEET REQUIREMENTS. DO NOT USE FOR STRENGTH, ELONGATION, OR TENSILE FAILURES, FUEL, OXYGEN, OR HYDRAULIC CONTAMINATION, OR FUNCTIONAL TEST FAILURES	Note any conditions of test specimens that may have contributed to failure Note any fabrication issues that may have contributed to failure (such as improper cleaning of part)
HEAT TREAT	DEFECTS PERTAINING TO THE HEAT TREATING PROCESS (EMBRITTLMENT, STRESS RELIEVED, SOLUTION HEAT TREAT, AGED, ETC.) RQMT. FAILURE	Note hardness and conductivity measurements for the material Note any processing performed to restore the material to conforming condition Note any coordination with Boeing engineers (names, phone)
CHEM MILL THICKNESS	CHEM MILL THICKNESS DIMENSIONS NOT WITHIN BLUEPRINT REQUIREMENTS.	Note b/p and actual chem mill steps to adjacent surfaces from defective chem mill area
MAG PARTICLE OR PENETRANT INDICATIONS	FLAWS, WHICH CANNOT BE INTERPRETED, AS CRACKS, LAPS, ETC. AFTER NONDESTRUCTIVE INSPECTION (NDI).	Note location, length and orientation of indications Note any additional NDI performed and results of inspection
ELONGATION OR STRENGTH OR TENSILE	MATERIAL NOT MEETING PHYSICAL TEST REQUIREMENTS.	Note hardness and conductivity measurements for the material Note any processing nonconformance Note any test specimen deviation Note availability of additional specimens or material to fabricate specimens
DRY	DRY COMPOSITES PRE-PREG MATERIAL.	
SHELF LIFE	PART(S) AND/OR MATERIAL EXCEEDING SHELF LIFE REQUIREMENTS AND NOT LOCATED ON THE AIRCRAFT.	Provide details on material in question, certification, test specimen results Note any coordination with Boeing engineers (names, phone)
FUEL DEFECTIVE	SWIRL CHECK, WATER CONTENT, API GRAVITY, CONDUCTIVITY TEST, SEDIMENT, DE-ICER AND FLASH POINT.	

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Defect Name	Defect Definition	Data Needed to Define Condition
MACHINING DEFECTS		
CUSP	CUTTER MISMATCH RESULTING IN A PEAK OR RIDGE.	Height of cusp. B/P and actual thicknesses of adjacent surfaces forming the cusp
FLANGE OR RIB HEIGHT	FLANGE OR RIB HEIGHT DOES NOT MEET REQUIREMENTS.	Notation if flange or rib height defect is localized or entire surface. If local, detail length/location/condition (smooth transition, jagged, stepped, etc.). Note the b/p and actual thickness of flange or rib. Notation if holes have been drilled in defective flange or rib.
FLANGE THICKNESS OVERSIZED	THICKNESS OF FLANGE EXCEEDS REQUIREMENTS.	If identifiable, note which side has excess material. Notation if excess thickness is localized or entire surface. If local, detail condition (smooth transition, jagged, stepped, etc.). If condition is tapered, note the direction of the taper. Notation if holes have been drilled in defective flange or rib.
LOCATION DIMENSION	DIMENSION LOCATING A FEATURE EXCEEDS THE BLUEPRINT TOLERANCE. DO NOT USE FOR GD&T-RELATED NONCONFORMANCES	Detailed description of +/- from b/p location requirements. Define direction of miss-location. Note any other nonconformance resulting from the miss-location of the b/p dimension.
RADII	DEFECTS PERTAINING TO INSIDE OR OUTSIDE BEND OR FILLET RADIUS.	Note the radii Note the b/p and actual thicknesses of the features forming the radii at the radius transition
RIB THICKNESS OVERSIZED	THICKNESS OF RIB EXCEEDS REQUIREMENTS.	If identifiable, note which side has excess material. Notation if excess thickness is localized or entire surface. If local, detail condition (smooth transition, jagged, stepped, etc.) If condition is tapered, note the direction of the taper. Provide grid of defect. Size of grid relative to area and transition of defect. Notation if holes have been drilled in defective rib
WEB THICKNESS OVERSIZED	THICKNESS OF WEB EXCEEDS REQUIREMENTS.	If identifiable, note which side has excess material. Notation if excess thickness is localized or entire surface. If local, detail condition (smooth transition, jagged, stepped, etc.) If condition is tapered, note the direction of the taper. If defect on mating surface side, provide grid of defect. Size of grid relative to area and transition of defect. Notation if holes have been drilled in defective web
WEIGHT	UNDER OR OVER REQUIREMENTS. TEST FAILURE	Note b/p and actual weight requirements. Note the tag numbers for any nonconforming conditions
BLATS FORMED	CONTOUR DOES NOT MEET REQUIREMENTS.	Detailed description of +/- from b/p contour requirements Define direction of miss-forming. Plot of contour deviation.

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Defect Name	Defect Definition	Data Needed to Define Condition
FLANGE THICKNESS UNDERSIZED	INSUFFICIENT FLANGE THICKNESS NOT MEETING REQUIREMENTS.	If identifiable, note which side has undersize material. Notation if undersize thickness is localized or entire surface. If local, detail condition (smooth transition, jagged, stepped, etc.). If condition is tapered, note the direction of the taper. Notation if holes have been drilled in defective flange or rib.
FORMING	DISPLACEMENT OF MATERIAL NOT MEETING CONTOUR REQUIREMENTS. DO NOT USE FOR GD&T-RELATED NONCONFORMANCES - SEE CATEGORY G. PART	Detailed description of +/- from b/p contour requirements. Define direction of miss-forming. Plot of contour deviation. Notation if holes have been drilled in defective part
OUTSIDE DIAMETER	DEFECTS PERTAINING TO THE OUTSIDE DIAMETER OF ROUND FEATURES (SHAFTS, BOSSES, ETC), SUCH AS OVERSIZED, UNDERSIZED, ETC. DO NOT USE FOR HOLES OR GD&T RELATED NONCONFORMANCES - SEE CATEGORY G OR H. FEATURE MEASURED	Denote if the outside diameter defect is localized, such as at the edge of the feature (from over blending), tapers Denote information relative to other b/p requirements for features, ex. Meets b/p position requirements, concentric requirements, etc.
RIB THICKNESS UNDERSIZED	INSUFFICIENT RIB THICKNESS NOT MEETING REQUIREMENTS.	If identifiable, note which side has undersize material. Notation if undersize thickness is localized or entire surface. If local, detail condition (smooth transition, jagged, stepped, etc.) If condition is tapered, note the direction of the taper. Provide grid of defect. Size of grid relative to area and transition of defect. Notation if holes have been drilled in defective rib
THREADS	DEFECTS PERTAINING TO THREADS (STRIPPED, CROSS THREADED, ETC.)	Note condition of threads, length and location of defective area of threads if not 100%
WEB THICKNESS UNDERSIZED	INSUFFICIENT WEB THICKNESS NOT MEETING REQUIREMENTS.	If identifiable, note which side has undersize material. Notation if undersize thickness is localized or entire surface. If local, detail condition (smooth transition, jagged, stepped, etc.) If condition is tapered, note the direction of the taper. Provide grid of defect. Size of grid relative to area and transition of defect. Notation if holes have been drilled in defective web
CHAMFER	ANGLE CUT NOT WITHIN BLUEPRINT TOLERANCE, THUS INCREASING OR DECREASING WIDTH.	B/P chamfer definition. Depth/width/length dimensions of actual chamfer. Specific location of beginning and end of defective detail.
MISMATCH	A STEP BETWEEN ADJACENT FLAT OR SLIGHTLY CURVED SURFACES. DO NOT USE FOR ASSEMBLY MISMATCH	B/P allowable mismatch. Actual mismatch. Area with mismatch. Feature of part with mismatch. Location on part.
SLOT UNDERSIZED	SLOT WIDTH LESS THAN BLUEPRINT REQUIREMENTS. SLOT	Note slot dimensions, denote relative position to b/p requirements to identify location of undersize area of slot

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Defect Name	Defect Definition	Data Needed to Define Condition
UNDERCUT	LOCALIZED AREA MACHINED BELOW TANGENT POINT OF ADJACENT OR INTERSECTING SURFACES. DO NOT USE FOR WELD UNDERCUTS - SEE W10.	Note the minimum remaining thickness in the undercut area. Note which surface has undercut defect. Provide pictures or sketches. Provide profile of undercut. Note the b/p and actual thicknesses of the surfaces adjacent to the undercut. Note detail condition (smooth transition, jagged, stepped, etc.) Note cause of undercut, ex. Cutter broke Note if NDI was performed on undercut, if so provide results Notation if holes have been drilled in defective area
BEND ANGLE	UNDERSIZE OR OVERSIZE BEND ANGLE	Note the angle Note the b/p and actual thicknesses of the features forming the angle at the radius transition Notation if holes have been drilled in part
GENERIC DEFECTS		
ALPHA CASE	Oxidation of part surface on titanium	Number of parts affected (mating parts) List affected parts. Location on parts. Area with alpha case. Processing remaining and completed.
BOWED	Ben, formed or distorted into a partial curve. Do not use for GD&T straightness or flatness	Number of parts affected Feature of part bowed Amount bowed. Location on part
BURR OR SHARP EDGE	Rough, thin, or keen edge or point remaining on material and/or part capable of cutting.	Number of parts affected Feature of part with burr (flange. Rib, web, etc.) Size of burr. Location on part
CRACKED OR CRAZED	Break, partial or light split or pattern of fine cracks including adhesive cracking, resin crazing, etc.	Number of parts affected Feature of part with cracks/crazing (flange. Rib, web, etc.) Size of defective area Number of laminations containing condition. Location on part
DELAMINATIONS	Splitting or separation of material into layers. Do not use for unbond.	Number of parts affected Feature of part with delamination (flange. Rib, web, etc.) Size of defective area. Depth of delamination Number of laminations containing condition. Location on part
DIMENSIONS	Over or undersized material and/or parts due to manufacturing processes. Do not use of GD&T issues.	Number of parts affected Feature of part with condition (flange. Rib, web, etc.) Size of defective area. B/P Dimension Actual Dimension checks Location on part
INCLUSIONS	Metallic or non-metallic foreign substance entrapped or embedded in composite material.	Number of parts affected Feature of part with inclusions (flange. Rib, web, etc.) Size of inclusions. Number of inclusions Depth of inclusions Location on part

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Defect Name	Defect Definition	Data Needed to Define Condition
TRIM	Excessive deviation from requirements. Do not use for raw bonding material or uncured composites.	Number of parts affected Feature of part with condition (flange. Rib, web, etc.) Size of defective area. B/P trim Actual trim checks Location on part
WARPAGE, WAVY, OR WRINKLED	Distorted material forming crease, curve, ridge, etc.	Number of parts affected Feature of part with wavy/wrinkled cond. (flange. Rib, web, etc.) Size of area. Actual waviness/wrinkle dim. B/P waviness/wrinkle allowable Cause of defect. Location on part
BUSHING CRACKED / DAMAGED	Bushing cracked or damaged during installation	Number of holes affected Number of parts affected (mating parts) List bushing callouts. B/P hole size (xxx +/- .xxx) Actual hole size (xxx +/- .xxx) Type of damage
BUSHING DEFECTIVE	Bushing itself is defective (oversize, undersize, etc.) Not for installation defects.	Number of holes affected Number of parts affected (mating parts) List bushing callouts. B/P hole size (xxx +/- .xxx) Actual hole size (xxx +/- .xxx) Type of defect
BUSING INSTL. DEFECTIVE	Installation of bushing defective	Number of holes affected Number of parts affected (mating parts) List bushing callouts. B/P hole size (xxx +/- .xxx) Actual hole size (xxx +/- .xxx) Type of defect Processing complete during installation

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Product

Boeing St. Louis – Defect Descriptions for Supplier Nonconformances - Tooling

Defect Name	Defect Definition	Data Needed to Define Condition
Identification	Identification	Accurate Tool ID including Unit/Dup and Barcode if available
Material Properties	Heat Treat	Material "SHOULD BE" and "IS" conditions
Material Properties	Wrong Material	Material "SHOULD BE" and "IS" conditions
Detail Fabrication	Burrs/Sharp Edges	Detail number(s) and quantities
Detail Fabrication	Flat/Parallel	Detail number(s) "SHOULD BE" and "IS" conditions
Detail Fabrication	Surface Finish	Detail number(s) "SHOULD BE" and "IS" conditions
Detail Fabrication	Dimensional	Detail number(s) "SHOULD BE" and "IS" conditions
Detail Fabrication	Contour	Detail number(s) "SHOULD BE" and "IS" conditions
Detail Fabrication	Angularity	Detail number(s) "SHOULD BE" and "IS" conditions
Setting Details	Detail Mislocated	Detail number(s) "SHOULD BE" and "IS" conditions
Setting Details	Detail Missing	Detail number(s) and quantities
Trimming Tools	Trim	Detail number(s) "SHOULD BE" and "IS" conditions
Holes	Holes	Detail number(s) "SHOULD BE" and "IS" conditions
Other	Calibration/Periodic Inspection	Document actual expiration date and Tool Type (i.e. MOI, recycle, Hoist Tool, etc.)
Other	Storage Box	Detail number "SHOULD BE" and "IS" conditions
Other	Shop Worn	Detail number "SHOULD BE" and "IS" conditions
Other	Damaged	Detail number "SHOULD BE" and "IS" conditions; location and magnitude of damage
Other	Unauthorized Repair	Detail number "SHOULD BE" and "IS" conditions
Other	Proof Load	Document actual proof load and required proof load
TFIM/TPIM	Paint	Detail number(s) "SHOULD BE" and "IS" conditions