

Collins Aerospace
Cosmetic Standard Process Specification

For
Seating, Colorado Springs
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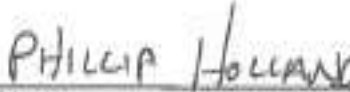
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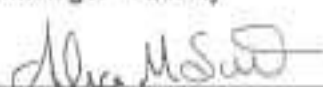

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Revision Table

Revision	Reason for Revision	Section	DCRN Number	Date
NC	- Original Release	All	NA	09/14/2012
A	- Updated Scope, Applicable Documents, Definitions, Preferred Appearance Quality, Product Surface Classification, Acceptance Criteria, Cosmetic Surface Classification Examples - Added Section 15.0: ITC Requirements - Added Section 17.0: Appendix B-Upholstery Defect Examples	5.0 6.0 7.0 8.0 11.0 13.0 15.0 16.0 17.0	129165	11/20/2015
B	Section 7.0 Definitions - Updated wrinkle definition (to not include grain wrinkles) & added "cut" definition Section 8.0 Preferred Appearance Quality - Restraint webbing & winged headrests Section 11.0 Product Surface Classification - Updated Table 2 to match Appendix A UPH surface diagram Section 13.0 Acceptance Criteria - Added "cut" and restraint webbing to section Section 16.0 Appendix A - Updated figure 19 per negotiations with upholstery vendors & clarified figure 18 Section 17.0 Appendix B - Added photo for cut defect example Section 18.0 Appendix C - Added entire section for winged headrest requirements	7.0 11.0 13.0 16.0 17.0 18.0	129582	3/30/2016
C	Section 7.0 Definition - Added Facet & Discontinuity in	7.0 11.0	130011	9/29/2016

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	<p>Surface Profile definitions</p> <p>Section 11.0 Product Surface Classification</p> <ul style="list-style-type: none"> - Updated Table 2 to match Appendix A Upholstery & Shroud w/ Stowage surface diagrams <p>Section 13.0 Acceptance Criteria</p> <ul style="list-style-type: none"> - Added Facet & Surface Profile Discontinuity to section - Updated Stitching “Deviation from Nominal” requirement per UPH vendor negotiations <p>Section 15.0 ITC Requirements</p> <ul style="list-style-type: none"> - Removed entire section. This is an external document UTAS suppliers use and do not have access to UTAS ITC documents. <p>Section 16.0 Appendix A</p> <ul style="list-style-type: none"> - Updated figure 19 per negotiations with upholstery vendors & added Figure 20 <p>Section 19.0 Appendix D</p> <ul style="list-style-type: none"> - Added entire section for plastic shroud defect examples 	<p>13.0</p> <p>16.0</p> <p>19.0</p>		
D	<p>Updated:</p> <ul style="list-style-type: none"> - Added reference to Procedure 1.4.24.2 – Restraint and Webbing Verification/Acceptance to section 8.11 - Section 7 update to definitions: <ul style="list-style-type: none"> o Cracking definition was changed o Finger Prints was removed o Plating Layers was removed o Smearing was removed o Tooling Marks definition was changed - Update to section 9 for process alignment - Updated Table 3 to change Plating Layers to Metals 	<p>7</p> <p>8.11</p> <p>9.1</p>	130539	08/28/2017
E	Section 7 Definitions	7	132982	9/19/2019

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	<ul style="list-style-type: none"> - Added clarification to scratch definition 			
	<p>Section 8 Preferred Appearance Quality</p> <ul style="list-style-type: none"> - Added section 8.13 Pilot / Co-Pilot Seat Tracks (referenced 1.4.24.1) 	8.13		
	<p>Section 16 Defect Evaluation Table</p> <ul style="list-style-type: none"> - Added entire section to address very small defects 	16		

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TABLE OF CONTENTS

1. INTRODUCTION	7
2. QUALITY POLICY AND DEFINITION	7
3. PURPOSE	7
4. INSPECTION PURPOSE	7
5. SCOPE	7
6. APPLICABLE DOCUMENTS	8
7. DEFINITIONS	8
8. PREFERRED APPEARANCE QUALITY	17
8.1. Paint	17
8.2. Chemical Conversion Coating (alodine)	17
8.3. Cadmium Plating	17
8.4. Liquid Penetrant Testing	17
8.5. Solid Film Lubricant	17
8.6. Chemical Film Treatment/Chromate	17
8.7. Electroless Nickel Plating	18
8.8. Passivate	18
8.9. Phosphate	18
8.10. Upholstery	18
8.10.1. Wrinkles	18
8.10.2. Stitching	18
8.10.3. Seams	18
8.10.4. Leather or Fabric Surface	18
8.10.5. Glue and/or Velcro	18
8.11. Restraint Webbing	19
8.12. Winged Headrests	19
8.13. Pilot / Co-Pilot Seat Tracks	19
9. INSPECTION RECOMMENDATIONS	20
9.1. Viewing Conditions and Orientation	20
9.2. Viewing Light Source	20
9.3. Viewing Inspection Table Surface	20
9.4. Viewing Tools	20
10. SURFACE CLASSES, VIEWING TIMES AND VIEWING DISTANCES	21
11. PRODUCT SURFACE CLASSIFICATION	22
12. ESCALATION PROCESS AND SPECIFICATION PRECEDENCE	23
12.1. Escalation Process	23
12.2. Order of Precedence	23
13. ACCEPTANCE CRITERIA	24
14. ACCEPTABLE DEFECTS FOR GENERAL ITEMS	32
14.1. Product Labels	32
14.2. Packaging Labels	32
14.3. Packaging	32
15. DEFECT EVALUATION TABLES	33

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16. APPENDIX A- Cosmetic Surface Classification Examples	34
17. APPENDIX B- Upholstery Defect Examples	41
18. APPENDIX C- Winged Headrest Cosmetic Criteria	45
19. APPENDIX D- Plastic Shroud Defect Examples.....	48

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1. INTRODUCTION

UTAS Seating is dedicated to providing quality products to its internal and external customers. A significant factor in determining that quality is the cosmetic appearance of the parts and sub-assemblies that make up the final product. This Standard Process Specification (SPS) has been created to provide objective criteria and inspection methods to assist in providing consistent decisions regarding the cosmetic acceptability of the product being inspected.

2. QUALITY POLICY AND DEFINITION

This SPS is written and maintained in accordance with UTAS Seating AS 9100 Quality Policy and Quality Manual. Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

Stated needs: Specifications, Standards, Legal

Implied needs: Sometimes unknown, unspoken or interpreted customer needs.

(Note that every individual has a different point of quality and different acceptance criteria that is why objective criteria and methods are the preferred approach.)

3. PURPOSE

The purpose of this SPS is to define and establish objective standard acceptance criteria for surface finish for incoming and outgoing inspections applicable at Customers, Suppliers and UTAS.

This SPS attempts to define industrial standard finish criteria for the various surface categories. Special cosmetic finish criteria can also be specified beyond this SPS (drawings, engineering or customer specifications, work instructions, etc.), but these usually come with an associated cost factor which need to be taken into account when planning and estimating the product. Manufacturing processes of bare material (e.g. steel, aluminum, extruded parts, molding) as well as machine processes (e.g. punching, forming, polishing, and routing) and surface treatments (e.g., anodizing, alodizing, paint, prime, and powder coating) may leave visible marks at the finished products, which are not avoidable. All of this needs to be considered in any cosmetic standard.

4. INSPECTION PURPOSE

The cosmetic inspection purpose is to determine acceptance criteria to which the part or product will be inspected. The intent of cosmetic inspection is to ship a part or product that meets the specified finish standard. It is NOT the intent of cosmetic inspection to find all imperfections on a part or product.

5. SCOPE

This standard applies to surface finishes such as machining, sheet metal, paint and/or powder coat, chemical conversion coating (alodizing, anodizing), plating, molding, upholstery and other special processes for the transport seats.

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6. APPLICABLE DOCUMENTS

- Applicable Customer requests and specifications.
- SPEC 5000 (1.9.6)
- Special processes specifications per drawing.
- Fabric Acceptance (1.10.24.2)
- Leather Acceptance (1.10.24.3)
- Restraint and Webbing Verification/Acceptance (1.4.24.2)

7. DEFINITIONS

ACCEPT PER APPROVED ENGINEERING DRAWING

Some cosmetic imperfections are not avoidable in certain process and design circumstances. Approved engineering documents will point this out.

ABRASION

Surface imperfection that doesn't remove or displace material - appears as a scuff or changes to the surface finish.

AIR POCKETS

Entrapped air forming a bubble in the resin which then hardens with the air pocket in place.

ANODIZING

An electrolytic passivation process used to increase the thickness of the natural oxide layer on the surface of metal parts. Provides corrosion and wear resistance and provides better adhesion for paint primers and glues than bare metal. Anodic films are also used for a number of cosmetic effects, either with thick porous coatings that can absorb dyes or with thin transparent coatings that add interference effects to reflected light.

BARE METAL

A metal surface that has an intact protective coating but no cosmetic finish.

BASE METAL

A bare metal surface on which the protective coating has been compromised.

BLEED OUT

A substance that runs out of seams or holes during plating or other base material processing.

BLEEDING

Unwanted appearance of underlying substance through finish layer. Unwanted appearance of adjacent substance into another region. Usually due to improper application or material incompatibility. Not to be confused with insufficient coverage of finish layer substance.

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BLISTER/BUBBLE

A bubbling in the surface of the finish. Non-adhesion or lack of proper sticking of the coating to the surface caused by trapped air, gas or moisture.

BLUSH

Discoloration or change in gloss.

BUMP

Protrusions caused by trapped air / gas or moisture usually seen in finished parts. Concerning upholstery, a small raised area above the surrounding surface not caused by cushion seams.

BURNISH MARKS

Marks or lines that cannot be felt that are usually caused by tooling dies most common on flattened cold rolled material e.g. Steel or aluminum sheets.

BURNS

Brown marks or streaks on a surface of the part caused by trapped gases burning the surface of the plastic or by the resin being subjected to over temperature conditions during molding operation.

BURRS

Sharp edges around part features caused by manufacturing process like punching, shearing, milling or drilling.

Caution: Sheet metal edges that are compliant to UL 1439 can still cut through protective gloves and/or human hands.

CADMIUM PLATING

An electro-plating process used to provide corrosion resistance at relatively low thicknesses to aluminum and steel alloys. Cadmium plating will resist corrosion in a salt atmosphere. As well, cadmium plating can be dyed to many colors and clear, has good lubricity and solderability, and works well either as a final finish or as a paint base.

CHEMICAL FILM TREATMENT

Intended to provide corrosion preventions on unpainted items as well as improve adhesion of paint finish systems on aluminum and aluminum alloys.

CHIPPING/FLAKING

Areas in which the adhesion between the paint and the surface is poor, causing the paint to come off with light rubbing.

CHROMATE

See CHEMICAL FILM TREATMENT.

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CLOUDINESS/HAZE

A haziness or lack of clarity in otherwise transparent part.

CONTAMINATION (FOD)

Foreign material embedded in or on the part surface.

CORRISION

Areas of corrosion on any metal surfaces.

CHILL LINES (Plastic):

Raised line or surface in molded or formed part caused by uneven cooling and shrinking rates often associated with a change in material thickness on molded parts.

CRACK

A break, material separation or delamination on the surface of a base material or plated surface.

CRAZING

A fine mesh of minute cracks on the surface of some plastics due mainly to the effects of UV light.

CUT

An opening or hole in a fabric, leather or plastic surface made with a sharp tool.

DELAMINATING

Separation, peeling of thin layer of material.

DENT

A surface depression caused by an impact.

Note: Tooling marks are not dents.

DEVIATION FROM NOMINAL

Upholstery seam lines shall not deviate from their nominal line. The nominal seam line defines which line or curve the seam should follow.

DIE MARKS

Marks made on the metal's surface when it is formed, usually consist of long straight lines.

DING

Roughly funnel shaped dent caused by an impact.

DIRT

Any particle of foreign material.

DISCOLORATION

Any change from the original color or shade in the finish.

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DISCONTINUITY IN SURFACE PROFILE

An interruption, uneven changes in profile or offsets in curved or flat surfaces. These mismatches can be the result of damage, rework or surfacing operations.

DISTORTION

A deformation of a die-cast part.

DUST

Small particles.

EJECTOR MARKS

Marks formed on the opposite side of ejector pins in a mold. Mold design should not have ejector pins in critical structural areas.

ELECTROLESS NICKEL

A decorative, durable finish that provides moderate corrosion protection that can be applied to non-ferrous metal or copper over steel. Electroless is able to cover into tight corners and can be applied to non-ferrous metals or to copper over steel.

ENGINEERING DOCUMENT

Any drawing, special process specification, or other Goodrich approved document.

FACETS

Flat faces or planes on a geometric shape.

FILL IN

An excess of ink that alters the form of a screened feature not affecting legibility.

FINISH

An area of comparatively smoother finish of molded plastic parts.

FLASH

Thin, excess material usually around the area of the mold parting line or internal shutoff areas.

FLOW MARKS

Directionally off tone, wavy lines or patterns in molded parts.

FRACTURE

Material splitting usually on the outside bend radius.

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GAP

Empty space between two mating parts. Concerning upholstery, a gap is the empty space between the upholstery and its mating structure or shroud.

GATES

Point at which plastic is injected in cavity, usually on parting line.

GLASS FILL

Parts which are molded with a resin containing glass fiber filler for strength. Adequate resin coverage on the surface of the part should assure that no filler fiber is exposed. As well, the surface finish should be uniform.

GLOSS

A uniform appearance of a painted or molded area (e.g. shiny, matte).

GLOSSINESS

An area of either excessive or deficient gloss.

GOUGE

A groove or scratch that extends through the finish and into the base material caused by a sharp object. A gouge should have a measurable depth.

GREASE

Any lubricant transferred to the part's surface, shiny or glossy patches on the surface of the part.

HEAT TREAT

A process used to harden steel alloys by heating them to high temperatures for specific durations of time. This process also increases a metals resistance to corrosion and other surface imperfections.

INCONSISTENCY

Variation of gloss, thickness of line or surface texture.

INCLUSIONS

Small craters on surface caused by dust or dirt.

LINT

Any unintended foreign substance in the coating or on the surface.

LIQUID PENETRANT TESTING

A test method used to inspect for surface damages and discontinuities such as cracks, corrosion, porosity, cold shuts, and laps on nonporous metal and nonmetallic materials. The liquid is applied to the material and then the material is viewed under black light lamps.

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MARBLINGS

Colored streaks on a surface caused by improper mixing of molten plastic or paint.

MARKS

Pits, sanding, or other marks on base material that remains visible after coating.

MATTE FINISH

A less glossy finish of a surface area.

METAL FUZZ

Fine grit metal shavings that are clumped together - may also be magnetic.

NICKS

Like gouges but short in length, typically caused by impact.

NON-ADHESION

Lack of proper sticking of the coating or a glued material to the surface.

NON-UNIFORM COVERAGE

Areas that have an insufficient or excessive coating.

OILS

Oily material on the surface due to materials used in manufacturing processes, e.g., oily looking spots caused by Loctite locking feature.

ORANGE PEEL

Paint defect, rippled or mottled appearance viewable as concentric lines caused by under pressurizing paint surfaces before the paint has dried and cured.

ORANGE SKIN

See ORANGE PEEL.

OXIDATION

Has a rough feel or appearance. Dull gray, dark gray, black, brown, dark cinnamon or possibly white colored substance.

PASSIVATE

A process used to remove iron from surfaces to reduce rusting.

PEELING

Areas in which the adhesion between the paint and the surface is poor, causing the paint to come off with light rubbing.

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PHOSPHATE

A process used to increase the corrosion resistance and lubricity of steel alloys. Can also serve as a foundation for subsequent coatings or paint finishes.

PITTING

Small craters on surface.

PULL

In plastics, pull is an undesirable condition of the part being released from the mold, creating deformed features in the part. The cause may be uneven positioning of the part as it is ejected, or the part sticking in the mold because of difficult situations in draft, texture, etc.

PUNCH MARK

Mark on the surface of a material due to punch process.

RUNS

Drips, bleeding, visible lines or raised areas of excessive paint or chemical coating similar to non-uniform coverage.

RUST

Areas of corrosion on any metal surfaces.

SCRATCH

A long, narrow (less than 0.015" wide) mark on the surface deep enough to catch the fingernail.

SCUFF MARKS

A series of very light, concentrated marks that can be seen but not felt.

SHORT-SHOT

Incomplete molded feature.

SINK

Depression or dimple caused by non-uniform material shrinkage. Resembles a dent in metal.

SLUG MARK

A surface deformity caused by the punching process.

SMUDGE

Any dirt particle of foreign material.

SOLID FILM LUBRICANT

A heat cured solid film lubricant that is intended to reduce wear and prevent galling, corrosion, and seizure of metals. Can be applied to aluminum or steel alloys.

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SPACING

Individual stitches that are not spaced evenly between each other. A majority of UTAS upholstery prints require 8-10 stitches per inch.

SPECKS

Small particles.

SPLATTERS

Drips or raised areas of excessive paint or chemical coating similar to non-uniform coverage.

SPLAY

In plastics, splay is generally identified as a visual effect in a part which leaves radial lines of discoloration from the gate area. This is usually a result of moisture in the resin being injected into the mold.

SPOT WELD MARK

Dish shaped surface caused by spot welding process.

TOOLING MARKS

Sheet Metal: Shallow lines that are parallel to bonds in part. Unwanted impact of a tool during punch process.

Machining: Machine transitional lines or chatter created by machining process.

TORN THREAD HOLES

Thread holes that display torn fabric or leather at their perimeter. Most thread holes are visible or torn because thread tension is too loose or dull needles were used thus tearing the material.

TEXTURE

An area of comparatively rougher finish of plastic molded parts. A rougher but uniform finish of painted parts.

VISIBLE SURFACE

Surfaces that are visible when the enclosure or part is installed in a completed assembly.

VISIBLE THREADS / NEEDLE HOLES IN UPHOLSTERY SEAMS

Seams in upholstery should have adequate thread tension as not to allow the holes and threads to become visible.

VOID

The failure of ink to define a graphic feature.

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WARPAGE

Dimensional distortion in a part after machining, molding, pressing or laminating. Twist or bows in the part.

WATER SPOTS

Rough and not densely packed dull gray lines at plated material.

WELD LINES

Line where molten plastic or metal joins form a part. A weld line usually appears as a noticeable line or gloss variation across the surface of the part.

WRINKLE

A line or fold in the upholstery surface due to loose or poor fit against the assembled structure.

Note: This definition does not include wrinkles within the grain surface of a hide or leather, see 1.10.24.3 for grain surface requirements.

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8. PREFERRED APPEARANCE QUALITY

8.1. Paint

Painted surfaces should be defect free and the texture and color should be uniform throughout the entire surface. The finish on a continuous surface shall exhibit no gross imperfections such as gouges, large chips, runs, blisters, oil spots, flaking, or any defects that will affect the functional properties of the finish. Paint touch-up is acceptable. A touch-up is not acceptable if visible at the viewing distance for that class of surface.

8.2. Chemical Conversion Coating (alodine)

The finish shall have uniform appearance; smooth with surface appearance and color per the applicable engineering documentation. Visual appearance will vary between different alloys and between machined, milled, cast, and grained surfaces. Outside surface shall be free from scratches, dents, or gouges. Note that anodized material is more scratch resistant than alodized material.

8.3. Cadmium Plating

The cadmium plating shall be smooth, adherent, uniform in appearance, free from blisters, pits, nodules, burning and other defects when examined visually without magnification. The plating shall show no indication of contamination or improper operation of equipment used to produce the cadmium deposit, such as excessively powdered or darkened plating. Superficial staining, which has been demonstrated as resulting from rinsing, or slight discoloration resulting from any drying or baking operations as specified shall not be cause for rejection.

8.4. Liquid Penetrant Testing

The surface should show no evidence of discontinuities, such as lack of fusion, corrosion, cracks, laps, cold shuts, and porosity, that are open or connected to the surface of the component under examination unless otherwise specified in an approved engineering document.

8.5. Solid Film Lubricant

The bonded solid film lubricant shall appear uniform in color and shall be smooth, free from any cracks, scratches, pinholes, blisters, bubbles, runs, sags, foreign matter, grit, rough particles, or separation of ingredients.

8.6. Chemical Film Treatment/Chromate

The chemical conversion coating shall be continuous in appearance and visibly discernible in daylight. It shall be free from areas of powdery or loose coating, voids, scratches, flaws, and other defects or damages which reduce the serviceability of parts or are detrimental to the protective value and paint bonding characteristics. The size and number of contact marks shall be minimal, consistent with good practice. If specified in the contract or order, contact marks shall be touched up with MIL-DTL-81706 material approved on QPL-81706 for the applicable type, class, form, and method to prevent localized corrosion.

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8.7. Electroless Nickel Plating

The nickel coating shall be smooth, adherent, and free from visible blisters, pits, nodules, porosity, cracks, and other defects. All details of workmanship shall conform to the best practices for high quality coating.

8.8. Passivate

After completion of processing, there shall be no evidence of etching, pitting, smutting, frosting, dimensional changes, or other chemical attack on the parts. However, loss of temper color when Method 2 (reference specification document) is used is acceptable.

8.9. Phosphate

The chemical conversion coating shall be continuous in appearance and visibly discernable in daylight. It shall be free from areas of powdery or loose coating, voids, scratches, flaws, and other defects or damages which reduce the serviceability of parts or are detrimental to the protective value and paint bonding characteristics. The size and number of contact marks shall be minimal, consistent with good practice. If specified in the contract or order, contact marks shall be touched up with MIL-DTL-81706 material approved on QPL-81706 for the applicable type, class, form, and method to prevent localized corrosion.

8.10. Upholstery

8.10.1. Wrinkles

The upholstery surface shall be smooth, taught and free of wrinkles.

8.10.2. Stitching

Stitching shall be even and consistent, with no loose or exposed threads. Stitching shall not be pulled so tight as to see the stitching holes or thread (where applicable).

8.10.3. Seams

Seams shall be uniform and straight throughout the entire seat. Where applicable, seams on the right side shall match seams on the left side of the seat.

8.10.4. Leather or Fabric Surface

Reference 1.10.24.2 or 1.10.24.3 – Fabric and Leather Acceptance, for details on acceptable upholstery surface imperfections.

8.10.5. Glue and/or Velcro

There shall be no glue or Velcro showing throughout the surface of the upholstery. There shall be no hard bond lines on cushions and no witness of bond lines through a cushion cover either by sight or feel.

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8.11. Restraint Webbing

Reference 1.10.24.2 – Restraint and Webbing Verification/Acceptance, for details on acceptable restraint and webbing imperfections.

8.12. Winged Headrests

Winged headrests should be free of wrinkles and the upholstery should be stretched and formed tightly around the cushion and structure. Due to the complicated design of winged headrests, acceptable wrinkles and visible reinforcement stitches are defined further in Appendix C.

8.13. Pilot / Co-Pilot Seat Tracks

Reference 1.4.24.1 – Acceptance Criteria for Tracks, for details on seat track cosmetic criteria.

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9. INSPECTION RECOMMENDATIONS

9.1. Viewing Conditions and Orientation

The inspector shall scan the surface in a continuous manner. During inspection, view objects initially in an orientation perpendicular to each surface. Rotation of part or viewing angle to simulate what a customer may see is acceptable. During assembly, view objects in normal orientation of manufacturing process. In some cases inspection should be held prior to assembly. Any visible surface flaw has to be verified against the acceptable defect matrix.

9.2. Viewing Light Source

The following light source guidelines should be utilized for cosmetic inspections:

Light Specification- White, cool artificial office lighting (e.g. fluorescent light). Do not use direct sunlight.

Light Intensity- Uniform intensity between 40 and 120 foot-candles (431 and 1292 Lux).

Note: At levels of greater light intensity, caution should be used to not over inspect the parts due to accentuated surface flaws.

9.3. Viewing Inspection Table Surface

The table surface should be made of a non-reflective dark color to avoid twilight conditions.

Preferred: Black rubber mat.

Acceptable: Dark colored or neutral gray rubber mat.

Unacceptable: Light color surfaces e.g. white, yellow, metallic etc.

Note: Reflective, light-colored surfaces can eliminate or accentuate surface flaws.

9.4. Viewing Tools

Magnification Tools

Magnification tools may be used to find root causes for defects or to verify correctness of special areas.

Note: Magnification should not be used when inspecting for general cosmetic defects.

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10. SURFACE CLASSES, VIEWING TIMES AND VIEWING DISTANCES

Table 1: Surface classes, viewing times, and viewing distances.

Class	Description	Viewing Time	Viewing Distance
A	Is a critical cosmetic surface; usually (front or top) exterior surfaces which are most often closely viewed by the user / customer, e.g. side panel .	Five (5) seconds per 50 square inches (323 square centimeters) per part.	24 Inches (610 millimeters)
B	Is a semi-critical cosmetic surface; usually exterior /interior surface which are adjacent to Class A, not viewed as often but easily seen.	Seven (7) seconds per 200 square inches (1290 square centimeters) per part	30 Inches (762 millimeters)
C	Is a non-critical cosmetic surface; either structural part or exterior surface rarely viewed by the user / customer, such as back surface; or an internal surface that is visible but not normally viewed by the user / customer.	Unspecified	Unspecified

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11. PRODUCT SURFACE CLASSIFICATION

Table 2: Product Surface Classification

Part Description	A External (Critical)	B External or Internal (Semi-critical)	C Structural (Non- critical)
Seat Pan	Outside / Top Side / Lateral Sides	None	Inside
Side Panel	Outside / Lateral Sides	None	Inside
Door	Front	Sides /Inside	None
Latch/Latch Handle	Outside	Inside	None
Mounting/Base Plate/Floor pan	None	Inside	Outside
Lever/Knob	Outside / Inside	None	None
Life Vest Cont.	Front / lateral Sides	None	Inside
Seat Pan (Fixed)	None	Front/Lateral Sides	None
Armrest Structure	Outside	None	Inside
Food Tray	Top / Sides	Bottom	None
Seal Frame	Outside	None	Inside
Back skin	Outside	None	Inside
Support Leg	None	All	None
Cross member	Front	None	Inside
Restraint Webbing	All	None	None
Rub Strip Cover	Top / Ends	None	Bottom
Rub Strip End Cap	Top / Sides	None	Bottom

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Part Description	A External (Critical)	B External or Internal (Semi-critical)	C Structural (Non- critical)
Rub Strip Channel	Sides / Top	None	Bottom
Shrouds	Outside	None	Inside
Shrouds w/ Stowage	Outside	Inside (Visible area upon normal use)	Inside (Non visible area upon normal use)
Upholstery (Pilot & Copilot Seats)	Headrest, Backrest, Armrest, Seat Pan	None	Inside
Upholstery (Cabin Attendant Seats)	Headrest	Backrest, Armrest, Seat Pan, Foot Rest	Inside

(See Appendix A for figures with surface classifications marked)

12. ESCALATION PROCESS AND SPECIFICATION PRECEDENCE

12.1. Escalation Process

Every team member has to question inferior workmanship **ONLY** when you see a defect that is not clearly identified in this SPS or other overriding documentation.

When questioning a product or part for inferior cosmetic issues, follow this escalation process:

1. Locate suspected defect
2. Check the appropriate documentation hierarchy path as specified below. If no applicable criteria is found, contact the following support team members:

Responsible Product Support Engineer

Quality/Manufacturing Engineering

Supplier Engineer if it is a Vendor part

The support team member must evaluate and make a decision on the suspected defect.

12.2. Order of Precedence

In case of a conflict between this SPS and other applicable specifications, the following hierarchy will apply:

1. Purchase Order
2. Drawing
3. Engineering Specification

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- 4. Work Instruction (WI)
- 5. This SPS

13. ACCEPTANCE CRITERIA

Table 3: Acceptance criteria for Classes A, B, and C

CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Plastics/ Upholstery/ Restraint Webbing	Abrasions	None		Acceptable provided there is no effect on structural integrity or detracting from overall finished appearance.
Plastics	Air Pockets	None		Acceptable provided there is no effect on structural integrity or detracting from overall finished appearance.
Metals	Bubble	None		
Upholstery	Bump	None	Up to 1/8 inch in height	Acceptable provided there is no effect on structural integrity or detracting from overall finished appearance.
Plastics	Burns	None unless accepted per approved engineering document for particular process.		

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Metals / Plastics	Burrs	Remove the burr that projects beyond the edge corner. A sharp edge may remain or the edge may be broken to 10% of the material thickness to a maximum of .015".		
Plastics/ Upholstery/ Restraint Webbing	Cleanliness	No oil, grease, dirt, mold release, plastic shavings, etc. allowed. Visibly clean.		No oil, grease, dirt, mold release, plastic shavings, etc. allowed.
Plastics	Cloudiness/ Haziness	None		Allowed provided defect does not detract from overall finish appearance.
Metals/ Plastics / Upholstery	Color Consistency	See procedure 1.10.24.1		
Metals/ Plastics/ Upholstery/ Restraint Webbing	Contamination /FOD	None		
Metals	Corrosion/ Rust / Oxidation	None unless accepted per approved engineering document.		
Metals / Plastics	Cracks	None		
Plastic	Chill lines	None		Acceptable provided the defect does not detract from overall finish appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Plastic/ Upholstery	Cuts (Appendix B: Table 7.7)	None		Acceptable provided the defect does not detract from overall finish appearance.
Restraint Webbing	Cuts	None		
Metals / Plastics	Decorative/ Cosmetic surface	Free of all dents, dings, and scratches. Finish surface to a surface roughness of a maximum of 45 µin (RMS parameter). Material/part must still meet minimum thickness requirement(s).		N/A
Metals / Plastics	Dent / Ding / Pitting	None		Less than or equal to 0.09 inches (2.3 millimeters) in depth or less than 10% of material thickness.
Upholstery	Deviation From Nominal (Appendix B: Table 6.9, 7.3)	Stitching lines shall not deviate from nominal line by more than 0.060".		Acceptable provided the defect does not detract from overall finished appearance.
Plastics	Discontinuity in Surface Profile (Appendix D: Table 9.3)	None		Acceptable provided the defect does not detract from overall finish appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Plastics	Ejector Marks	None		Acceptable provided the defect does not detract from overall finish appearance.
Plastics	Facets (in rounded areas or radii) (Appendix D: Table 9.1, 9.2)	None		Acceptable provided the defect does not detract from overall finish appearance.
Metals / Plastics	Flash	None	Less than or equal to 0.005 (0.13 millimeters) in height	Less than or equal to 0.02 inches (0.51 millimeters) in height
Plastics	Flow Marks	None		Acceptable provided the defect does not detract from overall finish appearance.
Metals	Flaking / Chipping / Peeling	None unless accepted per approved engineering document.		
Rub Strip	Gap (between cover and end cap)	Up to 1/8 inch		Acceptable provided the defect does not detract from overall finish appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Upholstery	Gap (Appendix B: Table 6.4, 7.5)	Must be uniform and $\leq 1/8$ inch		Acceptable provided the defect does not detract from overall finish appearance.
Metals/ Plastics	Gloss / Finish	100% uniformity of surface per finish call out, Accept per approved engineering document.	90% uniformity of surface per finish call out, Accept per approved engineering document.	60% uniformity of surface per finish call out, Accept per approved engineering document.
Upholstery	Loose Threads (Appendix B: Table 6.1)	None	Acceptable up to 1/8 inch	Acceptable provided the defect does not detract from overall finish appearance.
Metals	Metal Fuzz	None		
Metals	Nibble	Maximum scallop height shall not exceed 0.01"		Maximum scallop height shall not exceed 0.1" provided there is no effect on form, fit or function/no detract from overall finished appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Metals / Plastics	Paint Non- Adhesion / Non- Uniformity / Inconsistency	None		Acceptable provided the defect does not detract from overall finish appearance.
Plastics	Pull	None		Acceptable provided the defect does not impact form, fit, or function and there is no detraction from overall finished appearance.
Metals / Plastics	Paint runs / splatters	None		Acceptable provided the defect does not detract from overall finish appearance.
Metals / Restraint Webbing	Scratches/ Gouges	None		Acceptable provided the defect does not impact form, fit, or function and there is no detraction from overall finished appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Raw Materials / Plastics	Scratches/ Gouges	Qty. 3, less than or equal to 0.01 x 0.03 inches (0.25 x 0.76 millimeters)	Qty. 2; Less than or equal to 0.02 x 0.09 inches (0.51 x 2.29 millimeters). Qty. 1; Less than or equal to 0.01 x 0.25 inches (0.25 x 6.4 millimeters).	Less than or equal to 0.02 x 0.25 inches (0.51 x 6.4 millimeters); Qty. 3; Less than or equal to 0.01 x 0.5 inches (0.25 x 12.7 millimeters)
Metals / Plastics / Upholstery / Restraint Webbing	Scuff Marks	None		Acceptable provided the defect does not detract from overall finish appearance.
Plastics	Short-Shots	None		
Plastics / Raw Materials	Sink	Less than or equal to 0.003 inches (0.076 millimeters) deep	Less than or equal to 0.005 inches (0.13 millimeters) deep	Less than or equal to 0.03 inches (0.76 millimeters) deep
Upholstery	Spacing	Even and consistent varying no more than ± 1 stitch per inch.		Acceptable provided the defect does not detract from overall finished appearance.
Plastics	Splay	None		Acceptable provided the defect does not detract from overall finished appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Metals / Plastics	Spot weld, Welding Lines	None	Less than or equal to 0.005 inches (0.13 millimeters) in height or depth.	Less than or equal 0.005 inches (0.13 millimeters) in height or depth.
Plating layers/ Plastics	Texture	See Decorative/ Cosmetic Surface.	Machined surfaces shall be $\sqrt{125}$ μin max unless called out as Cosmetic or Decorative surface per drawing. In such case, see Decorative/ Cosmetic Surface.	Machined surfaces shall be $\sqrt{125}$ μin max unless otherwise specified.
Metals / Plastics	Tooling marks / Die marks / Slug mark / Punch mark / Burnish marks	None unless specifically allowed by approved engineering document.	Less than or equal to 0.5 of the tolerance of the feature on which the mark is found.	
Upholstery	Torn thread holes	None		Acceptable provided the defect does not detract from overall finished appearance.
Upholstery	Visible thread/holes on seam (Appendix B: Table 6.2, 7.1, 7.2)	None		Acceptable provided the defect does not detract from overall finished appearance.

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CATEGORY	DEFECT	CLASS "A"	CLASS "B"	CLASS "C"
Plastics	Voids	Less than or equal to 0.01 square inches (6.5 square millimeters)	Less than or equal to 0.03 square inches (19.4 square millimeters)	Less than or equal to 0.06 square inches (38.7 square millimeters)
Metals	Water Spots	None		Less than or equal to 25% of surface
Upholstery	Wrinkle (Appendix B: Table 6.5, 6.6, 6.7)	None – except within 1 inch of seam (Qty. 1 per 50 in ²)	Acceptable up to 2 inches in length (Qty. 1 per 50 in ²)	Acceptable provided the defect does not detract from overall finished appearance.

14. ACCEPTABLE DEFECTS FOR GENERAL ITEMS

14.1. Product Labels

Position and content per approved engineering document (where applicable). If not otherwise specified, label should be centered on mounting surface with label edges parallel to other visible surface features if possible. Any label flaw such as smudges that obscure printed information, tears in label, wrinkles or debris behind label that creates bumps or ridges, and labels that are not firmly attached can serve as basis for rejection and corrective action.

14.2. Packaging Labels

Position and content per approved engineering document (where applicable). If not otherwise specified, label should be centered on mounting surface with label edges parallel to other visible surface features if possible. Any label flaw such as smudges that obscure printed information, tears in label, wrinkles or debris behind label that creates bumps or ridges, and labels that are not firmly attached can serve as basis for rejection and corrective action.

14.3. Packaging

Materials and parts shall be packaged to ensure adequate protection of the contents (shipping or outer pack). Good commercial practices and procedures for preservation, packaging, and shipping are to apply when not otherwise specified. Crush marks due to banding that do not damage integrity

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of packaging are allowed. Any flaw(s) that create rips, tears, gouges, or holes that damage the integrity of the packaging can serve as a basis for rejection.

15. DEFECT EVALUATION TABLES

Table 4: Evaluation table valid for parts up to 2 sq ft.

Size of defect – max allowed 0.025”	Number of Defects Allowed			Min. distance between defects
	Zone			
	A	B	C	
Up to 0.010”	any	any	any	5”
0.010 – 0.015”	3	5	any	7.5”
0.015 – 0.020”	1	4	any	10”
0.020 – 0.025”	-	1	any	12.5”

Table 5: Evaluation table valid for parts greater than 2 sq ft.

Size of defect – max allowed 0.035”	Number of Defects Allowed			Min. distance between defects
	Zone			
	A	B	C	
Up to 0.015”	4	any	any	5”
0.015 – 0.020”	3	any	any	7.5”
0.020 – 0.025”	2	6	any	10”
0.025 – 0.030”	1	4	any	12.5”
0.030 – 0.035”	-	2	any	14”

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16. APPENDIX A- Cosmetic Surface Classification Examples

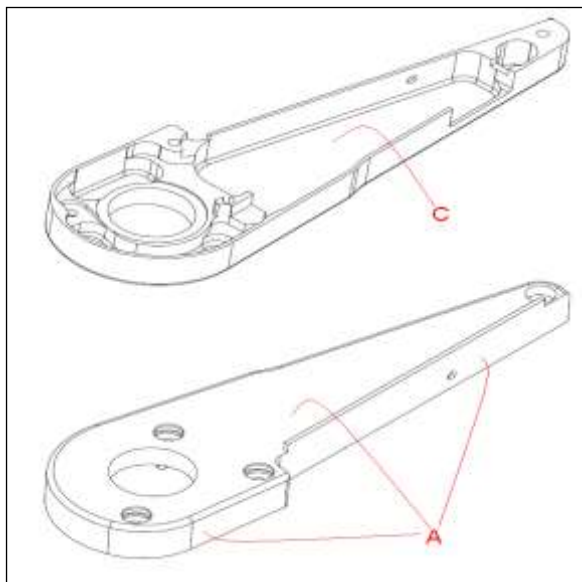


Figure 1: Armrest

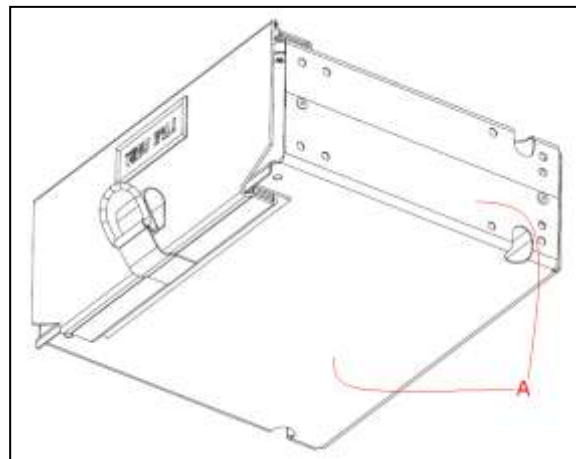


Figure 2: Life Vest Container

Figure 3: Crossmember front (a)

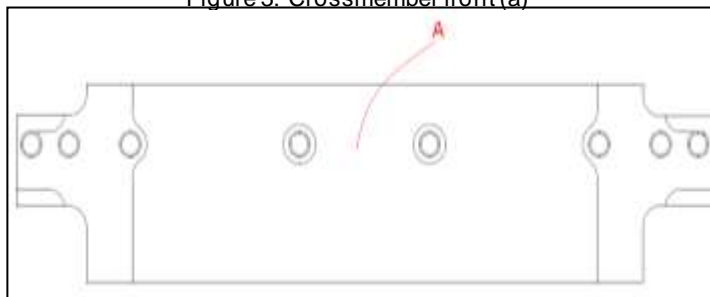
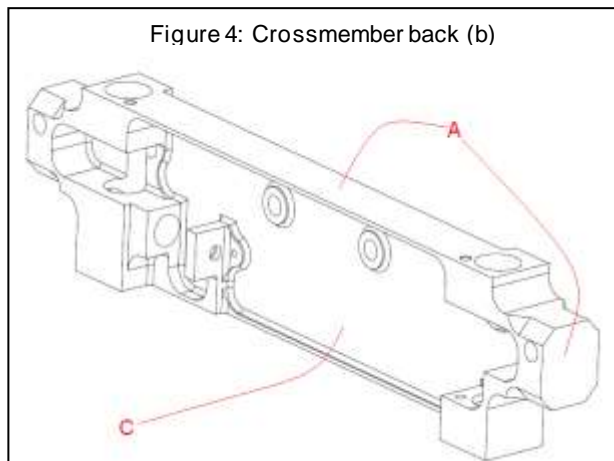


Figure 4: Crossmember back (b)

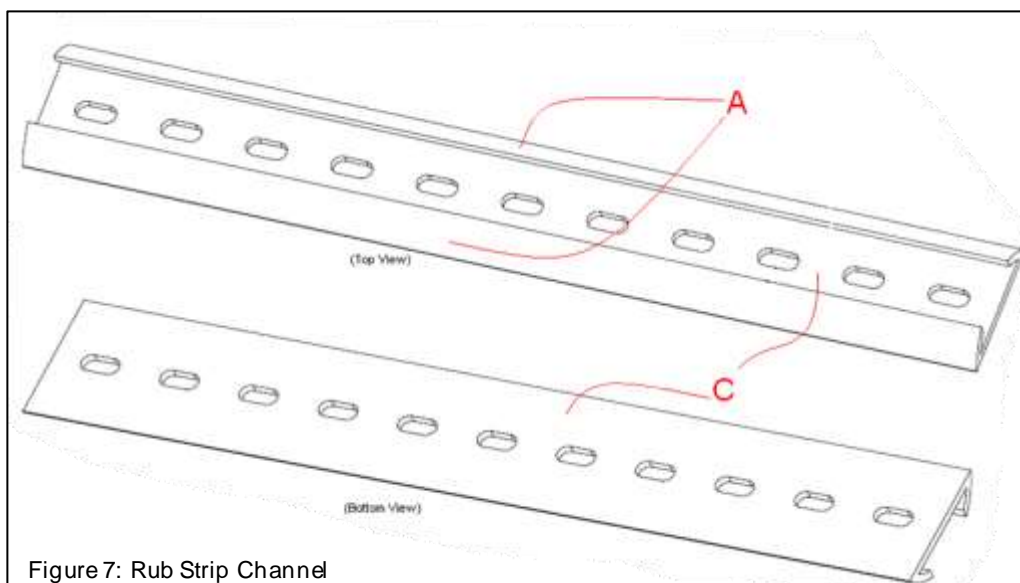
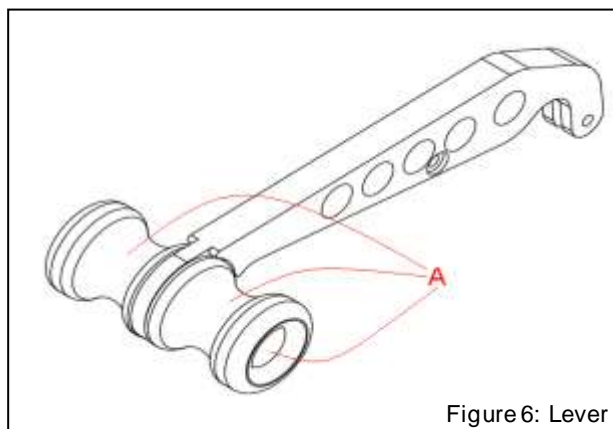
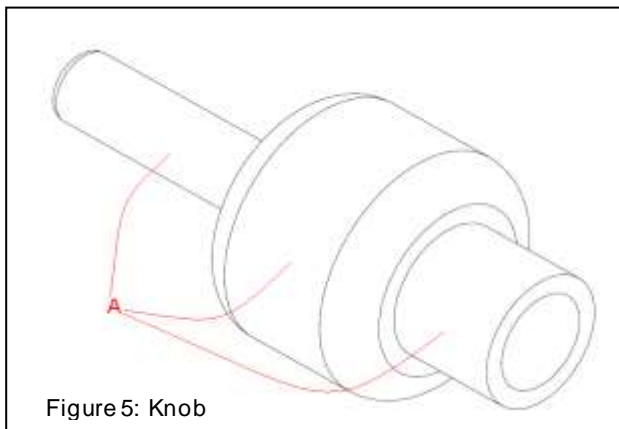


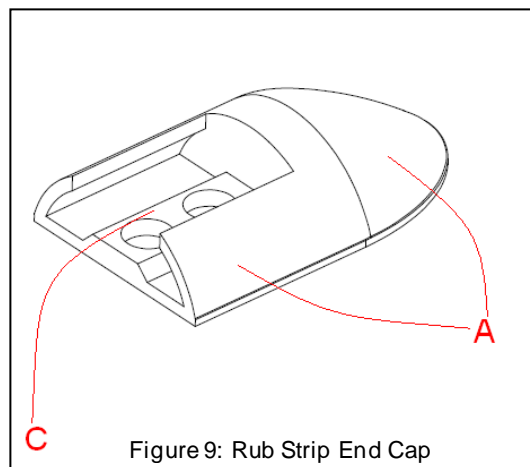
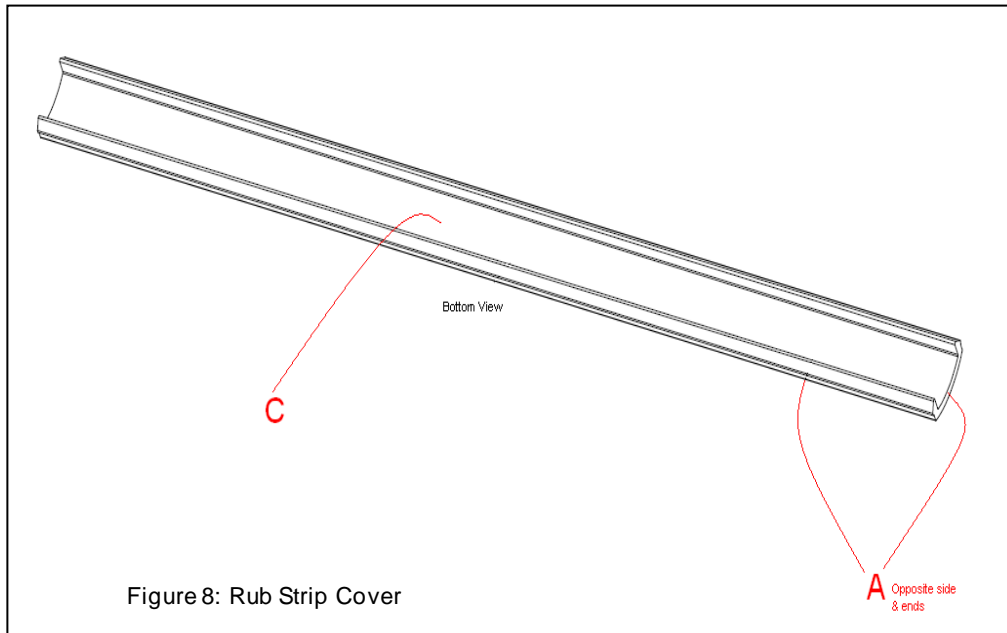
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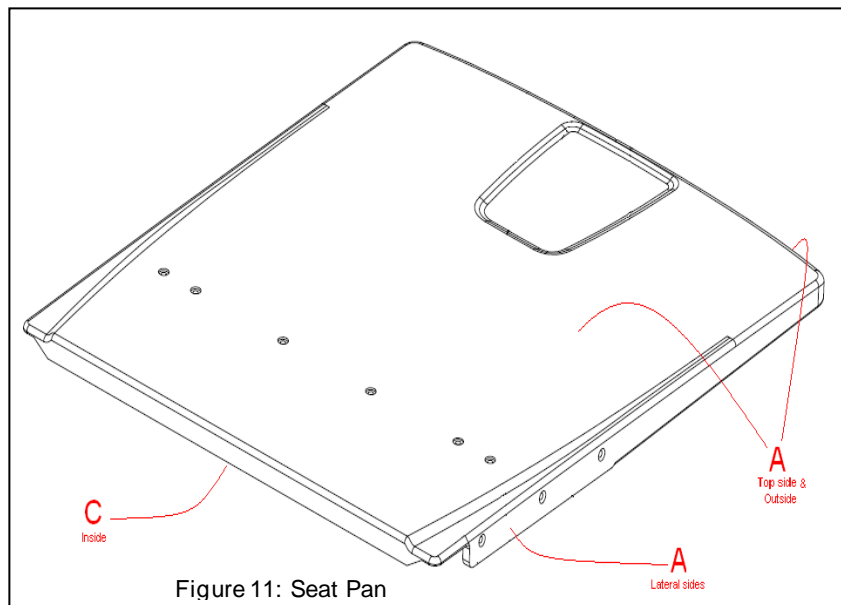
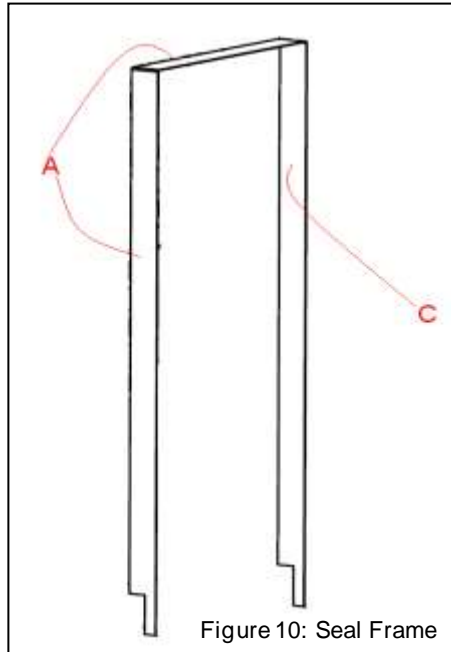
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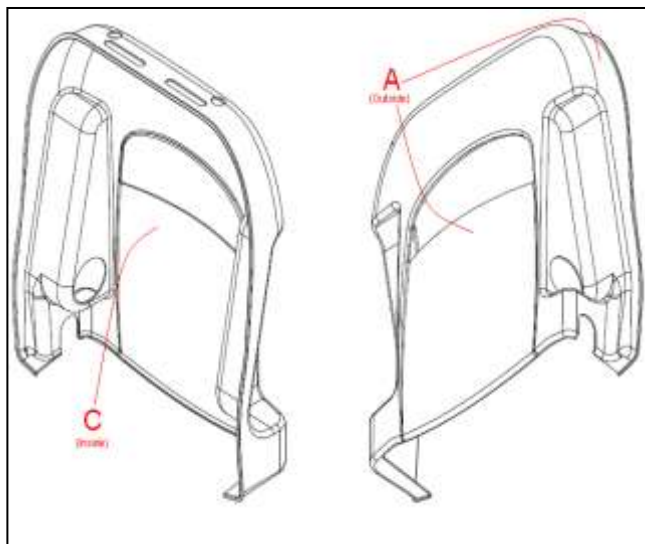


Figure 12: Shroud

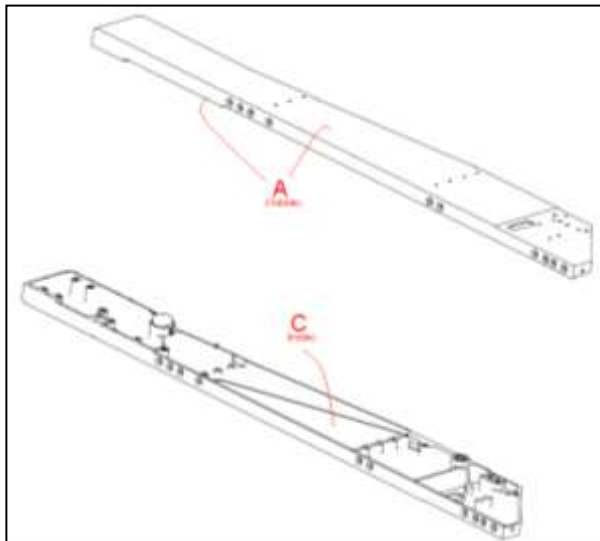


Figure 13: Side Panel

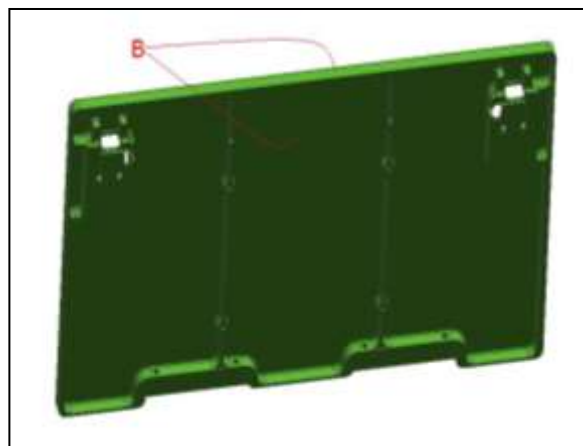


Figure 14: Door (inside)

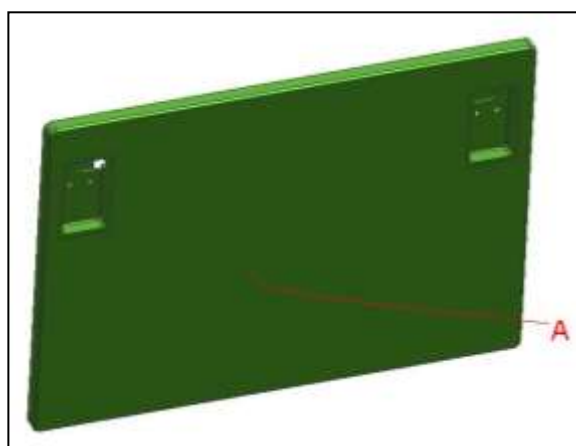


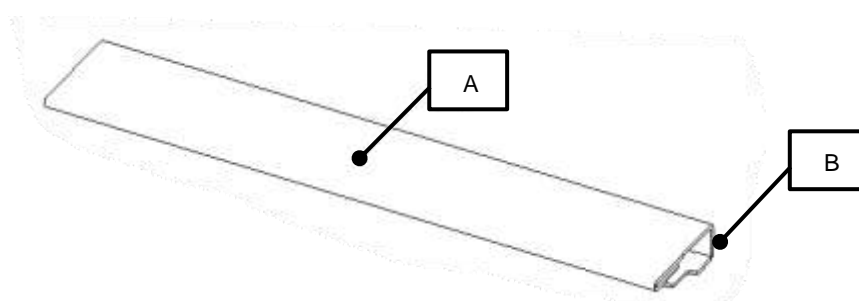
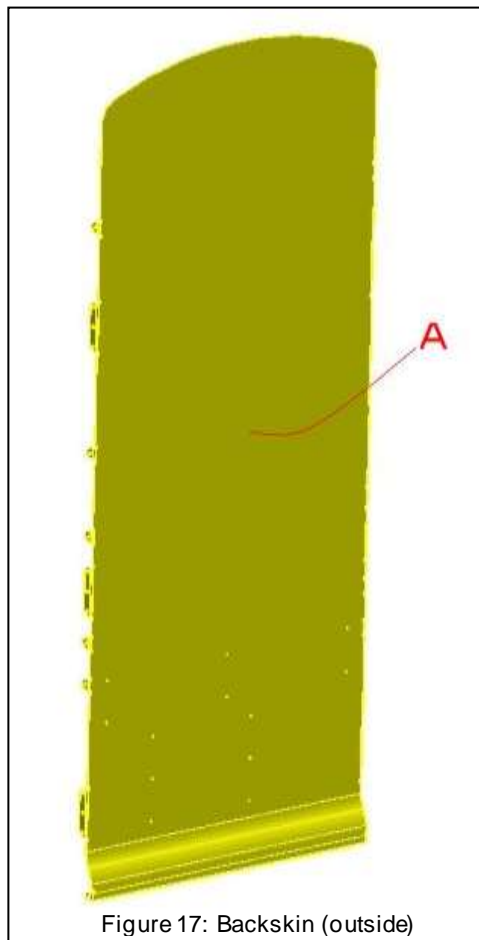
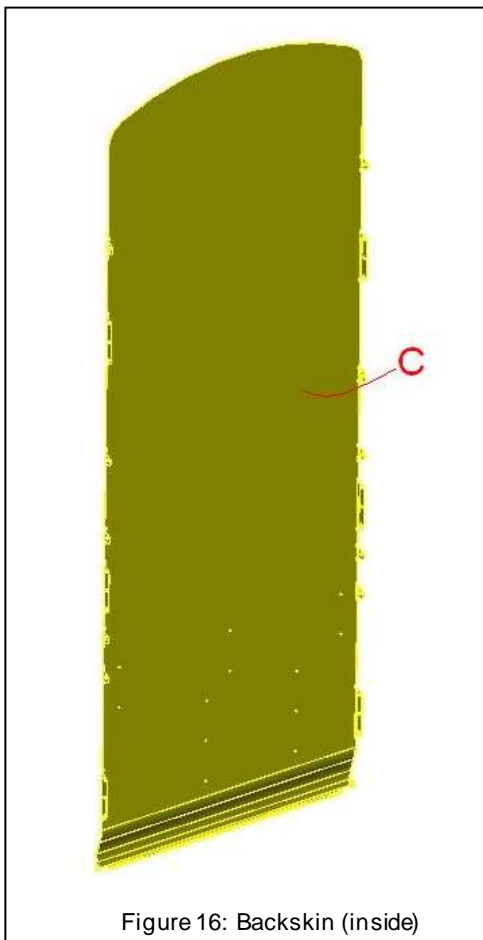
Figure 15: Door (outside)

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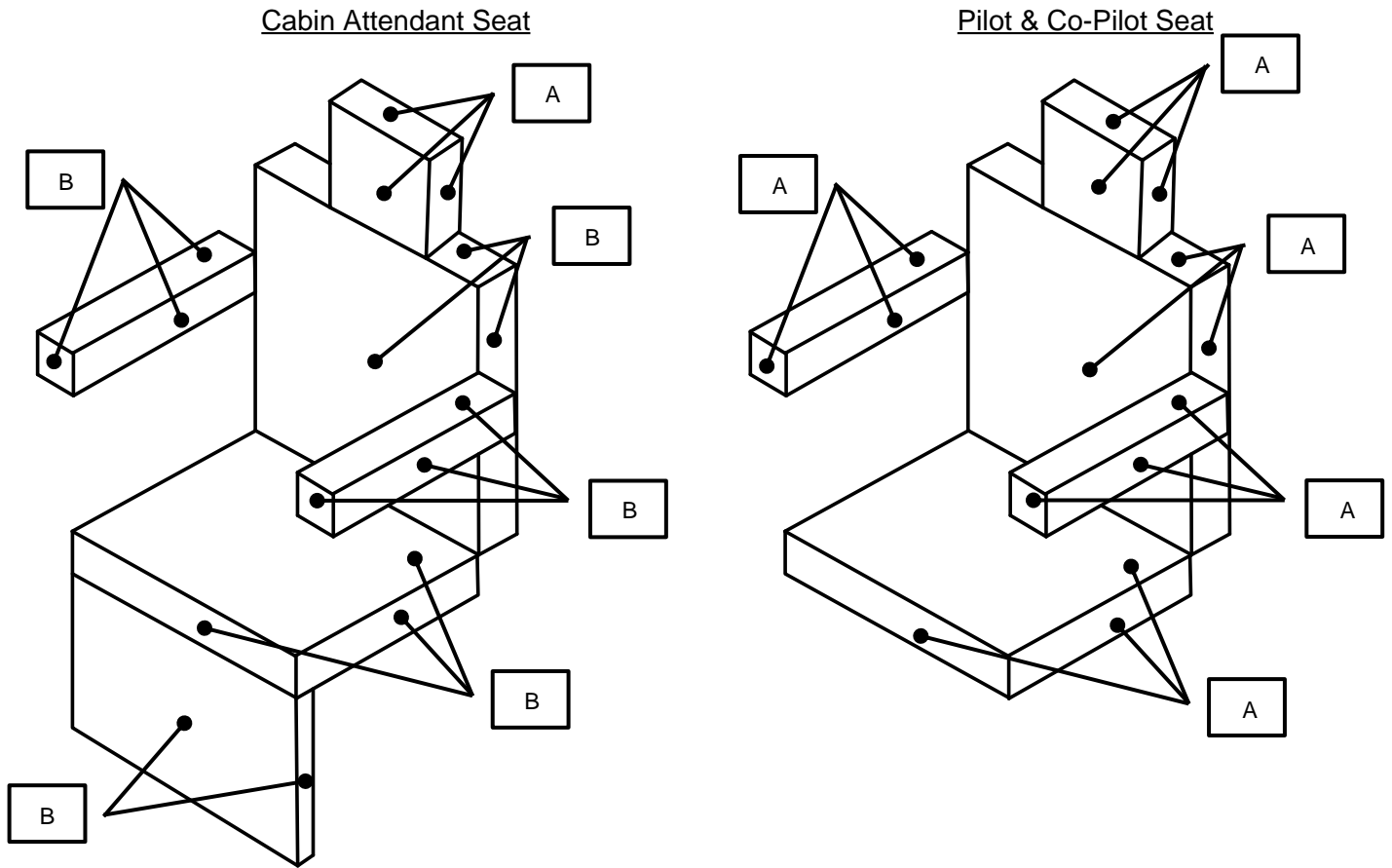


Figure 19: Pilot and Cabin Attendant Seat Upholstery Zone Classification

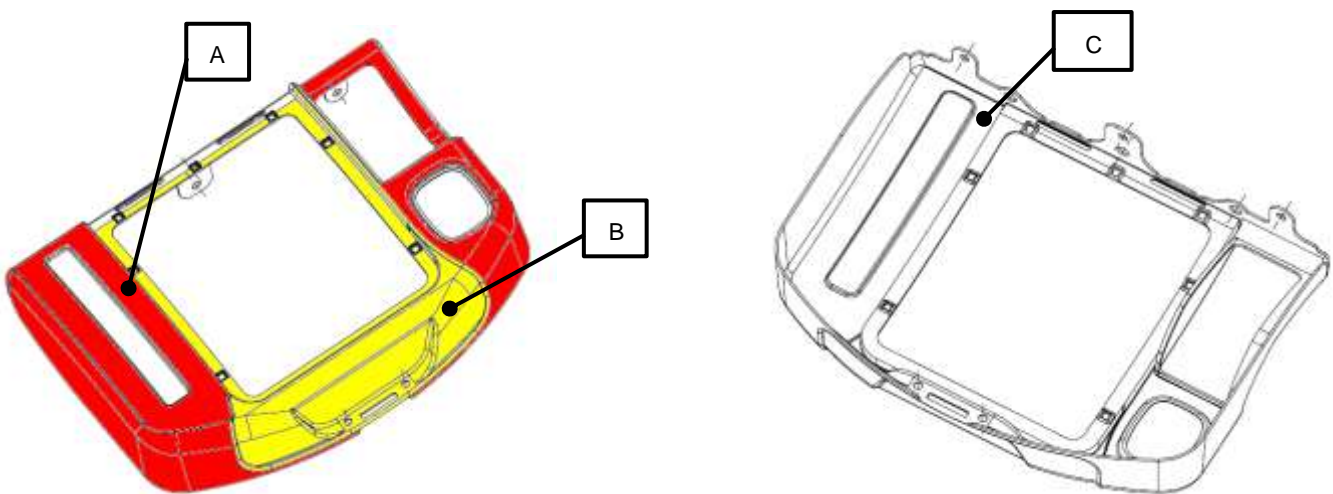


Figure 20: Shroud with Stowage

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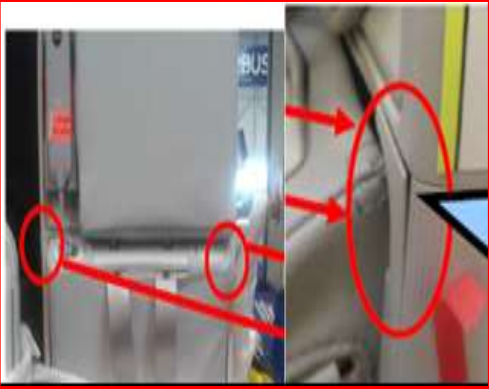



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17. APPENDIX B- Upholstery Defect Examples

Table 6: Cabin Attendant Seat Non Conformance Examples

Cabin Attendant Seats	
<p>6.1 Loose Thread</p> 	<p>6.2 Exposed Stitching</p> 
<p>6.3 Excessive Gap</p> 	<p>6.4 Excessive Gap</p> 
<p>6.5 Wrinkles in Zone A</p> 	<p>6.6 Wrinkles in Zone A/B</p> 

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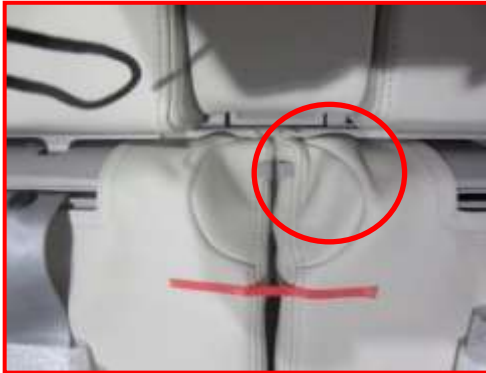
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Cabin Attendant Seats

6.7 Wrinkles in Zone B



6.9 Stitching (Deviation from Nominal)








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Table 7: Pilot / Copilot Seat Non Conformance Examples

Pilot / Copilot Seats	
<p>7.1 Visible Holes</p> 	<p>7.2 Visible Thread</p> 
<p>7.3 Deviation from Nominal</p> 	<p>7.4 Exposed Velcro</p> 
<p>7.5 Gap btwn Upholstery & Structure</p> 	

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Pilot / Copilot Seats

7.7 Cut on Leather Surface



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18. APPENDIX C- Winged Headrest Cosmetic Criteria

Table 8: Winged Headrest Cosmetic Examples

Pilot / Copilot Seats & Cabin Attendant Seats	
<p>8.1 Acceptable Condition Maximum Allowance for Wrinkles</p> 	<p>8.2 Acceptable Condition Almost Ideal Wrinkles</p> 
<p>8.3 Unacceptable Condition Deep Wrinkles in Upholstery</p> 	<p>8.4 Unacceptable Condition Deep Wrinkles in Upholstery</p> 

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Pilot / Copilot Seats & Cabin Attendant Seats

8.5 Acceptable Condition
Minimal leather bunching @ shroud interface
Reinforcement stitching hidden @ top of HR



8.6 Unacceptable Condition
Leather bunching @ shroud interface
Reinforcement stitching visible @ top of HR



8.7 Acceptable Condition
Minimal leather bunching @ shroud interface
Outer reinforcement stitching hidden @ bottom of HR
Inner reinforcement stitching visible @ bottom of HR



8.8 Unacceptable Condition
Outer reinforcement stitching visible @ bottom of HR



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Pilot / Copilot Seats & Cabin Attendant Seats

8.9 Acceptable Condition
Minimal loose leather at wings



8.10 Unacceptable Condition
Wings not fully filled out – loose leather



8.11 Unacceptable Condition
Non uniform gaps



8.12 Unacceptable Condition
Non uniform gaps created by leather bunching



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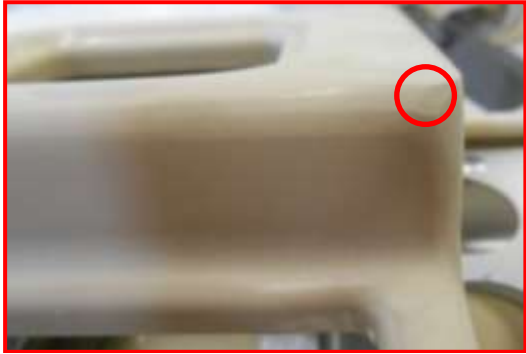

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19. APPENDIX D- Plastic Shroud Defect Examples

Table 9: Plastic Shroud Non Conformance Examples

Headrest Shrouds	
<p>9.1 Unacceptable Condition Facet in radius</p> 	<p>9.2 Unacceptable Condition Facet in radius</p> 
<p>9.3 Unacceptable Condition Discontinuity in Surface Profile</p> 	

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