Sikorsky
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A LOCKHEED MARTIN COMPANY

Date: 19 October 2017
To: Thai Aviation Services Limited
Attention: Grant Robinson
Regarding: S-76D AMM T-Rev 78-17 - Flange Inspect Procedure
Technical Case #: C0072075

Grant Robinson,

Perform inspection in accordance with inspection requirements block in the drawing on sheet 1, zone 6A, and 6B.

Per note 10, Class 2 part is as below:
Class 1 - Components the single failure of which would cause significant danger to operating personnel or would result in a significant operational penalty, such as a loss of major components, loss of control, unintentional release or inability to release armament stores, or failure of weapon installation components.
Class 1 components shall be further classified as Class 1A or 1B.
Class 1A - A Class 1 component, the single failure of which would result in the loss of an aircraft. This Class includes all Flight Safety Parts.
Class 1B - A Class 1 component not included in Class 1A.
Class 2 - All components not classified as Class 1A or 1B.

Penetrant inspect after welding per:
Type I – Fluorescent penetrant inspect
Method A - Water washable liquid penetrant inspection method
Level 3 - High sensitivity level for liquid penetrant inspection

Grade B acceptance criteria is as attached table and description:
Cross Reference - The correlation between the quality grades used in this specification in TABLE II and previous revisions of this specification are indicated in TABLE III. (Note Quality Grades A and B were defined prior to the development of grade C which was an intermediate grade)

TABLE III. CORRELATION OF QUALITY GRADES

Current Quality Grade Designation	Previous Quality Grade Designation
1	A
2	C
3	B

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TABLE II. DISCONTINUITY ACCEPTANCE LIMITS AND DISPOSITIONS

DISCONTINUITY ACCEPTANCE LIMITS AND DISPOSITION CODES 3/ 4/ 5/ 6			
	Quality Grades		
	1	2	3
Linear Indications – General All Materials			
Cracks 1/	(1)	(1)	(1)
Corrosion 2/	(1)	(1)	(1)
Linear Indications – Wrought or Forged			
Laps, Laminations, Seams, Bursts	(2)(3)	(2)(3)	(2)(3)
Linear Indications – Castings or Welds			
Cold Shuts, Shrinkage, Hot Tears	(2)(3)	(2)(3)	(2)(3)
Inclusion- linear	(2)(3)	(2)(3)	(2)(3)
Chain Porosity	(2)(3)	(2)(3)	(2)(3)
Rounded Discontinuities – Wrought or Forged			
Corrosion 2/	(2)(3)	(2)(5)	(2)(6)
Porosity	(2)(11)	(2)(5)	(2)(6)
Rounded Discontinuities – Castings, Welds or Powder Metallurgy (Sintered) Products or Thermal Spray Coatings			
Porosity	(2)(3)(9)	(2)(5)	(2)(6)
Microshrinkage	(2)(3)	(10)	(10)
Corrosion 2/	(2)(3)	(2)(5)	(2)(6)
Inclusion-nonlinear	(2)(3)	(2)(5)	(2)(6)

Disposition:

(1) Reject all indications.

(2) Reject thru-wall indications regardless of size. Back-to-back discontinuities (see 6.3.1) may be through wall indications that shall require further investigation.

(3) Reject all relevant indications that do not meet the specified acceptance criteria. Subsequent removal shall be performed by qualified personnel. Qualified personnel shall be capable of performing dimensional checks to the accuracy specified by the drawing.

(4) Deleted.

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(5) Accept if one of the following criteria is met:

Up to .010 inch diameter	Acceptable
.011 to .040 inch diameter	Acceptable up to 3 within any .25 inch diameter

If otherwise, use disposition (3).

(6) Accept if one of the following criteria is met:

Up to .010 inch diameter	Acceptable
.011 to .040 inch diameter	Acceptable up to 3 within any .25 inch diameter
.041 to .080 inch diameter	Acceptable up to 3 within any .50 inch diameter

If otherwise, use disposition (3).

(7) Deleted.

(8) Deleted.

(9) Accept if one of the following criteria is met:
Up to .010 inch diameter is Acceptable
Otherwise, use disposition (3).

(10) Reject thru-wall indications (see 6.3.1.1) and back-to-back discontinuities (see 6.3.1) that result in a thru-wall indication, regardless of size otherwise accept. Clean and reprocess if unable to confirm microshrinkage in accordance with 3.6.6

(11) For Rounded Discontinuities – Wrought or Forged products disposition in accordance with the following:
Up to .010 inch diameter and well dispersed (see 6.3.36) is Acceptable
Greater than .010 inch or linear aligned (see 6.3.22) use disposition (3).

NOTES: 1/ Inherent crazing cracks in chromium plate that are not visible on the metal surface without magnification under white light are acceptable.

2/ Penetrant inspection is not generally used to detect corrosion. However, in advanced stages stress corrosion cracks exist as linear indications, intergranular corrosion displays a network pattern, and pitting can be seen as round indications.

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3/ Acceptance of Surface Nicks/Dents and Scratches: After final part fluorescent penetrant inspection has been performed, requirements and acceptance of nicks/dents and scratches shall be as follows:

Polish/blend and accept to engineering drawing dimensional and surface finish requirements. No additional penetrant inspection is required.

NOTE: The same method used to discover/determine the nature of nicks/dents and scratches will be used to verify their removal.

The nicks/dents and scratches criteria includes Flight Safety parts where the Final Fluorescent Penetrant inspection was Critical Characteristic.

Rework to remove nicks/dents and scratches shall not violate Engineering Drawing dimensions.

4/ Discontinuities in as-cast surfaces that have been previously inspected may be held to the original acceptance criteria utilized at the time of the previous inspection. For example: A finish machined surface is inspected to Grade A but the casting it is machined from was inspected to Grade B at the casting level. As-cast surfaces will be inspected but will meet the Grade originally specified.

5/ Chain Porosity is evaluated using the size limitations as determined using the assigned Quality Grade. (See 6.3.22 Linear Aligned Discontinuities) For example; 3 porosity indications in Linear Alignment within a .25 inch area of a Quality Grade B casting, would have to be separated from each other by at least 0.12 to be considered acceptable.

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3.6 Procedure

3.6.4.11 Developers. It is not necessary to apply developers to magnesium and aluminum castings that have not been in service. Instead, a 10 minute to 2 hour penetrant bleed out time shall be provided after drying. Developer will be applied to questionable indications, and evaluated immediately in accordance with 3.6.6. Castings that have not been inspected within the 2 hour maximum bleed out time shall be cleaned and reprocessed.

3.6.6 Indication Verification. Any area that exhibits background fluorescence or any questionable indication shall be processed as follows:

a. Lightly wipe the suspect area with a soft brush or cotton swab dampened with a chromate free solvent.

b. Do not permit the liquid to run over or flood the surface.

c. Allow the solvent to evaporate from the surface; apply dry or nonaqueous developer (see 3.6.4.11) to the area in question and examine under black light again.

d. Magnification (3X - 10X) and white light shall be used to determine the type of discontinuity.

e. If the indication reappears immediately, it shall be evaluated immediately. If the indication does not reappear, immediately, a minimum of 10 minutes shall be allowed before final evaluation.

f. Steps a through d may be performed no more than two times.

6.3 Definitions

6.3.1 Back-to-back: Discontinuities. Discontinuities on opposite sides of a material wall. Discontinuities that are not connected are considered back-to-back only and shall be evaluated as two indications. Back-to-back discontinuities must be further evaluated to determine if a thru-wall condition exists. Discontinuities on opposing sides of a wall that are connected are considered to be a single thru-wall defect (see 6.3.1.1).

6.3.1.1 Thru-Wall. The condition associated with any discontinuity which has a migration path from one side of a material surface to the opposite side of the same wall (see Figures 1 and 2).

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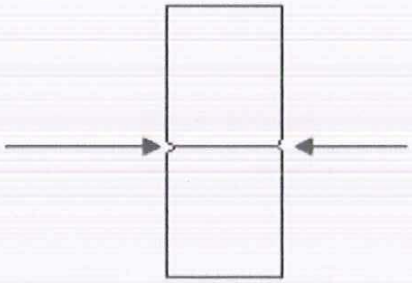

Figure 1.

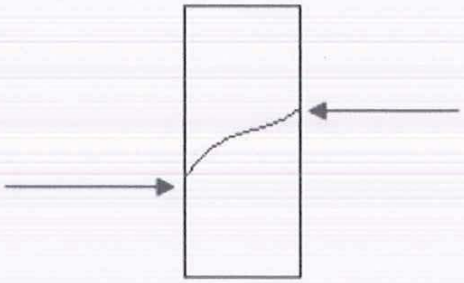

Figure 2.

6.3.22 Linear Aligned Discontinuities. Three or more discontinuities separated from one another by less than three times the maximum discontinuity dimension as defined by the quality grade.

6.3.36 Well Dispersed. - Discontinuities separated by .125" or more.

Best Regards,

S. Blayne Ashmore

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