

T-401 Inspection Limits and Repair

**E3840004-5 1st Stage Turbine Blade
E3840008-2 2nd Stage Turbine Blade**

Engine Application(s):	Allied Signal 331-200 and -250 Series Auxiliary Power Unit.	
Subject:	Inspection Limits and Repair	
Compliance:	On condition.	
Revisions:	N/C	Dated 10/8/99 Original issue.
	A	Dated 7/23/09 Updated EXTEX to TIMKEN.
	B	Dated 2/08/16 Updated Timken to EXTEX Engineered Products.

1.0 INSPECTION PROCEDURES:

Feature	Service Limit	Repair Limit	Corrective Action
Axial movement between blade and retainer.	.010" maximum when retainer is tight against disk.	None.	Replace
Leading edge damage (scratches, nicks, tip rub)	Damage less than .003" may be returned to service.	Damage less than .025" Damage greater than .025"	Repair per 2.2 Replace
Tip damage (scratches, nicks, tip rub)	Damage less than .003" may be returned to service.	Damage less than .010" Damage greater than .010"	Repair per 2.2 Replace
Sulfidation damage, Area A	None	Damage less than .010"	Repair per 2.3
Sulfidation, Areas B and C	None	None	Replace
Erosion damage	Damage up to .125" Damage greater than .125"		Repair per 2.4 Replace

2.0 REPAIR PROCEDURES

2.1 Repair by Hand finishing – All Areas

- Surface finish of 63 micro-inches or better required
- No undercutting allowed
- All transitions between blended areas and original material surface shall be smooth and continuous.
- Trailing and leading edges must be re-established as a full radius.

2.2 Repair Leading Edge, Trailing Edge, and Tip damage

- Hand finish blades to remove nicks, burrs, and cracks that do not exceed repair limits

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- After hand finishing, apply a corrosion resistant finish such as Sermatel J, or re-coat as described in 2.3 to ensure maximum service life.

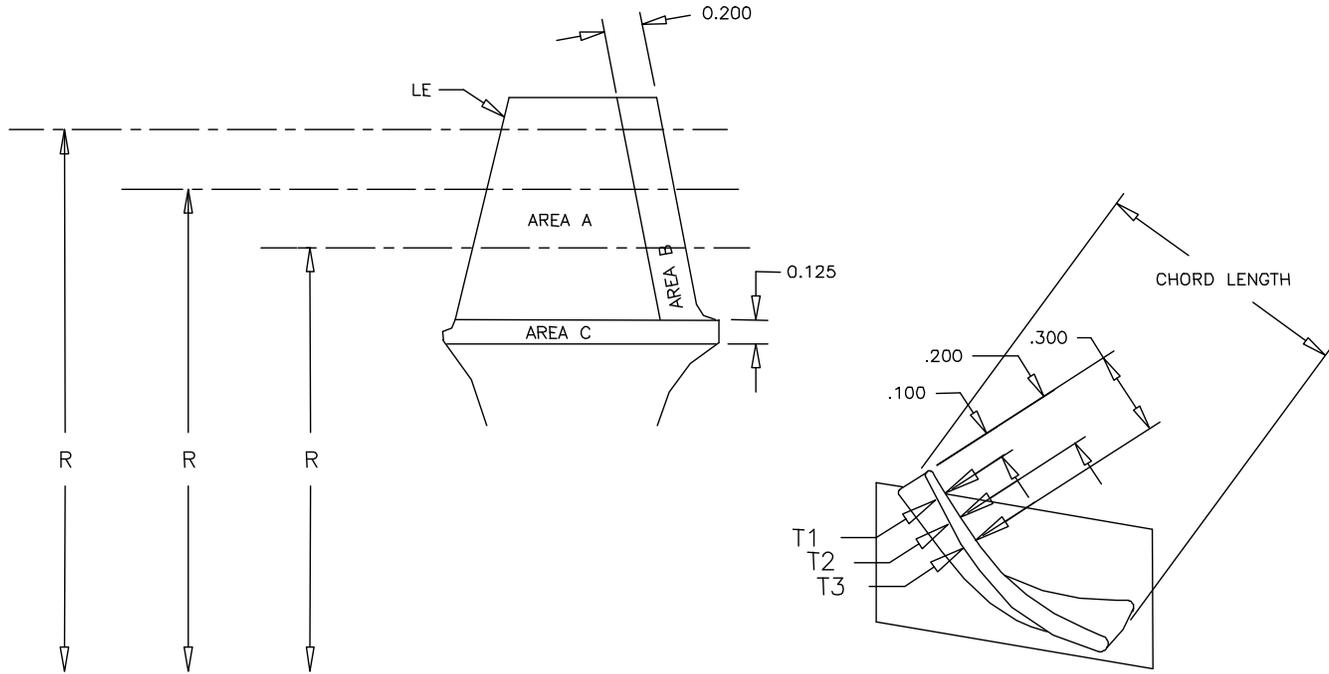
2.3 Repair Sulfidation

- Remove Platinum-Aluminide coating.
- Check for complete removal of coating by heating the blade and a piece of test material to 1050-1100°F for 60 minutes. A color match, usually blue, indicates complete coating removal.
- Leading edge damage to .025 deep may be removed by hand finishing. Full radius must be maintained after blending.
- Area A damage to .010 max depth may be repaired.
- FPI per ASTM E 1417. Scratches may be hand finished to blend smoothly. Blades with cracks must be replaced.
- Clean by vapor degrease or equivalent.
- Re-coat blended area using diffused aluminum per CR178, RT21 or RT22, .002-.004 thick.

2.4 Repair Erosion

- LE Radius may be blended provided part meets all dimensional requirements in Figure 1 after blending. Full radius must be re-established on leading edge after blending.
- TE erosion thinning is acceptable provided the airfoil meets all limits in Figure 1.
- After erosion repair, strip, heat tint, FPI, clean and re-coat as above.

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E3840004-5				
FIRST STAGE BLADE – MINIMUM LIMITS				
RADIUS	T1	T2	T3	CHORD LENGTH
R=3.163	0.0204	0.0348	0.0597	0.906
R=3.363	0.0177	0.0225	0.0382	0.882
R=3.500	0.0165	0.0178	0.0244	0.876

E3840008-2				
SECOND STAGE BLADE – MINIMUM LIMITS				
RADIUS	T1	T2	T3	CHORD LENGTH
R=2.963	0.0216	0.0344	0.0594	0.959
R=3.163	0.0208	0.0321	0.0531	0.942
R=3.263	0.0203	0.0301	0.0484	0.943
R=3.562	0.0192	0.0255	0.0363	0.963
R=3.863	0.0183	0.0199	0.0256	0.984

Figure 1