

## 2<sup>nd</sup> Stage Turbine Nozzle Assembly

<b>Engine Application(s):</b>	250-C30, C30G, C30G/2, C30L, C30M, C30P, C30R, C30S
<b>Subject:</b>	Inspection and Rework Procedures for the E23032335, E23055438 & E23062029 2 <sup>nd</sup> Stage Turbine Nozzle Assembly.
<b>Compliance:</b>	Any time the Nozzle Assembly is removed for overhaul. Refer to the Table and Figures for Inspection and Rework Procedures.  Table 1: Acceptance and Rework Limits and Procedures Figure 1: Inspection Figure 2: Dimensional Inspection
<b>Notes:</b>	EXTEX P/N E23032335, E23055438 & E23062029 limits the maximum radial movement to 0.003". This amount of movement complies with Allison CEB 72-3188. Refer to OEM's published data for installation, engine operation and disassembly.
<b>Revisions:</b>	N/C Dated: 6/16/97 Initial release. A Dated: 6/28/99 Removed sources. B Dated: 1/29/01 Added P/Ns E23055438 & E23062029. Updated format. C Dated: 12/3/02 Updated format and revised FPI note **. Added "3 SIDES" to Figure 2 weld symbol. D Dated: 3/21/03 Page 5: "BNi-10 or N99622(UNS)" was AMS4777". Page 6: Removed "blaze" and .100" was .01". E Dated: 9/04/09 Updated EXTEX to TIMKEN. F Dated: 2/02/16 Updated Timken to EXTEX Engineered Products.

**REASON:**

To provide instructions for continued airworthiness

**DESCRIPTION:**

Instructions for continued airworthiness.

**APPROVAL:**

Technical aspects are FAA Approved.

**WEIGHT AND BALANCE:**

Not Affected.

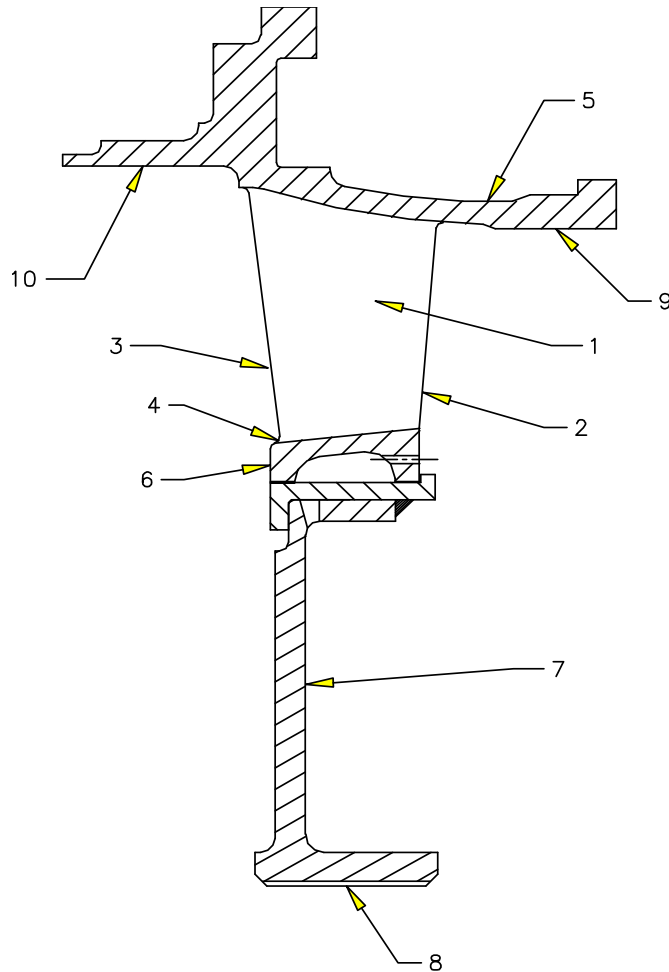
**PREREQUISITES:**

None.

**ACCOMPLISHMENT INSTRUCTIONS:**

E23032335, E23055438 & E23062029

**Second Stage Turbine Nozzle Repair**



Key	Location	Description of Condition
1	Vane Airfoil	Cracks
2	Vane Leading Edge	Nicked, Dented
3	Vane Trailing Edge	Nicked, Dented, Warped, Burned
4	Vane Fillet	Cracks
5	Outer Band	Cracks
6	Inner Band	Cracks
7	Diaphragm	Cracks
8	Seal Surface	Wear
9	#1 Blade Tip Path	Wear
10	#2 Blade Tip Path	Wear or Warped

**FIGURE 1**

**E23032335, E23055438 & E23062029  
Second Stage Turbine Nozzle Assembly  
Inspection and Rework Limits**

<b>Condition</b>	<b>Service and/or Repair</b>	<b>Corrective Action</b>
<b>Airfoil Crack Indications, Visual and FPI**</b>	Leading Edge: 0.25 inch maximum is acceptable. Trailing Edge: 0.25 inch maximum is acceptable.  Acceptance is contingent upon the following: 1) Two or more cracks cannot lie in the same plane. 2) Multiple cracks are separated by at least 0.25 inch. 3) Two or more cracks do not propagate toward one another.	1) Weld repair. Open void areas. 2) Replace when welding capability exceeded. 3) Furnace braze per approved procedure when crack condition permits. Welding not required when brazing condition exists.  Airfoils may be repaired using FAA/DER approved procedure.
<b>Damaged Airfoils**</b>	Leading Edge: 0.156inch maximum after blending is acceptable provided the EFA is between 6.92 and 7.22. Trailing Edge: 0.156 inch maximum after blending is acceptable provided the EFA is between 6.92 and 7.22.	Install new or serviceable Nozzle or weld repair Vane Ring per approved procedure if Service Limit cannot be met. Blend airfoil to remove damage. <b>*** See Note on Page 5</b> Airfoils may be repaired using FAA/DER approved procedure.
<b>Airfoil Fillet Crack Indications, Visual and FPI*</b>	At Inner Band: 0.25 inch maximum from Leading or Trailing edge. At Outer Band: 0.25 inch maximum from Leading or Trailing edge. <b>NOTE:</b> Length specified is for cracks along the airfoil measured parallel to the adjacent band. Two or more cracks are acceptable provided they do not propagate towards one another.	Install new or serviceable Nozzle if Service Limit cannot be met. Repair using approved braze procedure. Repair using approved weld procedure when braze capability is exceeded. EFA to be between 6.92 and 7.22 after repair. Airfoils may be repaired using FAA/DER approved procedure.
<b>Outer Band Crack Indications, Visual and FPI*</b>	Axial: 0.50 inch maximum into band provided there are not cracks in line on the opposite edge. Circumferential: 0.62 inch maximum completely through wall, provided cracks are between vanes.	Install new or serviceable Nozzle if Service Limit cannot be met. Repair using approved braze procedure when crack condition permits. Weld repair open void areas per approved weld procedure. EFA to be between 6.92 and 7.22 after repair.
<b>Inner Band Crack Indications, Visual and FPI**</b>	Axial: 0.188 inch maximum into band provided there are not cracks in line on the opposite edge. Circumferential: Circumferential cracks are not acceptable.	Repair using approved braze procedure. Repair using approved weld procedure when braze capability is exceeded. EFA to be between 6.92 and 7.22 after repair. Install new or serviceable Nozzle or replace Vane Ring per approved procedure if Service Limit cannot be met.

**TABLE 1 (sheet 1 of 2)**

E23032335, E23055438 & E23062029  
Second Stage Turbine Nozzle Assembly  
Inspection and Rework Limits

Condition	Service and/or Repair Limits	Corrective Action
<b>Diaphragm Cracking, Visual and FPI***</b>	Radial cracks not extending into the inner bore are acceptable. Furnace braze repair is permitted on a maximum of 2 cracks, provided they are a minimum of 2 inches apart. Dimples are not permitted.	Install new or serviceable Nozzle or replace Diaphragm assembly per approved procedure if Service Limit cannot be met. Repair using approved braze procedure when crack condition permits. Weld repair open void areas per approved weld procedure. EFA to be between 6.92 and 7.22 after repair.
<b>Inner Seal Bore Wear/ Grooving</b>	Polish to remove burrs and sharp edges. I.D.: 1.833 - 1.835 inch diameter. Depth of Grooves: 0.012 inch maximum. Concentricity: 0.003 inch maximum TIR.	Replate or metallize per approved procedures - <b>See Figure 2.</b> Max. Dia 1.885 inch before brazing or metallizing.
<b>#1 Blade Tip Path</b>	Maximum Inner Diameter of blade tip path: 6.273 inch diameter. Concentricity: 0.005 inch max TIR.	Restore blade path by brazing or metallizing per approved procedures - <b>See Figure 2.</b> Metal removal limits: #1 blade path: 6.281 inch maximum diameter. 0.047 inch minimum localized wall thickness.
<b>Negative Imperfections (Pitting)</b>	Smaller than 0.050 dia and 0.010 deep. Must not be within 0.080 of L.E. or T.E. Limited to one per airfoil and five per part.	Blend to transition smoothly to parent material. Parting line evidence is not acceptable.
<b>Positive Imperfections</b>	Smaller than 0.050 dia and 0.005 tall. Must not be within 0.080 of L.E. or T.E. Limited to one per airfoil and five per part.	Blend to transition smoothly to parent material. Parting line evidence is not acceptable.
<b>#2 Blade Tip Path</b>	Maximum Inner Diameter of blade tip path: 6.697 inch diameter. Concentricity: 0.005 inch max TIR.	Restore blade path by brazing or metallizing per approved procedures - see Figure 2. Metal removal limits: #2 blade path: 6.704 inch maximum diameter. 0.047 inch minimum localized**** wall thickness.

TABLE 1 (sheet 2 of 2)

**T-028 Inspection Limits and Repair**

Revision: F

Issued: 2/02/16

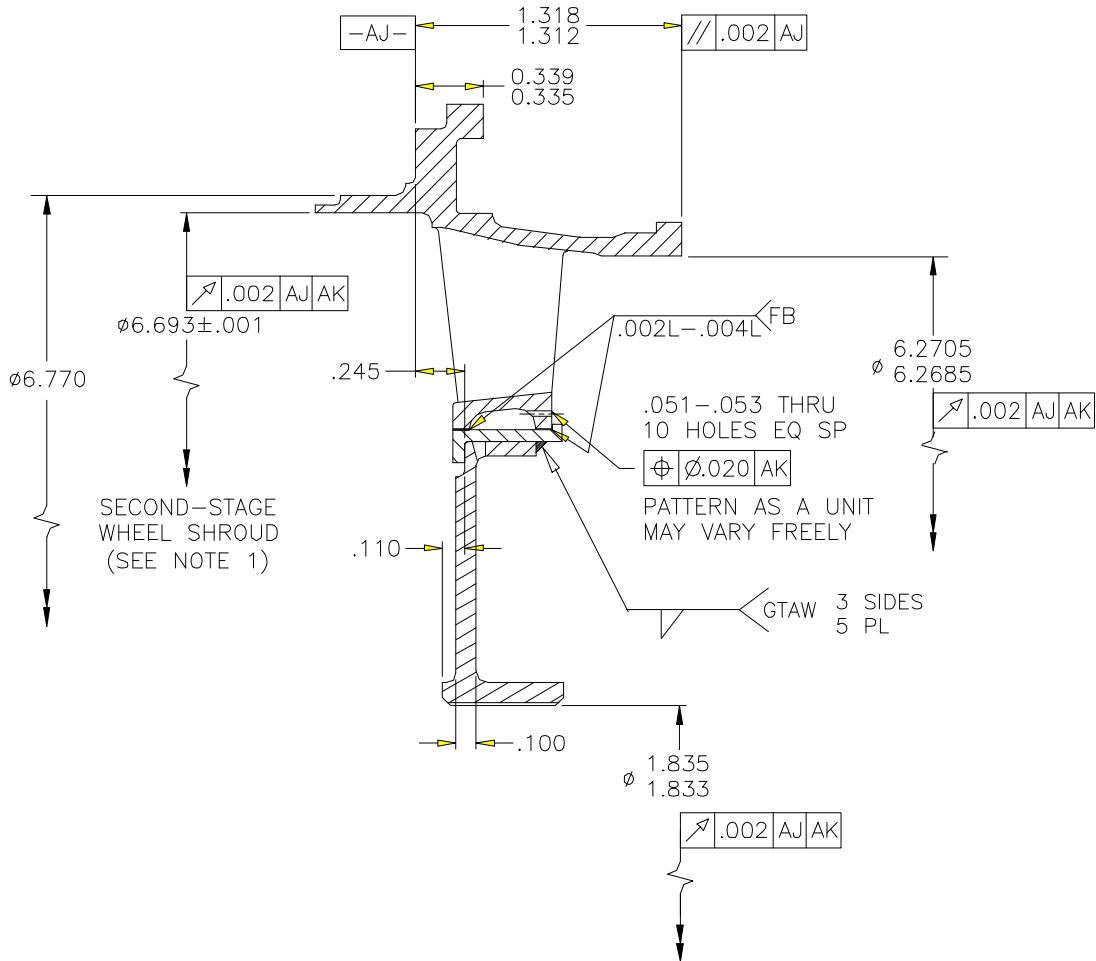
E23032335, E23055438 & E23062029  
Second Stage Turbine Nozzle Assembly  
Inspection and Rework Limits

**NOTES:**

- 1 EXTEX considers airfoil restoration of this part a Major Repair, (as defined in FAR 1,) and should be performed under FAA authorization.
- 2 Airfoil repairs to be performed by an FAA Approved repair facility with Major Repair experience.
- 3 Blending to remove L.E. and/or T.E. damage may effect airflow.
- 4 Recommended airflow to be 6.92 to 7.22 EFA (as determined with a Fleming Flow Rig.)
- 5 FPI indications less than 0.005 inch are acceptable.
- 6 Blend and polish acceptable vane edge damage in a radial direction using a fine file or 320 grit abrasive paper. Optimum blend should produce scallops with a 3:1 width to depth ratio. Maintain a smooth blend with the basic airfoil. Trailing edge radius after blend to be greater than 0.005 inch.
- \* FPI per approved water washable or post-emulsifiable technique. Indications less than 0.005 inch are not interpretable.
- \*\* Weld wire per AMS 5798 or AMS 5675.  
Braze material per BNi-10 or N99622(UNS) procedure per AMS 2675.  
Airfoils may be repaired using FAA/DER approved procedure.
- \*\*\* Blend and polish acceptable vane edge damage in a radial direction using a fine file and 320 grit abrasive paper. Maintain a smooth blend with the basic airfoil. Trailing edge radius after blend to be greater than 0.005 inch.
- \*\*\*\* Localized = Less than 16% (60°) of the Total Circumference of the blade path and no greater than 8% (30°) of the circumference of the blade path in any one area.

E23032335, E23055438 & E23062029

**Second Stage Turbine Nozzle Repair**



DATUM -AK- ESTABLISHED BY 8 EQ SP LOCATION TANGS  
DIMENSIONS ARE IN INCHES.

**FIGURE 2**

**NOTES**

1. FOR DIMENSIONAL RESTORATION OF WHEEL SHROUDS USE AMDRY960, METCO 443, OR METCO 450 REPAIR PROCEDURE.
2. MEASURE DIAPHRAGM WEB THICKNESS. IF WEB THICKNESS IS LESS THAN .100 REPLACE THE DIAPHRAGM.
3. NOMINAL DIMENSION IS 0.115-0.105. DIAPHRAGM BOWING CAN CAUSE THIS DIMENSION TO INCREASE. IF THE SERVICE LIMIT OF 0.135 IS EXCEEDED, REPLACE THE DIAPHRAGM.

Parts meeting the above criteria are eligible for return to service.

**T-028 Inspection Limits and Repair**

Revision: F

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**MATERIAL INFORMATION:**

N/A.