EXTEX Engineered Products
A KAMAN Company

T-016 Service Bulletin

Inspection Limits and Repair

P/N(s): A23037403, E23037403 & E23071309, 23071309AL

Revision: H Issued: 2/02/16

Subject:	Inspection and Repair of Power Turbine Inner Shafts
EXTEX Engineered Products Part Numbers:	A23037403, E23037403, E23071309, 23071309AL
Installations:	Rolls-Royce (250-B17, B17B, B17C, B17D, B17E, B17F, B17F/1, B17F/2; 250-C20, C20B, C20C, C20F, C20J, C20S, C20W, C20R, C20R/1, C20R/2, C20R/4)
Revision History:	NC – Dated 1/30/97 Original Release. A – Dated 12/02/97 Updated format. B – Dated 06/11/98 Added Repair instructions. Updated format. C – Dated 02/01/01 Added P/N E23071309. D – Dated 01/13/02 Updated format and revised Inspection procedures. E – Dated 09/09/09 Updated EXTEX to TIMKEN. F – Dated 11/27/12 Added P/N 23071309AL and updated eligible installations. Updated to current format. G – Dated 02/05/13 Added Table entry on buttress thread length and added associated Figure as “Figure 1”. Former “Figure 1” now “Figure 2”. Updated Timken Logo and incorporated warning graphics on page 4. Removed references to other figures, corrected font in Figure 2. H – Dated 2/02/16 Updated Timken to EXTEX Engineered Products.
Reason:	To provide Instruction for Continued Airworthiness (ICA)
Description:	This document is intended to guide the owner / operators through the inspection and repair procedures for the Power Turbine Inner Shaft. Any time this component is removed for engine overhaul, it should be inspected to EXTEX Engineered Products criteria. The inspection will determine if the component is serviceable in its current condition, if the component is repairable per this instruction or if the component should be replaced.
Applicability:	P/N’s A23037403, E23037403, E23071309, 23071309AL
Accomplishment Instructions:	1. Clean part in an alkaline bath per standard practices using AMS 1536, AMS 1537, or equivalent. 2. Perform Non-Destructive Testing (NDT) via Magnetic Particle Inspection (MPI) per AMS 2640 or equivalent. 3. Inspect part using the following criteria.
Approval:	This document is FAA approved.
Notes:	Replaces Service Letter T95-003 issued by Superior Turbine on April 1, 1995. Refer to Type Certificate Holder’s published data for installation, engine operation, and disassembly. Please contact your EXTEX Engineered Products representative with any questions.

WEIGHT AND BALANCE:

Not Affected.

PREREQUISITES:

None.

Condition	(1) Service Limit	(2) Repair Limit	(3) Corrective Action
Cracks, Visual and MPI*	Cracks are not acceptable.	No permissible repair.	Replace.
Nicks, grooves, gouges, scratches, or spalls at tapered end of shaft	Part must pass pressure test at assembly.	No repair limit.	Blend to remove sharp edges and re-plate. **OR** Replace.
Bearing Race Wear	See Figure 2.	No permissible repair.	Replace.
Loss of Plating	Loss of plating coverage is not acceptable.	No repair limit.	Strip, re-plate and recoat per Figure 2 and procedures. **OR** Replace.
Loss of Alseal coating	Loss by scratches during assembly provided it is less than 5% of the coated area, scratch is less than 0.040 x 0.750 and nickel plating under the scratch is intact	No repair limit.	Strip and recoat per Figure 2 and procedures. **OR** Replace.
Corrosion on the Bearing Race	None.	No permissible repair.	Replace.
Pitting on the Bearing Race	Max pit size 0.010". Max cluster of pits (3 or more, including open slag inclusions) within an area .25" in dia, no pit larger than .006" detectable with R.030" scribe.	No permissible repair.	Replace.
Corrosion Pitting on Areas Other than Bearing Race	Min wall thickness of .030 after blending	No repair limit.	Blend pitted area removing minimum material. **OR** Replace Shaft.
Buttress Thread Length for Nut Locking Feature	Refer to Figure 1.	No permissible repair.	Replace.

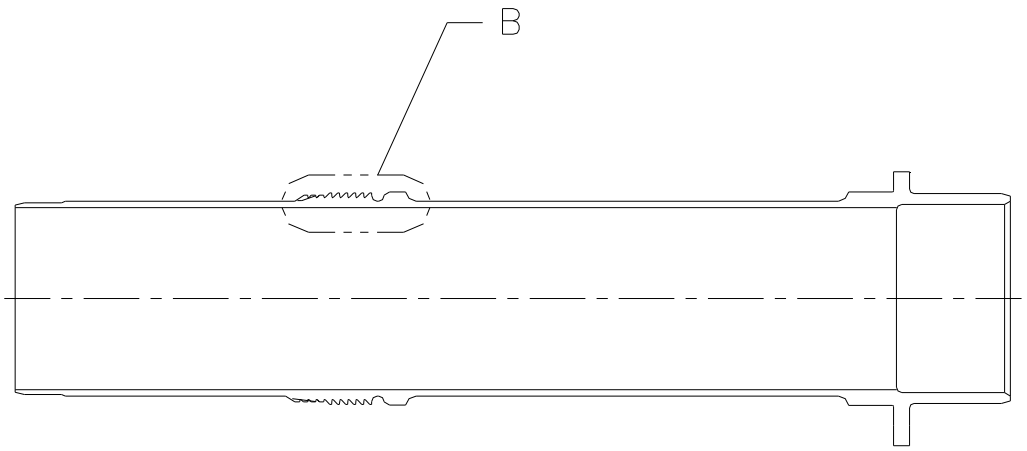
Notes:

* MPI technique as follows: Circular between heads and Longitudinal in a coil.

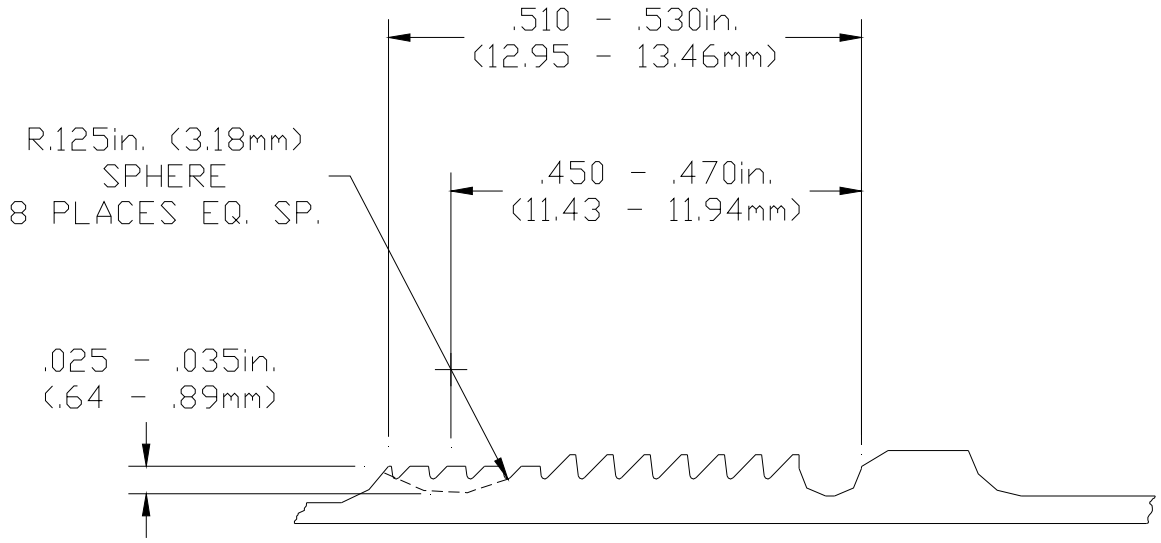
(1) Parts meeting the service limits in the table may be returned to service.

(2) When no repair limit is specified, any amount of the noted condition may be repaired.

(3) Parts that do not meet the service limits must be replaced if there is no permissible repair.

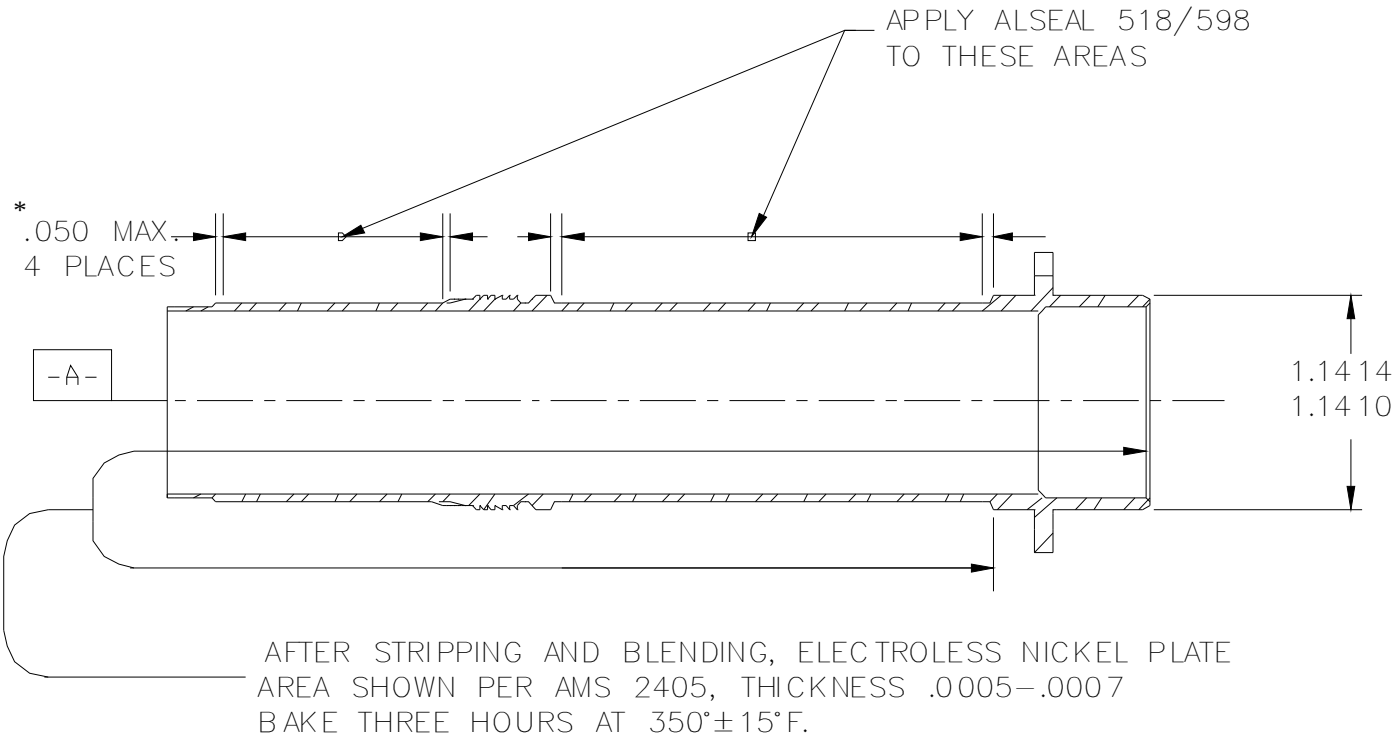


SECTION–POWER TURBINE INNER SHAFT



DETAIL B

FIGURE 1



POWER TURBINE INNER SHAFT
DIMENSIONS ARE IN INCHES AFTER STRIPPING.

FIGURE 2

*.050 MAX APPLIES TO A23037403 & E23037403 ONLY.
E23071309 AND 23071309AL MUST BE COVERED COMPLETELY TO SHOULDER.

Stripping Procedures

The following procedure is to be used at time of overhaul to allow inspection of the power turbine inner shaft.

1.0 Remove Alseal coating by soaking the part in a caustic solution of potash.

WARNING

When mixing the caustic solution, wear protective gloves, apron and safety glasses. Add the caustic pot ash to the water. Never add water to the caustic pot ash or solution. To do so could result in the caustic pot ash or solution boiling over violently.

(a) Add two pounds of potash to one gallon of water. (0.907 kg potash to 3.8 liters of water.)
(b) Stir material well until all is mixed.
(c) Soak the part in the solution for one hour at 125°F (79°C). Rinse with clear water.

(d) After rinsing, remove the residue by glass bead peening at 20 psi (138 kPa).

2.0 Remove the nickel coating by immersing the clean dry shaft into concentrated nitric acid. Rinse thoroughly in clear running water for 30 to 60 seconds. Immerse in clean hot water, 160°F (71°C) minimum, for at least 10 seconds, then dry.

Plating and Coating

1.0 Apply electroless nickel plating, to the areas shown in Figure 2, to the shafts that have passed the inspection criteria and are considered serviceable.

2.0 Apply Alseal 518/598 coating over the electroless nickel plating in areas shown in Figure 2 except for:

a. Base coat shall be 0.002-0.004 inch thick (two layers 0.001-0.002 in).
b. Prior to application of top coat, burnish base coat using 00 grade steel wool or lightly aluminum oxide grit blast until a reading of 0.25-3.0 ohms is obtained when the probes of an ohmmeter are lightly held 1.00 inch apart.
c. No requirements are established for coating thickness for deep recesses in which controlled coating thickness cannot be obtained under normal application techniques.

NOTES: Scratches on the inner shaft that occur during disassembly and assembly are acceptable if:

(1) Scratched area is less than 5% of the coated area.
(2) Maximum scratch is 0.040 X 0.750 inch.
(3) Nickel plating is not damaged under the scratch. The Alseal coating is sacrificial so any uncoated area of a limited size will be protected by the coating on adjacent surfaces.

Scratches on the coated safety flange are acceptable if nickel plating under the scratch is not damaged.

MATERIAL INFORMATION:

N/A