E23068295 Gearshaft, Helical Power Takeoff (PTO)

Engine Application(s):		Rolls Royce (Allison) 250-C Engine Models (refer to Extex PMA supplement for specific engine model applicability)
Subject:		Helical Power Take Off Gear Inspection Limits and Repair
Compliance:		On condition or at scheduled engine service event.
Revisions:	N/C A B	Dated: 6/13/06 Initial Release. Dated: 8/12/09 Updated EXTEX to TIMKEN. Dated: 2/05/16 Updated Timken to EXTEX Engineered Products.

- Refer to OEM's published data for instructions regarding engine disassembly, cleaning, inspection, rework, assembly, operation, and testing.
- The Extex part is made from the same material and has the same configuration as the equivalent OEM part. As part of the FAA approval process, Extex demonstrated that the OEM's ICA is applicable to these replacement parts.
- Inspection and repair may be performed by either of the following options:
    - Option 1: Use the OEM Instructions for Continued Airworthiness (ICA) for the equivalent OEM part to inspect, repair, and overhaul the Extex gear.
    - Option 2: Use the instructions contained in this document to inspect and repair Extex E23068295 Helical Power Takeoff gears. All work must be performed at an FAA approved repair facility.

Gear Inspection
Inspect and rework PTO gear in accordance with Tables 1, 2 and 3 and Figure 1.

Magnetic Plug Inspection
Electrical resistance of the magnetic plug shall be a minimum of 2 meg-ohms at 350℉ (177℃). Magneti sm of the plug shall be able to lift a minimum of 2.91 grams or 45 grains of wheelabrator steel shot #550. Replace plug if both criteria are not meet.

Table 1

Condition	Service Limit	Repairable Limit	Corrective Action
Gear teeth wear	Slight Normal wear, in good condition and within Table 2 limits.	No repair	Remove sharp edges by stoning. Replace gear with evidence of healed prior scuffing.
Gear teeth spalling (use 2X magnification)	Very light to light pitting, that does not exceed 35% of the contact area of the tooth.	No repair	Stone and/or hone lightly any raised material.
Gear teeth scuffing	Minor scuffing if gear assembly is still matched with mating gears.	No repair	Remove sharp edges by stoning.
Gear teeth damage which involves metal displacement to the degree that subsurface damage is detected by magnetic inspection.	None	No repair	Replace
Internal spline backlash	The circumferential backlash shall not exceed .006 in (0.15 mm) or be less than .002 in (0.05 mm) when measured at three equally spaced locations. NOTE: Check backlash with splines mated and in normal operating position.	No repair	Replace
Internal spline teeth wear	Dimension between two - .0864 in (2.195 mm) pins, or across adjustable T-gage with .0864 in (2.195 mm) balls. Measure worn and unworn areas of the same spline teeth. Worn and unworn areas must differ by less than .0037 in (0.094 mm).	No repair	Replace
Cracks in root radii of spline teeth or near involute of gear teeth (visual with magnification)	None	No repair	Replace
Rough surface on bearing journal thrust face	No rough surface allowed, must repair.	Max of 20% of area affected, condition not well dispersed.	Remove roughness by stoning.
Grinding checks on bearing journal thrust face	Minor checks not breaking on an edge or extending into a radius are acceptable.	No repair	Replace

Nicks and dents on bearing journal surfaces	Max of .010 in (0.25 mm) length, width, or diameter and without sharp corners.	Max of .060 in (1.52 mm) length, width, or diameter after sharp corners are removed.	Remove sharp edges by stoning.
Seal journal wear	Max of .0015 in (0.038mm) radial wear.		Plate per Note 1
Scoring, grooves, nicks, gouges, scuffing, or minute flats on the seal journal surfaces	Must have evenly polished surface in seal contact without lead or axial marking.		Plate per Note 1
Retaining (damper) ring groove wear	Max ID 6.571 in (166.90 mm). Max width .106 in (2.69 mm). .040 in (1.02 mm) max localized wear on a 45° arc. NOTE: If serviceable, install ring with gap in position of least wear.	No repair	Replace

Table 2

Item	Service Limit Over Pins	Pin Diameter	Corrective Action
70 Teeth	7.4383 (188.93 mm) Min	.1728 in (4.389 mm)	If serviceable, remove any sharp edges by stoning. If unserviceable, replace gear.
37 Teeth	R 1.2357 (31.39 mm) Min	0.12 (3.048 mm)	

Table 3

Item	Serviceable limit	Corrective Action
Forward bearing shaft OD	1.5762 (40.035 mm) Min	If serviceable, plate per Note 1. If unserviceable, replace gear.
Thrust bearing shaft OD	1.7718 (45.004 mm) Min	

Note 1

Plate bearing and seal journals as follows:

1. Grind journal within the concentricity requirements of Figure 1 to remove any roughness or previous plating.
2. MPI the ground journals.
3. Mask areas not to be plated.
   NOTE: Plating shall extend to within .060 in (1.52 mm) of the journal shoulder.
4. Electroless nickel plate per AMS 2405. The plating shall be .0005 in (0.013 mm) minimum thickness after final grind.
5. Heat treat at 275 ± 10℉ (135 ± 6℃) for five ho urs.
6. After plating, finish grind the plated journals within the concentricity requirements and nominal size limits of Figure 1 unless special sizing is required.

Figure 1