

REPORT ON A DEMONSTRATION RESTORATIVE REPAIR

16K20 lathe: gear teeth restored, longer gearbox service life

JSC Perm Scientific and Industrial Instrument Making Company · approved by production director V. A. Ryaposov; work and measurements — chief mechanic A. I. Kharitonov, chief engineer of the Chief Mechanic Service S. M. Vorotnikov

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PRODUCT

XADO revitalizant gel
for compressors and bearings ·
three doses of 4 tubes at 10 h
intervals into a 10 l oil bath

TREATED UNIT

Gearbox of the headstock
drive
16K20 lathe, No. 3011588 · gear
trains and shaft bearing unit

DOCUMENT TYPE

Restorative repair report,
JSC PNPPK, two seals

EQUIPMENT**CONDITION AT THE START OF WORK****WHAT WAS MEASURED**

16K20 lathe, No. 3011588

In service since 1981; longitudinal
scoring and pits up to 0.2 mm deep
on the gear teeth

Run-out of the bearing unit shaft,
no-load current of the electric motor,
condition of the tooth working
surfaces

Control measurements were taken after 400 hours of total machine operation.

Key result

↓ **40 %**

axial run-out of the bearing unit shaft, 0.05 → 0.03 mm

Run-out of the bearing unit shaft

PARAMETER	BEFORE TREATMENT	AFTER 400 H OF OPERATION
Axial run-out	0.05 mm	0.03 mm
Radial run-out	0.02 mm	0.01 mm

Measured with a dial indicator graduated in 0.01 mm.

No-load current of the machine's electric motor

PHASE	BEFORE TREATMENT	AFTER 400 H OF OPERATION
Phase A	7 A	7.3 A
Phase B	8 A	7.3 A
Phase C	8 A	7.8 A

According to the conclusions of the report, reduced friction in the bearings lowered the current drawn by the motor phases.

Working surfaces of the gear teeth

PARAMETER	BEFORE TREATMENT	AFTER 400 H OF OPERATION
Condition of the teeth	Longitudinal scoring and pits up to 0.2 mm deep	A strong metal-ceramic layer formed at the contact areas, scratches and micro-pits disappeared, a characteristic sheen appeared

Inspection during disassembly of the gearbox. The report also notes reduced noise during machine operation.

Conclusions of the report

Before treatment the machine had been in service for more than a quarter of a century, and the gearbox teeth carried longitudinal scoring and pits up to **0.2 mm** deep. The commission of JSC Perm Scientific and Industrial Instrument Making Company recorded:

1. As a result of the treatment, the strength of the working surfaces of the gear teeth increased, which leads to a longer service life of the machine.
2. Reduced friction in the bearings lowered the current drawn by the motor phases.
3. The run-out of the bearing unit shaft decreased.
4. It is advisable to use XADO products as standard lubricants for machine tools and process equipment.



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The results refer to the gearbox of the headstock drive of a 16K20 lathe and to the stated treatment procedure; on other equipment and under different operating modes the figures may differ. The original report with signatures and seals is published in full and available for download.