



TREATMENT REPORT ON A SCREW-CUTTING LATHE

43-year-old 1K62 lathe: accuracy restored with no teardown and no repair

Gidroprivod JSC · approved by the chief engineer, signed by the plant's chief mechanical engineer,
Krater ME and XADO LLC

Kharkiv, Ukraine · treatment 15–20.11.2001 · report dated 18.02.2002

PRODUCT	TREATED OBJECT	OBSERVATION CYCLE
XADO revitalizants treatment by XADO technology, without dismantling the lathe	Headstock of the 1K62 lathe spindle unit and gears m = 3 · 3.5 · 6 mm	418 operating hours measurements before treatment and at the end of the cycle

EQUIPMENT	CONDITION AT THE START OF TESTING	WHAT WAS MEASURED
Screw-cutting lathe 1K62, inv. no. 1202	Built in 1958 , 43 years in service; last overhaul — 1986	Spindle runout and play, noise, vibration, turning accuracy on a test workpiece
Headstock gears	In service for the entire life of the lathe, not replaced during treatment	Tooth thickness over the constant chord at 7 points on three gears

The treatment was performed in place, in the plant's workshop, without dismantling the lathe.

Key results

↑ **0.2-0.4 mm**

tooth thickness over the constant chord,
2.85-6.1 → 3.25-6.3 mm

↓ **43 %**

spindle radial runout, 0.07 → 0.04 mm

↓ **33 %**

headstock vibration at 165 rpm, 5.4 → 3.6 mm/s

↓ **80 %**

taper of the turned surface over 100 mm, 0.05 → 0.01 mm

Headstock spindle unit

PARAMETER	BEFORE TREATMENT	AFTER 418 H	CHANGE
Spindle radial runout	0.07 mm	0.04 mm	0.03 mm
Spindle axial runout	0.03 mm	0.01 mm	0.02 mm
Spindle radial play	0.045 mm	0.03 mm	0.015 mm
Spindle axial play	0.1 mm	0.06 mm	0.04 mm

All four parameters of the spindle bearings decreased — clearances in the unit shrank without dismantling or regrinding.

Headstock gears — tooth thickness over the constant chord

GEAR	POINT	BEFORE TREATMENT	AFTER 418 H	GAIN
m = 6 mm, h = 4.5 mm	S ₁	6.1 mm	6.3 mm	0.2 mm
m = 6 mm, h = 4.5 mm	S ₂	6.0 mm	6.3 mm	0.3 mm
m = 6 mm, h = 4.5 mm	S ₃	5.95 mm	6.2 mm	0.25 mm
m = 3.5 mm, h = 3 mm	S ₄	3.15 mm	3.4 mm	0.25 mm
m = 3.5 mm, h = 3 mm	S ₅	3.2 mm	3.4 mm	0.2 mm
m = 3.5 mm, h = 3 mm	S ₆	3.2 mm	3.4 mm	0.2 mm
m = 3 mm, h = 2 mm	S ₇	2.85 mm	3.25 mm	0.4 mm

Metal built up at all seven points on the three gears — that is exactly why the clearances in the headstock decreased.

Lathe operation and machining accuracy

PARAMETER	MEASUREMENT MODE	BEFORE TREATMENT	AFTER 418 H
Vibration (vibration velocity)	idle running, 165 rpm	5.4 mm/s	3.6 mm/s
Noise level	idle running, 165 rpm	93.6 dBA	89 dBA
Taper over 100 mm	turning, 630 rpm , feed 0.3 mm/rev	0.05 mm	0.01 mm
Ovality	turning, 630 rpm , feed 0.3 mm/rev	0.01 mm	0.008 mm

Accuracy was checked by turning a test workpiece of 40Kh steel — the standard geometric accuracy check for a lathe.

Conclusion of the report

The commission of Hidroprivod JSC, with the participation of Krater ME and XADO LLC, recorded: «Based on the results of the parameter measurements, it can be concluded that after treating the lathe with XADO Revitalizants there is no need to carry out the conventional intermediate repair of the headstock». The lathe, built in **1958** and **15** years past its last overhaul, was treated in place, without dismantling: over **418** operating hours metal built up on the teeth of all three gears, spindle clearances and runouts decreased, and the test turning showed a return of geometric accuracy. According to the calculation of the report's signatories, a conventional overhaul of the lathe would have cost **3000 UAH** against **1500 UAH** for restoration by XADO technology — a saving of **1500 UAH**.

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The results apply to the screw-cutting lathe 1K62 of the stated build year and wear condition; on other equipment and with different component condition the figures may differ. The repair cost is given according to the calculation of the report's signatories, who include those who performed the treatment. The original report with signatures and seal is published in full and available for download.