



PLANT COMMISSION ACT · 20.05.2002

Turret lathes: 1336 M gearboxes run quieter without disassembly

JSC Elektroagregat · measurements — laboratory of the plant's chief mechanic
department · commission: chief mechanic, building mechanic, XADO-Kursk centre
Kursk, Russia · treatment 19.04.2002 · measurements 19.04 and 14.05.2002

PRODUCT	TEST OBJECT	DOCUMENT TYPE
XADO technology treatment per Instruction No. 004 XADO-2001, without disassembling the gearboxes	Gearboxes of the transmission units two 1336 M turret lathes (No. 7 and No. 8)	Commission act of JSC Elektroagregat, with seal

MACHINE	CONDITION AT START OF TRIALS	WHAT WAS MEASURED
Turret lathe 1336 M, No. 7	Gearbox noise 85 dBA against a limit of 80 dBA	Noise level and spectrum across nine octave bands
Turret lathe 1336 M, No. 8	Gearbox noise 88 dBA against a limit of 80 dBA	Noise level and spectrum across nine octave bands

The 80 dBA limit is stated in the act itself. Measurements before treatment and after 100 h of machine operation were taken by the plant laboratory with a VShV-003M2 sound level meter.

Key result

↓ **3-4 dBA**

gearbox noise level, 85-88 → 82-84 dBA

Gearbox noise level — before treatment and after 100 h of operation

MACHINE	BEFORE TREATMENT	AFTER 100 h OF OPERATION	CHANGE
1336 M, No. 7	85 dBA	82 dBA	–3 dBA
1336 M, No. 8	88 dBA	84 dBA	–4 dBA

Treatment on 19.04.2002, control measurement on 14.05.2002 after 100 h of machine operation; VShV-003M2 sound level meter.

Noise spectrum by octave bands, dB

OCTAVE, Hz	No. 7 BEFORE	No. 7 AFTER	No. 8 BEFORE	No. 8 AFTER
31.5	87	84	89	88
63	86	84	89	88
125	86	85	91	88
250	86	88	90	88
500	86	87	91	88
1000	86	86	91	88
2000	85	84	90	87
4000	85	85	90	87
8000	85	84	90	86

On machine No. 8 the level dropped in all nine octave bands. Measurements at the same observation points, VShV-003M2 sound level meter.

Conclusion of the plant commission

Before treatment the gearboxes of both machines were louder than the **80 dBA** limit stated in the act. The compounds were introduced without disassembling the transmission units, and the machines stayed in shop-floor operation; the control measurement was taken after **100 h** of normal service. The commission of JSC Elektroagregat recorded: "Instrumental measurements of the noise assessment parameters show a reduction of the machine gearbox noise by **3 and 4 dB**". The act also gives the conversion of this reduction into perception: "After substituting the value $\Delta P = 4 \text{ dB}$ into the formula, we obtain $P_n / P_o = 2.512$. Thus the subjective sound power decreased **2.512x**".



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The results apply to the gearboxes of the transmission units of 1336 M turret lathes and to the measurement conditions stated in the act; on other equipment and under other operating modes the figures may differ. The original act of JSC Elektroagregat dated 20.05.2002 is published in full and available for download.