

ACT ON THE RESULTS OF RESTORATIVE REPAIR · 19.05.2000

Compressors, gearboxes, bearings and a locomotive: restoration without disassembly

OJSC "Southern Mining and Processing Plant" (YuGOK) · approved by chief engineer N. I. Garmash; the act was signed by the plant's chief mechanic, CJSC "Krivbassrudprom" and XADO LLC

Kryvyi Rih, Ukraine · contract No. 158 of 31.03.2000 · work 05.04–18.05.2000 · act dated 19.05.2000

PRODUCT

XADO compounds
treatment using XADO
technology® during normal
operation, without
disassembling the mechanisms

TREATED EQUIPMENT

Plant workshop equipment
305VP30/8 compressors ·
ROF-1, ROF-2, DF-1 and EKG-10
excavator gearboxes ·
induced-draught fan bearings ·
TM2UM-941 locomotive

DOCUMENT TYPE

Company act
with signatures and seal

EQUIPMENT	CONDITION AT THE START OF WORK	WHAT WAS MEASURED
305VP30/8 compressors, sinter plant	in operation, parameters recorded before treatment	filling time, current draw
ROF-1, ROF-2, DF-1 gearboxes	tooth working surface wear of at least 1.5 mm , scoring, pitting	tooth thickness, surface condition, no-load current
EKG-10 excavator gearbox	tooth wear, scoring, pitting	tooth thickness, surface condition
No. 3636 bearings of the induced-draught fan, DF-1	in operation, clearances recorded before treatment	radial and axial clearances
TM2UM-941 locomotive, UZhDT	in operation, parameters recorded before treatment	fuel consumption, oil pressure, compression

The treatment was carried out without disassembling the mechanisms, during normal operation; repeat measurements of the same parameters were taken after 350–560 h of running time.

Key results

↑ **0.9-1.6 mm**

gearbox tooth thickness, wear before treatment at least 1.5 mm

↓ **37.5 %**

radial clearance of the induced-draught fan bearings

↓ **8.3-29.2 %**

current draw of the 305VP30/8 compressors

↓ **15 %**

locomotive fuel consumption at idle

ROF-1, ROF-2, DF-1 and EKG-10 excavator gearboxes

PARAMETER	REPEAT MEASUREMENT RESULT
Tooth thickness of the mating gears	growth of 0.9-1.6 mm
Tooth working surface	scoring and pitting disappeared, the surface took on the look of a smooth ground finish; a build-up of the metal layer was recorded in the contact zone
No-load current draw	reduction of 3.5-5 %
Noise and vibration	reduction recorded by the commission

The layer builds up in the contact zone — exactly where the wear was: the coating regulates itself according to the load on the assembly.

No. 3636 bearings of the induced-draught fan, DF-1

PARAMETER	REPEAT MEASUREMENT RESULT
Radial clearance	reduction of 37.5 %
Axial clearance	reduction of 12.2 %

Narrowed clearances mean restored geometry of the raceways and rolling elements — that is, a deferred replacement of the bearing assembly.

305VP30/8 compressors, sinter plant

PARAMETER	REPEAT MEASUREMENT RESULT
Capacity (by filling time)	increase of 6.4-13.9 %
Current draw	reduction of 8.3-29.2 %

Filling time is a direct measure of a piston compressor's capacity: more air in the same time and at a lower current.

Engine of the TM2UM-941 locomotive, UZhDT

PARAMETER	REPEAT MEASUREMENT RESULT
Compression across the cylinders	increase of 2-6 kgf/cm² together with levelling across all cylinders
Fuel consumption at idle	reduction of 15 %
Oil pressure	increase of 0.1 kgf/cm²

Higher compression levelled across the cylinders means restored sealing of the cylinder-piston group; hence the lower fuel consumption.

Findings of the OJSC «YuGOK» commission

The commission of OJSC «YuGOK» recorded: the positive results achieved testify to the effectiveness of applying XADO technology® to industrial equipment. The gear drives of the gearboxes, which before treatment had wear **of at least 1.5 mm**, scoring and pitting, took on the look of a smooth ground surface. Repair using XADO technology® is carried out during normal operation and requires no special equipment, premises or spare parts. XADO technology® makes it possible to:

1. extend the service life of equipment without replacing assemblies and parts;
2. extend the equipment overhaul interval;
3. cut equipment repair costs;
4. increase equipment output and reduce energy consumption;
5. extend oil service life, prevent wear and optimise clearances in mechanisms. The commission recommended introducing the technology at enterprises of the ore-mining industry.

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The results relate to the listed equipment of the OJSC "YuGOK" workshops — the 305VP30/8 compressors, the gearboxes of the ore-processing plants and of the EKG-10 excavator, the induced-draught fan bearings and the TM2UM-941 locomotive; on other machinery and under other operating conditions the figures may differ. The original act with signatures and seal is published in full and available for download.