

JOINT COMMISSION ACTS 01.02 — 02.03.2001

ORU-220 kV compressor and GAZ-31: worn units recovered performance without teardown

Razdanskaya TES CJSC, power unit No. 2 and the ORU-220 kV switchyard · joint commission of the plant and Armen-XADO · chief engineer A. S. Abraamyan

Kotayk marz, Armenia · treatment 01.02.2001 · measurements through 02.03.2001

PRODUCT

XADO compounds
repair gel · protective grease ·
restoring compound 125 ml · gel
for the oil system

TEST OBJECT

ORU-220 kV compressor,
turning gear of power unit
No. 2, GAZ-31 car
bearings 2314 and 313 SEN-4B
· bearings No. 3 and No. 4 and
the compressor piston group ·
petrol engine, gearbox,
reduction gears

DOCUMENT TYPE

Acts of the joint
commission of
Razdanskaya TES CJSC
and Armen-XADO

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

Compressor No. 1, ORU-220
kV, three-stage piston type

Increased noise, thermal gap of the
1st-stage piston ring 1.6 mm, motor
current 60 A

Vibration of bearings No. 3 and
No. 4, air pressure by the gauges

Turning gear motor of power
unit No. 2

Bearing 2314 — pitting, wear,
run-out; bearing 313 SEN-4B —
radial clearance 0.04, roughness
and run-out

Condition of the bearings in
service

GAZ-31 car, petrol engine

Compression 2.9-3.0 atm in all four
cylinders

Compression after 1500 and 3000
km of mileage

The treatment was performed on 01.02.2001 without disassembling the units; repeat measurements — after 208 h of compressor operation and 3000 km of car mileage.

Key results

↑ 2.5×

compression in the GAZ-31 cylinders, 2.9-3.0 → 7.3-7.5 atm

↑ 11-31 %

air pressure at the compressor gauges, 2.7-7.5 → 3.0-9.8 atm

↓ 17-31 %

vibration of compressor bearings No. 3 and No. 4, 50-240 → 40-200 mkr

Compressor No. 1, ORU-220 kV — bearing vibration

MEASUREMENT DIRECTION	BEARING No. 3, BEFORE → AFTER	BEARING No. 4, BEFORE → AFTER
Vertical	100 → 80	50 → 40
Transverse	240 → 200	210 → 200
Axial	130 → 90	130 → 90

Measured in three directions on each bearing after 208 h of operation; the vibration level is given in the units used in the act — «mkr».

Compressor No. 1, ORU-220 kV — air pressure

GAUGE	BEFORE TREATMENT	AFTER 208 H OF OPERATION
Gauge 1	2.7 atm	3.0 atm
Gauge 2	7.5 atm	9.8 atm

The compressor's standard gauges; the rise in air pressure follows from the restored sealing of the 1st-stage piston group.

GAZ-31 car — compression by cylinder, atm

CYLINDER	BEFORE TREATMENT	AFTER 1500 KM	AFTER 3000 KM
Cylinder 1	2.9	3.1	7.3
Cylinder 2	3.0	3.7	7.5
Cylinder 3	3.0	4.9	7.5
Cylinder 4	3.0	4.9	7.5

Compression grew with mileage: by 3000 km three cylinders out of four came to one and the same value — the engine started running evenly.

Commission conclusions

The joint commission of Razdanskaya TES CJSC and Armen-XADO recorded in the act of 02.03.2001: for bearing 313 SEN-4B of the turning gear motor of unit No. 2 — «the run-out and roughness have stopped; according to the operating personnel everything is normal, no deviations have been noticed»; for compressor No. 1 of the ORU-220 kV switchyard — a drop in the vibration of bearings No. 3 and No. 4 in all three measurement directions and a rise in air pressure on both gauges after **208 h** of operation; for the GAZ-31 car — a rise in compression in all four cylinders, **2.9-3.0 → 7.3-7.5 atm** over **3000 km** of mileage. The act of 28.02.2001 additionally notes: «the noise, as observed by the operating personnel, is fairly reduced». The units were treated in a worn condition — with pitting, run-out, radial clearance and increased noise — without disassembly and without taking the equipment out of service.



© XADO. All rights reserved.

The results relate to the equipment of Razdanskaya TES CJSC — the ORU-220 kV piston compressor, the bearings of the turning gear motor of power unit No. 2 and the GAZ-31 petrol engine; on other machines and duties the figures may differ. The treatment was performed by Armen-XADO, whose representatives were members of the commission. The originals of the acts of 01.02.2001, 28.02.2001 and 02.03.2001, with signatures and stamps, are published in full and available for download.