

REPORT ON MEASUREMENTS BEFORE AND AFTER TREATMENT WITH XADO TECHNOLOGY

TGM-40 locomotive: compression and oil pressure up without teardown

Kremenchug Steel Works JSC, railway shop · measurements: N. I. Protsenko, head of the railway shop, and V. V. Ivanov, technical director of Azurit LLC · V. P. Yakovenko, chief mechanical engineer of the plant

Kremenchug, Ukraine · contract No. 7/11 of 07.10.2000 · report of 20.02.2001

PRODUCT

Treatment with XADO technology
under contract No. 7/11 of 07.10.2000 · without engine teardown

TEST OBJECT

TGM-40 locomotive
diesel engine, 12 cylinders ·
shunting duty in the plant
railway shop

DOCUMENT TYPE

Report on parameter measurements
signatures of both parties,
seals of the plant and the contractor

EQUIPMENT

TGM-40 locomotive,
railway shop of the plant

CONDITION AT THE START OF TESTING

In service; compression **23-25** on all cylinders, oil pressure **5.2 kgf/cm²**

WHAT WAS MEASURED

Compression on each of the 12 cylinders; oil pressure at an oil temperature of **45 °C**

The "before" and "after" measurements were taken on the same engine; in both cases oil pressure was measured at the same oil temperature of 45 °C.

Key results

↑ **12-21.7 %**

compression on all 12 cylinders, 23-25 → 28

↑ **17.3 %**

oil pressure at 45 °C, 5.2 → 6.1 kgf/cm²

Compression by diesel engine cylinder

CYLINDER	BEFORE TREATMENT	AFTER TREATMENT	CHANGE
No. 1	23	28	+21.7 %
No. 2	24	28	+16.7 %
No. 3	24	28	+16.7 %
No. 4	23	28	+21.7 %
No. 5	25	28	+12.0 %
No. 6	25	28	+12.0 %
No. 7	25	28	+12.0 %
No. 8	24	28	+16.7 %
No. 9	23	28	+21.7 %
No. 10	25	28	+12.0 %
No. 11	24	28	+16.7 %
No. 12	24	28	+16.7 %

Compression is recorded in the report without a unit of measurement, so the change for each cylinder is given in relative terms.

Oil pressure in the engine lubrication system

PARAMETER	BEFORE TREATMENT	AFTER TREATMENT	CHANGE
Oil pressure at an oil temperature of 45 °C	5.2 kgf/cm²	6.1 kgf/cm²	+17.3 %

Higher pressure in the lubrication system indicates restored clearances in the engine friction pairs.

What the measurements showed

The TGM-40 locomotive of the plant railway shop was treated with XADO technology without engine teardown — the machine stayed in service. Measurements taken by the head of the shop together with a representative of the contractor recorded higher compression in all twelve cylinders: from an initial **23-25** the readings rose to **28**. Compression does not rise above the rating set by the engine manufacturer, so an increase across the whole set at once means restored sealing of the cylinder-piston group rather than luck on a single cylinder. Even compression means even diesel operation: steady power output and stable fuel consumption. At the same time oil pressure rose, **5.2 → 6.1 kgf/cm²** at the same oil temperature of **45 °C** — a sign of restored clearances in the friction pairs of the lubrication system. The report was approved by the chief engineer of the plant and certified with the seals of the customer and the contractor.

XADO

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The results apply to a TGM-40 shunting locomotive with a diesel engine operating in the railway shop of a steel plant; on other equipment and under other operating conditions the figures may differ. The original report of 20.02.2001 with signatures and seals is published in full and available for download.