FOUR TEST REPORTS · MARCH — MAY 2006

Drill rig diesels: UBSh-312A, BOOMER, AXERA — compression gain repeated

CJSC Zaporizhzhia Iron Ore Plant, Prokhodcheskaya mine, section No. 9 · reports approved by the chief mechanic of the plant

Zaporizhzhia region, Ukraine · treatment and control measurements 16.03 — 17.05.2006 · reports signed in May — June 2006

PRODUCT

XADO gel revitalizants

for diesel engines — oil system, 3 stages · for injection pumps — fuel system, 2 stages

TEST OBJECT

Diesel engines of self-propelled drill rigs

Deutz F4L912W — BOOMER 251, AXERA D05 · D243 — UBSh-312A No. 14 and No. 18

DOCUMENT TYPE

Four technical reports signed and stamped by the plant

RIG	ENGINE	LEVEL	ENGINE HOURS BETWEEN MEASUREMENTS	WHAT WAS MEASURED
BOOMER 251, unit No. 1	Deutz F4L912W	340 m	107 engine hours	Compression on all four cylinders
AXERA D05, unit No. 2	Deutz F4L912W	840 m	54 engine hours	Compression on all four cylinders, fuel consumption
UBSh-312A, unit No. 14	D243	340 m	96 engine hours	Compression on all four cylinders
UBSh-312A, unit No. 18	D243	340 m	107 engine hours	Compression on all four cylinders

Oil and fuel systems were treated in a single cycle from 16 March to 17 May 2006 — without dismantling the engines, on machines in normal underground service.

Key result

↑ 20-33 %

compression across cylinders, 15.5-33 → 27-40 kgf/cm²

↓ 0.26 l/h

idle fuel consumption, 1.58 → 1.32 l/h

Cylinder compression — four rigs

RIG	BEFORE TREATMENT, KGF/CM²	AFTER, KGF/CM²	GAIN, KGF/CM²	GAIN, %
BOOMER 251 No. 1, Deutz F4L912W	29.0-33.0	37.5-39.5	6.5-8.5	20-29
AXERA D05 No. 2, Deutz F4L912W	31.0-32.0	37.0-40.0	5.0-9.0	16-29
UBSh-312A No. 14, D243	15.5-22.1	27.0-29.5	7.4-13.5	34-87
UBSh-312A No. 18, D243	22.0-23.0	27.0-29.0	4.2-6.0	18-27

Each cylinder was measured with a ZECA 363 diesel compression tester — before treatment and after the operating period. A gain was recorded on every cylinder measured on all four rigs.

Fuel consumption — AXERA D05 No. 2, fuel system

PARAMETER	BEFORE TREATMENT	AFTER	CHANGE
Running time on 100 ml of fuel, idle	3 min 48 s	4 min 32 s	+44 s
Fuel consumption, idle	1.58 l/h	1.32 l/h	−0.26 l/h

Measured with a stopwatch on a fixed fuel volume before treatment and after 54 engine hours. The fuel system was treated on all four rigs.

What the commissions recorded

All four commissions of CJSC Zaporizhzhia Iron Ore Plant recorded the same result: compression rose on every cylinder — by **4.2-6** and **7.4-13.5 kgf/cm²** on the UBSh-312A rigs, by **6.5-8.5** on BOOMER 251, by **5-9** on AXERA D05, where idle fuel consumption fell from **1.58** to **1.32 l/h**. The compression gain, in the wording of the reports, "indicates restoration of wear on the working surfaces of engine parts and, accordingly, an increase in engine life before overhaul"; the commissions estimated the added service life at **1.4-2×**. The most worn diesel responded the strongest: a cylinder at **15.5 kgf/cm²** reached **29.0** and matched its neighbours. The engines were not dismantled — the rigs stayed in normal service at the **340** and **840 m** levels.

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The results refer to Deutz F4L912W and D243 diesel engines of self-propelled drill rigs operating underground; with other equipment and other duty cycles the figures may differ. The originals of all four reports, signed and stamped by the plant, are published in full and available for download.