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IE B014 | FIELD CASE STUDY | AGRICULTURE | ENGINE · CYLINDER-PISTON GROUP

IN-SERVICE TEST REPORT · 622 ENGINE HOURS

DON 1500 M combine: compression evened out, lower fuel and oil use

Gavrilenko V. D. Peasant Farm Enterprise · report approved by the head of the farm, measurements taken jointly with engineers of XADO LLC

Tikhoretsk District, Krasnodar Krai, Russia · in service from 18.06.2007 · report 15.10.2008

PRODUCT

XADO Atomic Oil 15W-40 CI-4 Diesel

motor oil with revitalizant · filled into the lubrication system and running continuously

TEST OBJECT

YaMZ-236 BK engine

cylinder-piston group (6 cylinders) and lubrication system of the DON 1500 M (ACROS) combine

DOCUMENT TYPE

In-service test report, signatures and stamp

MACHINE	HOURS AT START	WHAT WAS MEASURED
DON 1500 M (ACROS) combine harvester, YaMZ-236 BK diesel	**2354 engine hours**	Compression in all six cylinders, running time on 100 ml of diesel fuel, oil pressure, oil consumption on burn-off

The engine ran on XADO oil for **622 engine hours** — from 18.06.2007 to 15.10.2008; measurements were taken before the fill and after this running time.

Key results

↑ 1.6-5.1 %

compression in all six cylinders, 29.5-30.5 → 31.0-31.5 kgf/cm²

↓ 17 %

fuel consumption at idle, 100 ml in 3 min 25 s → 4 min 06 s

↓ 2.8×

oil consumption on burn-off, 0.9 → 0.32 l per 10 hours of operation

Compression by cylinder — before and after 622 engine hours

CYLINDER	BEFORE, kgf/cm²	AFTER, kgf/cm²	GAIN
I	30.0	31.0	+1.0 kgf/cm² (+3.3 %)
II	30.5	31.0	+0.5 kgf/cm² (+1.6 %)
III	30.0	31.5	+1.5 kgf/cm² (+5.0 %)
IV	29.5	31.0	+1.5 kgf/cm² (+5.1 %)
V	29.5	31.0	+1.5 kgf/cm² (+5.1 %)
VI	30.0	31.0	+1.0 kgf/cm² (+3.3 %)
Average of six	29.92	31.08	+1.17 kgf/cm² (+3.9 %)
Spread between cylinders	1.0	0.5	−0.5 kgf/cm²

ZEGA 363 compression tester. The report's conclusion states that compression rose by **2-6 %**; the measurement table gives a gain of **1.6-5.1 %**, positive in all six cylinders.

Fuel, oil and pressure in the lubrication system

PARAMETER	BEFORE	AFTER	CHANGE
Running time on 100 ml of diesel fuel, idle	3 min 25 s	4 min 06 s	+41 s
Oil consumption on burn-off per 10 hours of operation	0.9 l	0.32 l	−0.58 l
Oil pressure, 700 rpm	2.5 kgf/cm²	2.7 kgf/cm²	+0.2 kgf/cm²
Oil pressure, 1250 rpm	5.5 kgf/cm²	5.8 kgf/cm²	+0.3 kgf/cm²

Oil pressure was measured at an oil temperature of **78 °C**, identical in both measurements. The **17 %** reduction in fuel consumption was derived in the report from the running time on 100 ml.

Conclusion of the report

By the start of the observation the engine had run **2354 engine hours**. After a further **622 engine hours** on XADO Atomic Oil 15W-40 CI-4 Diesel, the report records: «compression evened out across all cylinders and increased by **2-6 %**». The rise and the evening-out of compression across the cylinders, together with the **17 %** reduction in fuel consumption, are attributed by the report to the restoration of existing wear on the working surfaces of engine parts, an increase in power and optimisation of the fuel combustion process. It is also noted that throughout the entire period of combine operation with XADO oil in the lubrication system the engine ran faultlessly, while oil consumption fell from **0.9 l** to **0.32 l** per 10 hours of operation — roughly threefold. The engine was not disassembled and was not taken out of service: the combine worked through the season in normal operation, and the oil with revitalizant ran in the lubrication system continuously.

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The results apply to the YaMZ-236 BK diesel of a DON 1500 M combine harvester with 2354 engine hours at the start of the observation; fuel consumption was measured at idle. On other machinery and with a different condition of components the figures may differ. The original report with signatures and stamp is published in full and available for download. Measurements were taken jointly with engineers of XADO LLC.