FIELD TRIAL REPORT OF 10.04.2009

OTOYOL bus: diesel, pump and turbo grew quieter with no teardown, in service

FIDAN LLC, road haulage company · commission: director and chief mechanic of FIDAN, bus driver, specialists of MOTORDOCTOR, representative of the XADO group

Azerbaijan · observed February–April 2009 · report of 10.04.2009

PRODUCT

XADO 15W40 DIESEL motor oil

revitalizant gel for diesel engines · VITAFLUSH cleaner before the oil change

TEST OBJECT

OTOYOL bus, 493 887 km on the odometer

diesel engine · injection pump with injectors · turbocharger

DOCUMENT TYPE

Field trial report of FIDAN LLC

signed by a commission of six members

EQUIPMENT	MILEAGE AT START	WHAT WAS MEASURED
OTOYOL bus, turbocharged diesel	**493 887 km**	Vibration level at the crankshaft main journals, injection pump injectors and turbocharger

Run after treatment — 17 500 km over February–April 2009, with no change of oil or oil filter.

Key results

↓ 40-52 %

vibration of the crankshaft main journals, 80-100 → 45-48 dB

↓ 44-45 %

vibration of the injection pump injectors, 18-22 → 10-12 dB

↓ 11 %

vibration of the turbocharger, 54 → 48 dB

Engine — vibration at the crankshaft main journals

MEASURING POINT	BEFORE OIL CHANGE	AFTER 17 500 KM	CHANGE
Main journal R1	80 dB	45 dB	−35 dB
Main journal R2	80 dB	45 dB	−35 dB
Main journal R3	100 dB	48 dB	−52 dB
Main journal R4	80 dB	48 dB	−32 dB
Main journal R5	50 dB	42 dB	−8 dB

Measurement in decibels at each main journal — before the oil change and again after 17 500 km of running.

Injection pump and turbocharger — vibration

MEASURING POINT	BEFORE OIL CHANGE	AFTER 17 500 KM	CHANGE
Injection pump injector I	22 dB	20 dB	−2 dB
Injection pump injector II	18 dB	10 dB	−8 dB
Injection pump injector III	22 dB	12 dB	−10 dB
Injection pump injector IV	20 dB	18 dB	−2 dB
Turbocharger	54 dB	48 dB	−6 dB

The injection pump injectors and the turbocharger were measured by the same method and on the same dates as the main journals.

Findings of the commission

The bus had run **493 887 km**; before treatment the vibration level at the crankshaft main journals reached **100 dB**. The engine was not disassembled — after flushing it was filled with XADO 15W40 DIESEL oil, the revitalizant gel was applied as instructed, and the vehicle stayed in service on its route. Over **17 500 km** with no change of oil or oil filter the vibration fell at all ten measuring points: at the main journals, the injection pump injectors and the turbocharger. The commission of FIDAN LLC recorded in the findings of the report: XADO 15W40 DIESEL motor oil in the engine of an OTOYOL bus with such mileage can be operated for up to **25 000 km** without changing the oil filter — the residual oil life at the time of measurement was **30 %**; owing to the revitalization process, individual thermal clearances between the main journals and the engine bearing shells were restored by **50 %**, the injection pump injectors to the specified **0.09-0.10 mm** by **45 %**, and the turbocharger by **12 %**.

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The results relate to an OTOYOL diesel bus with 493 887 km of mileage and to its scheduled route operation; on other equipment and under other conditions the figures may differ. The trials were organized by the XADO group together with FIDAN LLC. The original report is published in full and available for download.