

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**

OTOYOL bus, turbocharged  
diesel

**MILEAGE AT  
START**

**493 887 km**

**WHAT WAS MEASURED**

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.