

TECHNICAL REPORT OF 12.12.2007

Passenger car reduction gear: tooth thickness restored without teardown, in service

Baku Carriage Depot of Azerbaijan State Railways · approved by depot manager R. Abishev · measurements by the commission: depot running-repair foreman, repair group foreman of the Baku Metro

Baku, Azerbaijan · treatment and 'before' measurement 28.11.2007 · control measurement 12.12.2007

PRODUCT

XADO revitalizant gel
for gearboxes and
reduction gears

6 tubes of 9.0 ml for a 6.0 l oil
bath, added via 300.0 ml of
pre-heated standard oil

TREATED UNIT

Reduction gear of
passenger car No. 13585

bevel gear drive · 'Baku — St.
Petersburg' train

DOCUMENT TYPE

Depot technical report
with signatures and seal

EQUIPMENT

Passenger car No. 13585,
reduction gear with bevel
gear drive

**SERVICE RUN AFTER
TREATMENT**

10,000 km in the 'Baku
— St. Petersburg' train

WHAT WAS MEASURED

Thickness of two diametrically opposite gear
wheel teeth at a height of **2.82 mm** from the tip
— at the outer, mid and inner diameter of the rim

The reduction gear was operating with accumulated mechanical tooth wear; the 'before' and 'after' measurements were taken at the same marked points by the same commission.

Key result

↑ **2.4-4.2 %**

tooth thickness at the mid and inner rim diameter, 5.00-5.18 → 5.12-5.40 mm

Bevel gear wheel tooth thickness — three points across the rim width

MEASUREMENT POINT	BEFORE, mm	AFTER 10,000 KM, mm	CHANGE, mm
Outer diameter, tooth 1	6.10	6.10	0.00
Outer diameter, tooth 2	6.08	6.10	+0.02
Mid diameter, tooth 1	5.18	5.40	+0.22
Mid diameter, tooth 2	5.18	5.40	+0.22
Inner diameter, tooth 1	5.00	5.12	+0.12
Inner diameter, tooth 2	5.00	5.12	+0.12

Measured at a height of **2.82 mm** from the tooth tip on two diametrically opposite teeth; the report records a gain of **0.02 - 0.22 mm** at different points of the contact pattern.

Findings of the depot commission

The commission of the Baku Carriage Depot recorded: as a result of treating the reduction gear with XADO revitalizant gel for gearboxes and reduction gears, the tooth thickness of the bevel gear wheel increased by **0.02 - 0.22 mm** at different points of the contact pattern through the formation of a metal-ceramic layer, which stopped further tooth wear and partially restored the accumulated mechanical wear. Under continued standard operation of the reduction gear, the restoration of tooth wear will proceed until optimal clearances in the gear drive are formed, which contributes to higher gear drive reliability and a longer service life of the reduction gear. Metal was added to a worn unit without disassembling the reduction gear and without taking the car out of service: the product was added to the standard oil, and the control measurement was taken after **10,000 km** of scheduled service.

XADO

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The results apply to the bevel-gear reduction gear of a passenger car and to the stated conditions of standard operation; on other units and duty cycles the figures may differ. The original technical report of the Baku Carriage Depot of Azerbaijan State Railways dated 12.12.2007, with signatures and seal, is published in full and available for download.