TECHNICAL ACT ON HYDRAULIC MOTOR RESTORATION · OCTOBER 2001

Marine hydraulic motor A2F: friction pairs restored without replacing parts

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PRODUCT

XADO technology

treatment in three stages, formula 2+3+2 tubes, one stage every 8 h of unit operation

TREATED UNIT

Hydraulic motor, type A2F

tanker "NATA" · precision pairs, cylinder-piston group, cylinder block face, valve plate, bearing

DOCUMENT TYPE

Technical act of a three-party commission

SIA "SimSS AUTO" · SIA "A.S.V." · SIA "TERRANOVA"

EQUIPMENT	CONDITION AT THE START OF WORK	WHAT WAS MEASURED
Hydraulic motor A2F, tanker "NATA"	Severe wear of the precision pairs and the cylinder-piston group: deep pits, scuffing and scratches; bearing noise when rotating; oil seal missing	Oil leakage on the test bench, condition of the working surfaces at disassembly

Test bench for the restoration of hydraulic systems, HLP-46 oil, system volume {{20 l}}; leakage was measured as the oil volume over 30 minutes of operation.

Key results

↓ 3.6×

oil leakage through the precision pairs, 21.7 → 6 l

↓ 2.9×

cost of restoring the hydraulic motor, 300 → 102 lats

Oil leakage through the precision pairs and the cylinder-piston group

STAGE OF WORK	RUNNING TIME ON THE BENCH	OIL LEAKAGE
Before treatment	—	**21.7 l** in 30 min
After the first treatment stage	**18 h**	**7 l** in 30 min
After the full treatment cycle	**60 h**	**6 l**
Grinding of the cylinder block face and the valve plate, then treatment	**75 h**	**5.4 l**

The grinding was carried out at the customer's request as a separate experiment; the act recommends it as surface preparation for bench restoration.

Condition of the working surfaces at disassembly

COMPONENT	BEFORE TREATMENT	AFTER THE FULL TREATMENT CYCLE
Precision pairs	Deep pits, scuffing and scratches	Pits and scratches have practically disappeared, the surface is even and smooth
Cylinder block face, valve plate	Severe wear, deep pits	Metal-ceramic layer at the points of closest contact between the parts
Cylinders and pistons	Wear, scratches on the cylinder walls	The surface feels perfectly smooth; a metal-ceramic layer on the pistons, most pronounced in the upper, most heavily loaded part
Bearing	Noise when rotating	No noise audible

Inspection by the commission at partial disassembly after **40 h** and at full disassembly after **60 h** of operation on the bench.

Conclusion of the commission

The three-party commission of SIA "SimSS AUTO", SIA "A.S.V." and SIA "TERRANOVA" recorded: treatment of the hydraulic motor with XADO technology without disassembling it, under normal operating conditions, gives an absolute positive effect. The unit arrived for fault detection with severe wear of the precision pairs and the cylinder-piston group — deep pits, scuffing, scratches; after **60 h** of treatment the pits and scratches had practically disappeared, a metal-ceramic layer is observed at the points of closest contact between the parts, and the bearing noise is no longer audible. Conclusion of the act: "The motor is ready for operation in normal mode." For bench restoration the commission recommends grinding the surfaces to be treated beforehand, excluding the cylinder-piston group and the bearings. The economic effect is evident: conventional repair of the hydraulic motor costs **300 lats**, restoration with XADO technology cost **102 lats**, the saving amounted to **66 %**.

XADO

The results relate to a marine hydraulic motor of type A2F restored on a test bench for the repair of hydraulic systems; with other units and under other conditions the figures may differ. The treatment was performed and the restoration cost calculated by SIA "SimSS AUTO". The original technical act is published in full and available for download.