

Contents

00 - Technical data	1
1 Technical data	1
1.1 Technical data	1
1.2 Engine number	1
1.3 Engine data	1
10 - Removing and installing engine	3
1 Removing and installing engine	3
1.1 Removing and installing engine	3
1.2 Removing	4
1.3 Attaching engine to engine stand	13
1.4 Installing	14
1.5 Tightening torques	15
13 - Crankshaft group	17
1 Dismantling and assembling engine	17
1.1 Dismantling and assembling engine	17
1.2 Ribbed belt drive for vane pump, alternator and viscous fan	17
1.3 Removing and installing ribbed belt	23
1.4 Removing and installing vibration damper	24
1.5 Toothed belt drive for camshafts	26
1.6 Removing and installing camshaft toothed belt	31
1.7 Toothed belt drive for injection pump	38
1.8 Removing and installing injection pump toothed belt	41
1.9 Positioning crankshaft to TDC with engine removed	43
2 Removing and installing crankshaft, flywheel and sealing flange	45
2.1 Removing and installing crankshaft, flywheel and sealing flange	45
2.2 Replacing crankshaft oil seal on pulley end	50
2.3 Removing and installing flywheel	51
2.4 Removing and installing needle bearing in flywheel	52
2.5 Crankshaft dimensions	53
3 Dismantling and assembling pistons and conrods	54
3.1 Dismantling and assembling pistons and conrods	54
3.2 Checking piston projection at TDC	61
3.3 Piston and cylinder dimensions	62
3.4 Checking radial play of conrods	62
15 - Cylinder head, Valve gear	63
1 Removing and installing cylinder head	63
1.1 Removing and installing cylinder head	63
1.2 Removing and installing cylinder head cover	68
1.3 Removing cylinder head	69
1.4 Installing cylinder head	74
1.5 Checking compression	76
2 Servicing valve gear	78
2.1 Servicing valve gear	78
2.2 Checking camshaft axial play	84
2.3 Removing and installing camshaft	85
2.4 Checking hydraulic bucket tappets	89
2.5 Renewing valve stem seals	90
2.6 Reworking valve seats	93
2.7 Checking valve guides	95
2.8 Replacing valve guides	96



17 - Lubrication	98
1 Removing and installing parts of the lubrication system	98
1.1 Removing and installing parts of the lubrication system	98
1.2 Removing and installing oil pan	102
1.3 Removing and installing oil pump	105
1.4 Checking oil pressure and oil pressure switch	108
1.5 Engine oil	110
1.6 Checking oil level	110
19 - Cooling system	112
1 Removing and installing parts of the cooling system	112
1.1 Removing and installing parts of the cooling system	112
1.2 Parts of cooling system	113
1.3 Draining and filling cooling system	117
1.4 Removing and installing coolant pump	120
1.5 Removing and installing, checking coolant thermostat	121
1.6 Removing and installing viscous fan	122
1.7 Checking viscous fan	123
1.8 Removing and installing radiator	124
1.9 Checking cooling system for leaks	127
26 - Exhaust system	129
1 Removing and installing parts of exhaust system	129
1.1 Removing and installing parts of exhaust system	129
1.2 Stress free alignment of exhaust system	134
1.3 Checking exhaust system for leaks	135