

Contents

00 - Technical data	1
1 Technical data	1
1.1 Technical data	1
1.2 Engine number	1
1.3 Engine data	2
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 repair stand	16
1.4 Installing	16
1.5 Tightening torques	19
1.6 Vacuum connections	21
13 - Crankshaft group	23
1 Dismantling and assembling engine	23
1.1 Dismantling and assembling engine	23
1.2 Ribbed belt drive for vane pump, alternator and AC compressor	23
1.3 Removing and installing ribbed belt	27
1.4 Removing and installing vibration damper	29
1.5 Toothed belt drive	30
1.6 Removing and installing toothed belt	35
2 Removing and installing sealing flange and flywheel/drive plate	41
2.1 Removing and installing sealing flange and flywheel/drive plate	41
2.2 Replacing crankshaft oil seal on pulley end	46
2.3 Removing and installing dual mass flywheel/drive plate	48
2.4 Removing and installing needle bearing in dual mass flywheel	52
3 Removing and installing crankshaft	54
3.1 Removing and installing crankshaft	54
3.2 Crankshaft dimensions	58
3.3 Measuring axial and radial play	58
4 Dismantling and assembling pistons and conrods	60
4.1 Dismantling and assembling pistons and conrods	60
4.2 Piston and cylinder dimensions	65
4.3 Checking radial play of conrods	66
15 - Cylinder head, Valve gear	67
1 Removing and installing cylinder head	67
1.1 Removing and installing cylinder head	67
1.2 Removing and installing intake manifold	74
1.3 Removing and installing left cylinder head cover	77
1.4 Removing and installing right cylinder head cover	79
1.5 Removing left cylinder head	82
1.6 Removing right cylinder head	84
1.7 Installing cylinder head	86
1.8 Checking compression	89
2 Servicing valve gear	91
2.1 Servicing valve gear	91
2.2 Checking camshaft axial play	99
2.3 Replacing camshaft oil seals	100
2.4 Replacing oil seal for Hall sender and sealing cap - left cylinder head	102
2.5 Replacing oil seal for Hall sender - right cylinder head	103



2.6	Removing and installing camshafts and camshaft adjuster	106
2.7	Checking hydraulic bucket tappets	111
2.8	Replacing valve stem seals	113
2.9	Checking valve guides	117
2.10	Checking valves	118
2.11	Reworking valve seats	118
3	Checking camshaft timing control	120
3.1	Checking camshaft timing control	120
3.2	Checking camshaft adjustment solenoid valves	120
17	- Lubrication	125
1	Removing and installing parts of the lubrication system	125
1.1	Removing and installing parts of the lubrication system	125
1.2	Removing and installing lower section of oil pan	130
1.3	Removing and installing upper section of oil pan	133
1.4	Removing and installing oil pump	138
1.5	Replacing oil retention valves	141
1.6	Checking oil pressure and oil pressure switch	142
1.7	Engine oil	145
1.8	Checking oil level	145
19	- Cooling system	147
1	Removing and installing parts of the cooling system	147
1.1	Removing and installing parts of the cooling system	147
1.2	Draining and filling cooling system	149
1.3	Coolant pump and coolant thermostat	154
1.4	Removing and installing coolant pump	155
1.5	Removing, installing and checking coolant thermostat	156
1.6	Coolant pipes - overview	161
1.7	Removing and installing front section of coolant pipe	163
1.8	Removing and installing small coolant pipe	164
1.9	Removing and installing rear coolant pipe	165
1.10	Removing and installing radiator	166
1.11	Removing and installing viscous fan	170
1.12	Checking cooling system for leaks	172
26	- Exhaust system	174
1	Removing and installing parts of exhaust system	174
1.1	Removing and installing parts of exhaust system	174
1.2	Vehicles with front-wheel drive	174
1.3	Installing exhaust system stress-free - vehicles with front-wheel drive	182
1.4	Vehicles with four-wheel drive	187
1.5	Separating centre and rear silencers - Vehicles with four-wheel drive	191
1.6	Installing exhaust system stress-free - vehicles with four-wheel drive	192