



## Contents

<b>00 - Technical data</b> .....	<b>1</b>
<b>1 Technical data</b> .....	<b>1</b>
1.1 Technical data .....	1
1.2 Engine number .....	1
1.3 Engine data .....	1
<b>10 - Removing and installing engine</b> .....	<b>3</b>
<b>1 Removing and installing engine</b> .....	<b>3</b>
1.1 Removing and installing engine .....	3
1.2 Notes on removing .....	4
1.3 Securing engine to assembly stand .....	7
1.4 Notes on installing .....	7
1.5 Tightening torques .....	9
1.6 Assembly mountings .....	9
1.7 Additional information and removal instructions for vehicles with air conditioner .....	10
<b>13 - Crankshaft group</b> .....	<b>12</b>
<b>1 Dismantling and assembling engine</b> .....	<b>12</b>
1.1 Dismantling and assembling engine .....	12
1.2 Removing and installing ribbed belt .....	27
<b>2 Removing and installing sealing flange and flywheel</b> .....	<b>29</b>
2.1 Removing and installing sealing flange and flywheel .....	29
2.2 Removing and installing drive plate .....	32
2.3 Renewing crankshaft oil seal -pulley end .....	35
2.4 Removing and installing sealing flange, pulley end .....	38
<b>3 Removing and installing crankshaft</b> .....	<b>41</b>
3.1 Removing and installing crankshaft .....	41
3.2 Crankshaft dimensions .....	44
<b>4 Dismantling and assembling pistons and conrods</b> .....	<b>45</b>
4.1 Dismantling and assembling pistons and conrods .....	45
4.2 Checking piston projection at TDC .....	51
4.3 Piston and cylinder dimensions .....	52
<b>15 - Cylinder head, Valve gear</b> .....	<b>53</b>
<b>1 Removing and installing cylinder head</b> .....	<b>53</b>
1.1 Removing and installing cylinder head .....	53
1.2 Removing, installing and tensioning toothed belt .....	60
1.3 Removing and installing cylinder head .....	72
1.4 Checking compression pressures .....	77
<b>2 Servicing valve gear</b> .....	<b>79</b>
2.1 Servicing valve gear .....	79
2.2 Reworking valve seats .....	86
2.3 Checking valve guides .....	88
2.4 Renewing valve stem seals .....	89
2.5 Removing and installing camshaft .....	91
2.6 Removing and installing camshaft oil seal .....	95
<b>17 - Lubrication</b> .....	<b>97</b>
<b>1 Removing and installing parts of the lubrication system</b> .....	<b>97</b>
1.1 Removing and installing parts of the lubrication system .....	97
1.2 Removing and installing sump .....	104
1.3 Checking oil pressure and oil pressure switch .....	107



<b>19 - Cooling system</b> . . . . .	<b>110</b>
<b>1 Removing and installing parts of cooling system</b> . . . . .	<b>110</b>
1.1 Removing and installing parts of cooling system . . . . .	110
1.2 Parts of cooling system body side . . . . .	111
1.3 Parts of cooling system engine side . . . . .	115
1.4 Coolant hose connection diagram . . . . .	120
1.5 Draining and filling cooling system . . . . .	123
1.6 Removing and installing radiator . . . . .	125
1.7 Removing and installing coolant pump . . . . .	127
1.8 Removing and installing thermostat . . . . .	129
<b>20 - Fuel supply system</b> . . . . .	<b>131</b>
<b>1 Removing and installing parts of fuel supply system</b> . . . . .	<b>131</b>
1.1 Removing and installing parts of fuel supply system . . . . .	131
1.2 Removing and installing fuel tank with its attachments . . . . .	131
1.3 Servicing fuel filter . . . . .	136
1.4 Safety precautions when working on the fuel supply system . . . . .	138
1.5 Rules for cleanliness . . . . .	139
1.6 Removing and installing fuel cooler . . . . .	139
1.7 Servicing accelerator mechanism . . . . .	140
1.8 Checking accelerator pedal position sender . . . . .	141
1.9 Checking tandem pump . . . . .	143
1.10 Removing and installing tandem pump . . . . .	146
<b>21 - Charging</b> . . . . .	<b>149</b>
<b>1 Charge air system with turbocharger</b> . . . . .	<b>149</b>
1.1 Charge air system with turbocharger . . . . .	149
1.2 Removing and installing turbocharger with attachments . . . . .	149
1.3 Removing and installing parts of charge air cooling . . . . .	156
1.4 Hose connection diagram for charge pressure control . . . . .	159
1.5 Rules for cleanliness . . . . .	162
<b>2 Checking charge pressure system</b> . . . . .	<b>163</b>
2.1 Checking charge pressure system . . . . .	163
2.2 Checking pressure unit for charge pressure regulating valve . . . . .	163
2.3 Removing and installing pressure unit for charge pressure regulating valve . . . . .	164
2.4 Checking turbocharger . . . . .	165
2.5 Checking charge pressure control . . . . .	167
<b>26 - Exhaust system</b> . . . . .	<b>174</b>
<b>1 Removing and installing parts of exhaust system</b> . . . . .	<b>174</b>
1.1 Removing and installing parts of exhaust system . . . . .	174
1.2 Exhaust manifold, front exhaust pipe and catalyst with attachments . . . . .	174
1.3 Silencer with mountings . . . . .	176
<b>2 Exhaust gas recirculation system</b> . . . . .	<b>177</b>
2.1 Exhaust gas recirculation system . . . . .	177
2.2 Removing and installing parts of exhaust gas recirculation system . . . . .	178
2.3 Checking exhaust gas recirculation valve (mechanical) . . . . .	184
2.4 Checking exhaust gas recirculation . . . . .	185