



## Contents

<b>00 - Technical data</b>	<b>1</b>
<b>1 Technical data</b>	<b>1</b>
1.1 Engine number	1
1.2 Engine data	1
<b>10 - Removing and installing engine</b>	<b>2</b>
<b>1 Removing and installing engine</b>	<b>2</b>
1.1 Removing	3
1.2 Installing	5
1.3 Torque settings	7
1.4 Additional notes and assembly work for vehicles with air conditioner	8
<b>13 - Crankshaft group</b>	<b>10</b>
<b>1 Dismantling and assembling engine</b>	<b>10</b>
1.1 Assembly overview - parts I and II	10
1.2 Part I Assembly overview - belt drive	12
1.3 Part II: Assembly overview - chain drive system	13
1.4 Removing and installing poly V-belt	15
1.5 Removing and installing valve timing housing	16
<b>2 Cylinder block, sealing flange</b>	<b>20</b>
2.1 Assembly overview	20
2.2 Renewing crankshaft oil seal - belt pulley end	22
2.3 Poly V-belt pulley securing bolt tightening procedure	23
2.4 Characteristics of the sealing flange and the assembly device T10017 and T10134	26
2.5 Renewing crankshaft sealing flange - flywheel end ( assembly tool T10134 )	27
2.6 Renewing crankshaft sealing flange - flywheel end ( assembly tool T10017 )	35
2.7 Crankshaft dimensions	42
<b>3 Pistons and conrods</b>	<b>44</b>
3.1 Assembly overview	44
3.2 Checking piston	45
3.3 Checking cylinder bores	46
3.4 Piston and cylinder dimensions	46
<b>15 - Cylinder head, valve gear</b>	<b>47</b>
<b>1 Cylinder head</b>	<b>47</b>
1.1 Assembly overview	47
1.2 Checking valve timing	50
1.3 Adjusting valve timing	51
1.4 Removing and installing timing chain and chain drive for oil pump	55
1.5 Removing and installing camshaft housing	63
1.6 Removing and installing cylinder head	67
1.7 Checking compression	70
<b>2 Valve gear</b>	<b>72</b>
2.1 Assembly overview	72
2.2 Checking camshaft axial clearance	74
2.3 Reworking valve seats	74
2.4 Checking valve guides	76
2.5 Renewing valve stem seals	76
<b>17 - Lubrication</b>	<b>79</b>
<b>1 Parts of lubrication system</b>	<b>79</b>
1.1 Engine oil	79
1.2 Assembly overview	79



1.3	Removing and installing sump	82
1.4	Removing and installing oil pump	83
1.5	Checking oil pressure and oil pressure switch	85
<b>19</b>	<b>- Cooling</b>	<b>88</b>
<b>1</b>	<b>Parts of cooling system</b>	<b>88</b>
1.1	Assembly overview - parts of cooling system, body side	88
1.2	Assembly overview - parts of cooling system, engine side	90
1.3	Coolant hose schematic diagram	92
1.4	Draining and filling coolant	93
1.5	Removing and installing radiator	95
1.6	Removing and installing coolant pump	96
<b>20</b>	<b>- Fuel supply system</b>	<b>99</b>
<b>1</b>	<b>Parts of fuel supply system</b>	<b>99</b>
1.1	Assembly overview - fuel tank with attachments	99
1.2	Safety precautions when working on fuel supply system	102
1.3	Rules for cleanliness	102
1.4	Removing and installing fuel delivery unit	102
1.5	Removing and installing fuel gauge sender G	104
1.6	Removing and installing fuel tank	105
1.7	Assembly overview - fuel filter with attachments	107
1.8	Removing and installing fuel filter	108
1.9	Crash fuel shut-off	109
1.10	Checking fuel pump	109
1.11	Bleeding fuel system	114
<b>2</b>	<b>Electronic power control (EPC)</b>	<b>117</b>
2.1	Assembly overview	117
<b>3</b>	<b>Activated charcoal filter system</b>	<b>118</b>
3.1	Assembly overview	118
3.2	Checking fuel tank breather	119
<b>24</b>	<b>- Mixture preparation - injection</b>	<b>120</b>
<b>1</b>	<b>Injection system</b>	<b>120</b>
1.1	General notes on injection	120
1.2	Assembly overview - intake manifold	120
1.3	Assembly overview - fuel rail with injectors	122
1.4	Removing and installing injectors	122
1.5	Assembly overview - air filter	123
1.6	Removing and installing air filter housing	125
1.7	Cleaning throttle valve module J338	126
1.8	Safety precautions	127
1.9	Rules for cleanliness	128
1.10	Technical data	128
<b>2</b>	<b>Checking components</b>	<b>129</b>
2.1	Checking injectors for leaks and quantity injected	129
2.2	Checking fuel pressure regulator and holding pressure	131
<b>3</b>	<b>Engine control unit J623</b>	<b>134</b>
3.1	Removing and installing engine control unit J623	134
3.2	Vehicles with anti-theft secured engine control unit J623	134
<b>26</b>	<b>- Exhaust system</b>	<b>136</b>
<b>1</b>	<b>Parts of the exhaust system</b>	<b>136</b>
1.1	Assembly overview - catalytic converters and attachments	136
1.2	Assembly overview - silencers with mountings	138



<b>28 - Ignition system</b> .....	<b>139</b>
<b>1 Ignition system</b> .....	<b>139</b>
1.1 Assembly overview - ignition system .....	139
1.2 Removing and installing ignition coils with output stage .....	140
1.3 Safety precautions .....	141
1.4 Spark plug test data .....	142