



## Contents

<b>00 - Materials . . . . .</b>	<b>1</b>
1 <b>Technical data . . . . .</b>	1
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>
1 <b>Removing and installing engine . . . . .</b>	3
1.1    Removing and installing engine . . . . .	3
1.2    Notes on removing . . . . .	4
1.3    Securing engine to assembly stand . . . . .	8
1.4    Notes on installing . . . . .	9
1.5    Aligning engine and gearbox mountings . . . . .	11
1.6    Tightening torques . . . . .	12
1.7    Additional information and removal instructions for vehicles with air conditioner . . . . .	12
<b>13 - Crankshaft group . . . . .</b>	<b>14</b>
1 <b>Dismantling and assembling engine . . . . .</b>	14
1.1    Dismantling and assembling engine . . . . .	14
1.2    Removing and installing ribbed belt . . . . .	29
2 <b>Removing and installing sealing flange and dual mass flywheel/drive plate . . . . .</b>	31
2.1    Removing and installing sealing flange and dual mass flywheel/drive plate . . . . .	31
2.2    Renewing crankshaft oil seal -vibration damper end- . . . . .	36
2.3    Removing and installing drive plate . . . . .	39
3 <b>Removing and installing crankshaft . . . . .</b>	41
3.1    Removing and installing crankshaft . . . . .	41
4 <b>Dismantling and assembling pistons and conrods . . . . .</b>	46
4.1    Dismantling and assembling pistons and conrods . . . . .	46
4.2    Piston and cylinder dimensions . . . . .	52
<b>15 - Cylinder head, Valve gear . . . . .</b>	<b>53</b>
1 <b>Removing and installing cylinder head . . . . .</b>	53
1.1    Removing and installing cylinder head . . . . .	53
1.2    Removing and installing cover . . . . .	61
1.3    Removing and installing cylinder head cover . . . . .	65
1.4    Removing and installing cylinder head . . . . .	69
1.5    Checking valve timing . . . . .	76
1.6    Adjusting valve timing . . . . .	78
1.7    Checking compression pressures . . . . .	85
2 <b>Servicing valve gear . . . . .</b>	87
2.1    Servicing valve gear . . . . .	87
2.2    Reworking valve seats . . . . .	98
2.3    Removing and installing camshafts . . . . .	100
2.4    Checking camshaft adjustment . . . . .	108
2.5    Checking valve guides . . . . .	113
2.6    Renewing valve stem seals . . . . .	114
<b>17 - Lubrication . . . . .</b>	<b>117</b>
1 <b>Removing and installing parts of the lubrication system . . . . .</b>	117
1.1    Removing and installing parts of the lubrication system . . . . .	117
1.2    Dismantling and assembling oil filter housing . . . . .	123
1.3    Dismantling and assembling oil pump . . . . .	126
1.4    Removing and installing oil sump . . . . .	129



1.5	Checking oil pressure and oil pressure switch . . . . .	132
<b>19 - Cooling system . . . . .</b>		<b>135</b>
1	<b>Removing and installing parts of cooling system . . . . .</b>	135
1.1	Removing and installing parts of cooling system . . . . .	135
1.2	Parts of cooling system body side . . . . .	136
1.3	Parts of cooling system engine side . . . . .	139
1.4	Coolant hose connection diagram . . . . .	144
1.5	Dismantling and assembling coolant thermostat housing . . . . .	146
1.6	Draining and filling cooling system . . . . .	148
1.7	Removing and installing radiator and fans . . . . .	151
1.8	Removing and installing coolant pump . . . . .	154
1.9	Checking continued coolant circulation pump . . . . .	157
<b>20 - Fuel supply system . . . . .</b>		<b>160</b>
1	<b>Removing and installing parts of fuel supply system . . . . .</b>	160
1.1	Removing and installing parts of fuel supply system . . . . .	160
1.2	Removing and installing fuel tank with its attachments and fuel filter . . . . .	161
1.3	Safety precautions when working on the fuel supply system . . . . .	168
1.4	Rules for cleanliness . . . . .	169
1.5	Crash fuel shut-off . . . . .	169
1.6	Removing and installing fuel delivery unit . . . . .	169
1.7	Removing and installing fuel gauge sender . . . . .	171
1.8	Removing and installing fuel tank . . . . .	171
1.9	Checking fuel pump . . . . .	174
2	<b>Electronic power control (EPC) . . . . .</b>	181
2.1	Electronic power control (EPC) . . . . .	181
2.2	Function of EPC system . . . . .	181
2.3	Servicing parts of electronic power control (EPC) . . . . .	182
2.4	Checking accelerator pedal position sender . . . . .	184
3	<b>Activated charcoal filter system . . . . .</b>	187
3.1	Activated charcoal filter system . . . . .	187
3.2	Function . . . . .	187
3.3	Servicing parts of the activated charcoal filter system . . . . .	188
3.4	Checking activated charcoal filter canister solenoid valve 1 . . . . .	190
3.5	Checking fuel tank breather . . . . .	192
<b>26 - Exhaust system . . . . .</b>		<b>195</b>
1	<b>Removing and installing parts of exhaust system . . . . .</b>	195
1.1	Removing and installing parts of exhaust system . . . . .	195
1.2	Exhaust manifold, front exhaust pipe and catalytic converter with attachments . . . . .	196
1.3	Silencer with mountings . . . . .	200
1.4	Checking catalytic converter . . . . .	204
2	<b>Secondary air system . . . . .</b>	206
2.1	Secondary air system . . . . .	206
2.2	Function . . . . .	206
2.3	Removing and installing parts of the secondary air system . . . . .	207
2.4	Checking secondary air system . . . . .	212
2.5	Checking secondary air pump motor . . . . .	214
2.6	Removing and installing secondary air pump motor . . . . .	216
2.7	Checking combi-valve . . . . .	217