



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 Notes on removing	3
1.3 Securing engine to engine stand	6
1.4 Notes on installing	6
1.5 Tightening torques	8
1.6 Assembly mountings	9
1.7 Additional information and removal instructions for vehicles with air conditioner	10
13 - Crankshaft group	11
1 Dismantling and assembling engine	11
1.1 Dismantling and assembling engine	11
1.2 Removing and installing ribbed belt	32
1.3 Checking valve timing	33
1.4 Adjusting valve timing	34
2 Removing and installing sealing flanges and flywheel/drive plate	40
2.1 Removing and installing sealing flanges and flywheel/drive plate	40
2.2 Renewing crankshaft oil seal - vibration damper end -	43
2.3 Removing and installing dual mass flywheel	46
2.4 Removing and installing drive plate	47
3 Removing and installing crankshaft	49
3.1 Removing and installing crankshaft	49
4 Dismantling and assembling pistons and conrods	52
4.1 Dismantling and assembling pistons and conrods	52
4.2 Piston and cylinder dimensions	58
15 - Cylinder head, Valve gear	59
1 Removing and installing cylinder head	59
1.1 Removing and installing cylinder head	59
1.2 Removing and installing cylinder head cover	67
1.3 Installing cylinder head	72
1.4 Checking compressions	73
2 Servicing valve gear	75
2.1 Servicing valve gear	75
2.2 Reworking valve seats	81
2.3 Removing and installing camshafts	83
2.4 Checking hydraulic bucket tappets	86
2.5 Checking valve guides	87
2.6 Renewing valve guides	88
2.7 Renewing valve stem seals	89
17 - Lubrication	90
1 Removing and installing parts of the lubrication system	90
1.1 Removing and installing parts of the lubrication system	90
1.2 Dismantling and assembling oil filter housing	96
1.3 Dismantling and assembling oil pump	99



1.4	Checking oil pressure and oil pressure switch	102
19	- Cooling system	104
1	Removing and installing parts of cooling system	104
1.1	Removing and installing parts of cooling system	104
1.2	Parts of cooling system body side	105
1.3	Parts of cooling system engine side	109
1.4	Coolant hose connection diagram	113
1.5	Dismantling and assembling coolant thermostat housing	115
1.6	Draining and filling cooling system	117
1.7	Removing and installing radiator and radiator fan	119
1.8	Removing and installing coolant pump	121
1.9	Checking thermo switch and continued coolant circulation pump	121
1.10	Checking vacuum valve	123
20	- Fuel supply system	125
1	Removing and installing parts of fuel supply system	125
1.1	Removing and installing parts of fuel supply system	125
1.2	Removing and installing fuel tank with its attachments and fuel filter	126
1.3	Safety precautions when working on the fuel supply system	132
1.4	Rules for cleanliness	132
1.5	Removing and installing fuel delivery unit	132
1.6	Removing and installing fuel tank	134
1.7	Checking fuel pump	135
1.8	Servicing accelerator mechanism	141
1.9	Adjusting throttle cable	143
1.10	Servicing parts of the activated charcoal filter system	145
26	- Exhaust system	147
1	Removing and installing parts of exhaust system	147
1.1	Removing and installing parts of exhaust system	147
1.2	Exhaust manifold, front exhaust pipe and catalyst with attachments	147
1.3	Silencer with mountings	152
2	Exhaust gas recirculation system	153
2.1	Exhaust gas recirculation system	153
2.2	Checking exhaust gas recirculation valve	156
3	Secondary air system	158
3.1	Secondary air system	158
3.2	Function	158
3.3	Removing and installing parts of the secondary air system	159
3.4	Checking combi-valve	163
3.5	Removing and installing combi-valve	164