



Contents

00 - Technical data	1
1 Technical data	1
1.1 Engine number	1
1.2 Engine data	1
10 - Removing and installing engine	2
1 Removing and installing engine	2
1.1 Removing	3
1.2 Installing	7
1.3 Torque settings	8
1.4 Additional notes and assembly work for vehicles with air conditioner	9
13 - Crankshaft group	11
1 Dismantling and assembling engine	11
1.1 Assembly overview - parts I and II	11
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	16
1.5 Removing and installing valve timing housing	17
2 Cylinder block, sealing flange	22
2.1 Assembly overview	22
2.2 Renewing crankshaft oil seal - belt pulley end	24
2.3 Poly V-belt pulley securing bolt tightening procedure	26
2.4 Characteristics of the sealing flange and the assembly device T10134	30
2.5 Renewing crankshaft sealing flange - flywheel end (assembly tool T10134)	31
3 Removing and installing crankshaft	42
3.1 Exploded view crankshaft	42
3.2 Crankshaft bearings	44
3.3 Crankshaft dimensions	44
4 Pistons and conrods	45
4.1 Assembly overview	45
4.2 Checking piston	47
4.3 Checking cylinder bores	48
4.4 Piston and cylinder dimensions	49
15 - Cylinder head, valve gear	50
1 Cylinder head	50
1.1 Assembly overview	50
1.2 Checking valve timing	52
1.3 Adjusting valve timing	55
1.4 Removing and installing timing chain and chain drive for oil pump	61
1.5 Removing and installing camshaft housing	70
1.6 Removing and installing cylinder head	76
1.7 Checking compression	80
2 Valve gear	83
2.1 Assembly overview	83
2.2 Checking camshaft axial clearance	86
2.3 Reworking valve seats	86
2.4 Checking valve guides	88
2.5 Renewing valve stem seals	89
17 - Lubrication	92



1	Parts of lubrication system	92
1.1	Engine oil	92
1.2	Assembly overview	92
1.3	Removing and installing sump	95
1.4	Removing and installing oil pump	97
1.5	Checking oil pressure and oil pressure switch	99
19	- Cooling	102
1	Parts of cooling system	102
1.1	Assembly overview - parts of cooling system, body side	102
1.2	Assembly overview - parts of cooling system, engine side	104
1.3	Coolant hose schematic diagram	106
1.4	Draining and filling coolant	107
1.5	Removing and installing radiator	116
1.6	Removing and installing coolant pump	118
20	- Fuel supply system	120
1	Parts of fuel supply system	120
1.1	Assembly overview - fuel tank with attachments	120
1.2	Safety precautions when working on fuel supply system	123
1.3	Rules for cleanliness	124
1.4	Removing and installing fuel delivery unit	124
1.5	Removing and installing fuel gauge sender G	126
1.6	Removing and installing fuel tank	127
1.7	Assembly overview - fuel filter with attachments	129
1.8	Removing and installing fuel filter	130
1.9	Crash fuel shut-off	132
1.10	Checking fuel pump	132
1.11	Bleeding fuel system	138
2	Electronic power control (EPC)	142
2.1	Assembly overview	142
2.2	Removing and installing accelerator pedal module GX2	142
3	Activated charcoal filter system	145
3.1	Assembly overview	145
3.2	Checking fuel tank breather	146
24	- Mixture preparation - injection	147
1	Injection system	147
1.1	General notes on injection	147
1.2	Assembly overview - intake manifold	147
1.3	Removing and installing intake manifold	148
1.4	Assembly overview - fuel rail with injectors	151
1.5	Removing and installing injectors	152
1.6	Assembly overview - air filter	154
1.7	Removing and installing air filter housing	156
1.8	Cleaning throttle valve module J338	157
1.9	Safety precautions	158
1.10	Rules for cleanliness	159
1.11	Technical data	160
2	Checking components	161
2.1	Checking injectors for leaks and quantity injected	161
2.2	Checking fuel pressure regulator and holding pressure	164
3	Engine control unit J623	168
3.1	Removing and installing engine control unit J623	168
3.2	Vehicles with anti-theft secured engine control unit J623	169



26 - Exhaust system	171
1 Parts of the exhaust system	171
1.1 Assembly overview - catalytic converters and attachments	171
1.2 Assembly overview - silencers with mountings	173
28 - Ignition system	175
1 Ignition system	175
1.1 Assembly overview - ignition system	175
1.2 Removing and installing ignition coils with output stage	176
1.3 Safety precautions	178
1.4 Spark plug test data	179