



Contents

00 - Technical data	1
1 Technical data	1
1.1 Engine number	1
1.2 Engine data	1
10 - Removing and installing engine	3
1 Removing and installing engine	3
1.1 Removing engine	3
1.2 Securing engine to assembly stand	7
1.3 Installing engine	7
1.4 Specified torques	8
1.5 Assembly mountings	9
1.6 Additional information and assembly work for vehicles with air conditioner	10
13 - Crankshaft group	11
1 Dismantling and assembling engine	11
1.1 Assembly overview – parts I and II	11
1.2 Removing and installing poly V-belt	14
1.3 Checking valve timing	15
1.4 Removing, installing and tensioning toothed belt	15
1.5 Checking semi-automatic toothed belt tensioner	21
1.6 Checking coupling drive tensioning roller	24
2 Cylinder block, sealing flange and flywheel/drive plate	26
2.1 Assembly overview	26
2.2 Renewing crankshaft oil seal on belt pulley end	28
2.3 Poly V-belt pulley securing bolt tightening procedure	29
2.4 Removing and installing drive plate	30
2.5 Renewing crankshaft sealing flange - flywheel end	32
2.6 Crankshaft dimensions	39
3 Dismantling and assembling pistons and conrods	41
3.1 Piston and cylinder dimensions	44
15 - Cylinder head, valve gear	45
1 Removing and installing cylinder head	45
1.1 Removing and installing camshaft housing	47
1.2 Removing and installing cylinder head	49
1.3 Checking compression	53
2 Repairing valve gear	56
2.1 Reworking valve seats	59
2.2 Renewing camshaft oil seals	60
2.3 Checking valve guides	62
2.4 Renewing valve stem seals	63
17 - Lubrication	65
1 Parts of lubrication system	65
1.1 Engine oil	65
1.2 Assembly overview	65
1.3 Removing and installing oil sump	68
1.4 Removing and installing oil pump	70
1.5 Checking oil pressure and oil pressure switch	73
19 - Cooling	75
1 Removing and installing parts of cooling system	75



1.1	Parts of cooling system, body side	75
1.2	Parts of cooling system - engine side	77
1.3	Coolant hose schematic diagram	79
1.4	Draining and filling coolant	80
1.5	Removing and installing radiator	82
1.6	Removing and installing coolant pump	83
20	- Fuel supply system	86
1	Removing and installing parts of fuel supply system	86
1.1	Removing and installing fuel tank with attachments and fuel filter	86
1.2	Safety precautions when working on fuel supply system	89
1.3	Rules for cleanliness	89
1.4	Removing and installing fuel delivery unit	90
1.5	Removing and installing fuel tank	91
1.6	Crash fuel shut-off	92
1.7	Checking fuel pump	92
2	Accelerator mechanism	99
2.1	Assembly overview	99
2.2	Adjusting accelerator cable	100
3	Checking electronic power control (EPC)	101
3.1	Assembly overview	101
4	Activated charcoal filter system	102
4.1	Repairing parts of activated charcoal filter system	102
4.2	Checking fuel tank breather	102
24	- Mixture preparation - injection	105
1	Repairing injection system	105
1.1	Overview of fitting locations	105
1.2	General notes on injection	106
1.3	Removing and installing parts of the injection system	107
1.4	Dismantling and assembling intake manifold	110
1.5	Dismantling and assembling fuel rail with injectors	111
1.6	Dismantling and assembling air filter	111
1.7	Cleaning throttle valve module J338	113
1.8	Safety precautions	114
1.9	Rules for cleanliness	115
1.10	Technical data	116
2	Checking components	117
2.1	Checking injectors	117
2.2	Checking fuel pressure regulator and holding pressure	118
2.3	Adapting functions and components	121
2.4	Reading and erasing engine control unit fault memory	122
26	- Exhaust system	123
1	Removing and installing parts of exhaust system	123
1.1	Assembly overview - exhaust manifold with catalytic converter and add-on parts	123
1.2	Assembly overview - silencers with mountings	125
2	Exhaust gas recirculation system	126
2.1	Assembly overview - exhaust gas recirculation system	126
2.2	Checking exhaust gas recirculation valve N18	127
28	- Ignition system	129
1	Repairing ignition	129
1.1	General notes on ignition system	129
1.2	Assembly overview - parts of ignition system	129



1.3	Safety precautions	131
1.4	Test data, spark plugs	132