



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 engine	3
1.2 Securing engine to assembly stand	7
1.3 Installing engine	7
1.4 Assembly mountings	10
13 - Crankshaft group	12
1 Dismantling and assembling engine	12
1.1 Part I Assembly overview - belt drive	12
1.2 Part II Assembly overview - cylinder block	14
1.3 Removing and installing poly V-belt	16
1.4 Removing and installing valve timing housing	17
2 Sealing flange and flywheel	21
2.1 Assembly overview - sealing flange	21
2.2 Renewing crankshaft oil seal - belt pulley end	23
2.3 Poly V-belt pulley securing bolt tightening procedure	24
2.4 Renewing crankshaft sealing flange - flywheel end	27
2.5 Crankshaft dimensions	34
3 Pistons and conrods	36
3.1 Assembly overview - Pistons and conrods	36
3.2 Checking piston	37
3.3 Piston and cylinder dimensions	38
15 - Cylinder head, valve gear	39
1 Cylinder head	39
1.1 Assembly overview - cylinder head	39
1.2 Checking valve timing	42
1.3 Adjusting valve timing	43
1.4 Removing and installing timing chain and chain drive for oil pump	47
1.5 Removing and installing camshaft housing	54
1.6 Removing and installing cylinder head	59
1.7 Checking compression	61
2 Valve gear	63
2.1 Assembly overview - valve gear	63
2.2 Checking camshaft axial clearance	65
2.3 Machining valve seats	65
2.4 Checking valve guides	67
2.5 Renewing valve stem seals	67
17 - Lubrication	70
1 Parts of lubrication system	70
1.1 Engine oil	70
1.2 Assembly overview - parts of lubrication system	70
1.3 Removing and installing sump	73
1.4 Removing and installing oil pump	74
1.5 Checking oil pressure and oil pressure switch	76



19 - Cooling	79
1 Parts of cooling system	79
1.1 Assembly overview - parts of cooling system, body side	79
1.2 Assembly overview - parts of cooling system, engine side	81
1.3 Coolant hose schematic diagram	83
1.4 Draining and filling coolant	84
1.5 Removing and installing radiator fan V7 and radiator fan 2 V177	87
1.6 Removing and installing radiator	88
1.7 Removing and installing coolant pump	91
1.8 Checking cooling system for leaks	92
20 - Fuel supply system	95
1 Safety precautions	95
1.1 Safety precautions when working on fuel supply system	95
1.2 Releasing fuel pressure in high-pressure section	96
2 Fuel tank	98
2.1 Rules for cleanliness	98
2.2 Assembly overview - fuel tank	98
2.3 Emptying fuel tank	100
2.4 Removing and installing fuel tank	102
3 Repairing fuel supply system	106
3.1 Rules for cleanliness	106
3.2 Removing and installing fuel delivery unit	106
3.3 Removing and installing fuel gauge sender G	108
3.4 Checking fuel pump	108
4 Electronic power control (EPC)	117
4.1 Assembly overview - accelerator module	117
4.2 Removing and installing accelerator pedal module	117
5 Activated charcoal filter system	120
5.1 Assembly overview - activated charcoal filter system	120
5.2 Checking fuel tank breather	120
24 - Mixture preparation - injection	123
1 Injection system	123
1.1 General notes on injection	123
1.2 Technical data	123
1.3 Assembly overview - air filter	124
1.4 Removing and installing air filter	124
1.5 Assembly overview - intake manifold	126
1.6 Assembly overview - Fuel rail with injectors	128
1.7 Removing and installing injectors	130
1.8 Removing and installing high-pressure pump	133
1.9 Cleaning throttle valve module J338	137
2 Checking components	139
2.1 Checking function of intake manifold flap	139
2.2 Checking vacuum reservoir in intake manifold for leaks	139
2.3 Checking intake air preheating	140
3 Engine control unit J623	141
3.1 Removing and installing engine control unit J623	141
3.2 Removing and installing anti-theft engine control unit J623	141
26 - Exhaust system	145
1 Parts of exhaust system	145
1.1 Assembly overview - catalytic converters and attachments	145



1.2	Assembly overview - silencers with mountings	147
1.3	Separating centre and rear silencers	147
2	Exhaust gas recirculation system	149
2.1	Assembly overview - exhaust gas recirculation system	149
2.2	Removing and installing exhaust gas recirculation valve N18	150
28	Ignition system	151
1	Ignition system	151
1.1	General notes on ignition system	151
1.2	Safety precautions	151
1.3	Assembly overview - ignition system	152
1.4	Removing and installing ignition coils with output stage	153
1.5	Spark plug test data	154