



Contents

00 - Technical data	1
1 Engine number	1
2 Engine data	2
01 - Self-diagnosis	3
1 Reading fault memory for fuel system (LPG)	3
1.1 Preparation to read fault memory	3
1.2 Read fault memory	3
1.3 Erasing fault memory	4
10 - Removing and installing engine	5
1 Removing and installing engine	5
1.1 Removing engine	7
1.2 Securing engine to assembly stand	10
1.3 Installing engine	10
1.4 Torque settings	12
1.5 Assembly mountings	13
1.6 Additional information and assembly work for vehicles with air conditioner	14
13 - Crankshaft group	15
1 Dismantling and assembling engine	15
1.1 Assembly overview - parts I and II	15
1.2 Assembly overview - part I, belt drive	17
1.3 Assembly overview - part II, cylinder block	19
1.4 Removing and installing poly-V belt	20
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	25
2.4 Removing and installing drive plate	26
2.5 Characteristics of the sealing flange and the assembly devices T10017 and assembly device T10134	28
2.6 Renewing crankshaft sealing flange - flywheel end (assembly tool T10134)	29
2.7 Renewing crankshaft sealing flange - flywheel end (assembly tool T10017)	37
2.8 Crankshaft dimensions	44
3 Pistons and conrods	46
3.1 Assembly overview	46
3.2 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 Removing, installing and tensioning toothed belt	53
1.4 Checking semi-automatic toothed belt tensioner	58
1.5 Removing and installing camshaft housing	62
1.6 Removing and installing cylinder head	64
1.7 Checking compression	68
2 Valve gear	70
2.1 Assembly overview	70
2.2 Reworking valve seats	73
2.3 Renewing camshaft oil seals	74
2.4 Checking valve guides	76



2.5	Renewing valve stem seals	77
17	- Lubrication	79
1	Parts of lubrication system	79
1.1	Engine oil:	79
1.2	Assembly overview	79
1.3	Removing and installing oil sump	81
1.4	Removing and installing oil pump	83
1.5	Checking oil pressure and oil pressure switch	86
19	- Cooling	88
1	Parts of cooling system	88
1.1	Assembly overview - parts of cooling system, body side	88
1.2	Assembly overview - parts of cooling system, engine side	90
1.3	Coolant hose connection diagram	92
1.4	Draining and adding coolant	93
1.5	Removing and installing radiator	96
1.6	Removing and installing coolant pump	98
20	- Fuel supply system	100
1	Parts of fuel supply system	100
1.1	Assembly overview - fuel tank with attachments	100
1.2	Safety regulations for working on fuel supply	103
1.3	Rules for cleanliness	104
1.4	Removing and installing fuel delivery unit	104
1.5	Removing and installing fuel gauge sender	106
1.6	Removing and installing fuel tank	106
1.7	Crash fuel shut-off	108
1.8	Checking fuel pump	108
1.9	Bleeding fuel system	116
1.10	Parts of fuel supply system (LPG)	119
2	Electronic power control (EPC)	133
2.1	Assembly overview	133
3	Activated charcoal filter system	134
3.1	Assembly overview - parts of activated charcoal filter system	134
3.2	Checking fuel tank breather	135
24	- Mixture preparation - injection	136
1	Injection system	136
1.1	General notes on injection	136
1.2	Assembly overview - parts of injection system	136
1.3	Assembly overview - intake manifold	139
1.4	Assembly overview - fuel rail with injectors	140
1.5	Fuel rail, removing and installing gas rail	140
1.6	Assembly overview - air filter	141
1.7	Removing and installing air filter housing	143
1.8	Cleaning throttle valve module J338	144
1.9	Checking injectors	144
1.10	Safety precautions	146
1.11	Rules for cleanliness	148
1.12	Technical data	148
1.13	Removing and installing vaporiser on vehicles which can be operated with liquid gas	148
2	Engine control unit J623	151
2.1	Removing and installing engine (motor) control unit J623	151
2.2	Removing and installing anti-theft engine control unit J623	151
2.3	Removing and installing anti-theft engine control unit J623	153



3	Gas mode control unit J659	155
3.1	Removing and installing gas mode control unit J659	155
3.2	Removing holder for gas mode control unit J659	155
26	- Exhaust system	157
1	Parts of the exhaust system	157
1.1	Assembly overview - front exhaust system with attachments	157
1.2	Assembly overview - silencers with mountings	159
28	- Ignition system	160
1	Ignition system	160
1.1	General notes on ignition system	160
1.2	Assembly overview - parts of ignition system	160
1.3	Safety precautions	161
1.4	Test data, spark plugs	162