



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	4
1.2 Securing engine on engine and gearbox support VAS 6095	14
1.3 Installing engine	15
13 - Crankshaft group	19
1 Dismantling and assembling engine	19
1.1 Part I: assembly overview - chain drive	20
1.2 Part II: assembly overview - cylinder block	23
1.3 Removing and installing vibration damper	25
1.4 Removing and installing engine bracket and engine mounting on left or right side	26
1.5 Removing and installing poly V-belt	28
2 Sealing flange and dual-mass flywheel	30
2.1 Assembly overview	30
2.2 Removing and installing seal, flywheel end	31
2.3 Removing and installing flywheel	33
2.4 Removing and installing drive plate	34
2.5 Renewing crankshaft oil seal, vibration damper end	35
2.6 Renewing crankshaft sealing flange -vibration damper side-	37
3 Pistons and conrods	40
3.1 Assembly overview	40
3.2 Separating new conrod	41
3.3 Checking piston and cylinder	41
3.4 Piston and cylinder dimensions	43
4 Crankshaft	44
4.1 Assembly overview	44
4.2 Fitting sender wheel to crankshaft	45
4.3 Allocation of crankshaft bearing shells (classification)	46
15 - Cylinder head, valve gear	48
1 Cylinder head	48
1.1 Assembly overview	48
1.2 Removing and installing cylinder head	52
1.3 Checking valve timing	56
1.4 Installing timing chain for intermediate shaft drive and camshaft drive	58
1.5 Installing camshaft adjuster with timing chain for camshaft drive	64
1.6 Removing and installing cylinder head cover	68
1.7 Assembly overview - cover part	71
1.8 Checking compression	74
2 Valve gear	76
2.1 Assembly overview - valve gear	76
2.2 Removing and installing camshaft control valves	79
2.3 Removing and installing camshafts	82
2.4 Renewing valve stem seals	87
2.5 Checking valve guides	91
2.6 Reworking valve seats	91



17 - Lubrication	95
1 Parts of lubrication system	95
1.1 Engine oil	95
1.2 Assembly overview	95
1.3 Assembly overview - dismantling and assembling oil filter housing	98
1.4 Assembly overview - dismantling and assembling oil pump	100
1.5 Removing and installing sump	101
1.6 Checking oil pressure and oil pressure switch	104
19 - Cooling	108
1 Parts of cooling system	108
1.1 Assembly overview - radiator	109
1.2 Assembly overview - removing and installing fan	110
1.3 Assembly overview - parts of cooling system, body side	111
1.4 Assembly overview - thermostat housing	112
1.5 Assembly overview - parts of cooling system, engine side	113
1.6 Coolant hose schematic diagram	114
1.7 Draining and filling coolant	115
1.8 Removing and installing radiator	118
1.9 Removing and installing coolant pump	119
20 - Fuel supply system	120
1 Parts of fuel supply system	120
1.1 Assembly overview - fuel tank with attachments and fuel filter	120
1.2 Dismantling and assembling right side fuel delivery unit, fuel gauge sender and suction-jet pump	122
1.3 Assembly overview - fuel delivery unit, fuel gauge sender and suction jet pump on left side	124
1.4 Schematic diagram of fuel lines and components in fuel tank	126
1.5 Safety precautions when working on fuel supply system	128
1.6 Rules for cleanliness	128
1.7 Emptying fuel tank	128
1.8 Removing and installing fuel delivery unit, fuel gauge sender and suction-jet pump, right side	131
1.9 Removing and installing fuel delivery unit, fuel gauge sender and suction-jet pump, left side	134
1.10 Removing and installing fuel tank with attachments and fuel filter	137
1.11 Checking fuel pumps	139
2 Activated charcoal filter system	148
2.1 Assembly overview - parts of activated charcoal filter system	148
2.2 Checking activated charcoal filter system for leaks	150
3 Checking electronic power control (EPC)	153
24 - Mixture preparation - injection	155
1 Injection system	155
1.1 General notes on injection	155
1.2 Assembly overview - intake manifold	155
1.3 Assembly overview - fuel rail	157
1.4 Assembly overview - air filter	158
1.5 Safety precautions	158
1.6 Rules for cleanliness	159
1.7 Technical data	159
2 Checking components	161
2.1 Checking injectors	161
2.2 Checking fuel pressure regulator and holding pressure	163



3	Engine control unit	167
3.1	Removing and installing engine control unit	167
3.2	Reading and erasing engine control unit fault memory	167
26	- Exhaust system	169
1	Parts of exhaust system	169
1.1	Assembly overview - exhaust manifold with starter catalytic converters and attachments	170
1.2	Exhaust pipes with main catalytic converters and silencers with mountings	172
1.3	Removing and installing exhaust manifolds and exhaust pipes with starter catalytic converters	174
2	Secondary air system	176
2.1	Assembly overview - parts of secondary air system	176
2.2	Checking combination valve	178
28	- Ignition system	180
1	Ignition system	180
1.1	Assembly overview - parts of ignition system	180
1.2	Safety precautions	182
1.3	Removing and installing ignition coils with output stage	182
1.4	Test data, spark plugs	184

