



Contents

00 - Technical data	1
1 Engine number	1
2 Engine data	2
10 - Removing and installing engine	3
1 Removing and installing engine	3
1.1 Removing engine	4
1.2 Securing engine to assembly stand	9
1.3 Installing engine	11
1.4 Assembly mountings	13
13 - Crankshaft group	15
1 Dismantling and assembling engine	15
1.1 Assembly overview	15
1.2 Removing and installing poly-V belt	22
2 Sealing flange and flywheel or drive plate	25
2.1 Assembly overview - sealing flange	25
2.2 Renewing crankshaft oil seal (belt pulley end)	26
2.3 Removing and installing sealing flange (belt pulley end)	28
2.4 Removing and installing crankshaft sealing flange (flywheel end)	31
2.5 Removing and installing flywheel	32
2.6 Removing and installing drive plate	33
3 Crankshaft	35
3.1 Assembly overview - crankshaft	35
3.2 Pulling needle bearing out of and driving into crankshaft	37
3.3 Crankshaft dimensions	39
3.4 Identification of crankshaft upper bearing	39
4 Pistons and conrods	40
4.1 Assembly overview - pistons and conrods	40
4.2 Separating new conrod	41
4.3 Removing and installing pistons	42
4.4 Checking pistons and cylinder bores	43
15 - Cylinder head, valve gear	46
1 Cylinder head	46
1.1 Assembly overview - cylinder head	46
1.2 Removing and installing cylinder head cover	48
1.3 Removing and installing cylinder head	50
1.4 Removing and installing toothed belt, vehicles without split toothed belt guard	55
1.5 Removing and installing toothed belt, vehicles with split toothed belt guard	66
1.6 Checking compression	76
2 Valve gear	79
2.1 Assembly overview - valve gear	79
2.2 Valve dimensions	81
2.3 Checking valve guides	81
2.4 Renewing valve stem seals	82
2.5 Renewing exhaust camshaft seal	86
2.6 Removing and installing camshaft adjuster	89
2.7 Removing and installing camshaft control valve 1 N205	92
2.8 Removing and installing camshafts	94
17 - Lubrication	98



1	Parts of lubrication system	98
1.1	Engine oil:	98
1.2	Assembly overview - parts of lubrication system	98
1.3	Drain oiling filter housing	103
1.4	Removing and installing sump	104
1.5	Removing and installing oil pump with balance shaft gear assembly	107
1.6	Removing and installing oil filter bracket	111
1.7	Removing and installing oil pressure switch F1	112
1.8	Checking oil pressure and oil pressure switch (single pin oil pressure switch)	113
1.9	Checking oil pressure and oil pressure switch (2-pin oil pressure switch)	115
19	Cooling	118
1	Parts of cooling system	118
1.1	Assembly overview - parts of cooling system, engine side	118
1.2	Assembly overview - coolant circulation pump V50 (vehicles with bypass thermostat)	120
1.3	Assembly overview - coolant circulation pump V50 (vehicles with no bypass thermostat)	121
1.4	Assembly overview - parts of cooling system, body side	122
1.5	Coolant hose schematic diagram (vehicles to 06.2005)	123
1.6	Coolant hose schematic diagram (vehicles from 06.2005)	124
1.7	Bypass thermostat	125
1.8	Draining and adding coolant	126
1.9	Removing and installing coolant pump	129
1.10	Removing and installing coolant pipes	131
1.11	Removing and installing coolant thermostat housing with thermostat	133
1.12	Removing and installing radiator fan V7 and radiator fan 2 V177	134
1.13	Removing and installing radiator, Golf and Eos	134
1.14	Removing and installing radiator, Passat	136
1.15	Checking cooling system for leaks	137
20	Fuel supply system	140
1	Safety precautions	140
1.1	Safety regulations for working on fuel supply	140
1.2	Releasing fuel pressure in high-pressure section	141
2	Rules for cleanliness	143
3	Fuel tank, Golf	144
3.1	Assembly overview - fuel tank (engine code BPY)	144
3.2	Assembly overview - fuel tank (engine codes AXX, BWA)	146
3.3	Emptying fuel tank	147
3.4	Removing and installing fuel tank	152
4	Fuel tank, Eos	155
4.1	Assembly overview - fuel tank (engine code BWA)	155
4.2	Assembly overview - fuel tank (engine code BPY)	157
4.3	Emptying fuel tank	159
4.4	Removing and installing fuel tank	163
5	Fuel tank, Passat	167
5.1	Assembly overview - fuel tank (engine code BPY)	167
5.2	Assembly overview - fuel tank (engine codes AXX, BWA)	169
5.3	Emptying fuel tank	170
5.4	Removing and installing fuel tank	174
6	Repairing fuel supply system, Golf, Eos	179
6.1	Removing and installing fuel delivery unit	179
6.2	Removing and installing fuel gauge sender G	182
6.3	Checking fuel pump G6	183
7	Repairing fuel supply system, Passat	196



7.1	Removing and installing fuel delivery unit	196
7.2	Removing and installing fuel gauge sender G	199
7.3	Checking fuel pump	200
8	Electronic power control (EPC)	210
8.1	Function of EPC system	210
8.2	Assembly overview - accelerator module	210
8.3	Removing and installing accelerator pedal module	211
9	Activated charcoal filter system (Golf, Eos)	214
9.1	Assembly overview - activated charcoal filter system (engine codes AXX, BWA)	214
9.2	Checking fuel tank breather (engine codes AXX, BWA)	215
9.3	Schematic diagram of activated charcoal filter system (engine code BPY)	217
9.4	Assembly overview - activated charcoal filter system (Golf with engine code BPY)	219
9.5	Assembly overview - activated charcoal filter system (Eos with engine code BPY)	220
9.6	Removing and installing activated charcoal filter (engine code BPY)	221
9.7	Removing and installing fuel system diagnostic pump V144 (Golf with engine code BPY)	222
9.8	Removing and installing fuel system diagnostic pump V144 (Eos with engine code BPY)	223
9.9	Checking fuel system for leaks	223
10	Activated charcoal filter system (Passat)	231
10.1	Assembly overview - activated charcoal filter system (engine codes AXX, BWA)	231
10.2	Checking fuel tank breather (engine codes AXX, BWA)	232
10.3	Schematic diagram of activated charcoal filter system (engine code BPY)	233
10.4	Assembly overview - activated charcoal filter system (engine code BPY)	235
10.5	Checking fuel system for leaks	235
21 - Turbocharging/supercharging		243
1	Exhaust turbocharger	243
1.1	Fitting hose connections with plug-in connectors	243
1.2	Rules for cleanliness	244
1.3	Assembly overview - turbocharger	244
1.4	Removing and installing turbocharger	248
1.5	Checking vacuum unit for turbocharger	256
1.6	Removing and installing vacuum unit for turbocharger	257
1.7	Adjusting vacuum unit for turbocharger	257
2	Charge air system	262
2.1	Assembly overview - charge air cooling, Golf	262
2.2	Assembly overview - sound amplifier, Golf	263
2.3	Assembly overview - charge air cooling, Eos, Passat	264
2.4	Removing and installing charge air cooler (Golf, Eos)	264
2.5	Removing and installing charge air cooler, Passat	266
2.6	Schematic diagram of turbocharging system	267
2.7	Checking charge air system for leaks	268
24 - Mixture preparation - injection		271
1	Injection system	271
1.1	General notes on injection	271
1.2	Technical data	272
1.3	Assembly overview - engine cover panel/air filter	272
1.4	Removing and installing engine cover panel/air filter	273
1.5	Removing and installing air filter element	274
1.6	Assembly overview - intake manifold	275
1.7	Removing and installing intake manifold	277
1.8	Removing and installing intake manifold flap motor V157 and intake manifold flap potentiometer G336	280
1.9	Assembly overview - fuel rail (vehicles up to 05.2006)	282



1.10	Assembly overview - fuel rail (vehicles from 05.2006)	283
1.11	Removing and installing fuel rail	285
1.12	Removing and installing throttle valve module J338	286
1.13	Cleaning throttle valve module J338	286
1.14	Assembly overview - high-pressure pump	287
1.15	Removing and installing high-pressure pump	289
1.16	Removing and installing fuel pressure sender G247	290
1.17	Checking fuel pressure sender G247	292
1.18	Removing and installing injectors	295
1.19	Renewing Teflon seal on injector	296
2	Checking components	299
3	Engine control unit J623 , Golf, Eos	300
3.1	Removing and installing engine (motor) control unit J623	300
3.2	Removing and installing anti-theft engine control unit J623	300
4	Engine control unit J623 (Passat)	304
4.1	Removing and installing engine (motor) control unit J623	304
4.2	Removing and installing anti-theft engine control unit J623 (with locking plate)	305
4.3	Removing and installing anti-theft engine control unit J623 (with locking clip)	309
26	- Exhaust system	312
1	Removing and installing parts of exhaust system	312
1.1	Assembly overview - exhaust system; Golf, Eos	312
1.2	Assembly overview - exhaust system, Passat	314
1.3	Clamps	315
1.4	Separating centre and rear silencers, Golf, Eos	316
1.5	Separating centre and rear silencers, Passat	317
1.6	Removing and installing front exhaust pipe with catalytic converter	318
1.7	Aligning exhaust system free of stress	320
28	- Ignition system	322
1	Repairing ignition system	322
1.1	General notes on ignition system	322
1.2	Safety precautions	322
1.3	Assembly overview - ignition system	322
1.4	Removing and installing ignition coils with output stage	323
1.5	Test data, spark plugs	324