



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 to assembly stand	11
1.3 Notes on installing	13
1.4 Assembly mountings	14
13 - Crankshaft group	15
1 Dismantling and assembling engine	15
1.1 Assembly overview - poly V-belt drive	15
1.2 Removing and installing poly V-belt	16
1.3 Assembly overview - toothed belt drive	17
1.4 Assembly overview - crankcase	21
2 Removing and installing sealing flange and flywheel	23
2.1 Renewing crankshaft sealing flange - flywheel end	24
2.2 Renewing crankshaft oil seal - pulley end	31
2.3 Removing and installing sealing flange - pulley end	33
2.4 Removing and installing engine speed sender G28	36
3 Pistons and conrods	38
3.1 Assembly overview - pistons and conrods	38
3.2 Piston and cylinder dimensions	39
3.3 Checking piston projection at TDC	39
3.4 Piston rings, cylinder bore and piston installation position	41
4 Crankshaft	43
4.1 Assembly overview - crankshaft	43
4.2 Crankshaft dimensions	43
4.3 Pulling needle bearing out of and driving into crankshaft	44
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, installing and tensioning toothed belt	50
1.4 Removing and installing cylinder head	64
1.5 Checking compression	70
2 Valve gear	71
2.1 Assembly overview - valve gear	71
2.2 Removing and installing roller rocker finger	73
2.3 Valves	75
2.4 Removing and installing camshafts	77
2.5 Removing and installing camshaft oil seal	82
17 - Lubrication	85
1 Engine oil	85
1.1 Oil capacities - Golf, Golf Plus, Touran	85
1.2 Oil capacities - Passat	85
1.3 Checking engine oil level	85



2	Parts of lubrication system (Golf, Golf Plus, Touran)	86
2.1	Assembly overview - oil pump, sump	86
2.2	Removing and installing oil sump	88
3	Parts of lubrication system (Passat)	91
3.1	Assembly overview - oil pump, sump, balancer shaft module with chain drive	91
3.2	Removing and installing oil pump (for balancer shaft module with chain drive)	93
3.3	Removing and installing balancer shaft module with chain drive	96
3.4	Retrofitting spur gear drive for balancer shaft module	100
3.5	Assembly overview - oil pump, sump, balancer shaft module with spur gear drive	103
3.6	Removing and installing oil pump (for balancer shaft module with spur gear drive)	106
3.7	Removing balancer shaft module with spur gear drive	106
3.8	Renewing spur gear for crankshaft	107
3.9	Installing balancer shaft module	110
3.10	Removing and installing oil sump	116
4	Oil filter bracket, oil cooler, oil pressure and oil supply line	119
4.1	Assembly overview - oil filter bracket and oil cooler	119
4.2	Checking oil pressure and oil pressure switch	121
4.3	Assembly overview - oil supply line to turbocharger	122
4.4	Removing and installing oil supply line to turbocharger	123
19 - Cooling		124
1	Parts of cooling system	124
1.1	Parts of cooling system, body side	124
1.2	Assembly overview - parts of cooling system, engine side (Golf, Golf Plus, Touran)	126
1.3	Assembly overview - parts of cooling system, engine side (Passat)	128
1.4	Coolant hose schematic diagram	130
1.5	Draining and filling coolant	133
1.6	Removing and installing fan support with fans	138
1.7	Removing and installing radiator	139
1.8	Removing and installing coolant pump	140
1.9	Removing and installing thermostat	142
1.10	Checking cooling system for leaks	143
1.11	Checking oil cooler for leaks	145
20 - Fuel supply system		148
1	Safety precautions	148
1.1	Safety precautions when working on fuel supply system	148
2	Rules for cleanliness	149
2.1	Rules for cleanliness when working on fuel supply system	149
3	Parts of fuel supply system (Golf, Golf Plus)	150
3.1	Fuel tank, vehicles with front-wheel drive	150
3.2	Fuel tank, vehicles with four-wheel drive	153
3.3	Emptying fuel tank	160
3.4	Removing and installing fuel delivery unit	162
3.5	Removing and installing fuel gauge sender	164
3.6	Checking fuel pump	164
3.7	Assembly overview - fuel filter	169
3.8	Removing and installing fuel cooler	171
4	Parts of fuel supply system (Touran)	173
4.1	Assembly overview - fuel tank with attachments	173
4.2	Emptying fuel tank	175
4.3	Removing and installing fuel tank	178
4.4	Assembly overview - fuel filter	179
4.5	Removing and installing fuel cooler	181
4.6	Removing and installing fuel delivery unit	181



4.7	Removing and installing fuel gauge sender	183
4.8	Checking fuel pump	184
5	Parts of fuel supply system (Passat)	189
5.1	Fuel tank, vehicles with four-wheel drive	189
5.2	Emptying fuel tank, vehicles with four-wheel drive	199
5.3	Fuel tank, vehicles with front-wheel drive	202
5.4	Emptying fuel tank, vehicles with front-wheel drive	210
5.5	Checking fuel pump	212
5.6	Assembly overview - fuel filter	216
5.7	Removing and installing fuel cooler	218
6	Accelerator mechanism	220
6.1	Assembly overview - accelerator mechanism	220
7	Tandem pump	222
7.1	Checking tandem pump	222
7.2	Removing and installing tandem pump	224
21	Turbocharging/supercharging	227
1	Charge air system with turbocharger	227
1.1	Safety precautions	227
1.2	Rules for cleanliness	227
1.3	Hose connections	228
1.4	Assembly overview - turbocharger with attachments	229
1.5	Removing and installing turbocharger	232
1.6	Assembly overview - charge air cooling	234
1.7	Checking charge air system for leaks	235
1.8	Vacuum hose schematic diagram	237
23	Mixture preparation - injection	239
1	Diesel direct injection system	239
1.1	Safety precautions	239
1.2	Rules for cleanliness	240
1.3	Assembly overview - intake manifold with attachments	240
1.4	Assembly overview - pre-wired wiring harness for unit injectors and glow plugs	243
1.5	Removing and installing pre-wired wiring harness for unit injectors and glow plugs	243
1.6	Assembly overview - unit injector	246
1.7	Removing and installing unit injector	248
1.8	Cleaning unit injectors (engine codes BMN, BKP, BMA, BUZ and BMR)	252
1.9	Removing and installing O-rings for unit injector	254
1.10	Assembly overview - air filter	255
2	Engine control unit (Golf)	257
2.1	Removing and installing engine control unit	257
2.2	Removing and installing anti-theft engine control unit	257
3	Engine control unit (Golf Plus, Touran)	261
3.1	Removing and installing engine control unit	261
3.2	Removing and installing anti-theft engine control unit	262
4	Engine control unit (Passat)	265
4.1	Removing and installing engine control unit	265
4.2	Removing and installing anti-theft engine control unit	266
26	Exhaust system	270
1	Front exhaust pipe	270
1.1	Assembly overview - front exhaust pipe with catalytic converter	270
1.2	Assembly overview - front exhaust pipe with particulate filter	271
2	Silencer (Golf, Golf Plus)	274
2.1	Assembly overview - silencer, vehicles with front-wheel drive	274



2.2	Assembly overview - silencer, vehicles with four-wheel drive	275
2.3	Cutting exhaust pipe	275
2.4	Installation position and specified torque of the clamp	276
2.5	Aligning exhaust system free of stress	277
3	Silencer (Touran)	279
3.1	Assembly overview - silencers	279
3.2	Cutting exhaust pipe	280
3.3	Aligning exhaust system free of stress	280
4	Silencer (Passat)	281
4.1	Assembly overview - silencer, vehicles with front-wheel drive	281
4.2	Assembly overview - silencer, vehicles with four-wheel drive	282
4.3	Aligning exhaust system free of stress	282
5	Exhaust gas recirculation system	284
5.1	Assembly overview - exhaust gas recirculation	284
28	Glow plug system	287
1	Optical characteristics of metal or ceramic glow plugs	287
1.1	Removing and installing metal glow plug	287
1.2	Removing and installing ceramic glow plugs	288