



## Contents

<b>00 - Technical data</b> .....	<b>1</b>
<b>1 Engine number/engine data</b> .....	<b>1</b>
<b>2 Safety precautions</b> .....	<b>5</b>
2.1 Safety regulations for working on fuel supply .....	5
2.2 Safety precautions when working on ignition system .....	5
2.3 Releasing pressure in high-pressure area .....	6
<b>3 General repair instructions</b> .....	<b>7</b>
3.1 Rules for cleanliness .....	7
<b>10 - Removing and installing engine</b> .....	<b>8</b>
<b>1 Removing and installing motor</b> .....	<b>8</b>
1.1 Removing engine (Golf Plus, Eos, Scirocco, Golf, Touran, Golf Cabriolet) .....	8
1.2 Installing engine (Golf Plus, Eos, Scirocco, Golf, Touran, Golf Cabriolet) .....	18
1.3 Removing engine (Tiguan) .....	20
1.4 Installing engine (Tiguan) .....	28
1.5 Removing engine (Polo) .....	31
1.6 Installing engine (Polo) .....	39
1.7 Removing engine (Sharan) .....	40
1.8 Installing engine (Sharan) .....	48
1.9 Removing engine (Passat, Passat CC) .....	50
1.10 Installing engine (Passat, Passat CC) .....	60
<b>2 Assembly mountings</b> .....	<b>64</b>
2.1 Assembly overview - assembly mountings (Touran, Golf Plus, Eos, Scirocco, Golf, Golf Cabriolet) .....	64
2.2 Assembly overview - assembly mountings (Tiguan) .....	65
2.3 Assembly overview - assembly mountings (Polo) .....	66
2.4 Assembly overview - assembly mountings (Sharan) .....	67
2.5 Assembly overview - assembly mountings (Passat, Passat CC) .....	67
<b>13 - Crankshaft group</b> .....	<b>69</b>
<b>1 Cylinder block (pulley end)</b> .....	<b>69</b>
1.1 Assembly overview - poly V-belt drive .....	71
1.2 Assembly overview - cylinder block, belt pulley end .....	73
1.3 Removing and installing poly V-belt (Golf Plus, Eos, Scirocco, Golf, Touran, Polo, Sharan, Passat, Passat CC, Golf Cabriolet) .....	75
1.4 Removing and installing poly V-belt (Tiguan) .....	78
1.5 Removing and installing bracket for ancillaries .....	80
1.6 Renewing crankshaft oil seal - pulley end .....	81
1.7 Removing and installing crankshaft pulley .....	83
<b>2 Cylinder block, gearbox end</b> .....	<b>87</b>
2.1 Assembly overview - cylinder block, gearbox end .....	87
2.2 Removing and installing sealing flange on gearbox side .....	89
<b>3 Crankshaft</b> .....	<b>97</b>
3.1 Assembly overview - crankshaft .....	97
3.2 Pulling needle bearing out of and driving into crankshaft .....	98
3.3 Crankshaft dimensions .....	100
<b>4 Pistons and conrods</b> .....	<b>101</b>
4.1 Assembly overview - pistons and conrods .....	101
4.2 Checking piston .....	103
4.3 Checking cylinder bores .....	104
4.4 Separating new conrod .....	104
4.5 Removing and installing pistons .....	104



4.6	Removing and installing oil spray jets	105
<b>15</b>	<b>- Cylinder head, valve gear</b>	<b>107</b>
<b>1</b>	<b>Cylinder head</b>	<b>107</b>
1.1	Assembly overview - cylinder head	107
1.2	Removing and installing camshaft housing	110
1.3	Removing and installing cylinder head	116
1.4	Checking compression	118
<b>2</b>	<b>Valve gear</b>	<b>121</b>
2.1	Assembly overview - valve gear	121
2.2	Measuring axial clearance of camshaft	123
2.3	Reworking valve seats	123
2.4	Checking valve guides	125
2.5	Removing and installing valve stem seals	125
<b>3</b>	<b>Cover for timing chain</b>	<b>128</b>
3.1	Removing and installing valve timing housing (Eos, Golf Plus, Scirocco, Golf, Polo, Sharan, Golf Cabriolet)	128
3.2	Removing and installing valve timing housing (Touran, Tiguan)	132
3.3	Removing and installing valve timing housing (Passat CC, Passat)	138
<b>4</b>	<b>Chain drive</b>	<b>143</b>
4.1	Checking valve timing	143
4.2	Adjusting valve timing	145
4.3	Checking timing chain	152
4.4	Removing and installing timing chain and chain drive for oil pump	159
<b>17</b>	<b>- Lubrication</b>	<b>168</b>
<b>1</b>	<b>Sump, oil pump</b>	<b>168</b>
1.1	Engine oil:	168
1.2	Assembly overview - sump, oil pump	168
1.3	Removing and installing sump	171
1.4	Removing and installing oil pump	175
<b>2</b>	<b>Oil filter, oil pressure switch</b>	<b>178</b>
2.1	Checking oil pressure and oil pressure switch	178
<b>19</b>	<b>- Cooling</b>	<b>180</b>
<b>1</b>	<b>Cooling system/coolant</b>	<b>180</b>
1.1	Coolant hose schematic diagram (Golf Plus, Eos, Scirocco, Golf, Touran, Polo, Golf Cabriolet)	181
1.2	Schematic diagram for coolant hoses (Tiguan)	182
1.3	Schematic diagram for coolant hoses (Sharan)	183
1.4	Coolant hose schematic diagram (Passat, Passat CC)	184
1.5	Draining and filling with coolant (Golf Plus, Eos, Scirocco, Golf, Touran, Tiguan, Golf Cabriolet)	185
1.6	Draining and filling coolant (Polo)	189
1.7	Draining and filling coolant (Sharan)	193
1.8	Draining and filling coolant (Passat, Passat CC)	198
1.9	Checking cooling system for leaks (Polo, Touran, Golf Plus, Eos, Scirocco, Golf, Golf Cabriolet)	204
1.10	Checking cooling system for leaks (Sharan, Tiguan)	206
1.11	Checking cooling system for leaks (Passat, Passat CC)	208
<b>2</b>	<b>Coolant pump, regulation of cooling system</b>	<b>211</b>
2.1	Assembly overview - thermostat	211
2.2	Assembly overview - thermostat (Passat, Passat CC)	213
2.3	Removing and installing coolant pump (Polo, Touran, Golf Plus, Eos, Tiguan, Scirocco, Golf, Golf Cabriolet)	214



2.4	Removing and installing coolant pump belt pulley (Polo, Touran, Golf Plus, Eos, Tiguan, Scirocco, Golf, Golf Cabriolet)	218
2.5	Removing and installing coolant circulation pump V50 (Polo, Touran, Golf Plus, Eos, Tiguan, Scirocco, Golf, Golf Cabriolet)	223
2.6	Removing and installing coolant pump (Sharan)	225
2.7	Removing and installing coolant pump belt pulley (Sharan)	230
2.8	Removing and installing coolant circulation pump V50 (Sharan)	234
2.9	Removing and installing coolant pump belt pulley (Passat, Passat CC)	236
2.10	Removing and installing coolant pump (Passat, Passat CC)	242
2.11	Removing and installing coolant circulation pump V50 (Passat, Passat CC)	249
2.12	Assembly overview - heater element for engine preheater Z97 (Passat, Passat CC)	251
2.13	Removing and installing heater element for engine preheater Z97 (Passat, Passat CC)	253
<b>3</b>	<b>Radiator, radiator fan</b>	<b>256</b>
3.1	Assembly overview - radiator/radiator fan (Eos, Golf Plus, Scirocco, Golf, Touran, Golf Cabriolet)	256
3.2	Assembly overview - parts of cooling system, body side (Tiguan)	258
3.3	Assembly overview - radiator/radiator fan (Polo)	260
3.4	Assembly overview - radiator/radiator fan (Sharan)	261
3.5	Assembly overview - radiator/radiator fan (Passat, Passat CC)	262
3.6	Removing and installing radiator fan V7 and radiator fan 2 V177 (Eos, Golf Plus, Scirocco, Golf, Touran, Golf Cabriolet)	263
3.7	Removing and installing radiator fan V7 and radiator fan 2 V177 (Polo)	264
3.8	Removing and installing radiator, radiator fan V7 and radiator fan 2 V177 (Sharan)	265
3.9	Removing and installing radiator (Passat, Passat CC)	267
3.10	Removing and installing fan cowling (Passat, Passat CC)	270
3.11	Removing and installing radiator fan V7 and radiator fan 2 V177 (Passat, Passat CC)	271
3.12	Removing and installing radiator (Golf Plus, Eos, Scirocco, Golf, Touran, Golf Cabriolet)	272
3.13	Removing and installing radiator and radiator fan V7 (Tiguan)	273
3.14	Removing and installing radiator with charge air cooler (Polo)	275
<b>21</b>	<b>Turbocharging/supercharging</b>	<b>278</b>
<b>1</b>	<b>Turbocharger</b>	<b>278</b>
1.1	Assembly overview - turbocharger	278
1.2	Removing and installing turbocharger	282
1.3	Checking vacuum unit for turbocharger	287
1.4	Removing and installing vacuum unit for turbocharger	289
1.5	Adjusting vacuum unit for turbocharger	291
<b>2</b>	<b>Compressor</b>	<b>297</b>
2.1	Assembly overview - supercharger	297
2.2	Removing and installing supercharger	299
2.3	Removing and installing supercharger (Tiguan with four-wheel drive)	307
2.4	Removing and installing drive unit seal for supercharger	315
<b>3</b>	<b>Charge air system</b>	<b>319</b>
3.1	Assembly overview - charge air system (Eos, Golf Plus, Golf, Touran, Scirocco, Tiguan, Sharan, Golf Cabriolet)	320
3.2	Assembly overview - charge air system (Polo)	321
3.3	Assembly overview - charge air system (Passat, Passat CC)	322
3.4	Fitting hose connections with plug-in connectors	323
3.5	Checking charge air system for leaks	324
3.6	Removing and installing charge air cooler (Eos, Golf Plus, Golf, Golf Cabriolet, Touran)	327
3.7	Removing and installing charge air cooler, Sharan	329
3.8	Removing and installing charge air cooler (Scirocco)	331
3.9	Removing and installing charge air cooler, Tiguan	333
3.10	Removing and installing charge air cooler (Passat, Passat CC)	335
<b>24</b>	<b>Mixture preparation - injection</b>	<b>340</b>



<b>1</b>	<b>Air filter</b> .....	<b>340</b>
1.1	Assembly overview - air filter .....	340
1.2	Assembly overview - air filter (Polo) .....	341
1.3	Removing and installing air filter housing .....	342
1.4	Removing and installing air filter housing (Polo) .....	343
<b>2</b>	<b>Intake manifold</b> .....	<b>344</b>
2.1	Assembly overview - intake manifold .....	344
2.2	Removing and installing regulating flap control unit J808 and throttle valve module J338 .....	349
2.3	Cleaning throttle valve module J338 .....	351
<b>3</b>	<b>Injectors</b> .....	<b>353</b>
3.1	Assembly overview - fuel rail with injectors .....	353
3.2	Removing and installing injectors .....	355
3.3	Renewing seals on injectors .....	358
<b>4</b>	<b>Senders and sensors</b> .....	<b>362</b>
4.1	Checking fuel pressure sender .....	362
4.2	Actuator for structure-borne sound R214 and control unit for structure-borne sound J869 (Polo, left-hand drive) .....	365
4.3	Assembly overview - actuator for structure-borne sound R214 and control unit for structure- borne sound J869 (Polo, right-hand drive) .....	367
<b>5</b>	<b>High-pressure pump</b> .....	<b>368</b>
5.1	Assembly overview - high-pressure pump .....	368
5.2	Removing and installing high-pressure pump .....	369
<b>6</b>	<b>Engine control unit J623</b> .....	<b>373</b>
6.1	Removing and installing engine control unit J623 (Golf Plus, Touran) .....	373
6.2	Removing and installing engine control unit J623 with protective housing (Golf Plus, Touran) .....	375
6.3	Removing and installing engine control unit J623 (Eos) .....	377
6.4	Removing and installing engine control unit J623 with protective housing (Eos▶ 10.2008) .....	378
6.5	Removing and installing engine control unit J623 (Tiguan) .....	380
6.6	Removing and installing engine control unit J623 with protective housing (Tiguan) .....	381
6.7	Removing and installing engine control unit J623 (Scirocco) .....	383
6.8	Removing and installing engine control unit J623 with protective housing (Scirocco▶ 09.2008) .....	384
6.9	Removing and installing engine control unit J623 (Golf, Golf Cabriolet) .....	386
6.10	Removing and installing engine control unit J623 (Passat, Passat CC) .....	387
6.11	Removing and installing engine control unit J623 with protective housing (Golf, Eos 11.2008▶, Scirocco 10.2008▶, Passat, Passat CC, Golf Cabriolet) .....	388
6.12	Removing and installing engine control unit J623 (Polo) .....	391
6.13	Removing and installing engine control unit J623 with protective housing (Polo) .....	392
6.14	Removing and installing engine control unit J623 (Sharan) .....	393
6.15	Removing and installing engine control unit J623 with protective housing (Sharan) .....	394
<b>26</b>	<b>Exhaust system</b> .....	<b>396</b>
<b>1</b>	<b>Exhaust pipes and silencers</b> .....	<b>396</b>
1.1	Assembly overview - silencer (Golf Plus, Eos, Scirocco, Golf, Touran, Golf Cabriolet) .....	397
1.2	Assembly overview - silencers (Tiguan) .....	398
1.3	Assembly overview - silencers (Polo) .....	399
1.4	Assembly overview - silencers (Sharan) .....	400
1.5	Assembly overview - silencer (Passat, Passat CC) .....	401
1.6	Removing and installing front exhaust pipe (Tiguan with four-wheel drive) .....	402
1.7	Removing and installing front exhaust pipe (Golf Plus, Eos, Scirocco, Golf, Tiguan, Touran, Golf Cabriolet) .....	403
1.8	Removing and installing front exhaust pipe (Sharan) .....	404
1.9	Removing and installing (Passat, Passat CC) .....	405



1.10	Separating exhaust pipes, silencers (Tiguan)	407
1.11	Separating exhaust pipes/silencers (Golf Plus, Eos, Scirocco, Golf, Touran, Golf Cabriolet)	408
1.12	Separating exhaust pipes, silencers (Polo)	410
1.13	Separating exhaust pipes, silencers (Sharan)	411
1.14	Separating exhaust pipes/silencers (Passat, Passat CC)	412
1.15	Aligning exhaust system free of stress (Passat, Passat CC)	414
1.16	Installation position of clamp	415
<b>2</b>	<b>Emission control</b>	<b>416</b>
2.1	Assembly overview - exhaust gas treatment (Golf Plus, Eos, Scirocco, Golf, Touran, Tiguan, Golf Cabriolet)	416
2.2	Assembly overview - exhaust gas treatment (Tiguan with four-wheel drive)	418
2.3	Assembly overview - exhaust gas treatment (Polo)	420
2.4	Assembly overview - exhaust gas treatment (Sharan)	421
2.5	Assembly overview - exhaust gas treatment (Passat, Passat CC)	422
2.6	Removing and installing catalytic converter (Polo)	424
2.7	Removing and installing (Passat, Passat CC)	425
<b>28</b>	<b>Ignition system</b>	<b>428</b>
<b>1</b>	<b>Ignition system</b>	<b>428</b>
1.1	Assembly overview - ignition system	428
1.2	Removing and installing ignition coils with output stage	429
1.3	Removing and installing engine speed sender G28	431
1.4	Test data, spark plugs	433