

Contents

00 - Technical data	1
1 Identification	1
2 Safety precautions	2
3 Repair instructions	3
10 - Removing and installing engine	4
1 Removing and installing engine	4
1.1 Removing engine	4
1.2 Separating engine and gearbox	25
1.3 Securing engine to engine and gearbox support	31
1.4 Installing engine	32
2 Assembly mountings	36
2.1 Exploded view - assembly mountings	36
2.2 Removing and installing engine mountings	38
2.3 Checking adjustment of assembly mountings (engine/gearbox mountings)	39
2.4 Adjusting assembly mountings	40
3 Engine cover panel	44
13 - Crankshaft group	45
1 Cylinder block (pulley end)	45
1.1 Exploded view - cylinder block (pulley end)	45
1.2 Removing and installing poly V-belt	45
1.3 Removing and installing tensioner for poly V-belt	45
1.4 Removing and installing vibration damper	46
1.5 Removing and installing bracket for ancillaries	46
1.6 Removing and installing engine support	46
2 Cylinder block (gearbox end)	48
3 Crankshaft	49
4 Balance shaft	50
5 Pistons and conrods	51
15 - Cylinder head, valve gear	52
1 Timing chain cover	52
1.1 Exploded view - timing chain cover	52
1.2 Removing and installing timing chain cover	52
1.3 Renewing oil seal for vibration damper	52
2 Chain drive	53
2.1 Exploded view - camshaft timing chains	53
2.2 Exploded view - drive chain for balance shaft	53
2.3 Removing and installing bearing saddle	53
2.4 Removing camshaft timing chain from camshafts	53
2.5 Removing and installing camshaft timing chain	54
2.6 Removing and installing drive chain for balance shaft	54
2.7 Checking valve timing	54
3 Cylinder head	55
3.1 Exploded view - cylinder head	55
3.2 Removing and installing cylinder head	55
3.3 Checking compression	59
4 Valve gear	60
4.1 Exploded view - valve gear	60
4.2 Removing and installing camshaft	60



4.3	Installing ball for slider	61
4.4	Removing and installing actuators for camshaft adjustment	61
4.5	Removing and installing camshaft control valve 1 N205	61
4.6	Removing and installing valve stem oil seals	61
5	Inlet and exhaust valves	62
17	- Lubrication	63
1	Sump/oil pump	63
1.1	Exploded view - sump/oil pump	63
1.2	Engine oil	63
1.3	Removing and installing sump (bottom section)	63
1.4	Removing and installing oil pump	63
1.5	Removing and installing sump (top section)	63
1.6	Removing and installing oil level and oil temperature sender G266	64
2	Engine oil cooler	65
3	Crankcase breather	66
4	Oil filter/oil pressure switches	67
19	- Cooling	68
1	Cooling system/coolant	68
1.1	Connection diagram - coolant hoses	68
1.2	Checking cooling system for leaks	69
1.3	Draining and filling cooling system	69
2	Coolant pump/thermostat assembly	75
2.1	Exploded view - coolant pump/thermostat	75
2.2	Exploded view - electric coolant pump	75
2.3	Removing and installing electric coolant pump	76
2.4	Removing and installing coolant pump	78
2.5	Removing and installing toothed belt for coolant pump	78
2.6	Removing and installing thermostat	78
2.7	Checking thermostat	79
2.8	Removing and installing coolant temperature sender G62	79
2.9	Removing and installing radiator outlet coolant temperature sender G83	79
3	Coolant pipes	80
3.1	Exploded view - coolant pipes	80
3.2	Removing and installing coolant pipes	80
4	Radiator/radiator fans	84
4.1	Exploded view - radiator/radiator fans	84
4.2	Removing and installing radiator	85
4.3	Removing and installing radiator cowl	86
4.4	Removing and installing radiator fan V7	87
21	- Turbocharging/supercharging	88
1	Turbocharger	88
1.1	Exploded view - turbocharger	88
1.2	Removing and installing turbocharger	88
1.3	Checking vacuum unit for turbocharger	90
1.4	Renewing vacuum unit for turbocharger	90
1.5	Adjusting vacuum unit for turbocharger	90
2	Charge air system	91
2.1	Overview - charge air system	91
2.2	Exploded view - charge air system	92
2.3	Removing and installing air pipe	93
2.4	Removing and installing charge air cooler	93

2.5	Removing and installing charge pressure sender G31	95
2.6	Checking charge air system for leaks	95
24	Mixture preparation - injection	97
1	Injection system	97
1.1	Overview of fitting locations - injection system	97
2	Vacuum system	108
3	Air cleaner	109
3.1	Exploded view - air cleaner housing	109
3.2	Removing and installing air cleaner housing	109
4	Intake manifold	111
5	Injectors	112
6	Senders and sensors	113
6.1	Exploded view - actuator for structure-borne sound and control unit for structure-borne sound	113
6.2	Removing and installing control unit for structure-borne sound J869 and actuator for structure-borne sound R214	114
6.3	Removing and installing air mass meter G70	114
6.4	Removing and installing fuel pressure sender G247	114
6.5	Checking fuel pressure sender G247	115
7	High-pressure pump	116
8	Lambda probe	117
8.1	Exploded view - Lambda probe	117
8.2	Removing and installing Lambda probe	117
9	Engine control unit	121
9.1	Removing and installing engine control unit J623	121
9.2	Wiring and component check	123
26	Exhaust system	124
1	Exhaust pipes/silencers	124
1.1	Exploded view - silencers	124
1.2	Removing and installing front exhaust pipe	125
1.3	Stress-free alignment of exhaust system	127
1.4	Checking exhaust system for leaks	128
28	Ignition system	129
1	Ignition system	129