

## Contents

<b>00 - Technical data</b>	<b>1</b>
<b>1 Identification</b>	<b>1</b>
<b>2 Safety precautions</b>	<b>2</b>
<b>3 Repair instructions</b>	<b>3</b>
<b>10 - Removing and installing engine</b>	<b>4</b>
<b>1 Removing and installing engine</b>	<b>4</b>
1.1 Removing engine	4
1.2 Separating engine and gearbox	23
1.3 Securing engine to engine and gearbox support	23
1.4 Installing engine	23
<b>2 Assembly mountings</b>	<b>27</b>
2.1 Exploded view - assembly mountings	27
2.2 Supporting engine in installation position	29
2.3 Removing and installing engine mountings	32
2.4 Removing and installing gearbox mounting	32
2.5 Removing and installing pendulum support	35
2.6 Checking adjustment of assembly mountings (engine/gearbox mountings)	35
2.7 Adjusting assembly mountings	36
<b>3 Engine cover panel</b>	<b>39</b>
<b>13 - Crankshaft group</b>	<b>40</b>
<b>1 Cylinder block (pulley end)</b>	<b>40</b>
1.1 Exploded view - cylinder block (pulley end)	40
1.2 Removing and installing poly V-belt	40
1.3 Removing and installing poly V-belt tensioner	40
1.4 Removing and installing vibration damper	40
1.5 Removing and installing bracket for ancillaries	40
1.6 Removing and installing engine support	40
<b>2 Cylinder block (gearbox end)</b>	<b>42</b>
<b>3 Crankshaft</b>	<b>43</b>
<b>4 Balance shaft</b>	<b>44</b>
<b>5 Pistons and conrods</b>	<b>45</b>
<b>15 - Cylinder head, valve gear</b>	<b>46</b>
<b>1 Timing chain cover</b>	<b>46</b>
<b>2 Chain drive</b>	<b>47</b>
<b>3 Cylinder head</b>	<b>48</b>
3.1 Exploded view - cylinder head	48
3.2 Removing and installing cylinder head	48
3.3 Checking compression	48
<b>4 Valve gear</b>	<b>49</b>
<b>5 Inlet and exhaust valves</b>	<b>50</b>
<b>17 - Lubrication</b>	<b>51</b>
<b>1 Sump/oil pump</b>	<b>51</b>
1.1 Exploded view - sump/oil pump	51
1.2 Engine oil	51
1.3 Removing and installing sump (bottom section)	51
1.4 Removing and installing oil pump	51
1.5 Removing and installing sump (top section)	51



1.6	Removing and installing oil level and oil temperature sender G266	51
<b>2</b>	<b>Engine oil cooler</b>	<b>52</b>
<b>3</b>	<b>Crankcase breather</b>	<b>53</b>
<b>4</b>	<b>Oil filter/oil pressure switches</b>	<b>54</b>
<b>19</b>	<b>Cooling</b>	<b>55</b>
<b>1</b>	<b>Cooling system/coolant</b>	<b>55</b>
1.1	Connection diagram - coolant hoses	55
1.2	Checking cooling system for leaks	58
1.3	Draining and filling cooling system	58
<b>2</b>	<b>Coolant pump/thermostat assembly</b>	<b>65</b>
2.1	Exploded view - coolant pump/thermostat	65
2.2	Exploded view - electric coolant pump	65
2.3	Exploded view - coolant temperature senders	65
2.4	Removing and installing electric coolant pump	65
2.5	Removing and installing coolant pump	65
2.6	Removing and installing toothed belt for coolant pump	66
2.7	Removing and installing actuator for engine temperature regulation N493	67
2.8	Removing and installing coolant temperature sender G62	67
2.9	Removing and installing radiator outlet coolant temperature sender G83	67
2.10	Removing and installing coolant valves	67
<b>3</b>	<b>Coolant pipes</b>	<b>68</b>
<b>4</b>	<b>Radiator/radiator fan</b>	<b>69</b>
4.1	Exploded view - radiator/radiator fan	69
4.2	Removing and installing radiator	72
4.3	Removing and installing radiator cowl	74
4.4	Removing and installing radiator fan V7	75
<b>21</b>	<b>Turbocharging/supercharging</b>	<b>76</b>
<b>1</b>	<b>Turbocharger</b>	<b>76</b>
<b>2</b>	<b>Charge air system</b>	<b>77</b>
2.1	Exploded view - charge air system	77
2.2	Exploded view - hose connections for charge air system	79
2.3	Removing and installing charge air cooler	79
2.4	Removing and installing charge pressure sender G31	81
2.5	Checking charge air system for leaks	82
<b>24</b>	<b>Mixture preparation - injection</b>	<b>84</b>
<b>1</b>	<b>Injection system</b>	<b>84</b>
1.1	Overview of fitting locations - injection system	84
<b>2</b>	<b>Air cleaner</b>	<b>95</b>
2.1	Exploded view - air cleaner housing	95
2.2	Removing and installing air cleaner housing	97
<b>3</b>	<b>Intake manifold</b>	<b>99</b>
3.1	Exploded view - intake manifold	99
3.2	Removing and installing intake manifold	99
3.3	Removing and installing throttle valve module J338	100
3.4	Cleaning throttle valve module	101
3.5	Checking intake manifold change-over function	101
<b>4</b>	<b>Injectors</b>	<b>102</b>
<b>5</b>	<b>Senders and sensors</b>	<b>103</b>
5.1	Exploded view - actuator for structure-borne sound and control unit for structure-borne sound	103

5.2	Removing and installing control unit for structure-borne sound J869 and actuator for structure-borne sound R214	104
5.3	Removing and installing intake air temperature sender G42/intake manifold pressure sender G71	104
5.4	Removing and installing air mass meter G70	105
5.5	Removing and installing fuel pressure sender G247	106
5.6	Checking fuel pressure sender G247	107
5.7	Removing and installing fuel pressure sender for low pressure G410	107
<b>6</b>	<b>High-pressure pump</b>	<b>108</b>
<b>7</b>	<b>Lambda probe</b>	<b>109</b>
<b>8</b>	<b>Engine control unit</b>	<b>110</b>
8.1	Removing and installing engine/motor control unit J623	110
<b>26 - Exhaust system</b>		<b>115</b>
<b>1</b>	<b>Exhaust pipes/silencers</b>	<b>115</b>
1.1	Exploded view - silencers	115
1.2	Separating exhaust pipes/silencers	119
1.3	Removing and installing silencers	121
1.4	Stress-free alignment of exhaust system	123
1.5	Checking exhaust system for leaks	124
<b>2</b>	<b>Emission control system</b>	<b>125</b>
<b>28 - Ignition system</b>		<b>126</b>
<b>1</b>	<b>Ignition system</b>	<b>126</b>