



## Contents

<b>00 - Technical data</b> .....	<b>1</b>
<b>1 Technical data</b> .....	<b>1</b>
1.1 Engine number/engine data .....	1
<b>2 Safety information</b> .....	<b>3</b>
2.1 Safety regulations for working on fuel supply .....	3
2.2 Safety precautions when using testers and measuring instruments during a road test .....	4
2.3 Safety precautions when working on the cooling system .....	4
2.4 Safety precautions when working on charge air system .....	5
2.5 Safety precautions when working on injection system .....	5
2.6 Safety precautions when working on the SCR system .....	6
<b>3 Repair instructions</b> .....	<b>7</b>
3.1 Rules for cleanliness when working on fuel supply system .....	7
3.2 Rules for cleanliness during work on fuel system .....	7
3.3 Rules for cleanliness and instructions for working on injection system .....	7
3.4 General notes on the lubrication system .....	9
3.5 Foreign objects in engine .....	9
<b>10 - Removing and installing engine</b> .....	<b>10</b>
<b>1 Removing and installing engine</b> .....	<b>10</b>
1.1 Removing engine .....	10
1.2 Installing engine .....	14
1.3 Securing engine on engine and gearbox support VAS 6095 .....	16
<b>13 - Crankshaft group</b> .....	<b>17</b>
<b>1 Cylinder block (pulley end)</b> .....	<b>17</b>
1.1 Assembly overview - cylinder block (pulley end) .....	17
1.2 Assembly overview - poly V-belt drive .....	18
1.3 Removing and installing poly-V belt .....	19
1.4 Removing and installing tensioner for poly V-belt .....	20
1.5 Renewing crankshaft oil seal - belt pulley end .....	21
<b>2 Cylinder block, gearbox end</b> .....	<b>24</b>
2.1 Assembly overview - flywheel .....	24
2.2 Removing and installing sealing flange on gearbox side .....	26
2.3 Removing and installing flywheel .....	34
2.4 Renewing needle bearing .....	35
<b>3 Power take-off</b> .....	<b>37</b>
3.1 Engine power take-off .....	37
3.2 Removing and installing poly V-belt for power take-off .....	37
<b>4 Crankshaft</b> .....	<b>40</b>
4.1 Assembly overview - crankshaft .....	40
4.2 Crankshaft dimensions .....	41
<b>5 Pistons and conrods</b> .....	<b>42</b>
5.1 Assembly overview - pistons and conrods .....	42
5.2 Checking pistons and cylinder bores .....	43
5.3 Measuring piston projection at TDC .....	44
5.4 Piston and cylinder dimensions .....	45
<b>15 - Cylinder head, valve gear</b> .....	<b>46</b>
<b>1 Cylinder head</b> .....	<b>46</b>
1.1 Assembly overview - cylinder head .....	46
1.2 Removing and installing cylinder head .....	49
1.3 Removing and installing cylinder head cover .....	53



1.4	Checking compression	54
<b>2</b>	<b>Toothed belt drive</b>	<b>56</b>
2.1	Assembly overview - toothed belt	56
2.2	Removing and installing toothed belt	58
<b>3</b>	<b>Valve gear</b>	<b>64</b>
3.1	Assembly overview - valve gear	64
3.2	Measuring axial play of camshaft	65
3.3	Removing and installing camshaft	66
3.4	Removing and installing valve stem seals	67
<b>4</b>	<b>Inlet and exhaust valves</b>	<b>70</b>
4.1	Reworking valve seats	70
4.2	Checking valve guides	71
4.3	Removing and installing valve guides	71
4.4	Valve dimensions	73
<b>17 - Lubrication</b>		<b>74</b>
<b>1</b>	<b>Sump, oil pump</b>	<b>74</b>
1.1	Assembly overview - sump/oil pump	74
1.2	Removing and installing sump	76
1.3	Removing and installing oil pump	80
1.4	Measuring oil consumption	83
1.5	Engine oil:	83
<b>2</b>	<b>Engine oil cooler</b>	<b>85</b>
2.1	Checking engine oil cooler for leaks	85
<b>3</b>	<b>Oil filter, oil pressure switch</b>	<b>87</b>
3.1	Checking oil pressure and oil pressure switch	87
<b>19 - Cooling</b>		<b>89</b>
<b>1</b>	<b>Cooling system/coolant</b>	<b>89</b>
1.1	Connection diagram - coolant hoses	89
1.2	Coolant hose schematic diagram, vehicles with auxiliary heater	90
1.3	Coolant hose schematic diagram, vehicles with auxiliary heater and 2nd heat exchanger	91
1.4	Checking cooling system for leaks	91
1.5	Draining and adding coolant	93
<b>2</b>	<b>Coolant pump, regulation of cooling system</b>	<b>101</b>
2.1	Assembly overview - coolant pump, thermostat	101
2.2	Removing and installing coolant pump	103
2.3	Removing and installing thermostat	104
<b>3</b>	<b>Radiator, radiator fan</b>	<b>106</b>
3.1	Assembly overview - radiator/radiator fan	106
3.2	Removing and installing radiator	107
3.3	Removing and installing viscous fan	108
<b>21 - Turbocharging/supercharging</b>		<b>110</b>
<b>1</b>	<b>Turbocharger</b>	<b>110</b>
1.1	Assembly overview - turbocharger (engine codes BJJ, BJK, BJL, BJM)	110
1.2	Assembly overview - turbocharger (engine codes CEBA, CEBB, CECA, CECB)	112
1.3	Removing and installing turbocharger (engine codes BJJ, BJK, BJL, BJM)	114
1.4	Removing and installing turbocharger (engine codes CEBA, CEBB, CECA, CECB)	115
<b>2</b>	<b>Charge air system</b>	<b>118</b>
2.1	Assembly overview - charge air system	118
2.2	Checking charge air system for leaks	118
<b>23 - Mixture preparation - injection</b>		<b>122</b>



<b>1</b>	<b>Injection system</b>	<b>122</b>
1.1	Schematic overview - fuel system	122
1.2	Assembly overview - fuel system	123
1.3	Filling fuel system	126
1.4	Checking fuel system for leaks	126
<b>2</b>	<b>Injectors/high-pressure accumulator (rail)</b>	<b>128</b>
2.1	Check pressure retention valve in fuel return line	128
2.2	Removing and installing injectors (piezo injectors)	129
2.3	Removing and installing fuel overflow valve	132
<b>3</b>	<b>Vacuum system</b>	<b>136</b>
3.1	Connection diagram - vacuum system	136
<b>4</b>	<b>High-pressure pump</b>	<b>137</b>
4.1	Removing and installing high-pressure pump	137
<b>5</b>	<b>Senders and sensors</b>	<b>140</b>
5.1	Removing and installing fuel pressure regulating valve N276	140
5.2	Checking fuel pressure regulating valve N276	142
5.3	Removing and installing fuel pressure sender G247	142
5.4	Removing and installing fuel metering valve N290	144
5.5	Removing and installing air mass meter G70	149
<b>6</b>	<b>Intake manifold</b>	<b>150</b>
6.1	Assembly overview - intake manifold	150
6.2	Removing and installing intake manifold	150
<b>7</b>	<b>Air filter</b>	<b>153</b>
7.1	Assembly overview - air filter	153
<b>8</b>	<b>Engine control unit</b>	<b>154</b>
8.1	Removing and installing engine control unit J623	154
<b>26</b>	<b>Exhaust system</b>	<b>155</b>
<b>1</b>	<b>Exhaust pipes and silencers</b>	<b>155</b>
1.1	Assembly overview - silencer (engine codes BJJ, BJK, BJL, BJM)	155
1.2	Assembly overview - silencers and SCR catalytic converters (engine codes CEBA, CEBB, CECA, CECB)	156
1.3	Checking exhaust system for leaks	157
<b>2</b>	<b>Emission control</b>	<b>158</b>
2.1	Assembly overview - diesel particulate filter (engine codes CEBA, CEBB, CECA, CECB)	158
2.2	Assembly overview - diesel particulate filter (engine codes BJJ, BJK, BJL, BJM)	160
2.3	Removing and installing diesel particulate filter (engine codes CEBA, CEBB, CECA, CECB)	162
2.4	Removing and installing diesel particulate filter (engine codes BJJ, BJK, BJL, BJM)	165
2.5	Removing and installing catalytic converter (engine codes BJJ, BJK, BJL, BJM)	169
<b>3</b>	<b>SCR system (selective catalytic reduction)</b>	<b>172</b>
3.1	AdBlue® technology	172
3.2	Assembly overview - tank for reducing agent (Crafter panel van and Crafter window van)	172
3.3	Assembly overview - tank for reducing agent (Crafter dropside and Crafter chassis)	175
3.4	Removing and installing injector for reduction agent N474	176
3.5	Removing and installing reducing agent supply line	177
3.6	Removing and installing filler line for reducing agent (panel van and window van)	179
3.7	Removing and installing filler neck for reducing agent (panel van and window van)	181
3.8	Removing and installing reducing agent tank (panel van and window van)	181
3.9	Removing and installing reducing agent tank (platform van and chassis)	183
3.10	Emptying reducing agent tank (panel van and window van)	184
3.11	Emptying reducing agent tank (platform van and chassis)	185
3.12	Removing and installing heater element (heater cup)	187



<b>4</b>	<b>Exhaust gas recirculation</b> .....	<b>190</b>
4.1	Assembly overview - exhaust gas recirculation .....	190
<b>28</b>	<b>Glow plug system</b> .....	<b>192</b>
<b>1</b>	<b>Glow plug system</b> .....	<b>192</b>
1.1	Handling ceramic glow plugs .....	192
1.2	Testing glow plug 1 Q10 to glow plug 5 Q14 .....	192
1.3	Testing glow plug 1 Q10 to glow plug 5 Q14 (removed) .....	193
1.4	Removing and installing glow plug 1 Q10 to glow plug 5 Q14 .....	193
1.5	Removing and installing engine speed sender G28 .....	197