

## Contents

<b>01 - Self-diagnosis</b> .....	<b>1</b>
<b>1 Self-diagnosis</b> .....	<b>1</b>
1.1 Self-diagnosis .....	1
1.2 Technical data of self-diagnosis .....	1
1.3 Safety precautions .....	1
1.4 Connecting vehicle diagnostic, testing and information system VAS 5051 and selecting functions .....	1
<b>2 Interrogating and erasing fault memory</b> .....	<b>5</b>
2.1 Interrogating and erasing fault memory .....	5
2.2 Interrogating fault memory .....	5
2.3 Erasing fault memory .....	6
2.4 Ending output .....	7
2.5 Fault table .....	8
2.6 Fault codes 16485 - 17948 .....	8
2.7 Fault codes 17954 - 19466 .....	16
<b>3 Final control diagnosis</b> .....	<b>23</b>
3.1 Final control diagnosis .....	23
<b>4 Basic setting</b> .....	<b>31</b>
4.1 Basic setting .....	31
<b>5 Coding control unit</b> .....	<b>34</b>
5.1 Coding control unit .....	34
<b>6 Reading measured value block</b> .....	<b>36</b>
6.1 Reading measured value block .....	36
6.2 Performing road test at full throttle .....	37
6.3 Display group overview .....	38
6.4 Readout specifications for general vehicle inspection .....	41
6.5 Readout specifications for unit injectors .....	43
6.6 Readout specifications for engine idling speed .....	44
6.7 Readout specifications for exhaust gas recirculation .....	46
6.8 Readout specifications for temperature senders .....	46
6.9 Readout specifications for engine power output .....	47
6.10 Readout specifications for charge pressure control .....	49
6.11 Readout specifications for data bus .....	49
<b>23 - Mixture preparation, Injection</b> .....	<b>51</b>
<b>1 Servicing diesel direct injection system</b> .....	<b>51</b>
1.1 Servicing diesel direct injection system .....	51
1.2 Safety precautions .....	51
1.3 Rules for cleanliness .....	51
1.4 Fitting locations overview .....	52
1.5 Servicing intake manifold flap .....	57
1.6 Testing intake manifold flap change-over function .....	59
1.7 Servicing unit injector .....	64
1.8 Testing unit injector solenoid valves .....	67
1.9 Removing and installing unit injector .....	71
1.10 Removing and installing O rings for unit injector .....	75
1.11 Wiring and component check with test box V.A.G 1598/31 .....	76
1.12 Renewing engine control unit .....	78
1.13 Testing voltage supply for diesel direct injection system .....	80
<b>2 Testing control unit input values</b> .....	<b>85</b>
2.1 Testing control unit input values .....	85
2.2 Testing engine speed sender -G28 .....	85
2.3 Testing intake manifold pressure sender -G71 and altitude sender -F96 .....	87



2.4	Testing coolant temperature sender -G62 . . . . .	89
2.5	Checking brake light switch -F and brake pedal switch -F47 . . . . .	91
2.6	Testing clutch pedal switch -F36 . . . . .	94
2.7	Checking intake manifold temperature sender -G72 . . . . .	97
2.8	Testing fuel temperature sender -G81 . . . . .	99
2.9	Testing air mass meter -G70 . . . . .	101
2.10	Checking Hall sender for camshaft position -G40 . . . . .	103
<b>3</b>	<b>Testing auxiliary signals . . . . .</b>	<b>105</b>
3.1	Testing auxiliary signals . . . . .	105
3.2	Testing AC compressor signal and AC compressor shut-off . . . . .	106
3.3	Testing speed signal . . . . .	107
3.4	Testing cruise control system (CCS) . . . . .	109
3.5	Testing engine speed signal . . . . .	111
<b>4</b>	<b>Testing signals from and to automatic gearbox . . . . .</b>	<b>111</b>
4.1	Testing signals from and to automatic gearbox . . . . .	111
4.2	Testing signal wire (CAN bus) between engine control unit and gearbox control unit . . . . .	111
<b>5</b>	<b>Testing signals from and to ABS control unit . . . . .</b>	<b>112</b>
5.1	Testing signals from and to ABS control unit . . . . .	112
5.2	Testing signal wire (CAN bus) between engine control unit and ABS control unit . . . . .	112
<b>6</b>	<b>Testing signals to and from dash panel insert . . . . .</b>	<b>112</b>
6.1	Testing signals to and from dash panel insert . . . . .	112
6.2	Testing signal wire (CAN bus) between engine control unit and dash panel insert . . . . .	112
<b>7</b>	<b>Testing a 2-wire bus system (CAN bus) . . . . .</b>	<b>113</b>
7.1	Testing a 2-wire bus system (CAN bus) . . . . .	113
7.2	Testing data exchange between engine control unit and other control units with CAN interface . . . . .	113
<b>28</b>	<b>- Glow plug system . . . . .</b>	<b>117</b>
<b>1</b>	<b>Checking glow plug system . . . . .</b>	<b>117</b>
1.1	Checking glow plug system . . . . .	117
1.2	Testing operation . . . . .	117
1.3	Testing glow plug relay -J52 and activation . . . . .	119
1.4	Checking glow plugs . . . . .	122