



## Contents

<b>01 - Self-diagnosis</b> .....	<b>1</b>
<b>1 Self-diagnosis</b> .....	<b>1</b>
1.1 Self-diagnosis .....	1
1.2 Function .....	1
1.3 Technical data of self-diagnosis .....	1
1.4 Connecting fault reader .....	2
<b>2 Fault memory</b> .....	<b>5</b>
2.1 Fault memory .....	5
2.2 Interrogating fault memory .....	5
2.3 Fault table .....	6
2.4 Erasing fault memory and ending output .....	18
<b>3 Final control diagnosis</b> .....	<b>20</b>
3.1 Final control diagnosis .....	20
3.2 Performing final control diagnosis .....	20
<b>4 Measured value blocks</b> .....	<b>23</b>
4.1 Measured value blocks .....	23
4.2 Safety precautions .....	23
4.3 Reading measured value block .....	23
4.4 Evaluating measured value blocks, at idling speed .....	24
4.5 Evaluating measured value blocks, at full throttle/load .....	32
<b>23 - Mixture preparation, Injection</b> .....	<b>37</b>
<b>1 Servicing Diesel direct injection system</b> .....	<b>37</b>
1.1 Servicing Diesel direct injection system .....	37
1.2 Safety precautions .....	37
1.3 Rules for cleanliness .....	37
1.4 Fitting locations overview .....	38
1.5 Servicing Diesel direct injection system .....	42
1.6 Servicing injection pump .....	42
1.7 Servicing intake manifold flap .....	47
1.8 Removing and installing injection pump .....	49
1.9 Dynamically checking and adjusting commencement of injection .....	56
1.10 Removing and installing injectors .....	59
1.11 Checking injectors .....	60
1.12 Renewing gasket on cover for metering adjuster .....	61
<b>2 Checking components and functions</b> .....	<b>61</b>
2.1 Checking components and functions .....	61
2.2 Checking Diesel direct injection system voltage supply .....	62
2.3 Checking engine speed sender .....	62
2.4 Checking intake manifold pressure sender and elevation sender .....	64
2.5 Checking coolant temperature sender .....	65
2.6 Checking intake manifold temperature sender .....	67
2.7 Checking fuel temperature sender .....	69
2.8 Checking modulating piston movement sender and metering adjuster .....	71
2.9 Checking needle lift sender .....	74
2.10 Checking injection timing control range .....	76
2.11 Checking charge pressure control .....	78
2.12 Checking air mass meter .....	80
2.13 Checking intake manifold flap change-over .....	83
<b>3 Checking additional signals</b> .....	<b>85</b>
3.1 Checking additional signals .....	85
3.2 Checking speed signal .....	85
3.3 Checking brake light switch and brake pedal switch .....	86



3.4	Checking clutch pedal switch . . . . .	87
3.5	Checking gear change signal from automatic gearbox . . . . .	89
3.6	Checking signals from/to air conditioning system . . . . .	90
3.7	Checking cruise control system (CCS) . . . . .	93
<b>4</b>	<b>Replacing, coding and matching engine control unit . . . . .</b>	<b>95</b>
4.1	Replacing, coding and matching engine control unit . . . . .	95
4.2	Replacing engine control unit . . . . .	95
4.3	Coding engine control unit . . . . .	96
4.4	Checking data bus . . . . .	97
<b>28</b>	<b>Glow plug system . . . . .</b>	<b>99</b>
<b>1</b>	<b>Checking glow plug system . . . . .</b>	<b>99</b>
1.1	Checking glow plug system . . . . .	99
1.2	Checking glow plugs . . . . .	99