

## Contents

<b>01 - Self-diagnosis</b> .....	<b>1</b>
<b>1 Self-diagnosis for the Motronic system</b> .....	<b>1</b>
1.1 Self-diagnosis for the Motronic system .....	1
1.2 Technical self-diagnosis data .....	1
1.3 Safety precautions .....	1
1.4 Connecting vehicle diagnostic, measurement and information system VAS 5051 or fault reader V.A.G 1551 and selecting functions .....	1
<b>2 Interrogating and erasing fault memory</b> .....	<b>4</b>
2.1 Interrogating and erasing fault memory .....	4
2.2 Fault table .....	6
2.3 Fault codes up to fault code P1338 (17746) .....	6
2.4 Fault codes up to fault code P3262 (16646) .....	15
<b>3 Final control diagnosis</b> .....	<b>20</b>
3.1 Final control diagnosis .....	20
<b>4 Basic setting</b> .....	<b>23</b>
4.1 Basic setting .....	23
<b>5 Encoding control unit</b> .....	<b>25</b>
5.1 Encoding control unit .....	25
5.2 Encoding table .....	26
<b>6 Reading measured value block</b> .....	<b>26</b>
6.1 Reading measured value block .....	26
<b>7 Readiness code</b> .....	<b>27</b>
7.1 Readiness code .....	27
7.2 Read out readiness code .....	28
7.3 Produce readiness code .....	29
<b>24 - Mixture preparation, Injection</b> .....	<b>43</b>
<b>1 Servicing Motronic injection system</b> .....	<b>43</b>
1.1 Servicing Motronic injection system .....	43
1.2 Safety precautions .....	43
1.3 Rules for cleanliness .....	43
1.4 Technical data .....	44
1.5 Fitting locations overview .....	45
1.6 Dismantling and assembling air cleaner .....	54
1.7 Removing and installing intake manifold changeover system components .....	55
1.8 Wiring and component check with test box V.A.G 1598/31 .....	56
1.9 Procedure following interruption of voltage supply .....	59
1.10 Renewing engine control unit .....	59
1.11 Exhaust warning lamp -K83 in dash panel insert .....	61
1.12 Check exhaust warning lamp -K83 .....	61
1.13 Checking idling speed .....	62
1.14 Checking fuel pressure regulator and holding pressure .....	64
1.15 Checking injectors .....	67
1.16 Dismantling and assembling fuel manifold with injectors .....	71
1.17 Remove and install injectors .....	73
1.18 Testing injection quantity, leak tightness and spray pattern of injectors .....	74
1.19 Fuel pump relay -J17 and actuation .....	76
1.20 Checking air mass meter -G70 .....	81
1.21 Checking intake air system for leaks (unmetered air) .....	85
<b>2 Checking intake manifold changeover function</b> .....	<b>86</b>
2.1 Checking intake manifold changeover function .....	86
2.2 Checking function .....	87
2.3 Checking vacuum system for leaks .....	87



2.4	Checking intake manifold changeover valve -N156 . . . . .	89
<b>3</b>	<b>Checking lambda control . . . . .</b>	<b>92</b>
3.1	Checking lambda control . . . . .	92
3.2	Function of lambda control . . . . .	92
3.3	Checking lambda probe and lambda control upstream of catalytic converter . . . . .	93
3.4	Check lambda probe ageing of lambda probe before catalytic converter . . . . .	99
3.5	Check lambda probe and lambda control after catalytic converter . . . . .	102
3.6	Check lambda probe heater for lambda probes upstream or downstream of cat . . . . .	111
3.7	Removing and installing lambda probe . . . . .	116
<b>4</b>	<b>Checking fuel tank breather . . . . .</b>	<b>117</b>
4.1	Checking fuel tank breather . . . . .	117
4.2	Checking activated charcoal filter system solenoid valve 1 -N80 . . . . .	117
<b>5</b>	<b>Checking electronic engine power control (electronic throttle) . . . . .</b>	<b>121</b>
5.1	Checking electronic engine power control (electronic throttle) . . . . .	121
5.2	Function of the electronic throttle system . . . . .	121
5.3	Fault lamp for electronic throttle in dash panel insert . . . . .	122
5.4	Check electronic throttle control fault lamp -K132 . . . . .	123
5.5	Checking throttle valve control unit -J338 . . . . .	123
5.6	Performing adaption of throttle valve control unit . . . . .	123
5.7	Checking angle sender for throttle valve control element . . . . .	126
5.8	Checking accelerator position sender . . . . .	129
5.9	Adapting kick down function . . . . .	132
5.10	Checking brake light switch and brake pedal switch . . . . .	134
5.11	Checking clutch pedal switch -F36 . . . . .	136
<b>6</b>	<b>Checking auxiliary signals . . . . .</b>	<b>139</b>
6.1	Checking auxiliary signals . . . . .	139
6.2	Checking engine speed signal . . . . .	140
6.3	Check vehicle speed signal . . . . .	140
6.4	Testing air conditioner compressor shut-off . . . . .	141
6.5	Check wiring for crash signal . . . . .	142
6.6	Checking consumption signal for vehicle computer . . . . .	143
6.7	Checking fuel level signal wiring . . . . .	143
6.8	Check signal for rough-road recognition. . . . .	143
6.9	Check data exchange between engine control unit and other CAN-control units . . . . .	143
<b>28</b>	<b>- Ignition system . . . . .</b>	<b>147</b>
<b>1</b>	<b>Checking ignition system . . . . .</b>	<b>147</b>
1.1	Checking ignition system . . . . .	147
1.2	General notes on ignition system . . . . .	147
1.3	Safety precautions . . . . .	147
1.4	Technical data for ignition system . . . . .	147
1.5	Removing and installing ignition system components . . . . .	148
1.6	Checking ignition coils . . . . .	151
1.7	Checking intake air temperature sensor -G42 . . . . .	155
1.8	Checking engine speed sender -G28 . . . . .	158
1.9	Checking coolant temperature sender -G62 . . . . .	160
1.10	Checking control unit power supply . . . . .	164
1.11	Checking knock control stop . . . . .	165
1.12	Checking knock sensors . . . . .	169
1.13	Checking Hall sender . . . . .	172
1.14	Testing misfire detection . . . . .	176