

Contents

01 - Self-diagnosis	1
1 Self-diagnosis of Motronic system	1
1.1 Self-diagnosis of Motronic system	1
1.2 Technical data for self-diagnosis	1
1.3 Connecting and selecting functions for vehicle diagnostic, testing and information system VAS 5051 or fault reader V.A.G 1551	2
2 Interrogating and erasing fault memory	4
2.1 Interrogating and erasing fault memory	4
2.2 Fault table	6
3 Final control diagnosis	17
3.1 Final control diagnosis	17
4 Basic setting	21
4.1 Basic setting	21
5 Coding engine control unit	23
5.1 Coding engine control unit	23
6 Reading measured value block	25
6.1 Reading measured value block	25
7 Readiness code	26
7.1 Readiness code	26
7.2 Reading off readiness code	26
7.3 Generating readiness code	28
24 - Mixture preparation, Injection	35
1 Servicing Motronic injection system	35
1.1 Servicing Motronic injection system	35
1.2 Safety precautions	35
1.3 Rules for cleanliness	35
1.4 Technical data	36
1.5 Fitting locations overview	36
1.6 Dismantling and assembling fuel rail with injectors	40
1.7 Testing wiring and components with test box V.A.G 1598/31	41
1.8 Renewing engine control unit	42
1.9 Testing idling speed	43
1.10 Checking fuel pressure regulator and holding pressure	44
1.11 Testing injection quantity, leak-tightness and spray pattern of injectors	47
1.12 Removing and installing injectors	48
1.13 Checking injectors	49
1.14 Testing fuel pump relay -J17 and activation	52
1.15 Testing Motronic current supply relay -J271	55
1.16 Testing air mass meter -G70	57
1.17 Testing intake air temperature sender -G42	61
1.18 Testing coolant temperature sender -G62	63
2 Testing lambda control (engine codes:APT, ARG)	65
2.1 Testing lambda control (engine codes:APT, ARG)	65
2.2 Testing lambda probe and lambda control	65
2.3 Checking Lambda probe heating	69
2.4 Testing lambda probe signal wiring and activation	72
2.5 Removing and installing lambda probe	74
3 Testing lambda control (engine code: AVV)	75
3.1 Testing lambda control (engine code: AVV)	75
3.2 Testing lambda probe and lambda control (before catalytic converter)	75
3.3 Testing lambda probe (before catalytic converter) for ageing	80
3.4 Testing lambda probe heating -Z19 at lambda probe (before catalytic converter)	83



3.5	Testing lambda probe and lambda control (after catalytic converter)	86
3.6	Testing lambda probe heating -Z29 at lambda probe (after catalytic converter)	92
3.7	Removing and installing lambda probe	95
4	Testing intake manifold change-over function	96
4.1	Testing intake manifold change-over function	96
4.2	Testing operation	96
4.3	Testing intake manifold change-over valve -N156	97
4.4	Testing vacuum system	100
5	Testing fuel tank breather system	101
5.1	Testing fuel tank breather system	101
5.2	Testing solenoid valve 1 for activated charcoal filter -N80	101
6	Testing secondary air inlet valve -N112	105
6.1	Testing secondary air inlet valve -N112	105
6.2	Testing secondary air pump relay -J299	107
7	Testing electronic engine power control (electronic throttle)	111
7.1	Testing electronic engine power control (electronic throttle)	111
7.2	Operation of electronic throttle system	111
7.3	Testing throttle valve control part -J338	111
7.4	Performing adaption of throttle valve control part	112
7.5	Testing angle senders for throttle valve drive -G187 and -G188	114
7.6	Notes on EPC warning lamp (fault warning lamp for electronic throttle -K132)	115
8	Testing accelerator position senders -G79 and -G185	117
8.1	Testing accelerator position senders -G79 and -G185	117
8.2	Testing kick-down switching point	120
8.3	Checking brake light switch -F and brake pedal switch -F47	121
8.4	Testing clutch pedal switch -F36	124
9	Testing auxiliary signals	126
9.1	Testing auxiliary signals	126
9.2	Checking engine speed signal	126
9.3	Testing fuel consumption signal	127
9.4	Testing crash signal	127
9.5	Testing road speed signal	128
9.6	Testing air conditioner compressor shut-off	129
9.7	Testing data exchange between engine control unit, ABS/EDL control unit and gearbox control unit	131
28	- Ignition system	134
1	Testing ignition system	134
1.1	Testing ignition system	134
1.2	General notes on ignition system	134
1.3	Safety precautions	134
1.4	Technical data for ignition system	134
1.5	Testing dual-spark ignition system (2 coils)	135
1.6	Checking control unit voltage supply	136
1.7	Testing engine speed sender -G28	138
1.8	Testing knock sensor control limit	140
1.9	Testing knock sensors -G61 and -G66	140
1.10	Testing Hall sender -G40	141
2	Testing camshaft timing control	145
2.1	Testing camshaft timing control	145
2.2	Operation of camshaft timing control	145
2.3	Testing solenoid valves for camshaft adjustment -N205.	146