

## Contents

<b>23 - Mixture preparation, Injection . . . . .</b>	<b>1</b>
<b>1 Servicing diesel direct injection system . . . . .</b>	<b>1</b>
1.1 Servicing diesel direct injection system . . . . .	1
1.2 Safety precautions . . . . .	1
1.3 Rules for cleanliness . . . . .	1
1.4 Overview of fitting locations . . . . .	2
1.5 Servicing injection pump . . . . .	6
1.6 Servicing fuel filter . . . . .	10
1.7 Servicing accelerator linkage . . . . .	12
1.8 Removing, installing and adjusting injection pump . . . . .	13
1.9 Crankshaft TDC position with engine removed . . . . .	18
1.10 Dynamic testing and adjustment of start of injection . . . . .	19
1.11 Testing fuel system for leaks . . . . .	20
1.12 Removing, installing and testing injectors . . . . .	21
1.13 Replacing O-ring on injection timing device . . . . .	23
1.14 Testing wiring and components with test box V.A.G 1598/18 . . . . .	23
1.15 Replacing control unit for engine electronics . . . . .	24
<b>2 Testing boost pressure system . . . . .</b>	<b>25</b>
2.1 Testing boost pressure system . . . . .	25
2.2 Testing boost pressure - engine code AFF, 1Z . . . . .	25
2.3 Testing boost pressure - engine code AFN . . . . .	28
2.4 Testing solenoid valve for boost pressure limitation . . . . .	30
2.5 Testing intake manifold temperature sender . . . . .	32
2.6 Testing intake manifold pressure sender and altitude sender . . . . .	33
2.7 Diagram of hoses for boost pressure control - engine code AFF, 1Z . . . . .	34
2.8 Diagram of hoses for boost pressure control - engine code AFN . . . . .	35
<b>3 Testing fuel injection control . . . . .</b>	<b>37</b>
3.1 Testing fuel injection control . . . . .	37
3.2 Testing injection timing device . . . . .	37
3.3 Testing start of injection valve . . . . .	38
3.4 Testing fuel temperature sender . . . . .	40
<b>4 Testing exhaust gas recirculation . . . . .</b>	<b>40</b>
4.1 Testing exhaust gas recirculation . . . . .	40
4.2 Testing operation . . . . .	40
4.3 Testing exhaust gas recirculation valve . . . . .	42
4.4 Testing air mass meter . . . . .	43
4.5 Vacuum system diagram . . . . .	46
<b>5 Testing control unit input variables . . . . .</b>	<b>47</b>
5.1 Testing control unit input variables . . . . .	47
5.2 Testing voltage supply for diesel direct injection system . . . . .	47
5.3 Testing engine speed sender . . . . .	50
5.4 Testing needle lift sender . . . . .	51
5.5 Testing coolant temperature sender . . . . .	51
5.6 Testing brake light switch and brake pedal switch . . . . .	52
5.7 Testing modulating piston movement sender and quantity adjuster . . . . .	53
5.8 Testing accelerator position sender . . . . .	55
<b>6 Testing additional signals . . . . .</b>	<b>57</b>
6.1 Testing additional signals . . . . .	57
6.2 Testing signals from/to automatic gearbox . . . . .	57
6.3 Test signals from/to AC . . . . .	58
6.4 Testing clutch pedal switch . . . . .	59
6.5 Testing speed signal . . . . .	60
6.6 Testing cruise control system (CCS) . . . . .	60

6.7	Testing engine speed signal . . . . .	62
6.8	Testing consumption signal . . . . .	64
6.9	Testing actuation of radiator fan . . . . .	64
<b>28 - Glow plug system . . . . .</b>		<b>66</b>
1	<b>Testing glow plug system . . . . .</b>	<b>66</b>
1.1	Testing glow plug system . . . . .	66
1.2	Testing operation . . . . .	66
1.3	Testing glow plugs . . . . .	66
1.4	Testing glow period warning lamp . . . . .	67