

## Contents

<b>00 - Technical data</b>	<b>1</b>
1     Brakes, wear limits .....	1
2     Assessment of ceramic brake discs .....	5
2.1     Visible features of ceramic brake discs .....	5
2.2     Superficial cracks in cooling channel lands .....	6
2.3     Cracks in area of bolted connection on ceramic brake discs .....	6
2.4     Edge fractures .....	7
2.5     Chipping on ceramic brake discs .....	7
2.6     Cracks extending into cooling channels .....	7
3     Assessing degree of wear on ceramic brake discs .....	8
3.1     Wear assessment by checking thickness of brake disc .....	12
3.2     Wear assessment according to wear indicators .....	12
3.3     Wear assessment by weighing brake disc .....	13
3.4     Wear assessment by weighing brake disc .....	14
3.5     Wear assessment of ceramic brake disc with tester VAS 6813 .....	15
4     Brake test .....	22
4.1     General notes .....	22
4.2     Vehicles with front-wheel drive .....	22
4.3     Vehicles with four-wheel drive .....	22
4.4     EPB (electronic parking brake) on brake dynamometer .....	22
5     Brake fluid .....	24
5.1     General notes .....	24
<b>45 - Anti-lock brake system</b>	<b>25</b>
1     General information on the anti-lock brake system .....	25
1.1     Notes for repair work on the ABS .....	25
2     Connecting VAS 505x and selecting functions .....	27
3     Electronic stabilisation program Bosch 5.7 .....	29
3.1     Overview of components - ESP Bosch 5.7 .....	29
3.2     Hydraulic unit and brake lines .....	31
3.3     Removing and installing hydraulic control unit .....	31
3.4     Renewing ABS control unit J104 .....	35
4     Removing and installing parts of ABS system on front and rear axles .....	38
4.1     Removing and installing parts of ABS system on front axle .....	38
4.2     Removing and installing parts of ABS system on rear axle .....	39
5     Removing and installing parts of ESP system .....	41
5.1     Removing and installing brake light switch .....	41
5.2     Removing and installing lateral acceleration sender G200 and yaw rate sender G202 .....	42
5.3     Removing and installing steering angle sender G85 .....	42
5.4     Removing and installing parking brake switch .....	43
5.5     Removing and installing brake pressure sender G201 .....	43
<b>46 - Brakes - mechanism</b>	<b>45</b>
1     Front brakes (1LG) .....	45
1.1     Servicing front brakes .....	45
1.2     Removing and installing brake pads .....	48
1.3     Renewing brake caliper .....	52
2     Front brakes (1LJ/1LL/1LM/1LK) .....	53
2.1     Servicing front brakes .....	53
2.2     Removing and installing brake pads .....	55
2.3     Renewing brake caliper .....	59

<b>3</b>	<b>Ceramic front brakes (1LW) .....</b>	<b>61</b>
3.1	Servicing ceramic brakes .....	61
3.2	Detaching and attaching damper spring .....	64
3.3	Removing and installing brake pads - ceramic brakes .....	64
3.4	Removing and installing brake caliper - ceramic brakes .....	67
3.5	Detaching and attaching front brake disc (ceramic brakes) .....	69
3.6	Renewing front brake disc (ceramic brakes) .....	70
<b>4</b>	<b>Rear brakes, electronic parking brake and handbrake (EPB) .....</b>	<b>73</b>
4.1	Servicing rear brakes - all models including ceramic brakes .....	73
4.2	Removing and installing brake pads - rear brakes .....	75
<b>5</b>	<b>Exploded view - brake pedal, left-hand drive vehicles .....</b>	<b>82</b>
5.1	Separating brake pedal from brake servo .....	83
5.2	Removing and installing brake pedal - left-hand drive vehicles .....	84
<b>6</b>	<b>Removing and installing mounting bracket .....</b>	<b>85</b>
6.1	Removing and installing mounting bracket .....	85
<b>7</b>	<b>Overview of components - electronic parking brake and handbrake (EPB) .....</b>	<b>86</b>
7.1	Removing and installing control unit for electronic parking brake and handbrake .....	87
7.2	Removing and installing actuator motor for electronic parking brake and handbrake .....	87
<b>47 - Brakes - hydraulics</b>	.....	<b>91</b>
<b>1</b>	<b>Pressurised leak test .....</b>	<b>91</b>
1.1	Pressurised leak test .....	91
1.2	High-pressure and low-pressure tests .....	91
<b>2</b>	<b>Brake calipers FNR G60 .....</b>	<b>92</b>
2.1	Servicing brake calipers .....	92
2.2	Removing and installing piston for front brake caliper .....	93
<b>3</b>	<b>Brake calipers 2FNR 42 AL .....</b>	<b>96</b>
3.1	Servicing brake calipers .....	96
3.2	Removing and installing piston for front brake caliper .....	97
<b>4</b>	<b>Brembo brake calipers (18") .....</b>	<b>100</b>
4.1	Servicing brake calipers .....	100
4.2	Removing and installing pistons for front brake caliper .....	101
<b>5</b>	<b>Brake caliper (ceramic brakes) .....</b>	<b>103</b>
5.1	Servicing brake caliper (ceramic brakes) .....	103
5.2	Removing and installing pistons for front brake caliper .....	105
<b>6</b>	<b>Rear brake calipers for electronic parking brake and handbrake (EPB) .....</b>	<b>108</b>
6.1	Servicing brake calipers .....	108
6.2	Removing and installing piston for rear brake caliper .....	109
<b>7</b>	<b>Bleeding brake system .....</b>	<b>118</b>
7.1	Bleeding hydraulic system with brake filling and bleeding equipment .....	118
7.2	Bleeding hydraulic system without brake filling and bleeding equipment .....	121
7.3	Changing brake fluid .....	123
<b>8</b>	<b>Exploded view - brake servo / brake master cylinder .....</b>	<b>124</b>
<b>9</b>	<b>Removing and installing brake master cylinder .....</b>	<b>126</b>
9.1	Removing and installing brake master cylinder .....	126
<b>10</b>	<b>Removing and installing brake servo .....</b>	<b>129</b>
10.1	Removing and installing brake servo .....	129
<b>11</b>	<b>Vacuum pumps for brake servo .....</b>	<b>133</b>
11.1	Exploded view - vacuum pump, vehicles with 3.0 ltr. TDI engine .....	133
11.2	Removing and installing vacuum pump - vehicles with 3.0 ltr. TDI engine .....	134
11.3	Exploded view - vacuum pump, vehicles with 4.0 ltr. TDI engine .....	135
11.4	Removing and installing vacuum pump - vehicles with 4.0 ltr. TDI engine .....	136
11.5	Exploded view - vacuum pump, vehicles with 4.2 ltr. TDI engine .....	137

11.6	Removing and installing vacuum pump - vehicles with 4.2 ltr. TDI engine . . . . .	139
11.7	Removing and installing vacuum pump - vehicles with 2.8 ltr. and 3.2 ltr. petrol engine . . . . .	143
<b>12</b>	<b>Electric vacuum pump for brakes V192 . . . . .</b>	<b>145</b>
12.1	Exploded view - vacuum pump for brakes V192 . . . . .	145
12.2	Removing and installing vacuum pump for brakes V192 . . . . .	145
12.3	Checking vacuum pump for brakes V192 . . . . .	146
12.4	Removing and installing brake servo pressure sensor G294 . . . . .	148
12.5	Checking non-return valve . . . . .	148
<b>13</b>	<b>Brake hoses and brake lines . . . . .</b>	<b>149</b>
13.1	Routing of brake hoses/lines . . . . .	149
13.2	Tightening torques . . . . .	150
<b>14</b>	<b>Repairing brake lines . . . . .</b>	<b>151</b>
14.1	Exploded view - flanging tool . . . . .	151
14.2	Instructions . . . . .	152