

Contents

00 - Technical data	1
1 Technical data	1
1.1 Technical data	1
1.2 Allocation of PR Nos./brakes	1
1.3 Brakes	2
2 Brake test	3
2.1 Brake test	3
2.2 General	3
2.3 Front-wheel drive vehicles	3
2.4 Four-wheel drive vehicles (Haldex coupling)	3
3 Brake fluid	4
3.1 Brake fluid	4
3.2 General information	4
45 - Anti-locking brake system	6
1 General notes on anti-locking brake system	6
1.1 General notes on anti-locking brake system	6
1.2 Notes for repair work on ABS	6
2 ABS/ESP ITT Mark 20	7
2.1 ABS/ESP ITT Mark 20	7
2.2 Exploded view	7
3 Removing and installing ABS/ESP ITT Mark 20 system components	13
3.1 Removing and installing ABS/ESP ITT Mark 20 system components	13
3.2 Removing and installing brake light switch (square housing)	13
3.3 Removing and installing brake light switch (round housing)	14
3.4 Removing and installing lateral acceleration sender -G200 and yaw rate sender -G202 ..	14
3.5 Removing and installing longitudinal acceleration sender -G251	16
3.6 Removing and installing steering angle sender -G85	17
3.7 Removing and installing brake pressure senders	19
4 Control unit and hydraulic unit; ABS/ESP ITT Mark 20	21
4.1 Control unit and hydraulic unit; ABS/ESP ITT Mark 20	21
4.2 Exploded view	21
4.3 Removing and installing control unit and hydraulic unit	23
5 Removing and installing ABS/ESP ITT Mark 20 system components on front axle	29
5.1 Removing and installing ABS/ESP ITT Mark 20 system components on front axle	29
5.2 Exploded view	29
5.3 Removing and installing wheel speed sensor	31
5.4 Checking rotor	31
5.5 Replacing speed sensor wire	32
6 Removing and installing ABS/ESP ITT Mark 20 system components on rear axle (vehicles with front-wheel drive)	37
6.1 Removing and installing ABS/ESP ITT Mark 20 system components on rear axle (vehicles with front-wheel drive)	37
6.2 Exploded view	37
6.3 Removing and installing speed sensor	39
6.4 Checking rotor	39
6.5 Replacing speed sensor wire	40
7 Removing and installing ABS/ESP ITT Mark 20 system components on rear axle (vehicles with four-wheel drive)	43
7.1 Removing and installing ABS/ESP ITT Mark 20 system components on rear axle (vehicles with four-wheel drive)	43
7.2 Exploded view	43
7.3 Removing and installing speed sensor	45



7.4	Checking rotor	46
7.5	Replacing speed sensor wire	46
8	ABS/ESP ITT Mark 60	49
8.1	ABS/ESP ITT Mark 60	49
8.2	Exploded view	49
9	Removing and installing ABS/ESP ITT Mark 60 system components	55
9.1	Removing and installing ABS/ESP ITT Mark 60 system components	55
9.2	Removing and installing brake light switch	55
9.3	Removing and installing lateral acceleration sender -G200 and yaw rate sender -G202 (vehicles up to approx. 08.01)	56
9.4	Removing and installing longitudinal acceleration sender -G251 (vehicles up to approx. 08.01)	58
9.5	Removing and installing ESP sensor unit -G419	58
9.6	Removing and installing steering angle sender -G85	59
9.7	Removing and installing brake pressure senders	61
10	Control unit and hydraulic unit; ABS/ESP ITT Mark 60	64
10.1	Control unit and hydraulic unit; ABS/ESP ITT Mark 60	64
10.2	Exploded view	64
10.3	Removing and installing control unit and hydraulic unit	67
11	Removing and installing ABS/ESP ITT Mark 60 system components on front axle	71
11.1	Removing and installing ABS/ESP ITT Mark 60 system components on front axle	71
11.2	Exploded view	72
11.3	Removing and installing speed sensor	73
11.4	Checking rotor	73
11.5	Replacing speed sensor wire	74
12	Removing and installing ABS/ESP ITT Mark 60 system components on rear axle (vehicles with front-wheel drive)	79
12.1	Removing and installing ABS/ESP ITT Mark 60 system components on rear axle (vehicles with front-wheel drive)	79
12.2	Exploded view	79
12.3	Removing and installing speed sensor	81
12.4	Checking rotor	81
12.5	Replacing speed sensor wire	82
13	Removing and installing ABS/ESP ITT Mark 60 system components on rear axle (vehicles with four-wheel drive)	85
13.1	Removing and installing ABS/ESP ITT Mark 60 system components on rear axle (vehicles with four-wheel drive)	85
13.2	Exploded view	85
13.3	Removing and installing speed sensor	87
13.4	Checking rotor	88
13.5	Replacing speed sensor wire	88
46	Brakes, Brake mechanics	91
1	Servicing front brake	91
1.1	Servicing front brake	91
1.2	Front brakes FN 3 - Exploded view	92
1.3	Removing and installing brake pads - Front brakes FN 3	97
1.4	Removing and installing brake caliper - Front brakes FN 3	101
2	Servicing rear brake	102
2.1	Servicing rear brake	102
2.2	Rear brake on vehicles with front-wheel drive - Exploded view	102
2.3	Removing and installing brake pads - Vehicles with front-wheel drive	106
2.4	Removing and installing brake caliper - Vehicles with front-wheel drive	109
2.5	Rear brake on vehicles with four-wheel drive - Exploded view	110
2.6	Removing and installing brake pads - Vehicles with four-wheel drive	115
2.7	Removing and installing brake caliper - Vehicles with four-wheel drive	118
3	Servicing front brake, brake caliper 2FN	119

3.1	Servicing front brake, brake caliper 2FN	119
3.2	Special tools and workshop equipment required	119
3.3	Removing and installing brake pads	127
4	Handbrake	132
4.1	Handbrake	132
4.2	Handbrake lever - Exploded view	132
4.3	Removing and installing handbrake cable - Vehicles with front-wheel drive	134
4.4	Removing and installing handbrake cable - Vehicles with four-wheel drive	136
4.5	Adjusting handbrake	139
5	Brake pedal	141
5.1	Brake pedal	141
5.2	Brake pedal on left-hand drive vehicles -Assembly overview	141
5.3	Brake pedal on right-hand drive vehicles - Assembly overview	144
5.4	Removing and installing brake pedal	147
5.5	Separating brake pedal from brake servo	148
47	- Brakes, Brake hydraulics	151
1	High-pressure and low-pressure test	151
1.1	High-pressure and low-pressure test	151
2	Servicing front brake caliper	152
2.1	Servicing front brake caliper	152
2.2	Brake caliper FN 3 - Assembly overview	152
2.3	Removing and installing front brake caliper piston	154
3	Servicing brake caliper 2FN	156
3.1	Servicing brake caliper 2FN	156
3.2	Removing and installing front brake caliper piston	159
4	Servicing rear brake caliper	162
4.1	Servicing rear brake caliper	162
4.2	Exploded view	162
4.3	Removing and installing rear brake caliper piston	165
5	Bleeding brake system - ABS/ESP ITT Mark 20	167
5.1	Bleeding brake system - ABS/ESP ITT Mark 20	167
5.2	Bleeding brake system using brake filling and bleeding appliance VAS 5234 or V.A.G 1869 A	168
5.3	Bleeding brake system without brake filling and bleeding appliance	169
5.4	Bleeding brake system when brake fluid reservoir was empty	169
6	Bleeding brake system - ITT ABS/ESP Mark 60	174
6.1	Bleeding brake system - ITT ABS/ESP Mark 60	174
6.2	Bleeding brake system using brake filling and bleeding appliance VAS 5234 or V.A.G 1869 A	175
6.3	Bleeding brake system without brake filling and bleeding appliance	176
6.4	Bleeding brake system when brake fluid reservoir was empty	176
7	Vacuum servo pump	181
7.1	Vacuum servo pump	181
7.2	Checking vacuum pump for brakes -V192	181
7.3	Removing and installing vacuum pump for brakes -V192	181
8	Brake servo/brake master cylinder - Left-hand drive vehicles	183
8.1	Brake servo/brake master cylinder - Left-hand drive vehicles	183
8.2	Exploded view	183
8.3	Removing and installing brake master cylinder	188
8.4	Removing and installing brake servo	191
9	Brake servo/brake master cylinder - Right hand drive	193
9.1	Brake servo/brake master cylinder - Right hand drive	193
9.2	Exploded view	193
9.3	Removing and installing brake master cylinder	198



9.4	Removing and installing brake servo201
10	Brake pipes and hoses204
10.1	Brake pipes and hoses204
10.2	Removing and installing brake pipes and hoses204