



Contents

00 - Technical data	1
1 Checklist for evaluating running gear of accident vehicles	1
2 General information	3
40 - Front suspension	4
1 Evaluating accident vehicles	4
2 Raising wheel suspension to unladen position	5
3 Overview - front axle	7
4 Assembly overview: subframe	9
4.1 Repairing thread in longitudinal member	10
4.2 Fixing position of subframe	10
4.3 Lowering subframe	13
4.4 Removing and installing subframe without steering rack	17
4.5 Removing and installing subframe with hydraulic steering rack	20
4.6 Removing and installing subframe with electromechanical steering rack	27
4.7 Repairing subframe	31
5 Assembly overview: front wheel suspension, suspension link	41
5.1 Checking swivel joint	42
5.2 Removing and installing swivel joint	43
5.3 Removing and installing suspension link	47
5.4 Removing and installing suspension link (left side of vehicles with dual clutch or automatic gearbox)	48
5.5 Renewing front bonded rubber bush for suspension link	53
5.6 Renewing rear bonded rubber bush for suspension link	55
6 Assembly overview: wheel bearing	58
6.1 Removing and installing wheel bearing unit	59
6.2 Removing and installing wheel bearing housing	62
7 Assembly overview: anti-roll bar	69
7.1 Removing and installing anti-roll bar	69
8 Assembly overview: suspension strut	74
8.1 Removing and installing suspension strut	75
8.2 Repairing suspension strut	81
9 Removing and installing drive shafts	84
9.1 Loosening and tightening twelve-point head bolt, with ribbing, securing drive shaft	84
9.2 Loosening and tightening twelve-point head bolt, without ribbing, securing drive shaft	85
9.3 Removing and installing drive shaft with constant velocity joint	87
9.4 Removing and installing right drive shaft with (push-on) constant velocity slip joint	90
9.5 Removing and installing drive shafts with triple roller joint AAR2600i	96
9.6 Removing and installing drive shafts with triple roller joint AAR3300i	100
10 Repairing drive shafts - overview of drive shafts	105
10.1 Heat shield for drive shafts	106
11 Assembly overview: drive shaft with VL100 constant velocity joint	107
11.1 Dismantling and assembling drive shaft with VL100 constant velocity joint	109
11.2 Checking outer constant velocity joint	113
11.3 Checking inner constant velocity joint	114
12 Assembly overview: drive shaft with VL107 constant velocity joint	117
12.1 Dismantling and assembling drive shaft with VL107 constant velocity joint	119
13 Assembly overview: drive shaft with VL107 constant velocity slip joint (push-on)	124
13.1 Dismantling and assembling drive shaft with VL107 (push-on) constant velocity slip joint	125
14 Assembly overview: drive shaft with triple roller joint AAR2600i	129



14.1	Dismantling and assembling drive shaft with triple roller joint AAR2600i	131
15	Assembly overview: drive shaft with triple roller joint AAR3300i	136
15.1	Dismantling and assembling drive shaft with triple roller joint AAR3300i	138
42 - Rear suspension		144
1	Evaluating accident vehicles	144
2	Rear axle in unladen position (torsion beam rear axle)	145
3	Overview of rear axle (torsion beam rear axle)	147
4	Assembly overview: axle beam, subframe, cross piece (torsion beam rear axle)	149
4.1	Removing and installing axle assembly	150
4.2	Removing and installing bonded rubber bush for axle beam	154
4.3	Removing and installing cross piece	158
4.4	Removing and installing bonded rubber bush for cross piece	160
5	Assembly overview - plate for axle beam, torsion beam rear axle	163
5.1	Removing plate for axle beam	163
5.2	Installing plate for axle beam	164
6	Assembly overview: wheel suspension (torsion beam rear axle)	170
6.1	Removing and installing coil spring	171
7	Assembly overview: shock absorbers (torsion beam rear axle)	173
7.1	Removing and installing shock absorbers	174
8	Assembly overview: wheel bearings, drum brake (torsion beam rear axle)	176
8.1	Removing and installing wheel hub with wheel bearing, vehicles with drum brakes	177
9	Assembly overview: wheel bearings, disc brake (torsion beam rear axle)	181
9.1	Removing and installing wheel hub with wheel bearing, vehicles with disc brakes	182
10	Rear axle in unladen position (multi-link rear suspension)	185
11	Overview of rear axle (multi-link rear suspension)	188
12	Assembly overview: subframe, transverse link, track rod (multi-link rear suspension)	189
12.1	Assembly overview: rear left vehicle level sender G76	191
12.2	Removing and installing rear left vehicle level sender G76	191
12.3	Fixing position of subframe	192
12.4	Lowering rear axle	193
12.5	Removing and installing rear axle	196
12.6	Removing and installing upper transverse link	199
12.7	Removing and installing lower transverse link	201
12.8	Removing and installing track rod	203
13	Assembly overview: wheel bearing housing, trailing arm (multi-link rear suspension)	206
13.1	Removing and installing wheel bearing housing	207
13.2	Renewing bonded rubber bush for wheel bearing housing	210
13.3	Removing and installing wheel bearing/wheel hub unit	213
13.4	Removing and installing trailing arm with mounting bracket	216
13.5	Repairing trailing arm	220
14	Assembly overview: shock absorber, coil spring (multi-link rear suspension)	224
14.1	Removing and installing coil spring	224
14.2	Removing and installing shock absorbers	226
14.3	Repairing shock absorber	228
15	Assembly overview: anti-roll bar (multi-link rear suspension)	230
15.1	Removing and installing anti-roll bar	230
16	Assembly overview: subframe attachments, BlueMotion vehicles	233
16.1	Removing and installing shield for rear axle	234
44 - Wheels, tyres, vehicle geometry		236
1	Evaluating accident vehicles	236
2	Specified torque for fitting wheels	237



3	Fitting wheel and tyre	238
3.1	General information	238
3.2	Fittings instructions	238
4	Removing and fitting tyres (wheels with tyre pressure monitoring)	240
4.1	Notes on safety and conditions for removing and fitting tyres (wheels with tyre pressure monitoring)	240
4.2	Wheel change	240
4.3	Fittings instructions	241
4.4	Pressing tyre off wheel rim	242
4.5	Removing tyre from wheel	243
4.6	Fitting tyre to wheel rim	243
5	Removing and fitting tyres with run-flat properties to wheel rims	245
5.1	Safety information	245
5.2	Fittings instructions	245
5.3	Pressing tyre off wheel rim	246
5.4	Removing tyre from wheel	247
5.5	Fitting tyre to wheel rim	248
6	Tyre pressure monitor display	251
6.1	General information	251
7	Tyre Pressure Monitoring System (TPMS)	253
7.1	Assembly overview: tyre pressure sensor	253
7.2	Removing and installing tyre pressure sensor	254
8	Vehicle alignment check	255
8.1	General information for vehicles with torsion beam rear axle	255
8.2	General information for vehicles with multi-link rear suspension	257
8.3	Conditions for testing	258
8.4	Checking trailing arm of axle beam (torsion beam rear axle) using VAS 241 001	259
8.5	Checking trailing arm of axle beam (torsion beam rear axle) using VAS 801	261
8.6	Test preparations	264
8.7	Vehicle alignment specifications for vehicles with torsion beam rear axle	264
8.8	Vehicle alignment specifications for vehicles with multi-link rear suspension	266
8.9	Transverse vehicle inclination "zero position"	268
8.10	Overview - wheel alignment procedure	268
8.11	Correcting front axle camber	269
8.12	Checking torsion beam rear axle camber	271
8.13	Adjusting multi-link rear suspension camber	271
8.14	Checking torsion beam rear axle toe	272
8.15	Adjusting multi-link rear suspension toe	273
8.16	Adjusting front axle toe	273
8.17	Basic setting of steering angle sensor G85	274
8.18	Vehicle data sticker	274
9	Wheels, tyres	276
9.1	Models with breakdown set	276
9.2	Removing a tyre	276
9.3	Fitting a new tyre	276
9.4	Tyre sealant disposal	277
10	Instructions for changing or fitting wheels	278
10.1	Fitting wheels	279
11	Protecting wheel centring seat against corrosion	280
12	Vibration due to wheels/tyres - causes and rectification	281
12.1	Causes of rough running	281
12.2	Balancing wheels	281
12.3	Conducting a road test before balancing wheels	281
12.4	Balancing wheels on stationary wheel balancing machine	282



12.5	Vibration control system VAS 6230 A	284
12.6	Finish balancer	284
12.7	Radial and lateral runout of wheels and tyres	285
12.8	Checking radial and lateral runout on wheels and tyres with tyre gauge V.A.G 1435	285
12.9	Checking radial and lateral run-out on wheel rim	286
12.10	Matching	287
12.11	Flat spots caused by storage or handling	288
48	- Steering	290
1	Evaluating accident vehicles	290
2	General repair instructions	291
2.1	Steering rack	291
2.2	Gaskets and seals	291
2.3	Nuts and bolts	291
2.4	Electrical components	292
2.5	Guided Fault Finding, vehicle self-diagnosis and Test Instruments	292
3	Assembly overview - airbag and steering wheel	293
3.1	Removing and installing airbag and steering wheel	293
4	Assembly overview: steering column, left-hand drive	296
4.1	Removing and installing steering column	296
4.2	Handling and transporting steering column	304
4.3	Checking steering column for damage	305
5	Assembly overview: steering column, right-hand drive	307
5.1	Removing and installing steering column, right-hand drive vehicle	307
5.2	Handling and transporting steering column	316
5.3	Checking steering column for damage	317
6	Electromechanical steering rack, LHD vehicle	318
6.1	Assembly overview - electromechanical steering rack for LHD vehicle	318
6.2	Removing and installing steering rack, left-hand drive vehicle	320
7	Electromechanical steering rack, RHD vehicle	328
7.1	Assembly overview - electromechanical steering rack for RHD vehicle	328
7.2	Removing and installing steering rack, right-hand drive vehicle	329
8	Repairing electromechanical steering rack	336
8.1	Assembly overview: electromechanical steering rack	336
8.2	Removing and installing track rod	337
8.3	Removing and installing track rod ball joint	340
8.4	Removing and installing boot	341
8.5	Checking play, security and boots of track rod ends	344
8.6	Checking and adjusting track rod length	344
8.7	Allocation of track rod ball joints	345
9	Assembly overview: hydraulic power steering	346
9.1	Removing and installing power-assisted steering rack	347
10	Repairing hydraulic power-assisted steering rack	353
10.1	Assembly overview: power-assisted steering rack	353
10.2	Removing and installing track rod	354
10.3	Removing and installing track rod ball joint	357
10.4	Removing and installing boot	358
10.5	Checking play, security and boots of track rod ends	360
10.6	Checking and adjusting left track rod length	360
10.7	Allocation of track rod ball joints	361
11	Vane pump, 4-cylinder petrol engine	362
11.1	Assembly overview: vane pump, 4-cylinder petrol engine	362
11.2	Removing and installing vane pump, 4-cylinder petrol engine	363
12	Vane pump, 5-cylinder petrol engine	366



12.1	Checking vane pump delivery pressure, 5-cylinder petrol engine	366
12.2	Assembly overview: vane pump, 5-cylinder petrol engine	369
12.3	Removing and installing vane pump, 5-cylinder petrol engine	370
13	Assembly overview: hydraulic lines, 4-cylinder petrol engine	374
14	Assembly overview: hydraulic lines, 5-cylinder petrol engine	376
15	Assembly overview: power steering reservoir, 4-cylinder petrol engine	378
16	Assembly overview: power steering reservoir, 5-cylinder petrol engine	379
17	Checking power steering fluid level	380
18	Bleeding steering system and checking for leaks	381
18.1	Bleeding steering system	381
18.2	Check steering system for leaks	381