



## Contents

<b>00 - Technical data</b>	<b>1</b>
<b>1 Safety information</b>	<b>1</b>
1.1 Safety measures when working on vehicles with a start/stop system	1
1.2 Safety precautions when using testers and measuring instruments during a road test	1
1.3 Operation and safety notes for gas discharge lamps	2
<b>2 General information</b>	<b>4</b>
<b>3 Repair instructions</b>	<b>5</b>
3.1 Contact corrosion	5
3.2 Routing and attachment of lines	5
<b>27 - Starter, current supply, CCS</b>	<b>6</b>
<b>1 Battery</b>	<b>6</b>
1.1 General description - battery	6
1.2 Assembly overview - battery	6
1.3 Disconnecting and connecting battery	8
1.4 Removing and installing battery	12
1.5 Checking battery	17
1.6 Charging battery	18
<b>2 Starter motor</b>	<b>19</b>
2.1 Assembly overview - starter	19
2.2 Removing and installing starter motor	20
2.3 Checking starter	49
<b>3 Alternator</b>	<b>51</b>
3.1 Assembly overview - alternator	51
3.2 Removing and installing alternator	65
3.3 Checking alternator	93
3.4 Repairing alternator	94
3.5 Checking poly V-belt	101
<b>4 Cruise control system (CCS)</b>	<b>102</b>
<b>5 Start/stop system</b>	<b>103</b>
5.1 General description - start/stop system	103
5.2 Removing and installing start-stop operation button	104
5.3 Removing and installing voltage stabiliser	104
5.4 Removing and installing battery monitoring control unit	108
<b>90 - Gauges, instruments</b>	<b>109</b>
<b>1 Dash panel insert</b>	<b>109</b>
1.1 General description - dash panel insert	109
1.2 Renewing dash panel insert	110
1.3 Removing and installing dash panel insert	110
1.4 Connector pin assignment - dash panel insert	111
1.5 Warning lamp symbols in dash panel insert	111
1.6 Coding dash panel insert	112
<b>2 Horn</b>	<b>113</b>
2.1 Removing and installing treble horn and bass horn	113
2.2 Checking treble horn and bass horn	113
<b>92 - Windscreen wash/wipe system</b>	<b>114</b>
<b>1 windscreen wiper system.</b>	<b>114</b>
1.1 Moving wipers to service position	114
1.2 Deactivating APP function of windscreen wiper motor	114
1.3 Removing and installing wiper arms	115



1.4	Removing and installing wiper frame with linkage and wiper motor	116
1.5	Removing and installing wiper motor	118
1.6	Removing and installing wiper blades	119
1.7	Renewing windscreen wiper rubber	120
1.8	Adjusting windscreen wiper park position	121
1.9	Removing and installing rain and light sensor	122
1.10	Coding rain and light sensor	125
<b>2</b>	<b>Windscreen washer system</b>	<b>126</b>
2.1	Assembly overview - windscreen washer system	126
2.2	Removing and installing washer fluid reservoir	128
2.3	Removing and installing filler pipe for washer fluid reservoir	131
2.4	Removing and installing windscreen and rear window washer pump V59	131
2.5	Removing and installing windscreen washer fluid level sender G33	133
2.6	Removing and installing windscreen spray jets	135
2.7	Adjusting windscreen washer system spray jets	135
<b>3</b>	<b>Rear window wiper system</b>	<b>137</b>
3.1	Assembly overview - rear window wiper system	137
3.2	Removing and installing rear window wiper arm	139
3.3	Removing and installing rear window wiper motor	141
3.4	Adjusting rear window wiper park position	143
3.5	Removing and installing rear window wiper blade	144
3.6	Renewing rear window wiper rubber	145
<b>4</b>	<b>Rear window washer system</b>	<b>148</b>
4.1	Assembly overview - rear window washer system	148
4.2	Removing and installing rear window spray jet	152
4.3	Adjusting spray jet for rear window washer system	152
<b>5</b>	<b>Headlight washer system</b>	<b>153</b>
5.1	General description - headlight washer system	153
5.2	Assembly overview - headlight washer system	154
5.3	Removing and installing headlight washer system pump V11	155
5.4	Removing and installing spray jet pop-up cylinders	156
5.5	Removing and installing spray jet retainer	159
5.6	Adjusting headlight washer system spray jets	160
5.7	Bleeding headlight washer system	161
<b>6</b>	<b>Washer fluid line hose couplings</b>	<b>162</b>
<b>7</b>	<b>Hose repair</b>	<b>163</b>
<b>94</b>	<b>Lights, bulbs, switches - exterior</b>	<b>164</b>
<b>1</b>	<b>Headlights</b>	<b>165</b>
1.1	Assembly overview - headlight	166
1.2	Removing and installing headlight	174
1.3	Adjusting headlights	182
1.4	Adjusting headlight installation position	183
1.5	Removing and installing front turn signal bulb M5 / M7	188
1.6	Removing and installing bulb for daytime running light and side light	193
1.7	Removing and installing daytime running light and main beam bulb	195
1.8	Removing and installing side light bulb M1 / M3	196
1.9	Removing and installing main beam and dipped beam bulb	199
1.10	Removing and installing dipped beam bulb M29 / M31	201
1.11	Removing and installing main beam bulb M30 / M32	204
1.12	Removing and installing bulb for static cornering light M51/M52	206
1.13	Removing and installing gas discharge bulb L13 / L14	208
1.14	Removing and installing LED modules for daytime running light and side light L176 / L177	210
1.15	Removing and installing dynamic cornering light control motor V318 / V319	210



1.16	Removing and installing swivel module position sensor G475 / G474	211
1.17	Removing and installing dipped beam screen	211
1.18	Removing and installing gas discharge bulb control unit J343 / J344	211
1.19	Removing and installing output module for headlight J667 / J668	213
1.20	Removing and installing control unit for daytime running light and side light J860 / J861	215
1.21	Removing and installing cornering light and headlight range control unit J745	216
1.22	Coding cornering light and headlight range control unit J745	217
1.23	Headlight conversion for left-hand/right-hand traffic	218
1.24	Removing and installing headlight range control motor V48 / V49	233
1.25	Removing and installing front left vehicle level sender G78	236
1.26	Removing and installing rear left vehicle level sender G76	238
1.27	Installing repair kit for headlight housing	240
<b>2</b>	<b>Fog lights</b>	<b>251</b>
2.1	Removing and installing fog light	251
2.2	Removing and installing fog light bulb	253
2.3	Adjusting fog lights	253
<b>3</b>	<b>Side turn signals</b>	<b>254</b>
3.1	Removing and installing side turn signals	254
3.2	Removing and installing turn signal light bulb	255
<b>4</b>	<b>Tail lights</b>	<b>257</b>
4.1	Assembly overview - tail light	257
4.2	Removing and installing tail light	258
4.3	Removing and installing tail light bulb carrier	261
<b>5</b>	<b>High-level brake light</b>	<b>263</b>
5.1	Removing and installing additional brake light	263
5.2	Removing and installing additional brake light bulb/LEDs	264
<b>6</b>	<b>Number plate light</b>	<b>265</b>
6.1	Removing and installing number plate light	265
6.2	Removing and installing bulb for number plate light	266
<b>7</b>	<b>Steering column switch module, vehicles up to model year 2010</b>	<b>267</b>
7.1	General description - steering column switch module, vehicles up to model year 2010	267
7.2	Assembly overview - steering column switch module, vehicles up to model year 2010	268
7.3	Components of steering column switch module - removal and installation sequence	269
7.4	Removing and installing steering column electronics control unit J527	270
7.5	Removing and installing coil connector F350	271
7.6	Removing and installing turn signal switch E2	273
7.7	Removing and installing windscreen wiper switch E	274
7.8	Removing and installing steering column switch module base	276
7.9	Coding steering column electronics control unit	277
7.10	Steering column electronics control unit - final control diagnosis	278
<b>8</b>	<b>Steering column switch module, vehicles as of model year 2011</b>	<b>279</b>
8.1	General description - steering column switch module, vehicles as of model year 2011	279
8.2	Assembly overview - steering column switch module, vehicles as of model year 2011	280
8.3	Components of steering column switch module - removal and installation sequence	281
8.4	Removing and installing steering column electronics control unit J527	282
8.5	Steering column combination switch E595	285
8.6	Steering column switch module base	287
8.7	Coding steering column electronics control unit J527	290
<b>9</b>	<b>Rear parking aid</b>	<b>291</b>
9.1	General description - rear parking aid system	291
9.2	Assembly overview - rear parking aid system	292
9.3	Removing and installing rear parking aid control unit	293
9.4	Adapting rear parking aid control unit	294
9.5	Removing and installing rear parking aid senders	294



9.6	Removing and installing parking aid system warning buzzer	295
<b>10</b>	<b>Park assist steering</b>	<b>296</b>
10.1	General description - park assist steering	296
10.2	Assembly overview - park assist steering	298
10.3	Removing and installing parking aid control unit J446	300
10.4	Coding parking aid control unit J446	301
10.5	Adapting parking aid control unit J446	301
10.6	Removing and installing front parking aid senders	302
10.7	Removing and installing rear parking aid senders	304
10.8	Removing and installing front park assist steering sender	307
10.9	Removing and installing rear park assist steering sender	310
10.10	Renewing parking aid sender or park assist steering sender	312
10.11	Renewing retainers for parking aid senders or park assist steering senders	313
10.12	Removing and installing park assist steering button E581	317
10.13	Removing and installing parking aid button E266	318
10.14	Removing and installing front parking aid warning buzzer	318
10.15	Removing and installing rear parking aid warning buzzer	319
10.16	Adapting parking aid warning buzzer	319
<b>11</b>	<b>Towing bracket</b>	<b>321</b>
11.1	General description - towing bracket	321
11.2	Removing and installing trailer socket U10	321
11.3	Pin assignment of trailer socket U10	324
11.4	Removing and installing trailer detector control unit	325
<b>96</b>	<b>Lights, bulbs, switches - interior</b>	<b>327</b>
<b>1</b>	<b>Lights and controls in the dash panel</b>	<b>327</b>
1.1	Removing and installing light switch	327
1.2	Removing and installing headlight range control regulator and switch and instrument illumination regulator	328
1.3	Removing and installing front passenger side airbag deactivated warning lamp	329
1.4	Removing and installing hazard warning light switch E229	330
1.5	Removing and installing key-operated switch to deactivate front passenger side airbag	331
<b>2</b>	<b>Lights and controls in front doors</b>	<b>332</b>
2.1	Removing and installing front left window regulator switch	332
2.2	Removing and installing front right window regulator switch	333
2.3	Removing and installing switch for exterior mirror adjustment and button for central locking, driver side	334
2.4	Removing and installing door contact switch	335
<b>3</b>	<b>Lights and controls in sliding doors</b>	<b>336</b>
3.1	Removing and installing contact strip in left sliding door	336
3.2	Removing and installing contact strip in right sliding door	338
3.3	Removing and installing rear door contact switches	338
<b>4</b>	<b>Lights and controls in the centre console</b>	<b>340</b>
4.1	Removing and installing buttons in centre console storage compartment	340
<b>5</b>	<b>Lights and controls in luggage compartment</b>	<b>342</b>
5.1	Removing and installing luggage compartment light	342
5.2	Removing and installing bulb for luggage compartment light	343
5.3	Removing and installing luggage compartment light switch F5	344
5.4	Removing and installing central locking switch in left wing door F213	344
5.5	Removing and installing rear door contact switches	344
5.6	Removing and installing rear lid release switch E165	344
<b>6</b>	<b>Lights and controls in the roof trim</b>	<b>345</b>
6.1	Removing and installing front interior light , vehicles as of 06.07	345
6.2	Removing and installing bulb for front interior light , vehicles as of 06.07	346



6.3	Removing and installing front interior light , driver side reading light and front passenger reading light	346
6.4	Removing and installing bulb for front interior light	348
6.5	Removing and installing bulb for front reading light	349
6.6	Removing and installing left centre reading lamp and right centre reading lamp	350
6.7	Removing and installing rear left interior light and rear right interior light	350
6.8	Removing and installing bulbs for centre reading lights and rear interior lights	351
6.9	Removing and installing vanity mirror light	352
6.10	Removing and installing light for vanity mirror	353
<b>7</b>	<b>Lights and controls in engine compartment</b>	<b>354</b>
7.1	Removing and installing bonnet contact switch	354
<b>8</b>	<b>Other interior lights and controls</b>	<b>355</b>
8.1	Removing and installing interior monitoring deactivation switch and deactivation button for vehicle inclination sender	355
<b>9</b>	<b>Cigarette lighter and 12 V socket</b>	<b>357</b>
9.1	Removing and installing cigarette lighter U1	357
9.2	Removing and installing 12 V socket	357
<b>10</b>	<b>Immobiliser</b>	<b>359</b>
10.1	General description - immobiliser	359
10.2	Removing and installing immobiliser control unit	359
10.3	Removing and installing immobiliser reader coil	359
10.4	Removing and installing ignition key variable code transponder	360
10.5	Adapting ignition keys to the immobiliser	360
10.6	Adapting ignition keys to the convenience system	360
<b>11</b>	<b>Anti-theft alarm (ATA)</b>	<b>362</b>
11.1	General description - anti-theft alarm system (ATA)	362
11.2	Removing and installing interior monitoring deactivation switch and deactivation button for vehicle inclination sender	363
11.3	Removing and installing interior monitoring sensor	363
11.4	Removing and installing vehicle inclination sender	364
11.5	Removing and installing central locking and anti-theft alarm system aerial	364
11.6	Removing and installing alarm horn	365
11.7	Reading alarm sources of anti-theft alarm	365
<b>12</b>	<b>Ignition/starter switch and lock cylinder.</b>	<b>367</b>
12.1	Removing and installing ignition/starter switch	367
12.2	Checking ignition/starter switch	370
12.3	Removing and installing lock cylinder	371
12.4	Removing and installing steering lock housing	375
12.5	Removing and installing ignition key withdrawal lock solenoid	376
<b>97 - Wiring</b>		<b>378</b>
<b>1</b>	<b>Relay carriers, fuse holders, electronics boxes</b>	<b>378</b>
1.1	Overview of fitting locations - relay carriers, fuse holders, E-boxes	378
1.2	Removing and installing fuse holder on left beneath dash panel	379
1.3	Removing and installing relay carrier on left of dash panel	379
1.4	Removing and installing relay carrier on onboard supply control unit	380
1.5	Removing and installing electronics box on left side of engine compartment	383
<b>2</b>	<b>Select Control units</b>	<b>388</b>
2.1	Removing and installing onboard supply control unit , vehicles up to model year 2010	388
2.2	Removing and installing onboard supply control unit , vehicles as of model year 2011	391
2.3	Removing and installing data bus diagnostic interface	396
2.4	Removing and installing convenience system central control unit	398
2.5	Removing and installing special vehicle control unit	401
<b>3</b>	<b>Connectors</b>	<b>410</b>
3.1	Repairing electrical wiring harnesses and plug-in connections	410



3.2	Converting airbag and belt tensioner wire .....	410
4	<b>Renewing Lambda probe .....</b>	<b>414</b>
5	<b>Vehicle diagnosis, testing and information systems .....</b>	<b>415</b>