

Contents

00 - Technical data	1
1 Safety precautions	1
1.1 Safety precautions when working on the high-voltage system	1
1.2 Safety precautions when working in the vicinity of high-voltage components	2
1.3 Safety precautions when working on vehicles with start/stop system	2
1.4 Safety precautions when using testers and measuring instruments during a road test	2
1.5 Safety precautions when handling gas discharge bulbs	2
2 Repair instructions	4
2.1 Rules for cleanliness	4
2.2 General notes	4
2.3 Contact corrosion	4
2.4 ESD (electrostatic discharge) workplace	5
2.5 Routing and attachment of lines and wiring	5
3 Battery	6
3.1 Battery - general notes	6
3.2 Battery types	6
27 - Starter, current supply, CCS	7
1 Battery	7
1.1 Exploded view - battery	7
1.2 Disconnecting and connecting battery	12
1.3 Removing and installing earth cable with battery monitor control unit J367	18
1.4 Removing and installing battery	22
1.5 Checking battery	37
1.6 Charging battery	37
1.7 Removing and installing battery cut-off relay/battery isolation igniter	38
2 Jump-start terminal	39
2.1 Exploded view - jump-start terminal	39
2.2 Removing and installing jump-start terminal	41
3 Alternator	46
3.1 Exploded view - alternator	46
3.2 Removing and installing alternator	50
3.3 Checking alternator	70
4 Starter	71
4.1 Exploded view - starter	71
4.2 Removing and installing starter	73
5 Start/stop system	93
5.1 Overview of fitting locations - start/stop system	93
5.2 Removing and installing voltage stabiliser	94
6 Adaptive cruise control	95
6.1 Overview of fitting locations - adaptive cruise control	95
6.2 Removing and installing adaptive cruise control unit	96
6.3 Calibrating adaptive cruise control	100
90 - Gauges, instruments	101
1 Dash panel insert	101
1.1 Exploded view - dash panel insert	101
1.2 Exploded view - head-up display	103
1.3 Removing and installing dash panel insert with control unit in dash panel insert J285	103
1.4 Pin assignment on multi-pin connectors in dash panel insert	106
1.5 Pin assignment on fuel gauge senders	107
1.6 Pin assignment on coolant temperature sender	108



1.7	Removing and installing ambient temperature sensor	108
1.8	Removing and installing control unit for head-up display	109
1.9	Calibrating control unit for head-up display	110
2	Horn	112
2.1	Exploded view - horn	112
2.2	Removing and installing treble horn H2/bass horn H7	115
92	- Windscreen wash/wipe system	118
1	Windscreen wiper system	118
1.1	Overview of fitting locations - windscreen wiper system	118
1.2	Exploded view - windscreen wiper system	119
1.3	Moving windscreen wipers to service position	121
1.4	Removing and installing wiper blade	121
1.5	Removing and installing wiper arms	122
1.6	Adjusting wiper arms	124
1.7	Removing and installing wiper motor V	125
1.8	Renewing windscreen wiper motor	127
1.9	Removing and installing rain and light sensor	127
2	Windscreen washer system	138
2.1	Exploded view - windscreen washer system	138
2.2	Removing and installing washer fluid reservoir	140
2.3	Removing and installing windscreen washer fluid level sender	143
2.4	Removing and installing washer pump	144
2.5	Removing and installing washer jets	145
2.6	Adjusting washer jets	145
3	Rear window wiper system	147
3.1	Overview of fitting locations - rear window wiper system	147
3.2	Exploded view - rear window wiper system	147
3.3	Removing and installing wiper blade	148
3.4	Removing and installing wiper arm	149
3.5	Adjusting wiper arm	150
3.6	Removing and installing rear window wiper motor V12	151
4	Rear window washer system	153
4.1	Exploded view - rear window washer system	153
4.2	Removing and installing washer fluid reservoir	153
4.3	Removing and installing rear window washer pump	154
4.4	Removing and installing washer jet	154
4.5	Adjusting washer jet	154
5	Headlight washer system	156
5.1	Exploded view - headlight washer system	156
5.2	Removing and installing washer fluid reservoir	157
5.3	Removing and installing headlight washer system pump V11	157
5.4	Removing and installing washer jets	158
5.5	Adjusting washer jets	160
6	Washer fluid hoses	161
94	- Lights, bulbs, switches - exterior	162
1	Headlights	163
1.1	Exploded view - headlights	163
1.2	Removing and installing headlights	176
1.3	Adjusting headlights	185
1.4	Calibrating headlights	214
1.5	Removing and installing front turn signal bulb M5/M7	224
1.6	Removing and installing side light bulb M1/M3	227
1.7	Removing and installing headlight dipped beam bulb	228

1.8	Removing and installing daytime running light bulb L174/L175, headlight main beam bulb M30/M32 - halogen headlights	229
1.9	Removing and installing gas discharge bulb L13/L14	230
1.10	Removing and installing LED module for daytime running light and side light L176/L177	232
1.11	Removing and installing cornering light bulb	232
1.12	Removing and installing dip beam screen motor V294/V295	235
1.13	Removing and installing dynamic cornering light control motor V318/V319	235
1.14	Removing and installing gas discharge bulb control unit J343/J344	236
1.15	Removing and installing control unit for daytime running light and side light J860/J861	240
1.16	Removing and installing output module for headlight J667/J668	242
1.17	Removing and installing output module for headlight	244
1.18	Removing and installing headlight range control motor V48/V49	254
1.19	Removing and installing headlight fan	264
1.20	Installing repair kit for headlight housing	269
1.21	Adapting headlights for driving on the left side of the road	271
1.22	Adapting headlights for driving on the right side of the road	272
2	Fog lights	273
2.1	Exploded view - fog light	273
2.2	Removing and installing fog lights	274
2.3	Removing and installing fog light bulb L22/L23	274
2.4	Adjusting fog lights	275
3	Daytime running lights	277
3.1	Removing and installing daytime running light bulb L174/L175, headlight main beam bulb M30/M32 - halogen headlights	277
3.2	Removing and installing LED module for daytime running light and side light L176/L177	277
3.3	Exploded view - signature lighting	277
3.4	Removing and installing signature lighting	278
3.5	Removing and installing light for signature lighting L275/L276	280
4	Lights in exterior mirror	281
4.1	Exploded view - lights in exterior mirror	281
4.2	Removing and installing exterior mirror turn signal bulb L131/L132	282
5	Lights in exterior door handle	284
5.1	Exploded view - lights in exterior door handle	284
5.2	Removing and installing exterior door handle illumination bulb	284
6	Lights in sill panel moulding	289
6.1	Overview - entry lights	289
6.2	Removing and installing entry light	289
7	Tail light cluster	291
7.1	Exploded view - tail light cluster on body	291
7.2	Exploded view - tail light cluster on rear lid	296
7.3	Removing and installing tail light cluster	302
7.4	Removing and installing tail light cluster on rear lid	304
7.5	Removing and installing bulb carrier	309
7.6	Correcting installation position of tail light cluster	312
7.7	Removing and installing rear fog light bulb L46/L47	314
7.8	Removing and installing reversing light bulb	315
8	High-level brake light	316
8.1	Exploded view - high-level brake light	316
8.2	Removing and installing high-level brake light bulb	318
9	Number plate light	321
9.1	Overview of fitting locations - number plate light	321
9.2	Removing and installing number plate light X4/X5	323
10	Entry and start authorisation	324
10.1	Overview of fitting locations - entry and start authorisation system	324
10.2	Overview of fitting locations - keyless entry system	326

10.3	Exploded view - exterior door handle for keyless entry system	330
10.4	Exploded view - rear lid power opening senders	331
10.5	Removing and installing front exterior door handle switches	332
10.6	Removing and installing rear exterior door handle switches	334
10.7	Removing and installing aerial for entry and start system	336
10.8	Removing and installing rear lid power opening control unit J938	339
10.9	Removing and installing rear lid power opening sender G750/G760	340
11	Steering column switch module	343
11.1	Exploded view - steering column switch module	343
11.2	Removing and installing steering column switch module	345
11.3	Removing and installing steering column electronics control unit J527	346
11.4	Removing and installing steering column combination switch	348
11.5	Pin assignment on steering column electronics control unit	348
12	Parking aid	350
12.1	Overview - parking aid	350
12.2	Removing and installing parking aid control unit J446	352
12.3	Removing and installing front parking aid warning buzzer H22	353
12.4	Removing and installing rear parking aid warning buzzer H15	354
12.5	Removing and installing front parking aid senders	354
12.6	Removing and installing rear parking aid senders	356
13	Park assist steering	359
13.1	Overview - park assist steering	359
13.2	Removing and installing park assist steering control unit J791	359
13.3	Removing and installing front sender	360
13.4	Removing and installing rear sender	361
14	Automatic headlight range control	362
14.1	Overview - automatic headlight range control	362
14.2	Removing and installing headlight range control unit	363
96	Lights, bulbs, switches - interior	364
1	Lights	365
1.1	Overview of fitting locations - lights in dash panel	366
1.2	Overview of fitting locations - lights in front doors	366
1.3	Overview of fitting locations - lights in rear doors	367
1.4	Overview of fitting locations - background lighting in doors	368
1.5	Overview of fitting locations - lights in centre console	369
1.6	Overview of fitting locations - lights in luggage compartment	371
1.7	Overview of fitting locations - lights in roof trim	372
1.8	Removing and installing glove compartment light W6	374
1.9	Renewing bulb for glove compartment light W6	374
1.10	Removing and installing footwell illumination bulb (front) L151/L152	375
1.11	Removing and installing central locking SAFELOCK function warning lamp K133	376
1.12	Removing and installing door opener illumination bulb L108/L109	376
1.13	Removing and installing front entry light W31/W32	377
1.14	Removing and installing door warning lamp W30/W36	378
1.15	Removing and installing door opener illumination bulb L110/L111	379
1.16	Removing and installing rear entry light W33/W34	380
1.17	Removing and installing rear door warning lamp W37/W38	381
1.18	Removing and installing front door background lighting bulb L164/L165	382
1.19	Removing and installing door storage compartment illumination bulb L160/L161	382
1.20	Removing and installing rear door background lighting bulb L166/L167	383
1.21	Removing and installing rear ashtray illumination bulb L48/L49	384
1.22	Removing and installing rear door storage compartment illumination bulb L170/L171	384
1.23	Removing and installing selector lever position display Y26	385
1.24	Removing and installing bulb for illuminated centre armrest L157	385

1.25	Removing and installing light for rear centre console background lighting L197/L198	386
1.26	Removing and installing rear footwell light W45/W46	387
1.27	Removing and installing luggage compartment light W3	387
1.28	Removing and installing illuminated vanity mirror W20/W14	390
1.29	Renewing bulb for front interior light W1/W13/W19	391
1.30	Renewing bulb for rear interior light W47/W48	392
1.31	Removing and installing LED for background lighting	392
2	Controls	395
2.1	Overview of fitting locations - controls in dash panel	396
2.2	Overview of fitting locations - controls in front doors	398
2.3	Overview of fitting locations - controls in rear doors	400
2.4	Overview of fitting locations - controls in centre console	402
2.5	Overview of fitting locations - controls in luggage compartment	404
2.6	Overview of fitting locations - controls in roof trim	406
2.7	Removing and installing light switch E1	407
2.8	Removing and installing switch and instrument illumination regulator E20	408
2.9	Removing and installing headlight range control regulator E102	408
2.10	Removing and installing rear fog light button E314, fog light button E315, button for night vision system E680	408
2.11	Removing and installing steering column adjustment switch E167/steering wheel heater button E522	409
2.12	Removing and installing display unit button E462/E506	410
2.13	Removing and installing switches in dash panel	410
2.14	Removing and installing hazard warning lights button E229	412
2.15	Removing and installing buttons for seat heating E653/E654	412
2.16	Removing and installing valet parking button E536	413
2.17	Removing and installing glove compartment light switch E26	413
2.18	Removing and installing mirror adjustment switch E43/E168	414
2.19	Removing and installing operating unit for window regulator in driver door E512	415
2.20	Removing and installing window regulator switch in front passenger door E107	416
2.21	Removing and installing interior locking switch E150/E198	416
2.22	Removing and installing driver seat/front passenger seat memory operating unit E97/E277	417
2.23	Removing and installing rear lid remote release button E233/fuel tank flap release button E319	418
2.24	Removing and installing alarm system off switch E217	419
2.25	Removing and installing rear window regulator button in rear door	420
2.26	Removing and installing rear interior locking switch E273/E274	421
2.27	Removing and installing backrest adjustment button E425/button for longitudinal adjustment of front passenger seat E603	422
2.28	Removing and installing button for air ionisation system E677	423
2.29	Removing and installing electromechanical parking brake button E538/auto-hold button E540	424
2.30	Removing and installing entry and start authorisation button E408	424
2.31	Removing and installing heated rear seat switch with regulator E128/E129	425
2.32	Removing and installing button for cup holder E674/E675	426
2.33	Removing and installing contact switch for rear centre console background lighting F501	427
2.34	Removing and installing rear seat massage function button E409/E410	427
2.35	Removing and installing release button for rear lid lock cylinder F248	429
2.36	Removing and installing button to close rear lid in luggage compartment E406	432
2.37	Removing and installing rear lid warning buzzer H32	434
2.38	Removing and installing rear lid contact switch	434
2.39	Removing and installing contact switch for vanity mirror F147/F148	434
2.40	Removing and installing sunroof button E325	435
2.41	Removing and installing interior light/reading light (front)	435
2.42	Removing and installing interior light/reading light (rear)	437
2.43	Removing and installing front reading light button E633/E634	437

2.44	Removing and installing garage door operating unit E284	439
3	Further lights and controls in vehicle interior	440
3.1	Overview of fitting locations - further lights and controls in vehicle interior	440
3.2	Removing and installing humidity sender G355	442
4	Anti-theft alarm system	446
4.1	Overview - interior monitoring	446
4.2	Removing and installing alarm horn H12	450
4.3	Removing and installing anti-theft alarm sensor G578	451
5	Immobiliser	453
5.1	Removing and installing immobiliser reader coil	453
6	Lane change assist	455
6.1	Overview - lane change assist	455
6.2	Removing and installing button for lane change assist E530	456
6.3	Removing and installing lane change assist warning lamp in exterior mirror K233/K234	456
6.4	Removing and installing lane change assist control unit J769/J770	457
6.5	Calibrating lane change assist	457
7	Front camera for driver assist systems	468
7.1	Overview of fitting locations - front camera for driver assist systems	468
7.2	Removing and installing front camera for driver assist systems	469
7.3	Removing and installing image processing control unit J851	471
8	Towing bracket	473
8.1	Overview - trailer socket, trailer detector control unit	473
8.2	Removing and installing LED warning lamp	474
8.3	Trailer socket	474
8.4	Removing and installing trailer detector control unit J345	474
9	Cigarette lighter, socket	476
9.1	Exploded view - cigarette lighter, 12 V socket	476
9.2	Removing and installing cigarette lighter U1	479
9.3	Removing and installing socket illumination bulb L42	482
9.4	Removing and installing rear cigarette lighter illumination bulb L32	489
9.5	Removing and installing rear cigarette lighter U9	491
9.6	Removing and installing AC/DC converter with socket, 12 V - 230 V U13	494
9.7	Removing and installing 12 V socket 3 U19	497
9.8	Renewing 12 V socket 3 U19	497
97 - Wiring		500
1	Relay carriers, fuse carriers, electronics boxes	500
1.1	Overview of fitting locations - relay carriers, fuse carriers, electronics boxes	500
1.2	Removing and installing electronics box	514
1.3	Removing and installing relay and fuse holder in electronics box	517
1.4	Removing and installing suppression filter C24	523
1.5	Removing and installing wiring junction	524
1.6	Removing and installing fuse holders in dash panel	529
1.7	Removing and installing relay and fuse carrier behind dash panel (driver side)	533
1.8	Removing and installing relay and fuse holder in luggage compartment (right-side)	539
2	Control units	546
2.1	Overview of fitting locations - control units	546
2.2	Exploded view - data bus diagnostic interface	546
2.3	Removing and installing onboard supply control unit J519	547
2.4	Removing and installing garage door operation control unit	549
2.5	Removing and installing data bus diagnostic interface J533	549
3	Connectors	552
3.1	Overview of fitting locations - connectors	552
3.2	Removing and installing CAN separating connector	553

3.3	Unplugging door coupling point	555
3.4	Removing and installing connector point at A-pillar (left-side)	557
3.5	Removing and installing connector point at A-pillar (right-side)	558
3.6	Repairing electrical wiring harnesses and electrical connectors	559
4	Releasing and dismantling connector housings	560
5	Cleaning contact surfaces	561
6	Repairing aerial wires	562
7	Fibre optic cables	563
8	Vehicle diagnostic, testing and information systems	564