



Contents

27 - Starter, current supply, CCS	1
1 Battery	1
1.1 General description - battery	1
1.2 Disconnecting and connecting battery	1
1.3 Removing and installing battery	7
1.4 Removing and installing battery tray	11
1.5 Removing and installing battery isolation relay for additional battery	12
1.6 Removing and installing battery monitor control unit J367	13
1.7 Checking battery	13
1.8 Charging battery	13
2 Starter motor	14
2.1 Removing and installing starter motor	14
3 Alternator	21
3.1 Assembly overview - alternator	21
3.2 Removing and installing alternator	24
3.3 Checking alternator	30
3.4 Repairing alternator	31
3.5 Checking poly V-belt	37
4 Cruise control system (CCS)	39
5 Engine start/stop system, vehicles up to 05.2011	40
5.1 General description - engine start/stop system, vehicles up to 05.2011	40
5.2 Overview of fitting locations - engine start/stop system	41
5.3 Removing and installing main switch for start/stop system	42
5.4 Removing and installing clutch pedal switch	44
6 Engine start/stop system, vehicles as of 06.2011	45
6.1 General description - engine start/stop system, vehicles as of 06.2011	45
6.2 Removing and installing Start/Stop operation button E693	46
6.3 Removing and installing battery monitor control unit J367	47
6.4 Removing and installing battery regulation control unit J840	48
6.5 Removing and installing voltage stabiliser J532	49
90 - Gauges, instruments	51
1 Dash panel insert	51
1.1 General description - dash panel insert	51
1.2 Removing and installing dash panel insert	51
1.3 Pin assignment - dash panel insert	53
1.4 Warning lamp symbols in dash panel insert	53
1.5 Coding dash panel insert	60
1.6 Removing and installing ambient temperature sensor	60
2 Horn	62
2.1 Removing and installing horn or dual tone horn H1 , vehicles up to 2010	62
2.2 Removing and installing horn or dual tone horn H1 , vehicles as of 2011	63
3 Tachograph "DTCO 1381"	66
3.1 General description - tachograph "DTCO 1381"	66
3.2 Overview of fitting locations - tachograph "DTCO 1381"	68
3.3 Removing and installing tachograph "DTCO 1381"	68
3.4 Messages displayed on tachograph "DTCO 1381"	70
3.5 Connector pin assignment - tachograph "DTCO 1381"	72
3.6 Removing and installing tachograph sender	72
3.7 Renewing tachograph sender	74
92 - Windscreen wash/wipe system	77



1	windscreen wiper system.	77
1.1	Removing and installing wiper arms	77
1.2	Removing and installing wiper frame with linkage and wiper motor	78
1.3	Removing and installing wiper blade	80
1.4	Adjusting wiper blade park position	81
1.5	Removing and installing rain sensor	81
2	Windscreen washer system	84
2.1	Assembly overview - windscreen washer system	84
2.2	Removing and installing washer fluid reservoir	85
2.3	Removing and installing washer pump for windscreen washer system	86
2.4	Removing and installing windscreen washer system spray jets	87
2.5	Adjusting windscreen washer system spray jets	88
3	Rear window wiper system	89
3.1	Removing and installing rear window wiper arm	89
3.2	Removing and installing rear window wiper motor	90
3.3	Adjusting rear window wiper blade park position	92
3.4	Removing and installing rear window wiper blade	92
4	Rear window washer system	94
4.1	Removing and installing washer pump for rear window washer system	94
4.2	Removing and installing rear window spray jet	94
4.3	Adjusting spray jet for rear window washer system	95
5	Headlight washer system	96
5.1	Removing and installing headlight washer system pump	96
5.2	Removing and installing spray jet pop-up cylinders	96
5.3	Removing and installing spray jet retainer	99
5.4	Adjusting headlight washer system spray jets	100
6	Washer fluid line hose couplings	101
7	Hose repair	102
94	Lights, bulbs, switches - exterior	103
1	Headlights	103
1.1	Assembly overview - headlight	103
1.2	Removing and installing headlight	104
1.3	Adjusting headlights	107
1.4	Removing and installing front turn signal bulb	107
1.5	Removing and installing side light bulb	108
1.6	Removing and installing daytime running light bulb L174/L175 /side light bulb	109
1.7	Removing and installing headlight dipped beam bulb	111
1.8	Removing and installing headlight main beam bulb	112
1.9	Converting headlights for driving on the left or right	114
1.10	Removing and installing headlight range control motor	118
1.11	Installing repair kit for headlight housing	119
2	Fog lights	122
2.1	Removing and installing fog light	122
2.2	Removing and installing fog light bulb	123
2.3	Adjusting fog lights	123
3	Side turn signals	124
3.1	Removing and installing turn signal repeater in exterior mirror	124
3.2	Removing and installing turn signal repeater in wing	125
3.3	Removing and installing bulb for turn signal repeater in wing	128
3.4	Removing and installing roof-mounted turn signal repeater	129
3.5	Removing and installing bulb for roof-mounted turn signal repeater	130
4	Tail lights	132
4.1	Assembly overview - tail lights	132



4.2	Removing and installing tail light cluster	134
4.3	Removing and installing tail light bulbs	136
5	High-level brake light	138
5.1	Removing and installing high-level brake light	138
5.2	Removing and installing bulb for high-level brake light M25	139
6	Number plate light	140
6.1	Removing and installing number plate light, panel van or Kombi vehicles	140
6.2	Removing and installing bulb for number plate light, panel van or Kombi vehicles	140
7	Side marker light	142
7.1	Removing and installing side marker light	142
7.2	Removing and installing bulb for side marker light	142
8	Steering column switch module (SCSM)	144
8.1	Removing and installing steering column switch module (SCSM)	144
9	Parking aid	146
9.1	General description - parking aid system	146
9.2	Assembly overview – parking aid	146
9.3	Removing and installing parking aid control unit	148
9.4	Removing and installing front parking aid display and warning buzzer	149
9.5	Removing and installing rear parking aid warning buzzer	150
9.6	Removing and installing front parking aid senders	151
9.7	Removing and installing rear parking aid senders	152
9.8	Removing and installing display unit in exterior mirror	154
10	Tyre pressure monitoring (TPM)	155
10.1	General description - tyre pressure monitoring (TPM)	155
10.2	Removing and installing tyre pressure monitor control unit	156
10.3	Calibrating tyre pressure monitor control unit	157
10.4	Removing and installing tyre pressure sensor	157
11	Towing bracket	158
11.1	Removing and installing trailer detector control unit	158
12	Reversing warning sender	159
12.1	Removing and installing reverse warning sender	159
96	Lights, bulbs, switches - interior	160
1	Lights and controls in the dash panel	160
1.1	Removing and installing light switch	160
1.2	Removing and installing headlight range control regulator	162
1.3	Removing and installing controls in centre of dash panel	162
1.4	Removing and installing switch units on left and right next to steering wheel	164
1.5	Removing and installing glove compartment light	167
1.6	Removing and installing bulb for glove compartment light	168
2	Lights and controls in front doors	170
2.1	Removing and installing window regulator switch in front doors	170
3	Lights and controls in sliding doors	172
3.1	Removing and installing electric sliding door control unit	172
3.2	Removing and installing electric sliding door button in dash panel	172
3.3	Removing and installing electric sliding door button in B-pillar	173
3.4	Removing and installing electric sliding door warning buzzer	173
4	Lights and controls in the centre console	174
4.1	Removing and installing ashtray illumination bulb	174
5	Lights and controls in the roof trim	175
5.1	Removing and installing front interior light	175
5.2	Removing and installing bulb for front interior light	178
5.3	Removing and installing rear interior light	178
5.4	Removing and installing bulb for rear interior light	180



6	Lights and controls in engine compartment	182
6.1	Removing and installing bonnet contact switch	182
7	Other interior lights and controls	184
7.1	Removing and installing entry light	184
7.2	Removing and installing bulb for entry light	185
8	Horn plate	186
8.1	Removing and installing horn plate in steering wheel	186
9	Cigarette lighter, socket	188
10	Anti-theft alarm	189
10.1	General description - anti-theft alarm system	189
10.2	Overview of fitting locations - anti-theft alarm system	190
10.3	Removing and installing the roof electronics control unit	192
10.4	Renew roof electronics control unit	193
11	Immobiliser	194
11.1	General description of immobiliser	194
11.2	Online system test - immobiliser	194
11.3	Adapting immobiliser after renewal of various components	195
12	Front camera for assist systems	198
12.1	Removing and installing front camera for driver assist systems R242	198
12.2	Calibrating front camera for driver assist systems R242	199
13	Ignition/starter switch and lock cylinder.	200
13.1	Removing and installing electronic ignition lock D9	200
97 - Wiring		203
1	Relay carriers, fuse holders, electronics boxes	203
1.1	Overview of fitting locations - fuse holder and relay carrier	203
1.2	Removing and installing carrier for fuse holder B SB and fuse holder C SC	204
1.3	Removing and installing fuse holder D SD	204
1.4	Removing and installing fuse holder A SA	205
1.5	Relay carrier in seat console of front left seat	206
2	Select Control units	208
2.1	Removing and installing onboard supply control unit	208
2.2	Removing and installing control unit for special functions	209
2.3	Removing and installing door control unit	212
2.4	Removing and installing fuel pump control unit	212
2.5	Removing and installing air compressor protection control unit	213
3	Connectors	214
3.1	Repairing electrical wiring harnesses and plug-in connections	214
4	Renewing Lambda probe	215
5	Vehicle diagnosis, testing and information systems	216