

Contents

00 - Technical data	1
1 Safety information	1
1.1 Safety precautions when working on air conditioners	1
1.2 Safety precautions when handling refrigerants	1
1.3 Safety precautions when working on the high-voltage system	2
1.4 Safety precautions when working in the vicinity of high-voltage components	3
1.5 Safety precautions when using testers and measuring instruments during a road test	3
1.6 Safety precautions when working on the cooling system	4
2 Identification	5
2.1 Identification of heater and air conditioning unit	5
3 General notes	7
3.1 Type plates	7
3.2 Notes on odours in vehicles with air conditioner	7
4 Repair instructions	9
4.1 Rules for cleanliness	9
4.2 General notes	9
4.3 Contact corrosion	10
4.4 Routing and attachment of pipes, hoses and wiring	10
4.5 Installing radiators and condensers	10
4.6 Working on refrigerant circuit	10
4.7 Refrigerant circuit seals	11
4.8 Notes on high-voltage components and potential equalisation lines	11
4.9 Use of impact wrenches	12
4.10 Identification plates	12
5 Technical data	14
5.1 Refrigerant capacities	14
5.2 Approved refrigerant oils and refrigerant oil capacities	14
5.3 Oil distribution	18
80 - Heating	19
1 Safety information	19
2 Overview of fitting locations - heater	20
87 - Air conditioning system	21
1 Safety information	21
2 Overview of fitting locations - air conditioner	22
2.1 Overview of fitting locations - components not located in passenger compartment	22
2.2 Overview of fitting locations - components in front passenger compartment	24
2.3 Overview of fitting locations - components in rear passenger compartment	26
3 Refrigerant circuit	28
3.1 System overview - refrigerant circuit	28
3.2 Assembly overview - refrigerant lines	31
3.3 Assembly overview - condenser	46
3.4 Assembly overview - heat exchanger for high-voltage battery	47
3.5 Assembly overview - heat exchanger for heat pump operation	49
3.6 Removing and installing heat exchanger for heat pump operation with refrigerant receiver	51
3.7 Removing and installing refrigerant receiver	54
3.8 Removing and installing heat exchanger for high-voltage battery	57
3.9 Removing and installing refrigerant pressure and temperature sender G395	60
3.10 Removing and installing refrigerant pressure and temperature sender 2 G826	63
3.11 Removing and installing refrigerant shut-off valve V424	66
3.12 Removing and installing refrigerant lines with internal heat exchanger	68

3.13	Removing and installing refrigerant lines in plenum chamber	70
3.14	Removing and installing expansion valve	72
3.15	Removing and installing non-return valves in refrigerant circuit	74
3.16	Unfastening and assembling connection points in refrigerant lines	80
3.17	Disconnecting and attaching refrigerant lines	82
3.18	Removing and installing condenser	85
3.19	Detaching and attaching refrigerant lines at condenser	86
3.20	Removing and installing desiccant bag/desiccant cartridge	88
3.21	Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)	89
3.22	Starting up air conditioner after charging refrigerant circuit	91
3.23	Cleaning air conditioner refrigerant circuit - vehicles with high-voltage system	92
4	Heat pump valve unit	112
4.1	Assembly overview - heat pump valve unit	112
4.2	Removing and installing heat pump valve unit	115
4.3	Dismantling and assembling heat pump valve unit	121
4.4	Removing and installing refrigerant expansion valve 2 N637	124
5	Air conditioner compressor	129
5.1	Assembly overview - air conditioner compressor	129
5.2	Detaching and attaching air conditioner compressor at bracket	131
5.3	Detaching and attaching refrigerant lines at air conditioner compressor	132
5.4	Removing and installing air conditioner compressor	132
6	Control motors	137
6.1	Overview of fitting locations - front control motors	137
6.2	Assembly overview - front control motors	147
6.3	Assembly overview - rear control motors	162
6.4	General information and procedure for removing and installing control motors	163
6.5	Removing and installing fresh air flap control motor V438	164
6.6	Removing and installing defroster flap control motor V107	166
6.7	Removing and installing left footwell flap control motor V108	168
6.8	Removing and installing right footwell flap control motor V109	170
6.9	Removing and installing left centre vent control motor V110	172
6.10	Removing and installing right centre vent control motor V111	176
6.11	Removing and installing air recirculation flap control motor V113	180
6.12	Removing and installing rear temperature flap control motor V137 / rear left air quantity flap control motor V239	181
6.13	Removing and installing left temperature flap control motor V158	183
6.14	Removing and installing right temperature flap control motor V159	184
6.15	Removing and installing right B-pillar and footwell shut-off flap control motor V211 / left B-pillar and footwell shut-off flap control motor V212	186
6.16	Removing and installing left side vent control motor V299 - vehicles with PR number 9AQ	187
6.17	Removing and installing right side vent control motor V300 - vehicles with PR number 9AQ	189
6.18	Removing and installing rear air distribution flap control motor V427 / rear right air distribution control motor V594	191
6.19	Removing and installing rear left air distribution control motor V593	192
6.20	Removing and installing rear right air quantity flap control motor V240	194
6.21	Removing and installing brackets for control motors on front heater and air conditioning unit	196
7	Front heater and air conditioning unit	207
7.1	Assembly overview - heater and air conditioning unit	207
7.2	Assembly overview - attachments for front heater and air conditioning unit (air distribution housing, heat exchanger etc.)	208
7.3	Assembly overview - air intake box of heater and air conditioning unit	210
7.4	Assembly overview - evaporator housing	212
7.5	Removing and installing evaporator	214
7.6	Cleaning evaporator	216

7.7	Removing and installing auxiliary air heater element Z35	221
7.8	Removing and installing heater and air conditioning unit	225
7.9	Detaching and attaching air intake box at heater and air conditioning unit	228
7.10	Removing and installing dust and pollen filter	229
7.11	Removing and installing fresh air blower V2 with fresh air blower control unit J126	230
7.12	Removing and installing heat exchanger	231
7.13	Removing and installing condensation drain	237
7.14	Checking condensation drain	238
8	Air duct	239
8.1	Assembly overview - routing of air flow and air distribution in passenger compartment ..	239
8.2	Air intake and air outlet openings	241
8.3	Removing and installing air duct to dash panel vents (centre)	245
8.4	Removing and installing air duct for vent (defrost function)	246
8.5	Removing and installing footwell vent (driver side)	246
8.6	Removing and installing footwell vent (passenger side)	247
8.7	Removing and installing air duct for glove compartment cooling	247
8.8	Removing and installing air duct (rear)	248
8.9	Removing and installing air duct for rear vent	248
8.10	Removing and installing forced ventilation vents in passenger compartment	248
8.11	Checking forced ventilation vents in passenger compartment	249
8.12	Removing and installing cover for fresh air intake	249
8.13	Removing and installing leaf grille for fresh air intake	250
8.14	Removing and installing fresh air intake	250
8.15	Removing and installing plenum chamber water drain	251
8.16	Checking plenum chamber water drain	252
8.17	Cleaning plenum chamber water drain	253
9	Coolant circuit	254
9.1	Assembly overview - high-voltage heater (PTC) Z115	254
9.2	Assembly overview - high-voltage heater 2 (PTC) Z190	255
9.3	Removing and installing high-voltage heater (PTC) Z115	256
9.4	Removing and installing high-voltage heater 2 (PTC) Z190	260
10	Operating and display unit	269
10.1	Overview - operating and display unit	269
10.2	Removing and installing rear operating and display unit	269
11	Further control components	271
11.1	Removing and installing air quality sensor G238 / external air quality and air humidity sensor G935	271
11.2	Removing and installing ambient temperature sensor G17	272
11.3	Removing and installing front chest vent temperature sensor G385 / G386	273
11.4	Removing and installing left footwell vent temperature sender G261	274
11.5	Removing and installing right footwell vent temperature sender G262	274
11.6	Removing and installing evaporator output temperature sender G263	275
11.7	Removing and installing rear left chest vent temperature sender G635 / rear right chest vent temperature sender G636	275
11.8	Removing and installing vent temperature sender for rear left footwell G637 / vent temperature sender for rear right footwell G638	276
11.9	Removing and installing dash panel temperature sensor G56	277
11.10	Removing and installing humidity sender G355	277
11.11	Removing and installing thermal management control unit J1024	277
12	Air quality improvement system	278
12.1	Overview of fitting locations - air quality improvement system	278
12.2	Assembly overview - fragrance diffuser system	280
12.3	Removing and installing control unit for fragrance diffuser system J1101 with blower for fragrance diffuser system V686	282
12.4	Removing and installing function unit for fragrance diffuser system GX43	282
12.5	Removing and installing control motor for fragrance diffuser system V687	284

12.6	Removing and installing temperature sensor for fragrance diffuser system G1056	285
12.7	Removing and installing hoses for fragrance diffuser system	285
12.8	Removing and installing ioniser control unit J897	286
12.9	Removing and installing bracket for ioniser control unit J897	286
12.10	Removing and installing driver side ioniser J1105	286
12.11	Removing and installing passenger side ioniser J1106	287
12.12	Removing and installing air conditioner sensor for fine particle concentration G930	288