



Contents

00 - Technical data	1
1 Safety information	1
1.1 Safety precautions when working on air conditioning systems	1
1.2 Safety precautions when working on vehicles with a start/stop system	1
1.3 Safety precautions when working on high-voltage system	2
1.4 Safety precautions when working in the vicinity of high-voltage components	3
1.5 Safety precautions when using testing and measuring instruments during a road test	3
1.6 Safety precautions when working on the cooling system	3
1.7 Safety precautions when handling refrigerants	3
1.8 Safety precautions for working on vehicles with auxiliary heater	4
1.9 Safety precautions when working on SCR system	5
2 General information	7
2.1 Type plates	7
2.2 Notes concerning odours in air conditioned vehicles	8
3 Repair notes	9
3.1 Rules for cleanliness	9
3.2 General notes	9
3.3 General repair instructions	9
3.4 Contact corrosion	10
3.5 Nuts and bolts	10
3.6 Line routing and attachment	10
3.7 Fitting radiators and condensers	11
3.8 Checking cooling output	11
3.9 Working on refrigerant circuit	12
3.10 Refrigerant circuit seals	13
4 Technical data	15
4.1 Refrigerant capacity	15
4.2 Refrigerant oil capacities	15
4.3 Oil distribution	16
80 - Heating	17
1 Heating	17
87 - Air conditioning system	18
1 Overview of fitting locations - air conditioning system	18
1.1 Overview of fitting locations - components not located in passenger compartment	18
1.2 Overview of fitting locations - components located in front section of passenger compartment	19
2 Refrigerant circuit	21
2.1 System overview - refrigerant circuit	21
2.2 Assembly overview - refrigerant lines	23
2.3 Assembly overview - condenser	26
2.4 Assembly overview - heat exchanger for high-voltage battery	27
2.5 Removing and installing refrigerant circuit pressure sender G805	28
2.6 Removing and installing refrigerant pressure and temperature sender G395	30
2.7 Removing and installing refrigerant pressure and temperature sender 2 G826	33
2.8 Removing and installing refrigerant shut-off valve for heater and air conditioner unit N541	36
2.9 Removing and installing refrigerant line with internal heat exchanger	40
2.10 Removing and installing expansion valve	43
2.11 Removing and installing condenser	46
2.12 Separating and connecting refrigerant lines on condenser	50
2.13 Removing and installing desiccant bag or cartridge	52
2.14 Removing and installing evacuating and charging valves on low and high-pressure side	54



2.15	Commissioning air conditioning system after filling refrigerant circuit	56
2.16	Removing and installing refrigerant line from air conditioner compressor to condenser	57
2.17	Removing and installing refrigerant line from condenser to refrigerant lines with inner heat exchanger	60
2.18	Removing and installing refrigerant line from refrigerant line with inner heat exchanger to air conditioner compressor	62
2.19	Removing and installing refrigerant line in plenum chamber	65
2.20	Removing and installing leadthrough for refrigerant lines into plenum chamber	68
2.21	Detaching and assembling connections of refrigerant lines	71
2.22	Disconnecting and connecting refrigerant lines	73
2.23	Removing and installing heat exchanger for high-voltage battery	75
2.24	Removing and installing refrigerant expansion valve 1 N636	80
2.25	Commissioning air conditioning system after filling refrigerant circuit	83
3	Air conditioner compressor	85
3.1	Assembly overview - drive unit of air conditioner compressor	85
3.2	Assembly overview - pulley	91
3.3	Removing air conditioning compressor from and installing on bracket	92
3.4	Removing and installing air conditioner compressor	99
3.5	Removing and installing pulley	114
4	Control motors	121
4.1	Overview of fitting locations – front control motors	122
4.2	Assembly overview - front control motors	128
4.3	General notes and procedure for removal and installation of control motors	134
4.4	Removing and installing defroster flap control motor V107	135
4.5	Removing and installing left footwell flap control motor V108	138
4.6	Removing and installing right footwell flap control motor V109	140
4.7	Removing and installing left centre vent control motor V110	143
4.8	Removing and installing right centre vent control motor V111	145
4.9	Removing and installing air recirculation flap control motor V113	147
4.10	Removing and installing rear temperature flap control motor V137	149
4.11	Removing and installing left temperature flap control motor V158	151
4.12	Removing and installing right temperature flap control motor V159	153
4.13	Removing and installing right B-pillar and footwell shut-off flap control motor V211	156
4.14	Removing and installing left B-pillar and footwell shut-off flap control motor V212	157
4.15	Removing and installing left side vent control motor V299	159
4.16	Removing and installing right side vent control motor V300	161
4.17	Removing and installing rear left temperature flap control motor V313	163
4.18	Removing and installing rear right temperature flap control motor V314	165
4.19	Removing and installing rear left chest vent control motor V315	167
4.20	Removing and installing rear right chest vent control motor V316	168
4.21	Removing and installing rear air distribution control motor V427	170
4.22	Removing and installing fresh air flap control motor V438	172
4.23	Removing and installing rear left air distribution control motor V593	174
4.24	Removing and installing rear right air distribution control motor V594	176
4.25	Removing and installing control motor bracket	177
5	Front heater and air conditioning unit	194
5.1	Assembly overview - add-on parts of heater and air conditioning unit and of air intake box	194
5.2	Assembly overview – heater and air conditioning unit	196
5.3	Assembly overview - air intake box of heater and air conditioning unit	196
5.4	Assembly overview – evaporator housing	197
5.5	Removing and installing evaporator	198
5.6	Removing and installing auxiliary air heater element Z35	198
5.7	Removing and installing heater and air conditioning unit	201
5.8	Dismantling and assembling heater and air conditioning unit	207
5.9	Removing and installing air distribution housing	210
5.10	Removing and installing dust and pollen filter	210



5.11	Removing and installing fresh air blower V2	211
5.12	Removing and installing fresh air blower control unit J126	212
5.13	Removing and installing heat exchanger	213
5.14	Removing and installing coolant pipes on heat exchanger	223
5.15	Removing and installing evaporator temperature sensor G308	224
5.16	Removing and installing condensation drain	225
5.17	Checking condensation drain	227
6	Air duct	228
6.1	Assembly overview - air duct and air distribution in passenger compartment	228
6.2	Assembly overview - rear air distribution housing	234
6.3	Air intake and air outlet openings	235
6.4	Removing and installing driver side footwell vents	237
6.5	Removing and installing front passenger side footwell vents	237
6.6	Removing and installing air ducts	239
6.7	Removing and installing forced ventilation for passenger compartment	250
6.8	Checking forced ventilation for passenger compartment	252
6.9	Removing and installing fresh air intake	252
6.10	Removing and installing water drain of plenum chamber	254
6.11	Checking water drain of plenum chamber	255
6.12	Removing and installing air duct for defroster vent	255
6.13	Removing and installing rear air distribution housing	256
6.14	Removing and installing cold air hose of glove compartment	257
6.15	Removing and installing connection for cold air hose of glove compartment	258
6.16	Removing and installing valve for cold air hose of glove compartment	259
7	Coolant circuit	260
7.1	Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)	260
7.2	Bleeding coolant circuit	266
8	Operating and display unit	268
8.1	Overview of operating and display unit	268
8.2	Removing and installing operating and display unit	272
9	Other controlling and regulating components	275
9.1	Removing and installing ambient temperature sensor G17	275
9.2	Removing and installing left footwell vent temperature sender G261	276
9.3	Removing and installing right footwell vent temperature sender G262	276
9.4	Removing and installing rear left footwell temperature sensor G309	277
9.5	Removing and installing rear right footwell temperature sensor G310	277
9.6	Removing and installing air humidity, rain and light sensor G823	277
9.7	Removing and installing temperature sensor for left side vent G911	278
9.8	Removing and installing temperature sensor for right side vent G912	278
9.9	Removing and installing temperature sender 1 in dash panel temperature sensor G922	279
9.10	Removing and installing external air quality and humidity sensor G935	279
9.11	Removing and installing thermal management control unit J1024	280