

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 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 working on the cooling system	2
2 General notes	3
2.1 Type plates	3
2.2 Notes on odours in vehicles with air conditioner	5
2.3 Notes on operation of auxiliary/supplementary heater on vehicles with diesel engine	6
2.4 Seat heating	10
3 Identification	16
3.1 Identification of heater and air conditioning unit	16
4 Repair instructions	19
4.1 Rules for cleanliness	19
4.2 General notes	19
4.3 Contact corrosion	20
4.4 Routing and attachment of pipes, hoses and wiring	20
4.5 Installing radiators and condensers	20
4.6 Checking heating output	21
4.7 Checking cooling output	37
4.8 Working on refrigerant circuit	54
4.9 Paintwork repairs on vehicles with air conditioning system	55
4.10 Gaskets, seals	55
4.11 Notes on control motors	56
4.12 Use of impact wrenches	58
4.13 Identification plates	59
5 Technical data	60
5.1 Refrigerant capacities	60
5.2 Approved refrigerant oils and refrigerant oil capacities	62
5.3 Oil distribution	67
80 - Heating	68
1 Overview of fitting locations - heater	68
1.1 Overview of fitting locations - components not located in passenger compartment	68
1.2 Overview of fitting locations - components in front passenger compartment	70
1.3 Heater	71
1.4 Air duct system	75
1.5 Operating and display unit	76
1.6 Further control components	77
87 - Air conditioning system	79
1 Overview of fitting locations - air conditioner	79
1.1 Overview of fitting locations - components not located in passenger compartment	79
1.2 Overview of fitting locations - components in front passenger compartment	86
2 Refrigerant circuit	97
2.1 System overview - refrigerant circuit	97
2.2 Assembly overview - condenser, air conditioner compressor, refrigerant lines and expansion valve	101
2.3 Removing and installing pressure sender for refrigerant circuit G805	108
2.4 Checking cut-in signal for air conditioner compressor regulating valve N280	110



2.5	Additional weight at refrigerant line	115
2.6	Removing and installing expansion valve	115
2.7	Detaching and attaching refrigerant lines at condenser	117
2.8	Removing and installing condenser	121
2.9	Removing and installing desiccant cartridge	123
2.10	Removing and installing refrigerant lines with internal heat exchanger	134
2.11	Differences in service connections depending on refrigerant (R134a or R1234yf)	140
2.12	Removing and installing service connections (low and high-pressure sides)	142
2.13	Starting up air conditioner after charging refrigerant circuit	145
3	Air conditioner compressor	149
3.1	Assembly overview - drive unit for air conditioner compressor	149
3.2	Assembly overview - pulley	154
3.3	Detaching and attaching air conditioner compressor at bracket	159
3.4	Detaching and attaching refrigerant lines at air conditioner compressor	164
3.5	Removing and installing air conditioner compressor	167
3.6	Removing and installing pulley	170
3.7	Removing and installing pulley - Delphi/Mahle air conditioner compressor	173
4	Control motors	175
4.1	Removing and installing temperature flap control motor V68 with potentiometer G92	175
4.2	Removing and installing defroster flap control motor V107 with potentiometer G135	177
4.3	Removing and installing air recirculation flap control motor V113	180
4.4	Removing and installing left temperature flap control motor V158 with potentiometer G220	182
4.5	Removing and installing right temperature flap control motor V159 with potentiometer G221	184
4.6	Removing and installing fresh air/air recirculation, air flow flap control motor V425 with potentiometer G644	186
4.7	Removing and installing actuator for fresh air/air recirculation, air flow flap	188
4.8	Removing and installing air distribution flap control motor V428 with potentiometer G645	190
4.9	Removing and installing front air distribution flap control motor V426 with potentiometer G642	193
4.10	Removing and installing control motor for left side window defroster flap V409 with potentiometer G318	196
4.11	Removing and installing control motor for right side window defroster flap V410 with potentiometer G317	197
4.12	Removing and installing actuator for air distribution flap	200
5	Front heater and air conditioning unit	205
5.1	Assembly overview - heater and air conditioning unit	205
5.2	Assembly overview - attachments for heater and air conditioning unit and air intake box	214
5.3	Assembly overview - evaporator housing	216
5.4	Assembly overview - flaps and partitions in air distribution housing	218
5.5	Removing and installing evaporator	223
5.6	Cleaning evaporator	225
5.7	Removing and installing evaporator output temperature sender G263	232
5.8	Removing and installing vent temperature sender G150/G151	234
5.9	Removing and installing heater and air conditioning unit	235
5.10	Removing and installing retainers for heater and air conditioning unit	239
5.11	Dismantling and assembling heater and air conditioning unit	240
5.12	Removing and installing air distribution housing	241
5.13	Removing and installing dust and pollen filter	243
5.14	Removing and installing fresh air blower V2	246
5.15	Removing and installing fresh air blower control unit J126	248
5.16	Removing and installing footwell vent temperature sender G192	249
5.17	Removing and installing auxiliary air heater element Z35	250
5.18	Removing and installing heat exchanger	252
5.19	Removing and installing coolant pipes at heat exchanger	265
5.20	Checking condensation drain hose	269

5.21	Removing and installing condensation drain hose	274
6	Air duct system	278
6.1	Assembly overview - routing of air flow and air distribution in passenger compartment ..	278
6.2	Removing and installing vents (front)	282
6.3	Removing and installing air ducts	290
6.4	Removing and installing intake duct	293
6.5	Removing and installing drip rail	294
6.6	Removing and installing fresh air intake	295
6.7	Checking forced ventilation vents in passenger compartment	296
6.8	Removing and installing forced ventilation vents in passenger compartment	301
6.9	Checking plenum chamber water drain	304
7	Operating and display unit	306
7.1	Overview of fitting locations - operating and display unit	306
7.2	Removing and installing air conditioner operating and display units	322
8	Coolant circuit	343
8.1	Removing and installing continued coolant circulation pump V51	343
8.2	Removing and installing coolant shut-off valve N82	343
9	Further control components	344
9.1	Removing and installing sunlight penetration photosensor G107	344
9.2	Removing and installing ambient temperature sensor G17	345
9.3	Removing and installing dash panel temperature sensor G56	346
9.4	Operation of air quality sensor G238	347
9.5	Checking air quality sensor G238	350
9.6	Operation of humidity sender in fresh air intake duct G657	355
9.7	Removing and installing air quality sensor G238/humidity sender in fresh air intake duct G657	356
9.8	Removing and installing humidity sender G355	357