

## Contents

<b>00 - Technical data</b>	<b>1</b>
<b>1 Safety and repair instructions</b>	<b>1</b>
1.1 Safety information	1
1.2 Repair instructions	1
<b>2 General notes, R134a/R1234yf</b>	<b>2</b>
2.1 Type plates	2
<b>3 General notes, R744</b>	<b>3</b>
3.1 Type plates	3
<b>4 Technical data, R134a/1234yf</b>	<b>4</b>
4.1 Capacities for refrigerant R134a	4
4.2 Refrigerant capacities, R1234yf	4
4.3 Capacities for refrigerant oil R134a	4
4.4 Refrigerant oil capacities, R1234yf	4
4.5 Oil distribution	4
4.6 Refrigerant oil capacities after renewal of components	5
<b>5 Technical data, R744</b>	<b>6</b>
5.1 Refrigerant capacities	6
5.2 Refrigerant oil capacities	6
5.3 Oil distribution	6
<b>6 Electrical components</b>	<b>7</b>
6.1 Access to diagnoses	7
<b>87 - Air conditioning system</b>	<b>9</b>
<b>1 Safety information and repair notes</b>	<b>9</b>
1.1 Safety information	9
1.2 Repair instructions	9
<b>2 Overview of fitting locations – air conditioning system, R134a/R1234yf</b>	<b>10</b>
2.1 Overview of fitting locations – components not located in passenger compartment	10
2.2 Overview of fitting locations – components in vehicle interior	12
<b>3 Overview of fitting locations – air conditioning system, R744</b>	<b>15</b>
3.1 Overview of fitting locations - components not located in passenger compartment	15
3.2 Overview of fitting locations – components in vehicle interior	17
<b>4 Refrigerant circuit, R134a/R1234yf</b>	<b>20</b>
4.1 System overview - refrigerant circuit	20
4.2 Assembly overview - refrigerant lines	22
4.3 Assembly overview - heat exchanger for high-voltage battery	24
4.4 Assembly overview - condenser	25
4.5 Removing and installing refrigerant pressure and temperature sender [G395]	26
4.6 Removing and installing pressure sender for refrigerant circuit G805	27
4.7 Removing and installing expansion valve	28
4.8 Detaching and attaching refrigerant line at expansion valve	29
4.9 Removing and installing desiccant bag	31
4.10 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)	33
4.11 Removing and installing refrigerant expansion valve 1 N636	34
4.12 Removing and installing heat exchanger for high-voltage battery	35
4.13 Removing and installing refrigerant shut-off valve for heater and air conditioner unit [N541], left-hand drive vehicles	38
4.14 Removing and installing refrigerant shut-off valve for heater and air conditioning unit N541 - right-hand drive vehicles	40
4.15 Removing and installing refrigerant line, R134a/R1234yf	41
4.16 Detaching and attaching refrigerant lines at condenser	50



4.17	Cleaning refrigerant circuit .....	52
<b>5</b>	<b>Refrigerant circuit, R744 .....</b>	<b>55</b>
5.1	System overview - refrigerant circuit .....	55
5.2	Assembly overview - refrigerant lines .....	57
5.3	Removing and installing refrigerant pressure and temperature sender [G395] .....	59
5.4	Removing and installing gas cooler .....	61
5.5	Removing and installing dryer in receiver .....	62
5.6	Removing and installing evacuating and charging valve (low-pressure and high-pressure sides) .....	64
5.7	Removing and installing refrigerant pressure and temperature sender 2 G826 .....	66
5.8	Removing and installing refrigerant pressure and temperature sender 3 G827 .....	69
5.9	Removing and installing refrigerant pressure and temperature sender 4 G828 .....	71
5.10	Removing and installing refrigerant pressure and temperature sender 5 G829 .....	72
5.11	Removing and installing pressure limiting valve .....	74
5.12	Removing and installing heat exchanger for high-voltage battery .....	76
5.13	Removing and installing heat condenser .....	77
5.14	Removing and installing refrigerant line .....	78
5.15	Disconnecting and connecting refrigerant lines on gas cooler .....	94
5.16	Cleaning refrigerant circuit .....	95
<b>6</b>	<b>Valve unit of heat pump, R744 .....</b>	<b>99</b>
6.1	Assembly overview – heat pump valve unit .....	99
6.2	Removing and installing heat pump valve unit .....	103
6.3	Removing and installing refrigerant expansion valve 1 N636 .....	108
6.4	Removing and installing refrigerant expansion valve 2 N637 .....	111
6.5	Removing and installing refrigerant expansion valve 3 N638 .....	113
6.6	Removing and installing refrigerant shut-off valve 1 N696 .....	113
6.7	Removing and installing refrigerant shut-off valve 2 [N640] .....	113
6.8	Removing and installing refrigerant shut-off valve 3 N641 .....	116
6.9	Removing and installing refrigerant shut-off valve 4 [N642] .....	117
6.10	Removing and installing refrigerant shut-off valve 5 N643 .....	121
<b>7</b>	<b>Air conditioner compressor, R134a/R1234yf .....</b>	<b>122</b>
7.1	Assembly overview - air conditioner compressor .....	122
7.2	Detaching and attaching refrigerant lines at air conditioner compressor .....	122
7.3	Removing and installing air conditioner compressor [VX81] .....	124
7.4	Detaching/attaching air conditioner compressor [VX81] from/to bracket .....	127
<b>8</b>	<b>Air conditioner compressor, R744 .....</b>	<b>128</b>
8.1	Assembly overview - air conditioner compressor .....	128
8.2	Detaching and attaching refrigerant lines at air conditioner compressor .....	128
8.3	Removing and installing air conditioner compressor [VX81] .....	131
8.4	Detaching/attaching air conditioner compressor [VX81] from/to bracket .....	134
<b>9</b>	<b>Control motors .....</b>	<b>135</b>
9.1	Overview of fitting locations - front control motors .....	135
9.2	Assembly overview - front control motors .....	137
9.3	Removing and installing control motor for front left temperature flap [VX34], LHD vehicles ..	139
9.4	Removing and installing control motor for front left temperature flap [VX34], right-hand drive vehicles .....	141
9.5	Removing and installing control motor for front right temperature flap [VX35], left-hand drive vehicles .....	142
9.6	Removing and installing control motor for front right temperature flap [VX35], right-hand drive vehicles .....	144
9.7	Removing and installing control motor for defroster flap [VX47] .....	145
9.8	Removing and installing front left air distributor flap control motor -VX93, left-hand drive ..	146
9.9	Removing and installing control motor for front left air distribution flap [VX93], right-hand drive vehicles .....	148
9.10	Removing and installing front right air distributor flap control motor -VX94, left-hand drive ..	149

9.11	Removing and installing control motor for front right air distribution flap [VX94], right-hand drive vehicles	151
9.12	Removing and installing rear temperature flap control unit -VX95	152
9.13	Removing and installing control motor for fresh air and air recirculation flap [VX96]	154
9.14	Removing and installing actuator for left air distribution flap	155
9.15	Removing and installing right air distribution flap actuator	156
<b>10</b>	<b>Front heater and air conditioning unit, R134a/R1234yf</b>	<b>158</b>
10.1	Assembly overview - heater and air conditioning unit	158
10.2	Assembly overview - evaporator housing	158
10.3	Assembly overview - air intake box of heater and air conditioning unit	159
10.4	Removing and installing heater and air conditioning unit	161
10.5	Removing and installing evaporator	164
10.6	Dismantling and assembling heater and air conditioning unit	166
10.7	Removing and installing dust and pollen filter	166
10.8	Removing and installing fresh air blower control unit [J126]	167
10.9	Removing and installing evaporator temperature sensor -G308	168
10.10	Removing and installing condensation drain	169
10.11	Checking condensation drain	170
10.12	Removing and installing air intake box of heater and air conditioning unit	171
10.13	Removing and installing air intake cowling	173
10.14	Removing and installing high-voltage heating system (PTC) -ZX17	174
<b>11</b>	<b>Front heater and air conditioning unit, R744</b>	<b>179</b>
11.1	Assembly overview - heater and air conditioning unit	179
11.2	Assembly overview - evaporator housing	179
11.3	Summary of components: Air inlet box of heater and air conditioning unit	180
11.4	Removing and installing heater and air conditioning unit	182
11.5	Removing and installing evaporator	187
11.6	Dismantling and assembling heater and air conditioning unit	187
11.7	Removing and installing dust and pollen filter	187
11.8	Removing and installing fresh air blower control unit [J126]	188
11.9	Removing and installing evaporator temperature sensor -G308	189
11.10	Removing and installing condensation drain	189
11.11	Checking condensation drain	190
11.12	Removing and installing air intake box of heater and air conditioning unit	191
11.13	Removing and installing air intake cowling	193
11.14	Removing and installing high-voltage heating system (PTC) -ZX17	195
<b>12</b>	<b>Air duct</b>	<b>199</b>
12.1	Assembly overview – air ducts and air distribution in passenger compartment	199
12.2	Removing and installing driver side footwell vents, left-hand drive vehicles	201
12.3	Removing and installing driver side footwell vents, right-hand drive vehicles	201
12.4	Removing and installing front passenger side footwell vents, left-hand drive vehicles	202
12.5	Removing and installing front passenger side footwell vents, right-hand drive vehicles	203
12.6	Removing and installing rear footwell vent	203
12.7	Removing and installing fresh air intake	204
12.8	Removing and installing defroster air vent	204
12.9	Removing and installing air vent duct in the centre of the dash panel	205
12.10	Removing and installing air duct for rear centre console vent	205
12.11	Removing and installing front air duct for dash panel	206
<b>13</b>	<b>Coolant circuit, rear-wheel drive</b>	<b>208</b>
13.1	Assembly overview - high-voltage heater (PTC)	208
13.2	Removing and installing PTC heater element 3 [Z132]	208
<b>14</b>	<b>Coolant circuit, all-wheel drive</b>	<b>212</b>
14.1	Assembly overview - high-voltage heater (PTC)	212
14.2	Removing and installing PTC heater element 3 [Z132]	212
<b>15</b>	<b>Operating and display unit</b>	<b>216</b>



15.1	Overview of fitting locations – operating and display unit .....	216
15.2	Removing and installing display unit for front information display and operating unit control unit [J685] .....	216
15.3	Removing and installing operating and display unit for rear air conditioning system [E265] ..	216
<b>16</b>	<b>Other controlling and regulating components .....</b>	<b>217</b>
16.1	Removing and installing external air quality and air humidity sensor G935 .....	217
16.2	Removing and installing ambient temperature sensor G17 .....	217
16.3	Removing and installing humidity sender for air conditioning system [G260] .....	218
16.4	Removing and installing left vent temperature encoder -G150, removing and installing, left-hand drive .....	218
16.5	Removing and installing right vent temperature encoder -G150, right-hand drive .....	218
16.6	Removing and installing right vent temperature encoder -G151, left-hand drive .....	219
16.7	Removing and installing right vent temperature encoder -G151, right-hand drive .....	219
16.8	Removing and installing left footwell vent temperature sender [G261] .....	220
16.9	Removing and installing right footwell vent temperature sender [G262] .....	221
16.10	Removing and installing interior carbon dioxide sensor -G929 .....	222
16.11	Removing and installing heater and air conditioning system control unit [J979] .....	222
16.12	Removing and installing interior temperature sensor -G1090 .....	223
16.13	Removing and installing rear vent temperature encoder -G174 .....	224