



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 handling refrigerants	2
1.3 Safety measures when working on vehicles with a start/stop system	2
1.4 Safety precautions when using air conditioner service stations	2
1.5 Safety measures for working on vehicles with high-voltage system	3
1.6 Safety precautions when working in the vicinity of high-voltage components	4
1.7 Safety precautions when working on pressurised tanks/containers	4
2 Laws and regulations	5
2.1 Provisions and directives	5
2.2 Charging refrigerant circuit with different refrigerants	6
2.3 Occupational health and safety	7
3 Repair notes	8
3.1 Rules for cleanliness	8
3.2 Refrigerant circuit seals	8
3.3 Refrigerant and refrigerant oil	9
3.4 Handling pressurised tanks/containers	11
3.5 Handling refrigerants	12
4 Identification	14
4.1 Notice for refrigerant circuit	14
5 Technical data	15
5.1 Refrigerant capacity	15
5.2 Refrigerant oil capacities	15
5.3 Safety data sheets	15
6 Basic technical and physical properties	16
6.1 Basics of air conditioning technology	16
6.2 Physical properties	20
6.3 Product properties	27
6.4 Function and role of air conditioning system	27
6.5 Other reference material	29
87 - Air conditioning system	30
1 Refrigerant circuit	30
1.1 System overview - refrigerant circuit	30
1.2 General description - components of refrigerant circuit	36
1.3 Possible complaints	71
1.4 Investigating leaks	75
1.5 Renewing components	86
1.6 Cleaning refrigerant circuit	98
1.7 Checking pressures with pressure gauge	127
2 Working with air conditioner service station	131
2.1 Working with air conditioner service station	132
2.2 Connecting air conditioner service station to refrigerant circuit	134
2.3 Performing gas analysis of refrigerant	137
2.4 Drain refrigerant circuit	140
2.5 Evacuating refrigerant circuit	143
2.6 Charge refrigerant circuit	149
2.7 Bringing air conditioning system into service after charging	152
2.8 Switching off air conditioner service station and separating from refrigerant circuit	154
2.9 Charging refrigerant in reservoir	156
2.10 Emptying air conditioner service station	157



2.11	Cleaning electrical air conditioning compressor	157
2.12	Cleaning refrigerant circuit	160
2.13	Filling contaminated refrigerant in a recycling cylinder for analysis, processing or disposal	164
2.14	Checking pressures	169
3	Testing equipment and tools	257
3.1	Tools and materials available from distribution centre or importer	257
3.2	Tools and materials available commercially	258
3.3	Tools that can be locally manufactured	258