

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 working on vehicles with high-voltage system	2
1.5 Safety precautions when working in the vicinity of high-voltage components	3
1.6 Safety precautions when using testers and measuring instruments during a road test	4
2 Laws and regulations	5
2.1 Legal regulations and standards	5
2.2 Charging refrigerant circuit with other refrigerants	6
2.3 Occupational health & safety	6
3 Repair instructions	8
3.1 Rules for cleanliness	8
3.2 Refrigerant circuit seals	8
3.3 Refrigerant and refrigerant oil	9
3.4 Handling pressure vessels	11
3.5 Handling refrigerant	12
4 Identification	14
4.1 Label for refrigerant circuit	14
5 Technical data	15
5.1 Refrigerant capacities	15
5.2 Refrigerant oil capacities	15
5.3 Safety data sheets	16
6 Basic technical and physical principles	17
6.1 Principles of air conditioning systems	17
6.2 Physical properties	21
6.3 Product properties	28
6.4 Function of air conditioner	28
6.5 Other reference material	30
87 - Air conditioning system	32
1 Safety information	32
2 Refrigerant circuit	33
2.1 System overview - refrigerant circuit	33
2.2 General description - refrigerant circuit components	39
2.3 Possible complaints	73
2.4 Locating leaks	77
2.5 Renewing components	88
2.6 Cleaning refrigerant circuit	104
2.7 Checking pressure values with a pressure gauge	158
3 Working with air conditioner service station	162
3.1 Working with air conditioner service station	163
3.2 Connecting air conditioner service station to refrigerant circuit	165
3.3 Performing gas analysis for refrigerant	168
3.4 Discharging refrigerant circuit	171
3.5 Evacuating refrigerant circuit	174
3.6 Charging refrigerant circuit	180
3.7 Starting up air conditioner after charging	183
3.8 Switching off air conditioner service station and disconnecting from refrigerant circuit	185
3.9 Filling reservoir with refrigerant	186
3.10 Discharging air conditioner service station	187



3.11	Cleaning electrically driven air conditioner compressor	188
3.12	Cleaning refrigerant circuit	190
3.13	Decanting contaminated refrigerant into recycling cylinder for analysis, treatment or disposal	193
3.14	Checking pressures	198
4	Test equipment and tools	286
4.1	Tools and materials available from distribution centre or importer	286
4.2	Commercially available tools and materials	287
4.3	Tools you can make yourself	287