Specifications for pressures in refrigerant circuit

High-pressure side:

Increasing from initial pressure (on connection of pressure gauges) up to 20 bar

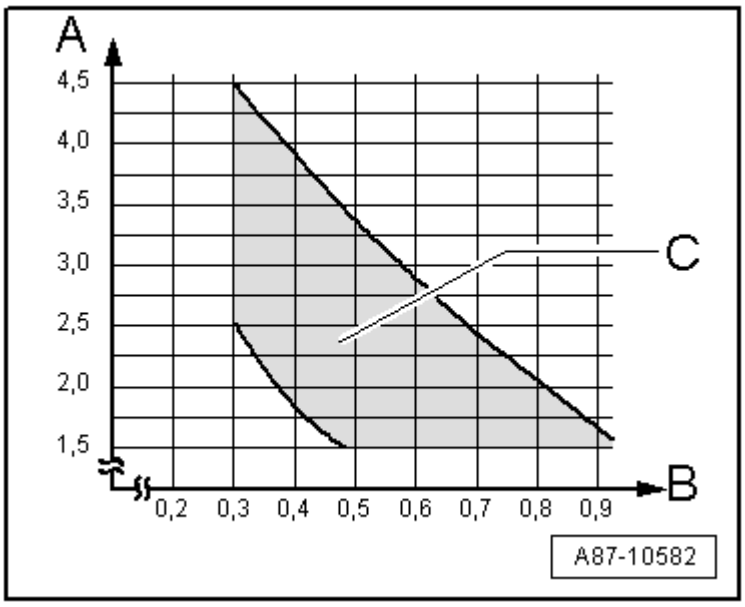
Low-pressure side:

Decreasing from initial pressure (on connecting pressure gauges) to value in graph

A - Low pressure (measured at service connection) in bar absolute

B - Control current for air conditioner compressor regulating valve - N280- in amps

C - Permissible tolerance range



Note

- *In the event of a very high cooling output requirement (e.g. high ambient temperature and high fresh-air blower speed at low engine speed), the air conditioner compressor cannot initially set the pressure on the low-pressure side to the value -C- given in the graph (e.g. for a certain time after switching on the air conditioner). The air conditioner compressor is actuated with the maximum specified control current, however the delivery volume of the air conditioner compressor is no longer sufficient under these ambient conditions and at this engine speed to reduce the pressure on the low-pressure side to the value in the graph. One way of checking the control action of the air conditioner compressor under these conditions is to actuate the fresh-air blower with only approx. 40 % of the maximum voltage and to check the pressures at reduced fresh-air blower speed → Vehicle diagnostic tester ("self-diagnosis" or "Guided Fault Finding" function for air conditioner) and → Heating, air conditioning; Rep. gr.00; Repair instructions; Checking the cooling output or →Heating, air conditioning; Rep. gr.87 (vehicle-specific Workshop Manual).*
- *Under unfavourable conditions (very high ambient temperatures, high humidity), pressure in high-pressure side may increase to max. 29 bar.*
- *The control current -B- is displayed in the measured value block of the*

operating and display unit for Climatronic air conditioning system -E87- or the operating and display unit, Climatronic control unit -J255-.

- *The pressure in the refrigerant circuit measured by the high-pressure sender -G65- or the refrigerant pressure and temperature sender -G395- is displayed in the measured value block of the operating and display unit for Climatronic air conditioning system -E87- or the operating and display unit, Climatronic control unit -J255- → Vehicle diagnostic tester ("self-diagnosis" or "Guided Fault Finding" function for air conditioner) and → Heating, air conditioning; Rep. gr.87; Refrigerant circuit; System overview - Refrigerant circuit (vehicle-specific Workshop Manual).*
- *The low pressure settles as a function of the control current for the air conditioner compressor regulating valve -N280- within the air conditioner compressor output range in the tolerance band.*
- *Under unfavourable conditions (very high ambient temperatures, high humidity), the air conditioner compressor output may not always be sufficient to attain the specified value.*
- *If the compressor capacity utilisation is greater than 90 %, the pressure on the low-pressure side may be in excess of the tolerance range "C" shown in the graph (the compressor output no longer suffices).*
- *The specified operating current for the regulating valve must be greater than 0.3 A to ensure reliable actuation of the regulating valve.*
- *"0 bar absolute pressure" corresponds to an absolute vacuum. Normal ambient pressure corresponds to 1 bar absolute. On the scales of most pressure gauges, 0 bar corresponds to an absolute pressure of one bar (can be seen from "-1 bar" mark below "0").*
- *In the "maximum cooling output" setting, the control current is regulated to approx. 0.65 (vehicle-specific up to 0.85 A) (displayed in measured value block) → Vehicle diagnostic tester ("self-diagnosis" or "Guided Fault Finding" function for air conditioner) and → Heating, air conditioning; Rep. gr.00; Repair instructions; Checking the cooling*

output or →Heating, air conditioning; Rep. gr.87 (vehicle-specific Workshop Manual).

Possible deviation from specification	Possible causes of fault	Fault elimination
• High pressure remains constant or only increases slightly (above pressure with engine stopped) • Low pressure quickly drops to value in graph or below • Required cooling output is not attained.	♦ Actuation of air conditioner compressor regulating valve -N280- not OK ♦ Not enough refrigerant in circuit	– Checking activation of the -N280- → Heating, air conditioning; Rep. gr.87; Refrigerant circuit; System overview - Refrigerant circuit (vehicle-specific Workshop Manual). – Localise leak with leak detector and eliminate – Re-charge refrigerant circuit.
• High pressure normal • Low pressure too low (see graph) • Required cooling output is not attained.		
• High pressure normal • Low pressure too low (see graph) • Required cooling output is not attained.		

Note

If no fault is found for this problem, clean refrigerant circuit (by flushing with refrigerant R134a → Chapter or blowing out with compressed air and nitrogen → Chapter).

Possible deviation from specification	Possible causes of fault	Fault elimination
• High pressure does not increase or only to slightly above the pressure with the engine stopped, • low pressure does not decrease or only slightly. • Required cooling output is not attained.	♦ No actuation of the air conditioner compressor (air conditioner compressor regulating valve -N280-) ♦ The air conditioner compressor is not driven.	– Check actuation and drive of the air conditioner compressor and perform repair → Heating, air conditioning; Rep. gr.87; Air conditioner compressor (vehicle-specific Workshop Manual). – Check actuation and operation of -N280-.
	♦ Constriction or blockage in the refrigerant circuit (e.g. in the refrigerant pipe between the “low-pressure end” service connection and the air conditioner compressor).	– Clean refrigerant circuit (flush with refrigerant R134a → Chapter or blow out with compressed air and nitrogen → Chapter). – Renew hose or pipe if kinked or constricted.
	♦	– Check operation of -N280-, remove -N280- if applicable and

	Air conditioner compressor regulating valve -N280- defective	check for contamination → Chapter.
	♦ The air conditioner compressor is defective.	– Renew air conditioner compressor.

Possible deviation from specification	Possible causes of fault	Fault elimination
• High pressure increases above specification • Low pressure quickly drops to value in graph or below • Required cooling output is not attained.	♦ Actuation of air conditioner compressor regulating valve -N280- not OK ♦ Constriction or obstruction in refrigerant circuit	– Checking activation of the -N280- → Heating, air conditioning; Rep. gr.87; Refrigerant circuit; System overview - Refrigerant circuit (vehicle-specific Workshop Manual). – Run hand over refrigerant circuit to check for differences in temperature • If difference in temperature is found at one component: – Renew hose or pipe if kinked or constricted. – Flush the refrigerant circuit with compressed air and nitrogen in the event of an obstruction. • If no fault is found: – Clean refrigerant circuit (flush with refrigerant R134a → Chapter or blow out with compressed air and nitrogen → Chapter).

Possible deviation from specification	Possible causes of fault	Fault elimination
• High and low pressure normal at first, after some time high pressure increases above specification and • Low pressure drops to value in graph or below • Required cooling output is no longer attained.	♦ Actuation of air conditioner compressor regulating valve -N280- not OK	– Checking activation of the -N280- → Heating, air conditioning; Rep. gr.87; Refrigerant circuit; System overview - Refrigerant circuit (vehicle-specific Workshop Manual). – Renew reservoir (with dryer) and evacuate refrigerant circuit for at least 3 hours (see note)
• High and low pressure normal at first • After lengthy operating period, low pressure drops excessively (evaporator ices up)	♦ Air conditioner compressor regulating valve -N280- defective	– Check operation of -N280-, remove -N280- if applicable and check for contamination → Chapter.
	♦ Moisture in refrigerant circuit	– Clean refrigerant circuit (flush with refrigerant R134a → Chapter or

		blow out with compressed air and nitrogen → Chapter).

Note

- *It is not initially necessary to clean the refrigerant circuit (flush with refrigerant R134a → Chapter or blow out with compressed air and nitrogen → Chapter) when this problem occurs. Normally, there is only a small quantity of moisture in the system which can be removed by lengthy evacuation.*
- *If a problem involving moisture in the refrigerant circuit only occurs after a lengthy operating period or only infrequently (low pressure drops below specification and evaporator ices up), it is sufficient to renew the dryer (adjust the quantity of refrigerant oil). Subsequently, evacuate refrigerant circuit for at least 3 hours.*
- *A problem with evaporator output temperature sender -G263- can also cause icing-up of refrigerant circuit. If this problem is encountered, also pay attention to the measured value of the evaporator output temperature sender -G263- → Vehicle diagnostic tester ("self-diagnosis" or "Guided Fault Finding" function for air conditioner) and → Heating, air conditioning; Rep. gr.00; Repair instructions; Checking the cooling output or →Heating, air conditioning; Rep. gr.87 (vehicle-specific Workshop Manual).*

Possible deviation from specification	Possible causes of fault	Fault elimination
• High pressure normal • Low pressure too low (see graph) • The required refrigeration capacity is attained.	♦ Actuation of air conditioner compressor regulating valve -N280- not OK ♦ Air conditioner compressor regulating valve -N280- defective	– Checking activation of the -N280- → Heating, air conditioning; Rep. gr.87; Refrigerant circuit; System overview - Refrigerant circuit (vehicle-specific Workshop Manual). – Check operation of -N280-, remove -N280- if applicable and check for contamination → Chapter.
	♦ The air conditioner compressor is defective.	– Clean refrigerant circuit (flush with refrigerant R134a → Chapter or blow out with compressed air and nitrogen → Chapter). – Renew air conditioner compressor.

Note

Observe the following with regard to fault "High pressure normal, low pressure too low": This fault may cause evaporator to ice up although quantity of refrigerant in circuit is OK. Check measured values of evaporator output temperature sender -G263- and actuation of air conditioner compressor regulating valve -N280-. If the measured value of the evaporator output temperature sender -G263- is incorrect, the evaporator may ice up or the cooling output is not attained → Vehicle diagnostic tester ("self-diagnosis" or "Guided Fault Finding" function for air conditioner) and → Heating, air conditioning; Rep. gr.00; Repair instructions; Checking the cooling output or →Air conditioning; Rep. gr.87 (vehicle-specific Workshop Manual).

Possible deviation from specification	Possible causes of fault	Fault elimination
•	♦	–

High pressure normal or too high • Low pressure too high (see graph) • Air conditioner compressor noise (particularly after switch-on), • Required cooling output is not attained.	Actuation of air conditioner compressor regulating valve -N280- not OK ♦ Too much refrigerant in the circuit.	Checking activation of the -N280- → Heating, air conditioning; Rep. gr.87; Refrigerant circuit; System overview - Refrigerant circuit (vehicle-specific Workshop Manual). – Extract refrigerant from refrigerant circuit. • If quantity of refrigerant extracted roughly corresponds to specified capacity: – Renew the air conditioning system compressor. • The quantity of refrigerant extracted is significantly greater than the prescribed charge quantity. – Re-charge refrigerant circuit. – Repeat test.
• High and low pressure normal • Required cooling output is not attained.	♦ Actuation of air conditioner compressor regulating valve -N280- not OK ♦ Too much refrigerant oil in the circuit.	– Check actuation of -N280-. – Discharge refrigerant circuit.
• High pressure and low pressure are normal. • Air conditioner compressor noise (particularly after switch-on). • The required refrigeration capacity is attained.		– Clean refrigerant circuit (flush with refrigerant R134a → Chapter or blow out with compressed air and nitrogen → Chapter).

Note

♦ *Overfilling with refrigerant oil may occur if, for example, the air conditioner compressor has been renewed without adjusting the quantity of refrigerant oil.*

♦ *If there is too much refrigerant oil in the circuit, drain the air conditioner compressor and renew the reservoir. After cleaning the refrigerant circuit (flush with refrigerant R134a → Chapter or blow out with compressed air and nitrogen → Chapter), add the correct amount of refrigerant oil to the circuit → Chapter.*