Fault diagnosis

Cooling performance check

Every workshop needs, besides special tools, technical knowledge to do a proffesional job. This can be purchased by special training. This applies particularly to air-conditioning systems. The following instructions can merely serve as guide due to the different systems in use.

1. Start the engine. Switch through blower stages

Blower works?

Yes No

2.

- Check the fuse, relays, switches, wiring

3.

Switch cooling to max.

Magnetic coil activated ?

Yes No

4.

- Check wiring/electr. connections, current supply (+/-)
- Temperature switch-/sensor,
- Check pressure switch
- Check refrigerant charge

go to **5.**

5. Let the system run for a few minutes at max. cooling. Blower must be switched on in middle position.

Air outlet temperature at the centre vent 3-8°C.

Yes No

6.

Outlet temperature is to warm:

- Heater turned off?
- Pollenfilter o.k. ?
- Check temperature switch/-sensor,
- Check thermostat (if available)
- Ventilation damper, heater valves, condenser ventilation must be checked

7. Proof low-(LP) and high pressure (HP) at 2000 – 2500 rpm :

LP: 0,5 – 3,0 bar HP: 6,0 – 25,0 bar

with load controlled compressors:

LP: ~ 2 bar, constant

Yes No

see table for pressure relationships

Air conditioning is ok.

It is very important to correctly interpret the pressure gauge reading. Some typical examples:

Air conditioning with expansion valve

Low pressure	High pressure	Outlet temperature on centre nozzle	Possible causes
high	high	higher, up to ambient temperature	overheated engine, foulted condenser, condenser fault-wrong direction of rotation, overfilled system
normal up to low at times	high, at times	higher perhaps fluctuating	sticked expansion valve, at times closed
normal	high	slight higher	aged dryer, foulted condenser
high	normal up to high	higher, depending on contraction	contracted pipe, compressor – to expansion valve
normal	normal	higher	overcharged with refrigerant oil
normal, but irregular	normal, but irregular	higher	moisture in the system, faulty expansion valve
fluctuating	fluctuating	fluctuating	faulty expansion valve or compressor
normal up to low	normal up to low	higher	foulted evaporator, system underfilled with refrigerant
high	low	higher, almost ambient temperature	sticked expension valve (opened), faulty compressor
low	low	higher, up to ambient temperature	system underfilled with refrigerant
same low and high pressure	same low and high pressure	ambient temperature	system underfilled, faulty compressor or electrical system

Air-conditioning with orifice tube

high	high	higher, up to ambient temperature	overheated engine, foulted condenser, condenser fault-wrong direction of rotation, overfilled system
normal up to high	high	higher	overfilled system, foulted condenser
normal	normal up to high	fluctuating	moisture in the system, orifice tube blocked at times
high	normal	higher	faulty orifice tube (cross-cut)
normal	normal	higher	system overcharged with oil
normal up to low	normal up to low	higher	system underfilled with refrigerant
same low and high pressure	same low and high pressure	ambient temperature	system underfilled, faulty compressor or electrical system

Ambient temp= surrounding environment temperature.
Tests should not be carried out in extreme cold or warm environmental conditions.