

A/C diagnosis - reading the gauges

What the refrigeration cycle is doing at each gauge, how high and low side readings pair into a diagnosis, and the EPA 609 rules you work under.

PROCEDURE

- 1 Verify the basics**
Condenser airflow, cabin filter, belt, compressor engaging. Half of poor-cooling complaints end here.
- 2 Connect the manifold**
Engine at operating temperature, A/C on max, blower high, doors open.
- 3 Read both sides together**
Match the pair against the patterns below instead of judging one gauge alone.
- 4 Check vent temperature**
Compare against ambient. The gauges tell you why; the vent tells you whether it is actually working.
- 5 Recover, evacuate, charge by weight**
Never top up by feel - the correct charge is a weight printed on the underhood label.

NUMBERS

Both sides low	undercharge or upstream restriction	look for leaks first
Both sides high	overcharge, air, or poor condenser airflow	
Low side high, high side low	weak or bypassing compressor	the classic pattern
Low side very low, high side low	blockage - orifice or expansion valve	low side may pull into vacuum
Evacuation	hold vacuum, then charge by weight	boils off moisture and proves integrity
Certification	EPA Section 609	required to open a system; does not expire

COMMON MISTAKES

- Topping up by gauge feel instead of charging the labelled weight.
- Diagnosing from one gauge - a low reading means nothing without its partner.
- Skipping evacuation, leaving moisture that turns acidic and destroys the compressor.
- Condemning parts before checking a blocked condenser or a clogged cabin filter.

Overhaul Prep · overhaulprep.app/learn/ac-diagnosis · practice and prep material, not a substitute for the manufacturer's service information.