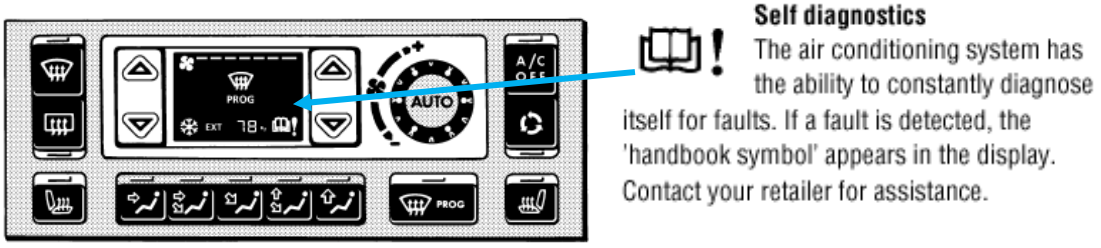
Troubleshooting Climate Control Faults in Range Rover P38A

I came across this posting on another message board and it seemed like it was worth cleaning up and reposting here. On the P38A Range Rovers, there is a warning symbol that may appear on your climate control display. According to the manual, the system is constantly self-diagnosing for faults and the “handbook symbol” will appear, when one of these is found. IF you don’t have access to a testbook or dealer and you want to diagnose this a little bit, here is a good collection of preliminary steps you can take.



This of course is not a complete list of issues or causes for the handbook symbol, but these are items that can readily test before getting in any deeper.

This is really a straight forward functional test. You should have a small flashlight, possibly reading glasses if you use them, and maybe a straightened paper clip. Technical isn't it?
When finished you will have tested :-

- Air Con compressor (and chilled air output),
- in-car temperature sensor,
- solar gain sensor,
- both blower motors,
- distribution flaps/motor,
- recirculation flaps,
- blend flaps that mix hot and cold air.

For these first two checks, the car and engine can be hot or cold.
Identify the in-car temperature sensor, this is behind the grill positioned just below the clock. There is only one sensor.
Peer through the grill with the flashlight, and glasses if required. Look sideways, there is a small fan, like a drum with blades on the outside, not like a propeller / radiator fan. Without starting the engine, switch the ignition on, you should just hear the fan running, and be able to see the blur of the blades moving. As a last resort, gently, GENTLY, probe sideways through the grill with the end of the paper clip. Withdraw when it vibrates!
The fan is there to improve the effectiveness of the sensor, by drawing air across it. Fan failure won't stop the system working, but the control of the internal temperature will be poor. The heat will stay on too long, or off too long, leading to wide variations from the set temperature.

Recirculation flaps.
You need quiet for this.

1. Turn the ignition on, but without the engine running. Wait for the brake pressurization motor to stop running (30 to 45 seconds).
2. Turn the Fan Speed (blower motors) down to minimum.
3. Operate the recirculation control and listen for the flaps moving. The noise will only last for 5 seconds or so. There is one flap on each blower motor. The blower motors are underneath the dashboard, above your knees rather than ankles, but against the outside of the car. The flap motors are very quiet. The flaps will move again when the recirculation control is restored. Repeat as required.
4. If you cannot hear them, you will have to test them while the car is moving. When the car is warm, switch the recirculation control on. The car will become noticeably stuffy within about 5 minutes.
5. Switch recirculation off, and the atmosphere will clear. Now have the engine at normal operating temperature, ticking over, with the A/C switched on.
   I assume the book symbol is still showing. The system will self check every time the vehicle is restarted.
   If the fault disappears, so will the symbol.
6. Compressor / chilled air faults will be self evident throughout these tests, no Cold Air.
   If this is apparent, open the bonnet, and with the engine running, have someone switch the A/C on and off. There will be an audible click from the Compressor as the clutch engages. Placement of the compressor varies from engine to engine.
   Remember, in the absence of chilled air, either through a faulty system, or because the A/C is switched off, the system will substitute external air, at the ambient temperature. In some parts of the world (rarely in the UK) this can be hot. Thus sometimes "cold" air is hot.

Distribution Flaps.

1. Set both Driver and Passenger temperatures to 60F.
2. Turn the Fan up to get a decent airflow, that is half or three-quarter speed.
3. Using the manual buttons, direct the air towards the footwells. Check with your hand that the airflow is of similar strength and temperature. Note any side to side differences. The air issues from triangular holes on the sides of the transmission tunnel above your ankles.
4. Check there is no air flow from the Fascia or Screen outlets.
5. Use the buttons again and divert the air towards the fascia vents, remember to have them open, check again for flow and temperature. It takes a few seconds for the Distribution flaps to move to the new position.
6. Check there is no flow from the non selected outlets (Footwell and Screen).
   Use the buttons again and divert the air to the screen, check again for flow and temperature, especially any side to side differences.
7. Assuming the airflow moved correctly from footwell to fascia to screen, and DID NOT appear from any outlets that were not selected at the time, you have proved the Distribution flap / Motor works.

Blower Fans.

1. With the air issuing from whichever vents you find most convenient to monitor, turn the Fan speed up and down.
2. Check the air flow varies on both sides of the car. There are two Blower motors, one Left, one Right. They should both change together as you adjust the speed.
   Assuming they do, you have just proved the blower fans work. Leave them on half or three-quarter speed.

Blend Flaps.

1. With the air issuing from whichever vents you find most convenient to test, raise the Drivers side temperature to 72 (F), wait a few seconds, can you feel a temperature difference when comparing Driver side air output to Passenger side air output?
2. Raise the Drivers side to 82F, there should be an obvious difference in temperature.
   If the Drivers side airflow temperature has not changed, the Driver side blend flap is faulty.
3. Reset the Driver side temperature to 60F, then repeat the test, varying the Passenger side temperature.
4. If the Passenger side airflow temperature does not change, the Passenger side blend flap is faulty.

Solar Gain.

The solar gain sensor is a black button on the centre top of the dashboard, near the windscreen (near the Alarm LED).

1. With engine ticking over, and A/C on, switch it to AUTO mode.
2. Adjust both temperatures to a medium/ low setting, (60-70F) and let the system stabilize, with the blowers running but not too fast.
3. Shine a bright flashlight on the Solar Gain sensor, it may take 30 seconds or so, but you will hear the system adjust to compensate for the additional heat, probably by increasing the fan speed.
4. Remove the flashlight and the system will adjust back, give it a minute or so.
   If the system compensated for the additional heat, the solar gain sensor works.

In car temperature sensor.

1. This is situated behind the grill below the clock. With the system set as for Solar gain, heat up the Cigar Lighter, and hold the hot end in front of the grill, but not close enough to melt the plastic!
   1 to 2 cm should be fine.
   If the system compensates for the additional heat, the in-car sensor works.

Additional information.

When on Auto, if a number is showing in the temperature setting, the system will control the position of the blend flaps, dependant on internal temperature, external air temperature, etc.
If you adjust the setting to LO, the blend flaps are forced to the end of their range, to deliver ONLY cold air, whatever the actual temperature is, inside or outside.
Remember Cold air will be hot if you are in a hot climate and the A/C is switched off.
If you adjust the setting to HI, the blend flaps are forced to the end of their range, to deliver ONLY heated air, whatever the actual temperature is, inside or outside.