

AC System Diagnostics - Operating Pressures R134A

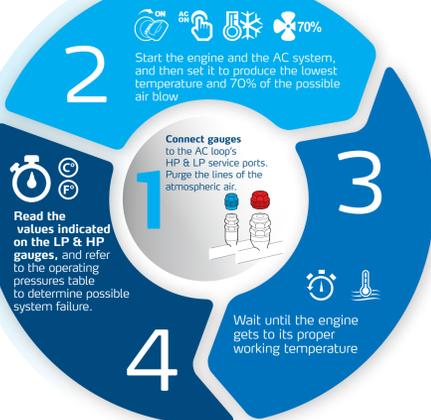


Working pressures diagnostics method is an easy and cost effective way to determine major AC system problems. However, to perform the right measurements, the system must be in operational condition. This requires a correct level of refrigerant charge (at least 1,5/25 PSI to run the compressor). Before the vehicle is started, the static system pressure should be read. Pressure values should be very nearly equal on both LP and HP gauges. The actual static pressure will depend on the ambient temperature. To ensure it is on the right level, refer to a static pressures table applicable for R134A refrigerant (N.B. not shown on this poster). A low static pressure means a too low system charge, indicating a leak that must be found and repaired. Bear in mind, that an average AC system loses up to 50 grams/2 oz. of refrigerant per year.

HOW TO PROCEED
FOR PROPER DIAGNOSTICS,
FOLLOW THE STEPS BELOW

RECOMMENDED TOOLS
PROPERLY CALIBRATED
R134A GAUGES

GAUGES
MANIFOLD SET
FILLING STATION
WITH GAUGES



Important remarks for operation pressures diagnostics

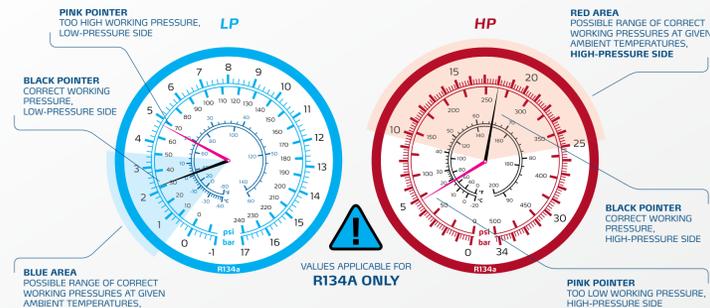
Air recirculation function must be disabled during the pressure measurements – set the air intake function as coming from outside the vehicle cabin!

Set the air recirculation function ON only if the ambient temperature is above 30 °C / 86 °F and make sure that before the test is performed, the AC system operates for 10-15 mins., lowering the cabin temperature properly. It is not recommended to take the pressure measurement in an ambient temperature above 35 °C / 95 °F.

The most effective method of system troubleshooting is by pressure measurement, and consists of two reading phases – first, measurements are taken while the engine is idling, second, measurements are taken while keeping the engine at a constant speed of 1,500-2,000 RPM.

For vehicles equipped with spherical and automated AC systems (zonal climatronics), the measurement should be taken by different air production scenarios for available zones (i.e. at frontal zone, at rear zone, etc.).

HOW TO READ THE POSTER SCENARIOS:

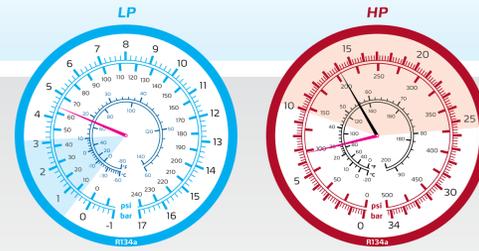


ABBREVIATIONS
F APPLICABLE FOR FIXED DISPLACEMENT COMPRESSOR
V APPLICABLE FOR VARIABLE DISPLACEMENT COMPRESSOR

R134A OPERATING PRESSURES TABLE

AMBIENT TEMP. °C	VARIABLE DISPLACEMENT COMPRESSOR				FIXED DISPLACEMENT COMPRESSOR			
	LP (bar)		HP (bar)		LP (bar)		HP (bar)	
	min.	max.	min.	max.	min.	max.	min.	max.
15.5	1.5	2.3	9.5	13.0	0.5	3.0	9.5	13.0
21.0	1.5	2.3	12.5	17.5	0.5	3.0	12.5	17.5
26.5	1.5	2.3	14.0	20.5	0.5	3.0	14.0	20.5
32.0	1.5	2.5	16.0	24.0	0.5	3.5	16.0	24.0
38.8	1.5	2.5	18.5	25.5	0.5	3.5	18.5	25.5
43.0	1.5	2.5	22.0	28.0	0.5	3.5	22.0	28.0

SCENARIO 1

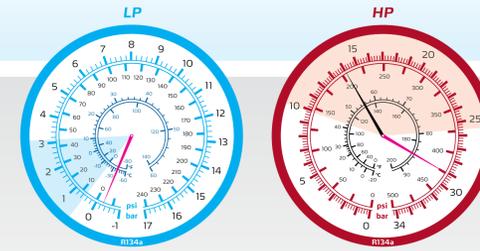


Low pressure: too high

High pressure: Normal or too low

- Improper connection of the suction and pressure lines on the compressor – reversed
- The compressor magnetic clutch does not engage - hub slips on the pulley
- The expansion valve is blocked in the open position
- The compressor's ECV valve is defective or misses the correct regulation
- The compressor is malfunctioning or damaged

SCENARIO 2

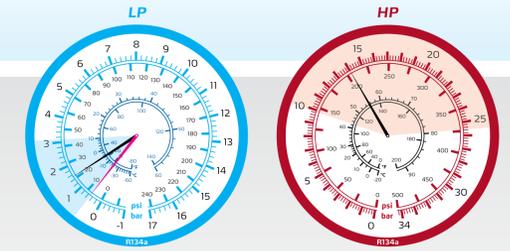


Low pressure: too low

High pressure: Normal or too high

- The thermostatic pressure valve is defective
- The expansion valve is closed, i.e. blocked or clogged
- Restriction in the refrigerant line between the receiver dryer and the expansion valve
- The compressor's suction valve (MCV/ECV) is blocked and does not allow flow of a high refrigerant volume
- The receiver dryer is malfunctioning – clogged or saturated

SCENARIO 3

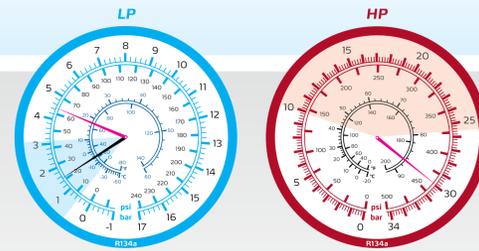


Low pressure: Normal or too low

High pressure: Normal

- Warm air getting into the evaporator's cassette/compartment
- Heater does not stop warming
- Evaporator freezing

SCENARIO 4

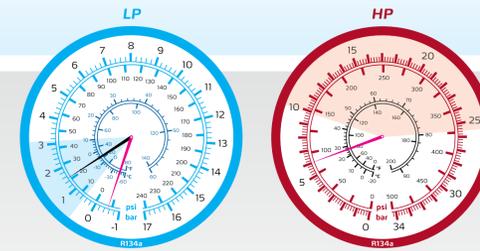


Low pressure: Normal or too high

High pressure: Too high

- System overcharge
- ECV/MCV failure causing improper suction pressure
- Condenser inner stoppage/contaminations
- High-pressure side clogged – stoppage around service port and in between compressor-condenser-filter
- Ambient temperature above 40 °C / 104 °F

SCENARIO 5

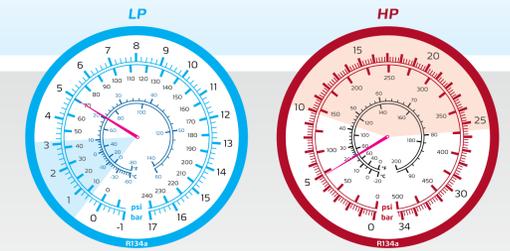


Low pressure: Normal or too low

High pressure: Too low

- Too low refrigerant level
- Expansion valve failure – clogged or blocked
- System stoppage between receiver dryer and evaporator
- High-pressure side stoppage
- Low ambient temperature below 5 °C / 41 °F

SCENARIO 6



Improper Low & High pressure: Pointers indicate same values on both gauges

- Compressor failure
- Electromagnetic clutch of the compressor does not operate properly
- Driving belt/compressor's pulley malfunction
- ECV/MCV failure causing improper suction pressure



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