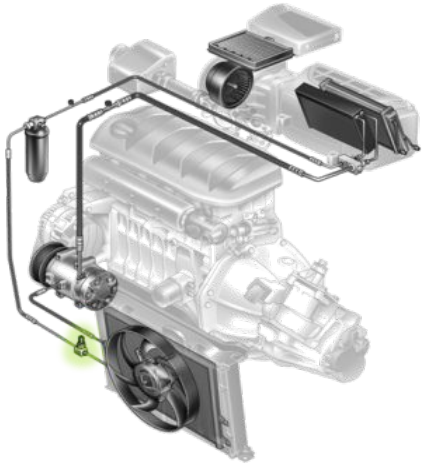
Technical Bulletin

June 2021, TSB-VSA-VCC-062021-03



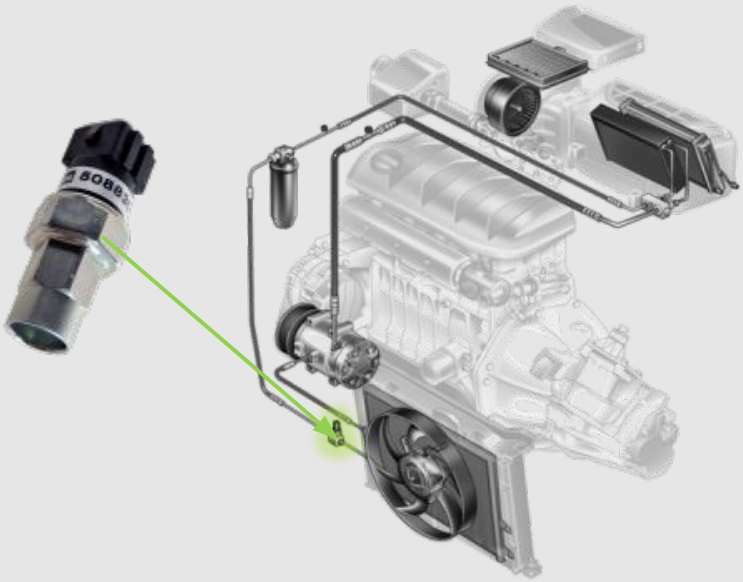
TIPS AND TRICKS

Pressure sensor

Application

Vehicles equipped with A/C

Pressure sensor/pressure switch

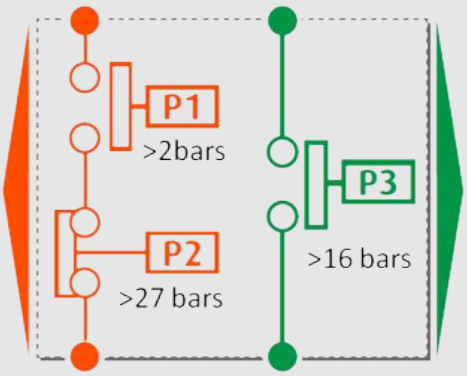


- **Pressure sensor/switch** is a **safeguard** and **protect** the system from failure
- **Pressure sensor** **controls** the **pressure** in the system and **controls** the compressor **ON** and **OFF** times. It can also control the **fan** operating times and performance
- It is located on the **high pressure line** between the **compressor** and the **pressure regulator.**

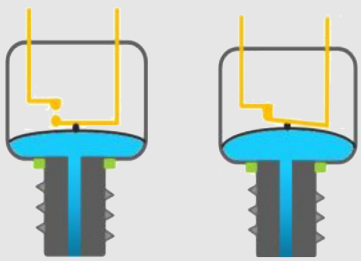
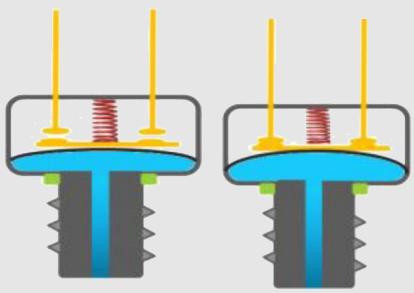
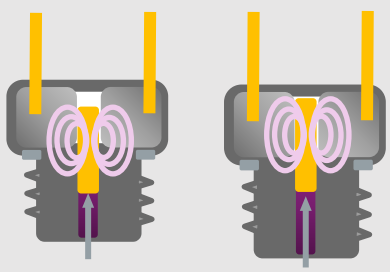
Operation mode

This values below are for R1234yf and R134a refrigerant.

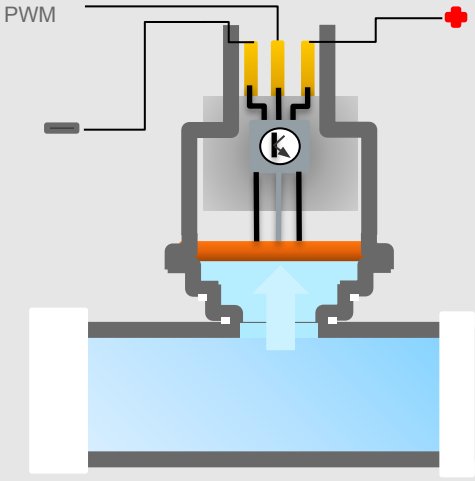
Activation	2 speed	Deactivation
• The system is active **P1>2 bar**: • If measured pressure **P1** is **lower** than **2 bar** (leakage or no refrigerant) the sensor **prevents** against turning **ON** the compressor and protects it against failure	• Activating 2 speed of the fan if **P3>16 bar** (HP) • Deactivating 2 speed if HP pressure drops below 14 bar	**Deactivates** the compressor if **P2>27 bar** protecting the system against too **high** pressure

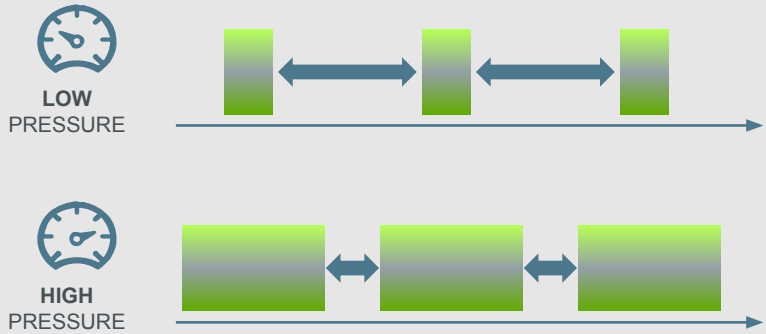


Types of pressure sensor/switch

Classic with membrane	Electromechanical	Electronic
 Open closed	 Open closed	 Open closed
Pressure **inflates** a diaphragm which triggers the internal microswitches which activates **micro contacts**	Fitted with one or several **preloaded springs**, pressure in the circuit **pushes** the diaphragm, compressed by the spring, until it triggers a microswitch.	it **converts** pressure into a **proportional electrical signal**, the **control unit** then interacts on the compressor and the fan unit.

PWM pressure sensor





- Pressure sensing is required for **highly** efficient A/C loop system that **reduce** fuel consumption and improved emissions
- Pressure sensors have **three** wires leading to the **control module**. This could be the (**ECC**) **E**lectronic **C**limate **C**ontrol, (**PCM**) **P**owertrain **C**ontrol **M**odule or the (**BCM**) **B**ody **C**ontrol **M**odule.
- The pressure is applied to a **silicon** crystal. Depending on the pressure level, the crystal will be more or less “deformed“.
  - Low pressure → min deformation → low voltage
  - High pressure → high deformation → high voltage

Replacing pressure sensor

- Can be screwed to the pipe, dryer or condenser
- Pressure switch can be disassembled without empty the system
- Schrader type valve protects the circuit against losing the refrigerant

Pressure sensor diagnosing

Symptoms	**Lack** of **visual defects** but the engine needs a **long time** to **warm up** or reaches an excessively high temperature of **over 100°C**
Diagnosis	Fan is turned **ON permanently** or does **NOT** turn on at all
Possible causes	• Too **high** pressure in the system • Fan **defect/failure** • Pressure switch **microswitch failure** • **Blown** fan **fuse** • Pressure sensor **defect**
Photo	

Symptoms	No visual effect
Diagnosis	Compressor does **NOT** turn on, air conditioning does **NOT** work
Possible causes	• System **without** refrigerant • **Defective** compressor clutch • Pressure sensor **defect**
Photo