

## Top Tips for Servicing Climate Control Systems

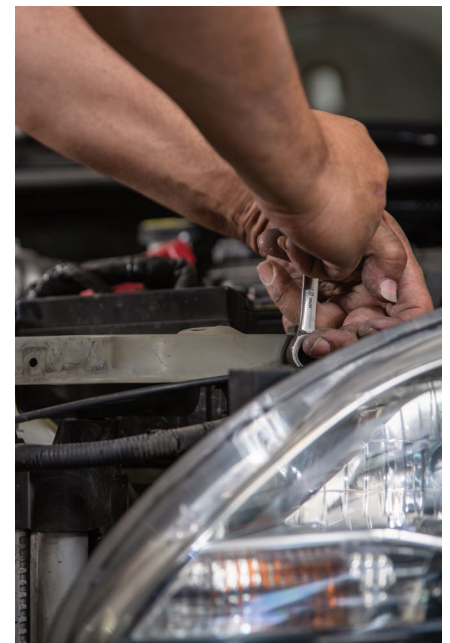
Almost all vehicles on the road are equipped with air conditioning systems, and proper operation is crucial to the customer's driving experience. Whether it is having heat in the winter or A/C in the middle of summer, there are various system components that may need to be serviced. When servicing the HVAC system on a vehicle it is important to consider the type of refrigerant used, the A/C compressor operation and specifications, as well as related heating system components such as the heater core or cooling fans. Understanding components that distribute airflow, such as blend and mode doors, actuators, and the blower motor, is also useful for A/C system service.

The following tips offer guidance on A/C system diagnosis, compressor replacement, as well as scan tool recalibration procedures.

1

### Replace A/C compressors correctly

If an A/C system is not operating at the proper pressures or has a leak, and the A/C compressor is deemed faulty, replacing it is the next logical step. It may be tempting to just replace the compressor and charge the system, but extra steps should be taken to ensure the repair is completed to full capacity. Depending on how a compressor fails, there may be debris left in the system, and a flush must be performed to prevent any further damage after the compressor is replaced. It is also good practice to replace the receiver drier or accumulator when servicing the compressor to ensure the highest quality system operation after completing the replacement. In some cases, these components can be purchased in a comprehensive kit that makes replacements more cost-effective.



## 2

### Verify system airflow and cooling fan operation

An A/C system issue isn't always obvious and may not be directly related to the refrigeration components. Most vehicles have electric cooling fans and front facing air-to-refrigerant A/C condensers. As air flows through the A/C condenser, it cools refrigerant, which is a vital part of the A/C system's operation. If a cooling fan fails or a condenser becomes restricted, it can lead to reduced cabin cooling performance and a higher than normal pressure reading in the refrigeration system. Check for debris including on the cooling fins, by monitoring pressure readings, or measuring the condenser's inlet and outlet temperatures. Fan operation can also be easily tested by commanding the fans with a scan tool and performing basic circuit testing.



## 3

### Don't overlook possible heater core issues

Heater core operation is crucial to providing heat to passengers inside the vehicle's cabin. The heater core is usually mounted behind the dashboard and contains small passages through which coolant can travel. If coolant is not regularly changed, heater cores can gradually become clogged. Passengers may experience low heat output in the cabin, particularly on the driver's side. If a heater core becomes clogged, it can be flushed with a special flushing agent. If it is severely clogged or starts to leak, the heater core must be replaced.

## 4

### Perform door actuator calibration procedures

Some A/C or heating underperformance issues are caused by failing mode or blend door actuators. If an actuator needs replacement, an initialization procedure may be required to calibrate it correctly. Failure to complete this calibration could result in an actuator not operating or malfunctioning, potentially causing damage inside the dashboard. Recalibration procedures can be performed using bi-directional controls or functional tests related to the A/C system within a scan tool. Scan tool procedures should always be checked after servicing A/C components to ensure the system is properly calibrated and all functions work correctly. In some cases, these actuators can be tested or operated through the scan tool as well as a method for diagnosis.



## 5

### Service blower motors properly

A blower motor, resistor, or control may fail, causing issues with changing speeds or complete loss of blower operation. If equipped, verify that the cabin filter or any air ducts leading out of the blower motor housing are free of clogs or restrictions. If a blower motor works at some speeds, such as full speed, but not at lower speeds, checking the blower motor resistor is a good place to start diagnostics. If a blower motor is not operating at all, verifying proper power and ground are good tests to perform. In some cases, the blower motor can make noise, collect debris, or become damaged due to a clogged evaporator drain.



## 6

### Inspect and replace worn A/C hoses and faulty lines

While crucial components such as A/C compressors are often replaced, it is important not to overlook potential issues with the system's hoses and lines. Hoses can degrade over time, and crimps that connect hoses to lines can be common sources of leaks. To check for system leaks, use an audible leak detector or UV dye for best results. If a system is contaminated or a compressor fails, there is potential for debris to clog lines or puncture hoses. In some cases, lines can be flushed but may require replacement if a leak or severe damage is present.

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