

TECH TIP

Checking Those Switches

A customer arrives with a typical computer controlled vehicle with the complaint of no A/C operation. Testing confirms no A/C clutch operation. Initial inspection finds the fuses are good, A/C gauges confirm a sufficient amount of refrigerant pressure, and the scanner shows no A/C request at the *Powertrain Control Module (PCM) or Engine Control Module (ECM)*.

Use a wiring diagram to determine the total number of switches, aside from the *clutch cycling switch*. Most systems utilize one or two *pressure switch(s)* on the high side. The first switch is a high pressure cutout and may be mounted in the rear of the compressor or in the discharge line. The second switch is a low-pressure cutoff and may be mounted in the rear of the compressor or in the liquid line.

In the wiring diagram shown below a positive voltage signal is sent from the *A/C control head* to the high-pressure switch. The high-pressure switch should be closed below 400-psi, which will allow the signal to pass on to the low-pressure switch. If there is sufficient refrigerant pressure (minimum of 40-psi) at the low-pressure switch, the signal will pass through the low-pressure switch where it will be received by the PCM. After the PCM receives this signal, it processes this information and checks to see if all other input sensors are within specifications before proceeding. If everything passes, the PCM will supply a ground signal to the *compressor clutch control relay* which will then engage the compressor clutch.

With the customer's vehicle the scanner revealed no A/C request to the PCM. So the no clutch operation could be due to a faulty low-pressure switch or a faulty high-pressure switch. Use a fused (10amp) jumper wire to bypass each switch individually. When the scan tool shows an A/C request then the problem has been isolated to the switch and/or harness connector. Further testing of these two components will be required to pinpoint the exact problem.

