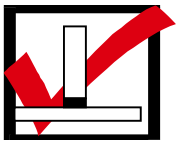
CARQUEST temperature control

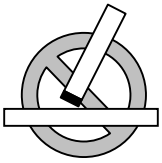
Tech Tips

Temperature Testing Methods

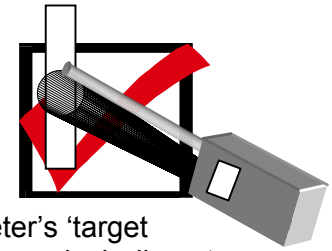
An important step in air conditioning diagnosis is temperature testing components using a digital pyrometer. Pyrometers should have a temperature scale ranging from 0ºF to a minimum of 300ºF. There are two types of pyrometers, contact (thermocouple) and non-contact (infrared). Understanding both the advantages and limitations of each is crucial in obtaining accurate temperature readings.



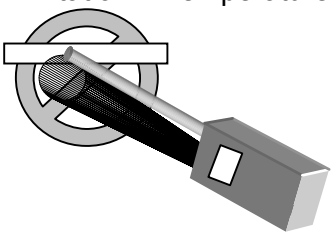
Contact pyrometer: two styles – touch probe and clamp
Advantage – More accurate temperature reading due to physical contact with component. For best results, the tip should rest squarely on the component. A clamp style pyrometer offers more consistent contact.



Limitation – A rigid probe can make solid contact difficult in hard to reach locations and tilting can alter readings as much as 20ºF. Clamps can be hard to attach in tight spots without removing other parts for access.



Non-contact pyrometer: Infrared (with or without laser sighting)
Advantage – Contact is not necessary, making it easier to take readings in hard to reach locations. Best results occur when readings are taken within two inches and inline with the component.
Limitation – Temperature readings can be affected by surrounding heat sources such as an exhaust manifold or radiator. Most infrared pyrometer's 'target area' increases with distance. Example: A one inch diameter 'target area' from six inches away can increase to a four inch diameter 'target area' twenty inches away. Also, some laser sights (red dot) may not point at the actual test location. The red dot could be a half-inch or more from the 'target area'.



Procedures:
When using either type of digital pyrometer, it's important that the surfaces to be tested are clean and free of dirt or oil. Since temperature diagnosis compares the difference between both ends of a component (i.e. condenser inlet compared to condenser outlet), make sure the surfaces are the same. In other words, compare steel to steel and aluminum to aluminum. Some components, like condensers, have painted surfaces. It may be necessary to remove the paint because paint can effect readings by as much as 30ºF. Different thickness', such as a fitting nut compared to the line, can vary readings by 20ºF.

With practice and care, accurate testing and diagnosis can be achieved.