

TECH TIP

WINTERTIME A/C OPERATION

It's important to remember that the A/C system works in the winter months just as it does the rest of the year. However, the compressor is very susceptible to premature failure in the winter. When the driver selects defrost mode, the A/C system is operated to remove moisture from the incoming air to help keep the windshield clear. If the A/C system is not fully charged and 100% functional, the compressor will fail due to improper lubrication. This offers a good selling point when your customer doesn't think he or she needs to service or repair their A/C system in the waning days of summer.

The system functions in cold weather but at much lower pressures. Even fully charged, the high side pressure will only reach around 100-130psi and the low side will generally operate at about 20psi. When the A/C system is low on charge or not operating properly, the low side pressure can drop below 10psi. System lubricant will not circulate with the refrigerant below 10psi and will be left behind in the evaporator. The compressor will eventually fail from the lack of lubrication. Also, in cold weather, the compressor oil may become too thick and not properly lubricate the moving parts, which leads to compressor failure.

Some vehicles incorporate safety switches to prevent compressor operation in cold weather. A common addition is an ambient temperature switch. This switch prevents compressor operation below 40°F and is the best option, but is not incorporated into all systems. Other vehicles depend on a low side pressure cycling switch to prevent compressor operation, however this usually will not occur until the ambient temperature gets below 25°F. This can leave the compressor susceptible to failure. Another option is an evaporator temperature sensor that cycles the compressor off when the evaporator gets cold. Unfortunately, if the system is low on charge or is malfunctioning, the evaporator will not get cold and the compressor will not cycle off, resulting in premature compressor failure.

By informing your customers about wintertime A/C operation, they may find an end of summer repair less costly than a compressor replacement in the spring.