One of the most profitable areas of auto repair is general maintenance. General maintenance usually does not require high skill or expensive equipment, so it can be performed quickly and efficiently. We are all familiar with 30,000 mile services, oil changes, and other regularly scheduled maintenance procedures. These services can be quite lucrative, but there is another area of general maintenance that is often overlooked.

Car owners don’t always know what they need to have done to their car, so they must rely on a reputable garage to keep them informed while keeping their vehicles in top running condition. One way a garage can do this is by using seasonal check lists to outline special inspection procedures.

Keeping these lists readily available for your customers’ “inspection” provides a visible indication of your ability to perform the manufacturer’s recommended maintenance items, while paying particular attention to the special maintenance requirements imposed by the climate in your area.

The seasons are different in different parts of the country. For the sake of discussion, we’ll agree that there should be a minimum of one check list for each season of the year. These check lists should be individually tailored to include items that are important for your climate at different times of the year.

Seasonal check lists aren’t intended to replace your normal inspections, such as brake or suspension checks, but should be offered in addition to any other services a customer may request. These check lists should be relatively short. It shouldn’t take more than about a half hour to perform all of the checks on a seasonal check list. These lists are designed to prevent breakdowns for the customer, but they can also become a good way to generate additional revenue for your shop.

Since this article is appearing in January, we will perform a winter vehicle check on a fuel injected 1991 Nissan Stanza with a manual transmission and a 2.4 liter engine. Even though the car has 103,000 miles on the odometer, its owner has made sure that it has received reasonable care since it was new.

—By Randy Bernklau
A reliable vehicle is important at any time of year, but especially in winter. A winter vehicle check assures owner safety and comfort. Tailor your winter check list with these factors in mind. The above list includes example of the types of items that should be included on a winter vehicle check.

Like any good diagnosis, each vehicle inspection should begin with a thorough road test. Road testing this vehicle did not reveal any unusual noises, braking, or handling problems. However, we did notice that the heater vent’s outlet temperature seemed to be lower than normal.

Cabin heat assures passenger comfort and safety in extremely cold areas, and should be checked during the road test. Even after several miles of driving, this Nissan still wasn’t warming up. The heater and temperature controls appeared to be working normally, so a thermostat check is next.

After our road test, the non-contact temperature probe indicates that the coolant temperature is just 152 degrees (too cold). The thermostat is located at the lower hose connection on this engine, so don’t assume the thermostat is open and allowing coolant flow, just because the upper hose is warm.

Adequate coolant protection can save an engine when the thermometer takes a dive. Waiting until January to check the coolant may be too late, especially if the owner has diluted the mixture by adding water. This coolant looks relatively fresh and is strong enough to offer -34 degree protection.

Windshield wipers take severe abuse during the winter months, as road salt, ice, and sand work their magic. Check the condition of the blades, arms, and inserts. Washer fluid also gets used up more quickly during the winter, so top off the reservoir(s) with a winter washer solvent mix.
Many states do not have mandatory vehicle safety inspection programs. This increases the likelihood that some vehicles will be driving around with one or more exterior lights burned out. Longer winter nights increase the importance of exterior lighting. A quick check now will maintain vehicle safety.

A battery that was tested last fall may not be adequate after the cold of winter has sapped the energy out of it. This one failed a load test. It frequently drops below zero during the winter here in Colorado, and it's a sure bet that this battery won't be able to start the car at those temperatures.

Tire pressures drop as the mercury drops, so be sure all four tires (and the spare) have enough air in them. While you're at it, check the condition of the tires. Unusual tire wear may indicate alignment or other suspension problems. Did your road test reveal any indication of tire imbalance or pulling?

The oil change sticker revealed a recent oil change to the correct weight and grade for winter driving. However, the work had been done at another shop, so a check of the underhood fluid levels still seemed like a good idea. This customer has taken good care of his car and all the fluids are fine.

Breaking a belt or blowing a radiator hose is no fun under ordinary circumstances, but it can be especially dangerous during sub-zero weather. Check for cracked or frayed belts. Check for weak cooling system hoses by squeezing them, especially near their connections. Also check the vacuum hoses.

We've completed the winter check list, so the next step is to contact the customer and receive permission to make the needed repairs. As we mentioned, this car has been well maintained and didn't need much. The old battery was replaced with a new one and the windshield wipers were replaced.
The thermostat on the Nissan 2400 engine is located near the lower hose connection, right under the alternator. The coolant flows through the cooling system in the conventional manner, but the thermostat blocks an inlet, rather than an outlet. It’s not as hard as it looks to replace the thermostat.

Drain the cooling system using the radiator petcock and block drain plug. There are four bolts attaching the thermostat housing and two more holding the lower hose pipe in position. With these six bolts removed, the housing will slide right out of the way to expose the thermostat.

Be sure to replace the o-ring on the inlet side of the thermostat housing where the lower hose pipe attaches. Check parts availability before tearing the engine apart. When it came time to order the o-ring, we found out it was out of stock. This required an overnight stay for the customer’s car.

To refill the cooling system, remove the upper hose at the radiator, then pour coolant into the upper hose. This method eliminates the possibility of trapping air in the cooling system and speeds up the refill process. Place a rag over the alternator to protect it from any spilled coolant.

The best way to check the operating temperature of the cooling system is with the cooling fans running full time. This simulates the air flow the radiator would be experiencing under normal conditions. Our infrared temperature probe indicated an upper radiator hose temperature of 180 degrees F.

With a properly-functioning thermostat, the heater should put out enough heat to keep the occupants warm during winter driving. On our final road test, the heater vents were putting out 160 degree air. This was with an outside temperature of 30 degrees. Plenty warm, don’t you think?