items in the owner's manual and maintenance schedules is the best thing you can do to keep your warranty in effect and to ensure reliability. You'll also improve the trade-in or resale value and make it much easier to sell when the time comes.

Your drivetrain basically consists of all the parts that "drive" the motorhome down the road. For the purpose of this article, we'll include the engine with its driven accessories and radiator, the transmission and torque converter, drivelines (driveshafts) and drive axle. Each item needs regular inspections and maintenance.

Maintenance is done by time and/or mileage intervals. Sometimes it gets a bit confusing, particularly with motorhomes that aren't driven many miles annually. Short trips and towing a trailer or dinghy vehicle are considered severe duty and call for more frequent service intervals. These are also routinely noted in the maintenance schedules. To protect the warranty, it's important to perform the manufacturer-required services at the recommended intervals. You or an independent service facility rather than a franchised dealer may do these services, or portions of them. However, all work must be done according to the manufacturer's procedures, using materials that are approved by the factory.

We recommend that owners keep a maintenance logbook with a record of everything that has been done and where, along with date and mileage. Additionally, keep a folder with all receipts in the coach when you travel. There are also maintenance-tracking software programs and smartphone applications that can help you keep track of services.

In addition to scheduled maintenance, you should book a service appointment immediately if you notice any of these symptoms:

- The CHECK ENGINE icon on your dash doesn't light up when you start the vehicle, or it lights up and doesn't turn off after the engine starts.
- Fluids are noticed leaking from the engine or transmission (note: water from the dash air conditioner condensation coming from a drip tube is normal).
- Visible damage to any engine or drivetrain components.
- Loud noises coming from the engine, transmission, drivelines or axle.
- Smoke or unusual odors are noticed coming from under the vehicle. (Brake smell

GENERIC DRIVETRAIN MAINTENANCE CHECKLIST

- ❑ Engine oil check — oil and filter change
- ❑ Transmission fluid level check — fluid and filter change
- ❑ Power steering fluid level check
- ❑ Radiator coolant check — flush
- ❑ Radiator, hoses and clamps — remove bugs and leaves, inspect for looseness, cracks, deterioration
- ❑ Differential oil level check — change
- ❑ Battery terminals — clean
- ❑ Battery water level check and top off with distilled water
- ❑ Air filter — check, clean/replace
- ❑ Master brake cylinder fluid level check (flush and replace every two years)
- ❑ Drive belts — check for cracks, wear, tension
- ❑ Fuel filter change
- ❑ General visual inspection for leaks, cleanliness, items rubbing or chafing
- ❑ Keep necessary parts greased and lubricated
- ❑ Top off windshield washer fluid
- ❑ Spark plugs and spark plug cables (if equipped) — check and replace as needed
- ❑ Check/replace PCV valve
- ❑ Check/replace oxygen sensors
- ❑ Check EGR valve (when equipped)
- ❑ Check fuel evaporative canister system (when equipped)

Check parking brake cable tension and operation.

Oxygen sensors are mounted in the exhaust pipes and need to be checked.

Fuel filters are often hidden within the frame rails and are easily overlooked.

This type of hose clamp is prone to rust and breakage — replace with stainless steel clamps.

Check air inlet tubes for leaks, mounting security and damage.

U-joints and slip yokes need to be greased and inspected for looseness and wear.

Check driveline hangers for cracked and damaged rubber, and bearings for wear.

Check U-joint mounting fasteners and items such as exhaust hangers (on the right) for wear.

after descending a long grade is not unusual, but smoke is certainly cause for concern.)

When a motorhome that has an onboard diagnostic system is serviced, it's a good practice to connect a scan tool and check for stored trouble codes and determine if there are any problems. In general, there are minor services that are done more frequently and call for an engine oil and filter change, along with fluid level checks for coolant, washer fluid, brake fluid, differential and transmission fluid. Then there are major services where items such as air and gas filters and spark plugs are replaced (see checklist on opposite page).

MOTOR OILS

The Society of Automotive Engineers (SAE) has established a numerical coding system for grading motor oils according to their viscosity. The SAE viscosity grades run from a low of zero to a high of 60, the thickest. The SAE designation for multigrade oils includes two viscosity numbers. Numbers before the letter W designate the oil's "winter" viscosity at low temperatures, the number after indicates the hot oil's viscosity. The SAE has a separate viscosity rating system for gear and manual transmission oils.

The latest service category rating for gasoline engines for 2011 is "SN." The API SN rating is equivalent to the new GF-5 oil rating by the International Lubricant Standardization and Approval Committee (ILSAC). ILSAC works with API in creating gasoline engine oil specifications. SN and GF-5 motor oils are designed to improve fuel economy, the life of emission components such as catalytic converters and oxygen sensors, and reduce sludge, deposit and oxidation. The oils also have better low-temperature viscosity, aeration control, high- and low-temperature corrosion protection, and improved filter-clogging protection.

The previous API service category rating for gas engines was SM, introduced in late 2004 for 2005 and newer engines.

Oil viscosity should be selected for the ambient temperatures expected; thicker for summer's heat and thinner for the winter's cold. Oil that's too thick won't circulate quickly on cold startup. Oil with too low a viscosity runs the risk of metal-to-metal abrasion, particularly in the camshaft and valve train when it gets hot.

Motor oil manufacturers often use supplements such as alkaline additives to neutralize acids and detergents, corrosion inhibitors and dispersants to keep engines clean and minimize sludge. Most motor oils have traditionally used zinc dialkyldithiophosphate (let's call it ZDDP) as an antiwear additive to protect engines from metal-

Check for oil leaks; this front seal is just starting to seep.

Oil pan with drain plug.

The oil filter (on the right) is often tucked away in a spot that is difficult to reach.