e. Check for a restricted exhaust system. Check for bent or crimped exhaust pipes, or internally restricted mufflers or catalytic converters. Compare inlet and outlet temperatures for the converter or muffler. If the inlet is hot, but outlet cold, the component is restricted.
f. Check for a loose or defective knock sensor. A loose, improperly torqued or defective knock sensor will decrease spark advance and reduce power. Replace defective knock sensors and install using the recommended torque specification.
g. Check for engine mechanical conditions such as low compression, worn piston rings, worn valves, worn camshafts and related parts. An engine which has severe mechanical wear, or has suffered internal mechanical damage must be rebuilt or replaced to restore lost power.
h. Check the engine oil level for being overfilled. Adjust the engine's oil level, or change the engine oil and filter, and top off to the correct level.
i. Check for an intake manifold or vacuum hose leak. Replace leaking gaskets or worn vacuum hoses.
j. Check for dragging brakes and replace or repair as necessary.
k. Check tire air pressure and tire wear. Adjust the pressure to the recommended settings. Check the tire wear for possible alignment problems causing increased rolling resistance, decreased acceleration and increased fuel usage.
l. Check the octane rating of the fuel used during refilling, and use a higher octane rated fuel.

3. Poor fuel economy

a. Inspect the air filter and check for any air restrictions going into the air filter housing. Replace the air filter if it is dirty or contaminated.
b. Check the engine for tune-up and related adjustments. Replace worn ignition parts, check the engine ignition timing and fuel mixture, and set to specifications if possible.
c. Check the tire size, tire wear, alignment and tire pressure. Large tires create more rolling resistance, smaller tires require more engine speed to maintain a vehicle's road speed. Excessive tire wear can be caused by incorrect tire pressure, incorrect wheel alignment or a suspension problem. All of these conditions create increased rolling resistance, causing the engine to work harder to accelerate and maintain a vehicle's speed.
d. Inspect the brakes for binding or excessive drag. A sticking brake caliper, overly adjusted brake shoe, broken brake shoe return spring, or binding parking brake cable or linkage can create a significant drag, brake wear and loss of fuel economy. Check the brake system operation and repair as necessary.

4. Engine runs on (diesels) when turned off

a. Check for idle speed set too high and readjust to specification.
b. Check the operation of the idle control valve, and replace if defective.
c. Check the ignition timing and adjust to recommended settings. Check for defective sensors or related components and replace if defective.
d. Check for a vacuum leak at the intake manifold or vacuum hose and replace defective gaskets or hoses.
e. Check the engine for excessive carbon build-up in the combustion chamber. Use a recommended decarbonizing fuel additive or disassemble the cylinder head to remove the carbon.
f. Check the operation of the engine fuel management system and replace defective sensors or control units.
g. Check the engine operating temperature for overheating and repair as necessary.

5. Engine knocks and pings during heavy acceleration, and on steep hills

a. Check the octane rating of the fuel used during refilling, and use a higher octane rated fuel.
b. Check the ignition timing and adjust to recommended settings. Check for defective sensors or related components and replace if defective.
c. Check the engine for excessive carbon build-up in the combustion chamber. Use a recommended decarbonizing fuel additive or disassemble the cylinder head to remove the carbon.
d. Check the spark plugs for the correct type, electrode gap and heat range. Replace worn or damaged spark plugs. For severe or continuous high speed use, install a spark plug that is one heat range colder.
e. Check the operation of the engine fuel management system and replace defective sensors or control units.
f. Check for a restricted exhaust system. Check for bent or crimped exhaust pipes, or internally restricted mufflers or catalytic converters. Compare inlet and outlet temperatures for the converter or muffler. If the inlet is hot, but outlet cold, the component is restricted.

6. Engine accelerates, but vehicle does not gain speed

a. On manual transmission vehicles, check for causes of a slipping clutch. Refer to the clutch troubleshooting section for additional information.
b. On automatic transmission vehicles, check for a slipping transmission. Check the transmission fluid level and condition. If the fluid level is too high, adjust to the correct level. If the fluid level is low, top off using the recommended fluid type. If the fluid exhibits a burning odor, the transmission has been slipping internally. Changing the fluid and filter may help temporarily, however in this situation a transmission may require overhauling to ensure long-term reliability.

Diesel Engines

1. Engine runs poorly

a. Check the injection pump timing and adjust to specification.
b. Check for air in the fuel lines or leaks, and bleed the air from the fuel system.
c. Check the fuel filter, fuel feed and return lines for a restriction and repair as necessary.
d. Check the fuel for contamination, drain and flush the fuel tank and replenish with fresh fuel.

2. Engine lacks power

a. Inspect the air intake system and air filter for restrictions and, if necessary, replace the air filter.
b. Verify the injection pump timing and reset if out of specification.