

11-8 TROUBLESHOOTING

6. Engine is difficult to start when hot

- a. Check the air filter and air intake system. Replace the air filter if it is dirty or contaminated. Check the fresh air intake system for restrictions or blockage.
- b. Check for loose or deteriorated engine grounds and clean, tighten or replace as needed.
- c. Check for needed maintenance. Inspect tune-up and service related items such as spark plugs and engine oil condition, and check the operation of the engine fuel and ignition management system.

Diesel Engines

1. Engine turns over but won't start

- a. Check engine starting procedure and restart engine.
- b. Check the glow plug operation and repair or replace as necessary.
- c. Check for air in the fuel system or fuel filter and bleed the air as necessary.
- d. Check the fuel delivery system and repair or replace as necessary.
- e. Check fuel level and add fuel as needed.
- f. Check fuel quality. If the fuel is contaminated, drain and flush the fuel tank.
- g. Check engine compression. If compression is below specification, the engine may need to be renewed or replaced.
- h. Check the injection pump timing and set to specification.
- i. Check the injection pump condition and replace as necessary.
- j. Check the fuel nozzle operation and condition or replace as necessary.

2. Engine does not turn over when attempting to start

- a. Check the battery state of charge and condition. If the dash lights are not visible or very dim when turning the ignition key on, the battery has either failed internally or discharged, the battery cables are loose, excessively corroded or damaged, or the alternator has failed or internally shorted, discharging the battery. Charge or replace the battery, clean or replace the battery cables, and check the alternator output.
- b. Check the operation of the neutral safety switch. On automatic transmission vehicles, try starting the vehicle in both Park and Neutral. On manual transmission vehicles, depress the clutch pedal and attempt to start. On some vehicles, these switches can be adjusted. Make sure the switches or wire connectors are not loose or damaged. Replace or adjust the switches as necessary.
- c. Check the starter motor, starter solenoid or relay, and starter motor cables and wires. Check the ground from the engine to the chassis. Make sure the wires are not loose, damaged, or corroded. If battery voltage is present at the starter relay, try using a remote starter to start the vehicle for test purposes only. Replace any damaged or corroded cables, in addition to replacing any failed components.
- d. Check the engine for seizure. If the engine has not been started for a long period of time, internal parts such as the rings may have rusted to the cylinder walls. The engine may have suffered internal damage, or could be hydro-locked from ingesting water. Remove the injectors and carefully attempt to rotate the engine

using a suitable breaker bar and socket on the crankshaft pulley. If the engine is resistant to moving, or moves slightly and then binds, do not force the engine any further before determining the cause of the problem.

3. Engine stalls after starting

- a. Check for a restriction in the fuel return line or the return line check valve and repair as necessary.
- b. Check the glow plug operation for turning the glow plugs off too soon and repair as necessary.
- c. Check for incorrect injection pump timing and reset to specification.
- d. Test the engine fuel pump and replace if the output is below specification.
- e. Check for contaminated or incorrect fuel. Completely flush the fuel system and replace with fresh fuel.
- f. Test the engine's compression for low compression. If below specification, mechanical repairs are necessary to repair.
- g. Check for air in the fuel. Check fuel tank fuel and fill as needed.
- h. Check for a failed injection pump. Replace the pump, making sure to properly set the pump timing.

4. Starter motor spins, but does not engage

- a. Check the starter motor for a seized or binding pinion gear.
- b. Remove the flywheel inspection plate and check for a damaged ring gear.

1-B. Engine Running Conditions

Gasoline Engines

1. Engine runs poorly, hesitates

- a. Check the engine ignition system operation and adjust if possible, or replace defective parts.
- b. Check for restricted fuel injectors and replace as necessary.
- c. Check the fuel pump output and delivery. Inspect fuel lines for restrictions. If the fuel pump pressure is below specification, replace the fuel pump.
- d. Check the operation of the engine management system and repair as necessary.

2. Engine lacks power

- a. Check the engine's tune-up status. Note the tune-up specifications and check for items such as severely worn spark plugs; adjust or replace as needed. On vehicles with manually adjusted valve clearances, check for tight valves and adjust to specification.
- b. Check the air filter and air intake system. Replace the air filter if it is dirty or contaminated. Check the fresh air intake system for restrictions or blockage.
- c. Check the operation of the engine fuel and ignition management systems. Check the sensor operation and wiring. Check for low fuel pump pressure and repair or replace components as necessary.
- d. Check the throttle linkage adjustments. Check to make sure the linkage is fully opening the throttle. Replace any worn or defective bushings or linkages.