Engine Trouble Shooting

GASOLINE ENGINE TROUBLE SHOOTING (Cont.)

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
Noisy Valve Train Components (Cont.) • Excessively worn camshaft lobes. • Plugged valve lifter oil feed holes. • Faulty valve lifter check ball. • Rocker arm retaining nut installed upside down. • Valve lifters incorrectly fitted to bore size. • Faulty valve lifter plunger, or push rod seat. • Improper valve lash. **Burned, Sticking or Broken Valves** • Weak valve springs. • Improper valve lifter clearance. • Improper valve guide clearance, or worn guides. • Out-of-round valve seats, or improper valve seat width. • Deposits or gum formation on valve stems, seats or guides. • Warped valves or faulty valve forgings.	**Burned, Sticking or Broken Valves (Cont.)** • Exhaust back pressure. • Improper spark timing. **Broken Pistons and/or Rings** • Undersize pistons. • Wrong type or size of rings. • Tapered or eccentric cylinder bore. • Improper connecting rod alignment. • Excessively worn ring grooves. • Improperly assembled piston pins. • Insufficient ring gap clearance. • Engine overheating. • Incorrect ignition timing. **Excessive Exhaust Noise** • Leaks at exhaust pipe joints. • Burned or blown out muffler or exhaust pipe. • Exhaust pipe leaking at manifold flange. • Exhaust manifold cracked or broken. • Leak between manifold and cylinder head. • Obstruction in muffler or tail pipe.

DIESEL ENGINE TROUBLE SHOOTING

Diesel engine mechanical diagnosis is the same as that for gasoline engines for such items as noisy lifters, rod bearings, main bearings, valves, rings and pistons. The following trouble shooting guide cover those items which apply only to diesel engines.

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
Engine Does Not Crank • Loose or corroded battery cables, or dead batteries. • Loose starter connections or faulty starter. **Engine Cranks Slowly but Does Not Start** • Loose or corroded battery cables, or batteries do not have a sufficient charge. • Wrong weight engine oil in engine.	**Engine Cranks Normally but Does Not Start** • Glow plugs not functioning. • Glow plug control system not functioning. • Fuel not being injected into cylinders. • No fuel going to injection pump. • Fuel filter blocked. • Fuel tank filter blocked. • Fuel pump not operating. • Fuel return system blocked. • No voltage to fuel solenoid. • Incorrect or contaminated fuel.

DIESEL ENGINE TROUBLE SHOOTING (Cont.)

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
Engine Cranks Normally but Does Not Start (Cont.) • Incorrect injection pump timing. • Low compression. • Injection pump malfunction. **Engine Starts but Will Not Run at Idle** • Incorrect slow idle adjustment. • Fast idle solenoid not functioning. • Fuel return system blocked. • Glow plugs turning off too soon. • Injection pump timing incorrect. • Insufficient fuel going to injection pump. • Incorrect or contaminated fuel. • Low compression. • Injection pump malfunction. • Fuel solenoid closes in "RUN" position. **Engine Starts and Idles Rough Without Abnormal Smoke or Noise** • Incorrect slow idle adjustment. • Injection line fuel leaks. • Fuel return system blocked. • Air in fuel system. • Incorrect or contaminated fuel. • Injector nozzle malfunction. **Engine Starts and Idles Rough Without Abnormal Smoke or Noise, but Clears After Warm-Up** • Injection pump timing incorrect. • Engine has not fully broken in. • Air in fuel system. • Injector nozzle malfunction. **Engine Misfires Above Idle but Idles Correctly** • Blocked fuel filter. • Injection pump timing incorrect. • Incorrect or contaminated fuel. **Engine Will Not Return to Idle** • External linkage binding or adjusted wrong. • Fast idle adjustment incorrect. • Internal injection pump malfunction. **Fuel Leaking on Ground** • Loose or broken fuel line or connection. • Internal injection pump seal leak.	**Knocking Noise from Cylinders** • Injector nozzles sticking open. • Very low nozzle opening pressure. **Noticeable Loss of Engine Power** • Restricted air intake. • EGR valve malfunction. • Restricted or damaged exhaust system. • Blocked fuel tank filter • Blocked fuel filter, or fuel tank vacuum vent in gas cap. • Restricted fuel supply from tank to injection pump. • Restricted fuel return system. • Incorrect or contaminated fuel. • External compression leaks. • Blocked injector nozzles. • Low compression. **Excessive Black Smoke and Loud Engine Noise** • Basic timing incorrect. • EGR valve malfunction. • Injector pump housing pressure not to specifications. • Internal injection pump malfunction. **Engine Overheating** • Cooling system leaks. • Belt slipping or damaged. • Thermostat stuck closed. • Head gasket leaking **Oil Light On at Idle** • Oil cooler, or oil cooler line restricted. • Low oil pump pressure. **Engine Will Not Shut Off** • Injector pump fuel solenoid doesn't return fuel valve to "OFF" position. **VACUUM PUMP DIAGNOSIS** **Excessive Noise** • Loose screws between pump and drive assembly. • Loose tube on pump assembly. • Valves not functioning properly. **Oil Leakage** • Loose end plug. • Bad crimp.