

# ENGINE SUPPORT TROUBLESHOOTING THE ENGINE

ENGINE PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
Engine will not start but producing exhaust smoke	Starting procedure is not correct	Verify the correct starting procedure
	Engine cranking speed is too low	Check the engine cranking speed with a handheld tachometer. If the cranking speed is less than 150 rpm, refer to engine manual
	Starting aid is necessary for cold weather	Check for correct operation of cold starting aid
	Air in the fuel system	Bleed the fuel system and check for leaks
	Fuel supply is not adequate	Check the flow through the filter to locate the source of the restriction
	Fuel drain backup	Verify the fuel return line is plumbed to the bottom of the tank
	Fuel pump overow valve is malfunctioning	Check the overow valve. Replace if necessary
	Fuel transfer pump malfunctioning	Inspect the fuel transfer pump. Replace if necessary
	Intake air restriction is high	Check the air intake system for restriction
	Fuel contaminated	Verify by operating the engine with clean fuel from a temporary tank
	Throttle linkage adjustment is not correct	Check the fuel pump throttle linkage adjustment
	Valves or injectors adjusted wrong	Adjust valves and injectors
	Injector is malfunctioning	Inspect the injectors. Replace if necessary
Engine will not start and is not producing exhaust smoke	Starting procedure is not correct	Verify the correct starting procedure
	Fuel level is low in tank	Fill the fuel tank
	Electric or manual fuel shutdown binds	Check for loose wires and verify that the solenoid is functioning. Check that the manual shuto level is not binding at the injector pump
	Air in the fuel system	Bleed the fuel system and check for leaks
	Fuel transfer pump malfunctioning	Inspect the fuel transfer pump. Replace if necessary
Engine will not start and is not producing exhaust smoke continued	Fuel drain backup	Verify the fuel return line is plumbed to the bottom of the tank
	Fuel pump overow valve is malfunctioning	Check the overow valve. Replace if necessary
	Throttle linkage adjustment is not correct	Check the fuel pump throttle linkage adjustment
	Fuel injector pump is malfunctioning	Perform the fuel injector pump test
	Fuel injector pump timing is not correct	Adjust injector timing

ENGINE PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
Engine will not start and is not producing exhaust smoke continued (cont)	Blown low oil pressure and/or high coolant temperature safety cut-out switches	Check fuse and/or replace gauges if necessary
Coolant temperature is above normal	Coolant level is low	Inspect the engine and cooling system for external coolant leaks. Repair if necessary and replace lost coolant
	Radiator fins are damaged or obstructed with debris	Inspect the radiator fins. Clean and repair the fins as necessary
	Cooling system hose is collapsed, restricted or leaking	Inspect the radiator hoses
	Lubricating oil level is low	Check the lubricating oil level. Verify the dipstick calibration and the oil pan capacity. Fill the system to the specified level
	Fan shroud is damaged or missing or the air recirculation bases are damaged or missing	Inspect the shroud and the recirculation bases. Repair, replace or install if necessary
	Fan drive belt is loose, tight or not in alignment	Check the fan drive belt
	Fan drive is malfunctioning	Check the fan drive belt
	Fan drive is malfunctioning	Check the fan drive
	Radiator cap is not correct, is malfunctioning, or has low-pressure rating	Check the radiator pressure cap
	Temperature gauge is malfunctioning	Check and/or replace the temperature gauge
	Thermostat is not correct or is malfunctioning	Check the thermostat for the correct part number and for the correct operation
	Fuel pump is malfunctioning.	Test the fuel pump on a fuel pump test stand. Replace the fuel pump if necessary.
	Engine's water pump is malfunctioning.	Check the engine's water pump for correct operation. Replace the water pump if necessary.
	Air in the cooling system.	Inspect and bleed the cooling system.
	Cooling system is contaminated with dirt, scale or sludge.	Clean the cooling system.
Low lubricating oil pressure	Lubricating oil level is low.	Check and replenish lubricating oil.
	Lubricating oil pressure sensor or gauge is malfunctioning.	Check the oil pressure switch or gauge for correct operation.
	Lubricating oil is diluted with fuel.	Change the oil. If the oil becomes diluted again, contact an authorized repair facility.
	Lubricating oil is diluted with water.	Check for a missing dipstick, rain cap and/or oil fill cap.
	Lubricating oil does not meet specification for operating conditions.	Change the oil and filters.
	Lubricating oil leak.	Inspect the engine for external oil leaks. Tighten the capscrews, pipe plugs and fittings. Replace gaskets if necessary.
	Lubricating oil viscosity not correct.	Make sure the correct lubricating oil is being used.
	Lubricating oil high-pressure relief valve is malfunctioning.	Remove and inspect the high-pressure relief valve.
Engine runs rough or misfires	Lubricating oil filter is plugged.	Change the oil and filter.
	Fuel contaminated.	Verify operation of engine with clean fuel in a temporary tank.
	Air in the fuel	Bleed the fuel system and check for leaks
	Fuel leak	Check the fuel lines, fuel connections and fuel filters for leaks

ENGINE PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
Engine runs rough or misfires (cont.)	Fuel pump overow valve is malfunctioning.	Check the overow valve. Replace if necessary.
	Fuel lift pump is malfunctioning.	Check the fuel lift pump for correct operation. Check the pump output pressure. Replace the fuel lift pump if necessary.
	Valve lash excessive.	Adjust valves. Make sure the push rods are not bent and/or rocker levers are not severely worn.
	Fuel injector pump timing not correct	Inspect the injectors. Replace the injectors as necessary.
	Fuel injector pump malfunctioning.	Put the engine at top dead center. Check and adjust the fuel timing.



**GLOBAL PUMP**  
 10162 East Coldwater Road, Davison, MI 48423  
 Tel: 810.653.4828 Fax: 810.658.0632  
**1.866.360.PUMP**      [www.globalpump.com](http://www.globalpump.com)