

Tune-Up

TUNE-UP TROUBLE SHOOTING

CONDITION	POSSIBLE CAUSE	CORRECTION
SPARK PLUG DIAGNOSIS		
Normal Spark Plug Condition	Light Tan or Gray deposits on insulator Electrode not burned or fouled Gap tolerance not changed	
Cold Fouling or Carbon Deposits	Over-rich air/fuel mixture Faulty choke Clogged air filter Incorrect idle speed or dirty carburetor Faulty ignition wiring Prolonged operation at idle Sticking valves or worn valve guide seals	Adjust air/fuel mixture, see TUNE-UP Replace choke assembly, see FUEL Clean and/or replace air filter Reset idle speed and/or clean carburetor Replace ignition wiring Shut engine off during long idle Check valve train, see ENGINES
Wet Fouling or Oil Deposits	Worn rings and pistons Excessive cylinder wear Worn or loose bearings	Install new rings and pistons, see ENGINES Rebore or replace block Tighten or replace bearings, see ENGINES
Gap Bridged	Deposits in combustion chamber becoming fused to electrode	Clean combustion chamber of deposits
Blistered Electrode	Engine overheating Wrong type of fuel Loose spark plugs Over-advanced ignition timing	Check cooling system, see COOLING Replace with correct fuel Re-tighten spark plugs Reset ignition timing, see TUNE-UP
Pre-ignition or Melted Electrodes	Incorrect type of fuel Incorrect ignition timing Burned valves Engine overheating Wrong type of spark plug, too hot	Replace with correct fuel Reset ignition timing, see TUNE-UP Replace valves, see ENGINES Check cooling system, see COOLING Replace with correct spark plug, see TUNE-UP
Chipped Insulators	Severe detonation Improper gapping procedure	Check for over-advanced timing or combustion chamber deposits Re-gap spark plugs
Rust Colored Deposits	Additives in unleaded fuel Water in combustion chamber	Try different fuel brand These deposits do not affect plug performance
ELECTRONIC IGNITION DIAGNOSIS		
<i>Before diagnosing an electronic ignition system, ensure that all wiring is properly connected between distributor, wiring connector and spark plugs. Ignition problems will show up either as: Engine Will Not Start or Engine Runs Rough.</i>		
Engine Won't Start	Open circuits in the following locations: Between distributor and bulkhead connector Between bulkhead connector and ignition switch Between ignition switch and starter solenoid	Repair circuit Repair circuit Repair circuit
Engine Runs Rough	Fuel lines leaking or clogged Ignition timing incorrect Centrifugal advance malfunction Defective spark plugs, or wiring	Tighten fitting, remove restriction Reset ignition timing, see TUNE-UP Check distributor advance, see ELECTRICAL Replace plugs or plug wiring
Component Failure	Spark arc-over on rotor, coil or cap Defective pick-up coil Defective ignition coil Defective vacuum unit Defective control module	Replace rotor, cap or coil Replace pick-up coil, see ELECTRICAL Replace ignition coil Replace vacuum unit, see ELECTRICAL Replace control module

TUNE-UP TROUBLE SHOOTING (Cont.)

CONDITION	POSSIBLE CAUSE	CORRECTION
ELECTRONIC IGNITION DIAGNOSIS BY OSCILLOSCOPE PATTERN		
Firing Voltage Lines are the Same, But Abnormally High	Retarded ignition timing Fuel mixture too lean High resistance in coil wire Corrosion in coil tower terminal Corrosion in distributor coil terminal	Reset ignition timing, see TUNE-UP Re-adjust carburetor, see TUNE-UP Replace coil wire Clean and/or replace coil Clean or replace distributor cap
Firing Voltage Lines are the Same, But Abnormally Low	Fuel mixture too rich Breaks in coil wire causing arcing Cracked coil tower causing arcing Low coil output Low engine compression	Re-adjust carburetor, see TUNE-UP Replace coil wire Replace coil Replace coil Determine cause and repair, see ENGINES
One or More, But Not All Firing Voltage Lines Are Higher Than the Others	Carburetor idle mixture not balanced EGR valve stuck open High resistance in spark plug wire Cracked or broken spark plug insulator Intake vacuum leak Defective spark plugs Corroded spark plug terminals	Re-adjust idle mixture, see TUNE-UP Inspect and/or replace EGR valve Replace spark plug wires Replace spark plugs Repair leak Replace spark plugs Replace spark plugs
One or More, But Not All Firing Voltage Lines Are Lower	Curb idle mixture not balanced. Breaks in plug wires causing arcing. Cracked coil tower causing arcing. Low compression. Defective or fouled spark plugs	Re-adjust idle mixture, see TUNE-UP Replace spark plug wires Replace coil Determine cause and repair Replace spark plugs
Cylinders Not Firing	Cracked distributor cap terminals. Shorted spark plug wire. Mechanical problem in engine. Defective spark plugs. Spark plugs fouled.	Replace distributor cap Determine cause of short and replace wire Determine problem and correct Replace spark plugs Replace spark plugs
GENERAL DIAGNOSIS		
Hard Starting	Binding carburetor linkage Binding choke linkage Binding choke piston Restricted choke vacuum Worn or dirty needle valve and seat Float sticking Incorrect choke adjustment. Defective coil. Improper spark plug gap. Incorrect ignition timing.	Eliminate binding Eliminate binding Eliminate binding Check vacuum lines for blockage Clean carburetor, see FUEL Re-adjust or replace float, see FUEL Reset choke adjustment, see TUNE-UP Replace coil Re-gap spark plugs Reset ignition timing, see TUNE-UP
Detonation	Over-advanced ignition timing Defective spark plugs Fuel lines clogged EGR system malfunction PCV system malfunction Vacuum leaks Loose fan belts Restricted air flow Vacuum advance malfunction	Reset ignition timing, see TUNE-UP Replace spark plugs Clean out fuel lines Check EGR system Check PCV system Check and repair vacuum system Tighten or replace fan belts, see TUNE-UP Remove restriction Check distributor operation, see ELECTRICAL

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TUNE-UP TROUBLE SHOOTING (Cont.)

CONDITION	POSSIBLE CAUSE	CORRECTION
GENERAL DIAGNOSIS (Cont.)		
Dieseling	Binding carburetor linkage Binding throttle linkage Binding choke linkage or fast idle cam Defective idle solenoid Improper base idle speed Incorrect ignition timing Incorrect idle mixture setting	Free carburetor linkage Free throttle linkage Free binding linkage Replace solenoid, see FUEL Reset idle speed, see TUNE-UP Reset ignition timing, see TUNE-UP Reset idle mixture setting, see TUNE-UP
Faulty Acceleration	Incorrect ignition timing Engine cold and choke too lean Defective spark plugs Defective coil	Reset ignition timing, see TUNE-UP Adjust choke and allow engine to warm-up Replace spark plugs Replace coil
Faulty Low Speed Operation	Clogged idle transfer slots Restricted idle air bleeds and passages. Clogged air cleaner filter Defective spark plugs Defective ignition wires Defective distributor cap	Clean idle transfer slots, see FUEL Disassemble carburetor and clean, see FUEL Replace air cleaner Replace spark plugs Replace ignition wires, see TUNE-UP Replace distributor cap
Faulty High Speed Operation	Incorrect ignition timing Defective distributor centrifugal advance. Defective distributor vacuum advance Incorrect spark plugs or plug gap Faulty choke operation Clogged vacuum passages Improper size or clogged main jet Restricted air cleaner Defective distributor cap, rotor or coil Worn distributor shaft	Reset ignition timing, see TUNE-UP Replace mechanism, see ELECTRICAL Replace advance unit, see ELECTRICAL Check gap and/or replace spark plugs Check choke and repair as required Remove restrictions Check jet size and clean, see FUEL Check filter and replace as required Replace cap, rotor or coil Replace distributor
Misfire At All Speeds	Defective spark plugs Defective spark plug wires Defective distributor cap, rotor or coil Cracked or broken vacuum hoses Vacuum leaks Fuel lines clogged	Replace spark plugs Replace spark plug wires Replace cap, rotor, or coil Replace vacuum hoses Seal leaks Remove restriction
Hesitation	Cracked or broken vacuum hoses Vacuum leaks Binding carburetor linkage Binding throttle linkage Binding choke linkage or fast idle cam Improper float setting Cracked or broken ignition wires	Replace vacuum hoses Repair leaks Eliminate binding Eliminate binding Eliminate binding Re-adjust float setting, see FUEL Replace ignition wires
Rough Idle, Missing or Stalling	Incorrect curb idle or fast idle speed. Incorrect basic timing Improper idle mixture adjustment Improper feedback system operation Incorrect spark plug gap Moisture in ignition components Loose or broken ignition wires Damaged distributor cap or rotor Faulty ignition coil Fuel filter clogged or worn Damaged idle mixture screw Improper fast idle cam adjustment Improper EGR valve operation Faulty PCV valve air flow	Reset idle speeds, see TUNE-UP Reset ignition timing, see TUNE-UP Reset idle mixture adjustment, see TUNE-UP Check feedback system, see FUEL Reset spark plug gap, see TUNE-UP Dry components Replace ignition wires Replace cap or rotor Replace coil Replace fuel filter Replace idle mixture screw, see FUEL Reset fast idle cam adjustment, see TUNE-UP Replace EGR valve Replace PCV valve

TUNE-UP TROUBLE SHOOTING (Cont.)

CONDITION	POSSIBLE CAUSE	CORRECTION
GENERAL DIAGNOSIS (Cont.)		
Rough Idle, Missing or Stalling (Cont.)	Choke binding, or improper setting Vacuum leak Improper float bowl fuel level Clogged air bleed or idle passages Clogged or worn air cleaner filter Faulty choke vacuum diaphragm Exhaust manifold heat valve inoperative Improper distributor spark advance Leaking valves or valve components Improper carburetor mounting Excessive play in distributor shaft Loose or corroded wiring connections	Reset choke and eliminate binding Eliminate leak Reset float adjustment, see FUEL Clean carburetor passages, see FUEL Replace air filter Replace diaphragm, see FUEL Replace heat valve Check distributor operation, see ELECTRICAL Check valve train, see ENGINES Remove and remount carburetor Replace distributor, see ELECTRICAL Repair or replace as required
Engine Surges	Improper PCV valve air flow Vacuum leaks Clogged main jets Clogged air bleeds EGR valve malfunction Restricted air cleaner filter Cracked or broken vacuum hoses Cracked or broken ignition wires Vacuum advance malfunction Defective or fouled spark plugs	Replace PCV valve Eliminate leaks Remove restriction Remove restriction Replace EGR valve Replace air filter Repair or replace hoses Replace ignition wires Check unit and replace if required Replace spark plugs
Ping or Spark Knock	Incorrect ignition timing Distributor centrifugal or vacuum advance malfunction Carburetor setting too lean Vacuum leak EGR valve malfunction	Reset ignition timing, see TUNE-UP Check operation and replace as required Re-adjust mixture setting, see TUNE-UP Eliminate leak Replace EGR valve
Poor Gasoline Mileage	Cracked or broken vacuum hoses Vacuum leaks Defective ignition wires Incorrect choke setting Defective vacuum advance Defective spark plugs Binding carburetor power piston Dirt in carburetor jets Incorrect float adjustment Defective power valves	Replace vacuum hoses Eliminate leaks Replace wires Re-adjust setting, see FUEL Replace vacuum advance, see ELECTRICAL Replace spark plugs Eliminate binding Clean jets and/or replace, see FUEL Re-adjust float setting, see FUEL Replace power valve, see FUEL
Engine Stalls	Incorrect idle speed Improper float level Leaking needle valve and seat Vacuum Leaks	Re-adjust idle speed, see TUNE-UP Re-adjust float level, see FUEL Replace needle valve and seat, see FUEL Eliminate leaks