

## TROUBLE SHOOTING - BASIC PROCEDURES

## Article Text

1993 Mazda 929

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Thursday, March 25, 1999 12:15AM

## ARTICLE BEGINNING

## GENERAL TROUBLE SHOOTING

## AIR CONDITIONING TROUBLE SHOOTING

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# BASIC AIR CONDITIONING TROUBLE SHOOTING CHART

[illegible]

CONDITION	POSSIBLE CAUSE
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.....

## Compressor Not Working

- ù Compressor clutch circuit open.
- ù Compressor clutch coil inoperative.
- ù Poor clutch ground connection.
- ù Fan belts loose.
- ù Thermostatic switch inoperative.
- ù Thermostatic switch not adjusted.
- ù Ambient temperature switch open.
- ù Superheat fuse blown.

[illegible]

### Excessive Noise or Vibration

- ù Missing or loose mounting bolts.
- ù Bad idler pulley bearings.
- ù Fan belts not tightened correctly.
- ù Compressor clutch contacting body.
- ù Excessive system pressure.
- ù Compressor oil level low.
- ù Damaged clutch bearings.
- ù Damaged reed valves.
- ù Damaged compressor.

[illegible]

Insufficient or No Cooling;

## Compressor Working

- ù Expansion valve inoperative.
- ù Heater control valve stuck open.
- ù Low system pressure.
- ù Blocked condenser fins.
- ù Blocked evaporator fins.
- ù Vacuum system leak.
- ù Vacuum motors inoperative.
- ù Control cables improperly adjusted.
- ù Restricted air inlet.
- ù Mode doors binding.
- ù Blower motor inoperative.
- ù Temperature above system capacity.

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## BRAKE SYSTEM TROUBLE SHOOTING

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### BRAKE SYSTEM TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
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AA

Brakes Pull Left or Right	Incorrect tire pressure	Inflate tires to proper pressure
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Front end out of alignment	See WHEEL ALIGNMENT
----------------------------	---------------------

Mismatched tires	Check tires sizes
------------------	-------------------

Restricted brake lines or hoses	Check hose routing
---------------------------------	--------------------

Loose or malfunctioning caliper	See DISC BRAKES or BRAKE SYSTEM
---------------------------------	---------------------------------

Bent shoe or oily linings	See DRUM BRAKES or BRAKE SYSTEM
---------------------------	---------------------------------

Malfunctioning rear brakes	See DRUM, DISC BRAKES or BRAKE SYSTEM
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Loose suspension parts	See SUSPENSION
------------------------	----------------

AA

Noises Without Brakes Applied	Front linings worn out	Replace linings
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Dust or oil on drums or rotors	See DRUM, DISC BRAKES or BRAKE SYSTEM
--------------------------------	---------------------------------------

AA

Noises With Brakes Applied	Insulator on outboard shoe damaged	See DISC BRAKES or BRAKE SYSTEM
----------------------------	------------------------------------	---------------------------------

Incorrect pads or linings	Replace pads or linings
---------------------------	-------------------------

AA

Brake Rough, Chatters or Pulsates	Excessive lateral runout	Check rotor runout
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Parallelism not to specifications	Reface or replace rotor
Wheel bearings not adjusted	See SUSPENSION
Rear drums out-of-round	Reface or replace drums
Disc pad reversed, steel against rotor	Remove and reinstall pad

AA

Excessive Pedal Effort	Malfunctioning power unit	See POWER BRAKES or BRAKE SYSTEM
	Partial system failure	Check fluid and pipes
	Worn disc pad or lining	Replace pad or lining
	Caliper piston stuck or sluggish	See DISC BRAKES or BRAKE SYSTEM
	Master cylinder piston stuck	See MASTER CYLINDERS or BRAKE SYSTEM
	Brake fade due to incorrect pads for linings	Replace pads or linings
	Linings or pads glazed	Replace pads or linings
	Worn drums	Reface or replace drums

AA

Excessive Pedal Travel	Partial brake system failure	Check fluid and pipes
	Insufficient fluid in master cylinder	See MASTER CYLINDERS or BRAKE SYSTEM
	Air trapped in system	See BRAKE BLEEDING or BRAKE SYSTEM
	Rear brakes not adjusted	See Adjustments in DRUM BRAKES or BRAKE SYSTEM
	Bent shoe or lining	See DRUM BRAKES or BRAKE SYSTEM
	Plugged master cylinder cap	See MASTER CYLINDERS or BRAKE SYSTEM

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Improper brake fluid

Replace brake fluid

AA

Pedal Travel

Decreasing

Compensating port plugged

See MASTER CYLINDERS  
or BRAKE SYSTEM

Swollen cup in master  
cylinder

See MASTER CYLINDERS  
or BRAKE SYSTEM

Master cylinder piston  
not returning

See MASTER CYLINDERS  
or BRAKE SYSTEM

Weak shoe retracting springs  
See DRUM BRAKES  
BRAKE SYSTEM

Wheel cylinder piston  
sticking

See DRUM BRAKES or  
BRAKE SYSTEM

AA

Dragging

Brakes

Master cylinder pistons  
not returning

See MASTER CYLINDERS  
BRAKE SYSTEM

Restricted brake lines  
or hoses  
Incorrect parking brake  
adjustment

Check line routing

See DRUM BRAKES  
BRAKE SYSTEM

Parking Brake cables frozen  
See DRUM BRAKES  
BRAKE SYSTEM

Incorrect installation of  
inboard disc pad  
Remove and replace  
correctly

Power booster output  
rod too long

See POWER BRAKE UNITS  
BRAKE SYSTEM

Brake pedal not returning  
freely  
See DISC, DRUM BRAKES  
BRAKE SYSTEM

AA

Brakes Grab or  
Uneven Braking

Action

Malfunction of combination  
valve

See CONTROL VALVE or  
BRAKE SYSTEM

Malfunction of power brake  
unit

See POWER BRAKE UNITS  
or BRAKE SYSTEM

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Binding brake pedal

See DISC, DRUM BRAKES  
or BRAKE SYSTEM

AA

Pulsation or

Roughness

Uneven pad wear caused by  
caliper

See DISC BRAKES or  
BRAKE SYSTEM

Uneven rotor wear

See DISC BRAKES or  
BRAKE SYSTEM

Drums out-of-round

Reface or replace drums

AA

### CARBURETOR TROUBLE SHOOTING:

#### READ THIS FIRST:

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#### COLD START SYMPTOMS

##### BASIC COLD START SYMPTOMS TROUBLE SHOOTING CHART

AA

CONDITION

POSSIBLE CAUSE

CORRECTION

AA

Engine Won't  
Start

Choke not closing

Check choke  
operation, see  
FUEL SYSTEMS

Choke linkage bent

Check linkage, see  
FUEL SYSTEM

AA

Engine Starts,  
Then Dies

Choke vacuum kick setting  
too wide

Check setting and  
adjust see, FUEL  
SYSTEMS

Fast idle RPM too low

Reset RPM to specifi-  
cation, see TUNE-UP

Fast idle cam index  
incorrect

Reset fast idle cam  
index, see FUEL  
SYSTEMS

Vacuum leak

Inspect vacuum  
system for leaks

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Low fuel pump outlet

Repair or replace  
pump, see FUEL  
SYSTEMS

Low carburetor fuel level

Check float setting  
see FUEL SYSTEM

AA

Engine Quits  
Under Load

Choke vacuum kick setting  
incorrect

Reset vacuum kick  
setting, see FUEL  
SYSTEMS

Fast idle cam index  
incorrect

Reset fast idle cam  
index, see FUEL  
SYSTEM

Incorrect hot fast idle  
speed RPM

Reset fast idle RPM,  
see TUNE-UP

AA

Engine Starts,  
Runs Up, Then  
Idles, Slowly  
With Black Smoke

Choke vacuum kick set too  
narrow

Reset vacuum kick,  
see FUEL SYSTEMS

Fast idle cam index  
incorrect

Reset fast idle cam  
index, see FUEL  
SYSTEMS

Hot fast idle RPM too low

Reset fast idle RPM,  
see TUNE-UP

AA

## HOT STARTING SYMPTOMS

### BASIC HOT START SYMPTOMS TROUBLE SHOOTING CHART

AA

CONDITION

POSSIBLE CAUSE

CORRECTION

AA

Engine Won't  
Start

Engine flooded

Allow fuel to  
evaporate

AA

## COLD ENGINE DRIVEABILITY SYMPTOMS

### BASIC COLD ENGINE DRIVEABILITY SYMPTOMS TROUBLE SHOOTING CHART

AA

CONDITION

POSSIBLE CAUSE

CORRECTION

AA

Engine Stalls in  
Gear

Choke vacuum kick setting  
incorrect

Reset choke vacuum  
kick, see FUEL  
SYSTEMS

Fast idle RPM incorrect

Reset fast idle RPM,  
see TUNE-UP

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	Fast idle cam index incorrect	Reset fast idle cam see FUEL SYSTEMS
AA		
Acceleration Sag or Stall	Defective choke control switch	Replace choke control switch
	Choke vacuum kick setting incorrect	Reset choke vacuum kick see, FUEL SYSTEMS
	Float level incorrect (too low)	Adjust float level, FUEL SYSTEMS
	Accelerator pump defective	Repair or replace pump see FUEL SYSTEMS
	Secondary throttles not closed	Inspect lockout adjustment, see FUEL SYSTEMS
AA		
Sag or Stall After Warmup	Defective choke control switch	Replace choke control switch, see FUEL SYSTEMS
	Defective accelerator pump	Replace pump, see FUEL SYSTEMS
	Float level incorrect (too low)	Adjust float level, see FUEL SYSTEMS
AA		
Backfiring & Black Smoke	Plugged heat crossover system	Remove restriction
AA		

## WARM ENGINE DRIVEABILITY SYMPTOM

### BASIC WARM ENGINE DRIVEABILITY SYMPTOMS TROUBLE SHOOTING CHART

AA		
CONDITION	POSSIBLE CAUSE	CORRECTION
AA		
Hesitation With Small Amount of Gas Pedal Movement	Vacuum leak	Inspect vacuum lines
	Accelerator pump weak or inoperable	Replace pump, see FUEL SYSTEMS
	Float level setting too low	Reset float level, see, FUEL SYSTEMS
	Metering rods sticking or binding	Inspect and/or replace rods, see

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#### FUEL SYSTEMS

Carburetor idle or transfer system plugged	Inspect system and remove restriction
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Frozen or binding heated air inlet	Inspect heated air door for binding
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AA

Hesitation With Heavy Gas Pedal Movement	Defective accelerator pump	Replace pump, see FUEL SYSTEMS
--	----------------------------	--------------------------------

Metering rod carrier sticking or binding	Remove restriction
--	--------------------

Large vacuum leak	Inspect vacuum system and repair leak
-------------------	---------------------------------------

Float level setting too low	Reset float level, see FUEL SYSTEMS
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Defective fuel pump, lines or filter	Inspect pump, lines and filter
--------------------------------------	--------------------------------

Air door setting incorrect	Adjust air door setting, see FUEL
----------------------------	-----------------------------------

AA

#### CHARGING SYSTEM TROUBLE SHOOTING

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#### BASIC CHARGING SYSTEM TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
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AA

Vehicle Will Not Start	Dead battery	Check battery cells, alternator belt tension and alternator output
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Loose or corroded battery connections	Check all charging system connections
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Ignition circuit or switch	Check and replace as
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malfunction		necessary
AA		
Alternator Light Stays On With Engine Running	Loose or worn alternator drive belt	Check alternator drive tension and condition, See Belt Adjustment in TUNE-UP article in the TUNE-UP section
	Loose alternator wiring connections	Check all charging system connections
	Short in alternator light wiring	See Indicator Warning Lights in STANDARD INSTRUMENTS in the ACCESSORIES & EQUIPMENT section
	Defective alternator stator or diodes	See Bench Tests in ALTERNATOR article
	Defective regulator	See Regulator Check in ALTERNATOR article
AA		
Alternator Light Stays Off With Ignition Switch ON	Blown fuse	See WIRING DIAGRAMS
	Defective alternator	See Testing in ALTERNATOR article
	Defective indicator light bulb or socket	See Indicator Warning Lights in STANDARD INSTRUMENTS in the ACCESSORIES & EQUIPMENT section
AA		
Alternator Light Stays OFF With Ignition Switch ON	Short in alternator wiring	See On-Vehicle Tests in ALTERNATOR article
	Defective rectifier bridge	See Bench Tests in ALTERNATOR article
AA		
Lights or Fuses Burn Out Frequently	Defective alternator wiring	See On-Vehicle Tests in ALTERNATOR article
	Defective regulator	See Regulator Check in ALTERNATOR article

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Defective battery

Check and replace as necessary

AA

Ammeter Gauge      Loose or worn drive belt  
Shows Discharge

Check alternator drive belt tension and condition. See Belt Adjustment in TUNE-UP article in the TUNE-UP section

Defective wiring

Check all wires and wire connections

Defective alternator or regulator

See Bench Tests and On-Vehicle Tests in ALTERNATOR article

Defective ammeter, or improper ammeter wiring connection

See Testing in STANDARD INSTRUMENTS in the ACCESSORIES & EQUIPMENT section

AA

Noisy                      Loose drive pulley  
Alternator

Tighten drive pulley attaching nut

Loose mounting bolts

Tighten all alternator mounting bolts

Worn or dirty bearings

See Bearing Replacement ALTERNATOR article

Defective diodes or stator

See Bench Test in ALTERNATOR article

AA

Battery Does              Loose or worn drive belt  
Stay Charged

Check alternator drive belt tension and condition. See Belt Adjustment in appropriate TUNE-UP article in the TUNE-UP section

Loose or corroded battery connections

Check all charging system connections

Loose alternator connections

Check all charging system connections

Defective alternator or battery

See On-Vehicle Tests and Bench Tests in

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#### ALTERNATOR article

Add-on electrical accessories    Install larger  
exceeding alternator capacity    alternator

AA

Battery	Defective battery	Check alternator
Overcharged-		output and repair as
Uses Too Much		necessary
Water		

Defective alternator	See On-Vehicle Test and Bench Tests in ALTERNATOR article
----------------------	---

Excessive alternator voltage	Check alternator output and repair as necessary
------------------------------	--

AA

#### CLUTCH TROUBLE SHOOTING

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#### BASIC CLUTCH TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

Chattering or Grabbing	Incorrect clutch adjustment	Adjust clutch
	Oil, grease or glaze on facings	Disassemble and clean or replace
	Loose "U" joint flange	See DRIVE AXLES article
	Worn input shaft spline	Replace input shaft
	Binding pressure plate	Replace pressure plate
	Binding release lever	See CLUTCH article
	Binding clutch disc hub	Replace clutch disc
	Unequal pressure plate contact	Replace worn/misaligned components
	Loose/bent clutch disc	Replace clutch disc

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Incorrect transmission alignment	Realign transmission
Worn pressure plate, disc or flywheel	Replace damaged components
Broken or weak pressure springs	Replace pressure plate
Sticking clutch pedal	Lubricate clutch pedal & linkage
Incorrect clutch disc facing	Replace clutch disc
Engine loose in chassis	Tighten all mounting bolts
AA	
Failure to Release	Clean or replace clutch disc
Oil or grease on clutch facings	
Incorrect release lever or pedal adjustment	See CLUTCH article
Worn or broken clutch facings	Replace clutch disc
Bent clutch disc or pressure plate	Replace damaged components
Clutch disc hub binding on input shaft	Clean or replace clutch disc and/or input shaft
Binding pilot bearing	Replace pilot bearing
Sticking release bearing sleeve	Replace release bearing and/or sleeve
Binding clutch cable	See CLUTCH article
Defective clutch master	Replace master cylinder
Defective clutch slave	Replace slave cylinder
Air in hydraulic system	Bleed hydraulic system
AA	
Rattling	Replace spring and check alignment
Weak or broken release lever spring	
Damaged pressure plate	Replace pressure plate

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Broken clutch return spring	Replace return spring
Worn splines on clutch disc or input shaft	Replace clutch disc and/or input shaft
Worn clutch release bearing	Replace release bearing
Dry or worn pilot bearing	Lubricate or replace pilot bearing
Unequal release lever contact	Align or replace release lever
Incorrect pedal free play	Adjust free play
Warped or damaged clutch disc	Replace damaged components

AA

Slipping	Pressure springs worn or	Release pressure plate
	Oily, greasy or worn facings	Clean or replace clutch disc
	Incorrect clutch alignment	Realign clutch assembly
	Warped clutch disc or pressure plate	Replace damaged components
	Binding release levers or clutch pedal	Lubricate and/or replace release components

AA

Squeaking	Worn or damaged release	Replace release bearing
	Dry or worn pilot or release bearing	Lubricate or replace assembly
	Pilot bearing turning in crankshaft	Replace pilot bearing and/or crankshaft
	Worn input shaft bearing	Replace bearing and seal
	Incorrect transmission alignment	Realign transmission
	Dry release fork between pivot	Lubricate release fork and pivot

AA

Heavy and/or Stiff Pedal	Sticking release bearing sleeve	Replace release bearing and/or sleeve
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Dry or binding clutch  
pedal hub

Lubricate and align  
components

Floor mat interference  
with pedal

Lay mat flat in proper  
area

Dry or binding ball/fork  
pivots

Lubricate and align  
components

Faulty clutch cable

Replace clutch cable

AA

Noisy Clutch  
Pedal

Faulty interlock switch

Replace interlock  
switch

Self-adjuster ratchet  
noise

Lubricate or replace  
self-adjuster

Speed control interlock  
switch

Lubricate or replace  
interlock switch

AA

Clutch Pedal  
Sticks Down

Binding clutch cable

See CLUTCH article

Springs weak in pressure  
plate

Replace pressure plate

Binding in clutch linkage

Lubricate and free  
linkage

AA

Noisy

Dry release bearing

Lubricate or replace  
release bearing

Dry or worn pilot bearing

Lubricate or replace  
bearing

Worn input shaft bearing

Replace bearing

AA

Transmission  
Click

Weak springs in pressure  
plate

Replace pressure plate

Release fork loose on ball  
stud

Replace release fork  
and/or ball stud

Oil on clutch disc damper

Replace clutch disc

Broken spring in slave  
cylinder

Replace slave cylinder

AA

## COOLING SYSTEM TROUBLE SHOOTING

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#### COOLING SYSTEM TROUBLE SHOOTING

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
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AA

Overheating	Coolant Leak	Fill/Pressure Test System
	A/C Condenser Fins Clogged	Remove/Clean Condenser
	Radiator Fins Clogged	Remove/Clean Radiator
	Thermostat Stuck Closed	Replace Thermostat
	Clogged Cooling System Passages	Clean/Flush Cooling System
	Water Pump Malfunction	Replace Water Pump
	Fan Clutch Malfunction	Replace Fan Clutch
	Retarded Ignition Timing	Reset Ignition Timing
	Cooling Fan Malfunction	Test Cooling Fan/Circuit
	Cooling Fan Motor Malfunction	Test Fan Motor
	Cooling Fan Relay Malfunction	Test Fan Relay
	Faulty Radiator Cap	Replace Radiator Cap
	Broken/Slipping Fan Belt	Replace Fan Belt
	Restricted Exhaust	Repair Exhaust System

AA

Corrosion	Impurities In Coolant	Clean/Flush System
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AA

Coolant Leakage	Damaged hose	Replace Hose
	Leaky Water Pump	Replace Water Pump

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Damaged Radiator Seam	Replace/Repair Radiator
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Leaky Thermostat Cover	Replace Thermostat Cover
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Cylinder Head Problem	Check Head/Head Gasket
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Leaky Freeze Plugs	Replace Freeze Plugs
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AA

Recovery System Inoperative

Loose and/or Defective Radiator Cap
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Replace Radiator Cap
----------------------

Overflow Tube Clogged and/or Leaking
--------------------------------------

Repair Tube
-------------

Recovery Bottle Vent Restricted
---------------------------------

Clean Vent
------------

AA

No Heater Core Flow

Collapsed Heater Hose
-----------------------

Replace Heater Hose
---------------------

Plugged Heater Core
---------------------

Clean/Replace Heater Core
---------------------------

Faulty Heater Valve
---------------------

Replace Heater Valve
----------------------

AA

## DIESEL ENGINE TROUBLE SHOOTING

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NOTE: Diesel engines mechanical diagnosis is the same as gasoline engines for items such as noisy valves, bearings, pistons, etc. The following trouble shooting covers only items pertaining to diesel engines.

### BASIC DIESEL ENGINE TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
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AA

Engine Won't Crank
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Bad battery connections or dead batteries
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Check connections and/or replace batteries
--

Bad starter connections or bad starter
--

Check connections and/or replace
----------------------------------



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		batteries
AA		
Engine Cranks	Bad battery connections	Check connections
Slowly, Won't	or dead batteries	and/or replace
Start		batteries
	Engine oil too heavy	Replace engine oil
AA		
Engine Cranks	Glow plugs not functioning	Check glow plug system,
Normally, But		see FUEL SYSTEMS
Will Not Start	Glow plug control not	Check controller, see
	functioning	FUEL SYSTEMS
	Fuel not injected into	Check fuel injectors,
	cylinders	see FUEL SYSTEMS
	No fuel to injection pump	Check fuel delivery
		system
	Fuel filter blocked	Replace fuel filter
	Fuel tank filter blocked	Replace fuel tank
		filter
	Fuel pump not operating	Check pump operation
		and/or replace pump
	Fuel return system blocked	Inspect system and
		remove restriction
	No voltage to fuel solenoid	Check solenoid and
		connections
	Incorrect or contaminated	Replace fuel
	fuel	
	Incorrect injection pump	Re-adjust pump timing,
	timing	see FUEL SYSTEMS
	Low compression	Check valves, pistons,
		rings, see ENGINES
	Injection pump malfunction	Inspect and/or replace
		injection pump
AA		
Engine Starts,	Incorrect slow idle	Reset idle adjustment,
Won't Idle	adjustment	see TUNE-UP
	Fast idle solenoid	Check solenoid and
	malfunctioning	connections
	Fuel return system blocked	Check system and remove
		restrictions
	Glow plugs go off too soon	See glow plug diagnosis
		in FUEL SYSTEMS
	Injection pump timing	Reset pump timing, see
	incorrect	FUEL SYSTEMS
	No fuel to injection pump	Check fuel delivery
		system
	Incorrect or contaminated	Replace fuel
	fuel	
	Low compression	Check valves, piston,
		rings, see ENGINES
	Injection pump malfunction	Replace injection pump,
		see FUEL SYSTEMS
	Fuel solenoid closes in RUN	Check solenoid and

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	position	connections
Engines Starts/ Idles Rough W/out 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	Reset slow idle, see TUNE-UP Check lines and connections Check lines and connections Bleed air from system Replace fuel Check nozzles, see FUEL SYSTEMS
Engines Starts and Idles Rough W/out Smoke or Noise, But Clears After Warm-Up	Injection pump timing incorrect Engine not fully broken in Air in system Injector nozzle malfunction	Reset pump timing, see FUEL SYSTEMS Put more miles on engine Bleed air from system Check nozzles, see FUEL SYSTEMS
Engine Idles Correctly, Misfires Above Idle	Blocked fuel filter Injection pump timing incorrect Incorrect or contaminated fuel	Replace fuel filter Reset pump timing, see FUEL SYSTEMS Replace fuel
Engine Won't Return To Idle	Fast idle adjustment incorrect Internal injection pump malfunction External linkage binding	Reset fast idle, see TUNE-UP Replace injection pump, see FUEL SYSTEMS Check linkage and remove binding
Fuel Leaks On Ground	Loose or broken fuel line Internal injection pump seal leak	Check lines and connections Replace injection pump, see FUEL SYSTEMS
Cylinder Knocking Noise	Injector nozzles sticking open Very low nozzle opening pressure	Test injectors, see FUEL SYSTEMS Test injectors and/or replace
Loss of Engine Power	Restricted air intake EGR valve malfunction Blocked or damaged exhaust system Blocked fuel tank filter Restricted fuel filter	Remove restriction Replace EGR valve Remove restriction and/or replace components Replace filter Remove restriction

## TROUBLE SHOOTING - BASIC PROCEDURES

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	and/or replace filter
Block vent in gas cap	Remove restriction and/or replace cap
Tank-to-injection pump fuel supply blocked	Check fuel lines and connections
Blocked fuel return system	Remove restriction
Incorrect or contaminated fuel	Replace fuel
Blocked injector nozzles	Check nozzle for blockage, see FUEL SYSTEMS
Low compression	Check valves, rings, pistons, see ENGINES

[illegible]

Loud Engine	Basic timing incorrect	Reset timing, see
Noise With Black		FUEL SYSTEMS
Smoke	EGR valve malfunction	Replace EGR valve
	Internal injection pump	Replace injection pump,
	malfunction	see FUEL SYSTEMS
	Incorrect injector pump	Check pressure, see
	housing pressure	FUEL SYSTEMS

[illegible]

Engine	Cooling system leaks	Check cooling system
Overheating		and repair leaks
	Belt slipping or damaged	Check tension and/or
		replace belt
	Thermostat stuck closed	Remove and replace
		thermostat, see
		ENGINE COOLING

Head gasket leaking	Replace head gasket
---------------------	---------------------

[illegible]

Oil Light on at Idle	Low oil pump pressure	Check oil pump operation, see ENGINES
	Oil cooler or line restricted	Remove restriction and/or replace cooler

[illegible]

Engine Won't Shut Off	Injector pump fuel solenoid does not return fuel valve to OFF position	Remove and check solenoid and replace if needed
-----------------------	--	---

[illegible]

## VACUUM PUMP DIAGNOSIS

Excessive Noise	Loose pump-to-drive assembly screws	Tighten screws
	Loose tube on pump assembly	Tighten tube
	Valves not functioning properly	Replace valves

Oil Leakage	Loose end plug	Tighten end plug
	Bad seal crimp	Remove and re-crimp seal

[illegible]

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### DRIVE AXLE - RWD TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

#### DRIVE AXLE (RWD) TROUBLE SHOOTING

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

#### Knocking or Clunking

Differential Side Gear Clearance	Check Clearance
Worn Pinion Shaft	Replace Pinion Shaft
Axle Shaft End Play	Check End Play
Missing Gear Teeth	Check Differential/ Replace Gear
Wrong Axle Backlash	Check Backlash
Misaligned Driveline	Realign Driveline

AA

#### Clinking During Engagement

Side Gear Clearance	Check Clearance
Ring and Pinion Backlash	Check Backlash
Worn/Loose Pinion Shaft	Replace Shaft/Bearing
Bad "U" Joint	Replace "U" Joint
Sticking Slip Yoke	Lube Slip Yoke
Broken Rear Axle Mount	Replace Mount

Loose Drive Shaft Flange	Check Flange
--------------------------	--------------

AA

#### Click/Chatter On Turns

Differential Side Gear Clearance	Check Clearance
Wrong Turn On Plates (1)	Replace Clutch Plates
Wrong Differential	

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Lubricant (1)	Change Lubricant
Knock Or Click	Flat Spot on Rear Wheel Bearing
Low Vibration At All Speeds	Faulty Wheel Bearing
	Faulty "U" Joint
	Faulty Drive Shaft
	Faulty Companion Flange
	Faulty Slip Yoke Flange

(1) - Limited slip differential only.

## FWD AXLE SHAFTS & CV JOINTS TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

### BASIC FWD AXLE SHAFTS & CV JOINTS TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE
Grease Leaks	CV boot torn or cracked
Clicking Noise on Cornering	Damaged outer CV
Clunk Noise on Acceleration	Damaged inner CV
Vibration or Shudder on Acceleration	Sticking, damaged or worn CV Misalignment or spring height

## FUEL INJECTION TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

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#### BASIC FUEL INJECTION TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

Engine Won't Start (Cranks Normally)	Cold start valve inoperative	Test valve and circuit
	Poor connection;vacuum or wiring	Check vacuum and electrical connections
	Contaminated fuel	Test fuel for water or alcohol
	Defective fuel pump relay or circuit	Test relay and wiring
	Battery too low	Charge and test battery
	Low fuel pressure	Test pressure regulator and fuel pump, check for restricted lines and filters
	No distributor reference pulses	Repair ignition system as necessary
	Open coolant temperature sensor circuit	Test sensor and wiring
	Shorted W.O.T. switch in T.P.S.	Disconnect W.O.T. switch, engine should start
	Defective ECM	Replace ECM
	Fuel tank residual pressure valve leaks	Test for fuel pressure drop after shut down

AA

Hard Starting	Disconnected hot air tube to air cleaner	Reconnect tube and test control valve
	Defective Idle Air Control (IAC) valve	Test valve operation and circuit
	Shorted, open or misadjusted T.P.S.	Test and adjust or replace T.P.S.
	EGR valve open	Test EGR valve and

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		control circuit
Poor Oxygen sensor signal		Test for shorted or circuit
Incorrect mixture from PCV system		Test PCV for flow, check sealing of oil filter cap
AA		
Poor High Speed Operation	Low fuel pump volume	Faulty pump or restricted fuel lines or filters
	Poor MAP sensor signal	Test MAP sensor, vacuum hose and wiring
	Poor Oxygen sensor signal	Test for shorted or open sensor or circuit
	Open coolant temperature sensor circuit	Test sensor and wiring
	Faulty ignition operation	Check wires for cracks or poor connections, test secondary voltage with oscilloscope
	Contaminated fuel	Test fuel for water or alcohol
	Intermittent ECM ground	Test ECM ground connection for resistance
	Restricted air cleaner	Replace air cleaner
	Restricted exhaust system	Test for exhaust manifold back pressure
	Poor MAF sensor signal	Check leakage between sensor and manifold
	Poor VSS signal	If tester for ALCL hook-up is available check that VSS reading matches speedometer

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AA

Ping or Knock on Acceleration	Poor Knock sensor signal	Test for shorted or open sensor or circuit
	Poor Baro sensor signal	Test for shorted or open sensor or circuit
	Improper ignition timing	See VEHICLE EMISSION CONTROL LABEL (where applicable)
	Check for engine overheating problems	Low coolant, loose belts or electric cooling fan inoperative

AA

NOTE: For additional electronic fuel injection trouble shooting information, see the appropriate article in the ENGINE PERFORMANCE section (not all vehicles have Computer Engine Control articles). Information is provided there for diagnosing fuel system problems on vehicles with electronic fuel injection.

## GASOLINE ENGINE - MECHANICAL TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

### BASIC GASOLINE ENGINE - MECHANICAL TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Lopes At Idle	Intake manifold-to-head leaks Blown head gasket	Replace manifold gasket, See ENGINES Replace head gasket, See ENGINES
	Worn timing gears, chain or sprocket	Replace gears, chain or sprocket
	Worn camshaft lobes	Replace camshaft, See ENGINES
	Overheated engine	Check cooling system, See COOLING
	Blocked crankcase vent valve	Remove restriction



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	Leaking EGR valve	Repair leak and/or replace valve
	Faulty fuel pump	Replace fuel pump
AA		
Engine Has Low Power	Leaking fuel pump	Repair leak and/or replace fuel pump
	Excessive piston-to-bore clearance	Install larger pistons, See ENGINES
	Sticking valves or weak valve springs	Check valve train components, See ENGINES
	Incorrect valve timing	Reset valve timing, See ENGINES
	Worn camshaft lobes	Replace camshaft, See ENGINES
	Blown head gasket	Replace camshaft, See ENGINES
	Clutch slipping	Adjust pedal and/or replace components, See ENGINES
	Engine overheating	Check cooling system, See COOLING
	Auto. Trans. pressure regulator valve faulty	Replace pressure regulator valve
	Auto. Trans. fluid level too low	Add fluid as necessary
	Improper vacuum diverter valve operation	Replace vacuum diverter valve
	Vacuum leaks	Inspect vacuum system and repair as required
	Leaking piston rings	Replace piston rings, See ENGINES
AA		
Faulty High Speed Operation	Low fuel pump volume	Replace fuel pump
	Leaking valves or worn	Replace valves and/or springs, See ENGINES
	Incorrect valve timing	Reset valve timing, See ENGINES
	Intake manifold restricted	Remove restriction
	Worn distributor shaft	Replace distributor
AA		
Faulty Acceleration	Improper fuel pump stroke	Remove pump and reset pump stroke
	Incorrect ignition timing	Reset ignition timing, See TUNE-UP
	Leaking valves	Replace valves, See ENGINES
	Worn fuel pump diaphragm or piston	Replace diaphragm or piston
AA		

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Intake Backfire	Improper ignition timing	Reset ignition timing, See TUNE-UP
	Faulty accelerator pump discharge	Replace accelerator pump
	Improper choke operation	Check choke and adjust as required
	Defective EGR valve	Replace EGR valve
	Fuel mixture too lean	Reset air/fuel mixture, See TUNE-UP
	Choke valve initial clearance too large	Reset choke valve initial clearance

AA

Exhaust Backfire	Vacuum leak	Inspect and repair vacuum system
	Faulty vacuum diverter valve	Replace vacuum diverter valve
	Faulty choke operation	Check choke and adjust as required
	Exhaust system leak	repair exhaust system leak

AA

Engine Detonation	Ignition timing too far advanced	Reset ignition timing, See TUNE-UP
	Faulty ignition system	Check ignition timing, See TUNE-UP
	Spark plugs loose or faulty	Retighten or replace plugs
	Fuel delivery system clogged	Inspect lines, pump and filter for clog
	EGR valve inoperative	Replace EGR valve
	PCV system inoperative	Inspect and/or replace hoses or valve
	Vacuum leaks	Check vacuum system and repair leaks
	Excessive combustion chamber deposits	Remove built-up deposits
	Leaking, sticking or broken valves	Inspect and/or replace valves

AA

External Oil Leakage	Fuel pump improperly seated or worn gasket	Remove pump, replace gasket and seat properly
	Oil pan gasket broken or pan bent	Straighten pan and replace gasket
	Timing chain cover gasket broken	Replace timing chain cover gasket
	Rear main oil seal worn	Replace rear main oil seal
	Oil pan drain plug not seated properly	Remove and reinstall drain plug
	Camshaft bearing drain	Remove restriction

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hole blocked

Oil pressure sending

switch leaking

Remove and reinstall

sending switch

AA

Excessive Oil  
Consumption

Worn valve stems or guides

Replace stems or  
guides, See ENGINES

Valve "O" ring seals  
damaged

Replace "O" ring seals,  
See ENGINES

Plugged oil drain back holes

Remove restrictions

Improper PCV valve  
operation

Replace PCV valve

Engine oil level too high

Remove excess oil

Engine oil too thin

Replace thicker oil

Valve stem oil deflectors  
damaged

Replace oil deflectors

Incorrect piston rings

Replace piston rings,  
See ENGINES

Piston ring gaps not  
staggered

Reinstall piston rings,  
See ENGINES

Insufficient piston ring  
tension

Replace rings, See  
ENGINES

Piston ring grooves or oil  
return slots clogged

Replace piston rings,  
See ENGINES

Piston rings sticking in  
grooves

Replace piston rings,  
See ENGINES

Piston ring grooves  
excessively worn

Replace piston and  
rings, See ENGINES

Compression rings installed  
upside down

Replace compression  
rings correctly, See  
ENGINES

Worn or scored cylinder  
walls

Rebore cylinders or  
replace block

Mismatched oil ring  
expander and rail

Replace oil ring  
expander and rail, See  
ENGINES

Intake gasket dowels too  
long

Replace intake gasket  
dowels

Excessive main or connecting  
rod bearing clearance

Replace main or  
connecting rod  
bearings, See ENGINES

AA

No Oil Pressure

Low oil level

Add oil to proper level

Oil pressure sender or  
gauge broken

Replace sender or gauge

Oil pump malfunction

Remove and overhaul oil  
pump, See ENGINES

Oil pressure relief valve  
sticking

Remove and reinstall  
valve

Oil pump passages blocked

Overhaul oil pump, See  
ENGINES

Oil pickup screen or tube  
blocked

remove restriction

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Loose oil inlet tube	Tighten oil inlet tube
Loose camshaft bearings	Replace camshaft bearings, See ENGINES
Internal leakage at oil passages	Replace block or cylinder head

AA

Low Oil Pressure	Low engine oil level	Add oil to proper level
	Engine oil too thin	Remove and replace with thicker oil
	Excessive oil pump clearance	Reduce oil pump clearance, See ENGINES
	Oil pickup tube or screen blocked	Remove restrictions
	Main, rod or cam bearing clearance excessive	Replace bearing to reduce clearance, See ENGINES

AA

High Oil Pressure	Improper grade of oil	Replace with proper oil
	Oil pressure relief valve stuck closed	Eliminate binding
	Oil pressure sender or gauge faulty	Replace sender or gauge

AA

Noisy Main Bearings	Inadequate oil supply	Check oil delivery to main bearings
	Excessive main bearing clearance	Replace main bearings, See ENGINES
	Excessive crankshaft end play	Replace crankshaft, See ENGINES
	Loose flywheel or torque converter	Tighten attaching bolts
	Loose or damaged vibration damper	Tighten or replace vibration damper
	Crankshaft journals out-of-round	Re-grind crankshaft journals
	Excessive belt tension	Loosen belt tension

AA

Noisy Connecting Rods	Excessive bearing clearance or missing bearing	Replace bearing, See ENGINES
	Crankshaft rod journal out-of-round	Re-grind crankshaft journal
	Misaligned connecting rod or cap	Remove rod or cap and realign
	Incorrectly tightened rod bolts	Remove and re-tighten rod bolts

AA

Noisy Pistons and Rings	Excessive piston-to-bore clearance	Install larger pistons, See ENGINES
	Bore tapered or out-of-round	Rebore block
	Piston ring broken	Replace piston rings, See ENGINES
	Piston pin loose or seized	Replace piston pin, See

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	Connecting rods misaligned	ENGINE
	Ring side clearance too loose or tight	Realign connecting rods
	Carbon build-up on piston	Replace with larger or smaller rings
		Remove carbon
AA		
Noisy Valve Train	Worn or bent push rods	Replace push rods, See ENGINE
	Worn rocker arms or bridged pivots	Replace push rods, See ENGINE
	Dirt or chips in valve lifters	Remove lifters and remove dirt/chips
	Excessive valve lifter leak-down	Replace valve lifters, See ENGINE
	Valve lifter face worn	Replace valve lifters, See ENGINE
	Broken or cocked valve springs	replace or reposition springs
	Too much valve stem-to-guide clearance	Replace valve guides, See ENGINE
	Valve bent	Replace valve, See ENGINE
	Loose rocker arms	Retighten rocker arms, See ENGINE
	Excessive valve seat run-out	Reface valve seats, See ENGINE
	Missing valve lock	Install new valve lock
	Excessively worn camshaft lobes	Replace camshaft, See ENGINE
	Plugged valve lifter oil holes	Eliminate restriction or replace lifter
	Faulty valve lifter check ball	Replace lifter check ball, See ENGINE
	Rocker arm nut installed upside down	Remove and reinstall correctly
	Valve lifter incorrect for engine	Remove and replace valve lifters
	Faulty push rod seat or lifter plunger	Replace plunger or push rod
AA		
Noisy Valves	Improper valve lash	Re-adjust valve lash, See ENGINE
	Worn or dirty valve lifters	Clean and/or replace lifters
	Worn valve guides	Replace valve guides, See ENGINE
	Excessive valve seat or face run-out	Reface seats or valve face
	Worn camshaft lobes	Replace camshaft, See ENGINE
	Loose rocker arm studs	Re-tighten rocker arm studs, See ENGINE

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[illegible]

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#### CONDITION

#### POSSIBLE CAUSE

AA

Insufficient, Erratic,  
or No Heat

- ù Low Coolant Level
- ù Incorrect thermostat.
- ù Restricted coolant flow through heater core.
- ù Heater hoses plugged.
- ù Misadjusted control cable.
- ù Sticking heater control valve.
- ù Vacuum hose leaking.
- ù Vacuum hose blocked.
- ù Vacuum motors inoperative.
- ù Blocked air inlet.
- ù Inoperative heater blower motor.
- ù Oil residue on heater core fins.
- ù Dirt on heater core fins.

AA

Too Much Heat

- ù Improperly adjusted cables.
- ù Sticking heater control valve.
- ù No vacuum to heater control valve.
- ù Temperature door stuck open.

AA

Air Flow Changes During  
Acceleration

- ù Vacuum system leak.
- ù Bad check valve or reservoir.

AA

Air From Defroster At All  
Times

- ù Vacuum system leak.
- ù Improperly adjusted control cables.
- ù Inoperative vacuum motor.

AA

Blower Does Not Operate  
Correctly

- ù Blown fuse.
- ù Blower motor windings open.
- ù Resistors burned out.
- ù Motor ground connection loose.
- ù Wiring harness connections loose.
- ù Blower motor switch inoperative.
- ù Blower relay inoperative.
- ù Fan binding or foreign object in housing.
- ù Fan blades broken or bent.

AA

## IGNITION SYSTEM TROUBLE SHOOTING

PLEASE READ THIS FIRST:

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3 \* If vehicle fails to run at this point, go to 3

Tighten all mounting bolts

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Steering gear adjustment  
too loose

See MANUAL STEERING  
GEAR article

## Steering arms loose on knuckles

Tighten and check  
steering linkage

Rack and pinion mounting  
loose

Tighten all mounting bolts

Rack and pinion out of adjustment

See adjustment in  
STEERING article

Tie rod end loose

Tighten and check steering linkage

Excessive Pitman shaft-to-ball nut lash

Repair as necessary

[illegible]

Poor  
Returnability

Lack of lubricant in ball joint or linkage

Lubricate and service  
systems

## Binding in linkage or ball joints

See STEERING LINKAGE  
and SUSPENSION article

Improper front end alignment

See WHEEL ALIGNMENT  
article

Improper tire pressure

Inflate to proper pressure

## Tie rod binding

Inflate to proper pressure

Shaft seal rubbing shaft

See STEERING COLUMN  
article

[illegible]

## Excessive Vertical Motion

Improper tire pressure

Inflate to proper pressure

Tires, wheels or rotors  
out of balance

Balance tires then  
check wheels and  
rotors

Worn or faulty shock absorbers

Check and replace if  
necessary

Loose tie rod ends or steering

Tighten or replace if  
necessary

Loose or worn wheel  
bearings

See SUSPENSION article

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AA

Steering Pulls to One Side	Improper tire pressure	Inflate to proper pressure
	Front tires are different sizes	Rotate or replace if necessary
	Wheel bearings not adjusted properly	See FRONT SUSPENSION article
	Bent or broken suspension components	See FRONT SUSPENSION article
	Improper wheel alignment	See WHEEL ALIGNMENT article
	Brakes dragging	See BRAKES article

AA

Instability	Low or uneven tire pressure	Inflate to proper pressure
	Loose or worn wheel bearings	See FRONT SUSPENSION article
	Loose or worn idler arm bushing	See FRONT SUSPENSION article
	Loose or worn strut bushings	See FRONT SUSPENSION article
	Incorrect front wheel alignment	See WHEEL ALIGNMENT article
	Steering gear not centered	See MANUAL STEERING GEARS article
	Springs or shock	Check and replace if necessary
	Improper cross shaft	See MANUAL STEERING GEARS article

AA

## POWER STEERING TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available



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Groan in Steering Pump	Air in fluid	See POWER STEERING PUMP article
	Poor pressure hose connection	Tighten and check, replace if necessary
AA		
Squawk When Turning	Damper "O" ring on valve spool cut	See POWER STEERING PUMP article
AA		
Moan or Whine in Pump	Pump shaft bearing scored	Replace bearing and fluid
	Air in fluid or fluid level low	See POWER STEERING PUMP article
	Hose or column grounded	Check and replace if necessary
	Cover "O" ring missing or damaged	See POWER STEERING PUMP article
	Valve cover baffle missing or damaged	See POWER STEERING PUMP article
	Interference of components in pump	See POWER STEERING PUMP article
	Loose or poor bracket alignment	Correct or replace if necessary
AA		
Hissing When Parking	Internal leakage in steering gear	Check valved assembly first
AA		
Chirp in Steering Pump	Loose or worn power steering belt	Adjust or replace if necessary
AA		
Buzzing When Not Steering	Noisy pump	See POWER STEERING PUMP article
	Free play in steering shaft bearing	See STEERING COLUMN article
	Bearing loose on shaft serrations	See STEERING COLUMN article
AA		
Clicking Noise in Pump	Pump slippers too long	See POWER STEERING PUMP article
	Broken slipper springs	See POWER STEERING PUMP article
	Excessive wear or nicked	See POWER STEERING PUMP

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rotors

article

Damaged cam contour

See POWER STEERING PUMP  
article

AA

Poor Return of  
Wheel

Wheel rubbing against  
turn signal

See STEERING COLUMN  
SWITCHES article

Flange rubbing steering  
gear adjuster

See STEERING COLUMN  
article

Tight or frozen steering  
shaft bearing

See STEERING COLUMN  
article

Steering gear out of  
adjustment

See POWER STEERING GEAR  
article

Sticking or plugged  
spool valve

See POWER STEERING PUMP  
article

Improper front end  
alignment

See WHEEL ALIGNMENT  
article

Wheel bearings worn or  
loose

See FRONT SUSPENSION  
article

Ties rods or ball joints  
binding

Check and replace if  
necessary

Intermediate shaft joints  
binding

See STEERING COLUMN  
article

Kinked pressure hoses

Correct or replace if  
necessary

Loose housing head  
spanner nut

See POWER STEERING GEAR  
article

Damaged valve lever

See POWER STEERING GEAR  
article

Sector shaft adjusted  
too tight

See ADJUSTMENTS in POWER  
STEERING GEAR article

Worm thrust bearing  
adjusted too tight

See ADJUSTMENTS in POWER  
STEERING GEAR article

Reaction ring sticking  
in cylinder

See POWER STEERING GEAR  
article

Reaction ring sticking  
in housing head

See POWER STEERING GEAR  
article

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Steering pump internal leakage	See POWER STEERING PUMP article
Steering gear-to-column misalignment	See STEERING COLUMN article
Lack of lubrication in linkage	Service front suspension
Lack of lubrication in ball joints	Service front suspension

AA

Increased Effort When Turning	High internal pump leakage	See POWER STEERING PUMP article
Wheel Fast Foaming, Milky Power Steering Fluid, Low Fluid Level or Low Pressure	Power steering pump belt slipping	Adjust or replace if necessary
	Low fluid level	Check and fill to proper level
	Engine idle speed to low	Adjust to correct setting
	Air in pump fluid system	See POWER STEERING PUMP article
	Pump output low	See POWER STEERING PUMP article
	Steering gear malfunctioning	See POWER STEERING GEAR article

AA

Wheel Surges or Jerks	Low fluid level	Check and fill to proper level
	Loose fan belt	Adjust or replace if necessary
	Insufficient pump pressure	See POWER STEERING PUMP article
	Sticky flow control valve	See POWER STEERING PUMP article
	Linkage hitting oil pan at full turn	Replace bent components

AA

Kick Back or Free Play	Air in pump fluid system	See POWER STEERING PUMP article
	Worn poppet valve in	See POWER STEERING PUMP



## TROUBLE SHOOTING - BASIC PROCEDURES

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steering gear	article
Excessive over center lash	See POWER STEERING GEAR article
Thrust bearing out of adjustment	See POWER STEERING GEAR article
Free play in pot coupling	See POWER STEERING PUMP article
Steering gear coupling loose on shaft	See POWER STEERING PUMP article
Steering disc mounting bolts loose	Tighten or replace if necessary
Coupling loose on worm shaft	Tighten or replace if necessary
Improper sector shaft adjustment	See POWER STEERING GEAR article
Excessive worm piston side play	See POWER STEERING GEAR article
Damaged valve lever	See POWER STEERING GEAR article
Universal joint loose	Tighten or replace if necessary
Defective rotary valve	See POWER STEERING GEAR article
AA	
No Power When Parking	Sticking flow control valve
	See POWER STEERING PUMP article
	Insufficient pump pressure output
	See POWER STEERING PUMP article
	Excessive internal pump leakage
	See POWER STEERING PUMP article
	Excessive internal gear leakage
	See POWER STEERING PUMP article
	Flange rubs against gear adjust plug
	See STEERING COLUMN article
	Loose pump belt
	Adjust or replace if necessary

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Low fluid level	Check and add proper amount of fluid
-----------------	--------------------------------------

Engine idle too low	Adjust to correct setting
---------------------	---------------------------

Steering gear-to-column misaligned	See STEERING COLUMN article
------------------------------------	-----------------------------

AA

No Power, Left Turn	Left turn reaction seal "O" ring worn	See POWER STEERING GEAR article
---------------------	---------------------------------------	---------------------------------

Left turn reaction seal damaged/missing	See POWER STEERING GEAR article
---	---------------------------------

Cylinder head "O" ring damaged	See POWER STEERING PUMP article
--------------------------------	---------------------------------

AA

No Power, Right Turns	Column pot coupling bottomed	See STEERING COLUMN article
-----------------------	------------------------------	-----------------------------

Right turn reaction seal "O" ring worn	See POWER STEERING GEAR article
--	---------------------------------

Right turn reaction seal damaged	See POWER STEERING GEAR article
----------------------------------	---------------------------------

Internal leakage through piston end plug	See POWER STEERING GEAR article
--	---------------------------------

Internal leakage through side plugs	See POWER STEERING GEAR article
-------------------------------------	---------------------------------

AA

Lack of Effort in Turning	Left and/or right reaction seal sticking in cylinder head	Replace, see POWER STEERING GEAR article
---------------------------	---	--

AA

Wanders to One Side	Front end alignment incorrect	See WHEEL ALIGNMENT article
---------------------	-------------------------------	-----------------------------

Unbalanced steering gear valve	See POWER STEERING GEAR article
--------------------------------	---------------------------------

AA

Low Pressure Due to Steering Pump	Flow control valve stuck or inoperative	See POWER STEERING PUMP article
-----------------------------------	---	---------------------------------

Pressure plate not flat against cam ring	See POWER STEERING PUMP article
--	---------------------------------

Extreme wear of cam ring	Replace and check adjustments
--------------------------	-------------------------------

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Scored plate, thrust plate or rotor	See POWER STEERING PUMP article
Vanes not installed properly	See POWER STEERING PUMP article
Vanes sticking in rotor slots	See POWER STEERING PUMP article
Cracked/broken thrust or pressure plate	See POWER STEERING PUMP article

AA

### STARTER TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

#### BASIC STARTER TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

Starter Fails to Operate	Dead battery or bad connections between starter and battery	Check battery charge and all wires and connections to starter
-----------------------------	---	---

Ignition switch faulty or misadjusted	Adjust or replace ignition switch
--	--------------------------------------

Open circuit between starter switch ignition terminal on starter relay	Check and repair wires and connections as necessary
--	---

Starter relay or starter defective	See Testing in STARTER article
---------------------------------------	-----------------------------------

Open solenoid pull-in wire	See Testing in STARTER article
-------------------------------	-----------------------------------

AA

Starter Does Not Operate and Headlights Dim	Weak battery or dead cell	Charge or replace battery as necessary
---	------------------------------	---

Loose or corroded battery connections	Check that battery connections are clean and tight
--	--

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Internal ground in starter windings	See Testing in STARTER article
-------------------------------------	--------------------------------

Grounded starter fields	See Testing in STARTERS
-------------------------	-------------------------

Armature rubbing on pole shoes	See STARTER article
--------------------------------	---------------------

AA

Starter Turns but Engine Does Not Rotate	Starter clutch slipping	See STARTER article
--	-------------------------	---------------------

Broken clutch housing	See STARTER article
-----------------------	---------------------

Pinion shaft rusted or dry	See STARTER article
----------------------------	---------------------

Engine basic timing incorrect	See Ignition Timing in TUNE-UP article
-------------------------------	--

Broken teeth on engine flywheel	Replace flywheel and check for starter pinion gear damage
---------------------------------	---

AA

Starter Will Not Crank Engine	Faulty overrunning clutch	See STARTER article
-------------------------------	---------------------------	---------------------

Broken clutch housing	See STARTER article
-----------------------	---------------------

Broken flywheel teeth	Replace flywheel and check for starter pinion gear damage
-----------------------	---

Armature shaft sheared or reduction gear teeth stripped	See STARTER article
---	---------------------

Weak battery	Charge or replace battery as necessary
--------------	--

Faulty solenoid	See On-Vehicle Tests in STARTER article
-----------------	---

Poor grounds	Check all ground connections for tight and clean connections
--------------	--

Ignition switch faulty or misadjusted	Adjust or replace ignition switch as necessary
---------------------------------------	--

AA

Starter Cranks	Battery weak or	Charge or replace
----------------	-----------------	-------------------

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Engine Slowly	defective	battery as necessary
	Engine overheated	See ENGINE COOLING SYSTEM article
	Engine oil too heavy	Check that proper viscosity oil is used
	Poor battery-to-starter connections	Check that all between battery and starter are clean and tight
	Current draw too low or too high	See Bench Tests in STARTER article
	Bent armature, loose pole shoes screws or worn bearings	See STARTER article
	Burned solenoid contacts	Replace solenoid
	Faulty starter	Replace starter
AA		
Starter Engages Engine Only Momentarily	Engine timing too far advanced	See Ignition Timing in TUNE-UP article
	Overrunning clutch not engaging properly	Replace overrunning clutch. See STARTER article
	Broken starter clutch	See STARTER article
	Broken teeth on engine flywheel	Replace flywheel and check starter pinion gear for damage
	Weak drive assembly thrust spring	See STARTER article
	Weak hold-in coil	See Bench Tests in STARTER article
AA		
Starter Drive Will Not Engage	Defective point assembly	See Testing in STARTER article
	Poor point assembly ground	See Testing in STARTER article
	Defective pull-in coil	Replace starter solenoid

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AA

Starter Relay Does Not Close	Dead battery	Charge or replace battery as necessary
	Faulty wiring	Check all wiring and connections leading to relay
	Neutral safety switch faulty	Replace neutral safety switch
	Starter relay faulty	Replace starter relay

AA

Starter Drive Will Not Disengage	Starter motor loose on mountings	Tighten starter attach bolts
	Worn drive end bushing	See STARTER article
	Damaged engine flywheel teeth	Replace flywheel and starter pinion gear for damage
	Drive yolk return spring broken or missing	Replace return spring
	Faulty ignition switch	Replace ignition switch
	Insufficient clearance between winding leads to solenoid terminal and main contact in solenoid	Replace starter solenoid
	Starter clutch not disengaging	Replace starter clutch
	Ignition starter switch contacts sticking	Replace ignition switch

AA

Starter Relay Operates but Solenoid Does Not	Faulty solenoid switch, switch connections or	Check all wiring between relay and solenoid or replace relay or solenoid as necessary
	Broken lead or loose soldered connections	Repair wire or wire connections as necessary

AA

Solenoid Plunger Vibrates When Switch is Engaged	Weak battery	Charge or replace battery as necessary
	Solenoid contacts	Clean contacts or

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corroded	replace solenoid
Faulty wiring	Check all wiring leading to solenoid
Broken connections inside switch cover	Repair connections or replace solenoid
Open hold-in wire	Replace solenoid

AA

Low Current Draw	Worn brushes or weak	Replace brushes or brush springs as necessary
------------------	----------------------	---

AA

High Pitched Whine During Cranking Before Engine Fires but Engine Fires and Cranks Normally	Distance too great between starter pinion and flywheel	Align starter or check that correct starter and flywheel are being used
--	--	--

AA

High Pitched Whine After Engine Fires With Key released. Engine Fires and Cranks Normally	Distance too small between starter pinion and flywheel Flywheel runout contributes to the intermittent nature
--	--

AA

## STEERING COLUMN TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

### BASIC STEERING COLUMN TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

Noise in Steering	Coupling pulled apart	See STEERING COLUMNS article
----------------------	-----------------------	---------------------------------

Column not correctly aligned	See STEERING COLUMNS article
---------------------------------	---------------------------------

Broken lower joint	Replace joint
--------------------	---------------

Horn contact ring not	See STEERING COLUMN
-----------------------	---------------------

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		article
	Bearing not lubricated	See STEERING COLUMN article
	Shaft snap ring not properly seated	Reseat or replace snap ring
	Plastic spherical joint not lubricated	See STEERING COLUMN article
	Shroud or housing loose	Tighten holding screws
	Lock plate retaining ring not seated	See STEERING COLUMN article
	Loose sight shield	Tighten holding screws
AA		
High Steering Shaft Effort	Column assembly misaligned	See STEERING COLUMN article
	Improperly installed dust shield	Adjust or replace
	Tight steering universal joint	See STEERING COLUMN article
AA		
High Shift Effort	Column is out of alignment	See STEERING COLUMN article
	Improperly installed dust shield	Adjust or replace
	Seals or bearings not lubricated	See STEERING COLUMNS article
	Mounting bracket screws too long	Replace with new shorter screws
	Burrs on shift tube	Remove burrs or replace tube
	Lower bowl bearing assembled wrong	See STEERING COLUMN article
	Shift tube bent or broken	Replace as necessary
	Improper adjustment of shift levers	See STEERING COLUMN article
AA		
Improper Trans. Shifting	Sheared shift tube joint	Replace as necessary



## TROUBLE SHOOTING - BASIC PROCEDURES

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Sheared lower shaft lever	Replace as necessary
---------------------------	----------------------

Improper shift lever adjustment	See STEERING COLUMN article
---------------------------------	-----------------------------

Improper gate plate adjustment	See STEERING COLUMN article
--------------------------------	-----------------------------

AA

Excess Play in Column	Instrument panel bracket bolts loose	Tighten bolts and check bracket
-----------------------	--------------------------------------	---------------------------------

Broken weld nut on jacket	See STEERING COLUMN article
---------------------------	-----------------------------

Instrument bracket capsule sheared	See STEERING COLUMN article
------------------------------------	-----------------------------

Column bracket/jacket bolts loose	Tighten bolts and check bracket
-----------------------------------	---------------------------------

AA

Steering Locks in Gear	Release lever mechanism	See STEERING COLUMN article
------------------------	-------------------------	-----------------------------

AA

## SUSPENSION TROUBLE SHOOTING

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### BASIC SUSPENSION TROUBLE SHOOTING CHART

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

Front End Noise	Loose or worn wheel	See Wheel Bearing Adjustment in SUSPENSION
-----------------	---------------------	--

Worn shocks or shock mountings	Replace struts or strut mountings
--------------------------------	-----------------------------------

Worn struts or strut mountings	Replace struts or strut mountings
--------------------------------	-----------------------------------

Loose or worn lower control arm	See SUSPENSION
---------------------------------	----------------

Loose steering gear-to-	See STEERING
-------------------------	--------------

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frame bolts

Worn control arm bushings      See SUSPENSION

Ball joints not lubricated      Lubricate ball joints &  
see Ball Joint Checking  
in SUSPENSION

AA

Front Wheel      Tires or wheels out of      Check tire balance  
Shake, Shimmy,  
or Vibration      balance

Incorrect wheel alignment      See WHEEL ALIGNMENT

Drive shaft unbalanced      Check drive shaft  
balance

Loose or worn wheel      See WHEEL ALIGNMENT  
bearings

Loose or worn tie rod ends      See SUSPENSION

Worn upper ball joints      See Ball Joint Checking  
in SUSPENSION

Worn shock absorbers      Replace shock absorbers

Worn strut bushings      Replace strut bushings

AA

Car Pulls to      Mismatched or uneven tires      Check tire condition  
One Side

Broken or sagging springs      See SUSPENSION

Loose or worn strut      See SUSPENSION  
bushings

Improper wheel alignment      See WHEEL ALIGNMENT

Improper rear axle      Check rear axle  
alignment      alignment

Power steering gear      See STEERING  
unbalanced

Front brakes dragging      See BRAKES

AA

Abnormal Tire      Unbalanced tires      Check tire balance &  
Wear      rotation

Sagging or broken springs      See SUSPENSION

Incorrect front end      See WHEEL ALIGNMENT  
alignment

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	Faulty shock absorbers	Replace chock absorbers
AA		
Scuffed Tires	Toe-In incorrect	See WHEEL ALIGNMENT
	Suspension arm bent or twisted	See appropriate SUSPENSION article
AA		
Springs Bottom or Sag	Bent or broken springs	See SUSPENSION
	Leaking or worn shock absorbers	Replace shock absorbers
	Frame misalignment	Check frame for damage
AA		
Spring Noises	Loose "U" Bolts	See SUSPENSION
	Loose or worn bushings	See SUSPENSION
	Worn or missing interliners	See SUSPENSION
AA		
Shock Absorber Noise	Loose shock mountings	Check & tighten mountings
	Worn bushings	Replace bushings
	Air in system	Bleed air from system
	Undercoating on shocks	Remove undercoating
AA		
Car Leans or Sways on Corners	Loose stabilizer bar	See SUSPENSION
	Faulty shocks or mountings	Replace shocks or mountings
	Broken or sagging springs	See SUSPENSION
AA		
Shock Absorbers Leaking	Worn seals or reservoir tube crimped	See SUSPENSION
AA		
Broken Springs	Loose "U" bolts	See SUSPENSION
	Inoperative shock absorbers	Replace shock absorbers
AA		

## TUNE-UP TROUBLE SHOOTING - GAS ENGINE VEHICLES

PLEASE READ THIS FIRST:

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configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

### SPARK PLUG DIAGNOSIS

#### BASIC SPARK PLUG TROUBLE SHOOTING CHARTS

AA

CONDITION	POSSIBLE CAUSE	CORRECTION
-----------	----------------	------------

AA

Normal Spark Plug Condition	Light Tan or Gray deposits	No Action
	Electrode not burned or fouled	No Action

	Gap tolerance not changed	No Action
--	---------------------------	-----------

AA

Cold Fouling or Carbon Deposits	Overrich air/fuel mixture	Adjust air/fuel mixture, see ENGINE PERFORMANCE section
---------------------------------	---------------------------	---

	Faulty choke	Replace choke assembly, see ENGINE PERFORMANCE section
--	--------------	--

	Clogged air filter	Clean and/or replace air filter
--	--------------------	---------------------------------

	Incorrect idle speed or dirty carburetor	Reset idle speed and/or clean carburetor
--	--	--

	Faulty ignition wires	Replace ignition wiring
--	-----------------------	-------------------------

	Prolonged operation at idle	Shut engine off during long idle
--	-----------------------------	----------------------------------

	Sticking valves or worn valve guide seals	Check valve train
--	---	-------------------

AA

Wet Fouling or Oil Deposits	Worn rings and pistons	Install new rings and pistons
-----------------------------	------------------------	-------------------------------

	Excessive cylinder wear	Rebore or replace block
--	-------------------------	-------------------------

	Excessive valve guide clearance	Worn or loose bearing
--	---------------------------------	-----------------------

AA

Gap Bridged	Deposits in combustion	Clean combustion
-------------	------------------------	------------------

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[illegible]

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Engine Won't Start	Open circuit between distributor and bulkhead connector	Repair circuit
	Open circuit between bulkhead connector and ignition switch	Repair circuit
	Open circuit between ignition switch and starter solenoid	Repair circuit
AA		
Engine Runs Rough	Fuel lines leaking or clogged	Tighten fitting, remove restriction
	Initial timing incorrect	Reset ignition timing see ENGINE PERFORMANCE
	Centrifugal advance malfunction	Repair distributor advance
	Defective spark plugs or wiring	Replace plugs or plug wiring
	AA	
Component Failure	Spark arc-over on cap, rotor or coil	Replace cap, rotor or or coil
	Defective pick-up coil	Replace pick-up coil
	Defective ignition coil	Replace ignition coil
	Defective vacuum unit	Replace vacuum unit
	Defective control module	Replace control module
AA		

## ELECTRONIC IGNITION DIAGNOSIS BY OSCILLOSCOPE PATTERN

### BASIC ELECTRONIC IGNITION TROUBLE SHOOTING

#### CHARTS - USING OSCILLOSCOPE PATTERNS

AA		
CONDITION	POSSIBLE CAUSE	CORRECTION
AA		
Firing Voltage Lines are the Same, but Abnormally High	Retarded ignition timing	Reset ignition timing, see ENGINE PERFORMANCE section
	Fuel mixture too lean	Readjust carburetor, see ENGINE PERFORMANCE
	High resistance in coil wire	Replace coil wire

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Corrosion in coil tower terminal	Clean and/or replace coil
----------------------------------	---------------------------

Corrosion in distributor coil terminal	Clean and/or replace distributor cap
--	--------------------------------------

AA

Firing Voltage Lines are the Same but Abnormally Low	Fuel mixture too rich	Readjust carburetor, see ENGINE PERFORMANCE
--	-----------------------	---

Breaks in coil wire causing arcing	Replace coil wire
------------------------------------	-------------------

Cracked coil tower causing arcing	Replace coil
-----------------------------------	--------------

Low coil output	Replace coil
-----------------	--------------

Low engine compression	Determine cause and repair
------------------------	----------------------------

AA

One or More, But Not All Firing	Carburetor idle mixture not balanced	Readjust carburetor, see ENGINE PERFORMANCE
---------------------------------	--------------------------------------	---

Voltage Lines are Higher Than Others	EGR valve stuck open	Clean and/or replace valve
--------------------------------------	----------------------	----------------------------

High resistance in spark plug wires	Replace spark plug wires
-------------------------------------	--------------------------

Cracked or broken spark plug insulator	Replace spark plugs
--	---------------------

Intake vacuum leak	Repair leak
--------------------	-------------

Defective spark plugs	Replace spark plugs
-----------------------	---------------------

Corroded spark plug terminals	Replace spark plugs
-------------------------------	---------------------

AA

One or More, But Not All Firing	Curb idle mixture not balanced	Readjust carburetor, see ENGINE PERFORMANCE
---------------------------------	--------------------------------	---

Voltage Lines Are Lower Than Others	Breaks in plug wires causing arcing	Replace plug wires
-------------------------------------	-------------------------------------	--------------------

Cracked coil tower causing arcing	Replace coil
-----------------------------------	--------------

Low compression	Determine cause and repair
-----------------	----------------------------

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	Defective spark plugs	Replace spark plugs
	Corroded spark plugs	Replace spark plugs
AA		
Cylinders Not Firing	Cracked distributor cap terminals	Replace distributor cap
	Shorted spark plug wire	Determine cause and repair
	Mechanical problem in engine	Determine cause and repair
	Defective spark plugs	Replace spark plugs
	Spark plugs fouled	Replace spark plugs
AA		

## DRIVEABILITY PROBLEMS TROUBLE SHOOTING

### BASIC DRIVEABILITY PROBLEMS TROUBLE SHOOTING TABLE

AA		
CONDITION	POSSIBLE CAUSE	CORRECTION
AA		
Hard Starting	Binding carburetor linkage	Eliminate binding
	Binding choke linkage	Eliminate binding
	Binding choke piston	Eliminate binding
	Restricted choke vacuum	Check vacuum lines for blockage
	Worn or dirty needle valve and seat	Clean carburetor, see ENGINE PERFORMANCE
	Float sticking	Readjust or replace float see the ENGINE PERFORMANCE section
	Incorrect choke adjustment	Reset choke adjustment see ENGINE PERFORMANCE
	Defective coil	Replace coil
	Improper spark plug gap	Regap spark plugs
	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
AA		
Detonation	Over-advanced ignition timing	Reset ignition timing see ENGINE PERFORMANCE



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Defective spark plugs	Replace spark plugs
Fuel lines clogged	Clean fuel lines
EGR system malfunction	Check and repair EGR system
PCV system malfunction	Repair PCV system
Vacuum leaks	Check and repair vacuum system
Loose fan belts	Tighten or replace fan belts, see ENGINE PERFORMANCE
Restricted airflow	Remove restriction
Vacuum advance malfunction	Check distributor operation
AA	
Dieseling	Binding carburetor linkage
	Eliminate binding
	Binding throttle linkage
	Eliminate blinding
	Binding choke linkage or fast idle cam
	Eliminate binding
	Defective idle solenoid
	Replace idle solenoid see ENGINE PERFORMANCE
	Improper base idle speed
	Reset idle speed, see see ENGINE PERFORMANCE
	Incorrect ignition timing
	Reset ignition timing see ENGINE PERFORMANCE
	Incorrect idle mixture setting
	Reset idle mixture, see ENGINE PERFORMANCE
AA	
Faulty Acceleration	Incorrect ignition timing
	Reset ignition timing see ENGINE PERFORMANCE
	Engine cold and choke too lean
	Adjust choke and allow engine to warm-up
	Defective spark plugs
	Replace spark plugs
	Defective coil
	Replace coil
AA	

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## Faulty Low Speed Operation

## Clogged idle transfer slots

Clean idle transfer  
slots, see FUEL

Restricted idle air bleeds  
and passages

Disassemble and clean  
carburetor, see FUEL

Clogged air cleaner

## Replace air filter

## Defective spark plugs

## Replace spark plugs

Defective ignition wires

Replace ignition wire  
see ENGINE PERFORMANCE

Defective distributor cap

Replace distributor  
cap

[illegible]

## Faulty High Speed Operation

Incorrect ignition timing

Reset ignition timing  
see ENGINE PERFORMANCE

Defective distributor  
centrifugal advance

Replace advance  
mechanism

Defective distributor  
vacuum advance

Replace advance unit

Incorrect spark plugs or  
plug gap

Check gap and/or  
replace spark plugs

## Faulty choke operation

Check choke and  
repair as required

Clogged vacuum passages

Remove restrictions

Improper size or clogged  
main jet

Check jet size and  
clean, see FUEL

Restricted air cleaner

Check filter and  
replace as necessary

Defective distributor cap,  
rotor or coil

Replace cap, rotor or coil

[illegible]

# Misfire at All Speeds

## Defective spark plugs

## Replace spark plugs

Defective spark plug wires

```
Replace spark plug
wires
```

Defective distributor cap,  
rotor, or coil

Replace cap, rotor,  
or coil

Cracked or broken vacuum

Replace vacuum hoses

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hoses

Vacuum leaks

Repair vacuum leaks

Fuel lines clogged

Remove restriction

AA

Hesitation

Cracked or broken vacuum hoses

Replace vacuum hoses

Vacuum leaks

Repair Vacuum leaks

Binding carburetor linkage

Eliminate binding

Binding throttle linkage

Eliminate binding

Binding choke linkage or fast idle cam

Eliminate binding

Improper float setting

Readjust float setting, see FUEL

Cracked or broken ignition wires

Replace ignition wires

AA

Rough idle,  
Missing or  
Stalling

Incorrect curb idle or fast idle speed

Reset idle speed, see  
see ENGINE PERFORMANCE

Incorrect basic timing

Reset ignition timing  
see ENGINE PERFORMANCE

Improper idle mixture adjustment

Reset idle mixture,  
see ENGINE PERFORMANCE

Improper feedback system operation

Check feedback system  
see ENGINE PERFORMANCE

Incorrect spark plug gap

Reset spark plug gap,  
see ENGINE PERFORMANCE

Moisture in ignition components

Dry components

Loose or broken ignition wires

Replace ignition wires

Damaged distributor cap or rotor

Replace distributor cap or rotor

Faulty ignition coil

Replace ignition coil

Fuel filter clogged or worn

Replace fuel filter

## TROUBLE SHOOTING - BASIC PROCEDURES

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Damaged idle mixture screw	Replace idle mixture screw, see FUEL
Improper fast idle cam adjustment	Reset fast idle cam adjustment, see TUNE-see ENGINE PERFORMANCE
Improper EGR valve operation	Replace EGR valve
Faulty PCV valve air flow	Replace PCV valve
Choke binding or improper choke setting	Reset choke or eliminate binding
Vacuum leak	Repair vacuum leak
Improper float bowl fuel level	Reset float adjustment, see FUEL
Clogged air bleed or idle passages	Clean carburetor passages, see FUEL
Clogged or worn air cleaner filter	Replace air filter
Faulty choke vacuum diaphragm	Replace diaphragm, see ENGINE PERFORMANCE
Exhaust manifold heat valve inoperative	Replace heat valve
Improper distributor spark advance	Check distributor operation
Leaking valves or valve components	Check and repair valvetrain
Improper carburetor mounting	Remove and remount carburetor
Excessive play in distributor shaft	Replace distributor
Loose or corroded wiring connections	Repair or replace as required
Engine Surges	Improper PCV valve airflow
	Replace PCV valve
	Vacuum leaks
	Repair vacuum leaks
	Clogged air bleeds
	Remove restriction

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EGR valve malfunction	Replace EGR valve
Restricted air cleaner filter	Replace air filter
Cracked or broken vacuum hoses	Replace vacuum hoses
Cracked or broken ignition wires	Replace ignition wires
Vacuum advance malfunction	Check unit and replace as necessary
Defective or fouled spark plugs	Replace spark plugs

AA

Ping or Spark Knock	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
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Distributor centrifugal or vacuum advance malfunction	Check operation and replace as necessary
Carburetor setting too lean	Readjust mixture setting, see ENGINE PERFORMANCE
Vacuum leak	Eliminate vacuum leak

AA

Poor Gasoline Mileage	EGR valve malfunction	Replace EGR valve
	Cracked or broken vacuum hoses	Replace vacuum hoses

Vacuum leaks	Repair vacuum leaks
Defective ignition wires	Replace wires
Incorrect choke setting	Readjust setting, see ENGINE PERFORMANCE
Defective vacuum advance	Replace vacuum advance
Defective spark plugs	Replace spark plugs
Binding carburetor power piston	Eliminate binding
Dirt in carburetor jets	Clean and/or replace jets
Incorrect float adjustment	Readjust float

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setting, see FUEL

Defective power valve

Replace power valve,  
see ENGINE PERFORMANCE

Incorrect idle speed

Readjust idle speed

AA

Engine Stalls

Improper float level

Readjust float level

Leaking needle valve and  
seat

Replace needle valve  
and seat

Vacuum leaks

Eliminate vacuum  
leaks

AA

### VACUUM PUMP - DIESEL TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

NOTE: Diesel engines mechanical diagnosis is the same as gasoline engines for items such as noisy valves, bearings, pistons, etc. The following trouble shooting covers only items pertaining to diesel engines.

#### VACUUM PUMP (DIESEL) TROUBLE SHOOTING CHART

AA

CONDITION

POSSIBLE CAUSE

CORRECTION

AA

Excessive Noise

Loose pump-to-drive  
assembly screws

Tighten screws

Loose tube on pump assembly

Tighten tube

Valves not functioning  
properly

Replace valves

AA

Oil Leakage

Loose end plug  
Bad seal crimp

Tighten end plug

Remove and re-crimp  
seal

AA

### WHEEL ALIGNMENT TROUBLE SHOOTING

WARNING: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to

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problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

#### BASIC WHEEL ALIGNMENT TROUBLE SHOOTING CHART

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CONDITION	POSSIBLE CAUSE	CORRECTION
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AA

Premature Tire Wear	Improper tire inflation	Check tire pressure
	Front alignment out of tolerance	See ALIGNMENT SPECS in WHEEL ALIGNMENT section
	Suspension components worn	See SUSPENSION section
	Steering system components worn	See STEERING section
	Improper standing height	See WHEEL ALIGNMENT
	Uneven or sagging springs	See SUSPENSION section
	Bent wheel	See WHEEL ALIGNMENT
	Improper torsion bar adjustment	See SUSPENSION section
	Loose or worn wheel bearings	See WHEEL BEARING ADJ. in SUSPENSION section
	Worn or defective shock	Replace shock absorbers
	Tires out of balance	Check tire balance

AA

Pulls to One Side	Improper tire inflation	Check tire pressure
	Brake dragging	See BRAKE section
	Mismatched tires	See WHEEL ALIGNMENT
	Broken or sagging spring	See SUSPENSION section
	Broken torsion bar	See SUSPENSION section
	Power steering valve not centered	See STEERING section
	Front alignment out of tolerance	See WHEEL ALIGNMENT section
	Defective wheel bearing	See WHEEL BEARINGS in SUSPENSION section

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Uneven sway bar links                      See SUSPENSION section

Frame bent                      Check for frame damage

Steering system bushing worn	See STEERING section
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[illegible]

Hard Steering	Idler arm bushing too tight	See STEERING LINKAGE in STEERING section
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Ball joint tight or seized      See SUSPENSION section

Steering linkage too tight	See STEERING LINKAGE in STEERING section
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Power steering fluid low	Add proper amount of fluid
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Power steering drive belt loose See STEERING section

Power steering pump defective	See STEERING section
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Steering gear out of adjustment	See STEERING section
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Incorrect wheel alignment      See WHEEL ALIGNMENT

Damaged steering gear	See STEERING section
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Damaged suspension                      See SUSPENSION section

Bent steering knuckle or supports      See SUSPENSION section

[illegible]

Vehicle	Strut rod or control arm	See SUSPENSION section
"Wanders"	bushing worn	

Loose or worn wheel bearings	See WHEEL BEARINGS in SUSPENSION section
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Improper tire inflation	Check tire pressure
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Stabilizer bar missing or defective	See SUSPENSION section
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Wheel alignment out of tolerance	See Adjustment in WHEEL ALIGNMENT section
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Broken spring                      See SUSPENSION section



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Defective shock absorbers	Replace shock absorbers
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Worn steering & suspension components	See SUSPENSION section
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AA

Front End Shimmy	Tire out of balance/round	Check tire balance
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Excessive wheel runout	See WHEEL ALIGNMENT
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Insufficient or improper caster	See WHEEL ALIGNMENT section
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Worn suspension or steering components	See SUSPENSION section
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Defective shock absorbers	Replace shock absorber
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Wheel bearings worn or loose	See WHEEL BEARING ADJ. in SUSPENSION section
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Power steering reaction Bracket loose	See STEERING section
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Steering gear box (rack) mounting loose	See STEERING section
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Steering gear adjustment loose	See STEERING section
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Worn spherical joints	See SUSPENSION section
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AA

Toe-In Not Adjustable	Lower control arm bent	See SUSPENSION section
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Frame bent	Check frame for damage
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AA

Camber Not Adjustable	Control arm bent	See SUSPENSION section
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Frame bent	Check frame for damage
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Hub & bearing not seated properly	See SUSPENSION section
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AA

END OF ARTICLE