

# Troubleshooting

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## Engine doesn't start or is difficult to start

### 1 Starter motor does not rotate

- 1 Engine kill switch Off.
- 2 Fuse blown. Check fuse block (Chapter 9).
- 3 Battery voltage low. Check and recharge battery (Chapter 9).
- 4 Starter motor defective. Make sure the wiring to the starter is secure. Make sure the starter relay clicks when the start button is pushed. If the solenoid clicks, then the fault is in the wiring or motor.
- 5 Starter relay faulty. Check it according to the procedure in Chapter 9.
- 6 Starter button not contacting. The contacts could be wet, corroded or dirty. Disassemble and clean the switch (Chapter 9).
- 7 Wiring open or shorted. Check all wiring connections and harnesses to make sure that they are dry, tight and not corroded. Also

check for broken or frayed wires that can cause a short to ground/earth (see wiring diagram, Chapter 9).

8 Ignition switch defective. Check the switch according to the procedure in Chapter 9. Replace the switch with a new one if it is defective.

9 Engine kill switch defective. Check for wet, dirty or corroded contacts. Clean or replace the switch as necessary (Chapter 9).

10 Faulty sidestand switch. Check the switch circuit and the switch itself according to the procedures in Chapter 9.

### 2 Starter motor rotates but engine does not turn over

- 1 Starter motor clutch defective. Inspect and repair or replace (Chapter 9).
- 2 Damaged starter reduction or idle gear. Inspect and replace the damaged parts (Chapter 9).

### 3 Starter works but engine won't turn over (seized)

Seized engine caused by one or more internally damaged components. Failure due to wear, abuse or lack of lubrication. Damage can include seized valves, camshafts, pistons, crankshaft, connecting rod bearings, or transmission gears or bearings. Refer to Chapter 2 for engine disassembly.

### 4 No fuel flow

- 1 No fuel in tank.
- 2 Fuel tap turned off or clogged. Disassemble and clean strainer.
- 3 Fuel tank breather (in cap) clogged. Usually caused by dirt or water. Remove it and clean the cap vent hole.
- 4 Fuel filter clogged. Inspect and, if necessary, replace the filter (Chapter 4).
- 5 Fuel line clogged. Pull the fuel line loose and carefully blow through it.
- 6 Float valve(s) clogged. If the machine has been stored for many months without running, old fuel may turn into a varnish-like liquid and form deposits on the float valves and jets. Or a bad batch of fuel or an unusual additive may have been used. Try draining the float bowls and cleaning the float valves. If that doesn't alleviate the problem, overhaul the carburetors. Drain and clean the tank too.

### 5 Engine flooded

- 1 Float level too high. Check and adjust (Chapter 4).
- 2 Float valve worn or stuck open. A piece of dirt, rust or other debris can cause the float valve to seat improperly, causing excess fuel to be admitted to the float bowl. Clean the float bowl and inspect the float valve and seat. If the valve and seat are worn, replace them (Chapter 4).
- 3 Starting technique incorrect. If the carburetors are functioning correctly, the machine should start with little or no throttle. When the engine is cold, the choke should be used and the engine started without opening the throttle. When the engine is at operating temperature, only a very slight amount of throttle should be necessary. If the engine is flooded, turn the fuel tap off and hold the throttle open while cranking the engine. This will allow additional air to reach the cylinders. Remember to turn the fuel back on after the engine starts.

### 6 No spark or weak spark

- 1 Ignition switch Off.
- 2 Engine kill switch turned to the Off position.
- 3 Battery voltage low. Check and recharge battery as necessary (Chapter 9).
- 4 Spark plug dirty, defective or worn out. Locate reason for fouled plug(s) using spark plug condition chart and follow the plug maintenance procedures in Chapter 1.
- 5 Spark plug cap or plug wire faulty. Inspect the plug wires for cracks or deterioration. Make sure that the caps are still firmly attached to the wires. Replace the plug wires if they're worn or damaged (Chapter 5).
- 6 Spark plug cap not making good contact. Make sure that the plug cap fits snugly over the plug end.
- 7 Ignition control module defective. Check the module (Chapter 5).
- 8 Ignition pulse generator(s) defective. Check the ignition pulse generators (Chapter 5).
- 9 Ignition coil(s) defective. Check the coils, referring to Chapter 5.
- 10 Ignition or kill switch shorted. This is usually caused by water, corrosion, damage or excessive wear. The switches can be disassembled and cleaned with electrical contact cleaner. If cleaning does not help, replace the switches (Chapter 9).

11 Wiring shorted or broken between:

- a) Ignition switch and engine kill switch
- b) Ignition control module and engine kill switch
- c) Ignition control module and ignition coil
- d) Ignition coil and spark plug
- e) Ignition control module and ignition pulse generator

Make sure that all wiring connections are clean, dry and tight. Look for chafed and broken wires (Chapters 5 and 9).

### 7 Compression low

- 1 Spark plug loose. Remove the plug and inspect the threads. Reinstall and tighten to the specified torque (Chapter 1).
- 2 Cylinder head not sufficiently tightened down. The head bolts should be tightened to the proper torque in the correct sequence (Chapter 2). If the cylinder head has been loose for awhile, the gasket or head may be damaged, which could cause coolant or oil leaks.
- 3 Incorrect valve clearance. If the valve is not closing completely, compression pressure is leaking past the valve. Check and adjust the valve clearances (Chapter 1).
- 4 Cylinder and/or piston worn. Excessive wear will cause compression pressure to leak past the rings. This is usually accompanied by worn rings as well. A top end overhaul is necessary (Chapter 2).
- 5 Piston rings worn, weak, broken, or sticking. Broken or sticking piston rings usually indicate a lubrication or carburetion problem that causes excess carbon deposits to form on the pistons and rings. Top end overhaul is necessary (Chapter 2).
- 6 Piston ring-to-groove clearance excessive. This is caused by excessive wear of the piston ring lands. Piston replacement is necessary (Chapter 2).
- 7 Cylinder head gasket damaged. If the head is allowed to become loose, or if excessive carbon build-up on the piston crown and combustion chamber causes extremely high compression, the head gasket may leak. Retorquing the head is not always sufficient to restore the seal, so gasket replacement is necessary (Chapter 2).
- 8 Cylinder head warped. This is caused by overheating or improperly tightened head bolts. Machine shop resurfacing or head replacement is necessary (Chapter 2).
- 9 Valve spring broken or weak. Caused by component failure or wear; the spring(s) must be replaced (Chapter 2).
- 10 Valve not seating properly. This is caused by a bent valve (from over-revving or improper valve adjustment), burned valve or seat (incorrect carburetion) or an accumulation of carbon deposits on the seat (from carburetion, lubrication problems). The valves must be cleaned and/or replaced and the seats serviced if possible (Chapter 2).

### 8 Stalls after starting

- 1 Incorrect choke operation. Make sure the choke knob is all the way out (Chapter 4).
- 2 Ignition malfunction (Chapter 5).
- 3 Carburetor malfunction (Chapter 4).
- 4 Fuel contaminated. The fuel can be contaminated with either dirt or water, or can change chemically if the machine is allowed to sit for several months or more. Drain the tank and float bowls (Chapter 4).
- 5 Intake air leak. Check for loose carburetor-to-intake manifold connections, loose or missing vacuum gauge access plug, or loose vacuum chamber cover (Chapter 4).
- 6 Idle speed incorrect. Adjust idle speed (Chapter 1).

### 9 Rough idle

- 1 Ignition malfunction (Chapter 5).
- 2 Idle speed incorrect. Adjust idle speed (Chapter 1).
- 3 Carburetors not synchronized. Synchronize carburetors (Chapter 1).

- 4 Carburetor malfunction (Chapter 4).
- 5 Fuel contaminated. The fuel can be contaminated with either dirt or water, or can change chemically if the machine is allowed to sit for several months or more. Drain the tank and float bowls. If the problem is severe, a carburetor overhaul may be necessary (Chapter 4).
- 6 Intake air leak (Chapter 4).
- 7 Air cleaner clogged. Service or replace air filter element (Chapter 1).

### Poor running at low speed

#### 10 Spark weak

- 1 Battery voltage low. Check and recharge battery (Chapter 9).
- 2 Spark plug fouled, defective or worn out. Clean and inspect the plugs (Chapter 1).
- 3 Spark plug cap or plug wire defective. Inspect the plug wires (Chapter 5).
- 4 Spark plug cap not making contact.
- 5 Incorrect spark plug. Wrong type, heat range or cap configuration. Check and install correct plugs listed in Chapter 1. A cold plug or one with a recessed firing electrode will not operate at low speeds without fouling.
- 6 Ignition control module defective (Chapter 5).
- 7 Ignition pulse generator defective (Chapter 5).
- 8 Ignition coil(s) defective (Chapter 5).

#### 11 Fuel/air mixture incorrect

- 1 Pilot screw(s) out of adjustment (Chapter 4).
- 2 Pilot air passage clogged. Remove and overhaul the carburetors (Chapter 4).
- 3 Air bleed holes clogged. Remove carburetor and blow out all passages (Chapter 4).
- 4 Air filter element clogged, poorly sealed or missing (Chapter 1).
- 5 Air cleaner housing, chamber or intake duct loose or damaged. Look for cracks, holes or loose clamps and replace or repair defective parts (Chapter 4).
- 6 Fuel level too high or too low. Adjust the floats (Chapter 4).
- 7 Fuel tank breather (in cap) obstructed. Make sure that the air vent passage in the filler cap is open (except California models, on which the vent is plumbed into the EVAP system).
- 8 Carburetor intake manifolds loose. Check for cracks, breaks, tears or loose clamps or bolts. Repair or replace the rubber boots.

#### 12 Compression low

- 1 Spark plug loose. Remove the plug and inspect the threads. Reinstall and tighten to the torque listed in the Chapter 1 Specifications.
- 2 Cylinder head not sufficiently tightened down. If the cylinder head has been loose for awhile, the gasket and head may be damaged. The head bolts should be tightened to the correct torque in the correct sequence (Chapter 2).
- 3 Incorrect valve clearance. If the valve is not closing completely, compression pressure is leaking past the valve. Check and adjust the valve clearances (Chapter 1).
- 4 Cylinder and/or piston worn. Excessive wear will cause compression pressure to leak past the rings. This is usually accompanied by worn rings as well. A top end overhaul is necessary (Chapter 2).
- 5 Piston rings worn, weak, broken, or sticking. Broken or sticking piston rings usually indicate a lubrication or carburetion problem that causes excess carbon deposits to form on the pistons and rings. Top end overhaul is necessary (Chapter 2).
- 6 Piston ring-to-groove clearance excessive. This is caused by excessive wear of the piston ring lands. Piston replacement is neces-

- sary (Chapter 2).
- 7 Cylinder head gasket damaged. If the head is allowed to become loose, or if excessive carbon build-up on the piston crown and combustion chamber causes extremely high compression, the head gasket may leak. Retorquing the head is not always sufficient to restore the seal, so gasket replacement is necessary (Chapter 2).
- 8 Cylinder head warped. This is caused by overheating or incorrectly tightened head bolts. Machine shop resurfacing or head replacement is necessary (Chapter 2).
- 9 Valve spring broken or weak. Caused by component failure or wear; the spring(s) must be replaced (Chapter 2).
- 10 Valve not seating properly. This is caused by a bent valve (from over-revving or improper valve adjustment), burned valve or seat (incorrect carburetion) or an accumulation of carbon deposits on the seat (from carburetion, lubrication problems). The valves must be cleaned and/or replaced and the seats serviced if possible (Chapter 2).

#### 13 Poor acceleration

- 1 Carburetors leaking or dirty. Overhaul the carburetors (Chapter 4).
- 2 Timing not advancing. The ignition pulse generator(s) or the ignition control module may be defective (Chapter 5). If any of these components are defective, they must be replaced; they can't be repaired.
- 3 Carburetors not synchronized. Synchronize the carburetors (Chapter 1).
- 4 Engine oil viscosity too high. Using a heavier oil than that recommended in Chapter 1 can damage the oil pump or lubrication system and cause drag on the engine.
- 5 Brakes dragging. Can be caused by debris which has entered the brake piston sealing boot, by a warped disc, or by a bent axle. Repair as necessary (Chapter 7).

### Poor running or no power at high speed

#### 14 Firing incorrect

- 1 Air filter element restricted. Replace filter (Chapter 1).
- 2 Spark plug fouled, defective or worn out. Clean or replace the spark plugs (Chapter 1).
- 3 Spark plug cap or plug wire defective (Chapter 5).
- 4 Spark plug cap not in good contact (Chapter 5).
- 5 Incorrect spark plug. Wrong type, heat range or cap configuration. Check and install correct plugs listed in Chapter 1. A cold plug or one with a recessed firing electrode will not operate at low speeds without fouling.
- 6 Ignition control module defective. Check and, if necessary, replace the module (Chapter 5).
- 7 Ignition coil(s) defective. Check and, if necessary, replace the coil(s) (Chapter 5).

#### 15 Fuel/air mixture incorrect

- 1 Main jet clogged. Dirt, water and other contaminants can clog the main jets. Clean the fuel tap filter screen, the float bowl, the jets and the fuel passages (Chapter 4).
- 2 Incorrect size main jet. The standard jetting is for sea-level atmospheric pressure and oxygen content.
- 3 Excessive throttle shaft-to-carburetor body clearance. If the throttle shaft of either carburetor is loose, replace the carburetor (Chapter 4).
- 4 Air bleed holes clogged. Remove and overhaul carburetors (Chapter 4).
- 5 Air filter element clogged, poorly sealed or missing.
- 6 Air cleaner-to-carburetor boot poorly sealed. Look for cracks, holes or loose clamps, and replace or repair defective parts.

- 7 Fuel level too high or too low. Adjust the float(s) (Chapter 4).
- 8 Fuel tank air vent obstructed. Make sure the air vent passage in the filler cap is open.
- 9 Carburetor intake manifolds loose. Check for cracks, breaks, tears or loose clamps or bolts. Repair or replace the rubber boots (Chapter 2).
- 10 Fuel filter clogged. Clean, and if necessary, replace the filter (Chapter 1).
- 11 Fuel line clogged. Pull the fuel line loose and carefully blow through it.

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## 16 Compression low

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- 1 Spark plug loose. Remove the plug and inspect the threads. Reinstall and tighten to the specified torque (Chapter 1).
- 2 Cylinder head not sufficiently tightened down. If the cylinder head is suspected of being loose, then there's a chance that the gasket and head are damaged if the problem has persisted for any length of time. The head bolts should be tightened to the proper torque in the correct sequence (Chapter 2).
- 3 Improper valve clearance. This means that the valve is not closing completely and compression pressure is leaking past the valve. Check and adjust the valve clearances (Chapter 1).
- 4 Cylinder and/or piston worn. Excessive wear will cause compression pressure to leak past the rings. This is usually accompanied by worn rings as well. A top end overhaul is necessary (Chapter 2).
- 5 Piston rings worn, weak, broken, or sticking. Broken or sticking piston rings usually indicate a lubrication or carburetion problem that causes excess carbon deposits or seizures to form on the pistons and rings. Top end overhaul is necessary (Chapter 2).
- 6 Piston ring-to-groove clearance excessive. This is caused by excessive wear of the piston ring lands. Piston replacement is necessary (Chapter 2).
- 7 Cylinder head gasket damaged. If the head is allowed to become loose, or if excessive carbon build-up on the piston crown and combustion chamber causes extremely high compression, the head gasket may leak. Retorquing the head is not always sufficient to restore the seal, so gasket replacement is necessary (Chapter 2).
- 8 Cylinder head warped. This is caused by overheating or improperly tightened head bolts. Machine shop resurfacing or head replacement is necessary (Chapter 2).
- 9 Valve spring broken or weak. Caused by component failure or wear; the spring(s) must be replaced (Chapter 2).
- 10 Valve not seating properly. This is caused by a bent valve (from over-revving or improper valve adjustment), burned valve or seat (incorrect carburetion) or an accumulation of carbon deposits on the seat (from carburetion, lubrication problems). The valves must be cleaned and/or replaced and the seats serviced if possible (Chapter 2).

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## 17 Knocking or pinging

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- 1 Carbon build-up in combustion chamber. Use of a fuel additive that will dissolve the adhesive bonding the carbon particles to the crown and chamber is the easiest way to remove the build-up. Otherwise, the cylinder head will have to be removed and decarbonized (Chapter 2).
- 2 Incorrect or poor quality fuel. Old or improper grades of gasoline can cause detonation. This causes the piston to rattle, thus the knocking or pinging sound. Drain old fuel and always use the recommended fuel grade.
- 3 Spark plug heat range incorrect. Uncontrolled detonation indicates the plug heat range is too hot. The plug in effect becomes a glow plug, raising cylinder temperatures. Install the proper heat range plug (Chapter 1).
- 4 Improper air/fuel mixture. This will cause the cylinder to run hot, which leads to detonation. Clogged jets or an air leak can cause this imbalance (Chapter 4).

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## 18 Miscellaneous causes

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- 1 Throttle valve doesn't open fully. Adjust the throttle cable (Chapter 1).
- 2 Clutch slipping. Caused by damaged, loose or worn clutch components. Try adjusting the clutch cable; if that doesn't work, overhaul the clutch (Chapter 2).
- 3 Ignition timing incorrect and/or not advancing. Ignition timing can be checked, but it is not adjustable. If the timing is incorrect, check the ignition control module and, if necessary, replace it (Chapter 5).
- 4 Engine oil viscosity too high. Using a heavier oil than the one recommended in Chapter 1 can damage the oil pump or lubrication system and cause drag on the engine.
- 5 Brakes dragging. Usually caused by debris which has entered the brake piston sealing boot, or by a warped disc, or by a bent axle. Repair as necessary.

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## Overheating

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### 19 Cooling system not operating properly

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- 1 Coolant level low. Check coolant level as described in Chapter 1. If coolant level is low, the engine will overheat.
- 2 Leak in cooling system. Check cooling system hoses and radiator for leaks and other damage. Repair or replace parts as necessary (Chapter 3).
- 3 Thermostat sticking open or closed. Check and replace as described in Chapter 3.
- 4 Faulty radiator cap. Remove the cap and have it pressure checked at a service station.
- 5 Coolant passages clogged. Have the entire system drained and flushed, then refill with new coolant.
- 6 Water pump defective. Remove the pump and check the components.
- 7 Clogged radiator fins. Clean them by blowing compressed air through the fins from the back side.

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## 20 Firing incorrect

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- 1 Spark plug fouled, defective or worn out. Clean, inspect and, if necessary, replace the spark plugs (Chapter 1).
- 2 Incorrect spark plug. Wrong type, heat range or cap configuration. Check and install correct plugs listed in Chapter 1.
- 3 Faulty ignition coil(s) (Chapter 5).

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## 21 Fuel/air mixture incorrect

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- 1 Main jet clogged. Dirt, water and other contaminants can clog the main jets. Clean the fuel tap filter, the float bowl area and the jets and carburetor orifices (Chapter 4).
- 2 Main jet wrong size. The standard jetting is for sea level atmospheric pressure and oxygen content.
- 3 Air cleaner poorly sealed or missing.
- 4 Air cleaner-to-carburetor boot poorly sealed. Look for cracks, holes or loose clamps and replace or repair.
- 5 Fuel level too low. Adjust the float(s) (Chapter 4).
- 6 Fuel tank air vent obstructed. Make sure that the air vent passage in the filler cap is open (except California models).
- 7 Carburetor intake manifolds loose. Check for cracks, breaks, tears or loose clamps or bolts. Repair or replace the rubber boots (Chapter 4).

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## 22 Compression too high

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- 1 Carbon build-up in combustion chamber. To remove the build-up, use a fuel additive that will dissolve the layer of carbon on the piston crown and combustion chamber. If that doesn't work, the cylinder head will have to be removed and decarbonized (Chapter 2).
- 2 Improperly machined head surface or installation of incorrect gasket during engine assembly. Check Specifications (Chapter 2).

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## 23 Engine load excessive

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- 1 Clutch slipping. Caused by damaged, loose or worn clutch components. Inspect and, if necessary, overhaul the clutch (Chapter 2).
- 2 Engine oil level too high. The addition of too much oil will cause pressurization of the crankcase and inefficient engine operation. Check Specifications and drain to proper level (Chapter 1).
- 3 Engine oil viscosity too high. Using a heavier oil than the one recommended in Chapter 1 can damage the oil pump or lubrication system as well as cause drag on the engine.
- 4 Brakes dragging. Usually caused by debris which has entered the brake piston sealing boot, by a warped disc, or by a bent axle. Repair as necessary.

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## 24 Lubrication inadequate

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- 1 Engine oil level too low. Friction caused by intermittent lack of lubrication or from oil that is "overworked" can cause overheating. The oil provides a definite cooling function in the engine. Check the oil level (Chapter 1).
- 2 Poor quality engine oil or incorrect viscosity or type. Oil is rated not only according to viscosity but also according to type. Some oils are not rated high enough for use in this engine. Check the Specifications section and change to the correct oil (Chapter 1).

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## 25 Miscellaneous causes

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Modification to exhaust system. Most aftermarket exhaust systems cause the engine to run leaner, which makes it run hotter. When installing an accessory exhaust system, rejet the carburetors in accordance with the exhaust manufacturer's instructions.

### Clutch problems

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#### 26 Clutch lever hard to operate

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- 1 Damaged, kinked or dirty clutch cable. Inspect, lubricate and, if necessary, replace clutch cable (Chapter 2).
- 2 Faulty clutch lifter plate bearing. Inspect and, if necessary, replace lifter plate bearing (Chapter 2).
- 3 Damaged clutch lifter mechanism. Inspect and, if necessary, replace lifter mechanism (Chapter 2).
- 4 Incorrectly routed clutch cable (Chapter 2).

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#### 27 Clutch slipping

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- 1 Friction plates worn or warped. Overhaul the clutch assembly (Chapter 2).
- 2 Metal plates worn or warped (Chapter 2).
- 3 Clutch springs broken or weak. Old or heat-damaged (from slipping clutch) springs should be replaced with new ones (Chapter 2).
- 4 Clutch release mechanism defective. Check the mechanism and replace any defective parts (Chapter 2).

- 5 Clutch hub or housing unevenly worn. This causes improper engagement of the discs. Replace the damaged or worn parts (Chapter 2).

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#### 28 Clutch not disengaging completely

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- 1 Clutch plates warped or damaged. This will cause clutch drag, which in turn causes the machine to creep. Overhaul the clutch assembly (Chapter 2).
- 2 Clutch spring tension uneven. Usually caused by a sagged or broken spring. Check and replace the springs (Chapter 2).
- 3 Engine oil deteriorated. Old, thin, worn out oil will not provide proper lubrication for the discs, causing the clutch to drag. Replace the oil and filter (Chapter 1).
- 4 Engine oil viscosity too high. Using a heavier oil than recommended in Chapter 1 can cause the plates to stick together, putting a drag on the engine. Change to the correct weight oil (Chapter 1).
- 5 Clutch housing seized on shaft. Lack of lubrication, severe wear or damage can cause the housing to seize on the shaft. Overhaul of the clutch, and perhaps transmission, may be necessary to repair damage (Chapter 2).
- 6 Clutch release mechanism defective. Worn or damaged release mechanism parts can stick and fail to apply force to the pressure plate. Overhaul the release mechanism (Chapter 2).
- 7 Loose clutch hub nut. Causes housing and hub misalignment putting a drag on the engine. Engagement adjustment continually varies. Overhaul the clutch assembly (Chapter 2).

### Gear shifting problems

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#### 29 Doesn't go into gear or lever doesn't return

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- 1 Clutch cable out of adjustment (Chapter 1) or clutch not disengaging (see Section 27).
- 2 Shift fork(s) or shift fork shaft bent, worn or jammed. Often caused by dropping the machine or from lack of lubrication. Overhaul the transmission (Chapter 2).
- 3 Gear(s) stuck on shaft. Most often caused by a lack of lubrication or excessive wear in transmission bearings and bushings. Overhaul the transmission (Chapter 2).
- 4 Shift drum binding. Caused by lubrication failure or excessive wear. Replace the drum and bearings (Chapter 2).
- 5 Gearshift spindle bent or damaged. Replace gearshift spindle (Chapter 2).
- 6 Shift lever broken. Splines stripped out of lever or shaft, caused by allowing the lever to get loose or from dropping the machine. Replace necessary parts (Chapter 2).

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#### 30 Jumps out of gear

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- 1 Shift fork(s) or shift fork shaft bent or worn. Overhaul the transmission (Chapter 2).
- 2 Gear dogs or dog slots worn or damaged. The gears should be inspected and, if necessary, replaced. No attempt should be made to service the worn parts.
- 3 Shift drum stopper arm broken (Chapter 2).
- 4 Broken shift linkage return spring (Chapter 2).

### Abnormal engine noise

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#### 31 Knocking or pinging

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- 1 Carbon build-up in combustion chamber. To remove the build-up, use a fuel additive that will dissolve the layer of carbon on the piston

crown and combustion chamber. If that doesn't work, the cylinder head will have to be removed and decarbonized (Chapter 2).

2 Old, incorrect or poor quality fuel can cause detonation. This causes the piston to rattle, thus the knocking or pinging sound. Drain the fuel, clean the tank and refill with the recommended grade (Chapter 4).

3 Spark plug heat range incorrect. Uncontrolled detonation indicates that the plug heat range is too hot. The plug in effect becomes a glow plug, raising cylinder temperatures. Install the proper heat range plug (Chapter 1).

4 An incorrect air/fuel mixture can cause the cylinder to run hot and detonate. Clogged jets or an air leak can cause this imbalance (Chapter 4).

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### 32 Piston slap or rattling

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1 Cylinder-to-piston clearance excessive. Caused by incorrect assembly. Inspect and overhaul top end parts (Chapter 2).

2 Connecting rod bent. Caused by over-revving, by trying to start a badly flooded engine or by ingesting a foreign object into the combustion chamber. Replace the damaged parts (Chapter 2).

3 Piston pin or piston pin bore worn or seized from wear or lack of lubrication. Replace damaged parts (Chapter 2).

4 Piston ring(s) worn, broken or sticking. Overhaul the top end (Chapter 2).

5 Piston seizure damage. Usually from lack of lubrication or overheating. Replace the pistons and bore the cylinders, as necessary (Chapter 2).

6 Connecting rod bearing and/or piston pin-end clearance excessive. Caused by excessive wear or lack of lubrication. Replace worn parts.

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### 33 Valve noise

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1 Incorrect valve clearances. Adjust the valves (Chapter 1).

2 Valve springs broken or weak. Inspect and, if necessary, replace the valve springs (Chapter 2).

3 Camshaft or cylinder head worn or damaged. Lack of lubrication at high rpm is usually the cause of damage. Low oil level or failure to change the oil at the recommended intervals are the chief causes. Since there are no replaceable bearings in the head, the head itself will have to be replaced if there is excessive wear or damage (Chapter 2).

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### 34 Other noise

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1 Cylinder head gasket leaking. This will cause compression leakage into the cooling system (which may show up as air bubbles in the coolant in the radiator). Also, coolant may get into the oil (which will turn the oil into a bubbly gray-brown sludge). In either case, have the cooling system pressure-checked by a dealer service department.

2 Exhaust pipe leaking at cylinder head connection. Caused by improper fit of pipe(s) or loose exhaust flange. All exhaust fasteners should be tightened evenly and carefully. Failure to do this will lead to a leak.

3 Crankshaft runout excessive. Caused by a bent crankshaft (from over-revving) or damage from an upper cylinder component failure. Can also be attributed to dropping the machine on either of the crankshaft ends.

4 Engine mounting fasteners loose. Tighten all engine mounting fasteners to the torque listed in Chapter 2 Specifications.

5 Crankshaft bearings worn (Chapter 2).

6 Camshaft chain tensioner worn or broken. Replace the tensioner (Chapter 2).

7 Camshaft chain, sprockets or guides worn (Chapter 2).

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### Abnormal driveline noise

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#### 35 Clutch noise

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- 1 Clutch housing/friction plate clearance excessive (Chapter 2).
- 2 Loose or damaged clutch pressure plate and/or bolts (Chapter 2).

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#### 36 Transmission noise

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- 1 Bearings or shafts are worn. Overhaul the transmission (Chapter 2).
- 2 Gears are worn or chipped (Chapter 2).
- 3 Metal chips jammed in gear teeth. Probably pieces from a broken clutch, gear or shift mechanism that were picked up by the gears. This will cause early bearing failure (Chapter 2).
- 4 Engine oil level too low. Causes a howl from transmission. Also affects engine power and clutch operation (Chapter 1).

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#### 37 Chain or final drive noise

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- 1 Chain not adjusted properly (Chapter 1).
- 2 Sprocket (engine sprocket or rear sprocket) loose. Tighten fasteners (Chapter 6).
- 3 Sprocket(s) worn. Replace sprocket(s) (Chapter 6).
- 4 Rear sprocket warped. Replace sprockets and chain as a set (Chapter 6).
- 5 Wheel coupling worn. Replace coupling (Chapter 6).

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### Abnormal frame and suspension noise

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#### 38 Front end noise

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- 1 Low fluid level or incorrect viscosity oil in forks. This can sound like "spurting" and is usually accompanied by inconsistent fork action (Chapter 6).
- 2 Fork spring weak or broken. Makes a clicking or scraping sound. Fork oil, when drained, will have metal particles in it (Chapter 6).
- 3 Steering head bearings loose or damaged. Clunks when braking. Check and adjust or replace as necessary (Chapters 1 and 6).
- 4 Triple clamp-to-fork tube pinch bolts loose. Make sure all triple-clamp-to-fork tube pinch bolts are tight (Chapter 6).
- 5 Fork tube bent. Good possibility if machine has been dropped. Replace tube with a new one (Chapter 6).
- 6 Front axle nut or axle pinch bolts loose. Tighten all axle fasteners to the torque listed in this Chapter's Specifications (Chapter 7).

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#### 39 Shock absorber noise

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- 1 Fluid level incorrect. Indicates a leak caused by a defective seal. Shock will be covered with oil. Replace shock (Chapter 6).
- 2 Defective shock absorber with internal damage. This is in the body of the shock and cannot be remedied. The shock must be replaced (Chapter 6).
- 3 Bent or damaged shock body. Replace the shock (Chapter 6).

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#### 40 Brake noise

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- 1 Squeal caused by dust on brake pads. Usually found in combination with glazed pads. Clean parts with brake cleaning solvent (Chapter 7).
- 2 Contamination of brake pads. Oil, brake fluid or dirt causing brake

to chatter or squeal. Clean or replace pads (Chapter 7).

3 Pads glazed. Caused by excessive heat from prolonged use or from contamination. Do not use sandpaper, emery cloth, carborundum cloth or any other abrasive to roughen the pad surfaces as abrasives will stay in the pad material and damage the disc. A very fine flat file can be used, but pad replacement is the preferred cure (Chapter 7).

4 Disc warped. Can cause a chattering, clicking or intermittent squeal. Usually accompanied by a pulsating lever and uneven braking. Replace the disc (Chapter 7).

5 Loose or worn wheel bearings. Check and replace as needed (Chapter 7).

### Oil pressure indicator light comes on

#### 41 Engine lubrication system

1 Engine oil pump defective (Chapter 2).

2 Engine oil level low. Inspect for leak or other problem causing low oil level and add recommended lubricant (Chapters 1 and 2).

3 Engine oil viscosity too low. Very old, thin oil or an improper weight of oil used in engine. Change to correct lubricant (Chapter 1).

4 Camshaft or journals worn. Excessive wear causing drop in oil pressure. Replace cam and/or head. Abnormal wear could be caused by oil starvation at high rpm from low oil level or improper oil weight or type (Chapter 1).

5 Crankshaft and/or bearings worn. Same problems as above. Check and replace crankshaft and/or bearings (Chapter 2).

#### 42 Electrical system

1 Oil pressure switch defective. Check and, if necessary, replace the switch (Chapter 9).

2 Oil pressure indicator light circuit defective. Check for pinched, shorted, disconnected or damaged wiring (Chapter 9).

### Excessive exhaust smoke

#### 43 White smoke

1 Piston oil ring worn. The ring may be broken or damaged, causing oil from the crankcase to be pulled past the piston into the combustion chamber. Replace the rings (Chapter 2).

2 Cylinders worn, cracked, or scored. Caused by overheating or oil starvation. The cylinders will have to be rebored and new pistons installed.

3 Valve guide oil seal(s) damaged or worn. Replace the valve guide seals (Chapter 2).

4 Valve guide(s) worn. Remove the heads, take them to a motorcycle machine shop or a dealer service department and get a valve job (Chapter 2).

5 Engine oil level too high, which causes oil to be forced past the rings. Drain oil to the correct level (Chapter 1).

6 Head gasket broken between oil return passage and cylinder. Causes oil to be pulled into combustion chamber. Replace the head gasket and measure the head for warpage (Chapter 2).

7 Abnormal crankcase pressurization, which forces oil past the rings. Clogged crankcase breather or hoses usually the cause (Chapter 4).

#### 44 Black smoke

1 Air cleaner clogged. Clean or replace the element (Chapter 1).

2 Main jet too large or loose. Compare the jet size to the Specifica-

tions (Chapter 4).

3 Choke stuck, causing fuel to be pulled through choke circuit (Chapter 4).

4 Fuel level too high. Check and adjust the float height as necessary (Chapter 4).

5 Float valve held off seat. Clean float bowl and fuel line and, if necessary, replace float valve and seat (Chapter 4).

#### 45 Brown smoke

1 Main jet too small or clogged. Lean condition caused by wrong size main jet or by a restricted orifice. Clean float bowl and jets and compare jet size to Specifications (Chapter 4).

2 Fuel flow insufficient. Float valve stuck closed due to chemical reaction with old fuel. Float height incorrect. Restricted fuel line. Clean line and float bowl and adjust floats if necessary (Chapter 4).

3 Carburetor intake manifolds loose (Chapter 4).

4 Air cleaner poorly sealed or not installed (Chapter 1).

### Poor handling or stability

#### 46 Handlebar hard to turn

1 Steering stem locknut too tight (Chapter 6).

2 Steering head bearings damaged. Roughness can be felt as the bars are turned from side-to-side. Replace bearings and races (Chapter 6).

3 Steering head bearing races dented or worn. Dents are the result of wear in only one position (e.g., straight ahead), or can be caused by hitting a curb, expansion joint or hole, or by dropping the machine. Replace the steering head bearings and races (Chapter 6).

4 Steering stem lubrication inadequate. Either because the old grease has gotten hard, or because it has been removed by repeated high-pressure car washes. Disassemble the steering head and repack the bearings (Chapter 6).

5 Steering stem bent. Caused by hitting a curb or hole, or by dropping the machine. Replace the stem; do not try to straighten it (Chapter 6).

6 Front tire air pressure too low (Chapter 1).

#### 47 Handlebar shakes or vibrates excessively

1 Tires worn or out of balance (Chapter 7).

2 Swingarm bearings worn. Replace worn bearings by referring to Chapter 6.

3 Rim(s) warped or damaged. Inspect wheels for runout (Chapter 7).

4 Wheel bearings worn. Worn front or rear wheel bearings can cause poor tracking. Worn front bearings will cause wobble (Chapter 7).

5 Handlebar clamp bolts loose (Chapter 6).

6 Steering stem or fork clamps loose. Tighten them to the specified torque (Chapter 6).

7 Engine mount bolts loose. Will cause excessive vibration with increased engine rpm (Chapter 2).

#### 48 Handlebar pulls to one side

1 Frame bent. Definitely suspect this if the machine has been dropped. May or may not be accompanied by cracking near the bend. Replace the frame (Chapter 6).

2 Wheels out of alignment. Caused by improper location of axle spacers or from bent steering stem or frame (Chapter 6).

3 Swingarm bent or twisted. Caused by age (metal fatigue) or impact damage. Replace the arm (Chapter 6).

- 4 Steering stem bent. Caused by impact damage or from dropping the motorcycle. Replace the steering stem (Chapter 6).
- 5 Fork leg bent. Disassemble the forks and replace the damaged parts (Chapter 6).
- 6 Fork oil level uneven. Replace the fork oil (Chapter 1).

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#### 49 Poor shock absorbing qualities

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- 1 Too hard:
  - a) Fork oil level excessive (Chapter 6).
  - b) Fork oil viscosity too high. Use a lighter oil (see the Specifications in Chapter 6).
  - c) Fork tube bent. Causes a harsh, sticking feeling (Chapter 6).
  - d) Shock shaft or body bent or damaged (Chapter 6).
  - e) Fork internal damage (Chapter 6).
  - f) Shock internal damage.
  - g) Tire pressure too high (Chapters 1 and 7).
- 2 Too soft:
  - a) Fork or shock oil insufficient and/or leaking (Chapter 6).
  - b) Fork oil viscosity too light (Chapter 6).
  - c) Fork springs weak or broken (Chapter 6).

#### Braking problems

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#### 50 Front brakes are spongy, don't hold

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- 1 Air in brake line. Caused by extremely low master cylinder fluid level or by leakage. Locate problem and bleed brakes (Chapter 7).
- 2 Pad or disc worn (Chapters 1 and 7).
- 3 Brake fluid leak. See paragraph 1.
- 4 Contaminated pads. Caused by contamination with oil, grease, brake fluid, etc. Clean or replace pads. Clean disc thoroughly with brake cleaner (Chapter 7).
- 5 Brake fluid deteriorated. Fluid is old or contaminated. Drain system, replenish with new fluid and bleed the system (Chapter 7).
- 6 Master cylinder internal parts worn or damaged causing fluid to bypass (Chapter 7).
- 7 Master cylinder bore scratched from ingestion of foreign material or broken spring. Repair or replace master cylinder (Chapter 7).
- 8 Disc warped. Replace disc (Chapter 7).

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#### 51 Brake lever or pedal pulsates

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- 1 Disc warped. Replace disc (Chapter 7).
- 2 Axle bent. Replace axle (Chapter 6).

- 3 Brake caliper bolts loose (Chapter 7).
- 4 Brake caliper shafts damaged or sticking, causing caliper to bind. Lube the shafts and/or replace them if they are corroded or bent (Chapter 7).
- 5 Wheel warped or otherwise damaged (Chapter 7).
- 6 Wheel bearings damaged or worn (Chapter 7).

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#### 52 Brakes drag

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- 1 Master cylinder piston seized. Caused by wear or damage to piston or cylinder bore (Chapter 7).
- 2 Brake lever balky or stuck. Check pivot and lubricate (Chapter 7).
- 3 Brake caliper binds. Caused by inadequate lubrication or damage to caliper slider pins (Chapter 7).
- 4 Brake caliper piston seized in bore. Caused by excessive wear, or by a deteriorated piston dust seal, which allows dirt or water to enter piston bore (Chapter 7).
- 5 Brake pad damaged. Pad material separating from backing plate. Usually caused by faulty manufacturing process or from contact with chemicals. Replace pads (Chapter 7).
- 6 Pads improperly installed (Chapter 7).

#### Electrical problems

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#### 53 Battery dead or weak

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- 1 Battery faulty. Caused by sulfated plates which are shorted by sedimentation or by low electrolyte level. Also, broken battery terminal making only occasional contact (Chapter 9).
- 2 Battery cables making poor contact (Chapter 9).
- 3 Load excessive. Caused by addition of high wattage lights or other electrical accessories.
- 4 Ignition switch defective. Switch either grounds internally or fails to shut off system. Replace the switch (Chapter 9).
- 5 Regulator/rectifier defective (Chapter 9).
- 6 Stator coil open or shorted (Chapter 9).
- 7 Wiring faulty. Wiring grounded or connections loose in ignition, charging or lighting circuits (Chapter 9).

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#### 54 Battery overcharged

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- 1 Regulator/rectifier defective. Overcharging is noticed when battery gets excessively warm or "boils" over (Chapter 9).
- 2 Battery defective. Replace battery with a new one (Chapter 9).
- 3 Battery amperage too low, wrong type or size. Install manufacturer's specified amp-hour battery to handle charging load (Chapter 9).