

SERVICING INFORMATION

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TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	Compression too low <ol style="list-style-type: none"> 1. Valve clearance out of adjustment. 2. Worn valve guides or poor seating of valves. 3. Valves mistiming. 4. Piston rings excessively worn. 5. Worn-down cylinder bores. 6. Starter motor cranks but too slowly. 7. Poor seating of spark plugs. Plugs not sparking <ol style="list-style-type: none"> 1. Fouled spark plugs. 2. Wet spark plugs. 3. Defective ignition coil. 4. Open or short in high-tension cords. 5. Defective signal generator or ignitor unit. No fuel reaching the carburetors <ol style="list-style-type: none"> 1. Clogged fuel tank vent hose. 2. Clogged or defective fuel/cock. 3. Defective carburetor float valve. 4. Clogged fuel hose or fuel filter. 	Adjust. Repair, or replace. Adjust. Replace. Replace, or rebore. Consult "electrical complaints" Retighten. Clean. Clean and dry. Replace. Replace. Replace. Clean or replace. Clean or replace. Replace. Clean or replace.
Engine stalls easily.	<ol style="list-style-type: none"> 1. Fouled spark plugs. 2. Defective signal generator or ignitor unit. 3. Clogged fuel hose. 4. Clogged jets in carburetors. 5. Valve clearance out of adjustment. 	Clean. Replace. Clean. Clean. Adjust.
Noisy engine.	Excessive valve chatter <ol style="list-style-type: none"> 1. Valve clearance too large. 2. Weakened or broken valve springs. 3. Worn down rocker arm or rocker arm shaft. 4. Camshaft journal worn and burnt. Noise appears to come from piston <ol style="list-style-type: none"> 1. Pistons or cylinders worn down. 2. Combustion chambers fouled with carbon. 3. Piston pins or piston pin bore worn. 4. Piston rings or ring grooves worn. Noise seems to come from timing chain <ol style="list-style-type: none"> 1. Stretched chain. 2. Worn sprockets. 3. Tension adjuster not working. Noise seems to come from clutch <ol style="list-style-type: none"> 1. Worn splines of countershaft or hub. 2. Worn teeth of clutch plates. 3. Distorted clutch plates, driven and drive. 4. Worn clutch release bearing. 5. Clutch dampers weakened. 	Adjust. Replace. Replace. Replace. Replace. Clean. Replace. Replace. Replace. Replace. Repair, or replace. Replace. Replace. Replace. Replace. Replace the primary driven gear.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	<p>Noise seems to come from crankshaft</p> <ol style="list-style-type: none"> 1. Rattling bearings due to wear. 2. Big-end bearings worn and burnt. 3. Journal bearings worn and burnt. 4. Thrust clearance too large. <p>Noise seems to come from transmission</p> <ol style="list-style-type: none"> 1. Gears worn or rubbing. 2. Badly worn splines. 3. Primary gears worn or rubbing. 4. Badly worn bearings. <p>Noise seems to come from water pump</p> <ol style="list-style-type: none"> 1. Too much play on pump shaft bearing. 2. Worn or damaged mechanical seal. 3. Impeller touches pump case. 	<p>Replace. Replace. Replace. Replace thrust bearing.</p> <p>Replace. Replace. Replace. Replace.</p> <p>Replace. Replace. Replace.</p>
Slipping clutch.	<ol style="list-style-type: none"> 1. Clutch control out of adjustment or loss of play. 2. Weakened clutch springs. 3. Worn or distorted pressure plate. 4. Distorted clutch plates, driven and drive. 	<p>Adjust. Replace. Replace. Replace.</p>
Dragging clutch.	<ol style="list-style-type: none"> 1. Clutch control out of adjustment or too much play. 2. Some clutch springs weakened while others are not. 3. Distorted pressure plate or clutch plate. 	<p>Adjust. Replace. Replace.</p>
Transmission will not shift.	<ol style="list-style-type: none"> 1. Broken gearshift cam. 2. Distorted gearshift forks. 3. Worn gearshift pawl. 	<p>Replace. Replace. Replace.</p>
Transmission will not shift back.	<ol style="list-style-type: none"> 1. Broken return spring on shift shaft. 2. Shift shaft is rubbing or sticky. 3. Distorted or worn gearshift forks. 	<p>Replace. Repair. Replace.</p>
Transmission jumps out of gear.	<ol style="list-style-type: none"> 1. Worn shifting gears on driveshaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper spring on gearshift stopper. 4. Worn gearshift pawl. 	<p>Replace. Replace. Replace. Replace.</p>
Engine idles poorly.	<ol style="list-style-type: none"> 1. Valve clearance out of adjustment. 2. Poor seating of valves. 3. Defective valve guides. 4. Worn rocker arms or arm shafts. 5. Spark plug gaps too wide. 6. Defective ignition coil. 7. Defective signal generator or ignitor unit. 8. Float-chamber fuel level out of adjustment in carburetors. 9. Clogged jets or imbalance of carburetors. 	<p>Adjust. Replace or repair. Replace. Replace. Adjust or replace. Replace. Replace. Adjust. Clean or adjust.</p>
Engine runs poorly in high speed range.	<ol style="list-style-type: none"> 1. Valve springs weakened. 2. Worn cams or rocker arms. 3. Valve timing out of adjustment. 4. Spark plug gaps too narrow. 5. Ignition not advanced sufficiently due to poorly working timing advance circuit. 6. Defective ignition coil. 7. Defective signal generator or ignitor unit. 8. Float-chamber fuel level too low. 9. Clogged air cleaner element. 10. Clogged fuel hose, resulting in inadequate fuel supply to carburetors. 	<p>Replace. Replace. Adjust. Adjust. Replace ignitor unit.</p> <p>Replace. Replace. Adjust. Clean. Clean, and prime.</p>

8-3 SERVICING INFORMATION

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke.	<ol style="list-style-type: none">1. Too much engine oil in the engine.2. Worn piston rings or cylinders.3. Worn valve guides.4. Cylinder walls scored or scuffed.5. Worn valves stems.6. Defective stem seal.7. Worn oil ring side rails.	<p>Check with level window, drain out excess oil</p> <p>Replace. Replace. Rebore or replace. Replace. Replace. Replace.</p>
Engine lacks power.	<ol style="list-style-type: none">1. Loss of valve clearance.2. Weakened valve springs.3. Valve timing out of adjustment.4. Worn piston rings or cylinders.5. Poor seating of valves.6. Fouled spark plug.7. Spark plug gaps incorrect.8. Clogged jets in carburetors.9. Float-chamber fuel level out of adjustment.10. Clogged air cleaner element.11. Carburetor balancing screw loose.12. Sucking air from intake pipe.13. Too much engine oil.	<p>Adjust. Replace. Adjust. Replace. Repair. Clean or replace. Adjust or replace. Clean. Adjust. Clean. Retighten. Retighten or replace. Drain out excess oil.</p>
Engine overheats.	<ol style="list-style-type: none">1. Heavy carbon deposit on piston crowns.2. Not enough oil in the engine.3. Defective oil pump or clogged oil circuit.4. Fuel level too low in float chambers.5. Sucking air from intake pipes.6. Use incorrect engine oil.7. Defective cooling system.	<p>Clean. Add oil. Replace or clean. Adjust. Retighten or replace. Change. See radiator section.</p>

RADIATOR

Complaint	Symptom and possible causes	Remedy
Engine overheats.	<ol style="list-style-type: none">1. Not enough cooling water.2. Radiator core is clogged with dirt or trashes.3. Erratic thermostat, stuck in closed position.4. Faulty cooling fan.5. Defective thermo-switch.6. Clogged water passage.7. Air trapped in the cooling circuit.8. Defective water pump.9. Use incorrect coolant.	<p>Add coolant. Clean. Replace. Repair or replace. Replace. Clean. Bleed out air. Replace. Replace.</p>
Engine overcools.	<ol style="list-style-type: none">1. Erratic thermostat, stuck in full-open position.2. Defective thermo-switch.3. Extremely cold weather.	<p>Replace. Replace. Put on the radiator cover.</p>

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	<ol style="list-style-type: none"> 1. Starter jet is clogged. 2. Starter pipe is clogged. 3. Air leaking from a joint between starter body and carburetor. 4. Air leaking from carburetor's joint or vacuum gauge joint. 5. Starter plunger is not operating properly. 	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust. Check and adjust.
Idling or low-speed trouble.	<ol style="list-style-type: none"> 1. Pilot jet, pilot air jet are clogged or loose. 2. Air leaking from carburetor's joint, vacuum gauge joint, or starter. 3. Pilot outlet or bypass is clogged. 4. Starter plunger is not fully closed. 	Check and clean. Check and adjust. Check and clean. Check and adjust.
Medium-or high speed trouble.	<ol style="list-style-type: none"> 1. Main jet or main air jet is clogged. 2. Needle jet is clogged. 3. Throttle valve is not operating properly. 4. Fuel filter is clogged. 	Check and clean. Check and clean. Check throttle valve for operation. Check and clean.
Overflow and fuel level fluctuations.	<ol style="list-style-type: none"> 1. Needle valve is worn or damaged. 2. Spring in needle valve is broken. 3. Float is not working properly. 4. Foreign matter has adhered to needle valve. 5. Fuel level is too high or low. 	Replace. Replace. Check and adjust. Clean. Adjust float height.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> 1. Defective ignition coil. 2. Defective spark plugs. 3. Defective signal generator or ignitor unit. 	Replace. Replace. Replace.
Spark plugs soon become fouled with carbon.	<ol style="list-style-type: none"> 1. Mixture too rich. 2. Idling speed set to high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold. 	Adjust carburetors. Adjust carburetors. Change. Clean. Replace with hot type plugs.
Spark plugs become fouled too soon.	<ol style="list-style-type: none"> 1. Worn piston rings. 2. Piston or cylinders worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal. 	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> 1. Spark plugs too hot. 2. The engine overheats. 3. Spark plugs loose. 4. Mixture too lean. 	Replace with cold type plugs. Tune up. Retighten. Adjust carburetors.
Generator does not charge.	<ol style="list-style-type: none"> 1. Open or short lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or punctured regulator/rectifier. 	Repair or replace or retighten. Replace. Replace.
Generator does charge, but charging rate is below the specification.	<ol style="list-style-type: none"> 1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective regulator/rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery. 	Repair, or retighten. Replace. Replace. Add distilled water to the upper level. Replace the battery.
Generator overcharges.	<ol style="list-style-type: none"> 1. Internal short-circuit in the battery. 2. Resistor element in the regulator/rectifier damaged or defective. 3. Regulator/rectifier poorly grounded. 	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging.	<ol style="list-style-type: none"> 1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator/rectifier. 	Repair, or replace. Replace. Replace.
Starter button is not effective.	<ol style="list-style-type: none"> 1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay/starter interlock switch. 	Repair, or replace. Replace. Repair, or replace. Replace.

BATTERY

Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	<ol style="list-style-type: none"> 1. Battery case is cracked. 2. Battery has been left in a run-down condition for a long time. 	<p>Replace the battery.</p> <p>Replace the battery.</p>
Battery runs down quickly.	<ol style="list-style-type: none"> 1. The charging system is not correct. 2. Cell plates have lost much of their active material as a result of overcharging. 3. A short-circuit condition exists within the battery. 4. Battery voltage is too low. 5. Battery is too old. 	<p>Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation.</p> <p>Replace the battery, and correct the charging system.</p> <p>Replace the battery.</p> <p>Recharge the battery fully.</p> <p>Replace the battery.</p>
Battery "sulfation".	<ol style="list-style-type: none"> 1. Charging rate too low or too high. (When not in use batteries should be recharged at least once a month to avoid sulfation.) 2. The battery left unused for too long in cold climate. 	<p>Replace the battery.</p> <p>Replace the battery, if badly sulfated.</p>
Battery discharges too rapidly.	Dirty container top and sides.	Clean.

CHASSIS

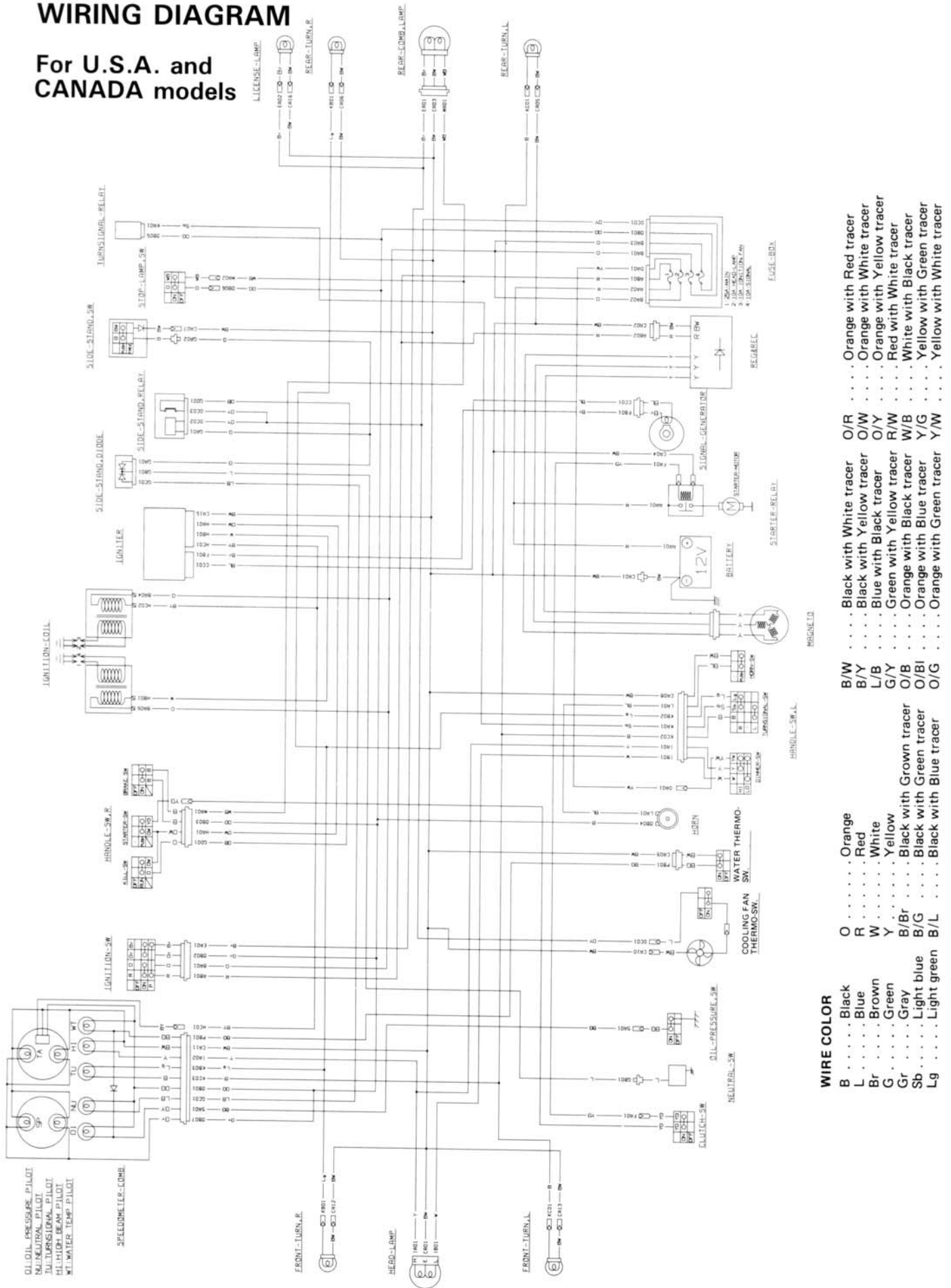
Complaint	Symptom and possible causes	Remedy
Heavy steering.	<ol style="list-style-type: none"> 1. Steering stem nut overtightened. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 	Adjust. Replace. Replace. Adjust.
Wobbly handlebars.	<ol style="list-style-type: none"> 1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle or crooked tire. 	Replace. Repair, or replace. Replace.
Wobbly front wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn front wheel bearings. 3. Defective or incorrect tire. 4. Loose axle. 5. Incorrect front fork oil. 	Replace. Replace. Replace. Retighten. Adjust.
Front suspension too soft.	<ol style="list-style-type: none"> 1. Weakened springs. 2. Not enough fork oil. 	Replace. Refill.
Front suspension too stiff.	<ol style="list-style-type: none"> 1. Fork oil too viscous. 2. Too much fork oil. 	Replace. Drain excess oil.
Noisy front suspension.	<ol style="list-style-type: none"> 1. Not enough fork oil. 2. Loose bolts on suspension. 	Refill. Reighten.
Wobbly rear wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn rear wheel bearing or swingarm bearings. 3. Defective or incorrect tire. 4. Worn swingarm and rear cushion related bearings. 5. Loose nuts or bolts on rear suspensions. 	Replace. Replace. Replace. Replace. Reighten.
Rear suspension too soft.	<ol style="list-style-type: none"> 1. Weakened shock absorber spring. 2. Rear suspension adjuster improperly set. 3. Oil leakage of shock absorber. 4. Gas leakage of shock absorber. 	Replace. Adjust. Replace. Replace.
Rear suspension too stiff.	<ol style="list-style-type: none"> 1. Rear suspension adjuster improperly set. 2. Shock absorber shaft bent. 3. Swingarm bent. 4. Worn swingarm and rear cushion related bearings. 	Adjust. Replace. Replace. Replace.
Noisy rear suspension.	<ol style="list-style-type: none"> 1. Loose nuts or bolts on rear suspension. 2. Worn swingarm and rear cushion related bearings. 	Retighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Insufficient brake power.	<ol style="list-style-type: none"> 1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion on engaging surface of pads. 4. Worn disc. 5. Air in hydraulic system. 	Repair, or replace. Replace. Clean disc and pads. Replace. Bleed air.
Brake squeaking.	<ol style="list-style-type: none"> 1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loose front-wheel axle or rear-wheel axle. 5. Worn pads. 6. Foreign material in brake fluid. 7. Clogged return port of master cylinder. 	Repair surface with sand-paper. Modify pad fitting, or replace. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever stroke.	<ol style="list-style-type: none"> 1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid. 	Bleed air. Replenish fluid to specified level; bleed air. Replace with correct fluid.
Leakage of brake fluid.	<ol style="list-style-type: none"> 1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup. 	Tighten to specified torque. Replace. Replace piston and/or cup.

WIRING DIAGRAM

For U.S.A. and CANADA models



WIRE COLOR

B . . . Black
L . . . Blue
Br . . . Brown
G . . . Green
Sb . . . Gray
Lg . . . Light blue

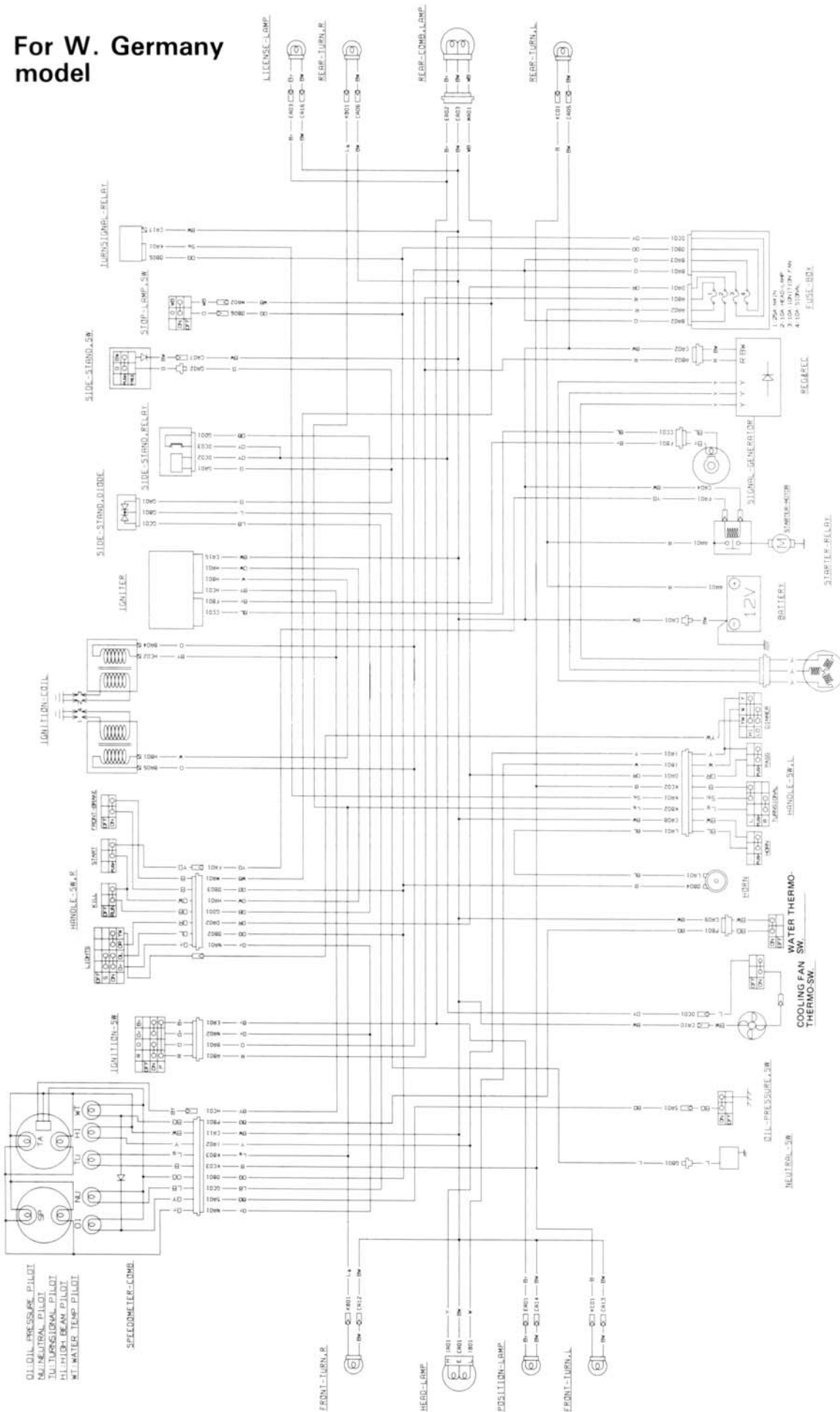
O . . . Orange
R . . . Red
W . . . White
Y . . . Yellow
B/Br . . . Black with Brown
B/G . . . Black with Green
B/L . . . Black with Light blue

B/W . . . Black with White
B/Y . . . Black with Yellow
L/B . . . Blue with Brown
G/Y . . . Green with Yellow
O/B . . . Orange with Brown
O/G . . . Orange with Green

O/R . . . Orange with Red
O/W . . . Orange with White
O/Y . . . Orange with Yellow
R/W . . . Red with White
W/B . . . White with Brown
Y/G . . . Yellow with Green
Y/W . . . Yellow with White

O/R . . . Orange with Red
O/W . . . Orange with White
O/Y . . . Orange with Yellow
R/W . . . Red with White
W/B . . . White with Brown
Y/G . . . Yellow with Green
Y/W . . . Yellow with White

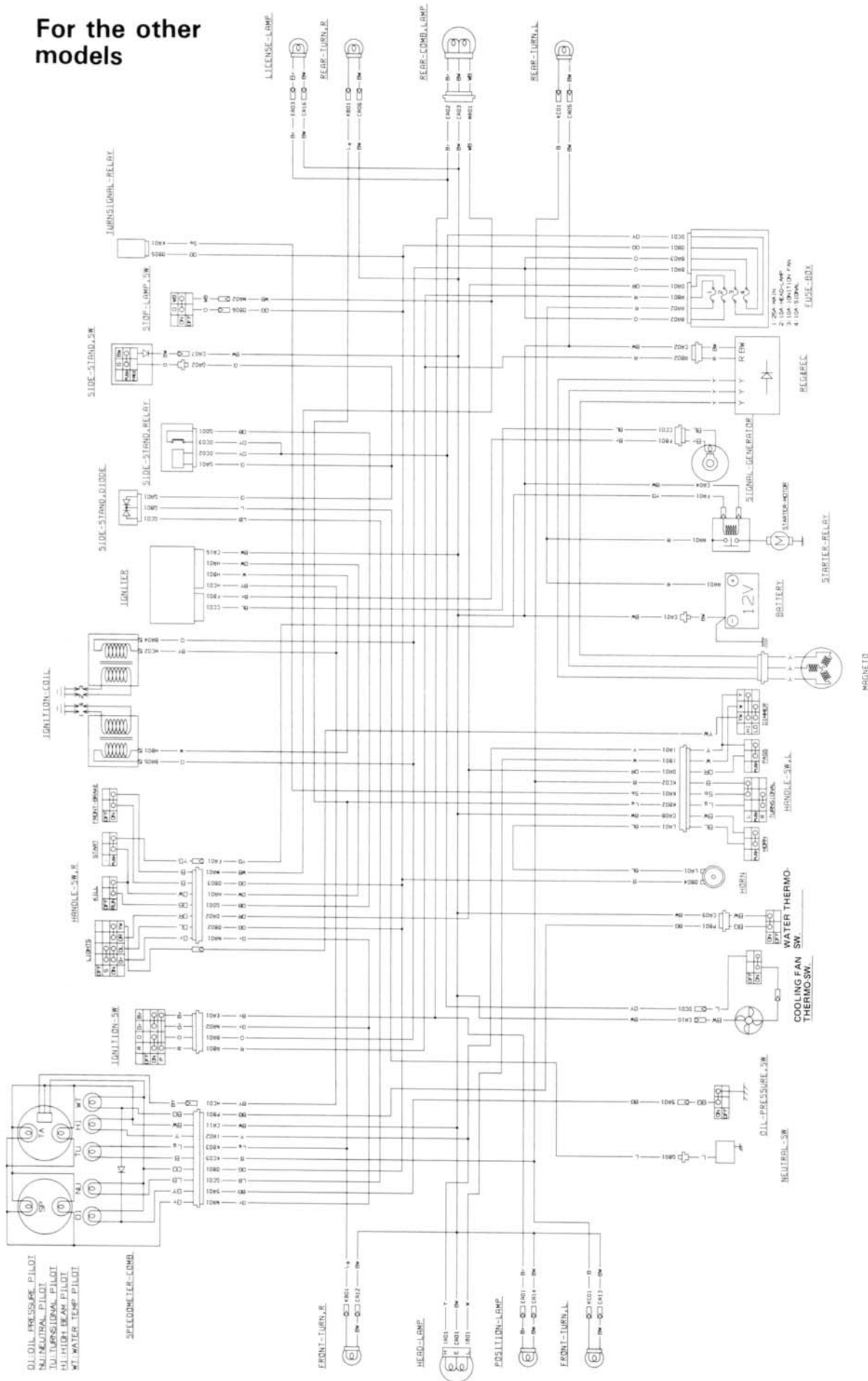
**For W. Germany
model**

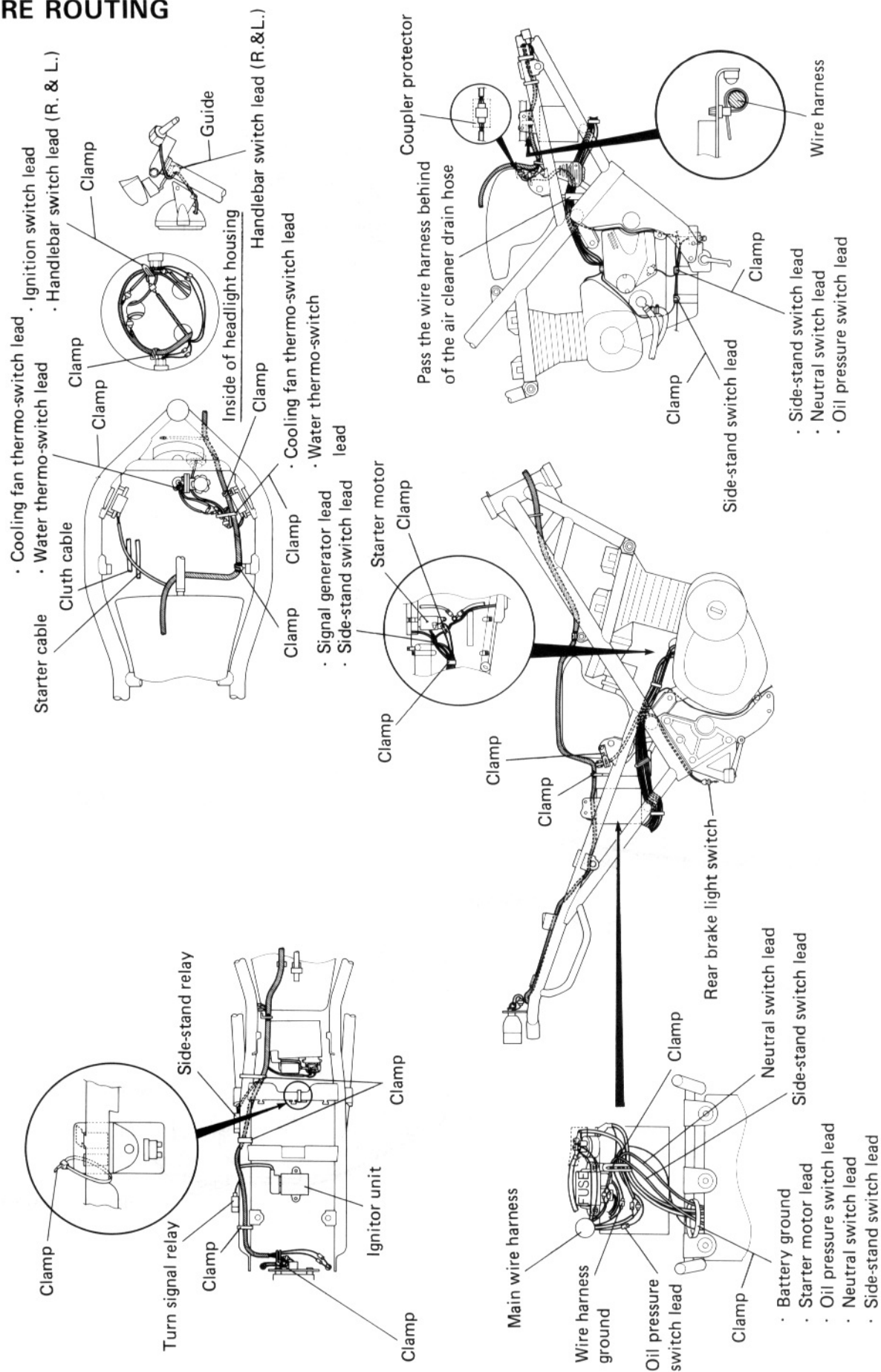


WIRE COLOR

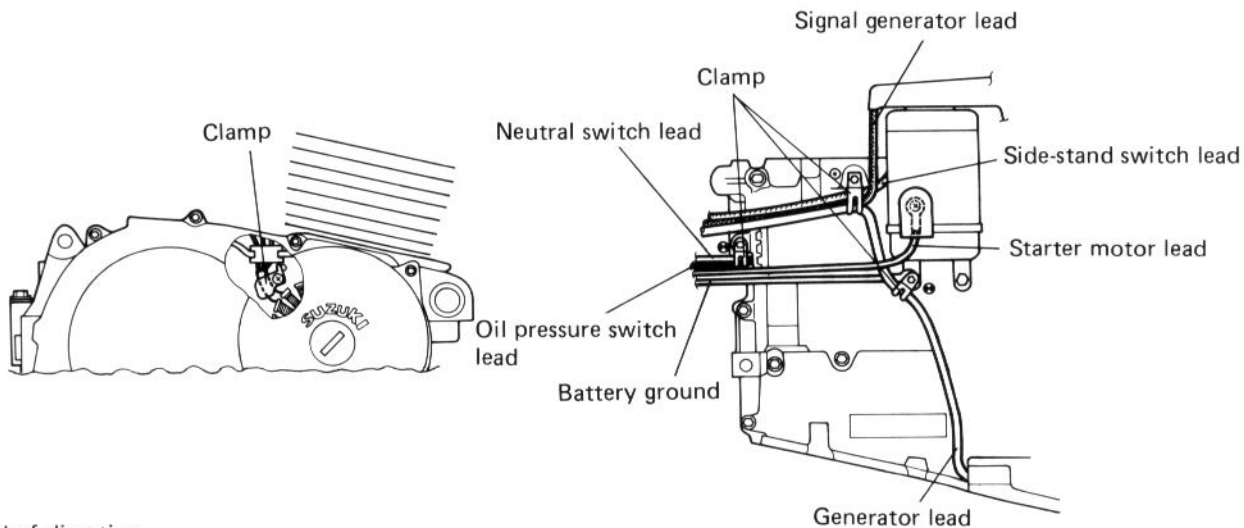
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For the other models

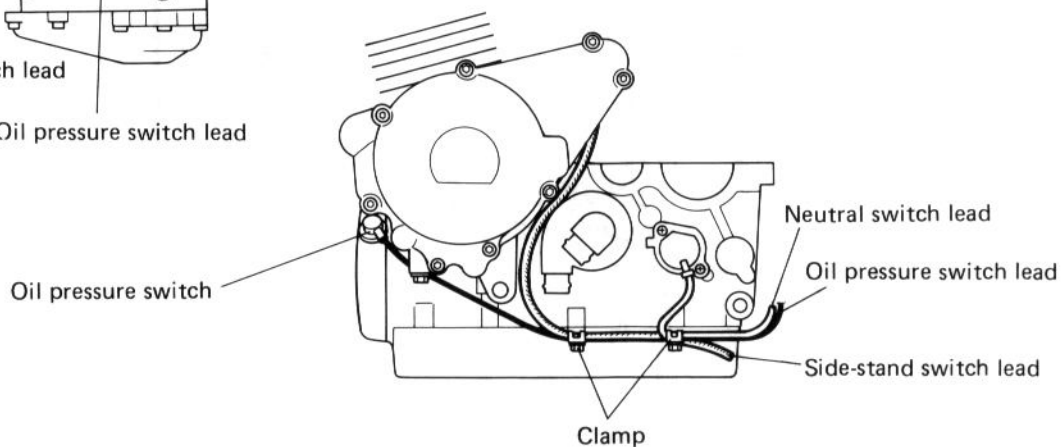
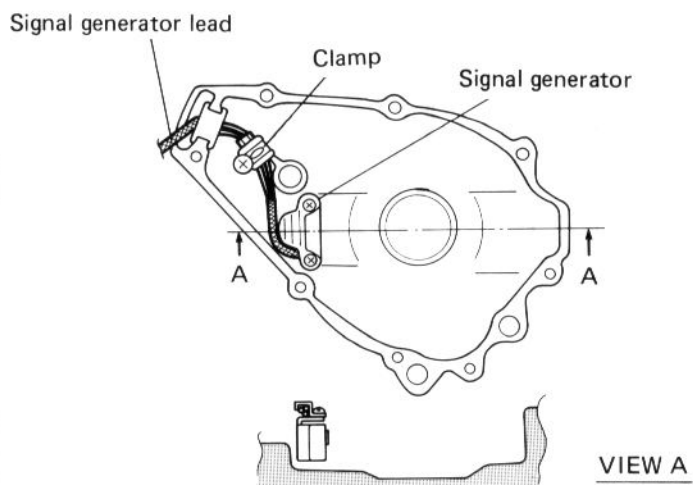
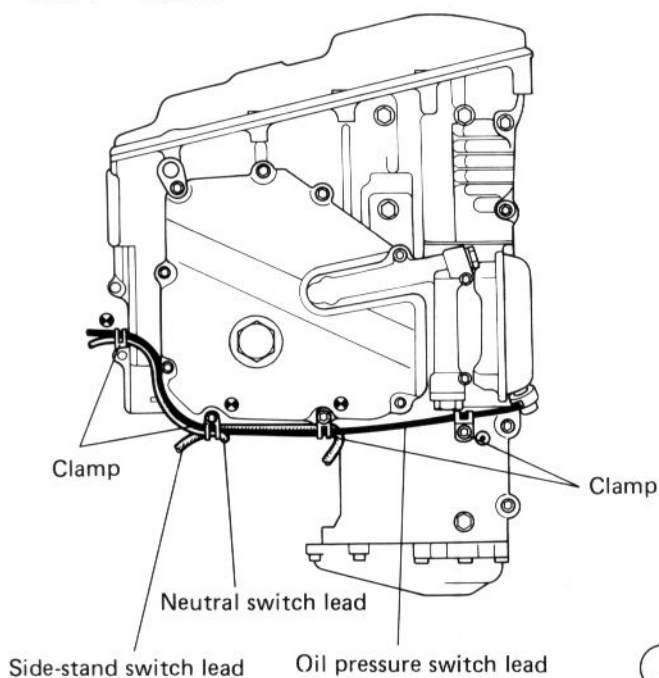
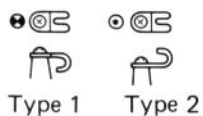




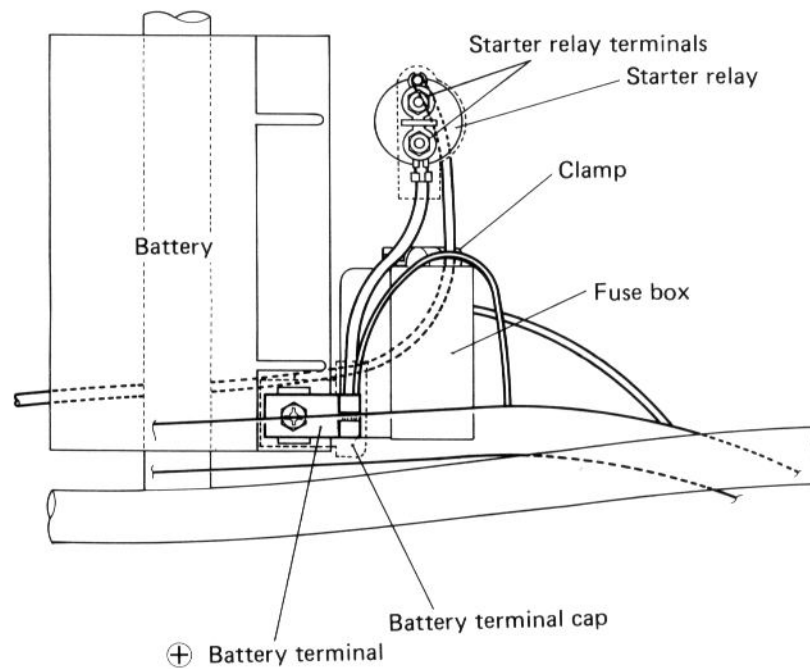
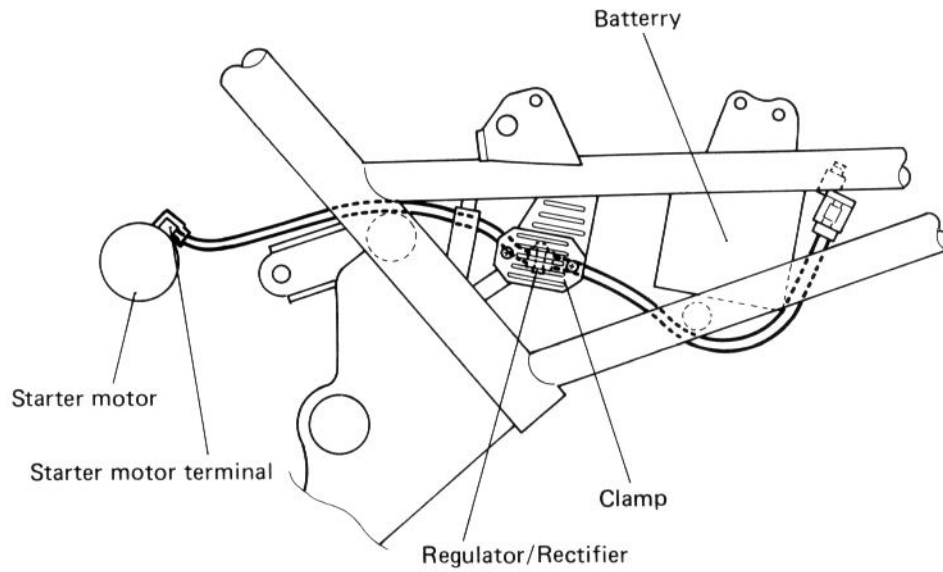
WIRE ROUTING



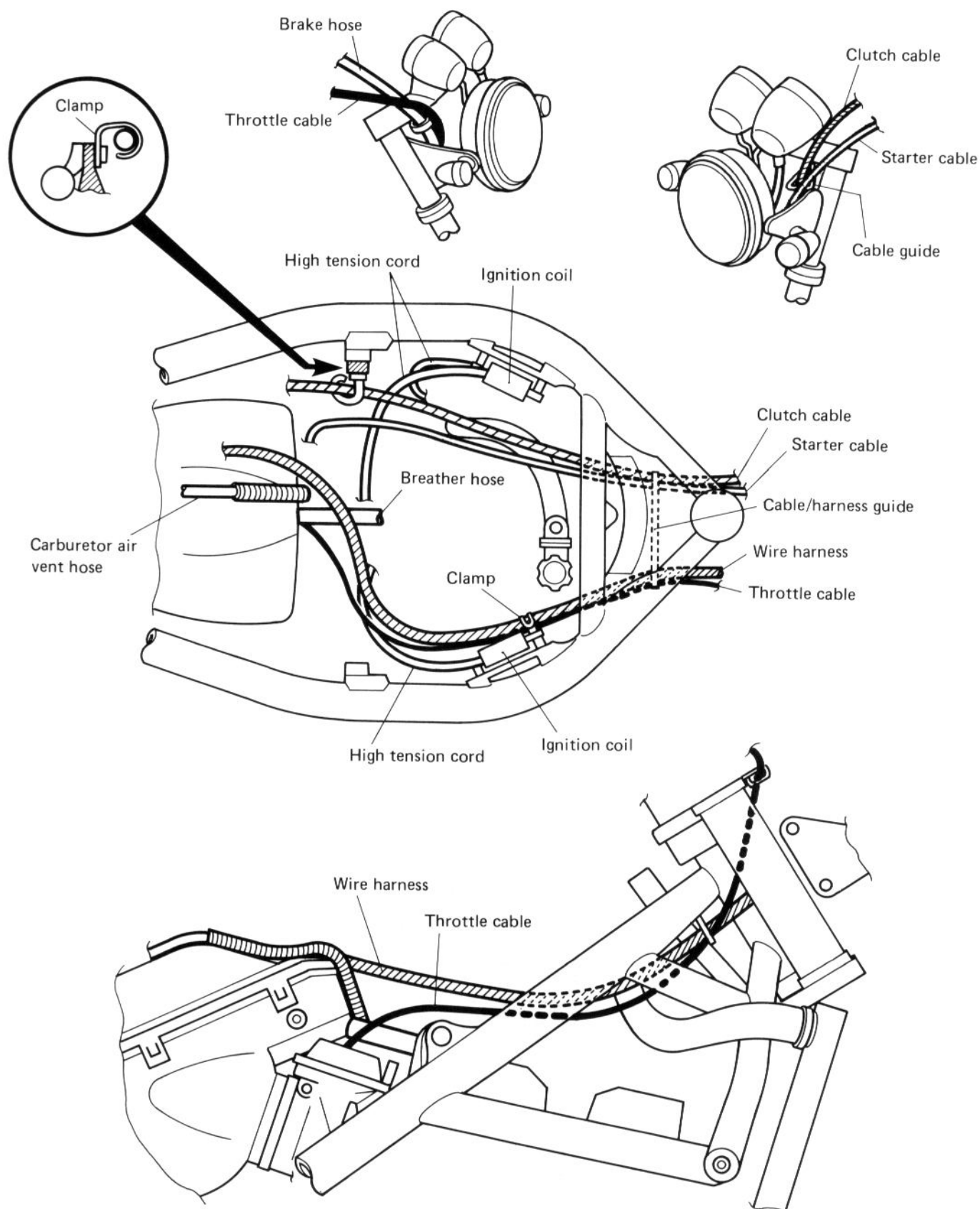
Bend of direction



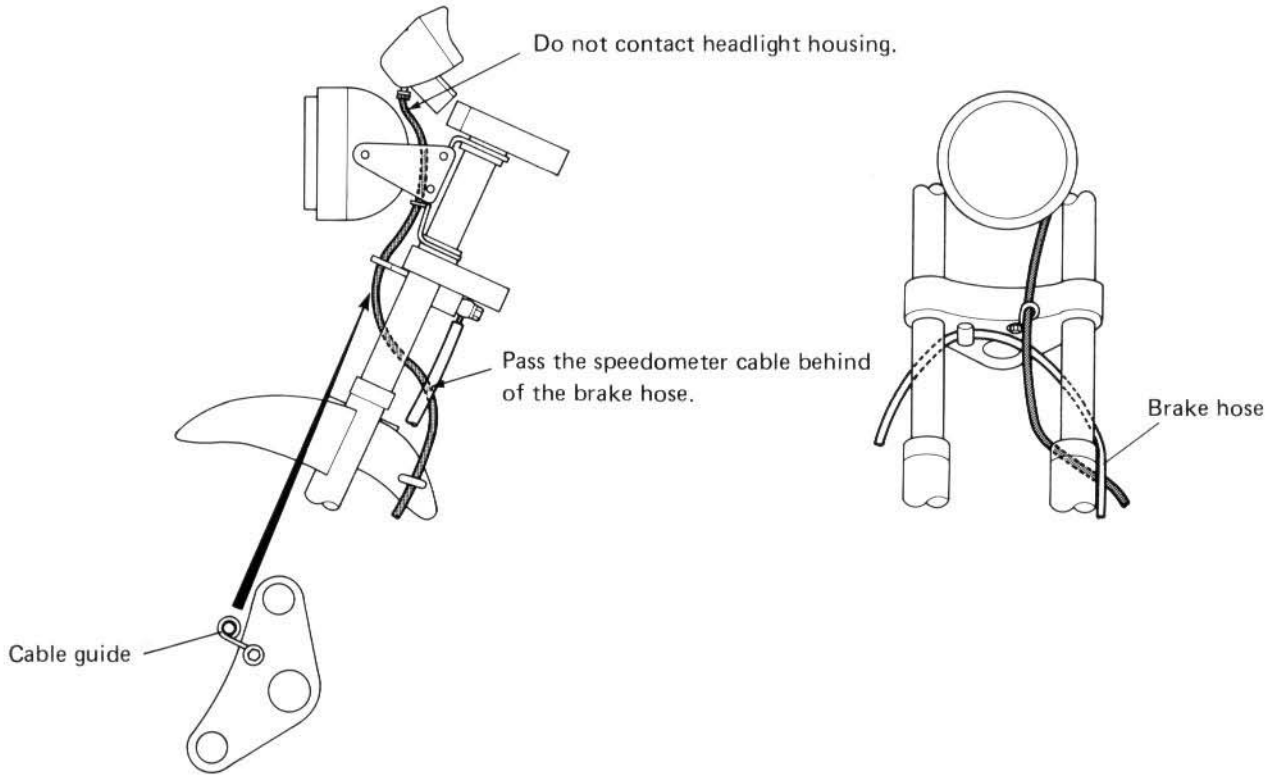
WIRE ROUTING



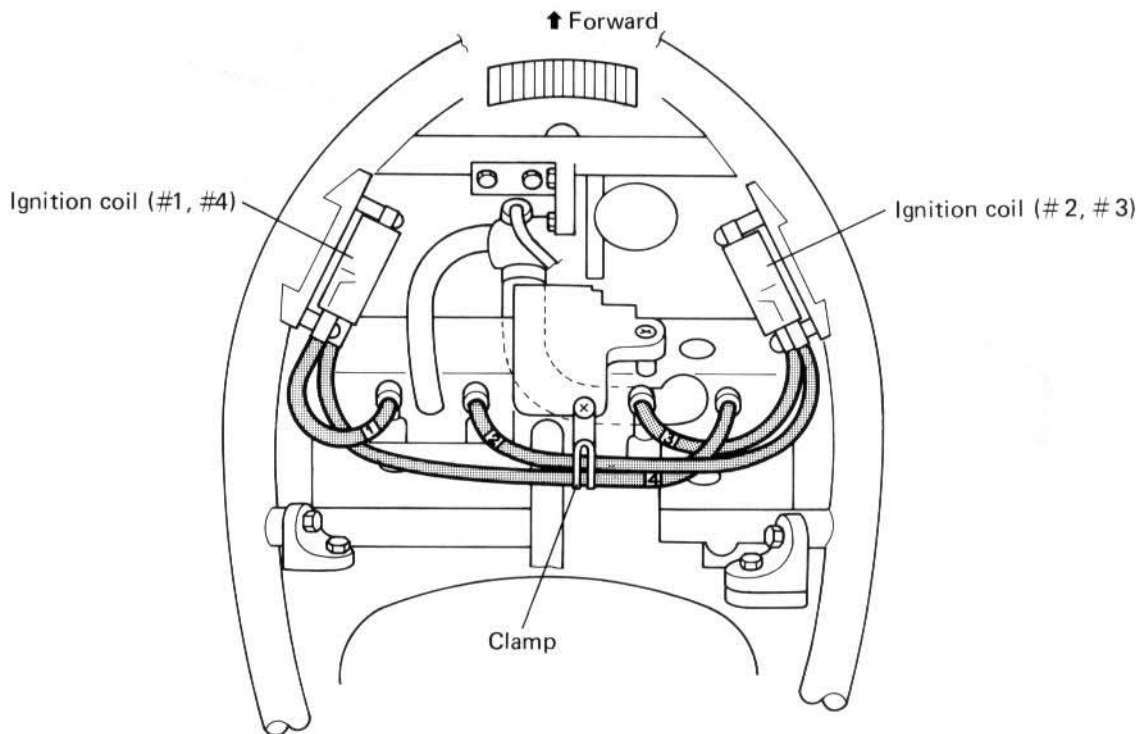
CABLE ROUTING



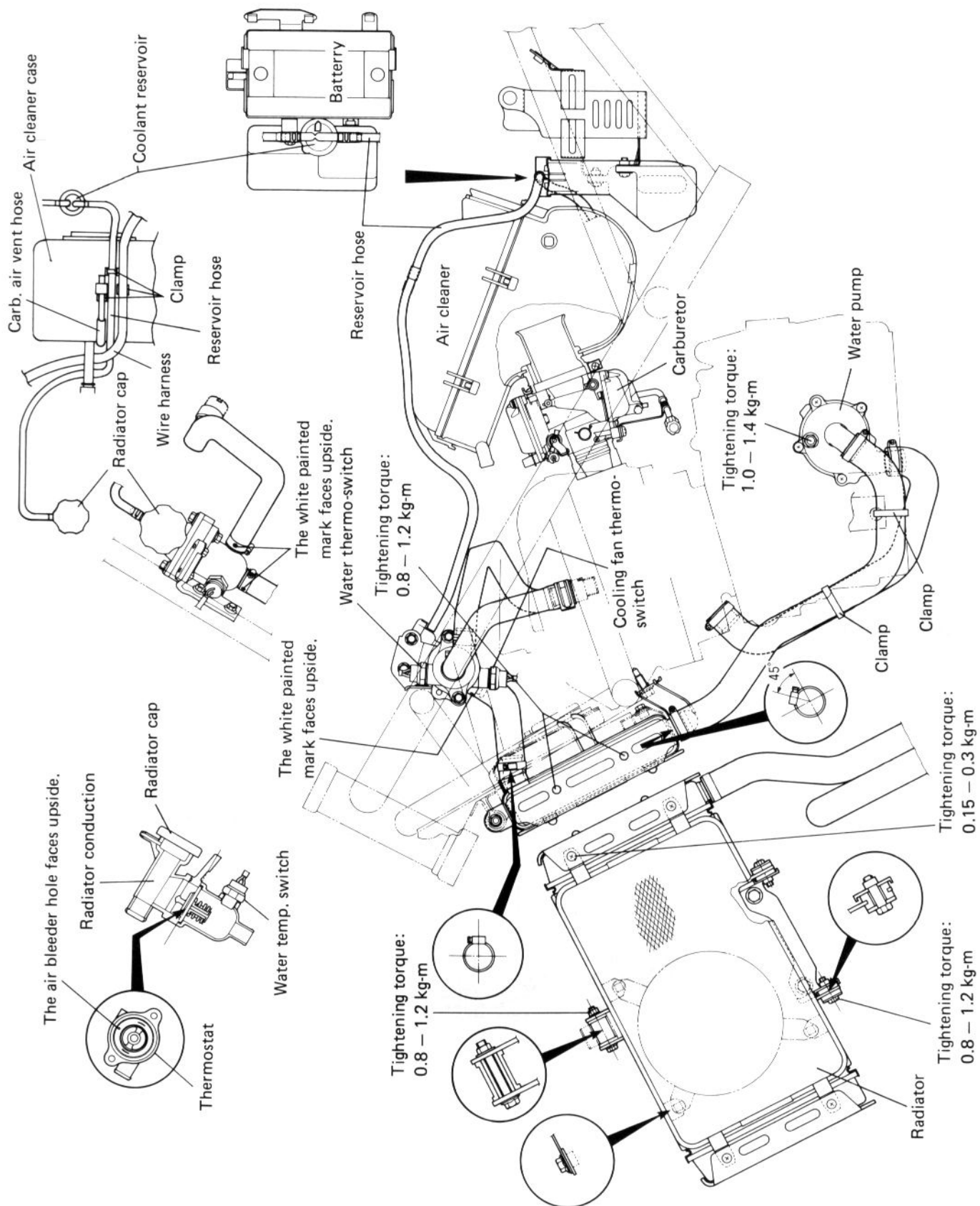
SPEEDOMETER CABLE ROUTING



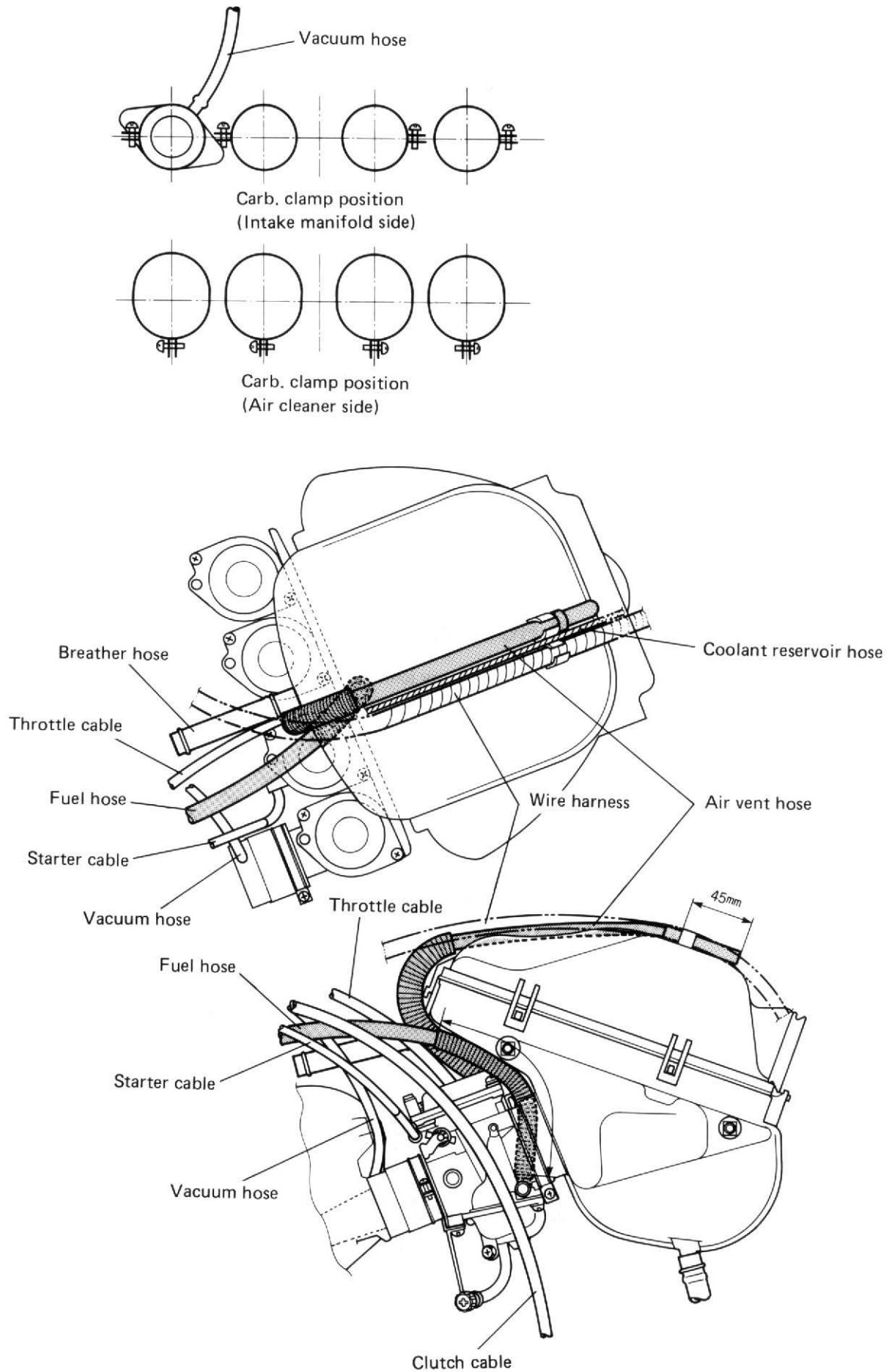
HIGH TENSION CORD ROUTING



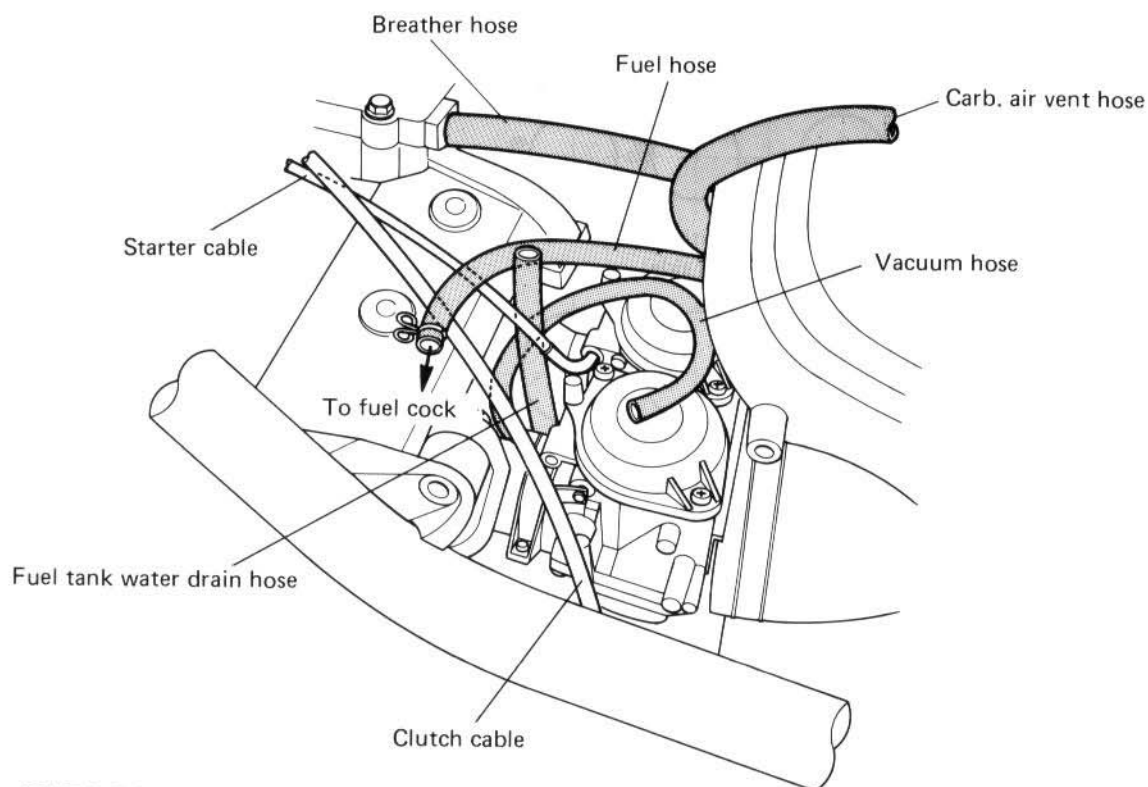
RADIATOR HOSE ROUTING



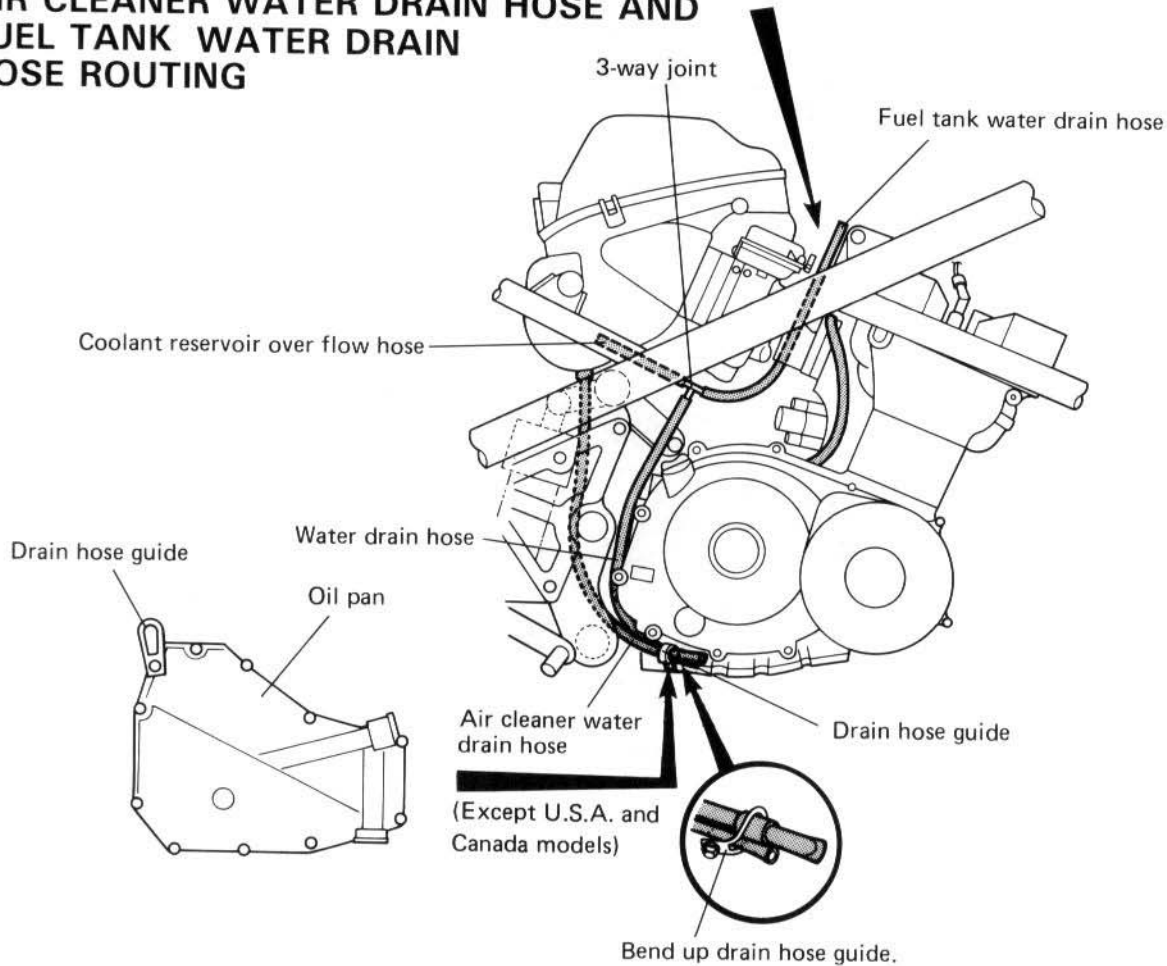
FUEL HOSE, VACUUM HOSE AND AIR VENT HOSE ROUTING



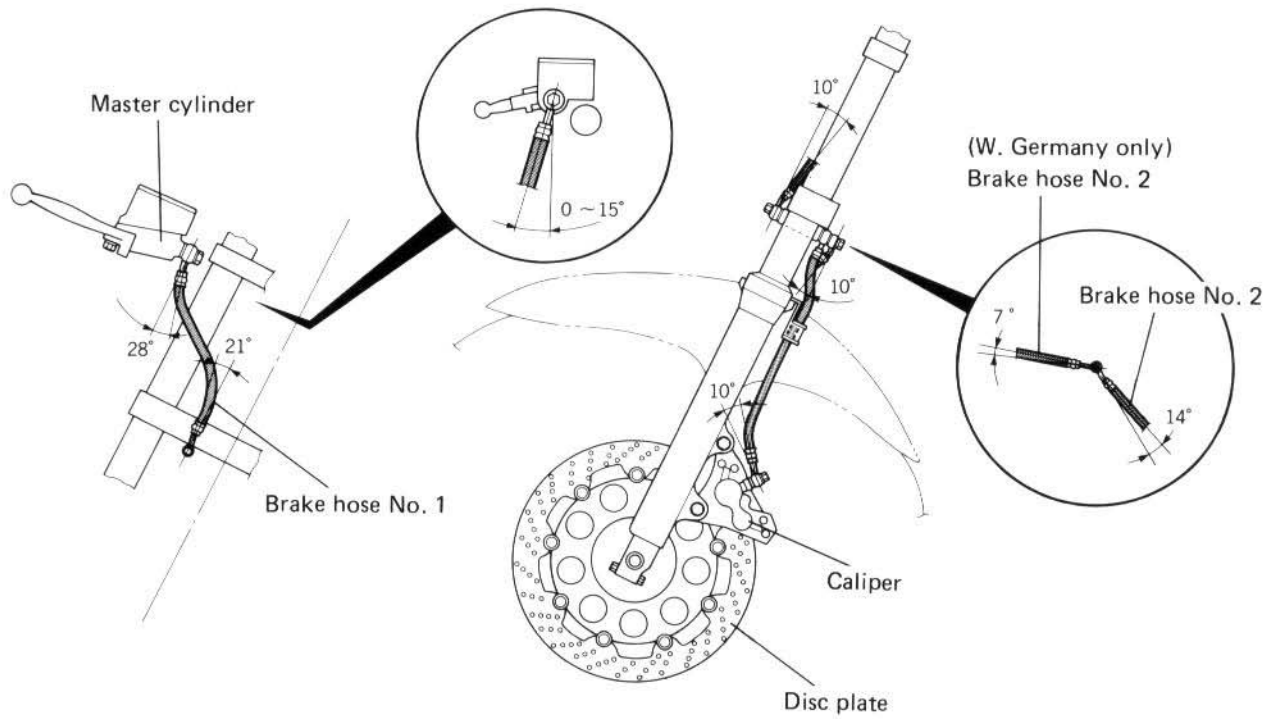
FUEL HOSE AND VACUUM HOSE ROUTING



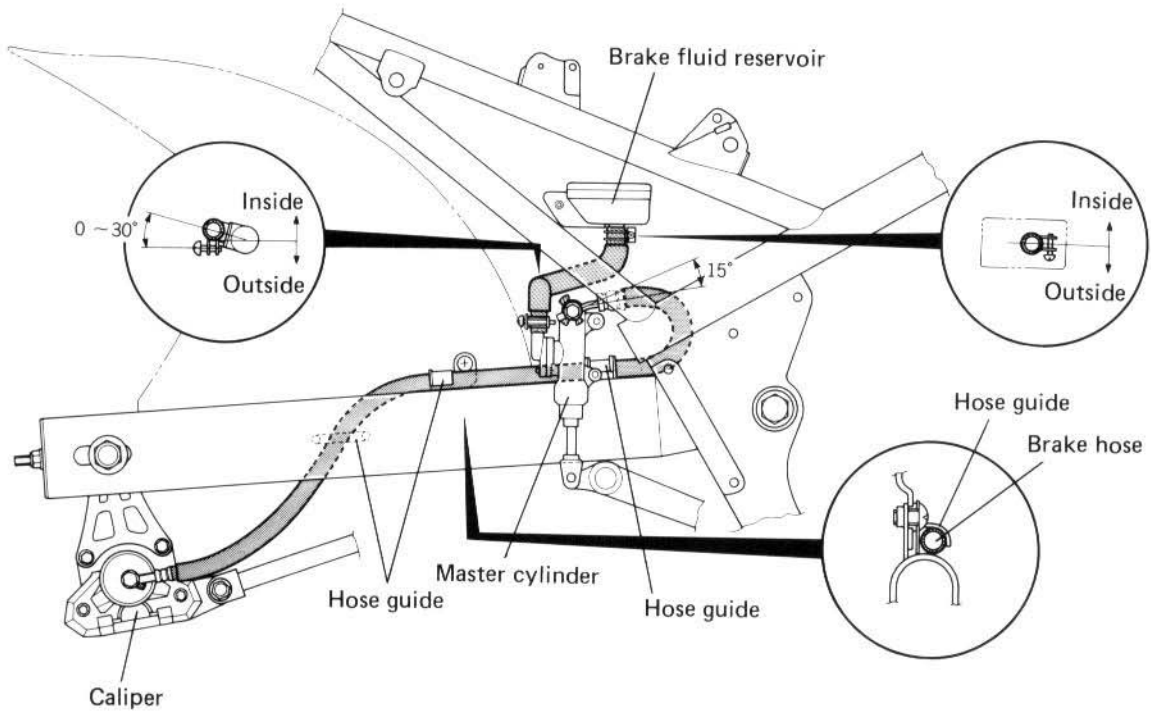
AIR CLEANER WATER DRAIN HOSE AND FUEL TANK WATER DRAIN HOSE ROUTING



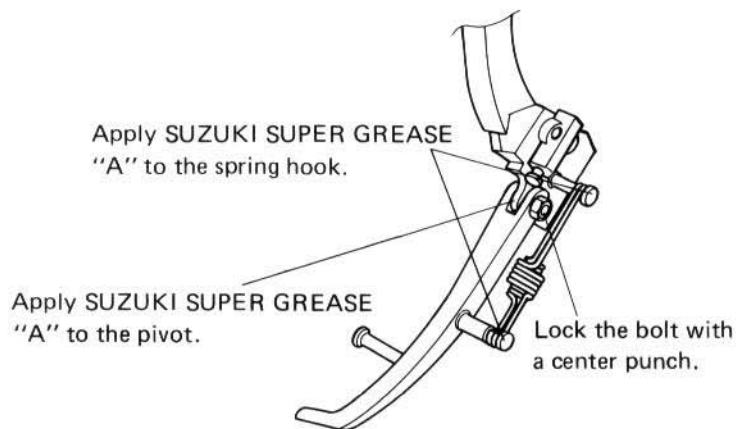
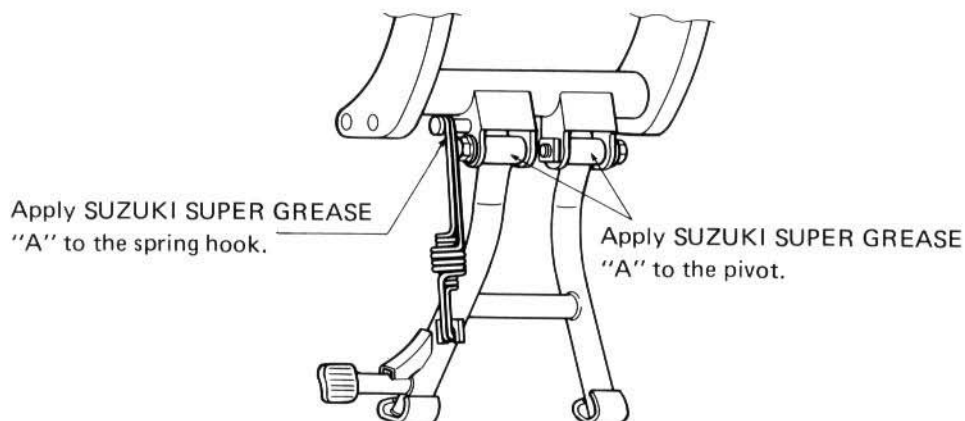
FRONT BRAKE HOSE ROUTING



REAR BRAKE HOSE ROUTING



CENTER STAND SPRING AND SIDE-STAND SPRING






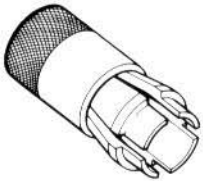


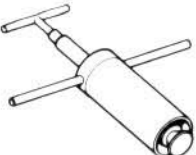



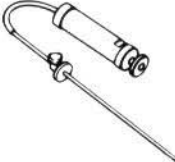
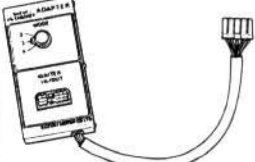
NOTE:

Be sure to bring the long arm side of the spring to top when fitting.

SPECIAL TOOLS

 <p>09900-00401 "L" type hexagon wrench set</p>	 <p>09900-00410 Hexagon wrench set</p>	 <p>09900-06105 Snap ring pliers</p>	 <p>09900-06107 Snap ring pliers</p>	 <p>09900-06108 Snap ring pliers</p>
 <p>09900-09003 Impact driver set</p>	 <p>09900-20102 Vernier calipers (1/20 mm, 200 mm)</p>	 <p>09900-20202 Micrometer (1/100 mm, 25-50 mm)</p>	 <p>09900-20203 Micrometer (1/100 mm, 50-75 mm)</p>	 <p>09900-20205 Micrometer (1/1000 mm, 0-25 mm)</p>
 <p>09900-20508 Cylinder gauge set (1/100 mm, 40-80 mm)</p>	 <p>09900-20602 Dial gauge (1/1000 mm, 1mm)</p>	 <p>09900-20605 Dial calipers (1/100 mm, 10-34 mm)</p>	 <p>09900-20606 Dial gauge (1/100 mm, 10 mm)</p>	 <p>09900-20701 Magnetic stand</p>
 <p>09900-20803 Thickness gauge</p>	 <p>09900-20805 Tire depth gauge</p>	 <p>09900-21304 V-block set (100 mm)</p>	 <p>09900-22301 Plastigauge</p>	 <p>09900-22401 Small bore gauge (10-18 mm)</p>
 <p>09900-25002 Pocket tester</p>	 <p>09900-28106 Electro tester</p>	 <p>09910-34510 Piston pin puller</p>	 <p>09911-73730 "T" type hexagon wrench (5 mm)</p>	 <p>09911-74520 Long socket (12 mm)</p>
 <p>09912-34510 Cylinder disassembler</p>	 <p>09913-13121 Carburetor balancer</p>	 <p>09913-75520 Bearing installer</p>	 <p>09914-24510 T-handle</p>	 <p>09914-25811 "T" type hexagon wrench (6 mm)</p>

 <p>09915-64510 Compression gauge 09915-63310 (Adaptor)</p>	 <p>09915-74510 Oil pressure gauge 09915-77330(Meter)</p>	 <p>09916-14510 Valve lifter</p>	 <p>09916-14910 Valve lifer attachment</p>	 <p>09916-20640 Solid pilot (N-100-4.5)</p>
 <p>09916-21110 Valve seat cutter set</p>	 <p>See page 3-24. Valve seat cutter head 45°, 15° and 60°</p>	 <p>09916-33210 Valve guide reamer (4.5 mm)</p>	 <p>09916-34542 Valve guide reamer handle</p>	 <p>09916-34580 Valve guide reamer (10.8 mm)</p>
 <p>09916-43210 Valve guide remover/ installer</p>	 <p>09916-43220 Attachment</p>	 <p>09916-74521 Piston ring compressor body</p>	 <p>09916-74530 Piston ring compressor band (53 – 65 mm)</p>	 <p>09916-84510 Tweezers</p>
 <p>09917-14920 Valve adjuster driver</p>	 <p>09920-13120 Crankcase separating tool</p>	 <p>09920-53710 Clutch sleeve hub holder</p>	 <p>09923-73210 Bearing puller (17 – 20 mm)</p>	 <p>09924-84510 Bearing installer set</p>
 <p>09924-84521 Bearing installer</p>	 <p>09930-10120 Spark plug socket wrench set</p>	 <p>09930-11910 Torx wrench</p>	 <p>09930-14530 Universal joint</p>	 <p>09930-30102 Sliding shaft</p>
 <p>09930-32420 Generator rotor holder</p>	 <p>09930-34960 Rotor remover</p>	 <p>09931-94430 Ignitor checker (Digital type)</p>	 <p>09940-14911 Steering stem nut wrench</p>	 <p>09940-34520 T-handle (Front fork disassembler)</p>

 09940-34592 Attachment G (Front fork disassembler)	 09940-50113 Front fork oil seal installer	 09940-92710 Spring scale	 09941-34513 Steering outer race installer	 09941-44910 Swingarm bearing remover
 09941-50110 Bearing remover	 09941-74910 Steering bearing installer	 09941-84510 Bearing remover	 09943-74111 Front fork oil level gauge	 09931-94460 Adaptor (Ignitor checker)

NOTE:

When ordering the special tool, please confirm whether it is available or not.

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg·m	lb·ft
Cylinder head cover bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cylinder head oil pipe bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cylinder head nut	25 – 29	2.5 – 2.9	18.0 – 21.0
Cylinder head bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cylinder stud bolt	13 – 16	1.3 – 1.6	9.5 – 11.5
Valve clearance adjuster lock nut	9 – 11	0.9 – 1.1	6.5 – 8.0
Camshaft journal holder bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt	24 – 26	2.4 – 2.6	17.5 – 19.0
Rocker arm shaft set bolt	8 – 10	0.8 – 1.0	6.0 – 7.0
Rocker arm shaft plug	25 – 30	2.5 – 3.0	18.0 – 21.5
Oil hose union bolt (Cylinder head side)	18 – 22	1.8 – 2.2	13.0 – 16.0
Oil hose union bolt (Crankcase side)	20 – 24	2.0 – 2.4	14.5 – 17.5
Cam chain tensioner mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Conrod bearing cap nut	28.5 – 31.5	2.85 – 3.15	20.5 – 23.0
Starter clutch mounting bolt	85 – 95	8.5 – 9.5	61.5 – 68.5
Generator rotor bolt	110 – 130	11.0 – 13.0	79.5 – 94.0
Crankcase bolt (6 mm)	9 – 13	0.9 – 1.3	6.5 – 9.5
(8 mm)	28 – 32	2.8 – 3.2	20.0 – 23.0
Oil pump mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil drain plug	20 – 25	2.0 – 2.5	14.5 – 18.0
Oil pan bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Oil filter cap nut	12 – 16	1.2 – 1.6	8.5 – 11.5
Oil pressure switch	12 – 15	1.2 – 1.5	8.5 – 11.0
Oil pressure regulator	25 – 30	2.5 – 3.0	18.0 – 21.5
Clutch sleeve hub nut	50 – 70	5.0 – 7.0	36.0 – 50.5
Clutch spring set bolt	7 – 11	0.7 – 1.1	5.0 – 8.0
Exhaust pipe bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Muffler mounting bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Engine mount- (L: 55 mm)	22 – 30	2.2 – 3.0	16.0 – 21.5
ing bolt (L: 145 mm, 135 mm and 70 mm)	60 – 72	6.0 – 7.2	43.5 – 52.5

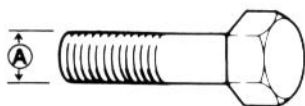
CHASSIS

ITEM		N·m	kg-m	lb-ft
Steering stem head nut		50 – 80	5.0 – 8.0	36.0 – 58.0
Front fork upper clamp bolt		40 – 60	4.0 – 6.0	29.0 – 43.5
Front fork lower clamp bolt		28 – 44	2.8 – 4.4	20.0 – 32.0
Front axle shaft		50 – 80	5.0 – 8.0	36.0 – 58.0
Front axle pinch bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
Handlebar clamp bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
Front footrest bracket mounting bolt		18 – 28	1.8 – 2.9	13.0 – 20.0
Front brake master cylinder mounting bolt		5 – 8	0.5 – 0.8	3.5 – 6.0
Front brake caliper mounting bolt		30 – 48	3.0 – 4.8	21.5 – 35.0
Front brake caliper housing bolt		30 – 36	3.0 – 3.6	21.5 – 26.0
Brake hose union bolt		15 – 20	1.5 – 2.0	11.0 – 14.5
Air bleeder valve		6 – 9	0.6 – 0.9	4.5 – 6.5
Front and rear disc bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
Swingarm pivot nut		85 – 115	8.5 – 11.5	61.5 – 83.0
Rear shock absorber upper/lower mounting nut		48 – 72	4.8 – 7.2	34.5 – 52.0
Rear cushion lever mounting nut		84 – 120	8.4 – 12.0	60.5 – 87.0
Rear cushion lever rod mounting nut (Upper & Lower)		84 – 120	8.4 – 12.0	60.5 – 87.0
Rear brake caliper mounting bolt		20 – 31	2.0 – 3.1	14.5 – 22.5
Rear brake caliper housing bolt		30 – 36	3.0 – 3.6	21.5 – 26.0
Torque link nut (Front & Rear)	Normal nut with cotter pin	22 – 35	2.2 – 3.5	16.0 – 25.5
	Self-lock nut	25 – 39	2.5 – 3.9	18.0 – 28.0
Rear brake pedal boss nut		35 – 55	3.5 – 5.5	25.5 – 40.0
Rear brake push rod lock nut		15 – 20	1.5 – 2.0	11.0 – 14.5
Rear brake master cylinder mounting bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
Rear axle nut	Normal nut with cotter pin	50 – 80	5.0 – 8.0	36.0 – 58.0
	Self-lock nut	55 – 88	5.5 – 8.8	40.0 – 63.5
Rear sprocket nut		40 – 60	4.0 – 6.0	29.0 – 43.5

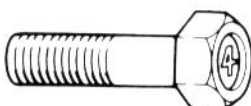
TIGHTENING TORQUE CHART

For other bolts and nuts not listed previously, refer to this chart:

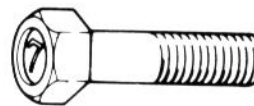
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg·m	lb·ft	N·m	kg·m	lb·ft
4	1.0 – 2.0	0.1 – 0.2	0.7 – 1.5	1.5 – 3.0	0.15 – 0.3	1.0 – 2.0
5	2.0 – 4.0	0.2 – 0.4	1.5 – 3.0	3.0 – 6.0	0.3 – 0.6	2.0 – 4.5
6	4.0 – 7.0	0.4 – 0.7	3.0 – 5.0	8.0 – 12.0	0.8 – 1.2	6.0 – 8.5
8	10.0 – 16.0	1.0 – 1.6	7.0 – 11.5	18.0 – 28.0	1.8 – 2.8	13.0 – 20.0
10	22.0 – 35.0	2.2 – 3.5	16.0 – 25.5	40.0 – 60.0	4.0 – 6.0	29.0 – 43.5
12	35.0 – 55.0	3.5 – 5.5	25.5 – 40.0	70.0 – 100.0	7.0 – 10.0	50.5 – 72.5
14	50.0 – 80.0	5.0 – 8.0	36.0 – 58.0	110.0 – 160.0	11.0 – 16.0	79.5 – 115.5
16	80.0 – 130.0	8.0 – 13.0	58.0 – 94.0	170.0 – 250.0	17.0 – 25.0	123.0 – 181.0
18	130.0 – 190.0	13.0 – 19.0	94.0 – 137.5	200.0 – 280.0	20.0 – 28.0	144.5 – 202.5



Conventional bolt



"4" marked bolt



"7" marked bolt

SERVICE DATA**VALVE + GUIDE**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Valve diam.		IN.	22.4 (0.88)	—
		EX.	20.0 (0.79)	—
Valve lift	E-33	IN.	6.5 (0.26)	—
	The others		7.6 (0.30)	—
		EX.	7.0 (0.28)	—
Valve clearance (when cold)		IN.	0.10–0.15 (0.004–0.006)	—
		EX.	0.15–0.20 (0.006–0.008)	—
Valve guide to valve stem clearance		IN.	0.025–0.052 (0.0010–0.0020)	—
		EX.	0.040–0.067 (0.0016–0.0026)	—
Valve stem deflection		IN. & EX.	—	0.35 (0.014)
Valve guide I.D.		IN. & EX.	4.500–4.512 (0.1772–0.1776)	—
Valve stem O.D.		IN.	4.460–4.475 (0.1756–0.1762)	—
		EX.	4.445–4.460 (0.1750–0.1756)	—
Valve stem runout		IN. & EX.	—	0.05 (0.002)
Valve head thickness		IN. & EX.	—	0.5 (0.02)
Valve stem end length		IN. & EX.	—	2.7 (0.11)
Valve seat width		IN. & EX.	0.7–0.9 (0.03–0.04)	—
Valve head radial runout		IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)		INNER	—	32.6 (1.28)
		OUTER	—	37.3 (1.47)
Valve spring tension (IN. & EX.)		INNER	6.5–7.5 kg (14.3–16.5 lbs) at length 28.6 mm (1.13 in)	—
		OUTER	8.8–10.2 kg (19.4–22.5 lbs) at length 31.6 mm (1.24 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-33	IN.	32.530–32.570 (1.2807–1.2823)	32.230 (1.2689)
	The others		33.134–33.174 (1.3045–1.3061)	32.840 (1.2929)
		EX.	32.839–32.879 (1.2929–1.2944)	32.540 (1.2811)
Camshaft journal oil clearance		IN. & EX.	0.032–0.066 (0.0013–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.		IN. & EX.	22.012–22.025 (0.8666–0.8671)	—
Camshaft journal O.D.		IN. & EX.	21.959–21.980 (0.8645–0.8654)	—
Camshaft runout		IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length			—	143 (5.63)
Cam chain pin (at arrow "3")			20 th pin	—
Rocker arm I.D.		IN. & EX.	12.000–12.018 (0.4724–0.4731)	—
Rocker arm shaft O.D.		IN. & EX.	11.973–11.984 (0.4714–0.4718)	—
Cylinder head distortion			—	0.20 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM		STANDARD		LIMIT
Compression pressure			1000–1450 kPa (10–14.5 kg/cm ²) 142–206 psi	800 kPa (8 kg/cm ²) 114 psi
Compression pressure difference			—	200 kPa (2 kg/cm ²) 28 psi
Piston to cylinder clearance			0.050–0.060 (0.0020–0.0024)	0.120 (0.0047)
Cylinder bore			56.000–56.015 (2.2047–2.2053)	56.080 (2.2079)
Piston diam.			55.945–55.960 (2.2026–2.2031) Measure at 10 mm (0.4 in) from the skirt end.	55.880 (2.2000)
Cylinder distortion			—	0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 5.6 (0.22)	4.5 (0.18)
	2nd	RN	Approx. 5.7 (0.22)	4.6 (0.18)
Piston ring end gap	1st		0.15–0.30 (0.006–0.012)	0.5 (0.02)
	2nd		0.10–0.30 (0.004–0.012)	0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	———	0.180 (0.0071)
	2nd	———	0.150 (0.0059)
Piston ring groove width	1st	0.81–0.83 (0.032–0.033)	———
	2nd	0.81–0.83 (0.032–0.033)	———
	Oil	1.51–1.53 (0.059–0.060)	———
Piston ring thickness	1st	0.77–0.79 (0.030–0.031)	———
	2nd	0.77–0.79 (0.030–0.031)	———
Piston pin bore	16.002–16.008 (0.6300–0.6302)		16.030 (0.6311)
Piston pin O.D.	15.995–16.000 (0.6297–0.6299)		15.980 (0.6291)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.010–16.018 (0.6303–0.6306)		16.040 (0.6315)
Conrod big end side clearance	0.10–0.20 (0.004–0.008)		0.30 (0.012)
Conrod big end width	16.95–17.00 (0.667–0.669)		———
Crank pin width	17.10–17.15 (0.673–0.675)		———
Conrod big end oil clearance	0.024–0.048 (0.0009–0.0019)		0.080 (0.0031)
Crank pin O.D.	29.976–30.000 (1.1802–1.1811)		———
Crankshaft journal oil clearance	0.012–0.036 (0.0005–0.0014)		0.080 (0.0031)
Crankshaft journal O.D.	31.976–32.000 (1.2589–1.2598)		———
Crankshaft thrust bearing thickness	Left side	2.350–2.500 (0.0925–0.0984)	———
	Right side	2.425–2.450 (0.0955–0.0965)	———
Crankshaft thrust clearance	0.045–0.100 (0.0018–0.0039)		———
Crankshaft runout	———		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.084 (86/44 x 32/30)	—
Oil pressure (at 60°C, 140°F)	Above 250 kPa (2.5 kg/cm ² , 36 psi) Below 600 kPa (6.0 kg/cm ² , 85 psi) at 3 000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.16)	—
Clutch release screw	¼ – ½ turn back	—
Drive plate thickness	2.90–3.10 (0.114–0.122)	2.60 (0.102)
Drive plate claw width	11.8–12.0 (0.46–0.47)	11.0 (0.43)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	31.0 (1.22)

THERMOSTAT + RADIATOR + FAN

ITEM		STANDARD	LIMIT
Thermostat valve opening temperature		74.5–78.5°C (166.1–173.3°F)	—
Thermostat valve lift		Over 7 mm (0.28 in) at 90°C (194°F)	—
Radiator cap valve opening pressure		110 kPa (1.1 kg/cm ² , 15.6 psi)	—
Cooling fan thermo-switch operating temperature	ON	Approx. 95°C (203 °F)	—
	OFF	Approx. 88°C (190.4 °F)	—
Water thermo-switch operating temperature	ON	Approx. 117°C (243°F)	—
	OFF	Approx. 110°C (230°F)	—

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.954 (86/44)	—
Final reduction ratio		3.357 (47/14)	—
Gear ratios	Low	3.363 (37/11)	—
	2nd	2.307 (30/13)	—
	3rd	1.750 (28/16)	—
	4th	1.437 (23/16)	—
	5th	1.250 (30/24)	—
	Top	1.150 (23/20)	—
Shift fork to groove clearance	No.1, No.2 & No.3	0.10–0.30 (0.004–0.012)	0.50 (0.020)
Shift fork groove width	No.1, No.2 & No.3	5.5–5.6 (0.217–0.220)	—

ITEM	STANDARD		LIMIT
Shift fork thickness	No.1, No.2 & No.3	5.3–5.4 (0.209–0.213)	—
Countershaft length (Low to 2nd)	113.1–113.2 (4.453–4.457)		—
Drive chain	Type	D.I.D.: DID525V ₉ TAKASAGO: RK525SMOZ ₂	—
	Links	114	—
	20-pitch length	—	319.4 (12.57)
Drive chain slack	25–35 (1.0–1.4)		—
Gearshift lever height	45 (1.8)		—

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST32SS	←
Bore size	32 mm	←
I.D. No	10D2	10D4
Idle r/min.	1 400 ± 50 r/min.	←
Float height	14.6 ± 1.0 mm	←
Main jet (M.J.)	# 102.5	←
Main air jet (M.A.J.)	0.6 mm	←
Jet needle (J.N.)	5EZ74	←
Needle jet (N.J.)	□-9	←
Throttle valve (Th.V.)	# 130	←
Pilot jet (P.J.)	# 32.5	←
By-pass (B.P.)	* ¹ 0.8, * ² 0.8, * ³ 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	0.9 mm
Valve seat (V.S.)	2.0 mm	←
Starter jet (G.S.)	# 32.5	←
Pilot screw (P.S.)	PRE-SET	←
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)	←

ITEM	SPECIFICATION		
	E-02,04,21,25,28,34	E-24	E-22
Carburetor type	BST33SS	←	←
Bore size	33 mm	←	←
I.D. No.	10D1	10D3	10D5
Idle r/min.	1 300 ± 100 r/min	←	1 400 ± 50 r/min
Float height	14.6 ± 1.0 mm	←	←
Main jet (M.J.)	# 100	←	←
Main air jet (M.A.J.)	0.6 mm	←	←
Jet needle (J.N.)	5EZ67-3rd	←	←
Needle jet (N.J.)	P-0	←	←
Throttle valve (Th.V.)	# 130	←	←
Pilot jet (P.J.)	# 32.5	←	←
By-pass (B.P.)	# ¹ 0.8, # ² 0.8, # ³ 0.8 mm	←	←

ITEM		SPECIFICATION		
		E-02,04,21,25,28,34	E-24	E-22
Pilot outlet	(P.O.)	0.7 mm	←	←
Valve seat	(V.S.)	2.0 mm	←	←
Starter jet	(G.S.)	# 32.5	←	←
Pilot screw	(P.S.)	PRE-SET (1½ turns back)	←	PRE-SET (1¼ turns back)
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		7° B.T.D.C. below 1 500 r/min.		For California model
		15° B.T.D.C. below 1 500 r/min.		For the Other model
Firing order		1·2·4·3		
Spark plug	Type	ND.: U24ETR N.G.K.: CR8EK		
	Gap	0.6–0.7 (0.02–0.03)		
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		80–120 Ω		Tester range: x 10 Ω
Ignition coil resistance	Primary	⊕ tap—⊖ tap 2.5–3.8 Ω		Tester range: x 1 Ω
	Secondary	Plug cap—Plug cap 30–50 k Ω		Tester range: x 1 kΩ
Generator no-load voltage		More than 70 V (AC) at 5 000 r/min.		When cold
Regulated voltage		13.5–15.5 V at 5 000 r/min.		
Starter motor brush length		Limit: 3.5 (0.14)		
Commutator under-cut		Limit: 0.5 (0.02)		
Starter relay resistance		3–5 Ω		
Battery	Type designation	YTX9-BS		
	Capacity	12V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.	1.32 at 20°C (68°F)		
Fuse size	Headlight	15 A		
	Signal	10 A		
	Ignition	10 A		
	Main	25 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Parking or position light		4 (Except E-03,28 and 33)
Tail/Brake light		5/21
Turn signal light		21
Tachometer light		1.7 x 2pcs
Speedometer light		1.7 x 2pcs

ITEM	SPECIFICATION
Water temp. check light	3.4
Turn signal indicator light	3.4
High beam indicator light	1.7
Neutral indicator light	3
Oil pressure indicator light	3.4
License light	5

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height		45 (1.8)	—
Brake disc thickness	Front	4.5 ± 0.2 (0.18 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.24 ± 0.008)	5.5 (0.22)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)	—
	Rear	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4994)	—
	Rear	12.657–12.684 (0.4983–0.4994)	—
Brake caliper cylinder bore	Front	27.000–27.076 (1.0630–1.0660)	—
		33.960–34.036 (1.3370–1.3400)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	26.920–26.970 (1.0598–1.0618)	—
		33.884–33.934 (1.3340–1.3360)	—
	Rear	38.098–38.148 (1.4999–1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/70-17 54H	—
	Rear	150/70-17 69H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.72)	—	
Front fork spring free length	—	262 (10.3)	
Front fork oil level	106 (4.17)	—	For E-03,28 and 33 models
	105 (4.13)	—	For the other models
Rear shock absorber spring adjuster	4/7	—	
Rear wheel travel	120 (4.72)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	200	2.00	29	200	2.00	29
REAR	225	2.25	33	250	2.50	36

FUEL + OIL + COOLANT

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		For U.S.A. model
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Reserch Method.		For Canada model
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the other models
Fuel tank including reserve	14.5 L (3.8/3.2 US/Imp gal)		For California model
	16 L (4.2/3.5 US/Imp gal)		For the other models
	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 300 ml (2.4/2.0 US/Imp qt)	
	Filter change	2 800 ml (3.0/2.5 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	

ITEM	SPECIFICATION	NOTE
Front fork oil type	Fork oil # 10	
Front fork oil capacity (each leg)	494 ml (16.7/17.4 US/Imp oz)	For E-03,28 and 33 models
	495 ml (16.7/17.4 US/Imp oz)	For the other models
Brake fluid type	DOT3 or DOT4	
Coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.	
Coolant including reserve	1 900 ml (2.0/1.7 US/Imp qt)	