SuperPowerSports

Before Servicing

Before starting to service a motorcycle, careful reading of the applicable section is recommended to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Dirt

Before removal and disassembly, clean the motorcycle. Any dirt entering the engine or other parts will work as an abrasive and shorten the life of the motorcycle. For the same reason, before installing a new part, clean off any dust or metal filings.

(2) Battery Leads

Remove the ground (–) lead from the battery before performing any disassembly operations on the motorcycle. When installing, connect the positive (+) lead first, then the negative (–) lead to the battery. This prevents: (a) the possibility of accidentally turning the engine over while partially disassembled. (b) sparks at electrical connections which will occur when they are disconnected. (c) damage to electrical parts.

(3) Installation, Assembly

Generally, installation or assembly is the reverse of removal or disassembly. But if this Service Manual has installation or assembly procedures, follow them. Note parts locations and cable, wire, and hose routing during removal or disassembly so they can be installed or assembled in the same way. It is preferable to mark and record the locations and routing as much as possible.

(4) Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them evenly in a cross pattern. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.

(5) Torque

When torque values are given in this Service Manual, use them. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(6) Force

Common sense should dictate how much force is necessary in assembly and disassembly. If a part seems especially difficult to remove or install, stop and examine what may be causing the problem. Whenever tapping is necessary, tap lightly using a wooden or plastic-faced mallet. Use an impact driver for screws (particularly for the removal of screws held by a locking agent) in order to avoid damaging the screw heads.

(7) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(8) High-Flash Point Solvent

A high-flash point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is Standard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.

(9) Gasket, O-Ring

Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leakage.

(10) Liquid Gasket, Non-Permanent Locking Agent

Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine oil passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Loctite Lock'n Seal (Blue).

(11) Press

A part installed using a press or driver, such as a wheel bearing, should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.

(12) Ball Bearing and Needle Bearing

Do not remove a ball bearing or a needle bearing unless it is absolutely necessary. Replace any ball or needle bearings that were removed with new ones, as removal generally damages bearings. Install bearings with the marked side facing out applying pressure evenly with a suitable driver. Only press on the race that forms the press fit with the base component to avoid damaging the bearings. This prevents severe stress on the balls or needles and races, and prevent races and balls or needles from being dented. Press a ball bearing until it stops at the stops in the hole or on the shaft.

(13) Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals. When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole. Before a shaft passes through a seal, apply a little high temperature grease on the lips to reduce rubber to metal friction.

Technical Information – KLEEN (KAWASAKI LOW EXHAUST EMISSION)

3. Maintenance

Special maintenance is not necessary except for the inspection of the air suction valve (which has been described in this manual).

1) Replacement of Muffler Assy

It is impossible to replace only catalytic converters because they are welded in the muffler. So, in the following case, the replacement of the muffler assy is also necessary.

- In case of using not-appointed fuel (leaded gasoline, etc.):
  Purification efficiency decreases in a very short period because lead poisons the catalytic converters. Although the appearance of the converter and engine performance are not effected, the replacement of a muffler assy is necessary to secure the purification efficiency of exhaust gas.
- In case catalytic converters melt down by overheating:
  Especially in the case that a lot of unburned gasoline flows into the catalytic converters under the extreme running condition far beyond common sense, there is a possibility that the catalysts overreact and that catalytic converters overheat severely. If they melt down, it causes poor engine performance, deterioration of emission noise level, and purification efficiency. So, the muffler assy must be replaced

2) Durability

It has the same durability as a conventional muffler.

3) Disposal to Waste

As any harmful toxic substance is not used especially, it can be disposed as usual industrial wastes. The body of the muffler is made of aluminum steel. The catalytic converter is also made of stainless steel which has alumina on its surface, and the main ingredients of catalysts are platinum and rhodium.

4. Handling Precautions

Catalyst protection system against mishandling is applied to a vehicle with catalysts. But, we prohibit depending on the system too much when running.

1) Use only unleaded gasoline:

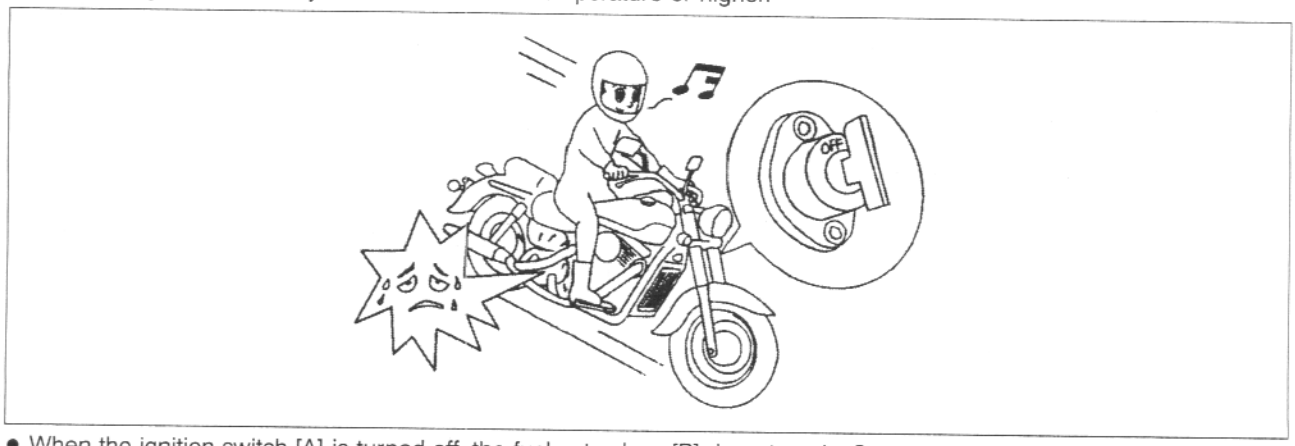
Usage of leaded gasoline is prohibited completely. Only fuel and additives which are specified in the Owner's Manual can be used.

2) Use specified engine oil which is described in the Owner's Manual:

In case of some ingredients which give bad effects to the catalysts (such as phosphorus "P", lead "Pb", sulfur "S") are included, the purification efficiency decreases.

3) Coasting (such as cranking while going down a slope) is prohibited with the ignition system OFF:

The engine running without igniting causes a great flow of unburned gasoline and the decreasing of purification efficiency, and melting down of catalysts at the activation temperature or higher.

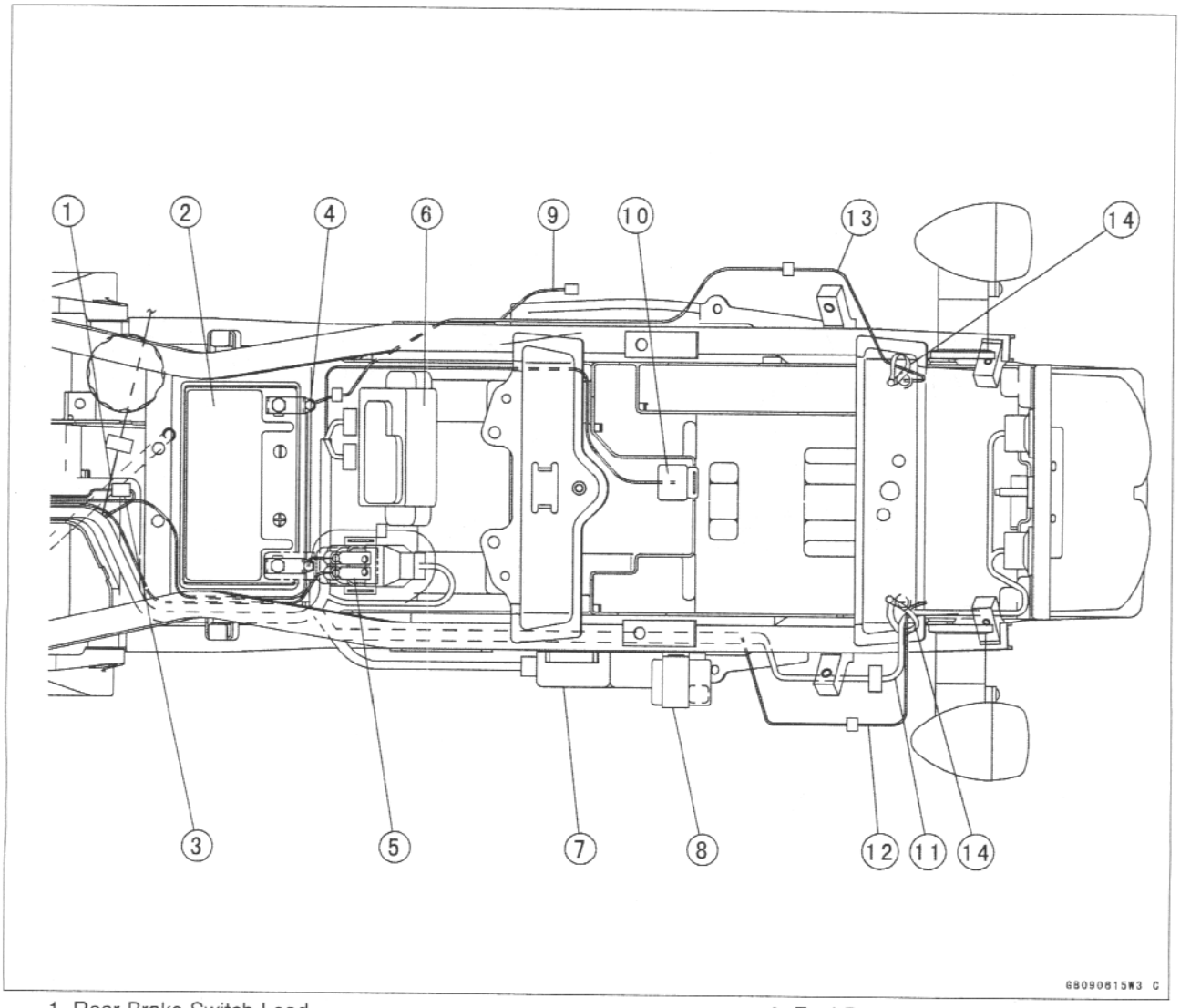


- When the ignition switch [A] is turned off, the fuel cut valves [B] do not work. So, avoid coasting with the ignition switch OFF.
- Do not run the engine nor coast the motorcycle under the misfire which occurs by defects such as a bad connection with the spark plug at the secondary wiring of the stick coil [C].
- Do not coast too much with the engine stop switch [D] OFF. Under the condition that the engine stop switch is turned off during running, the IC igniter [E] closes the fuel cut valves to shut off fuel.
- Do not run the engine nor coast the motorcycle too much under the condition that the primary wiring of the stick coil does not connect completely (misfire). Incomplete connection or cut-off of the primary coil makes the fuel cut valves start to cut fuel. In this case, from the standpoint to protect the catalysts, the fuel for all cylinders is cut off even if one cylinder has been affected.

Torque and Locking Agent

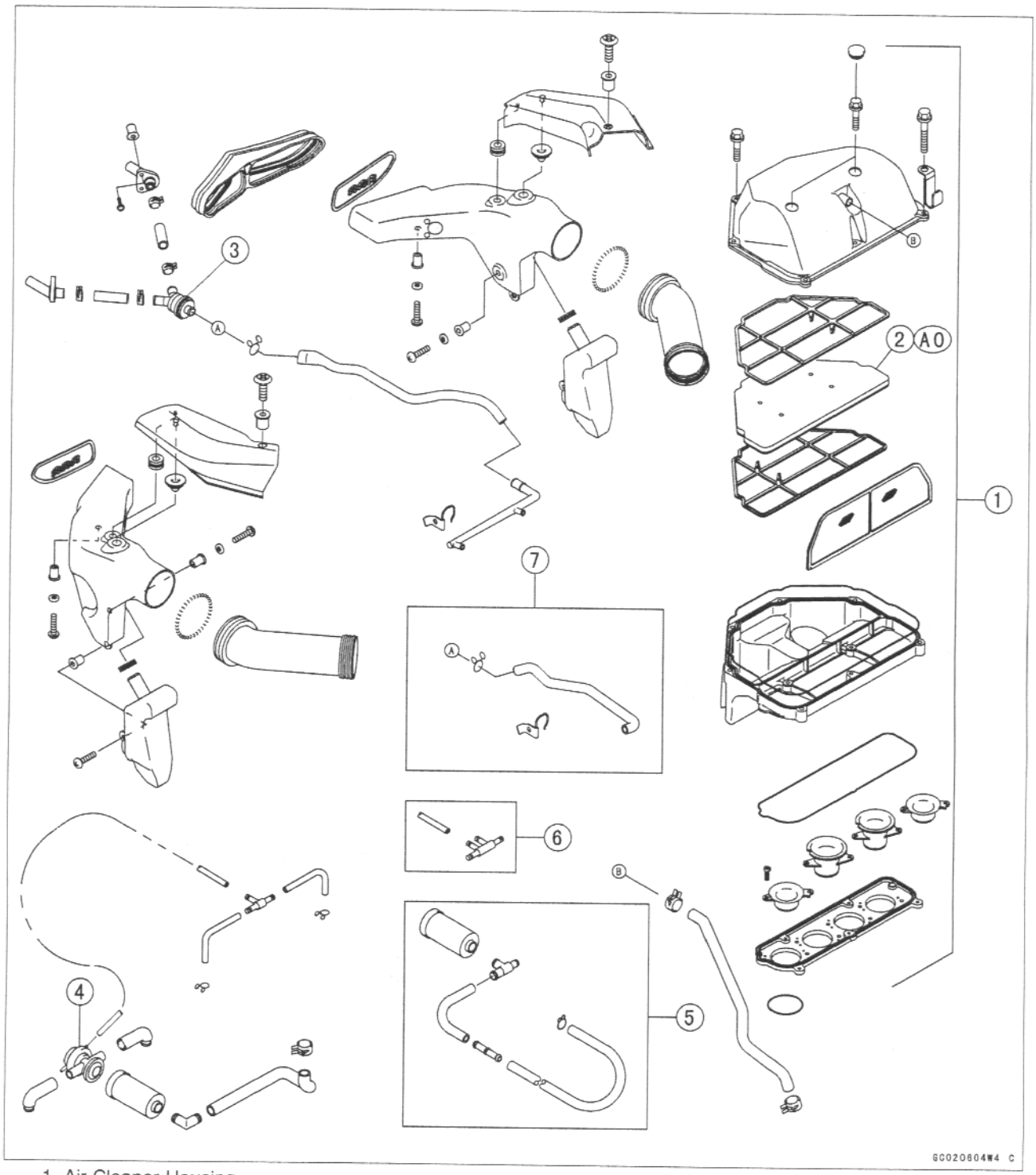
Fastener	Torque			Remarks
	N·m	kg·m	ft·lb	
Wheels/Tires:				
Front Axle Clamp Bolts	20	2.0	14.5	
Front Axle Nut	125	13.0	92	
Rear Axle Nut	125	13.0	92	
Final Drive:				
Engine Sprocket Nut	125	13.0	92	O
Engine Sprocket Cover Bolts	12	1.2	104 in·lb	
Speed Sensor Mounting Bolt	6.9	0.70	61 in·lb	L
Rear Sprocket Nuts	59	6.0	43	
Rear Sprocket Studs	-	-	-	L
Brakes:				
Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	25	2.5	18.0	
Brake Lever Pivot Bolt	1.0	0.10	9 in·lb	
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Front Brake Reservoir Cap Stopper Screws	1.5	0.15	13 in·lb	
Front Brake Reservoir Bracket Bolt	6.9	0.70	61 in·lb	
Front Brake Light Switch Screws	1.0	0.10	9 in·lb	
Front Master Cylinder Clamp Bolts	11	1.1	95 in·lb	S
Pad Spring Screws (Front Caliper)	2.9	0.30	26 in·lb	
Caliper Mounting Bolts (Front)	34	3.5	25	
Caliper Assembly Bolts (Front)	21	2.1	15.0	
Front Brake Disc Mounting Bolts	27	2.8	20	L
Rear Brake Disc Mounting Bolts	27	2.8	20	L
Caliper Mounting Bolts (Rear)	25	2.5	18.0	
Rear Master Cylinder Guard Bolts	25	2.5	18.0	
Rear Master Cylinder Push Rod Locknut	18	1.8	13.0	
Suspension:				
Front Fork Clamp Bolts (Upper)	20	2.0	14.5	
Front Fork Clamp Bolts (Lower)	20	2.0	14.5	
Front Fork Top Plugs	23	2.3	16.5	
Piston Rod Nut	28	2.9	21	
Front Fork Bottom Allen Bolts	39	4.0	29	L
Front Axle Clamp Bolts	20	2.0	14.5	
Rear Shock Absorber Nuts (Upper and Lower)	34	3.5	25	
Rear Shock Absorber Upper Bracket Nut	59	6.0	43	
Swingarm Pivot Shaft Nut	110	11.0	80	
Uni-Trak				
Rocker Arm Nut	34	3.5	25	
Tie-Rod Nuts	59	6.0	43	
Steering:				
Steering Stem Head Nut	49	5.0	36	
Steering Stem Nut	15	1.5	11	
Handlebar Bolts	34	3.5	25	L
Handlebar Holder Bolts	23	2.3	16.5	
Handlebar Holder Position Bolts	9.8	1.0	87 in·lb	L

Cable, Wire, and Hose Routing



1. Rear Brake Switch Lead
2. Battery
3. Alternator Lead Connector
4. Battery (–) Lead
5. Starter Relay
6. Junction Box
7. IC Igniter
8. Fuel Pump Relay
9. Headlight Fuse Lead
10. Turn Signal Relay
11. Tail/Brake Light Lead
12. Left Turn Signal Light Lead
13. Right Turn Signal Light Lead
14. Clamp

Exploded View



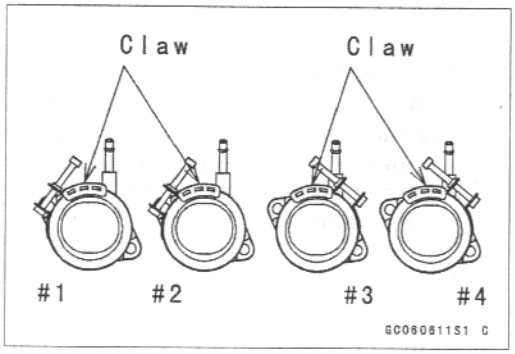
1. Air Cleaner Housing
2. Air Cleaner Element
3. Air Vent Filter
4. Vacuum Switch Valve
5. Silencer Ass'y (CA Model)
6. Vacuum Hose Ass'y (CA Model)
7. Carburetor Vent Hose (CA Model)

AO: Apply high-quality-form-air-filter oil
CA: California

Carburetors

Carburetor Installation

- Route the cables, harness, and hoses correctly (see General Information chapter).
- Tighten the clamps for the carburetor holders at the position in the figure.



⚠ WARNING

Be sure to install the holder clamp screws in the direction shown. Or, the screws could come in contact with the throttle linkage resulting in unsafe riding condition.

- Check fuel leakage from the carburetors.

⚠ WARNING

Fuel spilled from the carburetors is hazardous.

- Adjust the following items if necessary.
  - Idle Speed
  - Carburetor Synchronization
  - Throttle Cables
  - Choke Cable

Carburetor Disassembly

- Remove the carburetors.

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

NOTE

○ *Carburetor can be disassembled in the joined state.*

- For the US model, remove the pilot screw plug as follows: punch a hole in the plug and pry there with an awl or other suitable tool.
- Turn in the pilot screw and count the number of turns until it seats fully but not tightly, and then remove the screw. This is to set the screw to its original position when assembling.

CAUTION

During carburetor disassembly, be careful not to damage the diaphragm. Never use a sharp edge to remove the diaphragm.

Evaporative Emission Control System (California Model Only)

The Evaporative Emission Control System routes fuel vapors from the fuel system into the running engine or stores the vapors in a canister when the engine is stopped. Although no adjustments are required, a thorough visual inspection must be made at the intervals specified by the Periodic Maintenance Chart.

Parts Removal/Installation

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

CAUTION

If gasoline, solvent, water or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.

- To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Connect the hoses according to the diagram of the system. Make sure they do not get pinched or kinked.
- Route hoses with a minimum of bending so that the air or vapor will not be obstructed.
- Be sure to plug the return hose to prevent fuel spilling before fuel tank removal.

⚠ WARNING

When removing the fuel tank, be careful not to spill the gasoline through the return hose. Spilled fuel is hazardous.

★ If liquid gasoline flows into the breather hose, remove the hose and blow it clean with compressed air.

Hose Inspection

- Check that the hoses are securely connected.
- Replace any kinked, deteriorated or damaged hoses.

Separator Inspection

- Remove the seats (see Frame chapter).
- Disconnect the hoses from the liquid/vapor separator, and remove the separator from the motorcycle.
- Visually inspect the separator for cracks and other damage.

★ If the separator has any cracks or is badly damaged, replace it with a new one.

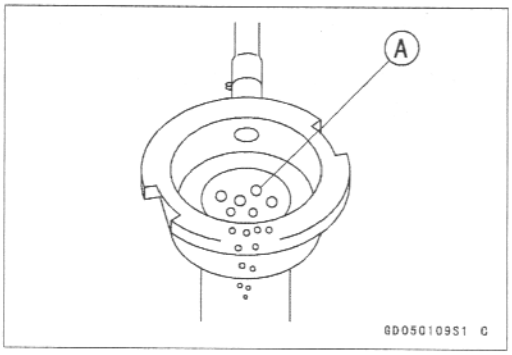
Coolant

Water and Coolant Mixture Ratio (Recommended)

Soft Water	:	**50%**
Coolant	:	**50%**
Freezing Point	:	**-35°C (-31°F)**
Total Amount	:	**2.3 L**

NOTE

○ *Choose a suitable mixture ratio by referring to the coolant manufacturer's directions.*



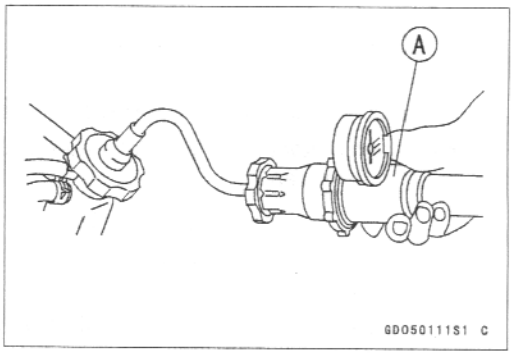
- Bleed the air from the cooling system as follows.
- ○ Start the engine with the radiator cap removed and run it until no more air bubbles [A] can be seen in the coolant.
- ○ Tap the radiator hoses to force any air bubbles caught inside.
- ○ Stop the engine and add coolant up to the radiator filler neck.
- Install the radiator cap.
- Start the engine, warm it up thoroughly until the radiator fan turns on and then stop the engine.
- Check the coolant level in the reserve tank after the engine cools down.
- ★ If the coolant level is lower than the low level line, add coolant to the full level line.

CAUTION

Do not add more coolant above the full level line.

Pressure Testing

- Remove:
  Lower Fairing (see Frame chapter)
- Remove the radiator cap, and install a cooling system pressure tester [A] on the filler neck.



NOTE

○ *Wet the cap sealing surfaces with water or coolant to prevent pressure leaks.*

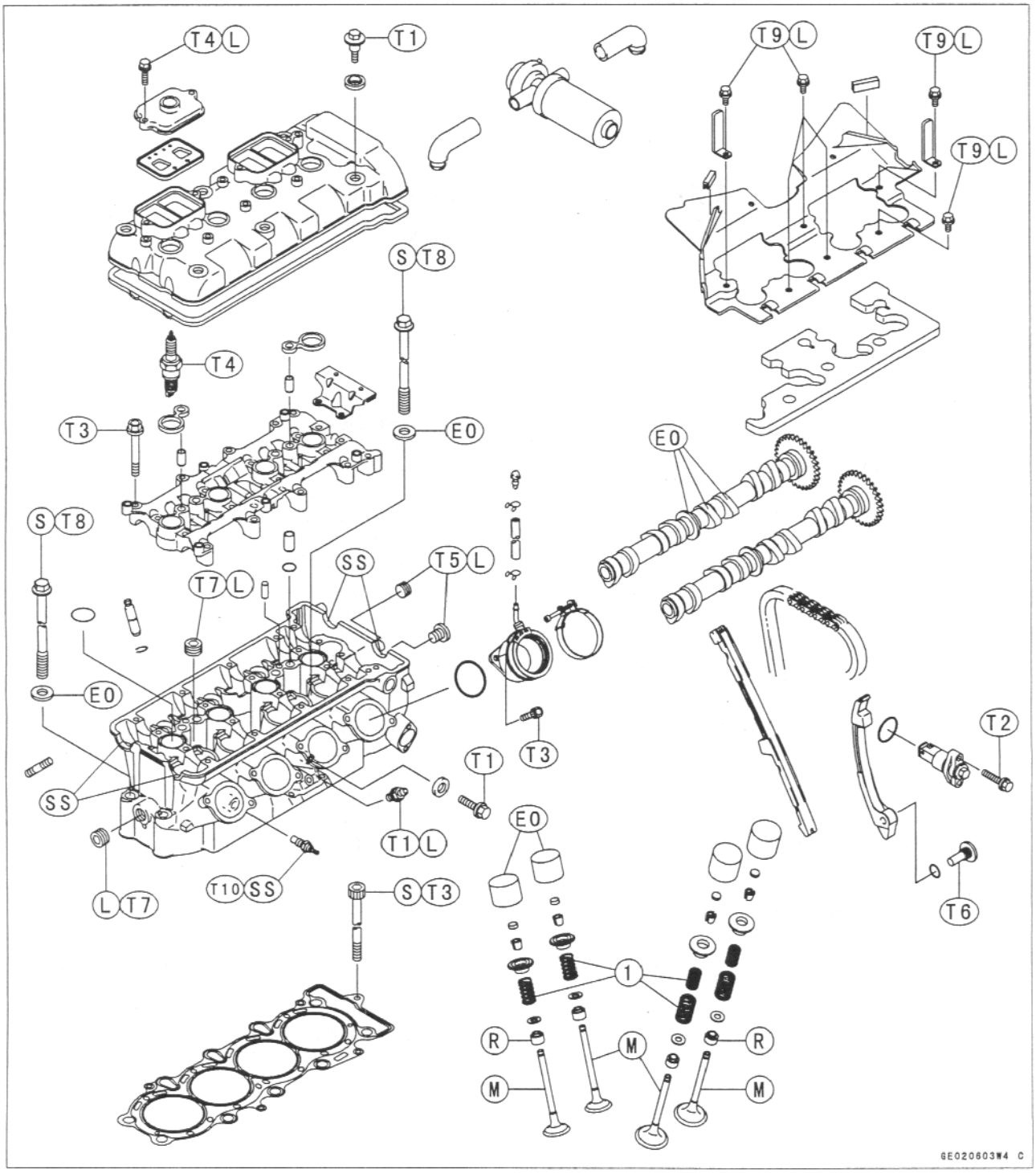
- Build up pressure in the system carefully until the pressure reaches 123 kPa (1.25 kg/cm^2, 18 psi).

CAUTION

During pressure testing, do not exceed the pressure for which the system is designed. The maximum pressure is 123 kPa (1.25 kg/cm^2, 18 psi).

- Watch the gauge for at least 6 seconds.
- ★ If the pressure holds steady, the system is all right.
- ★ If the pressure drops and no external source is found, check for internal leaks. Droplets in the engine oil indicate internal leakage. Check the cylinder head gasket and the water pump.
- Remove the pressure tester, replenish the coolant, and install the radiator cap.

Exploded View



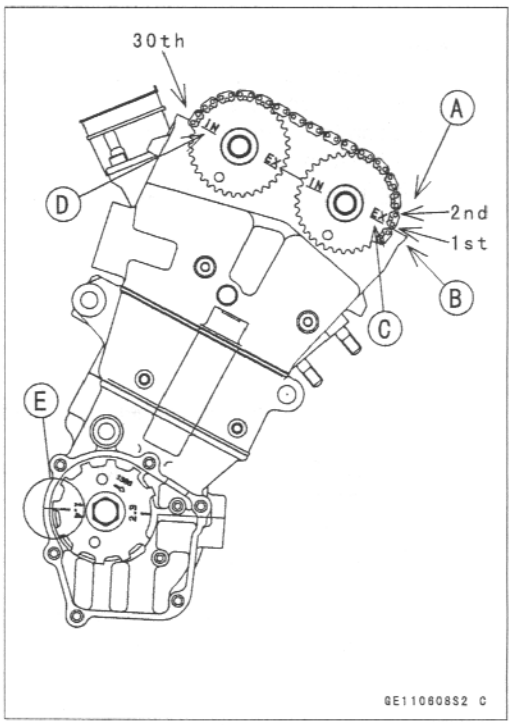
T1: 9.8 N·m (1.0 kg·m, 87 in·lb)
T2: 11 N·m (1.1 kg·m, 95 in·lb)
T3: 12 N·m (1.2 kg·m, 104 in·lb)
T4: 13 N·m (1.3 kg·m, 113 in·lb)
T5: 15 N·m (1.5 kg·m, 11.0 ft·lb)
T6: 25 N·m (2.5 kg·m, 18.0 ft·lb)
T7: 20 N·m (2.0 kg·m, 14.5 ft·lb)
T8: 49 N·m (5.0 kg·m, 36 ft·lb)
T9: 5.9 N·m (0.60 kg·m, 52 in·lb)
T10: 7.8 N·m (0.8 kg·m, 69 in·lb)

1. Closed coil end faces downward.
L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease.
EO: Apply engine oil.
SS: Apply silicone sealant.
R: Replacement Parts
S: Follow the specific tightening sequence.

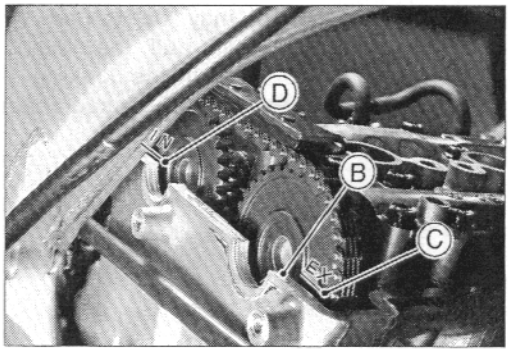
Camshaft, Camshaft Chain

- Position the crankshaft at #1, 4 piston TDC.
- Pull the tension side (exhaust side) [A] of the chain taut to install the chain.
- Engage the camshaft chain with the camshaft sprockets so that the timing marks on the sprockets are positioned as shown.

○ The timing marks of #1, 4 must be aligned with the lower surface of crankcase of rear side [E].



○ The timing marks must be aligned with the cylinder head upper surface [B].
[C] EX mark
[D] IN mark

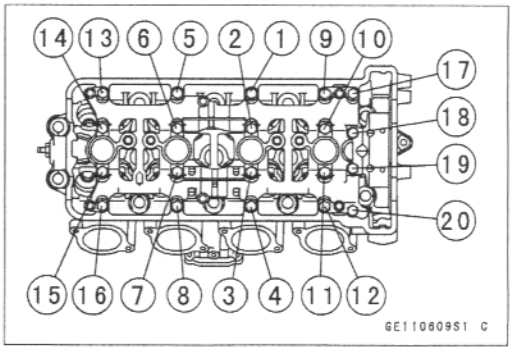


- Install the camshaft cap and chain guide.

○ First tighten the camshaft cap and all chain guide bolts evenly to seat the camshaft in place, then tighten all bolts following the specified tightening sequence.

Torque - Camshaft Cap Bolts: 12 N·m (1.2 kg·m, 104 in·lb)
Camshaft Chain Guide Bolts: 12 N·m (1.2 kg·m, 104 in·lb)

- Tighten the camshaft chain tensioner (see Camshaft Chain Tensioner Installation).
- Install the cylinder head cover (see Cylinder Head Cover Installation).



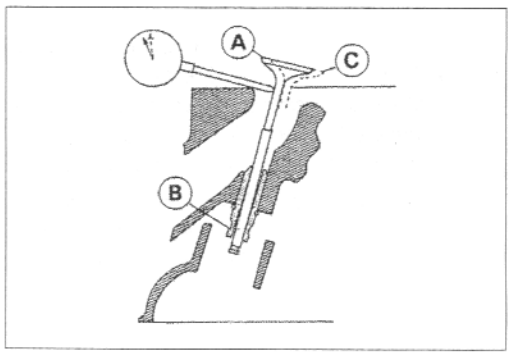
Valves

Valve-to-Guide Clearance Measurement (Wobble Method)

If a small bore gauge is not available, inspect the valve guide wear by measuring the valve to valve guide clearance with the wobble method as indicated below.

- Insert a new valve [A] into the guide [B] and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head mating surface.
- Move the stem back and forth [C] to measure valve/valve guide clearance.
- Repeat the measurement in a direction at a right angle to the first.

★If the reading exceeds the service limit, replace the guide.



NOTE

○ *The reading is not actual valve/valve guide clearance because the measuring point is above the guide.*

Valve/Valve Guide Clearance (Wobble Method)

	Standard	Service Limit
Inlet	0.03 ~ 0.12 mm	0.29 mm
Exhaust	0.10 ~ 0.18 mm	0.35 mm

Valve Seat Inspection

- Remove the valve (see Valve Removal).
- Check the valve seating surface [A] between the valve [B] and valve seat [C].

○ Measure the outside diameter [D] of the seating pattern on the valve seat.

★If the outside diameter is too large or too small, repair the seat (see Seat Repair).

Valve Seating Surface Outside Diameter

Standard:	Inlet	26.1 ~ 26.3 mm
	Exhaust	22.1 ~ 22.3 mm

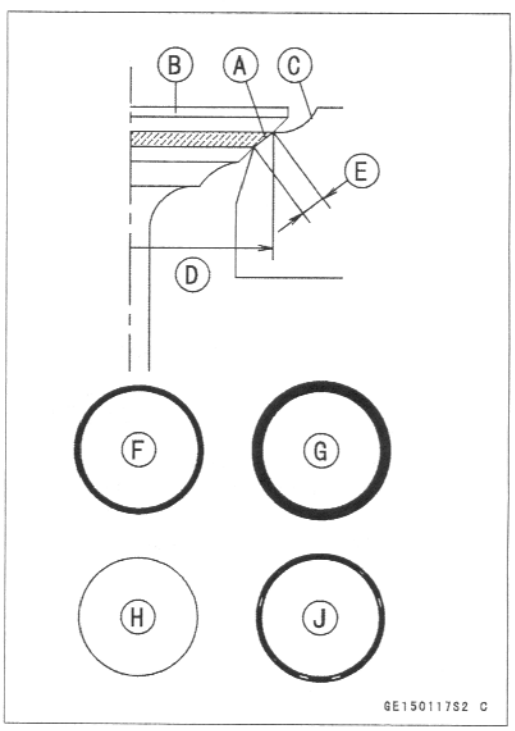
○ Measure the seat width [E] of the portion where there is no build-up carbon (white portion) of the valve seat with a vernier caliper.

Good [F]

★If the width is too wide [G], too narrow [H] or uneven [J], repair the seat (see Valve Seat Repair).

Valve Seating Surface Width

Standard:	Inlet, Exhaust	0.5 ~ 1.0 mm

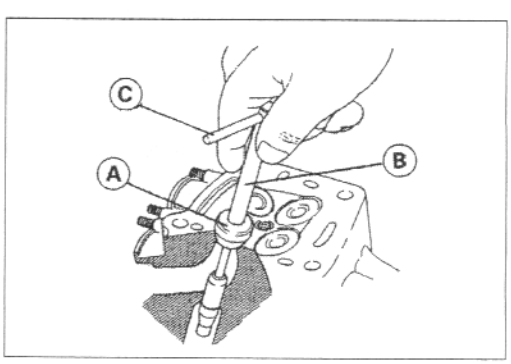


Valve Seat Repair

- Repair the valve seat with the valve seat cutters [A].

Special Tools - Valve Seat Cutter Holder, φ4: 57001-1275 [B]
Valve Seat Cutter Holder Bar: 57001-1128 [C]
[For Inlet Valve Seat]
Valve Seat Cutter, 45° - φ24: 57001-1113
Valve Seat Cutter, 32° - φ25: 57001-1118
Valve Seat Cutter, 60° - φ25: 57001-1328
[For Exhaust Valve Seat]
Valve Seat Cutter, 45° - φ27.5: 57001-1114
Valve Seat Cutter, 32° - φ28 : 57001-1119
Valve Seat Cutter, 60° - φ27: 57001-1409

★If the manufacturer's instructions are not available, use the following procedure.



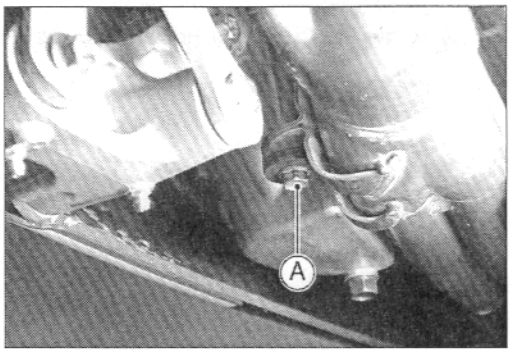
Muffler

⚠WARNING

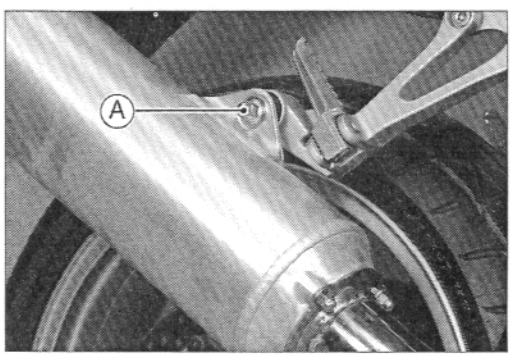
To avoid a serious burn, do not remove the mufflers when the engine is still hot. Wait until the mufflers cool down.

Muffler and Exhaust Pipe Removal

- Remove:
  Lower Fairings (see Frame chapter)
  Exhaust Pipe Mounting Bolt [A]

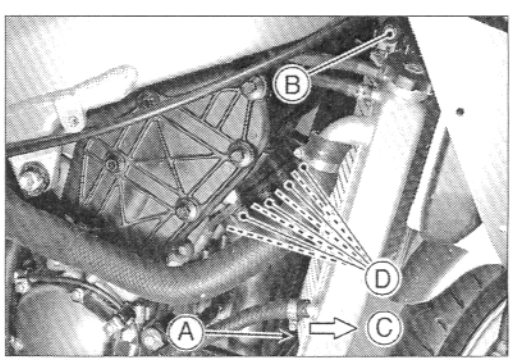


- Remove the muffler mounting nut [A].



- Remove the radiator mount bolt [A].
- Loosen the radiator bolts [B].
- Move the bottom of the radiator toward the front [C], and then tighten the radiator bolts [B].
- Remove:
  Exhaust Pipe Manifold Holder Nuts [D]
- Pull the muffler mounting bolt and remove the muffler assembly.

○ When removing the exhaust pipe manifold, don't hit the radiator.



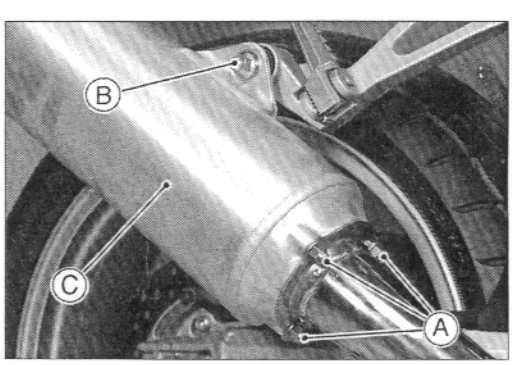
Muffler and Exhaust Pipe Installation

- Replace the exhaust pipe manifold gaskets with new ones.
- Thoroughly warm up the engine, wait until the engine cools down, and retighten all the bolts and nuts.
- Tighten the exhaust pipe manifold holder nuts.
- Tighten:

Torque - Exhaust Pipe Mounting Bolt: 34 N·m (3.5 kg·m, 25 ft·lb)

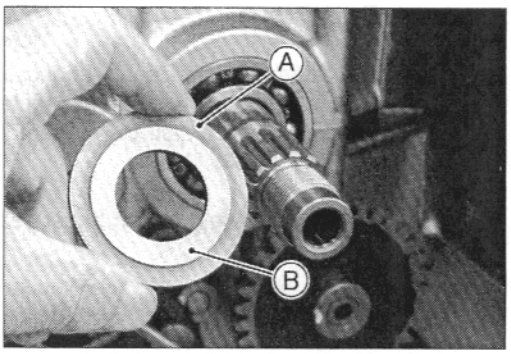
Muffler Body Removal

- Remove:
  Exhaust Pipe Connecting Nuts [A]
  Muffler Mounting Bolt, Nut [B] and Washer
  Pull the muffler body [C] backward.

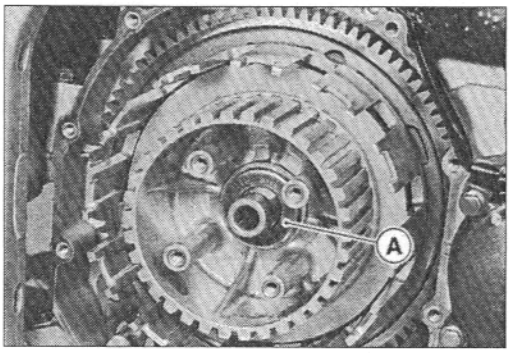


Clutch

○ Install the spacer [A] so that the stepped side [B] faces inward.



○ Install the washer [A] so that the OUT SIDE mark faces outward.

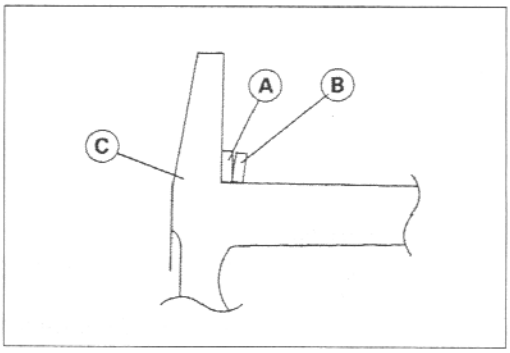


○ Replace the clutch hub nut with a new one.
○ Holding the clutch hub, tighten the clutch hub nut.

Special Tool - Clutch Holder: 57001-1243

Torque - Clutch Hub Nut: 130 N·m (13.5 kg·m, 98 ft·lb)

● Install the spring seat [A] and spring [B] as shown.
[C] Clutch Hub

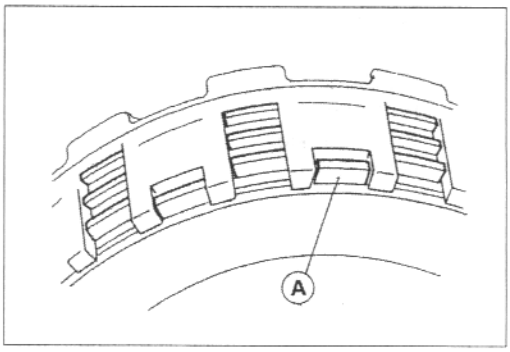


● Install the friction plates and steel plates, starting with a friction plate and alternating them.

CAUTION

If new dry friction plates and steel plates are installed, apply engine oil to the surfaces of each plate to avoid clutch plate seizure.

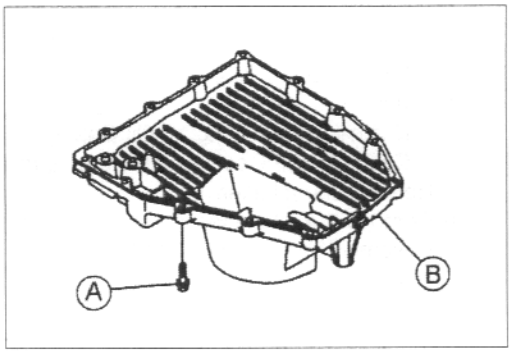
○ Install the last friction plate [A] fitting the tangs in the grooves in the housing as shown.



Oil Pan

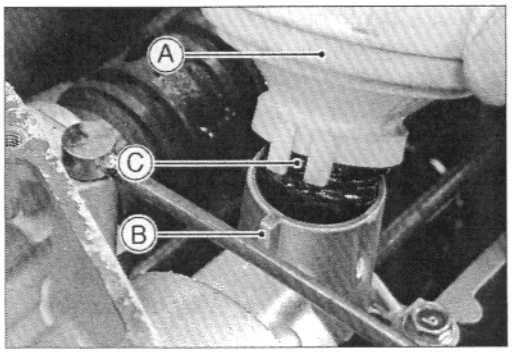
Oil Pan Removal

- Remove:
  Engine Oil (drain, see Engine Oil Change)
  Muffler (see Engine Top End chapter)
  Oil Pan Bolts [A]
  Oil Pan [B]



Oil Pan Installation

- Clean the oil screen [A].
- Install the oil screen so that the crankcase rib [B] fits the slot [C] of the oil screen.

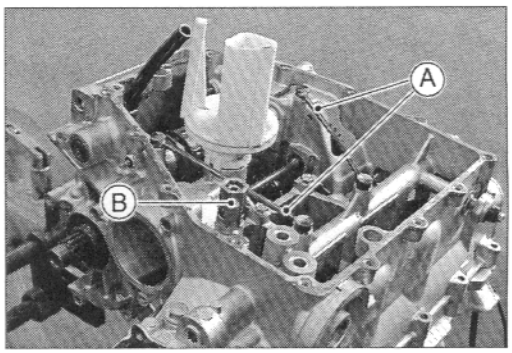


- Apply grease to the O-rings on the oil pipes [A].
- Apply a non-permanent locking agent to the threads of the relief valve [B], and tighten it.

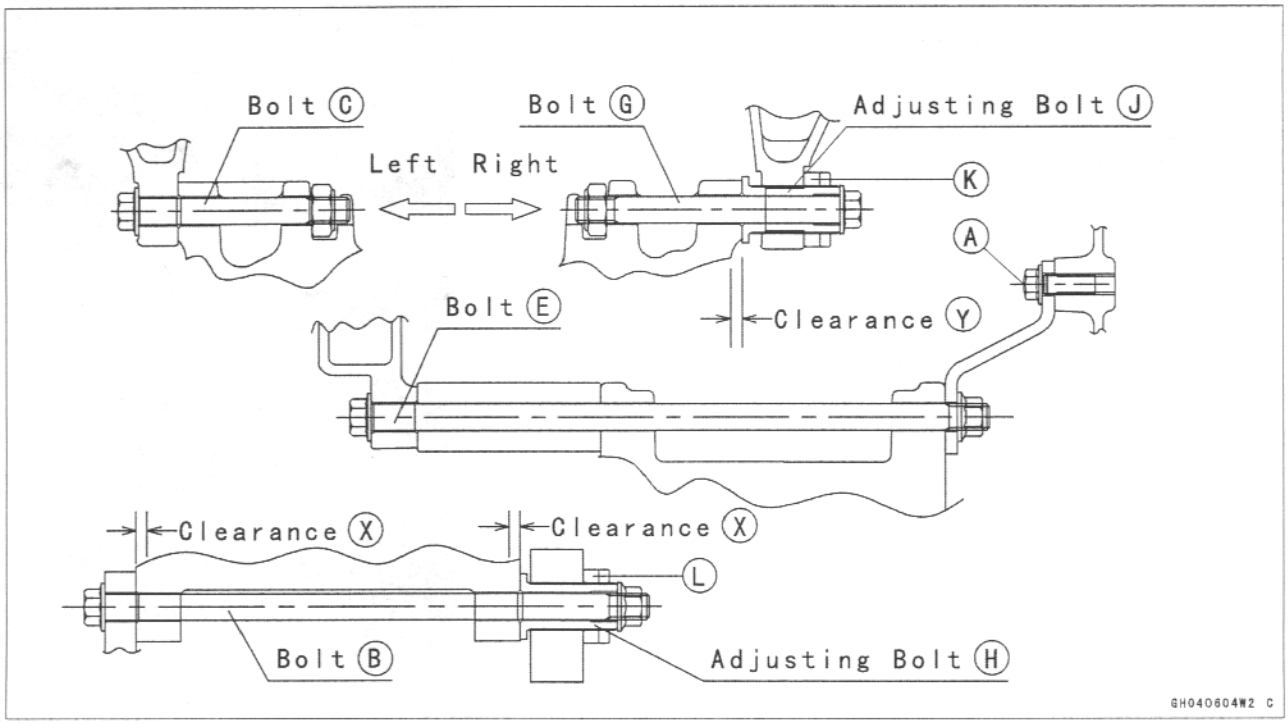
Torque - Oil Pressure Relief Valve: 15 N·m (1.5 kg·m, 11.0 ft·lb)

- Replace the oil pan gasket with a new one.
- Tighten the oil pan bolts.

Torque - Oil Pan Bolts: 11 N·m (1.1 kg·m, 95 in·lb)



Engine Removal/Installation



- Turn the adjusting bolt [H] until the clearance [X] between the crankcase and frame come to zero mm.
- Tighten the bracket bolts [A].

Torque - Engine Bracket Bolts: 25 N·m (2.5 kg·m, 18 ft·lb)

- Tighten the engine mounting bolts [C], [B], [E] and lock nut [L] with specified torque.

Torque - Engine Mounting Bolts: 44 N·m (4.5 kg·m, 33 ft·lb)
Engine Mounting Lock Nut: 49 N·m (5.0 kg·m, 36 ft·lb)

Special Tool - Engine Mount Nut Wrench: 57001–1450

- Pull out the engine mounting bolt [G] temporarily, and turn the adjusting bolt [J] until the clearance [Y] between the adjusting bolt and cylinder come to zero mm.
- Insert the bolt [G] into engine mounting hole, and tighten the bolt and lock nut [K] with specified torque

Torque - Engine Mounting Bolts: 44 N·m (4.5 kg·m, 33 ft·lb)
Engine Mounting Lock Nut: 49 N·m (5.0 kg·m, 36 ft·lb)

Special Tool - Engine Mount Nut Wrench: 57001–1450

- Install the removed parts (see appropriate chapters).
- Adjust:
  Throttle Cables (see Fuel System chapter)
  Choke Cable (see Fuel System chapter)
  Drive Chain (see Final drive chapter)

Crankshaft and Connecting Rods

- Replace the connecting rod big end bolts and nuts with new ones.
- Be sure to clean the bolts, nuts, and connecting rods thoroughly with high-flash point solvent, because the new connecting rods, bolts, and nuts are treated with an anti-rust solution.

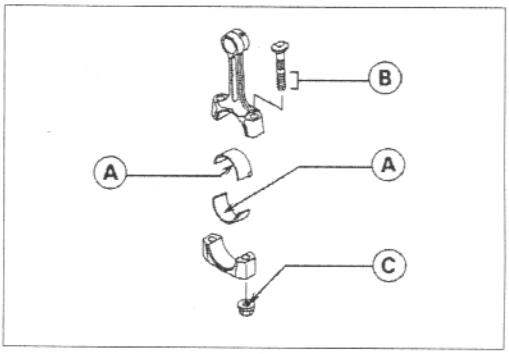
⚠WARNING

Clean he bolts, nuts, and connecting rods in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. This includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents to clean them.

CAUTION

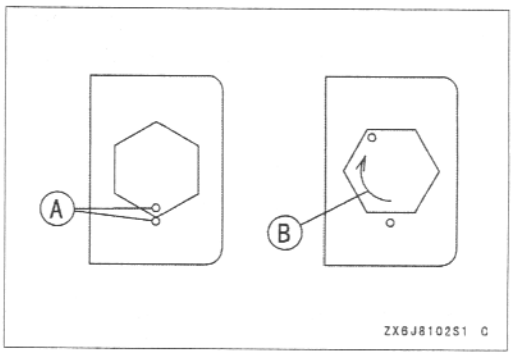
Immediately dry the bolts and nuts with compressed air after cleaning.
Clean and dry the bolts and nuts completely.

- Apply engine oil to the inner surface of upper and lower bearing inserts [A].
- Apply a small amount of engine oil to the threads [B] and seating surface [C] of the connecting rod nuts.



- First, tighten the nuts to the specified torque.
- Next, tighten the nuts **160°** more.
- Mark [A] the connecting rod big end caps and nuts so that nuts can be turned 160° [B] properly.

Torque + Angle – 15 N·m (1.5 kg·m, 11 ft·lb) + 160°



CAUTION

Since the friction force of the eating surface and thread portion of new nuts is different from that of used ones, the nut tightening torque should be changed as specified in the above table.
Be careful not to overtighten the nuts.

Crankshaft/Connecting Rod Cleaning

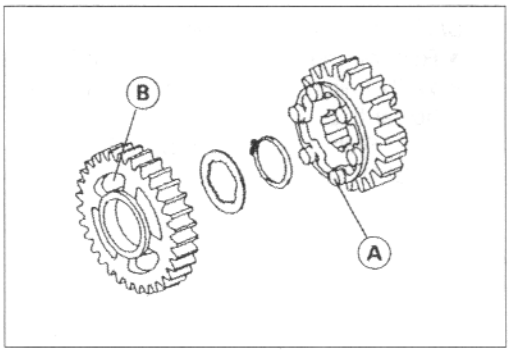
- After removing the connecting rods from the crankshaft, clean them with a high-flash point solvent.
- Blow the crankshaft oil passages with compressed air to remove any foreign particles or residue that may have accumulated in the passages.

Transmission

Gear Dog and Gear Dog Hole Damage

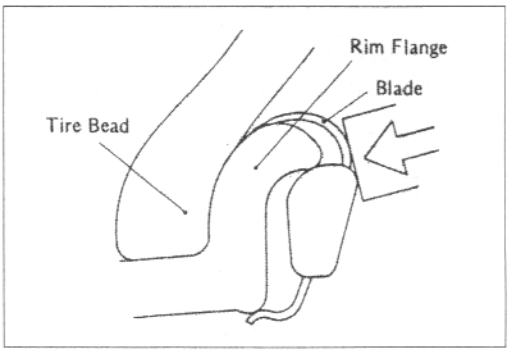
- Visually inspect the gear dogs [A] and gear dog holes [B].

★ Replace any damaged gears or gears with excessively worn dogs or dog holes.



Wheels (Rims)

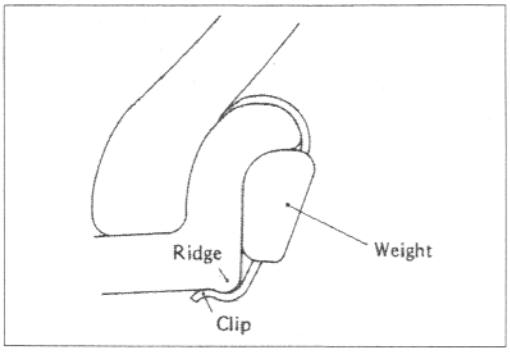
- Install the balance weight on the rim.
  - ○ Slip the weight on the rim flange by pushing or lightly hammering the weight in the direction shown in the figure.
  - ○ Check that the blade and weight seat fully on the rim flange, and that the clip is hooked over the rim ridge and reaches rim flat portion.



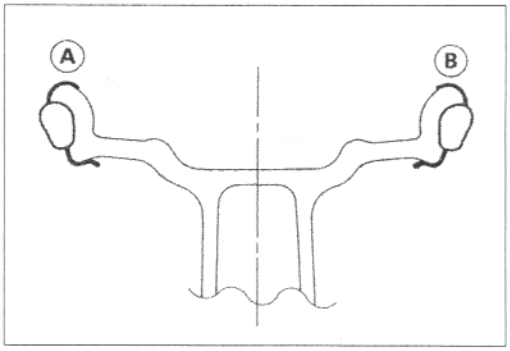
Installing Balance Weight

(a) Press or lightly hammer the weight in.

(b) Installation completed.



- When required total weight exceeds 20g, install balance weight at both sides of rim flange as shown.

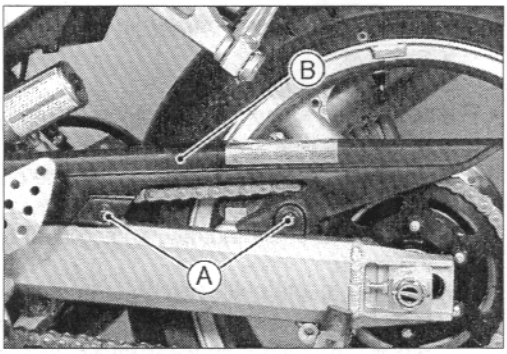


Required Total Weight	Weight Selection	
	One Side [A]	Other Side [B]
20g	10g	10g
30g	20g	10g
40g	20g	20g
50g	30g	20g
60g	30g	30g
70g	20g + 20g	30g
80g	20g + 20g	20g + 20g
90g	20g + 30g	20g + 20g

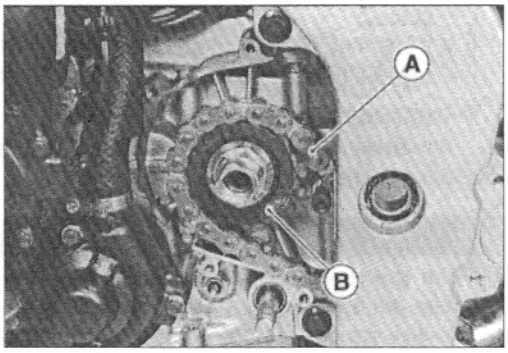
Drive Chain

Drive Chain Removal

- Remove:
  Chain Cover Screws [A]
  Chain Cover [B]
  Rear Wheel (see Wheels/Tires chapter)
  Swingarm (see Suspension chapter)
  Engine Sprocket Cover (see this chapter)

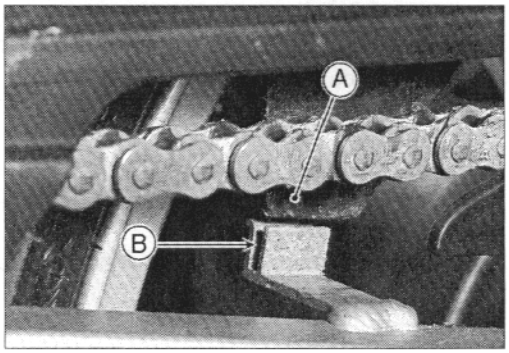


- Disengage the drive chain [A] from the engine sprocket [B], and take it off the chassis.



Drive Chain Installation

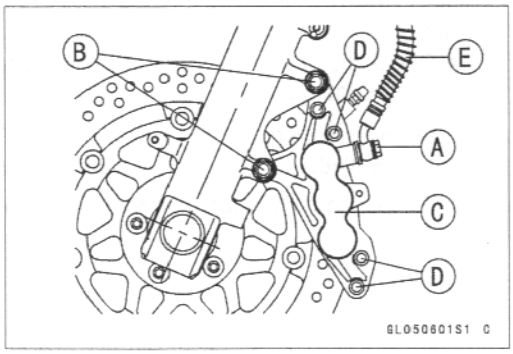
- Engage the drive chain to the engine sprocket.
- Install:
  Swingarm (see Suspension chapter)
  Rear Wheel (see Wheels/Tires chapter)
  Engine Sprocket Cover
  Chain Cover
- ○ Fit the flap [A] into the slot [B] in the swingarm.
- Adjust the chain slack after installing the chain (see Slack Adjustment).



Calipers

Front Caliper Removal

- Loosen the banjo bolt [A] at the brake hose lower end, and tighten it loosely.
- Unscrew the caliper mounting bolts [B], and detach the caliper [C] from the disc.



CAUTION

Do not loosen the caliper assembly bolts [D]. Take out only the caliper mounting bolts for caliper removal. Loosening the caliper assembly bolts will cause brake fluid leakage.

- Unscrew the banjo bolt and remove the brake hose [E] from the caliper (see Brake Hose Removal/Installation).

CAUTION

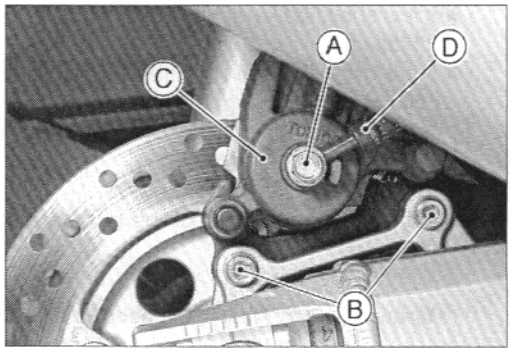
Immediately wash away any brake fluid that spills.

NOTE

○ *If the caliper is to be disassembled after removal and if compressed air is not available, disassemble the caliper before the brake hose is removed (see Front Caliper Disassembly).*

Rear Caliper Removal

- Loosen the banjo bolt [A] at the brake hose lower end, and tighten it loosely.
- Unscrew the caliper mounting bolts [B], and detach the caliper [C] from the disc.
- Unscrew the banjo bolt and remove the brake hose [D] from the caliper (see Brake Hose Removal/Installation).



CAUTION

Immediately wash away any brake fluid that spills.

NOTE

○ *If the caliper is to be disassembled after removal and if compressed air is not available, disassemble the caliper before the brake hose is removed (see Rear Caliper Disassembly).*

Caliper Installation

- Install the caliper and brake hose lower end.
- ○ Replace the washers that are on each side of hose fitting with new ones.
- Tighten the caliper mounting bolts and banjo bolt.

Torque - Caliper Mounting Bolts (Front): 34 N·m (3.5 kg·m, 25 ft·lb)
Caliper Mounting Bolts (Rear): 25 N·m (2.5 kg·m, 18.0 ft·lb)
Brake Hose Banjo Bolt: 25 N·m (2.5 kg·m, 18.0 ft·lb)

- Check the fluid level in the brake reservoirs.
- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠WARNING

Do not attempt to drive the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brakes will not function on the first application of the lever or pedal if this is not done.

Brake Fluid

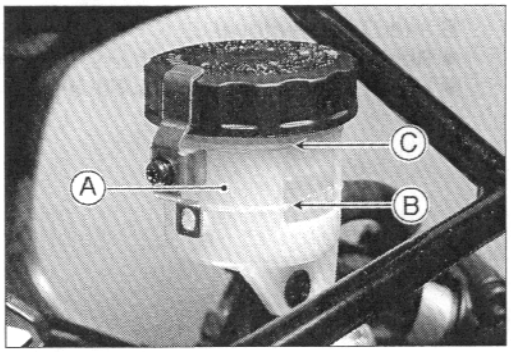
Level Inspection

- Check that the brake fluid level in the front brake reservoir [A] is above the lower level line [B].

NOTE

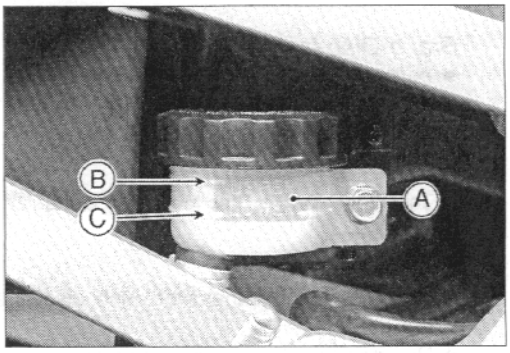
○ *Hold the reservoir horizontal by turning the handlebar when checking brake fluid level.*

★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [C] in the reservoir.



- Check that the brake fluid level in the rear brake reservoir [A] is between the upper [B] and the lower [C] level lines.

★ If the fluid level is lower than the lower level line, remove the fuel tank and fill the reservoir to the upper level line.



⚠WARNING

Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified. After changing the fluid, use only the same type and brand of fluid thereafter.

Recommended Disc Brake Fluid

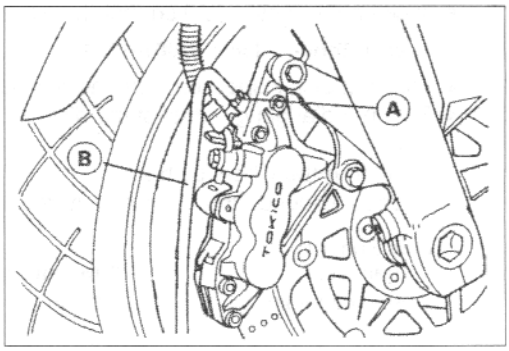
Grade:	**D.O.T.4**
Brand:	**Castrol Girling-Universal**
	Castrol GT (LMA)
	Castrol Disc Brake Fluid
	Check Shock Premium Heavy Duty

Brake Fluid Change

NOTE

○ *The procedure to change the front brake fluid is as follows. Changing the rear brake fluid is the same as for the front brake.*

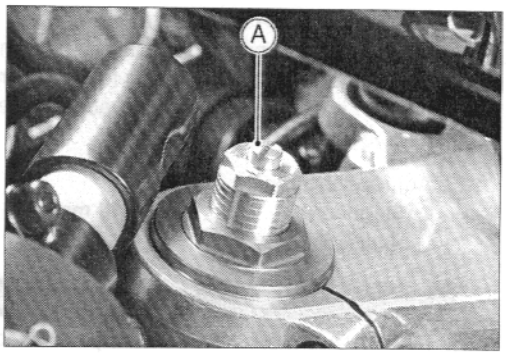
- Level the brake fluid reservoir.
- Remove the reservoir cap.
- Remove the rubber cap from the bleed valve [A] on the caliper.
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.
- Fill the reservoir with fresh specified brake fluid.



Front Fork

Rebound Damping Force Adjustment

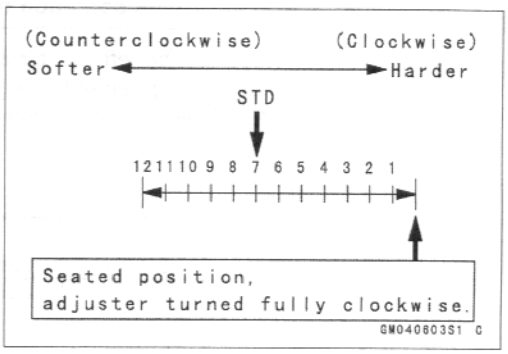
- To adjust the rebound damping force, turn the rebound damping adjuster [A] until you feel a click.
- The standard adjuster setting for the average-build rider of 68 kg (150 lb) with no passenger and no accessories is the **7th click** from the 1st click of the fully clockwise position.



⚠WARNING

If both adjusters are not adjusted equally, handling may be impaired and a hazardous condition may result.

- The damping force can be left soft for average riding. But it should be adjusted harder for high speed riding or riding with a passenger. If the damping feels too soft or too stiff, adjust it in accordance with the following table.

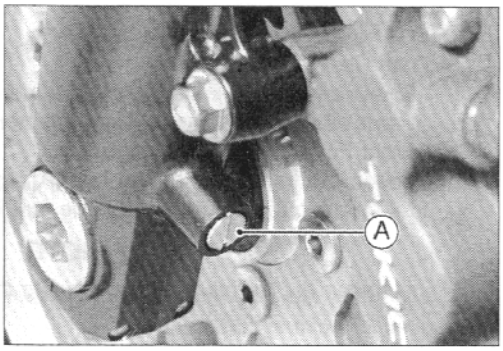


Rebound Damping Force Adjustment

Adjuster Position	Damping Force	Setting	Load	Road	Speed
12	Weak	Soft	Light	Good	Low
↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓
1	Strong	Hard	Heavy	Bad	High

Compression Damping Force Adjustment

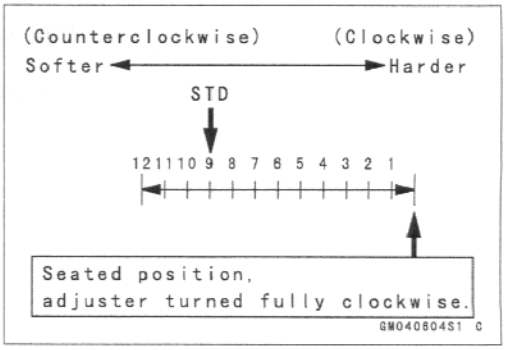
- To adjust the compression damping force, turn the compression damping adjuster [A] until you feel a click.
- The standard adjuster setting for the average-build rider of 68 kg (150 lb) with no passenger and no accessories is the **9th click** from the 1st click of the fully clockwise position.



⚠WARNING

If both adjusters are not adjusted equally, handling may be impaired and a hazardous condition may result.

- The damping force can be left soft for average riding. But it should be adjusted harder for high speed riding or riding with a passenger. If the damping feels too soft or too stiff, adjust it in accordance with the following table.



Compression Damping Force Adjustment

Adjuster Position	Damping Force	Setting	Load	Road	Speed
12	Weak	Soft	Light	Good	Low
↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓
1	Strong	Hard	Heavy	Bad	High

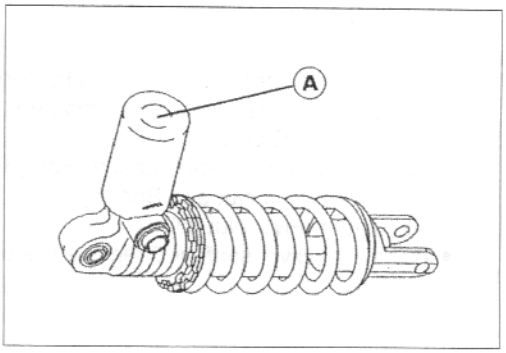
Rear Shock Absorber

Rear Shock Absorber Scrapping

⚠WARNING

Since the reservoir tank of the rear shock absorber contains nitrogen gas, do not incinerate the reservoir tank without first releasing the gas or it may explode.

- Remove the shock absorber (see Rear Shock Absorber Removal).
- Remove the valve cap [A] and release the nitrogen gas completely from the gas reservoir.
- Remove the valve.



⚠WARNING

Since the high pressure gas is dangerous, do not point the valve toward your face or body.

Steering Stem

NOTE

○ *Tighten the fork upper clamp bolts first, next the stem head nut, last the fork lower clamp bolts.*

Torque - Steering Stem Head Nut : 49 N·m (5.0 kg·m, 36 ft·lb)
Front Fork Clamp Bolts (Upper) : 20 N·m (2.0 kg·m, 14.5 ft·lb)
Front Fork Clamp Bolts (Lower) : 20 N·m (2.0 kg·m, 14.5 ft·lb)

- Install the removed parts (see appropriate chapters).

⚠WARNING

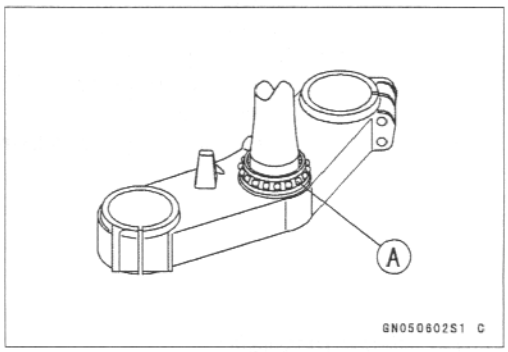
Do not impede the handlebar turning by routing the cables, harnesses and hoses improperly (see General Information chapter).

Stem Bearing Lubrication

- Remove the steering stem.
- Using a high flash-point solvent, wash the upper and lower ball bearings in the cages, and wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean off grease and dirt.
- Visually check the outer races and the ball bearings.

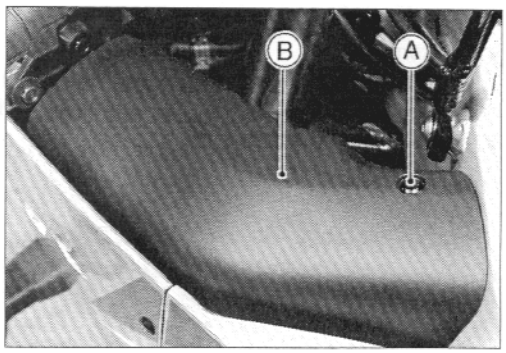
★ Replace the bearing assemblies if they show wear or damage.

- Pack the upper and lower ball bearings [A] in the cages with grease, and apply a light coat of grease to the upper and lower outer races.
- Install the steering stem, and adjust the steering.

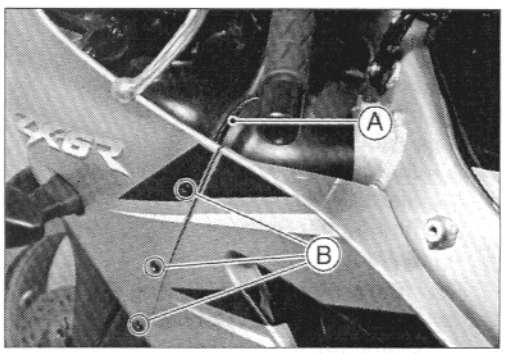


Fairings

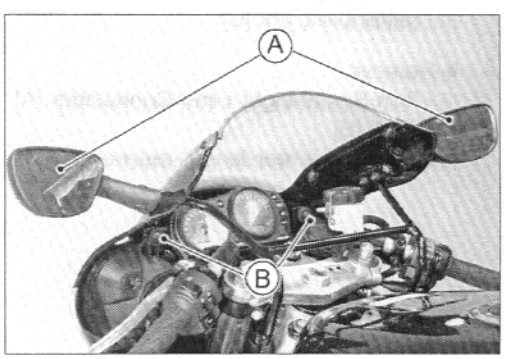
Inner Fairing Removal
- Remove the screws [A].
- Remove the inner fairing [B].



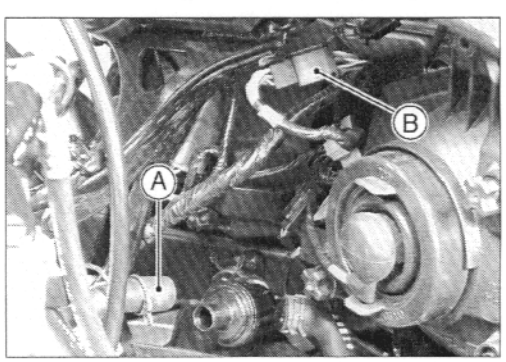
Upper Fairing Removal
- Removal:
  Inner Fairings
  Spring Bands [A] (Left and Right)
  Screws [B] (Left and Right)



- Remove:
  Rear View Mirrors [A]
  Bolts [B]



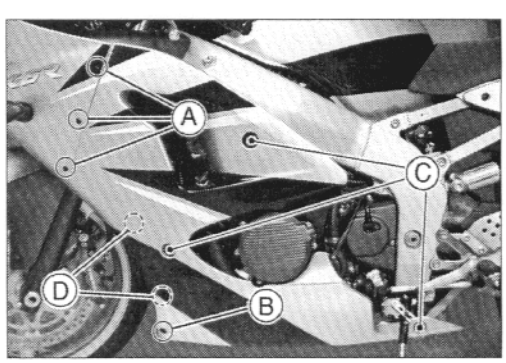
- Remove:
  Air Vent Filter Hose [A]
  Headlight/Turn Signal Light Lead Connector [B]
  Upper Fairing



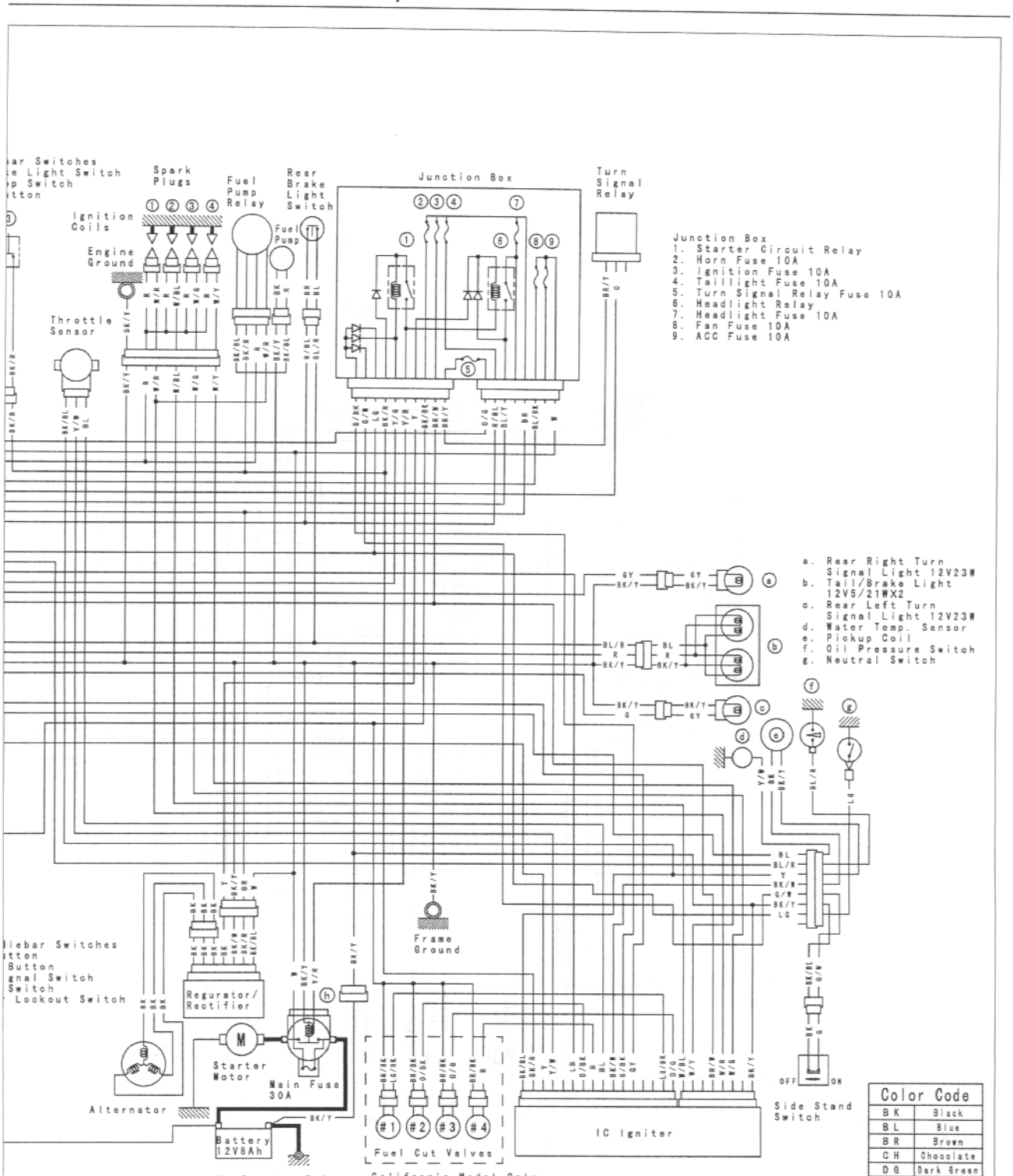
Lower Fairing Removal
- Remove:
  Screws [A] [B]
  Allen Bolts [C]
- Pull the lower front part of the lower fairing outward to clear the stoppers [D].
- Remove the lower fairing.
- Remove the other lower fairing in the same manner.

NOTE

○ *When removing the left and right lower fairings at the same time, do not remove the screws [B] (both sides) and stoppers [D].*



Wiring Diagram (U.S.A. and Canada)



Color Code	
BK	Black
BL	Blue
BR	Brown
CH	Chocolate
DG	Dark Green
G	Green
GY	Gray
LB	Light Blue
LG	Light Green
O	Orange
P	Pink
PU	Purple
R	Red
W	White
Y	Yellow

	Starter Lockout Switch		
Color	BK/Y	BK	BK/R
Clutch Lever			
Released		○	○
Pulled In	○		

IGNITION SWITCH CONNECTIONS							
	Ignition	Battery	Ignition	Tail1	Tail2	Battery	Tail3
Color	BR	W	GY	BL	R	W	O/G
OFF, LOCK							
ON	○	○	○	○	○	○	○
P		○		○		○	

RIGHT HANDLEBAR SWITCH CONNECTIONS							
Front Brake Light Switch			Engine Stop Switch			Starter Button	
Color	BK	BK	Color	Y/R	R	Color	BK/R	BK/R
Brake Lever			OFF					
Pulled In	○	○	RUN	○	○	Push	○	○

(98051-18968, 18978)

W221896BW5 C

Electrical Wiring

Wiring Inspection

- Visually inspect the wiring for signs of burning, fraying, etc.

★ If any wiring is poor, replace the damaged wiring.

- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.

★ If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.

- Check the wiring for continuity.

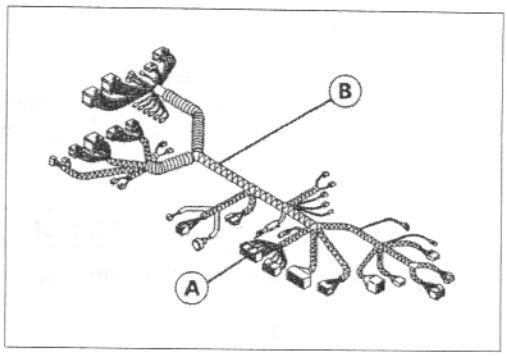
○ Use the wiring diagram to find the ends of the lead which is suspected of being a problem.

○ Connect the hand tester between the ends of the leads.

Special Tool - Hand Tester: 57001–1394

○ Set the tester to the × 1 Ω range, and read the tester.

★ If the tester does not read 0 Ω, the lead is defective. Replace the lead or the wiring harness [B] if necessary.



Charging System

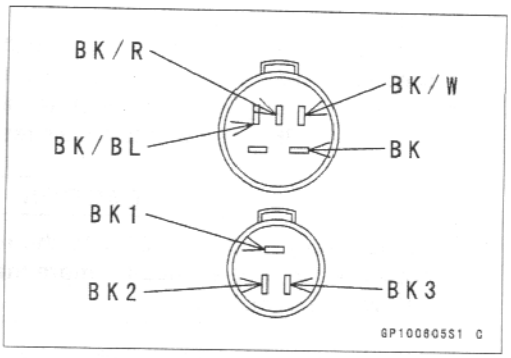
Rectifier Circuit Check:

- Check conductivity of the following pair of terminals.

Rectifier Circuit Inspection

Tester connection	BK/BL-BK1,	BK/BL–BK2,	BK/BL–BK3
	BK/W–BK1,	BK/W–BK2,	BK/W–BK3

★ The resistance should be low in one direction and more than ten times as much in the other direction. If any two leads are low or high in both directions, the rectifier is defective and must be replaced.



NOTE

○ *The actual meter reading varies with the meter used and the individual rectifier, but, generally speaking the lower reading should be from zero to one half the scale.*

Regulator Circuit Check:

To test the regulator out of circuit, use three 12 V batteries and a test light (12 V 3 ~ 6 W bulb in a socket with leads).

CAUTION

The test light works as an indicator and also a current limiter to protect the regulator/rectifier from excessive current. Do not use an ammeter instead of a test light.

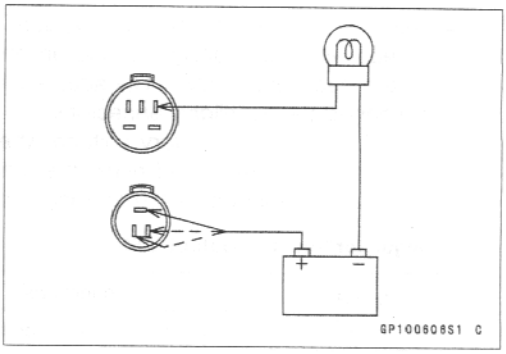
- Check to be sure the rectifier circuit is normal before continuing.

Regulator Circuit Test–1st Step:

- Connect the test light and the 12 V battery to the regulator/rectifier as shown.
- Check BK1, BK2, and BK3 terminal respectively.

★ If the test light turns on, the regulator/rectifier is defective. Replace it.

★ If the test light does not turn on, continue the test.

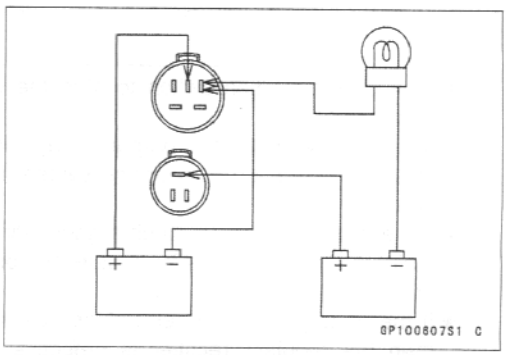


Regulator Circuit Test–2nd Step:

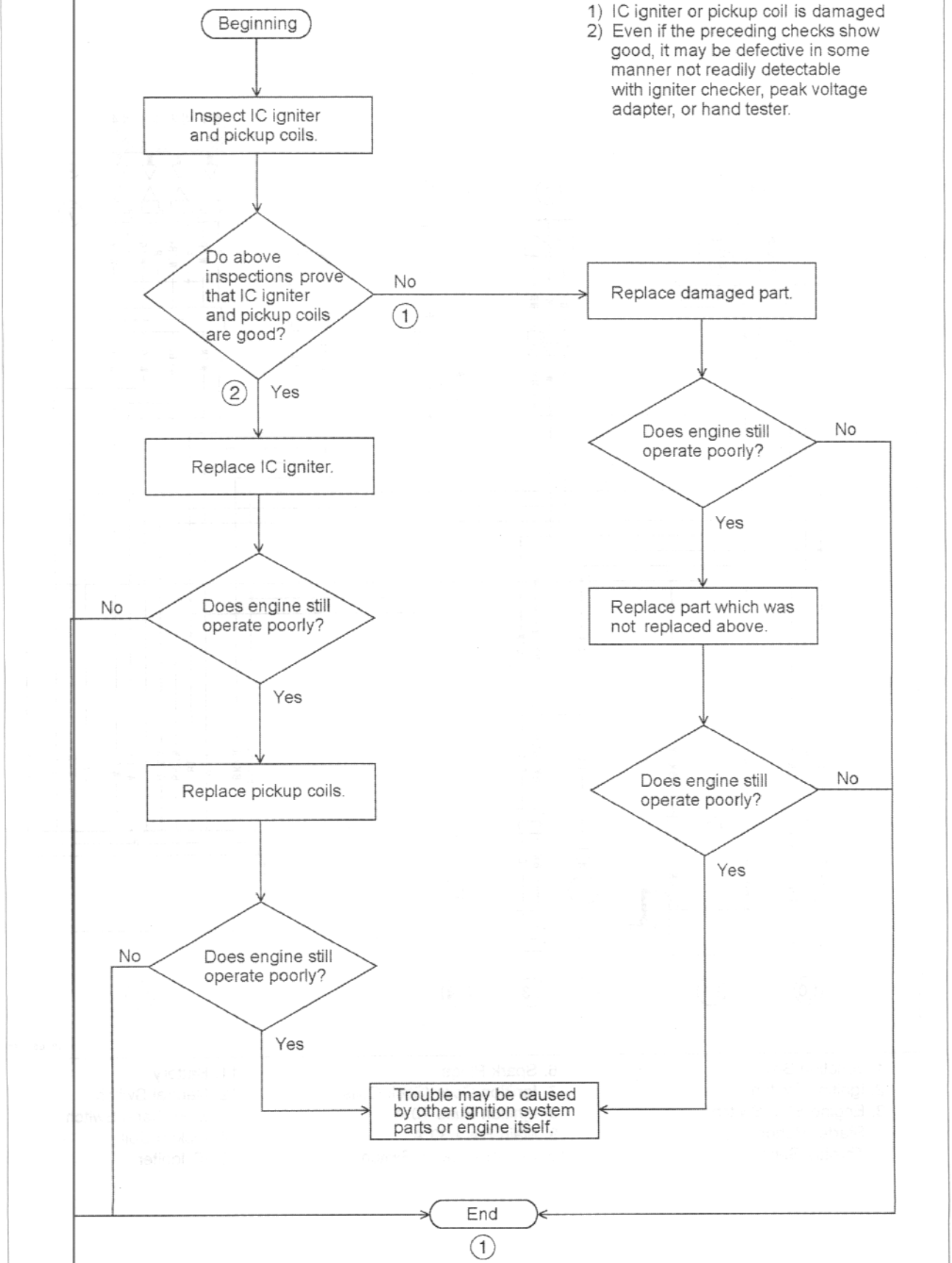
- Connect the test light and the 12 V battery in the same manner as specified in the "Regulator Circuit Test–1st Step".
- Apply 12 V to the BK/R terminal.
- Check BK1, BK2, and BK3 terminal respectively.

★ If the test light turns on, the regulator/rectifier is defective. Replace it.

- If the test light does not turn on, continue the test.

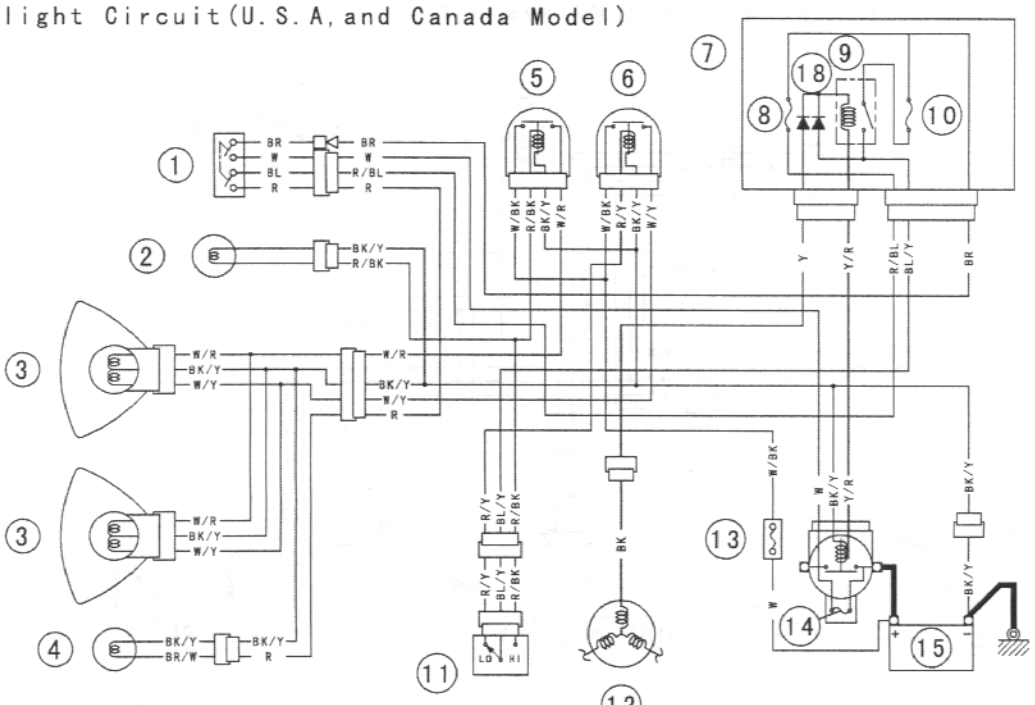


IC Igniter Troubleshooting

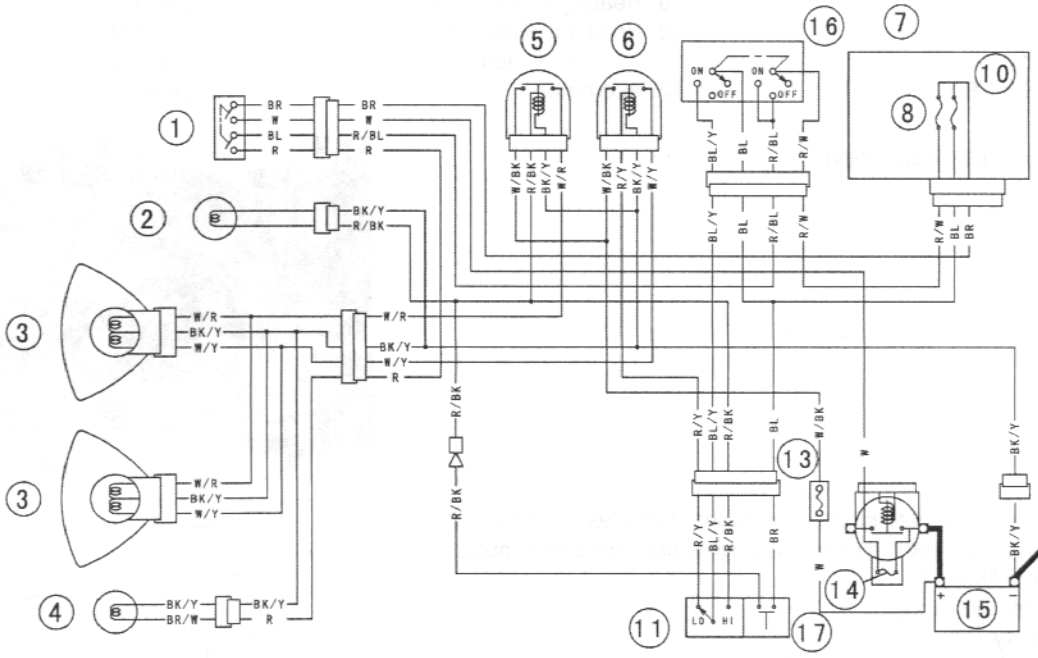


Lighting System

Headlight Circuit(U.S.A, and Canada Model)



Headlight Circuit(other than U.S.A, Canada, Australia and Malaysia Model)



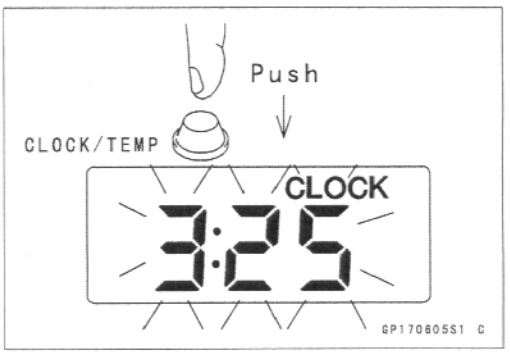
GP120604W4 C

1. Ignition Switch
2. High Beam Indicator Light
3. Headlight
4. City Light
5. Headlight Relay (Hi)
6. Headlight Relay (Lo)
7. Junction Box
8. Tail Light Fuse 10 A
9. Headlight Circuit Relay
10. Headlight Fuse 10 A
11. Dimmer Switch
12. Alternator
13. Headlight Fuse 20 A
14. Main Fuse 30 A
15. Battery
16. Headlight Switch
17. Passing Button
18. Diodes.

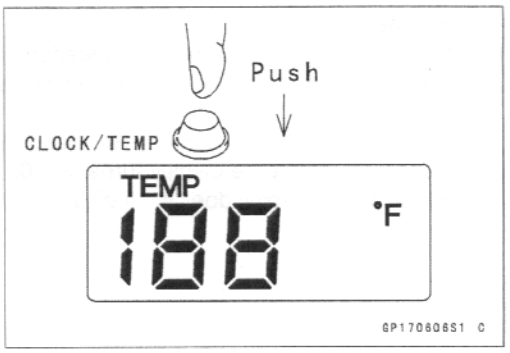
Meter

- Indicate the clock mode.
- Check that when the button in CLOCK mode is pushed for more than two seconds, the meter display turns to the clock set mode.
- Check that it is possible to adjust hours and minutes.

★ If the display function does not work and adjust, replace the meter assembly.



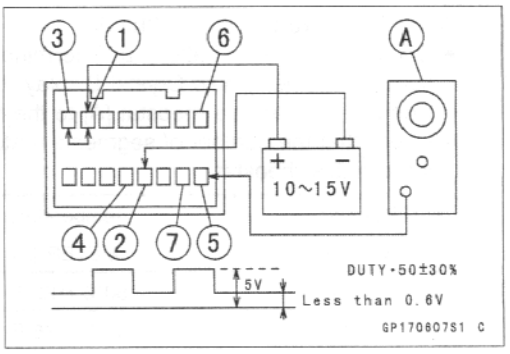
- Indicate the temp mode.
- Check that when the button in TEMP mode is pushed for more than two seconds, the figure display turns to Celsius degree or Fahrenheit degree of water temperature.



Speedometer Check:

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- The speed equivalent to the input frequency is indicated in the oscillator [A] if the square wave (illustrated as shown) would be input into the terminal [5].

○ Indicates approximately 60 mph in case the input frequency would be approximately 146 Hz.
○ Indicates approximately 60 km/h in case the input frequency would be approximately 91 Hz.



- If the oscillator is not available, the speedometer can be checked as follows.

○ Install the meter unit.
○ Raise the rear wheel off the ground, using the jack.
○ Turn on the ignition switch.
○ Rotate the rear wheel by hand.
○ Check that the speedometer shows the speed.

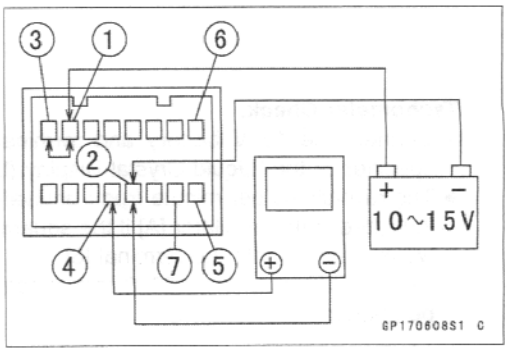
★ If the speedometer does not work, check the speed sensor electric source voltage and speed sensor.

Speed Sensor Electric Source Check:

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- Set the hand tester to the DC25 V range and connect it to the terminals [2] and [4].

★ If the voltage is less than 7 V, replace the meter assembly.

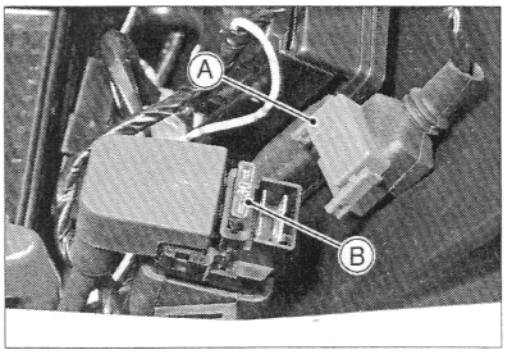
CAUTION
Do not short the terminals [2], [4] and [4], [5].



Fuse

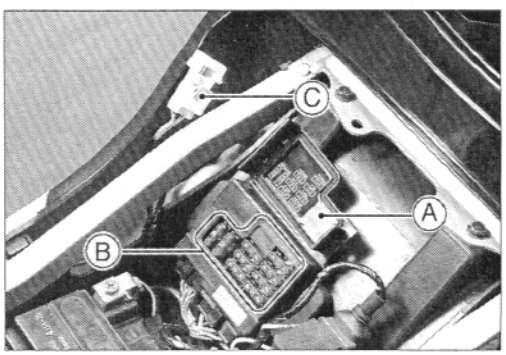
30A Main Fuse Removal

- Remove:
  Seats (see Frame chapter)
  Starter Relay and 30A Main Fuse Connector [A]
- Pull out the main fuse [B] from the starter relay with needle nose pliers.



Junction Box Fuse Removal

- Remove the seats (see Frame chapter).
- Unlock the hook to lift up the lid [A].
- Pull the fuses [B] straight out of the junction box with needle nose pliers.
  C: Headlight Fuse



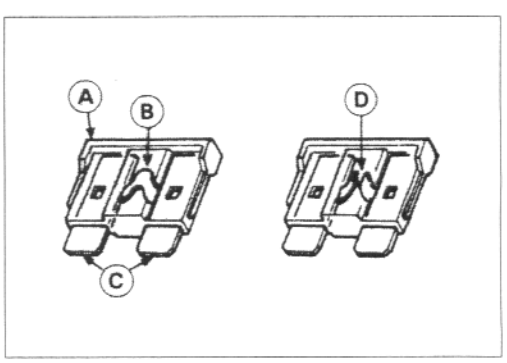
Fuse Installation

- If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse of proper amperage.
- Install the junction box fuses on the original position as specified on the lid.

Fuse Inspection

- Remove the fuse (see Fuse Removal).
- Inspect the fuse element.

★ If it is blown out, replace the fuse. Before replacing a blown fuse, always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.



Housing [A]
Fuse Element [B]
Terminals [C]
Blown Element [D]

CAUTION

When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.