

## **PREFACE**

This Service Manual describes the technical features and servicing procedures for the KYMCO *ZX / SCOUT 50*.

In this manual, many illustrations and drawings are used to help servicemen have better understanding.

Section 2 contains the service precautions for all operations and troubleshooting stated in this manual. Read them carefully before starting any operation.

Section 3 describes the inspection/adjustment procedures, safety rules and service information for each part, starting from periodic maintenance.

Sections 4 through 16 give instructions for disassembly, assembly and inspection of lubrication system, engine, fuel system and electrical equipment.

Section 17 is the maintenance and inspection directions for the evaporative/exhaust emission control system. Most sections start with an assembly or system illustration and troubleshooting for the section. The subsequent pages give detailed procedures for the section.

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# 1. SPECIFICATIONS

## SPECIFICATIONS

Name & Model		SC10AS	
Overall length (mm)		1792	
Overall width (mm)		690	
Overall height (mm)		1053	
Wheel base (mm)		1225	
Engine type		Air cooled 2-stroke	
Displacement (cc)		49.4 cc	
Net weight (kg)		92.5	
Seating capacity		2 riders (110kg)	
Gross weight(kg)		150	
Tires	Front wheel	120/70-12	
	Rear wheel	120/70-12	
Ground clearance (mm)		170	
Braking distance (m) (Initial speed Km/h)		7m (30km/h)	
Min. turning radius (mm)		1940	
Starting system		Starting motor & kick starter	
Fuel type		Gasoline, 2-stroke motor oil	
Cylinder arrangement		Single cylinder, flat	
Combustion chamber type		Semi-sphere	
Valve arrangement		Reed valve & piston	
Bore x stroke (mm)		39 x 41.4	
Compression ratio		7.3 : 1	
Compression pressure (kg/cm <sup>2</sup> rpm)		11.5kg/cm <sup>2</sup>	
Max. output (kw/rpm)		3.75/7000kw/rpm	
Max. torque (kg-m/rpm)		4.5/6500 kg m/rpm	
Port timing	Intake	Open	Automatic controlled
		Close	Automatic controlled
	Exhaust	Open	—
		Close	—
	Scavenge	Open	—
		Close	—
Idle speed (rpm)		2100±100	
Lubrication type		Separate type	
Oil pump type		Plunger type	
Oil filter type		Full-flow filtration	

Lubrication oil capacity (liter)		0.80	
Air cleaner type & No.		Wet, single	
Fuel capacity (liter)		4.9	
Carburetor	Type	Plunger type	
	Piston dia. (mm)	—	
	Venturi dia. (mm)	14	
Ignition system type		CDI electromagnetic Ignition	
Ignition timing F mark		15.5°±2°BTDC/2000rpm	
Spark plug	NGK	BR8HSA	
	ND	—	
Spark plug gap (mm)		0.6 0.7	
Battery capacity		12V3AH	
Power to transmission gear		Power-transmission gear-clutch	
Reduction ratio of power to transmission		—	
Clutch type		Dry multi-disc clutch	
Transmission gear operation type		Automatic centrifugal type	
Transmission ratio		1 speed	
Reduction gear	Type	Two-stage reduction	
	1st reduction ratio	—	
	2nd reduction ratio	—	
Transmission gear type		Non-stage transmission	
Tire pressure (kg/cm <sup>2</sup> )	Front wheel	1.50	1.75
	Rear wheel	1.75	2.25
Turning angle		Right & left 45°	
Brake system type	Front wheel	Expanding/hydraulic	
	Rear wheel	Expanding	
Suspension type	Front wheel	Telescope	
	Rear wheel	Unit swing	
Shock absorber type	Front wheel	Telescope	
	Rear wheel	Unit swing	
Frame type		Pipe under bone	
Exhaust emission concentration	CO	4.5%	
	HC	7000ppm Max	

## 2. GENERAL INFORMATION

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### GENERAL INFORMATION

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## 2. GENERAL INFORMATION

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### ENGINE SERIAL NUMBER/IDENTIFICATION

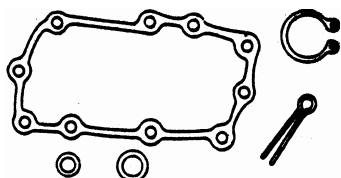


Location of Engine Serial Number

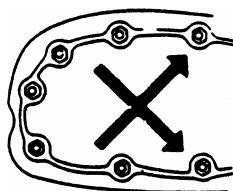
## 2. GENERAL INFORMATION

### SERVICE PRECAUTIONS

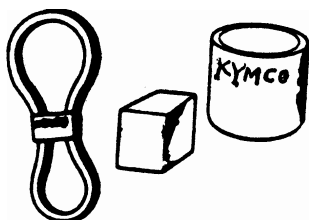
- Make sure to install new gaskets, O-rings, circlips, cotter pins, etc. when reassembling.



- When tightening bolts or nuts, begin with larger-diameter to smaller ones at several times, and tighten to the specified torque diagonally.



- Use genuine parts and lubricants.



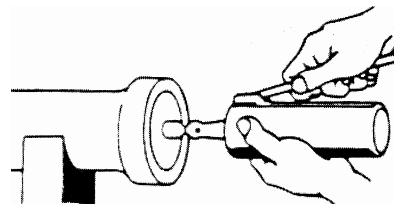
- When servicing the motorcycle, be sure to use special tools for removal and installation.



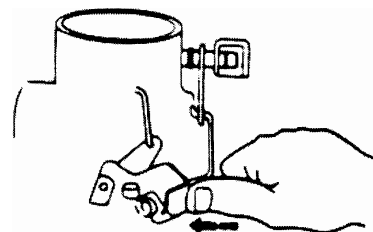
- After disassembly, clean removed parts. Lubricate sliding surfaces with engine oil before reassembly.



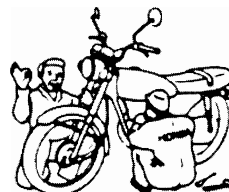
- Apply or add designated greases and lubricants to the specified lubrication points.



- After reassembly, check all parts for proper tightening and operation.

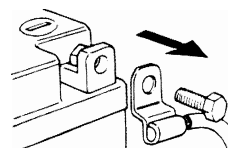


- When two persons work together, pay attention to the mutual working safety.



- Disconnect the battery negative (-) terminal before operation.

- When using a spanner or other tools, make sure not to damage the motorcycle surface.



- After operation, check all connecting points, fasteners, and lines for proper connection and installation.

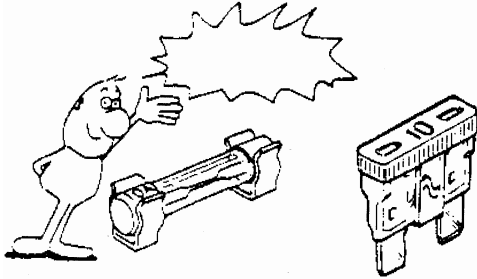
- When connecting the battery, the positive (+) terminal must be connected first.

- After connection, apply grease to the battery terminals.

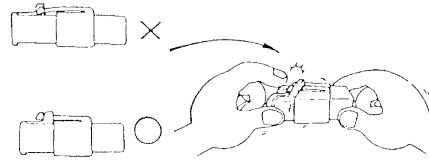
- Terminal caps shall be installed securely.

## 2. GENERAL INFORMATION

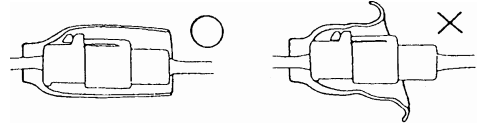
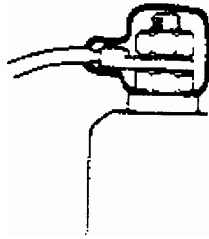
- If the fuse is burned out, find the cause and repair it. Replace it with a new one according to the specified capacity.



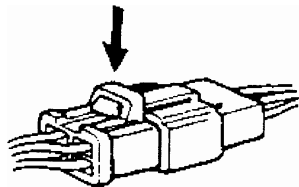
- The connector shall be inserted completely.
- If the double connector has a lock, lock it at the correct position.



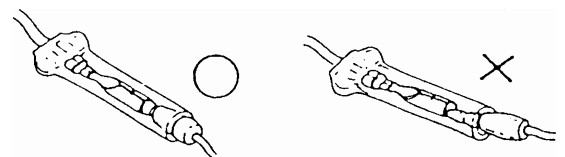
- After operation, terminal caps shall be installed securely.



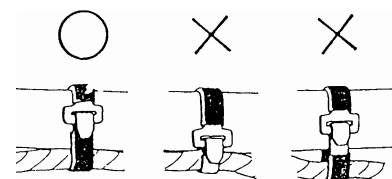
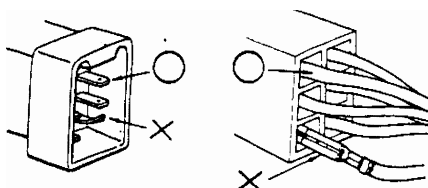
- When taking out the connector, the lock on the connector shall be released before operation.



- Hold the connector body when connecting or disconnecting it.
- Do not pull the connector wire.

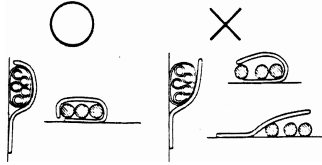


- Check if any connector terminal is bending, protruding or loose.

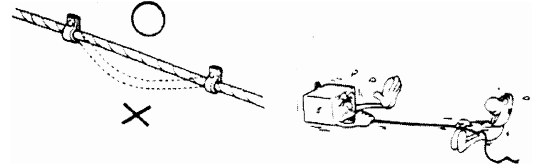


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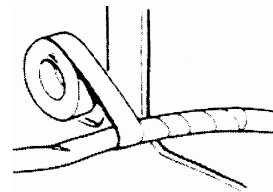
- After clamping, check each wire to make sure it is secure.



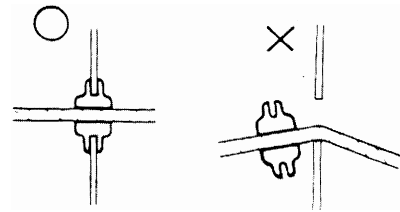
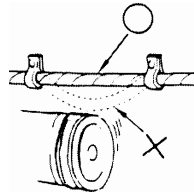
- Route harnesses so they are neither pulled tight nor have excessive slack.



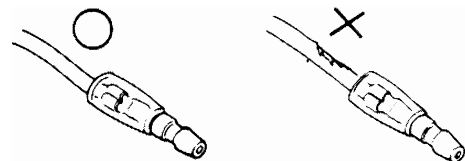
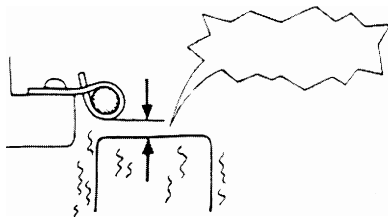
- Do not squeeze wires against the weld or its clamp.



- After clamping, check each harness to make sure that it is not interfering with any moving or sliding parts.

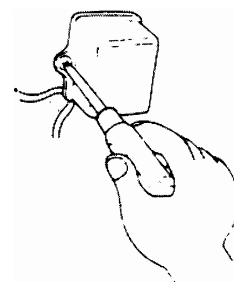
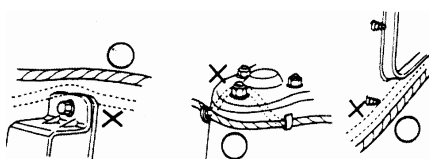


- When fixing the wire harnesses, do not make it contact the parts which will generate high heat.



- Route wire harnesses to avoid sharp edges or corners. Avoid the projected ends of bolts and screws.

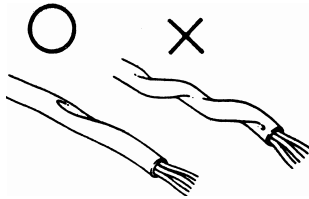
- Route wire harnesses passing through the side of bolts and screws. Avoid the projected ends of bolts and screws.



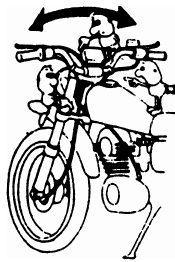


## 2. GENERAL INFORMATION

- After routing, check that the wire harnesses are not twisted or kinked.



- Wire harnesses routed along with handlebar should not be pulled tight, have excessive slack or interfere with adjacent or surrounding parts in all steering positions.



- When a testing device is used, make sure to understand the operating methods thoroughly and operate according to the operating instructions.



- Be careful not to damage components.



- When rust is found on a terminal, remove the rust with sand paper or equivalent before connecting.



- Symbols:

The following symbols represent the servicing methods and cautions included in this service manual.



: Caution



## 2. GENERAL INFORMATION

### SERVICE INFORMATION

ENGINE	Standard (mm)	Service Limit (mm)
	SC10AS	SC10AS
Item	SC10AS	SC10AS
Cylinder head warpage	—	0.10
Piston O.D.(5mm from bottom of piston skirt)	38.955 38.970	38.90
Cylinder-to- piston clearance		0.10
Piston pin hole I.D.	12.002 12.008	12.03
Piston pin O.D.	11.994 12.0	11.98
Piston-to-piston pin clearance	←	←
Piston ring end gap (top/second)	0.10 0.25	0.40
Connecting rod small end I.D.	17.005 17.017	17.03
Cylinder bore	39.0 39.025	39.05
Drive belt width	18	17
Drive pulley collar O.D.	20.01 20.025	←
Movable drive face ID.	20.035 20.085	19.97
Weight roller O.D.	13.0	12.4
Clutch outer I.D.	107 107.2	107.5
Driven face spring free length	87.9	82.6
Driven face O.D.	←	←
Movable driven face I.D.	←	←
Connecting rod big end side clearance	←	←
Connecting rod big end radial clearance	←	←
Crankshaft runout A/B	—	←

CARBURETOR	SC10AS
Venturi dia.	14mm
Identification number	014A
Float level	5.0mm
Main jet	#80
Slow jet	#35
Air screw opening	1 ±¼
Idle speed	2100±100rpm
Throttle grip free play	2 6mm
Jet needle clip notch	1st notch

## 2. GENERAL INFORMATION

FRAME		Standard (mm)	Service Limit (mm)
Item		SC10AS	SC10AS
Axle shaft runout		—	0.2
Front wheel rim runout	Radial		
	Axial		
Front shock absorber spring free length		200.0	182.8
Rear wheel rim runout			2.0
Brake drum I.D.	Front/rear	110	111
Brake lining thickness	Front/rear	4.0/4.0	2.0/2.0
Brake disk runout	Front/rear	—	0.30
Rear shock absorber spring free length		235.7	218.7

ELECTRICAL EQUIPMENT			SC10AS
Battery	Capacity		12V3AH
	Voltage		13.0 13.2V
	Charging current	Standard	0.4A/5H
		Quick	4A/0.5H
Spark plug	(NGK)		BR8HSA
Spark plug gap			0.6 0.7mm
Ignition coil resistance	Primary coil		0.153 0.187Ω
	Secondary coil (with plug cap)		6.99 10.21KΩ
	Secondary coil (without plug cap)		3.24 3.96KΩ
Pulser coil resistance (20 )			80 160Ω
Ignition timing			15.5°±2°BTDC/2000rpm

## 2. GENERAL INFORMATION

### TORQUE VALUES

#### ENGINE

Item	Thread dia. (mm)	Torque (kg-m)	Remarks
Cylinder head bolt	BF7x115	1.5 1.7	(cold)
Clutch drive plate nut	10	3.5 4.0	
Clutch outer nut	NH10	3.5 4.5	
Drive face nut	NH12	5.0 6.0	
Oil check bolt	10	1.0 1.5	
Engine mounting bolt	BF10x95	4.5 5.5	
Engine hanger bracket bolt	BF10x50	3.5 4.5	
Exhaust muffler joint lock nut	NC6mm	1.0 1.4	
Exhaust muffler lock bolt	BF8x35	3.0 3.6	
Spark plug		1.1 1.7	(cold)

#### FRAME

Item	Thread dia. (mm)	Torque (kg-m)	Remarks
Handlebar lock nut	10	4.5 5.0	Flange bolt/U-nut
Steering stem lock nut	25.4	8.0 12.0	
Steering top cone race	25.4	0.5 1.3	
Front axle nut	12	5.0 7.0	Flange U-nut
Rear axle nut	16	11.0 13.0	Flange U-nut
Rear brake arm bolt			Flange nut
Front shock absorber:			
upper mount bolt	8	3.3	Flange bolt/U-nut
lower mount bolt		3.3	Cross head
hex bolt		1.5 3.0	Apply locking agent
Front damper nut	8	1.5 3.0	
Front pivot arm bolt			Flange screw/U-nut
Rear shock absorber:			
upper mount bolt	10	3.5 4.5	Flange nut
lower mount bolt	8	2.4 3.0	
lower joint nut	8	1.5 2.5	

Torque specifications listed above are for important fasteners. Others should be tightened to standard torque values below.

#### STANDARD TORQUE VALUES

SH bolt: 8mm      Flange 6mm

bolt

Item	Torque (kg-m)	Item	Torque (kg-m)
5mm bolt, nut	0.45 0.6	5mm screw	0.35 0.5
6mm bolt, nut	0.8 1.2	6mm screw, SH bolt	0.7 1.1
8mm bolt, nut	1.8 2.5	6mm flange bolt, nut	1.0 1.4
10mm bolt, nut	3.0 4.0	8mm flange bolt, nut	2.4 3.0
12mm bolt, nut	5.0 6.0	10mm flange bolt, nut	3.5 4.5

## 2. GENERAL INFORMATION

### SPECIAL TOOLS

Tool Name	Tool No.	Remarks
Universal bearing puller	E030	Crankshaft bearing removal
Lock nut socket wrench	F001	Top cone race holding
Lock nut wrench,	F002	Stem lock nut tightening
Crankcase puller	E026	Crankcase disassembly
Bearing remover set, 12mm (Spindle assy, 12mm) (Remover weight)	E020	Drive shaft bearing removal/installation
Bearing remover set, 15mm (Spindle assy, 15mm) (Remover head, 15mm) (Remover shaft, 15mm)	E018	Drive shaft bearing removal/installation
Bearing outer driver, 28x30mm	E014	Bearing installation
Clutch spring compressor	E027	Driven pulley disassembly/assembly
Crankcase assembly collar	E023	Driven shaft, crankshaft & crankcase assembly
Crankcase assembly tool	E024	Crankshaft & crankcase assembly
Ball race remover	F005	Steering stem bearing races
Rear shock absorber compressor	F004	Rear shock absorber disassembly/assembly
Universal holder	E017	Flywheel holding
Flywheel puller	E001	Flywheel removal
Bearing outer driver, 32x35mm	E014	Drive shaft bearing installation Final shaft bearing installation
Bearing outer driver, 37x40mm	E014	Drive shaft bearing installation Final shaft bearing installation Crankshaft bearing installation
Universal bearing puller	E030	Crankshaft bearing removal

## 2. GENERAL INFORMATION

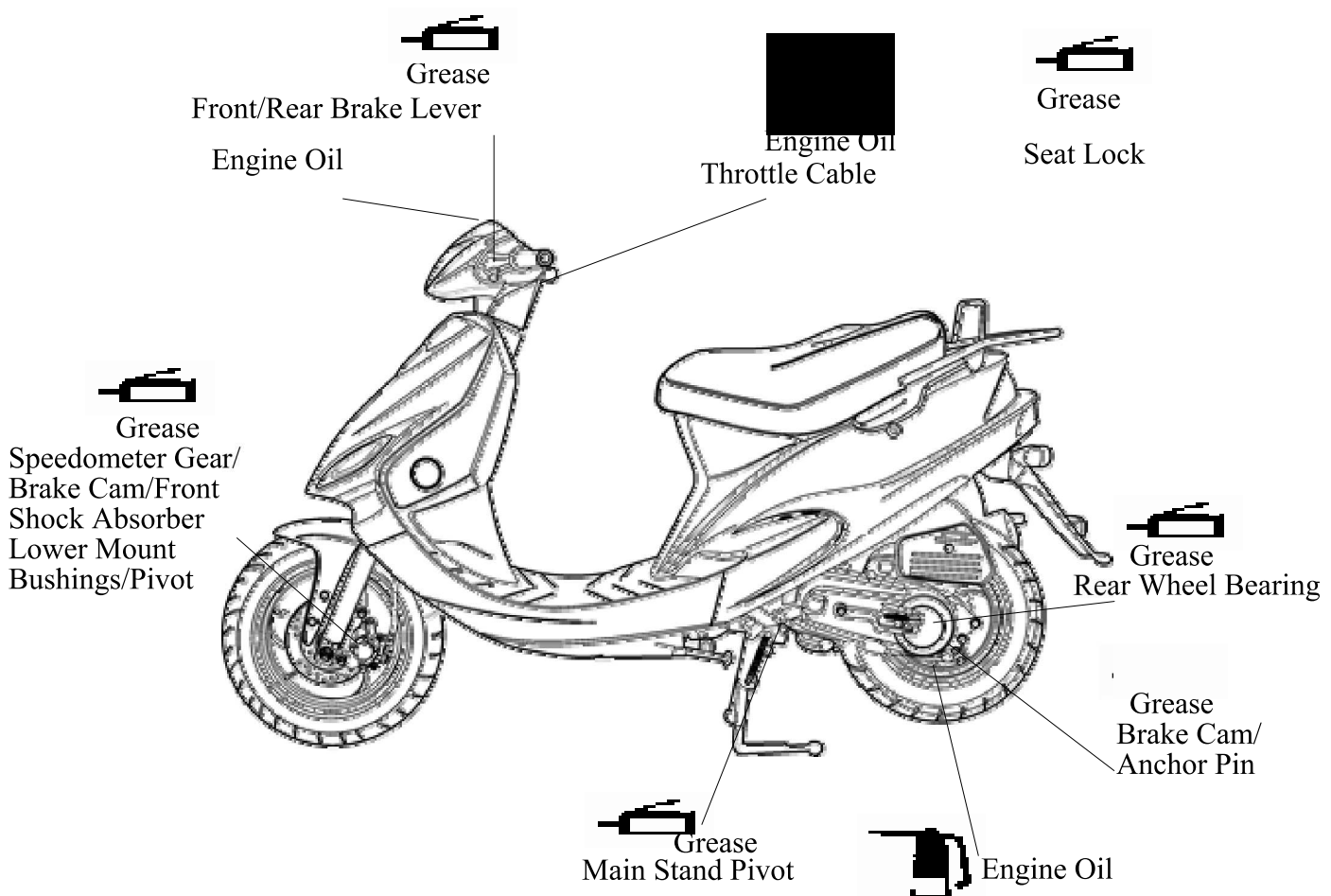
### LUBRICATION POINTS

#### ENGINE

NO.	Lubrication Points	Lubricant	Remarks
1	Crankcase sliding & movable	JASO-FC or API-TC	
2	Cylinder movable parts	JASO-FC or API-TC	
3	Transmission gear (final gear)	SAE-90#	
4	Kick starter spindle bushing	Grease	
5	Drive pulley movable parts	Grease	
6	Starter pinion movable parts	Grease	

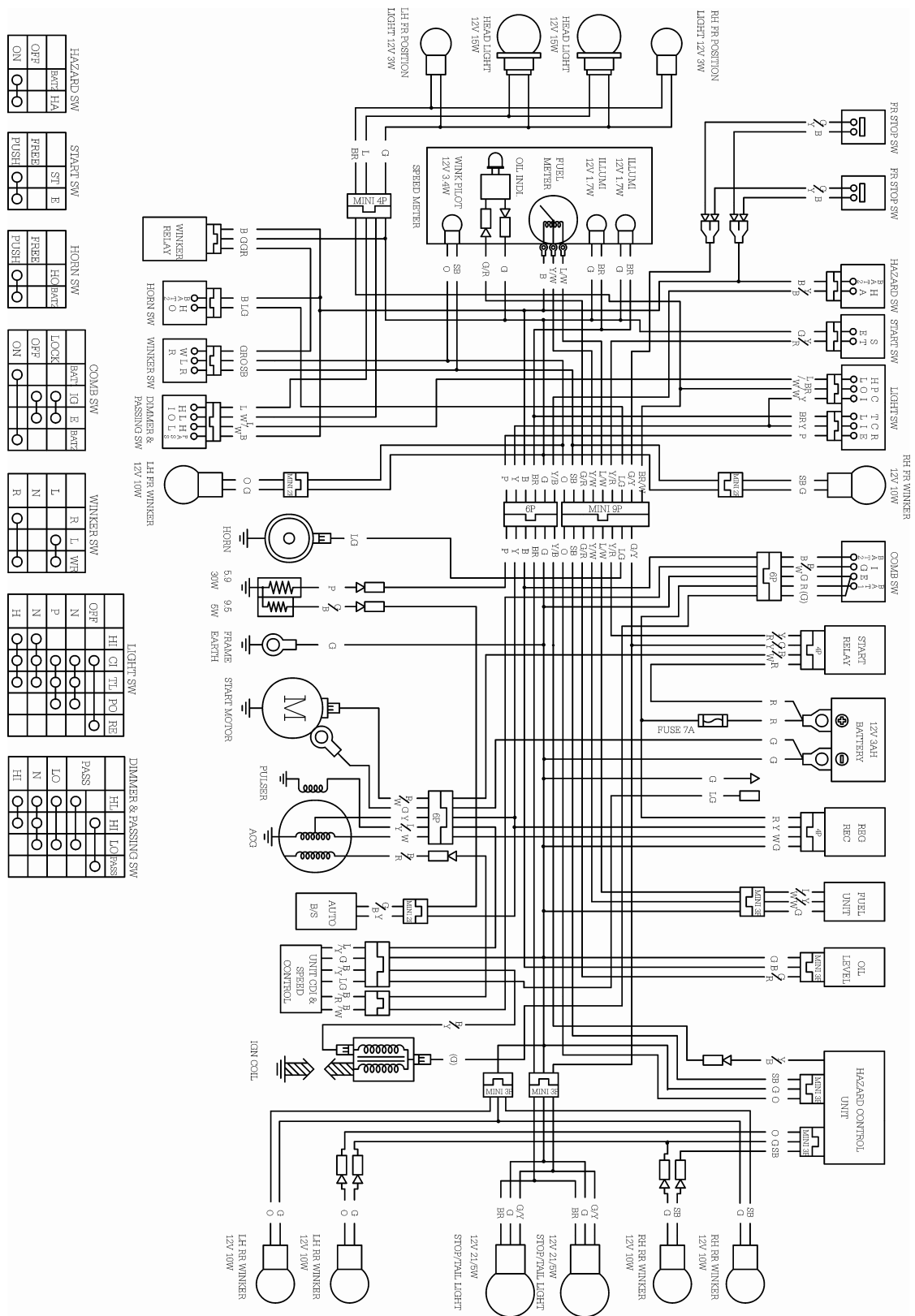
#### FRAME

Apply clean engine oil or grease to cables and movable parts not specified. This will avoid abnormal noise and rise the durability of the motorcycle.



# 2. GENERAL INFORMATION

## SC10AS WIRING DIAGRAM



HAZARD SW	
OFF	ON
BA	HA
○	○

START SW	
FREE	PUSH
ST	E
○	○

HORN SW	
FREE	PUSH
HO	BA
○	○

COMB SW	
LOCK	ON
BA	IG
○	○

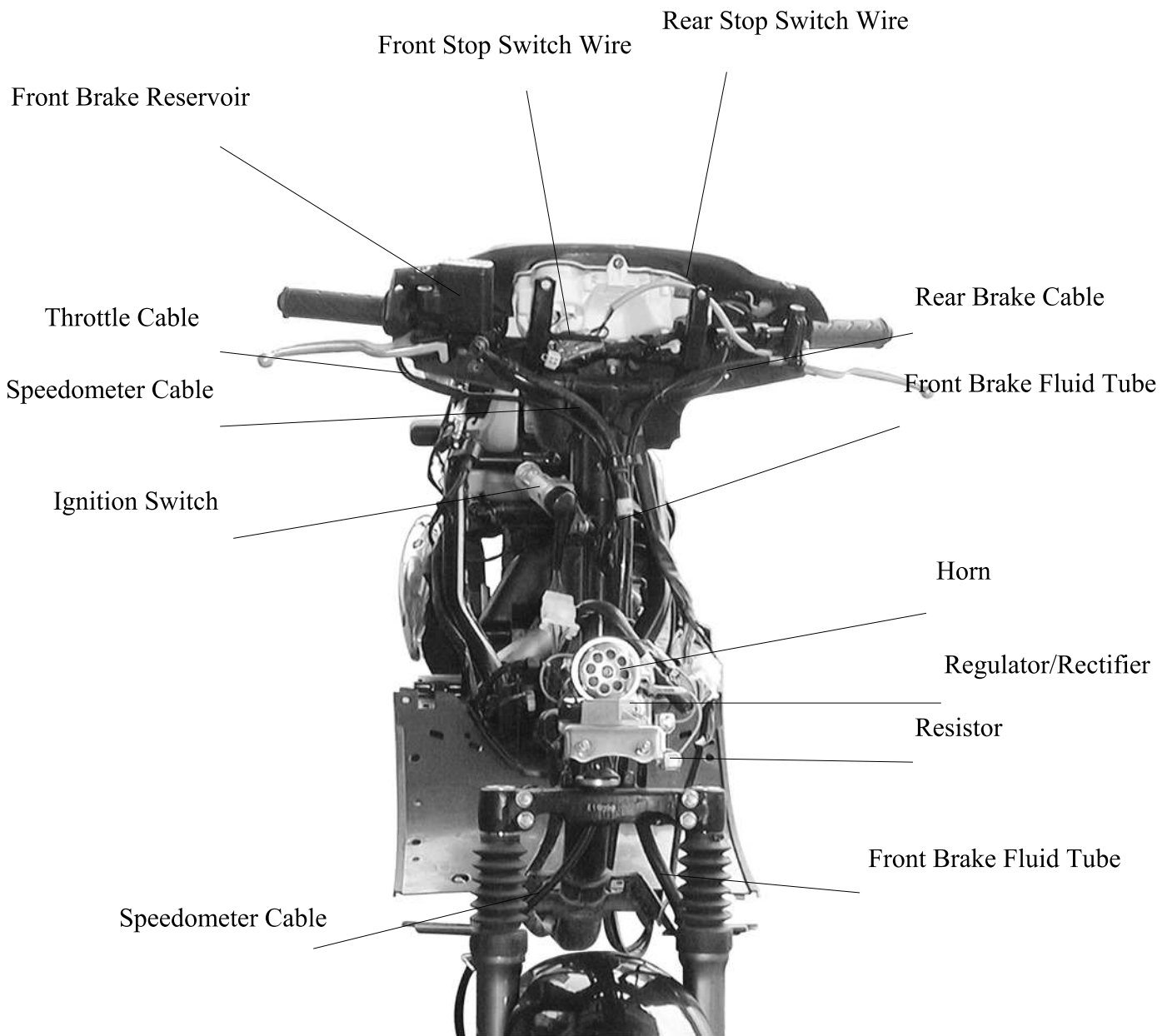
WINKER SW	
OFF	ON
R	L
○	○

LIGHT SW	
OFF	ON
HI	LO
○	○

DIMMER & PASSING SW	
OFF	ON
HI	LO
○	○

## 2. GENERAL INFORMATION

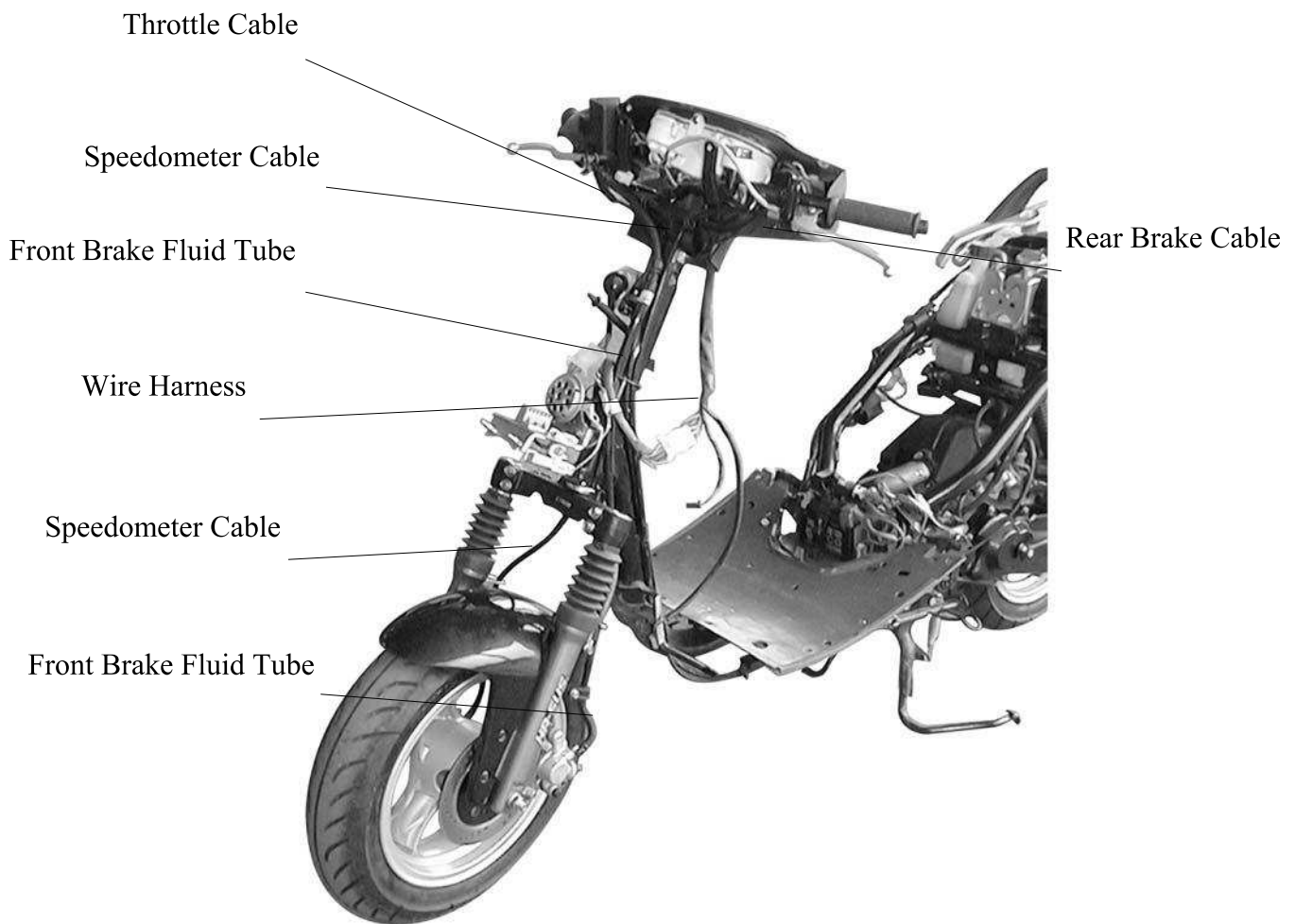
### CABLE & HARNESS ROUTING



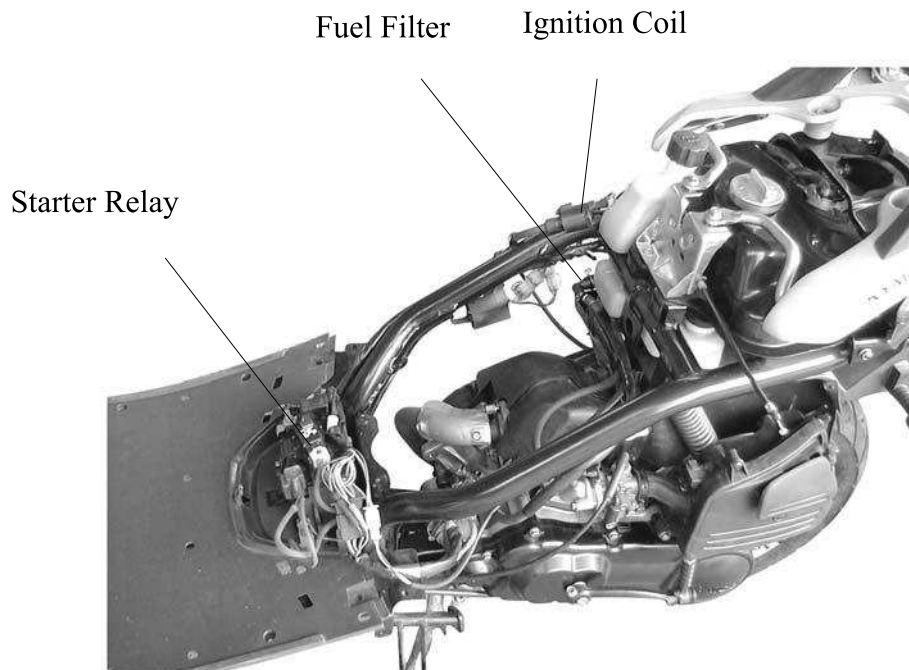
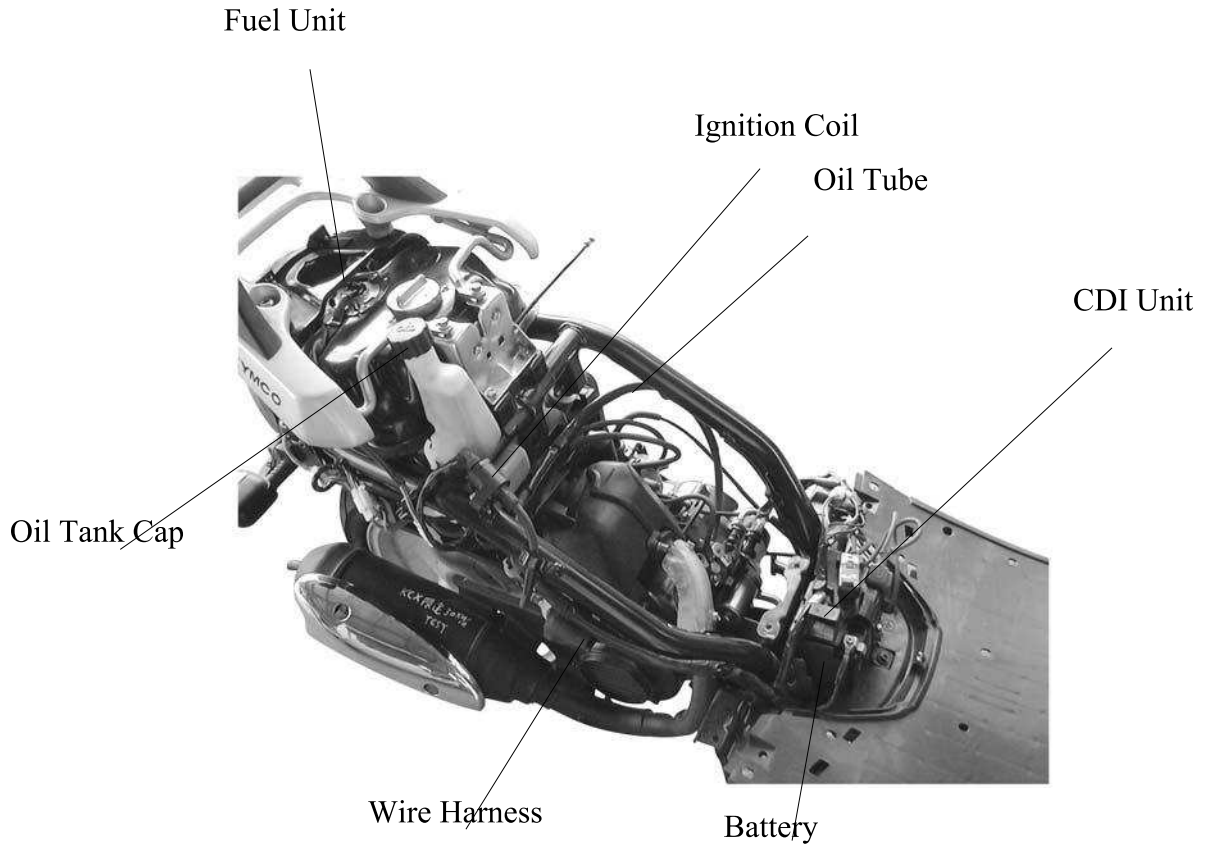


## 2. GENERAL INFORMATION

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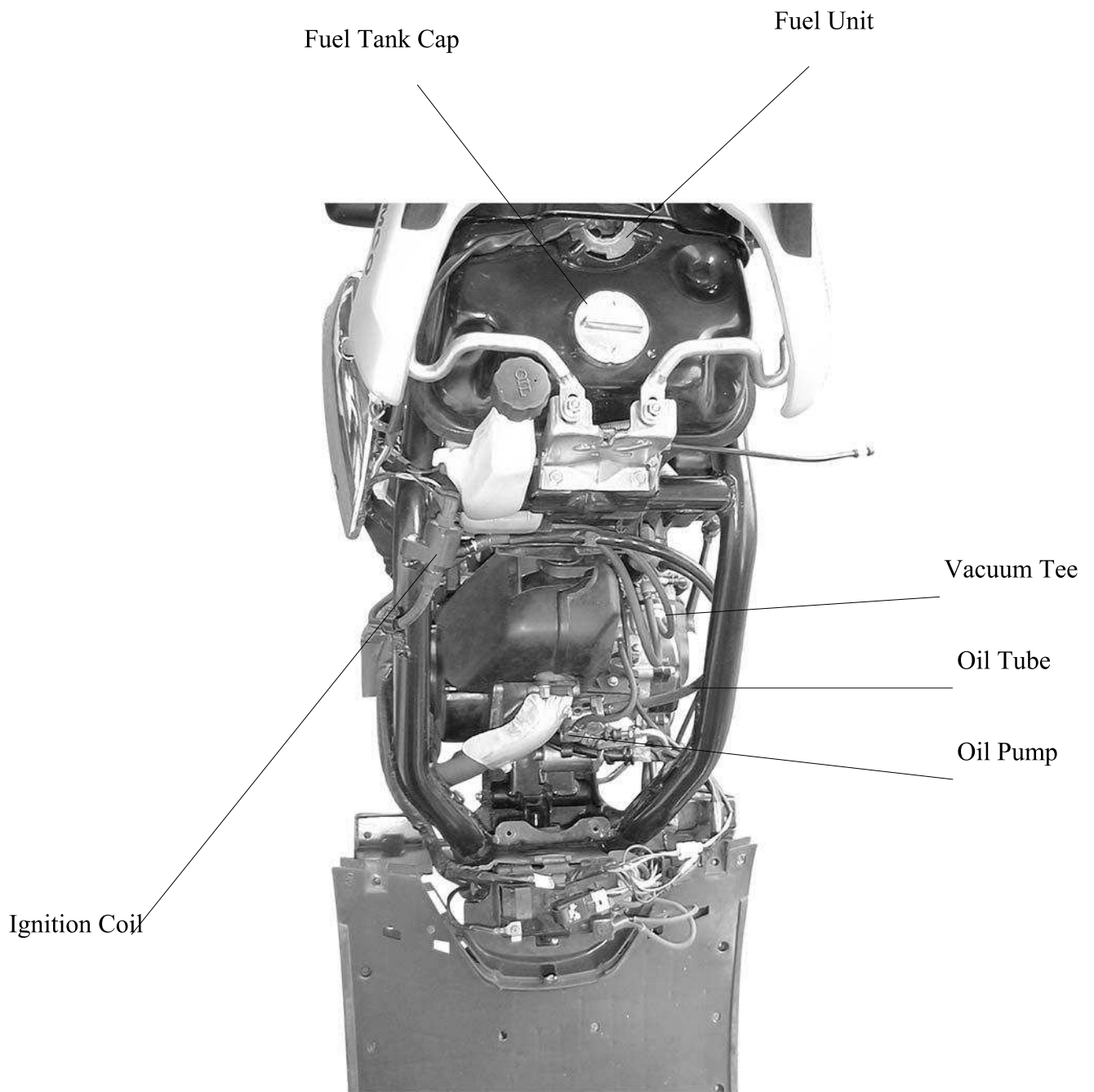


## 2. GENERAL INFORMATION



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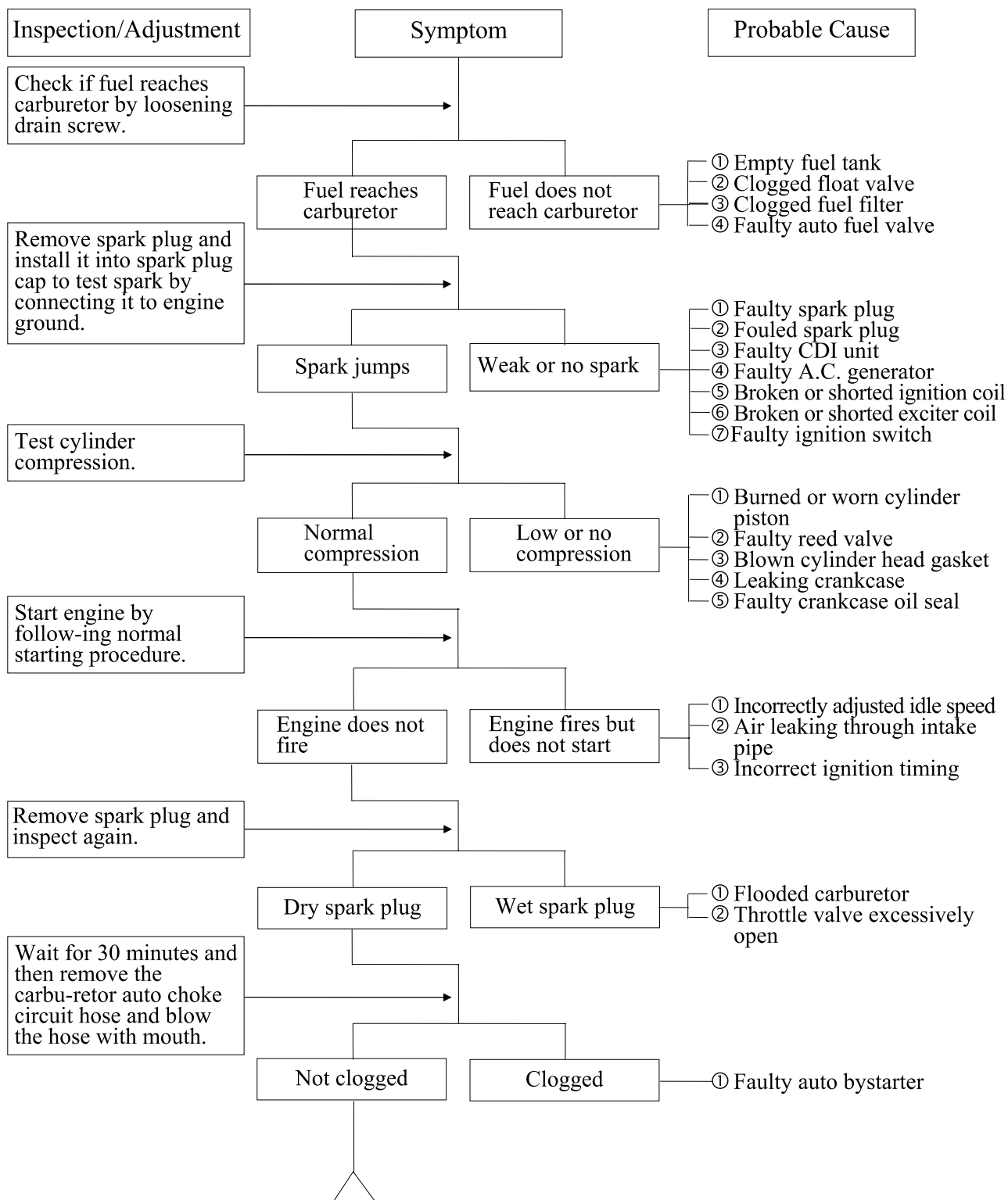
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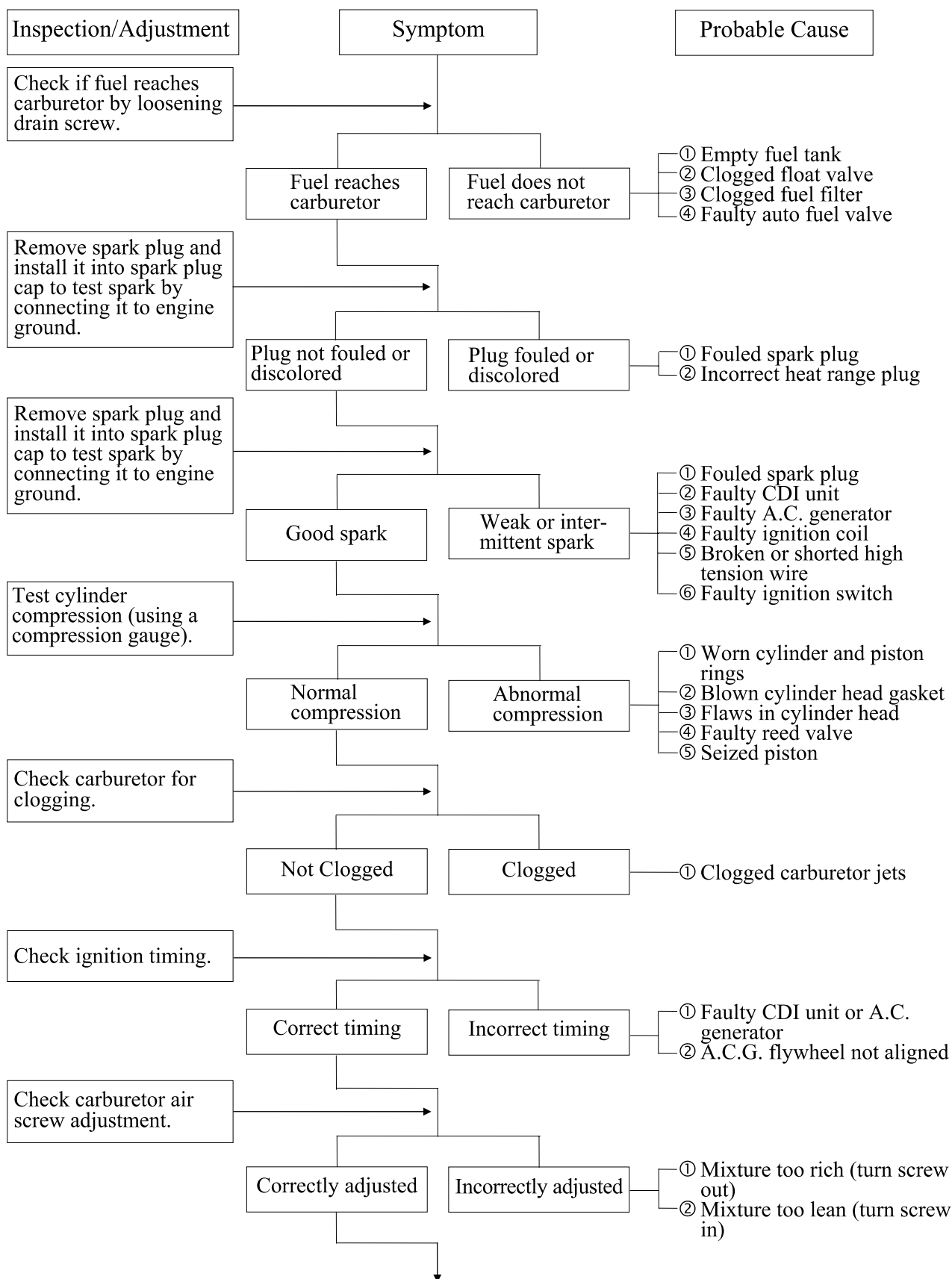
### TROUBLESHOOTING

#### ENGINE WILL NOT START OR IS HARD TO START

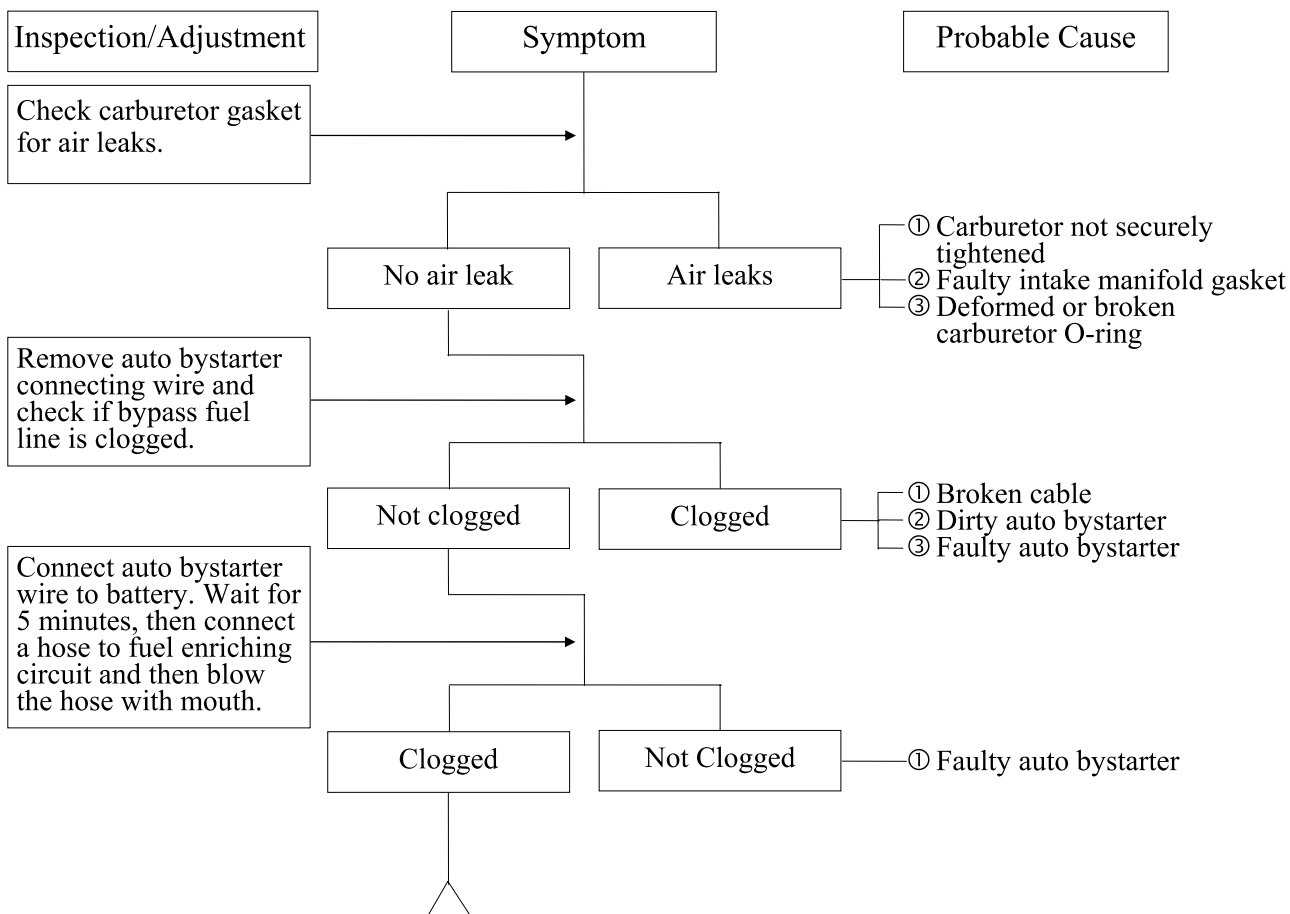


## 2. GENERAL INFORMATION

### ENGINE STOPS IMMEDIATELY AFTER IT STARTS

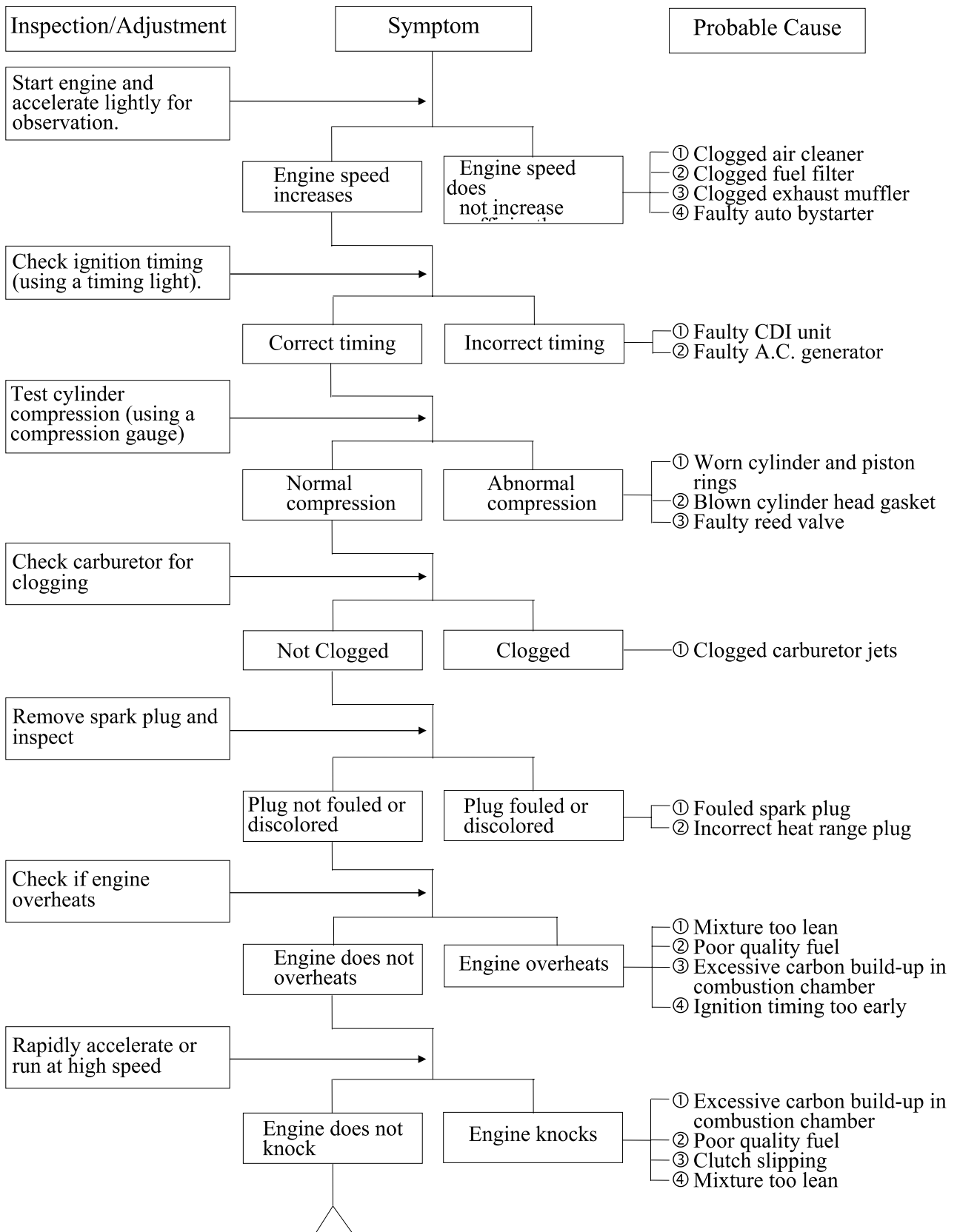


## 2. GENERAL INFORMATION



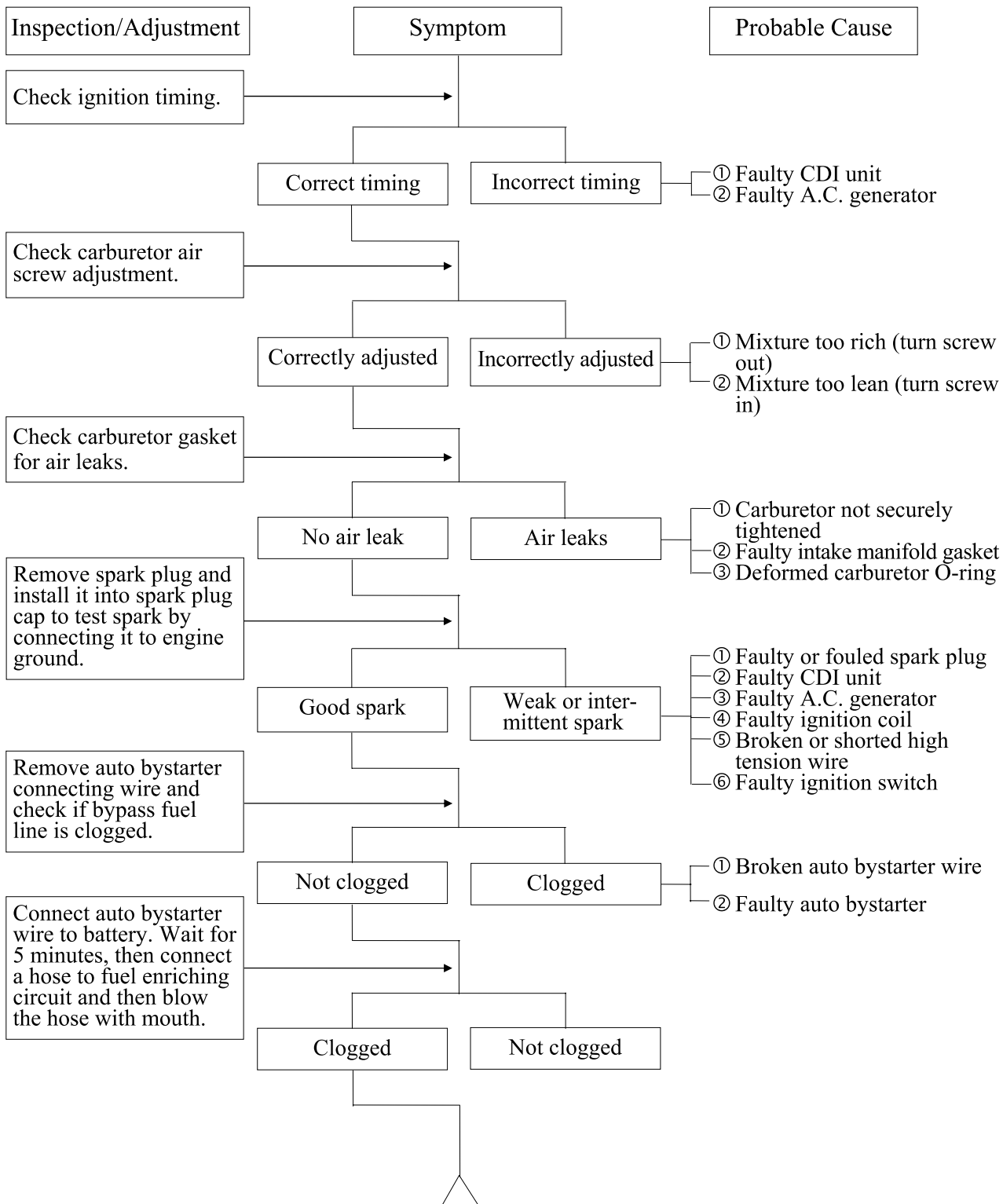
## 2. GENERAL INFORMATION

### ENGINE LACKS POWER



## 2. GENERAL INFORMATION

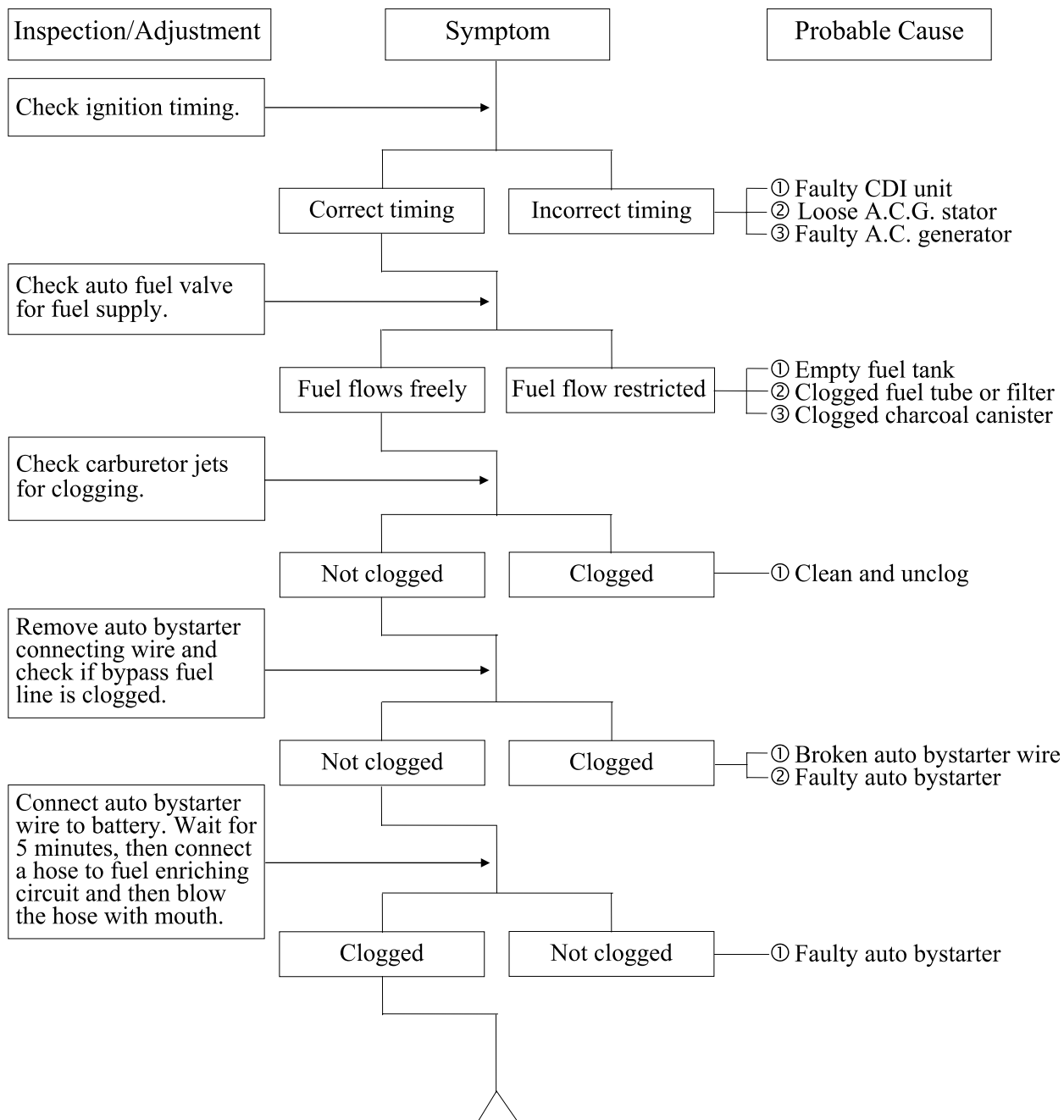
### POOR PERFORMANCE (ESPECIALLY AT IDLE AND LOW SPEEDS)





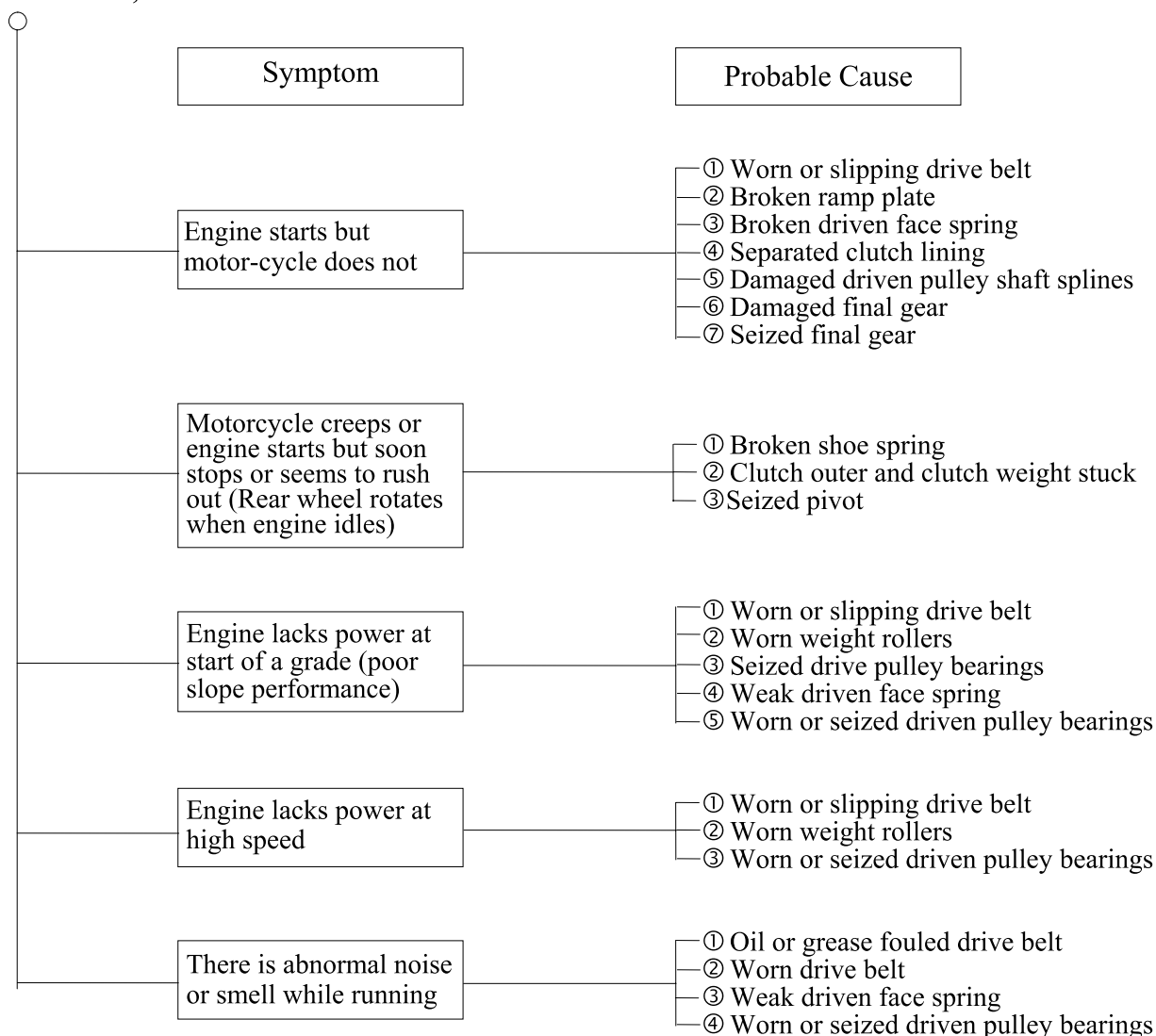
## 2. GENERAL INFORMATION

### POOR PERFORMANCE (AT HIGH SPEED)

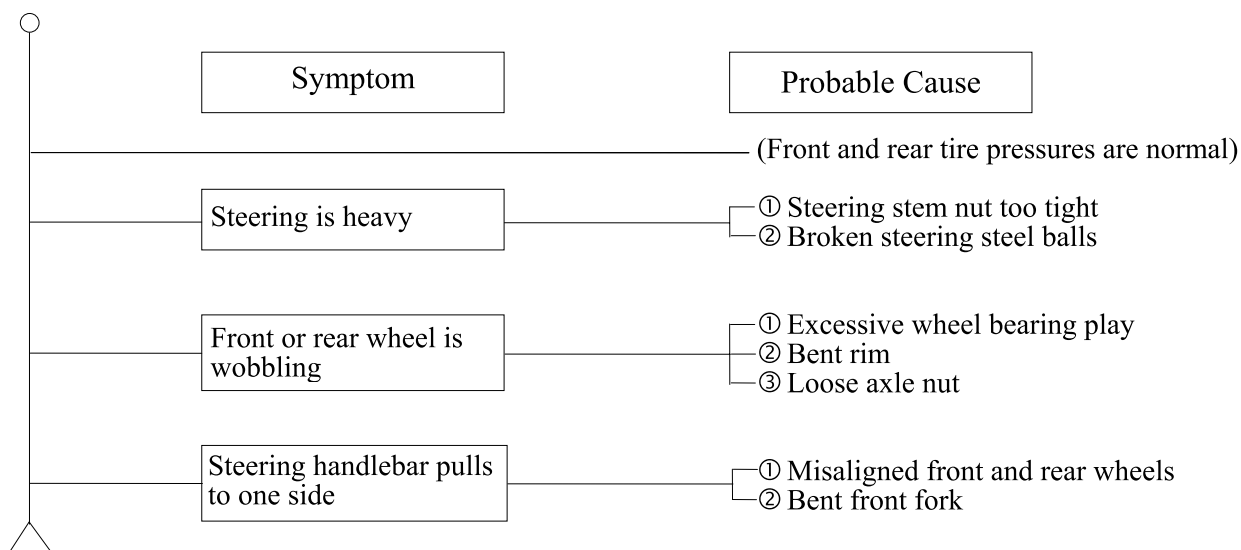


## 2. GENERAL INFORMATION

### CLUTCH, DRIVE AND DRIVEN PULLEYS

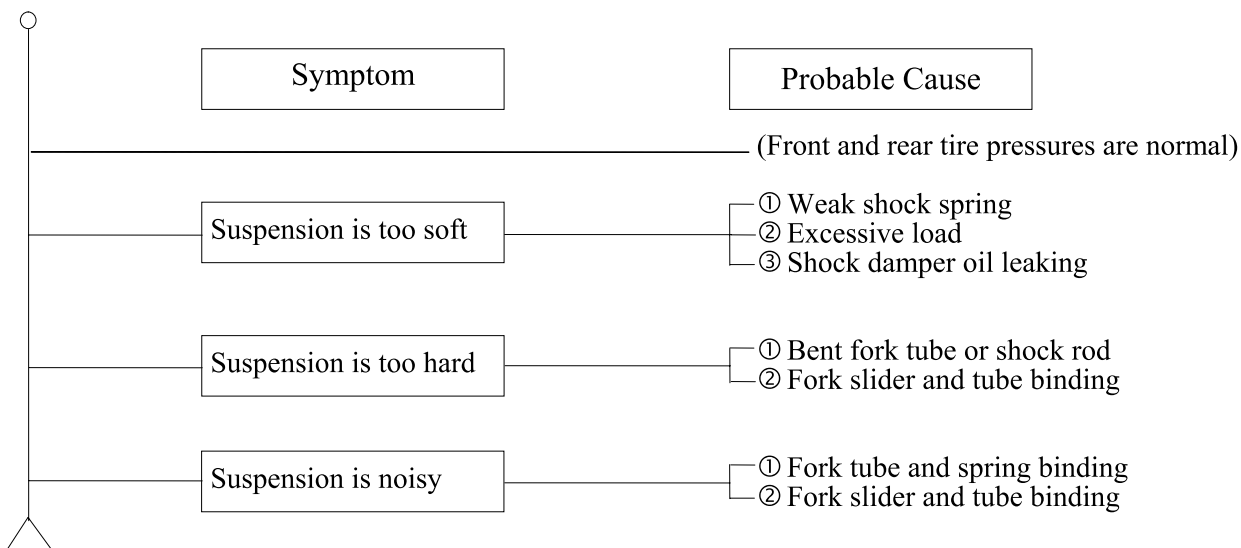


### STEERING HANDLEBAR DOES NOT TRACK STRAIGHT

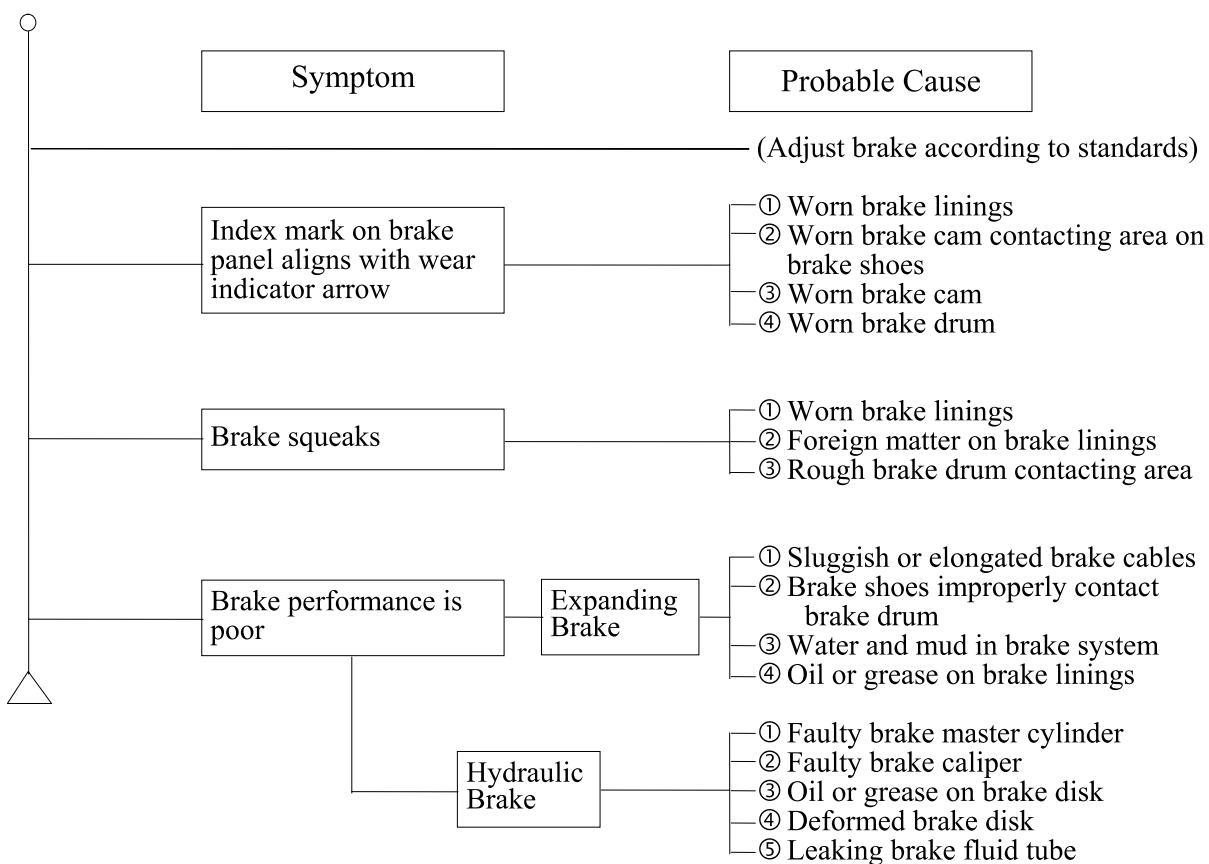


## 2. GENERAL INFORMATION

### POOR SUSPENSION PERFORMANCE



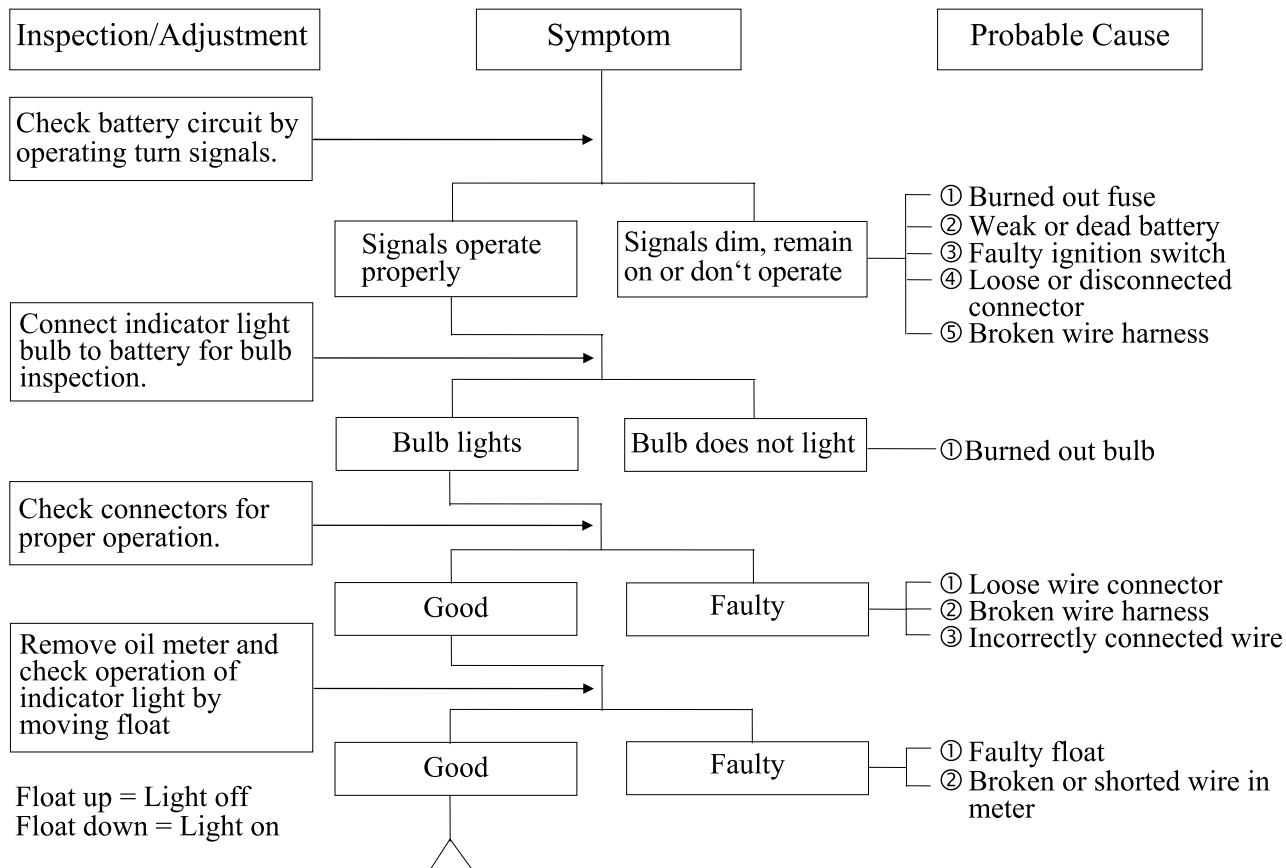
### POOR BRAKE PERFORMANCE



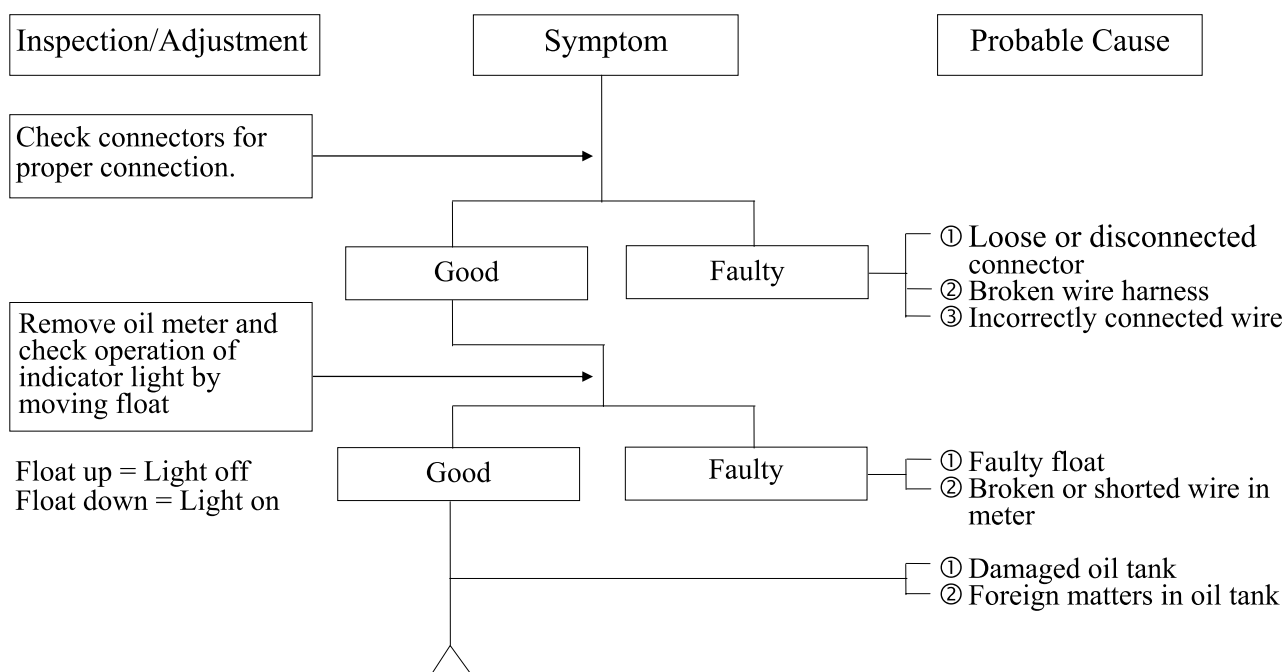
## 2. GENERAL INFORMATION

### OIL METER

1. Motor oil indicator light does not come on when there is no motor oil (Ignition switch ON)



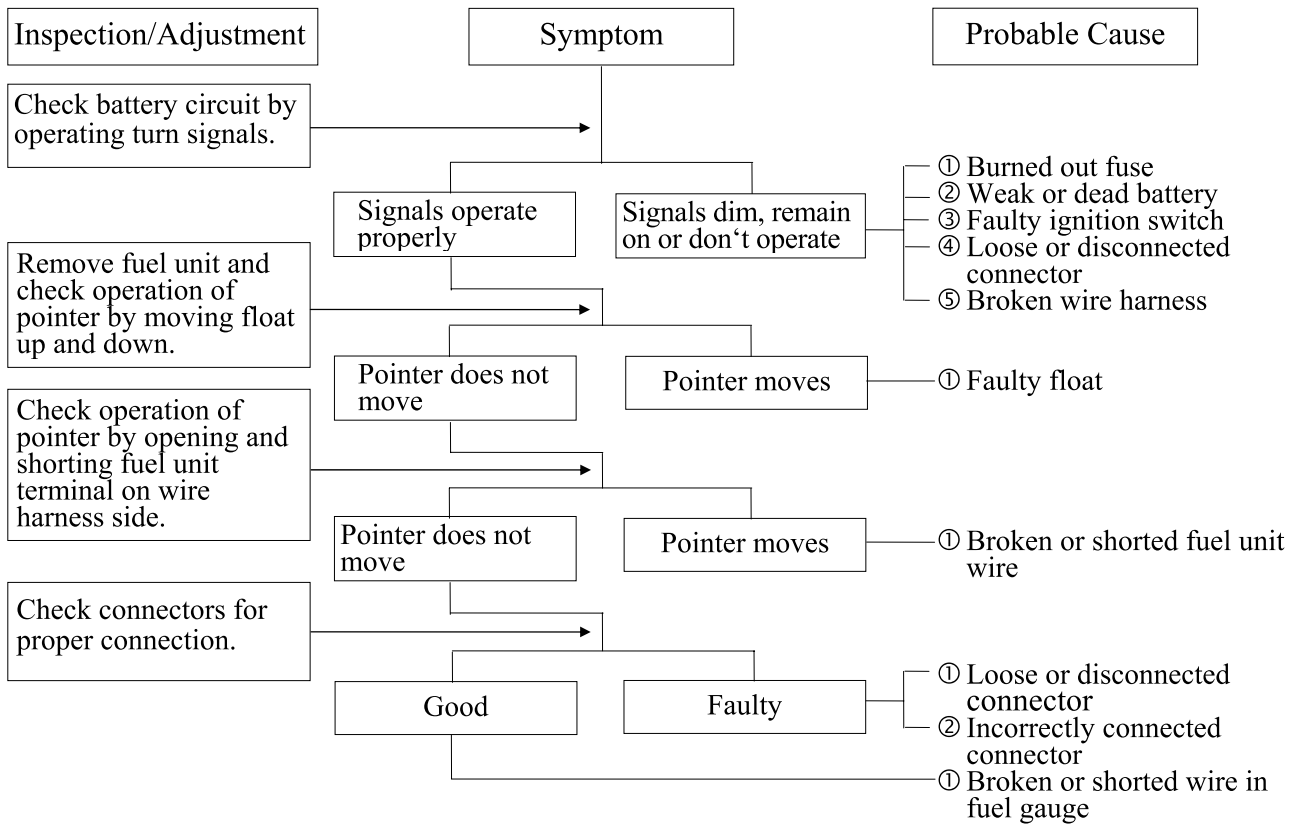
2. Motor oil is sufficient but the indicator light remains on (Ignition switch ON)



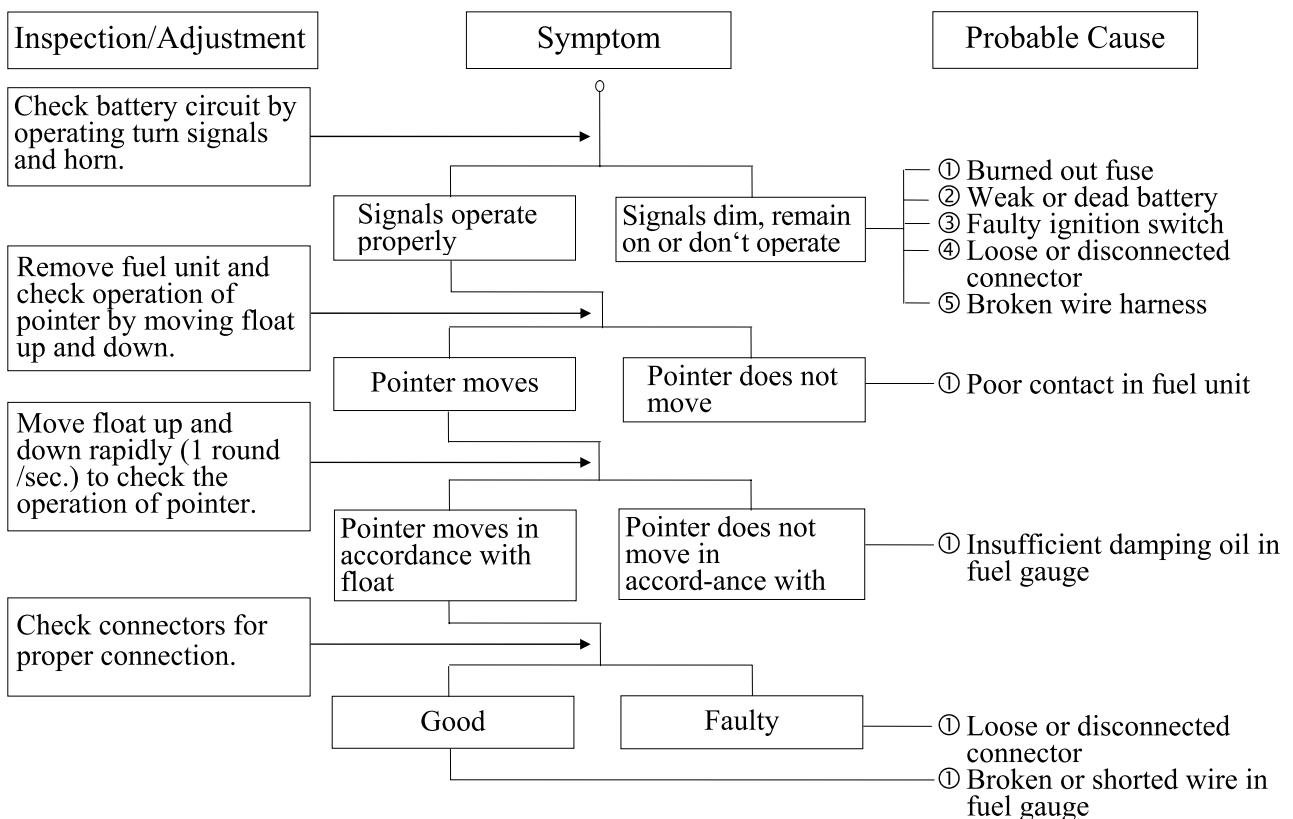
## 2. GENERAL INFORMATION

### FUEL GAUGE

#### 1. Pointer does not register correctly (Ignition switch ON)



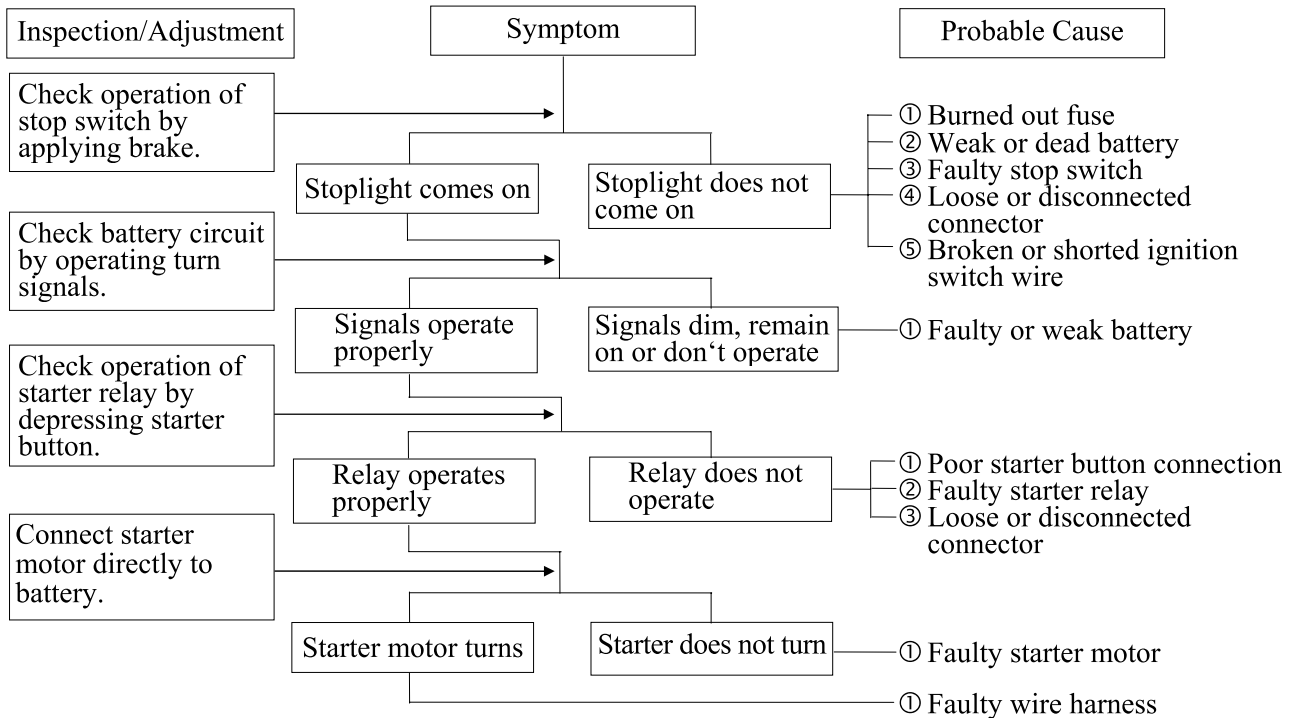
#### 2. Pointer fluctuates or swings (Ignition switch ON)



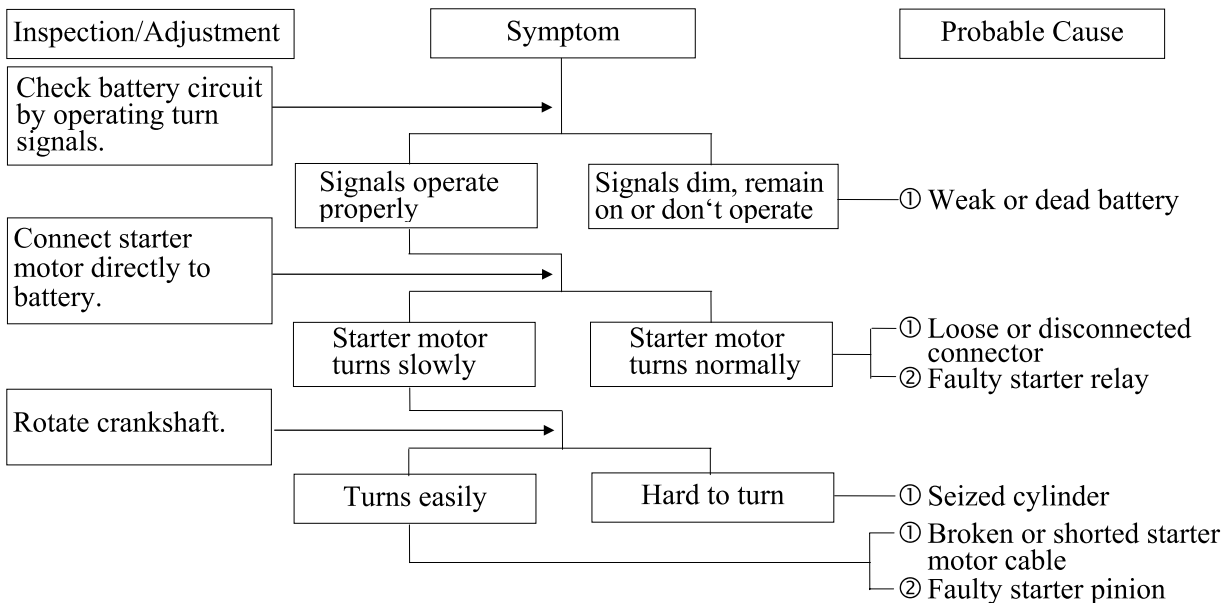
## 2. GENERAL INFORMATION

### STARTER MOTOR

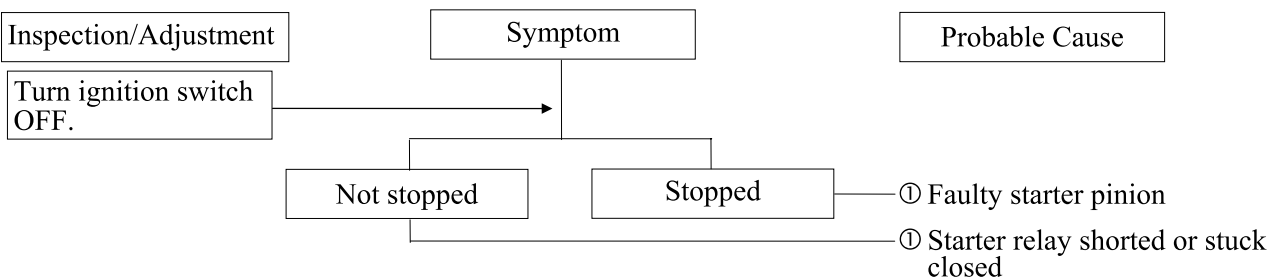
#### 1. Starter motor won't turn



#### 2. Starter motor turns slowly or idles



#### 3. Starter motor does not stop turning



### **3. INSPECTION/ADJUSTMENT**

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**3**

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### **INSPECTION/ADJUSTMENT**

---

INSPECTION AND MAINTENANCE SCHEDULE.....	3- 1
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ELECTRICAL EQUIPMENT.....	3- 7
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OTHERS.....	3- 11

### 3. INSPECTION/ADJUSTMENT

#### INSPECTION AND MAINTENANCE SCHEDULE

(Note) 1. ○ means time for inspection.

2. □ means regular replacement for the specified parts.

This inspection and maintenance schedule is based upon average riding conditions. Machines subjected to serve use, or ridden in unusually dusty areas, require more frequent servicing.

Inspection & Maintenance Item			Frequency				Judgment Standards	Remarks								
			Preride	1st month	Every 6 months	Every 12 months										
Suspension	Steering handlebar	Check for looseness and vertical play				○										
		Operating performance	○			○										
		Right/left turning angle				○										
	Front fork	Damage			○	○										
		Check for front fork pivot installation			○	○		Check steering stem								
		Check front fork pivot for looseness and abnormal noise				○		Check steering stem								
Brake System	Brake Lever	Front/rear brake lever free play			○	○	Free play: 10□20mm									
		Brake lever operation	○													
		Brake performance		○	○	○										
	Lever/Cable	Looseness, abnormal noise and damage		○		○										
	Brake drum/shoe	Drum-to-lining clearance			○	○										
		Brake shoe and lining wear				□		Indicator type								
Brake drum wear and damage					○	Standard: Front: 110 mm Rear : 110 mm Service Limits: Front: 111 mm Rear : 111 mm										
Moving Device	Tire	Tire pressure	○		○	○	<table border="1"> <thead> <tr> <th></th> <th>Front</th> <th>Rear</th> </tr> </thead> <tbody> <tr> <td>1 rider</td> <td>1.50 kg/cm<sup>2</sup></td> <td>1.75 kg/cm<sup>2</sup></td> </tr> <tr> <td>Tire Size</td> <td>120/70-12</td> <td>120/70-12</td> </tr> </tbody> </table>		Front	Rear	1 rider	1.50 kg/cm <sup>2</sup>	1.75 kg/cm <sup>2</sup>	Tire Size	120/70-12	120/70-12
	Front	Rear														
1 rider	1.50 kg/cm <sup>2</sup>	1.75 kg/cm <sup>2</sup>														
Tire Size	120/70-12	120/70-12														



### 3. INSPECTION/ADJUSTMENT

Inspection & Maintenance Item			Frequency				Judgment Standards	Remarks
			Preride	1st month	Every 6 months	Every 12 months		
Moving Device	Motor-cycle	Tire crack and damage	○		○	○		
		Tire groove and abnormal wear	○		○	○	Groove Depth: Front: 0.8mm Rear : 0.8mm	
		Imbedded objects, gravel, etc.	○		○	○		
		Axle nut looseness			○	○	Torque Values: Front axle nut 5.0□7.0kg-m Rear axle nut 11.0□13.0kg-m	Axle nut torque
		Check wheel rim, rim edge and spoke plate for damage		○		○	Rim runout at rim end: Front: Axial 2.0mm Radial 2.0mm Rear: Axial 2.0mm Radial 2.0mm	
		Check front wheel bearing for excessive play and abnormal noise				○		
		Check front wheel bearing for excessive play and abnormal noise				○		
Damping Device	Frame Spring	Damage						Shock spring free length
	Suspension arm	Connecting parts looseness and arm damage				○		
	Shock absorber	Oil leakage and damage				○		
Assembly parts looseness abnormal noise					○			
Power Drive System	Clutch	Operation		○	○	○		
	Transmission case	Oil leakage and oil level			○	○	Oil level: Oil check bolt hole at lower hole edge	Rear wheel transmission case
Electrical Equipment	Ignition device	Spark plug condition			○	○	Plug gap: 0.6□0.7mm	
	Battery	Terminal connection				○		

### 3. INSPECTION/ADJUSTMENT

	Wires	Loose connection and damage				○	
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Inspection & Maintenance Item			Frequency				Judgment Standards	Remarks
			Preride	1st month	Every 6 months	Every 12 months		
Engine	Body	Performance and abnormal noise			○	○		
		Conditions at low and high speeds		○	○	○		
		Exhaust smoke			○	○		
		Air cleaner			○	○		
	Lubrication system	Oil quality and quantity			○	○	<input type="checkbox"/> Oil level indicator Indicator light comes on when oil is insufficient	
		Oil leakage			○	○		
		Oil level	○					
		Check oil filter for clogging				○		
	Fuel System	Fuel leakage						
		Carburetor, throttle valve and auto bystarter				○		
		Check fuel filter for clogging				○		
		Fuel level	○					
		Fuel tube replacement					<input type="checkbox"/> Every 4 years	
	Lights & Winker	Operation						
		Winking action, dirt and damage	○					
Buzzer & Steering Lock	Operation				○			
Rearview Mirror & Reflector	Rearview mirror position	○					Rearview Mirror	
Reflector & License Plate	Dirt and damage	○						
Counter	Operation				○			
Exhaust Muffler	Joint looseness and damage				○			
	Exhaust muffler performance				○			
Body & Frame	Looseness and damage				○			
Abnormal Conditions Happened Last Time	Check if the abnormal conditions occur again	○						
	Lubrication points			○	○			

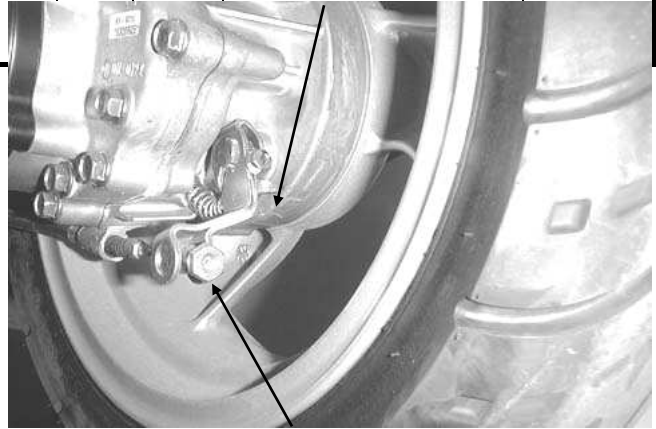
### 3. INSPECTION/ADJUSTMENT

Others	Lubrication points			○	○		
	Remove carbon deposits on combustion chamber, breather hole and exhaust muffler				○		

#### BRAKE DRUM/SHOE

##### Brake Shoe Wear

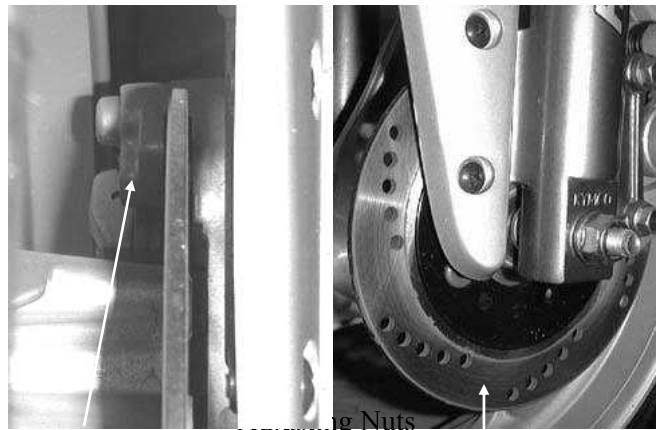
Replace the brake shoes if the arrow on the brake arm aligns with reference mark“□” on the brake panel when the brake is fully applied.



##### Brake Drum Wear/Damage

Check the brake drum appearance for damage. Check if the brake lining wear is within the specified service limit. Check the brake operation for abnormal noise and brake drum inside for wear or damage.

“□” Marks



#### BRAKE DISK/LINING

##### Brake Disk Surface and Brake Pad Wear

Check the brake disk surface for scratch. Check if the brake pad wear is within the specified service limit.

##### Brake Disk Runout Inspection

Jack the motorcycle wheels off the ground and check if the brake disk runout is within the specified service limit.

<Front>



#### BRAKE FLUID LEVEL INSPECTION

##### Brake Master Cylinder Fluid Level Inspection

Turn the steering handlebar upright and check if the front brake fluid level is within the specified limits through the front brake master cylinder check hole.

### 3. LUBRICATION SYSTEM

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Brake Master Cylinder



#### MOVING DEVICE

##### TIRES

###### Tire Pressure

Check the tire pressure.

Tire pressure should be checked when tires are cold.

Tire Pressure (one rider)

**Front:** 1.50 kg/cm<sup>2</sup>

**Rear:** 1.75 kg/cm<sup>2</sup>

Tire Size:

**Front:** 120/70-12

**Rear:** 120/70-12



###### Axle Nut/Axle Shaft Looseness

Check the front and rear axle nuts for looseness.

If the axle nuts are loose, tighten them to the specified torques.

Torques:

**Front:** 5.0□7.0kg-m

**Rear:** 11.0□13.0kg-m

###### Wheel Rim/Spoke Plate Damage

Check the wheel rim and spoke plate for wear or damage and measure the rim runout.



Rear Wheel

### 3. INSPECTION/ADJUSTMENT

Axle Nut



#### DAMPING DEVICE

##### SHOCK ABSORBERS

###### Oil Leak/Damage

Fully apply the front brake and check the action of the front shock absorber by compressing it several times.  
Check the entire shock absorber assembly for looseness or damage.  
Check the action of the rear shock absorber by compressing it several times.  
Check the entire shock absorber assembly for looseness or damage.



#### POWER DRIVE SYSTEM

##### TRANSMISSION CASE

Check the rear wheel transmission case surrounding area for oil leaks.  
Stop the engine and remove the oil check bolt.

Place the motorcycle on its main stand on level ground.

The gear oil level shall be at the oil check bolt hole. If the oil level is low, add the specified oil to the proper level.

**Specified Gear Oil:** SAE10W90#

Install and tighten the oil check bolt.

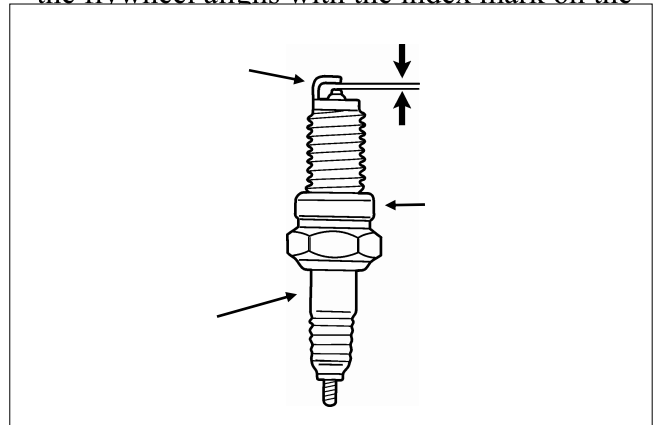
**Torque:** 1.0□1.5kg-m

Start the engine and check for oil leaks.



### 3. LUBRICATION SYSTEM

When the engine is running at the specified rpm, the ignition timing is correct if the "F" mark on the flywheel aligns with the index mark on the



### ELECTRICAL EQUIPMENT

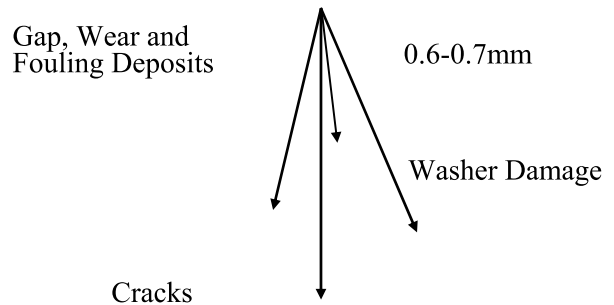
#### IGNITION APPARATUS

##### Spark Plug

Remove the frame center cover.  
Remove the spark plug cap and spark plug.  
Check the spark plug for wear, fouling and carbon deposits.  
Remove the fouling and carbon deposits with a spark plug cleaner or wire brush.

##### Specified Spark Plug

**BR8HSA**



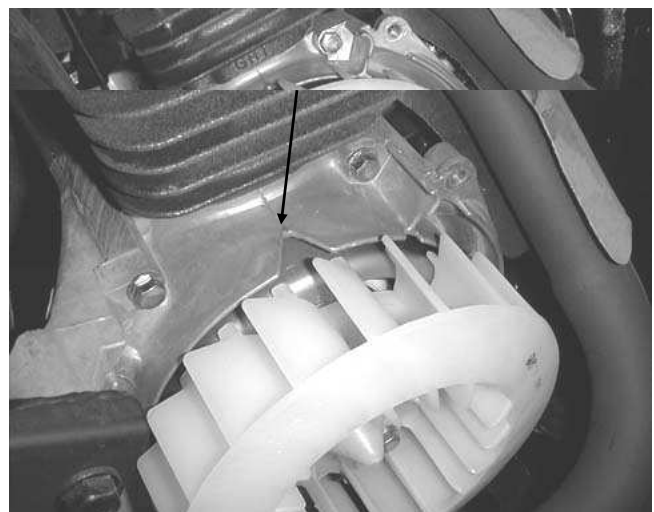
**Spark Plug Gap:** 0.6-0.7mm

##### Ignition Apparatus

The CDI ignition timing is not adjust-able. If the timing is incorrect, check the CDI unit, ignition coil and A.C. generator and replace any faulty

Remove the right side rail. (⇒12-4)  
Remove the A.C. generator fan cover. (⇒7-3)  
Remove the four bolts attaching the fan and then remove the fan.  
Warm up the engine and check the ignition timing with a timing light.

Bolt

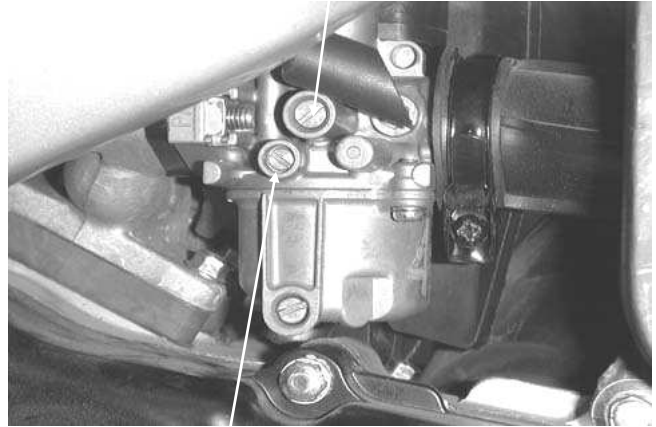


Index Mark

### 3. INSPECTION/ADJUSTMENT

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F Mark



Throttle Stop Screw

#### ENGINE

#### BODY

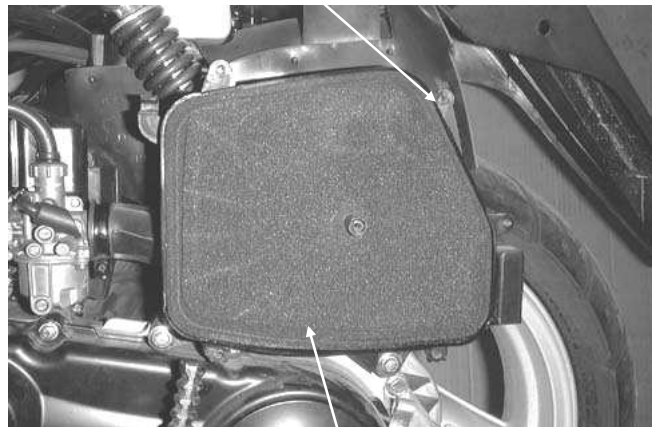
##### At High and Low Speeds

The engine must be warm for accurate idle speed adjustment.

Adjust the idle speed to the specified range by turning the throttle stop screw and air screw.

##### Idle Speed:

2100±100rpm



Screws

##### Air Cleaner

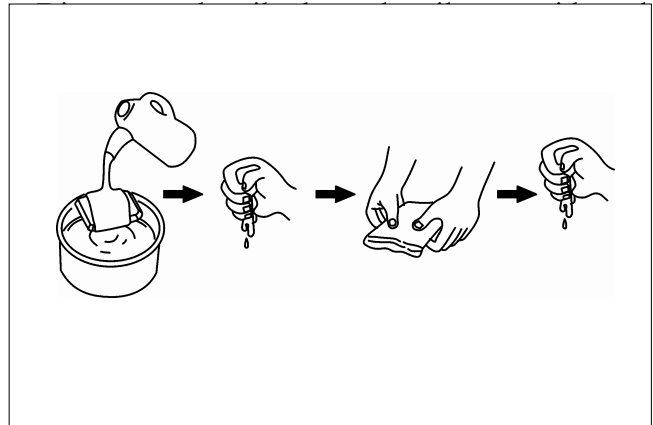
Remove the air cleaner cover by removing the six air cleaner cover screws.  
Remove the air cleaner element.



### 3. LUBRICATION SYSTEM

#### LUBRICATION SYSTEM

##### Oil Filter Cleaning



Wash the air cleaner element in detergent oil, squeeze out and allow to dry.

Never use gasoline or organic vaporable oil with acid or alkali for washing.

After washing, soak the element in clean engine oil SAE 15W-40# and squeeze out excess oil. Reinstall the element.

#### Cylinder Compression

Warm up the engine before compression test.

Remove the spark plug and insert a compression gauge. Open the throttle valve fully and push the starter button for 7-8 seconds to test the compression.

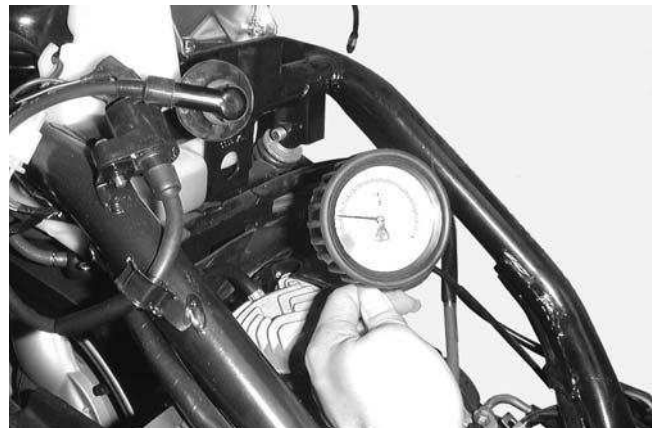
#### Compression:

11.5kg/cm<sup>2</sup>

If the compression is low, check for the following:

- Leaking cylinder head gasket
- Worn piston/cylinder

If the compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and the piston head.

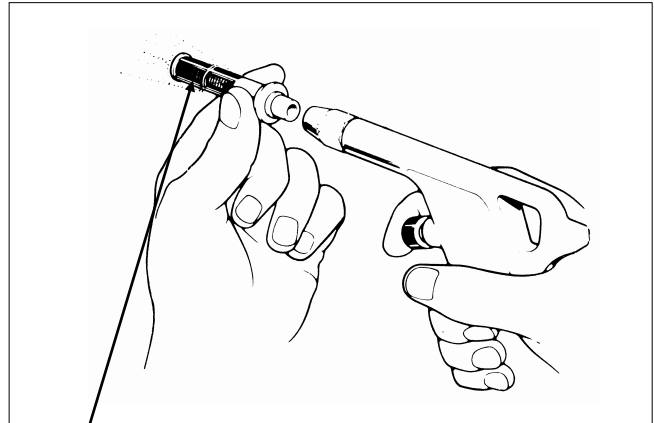


Clip



### 3. INSPECTION/ADJUSTMENT

Oil Filter



Clean the oil filter screen with compressed air.

Install the oil filter in the reverse order of removal and fill the oil tank with specified oil up to the proper level.

Bleed air from the oil pump and oil lines.

- Connect the oil tubes securely.
- Install the tube clip at the oil tank side and also install the clip to the lower oil tube that goes to the oil pump.
- Check for oil leaks.



Control Lever Aligning Mark

#### Oil Pump Condition

Adjust oil pump control cable after the throttle grip free play is adjusted.



Lock Nut

Adjusting Nut

Reference tip alignment within 1mm of index mark on open side is acceptable. However, the aligning mark on the control lever must never be on the closed side of the index mark, otherwise engine damage will occur because of insufficient lubrication.

### 3. LUBRICATION SYSTEM

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#### Headlight

Adjust the headlight beam by loosening the headlight adjusting bolt and moving the



#### FUEL SYSTEM

##### Throttle Grip Free Play

Measure the throttle grip free play.

**Free Play:** 2□6mm



If the throttle grip free play does not fall within the specified range, adjust by loosening the lock nut and turning the adjusting nut.



#### OTHERS

##### LIGHTS

### **3. INSPECTION/ADJUSTMENT**

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Headlight Adjusting Bolt

## 4. LUBRICATION SYSTEM

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**4**

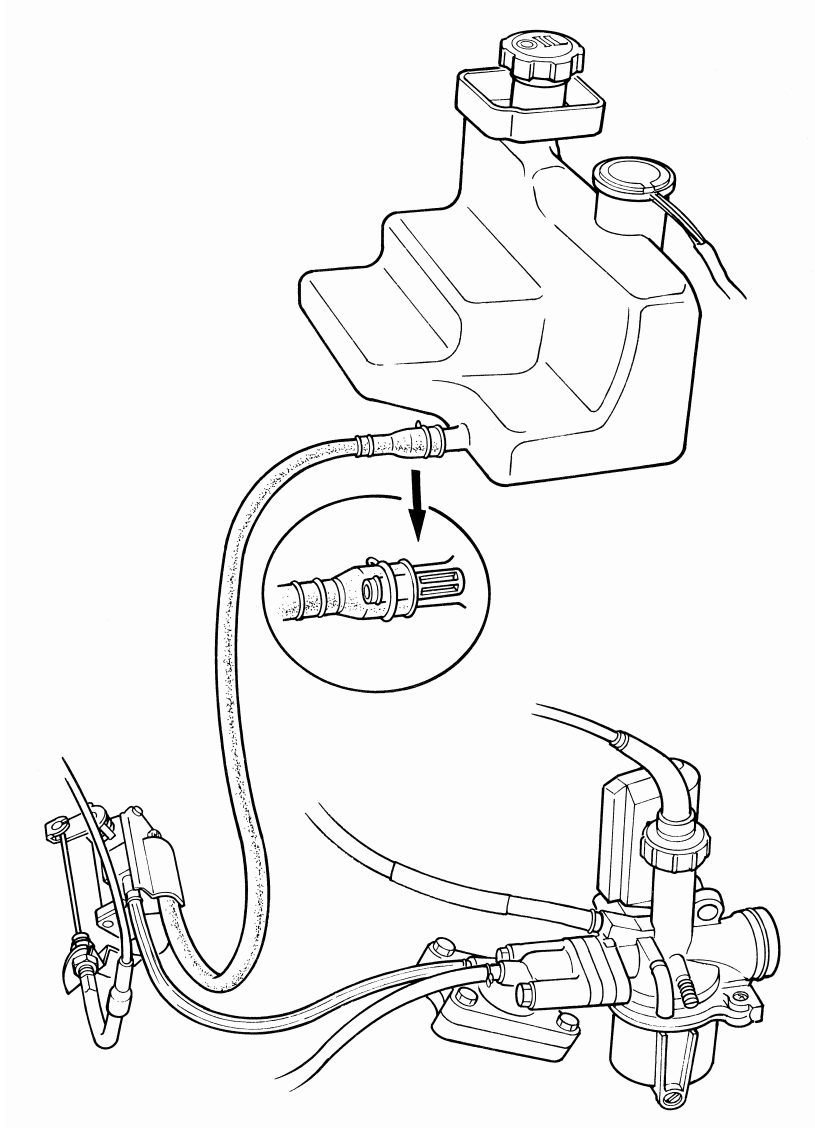
### LUBRICATION SYSTEM

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OIL PUMP INSPECTION .....	4-3
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OIL TANK .....	4-6

## 4. LUBRICATION SYSTEM

### LUBRICATION SYSTEM



## 4. LUBRICATION SYSTEM

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### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- Use care when removing and installing the oil pump not to allow dust and dirt to enter the engine and oil line.
- Do not attempt to disassemble the oil pump.
- Bleed air from the oil pump if there is air between the oil pump and oil line.
- If the oil is disconnected, refill the oil line with motor oil before connecting it.

#### SPECIFICATIONS

- Recommended Motor Oil: SAE20W20# 2-stroke Motor Oil
- Oil Capacity : 0.80 liter  
Light comes on : 0.25 liter

### TROUBLESHOOTING

#### Excessive white smoke or carbon deposits on spark plug

- Oil pump not properly synchronized (excessive oil)
- Poor quality oil

#### Engine overheating

- Oil pump not properly adjusted (insufficient oiling)
- Poor quality oil

#### Seized piston

- No oil in tank or clogged oil line
- Oil pump not properly adjusted (insufficient oiling)
- Air in oil line
- Faulty oil pump

#### Oil not flowing out of tank to engine

- Clogged oil tank cap breather hole
- Clogged oil filter

## 4. LUBRICATION SYSTEM

### OIL PUMP REMOVAL

Do not allow foreign matters to enter the crankcase. Before removing the oil pump, clean the oil pump and crankcase surfaces.

Remove the met-in box. (⇒12-4)

Disconnect the oil pump control cable from the pump body.  
 Disconnect the oil inlet line from the oil pump.  
 Then, disconnect the oil outlet line.

Before disconnecting the oil line, clip the oil line to avoid oil flowing out and then plug the oil line after it is disconnected.

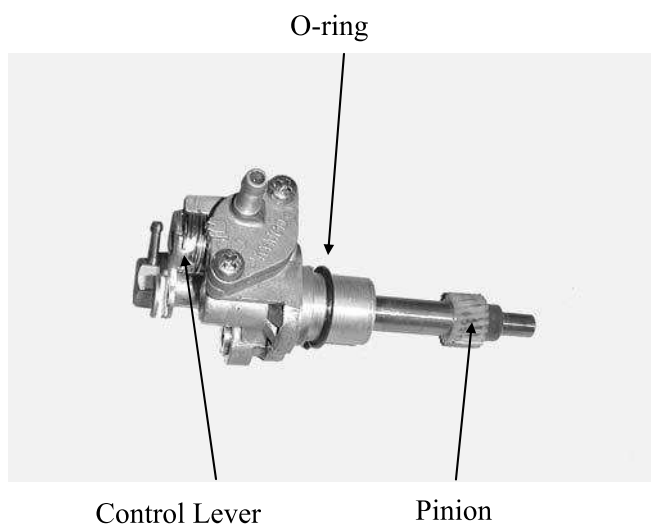
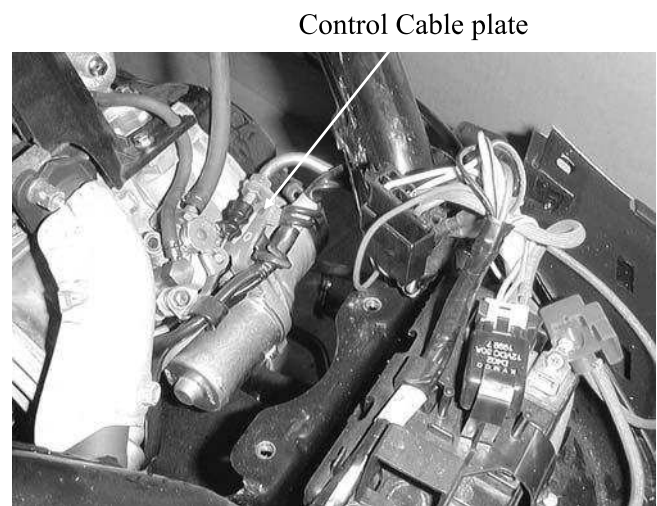
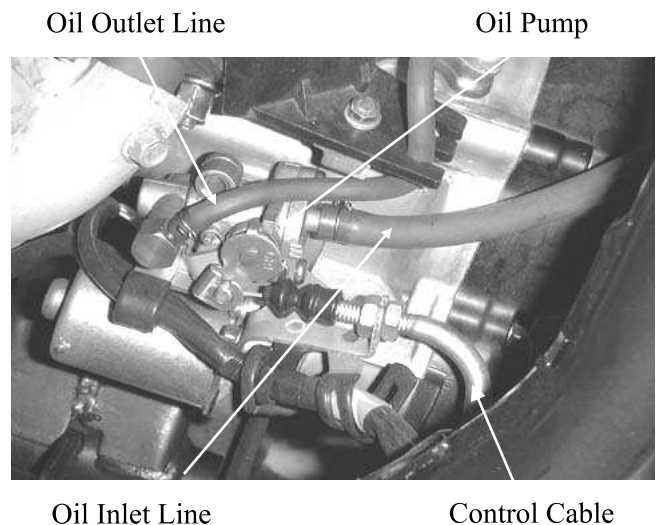
Remove the oil pump control cable plate bolt and copper washer.  
 Remove the oil pump from the crankcase.

### OIL PUMP INSPECTION

Remove the oil pump and inspect the following items:

- Weakened O-ring
- Damage to crankcase mating surface
- Damage to pump body
- Control lever operation
- Oil leaks through oil seals
- Worn or damaged pump pinion

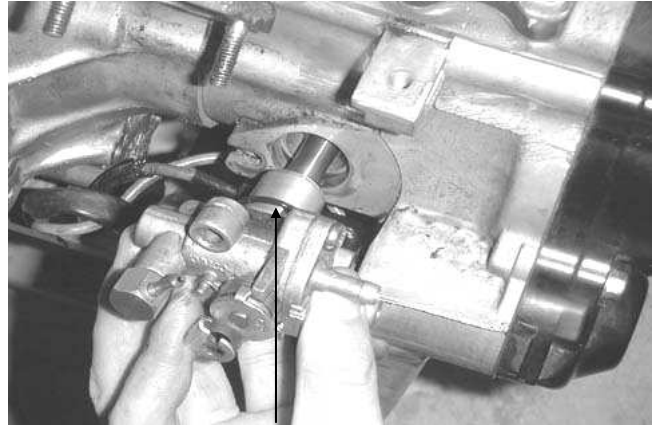
Do not disassemble the oil pump which cannot be used after disassembly.



## 4. LUBRICATION SYSTEM

### OIL PUMP INSTALLATION

- Lubricate the O-ring with grease or engine oil before installation.
- Make sure that the oil pump is inserted into the crankcase.
- Apply molybdenum disulfide or grease to the pump pinion.



Grease or Engine Oil

Install the oil pump onto the crankcase.



Install the oil pump control cable plate.  
Connect the oil inlet line and oil outlet line properly.  
Connect the oil pump control cable.  
Bleed air from the oil pump.



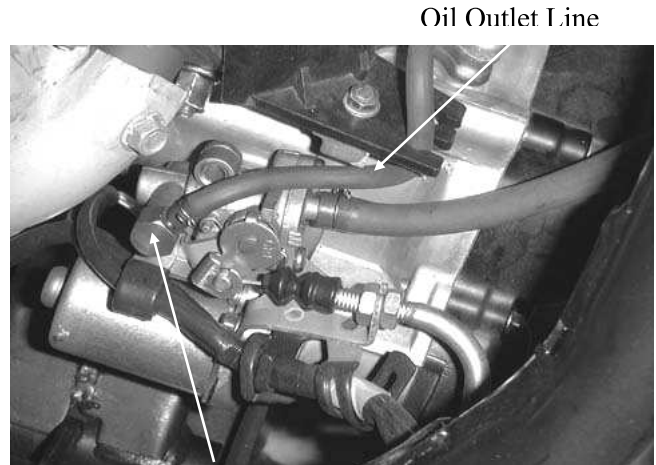
Control Cable



## 4. LUBRICATION SYSTEM

### OIL PUMP BLEEDING

- Air in the oil lines will block oil flow and result in severe engine damage.
- Bleed air from the oil lines and oil pump whenever the oil lines or pump have been removed or there is air in the oil lines.



Oil Pump

### OIL INLET LINE/OIL PUMP BLEEDING

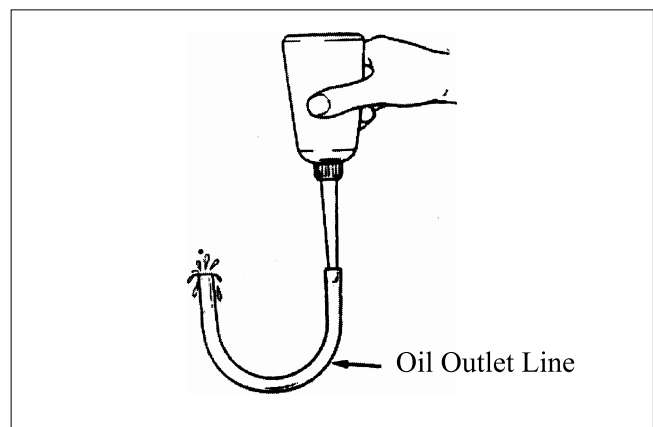
Fill the oil tank with recommended oil. Place a shop towel around the oil pump. Disconnect the oil inlet line from the oil pump and clip it. Fill the oil pump with oil by squirting clean oil through the joint. (About 3cc) Fill the oil line with oil and connect it to the oil pump.

Bleed air from the oil inlet line first, then bleed air from the oil outlet line.

### OIL OUTLET LINE BLEEDING

1. Disconnect the oil outlet line and bend it into U shape. Force air out of the tube by filling it with oil.
2. Start the engine and allow it to idle with the oil control lever in the fully open position. Visually check the oil flow.
3. If there is no oil flowing out within 1 minute, bleed air from the oil inlet line and oil pump.

- Never run the engine in a closed area.
- Do not increase the engine speed at will.



Oil Tube

## 4. LUBRICATION SYSTEM

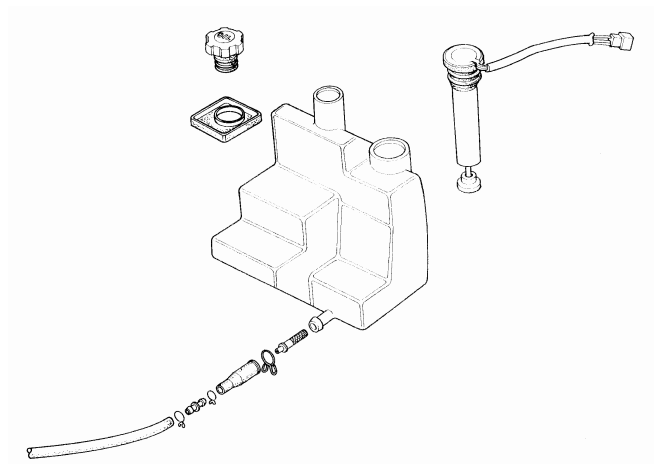
### OIL TANK

#### OIL TANK REMOVAL

Remove the rear carrier. (⇒12-5)  
Remove the frame body cover. (⇒12-5)  
Remove the oil meter connector.  
Remove the two bolts attaching the oil tank.  
Disconnect the oil inlet line.  
Drain the oil inside the oil tank into a clean container.  
Remove the oil tank.  
The installation sequence is the reverse of removal.



Wire Connector



- Connect the oil line properly.
- Bleed air from the oil pump after installation.
- The oil tube clip (at the oil tank side) must be locked from inside of the oil tube joint.

## **5. ENGINE REMOVAL/INSTALLATION**

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**5**

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### **ENGINE REMOVAL/INSTALLATION**

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SERVICE INFORMATION .....	5-1
ENGINE REMOVAL .....	5-2
ENGINE INSTALLATION .....	5-4

# 5. ENGINE REMOVAL/INSTALLATION

## SERVICE INFORMATION

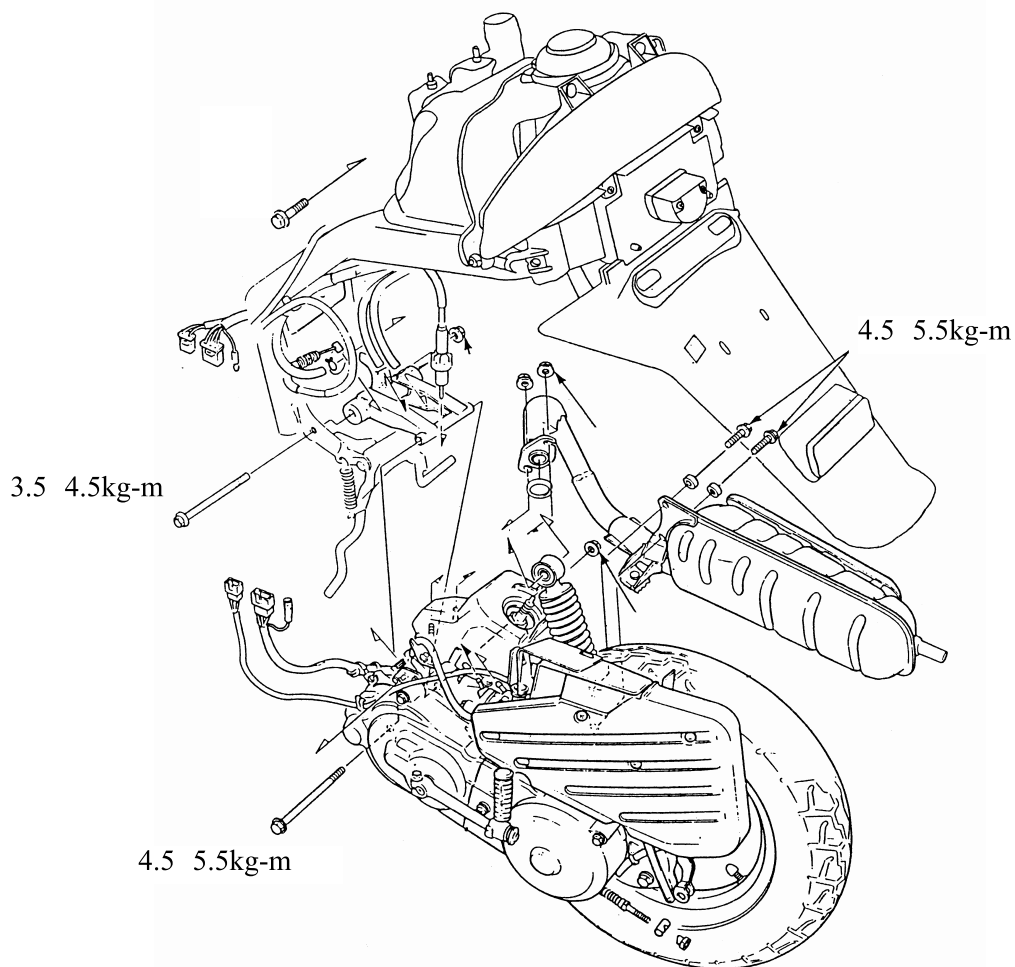
### GENERAL INSTRUCTIONS

- Parts requiring engine removal for servicing:

Crankcase  
Crankshaft

### TORQUE VALUES

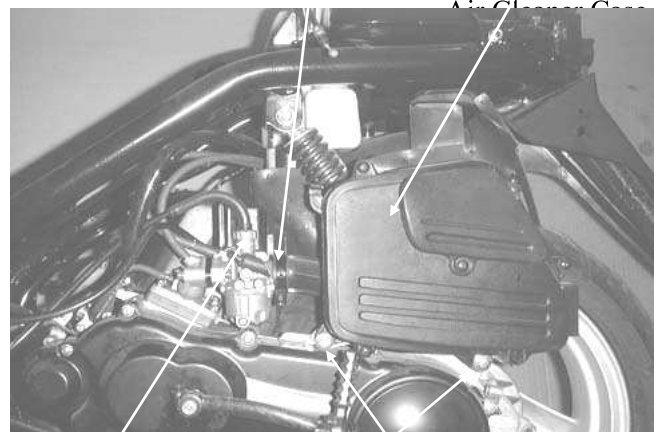
Engine mounting bolt	4.5	5.5kg-m
Rear shock absorber lower mount bolt	2.4	3.0kg-m
Engine hanger bracket bolt	3.5	4.5kg-m



## 5. ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Remove the frame body cover. (⇒12-5)  
 Remove the two bolts attaching the air cleaner case.  
 Loosen the band between the air cleaner and carburetor to remove the air cleaner case.  
 Remove the carburetor cap.



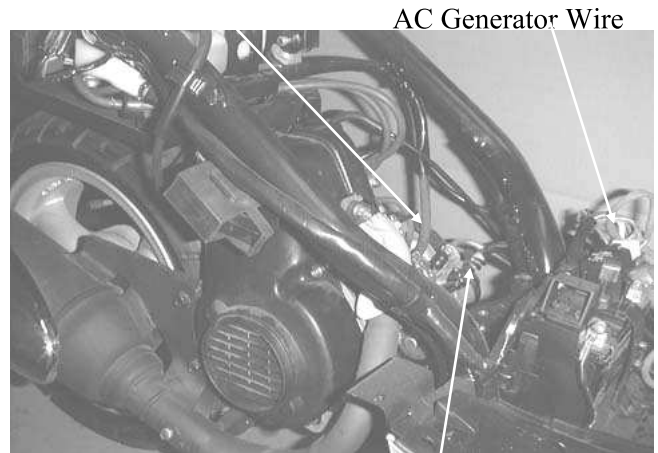
Carburetor Cap

Bolt

Disconnect the oil pump control cable from the pump body.  
 Disconnect the oil inlet line from the oil pump.

After the oil inlet line is disconnected, plug the oil line opening to prevent oil from flowing out.

Disconnect the auto bystarter, A.C. generator and starter motor wire connectors.



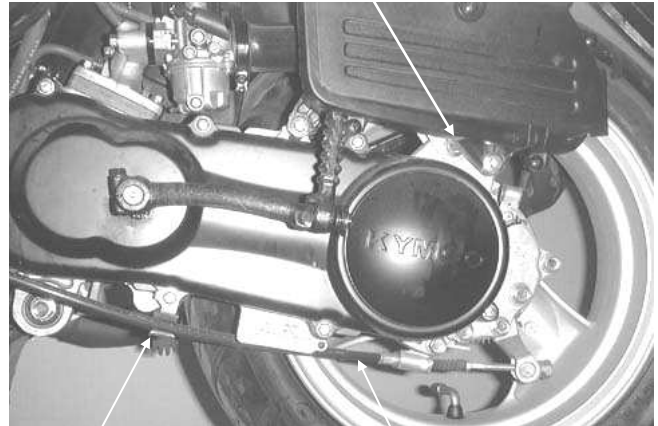
Oil Pump Control Cable

Remove the spark plug cap.



## 5. ENGINE REMOVAL/INSTALLATION

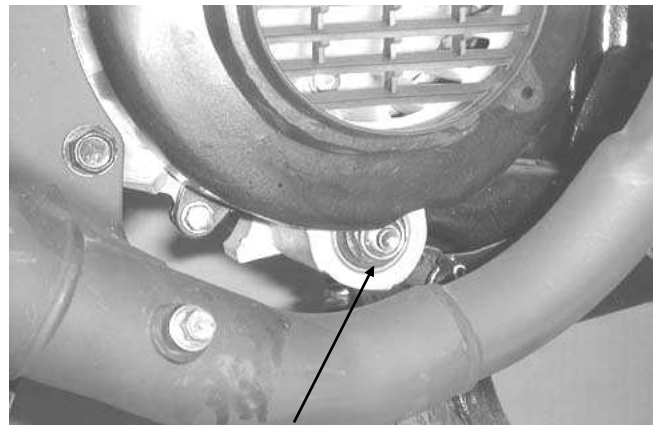
Remove the rear brake adjusting nut and disconnect the brake cable from the crankcase.  
 Remove the rear brake cable clamp and rear brake cable.  
 Remove the cooling air tube band on the left crankcase cover and disconnect the cooling air tube.  
 Remove the rear shock absorber lower mount bolt.



Clamp

Rear Brake Cable

Remove the right and left engine mounting nuts.  
 Take out the right and left engine mounting bolts.  
 Lift the frame upward to separate it from the engine and be careful not to damage the rear fender.

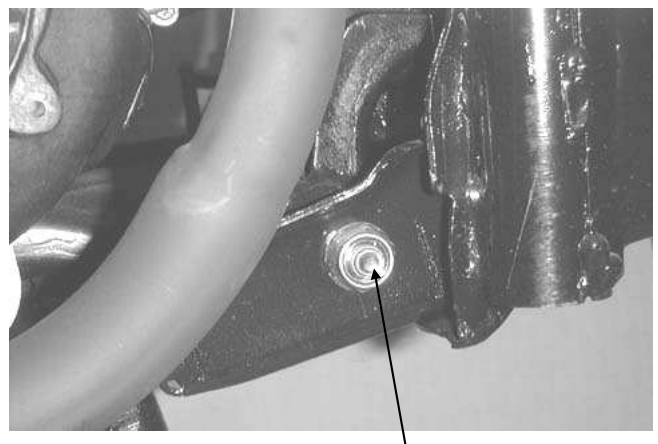


Engine Mounting Nuts

### ENGINE HANGER BRACKET REMOVAL

Remove the engine hanger bracket bolt and engine hanger bracket.  
 The installation sequence is the reverse of removal.

**Torque:** 3.5 4.5kg-m



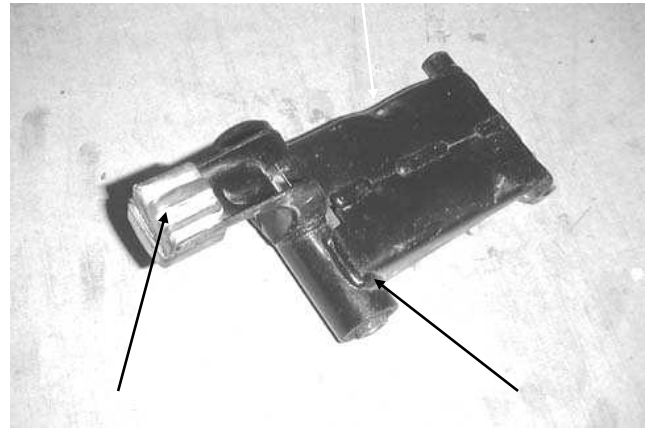
Engine Hanger Bracket Bolt

## 5. ENGINE REMOVAL/INSTALLATION

### ENGINE HANGER BRACKET INSPECTION

Inspect the stopper rubbers and bushings for damage and replace with new ones if necessary.

Engine Hanger



Stopper Rubbers

Bushings

### ENGINE INSTALLATION

Install the engine in the reverse order of removal.

Cables and wires should be routed properly.

#### Torque Values:

Engine mounting bolt: 4.5 5.5kg-m

Rear shock absorber lower mount bolt:  
2.4 3.0kg-m



Perform the following inspections and adjustments after installation.

- Throttle cable
- Oil pump control cable (⇒3-10)
- Rear brake cable (⇒3-4)
- Oil pump bleeding (⇒4-5)



## **5. ENGINE REMOVAL/INSTALLATION**

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## 6. CYLINDER HEAD/CYLINDER/PISTON

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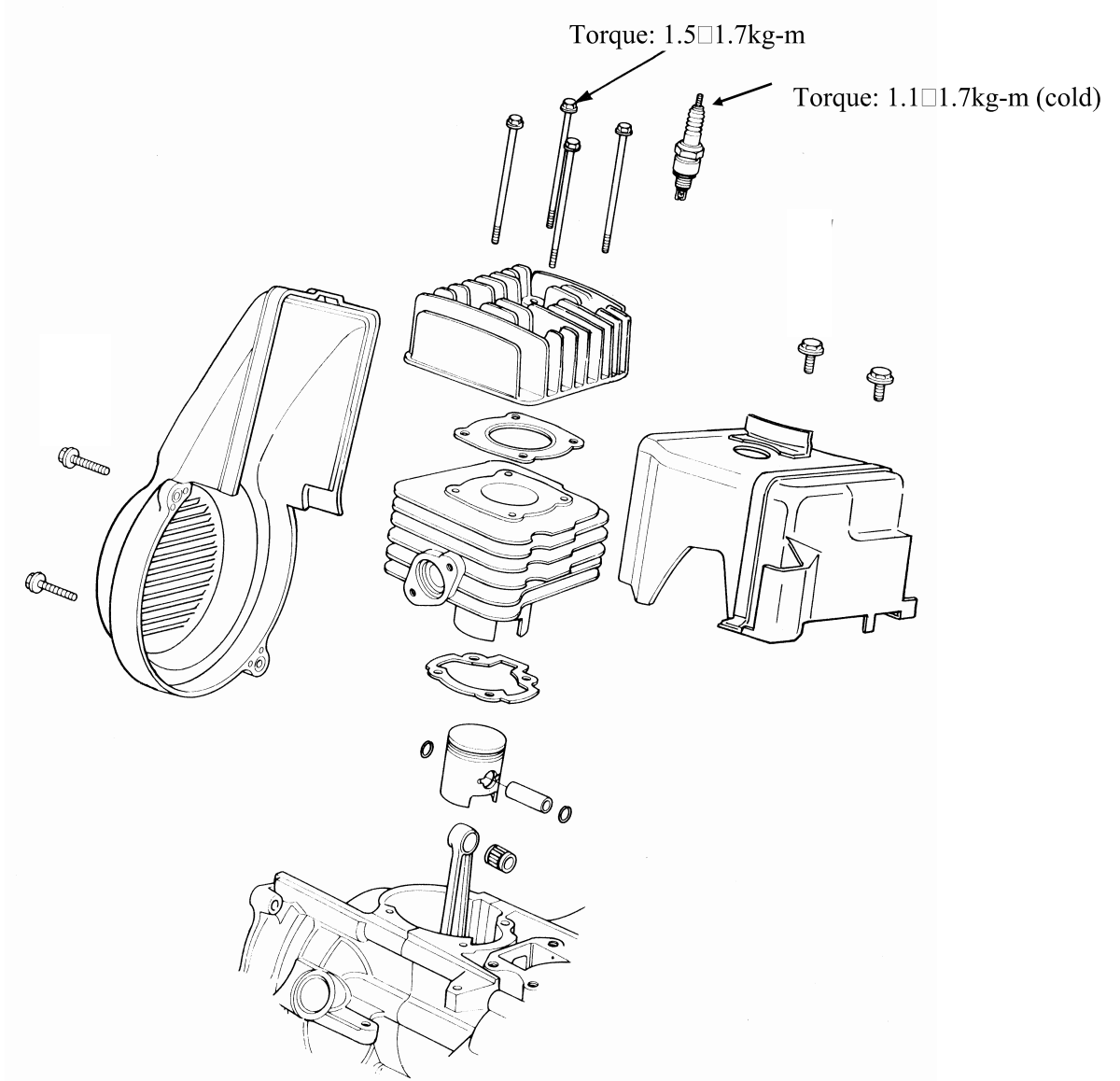
**6**

### CYLINDER HEAD/CYLINDER/PISTON

---

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TROUBLESHOOTING .....	6-2
CYLINDER HEAD .....	6-3
CYLINDER/PISTON .....	6-6

## 6. CYLINDER HEAD/CYLINDER/PISTON



## 6. CYLINDER HEAD/CYLINDER/PISTON

### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- The cylinder head, cylinder and piston can be serviced with the engine installed in the frame.
- Before disassembly, clean the engine to prevent dust from entering the engine.
- Remove all gasket material from the mating surfaces.
- Do not use a driver to pry between the cylinder and cylinder head, cylinder and crankcase.
- Do not damage the cylinder inside and the piston surface.
- After disassembly, clean the removed parts before inspection. When assembling, apply the specified engine oil to movable parts.

#### SPECIFICATIONS

Item	Standard (mm)	Service Limit (mm)
	SC10AS	SC10AS
Cylinder head warpage	—	0.10
Piston O.D.(5mm from bottom of piston)	38.955□38.970	38.90
Cylinder-to- piston clearance		0.10
Piston pin hole I.D.	12.002□12.008	12.03
Piston pin O.D.	11.994□12.0	11.98
Piston-to-piston pin clearance	←	←
Piston ring end gap (top/second)	0.10□0.25	0.40
Connecting rod small end I.D.	17.005□17.017	17.03
Cylinder bore	39.0□39.025	39.05

#### TORQUE VALUES

Cylinder head bolt	1.5□1.7kg-m
Exhaust muffler joint lock nut	1.0□1.4kg-m
Exhaust muffler lock bolt	3.0□3.6kg-m
Spark plug	1.1□1.7kg-m

#### ●TROUBLESHOOTING

##### Compression too low, hard starting or poor performance at low speed

- Leaking cylinder head gasket
- Loose spark plug
- Worn, stuck or broken piston and piston rings
- Worn or damaged cylinder and piston

##### Compression too high, overheating or knocking

- Excessive carbon build-up in cylinder head or on piston head

##### Abnormal noisy piston

- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod small end bearing

##### Abnormal noisy piston rings

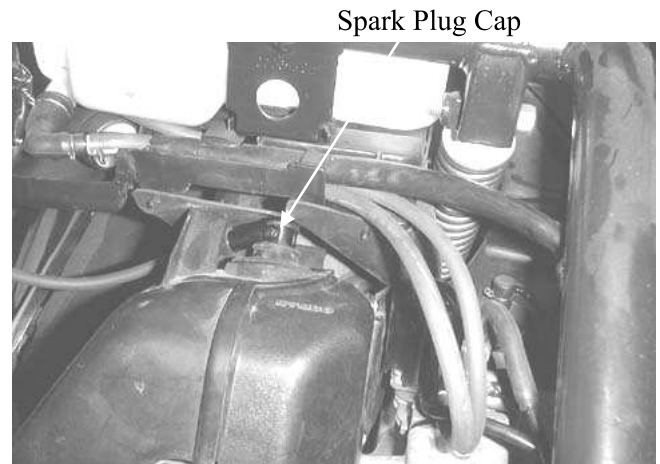
- Worn, stuck or broken piston rings
- Worn or damaged cylinder

## 6. CYLINDER HEAD/CYLINDER/PISTON

### CYLINDER HEAD

#### REMOVAL

Remove the rear carrier.  
Remove the frame body cover. (⇒12-5)



Remove the spark plug cap.  
Remove the three bolts attaching the fan cover to remove the fan cover.  
Remove the two joint lock nuts on the front of the exhaust muffler and then remove the two exhaust muffler lock bolts.  
Remove the bolt attaching the engine hood to remove the engine hood.  
The installation sequence is the reverse of removal.



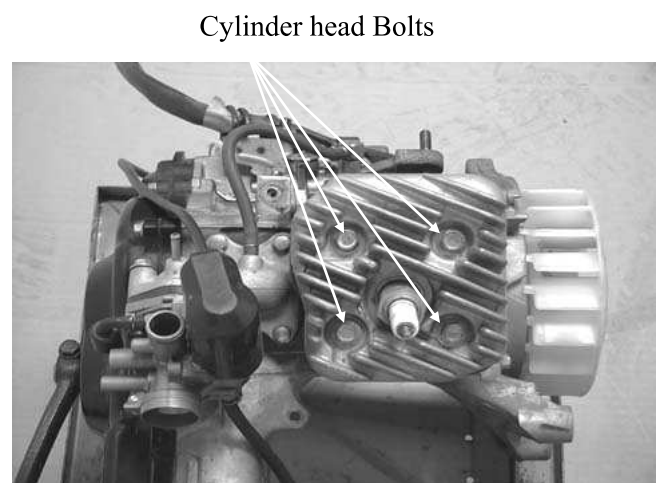
When installing the exhaust muffler, first tighten the two nuts on the front and then tighten the two bolts.

Bolts

Remove the spark plug.  
Remove the cylinder head bolts and the cylinder head.

Loosen the bolts diagonally in 2 or 3 times.

Remove the cylinder head gasket.



Cylinder head Bolts

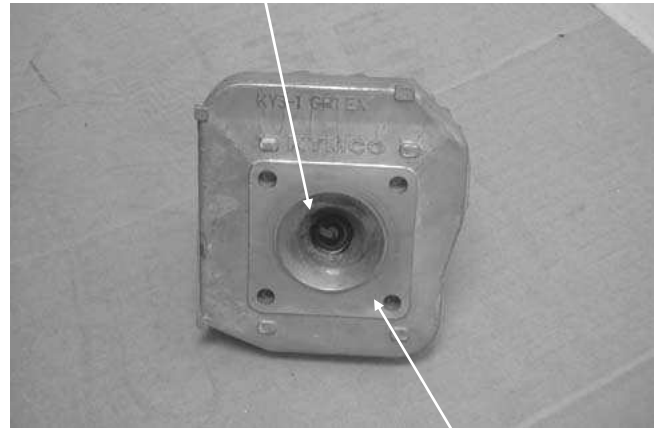
## 6. CYLINDER HEAD/CYLINDER/PISTON

### COMBUSTION CHAMBER DECARBONIZING

Remove the carbon deposits from the combustion chamber

Avoid damaging the combustion chamber wall and cylinder mating

Combustion Chamber



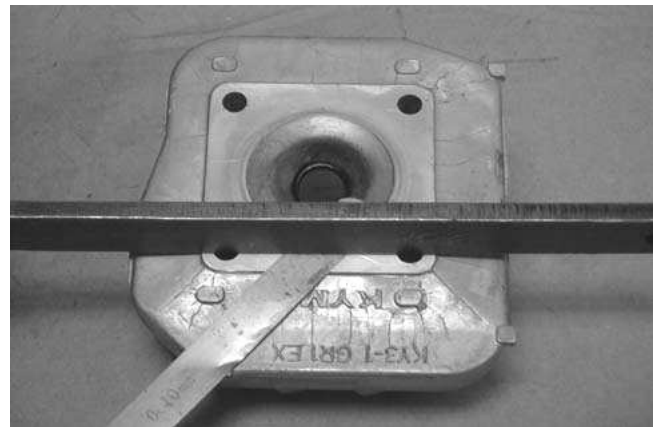
Mating Surface

### CYLINDER HEAD INSPECTION

Check the cylinder head for warpage with a straight edge and feeler gauge.

**Service Limit:**

0.10mm replace if over



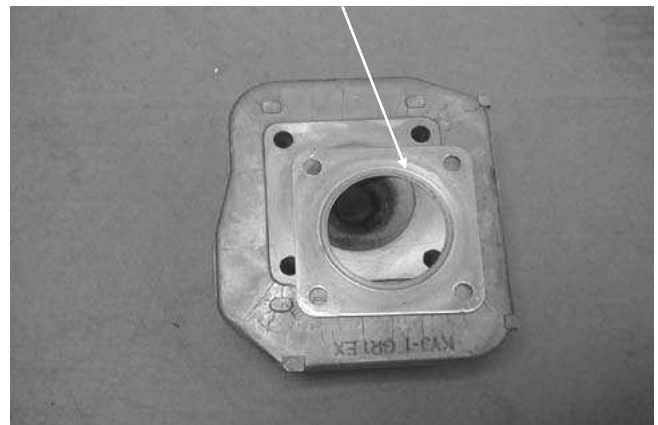
### CYLINDER HEAD INSTALLATION

Install the cylinder head on the cylinder properly.

Be careful not to damage the mating surfaces.

Install a new cylinder head gasket onto the cylinder.

Cylinder head Gasket



## 6. CYLINDER HEAD/CYLINDER/PISTON

### Cylinder Head Bolts Installation

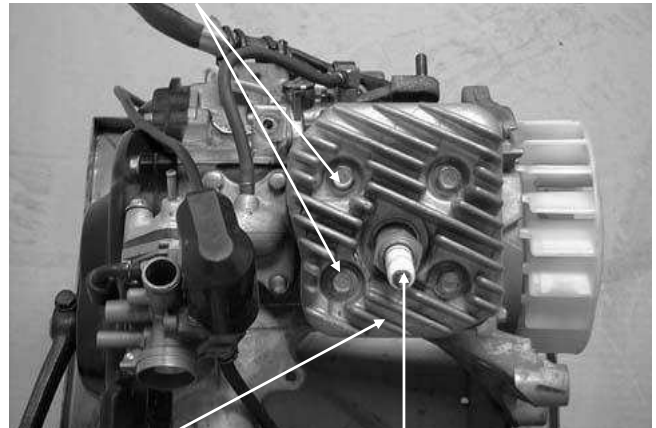
Install and tighten the cylinder head bolts diagonally in 2 or 3 times.

**Torque:** 1.5□1.7kg-m

Install the spark plug.

**Torque:** 1.1□1.7kg-m

Cylinder head Bolts



Cylinder Head

Spark Plug

### Engine Hood Installation

Install the engine hood.

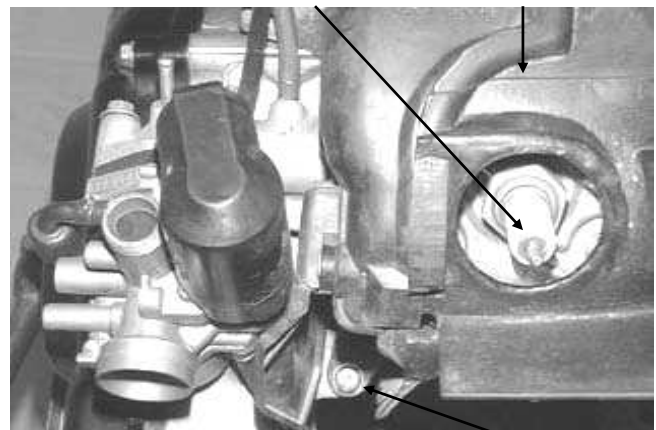
Install the spark plug cap.

Perform the following inspections after installation:

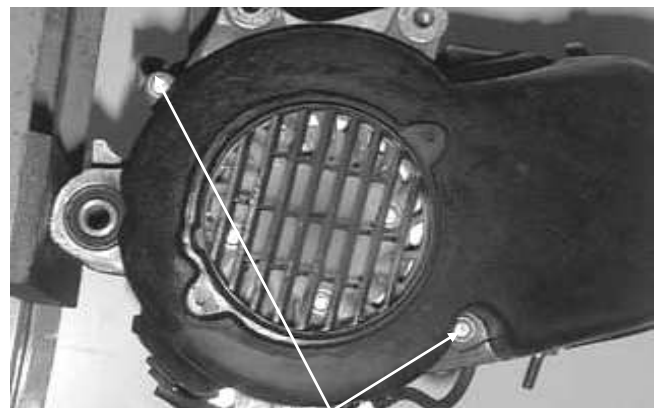
- Compression test
- Abnormal engine noise
- Cylinder air leaks

Spark Plug

Engine Hood



Bolt



Bolts

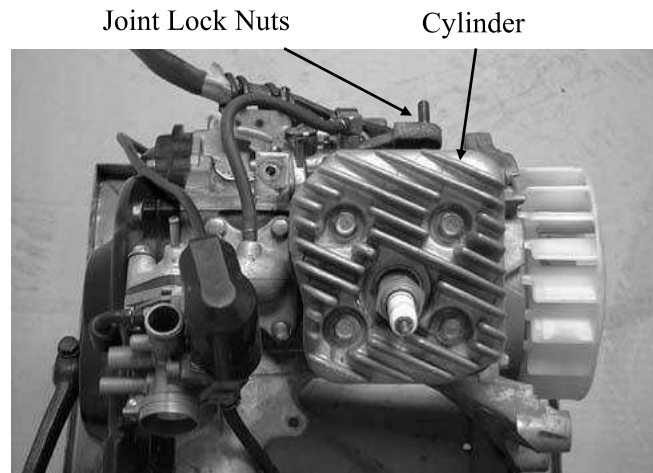
## 6. CYLINDER HEAD/CYLINDER/PISTON

### CYLINDER/PISTON

#### CYLINDER REMOVAL

Remove the met-in box and seat.  
Remove the frame body cover.  
Remove the cylinder head.  
Remove the two exhaust muffler joint lock nuts and two exhaust muffler lock bolts.  
Remove the exhaust muffler.  
Remove the cylinder.  
Remove the cylinder gasket.

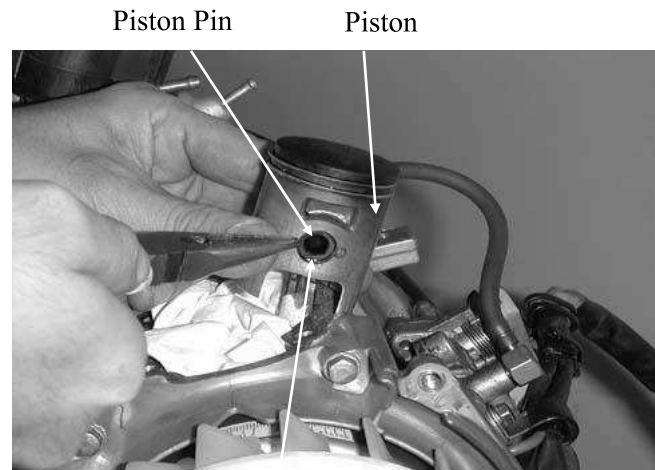
Do not pry between the cylinder and crankcase or strike the fins.



#### PISTON REMOVAL

Remove the piston pin clip to remove the piston pin and piston.

- Do not damage or scratch the piston.
- Do not apply side force to the connecting rod when removing the piston pin.
- Place clean shop towels in the crankcase to keep the piston pin clip



Piston Pin Clip

Spread each piston ring and remove by lifting it up at a point just opposite the gap.  
Remove the expander.

## 6. CYLINDER HEAD/CYLINDER/PISTON

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### CYLINDER/PISTON INSPECTION

Check the cylinder and piston for wear or damage.  
Clean carbon deposits from the exhaust port area.

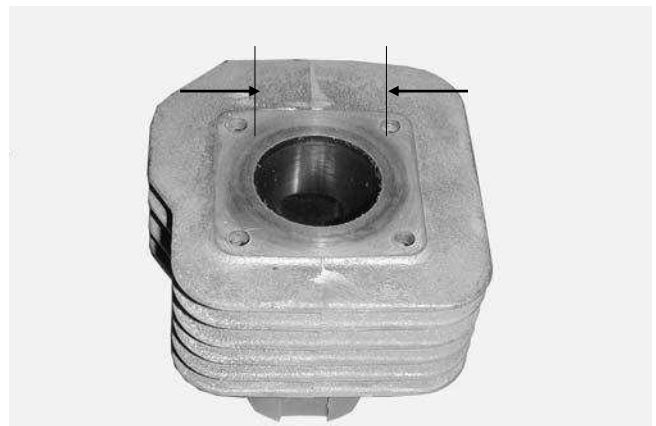
Be careful not to damage the cylinder inside wall.



Measure the cylinder bore at three levels of A, B and C in both X and Y directions. Avoid the port area. Take the maximum figure measured to determine the cylinder bore.

**Service Limit:**

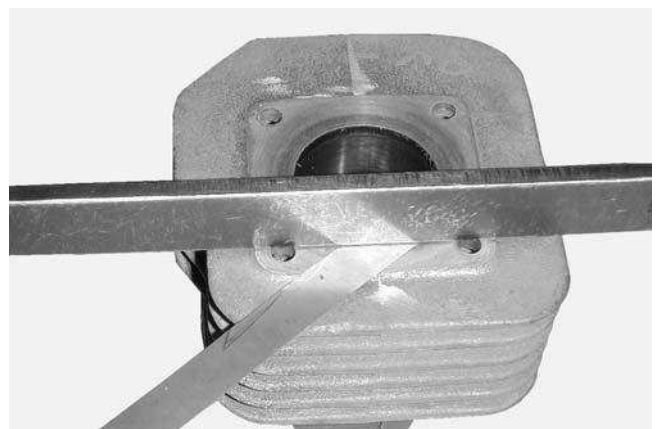
39.05mm replace if over



Inspect the top of the cylinder for warpage.

**Service Limit:**

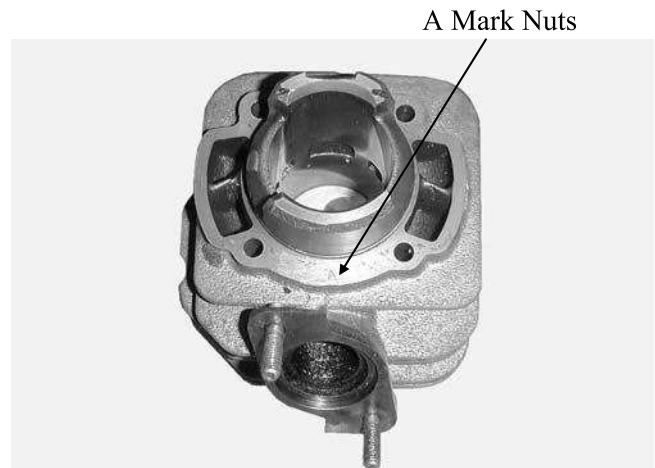
0.10mm replace if over





## 6. CYLINDER HEAD/CYLINDER/PISTON

The cylinder has an A mark or no mark on it. When replacing the cylinder with a new one, use a cylinder having the same mark as the old one.



Measure the piston O.D. at a point 5mm from the bottom of the piston skirt.

**Service Limit:**

38.90mm replace if below

Measure the piston-to-cylinder clearance.

**Service Limit:**

0.10mm replace if over

Measure the piston pin hole I.D.

**Service Limit:**

12.03mm replace if over

Measure the piston pin O.D.

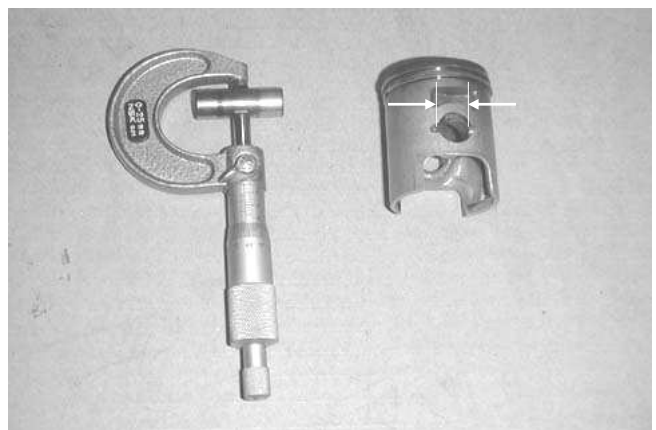
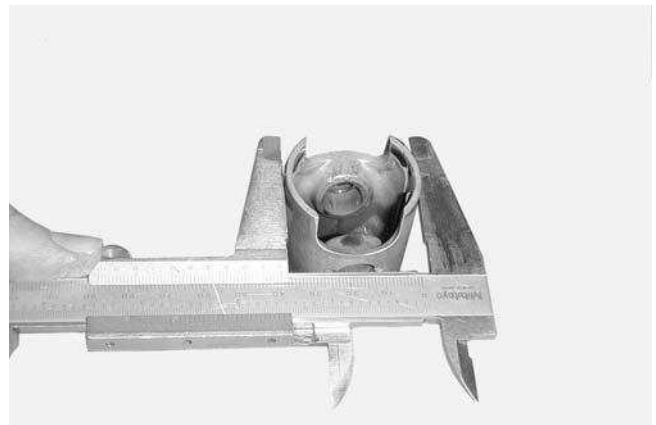
**Service Limit:**

11.98mm replace if below

Measure the piston-to-piston pin clearance.

**Service Limit:**

0.03mm replace if over



## 6. CYLINDER HEAD/CYLINDER/PISTON

### PISTON RING INSPECTION

Measure each piston ring end gap.

**Service Limits:** Top/Second

0.40mm replace if over

Set each piston ring squarely into the cylinder using the piston and measure the end gap.



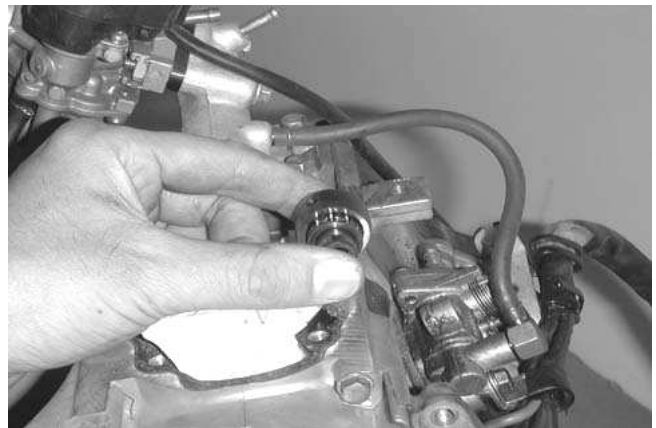
### CONNECTING ROD SMALL END INSPECTION

Install the piston pin and bearing in the connecting rod small end and check for excessive play.

Measure the connecting rod small end I.D.

**Service Limit:**

17.03mm replace if over



<Small End I.D. Measurement>

### PISTON/CYLINDER INSTALLATION

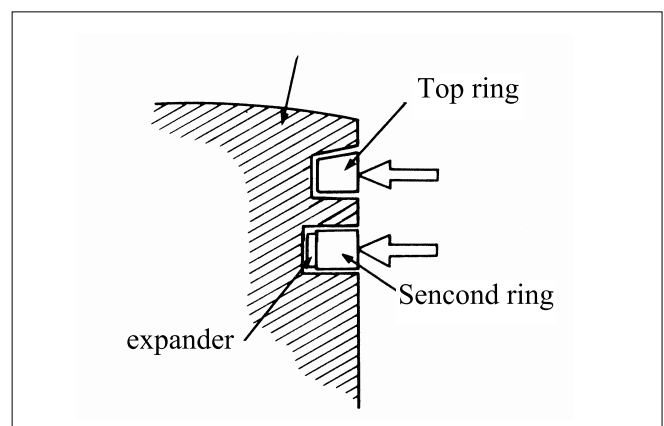
First install the expander in the second ring groove.

Then install the top and second rings in their respective ring grooves.

The piston rings should be pressed into the grooves with even force.

After installation, check and make sure that each ring is flush with the piston at several points around the ring.

A ring that will not compress means that the ring groove has carbon deposits in it and should be cleaned.



## 6. CYLINDER HEAD/CYLINDER/PISTON

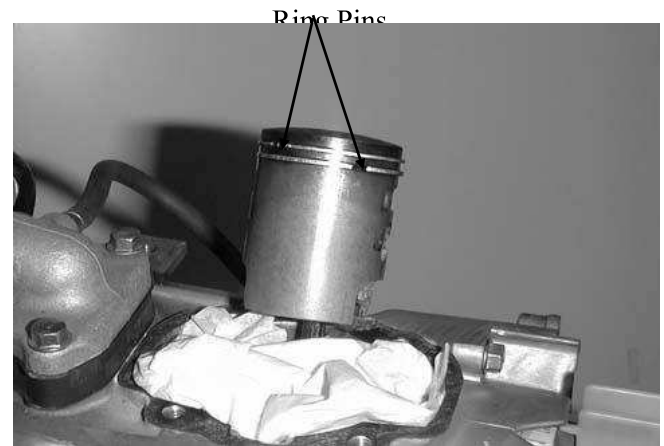
Install a new cylinder gasket on the mating surface between the cylinder and crankcase.



Cylinder Gasket

Make sure that the ring end gaps are aligned with the piston ring pins in the ring grooves.

Lubricate the cylinder inside and piston rings with engine oil and install the piston into the cylinder while compressing the piston rings.



Be careful not to damage the piston.

Install the cylinder head.

**Torque:** 1.5□1.7kg-m

Install the exhaust muffler and tighten the exhaust muffler joint lock nuts.

**Torque:** 1.0□1.4kg-m

Tighten the exhaust muffler lock bolts.

**Torque:** 3.0□3.6kg-m

Install the frame covers.

## **7. A.C. GENERATOR**

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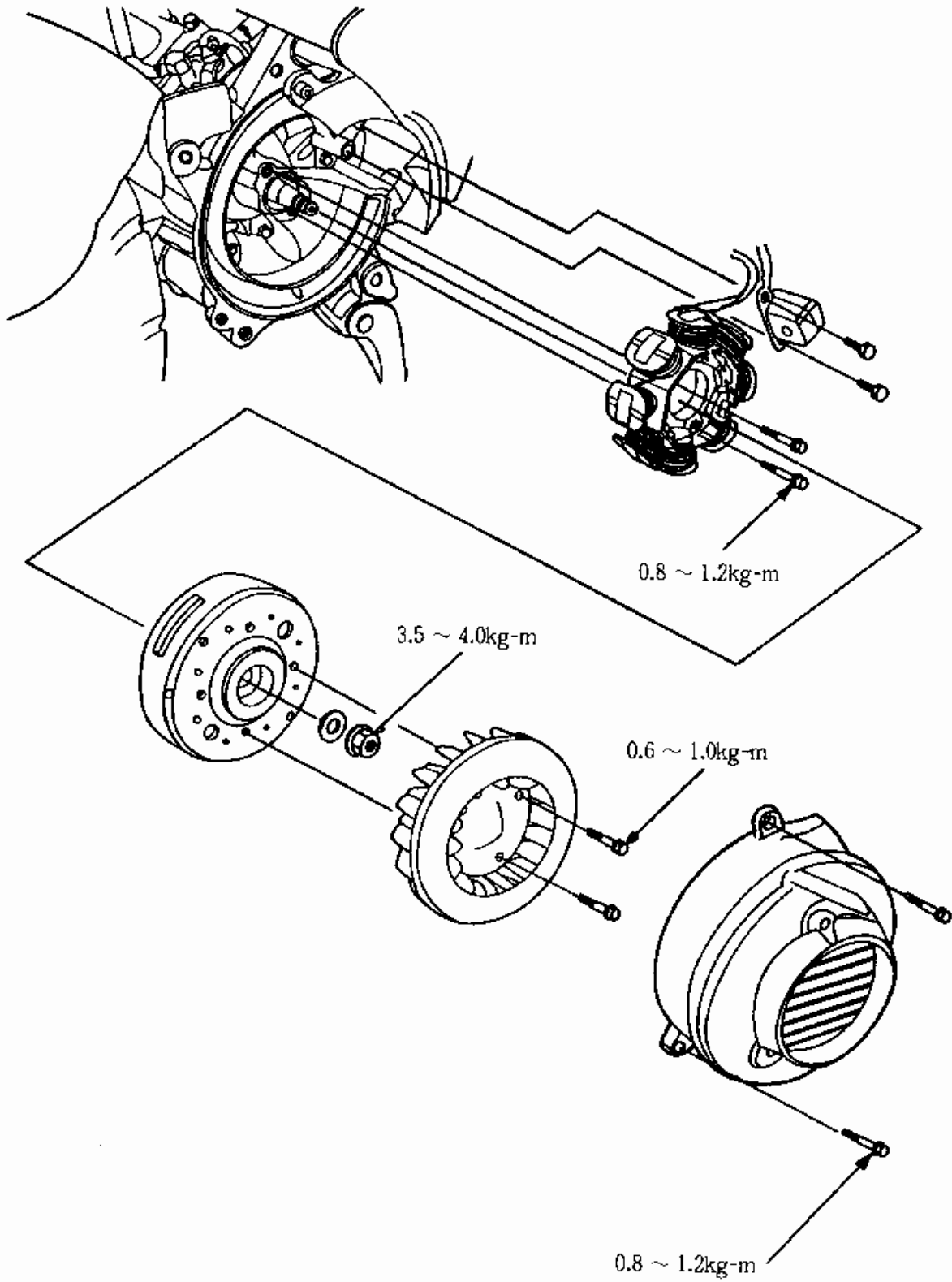


### **A.C. GENERATOR**

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A.C. GENERATOR INSTALLATION .....	7-4

# 7. A.C. GENERATOR



## **7. A.C. GENERATOR**

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### **SERVICE INFORMATION**

#### **GENERAL INSTRUCTIONS**

- All A.C. generator maintenance and inspection can be made with the engine installed.
- Refer to Section 15 for A.C. generator inspection.

#### **TORQUE VALUE**

Flywheel nut : 3.5 4.0kg-m

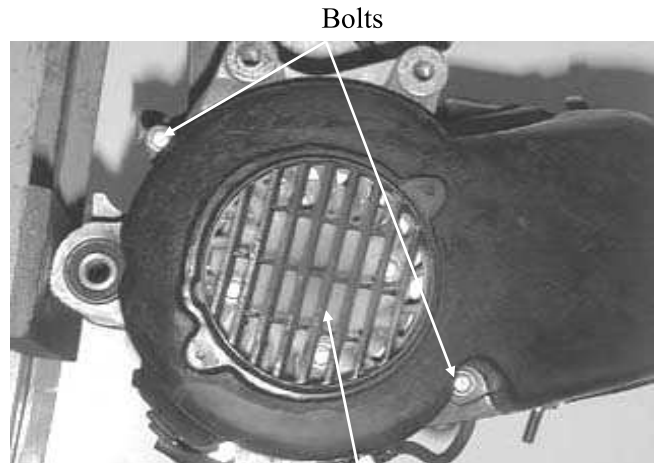
#### **SPECIAL TOOLS**

Flywheel puller  
Universal holder

## 7. A.C. GENERATOR

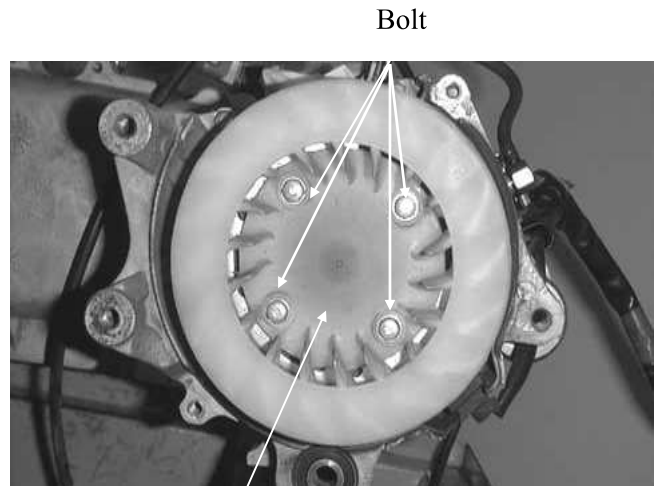
### A.C. GENERATOR REMOVAL

Remove the three bolts attaching the fan cover to remove the fan cover.



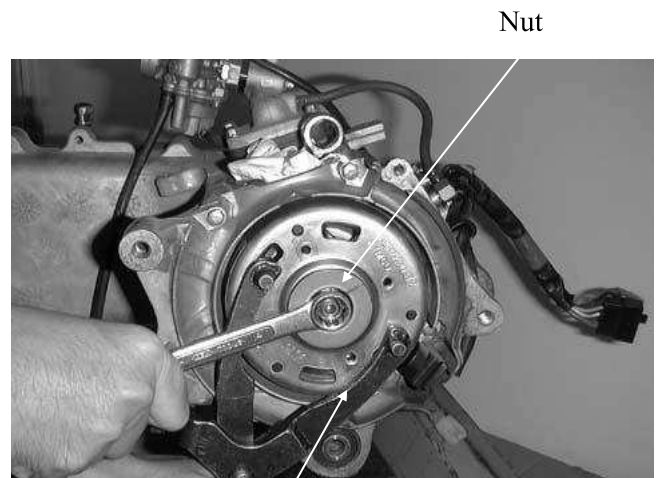
Fan Cover

Remove the cooling fan by removing the four bolts.



Cooling Fan

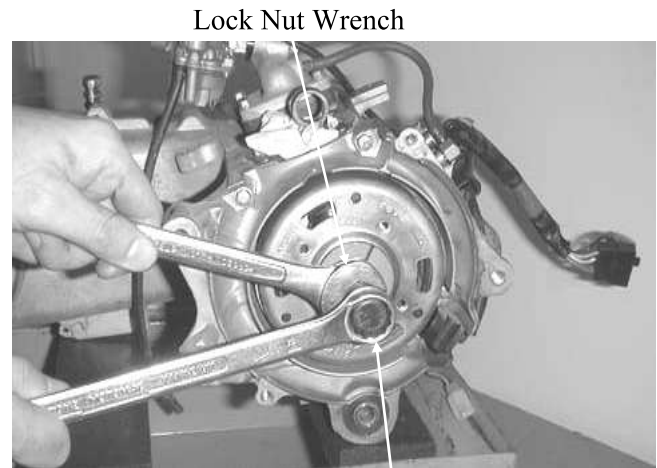
Hold the flywheel with an universal holder and then remove the flywheel nut.



Universal Holder

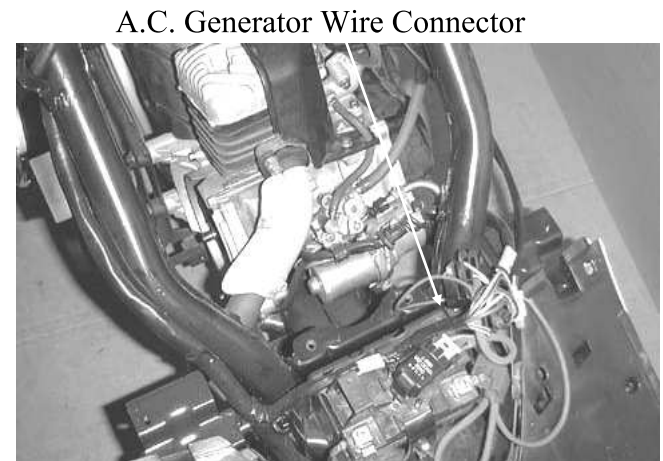
## 7. A.C. GENERATOR

Remove the A.C. generator flywheel using the flywheel puller.



Flywheel Puller

Remove the A.C. generator wire connector.

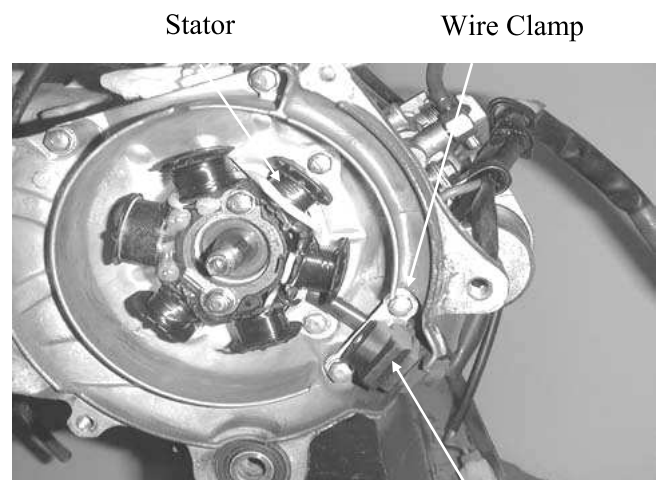


Remove the two pulser coil bolts and pulser coil from the right crankcase.  
Remove the pulser coil wire clamp from the right crankcase.  
Remove the two bolts attaching the A.C. generator stator.

Be careful not to damage the disconnected wire.

### A.C. GENERATOR INSTALLATION

Install the A.C. generator stator and pulser coil wire clamp onto the right crankcase, and then install the pulser coil.



Pulser Coil

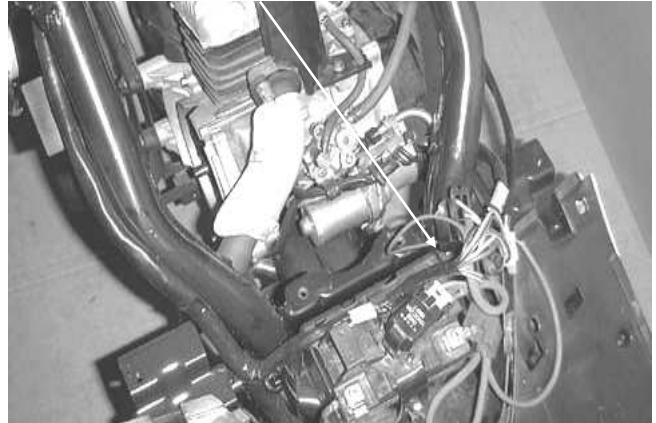


## 7. A.C. GENERATOR

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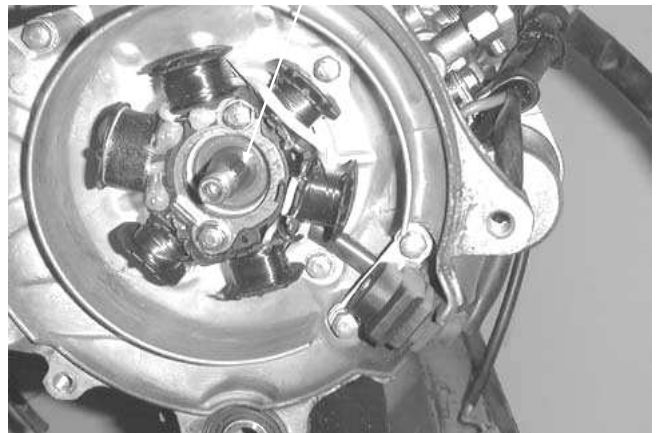
Connect the A.C. generator wire connector.

A.C. Generator Wire Connector



Clean the taper hole in the flywheel off any burrs and dirt.  
Install the woodruff key in the crankshaft keyway.

Woodruff Key

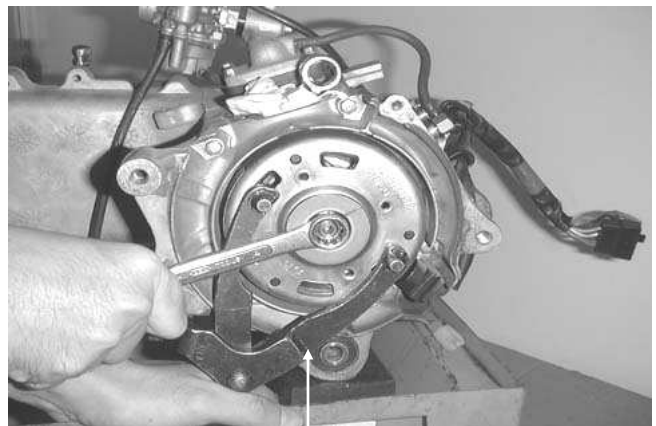


Install the flywheel onto the crankshaft with the flywheel groove aligned with the crankshaft woodruff key.  
Hold the flywheel with the universal holder and install the flywheel flange nut.

**Torque:** 3.5 4.0kg-m

Start the engine and check the ignition timing. (⇒3-7)

Install other removed parts in the reserve order of removal.



Universal Holder

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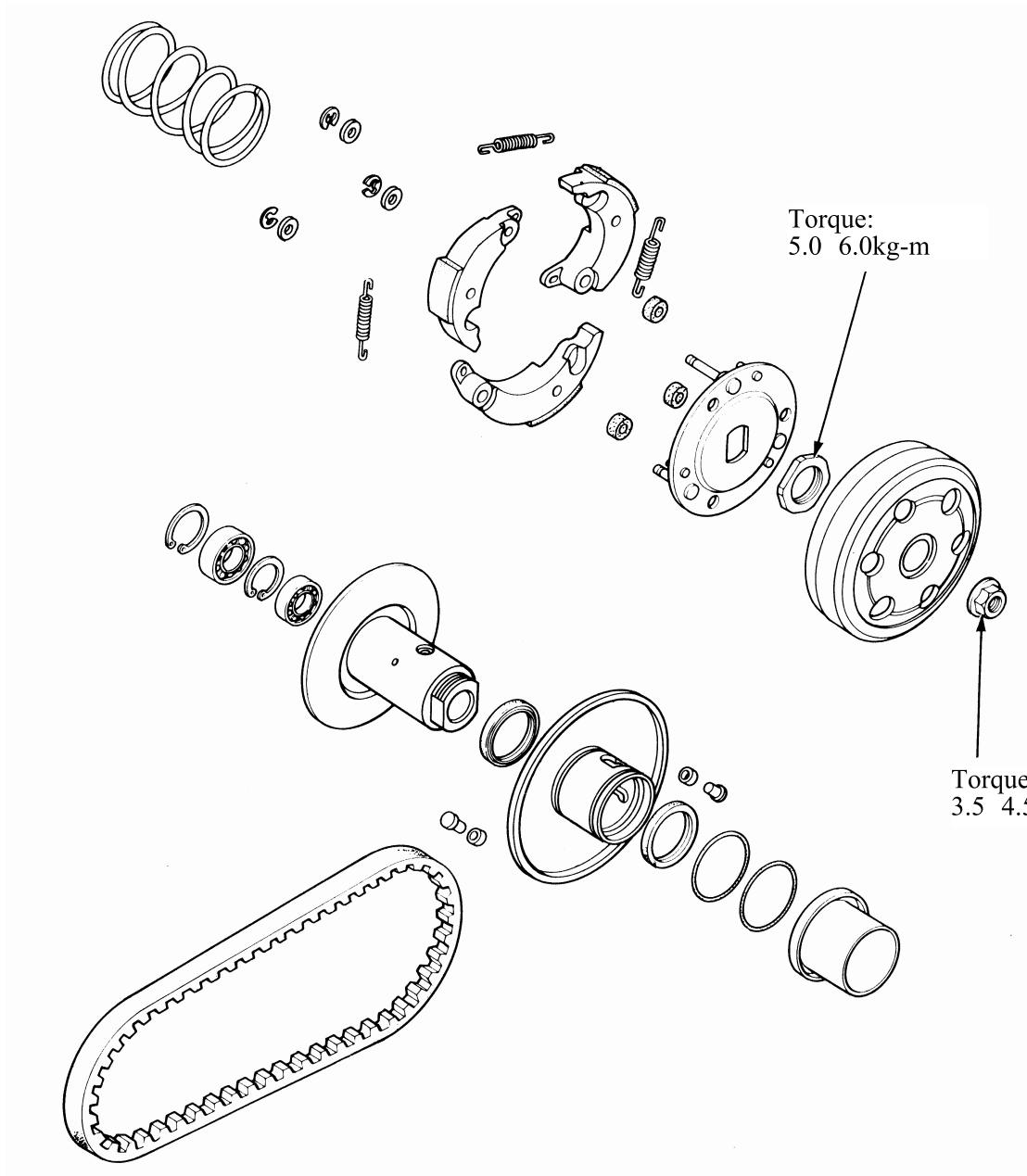
**KICK STARTER/DRIVE PULLEY/  
CLUTCH/DRIVEN PULLEY**

**8**

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# 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

MODEL SC10AS



## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- Avoid getting grease and oil on the drive belt and pulley faces.

SPECIFICATIONS	SC10AS	
	Standard (mm)	Service Limit (mm)
Drive pulley collar O.D.	20.01 20.025	24.24
Movable drive face I.D.	20.035 20.085	19.97
Weight roller O.D.	13.0	12.4
Clutch outer I.D.	107 107.2	107.5
Driven face spring free length	87.9	82.6
Driven face O.D.	33.965 33.985	33.94
Movable driven face I.D.	34.0 34.25	34.06
Drive belt width	18	17

#### TORQUE VALUES

Drive face nut	3.5 4.0kg-m
Clutch outer nut	3.5 4.5kg-m
Clutch drive plate nut	5.0 6.0kg-m

#### SPECIAL TOOLS

Lock nut wrench, 39mm	Universal holder
Clutch spring compressor	Lock nut socket wrench, 32mm
Bearing outer driver 37x40mm	Bearing driver pilot, 17mm
One-way clutch puller	Outer driver, 24x26mm

#### TROUBLESHOOTING

##### Engine starts but motorcycle won't move

- Worn drive belt
- Broken ramp plate
- Worn or damaged clutch lining

##### Engine stalls or motorcycle creeps

- Broken clutch weight spring

##### Poor performance at high speed or lack of power

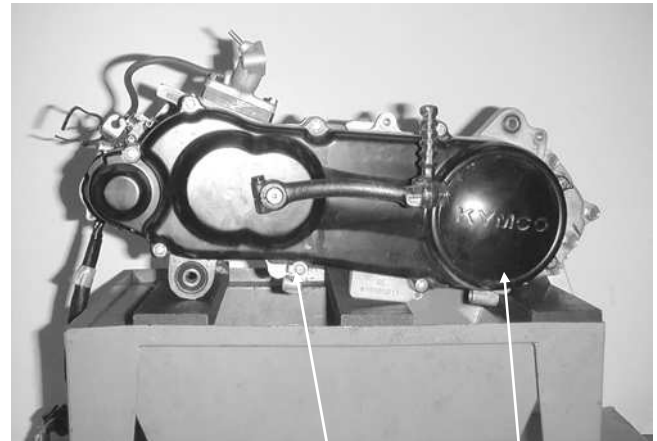
- Worn drive belt
- Weak driven face spring
- Worn weight roller
- Faulty driven face

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### KICK STARTER

#### LEFT CRANKCASE COVER REMOVAL

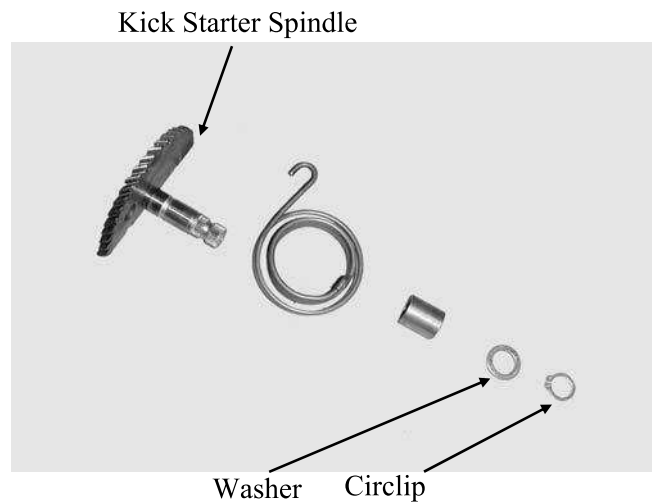
Remove the drive belt cooling air tube connector circlip.  
Remove the nine left crankcase cover bolts, left crankcase cover and dowel pins.  
Inspect the left crankcase cover seal rubber for damage or deterioration.



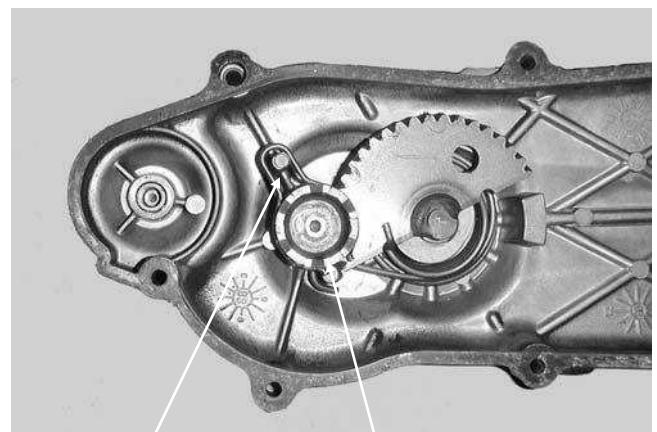
Bolt Left Crankcase Cover

#### KICK STARTER SPINDLE REMOVAL

Remove the kick lever from the kick starter spindle.  
Remove the circlip and washer from the kick starter spindle.



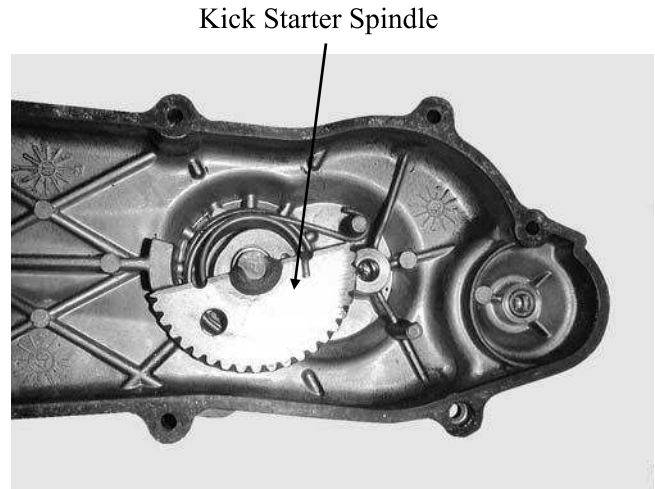
Slightly rotate the kick starter spindle to remove the kick starter driven gear together with the friction spring.



Friction Spring Kick Starter Driven Gear

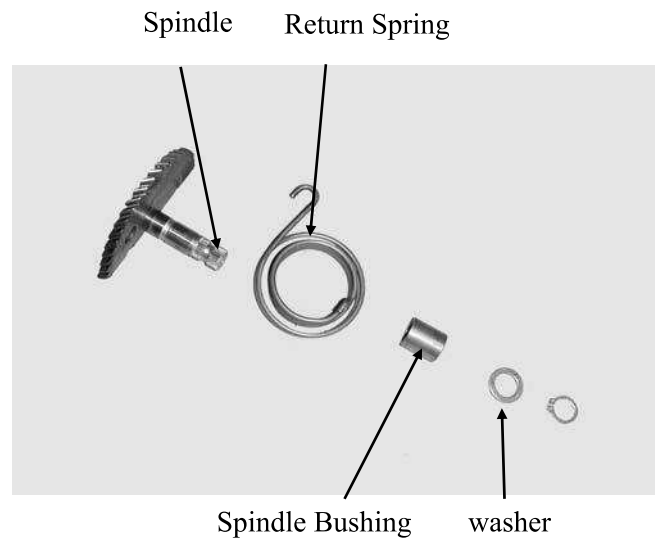
## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Remove the kick starter spindle and return spring from the left crankcase cover.  
Remove the kick starter spindle bushing.



### **KICK STARTER SPINDLE INSPECTION**

Inspect the kick starter spindle and gear for wear or damage.  
Inspect the return spring for weakness or damage.  
Inspect the kick starter spindle bushing for wear or damage.



Check the kick starter driven gear for wear or damage.  
Check the friction spring for wear or damage.

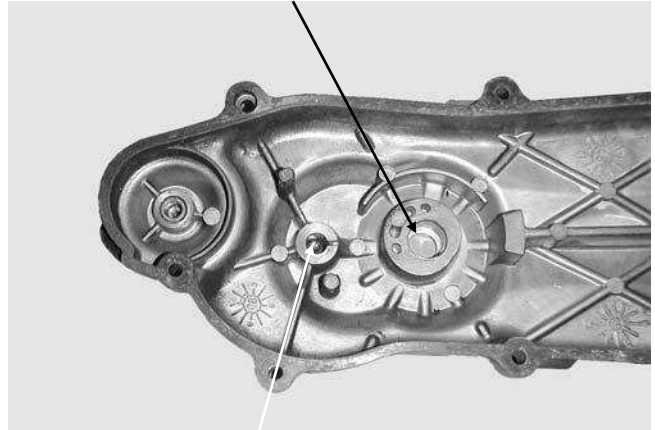


Kick Starter Driven Gear

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Inspect the kick starter spindle and driven gear forcing parts for wear or damage.

Kick Starter Spindle Forcing Part

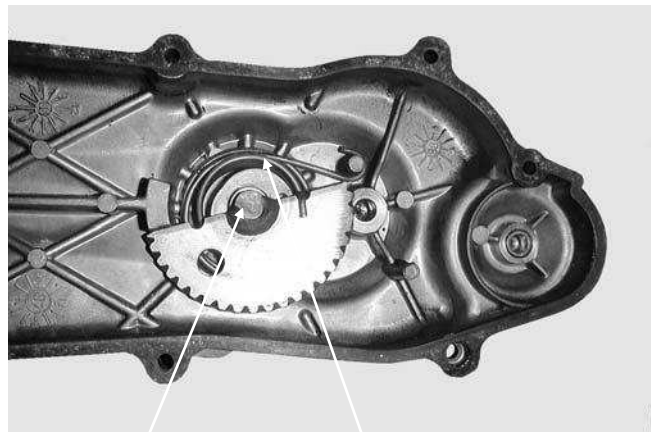


Kick Starter Driven Gear Forcing Part

### KICK STARTER INSTALLATION

Install the kick starter spindle bushing and return spring onto the left crankcase cover.

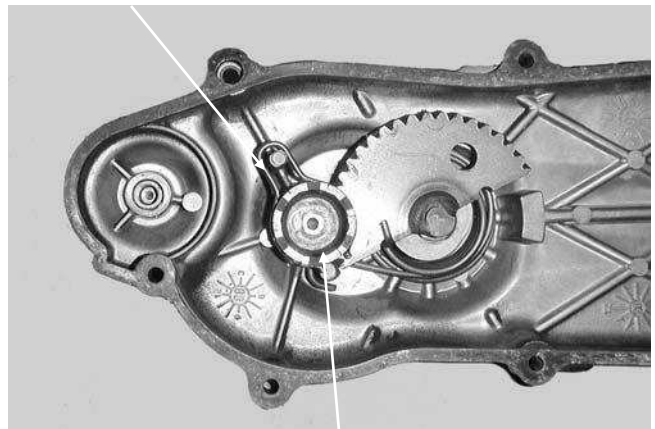
If the hooks of the return spring can not be installed properly, use a screw driver to press them into their locations respectively.



Kick Starter Spindle      Return Spring

Properly install the kick starter driven gear and friction spring as the figure shown.

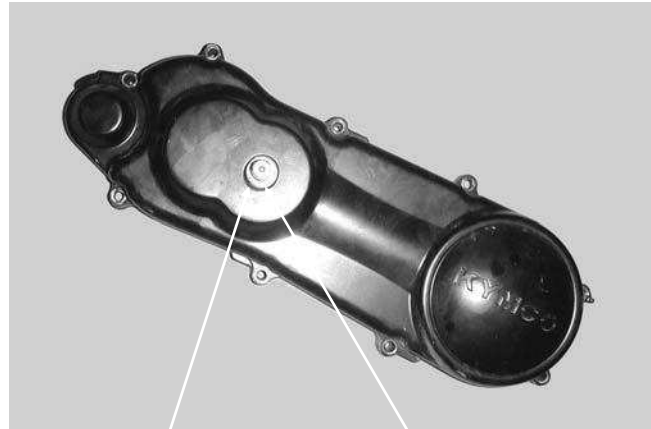
Friction Spring



Kick Starter Driven Gear

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

First install the washer and then the circlip onto the kick starter spindle.  
Install the kick lever.

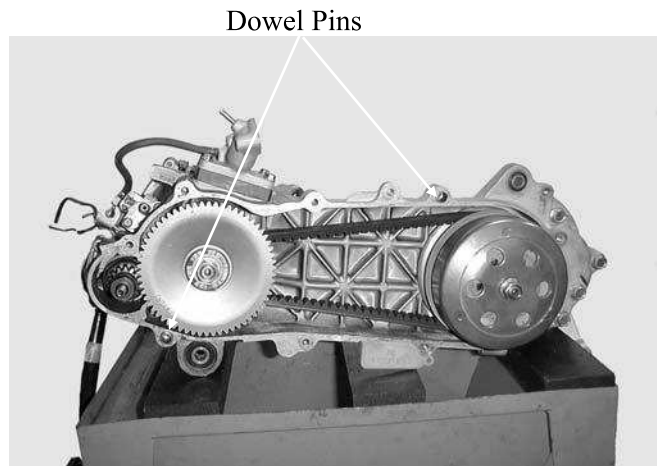


Washer

Circlip

### LEFT CRANKCASE COVER INSTALLATION

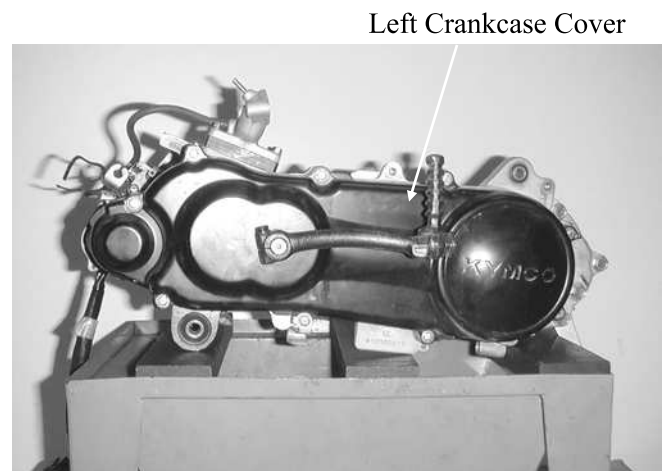
First install the dowel pins and then the seal rubber.



Dowel Pins

Install the left crankcase cover and tighten the nine bolts diagonally.  
Connect the drive belt cooling air tube and install the circlip.

For drum brake, note the location of the brake cable clamp and install the rear brake cable in place with the clamp.



Left Crankcase Cover



## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### DRIVE BELT

Remove the left crankcase cover.

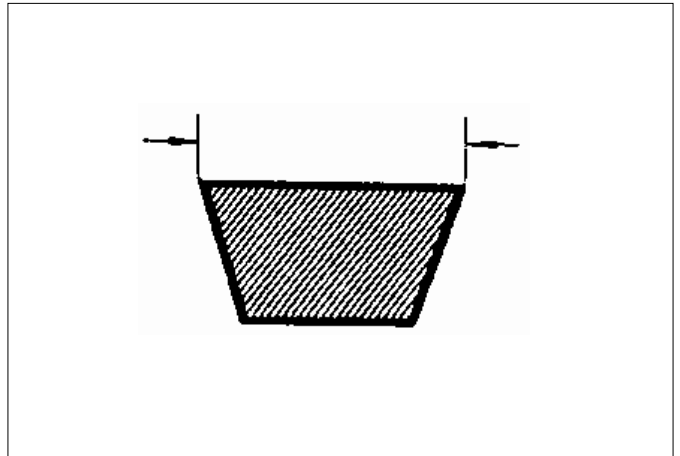
### INSPECTION

Check the drive belt for cracks, separation or abnormal or excessive wear.  
Measure the drive belt width.

### Service Limit:

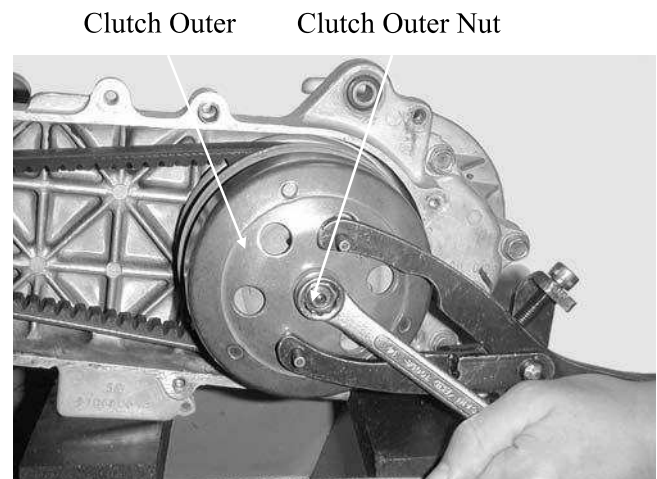
16.5mm replace if below

Use specified genuine parts for replacement.

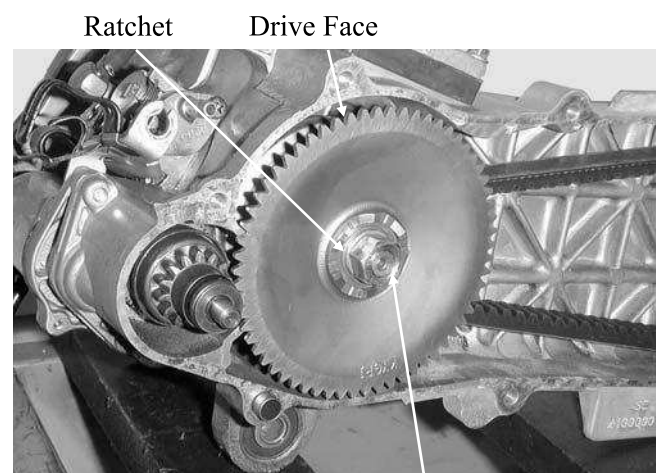


### REPLACEMENT

Remove the nine left crankcase cover bolts and left crankcase cover. (⇒8-3)  
Hold the clutch outer with the universal holder and remove the 14mm clutch outer nut and clutch outer.



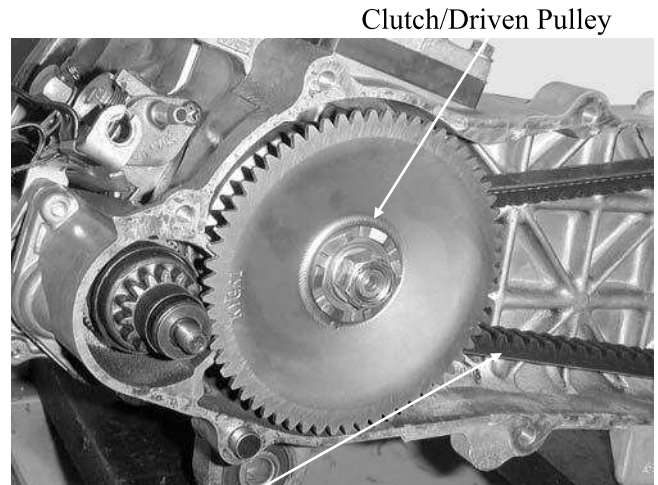
Hold the drive pulley with the holder and remove the drive face nut.  
Remove the starting ratchet.  
Remove the drive pulley face.



Drive Face Nut

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Remove the drive belt from the clutch/  
driven pulley.

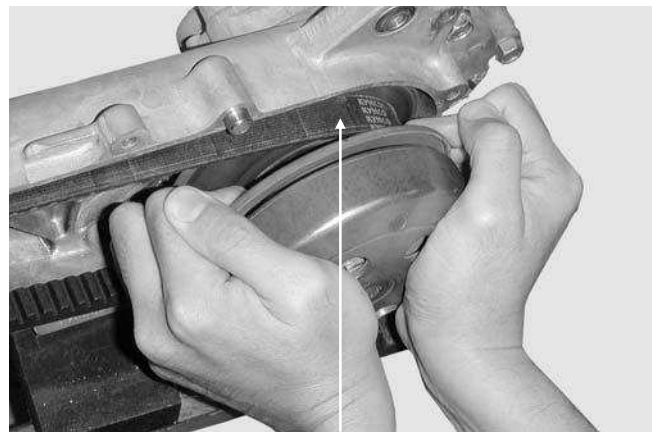


Clutch/Driven Pulley

Drive Belt

### DRIVE BELT INSTALLATION

Turn the driven pulley clockwise and lift it  
up to expand the drive belt groove and then  
install a new drive belt.

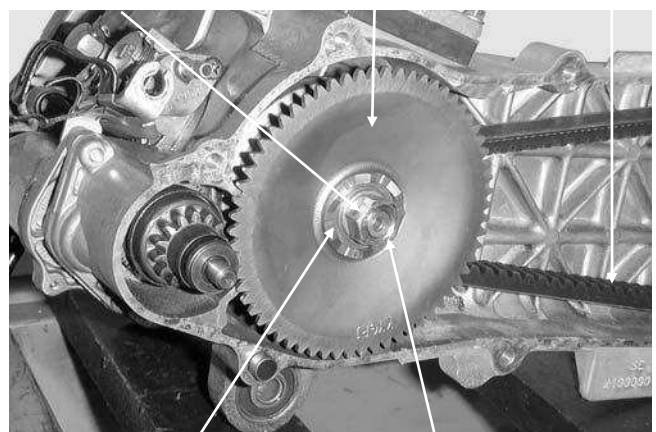


Drive Belt

Set the drive belt on the drive pulley.  
Install the drive pulley face, starting ratchet  
and washer, then tighten the drive face nut.  
**Torque:** 3.5 4.0kg-m

When installing the drive face nut, make  
sure that the tooth spaces of the drive  
pulley face and starting ratchet align  
with the teeth of the crankshaft.

Drive Face Nut    Drive Pulley Face    Drive Belt



Starting Ratchet

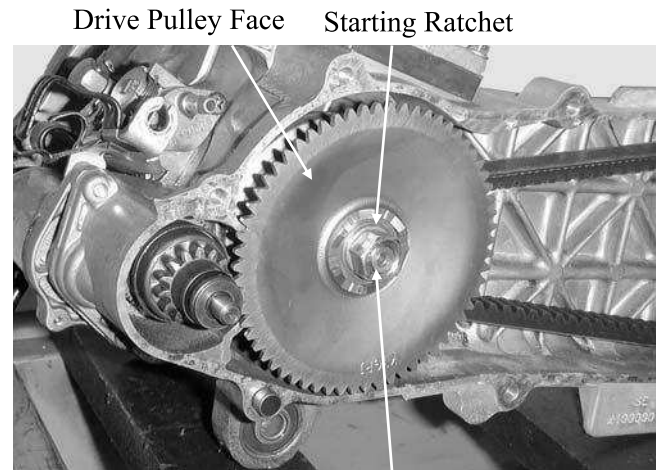
Washer

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### DRIVE PULLEY

#### REMOVAL

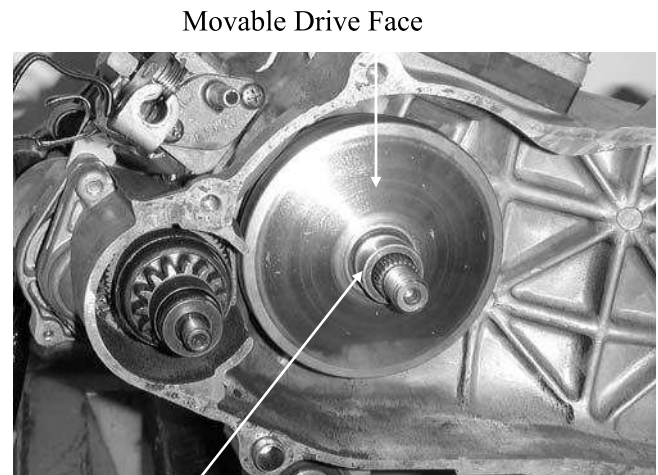
Hold the drive pulley with the holder and remove the drive face nut. Remove the starting ratchet, washer and drive pulley face.



Drive Face Nut

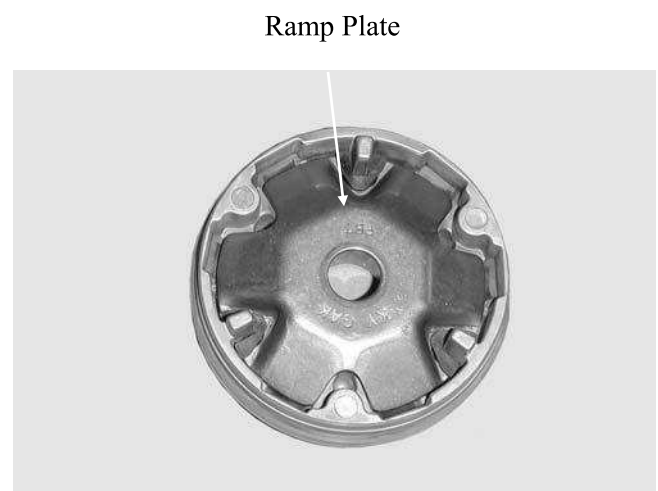
#### MOVABLE DRIVE FACE DISASSEMBLY

Remove the movable drive face and drive pulley collar from the crankshaft.



Drive Pulley Collar

Remove the ramp plate.



## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Remove the weight rollers.

Weight Roller



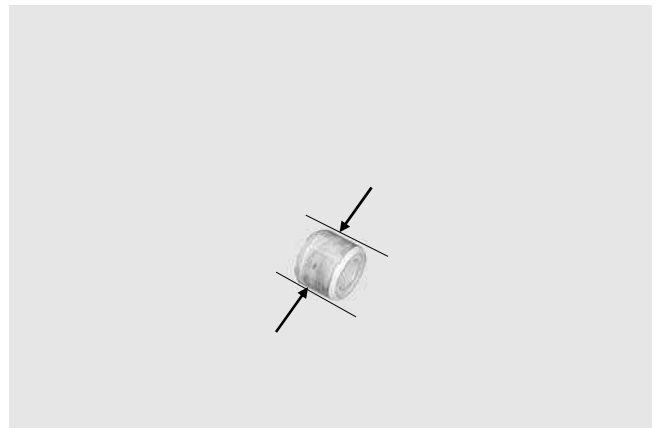
### MOVABLE DRIVE FACE INSPECTION

Check each weight roller for wear or damage.

Measure each roller O.D.

**Service Limit:**

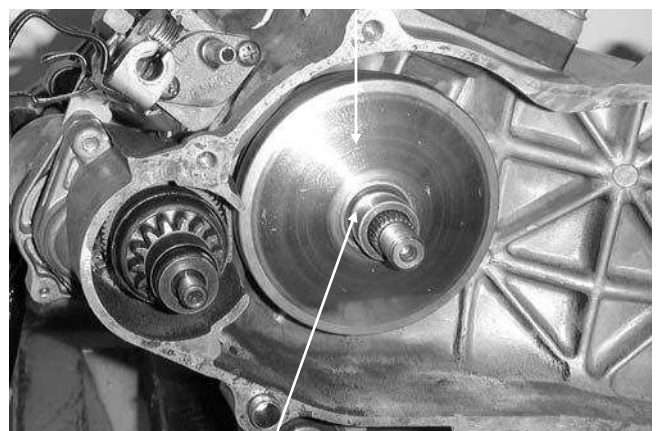
12.4mm replace if below



### DRIVE PULLEY INSTALLATION

Install the drive pulley collar and movable drive face onto the crankshaft.

Movable Drive Face



Drive Pulley Collar

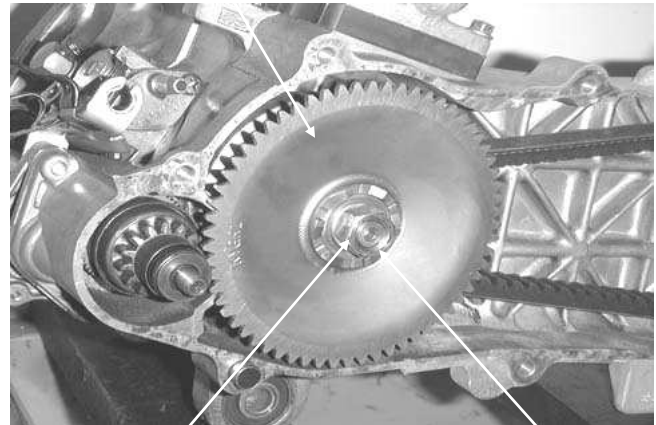
## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Install the drive belt on the crankshaft.  
Install the drive face, starting ratchet and  
washer, then tighten the 12mm drive face  
nut.

**Torque:** 3.5 4.0kg-m

Keep grease or oil off the drive belt and  
drive pulley faces.

Drive Pulley Face



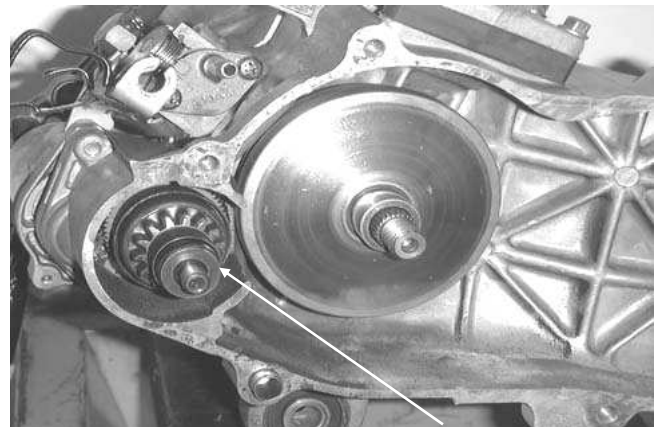
Drive Face Nut

Starting Ratchet

### STARTER PINION

#### REMOVAL

Remove the left crankcase cover. (⇒8-3)  
Remove the drive pulley. (⇒8-9)  
Remove the starter pinion.



Starter Pinion

#### INSPECTION

Inspect the starter pinion seat for wear.  
Inspect the starter pinion for smooth  
operation.  
Inspect the starter pinion shaft forcing parts  
for wear and damage.

#### INSTALLATION

Apply a small amount of grease to the  
starter pinion teeth.  
Install the starter pinion in the reverse order  
of removal.

Shaft Forcing Parts



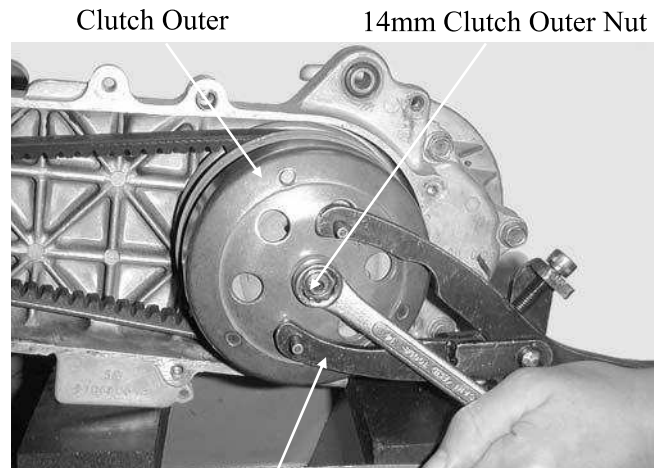
Starter Pinion

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### CLUTCH/DRIVEN PULLEY

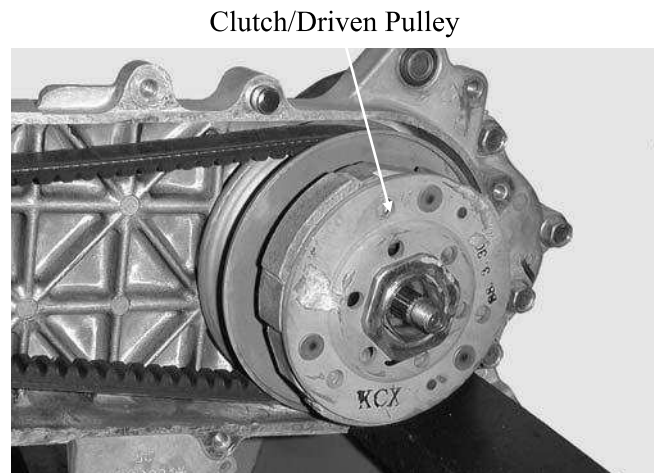
#### CLUTCH/DRIVEN PULLEY REMOVAL

Remove the drive pulley. (⇒8-9)  
Hold the clutch outer with the universal holder and remove the 14mm clutch outer nut.  
Remove the clutch outer.



Universal Holder

Remove the clutch/driven pulley.  
Remove the drive belt from the clutch/driven pulley.



Clutch/Driven Pulley

#### CLUTCH/DRIVEN PULLEY DIS-ASSEMBLY

Compress the clutch/driven pulley spring with the clutch spring compressor and remove the 39mm drive plate nut.  
Remove the driven face spring.



Clutch Spring Compressor

## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Remove the seal collar.



Pull out the guide roller pins from the driven pulley and then remove the O-rings and oil seal from the driven pulley.



### **CLUTCH/DRIVEN PULLEY INSPECTION**

Inspect the clutch outer for wear or damage.  
Measure the clutch outer I.D.

**Service Limit:**

107.5mm replace if below



## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Check the clutch shoes for wear or damage.  
Measure the clutch lining thickness.

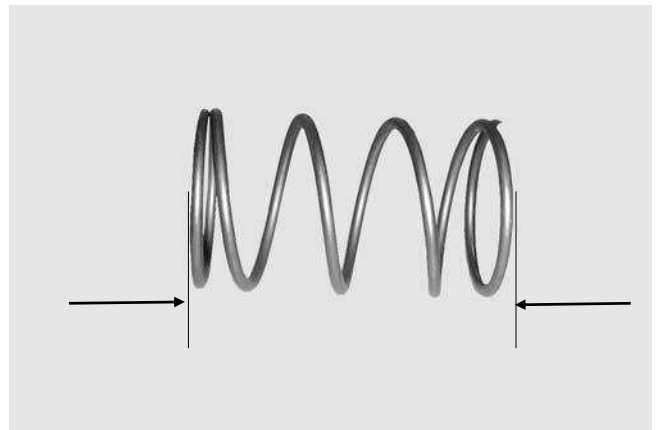
**Service Limit:** 2.0mm replace if below



Measure the driven face spring free length.

**Service Limit:**

82.6mm replace if below



Check the driven face assembly for wear or damage.

Measure the driven face O.D.

**Service Limit:** 33.94mm replace if below

Check the movable driven face for wear or damage.

Measure the movable driven face I.D.

**Service Limit:** 34.06mm replace if below

Check the guide roller pins for stepped wear.





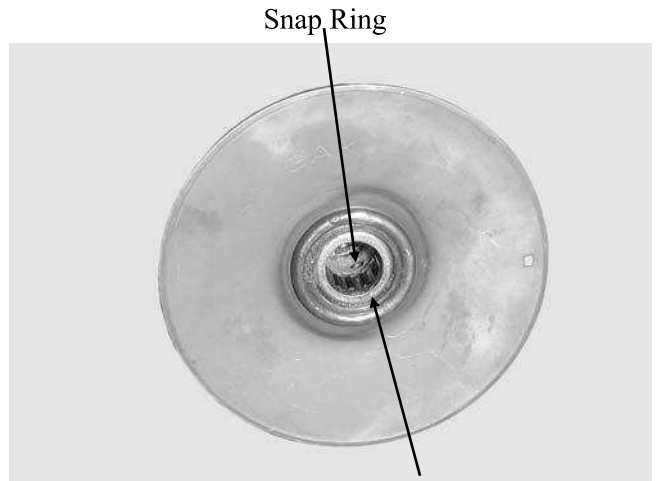
## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### DRIVEN PULLEY FACE BEARING REPLACEMENT

Check the needle bearings in the driven face and replace them if they have excessive play, damage or abnormal noise. Drive the inner bearing out of the driven pulley face.



Remove the snap ring and drive the outer bearing out of the driven face.



Outer Bearing

Drive a new outer bearing into the driven face with the sealed end facing up. Seat the snap ring in its groove.

Pack all bearing cavities with 5.0 5.6g grease.

Specified grease: 230 Heat-resistant grease

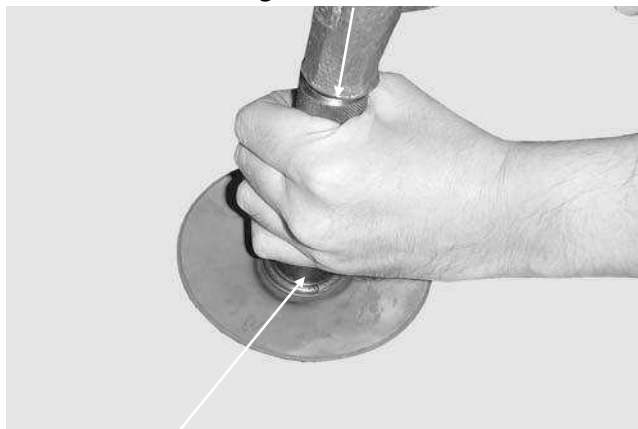
Bearing Outer Driver, 37x40mm



## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Drive in a new needle bearing into the driven face with the mark facing up.

Bearing Driver Pilot



Outer Driver, 24x26mm

### CLUTCH/DRIVEN PULLEY ASSEMBLY

First install the movable driven face onto the driven face. Then, install the guide roller pins, O-rings and a new oil seal.

Driven Pulley

Oil Seal



O-rings

Guide Roller Pin

Install the seal collar.



## 8. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Set the driven pulley, driven face spring and clutch assembly onto the clutch spring compressor. Compress the tool and install the 39mm drive plate nut. Tighten the 39mm nut to the specified torque.

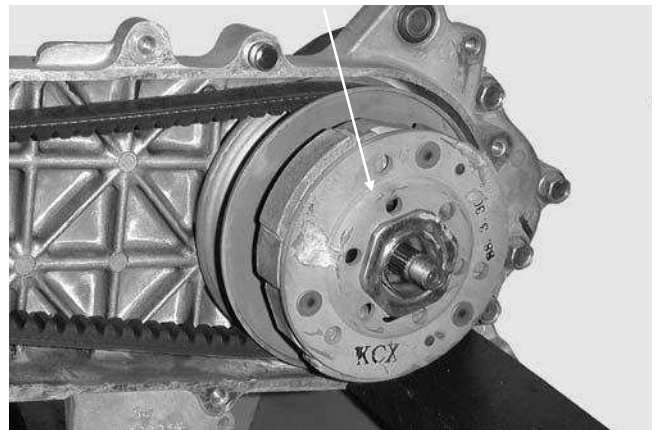
**Torque:** 5.0 6.0kg-m



### CLUTCH/DRIVEN PULLEY INSTALLATION

Install the drive belt on the clutch/driven pulley and then install the clutch/driven pulley onto the drive shaft.

Clutch/Driven Pulley

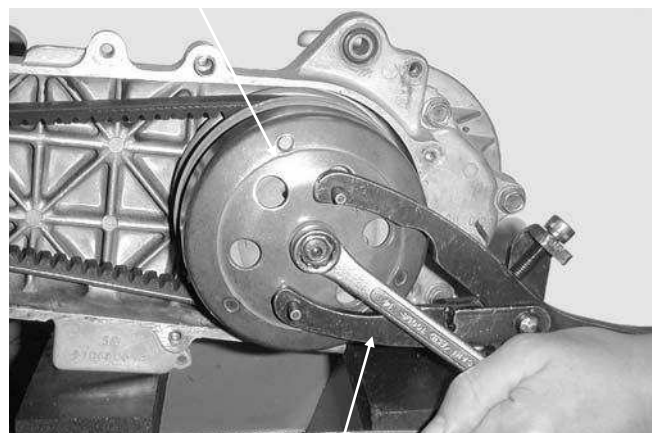


Install the clutch outer.  
Hold the clutch outer with the universal holder.  
Install and tighten the 10mm clutch outer nut.

**Torque:** 3.5 4.5kg-m

Install the left crankcase cover. (⇒8-6)

Clutch Outer



Universal Holder

## 9. FINAL REDUCTION

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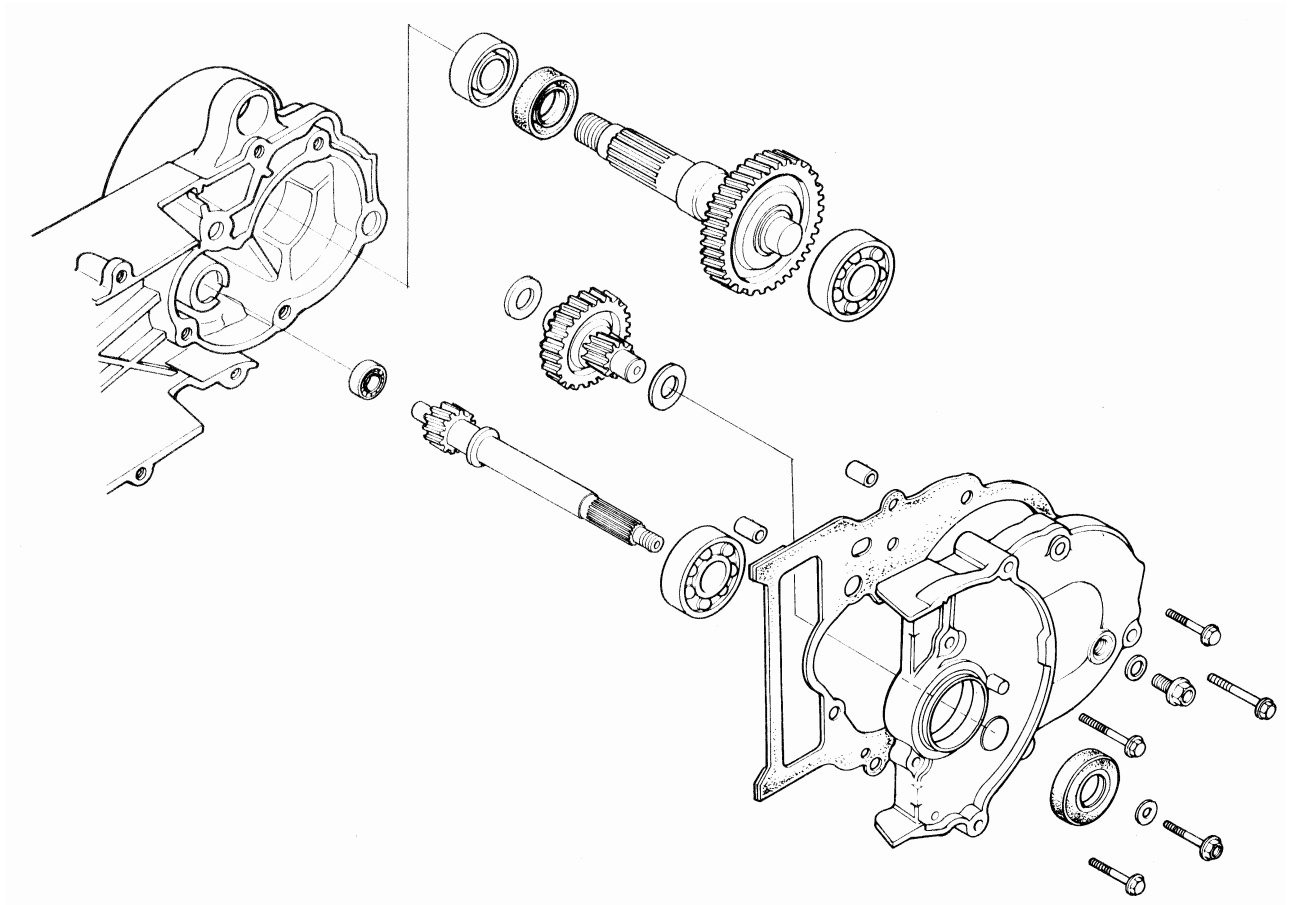
### FINAL REDUCTION

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FINAL REDUCTION INSPECTION.....	9-3
FINAL REDUCTION ASSEMBLY .....	9-6



## 9. FINAL REDUCTION



## 9. FINAL REDUCTION

### SERVICE INFORMATION

Specified Oil: SAE90#  
At disassembly: 0.12 liter  
At change: 0.1 liter

### SPECIAL TOOLS

Bearing remover set, 12mm  
Bearing remover set, 15mm  
Crankcase assembly collar  
Crankcase assembly shaft  
Bearing outer driver, 37x40mm  
Bearing outer driver, 32x35mm  
Bearing driver pilot, 17mm  
Bearing driver pilot, 15mm  
Bearing driver pilot, 12mm  
Bearing outer driver handle A

### TROUBLESHOOTING

#### **Engine starts but motorcycle won't move**

- Damaged transmission
- Seized or burnt transmission

#### **Abnormal noise**

- Worn, seized or chipped gears
- Worn bearing

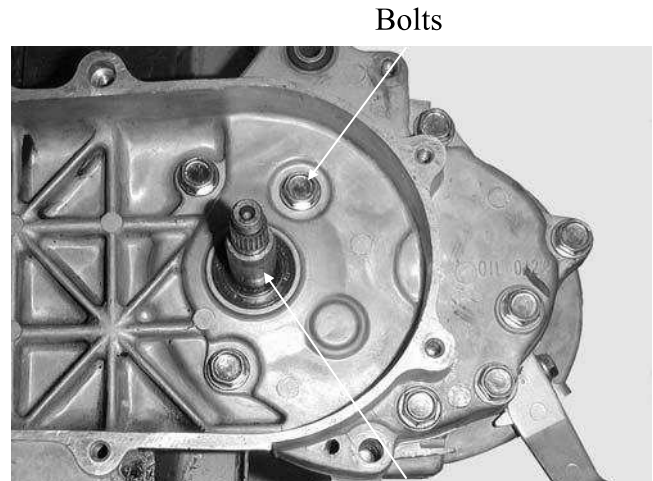
#### **Oil leaks**

- Oil level too high
- Worn or damaged oil seal

## 9. FINAL REDUCTION

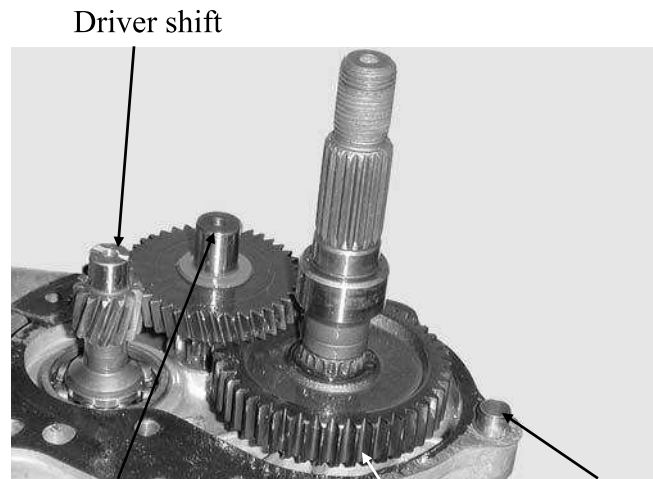
### FINAL REDUCTION DISASSEMBLY

Remove the rear wheel. (⇒14-3)  
 Remove the left crankcase cover. (⇒8-3)  
 Remove the clutch/driven pulley. (⇒8-7)  
 Drain the transmission gear oil into a clean container.  
 Remove the transmission case cover attaching bolts.  
 Remove the transmission case cover.  
 Remove the gasket and dowel pins.



Driver

Remove the final gear and countershaft.



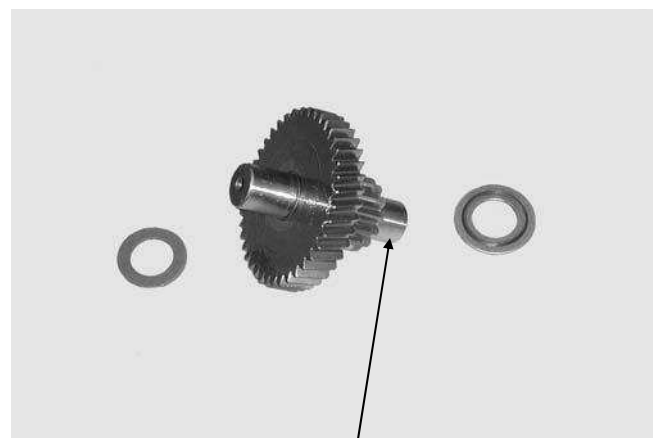
Countershaft

Final Gear

Dowel Pin

### FINAL REDUCTION INSPECTION

Inspect the countershaft and gear for wear or damage.



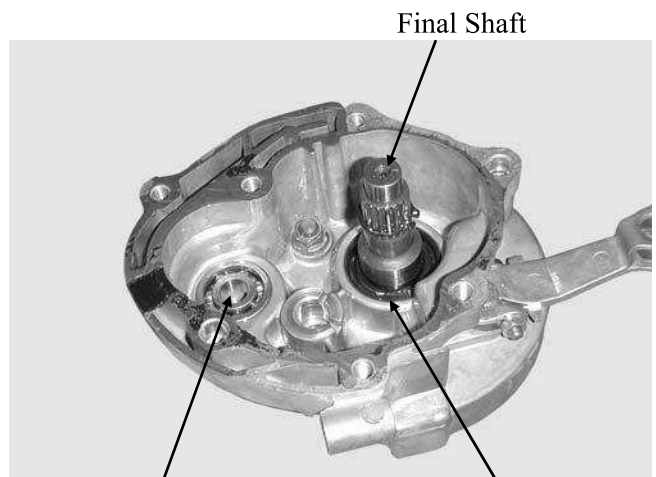
Countershaft

## 9. FINAL REDUCTION

Inspect the final gear and final shaft for wear, damage or seizure.



Check the left crankcase bearings for excessive play and inspect the oil seal for wear or damage.



Drive Shaft Bearing

Oil Seal

Inspect the drive shaft and gear for wear or damage.  
Check the transmission case cover bearings for excessive play and inspect the final shaft bearing oil seal for wear or damage.

Do not remove the transmission case cover except for necessary part replacement. When replacing the drive shaft, also replace the bearing and

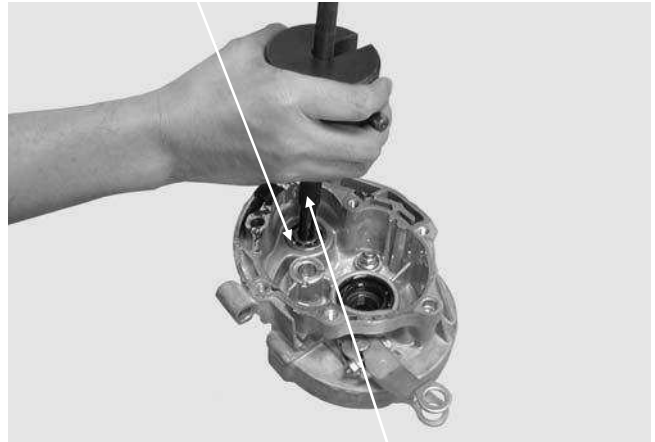


## 9. FINAL REDUCTION

### BEARING REPLACEMENT (Transmission Case Cover)

Remove the transmission case cover bearings using the bearing remover.  
Remove the final shaft oil seal.

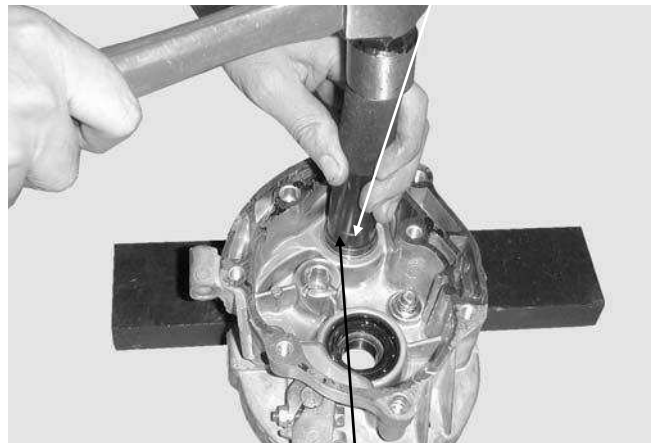
Drive Shaft Bearing



Bearing Remover Set

Drive new bearings into the transmission case cover.

Bearing Outer Driver Handle A



Bearing Outer Driver, 32x35mm

### BEARING REPLACEMENT (Left Crankcase Cover)

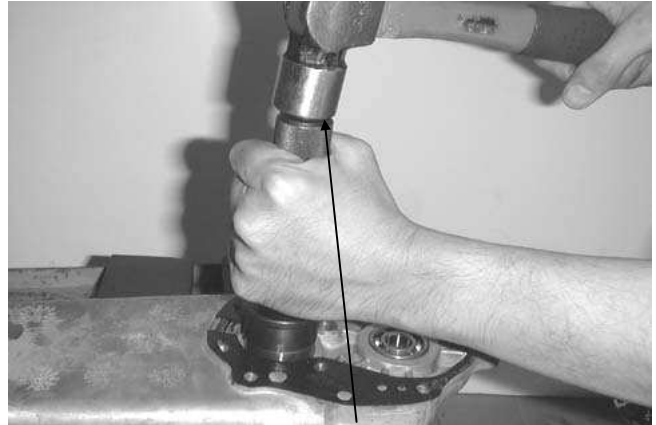
Remove the drive shaft.  
Remove the drive shaft oil seal.  
Remove the left crankcase bearings using the bearing remover.



Bearing Remover Set, 12mm

## 9. FINAL REDUCTION

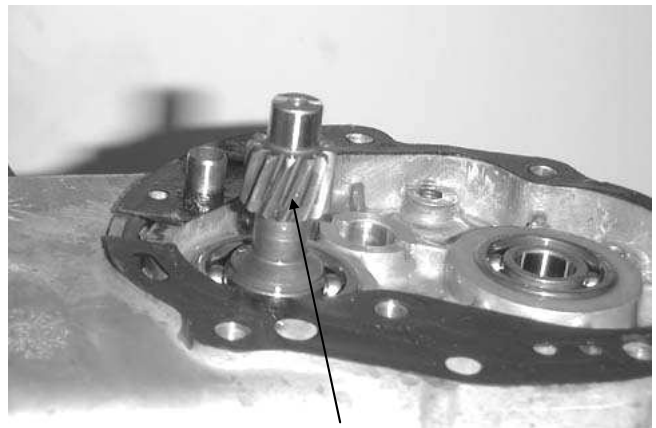
Drive new bearings into the left crankcase.  
Install a new drive shaft oil seal.



Bearing Outer Driver

### FINAL REDUCTION ASSEMBLY

Install the drive shaft into the left crankcase.



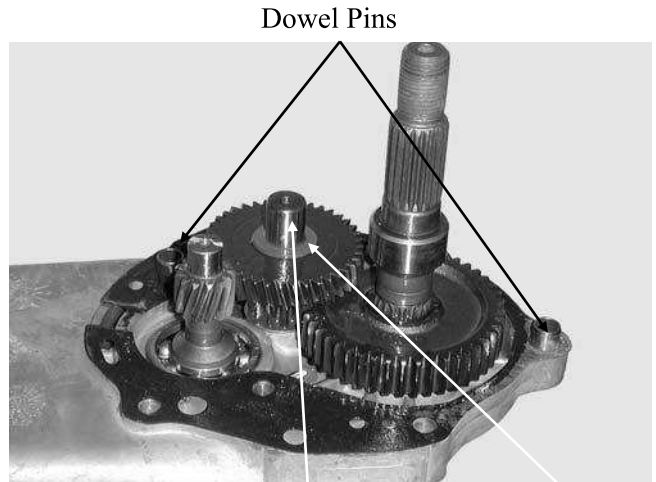
Drive Shaft

Install the final gear and final shaft into the left crankcase.



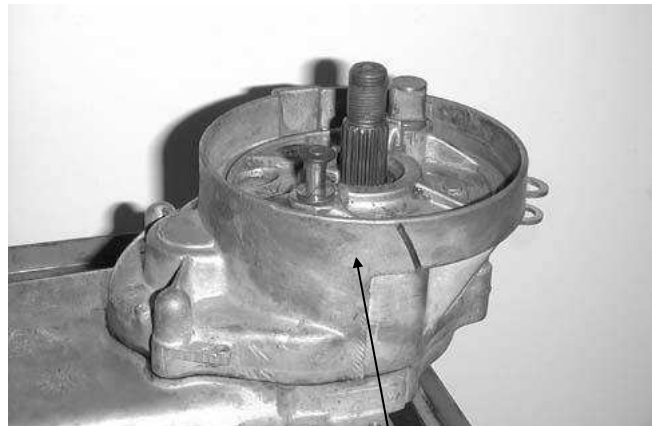
## 9. FINAL REDUCTION

Install the countershaft and gear into the left crankcase.  
Install the resin washer onto the counter-shaft.  
Install the dowel pins and a new gasket.



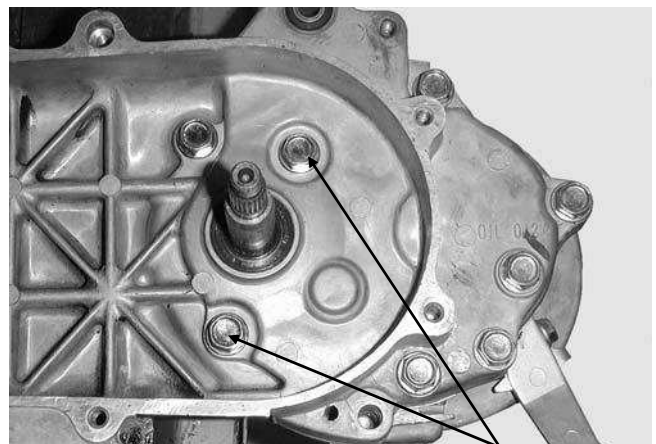
Countershaft Resin Washer

Install the transmission case cover.



Transmission Case Cover

Install and tighten the transmission case cover bolts.  
Install the clutch/driven pulley. (⇒8-17)  
Install other removed parts in the reverse order of removal.



Bolts

## 9. FINAL REDUCTION

After installation, fill the transmission case with the specified oil.

- Place the motorcycle on its main stand on level ground.
- Check the sealing washer for wear or damage.

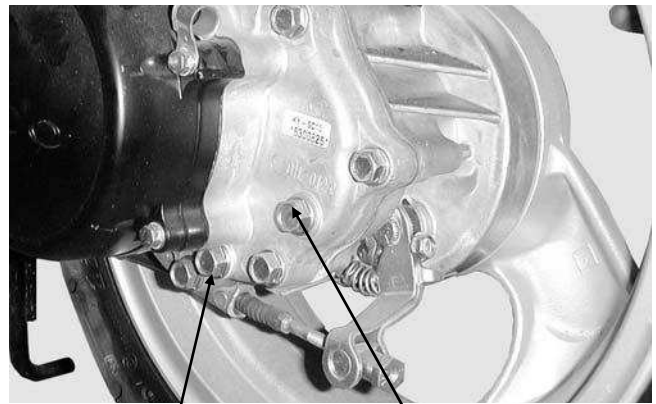
**Specified Gear Oil:** SAE90#

**Oil Capacity:** at disassembly: 0.12 liter  
at change: 0.1 liter

Install and tighten the oil check bolt.

**Torque:** 1.0 1.5kg-m

Start the engine and check for oil leaks.  
Check the oil level from the oil check bolt hole and add the specified oil to the proper level if the oil level is low.



Drain Bolt

Oil Check Bolt Hole/Filler

# 10. CRANKCASE/CRANKSHAFT

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## CRANKCASE/CRANKSHAFT

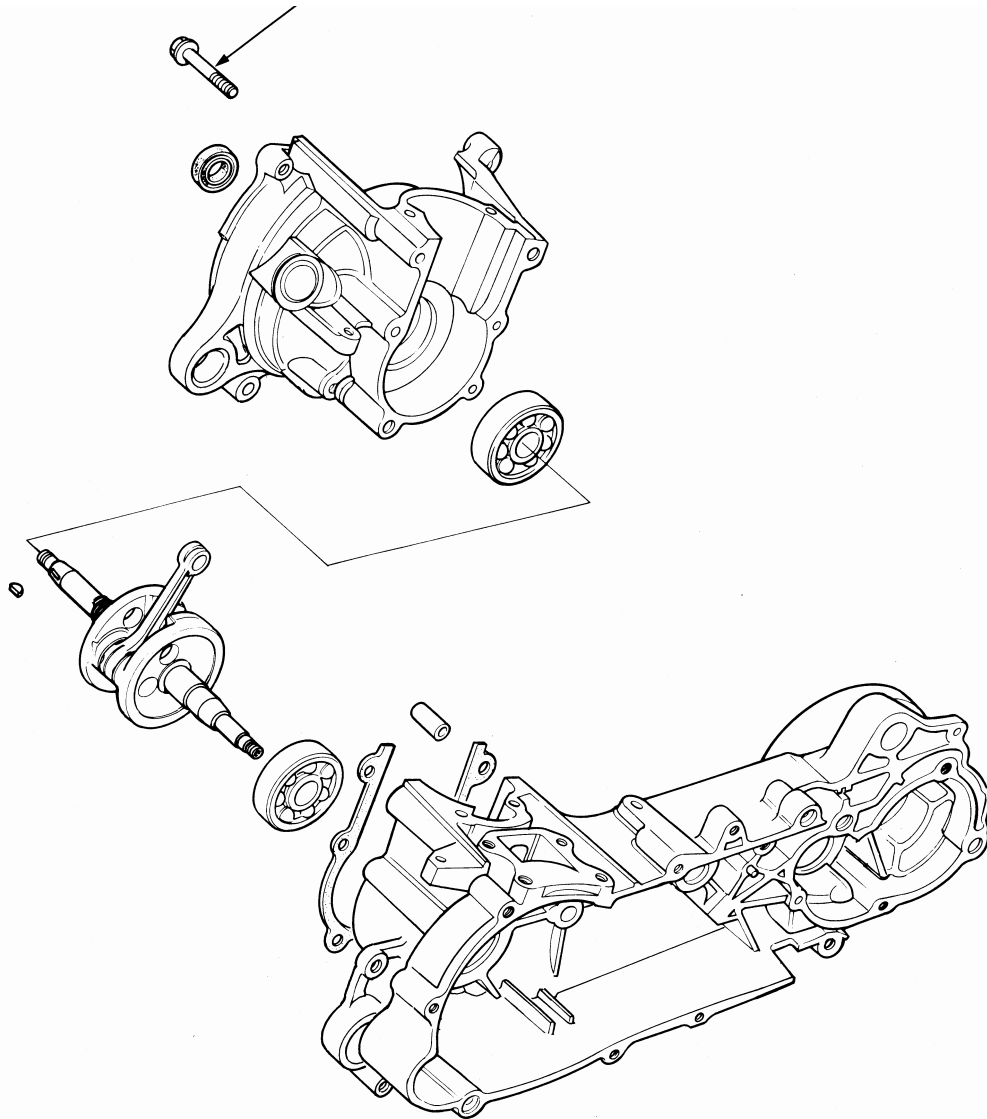
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CRANKSHAFT REMOVAL.....	10-3
CRANKSHAFT INSPECTION .....	10-4
CRANKSHAFT INSTALLATION .....	10-5
CRANKCASE ASSEMBLY.....	10-7



# 10. CRANKCASE/CRANKSHAFT

Torque: 0.8 1.2kg-m



# 10. CRANKCASE/CRANKSHAFT

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- This section covers crankcase separation to service the crankshaft.
- The following parts must be removed before separating the crankcase.
 

Engine (⇒Section 5)	Driven pulley (⇒Section 8)
Carburetor (⇒Section 11)	A.C. generator (⇒Section 7)
Oil pump (⇒Section 4)	Cylinder head/cylinder (⇒Section 6)
Reed valve (⇒Section 11)	
- When the left crankcase must be replaced, remove the following part in addition to the above.  
Final reduction removal
- Special tools must be used for crankshaft and crankcase assembly. When separating the crankcase, the bearing will remain in the crankcase and it should be removed. When assembling, drive a new bearing into the crankcase and install a new oil seal.

### SPECIFICATIONS

Item	SC10AS	
	Standard (mm)	Service Limit (mm)
Connecting rod big end side clearance	—	0.60
Connecting rod big end radial clearance	—	0.04
Crankshaft runout A/B	—	0.15/0.10

### SPECIAL TOOLS

Crankcase puller	Bearing outer driver handle A
Universal bearing puller	Bearing outer driver, 42x47mm
Crankcase assembly collar	Bearing driver pilot, 20mm
Crankcase assembly tool	Bearing outer driver, 37x40mm
	Bearing driver pilot, 17mm

### TROUBLESHOOTING

#### Abnormal engine noise

- Excessive crank journal bearing play
- Excessive crankpin bearing play
- Excessive transmission bearing play

## 10. CRANKCASE/CRANKSHAFT

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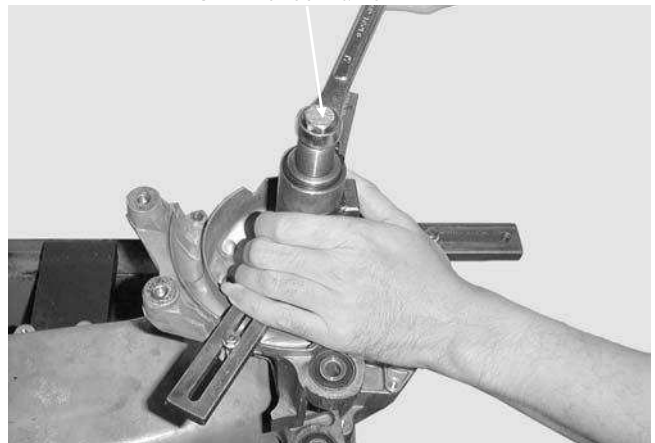
### CRANKCASE SEPARATION

Remove the crankcase attaching bolts.



Attach the crankcase puller on the right crankcase and remove the right crankcase from the left crankcase.

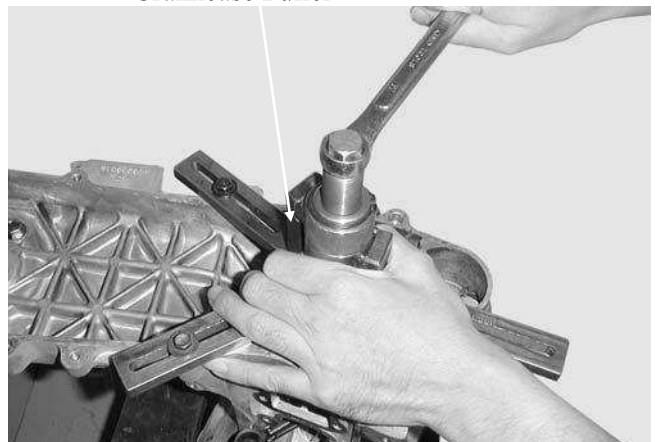
Crankcase Puller



### CRANKSHAFT REMOVAL

Attach the crankcase puller on the left crankcase and remove the crankshaft from the left crankcase.

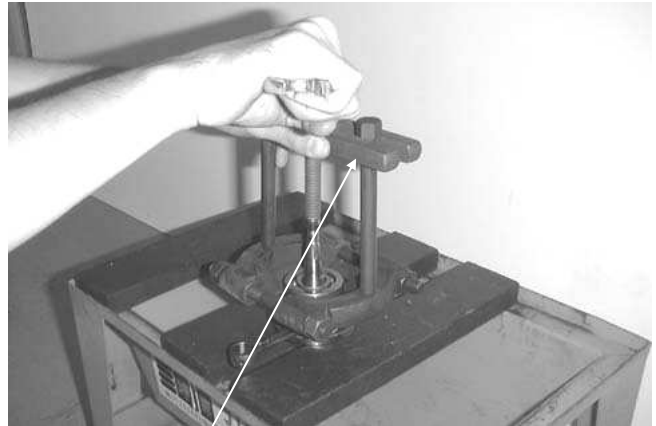
Crankcase Puller





## 10. CRANKCASE/CRANKSHAFT

Remove the remaining bearing on the crankshaft side using the universal bearing puller.



Universal Bearing Puller

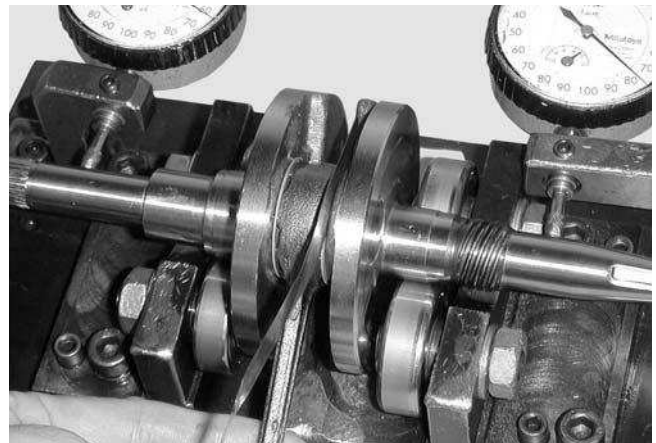
### CRANKSHAFT INSPECTION

Measure the connecting rod big end side clearance.

**Service Limit:** 0.6mm replace if over

Measure the connecting rod big end radial clearance at two points in the X and Y directions.

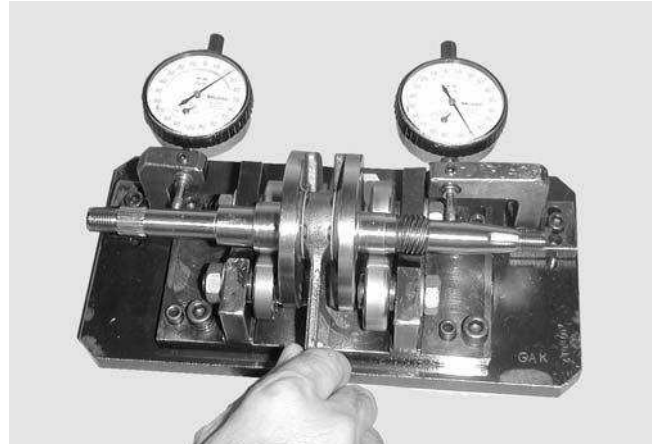
**Service Limit:** 0.04mm replace if over



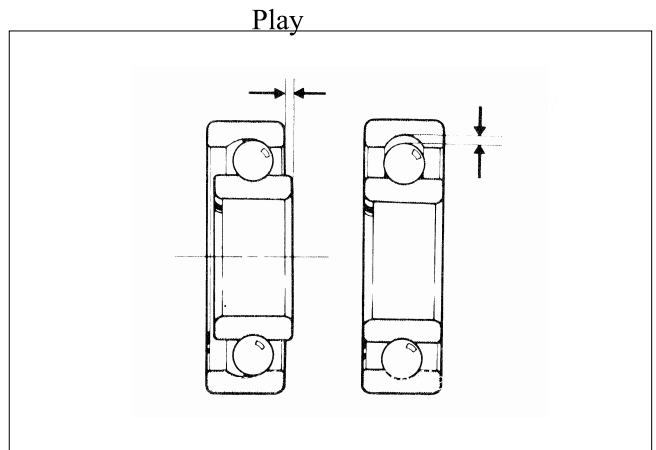
# 10. CRANKCASE/CRANKSHAFT

Measure the crankshaft runout.

Service Limit	
A	B
0.150mm replace if over	0.100mm replace if over



Check the crankshaft bearings for excessive play. The bearings must be replaced if they are noisy or have excessive play.



## CRANKSHAFT INSTALLATION

Wash the crankshaft in cleaning solvent and then check for cracks or other faults.



## 10. CRANKCASE/CRANKSHAFT

Drive a new crankshaft bearing into the right crankcase.

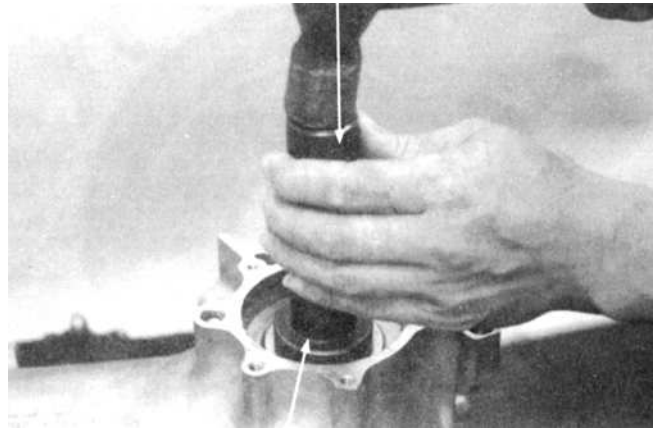
Bearing Outer Driver Handle A



Bearing Outer Driver, 37x40mm  
Bearing Driver Pilot, 17mm

Drive a new crankshaft bearing into the left crankcase.

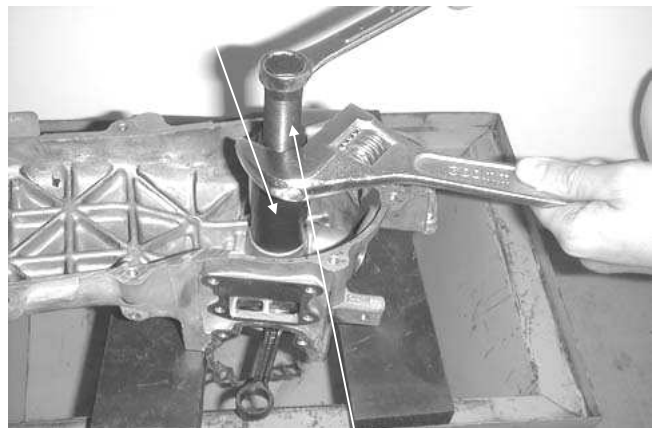
Bearing Outer Driver Handle A



Bearing Outer Driver, 42x47mm  
Pilot, 20mm

Install the crankshaft into the left crankcase.

Crankcase Assembly Collar

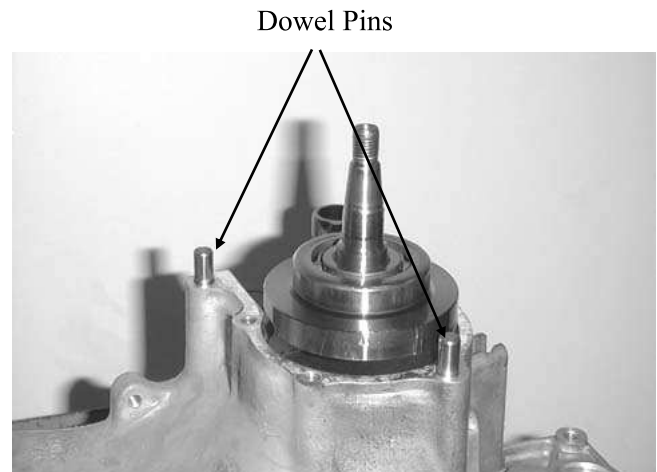


Crankcase Assembly Tool

# 10. CRANKCASE/CRANKSHAFT

## CRANKCASE ASSEMBLY

Install the dowel pins and a new gasket to the crankcase mating surface.



Assemble the crankcase halves.



Crankcase Assembly Tool

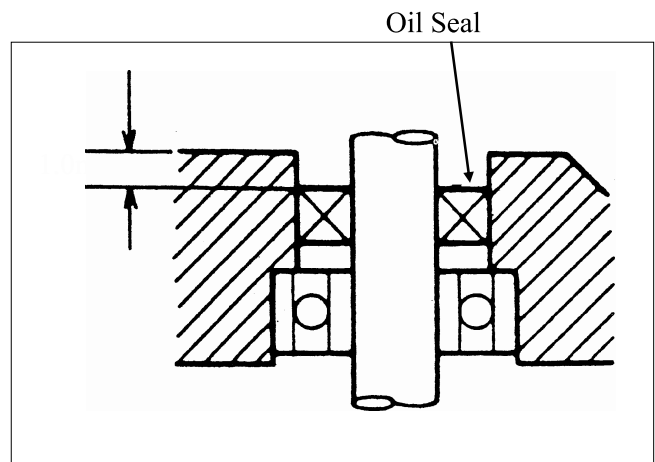
The distance between the right crankcase oil seal and crankcase surface is about  $12.5 \pm 0.5$  mm.



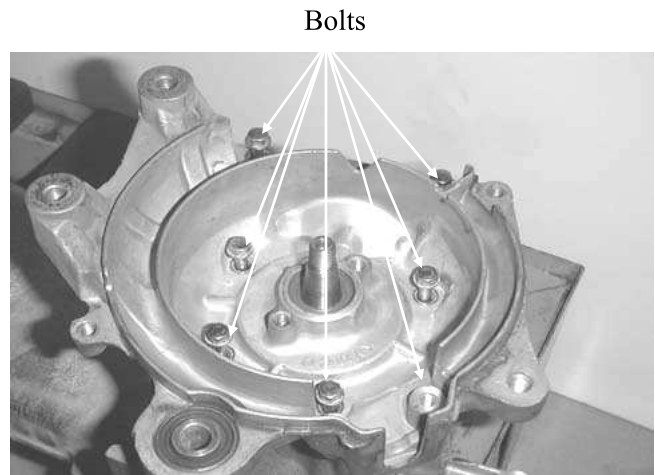
Crankcase Assembly Tool

## 10. CRANKCASE/CRANKSHAFT

The distance between the left crankcase oil seal and crankcase surface is about 1.0mm.



Install and tighten the crankcase attaching bolts.



# 11. CARBURETOR

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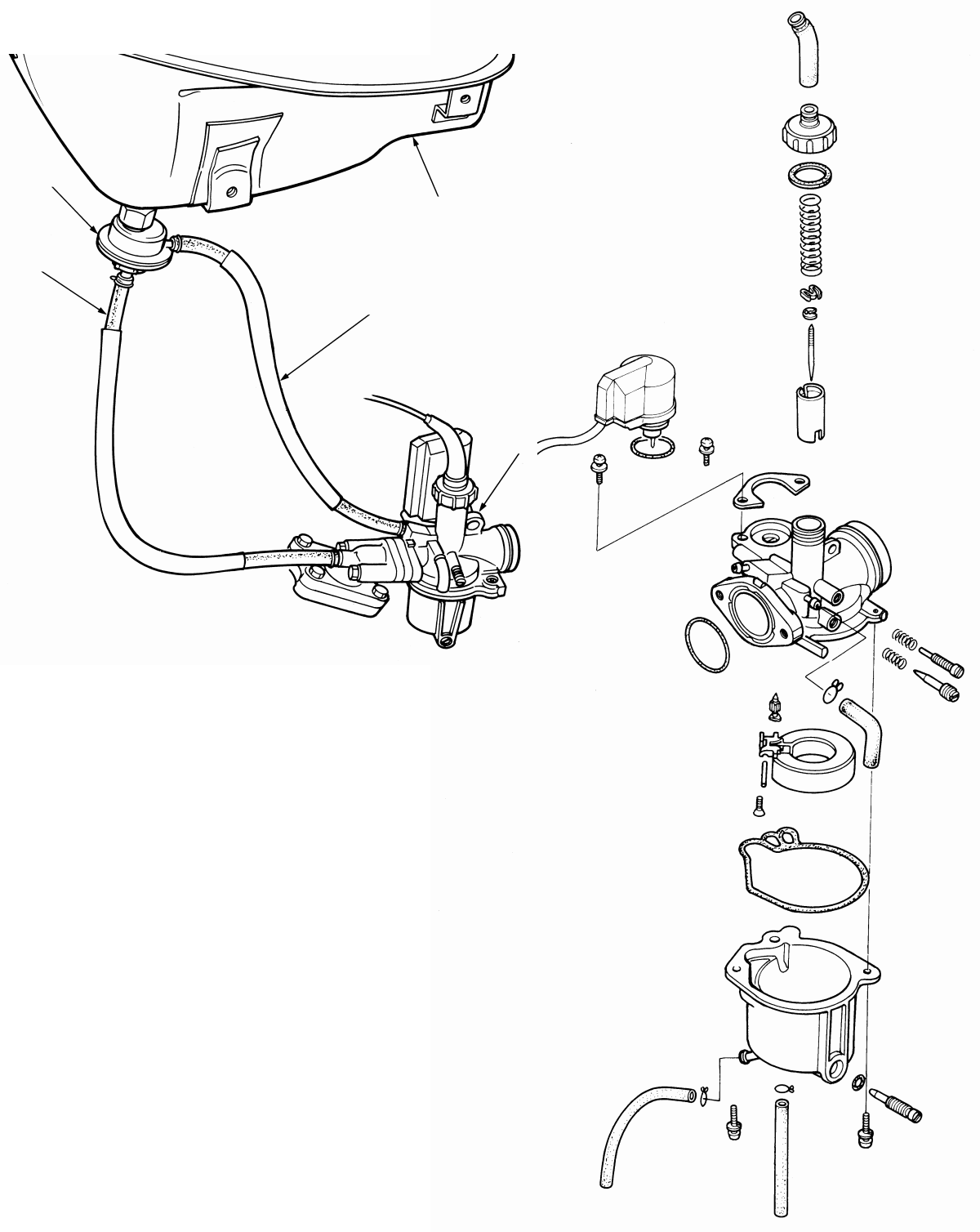
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## CARBURETOR

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# 11. CARBURETOR



# 11. CARBURETOR

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- When working with gasoline, keep away from sparks and flames..
- Note the locations of O-rings when disassembling and replace them with new ones during assembly.
- All cables, fuel lines and wires must be routed and secured at correct locations.
- Bleed air from the oil lines whenever they are disconnected.

### SPECIFICATIONS

Venturi dia.	14mm
Identification number	0.14A
Float level	5.0mm
Main jet	#80
Slow jet	#35
Air screw opening	1±¼
Idle speed	2100±100rpm
Throttle grip free play	2-6mm

### SPECIAL TOOL

Float level gauge

### TROUBLESHOOTING

#### Engine does not start

- No fuel in tank
- Too much fuel getting to cylinder
- Clogged fuel filter
- Clogged air cleaner

#### Lean mixture

- Clogged fuel jets
- Clogged fuel cap vent
- Clogged fuel filter
- Bent, kinked or restricted fuel line

- Faulty float valve
- Float level too low
- Clogged air cleaner

#### Engine idles roughly, stalls or runs poorly

- Incorrect idle speed
- Ignition malfunction
- Compression too low
- Incorrectly adjusted air screw
- Incorrect float level
- Clogged air cleaner
- Intake air leaks
- Fuel contaminated
- Faulty reed valve
- Clogged fuel jets

#### Rich mixture

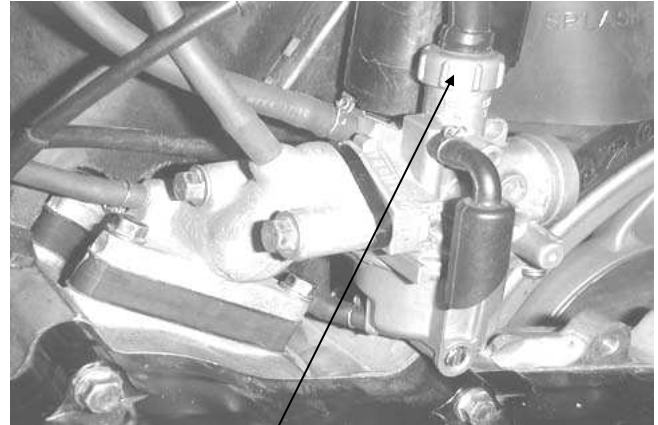
- Faulty float valve
- Float level too high
- Clogged air jets



# 11. CARBURETOR

## THROTTLE VALVE DIS-ASSEMBLY

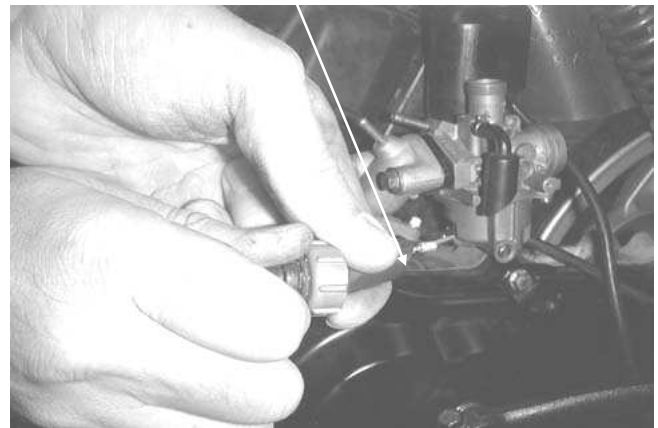
Remove the rear carrier. (⇒12-5)  
Remove the met-in box. (⇒12-4)  
Loosen the carburetor cap and remove the throttle valve.



Carburetor Cap

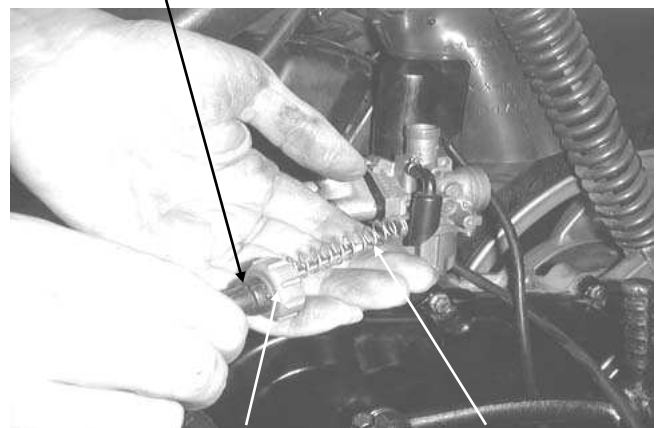
Disconnect the throttle cable from the throttle valve.

Throttle Valve



Remove the throttle valve spring, carburetor cap and rubber seal.

Rubber Seal

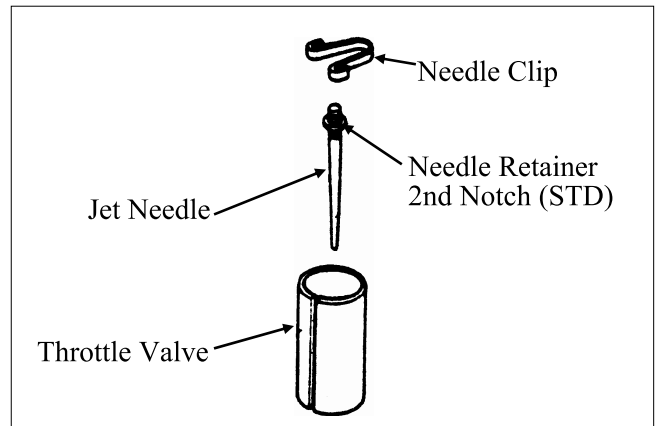


Carburetor Cap

Spring

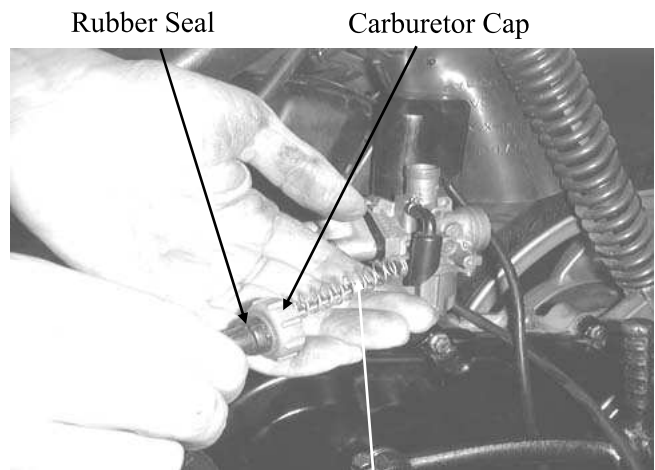
# 11. CARBURETOR

Remove the jet needle by removing the needle clip.  
Check the jet needle and throttle valve for wear or damage.



## THROTTLE VALVE INSTALLATION

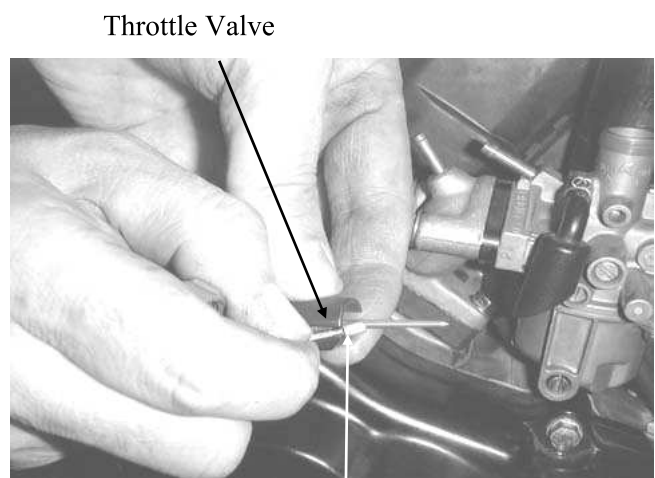
Install the jet needle on the throttle valve and secure with the needle clip.



Install the rubber seal on the throttle cable and then install the carburetor cap and throttle valve spring.

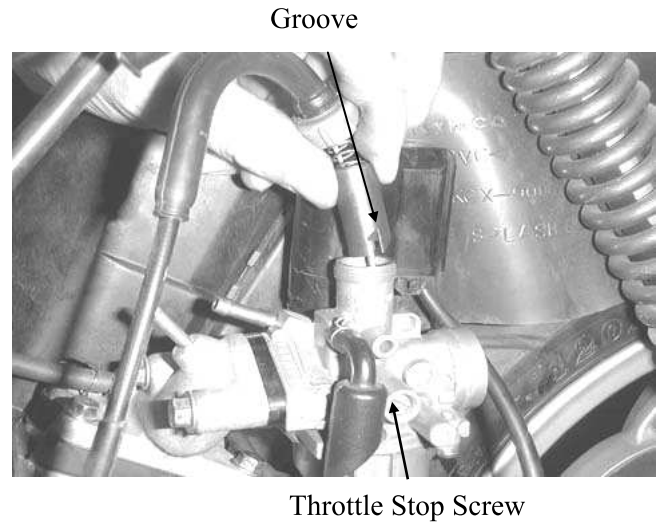
Throttle Valve Spring

Connect the throttle cable to the throttle valve.



# 11. CARBURETOR

Install the throttle valve by aligning the groove in the throttle valve with the throttle stop screw.

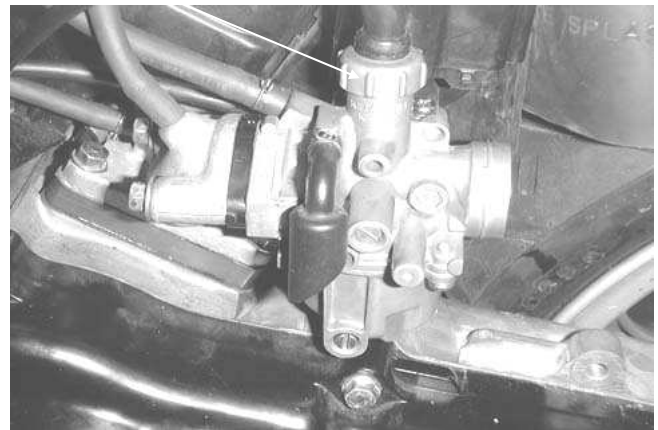


Tighten the carburetor cap.  
After installation, perform the following adjustments and inspections.

- Throttle cable free play (⇒3-11)
- Idle speed adjustment (⇒3-8)

Install the met-in box.

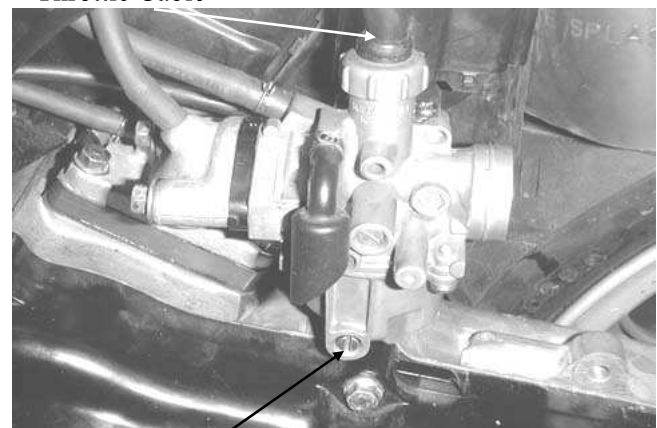
Carburetor Cap



## CARBURETOR REMOVAL

Remove the met-in box. (⇒12-4)  
Remove the air cleaner by removing the air cleaner band screw and attaching bolts.  
Disconnect the fuel tube.  
Loosen the drain bolt to drain fuel from the carburetor.  
Disconnect the auto bystarter wire connector.  
Remove the two carburetor lock nuts.

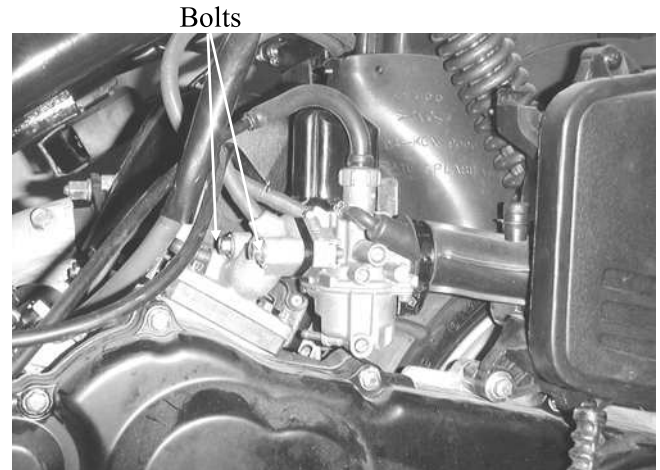
Throttle Cable



Drain Bolt

# 11. CARBURETOR

Remove the carburetor.



## AUTO BYSTARTER

### AUTO BYSTARTER INSPECTION

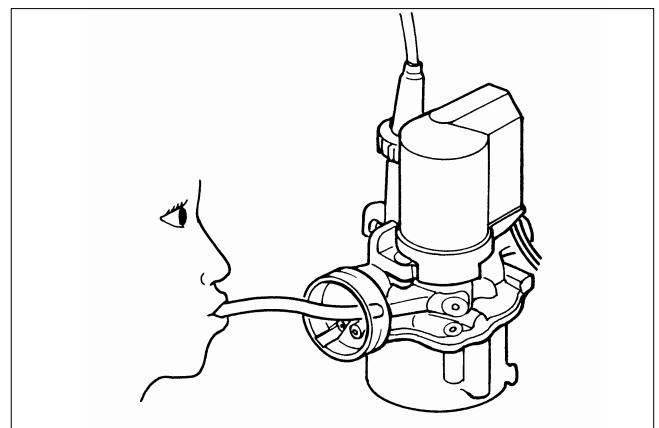
Measure the resistance between the auto bystarter wire terminals.

**Resistance:**  $5\Omega$  (10 minutes minimum after stopping the engine)

If the resistance exceeds  $5\Omega$ , replace the auto bystarter with a new one.

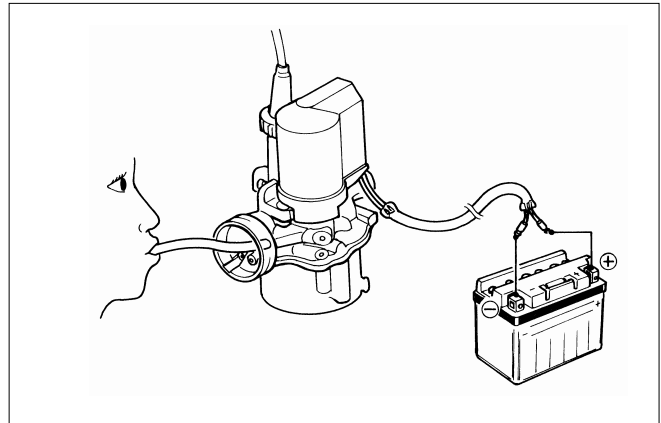


After the engine stops for 30 minutes, connect a hose to the fuel enriching circuit and blow the hose with mouth.  
If air cannot be blown into the hose (clogged), the auto bystarter is faulty.  
Replace it with a new one.



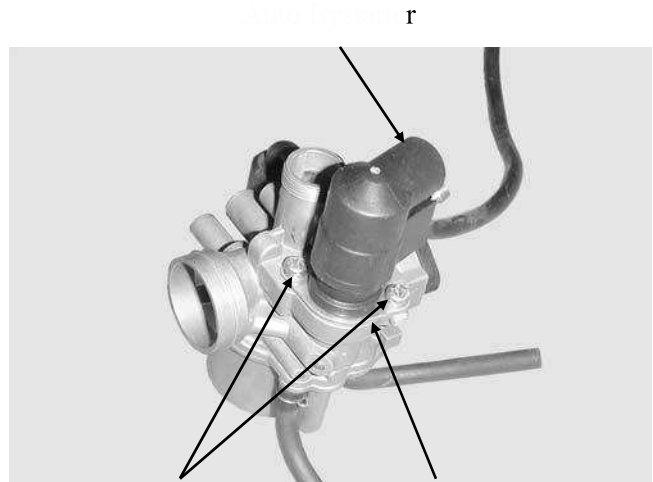
# 11. CARBURETOR

Connect the auto bystarter yellow wire to the battery positive (+) terminal and green/black wire to the battery negative (-) terminal and wait 5 minutes.  
 Connect a hose to the fuel enriching circuit and blow the hose with mouth.  
 If air can be blown into the hose, the auto bystarter is faulty and replace it with a new one.



## AUTO BYSTARTER REMOVAL

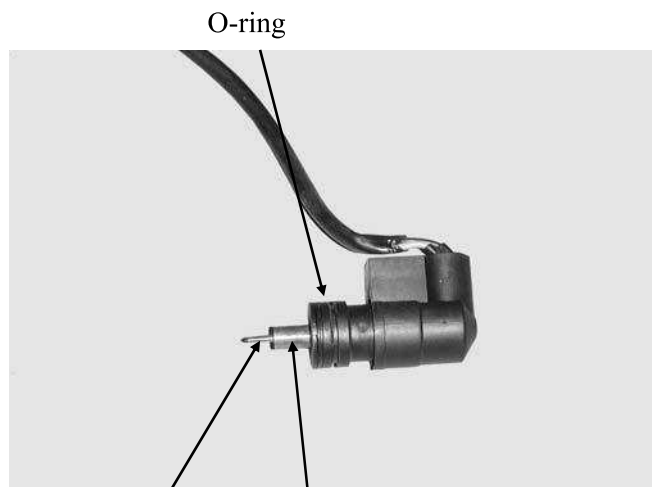
Remove the auto bystarter cover.  
 Remove the two auto bystarter set plate screws to remove the auto bystarter.



Screws

Set Plate

Check the auto bystarter valve and needle for wear or damage.  
 Check the O-ring for wear or damage.



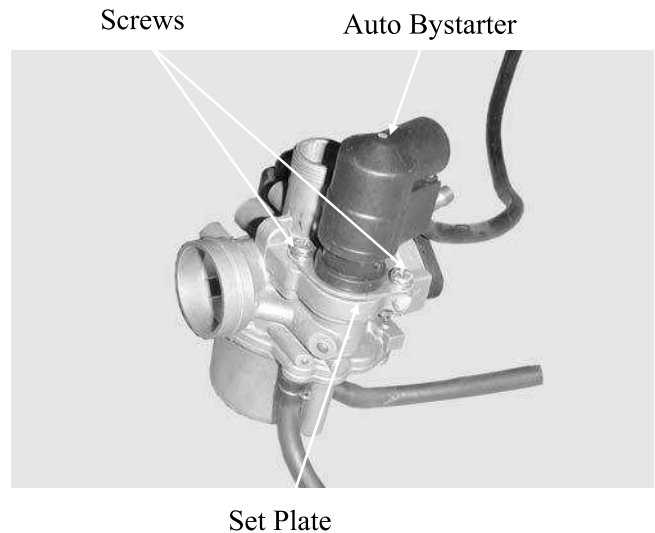
Bystarter Needle

Bystarter Valve

# 11. CARBURETOR

## AUTO BYSTARTER INSTALLATION

Install the auto bystarter into the carburetor body until it bottoms..  
Install the set plate and then tighten the two screws.

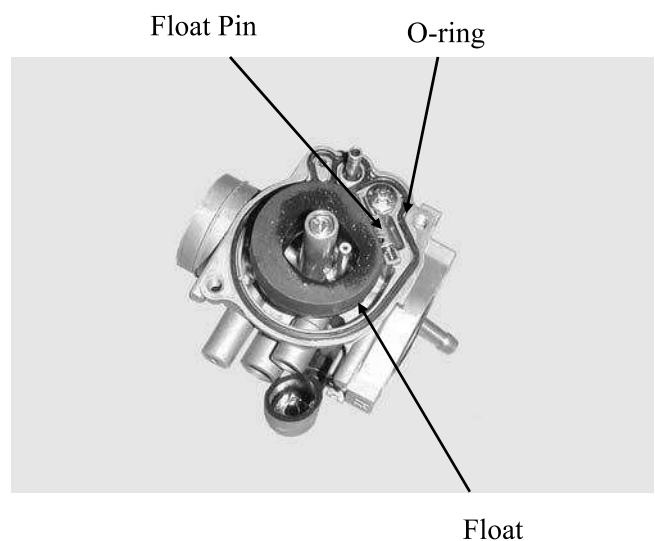


## FLOAT CHAMBER

Remove the two float chamber screws and the float chamber.



Remove the screw and O-ring.  
Remove the float pin, float and float valve.

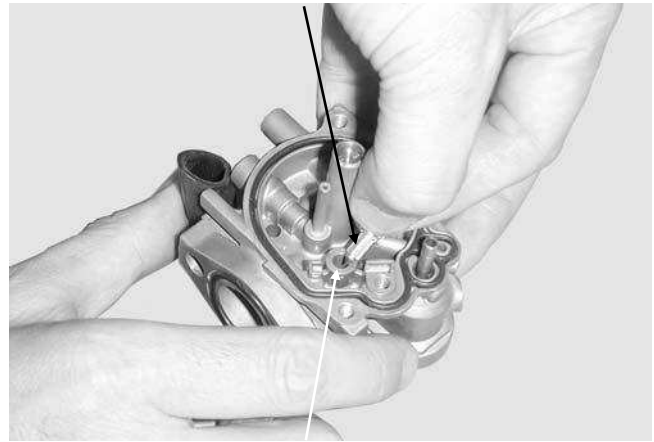


# 11. CARBURETOR

## FLOAT/FLOAT VALVE INSPECTION

Inspect the float for damage or fuel inside the float.  
Check the float valve seat for wear or damage.

Float Valve



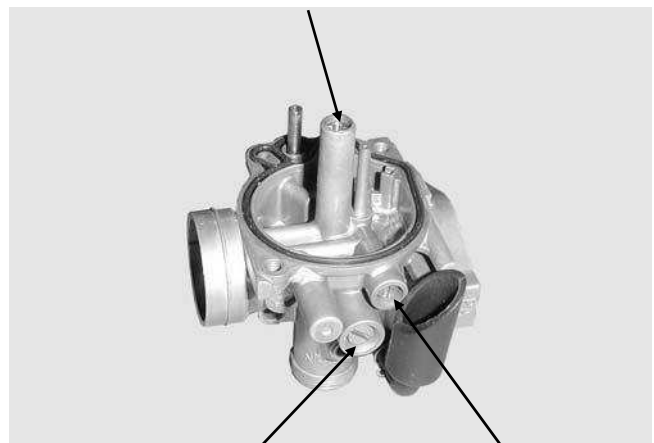
Float Seat

## JETS/SCREWS REMOVAL

Before removing the throttle stop screw or air screw, record the number of rotations until it seats lightly. Then, remove them.

Remove the main jet and needle jet holder.

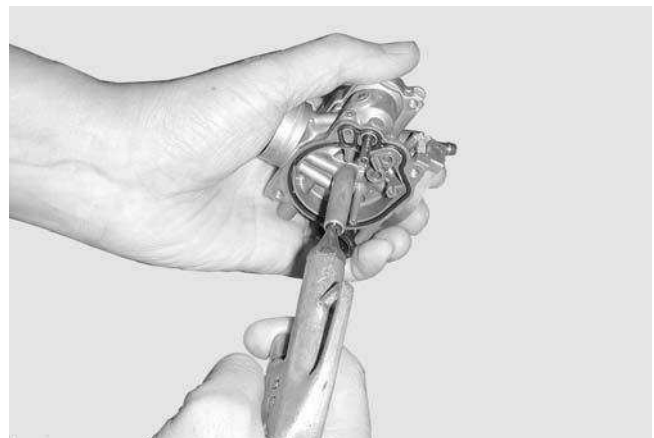
Main Jet



Throttle Stop Screw    Air Screw

## CARBURETOR PASSAGES CLEANING

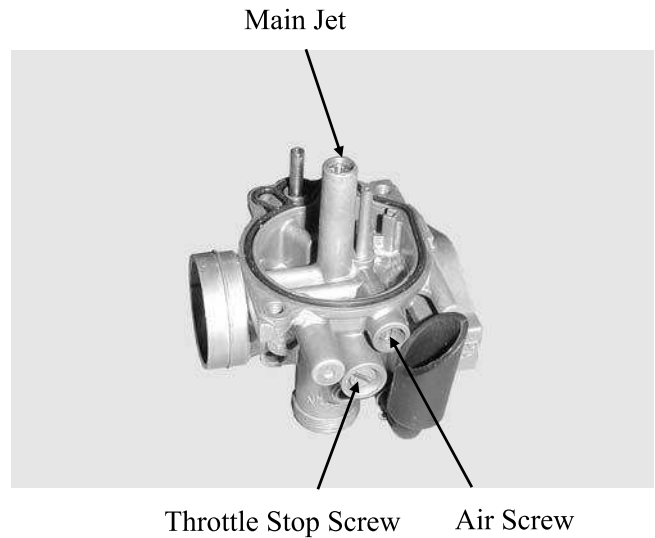
Blow compressed air through all passages of the carburetor body with an air gun.



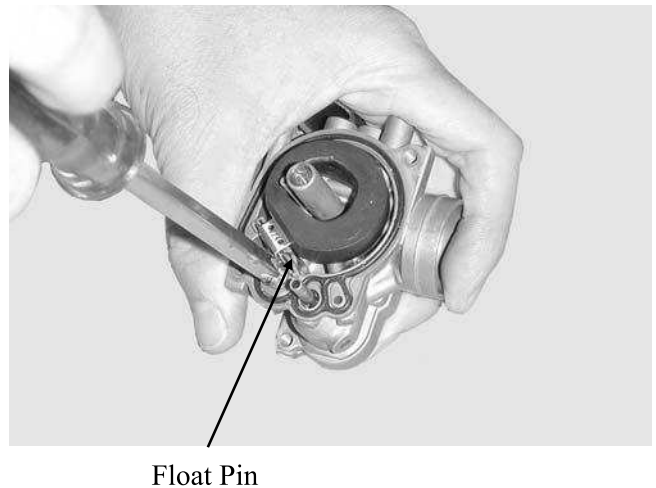
## 11. CARBURETOR

### FLOAT CHAMBER ASSEMBLY

Install the main jet and needle jet holder.  
Install the air screw and throttle stop screw according to the rotations recorded.



Install the float valve, float and float pin.  
Tighten the float screw securely.



### FLOAT LEVEL INSPECTION

Slightly tilt the carburetor and measure the float level with the float valve just connecting the float arm.

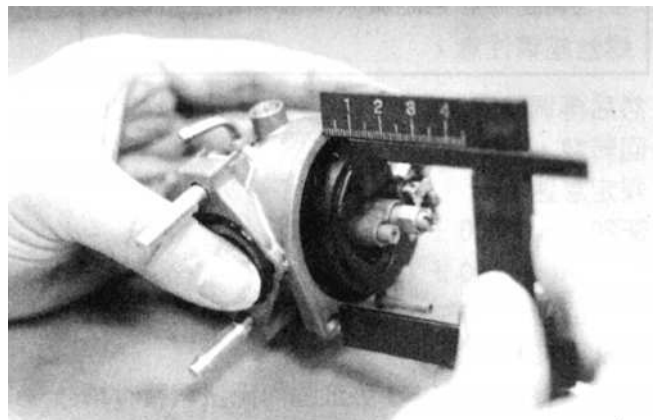
**Float Level:** 5.0mm

Replace the float if the level is out of the specified level range.

Install the O-ring.

Check the operation of the float and install the float chamber.

Tighten the screws.

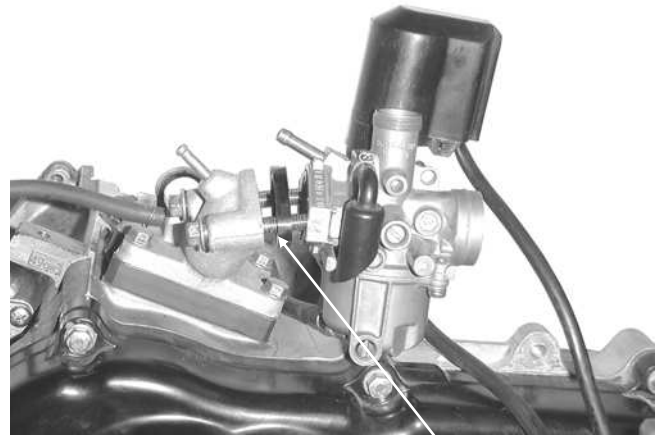




# 11. CARBURETOR

## CARBURETOR INSTALLATION

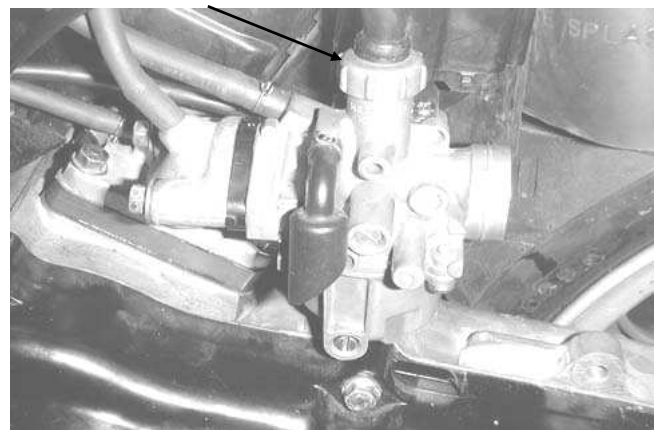
Check the carburetor insulator and O-ring for wear or damage.  
 Install the carburetor and insulator onto the intake manifold and tighten the two lock nuts.  
 Connect the fuel tube and auto bystarter wire connector.



Insulator

Install the carburetor cap. (⇒11-4)  
 Install the air cleaner onto the carburetor and tighten the band screw.  
 Install the met-in box. (⇒12-4)

Carburetor Cap



## AIR SCREW ADJUSTMENT

Remove the met-in box. (⇒12-4)

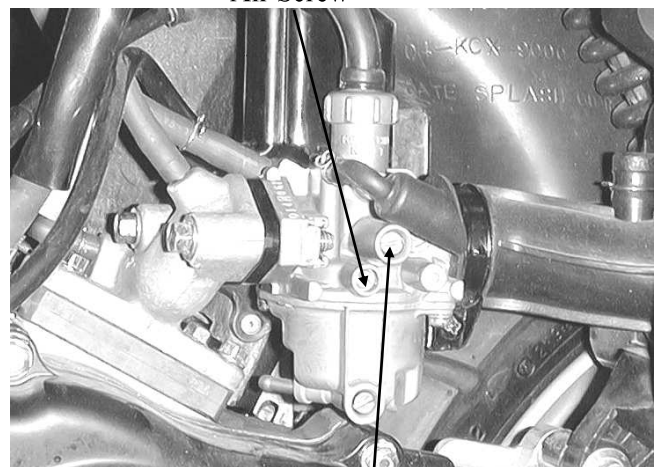
Turn the air screw clockwise until it seats lightly and back it to the specification given.

### Air Screw Opening:

$1 \pm \frac{1}{4}$  turns

Start the engine and turn the air screw in or out slowly to obtain the highest engine speed.

Air Screw



Turn the throttle stop screw to obtain the specified idle speed.

### Idle Speed:

$2100 \pm 100$ rpm

Slightly increase the engine speed and make sure that the engine does not miss or run erratic.

If the adjustment of the air screw within the range of  $\pm \frac{1}{2}$  turn makes no difference to the engine performance, check other related items.

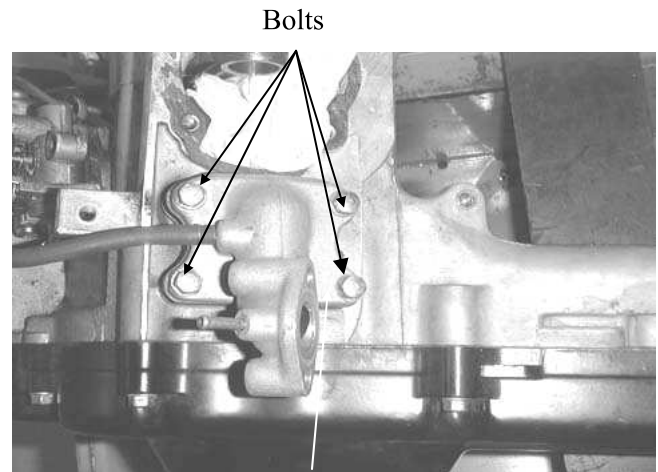
Throttle Stop Screw

# 11. CARBURETOR

## REED VALVE

### REMOVAL

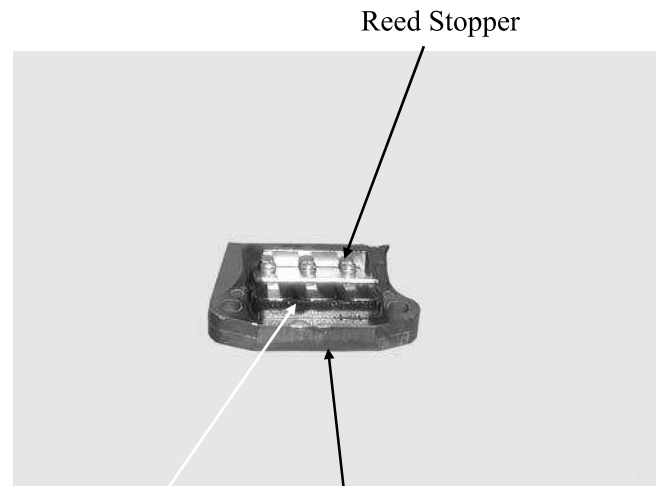
Remove the rear carrier.  
Remove the frame body cover.  
Remove the four intake manifold bolts and gasket.  
Remove the reed valve and gasket.



Intake Manifold

### INSPECTION

Check the reed valve for damaged or weak reeds.  
Check the reed valve seat for cracks, damage or clearance between the seat and reed.  
Replace the valve if necessary.



Reeds Reed Valve Seat

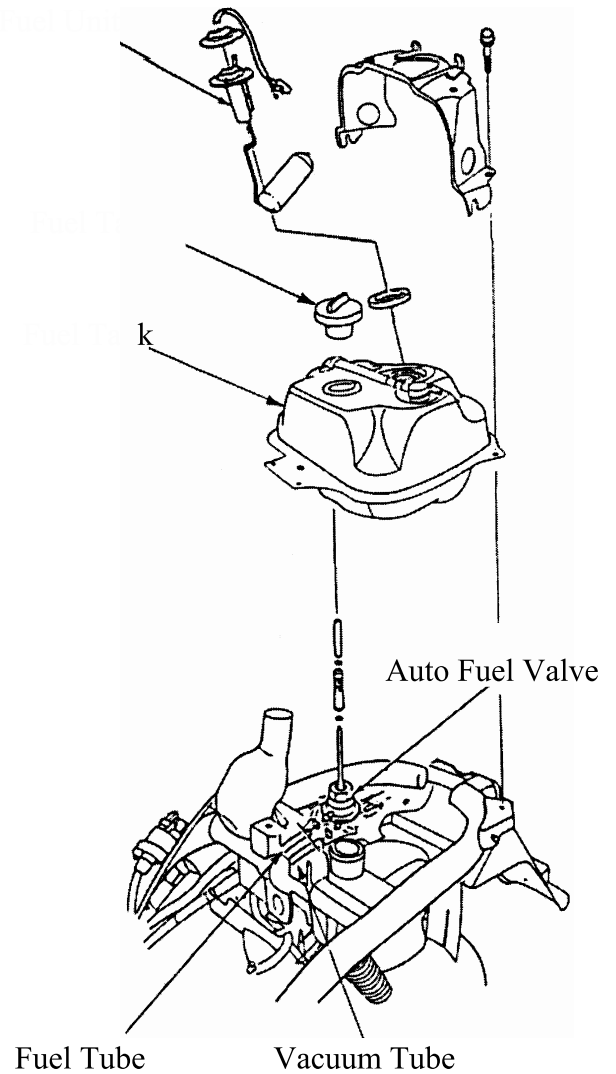
### INSTALLATION

Install the reed valve in the reverse order of removal.

# 11. CARBURETOR

## FUEL TANK

Inspect the fuel unit. (⇒16-2)  
Replace the fuel unit if necessary. (⇒16-2)



# 12. FRAME COVERS

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**12**

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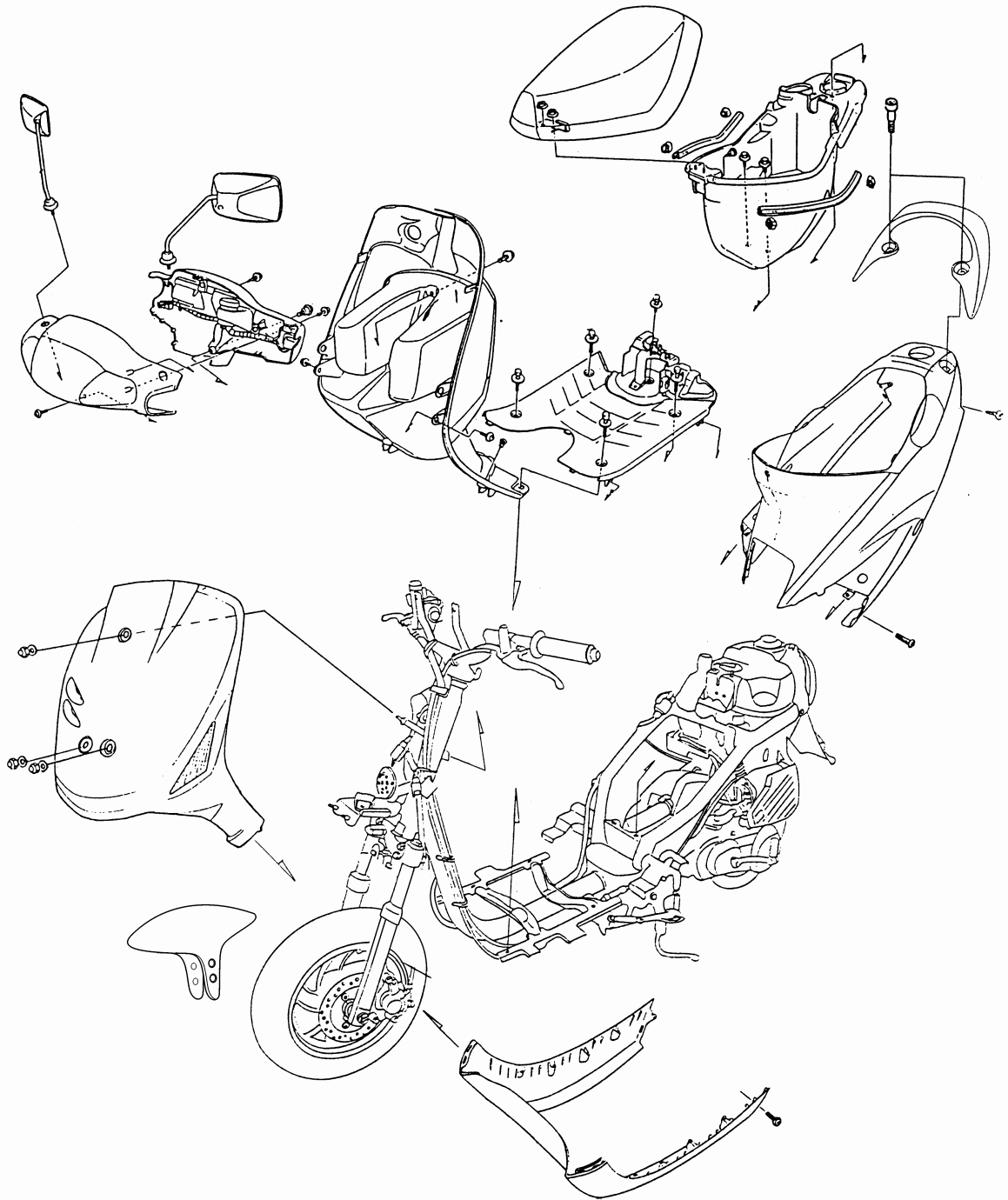
## FRAME COVERS

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SERVICE INFORMATION .....	12-2
FRAME COVERS REMOVAL.....	12-3

# 12. FRAME COVERS

## ASSEMBLY DRAWING



## 12. FRAME COVERS

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### SERVICE INFORMATION

- When removing frame covers, use care not to pull them by force because the cover joint claws may be damaged.

#### Items Related for Removal

- Handlebar front cover ——— Handlebar rear cover
- Front cover ——— Headlight wire
- Handlebar rear cover ——— Speedometer cable and instrument light wire connectors, etc.
- Frame body cover ——— Met-in box, rear carrier
- Floor board ——— Rear carrier, frame body cover, right and left side rails, battery
- Front tool box ——— Front cover, front right and left lower covers, right and left side rails, floor board

## 12. FRAME COVERS

### FRAME COVERS REMOVAL

#### FRONT COVER REMOVAL

Remove the bolt attaching the front cover.  
Remove the two screws on the back of the front cover.  
Remove the front cover downward.  
Disconnect the headlight wire connector.  
The installation sequence is the reverse of removal.

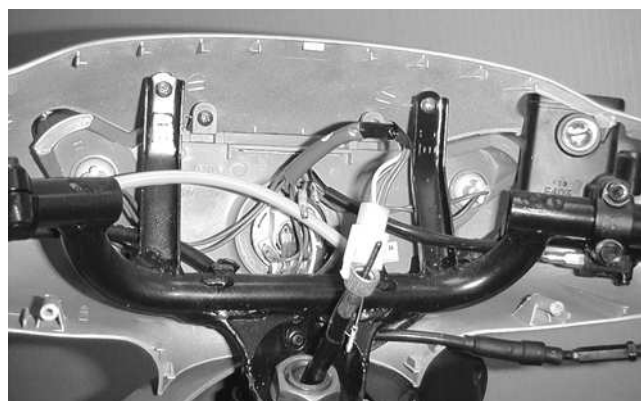
During removal, be careful not to pull the joint claws forcibly and remove the front cover downward.

Front Cover



#### HANDLEBAR FRONT/REAR COVER REMOVAL

First remove the handlebar rear cover:  
Remove the four screws attaching the handlebar rear cover.  
Disconnect the wire connectors.  
Remove the handlebar rear cover.  
Remove the two screws attaching the handlebar front cover.  
Remove the handlebar front cover.  
The installation sequence is the reverse of removal.



#### FRONT RIGHT & LEFT LOWER COVERS REMOVAL

First remove the front cover.  
Remove the right and left side rails by removing the two screws for each rail.  
Remove the two bolts and three screws attaching each of the front right and left lower covers.  
Remove the front right and left lower covers.  
The installation sequence is the reverse of removal.

When removing the right and left side rails, pull them backward not to damage the joint claws.

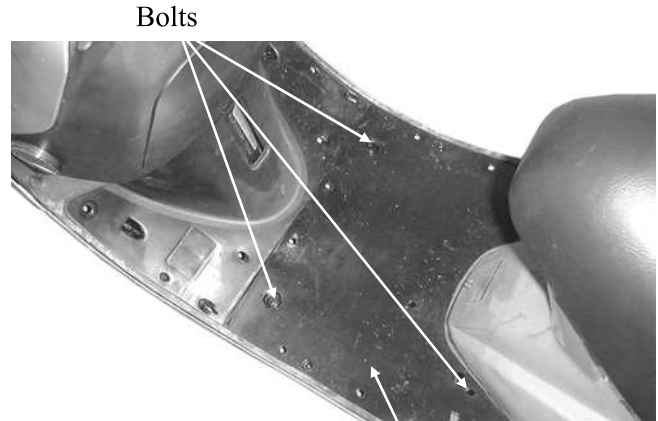


# 12. FRAME COVERS

## FLOOR BOARD REMOVAL

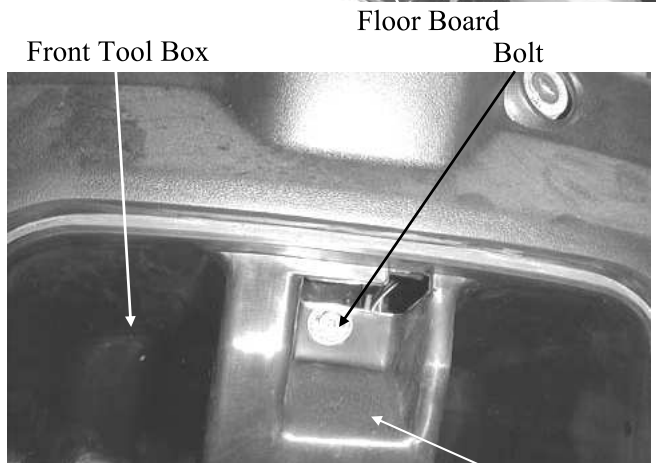
Remove the rear carrier. (⇒12-5)  
 Remove the frame body cover. (⇒12-5)  
 Remove the right and left side rails. (⇒12-3)  
 Remove the battery cover and battery.  
 Remove the four bolts attaching the floor board to remove the floor board.  
 The installation sequence is the reverse of removal.

When removing the battery, first disconnect the battery negative (-) cable and then the positive (+) cable.



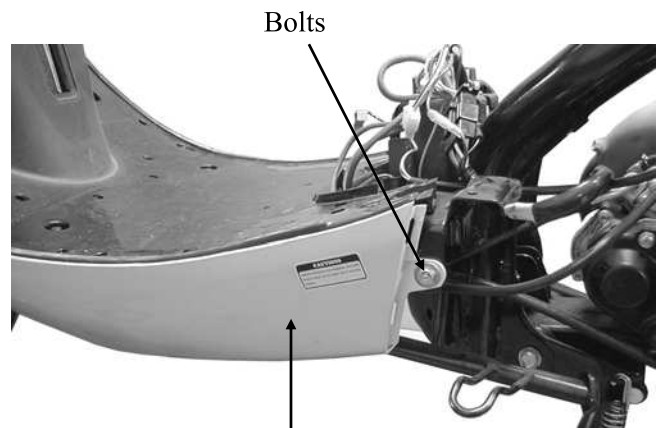
## FRONT TOOL BOX REMOVAL

Remove the rear carrier. (⇒12-5)  
 Remove the frame body cover. (⇒12-5)  
 Remove the floor board. (⇒12-3)  
 Remove the front right and left lower covers. (⇒12-3)  
 Remove the three bolts attaching the front tool box.  
 Remove the front tool box  
 The installation sequence is the reverse of removal.



## BOTTOM COVER REMOVAL

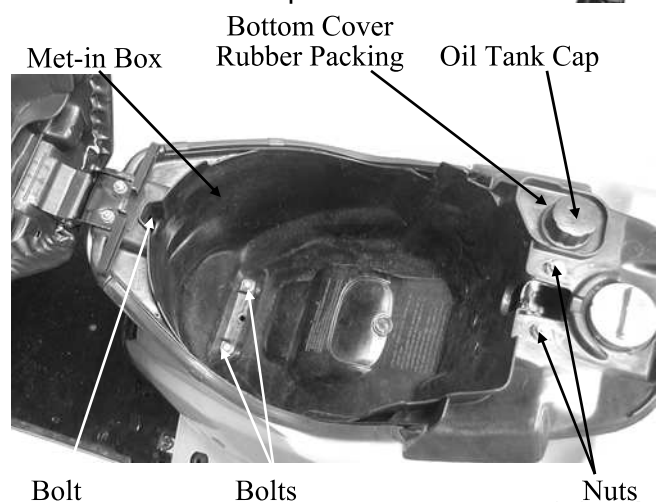
Remove the right and left side rails. (⇒12-3)  
 Remove the front cover. (⇒12-3)  
 Remove the front right and left lower covers. (⇒12-3)  
 Remove the three bolts attaching each side of the bottom cover.  
 Remove the bottom cover.  
 The installation sequence is the reverse of removal.



## MET-IN BOX REMOVAL:

Open the seat.  
 Remove the two bolts, two nuts and the center bolt attaching the met-in box.  
 Remove the oil tank cap and rubber packing.  
 Remove the met-in box.  
 The installation sequence is the reverse of removal .

Do not allow flames or sparks near the working area.



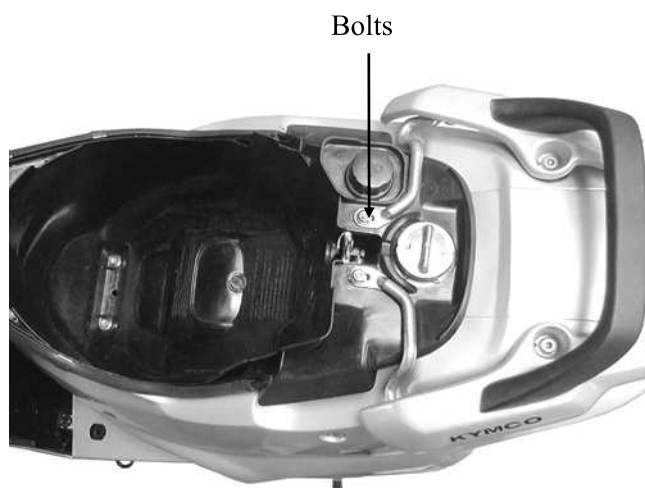


## 12. FRAME COVERS

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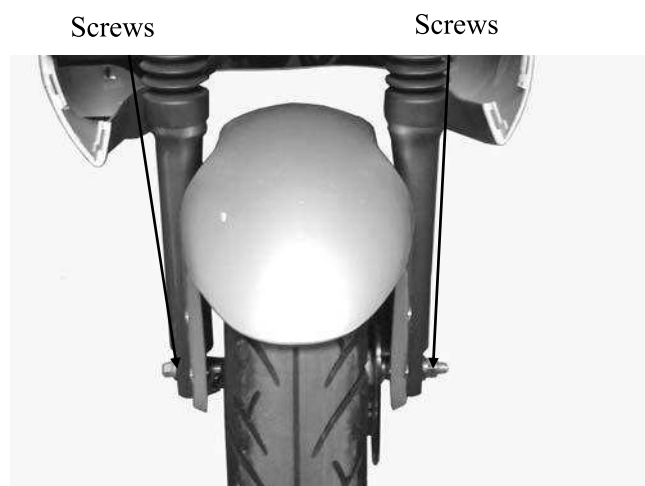
### FRAME BODY COVER REMOVAL

Remove the met-in box. (⇒12-4)  
Remove the three bolts attaching the rear carrier.  
Remove the rear carrier.  
Remove the frame body cover.  
The installation sequence is the reverse of removal.



### FRONT FENDER REMOVAL

Remove two bolts attaching each side of the front fender.  
Remove the front fender.  
The installation sequence is the reverse of removal.



Front Fender

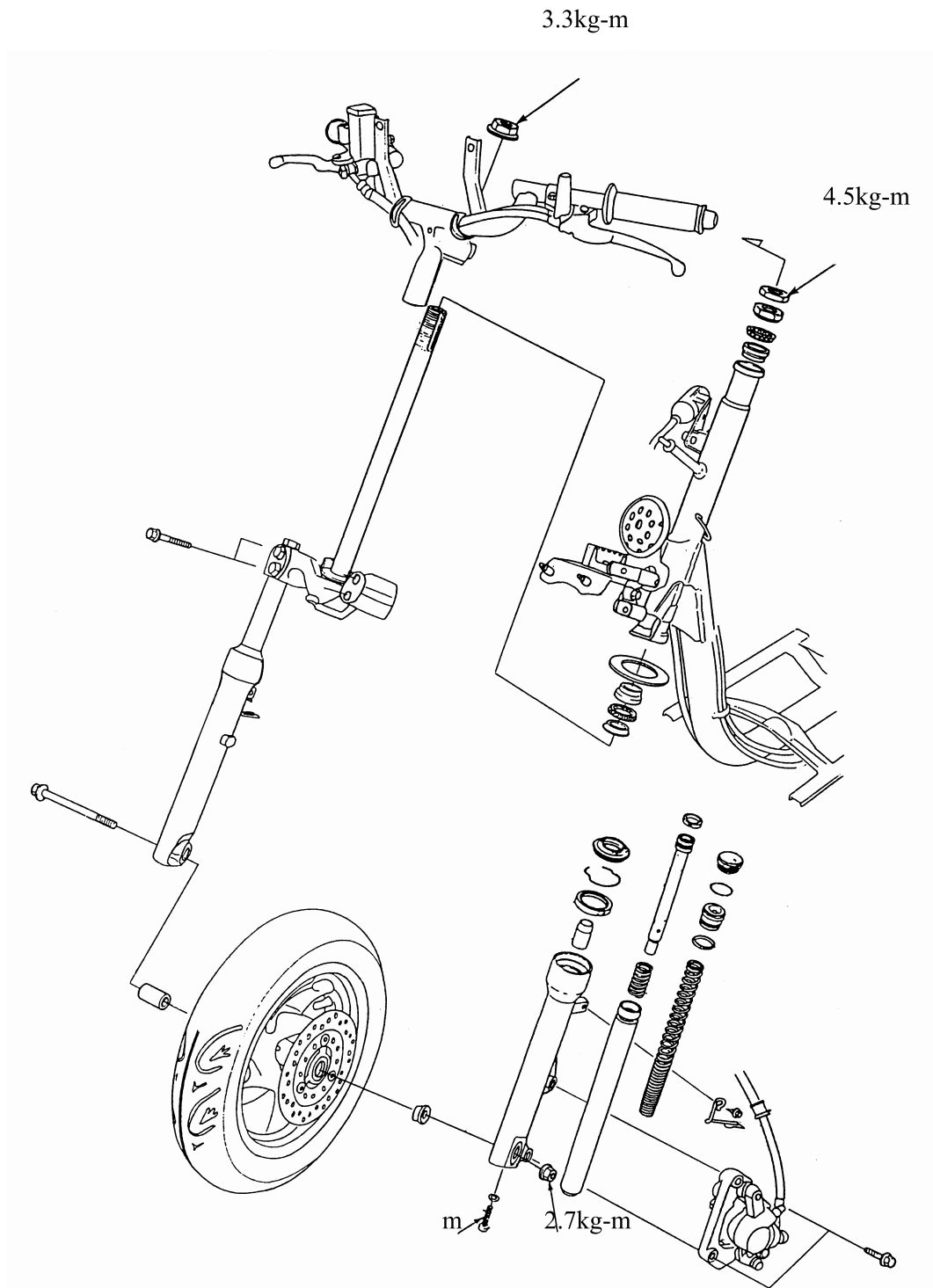
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**STEERING HANDLEBAR/FRONT WHEEL/FRONT  
BRAKE/FRONT SHOCK ABSORBER/FRONT FORK**

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FRONT BRAKE (DISK BRAKE).....	13- 9
FRONT SHOCK ABSORBER .....	13-17
FRONT FORK .....	13-20

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



SERVICE INFORMATION

# 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



## SPECIFICATIONS

Item	Standard (mm)	Service Limit (mm)
Axle shaft runout	—	0.2
Front wheel rim runout	Radial	2.0
	Axial	2.0
Front brake drum I.D.	110	111
Front brake lining thickness	4.0	2.0
Front shock absorber spring free length	200	182.8
Brake disk thickness	35 3.8	3.0
Brake disk runout	—	0.30
Brake master cylinder I.D.	12.700 12.743	12.75
Brake master cylinder piston O.D.	12.657 12.684	12.64
Brake caliper piston O.D.	25.400 25.405	25.45
Brake caliper piston I.D.	25.318 25.368	25.30

## TORQUE VALUES

Handlebar lock nut	4.0 5.0kg-m	Front damper nut	1.5 3.0kg-m
Steering stem lock nut	8.0 12.0kg-m	Front axle nut	5.0 7.0kg-m
Steering top cone race	0.5 1.3kg-m	Brake arm bolt	0.4 0.7kg-m

## SPECIAL TOOLS

Lock nut wrench	Driver handle A
Lock nut socket wrench	Outer driver, 37x40mm
Outer driver, 28x30mm	Pilot, 10mm
Rear shock absorber remover	Bearing puller
Rear shock absorber compressor	Snap ring pliers (close)
Ball race remover	Damper compressor

## TROUBLESHOOTING

### Hard steering (heavy)

- Excessively tightened steering stem top cone race
- Broken steering balls
- Insufficient tire pressure

### Steers to one side or does not track straight

- Broken clutch weight spring
- Bent front fork
- Bent front axle or uneven tire

### Poor brake performance

- Incorrectly adjusted brake
- Worn brake linings
- Contaminated brake lining surface
- Worn brake cam
- Worn brake drum
- Poorly connected brake arm

### Poor brake performance (disk brake)

- Air in brake system
- Deteriorated brake fluid

- Contaminated brake disk or disk pad
- Worn brake bushing
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake caliper

### Front wheel wobbling

- Bent rim
- Loose front axle
- Bent spoke plate
- Faulty tire
- Improperly tightened axle nut

### Soft front shock absorber

- Weak shock springs
- Insufficient damper oil

### Front shock absorber noise

- Slider bending
- Loose fork fasteners
- Lack of lubrication

# 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

## STEERING HANDLEBAR

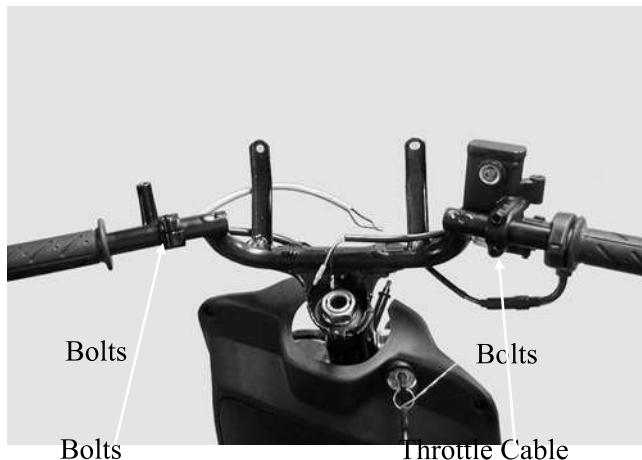
### REMOVAL

Remove the handlebar front and rear covers.

(⇒12-3)

Remove two bolts attaching the left brake lever holder.

Remove two bolts attaching the brake master cylinder (disk brake) to the right brake lever.



Remove the two right handlebar switch housing bolts and separate the housing. Disconnect the throttle cable and then remove the throttle pipe from the handlebar.



Remove the handlebar lock nut to remove the handlebar.



Brake Master Cylinder

### INSTALLATION

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Install the handlebar, aligning the tabs of the handlebar with the grooves in the steering stem.

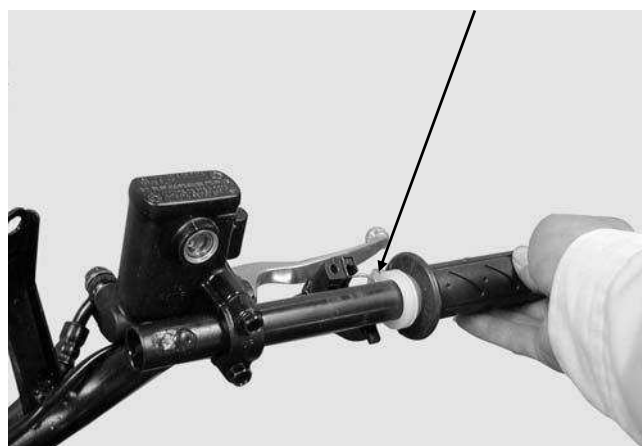
Install and tighten the handlebar lock nut.

**Torque:** 4.5 5.0kg-m



Lubricate the throttle pipe front end with grease.

Install the throttle grip and connect the throttle cable.



The installation sequence is the reverse of removal.

Install the rear brake lever holder.

Install the front brake master cylinder (disk brake).



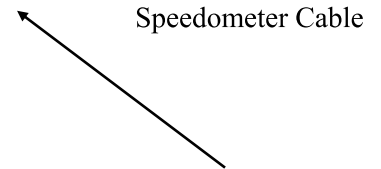
Tab/Groove

**FRONT WHEEL  
REMOVAL**

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Jack the motorcycle front wheel off the ground.

Remove the speedometer cable set screw and disconnect the speedometer cable.

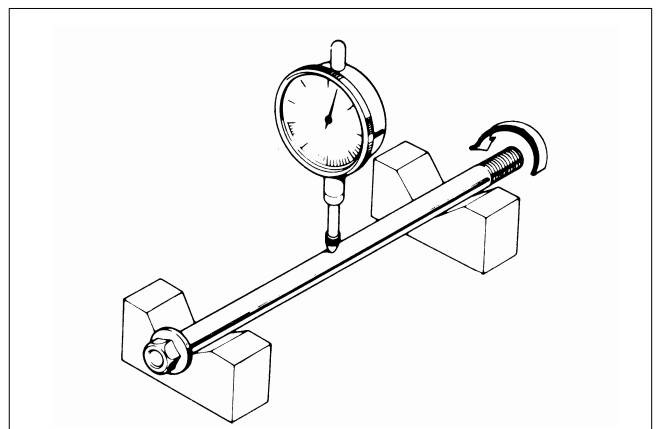


#### INSPECTION

Set the axle in V blocks and measure the runout.

The actual runout is  $\frac{1}{2}$  of the total indicator reading.

**Service Limit:** 0.2mm replace if over



Axle Nut

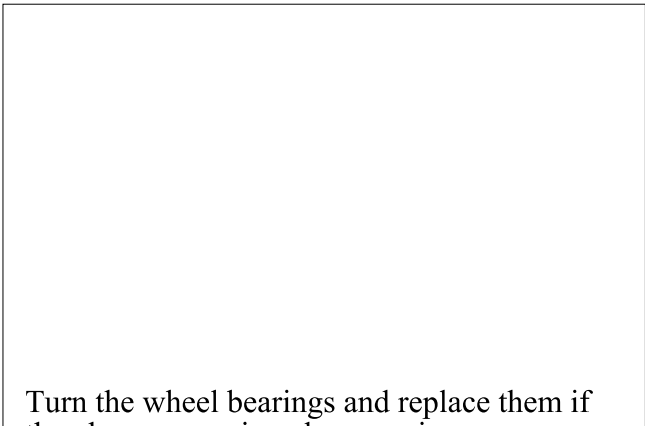
Check the wheel rim runout.

**Service Limits:**

**Radial:** 2.0mm replace if over

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

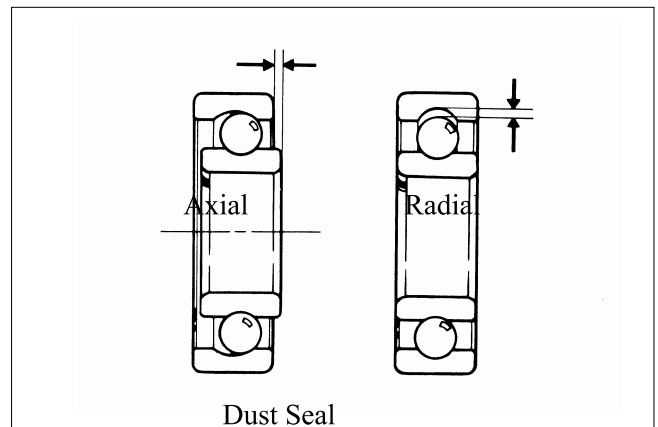
Axial: 2.0mm replace if over



Turn the wheel bearings and replace them if they have excessive play or noise.

Play

Play



#### DISASSEMBLY

Remove the dust seal.



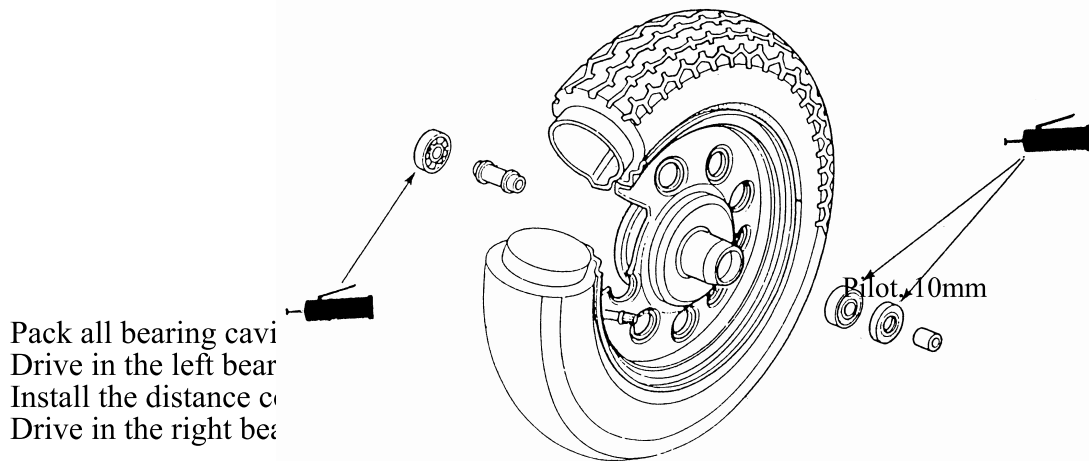


13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



Pilot, 10mm

Grease



Drive the bearing squarely with the sealed end facing out.



Install the side collar.

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



#### (Disk Brake)

Install the front wheel, aligning the speedometer gear tab with the front fork groove.

Connect the speedometer cable.

**Torque:** 5.0 7.0kg-m



Side Collar

#### HYDRAULIC BRAKE (FRONT BRAKE)

Brake Fluid Replacement/Air Bleeding

Check the brake fluid level on level ground.

- When operating the brake lever, the brake reservoir cap must be tightened securely to avoid spill of brake fluid.
- When servicing the brake system, use shop towels to cover plastic parts and coated surfaces to avoid damage.



Lower Limit

Bleed Valve

**Warning**

Brake fluid spilled on brake pads or brake disk will reduce the braking effect. Clean the brake pads and brake disk with a high quality brake degreaser.

Fully apply the brake lever and then loosen the brake caliper bleed valve to drain the brake fluid until there is no air bubbles in the brake fluid. Then, tighten the bleed valve.

Repeat these steps until the brake system is free of air.

**Brake Fluid Refilling**

Add DOT-3 brake fluid to the brake reservoir.

- When bleeding, be careful not to allow air in the brake reservoir flowing into the brake system.
- When using a brake bleeder, follow the manufacturer's instructions.
- Never use dirty or unspecified brake fluid or mix different brake fluids because it will damage the brake

Make sure to bleed air from the brake system.



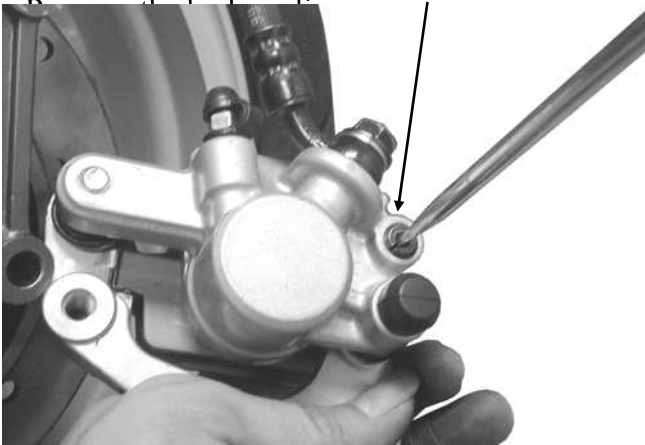
Upper Limit

**Brake Pad/Disk Replacement**

The brake pads must be replaced as a set to ensure the balance of the brake disk.

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Remove the two bolts attaching the brake caliper.



Torque: 1.5 - 2.0kg-m

Front Brake Caliper

Brake Pads

Keep grease or oil off the brake pads to avoid brake failure.

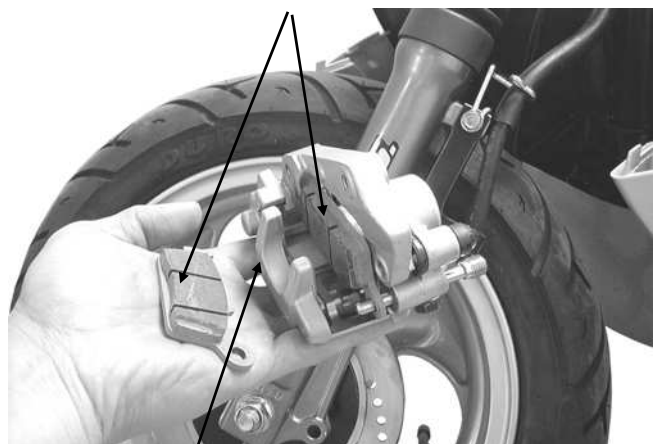
#### Brake Disk

Measure the brake disk thickness.

**Service Limit:** 3.0mm

Measure the brake disk runout.

**Service Limit:** 0.3mm



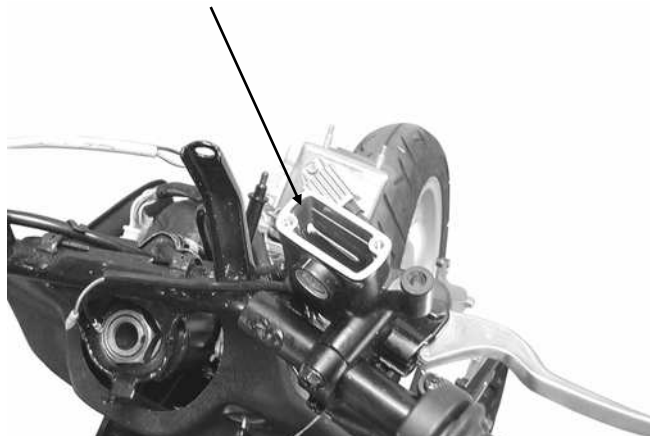
Pad Pin



First drain the brake fluid from the hydraulic brake system.

- When servicing the brake system, use shop towels to cover rubber and plastic parts and coated surfaces to avoid being contaminated by brake fluid.
- When removing the brake fluid pipe

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

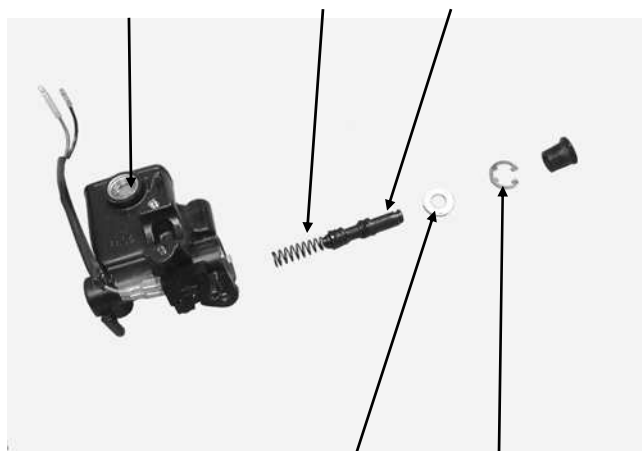


Bolts

Remove the washer, main piston and spring from the brake master cylinder.  
Clean the inside of the master cylinder and brake reservoir with brake fluid.



Brake Master Cylinder



Service Limit: 12.75mm

Inspect the master cylinder for scratch or crack.

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



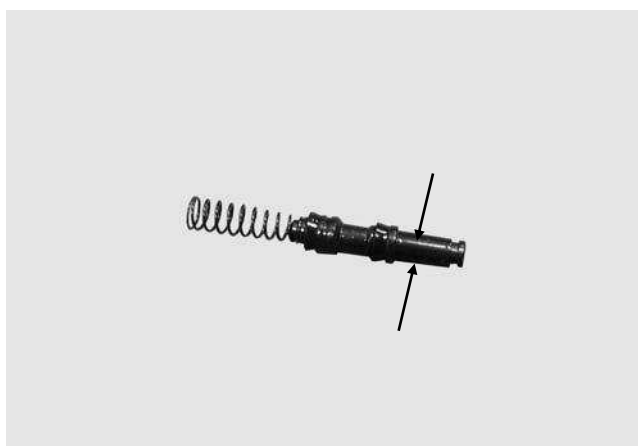
Rubber cups for wear.

#### Assembly

Before assembly, apply brake fluid to all removed parts.  
Install the spring together with the 1st rubber cup.

- During assembly, the main piston and spring must be installed as a unit without exchange.
- When assembling the piston, soak the cups in brake fluid for a while.
- Install the cups with the cup lips facing the correct direction.

Install the main piston, spring and snap ring.  
Install the rubber cover.  
Install the brake lever.



First tighten the upper bolt and then tighten the lower bolt.

**Torque:** 1.0 1.4kg-m

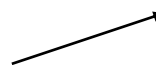
### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



Brake fluid to the upper limit and bleed air according to the method stated in 13-9.

Bolts

“Up” Mark



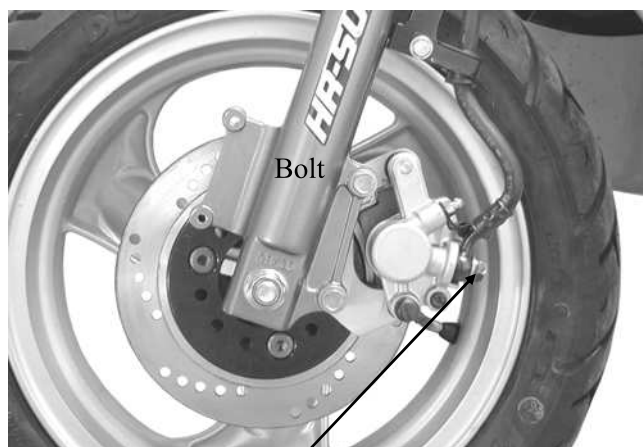
#### **BRAKE CALIPER (FRONT)**

##### **Removal**

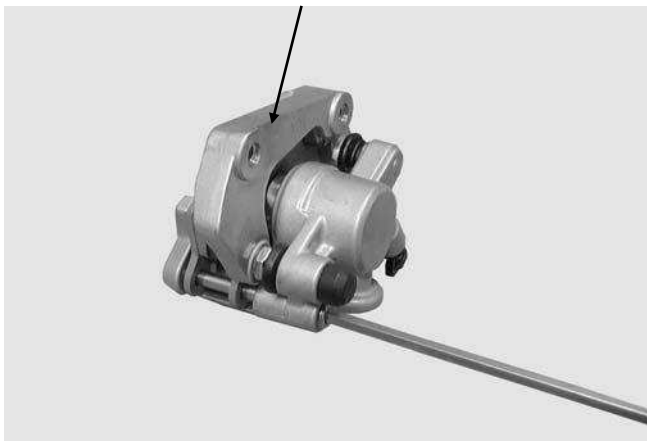
Remove the brake caliper. (⇒13-10)  
Place a clean container under the brake caliper and disconnect the brake fluid pipe from the caliper.

Do not spill brake fluid on any coated surfaces.

Punch Mark



### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



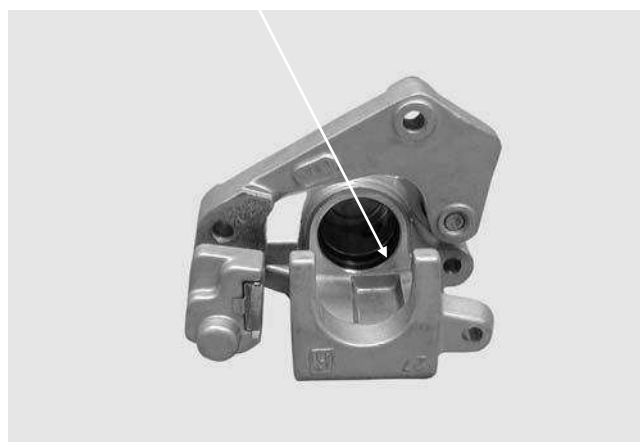
the removed piston.  
Check the piston cylinder for scratch or wear and replace if necessary.

Push the piston oil seal outward to remove it.  
Clean the oil seal groove with brake fluid.

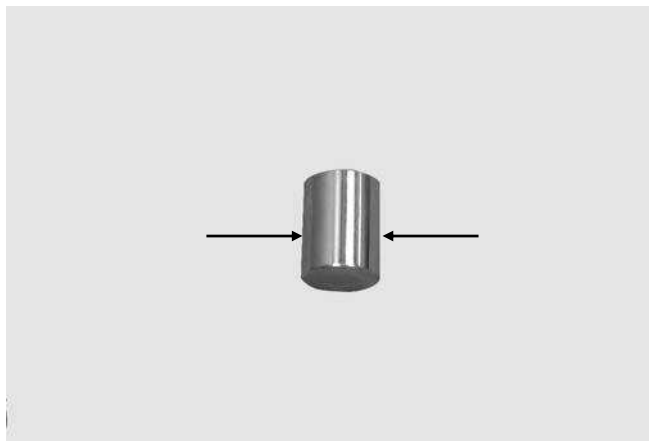
Be careful not to damage the piston surface.



Brake Caliper Seat







### Assembly

Clean all removed parts.  
Apply silicon grease to the piston and oil seal. Lubricate the brake caliper cylinder inside wall with brake fluid.  
Install the brake caliper piston with grooved side facing out.

Install the piston with its outer end 3  
5mm protruding beyond the brake  
caliper.

Wipe off excessive brake fluid with a clean shop towel. Apply silicon grease to the brake caliper seat pin and caliper inside.  
Install the brake caliper seat.





Bolts

## **FRONT SHOCK ABSORBER**

### **REMOVAL**

Remove the front wheel. (⇒ 13-5)

Remove the front shock absorber upper mount bolts.

Loosen the lower mount bolts to remove the front shock absorbers.

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



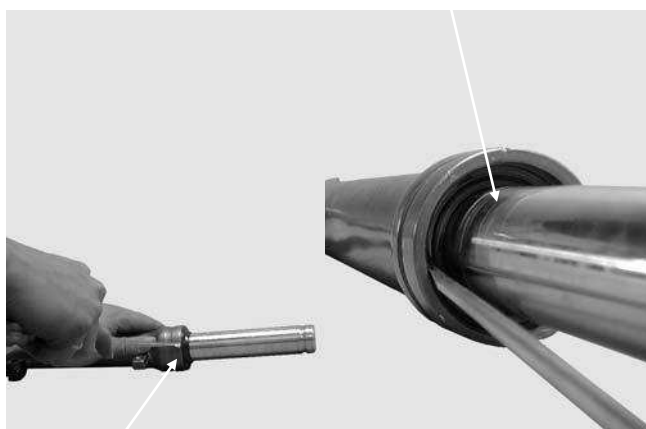
Front Shock Absorber

Mount Bolt

Circlip



Use a vise to hold the front shock absorber and remove the shock absorber tube, hex bolt and copper washer from the front shock absorber.

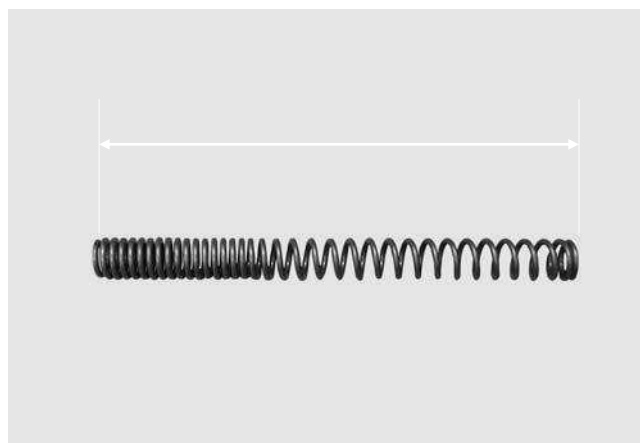


place a shop towel under it and do not apply too much force.



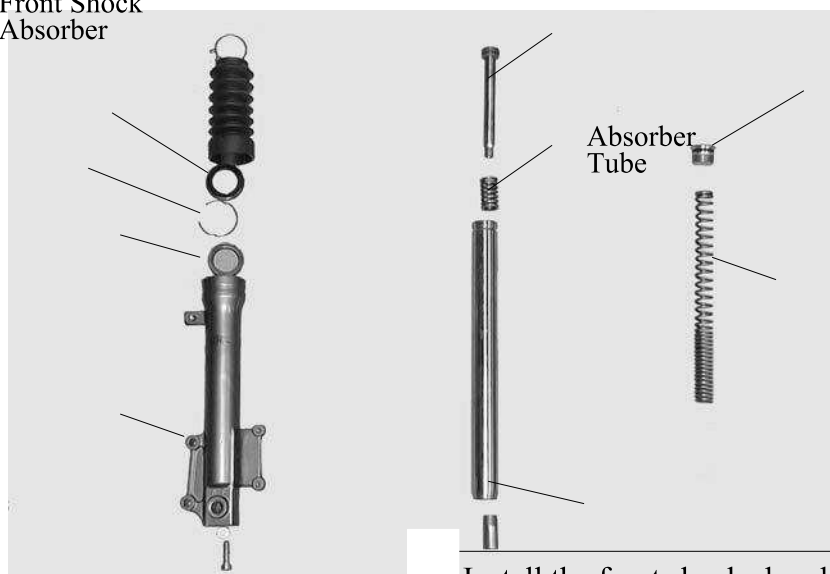
**FRONT SHOCK ABSORBER ASSEMBLY**

- Dust Seal
- Circlip
- Oil Seal



Damping Spring

Front Shock Absorber



the damper and shock absorber  
spring and

Install the front shock absorber spring with the loosely wound coils facing up.

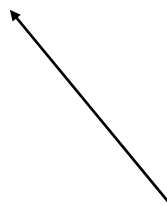
### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



**Oil Capacity:** 61cc

Damper Nut

Front Shock Absorber



Install the circlip.  
Install the dust boot.



Install and tighten  
the front shock absorber upper mount bolts.  
Tighten the lower mount bolts.

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Install the front wheel. (⇒13-8)



Front Shock Absorber

Disconnect the speedometer cable and front brake fluid pipe and remove the front brake caliper.

Remove the front wheel. (⇒13-5)

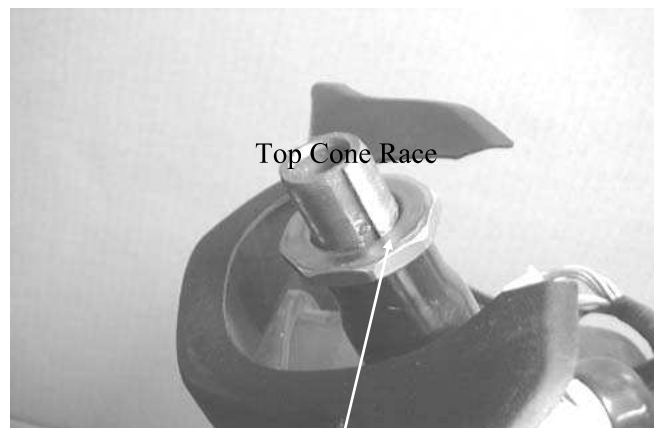
Hold the steering stem top cone race and remove the steering stem lock nut.

Remove the top cone race and remove the front fork.

Be careful not to lose the steel balls (26 on top race and 29 on bottom race).

Inspect the ball races, cone races and steel balls for wear or damage. Replace if necessary.

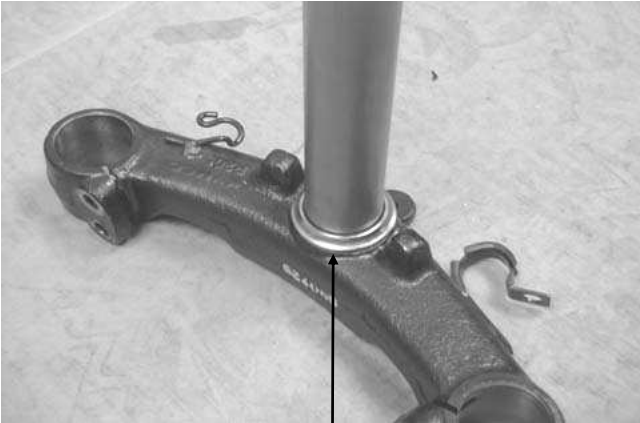
Mount Bolts



Top Cone Race

Be careful not to damage the steering stem and front fork.

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



Bottom Cone Race

Ball Race Remover

Drive in new ball races.

Be sure to drive the ball races into place completely.



install the front fork.

### 13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Apply grease to the top cone race and install it.  
Tighten the top cone race and then turn the steering stem right and left several times to make steel balls contact each other closely.

Check that the steering stem rotates freely without vertical play.



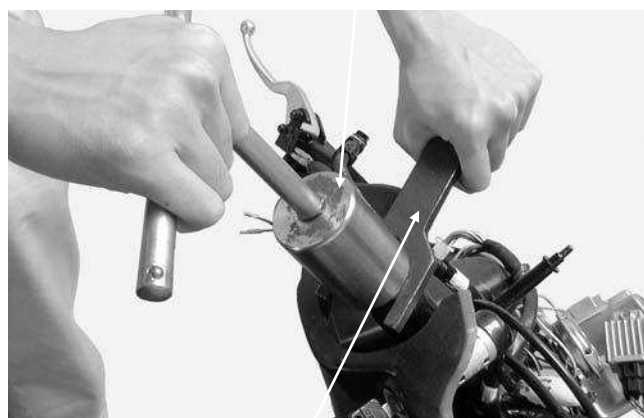
Install the steering stem lock nut and tighten it while holding the top cone race.

**Torque:** 8.0 12.0kg-m

Install the front wheel. (⇒13-8)

Install the handlebar. (⇒13-4)

Install the speedometer cable.





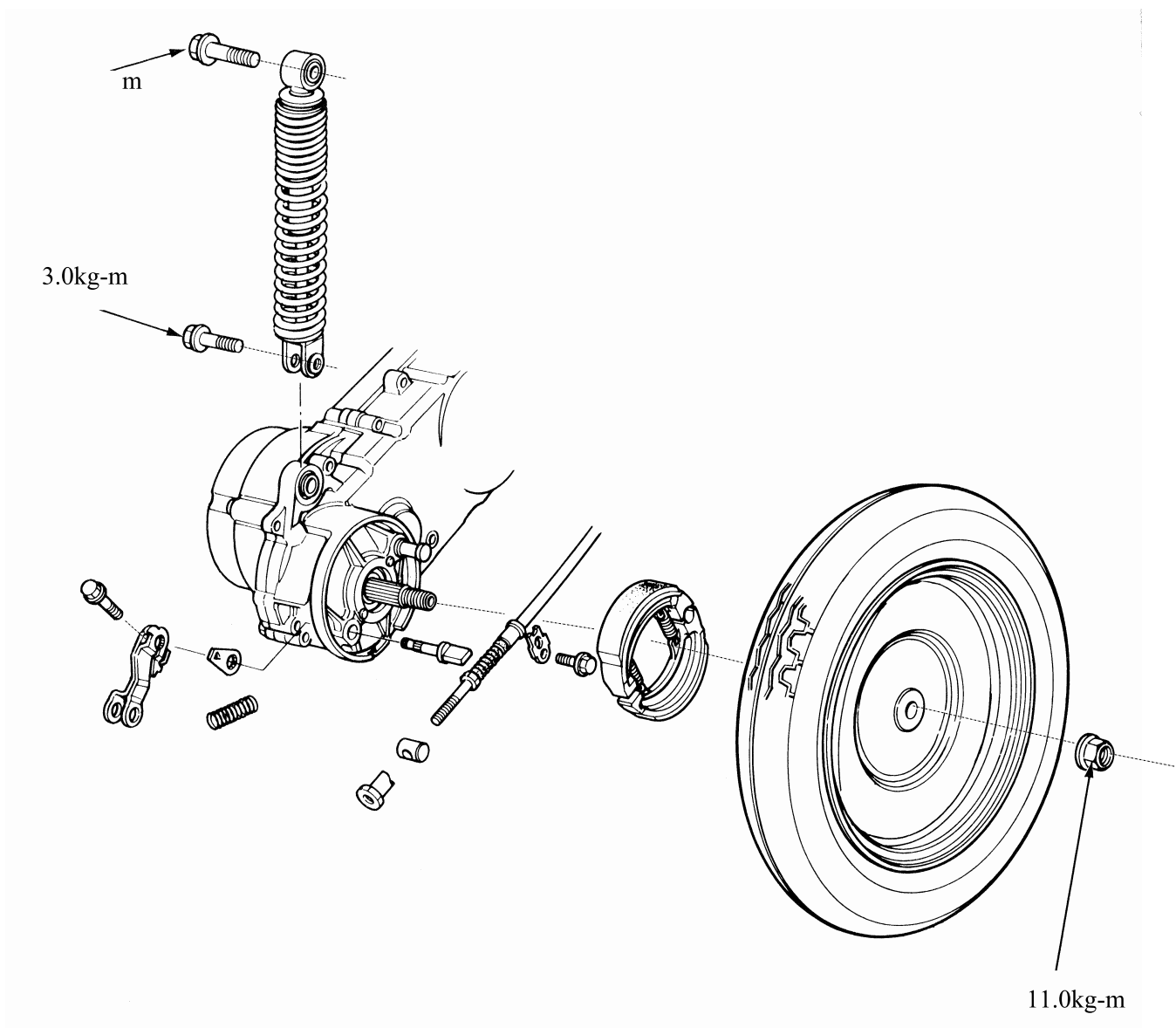
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**REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER**

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SERVICE INFORMATION ..... 14-2  
TROUBLESHOOTING ..... 14-2  
REAR WHEEL..... 14-3  
REAR BRAKE ..... 14-4  
REAR SHOCK ABSORBER..... 14-7

# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER



# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

## SERVICE INFORMATION

### SPECIFICATIONS

Item	Standard (mm)	Service Limit (mm)
Rear wheel rim runout		2.0
Rear brake drum I.D.	110	111
Rear brake lining thickness	4.0	2.0
Rear shock absorber spring free length	235.7	218.7

### TORQUE VALUES

Rear axle nut	11.0	13.0kg-m
Rear shock absorber upper mount bolt	3.5	4.5kg-m
Rear shock absorber lower mount bolt	2.4	3.0kg-m
Rear shock absorber lower joint nut	3.5	4.5kg-m (apply locking agent)

### SPECIAL TOOL

Rear shock absorber remover  
Rear shock absorber compressor

### TROUBLESHOOTING

#### Rear wheel wobbling

- Bent rim
- Faulty tire
- Axle not tightened properly

#### Soft rear shock absorber

- Weak shock absorber spring

#### Poor brake performance

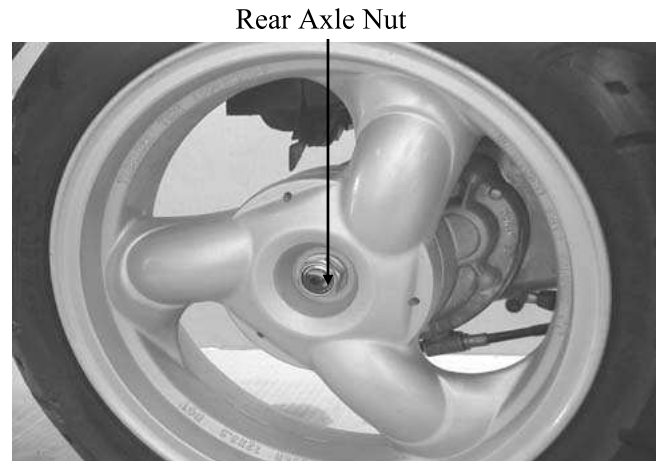
- Brake not adjusted properly
- Contaminated brake linings
- Worn brake linings
- Worn brake shoes at cam contacting area
- Worn brake cam
- Improper engagement between brake arm and wear indicator plate

# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

## REAR WHEEL

### REMOVAL

Remove the two exhaust muffler joint lock nuts.  
Remove the two exhaust muffler lock bolts.  
Remove the exhaust muffler.  
Remove the rear axle nut to remove the rear wheel.



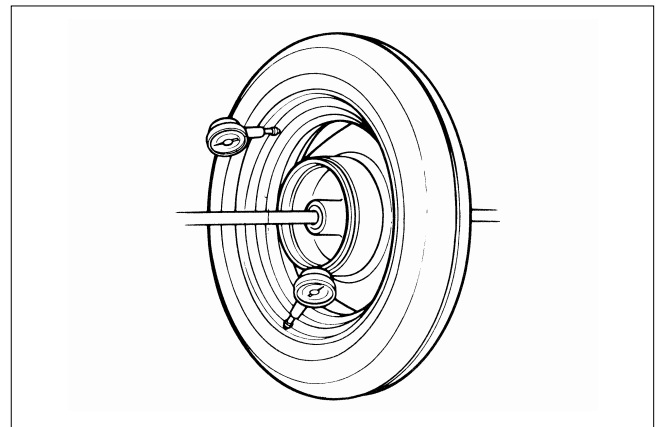
### INSPECTION

Measure the rear wheel rim runout.

#### Service Limits:

Radial : 2.0mm replace if over

Axial : 2.0mm replace if over

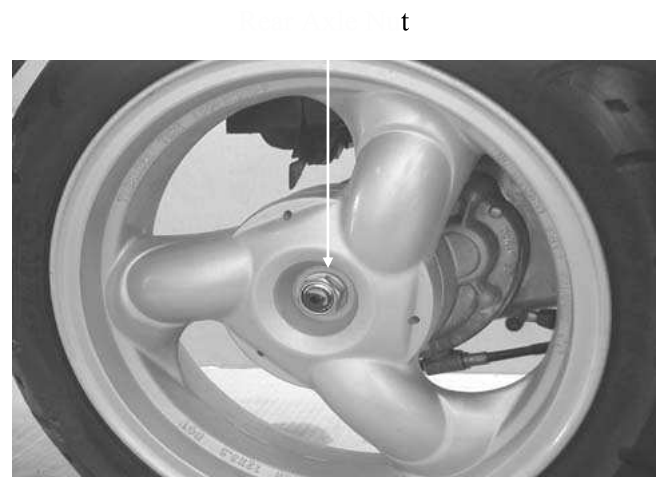


### INSTALLATION

Install the rear wheel and apply SAE30# engine oil to the axle threads. Then, tighten the rear axle nut.

#### Torque values:

Rear axle nut: 11.0 13.0kg-m



# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

## REAR BRAKE

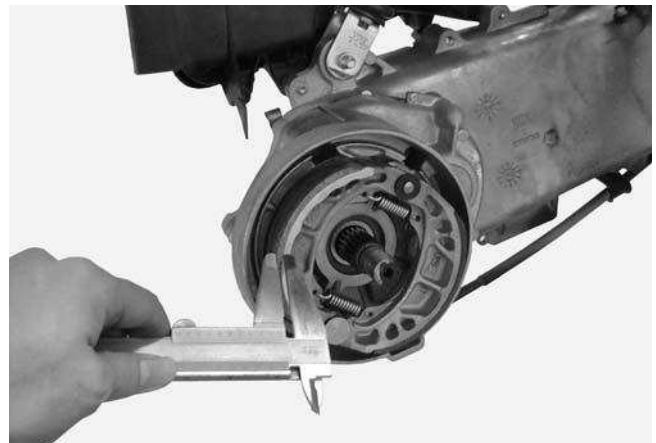
Remove the rear wheel. (⇒14-3)  
Inspect the rear brake drum.  
Measure the rear brake drum I.D.  
**Service Limit:** 95.5mm replace if over



## BRAKE LINING INSPECTION

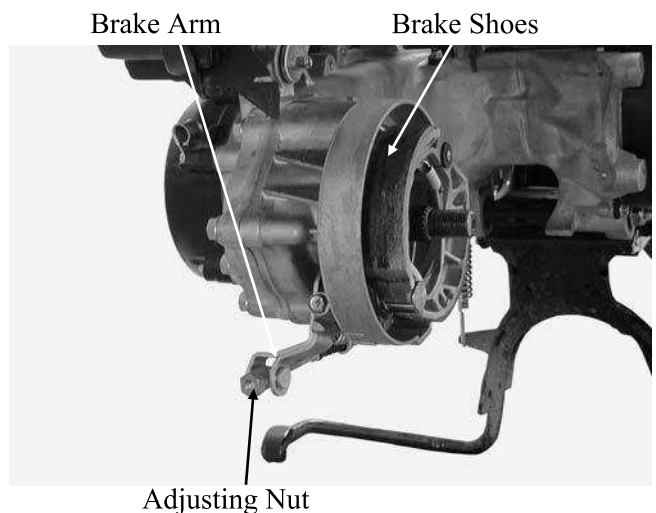
Measure the brake lining thickness.  
**Service Limit:** 2.0mm replace if below

Keep oil or grease off the brake linings.



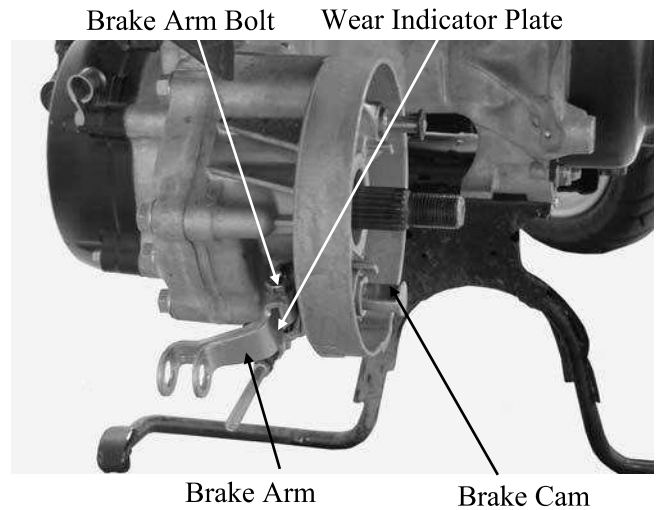
## REAR BRAKE DISASSEMBLY

Remove the rear brake adjusting nut and disconnect the rear brake cable.  
Remove the rear brake shoes.



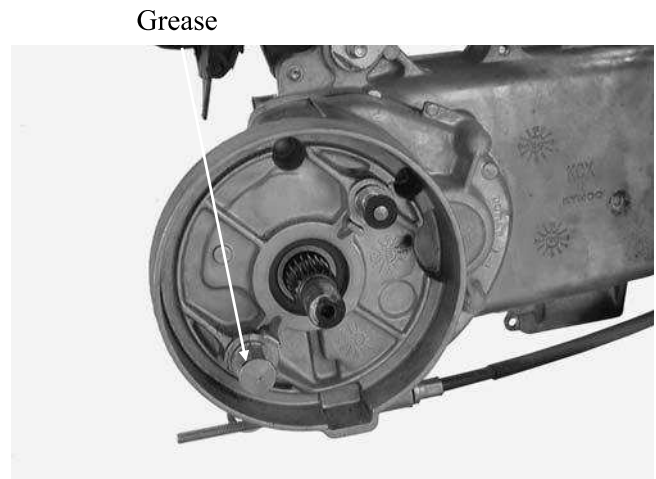
# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

Remove the brake arm bolt to remove the brake arm, wear indicator plate and felt seal.  
Remove the brake cam.



## REAR BRAKE ASSEMBLY

Apply grease to the anchor pin and brake shoe moving parts.  
Apply grease to the brake cam and install it.



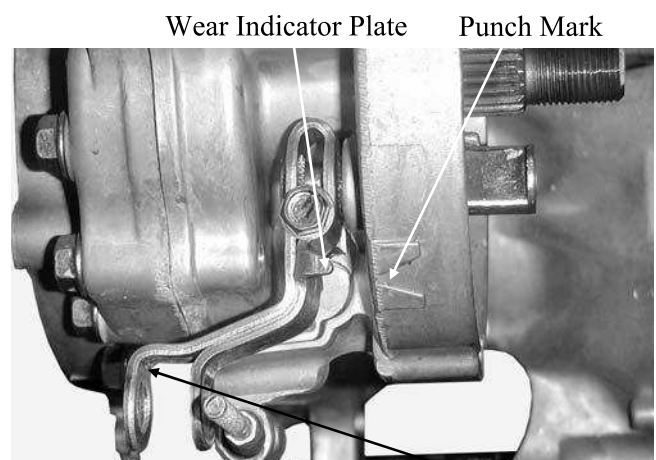
Apply engine oil to the felt seal and install it to the brake cam.

Install the wear indicator plate.

Align the wide tooth of the wear indicator plate with the wide groove on the brake cam.

Install the brake arm onto the brake cam.

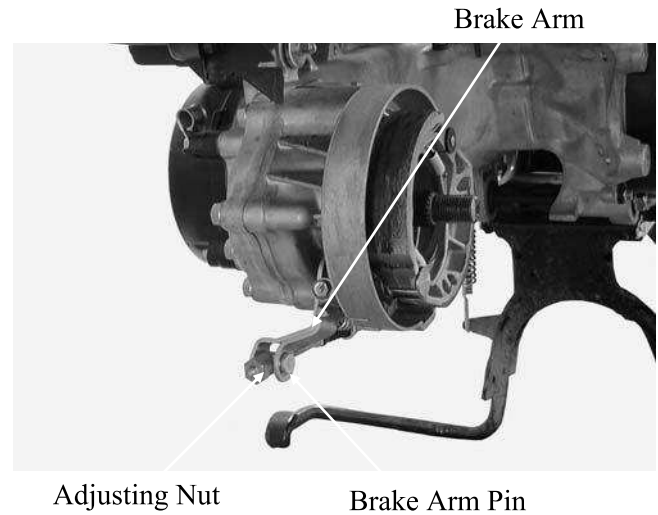
Align the punch mark on the brake arm with the scribed line on the brake cam.



Install and tighten the brake arm bolt.  
Install the brake arm return spring.  
Install the brake shoes.

# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

Install the brake arm pin.  
Connect the brake cable and install the adjusting nut.  
Install the rear wheel. (⇒14-3)  
Adjust the rear brake lever free play. (⇒3-4)



# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

## REAR SHOCK ABSORBER

### REMOVAL

Remove the rear carrier. (⇒12-5)  
Remove the met-in box. (⇒12-4)  
Remove the air cleaner case. (⇒5-2)  
Remove the rear shock absorber upper and lower mount bolts to remove the rear shock absorber.

Upper Mount Bolt



Lower Mount Bolt    Rear Shock Absorber

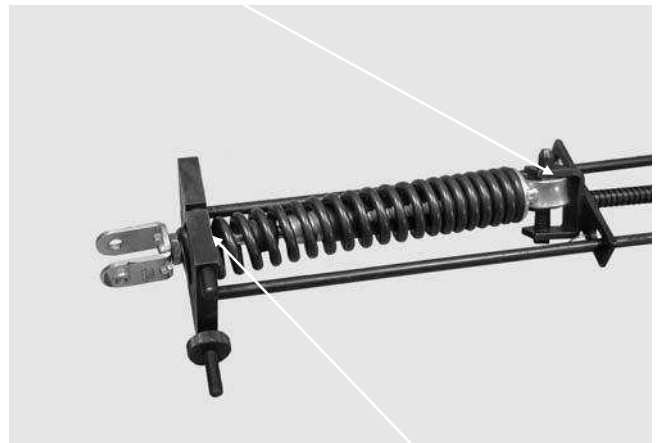
### DISASSEMBLY

Install the rear shock absorber compressor as the figure shown.

Install the rear shock absorber lower joint into the rear shock absorber compressor.

Compress the rear shock absorber spring.

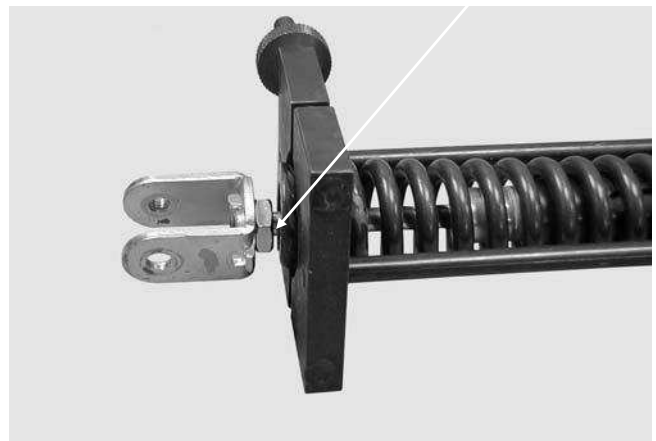
Rear Shock Absorber Compressor



Rear Shock Absorber Remover

Loosen the lower joint lock nut.  
Remove the lower joint.  
Remove the lock nut, rubber and damper.

Lock Nut

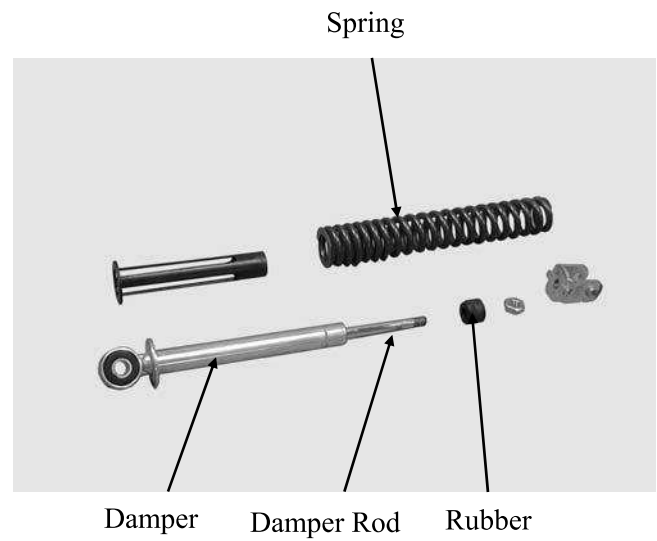




# 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

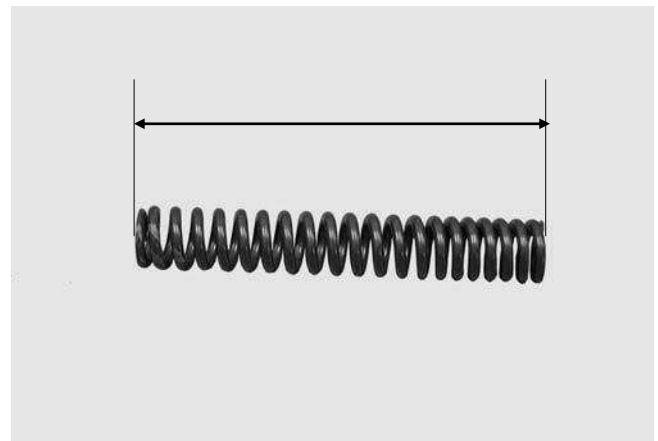
## INSPECTION

Inspect the damper rod for bending or damage.  
Inspect the damper for oil leaks.  
Inspect the damper rubber for deterioration or damage.



Measure the rear shock absorber spring free length.

**Service Limit:** 232mm replace if below



## ASSEMBLY

Assemble the rear shock absorber in the reverse order of disassembly.

- Install the shock absorber spring with loosely wound coils facing down.
- Apply locking agent to the lock nut thread and then install and tighten the lock nut.

Tighten the lock nut.

**Torque:** 3.5 4.5kg-m



## 14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

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### INSTALLATION

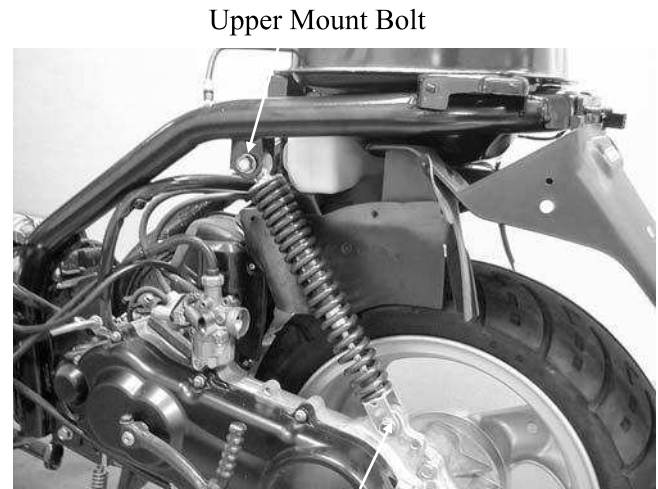
Install the rear shock absorber.  
Install the rear shock absorber upper mount bolt and then install the lower mount bolt.

#### Torque:

**Upper Mount Bolt:** 3.5 4.5kg-m

**Lower Mount Bolt:** 2.4 3.0kg-m

Install the frame body cover. (⇒12-5)



Upper Mount Bolt

Lower Mount Bolt

# 15. ELECTRICAL EQUIPMENT

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**15**

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## ELECTRICAL EQUIPMENT

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SERVICE INFORMATION .....	15- 1
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BATTERY .....	15- 4
IGNITION SYSTEM .....	15- 7
STARTING SYSTEM.....	15-11

# 15. ELECTRICAL EQUIPMENT

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- It is not necessary to check the battery electrolyte or fill with distilled water.
- Remove the battery from the motorcycle for charging. Do not remove the electrolyte cap..
- Do not quick charge the battery. Quick charging should only be done in an emergency..
- Charge the battery according to the charging current and time specified on the battery.
- When charging, check the voltage (open voltage) with an electric tester.
- When replacing the battery, do not use a traditional battery.

### SPECIFICATIONS

		SC10AS
Battery	Capacity	12V3AH
	Voltage	13.0□13.2V
	Charging current	Standard Quick
Spark plug	(NGK)	BR8HSA
Spark plug gap		0.6□0.7mm
Ignition coil resistance	Primary coil	0.153□0.187Ω
	Secondary coil (with plug cap)	6.99□10.21KΩ
	Secondary coil (without plug cap)	3.24□3.96KΩ
Pulser coil resistance (20□)		80□160Ω
Ignition timing		15.5°±2°BTDC/2000rpm

## TROUBLESHOOTING

### CHARGING SYSTEM

#### No power

- Dead battery
- Disconnected battery cable
- Fuse burned out
- Faulty ignition switch

#### Low power

- Weak battery
- Loose battery connection
- Charging system failure
- Faulty regulator/rectifier

#### Intermittent power

- Loose battery cable connection
- Loose charging system connection
- Loose connection or short circuit in ignition system
- Loose connection or short circuit in lighting system

#### Charging system failure

- Loose, broken or shorted wire or connector
- Faulty regulator/rectifier
- Faulty A.C. generator

## **15. ELECTRICAL EQUIPMENT**

---

### **IGNITION SYSTEM**

#### **No spark at plug**

- Faulty spark plug
- Poorly connected, broken or shorted wire
  - Between A.C. generator and CDI unit
  - Between CDI unit and ignition coil
  - Between CDI unit and ignition switch
  - Between ignition coil and spark plug
- Faulty ignition switch
- Faulty ignition coil
- Faulty CDI unit
- Faulty A.C. generator

#### **Engine starts but turns poorly**

- Ignition primary circuit
  - Faulty ignition coil
  - Poorly connected wire or connector
- Ignition secondary circuit
  - Faulty ignition coil
  - Faulty spark plug
  - Poorly insulated plug cap
- Improper ignition timing
  - Battery voltage too low (6V max.)
  - Faulty CDI unit

### **STARTING SYSTEM**

#### **Starter motor won't turn**

- Fuse burned out
- Weak battery
- Faulty ignition switch
- Faulty starter switch
- Faulty front or rear stop switch
- Faulty starter relay
- Poorly connected, broken or shorted wire
- Faulty starter motor

#### **Lack of power**

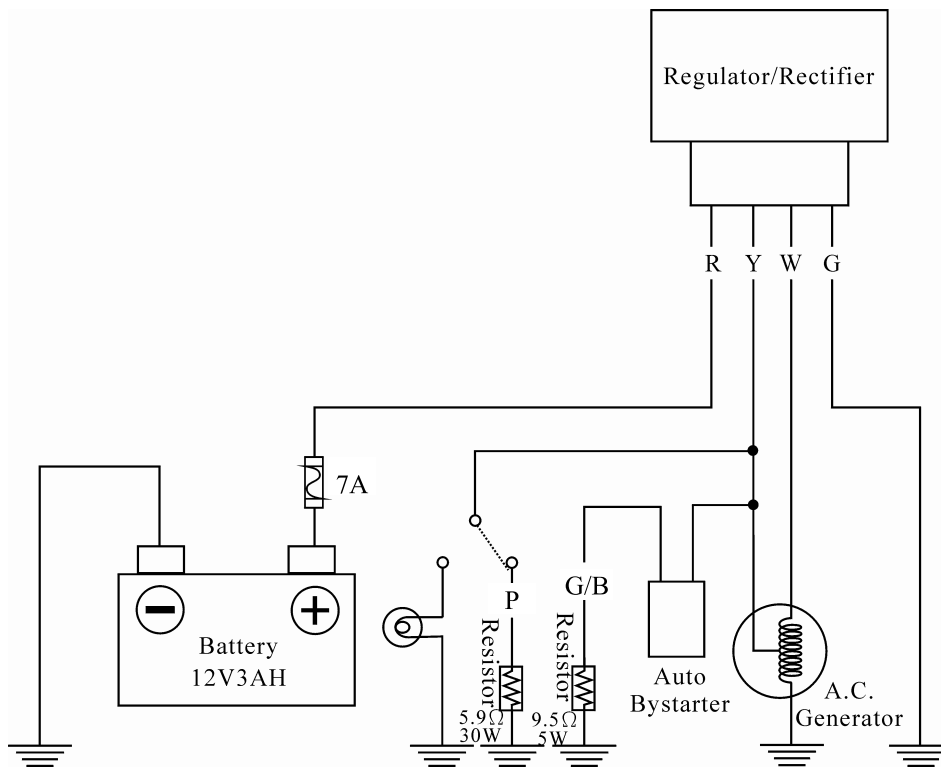
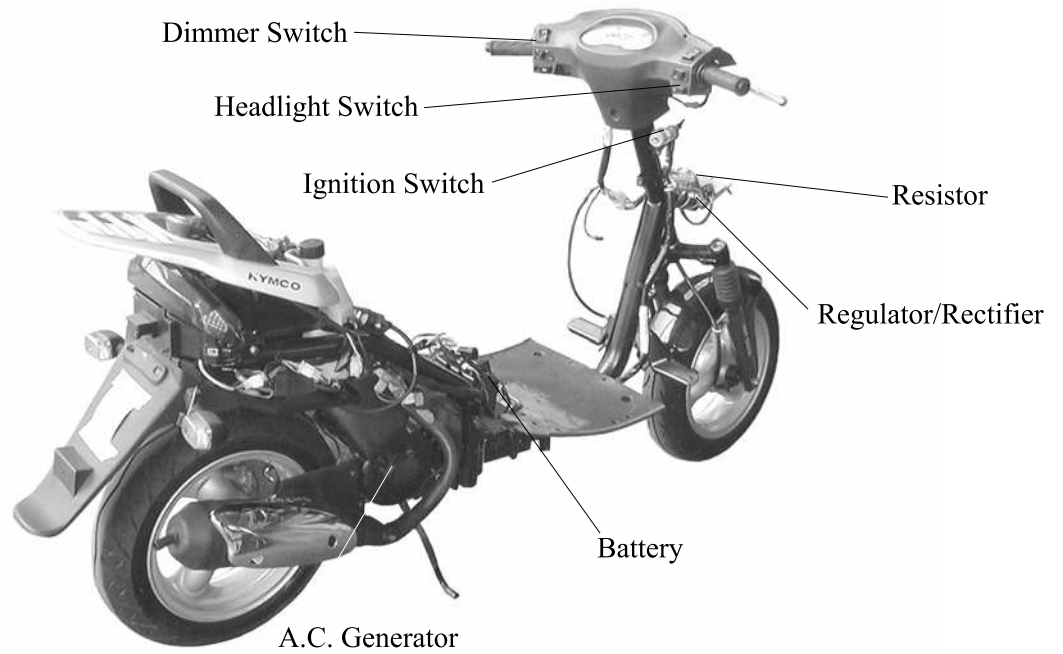
- Weak battery
- Loose wire or connection
- Foreign matter stuck in starter motor or pinion

#### **Starter motor rotates but engine does not start**

- Faulty starter pinion
- Starter motor rotates reversely
- Faulty starter clutch
- Weak battery

# 15. ELECTRICAL EQUIPMENT

## CHARGING SYSTEM



# 15. ELECTRICAL EQUIPMENT

## BATTERY

### BATTERY REMOVAL

Remove the battery cover.  
Disconnect the battery cables .

Remove the bolt and battery bracket.  
Remove the battery.  
The installation sequence is the reverse of removal.

### BATTERY CHARGING (OPEN CIRCUIT VOLTAGE) INSPECTION

Remove the battery cover and disconnect the battery cables.  
Measure the voltage between the battery terminals.  
Fully charged : 13.0V□13.2V  
Undercharged : 12.3V max.

### CHARGING METHOD

Connect the charger positive (+) cable to the battery positive (+) cable.  
Connect the charger negative (-) cable to the battery negative (-) cable.

Charging current: Standard : 0.4A  
Quick : 4A  
Charging time : Standard : 5 hours  
Quick : 0.5 hour  
After charging: Open circuit voltage: 12.8V min.

Battery Cover



Battery



Power Lamp (Green)

Charging Lamp (Red)

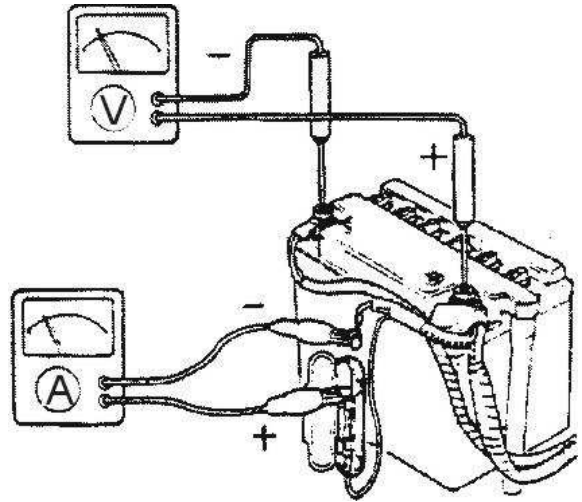


# 15. ELECTRICAL EQUIPMENT

## PERFORMANCE TEST

Warm up the engine.  
Remove the floor mat and battery cover.

Stop the engine and open the fuse box.  
Disconnect the wire lead from the fuse terminal. Connect an ammeter between the wire lead and fuse terminal as shown. Connect the battery positive (+) terminal to the voltmeter positive (+) probe and battery negative (-) terminal to the voltmeter negative (-) probe.  
Start the engine, gradually increase engine speed to test the output:



Position RPM	Day	Night
2500	1.3A min.	1.0A min.
6000	2.0A min.	2.0A min.

**Charging Limit Voltage:**  $14.5 \pm 0.5V/8000rpm$   
If the limit voltage is not within the specified range, check the regulator/rectifier.

## A.C. GENERATOR (CHARGING COIL) INSPECTION

Remove the met-in box. ( $\Rightarrow$ 12-4)  
Disconnect the A.C. generator connector.  
Measure the resistances between the charging coil terminals (white-green) and lighting coil terminals (yellow-green).

**Resistances:**

Charging coil	white-green	$0.2 \square 1.2\Omega$
Lighting coil	yellow-green	$0.3 \square 1.0\Omega$

Refer to 7-3 for A.C. generator removal.

A.C. Generator Connector





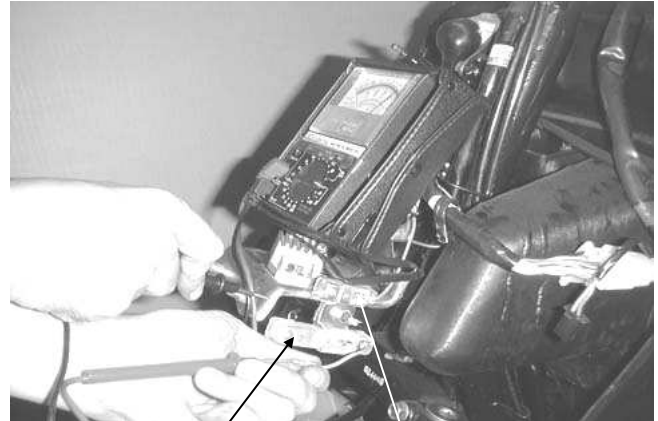
# 15. ELECTRICAL EQUIPMENT

## RESISTOR INSPECTION

Remove the frame front cover. (⇒12-3)  
 Measure the resistance between the resistor B pink wire and ground.  
 Measure the resistance between the resistor A green/black wire and ground.

**Resistances:**

- Resistor A: 9.9Ω-10.5Ω
- Resistor B: 5.6Ω-6.2Ω

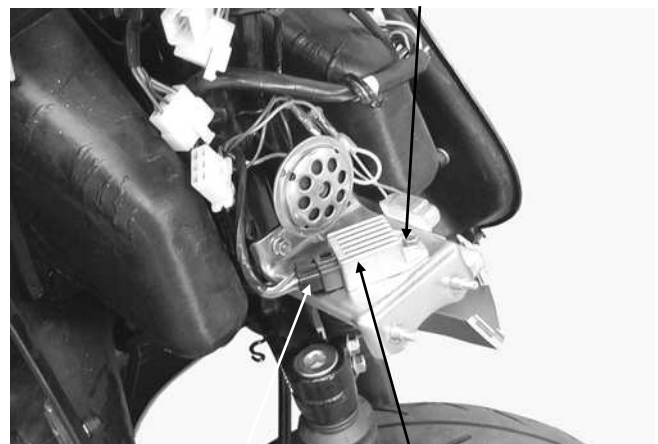


## REGULATOR/RECTIFIER INSPECTION

Remove the front cover. (⇒12-3)  
 Disconnect the regulator/rectifier wire coupler and remove the bolt to remove the regulator/rectifier.

Measure the resistances between the terminals.  
 Replace the regulator/rectifier if the readings are not within the specifications in the table below.

Resistor A      Resistor B



Coupler      Regulator/Rectifier



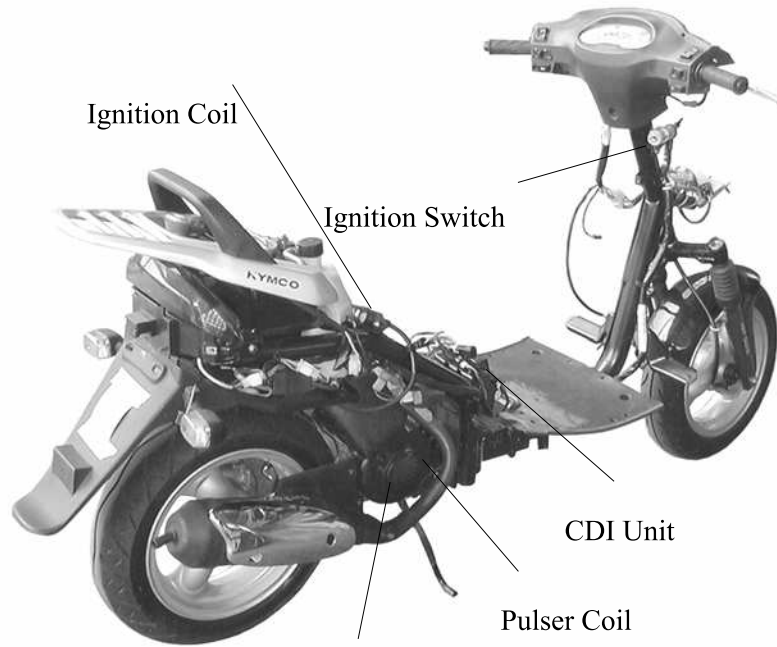
Probe⊕ Probe(-)	A (R)	B (W)	C (Y)	D (G)
A (R)		∞	∞	∞
B (W)	3-10KΩ		∞	∞
C (Y)	∞	∞		33-35K Ω
D (G)	∞	∞	33-35K Ω	

B (White)

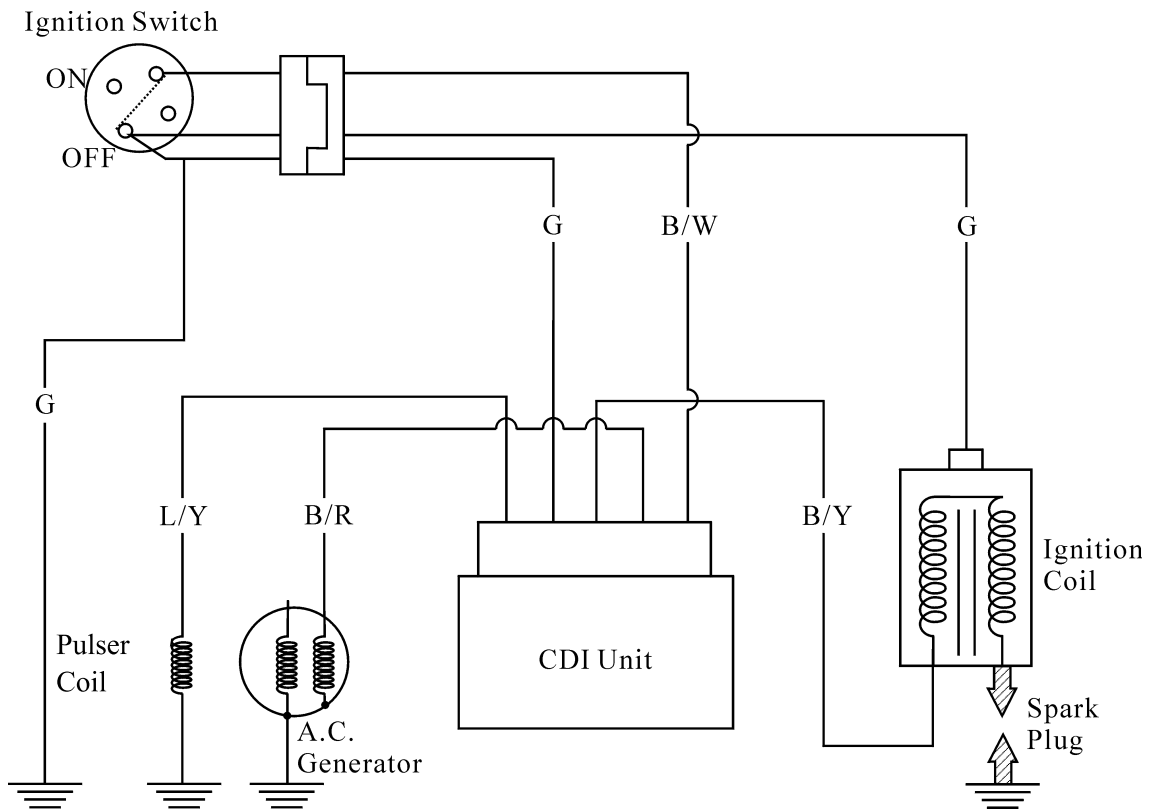
# 15. ELECTRICAL EQUIPMENT

D (Green)

## IGNITION SYSTEM



A.C. Generator (Exciter Coil)



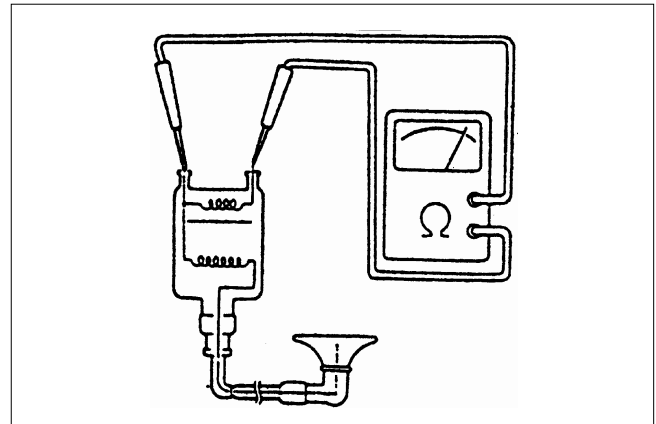
# 15. ELECTRICAL EQUIPMENT

## IGNITION COIL INSPECTION

### Continuity Test

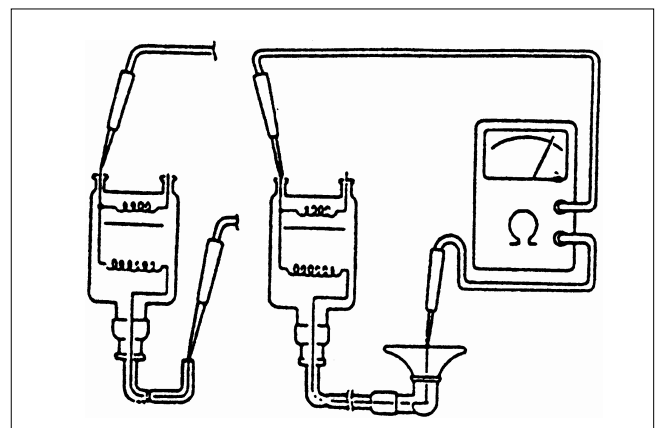
Remove the met-in box. (⇒ 12-4)  
 Measure the resistance between the ignition coil primary coil terminals.

**Resistance** (20°C): 0.153Ω-0.187Ω



Measure the secondary coil resistance between the spark plug cap and the primary coil terminal as Figure A shown.

**Resistance** (20°C) (with plug cap): 6.99Ω-10.21KΩ



Measure the secondary coil resistance between the ignition coil terminal and the primary coil terminal as Figure B shown.

**Resistance** (20°C) (without plug cap): 3.24Ω-3.96KΩ



## 15. ELECTRICAL EQUIPMENT

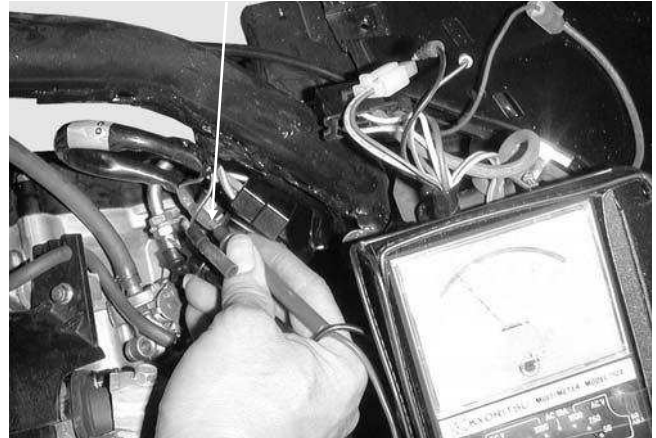
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### A.C. GENERATOR

#### Exciter Coil/Pulser Coil Inspection

Remove the met-in box. (⇒12-4)  
Disconnect the A.C. generator wire  
connector.  
Measure the pulser coil resistance between  
the blue/yellow wire and ground.

**Resistance** (20□): 80□160Ω

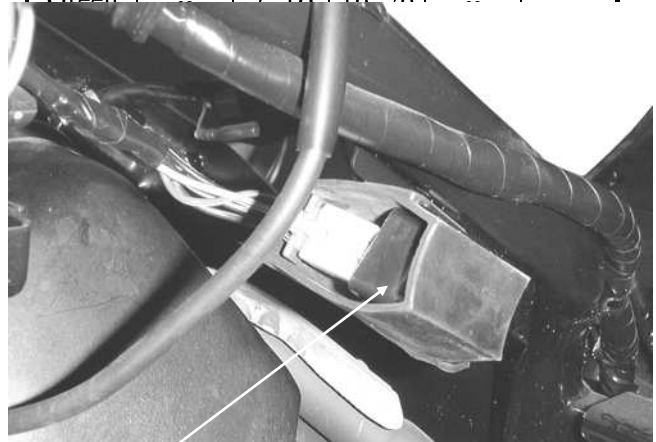


# 15. ELECTRICAL EQUIPMENT

Blue/ Yellow	$\infty$	3~40	80~120		10~30
Green		2~10	10~20		

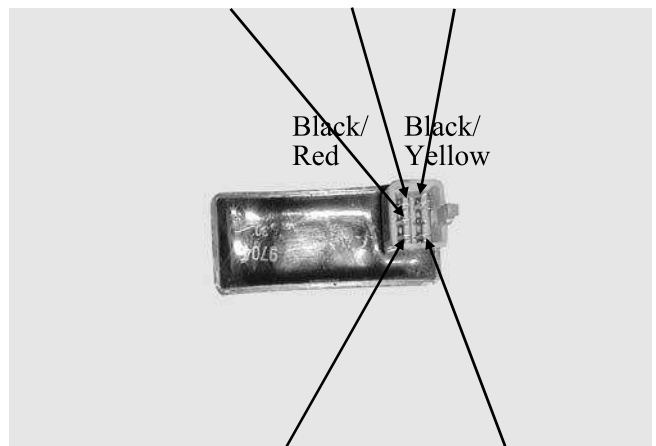
## CDI UNIT INSPECTION

Remove the battery cover.  
Disconnect the CDI coupler and remove the CDI unit.



## CDI CIRCUIT INSPECTION

Measure the resistance between the terminals.  
Replace the CDI unit if the readings are not within the specifications in the table below.



Use the x K $\Omega$  range for the Sanwa Tester.  
Use the x 100 $\Omega$  range for the Kowa Tester.

Green

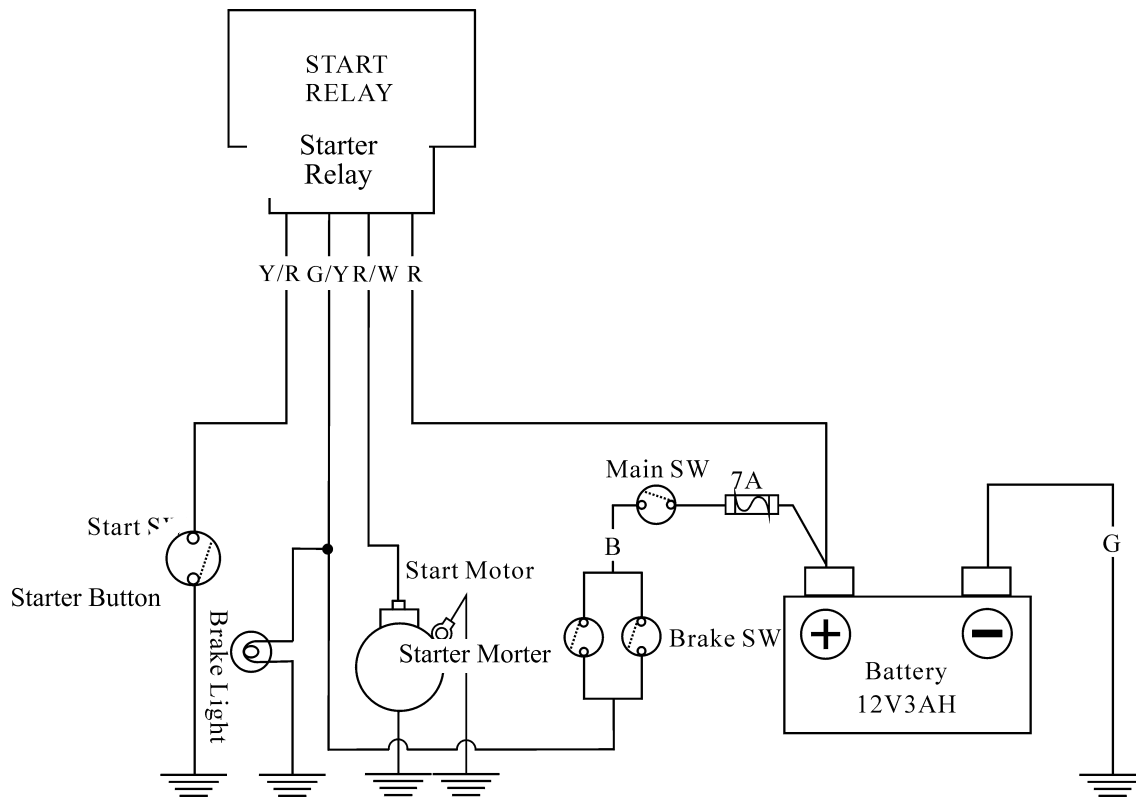
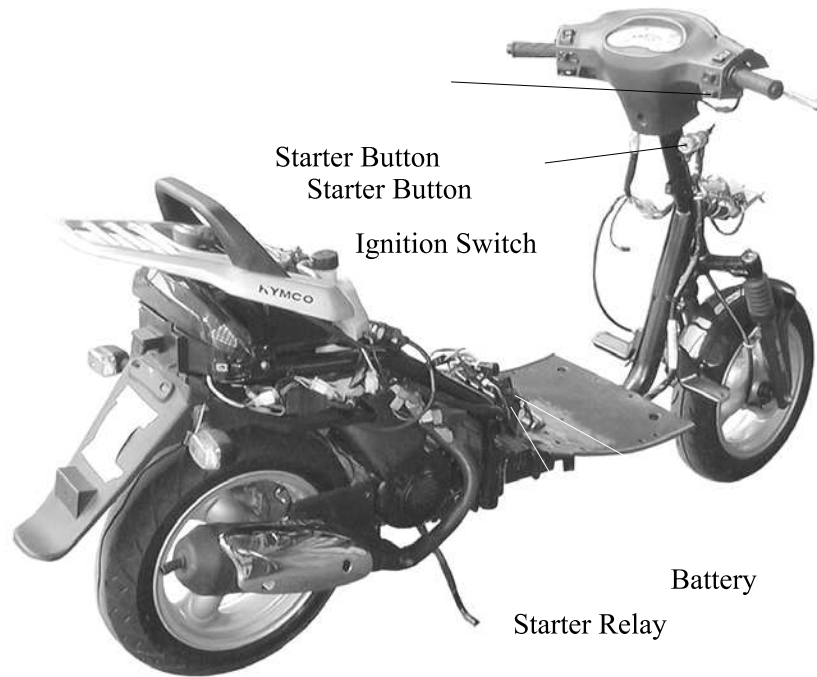
Blue/Yellow

 Unit: K $\Omega$ 

Probe $\oplus$ (-)Probe	Black/ Yellow	Black/ Red	Black/ White	Blue/ Yellow	Green
Black/ Yellow		$\infty$	$\infty$	$\infty$	$\infty$
Black/ Red	$\infty$		1~10	$\infty$	$\infty$
Black/ White	$\infty$	$\infty$		$\infty$	$\infty$

# 15. ELECTRICAL EQUIPMENT

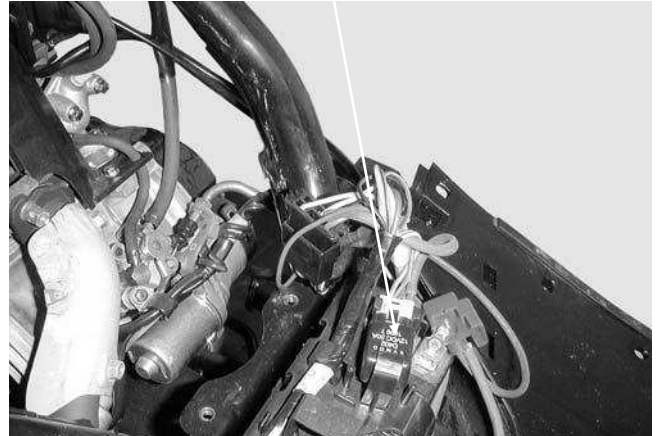
## Starting System



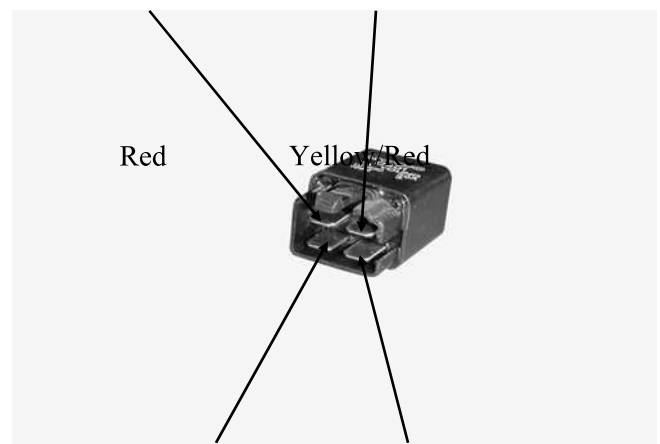
# 15. ELECTRICAL EQUIPMENT

## STARTER RELAY INSPECTION

Remove the battery cover.  
 Disconnect the starter relay coupler and then remove the starter relay.



Connect the starter relay green/yellow terminal to the 12V battery positive (+) terminal and the relay yellow/red terminal to the battery negative (-) terminal.  
 Check for continuity between the starter relay red and red/white terminals. The relay is normal if there is continuity.



## STARTER MOTOR REMOVAL

Disconnect the starter motor cable.  
 Remove the two bolts attaching the starter motor and remove the starter motor.

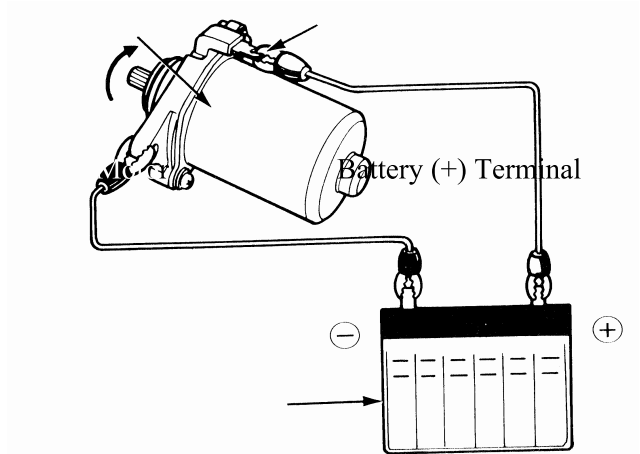
The installation sequence is the reverse of removal.



# 15. ELECTRICAL EQUIPMENT

## Starter Motor

**STARTER MOTOR INSPECTION**  
Connect a battery across the terminals and check for its operation.



Battery



**16. INSTRUMENT/SWITCHES/LIGHTS**

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**INSTRUMENT/SWITCHES/LIGHTS**

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SERVICE INFORMATION ..... 16-1  
TROUBLESHOOTING ..... 16-1  
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OIL METER ..... 16-3  
SWITCHES ..... 16-5  
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BULB REPLACEMENT ..... 16-7  
INSTRUMENT/HEADLIGHT ..... 16-8

## 16. INSTRUMENT/SWITCHES/LIGHTS

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### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- Wires should be connected to other wires of the same color. Couplers must be connected to other couplers of the same color.
- All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- After installation of each switch, a continuity check must be performed.

### TROUBLESHOOTING

#### Lights do not come on when ignition switch is "ON"

- Burned bulb
- Faulty switch
- Broken or shorted wire
- Fuse burned out
- Weak battery
- Poorly connected wire
- Faulty winker

#### Light dims

- Faulty ignition coil
- Wire or switch resistance too high
- Faulty regulator/rectifier

#### Headlight does not change when dimmer switch is turn to Hi or Lo

- Faulty or burned bulb
- Faulty dimmer switch

#### Motor oil indicator light does not come on (when motor oil is insufficient)

- Fuse burned out
- Dead battery
- Faulty ignition switch
- Faulty instrument
- Faulty oil meter

#### Motor oil indicator light winks

- Loose wire connection
- Broken wire
- Faulty oil meter

#### Fuel gauge pointer does not register correctly

- Disconnected wire or connector
- Broken wire
- Faulty float
- Faulty fuel unit
- Faulty instrument

#### Fuel gauge pointer fluctuates or swings

- Loose wire connection
- Faulty fuel unit
- Faulty instrument

# 16. INSTRUMENT/SWITCHES/LIGHTS

## FUEL UNIT

### REMOVAL

Remove the frame body cover. (⇒12-5)  
 Disconnect the fuel unit wire connectors.  
 Turn the fuel unit retainer counterclockwise to remove it.

Remove the fuel unit.



Fuel Unit

Fuel Unit Wire

### INSPECTION

Remove the fuel unit.  
 Measure the resistance between the fuel unit wire terminals with the float at upper and lower positions.

Wire Terminals	Upper	Lower
G□Y/W	33Ω	686Ω
G□L/W	566Ω	53Ω
Y/W□L/W	600Ω	600Ω



L/W

### FUEL GAUGE INSPECTION

Connect the fuel unit wire connectors and turn the ignition switch "ON".

Check the fuel gauge needle for correct indication by moving the fuel unit float up and down.

Float Position	Needle Position
Upper	"F" (Full)
Lower	"E" (Empty)



# 16. INSTRUMENT/SWITCHES/LIGHTS

## INSTALLATION

The installation sequence is the reverse of removal.



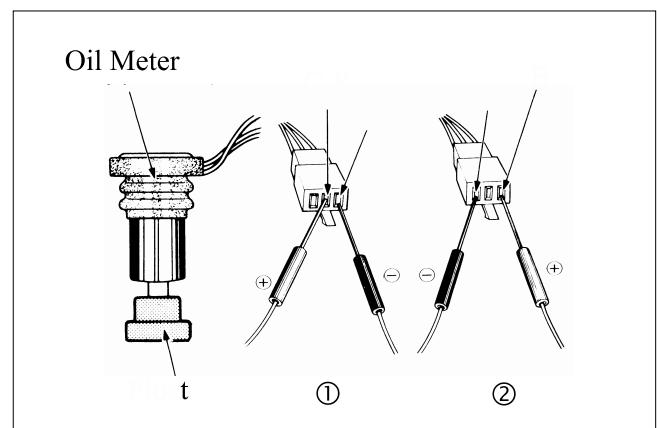
Retainer

## OIL METER

### INSPECTION

Remove the met-in box. (⇒12-4)  
 Remove the frame body cover. (⇒12-4)  
 Disconnect the oil meter wire connectors and remove the oil meter. Keep the oil meter float at the lower position.  
 Measure the resistances between the wire terminals as ① and ② shown in the left figure.

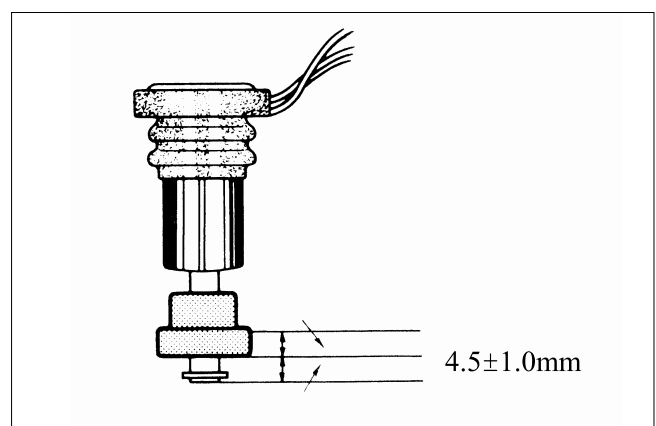
Wire Terminals	Resistance
Green/Red(+) $\square$ Black(-)	5 $\square$ 16 $\Omega$
Green(-) $\square$ Black(+)	$\infty$



### Oil Meter Operation Inspection

Connect the oil meter wire connectors and turn the ignition switch ON.  
 Measure the resistance between the wire terminals with the float at upper position.

Green/Red(+) $\square$ Black(-)	About 340 $\Omega$
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## 16. INSTRUMENT/SWITCHES/LIGHTS

Move the oil meter float up and down to see if the oil indicator light will go out and come on.



Oil Indicator Light

### SWITCHES

#### IGNITION SWITCH INSPECTION

Remove the front cover. (⇒12-3)  
Disconnect the ignition switch wire couplers and check for continuity between the wire terminals.

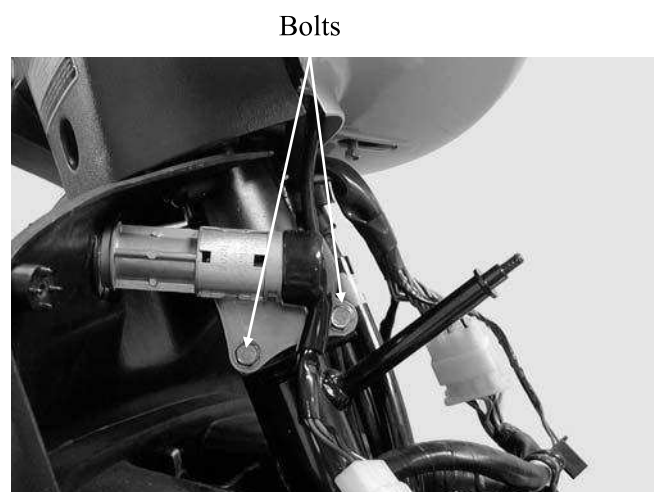
Color	Red	Black/White	Green	Black
Symbol	BAT <sub>1</sub>	IG	E	BAT <sub>2</sub>
LOCK		○ — ○	○	
OFF		○ — ○	○	
ON	○ —			○



Ignition Switch Coupler

#### IGNITION SWITCH REPLACEMENT

Remove the front cover. (⇒12-3)  
Disconnect the ignition switch wire couplers.  
Remove the two mounting bolts and remove the ignition switch.  
The installation sequence is the reverse of removal.



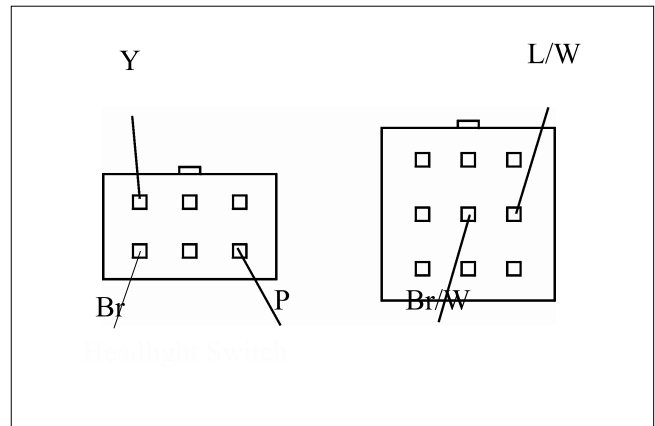
Bolts

# 16. INSTRUMENT/SWITCHES/LIGHTS

## HEADLIGHT SWITCH INSPECTION

Remove the handlebar rear cover. (⇒12-3)  
Disconnect the headlight switch wire coupler and check for continuity between wire terminals.

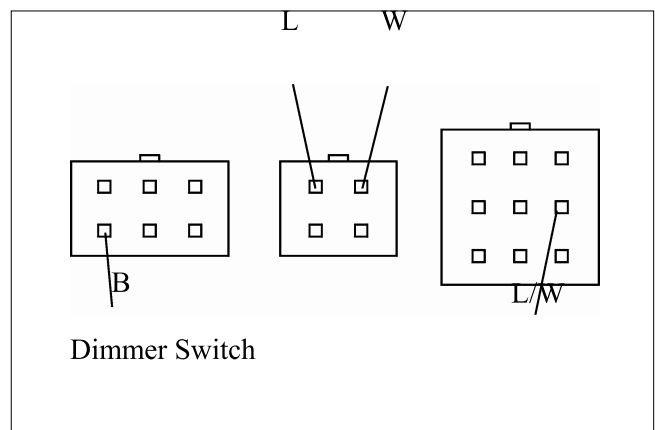
Color	Blue/White	Yellow	Brown	Pink	Brown/White
Symbol	HL	CL	TL	RE	
OFF		○	—	○	
P		○	—	○	—
H	○	○	○		



## DIMMER SWITCH INSPECTION

Check for continuity between wire terminals.

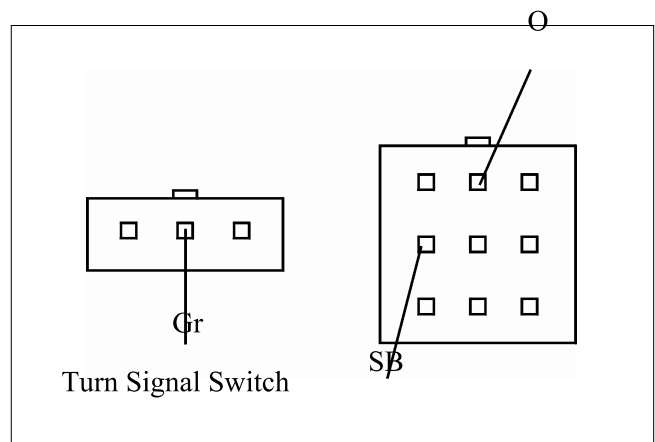
Color	Blue/White	Blue	White	Black
Symbol	HL	HI	LO	PASS
HI	○	—	○	
LO	○		—	○
PASSING		○	—	○



## TURN SIGNAL SWITCH INSPECTION

Check for continuity between the wire terminals.

Color	Light Blue	Orange	Gray
Symbol	R	L	WR
R	○	—	○
L		○	○

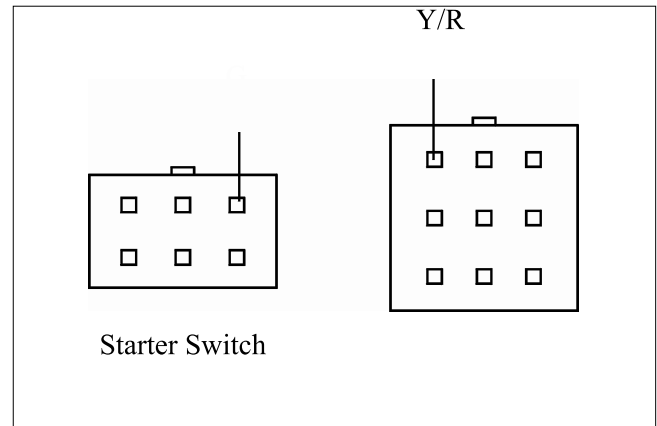


# 16. INSTRUMENT/SWITCHES/LIGHTS

## STARTER SWITCH INSPECTION

Check for continuity between wire terminals.  
 Push the starter button when measuring.

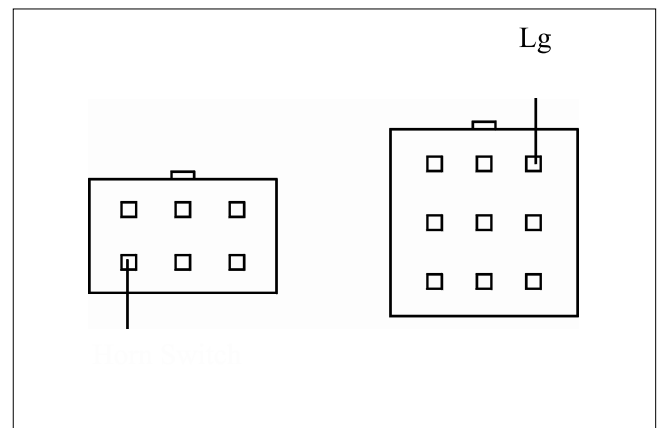
Color	Yellow/Red	Green
Symbol	ST	E
FREE		
PUSH	○ ———	——— ○



## HORN SWITCH INSPECTION

Check for continuity between wire terminals.  
 Push the horn button when measuring.

Color	Light Green	Black
Symbol	HO	BAT <sub>2</sub>
FREE		
PUSH	○ ———	——— ○



## STOP SWITCH INSPECTION

Remove the handlebar front cover. (⇒12-3)  
 Disconnect the front and rear stop switch wire couplers.  
 Check for continuity between the wire terminals when the front/rear brake lever is applied.



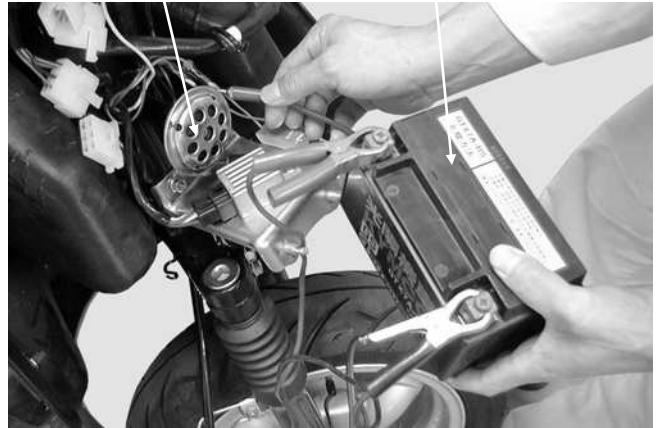
## 16. INSTRUMENT/SWITCHES/LIGHTS

### HORN INSPECTION

Remove the frame front cover. (⇒12-3)  
Disconnect the horn wire couplers. The horn is normal if it sounds when a 12V battery is connected across the horn wire terminals.

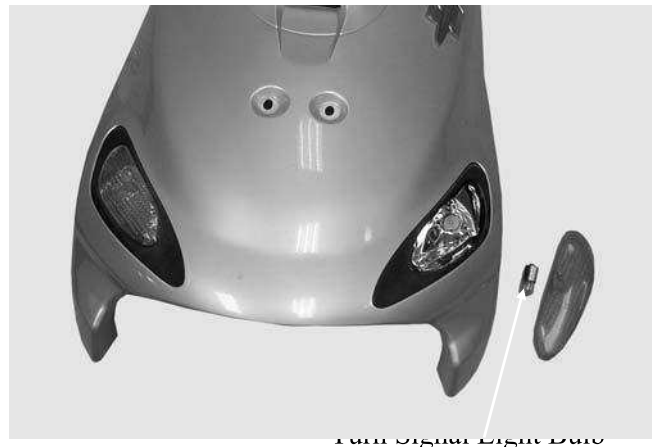
Horn

Battery



### FRONT TURN SIGNAL LIGHT REPLACEMENT

Remove the turn signal light shell and the bulb.  
Replace with new ones.

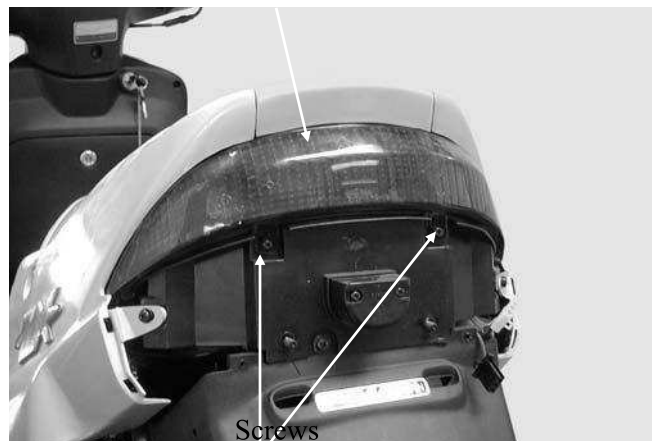


Turn Signal Light Bulb

### TAILLIGHT/STOPLIGHT/REAR TURN SIGNAL LIGHT BULB REPLACEMENT

**Taillight Shell Removal:**  
Remove two screws attaching the taillight shell.  
Remove the taillight shell and stop light bulb.  
Remove the rear turn signal light bulbs.  
The installation sequence is the reverse of removal.

Taillight Shell



Screws

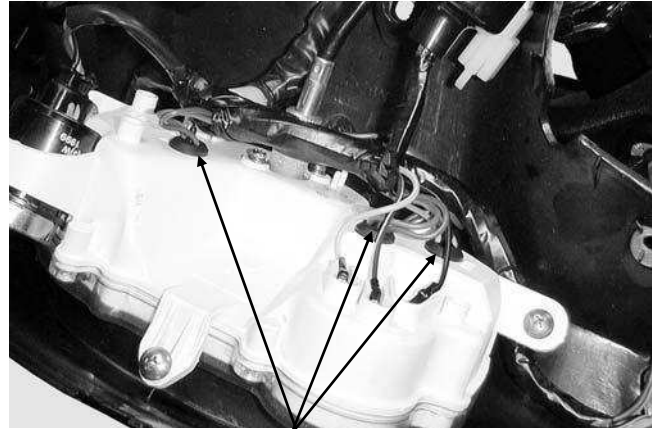


# 16. INSTRUMENT/SWITCHES/LIGHTS

## INSTRUMENT

### Instrument Bulbs Replacement

Remove the handlebar rear cover. (⇒12-3)  
 Remove the bulbs and replace with new ones.



Speedometer cable

### SPEEDOMETER REMOVAL

Disconnect the speedometer cable.  
 Disconnect the speedometer wire connector.  
 Remove the three screws attaching the speedometer.  
 Remove the speedometer.  
 The installation sequence is the reverse of removal.



Bulb Sockets

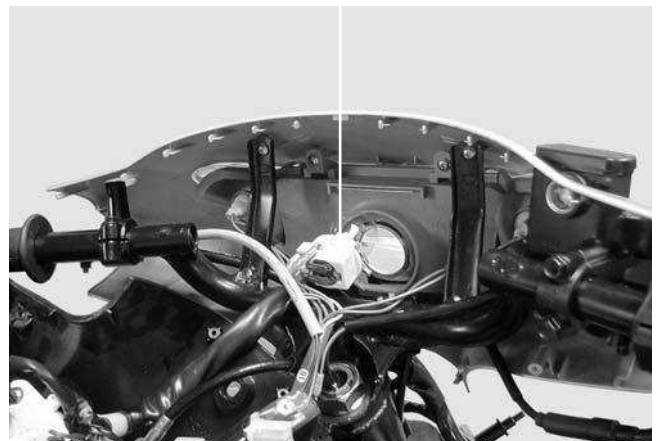
## HEADLIGHT

### REMOVAL/BULB REPLACEMENT

Remove the handlebar front cover. (⇒12-3)  
 Remove the bulb sockets and bulbs.

- The model adopts krypton gas bulb. When installing, do not directly touch the bulb glass with fingers.
- Use bulbs of the same specifications for replacement.

The installation sequence is the reverse of removal.



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**EVAPORATIVE/EXHAUST EMISSION  
CONTROL SYSTEM**

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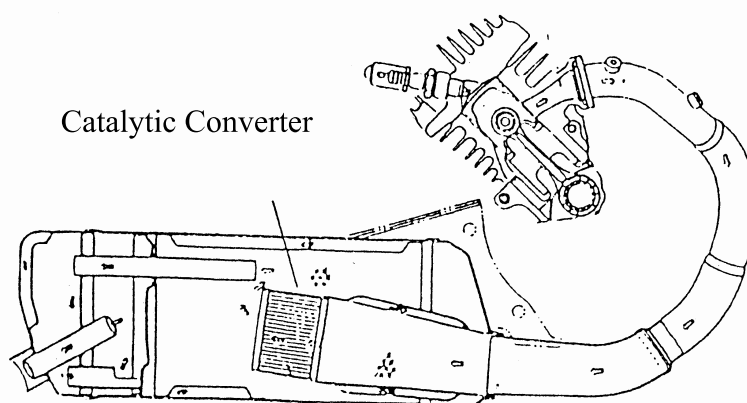
EXHAUST EMISSION CONTROL SYSTEM..... 17-1  
EXHAUST MUFFLER..... 17-2  
EXHAUST EMISSION RELATED SYSTEM INSPECTION ..... 17-3

# 17. EVAPORATIVE/EXHAUST EMISSION CONTROL SYSTEM

## EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system adopted by this model is an oxidizing catalytic converter which is located in the middle of the exhaust muffler to reduce pollutants in the exhaust emission.

### Exhaust Muffler Diagram



### FUNCTION

Item	Purpose	Function
Oxidizing Catalytic Converter	Reduce the concentration of HC and CO in the exhaust emission.	The precious metal in the oxidizing catalytic converter is used to oxidize HC and CO in the exhaust emission into CO <sub>2</sub> and H <sub>2</sub> O to avoid air pollution.

### TROUBLESHOOTING

#### Lack of power and high CO & HO

1. Clogged exhaust muffler
2. Faulty oxidizing catalytic converter
3. Carburetor adjusted improperly
4. Clogged air cleaner
5. Faulty spark plug
6. Incorrect ignition timing

#### Engine runs erratic at idle speed and high fuel consumption

1. Clogged exhaust muffler
2. Clogged carburetor
3. Clogged air cleaner
4. Faulty spark plug
5. Incorrect ignition timing

# 17. EVAPORATIVE/EXHAUST EMISSION CONTROL SYSTEM

## EXHAUST MUFFLER

### REMOVAL

Remove the two exhaust muffler joint lock nuts and two exhaust muffler lock bolts.  
Remove the exhaust muffler.

- The temperature of exhaust muffler is very high. Be careful to avoid burns during working.



Exhaust Muffler

Lock Bolts

### INSPECTION

1. Inspect the exhaust muffler and joint for damage or crack. Replace if necessary.
2. Inspect the exhaust muffler joint packing collar for deformation or damage. Replace if necessary.

### INSTALLATION

1. Install the exhaust muffler in the reverse order of removal.

- A large amount of unburned mixture flowing into the high-heat catalytic converter will burn again and cause damage to the converter due to overheat. Pay attention to the following.
- Use 92# or 95# nonleaded gasoline only. (Leaded gasoline will cause catalytic converter failure.)
- During riding, do not turn the ignition switch OFF to avoid a large amount of unburned mixture flowing into the exhaust muffler.
- Faulty ignition system or fuel system will cause overheat and damage to the catalytic converter.

Exhaust Muffler Joint Lock Nut

## EXHAUST EMISSION RELATED SYSTEM INSPECTION

- Clean or replace the air cleaner.
- Clean and adjust the carburetor.
- Inspect the auto bystarter system.
- Clean and inspect the spark plug.
- Inspect the ignition system.

## EXHAUST EMISSION TEST AND ADJUSTMENT

1. Start the engine and warm up for several minutes. (Engine surface temperature 50 – 60 °C)
2. Adjust the idle speed to:  $2000 \pm 100 \text{rpm}$   $\begin{matrix} +100 \\ -50 \end{matrix}$
3. Connect the emission tester sampling pipe to the exhaust muffler.  
Standard:  
CO:  $3 \pm 0.5\%$   
HC: 7000PPM max.
4. If CO or HC exceeds the specified values, adjust the carburetor air screw (A.S.) until CO and HC are within the specified standard values.  
A.S. Opening:  $1\frac{1}{4} \pm \frac{1}{2}$  turns
5. If the adjustment of carburetor makes no difference, inspect exhaust emission related system.

# KYMCO TECHNICAL INFORMATION

Model □ ALL MODEL (For EURO 2)  
Subject □ KYMCO Clean Air System (For EURO 2)

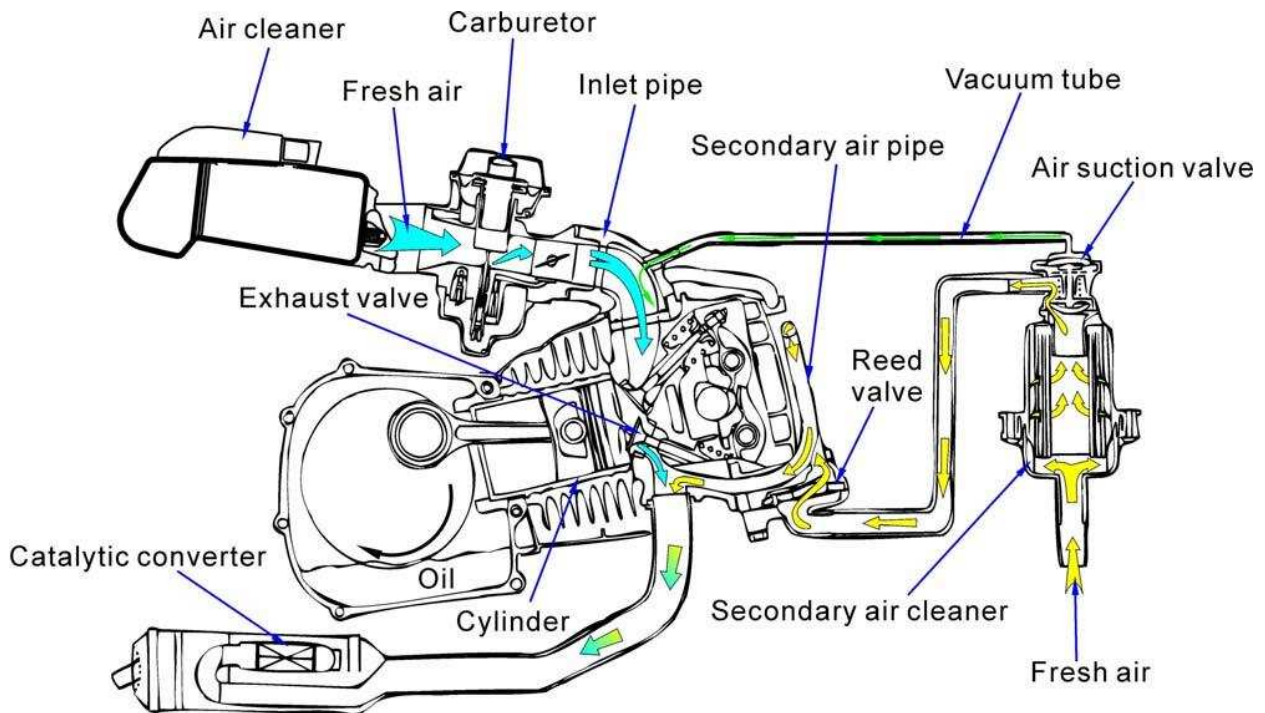
Date: 8.JAN.04

NO.: KTI-04002

## KYMCO Clean Air System (For EURO 2)

The KYMCO Clean Air System is a secondary air suction system that helps the exhaust gases to burn more completely. When the spent fuel charge is released into the exhaust system, it is still hot enough to burn. The system allows extra air into the exhaust system so that the spent fuel charge can continue to burn. This continued burning action tends to burn up a great deal of the normally unburned gases, as well as changing a significant portion of the poisonous carbon monoxide into harmless carbon dioxide.

### Secondary Air Suction System Diagram (4-stroke)



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## Secondary Air Suction System Diagram (2-stroke)

