



**Kawasaki**

**KFX90**



# **All Terrain Vehicle Service Manual**

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## SYMBOL

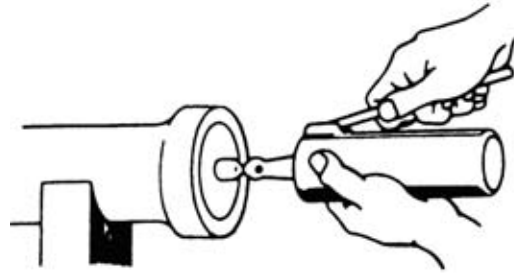
Throughout this manual are symbols indicating instructions and other information necessary for servicing. The meaning of each symbol is included in the table below. Where applicable, comparable Kawasaki products and their part numbers have been included.

SYMBOL	KYMCO DEFINITION	KAWASAKI DEFINITION
	Apply engine oil to the specified points. (Use designated engine oil for lubrication.)	Apply engine oil.
	Apply grease for lubrication.	←
	Transmission Gear Oil (SAE90)	←
*	This symbol indicates points of particular interest for more efficient and convenient operation.	←

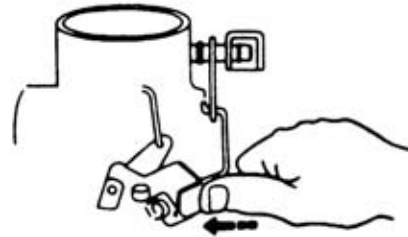
# 1. GENERAL INFORMATION

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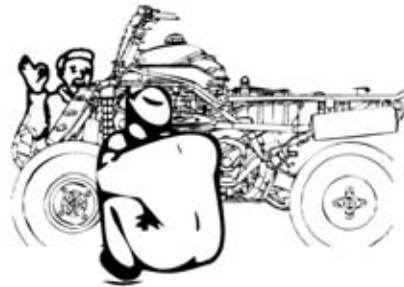
- Apply or add designated greases and lubricants to the specified lubrication points.



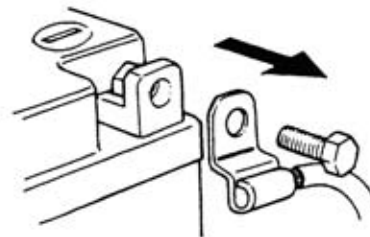
- After reassembly, check all parts for proper tightening and operation.



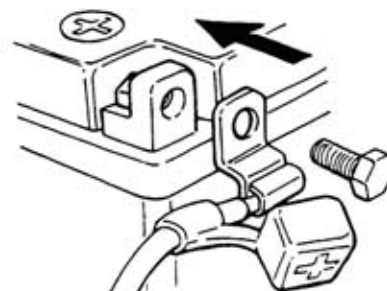
- When two persons work together, pay attention to the mutual working safety.



- Disconnect the battery negative (-) terminal before operation.
- When using a spanner or other tools, make sure not to damage the vehicle 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.



# 1. GENERAL INFORMATION

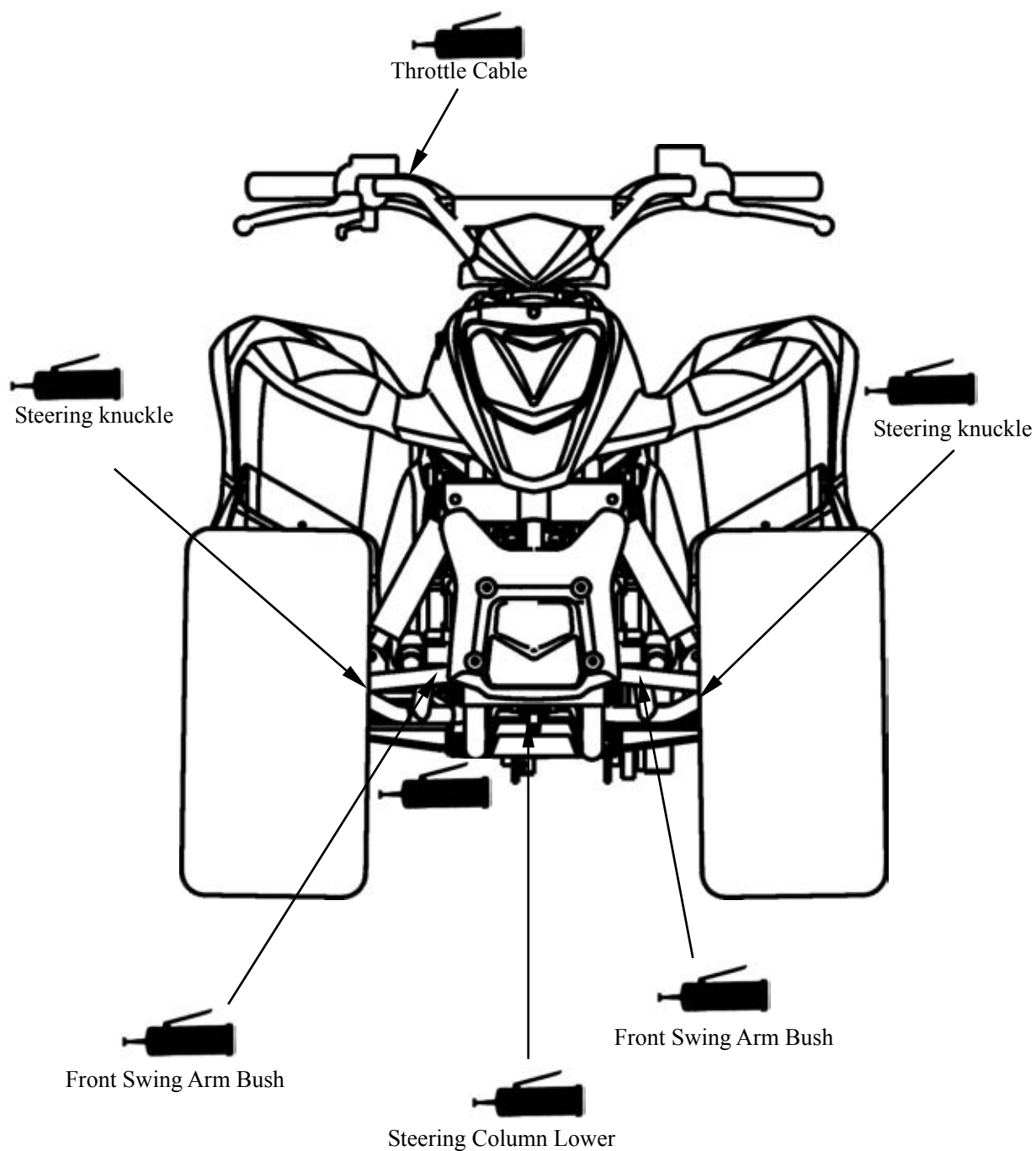
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## FRAME

The following is the lubrication points for the frame.

Use general purpose grease for parts not listed.

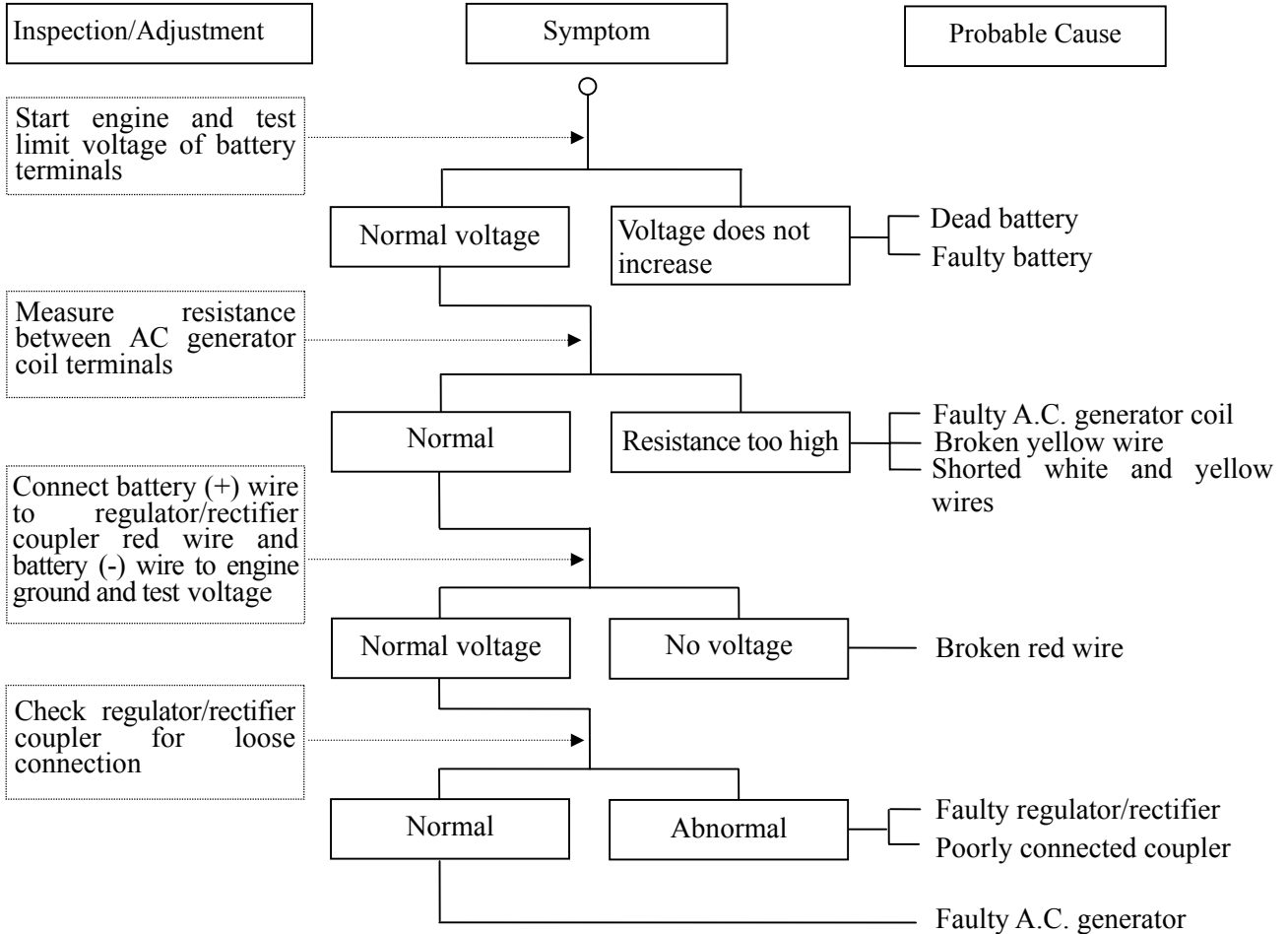
Apply clean engine oil or grease to cables and movable parts not specified. This will avoid abnormal noise and rise the durability of the ATV.



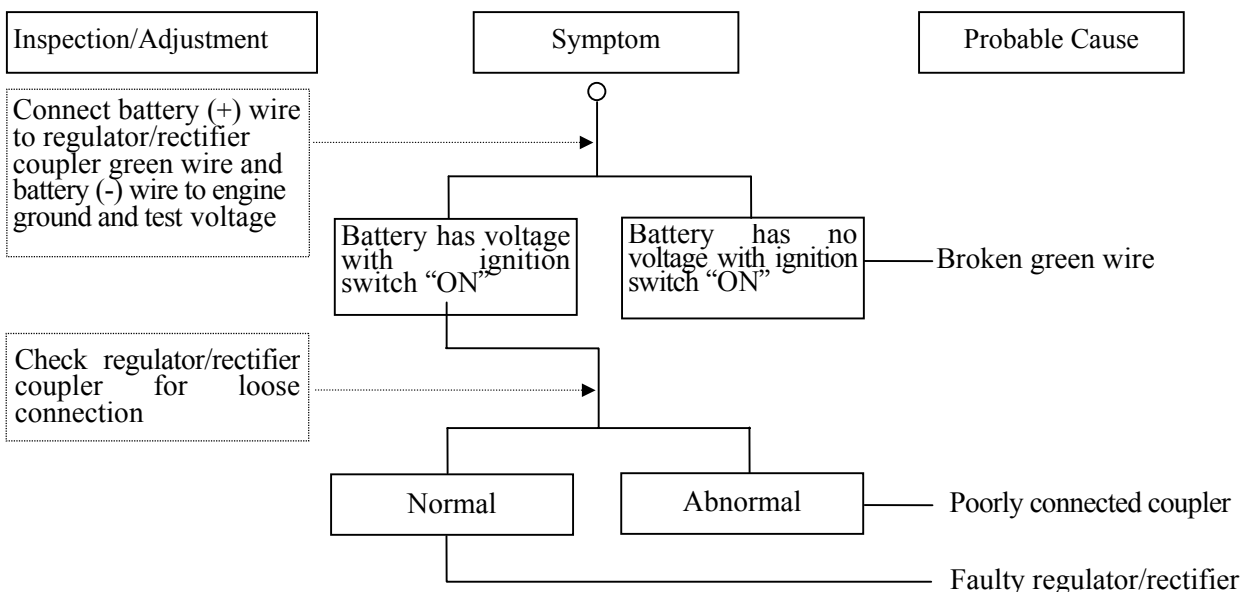
# 1. GENERAL INFORMATION

## POOR CHARGING (BATTERY OVER DISCHARGING OR OVERCHARGING)

### Undercharging



### Overcharging



## 2. FRAME COVERS/EXHAUST MUFFLER/BULB

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### INSTALLATION

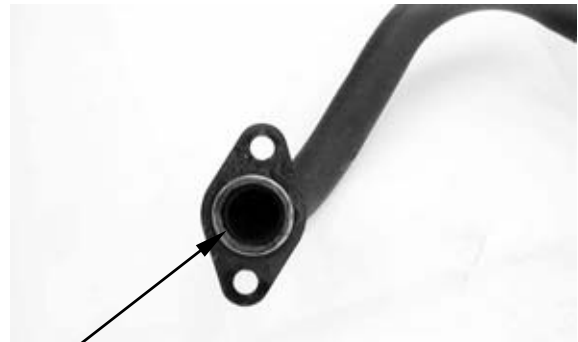
Install the exhaust muffler by reversing the removal sequence.

#### Torque:

Exhaust muffler lock bolts:  
35 N·m (3.5 kgf·m, 25 lbf·ft)

Exhaust muffler lock nuts:  
22 N·m (2.2 kgf·m, 16 lbf·ft)

\* Be sure to install a new exhaust gasket.

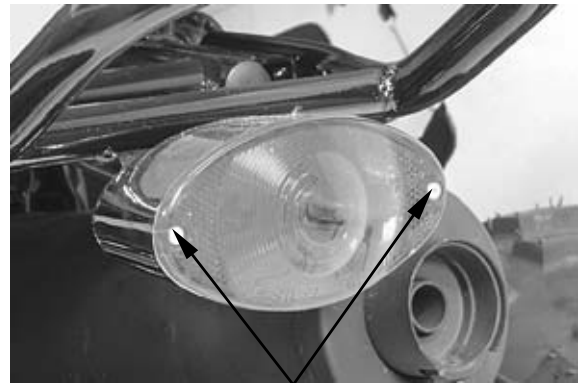


Gasket

### BRAKE LIGHT BULB

#### REMOVAL

Remove the two screws and brake light lenses.



Screws

Push and turn the bulb counterclockwise and remove it.



Bulb

### 3. INSPECTION/ADJUSTMENT

#### CYLINDER HEAD

##### CYLINDER COMPRESSION

Warm up the engine before compression test.

Remove the spark plug.

Install a compression gauge and adapter.

##### Special Tool:

Compression Gauge Adapter, M10 × 1.0 :  
57001-1486 (Kawasaki)

Open the throttle valve fully and push the starter button to test the compression.

##### Compression (electric start):

1170 ~ 1580 kPa (12 ~ 16 kgf/cm<sup>2</sup>, 170 ~ 230 psi)

If the compression is low, check for the following:

- Leaky valves
- Valve clearance too small
- Leaking cylinder head gasket
- Worn piston rings
- Worn piston/cylinder

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

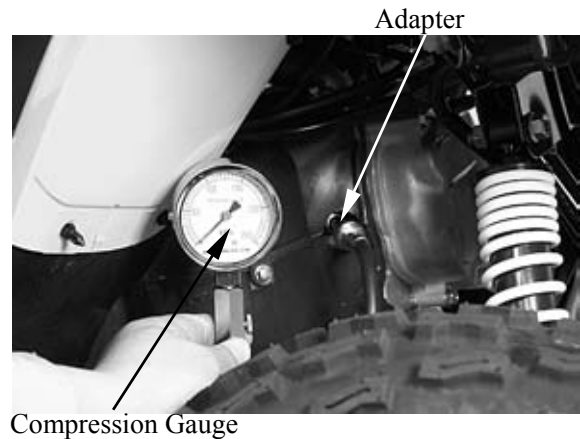
##### VALVE CLEARANCE

\* Inspect and adjust valve clearance while the engine is cold (below 35°C).

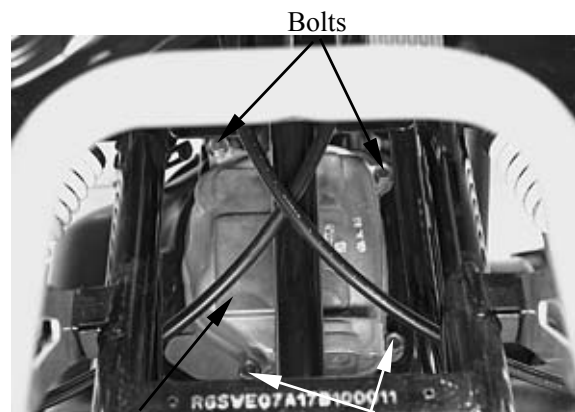
Disconnect the breather hose at the cylinder head cover.

Remove the four bolts and cylinder head cover.

Remove the two screws and two bolts, then remove the fan cover.

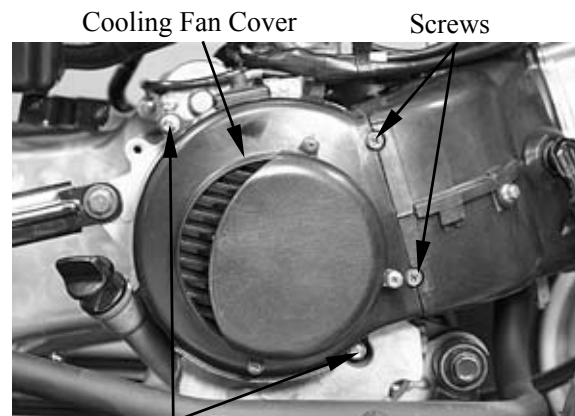


Compression Gauge



Cylinder Head Cover

Bolts



Bolts

### 3. INSPECTION/ADJUSTMENT

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#### **BRAKE HOSE REPLACEMENT**

Pump the brake fluid out of the line as explained in the Brake Fluid Change. (See page 3-17)

Remove the fluid tube bolts at both ends of the brake hose, and pull the hose off the vehicle.

Immediately wipe up any brake fluid that spills.

<b>CAUTION</b>
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<b>Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely washed away immediately.</b>
--

Use a new flat washer for each side of the hose fittings.

Install the new brake hose in its place (See page 1-16), and tighten the fluid tube bolts.

**Torque:**

Brake Hose Banjo Bolts: 35 N·m (3.5 kgf·m, 25 ft·lb)

#### **BRAKE MASTER CYLINDER PISTON ASSEMBLY AND DUST SEAL REPLACEMENT**

Remove the brake master cylinder (See page 13-17).

Refer to the disassembly and assembly of the master cylinder. (See page 13-17)

#### **CALIPER PISTON SEAL AND DUST SEAL REPLACEMENT**

Refer to the disassembly and Assembly of the caliper. (See page 13-19)

# 4. LUBRICATION SYSTEM

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## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The maintenance of lubrication system can be performed with the engine installed in the frame.
- Use care when removing and installing the oil pump not to allow dust and foreign matters to enter the engine and oil line.
- Do not attempt to disassemble the oil pump. The oil pump must be replaced as a set when it reaches its service limit.
- After the oil pump is installed, check each part for oil leaks.

### SPECIFICATIONS

mm (in)

Item		Standard	Service Limit
Oil pump	Inner rotor-to-outer rotor clearance	0.15 (0.006)	0.2 (0.008)
	Outer rotor-to-pump body clearance	0.15~0.2 (0.006 ~ 0.008)	0.25 (0.01)
	Rotor end-to-pump body clearance	0.04~0.09(0.0016 ~ 0.0036)	0.12 (0.0048)

### TROUBLESHOOTING

#### Oil level too low

- Natural oil consumption
- Oil leaks
- Worn or poorly installed piston rings
- Worn valve guide or seal

#### Poor lubrication pressure

- Oil level too low
- Clogged oil filter or oil passages
- Not use the specified oil

# 5. FUEL SYSTEM

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## FUEL TANK

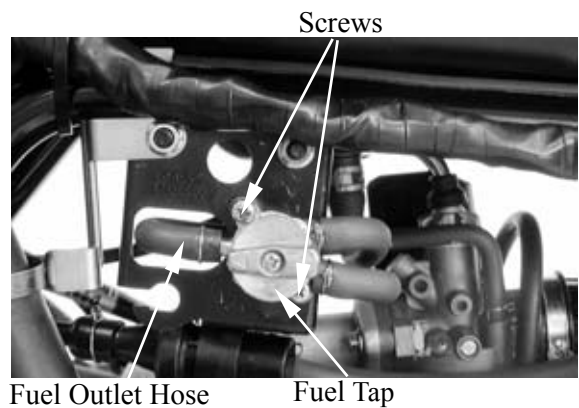
### REMOVAL

#### WARNING

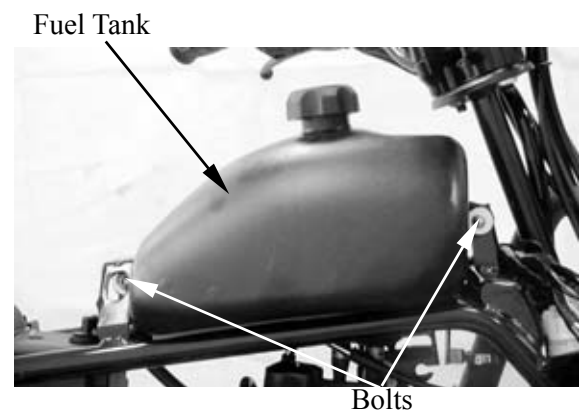
- Gasoline is extremely flammable and can be explosive under certain conditions.
- Keep sparks and flames away from the work area.
- Wipe off any spilled gasoline.

Remove front fender. (See page 2-5)

Switch the fuel tap “OFF”.  
Disconnect the fuel outlet hose from fuel tap.  
Remove two screws attaching the fuel tap and holder.

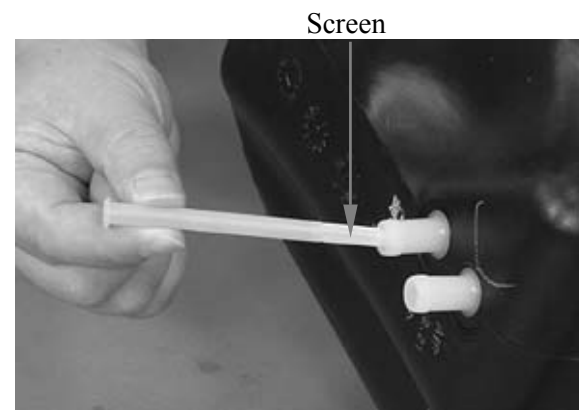


Remove the two bolts and then remove the fuel tank.



### SCREEN INSPECTION

Pull out the screen from the fuel tank.  
Check the screen for any breaks or deterioration.  
If the screen has any break or is deteriorated, replace the screen.  
Install the screen into the original position securely as shown.



## 5. FUEL SYSTEM

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### AUTO BYSTARTER INSPECTION

Measure the resistance between the auto bystarter wire terminals.

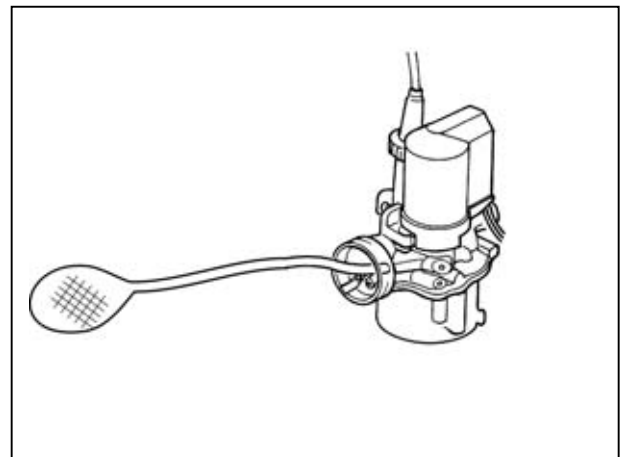
**Resistance:**  $5\Omega$  (10 minutes minimum after stopping the engine)

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 a blowing tool.

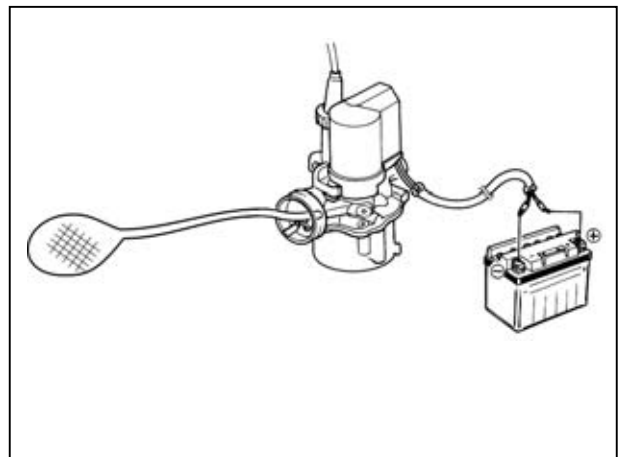
If air cannot be blown into the hose (clogged), the auto bystarter is faulty. Replace it with a new one.



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 a blowing tool.

If air can be blown into the hose, the auto bystarter is faulty and replace it with a new one.



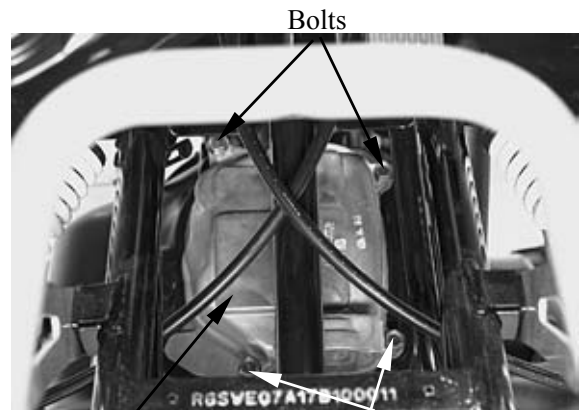
## 7. CYLINDER HEAD/VALVES

### CYLINDER HEAD COVER

#### REMOVAL

Disconnect the breather hose at the cylinder head cover.

Remove the four bolts at the cylinder head cover, then remove the cylinder head cover.



Cylinder Head Cover      Bolts

#### INSTALLATION

Install a new cylinder head cover O-ring and install the cylinder head cover.

Install and tighten the cylinder head cover bolts.

**Torque:** 10 N·m (1 kgf·m, 7 lbf·ft)

\* Be sure to install the O-ring into the groove properly.



O-ring

### CAMSHAFT/CAMSHAFT HOLDER

#### REMOVAL

Remove fuel tank. (Refer to the chapter 5)

Remove the cylinder head cover. (Refer to the "CYLINDER HEAD COVER REMOVAL")

Turn the cooling fan clockwise so that the "T" mark on the flywheel aligns with the index mark on the crankcase to bring the round hole on the camshaft gear facing up to the top dead center on the compression stroke.



Punch Marks

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# 8. CYLINDER/PISTON

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## CYLINDER /PISTON

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SERVICE INFORMATION .....	8- 2
CYLINDER/PISTON .....	8- 4



# 9. DRIVE AND DRIVEN PULLEYS

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## DRIVE AND DRIVEN PULLEYS

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LEFT CRANKCASE COVER/KICK STARTER.....	9-3
DRIVE PULLEY .....	9-6
CLUTCH/DRIVEN PULLEY .....	9-9



## 9. DRIVE AND DRIVEN PULLEYS

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### CLUTCH OUTER INSPECTION

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

**Service Limit:** 112.5 mm (4.5 in)



### CLUTCH/DRIVEN PULLEY DISASSEMBLY

Hold the clutch/driven pulley assembly with the clutch spring compressor.

\* Be sure to use a clutch spring compressor to avoid spring damage.

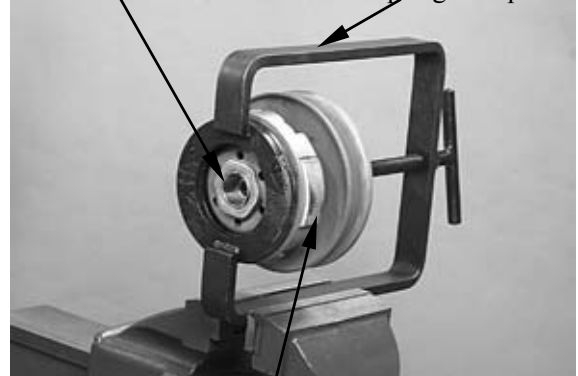
#### Special Tool:

Clutch Spring Compressor A120E00034

Set the clutch spring compressor in a vise and remove the clutch drive plate nut.

Loosen the clutch spring compressor and disassemble the clutch/driven pulley assembly.

Clutch Drive Plate Nut Clutch Spring Compressor

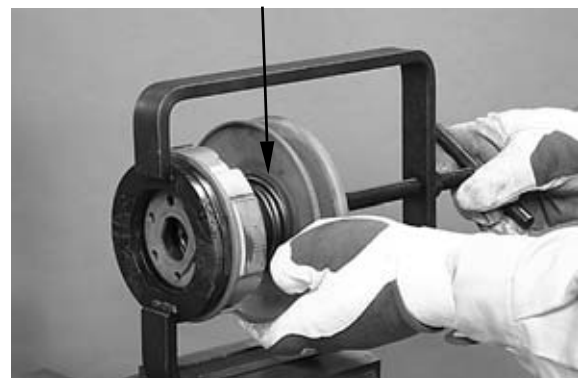


Clutch/Driven Pulley Assemble



Wrench in Clutch Spring Compressor

Clutch/Driven Pulley Assemble



# 10. TRANSMISSION SYSTEM

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## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The transmission system can be serviced with the engine installed in the frame.
- When replacing the drive axle, use a special tool to hold the bearing inner race for this operation.

### SPECIFICATIONS

Specified Oil: GEAR OIL SAE 90

Oil Capacity:

At disassembly: 0.12 L (0.11 Imp qt, 0.13 US qt)

At change: 0.11 L (0.1 Imp qt, 0.12 US qt)

### TORQUE VALUES

Transmission case cover bolt          27 N·m (2.7 kgf·m, 19 lbf·ft)

### TROUBLESHOOTING

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

- Damaged transmission
- Seized or burnt transmission

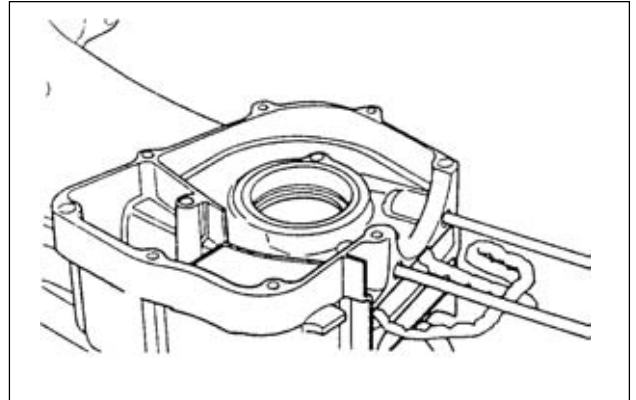
#### Oil leaks

- Oil too rich
- Worn or damaged oil seal

# 11.CRANKCASE/CRANKSHAFT

Clean off all gasket material from the crankcase mating surfaces.

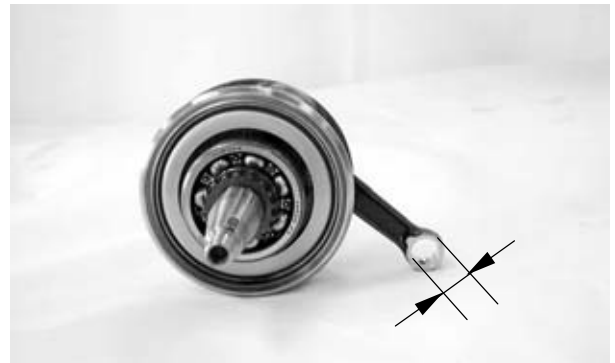
\* Avoid damaging the crankcase mating surfaces.



## CRANKSHAFT INSPECTION

Measure the connecting rod small end I.D.

**Service Limit:** 13.06 mm (0.5224 in)



Measure the connecting rod small end free play (A).

**Service Limit:** 0.6 mm (0.024 in)

Measure the crankshaft run out (B).

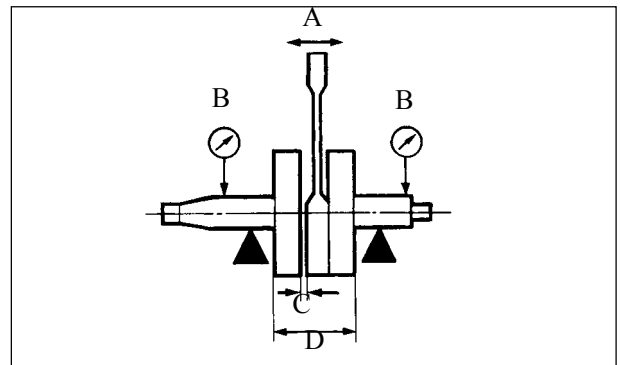
**Service Limit:** 0.1 mm (0.004 in)

Measure the connecting rod big end side clearance (C).

**Service Limit:** 0.05 mm (0.002 in)

Measure the crank width (D).

Out of specification: 45.15 ~ 45.2 mm (1.806 ~ 1.808 in)



# 12.FRONT WHEEL/FRONT BRAKE/FRONT SUSPENSION/ STEERING SYSTEM

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## FRONT WHEEL HUB DISASSEMBLY

Remove the dust seal of each side.



Dust Seal

Drive the bearing a few times to make the free play.

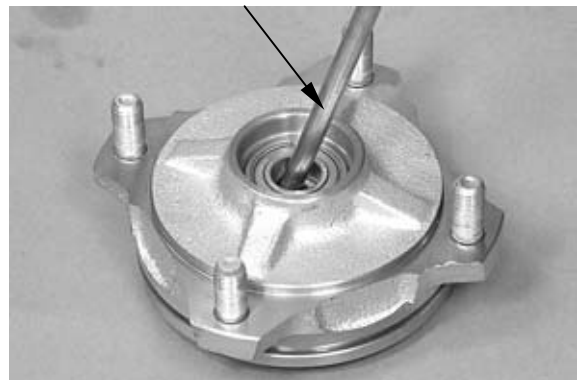


Drive the bearing on the other side of the hub when it is not make the free play.



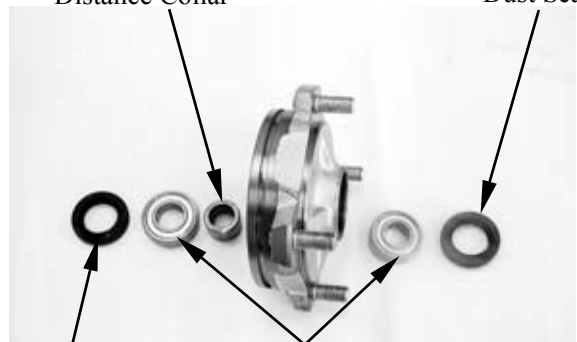
Rod

Drive the distance collar with a suitable rod and remove the front wheel hub bearings and distance collar.



Distance Collar

Dust Seal



Dust Seal

Wheel Hub Bearings

# 12.FRONT WHEEL/FRONT BRAKE/FRONT SUSPENSION/STEERING SYSTEM

## INSTALLATION

Apply grease to a new dust seal lip and install the dust seal (under frame).

Pack bearing cavities with grease.

Drive in the bearing and install snap ring.

Apply grease to a new dust seal lip and install the dust seal.

✖

- Do not allow the bearings to tilt while driving them in.
- Drive in the bearing squarely with the sealed end facing out.

### Special Tool:

Oil seal and bearing driver A120E00014

Apply the grease onto the bearings and oil seal lips of the frame.

Install steering column and collar, then tighten the nut.

**Torque:** 70 N·m (7 kgf·m, 50 lbf·ft)

Install cotter pins and band ends of cotter pin.

✖

Always use a new cotter pin.

Apply the grease onto the rubber collar and then install the rubber collar.

Install the steering bracket and front fender bracket, and tighten the two bolts.

**Torque:** 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the tie-rods and tighten the nuts.

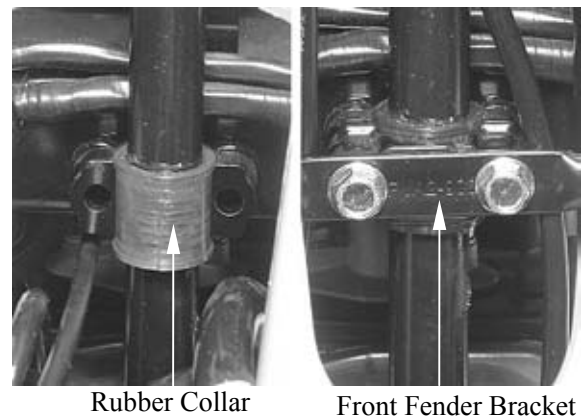
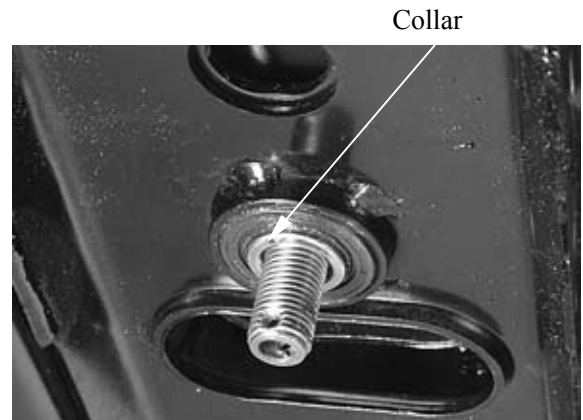
**Torque:** 35 N·m (3.5 kgf·m, 25 lbf·ft)

Install the cotter pin and band ends of cotter pin.

✖

Always use a new cotter pin.

Apply the grease onto the end of the throttle cable and end of the brake cable.

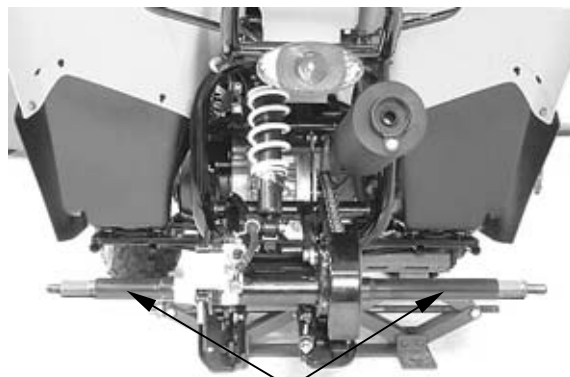


## **13. REAR WHEEL/SWING ARM/HYDRAULIC BRAKE**

### **REAR AXLE REMOVAL**

Remove the rear wheel hub of the both rear wheels.  
(See page 13-5).

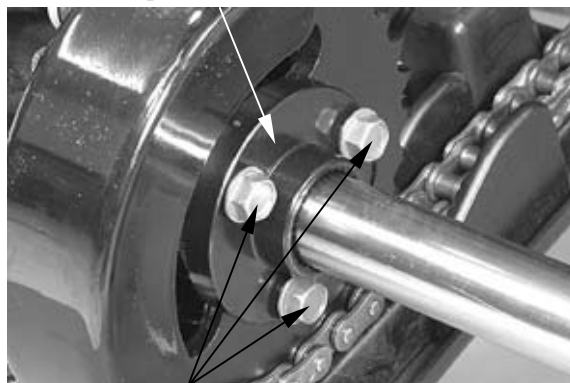
Remove the collars on the rear axle right and left side.



Collars  
Sprocket Holder

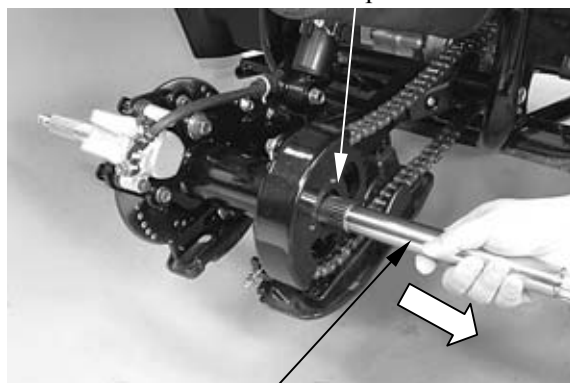
Relax the drive chain. (Refer to the “DRIVE CHAIN SLACK INSPECTION” section in the chapter 3.)

Remove the sprocket holder bolts and sprocket holder.



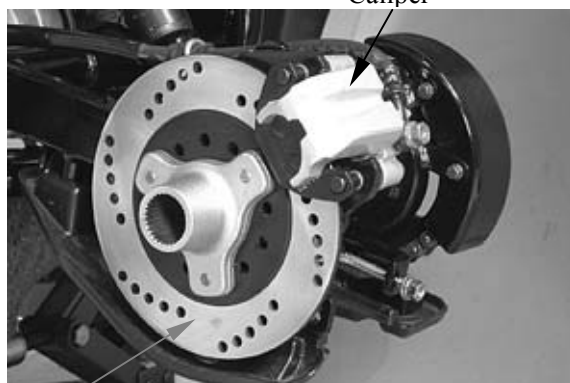
Bolts  
Driven Sprocket

Remove the rear axle from right side.  
Remove the driven sprocket.



Rear Axle  
Caliper

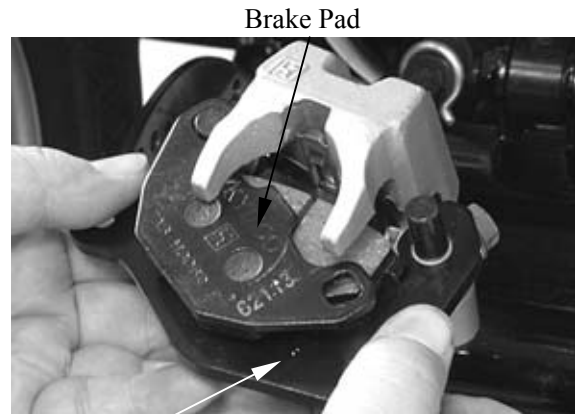
Remove the two bolts and caliper, and then remove  
brake disk.



Brake Disk

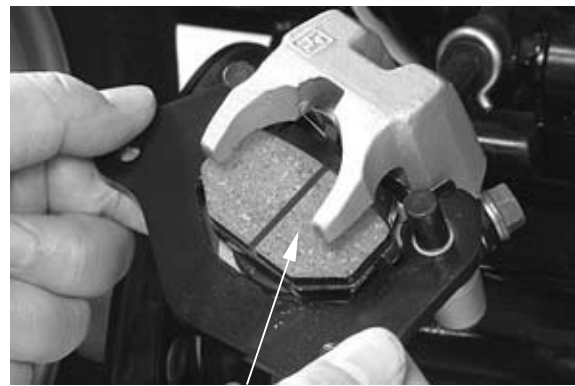
## 13. REAR WHEEL/SWING ARM/HYDRAULIC BRAKE

Push the brake caliper holder and then remove brake pad.



Brake Caliper Holder

Remove the other brake pad.



Brake Pad

### ASSEMBLY

Assemble the brake pads in the reverse order of removal.

\*

Make sure the pad spring has fitted.



Pad Spring

### BRAKE DISK

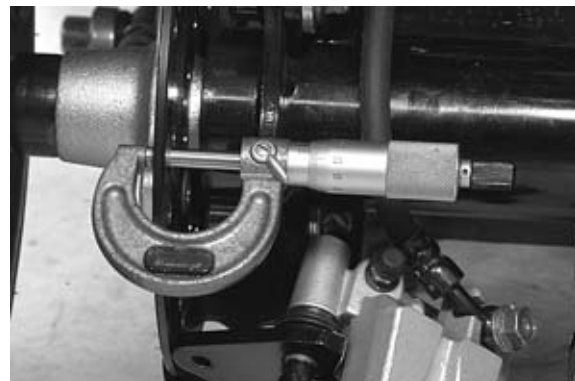
Measure the brake disk thickness.

**Service Limit:** 3 mm (0.12 in)

Measure the brake disk run out.

**Service Limit:** 0.3 mm (0.012 in)

Replace it if it is out of specification.

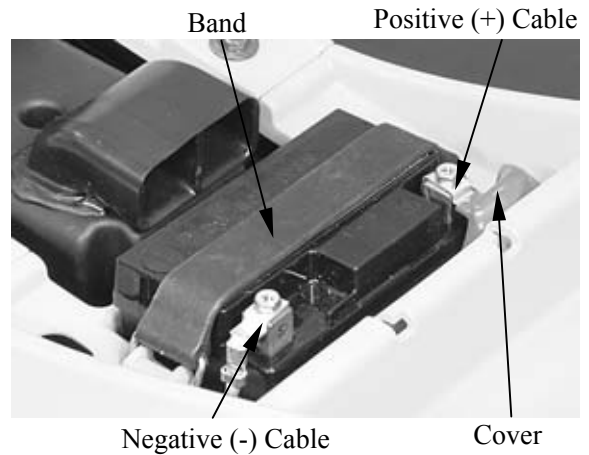


# 14. BATTERY/CHARGING SYSTEM/A.C. GENERATOR

## BATTERY

### REMOVAL

Remove seat. (See page 2-3)  
Make sure the ignition switch is OFF.  
First disconnect the battery negative (-) cable and then the positive (+) cable.  
Remove the battery by removing the band.



### INSTALLATION

The installation sequence is the reverse of removal.

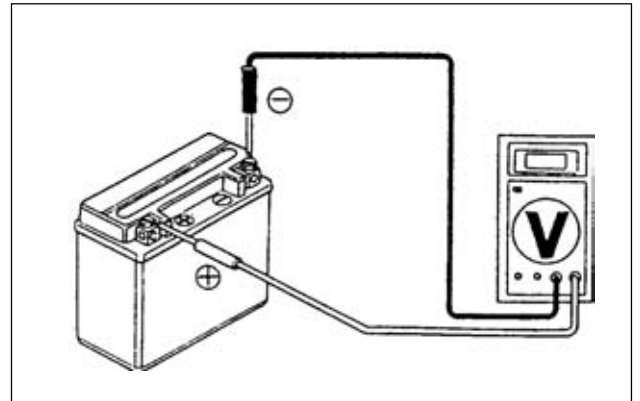
\* First connect the positive (+) cable and then negative (-) cable to avoid short circuit.

### BATTERY VOLTAGE (OPEN CIRCUIT VOLTAGE) INSPECTION

Remove the seat. (See page 2-3)  
Disconnect the battery cables.  
Measure the voltage between the battery terminals.

**Fully charged** 13.1 V  
**Undercharged** 12.3 V max

\* Battery charging inspection must be performed with a voltmeter.



# 15. IGNITION SYSTEM

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## IGNITION SYSTEM

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SERVICE INFORMATION -----	15- 3
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PULSER COIL -----	15- 7
IGNITION TIMING INSPECTION-----	15- 7

# 16. STARTING SYSTEM

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## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The removal of starter motor can be accomplished with the engine installed.

### TROUBLESHOOTING

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

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

#### **Lack of power**

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

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

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

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