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# PREFACE

This Service Manual describes the technical features and servicing procedures for the KYMCO *MX'er* 50.

Section 1 contains the precautions for all operations stated in this manual. Read them carefully before starting any operation.

Section 2 is the removal/installation procedures for the frame covers which are subject to higher removal/installation frequency during maintenance and servicing operations.

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

Sections 4 through 17 give instructions for disassembly, assembly and inspection of engine, chassis frame and electrical equipment.

Most sections start with an assembly or system illustration and troubleshooting for the section. The subsequent pages give detailed procedures for the section.

The information and contents included in this manual may be different from the motorcycle in case specifications are changed.

**KWANG YANG MOTOR CO., LTD.**  
**OVERSEAS SALES DEPARTMENT**  
**OVERSEAS SERVICE SECTION**

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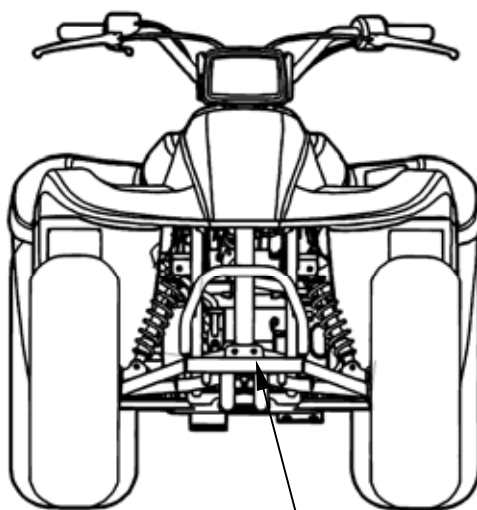
**GENERAL INFORMATION**

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# 1. GENERAL INFORMATION

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## SERIAL NUMBER



Location of Frame Serial Number



Location of Engine Serial Number

# 1. GENERAL INFORMATION

## SPECIFICATIONS

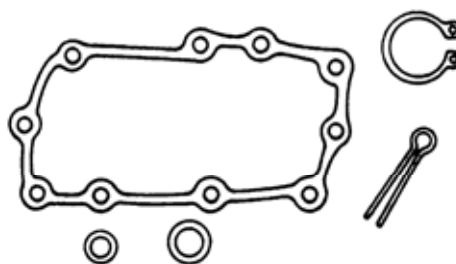
Name & Model No.		LA10AD	
Motorcycle Name & Type		MX'er	
Overall length (mm)		1685	
Overall width (mm)		980	
Overall height (mm)		1030	
Wheel base (mm)		1120	
Engine type		Air cooled 2-stroke	
Displacement (cc)		49.4	
Fuel Used		92# unleaded gasoline	
Net weight (kg)	Front wheel	67	
	Rear wheel	73	
	Total	140	
Gross weight(kg)	Front wheel	73	
	Rear wheel	77	
	Total	150	
Tires	Front wheel	20*7-8	
	Rear wheel	22*10-8	
Ground clearance (mm)		130	
Perform- Ance	Breaking distance (m)(ANSI)	20.6 below	
	Min. turning radius (m)	2.5	
Engine	Starting system		Starting motor & kick starter
	Type		Air cooled 2-stroke
	Cylinder arrangement		Single cylinder
	Combustion chamber type		Semi-sphere
	Valve arrangement		Reed valve & piston
	Bore x stroke (mm)		39 x 41.4
	Compression ratio		7.2:1
	Compression pressure (kg/cm <sup>2</sup> )		12.0
	Max. output (ps/rpm)		4.3/6000
	Max. torque (kg m/rpm)		0.55/5500
	Port timing	Intake (1mm)	Open Automatic controlled
			Close Automatic controlled
		Exhaust (1mm)	Open —
			Close —
	Valve clearance (cold) (mm)		Intake —
			Exhaust —
	Idle speed (rpm)		2000rpm
Lubrication type		Separate type	
Oil pump type		Plunger type	
Oil filter type		Full-flow filtration	

Fuel System	Air cleaner type & No			Sponge	
	Fuel capacity			8.1 liters	
	Carburetor	Type		PB	
		Main jet No.		80	
		Venturi dia.(mm)		φ14	
Throttle type		VALVE PISTON			
Electrical Equipment	Ignition System	Type		CDI	
		Ignition timing		22°/2000rpm	
		Spark plug		NGK BR8HAS	
		Spark plug gap		0.6~0.7mm	
	Battery	Capacity		12V4AH	
Power Drive System	Clutch	Type		CVT	
	Operation			Automatic centrifugal Type	
	Reduction Gear	Type		Chain drive	
		Reduction ratio	1st	—	
			2nd	—	
	Final gear ratio			23.678	
Moving Device	Front Axle	Caster angle		—	
		Trail length		—	
	Tire pressure (kg/cm <sup>2</sup> )		Front	0.35	
			Rear	0.35	
	Turning angle	Left	44°		
		Right	44°		
Brake system type			Rear	Disk brake	
			Front	Drum brake	
Damping Device	Suspension type	Front	Swing		
		Rear	Swing arm		
	Shock type	Front	Swing		
		Rear	Swing arm		
Frame type				SP pipe	

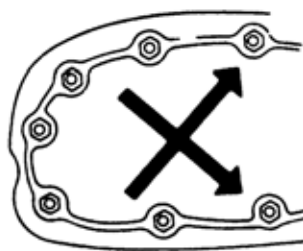


## SERVICE PRECAUTIONS

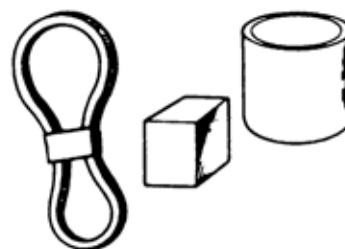
- Make sure to install new gaskets, O-rings, circlips, cotter pins, etc. when reassembling.



- 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.

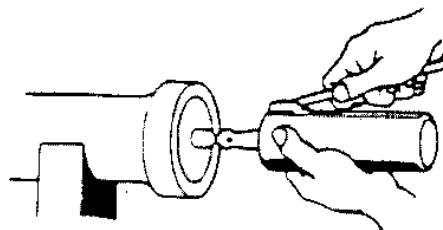


- After disassembly, clean removed parts. Lubricate sliding surfaces with engine oil before reassembly.

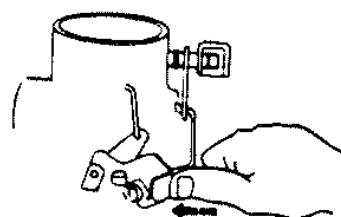


# 1. GENERAL INFORMATION

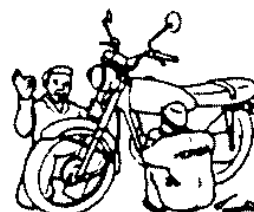
- Apply or add designated greases and lubricants to the specified lubrication points.



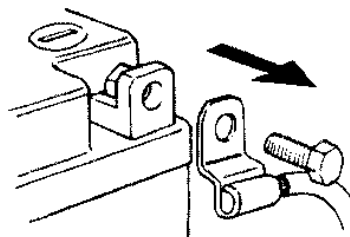
- After reassembly, check all parts for proper tightening and operation.



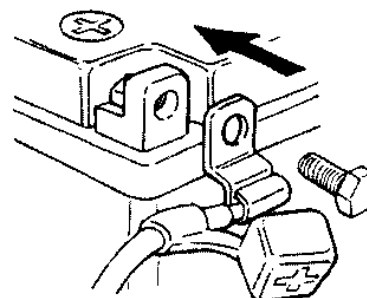
- When two persons work together, pay attention to the mutual working safety.



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

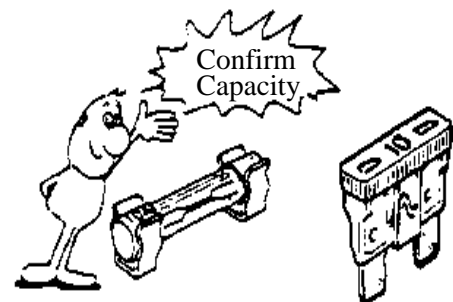


- After operation, check all connecting points, fasteners, and lines for proper connection and installation.
- When connecting the battery, the positive (+) terminal must be connected first.
- After connection, apply grease to the battery terminals.
- Terminal caps shall be installed securely.



# 1. GENERAL INFORMATION

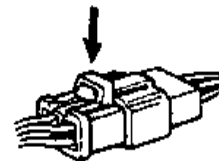
- If the fuse is burned out, find the cause and repair it. Replace it with a new one according to the specified capacity.



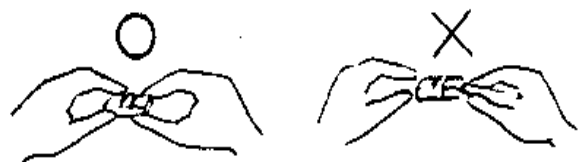
- After operation, terminal caps shall be installed securely.



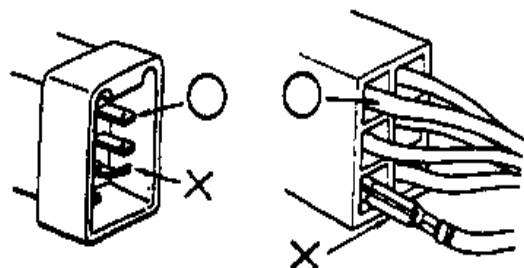
- When taking out the connector, the lock on the connector shall be released before operation.



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

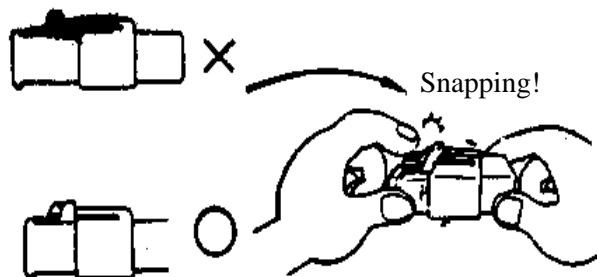


- Check if any connector terminal is bending, protruding or loose.

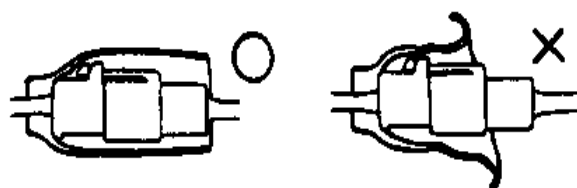


# 1. GENERAL INFORMATION

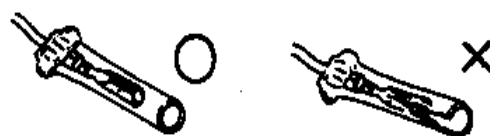
- The connector shall be inserted completely.
- If the double connector has a lock, lock it at the correct position.
- Check if there is any loose wire.



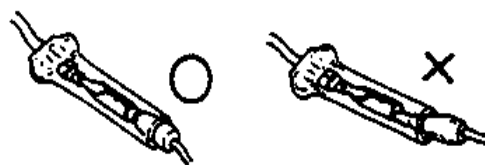
- Before connecting a terminal, check for damaged terminal cover or loose negative terminal.



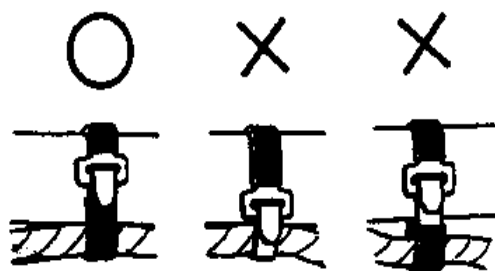
- Check the double connector cover for proper coverage and installation.



- Insert the terminal completely.
- Check the terminal cover for proper coverage.
- Do not make the terminal cover opening face up.

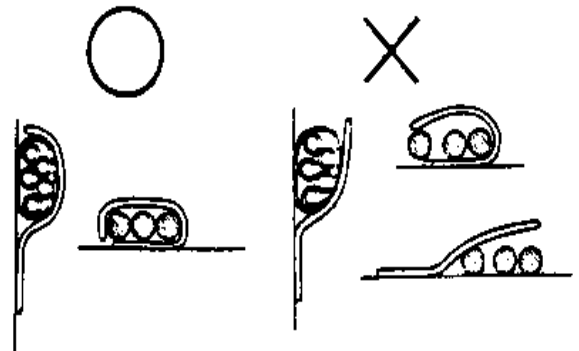


- Secure wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wire harnesses.



# 1. GENERAL INFORMATION

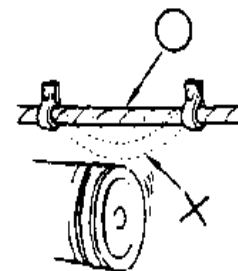
- After clamping, check each wire to make sure it is secure.



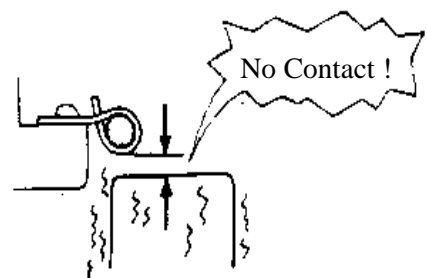
- Do not squeeze wires against the weld or its clamp.



- 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.

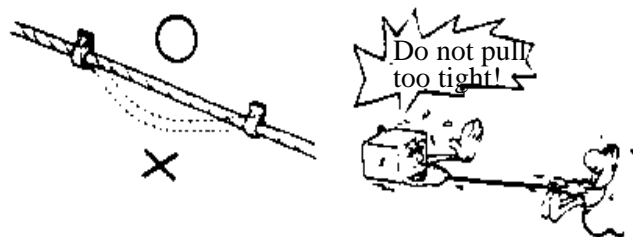


- Route wire harnesses to avoid sharp edges or corners. Avoid the projected ends of bolts and screws.
- Route wire harnesses passing through the side of bolts and screws. Avoid the projected ends of bolts and screws.

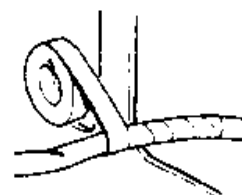


# 1. GENERAL INFORMATION

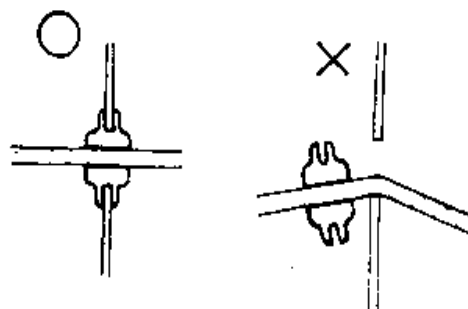
- Route harnesses so they are neither pulled tight nor have excessive slack.



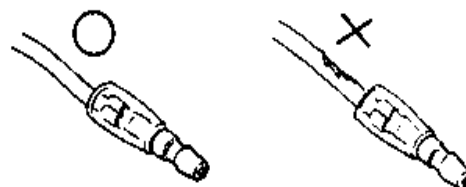
- Protect wires and harnesses with electrical tape or tube if they contact a sharp edge or corner.



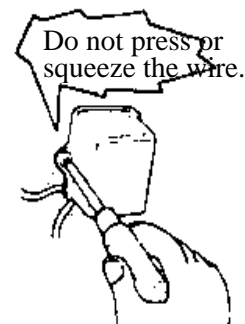
- When rubber protecting cover is used to protect the wire harnesses, it shall be installed securely.



- Do not break the sheath of wire.
- If a wire or harness is with a broken sheath, repair by wrapping it with protective tape or replace it.

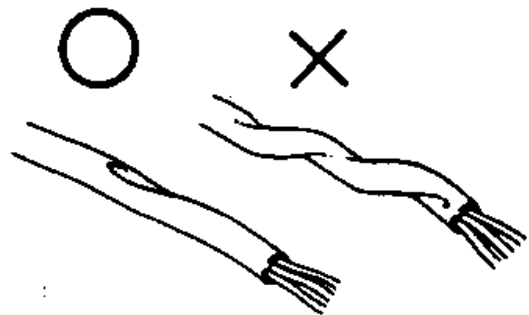


- When installing other parts, do not press or squeeze the wires.

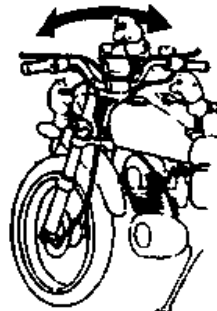


# 1. GENERAL INFORMATION

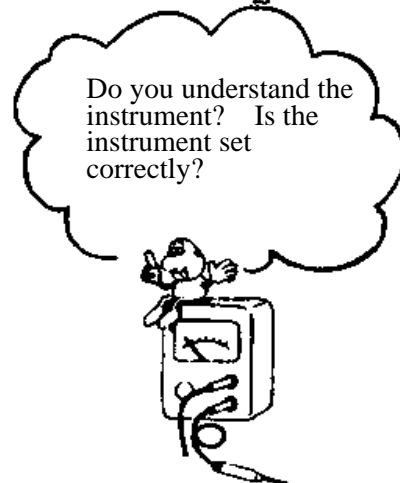
- After routing, check that the wire harnesses are not twisted or kinked.



- 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 drop any parts.



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



# 1. GENERAL INFORMATION

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## ■ Symbols:

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



Engine Oil

: Apply engine oil to the specified points. (Use designated engine oil for lubrication.)



Grease

: Apply grease for lubrication.



: Use special tool.



: Caution



: Warning



# 1. GENERAL INFORMATION

## TORQUE VALUES

### STANDARD TORQUE VALUES

Item	Torque (kgf-m)	Item	Torque (kgf-m)
5mm bolt, nut	0.45~0.6	4mm screw	0.15~0.4
6mm bolt, nut	0.8~1.2	5mm screw	0.3~0.5
8mm bolt, nut	1.8~2.5	6mm screw, SH bolt	0.7~1.1
10mm bolt, nut	3.0~4.0	6mm flange bolt and nut	1.0~1.4
12mm bolt, nut	5.0~6.0	8mm flange bolt and nut	2.4~3.0
14mm bolt, nut	6.0~8.0	10mm flange bolt and nut	3.5~4.5

Torque specifications listed below are for important fasteners.

### ENGINE

Item	Q'ty	Thread dia.(mm)	Torque (kgf-m)	Remarks
Cylinder head bolt	4	BF7X115	1.5~1.7	
Clutch drive plate nut	1	39	5.0~6.0	
Drive face nut	1	12	3.5~4.0	
Clutch outer nut	1	NH10	3.5~4.0	
A.C.G flywheel nut	1	10	3.5~4.0	
Oil check bolt	1	8	1.0~1.5	
Exhaust muffler joint lock nut	2	NC6mm	1.0~1.4	
Exhaust muffler lock bolt	2	BF8X35	3.0~3.6	
Spark plug			1.1~1.7	

### FRAME

Item	Q'ty	Thread dia.(mm)	Torque (kgf-m)	Remarks
Steering stem nut	1	14	6.0~8.0	
Swing arm nut	4	10	4.0~5.0	
Rear wheel nut	4	14	6.0~8.0	
Front wheel nut	4	14	6.0~8.0	
Rear shock absorber upper mount bolt	1	10	3.5~4.5	
Front shock absorber upper mount bolt	2	10	3.5~4.5	
Front shock absorber lower mount bolt	2	10	3.5~4.5	
Rear fork axle	1	14	6.0~8.0	
Rear hub nut	4	12	6.0~8.0	
Rear wheel shaft nut	2	32	11.0~13.0	
Rear engine bracket up bolt	1	10	3.5~4.5	
Rear engine bracket bolt	2	10	3.5~4.5	
Engine hanger bracket bolt	1	10	4.0~5.0	

# 1. SPECIFICATIONS

## SPECIAL TOOLS

Tool Name	Tool No.	Remarks Ref. Page
Flywheel puller	E001	
Oil seal and bearing install	E014	
Universal holder	E017	
Clutch spring compressor	E034	
Bearing puller	E037	
Crankshaft install	E016	
Crankshaft & crankcase install	E024	
Crankcase puller	E026	
Crankshaft Bearing puller	E030	
Nut wrench	F010	
Float level gauge		

## LUBRICATION POINTS

### ENGINE

Lubrication Points	Lubricant
Crankcase sliding & movable parts	JASO-FC or API-TC
Cylinder movable parts	JASO-FC or API-TC
Transmission gear (final gear)	Gear oil: SAE90#
Kick starter spindle bushing	Grease
Drive pulley movable parts	Grease
Starter pinion movable parts	Grease

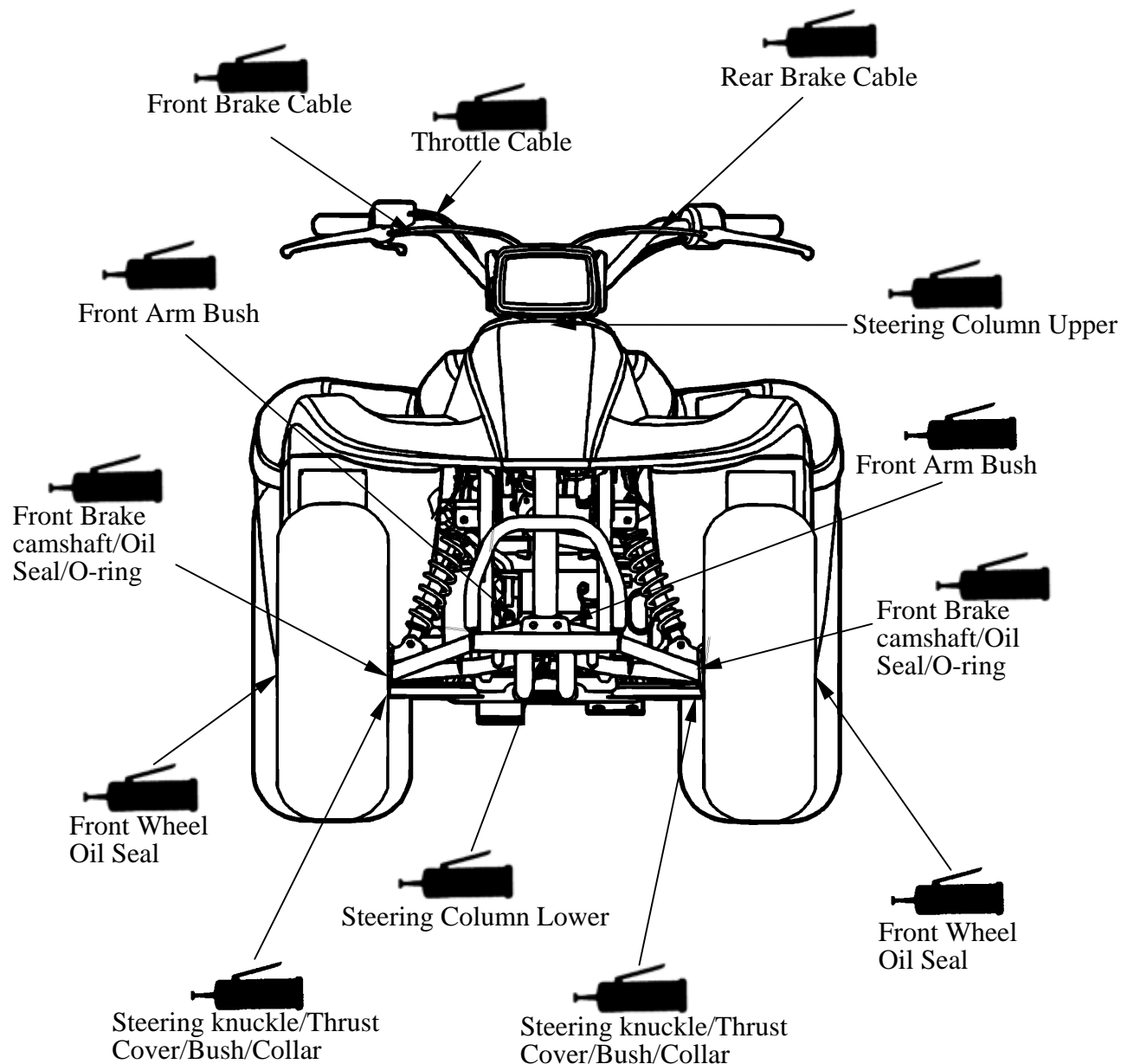
# 1. GENERAL INFORMATION

## FRAME

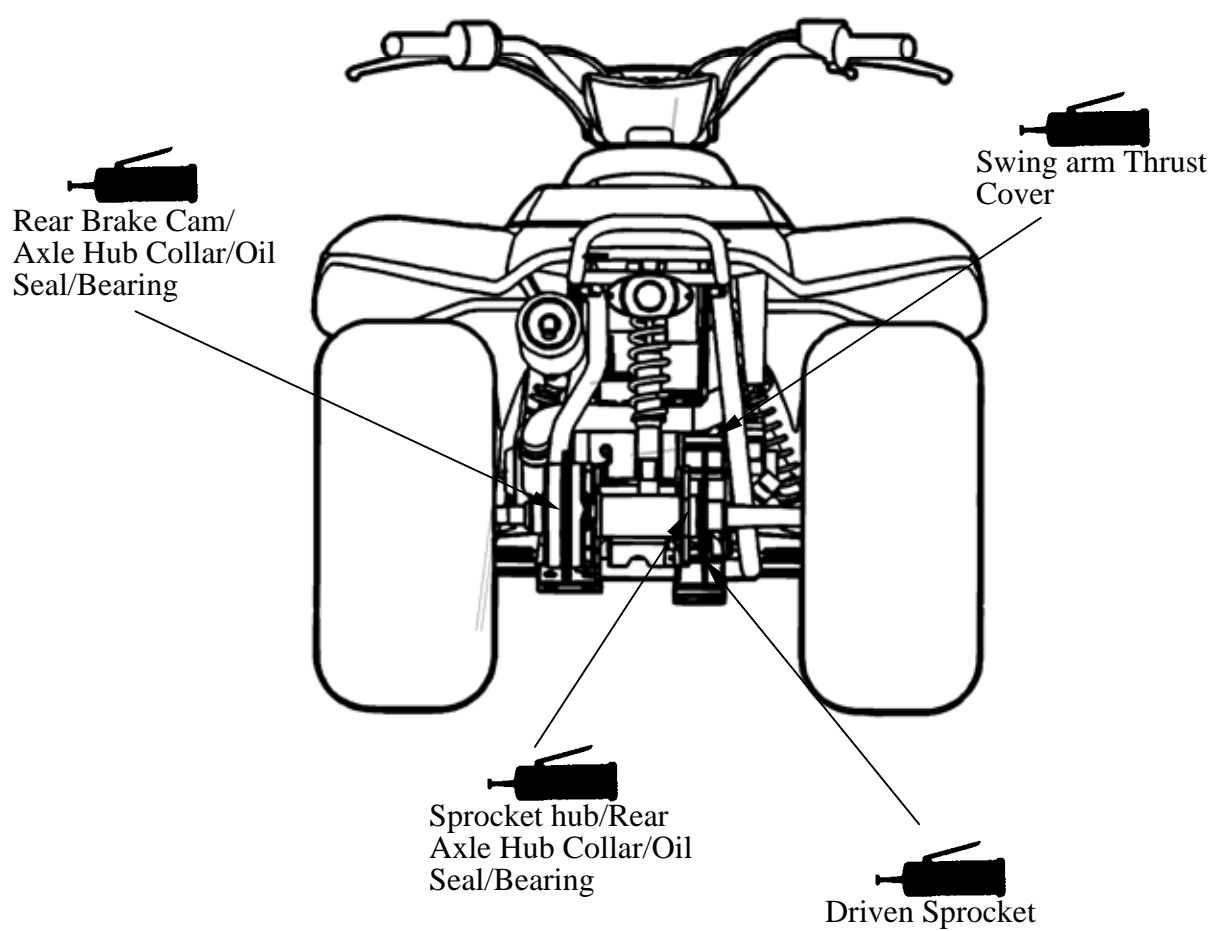
The following is the lubrication points for the frame.

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 motorcycle.



# 1. SPECIFICATIONS



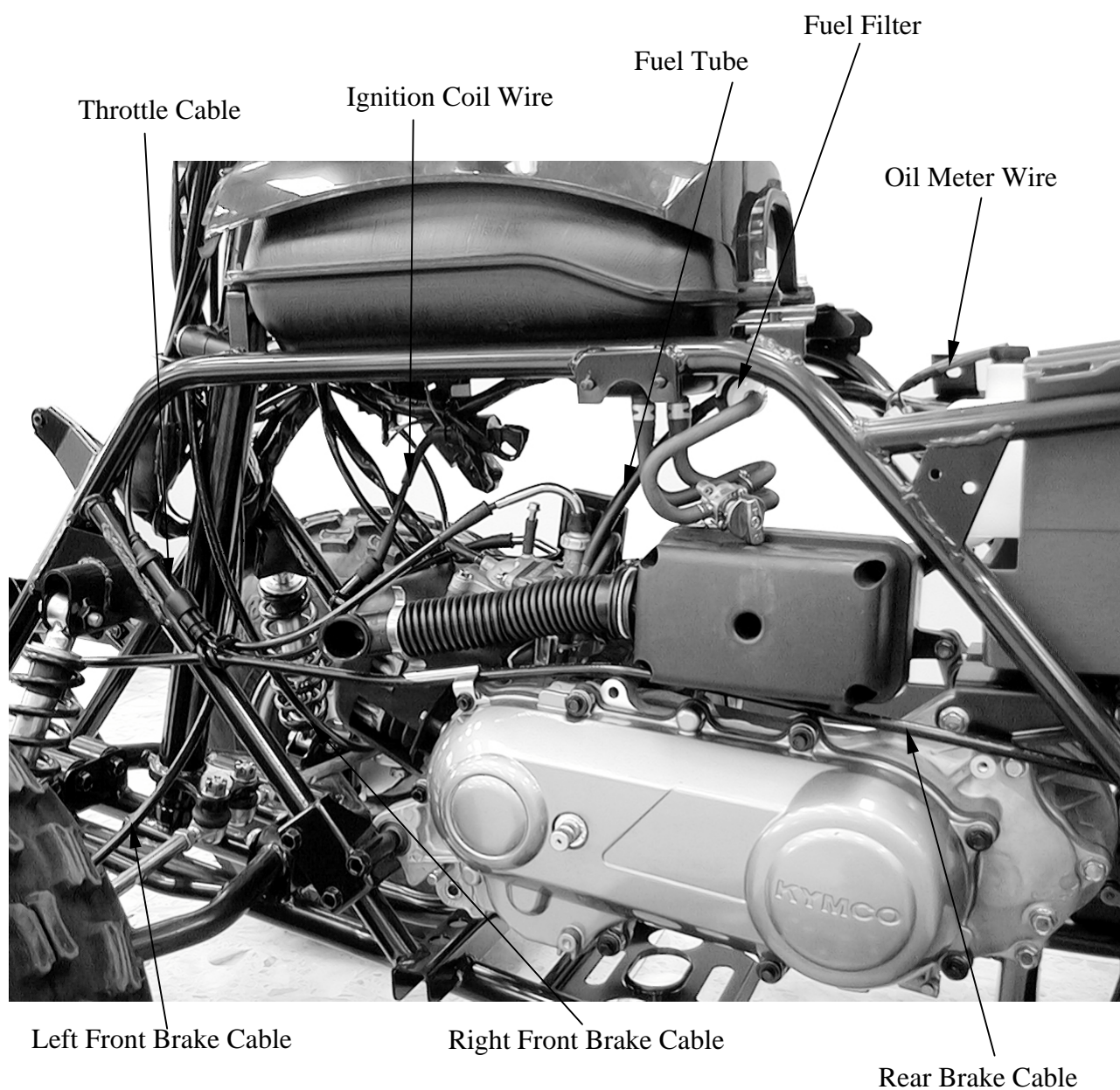
# 1. GENERAL INFORMATION

## CABLE & HARNESS ROUTING



# 1. SPECIFICATIONS

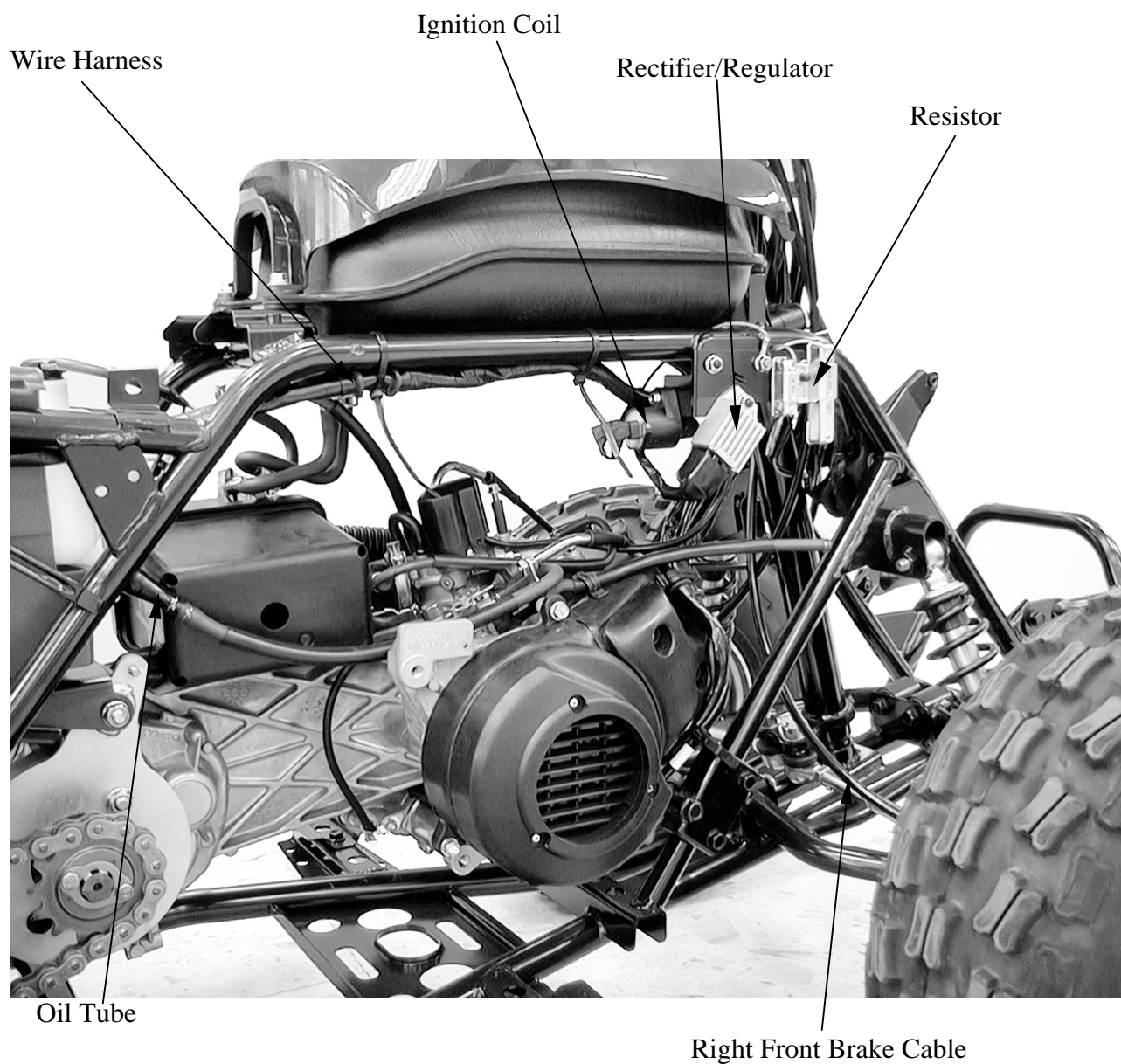
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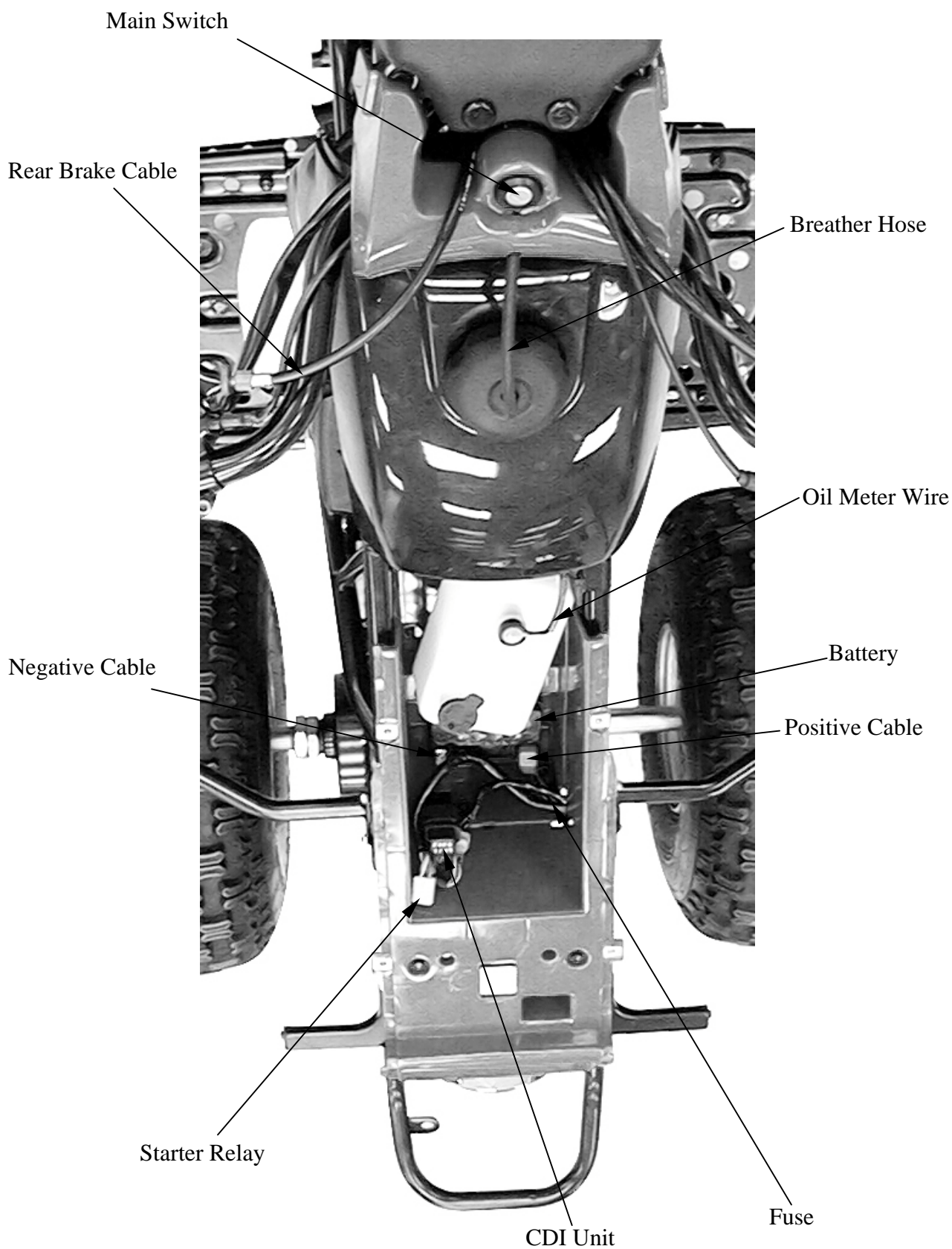


## 1. GENERAL INFORMATION

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# 1. SPECIFICATIONS





# 1. GENERAL INFORMATION

## WIRING DIAGRAM (ON ROAD)

HORN SW	
FREE	HO BAT
PUSH	O
COLOR	LG B

START SW	
FREE	ST E
PUSH	O
COLOR	Y/R G

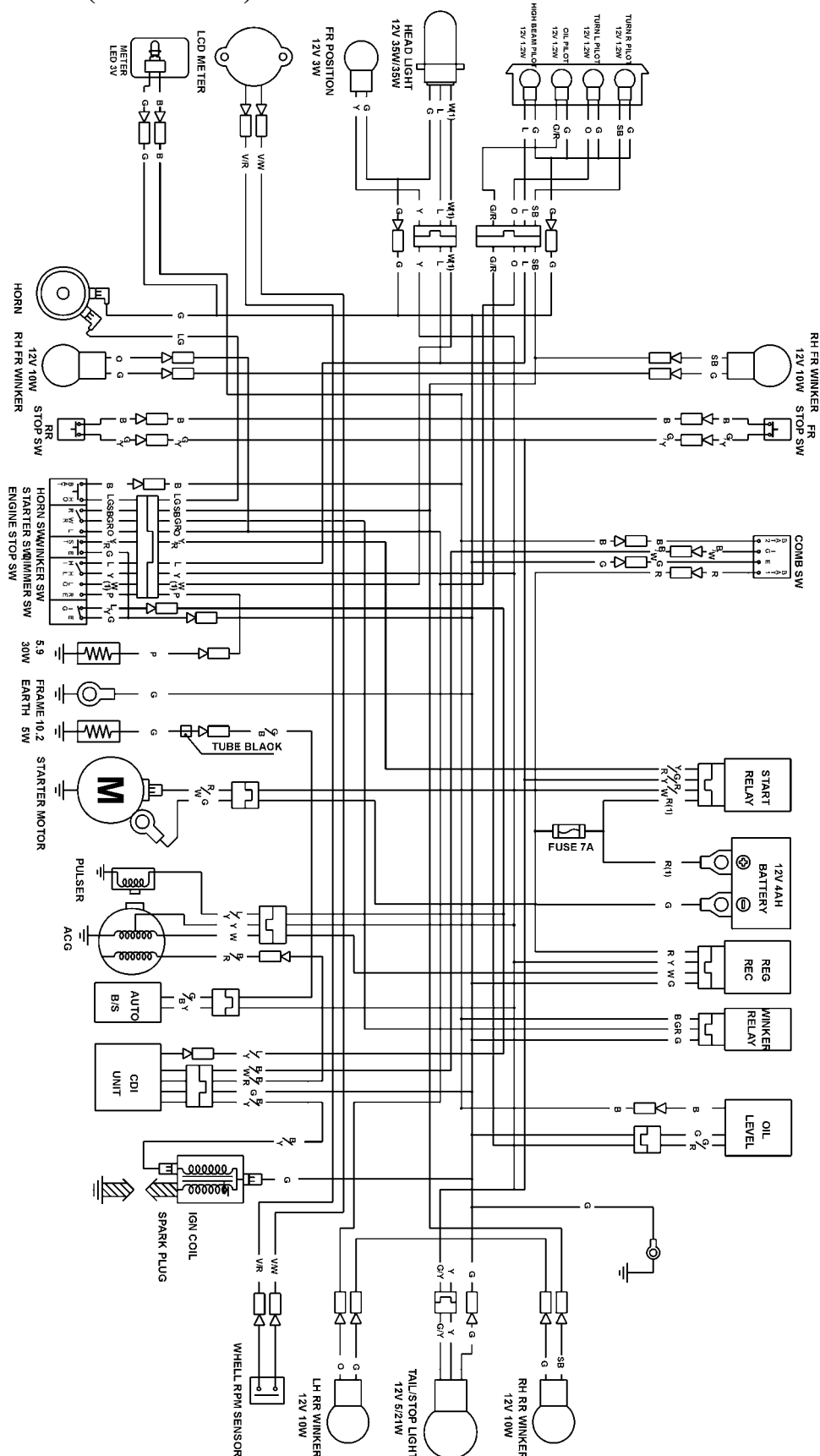
WINKER SW	
	R L WR
	O O
COLOR	SB O GR

DIMMER SW	
HL	LO HI RE
	O O O
COLOR	Y W L P

ENGINE STOP SW	
OFF	IG E
RUN	O
COLOR	LV G

COMB SW	
BAT1	IG E BAT2
OFF	O O

B	BLACK	BR	BROWN
G	GREEN	GR	GRAY
O	ORANGE	SB	SKY BLUE
L	BLUE	LG	LIGHT GREEN
W	WHITE	P	PINK
Y	YELLOW		
R	RED		



# 1. SPECIFICATIONS

## WIRING DIAGRAM (OFF ROAD)

COLOR COMB GROUND/MARKING

B	BLACK	BR	BROWN
Y	YELLOW	O	ORANGE
L	BLUE	SB	SKY BLUE
G	GREEN	LG	LIGHT GREEN
R	RED	P	PINK
W	WHITE	GR	GRAY

STARTER SW

FREE	E	ST
PUSH	O	O
COLOR	G	Y/R

ENGINE STOP SW

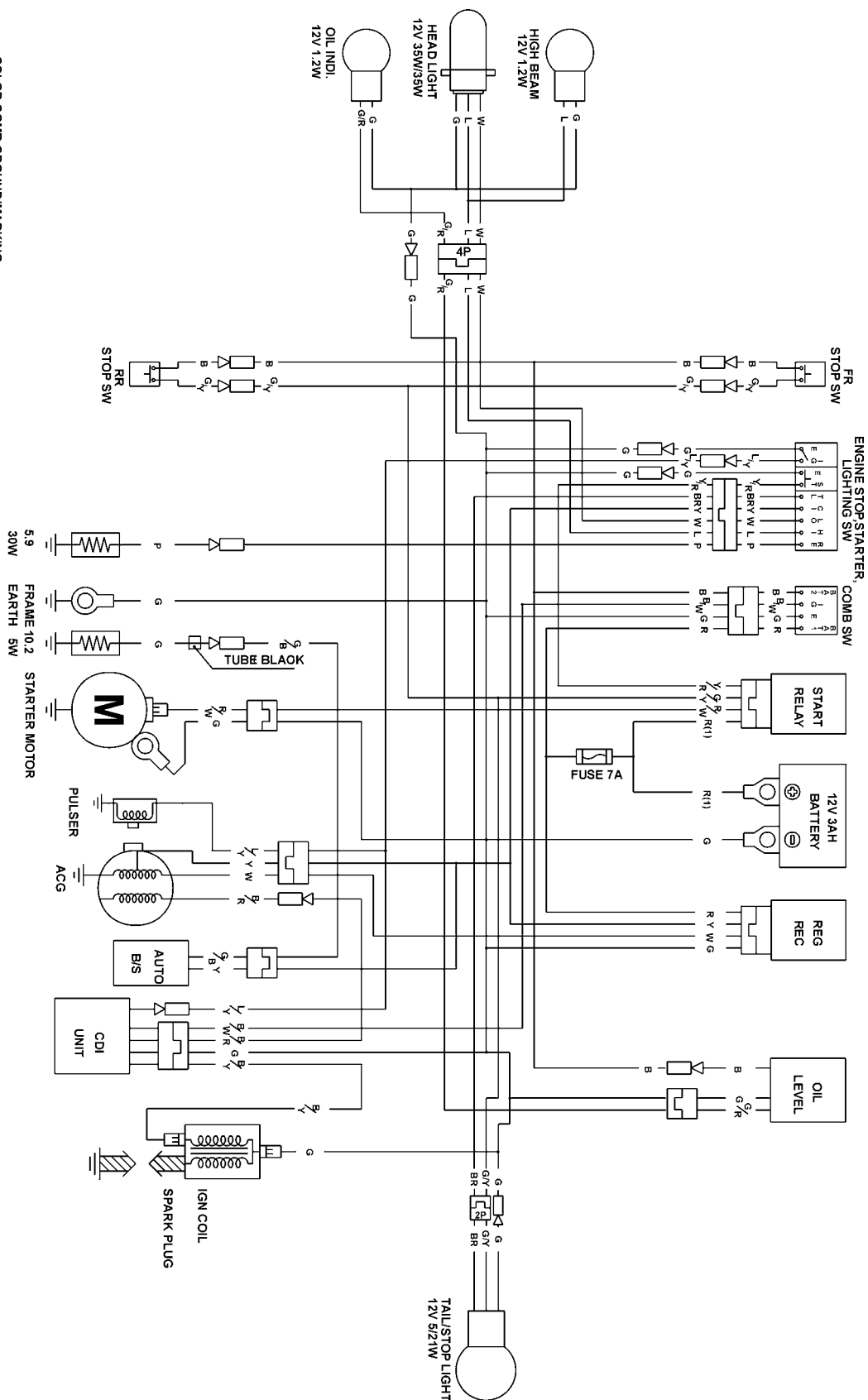
OFF	E	IG
RUN	O	O
COLOR	G	LY

COMB SW

ON	BATT	IG	E	BAT2
OFF	O	O	O	O

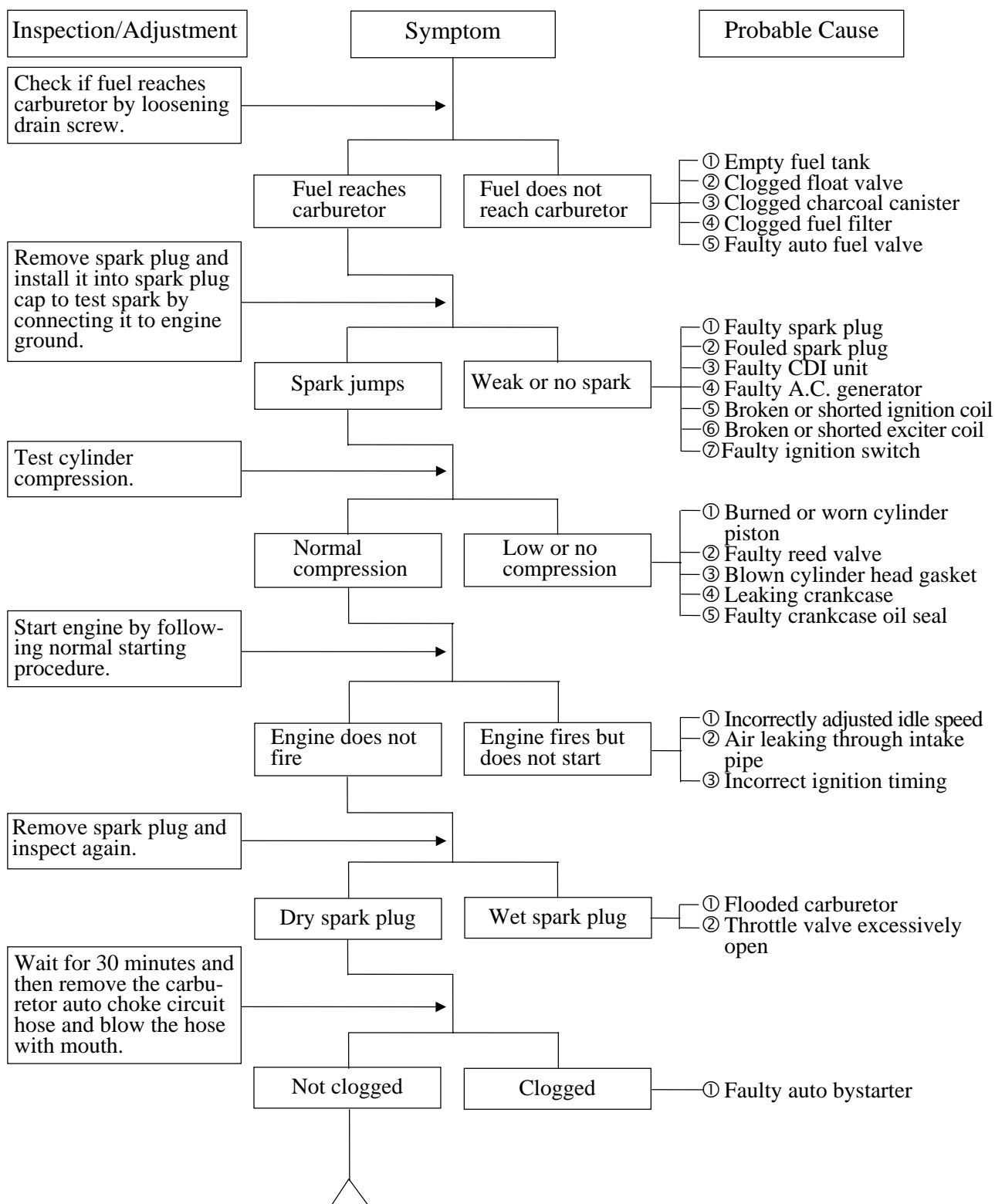
LIGHTING SW

●	CI	RE	TL	LO	HI
(N)	O	O	O	O	O
L	O	O	O	O	O
(N)	O	O	O	O	O
H	O	O	O	O	O
COLOR	Y	P	BR	W	L



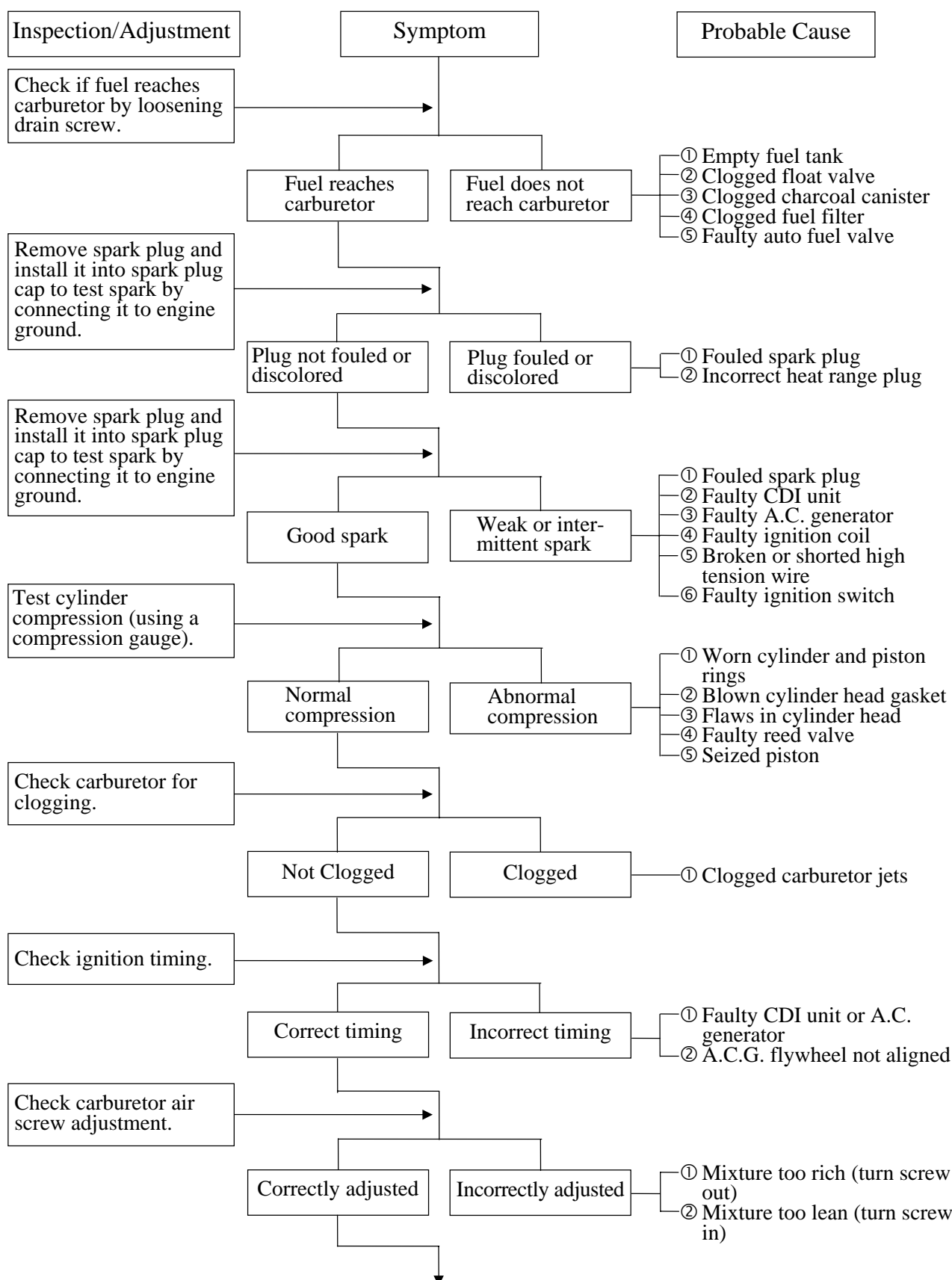
## TROUBLESHOOTING

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

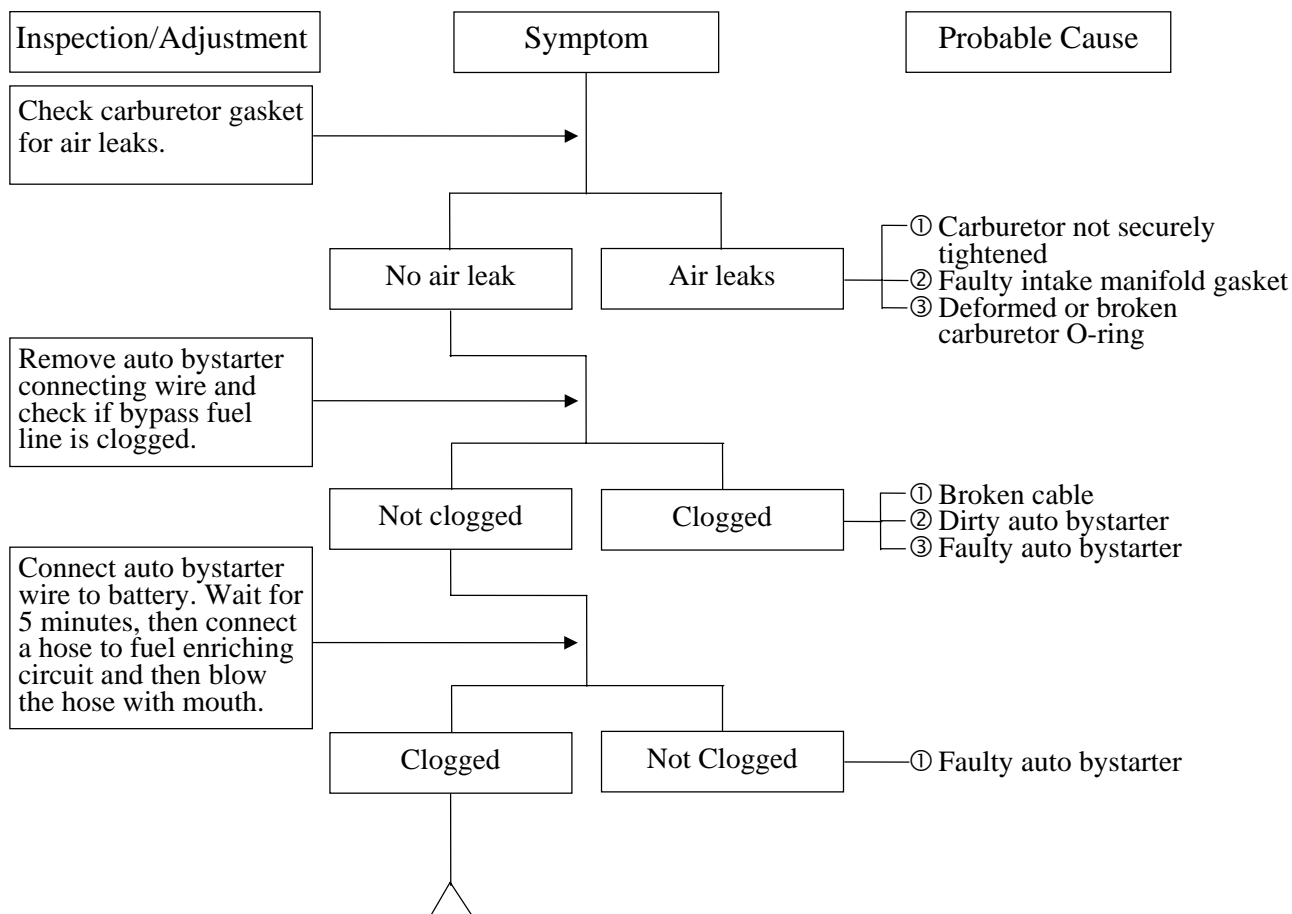


# 1. SPECIFICATIONS

## ENGINE STOPS IMMEDIATELY AFTER IT STARTS

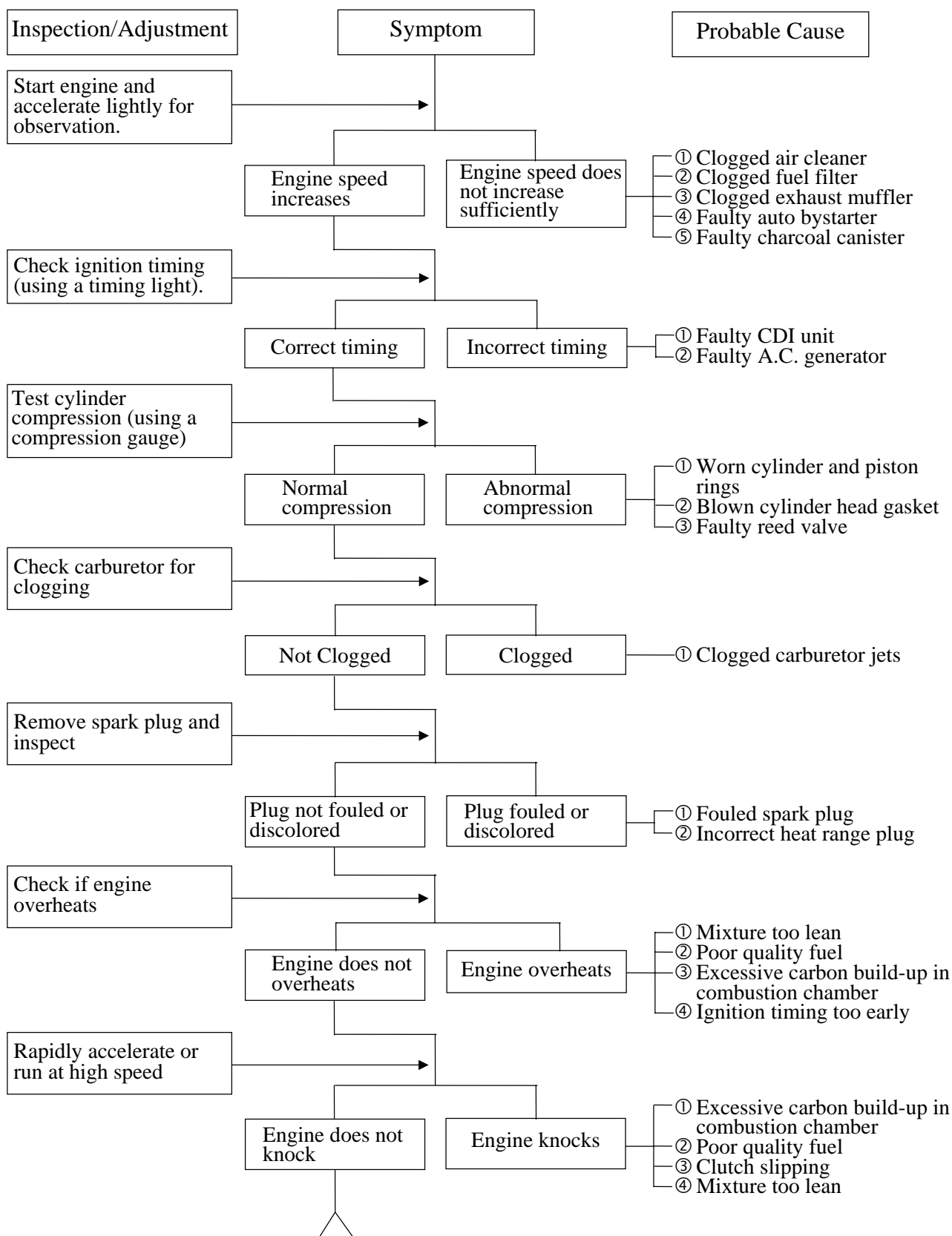


# 1. GENERAL INFORMATION



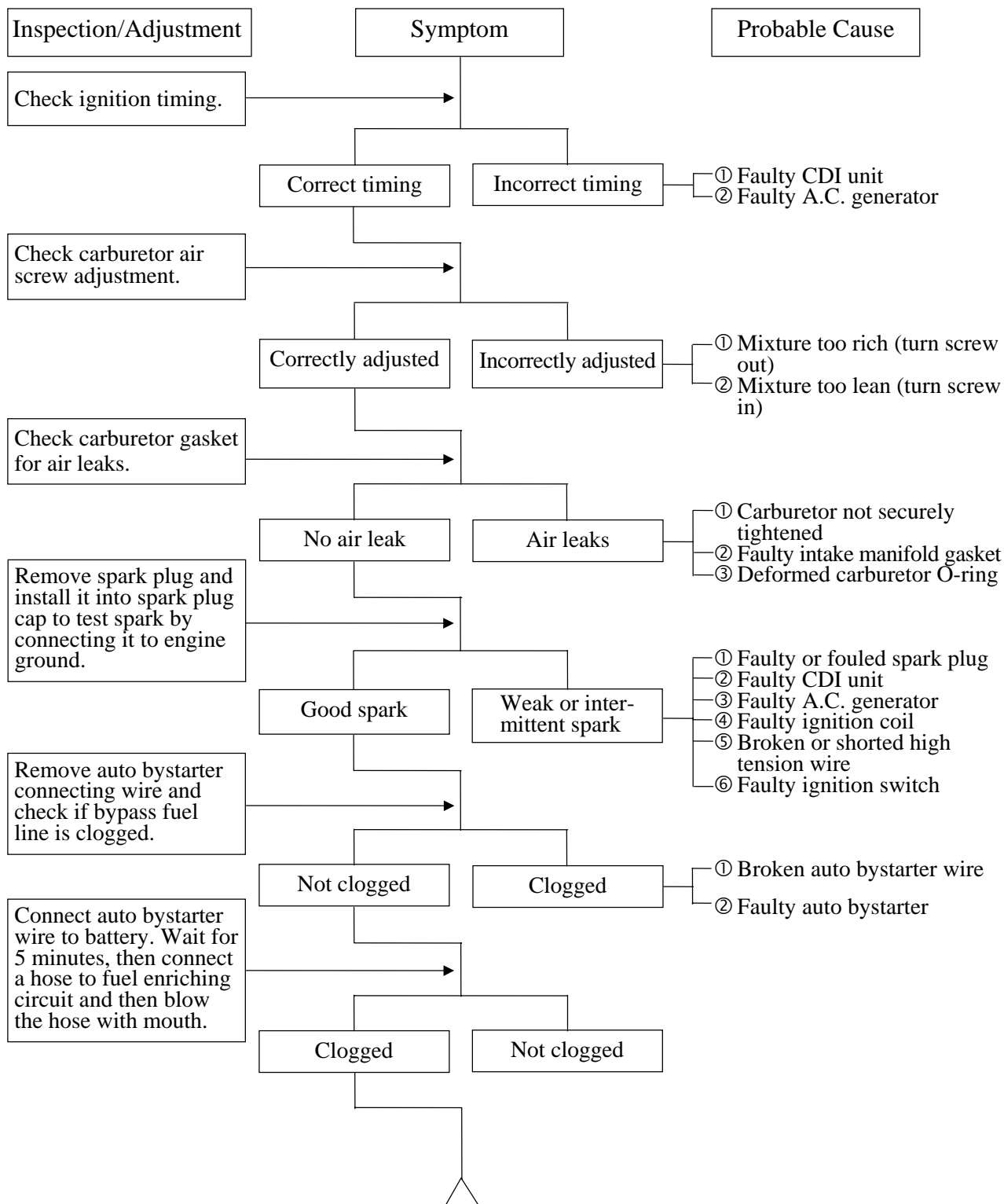
# 1. SPECIFICATIONS

## ENGINE LACKS POWER

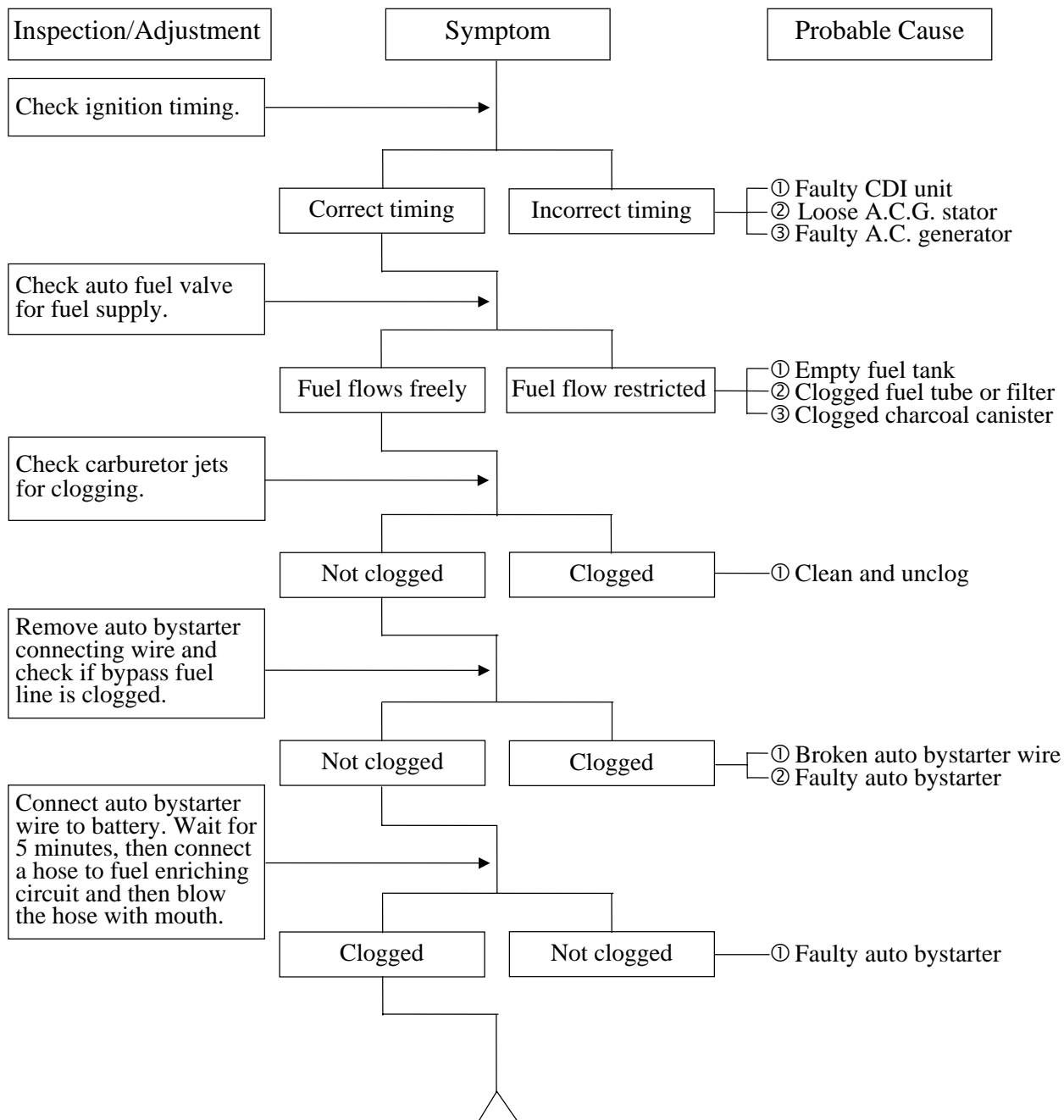


# 1. GENERAL INFORMATION

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



## POOR PERFORMANCE (AT HIGH SPEED)





# 1. GENERAL INFORMATION

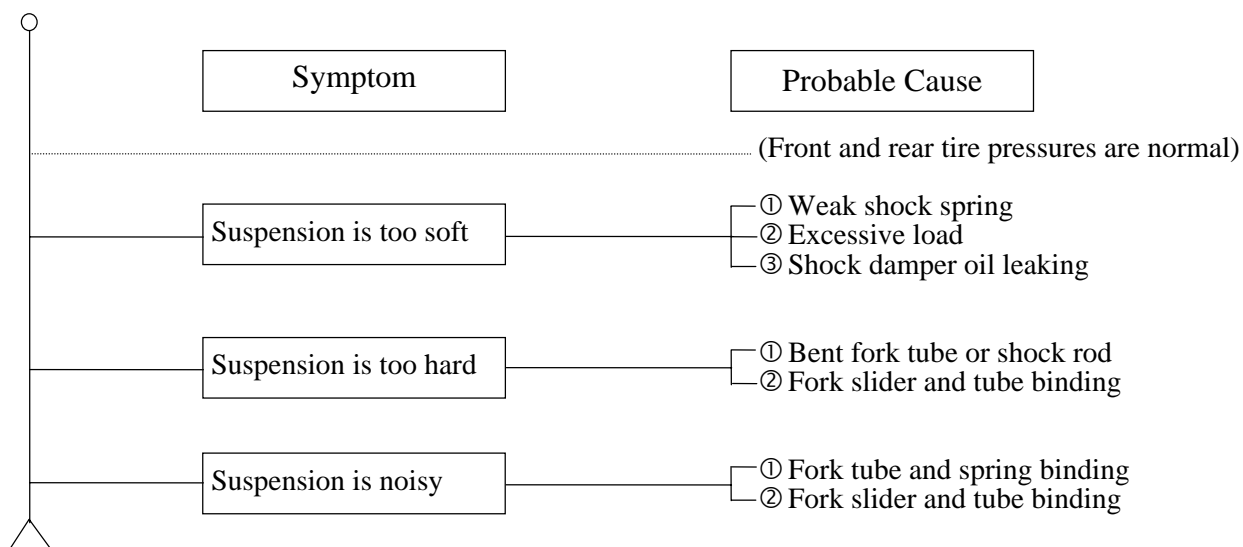
## CLUTCH, DRIVE AND DRIVEN PULLEYS

Symptom	Probable Cause
Engine starts but motorcycle does not move	<ul style="list-style-type: none"> <li>① Worn or slipping drive belt</li> <li>② Broken ramp plate</li> <li>③ Broken driven face spring</li> <li>④ Separated clutch lining</li> <li>⑤ Damaged driven pulley shaft splines</li> <li>⑥ Damaged final gear</li> <li>⑦ Seized final gear</li> </ul>
Motorcycle creeps or engine starts but soon stops or seems to rush out (Rear wheel rotates when engine idles)	<ul style="list-style-type: none"> <li>① Broken shoe spring</li> <li>② Clutch outer and clutch weight stuck</li> <li>③ Seized pivot</li> </ul>
Engine lacks power at start of a grade (poor slope performance)	<ul style="list-style-type: none"> <li>① Worn or slipping drive belt</li> <li>② Worn weight rollers</li> <li>③ Seized drive pulley bearings</li> <li>④ Weak driven face spring</li> <li>⑤ Worn or seized driven pulley bearings</li> </ul>
Engine lacks power at high speed	<ul style="list-style-type: none"> <li>① Worn or slipping drive belt</li> <li>② Worn weight rollers</li> <li>③ Worn or seized driven pulley bearings</li> </ul>
There is abnormal noise or smell while running	<ul style="list-style-type: none"> <li>① Oil or grease fouled drive belt</li> <li>② Worn drive belt</li> <li>③ Weak driven face spring</li> <li>④ Worn or seized driven pulley bearings</li> </ul>

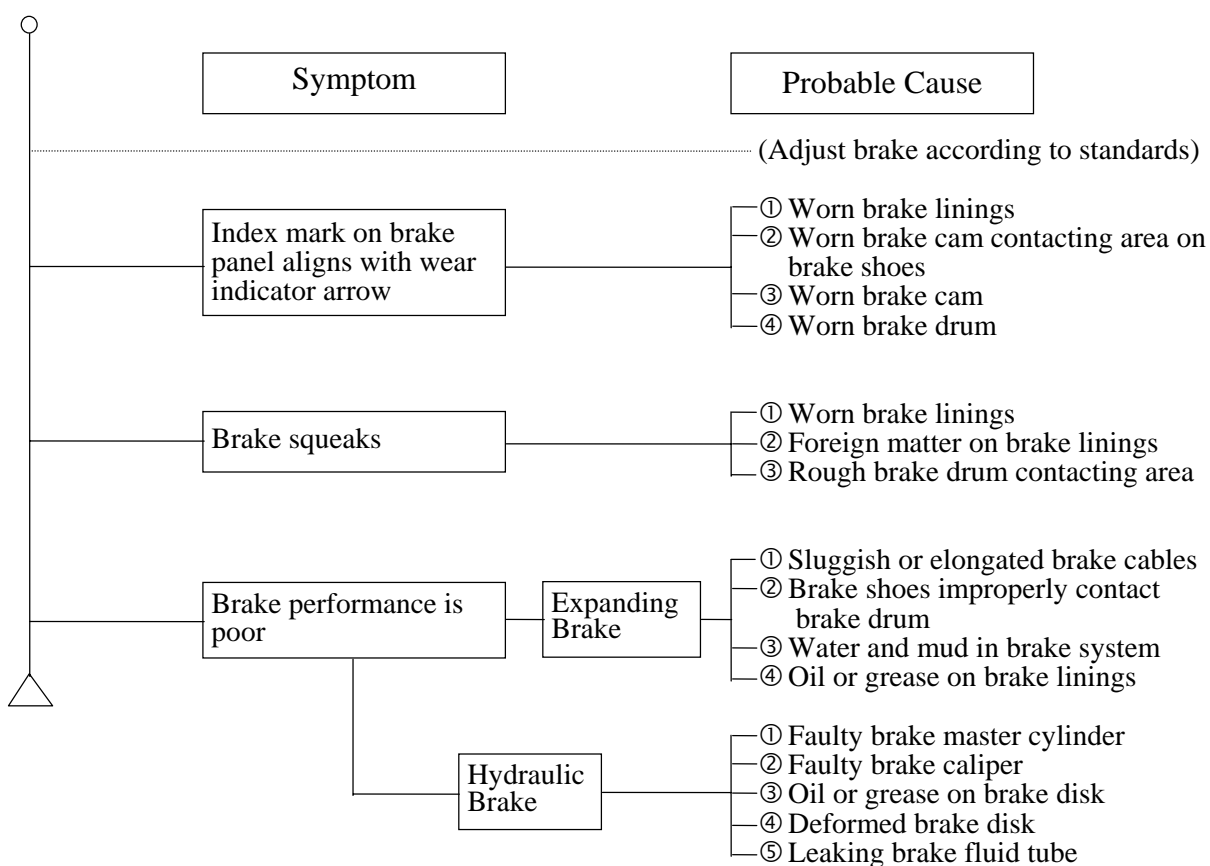
## STEERING HANDLEBAR DOES NOT TRACK STRAIGHT

Symptom	Probable Cause
	(Front and rear tire pressures are normal)
Steering is heavy	<ul style="list-style-type: none"> <li>① Steering stem nut too tight</li> <li>② Broken steering steel balls</li> </ul>
Front or rear wheel is wobbling	<ul style="list-style-type: none"> <li>① Excessive wheel bearing play</li> <li>② Bent rim</li> <li>③ Loose axle nut</li> </ul>
Steering handlebar pulls to one side	<ul style="list-style-type: none"> <li>① Misaligned front and rear wheels</li> <li>② Bent front fork</li> </ul>

## POOR SUSPENSION PERFORMANCE



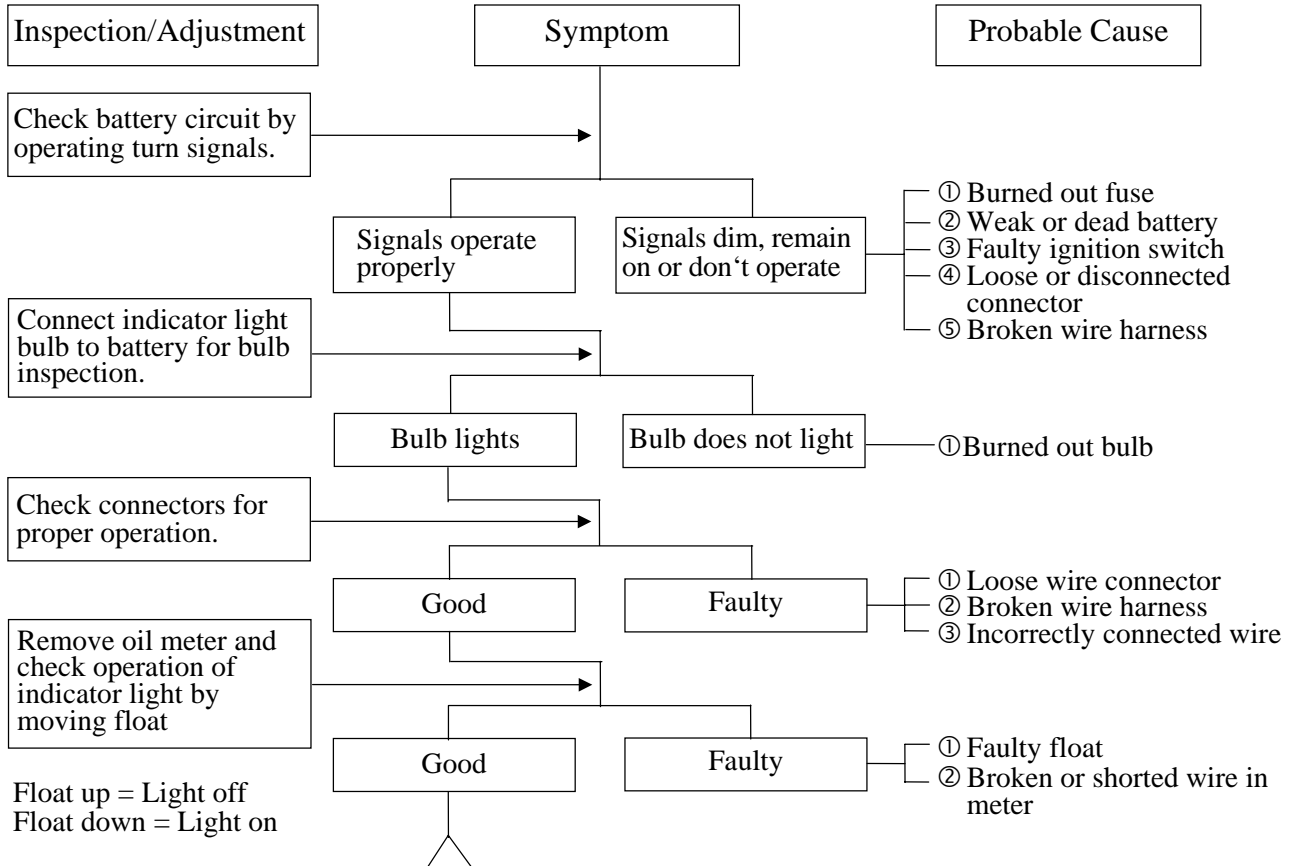
## POOR BRAKE PERFORMANCE



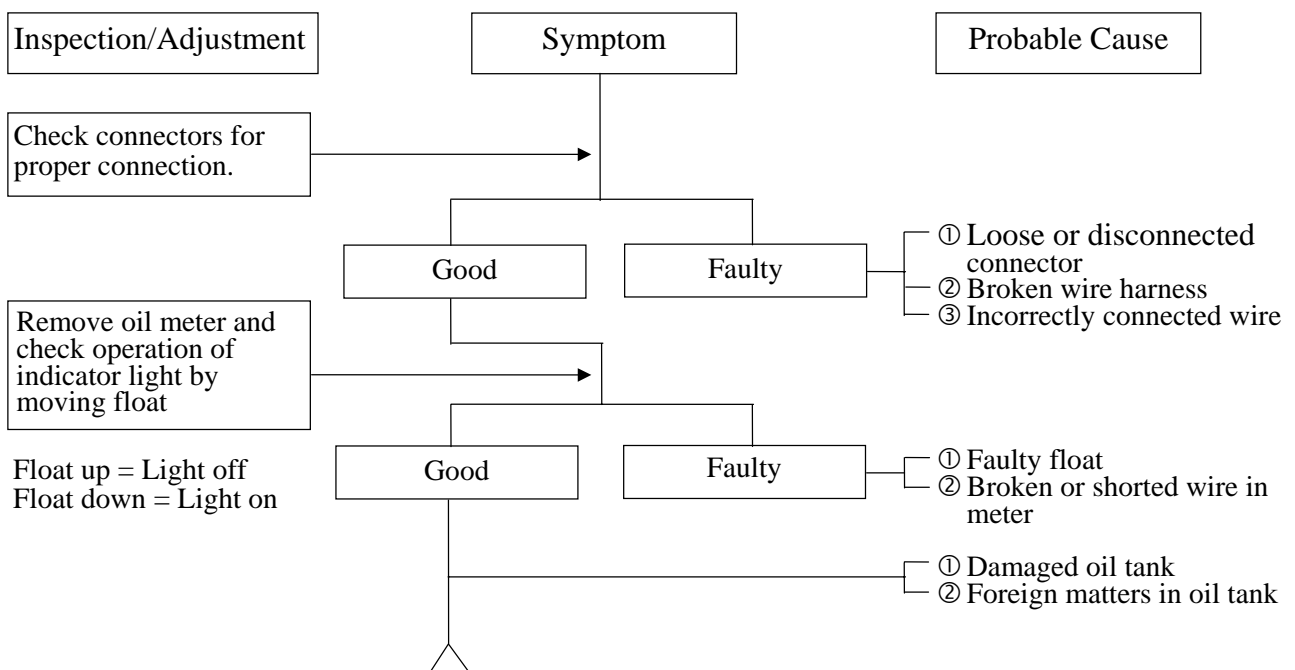
# 1. GENERAL INFORMATION

## OIL METER

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



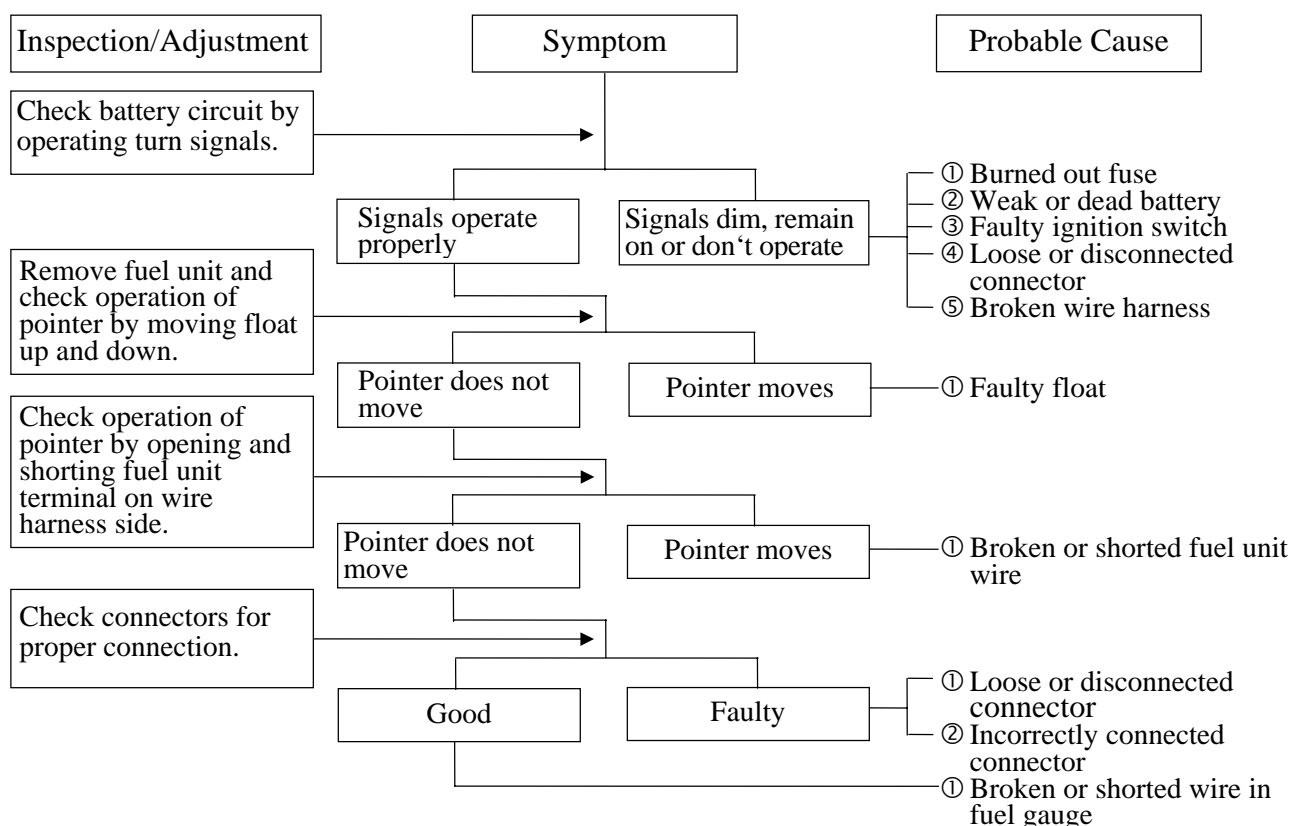
2. Motor oil is sufficient but the indicator light remains on (Ignition switch ON)



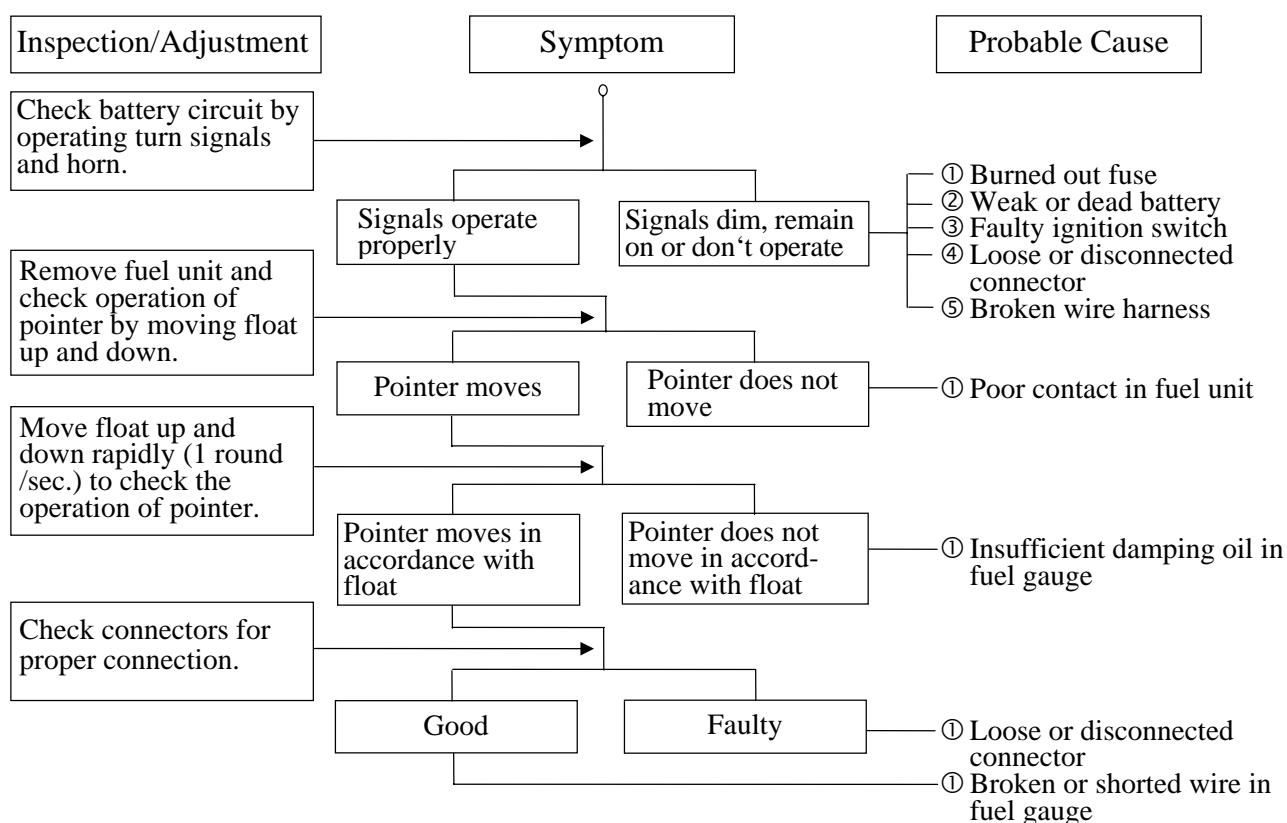
# 1. SPECIFICATIONS

## FUEL GAUGE

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



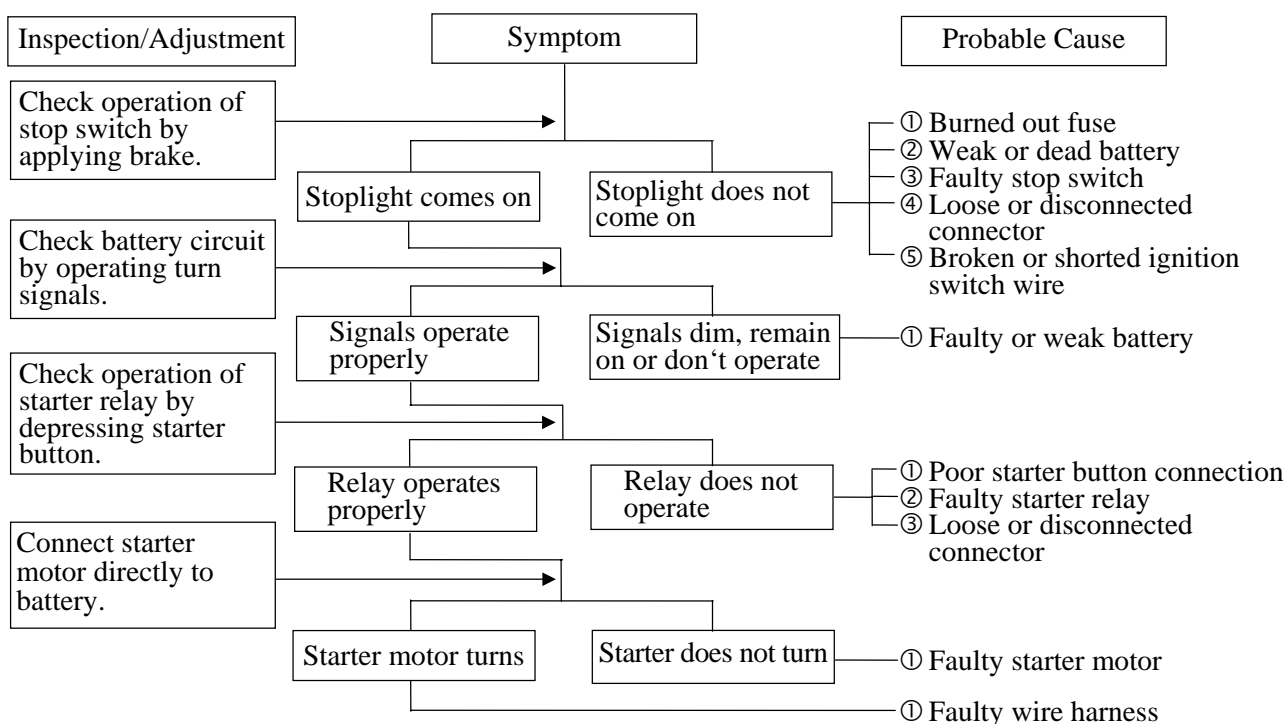
### 2. Pointer fluctuates or swings (Ignition switch ON)



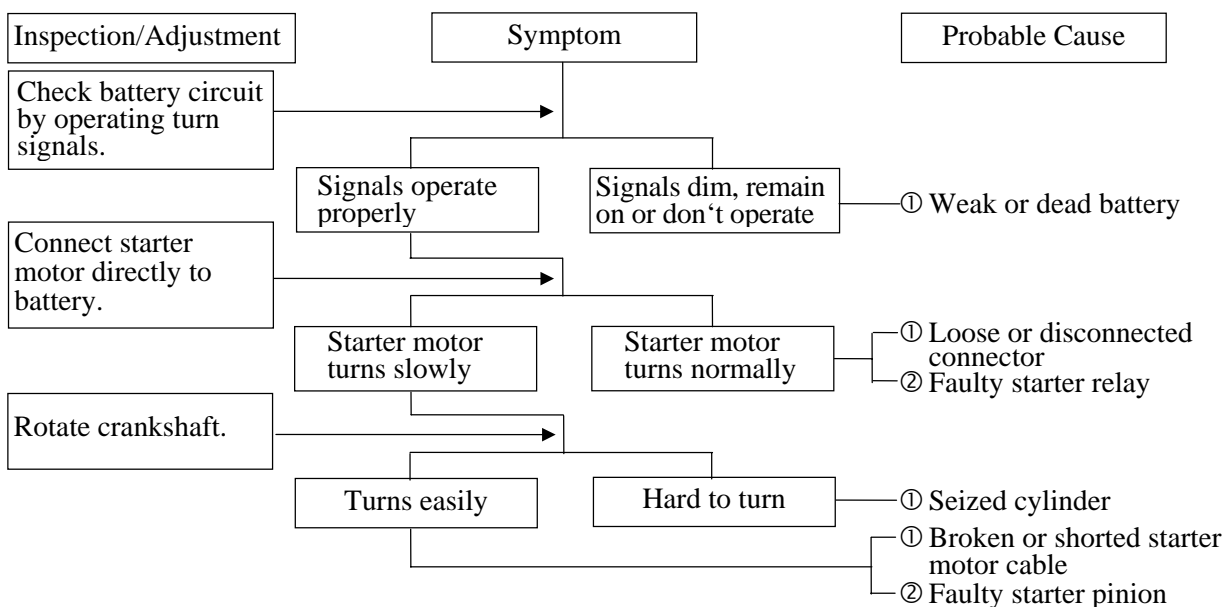
# 1. GENERAL INFORMATION

## STARTER MOTOR

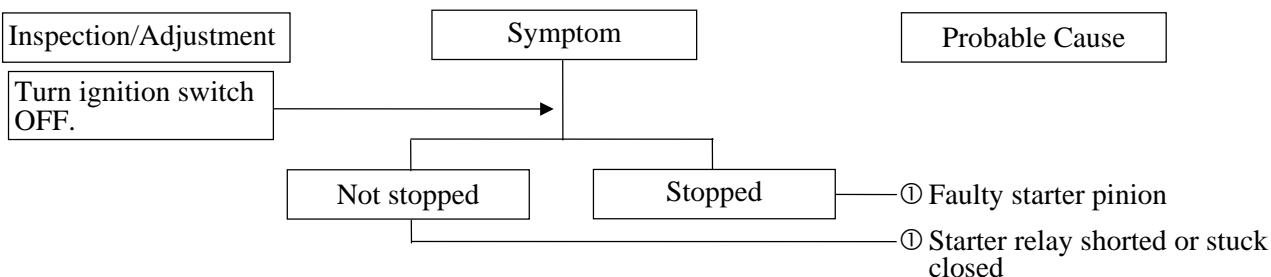
### 1. Starter motor won't turn



### 2. Starter motor turns slowly or idles



### 3. Starter motor does not stop turning



**FRAME COVERS/EXHAUST MUFFLER**

SERVICE INFORMATION----- 2- 2

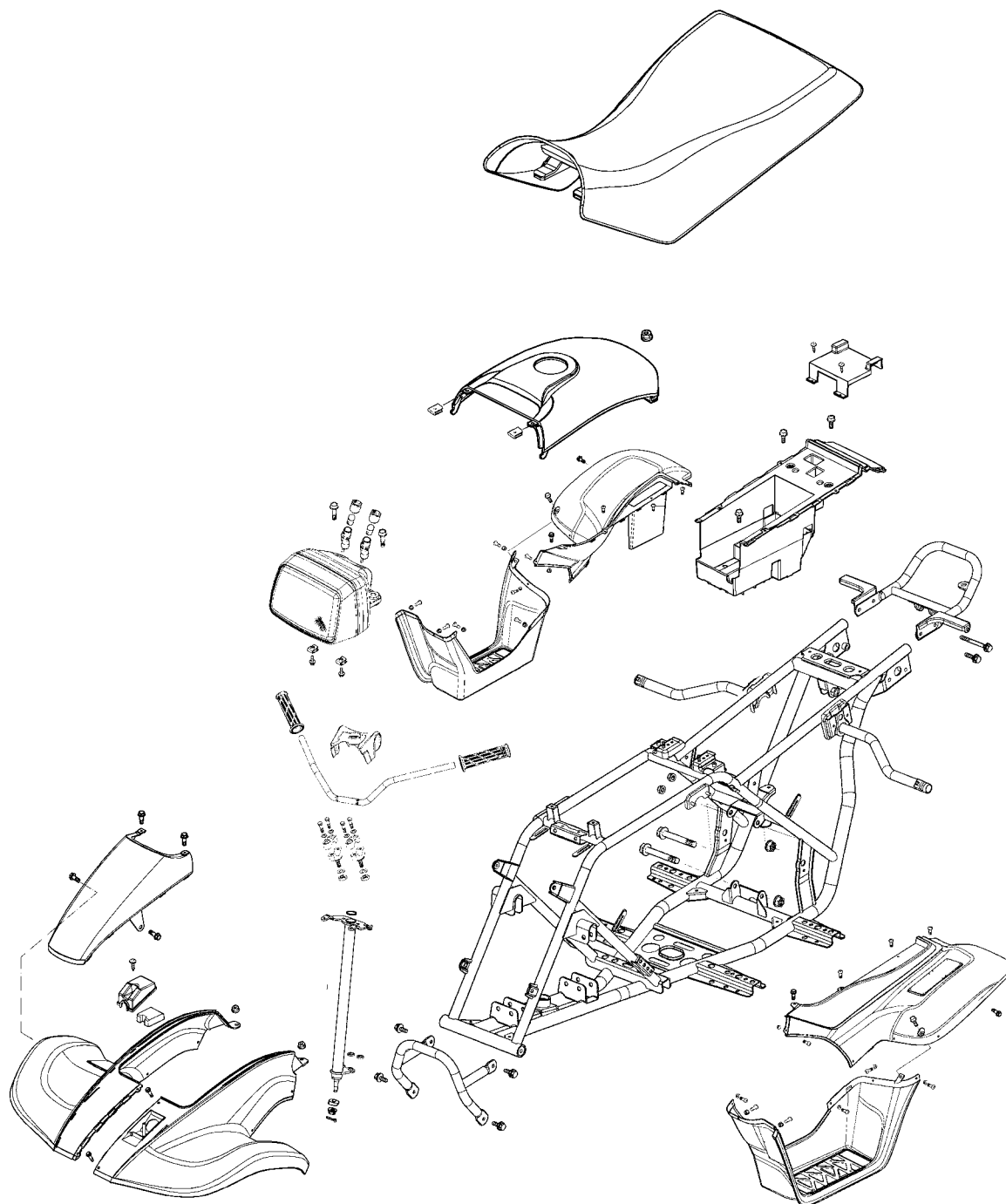
TROUBLESHOOTING----- 2- 2

FRAME COVERS ----- 2- 3

HEADLIGHT REMOVAL ----- 2- 5

EXHAUST MUFFLER REMOVAL ----- 2- 5

## 2. FRAME COVERS/EXHAUST MUFFLER



## 2. FRAME COVERS/EXHAUST MUFFLER

---

### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- When removing frame covers, use special care not to pull them by force because the cover joint claws may be damaged.
- Make sure to route cables and harnesses according to the Cable & Harness Routing.

#### TORQUE VALUES

Exhaust muffler lock bolt      3.0~3.6kgf-m

Exhaust muffler joint lock nut   1.0~1.4kgf-m

### TROUBLESHOOTING

#### Noisy exhaust muffler

- Damaged exhaust muffler
- Exhaust muffler joint air leaks

#### Lack of power

- Caved exhaust muffler
- Exhaust muffler air leaks
- Clogged exhaust muffler

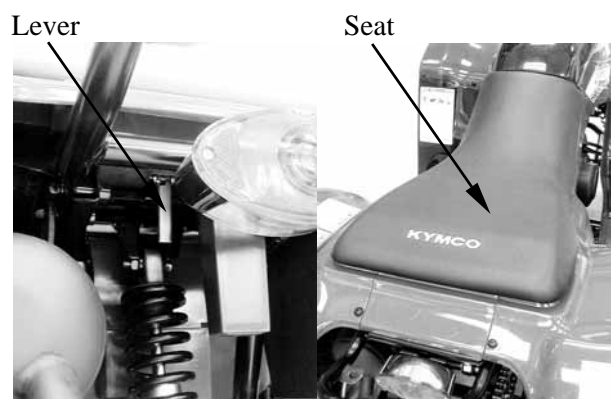


## 2. FRAME COVERS/EXHAUST MUFFLER

### FRAME COVERS

#### SEAT REMOVAL

Pull the lever backward, then pull up the seat at the rear.  
Remove the seat.

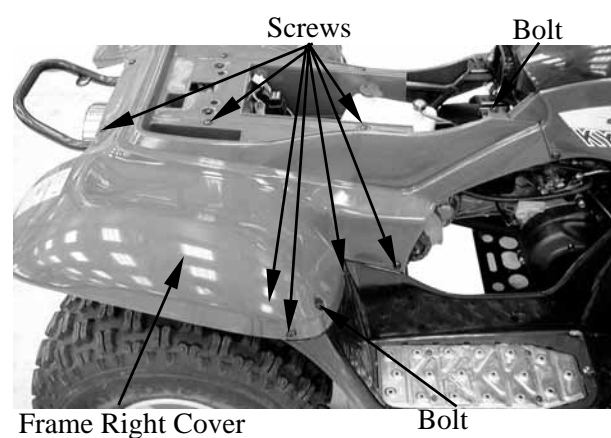


#### LEFT AND RIGHT FENDER REMOVAL

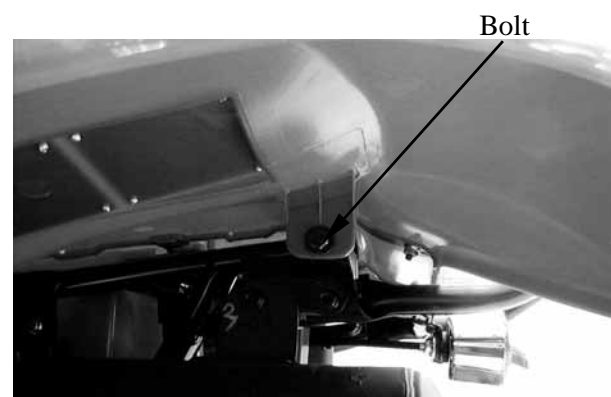
Remove seven screws and two bolts attaching the left rear fender.

Remove seven screws and two bolts attaching the right rear fender.

\* During removal, do not pull the joint claws forcedly to avoid damage.



Remove the left rear fender under bolt.  
Remove the left rear fender.



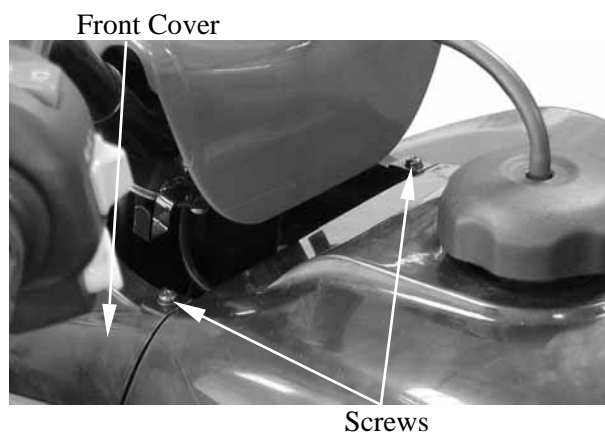
Remove right rear fender under bolt.  
Remove the right rear fender.



## 2. FRAME COVERS/EXHAUST MUFFLER

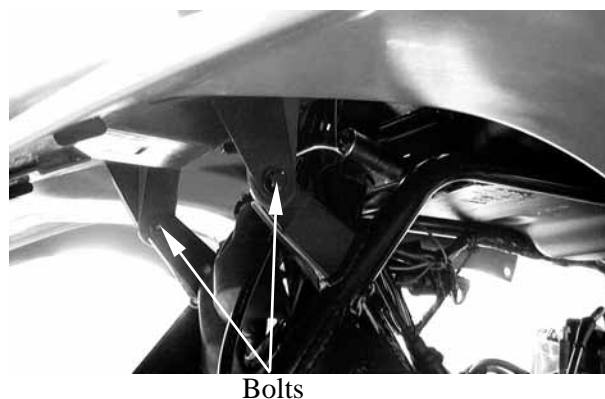
### FRONT COVERS REMOVAL

Remove the two screws on the front cover.



Remove the left and right front fender under bolt.

Remove the front cover.



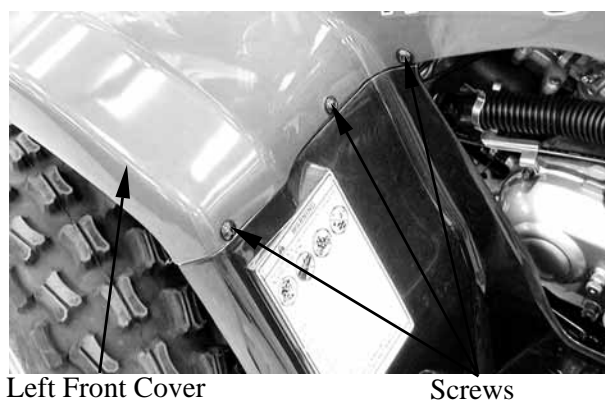
### FRONT FENDER REMOVAL

Remove screws attaching the left and right front fender.

Remove the left and right front fender.



\* During removal, be careful not to damage the joint claws.

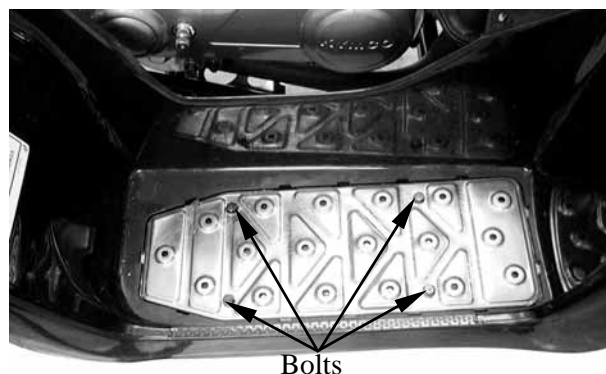


## 2. FRAME COVERS/EXHAUST MUFFLER

### FLOOR BOARD COVER REMOVAL

Remove the four bolts on the floorboard cover.

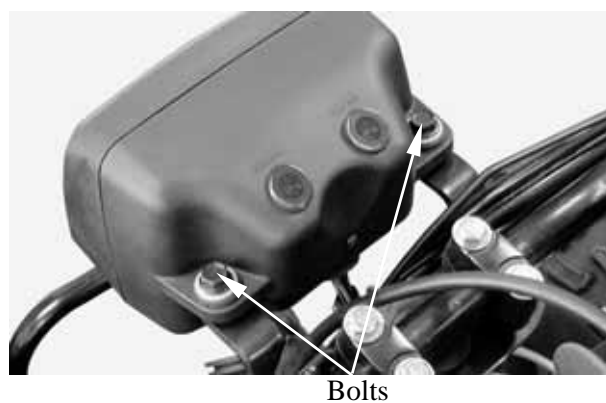
Remove the floorboard cover.



### HEADLIGHT REMOVAL

Remove the headlight connector wire.

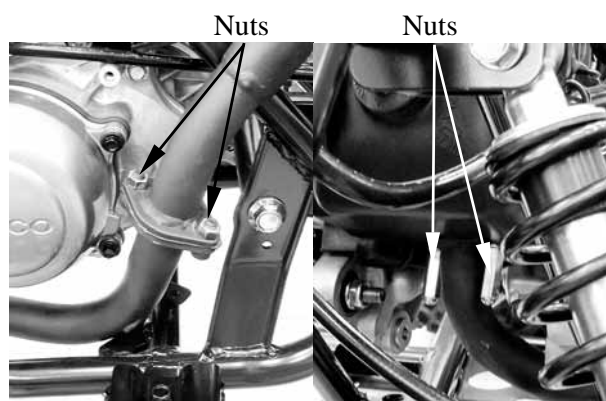
Remove the two bolts on the headlight.



### EXHAUST MUFFLER REMOVAL

Remove the two nuts attaching the exhaust muffler.

Remove the two nuts attaching the exhaust pipe.



## 2. FRAME COVERS/EXHAUST MUFFLER

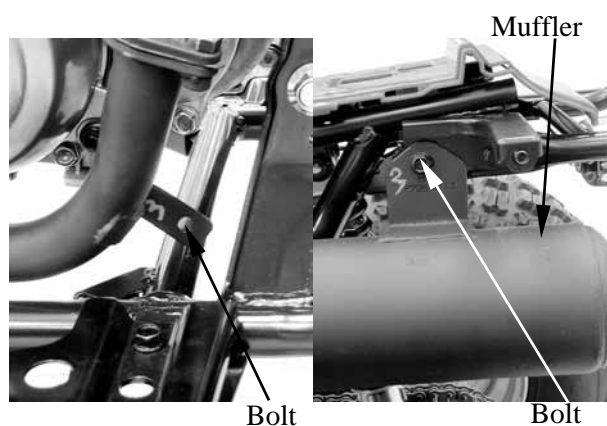
Remove the exhaust muffler lock bolts.  
Remove the exhaust muffler and then  
remove exhaust pipe.

When installing, first install the exhaust  
pipe onto the engine and then install the  
exhaust muffler.

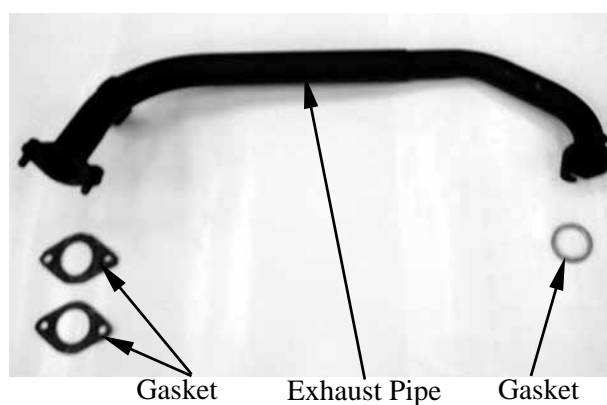
**Torque:**

Exhaust muffler lock bolt: 3.0~3.6kgf-m

Exhaust muffler joint lock nut: 1.0~1.4kgf-  
m



\* Be sure to install a new exhaust muffler  
gasket.



# 3. INSPECTION/ADJUSTMENT

3

## INSPECTION/ADJUSTMENT

SERVICE INFORMATION-----	3- 1
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## 3. INSPECTION/ADJUSTMENT

### SERVICE INFORMATION

#### GENERAL

#### WARNING

- Before running the engine, make sure that the working area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas which may cause death to people.
- Gasoline is extremely flammable and is explosive under some conditions. The working area must be well-ventilated and do not smoke or allow flames or sparks near the working area or fuel storage area.

#### SPECIFICATIONS

##### ENGINE

Throttle grip free play : 1~4mm  
 Spark plug gap : 0.6~0.7mm  
 Spark plug: Standard : NGK: BR8HAS  
 Idle speed : 2000±100rpm  
 Gear oil capacity :  
     At disassembly : 120cc  
     At change : 90cc  
 Cylinder compression : 12kg/cm<sup>2</sup>  
 Ignition timing : BTDC 22°/2000rpm

##### CHASSIS

Front brake free play: 10~20mm  
 Rear brake free play: 10~20mm

##### TIRE PRESSURE

	1 Rider
Front	0.35kgf/cm <sup>2</sup>
Rear	0.35kgf/cm <sup>2</sup>

##### TIRE SIZE:

Front : 20\*7-8  
 Rear : 22\*10-8

##### TORQUE VALUES

Front wheel nut 6.0~8.0kgf-m  
 Rear wheel nut 6.0~8.0kgf-m

### 3. INSPECTION/ADJUSTMENT

#### MAINTENANCE SCHEDULE

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

Item	Remarks	Initial			Every	
		1 month	3 month	6 month	6 month	1 year
<b>Spark plug</b>	Check condition. Clean or replace if necessary.	○	○	○	○	○
<b>Air clearance</b>	Clean. Replace if necessary.		○	○	○	○
<b>Carburetor</b>	Check idle speed/starter operation. Adjust if necessary.		○	○	○	○
<b>Fuel line</b>	Check fuel hose for cracks or damage. Replace if necessary.			○	○	○
<b>Engine oil</b>	Replace (Warm engine before draining).	○		○	○	○
<b>Engine oil filter screen</b>	Clean. Replace if necessary.	○				○
<b>Transmission oil</b>	Check oil leakage. Replace every 12 months.	○				○
<b>Brake system</b>	Check operation. Adjust if necessary.	○	○	○	○	○
<b>Drive belt</b>	Check operation/replace if damage or excessive wear.	○				○
<b>Wheels</b>	Check balance/damage/runout. Replace if necessary.	○		○	○	○
<b>Wheel bearings</b>	Check bearings assembly for looseness/damage. Replace if damaged.	○		○	○	○
<b>Steering system</b>	Check operation/replace if damage. Check toe-in/adjust if necessary.	○	○	○	○	○
<b>Knuckle shafts</b>	Lubricate every 6 months.			○	○	○
<b>Fitting/Fasteners</b>	Check all chassis fittings and fasteners. Correct if necessary.	○	○	○	○	○

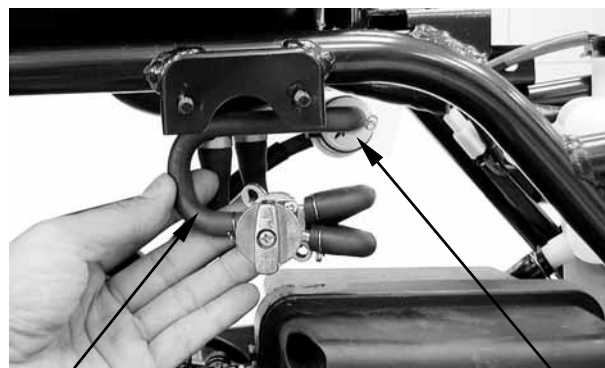
- In the interest of safety, we recommend these items should be serviced only by an authorized KYMCO motorcycle dealer.

### 3. INSPECTION/ADJUSTMENT

#### FUEL LINE

Check the fuel tubes and replace any parts, which show signs of deterioration, damage or leakage or leakage.

\* Do not smoke or allow flames or sparks in your working area.



Fuel tube

Fuel Filter

#### THROTTLE OPERATION

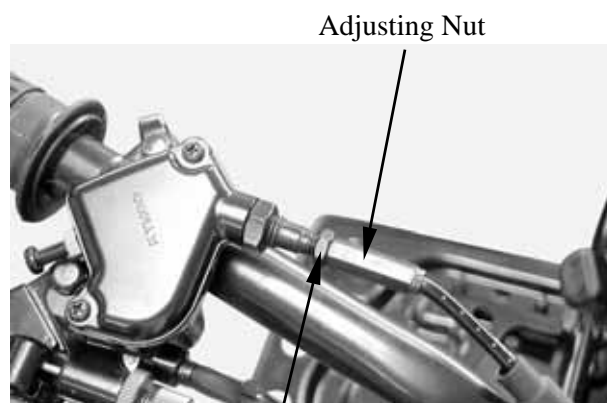
Check the throttle to swing for smooth movement.

Measure the throttle to swing free play.

**Free Play:** 1 ~ 4mm



Minor adjustment is made with the adjusting nut at the throttle to swing above. Slide the rubber cover out and adjust by loosening the lock nut and turning the adjusting nut.



Adjusting Nut

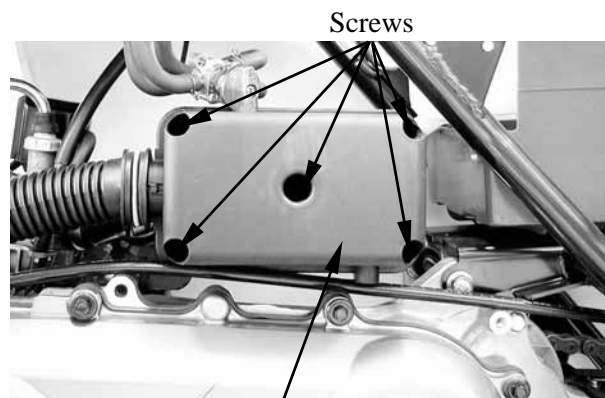
Lock Nut

#### AIR CLEANER

##### AIR CLEANER REPLACEMENT

Remove five screws on the air cleaner case cover and the cover.

Check the element and replace it if it is excessively dirty or damaged.



Screws

Air Cleaner Case Cover



### 3. INSPECTION/ADJUSTMENT

#### **CLEAN AIR FILTER ELEMENT**

Wash the element gently, but thoroughly in solvent.

- \* Use parts cleaning solvent only. Never use gasoline or low flash point solvents which may lead to a fire or explosion.

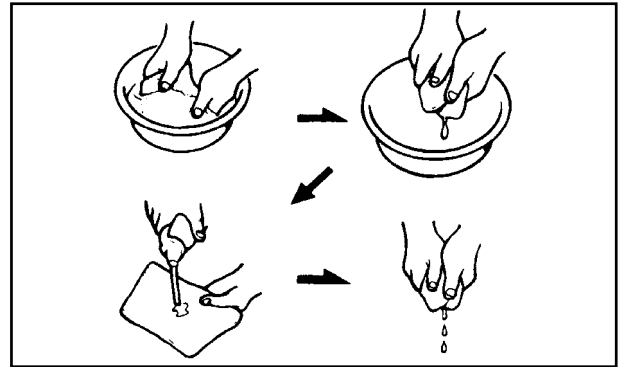
Squeeze the excess solvent out of the element and let dry.

- \* Do not twist or wring out the foam element. This could damage the foam material.

Apply the engine oil.

Squeeze out the excess oil.

- \* The element should be wet but not dripping.



#### **CHANGE INTERVAL**

More frequent replacement is required when riding in unusually dusty or rainy areas.



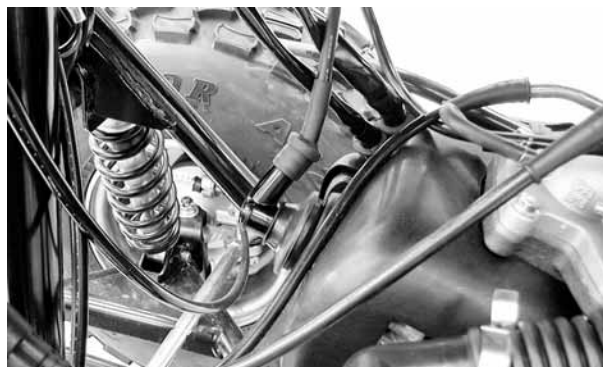
### 3. INSPECTION/ADJUSTMENT

#### SPARK PLUG

Remove the spark plug  
Check the spark plug for wear and fouling deposits.

Clean any fouling deposits with a spark plug cleaner or a wire brush.

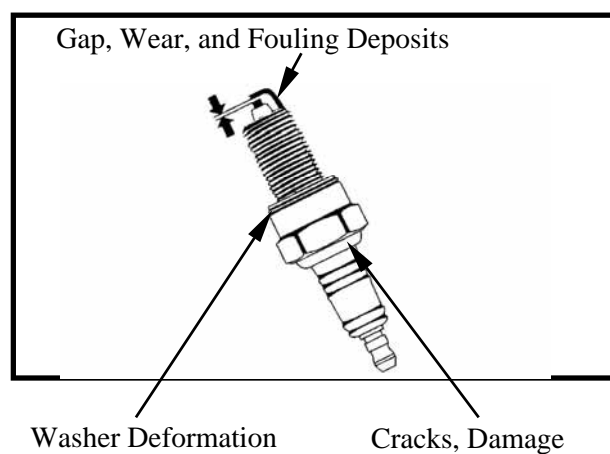
**Specified Spark Plug:** NGK: BR8HAS



Measure the spark plug gap.

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

\* When installing, first screw in the spark plug by hand and then tighten it with a spark plug wrench.

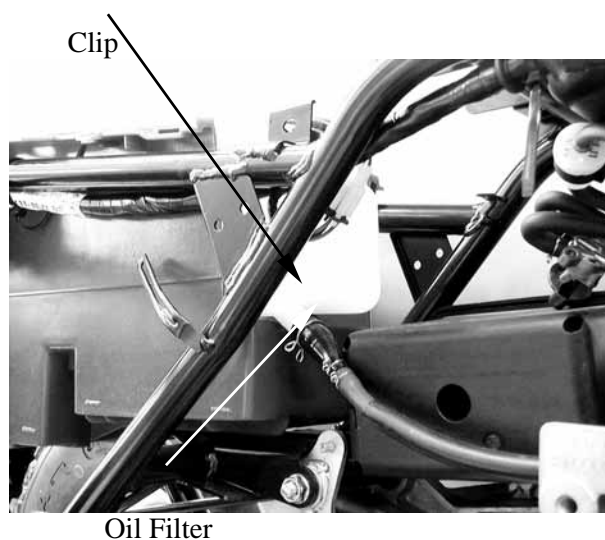


#### LUBRICATION SYSTEM

##### 《Oil Filter Cltaning》

Disconnect the oil tube at the oil pump side and allow oil to drain into a clean container. Remove the tube clip at the oil tank side and disconnect the oil tube.

Remove the oil filter.



### 3. INSPECTION/ADJUSTMENT

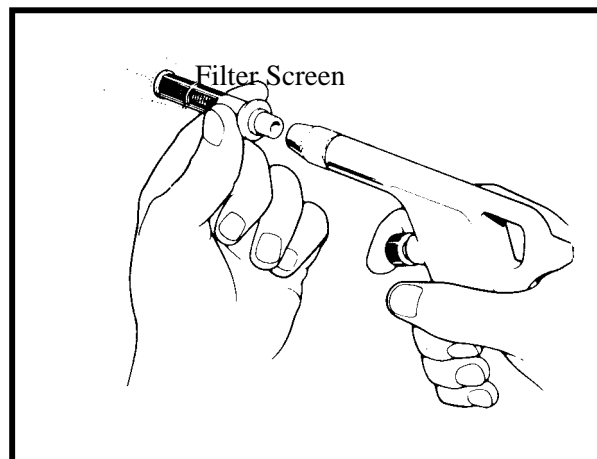
Clean the oil filter screen with compressed air.

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.



#### 《Oil Pump Condition》

**\***

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

Open the throttle valve fully and check that the index mark on the pump body aligns with the aligning mark on the oil pump control lever.

Reference tip alignment within 1mm of index mark on open side is acceptable.

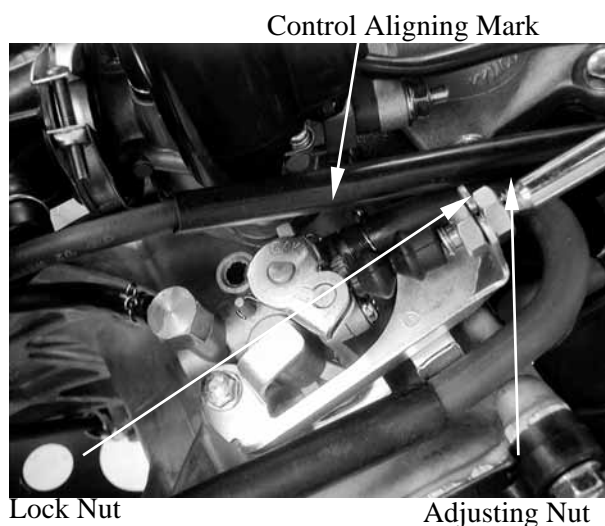
Start and idle the engine, then slowly open the throttle to increase engine rpm and check the operation of the oil pump control lever.

If adjustment is necessary, adjust the oil pump control cable by loosening the control cable lock nut and turning the adjusting nut.

After adjustment, tighten the lock 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.



If the oil pump is not synchronized properly,  
the following will occur:

- Excessive white smoke or hard starting due to pump control lever excessively open
- Seized piston due to pump control lever insufficiently open.

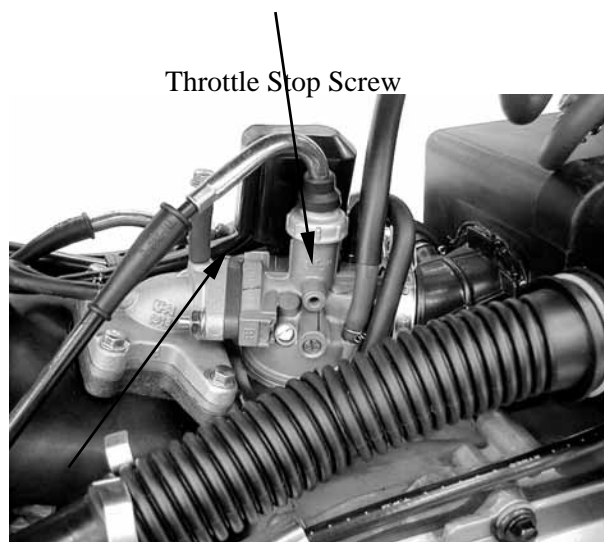
#### CARBURETOR IDLE SPEED

- \* The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine before this operation. Start the engine and connect a tachometer. Turn the throttle stop screw to obtain the specified idle speed.

**Idle Speed:**  $2000 \pm 100$  rpm

When the engine misses or runs erratic, adjust the air screw.



Air Screw

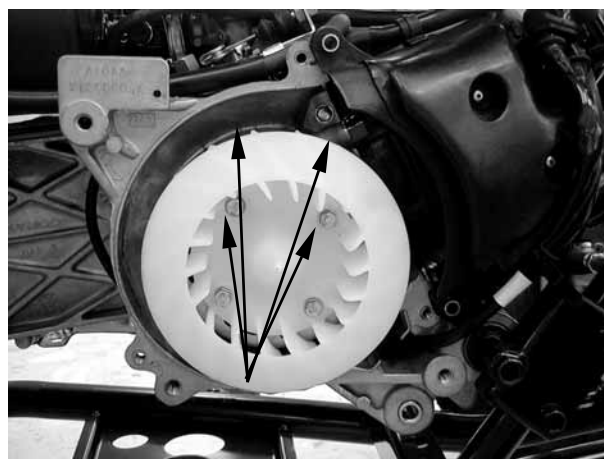
#### 《Ignition Apparatus》

- \* The CDI ignition timing is not adjustable. If the timing is incorrect, check the CDI unit, ignition coil and A.C. generator and replace any faulty parts.

Remove the A.C. generator fan cover.  
(⇒8-3)

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.



Bolts

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 crankcase within  $\pm 1.5^\circ$ .

**Ignition Timing:**

$22^\circ \pm 1.5^\circ$  BTDC/2000 rpm



"F" Mark

### 3. INSPECTION/ADJUSTMENT

leaks.

**Torque:** 1.0~1.5kgf-m

#### CYLINDER COMPRESSION

Warm up the engine before compression test.

Remove the spark plug.

Insert a compression gauge.

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

**Compression:** 12kg/cm<sup>2</sup>

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.



Compression Gauge

#### FINAL REDUCTION GEAR OIL

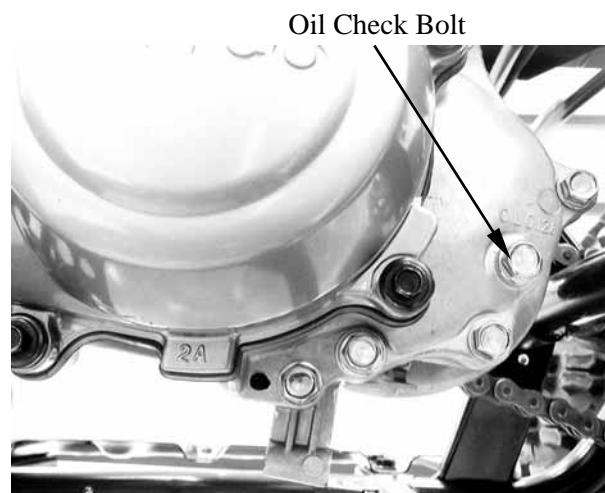
The gear oil level shall be at the oil check bolt hole. If the oil level is low, add the specified oil to the proper level.

**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.



#### GEAR OIL CHANGE

Remove the oil filler bolt.

Remove the oil drains bolt and drain the oil thoroughly.

Install the oil drain bolt.

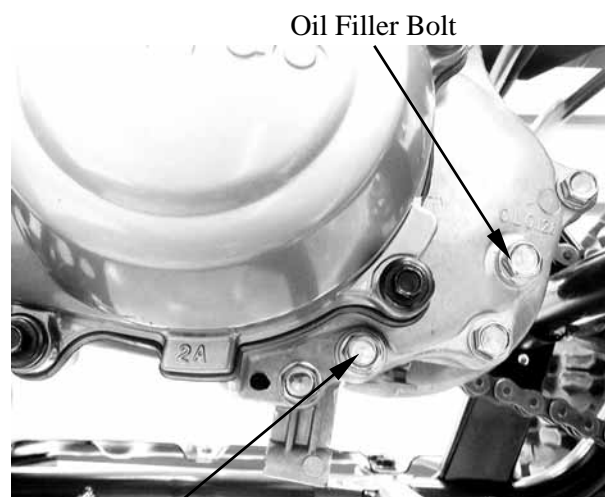
**Torque:** 1.0~1.5kgf-m

\* Make sure that the sealing washer is in good condition.

Fill with the recommended oil.

**Oil Capacity:** At disassembly : 0.12cc  
At change : 0.09cc

Reinstall the oil filler bolt and check for oil

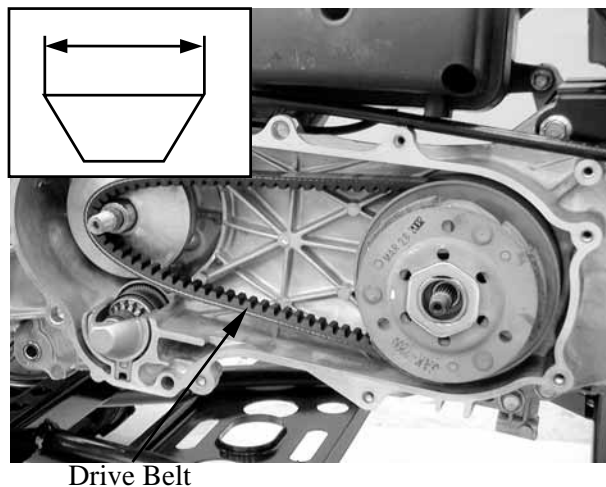


Oil Drain Bolt/ Sealing Washer

### 3. INSPECTION/ADJUSTMENT

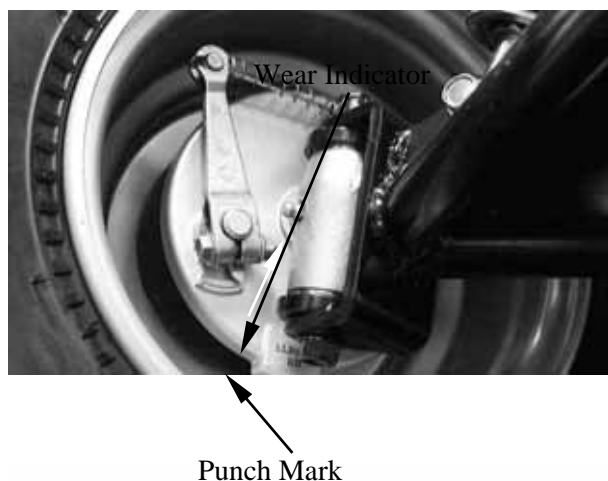
#### DRIVE BELT

Remove the left crankcase cover.  
Inspect the drive belt for cracks, scaling, chipping or excessive wear.  
Measure the V-belt width  
**Service limit:** 16.5mm  
Replace the drive belt if out of specification.



#### BRAKE SHOE

Replace the brake shoes if the arrow on the wear indicator plate aligns with the punch mark on the brake panel when the brake is fully applied.



#### BRAKE SYSTEM

##### FRONT BRAKE

Measure the front brake lever free play.  
**Free Play:** 10~20mm  
Adjust if out of specification.



### 3. INSPECTION/ADJUSTMENT

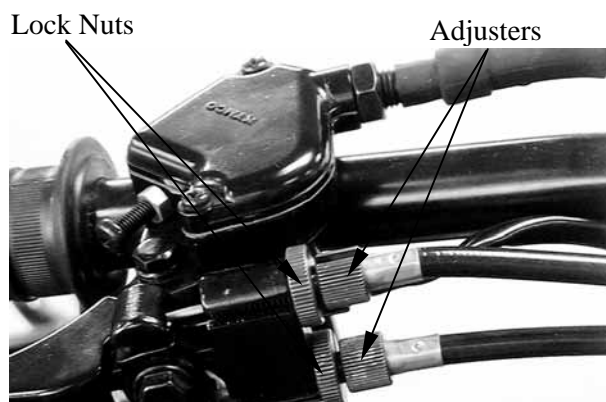
Adjust brake lever free play:

Loosen the lock nuts.

Turn the adjusters in or out until the specified free play is obtained.

Turning adjusters in that the free play is increased.

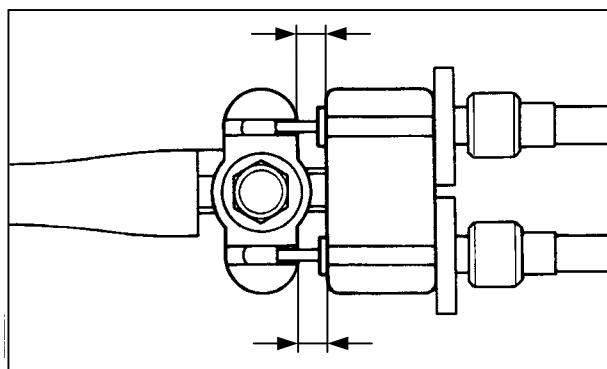
Turning adjusters out that the free play is decreased.



The difference between both clearances should be 2 mm or less when front brake is applied.

Tighten the lock nuts.

\* Make sure that the brake does not drag after adjusting.



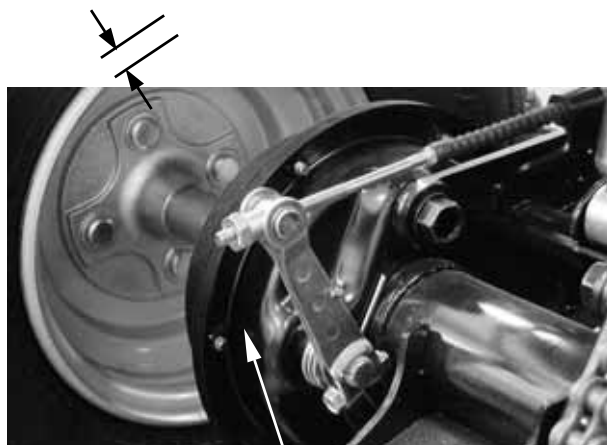
#### REAR BRAKE

Measure the rear brake lever free play.

**Free Play:** 10~20mm



If the free play do not fall within the limit, adjust by turning the adjusting nut.



### 3. INSPECTION/ADJUSTMENT

Adjusting Nut

#### HEADLIGHT AIM

Turn the ignition switch ON and start the engine.

Turn on the headlight switch.

Adjust the headlight aim by turning the headlight aim adjusting screw.



Adjusting Screw

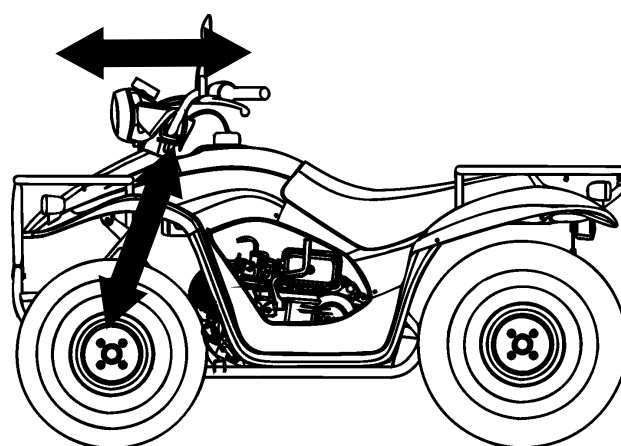
#### STEERING SYSTEM INSPECTION

Place the machine on a level place.

Check the steering column bushings and bearings:

Move the handlebar up and down, and/or back and forth.

Replace the steering column bushings and or bearings if excessive play



Check the tie-rod ends

Turn the handlebar to the left and/or right until it stops completely, then slightly move the handlebar from left to right.

Replace the tie-rod ends if tie-rod end has any vertical play.



Tie-rod Ends

Raise the front end of the machine so that there is no weight on the front wheels.

Check ball joints and/or wheel bearings.

Move the wheels laterally back and forth.

Replace the front arms and/or wheel bearings if excessive free play.





#### TOE-IN ADJUSTMENT

Place the machine on a level place.

Measure the toe-in

Adjust if out of specification.

Toe-in measurement steps:

Mark both front tire tread centers.

Raise the front end of the machine so that there is no weight on the front tires.

Fix the handlebar straight ahead.

Measure the width A between the marks.

Rotate the front tires 180 degrees until the marks come exactly opposite.

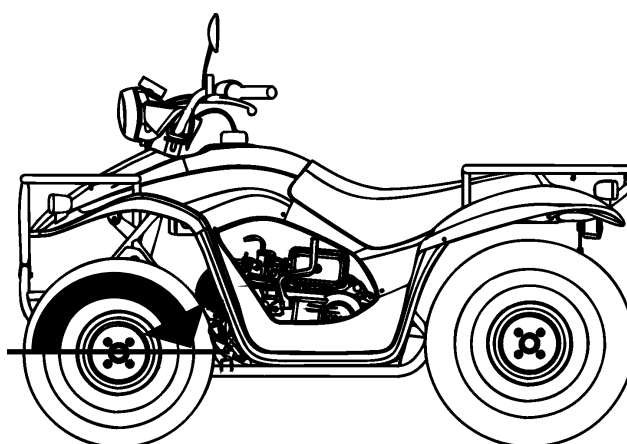
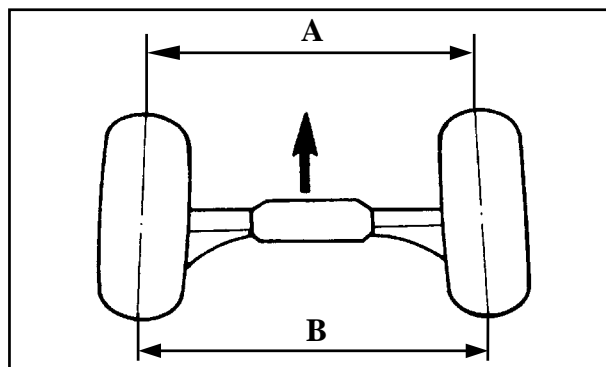
Measure the width B between the marks.

Calculate the toe-in using the formula given below.

Toe-in =  $B - A$

Toe-in: 0~10mm

If the toe-in is incorrect, adjust the toe-in



Adjust the toe-in step:

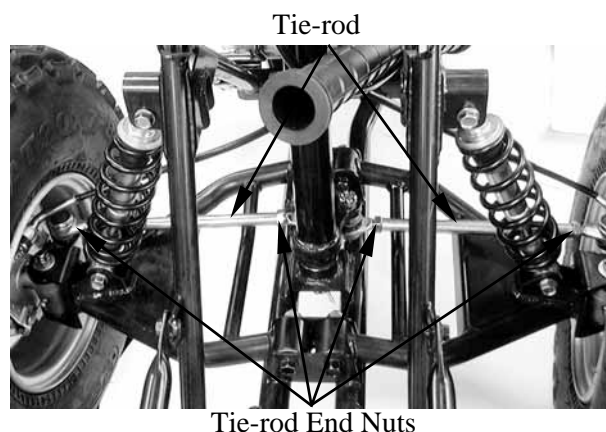
Mark both tie-rod ends.

This reference point will be needed during adjustment.

Loosen the lock nuts (tie-rod end) of both tie-rods

The same number of turns should be given to both tie-rods right and left until the specified toe-in is obtained, so that the lengths of the rods will be kept the same.

**Torque:** 2.5~3.5kgf-m



**\***

- Be sure that both tie-rod are turned the same amount. If not, the machine will drift tight or left even though the handlebar is positioned straight which may lead to mishandling and accident.
- After setting the toe-in to specification, run the machine slowly for some distance with hands placed lightly on the handlebar and check that the handlebar responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.

### 3. INSPECTION/ADJUSTMENT

#### WHEELS/TIRES

Check the tires for cuts, imbedded nails or other damages.  
Check the tire pressure.

\* Tire pressure should be checked when tires are cold.



#### TIRE PRESSURE

	1 Rider
Front	0.35kgf/cm <sup>2</sup>
Rear	0.35kgf/cm <sup>2</sup>

#### TIRE SIZE

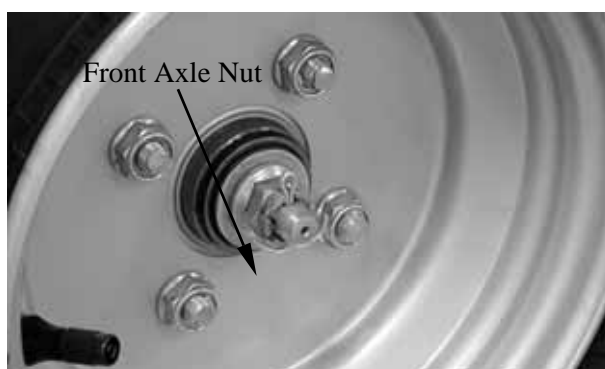
**Front** : 20\*7-8

**Rear** : 22\*10-8

Check the front axle nut for looseness.  
Check the rear axle nut for looseness.  
If the axle nuts are loose, tighten them to the specified torque.

**Torque: Front** : 6.0~8.0kgf-m

**Rear** : 6.0~8.0kgf-m

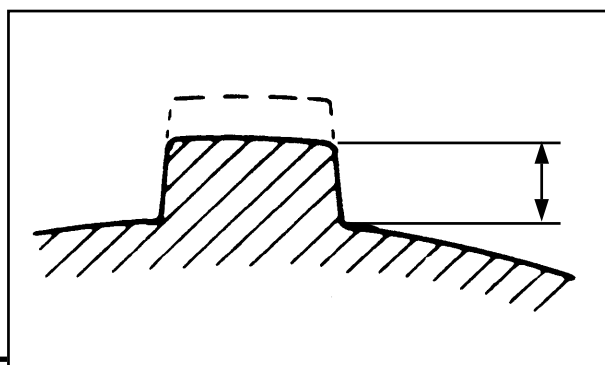


#### WHEEL INSPECTION

Inspect the tire surfaces.  
Replace if wear or damage.

**Tire wear limit**: 3.0mm

\* It is dangerous to ride with a worn out tire. When a tire wear is out of specification, replace the tire immediately.



### 3. INSPECTION/ADJUSTMENT

Inspect the wheel.

Replace if damage or bends

Always balance the wheel when a tire or wheel has been changed or replaced.

- \*
  - Never attempt even small repairs to the wheel.
  - Ride conservatively after installing a tire to allow it to seat itself properly on the rim.

#### DRIVE CHAIN SLACK ADJUSTMENT

Before checking and/or adjusting, rotate the rear wheels several revolutions and check slack at several points to find the tightest point. Check and/or adjust the chain slack with the rear wheels in this “tightest” position.

- \* Too little of chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

Place the machine on a level place.

- \* Wheels should be on the ground without the rider on it.

Check drive chain slack.

Adjust if out of specification.

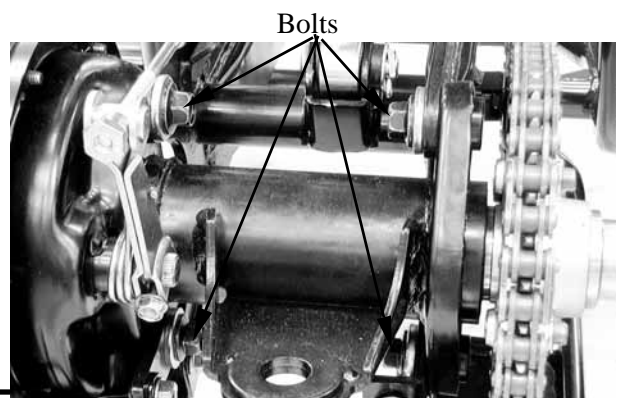
**Drive chain slack:** Approximately 30mm

Adjust drive chain slack:

Elevate the rear wheels by placing a suitable stand under the rear of frame.

- \* Support the machine securely so there is no danger of it falling over.

Loosen four bolts attaching rear axle hub.



### 3. INSPECTION/ADJUSTMENT

Turn the adjuster in or out until the specified slack is obtained.

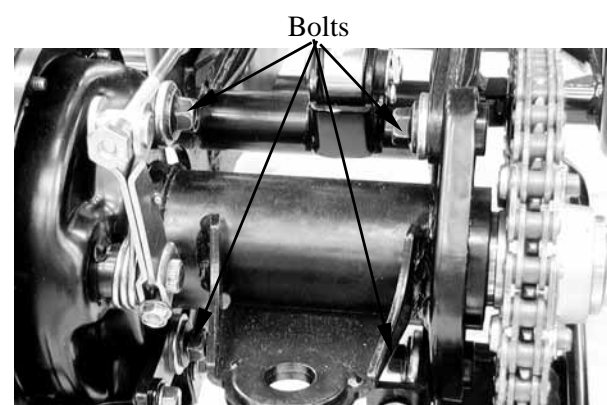
**Turn in:** Slack is increased.

**Turn out:** Slack is decreased.



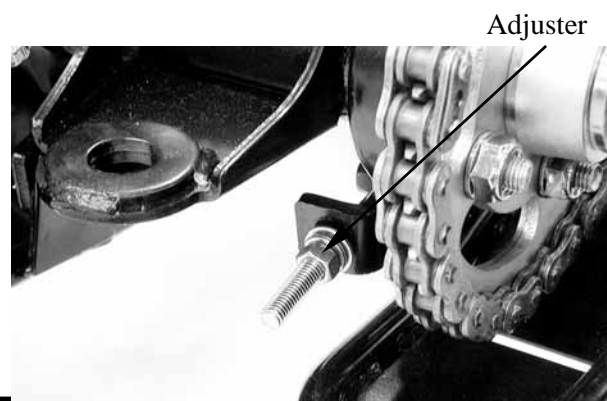
Tighten four bolts attaching rear axle hub to the specification. While pushing up or down on the chain to zero slack.

**Torque:** 6.0~8.0kgf-m



Tighten the adjuster.

**Torque:** 1.8~2.5kgf-m



### 3. INSPECTION/ADJUSTMENT

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#### CABLE INSPECTION AND LUBRICATION

- \* Damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace such cable as soon as possible.

Inspect the cable sheath.

Replace if damage.

Check the cable operation.

Lubricate or replace if unsmooth operation.

- \* Hold cable end high and apply several drops of lubricant to cable.

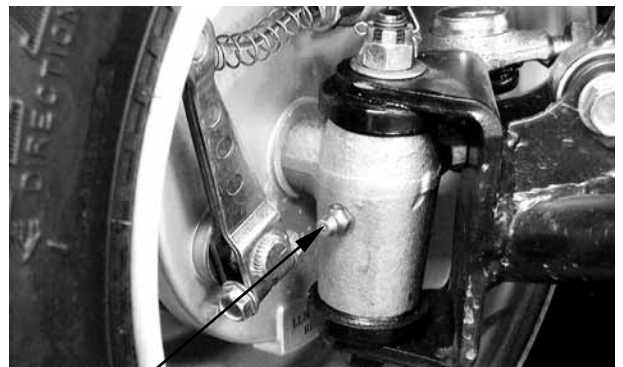
#### LEVER LUBRICATION

Lubricate the pivoting parts of each lever.

#### FRONT SUSPENSION LUBRICATION

Inject grease into the nipples using a grease gun until slight over flow is observed from the thrust covers.

- \* Wipe off the excess grease.



Nipple

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

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LUBRICATION SYSTEM

SERVICE INFORMATION ..... 4-2

TROUBLESHOOTING ..... 4-2

OIL PUMP REMOVAL..... 4-3

OIL PUMP INSPECTION ..... 4-3

OIL PUMP INSTALLATION ..... 4-4

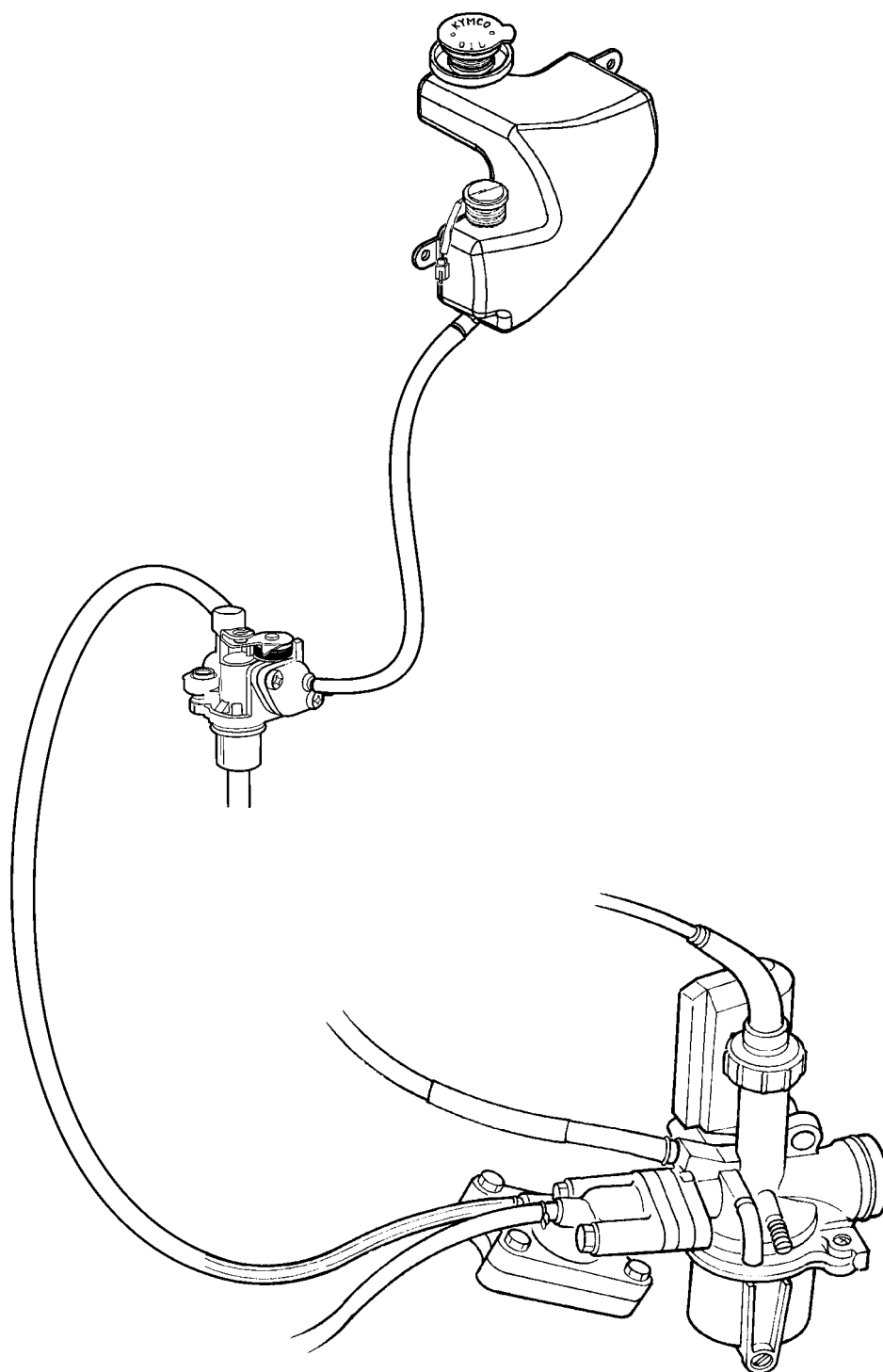
OIL PUMP BLEEDING..... 4-5

OIL TANK ..... 4-6

## 4. LUBRICATION SYSTEM

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### 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 : 1.0 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.

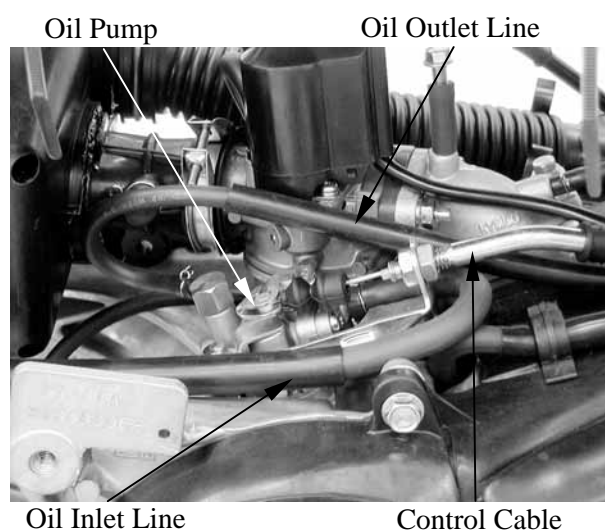
Disconnect the oil pump control cable from the pump body.

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.

Remove the oil pump from the crankcase.



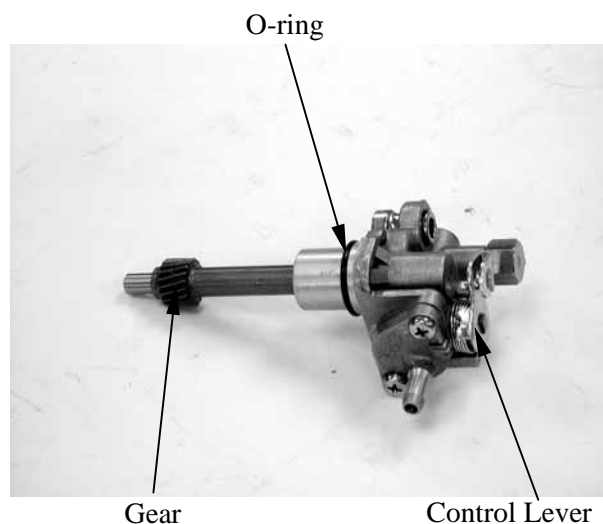
### OIL PUMP INSPECTION

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.

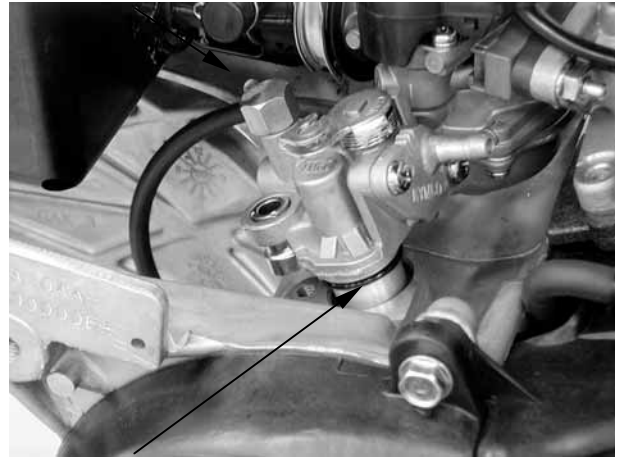


## 4. LUBRICATION SYSTEM

### 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.

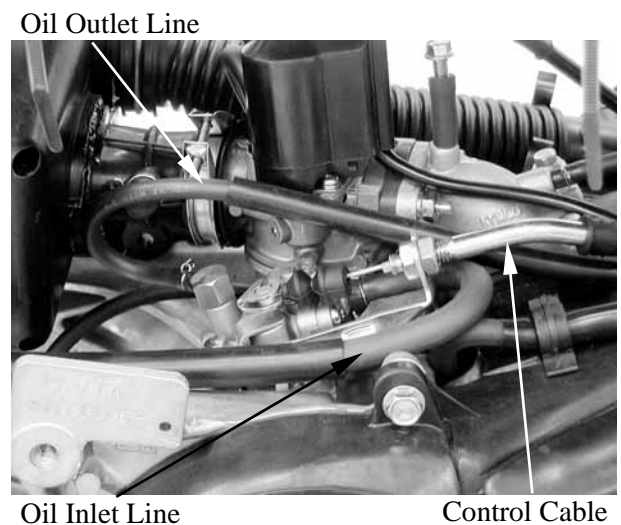


Grease or Engine Oil

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.

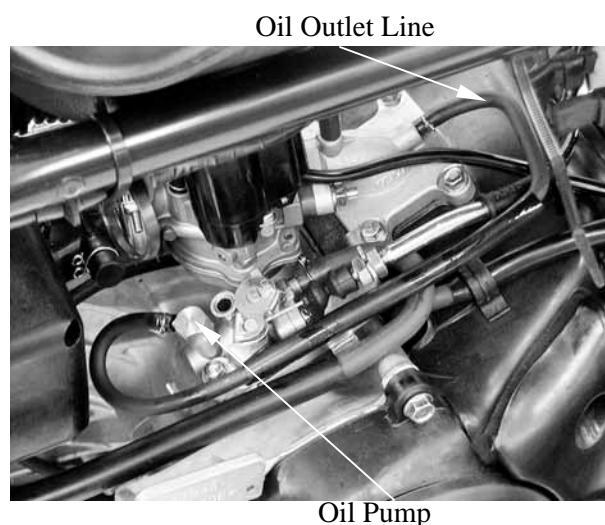


## 4. LUBRICATION SYSTEM

### OIL PUMP BLEEDING

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- 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 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.

★

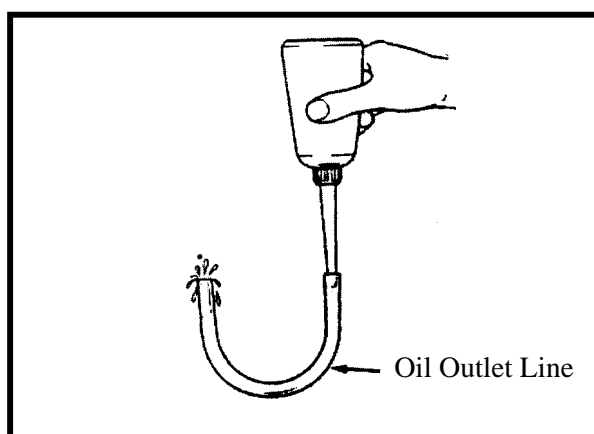
Bleed air from the oil inlet line first, then bleed air from the oil outlet line.

### 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.



## 4. LUBRICATION SYSTEM

### OIL TANK

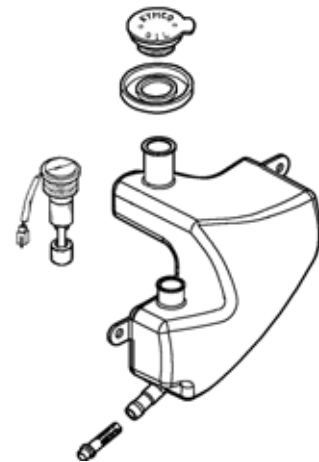
#### OIL TANK REMOVAL

Remove the seat. (⇒2-3)  
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.



**\***

- 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. FUEL SYSTEM

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5

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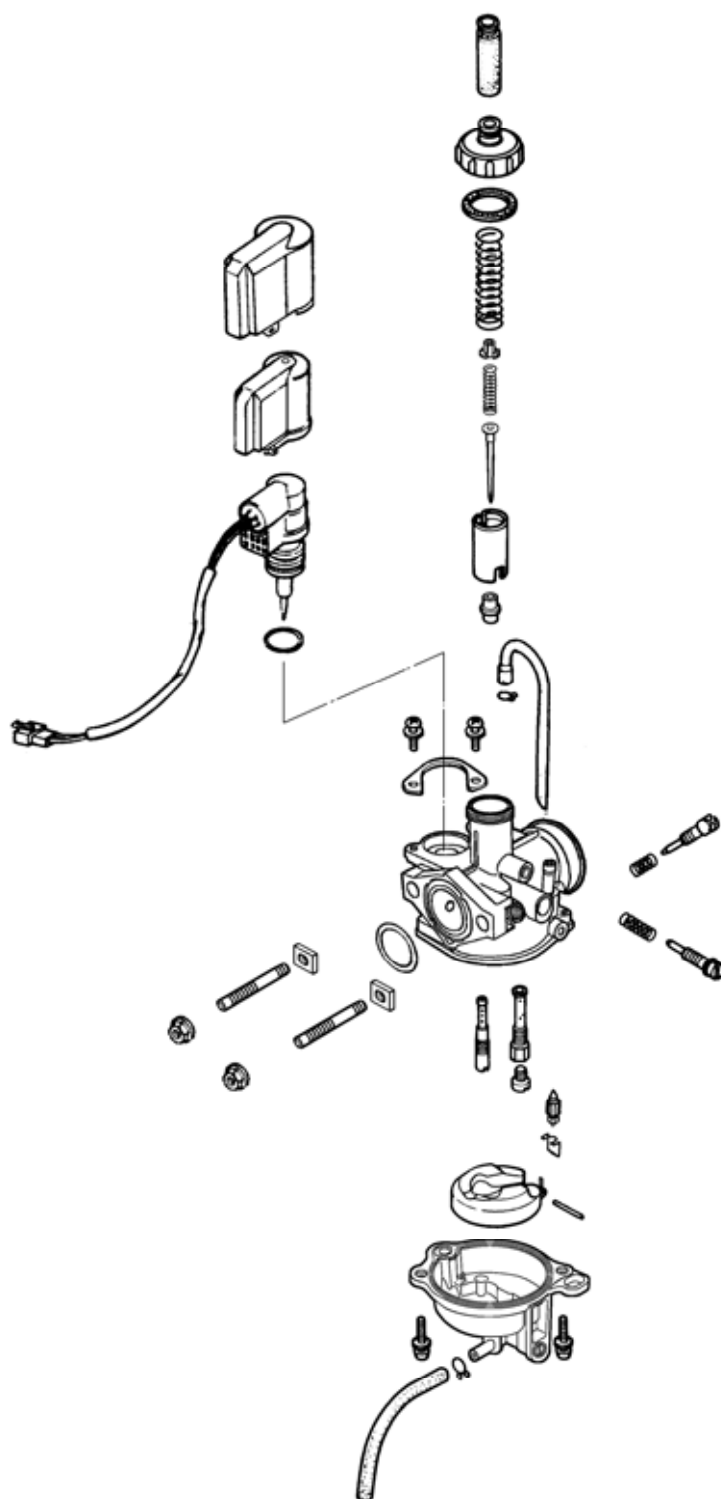
### FUEL SYSTEM

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SERVICE INFORMATION-----	5- 2
TROUBLESHOOTING-----	5- 2
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AIR CLEANER -----	5-15

## 5. FUEL SYSTEM

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## 5. FUEL SYSTEM

### 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

SPECIFICATIONS	MX'er 50
Venturi dia.	14mm
Identification number	PB
Float level	16.3mm
Main jet	#78
Slow jet	#40
Air screw opening	$2 \pm \frac{1}{2}$
Idle speed	2000±100rpm
Throttle grip free play	1 ~ 4mm

#### 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



## 5. FUEL SYSTEM

### THROTTLE VALVE DIS- ASSEMBLY/CARBURETOR REMOVAL

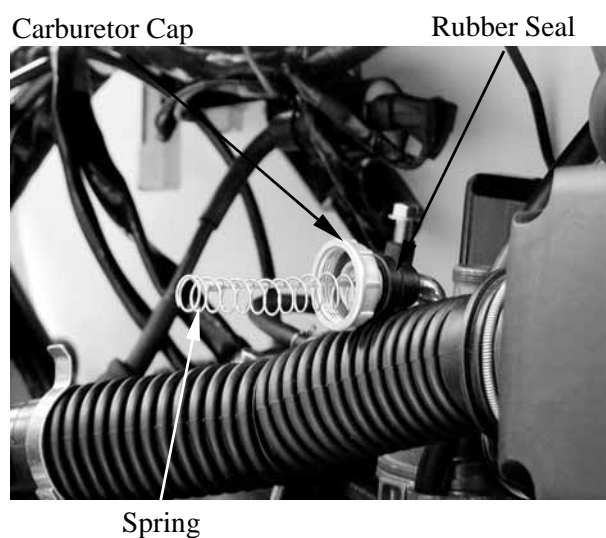
Loosen the carburetor cap and remove the throttle valve.



Disconnect the throttle cable from the throttle valve.

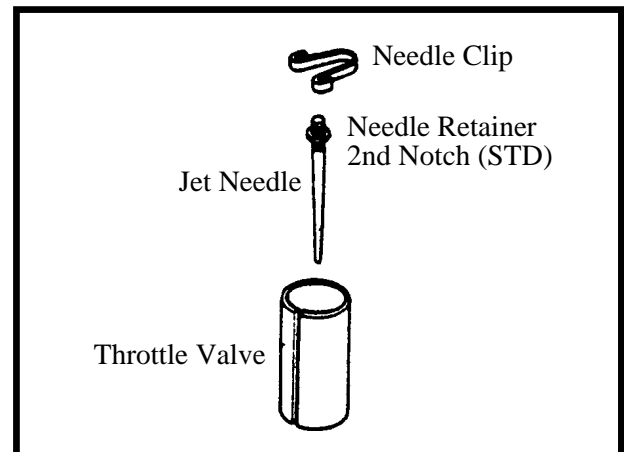


Remove the throttle valve spring, carburetor cap and rubber seal.



## 5. FUEL SYSTEM

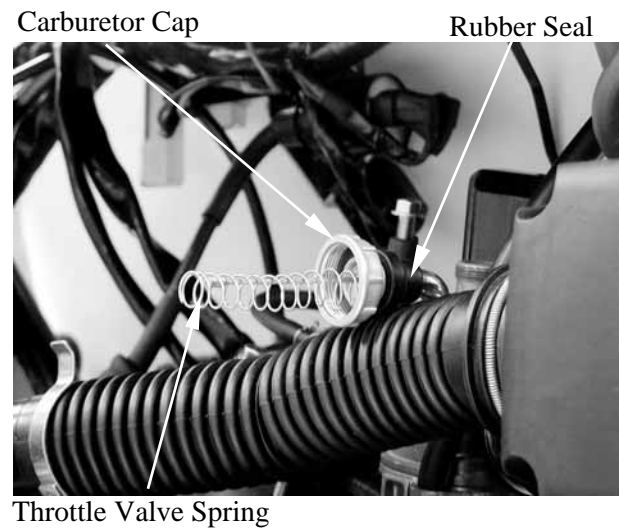
Remove the jet needle by removing the needle clip.  
Check the jet needle and throttle valve for wear or damage.



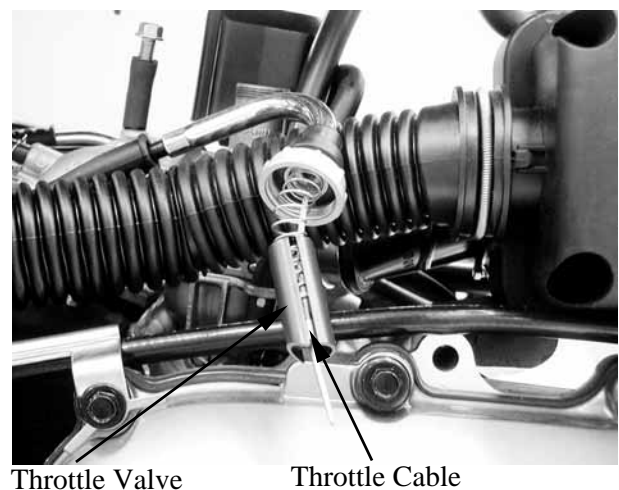
### THROTTLE VALVE INSTALLA-TION

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.



Connect the throttle cable to the throttle valve.



## 5. FUEL SYSTEM

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 (⇒3-3)
- Idle speed adjustment (⇒3-7)

Install the met-in box.



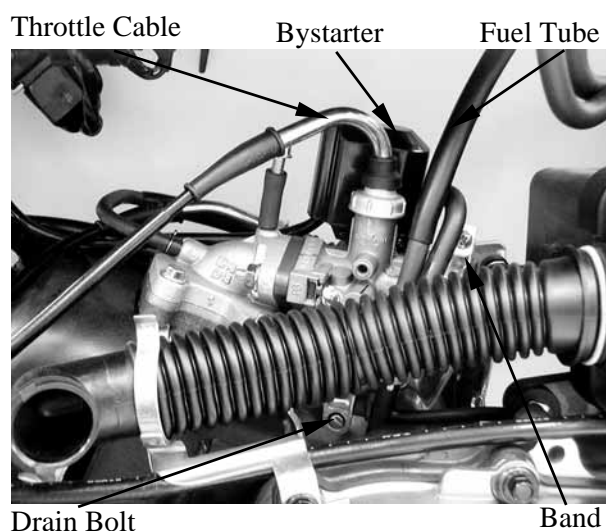
### CARBURETOR REMOVAL

Remove the air cleaner by removing the air cleaner band screw and attaching bolts.

Disconnect the fuel tube.

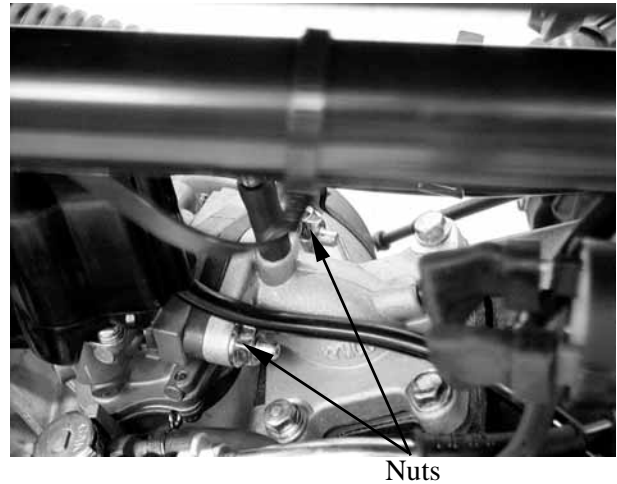
Loosen the drain bolt to drain fuel from the carburetor.

Disconnect the auto bystarter wire connector.



## 5. FUEL SYSTEM

Remove the two carburetor lock nuts.  
Remove the carburetor.



### AUTO BYSTARTER

#### AUTO BYSTARTER INSPECTION

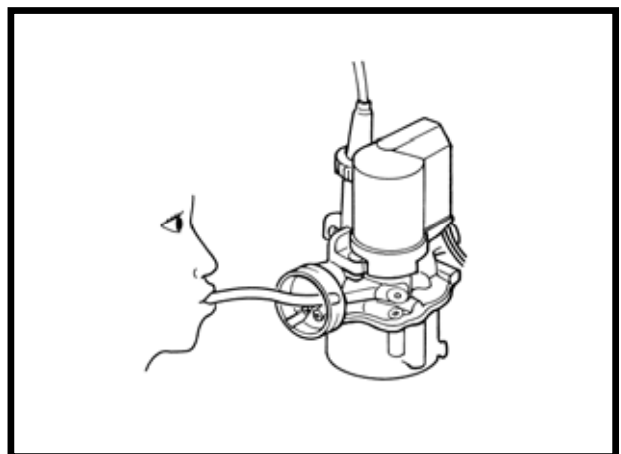
Measure the resistance between the auto bystarter wire terminals.

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

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

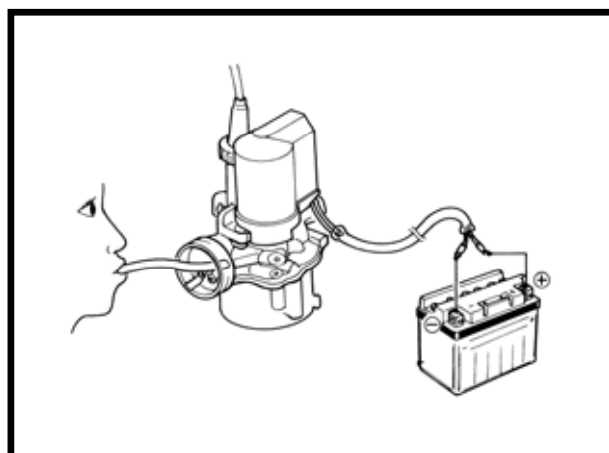


After the engine stops for 30 minutes, connect a hose to the fuel enriching circuit and blow the hose with mouth.  
If air cannot be blown into the hose (clogged), the auto bystarter is faulty.  
Replace it with a new one.



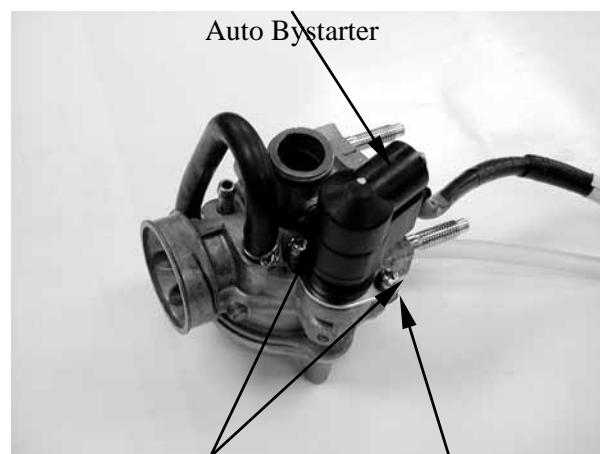
## 5. FUEL SYSTEM

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

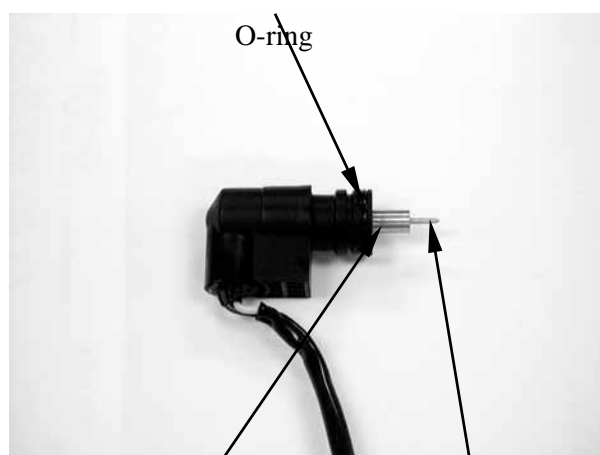
Remove the auto bystarter cover.  
Remove the two auto bystarter set plate screws to remove the auto bystarter.



Screws

Set Plate

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



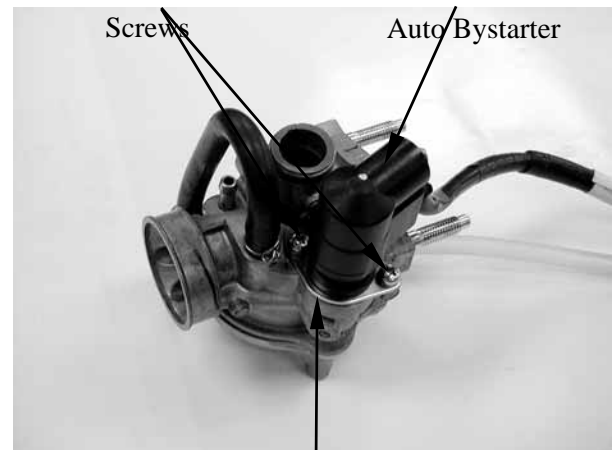
Bystarter Valve

Bystarter Needle

## 5. FUEL SYSTEM

### AUTO BYSTARTER INSTALLATION

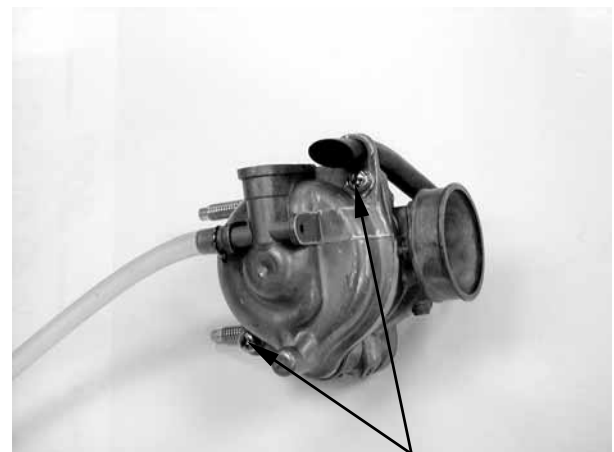
Install the auto bystarter into the carburetor body until it bottoms..  
Install the set plate and then tighten the two screws.



Set Plate

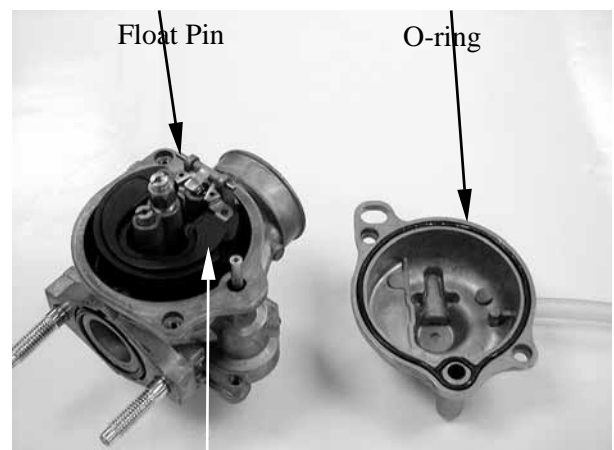
### FLOAT/FLOAT VALVE/JETS FLOAT CHAMBER

Remove the two float chamber screws and the float chamber.



Screws

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



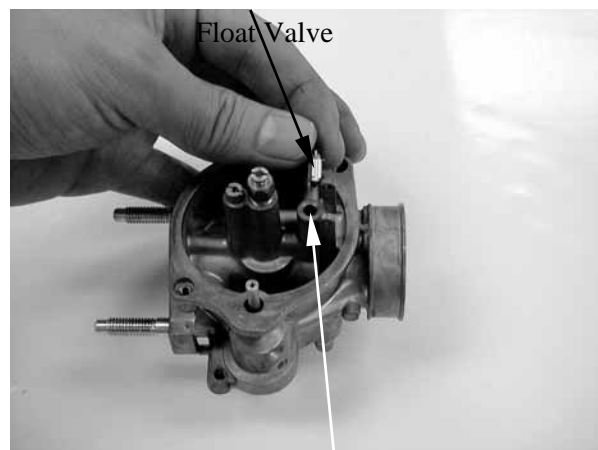
Float

## 5. FUEL SYSTEM

### FLOAT/FLOAT VALVE INSPECTION

Inspect the float for damage or fuel inside the float.

Check the float valve seat for wear or damage.



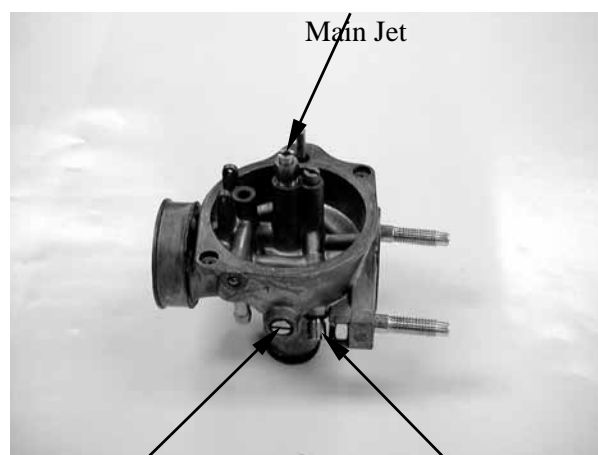
Float Seat

### JETS/SCREWS REMOVAL

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

\* Do not force the air screw against its seat to prevent damage.

Remove the main jet and needle jet holder.



Throttle Stop Screw

Air Screw

### CARBURETOR PASSAGES CLEANING

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

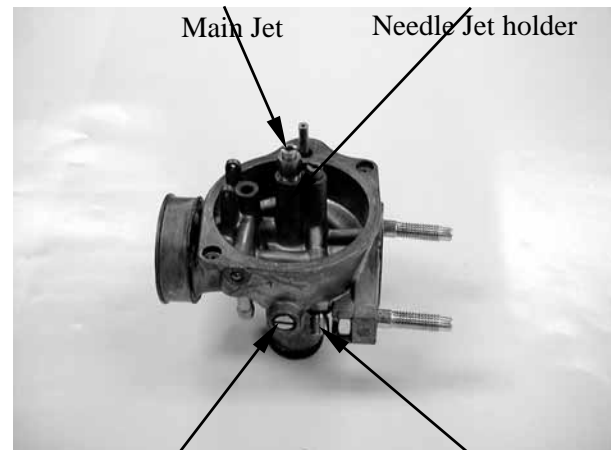


## 5. FUEL SYSTEM

### FLOAT CHAMBER ASSEMBLY

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

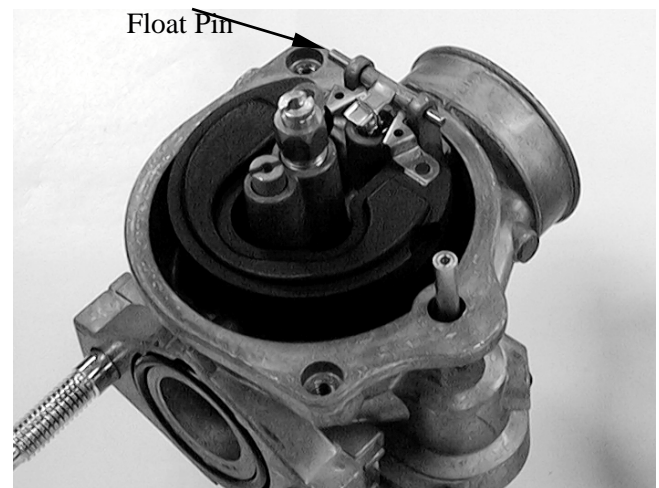
\* If the air screw must be replaced, be sure to perform the air screw adjustment again.



Throttle Stop Screw

Air Screw

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:** 8.6mm

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.





## 5. FUEL SYSTEM

### \* CARBURETOR INSTALLATION

When installation, do not allow foreign particles to enter the carburetor.

Check the carburetor insulator and O-ring for wear or damage.



Insulator

Install the carburetor and insulator onto the intake manifold and tighten the two lock nuts.

Connect the fuel tube and auto bystarter wire

\* ~~injector~~ Route the auto bystarter wire correctly and properly.

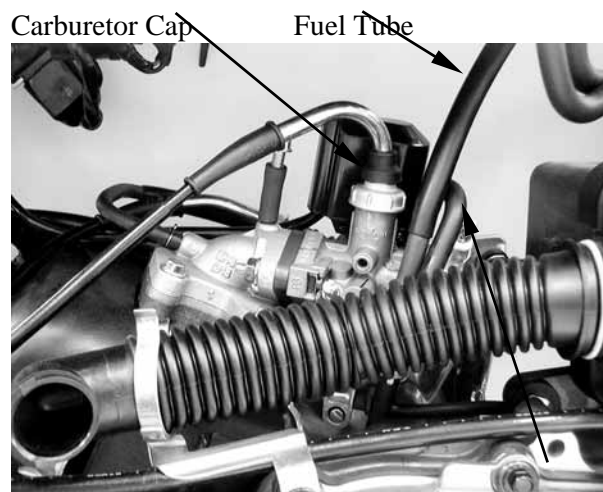


Nuts

Install the carburetor cap. (⇒5-4)

Install the fuel tube

Install the air cleaner onto the carburetor and tighten the band screw.



Band

## 5. FUEL SYSTEM

### AIR SCREW ADJUSTMENT

Turn the air screw clockwise until it seats  
\* ~~lightly and back it to the specification given.~~  
Do not force the air screw against its  
seat to prevent damage.

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



Throttle Stop Screw

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

**Idle Speed:** 2000±100rpm

**Air Screw Opening:**  $2 \pm \frac{1}{2}$  turns

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

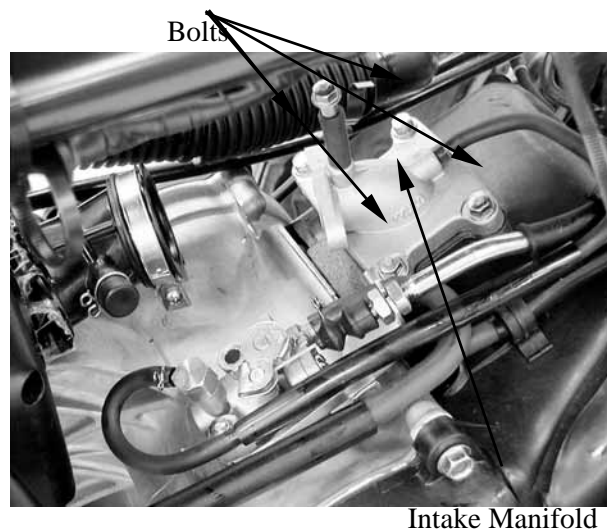
If the adjustment of the air screw within the  
range of  $\pm \frac{1}{2}$  turn makes no difference to the  
engine performance, check other related  
items.

## 5. FUEL SYSTEM

### REED VALVE

#### REMOVAL

Remove the four intake manifold bolts and gasket.  
Remove the reed valve and gasket.

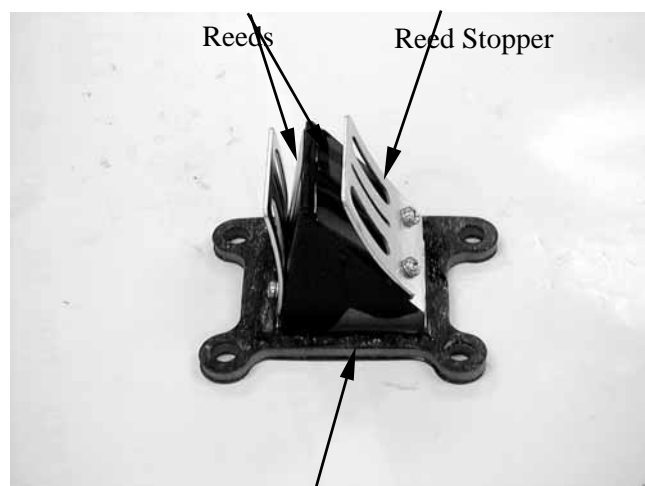


#### INSPECTION

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.

\*

Do not disassemble or bend the reed stopper. To do so can cause loss of engine power and engine damage. If any of the stopper, reed or valve seat is faulty, replace them as unit.



#### INSTALLATION

Install the reed valve in the reverse order of removal.

\*

Install a new gasket with the gasket indentation aligned with the reed valve. After installation, check for intake air leaks.

## 5. FUEL SYSTEM

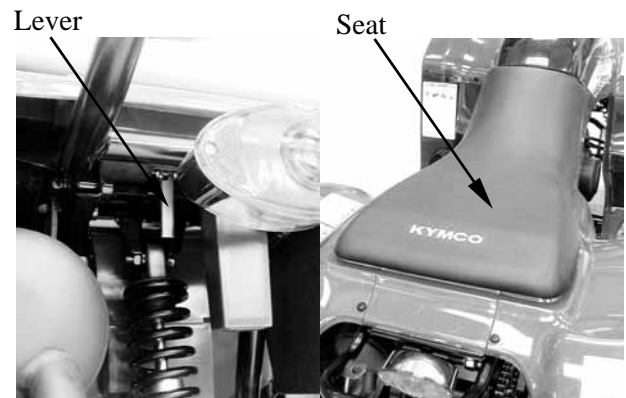
### FUEL TANK

#### FUEL TANK REMOVAL

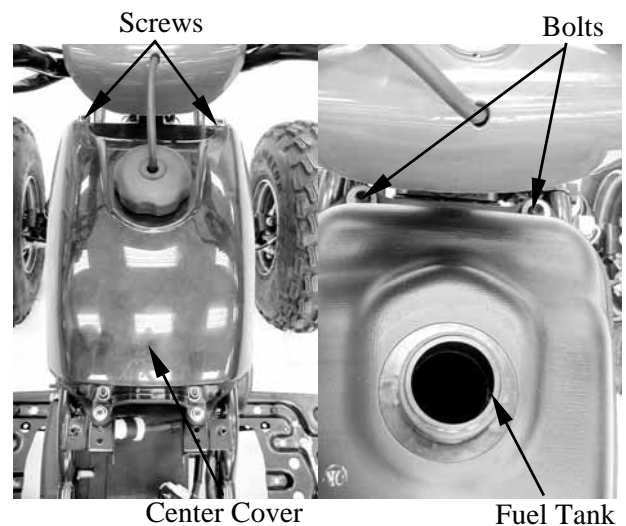
##### Warning

- Keep sparks and flames away from the work area.
- Wipe off any spilled gasoline.

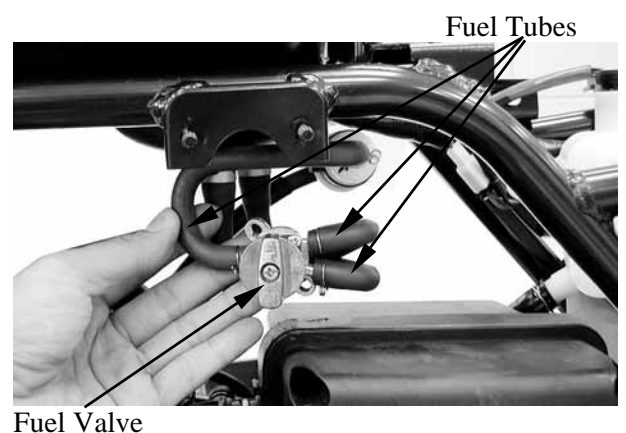
Remove the seat.  
Remove the center cover.  
Remove the right and left front fender.



Remove two bolts on the end of the fuel tank.



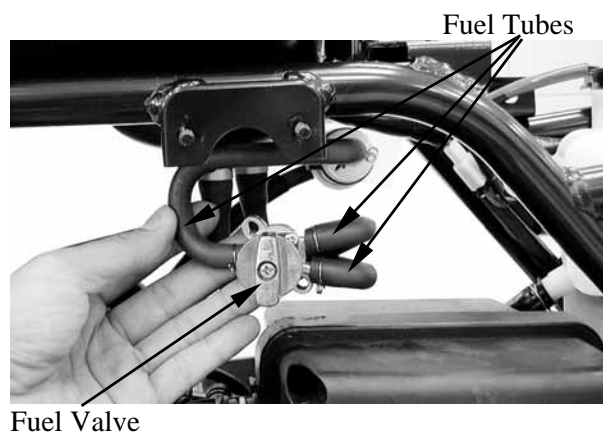
Switch the fuel valve "OFF".  
Disconnect the fuel tubes.  
Remove the fuel tank and fuel valve.



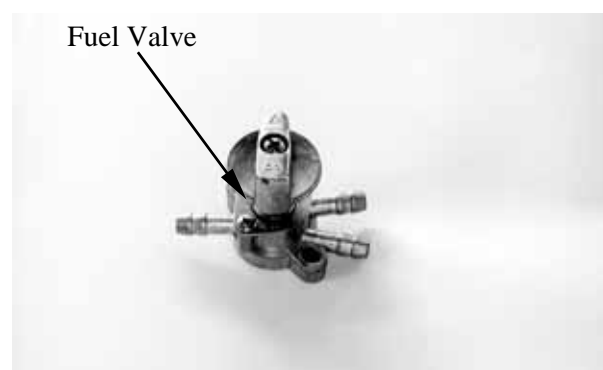
## 5. FUEL SYSTEM

### FUEL VALVE REMOVAL

Disconnect the fuel tubes and remove the bolts.



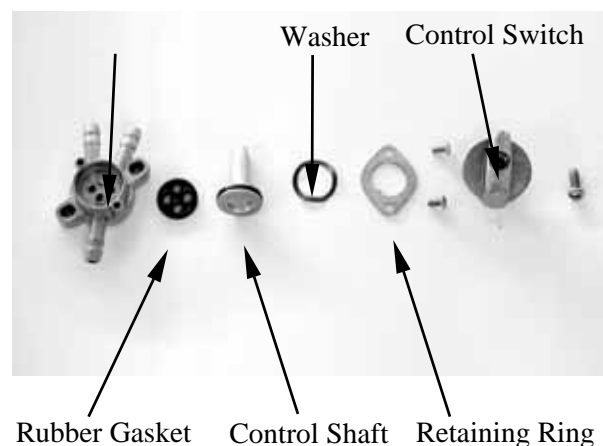
Remove the fuel valve and fuel cup.



Remove the screw on the fuel valve control switch.  
Remove the two screws on the fuel valve body.

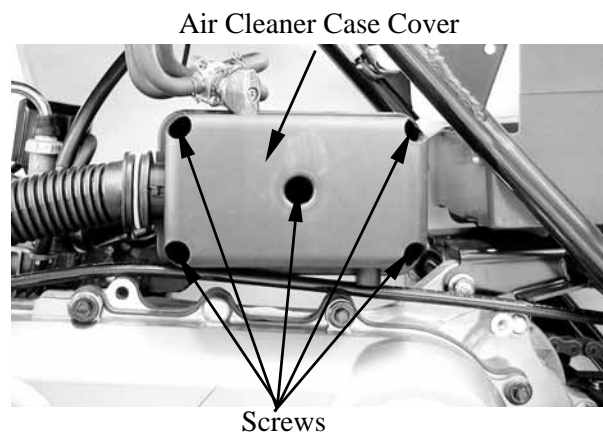
### INSPECTION

Inspect the fuel valve strainer for dirt and clog. Clean if necessary.  
Replace the O-rings with new ones if they are damaged or deteriorated.



### AIR CLEANER REMOVAL

Remove the five screws on the air cleaner case cover and the cover.  
Remove the air cleaner screen and element.



## **5. FUEL SYSTEM**

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ENGINE REMOVAL/INSTALLATION



SERVICE INFORMATION----- 6- 1

ENGINE REMOVAL ----- 6- 2

ENGINE INSTALLATION ----- 6- 4

## **6. ENGINE REMOVAL/INSTALLATION**

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### **SERVICE INFORMATION**

#### **GENERAL INSTRUCTIONS**

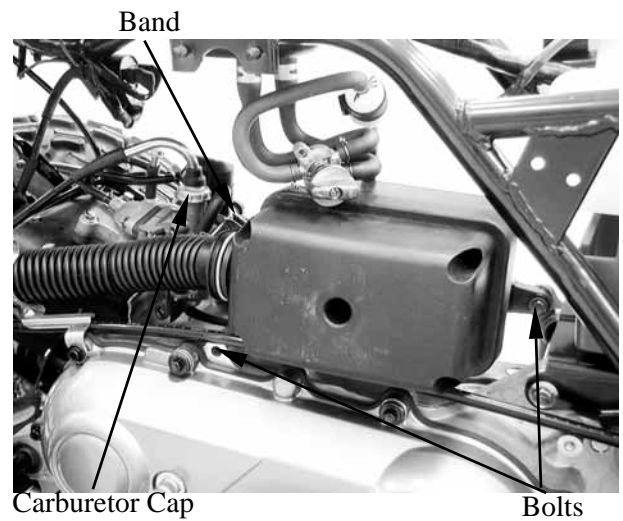
- A floor jack or other adjustable support is required to support and maneuver the engine. Be careful not to damage the machine body, cables and wires during engine removal.
- Use shop towels to protect the motorcycle body during engine removal.
- Parts requiring engine removal for servicing:
  - Crankcase
  - Crankshaft



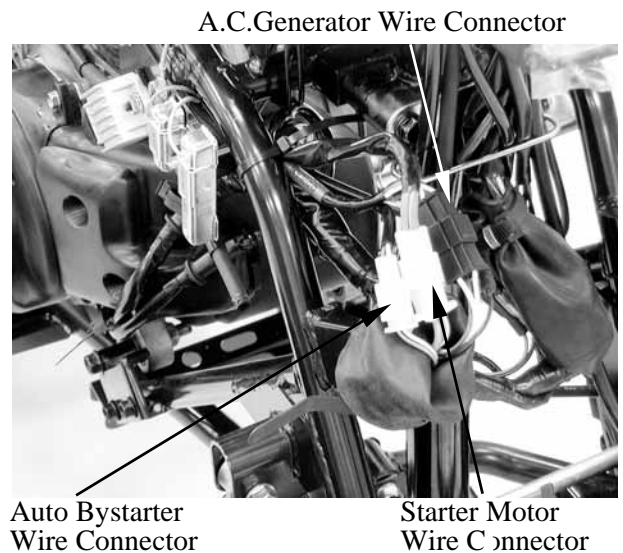
## 6. ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

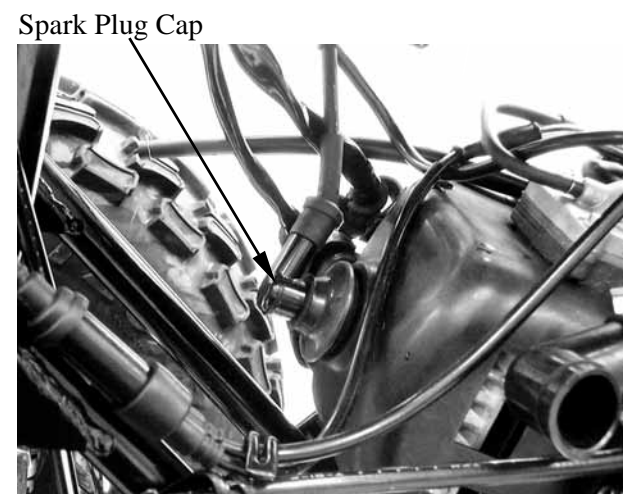
Remove the two bolts attaching the air cleaner case.  
Loosen the band between the air cleaner and carburetor to remove the air cleaner case.  
Remove the carburetor cap.



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



Remove the spark plug cap.

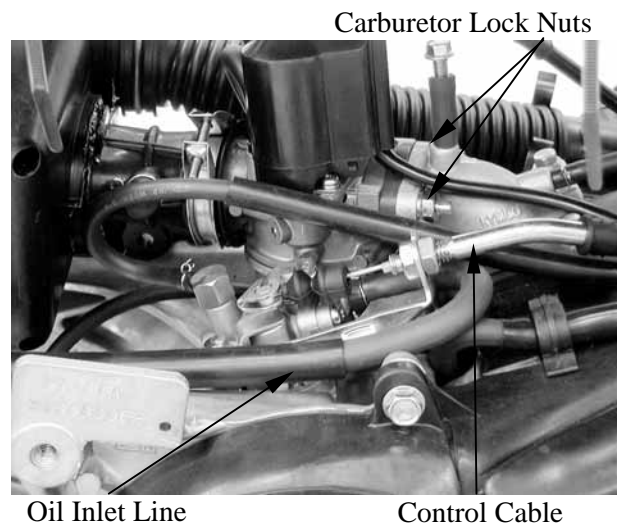


## 6. ENGINE REMOVAL/INSTALLATION

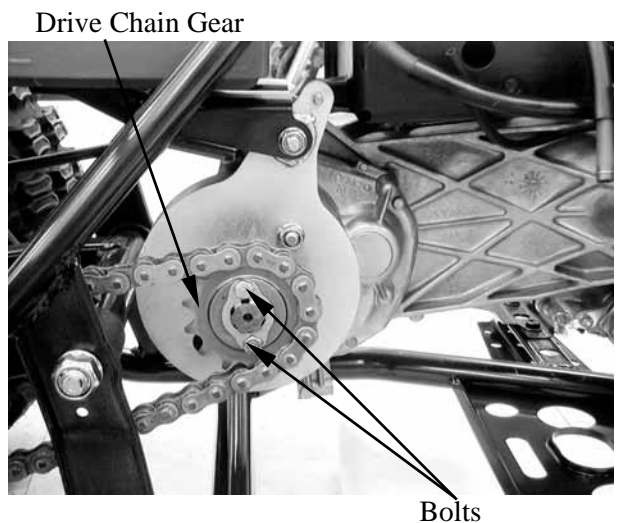
Disconnect the oil pump control cable from the pump body.  
Disconnect the oil inlet line from the oil pump.

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

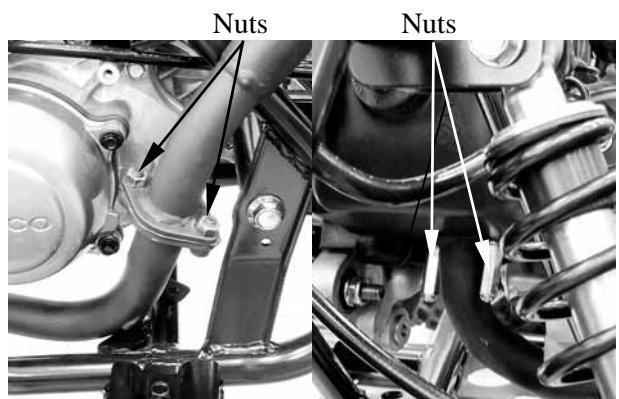
Remove the two carburetor lock nuts.  
Remove the carburetor.



Remove the rear drive chain gear on the bolts.  
Remove the drive chain gear.



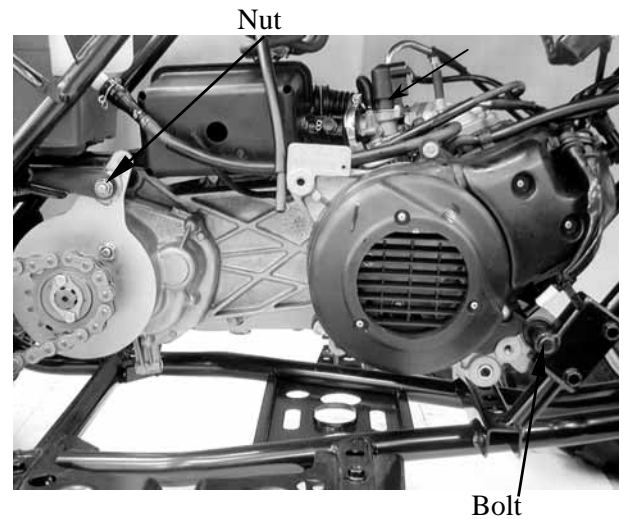
Remove the two nuts attaching the exhaust muffler.  
Remove the two nuts attaching the exhaust pipe.  
Remove the exhaust muffler lock bolts.  
Remove the exhaust muffler and exhaust pipe. (⇒2-5)



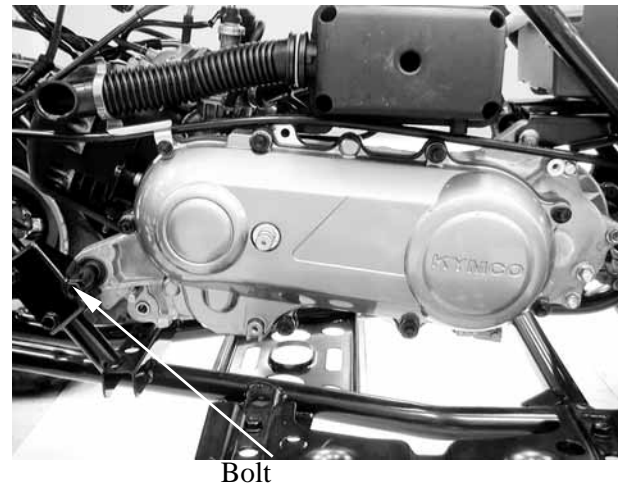
## 6. ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Remove the engine any connector thing.  
Remove the engine back bracket bolt, nut and collar.  
Remove the engine front right bracket bolt and nut.



Remove the engine front left bracket bolt and nut.



### ENGINE INSTALLATION

Install the engine and tighten the engine mounting bolts.

**Torque:** 3.5~4.5kgf-m

Install the removed parts in the reverse order of removal.

\* Route the wires and cables properly.



**7. CYLINDER HEAD/CYLINDER/PISTON** MX'er 50

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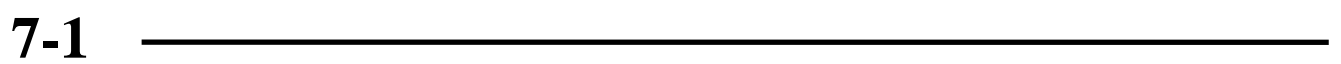
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**CYLINDER HEAD/CYLINDER/PISTON**

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SERVICE INFORMATION-----	7-2
TROUBLESHOOTING-----	7-2
CYLINDER HEAD-----	7-3
CYLINDER/PISTON -----	7-6

## 7. CYLINDER HEAD/CYLINDER/PISTON



## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

### 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	MX'er 50	
	Standard (mm)	Service Limit (mm)
Cylinder head warpage	—	0.10
Piston O.D.(5mm from bottom of piston	38.970~38.955	38.90
Cylinder-to- piston clearance	0.03~0.07	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	0.002~0.014	0.03
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

## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

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### CYLINDER HEAD

#### REMOVAL

Remove the spark plug cap.

Remove the exhaust muffler. (⇒2-5)

Spark Plug Cap

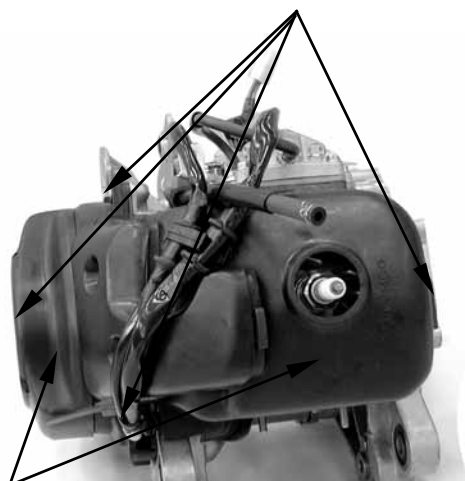


Remove the three bolts attaching the fan cover to remove the fan cover.

Remove the bolt attaching the engine hood to remove the engine hood.

The installation sequence is the reverse of removal.

Bolts



Fan Cover/Engine Hood

Remove the spark plug.

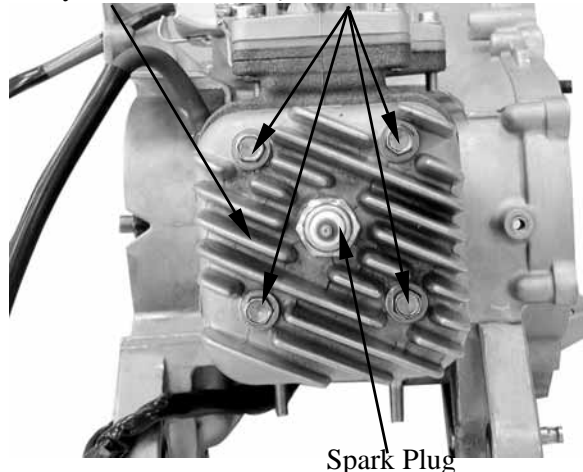
Remove the cylinder head bolts and the cylinder head.

**\***

Loosen the bolts diagonally in 2 or 3 times.

Remove the cylinder head gasket.

Cylinder Head    Cylinder head Bolts



Spark Plug

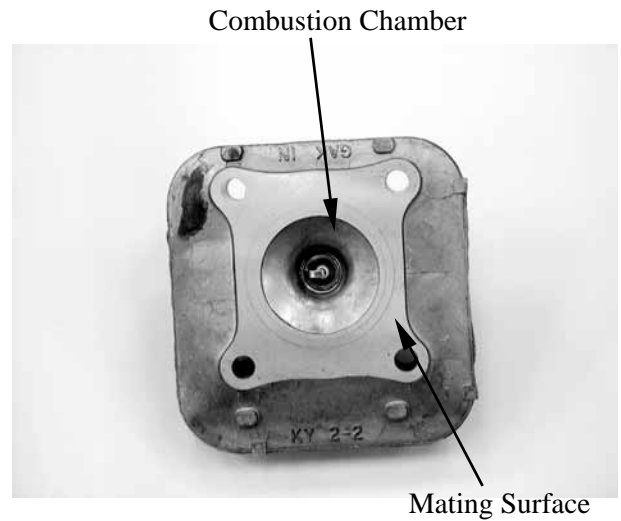
## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

### COMBUSTION CHAMBER DECARBONIZING

Remove the carbon deposits from the combustion chamber

\*

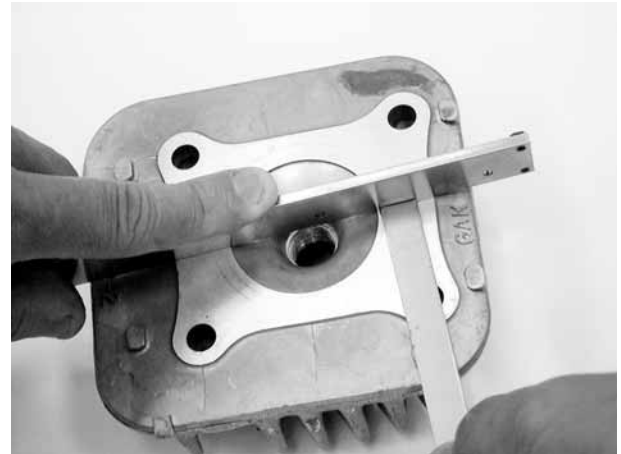
Avoid damaging the combustion chamber wall and cylinder mating surface.



### CYLINDER HEAD INSPECTION

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

**Service Limit:** 0.10mm replace if over



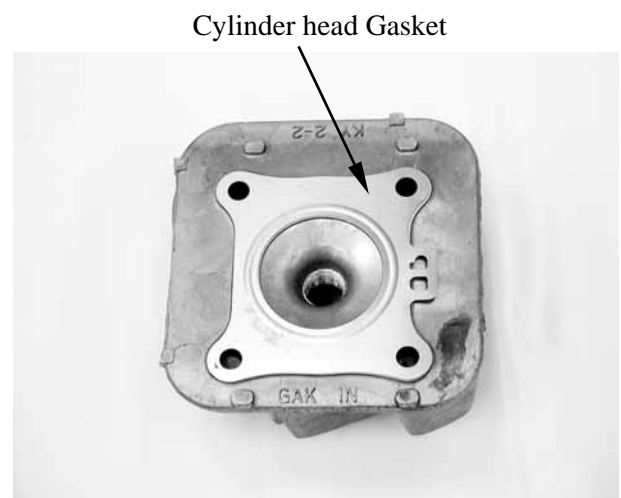
### CYLINDER HEAD INSTALLATION

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.





## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

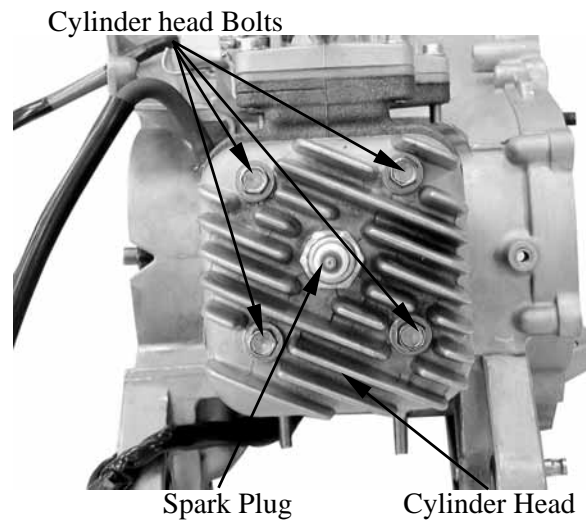
### Cylinder Head Bolts Installation

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



### Engine Hood Installation

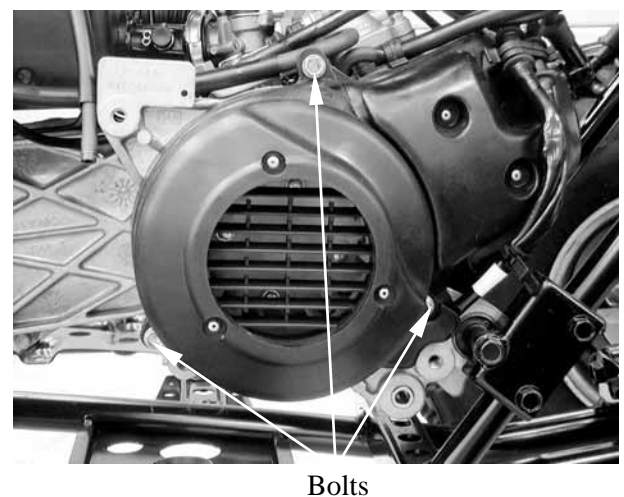
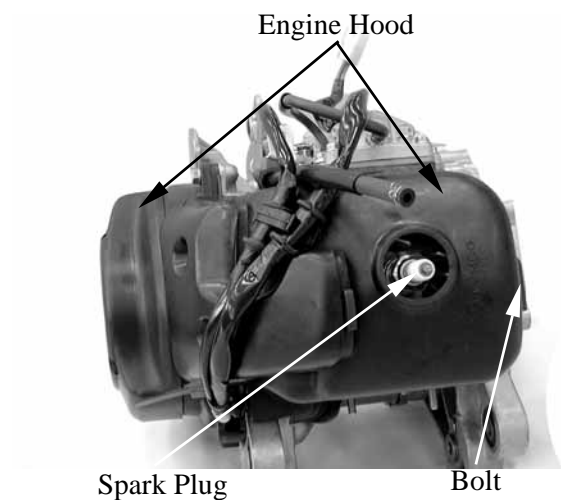
Install the engine hood. (⇒7-3)

Install the spark plug cap. (⇒7-3)

Install the exhaust muffler. (⇒7-3)

Perform the following inspections after installation:

- Compression test
- Abnormal engine noise
- Cylinder air leaks



## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

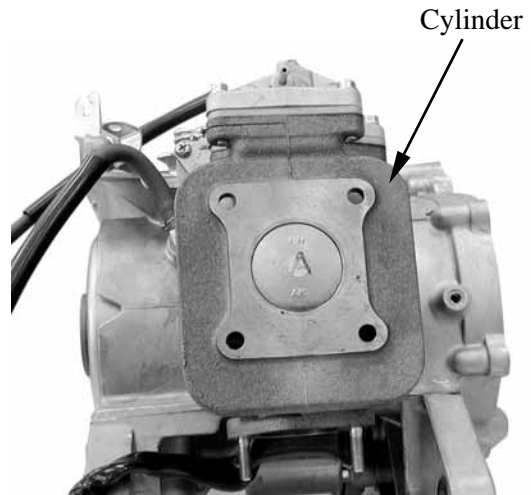
### CYLINDER/PISTON

#### CYLINDER REMOVAL

Remove the cylinder head.  
Remove the cylinder.  
Remove the cylinder gasket.



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

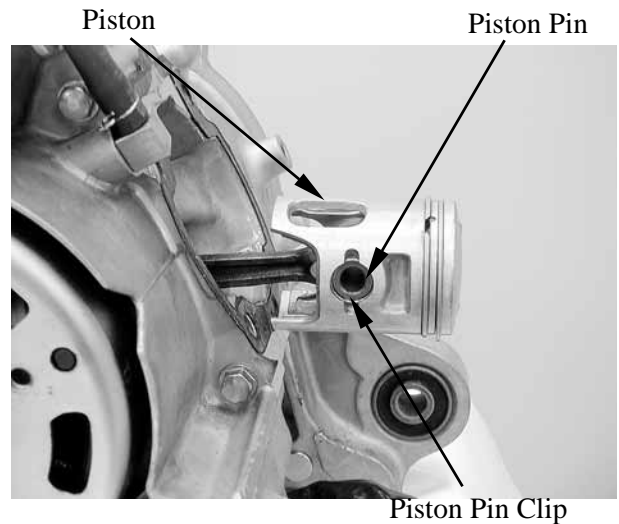


### PISTON REMOVAL

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 from falling into the crankcase.



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



## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

### CYLINDER/PISTON INSPECTION

Check the cylinder and piston for wear or damage.

Clean carbon deposits from the exhaust port area.

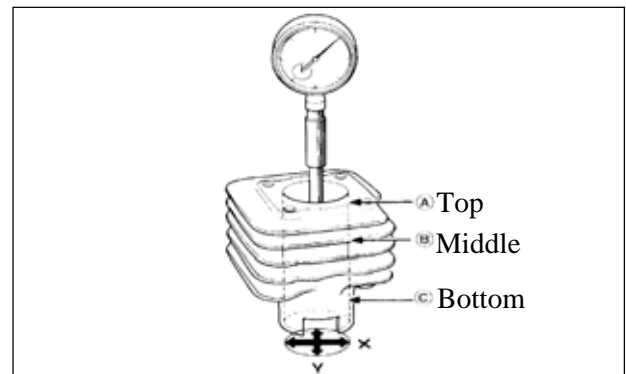
**\***

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



## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

\*

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.

A Mark



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



## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

### 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.

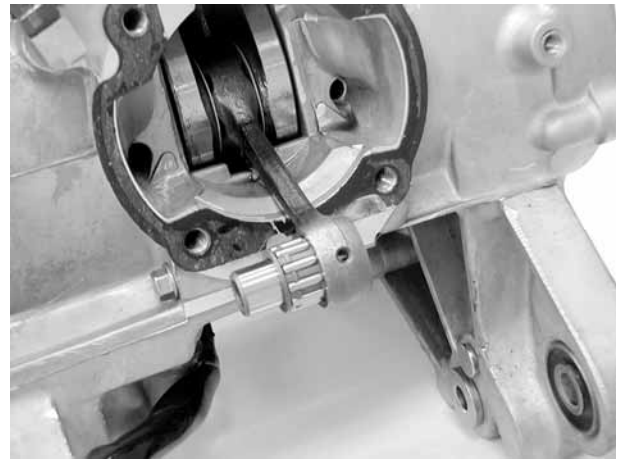


### CONNECTING ROD SMALL END INSPECTION

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



### PISTON/CYLINDER INSTALLATION

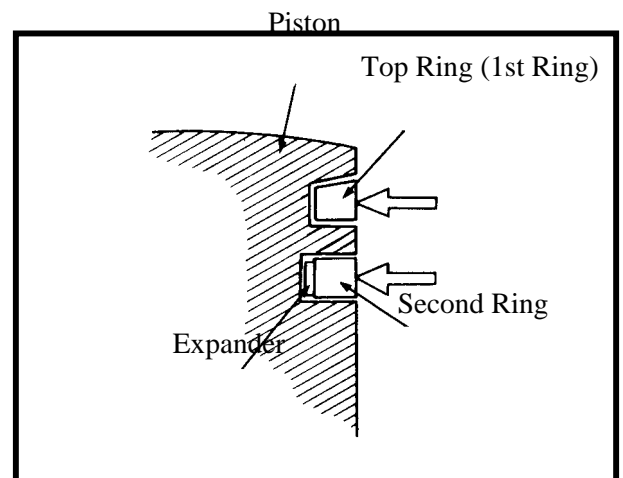
First install the expander in the second ring groove.

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

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

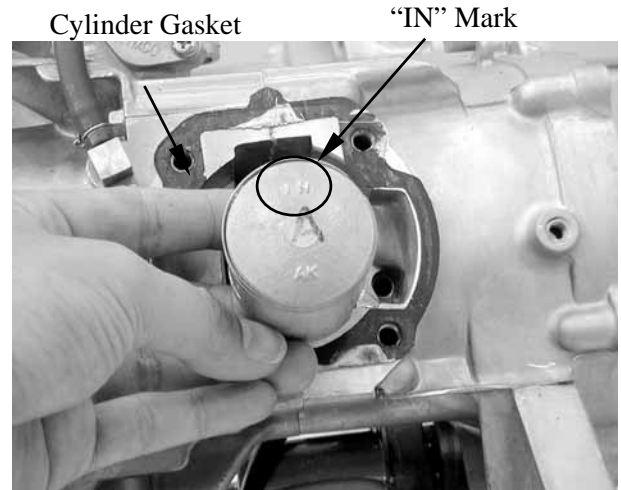
After installation, check and make sure that each ring is flush with the piston at several points around the ring.

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



## 7. CYLINDER HEAD/CYLINDER/PISTON MX'er 50

Install a new cylinder gasket on the mating surface between the cylinder and crankcase. Position the piston "IN" mark on the intake valve side.



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

The installation sequence is the reverse of removal .



**A.C. GENERATOR**

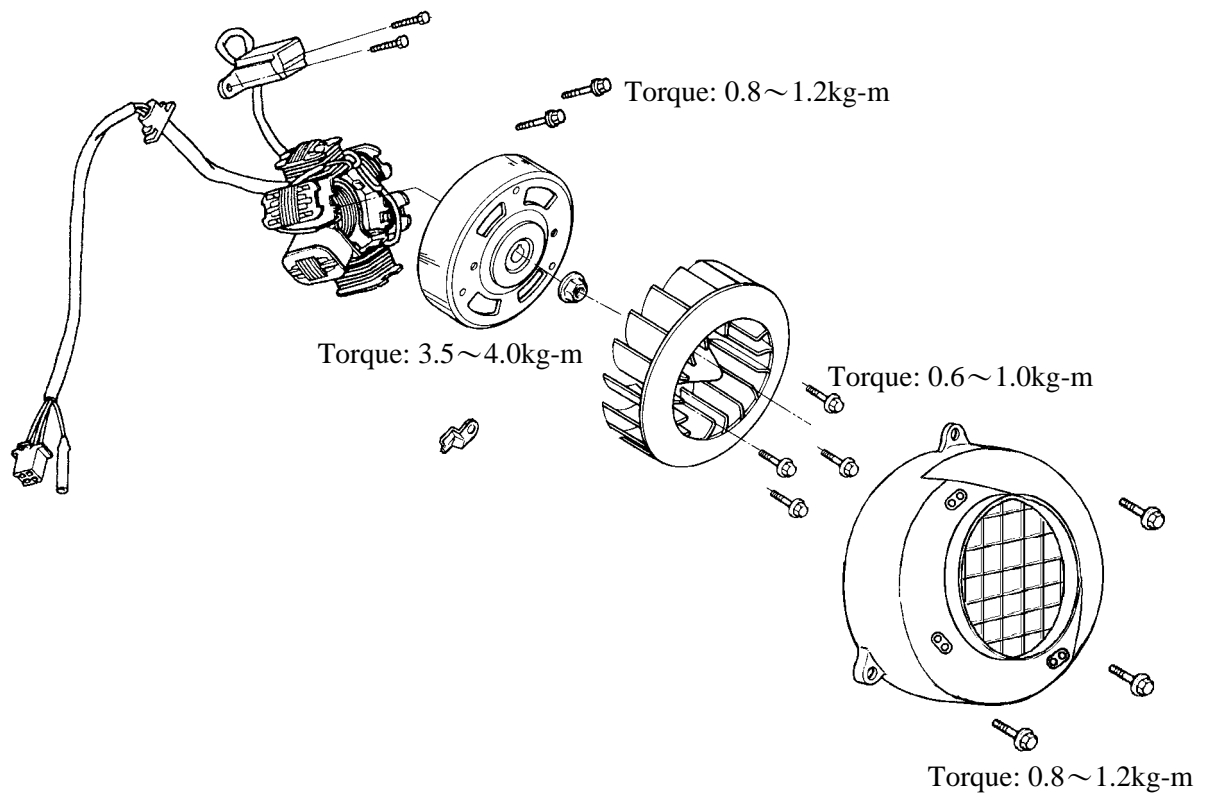
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A.C. GENERATOR REMOVAL..... 8-3

A.C. GENERATOR INSTALLATION ..... 8-4



## 8. A.C. GENERATOR





## **8. 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 14, 15 for A.C. generator inspection.

#### **TORQUE VALUE**

Flywheel nut : 3.5~4.0kg-m

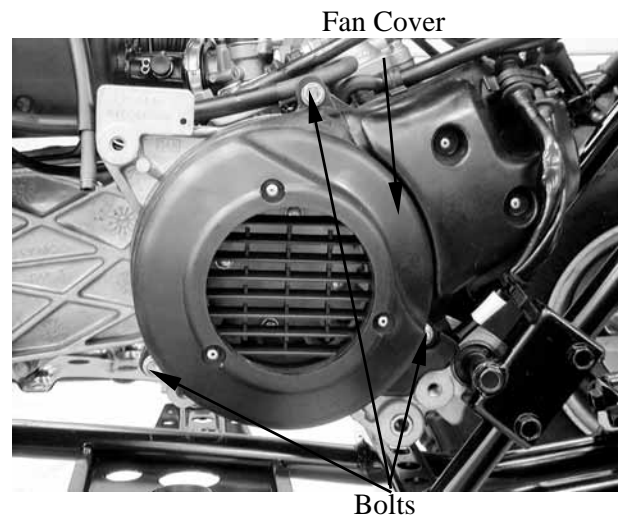
#### **SPECIAL TOOLS**

Flywheel puller  
Universal holder

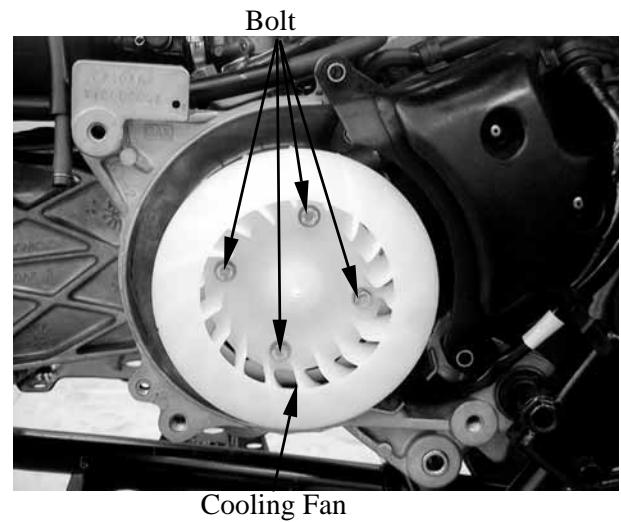
## 8. A.C. GENERATOR

### A.C. GENERATOR REMOVAL

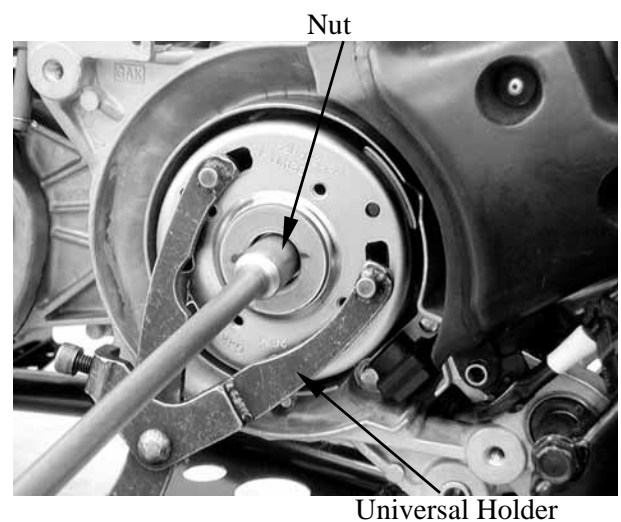
Remove the three bolts attaching the fan cover to remove the fan cover.



Remove the cooling fan by removing the four bolts.

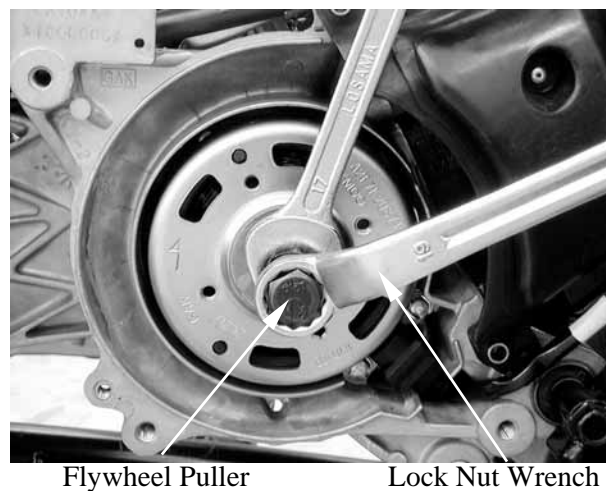


Hold the flywheel with an universal holder and then remove the flywheel nut.

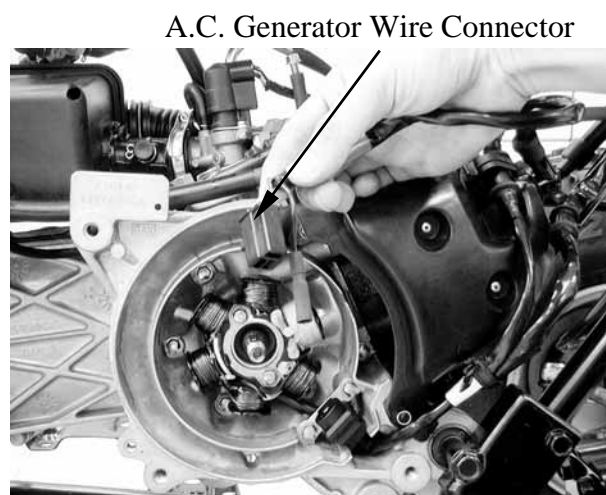


## 8. A.C. GENERATOR

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



Remove the A.C. generator wire connector.

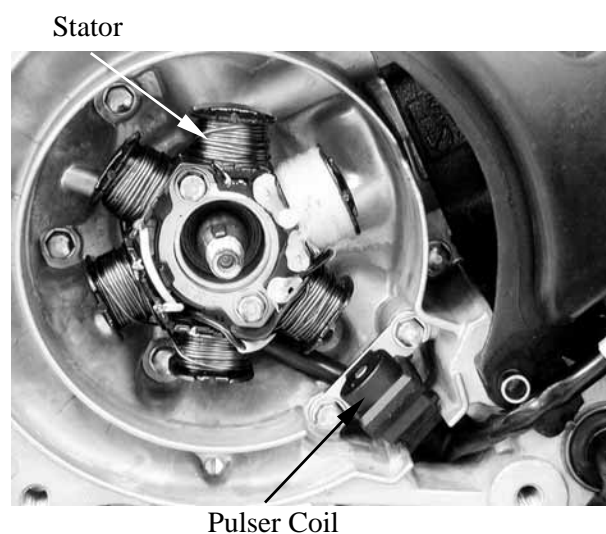


Remove the two pulser coil bolts and pulser coil from the right crankcase.  
Remove the two bolts attaching the A.C. generator stator.

\* 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.



## 8. A.C. GENERATOR

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 key way.

Woodruff Key



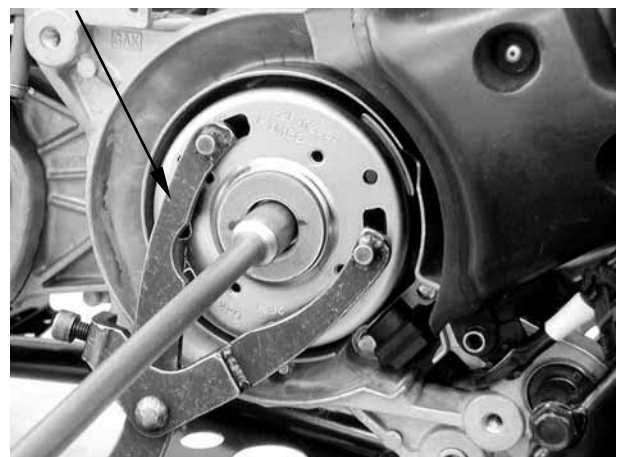
Install the flywheel onto the crankshaft with the flywheel groove aligned with the crankshaft woodruff key.  
Hold the flywheel with the universal holder and install the 10mm flywheel flange nut.

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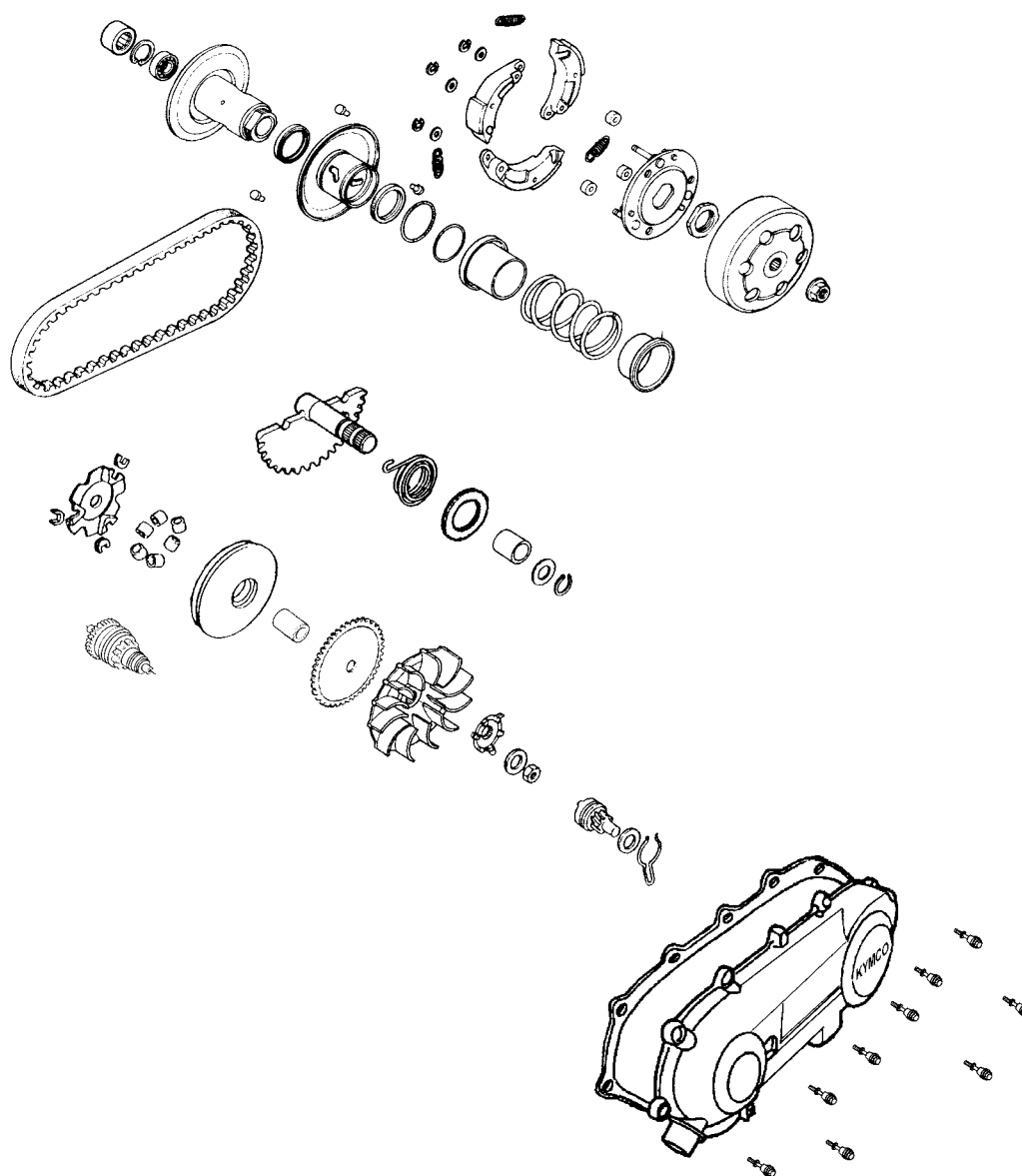
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KICK STARTER/DRIVE PULLEY/  
CLUTCH/DRIVEN PULLEY

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DRIVE BELT .....	9-7
DRIVE PULLEY .....	9-9
STARTER PINION .....	9-11
CLUTCH/DRIVEN PULLEY .....	9-12

**MX'er 50**

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



MX'er 50

### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

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

SPECIFICATIONS	MX'er 50	
	Standard (mm)	Service Limit (mm)
Drive pulley collar O.D.	20.01 ~ 20.025	19.97
Movable drive face I.D.	20.035 ~ 20.085	20.24
Weight roller O.D.	13.0	12.4
Clutch outer I.D.	107 ~ 107.2	107.5
Driven face spring free length	98.1	92.8
Driven face O.D.	33.965 ~ 33.985	33.94
Movable driven face I.D.	34.0 ~ 34.25	34.4
Drive belt width	17.5	16.5

#### 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

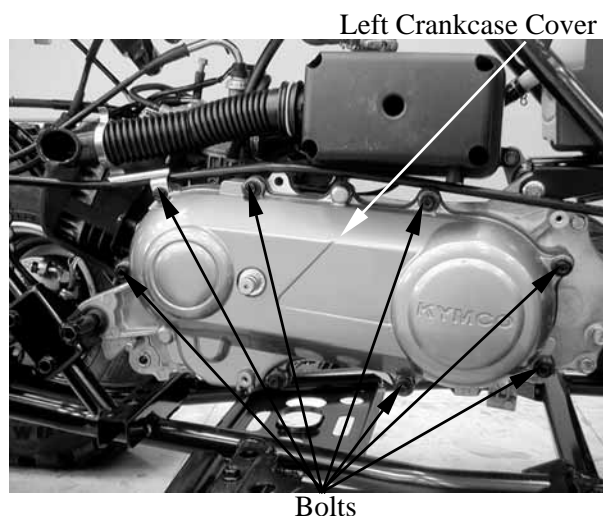
## 9. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

### KICK STARTER

#### LEFT CRANKCASE COVER REMOVAL

Remove the left crankcase cover bolts, left crankcase cover and dowel pins.

Inspect the left crankcase cover seal rubber for damage or deterioration.



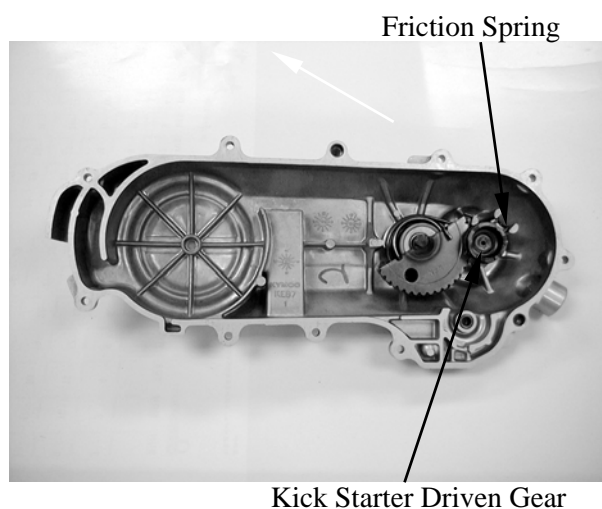
#### KICK STARTER SPINDLE REMOVAL

Remove the kick lever from the kick starter spindle.

Remove the circlip and washer from the kick starter spindle.



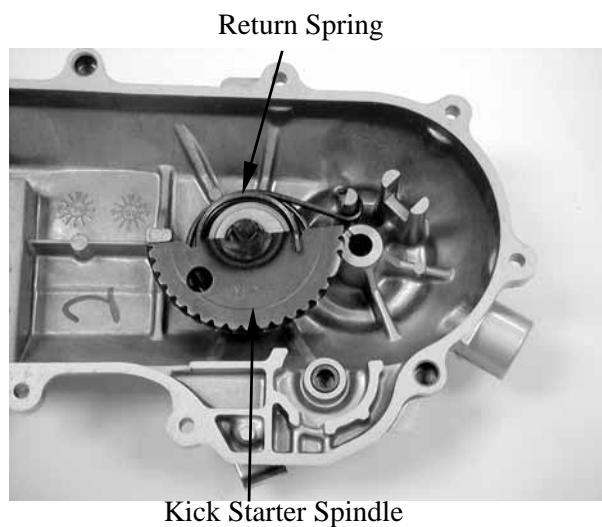
Slightly rotate the kick starter spindle to remove the kick starter driven gear together with the friction spring.





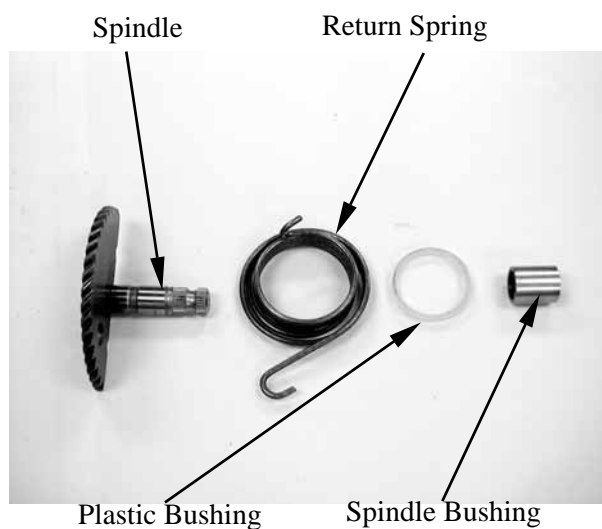
## 9. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

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.



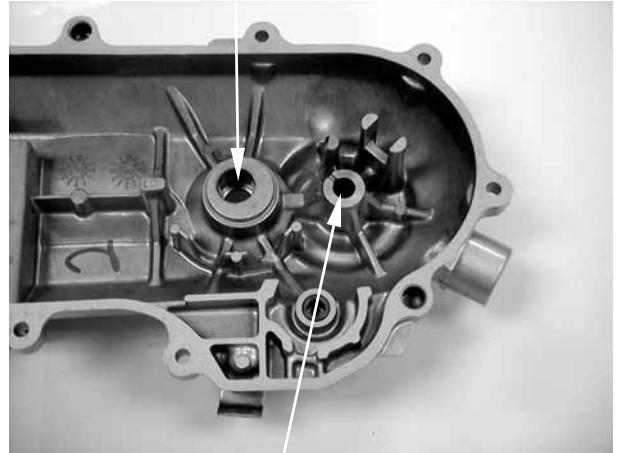
Check the kick starter driven gear for wear or damage.  
Check the friction spring for wear or damage.



## 9. 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



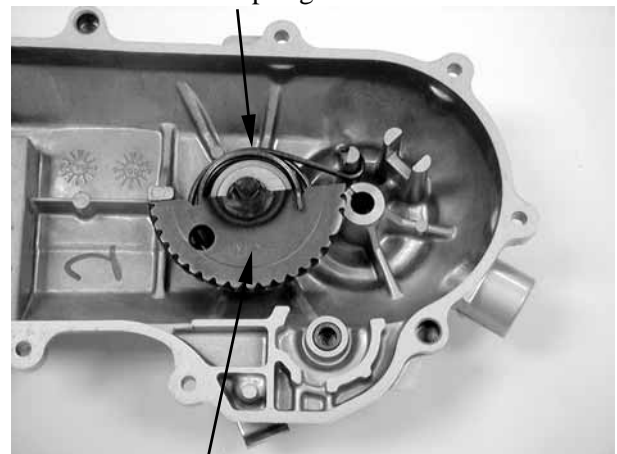
Kick Starter Driven Gear Forcing Part

### 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.

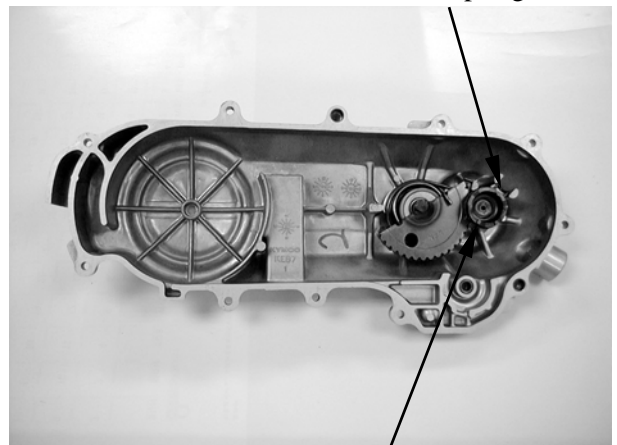
Friction Spring



Kick Starter Spindle

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

Friction Spring



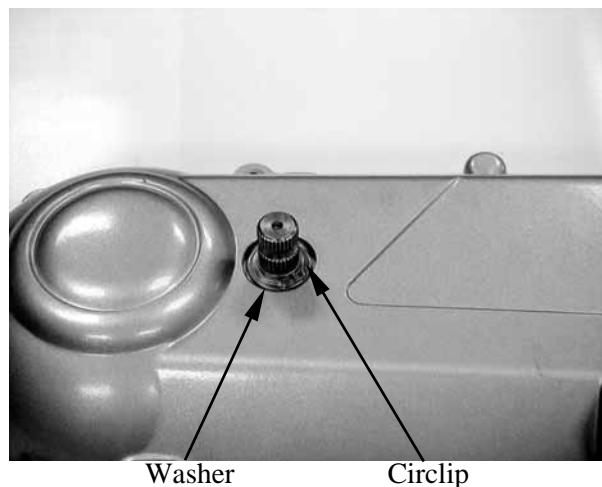
Kick Starter Driven Gear

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



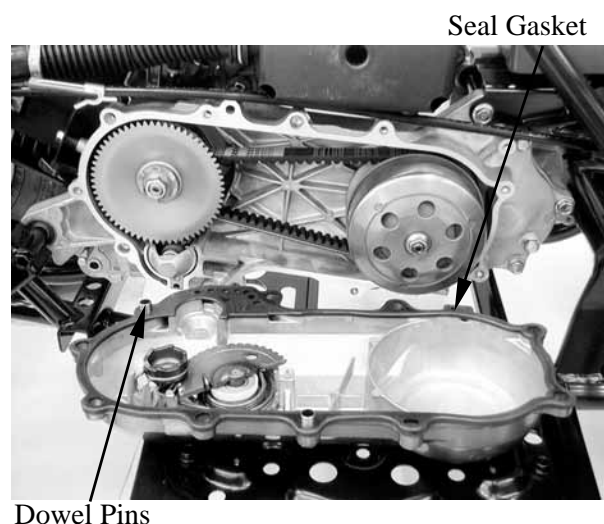
MX'er 50

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



### LEFT CRANKCASE COVER INSTALLATION

First install the dowel pins and then the seal gasket.



Install the left crankcase cover and tighten the ten bolts diagonally.

\*

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

Rear Brake Cable Clamp



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

### DRIVE BELT

Remove the left crankcase cover.

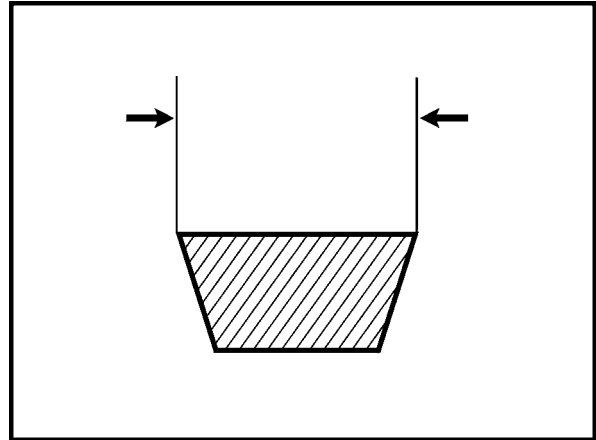
### INSPECTION

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

Measure the drive belt width.

**Service Limit:** 16.5mm replace if below

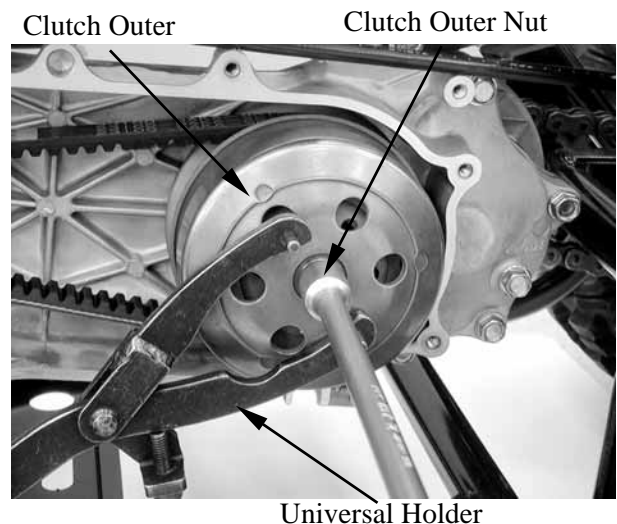
\* Use specified genuine parts for replacement.



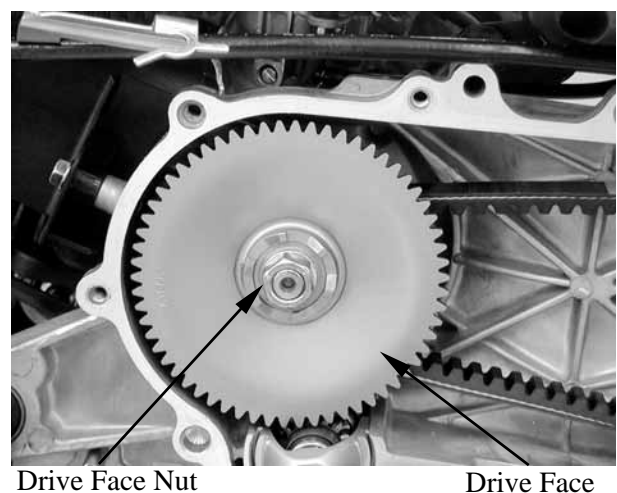
### REPLACEMENT

Remove the left crankcase cover bolts and left crankcase cover. (⇒9-3)

Hold the clutch outer with the universal holder and remove the clutch outer nut and clutch outer.



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

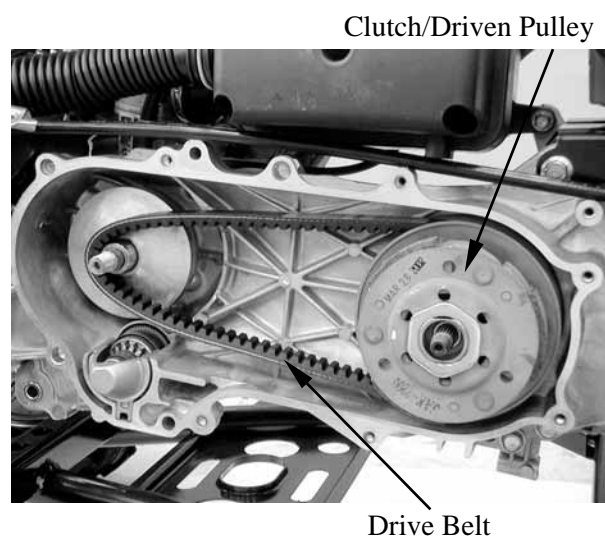


## 9. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY



MX'er 50

Remove the drive belt from the clutch/ driven pulley.

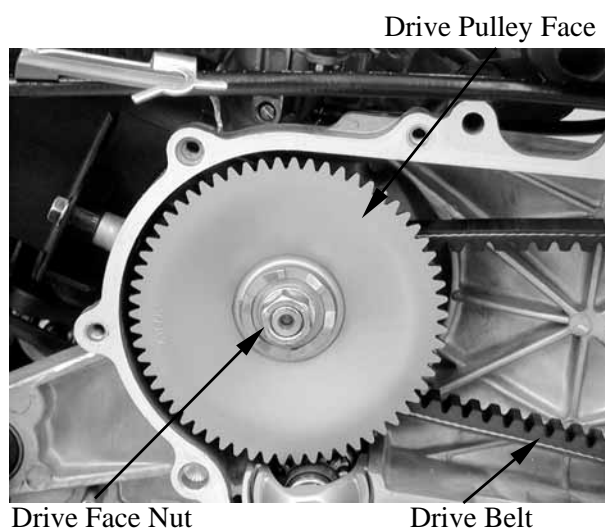


### DRIVE BELT INSTALLATION

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



Set the drive belt on the drive pulley.  
Install the drive pulley face, then tighten the drive face nut.



## 9. 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 drive pulley face.

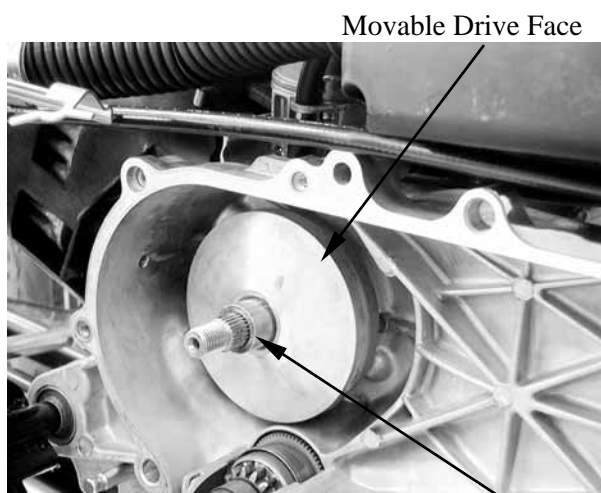


Drive Face Nut

Drive Pulley Face

#### MOVABLE DRIVE FACE DISASSEMBLY

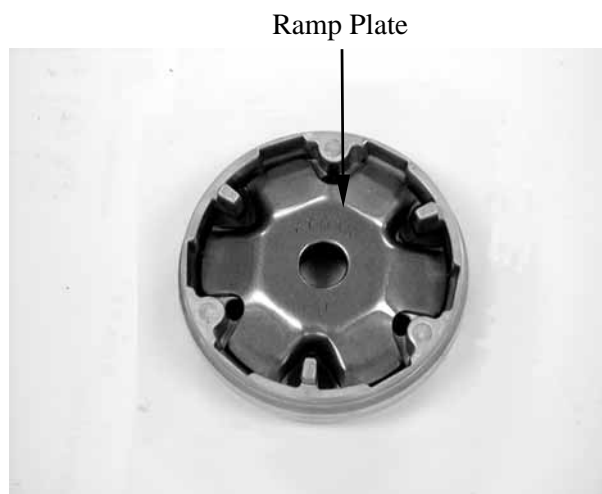
Remove the movable drive face and drive pulley collar from the crankshaft.



Movable Drive Face

Drive Pulley Collar

Remove the ramp plate.



Ramp Plate

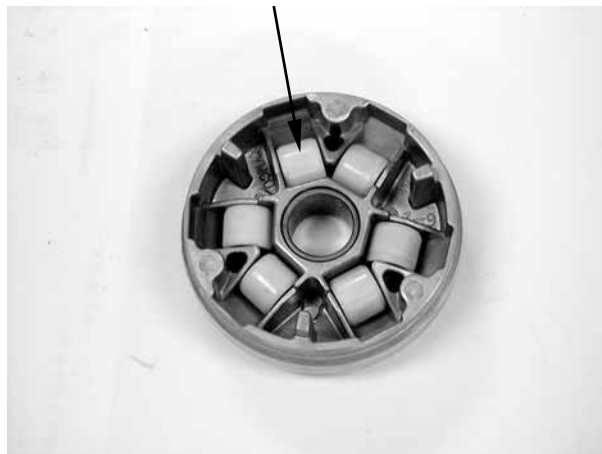
## 9. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY



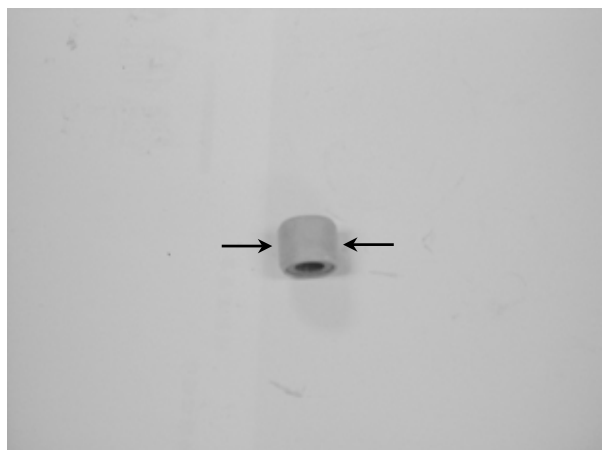
MX'er 50

Remove the weight rollers.

Weight Roller



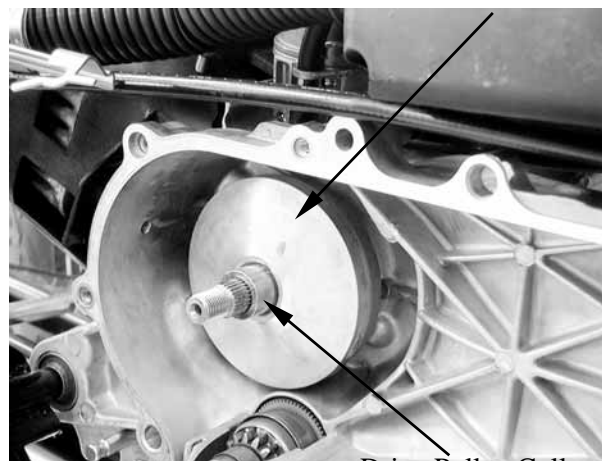
Remove the weight rollers.  
Check each weight roller for wear or damage.  
Measure each roller O.D.  
**Service Limit:** 12.4mm replace if below



### DRIVE PULLEY INSTALLATION

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

Movable Drive Face



Drive Pulley Collar

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

Install the drive belt on the crankshaft.  
Install the drive face, then tighten the drive  
face nut.

**Torque:** 3.5~4.0kg-m

**\***

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



Drive Face Nut

Drive Pulley Face

### STARTER PINION

#### REMOVAL

Remove the left crankcase cover. (⇒9-3)

Remove the drive pulley. (⇒9-9)

Remove the starter pinion cover.

Remove the starter pinion.



Starter Pinion Cover

#### INSPECTION

Inspect the starter pinion seat for wear.

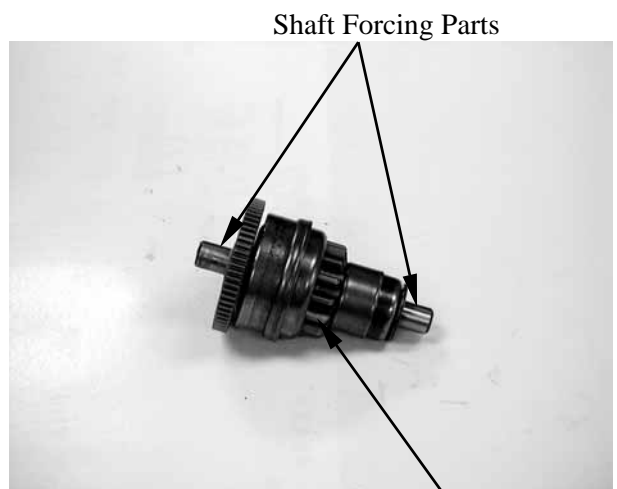
Inspect the starter pinion for smooth  
operation.

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.



Starter Pinion



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



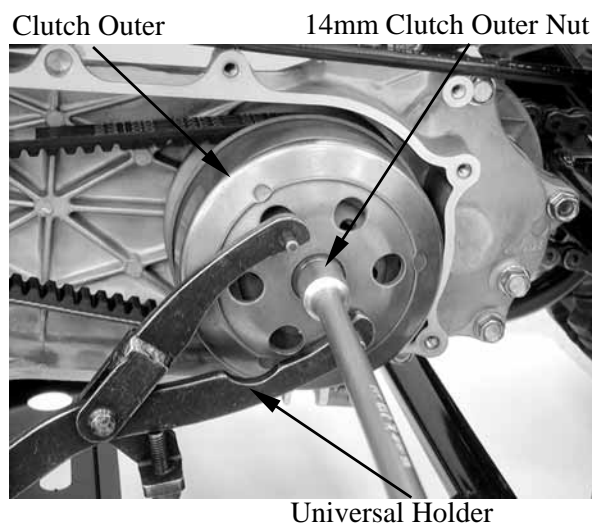
MX'er 50

### CLUTCH/DRIVEN PULLEY CLUTCH/DRIVEN PULLEY REMOVAL

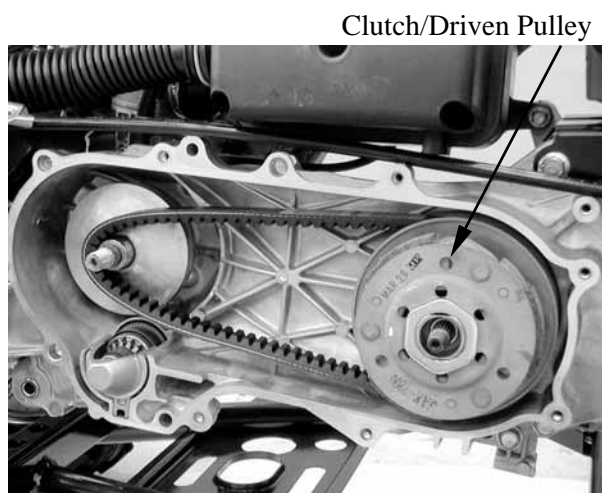
Remove the drive pulley. (⇒9-9)

Hold the clutch outer with the universal holder and remove the clutch outer nut

Remove the clutch outer.



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



### CLUTCH/DRIVEN PULLEY DIS- ASSEMBLY

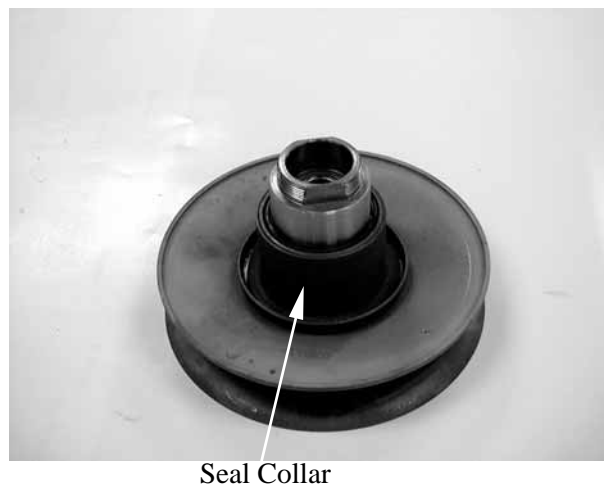
Compress the clutch/driven pulley spring with the clutch spring compressor and remove the 39mm drive plate nut.

Remove the driven face spring.

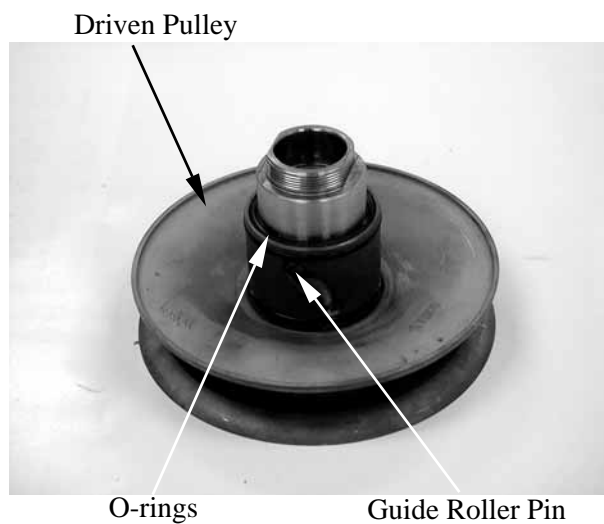


## 9. KICK STARTER/DRIVE PULLEY/ CLUTCH/DRIVEN PULLEY

Remove the seal collar.



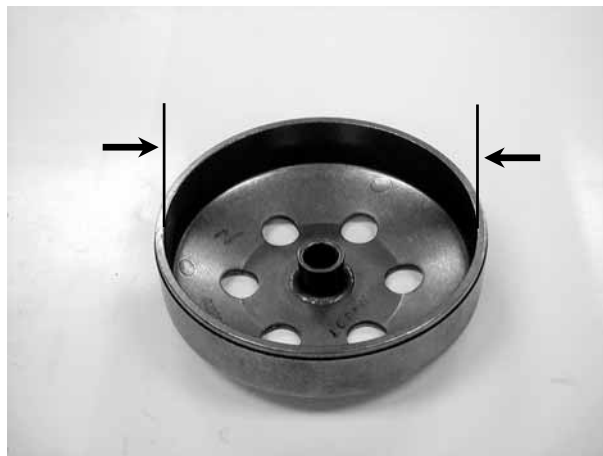
Pull out the guide roller pins from the driven pulley and then remove the O-rings and oil seal from the driven pulley.



### CLUTCH/DRIVEN PULLEY INSPECTION

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

**Service Limit:** 107.5mm replace if over



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



MX'er 50

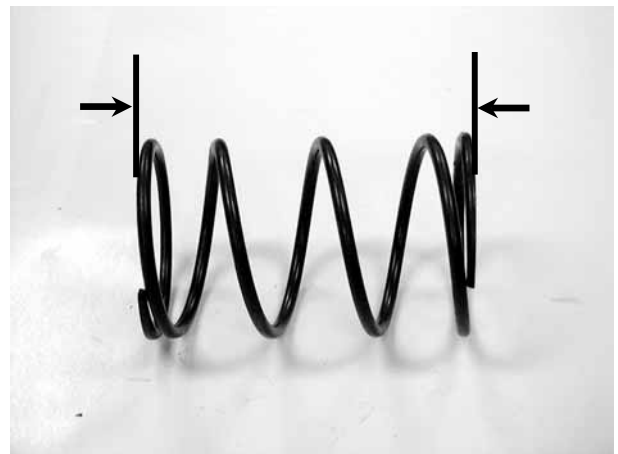
Check the clutch shoes for wear or damage.  
Measure the clutch lining thickness.

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



Measure the driven face spring free length.

**Service Limit:** 92.8mm replace if below



Check the driven face assembly for wear or damage.

Measure the driven face O.D.

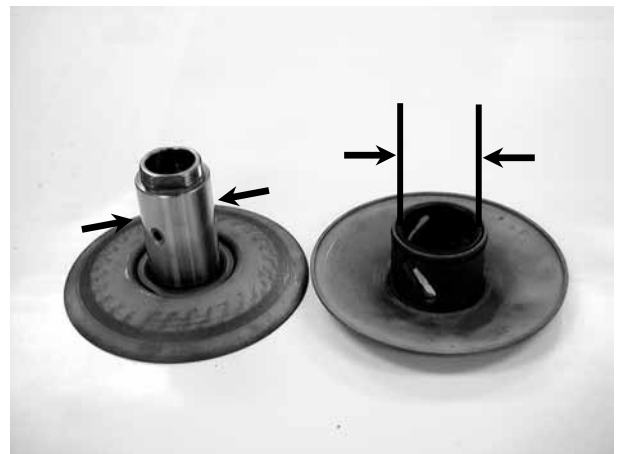
**Service Limit:** 33.94mm replace if below

Check the movable driven face for wear or damage.

Measure the movable driven face I.D.

**Service Limit:** 34.4mm replace if over

Check the guide roller pins for stepped wear.



## 9. 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.

Inner Bearing



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°C Heat-resistant grease

Bearing Outer Driver



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



MX'er 50

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

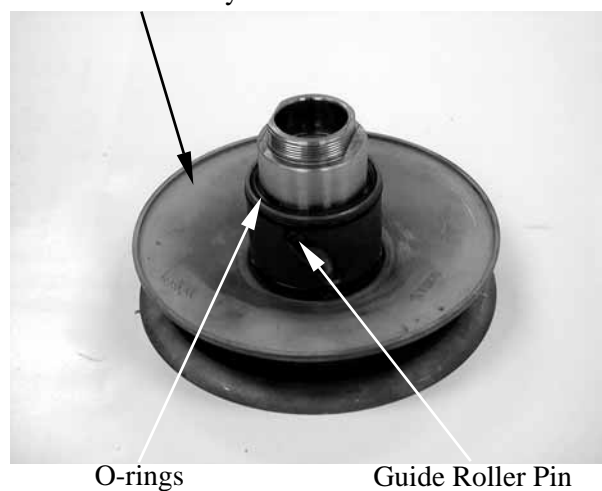
Bearing Driver Pilot



### 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



O-rings

Guide Roller Pin

Install the seal collar.



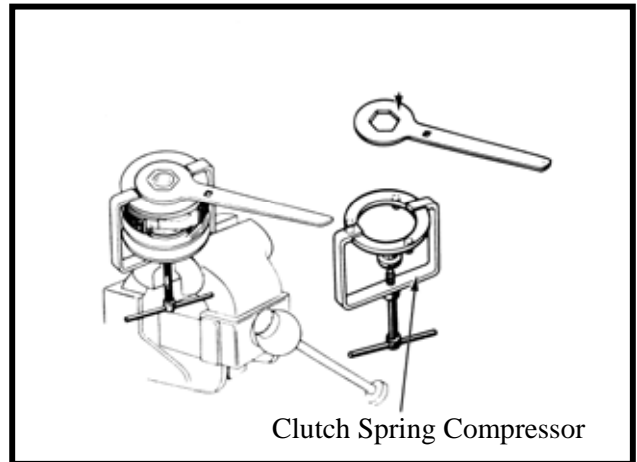
Seal Collar

## 9. 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.

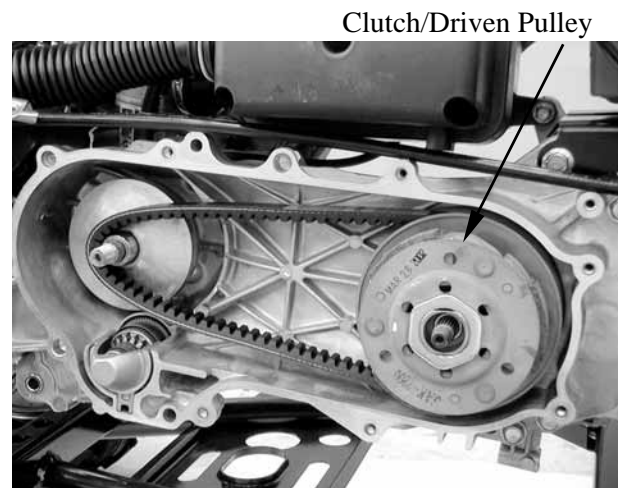
Tighten the 39mm nut to the specified torque.

**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.



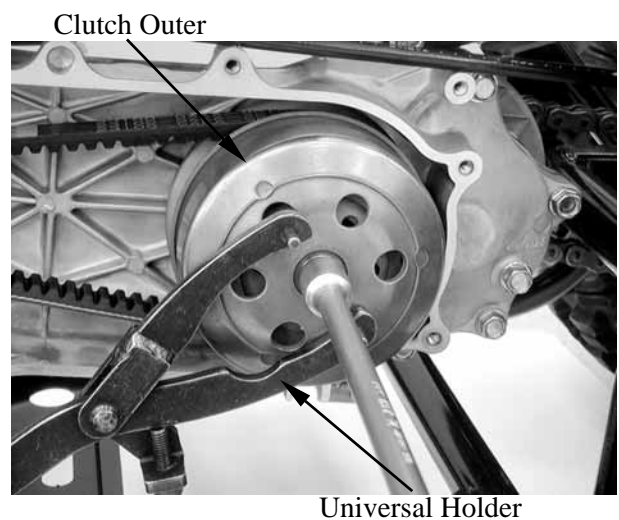
Install the clutch outer.

Hold the clutch outer with the universal holder.

Install and tighten the clutch outer nut.

**Torque:** 3.5~4.0kg-m

Install the left crankcase cover. (⇒9-6)



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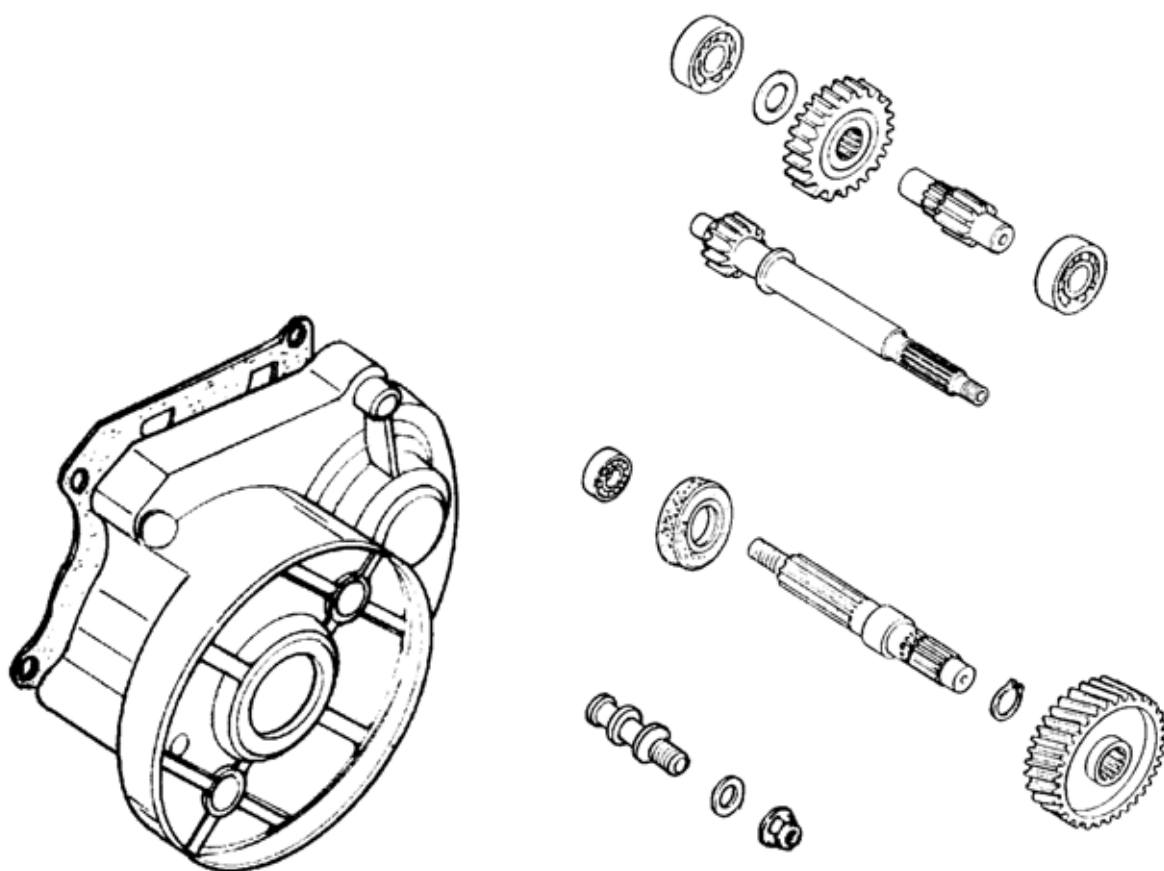
## FINAL REDUCTION

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FINAL REDUCTION ASSEMBLY .....	10-6

## 10. FINAL REDUCTION

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## 10. FINAL REDUCTION

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### SERVICE INFORMATION

Specified Oil: SAE90#  
At disassembly: 0.12 liter  
At change: 0.09 liter

### SPECIAL TOOLS

Bearing remover set, 12mm  
Bearing remover set, 15mm  
Bearing outer driver, 37x40mm  
Bearing outer driver, 32x35mm  
Bearing driver pilot, 17mm  
Bearing driver pilot, 15mm  
Bearing driver pilot, 12mm  
Bearing outer driver handle

### TROUBLESHOOTING

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

- Damaged transmission
- Seized or burnt transmission

#### Abnormal noise

- Worn, seized or chipped gears
- Worn bearing

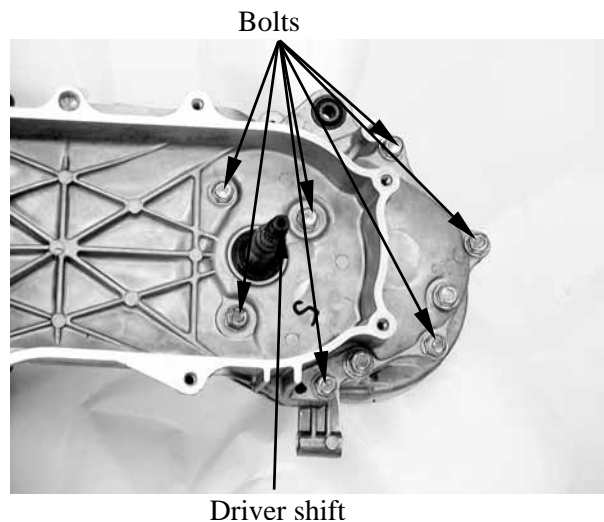
#### Oil leaks

- Oil level too high
- Worn or damaged oil seal

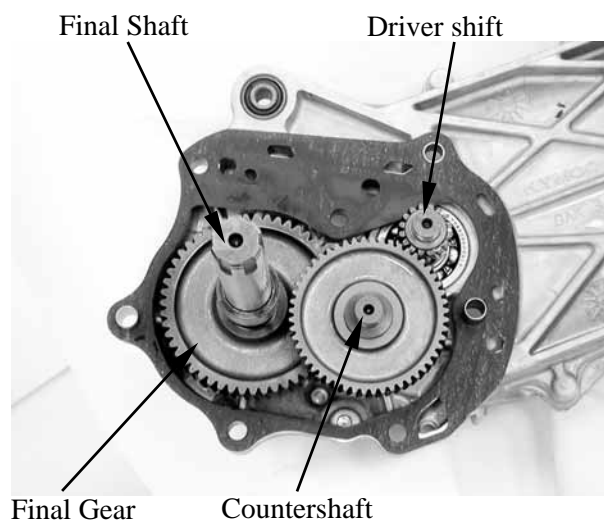
## 10. FINAL REDUCTION

### FINAL REDUCTION DISASSEMBLY

Remove the left crankcase cover. (⇒9-3)  
Remove the clutch/driven pulley. (⇒9-9)  
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.

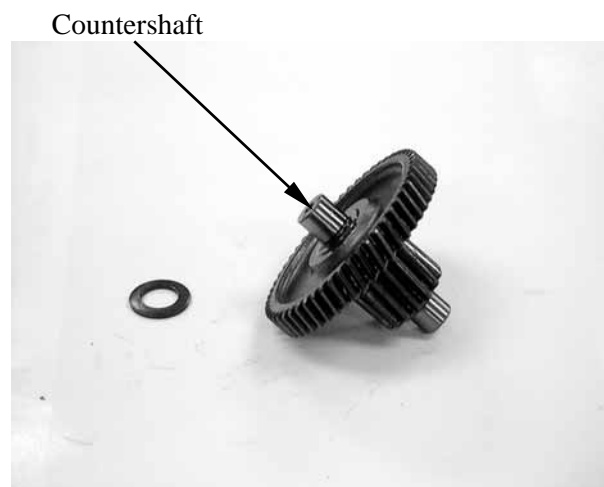


Remove the final gear and countershaft.



### FINAL REDUCTION INSPECTION

Inspect the countershaft and gear for wear or damage.

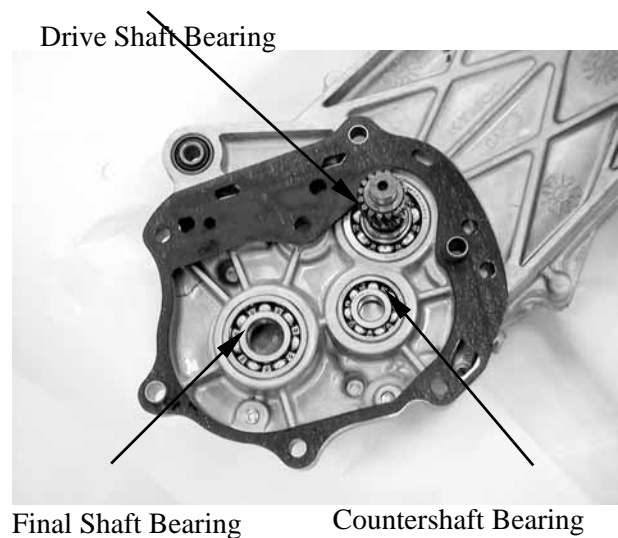


## 10. FINAL REDUCTION

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

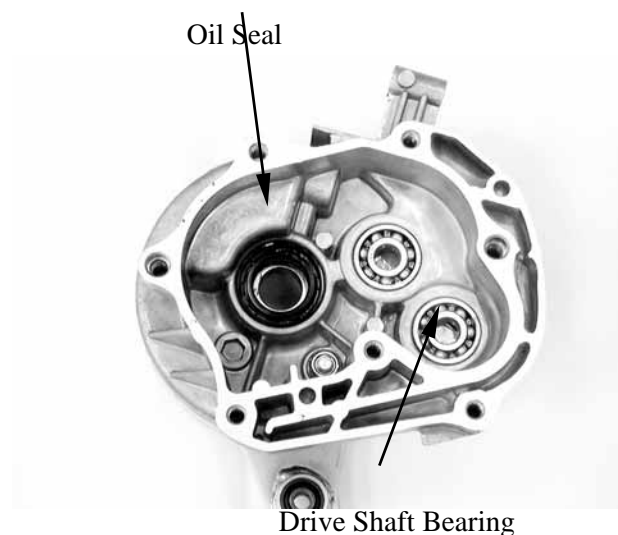


Check the left crankcase bearings for excessive play and inspect the oil seal for wear or damage.



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 oil seal.



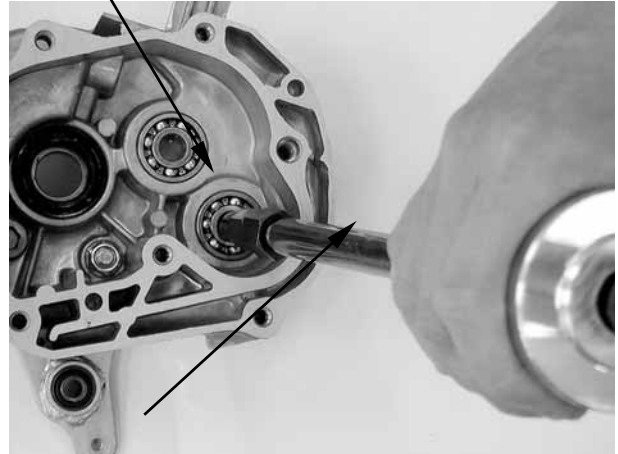
## 10. FINAL REDUCTION

### 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

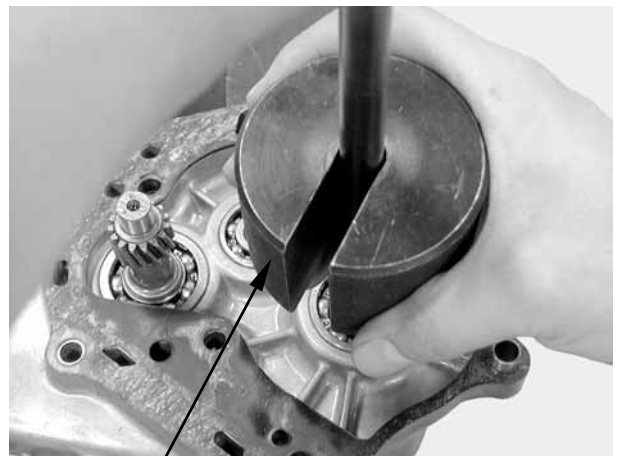


### BEARING REPLACEMENT (Left Crankcase Cover)

Remove the drive shaft.

Remove the drive shaft oil seal.

Remove the left crankcase bearings using the bearing remover.



Bearing Remover Set, 15mm

## 10. FINAL REDUCTION

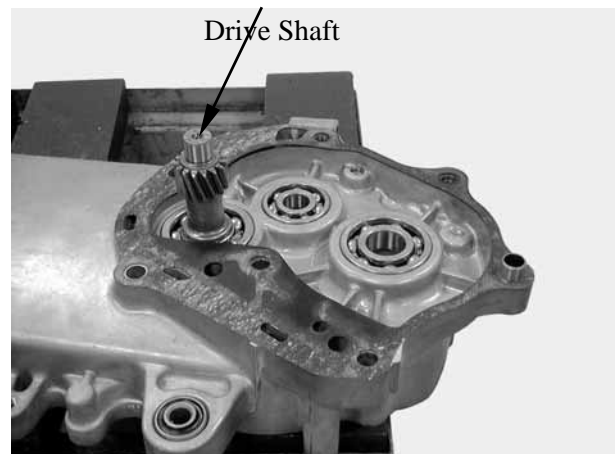
Drive new bearings into the left crankcase.  
Install a new drive shaft oil seal.



Bearing Outer Driver

### FINAL REDUCTION ASSEMBLY

Install the drive shaft into the left crankcase.



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

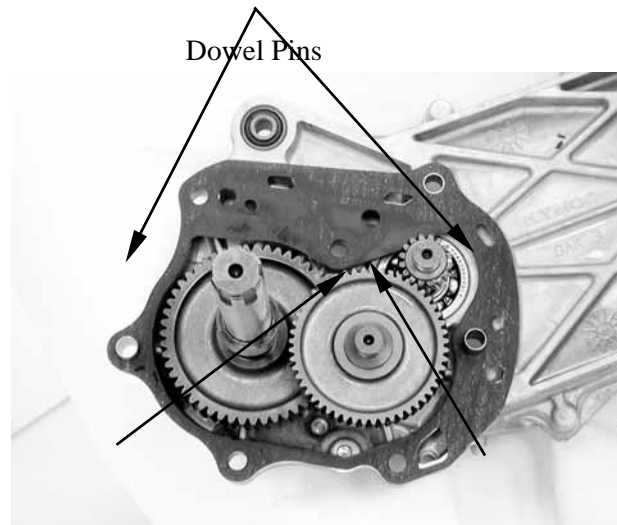


## 10. FINAL REDUCTION

Install the countershaft and gear into the left crankcase.

Install the resin washer onto the countershaft.

Install the dowel pins and a new gasket.



Resin Washer

Countershaft

Install the transmission case cover.

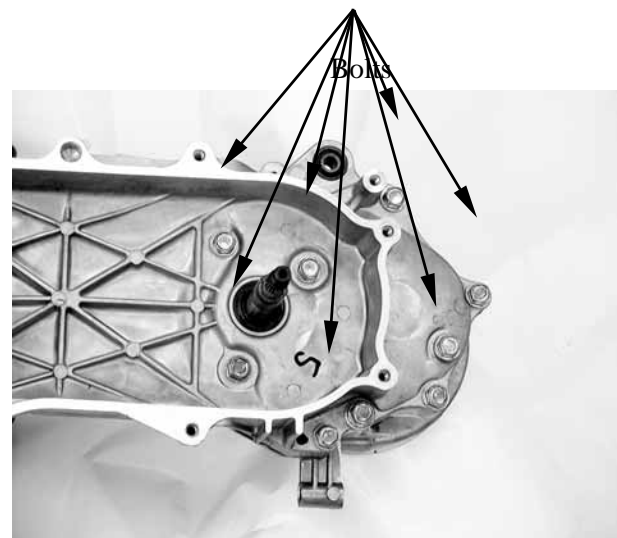


Transmission Case Cover

Install and tighten the transmission case cover bolts.

Install the clutch/driven pulley. (⇒9-12)

Install other removed parts in the reverse order of removal.



## 10. 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#

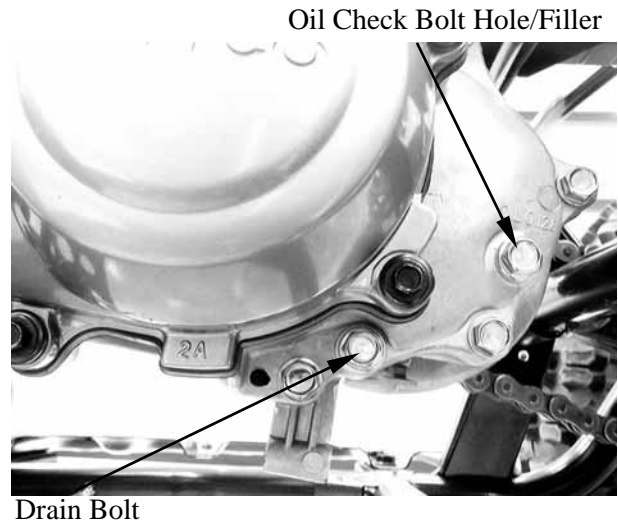
**Oil Capacity:** at disassembly: 0.12 liter  
at change: 0.09 liter

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.



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## CRANKCASE/CRANKSHAFT

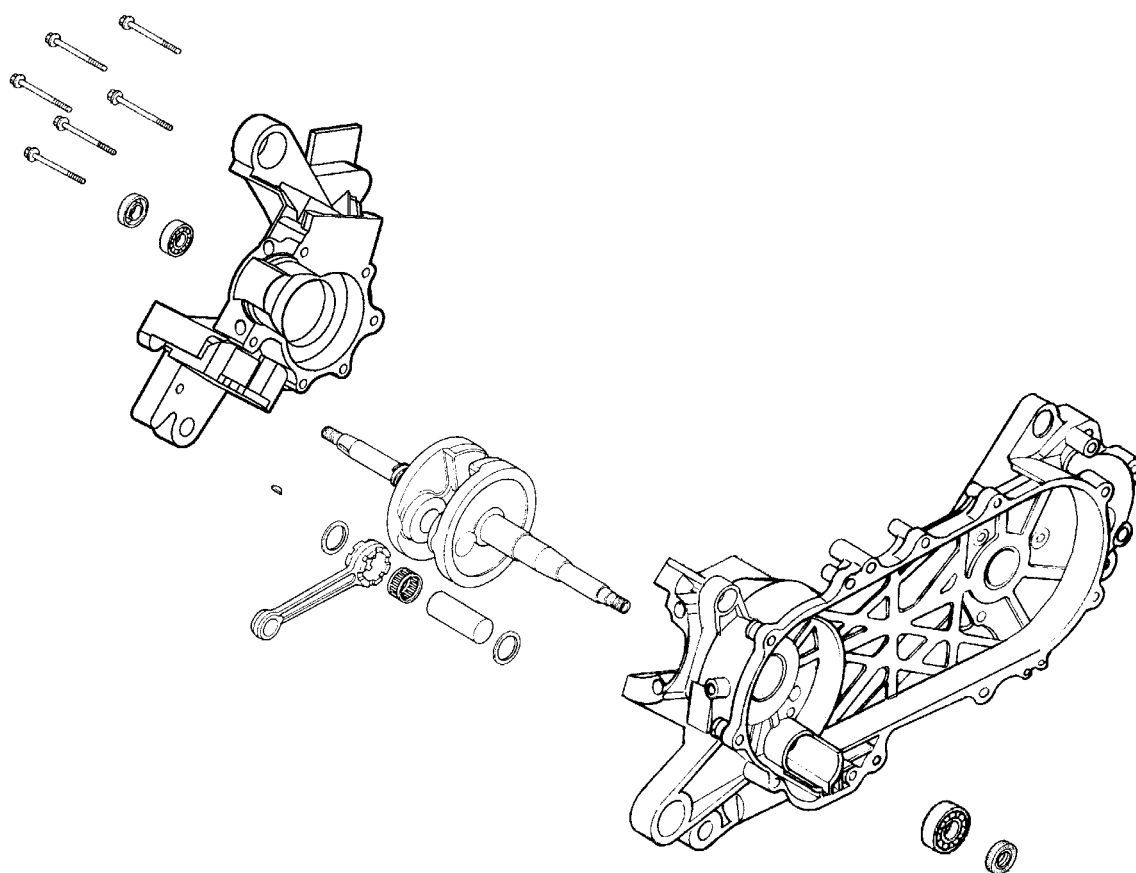
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## 11. CRANKCASE/CRANKSHAFT

---



# 11. 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 6)	Driven pulley (⇒Section 9)
Carburetor (⇒Section 5)	A.C. generator (⇒Section 8)
Oil pump (⇒Section 4)	Cylinder head/cylinder (⇒Section 7)
Reed valve (⇒Section 5)	
- 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	MX'er 50	
	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

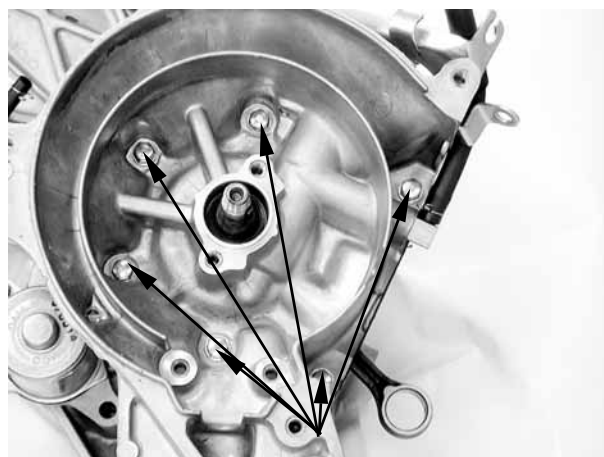
#### Abnormal engine noise

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

## 11. CRANKCASE/CRANKSHAFT

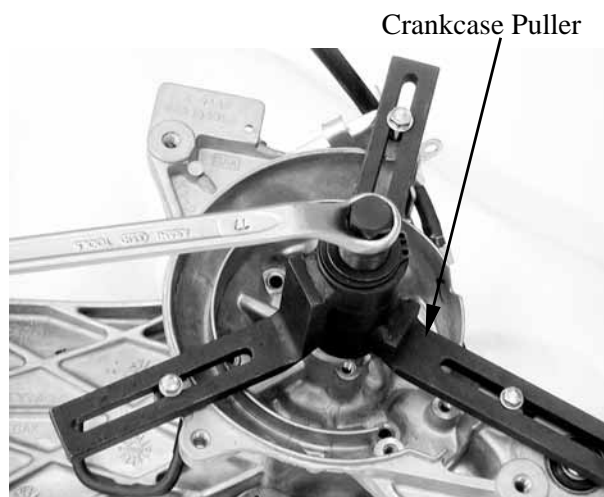
### CRANKCASE SEPARATION

Remove the crankcase attaching bolts.



Bolt

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.

★

When removing the crankshaft, do it slowly and gently.

Crankcase Puller

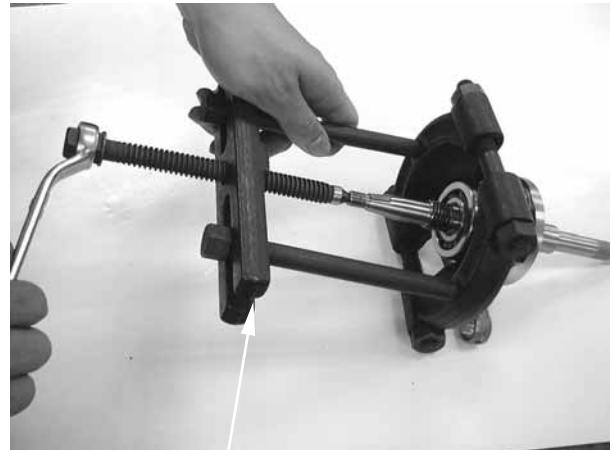


## 11. CRANKCASE/CRANKSHAFT

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

**\***

When separating the crankcase, the oil seals must be removed. Replace the oil seals with new ones.

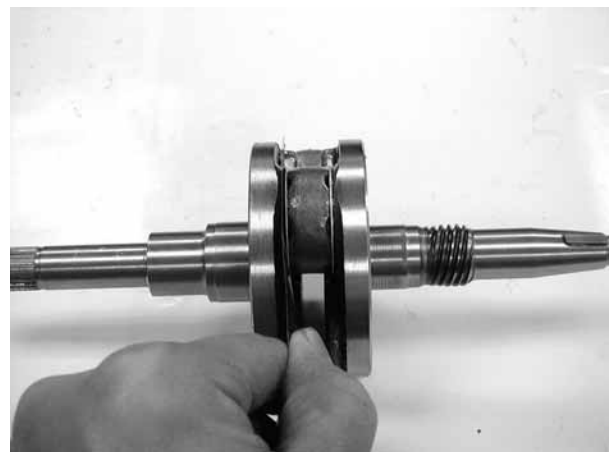


Universal Bearing Puller

### CRANKSHAFT INSPECTION

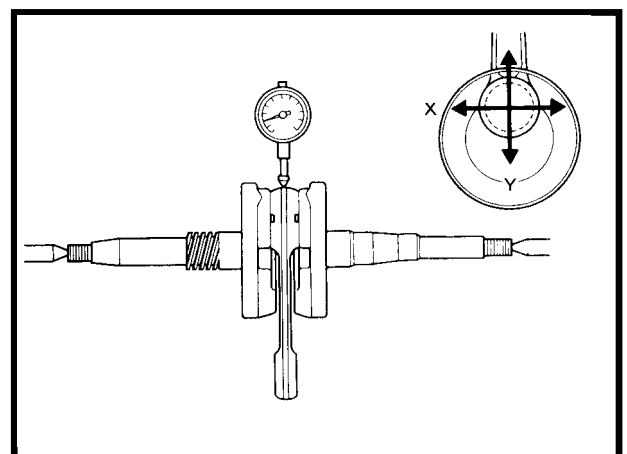
Measure the connecting rod big end side clearance.

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



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

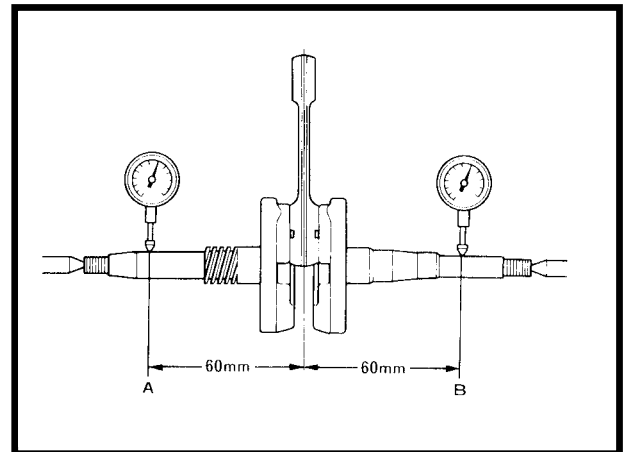
**Service Limit:** 0.04mm replace if over



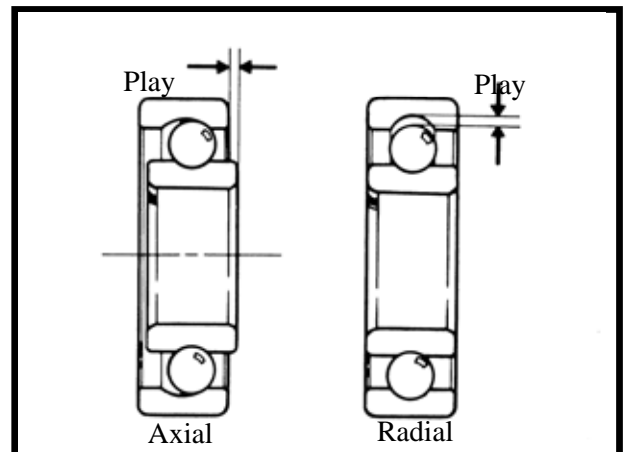
# 11. CRANKCASE/CRANKSHAFT

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.

★

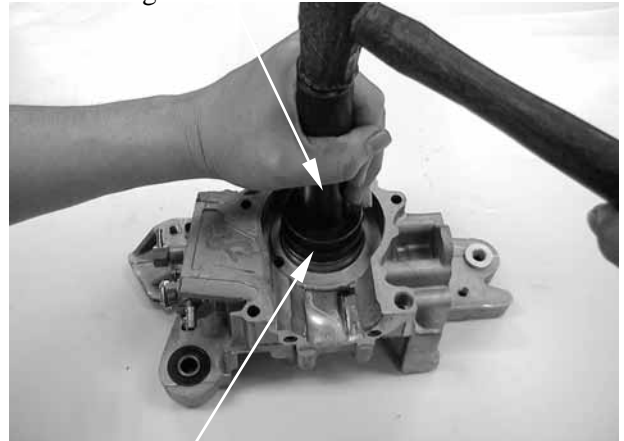
- After check, apply clean engine oil to all moving and sliding parts.
- Remove all gasket material from the crankcase mating surfaces. Dress any roughness or irregularities with an oil stone.



## 11. 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.

★

- Apply KYMCO ULTRA motor oil or molybdenum disulfide to the crankshaft bearings and connecting rod big end.
- Apply grease to the lip of the oil seal and then install it.

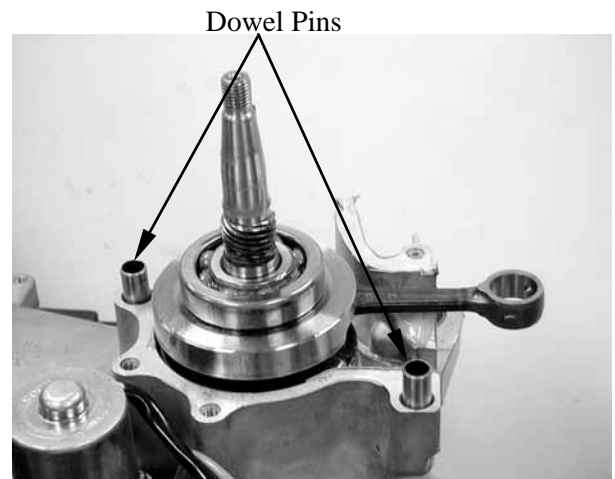


Crankcase Assembly Tool

## 11. CRANKCASE/CRANKSHAFT

### CRANKCASE ASSEMBLY

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



Assemble the crankcase halves.



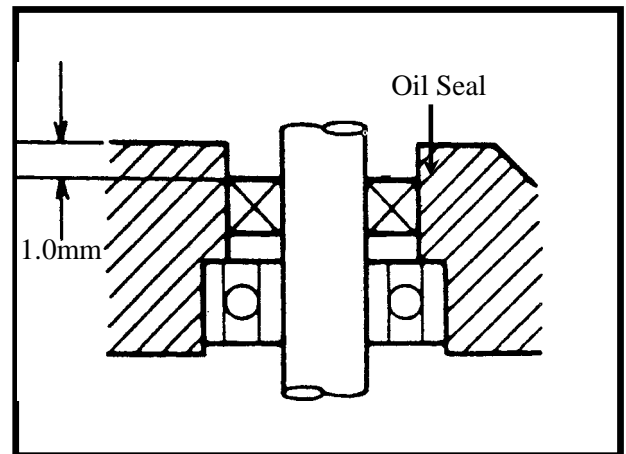
The distance between the right crankcase oil seal and crankcase surface is about  $12.5 \pm 0.5$  mm.

**\***

When installing the oil seal, be careful to press it with even force.

## 11. CRANKCASE/CRANKSHAFT

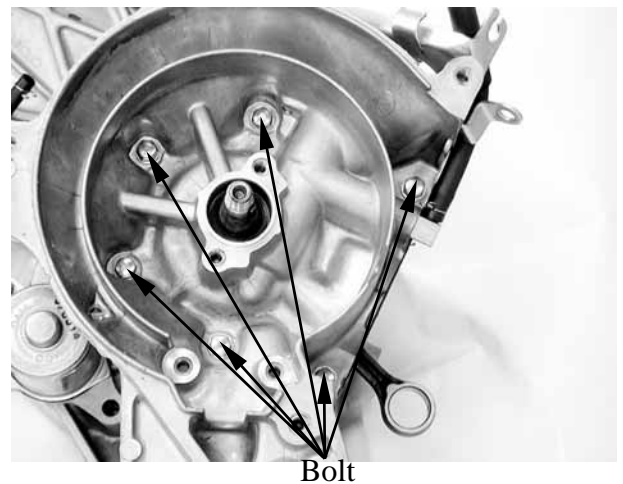
The distance between the left crankcase oil seal and crankcase surface is about 1.0mm.



Install and tighten the crankcase attaching bolts.

★

After assembly, check the crankshaft for smooth operation.





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### FRONT WHEEL/Front BRAKE/ FRONT SUSPENSION\STEERING SYSTEM

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SERVICE INFORMATION-----	12- 2
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FRONT WHEEL-----	12- 4
FRONT BRAKE -----	12- 7
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STEERING SYSTEM-----	12-13

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

**KYMCO**  
MX'er 50



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

### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- Remove the machine frame covers before removing the front wheel. Jack the machine front wheel off the ground and be careful to prevent the machine from falling down.
- During servicing, keep oil or grease off the brake drum and brake linings.
- Inspect the brake system before riding.

#### SPECIFICATIONS

Item		Standard (mm)	Service Limit (mm)
Front wheel rim run out	Radial	—	2.0
	Axial	—	2.0
Front brake drum I.D		110	111
Front brake lining thickness		4	1.5
Tie rod length		266.5	—
Rod-end (tie rod) angle		180°	—

#### TORQUE VALUES

Steering stem nut	6.0~8.0kgf-m
Swing arm nut	4.0~5.0kgf-m
Front wheel nut	6.0~8.0kgf-m
Front wheel hub nut	6.0~8.0kgf-m
Front shock absorber upper mount bolt	3.5~4.5kgf-m
Front shock absorber lower mount bolt	3.5~4.5kgf-m

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



### SPECIAL TOOLS

Oil seal and bearing install E014

### TROUBLESHOOTING

#### Hard steering (heavy)

- Insufficient tire pressure

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

- Uneven front shock absorbers
- Bent front arm
- Bent steering knuckle

#### Poor brake performance

- Incorrectly adjusted brake
- Worn brake linings
- Contaminated brake lining surface
- Worn brake shoes at cam contacting area
- Worn brake drum
- Poorly connected brake arm

#### Front wheel wobbling

- Bent rim
- Excessive wheel bearing play
- 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 arm fasteners
- Lack of lubrication

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

### FRONT WHEEL

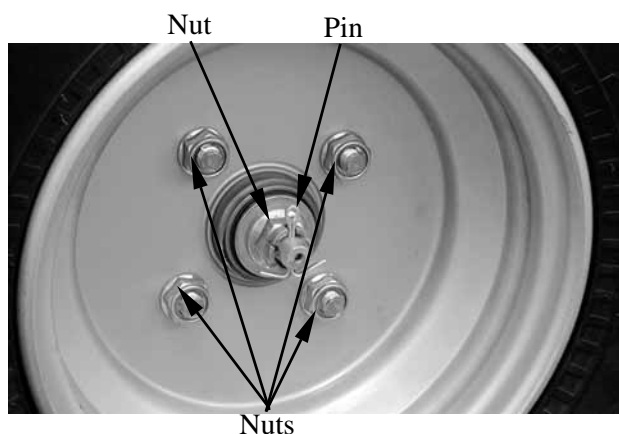
#### REMOVAL

Place the machine on a level place.

Remove four nuts attaching the wheel panel and front wheel.

Elevate the front wheels by placing a suitable stand under the frame.

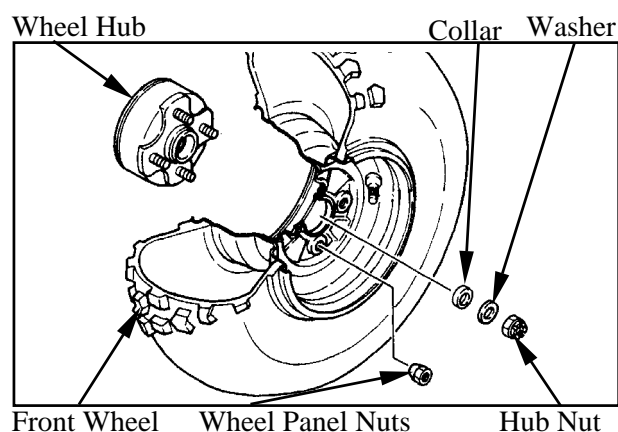
\* Support the machine securely so there is no danger of it falling over.



Remove the cotter pin.

Remove nut attaching the wheel hub and washer.

Remove the collar and wheel hub.

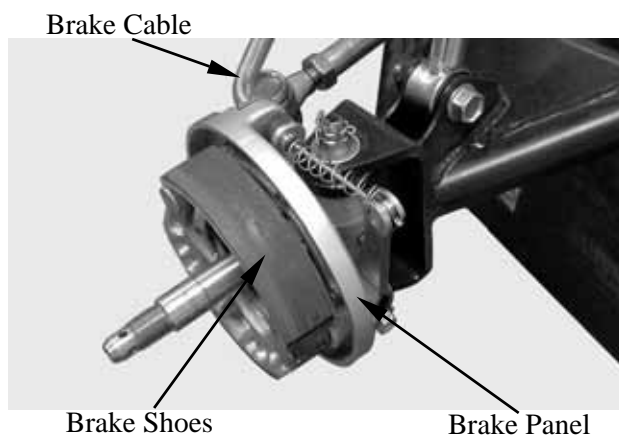


### FRONT BRAKE DISASSEMBLY

Loosen the lock nut and tighten the adjuster nut at brake lever. (Refer to the "FRONT BRAKE ADJUSTMENT" section in the CHAPTER 3.).

Disconnect the front brake cable from brake cam lever and remove the brake panel.

Remove the brake shoes.

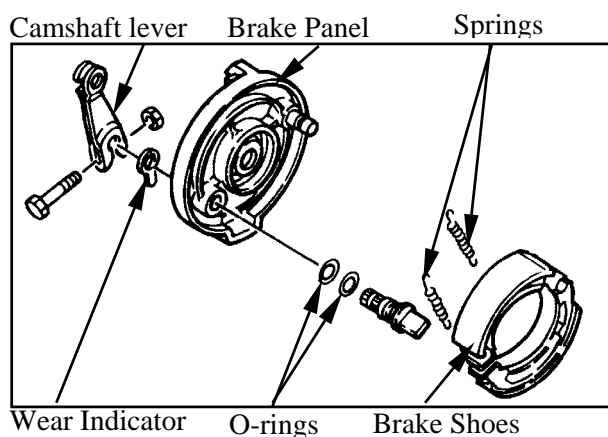


#### REMOVE

Remove brake shoes and springs.

Remove the bolt attaching camshaft lever and remove camshaft lever.

Remove the wear indicator, camshaft and O-rings



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

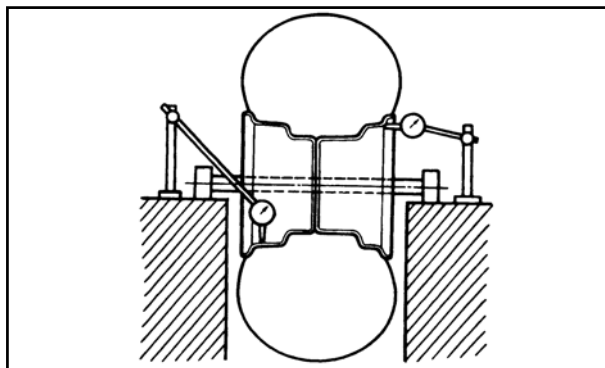
Measure the wheel run out.

Replace wheel or check bearing play if out of specification

**Rim run out limits:**

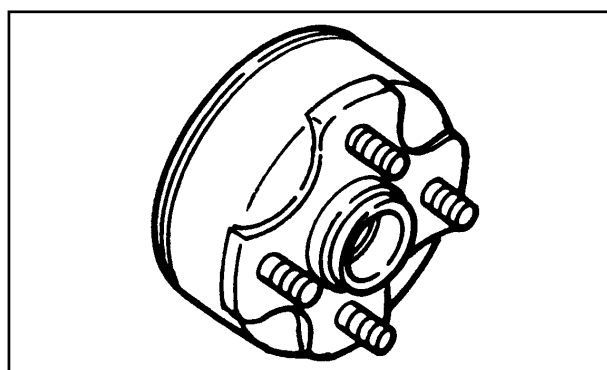
Vertical: 2.0mm

Lateral: 2.0mm



Inspect the front wheel hub.

Replace if cracks or damage.



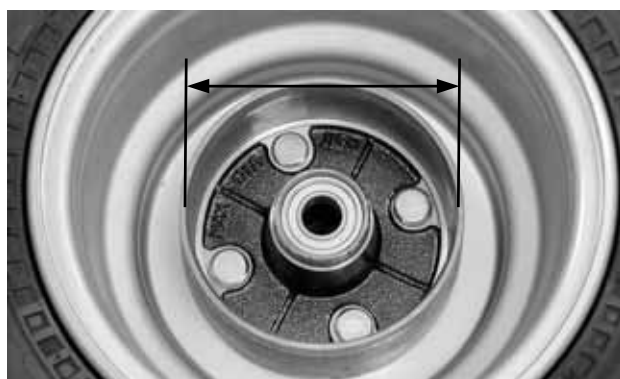
Inspect the front brake drum.

Measure the front brake drum I.D.

**Service limits:** 111mm

**\***

Keep oil or grease off the brake drum.



### FRONT WHEEL BEARING

Remove the side collar.



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

Remove the dust seal.

Turn the inner race of each bearing with your finger to see if they turn smoothly and quietly. Also check if the outer race fits tightly in the hub.



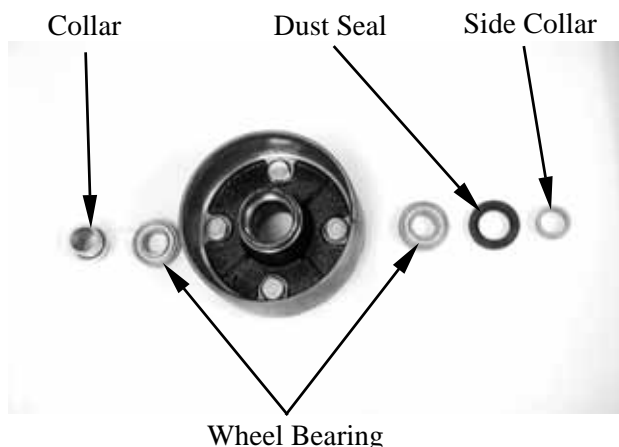
### BEARING REPLACEMENT

Remove the front wheel bearings and distance collar.



Replace the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

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



Pack all bearing cavities with grease.  
Drive in the left bearing.  
Install the distance collar.  
Drive in the right bearing.

**\***

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

**Special**

Oil seal and bearing install E014



Outer Driver

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

### FRONT BRAKE

#### FRONT BRAKE LINING INSPECTION

Measure the front brake lining thickness.

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

- \* Keep oil or grease off the brake linings.



### REMOVAL

Inspect the shoe springs, O-rings, camshaft lever and wear indicator.

Replace if damage.

Inspect the brake shoe plate.

Replace if cracks or damage.

Inspect the brake shoe pivot pin.

Replace if wear or damage.

Inspect the camshaft hole and camshaft.

Replace if scratches or excessive wear.

### INSTALLATION

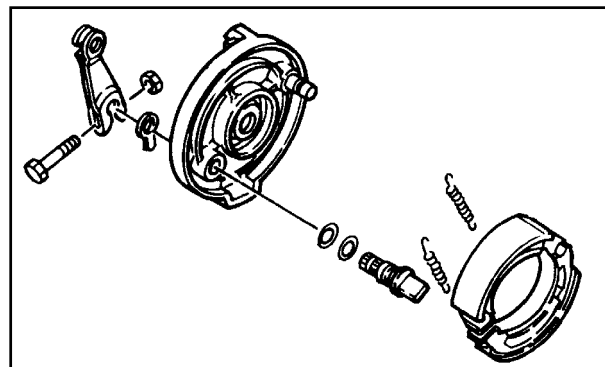
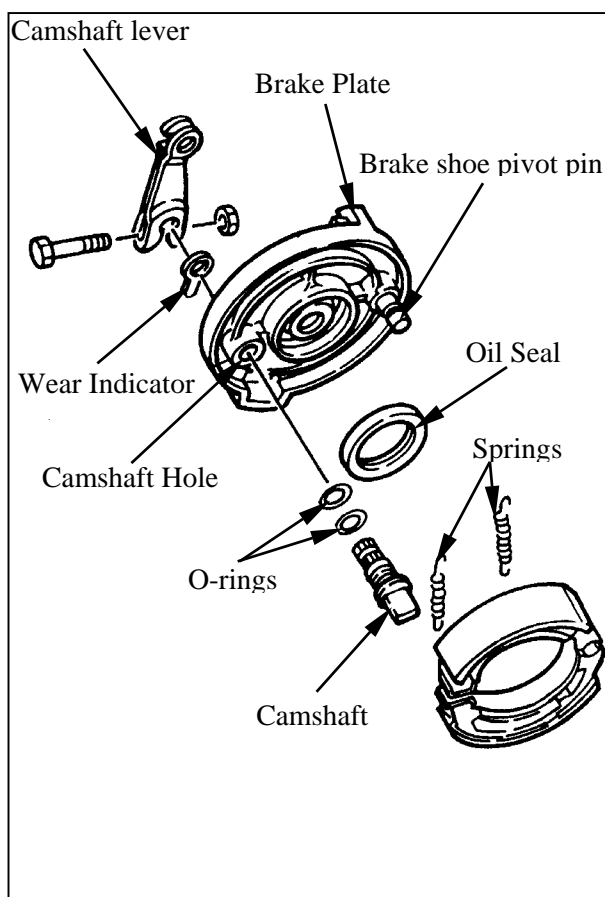
Reverse the "REMOVAL" procedures.

- \* Install the camshaft to the brake shoe plate with the slot of the camshaft placing at bass line of the wear indicator scale.
- Align the projection with the slot of the camshaft when installing the wear indicator to the camshaft.
- Align the cut-out of the camshaft lever with the slot of the camshaft when installing the camshaft lever to the camshaft.

Tighten the bolt for camshaft lever.

**Torque:** 1.8~2.5kgf-m

- \* Apply the grease onto the o-ring, oil seal lips, pivot pin of brake shoe and camshaft.

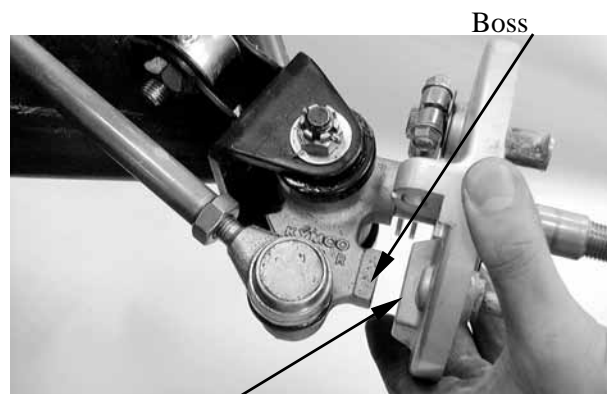




## 12. FRONT WHEEL/FRONT BRAKE/FRONT SUSPENSION/STEERING SYSTEM

Install the brake shoe plate.

- \* Make sure that the boss on the knuckle correctly engages with the locating slot on the brake shoe plate.



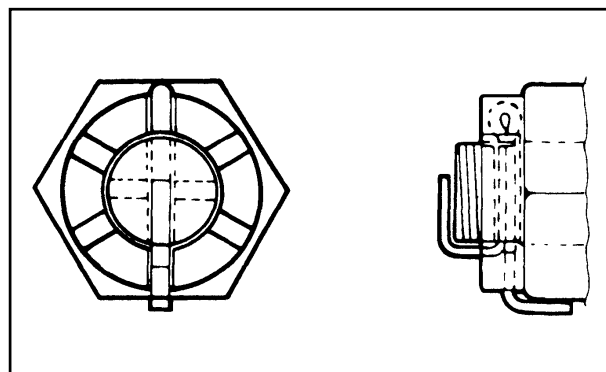
Locating Slot

Apply the grease onto the bearings and oil seal lips of the wheel hub.  
Install wheel hub, plate washer and tight the nut (wheel hub).

**Torque:** 6.0~8.0kgf-m

Install cotter pins.

- \* Always use a new cotter pin.
- \* Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening it on the axle nut.



Install the front wheel and tighten the nuts (wheel).

**Torque:** 6.0~8.0kgf-m

- \* Tapered wheel nuts are used for front wheels.  
Install the nuts with its tapered side towards the wheel.



Adjust the front brake cable free play.

Refer to the "FRONT BRAKE ADJUSTMENT" section in the CHAPTER 3.

**Brake cable free play:** 10~20mm at lever pivot.

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

### FRONT SUSPENSION

#### REMOVAL

Elevate the front wheels by placing a suitable stand under the frame.

- \* Support the machine securely so there is no danger of it falling over.

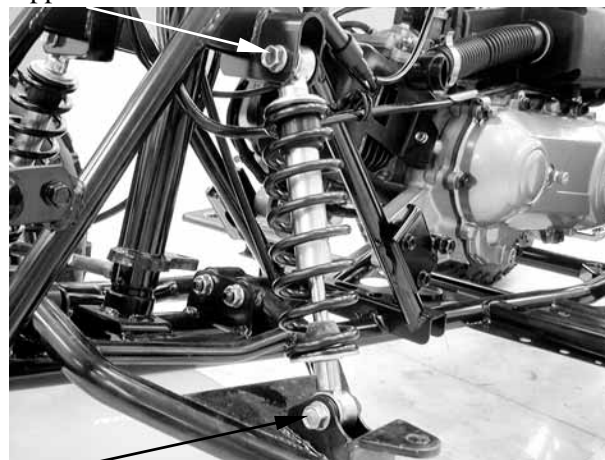
Remove the front wheel, wheel hub, brake shoe plate.

Remove the upper and lower bolt, then remove the shock absorber.

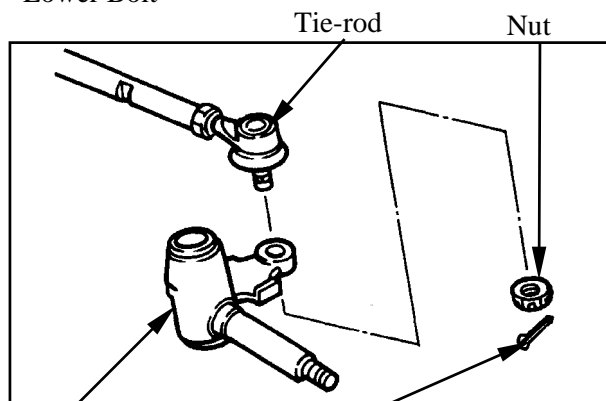
Remove the cotter pin and nut, then remove tie-rod from steering knuckle.

Remove cotter pin, nut, washer and bolt, then remove the steering knuckle, covers, collar and bush from the front arm.

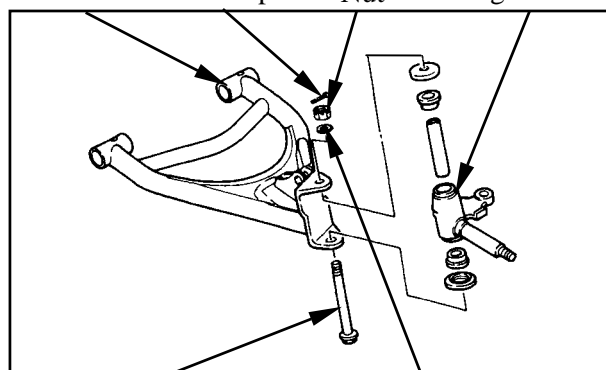
Upper Bolt



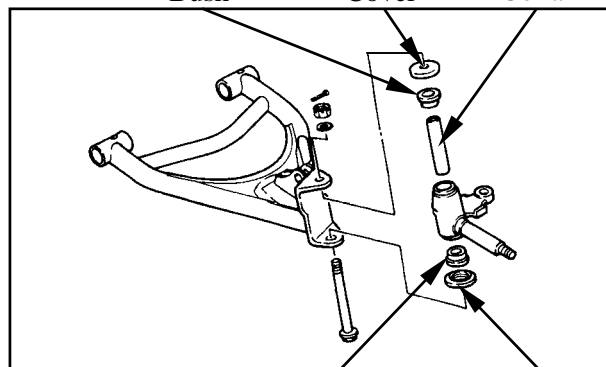
Lower Bolt



Steering Knuckle Front arm Cotter pin Nut Steering Knuckle



Bolt Bush Washer Collar



Bush Cover

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

### INSPECTION

Check the front arm brackets of the frame.

If bent, cracked or damaged, repair or replace the frame.

Check the tightening torque of the front arms securing nuts.

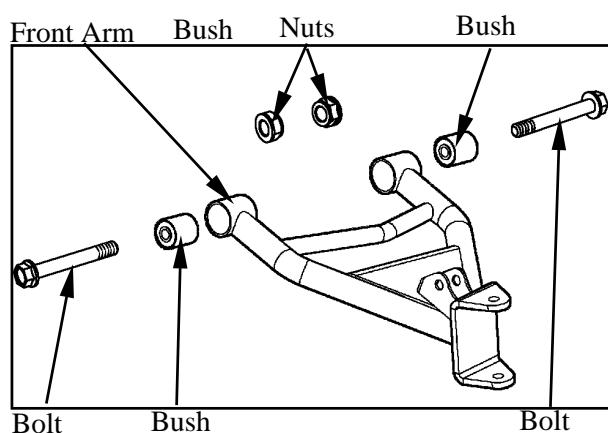
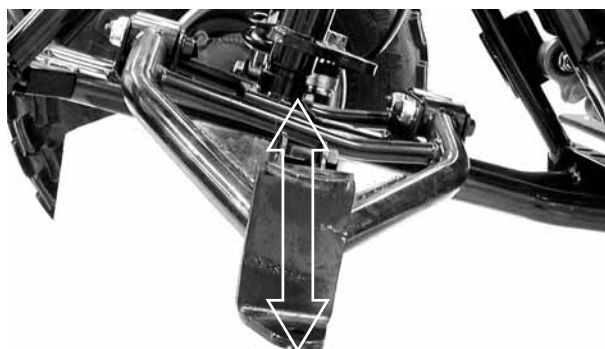
**Torque:** 4.0~5.0kgf-m

Check the front arm side play by moving it from side to side.

If side play noticeable, replace the inner collar, bushings and thrust covers as a set.

Check the front arm vertical movement by moving it up and down.  
If vertical movement is tight, binding or rough, replace the inner collar, bushings and thrust covers as a set.

Remove the two nut and two bolt attaching the front arm, then remove the front arm.



### INSPECTION

Inspect the shock absorber rod.

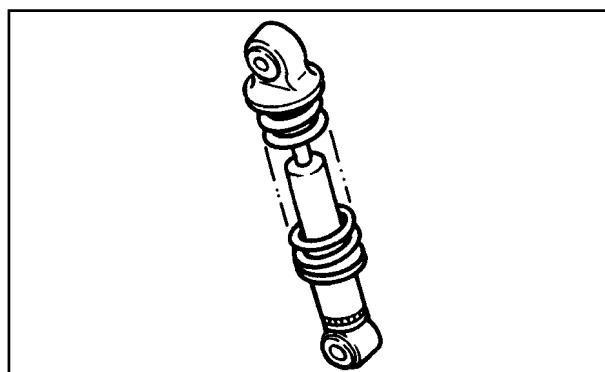
Replace the shock absorber assembly if bends or damage.

Inspect the shock absorber.

Replace the shock absorber assembly if oil leaks.

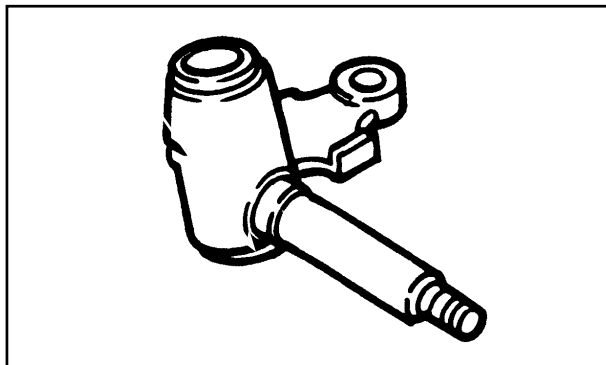
Inspect the spring of the shock absorber by move the spring up and down.

Replace the shock absorber assembly if fatigue.



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

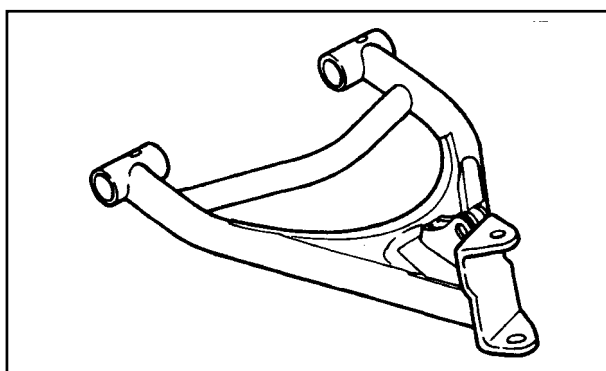
Inspect the steering knuckle.  
Replace if cracks, pitting or damage.



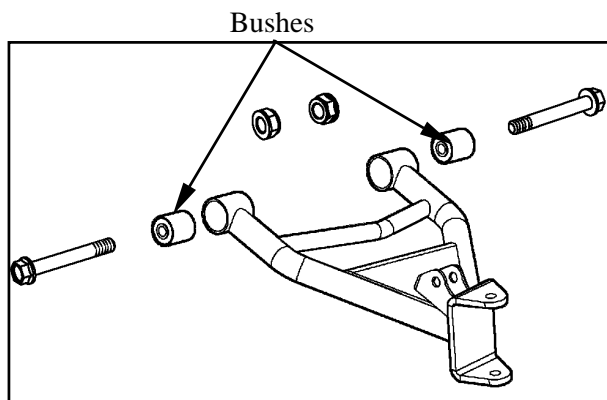
Inspect the front arm.  
Replace if cracks, bends or damage.

\*

Do not attempt to straighten a bent arm,  
this may dangerously weaken the arm.



Inspect bushes.  
Replace if wear or damage.



### INSTALLATION

Reverse the "REMOVAL" procedures.

\*

Apply the grease onto the bushes, collars  
and covers.

Install the front arm nut onto the frame and  
tighten the nuts.

**Torque:** 4.0~5.0kgf-m

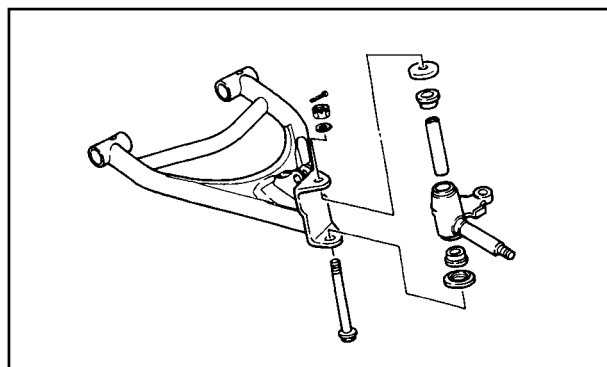
## 12. FRONT WHEEL/Front BRAKE/Front SUSPENSION/STEERING SYSTEM

Apply the grease onto the bush, collars and covers, then install the steering knuckle onto the front arm and tighten the nut.

**Torque:** 4.0~5.0kgf-m

Install the cotter pin and band ends of cotter pin.

\* Always use a new cotter pin.

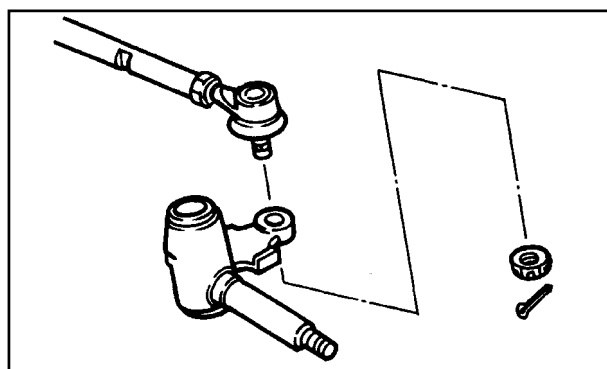


Install the tie-rod onto the steering knuckle and tighten the nut.

**Torque:** 4.0~5.0kgf-m

Install the cotter pin and band ends of cotter pin.

\* Always use a new cotter pin.



Bleed Valve

Install the shock absorber and tighten the upper and lower bolts.

**Torque:** 3.5~4.5kgf-m



Install the brake shoe plate, wheel hub and front wheel.

Refer to the "FRONT WHEEL INSTALLATION" section.

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

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### STEERING SYSTEM

#### REMOVAL

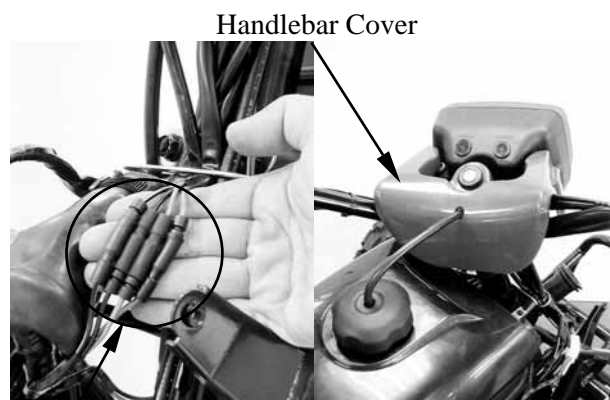
Remove the following parts:

Seat, Front cover, Center cover and Front fender

Refer to the "FENDERS" section in the CHAPTER 2

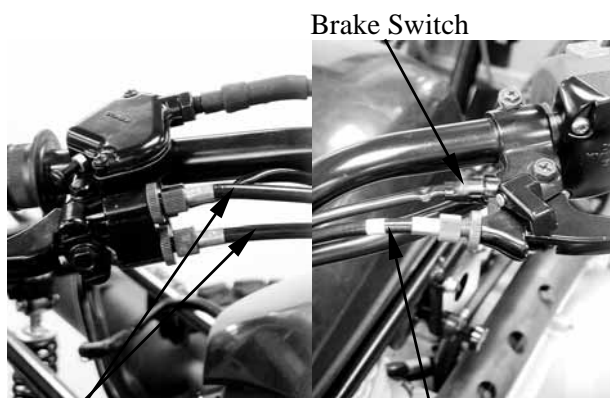
Disconnect the main switch lead.

Remove the handlebar cover with main switch.



Main Switch Lead

Disconnect the front brake cables from the brake lever, rear brake cable from the brake lever and brake switch from the bracket of the brake lever.



Front Brake Cables

Rear Brake Cable

\*

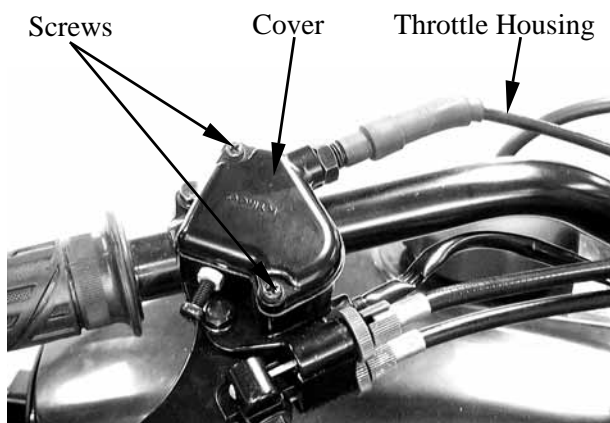
Disconnect the brake switch from the bracket of the brake lever while pushing the hook of the brake switch with a driver.



Hook

Remove the two screws to remove the cover of the throttle housing.

Disconnect the throttle cable from the lever.



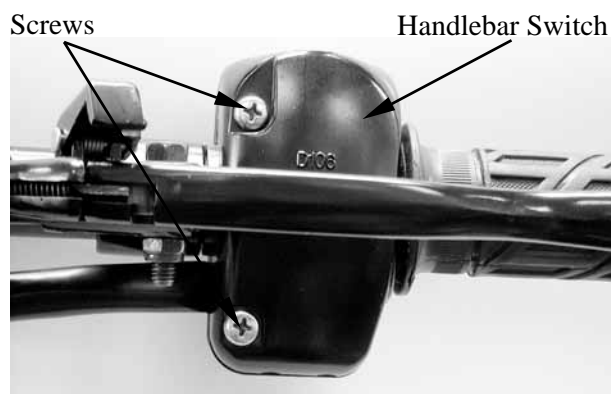
Screws

Cover

Throttle Housing

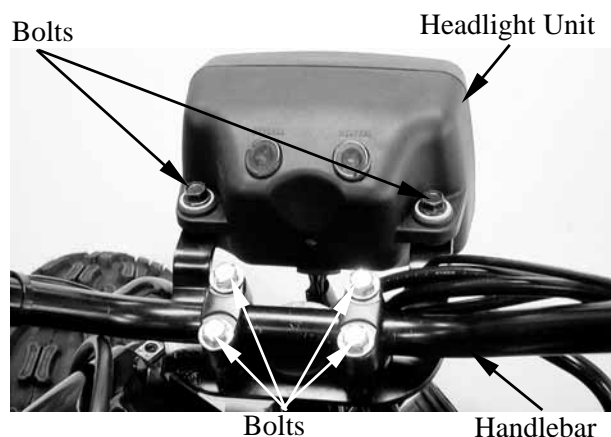
## 12. FRONT WHEEL/Front BRAKE/Front SUSPENSION/STEERING SYSTEM

Remove the two screws and remove the handlebar switch.

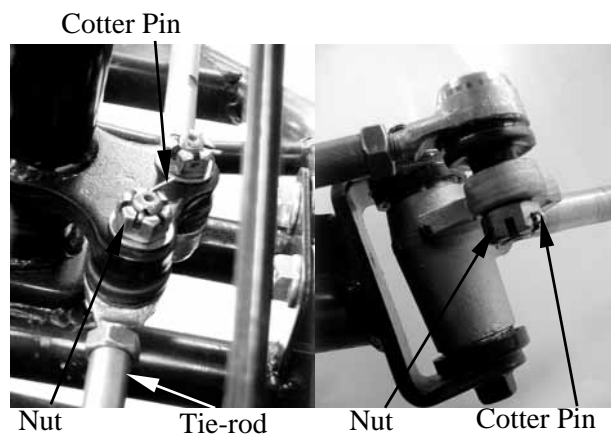


Remove the two bolts and remove headlight unit.

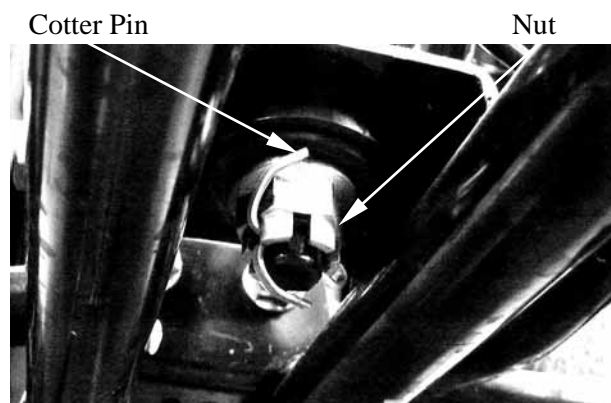
Remove the four handlebar holder bolts and remove the handlebar.



Remove the cotter pins and nuts attaching the tie-rods, then remove tie-rods.



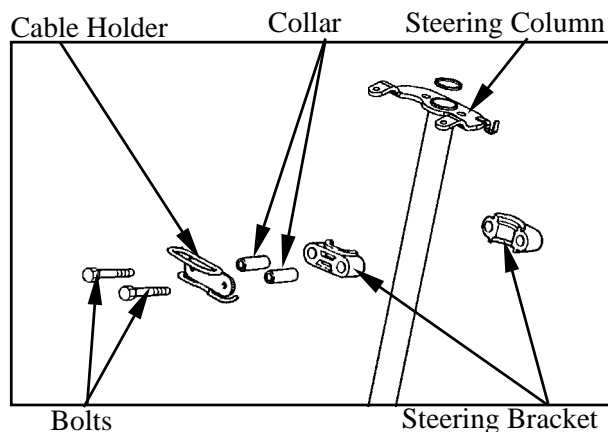
Remove the cotter pin and nut attaching the steering column, then remove steering column and collar.



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

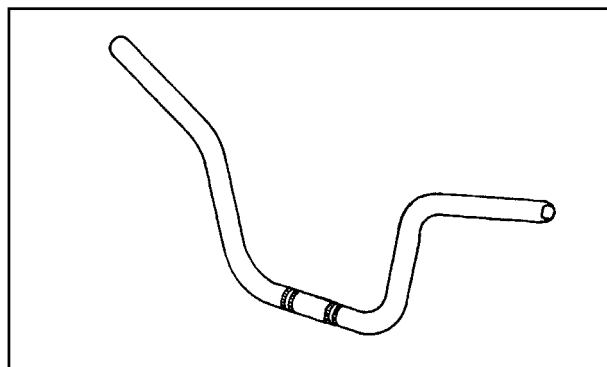
**KYMC** **KYMC**  
MX'er 50

Remove the two bolts to remove the cable holder, steering bracket, collars and steering column.



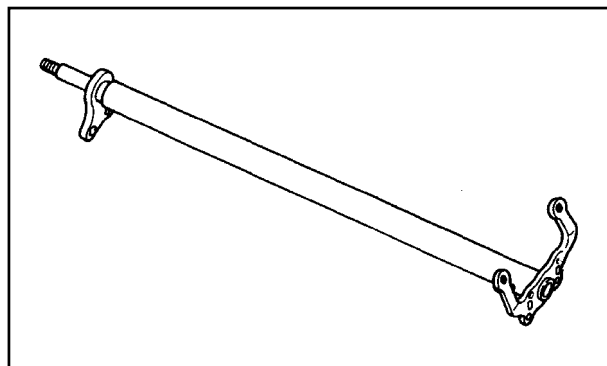
### INSPECTION

Inspect the handlebar.  
Replace if cracks, bends or damage.

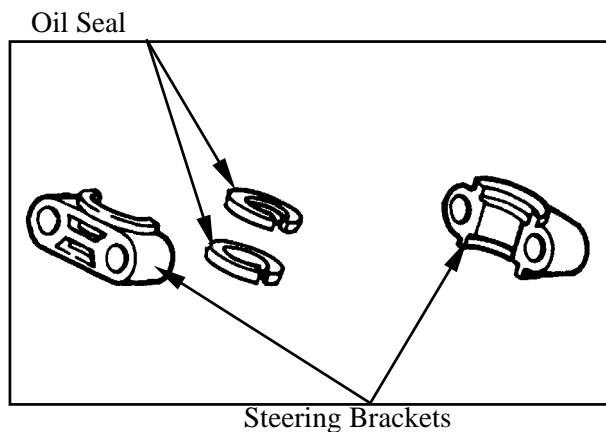


Inspect the steering column.  
Replace if bends or damage.

\* Do not attempt to straighten a bent shaft, this may dangerously weaken the shaft.



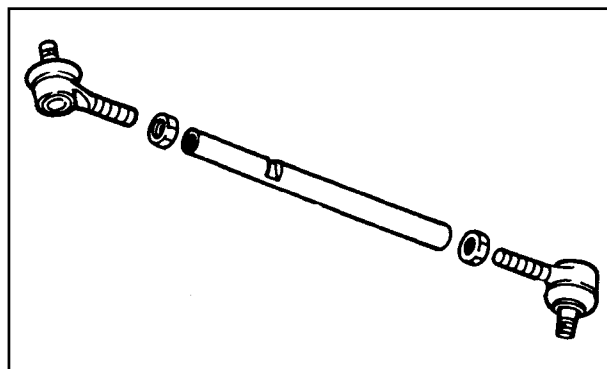
Inspect the steering brackets and oil seal.  
Replace if wear or damage.



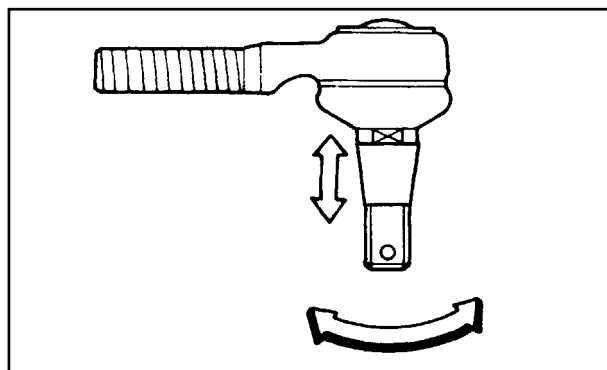


## 12. FRONT WHEEL/Front BRAKE/Front SUSPENSION/STEERING SYSTEM

Inspect the tie-rod.  
Replace if bend or damage.



Check the tie-rod end movement.  
Replace if the tie-rod end exists free play or turns roughly.  
Check the tapered surface of the tie-rod end.  
Replace if pitting, wear or damage.



Adjust the tie-rod length.  
Adjustment steps:  
(The following procedures are done on both tie-rods, right and left.)  
Loosen the lock nuts.  
Adjust the tie-rod length by tuning both tie-rod ends.

**Tie rod length:** 266.5mm

Set the rod-end (steering column side) in an angle where the indentation surface of the tie-rod is parallel to the rod-end shaft, and then tighten the lock nut.

**Torque:** 2.5~3.5kgf-m

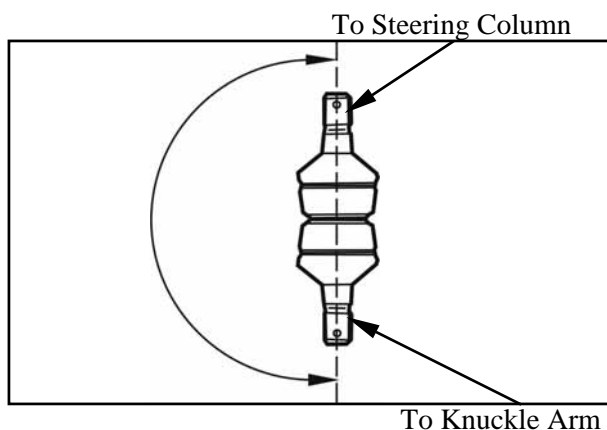
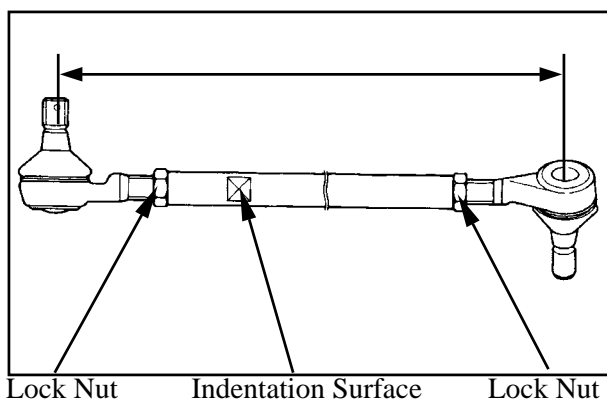
Set the other rod-end (knuckle arm side) in an angle as shown (right-hand tie-rod and left-hand tie-rod), and then tighten the lock nut.

Rod-end (tie rod) angle: 180°

**Torque:** 2.5~3.5kgf-m

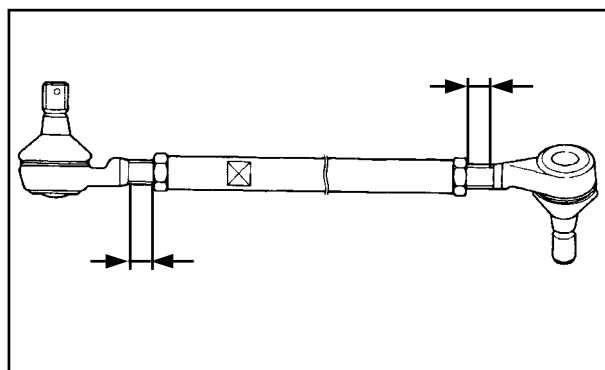
**\***

After making adjustment on both tie rods be sure to mark them R and L for identification.

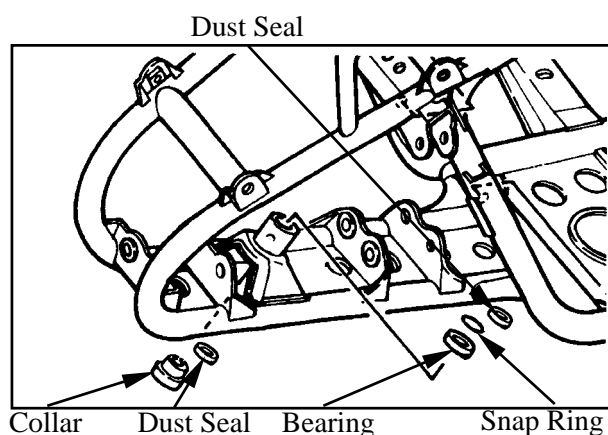


## 12. FRONT WHEEL/Front BRAKE/Front SUSPENSION/STEERING SYSTEM

- \* The threads on both rod-end must be of the same length.



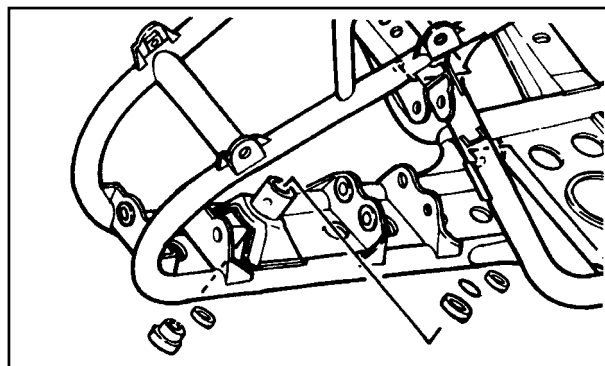
Inspect the collar, duty seal, snap ring and bearing.  
Replace if wear or damage.



### INSTALLATION

Reverse the "REMOVAL" procedures.

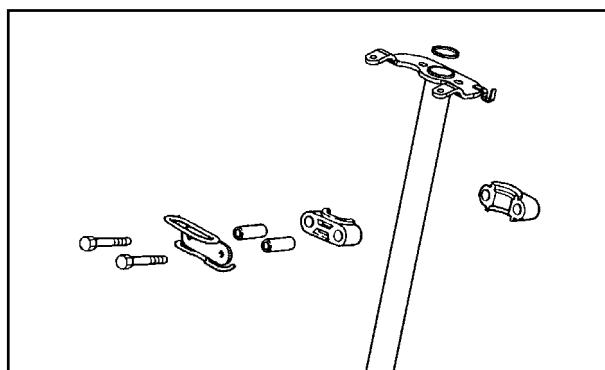
- \* Apply the grease onto the collar, duty seal, and bearing.



Assembly the steering column and tighten the two bolts.

**Torque:** 1.8~2.5kgf-m

Band the lock washer tabs.



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

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Install the steering column and collar, then tighten the nut.

**Torque:** 6.0~8.0kgf-m

Install the cotter pin and band ends of cotter pin.

\*

Always use a new cotter pin.

Cotter Pin

Nut



Install the tie rods and tighten the nut.

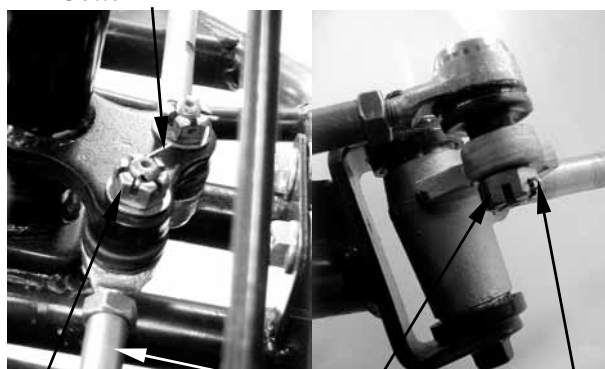
**Torque:** 4.0~5.0kgf-m

Install the cotter pin and band ends of cotter pin.

\*

Always use a new cotter pin.

Cotter Pin



Nut

Tie-rod

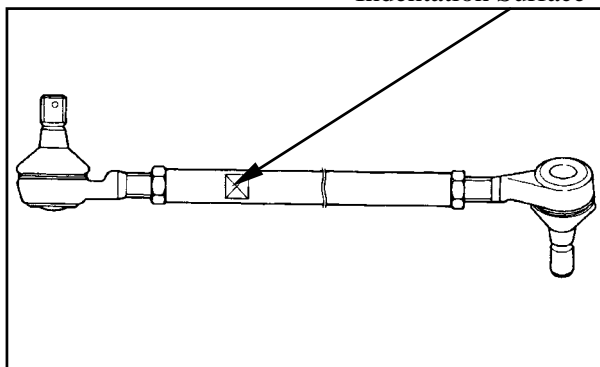
Nut

Cotter Pin

\*

Be sure that the rod-end on the indentation surface side is connected to the steering column.

Indentation Surface

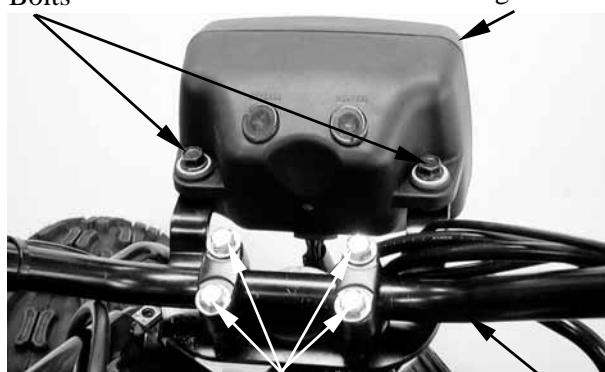


Install handlebar and handlebar holder, then tighten the four bolts.

**Torque:** 1.8~2.5kgf-m

Bolts

Headlight Unit



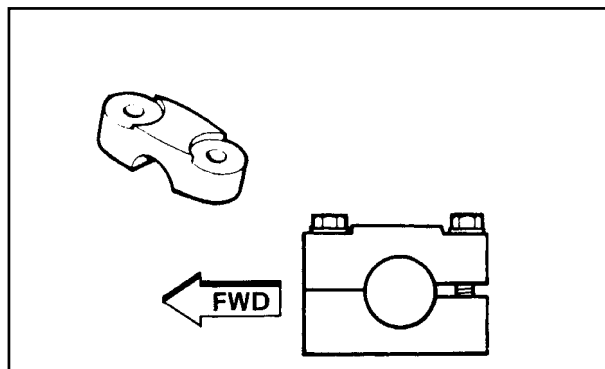
Bolts

Handlebar

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

\*

- Be sure the upper handlebar holder mark face to front.
- First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



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

Refer to the “TOE-IN ADJUSTMENT” section in the CHAPTER 3 to adjust toe-in.

Refer to the “FRONT BRAKE ADJUSTMENT” section in the CHAPTER 3 to adjust front brake.

Refer to the “REAR BRAKE ADJUSTMENT” section in the CHAPTER 3 to adjust rear brake.

**REAR WHEEL/SWING ARM/  
HYDRAULIC BRAKE**

SERVICE INFORMATION----- 13- 2

TROUBLESHOOTING----- 13- 3

REAR WHEEL----- 13- 4

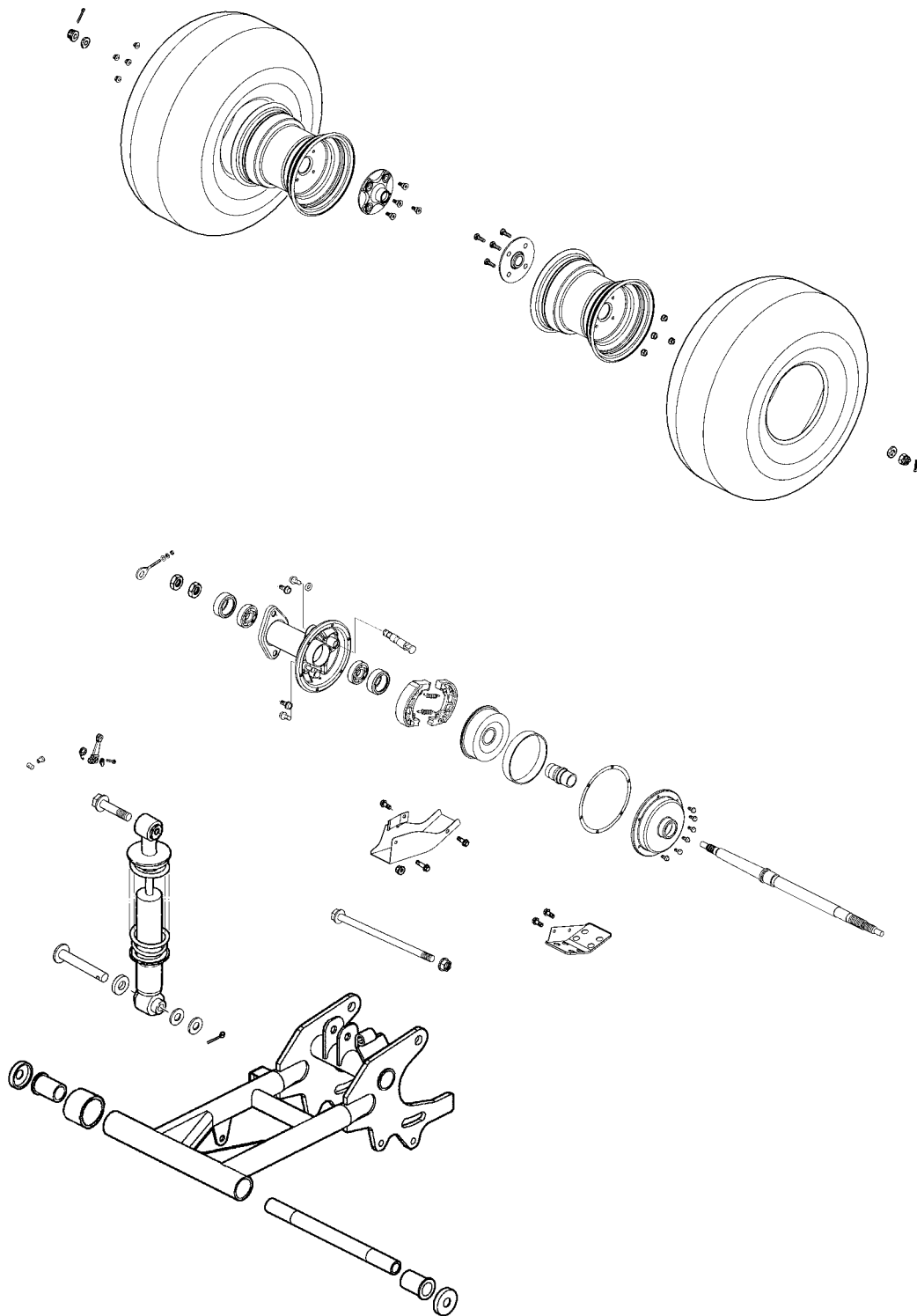
SWING ARM ----- 13- 13

HYDRAULIC BRAKE ----- 13- 17

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

---

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# 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- During servicing, keep oil or grease off the brake drum and brake linings.
- Drain the brake fluid from the hydraulic brake system before disassembly.
- Contaminated brake disk or brake pads reduce stopping power. Clean the contaminated brake disk with high-performance brake degreaser and replace the brake pads.
- Do not use brake fluid for cleaning.
- Bleed air from the brake system if the brake system is removed or the brake is soft.
- Do not allow any foreign matters entering the brake reservoir when filling the brake reservoir with brake fluid.
- Brake fluid will damage painted, coated surfaces and plastic parts. When working with brake fluid, use shop towels to cover and protect painted, rubber and plastic parts. Wipe off any splash of brake fluid with a clean towel. Do not wipe the motorcycle with a towel contaminated by brake fluid.
- Make sure to use recommended brake fluid. Use of other unspecified brake fluids may cause brake failure.
- Inspect the brake operation before riding.

### SPECIFICATIONS

Item			Standard (mm)	Service Limit (mm)
Rear wheel	Rim run out	Radial	—	2.0
		Axial	—	2.0
	Rear brake drum I.D		130	131
Rear brake lining thickness			4.5	2.0

Item	Standard Limit (mm)	Service Limit (mm)
Brake disk thickness	3.7	3.0
Brake disk runout	0.15	0.3
Brake master cylinder I.D.	12.7 ~ 12.743	12.75
Brake master cylinder piston O.D.	12.657 ~ 12.684	12.64
Brake caliper piston I.D.	33.95 ~ 33.99	34.05
Brake caliper cylinder O.D.	33.88 ~ 33.92	33.85

### TORQUE VALUES

Rear wheel nut	6.0 ~ 8.0kgf-m
Rear shock absorber upper mount bolt	3.5 ~ 4.5kgf-m
Rear swing arm axle	6.0 ~ 8.0kgf-m
Rear wheel hub nut	6.0 ~ 8.0kgf-m
Rear wheel shaft nut	11.0 ~ 13.0kgf-m
Brake arm bolt	1.8 ~ 2.5kgf-m
Caliper holder bolt	2.4 ~ 3.0kgf-m
Brake fluid tube bolt	2.5 ~ 3.5kgf-m
Caliper bleed valve	0.4 ~ 0.7kgf-m
Master cylinder bolt	1.0 ~ 1.4kgf-m

# 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

## SPECIAL TOOLS

Nut wrench      F010

## TROUBLESHOOTING

### Rear wheel wobbling

- Bent rim
- Faulty tire
- Axle not tightened properly

### Soft rear shock absorber

- Weak shock absorber spring
- Faulty damper

### Loose brake lever

- Air in hydraulic brake system
- Brake fluid level too low
- Hydraulic brake system leakage

### Hard braking

- Seized hydraulic brake system
- Seized piston

### Brake noise

- Contaminated brake pad surface
- Excessive brake disk run out
- Incorrectly installed caliper
- Brake disk or wheel not aligned

### Poor brake performance (Disk Brake)

- Air in brake system
- Deteriorated brake fluid
- Contaminated brake pads and brake disk
- Worn brake pads
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake caliper

### Poor brake performance

- Brake not adjusted properly
- Worn brake linings
- Worn brake shoes at cam contacting area
- Worn brake cam
- Worn brake drum

### Tight brake lever

- Seized piston
- Clogged hydraulic brake system
- Smooth or worn brake pad

### Poor brake performance

Contaminated brake pad surface



# 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

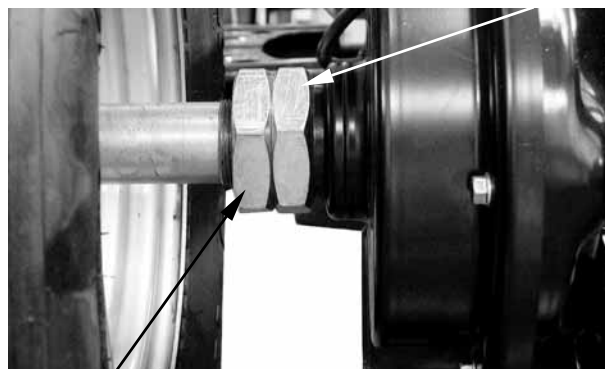
## REAR WHEEL

### REMOVAL

Place the machine on a level place.  
Use the nut wrench to loosen two nuts  
(inner and outer) of the rear axle.

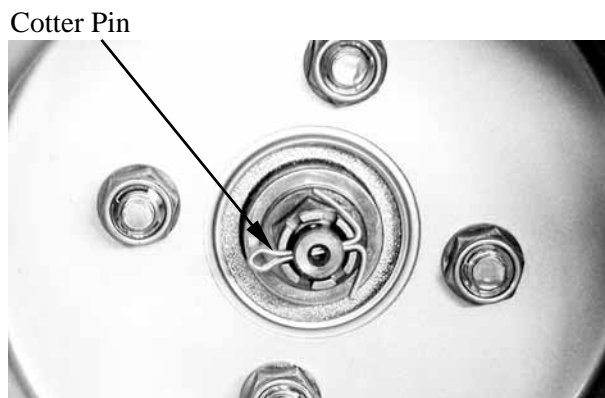
Special

Nut wrench F010



Outer Nut

Remove the cotter pin.

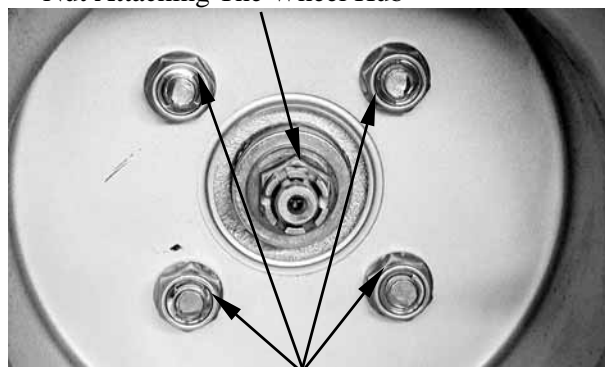


Cotter Pin

Remove four nuts attaching the wheel panel  
of the both rear wheels.  
Loosen nut attaching the wheel hub of the  
both rear wheels.

\* Elevate the rear wheels by placing a  
suitable stand under the rear of frame.  
Support the machine securely so there is  
no danger of it falling over.

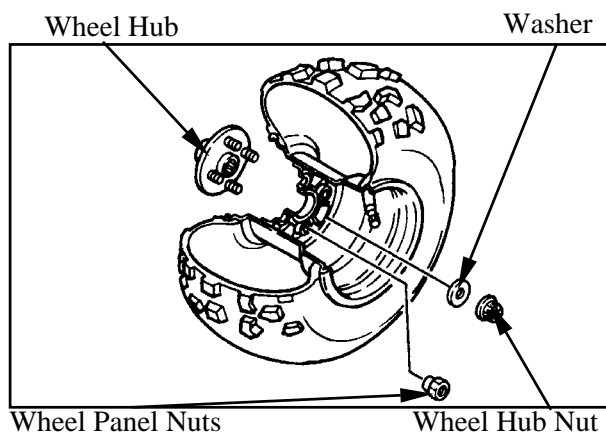
Nut Attaching The Wheel Hub



Nuts Attaching The Wheel Panel

### Remove

Remove four nuts attaching the wheel panel  
and rear wheel.  
Remove nut attaching the wheel hub and  
washer.  
Remove the wheel hub.



Wheel Hub

Washer

Wheel Panel Nuts

Wheel Hub Nut

Inner Nut

# 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

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## Inspection

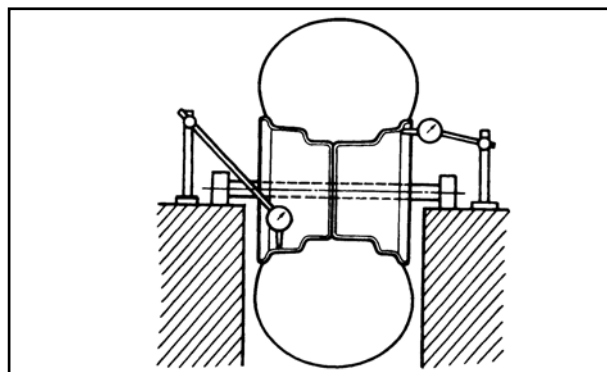
Measure the wheel runout.

## Service Limit:

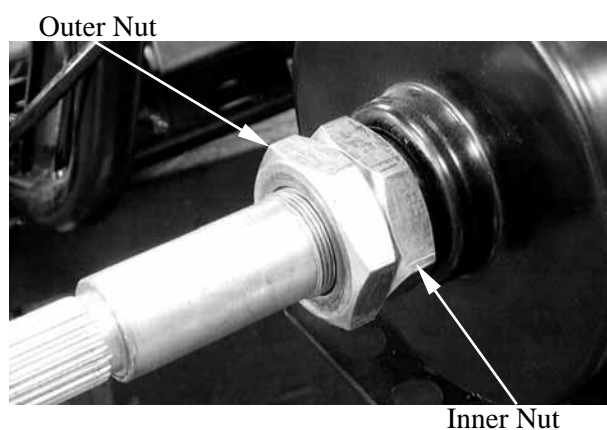
Vertical: 2.0 mm

Lateral: 2.0mm

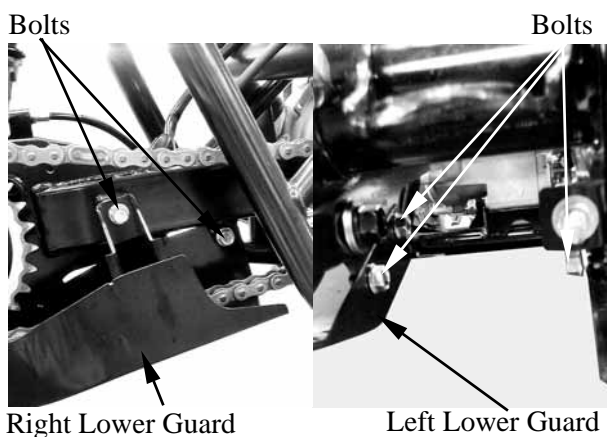
Replace wheel or check bearing play if out of specification.



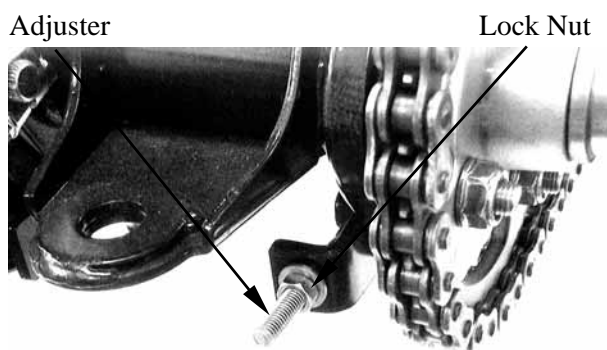
Remove two nuts of the rear axle (outer and inner).



Remove five bolts attaching left and right lower guard.

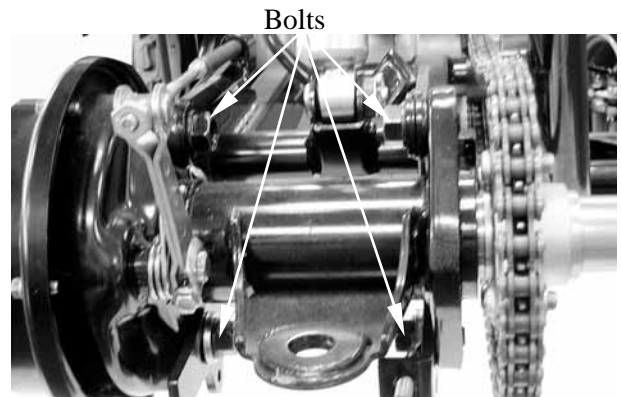


Loosen the lock nut for the adjuster of the drive chain slack.



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

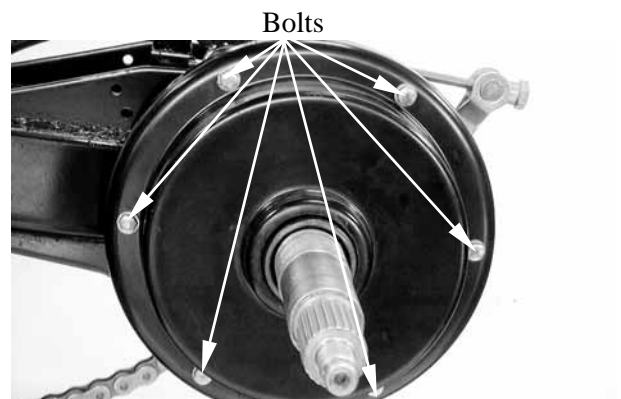
Loosen four bolts attaching rear axle hub.



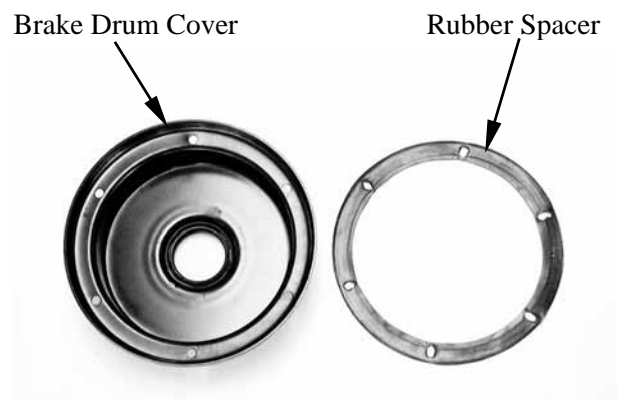
Remove the drive chain from driven sprocket.



Remove six bolts attaching brake drum cover.



Remove brake drum cover and rubber spacer.



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

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### Inspection

Inspect the inner surface of the brake drum is scratches, polish brake drum lightly and evenly with emery cloth.

Measure the inside diameter of the brake drum.

**Service limit:** 131mm

Replace if it is out of specification.



Disconnect the rear brake cable from the camshaft lever.

Brake Cable



Remove the brake shoes.

### INSPECTION

Measure lining thickness of the brake shoes.

**Service limit:** 2.0 mm

Replace if it is out of specification.

Brake Shoes



Remove the rear axle from left side.

\*

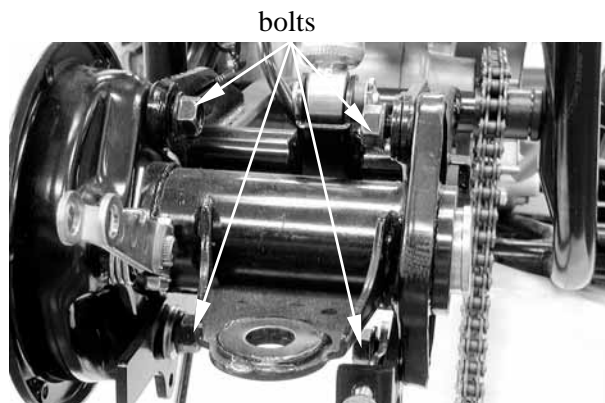
Tap the axle and with a rubber hammer, this will avoid damage the axle thread.

Rear Axle



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

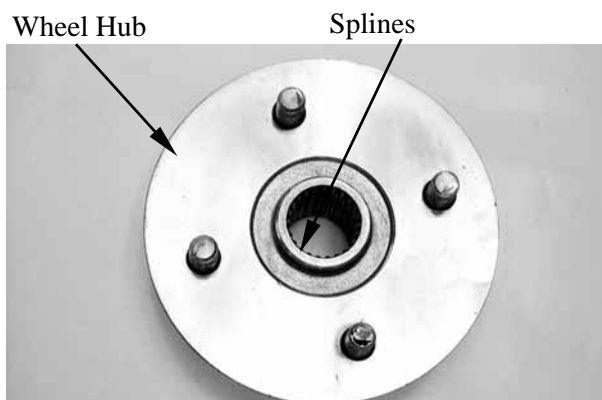
Remove four bolts and the rear axle hub.



### INSPECTION

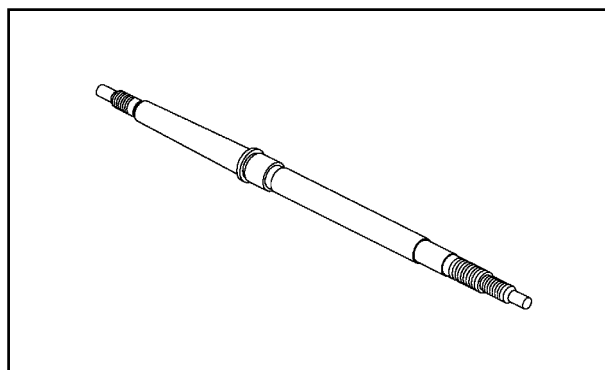
Replace if the wheel hub is cracked or damaged.

Replace if splines of the wheel hub are worn or damaged.



Replace if the rear axle is scratched (excessively) or damaged.

Replace if splines and threads of the rear axle are worn or damaged.

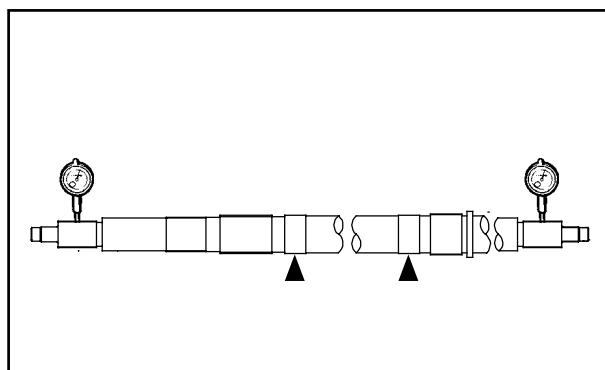


Measure the rear axle run out.

**Service limit:** less than 1.5mm

Replace if it is out of specification.

\* Do not attempt to straighten a bent axle.



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

### DRIVE CHAIN INSPECTION

Remove rear wheels, rear hub (with rear axle) and swing arm.

Refer to the "REAR WHEEL — REMOVAL" and "SWING ARM REMOVAL" section.

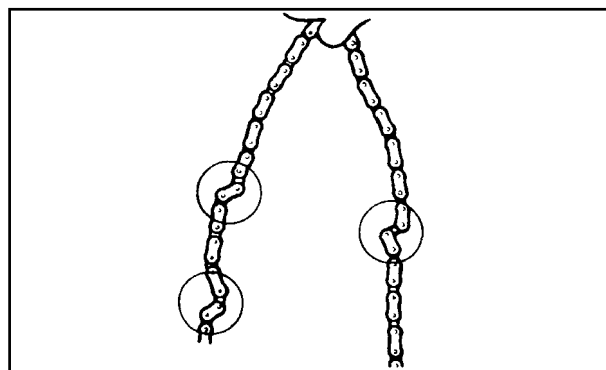
Remove right foot board.

Remove the drive sprocket.

Remove the drive chain.

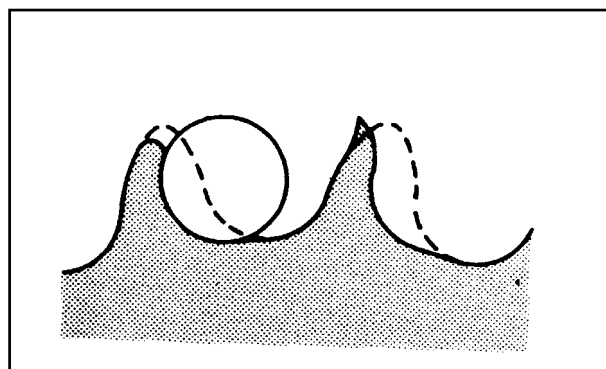
Inspect the drive chain stiffness.

Clean and lubricate or replace if stiff.



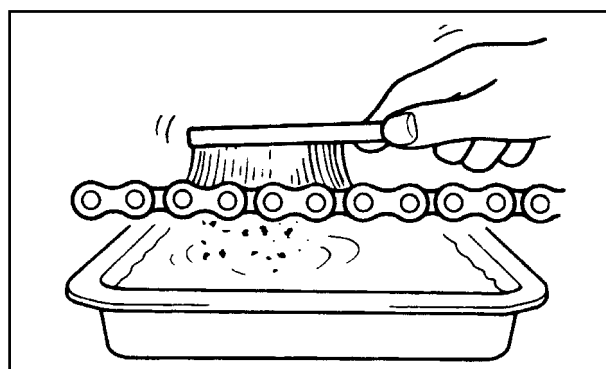
Inspect the drive sprocket and the driven sprocket.

Replace sprocket if more than 1/4 teeth wear or bent teeth.



### CLEAN

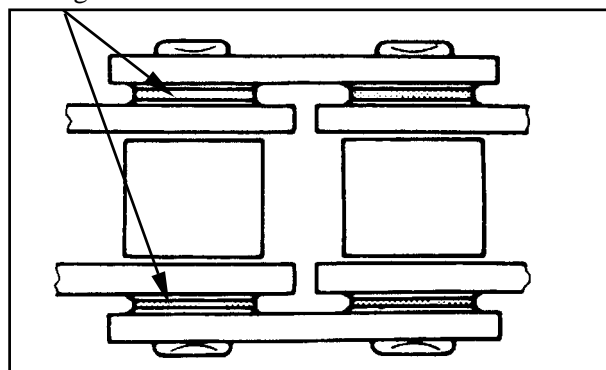
Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.



\*

This machine has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain.

O-ring



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

Inspect rear axle hub.

Replace if bearings allow play in the axle hub or the bearing turns roughly.

Replace if oil seals is wear or damage.

Replace if rear axle hub is cracks, bend or damage.

Bearing and oil seal replacement steps:

Clean the outside of the rear axle.

Remove the oil seal by a flat-head screw driver.



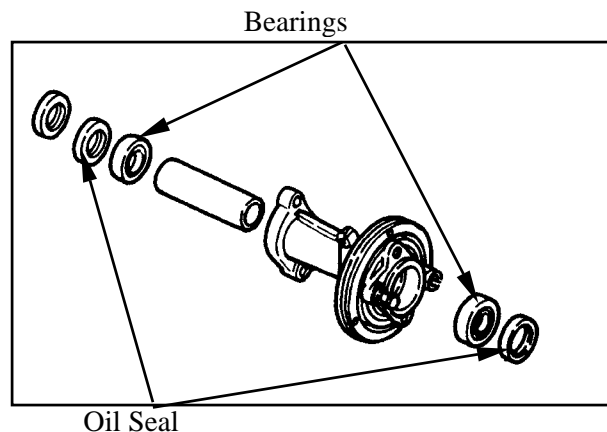
Place a wood block against the outer edge to protect this edge.

Remove the bearing by a general bearing puller.

Install the new bearings and oils seal by reversing the previous steps.



Do not strike the center race or balls of the bearing.  
Contact should be made only with the outer race.



### INSTALLATION

Reverse the "REMOVAL" procedures.

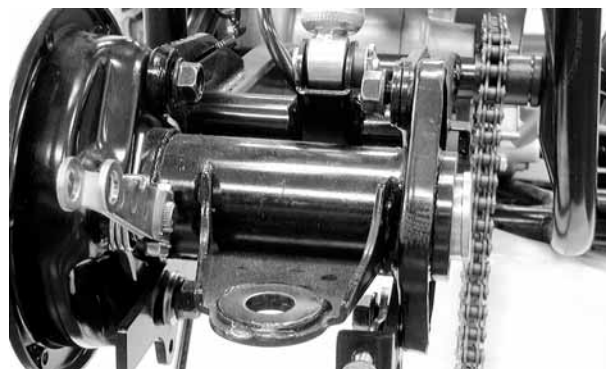


Apply grease onto the oil seal lips, bearings and bushes.

Install the rear axle hub.



At this time, the rear axle hub should not be tightened completely.  
Final tightening is done after the chain slack adjustment.



Install the rear axle.



Tap the axle and with a rubber hammer, this will avoid damage the axle thread.



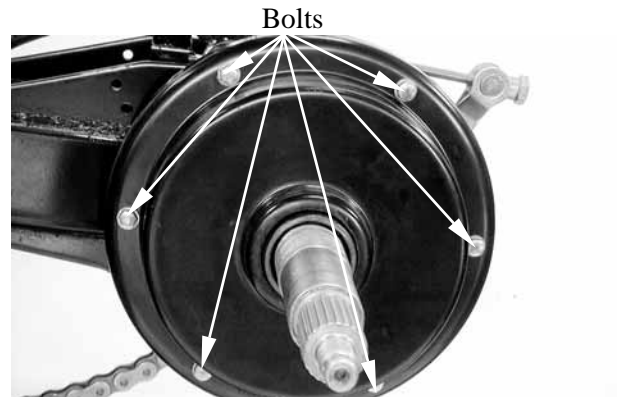
## 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

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Install the brake drum.

Install the rubber spacer and brake drum cover.

**Torque:** 0.8~1.2kgf-m



Adjust drive chain slack.

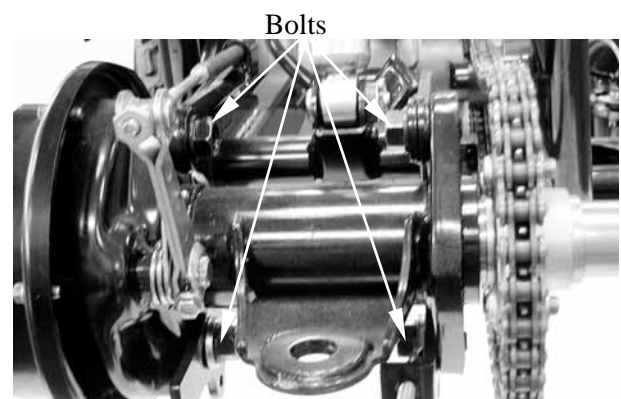
**Approximately:** 30 mm



Tighten the bolts.

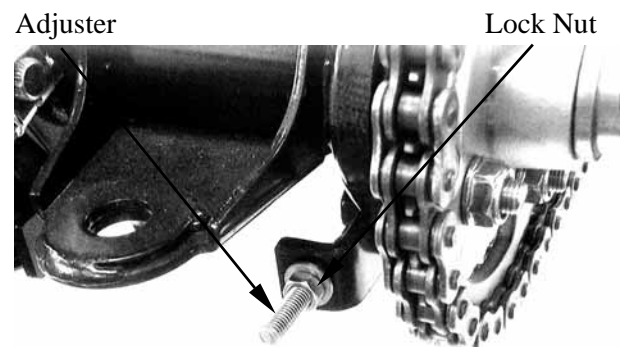
**Torque:** 6.0~8.0kgf-m

**Torque:** 6.0~8.0kgf-m



Tighten the lock nut.

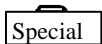
**Torque:** 1.8~2.5kgf-m





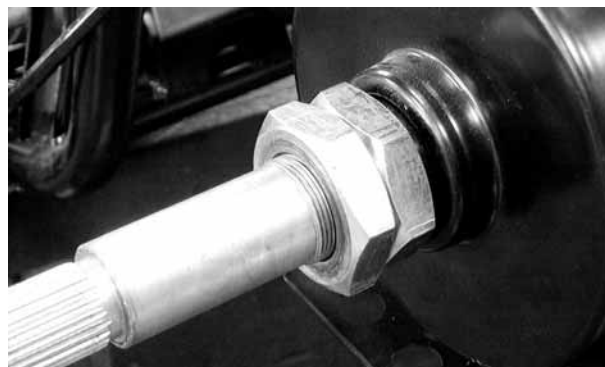
## 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

Tighten the two nuts with the nut wrench.



Nut wrench F010

**Torque:** 11.0~13.0kgf-m



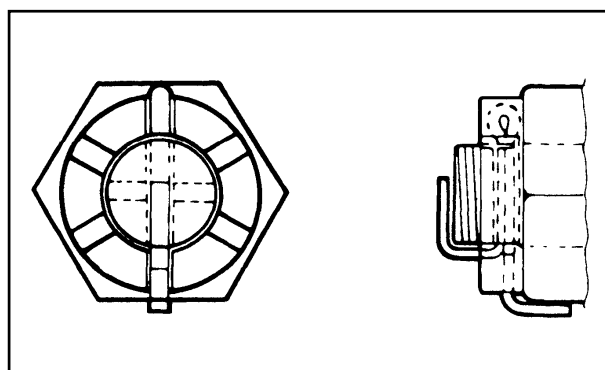
Install wheel hub, plate washer and nut (wheel hub).

**Torque:** 6.0~8.0kgf-m

Install cotter pins.

\*

Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening it on the axle nut.



\*

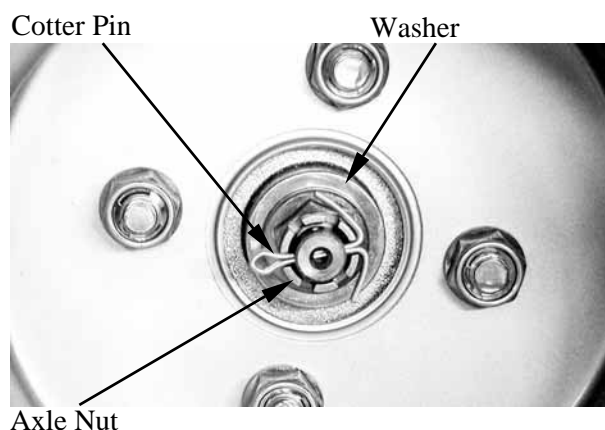
Always use a new cotter pin.

Install the rear wheel and tighten the nuts (wheel).

**Torque:** 6.0~8.0kgf-m

\*

Tapered wheel nuts are used for rear wheels.  
Install the nuts with its tapered side towards the wheel.



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

### SWING ARM

Place the machine on a level place.

Elevate the rear wheels by placing a suitable stand under the rear of frame.

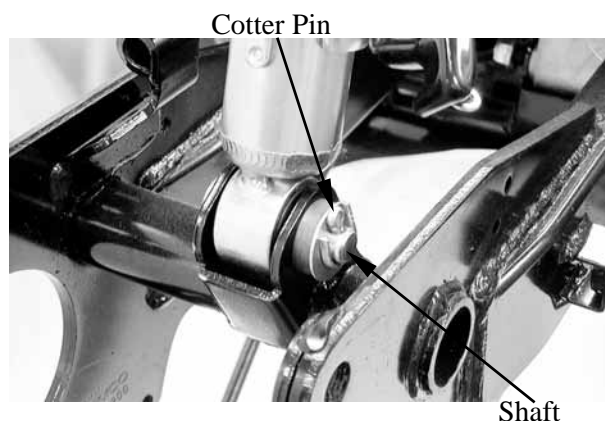
- \* Support the machine securely so there is no danger of it falling over.

Remove the rear wheels, rear hub with rear axle.

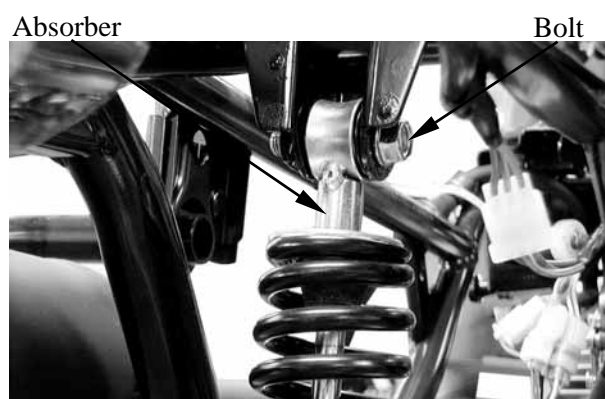
Refer to the "REAR WHEEL — REMOVAL" section

Remove the cotter pin, washer and shaft.

- \* When removing the lower shaft, hold the swing arm so that it does not drop downwards when the shaft is removed.



Remove the bolt, then remove the shock absorber.



Check the tightening torque of the pivot shaft (swingarm) securing nut.

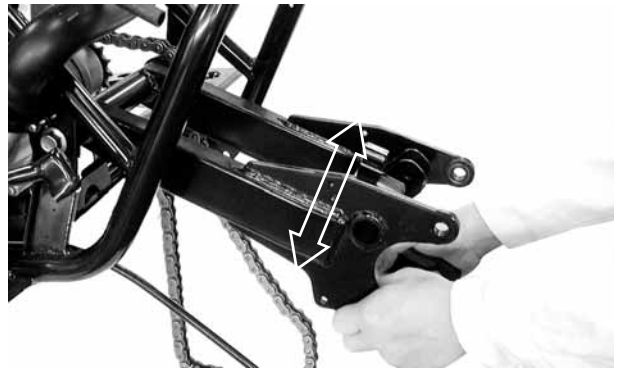
**Torque:** 6.0~8.0kgf-m



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

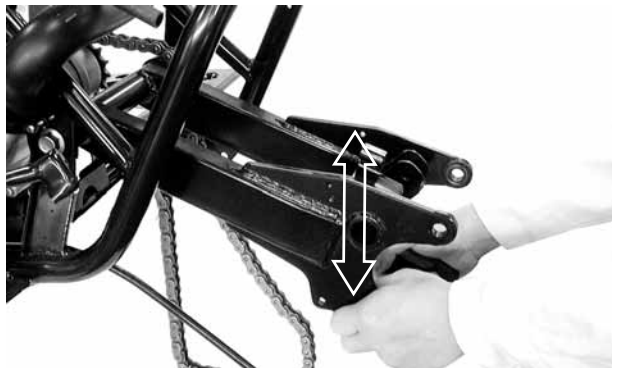
Check the swing arm side play by moving it from side to side.

If side play noticeable, check the inner collar, bearing, bushing and thrust cover, or adjust the shim.



Check the swing arm vertical movement by moving it up and down.

If vertical movement is tight, binding or rough, check the inner collar, bearing, bushing and thrust cover, or adjust the shim.

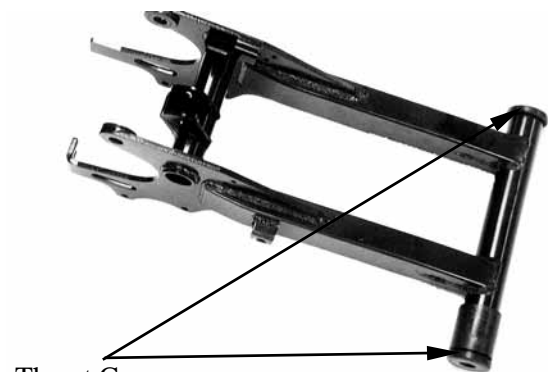


Remove the nut and pivot shaft, then remove swing arm.



Swing arm

Remove the thrust covers.



Thrust Covers

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

### INSPECTION

Inspect the shock absorber rod.

Replace the shock absorber assembly if bends or damage.

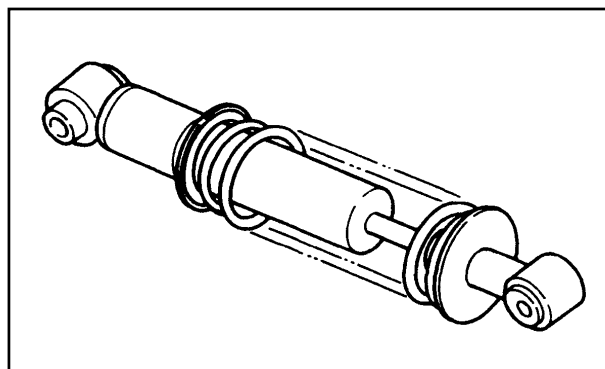
Inspect the shock absorber.

Replace the shock absorber assembly if oil leaks

Inspect the spring.

Replace the shock absorber assembly if fatigue.

Move the spring up and down.



Inspect the swing arm.

Replace if crack, bend or damage.

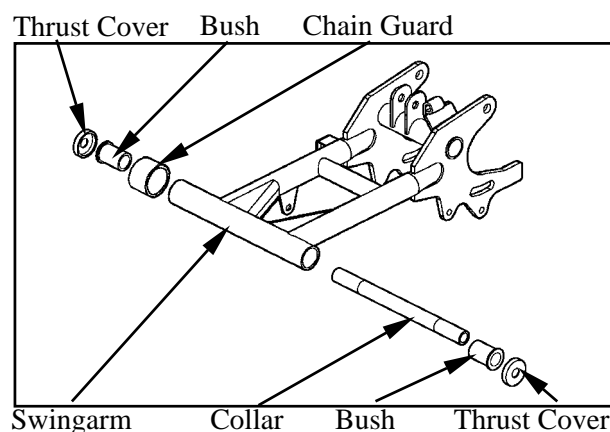
Roll the axle on a flat surface to inspect the pivot shaft.

Replace if bends.

**\*** Do not attempt to straighten a bent axle.

Inspect the thrust cover, chain guard, collar and bush.

Replace if wear or damage.



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

### INSTALLATION

Reverse the “REMOVAL” procedure.

Apply grease onto the collar, bush, pivot shaft and thrust cover.

Install the swing arm and tightening the nut.

**Torque:** 6.0~8.0kgf-m

Pivot Shaft



Install the shock absorber and tightening the bolt.

**Torque:** 3.5~4.5kgf-m



Install the shaft, washer and cotter pin.

\*

Always use a new cotter pin.



Install the rear hub and rear wheels.

Refer to the “REAR WHEEL  
INSTALLATION” section.

Adjust the drive chain slack.

Refer to the “DRIVE CHAIN SLACK  
ADJUSTMENT” section in the CHAPTER  
3.

**Approximately:** 30 mm

# 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

## HYDRAULIC BRAKE

### BRAKE FLUID CHANGE/AIR BLEED

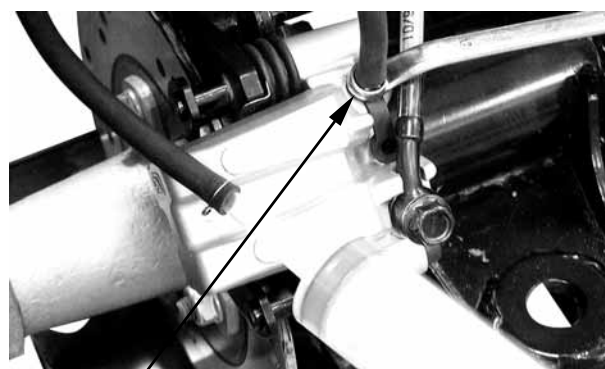
Place the motorcycle on its main stand on level ground and set the handlebar upright. Remove the two screws attaching the brake fluid reservoir cap.

★

Use shop towels to cover plastic parts and coated surfaces to avoid damage caused by splash of brake fluid.



Connect a transparent hose to the brake caliper bleed valve and then loosen the bleed valve nut. Use a syringe to draw the brake fluid out through the hose.



Bleed Valve

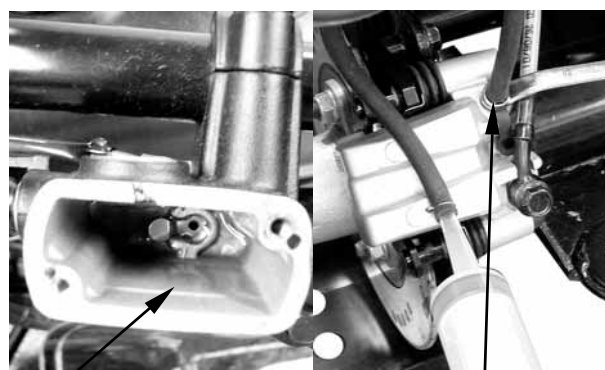
### BRAKE FLUID REFILLING

Connect a transparent hose and syringe to the brake caliper bleed valve and then loosen the bleed valve nut. Fill the brake reservoir with brake fluid and use the syringe to draw brake fluid into it until there is no air bubbles in the hose. Then, tighten the bleed valve nut.

**Torque:** 0.4~0.7kg-m

★

- When drawing brake fluid with the syringe, the brake fluid level should be kept over 1/2 of the brake reservoir height.
- Use only the recommended brake fluid.



Brake Reservoir

Bleed Valve

**Recommended Brake Fluid:** DOT-4

# 13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

## HYDRAULIC BRAKE

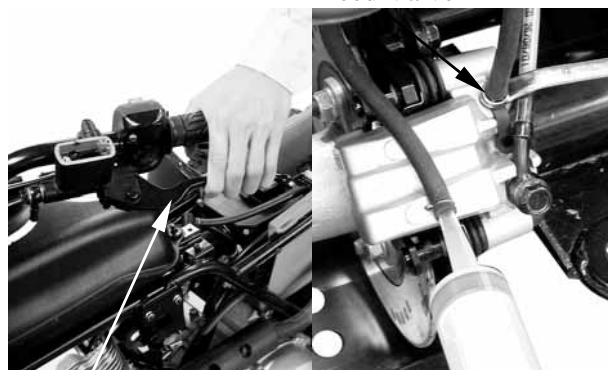
### BRAKE SYSTEM BLEEDING

Connect a transparent hose to the bleed valve and fully apply the brake lever after continuously pull it several times. Then, loosen the bleed valve nut to bleed air from the brake system. Repeat these steps until the brake system is free of air.



When bleeding air from the brake system, the brake fluid level should be kept over 1/2 of the brake reservoir height.

Bleed Valve



Brake Lever

### BRAKE PAD/DISK

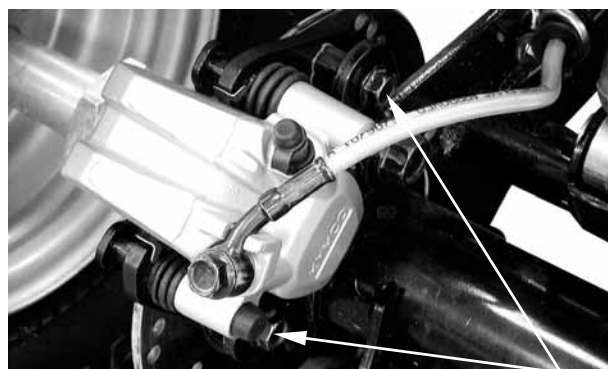
#### BRAKE PAD REPLACEMENT

Remove the two bolts attaching the brake caliper holder.



The brake pads can be replaced without removing the brake fluid tube.

Remove the brake caliper.

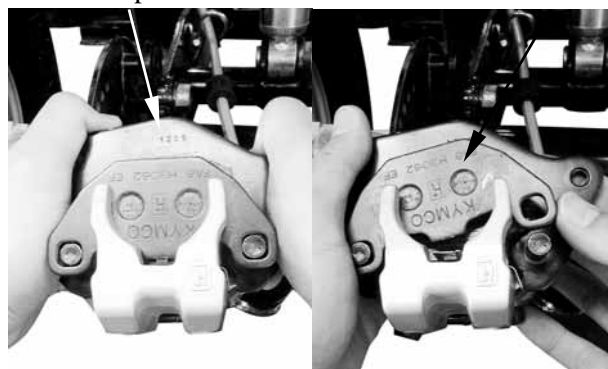


Bolts

Push the brake caliper holder and then remove brake pad.

Brake Caliper Holder

Brake Bad



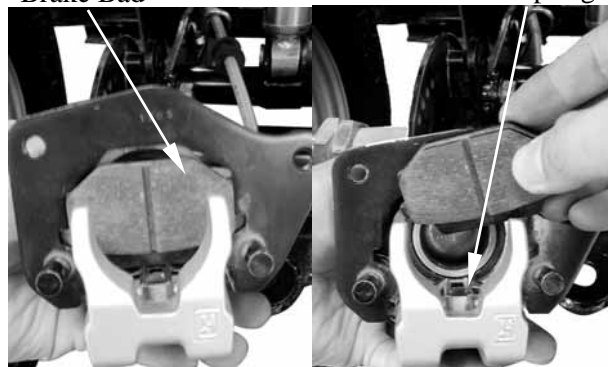
Remove the other brake pad and pad springs.

#### ASSEMBLY

Assemble the brake pads in the reverse order of removal.

Brake Bad

Pad Spring



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

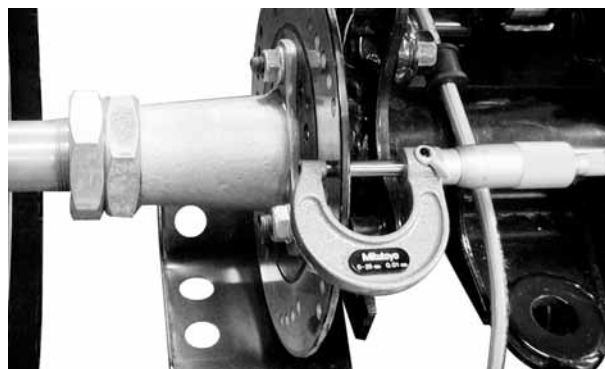
### BRAKE DISK

Measure the brake disk thickness.

**Service Limit:** 3.0mm

Measure the brake disk run out.

**Service Limit:** 0.3mm



### BRAKE MASTER CYLINDER

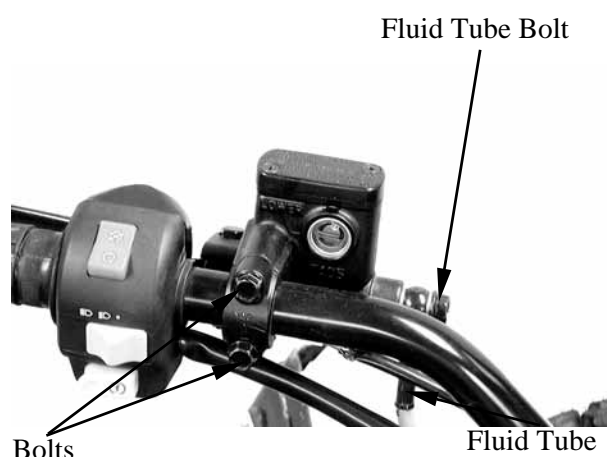
#### REMOVAL

Drain the brake fluid from the hydraulic brake system.

- \* Do not splash brake fluid onto any rubber, plastic and coated parts. When working with brake fluid, use shop towels to cover these parts.

Remove the two master cylinder holder bolts and remove the master cylinder.

- \* When removing the brake fluid tube bolt, be sure to place towels under the tube and plug the tube end to avoid brake fluid leakage and contamination.





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

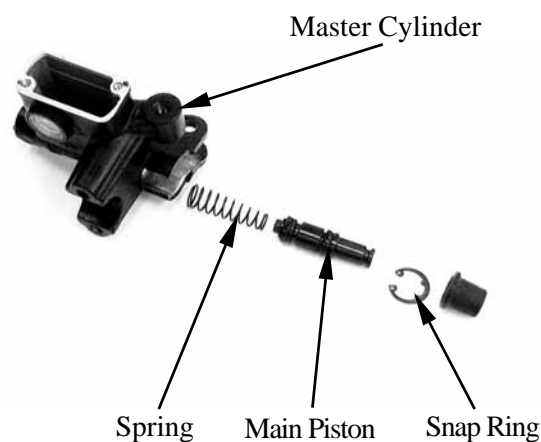
### DISASSEMBLY

Remove the piston rubber cover and snap ring from the brake master cylinder.



Snap Ring Pliers

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.



### INSPECTION

Measure the brake master cylinder I.D.  
Inspect the master cylinder for scratches or cracks.

**Service Limit:** 12.75mm replace if over



Measure the brake master cylinder piston O.D.

**Service Limit:** 12.64mm replace if below



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

### ASSEMBLY

Before assembly, apply brake fluid to all removed parts.

Install the spring together with the 1st rubber cup.

★

- During assembly, the master cylinder, 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 main piston and snap ring.

Install the rubber cover.

Install the brake lever.

Install the brake fluid tube with the bolt and two sealing washers. Then, install the rearview mirror.

Fill the brake reservoir with recommended brake fluid to the upper level.

Bleed air from the hydraulic brake system.  
(Refer to 13-17.)

Fluid Tube Bolt



Sealing Washer

Place the brake master cylinder on the handlebar and install the master cylinder holder with the "UP" mark facing up, aligning the tab on the holder with the hole in the handlebar.

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

**Torque:** 1.0~1.4kg-m



"UP" Mark

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

### BRAKE CALIPER

#### REMOVAL

Remove the brake caliper, brake pads and pad spring.  
Place a clean container under the brake caliper and disconnect the brake fluid tube from the brake caliper.



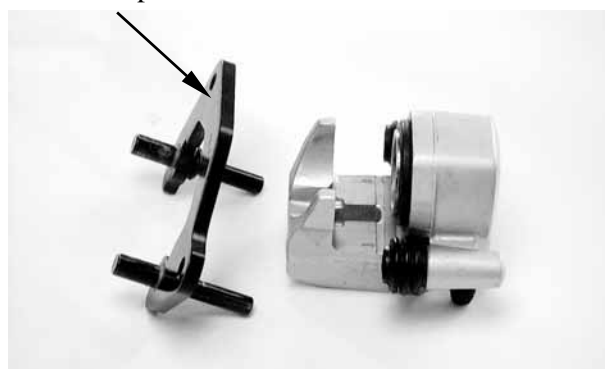
Be careful not to splash brake fluid on any coated surfaces.



#### DISASSEMBLY

Remove the brake caliper holder from the brake caliper.

Brake Caliper Holder



Remove the pistons from the brake caliper.  
Use compressed air to press out the pistons through the brake fluid inlet opening and place a shop towel under the caliper to avoid contamination caused by the removed pistons.



Push the piston oil seals inward to remove them.  
Clean each oil seal groove with brake fluid.



Be careful not to damage the piston surface.

Piston Oil Seals



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

### INSPECTION

Check the piston for scratches or wear.  
Measure the piston O.D. with a micrometer gauge.

**Service limit:** 33.85mm replace if below



Check the caliper cylinder for scratches or wear and measure the caliper cylinder I.D.

**Service limit:** 34.05mm replace if over



### ASSEMBLY

Clean all removed parts.

Apply silicon grease to the pistons and oil seals. Lubricate the brake caliper cylinder inside wall with brake fluid.

Install the oil seals and then install the brake caliper pistons with the grooved side facing out.

★

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



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

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

### INSTALLATION

Connect the brake fluid tube to the brake caliper, aligning the fluid tube with groove in the caliper and tighten the fluid tube bolt.

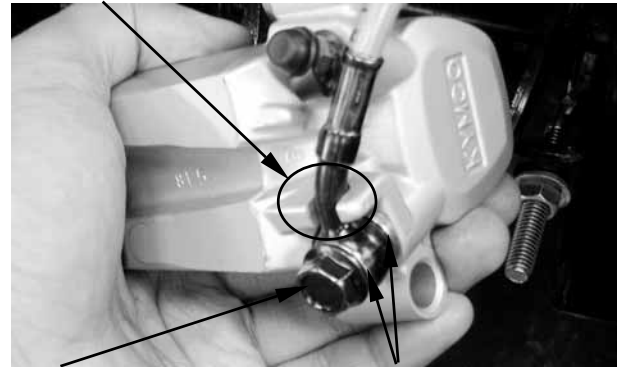
**Torque:** 2.8~3.5kg-m

Add the recommended brake fluid into the brake reservoir and bleed air from the brake system. (Refer to 13-17.)

Install the brake caliper onto rear axle hub and tighten the bolts.

**Torque:** 2.4~3.0kg-m

Aligning The Fluid Tube With Groove



Fluid Tube Bolt

Washer



---

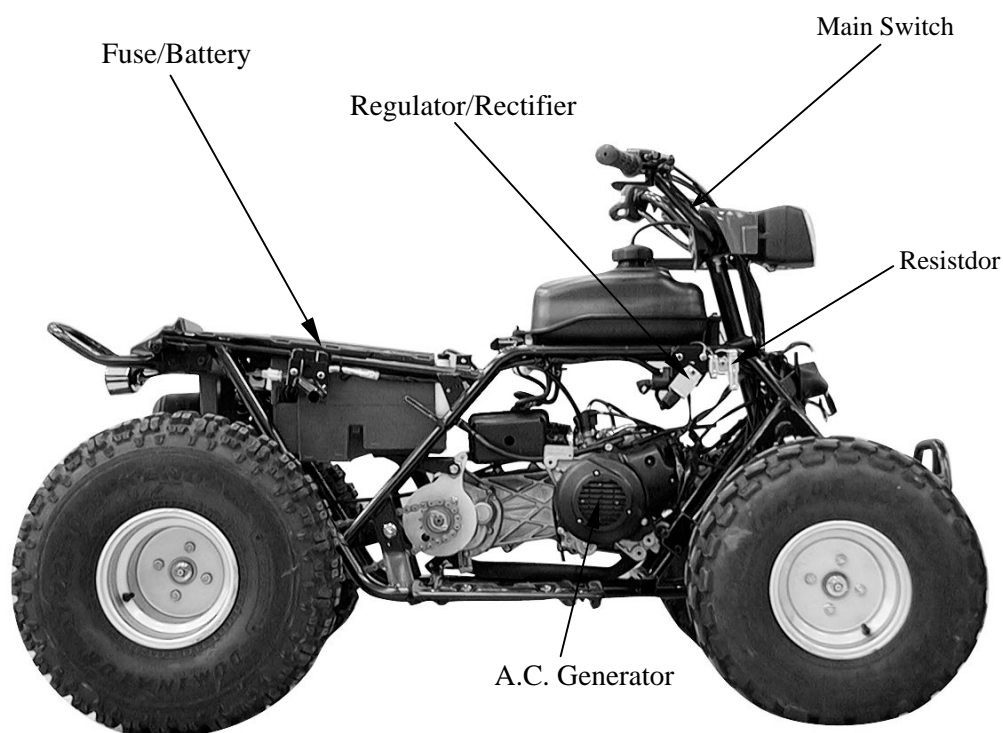
**BATTER/CHARGING SYSTEM/  
A.C. GENERATOR**

---

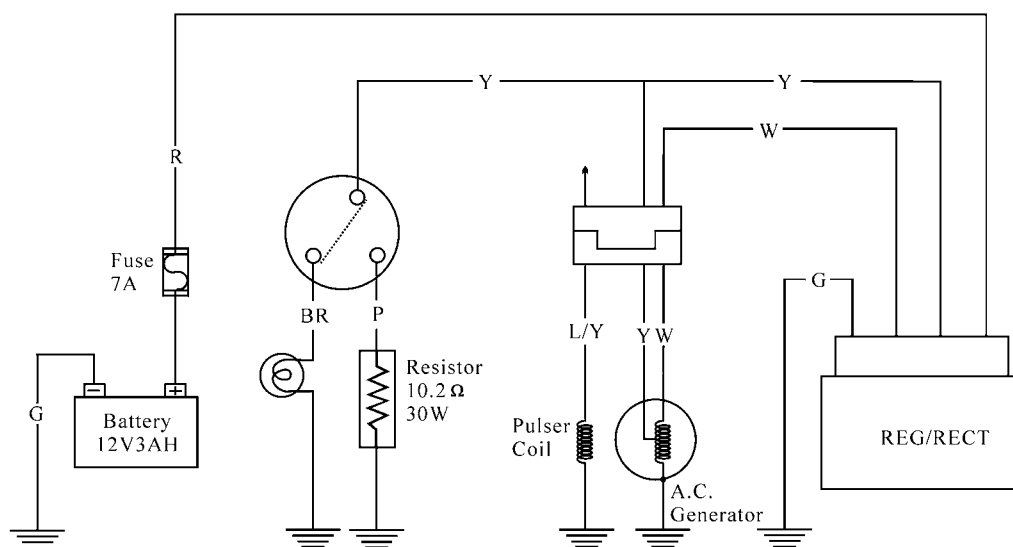
SERVICE INFORMATION-----	14- 2
TROUBLESHOOTING-----	14- 3
BATTERY REMOVAL -----	14- 4
PERFORMANCE TEST-----	14- 5
A.C. GENERATOR CHARGING COIL -----	14- 5
RESIETOR/REGULATOR/RECTIFIER-----	14- 6

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

**KYMCO**  
MX'er 50



### CHARGING CIRCUIT



## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

The battery electrolyte (sulfuric acid) is poisonous and may seriously damage the skin and eyes. Avoid contact with skin, eyes, or clothing. In case of contact, flush with water and get prompt medical attention

- The battery can be charged and discharged repeatedly. If a discharged battery is not used for a long time, its service life will be shortened. Generally, the capacity of a battery will decrease after it is used for 2~3 years. A capacity-decreased battery will resume its voltage after it is recharged but its voltage decreases suddenly and then increases when a load is added.
- When a battery is overcharged, some symptoms can be found. If there is a short circuit inside the battery, no voltage is produced on the battery terminals. If the rectifier won't operate, the voltage will become too high and shorten the battery service life.
- If a battery is not used for a long time, it will discharge by itself and should be recharged every 3 months.
- A new battery filled with electrolyte will generate voltage within a certain time and it should be recharged when the capacity is insufficient. Recharging a new battery will prolong its service life.
- Inspect the charging system according to the sequence specified in the Troubleshooting.
- Do not disconnect and soon reconnect the power of any electrical equipment because the electronic parts in the regulator/rectifier will be damaged. Turn off the ignition switch before operation.
- It is not necessary to check the MF battery electrolyte or fill with distilled water.
- Check the load of the whole charging system.
- Do not quick charge the battery. Quick charging should only be done in an emergency.
- Remove the battery from the motorcycle for charging.
- When replacing the battery, do not use a traditional battery.
- When charging, check the voltage with a voltmeter.

### SPECIFICATIONS

Item		Standard
Battery	Capacity/Model	12V-4AH
	Voltage (20°C)	Fully charged 13.1V
		Undercharged 12.3V
	Charging current	STD: 0.4A Quick: 4.0A
	Charging time	STD: 5~10hr Quick: 30min
A.C. Generator	Capacity	150W
	Charging coil resistance (20°C)	0.2~1.2Ω
Regulator/Rectifier	Type	Single-phase half-wave SCR
	Limit voltage	14.5±0.5V/8000



## TORQUE VALUES

Regulator/Rectifier lock nut

0.7~1.1kgf-m

## TESTING INSTRUMENTS

Kowa electric tester

Sanwa electric tester

## TROUBLESHOOTING

### 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 lighting system

### Charging system failure

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

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

## BATTERY

### BATTERY REMOVAL

Open the seat and battery cover.  
Disconnect the battery cables .

- \* First disconnect the battery negative (-) cable and then the positive (+) cable.

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.

- \* Battery charging inspection must be performed with an electric tester.

### CHARGING METHOD

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

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

- \*
  - Keep flames and sparks away from a charging battery.
  - Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery.
  - Charge the battery according to the current specified on the battery surface.

Charging current: Standard : 0.4A

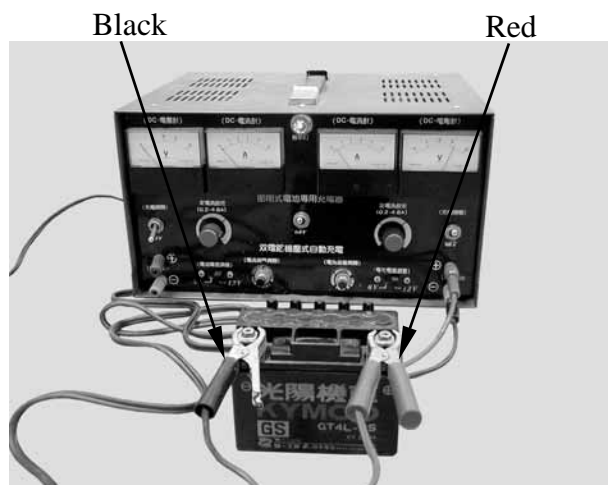
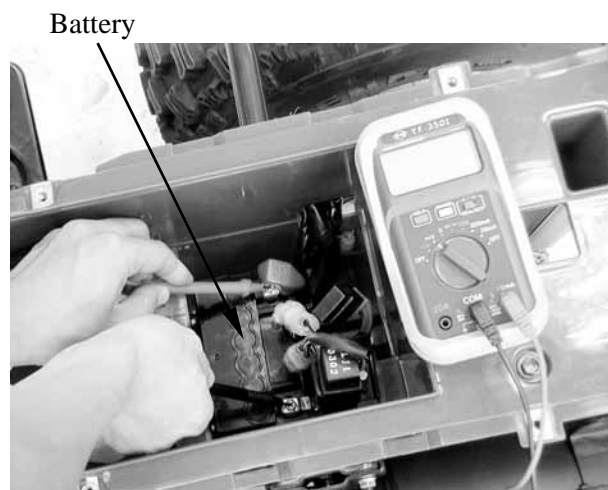
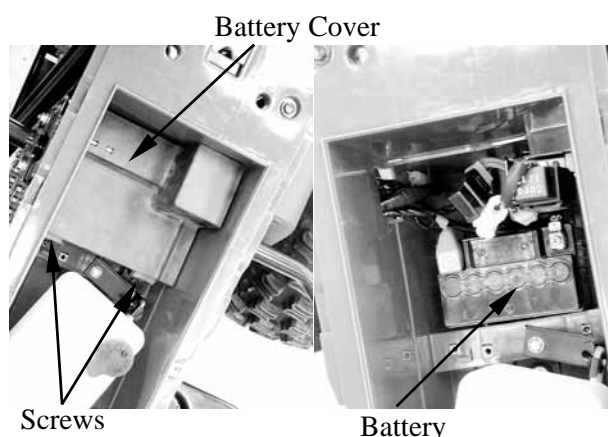
Quick : 4A

Charging time : Standard : 5 hours

Quick : 0.5 HOUR

After charging: Open circuit voltage: 12.8V min.

- \*
  - Quick charging should only be done in an emergency.
  - During quick charging, the battery temperature should not exceed 45°C.
  - Measure the voltage 30 minutes after the battery is charged.



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

## PERFORMANCE TEST

Warm up the engine.  
Open the seat and battery cover.

\* Use a fully charged battery to check the charging system output.

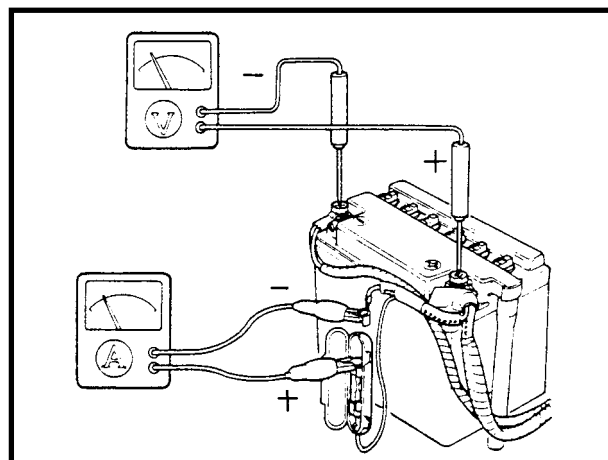
Stop the engine and open the fuse box. Disconnect the wire lead from the fuse terminal. Connect an ammeter between the wire lead and fuse terminal as shown. Connect the battery positive (+) terminal to the voltmeter positive (+) probe and battery negative (-) terminal to the voltmeter negative (-) probe.

Start the engine, gradually increase engine speed to test the output:

Position RPM	Day	Night
2500	0.7A min.	0.5A min.
6000	1.3A min.	1.3A min.

**Charging Limit Voltage:**  $14.5 \pm 0.5V/8000rpm$

If the limit voltage is not within the specified range, check the regulator/rectifier.



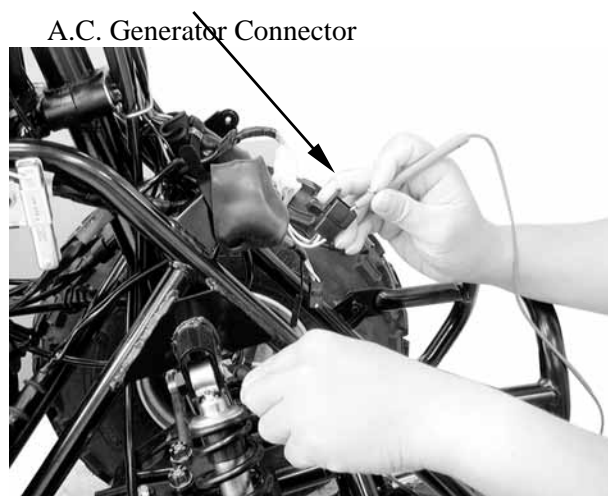
## A.C. GENERATOR (CHARGING COIL) INSPECTION

\* Inspect with the engine installed.

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	$0.2 \sim 1.2\Omega$
Lighting coil	Yellow-green	$0.3 \sim 1.0\Omega$



Refer to 8-3 for A.C. generator removal.

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

## RESISTOR INSPECTION

Measure the resistance between the resistor B pink wire and ground.

Measure the resistance between the resistor A green/black wire and ground.

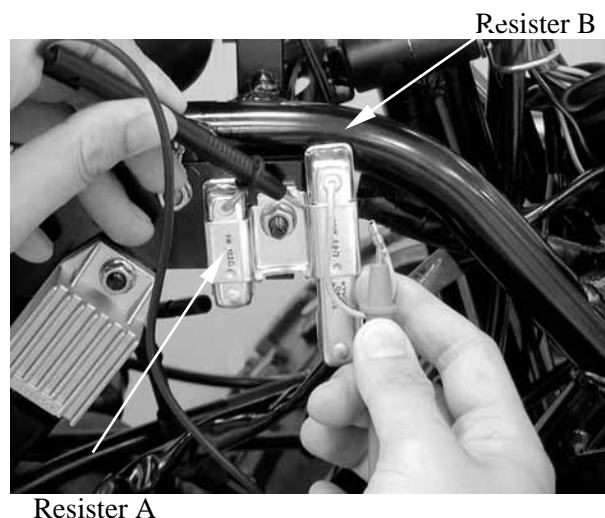
### Resistances:

Resistor A:  $9.2 \sim 9.8\Omega$

Resistor B:  $5.6 \sim 6.2\Omega$

**\***

Faulty resistor is the cause of faulty operation of the auto bystarter.



## REGULATOR/RECTIFIER INSPECTION

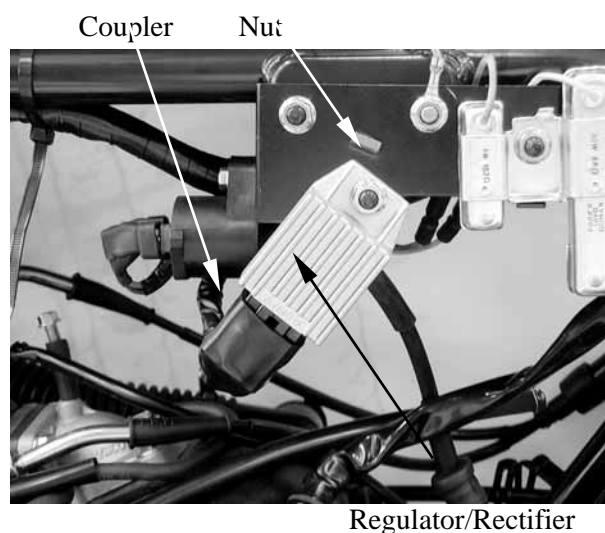
Disconnect the regulator/rectifier wire coupler and remove the nut to remove the regulator/rectifier.

Measure the resistances between the terminals.

Replace the regulator/rectifier if the readings are not within the specifications in the table below.

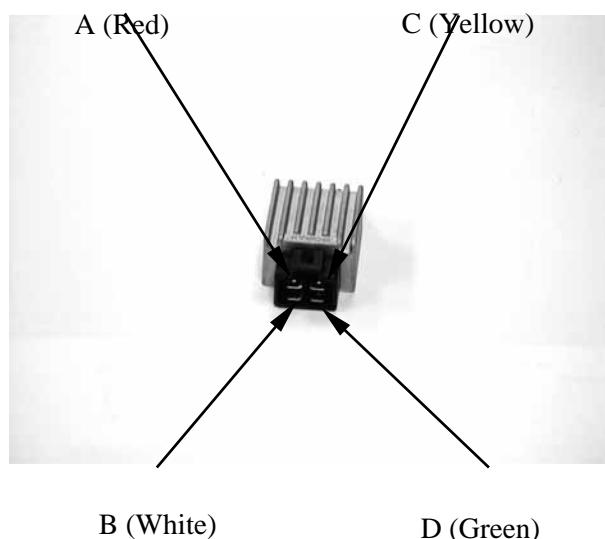
**\***

Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.



Model	Brand	Range
SP-10D	Sanwa	K $\Omega$
TH-5H	Kowa	100 $\Omega$

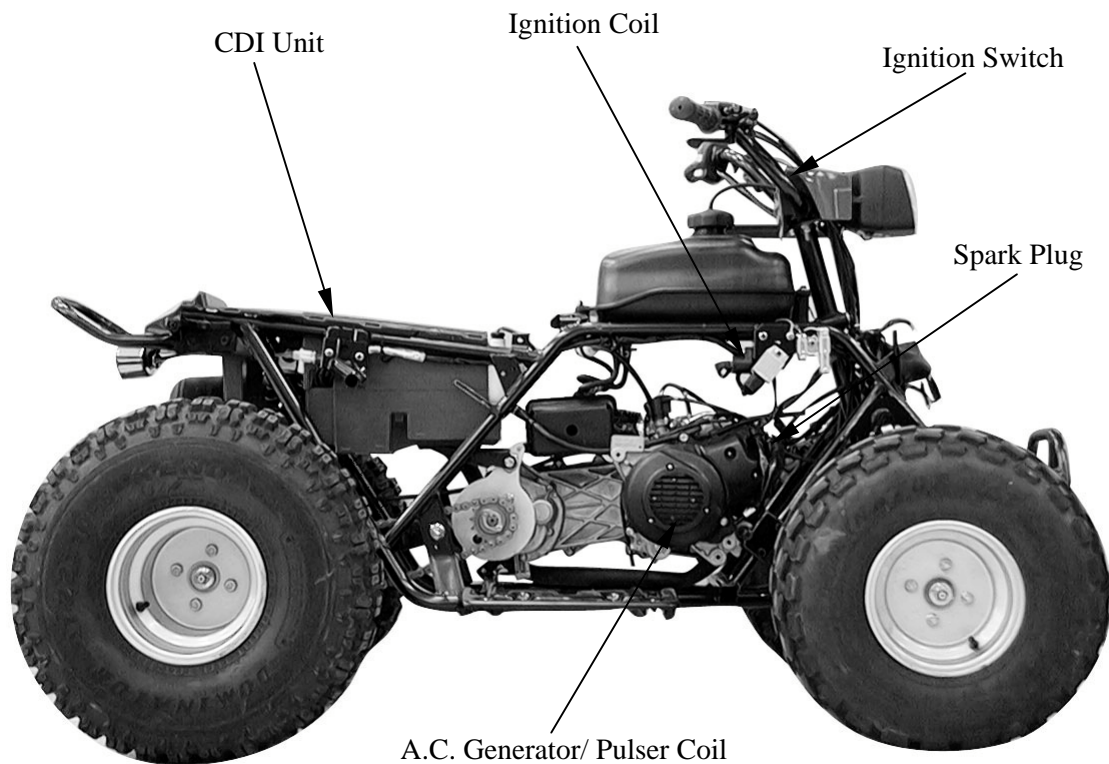
Probe $\oplus$ Probe(-)	A (R)	B (W)	C (Y)	D (G)
A (R)		$\infty$	$\infty$	$\infty$
B (W)	8-10K $\Omega$		$\infty$	$\infty$
C (Y)	$\infty$	$\infty$		33-35K $\Omega$
D (G)	$\infty$	$\infty$	33-35K $\Omega$	



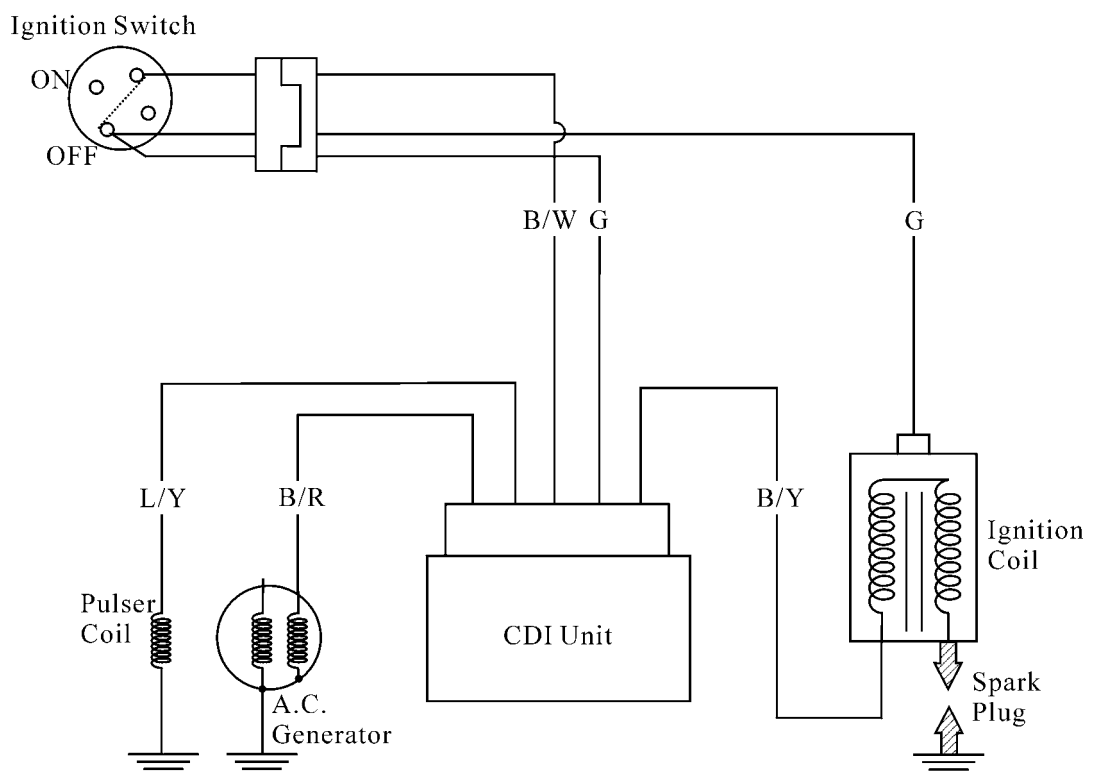
## IGNITION SYSTEM

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A.C.GENGRATOR-----	15- 5
CDI UNIT INSPECTION-----	15- 6

# 15. IGNITION SYSTEM



## IGNITION CIRCUIT



# 15. IGNITION SYSTEM

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- Check the ignition system according to the sequence specified in the Troubleshooting.
- The ignition system adopts CDI unit , change gear control and the ignition timing cannot be adjusted.
- If the timing is incorrect, inspect the CDI unit, A.C. generator, change gear control and replace any faulty parts. Inspect the CDI unit with a CDI tester
- Loose connector and poor wire connection are the main causes of faulty ignition system. Check each connector before operation.
- Use of spark plug with improper heat range is the main cause of poor engine performance.
- The inspections in this section are focused on maximum voltage. The inspection of ignition coil resistance is also described in this section.
- Inspect the ignition switch according to the continuity table specified in page 17-5.
- Inspect the spark plug referring to Section 3.

### SPECIFICATIONS

Item			Standard
Spark plug	Standard type		BR8HAS
	Hot type		
	Cold type		
Spark plug gap			0.6~0.7mm
Ignition timing	“F” mark Full advance		22°BTDC/2000±100rpm
Ignition coil resistance (20℃)	Primary coil		0.2~0.3Ω
	Secondary coil	with plug cap	8.0~9.3KΩ
		without plug cap	3.0~4.2KΩ
Pulser coil resistance (20℃)			50~200Ω
Exciter coil resistance (20℃)			400~700Ω

## 15. IGNITION SYSTEM

---

### TROUBLESHOOTING

#### **High voltage too low**

- Weak battery or low engine speed
- Loose ignition system connection
- Faulty CDI unit
- Faulty ignition coil
- Faulty pulser coil

#### **Normal high voltage but no spark at plug**

- Faulty spark plug
- Electric leakage in ignition secondary circuit
- Faulty ignition coil

#### **Good spark at plug but engine won't start**

- Faulty CDI or incorrect ignition timing
- Faulty change gear control unit
- Improperly tightened A.C. generator flywheel

#### **No high voltage**

- Faulty ignition switch
- Faulty CDI unit
- Poorly connected or broken CDI ground wire
- Dead battery or faulty regulator/rectifier
- Faulty ignition coil connector
- Faulty pulser coil



## 15. IGNITION SYSTEM

### Continuity Test

\*

This test is to inspect the continuity of ignition coil.

Measure the resistance between the ignition coil primary coil terminals.

**Resistance** (20°C): 0.2~0.3Ω



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): 8.0~9.3KΩ

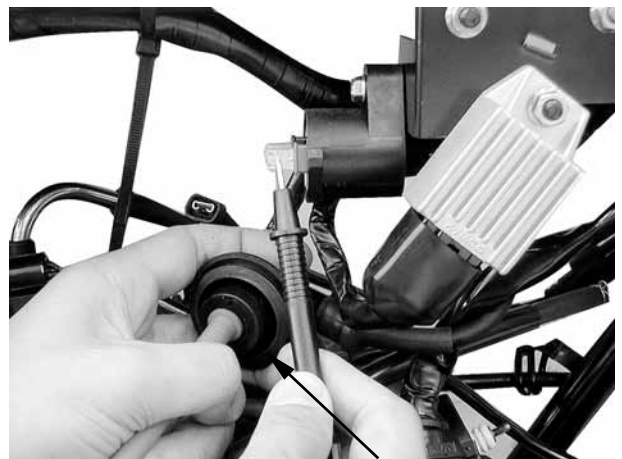
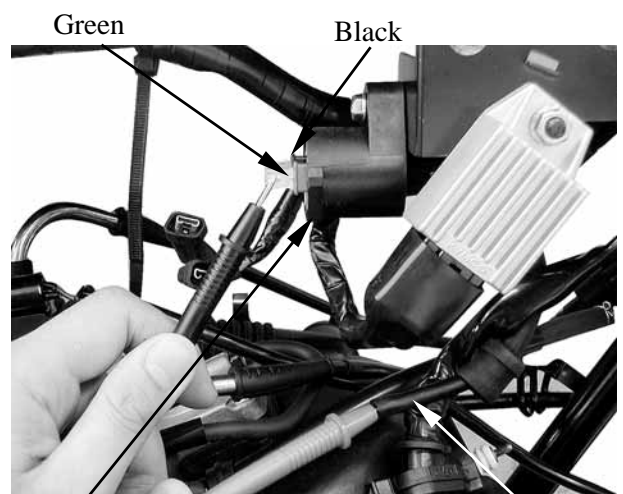


Figure A

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): 3.0~4.2KΩ

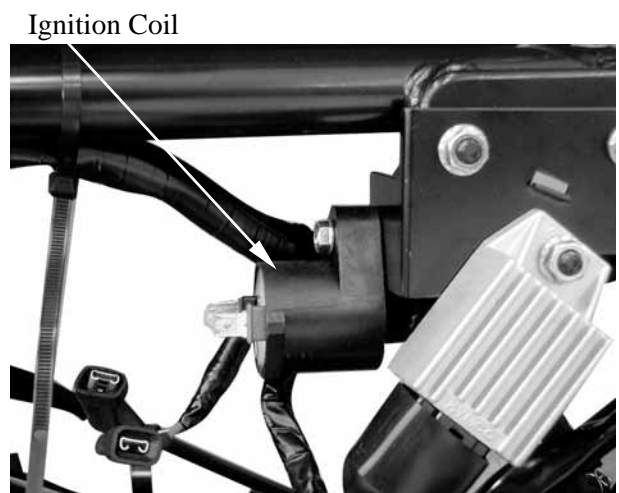


Ignition Coil

Figure B

## Performance Test

Remove the ignition coil.



Inspect the ignition coil with an ignition coil tester.

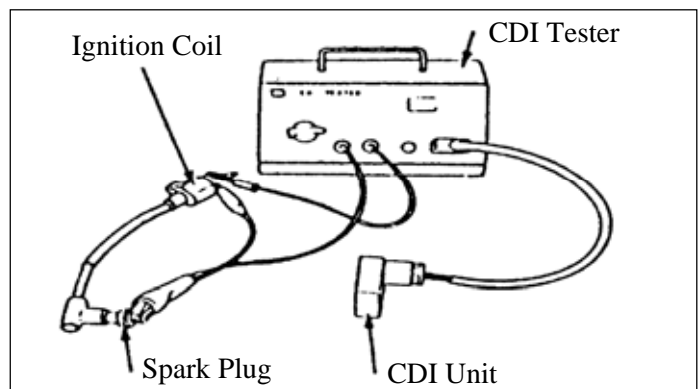
**\***

Follow the ignition coil tester manufacturer's instructions.

1. Turn the changeover switch to 12V and connect the ignition coil to the tester.
2. Turn the power switch ON and check the spark from the watch window.
  - Good : Normal and continuous spark
  - Faulty : Weak or intermittent spark

**\***

The test is performed at both conditions that the ignition coil is cold and hot.



## A.C. GENERATOR

### Exciter Coil/Pulser Coil Inspection

**\***

This test is performed with the stator installed in the engine.

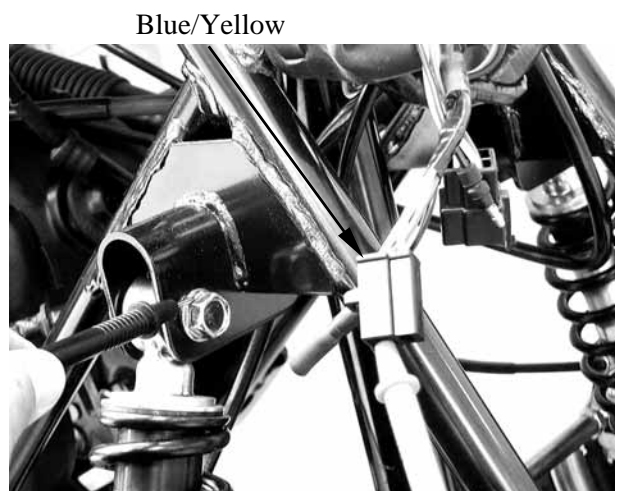
Disconnect the A.C. generator wire connector.

Measure the exciter coil resistance between the black/red wire and ground.

**Resistance (20°C):** 400~700Ω

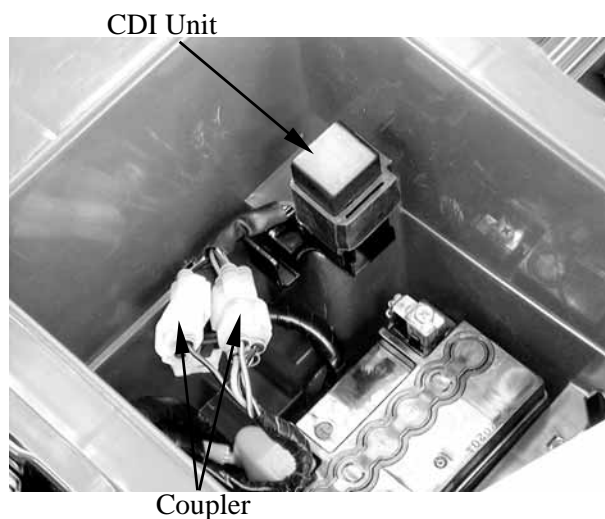
Measure the pulser coil resistance between the blue/yellow wire and ground.

**Resistance (20°C):** 50~200Ω



## CDI UNIT INSPECTION

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

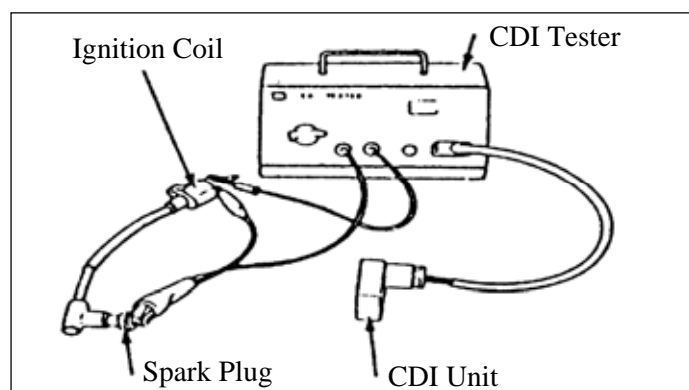


## CDI CIRCUIT INSPECTION

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

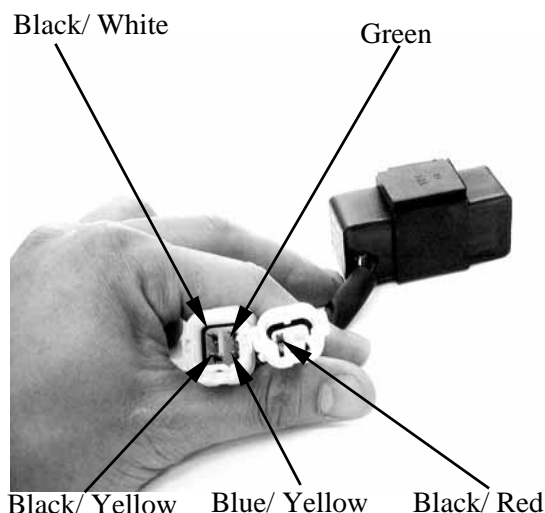
**\***

- Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.
- Use a Sanwa Electric Tester or Kowa Electric Tester (TH-5H).
- In this table, "Needle swings then returns" indicates that there is a charging current applied to a condenser. The needle will then remain at " $\infty$ " unless the condenser is discharged.



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

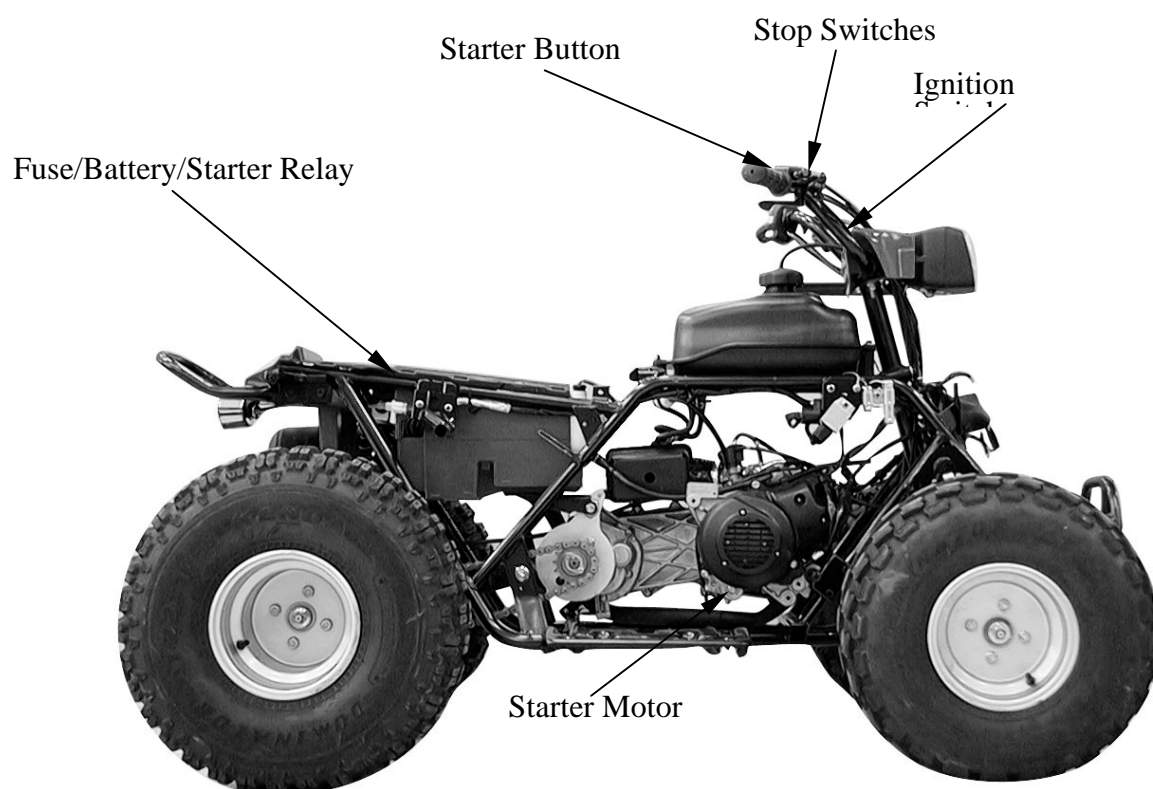
Probe $\oplus$ (-)Probe	Black/ Yellow	Black/ Red	Black/ White	Blue/ Yellow	Green
Black/ Yellow		$\infty$	$\infty$	$\infty$	$\infty$
Black/ Red	$\infty$		4-6	$\infty$	$\infty$
Black/ White	$\infty$	$\infty$		$\infty$	$\infty$
Blue/ Yellow	$\infty$	25-45	80-100		15-25
Green	$\infty$	4-6	10-20	$\infty$	



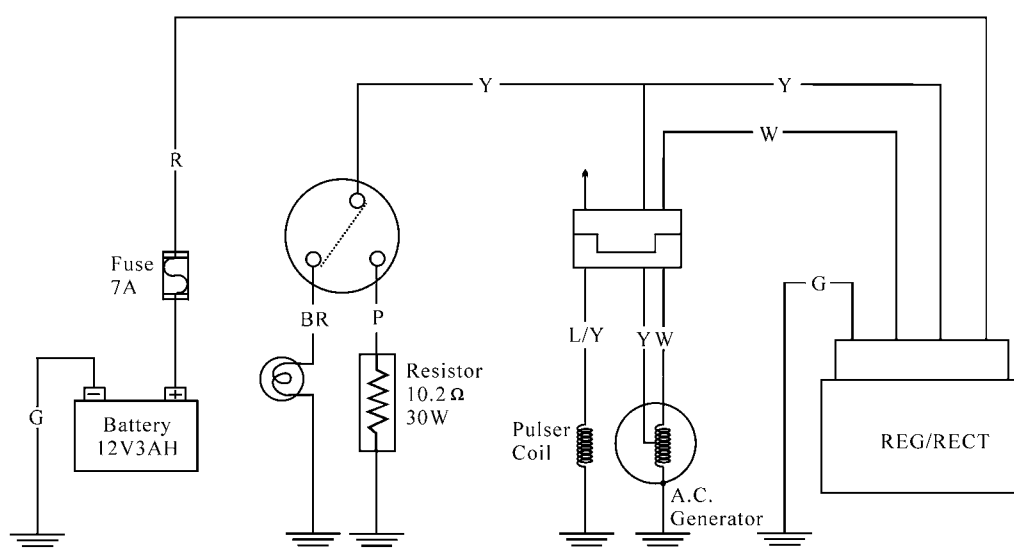
STARTING SYSTEM

SERVICE INFORMATION-----	16- 2
TROUBLESHOOTING-----	16- 2
STARTER RELAY -----	16- 3
STARTER MOTOR -----	16- 3

## 16. STARTING SYSTEM



### STARTING CIRCUIT



## 16. STARTING SYSTEM

---

### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- The removal of starter motor can be accomplished with the engine installed.
- For the starter clutch removal, refer to Section 4.

### 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

#### **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

## 16. STARTING SYSTEM

### STARTER RELAY INSPECTION

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

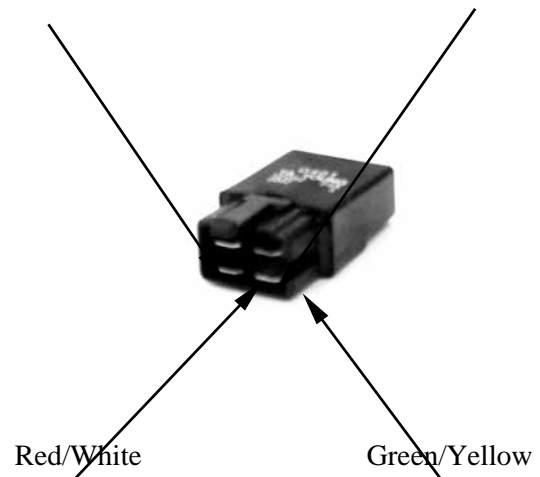
Starter Relay



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.

Red

Yellow/Red



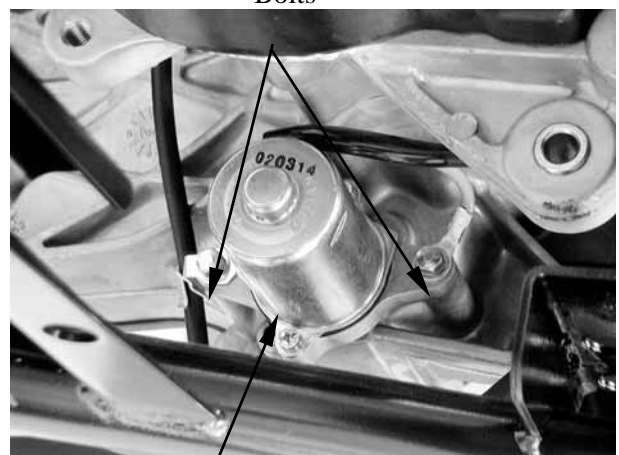
Red/White

Green/Yellow

### 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.

Bolts



Starter Motor

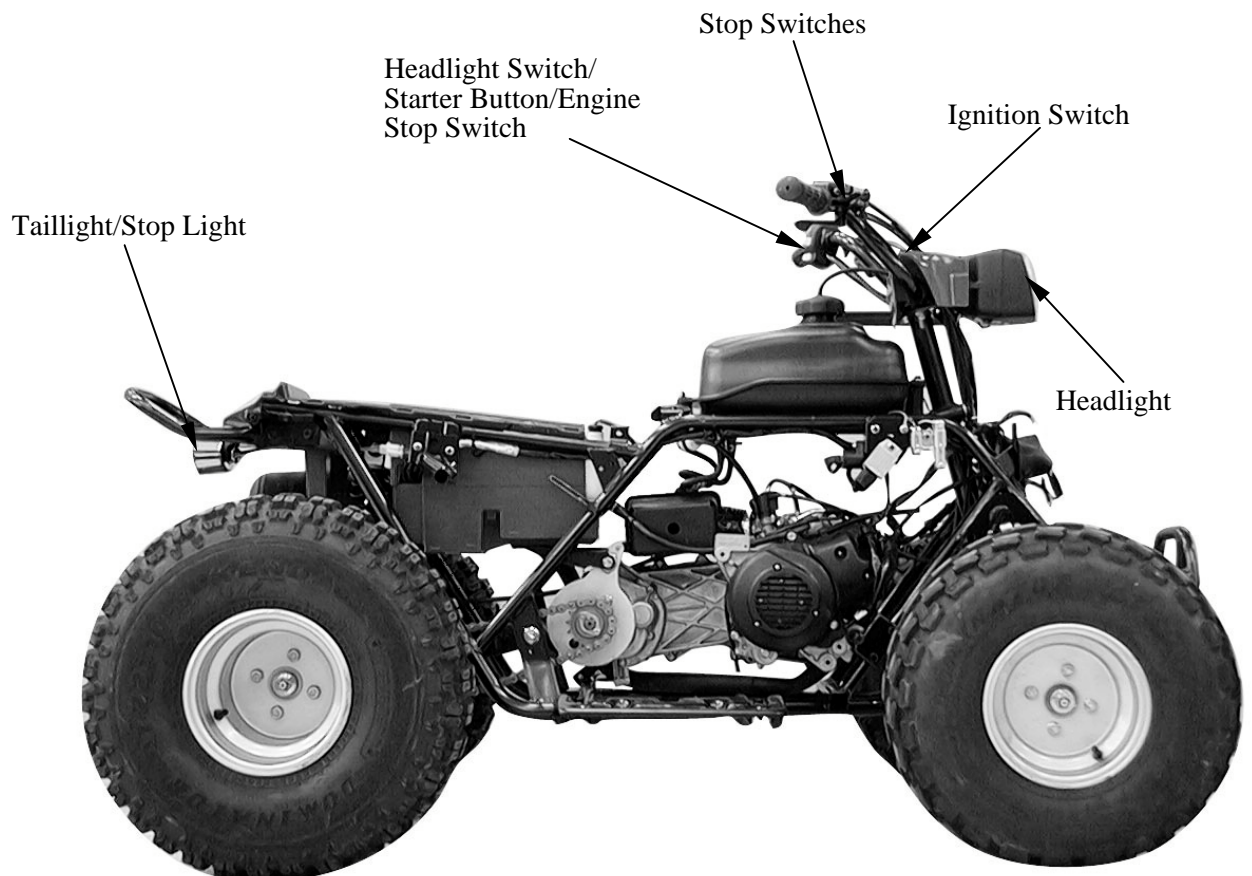
## LIGHTS/SWITCHES

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STOP SWITCH/OIL METER-----	17- 5
STARTER BUTTON-----	17- 6
HEADLIGHT SWITCH -----	17- 6
ENGINE STOP SWITCH -----	17- 7



## 17. LIGHTS/ SWITCHES

### ELECTRICAL EQUIPMENT LAYOUT



## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- An electric tester is needed to measure or test the electric equipment.
- Be sure to use fuses and bulbs of the same specifications to avoid damage of electrical equipment.
- After installation of each switch, a continuity check must be performed. A continuity check can usually be made without removing the part from the motorcycle.

## TROUBLESHOOTING

### Lights do not come on when ignition switch is “ON”

- Faulty ignition switch
- Fuse burned out
- Weak battery
- Burned bulb
- Faulty switch
- Poorly connected, broken or shorted wire

### Engine starts but stalls during idling

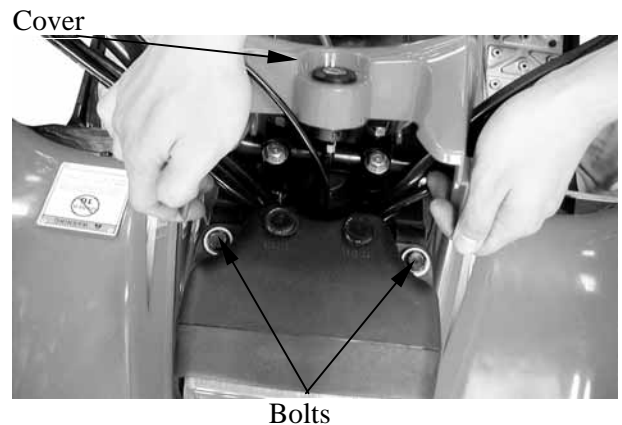
- Clogged carburetor

### HEADLIGHT

#### BULB REPLACEMENT

Disconnect the cover of the ignition switch and remove the two headlight attaching bolts.

Remove the headlight and disconnect the headlight wire coupler.



Remove the two headlight case attaching screws and disconnect the headlight.



Check the bulb for damage and replace with a new one if necessary.  
Disconnect the headlight wire coupler.

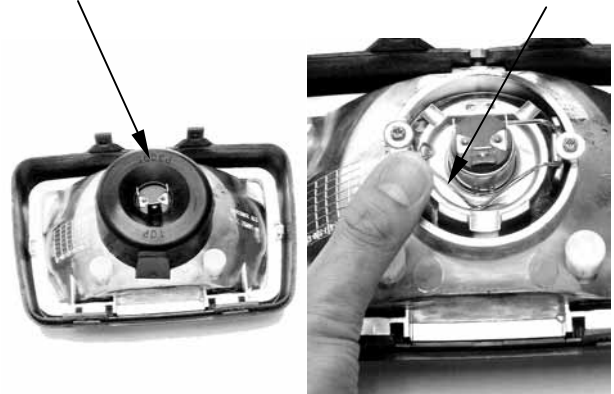
Headlight Wire Coupler



Remove the rubber boot.  
Push and disconnect the spring from the headlight cover.

Rubber Boot

Screws

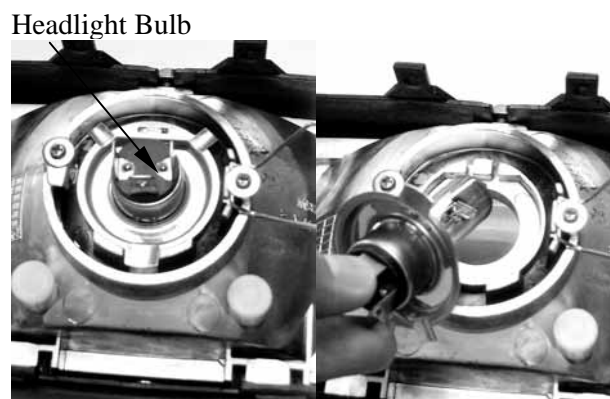


Remove the headlight bulb

### INSTALLATION

Install the headlight in the reverse order of removal.

\* After installation, adjust the headlight beam.



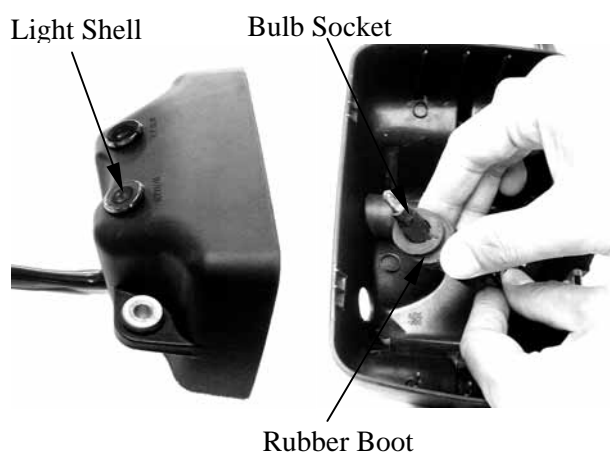
### INSTRUMENTS

#### REMOVAL

Remove the two headlight attaching bolts.  
Remove the headlight and disconnect the headlight wire coupler.  
Remove the two headlight case attaching screws and disconnect the headlight.

Remove the light shell, rubber boot and bulb socket.

Check the bulb for damage and replace with a new one if necessary.



#### INSTALLATION

The installation sequence is the reverse of removal.

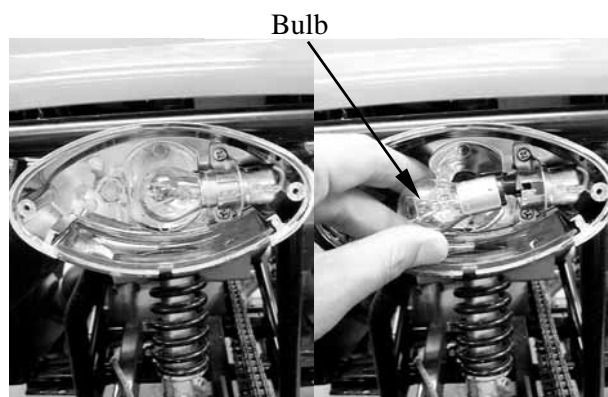
### STOP LIGHT/ TAILLIGHT

Remove the two taillight shell screws and the shell.



## 17. LIGHTS/ SWITCHES

Remove the bulb and check the bulb for damage. Replace with a new one if necessary.



### IGNITION SWITCH

Check for continuity between the wires indicated below.

Color Position	Black	Red	Black/ White	Green
OFF			○ — ○	○
ON	○ — ○			



### STOP SWITCH

Disconnect the front stop switch wire coupler.

Check for continuity between the front stop switch wires.

Brake lever applied: There is continuity.

Brake lever released: There is no continuity.

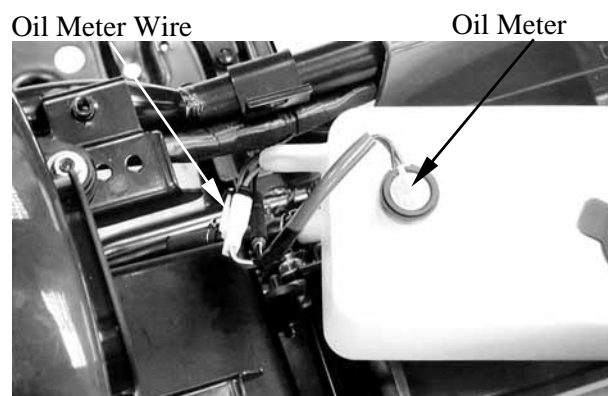


### OIL METER

Remove the seat. (⇒2-3)

Disconnect the oil meter wire connectors and remove the oil meter. Keep the oil meter float at the lower position (the oil meter is ON).

Measure the resistances between the wire terminals as ① and ② shown in the left figure.



## 17. LIGHTS/ SWITCHES

Wire Terminals	Resistance
Black/Red(+) ~ Green(-)	26KΩ
Green(-) ~ Black(+)	∞

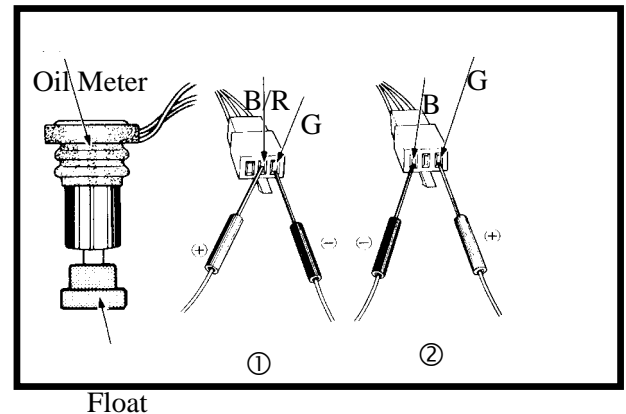
\* Before removing the oil meter, be sure to drain the motor oil and do not allow sparks or flames near the working area.

### Oil Meter Operation Inspection

Measure the resistance between the wire terminals with the float at upper position (the oil meter is OFF).

Black/Red(+) ~ Black(-)	∞
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\* Before performing the following test, operate the turn signals to determine that the battery circuit is normal.

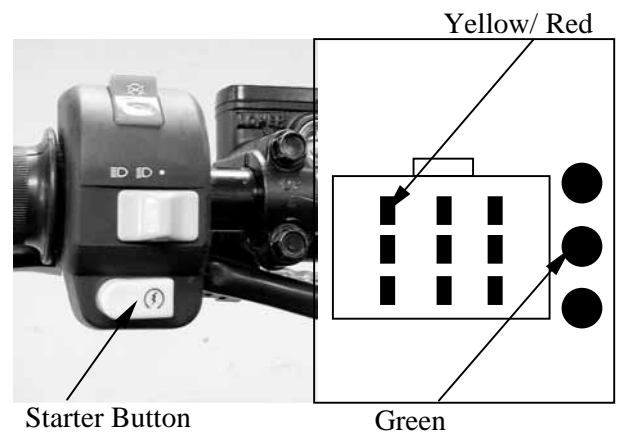


Float

### STARTER BUTTON

Remove the center cover.  
Disconnect the starter button yellow/brown and yellow/red wires.  
Check for continuity between the black and yellow/red wires.

Color Position	Green	Yellow/Red
FREE		
PUSH	○	○



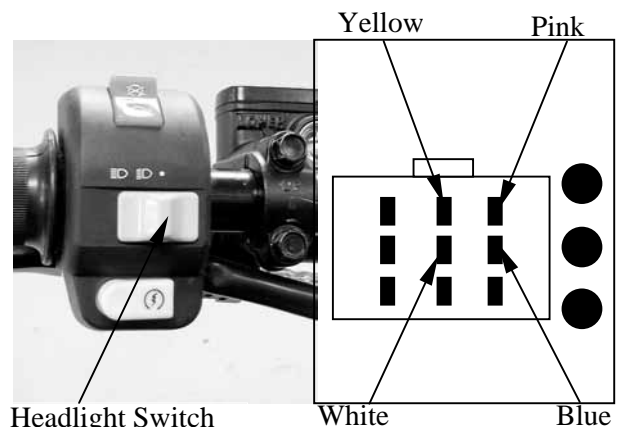
Starter Button

Green

### HEADLIGHT SWITCH

Remove the center cover.  
Disconnect the headlight switch wire coupler. Check for continuity between the headlight switch wires.

Color Position	Yellow	White	Blue	Pink
⊢ ⊢ ⊢	○			○
⊢ ⊢ ⊢	○	○		
⊢ ⊢ ⊢	○		○	



Headlight Switch





White

Blue

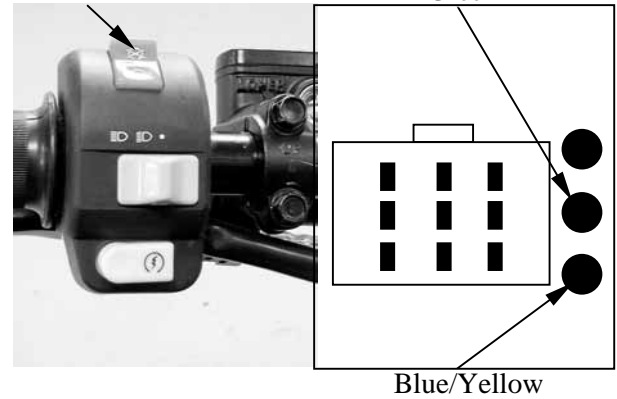
## 17. LIGHTS/ SWITCHES

### ENGINE STOP SWITCH

Remove the center cover.  
Disconnect the headlight switch wire coupler. Check for continuity between the headlight switch wires.

Color Position	Blue/Yellow	Green
		
		

Engine Stop Switch



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**ONLY ATV ON ROAD AVAILABLE**

**18**

INSTRUMENT .....	18- 1
INDICATOR LIGHT.....	18- 1
WINKER SWITCH/HORN .....	18- 2



## 18. ONLY ATV ON ROAD AVAILABLE

### INSTRUMENT

#### REMOVAL

Remove the two instrument attaching screws.

Disconnect the instrument.



Screws

Remove battery cover on instrument back to replace battery.

\*

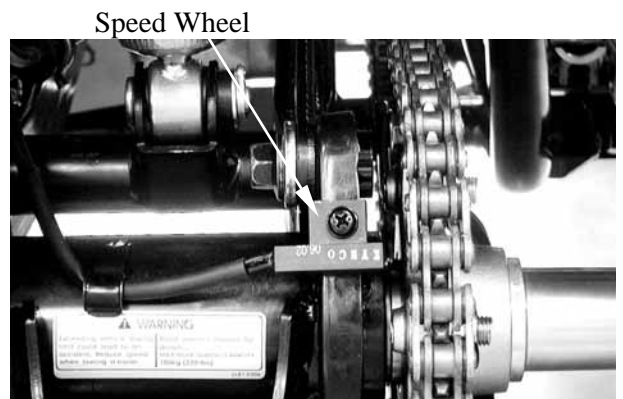
After replace battery, the instrument will be reset. (Refer to owner's manual)



Battery Cover

### SENSOR WHEEL

If the sensor is lost or wore, the speed will be not calculated on the instrument.



Speed Wheel

### INDICATOR LIGHT

#### REMOVAL

Remove the screw and disconnect the cover of the ignition switch.



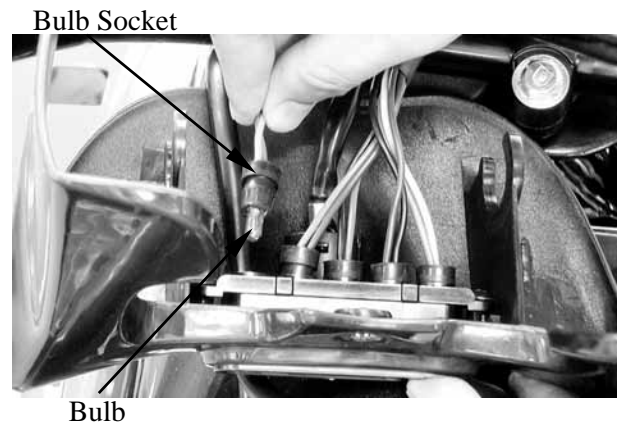
Screw

## 18. ONLY ATV ON ROAD AVAILABLE

Remove the bulb socket and bulb.  
Check the bulb for damage and replace with a new one if necessary.

### INSTALLATION

The installation sequence is the reverse of removal.



### WINKER SWITCH

Check for continuity between the wires indicated below.

Color Position	Sky Blue	Orange	Brown
L		—	—
R	—	—	—



### HORN SWITCH

Check for continuity between the wires indicated below.

Color Position	Light Green	Black
FREE		
PUSH	—	—



### HORN

#### REMOVAL

Disconnect the horn switch wire.  
Remove the bolt and remove horn.

#### INSTALLATION

The installation sequence is the reverse of removal.

