

AEON MOTOR CO.,LTD

**OVERLAND-125/180**



**SERVICE MANUAL**

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## **1. INFORMATION**

### **1.1 Safety**

### **1.2 Notes**

### **1.3 Specifications**

### **1.4 Serial number**

### **1.5 Torque valve**

## **1.1 Safety**

### **GASOLINE**

Gasoline is extremely flammable and is explosive under certain condition. Do not smoke or allow sparks or flames in your work area.

### **CARBON MONOXIDE**

Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.

### **BATTERY ELECTROLYTE**

The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. If you come into contact with the electrolyte, flush the area thoroughly with water. If you get the electrolyte in your eyes, flush with water and contact a doctor immediately.

### **HOT PARTS**

Engine and exhaust pipe become very hot and remain hot for one hour after the engine is run. Wear insulated gloves before handling these parts.

### **USED ENGINE /GEAR OIL**

Used engine oil and gear oil may cause skin disease after repeated contact with the skin for long periods. Keep out of reach of children.

## **1.2 NOTES**

All information, illustrations, directions and specifications included in this publication are base on the latest product information available at the time of approval for printing.

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### 1.3 SPECIFICATION

|                    |  |
|--------------------|--|
| <b>ENGINE</b>      | <b>180</b>                             |
| Type               | Air-Cooled 4-stroke<br>with Oil Cooler |
| Displacement       | 169 cc                                 |
| Bore and Stroke    | 61×57.8mm                              |
| Compression        | 9.1:1                                  |
| Maximum Power      | 6.2 Nm@6300 min <sup>-1</sup>          |
| Carburetor         | MIKUNI 180                             |
| Ignition           | C.D.I Electronic                       |
| Starting           | Electrical & Kick-Start                |
| Lubrication        | Wet crankcase with lobes<br>pump       |
| Air Cleaner        | AE-9                                   |
| Transmission       | Automatic(C.V.T. system)               |
| <b>CHASSIS</b>     |  |
| Overall Length     | 1790mm                                 |
| Overall Width      | 970mm                                  |
| Overall Height     | 1200mm                                 |
| Wheel Base         | 1050mm                                 |
| Dry Weight         | 156kg                                  |
| Fuel Tank Capacity | 8.0 liter                              |
| <b>SUSPENSION</b>  |  |
| Front              | Double wishbone                        |
| Rear               | Swing Arm                              |
| <b>BRAKES</b>      |  |
| Front              | Drum                                   |
| Rear               | Disc                                   |
| <b>TIRES</b>       |  |
| Front              | 21" × 7" - 10"                         |
| Rear               | 22" × 10" - 8"                         |

*\*Specifications subject to change without notice.*

#### 1.4 SERIAL NUMBER

The frame serial number is stamped on the front frame.  
And stick a bar code paper to cover it.



The engine number is stamped under the crankcase.



## 1.5 TORQUE VALUES

### STANDARD

|                   |                     |
|-------------------|---------------------|
| 5mm bolt and nut  | 5 N.m (3.5 lbs.ft)  |
| 6mm bolt and nut  | 10 N.m (7.2 lbs.ft) |
| 8mm bolt and nut  | 22 N.m (16 lbs.ft)  |
| 10mm bolt and nut | 35 N.m (25 lbs.ft)  |
| 12mm bolt and nut | 55 N.m (40 lbs.ft)  |

### ENGINE

|                    |                      |
|--------------------|----------------------|
| Cylinder head nut  | 28 N.m (20.7 lbs.ft) |
| Spark plug         | 12 N.m (8.9 lbs.ft)  |
| Cylinder head bolt | 20 N.m (14.8 lbs.ft) |
| Alternator bolt    | 8 N.m (5.9 lbs.ft)   |

### FRAME

|                                  |                      |
|----------------------------------|----------------------|
| Handlebar upper holder bolt      | 24 N.m (17.7 lbs.ft) |
| Throttle housing cover screw     | 4 N.m (2.9 lbs.ft)   |
| Steering shaft nut               | 50 N.m (36.9 lbs.ft) |
| Steering shaft holder bolt       | 33 N.m (24 lbs.ft)   |
| Wheel rim bolt                   | 18 N.m (13.3 lbs.ft) |
| Tie rod lock nut                 | 35 N.m (25.8 lbs.ft) |
| King pin nut                     | 40 N.m (29 lbs.ft)   |
| Handlebar lower holder nut       | 40 N.m (29.5 lbs.ft) |
| Front wheel bolt                 | 24 N.m (17.7 lbs.ft) |
| Front axle nut                   | 60 N.m (44 lbs.ft)   |
| Front brake arm nut              | 4 N.m (3.0 lbs.ft)   |
| Rear brake arm nut               | 7 N.m (5.2 lbs.ft)   |
| Rear axle nut                    | 60 N.m (44.3 lbs.ft) |
| Rear wheel bolt                  | 24 N.m (17.7 lbs.ft) |
| Exhaust muffler mounting bolt    | 30 N.m (22.1 lbs.ft) |
| Engine hanger bolt               | 30 N.m (22 lbs.ft)   |
| Rear axle holder bolt            | 90 N.m (65 lbs.ft)   |
| Swingarm pivot nut               | 90 N.m (65 lbs.ft)   |
| Rear shock absorber mounting nut | 45 N.m (33 lbs.ft)   |

## **2. Maintenance**

- 2.1 Maintenance data
- 2.2 Maintenance schedule
- 2.3 Fuel tube
- 2.4 Throttle operation
- 2.5 Throttle cable adjustment
- 2.6 Air cleaner
- 2.7 Spark plug
- 2.8 Idle speed
- 2.9 Drive chain
- 2.10 Brake system
- 2.11 Wheels and tires
- 2.12 Steering system
- 2.13 Toe-in
- 2.14 Gear oil

### **2.1 MAINTENANCE DATA**

#### **SPECIFICATION**

##### **SPARK PLUG**

|                           |                                      |
|---------------------------|--------------------------------------|
| Spark plug cap            | 0.6-0.7mm                            |
| Recommended spark plugs   | NGK C7HSA or CR7HSA                  |
| Throttle lever free play: | 5-10mm                               |
| Idle speed                | 1800rpm                              |
| Brake lever free play:    | 10~20mm                              |
| Drive chain slack         | 15-25mm                              |
| Front/rear tire size      | 21×7-10 / 22×10-8                    |
| Front/rear tire pressure  | 3±0.3psi (0.15 kgf/cm <sup>2</sup> ) |
| Toe-in                    | 5±10mm                               |

##### **TORQUE VALUES**

|                  |           |
|------------------|-----------|
| SPARK PLUG       | 12-19 N.m |
| TIE-ROD LOCK NUT | 35-43 N.m |

##### **ENGINE OIL**

|            |            |
|------------|------------|
| Viscosity: | SAE 15W-40 |
|------------|------------|

##### **GEAR LUBRICATION OIL**

|            |             |
|------------|-------------|
| Viscosity: | SAE 85W-140 |
|------------|-------------|

## 2.2 MAINTENANCE SCHEDULE

The maintenance intervals in the follow table is based upon average riding, condition. Riding in usually dusty areas, require more frequent servicing.

| Service Item                 | Initial Service<br>(First 30 hours)  | Every 100 hours | Every 200 hours | Every 300 hours |
|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| <b>ENGINE OIL</b>            | <b>R</b>                             | <b>R</b>        |                 |                 |
| <b>GEAR OIL</b>              | <b>R</b>                             |                 | <b>R</b>        |                 |
| <b>FUEL FILTER</b>           |                                      |                 |                 | <b>R</b>        |
| <b>AIR VLEAN<br/>FILTER</b>  |                                      |                 |                 | <b>R</b>        |
| <b>ENGINE OIL<br/>FILTER</b> |                                      |                 |                 | <b>C</b>        |
| <b>CARBURETOR</b>            |                                      |                 |                 | <b>I</b>        |
| <b>SPARK PLUG</b>            |                                      |                 | <b>C</b>        |                 |
| <b>VALVE GAP</b>             |                                      |                 |                 | <b>A</b>        |
| <b>IGNITION<br/>TIMING</b>   |                                      |                 |                 | <b>A</b>        |
| <b>CHAIN</b>                 |                                      |                 | <b>A</b>        |                 |
| <b>BATTERY</b>               |                                      |                 | <b>I</b>        |                 |
| <b>DRIVE<br/>BATTERY</b>     |                                      |                 |                 | <b>I</b>        |
| <b>CLUTCH</b>                |                                      |                 |                 | <b>I</b>        |
| <b>THROTTLE<br/>OPERATE</b>  |                                      |                 | <b>I</b>        |                 |
| <b>TIRE<br/>PRESSURE</b>     | <b>Check before riding each time</b> |                 |                 |                 |
| <b>BRAKE<br/>SYSTEM</b>      | <b>Check before riding each time</b> |                 |                 |                 |
| <b>NUTS/BOLTS</b>            |                                      |                 |                 | <b>T</b>        |

**A: Adjust    C: Clean    I: Inspection    R: Replace    T: Tighten**



## 2.3 FUEL TUBE

Inspect the fuel lines for deterioration, damage or leakage and replace if necessary.



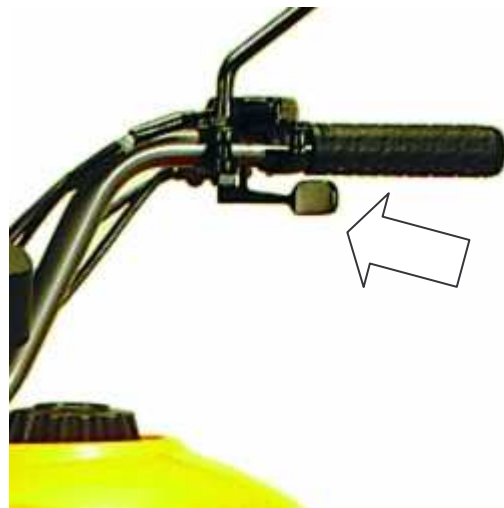
## 2.4 THROTTLE OPERATION

Inspect for smooth lever operation, full opening and automatic full closing in steering positions.

Inspect for deterioration, damage, cuts and nicks, or kink in the throttle cable, replace it if necessary.

**Check the throttle lever, free play should be not more than 5-10 mm at the tip of the throttle lever.**

Disconnect the throttle cable at the upper end.  
Lubricate the cable with commercially lubricant to prevent premature wear.



## **2.5 THROTTLE CABLE ADJUSTMENT**

Slide the rubber cap of the adjuster off the throttle housing, loosen the lock nut and adjust the free play of the throttle lever by turning the adjuster on the throttle housing. Inspect the free play of the throttle lever.



## **2.6 AIR CLEANER MAINTENANCE**

- (1) Loosen the screw and remove the air cleaner from carburetor.
- (2) Disassemble the air cleaner cover and body.
- (3) Remove the air cleaner element and screen..



- (4) Install the new one.
- (5) Assemble the air cleaner body and cover and re-attach to the carburetor with screw.

## 2.7 SPARK PLUG

The spark plug is located at the front of the engine.

- (1) Disconnect the spark plug cap and remove the spark plug
- (2) Visually inspect the spark plug electrode for wear or cracks in insulator. Replace if needed.
- (3) The center electrode should have square edges and the side electrode should have a constant thickness.
- (4) Discard the spark plug if there is apparent wear or if the insulator is cracked or chipped.
- (5) Measure the gap with a wire-type feeler gauge and adjust if necessary by carefully bending the side electrode.

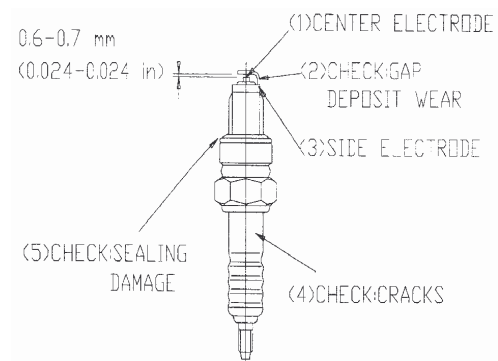


SPARK PLUG GAP: 0.6~0.7 mm

RECOMMENDED REPLACEMENT PLUG:

**NGK CR7HSA**

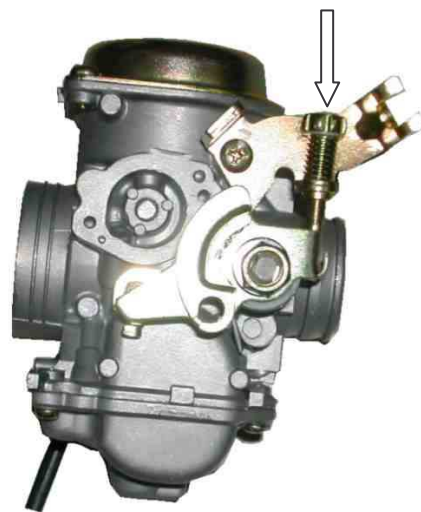
- (6) Check the sealing washer and replace with a new one if damaged.
- (7) With the sealing washer attached thread the spark plug in by hand to prevent cross threading. Tighten the spark plug. TORQUE: 12-19 N-m



## 2.8 IDLE SPEED SETTING

- (1) Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications. The engine must be warm for accurate idle speed inspection and adjustment.
- (2) Warm up the engine for about ten minutes and connect a tachometer.
- (3) Turn the throttle stop screw as required to obtain the specified idle speed.

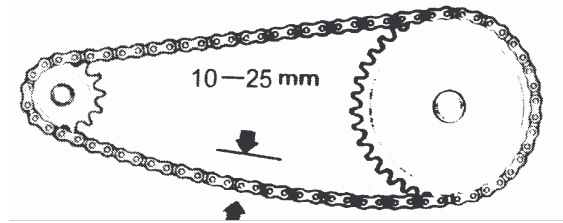
IDLE SPEED: 1700 ± 100 rpm



## 2.9 DRIVE CHAIN ADJUSTMENT

Stop ATV and shift transmission into neutral. Inspect the chain slack midway between the sprockets. The standard is 50-60 mm (2.0-2.3 inch).

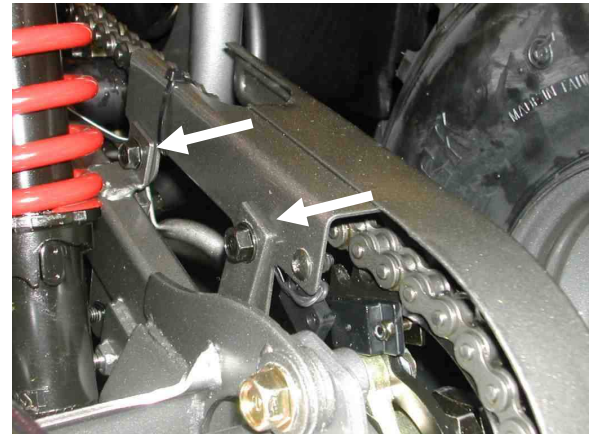
If needed remove the chain protective cover and adjust the chain slack.



Loosen the axle holder lock nut then adjust the drive chain slack by turning the adjusting nut. Tighten the axle holder lock nut.

Torque = 90N.m (65 Ft. lbs)

When the drive chain becomes very dirty, it should be removed, cleaned and lubricated with the specified lubricant.



Clean the drive chain with kerosene and wipe it dry.

Inspect the drive chain for possible wear or damage.

Replace the chain, if it is worn excessively or damaged.

Inspect the sprocket teeth, if it has excessive wear or damage, replace if needed.

Use a commercial chain lubricant to lubricate the drive chain, replace and adjust the slack as described above.



## **2.10 BRAKE SYSTEM ADJUSTMENT**

Inspect the front brake lever and cable for excessive play or other damage.

Replace or repair if necessary.

Measure the free play of the brake lever at the end of the lever. The standard is 10~20 mm.

Adjust the free play of the front brake lever by turning the adjuster on the brake lever assembly.



Inspect the rear brake lever and cable for excessive play or other damage.

Replace or repair if necessary.

Measure the free play of the brake lever at the end of the lever. The standard is 10-20 mm.

Adjust the free play of the rear brake lever by turning the adjuster on the rear axle.



## **BRAKE SHOE WEAR**

### ***Front Brake***

Release the front wheel and inspect the brake lining thickness. Service Limit: 2.0mm (0.08 inch), if either lining is worn beyond the service limit, replace both brakes shoes.



## **2.11 WHEELS AND TIRES**

Inspect the tire surface for cuts, nails or other sharp objects.

Check the tire pressure at cold tire conditions.  
The standard tire pressure is 3psi.  
(0.15kgf/cm<sup>2</sup>)



## **2.12 STEERING SYSTEM**

Check the free play of the steering shaft with the front wheels, turned straight ahead. When there is excessive play, inspect the tie-rod, kingpin bushing and ball joint.



### **Steering shaft holder bushing**

Remove the front fender.

Remove the steering shaft holder and check the steering shaft bushing for wears or damage.

If the bushing is worn or damaged, change a new one.

Grease the steering shaft bushing and install the parts in the reverse order of removal.

Torque: steering shaft holder bolt: 33N.m ( 24 Ft. lbs)



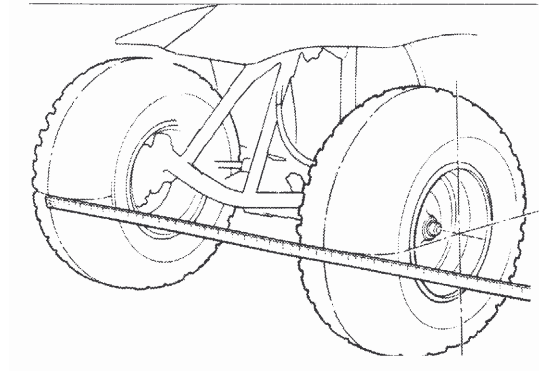
## **2.13 TOE-IN**

Park the vehicle on level ground with the front wheels facing straight ahead.

Mark the centers of the tires to indicate the axle center height.

Measure the distance between the marks.

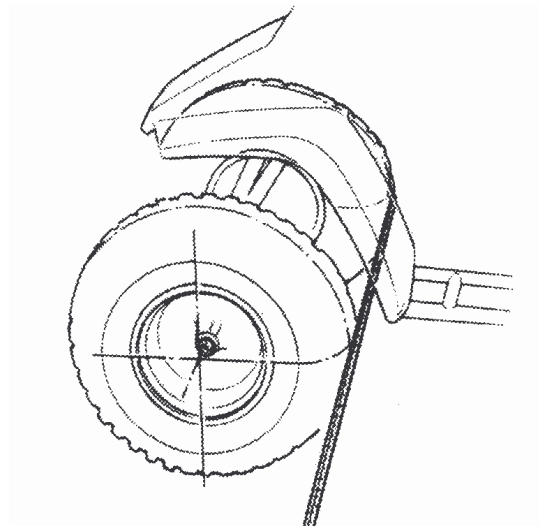
Carefully move the vehicle back, let the wheels turn 180° so the marks on the tires are aligned with the axle center height.



Measure the distance between the marks.

Calculate the difference in the front and rear measurements.

Toe-in:  $5 \pm 10$  mm



If the toe-in is out of standard, adjust it by changing the length of the tie-rods equally by turning the tie-rod while holding the ball joint.

Tighten the lock nuts.

Torque: 35-43 N.m



## 2.14 GEAR OIL MAINTENANCE

Gear oil needs to be changed every 200 hours. There is a gear oil drain hole bolt at the rear of the engine.



(STEP1)

Unscrew this drain hole bolt and let the dirty oil flow out, catching the oil in a proper container for later disposal.

(STEP2)

Reinstall the drain hole bolt an tightness.

(STEP3)

Fill with new gear oil through the oil fill hole located on the engine case beside the gear box.

### **3.1 ENGINE REMOVAL AND INSTALLATION**



***ENGINE SHOULD ONLY BE REMOVED IN THE CONDITIONS OF NECESSARY REPAIRS OR ADJUSTMENT TO THE TRANSMISSION AND COMBUSTION SYSTEM ONLY!***

### **3.2 ENGINE REMOVAL**

Remove the front, rear rack, and handle bar.

Remove the footrest.

Remove the spark plug cap from the spark plug.

Remove the exhaust muffler.

Disconnect the carburetor cable by unscrew two screws on top of the carburetor.

Disconnect the wire connectors. There are three connectors for carburetor auto-choke, starter motor and generator respectively.

Remove the engine hanger bolts over the engine.

Remove the engine and air cleaner together.



### **3.2 ENGINE REPLACEMENT**

Engine installation is essentially the reverse order of removal.

The torque of engine hanger bolt is 30 Nm

Route the wires and cable properly in reverse order of removal.

## **4. LUBRICATION**

- 4.1 Service Information**
- 4.2 Trouble Shooting**
- 4.3 Engine Oil Level**
- 4.4 Engine Oil & Filter Change**
- 4.5 Oil Pump Removal /Installation**

**4.1 SERVICE INFORMATION**

**GENERAL**

This section describes inspection and replacement of the engine oil, oil filter screen and assembly of the oil pump.

Fill the oil pump with clean oil when reassembling the pump.

**SPECIFICATIONS**

|                            |                                   |
|----------------------------|-----------------------------------|
| Engine Oil Capacity        | 0.8-1.0 Liters /                  |
| Engine Oil Recommendations | Viscosity: (SAE 15W-40)           |
|                            | API Service classification: SF-SG |

**OIL PUMP**

**STANDARD**

**SERVIC**

**LIMIT**

|                          |           |      |
|--------------------------|-----------|------|
| Cover-to-rotor clearance | -----     | 0.12 |
| Rotor tip clearance      | -----     | 0.12 |
| End clearance            | 0.01-0.10 | 0.2  |

## TORQUE VALUE

Oil Drain Bolt            20~30 N.m (14.8~22.1 lbs.ft)

## 4.2 THROTTLE SHOOTING

### *Oil level too low / high oil consumption*

- Normal oil consumption.
- External oil leaks.
- Oil not changed often enough.
- Worn piston rings.
- Faulty heat gasket.

### *Oil contamination*

- Worn piston rings.
- Faulty heat gasket.
- Oil or filter not changed often enough.

## 4.3 ENGINE OIL LEVEL

Place the engine on the level plane.  
Check the oil level with the oil level gauge,  
but do not screw it in when making this  
check.



## 4.3 ENGINE OIL LEVEL



Add the recommended oil up to the upper level if the oil level is below or near lower level line on the gauge.

#### 4.4 ENGINE OIL & FILTER CHANGE

Remove the oil filter cap and the oil drain bolt.

**NOTE:** drain the oil while the engine is warm to ensure complete draining.

LOWER LEVEL

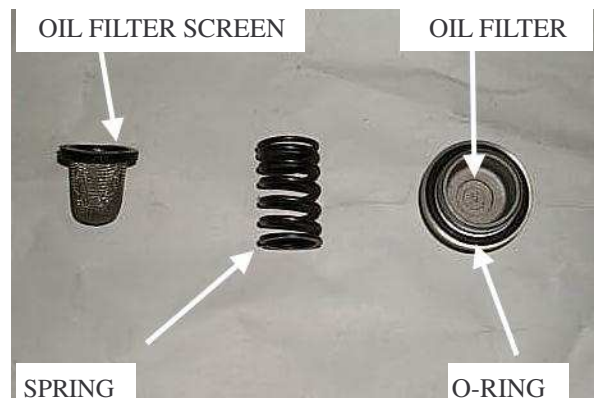
UPPER LEVEL



Remove the oil filter cap, spring and oil filter screen.

Check the O-ring for damage or fatigue.

Install a new oil filter screen and spring then install the cap.



Install the oil drain bolt with sealing washer.



TORQUE: 20~30 N.m (14.8~22.1 lbs.ft)

Fill the crankcase with recommended oil.

ENGINE OIL CAPACITY: 1.2 liter at draining.

Install the oil filter cap.

Install the oil level gauge.

Start the engine and let it idling for 2 or 3 minutes.

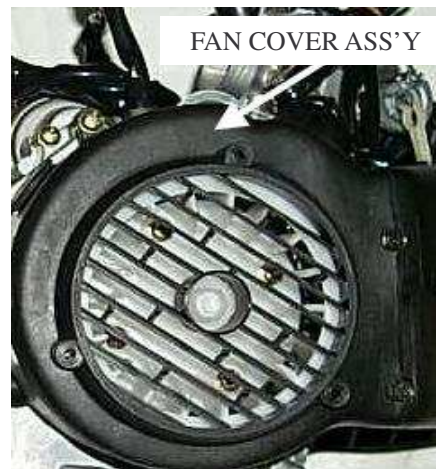
Stop the engine and check that the oil level at the upper line on the gauge. Make sure there are no oil leaks.

OIL DRAIN



#### 4.5 OIL PUMP REMOVAL

Remove the fan cover ass'y.



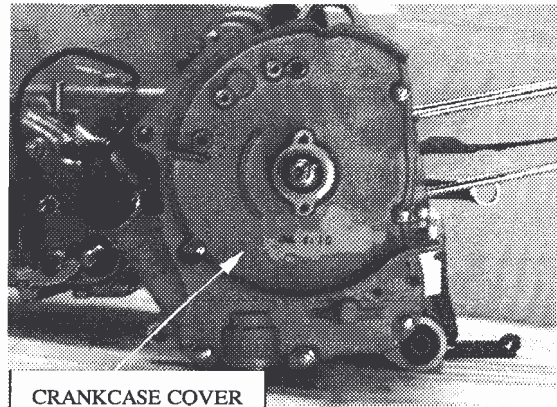
Remove the cooling fan composition.



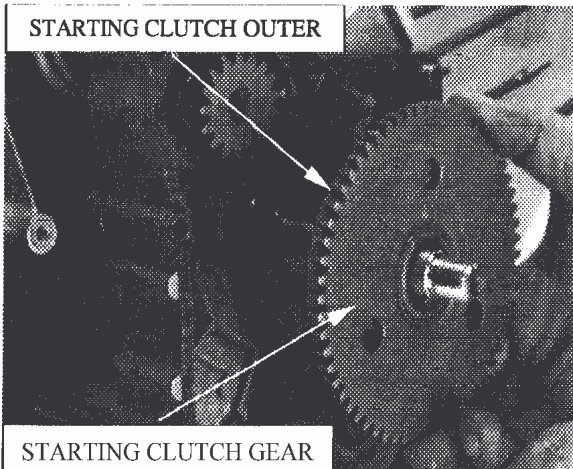
Remove the A.C.G generator ass'y.



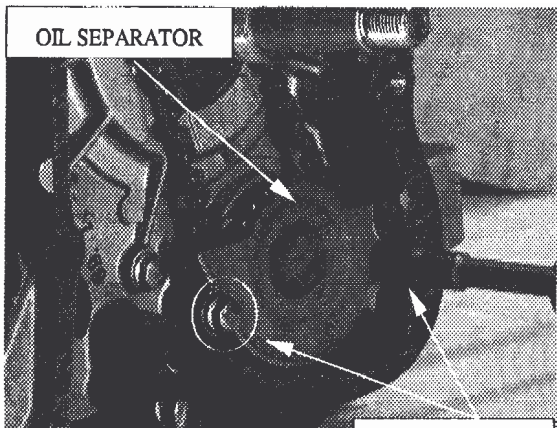
Remove the left crankcase cover.



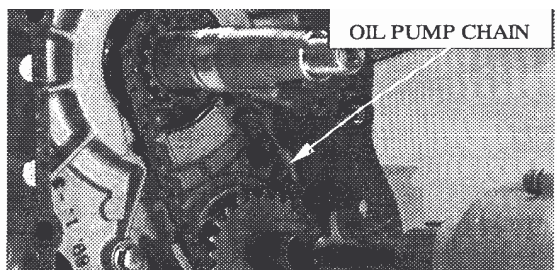
Remove the starting clutch outer and gear ass'y.



Remove the flange bolts and oil separator.

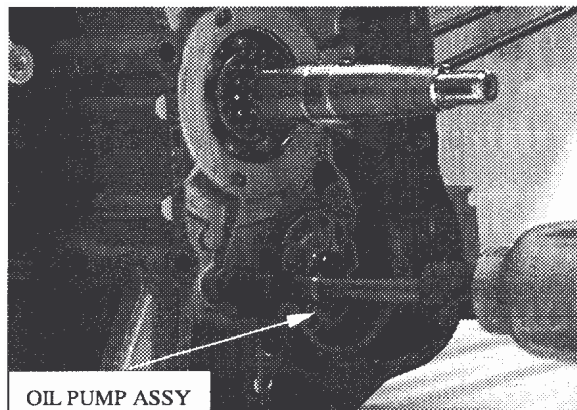


Remove the oil pump chain and oil pump driven

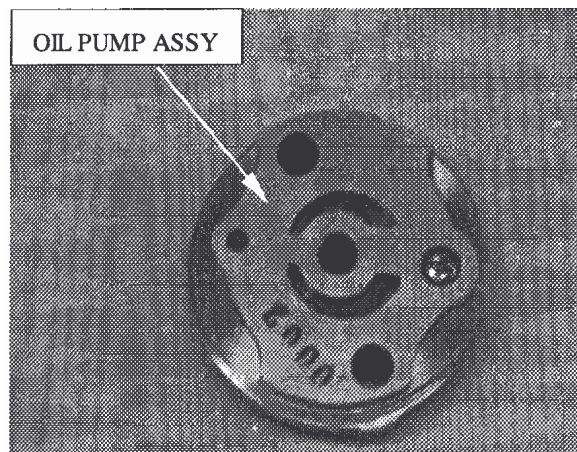


sprocket.

Remove the oil pump ass'y.



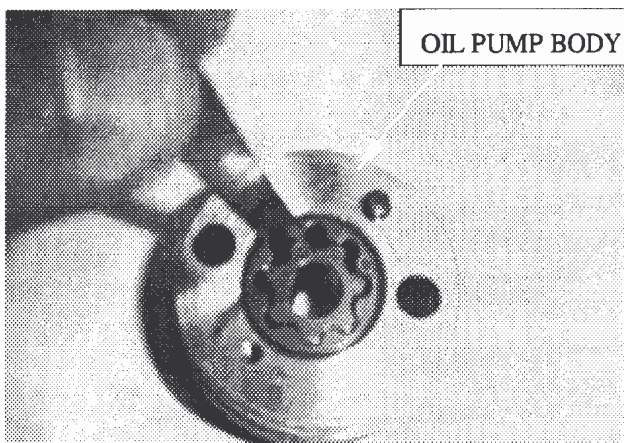
Disassemble the oil pump.



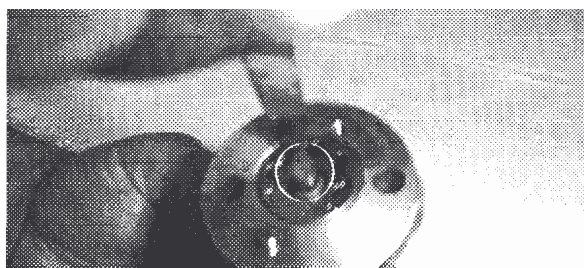
***INSPECTION***

Measure the oil pump rotor-to-body clearance.

***SERVICE LIMIT: 0.12 mm***



Install the oil pump shaft and measure the pump

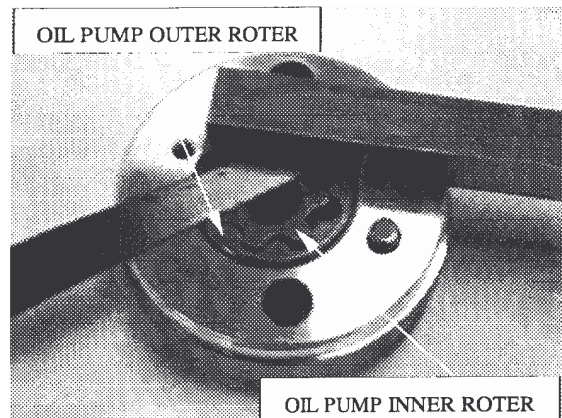


rotor tip clearance.

**SERVICE LIMMIT: 0.12 mm.**

Remove the oil pump shaft and measure the pump and clearance.

**SERVICE LIMMIT: 0.2 mm.**



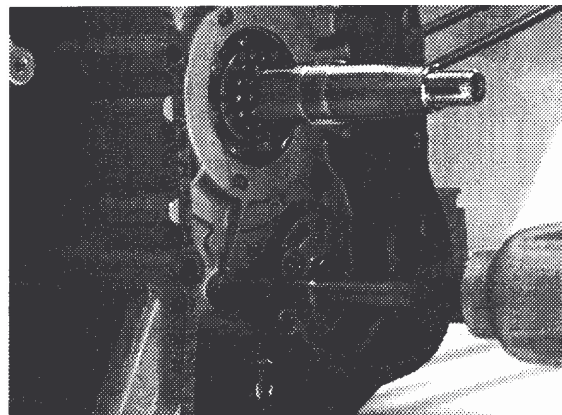
#### 4.5 OIL PUMP ASS'Y / INSTALLATION

Install the outer rotor, inner rotor and oil pump shaft onto the body.

**NOTE:** Pour a drop of clean engine oil inside the oil pump.



Install the oil pump ass'y



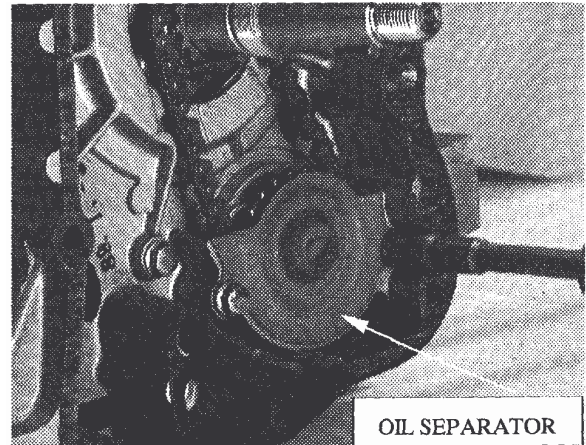
Install the oil pump driven sprocket and oil pump



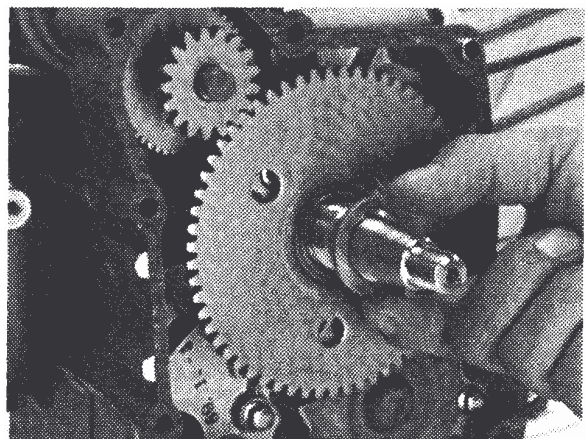


chain.

Install the oil separator.

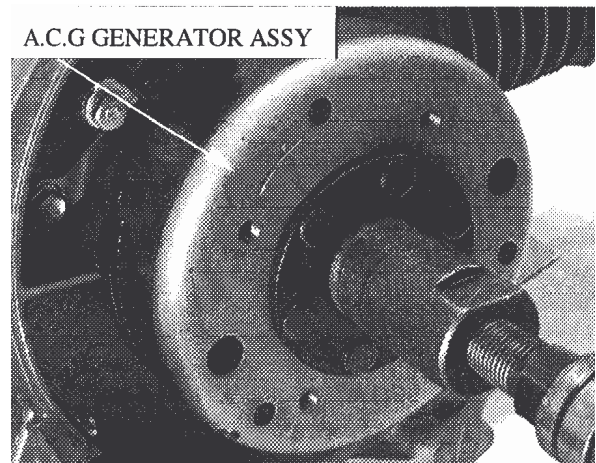


Install the starting clutch outer and gear ass'y.

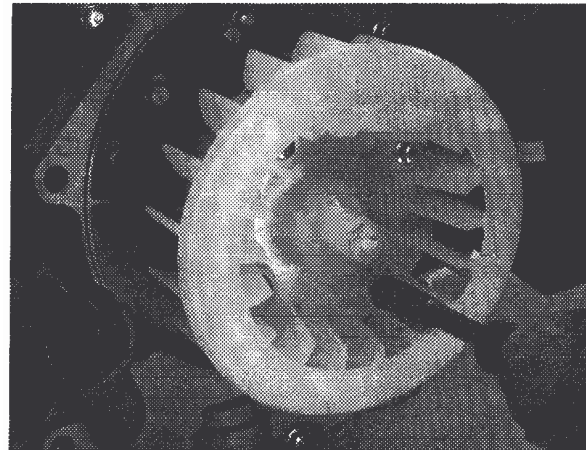


Install the new gasket, dowel pins and right crankcase cover.

Install the A.C.G generator ass'y



Install cooling fan composition



Install fan cover



## 5. CYLINDER HEAD / VALVES

## 5.1 SERVICE INFORMATION

### 5.2 TROUBLESHOOTING

### 5.3 CAMSHAFT ASS'Y REMOVAL

### 5.4 CYLINDER HEAD REMOVAL

### 5.5 CYLINDER HEAD INSTALLATION

## 5.1 SERVICE INFORMATION

### *GENERAL*

This section describes the maintenance of cylinder head, valves, camshaft and the other parts.

The engine must be removed from the frame to service cylinder head.

Camshaft lubrication oil is fed to the cylinder head through an oil orifice in the engine case.

Before installing the cylinder head be sure the orifice is not clogged and the gasket, O-ring and dowel pins are in place.

### *SPECIFICATIONS*

| ITEM                     |       | STANDARD                  | SERVICE LIMIT |
|--------------------------|-------|---------------------------|---------------|
| Cylinder compression     |       | 12±0.5 kg/cm <sup>2</sup> | -----         |
| Cam lobe height          | IN    | 25.965/27.195             | 25.57/26.7    |
|                          | EX    | 25.810/27.20              | 25.40/26.80   |
| Rocker arm I.D.          |       | 10.000-10.018             | 10.10         |
| Rocker arm shaft O.D.    |       | 9.972-9.987               | 9.91          |
| Valve spring free length | IN    | 32.3                      | 31.2          |
|                          | EX    | 35.0                      | 34.1          |
| Valve stem O.D.          | IN    | 4.975-4.990               | 4.90          |
|                          | EX    | 4.955-4.970               | 4.90          |
| Valve guide I.D.         | IN/EX | 5.000-5.012               | 5.30          |
| Stem-to-guide clearance  | IN    | 0.010-0.037               | 0.08          |
|                          | EX    | 0.030-0.057               | 0.10          |
| Valve seat width         | IN    | 1.0                       | 1.8           |
|                          | EX    | 1.0                       | 1.8           |

### *TORQUE VALUES*

|                             |                              |
|-----------------------------|------------------------------|
| Cylinder head bolts         | 8~12 N.m (5.9~8.9 lbs.ft)    |
| Camshaft holder flange nuts | 20~24 N.m (14.8~17.8 lbs.ft) |
| Tappet adjusting nut        | 9~12 N.m (6.6~8.9 lbs.ft)    |

## 5.2 TROUBLE SHOOTING

Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test, or by tracing engine noise to the top end with a sounding rod or stethoscope.

#### **Low compression valve**

- Incorrect valve adjustment.
- Worn or damaged valve seats.
- Burned or bent valve.
- Incorrect valve timing.
- Weak valve spring.

#### **Cylinder head**

- Leaking or damaged head gasket.
- Warped or cracked cylinder head.
- Faulty cylinder or piston

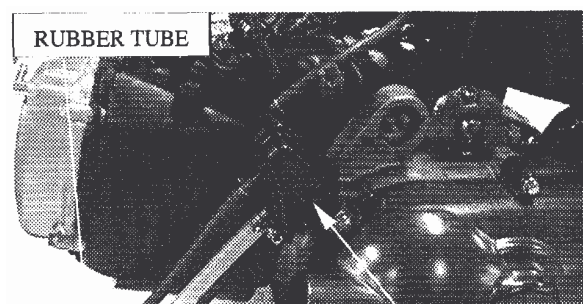
#### **Excessive noise**

- Incorrect valve adjustment
- Sticking valve or broken valve spring.
- Worn or damaged rocker arm or camshaft.
- Worn or damaged cam chain.
- Worn or damaged cam chain tensioner.
- Worn cam sprocket teeth.

#### **Excessive smoke**

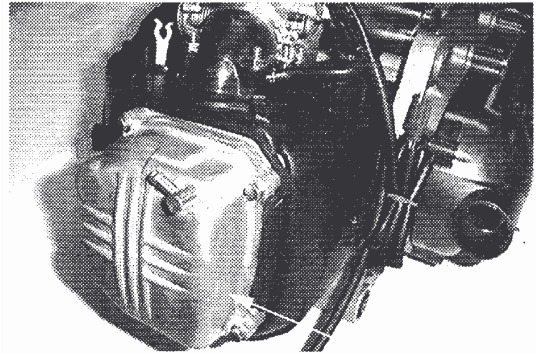
- Damaged valve stem seal.
- Faulty cylinder or piston rings.

### **5.3 CAM SHAFT ASS'Y REMOVAL**

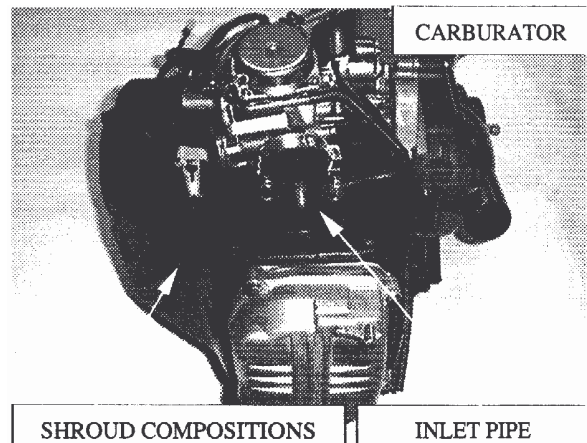


Remove the rubber tube of gas waste recovery.

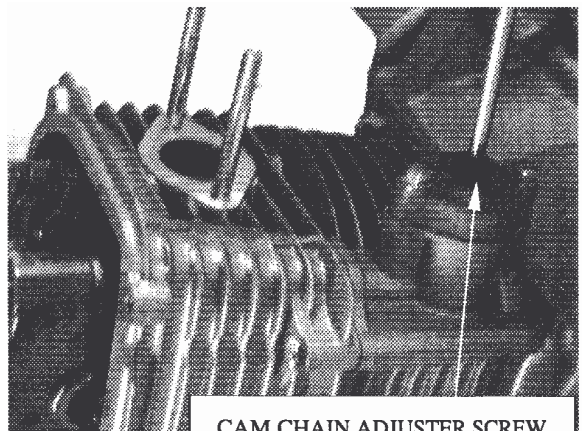
Remove the cylinder head cover.



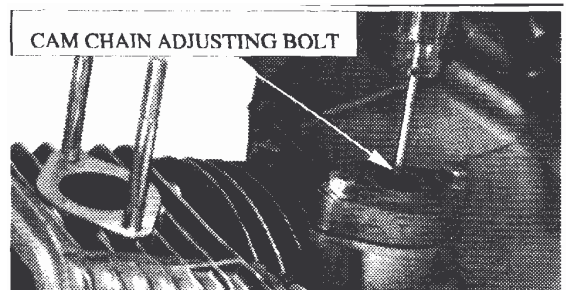
Remove the air cleaner and carburetor.  
Remove the inlet pipe ass'y.  
Remove the shroud compositions.



Relax the cam chain adjuster screw.



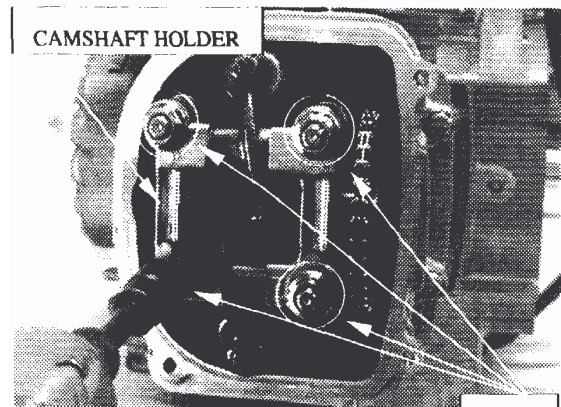
Remove the screw and O-ring and tighten the cam



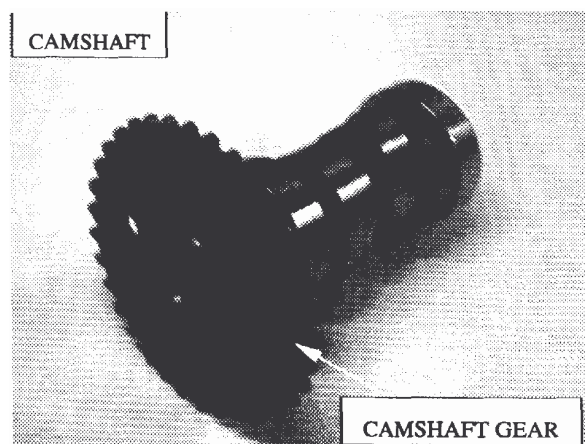
chain-adjusting bolt with clockwise direction.

Remove the nuts and washers

Remove the camshaft holder and dowel pins.



Relax the camshaft gear from cam chain and remove camshaft.

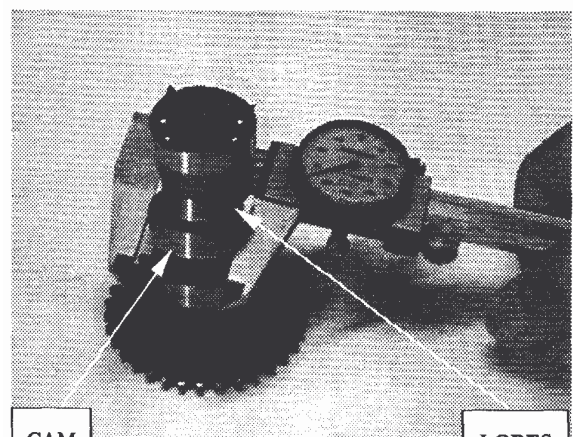


## INSPECTION

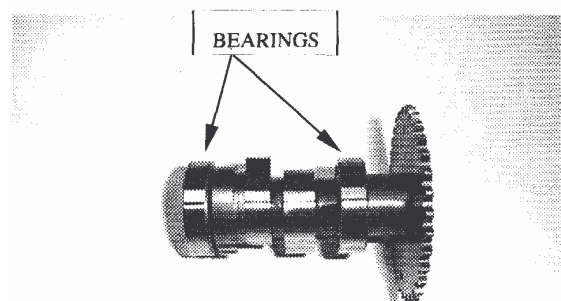
Inspect the cam lobes surface and height of cam wear or damage.

SERVICE LIMIT: IN  $\square$  25.57/26.18 mm

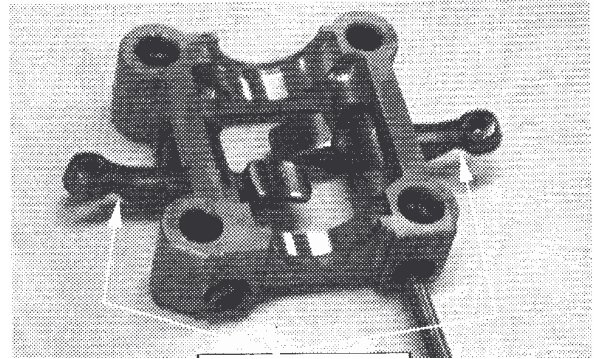
EX  $\square$  25.41/26.02 mm



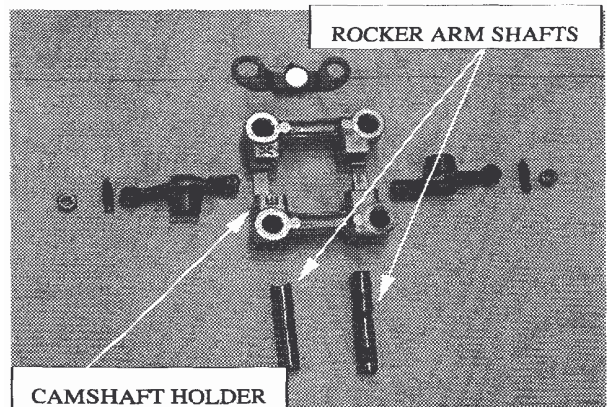
Inspect the camshaft and bearings for wear or damage and replace them if necessary.



Screw a 5 mm bolt into the rocker arm shaft threaded end.  
 Pull on the bolt to remove the shafts and rocker arms.



Inspect the camshaft holder, rocker arms and rocker shafts for wear or damage.

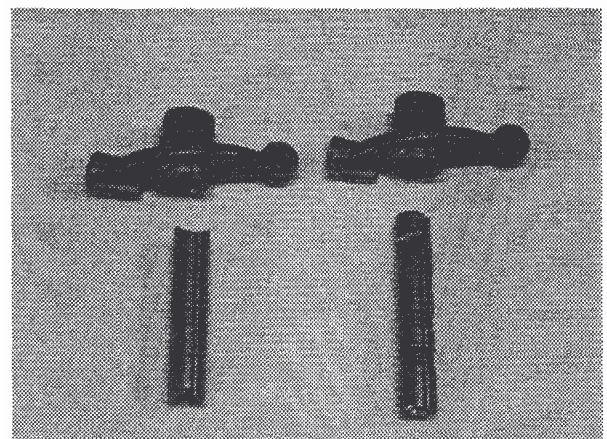


Measure the I.D. of each rocker arm.

SERVICE LIMIT: 10.10 mm

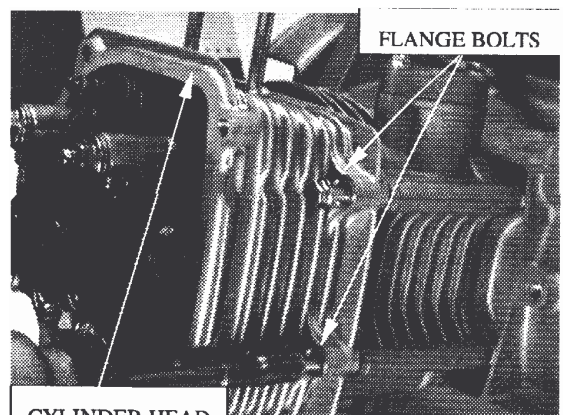
Measure the O.D. of each rocker arm shaft.

SERVICE LIMIT: 9.91 mm

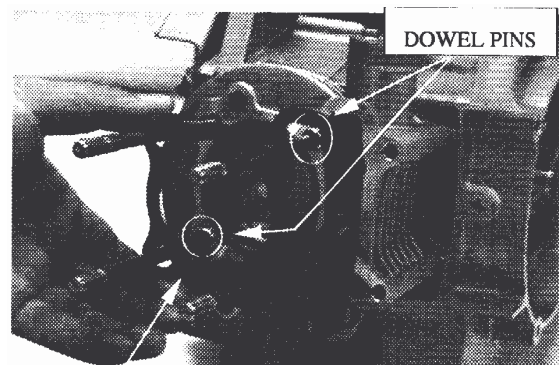


#### 5.4 CYLINDER HEAD REMOVAL

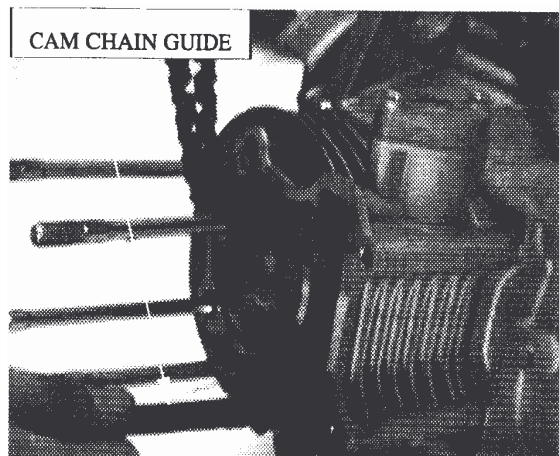
Remove the flange bolts and cylinder head.



Remove the cylinder head gasket and dowel pins

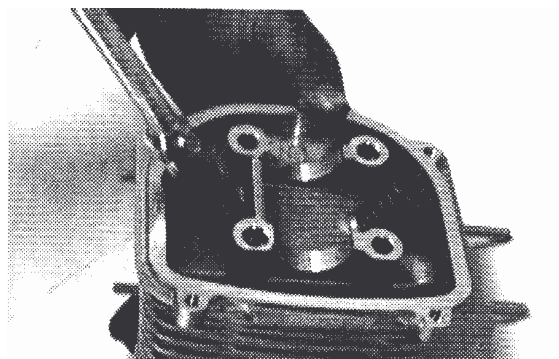


Remove the cam chain guide.



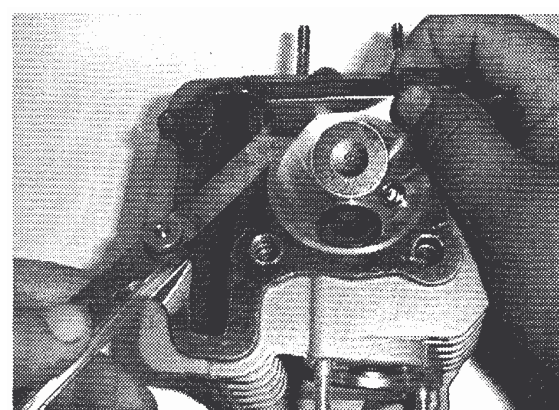
### CYLINDER HEAD DISASSEMBLY

Remove the valve cotters, spring retainers and valve springs with a valve spring compressor.



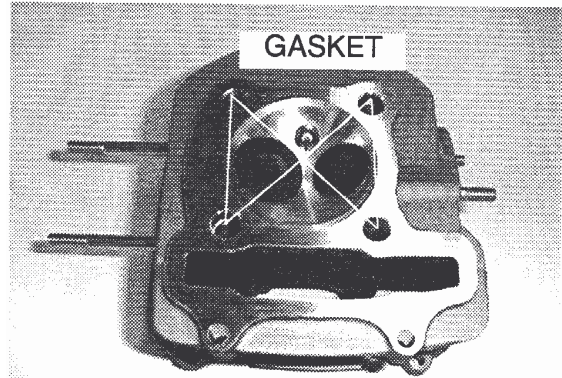
### INSPECTION

Clean off all carbon deposits from the combustion chamber. Check the spark plug hole and valve area for cracks.

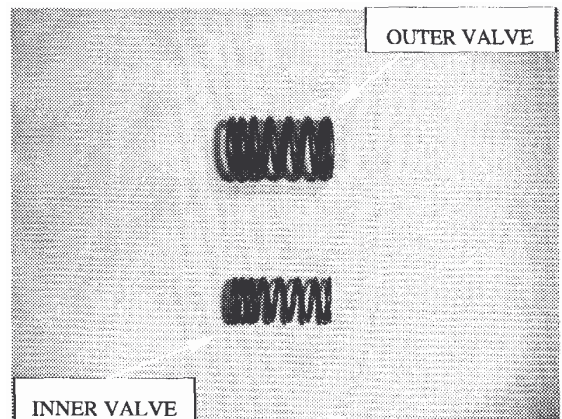




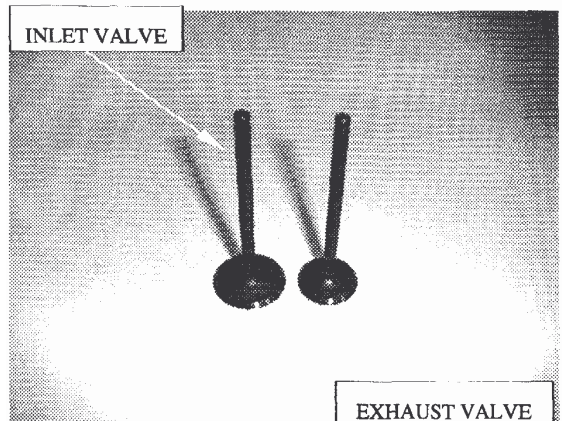
Measure the cylinder head diagonally for warp with a straight edge and feeler gauge.



Measure the free length of the inner and outer valve springs.  
SERVICE LIMITS: Inner 31.2 mm  
Outer 34.1 mm



Inspect each valve for turning, burning, scratches and abnormal stems wear.  
Check the valve movement in the guide.



Measure and record each valve stem O.D.  
SERVICE LIMITS: 4.90 mm

Measure and record the valve guide I.D.  
SERVICE LIMITS: IN / EX 5.30 mm

Calculate the stem-to-guide clearance.

SERVICE LIMITS: IN 0.08 mm

EX 0.10 mm

NOTE: If the stem-to-guide clearance exceeds the limits, determine if a new guide with standard dim would bring the clearance within tolerance.

If so, replace guides as necessary and ream to fit. If guide is replaced, the valve seat must be refaced.

### CYLINDER HEAD ASS'Y

Lubricate each valve stem with oil.

Insert the valves into the guides.

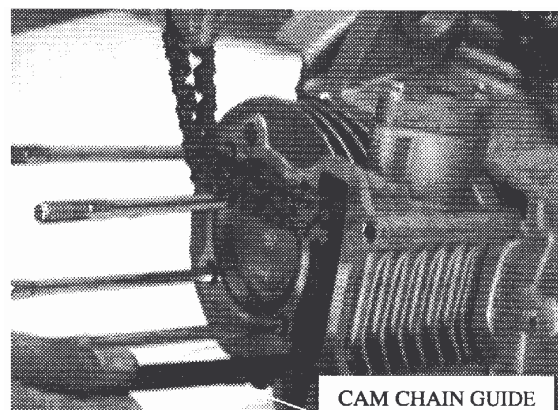
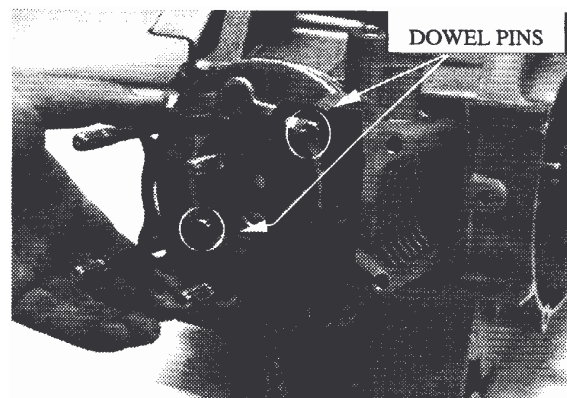
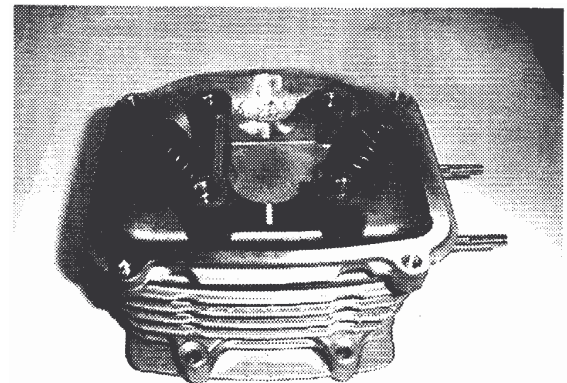
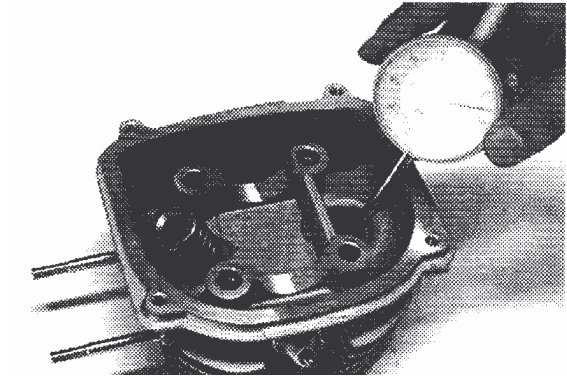
Install the valve springs, retainers and the cotters.

NOTE: To prevent loss of tension, don't compress springs more than necessary.

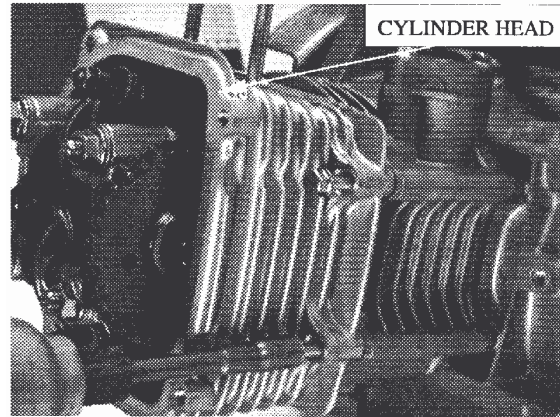
### INSTALLATION

Install the new gasket and dowel pins.

Install the cam chain guide.

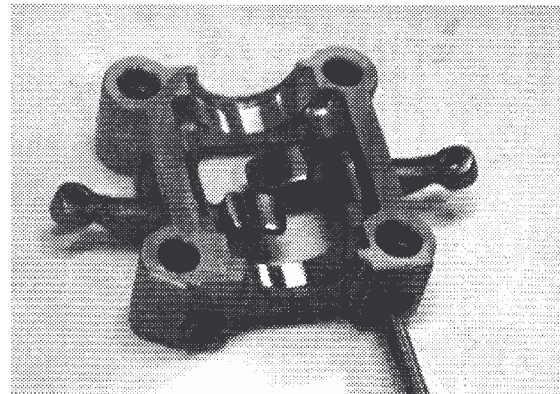


Install the cylinder head.

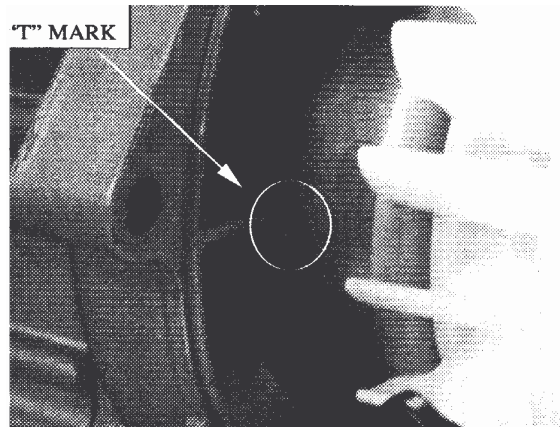


### CAMSHAFT ASS'Y INSTALLATION

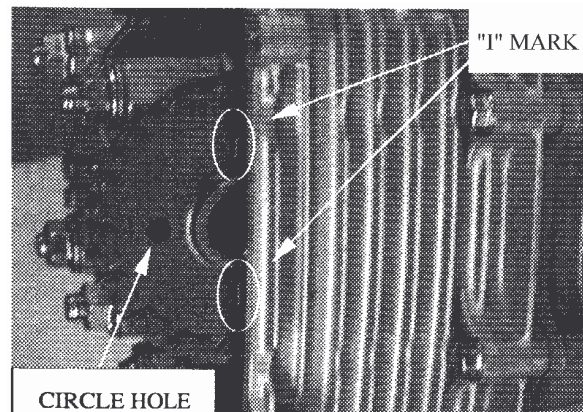
Install the rocker arms and rocker arm shafts into camshaft holder.



Align the "T" mark on the flywheel with the index mark on the alternator cover by turning the flywheel counter-clockwise.



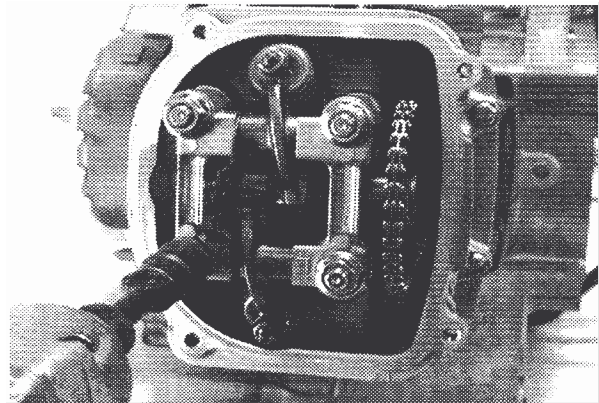
Position the camshaft gear with cam chain so that the mark aligns with the cylinder head surface and the hole towards the front.



Install the dowel pins and camshaft holder.

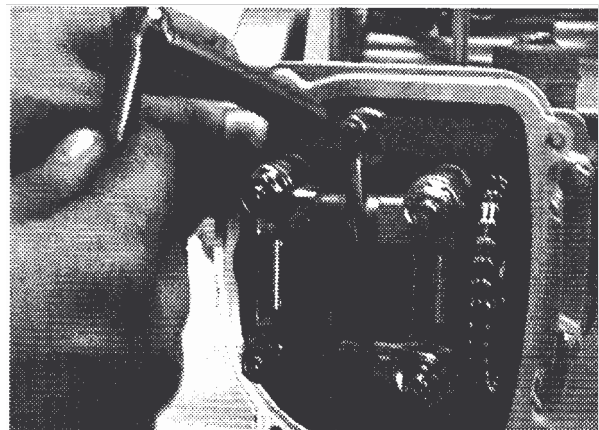
Tighten the washers and nuts.

Torque: 20 N.m (14.8 lbs.ft)

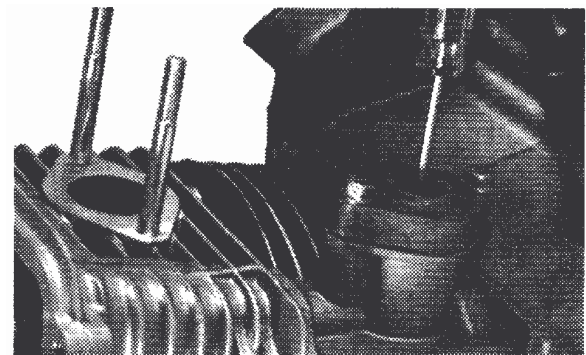


Adjust the clearance between the rocker arm and valve stem  
by applying a feeler gauge.

STANDARD VALVE: 0.08 mm



Relax the cam chain-adjusting bolt with counter-  
erclockwise direction and install the o-ring and s



Install the cylinder head cover.



## **6. CYLINDER AND PISTON**

**6.1 SERVICE INFORMATION**

**6.2 TROUBLESHOOTING**

**6.3 CYLINDER REMOVAL**

**6.4 PISTON REMOVAL**

**6.5 CYLINDER INSTALLATION**

### **6.1 SERVICE INFORMATION**

## GENERAL

Camshaft lubrication oil is fed to the cylinder head through an oil orifice in the cylinder head and engine case. Before installing the cylinder head be sure the orifice is not clogged and the gasket, O-ring and dowel pins are in place.

## SPECIFICATION

| ITEM                          |                         |         | STANDARD                        | SERVICE LIMIT    |
|-------------------------------|-------------------------|---------|---------------------------------|------------------|
| Cylinder                      | I.D.                    |         | 52,400-52,410/<br>61,730-61,740 | 52.50/<br>61.830 |
|                               | Taper                   |         | -----                           | 0.10             |
|                               | Out of round            |         | -----                           | 0.10             |
|                               | Warp across top         |         | -----                           | 0.10             |
| Piston                        | Piston O.D.             |         | 52,370-52,390<br>61,700-61,720  | 52,3/<br>61,63   |
| Piston pin                    | Piston pin bore         |         | 15.002-15.008                   | 15.04            |
| Piston rings                  | Piston pin O.D.         |         | 14.994-15.000                   | 14.960           |
|                               | Piston-to-pin clearance |         | 0.002-0.014                     | 0.02             |
|                               | Piston ring             | TOP     | 0.015-0.050                     | 0.12             |
|                               |                         | SECOND  | 0.015-0.050                     | 0.12             |
|                               | Groove Clearance        | TOP/SEC | 0.10-0.25                       | 0.5              |
|                               | Piston ring end gap     | OIL     | 0.2-0.7                         | -----            |
| Cylinder-to-piston clearance  |                         |         | 0.0005-0.1025                   | 0.1              |
| Connecting rod small end I.D. |                         |         | 15.010-15.028                   | 15.06            |

## TORQUE VALUES

|                             |                              |
|-----------------------------|------------------------------|
| Cylinder head bolts         | 8~12 N.m (5.9~8.9 lbs.ft)    |
| Camshaft holder flange nuts | 20~24 N.m (14.8~17.7 lbs.ft) |
| Tappet adjusting nut        | 9~12 N.m (6.6~8.9 lbs.ft)    |

## 6.2 TROUBLESHOOTING

### Low or unstable compression

Worn cylinder or piston rings.

### Overheating

Excessive carbon build-up on piston or combustion chamber wall.

### **Knocking or abnormal noise**

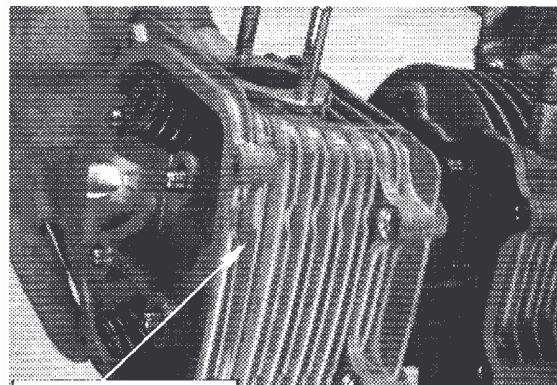
- Worn piston and cylinder.
- Excessive carbon build-up.

### **Excessive smoke**

- Worn cylinder, piston, or piston rings.
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall.
- Damaged valve stem seal.

## **6.3 CYLINDER REMOVAL**

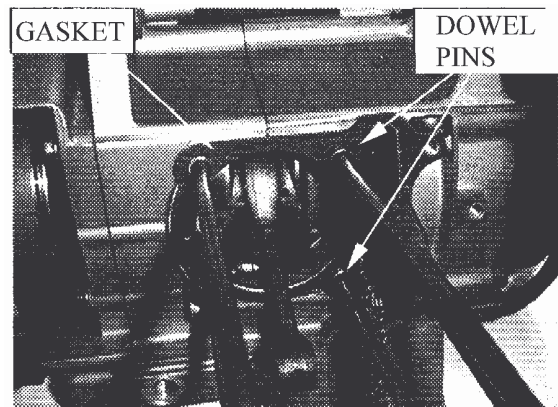
Remove the cylinder head.



Remove the cylinder.

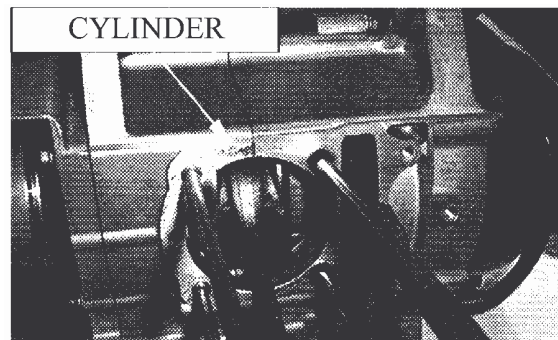


Remove the cylinder gasket and dowel pins.



Clean off any gasket materials from the cylinder surface.

NOTE: Be carefully not to damage the gasket surface.



#### 6.4 PISTON REMOVAL

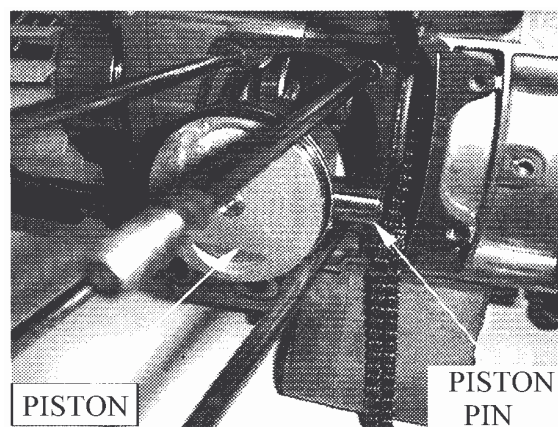
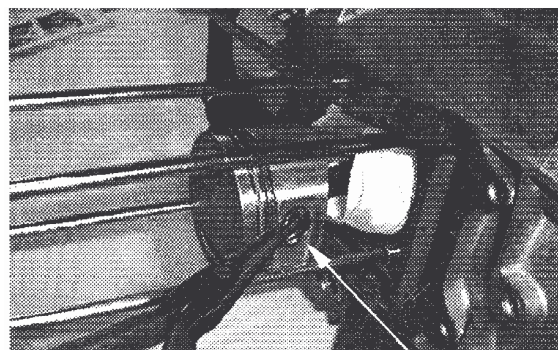
Stuff a shop towel into the crankcase.

Remove the piston pin clip with needle nose pliers.

NOTE: Do not allow the clip fall into the crankcase.

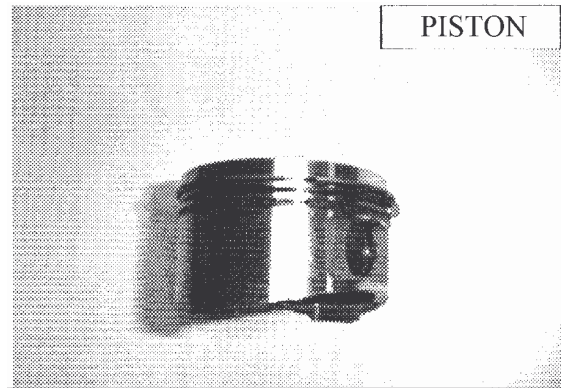
Remove the piston pin from the piston.

Remove the piston.



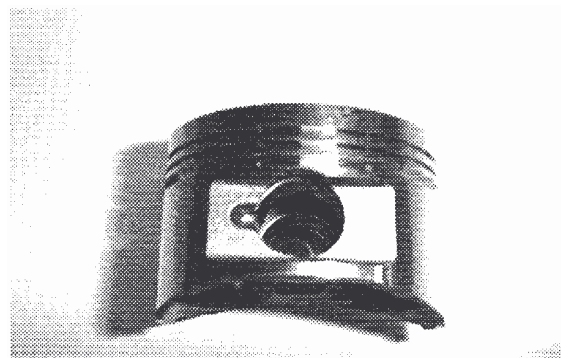


Spread each piston ring and remove it by lifting up at a point opposite the gap.



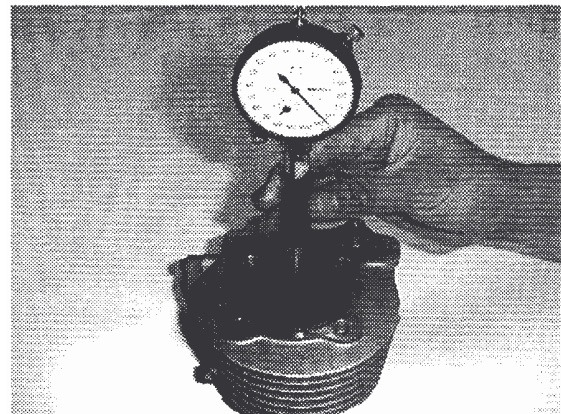
### INSPECTION

Inspect the cylinder walls for scratches or wear.



Measure and record the cylinder I.D. at three levels in an X and Y axis. Take the maximum reading to the wear.

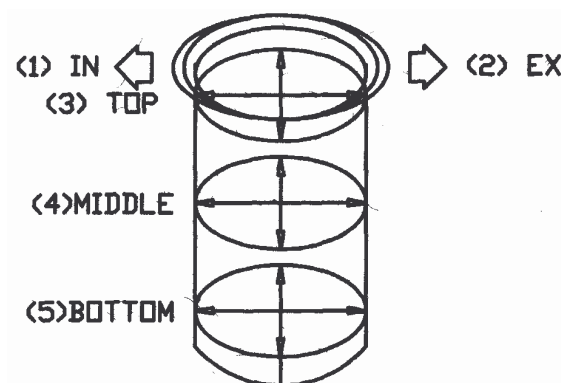
SERVICE LIMITS: 0.10 mm



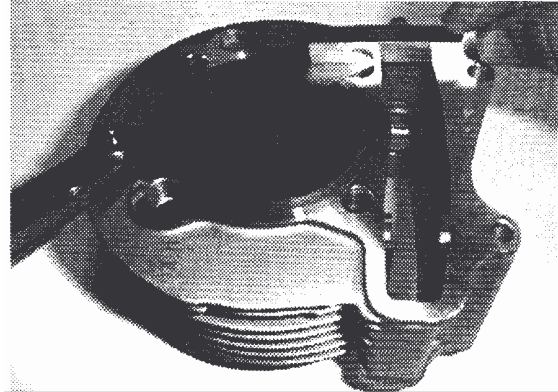
Calculate cylinder taper at three levels in an X and Y-axis.

Take the maximum reading to determine the out-

SERVICE LIMITS: 0.10 mm

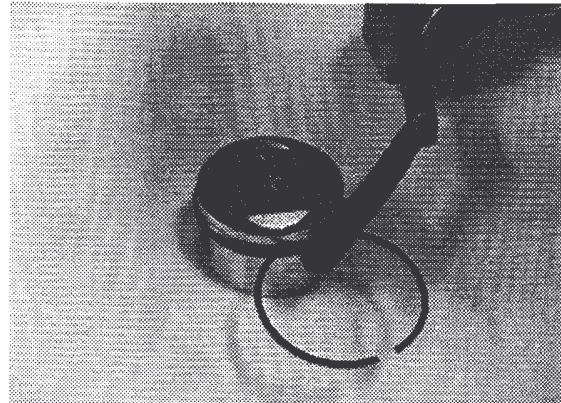


Inspect the top of the cylinder for warp.  
SERVICE LIMITS: 0.10 mm

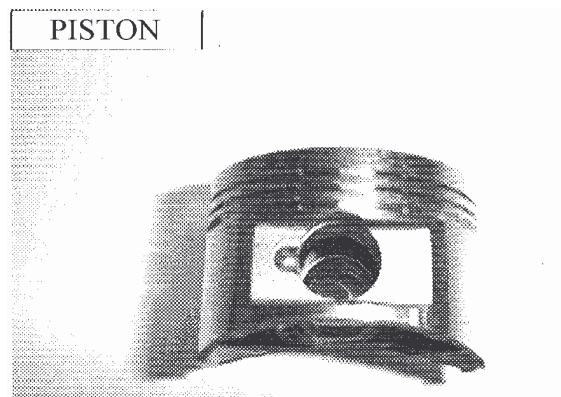


### PISTON / PISTON RING INSPECTION

Measure the piston ring-to-groove clearance.  
SERVICE LIMITS: TOP 0.12 mm  
SECOND 0.12 mm

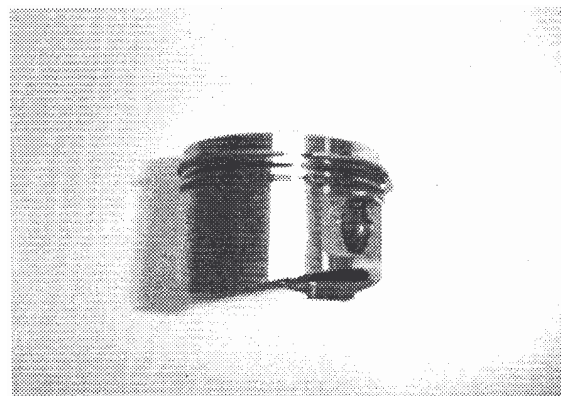


Inspect the piston for wear or damage.



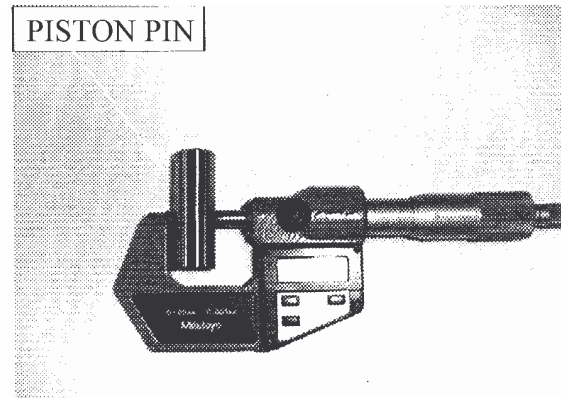
Insert each piston ring into the cylinder and measure the ring end gap.

NOTE: Push the rings into the cylinder with the piston to be sure they are squarely set in the cylinder.  
SERVICE LIMITS: TOP 0.5 mm

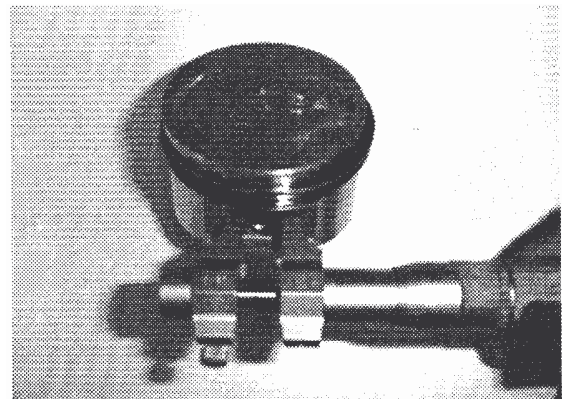


SECOND 0.5 mm

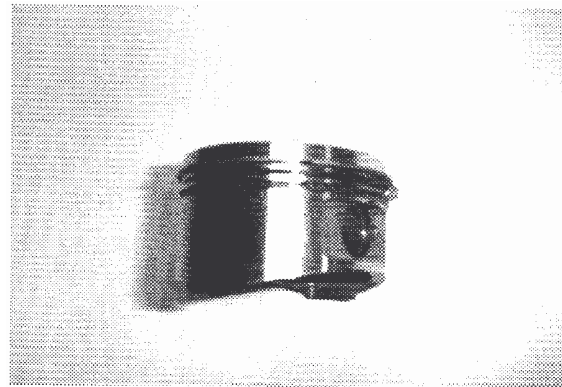
Measure the piston pin O.D.  
SERVICE LIMIT: 14.960 mm



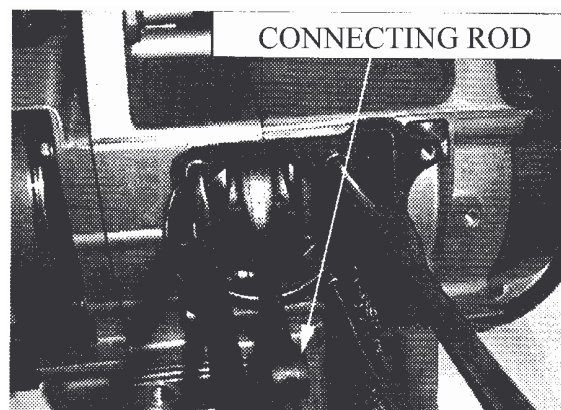
Measure the piston pin O.D.  
SERVICE LIMIT: 15.04 mm



Calculate the piston-to-piston pin clearance.  
SERVICE LIMITS: 0.02 mm



Measure the connecting rod small end I.D.  
SERVICE LIMITS: 15.06 mm

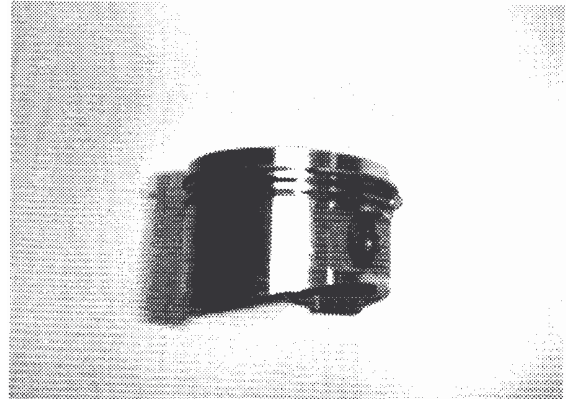


## 6.5 PISTON &

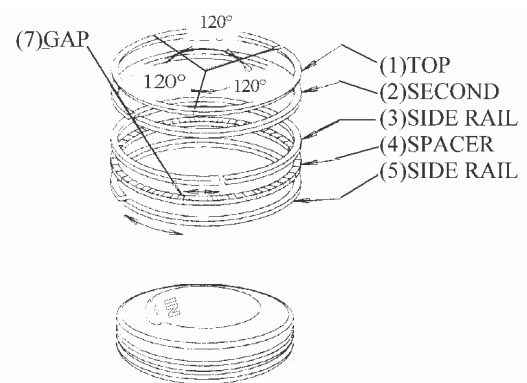
### PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly and ins  
piston ring with the marks facing up.

NOTE: Don't interchange the top and second  
rings. Avoid piston and piston ring damage  
installation.

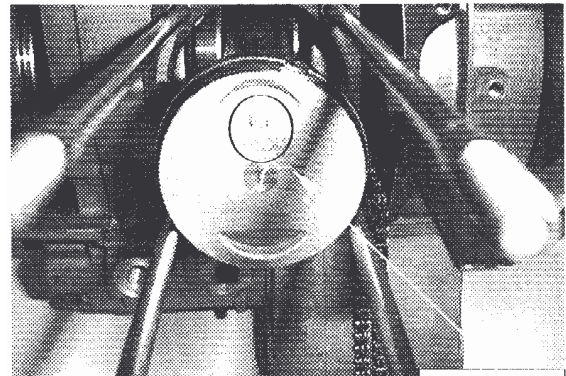


Space the piston ring end gaps 120 degrees apart



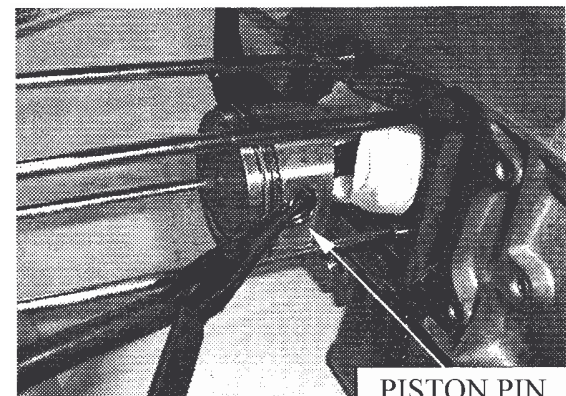
### PISTON INSTALLATION

Install the piston with it's "IN" mark on the intake



Install the piston pin with new pin clips.  
Do not align the piston pin clip end gap with the  
cutout.

NOTE: do not allow the clip to fall into the crank

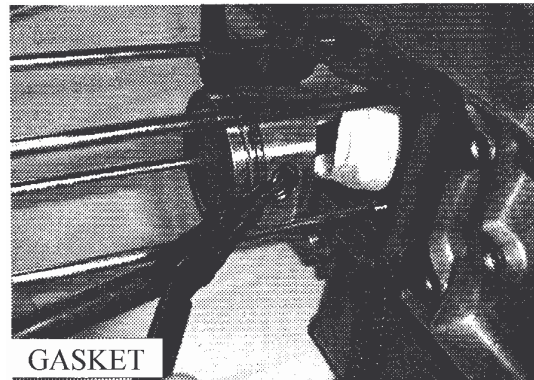
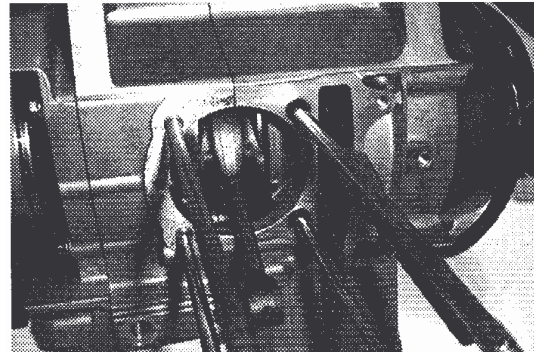


### 6.6 CYLINDER INSTALLATION

Clean any gasket material from the crankcase surface.

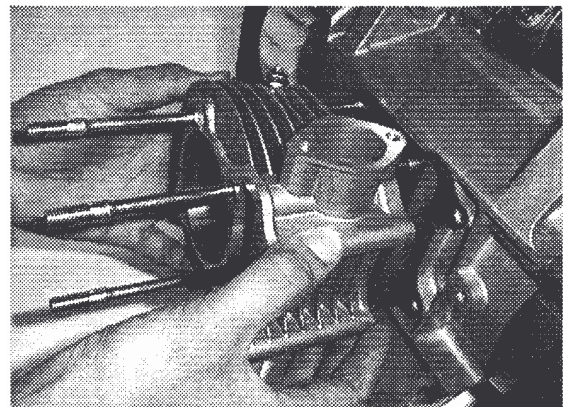
NOTE: Be careful not to damage the gasket surface.

Install the dowel pins and a new gasket.

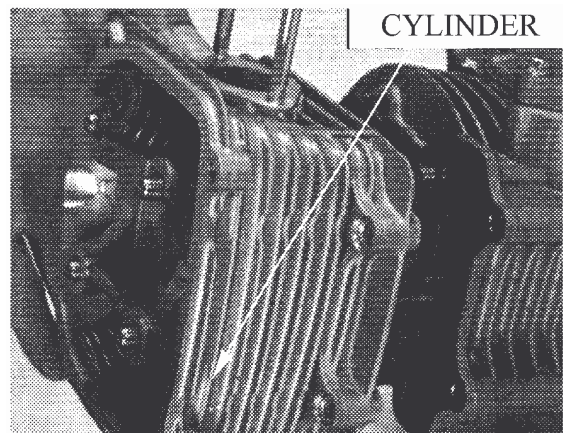


Coat the cylinder bore and piston rings with engine oil and install the cylinder.

NOTE: Avoid piston rings damaging the cylinder bore during installation. Do not allow the cam chain to fall into the crankcase.



Install the cylinder head.



## **7. TRANSMISSION & KICK STARTER**

### **7.1 SERVICE INFORMATION**

### **7.2 TROUBLE SHOOTING**

### **7.3 C.V.T DISASSEMBLY**

### **7.4 KICK STARTER DISASSEMBLY**

### **7.5 KICK STARTER ASSEMBLY**

### **7.6 C.V.T ASSEMBLY**

## **7.1 SERVICE INFORMATION**

If the drain tube ass'y fills with water, the tube should be drained.

### **SPECIFICATIONS**

| <b>ITEM</b>             | <b>STANDARD (mm)</b>  | <b>SERVICE LIMIT (mm)</b> |
|-------------------------|-----------------------|---------------------------|
| Driven the width        | 19.8-20.2             | 19.0                      |
| Weight roller O.D.      | 15.0-15.02/17.0-17.02 | 14.6/16.6                 |
| Movable drive face I.D. | 27.98-28.0            | 28.03                     |
| Drive face collar I.D.  | 24.06-24.09           | 24.098                    |
| Drive face boss O.D.    | 23.96-23.98           | 23.92                     |
| Clutch outer I.D.       | 124.8-125.2           | 125.5                     |

|                                |             |       |
|--------------------------------|-------------|-------|
| Clutch weight lining thickness | -----       | 1.5   |
| Driven face spring length      | 168.4-169.4 | 164.0 |

### **TORQUE VALUES**

|                  |                      |
|------------------|----------------------|
| Clutch outer nut | 55 N.m (40.6 lbs.ft) |
| Drive face nut   | 55 N.m (40.6 lbs.ft) |

## **7.2 TROUBLE SHOOTING**

### **Engine starts but can't travel**

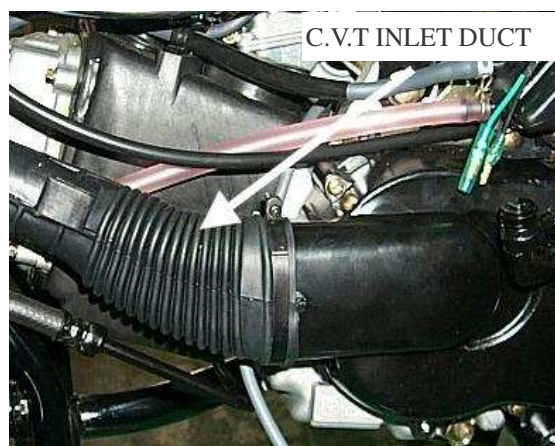
- Worn driven belt.
- Worn clutch lining.
- Damaged driven face spring.

### **Low engine power**

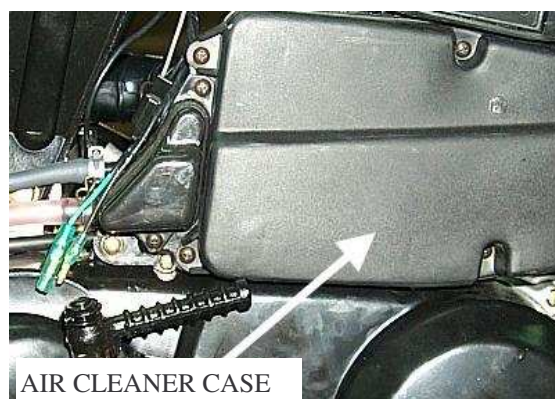
- Worn driven belt.
- Worn weight roller.
- Dirty driven face.

### 7.3 C.V.T DISASSEMBLY LH CRANKCASE REMOVAL

Relax the band screw and remove the C.V.T inlet

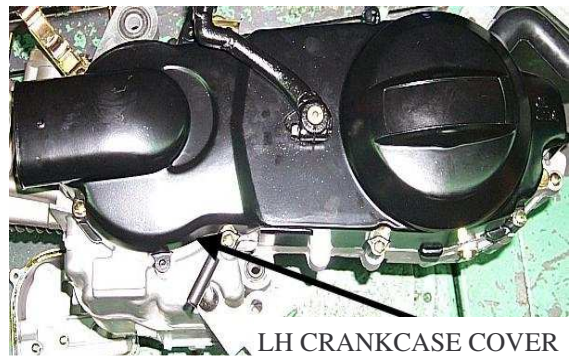


Remove the air cleaner case.

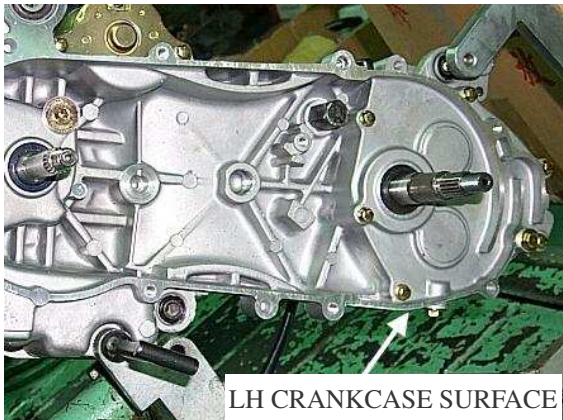




Remove the bolts and LH crankcase cover.

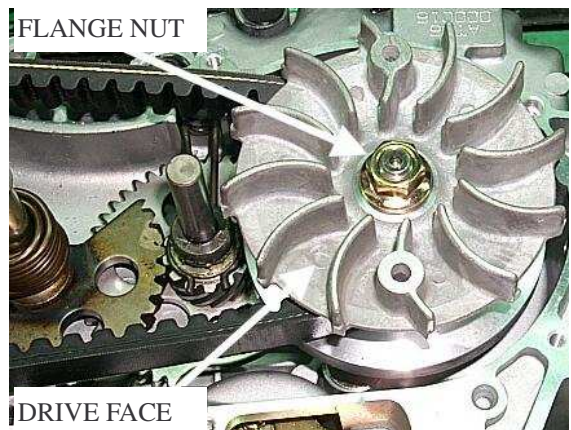


Remove the gasket and dowel pins.  
Clean off any gasket material from L crankcase s



### C.V.T REMOVAL

Relax the flange nut, and remove the drive face.



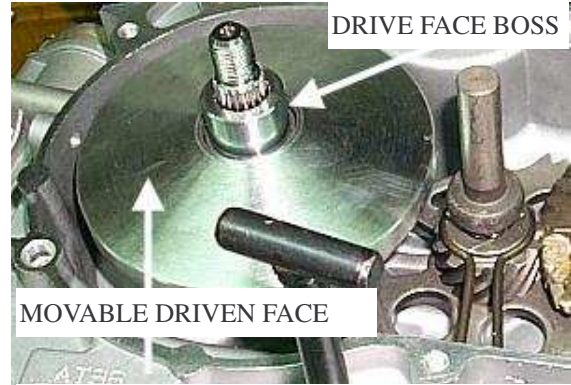
Relax the flange nut.  
Remove the drive pulley ass'y and driven belt.



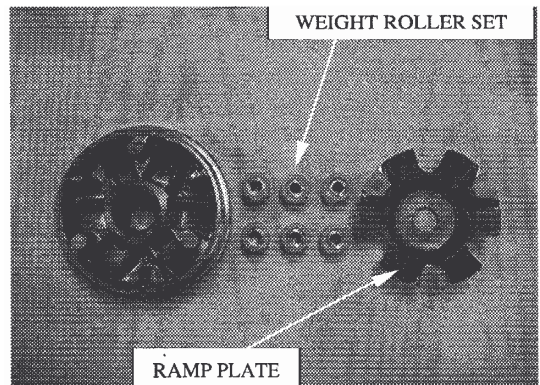
FLANGE BELT

DRIVE PULLEY

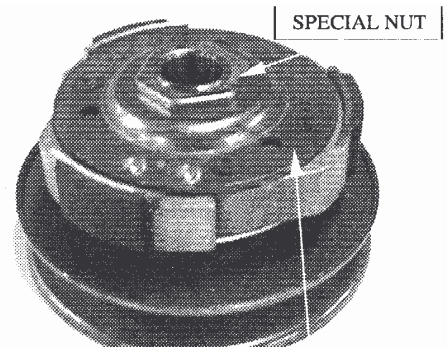
Remove the drive face boss and movable driven face assembly.



Remove the ramp plate and weight roller set.



Relax the special nut and remove the driven plate composition and driven face spring.

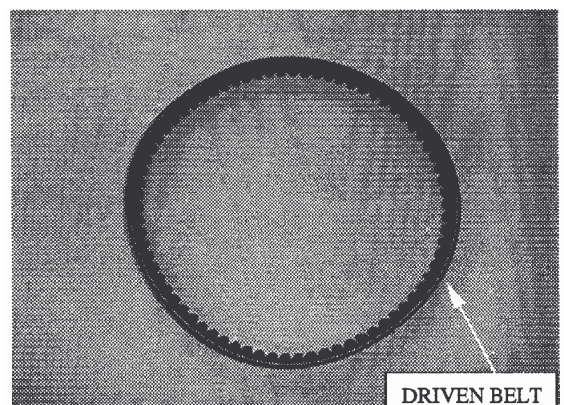


### **INSPECTION**

Inspect the driven belt for wear, tears or damage.

Measure the width of driven belt.

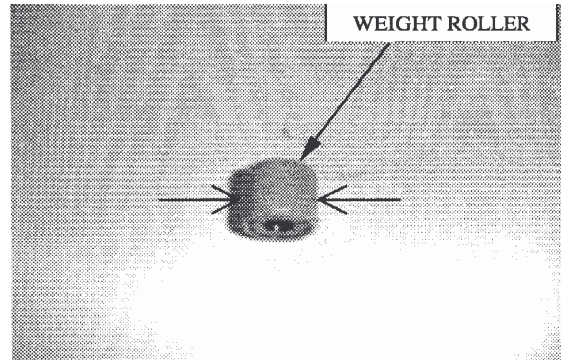
SERVICE LIMIT:19.0 mm



Inspect the weight roller for wear or damage and replace them if necessary.

Measure the O.D. of weight rollers.

SERVICE LIMIT:14.6/16.6 mm



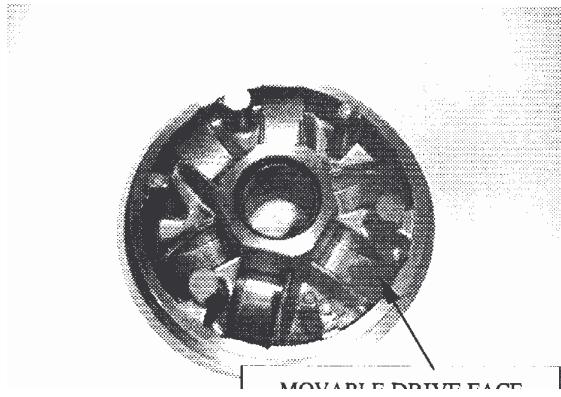
Measure the I.D. of movable driven face.

SERVICE LIMIT:28.03mm

Inspect the drive face collar for wear or damage.

Measure the I.D. of drive face collar.

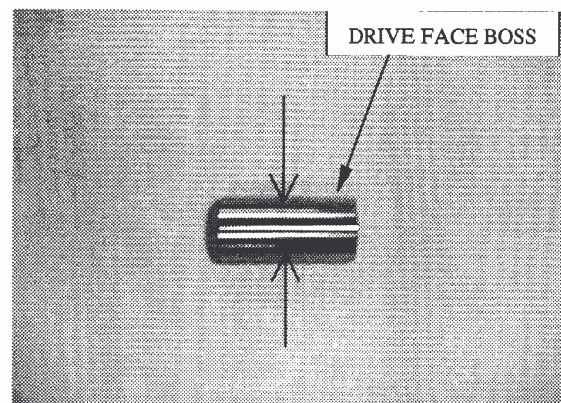
SERVICE LIMIT:24.098 mm



Inspect the drive face boss for wear or damage.

Measure the O.D. of drive face boss.

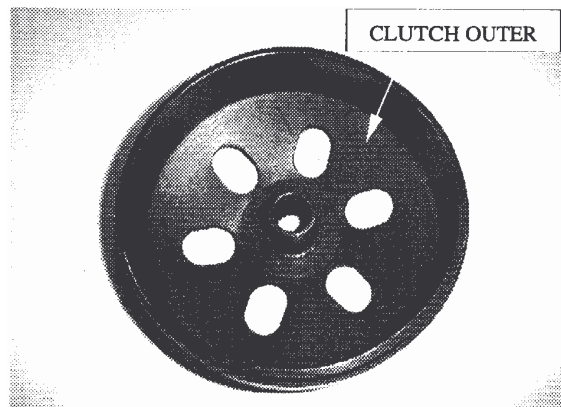
SERVICE LIMIT:23.92 mm



Inspect the clutch outer for wear or damage.

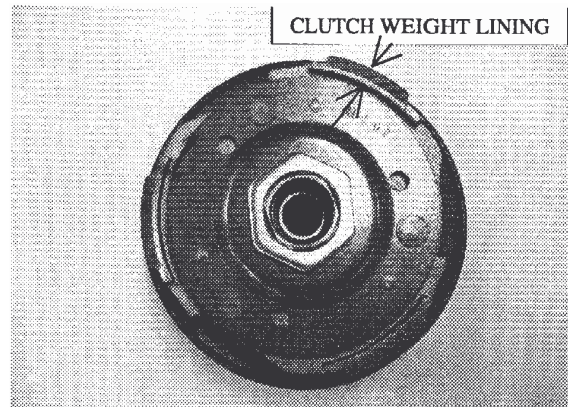
Measure the I.D. of clutch outer.

SERVICE LIMIT:125.5 mm

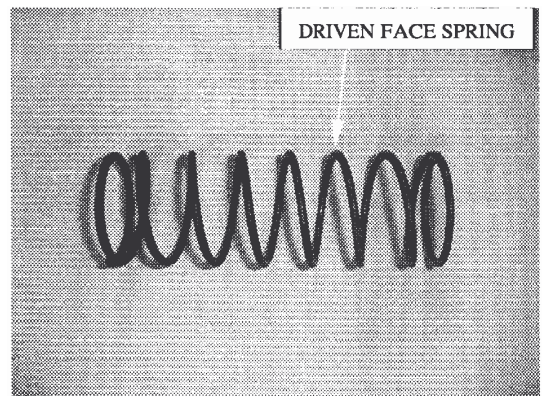


Inspect the clutch weight set for wear or damage.

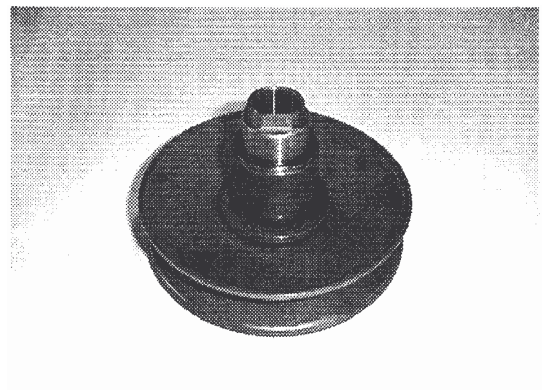
Measure the thickness of clutch weight lining.  
SERVICE LIMIT:1.5mm



Measure the length of driven face spring.  
SERVICE LIMIT:164.0 mm



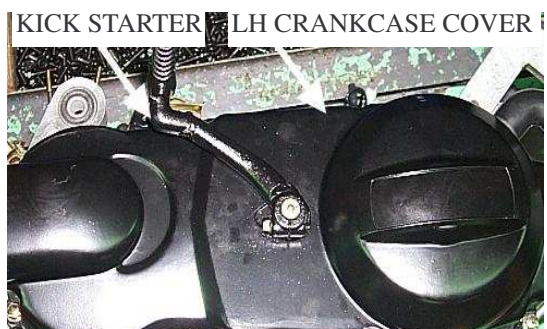
Inspect the driven face ass'y and replace them if necessary.



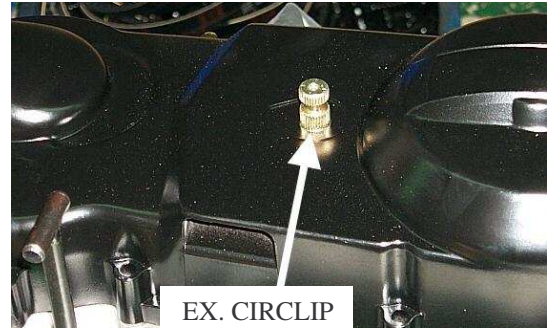
#### 7.4 KICK STARTER DISASSEMBLY

Remove the LH crankcase cover.

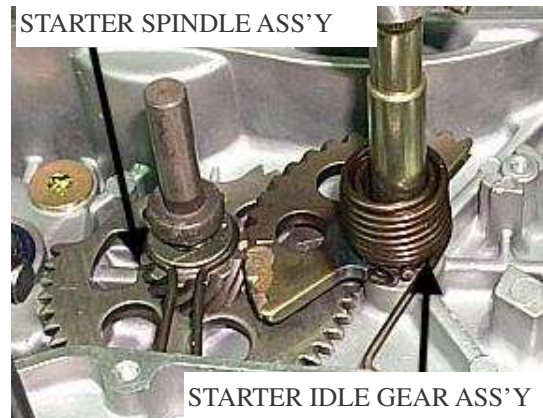
Remove the kick starter.



Remove the ex. Circle-clip and washer from kick starter spindle composition.



Remove the kick-starter spindle ass'y.  
Remove the kick-starter idle gear ass'y  
Remove the kick spindle bush.



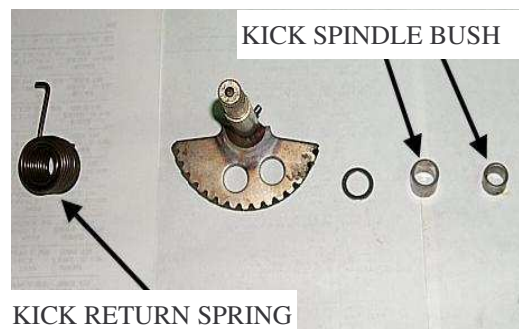
### INSPECTION

Inspect the kick-starter spindle composition for wear or damage.



Inspect the kick-starter return spring for fatigue or damage.

Inspect the kick-starter spindle bush for wear of damage.



Inspect the kick driven gear and spring for wear or damage.

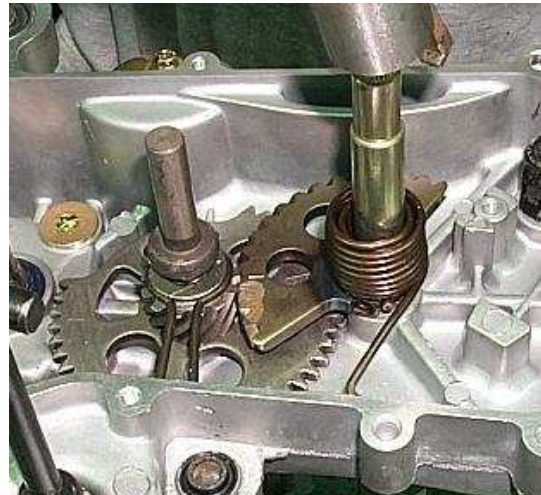


KICK DRIVEN SPRING

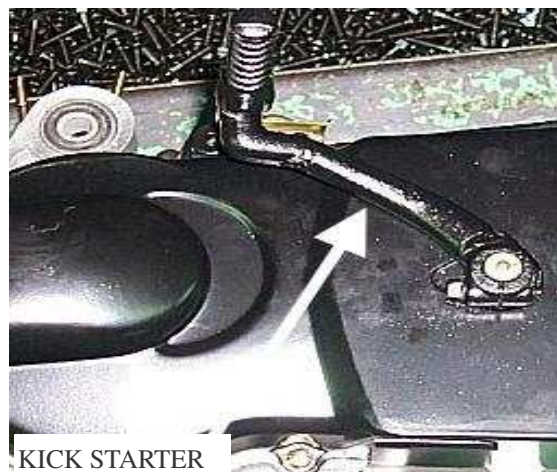
### **7.5 KICK-STARTER ASSEMBLY**

Install the kick driven gear and spring.

Install the kick spindle bush, return spring and spindle ass'y.



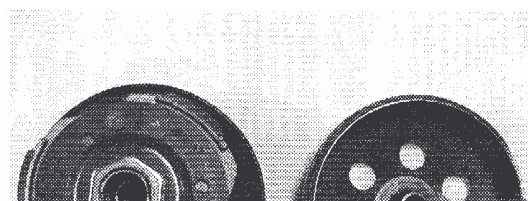
Install the kick-starter.



KICK STARTER

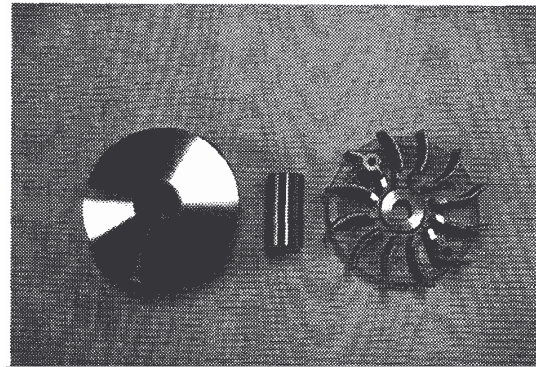
### **7.6 C.V.T ASSEMBLY**

Assemble the driven face ass'y, spring and

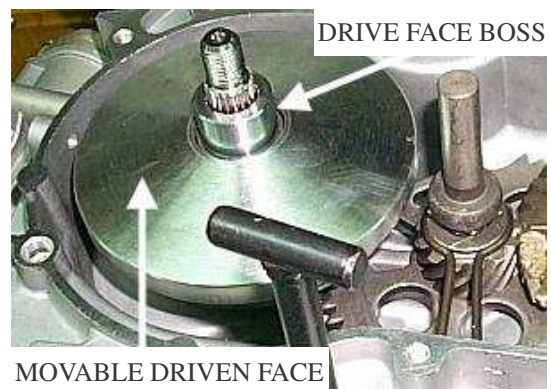


driven plate.

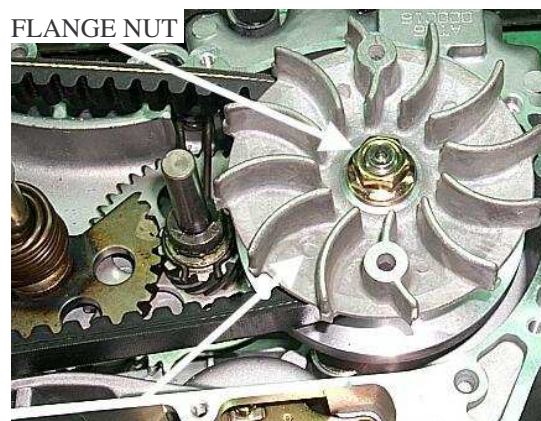
Assemble the movable drive face, weight roller set and drive face.



Install the movable drive face ass'y and boss.

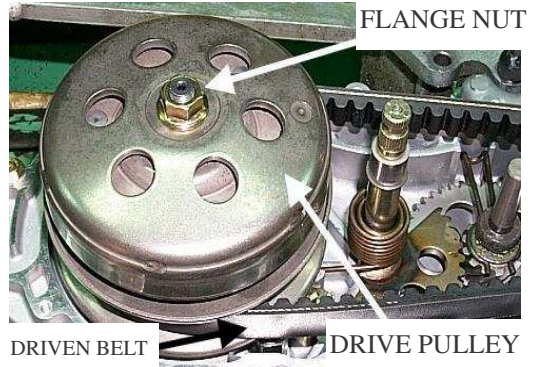


Install the drive face and kick starter ratchet.

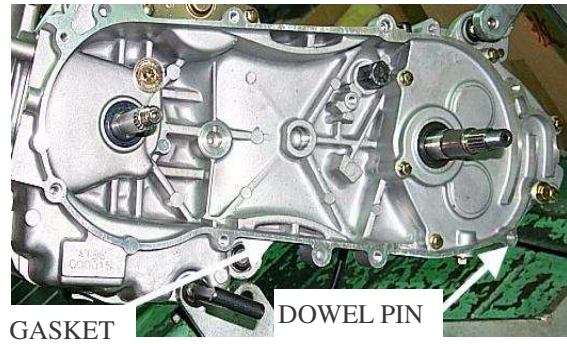


DRIVE FACE

Install the driven belt and driven pulley ass'y.



Install the dowel pins and gasket.



Install the LH crankcase cover.



Install the air cleaner case and C.V.T ducts.

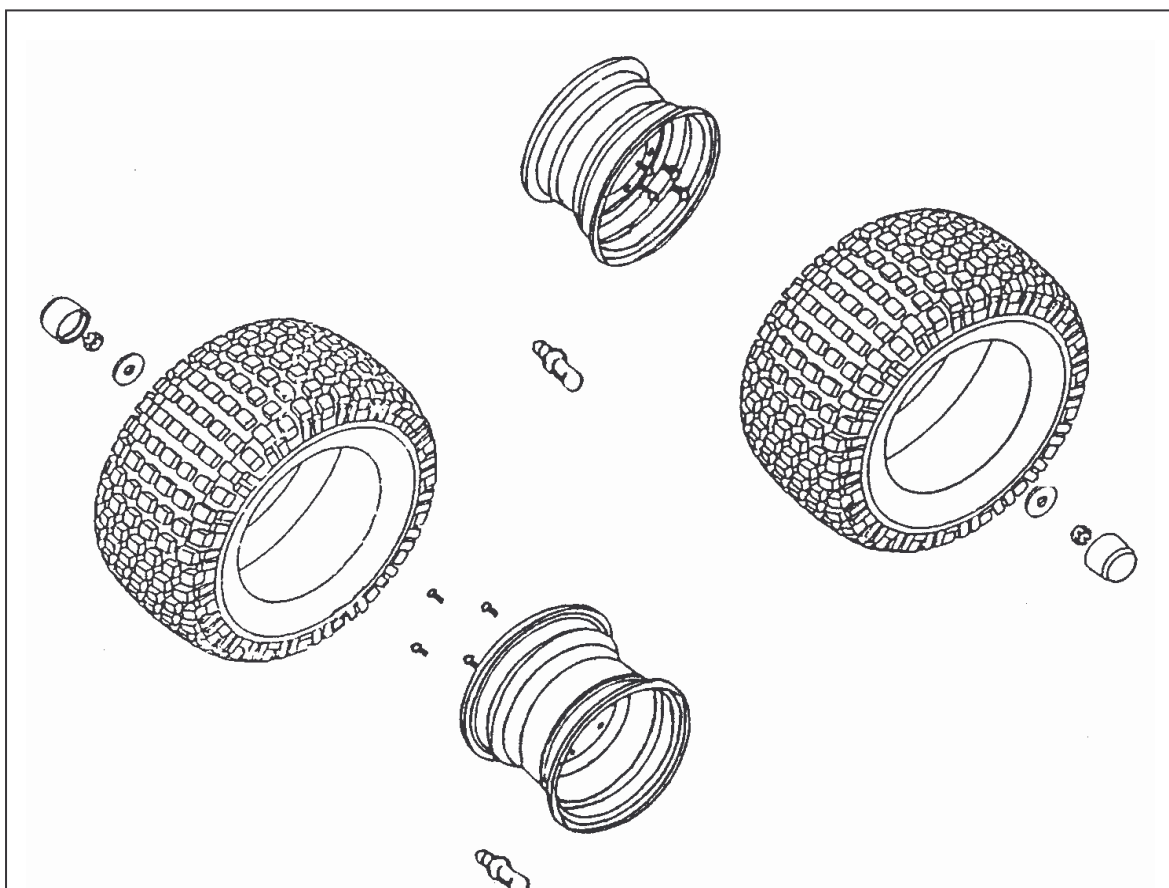


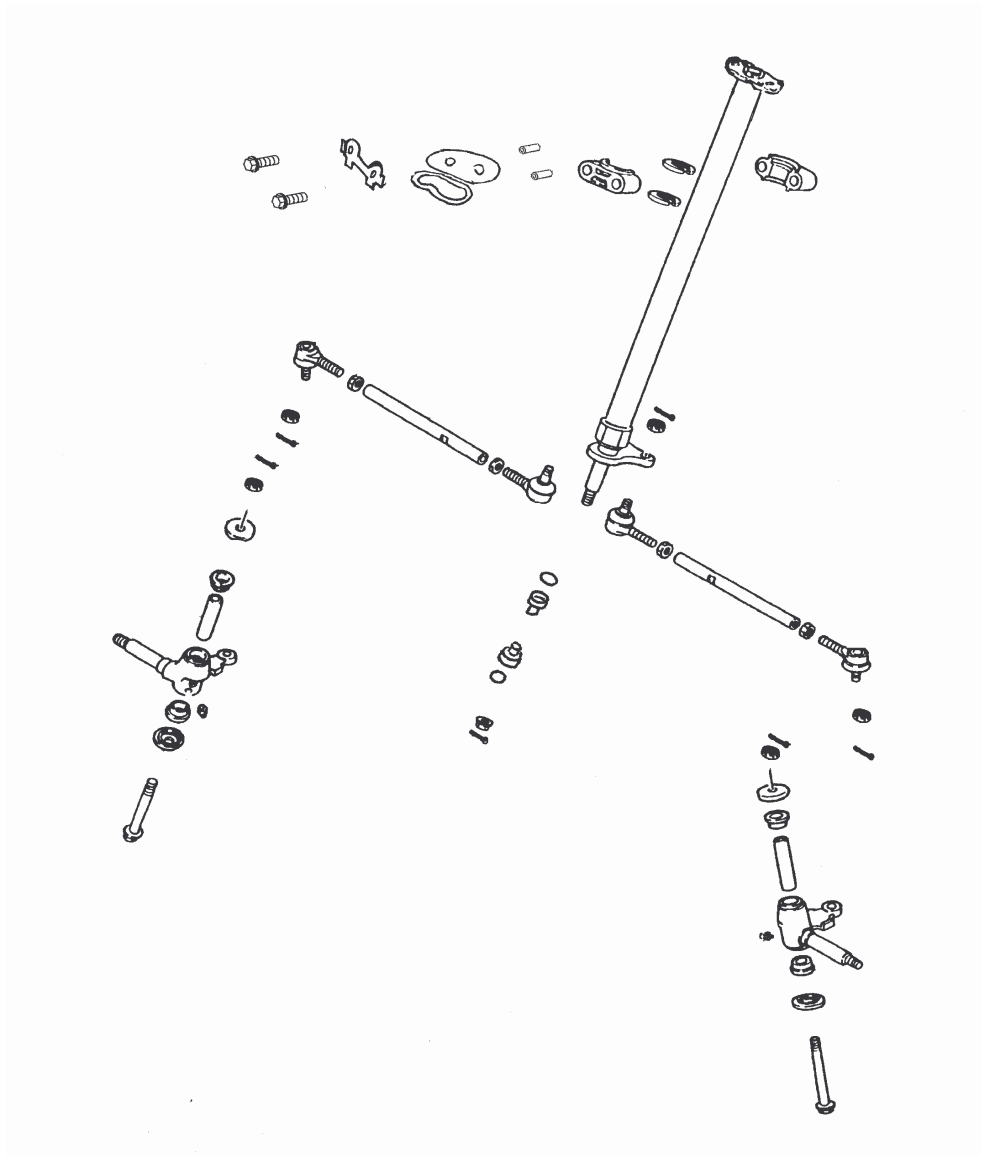


## **8. FRONT WHEEL, SUSPENSION AND STEERING**

- 8.1 PARTS DRAWING**
- 8.2 TROUBLESHOOTING**
- 8.3 HANDLEBAR**
- 8.4 THROTTLE HOUSING**
- 8.5 FRONT WHEEL**
- 8.6 FRONT BRAKES**
- 8.7 STEERING SYSTEM**
- 8.8 FRONT SUSPENSION**

### **8.1 PARTS DRAWING**





## 8.2 TROUBLESHOOTING

|                               |  |
|-------------------------------|--|
| <b>HARD STEERING</b>          | Faulty tire<br>Steering shaft holder too tight<br>Insufficient tire pressure<br>Faulty steering shaft bushing<br>Damaged steering shaft bushing  |
| <b>FRONT WHEEL WOBBLING</b>   | Faulty tire<br>Worn front brake drum bearing<br>Bent rim<br>Axle nut not tightened properly  |
| <b>BRAKE DRAG</b>             | Incorrect brake adjustment<br>Sticking brake cable   |
| <b>STEERS TO ONE SIDE</b>     | Bent tie rods<br>Wheel installed incorrectly<br>Unequal tire pressure<br>Bent frame<br>Worn swing arm pivot bushing<br>Incorrect wheel alignment |
| <b>POOR BRAKE PERFORMANCE</b> | Brake shoes worn<br>Worn brake drum<br>Brake lining oily, greasy or dirty<br>Improper brake adjustment   |
| <b>FRONT SUSPENSION</b>       | Loose front suspension fastener<br>Binding suspension link   |
| <b>HARD SUSPENSION</b>        | Faulty front swing arm bushing   |

|                        |  |
|------------------------|--|
|                        | Improperly installed front swing arms<br>Bent front shock absorber swing rod |
| <b>SOFT SUSPENSION</b> | Wear front shock absorber springs<br>Worn or damage front swing arm bushing  |

### 8.3 HANDLEBAR SYSTEM

#### Removal

Remove the handlebar cover by unscrew two fix screws.



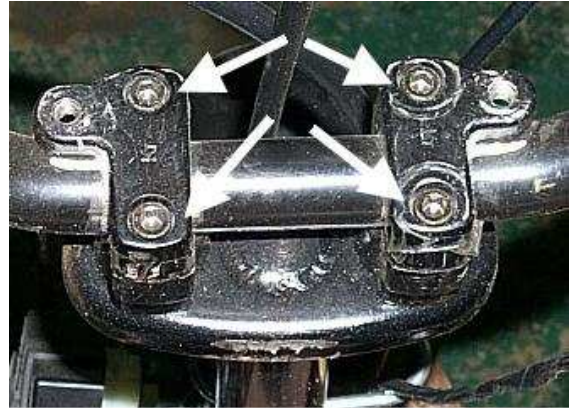
Remove the throttle lever housing on the right handlebar. Remove brake lever bracket assembly.



Remove the handlebar switch on the left handlebar. Remove rear brake lever bracket ass'y.



Remove the bolts attaching the handlebar upper holder. Remove the handlebar.



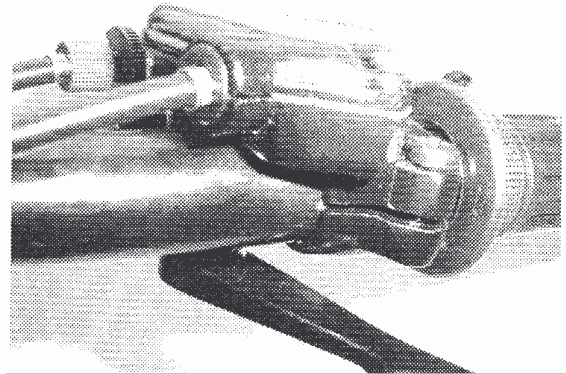
***Installation***

Install the switch housing. Tighten two screws securely.



Install the throttle lever housing, and brake lever bracket ass'y.





## 8.4 THROTTLE HOUSING

### Disassembly

Unscrew the screws on the throttle housing cover.

Remove throttle housing cover and gasket.

Disconnect throttle cable from the throttle arm and remove from the throttle housing.

Assembly is in the reverse order of disassembly.



## 8.5 FRONT WHEEL

### Remove

Raise the front wheels off the ground by placing a jack or other support under the frame.

Remove the front wheel nuts, washer and wheels.

### Installation

Install and tighten the four-wheel nuts torque: 60 N.m (44 lbs.ft ) Remember put a cotter pin in the castle nut.



## 8.6 FRONT BRAKES

Front brake inspection

Remove the front wheel  
Remove the brake drum.



Measure the brake lining thickness. The minimum limit: 1.5 mm

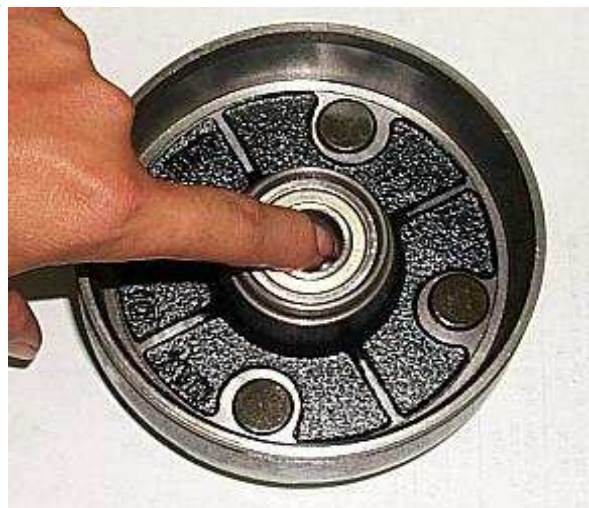
If they are thinner than the minimum limit, replace the brake lining.



Measure the brake drum inner diameter. The maximum limit: 111 mm.

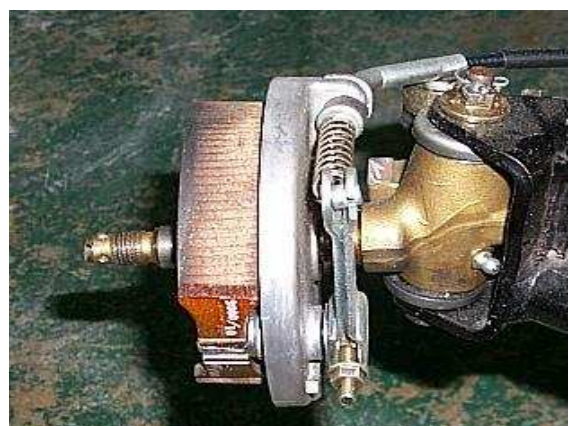


Turn the inner race of each bearing with fingers. The bearings should turn smoothly and quietly. If the race does not turn smoothly or quietly, remove and discard the bearings.



### ***Brake panel removal***

Disconnect the brake cable from the brake arm. Remove the brake panel from the knuckle.



Remove brake arm and cam.

Remove return spring.

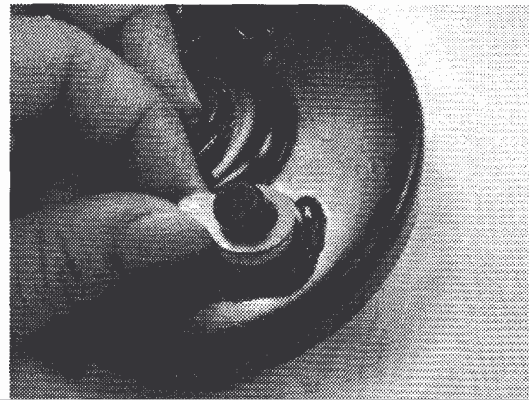
Remove indicator plate and felt seal.



### ***Install Brake panel***

Apply grease to the brake cam and anchor pin and install the cam in the brake panel.

Soak the felt seal in the engine oil and install the seal on the brake cam.

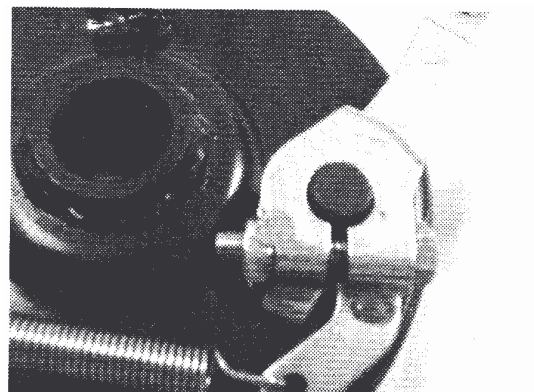


Install the brake arm on the cam by aligning the punch mark and the groove on the cam.

Tighten the brake arm bolt and nut.

Torque : 4-7 N.m

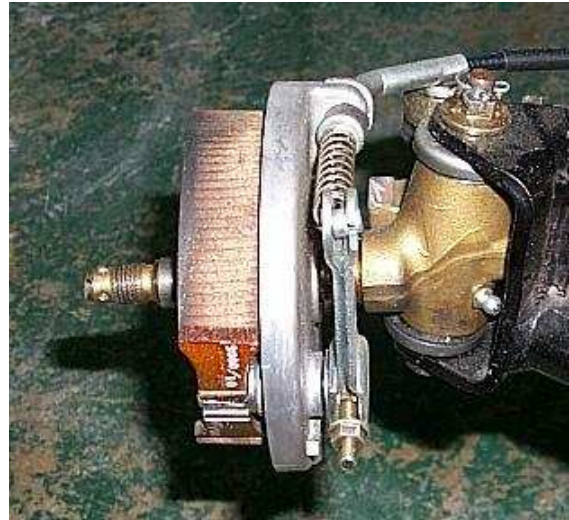
Install the return spring.





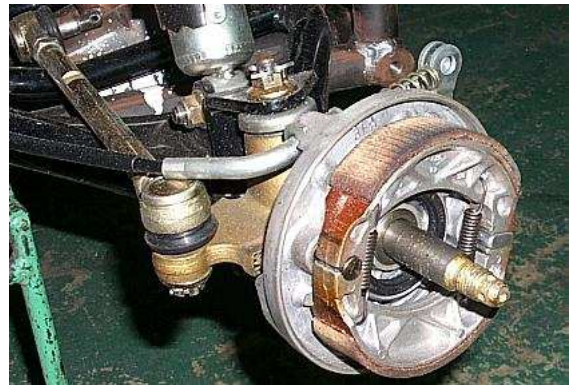
Install the brake panel on the knuckle.  
Connect the brake cable to the brake arm.

Install the brake arm cover  
Tighten the screws securely  
Position the brake shoes in their original locations and install the brake shoe spring.  
Install the brake drum and front wheel.  
Install the castle nut and cotter pin.

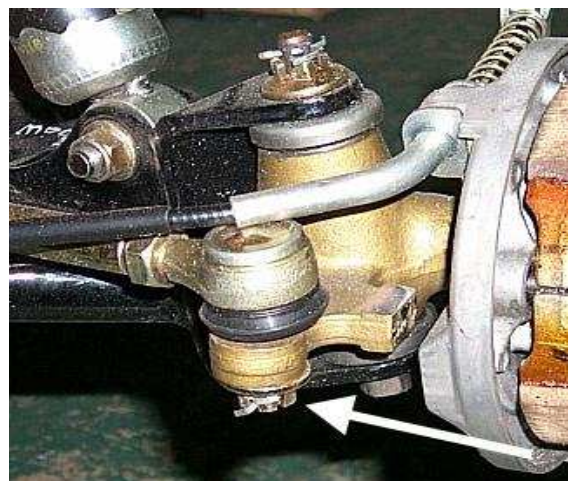


### **8.7 STEERING SYSTEM**

Remove the kingpin and Tie-rod  
Remove the front wheels and brakes plates.  
Remove the four self-lock nuts from the tie-rod ball joints and take off the two tie-rods.

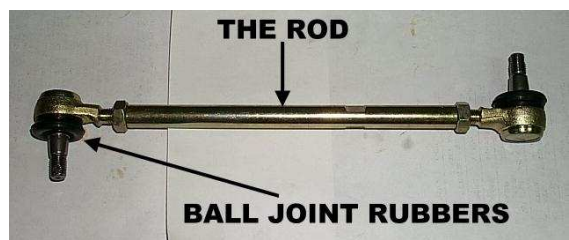


Remove the cotter pin on the kingpin.  
Unscrew the bolt and remove the kingpin.



### ***Tie-rod inspection***

Inspect the tie rod for damage or bending.  
Inspect the ball joint rubbers for damage, wear or deterioration. Turn the ball joints with fingers.



The ball joints should turn smoothly and quietly.

### *Kingpin inspection*

Inspect the kingpin for damage or cracks.



### *Steering shaft removal*

Remove the handle bar cover and handle bar.  
(see page 58)

Remove the front fender. (see page 72)

Remove handlebar lower holder.

Unscrew steering shaft holder bolt, remove  
steering shaft holder.

Take off the cotter pin below steering shaft.

Unscrew the steering shaft fix out below shaft.

Pull steering shaft carefully.



### *Steering shaft holder inspection*

Remove the steering shaft.

Remove the bushing from the shaft.

Inspect the bushing for damage or wear, replace  
if necessary.

Measure the bushing inner diameter.

**Maximum limit: Ø39.5 mm**



### *Steering shaft inspection*

Inspect the steering shaft for damage or cracks.

### *Installation of steering shaft*

Apply grease to the holder. Install the holder and oil seal tighten with the nuts.

**Torque : 33 N.m(24 lbs-ft)**

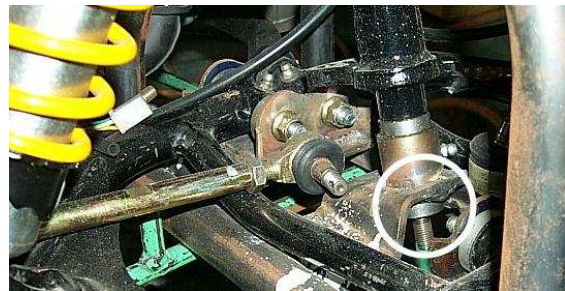


## 8.7 STEERING SYSTEM

### *Installation of steering shaft*

Install the steering shaft nut and tighten it.  
This nut is under this steering shaft.

**Torque : 50 N.m (37 lbs.ft)**



### *Installation of Tie-rod*

Install the tie-rod on the wheel side.  
Installation is in the reverse order of removal.

## **9. REAR WHEEL SYSTEM**

**9.1 PARTS DRAWING**

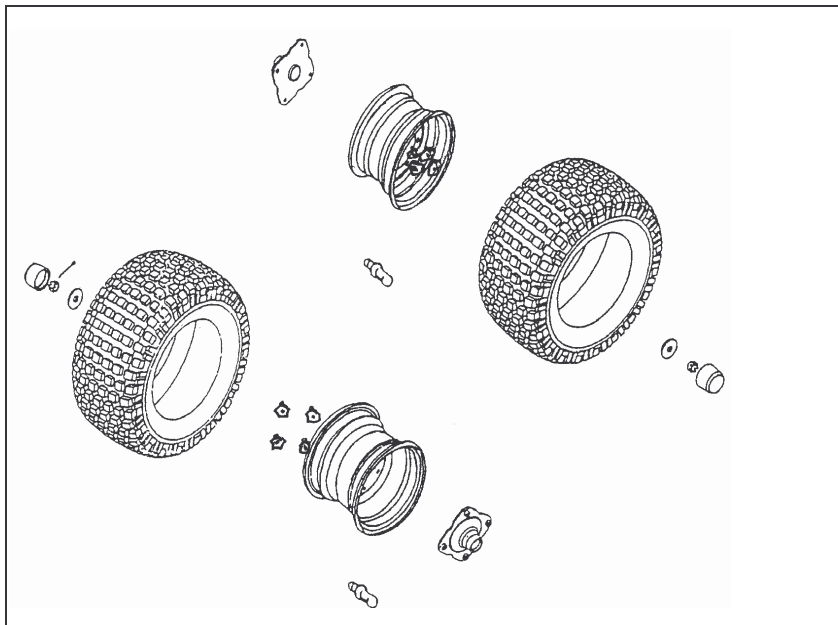
**9.2 TROUBLESHOOTING**

**9.3 REMOVE REAR WHEEL AND REAR BRAKE**

**9.4 DRIVE MECHNISM**

**9.5 REAR BRAKE AND WHEEL INSTALLATION**

### **9.1 Parts Drawings**



### 9.2 Troubleshooting

|                              |  |
|------------------------------|--|
| <b>Bad Brake Performance</b> | Brake shoes are worn<br>Bad brake adjustment<br>Brake lining are oily, greasy or dirty<br>Brake drums are worn<br>Brake arm setting is improperly engage |
| <b>Vibration or wobble</b>   | Axle is not tightened well<br>Bent rim<br>Axle bearings are worn<br>Faulty tires<br>Rear axle bearing holder is faulty                                   |
| <b>Brake Drag</b>            | Incorrect brake adjustment<br>Sticking brake cam<br>Sticking brake cable   |
| <b>Hard Suspension</b>       | Bent damper rod<br>Faulty swing arm pivot bushing  |
| <b>Soft Suspension</b>       | Wear shock absorber damper<br>Wear shock absorber spring   |

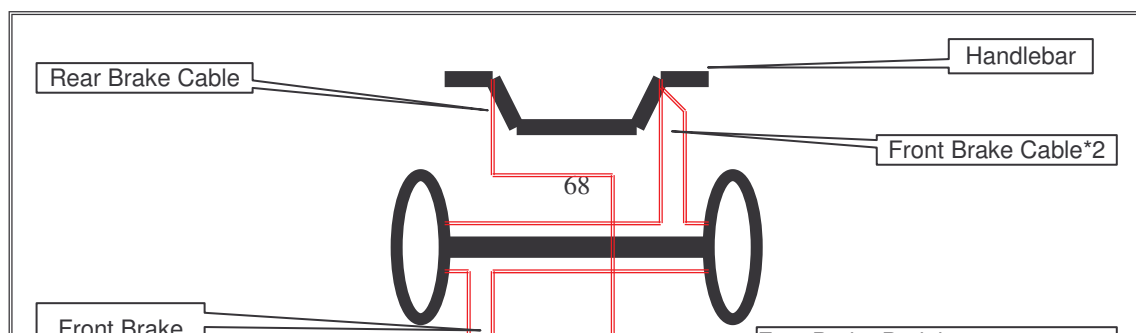
### 9.3 REMOVE REAR WHEEL & REAR BRAKE

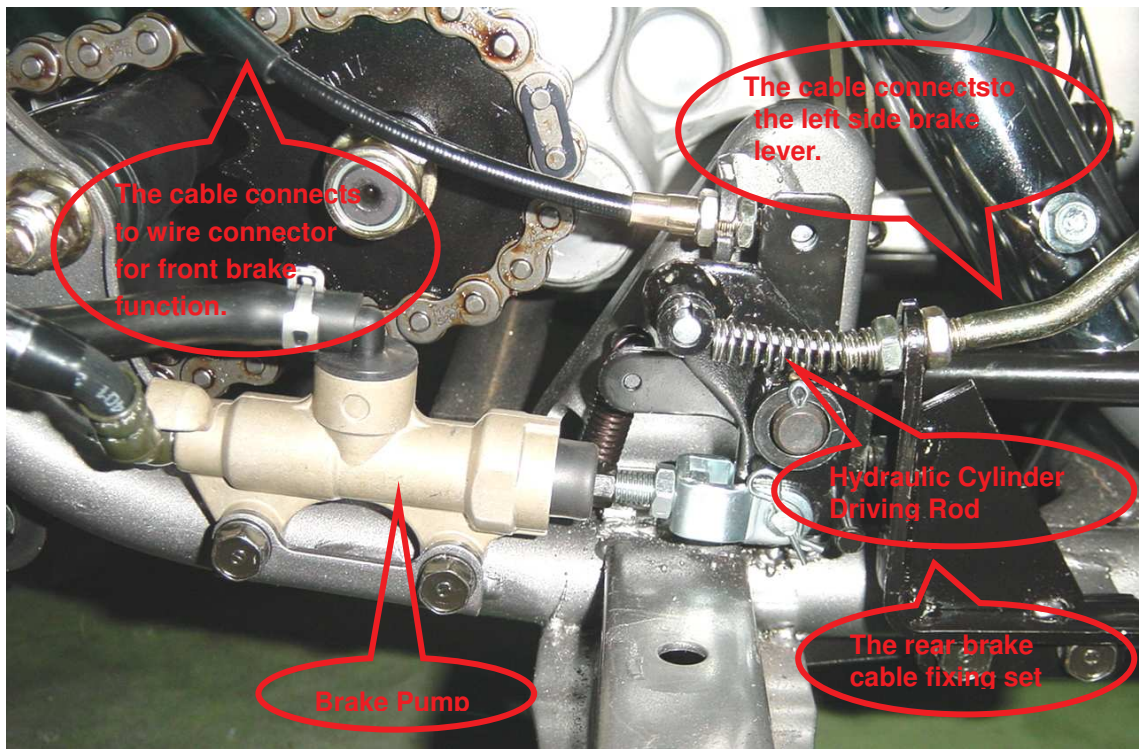
Loosen the cotter pin, and wheel nuts, raise the rear wheel off the ground by placing a support under the frame.

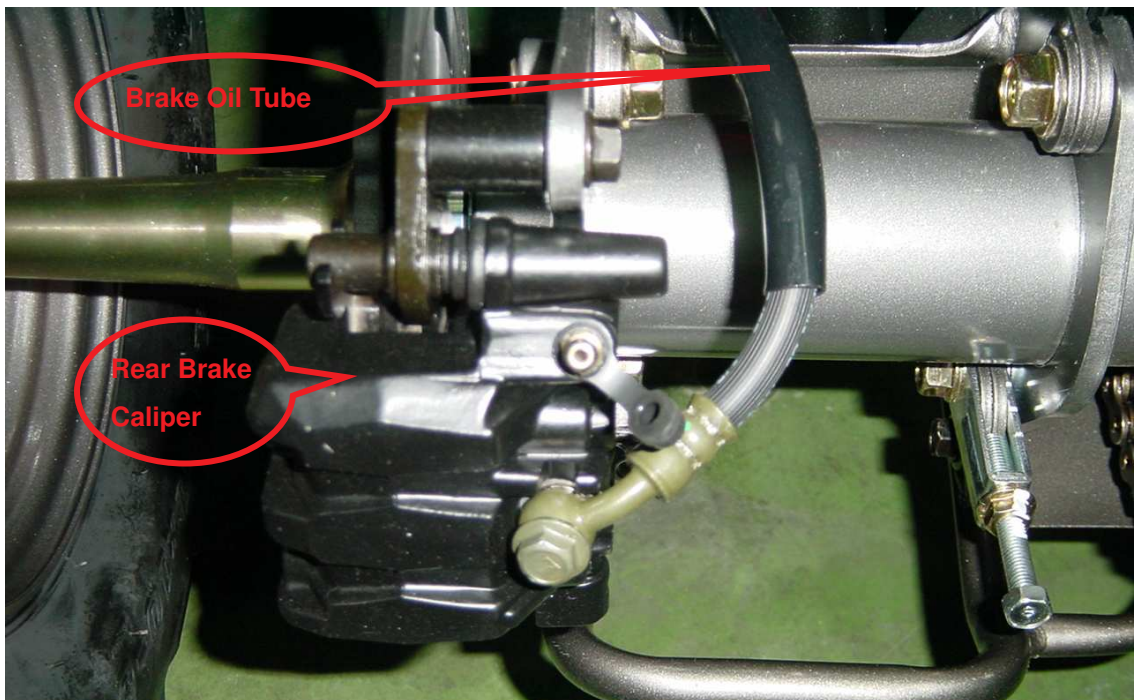
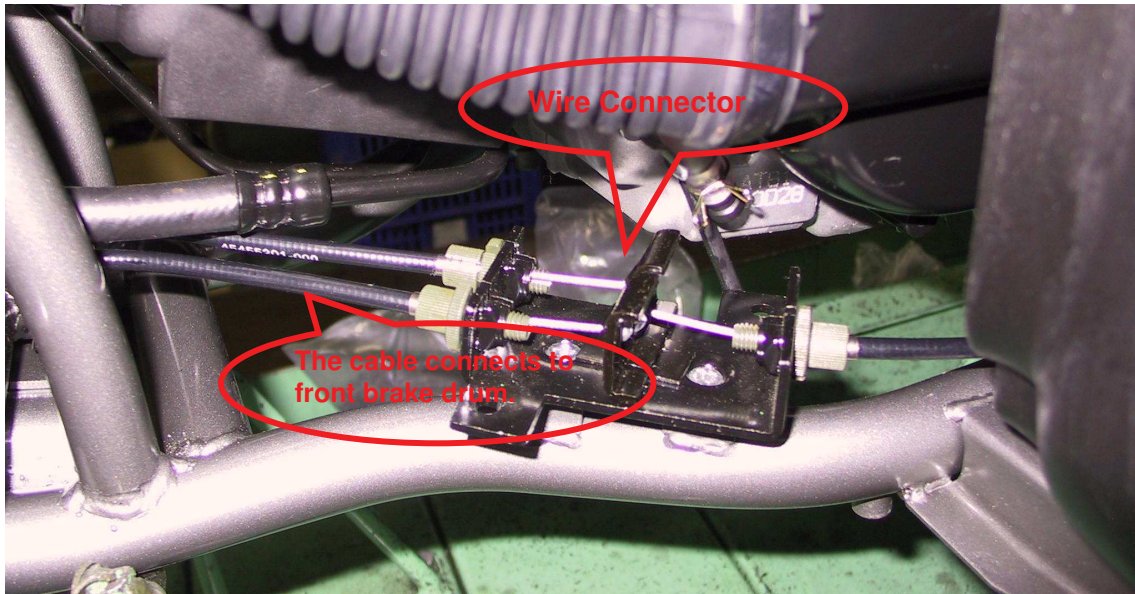
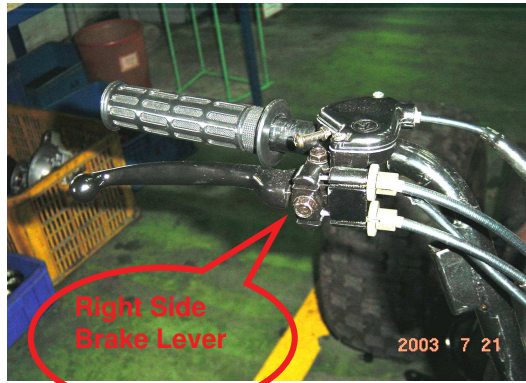
Release the wheel and wheel hub.



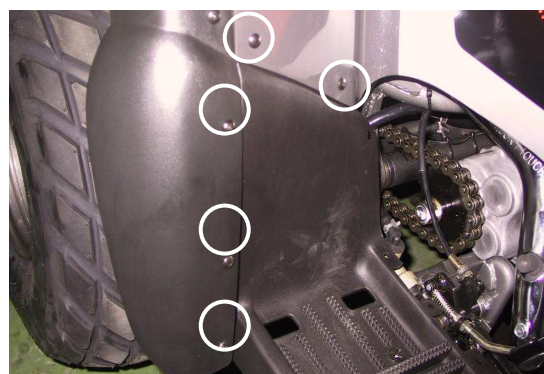
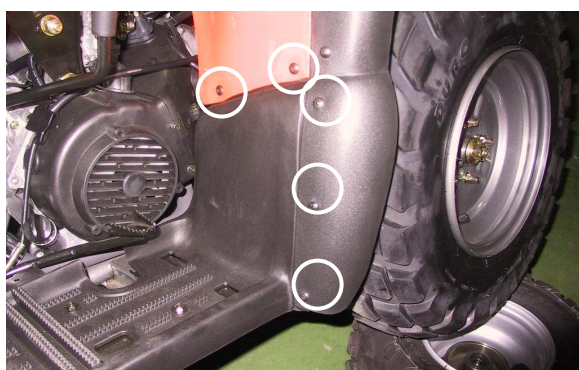
### Brake Parts & Location





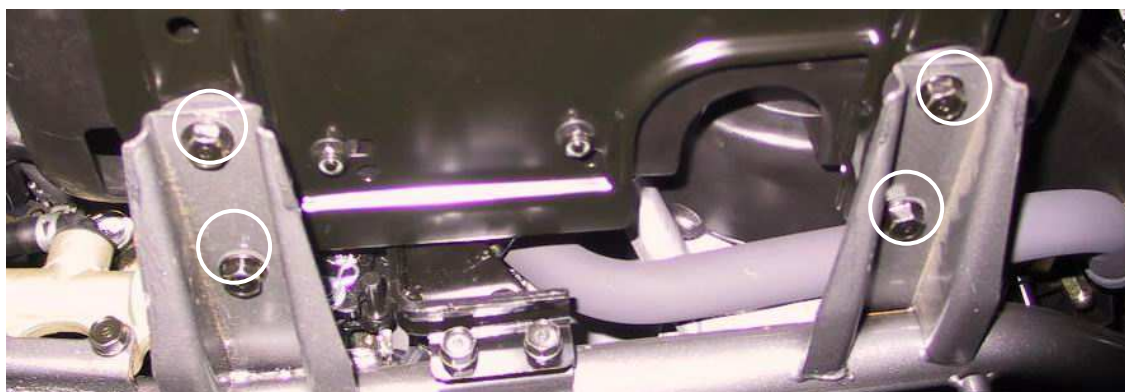


### The Brake Adjustment



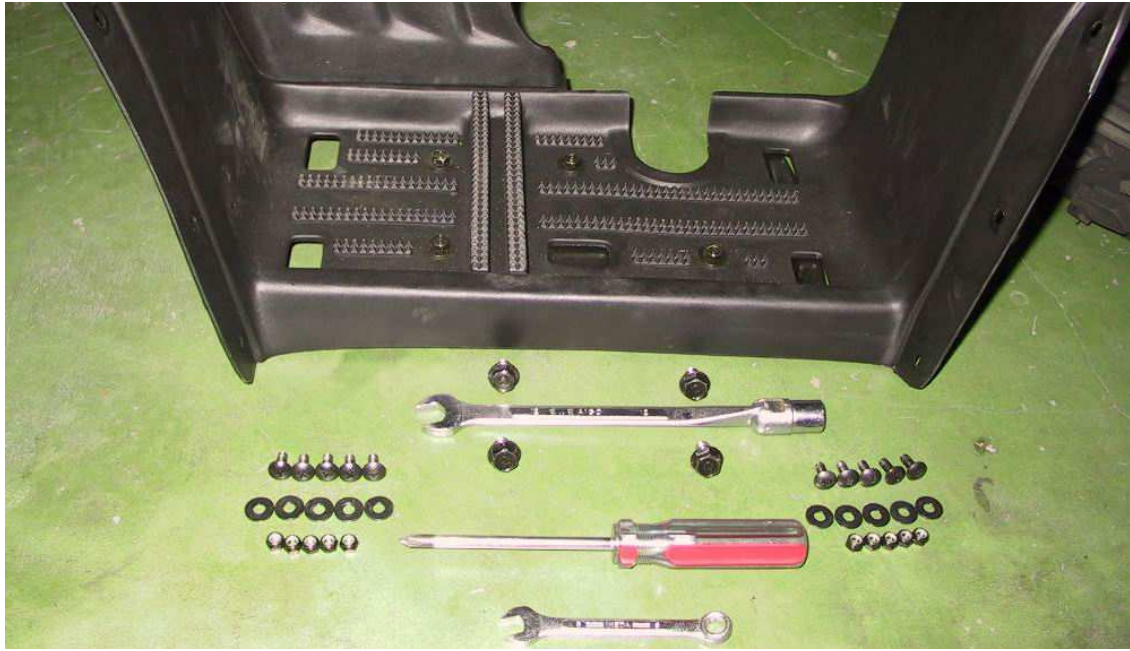
Pan

Phillips Bolts (93100-05016-K), Plain Washer(94101-0514010-K), Nylon Lock Nut(90350-05000-K) × 10 sets



Hex Flange Bolt (96000-08012-K) × 4

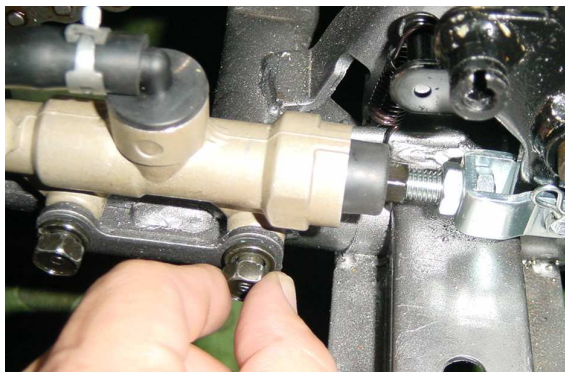
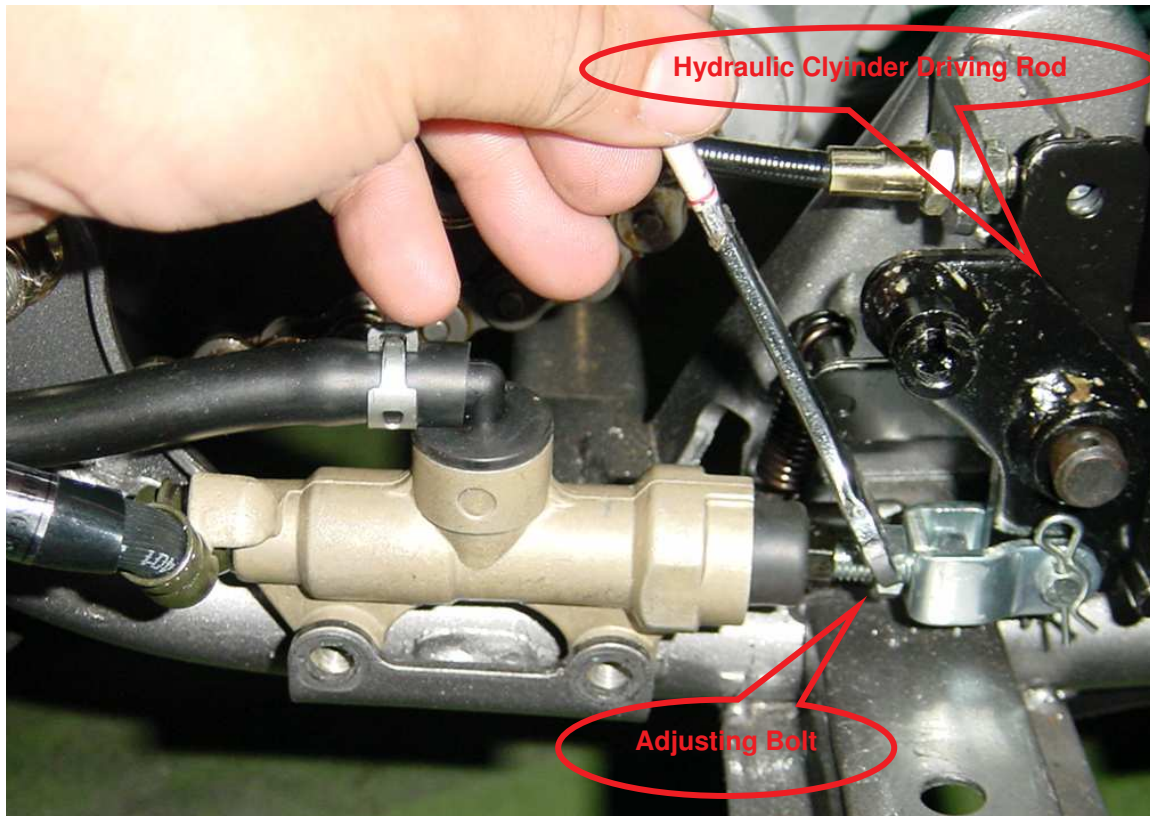




STEP.1) Take off the right side footwell for adjustment.



STEP.2) Take off the rear brake fixing set and the bolt of brake pump.



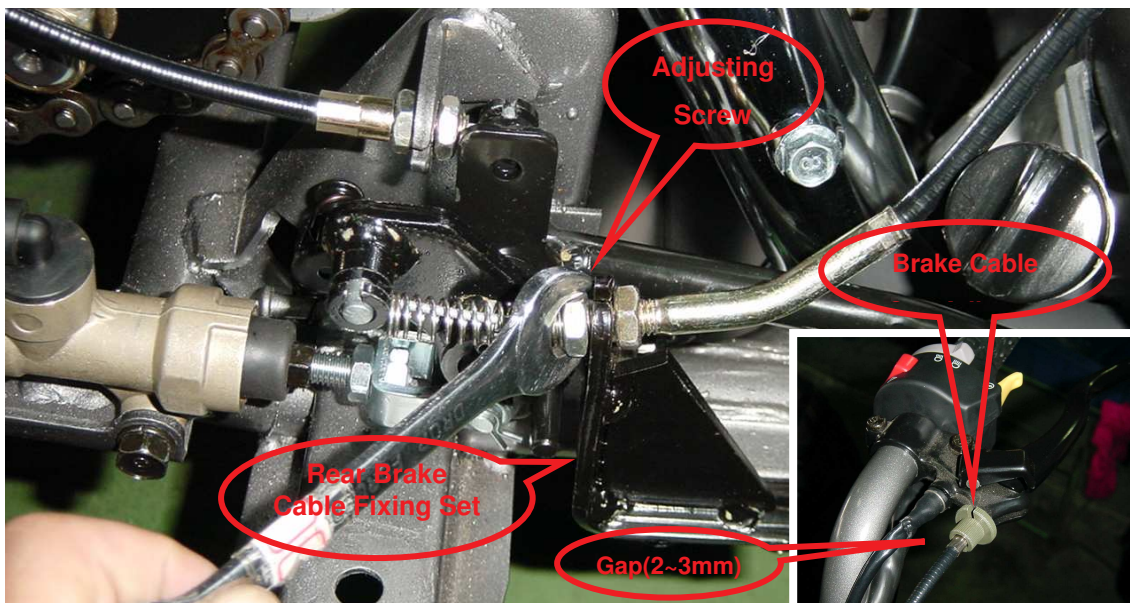
**STEP.3)** The setup of the adjusting nut of the brake pump:

- 1)The brake pedal should be in the highest location under the function of the returning spring.
- 2)The adjusting nut changes the distance between the brake pump and the hydraulic cylinder driving rod. Make the nut touch the surface of the rod and revolve 1 circle ( $360^{\circ}$ ), then confirm the nut location and spin the rod till the nut is locked.
- 3)Notice: If adjust the nut over 1 circle, it might result in the brake pump malfunction and jam the brake.



**STEP.4)** Drain the air in the brake oil tube in order to prevent the brake pump malfunction in power delivering.

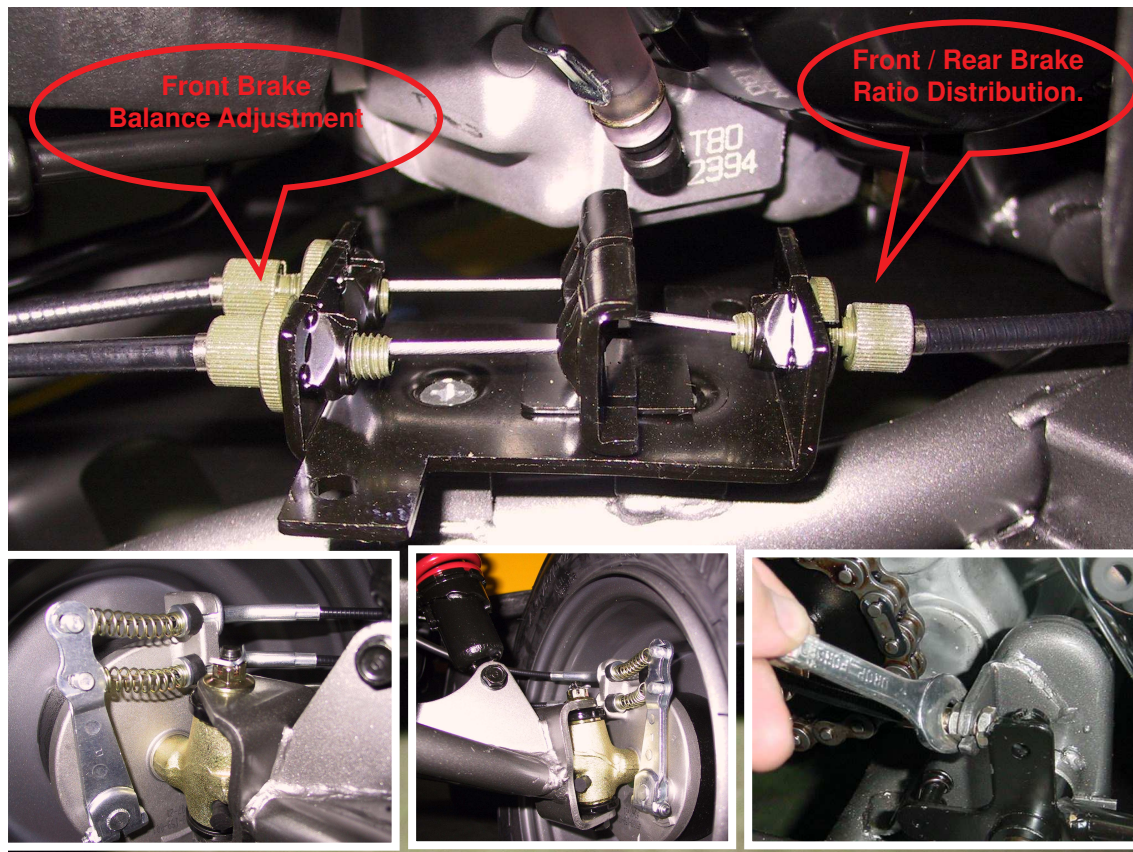
- 1). Open the brake oil tank, lose the drain screw of the brake caliper without braking motion. It functions normal if the brake oil could drain automatically, please try this for couple times for confirmation. If it doesn't work, please be back to *STEP 3.* and *decrease the distance until the oil could run out normally.*
- 2). Press on the brake pedal or the brake lever for several times then hold press, release the drain screw and lock it on immediately until no air bubble in the brake oil. Be careful for the splashing oil when operating.



**STEP.5)** Install the rear brake cable fixing set & adjust the brake cable.

1).Spin the gap adjuster on the left lever till the shortest position.

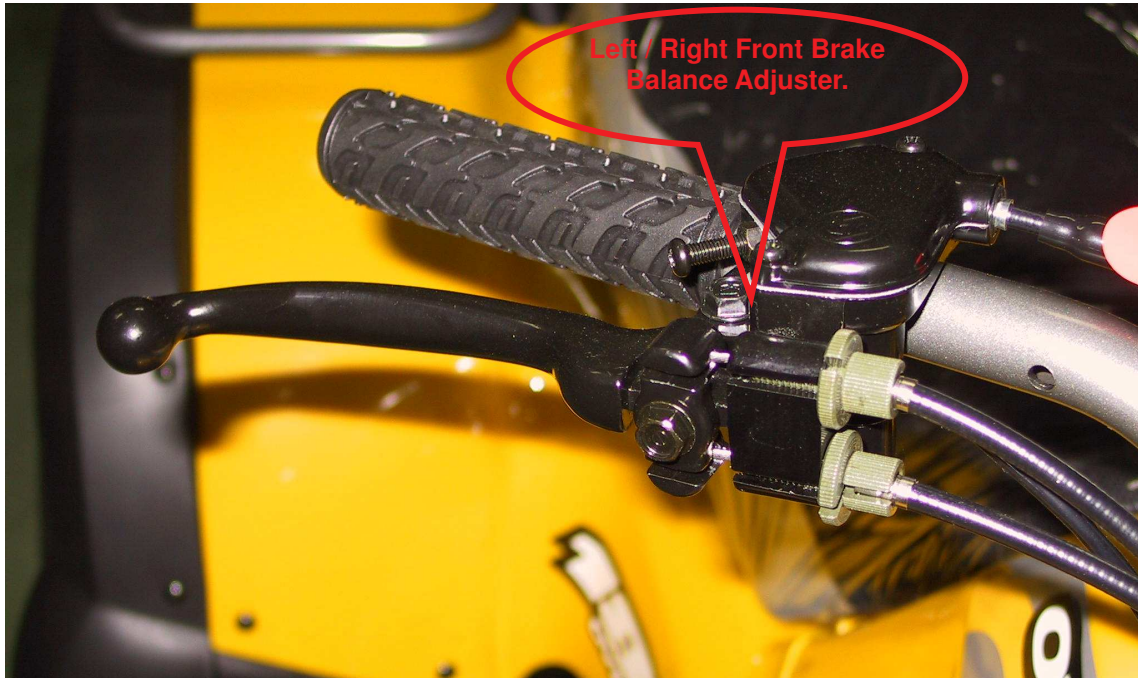
2).Adjust the adjusting screw and keep the gap being 2-3 mm.



**STEP.6)** Wire Connector Adjustment:

1).The distribution of front / rear brake force on left lever.

2).The balance adjustment of left / right front brake.



STEP.7) The brake balance adjuster on right lever.

#### 9.4 DRIVE MECHNISM



Removal and inspection.

Remove the rear wheel and the rear brake.

Remove the skid plate under swing arm.

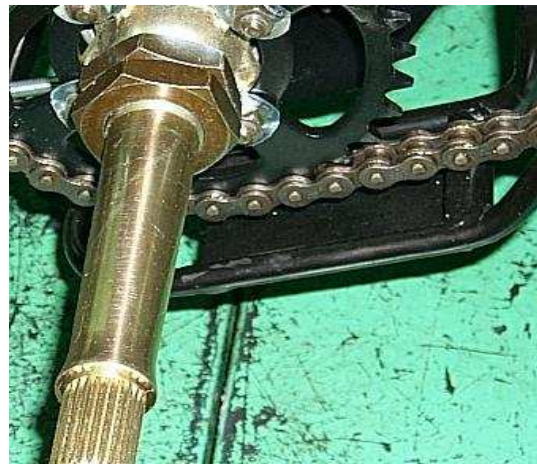
Remove the drive chain cover.

Disassemble the chain retaining clips and master link. Remove the chain.



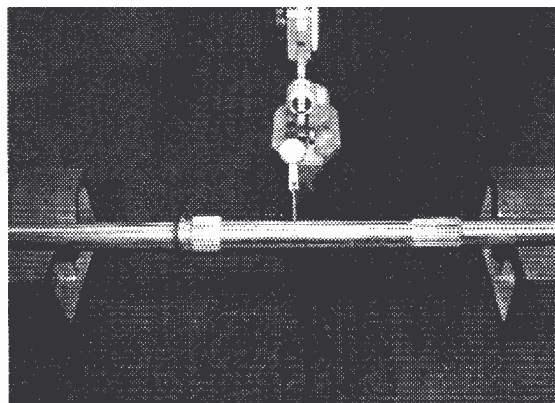
Disassemble the driven sprocket, axle and sprocket collar.

Check the driven sprocket for damage or wear.  
Replace if necessary.



Let the rear axle lie in V-blocks and check the runout.

The runout limit is 0.5 mm.



Check the turning of inner race of bearing with fingers. The bearings should turn smoothly and quietly. Replace if necessary.

Also check that the bearing outer race fits tightly in the axle holder. Replace if necessary.

**NOTE:** Replace the bearings in pairs.

### ***Installation***

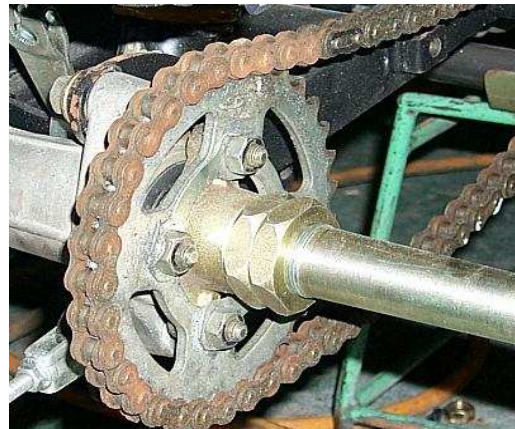
Add grease to the dust seal lips and install dust seals. Assemble the rear axle and the driven sprocket.



Assemble the drive chains on the driven sprocket. Assemble the master link and retaining clip.

**NOTE:** The retaining clip direction.

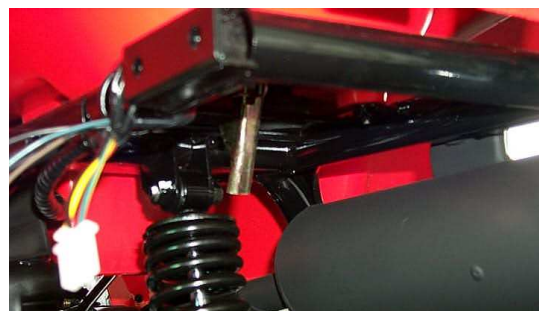
Install the drive chain cover.  
Assemble the chain under cover.



Install the skid plate.  
Install the drive chain cover.

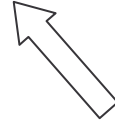


## **10. FENDER AND EXHAUST PIPE**



## 10.1 REAR FENDER REMOVAL

Pull the “Seat Release Bar” to take off the seat.  
This seat release bar is under the right side of the rear fender.



Procedure for rear fender removal:

Remove the rear rack and seat.

Unscrew the four bolts, which connect the front fender and rear fender.

Unscrew the four screws, which connect the rear fender and frame.

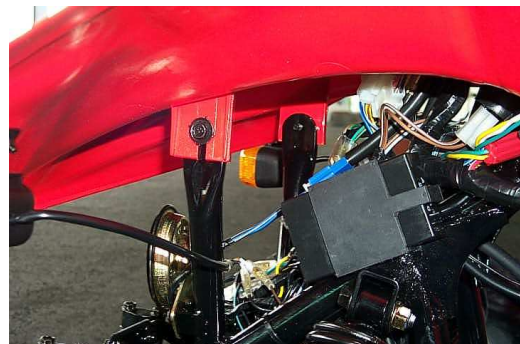


Unscrew the six screws, which connect with footrest plate. Pull the rear fender backward so the rear fender can be removed.



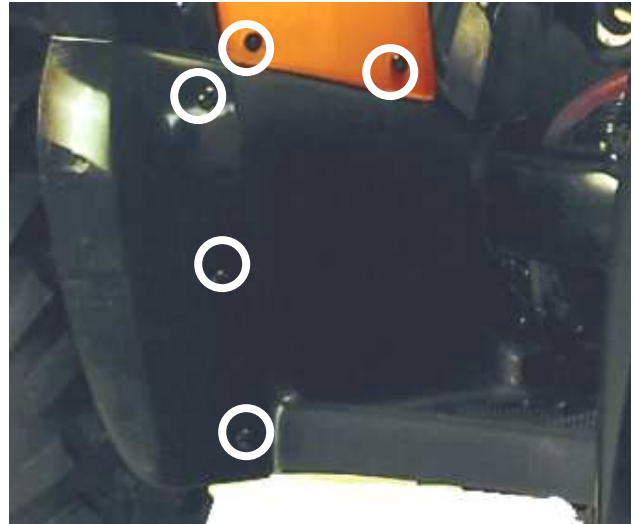
## 10.2 FRONT FENDER REMOVAL

After remove the rear fender, remove the two front fender mounting bolts from front frame.  
Remove the fuel tank cap.





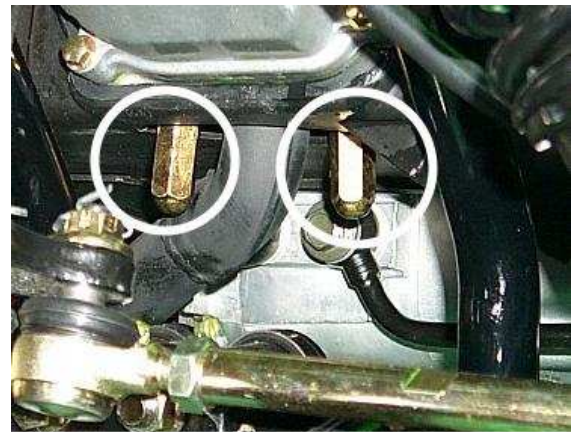
Remove the mounting bolts and nuts from the front fender and footrest plate.



### **10.3 EXHAUST PIPE REMOVAL**

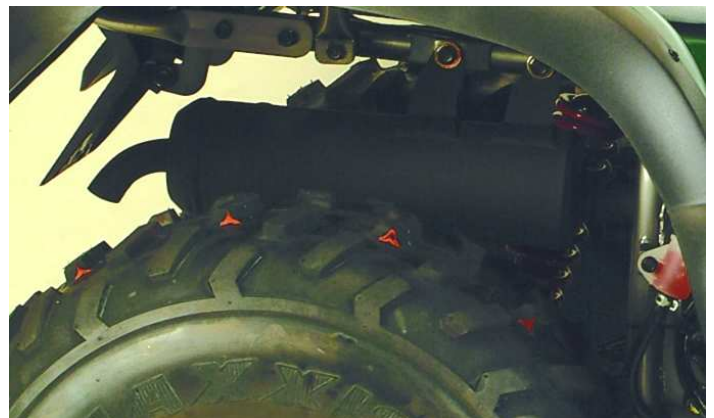
You must wait at least 15 minutes after turn off the engine. You need to remove the seat, rear fender and footrest plate, before you take off the exhaust pipe. Unscrew the two exhaust pipe bolts that fixed with engine.

*NOTE: Do not service the exhaust pipe while they are hot.*



Remove the exhaust pipe bolts mounting on the frame below the rear fender.

Remove the exhaust pipe carefully.



### **10.4 EXHAUST PIPE INSTALLATION**

Installation is the reverse order of removal.

**Torque: Exhaust muffler bolts 30 N.m (22 lbs.ft)**

**NOTE:** After installation, check entire system to make sure that there are no exhaust leaks.

## **11. ELECTRICAL SYSTEM**

**11.1 TROUBLESHOOTING**

**11.2 IGNITION COIL**

**11.3 IGNITION TIMING**

**11.4 ALTERNATOR EXCITER COIL**

**11.5 BATTERY CAUTION**

**11.6 BATTERY VOLTAGE**

**11.7 CHARGING**

**11.8 ELECTRIC STARTER**

**11.9 LIGHT BULBS REPLACEMENT**

**11.10 WIRING DIAGRAMS**

### **11.1 Troubleshooting**

|  |  |
|--|--|
| <b>ENGINE STARTS BUT STOPS</b>           | IMPROPER IGNITION TIMING<br>FAULTY SPARK PLUG  |
| <b>NO SPARK AT PLUG</b>                  | ENGINE STOP SWITCH AT LEFT OR<br>RIGHT POSITION<br>GEARSHIFT BAR IS NOT AT NEUTRAL<br>POSITION<br>FAULTY IGNITION COIL<br>FAULTY GENERATOR<br>FAULTY CDI UNIT<br>POORLY CONNECTED:<br>Between CDI and ignition coil<br>Between alternator and CDI unit<br>Between CDI and engine stop switch<br>Between ignition coil and spark plug<br>Between generator and CDI unit |
| <b>ENGINE STARTS BUT RUNS<br/>POORLY</b> | IGNITION PRIMARY CIRCUIT<br>Faulty generator<br>Faulty CDI unit<br>Faulty alternator<br>Loosen contacted terminals<br>Faulty ignition coil<br>IGNITION SECONDARY CIRCUIT<br>Faulty plug<br>Loosen contacted spark plug wire<br>IMPROPER IGNITION TIMING  |

|                                |   |
|--------------------------------|---|
|                                | Faulty generator<br>Faulty CDI unit   |
| <b>CHARGING SYSTEM FAILURE</b> | LOOSE, BROKEN OR SHORTED WIRE.<br>FAULTY ALTERNATOR<br>FAULTY IGNITION SWITCH |

|   |   |
|---|---|
| <b>INTERMITTENT ENGINE POWER</b>                                | LOOSE BATTERY CONNECTION<br>LOOSE CHARGING SYSTEM CONNECTION                                |
| <b>STARTER MOTOR WILL NOT TURN</b>                              | DEAD BATTERY<br>FAULTY IGNITION SWITCH<br>LOOSE OR DISCONNECTED WIRE                        |
| <b>STARTER MOTOR AND ENGINE TURN, BUT ENGINE DOES NOT START</b> | FAULTY IGNITION SYSTEM<br>FAULTY ENGINE STOP SWITCH<br>ENGINE PROBLEMS                      |
| <b>HEAD LIGHT DO NOT WORK</b>                                   | THE SWITCH DO NOT PUSH TO THE “ON” POSITION<br>THE LIGHT BULB IS BURN OUT, NEED BE REPLACED |

## 11.2 IGNITION COIL

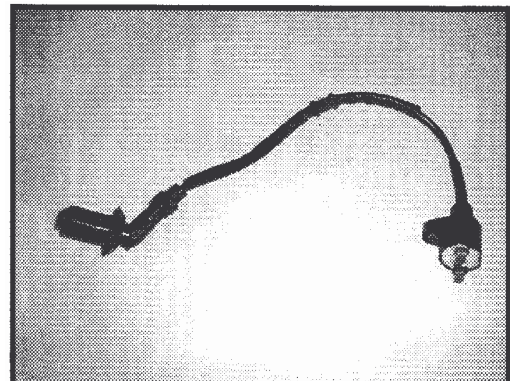
Remove the spark plug cap from the spark plug.  
Disconnect the ignition coil primary wire.

Measure the primary coil resistance.

**STANDARD: 0.1-0.30Ω**

Measure the secondary coil resistance with the spark plug cap in place.

**STANDARD: 7.4-11 KΩ**



## 11.3 IGNITION TIMING

The ignition advance is  $13 \pm 1 / 4000 \text{rpm}$

The capacitive discharge ignition(CDI) system is factory pre-set and does not require adjustment.

## 11.4 ALTERNATOR EXCITER COIL

Remove the seat/ rear fender and front fender. (see page 72) disconnect the exciter coil wire. Measure the resistance between the yellow or white or green wire and ground.

**STANDARD : 467-700Ω**

Electrolyte is poisonous. Drink large quantities of water or milk and call a physician if swallowed.

## 11.5 BATTERY CAUTION

The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging or using the battery in an open area. The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield. *Electrolyte is poisonous. Drink large quantities of water or milk and call a physician if swallowed.*

## 11.6 BATTERY VOLTAGE INSPECTION

Battery is under the seat; you can see this battery after removing the seat.  
Measure the battery voltage using a voltmeter.

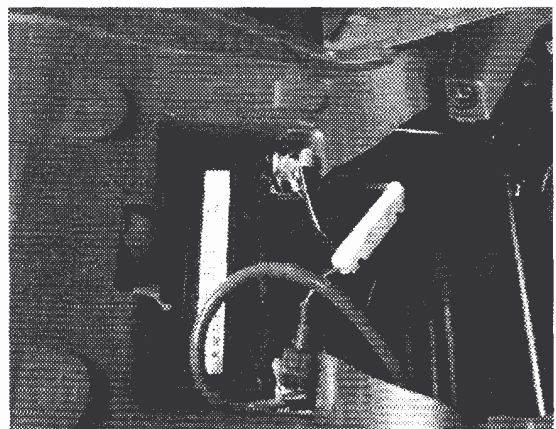
VOLTAGE: Fully charged : 13.1 V  
Undercharged : Below 12.0 V

### ***BATTERY REMOVAL***

Remove the seat, then you can see the battery.  
Disconnect the negative cable and then the position cable and remove the battery.

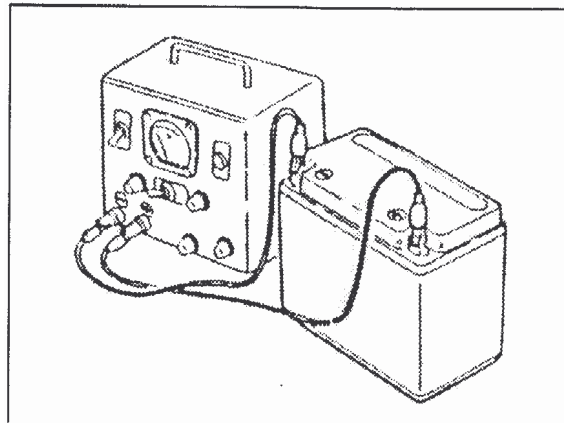
### ***BATTERY INSTALLATION***

Install the battery in the reverse order of removal. After installing the battery, terminals with clean grease.



## **11.7 CHARGING**

Connect the charge positive cable to the battery positive terminal. Connect the charge negative cable to the battery negative terminal. Using 0.9A charging current about 5 hours. (Normal charging) Or using 4A charging current about 1 hour. (Quick charging) Keep flames and spark away from a battery being charged. Quick charging should be limited to an emergency; normal charging is preferred.



## **11.8 ELECTRIC STARTER**

### Information

A weak battery may be unable run the starter motor quickly enough.

If the battery voltage is enough while the engine is not cranking, the starter motor may be damaged.

### *Troubleshooting*

#### Starter motor turns slowly

- Weak battery.
- Poorly connected starter motor cable.
- Faulty starter motor.
- Poorly connected battery ground cable.

#### Starter motor will not turn

- Engine stop switch at left or right position.
- Gearshift bar is not at neutral position.
- Check for a blown fuse near battery.
- Make sure that the battery is fully charged and in good condition.

## 11.9 LIGHT BULBS REPLACEMENT

Remove inside two bolts on both sides of the head light cover.



Remove the headlight bulb and position light.

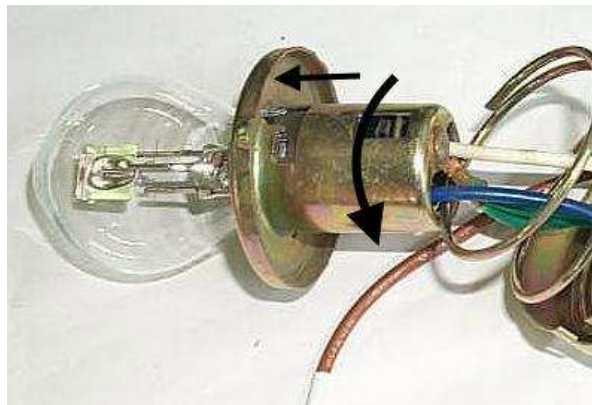


Remove the position light bulb.

Change the new one and install to the headlight seat.



Press and turn left to remove the bulb.



Change a new bulb and reinstall.



Install the bulb seat to headlight seat.



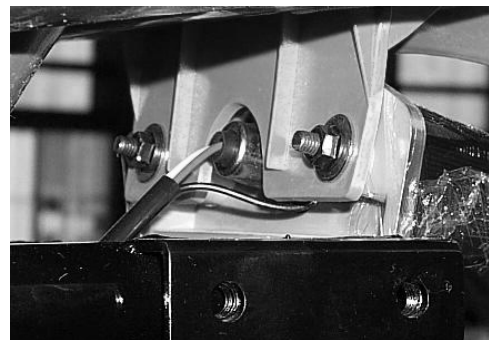
Tighten inside two bolts.



### ***TAIL LIGHT***

Remove taillight lens by removing the two nuts.

Replace taillight lens and secure with two nuts.



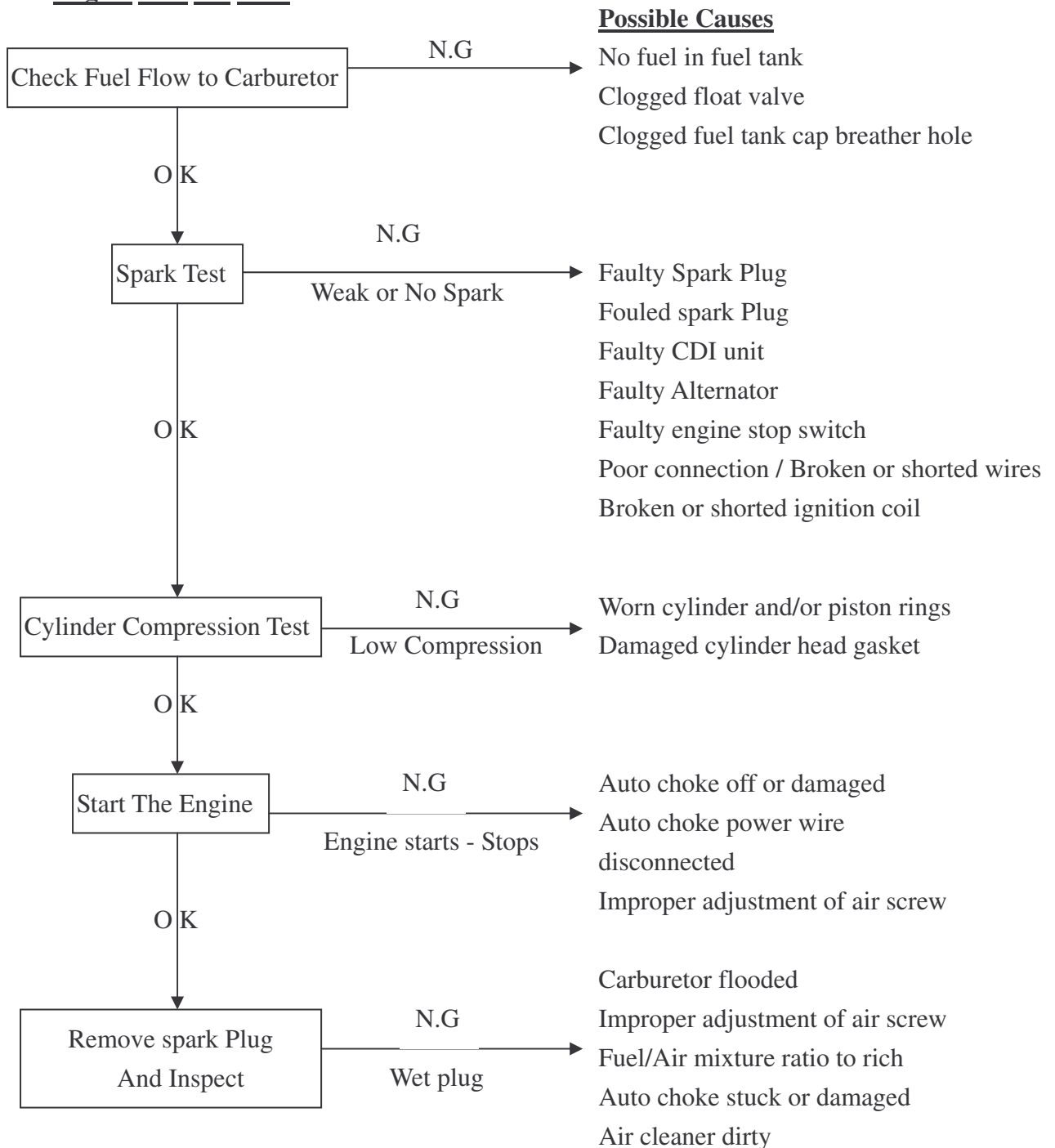
## 11.10 WIRING DIAGRAMS



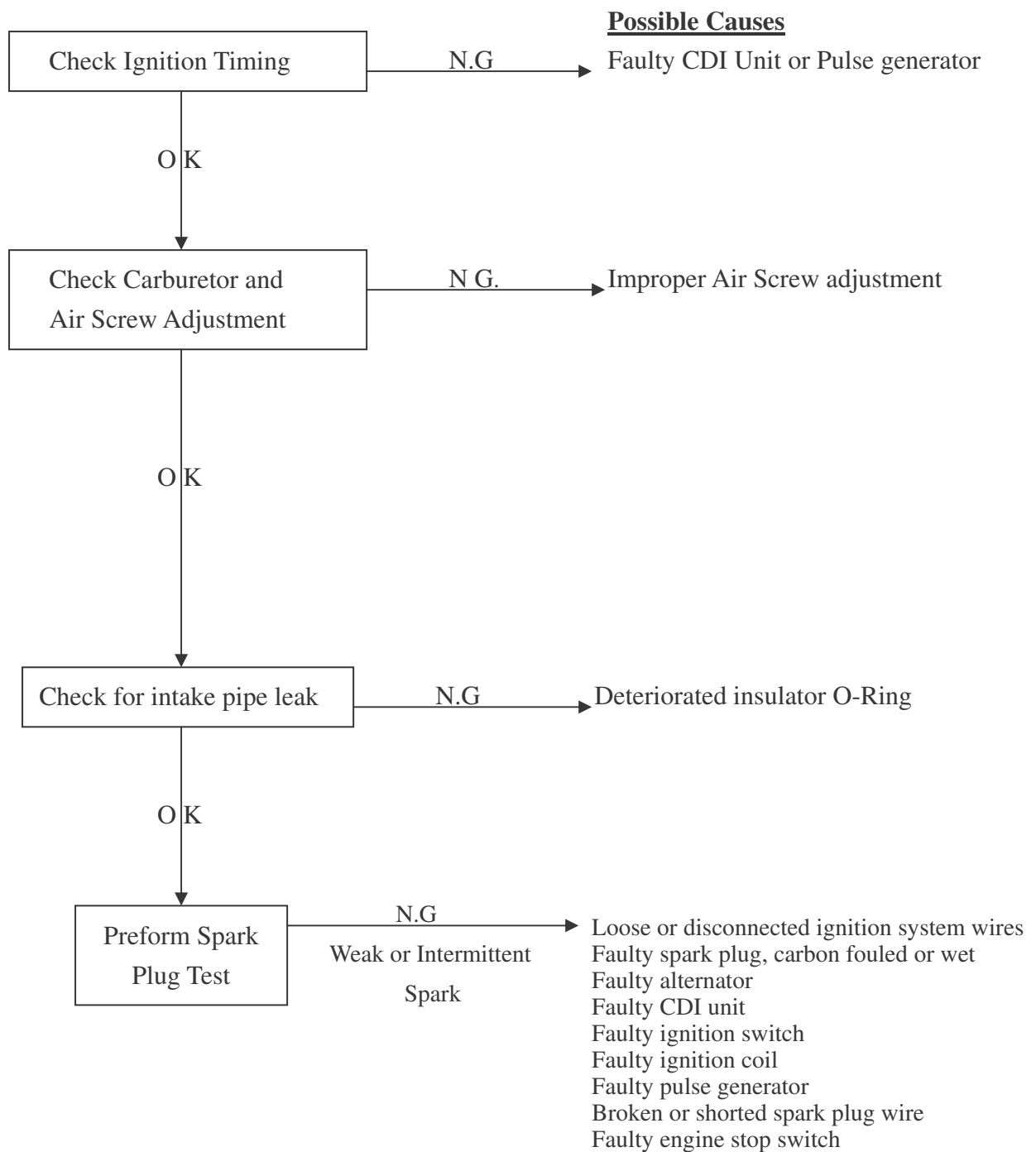
## 12. TROUBLE SHOOTING

- 12.1 Engine does not start
- 12.2 Poor Performance at low and idle speed
- 12.3 Poor Performance at high speed
- 12.4 Loss of power
- 12.5 Poor handling

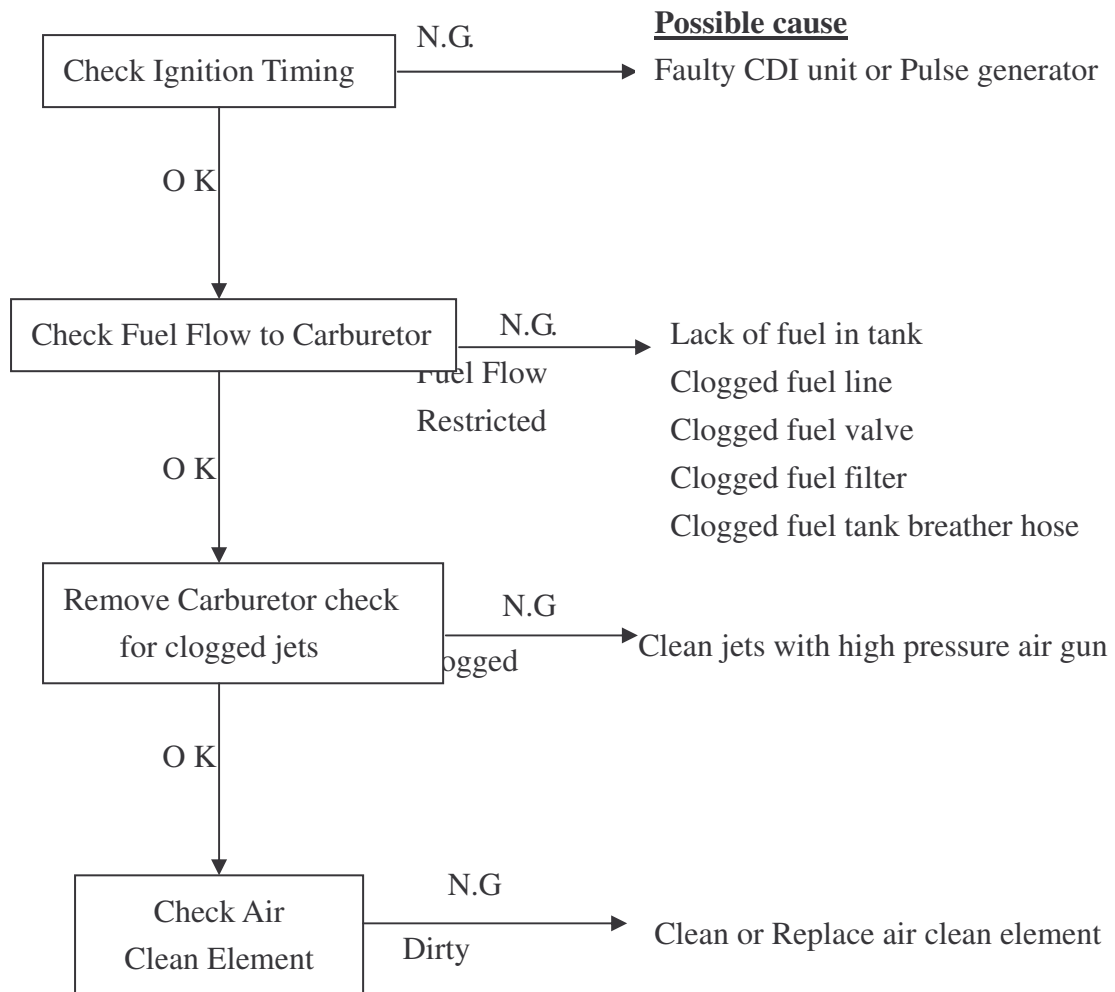
### 12.1 Engine does not start



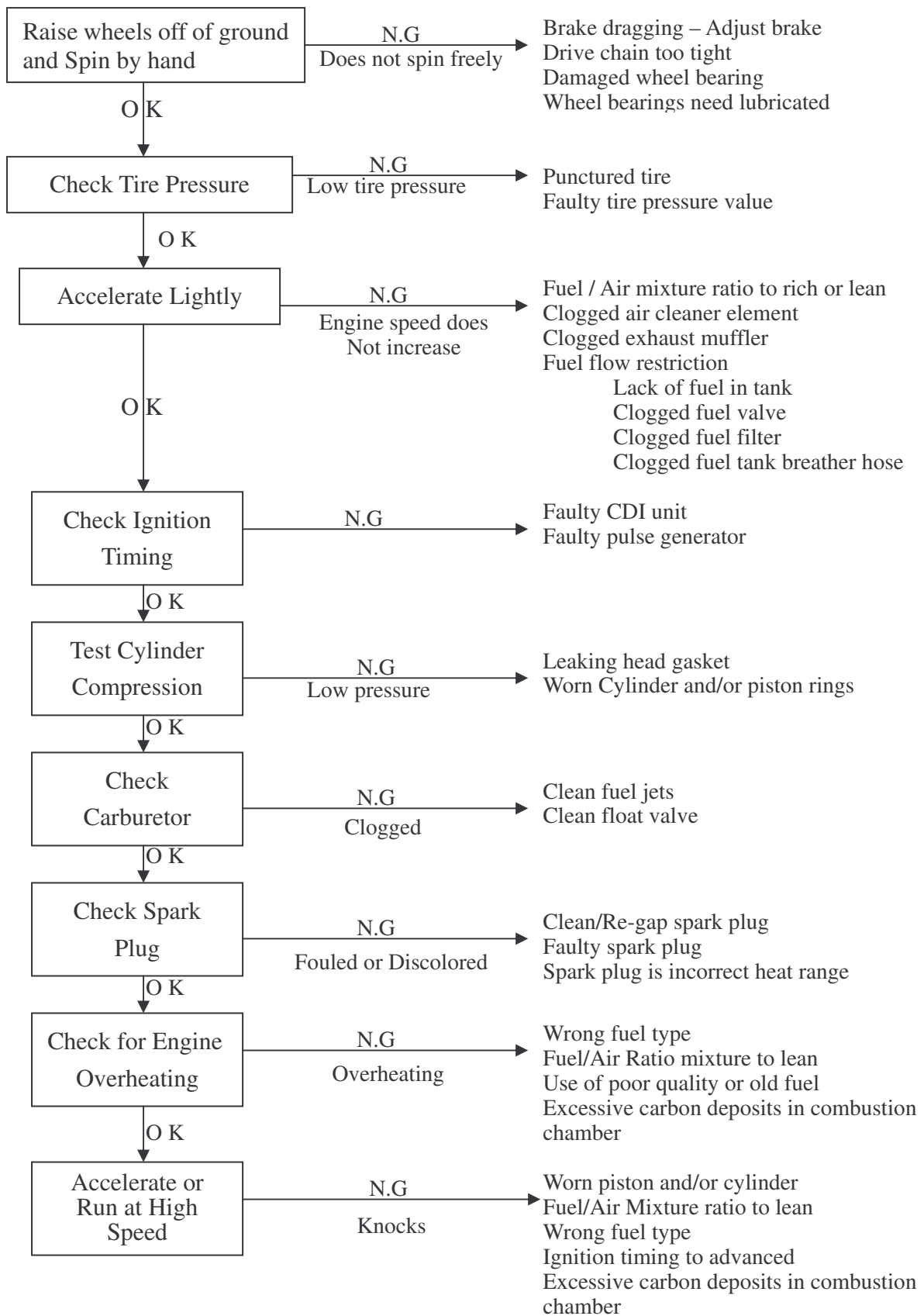
## 12.2 Poor Performance at Low / Idle Speed



### 12.3 Poor performance at high speed



## 12.4 Loose of power



## 12.5 Poor Handling

