# AEON MOTOR CO.,LTD

# NEW SPORTY-125/180


# SERVICE MANUAL

# CONTENTS

1. INFORMATION..... 2
2. MAINTENANCE..... 6
3. ENGINE REMOVAL AND INSTALLATION..... 16
4. ENGINE LUBRICATION AND COOLING SYSTEM.. 17
5. CYLINDER HEAD & VALVES..... 26
6. CYLINDER & PISTON..... 37
7. TRANSMISSION SYSTEM..... 46
8. FRONT WHEEL, SUSPENSION AND STEERING..... 57
9. REAR WHEEL SYSTEM..... 68
10. FENDERS AND EXHAUST PIPE..... 79
11. ELECTRICAL SYSTEM..... 81
12. TROUBLE SHOOTING..... 88

# 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.

## 1.3 SPECIFICATION

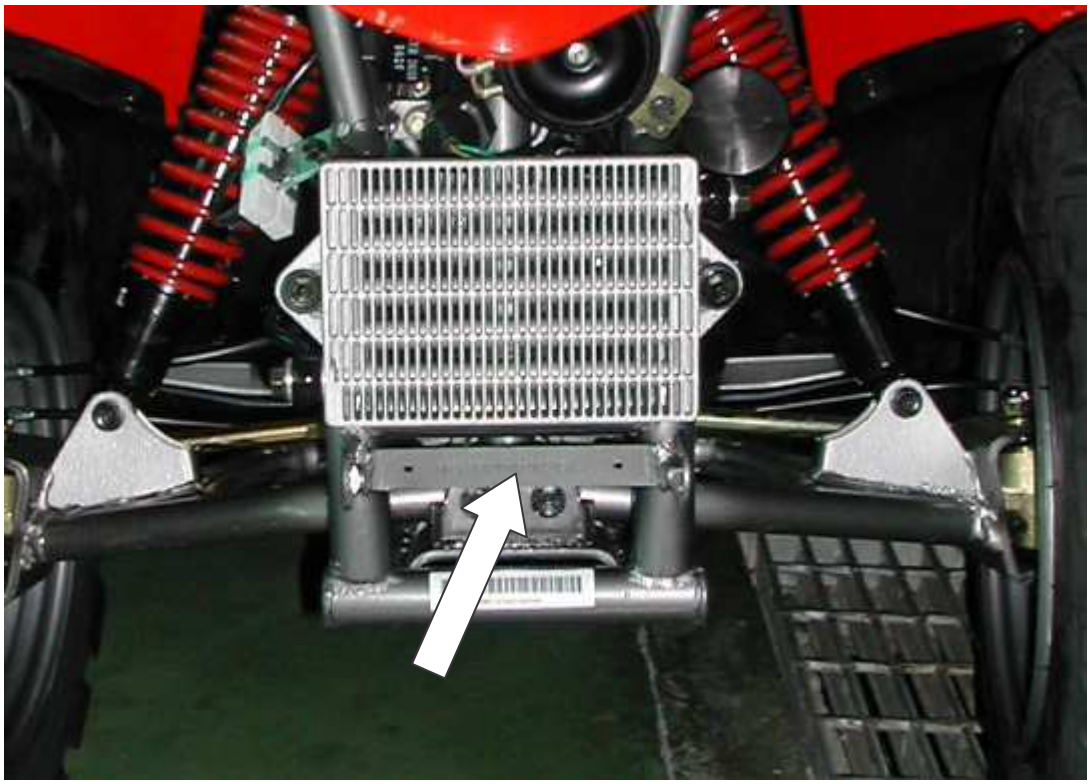
| | | |
|---|---|---|
| **ENGINE** | | **125 / 180** |
| | **Type** | **Air-Cooled 4-syroke with Oil Cooler** |
| | **Displacement** | **125 cc/169 cc** |
| | **Bore and Stroke** | **52.4×57.8mm/61×57.8mm** |
| | **Compression** | **9.1:1** |
| | **Maximum Torque** | **6.21 Nm@4017 rpm/10.24 Nm@4403 rpm** |
| | **Carburetor** | **MIKUNI 125/180** |
| | **Ignition** | **Capacitor Discharge** |
| | **Starting** | **Electrical & Kick-Start** |
| | **Lubrication** | **Forced pressure and wet sump** |
| | **Air Cleaner** | **AE-9** |
| | **Transmission** | **Automatic(C.V.T. V-belt)** |
| **CHASSIS** | | |
| | **Overall Length** | **71.7 inches (1820mm)** |
| | **Overall Width** | **38.4 inches (975mm)** |
| | **Overall Height** | **41.7 inches (1060mm)** |
| | **Seat Height** | **30.7 inches (675mm)** |
| | **Wheel Base** | **41.9 inches (1065mm)** |
| | **Ground Clearance** | **6.5 inches (165mm)** |
| | **Dry Weight** | **166kg (365lb)** |
| | **Fuel Tank Capacity** | **8.0 liter** |
| **SUSPENSION** | | |
| | **Front** | **Swing Axle** |
| | **Rear** | **Swing Arm** |
| **BRAKES** | | |
| | **Front** | **Drum** |
| | **Rear** | **Disc** |
| **TIRES** | | |
| | **Front** | **21” × 7” - 10”** |
| | **Rear** | **21” × 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$^2$) |
| 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 (First 30 hours) | Every 100 hours | Every 200 hours | Every 300 hours |
|---|---|---|---|---|
| **ENGINE OIL** | **R** | **R** | | |
| **GEAR OIL** | **R** | | **R** | |
| **FUEL FILTER** | | | | **R** |
| **AIR VLEAN FILTER** | | | | **R** |
| **ENGINE OIL FILTER** | | | | **C** |
| **CARBURETOR** | | | | **I** |
| **SPARK PLUG** | | | **C** | |
| **VALVE GAP** | | | | **A** |
| **IGNITION TIMING** | | | | **A** |
| **CHAIN** | | | **A** | |
| **BATTERY** | | | **I** | |
| **DRIVE BATTERY** | | | | **I** |
| **CLUTCH** | | | | **I** |
| **THROTTLE OPERATE** | | | **I** | |
| **TIRE PRESSURE** | **Check before riding each time** | | | |
| **BRAKE SYSTEM** | **Check before riding each time** | | | |
| **NUTS/BOLTS** | | | | **T** |

**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.

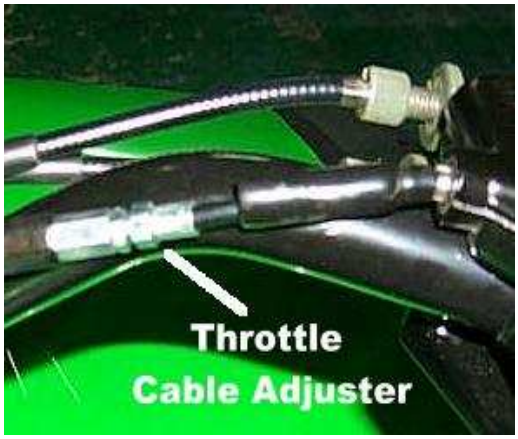
Inspect for deterioration, damage, cuts and nicks, or kink in the throttle cable, replace it if necessary.

**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 cranks 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.

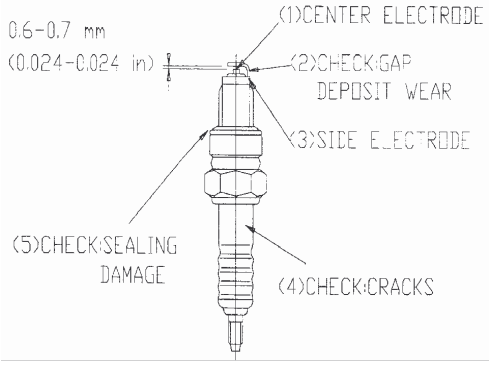
SPARK PLUG GAP: 0.6~0.7 mm

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

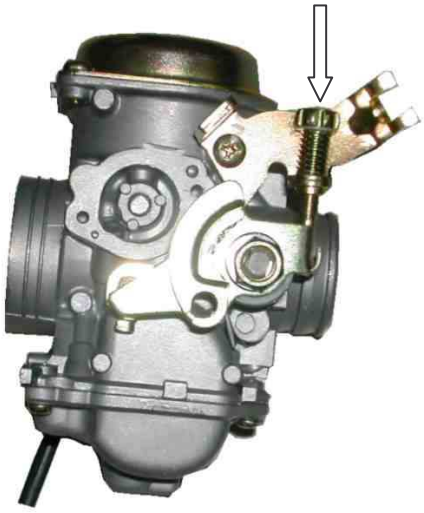

## 2.8 IDLE SPEED SETTING

(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.

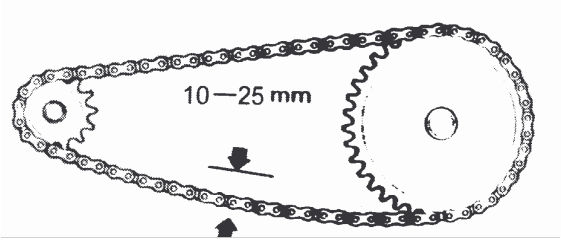
(3) Turn the throttle stop screw as required to obtain the specified idle speed.

IDLE SPEED: 1700 ± 100 rpm



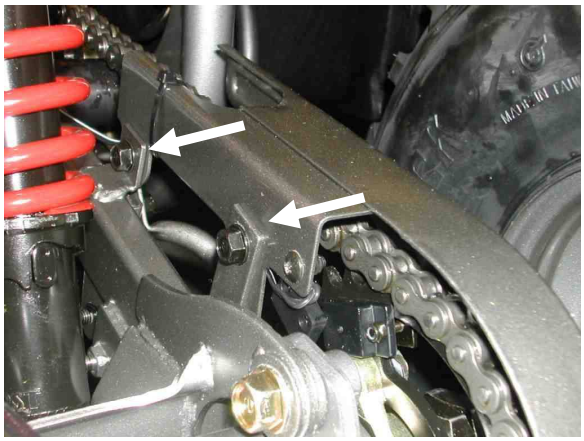
## 2.9 DRIVE CHAIN ADJUSTMENT

Stop ATV and shift transmission into neutral. Inspect the chain slack midway between the sprockets. The standard is 10-25 mm (5/8-1 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. ($0.15 kgf/cm^2$)

## 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.

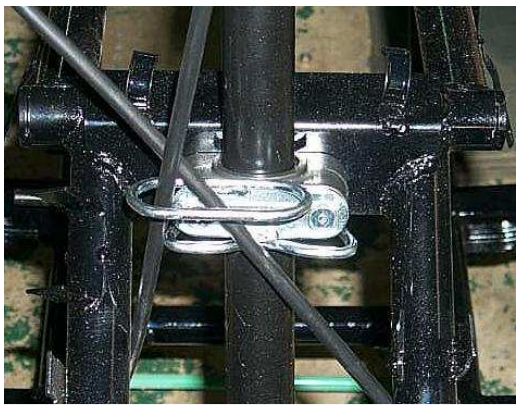
**Steering shaft holder bushing**

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.

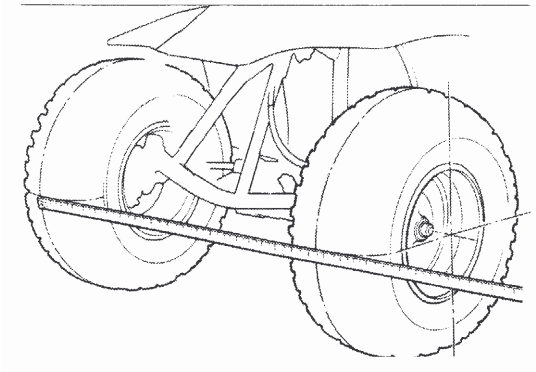
Grease the steering shaft bushing and install the parts in the reverse order of removal.



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

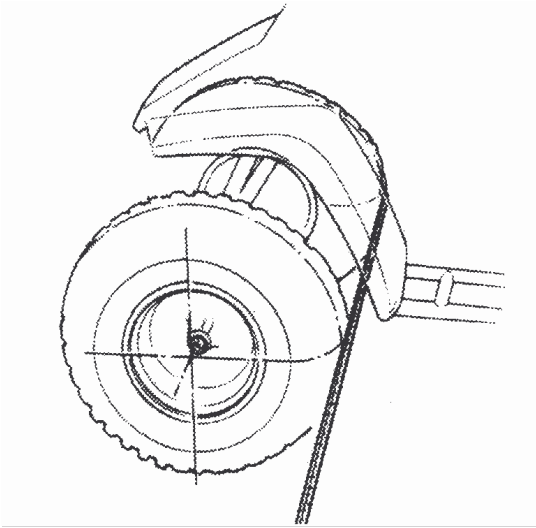
## 2.13 TOE-IN

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±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.

LOWER LEVEL UPPER LEVEL

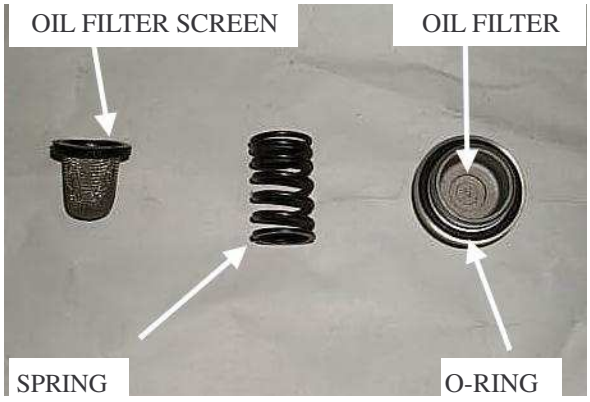
## 4.4 ENGINE OIL & FILTER CHANGE

Remove the oil filter cap and the oil drain bolt.

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


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.

OIL DRAIN

Install the oil filter cap.

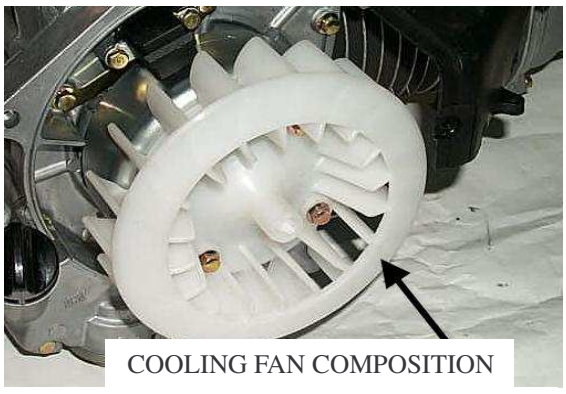

Install the oil level gauge.
Start the engine and let it idling for 2 or 3 minutes.

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

**4.5 <u>OIL PUMP REMOVAL</u>**

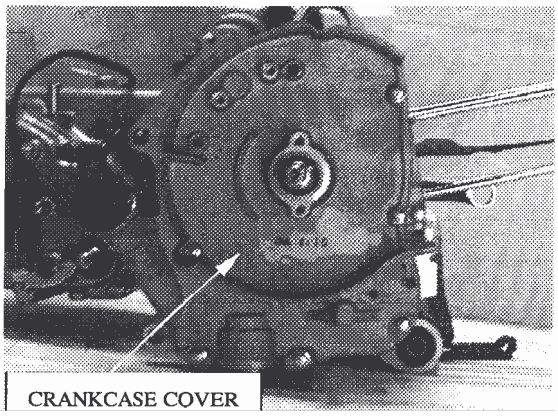
Remove the fan cover ass'y.


Remove the cooling fan composition.

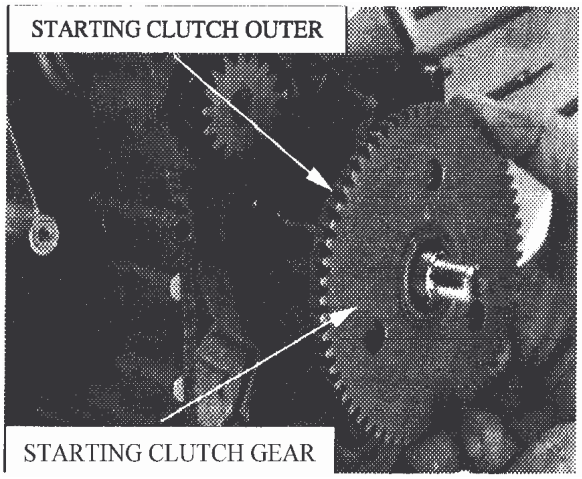



Remove the A.C.G generator ass'y.

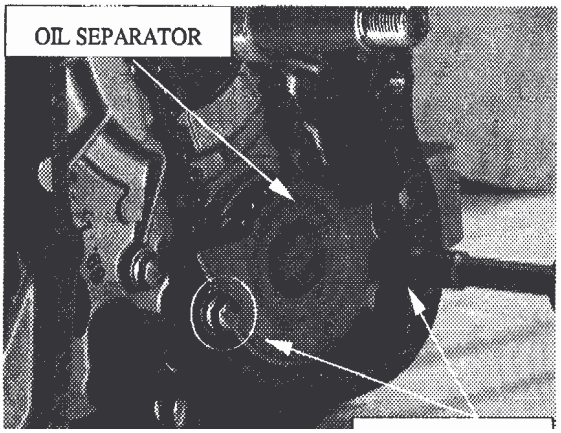
Remove the left crankcase cover.



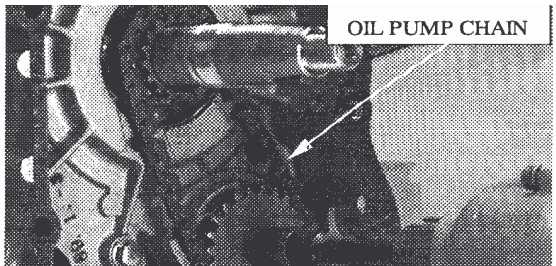

Remove the starting clutch outer and gear ass'y.




Remove the flange bolts and oil separator.

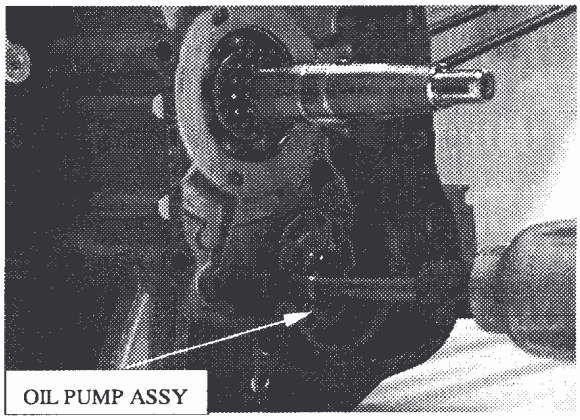



Remove the oil pump chain and oil pump driven

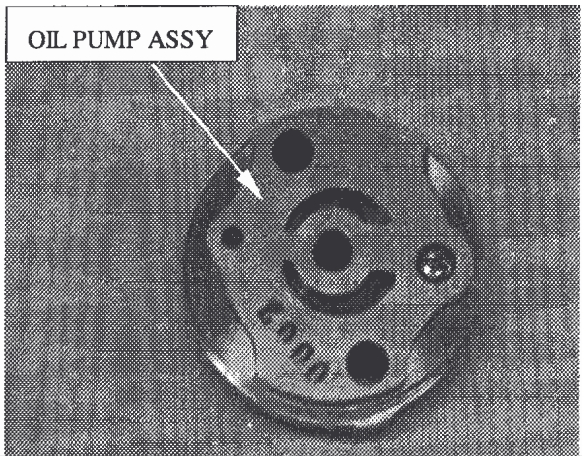


sprocket.

Remove the oil pump ass'y.

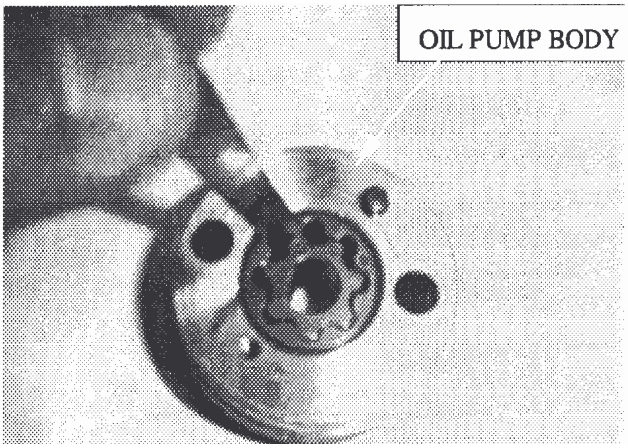



Disassemble the oil pump.

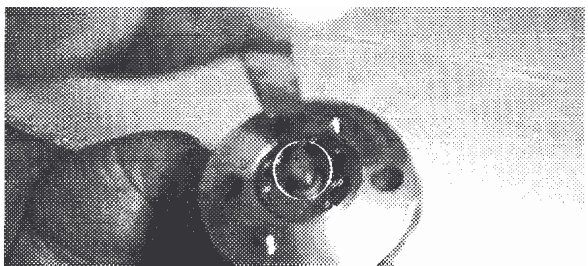



***INSPECTION***

Measure the oil pump rotor-to-body clearance.
***SERVICE LIMIT: 0.12 mm***

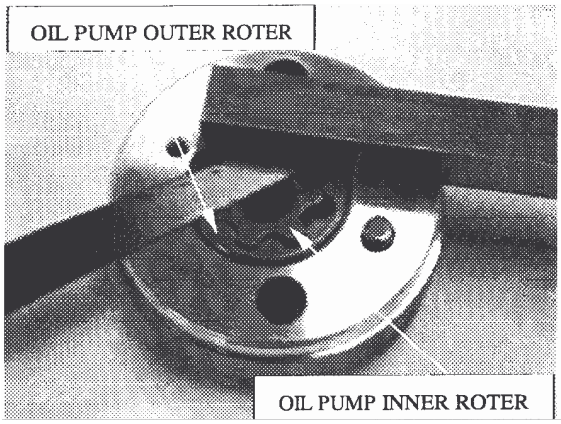



Install the oil pump shaft and measure the pump



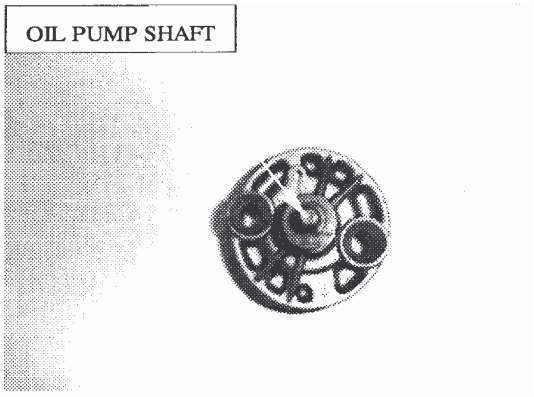
rotor tip clearance.
***SERVICE LIMMIT: 0.12 mm.***

Remove the oil pump shaft and measure the pump and clearance.
***SERVICE LIMMIT: 0.2 mm.***

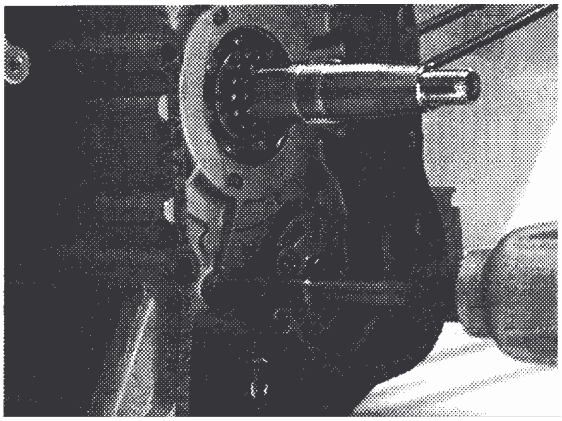



**4.5 OIL PUMP ASS'Y / INSTALLATION**

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.



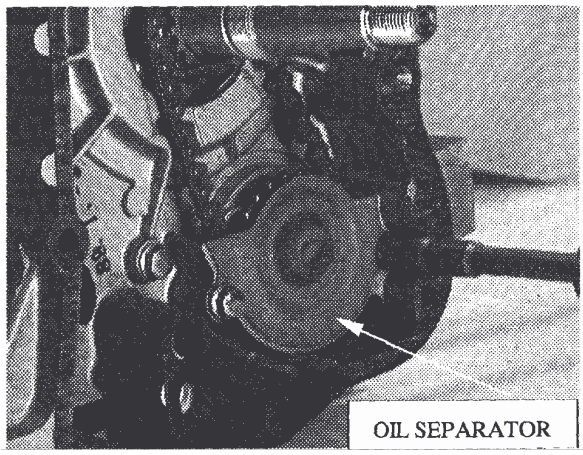

Install the oil pump ass'y



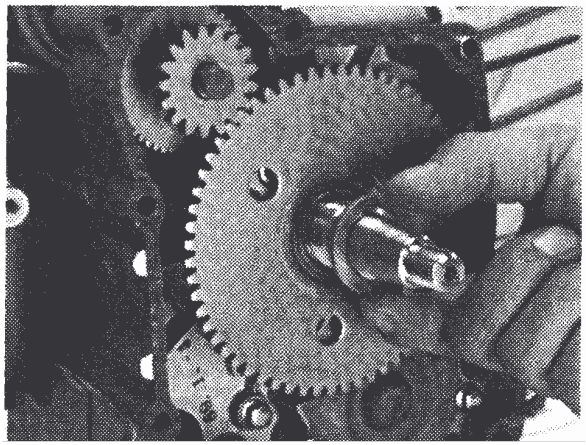
Install the oil pump driven sprocket and oil pump

chain.

Install the oil separator.

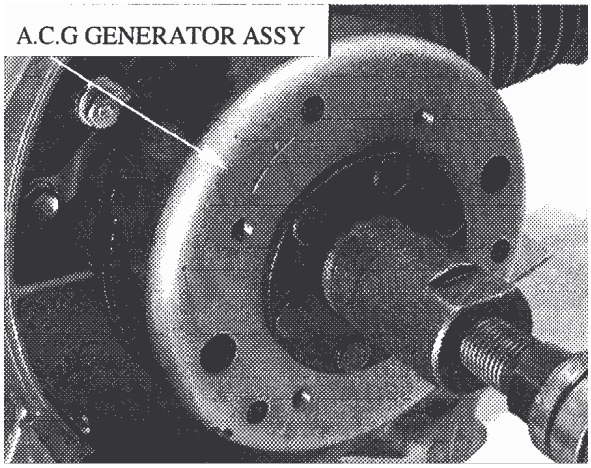



Install the starting clutch outer and gear ass'y.

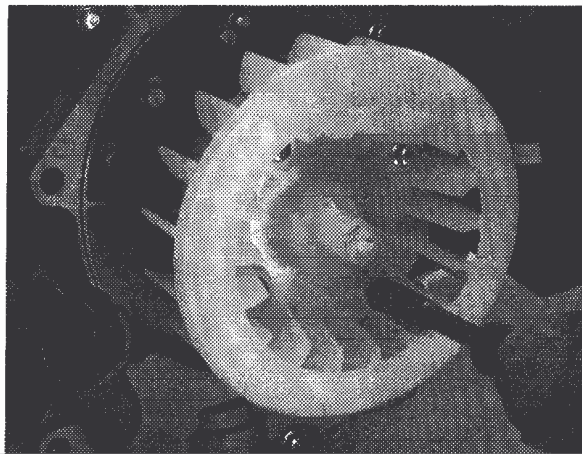


Install the new gasket, dowel pins and right crankcase cover.

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$^2$ | --------- |
| Cam lobe height | IN<br>EX | 25.965/27.195<br>25.810/27.20 | 25.57/26.7<br>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<br>EX | 32.3<br>35.0 | 31.2<br>34.1 |
| Valve stem O.D. | IN<br>EX | 4.975-4.990<br>4.955-4.970 | 4.90<br>4.90 |
| Valve guide I.D. | IN/EX | 5.000-5.012 | 5.30 |
| Stem-to-guide clearance | IN<br>EX | 0.010-0.037<br>0.030-0.057 | 0. 08<br>0.10 |
| Valve seat width | IN<br>EX | 1. 0<br>1.0 | 1. 8<br>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

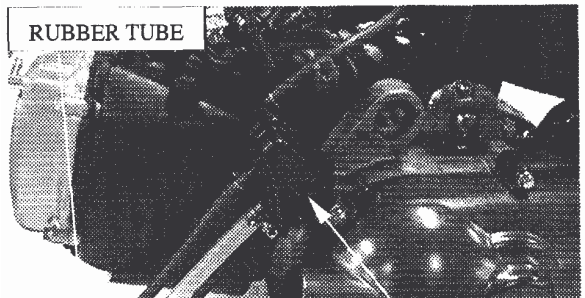
**Excessive noise**

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**

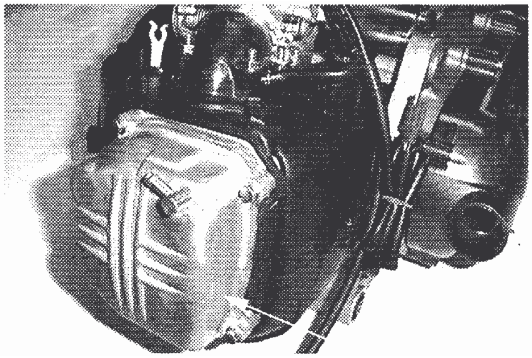
Damaged valve stem seal.
Faulty cylinder or piston rings.

## 5.3 CAM SHAFT ASS'Y REMOVAL

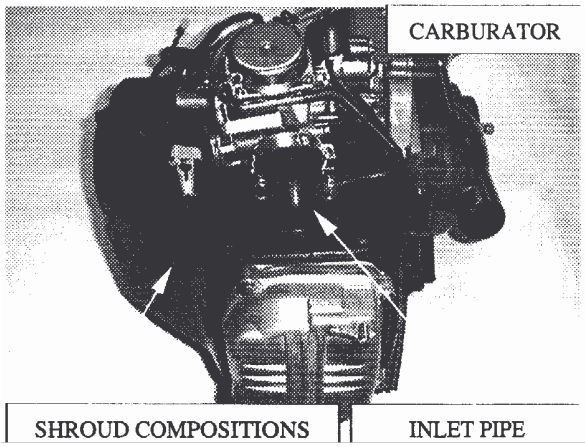


Remove the rubber tube of gas waste recovery.

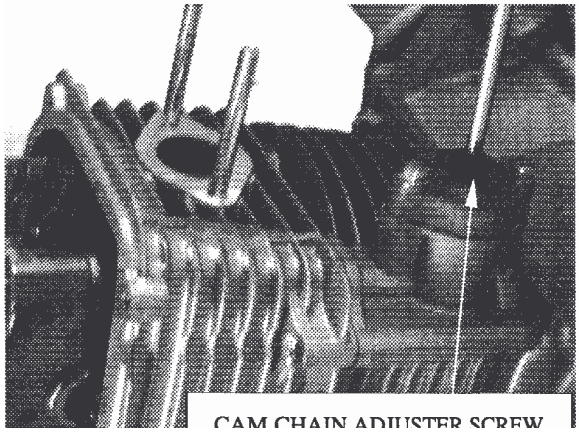
Remove the cylinder head cover.



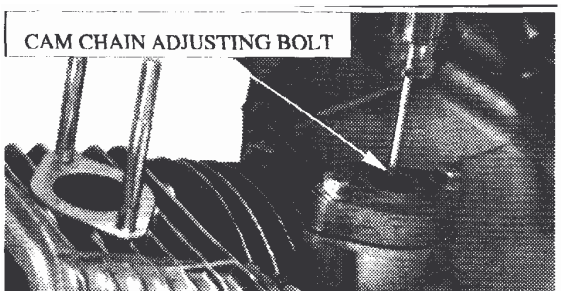
Remove the air cleaner and carburetor.
Remove the inlet pipe ass'y.
Remove the shroud compositions.




Relax the cam chain adjuster screw.

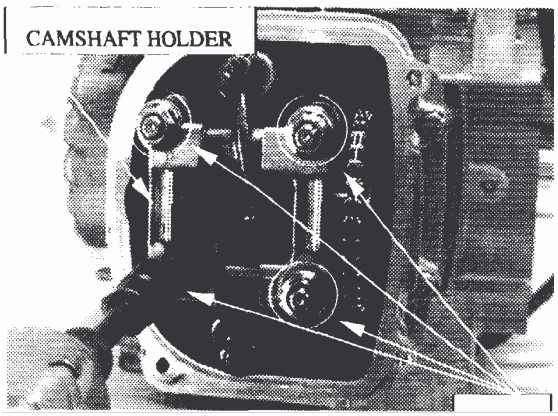



Remove the screw and O-ring and tighten the cai

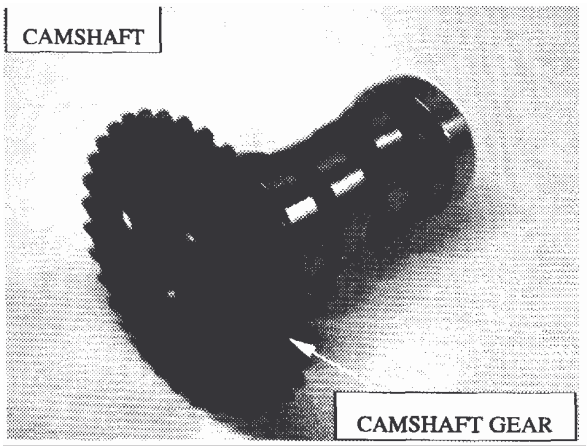


chain-adjusting bolt with clockwise direction.

Remove the nuts and washers
Remove the camshaft holder and dowel pins.

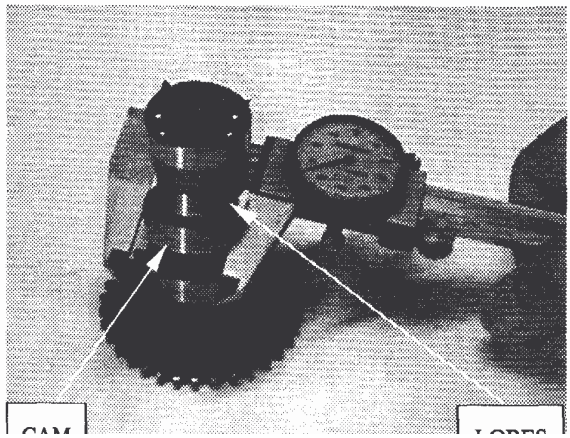



Relax the camshaft gear from cam chain and rem
camshaft.




INSPECTION

Inspect the cam lobes surface and height of cam
wear or damage.
SERVICE LIMIT: IN□25.57/26.18 mm
EX□25.41/26.02 mm



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