HYOSUNG

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HYOSUNG MOTORS & MACHINERY INC.

GF125

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SERVICE MANUAL

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99000-94200

FOREWORD

The HYOSUNG GF 125 was designed to offer superior performance through light weight design and four stroke power. The new GF 125 represents another major advance by HYOSUNG in four stroke motorcyles.

This service manual has been produced primarily for experienced mechanics whose job is to inspect, adjust, repair and service HYOSUNG Motorcycles. Apprentice mechanics and "do it yourself" mechanics will also find this manual to be an extremely useful guide.

Model GF 125 manufactured to standard specifcations is the main subject matter of this manual. However, the GF 125 machines distributed in your country might differ in minor respects from the standard-specification GF 125 and, if they do, if is because some minor modifications (Which are of no consequence in most cases as far as servicing is concerd) had to be made to comply with the statutry requirments of your country.

This manual contains up-to-date information at the time of its issue. Latermade modifications and changes will be explanied to each HYOSUNG distributor in respective markets, to whom you are requested to make query about updated information, if any.

HYOSUNG MOTORS & MACHINERY INC.

GROUP INDEX

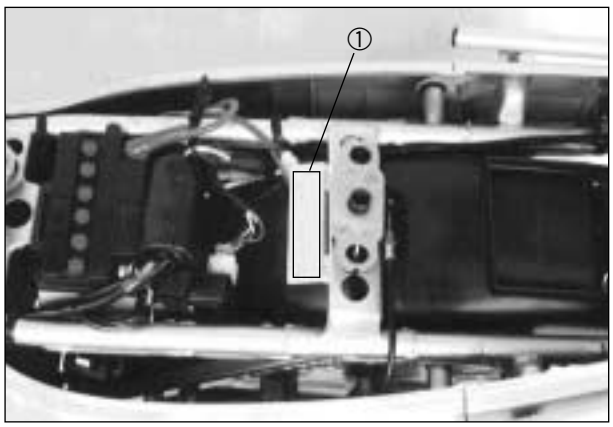
GENERAL INFORMATION

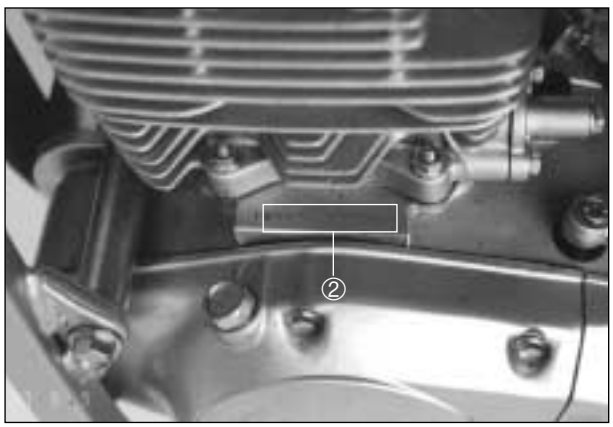
1

CONTENTS

SERIAL NUMBER LOCATIONS

The frame serial number ① is stamped on the rear end of the frame. The engine serial number ② is located on the crankcase.
These numbers are required especially for registering the machine and ordering spare parts.





FUEL AND OIL RECOMMENDATIONS

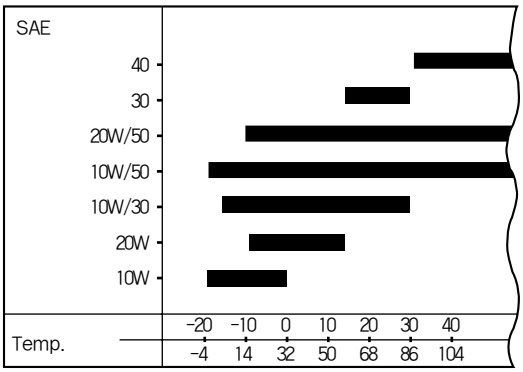
FUEL

Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead gasoline type is recommended.

NOTE:
Unleaded and low-lead gasoline will extend spark plug life.

ENGINE OIL

Be sure that the engine-oil you use comes under API classification of SF or SG and that its vicosity rating is SAE 10W-40. If SAE 10w-40 motor oil is not avaliable, select the oil viscosity according to the following chart.



FRONT-FORK OIL

TELLUS #22

BREAK-IN PROCEDURE

During manufacture only the best possible materials are used all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows:

Initial 800km	Below 4,500r/min
Up to 1,600km	Below 5,500r/min
Over 1,600km	Below 10,500r/min

- Keep to these break-in engine speed limits:
- Upon reaching an odometer reading of 1,600km you can subject the motorcycle to full throttle operation. However, do not exceed 10,500r/min at any time.
- Do not maintain constant engine speed for an extended time period during any portion of the break-in. Try to vary the throttle position.

SPECIAL FEATURES

HYOSUNG **GF 125** is a improved model that has been revised from 2 valve evgine of GF 125 to 4 valve engine and has much more developed features as follows.

1. IMPROVEMENT OF ENGINE POWER AT MIDDLE AND LOW SPEEDS

In order to make long distance driving more comfortable and easier which is the best point of American Style, the VALVE TIMING, multi-valve from 2 valve to 4 valve and the proper design of narrower angle VALVE port are done without losing TORQUE at high speeds.

2. LESS VIBRATION AND NOISE

In order to meet customer's demands for less vibration, the VIBRATION with the body is prevented by making the engine strength higher and natural frequency high order AND the previous SYSTEM which prevents vibration transmissibility is get together.

For less noise, the INTAKE & EXHAUST system and VALVE TRAIN system are redesigned in order to satisfy 71 db, the strict '96 KOREA NOISE REGULATION.

3. COMFORTABLE SEATING

The seat is made out of two different hardness FOAM URETHANE in order to absorb shock which makes seating more comfortable.

THE TECHINICAL FEATURES

1. CYLINDER HEAD

The best conbustion efficiency is done by the 4 VALVE seat system's connecting TWO IN ONE HOLE INTAKE AND EXHAUST to SPARK PLUG in Pentroof combustion chamber casted at the low pressure.

The silent chain is more closely united and the cylinder head wall is thickened more for decreasing chain noise.

By choosing ALUMINUM forging, HOLDER gets lighter and stronger.

2. PISTON, CONNECTING ROD and CAM CHAIN

PISTON, high tension HI-SILICON, AC8A, is FLAT type, HEAD, and T-type, SHORT SKIRT which is Ø57, suitble for high speeds and lightened for less vibration.

The part of CONNECTING ROD's small hole is Ø15, the PIN SIZE of large hole is Ø28 for enduring high engine power and PITCH is 99.8.

CAM CHAIN is LINK PITCH 6.350(1/4")'s endless type and gets TIMMING and less noise by adopting Borg warmer 92RH.

3. CLUTCH MISSION

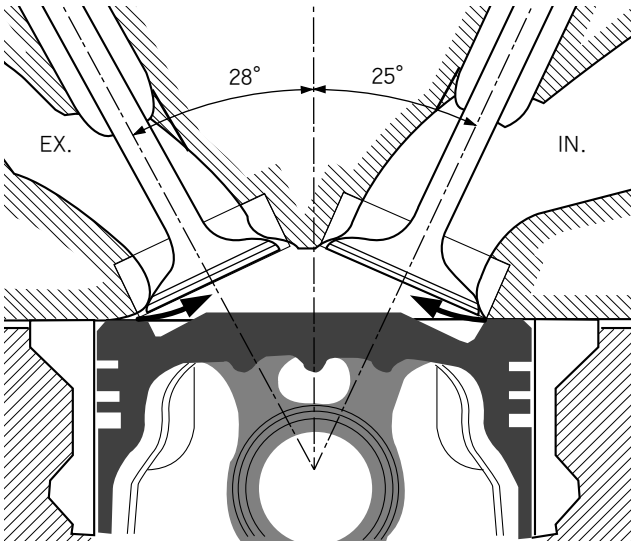
The Primary Gear Ratio is improved from 3.47 to 3.50 in order to increase rotation.
For improving CLUTCH durability while long distance driving, CLUTCH DAMPER is changed from rubber to steel Spring type.

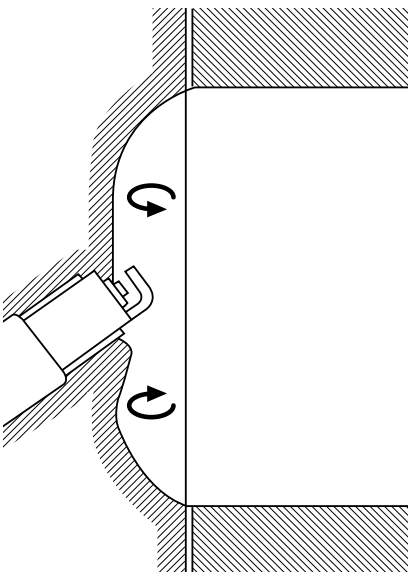
4. VALVE TRAIN

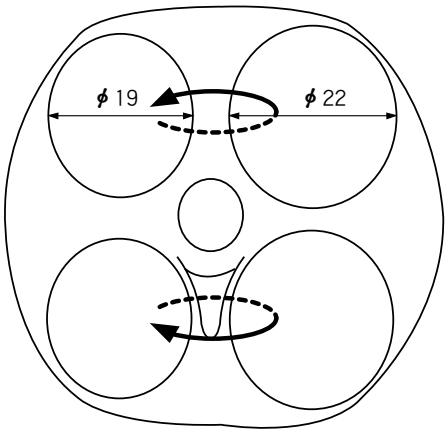
The maximum power appears at 8500rpm, so that TORQUE is good enough to have a long distance driving or downtown driving.
The valve angle is 25°(IN) and 28°(EX) which are much narrower agles for ROCKER ARM 4 VALVE and TORQUE(1.02㎏ · m) is achieved by improving VOLUME EFFICIENCY.
The technical design is done through the enough simulation by the design SOFTWARE which our company have kept, in order to not making trouble like JUMPING or SURGING.

5. CAM SHAFT, LOCK ARM and VALVE

The material of CAM is CHILLED FC, whose durability and safty is high.
For improving acceleration, the inside of Cam Shaft is designed empty.
For improving durability, BALL BEARING TYPE for CAM SHAFT is adopted and LOCK ARM is surfaced with HARD CROME COATING and LUBRITE.
For preventing the touching noise, the contacted SPRING CAM is adopted.
The Valve (IN 22, EX 19) is surfaced with TUFTLITE.
The left side of VALVE and TAPPET are surfaced with STELLITE, especially the surface hardness is over HRC50 by surfacing STELLITE NO 1, so thatTAPPET's durability is improved by preventing wearing.







IGNITION SYSTEM

DESCRIPTION

The GF 125 Engine is equipped with a new type ignition system. This new system further reduces timing fluctuations. It has an "ignition timing control circuit" wich accurately controls the advance curve and maintains consistent timing independent of high RPM fluctuation, magnetic force, temperature, and air gap.

ADVANTAGES OF CAPACITOR DISCHARGE IGNITION SYSTEM

- Trouble free operation due to elimination of contact breaker points which can become contaminated.
- Ignition timing is maintained properly at all times and require no maintenance.
- Free from arcing and provides the ignition coil with stable secondary voltage.
- Excellent vibration and moisture resistance.

OPERATION

When the magneto rotor rotates, an electric current is generated in the power source coil(L), and this charges the capacitor(C_1) via (D_1).
On the other hand, when the rotor tip on the magneto rotor passes the pick-up coil, the currents(P_1) and (P_2)are generated, they flow to the ignition timing control circuit, and they are converted into one ignition signal. This signal is sent to the (SCR),the (SCR) becomes ON, the circuit(C_1) → (SCR) → (Ig_1)is formed, and as the electric energy stored in capacitor (C_1) is discharged instantly, a high voltage is induced in the ignition secondary coil(Ig_2), and a spark crosses over the spark plug gap.

When the engine is running slowly (N_1 r/min or less Fig. 3), control by the ignition timing control circuit is executed so that the ignition signal is generated at the time ①(Fig. 2) when the current (P_1) is generated and is sent to the (SCR). When the engine speed increases (N_1 to N_2 r/min), control is executed so that the ignition signal ② is generated between (P_1) and (P_1) according to the engine speed. At this time, the advance angle is (θ_1).
At the time of high engine speed (N_2 r/min and over), control is executed so that the ignition signal is generated at the time ③ when (P_2) is generated. AT this time, this advance angle becomes(θ_2).

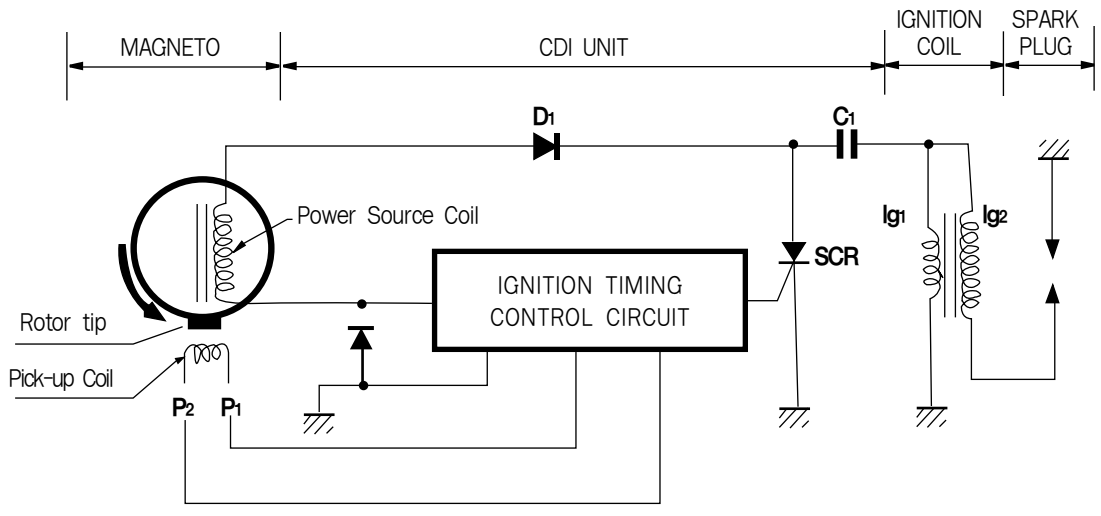


Fig. 1

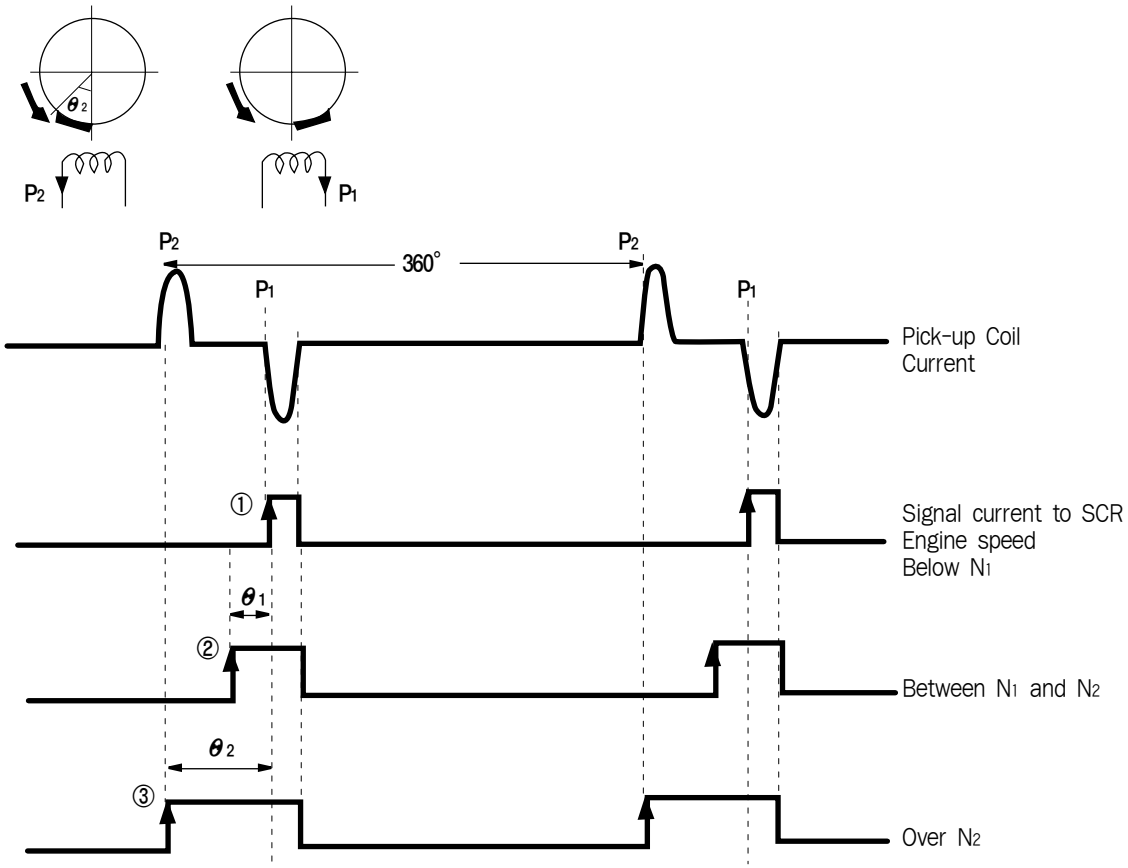

θ2
P2
P1
P2
360°
P2
P1
P1
Pick-up Coil
Current
①
Signal current to SCR
Engine speed
Below N1
θ1
②
Between N1 and N2
θ2
③
Over N2

Fig. 2

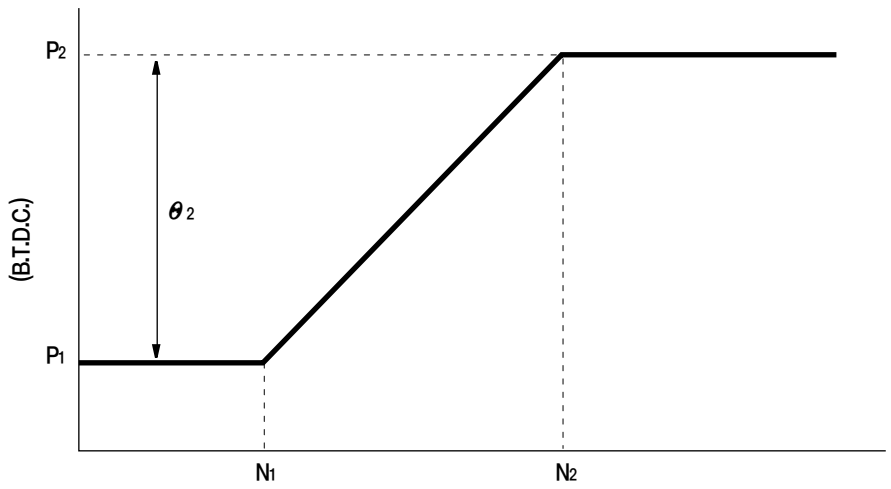
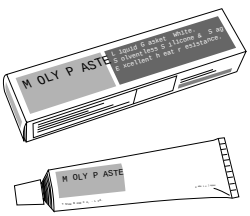
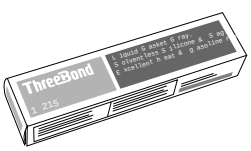

P2
θ2
(B.T.D.C.)
P1
N1
N2
Engine speed(r/min)

Fig. 3

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GF 125 and should be kept on hand for ready use. These items supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like.
How to use them and where to use them are described in the text of this manual.

Material	part	page	part	page
 GREASE "G2" 99000-07000	● Oil seals ● Wheel bearing ● Speedometer gear box ● Steering stem steel balls ● Brake cam ● Mounting drum ● Dust seal cover and spacer	3-45 6- 4 6-34 6- 5 6-18 6-35 6-36 6-39		
 SILICONE GREASE 99000-25100	● Brake caliper holder	6-22 6-26		
 MOLY PASTE 99000-25140	● Piston pin ● Valve stem ● Rocker arm shaft	3-22 3-23 3-25		
 THREE BOND No. 1215 99000-31110	● Mating surfaces of left and right crankcase ● Front fork damper rod bolt	3-45 6-10		

Material	part	page	part	page
 THREAD LOCK SUPER "1303B" 99000-32030	● 2nd drive gear ● Starter clutch allen bolt	3-42 3-51		
 THREAD LOCK CEMENT 99000-32040	● Front fork damper rod bolts	6-10		
 THREAD LOCK "1342" 99000-32050	● Countershaft bearing retainer screws ● Gearshift cam guide and pawl screws ● Engine oil pump mounting screws ● Pick up coil screws ● Stator mounting screws ● Starter motor securing screws	3-42 3-47 3-48 5-2 3-51 5-11		
 THREAD LOCK SUPER "1305" 99000-32100	● Magneto rotor nut	3-51		

PRECAUTIONS AND GENERAL INSTRUCTIONS

Observe the following items without fail when disassembling and reassembling motorcycles.

- Be sure to replace packings, gaskets, circlips, O-rings and cotter pins with new ones.

CAUTION:
Never reuse a circlip after a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.
When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.
After installing a circlip, always insure that it is completely seated in its groove and securely fitted.

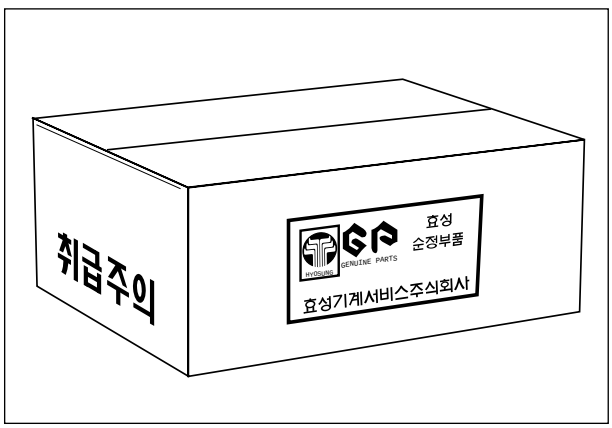
- Tighten bolts and nuts from the ones of larger diameter to those of smaller diameter, and from inside to out-side diagonally, with specified tightening torque.
- Use special tools where specified.
- Use specifide genuine parts and recommended oils.
- When more than 2 persons perform work in cooperation, pay attention to the safety of each other.
- After the reassembly, check parts for tightening condition and operation.
- Treat gasoline, which is extremely flammable and highly explosive, with greatest care. Never use gasoline as cleaning solvent.

Warning, caution and note are included in this manual occasionally, describing the following contents.

WARNING ..... Personal safety of the rider is involved, and disregard of the information could result in injury.
CAUTION ..... For the protection of the motorcycle, the instruction or rule must be strictly adhered to.
NOTE ..... Advice calculated to facilitate the repair of the motorcycle is given under this heading.

USE OF GENUINE HYOSUNG PARTS

To replace any part of the machine, use a genuine HYOSUNG replacement part. Imitation parts or parts supplied from any other source than HYOSUNG if used to replace HYOSUNG parts, can reduce the machine's performance and, even worse, could induce costly mechanical troubles.



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	1,968㎜
Overall width	763㎜
Overall height	1,073㎜
Wheel base	1,292㎜
Ground clearance	195㎜
Dry mass	125㎏

ENGINE

Type	Four-strock, air-cooled, OHC
Number of cylinder	1
Bore	57㎜
Stroke	48.8㎜
Piston displacement	124cc
Compression ratio	9.92:1
Carburetor	PISTON VALVE
Air cleaner	Polyurethane foam element
Starter system	Kick and Electric
Lubrication	Wet Sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	3.500
Final reduction	3.357
Gear ratios, Low	2.750
2 nd	1.785
3 rd	1.368
4 th	1.045
Top	0.913
Drive chain	126 links

ELECTRICAL

Ignition type	CDI TYPE
Ignition timing	15° B.T.D.C. below 2,250r/min and 35° B.T.D.C. above 4,000r/min
Spark plug	C8EH-9
Battery	12V9Ah
Headlight	35/35W
Tail/Brake light	10/5W×2
Turn signal light	10W
Neutral indicator light	3W
High beam indicator light	3W
Speedometer light	3.4W×2
Fuel indicator light	3W
Turn signal indicator light	3W
Fuse	15A

CHASSIS

Front suspension	Telescopic
Rear suspension	coil spring
Steering angle	42°(right and left)
Caster	25°30'
Trail	93mm
Front brake	Disc brake, single
Rear brake	Internal expanding
Front tire size	2.75-18 4PR
Rear tire size	3.00-18 6PR

CAPACITIES

Fuel tank including reserve	13.7 ℓ
Reserve	1.6 ℓ
Engine oil	950㎖
Front fork oil	175㎖

◈ The specification subject to change without notice.

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

CONTENTS

2-1 PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy.

NOTE:
More frequent servicing may be performed on motorcycles that are used under severe conditions.

PERIODIC MAINTENANCE CHART

ENGINE

Item \ Interval	Initial 1,000km	Every 5,000km	Every 10,000km	page
Battery	Inspect	Inspect	–	2-3
Cylinder head nuts, cylinder nuts, exhaust pipe bolts and nuts	Inspect	Inspect	–	2-4
Air cleaner element	Clean every 3,000			2-5
Valve clearance	Inspect	Inspect	–	2-6
Compression pressure	Inspect	Inspect	–	3-1
Spark plug	Inspect	Inspect	Replace	2-7
Fuel line	Inspect	Inspect	–	2-8
	Replace every 4 years			
Fuel strainer	Clean	–	Clean	2-8
Engine oil	Change	Change	–	2-8
Engine oil filter	Replace	Replace	–	2-9
Oil pressure	–	Inspect	–	3-1
Oil sump filter	–	–	Clean	2-9
Carburetor	Inspect	Inspect	–	2-10
Clutch	Inspect	Inspect	–	2-10

CHASSIS

Item \ Interval	Initial 1,000km	Every 5,000km	Every 10,000km	page
Drive chain	Inspect and clean every 1,000km			2-11
Brakes	Inspect	Inspect	–	2-12
Brakes hose	Inspect	Inspect	–	2-12
	Replace every 4 years			
Brakes fluid	Change every 2 years			2-12
Tires	Inspect	Inspect	–	2-14
Steering	Inspect	Inspect	–	2-15
Front fork oil	Change	–	Change	2-15
Chassis bolts and nuts	Inspect	Inspect	–	2-16

LUBRICATION CHART

The maintenance schedule, which follows, is based on this philosophy. It is timed by odometer indication, and is calculated to achieve the ultimate goal of motorcycle maintenance in the most ecomomical manner.

Interval / Item	Interval and Every 5,000km	Every 10,000km
Throttle cable	Motor oil	–
Throttle grip	–	Grease
Clutch cable	Motor oil	–
Brake cable	Motor oil	–
Speedometer cable	–	Grease
Speedometer gear box	–	Grease
Drive chain	Motor oil every 1,000km	
Brake pedal	Grease or oil	–
Brake cam shaft	–	Grease
Steering stem bearings	Grease every 2 years or 20,000km	
Swing arm bearings		

WARNING:
Be careful not to apply too much grease to the brake cam shaft. If greases gets on the linings, brake slippage will result.

Lubricate exposed parts which are subject to rust, with either motor oil or grease whenever the motorcycle has been operated under wet or rainy conditions.
Before lubricating each part, clean off any rusty sports and wipe off any grease, oil, dirt or grime.

MAINTENANCE PROCEDURES

This section describes the service procedures for each section of periodic Maintenance.

BATTERY

Inspect Initial 1,000km and Every 5,000km

- The battery must be removed to check the electrolyte level and specific gravity.
- Remove the seat.(Refer to page 3-2)
- Remove battery ⊖ lead at the battery terminal.
- Remove battery ⊕ lead.
- Remove battery from the frame.
- Check electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOWER level line ① but not above the UPPER level line ②.

For checking specific gravity, use a hydrometer to determine the charged condition.

09900-28403	Hydrometer

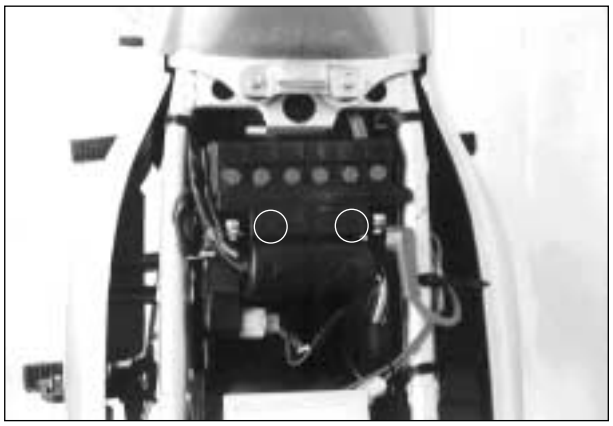
Standard specific gravity	12V 1.28 at 20˚C

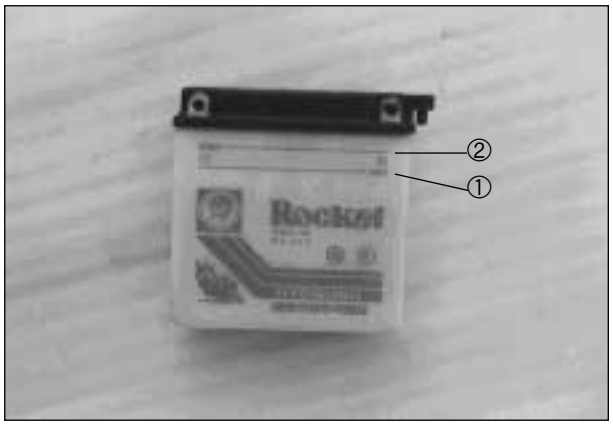
An S.G reading of 1.22(at 20˚C)or under means that the battery needs recharging off the machine : take it off and charge it from a recharger. Charging the battery in place can lead to failure of the regulator/rectifier.

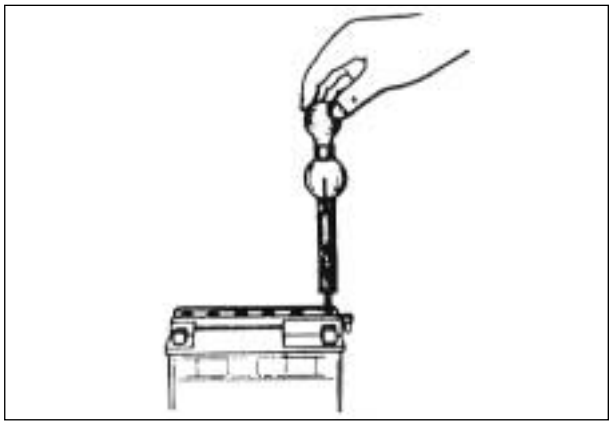
- To install the battery, reverse the procedure described above.

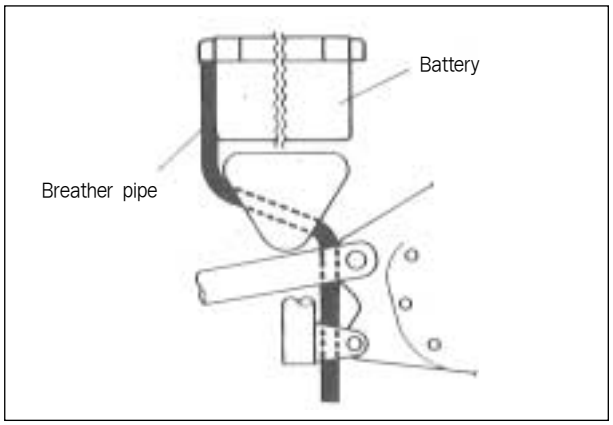
WARNING:
When installing the battery lead wires, fix the ⊕ lead first and ⊖ lead last

- Make sure that the breather pipe is tightly secured and undamaged, and is routed as shown in the figure.









CYLINER HEAD NUTS, CYLINDER NUTS, EXHAUST PIPE BOLTS AND NUTS

Inspect Initial 1,000km and Every 5,000km

CYLINDER HEAD NUTS

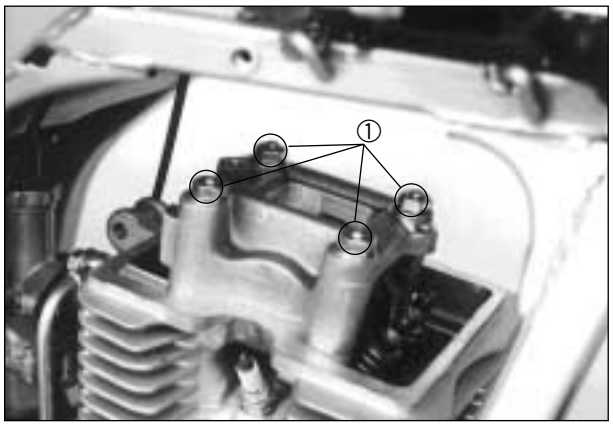
- Remove the seat and fuel tank. (Refer to page 3-2)
- Remove the cylinder head cover. (Refer to page 3-7)
- Tighten the four nuts ① and two nuts ② the specified torque with a torque wrench, when engine is cold.

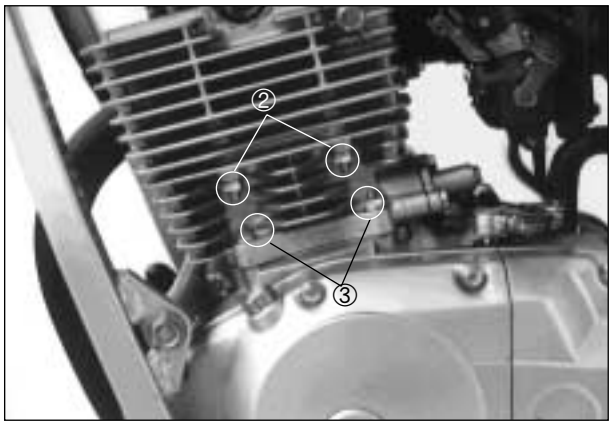
Tightening torque	①	25-29 N · m (2.5-2.9 kg · m)
	②	6-8 N · m (0.6-0.8 kg · m)

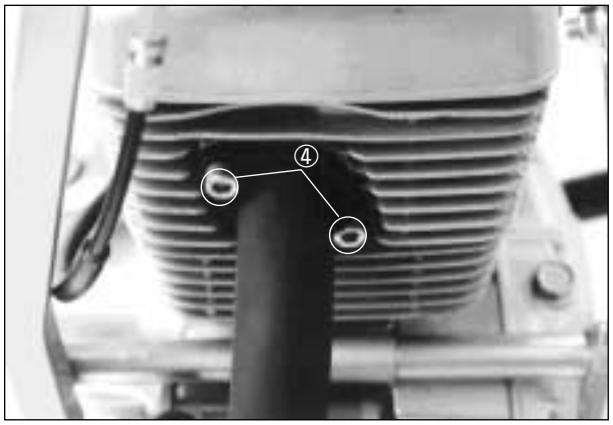
CYLINDER NUTS

- Tighten the two 6mm nuts ③ to the specified torque.

Tightening torque	6-8 N · m(0.6-0.8kg · m)





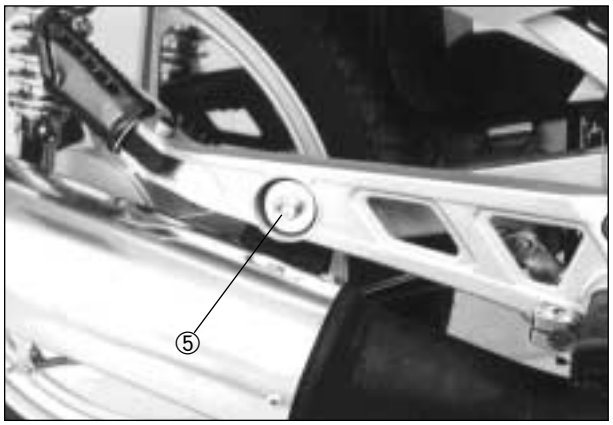


EXHAUST PIPE BOLTS AND MUFFLER CLAMP BOLT

- Tighten the exhaust pipe bolts ④ and muffler clamp bolt ⑤ to the specdified torque.

Tightening torque

Exhaust pipe bolts and muffler clamp bolt	9-12 N · m (0.9-1.2 kg · m)

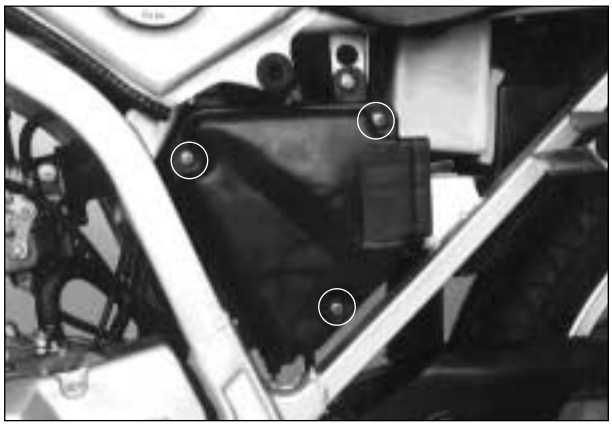


AIR CLEANER ELEMENT

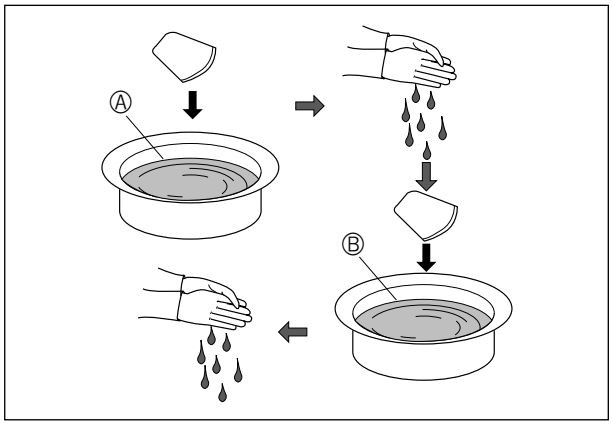
Clean Every 3000km

If the air cleaner is clogged with dust, intake resistance will be increased with a resultant decrease in power output and an increase in fuel consumption. Check and clean the element in the following manner.

- Remove the left frame cover.
- Remove the screw and take out the cover.
- Separate the polyurethane foam element from the element frame.



- Fill a washing pan of a proper size with nonflammable cleaning solvent. Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands.
- Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.



NOTE:
Do not twist or wring the element because it will tear or the individual cells of the element will be damaged.

CAUTION:
Inspect the element carefully for rips, torn seams, etc. If any damage is noted, replace the element.

Ⓐ Non-flammable cleaning solvent
Ⓑ Motor oil

VALVE CLEARANCE

Inspect Initial 1,000km and Every 5,000km

Excessive valve clearance results in valve noise and insufficient valve clearance results in valve damage and reduced power. At the distances indicated above, check and adjust the clearance to the following specification
The procedure for adjusting the valve clearance is as follows:

- Remove spark plug, cylinder head cover ①, and valve timing inspection plug ②.
- Remove the magneto cover cap ③ and rotate the magneto rotor with the 14mm box wrench to set the piston at (TDC) of the compression stroke. (Rotate the rotor until the "T" line Ⓐ on the rotor is aligned with the center of hole on the crankcase.)
- Insert the thickness gauge to the valve stem end and the adjusting screw on the rocker arm.

09900-20803	Thickness gauge

Valve clerance specifications

IN. and EX.	0.10-0.13mm

- If clearance is off the specification, bring it into the specified range by using the special tool.

09917-14910	Valve adjust driver

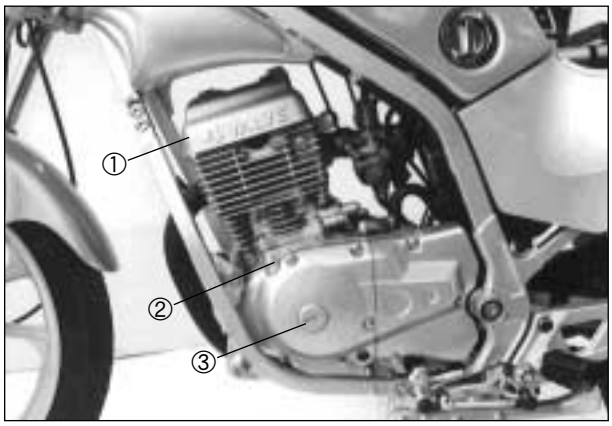
- Reinstall spark plug, cylinder head cover, valve timing inspection plug and magneto cover cap.

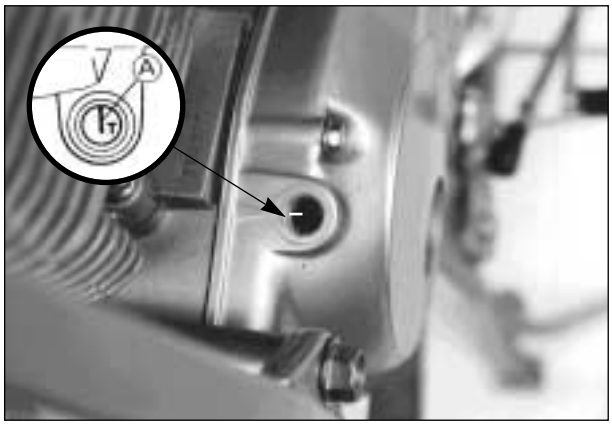
NOTE:
Valve clearance is to be checked when the engine is cold.
Both the intake and exhaust valves must be checked and adjusted when the piston is at Top-Dead-Center(TDC)of the compression stroke.

COMPRESSION PRESSURE

Inspect Initial 1,000km and Every 5,000km

Refer to page 3-1





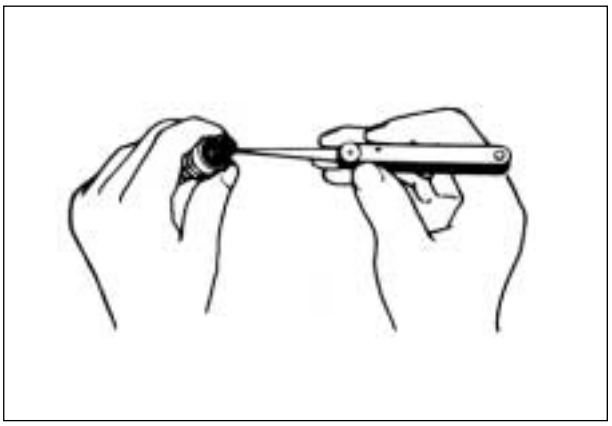
SPARK PLUG

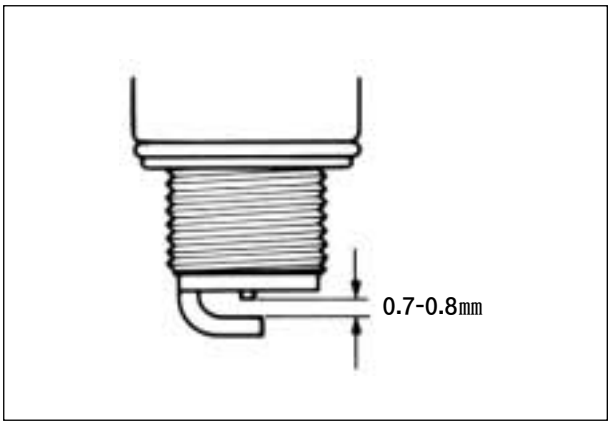
Inspect Initial 1,000km and 5,000km Replace Every 10,000km

Remove the carbon deposits with a wire or pin and adjust the spark plug gap to 0.7-0.8mm, measuring with a thickness gauge.

When removing carbon deposits, be sure to ovserve the appearance of the plug, noting the color of the carbon deposits. The color observed indicates whether the standard plug is suitable or not. If the standard plug is apt to get wet, a hotter plug should be used. If the standard plug is apt to overheat(porcelain is whitish in appearance), replace with a colder one.

TYPE	SPARK PLUG SPECIFICATION
Hot type	GOLDEN C7EA-9
Standard	GOLDEN C8EA-9
Cold type	GOLDEN C9EA-9

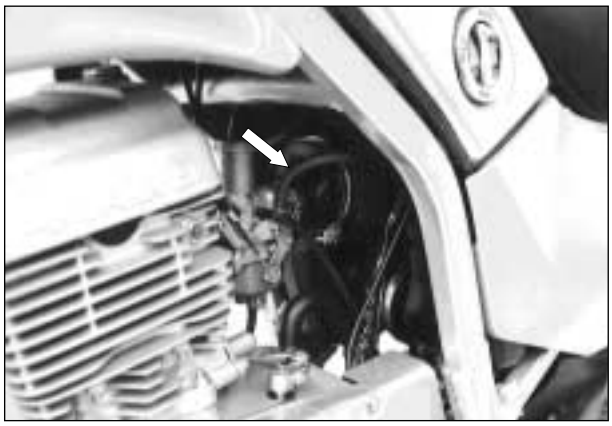




FUEL LINE

Inspect Initial 1,000km and Every 5,000km Replace every four years.

Inspect the fuel line and connections for damage and fuel leakage.
If any defects are found, the fuel line must be replaced.



FUEL STRAINER

Change Initial 1,000km Every 10,000km

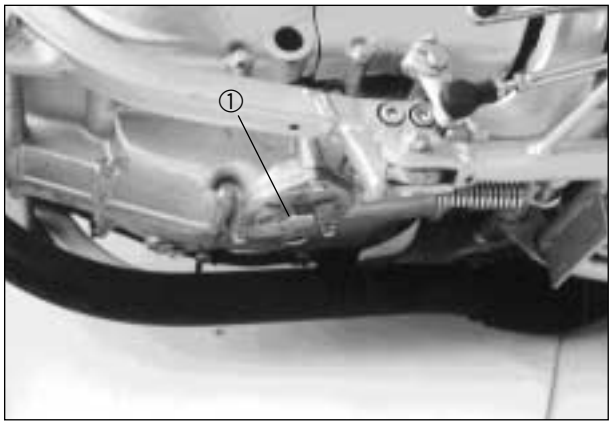
If the fuel strainer is dirty with sediment, fuel will not flow smoothly and loss in engine power may result.
Clean the strainer cup with non-flammable cleaning solvent.

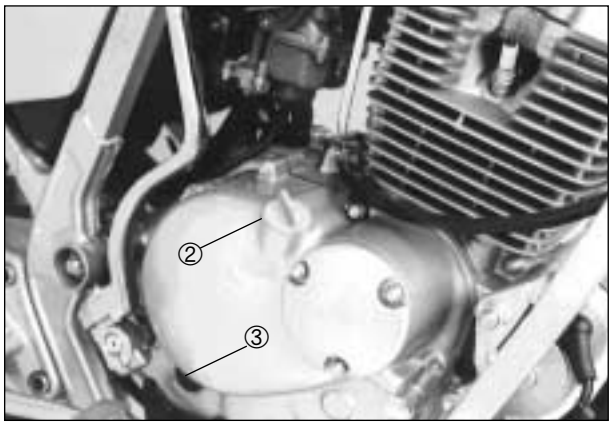
ENGINE OIL

Change Initial 1,000km Every 5,000km

The oil should be changed with the engine hot.
The procedure is follows:

- Support the motorcycle by center stand.
- Drain the oil by removing the drain plug ① and filler cap ②.
- Fit drain plug securely and add fresh oil through the filler. The engine will hold about 950ml of oil.
  Use 10W/40 viscosity of oil under API classfication of SF or SG.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ③. If the level is below mark "F", add oil to that level.





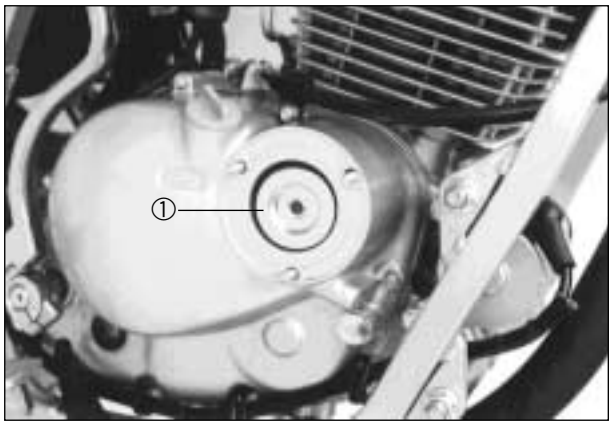
ENGINE OIL FILTER

✓Replace Initial 1,000km and Every 5,000km

Replace the oil filter in the following manner.

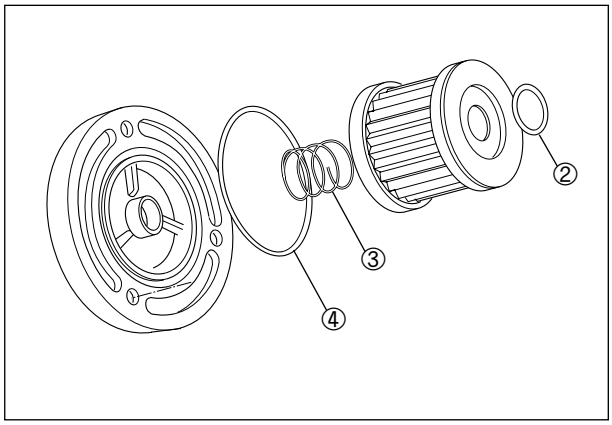
- Drain engine oil by removing the drain plug.
- Remove the three screws securing the filter cap.
- Take off the cap, and pull out the filter ①.

- Replace the filter with a new one.
- Before installing on the filter, check to be sure that the O-ring ② in properly installed.
- Before putting on the filter cap, check to be sure that the filter spring ③ and the O-ring ④ are installed correctly.
- Install the filter cap and tighten the screws securely.
- Pour in engine oil and check the level.



NOTE:
Pour about 950ml of engine oil into the engine only when changing oil and replacing oil filter at the same time.
When performing engine overhaul, the amount of oil to be replenished is 1300ml.

CAUTION:
When reassembling the oil filter, make sure to check the oil filter installed as shown in illustration. If the filter is installed improperly, serious engine damage may result.



OIL PRESSURE

Inspect Every 5,000km

Refer to page 3-1

OIL SUMP FILTER

Clean Every 10,000km

Clean the sump filter screen to remove any foreign matter that may be collected there. Inspect the screen to insure that it is free of any sign of damage.

CARBURETOR

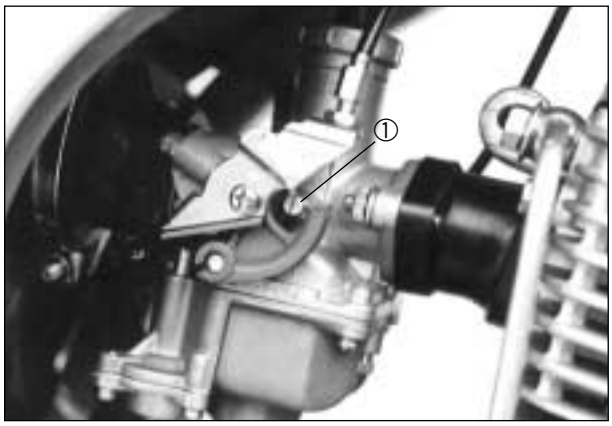
Inspect Initial 1,000km and Every 5,000km

IDLING ADJUSTMENT

NOTE: Make this adjustment when the engine is hot.

- Start up the engine and set its speed at anywhere between 1400 and 1500r/min by turning throttle stop screw ①.

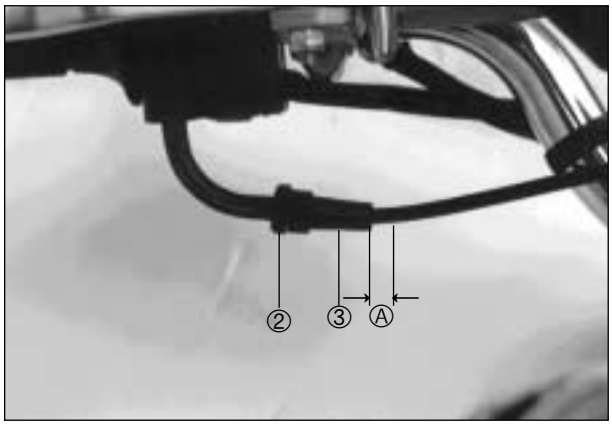
Engine idle speed	1450±50r/min



THROTTLE CABLE PLAY

There shoule be 0.5-1.0mm play Ⓐ on the throttle cable. To adjust the throttle cable play.

- Tug on the throttle cable to check the amount of play.
- Loosen the lock nut ② and turn the adjuster ③ in or out until the specified play in obtained.
- Secure the lock nuts while holding the adjuster in place.



Throttler cable play	0.5-1.0mm

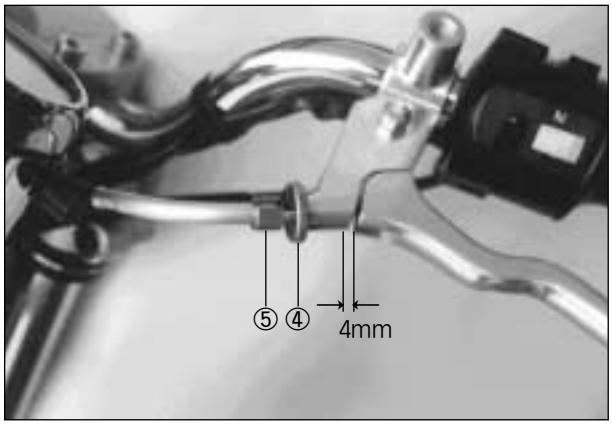
CLUTCH

Inspect Initial 1,000km and Every 5,000km

Clutch play should be 4mm as measured at the clutch lever holder before the clutch begins to disengage. If the play in the clutch is incorrect, adjust it in the following way:

- Loosen the lock nut ② and turn the adjuster ③in or out until the specified play in obtained.
- Secure the lock nuts while holding the adjuster in place.

The clutch cable should be lubricated with a light weight oil whenever it is adjusted.



DRIVE CHAIN

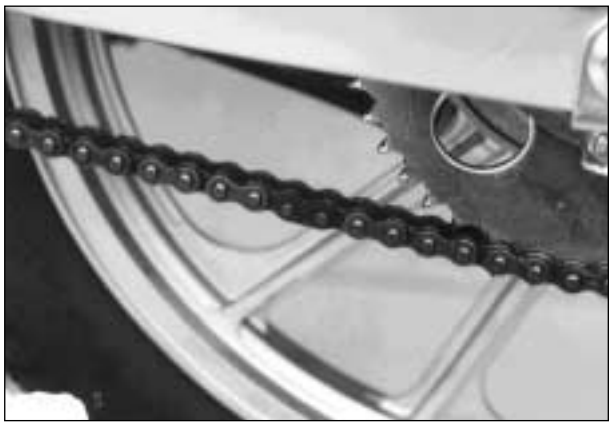
Inspect and Clean Every 1,000km

DRIVE CHAIN

Visually inspect the drive chain for the belos listed possible malconditions. (Lift the rear sheel by placing the center stand, and turn the rear wheel slowly by hand, with the transmission in NEUTRAL.)

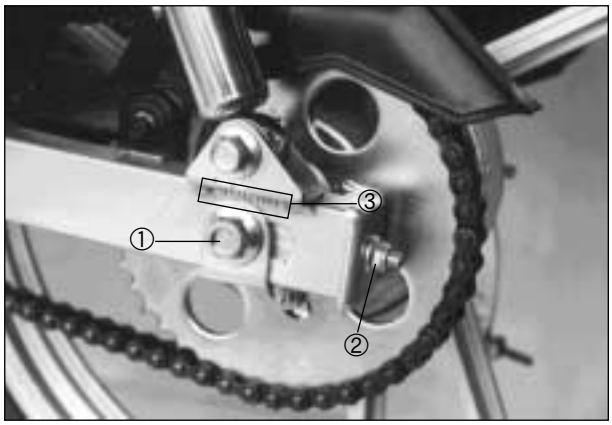
Inspect for:

1. Loose pins
2. Damaged rollers
3. Rusted links
4. Twinsted or seized links
5. Excessive wear



If any defects are found, the drive chain must be replaced.

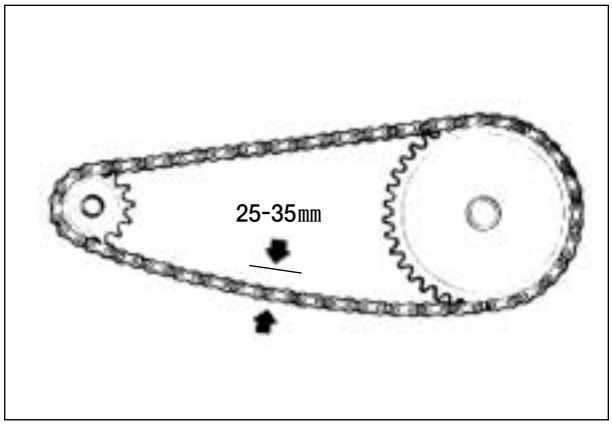
- Wash the chain with kerosene. If the chain tends to rust faster, the interval must be stortened.
- After washing and drying the chain, lubricate it with chain lube or gear oil SAE 90



CHECKING

- Loosen axle nut ①.
- Tense the drive chain fully to screw in the chain adjuster lock nuts ②.
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.

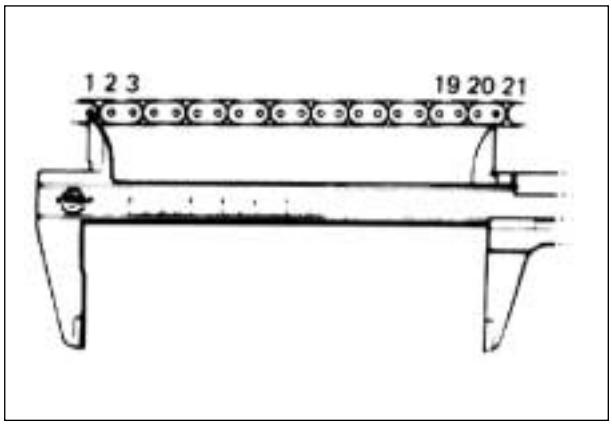
Service Limit	259.4 mm



ADJUSTING

- Loosen both chain adjuster lock nuts ② until the chain has 15-25mm(0.6-1.0in) of slack at the middle between engine and rear sprockets. The mark ③ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctry aligned.

Drive chain slack	25-35 mm



- After adjusting the drive chain, tighten the axle nut ① securery.

Tightening torque	50-80(5.0-8.0 kg · m)

BRAKES

Inspect Initial 1,000km and Every 5,000km Replace the hoses Every four years Change fluid hoses Every two years

FRONT BRAKE

Brake fluid level

- Support the motorcycle body on the center stand, and place the handlebars straight.
- Check the brake fluid level by observing the lower limit line on the brake fluid reservoir.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.

Specification and Classification	DOT3, DOT4 or SAE J1703

WARNING:
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will be caused. Do not use any brake fluid taken from old or used unsealed containers.
Never re-use the breke fluid left over from the last servicing and stored for long periods.

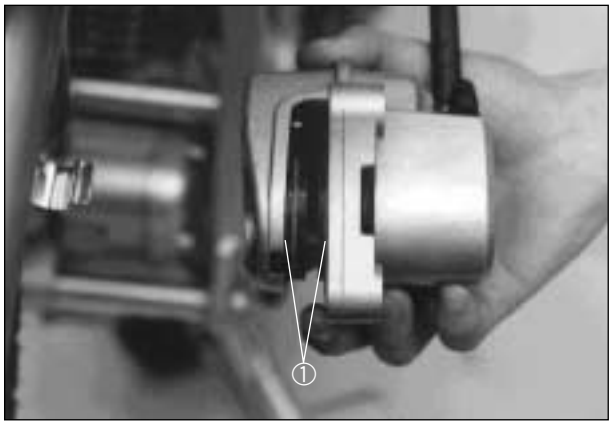
WARNING:
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces.
Check the brake hoses for cracks and hose joint for leakage before riding.

Brake pads

Wearing condition of brake pads can be checked by observing the red limit line ① marked on the pad.
When the wear exceeds the limit line, replace the pads with new ones. (refer to page 6-22)

Brake light switch

Replace the brake light switch with new one when brake light does not come on just before a pressure is felt when the brake lever is squeezed.



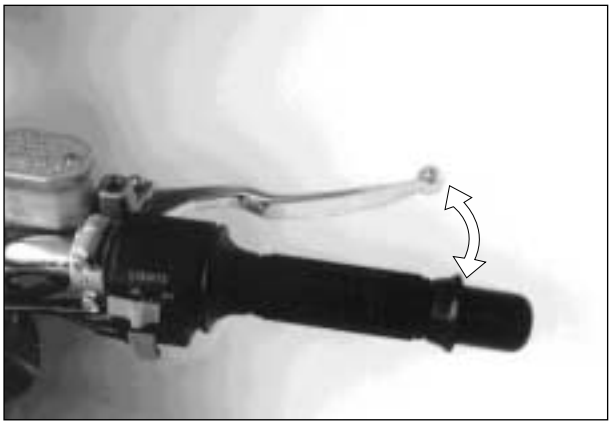
AIR BLEEDING THE BRAKE FLUID CIRCUIT

Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the caliper brake. The presence of air is indicated by "sponginess" of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner.

- Fill up the master cylinder reservoir to the "HIGH" level line. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

Bleeder valve tightening torque	6-9 N · m (0.6-0.9 kg · m)

- Squeeze and release the brake lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a trun so that the brake fluid runs into the receptacle: this will remove the tension of te brake lever causing it to touch the handlebar grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.



NOTE:
Replenish the brake fluid reservoir as necessary while bleeding the brake system.
Make sure that there is always some fluid visible in the reservoir.

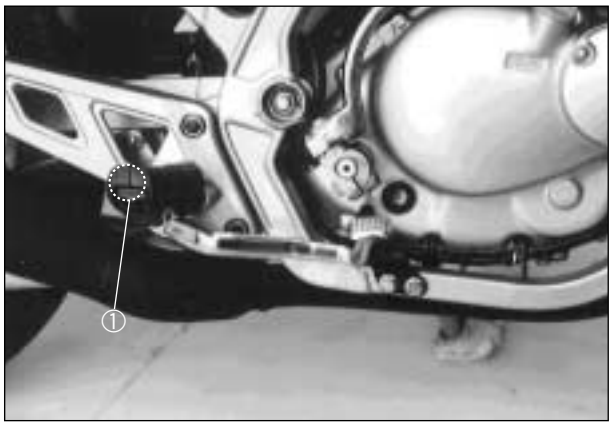
- Close the bleeder valve, and disconnect the pipe.
  Fill the reservoir to the "HIGH" level line.

CAUTION:
Handle the brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials, etc.

REAR BRAKE

This is effected by turning the brake pedal stopper ①. Be sure to tighten the lock nut securely after setting the bolt. After adjusting the rear brake height, adjust the brake pedal traval. First set the pedal at position for comfortable riding by turning the brake pedal stopper ①, and then adjust the free travel ② to 20-30 mm.
If adjustment is necessary, turn the rear brake adjuster ③ to obtain the specific play.

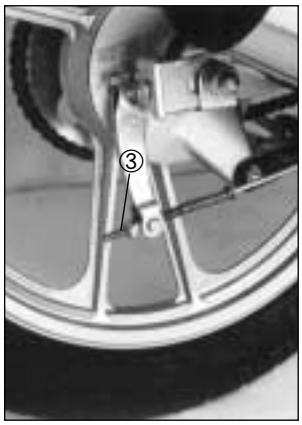
Brake pedal travel	20-30mm

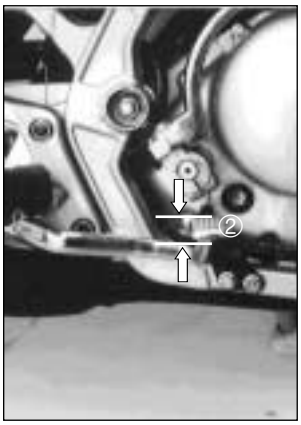


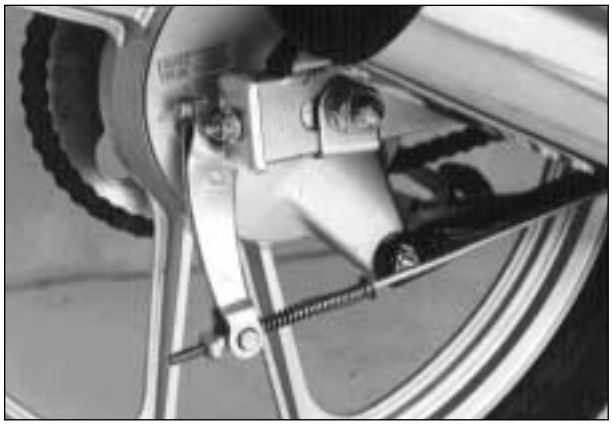
Brake lining wear limit

This motorcycle is equipped with brake lining wear limit indicators on both rear brakes. As shown in the illustration at right, at the condition of normal lining wear, an extended line from the index mark on the brake camshaft should be within the range embessed on the brake panel with the brake on. To check wear of the brake lining, follow the steps below.

- Fist check if the brake system is properly adjusted.
- While operating the brake, check to see that the range on the brake panel.
- If the index mark is outside the range as shown in the illustration at right, the brake shoe assembly should be replaced to ensure safe operation.







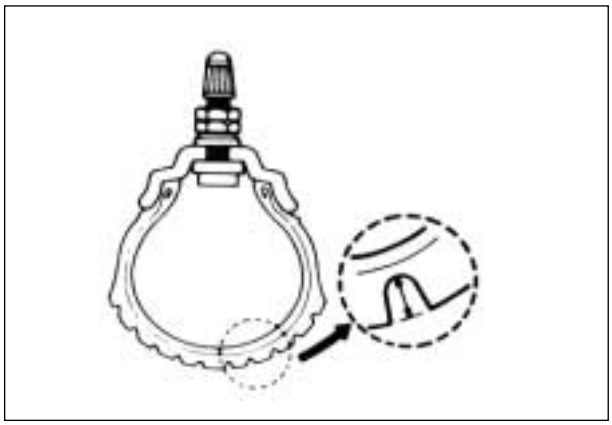
TIRES

Inspect Initial 1,000km and Every 5,000km

TREAD DEPTH SERVICE LIMIT

FRONT	1.6mm
Rear	1.6mm

Check the tire pressure, and examine the valve for evidence of air leakage.



TIRE PRESSURE

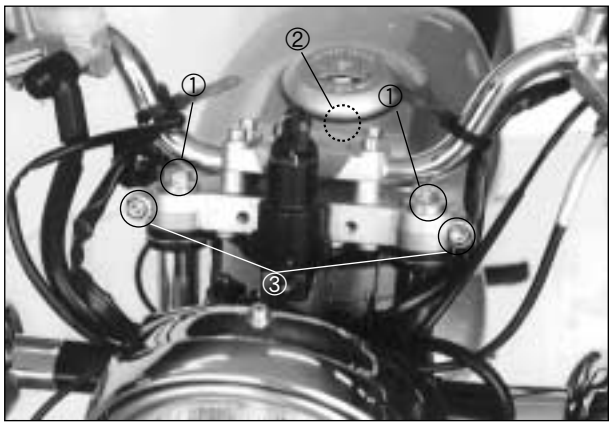
COLD INFLATION TIRE PRESSURE	NORMAL RIDING			
	SOLO RIDING		DULE RIDING	
	kpa	kg/㎠	kpa	kg/㎠
FRONT	175	1.75	175	1.75
REAR	200	2.00	225	2.25

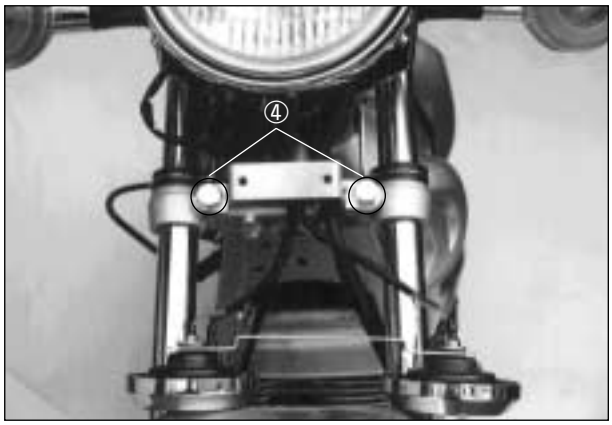
STEERING

Inspect Initial 1,000km and Every 5,000km

Steering stem bearings should be adjusted properly for smooth turning of the handlebars and safe running.
Steering which is too stiff prevents smooth movement of handlebars.
Steering which is too loose will cause vibration and damage to the steering bearings. Check to see that there is no play in the front fork attachment.

If the play is found, perform steering bearing adjustment as described in pages 6-18 and 6-19 of this manual.





Tightening torque

ITEM		kg · m
①	Fork bolt	1.8-2.8
②	Steering stem head bolt	3.5-5.5
③	Front fork upper bolt	3.5-5.5
④	Front fork lower clamp bolt	2.5-3.5

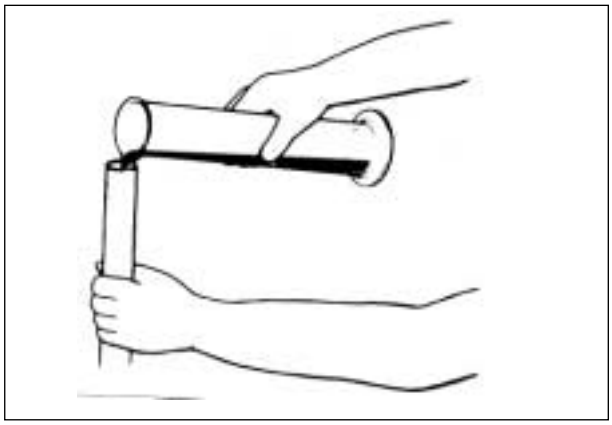
FRONT FORK OIL

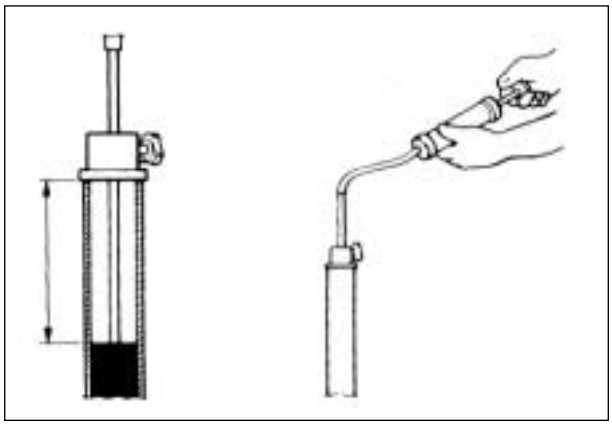
Change Initial 1,000km and Every 10,000km

- Remove the front fork. (Refer to 6-6)
- Drain the fork oil. (Refer to 6-7)
- Pour specified amount of oil from the top of the inner tube.

Specified amonut(for each leg)	175ml

Specification	TELLUS #22





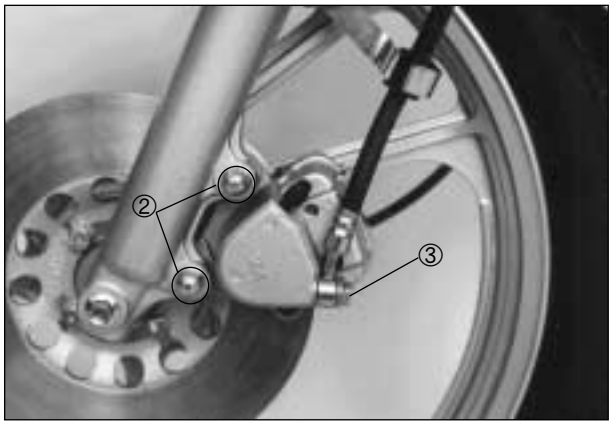
CHASSIS AND ENGINE MOUNTING BOLTS AND NUTS

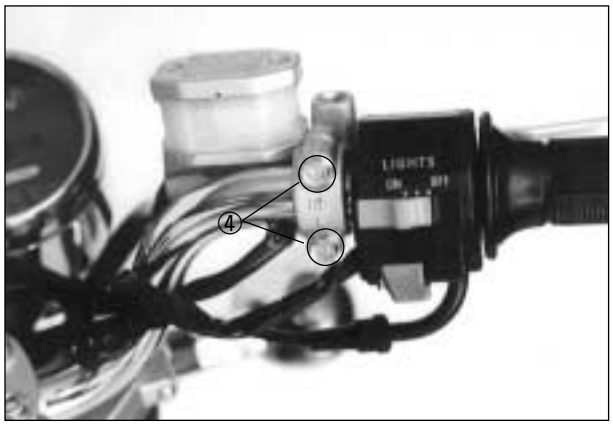
Inspect Initial 1,000km and Every 5,000km

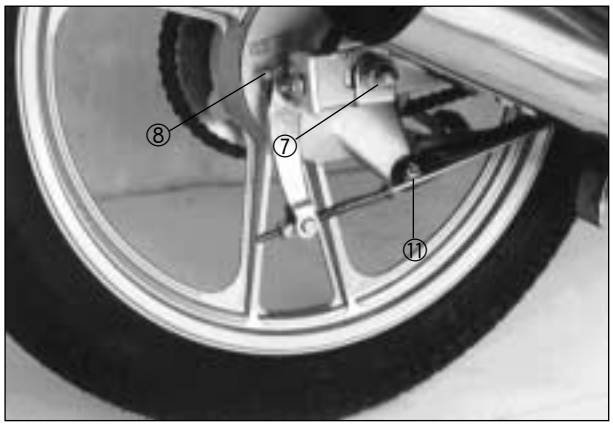
The nuts and bolts listed are important parts, and they must be in good condition for safety.
They must be retightened, as necessary, to the specified torque with a torque wrench.

Tightening torque

	ITEM	N · m	kg · m
①	Front axle nut	36 – 52	3.6 – 5.2
②	Caliper mounting bolt	15-25	1.5-2.5
③	Brake hose union bolt	20-25	2.0-2.5
④	Master cylinder mounting bolt	5-8	0.5-0.8
⑤	Swing arm pivot nut	50-80	5.0-8.0
⑥	Rear shock absorber	20-30	2.0-3.0
⑦	Rear axle nut	50-80	5.0-8.0
⑧	Rear brake cam lever bolt	5-8	0.5-0.8
⑨	Engine mounting bolt	37-45	3.7-4.5
⑩		80-95	8.0-9.5
⑪	Rear touque link bolts	10-15	1.0-1.5






⑧
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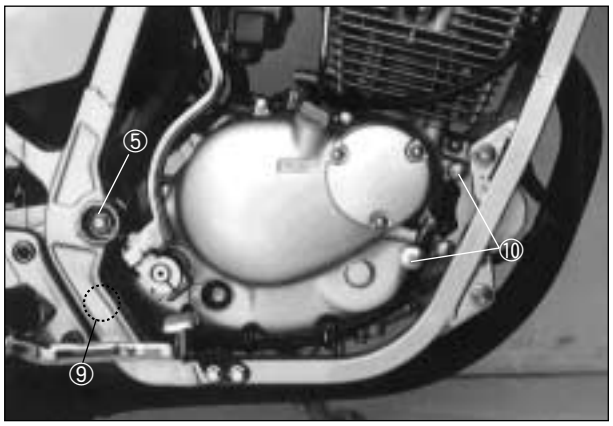
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⑨

SERVICING ENGINE

CONTENTS

COMPRESSION PRESSURE AND OIL PRESSURE

COMPRESSION PRESSURE

NOTE:
- **Before inspecting for compression pressure, make sure that the cylinder head nuts and bolts are tightend to specified torque values and valves are properly adjusted.**
- **Have the engine warmed up by idling before testing it.**

①	09915-64510	Compression gauge
②	09915-74530	Adapter

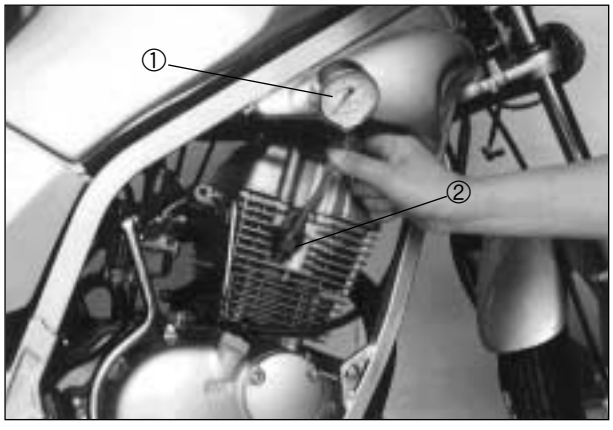
- Remove spark plug.
- Fit the compression gauge ① and adapter ② to the plug hole, taking care to make the connection absolutely tight.
- Twist the throttle grip into wide-open position.
- Crank the engine several times with the starter motor or kick starter, and read the highest gauge indication as the compression of the cylinder.

Compression pressure

Standard	Limit
12-15 kg/cm^2	8 kg/cm^2

A low compression pressure may indicate any of the following malfunction:
- Excessively worn cylinder wall.
- Worn piston or piston rings.
- Piston rings stuck in the grooves.
- Poor seating contact of valves.
- Defective cylinder head gasket

When the compression pressure noted is down to or below the limit indicated above, the engine must be disassembled, inspected and repaired as required to overhaul the engine, with these five malconditions in mind.



OIL PRESSURE

Install the oil pressure gauge in the position shown in the illustration.

Warm up the engine as follows:
- Summer approx, 10min. at 2000r/min.
- Winter approx. 20min. at 2000r/min.

After the warming up operation, increase the engine speed to 3,000r/min, and read the oil pressure gauge.

NOTE:
- **Engine oil must be warmed up to 60℃ (140°F)when checking the oil pressure.**

Oil pressure

Above 0.4 kg/cm^2(Oil temp. at 60℃)
Below 0.6 kg/cm^2 at 3,000rpm

③	09915-74510	Oil pressure gauge

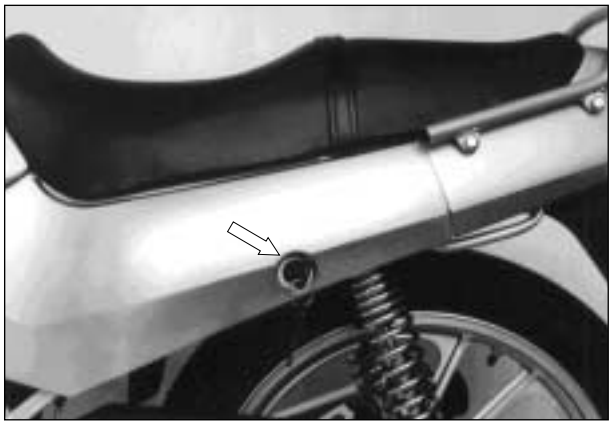
If the oil pressure is power or higher than the specifications, several causes may be considered
- Low oil pressure is usually the result of a clogged oil filter, oil leakage from the oil passageway,damaged oil seal, a defective oil pump or a combination of these items.
- High oil pressure is usually caused by a engine oil which is too heavy a weight, a clogged oil passage, improper installation of the oil filter or a combination of these items.

ENGINE REMOVAL AND REMOUNTING

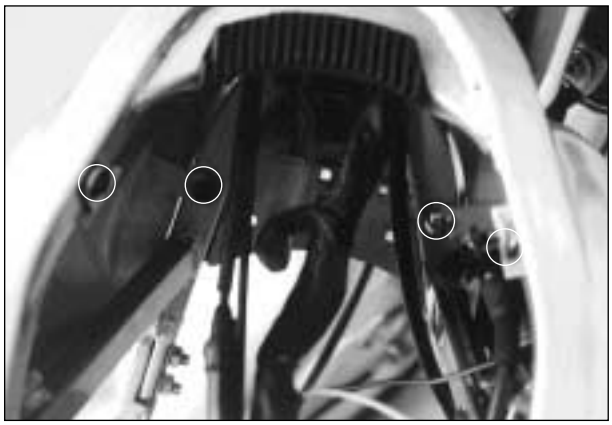
ENGINE REMOVAL

Before taking the engine out of the frame, thoroughly clean the engine with a suitable cleaner. The procedure of engine removal is sequentially explained in the following steps.

- Take off the seat by opening the seat lock.
- Take off the right and left frame covers.

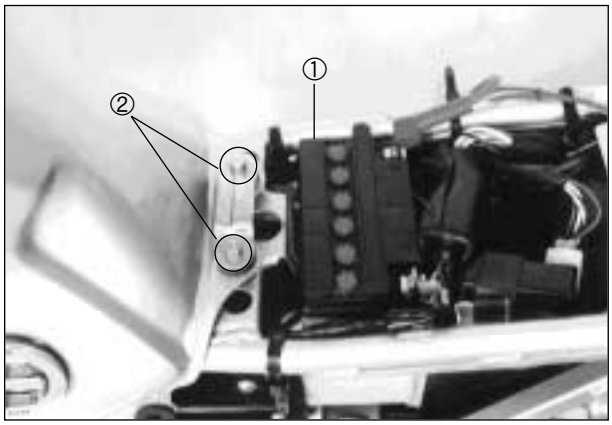


- Take off the right and left the frame head cover.



- Disconnect the ⊖ and ⊕ lead wires of battery ①.

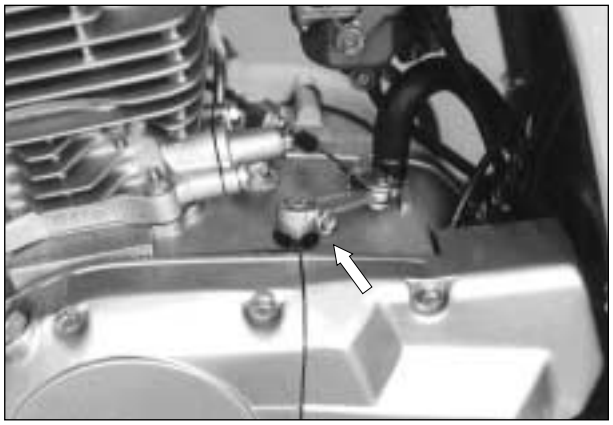
CAUTION:
First, disconnect the ⊖ lead wire.



- Take off the fuel tank by removing the mounting bolts ②.

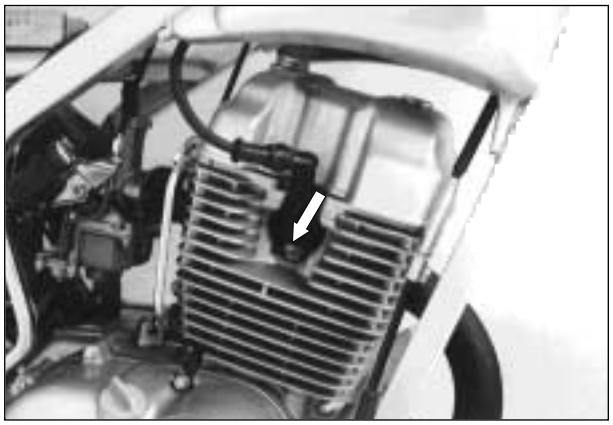
- Turn the fuel lever to the "OFF" position.
- Take off the fuel hose.
- Disconnect the coupler.

- Take off the clutch cable by removing the clutch release arm bolt.

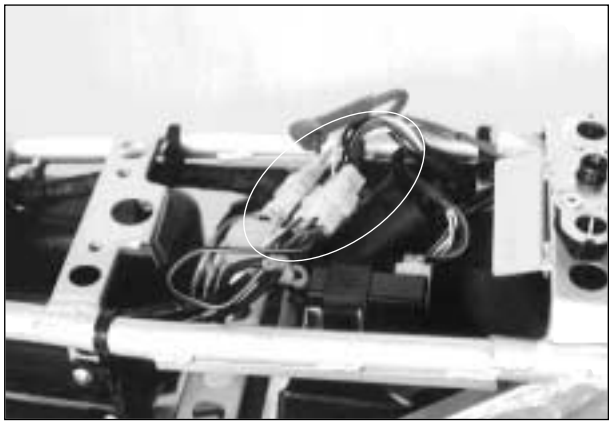


- Disconnect the lead wire of starter motor.

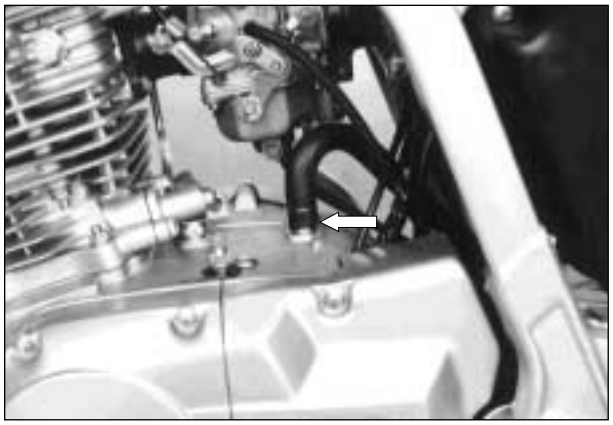
- Take off the spark plug cap.



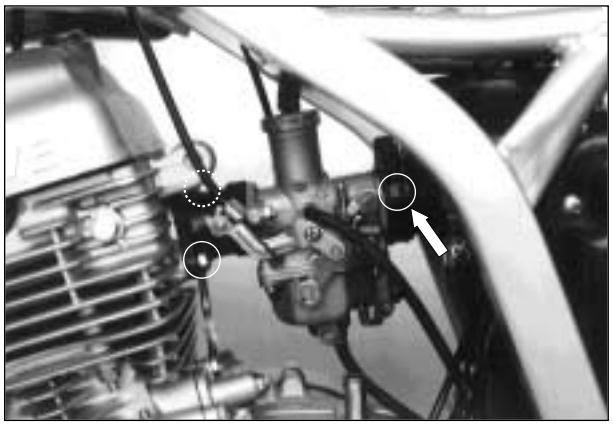
- Disconnect the couplers and lead wire.



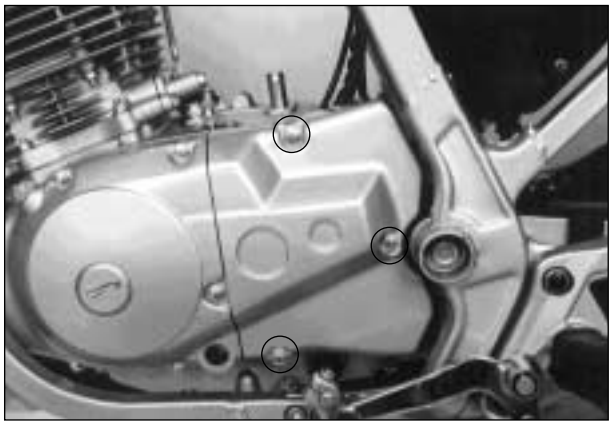
- Take off the breather pipe.



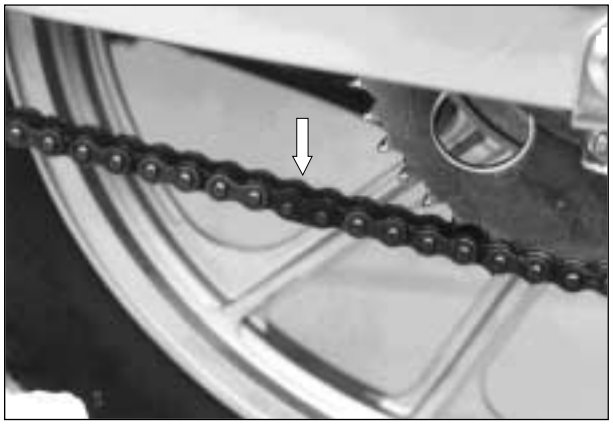
- Remove the carburetor with intake pipe loosening the intake bolts and carburetor clamp screw.



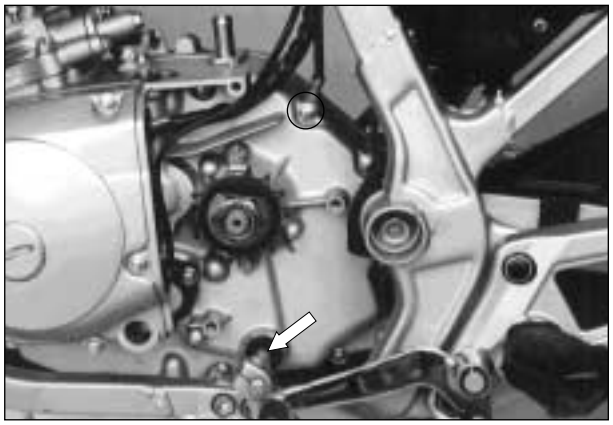
- Remove the engine sprocket cover.



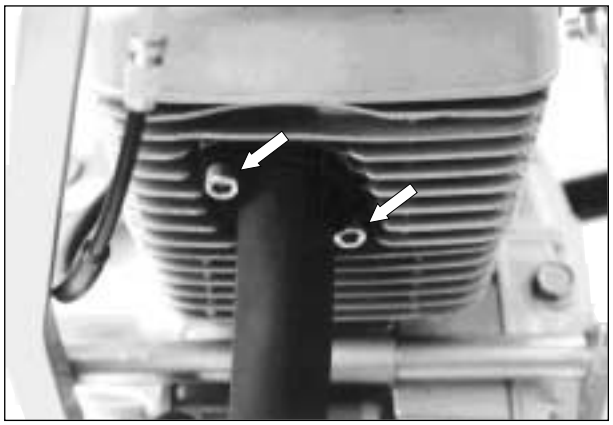
- Loosen the rear axle nut and chain adjuster nuts.
- Take off the drive chain by removing the clip.

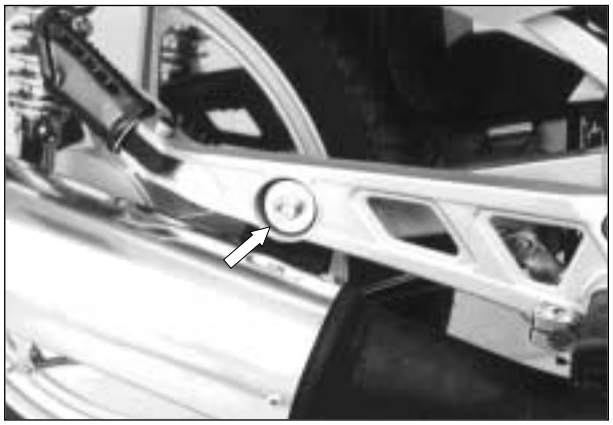


- Disconnect the ground wire from the crankcase.
- Take off the gear shift lever by removing the bolt.



- Remove the exhaust pipe bolts and muffler mounting bolt, then take off the muffler.



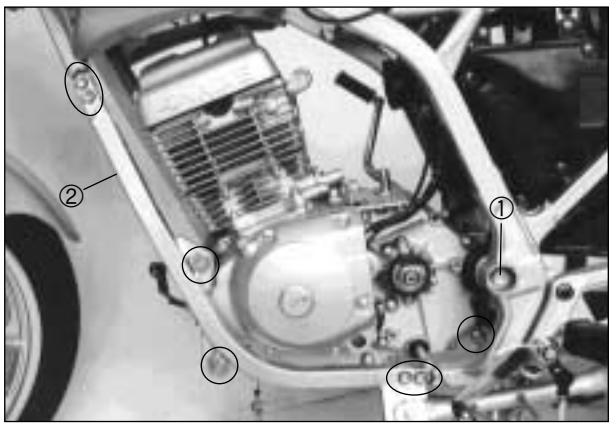


- Remove the swing arm pivot nut, and remove the shaft ①.

CAUTION:
Be careful not to draw out the swing arm pivot shaft completely from the left side swing arm pivot hole.

- Remove the engine mounting nuts and bolts.
- Remove the frame down tube ② by removing the mounting bolts.
- Use both hands, and lift the engine from the frame.

NOTE:
The engine must be taken out from the left side.



ENGINE REMOUNTING

The engine can be mounted in the reverse order of removal.

- Temporarily fasten the engine mounting spacer before inserting the engine mounting bolts.

NOTE:
The engine mounting nuts are self-lock nuts. Once the nut has been removed, it is no longer of any use. Be sure to use new nuts and tighten them to the specified torque.

Tightening torque for engine mounting bolts

①	80-95N · m (8.0-9.5kg · m)
②	37-45N · m (3.7-4.5kg · m)

- Tightening the exhaust pipe bolts and muffler mounting bolt to specified torque.

Tightening Torque	9-12N · m (0.9-1.2kg · m)

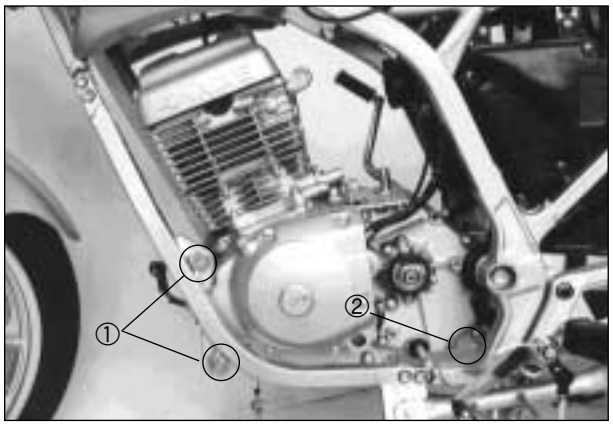
- Pour 1300㎖ of engine oil SAE 10W/40 graded SF or SG into the engine after overhauling engine.
- Start up the engine and allow it run for several seconds at idle speed. About one minute after stopping enine, check oil level.
  If the level is below the "F" mark, add oil until the level reaches the "F" mark.

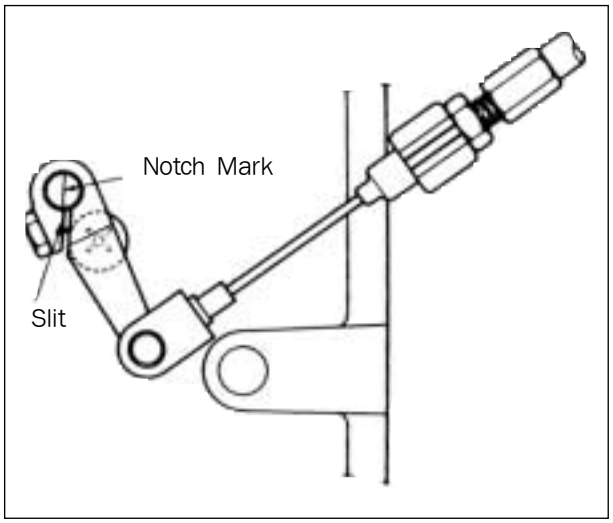
Installing position for clutch release arm.

- Align the release arm slit surface with the notch mark on the release cam shaft.

- After remounting the engine, following adjustments are necessary.

- Throttle cable (Page : 2-10)
- Clutch cable (Page : 2-10)
- Drive chain (Page : 2-11)
- Rear brake pedal (Page : 2-14)
- Idling speed (Page : 2-10)





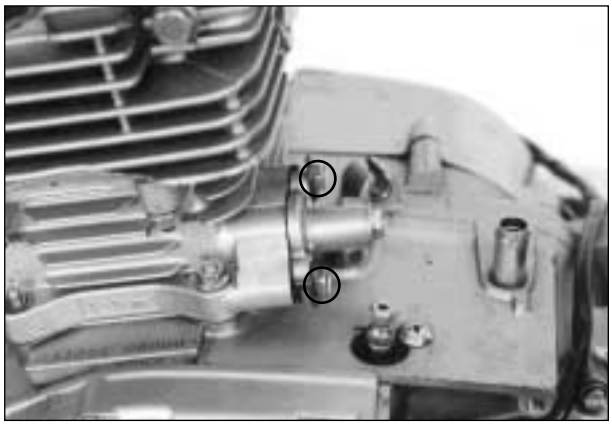
UPPER END COMPONENTS DISASSEMBLY

CYLINDER HEAD COVER-CAMSHAFT

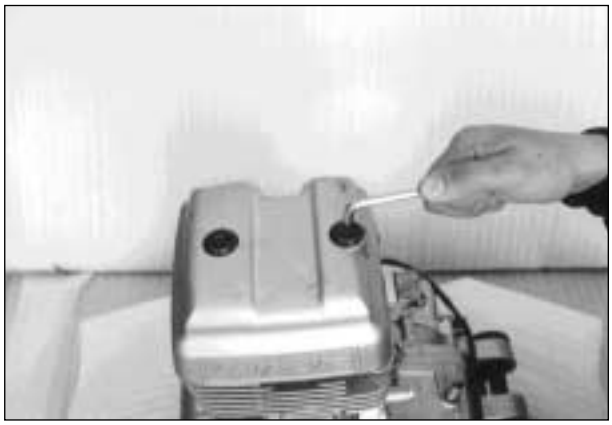
- Bring the piston to top dead center.

NOTE:
When removing cylinder head cover, piston must be at top dead center on compression stroke.

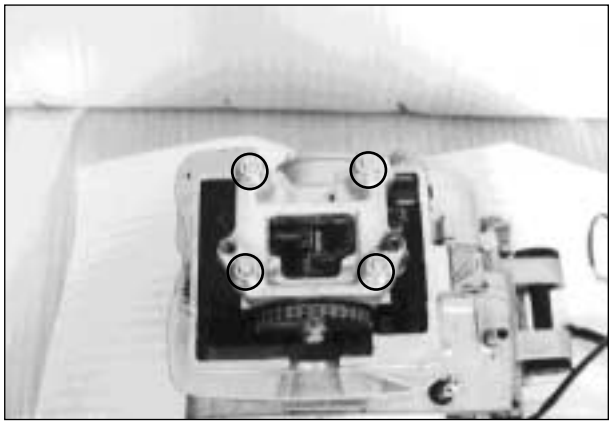
- Remove cam chain tensioner.



- Loosen the cylinder head cover bolts and detach the head cover.

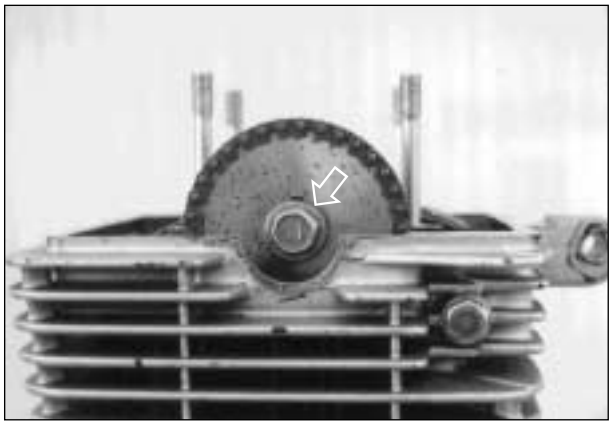


- Loosen the camshaft holder lock nuts diagonally, then detach the camshaft holder.



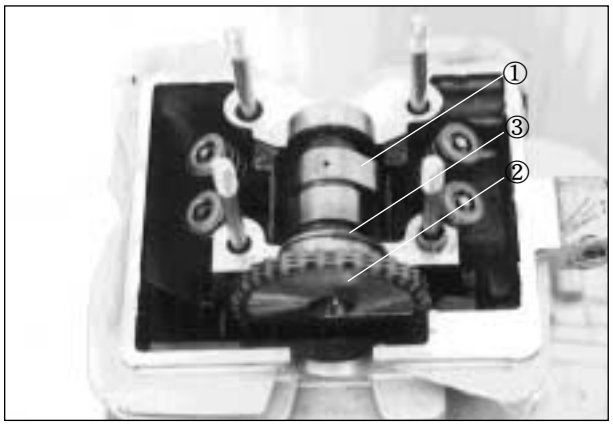
● Remove camshaft center bolt.

NOTE:
This is a left-hand thread nut.



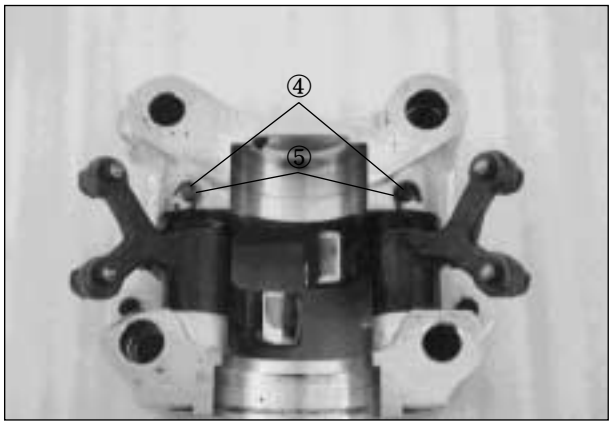
● Remove C-ring③, cam sprocket② and camshaft①.

CAUTION:
Do not drop camshaft drive chain, key and sprocket into the crankcase.

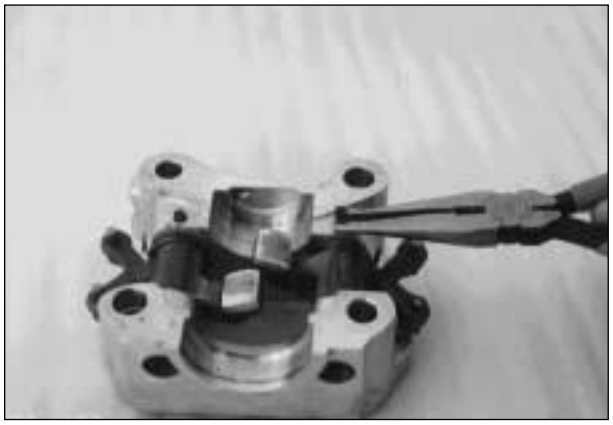


CAMSHAFT HOLDER

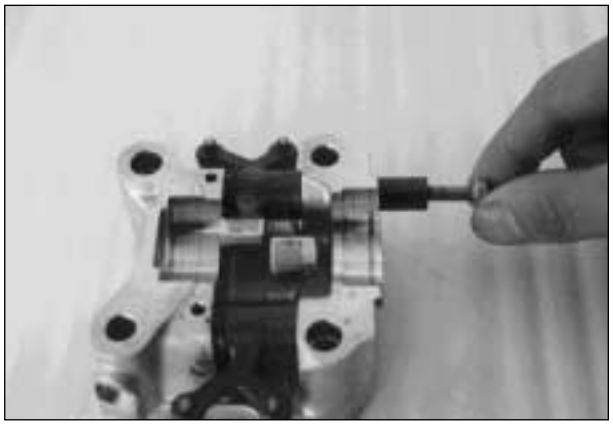
● Take off the rocker arm spring⑤ from dowel pin④.



● Remove the dowel pin with long-nose pliers.



- Install the bolt by the rocker arm shaft and pull out the rocker arm shaft.



CYLINDER HEAD

- Loosen the cylinder head nuts, then detach the cylinder head.

NOTE:
If it is difficult to remove the cylinder head, gently pry it off while tapping the finless portion of the cylinder head with a plastic hammer. Be careful not to break the fin.

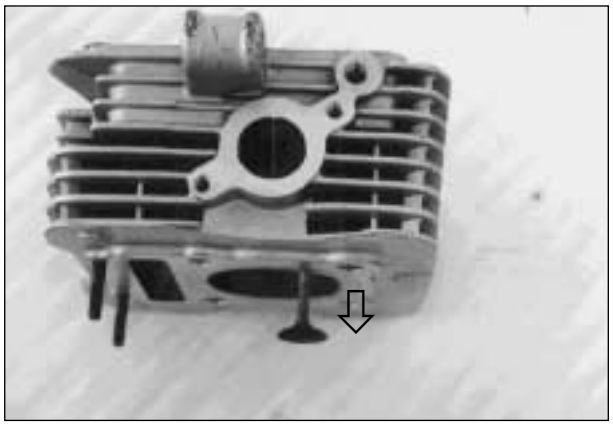
- Compress the valve spring by using the special tool.

09916-14510	Valve lifter
09916H35C00	Attachment

- Take off the valve cotters from valve stem.

09916-84510	Tweezers

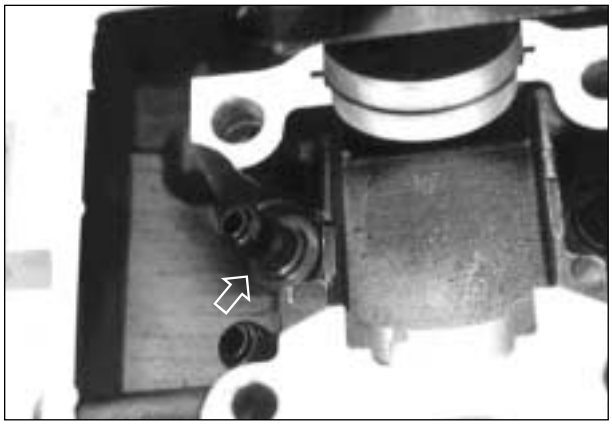
- Take out the valve spring retainer and spring.
- Pull out the valve from the other side.



● Remove oil seal, using long-nose pliers.

NOTE:
Removed oil seal should be replaced with a new one.

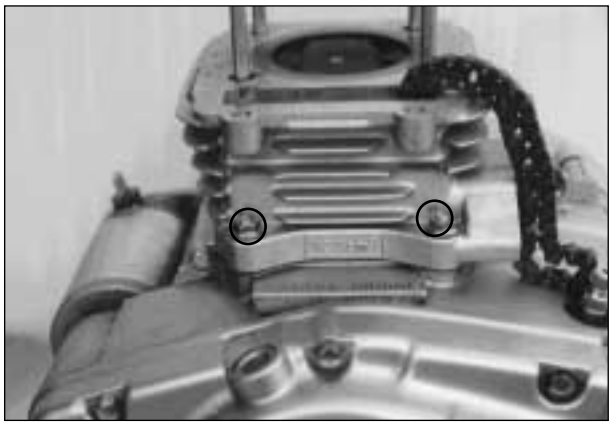
● Take out the spring seat.



CYLINDER

● Remove cylinder base nuts and cylinder.

CAUTION:
If tapping with plastic hammer is necessary, do not break the fins.

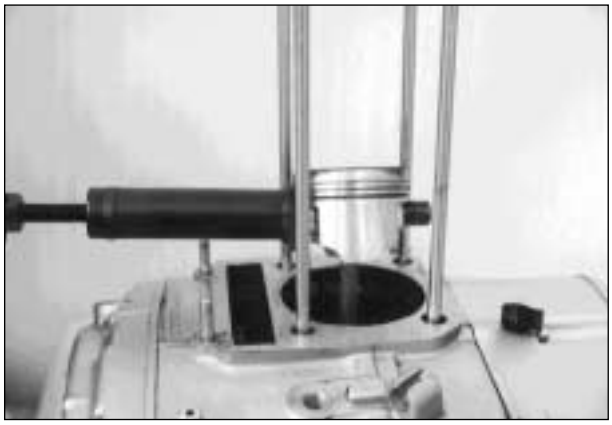


PISTON

● Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase and then, remove the piston pin circlip with long-nose pliers.

● Remove piston pin.

09910-34510	Piston pin puller

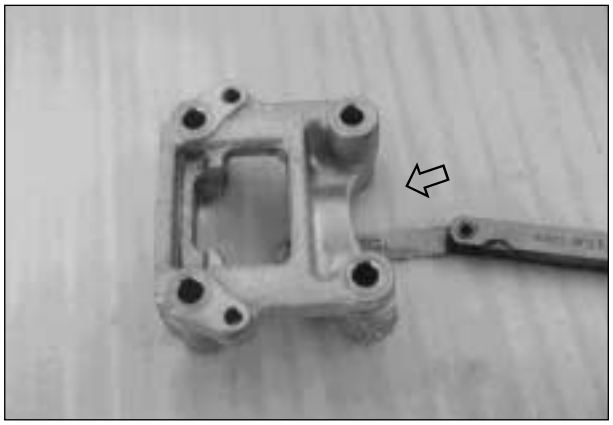


UPPER END COMPONENTS INSPECTION AND SERVICING

CAMSHAFT HOLDER DISTORTION

After removing oil from the fitting surface of the camshaft holder, place the camshaft holder on a surface plate and check for distortion with a thickness gauge. Check points are shown in Fig.

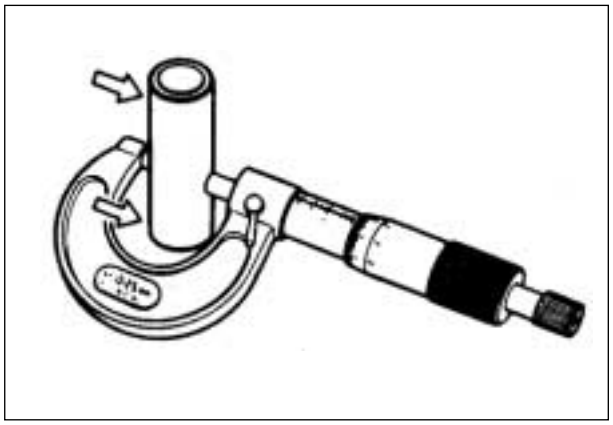
Service limit	0.05㎜



ROCKER ARM SHAFT O.D.

Measure diameter of rocker arm shaft.

Standard	11.977～11.955㎜



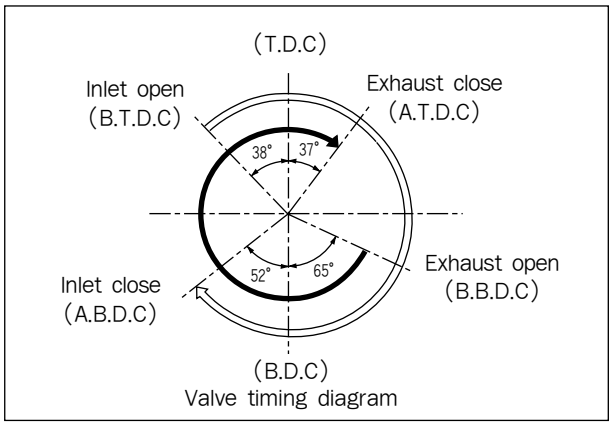
ROCKER ARM I.D.

When checking the valve rocker arm, the inside diameter of the valve rocker arm and wear of the camshaft contacting surface should be checked.

Standard	12.000～12.018㎜

CAMSHAFT

The camshaft should be checked for runout and also for wear of cams and journals if the engine has been noted to produce abnormal noise or vibration or a lack of output power. Any of these malconditions could be caused by a worn camshaft.

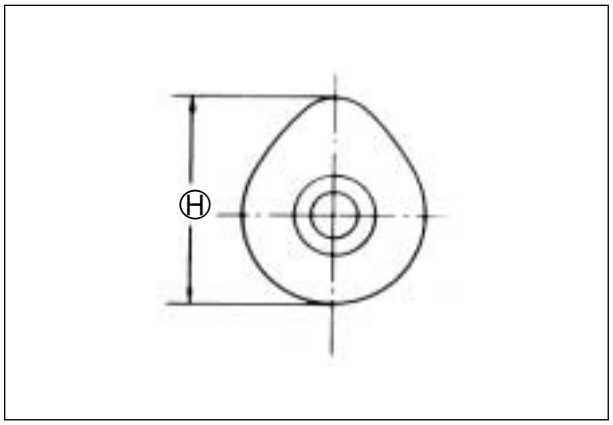


Valve timing diagram

CAMSHAFT CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced output power. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height Ⓗ, which is to be measured with a micrometer. Replace camshafts if found it worn down to the limit.

09900-20202	Micrometer(25~50㎜)



Cam height

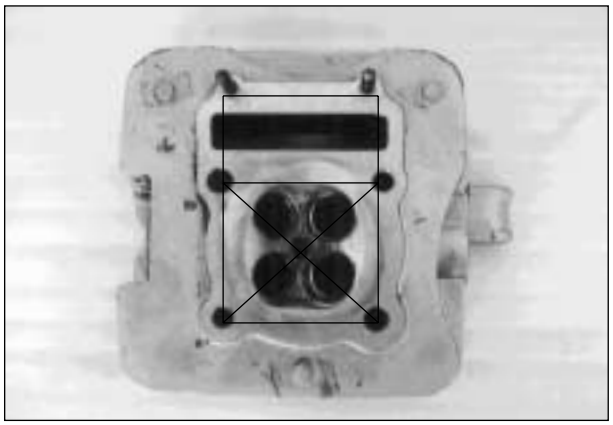
height Ⓗ	Service
Intake cam	34.18㎜
Exhaust cam	33.55㎜

CYLINDER HEAD DISTORTION

Decarbon combustion chamber.

Check the gasketed surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Service limit	0.05㎜

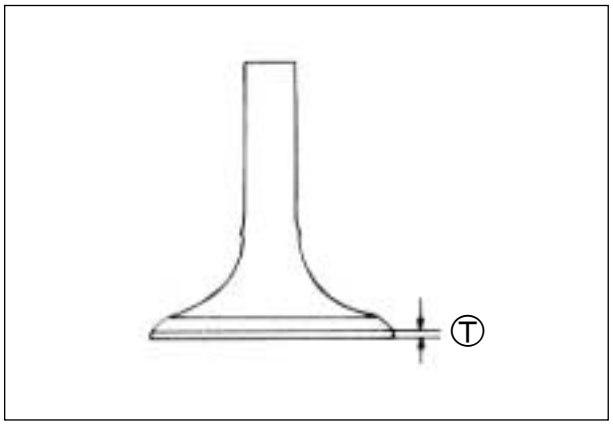


VALVE FACE WEAR

Measure the thickness Ⓣ and, if the thickness is found to have been reduced to the limit, replace the valve.

NOTE:
Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.

Service limit	0.5㎜

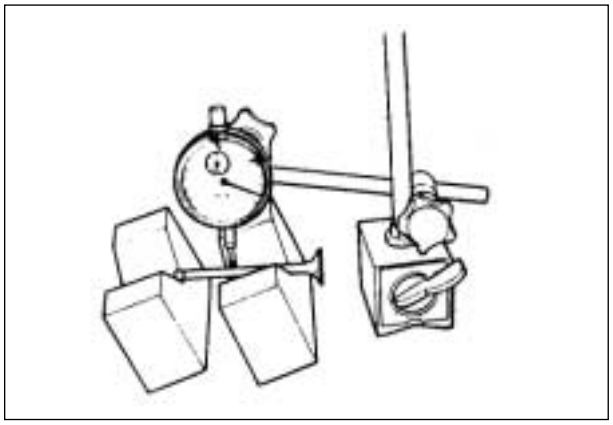


VALVE STEM RUNOUT

Support the valve with "V" blocks, as shown, and check its runout with a dial gauge. The valve must be replaced if the runout exceeds the limit.

09900-20701	Magnetic stand
09900-20606	Dial gauge(1/100㎜)
09900-21304	V-block(100㎜)

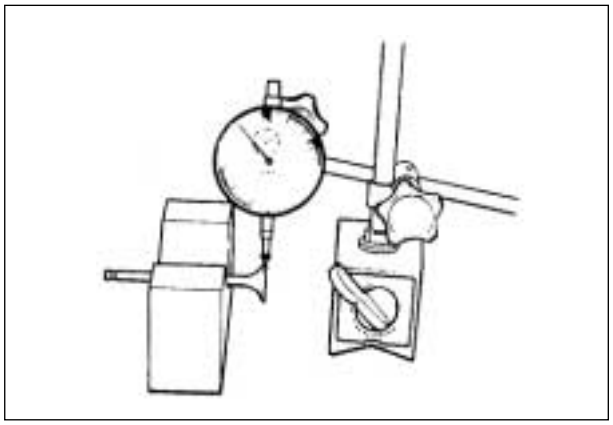
Service limit	0.05㎜



VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve head, and measure the valve head radial runout. If it measures more than limit, replace the valve.

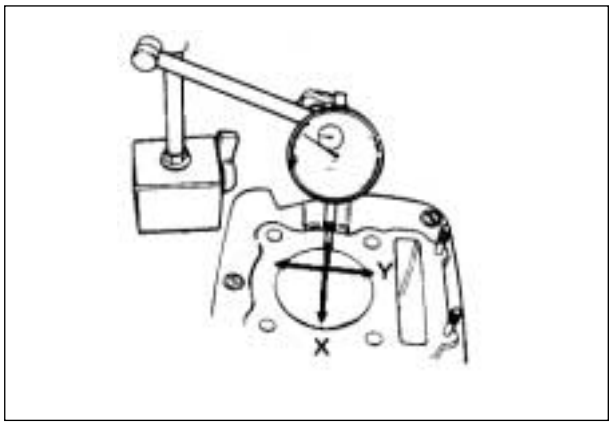
Service limit	0.03㎜



VALVE GUIDE-VALVE STEM CLEARANCE

Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by rigging up the dial gauge as shown. If the clearance measured exceeds the limit specified below, then determine whether the valve or the guide should be replaced to reduce the clearance to within the standard range:

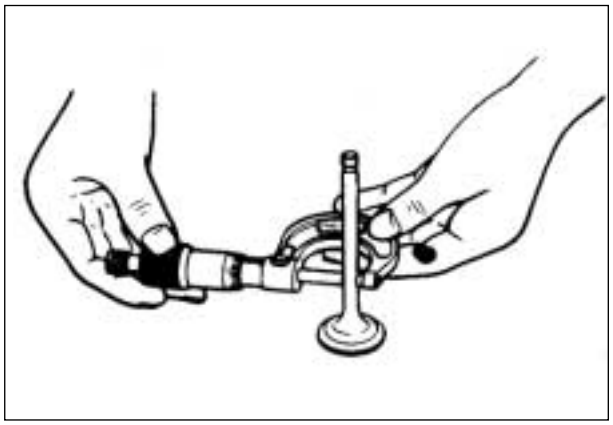
	Standard	Service limit
IN.	0.010～0.037㎜	0.35㎜
EX.	0.030～0.057㎜	0.35㎜



VALVE STEM WEAR

If the valve stem is worn down to the limit, when measured with a micrometer, and the clearance is found to be in excess of the limit previously indicated, replace the valve, if the stem is within the limit, then replace the guige. After replacing valve or guide, be sure to recheck the clearance.

09900-20205	Micrometer(0～25㎜)

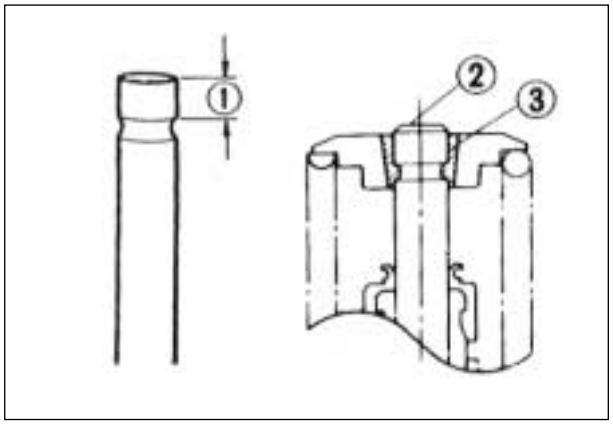


Valve stem O.D.

	Standard
IN.	4.975～4.990㎜
EX.	4.955～4.970㎜

VALVE STEM CONDITION

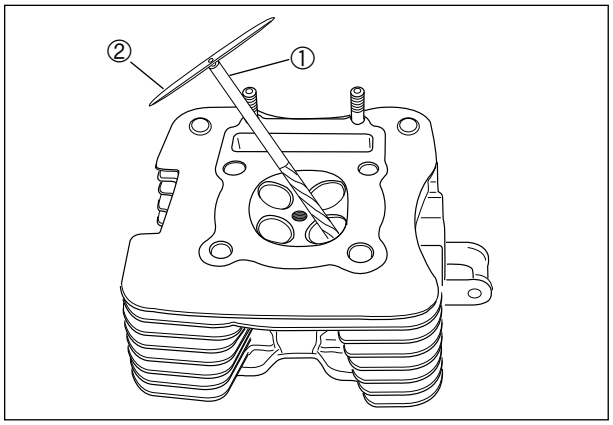
Inspect the valve stem end face for pitting and wear. If pitting or wear of the stem end face are present, the valve stem end may be resurfaced, providing that the length ① will not be reduced to less than 3.8㎜. If this length becomes less than 3.8㎜, the valve must be replaced. After installing a valve whose stem end has been ground off as above. check to ensure that the face ② of the valve stem end is above the cotters ③.



VALVE GUIDE INSTALLATION

- Re-finish the valve guide holes in cylinder head with a 10.5㎜ reamer ① and handle ②.

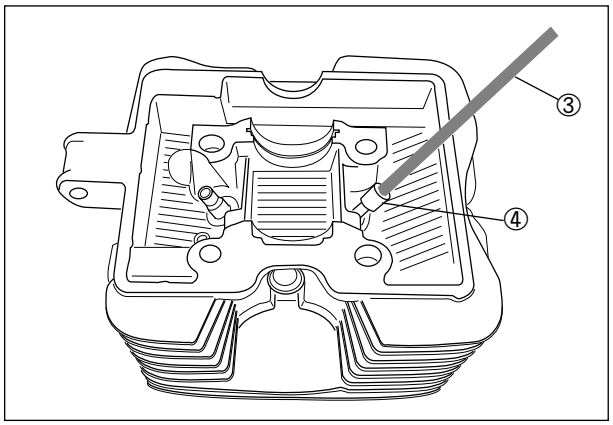
09916H34575	10.5㎜ reamer
09916-34541	Handle



- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Use of rings and valve guides removed in disassembly must be discarded.

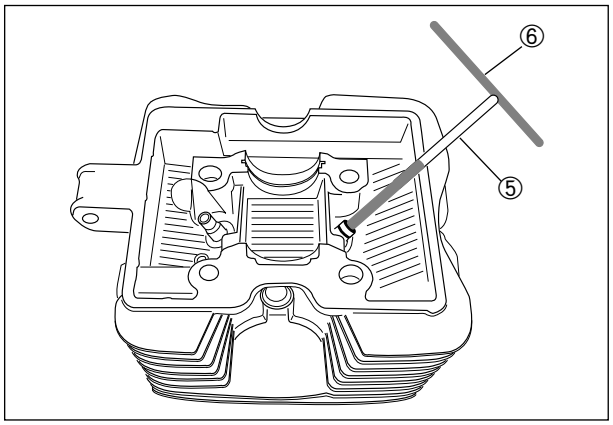
- Lubricate each valve guide and drive the guide into the guide hole using the valve guide installer handle ③ and valve guide installer attachment ④.

09916-44910	Valve guide installer and remover
09916-44920	Valve guide installer Attachment

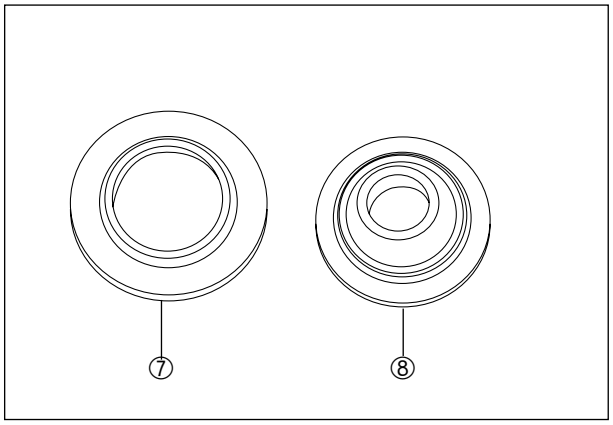


- After fitting all valve guides, re-finish their guiding bores will a 5.0㎜ reamer ⑤ and handle ⑥. Be sure to clean and oil the guides after reaming.

09916-34571	5.0㎜ reamer
09916-34541	Reamer handle



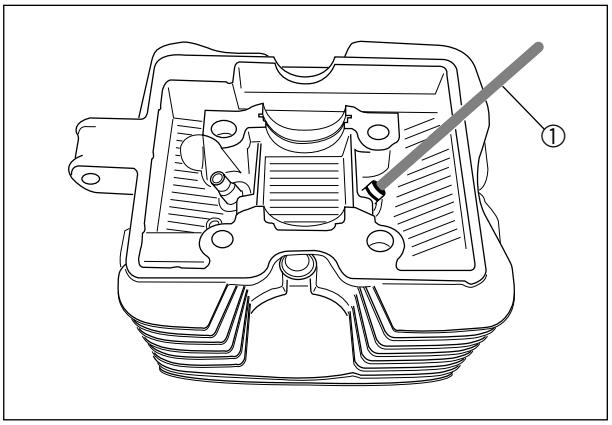
- Install valve spring lower seat ⑦. Be careful not to confuse the lower seat with the spring retainer ⑧.



● Lubricate each seal, and drive them into position with the valve stem seal installer ①.

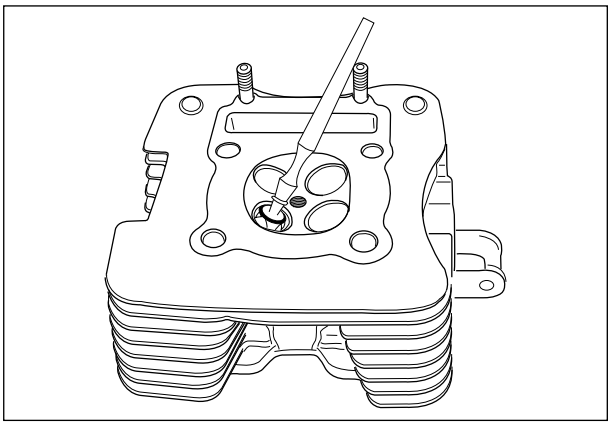
CAUTION:
Do not reuse the oil seals.

09916-44910	Valve guide installer and stem seal installer

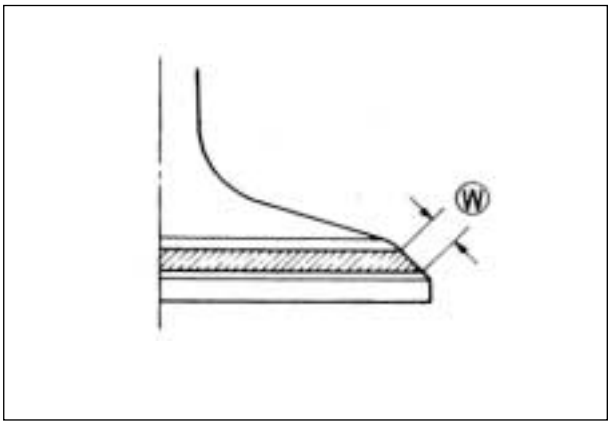


VALVE SEAT WIDTH

● Coat the valve seat with prussian blue uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.



● The ring-like dye impression left on the valve face must be continuous-without any break. In addition, the width of the dye ring, which is the visualized seat "width", must be within the specification.



Valve seat width

STD. Ⓦ	0.9~1.1㎜

If either requirement is not met, correct the seat by servicing it as follows.

VALVE SEAT SERVICING

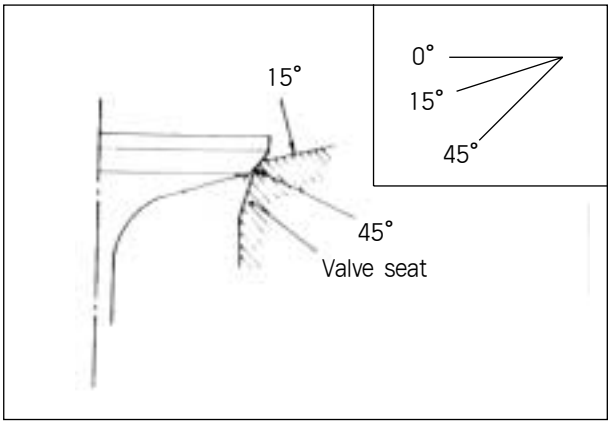
The valve seats for both intake and exhaust valves are angled to present two bevels, 15° and 45°.

09916-21110	Valve seat cutter set

Use only for 15° of intake side

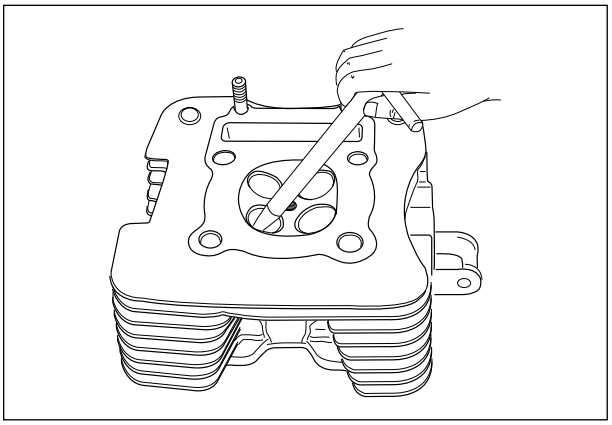
09916-24910	15° × 75° cutter(N-212)
09916-24480	Solid pilot(N-140-5.5)

NOTE:
The valve seat contact area must be inspected after each cut.



1. Insert with a slight rotation, the solid pilot that gives a snug fit. The shoulder on the pilot should be about 10 ㎜ from the valve guide.
2. Using the 45° cutter, descale and cleanup the seat with one or two turns.
3. Inspect the seat by the previous seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

CAUTION:
Cut the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.



If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area. If the contact area is too high or too wide, use the 15° cutter to lower and narrow the contact area.

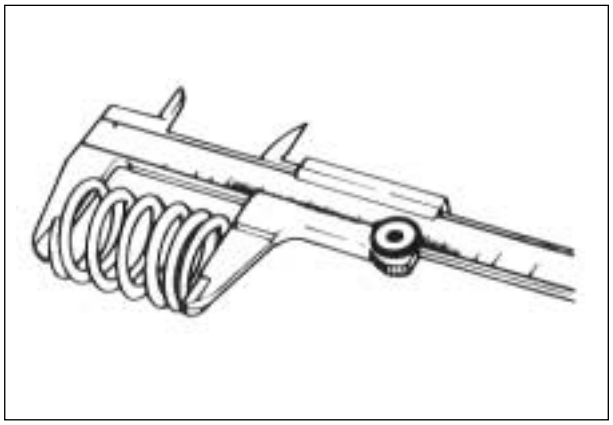
4. After the desired seat position and width is achieved, use he 45° cutter very lightly to clean up any burrs caused by the previous cutting operations. DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.
5. Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

WARNING:
Always use extreme caution when handling gasoline.

NOTE:
Be sure to adjust the valve clearance after reassembling the engine.

VALVE SPRINGS

Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force does not fall within the range specified, replace with a HYOSUNG spring as a set.



Valve spring free length

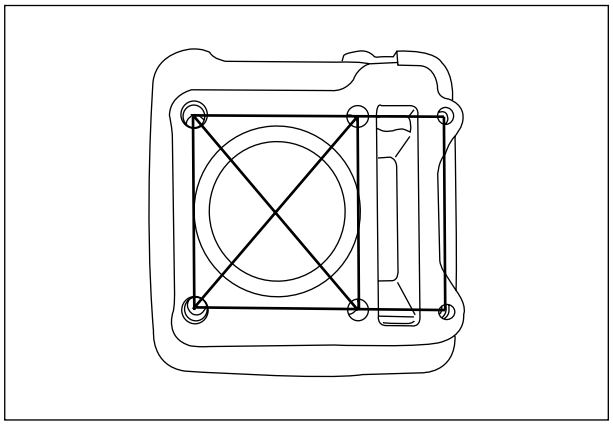
Spring	Service limit
IN. & EX.	41.65㎜

Valve spring tension

Spring	Standard
IN. & EX.	13.6～16.6㎏/36.6㎜

CYLINDER DISTORTION

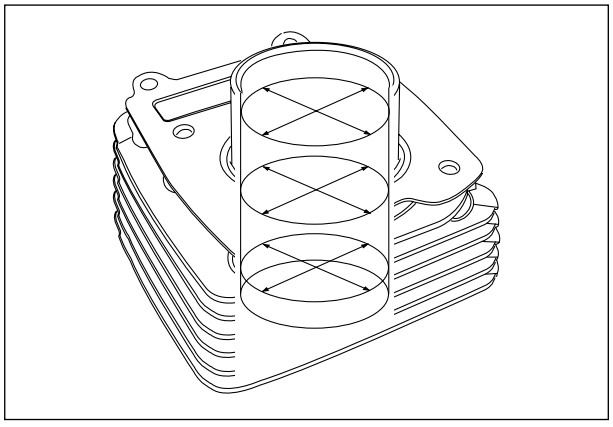
Check the gasketed surface of the cylinder for distortion with a straightedge and thickness guage, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder.



Service limit	0.05㎜

CYLINDER BORE

Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder.

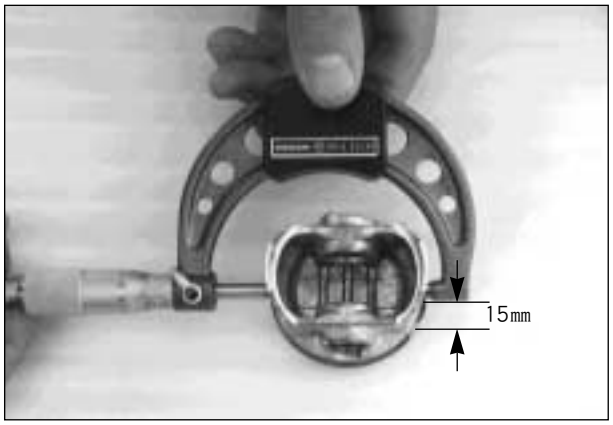


09900-20508	Cylinder guage set

Service limit	57.080㎜

PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place 15㎜ from the skirt end as shown in Fig. If the measurement is less than the limit, replace the piston.



09900-20203	Micrometer(50～75㎜)

Service limit	56.880㎜

Piston oversize	0.5, 1.0㎜

NOTE:
Using a soft-metal scraper, decarbon the crown of the piston. Clean the ring grooves similarly.

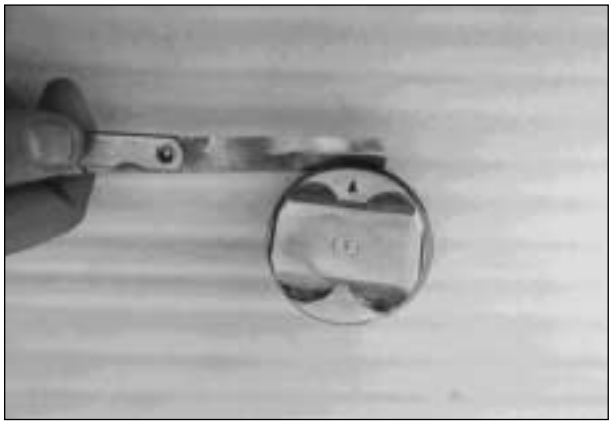
PISTON-CYLINDER CLEARANCE

As a result of the above measurement, if the piston to cylinder clearance exceeds the limit shown in the table below, overhaul the cylinder and use an oversize piston, or replace both cylinder and piston.

Service limit	0.120㎜

PISTON RING-GROOVE CLEARANCE

Using a thickness gauge, measure the side clearance of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.



09900-20803	Thickness gauge

Piston ring-groove clearance

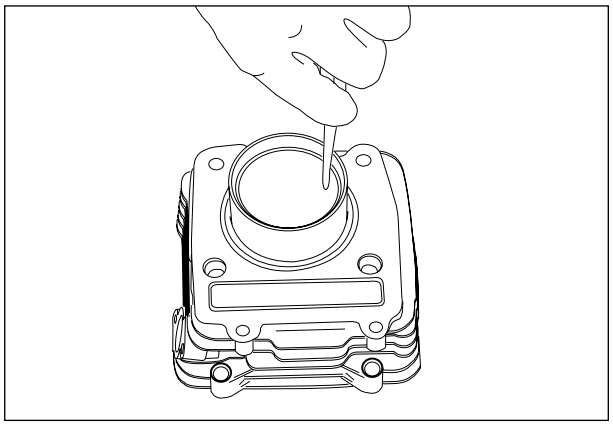
Piston ring	Service limit
1st	0.180㎜
2nd	0.150㎜

Piston ring groove width

Piston ring	Standard
1st	1.01～1.03㎜
2nd	1.01～1.03㎜
Oil	2.01～2.03㎜

PISTON RING FREE END GAP AND PISTON RING END GAP

Before installing piston rings, measure the free end gap of each ring using vernier calipers.
Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.
If any ring has an excess end gap, replace the ring.



Piston ring free end gap R:(RIKEN)

Piston ring		Service limit
1st	R	5.7㎜
2nd	R	4.6㎜

09900-20101	Vernier calipers

Piston ring free end gap

Piston ring	Service limit
1st and 2nd	0.50㎜

09900-20803	Thickness gauge

Piston ring thickness

Piston ring	Standard
1st	0.970～0.990㎜
2nd	0.970～0.990㎜

OVERSIZE RINGS

● **Oversize piston rings**

The following two types of oversize piston rings are used. They bear the following identification numbers.

Piston ring	1st	2nd
0.5㎜	50	50
1.0㎜	100	100

● **Oversize oil rings**

The following two types of oversize oil ring are used. They bear the following identification marks.

0.5㎜	Painted red
1.0㎜	Painted yellow

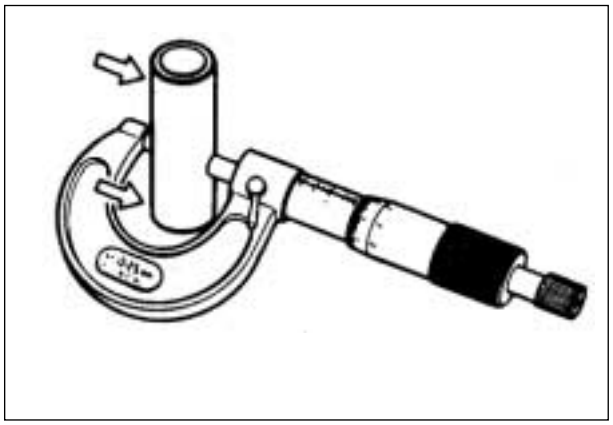
● **Oversize side rail**

Just measure outside diameter to identify the side rail as there is no mark or numbers on it.

PISTON PIN-PIN BORE

Using a caliper gauge, measure the piston pin bore inside diameter, and using a micrometer measure the piston pin outside diameter. If the difference between these two measurements is more than the limits, replace both piston and piston pin.

09900-20205	Micrometer(0～25㎜)

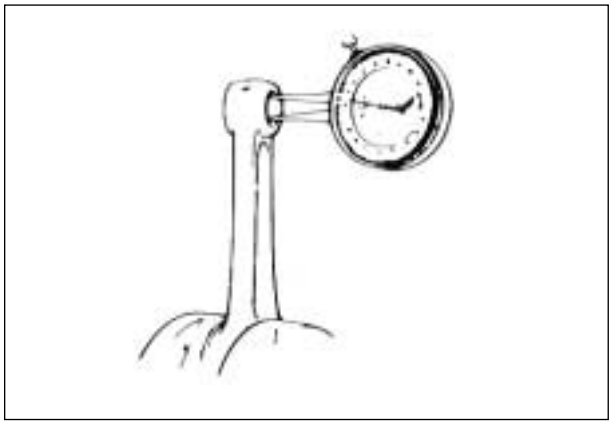


Piston pin bore

Service limit	15.030㎜

Piston pin O.D.

Service limit	14.980㎜



CONROD SMALL END I.D.

Using a caliper gauge, measure the conrod small end inside diameter.

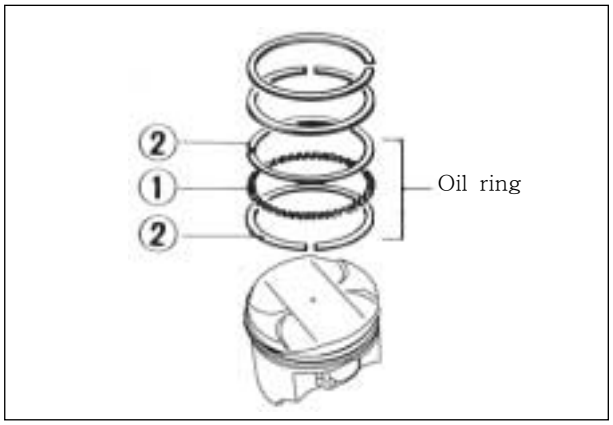
Service limit	15.040㎜

● If the conrod small end bore inside diameter exceeds the limit, replace conrod.

UPPER END COMPONENTS REASSEMBLY

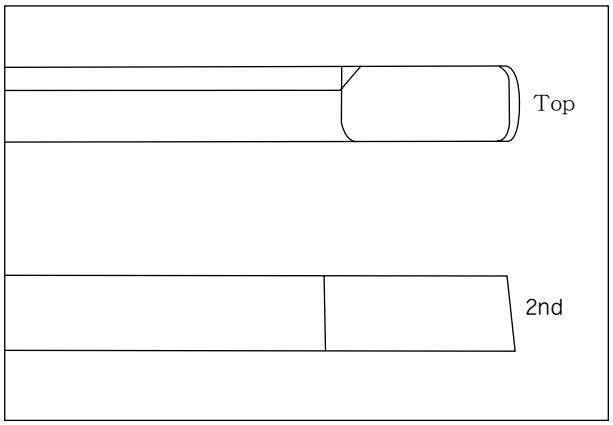
OIL RING

Install spacer ① into the bottom ring groove first. Then install both side rails ②, one on each side of the spacer. The spacer and side rails do not have a specific top or bottom when they are new. When reassembling used parts, install them in their original place and direction.

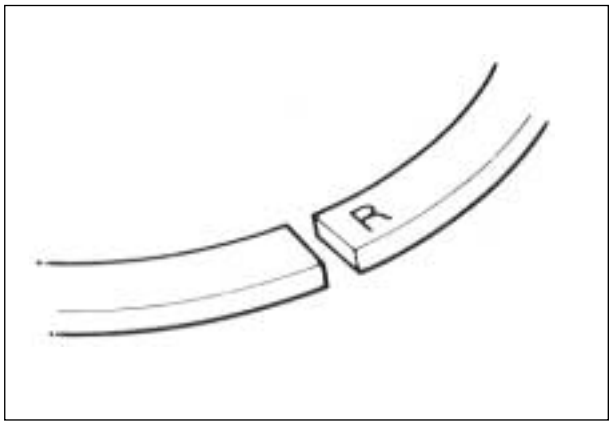


TOP RING AND 2ND RING

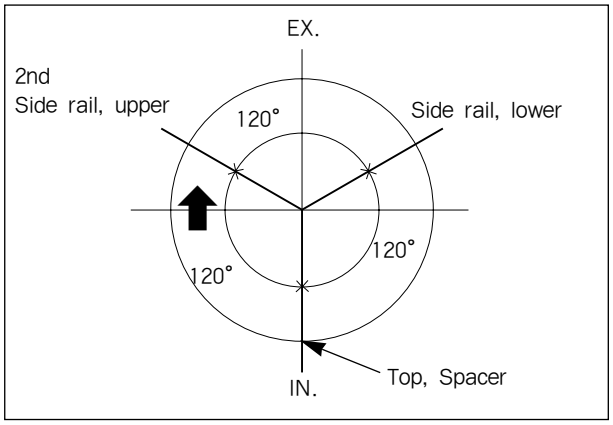
Top ring and 2nd ring differ in the shape of ring face and the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.



Install expander ring into the 2nd ring groove. Top and 2nd rings have the letter "R" or "Y" marked on the top. Be sure to bring the marked side to the top when fitting them to the piston.



Position the gaps of the three rings as shown.
Before inserting piston into the cylinder, check that the gaps are so located.



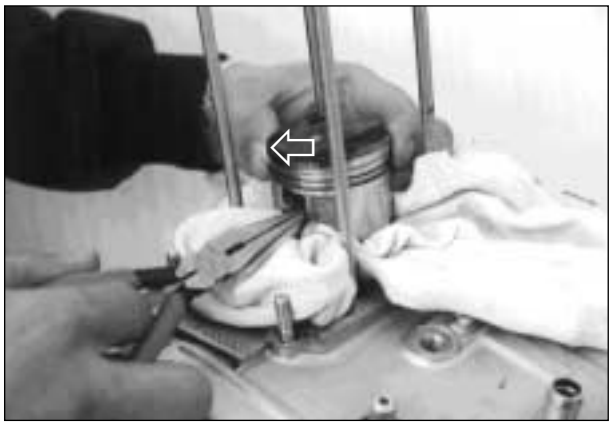
PISTON

The following are reminders for piston installation:

- Rub a small quantity of HYOSUNG MOLY PASTE onto the piston pin.
- Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase, and then fit the piston pin circlip with long-nose pliers.

CAUTION:
Use a new piston pin circlip to prevent circlip failue which will occur with a bent one.

- When fitting the piston, turn arrow mark on the piston head to exhaust side.

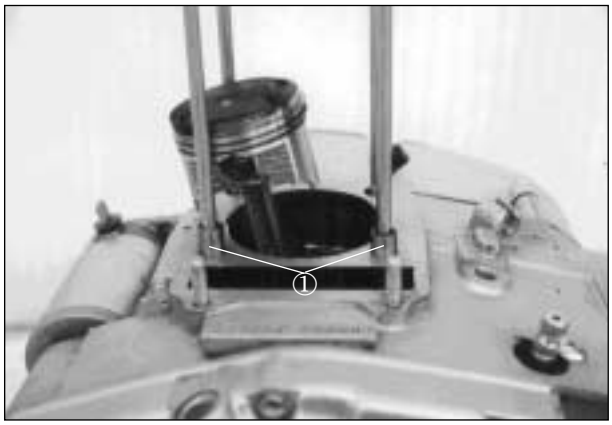


CYLINDER

Before mounting the cylinder, oil the big end and small end of the conrod and also the sliding surface of the piston.

- Fit dowel pins ① to crankcase and then fit gasket.

CAUTION:
To prevent oil leakage, do not use the old gasket again, always use new one.



- Hold each piston ring with the piston rings properly spaced and insert them into the cylinder.

  Check to insure that the piston rings are properly inserted into the cylinder skirt.

NOTE:
When mounting the cylinder, after attaching camshaft drive chain, keep the camshaft drive chain taut. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.

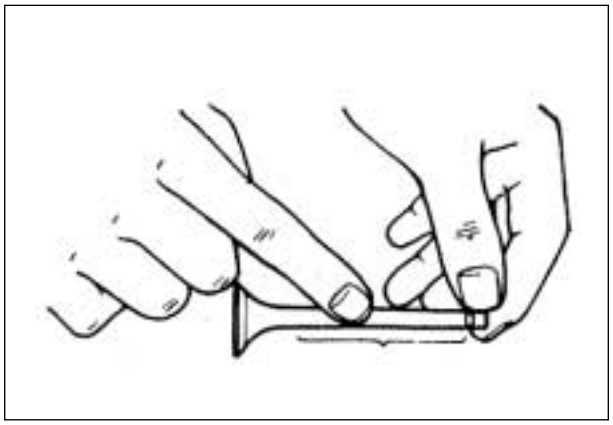
NOTE:
There is a holder for the bottom end of the cam chain guide cast in the crankcase. Be sure that the guide is inserted properly or binding of the cam chain and guide may result.

VALVE AND SPRING

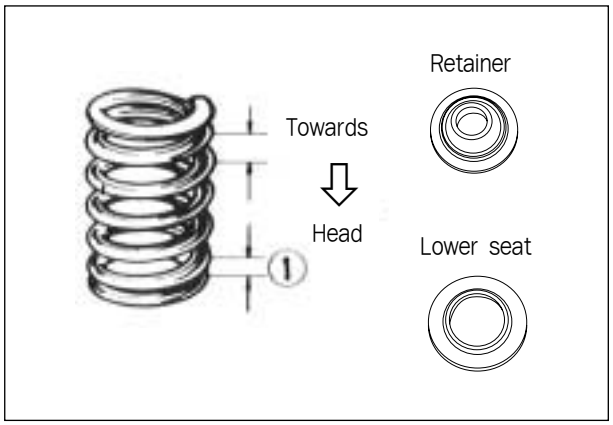
- Insert the valves, with their stems coated with (HYOSUNG MOLY PASTE) all around and along the full stem length without any break.
  Similarly oil the lip of the stem seal.

99000-25140	Hyosung moly paste

CAUTION:
When inserting each valve, take care not to damage the lip of the stem seal.



- Insert valve springs, making sure that the close-pitch end ① of each spring goes in first to rest on the head. The coil pitch is vary: the pitch decreases from top to bottom, as shown in the illustration.

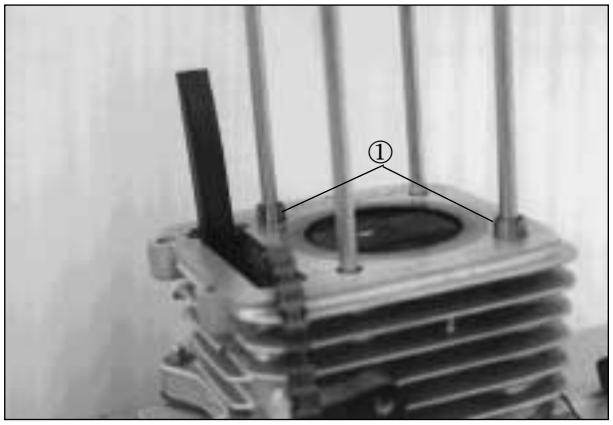


- Fit valve spring retainer, compress spring with a valve lifter and insert cotters.

CYLINDER HEAD

- Fit dowel pins ① to cylinder head, and then attach new gasket to cylinder head.

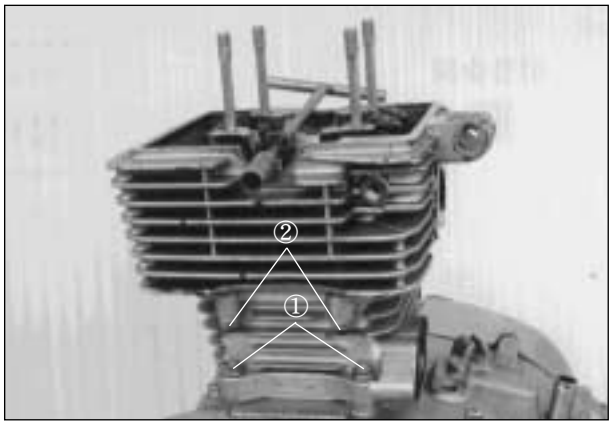
CAUTION:
Use a new cylinder head gasket to prevent oil leakage. Do not use the old gasket.



- Fit the cylinder head.
- Tighten the cylinder base nuts ①.
- Tighten the cylinder head base nuts ②.

Cylinder base nuts tightening Torque	60～80kg · cm

NOTE:
When mounting the cylinder, after attaching camshaft drive chain, keep the camshaft drive chain taut. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.



CAMSHAFT

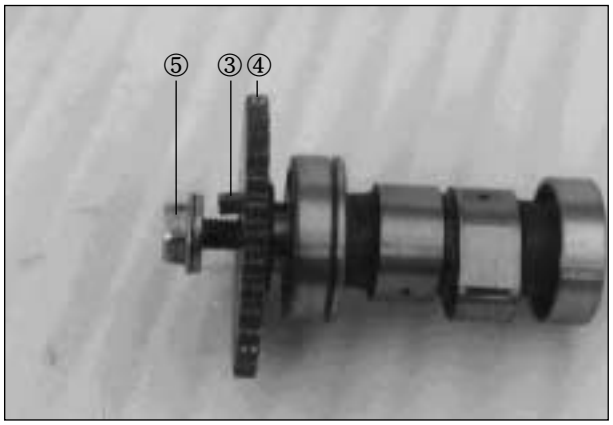
- Align the mark on magneto rotor with the index mark on the crankcase keeping the camshaft drive chain pulled upward.

CAUTION:
If crankshaft is turned without drawing the camshaft drive chain upward, the chain will be caught between crankcase and cam chain drive sprocket.

- Install the key ③, cam sprocket ④ and center bolt ⑤, tighten it with a torque wrench to the specified torque.

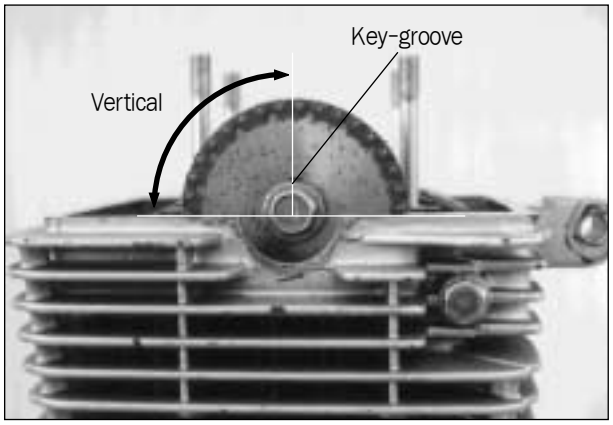
NOTE:
This is a left-hand thread bolt.

Tightening torque	250～300kg · cm

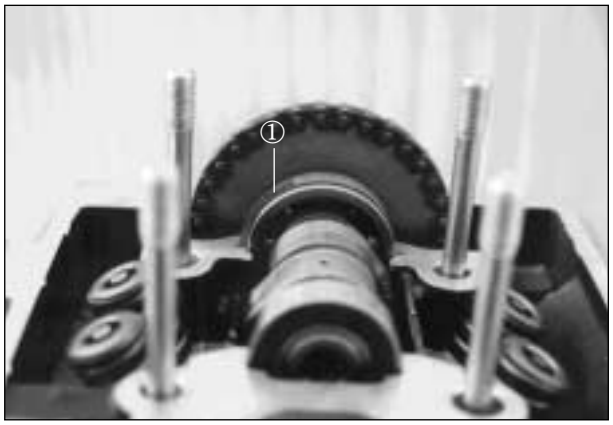


- Align the key-groove on the camshaft so it is vertical with the surface of the cylinder head.

NOTE:
Do not rotate magneto rotor while doing this. When the sprocket is not positioned correctly, turn the sprocket.

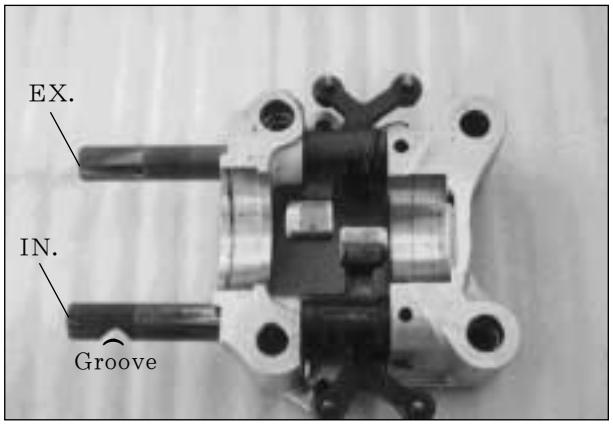


- Install the camshaft lock C-ring ①.

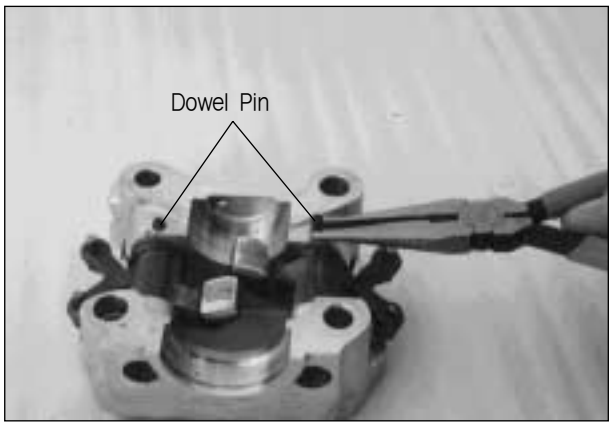


CAMSHAFT HOLD

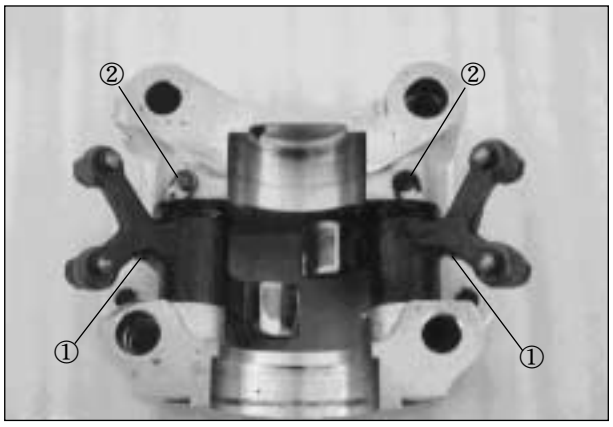
- Apply HYOSUNG MOLY PASTE to the rocker arm shafts.
- Install the rocker arm spring, rocker arm and inserting the shafts.



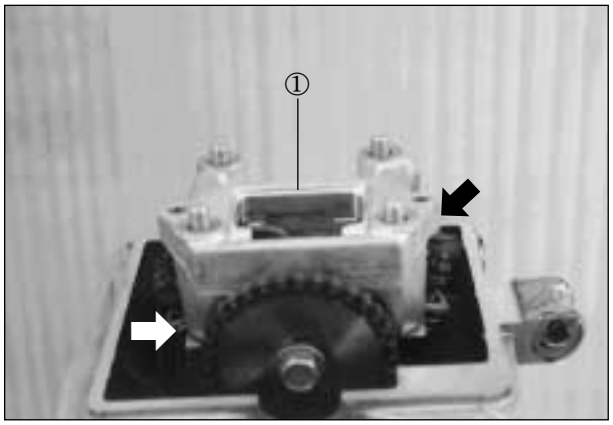
- Fit the two dowel pins to the camshaft holder.



- When fitting rocker arm spring, hook part ① of rocker arm spring onto rocker arm and hook part ② of rocker arm spring onto the dowel pins.

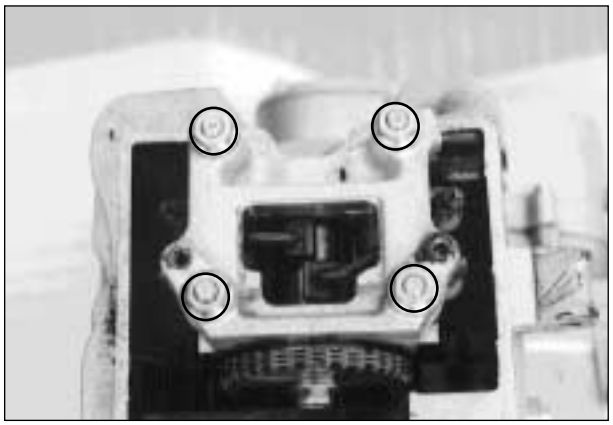


● Fit the two dowel pins and install the camshaft holder ①.



● Tighten the camshaft holder nuts to the specified.

Tightening torque	250～290kg・cm

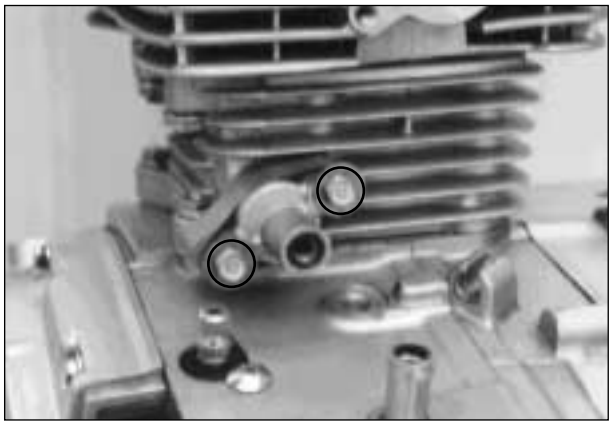


CHAIN TENSIONER

● Remove the bolt and spring at the tensioner body.
● Mount the tensioner body on the cylinder.

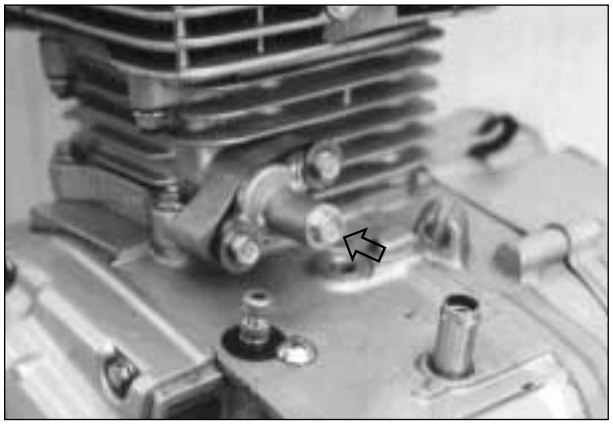
NOTE:
Racket side of tensioner is positioned cylinder head side.

Tightening torque	60～80kg・cm



● Install the spring and bolts.

Tightening torque	60～80kg・cm



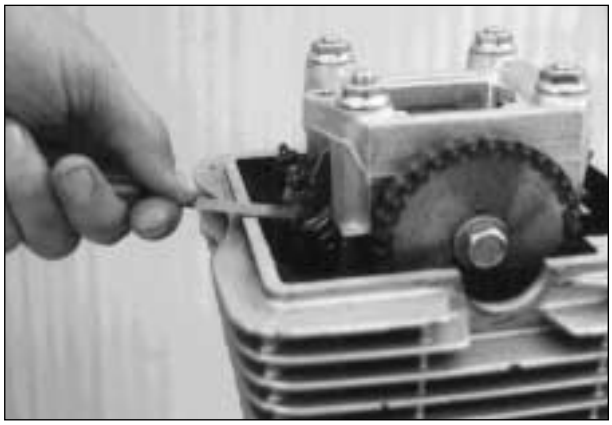
VALVE CLEARANCE

- After tightening the camshaft holder lock nuts, check and adjust the valve clearance.

Valve clearance specifications

IN. and EX.	0.10~0.13㎜

NOTE:
Valve clearance is to be checked when the engine is cold.
Both the intake and exhaust valves must be checked and adjusted when the piston is at Top-Dead-Center(TDC) of the compression stroke.

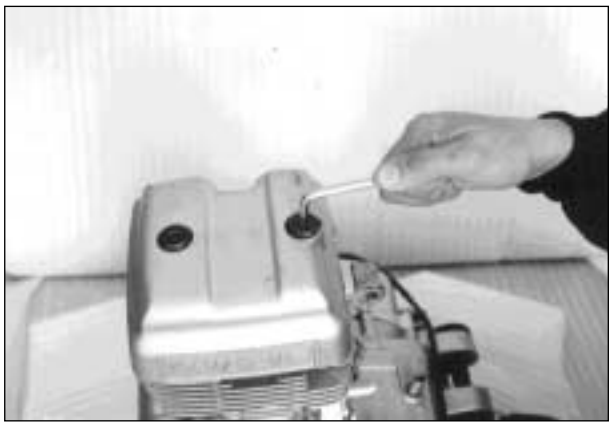


CYLINDER HEAD COVER

- Clean off oil from the surfaces of cylinder head and cover.
- Fit the packing ② to the cylinder head cover ①.

- Tighten the cylinder head cover bolts with hexagon wrench.

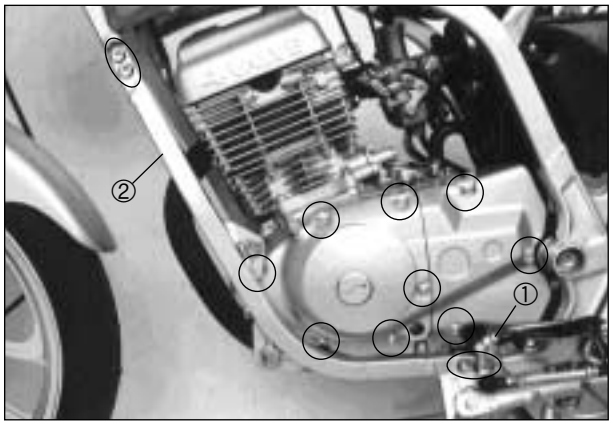
Tightening torque	120~160㎏ · ㎝



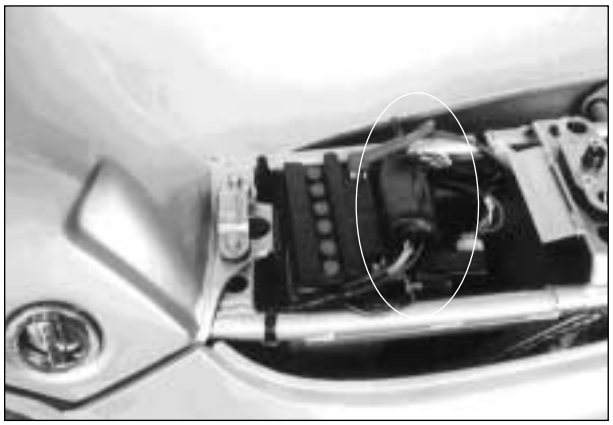
LEFT ENGINE DISASSEMBLY

MAGNETO ROTOR

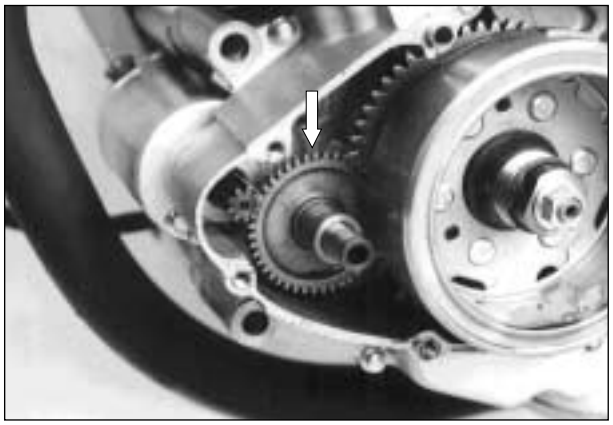
- Remove gear change lever bolt ①.
- Remove the frame down tube ② by removing the mounting bolts.
- Remove sprocket cover bolts and detach sprocket cover.
- Remove magneto cover bolts and detach magneto cover.



- Detach magneto leadwire terminal.



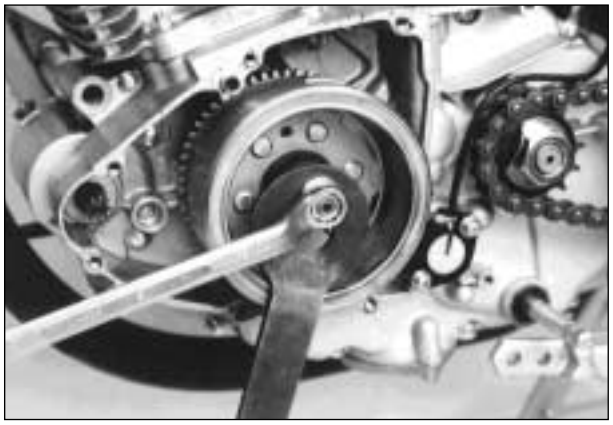
- Remove the starter idle gear.



- Remove magneto rotor nut.

09930-44511	Rotor holder

NOTE:
Do not allow camshaft drive chain to be caught between crankcase and camshaft drive sprocket.

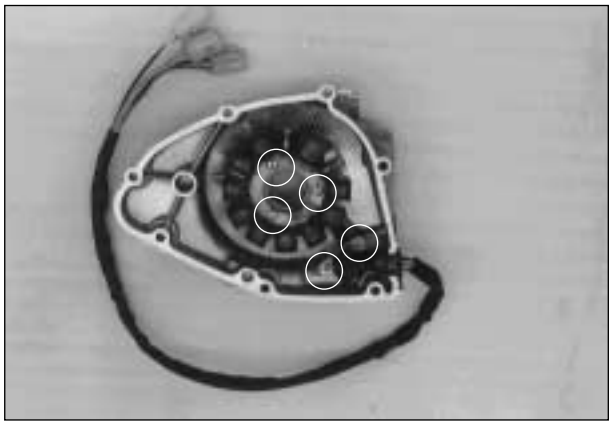


● Remove magneto rotor and key.

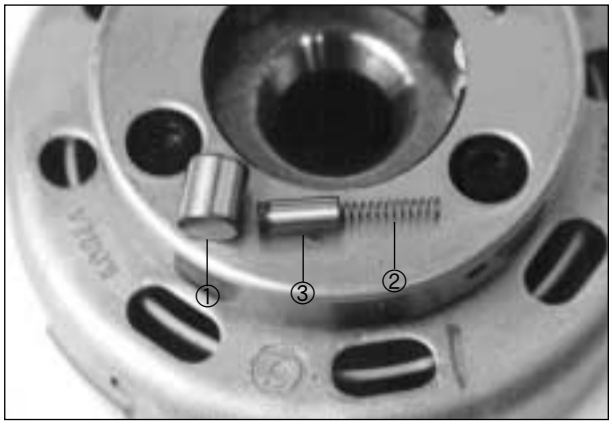
09930-30162	Rotor remover

● Remove starter clutch gear.

● Remove stator screw by using the impact drive and detach stator.

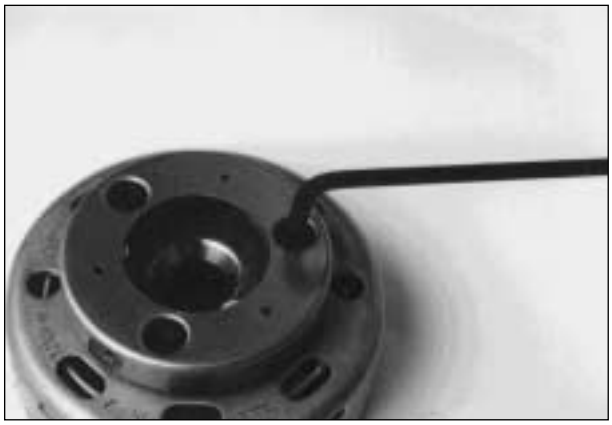


● Remove roller ①, spring ② and push piece ③ from stater clutch.



● Clamp the rotor with a vise taking care not to damage it and remove the three allen bolts using the 5mm "L" type hexagon wrench.

09900-00401	"L" type hexagon(5mm)



GEAR POSITION SWITCH

● Remove the gear position indicator switch by removing the screws.

NOTE:
When removing gear position switch, do not lose the O-ring, switch contact and spring.

ENGINE SPROCKET

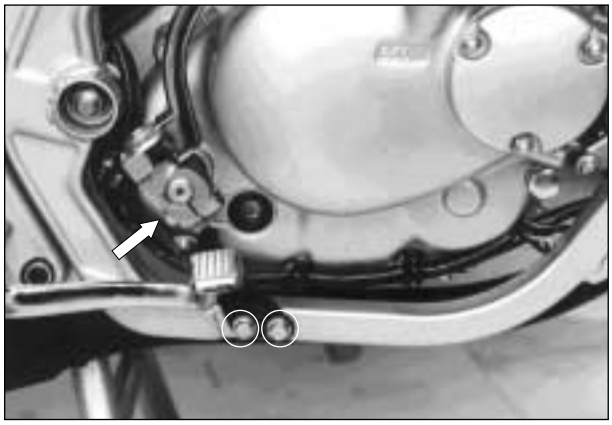
● Remove the drive chain.(Refer to page 3-4)
● Flatten the lock washer, then remove the sprocket nut by using the special tool.

09930-40113	Rotor and sprocket holder

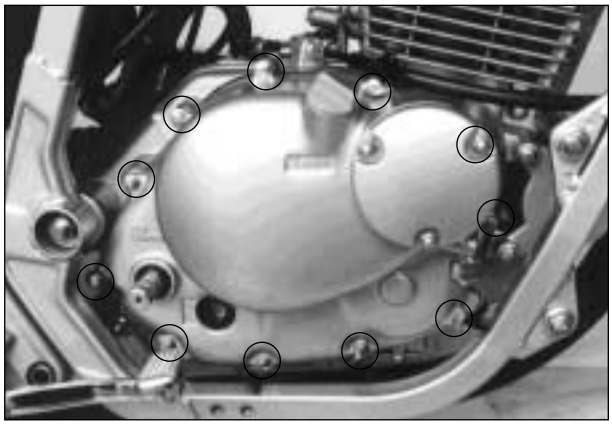
RIGHT ENGINE DISASSEMBLY

CLUTCH

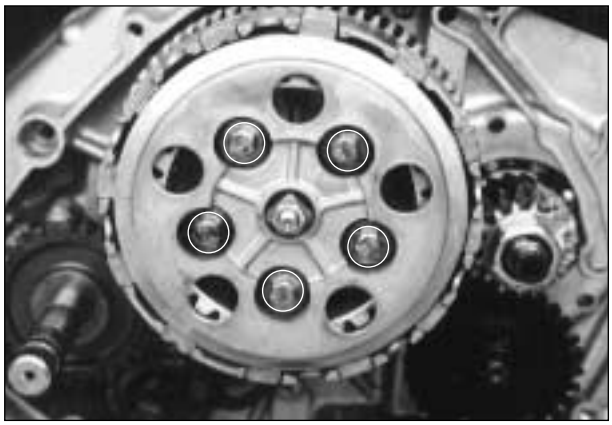
● Remove the kick starter by removing bolt.
● Remove the kick starter lever stopper by removing bolts.



- Remove clutch cover bolts and oil filter cap bolts, and detach clutch cover by tapping with a plastic hammer.



- Remove clutch spring mounting bolts diagonally while holding the primary driven gear, and remove clutch pressure plate.



- After removal of clutch drive and driven plates, flatten the lock washer and remove the clutch sleeve hub by using the special tool.

09920-53710	Clutch sleeve hub holder

- Take off the sleeve hub with the primary driven gear ass'y.

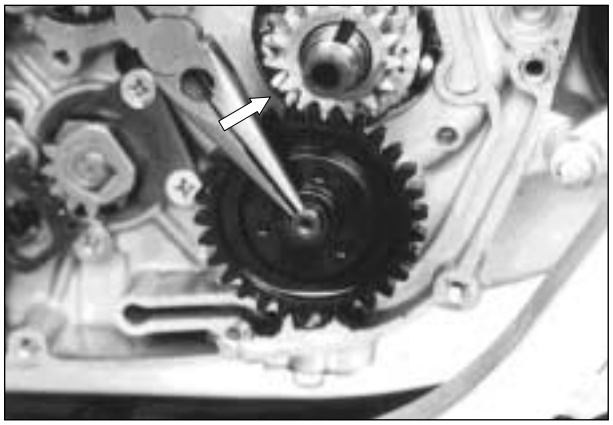
OIL PUMP DRIVE GEAR, DRIVEN GEAR AND PRIMARY DRIVE GEAR.

- Flatten the lock washer, then remove the nut, lock washer and oil pump drive gear.

09910-20116	Conrod holder

CAUTION:
This is a left-hand thread nut.

● Remove oil pump driven gear, then remove primary drive gear and key.



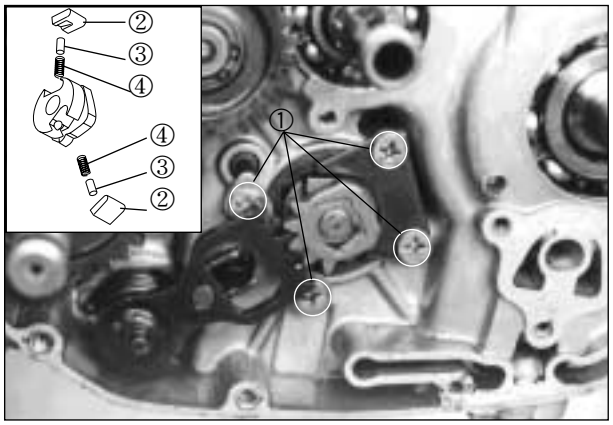
OIL PUMP

● Remove oil pump mounting screws and take off oil pump body.

GEAR SHIFTER

● To remove cam driven gear, first remove gear shifting shaft, and loosen pawl lifter and cam guide screws ① with an impact driver.

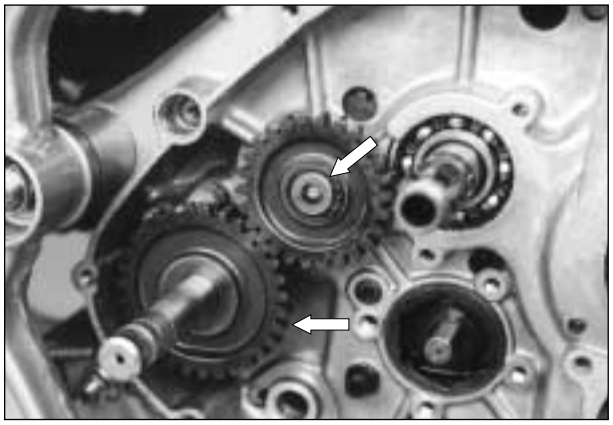
NOTE:
When removing cam driven gear, do not lose gear shifting pawl ②, pin ③ and spring ④.



KICK STARTER DRIVE GEAR AND IDLE GEAR

● Remove kick starter drive gear and kick starter idle gear.

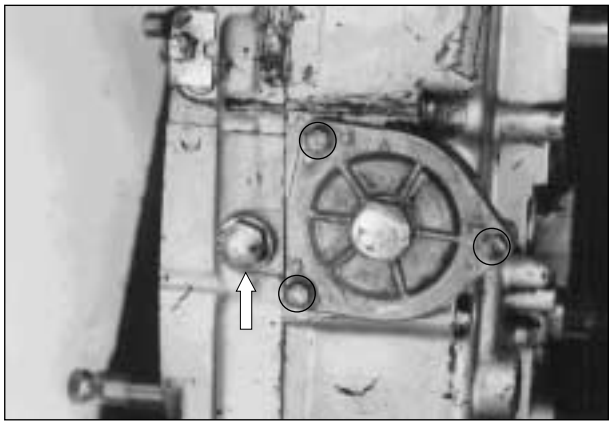
09900-06107	Snap ring pliers



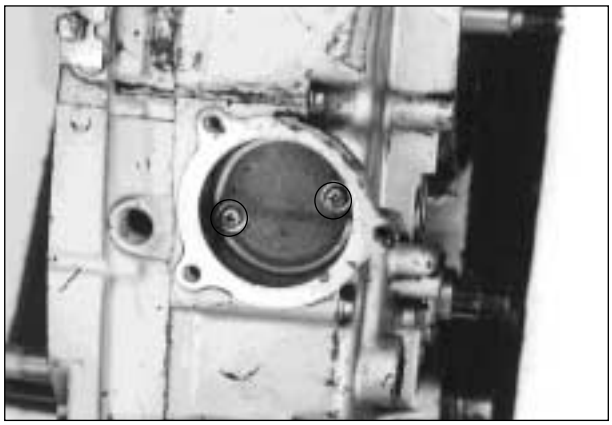
LOW END COMPONENTS DISASSEMBLY

CRANK CASE

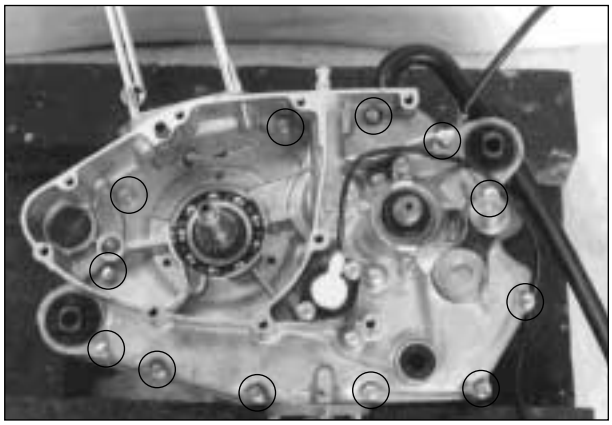
- Remove sump filter cap and neutral cam stopper.



- Remove sump filter.



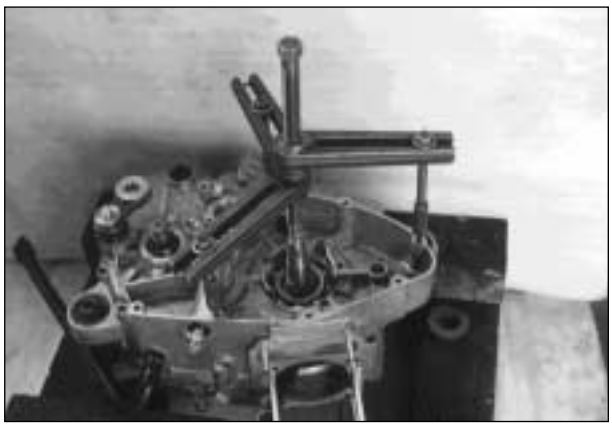
- Remove crankcase securing bolts.



- Separte the crankcase into 2 parts, right and left with crankcase separating tool.

09920-13120	Crankcase separating tool

- Fit the crankcase separating tool, so that the tool plate is parallel with the end face of the crankcase.

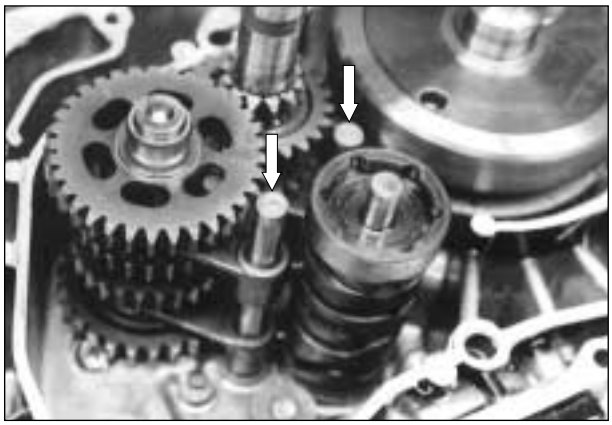


CAUTION:
The crankshaft and transmission components must remain in the left crankcase half. This is necessary because the gear shifting cam stopper is mounted on the left crankcase half and will be damaged if the transmission components remain in the right half.

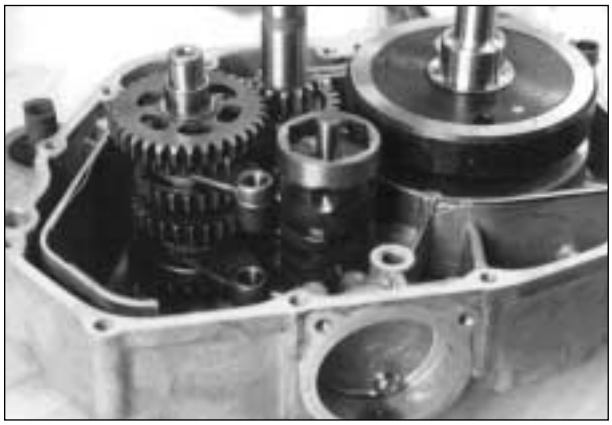
TRANSMISSION

- Remove gear cam stopper spring.

- Draw out gear shifting fork shafts and take off forks.

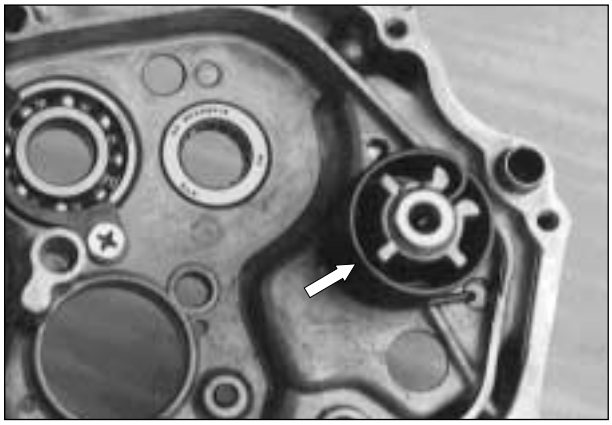


- Remove clusters of gears and gear shifting cam.



KICK STARTER SHAFT

- Remove circlip, spring guide and return spring.
- Then, pull out the kick starter shaft from the other side.



CRANKSHAFT

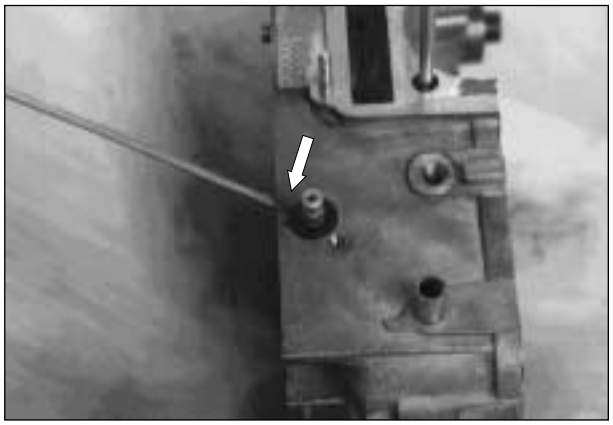
- Remove crankshaft by using crankcase remover.

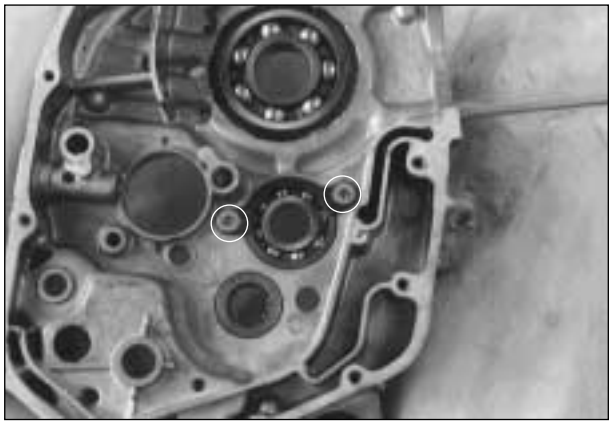
09920-13111	Crankshaft remover

OIL SEAL AND BEARING

- Remove retainer, oil seals and bearings.

09913-50121	Oil seal remover





LOWER END COMPONENTS INSPECTION AND SERVICING

CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

Wear on the big end of the conrod can be estimated by checking the movement of the samll end of the rod. This method can also check the extent of wear on the parts of the conrod's big end.

Service limit	3.0mm

09900-20701	Magnetic stand
09900-20606	Dial gauge(1/100mm)
09900-21304	V-block(100mm)

09900-20803	Thickness gauge

Push the big end of the conrod to one side and measure its side clearance with a thickness gauge.

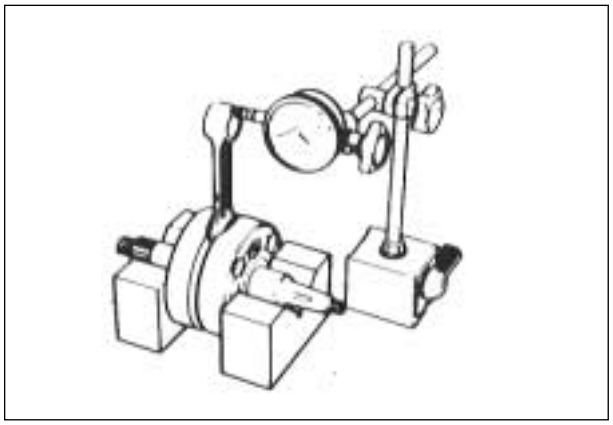
Standard	Service limit
0.10-0.45mm	1.00mm

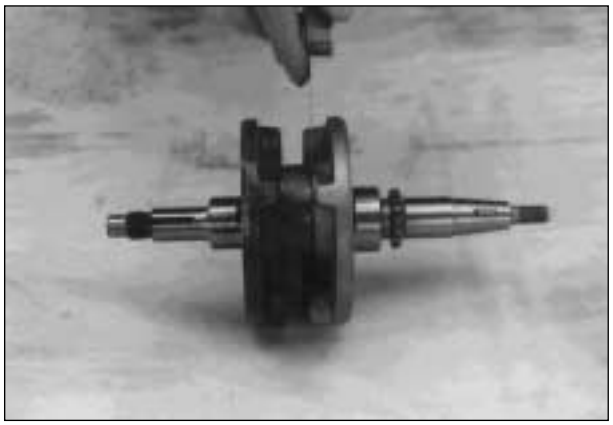
Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance to within the limit by replacing the worn parts-conrod, big end bearing, crankpin and thrust washers, etc. (Refer to the SERVICE DATA).

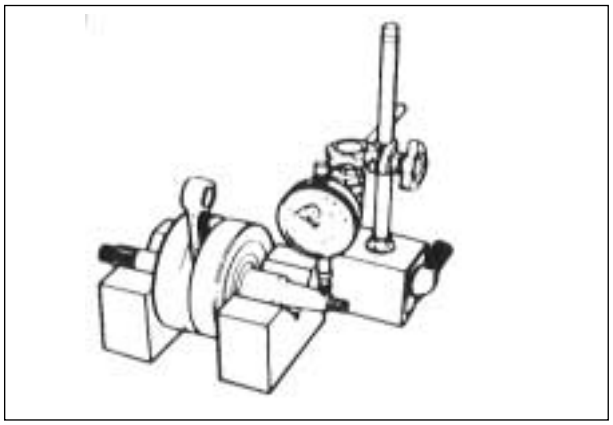
CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end joumals resting on the blocks.
Position the dial gauge, as shown, and rotate the crankshaft slowly to read the runout.
Correct or replace the crankshaft if the runout is greater than the limit.

Service limit	0.05mm





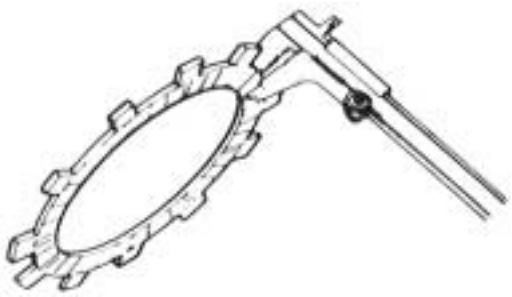


CLUTCH DRIVE PLATE

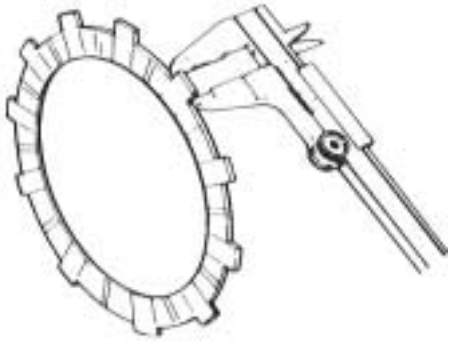
Measure the thickness and claw width of each drive plate with vernier calipers. Replace drive plates found to have worn down to the limit.

09900-20101	Vernier callipers

Item	Standard	Limit
Thickness	2.9-3.1mm	2.6mm
Claw width	11.8-12.0mm	11.0mm



Checking thickness



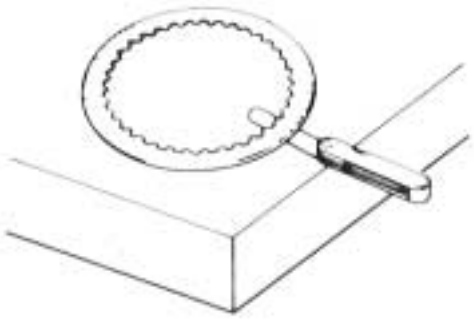
Checking claw width

CLUTCH DRIVEN PLATE

Measure each driven plate for distortion with a thickness gauge. Replace driven plates which.

Service limit	0.1mm

09916-20803	Thickness gauge



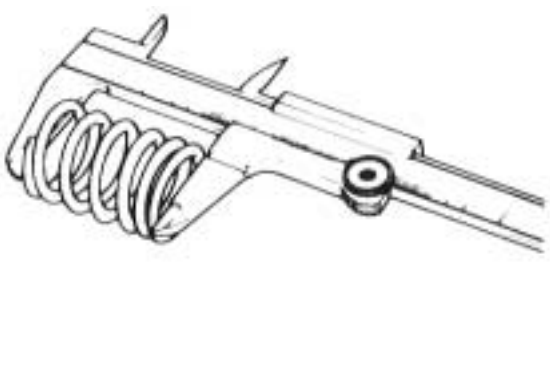
Checking distortion

CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with a vernier calipers, and determine the elastic strength of each. If any one of springs is not within the limit, replace all the springs at a time.

09900-20101	Vernier calipers

Service limit	29.5mm



CLUTCH RELEASE BEARING

Inspect the release bearing for any abnormality, particalarly cracks, to decide whether it can be reused or should be replaced.
Smooth engagement and disengagement of the clutch depends much on the condition of this bearing.

SHIFTING FORK AND GEAR

Using a thickness gauge, check the shifting fork clearance in the groove of its gear. If the clearance limit is exceeded by any of the three gears, determine whether the gear or the gear shifting fork should be replace by measuring the thickness and groove width.

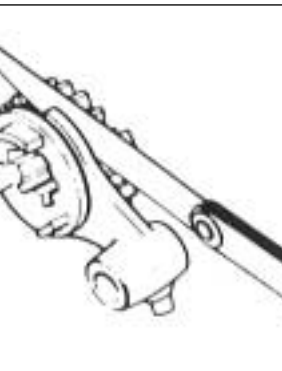
09900-20803	Thickness gauge

09900-20101	Vernier calipers

Item	Standard	Limit
Shifting fork to groove clearance	0.10-0.30mm	0.50mm

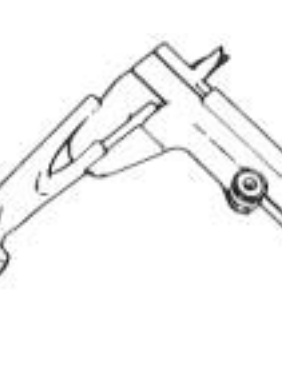
Shifting fork groove width		
Standard	No. 1 & N0. 2	5.0-5.1mm
	N0. 3	5.5-5.6mm

Shifting fork thickness		
Standard	No. 1 & N0. 2	4.8-4.9mm
	N0. 3	5.3-5.4mm



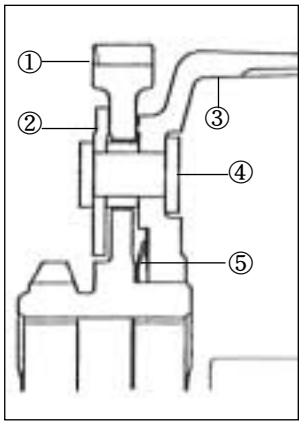
Checking clearance

Checking groove width



Checking thickness

PRIMARY DRIVEN GEAR

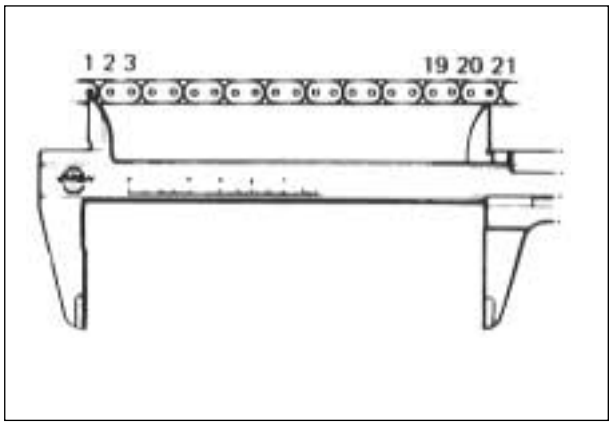


Primary driven gear is composed as shown.

① Primary driven gear ④ Rivet
② Damper ⑤ Clutch housing
③ Plate

If the internal damper wears, play is generated between gear and housing, causing abnormal noise.
If the play is extreme, replace the primary driven gear assembly with a new one.

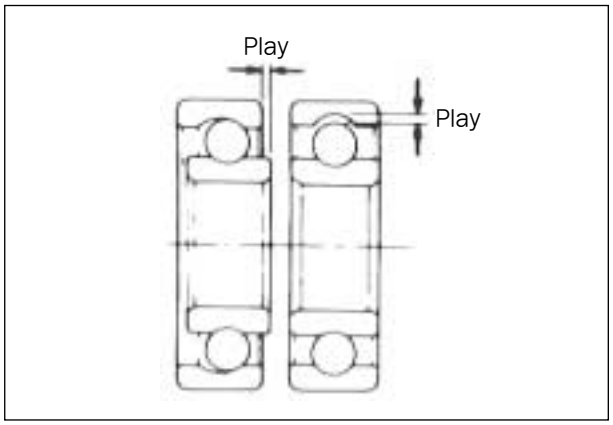
CAM CHAIN 20-PITCH LENGTH



Pull the chain tight to remove any slack, then using vernier caliper, measure the 20-pitch (21pins) length of cam chain. If it measure than the limits, replace the cam chain.

Service limit	129.9mm

CRANKCASE BEARING



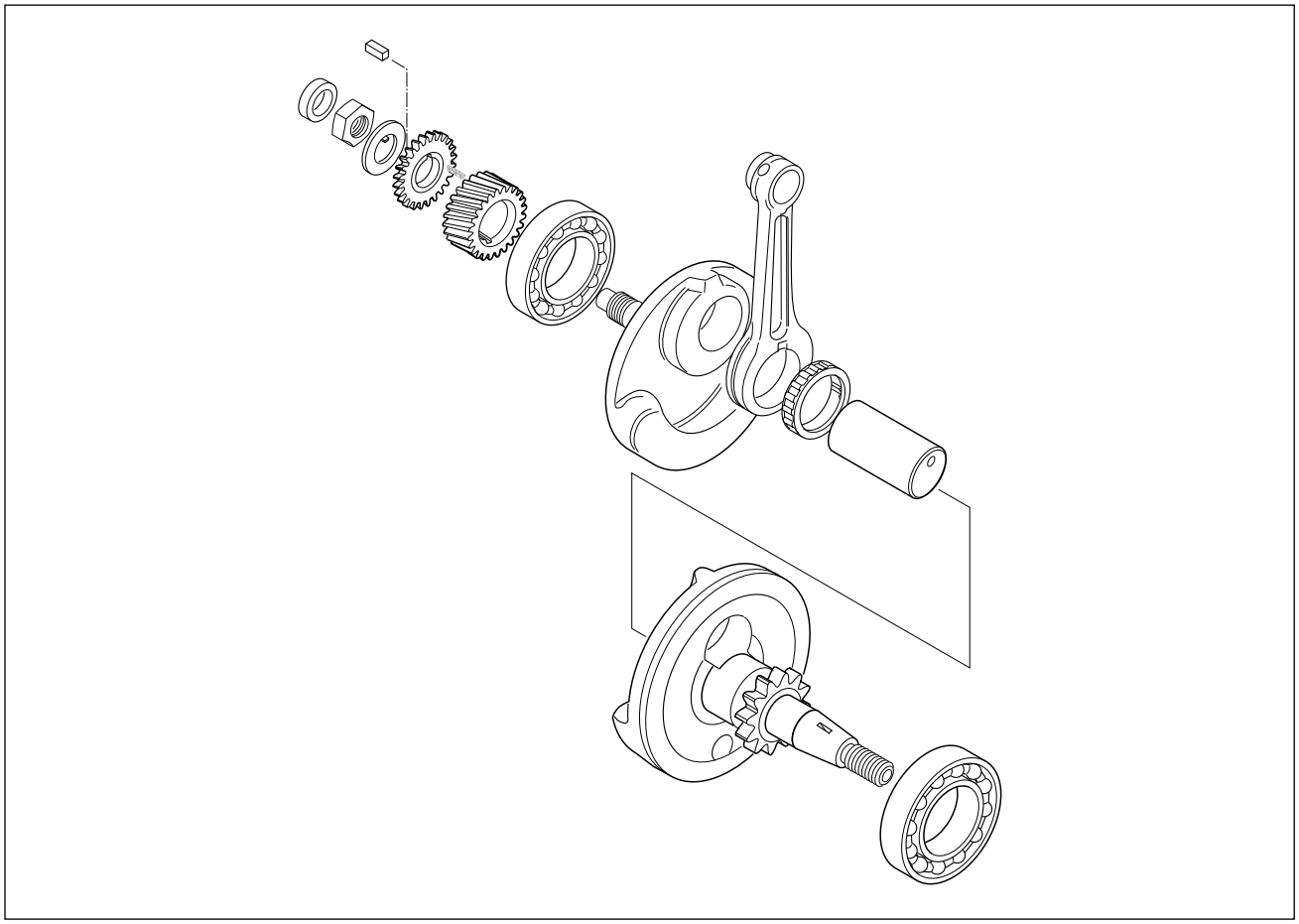
Inspect the play of crankcase bearing inner race by hand while fixing it in the case.
Rotate the inner race by hand to inspect for an abnormal noise and a smooth rotation. Replace the bearing if there is something unusual.

STARTER CLUTCH BEARING

Inspect the bearing for any abnormality, particularly cracks, to decide whether it can reused or should be replaced.

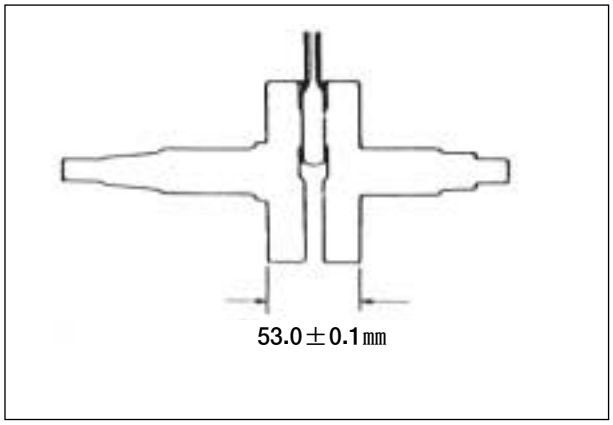
LOWER END COMPONENTS REASSEMBLY

CRANKSHAFT



- Decide the between the webs referring to the figure below when rebuilding the crankshaft.

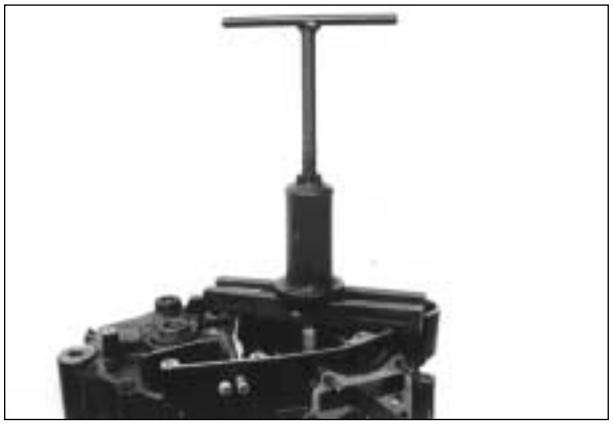
STD width between webs	53.0±0.1mm



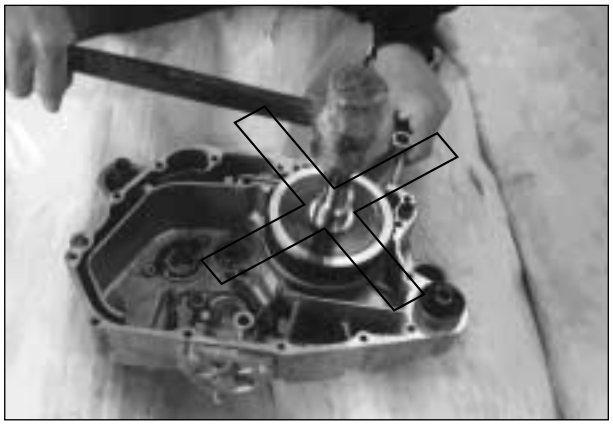
- When mounting the crankshaft in the crankcase, it is necessary to pull its left end into the crankcase.

09910-32812	Crankcase installer

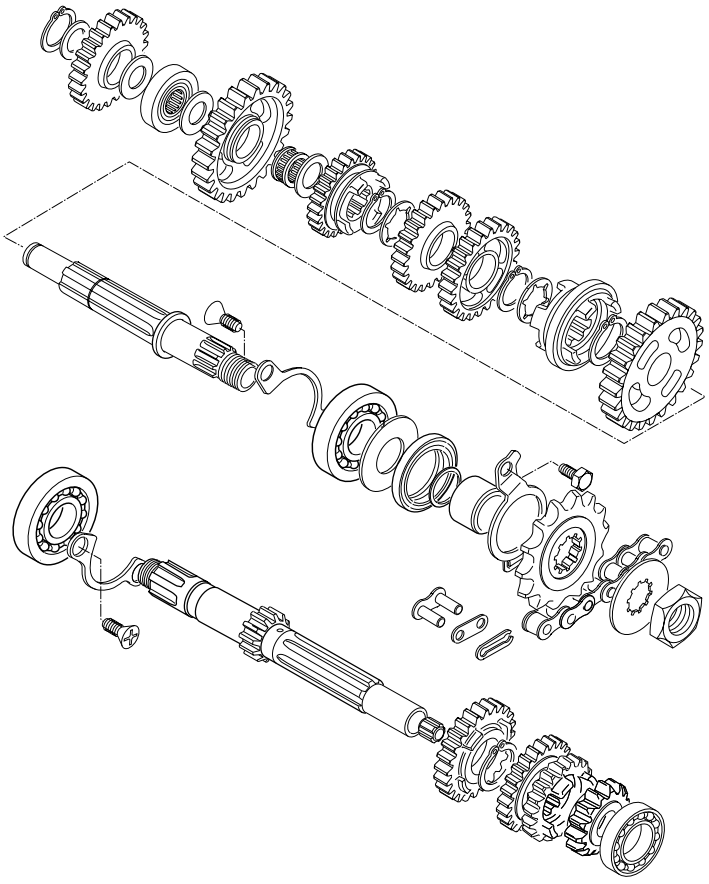
09910-20116	Conrod holder



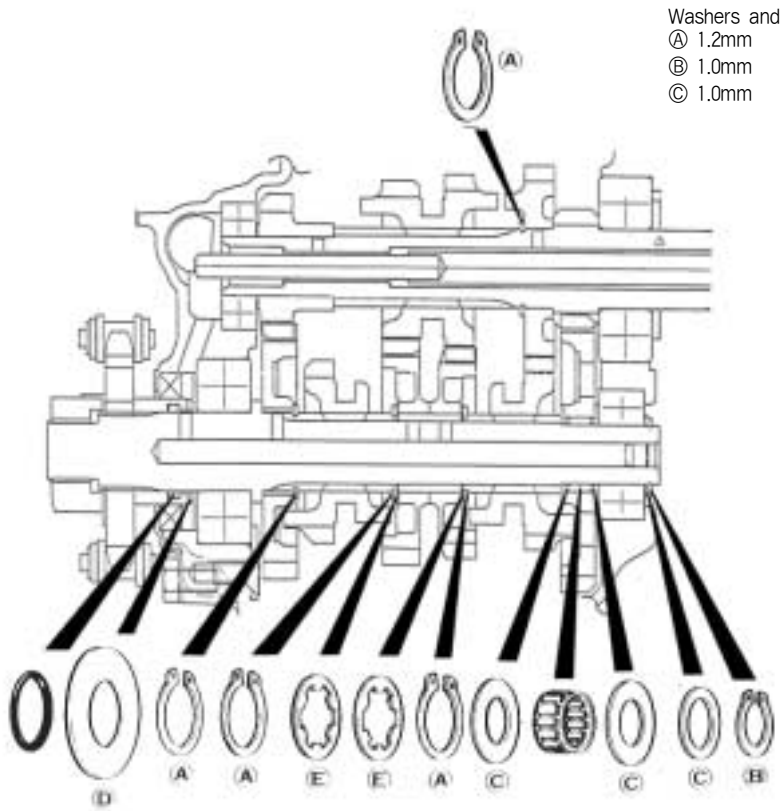
CAUTION:
Never fit the crankshaft into the crankcase by striking it with a plastic hammer.
Always use the special tool, otherwise crankshaft alignment accuracy will be affected.



TRANSMISSION



CAUTION:
- Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.
- When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip cover the shaft.
- After installing a circlip, always insure that it is completely seated in its groove and securely fitted.



NOTE:
When reassembling the bearing retainer, apply a small quantity of THREAD LOCK "1342" to the threaded parts of the bearing retainer screws.
In reassembling the transmission, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips.

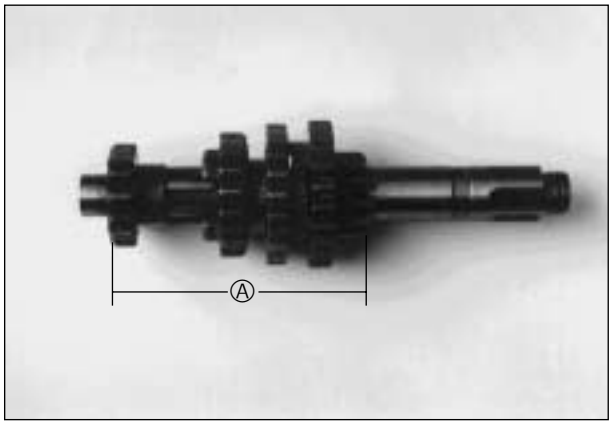
COUNTERSHAFT

Mounting 2nd drive gear

- Press-fit 2nd drive gear into the countershaft.Before reassembling, coat the internal face of the 2nd drive gear with THREAD LOCK SUPER "1303B" and install it so that the length Ⓐ is as shown in Fig.

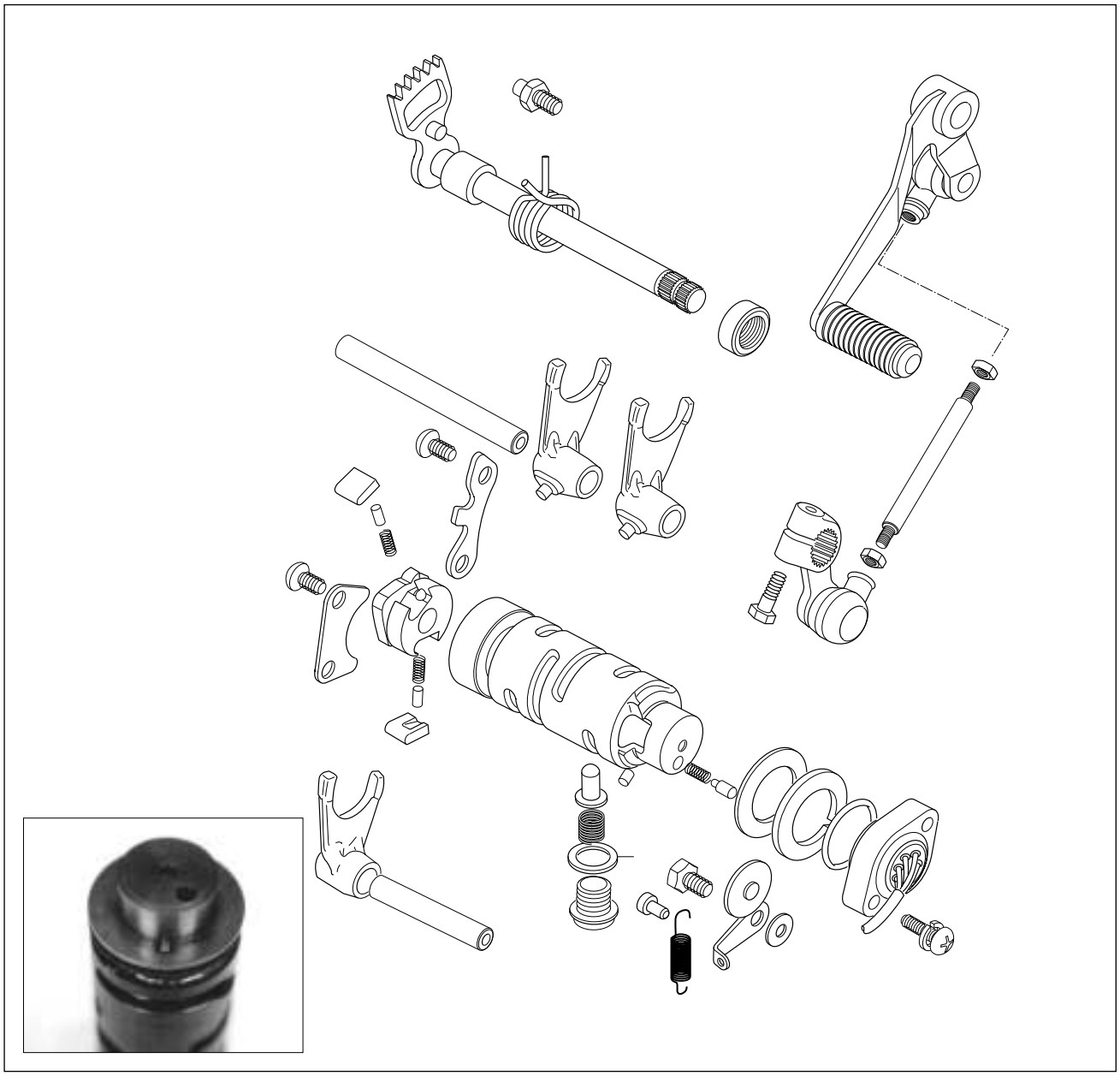
Countershaft length (Low to 2nd) Ⓐ	$88.0 \pm \begin{matrix}0\\0.2\end{matrix}$ mm

09920-32030	THREAD LOCK SUPER "1303B"

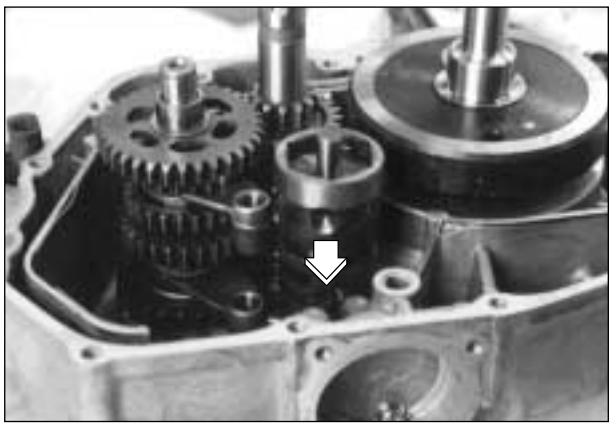


NOTE:
This procedure may be performed only twice before shaft replacement is required.

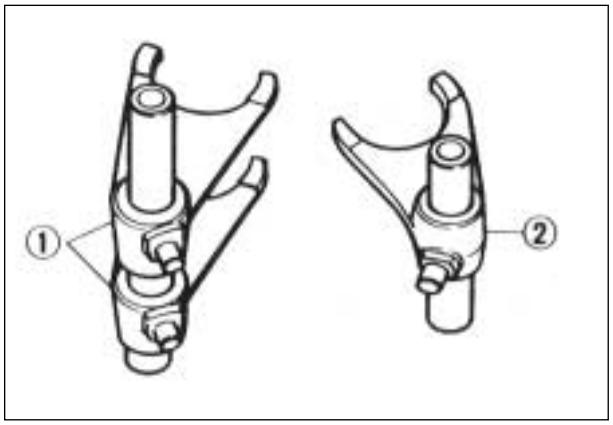
GEAR SHIFTING CAM AND FORK



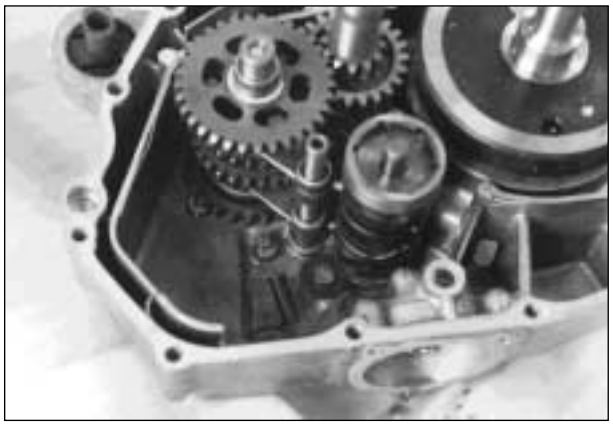
- Fit gear shifting cam on the crankcase. Position the cam as shown in Fig. so that the gear shifting fork can be installed easily.



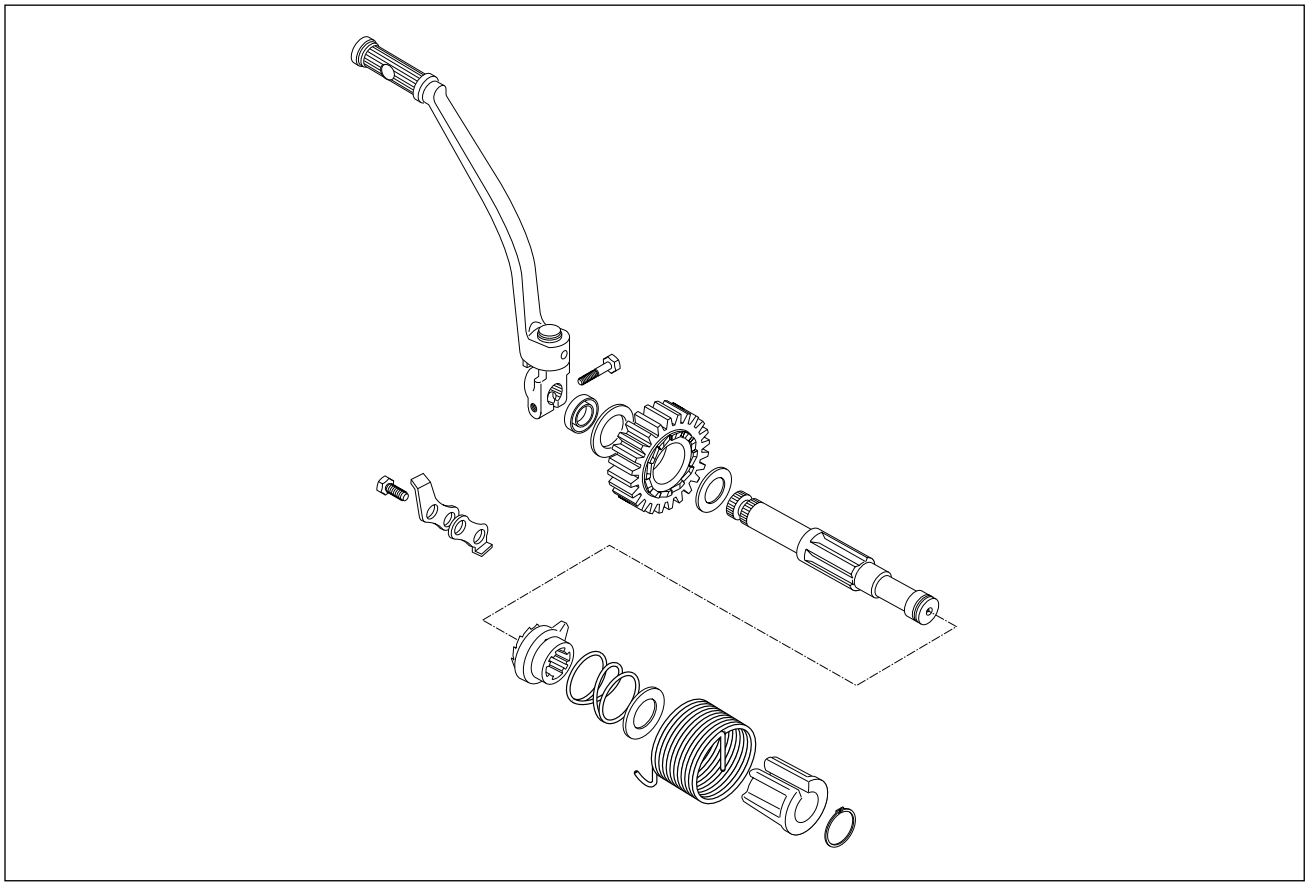
NOTE:
Two kinds of gear shifting forks, ① and ②, are used. They resembles each other very closely in external appearance and configuration.
Carefully examine the illustration for correct installing positions and directions.



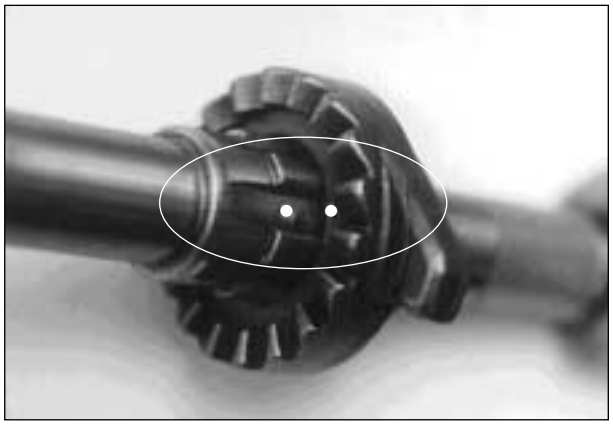
- After cam stopper and gear shifting forks have been fitted, hook cam stopper spring into the crankcase.



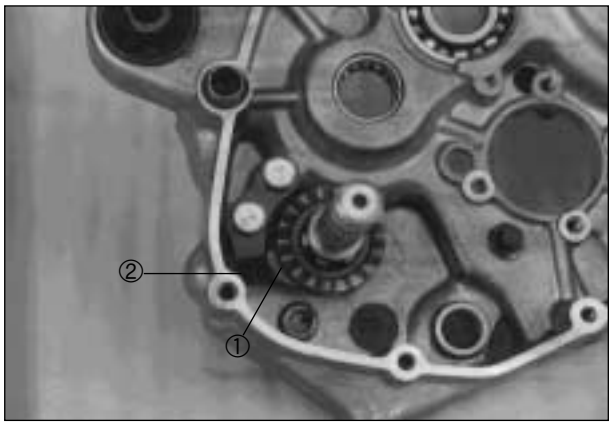
KICK STARTER



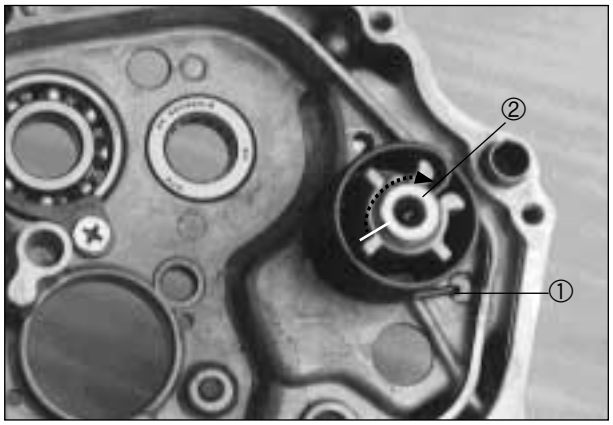
- When fitting the kick starter to the shaft, be sure to align the punched marks.



- Fit spring and washer on the shaft. Then, insert the kick starter shaft into crankcase. Engage pawl ① of kick starter guide ②.



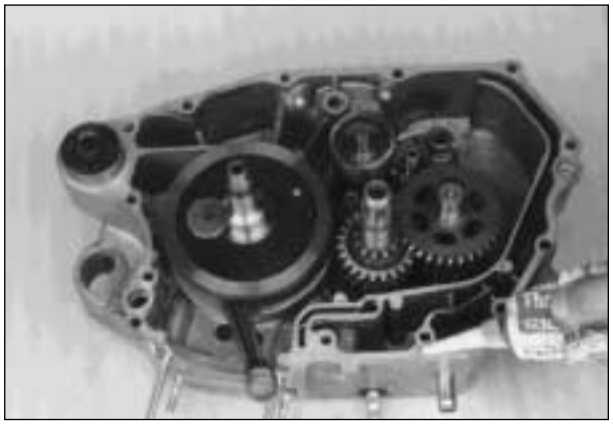
- When fitting kick return spring, hook part ① of return spring into crankcase, turn it 1/2 a turn clockwise with pliers and fit part ② of return spring into hole of kick shaft. Then, fit spring guide and circlip.



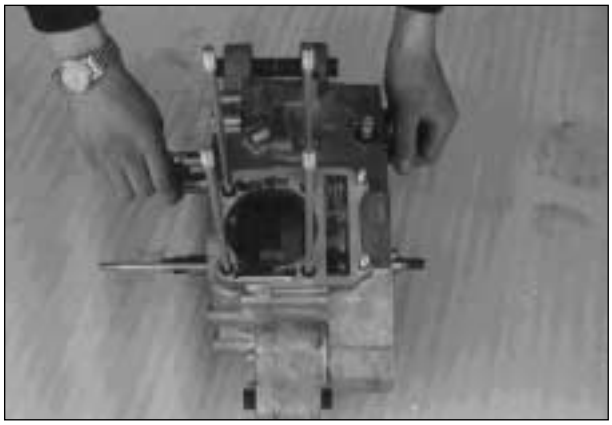
CRANKCASE

When reassembling the crankcase pay attention to the following.

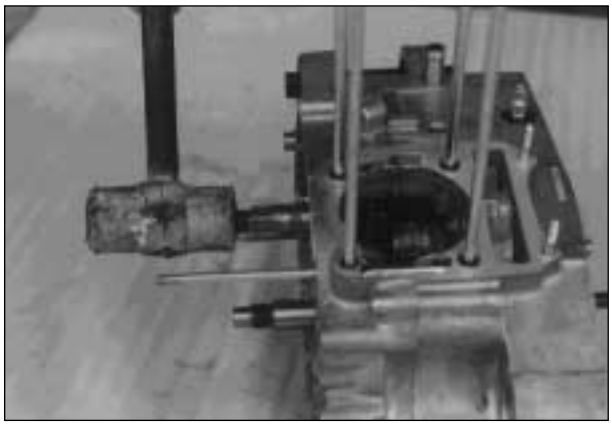
- Coat GREASE "G2" (99000-07000) to the lip of oil seals.
- Remove sealant material on the fitting surface of right and left halves of crankcase and thoroughly remove oil stains.
- Fit dowel pins on the left half.
- Apply engine oil to the big end of the crankshaft con-rod and all parts of the transmission gears.
- Apply THREE BOND No. 1215 (99000-31110) uniformly to the fitting surface of the left half of the crankcase, and after waiting a few minutes, fit the right half on the left half.



- After the crankcase bolts have been tightened, check if driveshaft and countershaft rotate smoothly.

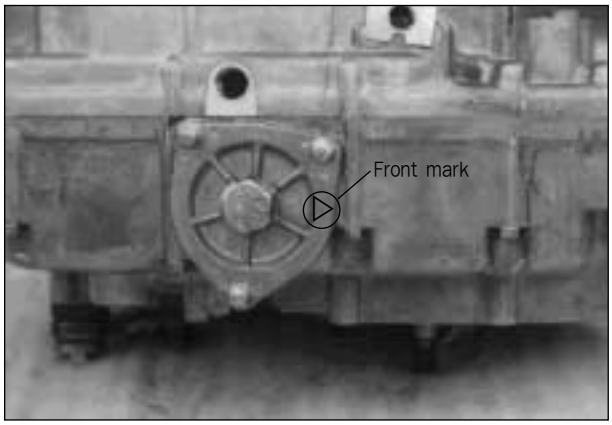


- If a large resistance is felt to rotation, try to free the shafts by tapping the driveshaft or countershaft with a plastic hammer as shown in Fig.



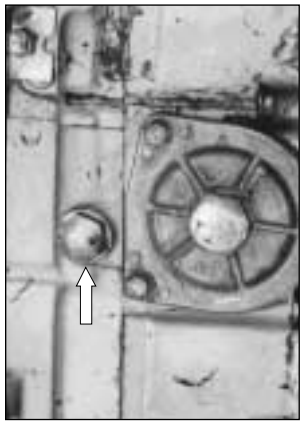
OIL SUMP FILTER

- Wash the sump filter with cleaning solvent, and then blow compressed air through it to dry off solvent.
- After mounting the sump filter, fit the cap and tighten it.

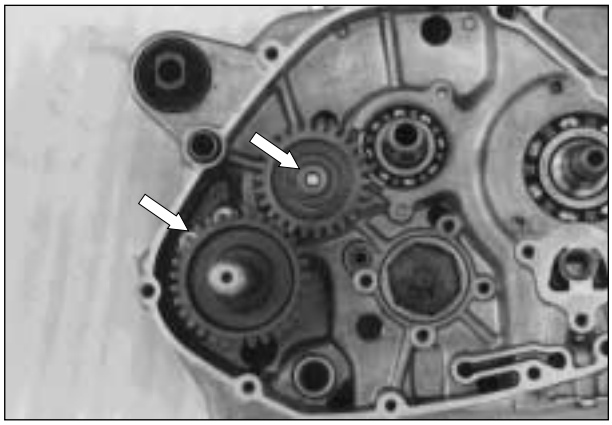


NEUTRAL CAM STOPPER

- Put in the neutral stopper and spring.
- Tighten the cam stopper plug.



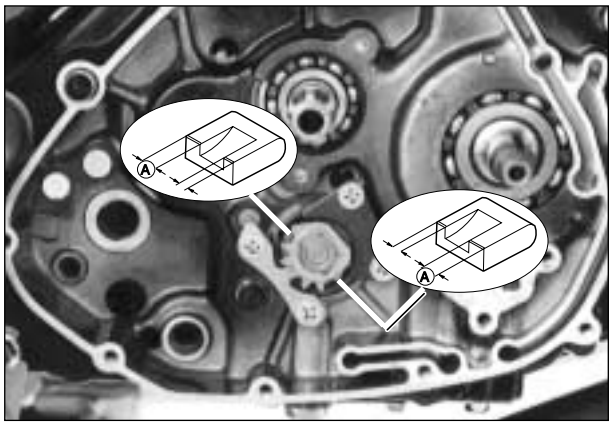
RIGHT ENGINE REASSEMBLY



KICK START DRIVE GEAR AND IDLE GEAR

- Install kick starter idle gear and drive gear.

09900-06107	Snap ring pliers

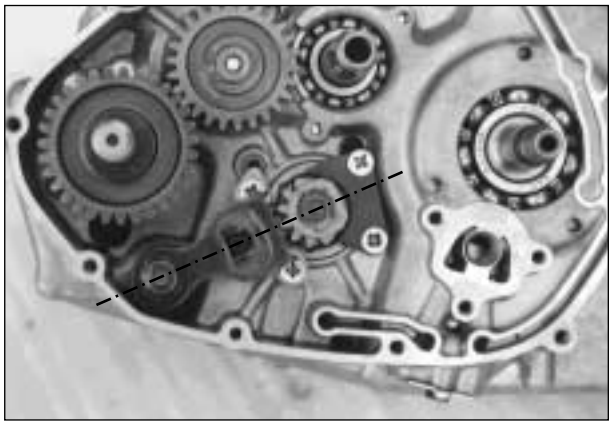


GEAR SHIFTING CAM DRIVEN GEAR

When installing the gear shifting pawls into the cam driven gear. The large shoulder Ⓐ must face to the outside as shown.

- Next, install cam guide and pawl lifter. Apply a samll quantity of THTEAD LOCK "1342" to the threaded parts of the screws.

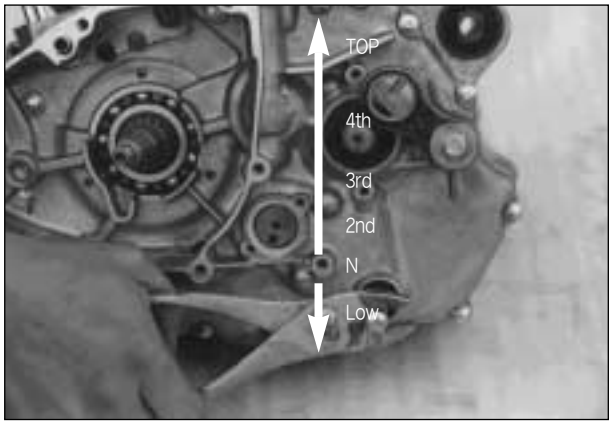
99000-32050	Thread lock "1342"



GEAR SHIFTING SHAFT

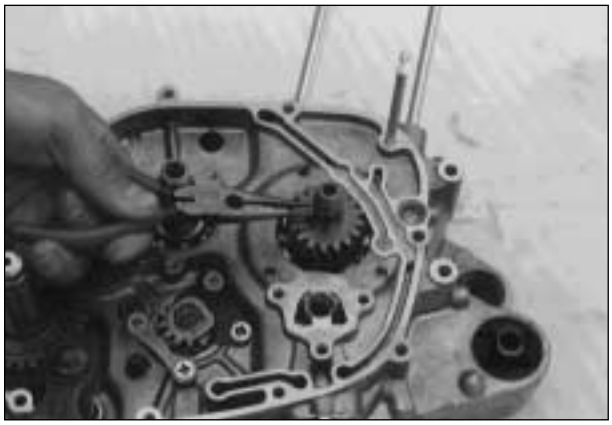
Install the gear shifting shaft. Match the center teeth of the gear on the shifting shaft with the center teeth on the shifting driven gear as shown.

NOTE:
After the cam driven gear, cam guide, gear shifting shaft and neutral cam stopper have been fitted, confirm that gear change is normal while turning, the countshaft and driveshaft. If gear change is not obtained, it means that assembly of gears or installation of gear shifting fork is incorrect. If this is the case, disassemble and trace the mistake.



PRIMARY DRIVE GEAR AND OIL PUMP

- Fit key in the solt on the crankshaft, and install the primary drive gear.

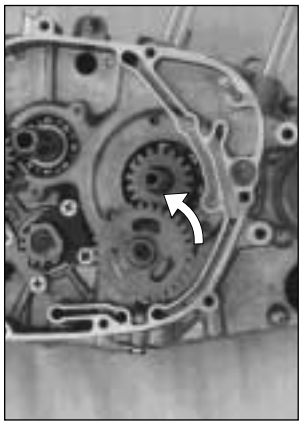


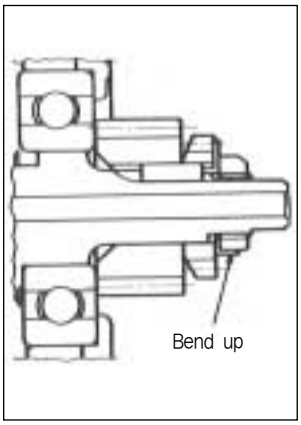
- Before mounting the oil pump, apply engine oil to the sliding surfaces of the case, outer rotor, inner rotor and shaft.
- Apply a samll quantity of THREAD LOCK "1342" to the threaded parts of oil pump mounting screws.

99000-32050	Thread lock "1342"

- Tightening the oil pump mounting screws.

NOTE:
After mounting the oil pump in the crankcase, rotate the pump gear by hand to see if it turns smoothy.



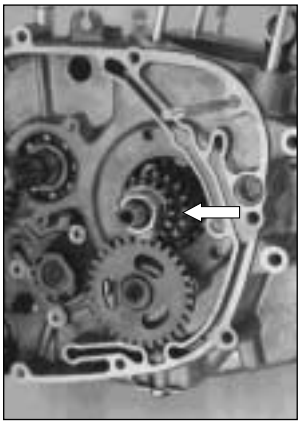


- After checking the oil pump, install the oil pump drive gear, lock washer and nut, tighten it with a torque wrench to the specified torque and bend up to the washer.

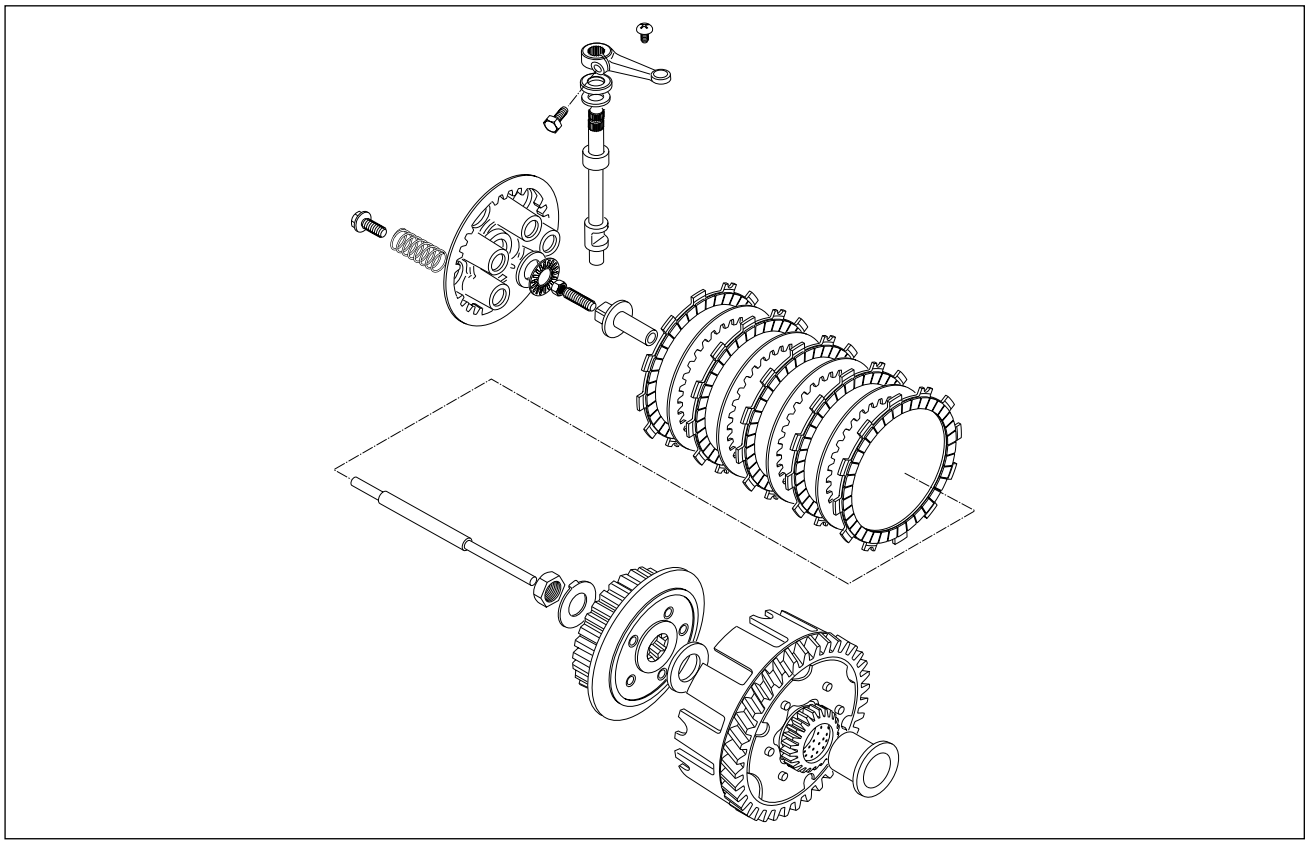
09910-20116	Conrod holder

NOTE:
This is a left-hand thread nut.

Tightening torque	40-60N · m(4.0-6.0kg · m)



CLUTCH



- Install the clutch camshaft by positioning the face to right side.
- Install the oil seal by using 17mm socket.

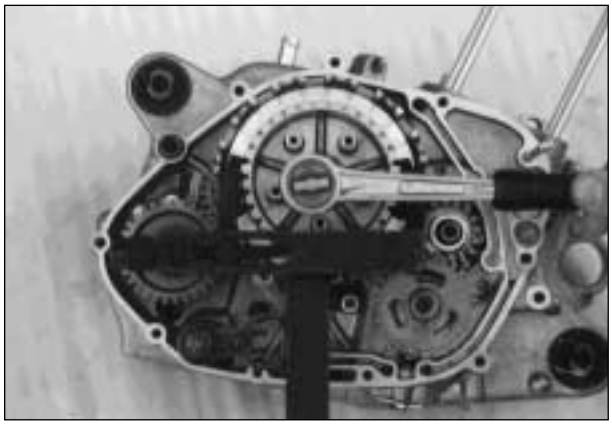
- Tighten the oil seal retainer screw.

Assemble the clutch, in the reverse order of disassembly. Pay attention to the following points.

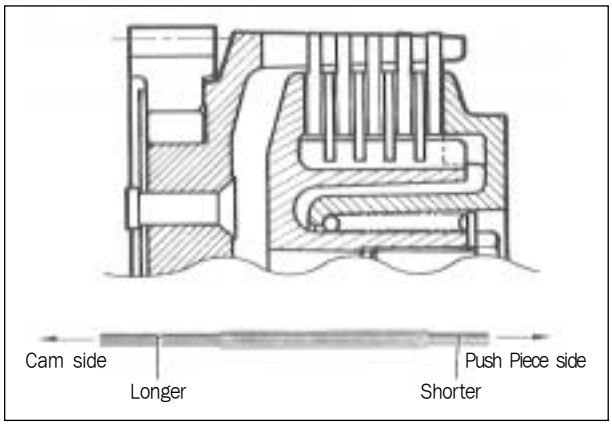
- When inserting spacer on countershaft, apply a small quantity of engine oil to both inside and outside of the spacer.
- Tighten clutch sleeve hub nut using the special tool to the specified torque.

09920-53710	Clutch sleeve hub holder

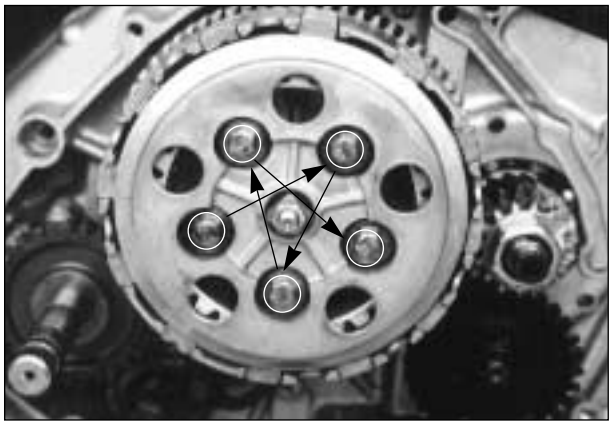
Tightening torque	30-50N · m(3.0-5.0kg · m)



- Be sure to lock the nut by firmly bending the tongue of the washer.
- Install drive plates and driven plates to the sleeve hub.
- Insert push rod in the countshaft.

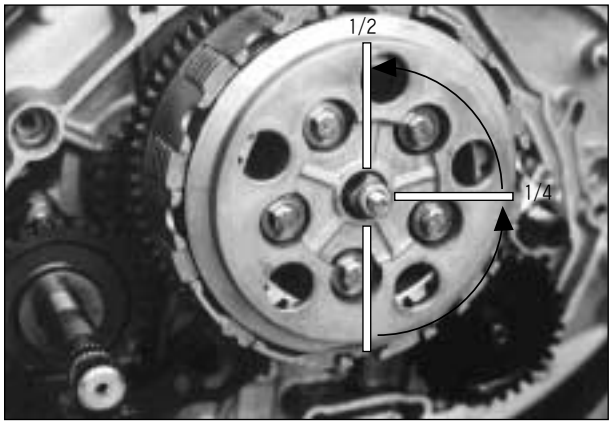


- Tighten clutch spring bolts diagonally.



Clutch release screw adjustment

- Loosen the lock nut, and turn in the release screw to feel high resistance.
- From that position, turn out the release screw 1/4-1/2 turn, and tighten the lock nut.

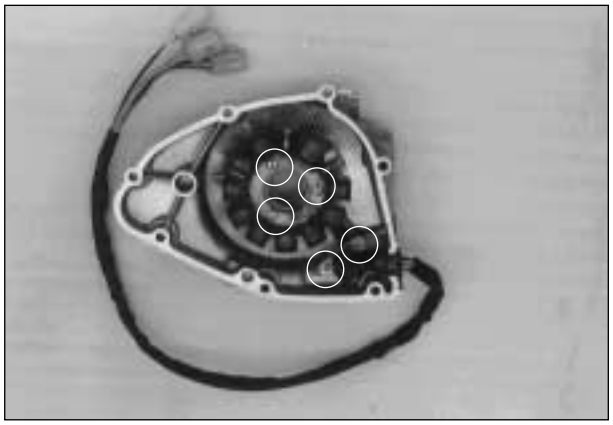


LEFT ENGINE REASSEMBLY

SRATOR

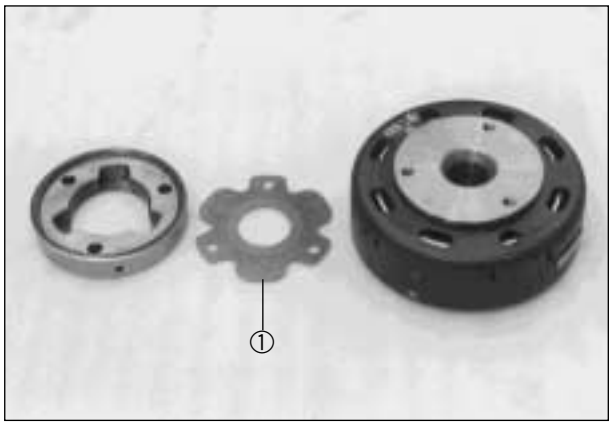
Apply a small quantity of THREAD LOCK "1342" to the threaded parts of screws.

99000-32050	Thread lock "1342"



STARTER CLUTCH

Locate the shim ① to the proper position.



- Apply THREAD LOCK SUPER "1303B" to allen bolts and tighten with specified torque.

99000-32030	Thread lock super "1303B"

09900-00401	"L" type hexagon wernch(5mm)

Tightening torque	15-20N · m(1.5-2.0kg · m)

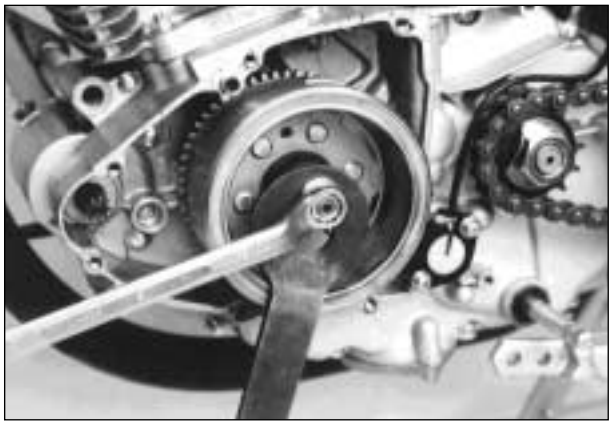
MAGNETO ROTOR

- Fit key in the key slot on the crankshaft.
- Install the magneto rotor.
- Apply a small quantity of THREAD LOCK SUPER "1305" to the threaded parts of crankshaft.
- Tighten magneto rotor nut to the specified torque.

99000-32100	Thread lock super "1305"

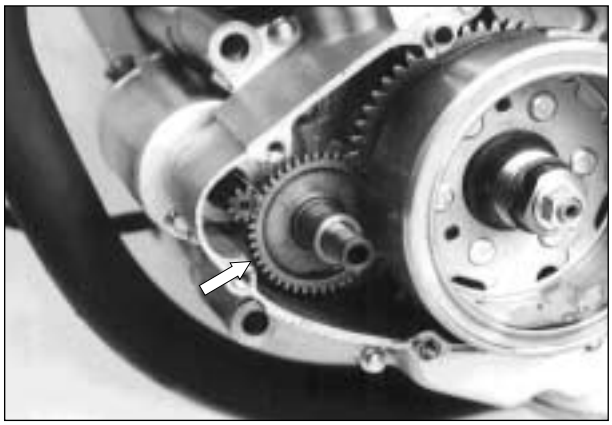
09930-44511	Rotor holder

Tightening torque	30-40N · m(3.0-4.0kg · m)

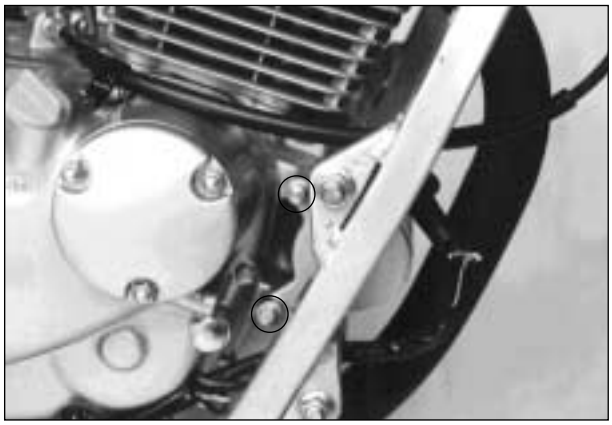


STARTER IDLE GEAR AND MOTOR

● Install the starter idle gear.



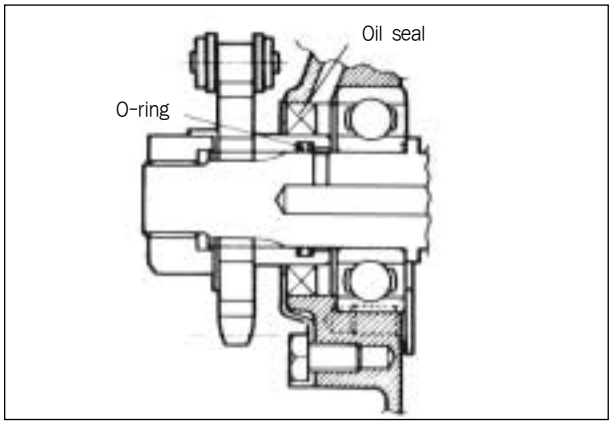
● Install the starter motor.



DRIVESHAFT OIL SEAL AND ENGINE SPROCKET

CAUTION:
- **Always replace the driveshaft oil seal with a new one every disassembly to prevent oil leakage. Also grease the oil seal lip. On installation, refer to Fig, for correct position and direction.**
- **Replace "O" ring with a new one every disassembly.**

NOTE:
After reassembling the LOWER END COMPONENTS, install the O-ring and spacer.



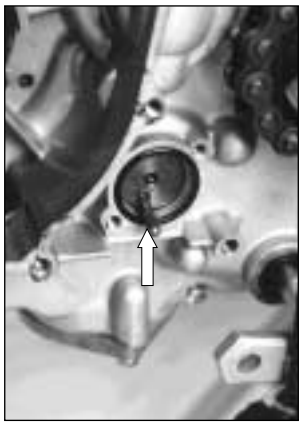
● Tighten the engine sprocket nut to the specified torque and bend up the washer.

09930-40113	Rotor and sprocket holder

Tightening torque	80-100N · m(8.0-10.0kg · m)

GEAR POSITION SWITCH

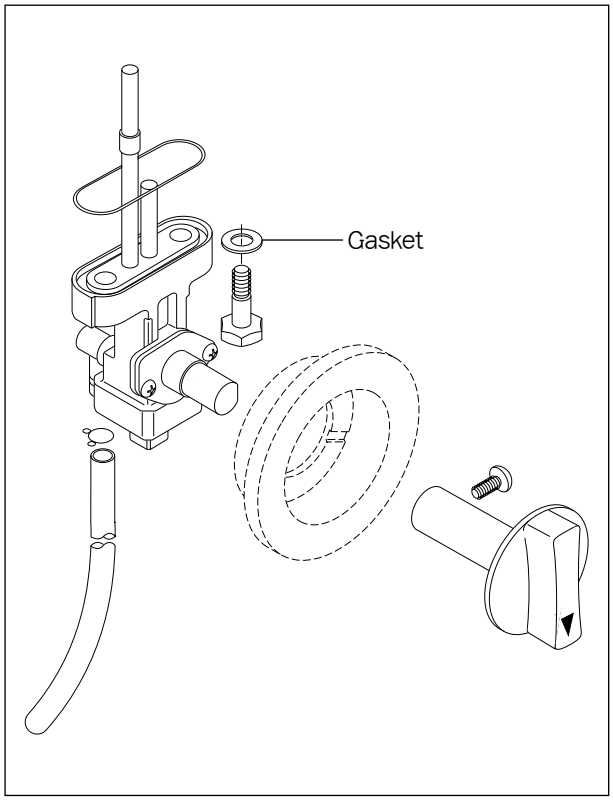
● Install gear position switch.



FUEL AND LUBRICATION SYSTEM

CONTENTS

FUEL COCK



DIASSEMBLY

- Remove the seat and frame covers.(Refer to page 3-2)
- Turn fuel to "OFF" position and disconnect fuel hose from the fuel cock.

- Place a clean oil pan under the fuel cock assembly, turn fuel cock to "ON" position and drain the fuel.

WARINING:
Gasoline is highly explosive.
Extreme care must be taken.

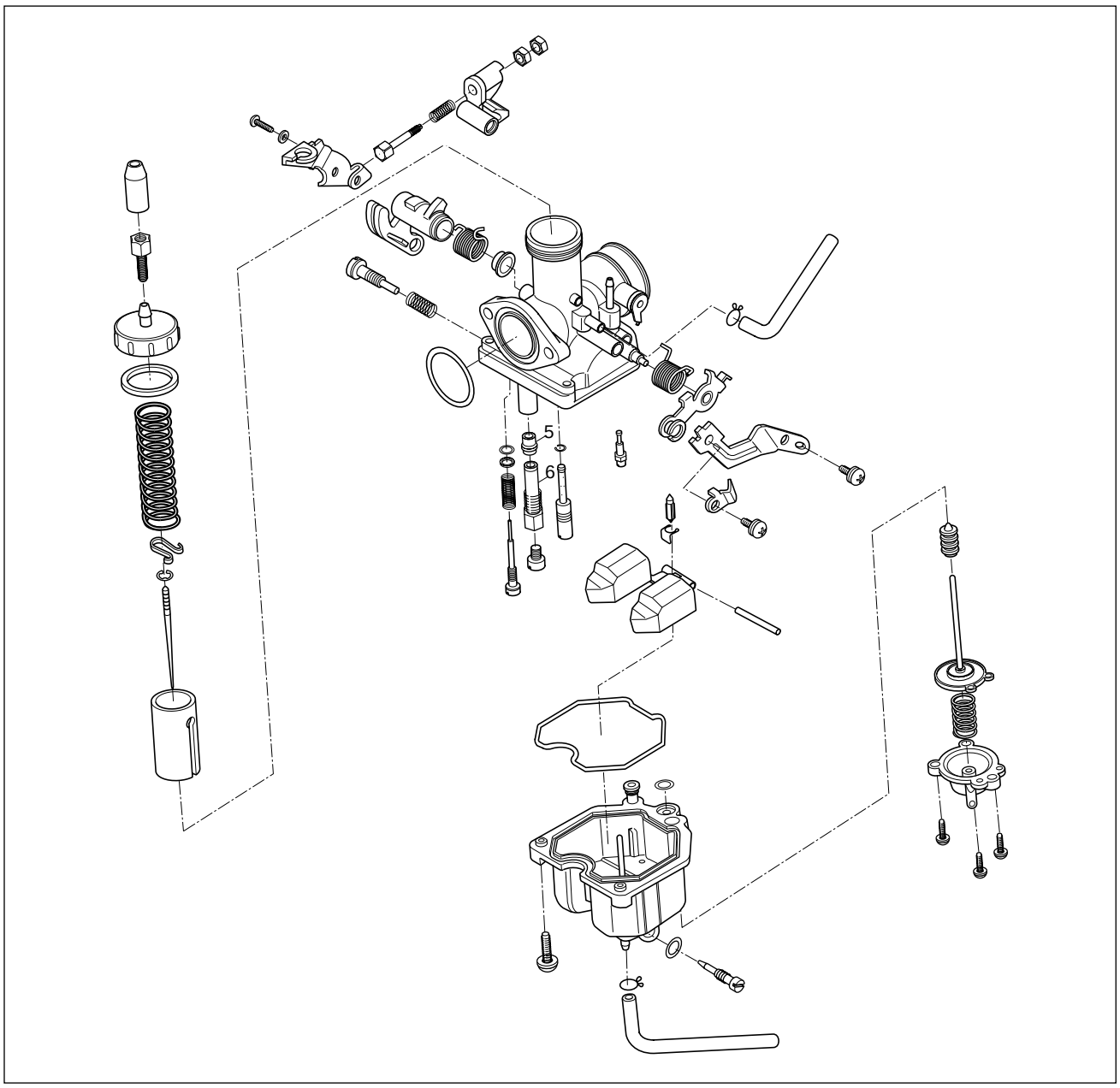
- Unscrew the fuel cock securing bolts, and take off the fuel cock assemble.

CLEANING

Rust from the fuel tank tends to build up in the filter, which, when the filter has been neglected for a long period, inhibits the flow of fuel.
Remove the rust from the filter using compressed air.

WARINING:
Gasket must be replaced with a new one to prevent leakage.

CARBURETOR

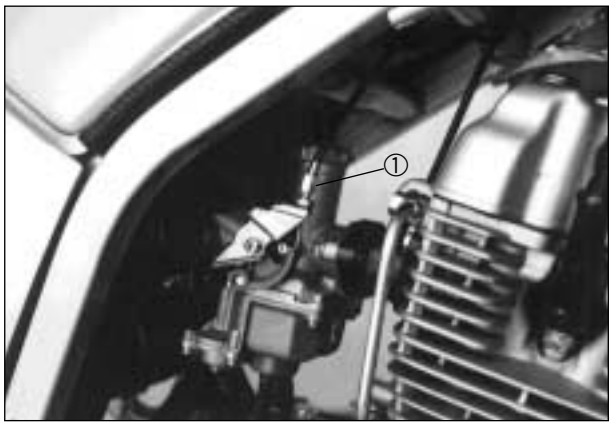


SPECIFICATIONS

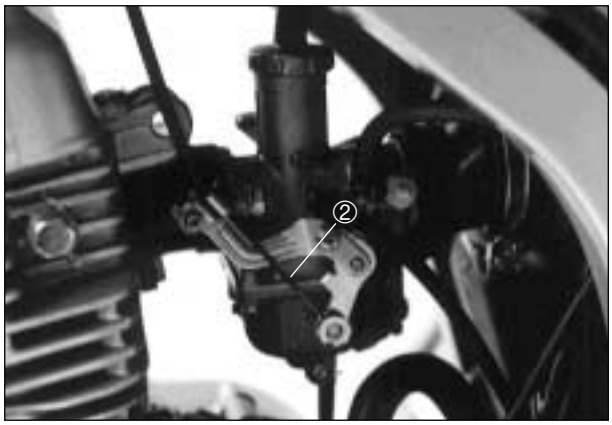
ITEM	SPECIFICATION	ITEM	SPECIFICATION
Carburetor type	PD 18 F	Needle jet (N. J.)	J6TC-3rd
Bore size	24mm	Pilot jet (P.J.)	#38
I.D. No.	93 BO	By pass (B.P.)	2.9, ø1.0, ø0.9
Idle r/min	1450±50 r/min	Pilot air jet (P.A.J.)	#150
Jet needle (J.N.)	J 29 B	Valve seat (V.S.)	ø2.0mm
Float height	12.5mm	Starter jet	MAX #500
Main jet (M.J.)	#100	Pilot screw (P.S.)	PRE-SET(2½)
Main air jet (M.A.J.)	#80		

REMOVAL, DISASSEMBLY AND INSPECTION

- Turn fuel cock to "OFF" position.
- Remove the accelerator pump cable ①.

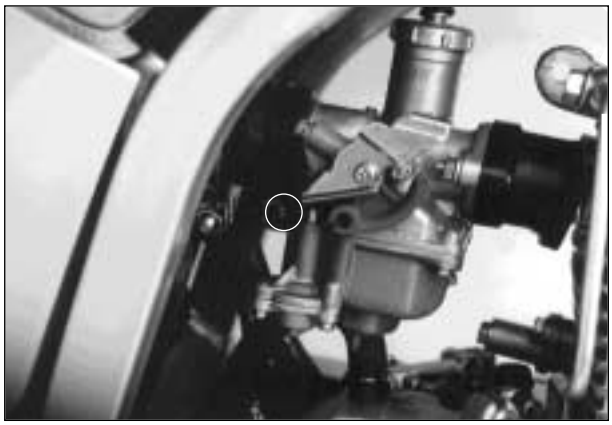


- Remove the choke cable ②.

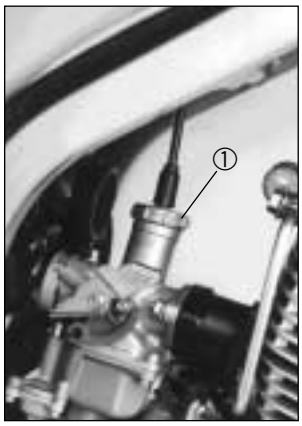


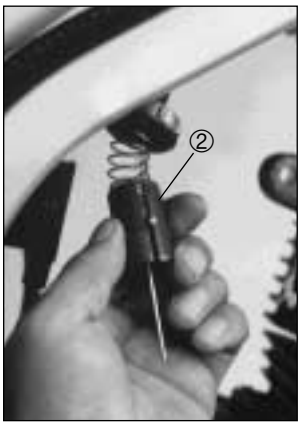
- Loosen the intake pipe bolts.

- Loosen the clamp screw.



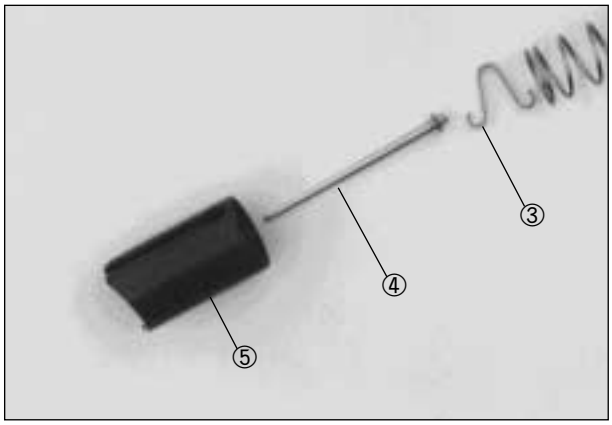
- Loosen the carburetor top ① and disconnect throttle valve.
- Remove throttle cable from the throttle valve ② and disconnect throttle cable.





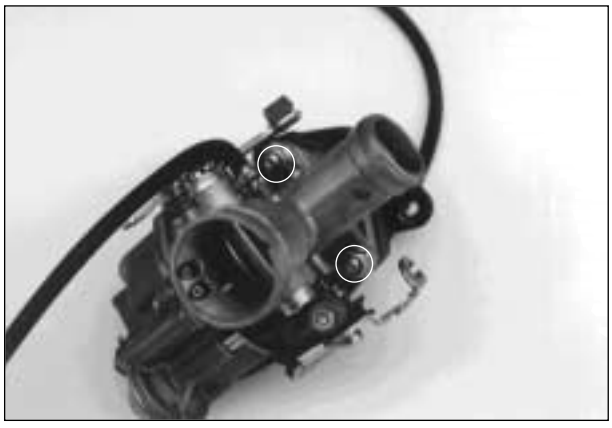
- Disconnect throttle valve spring and carburetor top from the throttle cable.

- Draw out retainer clip ③ and disconnect jet neddle ④.
- Inspect the jet needle and wear, domage of throttle ⑤.

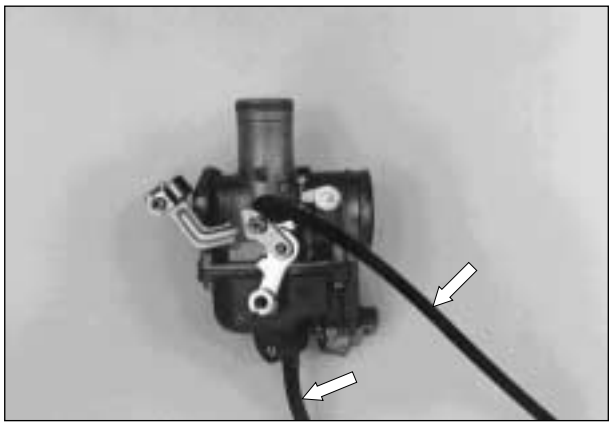


- Separate the intake pipe form the carburetor.
- Remove the carburetor drain screw and draw out in the carburetor.

WARNING:
Gasoline is highly explosive.
Extreme care must be taken.

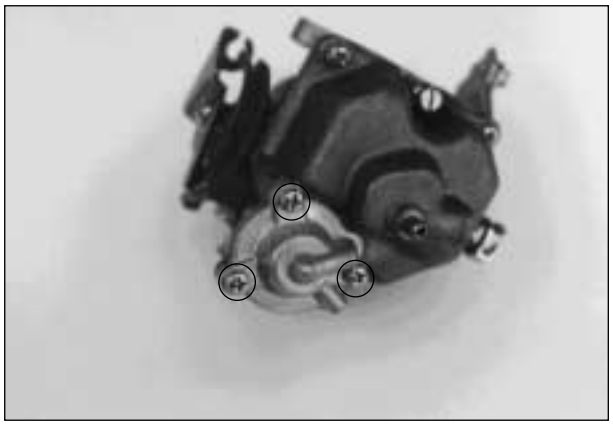


- Disconnect fuel tube and drain tube.



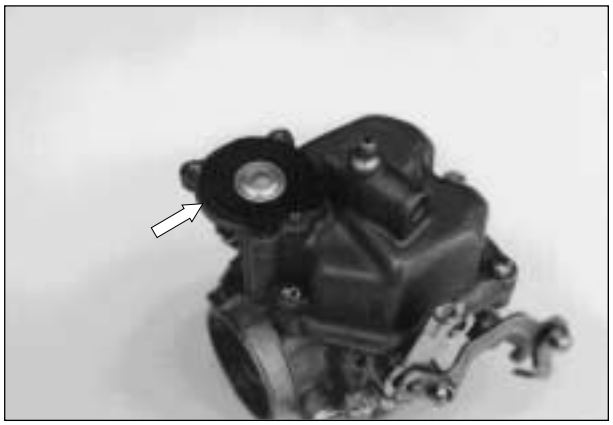
ACCELERATOR PUMP

- Loosen the screws and disconnect pump cover.



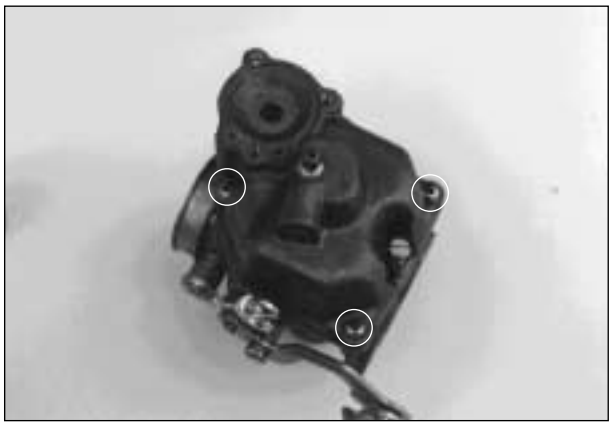
- Disconnect spring and diaphragm.
- Inspect the accelerator pump load and damage of diaphragm.
- Clean the diaphragm.
- When installing the diaphragm, align the tongue ① of the diaphragm with the groove of carburetor body.

- Set up diaphragm and the float chamber.
- Install the spring in the diaphragm and install the cover in the float chamber.
- Adjust the accelerator pump.

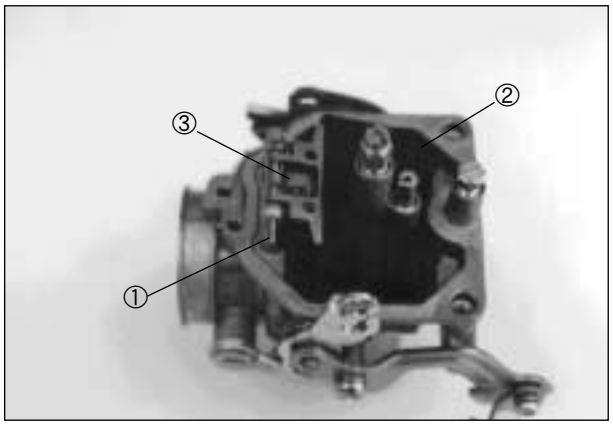


FLOAT AND NEEDLE VALVE

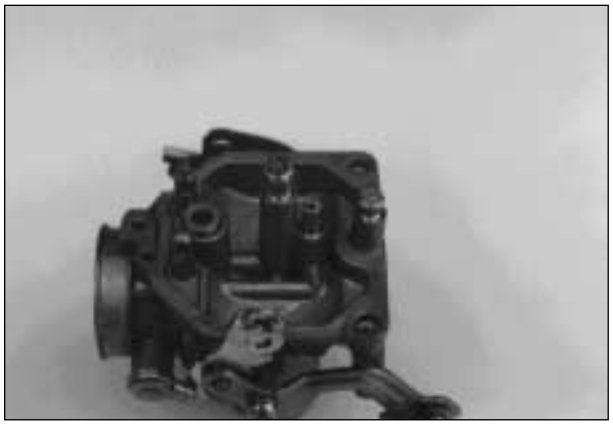
- Loosen the screws and remove the float chamber.



- Pull out float arm pin ①.
- Remove the float ② and needle valve ③.

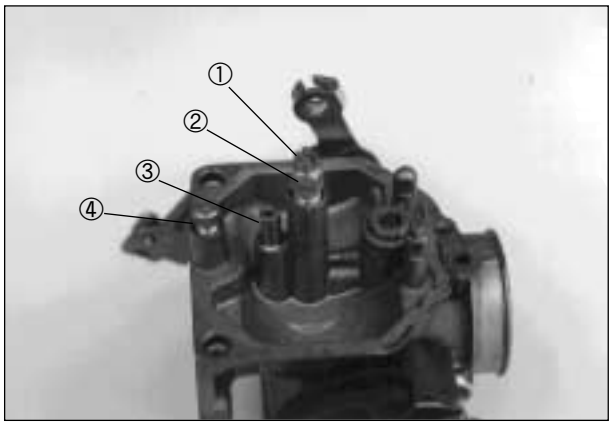


- Inspect the needle valve and valve seat for wear.
- Inspect the float for transformation.



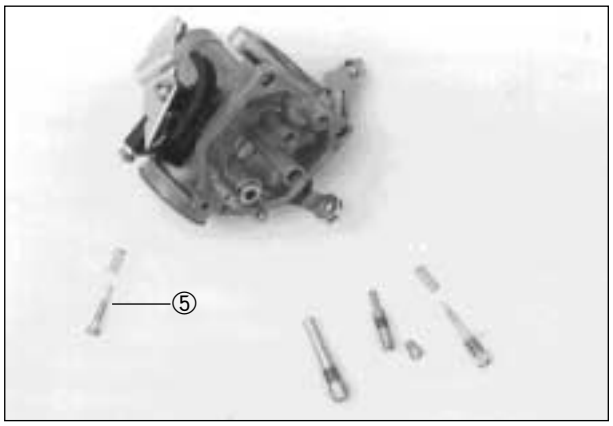
JETS

- Remove the main jet ① and needle jet ②.
- Remove the pilot jet ③.
- Remove pilot screw ④ after record the revolutions until tighten completely.



NOTE:
Do not tighten the pilot screw by force, otherwise can be damaged of seat.

- Disconnect throttle stop screw ⑤.
- Clean the jets with non-flammable cleaning solvent.
- Check following items for damage or clogging.
  - Main jet
  - Pilot jet
  - Pilot air screw
  - Needle jet



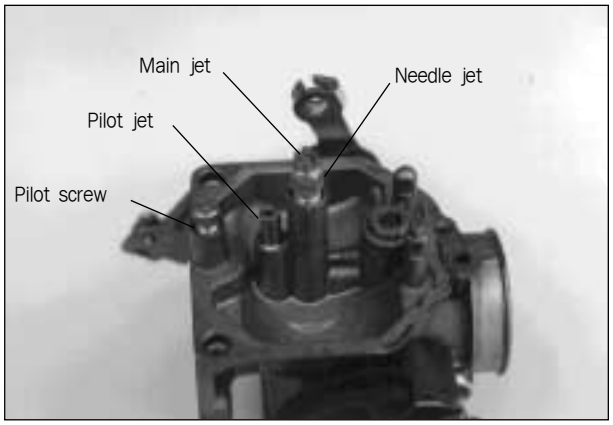
- Clean the jets and body passage with compressed air.

REASSEMBLY AND REMOUNTING

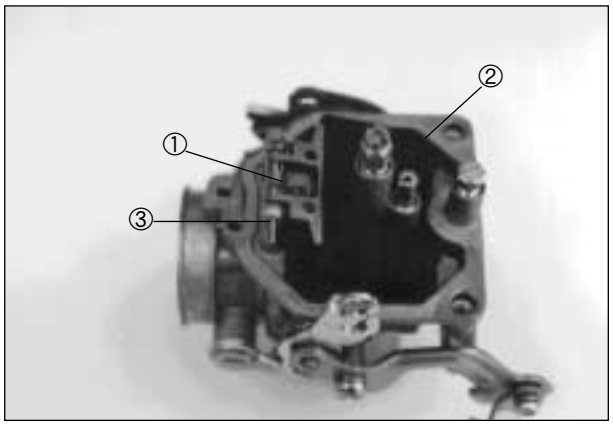
- Install neddle jet, main jet and pilot jet.
- Install throttle stop screw and pilot screw.

NOTE:
Install pilot screw as revolutions to a case of disassemble.

- Adjust the pilot screw, when use a new pilot screw.



- Install the needle valve ①, float ② float arm pin ③.

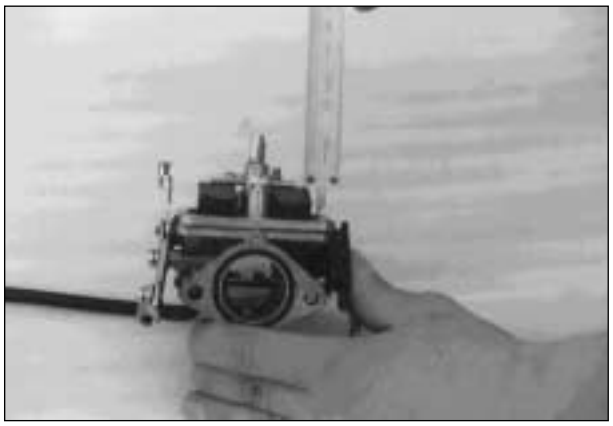


FLOAT ADJUSTMENT

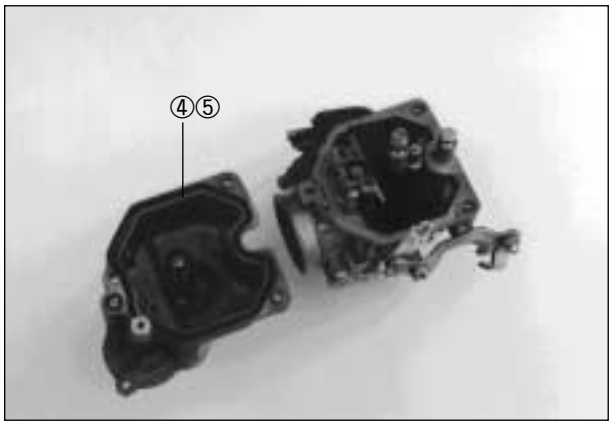
- To check the float height, invert the carburetor body, holding the float arm pin so that the pin will not slip off.

Float height	12.5 mm

- Check to be sure that the float moves freely.



- Install the new O-ring ④ and float chamber groove ⑤.
- Install the float chamber and screw.



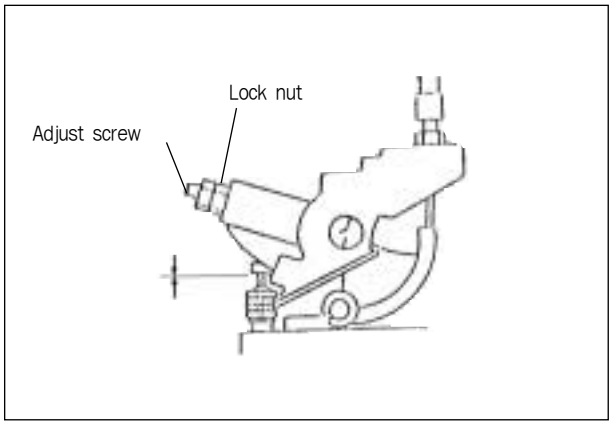
ACCELERATOR PUMP ADJUSTMENT

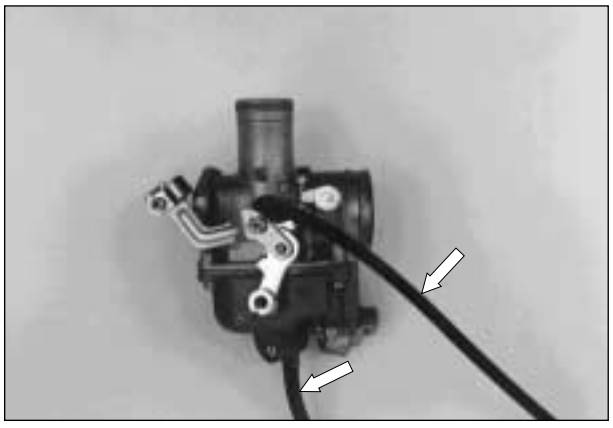
NOTE:
Do not adjust except for exchange adjust screw.

- Adjust idling (Refer to page 2-10).
- Adjust throttle grip (Refer to page 2-10).
- Adjust clearance of accelerator pump rod after loosen the lock nut and turn the adjust screw.

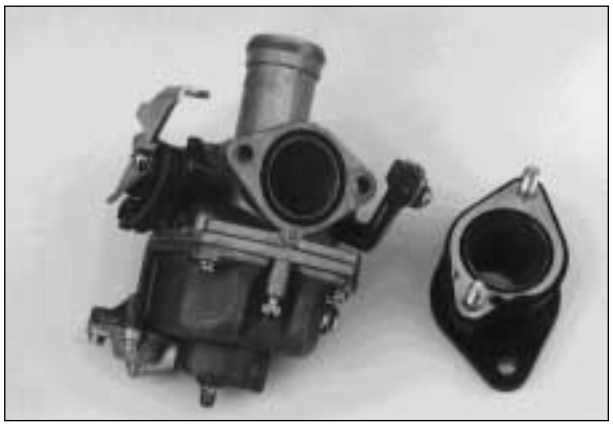
Clearance	0 mm

- Tighten the lock nut.
- Install the fuel tube and drain tube.

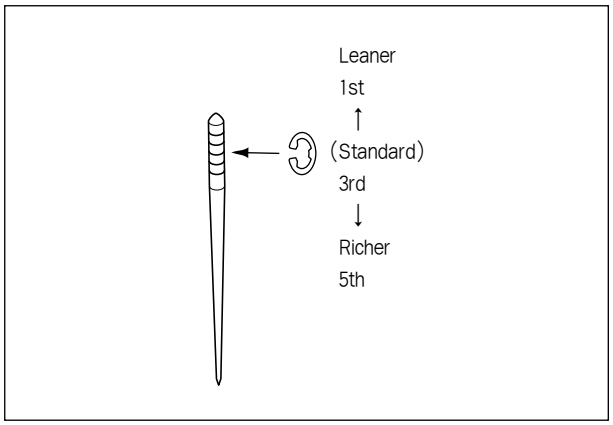




- Replace a new O-ring at the carburetor outlet side.

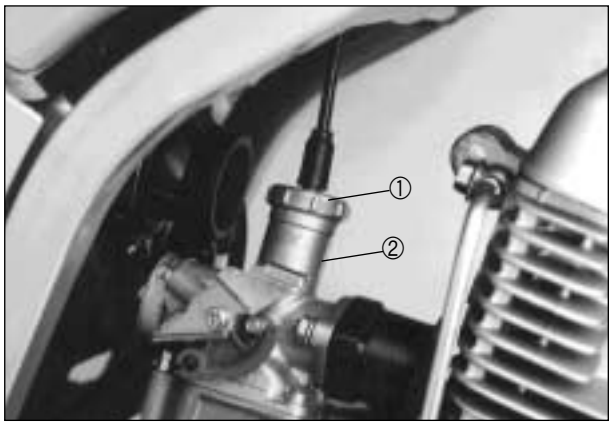


- Install the jet needle and retainer clip into the throttle valve.
  ※ Needle clip standard position : 3rd groove

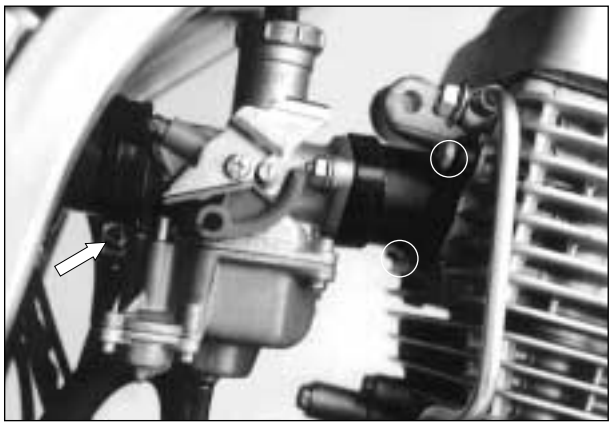


- Install the carburetor top and spring into the throttle cable.
- Install the throttle cable into the throttle valve.

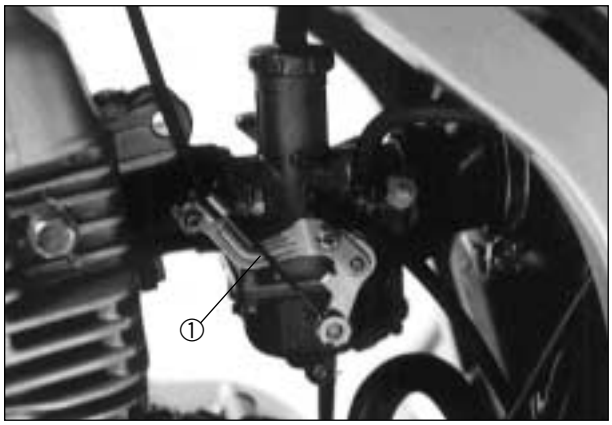
- Install the carburetor top ① on the carburetor body ②.



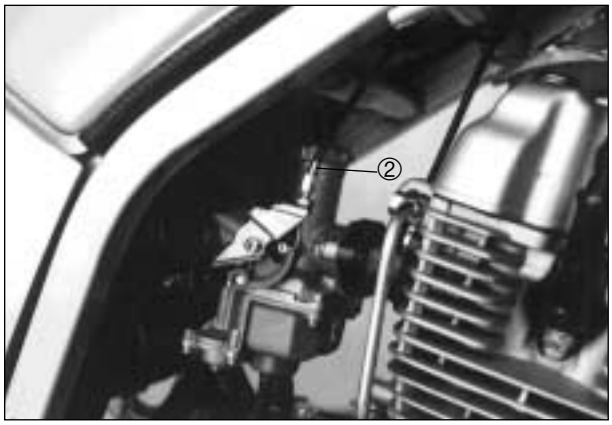
- Install the carburetor between the cylinder and air cleaner out let tube, tighten the intake pipe bolts and clamp screw.



- Install the choke cable ①.
- Adjust play of throttle grip. (Refer to page 2-10)



- Install the accelerator pump cable ②.

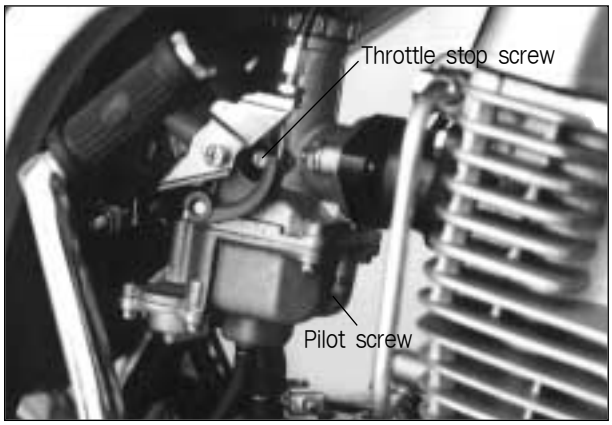


PILOT SCREW ADJUSTMENT

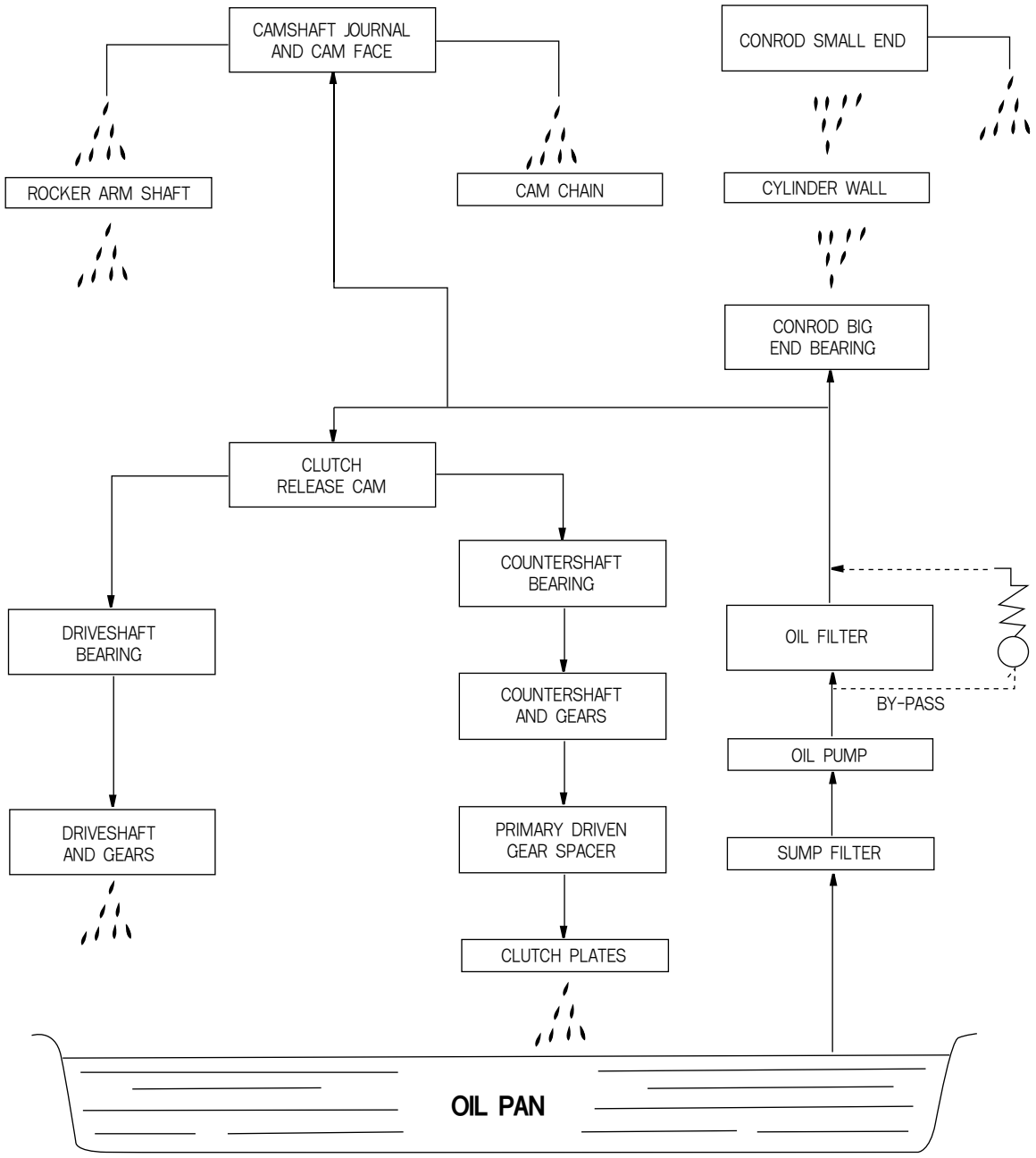
① Loosen as standard turn back revolutions after lock the pilot screw suitable.
Standard turn back revolutions : 2½ circle

NOTE:
Do not tighten the pilot screw by force, otherwise can be damaged of seat.

② Start up the engine and set its speed at any where between 1,400 and 1,500 rpm by turning throttle stop screw.
③ Adjust the engine speed at hight position pilot screw left-right turning.
④ Repeat again ② – ③.
⑤ Adjust standard engine idle speed by throttle stop screw.
⑥ Look into the change idling revolution with snap light of continuously. If the idling revolution is change, repeat the ② – ⑤.



LUBRICATION SYSTEM



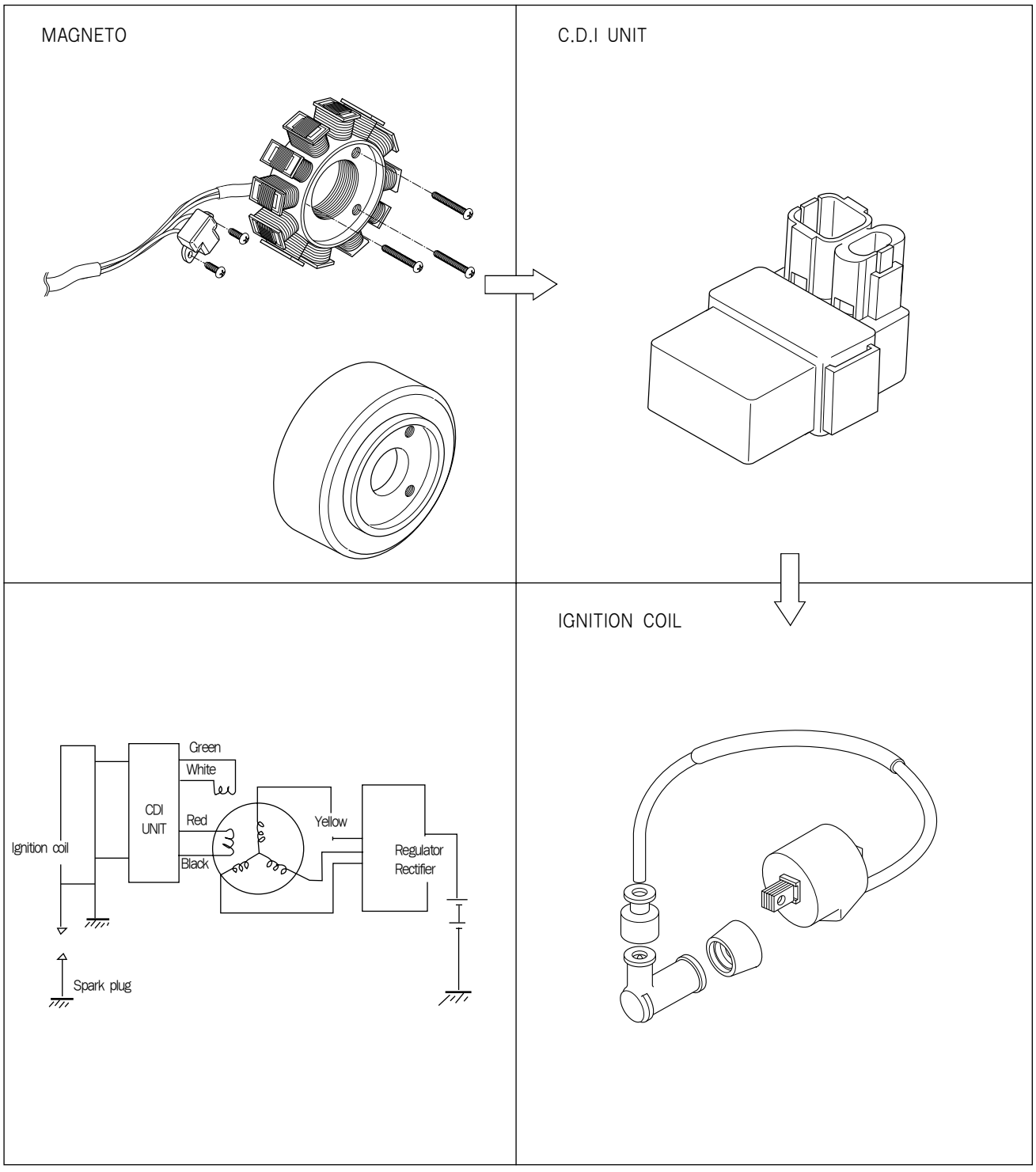
ELECTRICAL SYSTEM

CONTENTS

IGNITION SYSTEM

DESCRIPTION

In the capacitor discharged ignition system, the electrical energy generated by the magento charges the capacitor. This energy is released in a single surge at the specified ignition timing point, and current flows through the pirmary side of the ignition coil. A high voltage current is induced in the secondary windings of the ignition coil resulting in strong spark between the spark plug gap.



INSPECTION

MAGNETO

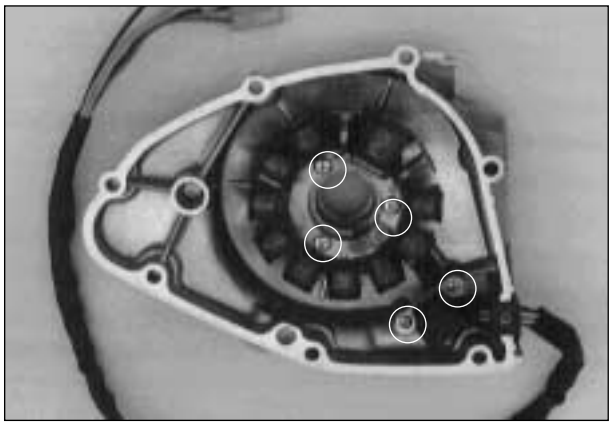
Using the pocket tester, measure the resistance between the lead wires in the following table.

Pick-up coil	G-W Approx. 90-120Ω
Power source I (HANKUK)	R-B Approx. 300-400Ω
Power source II (PUNG SUNG)	R-B Approx. 400-600Ω
Charging coil	Y-Y Approx. 0.5-1.5Ω

09900-25002	Pocket tester

NOTE:
When mounting the stator on the magneto cover, apply a small quantity of THREAD LOCK "1342" to the thereaded parts of screws.

09900-32050	Thread Lock "1342"



WIRE COLOR

Bl : Blue
G : Green
R : Red
W : White
Y : Yellow
B/R : Black with Red tracer
Bl/R : Blue with Red tracer
R/G : Red with Green tracer
W/G : White with Green tracer
W/R : White with Red tracer

CDI UNIT

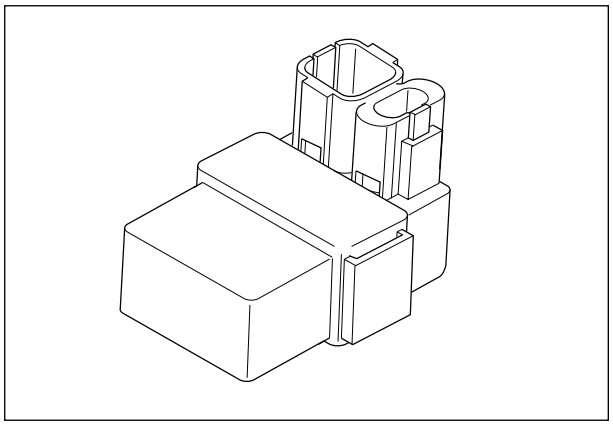
Using the pocket (R×1㏀ range), measure the resistance between the lead wires in the following table.

09900-25002	Pocket tester

⊖ Probe of tester \ ⊕ Probe of tester	R	W	R/G	Bl/R	B/W	B/Y	B
R		OFF	OFF	OFF	OFF	ON	OFF
W	●		●	●	●	●	OFF
R/G	Approx. 70-90	Approx. 70-90		Approx. 30-50	Approx. 30-50	Approx. 70-90	OFF
Bl/R	Approx. 3-5	Approx. 3-5	Approx. 5-6		Approx. 0.5-1.0	Approx. 3-5	OFF
B/W	Approx. 2-4	Approx. 2-4	Approx. 2-4	Approx. 0.5-1.0		Approx. 2-4	OFF
B/Y	ON	OFF	OFF	OFF	OFF		OFF
B	Approx. 10--12	Approx. 10--12	Approx. 12-15	Approx. 3-5	Approx. 2-4	Approx. 10-14	

WIRE COLOR

B : Black
R : Red
W : White
B/W : Black with White tracer
R/Y : Black with Yellow tracer
Bl/G : Blue with Green tracer
R/G : Red with Green tracer



IGNITION COIL

- Check the ignition coil with electro tester.
- Test the ignition coil for sparking performance. Test connection is as indicated. Make sure that the three-needle sparking distance is at least 8mm. Test it at least for 5 minutes.

09900-28106	Electro teste

STD Spark performance	8mm

- Check the ignition coil with pocket tester.

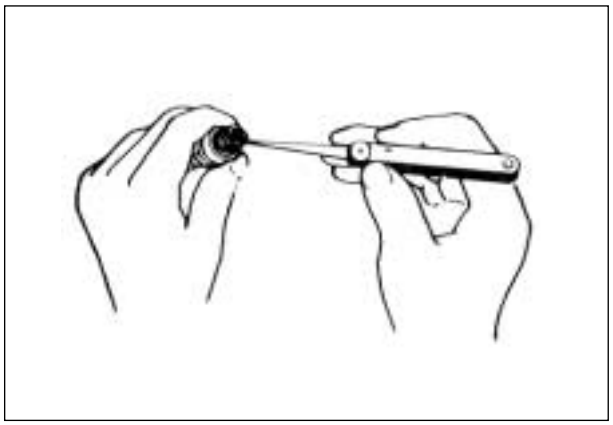
09900-25002	Pocket tester

IGNITION COIL RESISTANCE

Primary	B-Ground Approx. 0.5-1.5 Ω
Secondary	Plug cap-Ground Approx.4.7-5.57 KΩ

SPARK PLUG

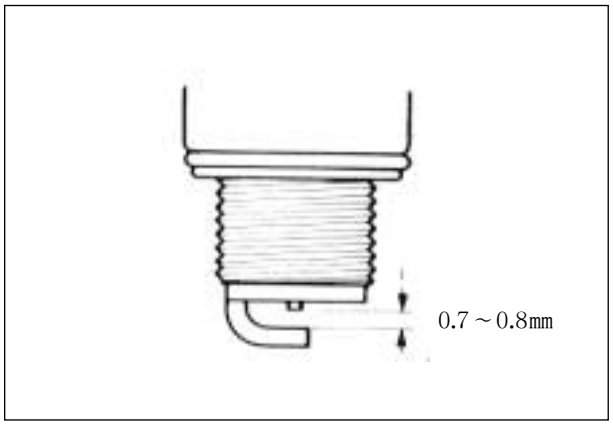
Clean the plug with a wire brush and pin. Use the pin to remove carbon, taking care not to damage the porcelain.



● Check the gap with a thickness gauge.

09900-20804	Thickness gauge

Spark plug gap	0.7-0.8mm

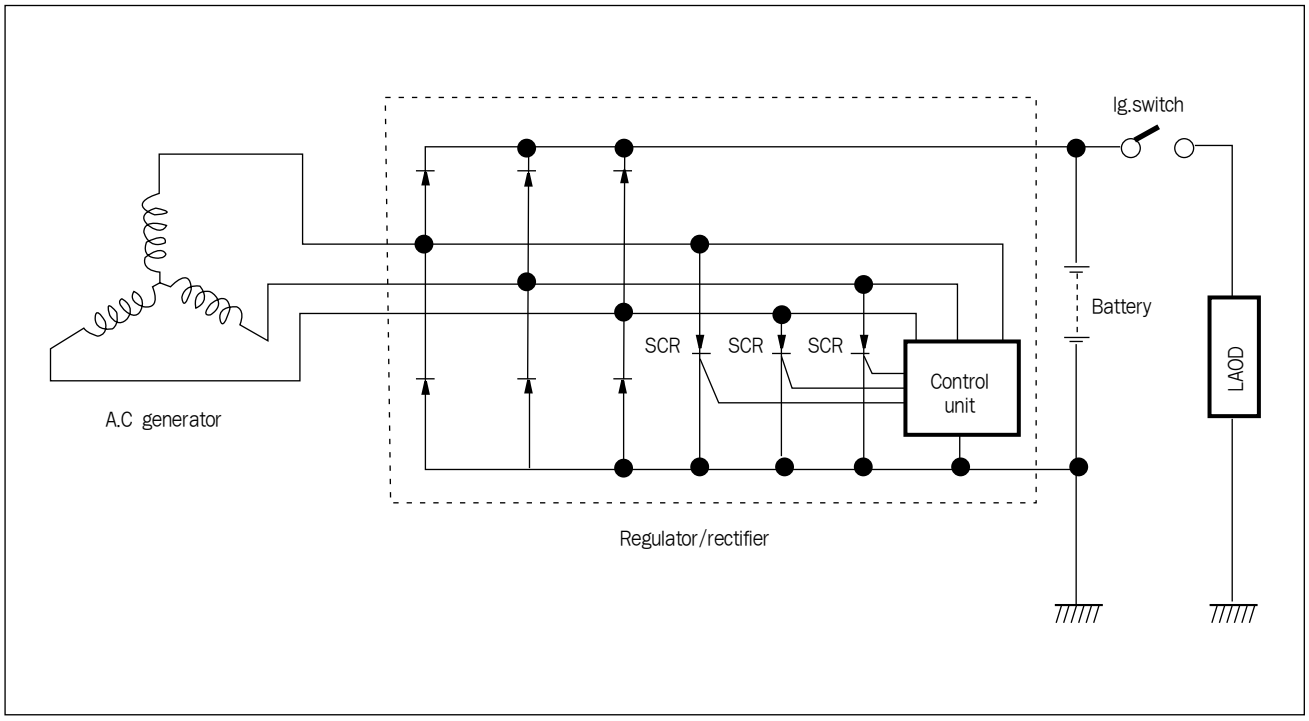


CHARGING SYSTEM

DESCRIPTION

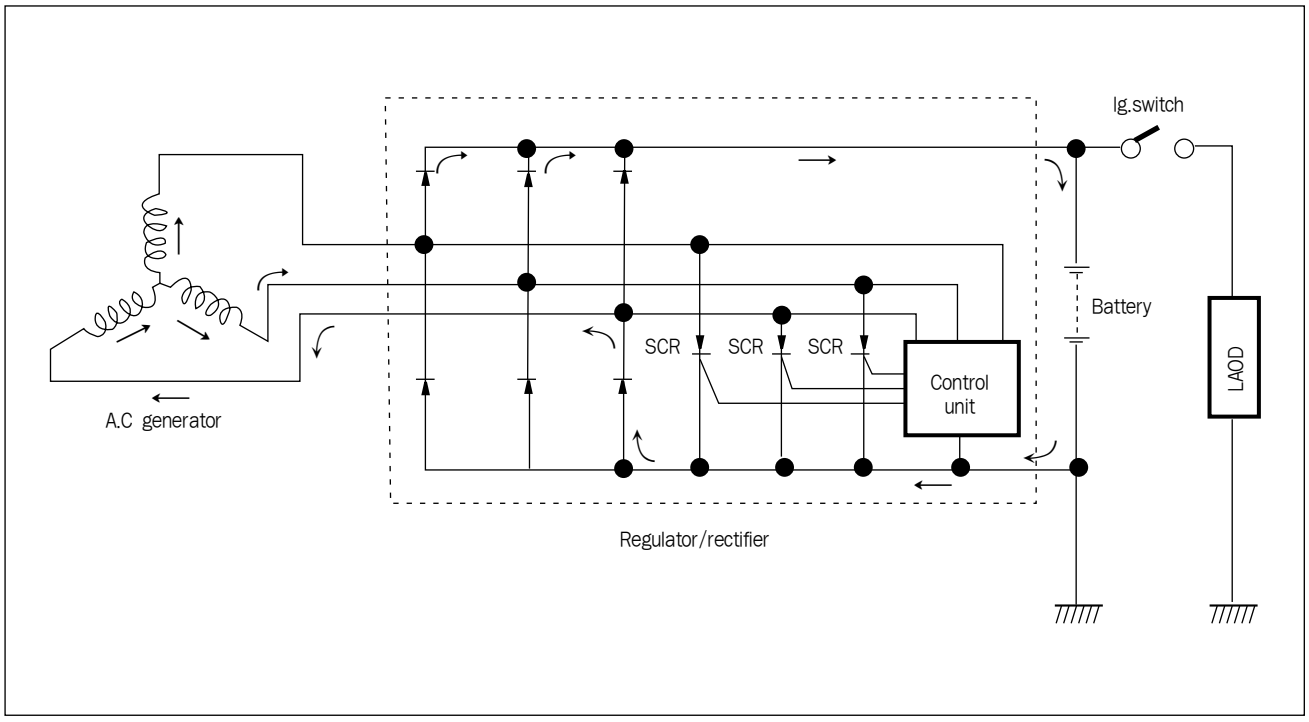
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is converted by rectifier and is turned into DC current, then it charges the battery.

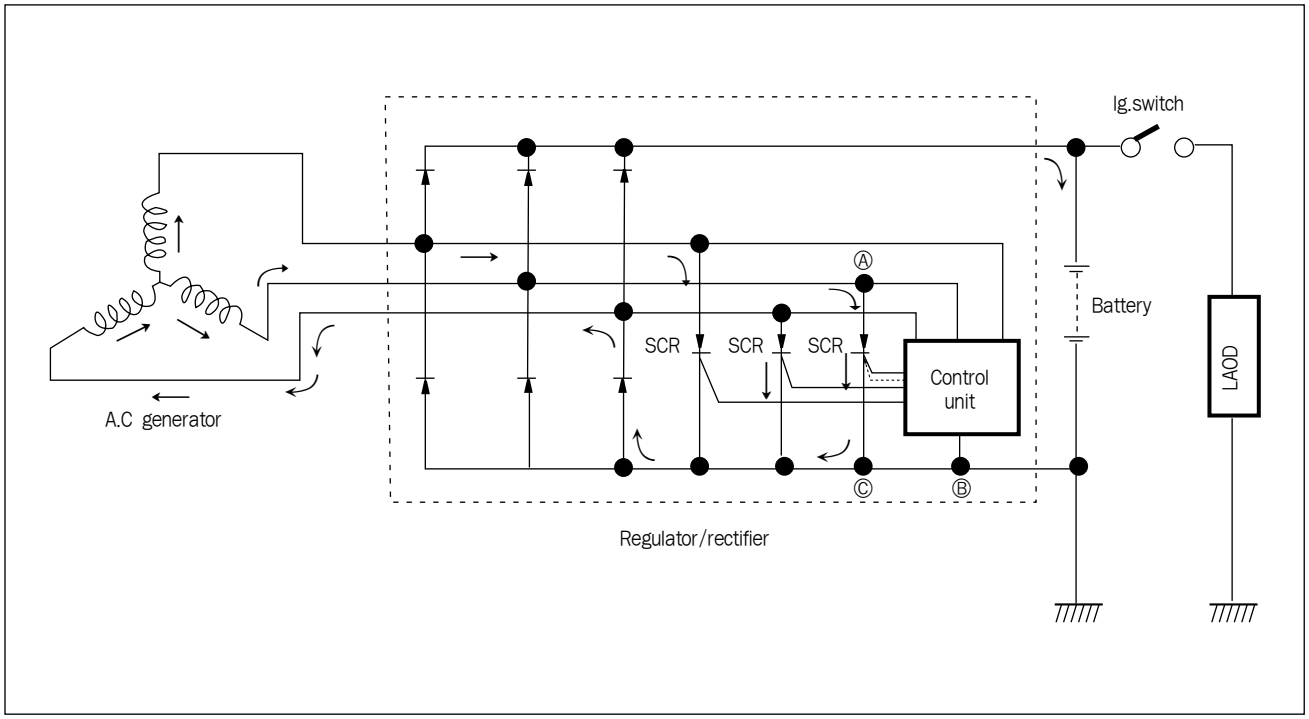


Function of regulator

While the engine r/min is low and the generated voltage of AC generator is lower than the adjusted voltage of regulator, the regulator does not function, incidentally the generated current charges the battery directly.



when the engine r/min become higher, the generated voltage of AC generator also becomes higher and the voltage between points Ⓐ and Ⓑ of regulator becomes high according, and when it reaches the adjusted voltage of control unit, control unit becomes "ON" condition consequently. On the "ON" condition of control unit, signal will be sent to the SCR(Thyristor) gate probe and SCR will become "ON" condition. Then the SCR becomes conductive to the direction from point Ⓐ to point Ⓒ. Namely at the state of this, the current generated from the AC generator gets through SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows into the point Ⓑ, reverse current tends to flow to SCR, then the circuit of SCR turns to OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



INSPECTION

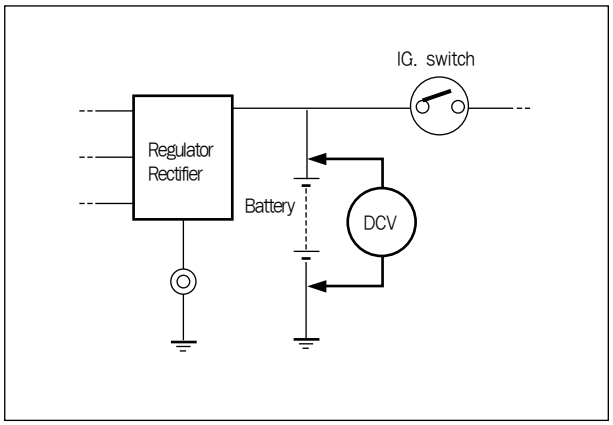
CHARGING OUTPUT CHECK

Start the engine and keep it running at 5000r/min.
Using the pocket tester, measure the DC voltage between the battery terminal ⊕ and ⊖.
If the tester reads under 13.5V or over 16.0V, check the AC generator no-load performance and regulator/rectifier.

NOTE:
When making this test, be sure that the battery is full-charged condition.

STD charging output	13.0V-16.0V at 5,000r/min

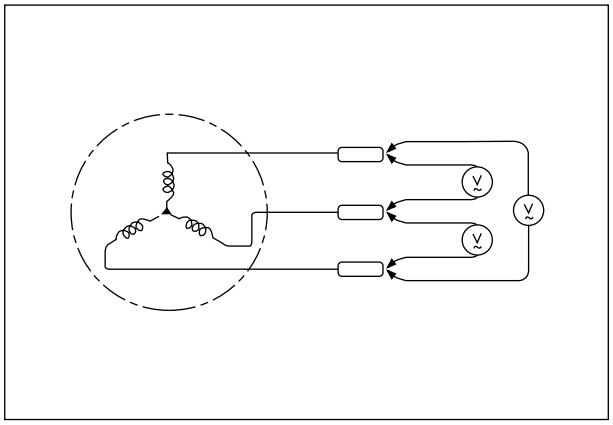
09900-25002	Pocket tester



AC GENERATOR NO-LOAD PERFORMANCE

Disconnect the three lead wires from the AC generator terminal.
Start the engine and keep it running at 5000 r/min.
Using the pocket tester, measure the AC voltage between the three lead wires.
If the tester reads under 70V the AC generator is faulty.

STD No-load performance
More than 70V(AC) at 5000r/min



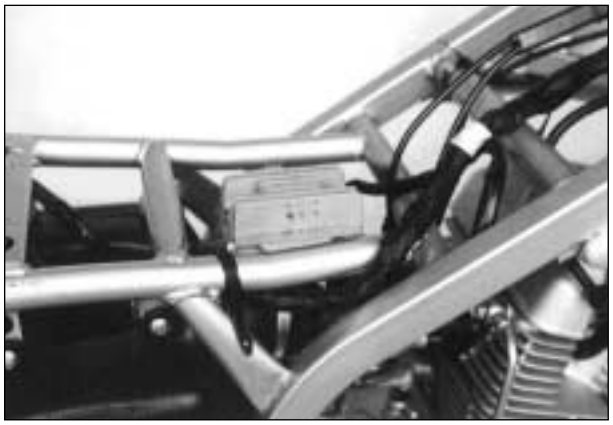
REGULATOR/RECTIFIER

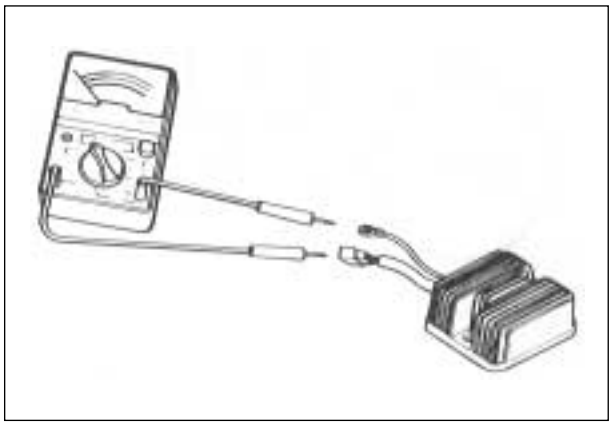
Using the pocket tester (× 1Ω range), measure the resistance between the lead wires in the following table.
If the resistance checked is incorrect, replace the regulator/rectifier.

09900-25002	Pocket tester

Unit : Ω

⊖ Probe of tester \ ⊕ Probe of tester	R	W/Bl	W/R	Y	B/W
R		OFF	OFF	OFF	OFF
W/Bl	7-8		OFF	OFF	OFF
W/R	7-8	OFF		OFF	OFF
Y	7-8	OFF	OFF		OFF
B/W	35-55	7-8	7-8	7-8	

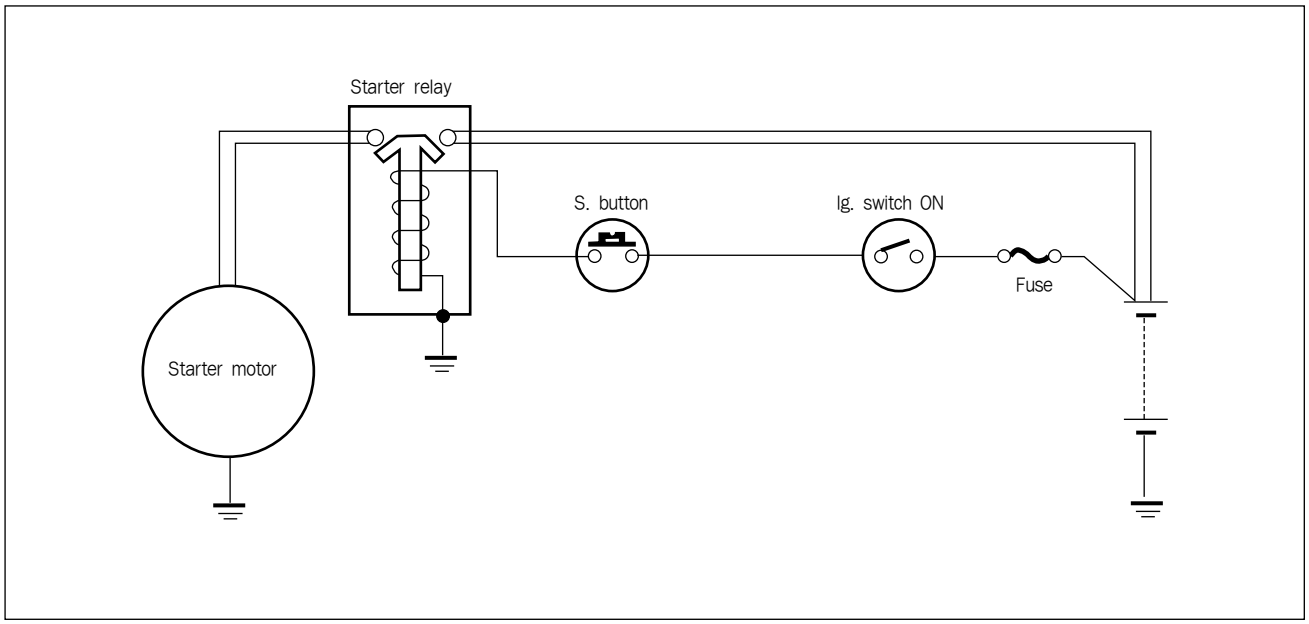




STARTER SYSTEM

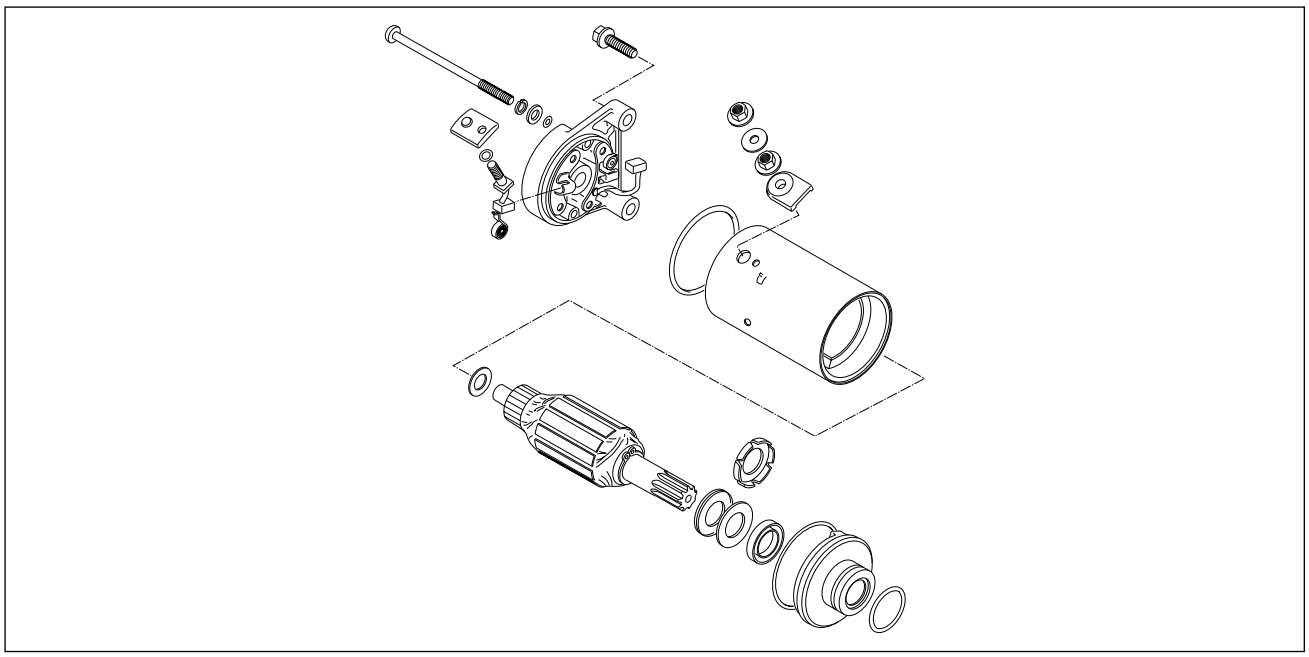
DESCRIPTION

The starter system in shown in the diagram below : namely, the starter motor, relay, IG switch, starter button and battery. Depressing the starter button (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery.
The motor draws about 80 amperes to start the engine.



STARTER MOTOR REMOVAL AND DISASSEMBLY

Remove the starter motor.
Disassemble the starter motor as follows.

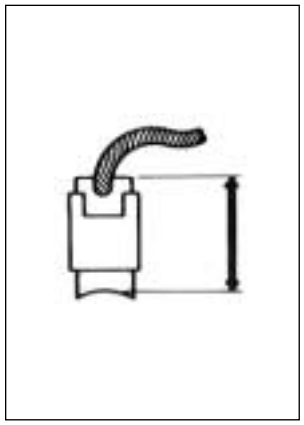


STARTER MOTOR INSPECTION

CARBON BRUSHES

When the brushes are worn, the motor will be unable to produce sufficient torque, and the engine will be difficult to turn over. To prevent this, periodically, inspect the length of the brushes, replacing them when they are too short or chipping.

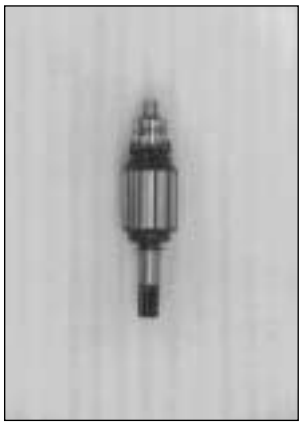
Service limit	3.5mm

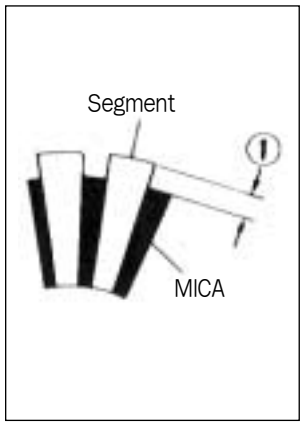


COMMUTATOR

If the commutator surface is dirty, starting performance decreases. Polish the commutator with #400 or similar fine emery paper when it is dirty.
After polishing it, wipe the commutator with a clean dry cloth.
Check the commutator under cut ①.

Service limit	0.5mm

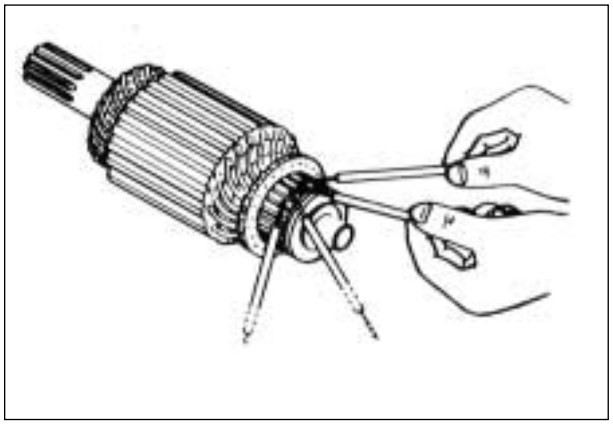




ARMATURE COIL

Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various place of the commutator surface.
If the coil is found to be open-circuited or grounded, replace the armatrue, Continuous use of a defective armature will cause the starter motor to suddenly fail.

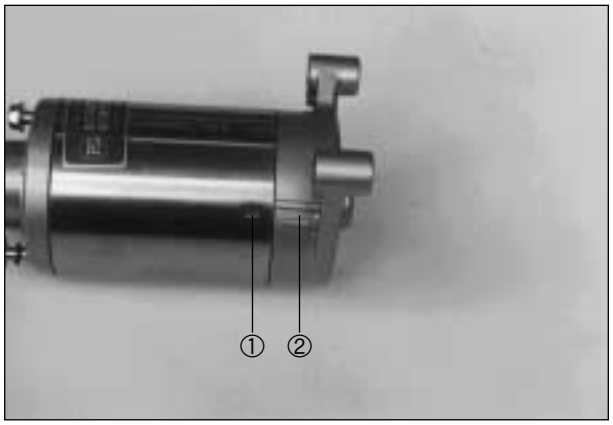
09900-25002	Pocket tester



STATER MOTOR REASSEMBLY

BRUSH HOLDER AND HOUSING END

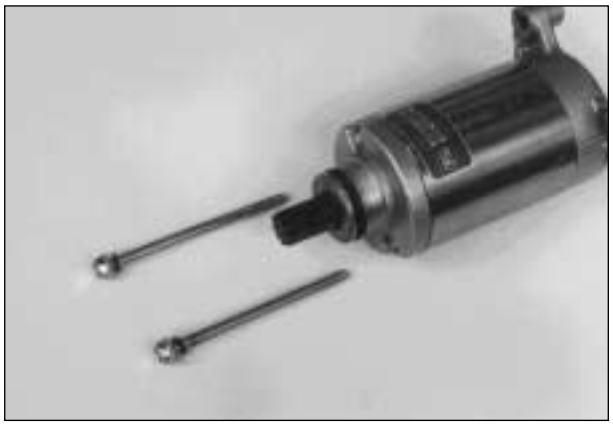
When fixing brush holder to starter motor case, align the protrusion ① of the starter motor case with the notch ② of the brush holder.



SECURING SCREWS

Apply therad lock "1342" to starter motor securing screws.

99000-32050	Thread Lock "1342"



STARTER RELAY INSPECTION

Disconnect lead wire of the starter motor at starter relay. Turn on the ignition switch, inspect the continuity between the terminals, positive and negative, when pushing the starter button.
If the starter relay is in sound condition, continuity is found.

99000-25002	Pocket tester

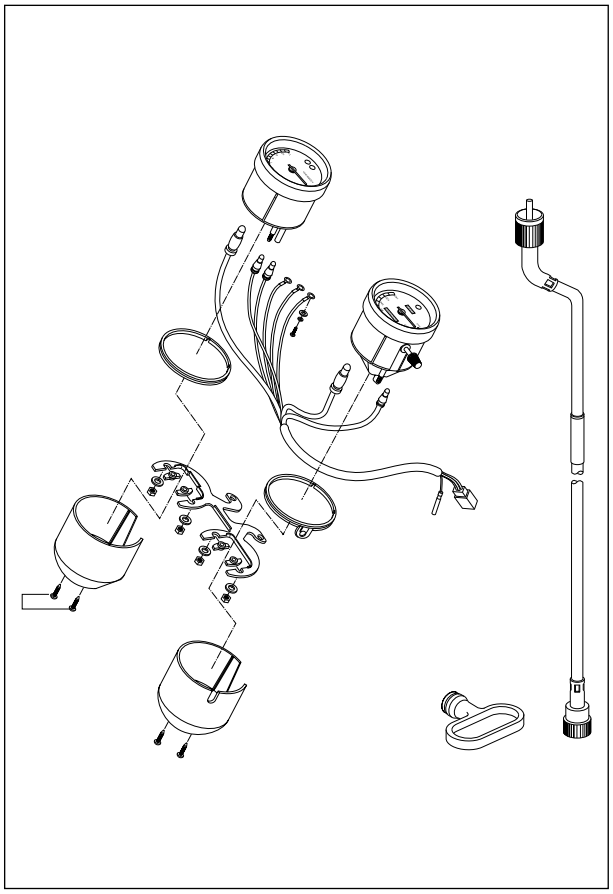
Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition of the resistance is as follows.

99000-25002	Pocket tester

STD resistance	Approx.3-4 Ω

SPEEDOMETER ASSY

Remove the speedometer assy (See page 6-16).
Disassemble the speedometer assy as shown in the illustration.



INSPECTION

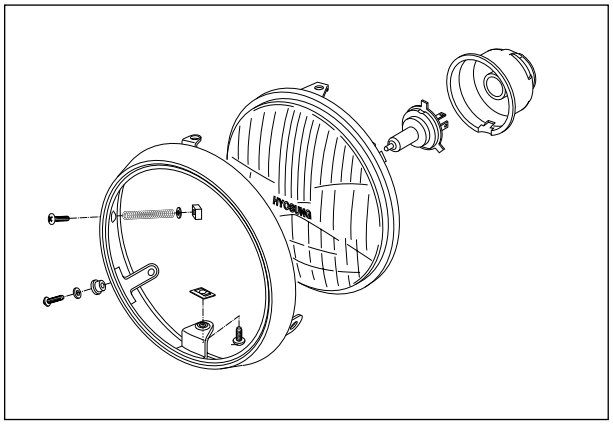
Using the pocket tester, check the continuity between lead wires in the following diagram.
If the continuity measured is incorrect, replace the respective part.

99000-25002	Pocket tester

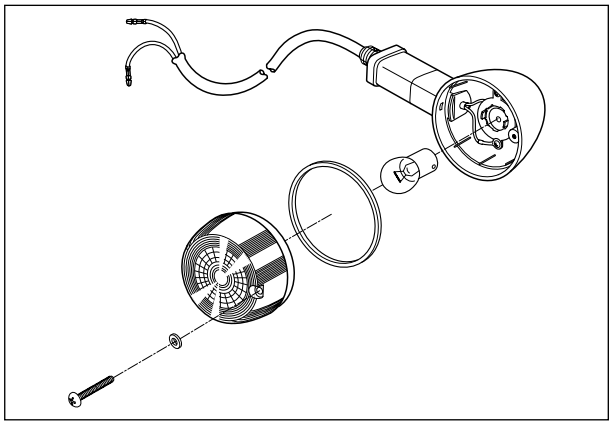
NOTE:
When making this test, it is not necessary to remove the speedometer ass'y.

LIGHTS

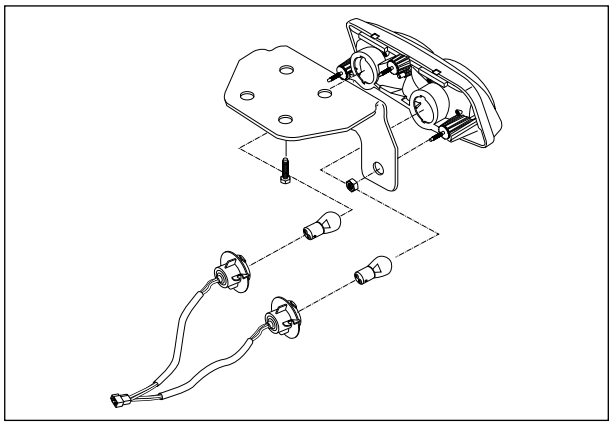
HEAD LIGHT



TURNSIGNAL LIGHT



TAIL/BRAKE LIGHT



SWITCHES

Inspect each switch for continuity with the pocket tester referring to the chart. If it is found any abnormality, replace the respective switch assembly with new one.

99000-25002	Pocket tester

IGNITION SWITCH

	R	O	BW	BR
LOCK			O—O	
OFF			O—O	O
ON	O—O			

STARTER SWITCH

	O	Y/G
OFF		
ON(push)	O	O

LIGHTING SWITCH

	O	Gr	Y/W
ON	O—O	O	O
·	O	O	
OFF			

FRONT BRAKE LIGHT SWITCH

	O	W/B
OFF		
ON	O	O

DIMMER SWITCH

	Y/W	Y	W
HI	○	○	
LO	○		○

TURN SIGNAL LIGHT SWITCH

	B	Sb	Lg
R		○	○
●			
L	○	○	

HORN SWITCH

	G	B/W
OFF		
ON(push)	○	○

REAR BRAKE LIGHT SWITCH

	O	W/B
OFF		
ON	○	○

NEUTRAL INDICATOR LIGHT SWITCH

	L	Ground
OFF		
ON	○	○

PASSING SWITCH

	Y	O
OFF		
ON	○	○

GEAR POSITION INDICATOR LIGHT SWITCH

	W/Y	L	R/B	G/L	Y/L	Br/R	Ground
LOW	○						○
Neutral		○					○
2nd			○				○
3rd				○			○
4th					○		○
Top						○	○

WIRE COLOR

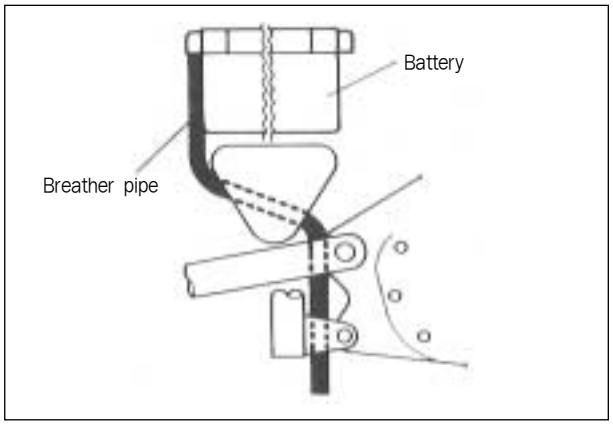
B	: Black	Y	: Yellow
Bl	: Blue	B/W	: Black with White
Br	: Brown	G/Bl	: Green with Blue tracer
G	: Green	R/B	: Red with Black tracer
Sb	: Light blue	W/B	: White with Black tracer
Lg	: Light green	W/Y	: White with Yellow tracer
O	: Orange	Y/Bl	: Yellow with Blue tracer
R	: Red	Y/G	: Yellow with Green tracer
W	: White	Y/W	: Yellow with White tracer

BATTERY

SPECIFICATIONS

Type designation	12M8-3B
Capacity Standard electrolyte S. G.	12V 9AH/10HR 1.280 at 20˚C(68˚F)

In fitting the battery to the motorcycle, connect the breather tube to the battery vent.



INITIAL CHARGING

Filling electrolyte

Remove short sealed tube cap ① before filling electroyte. Fill battery with electrolyte (dilute sulfuric acid solution with acid concentration of 35.0% by weight, having a specific gravity of 1.28 at 20˚C (68˚F) up to indicated UPPER LEVEL.

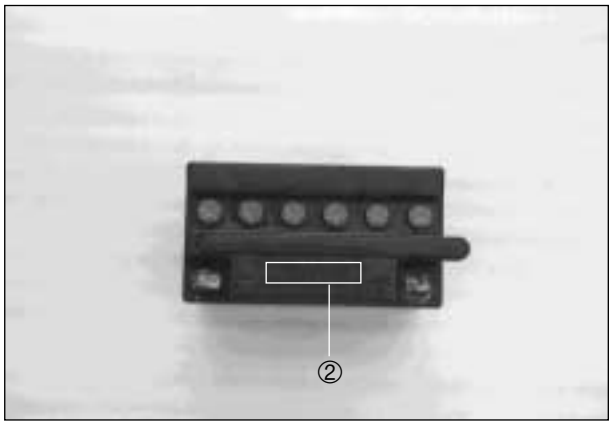
Filling electrolyte should be always cooled below 30˚C (86˚F) before filling into battery. Leave battery standing for half an hour after filling. Add additonal electrolyte if necessary.

Charge battery with current as described in the tables shown below.

Maximum charging current	0.8Ⓐ

Charging time

The charging time for a new battery is determined by the number of months that have elasped since the date of manufacture.



Confirmation for date of manufacture

Date of manufacture is indicated by a three-part number ②, as follows, each indicating month, data and year.

Near the end of charging period, adjust the specific gravity of electrolyte to value specified.

After charging, adjust the electrolyte level to the UPPER LEVEL with DISTILLED WATER.

Months after manufacturing	Within 6	Within 9	Within 12	Over 12
Necessary charging hours	20	30	40	60

Servicing

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte or electolyte leakage from the sides of the battery have occurred, replace the battery with a new one.

If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

Check the electrolyte level and add distilled water, as necessary, to raise the electrolyte to each cell's upper level.

Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.22 or less, as corrected to 20 ˚C(68˚F), it means that the battery is still in a run-down condition and needs recharging.

NOTE:
First, remove the ⊖ lead wire.

BASED ON S.G. READING RECHARGING OPERATION

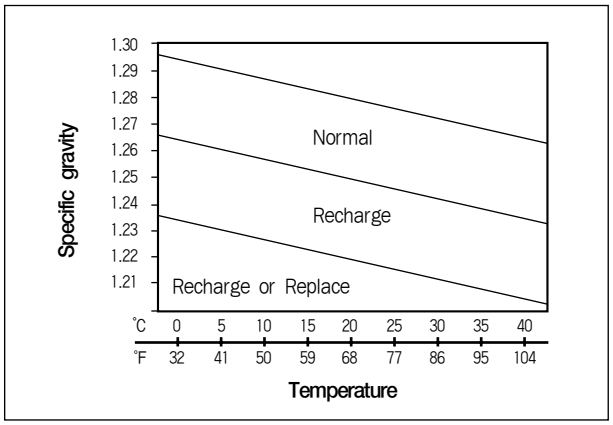
To correct an S.G. reading 20˚C(68˚F), use following table.

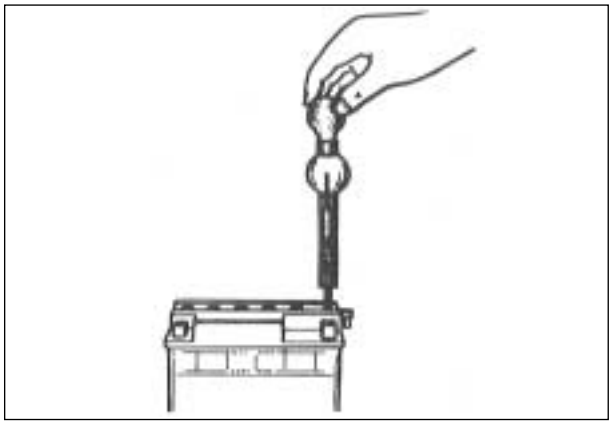
To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduations on the float scale bordering on the meniscus (curved-up portion of electrolyte surface), as shown in figure.

Check the reading (as corrected to 20˚C) with chart to determine the recharging time in hours by constant-current charging at a charging rate of 0.9 amperes (which is a tenth of the capacity of the present battery).

Be careful not to permit the electrolyte temperature to exceed 45˚C(113˚F), at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification.

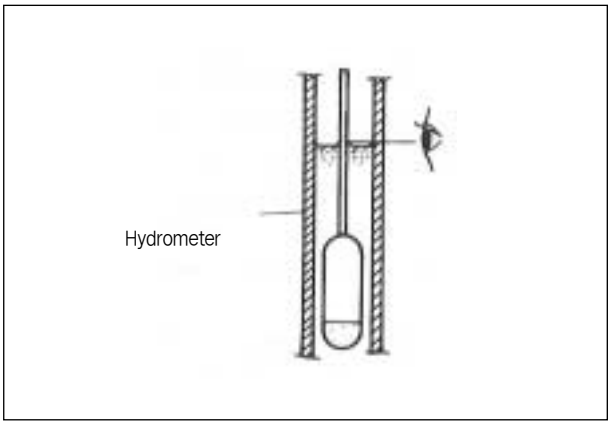
Electrolyte specific gravity	1.28 at 20˚C(68˚C)





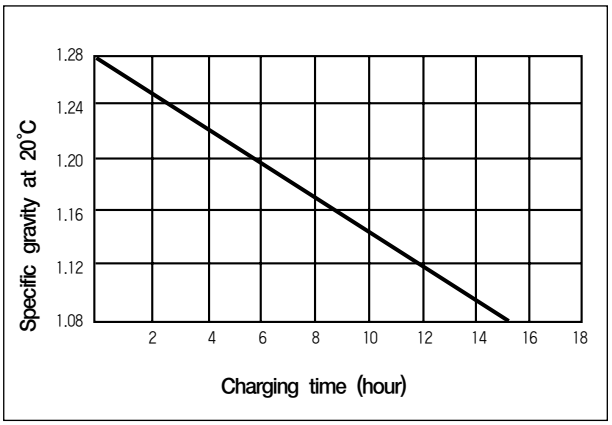
CAUTION:
Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery.

09900-28403	Hydrometer



SERVICE LIFE

Lead oxide is applied to the poles plate of the battery which will come off gradually during the service. When the bottom of the battery case becomes full of the sediment, the battery cannot be used any more. If the battery is not charged for a long time, lead sulfate is generated on the surface of the pole plates and will deteriorate the performance (sulfation). Replace the battery with new one in such a case.



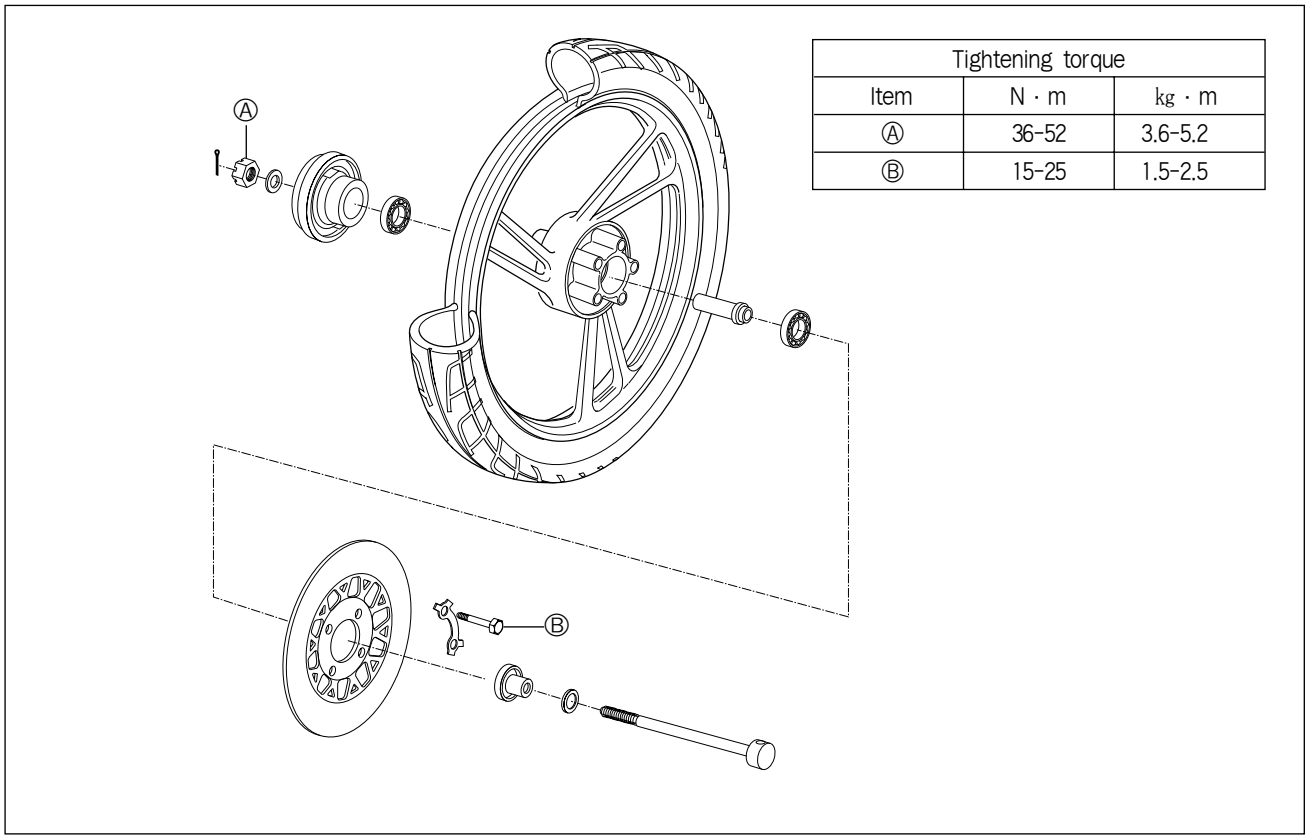
When a battery is left for a long term without using, it is apt to be subject to sulfation. When the motorcycle is not used for more than 1 month (especially during the winter season), recharge the battery once a month at least.

WARNING:
- **Before charging a battery, remove the seal cap from each cell.**
- **Keep fire and sparks away from a battery being charged.**
- **When removing a battery from the motorcycle, be sure to remove the ⊖ terminal first.**

CHASSIS

CONTENTS

FRONT WHEEL

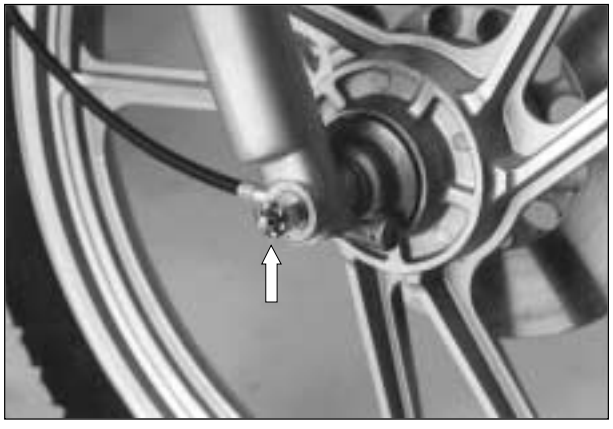


Tightening torque		
Item	N · m	kg · m
Ⓐ	36-52	3.6-5.2
Ⓑ	15-25	1.5-2.5

REMOVAL AND DISASSEMBLY

- Support the machine by the center stand and jack or block.

- Pull out the cotter pin and remove the axle nut.



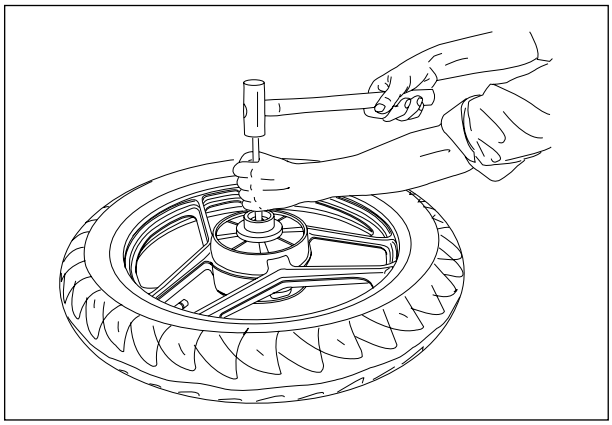
- Draw out the axle shaft and take off the front wheel.

NOTE:
Do not operate the front brake lever while dismounting the front wheel.

- Unlock the washers and remove the four bolts.
- Separate the disc plate from the wheel.

CAUTION:
Do not reuse the lock washers.

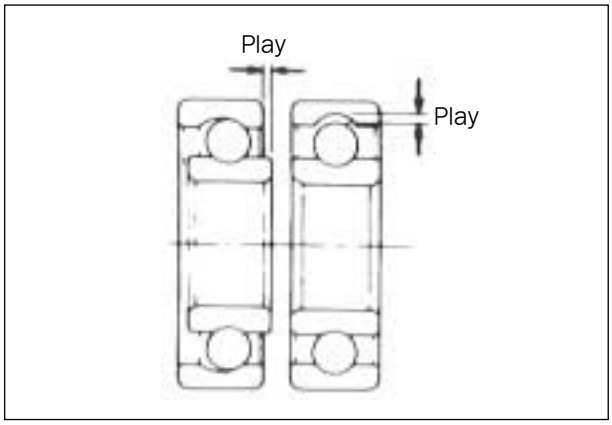
- Using the appropriate drift, drive out the wheel bearings.



INSPECTION

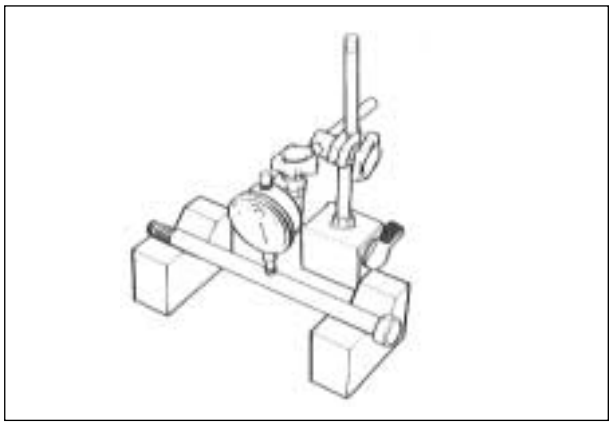
WHEEL BEARING

Inspect the play of wheel bearings inner race by hand while fixing it in the wheel hub.
Rotate the inner race by hand to inspect whether abnormal noise occurs or rotating smoothy.
Replace the bearing if there is something unusual.



AXLE SHAFT

Using the special tools, check the axle shaft for runout and replace it if the runout exceeds the limit.

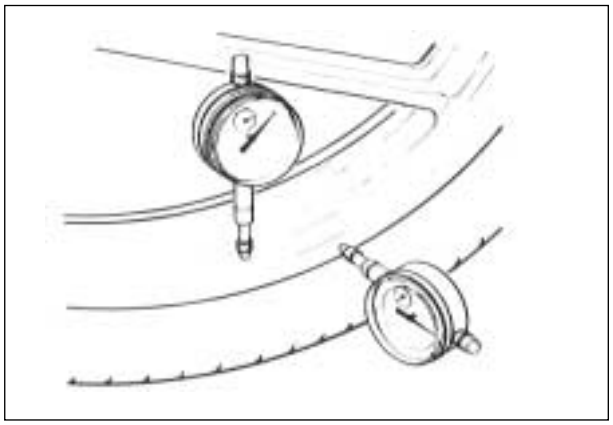


09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand
09900-21304	V-block (100mm)

Service	0.25mm

WHEEL RIM

Make sure that the wheel rim runout does not exceed the service limit when checked as shown.



NOTE:
Worn or loose wheel bearings must be replaced before attempting to true a wheel rim.

09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand

Service limit (Axial and Radial)	2.0mm

TIRE

(See page 2-14)

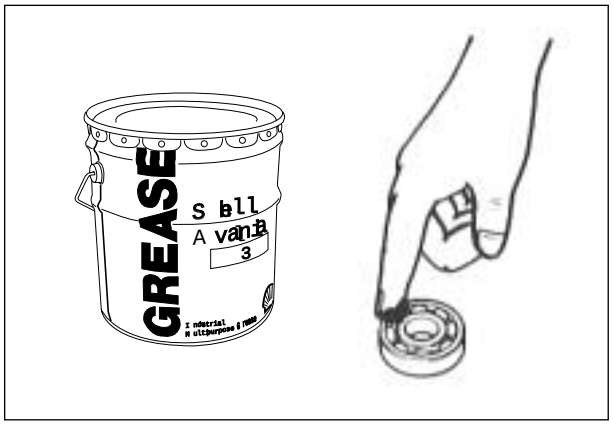
OIL SEAL

Inspect the lip of the oil seal for damage.

REASSEMBLY

Reassemble and remount the front wheel in the reverse order of disassembly and removal, and also carry out the following steps :

WHEEL BEARING



- Apply grease to the bearing before installing.

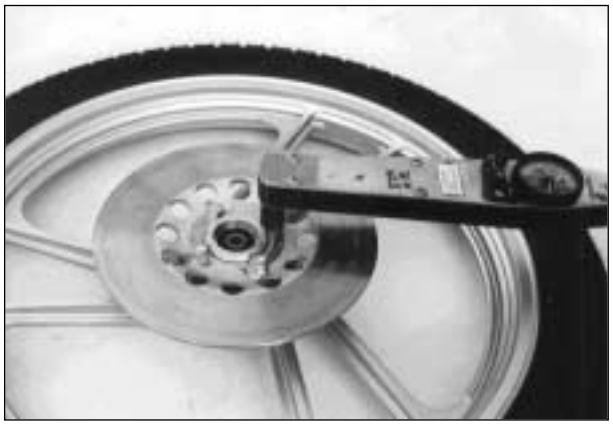
99000-07000	Grease "G2"

- Install the wheel bearings by using the special tool.

09913-75820	Bearing installer

BRAKE DISC

- Make sure that the brake disc is clean and free of any grease matter.
  After securing it in place by tightening its bolts, be sure to lock with specified torque.



Tightening torque	15-25N · m(1.5-2.5kg · m)

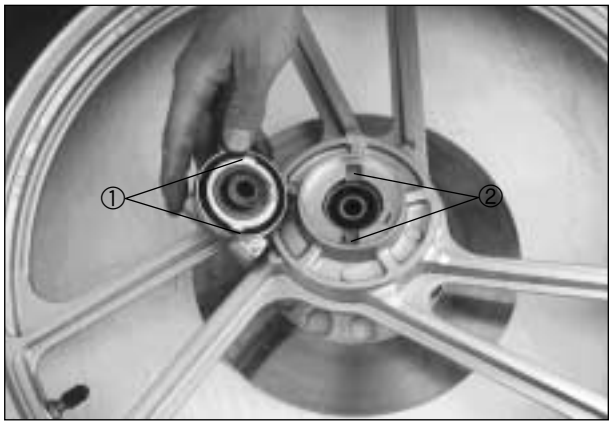
NOTE:
Always use new lock washers.

- Bend the washers to the bolts.

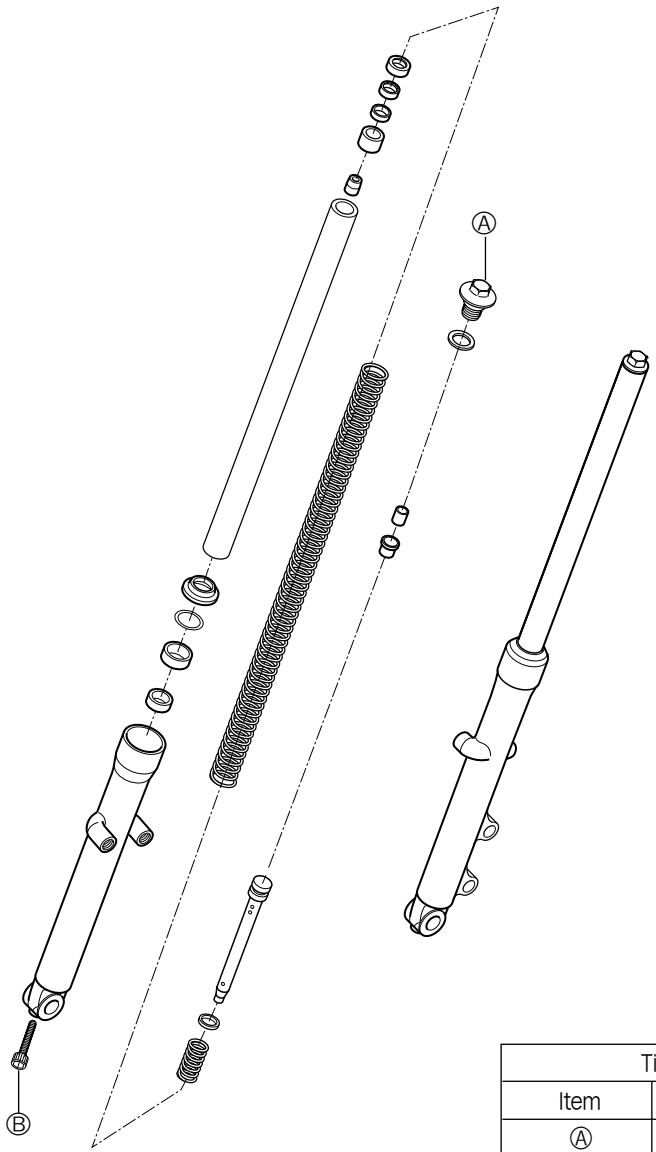
SPEEDOMETER GEAR BOX

Before installing the speedometer gear box grease it and align groove ① on the wheel hub with two drive pawls ② on the speedometer gear box.

99000-07000	Grease "G2"



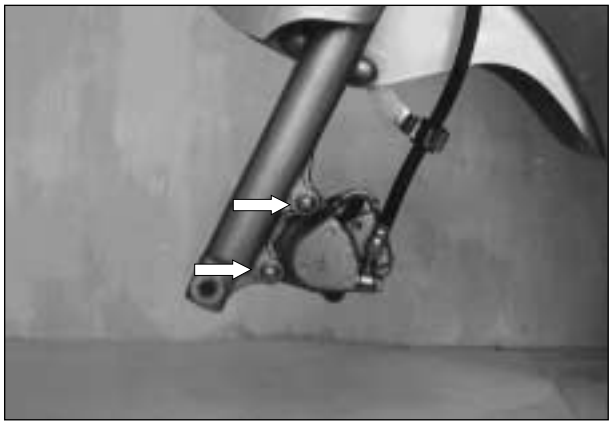
FRONT FORK



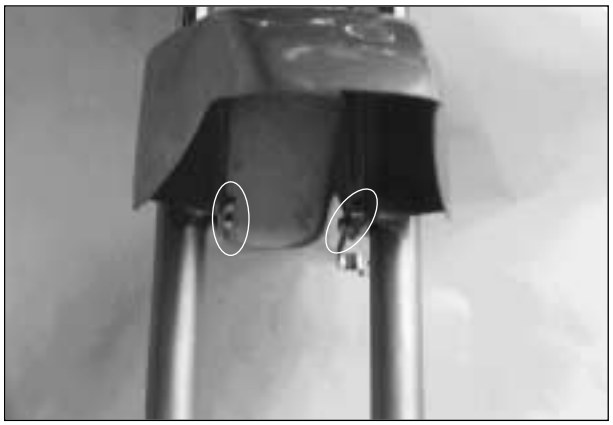
Tightening torque		
Item	N · m	kg · m
Ⓐ	18-28	1.8-2.8
Ⓑ	20-26	2.0-2.6

REMOVAL AND DISASSEMBLY

- Removal the front wheel. (See page 6-1)
- Remove the two bolts and take off the front caliper.

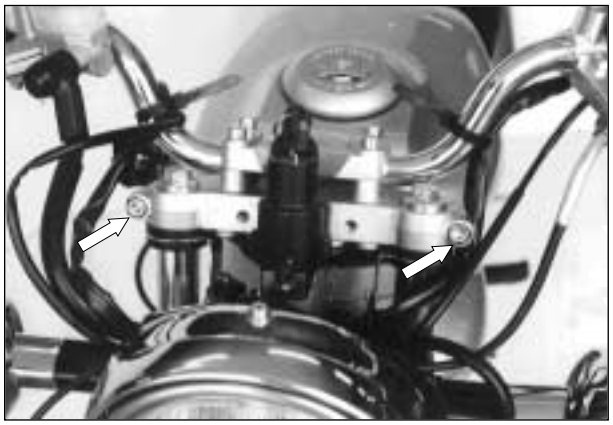


- Remove the four bolts and take off the front fender.

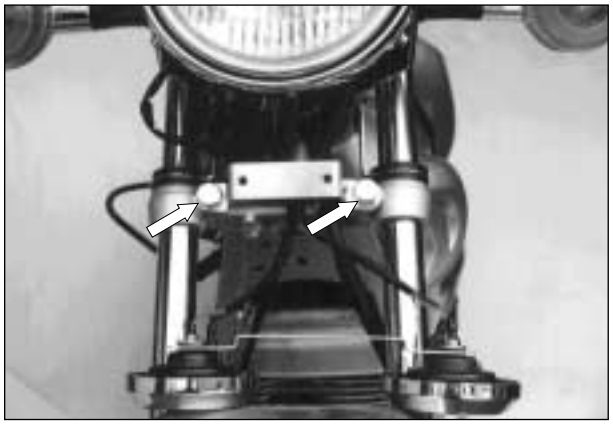


- Remove the two upper clamp bolts by using the 6 mm hexagon wrench.

09900-00401	"L" type hexagon wrench(6mm)

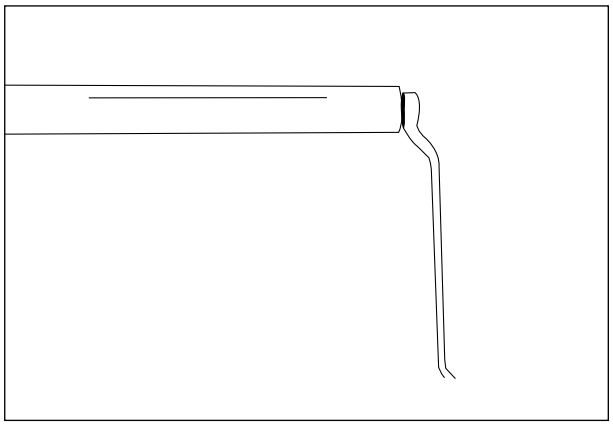


- Loosen the front fork lower clamp bolts.



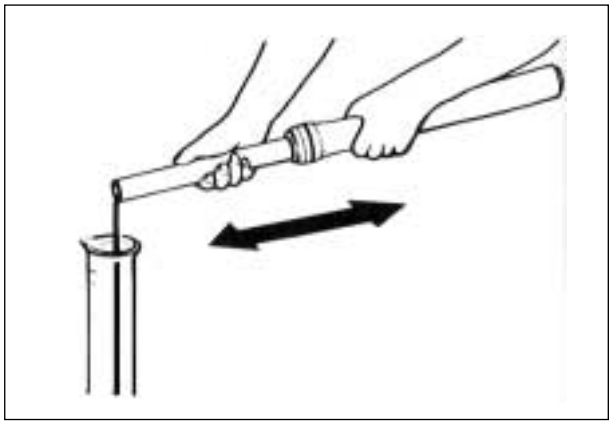
- Pull down right and left front forks.

- Loosen the fork bolt.



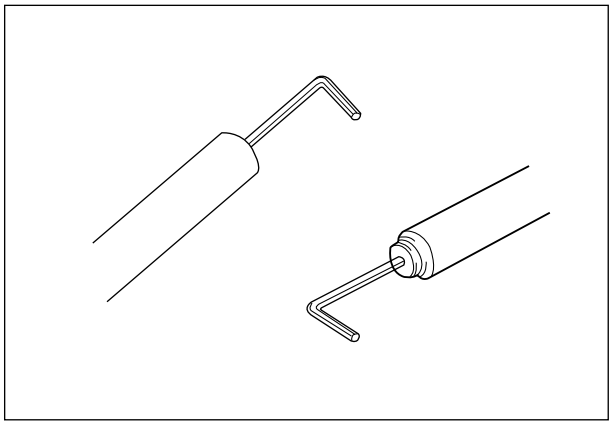
- Draw out the spacer and fork spring.

- Invert the fork and stroke it several times to remove the oil.
- Hold the fork inverted for a few minutes.

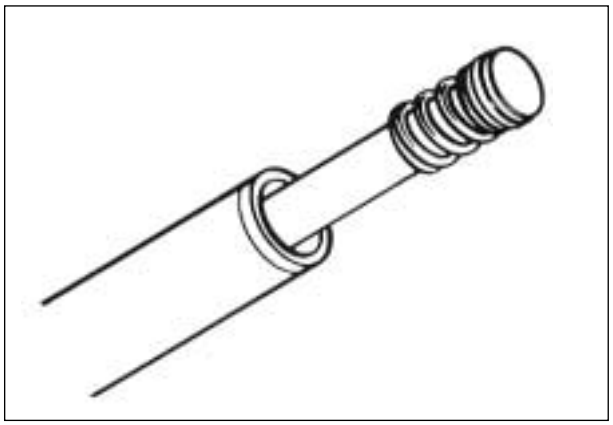


- Remove damper rod bolt by using the special tools and 8mm hexagon wrench.

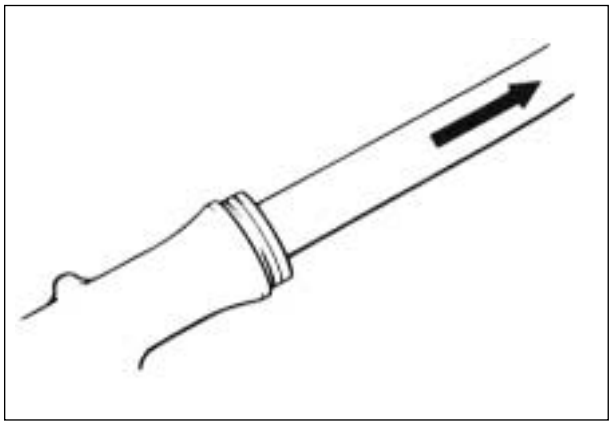
09900-00401	"L" type hexagon wrench(6mm)



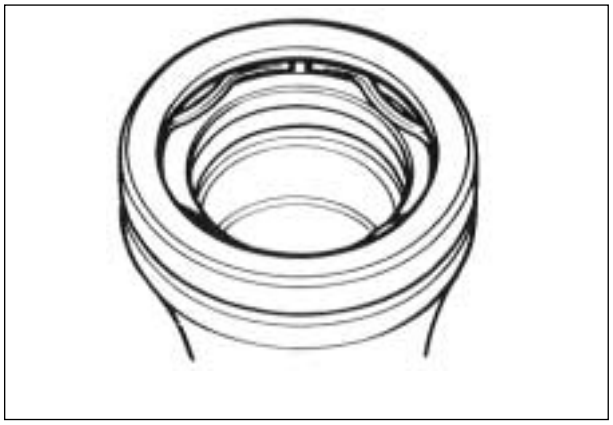
- Remove the oil lock piece and damper rod with rebound spring.



- Separate the inner tube from the outer tube.



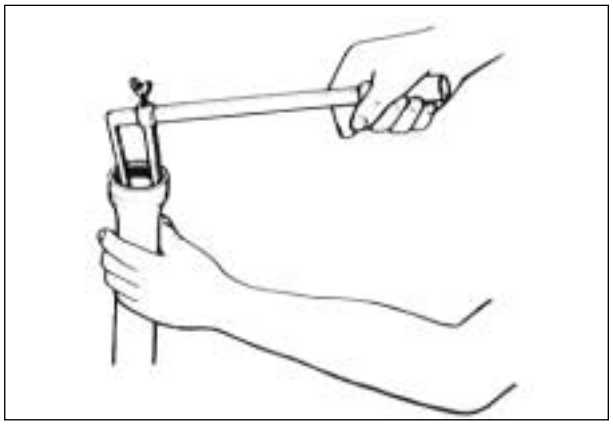
- Remove the oil seal stopper ring.



● Remove the oil seal by using the special tool.

09913-50121	Oil seal remover

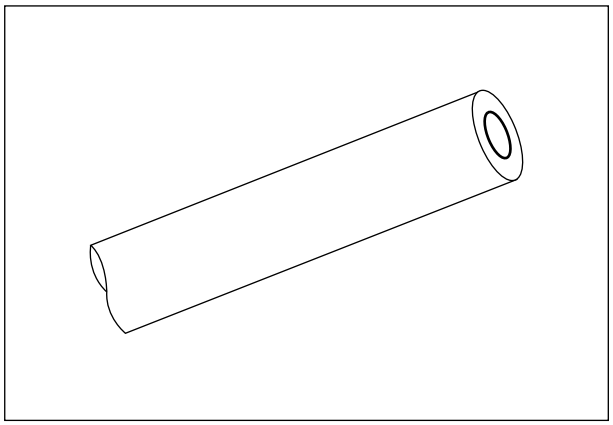
CAUTION:
The oil seal removed should be replaced with a new one.



INSPECTION

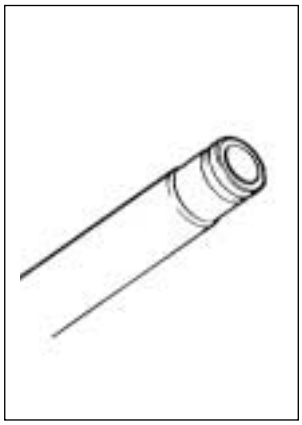
DAMPER ROD RING

Inspect the damper rod for wear and damage.



INNER TUBE AND OUTER TUBE

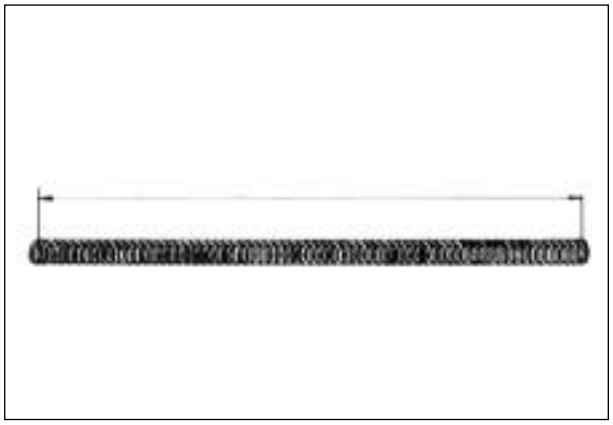
Inspect the inner tube and outer tube sliding surfaces for any scuffing or flaws.



FORK SPRING

Measure the fork spring free length, if it is shorter than the service limit, replace it.

Service limit	454.5mm



REASSEMBLY

Reassemble and remount the front fork in the reverse order of disassembly and removal, and also carry out the following steps :

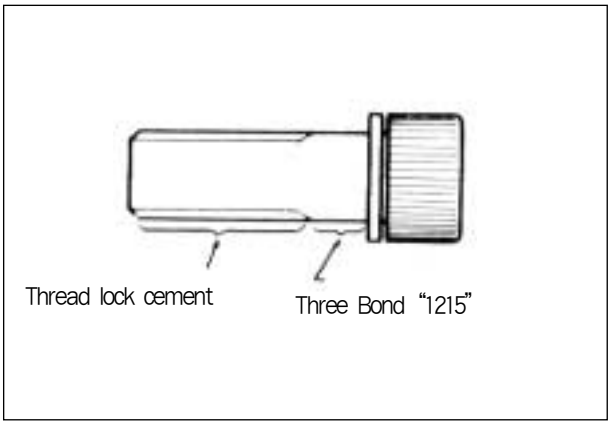
DAMPER ROD BOLT

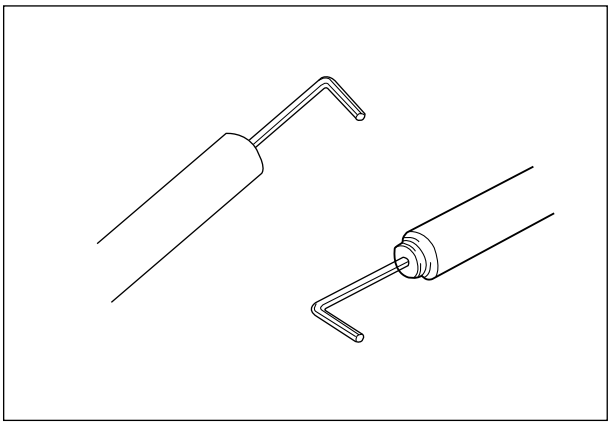
Apply Three Bond No. 1215 and Thread Lock Cement to the damper rod bolt and tighten the bolt with specified torque by using the 8mm hexagon wrench and special tools.

99000-31110	Three Bond No. 1215
99000-32040	Thread lock cement

09900-00401	"L" type hexagon wrench(6mm)

Tightening torque	20-26N · m(2.0-2.6kg · m)

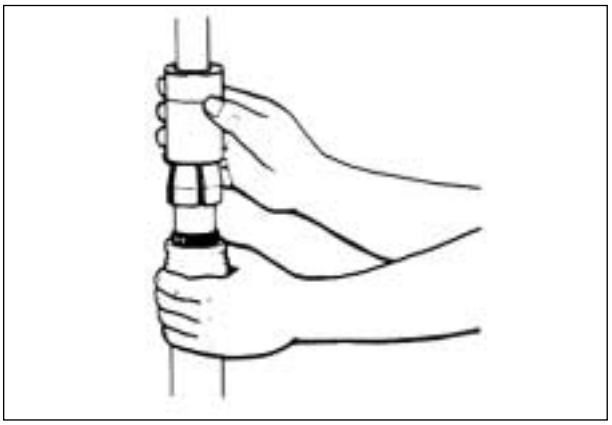




OIL SEAL

Install the oil seal to the outer tube by using the special tool as shown.

09940-50112	Front fork oil seal installer

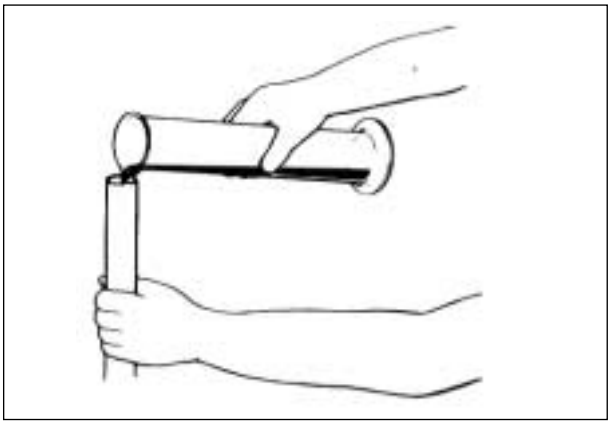


FORK OIL

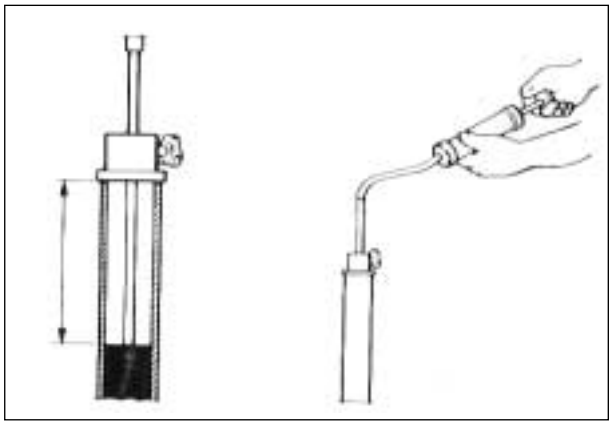
For the fork oil, be sure to use a front fork oil whose viscosity rating meets specifications below.

Fork oil type	FORK OIL # 15

Capacity(each leg)	175 ㎖



Hold the front vertical and adjust the fork oil level with the special tool.



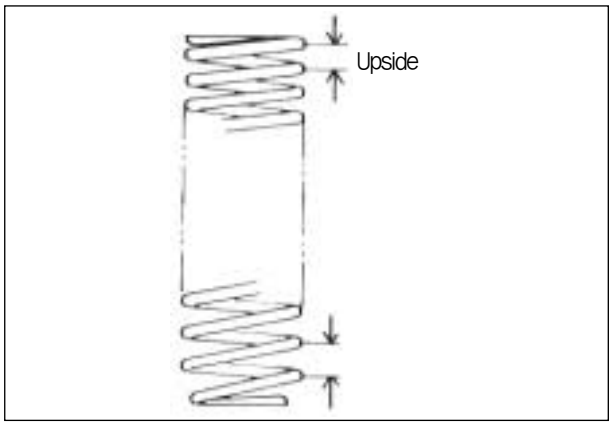
NOTE:
When adjusting oil level, remove the fork spring and compress the inner tube fully.

09943-74111	Fork oil level gauge

Oil level	185 mm

FORK SPRING

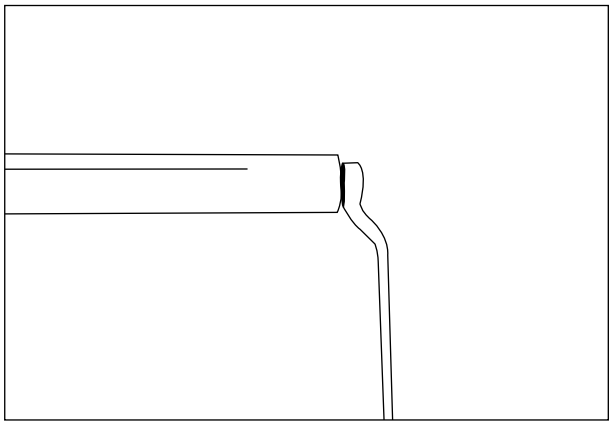
When installing the fork spring, the close pitch end should position upside.



FORK BOLT

Tighten the fork bolt with specified torque.

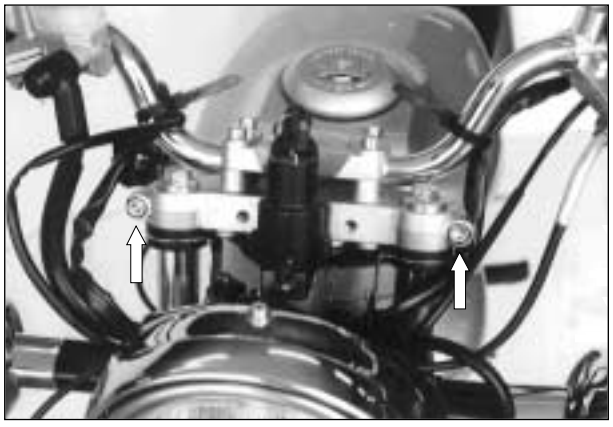
Tightening torque	18-28N · m(1.8-2.8kg · m)



REMOUNTING

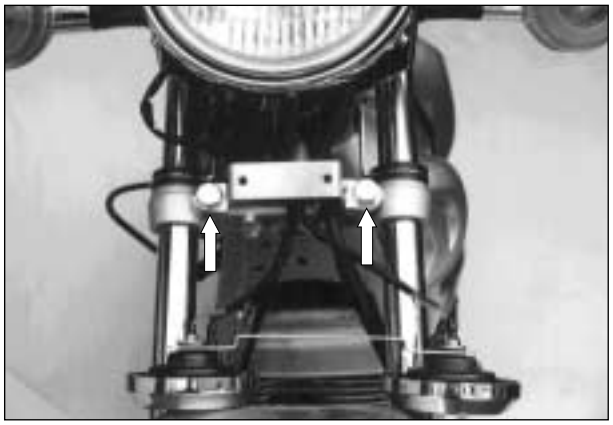
- Tighten the fork upper clamp bolts with specificed torque.

Tightening torque	35-55N · m(3.5-5.5kg · m)

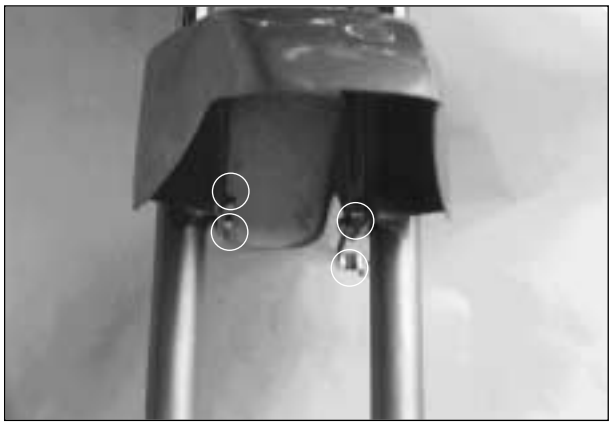


● Tighten the lower clamp bolts with specificed torque.

Tightening torque	25-35N · m(2.5-3.5kg · m)

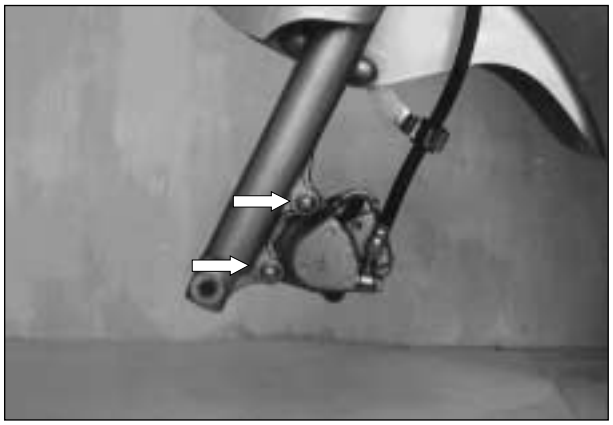


● Install the front fender.



● Tighten the caliper mounting bolts with specificed torque.

Tightening torque	15-25N · m(1.5-2.5kg · m)



● Install the front wheel.

SPEEDOMETER ASSY
DISASSEMBLY

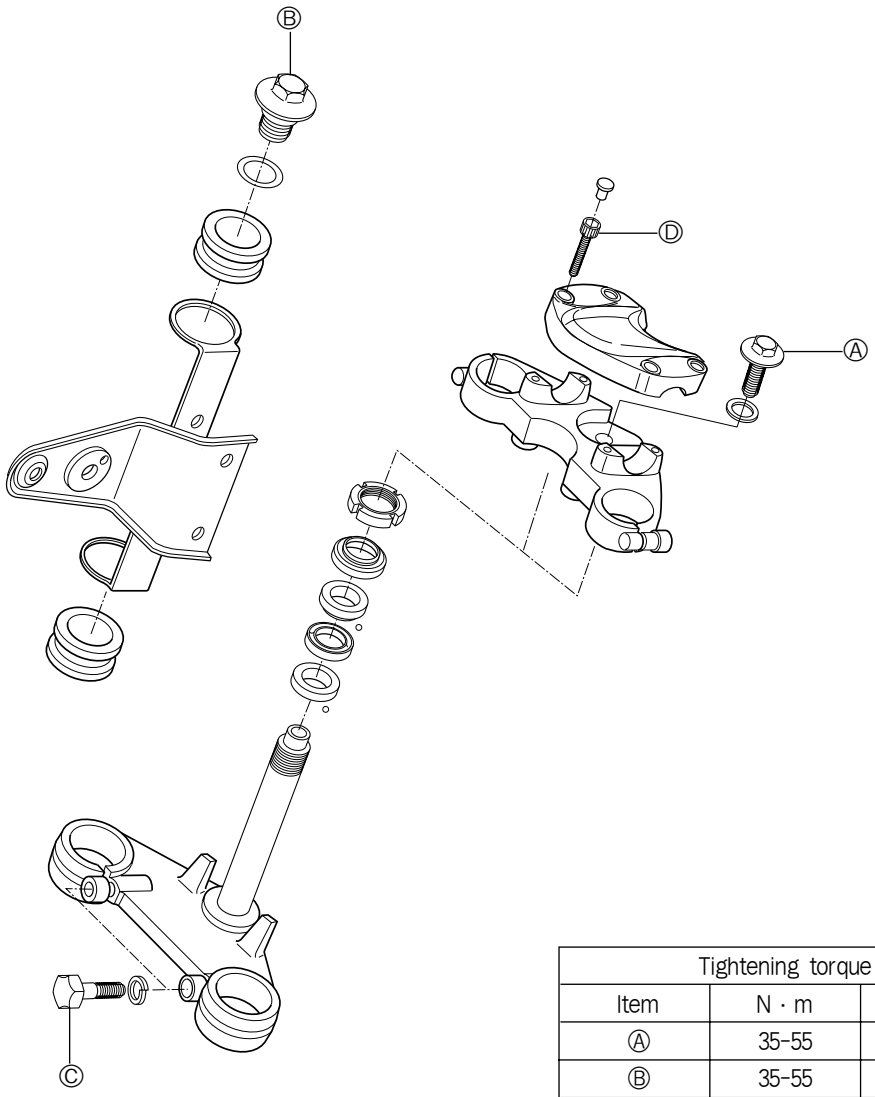
- Remove the speedometer cable.

- Loosen the head lamp lens screw.

- Disconnect the speedometer coupler.

- Loosen the bolts and remove the speedometer.

STEERING STEM

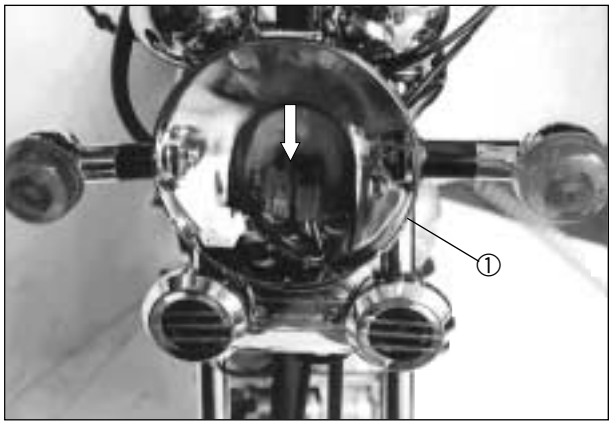


Tightening torque		
Item	N · m	kg · m
Ⓐ	35-55	3.5-5.5
Ⓑ	35-55	3.5-5.5
Ⓒ	25-35	2.5-3.5
Ⓓ	12-20	1.2-2.0

REMOVE AND DISASSEMBLY

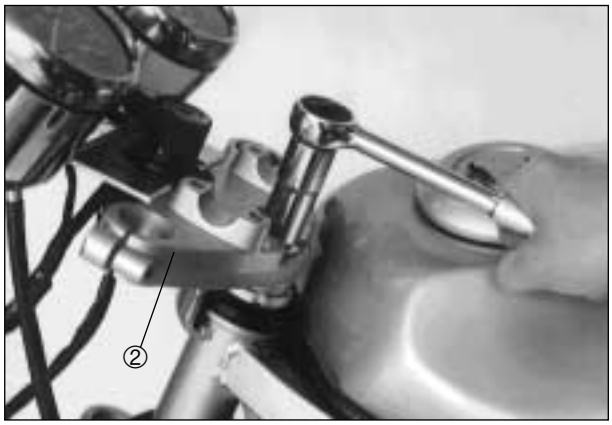
- Remove the front wheel. (Refer to Page 6-1)
- Remove the front fender. (Refer to Page 6-6)
- Remove the front fork. (Refer to Page 6-6)
- Loosen the headlamp screws and remove the lens.

- Disconnect the lead wire and remove the head lamp housing ①.

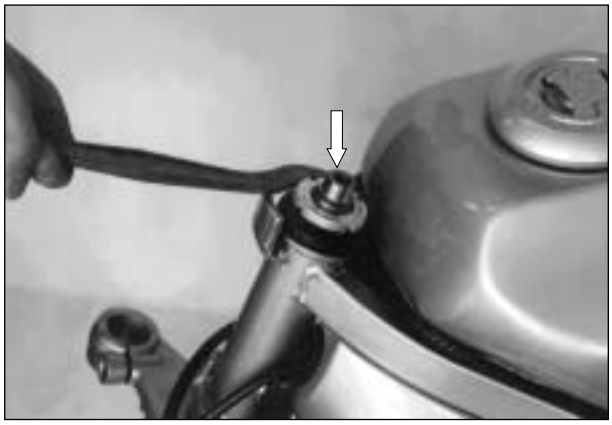


- Remove the steering head cover.

- Loosen the steering stem bolt and remove the front fork upper bracket ②.

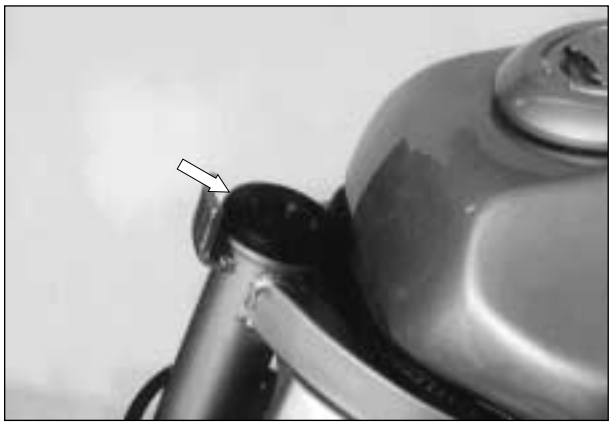


- Loosen the steering nut.



● Remove the steering stem.

● Remove the dust seal.

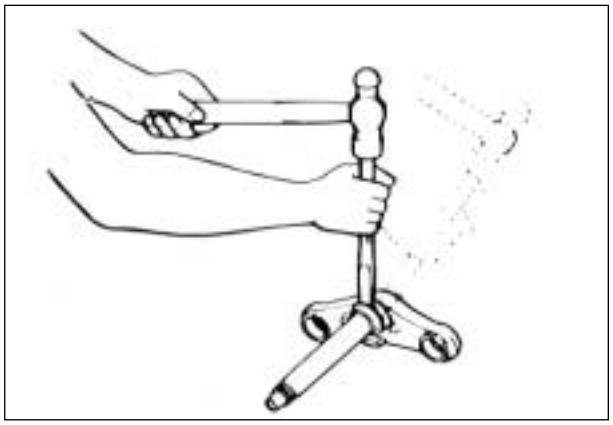


● Remove the upper outer race.

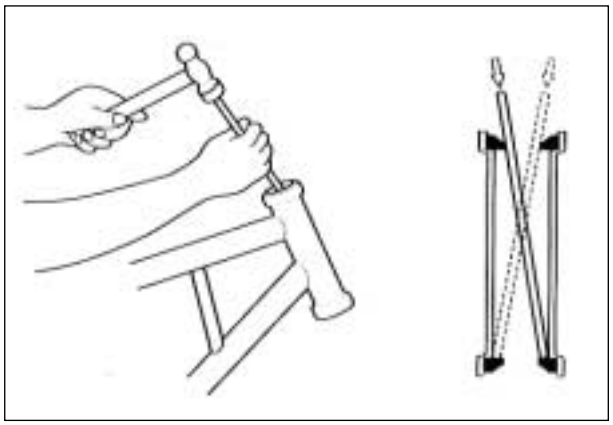
● Remove the upper and lower steel balls.

Number of balls	Upper	22 pcs
	Lower	18 pcs

- Remove the outer race fitted on the steering stem. This can be done with a chisel.



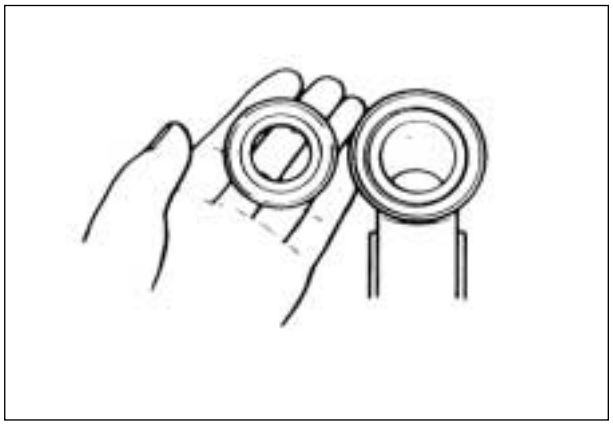
- Dwaw out the two inner reces fitted to the top and bottom ends of the head pipe.

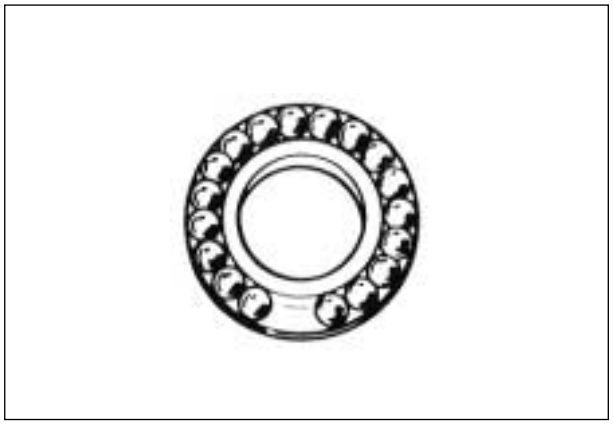


INSPECTION

Inspect and check the removed parts for the following abnormalities.

- Handlebars distortion.
- Handlebars clamp wear.
- Race wear and brinelling.
- Worn or damaged steel balls.
- Distortion of steering stem.





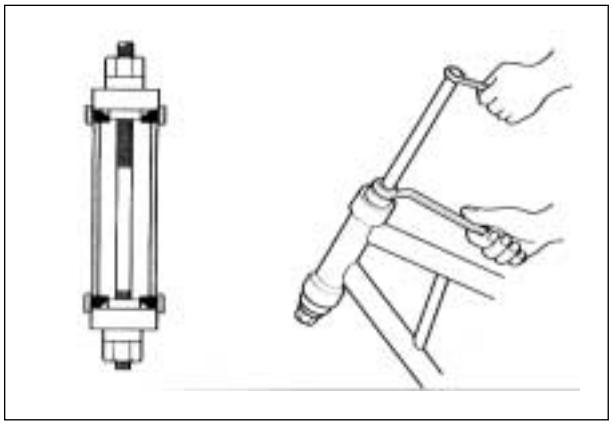
REASSEMBLY

Reassemble and remount the steering stem in the reverse order of disassembly and removal, and also carry out the following steps:

INNER RACES

Press in the upper and lower inner races using the special tool.

09941-34513	Steering race installer

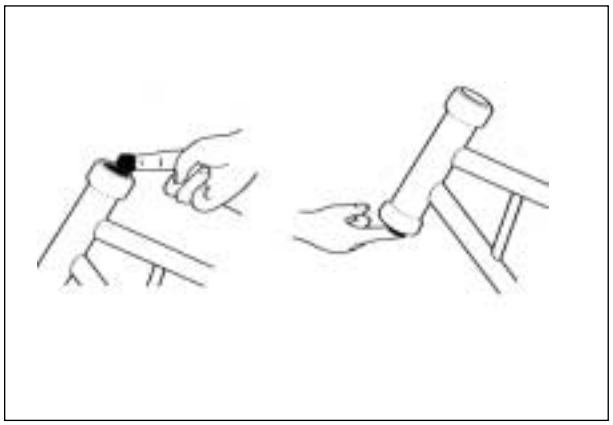


STEEL BALL

Apply grease to the upper and lower inner races when installing the steel balls.

99000-07000	Grease "G2"

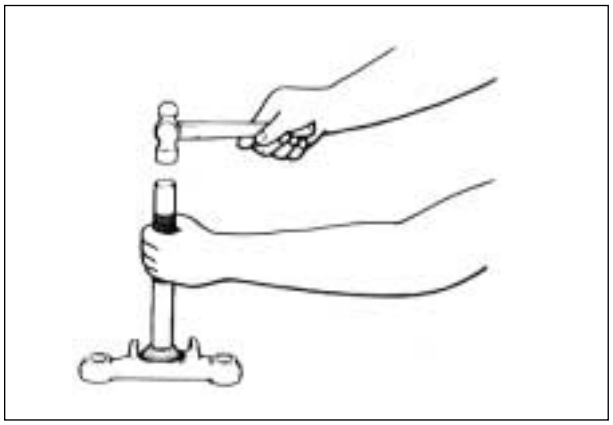
Number of balls	Upper	22 pcs
	Lower	18 pcs



OUTER RACE

Install the outer race to the steering stem by using the special tool.

09941-74910	Steering bearing installer

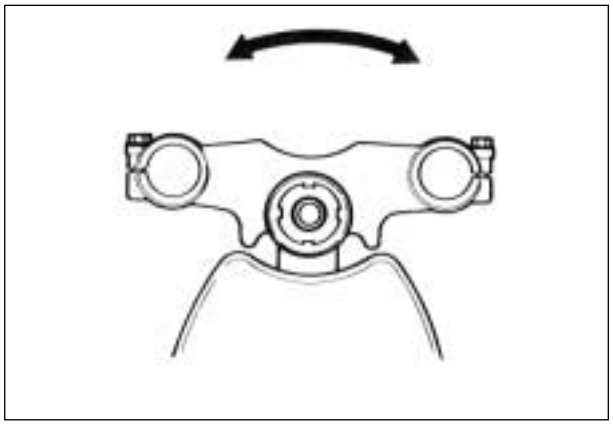


STEERING STEM NUT

Tighten the steering stem nut to 40-50 N · m(4.0-5.0kg · m) by using the special tool.

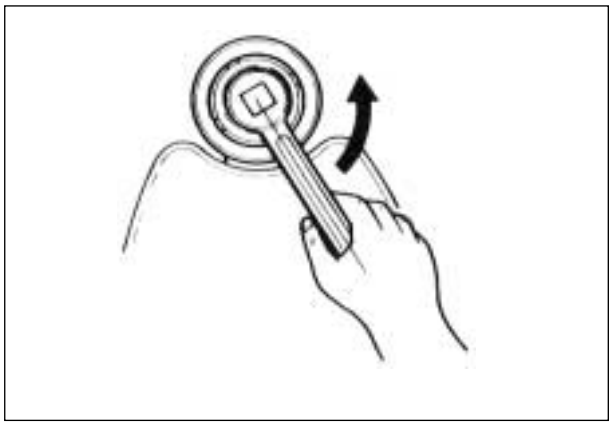
09940-14911	Steering nut socket wrench

- Turn the steering stem right and left, lock-to-lock, five or six times to "seat" the steel ball bearings.



- Turn back the stem nut by 1/4-1/2 turn.

NOTE:
This adjustment will vary from motorcycle to motorcycle.



- Tighten the steering stem head bolt with specified torque.

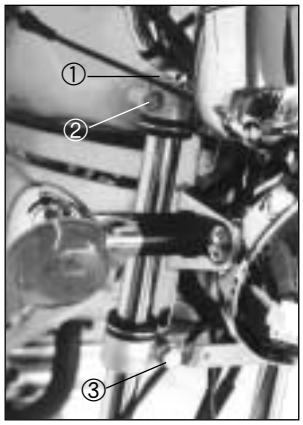
Tightening torque	35-55N · m(3.5-5.5kg · m)

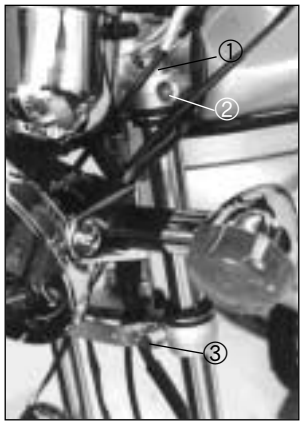
CAUTION:
After performing the adjustment and installing the steering stem upper bracket, "rock" the front wheel assembly forward and backward to ensure that there is no play and that the procedure was accomplished correctly.
Finally check to be sure that the steering stem moves freely from left to right with its own weight. If play or stiffness is noticeable, readjust the steering stem nut.

- Set the handlebars to match its punched mark to the mating face of the holder.
- Tighten the handlebars clamp bolts. (See page 6-14)

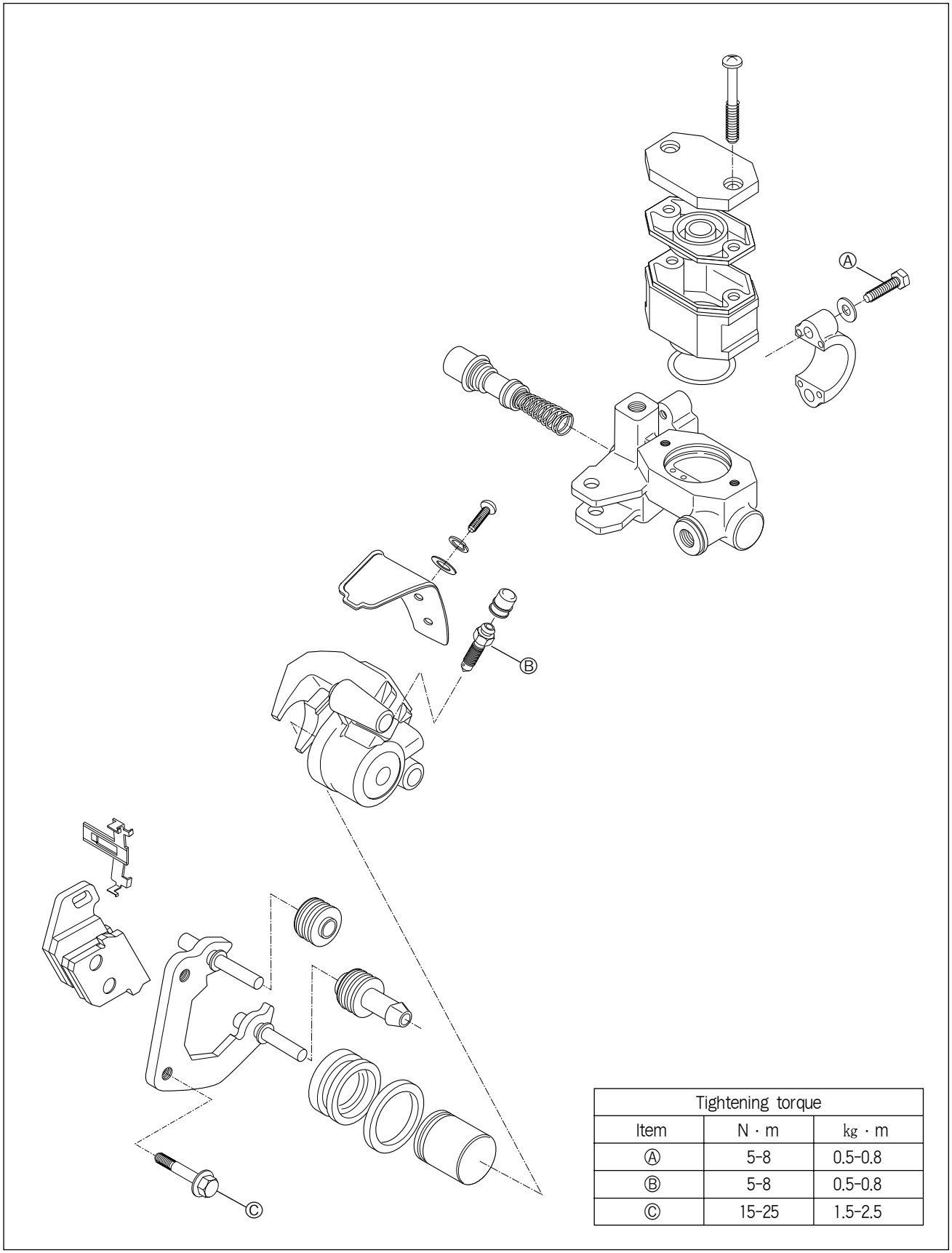
TIGHTENING TORQUE

Item	N · m	kg · m
①	35-55	3.5-5.5
②	35-55	3.5-5.5
③	25-35	2.5-3.5





FRONT BRAKE

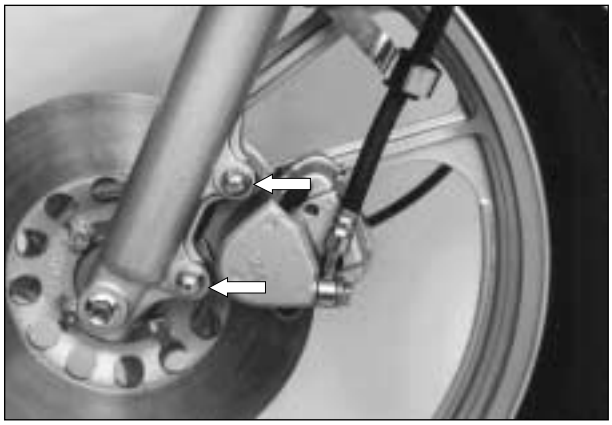


Tightening torque		
Item	N · m	kg · m
Ⓐ	5-8	0.5-0.8
Ⓑ	5-8	0.5-0.8
Ⓒ	15-25	1.5-2.5

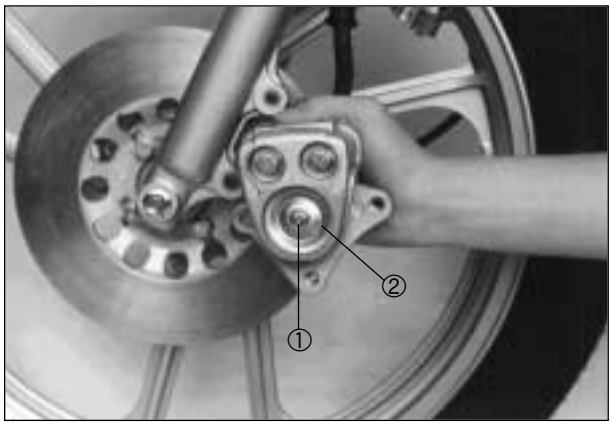
BRAKE PAD REPLACEMENT

- Remove the caliper mounting bolts and take off the caliper.

CAUTOIN:
Do not operate the brake lever while dismounting the caliper.

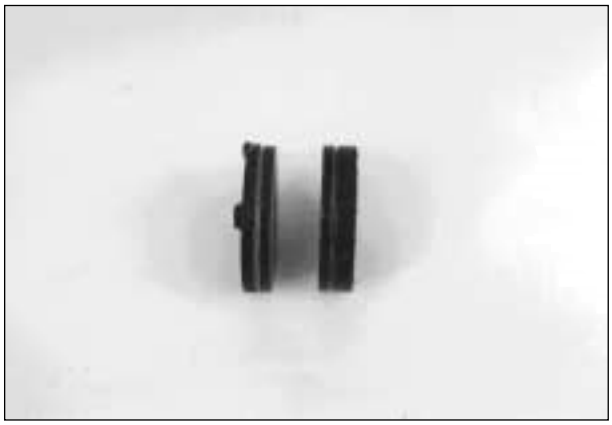


- Push the piston and caliper holder all the way to the caliper when removing the pad.
- Loosen the screw ① and take off the housing cover ②.



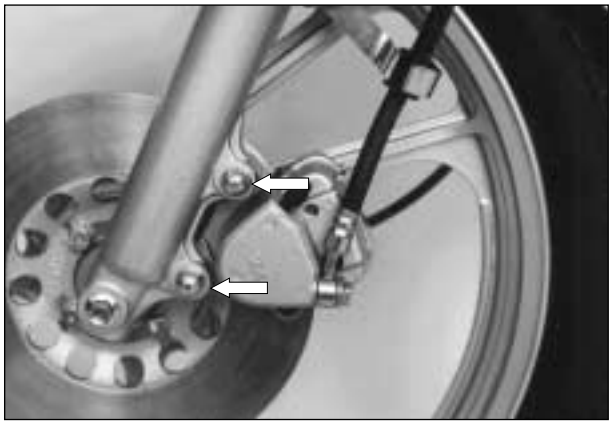
- Remove the pad.

CAUTOIN:
Replace the brake with a set, otherwise braking performance will be adversely affected.



- Apply the Silicone Grease to the caliper holder.

99000-25100	Silicone grease

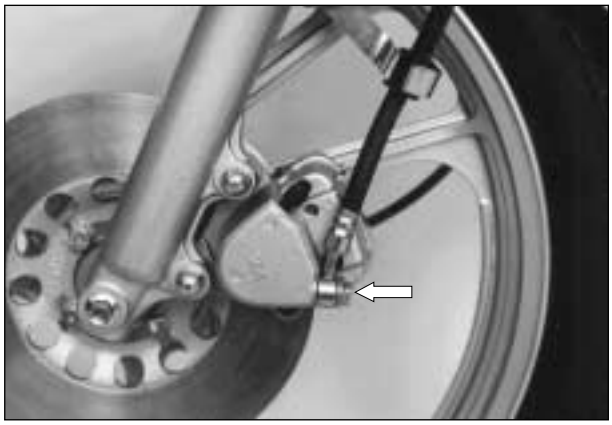


- Push in the piston and piston holder all the way to the caliper when remounting the caliper.
- Tighten the caliper mounting bolts with specified torque.

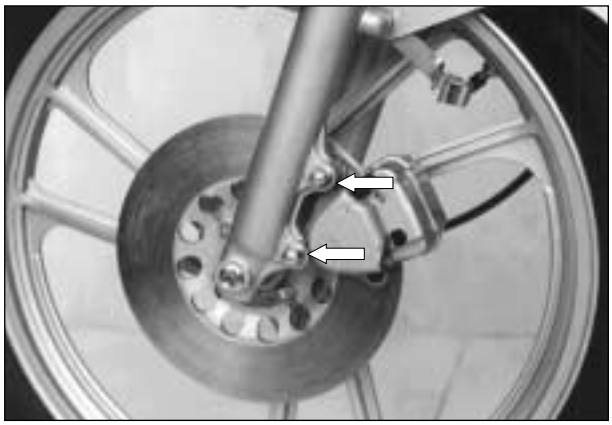
Tightening torque	15-25N · m(1.5-2.5kg · m)

CALIPER REMOVAL AND DISASSEMBLY

- Disconnect the brake hose from the caliper and catch the brake fluid in a suitable receptacle.

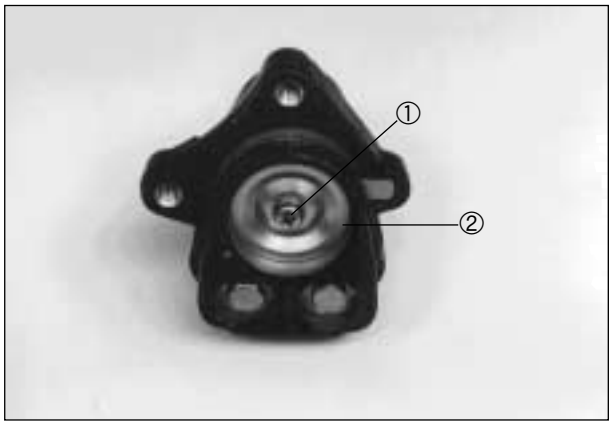


- Remove the caliper mounting bolts and take off the caliper.

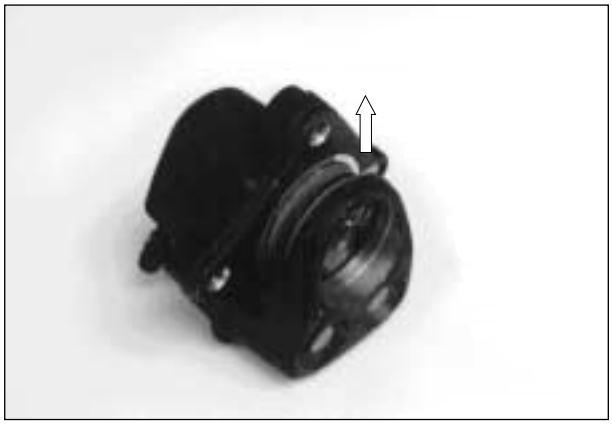


CAUTOIN:
Never re-use the brake fluid left over from the last servicing and stored for long periods.

- Loosen the screw ① and take off the housing cover ②.



- take off the pads.



- Remove the caliper holer from the caliper.

- Place a rag over the piston to prevent popping up. Force out the piston by using air gun.

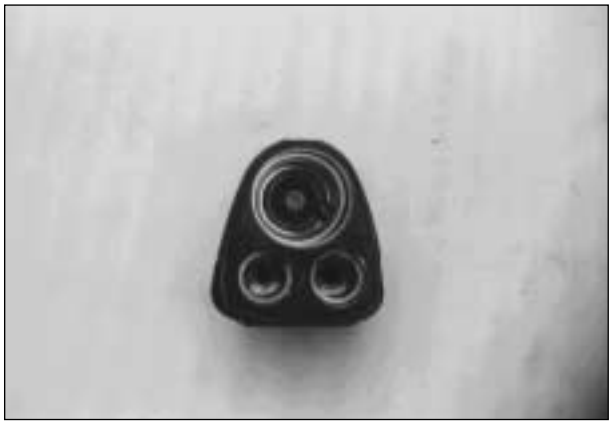
CAUTOIN:
Do not use high pressure air to prevent piston damage.

- Remove the piston, piston boot and piston seal.

INSPECTION

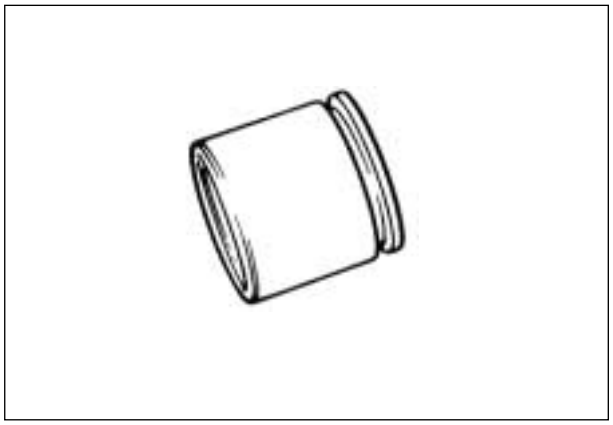
CALIPER CYLINDER

Inspect the cylinder bore wall for nick, scratches or other damage.



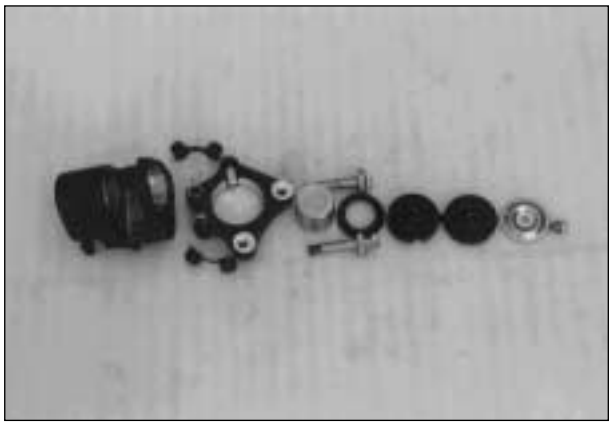
PISTON

Inspect the piston surface for any scratches or other damage.



RUBBER PARTS

Inspect the each rubber part for damage and wear.

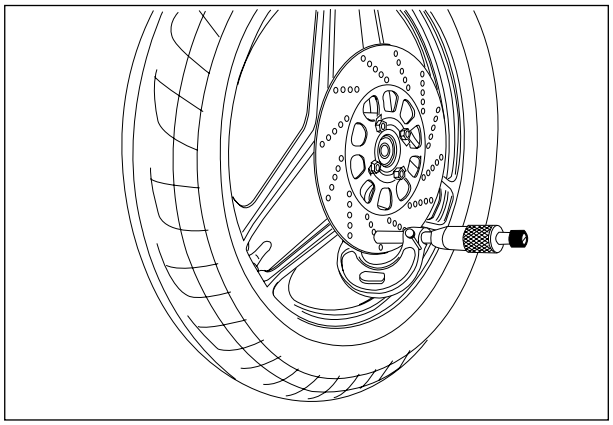


DISC

- Measure the disc thickness by using the micrometer.

09900-20205	Micrometer (0-25mm)

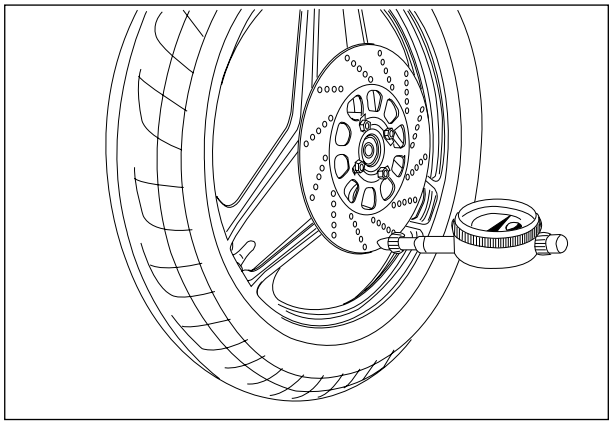
Service limit	3.0 mm



- With the disc mounted on the wheel check the disc for face runout with a dial gauge, as shown.

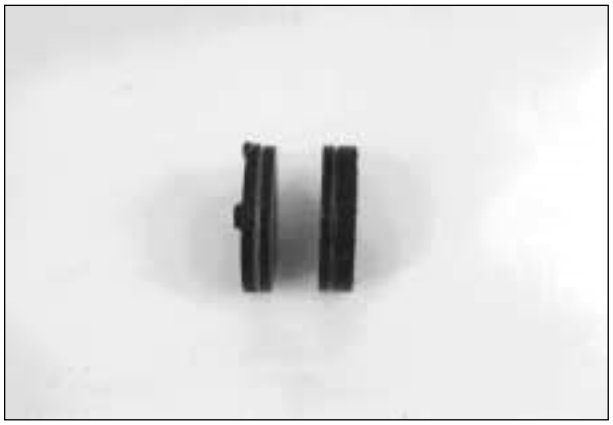
09900-20606	Dial gauge (1/100)

Service limit	0.3 mm



BRAKE PADS

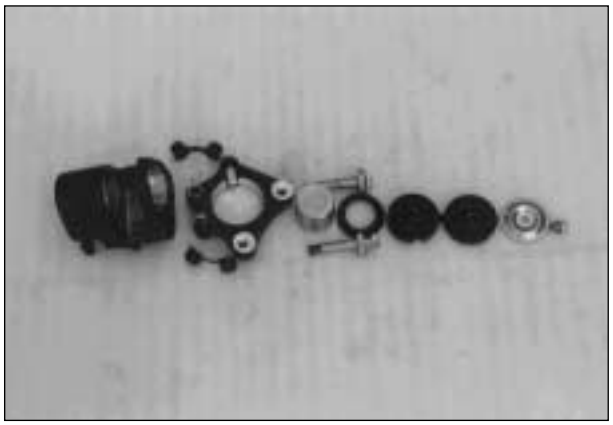
Wear condition of brake pads can be checked by observing the red limit line marked on the pad.
When the wear exceeds the limit line, replace the pad with new ones.



CAUTION:
Replace the brake pad with a set, otherwise braking performance will be adversely affected.

CALIPER REASSEMBLY

Reassemble and remount the caliper in the reverse orders of disassembly and removal, and also carry out the following steps.



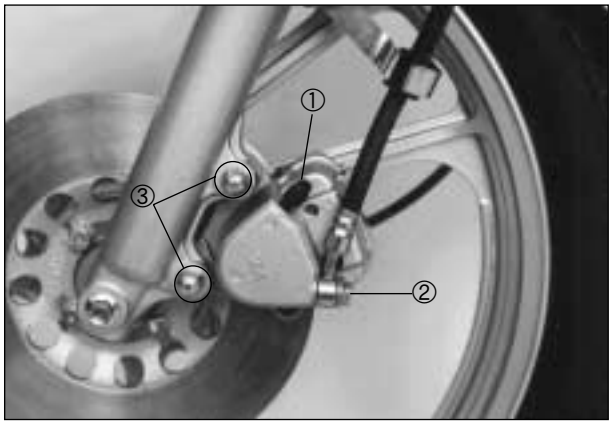
CAUTION:
Wash the caliper components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the caliper bore and all internal parts before inserting into the bore.

● Apply Silicone Grease to the caliper holder.

99000-25100	Silicone grease

TIGHTENING TORQUE

Item	N · m	kg · m
①	6-9	0.6-0.9
②	20-25	2.0-2.5
③	15-25	1.5-2.5



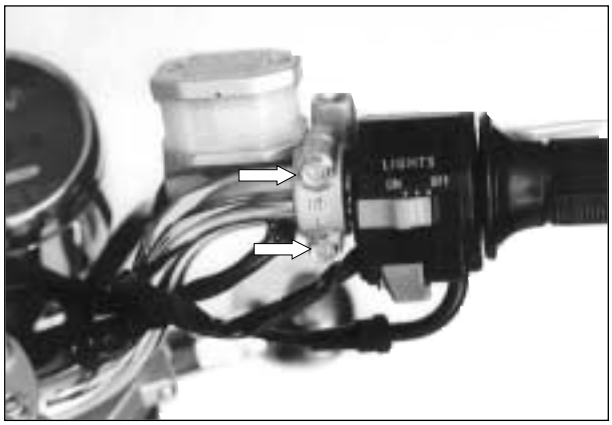
WARNING:
Bleed the air from brake fluid circuit after reassembling caliper. (See page 2-13)

MASTER CYLINDER REMOVAL AND DISASSEMBLY

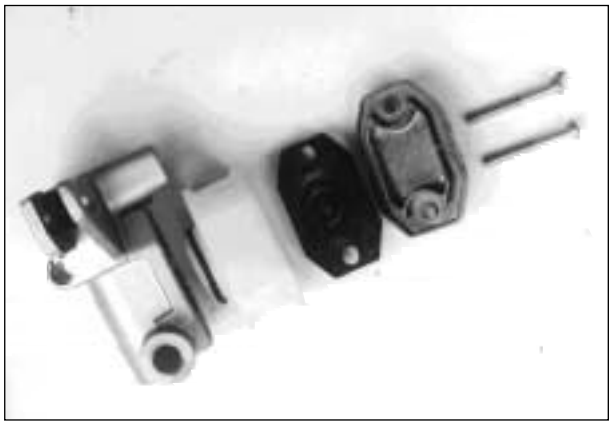
- Please a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolts and disconnect the brake hose from the master cylinder joint.

CAUTION:
Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint plastics, rubber materials, etc. , and will damage them severely.

- Remove the two clamp bolts and take off the master cylinder.



- Remove the two fitting screws and separate the cap and diaphragm.
- Drain brake fluid.



- Remove the dust seal boot.
- Remove the circlip by using the special tool.

09900-06018	Snap ring pliers

- Remove the piston, primary cup and spring.

INSPECTION

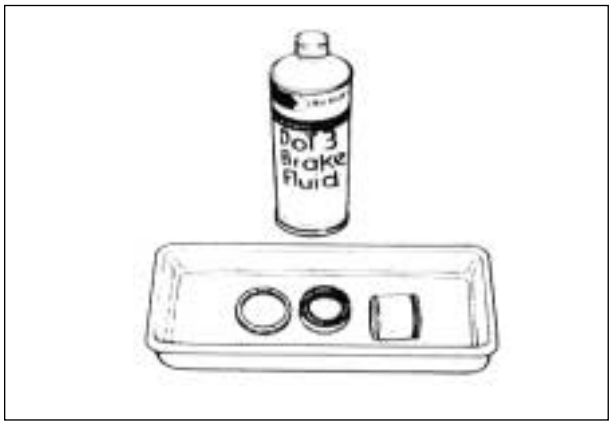
- Inspect the master cylinder bore for any scratches or other damage.

- Inspect the piston and cup surface for scratches or other damage.
- Inspect the dust seal boot for wear or damage.

REASSEMBLY

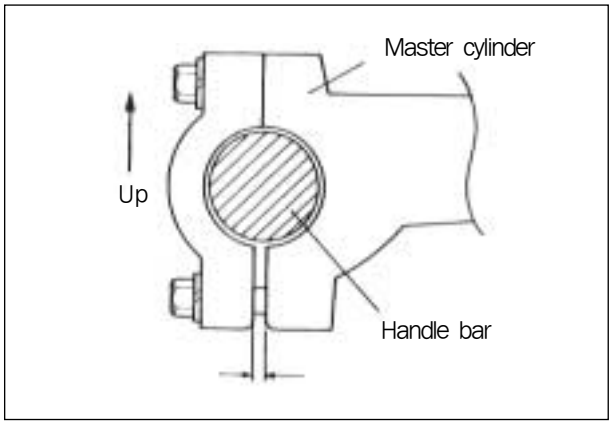
Reassemble and remount the master cylinder in the reverse orders of disassembly and removal, and also carry out the following steps:

CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the cylinder bore and all internal parts before inserting into the bore.



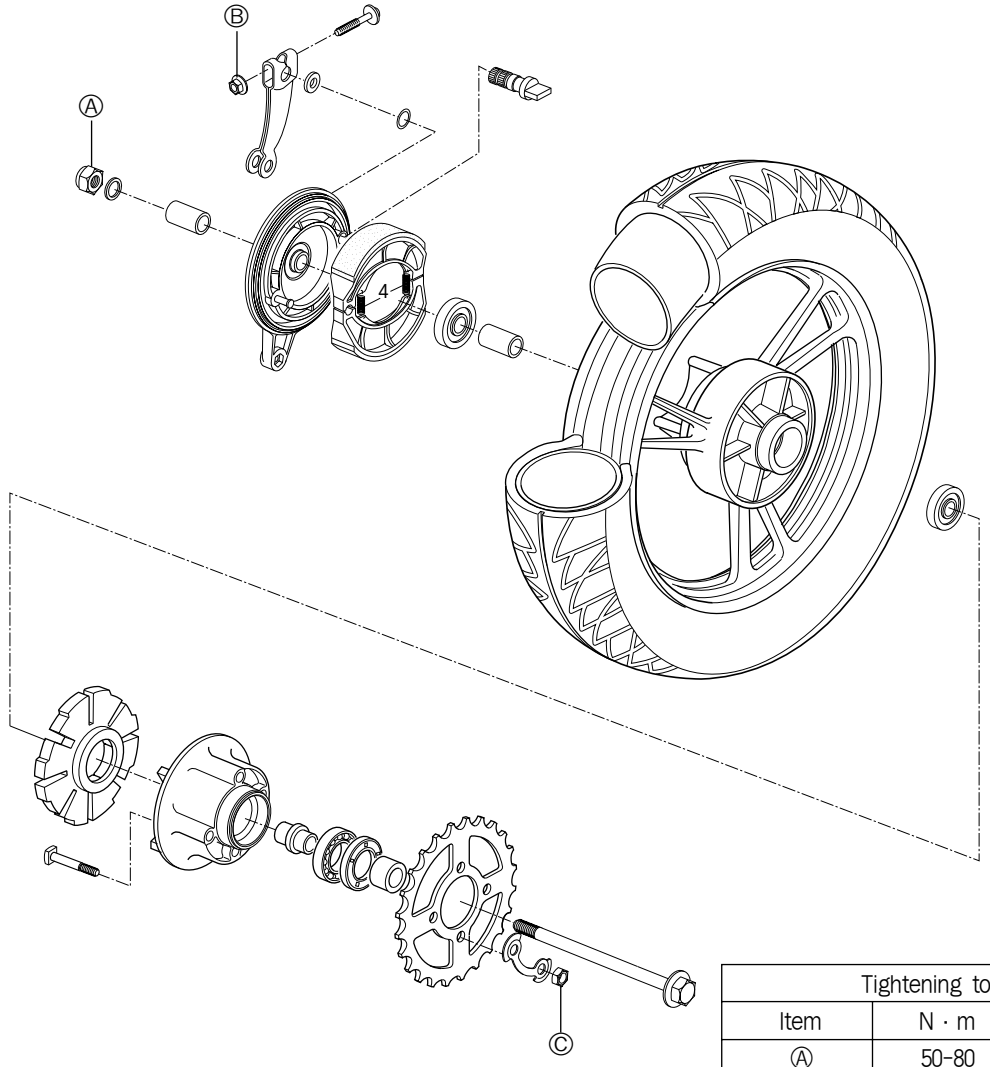
- When remounting the master cylinder to the handle-bars, first tighten the clamp bolts for upside as shown.

Tightening torque	5-8N · m(0.5-0.8kg · m)



WARING:
Bleed air from the brake fluid circuit after reassembling master cylinder. (See page 2-13)

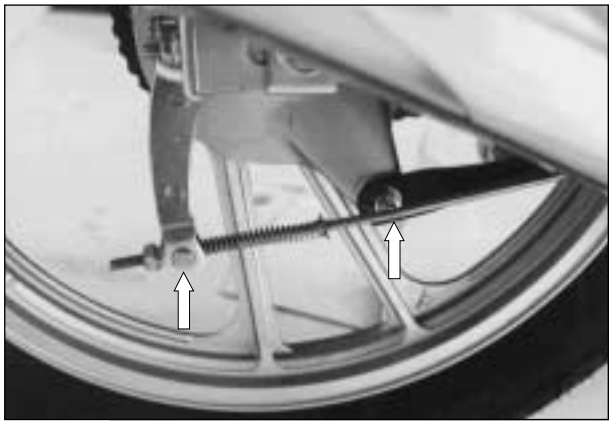
REAR WHEEL AND REAR BRAKE



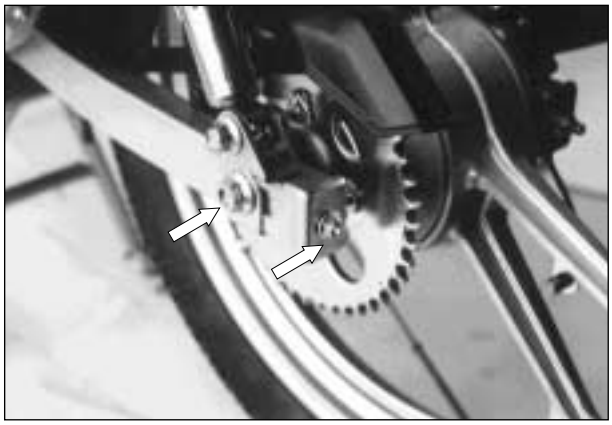
Tightening torque		
Item	N · m	kg · m
Ⓐ	50-80	5-8
Ⓑ	5-8	0.5-0.8
Ⓒ	18-28	1.8-2.8

REMOVAL AND DISASSEMBLY

- Support the machine by the center stand.
- Remove the rear brake adjuster nut and disconnect the brake rod.
- Pull out the cotter pin and remove the torque link nut and bolt.

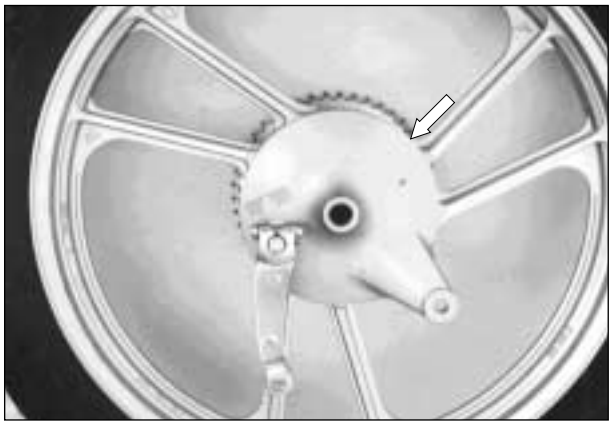


- Remove the rear axle nut.
- Loosen the chain adjuster lock nut and adjuster bolt, right and left.
- Remove the drive chain. (See page 3-4)



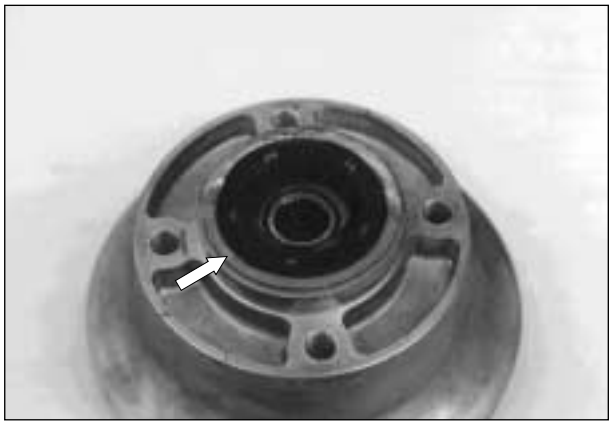
- Draw out the axle shaft and take off the rear wheel.

- Separate the brake panel from the wheel.



- Flatten the washers and remove the four nuts.
- Take off the rear sprocket and mounting drum.

- Remove the oil seal.

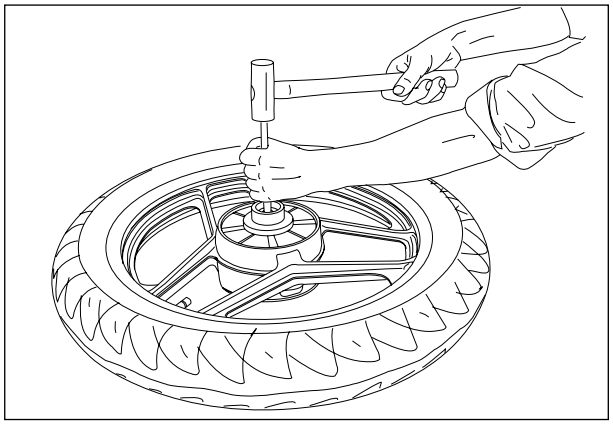


- Remove the bearing with retainer from the mounting drum.

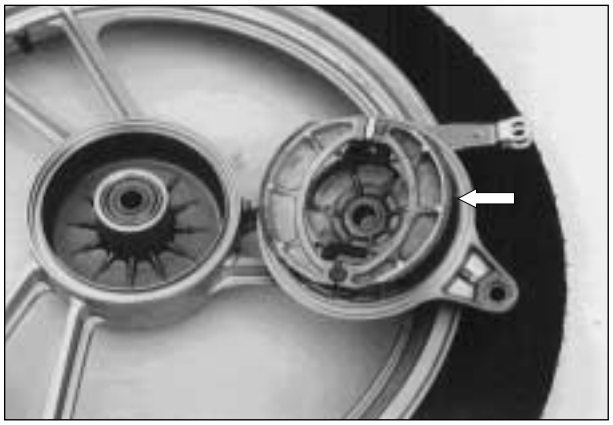
- Remove the cushion from the wheel.

- Remove the right and left side wheel bearings from the wheel.

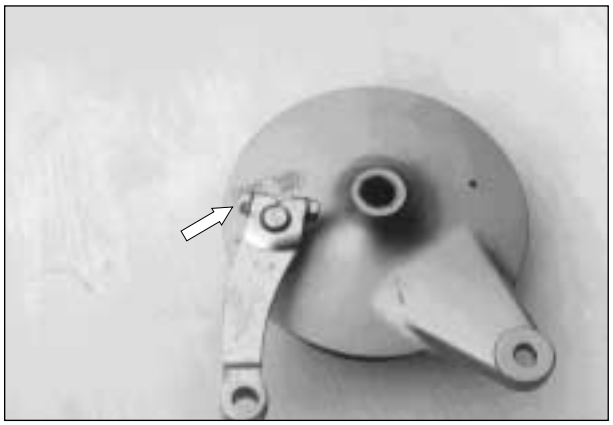
NOTE:
Remove the left side bearing first makes the job easier.



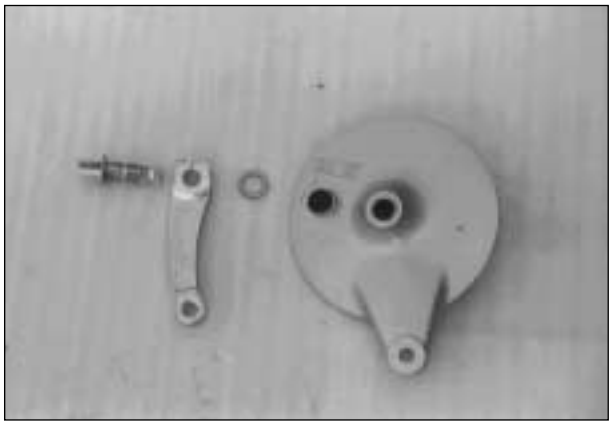
● Take off the brake shoes.



● Remove the cam lever nut and bolt.



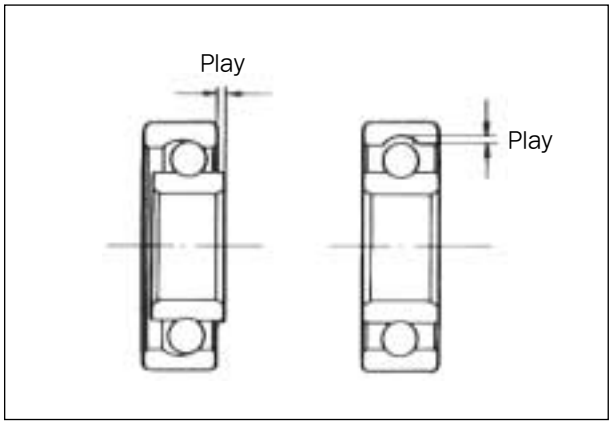
● Pull off the brake cam shaft, waaher, O-ring and cam lever.



INSPECTION

WHEEL BEARING

Inspect the wheel bearing for paly by hand.



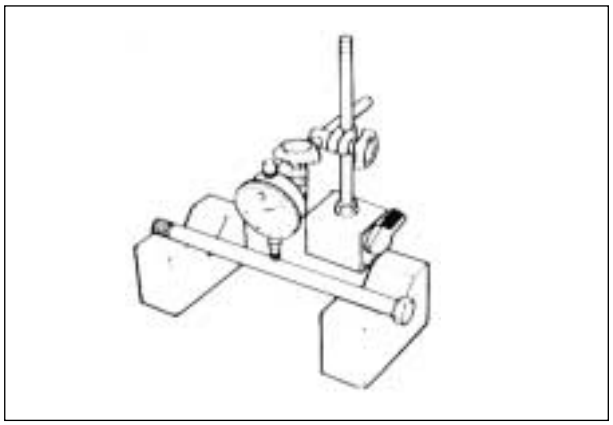
- Rotate the inner race by hand to inspect whether abnormal noise occurs and it rotates smoothly.
  Replace the bearing if there are any defects.

AXLE SHAFT

Using the special tools, check the axle shaft for runout exceeds the limit.

09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand
09900-21304	V-block (100mm)

Service limit	0.25 mm

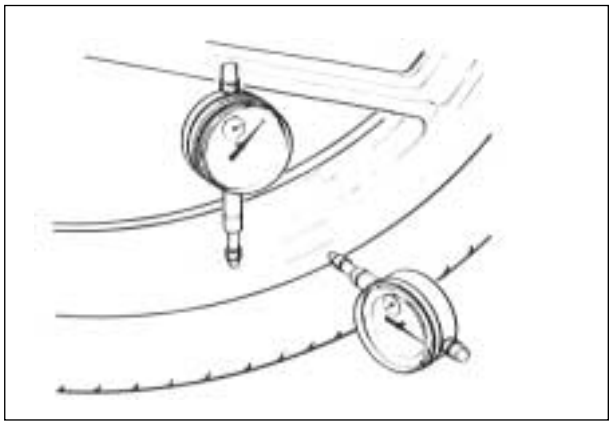


WHEEL RIM

Make sure that the wheel rim runout does not exceed the service limit when checked as shown.

NOTE:
Worn or loose wheel bearing must be replaced before attempting to true a wheel rim.

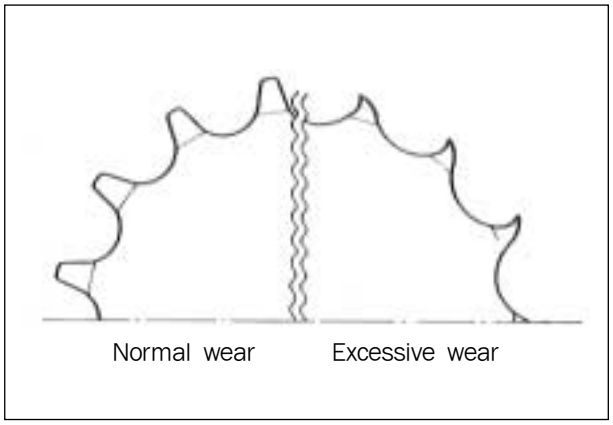
Service limit	2.0 mm



TIRE (see page 2-14)

SPROCET

Inspect the sprocket teeth for wear. If they are worn as illustrated, replace the sprocket and drive chain.



REAR BRAKE DRUM

Measure the brake drum I.D. to determine the extent of wear and, if the limit is exceed by the wear noted, replace the drum, the value of this limit is indicated inside the drum.

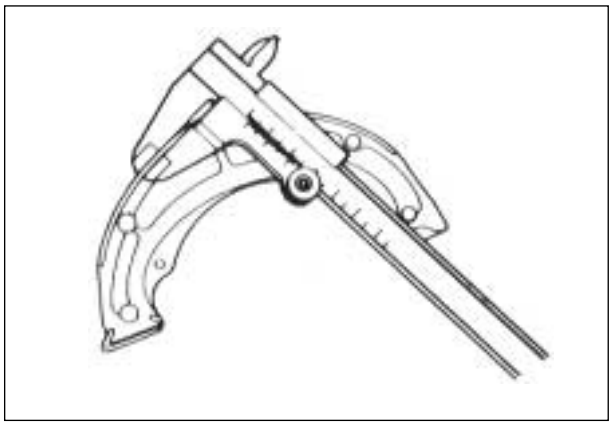
Service limit	130.7 mm

BRAKE SHOE

Check the brake shoes and decide whether it should be replaced or not from the thickness of the brake shoe linings.

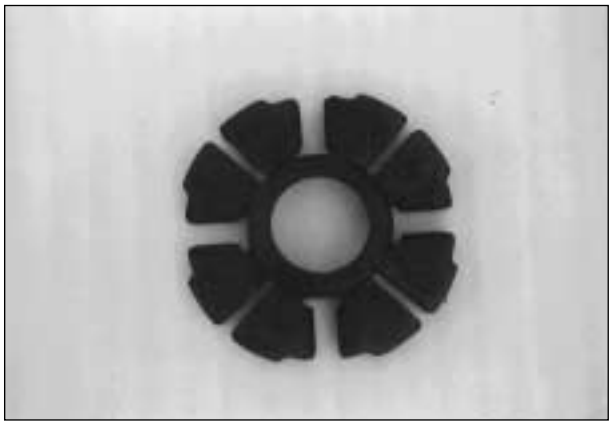
Service limit	1.5 mm

CAUTION:
Replace the brake shoes as a set, otherwise braking performance will be adversely affected.



CUSHION

Inspect the cushion for wear and damage.



REASSEMBLY

Reassemble and remount the wear wheel and rear brake in the reverse order of disassembly and removal, and also carry out the following steps.

WHEEL BEARING

- Apply grease to the bearing before installing.

99000-07000	Grease "G2"

● Install the wheel bearing by using the special tool.

NOTE: First install wheel bearing for right side.

09913-80112	Bearing installer

MOUNTING DRUM

● Insert the bearing with retainer by using the special tool.

09913-80112	Bearing installer

SPROCKET

After tightening the four nuts to specification, bend the washers lock tabs.

Tightening torque	18-28N · m(1.8-2.8kg · m)

BRAKE CAM

Apply grease to the brake cam.

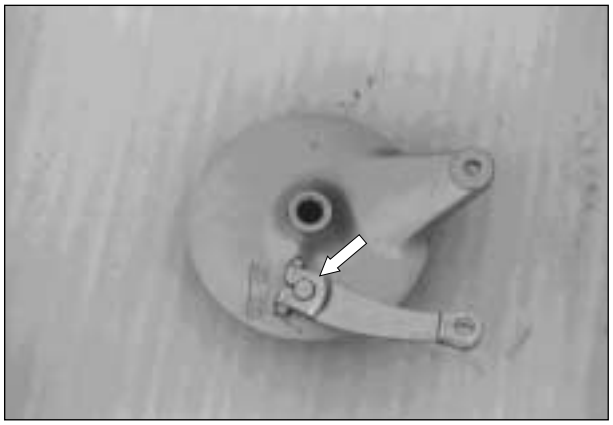
99000-07000	Grease "G2"

WARNING: Be careful not to apply too much grease to the brake cam. If grease gets on the lining, brake slippage will result.

BRAKE CAM LEVER

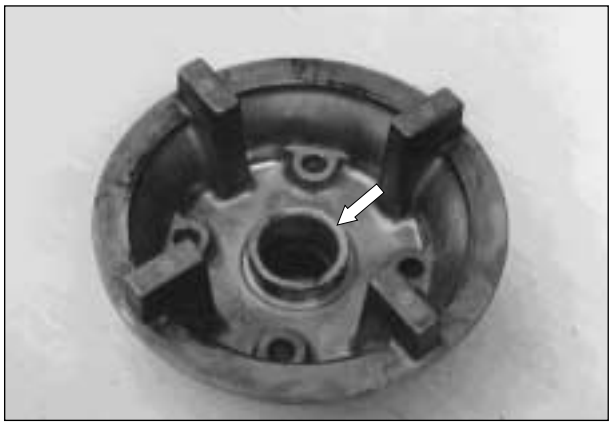
Install the brake cam lever and tighten the cam lever nut with specified torque.

Tightening torque	5-8 N · m(0.5-0.8kg · m)

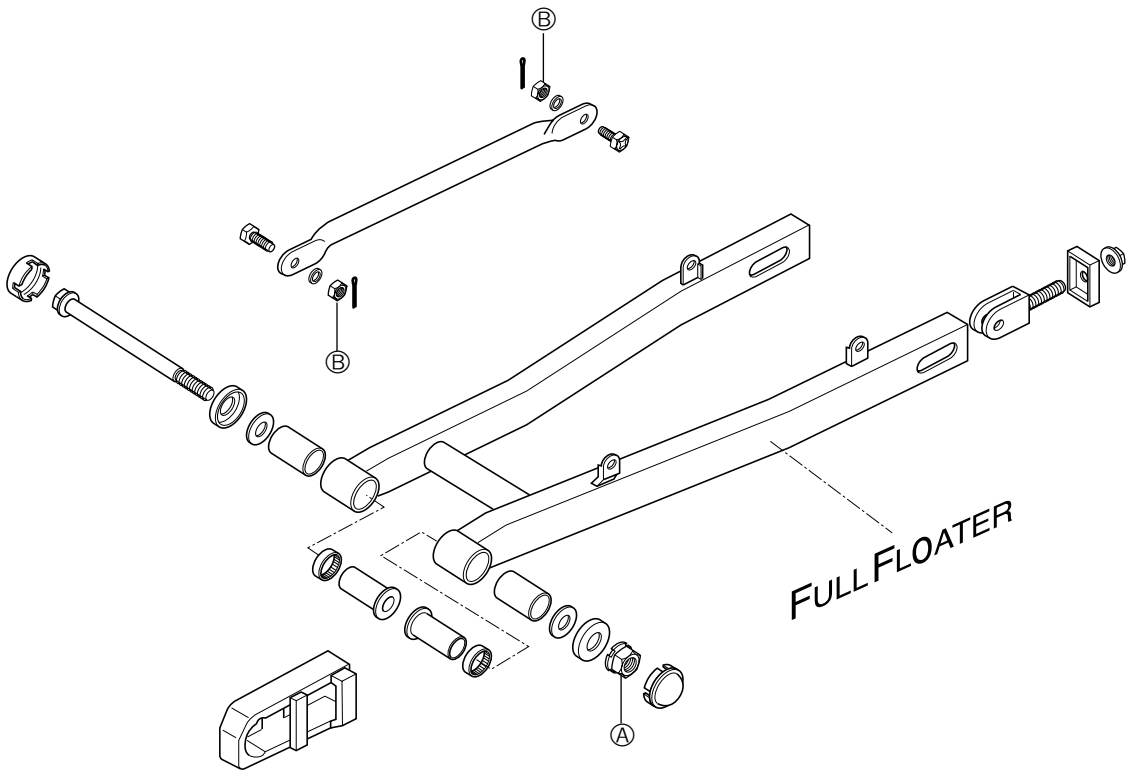


Apply grease to the mounting drum as shown.

99000-07000	Grease "G2"



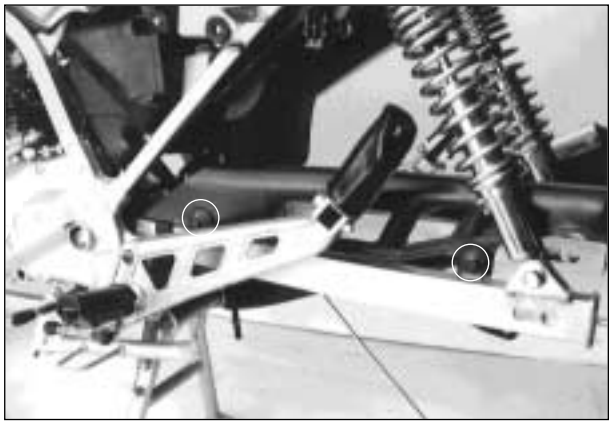
REAR SWING ARM



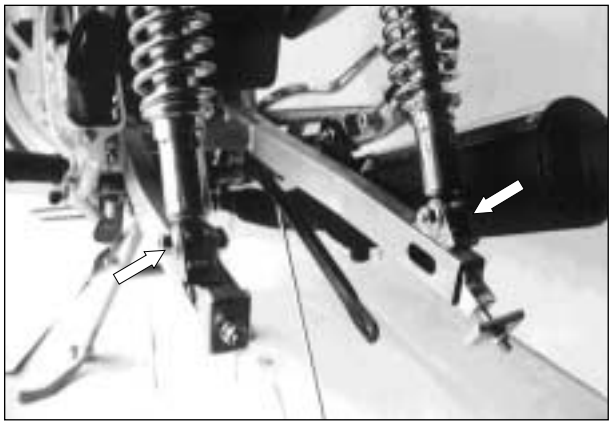
Tightening torque		
Item	N · m	kg · m
Ⓐ	50-80	5.0-8.0
Ⓑ	10-15	1.0-1.5

REMOVAL AND DISASSEMBLY

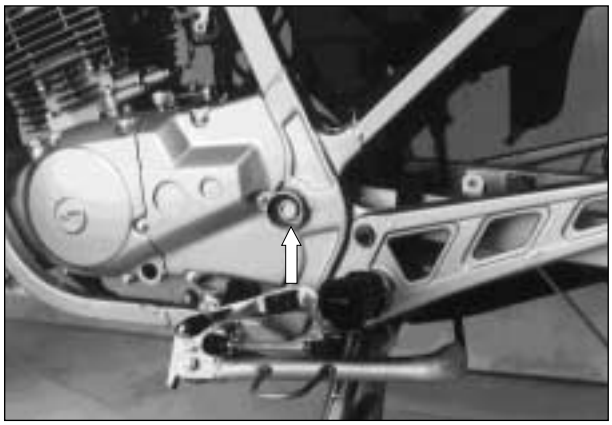
- Remove the rear wheel. (See page 6-29)
- Remove the two bolts and take off the chain case.



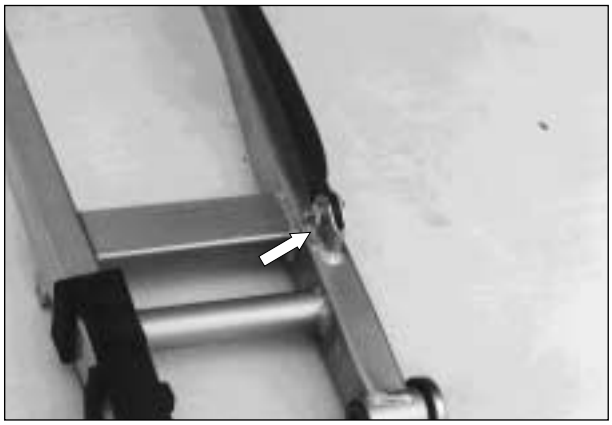
- Remove the rear shock absorber nuts and take off the shock absorber units.



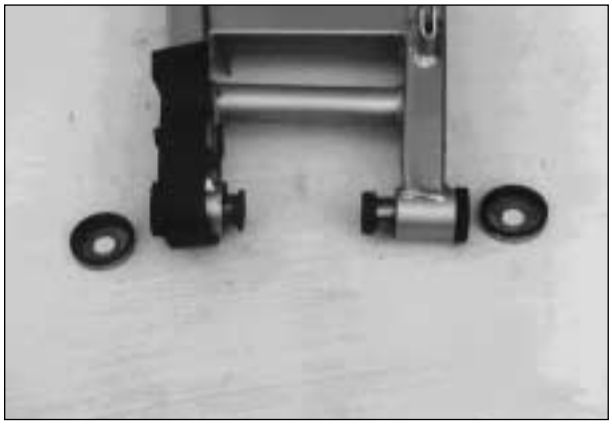
- Remove the swing arm pivot nut and draw out the shaft.
- Remove the swing arm.



- Pull out the cotter and remove the nut and bolt.
- Remove the torque link.



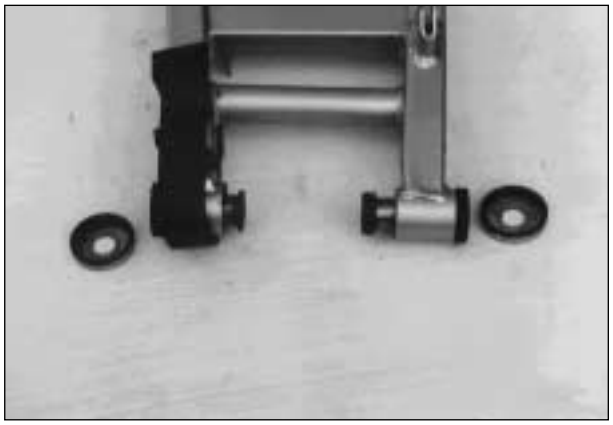
- Remove the dust seal covers and draw out the spacers.



INSPECTION

BUSHING

Inspect the bushing for wear and damage.

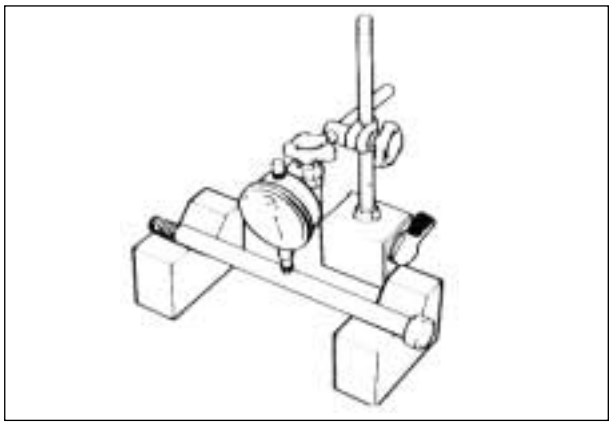


SWING ARM PIVOT SHAFT

Using the special tools, check the pivot shaft for runout and replace it if the runout exceeds the limit.

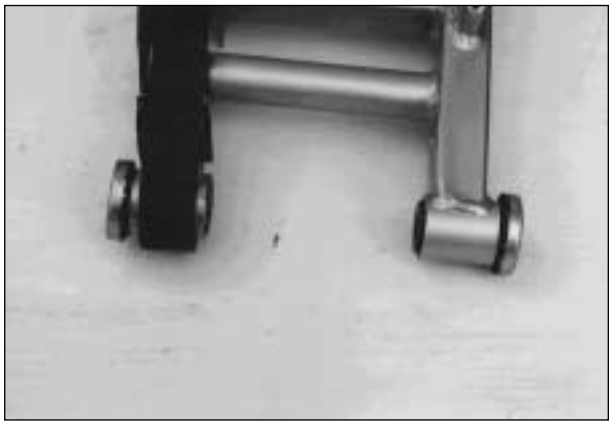
09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand
09900-21304	V-block (100 mm)

Service limit	0.6 mm



REASSEMBLY

Reassemble and remount the swing arm in the reverse order of disassembly and removal, and also carry out following steps:



SWING ARM BUSHINGS

Force-fit the bushings into the swing arm by using the special tool.

09924-84510	Bearing installer set

SPACER AND DUST SEAL COVER

Apply grease to the spacer and dust seal cover when installing.

99000-07000	Grease "G2"

SERVICING INFORMATION

CONTENTS

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start.	**Compression too low**	
	1. Valve clearance out of adjustment.	Adjust.
	2. Worn valve guides or poor seating of valves.	Repair or replace.
	3. Valves mistiming	Adjust.
	4. Piston rings excessively worn.	Replace.
	5. Worn-down cylinder bore.	Replace or rebore.
	6. Poor seating of spark plug.	Retighten.
	7. Starte motor cranks but too slowly.	Consult "electrical complaints"
	Plug not sparking	
	1. Fouled spark plug.	Clean or replace.
	2. Wet spark plug.	Clean and dry.
	3. Defective pick up coil.	Replace.
	4. Defective CDI unit.	Replace.
	5. Defective ignition coil.	Replace.
	6. Open or short circuit in high tension cord.	Replace.
	7. Open or short circuit of stator coil.	
	No fuel reaching the carburetor	
	1. Clogged hole in the fuel tank cap.	Clean.
	2. Clogged or defective fuel cock.	Clean or replace.
	3. Defective carburetor float valve.	Replace.
	4. Clogged fuel pipe.	Clean or replace.
Engine stalls easily.	1. Foulded spark plug.	Clean.
	2. Defective pick up coil.	Replace.
	3. Defective C.D.I unit.	Replace.
	4. Clogged fuel pipe.	Clean.
	5. Clogged jets in carburetor.	Clean.
	6. Valve clearance out of adjustment.	Adjust.
Noisy engine.	**Excessive valve chatter**	
	1. Valve clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Worn down rocker arm or rocker arm shaft.	Replace.
	Noise appears to come from piston	
	1. Piston or cylinder worn down.	Replace.
	2. Combustion chamber fouled with carbon.	Clean.
	3. Piston pin or piston pin bore worn.	Replace.
	4. Piston rings or ring groove worn.	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjuster not working.	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of cluth plates.	Replace.
	3. Distorted clutch plates, driven and drive.	Replace.
	4. Clutch dampers weakened.	Replace.
	Noise seems to come from crankshaft	
	1. Worn or burnt bearings.	Replace.
	2. Big-end bearings worn and burnt.	Replace.
	3. Thrust clearance too large.	Replace.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	**Noise seems to come from transmission**	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	Replace.
	4. Badly worn bearings.	Replace.
Slipping clutch.	1. Clutch contorl out of adjustment or loss of play.	Adjust.
	2. Weakened clutch springs.	Replace.
	3. Worn or distorted pressure plate.	Replace.
	4. Distored clutch plates, driven and drive.	Replace.
Dragging clutch.	1. Clutch control out of adjustment or too much play.	Adjust
	2. Some clutch spring weakened while others are not.	Replace.
	3. Distorted pressure plate or clutch plates.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift forks.	Replace.
	3. Worn gearshift pawl.	Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft.	Replace.
	2. Shift shafts are rubbing or sticky.	Repair
	3. Distorted or worn gearshift forks.	Replace.
Transmission jumps out of gear.	1. Worn shifting gears on driveshaft or countershaft.	Replace.
	2. Distorted or worn gearshift forks.	Replace.
	3. Weakened stopper pawl spring on gearshift cam.	Replace.
	4. Worn gearshift pawl.	Replace.
Engine idles poorly.	1. Valve clearance out of adjustment.	Adjust.
	2. Poor seating of valves.	Replace.
	3. Defective valve guides.	Replace.
	4. Worn rocker arm or arm shaft.	Replace.
	5. Defective pick up coil.	Replace.
	6. Defective C.D.I unit.	Replace.
	7. Spark plug gap too wide.	Adjust or replace.
	8. Defective ignition coil resulting in weak sparking.	Replace.
	9. Float-chamber fuel level out of adjustment in Carburetor.	Adjust.
	10. Clogged jets.	Clean.
Engine runs poorly in speed range.	1. Valve springs weakend.	Replace.
	2. Valve timing out of adjustment.	Adjust
	3. Worn cams or rocker arms.	Replace.
	4. Spark plug gap too narrow.	Repair.
	5. Defective ignition coil.	Replace.
	6. Float-chamber fuel level too low.	Adjust.
	7. Clogged air cleaner element.	Clean.
	8. Clogged fuel pipe, resulting in inadequate fuel supply to carburetor.	Clean and prime.
	9. Defective pick up coil or C.D.I unit.	Replace.
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine.	Check with insection window, drain out excess oil.
	2. Worn piston rings or cylinder.	Replace.
	3. Worn valve guides.	Replace.
	4. Cylinder wall scored or scuffed.	Replace.
	5. Worn valves stems.	Replace.
	6. Defective stem seals.	Replace.
	7. Worn side rails.	Replace.

Complaint	Symptom and possible causes	Remedy
Engine lacks power.	1. Loss of valve clearance. 2. Weakened valve springs. 3. Valve timing out of adjustment. 4. Worn piston ring or cylinder. 5. Poor seating of valves. 6. Fouled spark plug. 7. Worn rocker arms or its shafts. 8. Spark plug gap incorrect. 9. Clogged jets in carburetor. 10. Float-chamber fuel level out of adjustment. 11. Clogged air cleaner element. 12. Too much engine oil. 13. Suck air intake pipe.	Adjust. Replace. Adjust. Replace. Repair. Clean or replace. Replace. Adjust or replace. Clean. Adjust. Clean. Drain out excess oil. Retighten or replace.
Engine overheats.	1. Heavy carbon deposit on piston crown. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Fuel level too low in float chamber. 5. Air leak from intake pipe. 6. Use of incorrect engine oil. 7. Defective oil cooler.	Clean. Add oil. Repair or clean. Adjust. Retighten or replace. Change.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	1. Starter jet is clogged. 2. Starter pipe is clogged. 3. Air leaking from a joint between starter body and carburetor. 4. Starter plunger in not operating properly.	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust.
Idling or low-speed trouble.	1. Pilot jet, pilot air jet are clogged or loose. 2. Pilot outlet or bypass is clogged. 3. Starter plunger is not fully closed.	Check and clean. Check and clean. Check and clean.
Medium or high speed trouble.	1. Main jet or main air jet is clogged. 2. Needle jet is clogged. 3. Throttle valve is not operating properly. 4. Filter is clogged.	Check and clean. Check and clean. Check throttle valve for operation. Check and clean.
Overflow and fuel level fluctuations.	1. Needle valve is worn or damaged. 2. Spring in needle valve is broken. 3. Float is not working properly. 4. Foreign matter has adhered to needle valve. 5. Fuel level is too high or low.	Replace. Replace. Check and adjust. Clean. Adjust float height.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plug. 3. Defective pick up coil. 4. Defective CDI unit.	Replace. Replace. Replace. Replace.
Spark plug soon become fouled with carbon.	1. Mixture to rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plug too cold.	Adjust carburetor. Adjust carburetor. Change. Clean. Replace by hot type plug.
Spark plug become fouled too soon.	1. Worn piston rings. 2. Pistons or cylinder worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seals.	Replace. Replace. Replace. Replace.
Spark plug electordes overheat or burn.	1. Spark plug too hot. 2. The engine overheats. 3. Spark plug loose. 4. Mixture too lean.	Replace by cold type plug. Tune up. Retighten. Adjust carburetor.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or panctured regulator/rectifier.	Repair, replace or retighten. Replace. Replace.
Generator charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective regulator/rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery.	Repair or retighten. Replace. Replace. Add distilled water between the level lines. Replace the battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Resistor element in the regulator/rectifier damaged or defective. 3. Regulator/rectifier poorly grounded.	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator/rectufier.	Repair or replace. Replace. Replace.
Starter button is not effective.	1. battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay.	Recharge or replace. Replace. Repair or replace. Replace.

7-5 SERVICING INFORMATION

BATTERY

Complaint	Symptom and possible causes	Remedy
"Sulfation" acidic white powdery substance or spots on surfaces of cell plates	1. Not enough electrolyte. 2. Battery case is cracked. 3. Battery has been left in a run-down condition for a long time. 4. Contaminated electrolyte(Foreign matter has enters the battery and become mixed with the electrolyte.	Add distilled water, if the battery has not been damaged and "sulfation" has not advanced too far, and recharge. Replace the battery. Replace the battery. If "sulfation" has not advanced far, try to restore the battery by replacing the electrolyte, recharing it fully with the battery detached from the motorcycle and then adjusting electrolyte S.G.
Battery runs down quickly.	1. The charging method is not correct. 2. Cell plates have lost much of their active material as result of over-charging. 3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte S.G. 4. Electrolyte S. G. is too low. 5. Contaminated electrolyte. 6. Battery is too old.	Check the generator, regulator/rectifier and circuit connections, and make necessary adjustment to obtain specified charging operation. Replace the battery, and correct the charging system. Replace the battery. Recharge the battery fully and adjust electrolyte S.G. Replace the electrolyte, recharge the battery and then adjust S.G. Replace the battery.
Reversed battery polarity.	The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.	Replace the battery and be sure to connect the battery properly.
Battery "sulfation"	1. charging rate too low or too high. (When not in use, batteries should be recharged at least once a month to avoid sulfation.) 2. Battery electrolyte excessive or insufficient, or its specific griavity too high or too low. 3. The battery left ususued for too long in cold climate.	Replace the battery. Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions. Replace the battery, if badly sulfated.
Battery discharges too rapidly	1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte S.G. is too high.	Clean. Charge the electrolyte by consulting the battery maker's directions.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Steering feels too heavy or stiff.	1. Steering stem nut overtightened. 2. Worn bearing or race in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires.	Adjust. Replace. Replace. Adjust.
Steering oscillation.	1. Loss of balance between right and left front suspensions. 2. Distorted front fork. 3. Distorted front axle or crooked tire.	Replace. Repair or replace. Replace.
Wobby front wheel.	1. Distorted wheel rim. 2. Worn-down front wheel bearings. 3. Defective of incorrect tire. 4. Loose nut on axle.	Replace. Replace. Replace. Retighten.
Front suspention too soft.	1. Weakened springs. 2. Not enough fork oil.	Replace. Refill.
Front front too stiff.	1. Fork oil too viscous. 2. Too much fork oil.	Replace. Remove excess oil.
Noisy front suspension.	1. Not enough fork oil. 2. Loose nuts on suspension.	Refill. Retighten.
Wobbly rear wheel.	1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Defective or incorrect tire. 4. Loose nut on axle. 5. Worn swing arm bushing. 6. Loosen nuts on the rear shock.	Replace. Replace. Replace. Retighten. Replace. Retighten.
Rear suspension too soft.	1. Weakened springs. 2. Rear suspension adjuster improperly set.	Replace. Adjust.
Rear suspension too stiff.	1. Rear suspension adjuster improperly set. 2. Worn swing arm bushings.	Adjust. Replace.
Noisy rear suspension.	1. Loose nuts on suspension. 2. Worn swing arm bushing.	Retighten. Replace.

7-7 SERVICING INFORMATION

BRAKES

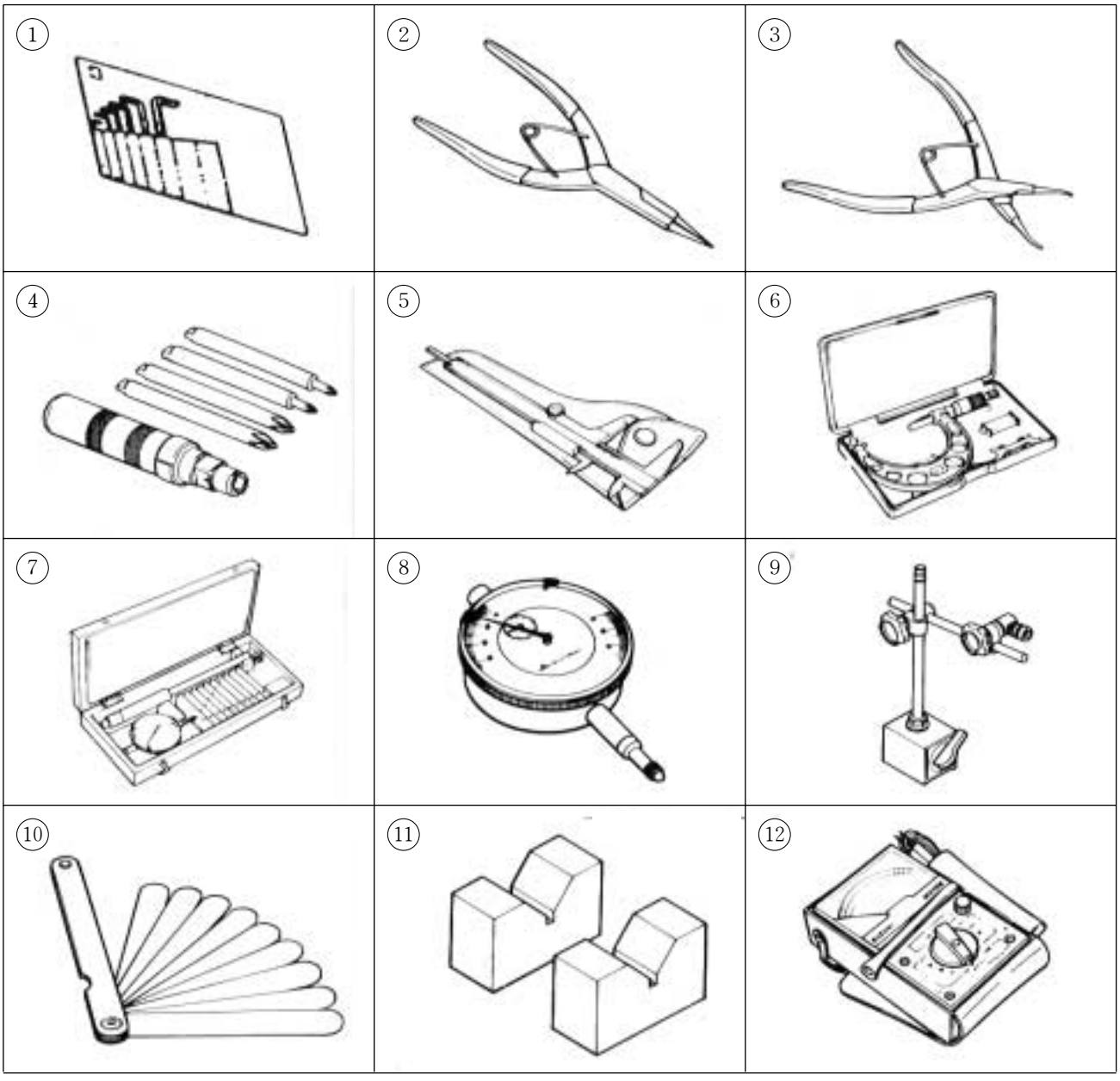
Complaint	Symptom and possible causes	Remedy
Poor braking (FRONT and REAR)	1. Not enough brake fluid in the reservoir. 2. Air trapped in brake fluid circuit. 3. Pads worn down. 4. Too much play on brake lever or pedal. 5. Linings worn down.	Refill to level mark. Bleed air out. Replace. Adjust. Replace.
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion on engaging surface of pads. 4. Worn disc. 5. Air in hydraulic system.	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air.
Brake squeaking.	1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loose front-wheel axle or rear-wheel axle. 5. Worn pads. 6. Foreign material in brake fluid. 7. Clogged return port of master cylinder.	Repair surface with sandpaper. Modify pad fitting. Replace. Tighten to specified torque. Replace. Replace brake fluid and clean. Disassemble and clean Master cylinder.
Excessive brake lever stroke.	1. Air in hydraulic system. 2. Worn brake lever cam. 3. Insufficient brake fluid. 4. Improper quality of brake fluid.	Bleed air. Replace brake lever. Replenish fluid to specified level ; bleed air. Replace with correct fluid.
Leakage of brake fluid.	1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup.	Tighten to specified torque. Replace. Replace piston and/or cup.

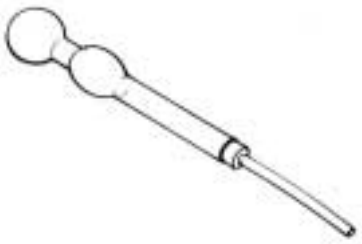
SPECIAL TOOLS

ITEM	PART No.	PART NAME
1	09900-00401	"L" Type hexagon wrench set
2	09900-06107	Snap ring pliers(opening type)
3	09900-06108	Snap ring pliers(closing type)
4	09900-09003	Impact driver set
5	09900-20101	Vernier calipers(150㎜)
6	09900-20202	Micrometer(25-50㎜)
	09900-20203	Micrometer(50-75㎜)
	09900-20205	Micrometer(75-100㎜)
7	09900-20508	Cylinder gauge set
8	09900-20606	Dial gauge(1/100)
9	09900-20701	Magnetic stand
10	09900-20803	Thickness gauge
	09900-20804	Thickness gauge
11	09900-21304	V-block
12	09900-25002	Poket tester
13	09900-28403	Hydrometer
14	09910-20116	Conrod holder
15	09910-32812	Crankshaft installer
16	09913-14511	Fuel level gauge
17	09913-50121	Oil seal remover
18	09913-75820	Bearing installer
19	09913-80112	Bearing installer
20	09915-63310	Compression pressure adapter
21	09915-64510	Compression gauge
22	09915-74510	Oil pressure gauge
23	09916-14510	Valve spring compressor
24	09916H35C00	Attachment
25	09916-21110	Valve spring cutter set
26	09916-24480	Solid pilot(N-140-5.5)
27	09916-24910	Valve seat cutter 15° × 75°
28	09916-34541	Reamer handle
29	09916-37571	5㎜ reamer
30	09916H34575	10.5㎜ reamer
31	09916-44910	Valve guide installer and remover
32	09916-44920	Valve guide installer attachment
33	09916-84510	Tweezers
34	09920-13111	Crankcase separating tool/crankshaft remover
35	09920-13120	Crankcase separating tool/crankshaft remover
36	09920-53710	Clutch sleeve hub holder
37	09923-73210	Bearing puller

7-9 SERVICING INFORMATION

ITEM	PART No.	PART NAME
38	09924-84510	Bearing installer set
39	09930-30102	Rotor remover slide shaft
40	09930-30162	Rotor remover
41	09930-40113	Rotor and sprocket holder
42	09930-44511	Rotor holder
43	09940-14911	Steering stem nut socket wrench
44	09940-50112	Fork oil seal installer
45	09941-34513	Steering race installer
46	09941-74910	Steering bearing installer
47	09943-74111	Fork oil level gauge



⑬ 	⑭ 	⑮ 
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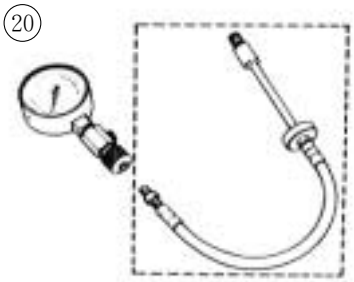
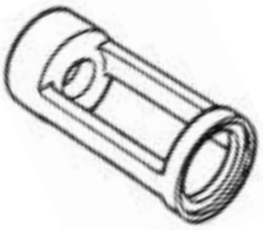
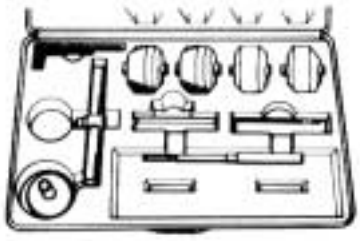
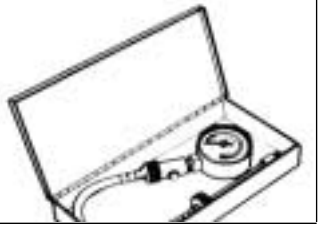
⑲ 	⑳ 	㉑ 
㉒ 	㉓ 	㉔ 
㉕ 	㉖ 	㉗ 
㉘ 	㉙ 	㉚ 

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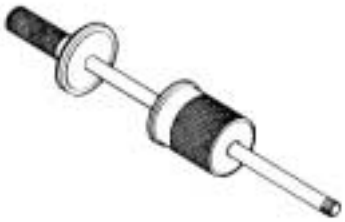
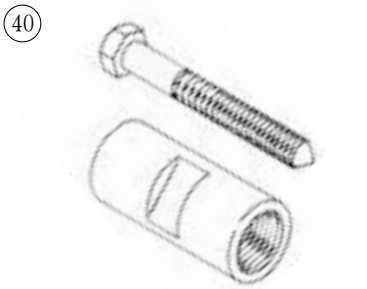
(37) 	(38) 	(39) 
(40) 	(41) 	(42) 
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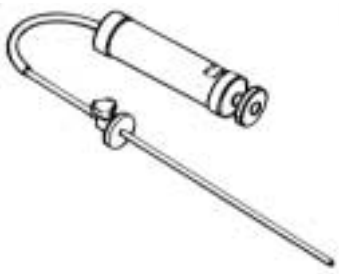
(46) 	(47) 	

TIGHTENING TORQUE

ENGINE

ITEM	N · m	kg · m
Cylinder head cover bolt	12-16	1.2-1.6
Camshaft holder nut	25-29	2.5-2.9
Camshaft sprocket center bolt	25-30	2.5-3.0
Cylinder head nut	6-8	0.6-0.8
Cylinder base nut	6-8	0.6-0.8
Magneto rotor nut	56-60	5.6-6.0
Primary drive gear nut / Oil pump drive gear nut	40-60	4.0-6.0
Clutch sleeve hub nut	30-50	3.0-5.0
Engine oil drain plug	18-20	1.8-2.0
Engine sprocket nut	80-100	8.0-10.0
Engine mounting nut(M10)	80-95	8.0-9.5
Engine mounting nut(M8)	37-45	3.7-4.5
Exhaust pipe clamp nut	9-12	0.9-1.2
Muffler clamp bolt	9-12	0.9-1.2
Starter clutch bolt	15-20	1.5-2.0

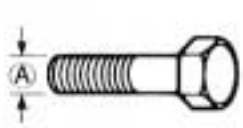
CHASSIS

ITEM		N · m	kg · m
Front axle nut		36-52	3.6-5.2
Front fork damper rod bolt		20-26	2.0-2.6
Front fork lower clamp bolt		25-35	2.5-3.5
Front fork upper bolt		35-55	3.5-5.5
Steering stem head bolt		35-55	3.5-5.5
Steering head cover bolt		12-20	1.2-2.0
Swing arm pivot nut		50-80	5.0-8.0
Rear torque link nut		10-16	1.0-1.6
Rear shock absorber fitting nut	Upper	20-30	2.0-3.0
	Lower	20-30	2.0-3.0
Rear axle nut		50-80	5.0-8.0
Rear sprocket nut		18-28	1.8-2.8
Rear brake cam lever bolt		5-8	0.5-0.8
Front brake caliper mounting bolt		15-25	1.5-2.5
Front disc bolt		15-25	1.5-2.5
Master cylinder mounting bolt		5-8	0.5-0.8
Caliper bleeder bolt		6-9	0.6-0.9
Front brake hose union bolt		20-25	2.0-2.5

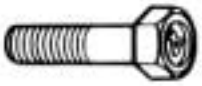
TIGHTENING TORQUE CHART

For other bolt and nuts who's is not listed, refer to this chart:

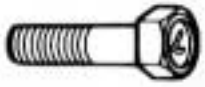
Bolt Diameter (mm)	Conventional or "4" marked bolt		"7" marked bolt	
	N · m	kg · m	N · m	kg · m
4	1.0 - 2.0	0.1 - 0.2	1.5 - 3.0	0.15 - 0.3
5	2.0 - 4.0	0.2 - 0.4	3.0 - 6.0	0.3 - 0.6
6	4.0 - 7.0	0.4 - 0.7	8.0 - 12.0	0.8 - 1.2
8	10.0 - 16.0	1.0 - 1.6	18.0 - 28.0	1.8 - 2.8
10	22.0 - 35.0	2.2 - 3.5	40.0 - 60.0	4.0 - 6.0
12	35.0 - 55.0	3.5 - 5.5	70.0 - 100.0	7.0 - 10.0
14	50.0 - 80.0	5.0 - 8.0	110.0 - 160.0	11.0 - 16.0
16	80.0 - 130.0	8.0 - 13.0	170.0 - 250.0	17.0 - 25.0
18	130.0 - 190.0	13.0 - 19.0	200.0 - 280.0	20.0 - 28.0



Conventional bolt



"4" marked bolt



"7" marked bolt

SERVICE DATA

VALVE+GUIDE

Unit : ㎜

ITEM	STANDARD		LIMIT
Valve diam	IN.	ϕ 22	–
	EX.	ϕ 19	–
Valve lift	IN.	7.4	–
	EX.	7.1	–
Valve clearance or tappet clearance (when cold)	IN.&EX.	0.10～0.13	–
Valve guide to valve stem clearance	IN.	0.010～0.037	0.35
	EX.	0.030～0.057	0.35
Valve guide I.D	IN.&EX.	5.000～5.012	–
Valve stem O.D	IN.	4.975～4.990	–
	EX.	4.955～4.970	–
Valve stem runout	IN.&EX.	–	0.05
Valve head thickness	IN.&EX.	–	0.5
Valve stem end length	IN.&EX.	3.5	3.38
Valve stem width	IN.&EX.	0.9～1.1	–
Valve head radial runout	IN.&EX.	–	0.03
Valve spring free length	IN.&EX.	41.65	–
Valve spring tension	IN.&EX.	13.6～16.6㎏ f:36.6㎜	–

CAMSHAFT+CYLINDER HEAD

Unit : ㎜

ITEM	STANDARD		LIMIT
Cam height	IN.	34.44～34.48	34.18
	EX.	33.81～33.85	33.55
Cam chain 20-pitch length	–	–	129.9
Camshaft runout	–	–	0.10
Rocker arm I.D	IN.&EX.	12.000～12.018	–
Rocker arm shaft O.D	IN.	11.977～11.995	0.35
Cylinder head distortion	–	–	0.05
Camshaft hold	–	–	0.05

CYLINDER+PISTON+PISTON RING Unit : mm

ITEM	STANDARD			LIMIT
Compression pressure	12.0~15.0kg/㎠			8.0kg/㎠
Piston to cylinder clearance	0.050-0.060			0.120
Cylinder bore	57.000-57.015			57.080
Piston diam	56.945-56.960			56.880
	Measure st 15 from the skirt end			
Cylinder distortion	-			0.05
Piston ring free end gap	1st	R	Aoorox. 7.2	5.7
	2nd	RN	Aoorox. 5.8	4.6
Piston ring end gap	1st		0.20-0.32	0.50
	2nd		0.20-0.32	0.50
Piston ring to groove clearance	1st		-	0.180
	2nd		-	0.150
Piston ring to groove width	1st		1.01-1.03	-
	2nd		1.01-1.03	-
	Oil		2.01-2.03	-
Piston ring to thickness	1st		0.970-0.990	-
	2nd		0.970-0.990	-
Piston pin bore	15.002-15.008			15.030
Piston pin O.D	14.994-15.000			14.980

CONROD+CRANKSHAFT Unit : mm

ITEM	STANDARD	LIMIT
Conrod small end I.D	15.006-15.014	15.040
Conrod deflection	-	3.0
Conrod big end side clearance	0.10-0.45	1.00
Conrod big end width	15.95-16.00	-
Crank web to web width	53.0±0.1	-
Crankshaft runout	-	0.05

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.000(30/15)	-
Oil pressure(at 60℃, 140℉)	0.4-0.6㎏/㎠(at 3000r/min)	-

CLUTCH

Unit : ㎜

ITEM	STANDARD	LIMIT
Clutch cable play	4	-
Clutch release screw	1/4-1/2 turn back	-
Drive plate thickness	2.9-4.1	2.6
Driven plate thickness	1.6±0.05	-
Driven plate distortion	-	0.10
Clutch spring free length	-	29.5

TRANSMISSION+DRIVE CHAIN

Unit : ㎜, Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		3.500(70/20)		-
Final reduction ratio		3.357(47/14)		-
Gear ratios	Low	2.750(33/12)		-
	2nd	1.785(25/14)		-
	3rd	1.368(26/19)		-
	4th	1.045(23/22)		-
	Top	0.913(21/23)		-
Shift fork to groove clearance		0.10-0.30		0.50
Shift fork to groove width		No.1&No.2	5.0-5.1	-
		No.3	5.5-5.6	-
Shift fork thickness		No.1&No.2	4.8-4.9	-
		No.3	5.3-5.4	-
Countershaft length(Low to 2nd)		$88.0^{+0.1}_{-0.2}$		-
Drive chain		Type	428DS	-
		Links	126 links	-
		20-pitch length		259.0
Drive chain slack		25-35		-

7-17 SERVICING INFORMATION

CARBURETOR

ITEM	SPECIFICATION
Carburetor type	PD 18F
Bore size	24㎜
I.D. No	93BO
Idle r/min	1450±50rpm
Float height	12.5㎜
Main jet(M.J)	#100
Main air jet(M.A.J)	#80
Jet needle(J.N)	J29B
Needle jet(N.J)	J6TC-3rd
Pilot jet(P.J)	#38
Throttle valve(T.V)	93C
By-pass(B.P)	2.9 ϕ1.0, ϕ0.9
Valve seat(V.S)	ϕ2.0㎜
Stater jet	MAX #500
Pilot screw(P.S)	PRE-SET(2½)
Pilot air jet(P.A.J)	#150

ELECTRICAL

Unit : ㎜

ITEM	SPECIFICATION	
Ignition timing	15° BTDC Below 2250±300rpm and 35° BTDC Above 4000±300rpm	
Spark plug	Type	C8EH-9
	Gap	0.7~0.8
Spark performance	-	Over 8㎜ at 1 atm
Ignition coil resistance	Primary	B-Ground, Approx.0.5~1.5Ω
	Secondary	Plug cap-Ground, Approx.4.7~5.57KΩ
Magneto coil resistance	Pick up	G-W Approx.90~120Ω
	Power source (HANKUK)	B-R Approx.300~400Ω
	Power source (PUNG SUNG)	B-R Approx.400~600Ω
	Charging	Y-Y-Y Approx.0.5~1.5Ω
Generator no-load voltage	More than 70V(AC) at 5000r/min	
Regulated voltage	13.5~16.0V at 5000r/min	
Battery	Capacity	12V9AH/10HR
	Standard electrolyte S.G	1,280 at 20℃(68℉)
Fuse size	15A	

BRAKE+WHEEL

Unit : mm

ITEM	STANDARD		LIMIT
Front brake lever distance	5-20		-
Rear brake pedal free travel	20-30		-
Rear brake pedal height	10		-
Brake drum I.D	Rear wheel	-	130.7
Brake lining thickness	Rear wheel	-	1.5
Brake disc thickness	Front wheel	4.0±0.2	3.0
Brake disc runout	Front wheel	-	0.3
Master cylinder bore	Front wheel	12.700-12.743	-
Master cylinder piston diam	Front wheel	12.657-12.684	-
Brake caliper cylinder bore	Front wheel	33.960-34.036	-
Brake caliper piston diam	Front wheel	33.884-33.934	-
Wheel rim runout	Axis direction	-	2.0
	Circular direction	-	2.0
Wheel axle runout	Front wheel	-	0.25
	Rear wheel	-	0.25
Tire size	Front wheel	2.75-18 4PR	-
	Rear wheel	3.00-18 6PR	-
Tire tread depth	Front wheel	6	1.6
	Rear wheel	8	1.6

SUSPENSION

Unit : mm

ITEM	STANDARD	LIMIT
Front fork stroke	130	-
Front fork spring free length	-	454.5
Front fork oil level	185	-
Rear wheel travel	91	-
Swing arm pivot shaft runout	-	0.6

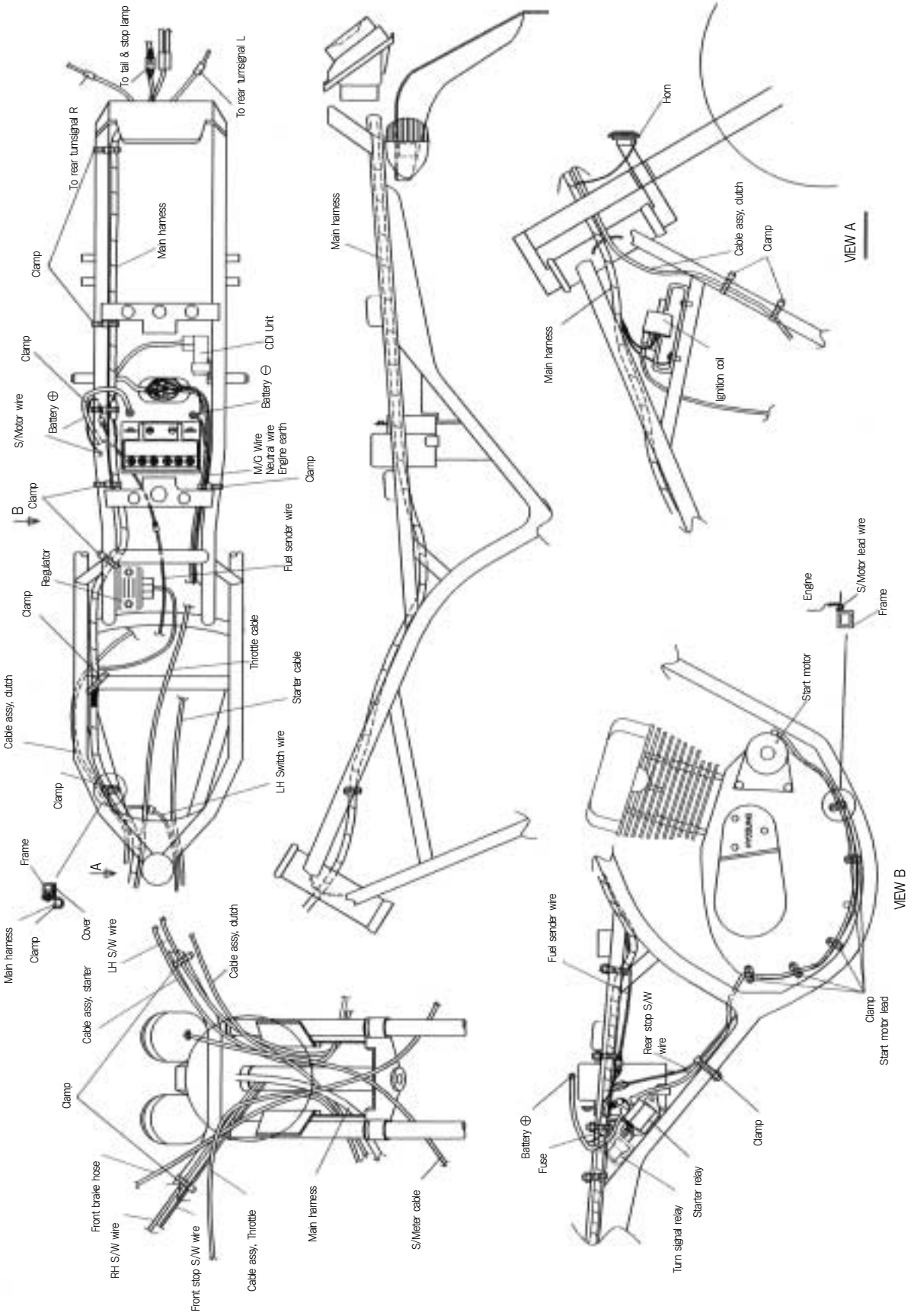
FUEL+OIL

ITEM		STANDARD		LIMIT
Fuel type		Gasoline used should be graded 85-95 octane or highter. An unleaded or low-lead type is recommended		-
Fuel tank including	reserve	13.7 ℓ		-
	reserve	1.6 ℓ		-
Engine oil type		SAE 10W/40, SF		-
Engine oil capacity		Change	850㎖	-
		Filter change	950㎖	-
		Overhaul	1300㎖	-
Front fork oil type		TELLUS # 22		-
Front fork oil capacity(each leg)		175㎖		-
Brake fluid type		SAE JI703, DOT 3 OR DOT 4		-

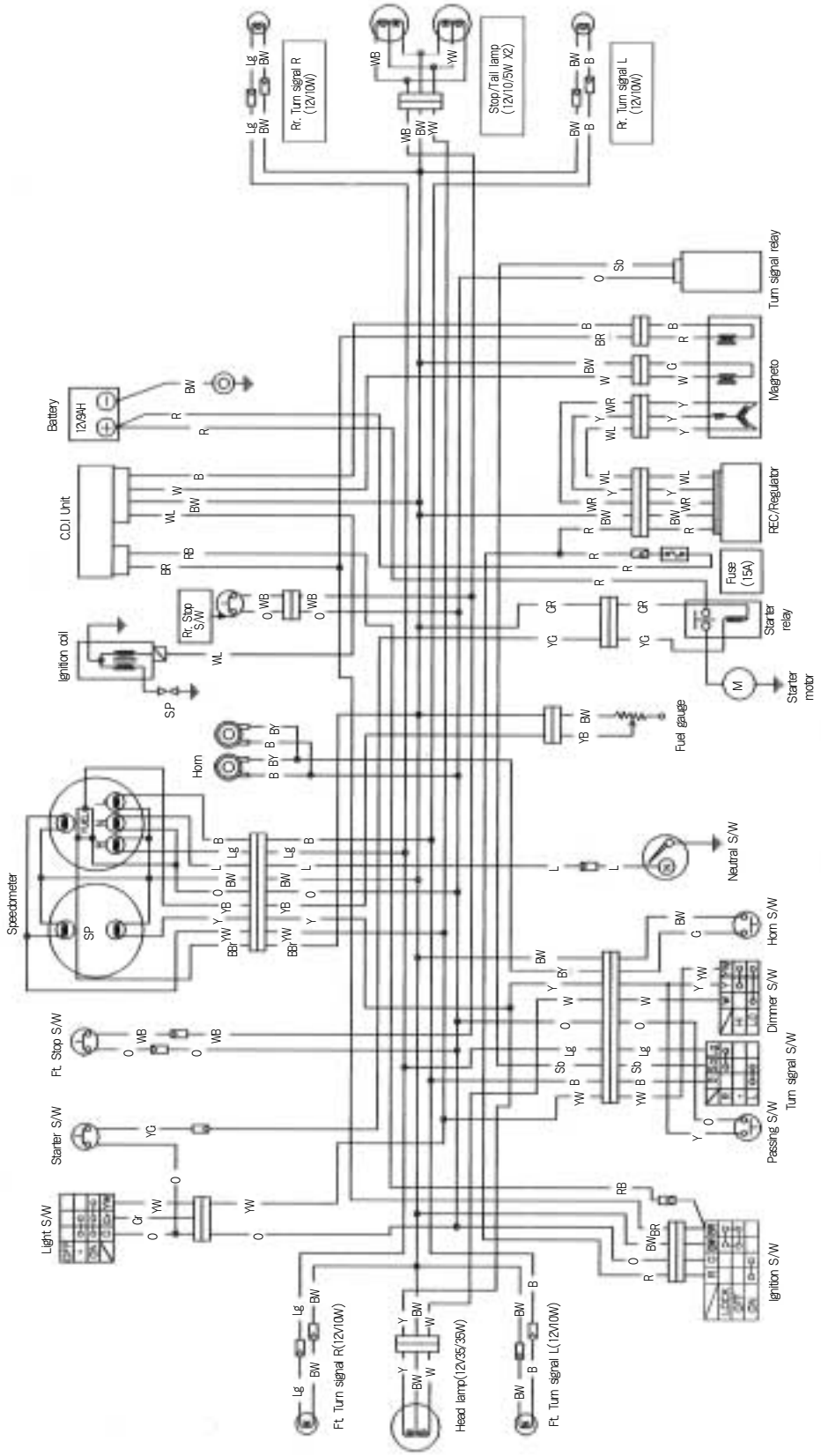
TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING					
	SOLO RIDING			DUAL RIDING		
	kpa	(㎏/㎠)	psi	kpa	(㎏/㎠)	psi
FRONT	175	1.75	24	175	1.75	24
REAR	200	2.00	28	225	2.25	32

WIRE AND CABLE ROUTING



WIRING DIAGRAM



WIRE COLOR

B	: Black	Lg	: Light green	Y	: Yellow
Br	: Brown	O	: Orange	BR	: Black with Red tracer
G	: Green	R	: Red	BW	: Black with White tracer
Gr	: Gray	W	: White	WR	: White with Red tracer
L	: Blue	Sb	: Light blue	WB	: White with Black tracer

WL	: White with Blue tracer		
YB	: Yellow with Black tracer		
YG	: Yellow with Green tracer		
YW	: Yellow with White tracer		

SPEEDOMETER	DRIVING LAMP	3	
	NEUTRAL LAMP	3	
	TURNSIGNAL LAMP	3	
	ILLUMINATION LAMP	3.4×2	
HEAD LAMP	DRIVING	35	
	PASSING	35	
REAR COMBI	TAIL	5×2	
	STOP	10×2	
T/SIG. LAMP	FRONT	10	
	REAR	10	
LAMP	DEST	WATT	

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