

SUZUKI

GN250

SERVICE MANUAL

FOREWORD

The SUZUKI GN250 was designed to offer superior performance through light weight design, four stroke power (TSCC engine). The new GN250 represents another major advance by Suzuki in four stroke motorcycles.

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

Model GN250 manufactured to standard specifications is the main subject matter of this manual. However, the GN250 machines distributed in your country might differ in minor respects from the standard-specification GN250 and, if they do, it is because some minor modifications (which are of no consequence in most cases as far as servicing is concerned) had to be made to comply with the statutory requirements of your country.

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

IMPORTANT

All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject Environmental Protection Agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service the GN250 in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

Further information concerning the EPA emission regulations and U.S. Suzuki's emission control program can be found in the U.S. SUZUKI EMISSION CONTROL PROGRAM MANUAL/SERVICE BULLETIN.

SUZUKI MOTOR CORPORATION

Motorcycle Technical Service Department

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VIEW OF SUZUKI GN250Z



RIGHT SIDE



LEFT SIDE

GROUP INDEX

GENERAL INFORMATION	1
PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES	2
SERVICING ENGINE	3
FUEL AND LUBRICATION SYSTEM	4
EMISSION CONTROL & REGULATIONS	5
ELECTRICAL SYSTEM	6
CHASSIS	7
SERVICING INFORMATION	8
GN250D	9
GN250E	10
GN250F	11
GN250J	12

CONTENTS

VIN AND SERIAL NUMBER LOCATIONS1- 1

FUEL AND OIL RECOMMENDATIONS1- 1

BREAK-IN PROCEDURE1- 1

SPECIAL FEATURES.....1- 2

SPECIAL MATERIALS.....1-11

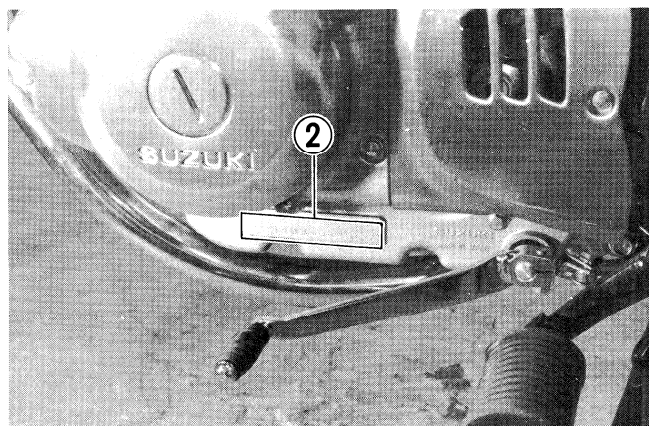
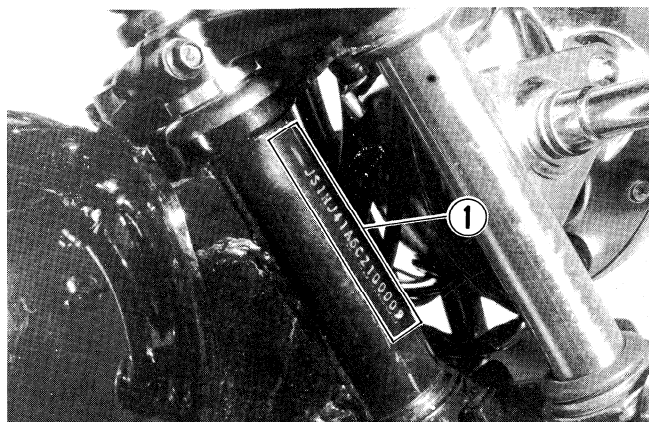
PRECAUTIONS AND GENERAL INSTRUCTIONS.....1-13

SPECIFICATIONS.....1-14

VIN AND SERIAL NUMBER LOCATIONS

The VIN number ① is stamped on the steering head pipe. The engine serial number ② is located on the crankcase.

These numbers are required especially for registering the machine and ordering spare parts.



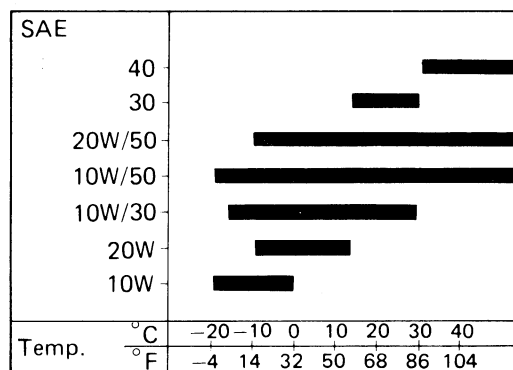
FUEL AND OIL RECOMMENDATIONS

FUEL

Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.

ENGINE OIL

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



FRONT FORK OIL

FORK OIL #10

BREAK-IN PROCEDURE

During manufacture only the best possible materials are used and 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:

- Keep to these breaking-in engine speed limits:

Initial	800 km 500 miles	Below 4,500 r/min
Up to	1,600 km 1,000 miles	Below 5,500 r/min
Over	1,600 km 1,000 miles	Below 8,500 r/min

- Upon reaching an odometer reading of 1,600 km (1,000 miles) you can subject the motorcycle to full throttle operation. However, do not exceed 8,500 r/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

TRANSISTORIZED IGNITION SYSTEM WITH ELECTRONIC ADVANCE

On the Model GN250, the timing advance characteristics of the ignition timing have been changed from the mechanical timing advance system, incorporating an advance governor, to an electronic timing advance system.

This system consists of Magneto tip, pick-up coil ignitor and ignition coil as shown in Fig. 1.

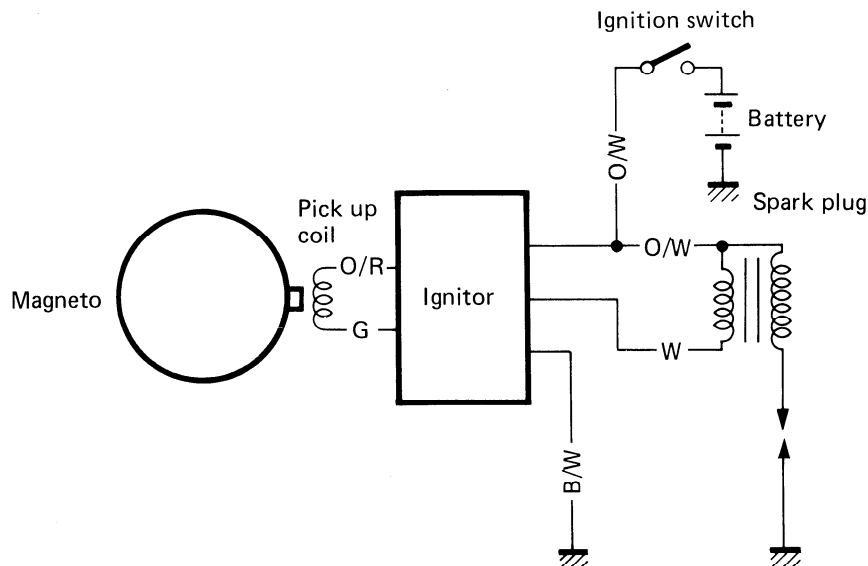


Fig. 1

When the Magneto tip is rotated in the system block diagram above, the signal "A" is generated in the pick-up coil. The thus-generated signal will be converted to the signal waveform "B" inside of the ignitor unit and ignition timing is controlled in response to the engine speed as shown in Fig. 2. That is, timing controlled in the ignitor unit becomes ① when the engine speed is lower than N_1 , and it becomes ② when the engine speed is $N_1 \sim N_2$. The advanced angle when ignited with ② is θ_1 . When higher than N_2 , timing is ③, and the timing does not advance higher than the above. The maximum advanced angle is θ_2 .

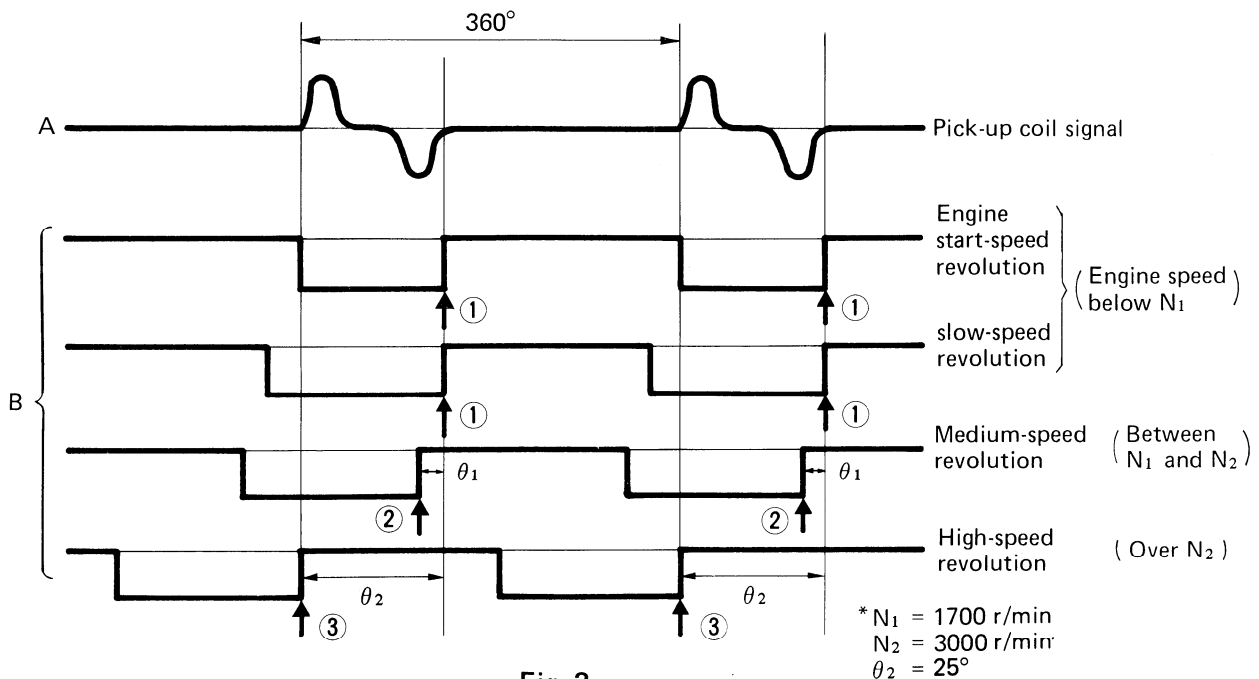


Fig. 2

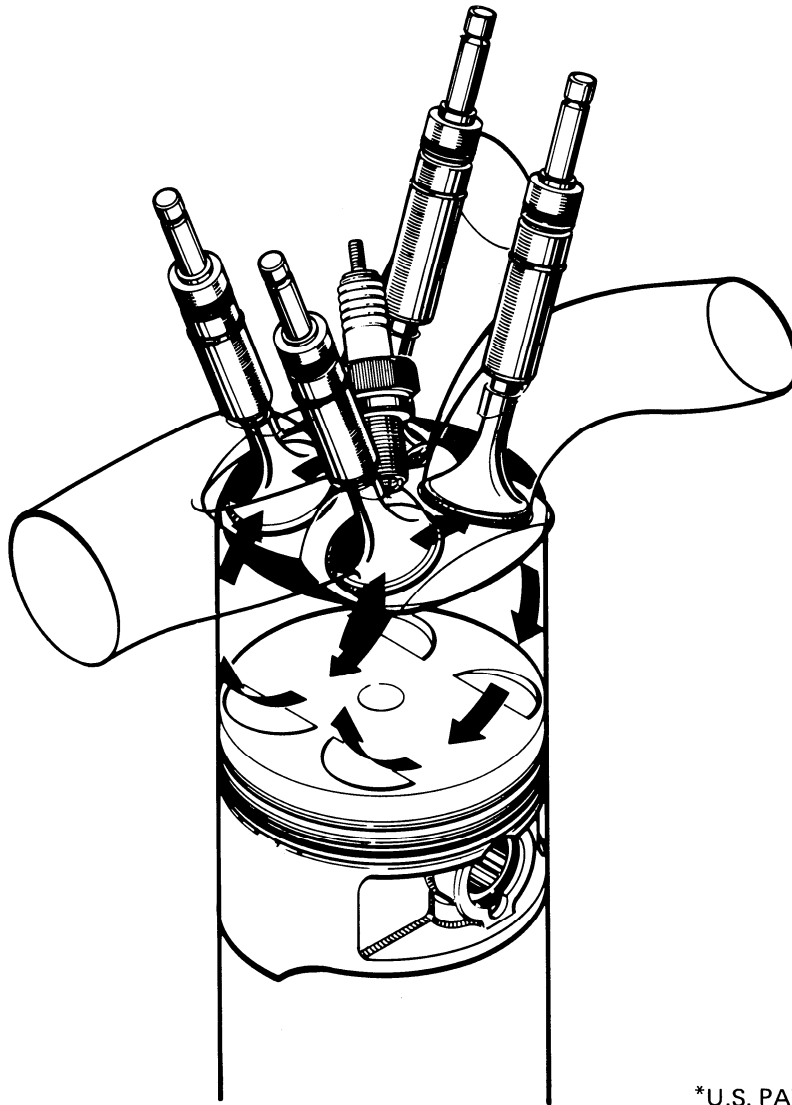
TSCC (TWIN SWIRL COMBUSTION CHAMBER)

GN250 models use SUZUKI's unique TSCC engine design, which is internationally acclaimed for its durability and performance. TSCC describes the heart of the engine, the Twin Swirl Combustion Chamber. What the TSCC engine series does better than conventional 4-stroke engines, either 2-valve or 4-valve, is improve on the two major factors which affect engine performance, charge burning efficiency and intake charging efficiency.

First, charge burning efficiency. The TSCC* system consists of a subtle, yet unique shape casted into the head. Each of the two intake valves is set into adjoining semi-hemispherical depressions in the head.

During the intake stroke these depressions channel the incoming fuel/air mixture to form two separate high-speed swirls. During the compression stroke the squish areas machined in the front and the rear of the cylinder head's combustion chamber accelerate the speed of the swirls. Thus, when the spark plug ignites the mixture, the flame spreads rapidly and completes the combustion more quickly.

To further aid burning efficiency, the spark plug is centrally located, the ideal location. This results in the shortest possible path for the flame to travel.



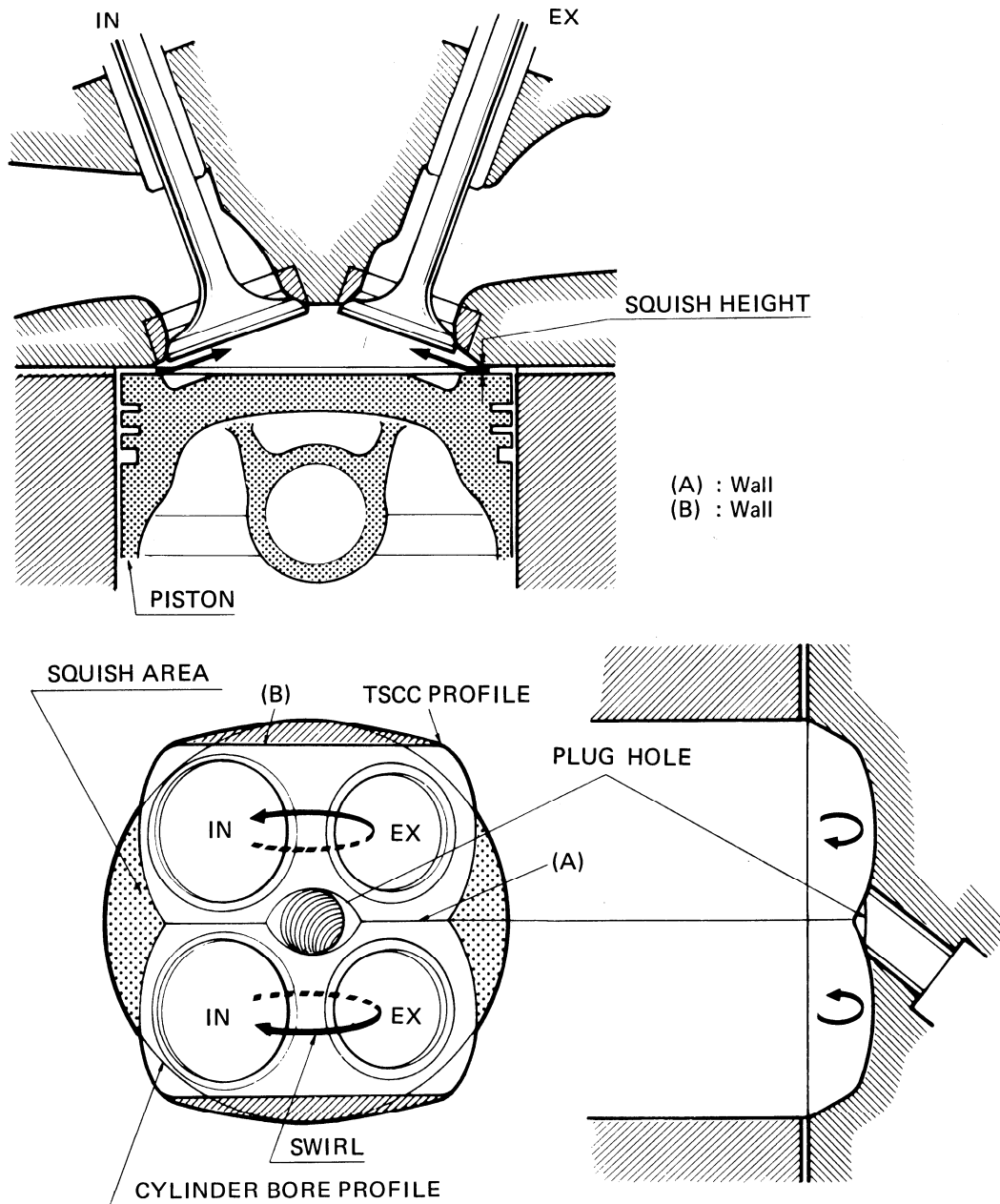
*U.S. PATENT NO. 3633577

The quick completion of burning results in more energy being developed while the piston is in position to transmit maximum power to the crankshaft.

High burning efficiency results in more power, improved throttle response at all rpm's, more complete combustion of the air/fuel mixture (cleaner combustion) and less chance of detonation.

Second, charging efficiency. The benefits of increased burning efficiency are further multiplied if intake charging efficiency is also increased. Basically, increasing the charging efficiency results in more fuel and air being drawn into the engine during each intake stroke. Thus, greater energy potential.

To achieve this, the four valve head was adopted. Two smaller diameter intake valve can flow more than one large valve. Additionally, two smaller valves run cooler due to increased valve seat area and two valve guides to increase heat transfer.



But SUZUKI went one step further. The valves are set in at a much shallower angle than other engines. The result is a smoother intake tract with less valve guide protrusion than in conventional cylinderheads. Therefore, increased flow, and smoother, less turbulent flow which contributes to more power and improved throttle response at all engine speeds.

There are several other benefits. This design is more efficient and will flow more air/fuel mixture than a conventional 4-valve head. Therefore, even smaller, lighter valves can be used with no decrease in power. Also, the valves can be shorter due to the placement angle. This allows more precise valve control since shorter, lighter valves are more easily controlled-especially at higher rpm's.

Yet another benefit of valves set at shallower angles is that the volume of the cylinder head combustion area is decreased. This allows the use of racing type flat-topped pistons since the desired compression ratio can be achieved without resorting to domed pistons. Flat topped pistons offer no restriction to the incoming air/fuel mixture and a flat-topped piston exposes the minimum amount of surface area to the hot burning mixture. This means that the flat piston absorbs less heat and therefore has to dissipate less heat through the rings and to the oil than a conventional domed piston. The result is a cooler running engine. Flat-topped pistons can also be made lighter resulting in less vibration and stress.

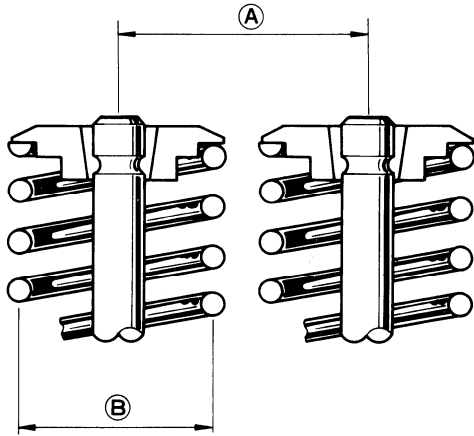
Increases burning efficiency. Increased charging efficiency. The result is more power throughout, from idle to redline. Throttle response is instant and clean. Displacement for displacement, no conventional engine, 2-valve or 4-valve, can compare. This could be enough, but SUZUKI went even further to ensure reliability and ease of maintenance.

Each rocker arm, when depressed by the cam lobe activates two valves at one time. With this system, engine performance is increased and tappets are not necessary. This system allows the use of larger valve springs which increases spring life by reducing stress. Valve adjustment is accomplished quickly and easily.

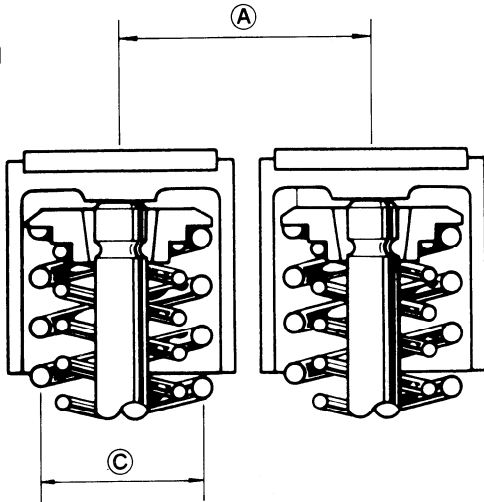
The patented TSCC combustion system combined with SUZUKI's high efficiency charging design results in power and throttle response found only in this new generation 4-stroke engine.

If valve pitch (A) is the same, spring diameter (B) is larger than (C)

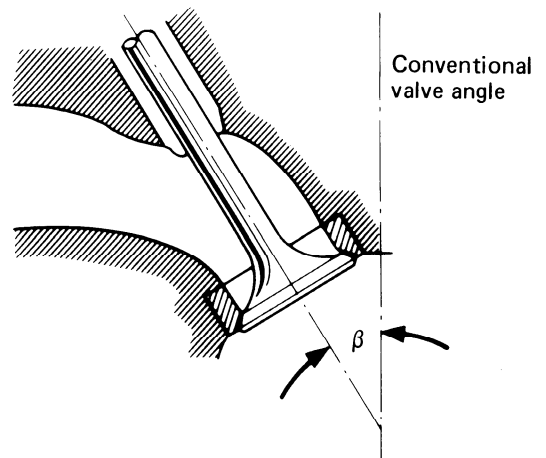
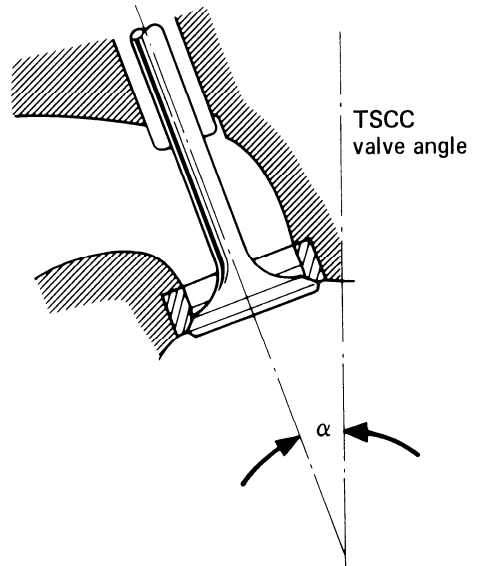
TSCC
4-valve



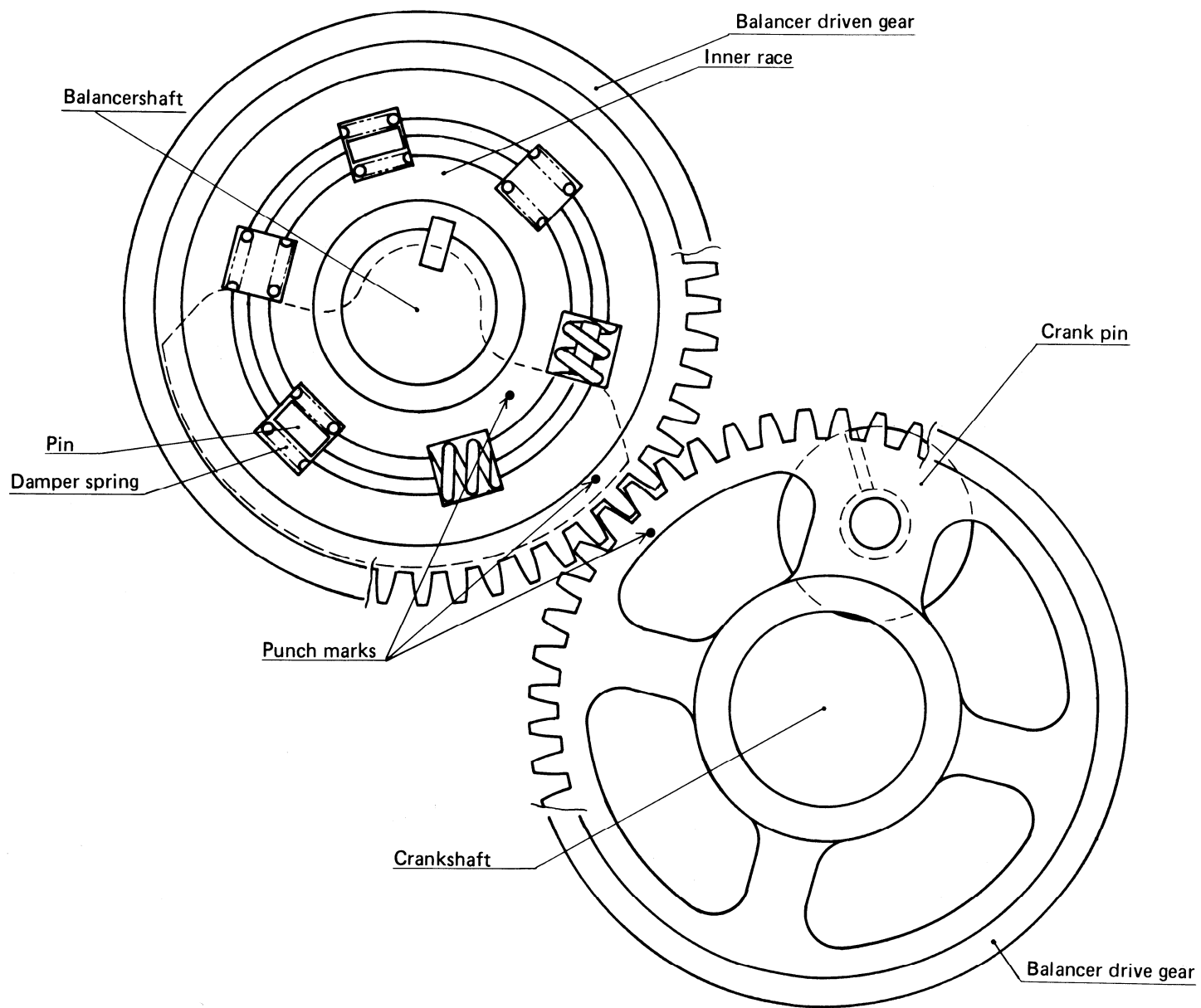
Conventional
4-valve



TSCC valve angle α is smaller than β .



COUNTER BALANCER

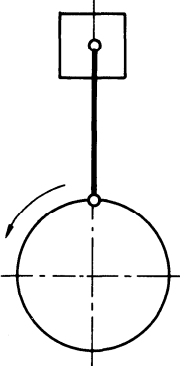
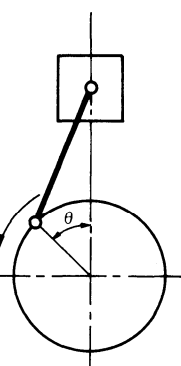
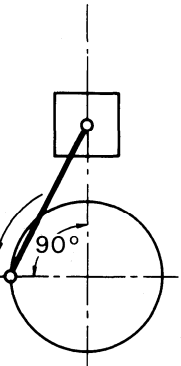
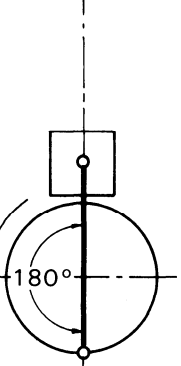
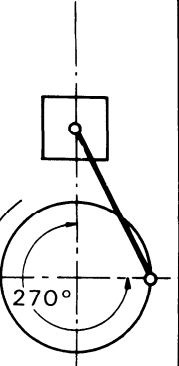
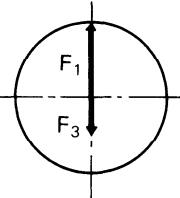
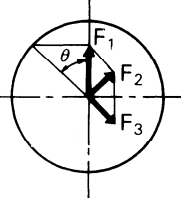
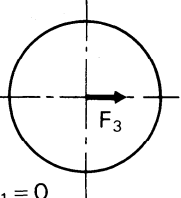
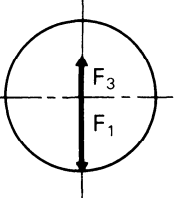
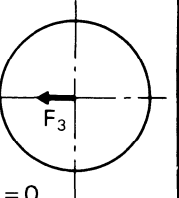
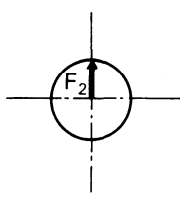
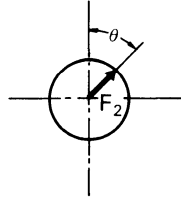
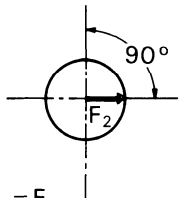
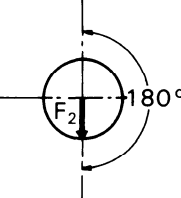
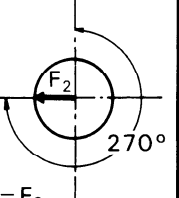
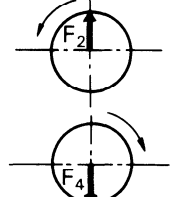
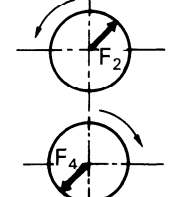
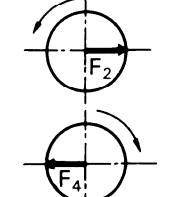
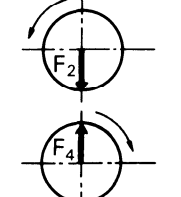
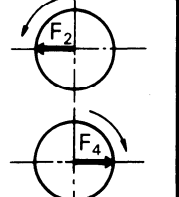


NOTE:
Align the three punch marks in line.

OPERATION

The mass (or weight) of the counter weight provided 180° on the opposite side of the crank pin is equivalent to approximately one half of the inertia force (F_1) that develops in the rising/falling directions of reciprocating engine. However, the counter weight creates a new extra centrifugal force (F_3). The inertia force (F_1) and extra centrifugal force (F_3) combine to become the resultant centrifugal force (F_2), which occurs at every crank angle. In order to cancel the resultant centrifugal force (F_2), the centrifugal force (F_4) of the counter balancer is needed.

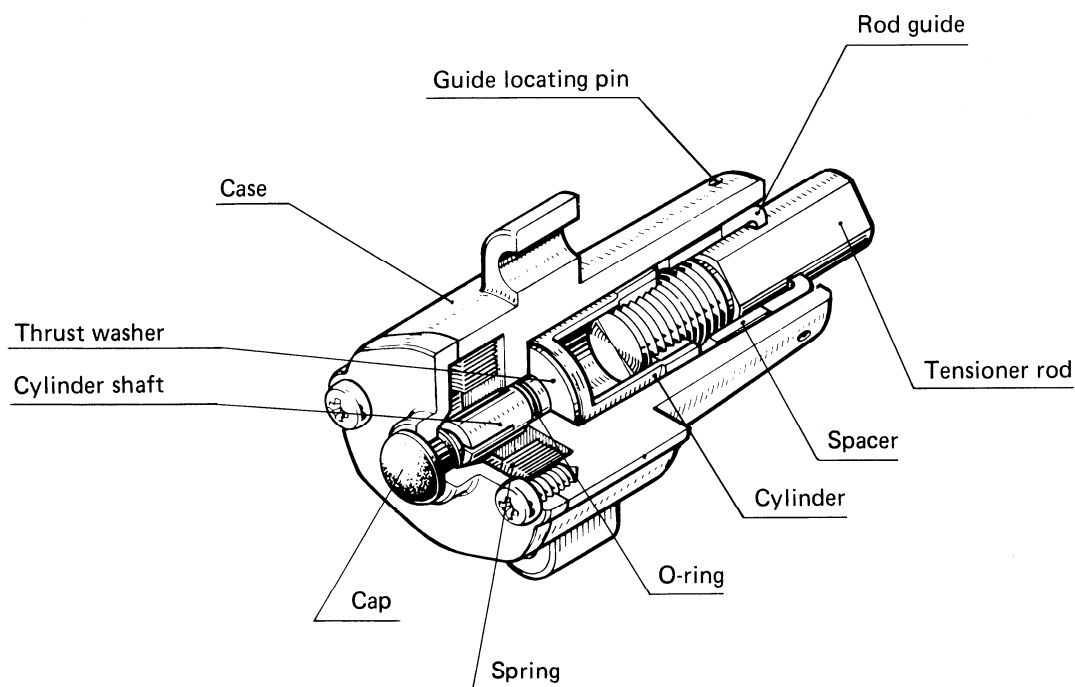
The foregoing explains how the inertia and centrifugal forces are reduced by the counter balancer.

Crank angle					
F_1 = Inertia force F_3 = Extra centrifugal force					
$F_1 + F_3 = F_2$ resultant centrifugal force					
F_4 = Centrifugal force on counter balancer $F_2 = F_4$ $F_2 - F_4 = 0$					

AUTOMATIC CAM CHAIN TENSIONER


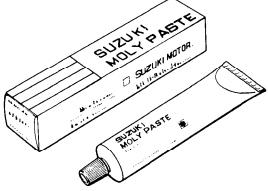



HOW THE CHAIN TENSIONER OPERATES



The spring attached to the cylinder shaft serves to revolve the cylinder. The threaded part of the inside of the cylinder is in contact with threaded part of the tensioner rod. Since the rod guide prevents the tensioner rod from revolving, as the cylinder turns, the tensioner rod is pushed out. The tensioner rod can be retracted by the following procedure: Remove the cap and turn the slotted end of the cylinder shaft with a screw driver in the clockwise direction.



SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GN250 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
 <p>SUZUKI SUPER GREASE "A" 99000-25030</p>	<ul style="list-style-type: none"> • Oil seals • Wheel bearing • Brake cam • Steering stem • Swing arm bearing • Dust cover 	3-52 3-53 7-6 7-28 7-7 7-29 7-19 7-33 7-33		
 <p>SUZUKI MOLY PASTE 99000-25140</p>	<ul style="list-style-type: none"> • Piston pin • Valve stem • Camshaft journal • Rocker arm shaft 	3-26 3-27 3-30 3-30		
 <p>SUZUKI BOND No. 1215 99104-31110</p>	<ul style="list-style-type: none"> • Cylinder head cover • Mating surfaces of left and right crankcase • Front fork damper rod bolt 	2-3 3-31 3-52 7-12		
 <p>THREAD LOCK SUPER "1303" 99104-32030</p>	<ul style="list-style-type: none"> • Cam sprocket bolts • Magneto rotor nut 	3-29 3-58		
 <p>THREAD LOCK CEMENT 99000-32040</p>	<ul style="list-style-type: none"> • Front fork damper rod bolts 	7-12		

Material	Part	Page	Part	Page
 THREAD LOCK "1342" 99104-32050	<ul style="list-style-type: none">• Countershaft bearing retainer screws• Gearshift cam guide and pawl screws• Engine oil pump mounting screws• Pick up coil screws	3-48 3-53 3-54 6-2		
 THREAD LOCK SUPER "1333B" 99104-32020	<ul style="list-style-type: none">• Starter clutch allen bolt	3-45		

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 specified 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.

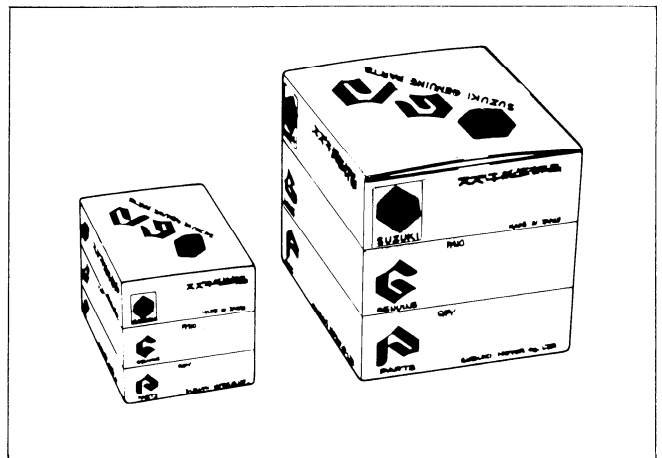
WARNING Personal safety of the rider is involved, and disregard of the information could result in injury.

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 SUZUKI PARTS

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



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 035 mm (80.1 in)
Overall width	835 mm (32.9 in)
Overall height	1 120 mm (44.1 in)
Wheelbase	1 350 mm (53.1 in)
Ground clearance	160 mm (6.3 in)
Seat height	740 mm (29.1 in)
Dry mass	129 kg (284 lbs)

ENGINE

Type	Four-stroke, air-cooled, OHC
Number of cylinders	1
Bore	72.0 mm (2.835 in)
Stroke	61.2 mm (2.409 in)
Piston displacement	249 cm ³ (15.2 cu. in)
Compression ratio	8.9 : 1
Carburetor	MIKUNI BS34SS, single
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	3.238 (68/21)
Final reduction	2.733 (41/15)
Gear ratios, Low	2.636 (29/11)
2nd	1.687 (27/16)
3rd	1.263 (24/19)
4th	1.000 (20/20)
Top	0.818 (18/22)
Drive chain	DAIDO D.I.D. 520UB or TAKASAGO RK520SU
Links	100 links

ELECTRICAL

Ignition type	Transistorized
Ignition timing	10° B.T.D.C. below 1 700 r/min and 35° B.T.D.C. above 3 000 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 43.2 kC (12 Ah)/10 HR
Fuse	15A
Headlight	12V 50/35W
Tail/Brake light	12V 8/23W
Turn signal light	12V 23W
Turn signal indicator light	12V 3.4W x 2
Neutral indicator light	12V 3.4W
Speedometer light	12V 3.4W
High beam indicator light	12V 3.4W

CHASSIS

Front suspension	Telescopic, coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, spring 5-way adjustable
Steering angle	40°
Caster	59° 45'
Trail	105 mm (4.13 in)
Turning radius	2.4 m (7.9 ft)
Front brake	Internal expanding
Rear brake	Internal expanding
Front tire size	3.00 S18 4PR
Rear tire size	4.60 S16 4PR

CAPACITIES

Fuel tank including reserve	10.3 L (2.7 US gal)
reserve	2.0 L (2.1 US qt)
Engine oil	1.3 L (1.4 US qt)
Front fork oil	216 ml (7.3 US oz)

* The specifications subject to change without notice.

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

CONTENTS

PERIODIC MAINTENANCE SCHEDULE	2- 1
MAINTENANCE PROCEDURES	2- 2
BATTERY	2- 2
CYLINDER HEAD NUTS, EXHAUST PIPE BOLTS AND NUT	2- 3
AIR CLEANER	2- 4
VALVE CLEARANCE	2- 5
SPARK PLUG	2- 6
FUEL LINE	2- 6
FUEL STRAINER	2- 6
ENGINE OIL	2- 7
ENGINE OIL FILTER	2- 7
ENGINE IDLE SPEED	2- 8
CLUTCH	2- 9
DRIVE CHAIN	2- 9
BRAKES	2-11
TIRES AND SPOKES	2-12
STEERING	2-13
CHASSIS AND ENGINE BOLTS AND NUTS	2-14

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. Traveled distance is expressed in terms of hours.

NOTE:

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

PERIODIC MAINTENANCE CHART

ENGINE AND CHASSIS

INTERVAL: This interval should be judged by odometer reading or month, which comes first.	mile	600	3,000	6,000	9,500	Page
	km	1,000	5,000	10,000	15,000	
	month	3	15	30	45	
Battery	—		I	I	I	2-2
Cylinder head nuts, exhaust pipe bolts and nuts	T		T	T	T	2-3
Air cleaner	—		C	C	C	2-4
Valve clearance	I		I	I	I	2-5
Spark plug	—		C	R	C	2-6
Fuel line	I		I	I	I	2-6
	Replace every four years					
Fuel strainer	C		—	C	—	2-6
*Engine oil and oil filter	R		R	R	R	2-7
*Engine idle rpm	I		I	I	I	2-8
Clutch	I		I	I	I	2-9
Drive chain	I		I	I	I	2-9
	Clean and lubricate every 600 miles (1,000 km)					
Brakes	I		I	I	I	2-11
Tires	I		I	I	I	2-12
Steering	I		I	I	I	2-13
Front fork	—		I	I	I	2-14
Chassis bolts and nuts	T		T	T	T	2-14

Note: T = Tighten, I = Inspect, R = Replace, C = Clean.

* The specific valve clearance, engine oil and idle rpm appears on the vehicle emission control information label.

MAINTENANCE PROCEDURES

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

BATTERY

5 000, 10 000, 15 000 km
3 000, 6 000, 9 500 mile

- The battery must be removed to check the electrolyte level and specific gravity.
- Remove the frame cover.
- Remove battery \ominus lead at the battery terminal.
- Remove battery \oplus lead at the battery terminal.
- 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	1.28 at 20°C (68°F)

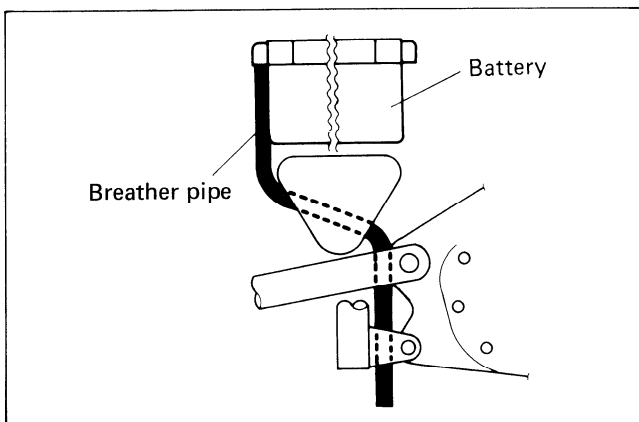
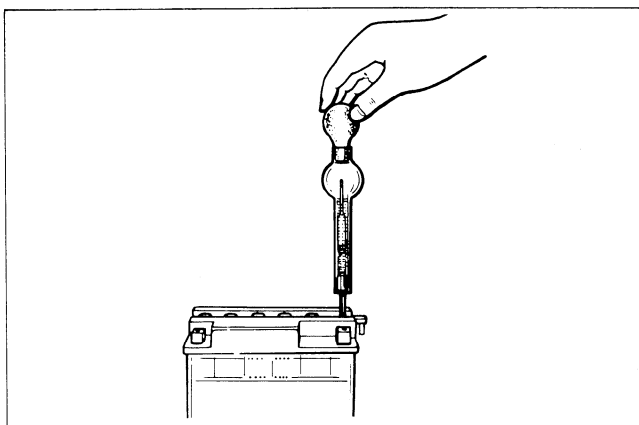
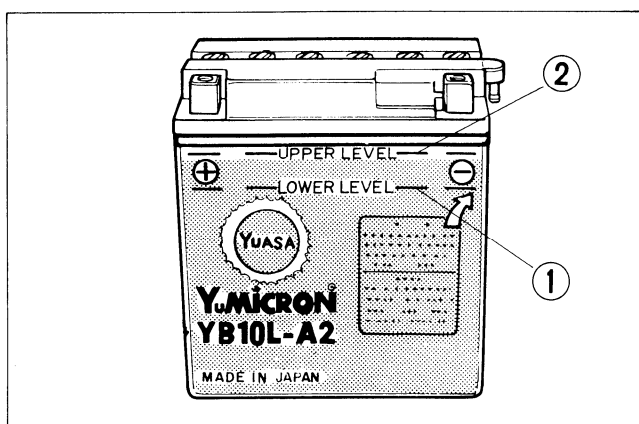
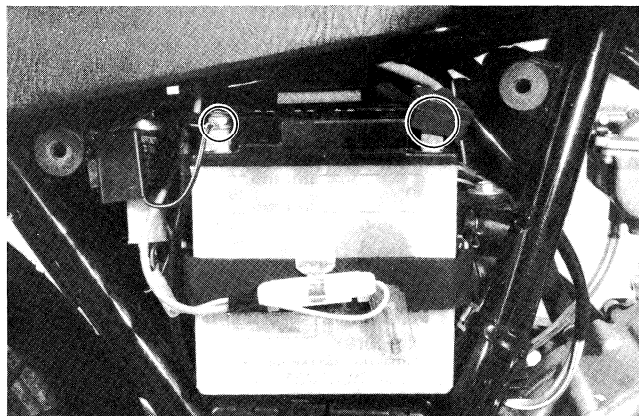
An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging off the machine: take it off and charge it from a recharger. Charging the battery in place can lead to failure of the regulator/rectifier.

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

WARNING:

When installing the battery lead wires, fix the \oplus lead first and \ominus lead next.

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



CYLINDER HEAD NUTS, CYLINDER NUTS, EXHAUST PIPE BOLTS

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile

Cylinder head nuts

- Remove the seat and fuel tank.
(Refer to page 3-2)
- Remove the cylinder head cover.
(Refer to page 3-8)
- Tighten the four 10-mm nuts and two 6-mm nuts to the specified torque with a torque wrench, when engine is cold.

Tightening torque

Tightening torque	10 mm	3.5 – 4.0 kg-m (35 – 40 N·m) (25.5 – 29.0 lb-ft)
	6 mm	0.8 – 1.2 kg-m (8 – 12 N·m) (6.0 – 8.5 lb-ft)

- When installing cylinder head cover, apply Suzuki Bond No. 1215 to the mating surface.
(Refer to page 3-31)

Suzuki Bond No. 1215	99104-31110
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Cylinder nuts

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

Tightening torque	0.7 – 1.1 kg-m (7 – 11 N·m) (5.0 – 8.0 lb-ft)
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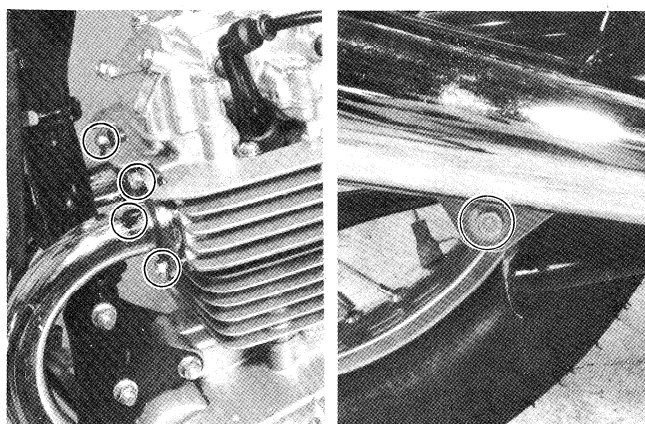
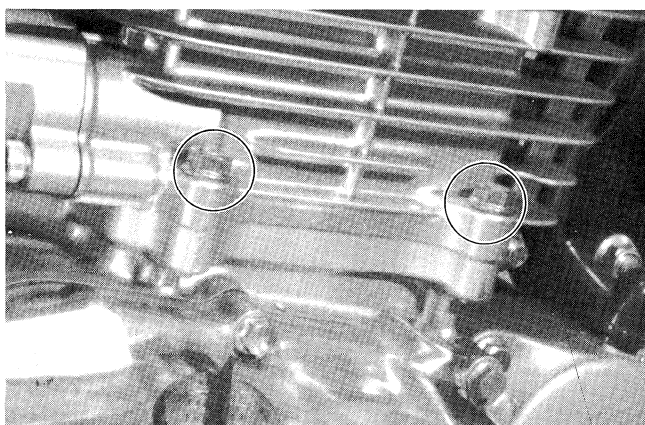
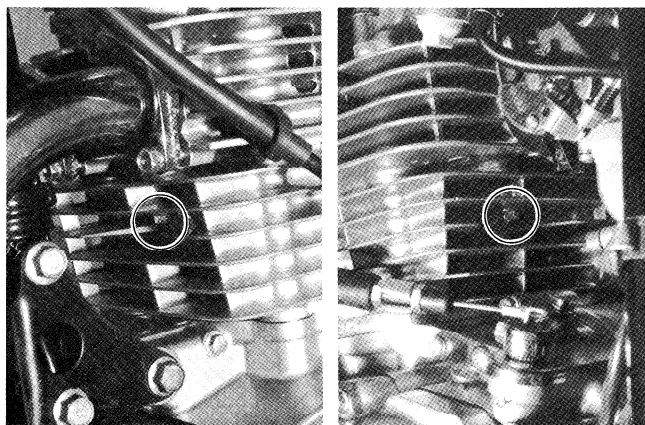
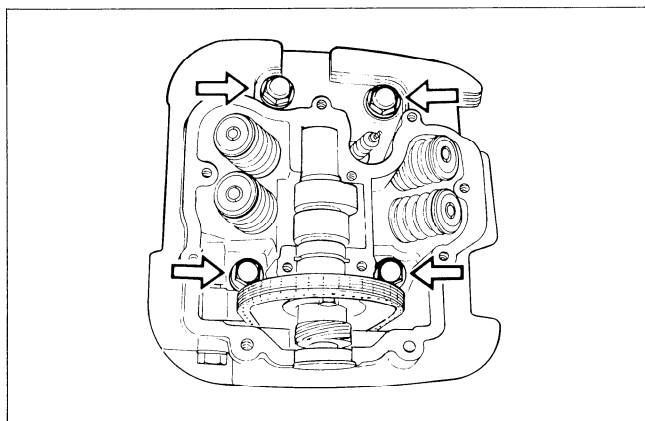
Exhaust pipe bolts and muffler clamp bolt

Tighten the exhaust pipe bolts and muffler clamp bolt to the specified torque.

Tightening torque

Exhaust pipe bolts	0.9 – 1.2 kg-m (9 – 12 N·m) (6.5 – 8.5 lb-ft)
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Muffler clamp bolt	2.2 – 3.5 kg-m (22 – 35 N·m) (16.0 – 25.5 lb-ft)
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AIR CLEANER ELEMENT

5 000, 10 000, 15 000 km
3 000, 6 000, 9 500 mile

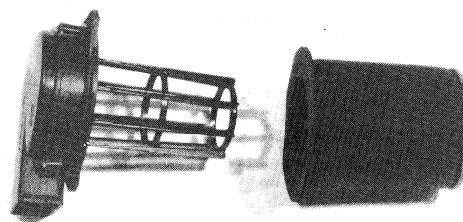
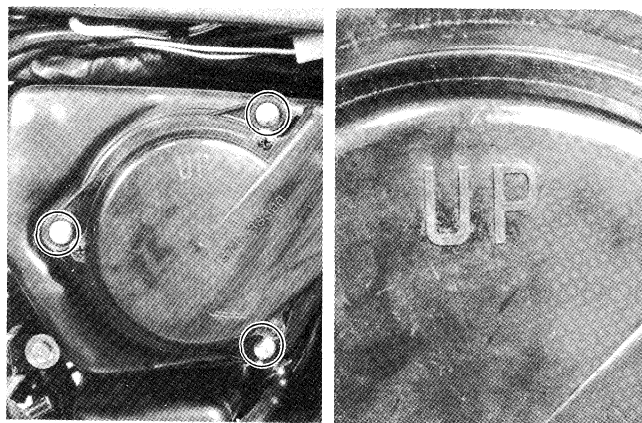
If the air cleaner is clogged with dust, intake resistance will be increased with a resultant decrease in power output and an increase in fuel consumption.

Check and clean the element in the following manner.

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

NOTE:

When installing the air cleaner case cover, place the "UP" mark upward.



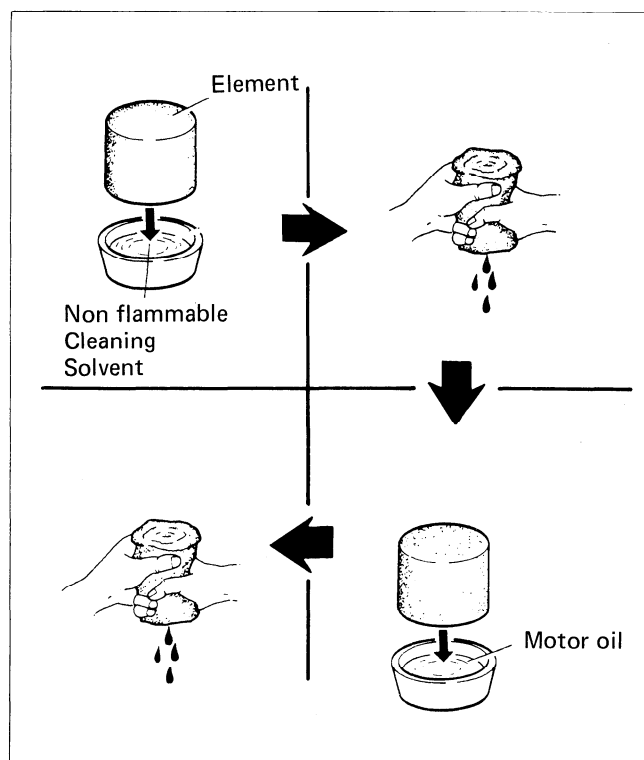
- Fill a washing pan of a proper size with non-flammable cleaning solvent. Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands.
- Immerse the element in motor oil, and squeeze the oil out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



VALVE CLEARANCE

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile

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 the seat and fuel tank.
- Remove spark plug, valve inspection caps, and valve timing inspection plug.
- Remove the magneto cover cap and rotate the magneto rotor with the 22-mm box wrench to set the piston at (TDC) of the compression stroke.
(Rotate the rotor until the "T" line ① 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.

Thickness gauge

09900 – 20803

Valve clearance specifications

IN.	0.03 – 0.08 mm (0.001 – 0.003 in)
EX.	0.08 – 0.13 mm (0.003 – 0.005 in)

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

Tappet adjust driver

09917 – 14910

CAUTION.

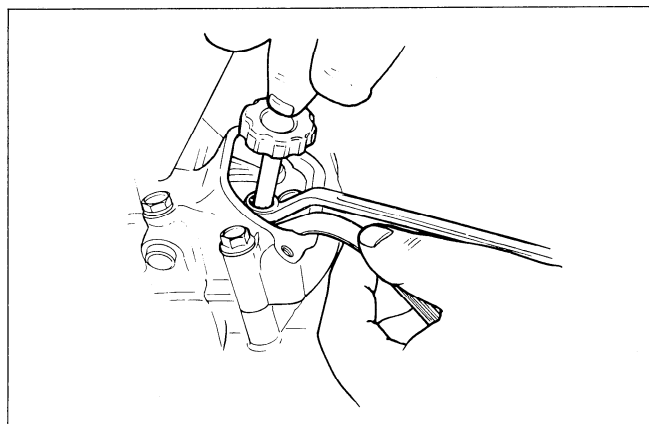
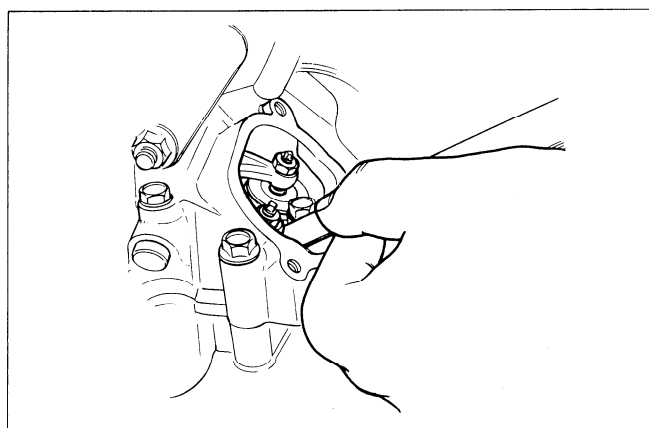
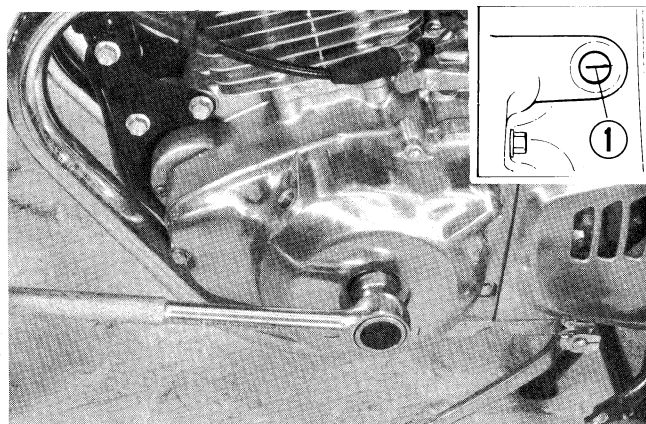
Both of the valve clearances, right and left, should be as closely set as possible.

- Reinstall spark plug, valve inspection caps, 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.



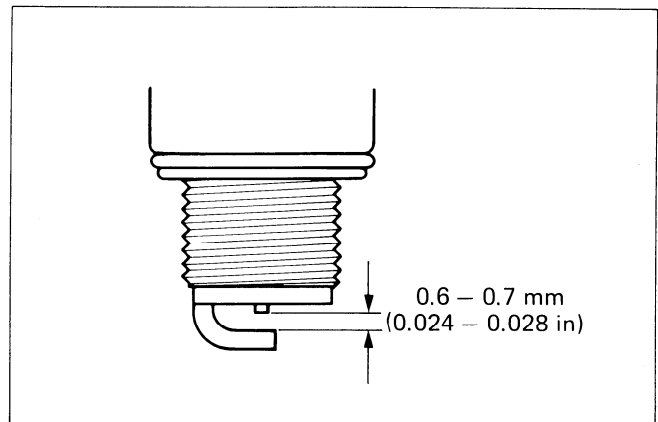
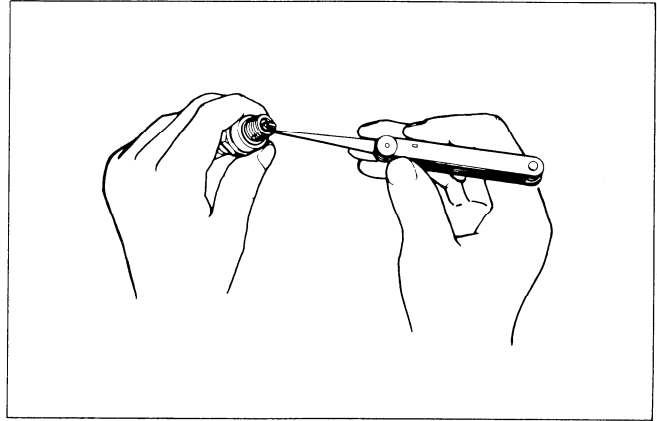
SPARK PLUG

5 000, 10 000, 15 000 km
3 000, 6 000, 9 500 mile

Remove the carbon deposits with a wire or pin and adjust the spark plug gap to 0.6 – 0.7 mm (0.024 – 0.028 in), measuring with a thickness gauge.

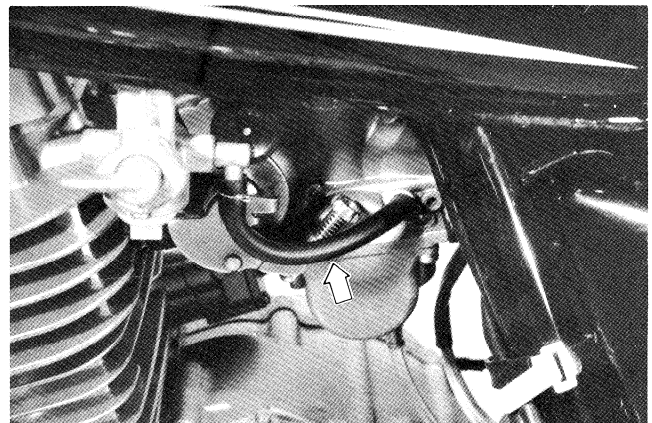
When removing carbon deposits, be sure to observe the appearance of the plug, noting the color of the carbon deposits. The color observed indicates whether the standard plug is suitable or not. If the standard plug is apt to get wet, a hotter plug should be used. If the standard plug is apt to overheat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

Hot type spark plug NGK D7EA or NIPPON DENSO X22ES-U
Standard spark plug NGK D8EA or NIPPON DENSO X24ES-U
Cold type spark plug NGK D9EA or NIPPON DENSO X27ES-U



FUEL LINE

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile
Replace every four years.

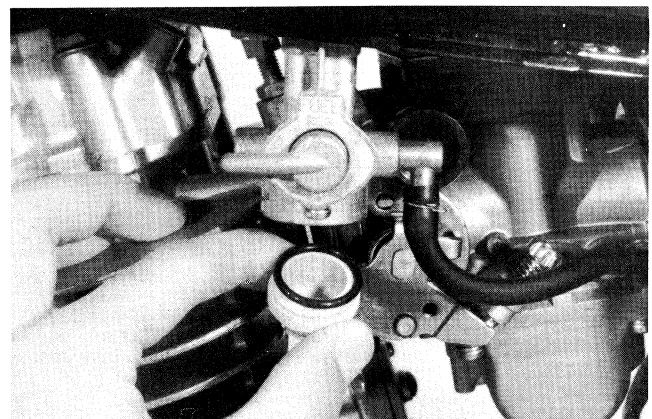


FUEL STRAINER

1 000, 10 000 km
600, 6 000 mile

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

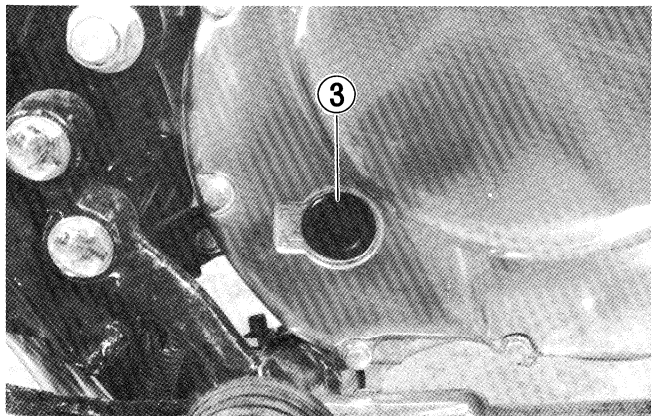
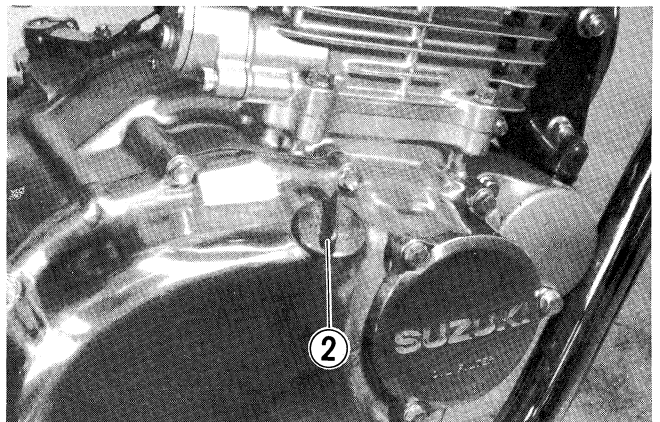
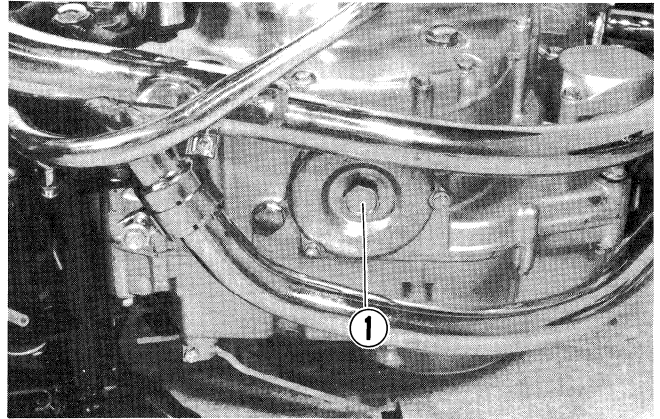
**1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile**

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

- Support the motorcycle by center stand.
- Drain the oil by removing the drain plug ① and filler cap ②.
- Fit drain plug ① securely and add fresh oil through the filler. The engine will hold about 1.3 L (1.4 US qt) of oil.

Use 10W/40 viscosity of oil under API classification of SE or SF.

- Start up the engine and allow it to run for several seconds at idling speed.
- Shut down the engine and wait about one minute. Then check the oil level in the oil level window ③. The motorcycle must be in a level, upright position for accurate measurement. If the level is below the "F" mark, add oil until the level reaches the "F" mark.

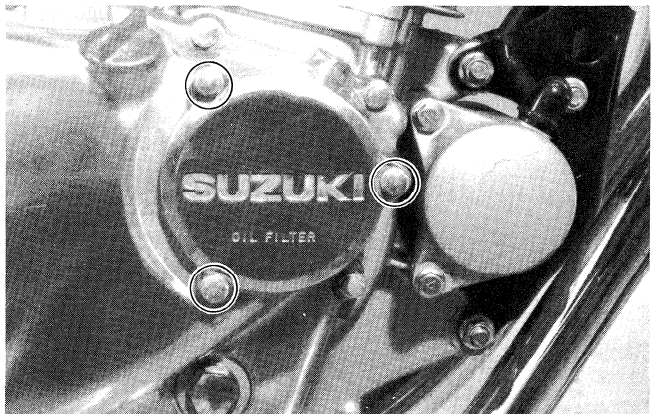


ENGINE OIL FILTER

**600, 3 000, 6 000, 9 500 mile
1 000, 5 000, 10 000, 15 000 km**

Replace the oil filter in the following manner:

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



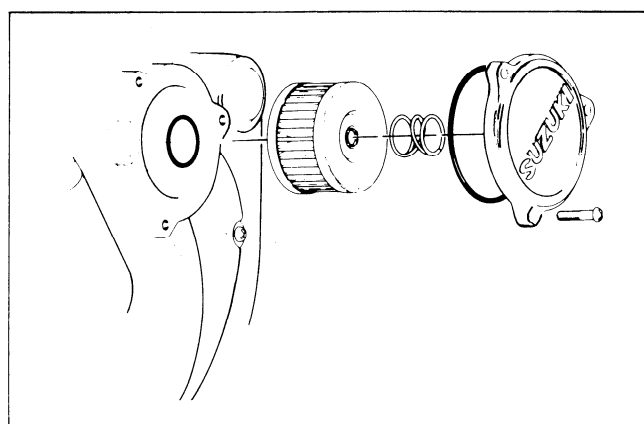
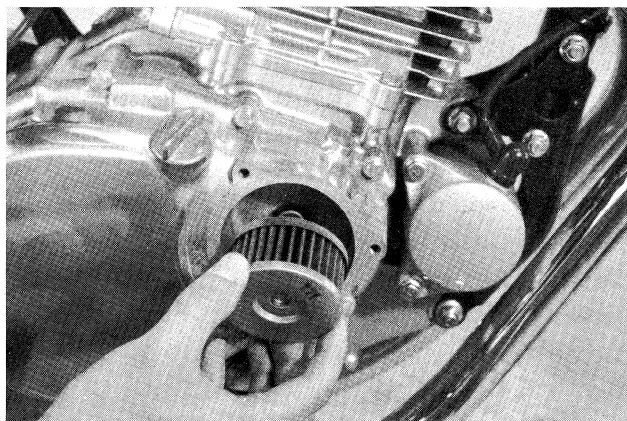
- Replace the filter with a new one.
- Before putting on the filter cap, check to be sure that the filter spring and the O-ring are installed correctly.
- Replace the filter cap and tighten the bolts securely.
- Pour in engine oil and check the level.

NOTE:

Pour about 1.3 L (1.4 US qt) 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 1.7 L (1.8 US qt).

CAUTION:

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



ENGINE IDLE SPEED

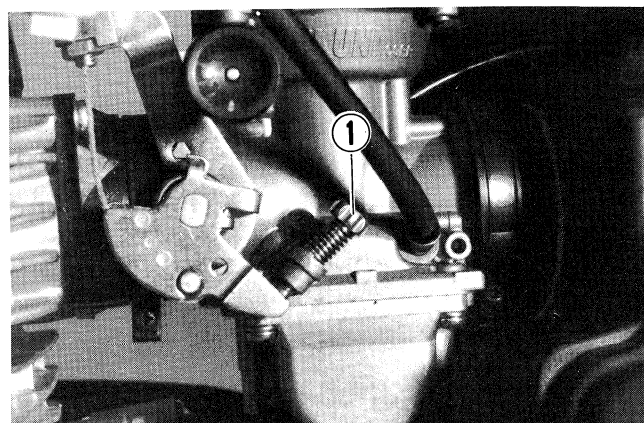
600, 3 000, 6 000, 9 500 mile
1 000, 5 000, 10 000, 15 000 km

Idling adjustment

NOTE:

Make this adjustment when the engine is hot.

- Start up the engine and set its speed at anywhere between 1 200 and 1 300 r/min by turning throttle stop screw ①.

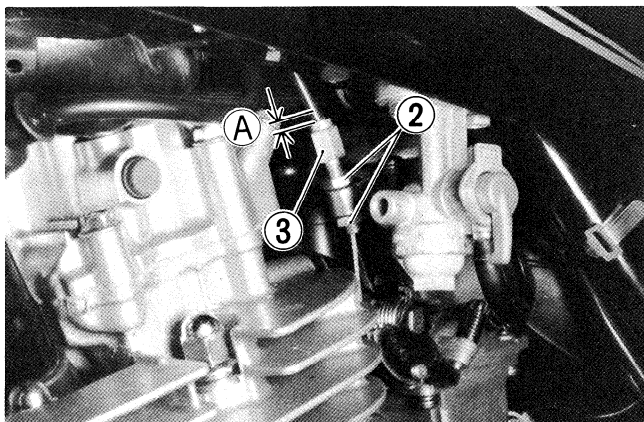


Engine idle speed	1200 – 1300 r/min
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Throttle cable play

There should be 0.5 – 1.0 mm play (A) on the throttle cable. To adjust the throttle cable play:

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



Throttle cable play	0.5 – 1.0 mm (0.02 – 0.04 in)
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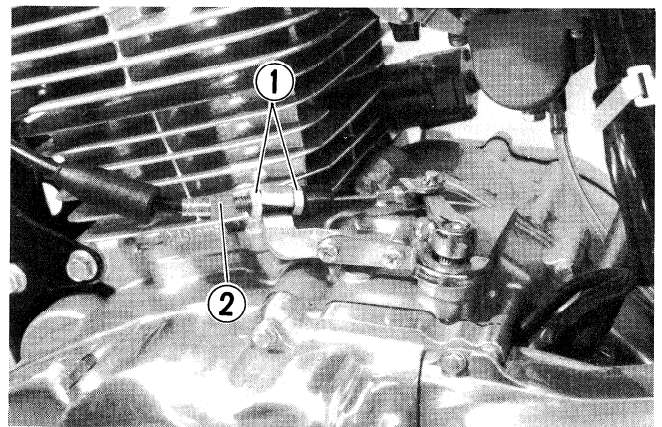
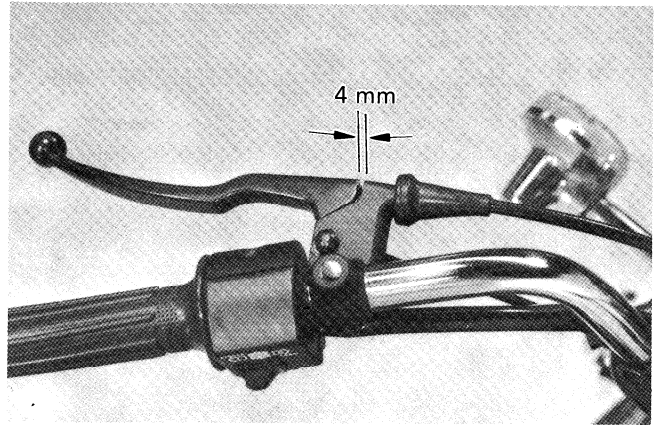
CLUTCH

**1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile**

Clutch play should be 4 mm (0.16 in) 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 on the lever adjuster screw.
- Screw the adjuster on the clutch lever holder all the way in.
- Loosen clutch cable adjuster lock nuts ①.
- Turn the clutch cable adjuster ② in or out to acquire the specified play.
- Tighten lock nut while holding the adjuster in position.

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



DRIVE CHAIN

**1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile
Clean and lubricate every 1 000 km (600 mile)**

Drive chain

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

Inspect for:

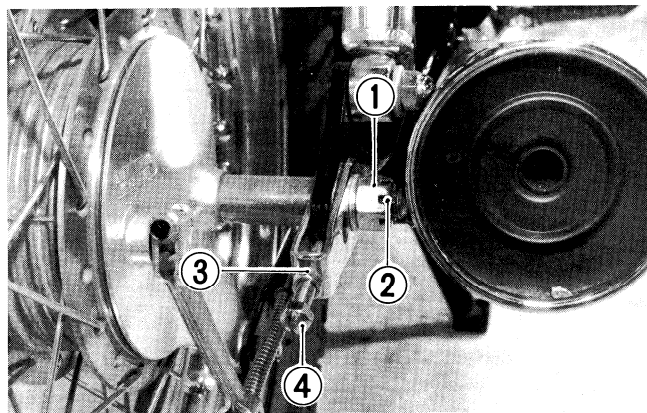
1. Loose pins
2. Damaged rollers
3. Rusted links
4. Twisted or seized links
5. Excessive wear

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 shortened.
- After washing and drying the chain, lubricate it with chain lube or gear oil SAE #90.

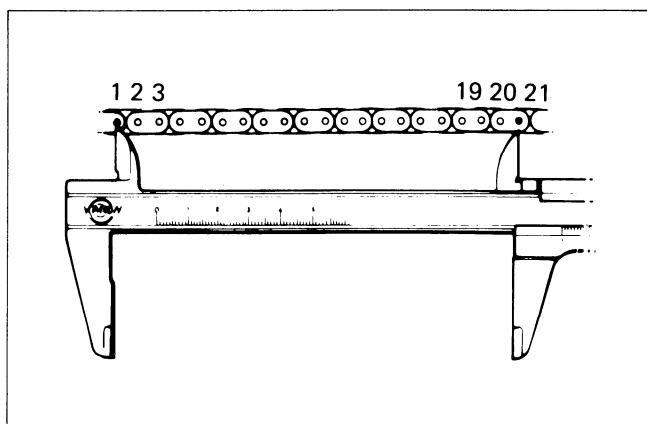
Check the drive chain for wear and adjust the chain tension as follows:

- Loosen axle nut ① after pulling out cotter pin ② and loosen the lock nut ③.
- Adjust the drive chain carefully by tightening the adjusters ④.



Chain wear

- Count out 21 pins on the chain and measure the length. If the length exceeds 324.2 mm (12.76 in), the chain must be replaced.

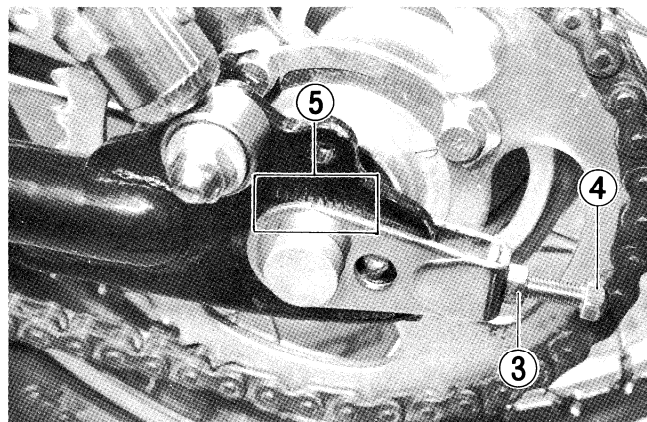
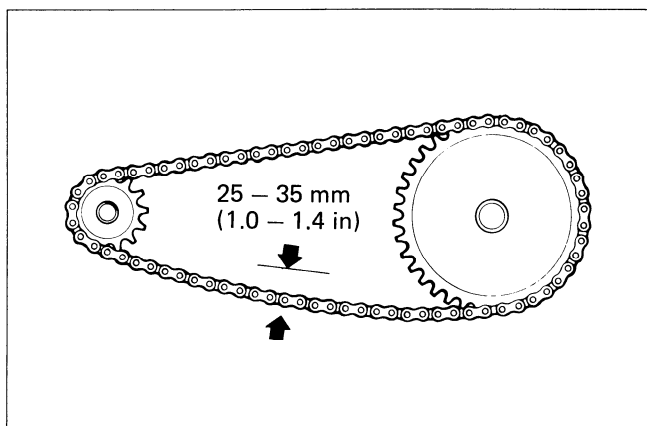


Chain Slack

- Loosen the adjuster ④ until the chain has 25 – 35 mm (1.0 – 1.4 in) of slack at the middle between engine and rear sprockets.

The mark ⑤ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.

- After adjusting the drive chain, tighten the axle nut ① and lock nut ③ securely and lock with cotter pin ②. Always use a new cotter pin.

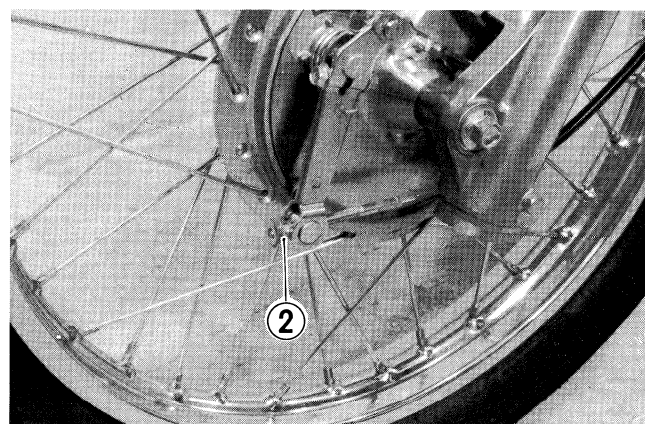
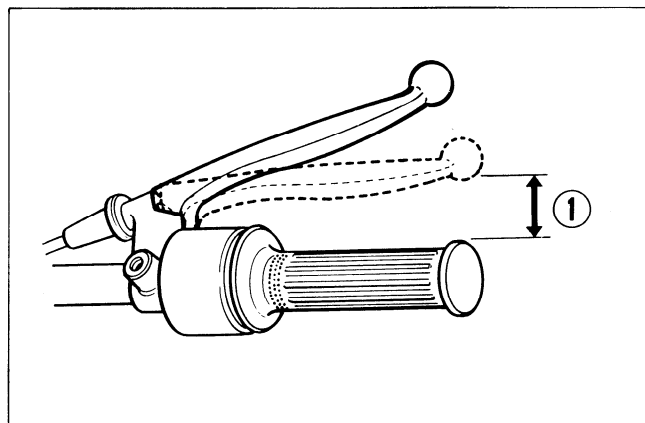


BRAKES

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile

Front brake

Squeeze the front brake lever firmly and measure the distance between the lever and the throttle grip. The distance ① should be 20 – 30 mm (0.8 – 1.2 in). If adjustment is necessary, slacken the cable by loosening the lock nut and screwing the adjuster on the front brake lever holder all the way in. Turning the adjuster ② to obtain the specified distance.



Rear brake

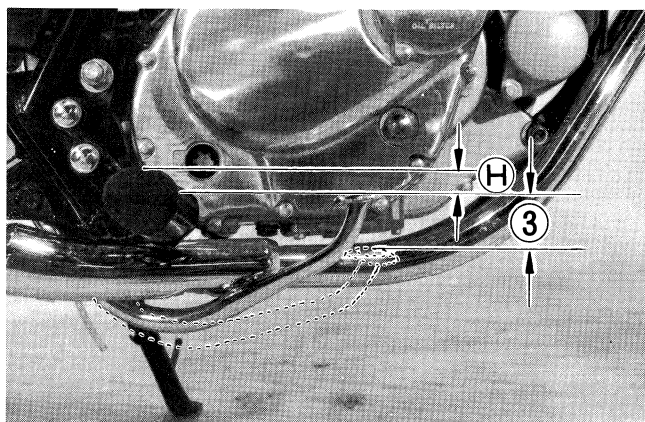
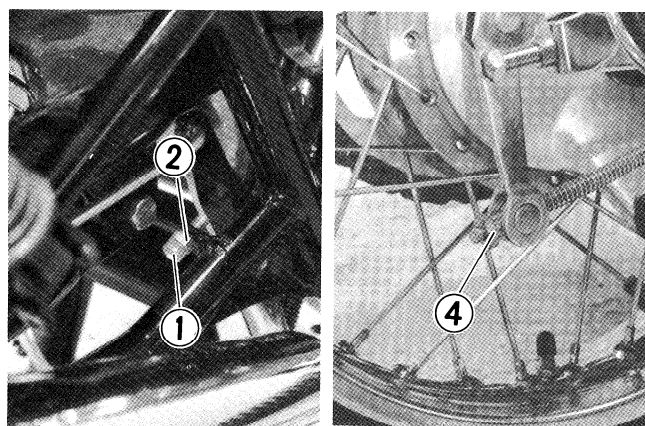
Bring the brake pedal to a position about 10 mm (0.4 in). This is effected by turning the brake pedal stopper ① (behind the frame). Be sure to tighten the lock nut ② securely after setting the bolt.

Rear brake height (H)	10 mm (0.4 in)
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After adjusting the rear brake height, adjust the brake pedal travel. First set the pedal at a position for comfortable riding by turning the brake pedal stopper ①, and then adjust the free travel ③ to 20 – 30 mm (0.8 – 1.2 in).

If adjustment is necessary, turn the rear brake adjuster ④ to obtain the specific play.

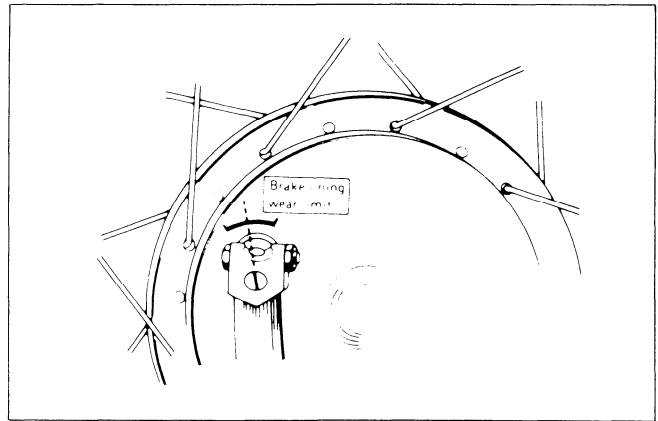
Brake pedal travel	20 – 30 mm (0.8 – 1.2 in)
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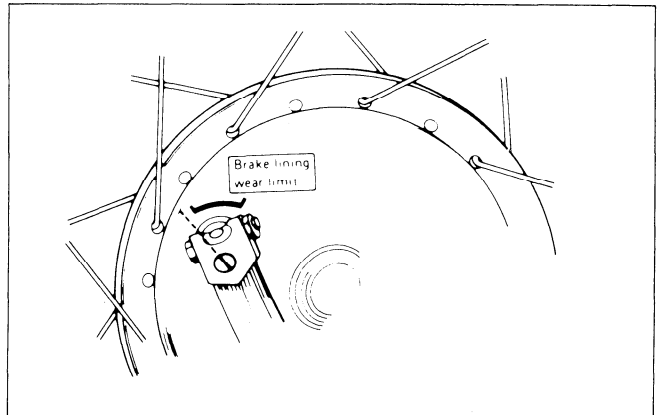
Brake lining wear limit

This motorcycle is equipped with brake lining wear limit indicators on both front and 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 embossed on the brake panel with the brake on. To check wear of the brake lining, follow the steps below.

- First check if the brake system is properly adjusted.
- While operating the brake, check to see that the extension line from the index mark is within 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.



The extension line of the index mark is within the range.



The extension line of the index mark is outside of the range.

TIRES AND SPOKES

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile

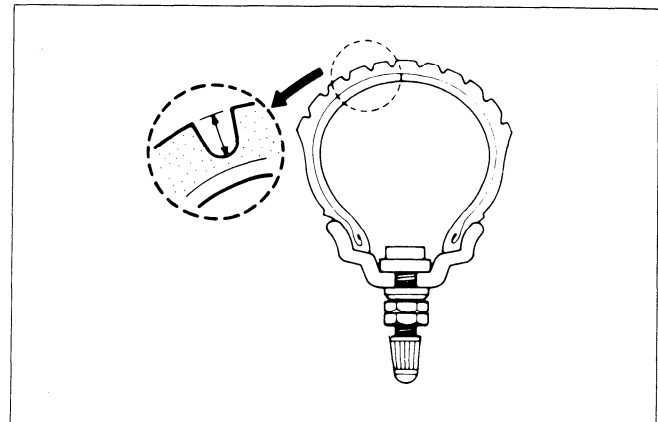
Tire

Inspect the tires for wear and damage; and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit

Front	1.6 mm (0.06 in)
Rear	2.0 mm (0.08 in)

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



TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLD RIDING			DUAL RIDING			SOLD RIDING			DUAL RIDING		
	KPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24	175	1.75	24	175	1.75	24	200	2.00	28
REAR	200	2.00	28	225	2.25	32	225	2.25	32	250	2.50	34

Spoke

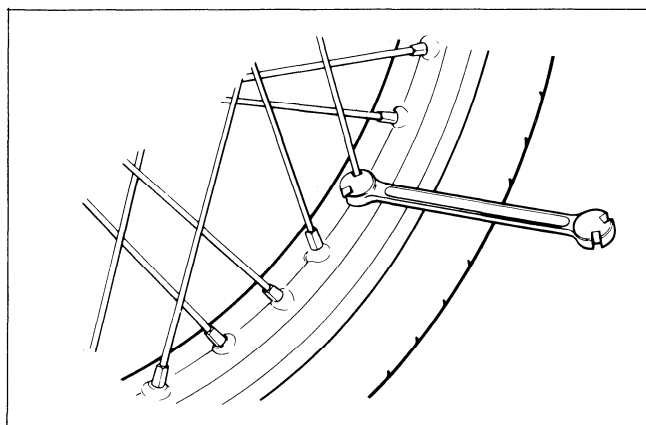
Check to be sure that all nipples are tight, and retighten them as necessary using special tool.

Spoke nipple wrench	09940-60113
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Tightening torque	0.4 – 0.5 kg-m (4 – 5 N·m) (3.0 – 3.5 lb-ft)
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CAUTION:

Over or under-tightening may cause spoke breakage.



STEERING

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile

Steering stem bearings should be adjusted properly for smooth turning of the handlebars and safe running.

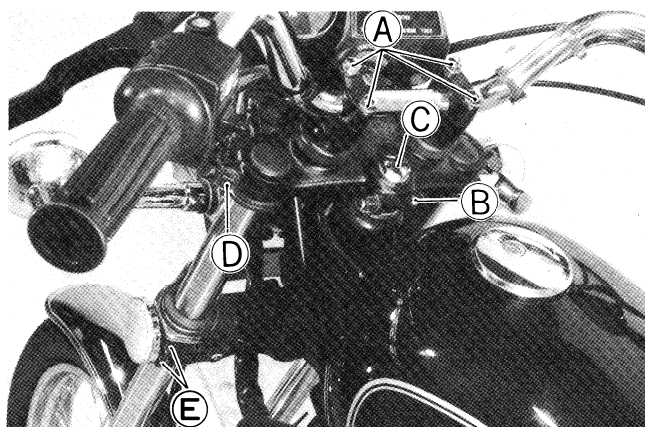
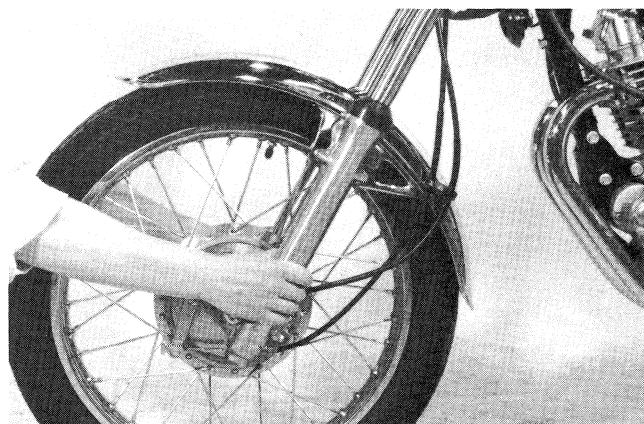
Steering which is too stiff prevents smooth movement of handlebars.

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 page 7-21 of this manual.

Tightening torque

ITEM	N·m	kg-m	lb-ft
(A) Handlebars clamp bolts	12 – 20	1.2 – 2.0	8.5 – 14.5
(B) Steering stem upper clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
(C) Steering stem head bolt	35 – 45	3.5 – 4.5	25.5 – 32.5
(D) Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
(E) Front fork lower clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0



FRONT FORK

5 000, 10 000 15 000 km
3 000, 6 000, 9 500 mile

Inspect the front fork for oil leakage, scoring and scratches on the outer surface of the inner tube every 5 000 km (3 000 mile) and replace the defective parts, if necessary.

CHASSIS

Bolts and Nuts

1 000, 5 000, 10 000, 15 000 km
600, 3 000, 6 000, 9 500 mile

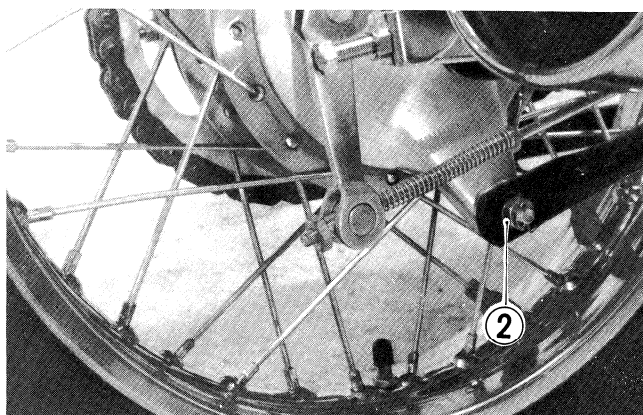
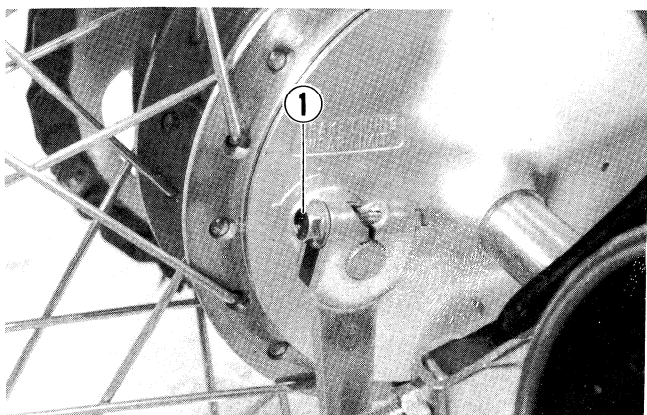
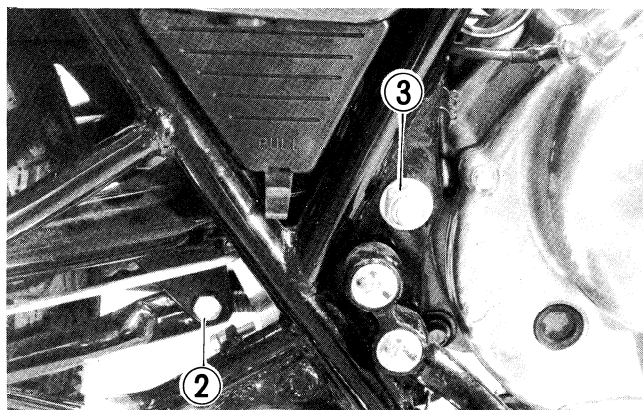
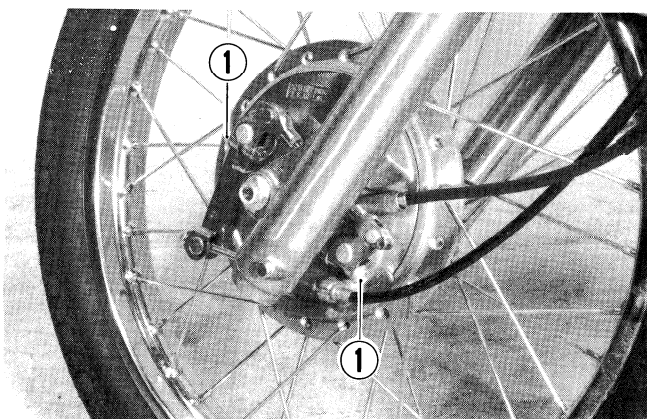
The nuts and bolts listed are important parts, and they must be in good condition for safety. They must be retightened, as necessary, to the specified torque with a torque wrench.

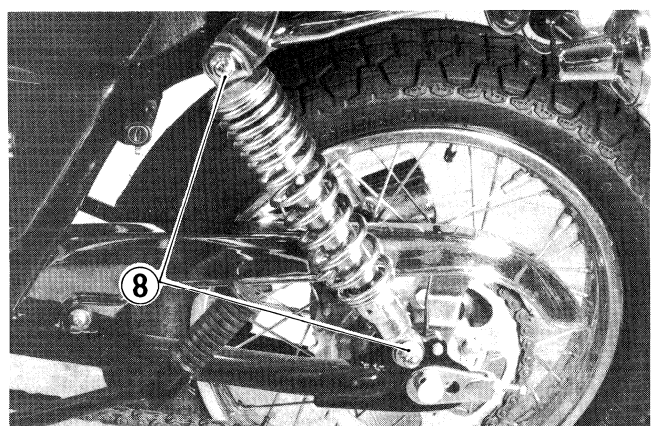
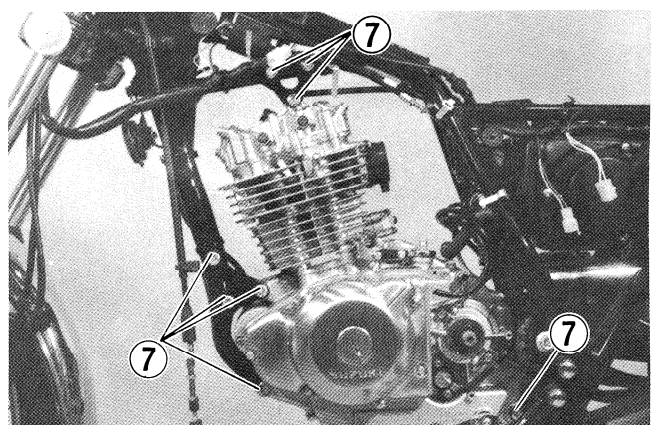
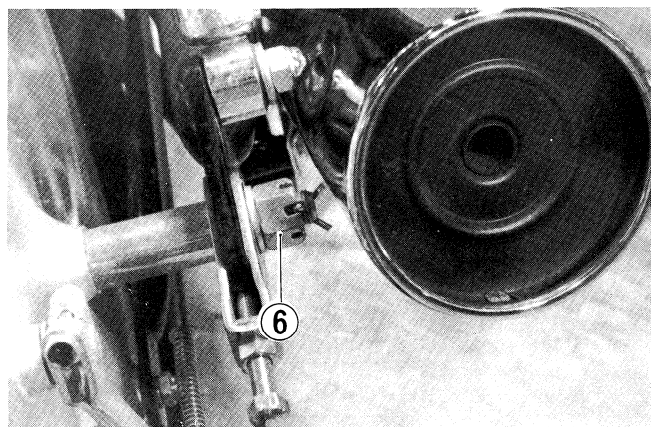
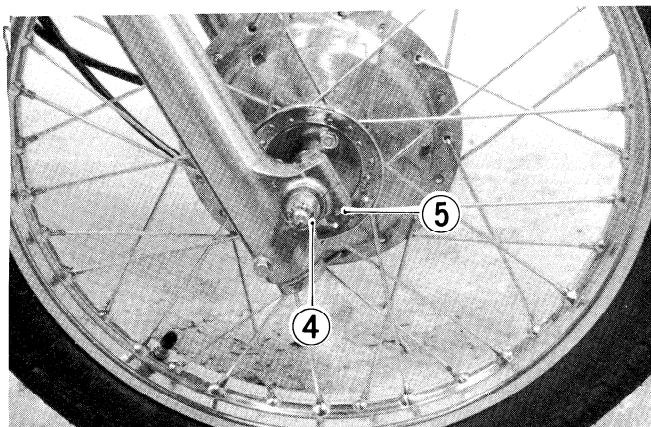
ENGINE

Mounting bolts

Tightening torque

ITEM		N·m	kg·m	lb·ft
①	Brake cam lever bolts (Front and Rear)	5 – 8	0.5 – 0.8	3.5 – 6.0
②	Rear torque link nut	10 – 15	1.0 – 1.5	7.0 – 11.0
③	Swing arm pivot nut	50 – 80	5.0 – 8.0	36.0 – 58.0
④	Front axle nut	36 – 52	3.6 – 5.2	26.0 – 37.5
⑤	Front axle clamp nut	15 – 25	1.5 – 2.5	11.0 – 18.0
⑥	Rear axle nut	50 – 80	5.0 – 8.0	36.0 – 58.0
⑦	Engine mount bolts	37 – 45	3.7 – 4.5	27.0 – 32.5
⑧	Rear shock absorber fitting nut	20 – 30	2.0 – 3.0	14.5 – 21.5





SERVICING ENGINE

CONTENTS

COMPRESSION PRESSURE AND OIL PRESSURE.....	3- 1
ENGINE REMOVAL AND REMOUNTING.....	3- 2
UPPER END COMPONENTS DISASSEMBLY	3- 7
UPPER END COMPONENTS INSPECTION AND SERVICING.....	3-1 3
UPPER END COMPONENTS REASSEMBLY.....	3-25
LOWER END COMPONENTS DISASSEMBLY	3-33
LOWER END COMPONENTS INSPECTION AND SERVICING.....	3- 41
LOWER END COMPONENTS REASSEMBLY	3- 46

COMPRESSION PRESSURE AND OIL PRESSURE

COMPRESSION PRESSURE

NOTE:

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

①	Compression gauge	09915-64510
②	Adapter	09915-63210

- Remove spark plug.
- Fit the compression gauge set ① and 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, and read the highest gauge indication as the compression of the cylinder.

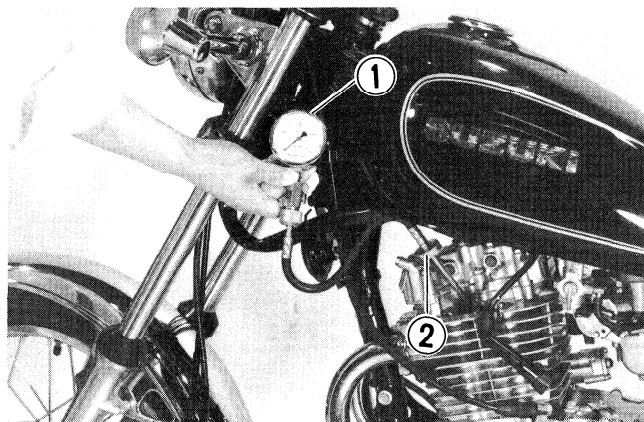
Compression pressure

Standard	Limit
10 – 14 kg/cm ² (142 – 199 psi)	8 kg/cm ² (114 psi)

A low compression pressure may indicate any of the following malfunctions:

- * 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, with these five malconditions in mind.



OIL PRESSURE

- Install the oil pressure gauge ① in the position shown in the illustration.
- Warm up the engine as follows.
Summer approx. 10 min. at 2 000 r/min.
Winter approx. 20 min. at 2 000 r/min.
- After the warming up operation, increase the engine speed to 3 000 r/min, and read the oil pressure gauge

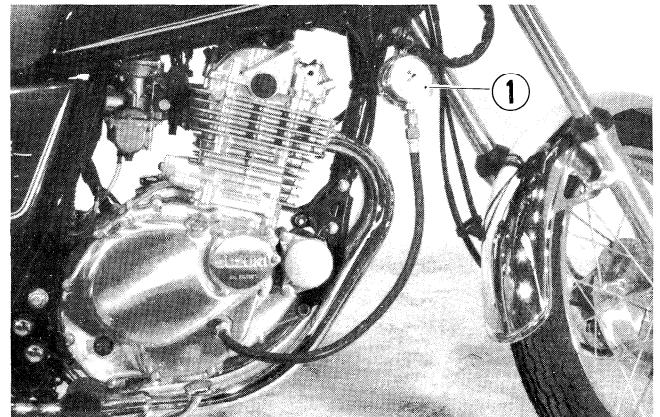
NOTE:

- Engine oil must be warmed up to 60°C (140°F) when checking the oil pressure.

Oil pressure

Above 0.30 kg/cm² (4.26 psi),
Below 0.70 kg/cm² (9.94 psi) at 3 000 r/min.

③	Oil pressure gauge	09915-74510
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If the oil pressure is lower 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 right and left frame covers.
- Disconnect the \oplus and \ominus lead wires of battery.

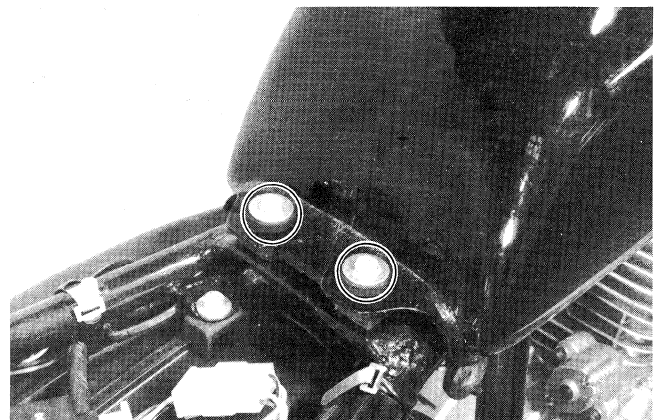
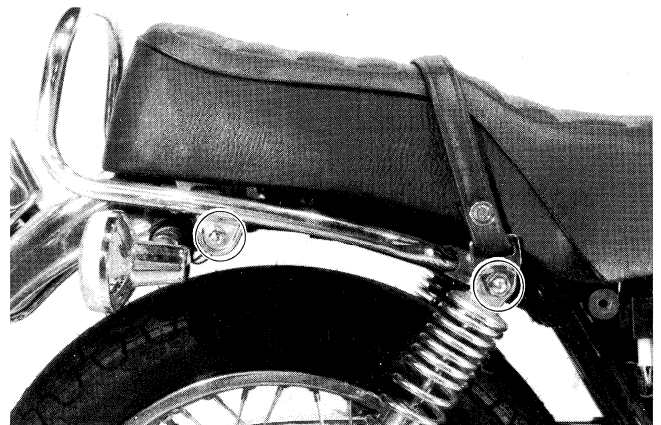
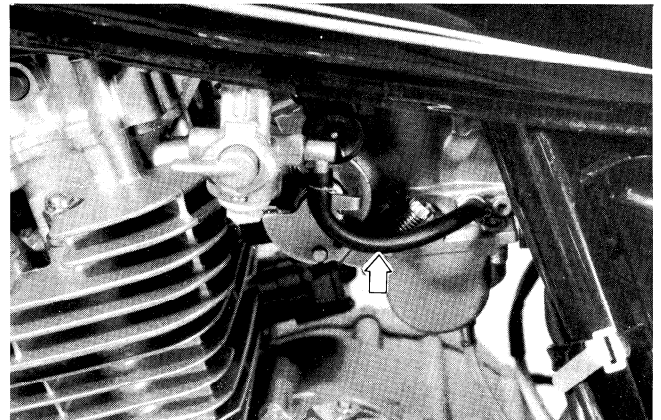
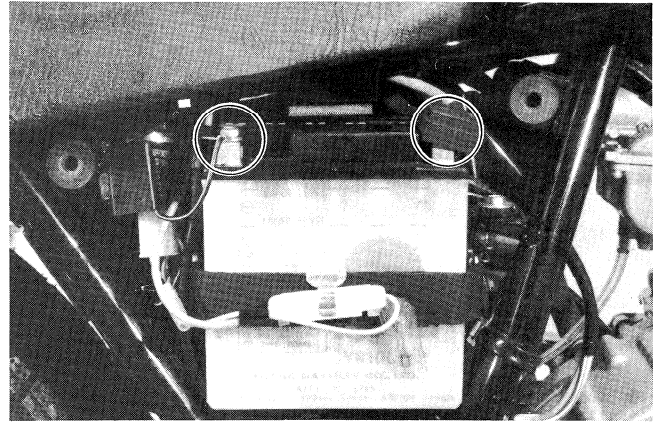
CAUTION:

First, disconnect the \ominus lead wire.

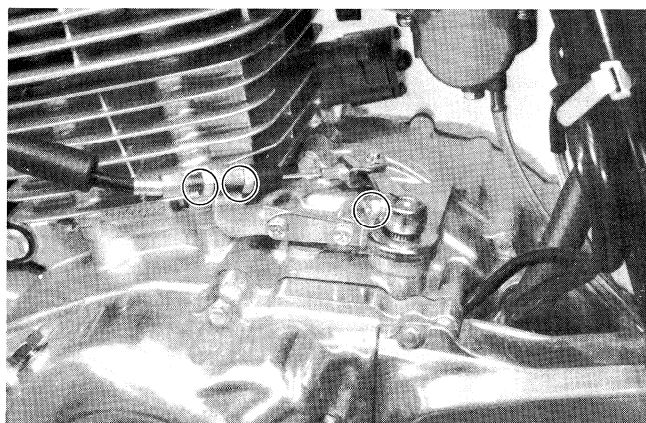
- Turn the fuel cock lever "OFF" position.
- Take off the fuel hose.

- Loosen and remove the seat mounting bolts and rear shock absorber nut.

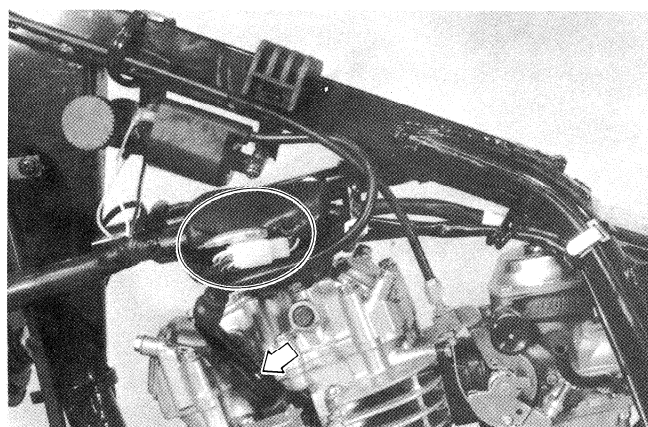
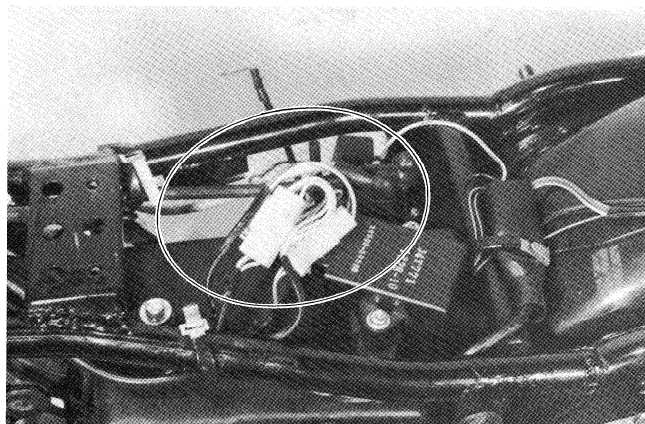
- Take off the fuel tank by removing the mounting bolts.



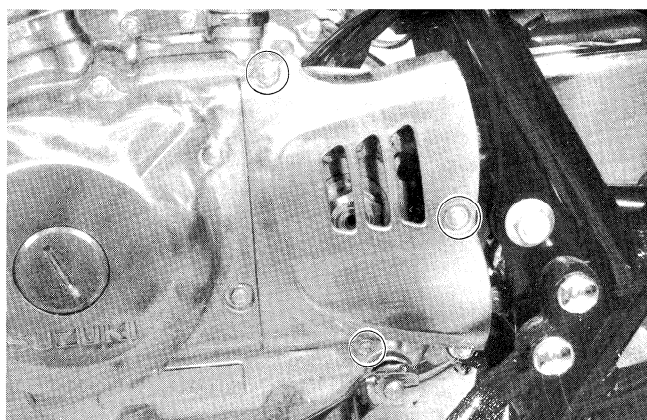
- Take off the clutch lever by removing the clutch lever bolt and adjuster lock nuts.



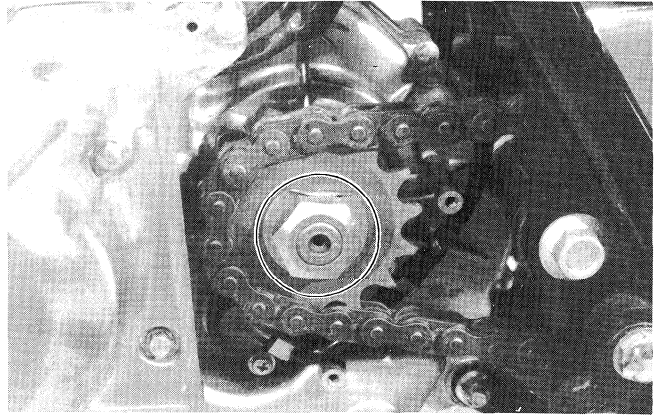
- Disconnect the generator lead, signal generator lead and gear position lead.
- Take off the plug cap.



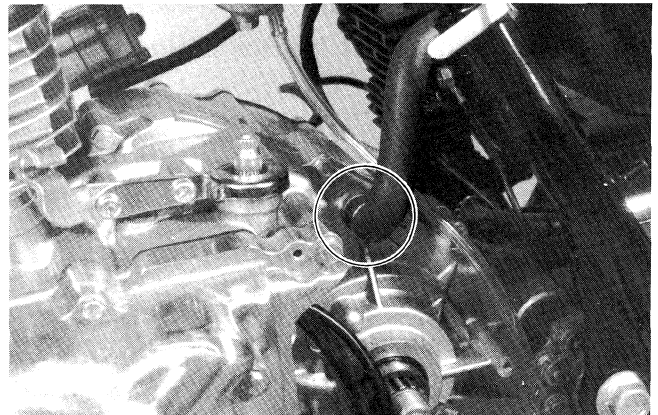
- Take off the engine sprocket cover.



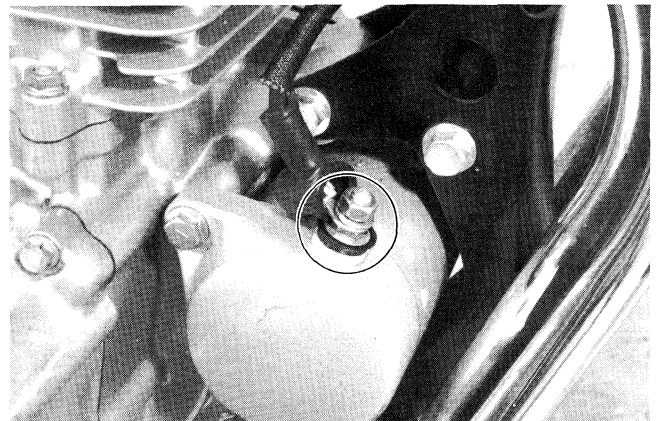
- After flattening the lock washer, remove the nut by applying the rear brake.
- Push forward the rear wheel after loosening the rear axle nut, chain adjusters and adjuster lock nuts.
- Take off the engine sprocket.



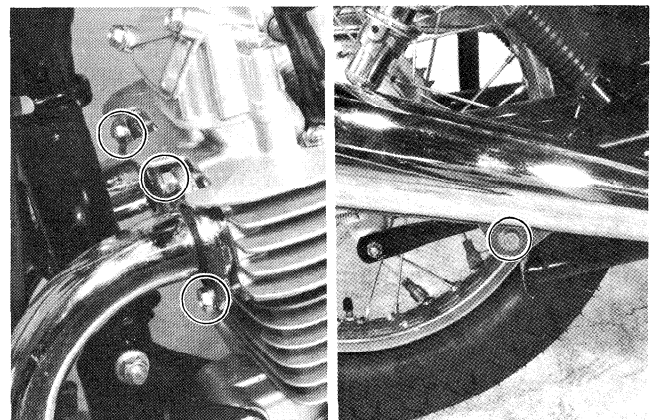
- Take off the breather pipe.



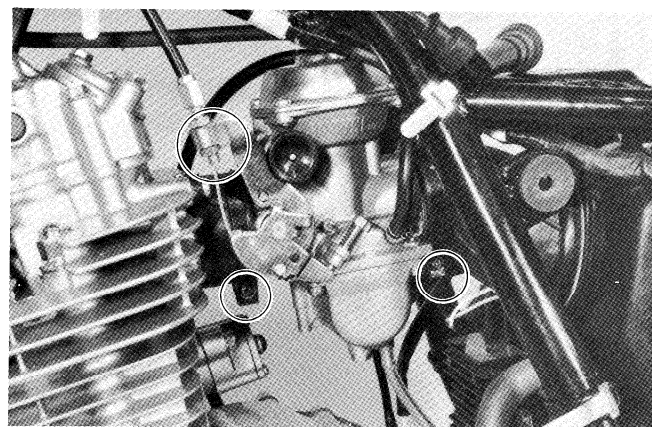
- Disconnect the lead wire of starter motor.



- Remove the exhaust pipe bolts and muffler clamp bolt.



- Loosen the throttle cable adjuster lock nuts.
- Take off the throttle cable.
- Remove the carburetor by unscrewing the retainer screw.



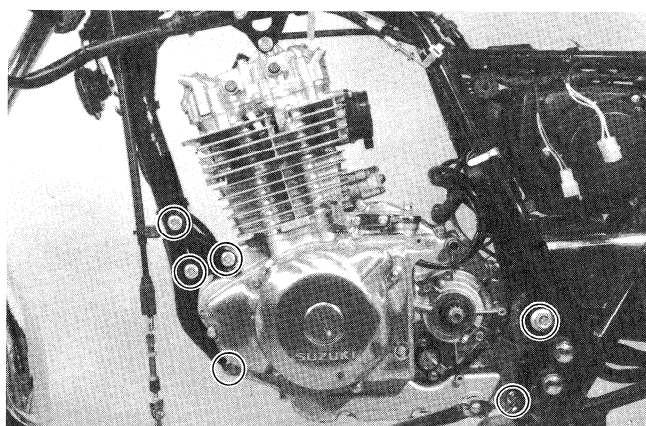
- Remove engine mounting bolts and brackets.
- Use both hands, and lift the engine from the frame.

NOTE:

The engine must be taken out from the right side.

CAUTION:

Be careful not to draw out the swing arm pivot shaft completely from the right side swing arm pivoting hole. Insert the shaft or rod into the left side pivoting hole from the left side of the frame to keep the alignment of the frame holes and swing arm pivoting holes.

**ENGINE REMOUNTING**

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

- Temporarily fasten the engine mounting bracket 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.

- After remounting the engine, following adjustments are necessary.

* Throttle cable	(Page: 4 – 10)
* Clutch cable	(Page: 2 – 9)
* Drive chain	(Page: 2 – 9)
* Rear brake pedal	(Page: 2 – 11)
* Idling speed	(Page: 2 – 8)

Tightening torque for engine mounting bolts

Tightening torque	3.7 – 4.5 kg-m (37 – 45 N·m) (27.0 – 32.5 lb-ft)
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- Tightening the exhaust pipe bolts and muffler clamp to specified torque.

Exhaust pipe bolts	0.9 – 1.2 kg-m (9 – 12 N·m) (6.5 – 8.5 lb-ft)
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Muffler clamp bolt	2.2 – 3.5 kg-m (22 – 35 N·m) (16.0 – 25.5 lb-ft)
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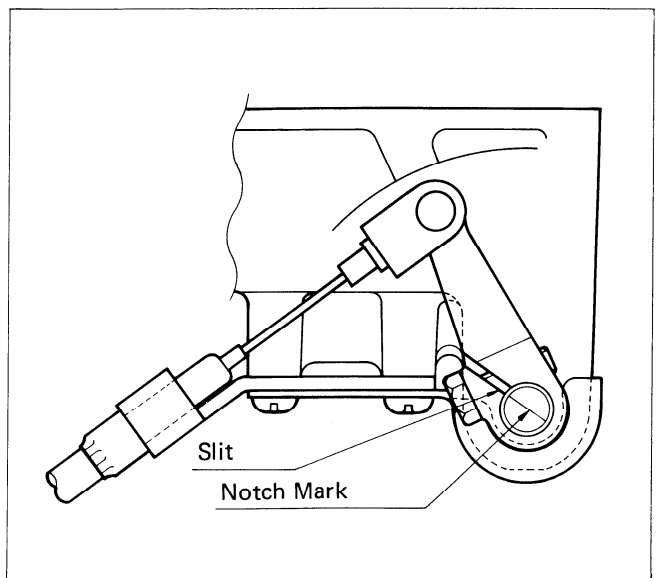
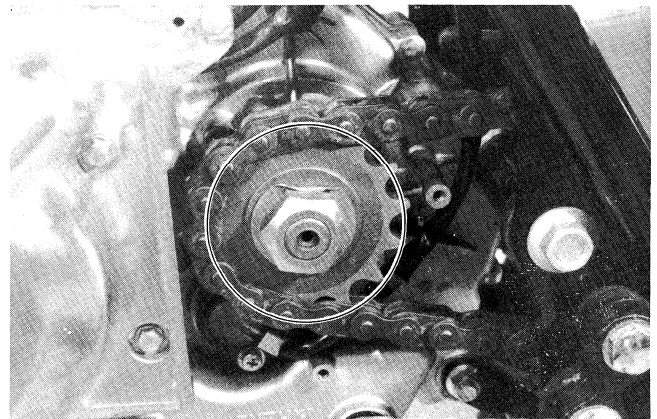
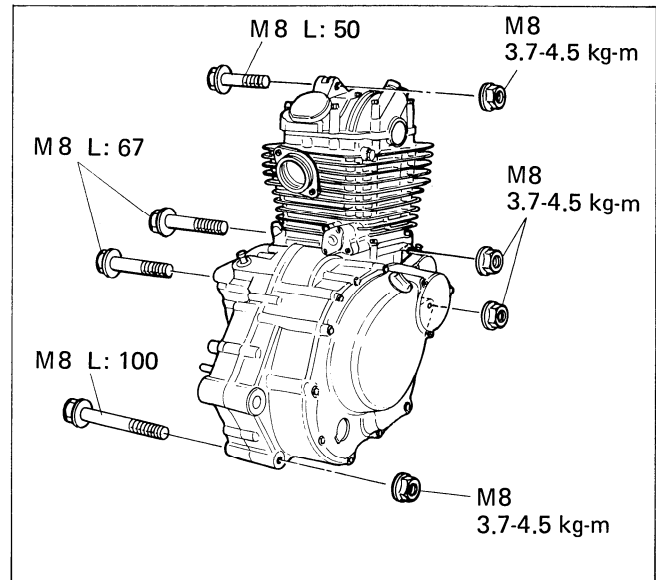
- Tighten the engine sprocket nut.

Tightening torque	8.0 – 10.0 kg-m (80 – 100 N·m) (58.0 – 72.5 lb-ft)
-------------------	--

- Pour 1.7 L (1.8 US qt) of engine oil SAE 10W/40 graded SE or SF 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 engine, 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.



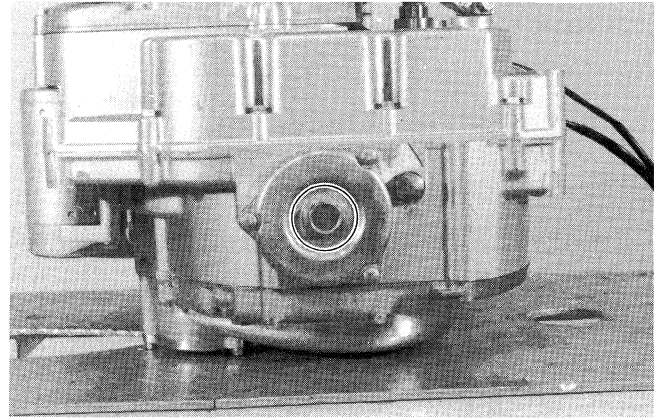
UPPER END COMPONENTS DISASSEMBLY

CYLINDER HEAD COVER AND CYLINDER HEAD

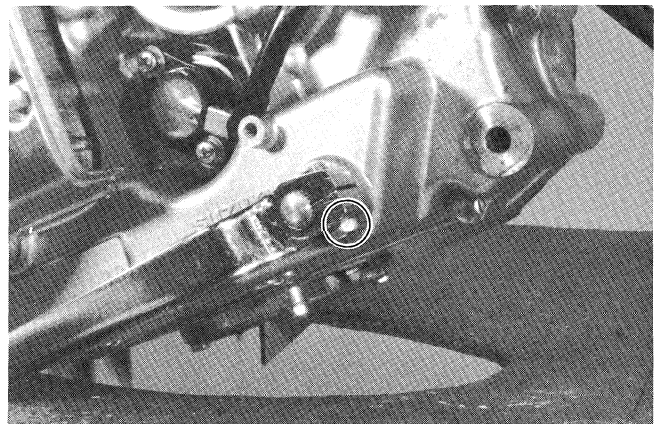
NOTE:

- * If top end repair only is being performed, it is not necessary to remove the engine from the frame.
- * As already noted, seat, fuel tank, side covers etc. must be removed.

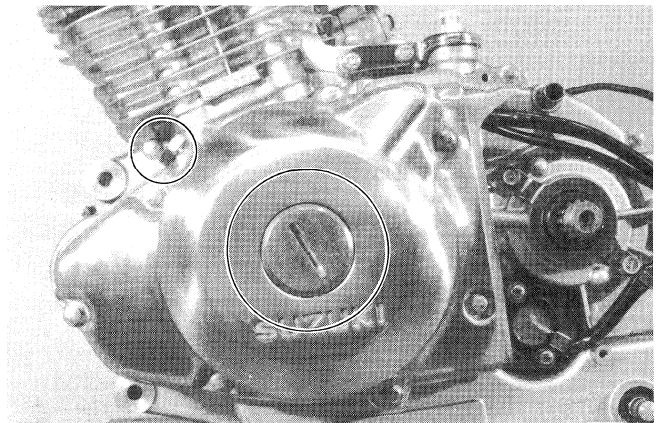
- Drain engine oil.



- Remove gear shift lever.



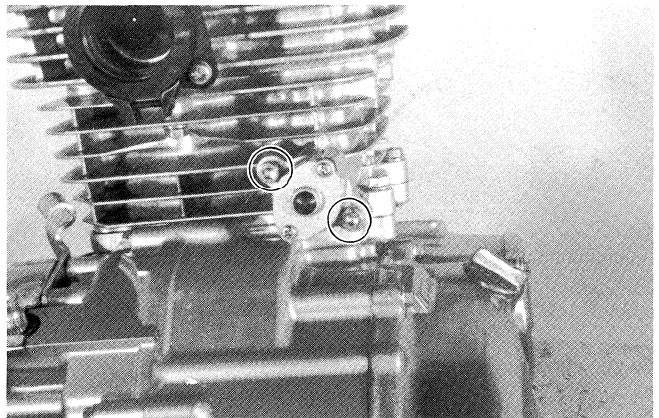
- Remove magneto cover cap and inspection plug.



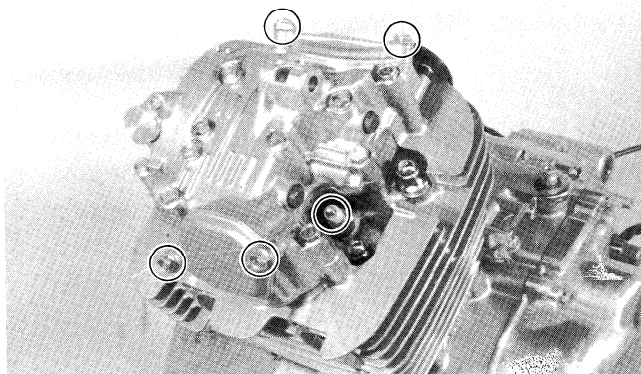
- Remove chain tensioner.

"T" type hexagon
wrench (5 mm)

09911-73730



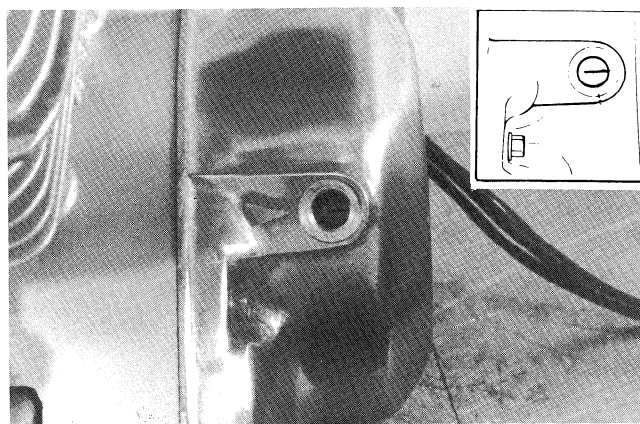
- Remove valve inspection caps and spark plug.



- Bring the piston to top dead center.

NOTE:

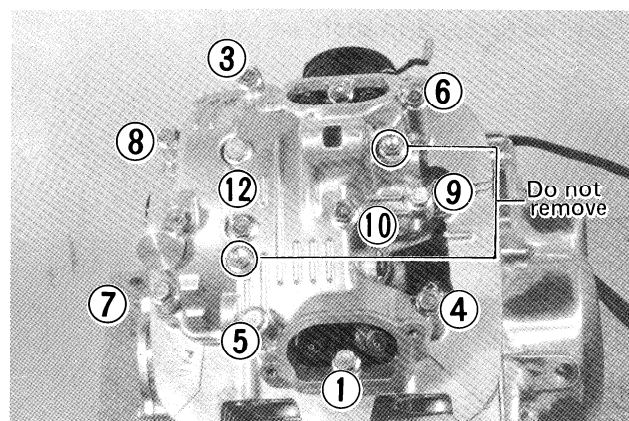
When removing cylinder head cover, piston must be at top dead center on compression stroke.



- First, remove the welch plug.
- Next, loosen the cylinder head cover bolts in the order indicated in the illustration and detach the cylinder head cover.

NOTE:

When removing cylinder head cover, do not remove conically recessed top bolts.



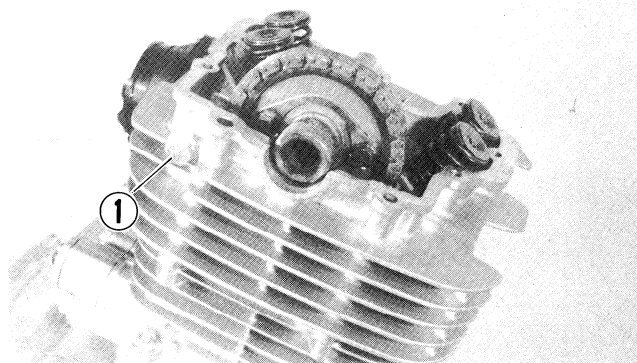
- Detach the camshaft end cap.
- Flatten camshaft sprocket lock washer.
- Remove camshaft sprocket bolts and detach the camshaft.

NOTE:

The cam chain tensioner bolt ① is to be removed only when disassembling the engine.

CAUTION:

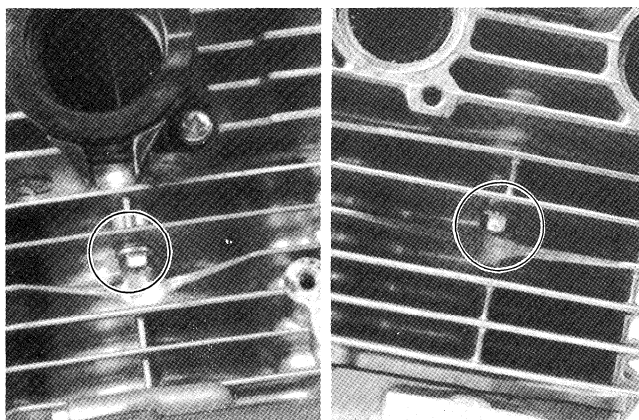
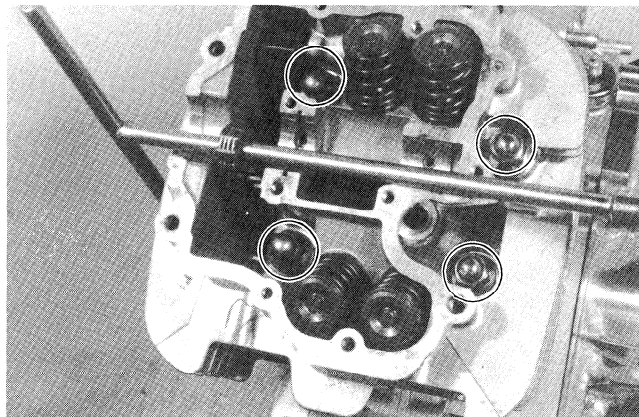
Do not drop camshaft drive chain, pin and sprocket into the crankcase.



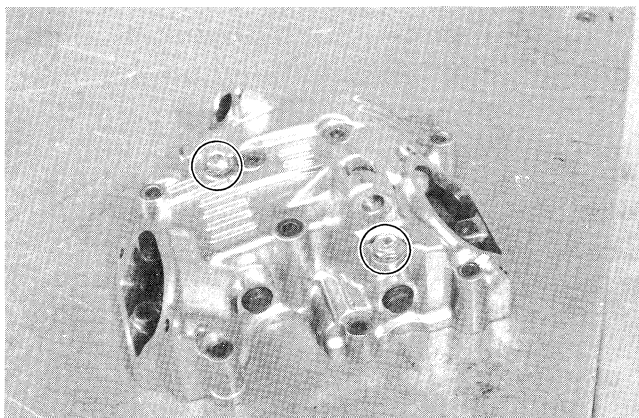
- Loosen the six cylinder head nuts diagonally, then detach the cylinder head.

NOTE:

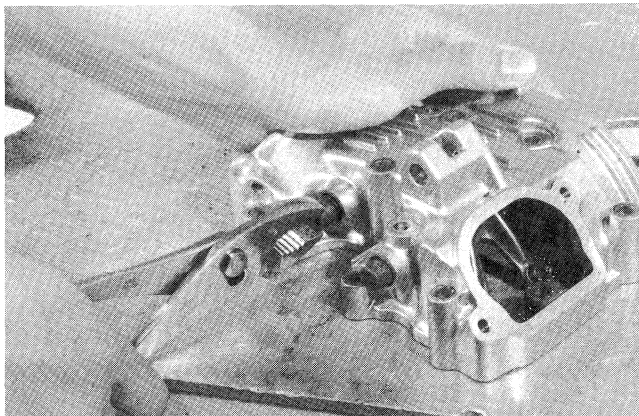
If it is difficult to remove the cylinder head, gently pry it off while tapping the finless portion of the cylinder head with a plastic hammer. Be careful not to break the fins.

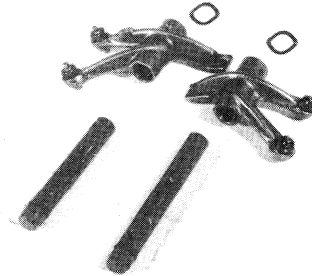


- Remove rocker arm shaft set bolts.



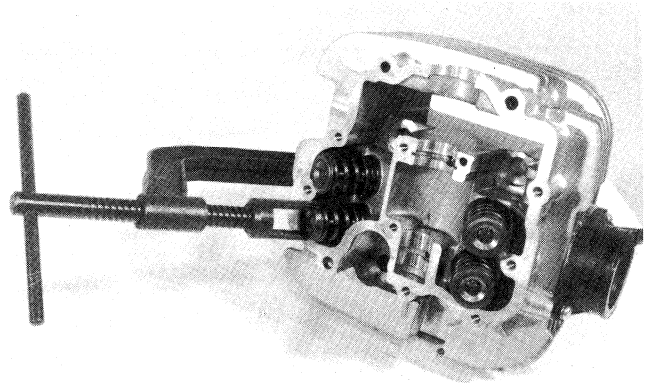
- Pull out the rocker arm shafts with pliers.





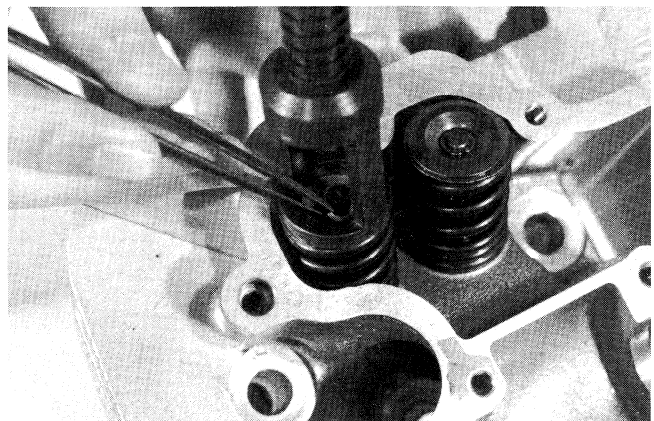
- Compress the valve spring by using the special tool.

Valve spring compressor	09916-14510
-------------------------	-------------

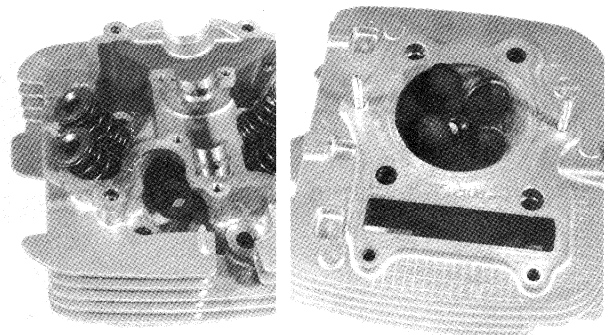


- Take off the valve cotteners from valve stem.

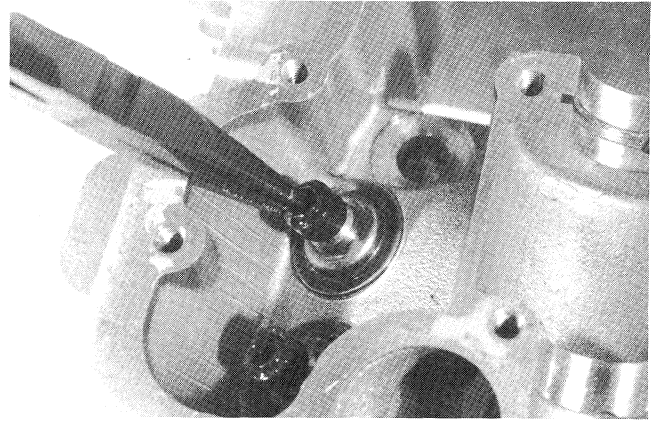
Tweezers	09916-84510
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- Take out the valve spring retainer and spring.
- Pull out the valve from the other side.

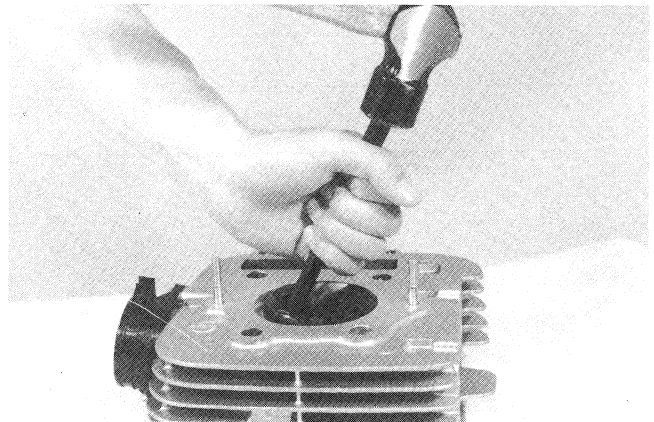


- Remove oil seal, using long-nose pliers.
- Take out the spring seat.

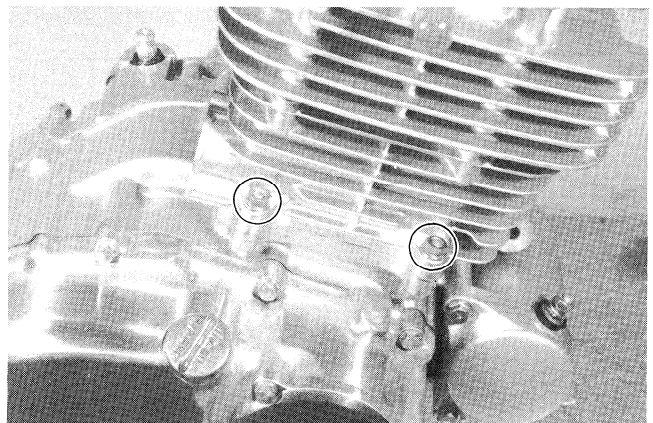


- Remove valve guide.

Valve guide installer and remover	09916-44910
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- Remove cylinder nuts.

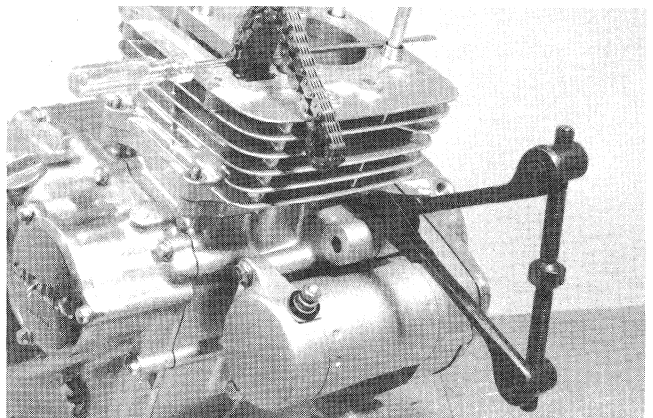


- Remove the cylinder by using the special tool.

Cylinder disassembling tool	09912-34510
-----------------------------	-------------

CAUTION:

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

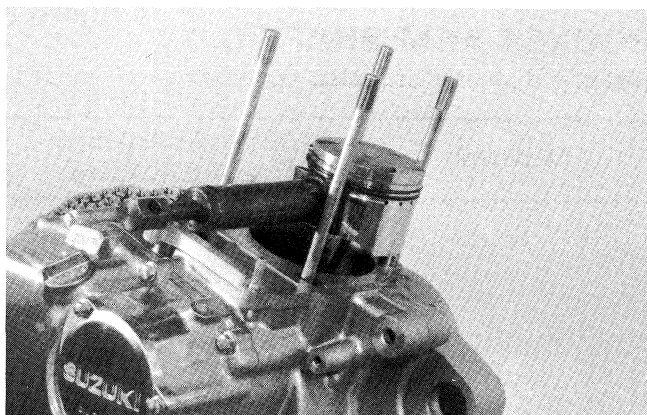


- Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase and then, remove the piston pin circlip with long-nose pliers.



- Remove piston pin.

Piston pin puller	09910-34510
-------------------	-------------



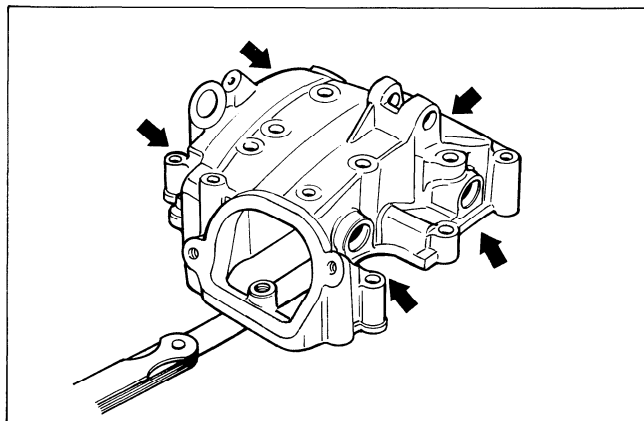
UPPER END COMPONENTS INSPECTION AND SERVICING

CYLINDER HEAD COVER DISTORTION

After removing sealant (SUZUKI BOND No. 1215) from the fitting surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a thickness gauge. Check points are shown in illustration.

Service limit	0.05 mm (0.002 in)
---------------	-----------------------

If the distortion exceeds the limit, replace the cylinder head cover.



ROCKER ARM SHAFT O.D.

Measure diameter of rocker arm shaft.

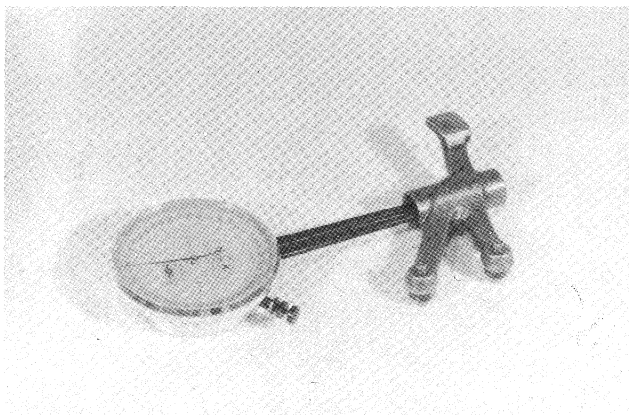
Standard	11.966 – 11.984 mm (0.4711 – 0.4718 in)
----------	--



ROCKER ARM I.D.

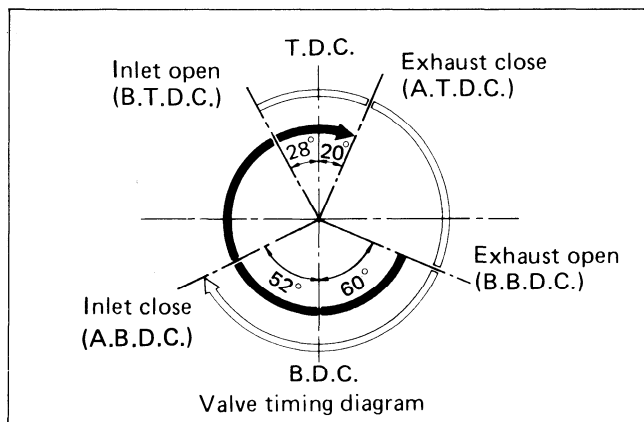
When checking the valve rocker arm, the inside diameter of the valve rocker arm and wear of the camshaft contacting surface should be checked.

Standard	12.000 – 12.018 mm (0.4724 – 0.4731 in)
----------	--



CAMSHAFT

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



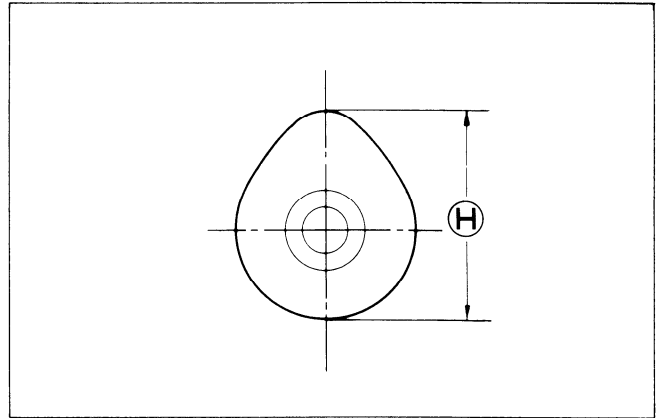
CAMSHAFT CAM WEAR

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 \textcircled{H} , which is to be measured with a micrometer. Replace camshafts if found it worn down to the limit.

Micrometer (25 – 50 mm)	09900 – 20202
----------------------------	---------------

Cam height

Height \textcircled{H}	Service limit
Intake cam	34.690 mm (1.3657 in)
Exhaust cam	34.730 mm (1.3673 in)



CAMSHAFT JOURNAL WEAR

Determine whether each journal is worn down to the limit or not by measuring camshaft journal oil clearance with the camshaft installed. Use plasti-gauge to read the clearance, which is specified as follows:

Camshaft journal oil clearance

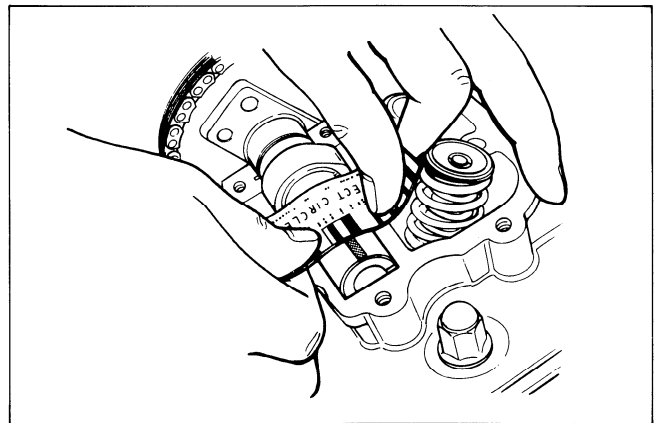
Service limit	0.15 mm (0.006 in)
---------------	-----------------------

Cylinder head cover tightening torque

Tightening Torque	0.9 – 1.0 kg-m (9 – 10 N·m) (6.5 – 7.0 lb-ft)
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NOTE:

At the stage when gasket material has been removed from fitting surfaces of cylinder head and cover, and before SUZUKI BOND No. 1215 has been applied, fit the cylinder head cover and tighten to the torque specified.



If the camshaft journal oil clearance measured exceeds the limit, measure the outside diameter of camshaft.

Replace either the cylinder head set or the cam shaft, if the clearance is incorrect.

Micrometer (0 – 25 mm)	09900 – 20205
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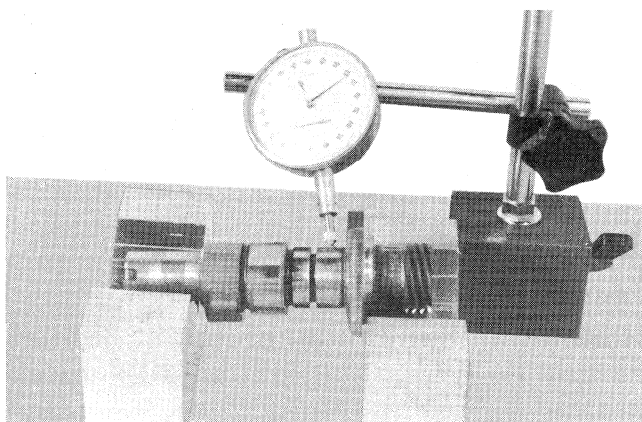
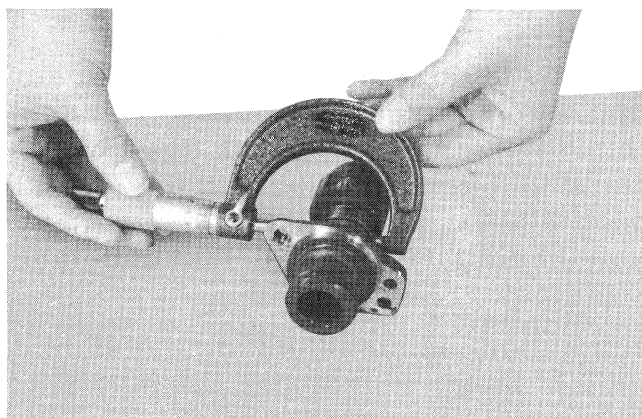
Camshaft journal O. D. (R. side)	24.959 – 24.980 mm (0.9826 – 0.9835 in)
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Camshaft journal O. D. (L. side)	19.959 – 19.980 mm (0.7858 – 0.7866 in)
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CAMSHAFT RUNOUT

Measure the runout with a dial gauge. Replace the camshaft if the runout exceeds the limit.

Service limit	0.10 mm (0.004 in)
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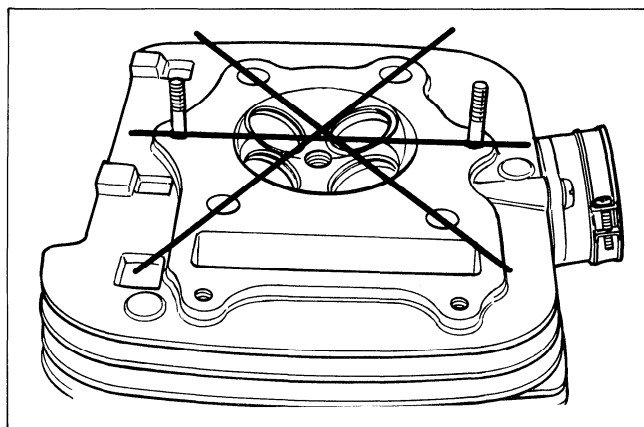


CYLINDER HEAD DISTORTION

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 mm (0.002 in)
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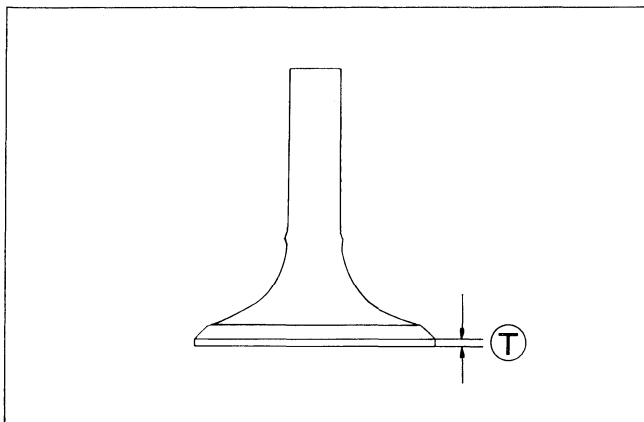
VALVE FACE WEAR

Measure the thickness ① 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.

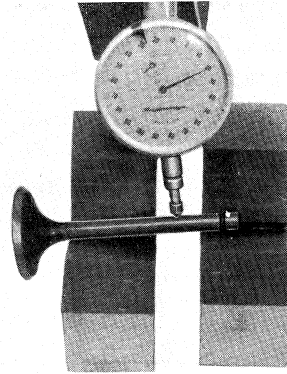
Service limit	0.5 mm (0.02 in)
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VALVE STEM RUNOUT

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.

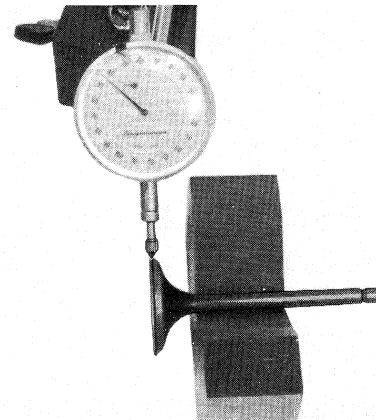
Service limit	0.05 mm (0.002 in)
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VALVE HEAD RADIAL RUNOUT

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.

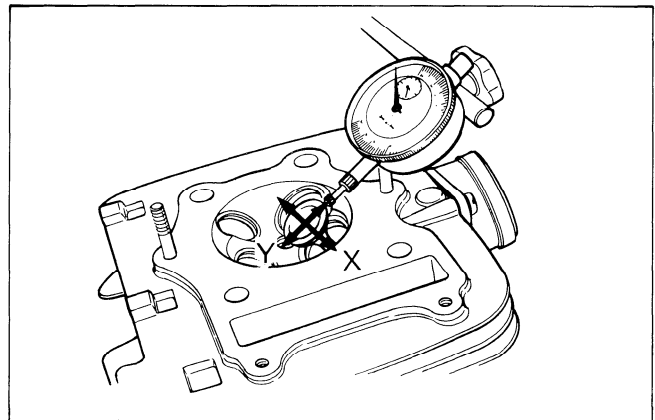
Service limit	0.03 mm (0.001 in)
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VALVE GUIDE-VALVE STEM CLEARANCE

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.	0.025 – 0.052 mm (0.0010 – 0.0020 in)	0.35 mm (0.014 in)
EX.	0.040 – 0.067 mm (0.0016 – 0.0026 in)	0.35 mm (0.014 in)



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 indicated above, replace the valve, if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to recheck the clearance.

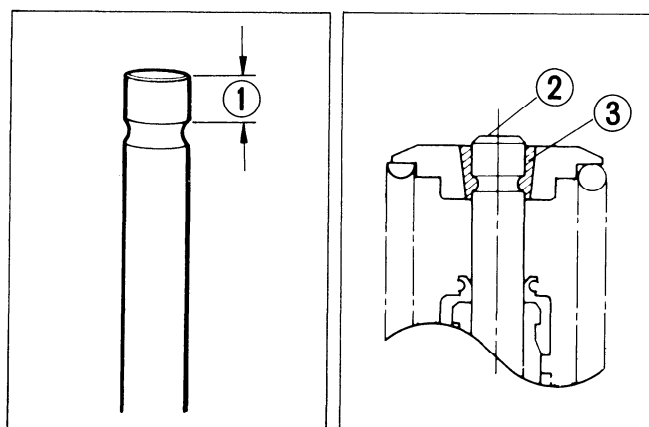
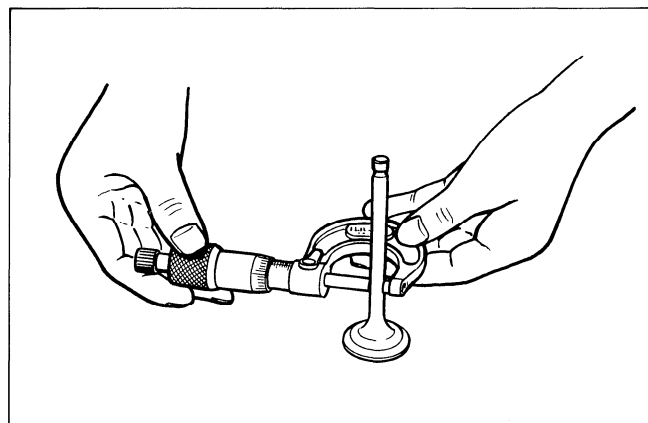
Micrometer (0 – 25 mm)	09900-20205
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Valve stem O. D.

	Standard
IN.	5.460 – 5.475 mm (0.2150 – 0.2156 in)
EX.	5.445 – 5.460 mm (0.2144 – 0.2150 in)

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 mm (0.15 in). If this length becomes less than 3.8 mm (0.15 in), 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.

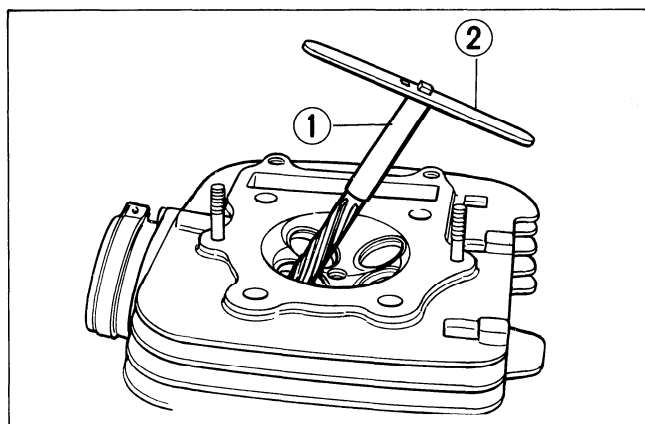


VALVE GUIDE INSTALLATION

- Re-finish the valve guide holes in cylinder head with a 11.2 mm reamer ① and handle.

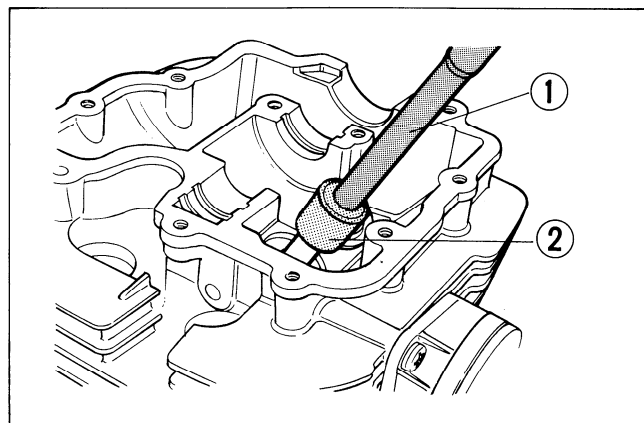
①	11.2 mm reamer	09916-34560
②	Handle	09916-34540

- 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 avoided.



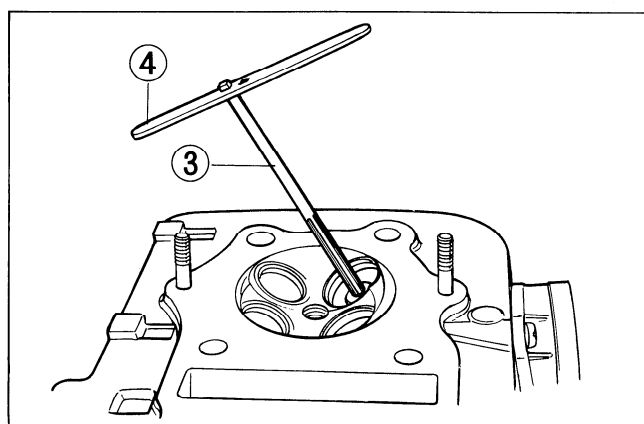
- Oil the stem hole, in each valve guide and drive the guide into the guide hole using the valve guide installer handle and valve guide installer attachment.

①	Valve guide installer and remover	09916-44910
②	Valve guide installer Attachment	09916-44920

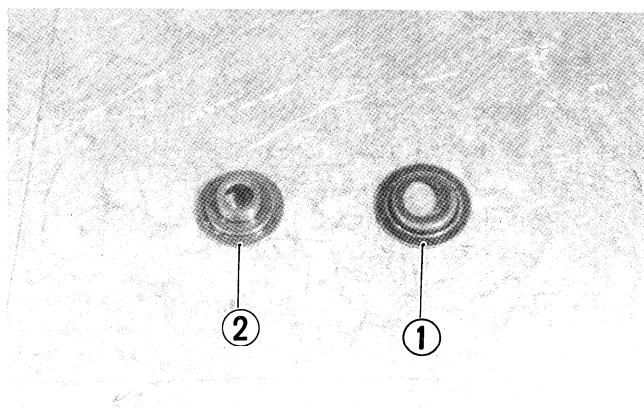


- After fitting all valve guides, re-finish their guiding bores with a 5.5 mm reamer. Be sure to clean and oil the guides after reaming.

③	5.5 mm reamer	09916-34550
④	Reamer handle	09916-34540



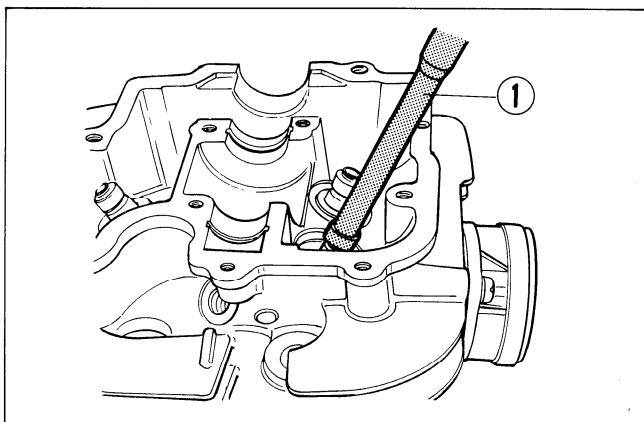
- Install valve spring lower seat ①. Be careful not to confuse the lower seat with the spring retainer ②.



- Oil each seal, and drive them into position with the valve stem seal installer.

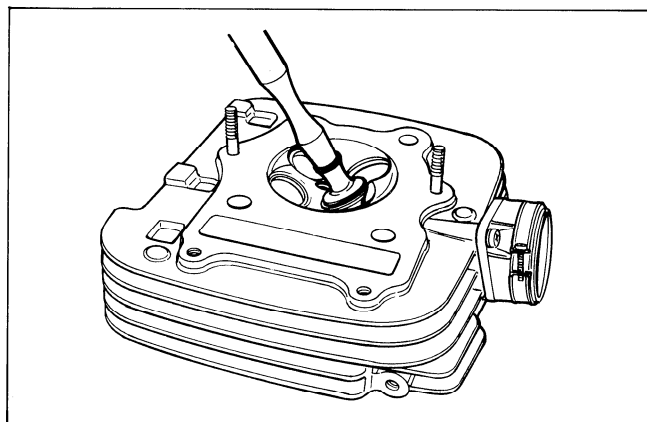
CAUTION:
Do not reuse the oil seals.

①	Valve guide installer and stem seal installer	09916-44910
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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.

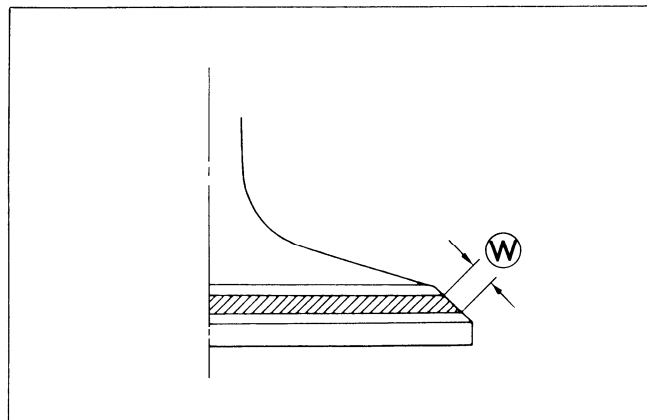


- The ring-like dye impression left on the valve face must be continuous-without any break. In addition, the width of the dye ring, which is the visualized seat "width", must be within the specification.

Valve seat width

STD. (W)	0.9 – 1.1 mm (0.035 – 0.043 in)
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If either requirement is not met, correct the seat by servicing it as follows.



VALVE SEAT SERVICING

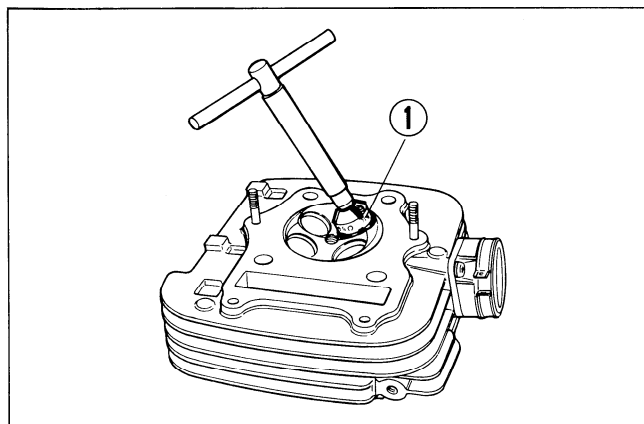
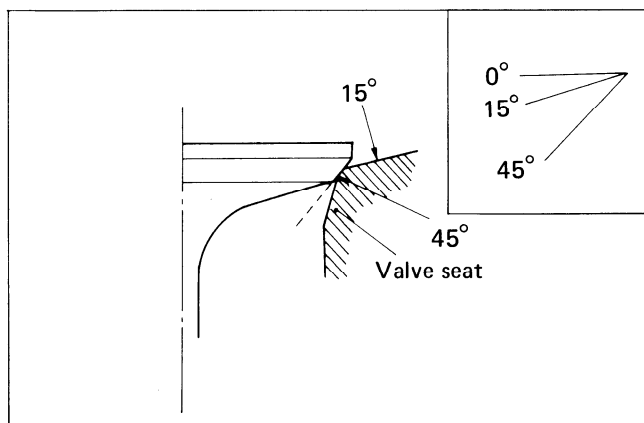
The valve seats for both intake and exhaust valves are angled to present two bevels, 15° and 45°.

① 15°X45° cutter (N-116)	99103-45012-003
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NOTE:

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

- Insert with a slight rotation, the solid pilot that gives a snug fit. The shoulder on the pilot should be about 10 mm (0.39 in) from the valve guide.
- Using the 45° cutter, descale and cleanup the seat with one or two turns.
- 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 45° cutter to raise and widen the contact area. If the contact area is too high or too wide, use 15° cutter to lower and narrow the contact area.

4. After the desired seat position and width is achieved, use the 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 ressembling the engine.

VALVE SPRINGS

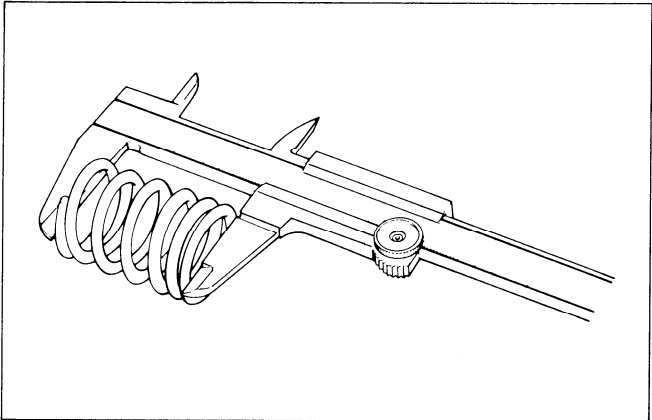
Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force does not fall within the range specified, replace with a SUZUKI spring.

Valve spring free length

Service limit	39.8 mm (1.57 in)
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Valve spring tension

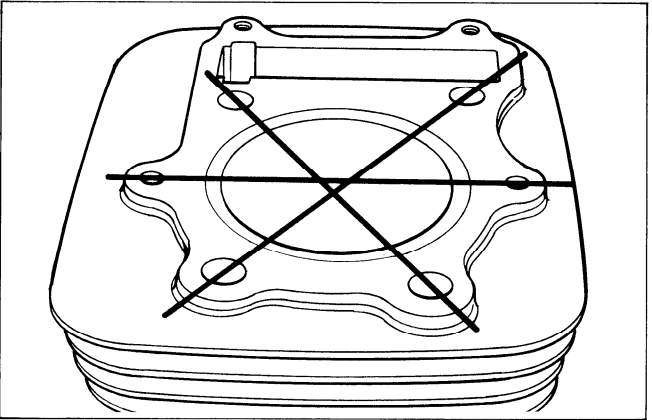
STD.	16.2 – 19.8 kg/35 mm (35.7 – 43.7 lbs/1.4 in)
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CYLINDER DISTORTION

Check the gasketed surface of the cylinder 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.

Service limit	0.05 mm (0.002 in)
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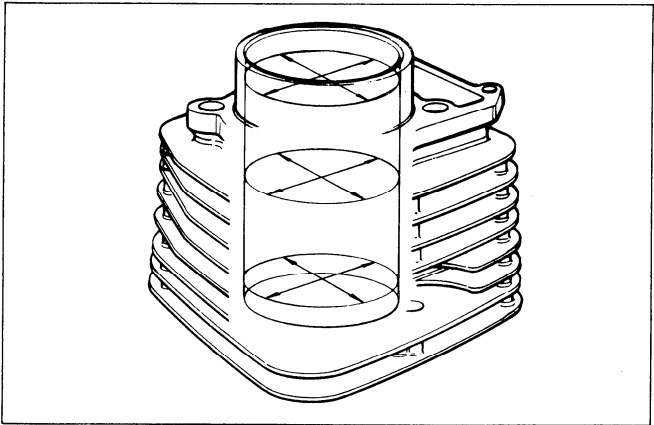


CYLINDER BORE

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.

Cylinder gauge set	09900-20508
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Service limit	72.085 mm (2.8380 in)
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PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place 15 mm (0.59 in) from the skirt end as shown in illustration. If the measurement is less than the limit, replace the piston.

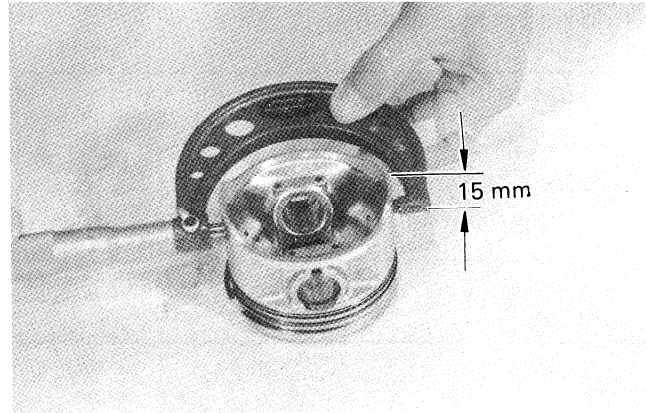
Micrometer (50 – 75 mm)	09900-20203
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Service limit	71.880 mm (2.8299 in)
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Piston oversize	0.5, 1.0 mm
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NOTE:

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 mm (0.0047 in)
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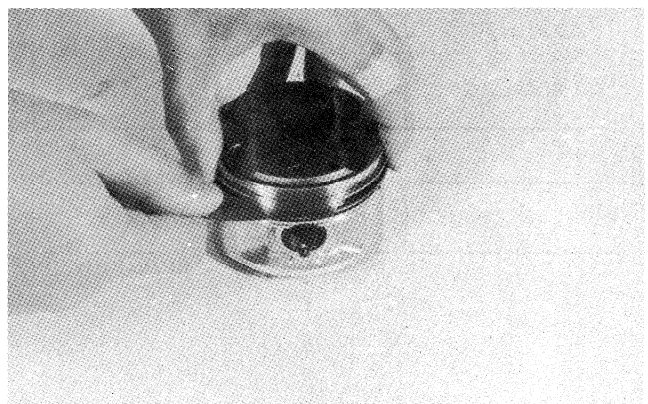
PISTON RING-GROOVE CLEARANCE

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.

Thickness gauge	09900-20803
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Piston ring-groove clearance

Piston ring	Service limit
1st	0.18 mm (0.007 in)
2nd	0.15 mm (0.006 in)



Piston ring groove width

Piston ring	Standard
1st	1.01 – 1.03 mm (0.039 – 0.040 in)
2nd	1.21 – 1.23 mm (0.047 – 0.048 in)
Oil	2.51 – 2.53 mm (0.099 – 0.100 in)

Piston ring thickness

Piston ring	Standard
1st	0.975 – 0.990 mm (0.0384 – 0.0390 in)
2nd	1.170 – 1.190 mm (0.0461 – 0.0469 in)

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.

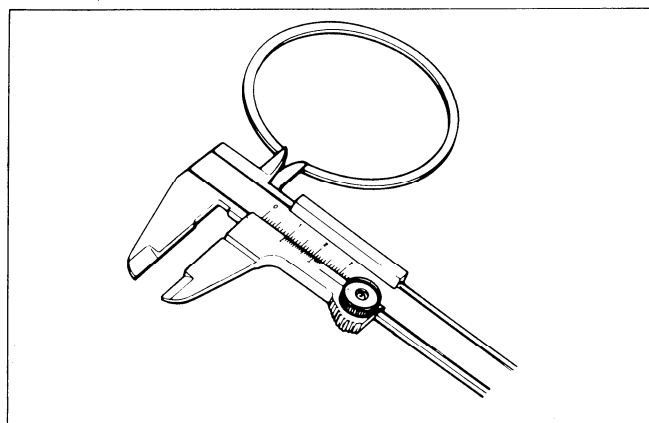
Piston ring free end gap

N: (NIPPON)

R: (RIKEN)

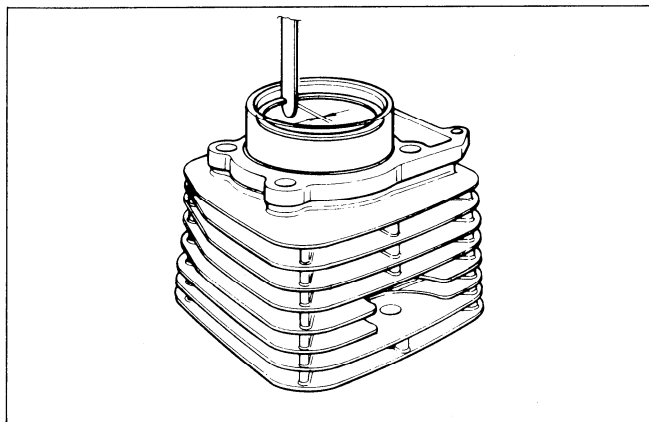
Piston ring		Service limit
1st	N	7.6 mm (0.30 in)
	R	8.4 mm (0.33 in)
2nd	N	8.8 mm (0.35 in)
	R	8.8 mm (0.35 in)

Vernier calipers (150 mm)	09900-20101
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**Piston ring end gap**

Piston ring	Service limit
1st and 2nd	0.7 mm (0.03 in)

Thickness gauge	09900-20803
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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 mm	50	50
1.0 mm	100	100

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.

Micrometer (0 – 25 mm)	09900-20205
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Piston pin bore

Service limit	18.030 mm (0.7098 in)
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Piston pin O.D.

Service limit	17.980 mm (0.7079 in)
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CONROD SMALL END I.D.

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

Service limit	18.040 mm (0.7102 in)
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- If the conrod small end bore inside diameter exceeds the limit, replace conrod.

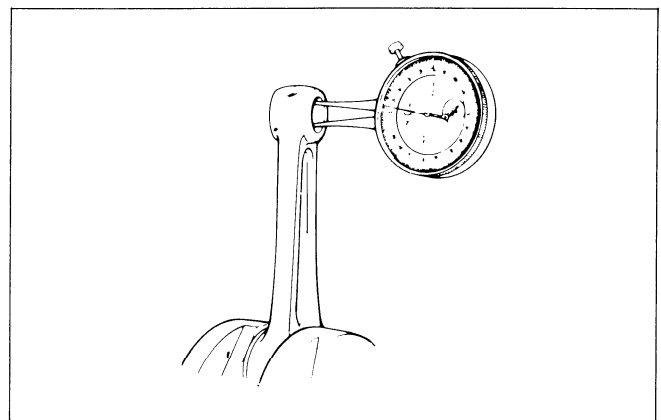
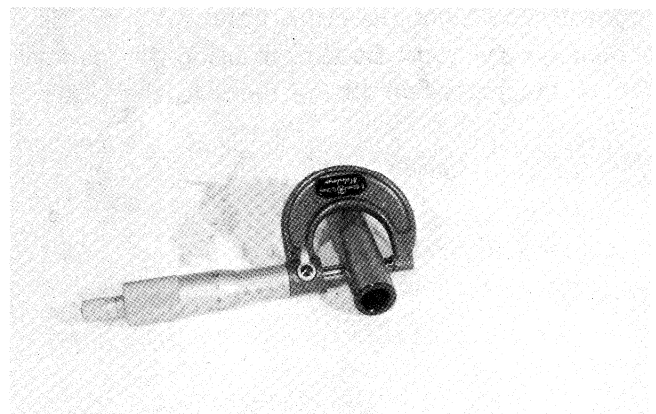
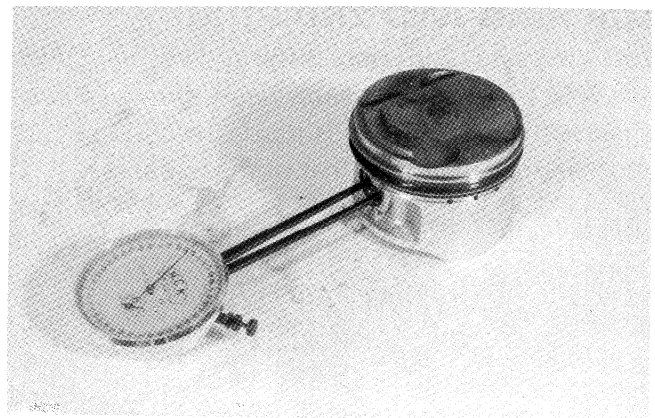
- **Oversize oil rings**

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

0.5 mm	Painted blue
1.0 mm	Painted yellow

- **Oversize side rail**

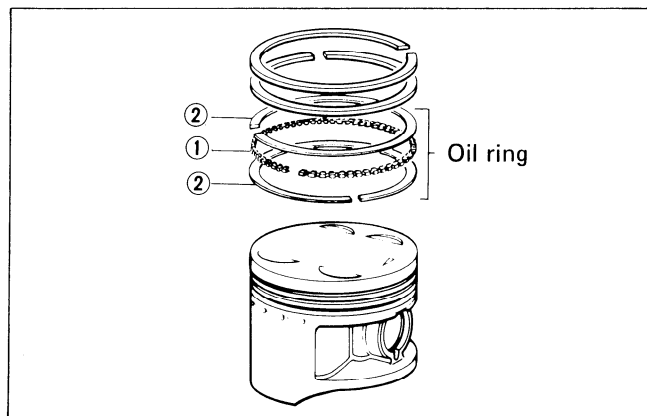
Just measure outside diameter to distinguish the standard size from oversize.



UPPER END COMPONENTS REASSEMBLY

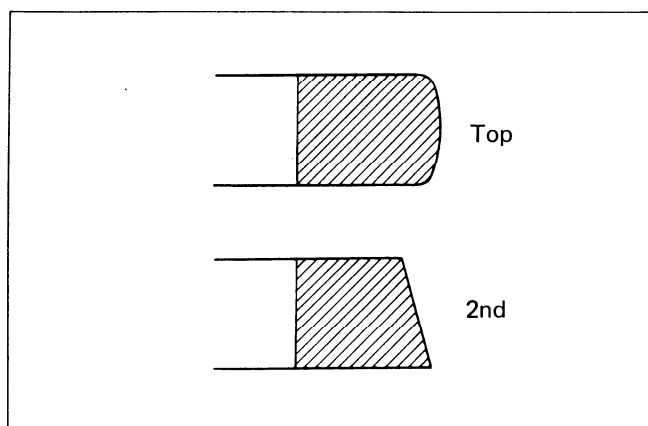
OIL RING

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.

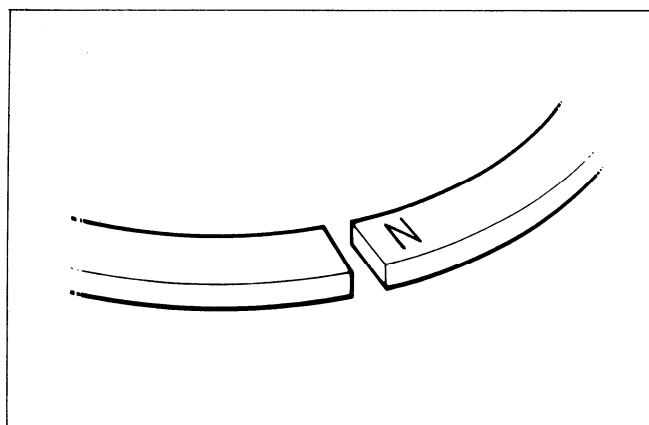


TOP RING AND 2ND RING

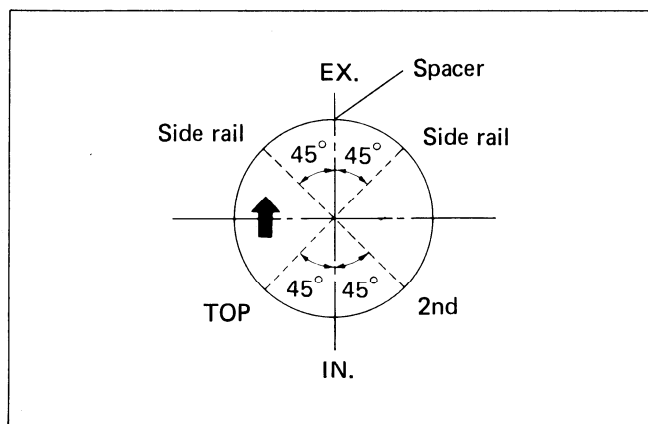
Top ring and 2nd ring differ in the shape of ring face and the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.



Top and 2nd rings have the letter "N" or "R" 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

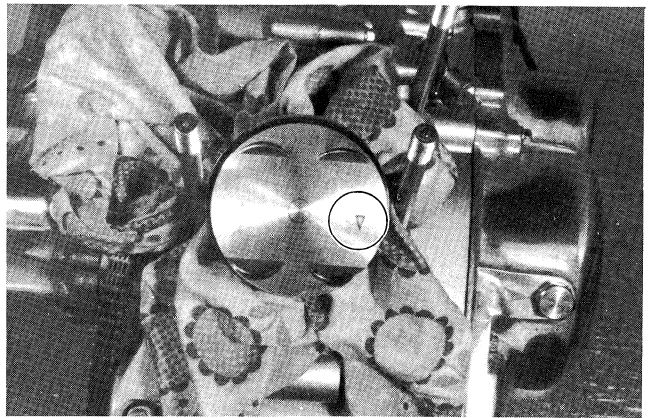
The following are reminders for piston installation:

- Rub a small quantity of SUZUKI 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 failure which will occur with a bent one.

- When fitting the piston, face the triangle mark on the piston head to exhaust side.



CYLINDER

Before mounting the cylinder block, 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.

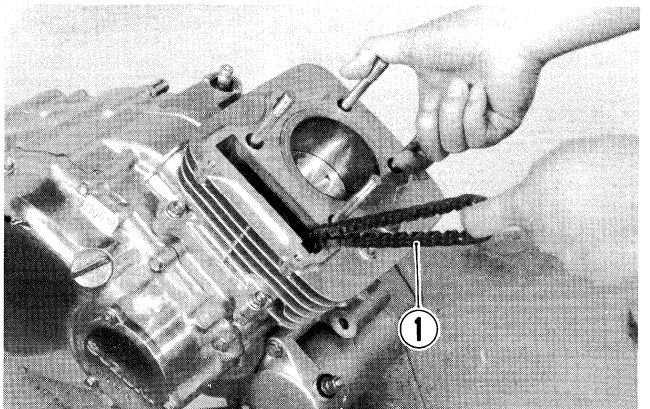
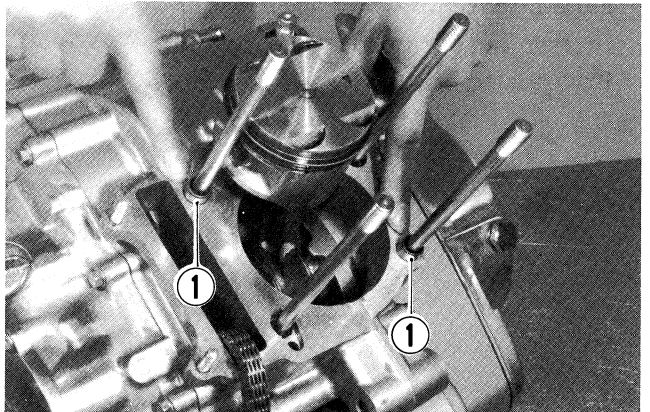
CAUTION:

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

- Hold each piston ring with the piston ring sections properly positioned 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 ①, 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 (SUZUKI MOLY PASTE) all around and along the full stem length without any break. Similarly oil the lip of the stem seal.

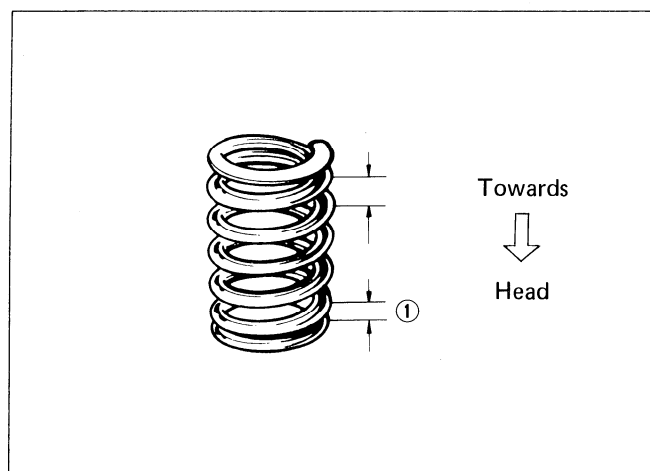
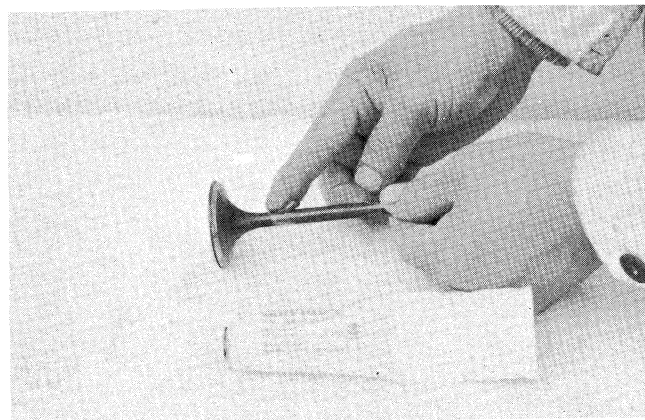
Suzuki moly paste

99000-25140

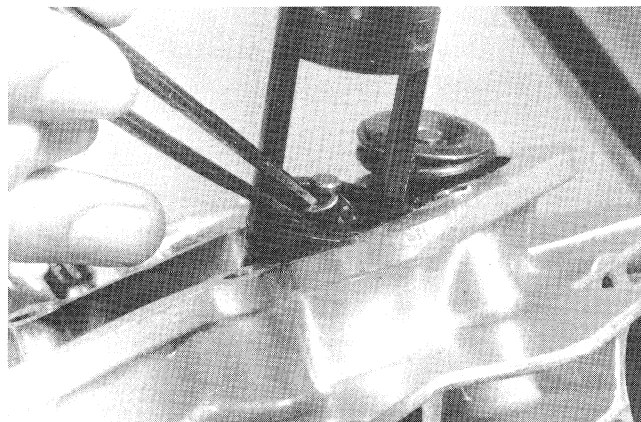
CAUTION:

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

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



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

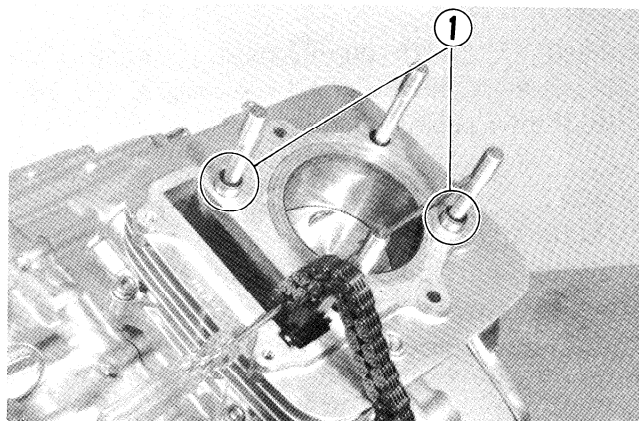


CYLINDER HEAD

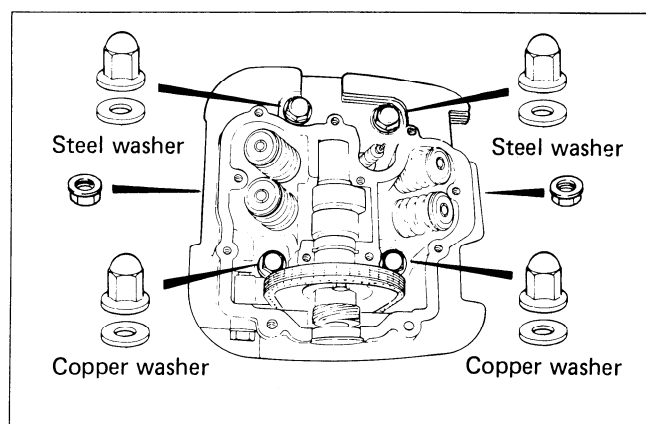
- Fit dowel pins ① to cylinder head and then, attach new gasket to cylinder head.

CAUTION:

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



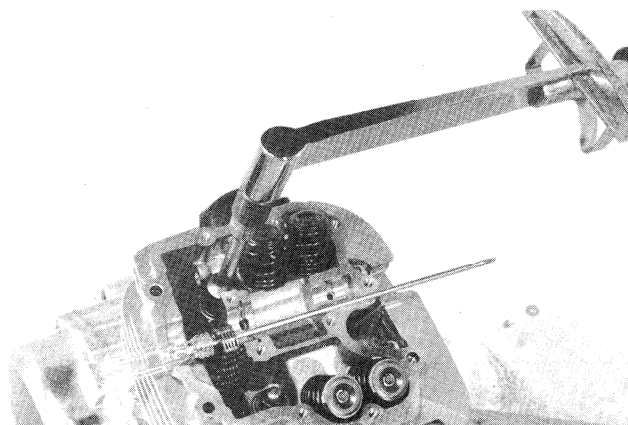
- Copper washers and cap nuts are used to secure the cylinder head. These parts must be fitted in the correct position.



- With the head snugly seated on the cylinder, secure it by tightening the nuts diagonally. Tighten each nut to the torque value specified below:

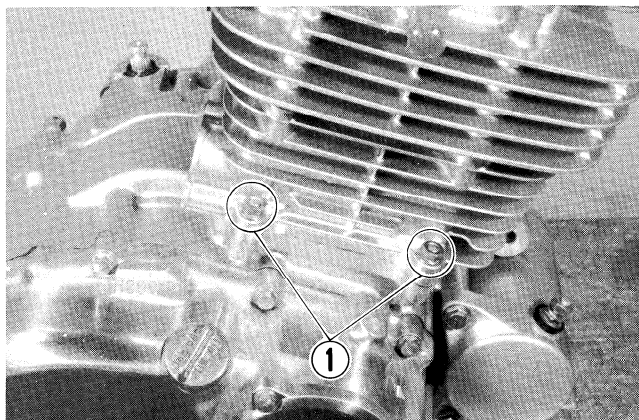
Cylinder head nuts tightening torque

10 mm Diam.	$3.5 - 4.0 \text{ kg-m}$ $(35 - 40 \text{ N-m})$ $(25.5 - 29.0 \text{ lb-ft})$
6 mm Diam.	$0.8 - 1.2 \text{ kg-m}$ $(8 - 12 \text{ N-m})$ $(6.0 - 8.5 \text{ lb-ft})$



- After tightening the cylinder head nuts to the specified torque, tighten the cylinder nuts ①.

Cylinder nuts tightening torque	$0.7 - 1.1 \text{ kg-m}$ $(7 - 11 \text{ N-m})$ $(5.0 - 8.0 \text{ lb-ft})$
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CAMSHAFT

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

NOTE:

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

NOTE:

Apply grease on the cam sprocket locating pin and install the pin into the camshaft.

- Engage the chain on the cam sprocket with the locating pin hole at the one o'clock position.

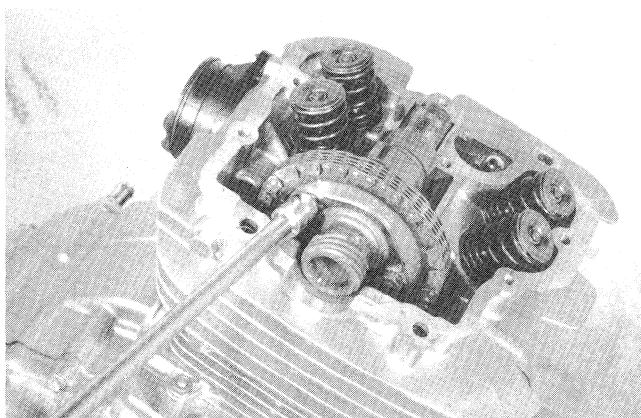
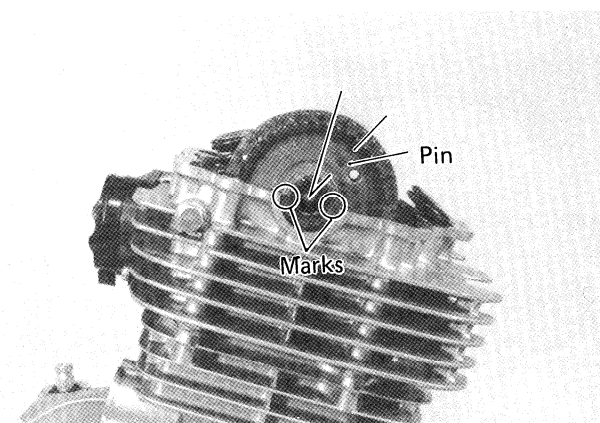
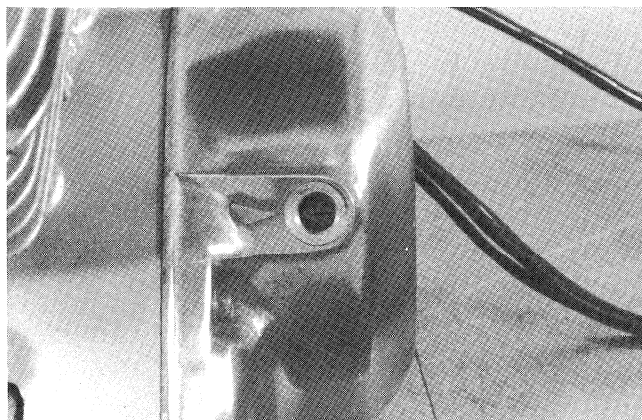
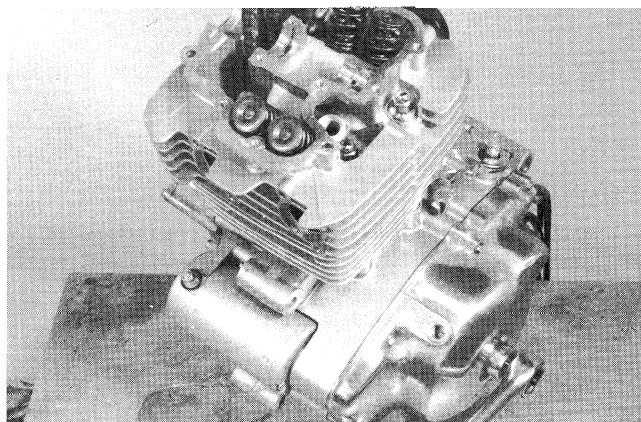
NOTE:

Do not rotate magneto rotor while doing this. When the sprocket is not positioned correctly, turn the sprocket. When installing the camshaft into the cam sprocket, pay attention not to dislodge the locating pin or it may fall into the crankcase.

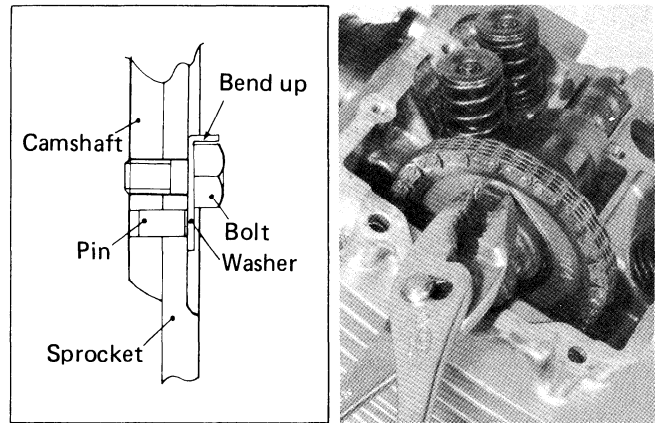
- Align the marks on the camshaft so it is parallel with the surface of the cylinder head.
- Fit lock washer so that it is covering the locating pin.
- Apply THREAD LOCK SUPER "1303" to the bolts and tighten the cam sprocket.

Tightening torque	$\begin{pmatrix} 1.4 - 1.6 \text{ kg-m} \\ 14 - 16 \text{ N.m} \\ 7.0 - 9.0 \text{ lb-ft} \end{pmatrix}$
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Thread lock super "1303"	99104-32030
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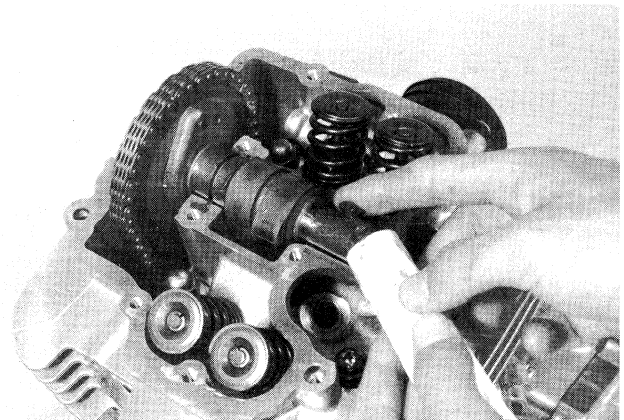


- Bend up the washer tongue positively to lock the bolts.



- Apply SUZUKI MOLY PASTE to the camshaft journal and place camshaft on cylinder head.

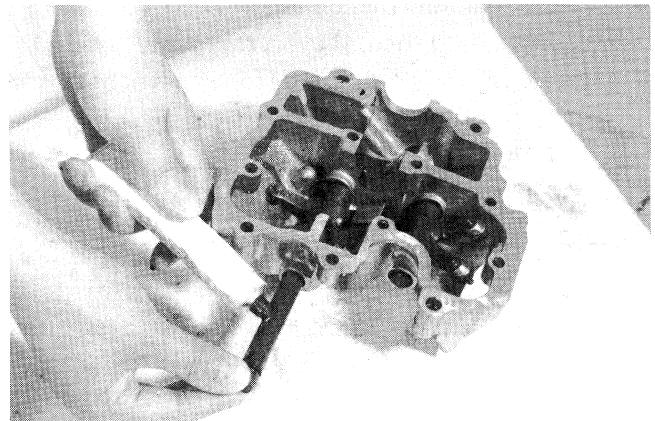
SUZUKI moly paste	99000-25140
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VALVE ROCKER ARM AND SHAFT

- Apply SUZUKI MOLY PASTE to the rocker arms and shafts.

SUZUKI moly paste	99000-25140
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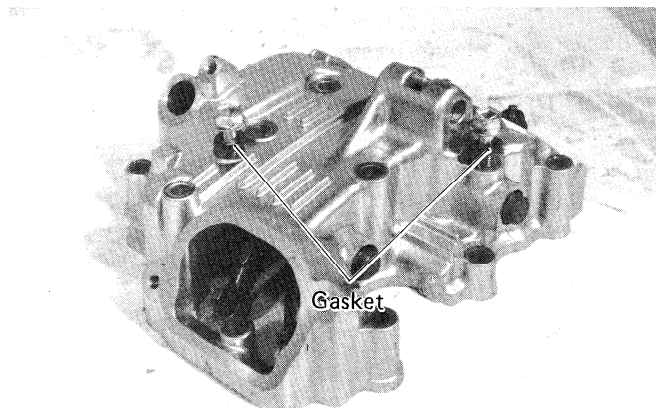
- After inserting the shafts, tighten the set bolts.

NOTE:

Use a conically recessed top bolt to retain the shaft.

CAUTION:

- * Use a new O-ring on the rocker arm shafts to prevent oil leakage.
- * Use a new gasket on the set bolts to prevent oil leakage.



CYLINDER HEAD COVER

- Thoroughly wipe off oil from the fitting surfaces of cylinder head and cover.
- Fit the two dowel pins to the cylinder head side.
- Uniformly apply SUZUKI BOND No. 1215 to the cylinder head surface.

Suzuki bond No. 1215	99104-31110
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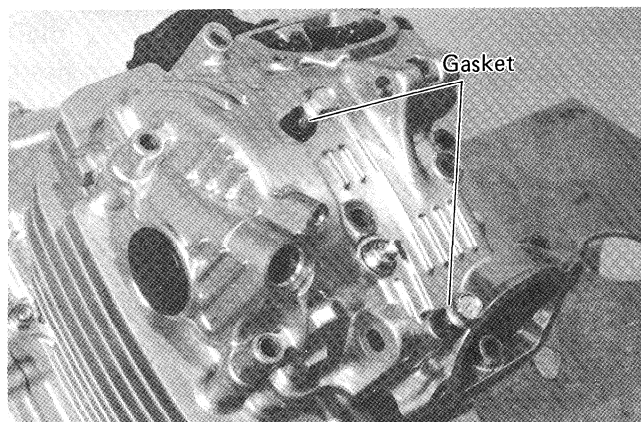
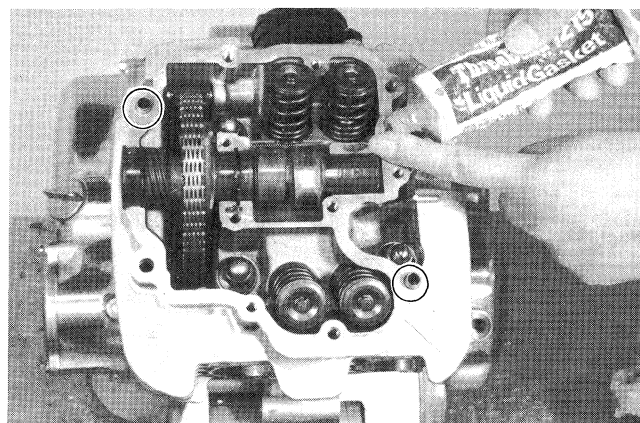
NOTE:

Do not apply SUZUKI BOND No. 1215 to the camshaft end cap.

- Fit a gasket to each head cover bolt as shown in the illustration.

CAUTION:

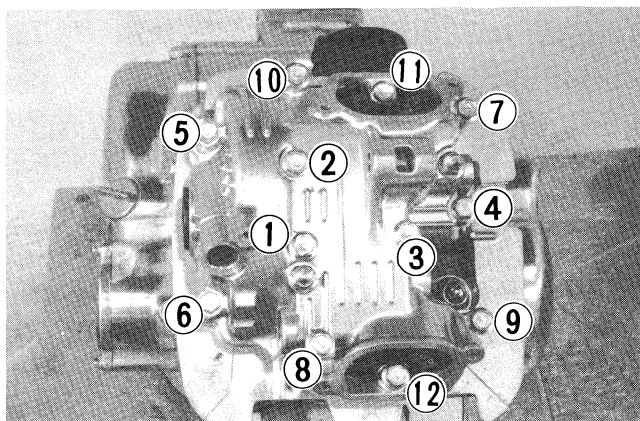
To prevent oil leakage use only new gaskets.



- Lightly tighten the cylinder head cover bolts diagonally and then, if everything is satisfactory, tighten securely with a torque wrench to the specified torque.

Tightening torque	0.9 – 1.0 kg-m (9 – 10 N-m) (6.5 – 7.0 lb-ft)
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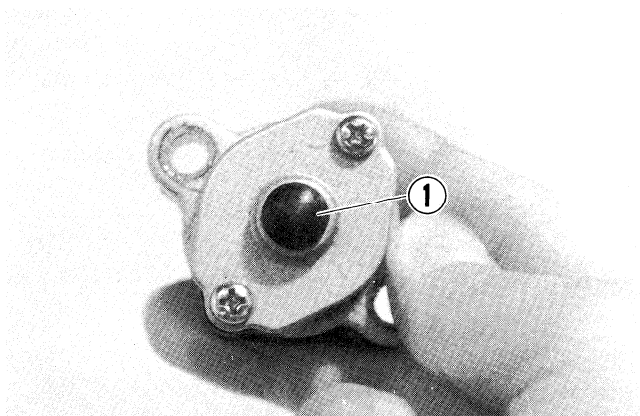
- After tightening the cylinder head cover bolts, insert the welch plug and tighten set screw.

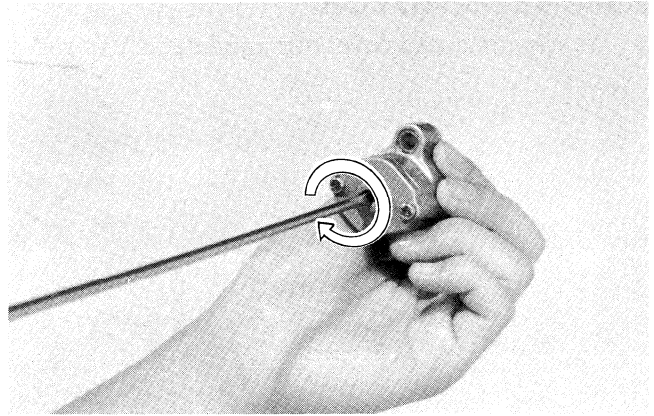


CAM DRIVE CHAIN TENSIONER

Install cam drive chain tensioner following the procedure below.

- Remove the cap ① and turn the slotted end of the cylinder shaft with a screw driver in the clockwise direction.

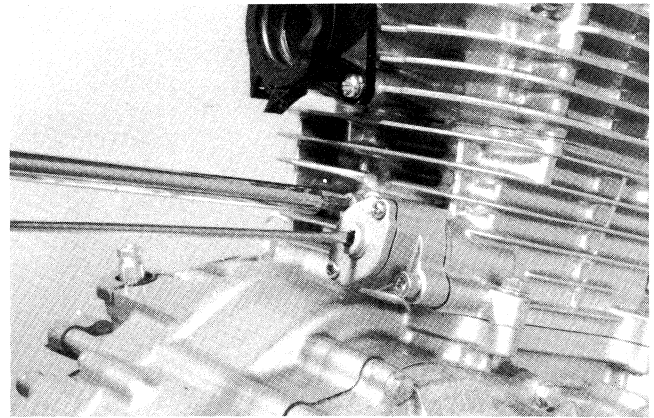




- Mount the chain tensioner on the cylinder.

"T" type hexagon wrench (5 mm)	09911-73730
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- Remove the screw driver from the cylinder shaft. As the spring tension forces the cylinder to rotate, the tensioner rod pushes the tensioner blade against the cam drive chain.



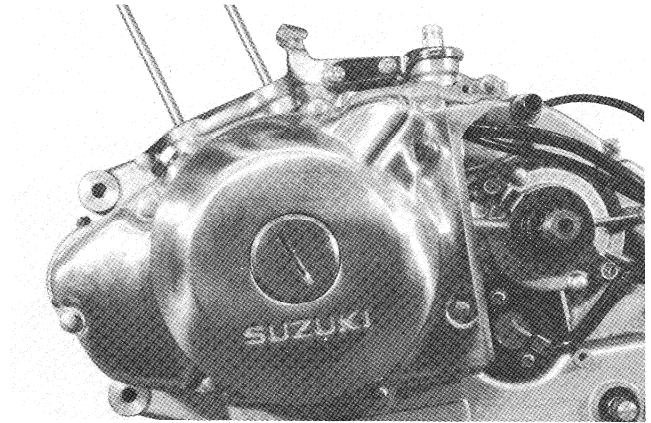
VALVE CLEARANCE

- After tightening the head cover bolts, check and adjust the valve clearance. Refer to page 2 – 5 for procedures.

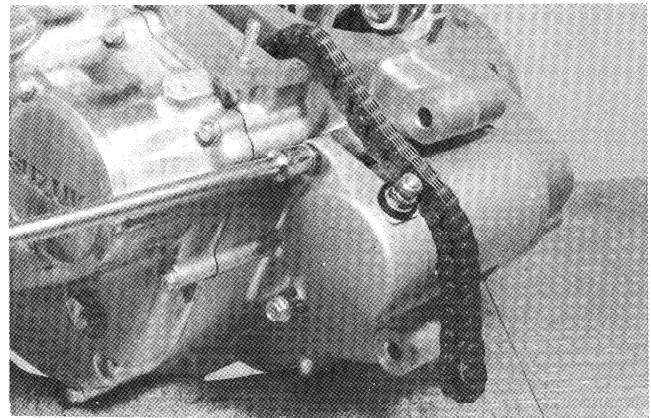
LOWER END COMPONENTS DISASSEMBLY

MAGNETO ROTOR

- Remove magneto cover bolts and detach magneto cover.

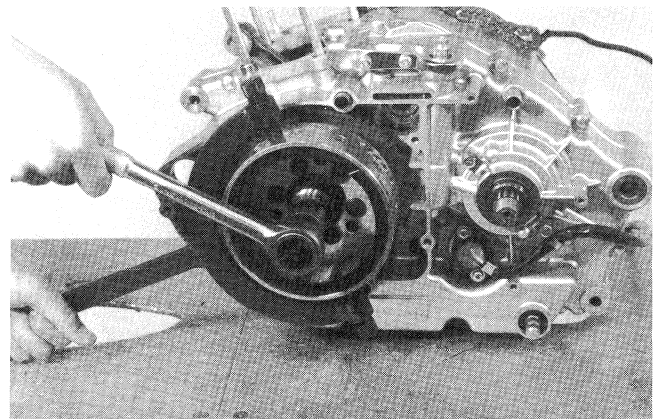


- Loosen and remove the starter motor mounting bolts.
- Take off the starter motor.



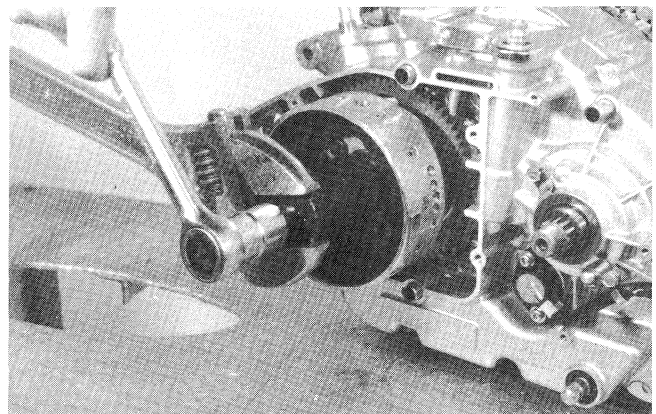
- Remove magneto rotor nut.

Rotor holder	09930-44911
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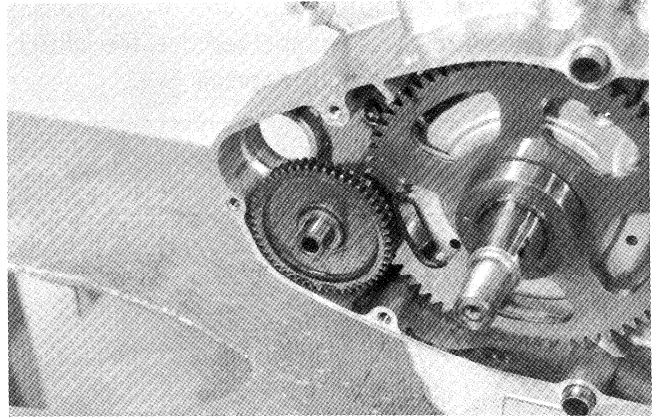


- Remove magneto rotor and key.

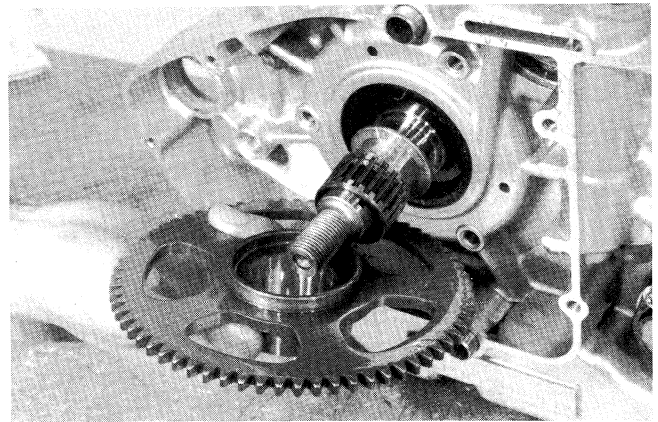
Rotor remover	09930-34912
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- Remove the starter idle gear.

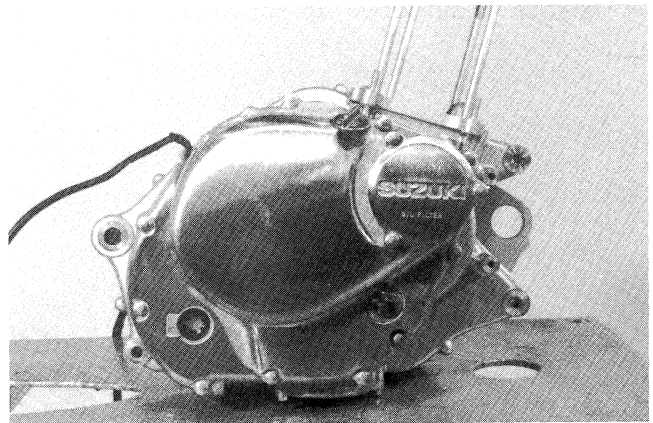


- Remove the starter clutch gear.



CLUTCH

- Remove clutch cover bolts and detach clutch cover by tapping with a plastic hammer.



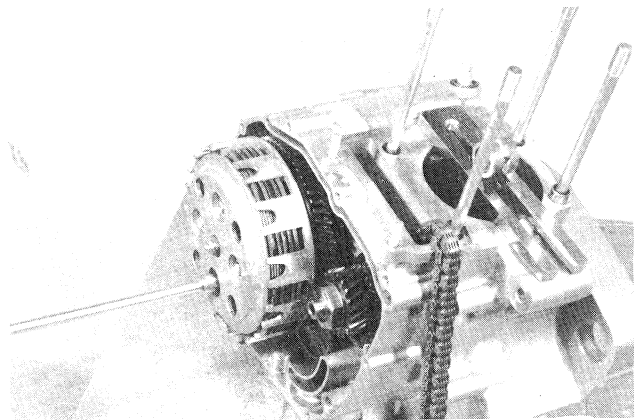
- Remove clutch spring mounting bolts diagonally while holding the primary driven gear, and remove clutch pressure plate.

Conrod holder

09910-20116

NOTE:

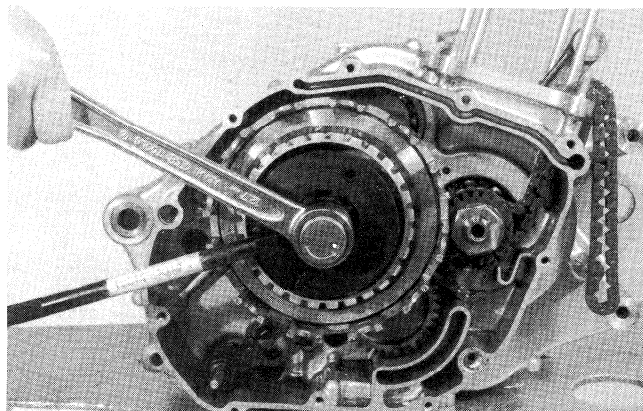
Do not allow camshaft drive chain to be caught between crankcase and camshaft drive sprocket.



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

Clutch sleeve hub holder	09920-53721
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- Take off the sleeve hub with the primary driven gear ass'y.



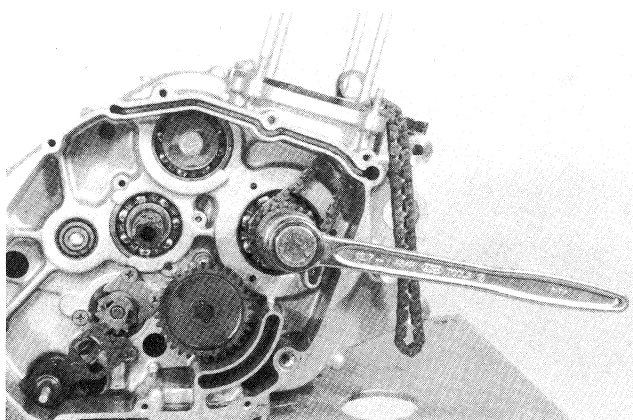
PRIMARY DRIVE GEAR AND CAMSHAFT DRIVE CHAIN

- Remove primary drive gear nut, then remove wave washer, primary drive gear and key.

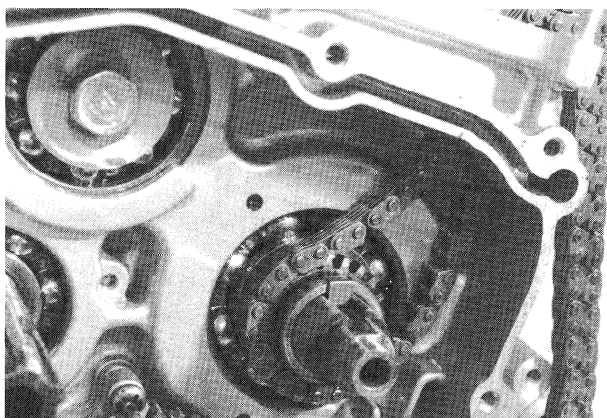
Conrod holder	09910-20116
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CAUTION:

This is a left-hand thread nut.



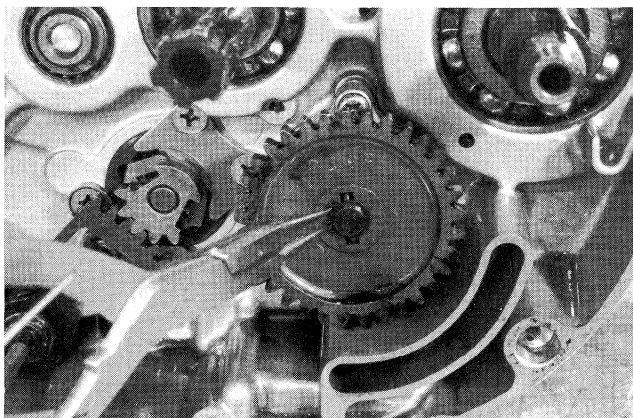
- Remove chain drive sprocket, key and drive chain.

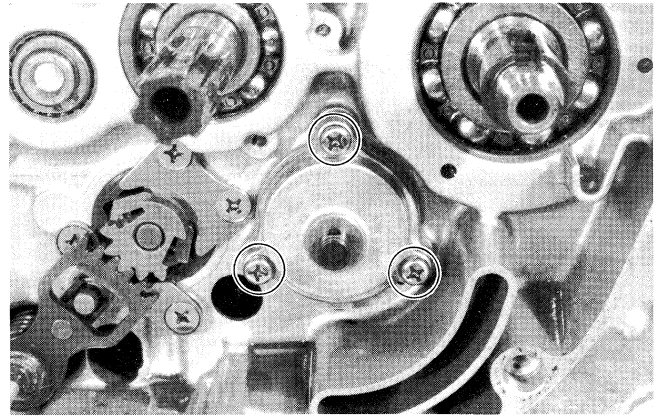


OIL PUMP

- Remove the oil pump driven gear by using snap ring pliers, then remove oil pump mounting screws and take off oil pump body.

Snap ring pliers	09900-06107
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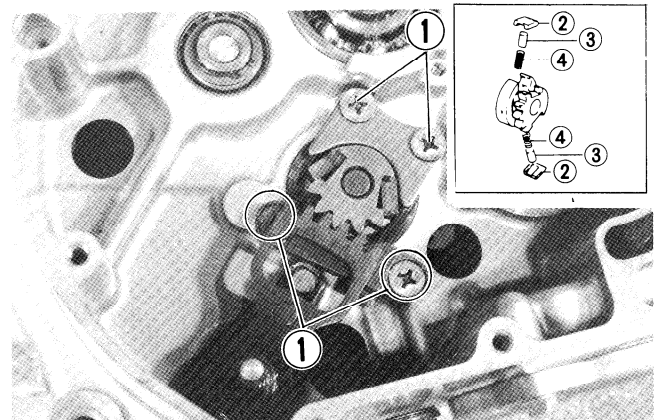


GEAR SHIFTER

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

NOTE:

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

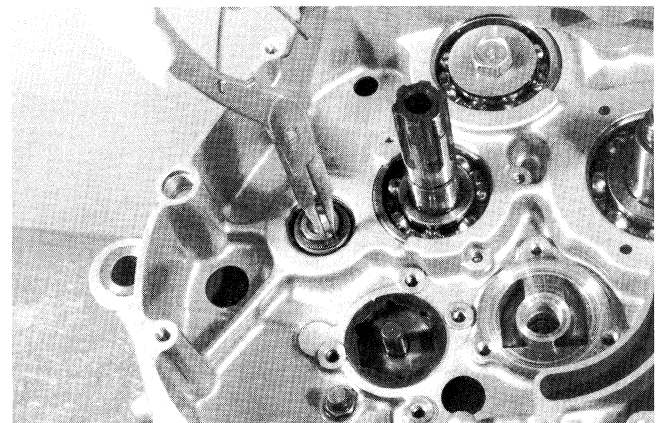


DRIVE SHAFT RETAINER

- Remove the drive shaft retainer circlip by using snap ring pliers.

Snap ring pliers

09900-06107

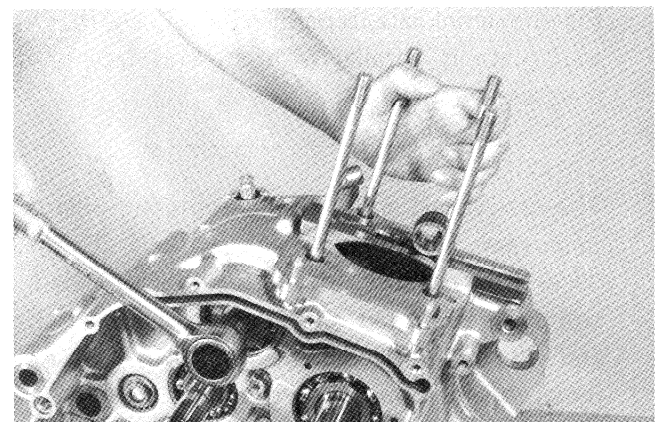


BALANCER

- Remove balancer setting bolt.

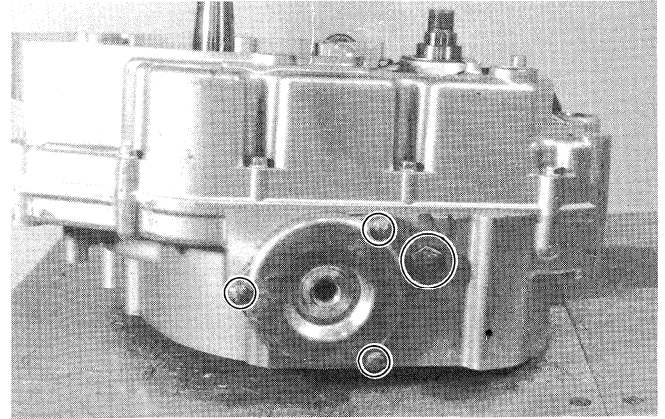
Conrod holder

09910-20116

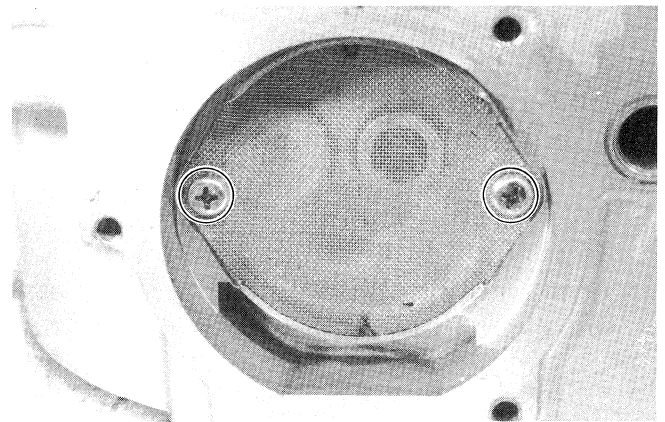


CRANKCASE

- Remove sump filter cap and neutral cam stopper.



- Remove sump filter.

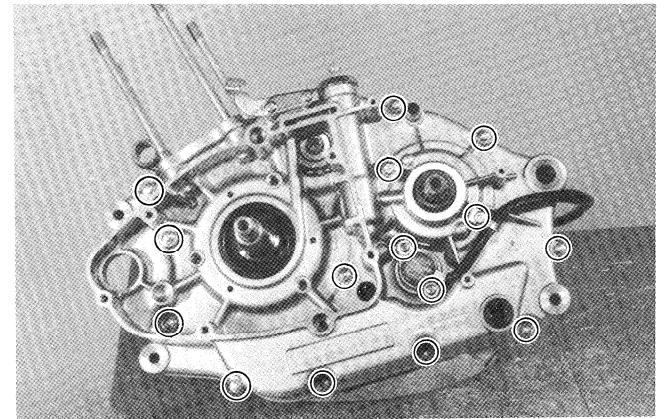


- Remove crankcase set bolts.
- Remove neutral switch.

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

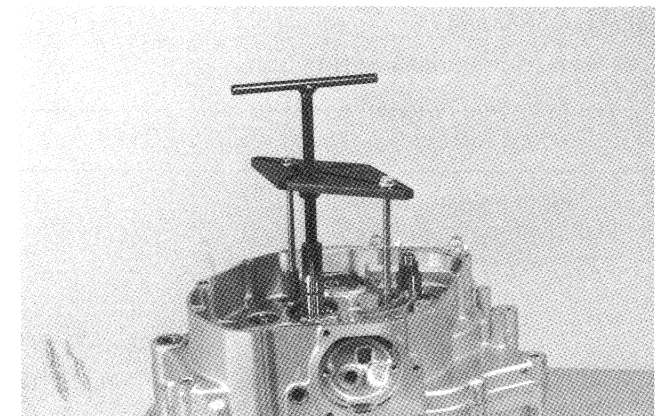
Crankcase separating tool	09920-13111
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- Fit the crankcase separating tool, so that the tool plate is parallel with the end face of the crankcase.



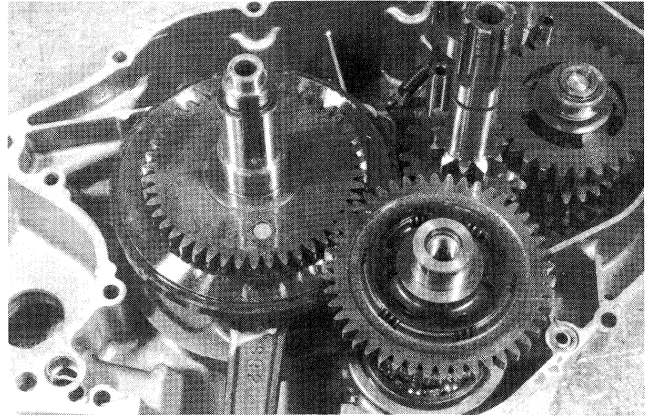
CAUTION:

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.

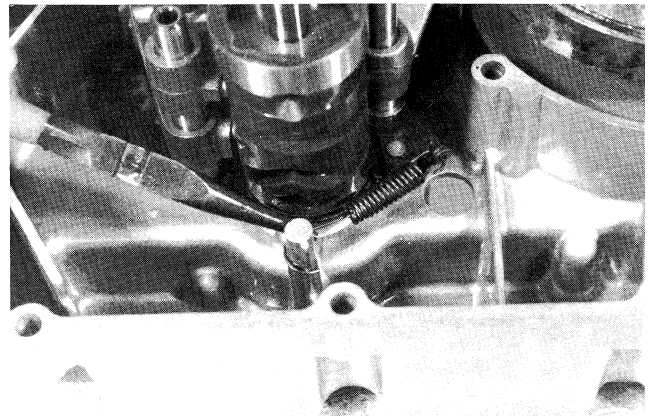


TRANSMISSION AND BALANCERSHAFT

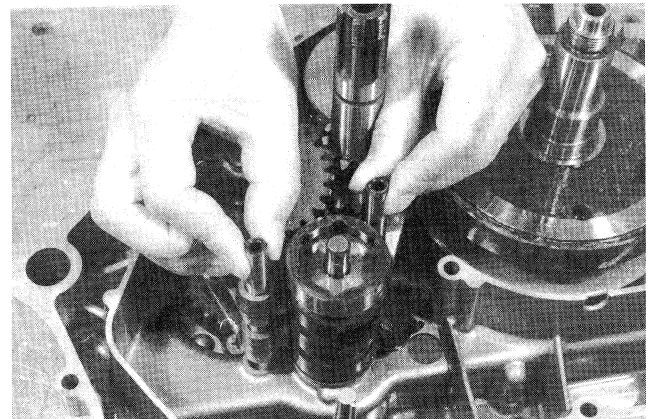
- Remove balancer drive gear.
- Remove balancer driven gear ass'y with balancer driven gear plates, outer and inner, then remove key.



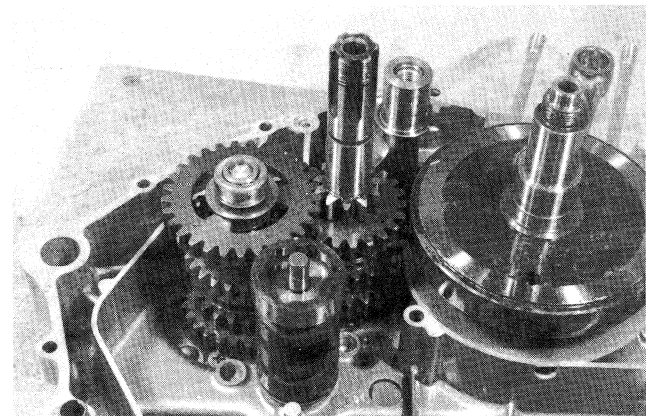
- Remove gear shifting cam stopper spring.



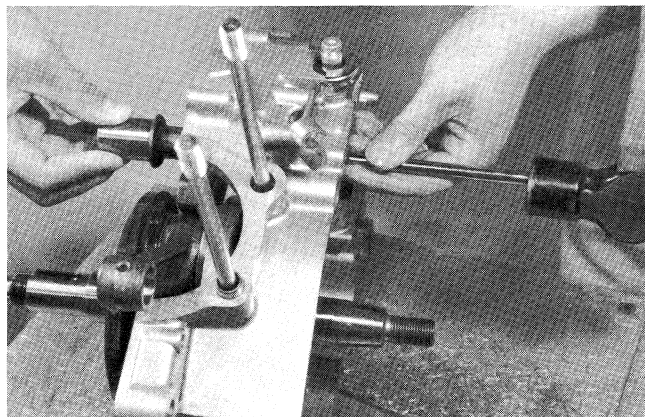
- Draw out gear shifting fork shafts and take off forks.



- Remove clusters of gears and gear shifting cam.



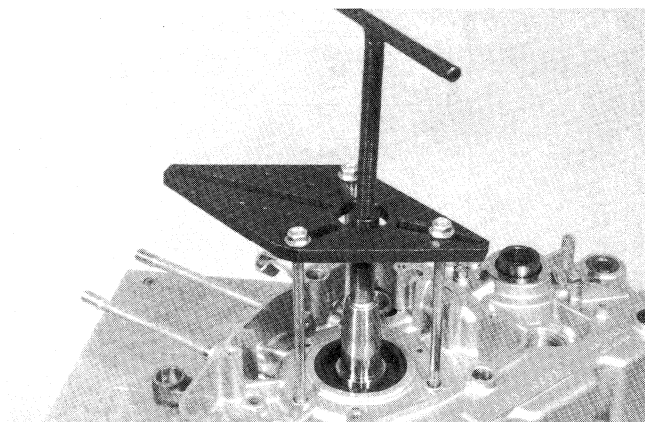
- Knock out balancershaft by using a soft drift.



CRANKSHAFT

- Remove crankshaft by using crankshaft remover.

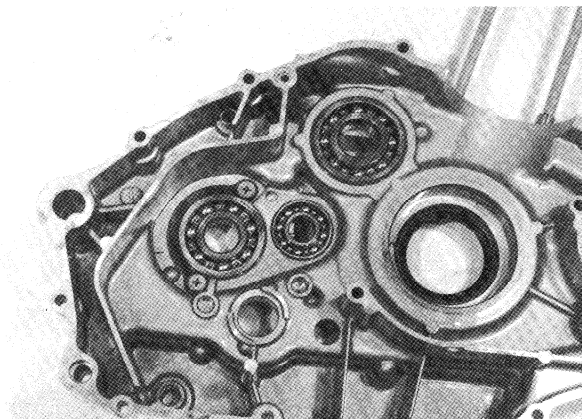
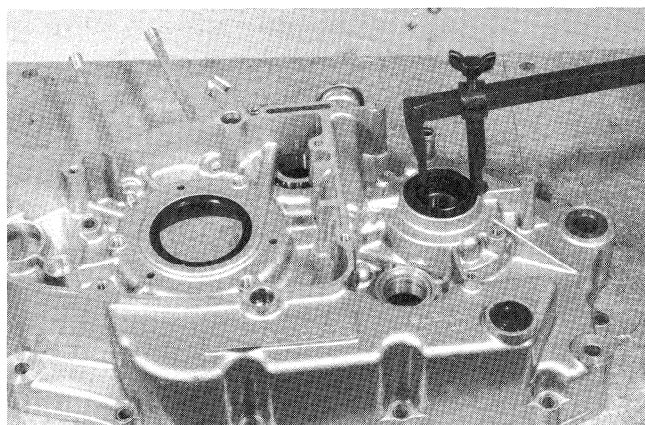
Crankshaft remover	09920-13111
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OIL SEAL AND BEARING

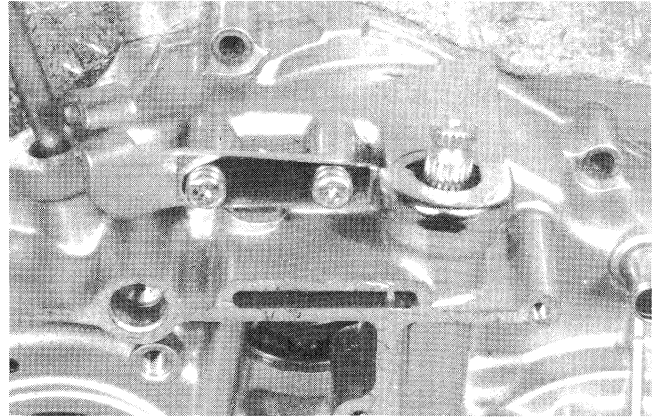
- Using the special tools, remove retainers, oil seals and bearings.

Oil seal remover	09913-50121
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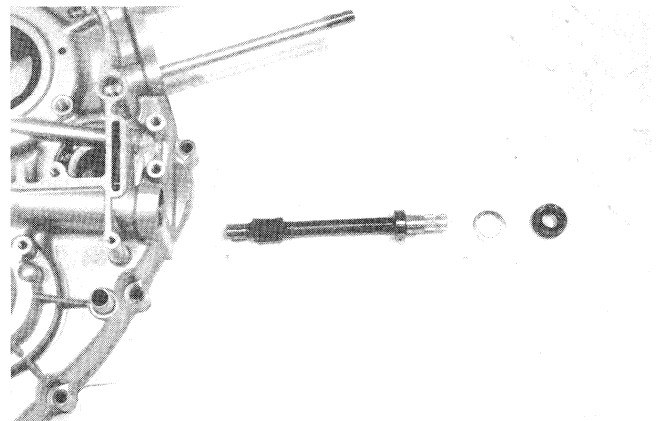
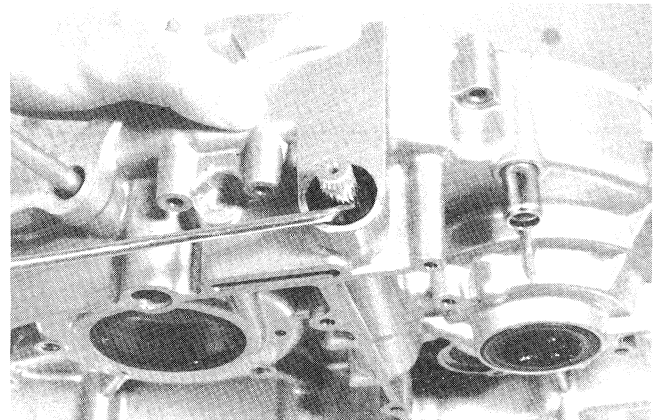


CLUTCH RELEASE CAMSHAFT

- Remove the oil seal plate by unscrewing oil seal plate screws.



- Take off the oil seal.

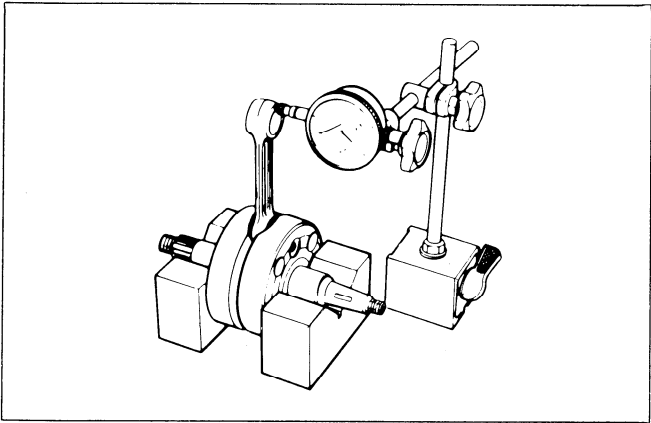


LOWER END COMPONENTS INSPECTION AND SERVICING

CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

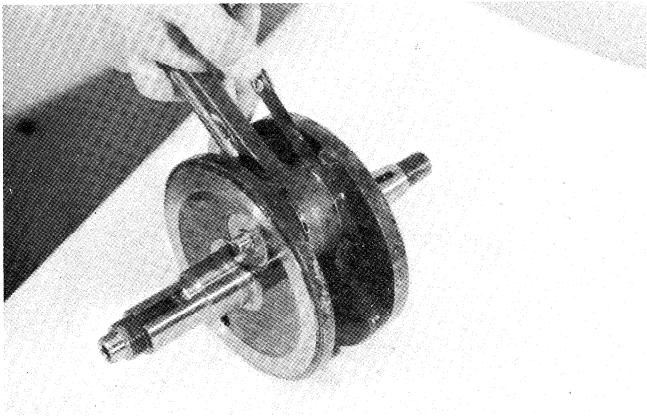
Wear on the big end of the conrod can be estimated by checking the movement of the small end of the rod. This method can also check the extent of wear on the parts of the conrod's big end.

Service limit	3.0 mm (0.12 in)
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Push the big end of the conrod to one side and measure its side clearance with a thickness gauge.

Standard	Service limit
0.10 – 0.65 mm (0.004 – 0.026 in)	1.00 mm (0.039 in)

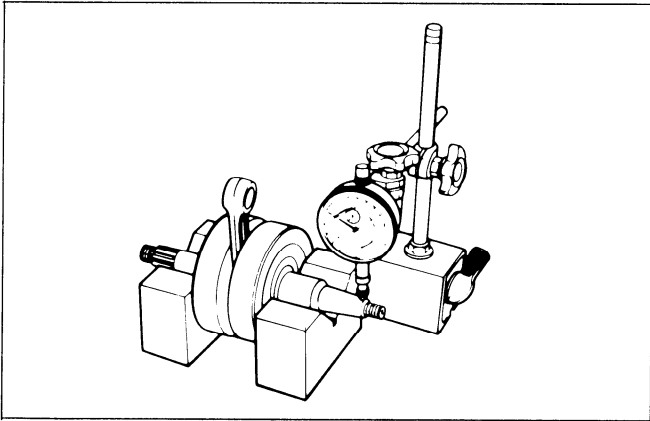


Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance to within the limit by replacing the worn parts – conrod, big end bearing, crankpin and thrust washers, etc. (Refer to the SERVICE DATA)

CRANKSHAFT RUNOUT

Support the crankshaft with “V” blocks as shown, with the two end journals 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	0.05 mm (0.002 in)
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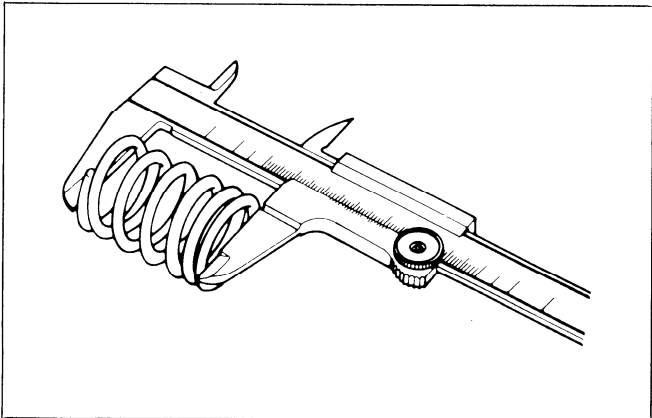


BALANCER SPRING FREE LENGTH

Measure the free length of each coil spring with a vernier calipers, and determine the elastic strength of each. Replace any spring not within the limit.

Vernier calipers	09900-20101
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Service limit	9.9 mm (0.39 in)
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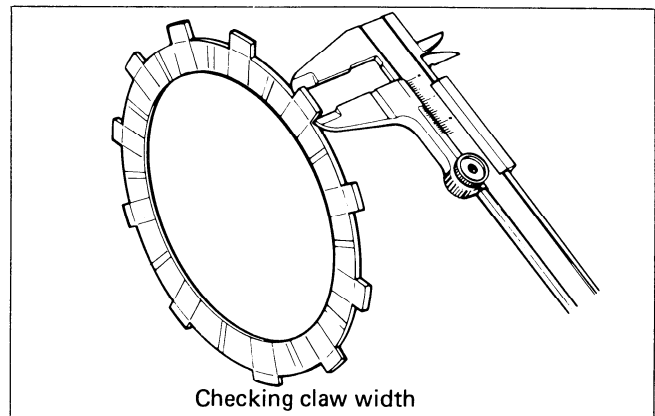
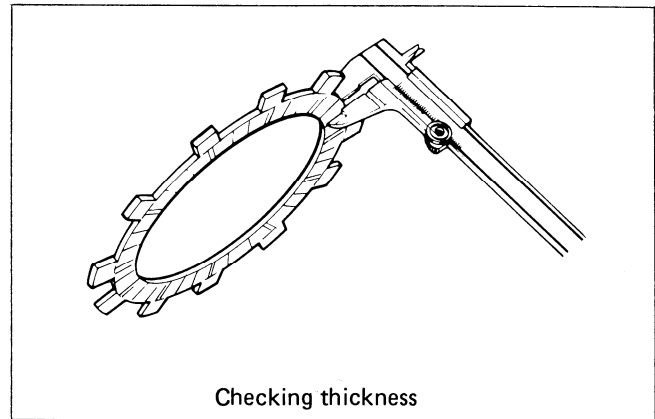


CLUTCH DRIVE PLATE

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

Vernier calipers	09900-20101
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Item		Standard	Limit
Thickness	No. 1	2.90 – 3.10 mm (0.114 – 0.122 in)	2.60 mm (0.102 in)
	No. 2	3.45 – 3.55 mm (0.136 – 0.140 in)	3.15 mm (0.124 in)
Claw width		15.8 – 16.0 mm (0.62 – 0.63 in)	15.0 mm (0.59 in)

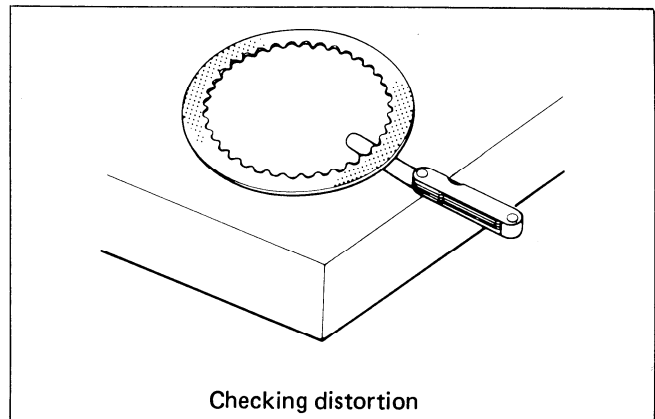


CLUTCH DRIVEN PLATE

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

Thickness gauge	09900-20803
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Service limit	0.1 mm (0.004 in)
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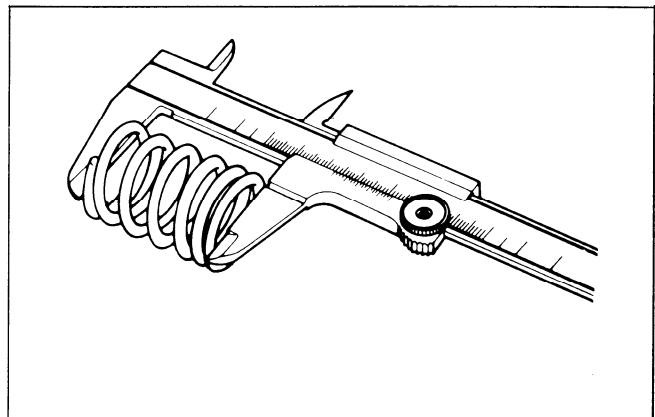


CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with a vernier calipers, and determine the elastic strength of each. Replace any spring not within the limit.

Vernier calipers	09900-20101
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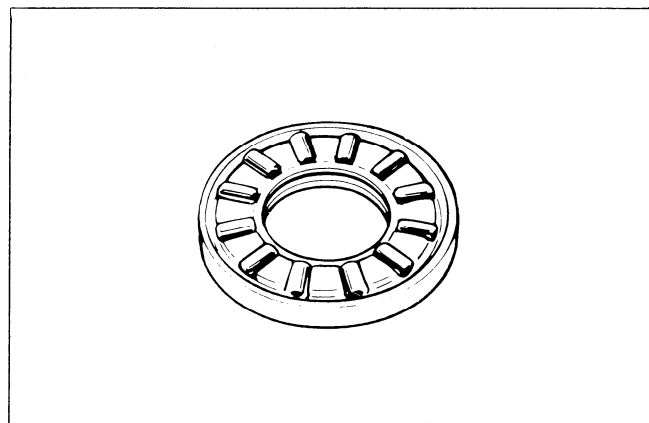
Service limit	34.0 mm (1.34 in)
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CLUTCH RELEASE BEARING

Inspect the release bearing for any abnormality, particularly 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 replaced by measuring the thickness and groove width.

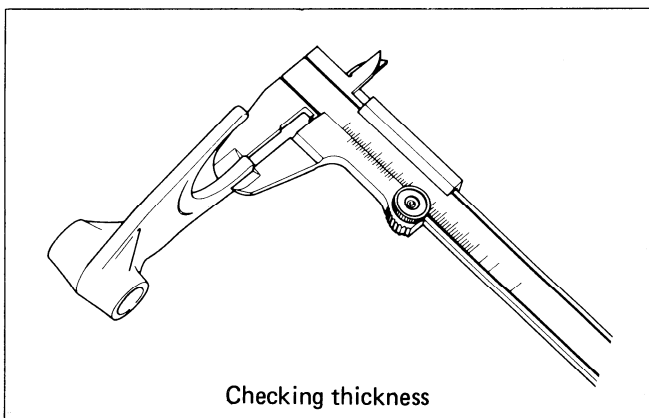
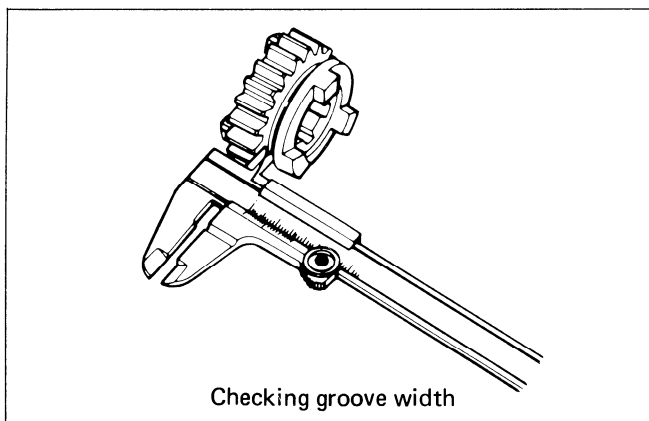
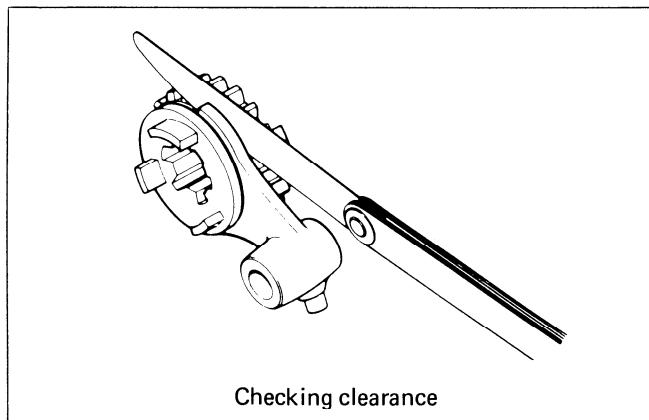
Thickness gauge	09900-20803
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Vernier calipers	09900-20101
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Item	Standard	Limit
Shifting fork to groove clearance	0.20 – 0.40 mm (0.008 – 0.016 in)	0.60 mm (0.023 in)

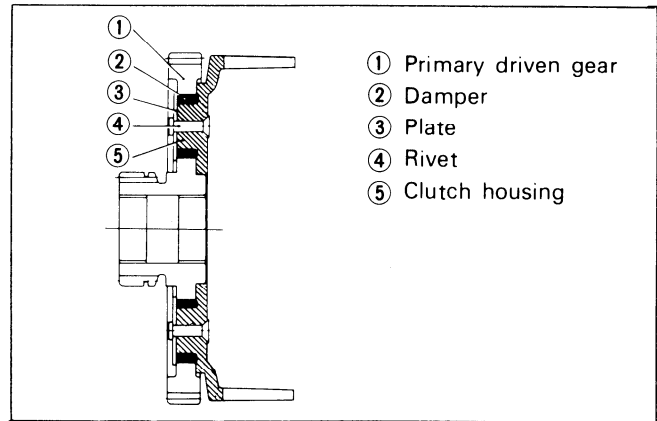
Shifting fork groove width	
Standard	4.25 – 4.35 mm (0.167 – 0.171 in)

Shifting fork thickness	
Standard	3.95 – 4.05 mm (0.156 – 0.159 in)



PRIMARY DRIVEN GEAR

Primary driven gear is composed as shown.



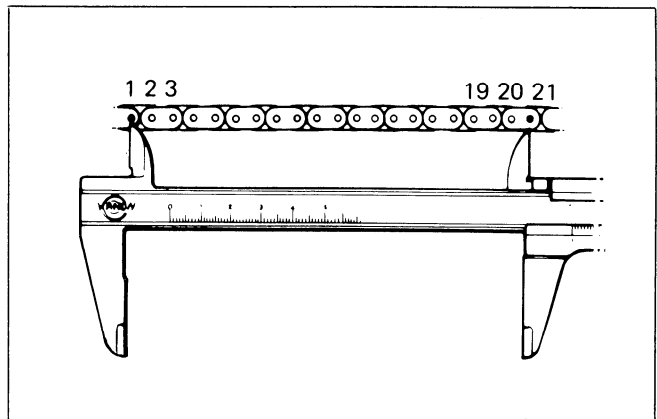
If the internal damper wears, play is generated between gear and housing, causing abnormal noise. If the play is extreme, replace the primary driven gear ass'y with a new one.



CAM CHAIN 20-PITCH LENGTH

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

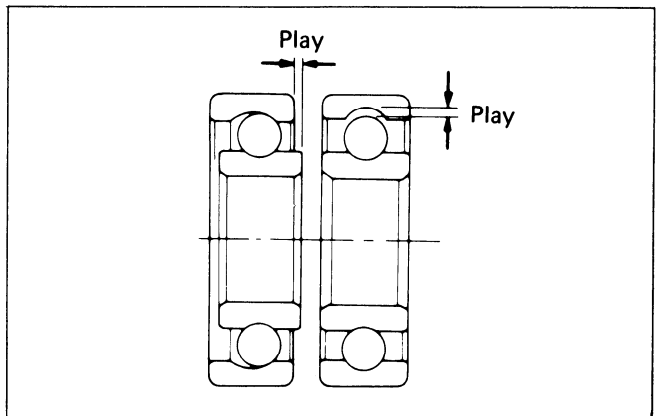
Service limit	128.90 mm (5.075 in)
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CRANKCASE BEARING

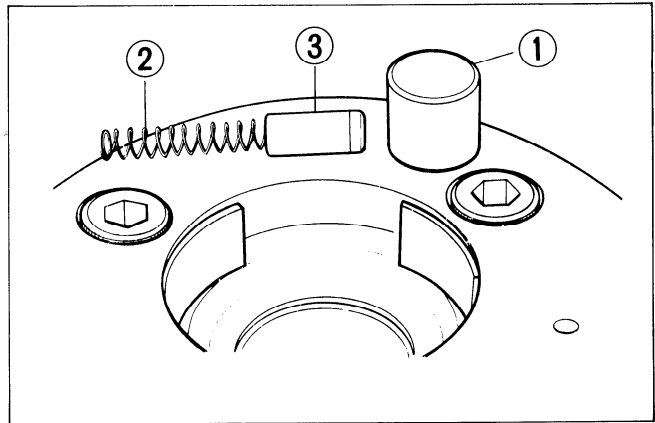
Inspect the play of crankcase bearing inner race by hand while fixing it in the case.

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 DISASSEMBLY

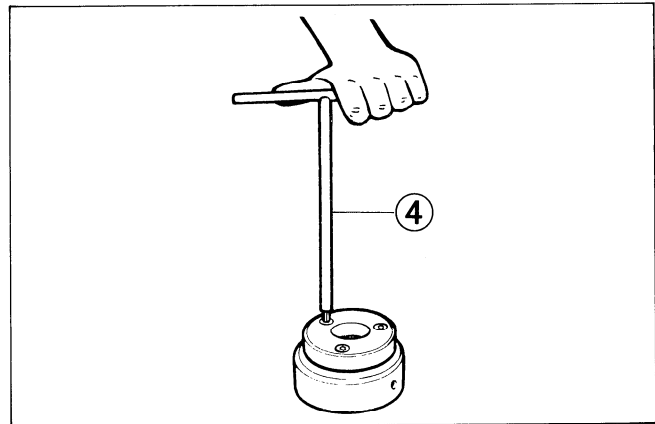
- Remove roller ①, spring ② and push piece ③ from starter clutch.



- Clamp the rotor with a vise taking care not to damage it and remove the three hexagon bolts using the 6 mm "T" type hexagon wrench ④.

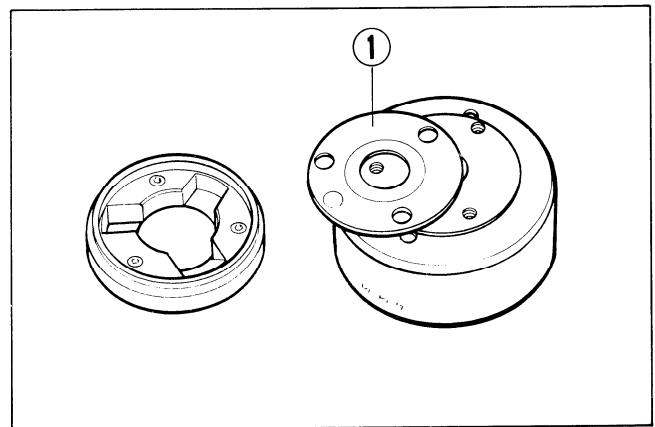
09914-25811

"T" type hexagon
wrench (6 mm)



ASSEMBLY

- Locate the shim ① to the proper position.



- Apply THREAD LOCK SUPER "1333B" to allen bolts and tighten with specified torque.

99104-32020

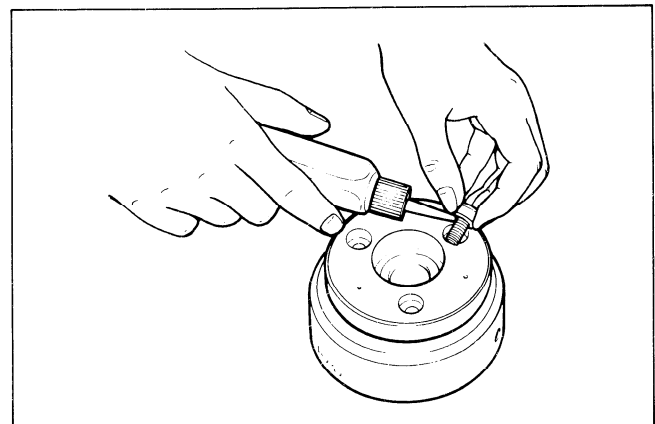
Thread lock super "1333B"

09914-25811

T-type hexagon wrench(6 mm)

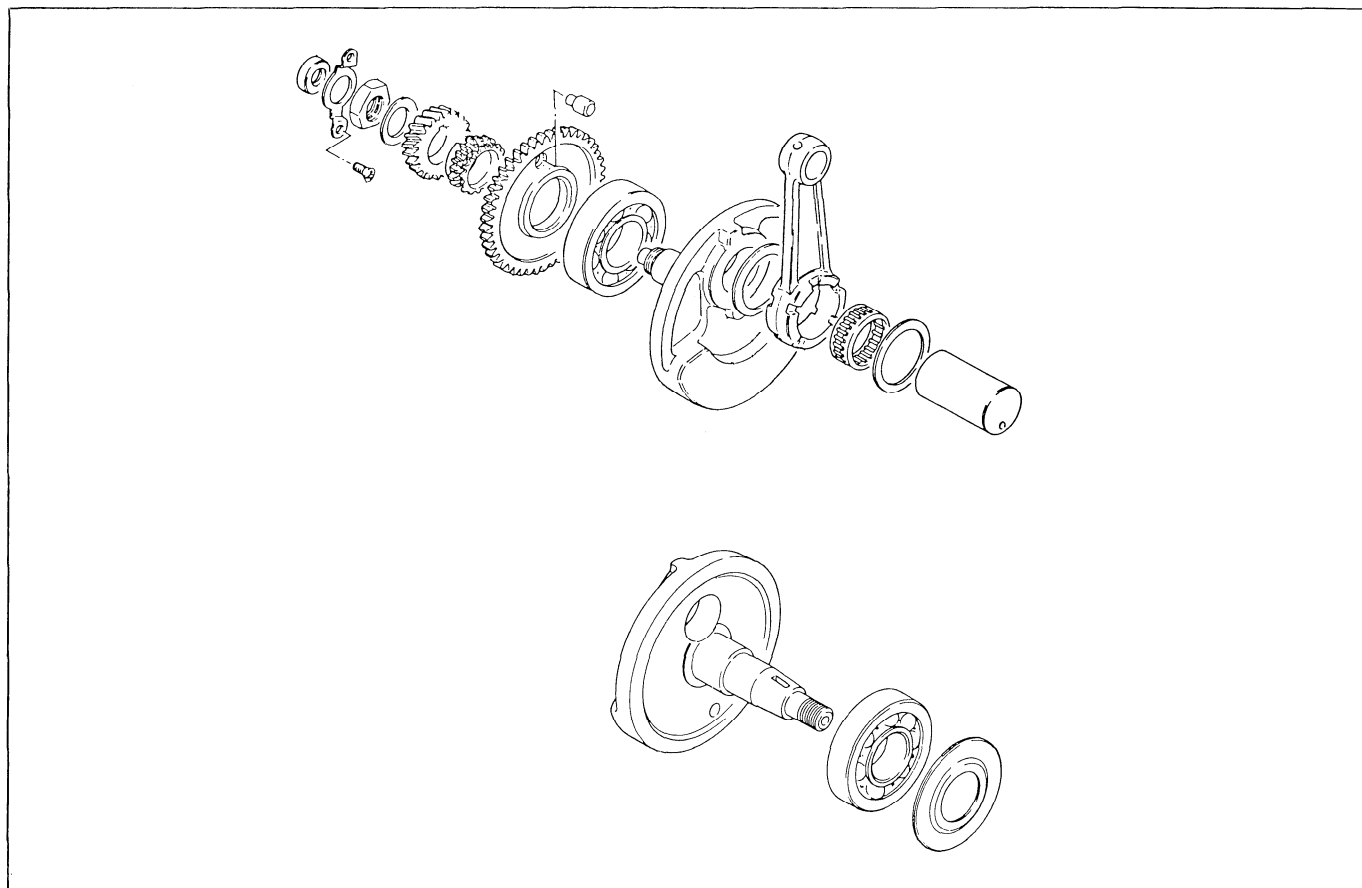
Tightening torque

1.5 – 2.0 kg-m
(15 – 20 N·m
11.0 – 14.5 lb-ft)



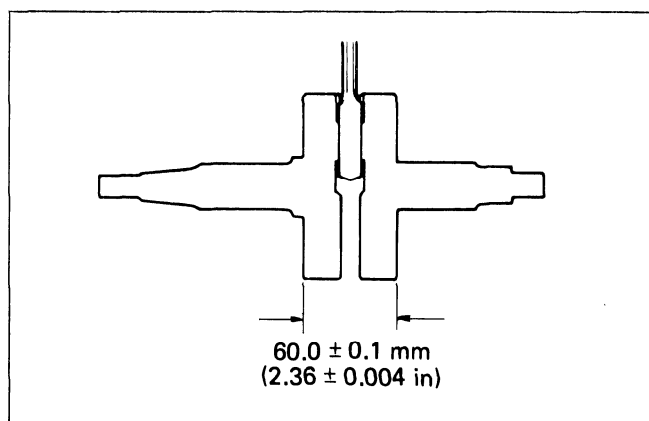
LOWER END COMPONENTS REASSEMBLY

CRANKSHAFT



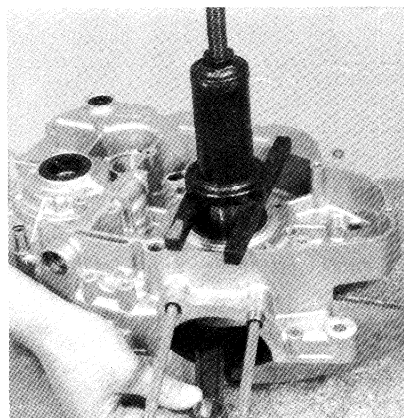
- Decide the width between the webs referring to the figure below when rebuilding the crankshaft.

STD width between webs	$60.0 \pm 0.1 \text{ mm}$ ($2.36 \pm 0.004 \text{ in}$)
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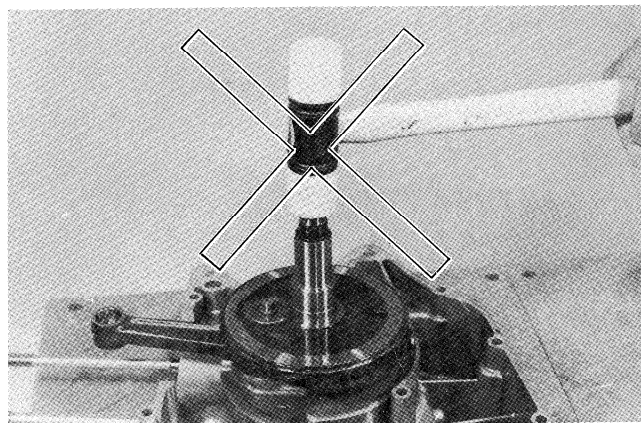
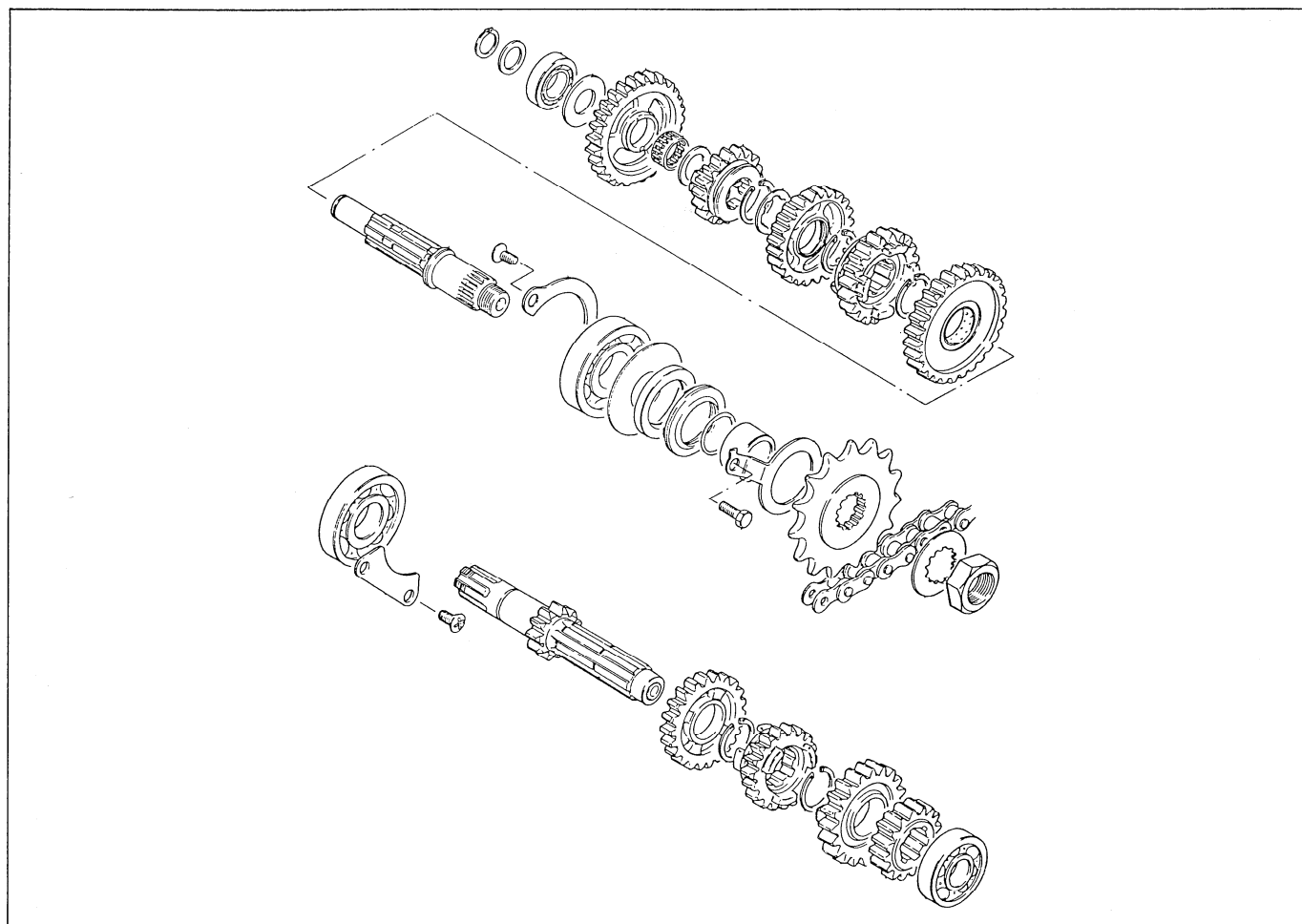
- When mounting the crankshaft in the crankcase, it is necessary to pull its left end into the crankcase.

Crankshaft installer	09910-32812
Conrod holder	09910-20116
Attachment	09930-33710

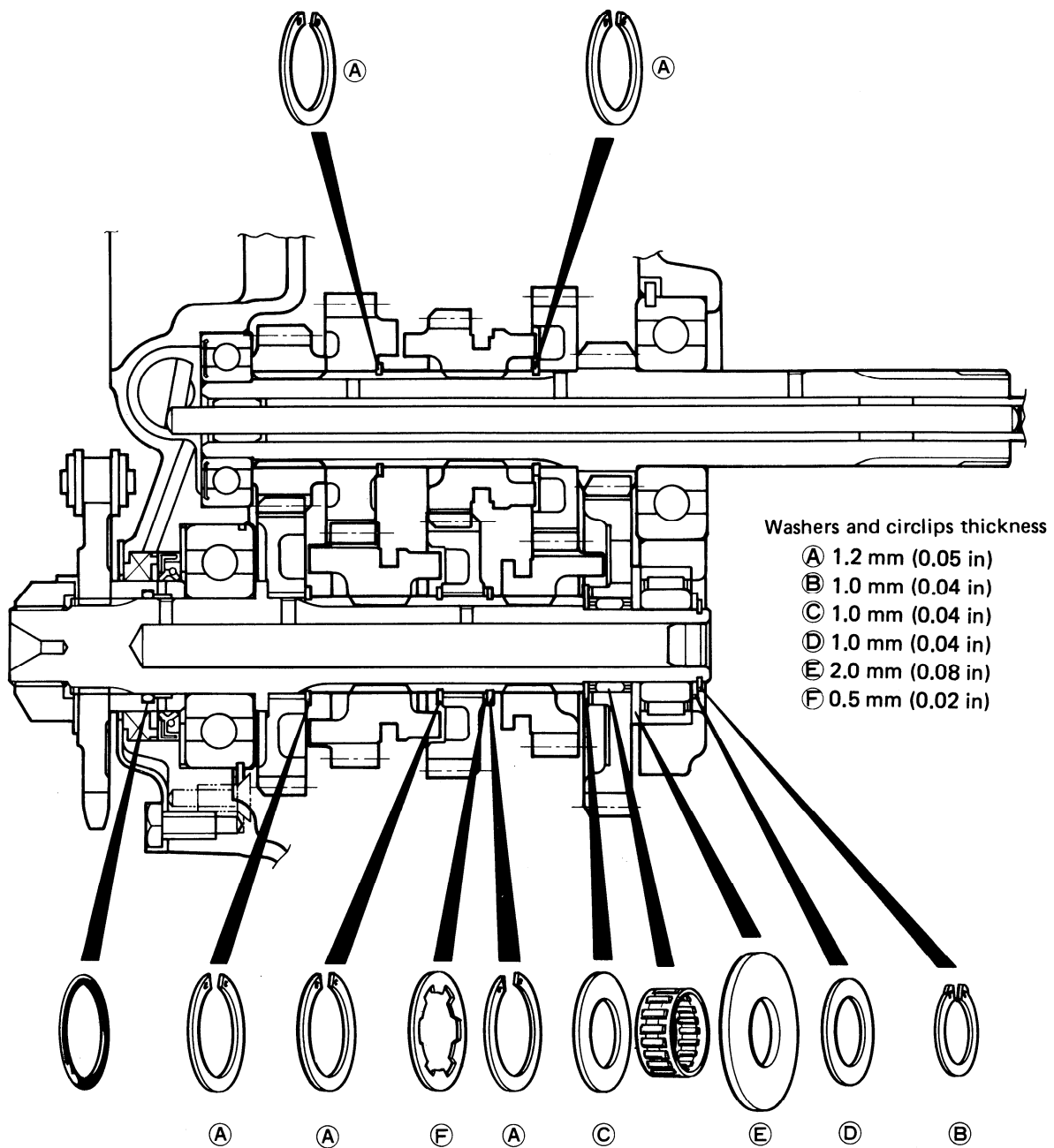


CAUTION:

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:**

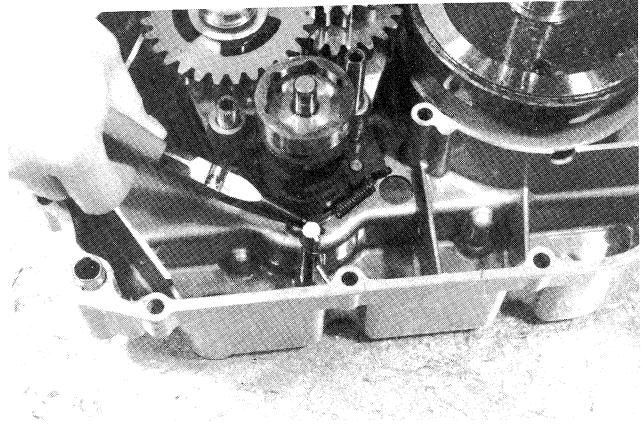
- * Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.
- * When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.
- * After installing a circlip, 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 "1303" to the threaded parts of the bearing retainer screws.

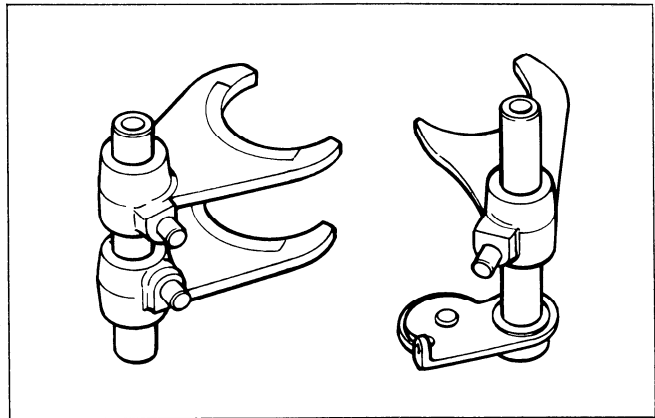
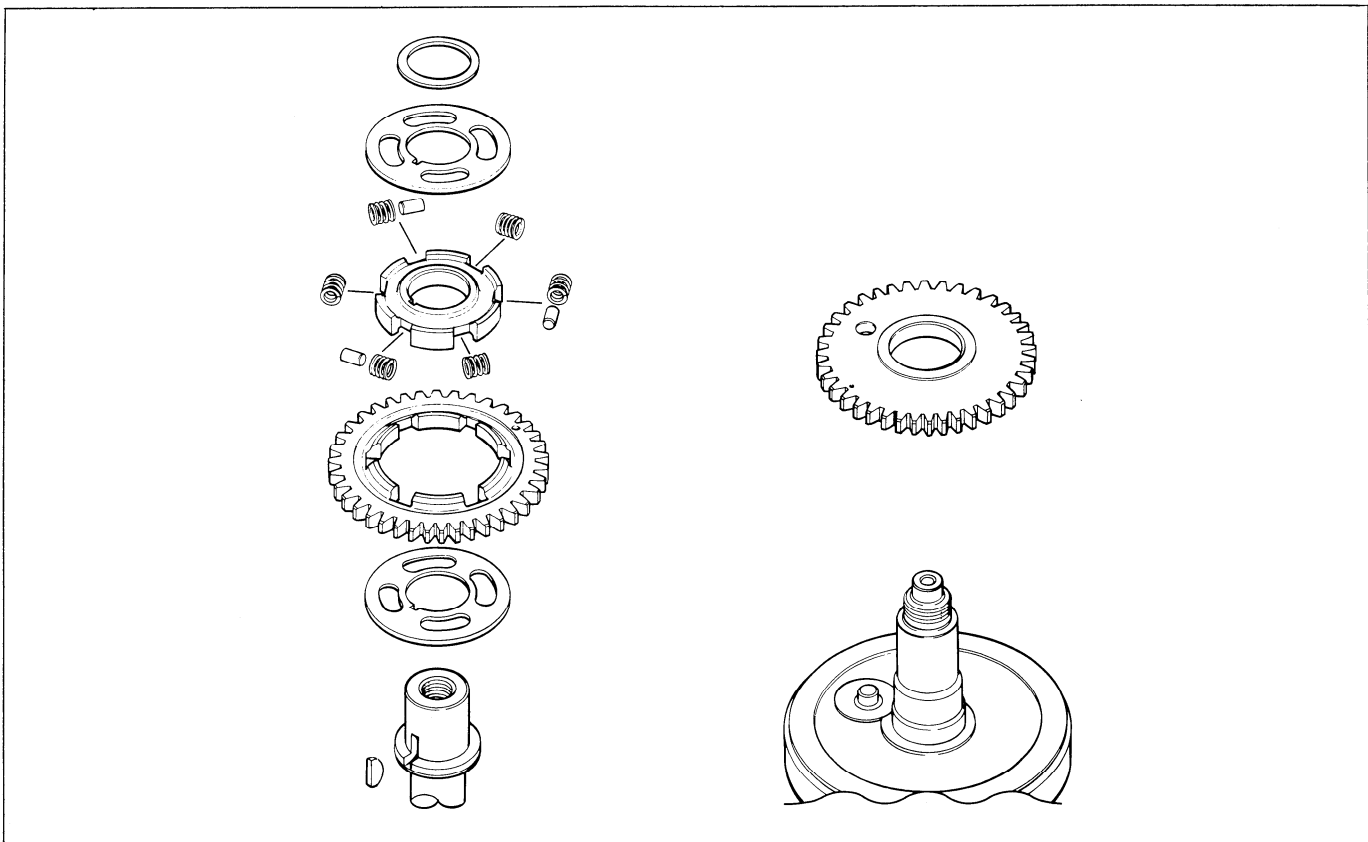
In reassembling the transmission, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips.

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

**NOTE:**

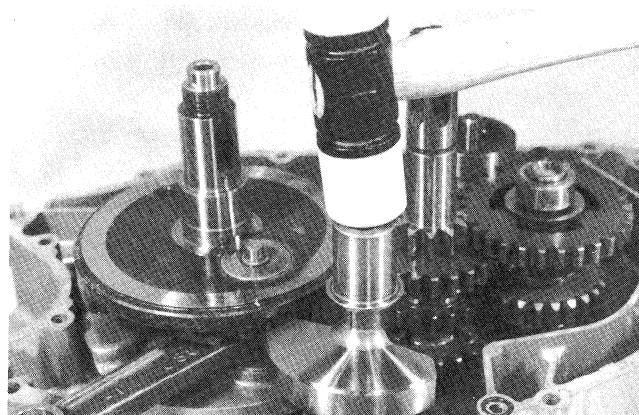
Three gear shifting forks are used. They resemble each other very closely in external appearance and configuration.

Carefully examine the illustration for correct installing positions and directions.

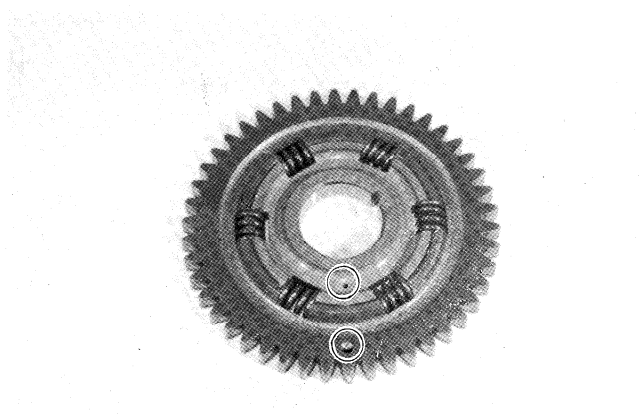
**BALANCER SHAFT DRIVE GEAR AND DRIVEN GEAR**

BALANCERSHAFT

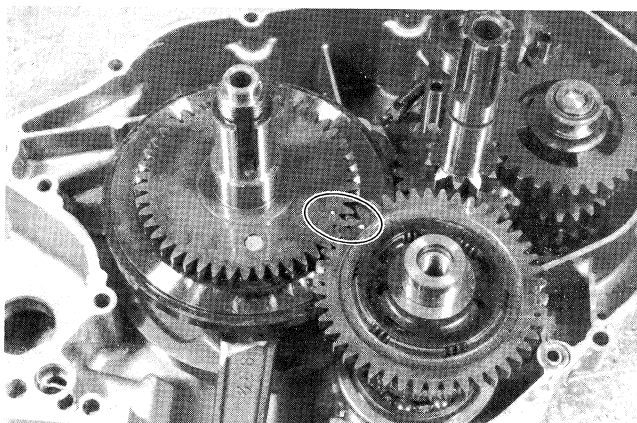
- Install the balancershaft into the left crankcase by plastic hammer, then fit the key.

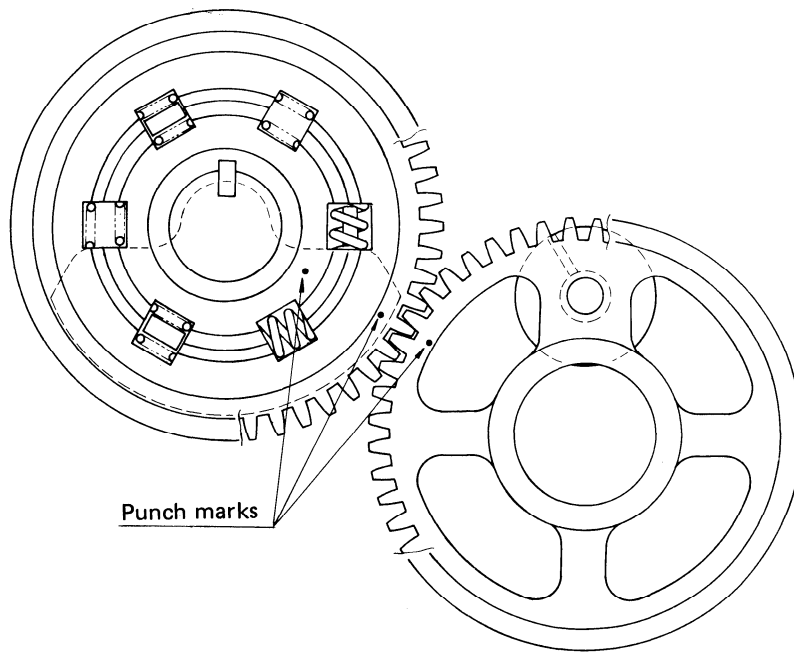
**BALANCER DRIVE GEAR AND DRIVEN GEAR**

- Align the punch mark shown on the driven gear with the punch mark shown on the inner race, then fit the damper springs and pins.
- Install the driven gear plates and driven gear ass'y onto the balancershaft.



- Install the drive gear onto the crankshaft, align the punch mark shown on the drive gear with the punch mark shown on the driven gear.



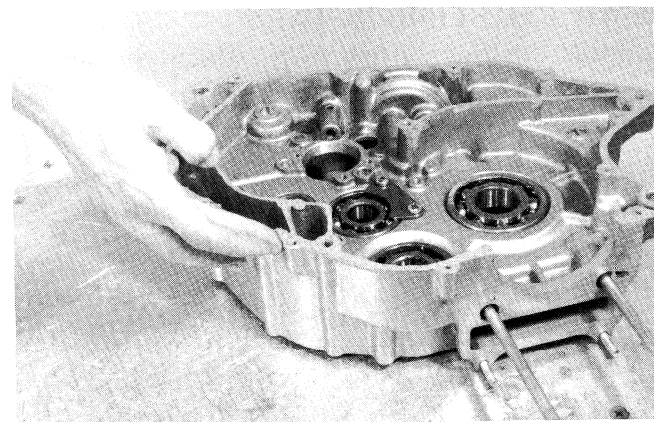
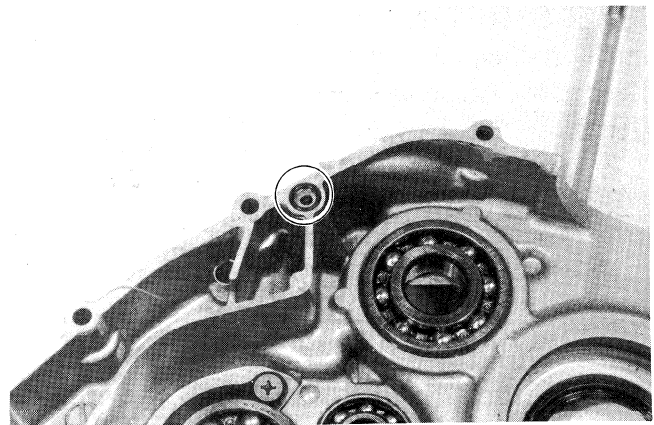


NOTE:
Align the three punch marks in line.

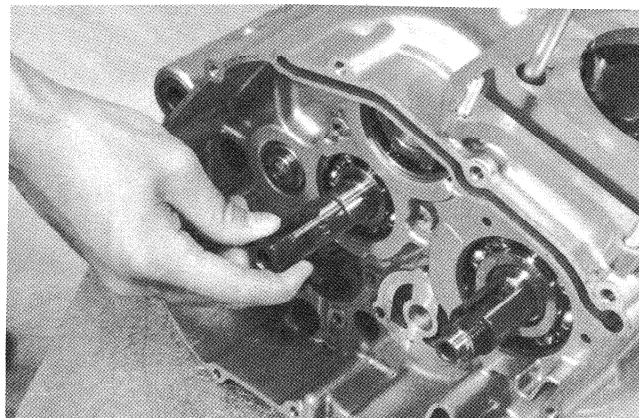
CRANKCASE

When reassembling the crankcase pay attention to the following.

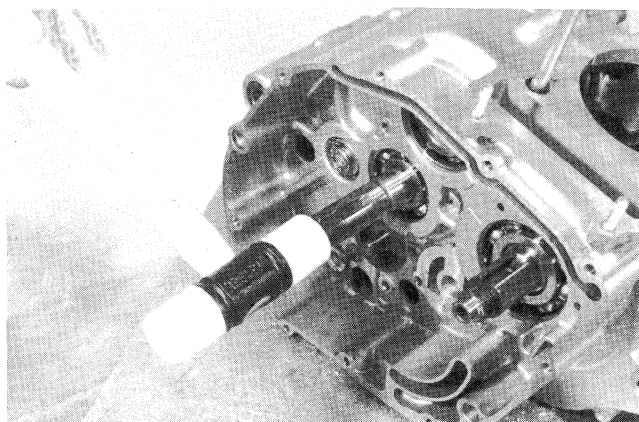
- Coat SUPER GREASE "A" to the lip of oil seals.
- Remove sealant material on the fitting surfaces of right and left halves of crankcase and thoroughly remove oil stains.
- Fit dowel pins on the left half.
- Fit O-ring the left half as shown in Fig.
- Apply engine oil to the big end of the crankshaft conrod and all parts of the transmission gears.
- Apply SUZUKI BOND No. 1215 (99104-31110) uniformly to the fitting surface of the right 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.



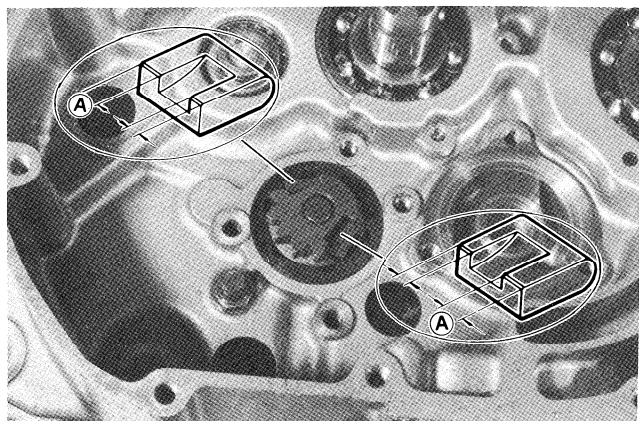
- If a large resistance is felt to rotation, try to free the shafts by tapping the driveshaft or countershaft with a plastic hammer as shown in Fig.



GEAR SHIFTING CAM DRIVEN GEAR

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

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

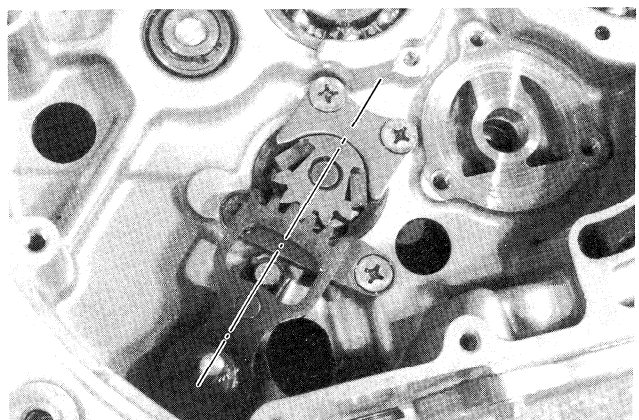


Thread lock "1342"	99104-32050
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GEAR SHIFTING SHAFT

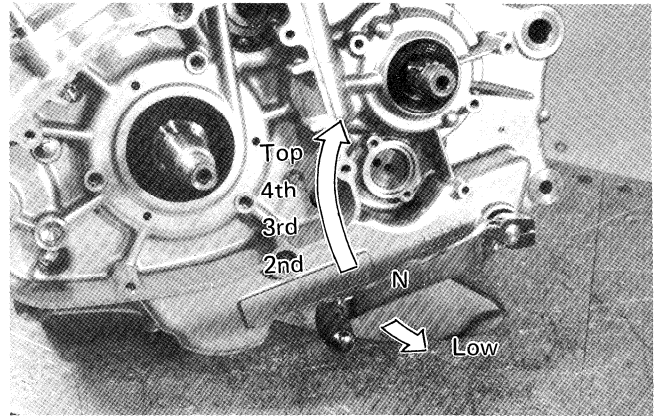
- Install the gear shifting shaft. Match the center teeth of the gear on the shifting shaft with the center teeth on the shifting driven gear as shown.
- Apply the grease to the oil seal lip of gear shifting shaft.

SUZUKI super grease "A"	99000-25030
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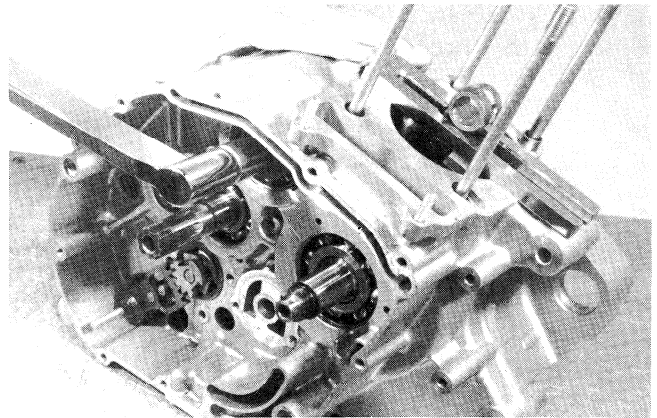
NOTE:

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 countershaft 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.

**BALANCER**

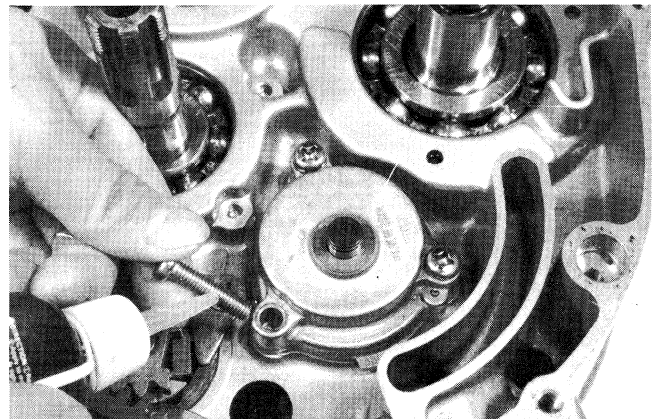
- Tighten balancer setting bolt to the specified torque.

Tightening torque	3.4 – 4.5 kg-m (34 – 45 N·m) (24.5 – 32.5 lb-ft)
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**OIL PUMP**

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

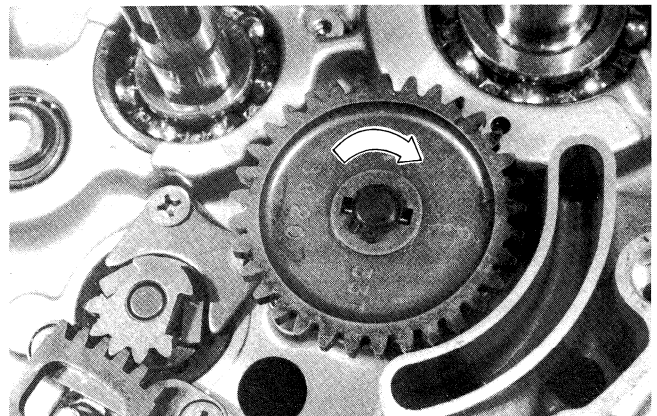
Thread lock "1342"	99104-32050
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- Tighten the oil pump mounting screws.

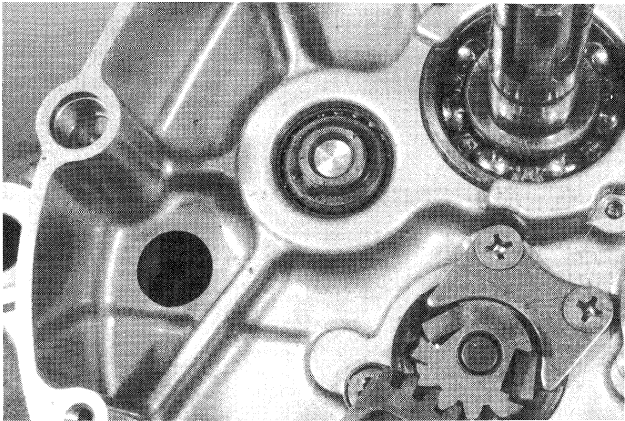
NOTE:

After mounting the oil pump in the crank-case, rotate the pump gear by hand to see if it turns smoothly.



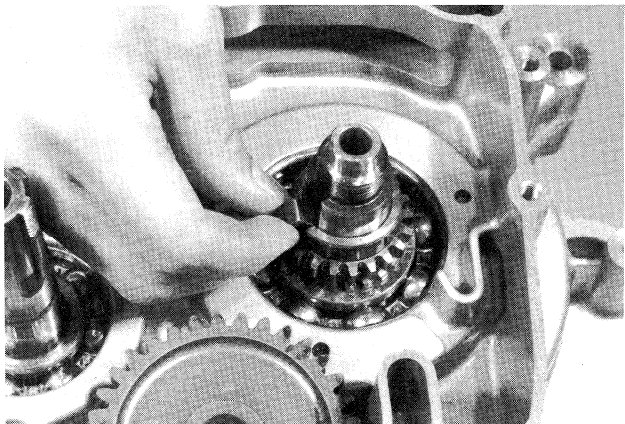
DRIVE SHAFT RETAINER

- Install the circlip.

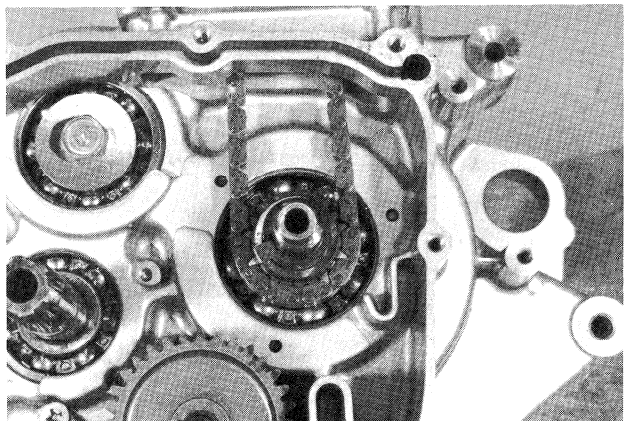


CHAIN DRIVE SPROCKET

- Install the sprocket and fit the keys.



- Engage the chain on the sprocket.



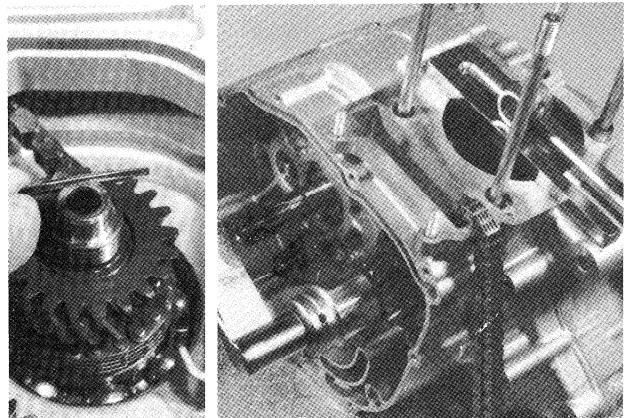
PRIMARY DRIVE GEAR

- Install the primary drive gear and wave washer, and tighten it with a torque wrench to the specified torque.

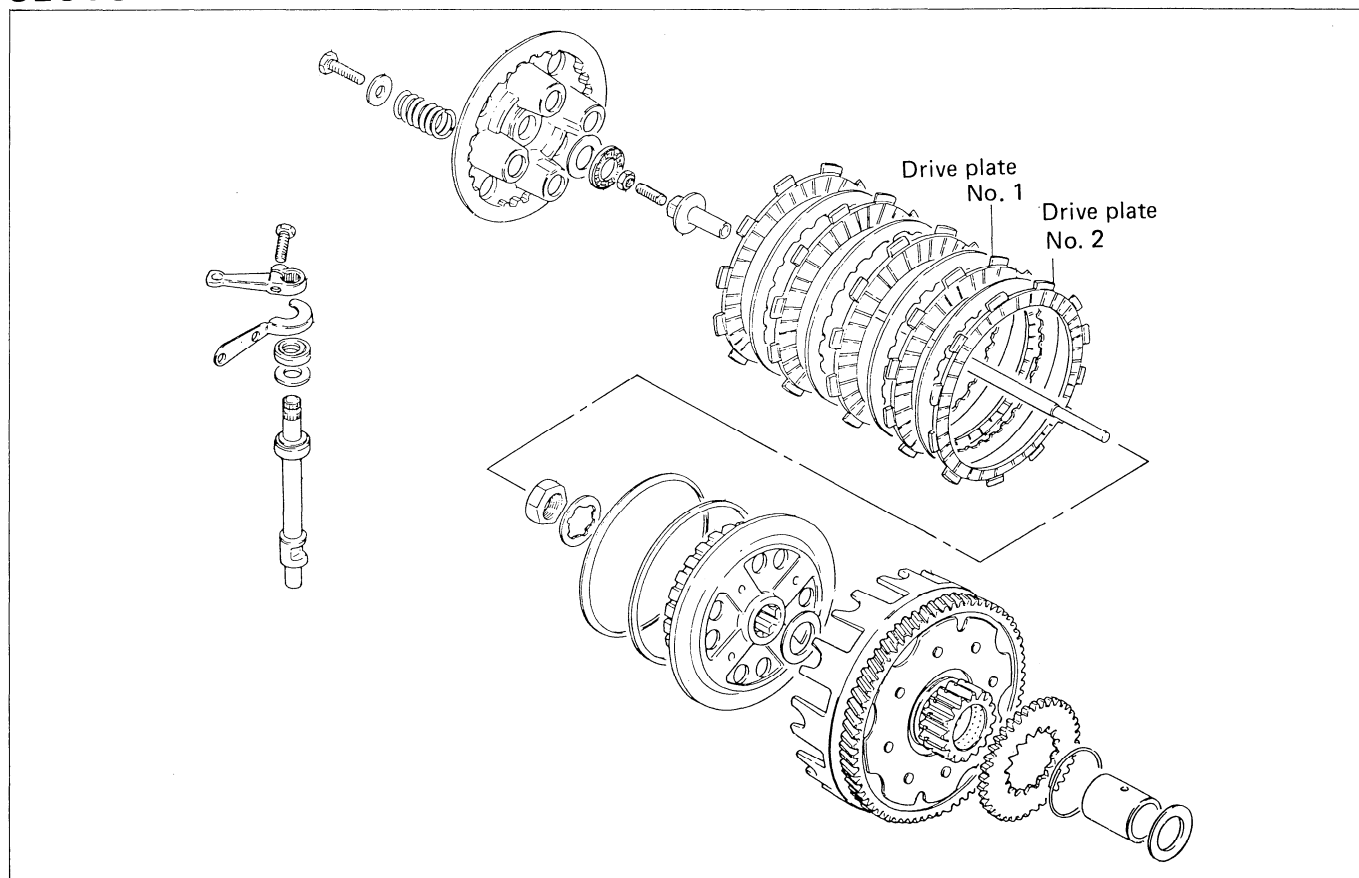
Conrod holder	09910-20116
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NOTE:
This is a left-hand thread nut.

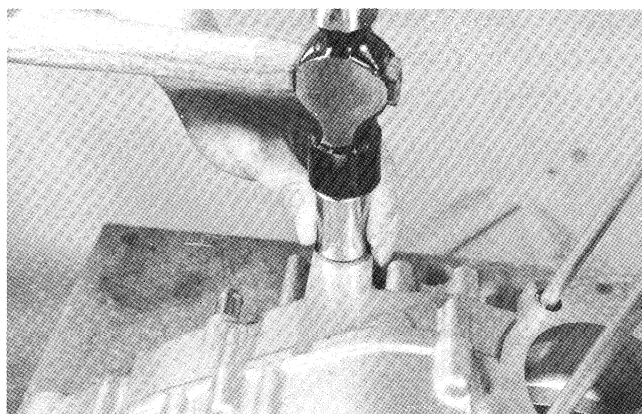
Tightening torque	9.0 – 11.0 kg-m (90 – 110 N·m) (65.0 – 79.5 lb-ft)
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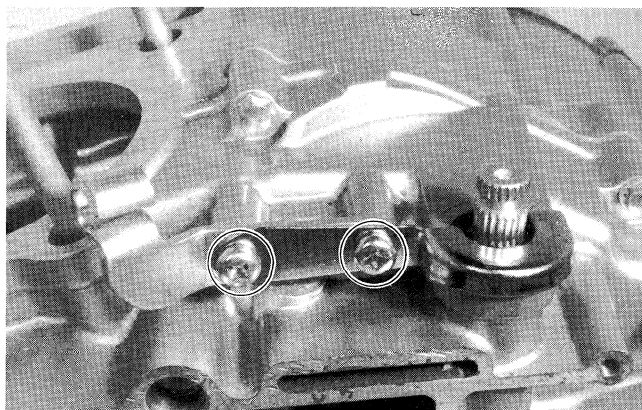
CLUTCH



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



- Fit the oil seal plate by screwing the retainer screws.



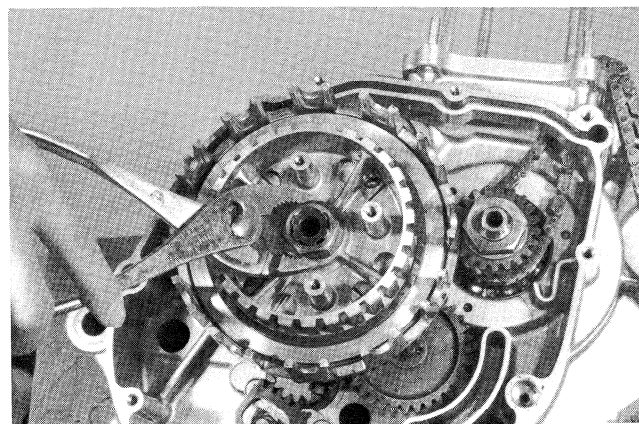
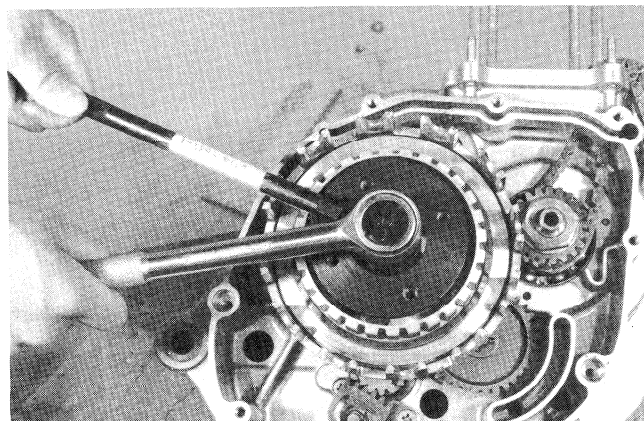
Assemble the clutch, in the reverse order of disassembly. Pay attention to the following points.

- 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.

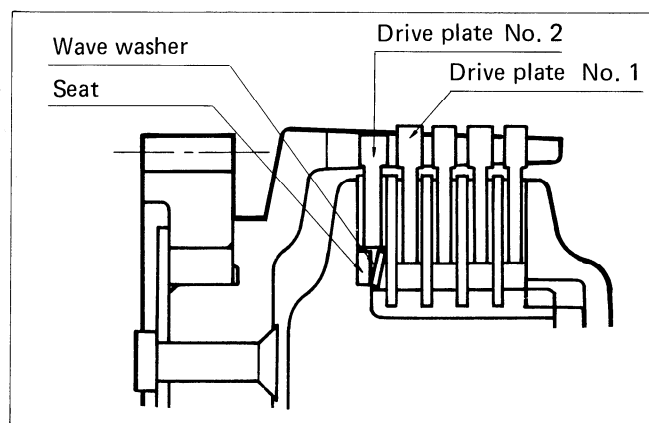
Clutch sleeve hub holder	09920-53721
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Tightening torque	$4.0 - 6.0 \text{ kg-m}$ $(40 - 60 \text{ N}\cdot\text{m})$ $(29.0 - 43.5 \text{ lb-ft})$
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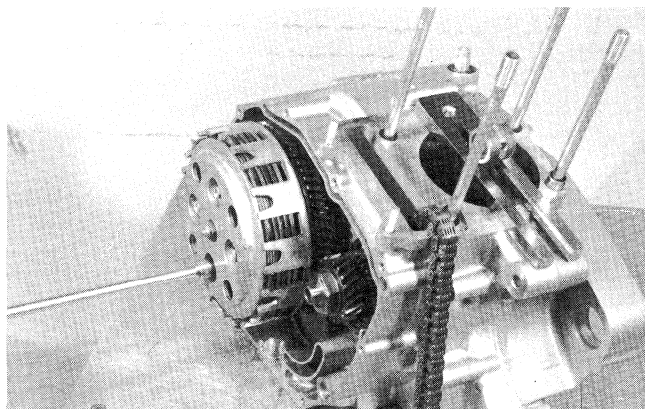
- Be sure to lock the nut by firmly bending the tongue of the washer.



- Install wave washer seat, wave washer, drive plates and driven plates to the sleeve hub.
- Insert push rod in the countershaft.

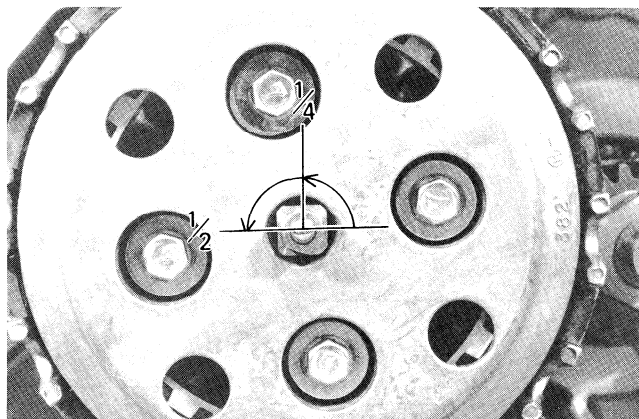


- Tighten clutch spring bolts diagonally.

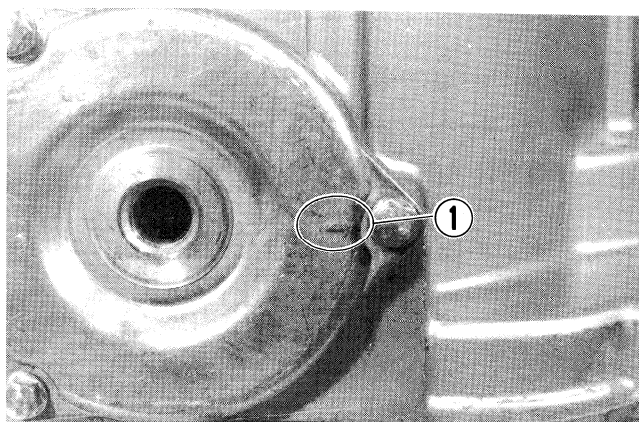


Clutch release screw adjustment

- Loosen the lock nut, and turn in the release screw to feel high resistance.
- From that position, turn out the release screw $\frac{1}{4}$ – $\frac{1}{2}$ turn, and tighten the lock nut.

**OIL SUMP FILTER**

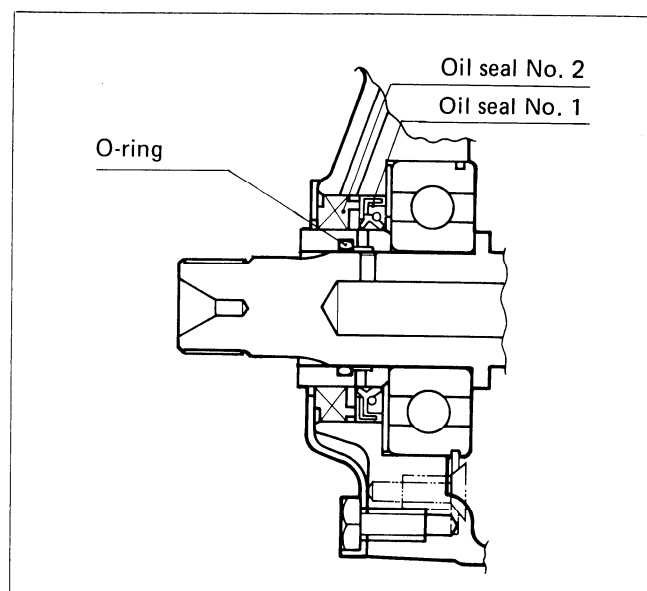
- Wash the sump filter with cleaning solvent, and then blow compressed air through it to dry off solvent.
- After mounting the sump filter, fit the cap and tighten it.

**DRIVESHAFT OIL SEAL****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 positions and directions.
- * Replace "O" ring with a new one every disassembly.

NOTE:

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



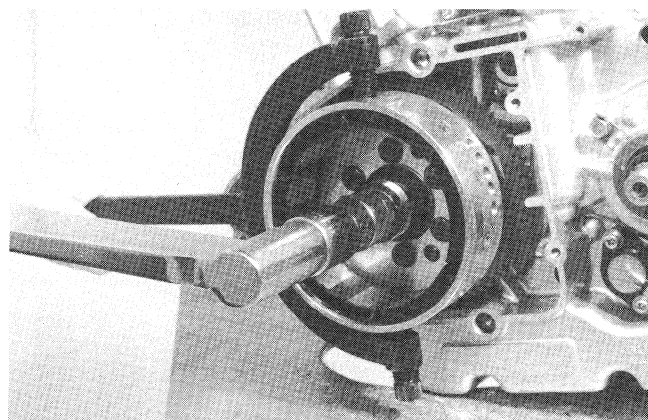
MAGNETO ROTOR

- Fit key in the key slot on the crankshaft.
- Install the magneto rotor.
- Apply a small quantity of THREAD LOCK SUPER "1303" to the threaded parts of crankshaft.
- Tighten magneto rotor nut to the specified

Thread lock super "1303"	99104-32090
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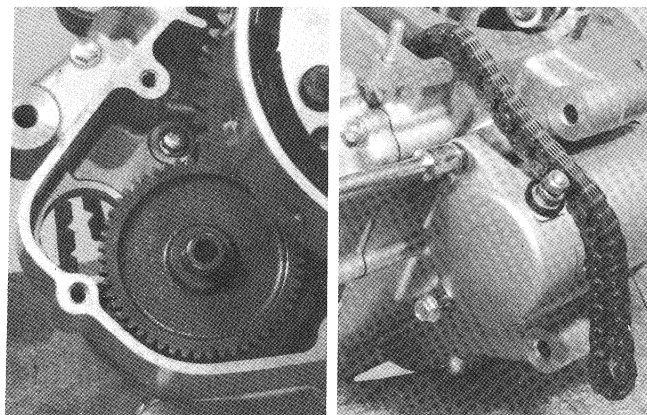
Rotor holder	09930-44911
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Tightening torque	13.0 – 14.0 kg-m (130 – 140 N·m) (94.0 – 101.5 lb-ft)
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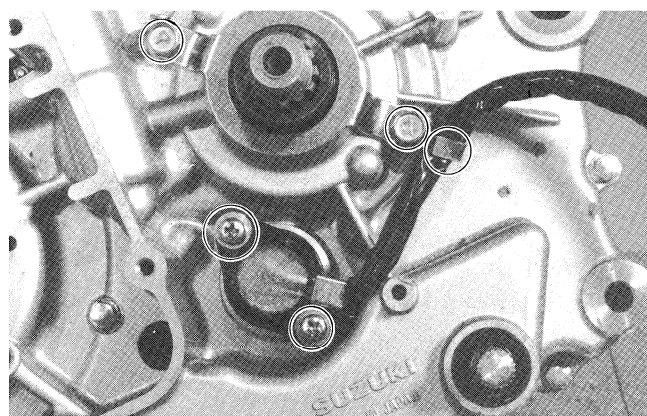
STARTER MOTOR

- Install the starter idle gear.
- Install the starter motor.



GEAR POSITION SWITCH

- Install the gear position switch and clamp the wire harness.



ENGINE SPROCKET

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

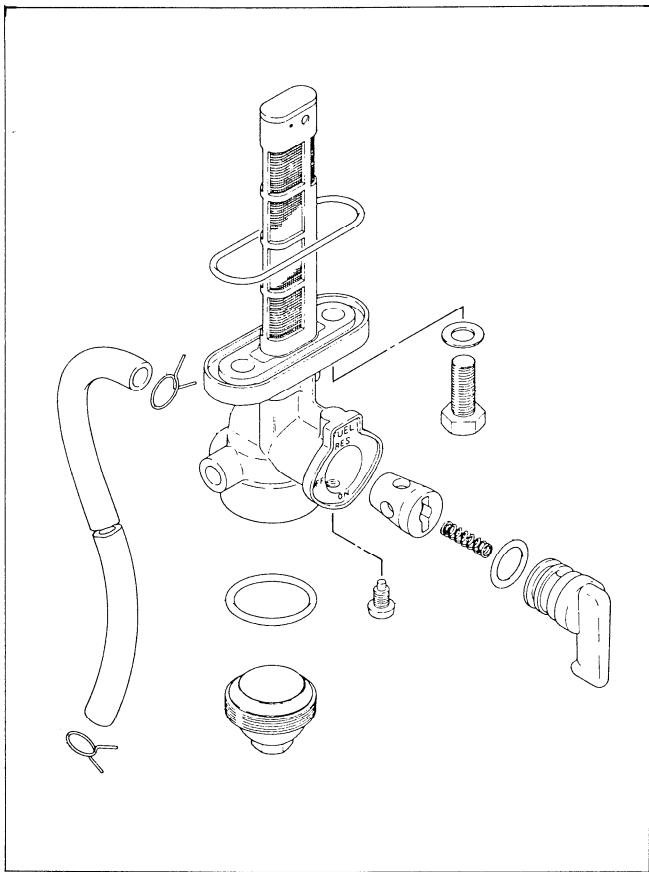
Tightening torque	80 – 100 N·m (8.0 – 10.0 kg-m) (58.0 – 72.5 lb-ft)
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FUEL AND LUBRICATION SYSTEM

CONTENTS

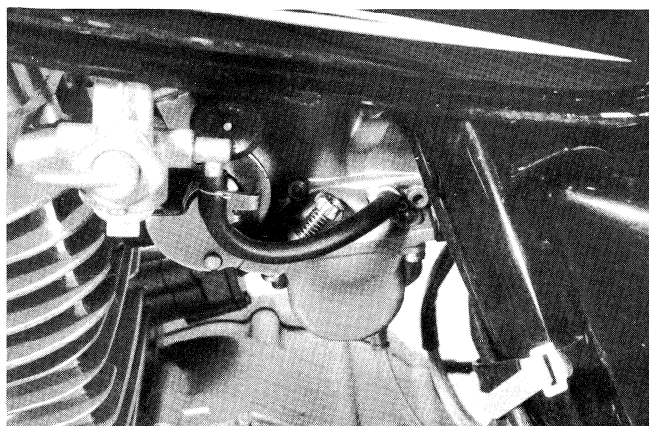
<i>FUEL COCK</i>	<i>4- 1</i>
<i>CARBURETOR</i>	<i>4- 2</i>
<i>LUBRICATION SYSTEM</i>	<i>4-1 1</i>

FUEL COCK



DISASSEMBLY

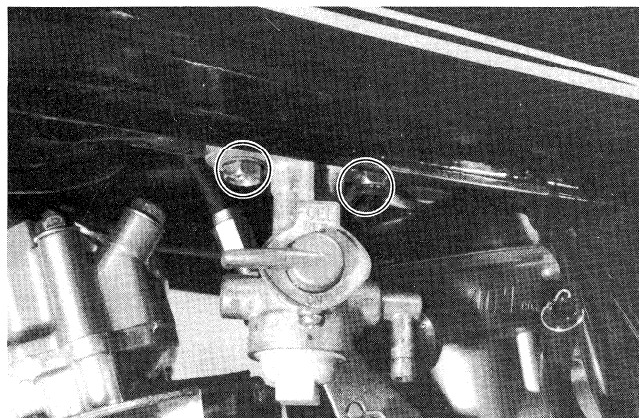
- Turn fuel cock to "OFF" position and disconnect fuel hose from the fuel cock.



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

WARNING:

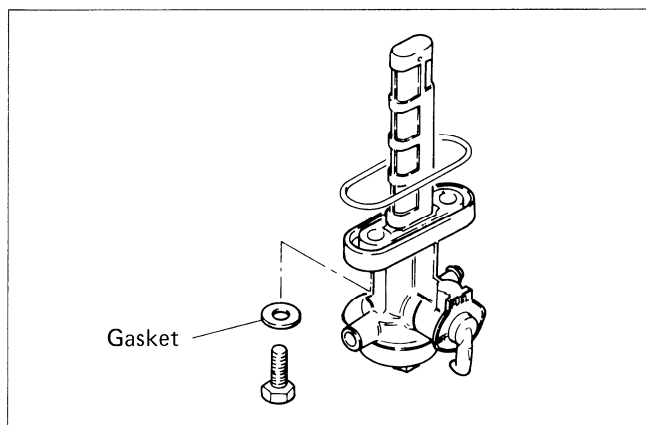
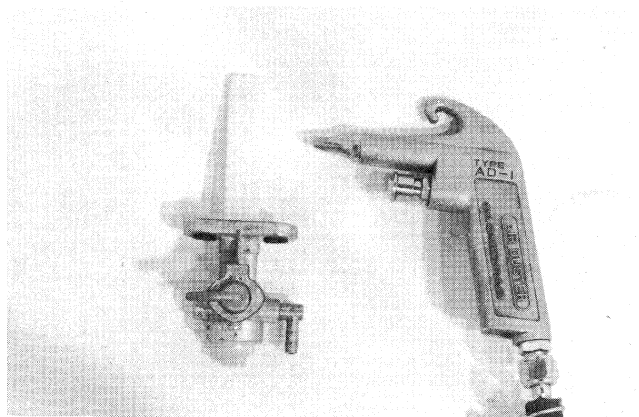
Gasoline is very explosive. Extreme care must be used.



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.

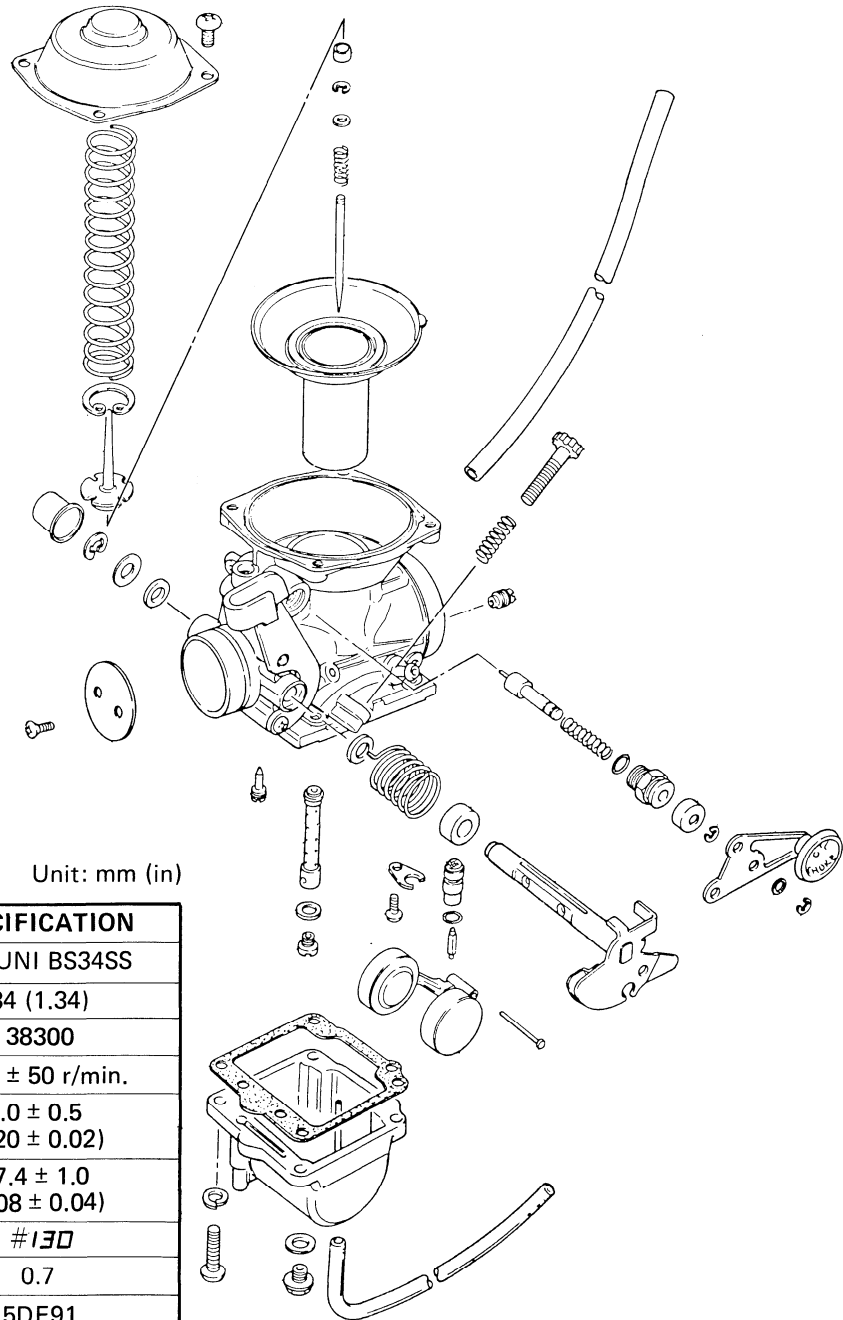


WARNING:

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

CARBURETOR

CARBURETOR CONSTRUCTION



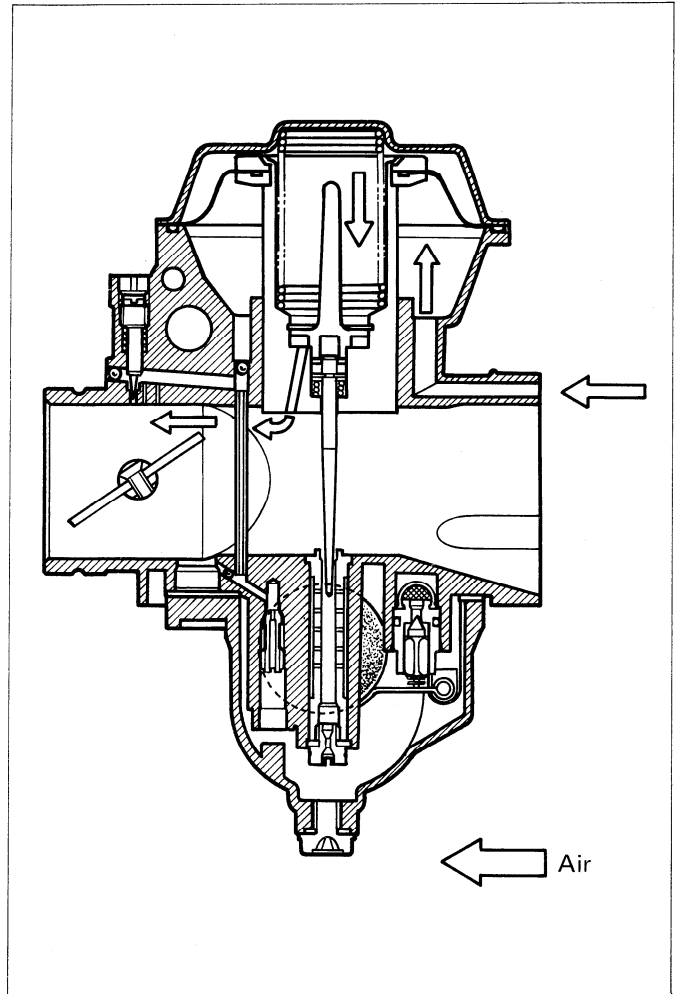
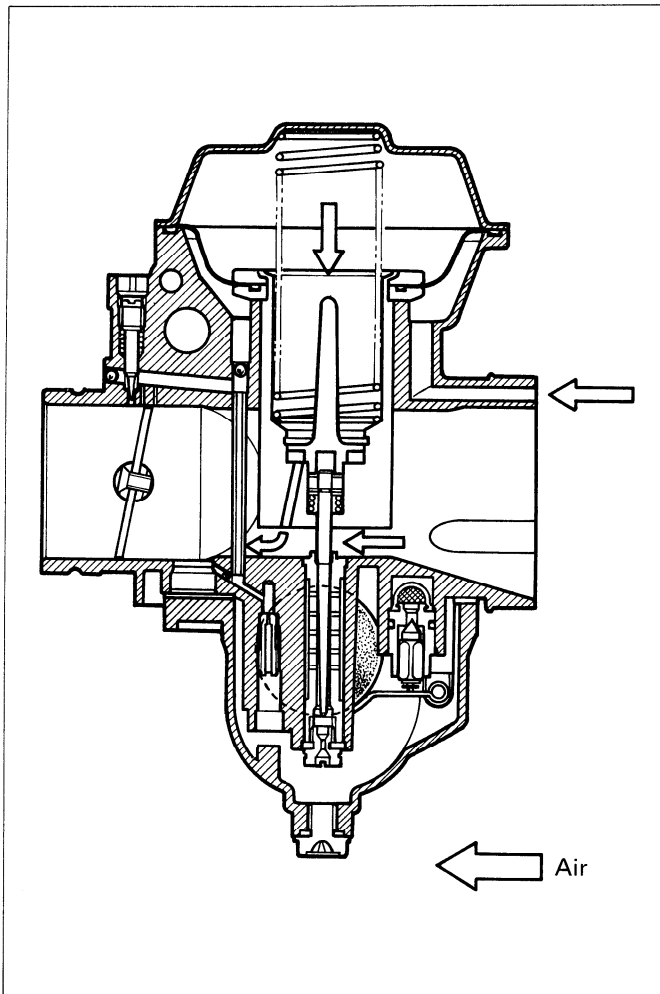
Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS34SS
Bore size		34 (1.34)
I.D. No.		38300
Idle r/min.		1250 ± 50 r/min.
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		27.4 ± 1.0 (1.08 ± 0.04)
Main jet	(M. J.)	#130
Main air jet	(M. A. J.)	0.7
Jet needle	(J. N.)	5DF91
Needle jet	(N. J.)	0-9
Pilot jet	(P. J.)	#42.5
By pass	(B. P.)	1.0, 0.7, 0.8, 0.8
Pilot outlet	(P. O.)	0.7
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	#40
Pilot screw	(P. S.)	PRE-SET
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)

DIAPHRAGM AND PISTON OPERATION

The carburetor is of a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston according to the vacuum present on the downstream side of the venturi. Vacuum is admitted into the diaphragm chamber through an orifice provided in the piston.

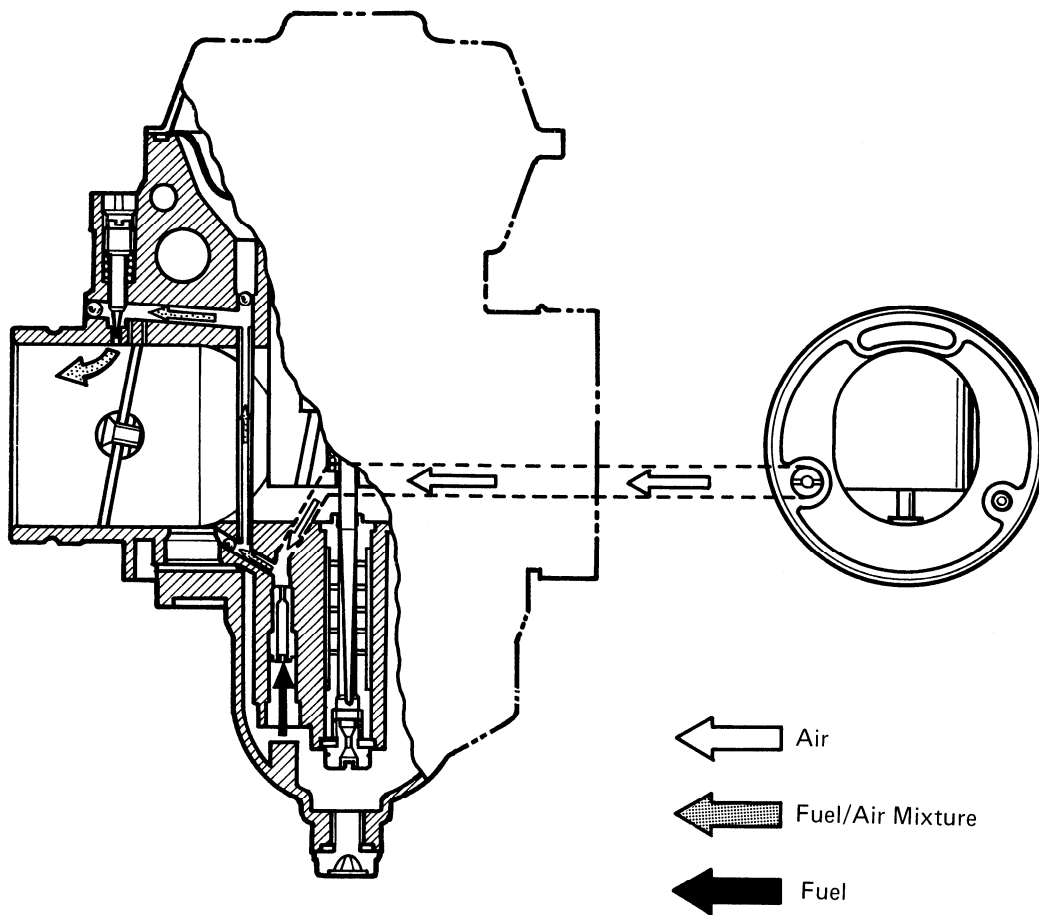
Rising vacuum overcomes the spring force, causing the piston to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing an optimum ratio of fuel to air in the mixture.



SLOW SYSTEM

This system supplies fuel during engine operation with throttle valve closed or slight opened.

The fuel from float chamber is metered by pilot jet where it mixes with air coming in through pilot air jet. This mixture, rich with fuel, then goes up through pilot pipe to pilot screw. A part of the mixture is discharged into the main bore out of by-pass ports. The remainder is then metered by pilot screw and sprayed out into the main bore through pilot outlet.



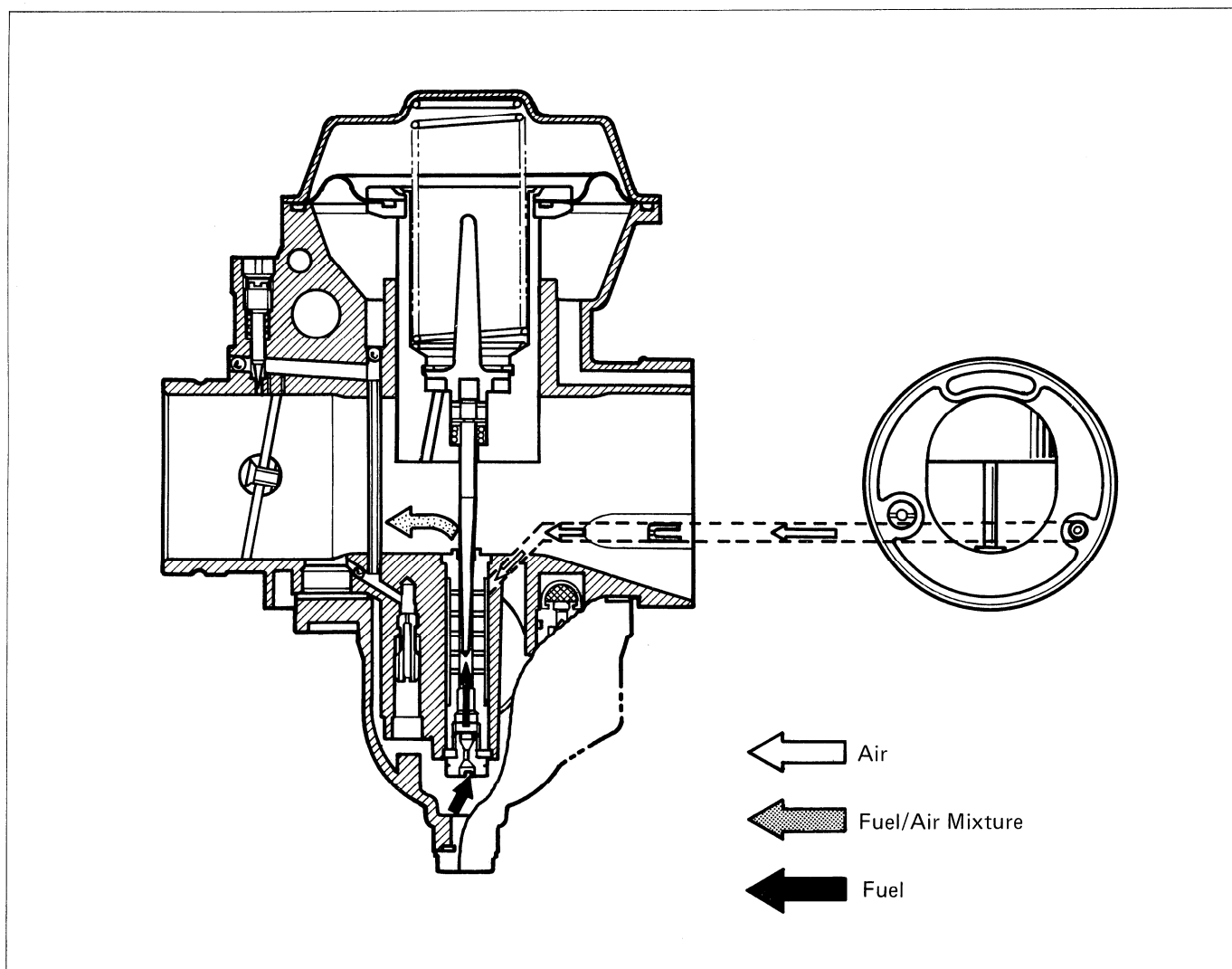
MAIN SYSTEM

As throttle valve is opened, engine speed rises, and this increases vacuum in the venturi. Consequently the piston valve moves upward.

Meanwhile, the fuel in float chamber is metered by main jet, and the metered fuel enters needle jet, in which it mixes with the air admitted through main air jet to form an emulsion.

The emulsified fuel then passes through the clearance between needle jet and jet needle, and is discharged into the venturi, in which it meets main air stream being drawn by the engine.

Mixture proportioning is accomplished in needle jet; the clearance through which the emulsified fuel must flow is large or small, depending ultimately on throttle position.

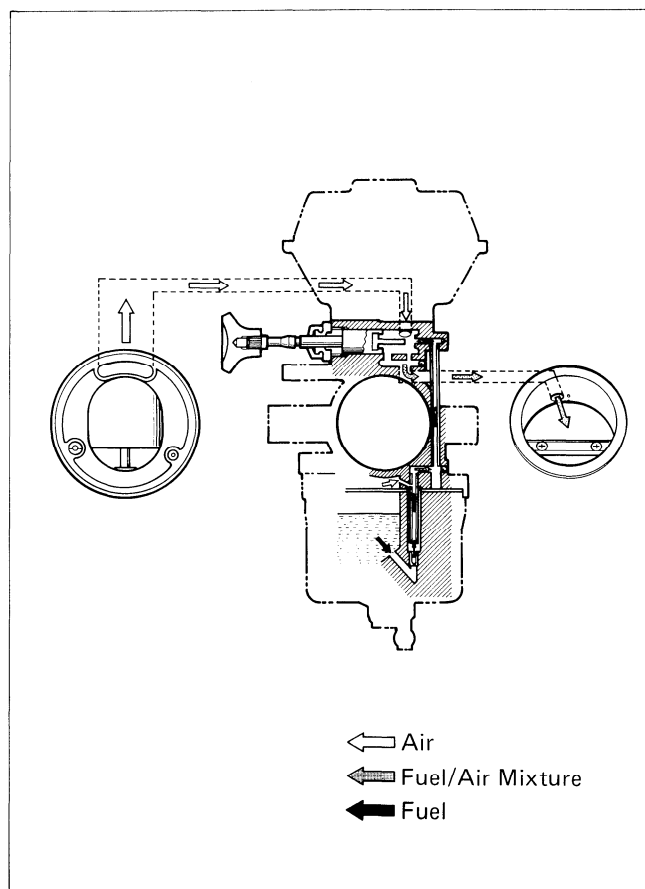


STARTER SYSTEM

Pulling the choke knob slides starting plunger to draw fuel into the starter circuit from the float chamber through starter jet.

Starter jet meters this fuel, which then flows into starter pipe and mixes with the air coming from the float chamber. The mixture, rich in fuel content, reaches starting plunger and mixes again with the air coming through a passage extending from behind the diaphragm.

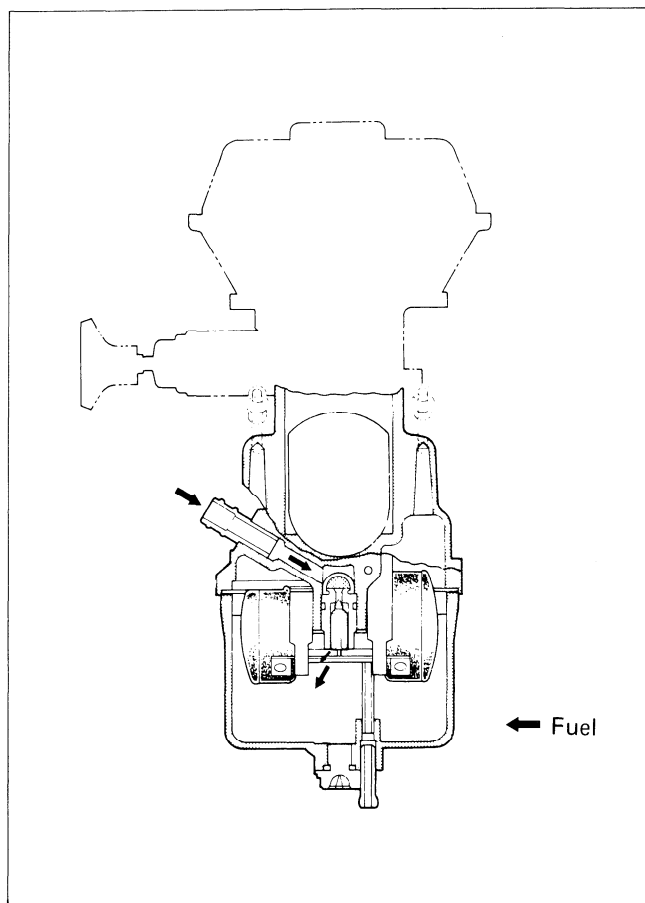
The two successive mixings of fuel with air are such that a proper air/fuel mixture to starting is produced when the mixture is sprayed out through starter outlet into the main bore.



FLOAT SYSTEM

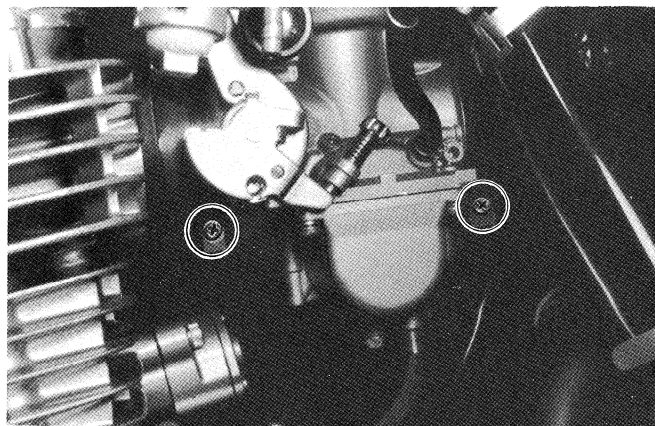
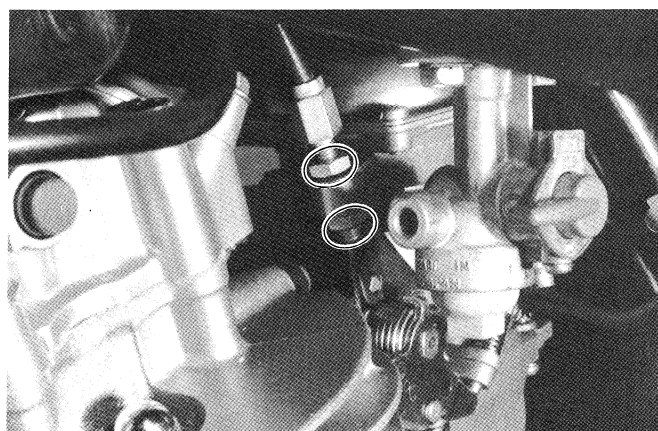
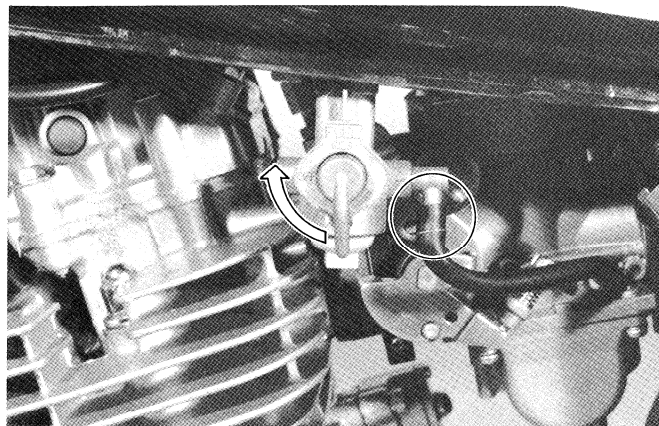
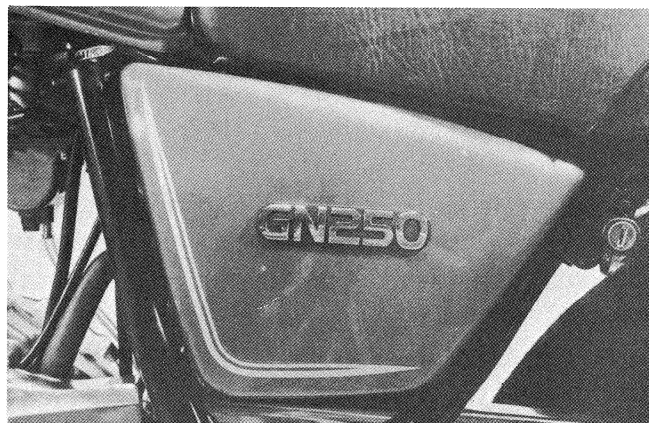
Floats and needle valve are associated with the same mechanism, so that, as the floats move up and down, the needle valve too moves likewise. When fuel level is up in float chamber, floats are up and needle valve remains pushed up against valve seat. Under this condition, no fuel enters the float chamber.

As the fuel level falls, floats go down and needle valve unseats itself to admit fuel into the chamber. In this manner, needle valve admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber.

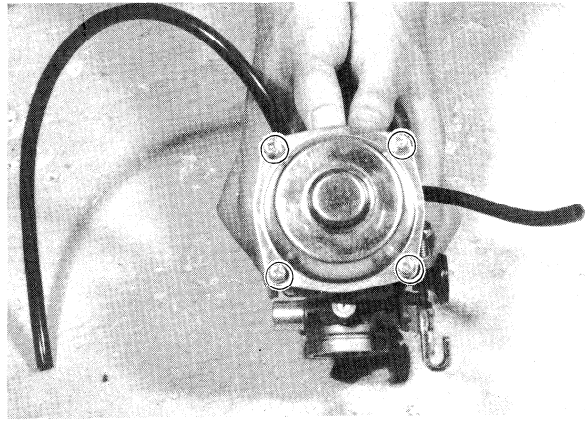


REMOVAL AND DISASSEMBLY

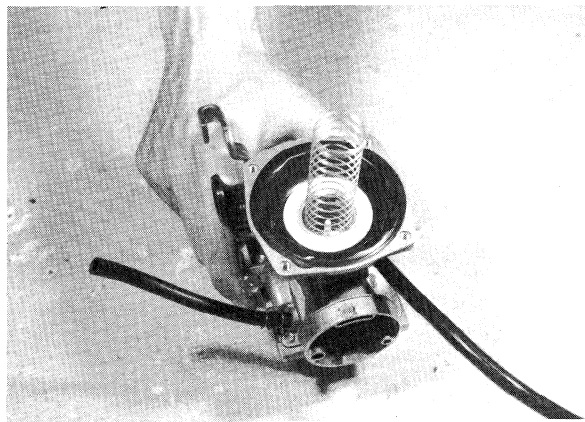
- Remove the left and right frame covers.
- Turn the fuel cock to the "OFF" position.
- Disconnect fuel hose from the fuel cock.
- Remove the throttle cable from the throttle lever.
- Loosen inlet pipe clamp screws, then take off the carburetor.



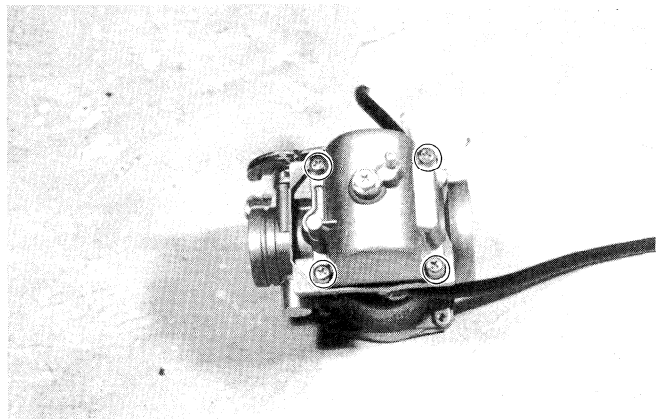
- Remove the carburetor top cover by unscrewing the cover screws.



- Remove the throttle valve and spring.



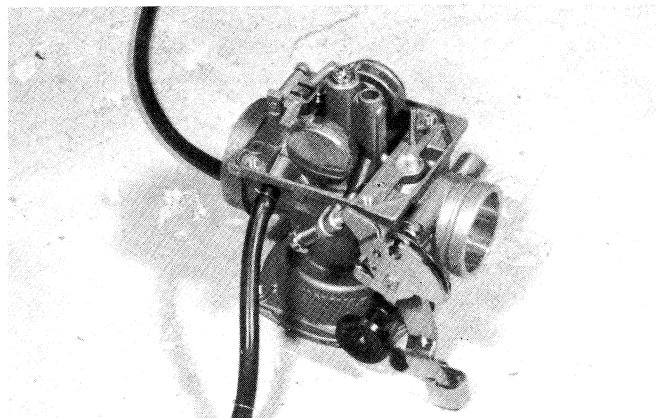
- Remove the float chamber body.



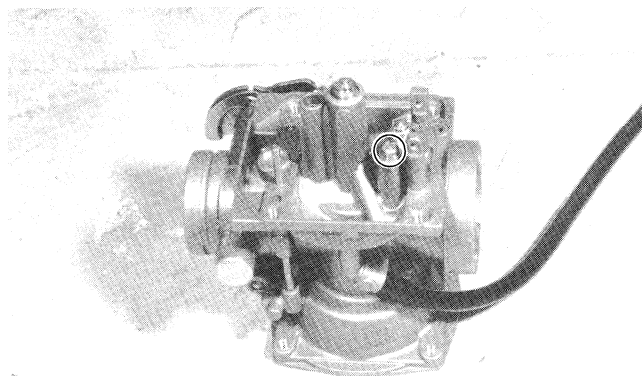
- Pull out the float pin and remove the float.

CAUTION:

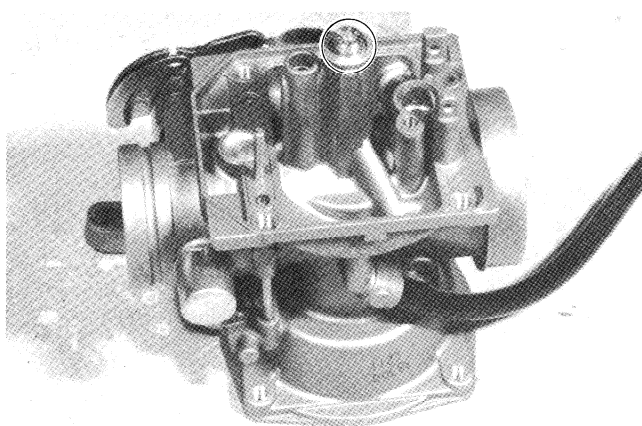
When removing the float pin be careful not to damage the carburetor body.



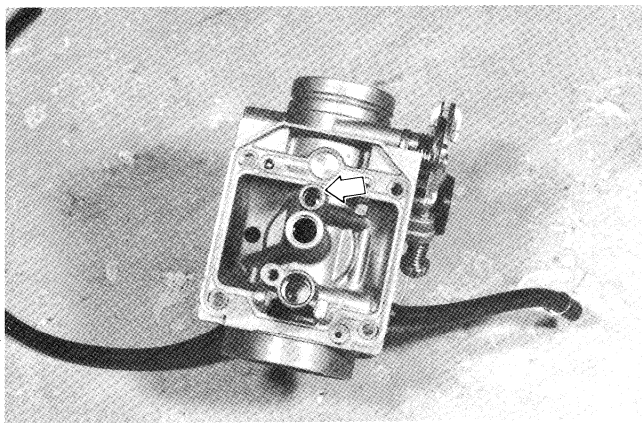
- Remove the valve seat plate and needle valve.



- Remove the main jet and needle jet.



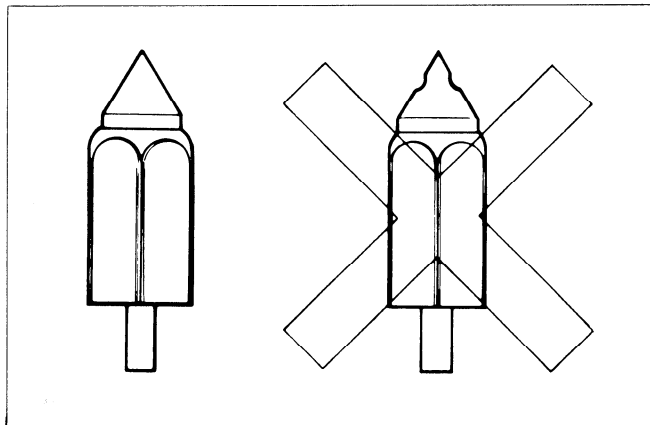
- Remove the pilot jet.



INSPECTION AND ADJUSTMENT

NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline. If the needle is worn as shown in the illustration, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.



FLOAT HEIGHT ADJUSTMENT

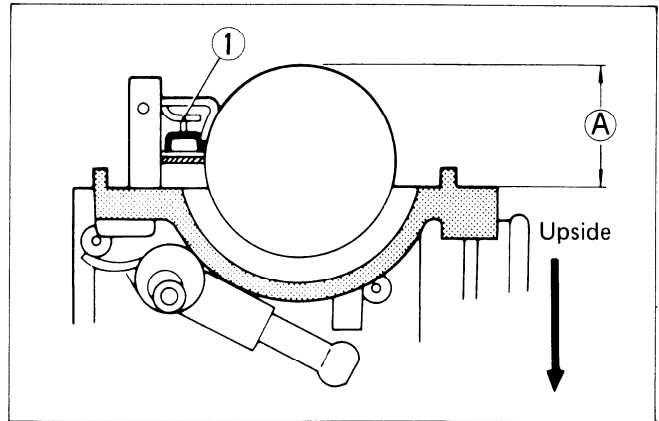
To check the float height, invert the carburetor body, holding the float arm pin so that the pin will not slip off. With the float arm kept free, measure the height **A** while float arm is just in contact with needle valve by using calipers.

Bend the tongue **1** as necessary to bring the height **A** to this value.

Float height	27.4 ± 1.0 mm (1.08 ± 0.04 in.)
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NOTE:

When measuring float height, be sure to remove the gasket.

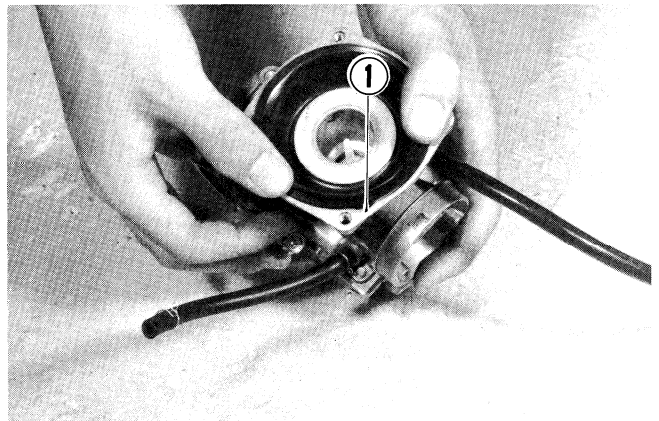


REASSEMBLY

Reassemble and remount the carburetor in the reverse order of disassembly and removal, and also carry out the following step and adjustment.

Step:

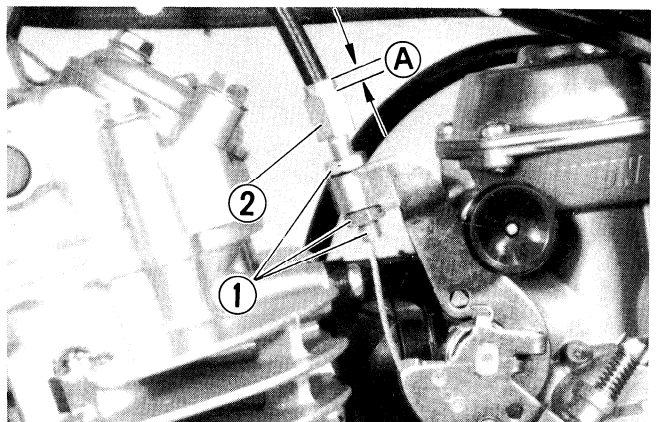
- Place torque **1** of diaphragm to carburetor body properly.



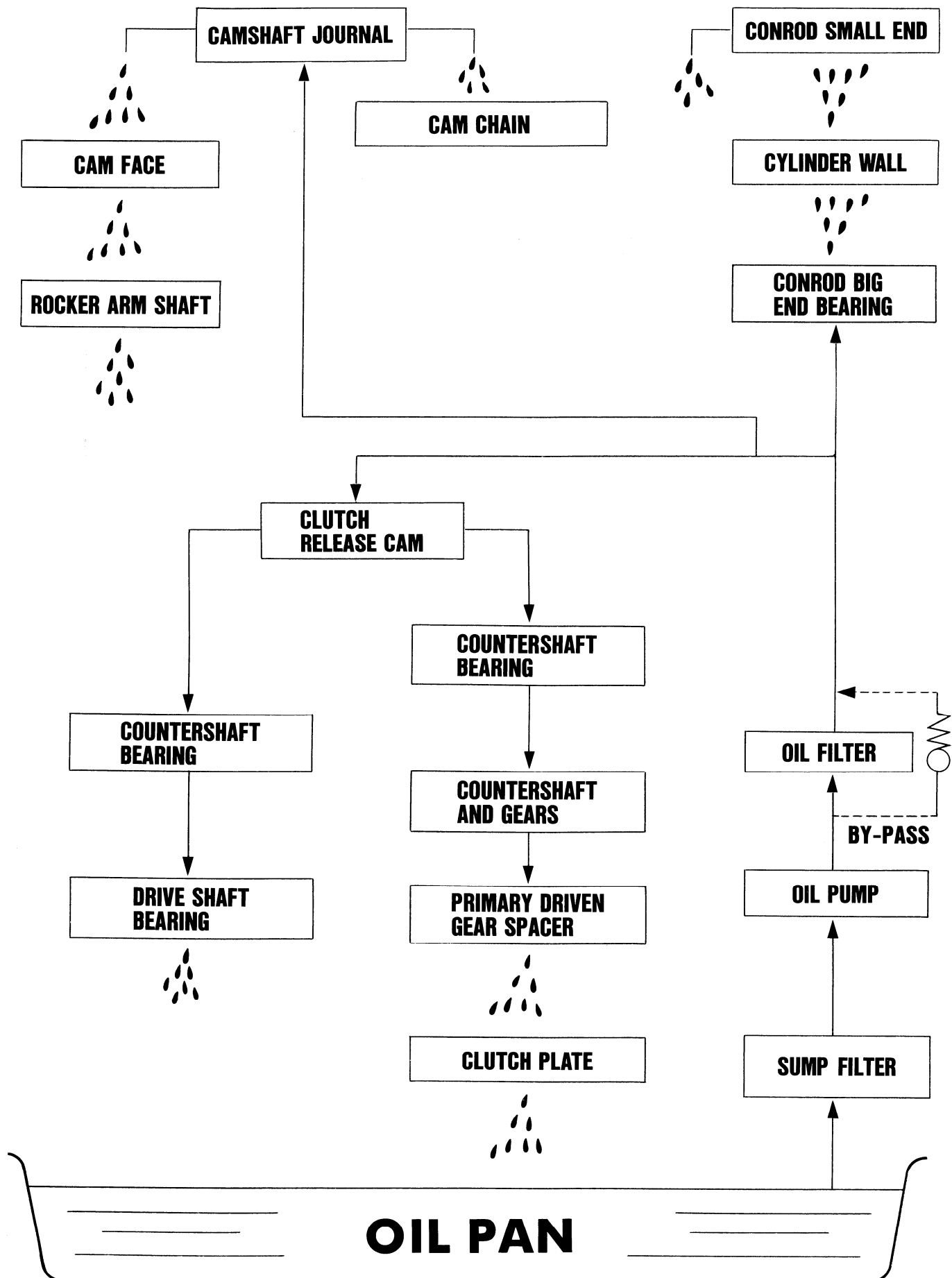
Adjustment:

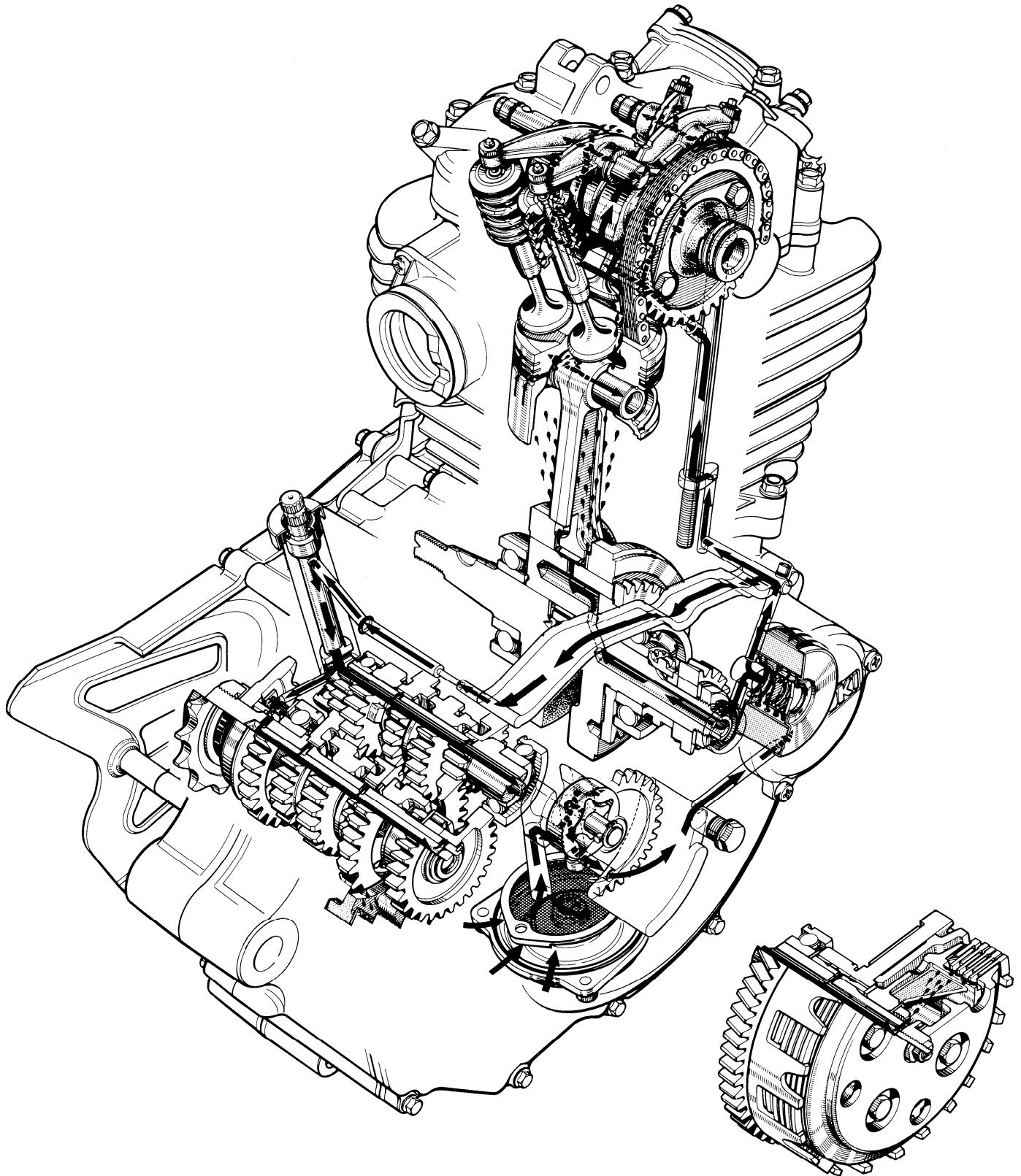
Throttle cable should be adjusted to have correct play **A** 0.5 – 1.0 mm (0.02 – 0.04 in).

- Loosen the lock nuts **1**.
- Slide the adjuster **2** to obtain the correct play 0.5 – 1.0 mm (0.02 – 0.04 in).
- After adjust the play, tighten the lock nuts.



LUBRICATION SYSTEM





EMISSION CONTROL & REGULATIONS

CONTENTS

<i>EMISSION REGULATIONS</i>	<i>5- 1</i>
<i>EMISSION CONTROL CARBURETOR COMPONENTS</i>	<i>5- 2</i>
<i>GENERAL EMISSION INFORMATION</i>	<i>5- 3</i>

EMISSION CONTROL AND REGULATIONS

EMISSION REGULATIONS

On February 4, 1977, Federal Emission Regulations for motorcycles that may be licensable took effect. The regulations provided for a gradual, multi-step application of stricter emission limits beginning with all effected motorcycles manufactured after January 1, 1978, culminating with the present 1980 emission level restrictions. For the 1980 and succeeding years one set of emission limits will be in effect. They are as follows:

1980 EMISSION LIMITS

CATEGORIES	HYDROCARBONS (HC)	CARBON MONOXIDE (CO)
All motorcycles 50 cc — Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

Emission-controlled motorcycles which are subject to the emission regulations are those motorcycles which are equipped with a headlight, taillight, stop light and which have an engine displacement larger than 50 cc.

Suzuki Motor Company performed all the necessary testing and certification of emission-controlled models in strict compliance with the E.P.A. testing regulations. Suzuki motorcycle dealers are not required to either test or certify emission levels on any motorcycles as Suzuki Motor Company is legally responsible for the entire certification procedure.

E.P.A. regulations also provide fines for individuals who alter, render inoperative or improperly service emission-controlled motorcycles ranging up to \$10,000.00 per motorcycle. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly all the service procedures presented in this manual. Under no circumstances should the recommended service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications or service procedures.

EMISSION CONTROL CARBURETOR COMPONENTS

GN250 motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

There are several carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard machined carburetor jets. These three (3) particular jets — MAIN JET, NEEDLE JET, PILOT JET — must not be replaced by standard jets. To aid in identifying these three (3) jets a different design of letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type close tolerance jets marked as in the examples shown below.

The jet needle is also of special manufacture. Only one clip position is provided on the jet needle. If replacement becomes necessary the jet needle may only be replaced with an equivalent performing replacement component. Suzuki recommends that Genuine Suzuki Parts be utilized whenever possible for the best possible performance and durability.

Conventional Figures Used on Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used On Close Tolerance Jet Components	<i>1 2 3 4 5 6 7 8 9 0</i>

The carburetor specification for the emission-controlled GN250 are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
38300	# <i>130</i>	<i>0-9</i>	5DF91	# <i>42.5</i>	PRE-SET DO NOT ADJUST

The pilot screw is pre-set by the factory utilizing specialized testing and adjusting procedures. The pilot screw is not adjustable as the idle circuit is "sealed" after factory adjustment. Adjusting, interfering with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If persons, who are unaware of these special carburetor servicing requirements tamper with the carburetor the Suzuki dealer should restore the carburetor to its original condition or if unable to effect repairs, contact the distributors representative for further technical information and assistance.

GENERAL EMISSION INFORMATION

There are three different types of regulated exhaust emissions. They are:

- Hydrocarbons (HC)
- Carbon Monoxide (CO)
- Oxides of Nitrogen (NOX)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

- Hydrocarbons (HC)
- Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air/fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%).

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner — Dirty or over oiled.
2. Idle Mixture — Adjusted incorrectly.
3. Idle Speed — Too high or low.
4. Fuel Level — Sticking float, leaking needle, incorrect setting.
5. Choke — Leaking or linkage sticking.

ENGINE MALFUNCTIONS

1. Valve Seals — Leaking or torn.
2. Valve Guide — Worn and leaking excess oil.
3. Gaskets — Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburned gasoline vapors and can be measured in two different ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark Plug — Fouled, dirty, improper type or improperly gapped.
2. Ignition Timing — Advanced or retarded.
3. Timing Advance — Too fast or too slow an advance rate.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner — Dirty, over oiled or torn.
2. Jets — Clogged, restricted or incorrect size.
3. Float Level — Level too low (lean) or too high (rich).
4. Choke — Leaking choke plunger or sticking linkage.
5. Air Leaks — Intake manifolds, engine gaskets and other sealing surfaces.
6. Exhaust System — Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emissions.

1. Rings — Low compression, leakage into crankcase.
2. Valves — Improper adjustment, bent stem or burnt.
3. Gaskets — Leaking, loss of compression.
4. Crank Seals — Leaking.
5. Oil Consumption — Worn valve guides, worn rings, clogged crankcase breather.

ELECTRICAL SYSTEM

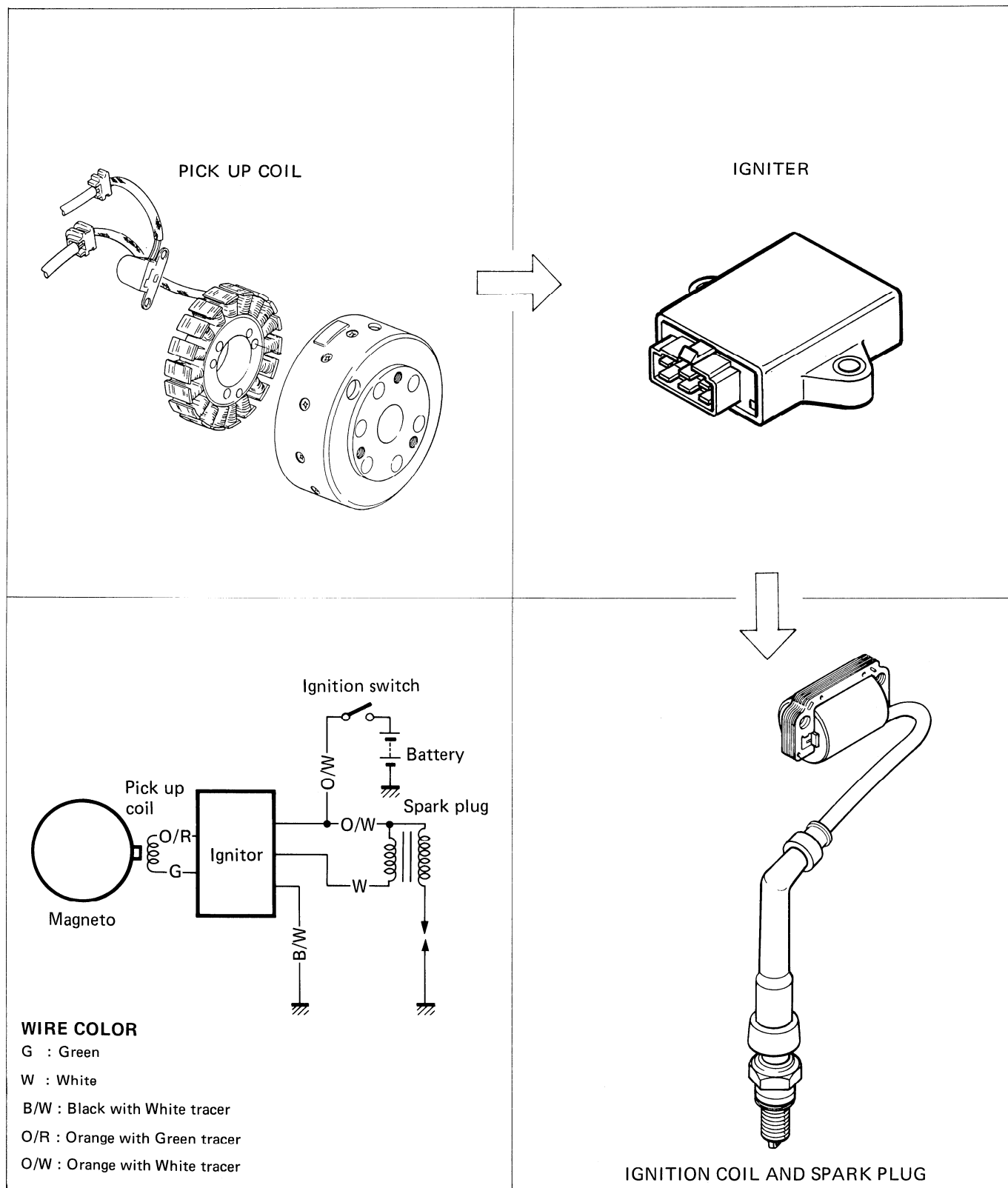
CONTENTS

<i>IGNITION SYSTEM.....</i>	<i>6- 1</i>
<i>CHARGING SYSTEM.....</i>	<i>6- 5</i>
<i>STARTER SYSTEM.....</i>	<i>6- 9</i>
<i>SPEEDOMETER AND INSTRUMENT PANEL</i>	<i>6-12</i>
<i>LAMPS</i>	<i>6-13</i>
<i>SWITCHES.....</i>	<i>6-15</i>
<i>BATTERY</i>	<i>6-18</i>

IGNITION SYSTEM

DESCRIPTION

In the full-transistorized ignition system, the electrical energy on the pick-up coil generated by the magneto rotor tip flows to the transistor/ignition timing control circuit. This energy is released in a single surge at the specified ignition timing point, and current flows through the primary 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

PICK-UP

- Using the pocket tester (RX1 Ω range), measure the resistance between the lead wires in the following table.

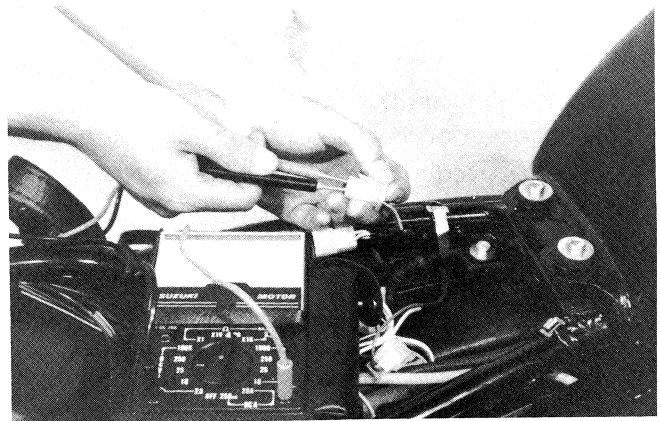
Pocket tester	09900-25002
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Pick-up coil resistance	O – G Approx. 160 – 240 Ω
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NOTE:

When mounting pick up coil on the magneto cover, apply a small quantity of **THREAD LOCK "1363C"** to the threaded parts of screws.

Thread Lock "1363C"	99104-32050
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WIRE COLOR

O : Orange

G : Green

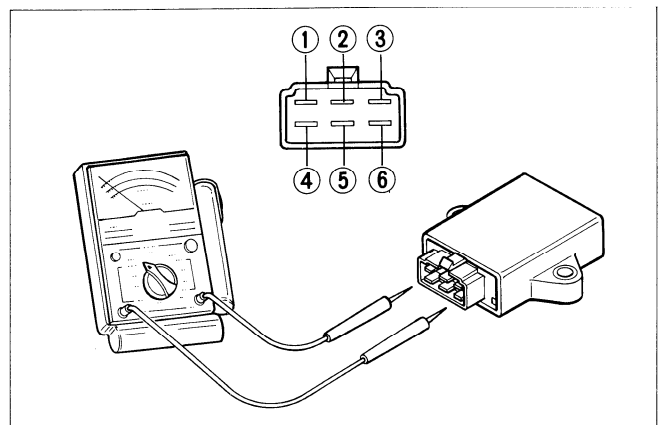
IGNITOR

- Using the pocket tester (RX1k Ω range), measure the resistance between the terminals in the following table.

Pocket tester	09900-25002
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Unit: k Ω

	⊕ Probe of tester					
	1	2	3	4	5	6
⊖ Probe of tester	1	8 – 13	12 – 18	*A ~	∞	5 – 8
	2	*A ~	3 – 5	*A ~	∞	1 – 4
	3	∞	∞	∞	∞	∞
	4	*A ~	8 – 13	12 – 18	∞	5 – 8
	5	∞	∞	∞	∞	∞
	6	*A ~	1 – 4	1 – 4	*A ~	∞



*A: 100 k Ω ~ 1 M Ω

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 8 mm (0.3 in.).

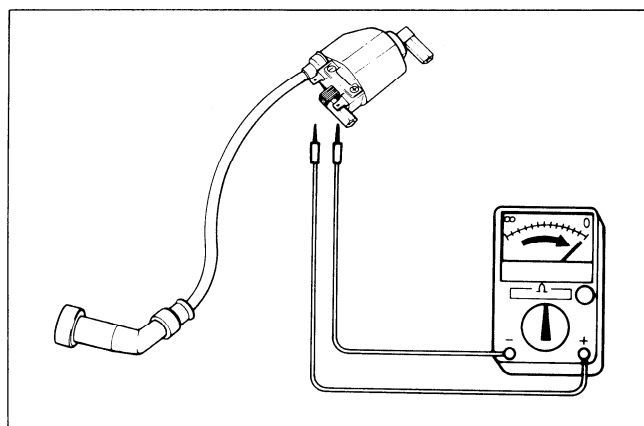
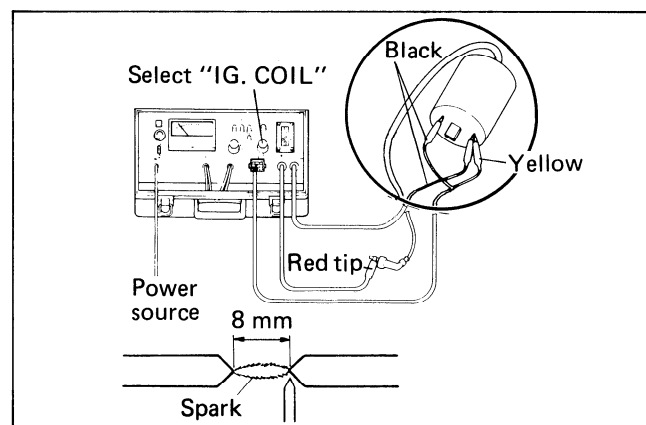
Electro tester	09900-28106
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STD Spark performance	8 mm (0.3 in.)
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- Check the ignition coil with pocket tester.

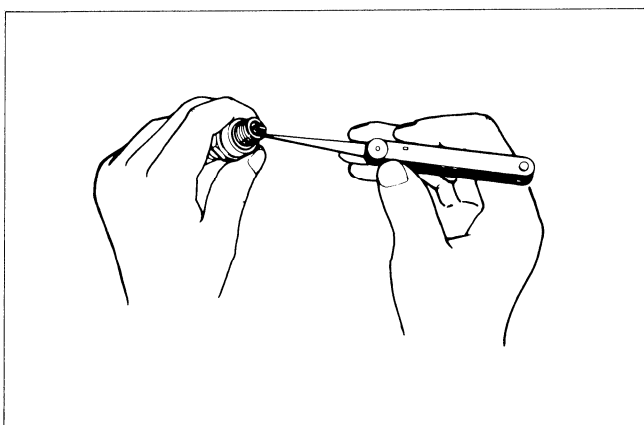
Pocket tester	09900-25002
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Ignition coil resistance	
Primary	Terminal – Terminal Approx. 3 – 5.5 Ω
Secondary	Plug cap – Terminal Approx. 19 – 29 k Ω



SPARK PLUG

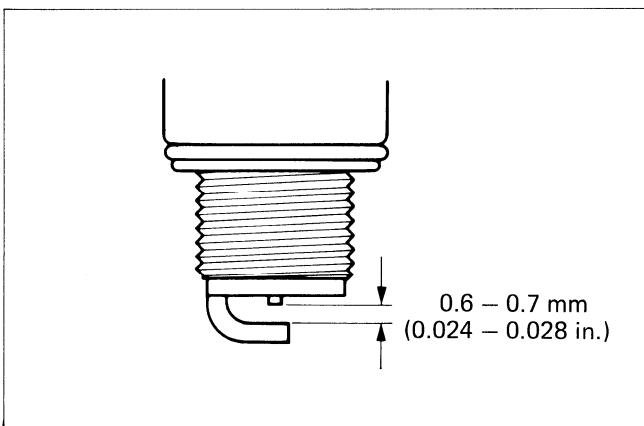
Clean the plug with a wire brush and pin. Use the pin to remove carbon, taking care not to damage the porcelain.



- Check the gap with a thickness gauge.

Thickness gauge	09900-20803
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Spark plug gap	0.6 – 0.7 mm (0.024 – 0.028 in.)
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IGNITOR UNIT

Remove the spark plug from the cylinder. Install the plug cap and place the spark plug on the cylinder head.

Remove the left frame cover and disconnect the lead wire from the pick-up coil.

Turn the ignition switch ON.

The transistor unit is in good condition if the following is observed.

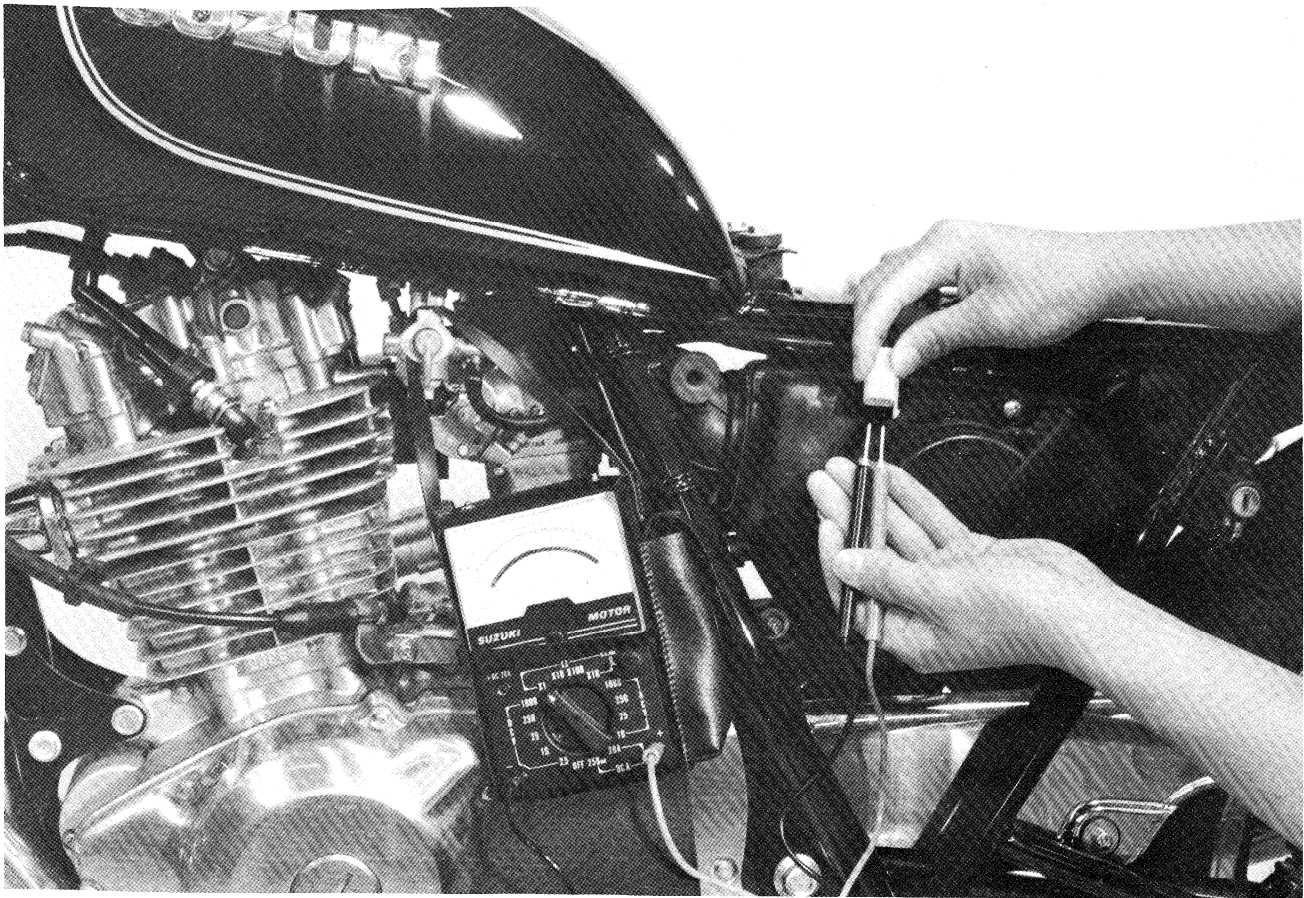
Connect \oplus probe of SUZUKI Pocket Tester ($\times 1\Omega$ range) with Green lead wire on the transistor unit side and \ominus probe with Orange lead wire.

Next connect \oplus probe with Orange lead wire on the transistor unit side and \ominus probe with Green lead wire. The moment the tester probes are connected, the spark plug sparks.

Pocket tester	09900-25002
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NOTE:

This check presupposes that the ignition coil used for checking is good.

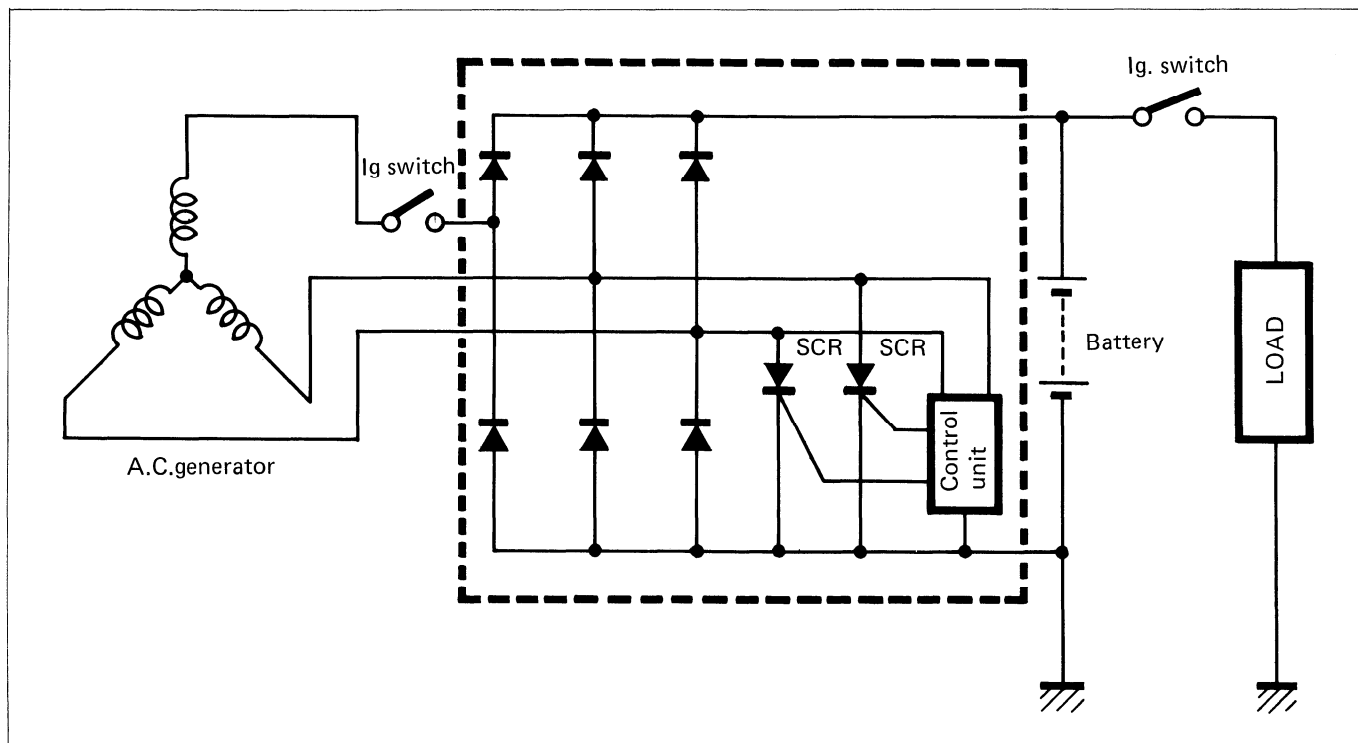


CHARGING SYSTEM

DESCRIPTION

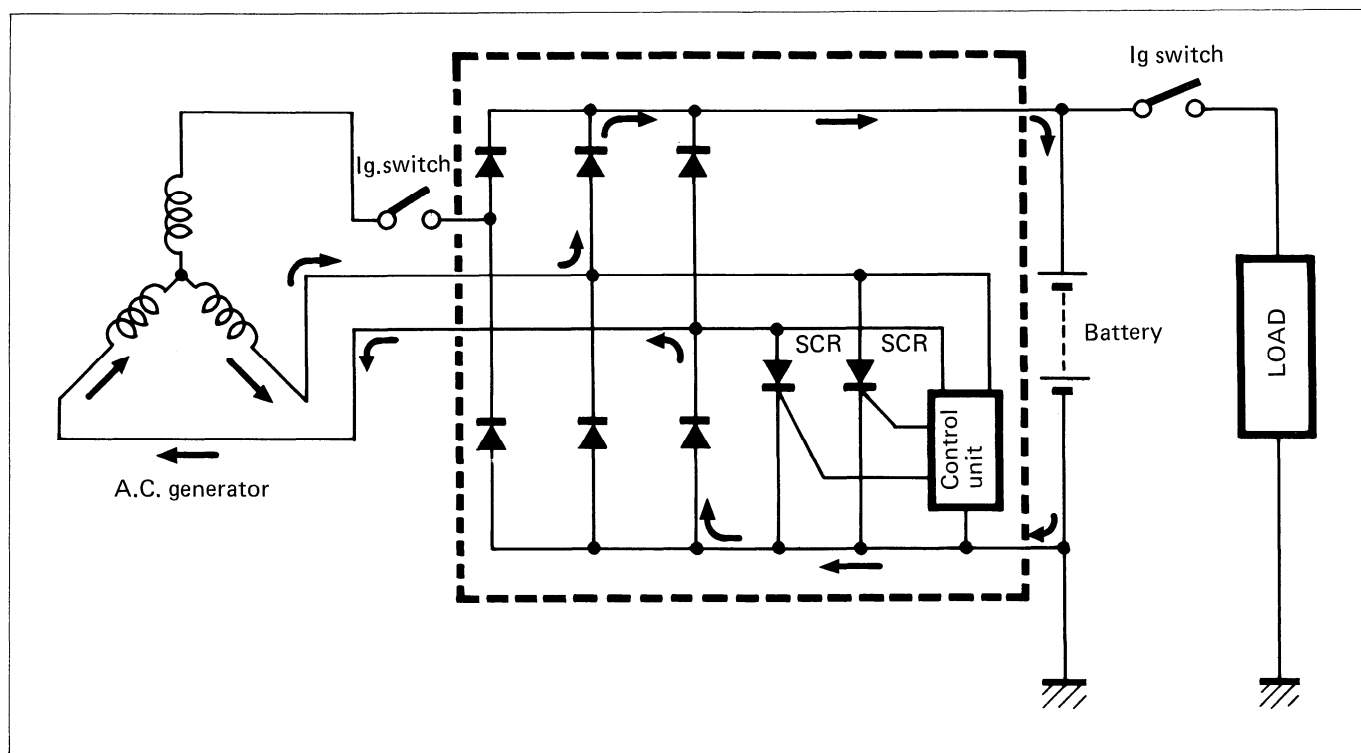
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

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

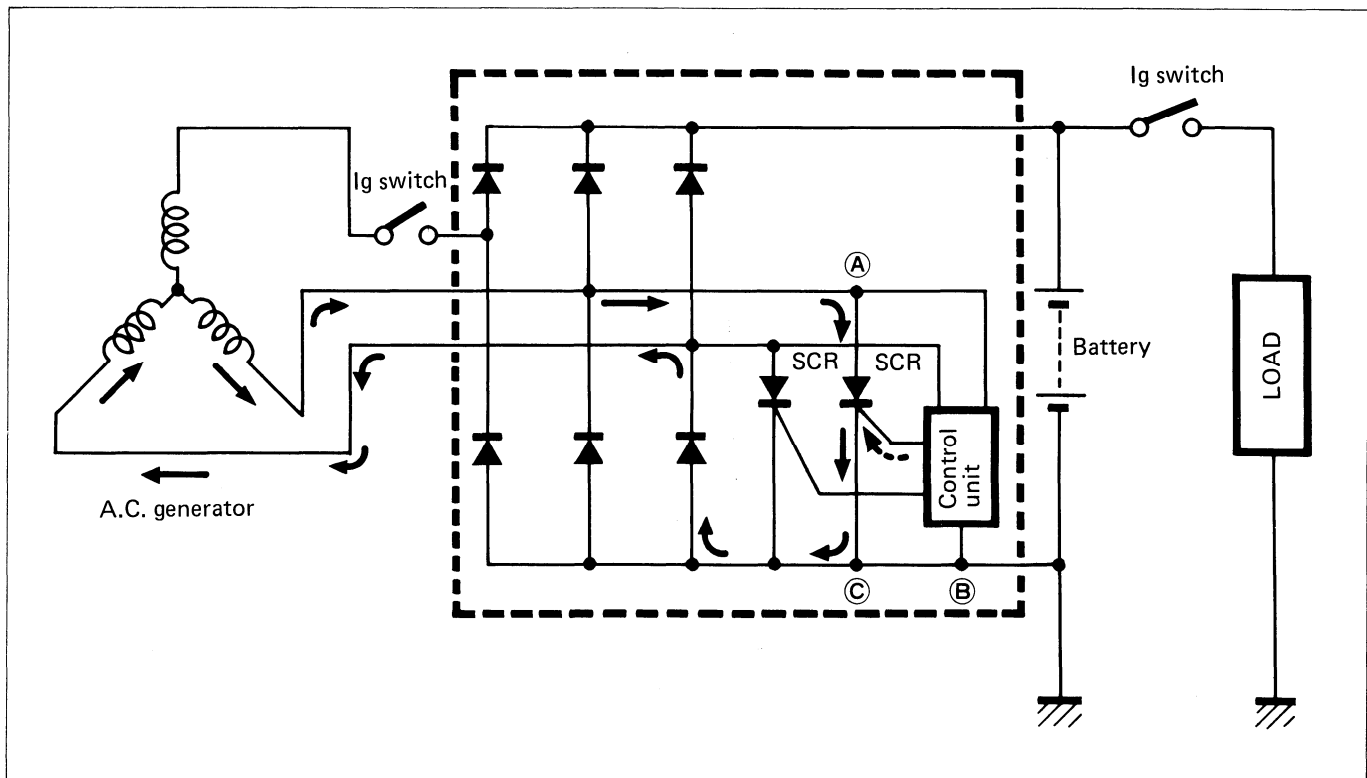


Function of Regulator

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 becomes higher, the generated voltage of AC generator also becomes higher and the voltage between points ① and ② 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 ① to point ③. 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 ③, 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

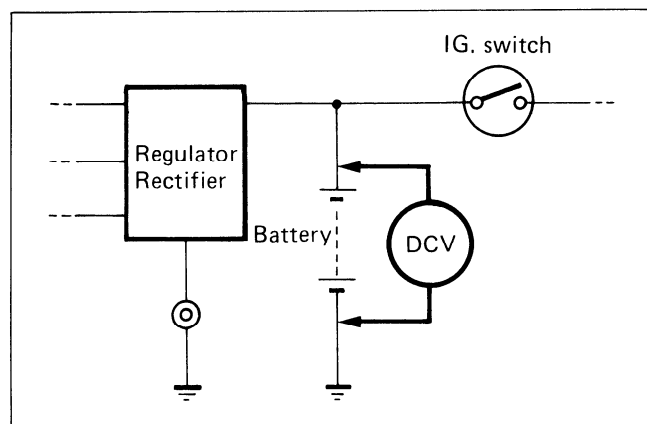
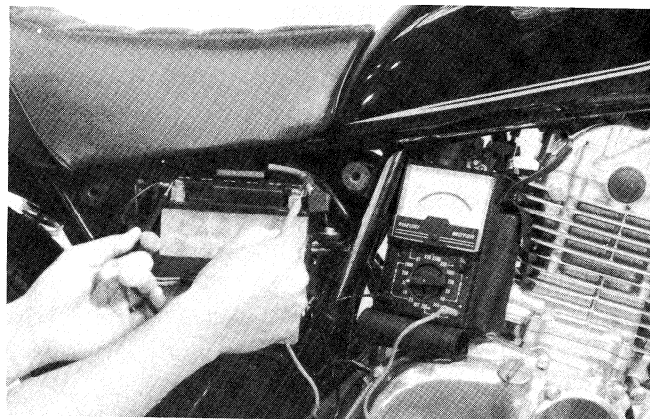
Start the engine and keep it running at 5 000 r/min. Using the pocket tester, measure the DC voltage between the battery terminal \oplus and \ominus .

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	
13.5V – 16.0V at 5 000 r/min.	
09900-25002	Pocket tester



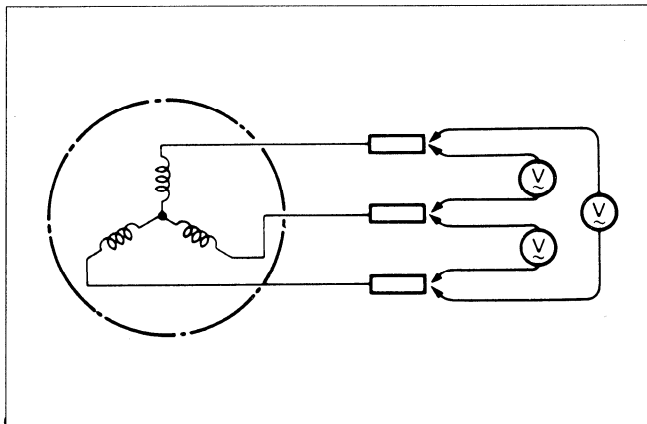
AC GENERATOR NO-LOAD PERFORMANCE

Disconnect the three lead wires from the AC generator terminal.

Start the engine and keep it running at 5 000 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 5 000 r/min.	

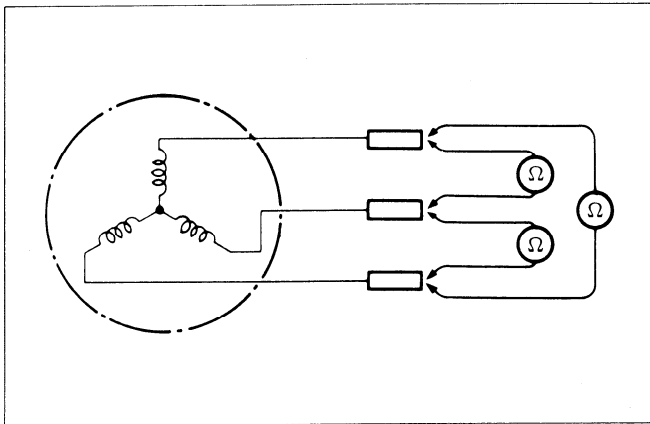
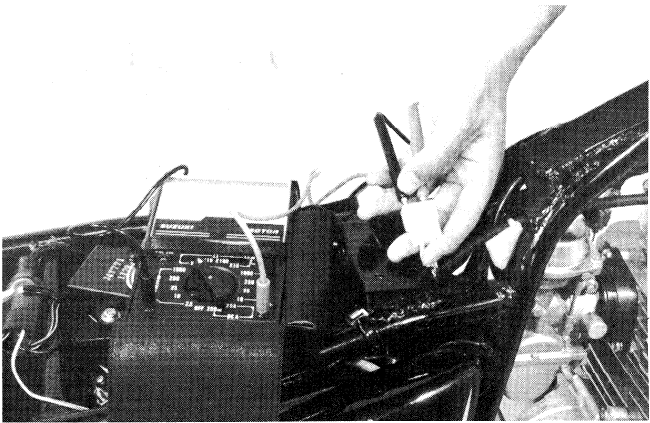


AC GENERATOR CONTINUITY CHECK

Using the pocket tester, check the continuity between the lead wires of the stator.
Also check that the stator core is insulated.

NOTE:
When making this test, it is not necessary to remove the AC generator.

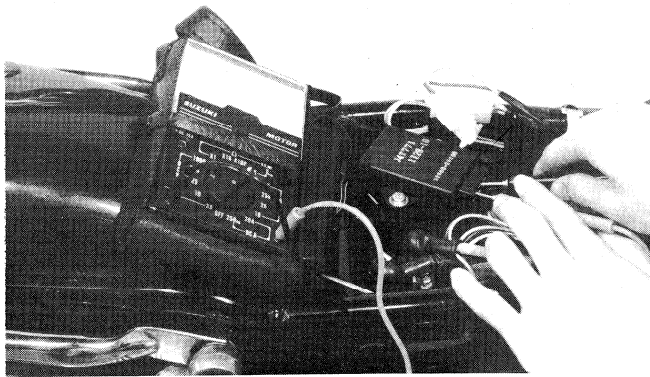
09900-25002	Pocket tester
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REGULATOR/RECTIFIER

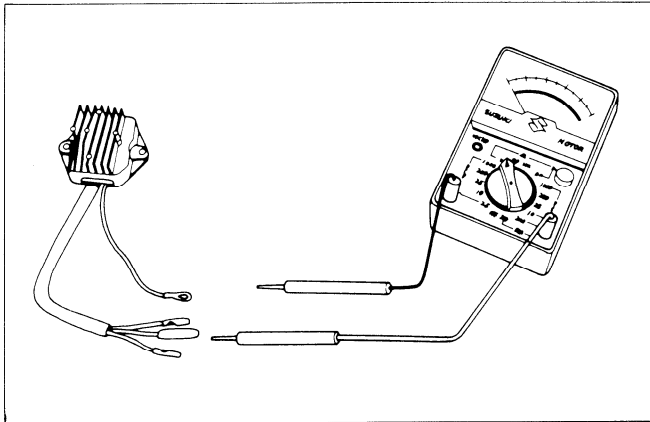
Using the pocket tester (X1Ω range), measure the resistance between the lead wires in the following table.
If the resistance checked is incorrect, replace the regulator/rectifier.

09900-25002	Pocket tester
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Unit: Ω

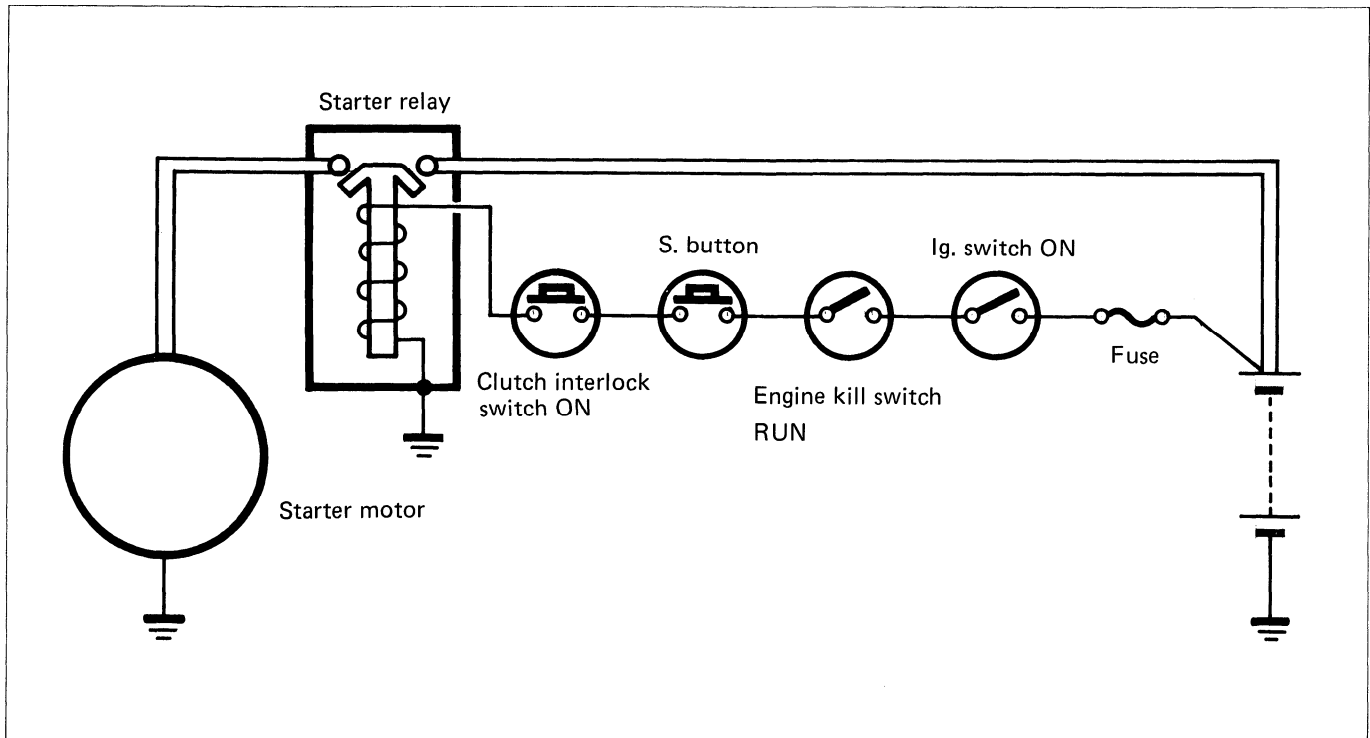
Probe of tester	⊕ Probe of tester					
	R	W/BI	W/R	Y	B/W	
⊖ Probe of tester	R	OFF	OFF	OFF	OFF	OFF
W/BI	7-8		OFF	OFF	OFF	OFF
W/R	7-8	OFF		OFF	OFF	OFF
Y	7-8	OFF	OFF		OFF	OFF
B/W	65-85	7-8	7-8	7-8		



STARTER SYSTEM

DESCRIPTION

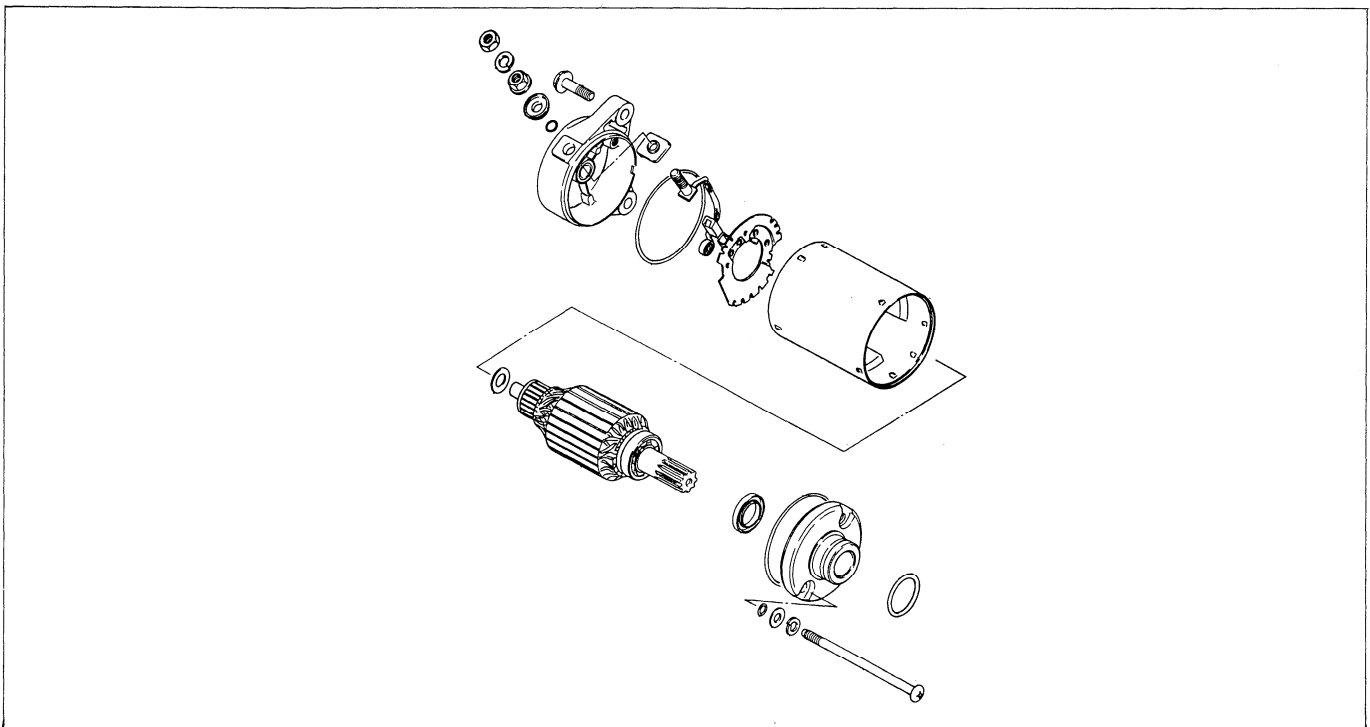
The starter system is shown in the diagram below: namely, the starter motor, starter relay, clutch interlock switch, starter button, engine kill switch, ignition switch, fuse and battery. Depressing the starter button (on the right handlebar switch box) energizes the relay, causing the contact points 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 (See page 3-33).

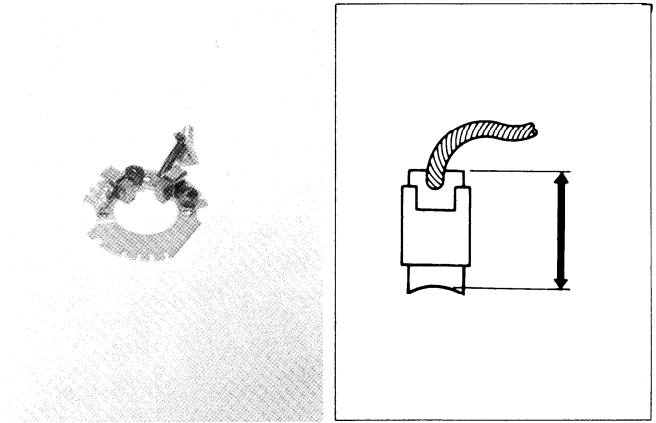
Disassemble the starter motor as follows.



STARTER MOTOR INSPECTION

CARBON BRUSHES

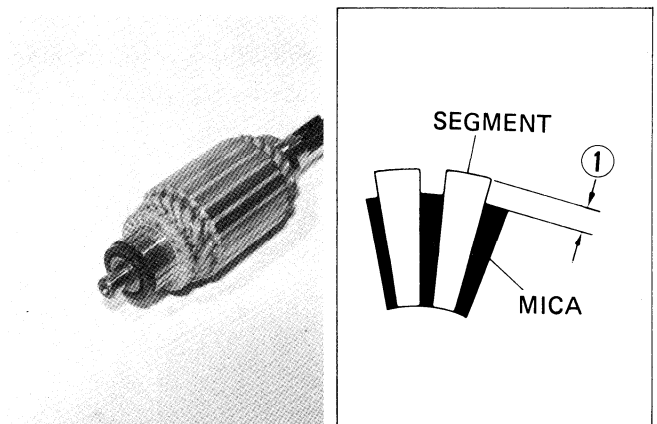
When the brushes are worn, the motor will be unable to produce sufficient torque, and the engine will be difficult to turn over. To prevent this, periodically, inspect the length of the brushes, replacing them when they are too short or chipping.



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.

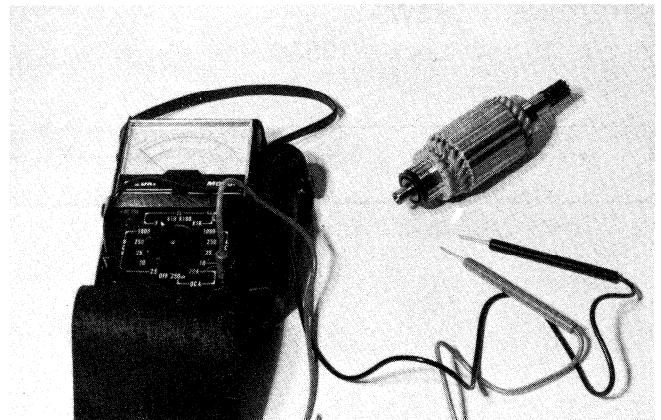
Check the commutator under cut ①.



ARMATURE COIL

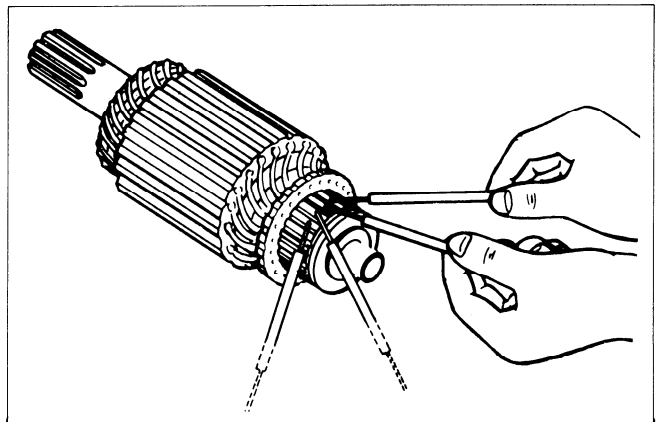
Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the brushes lifted off the commutator surface.

If the coil is found to be open-circuited or grounded replace the armature. Continuous use of a defective armature will cause the starter motor to suddenly fail.



09900-25002

Pocket tester

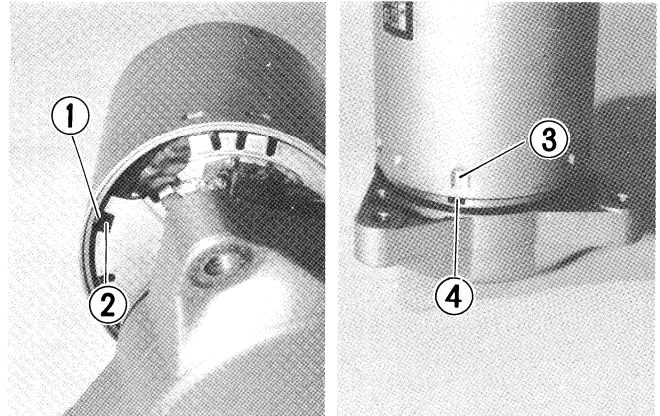


STARTER MOTOR REASSEMBLY

BRUSH HOLDER

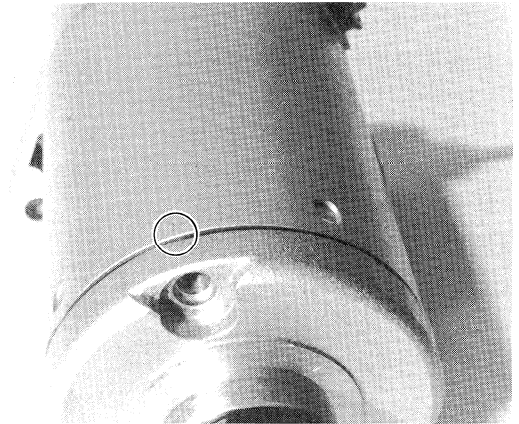
When fixing brush holder to starter motor case, align the protrusion ① of the starter motor case with the notch ② of the brush holder.

When installing housing end, fix the protrusion ③ of the starter motor case to the notch ④ on the housing end.



HOUSING END

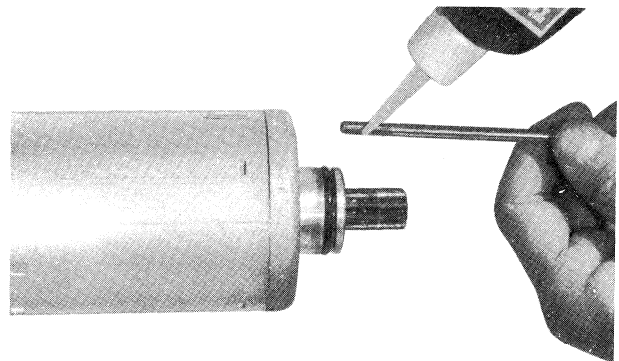
When installing housing end, fix the protrusion ③ of the starter motor case to the notch ④ on the housing end.



SECURING SCREWS

Apply Thread Lock "1363C" to starter motor securing screws.

99104-32050	Thread Lock "1363C"
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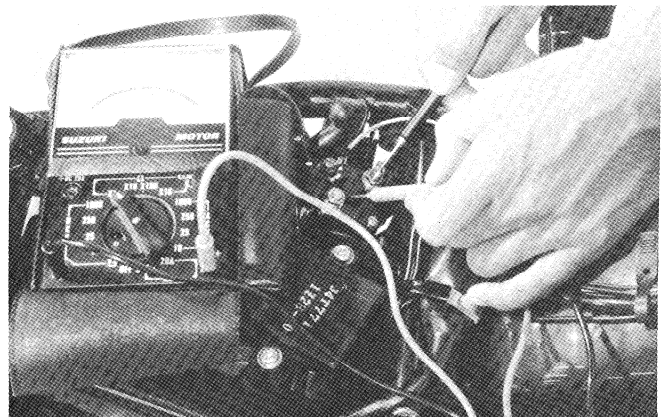
STARTER RELAY INSPECTION

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.

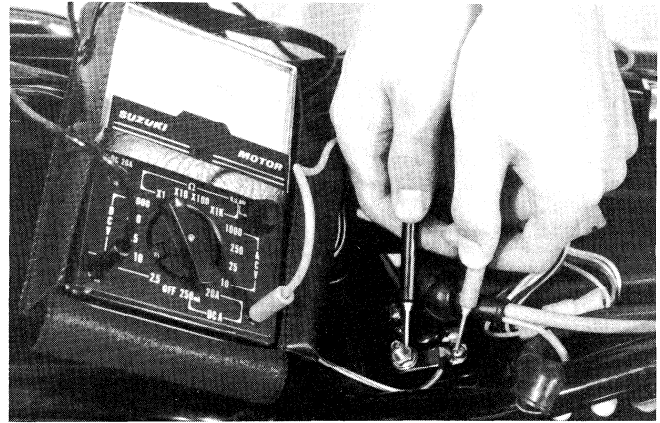
If the starter relay is in sound condition, continuity is found.

09900-25002	Pocket tester
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Check the coil for “open”, “ground” and ohmic resistance. The coil is in good condition if the resistance is as follows.

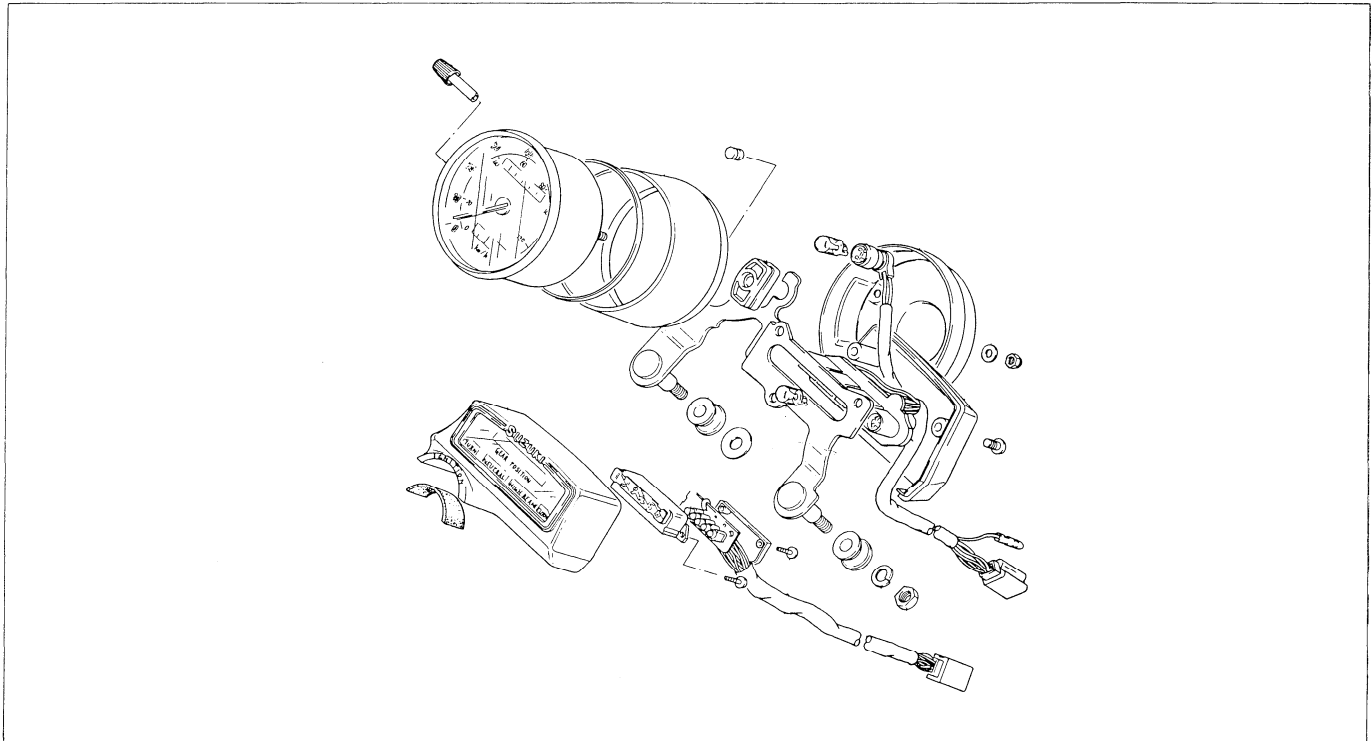
09900-25002	Pocket tester
STD resistance	Approx. 3 – 4 Ω



SPEEDOMETER & INSTRUMENT PANEL

Remove the combination meter (See page 7-16).

Disassemble the combination meter as follows.



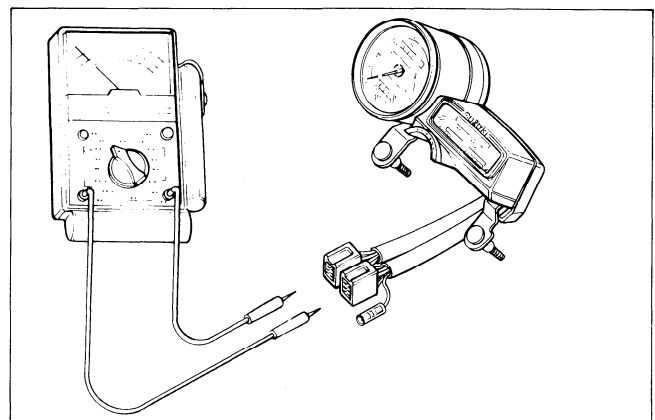
INSPECTION

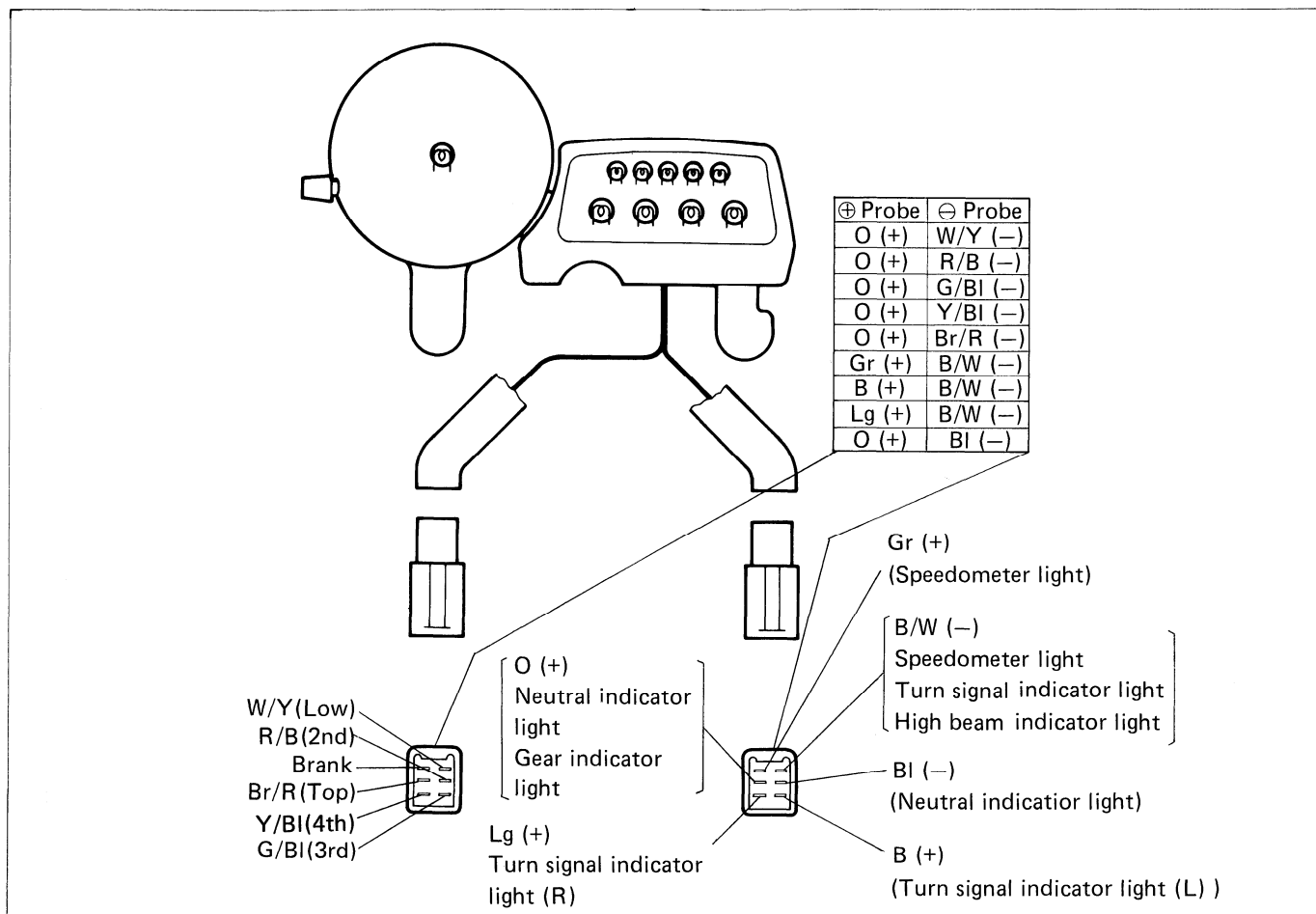
Using the pocket tester, check the continuity between lead wires in the following diagram. If the continuity measured is incorrect, replace the respective part.

09900-25002	Pocket tester
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NOTE:

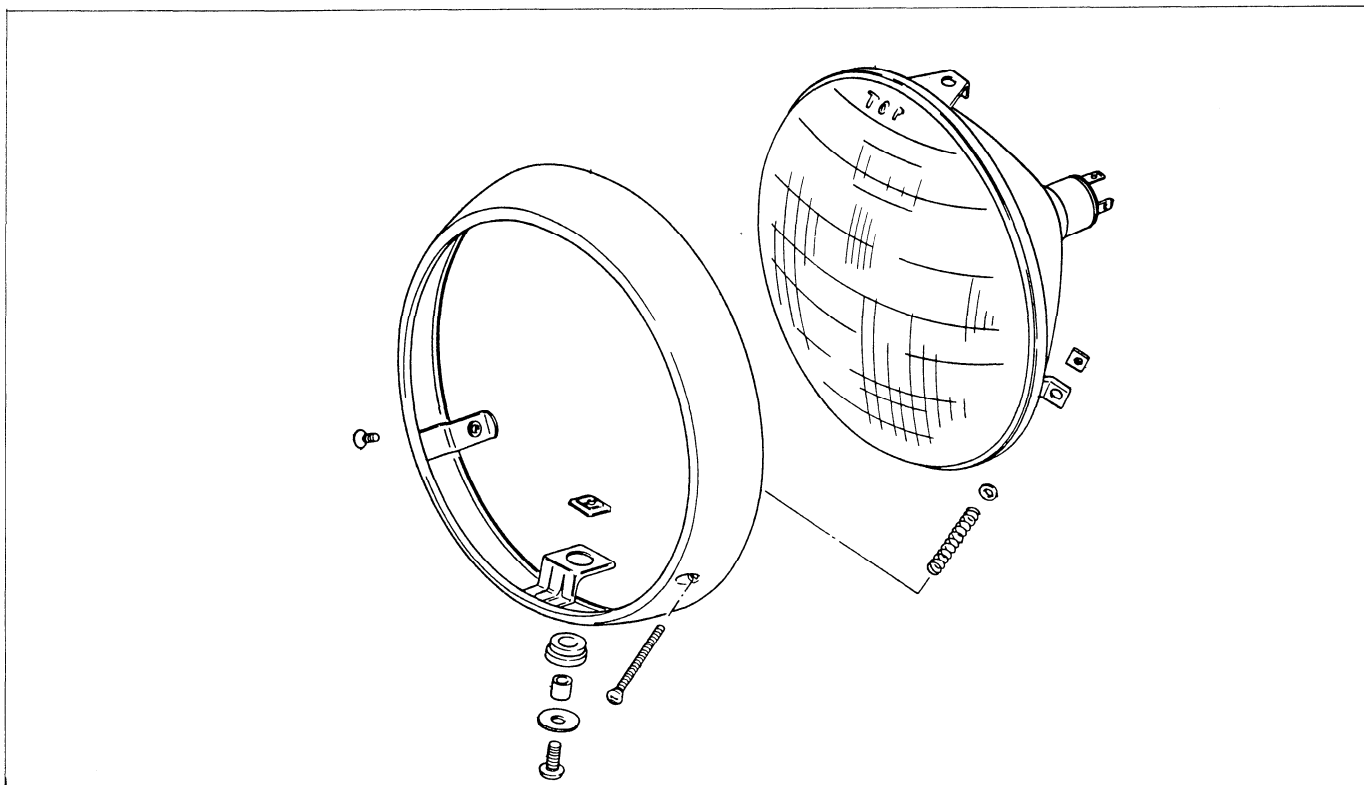
When making this test, it is not necessary to remove the combination meter.



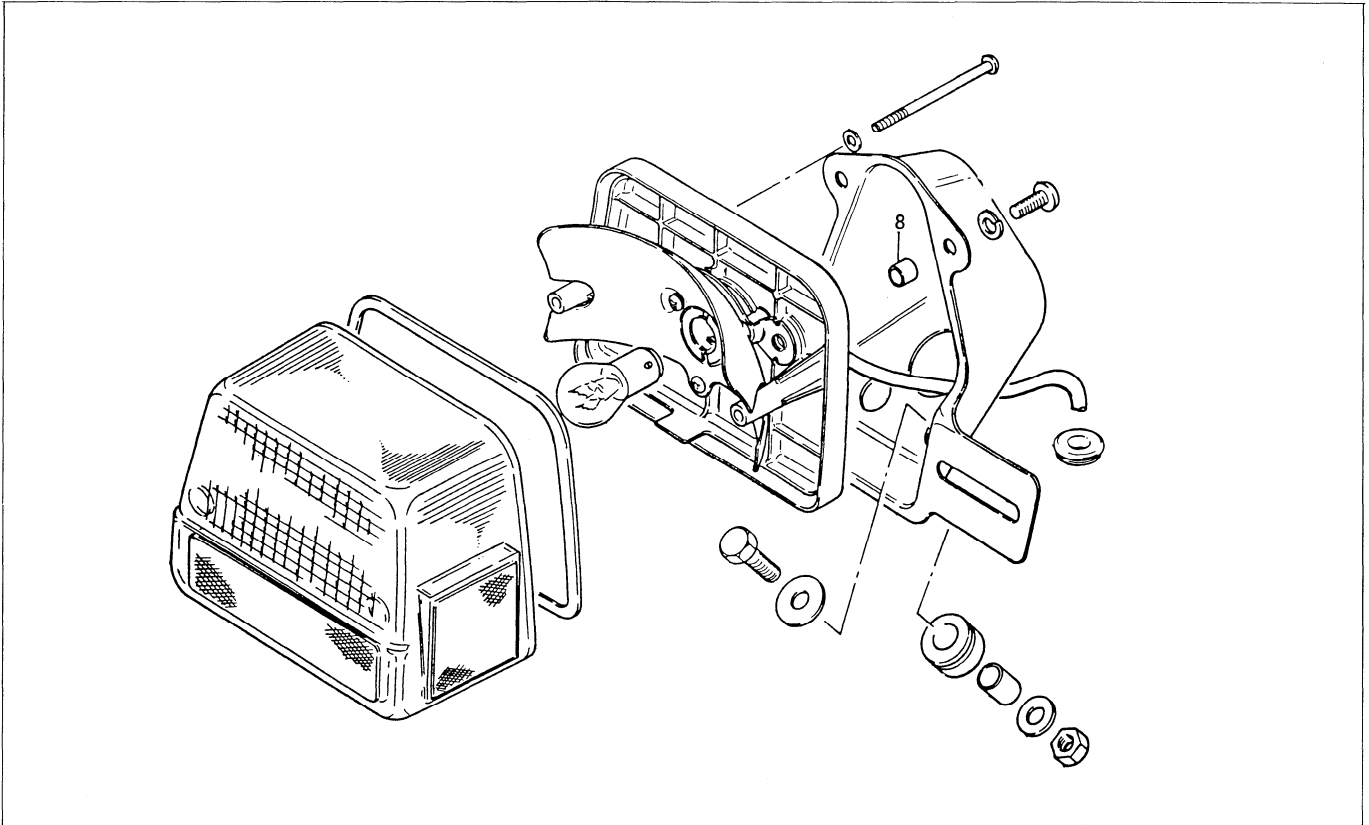


LAMPS

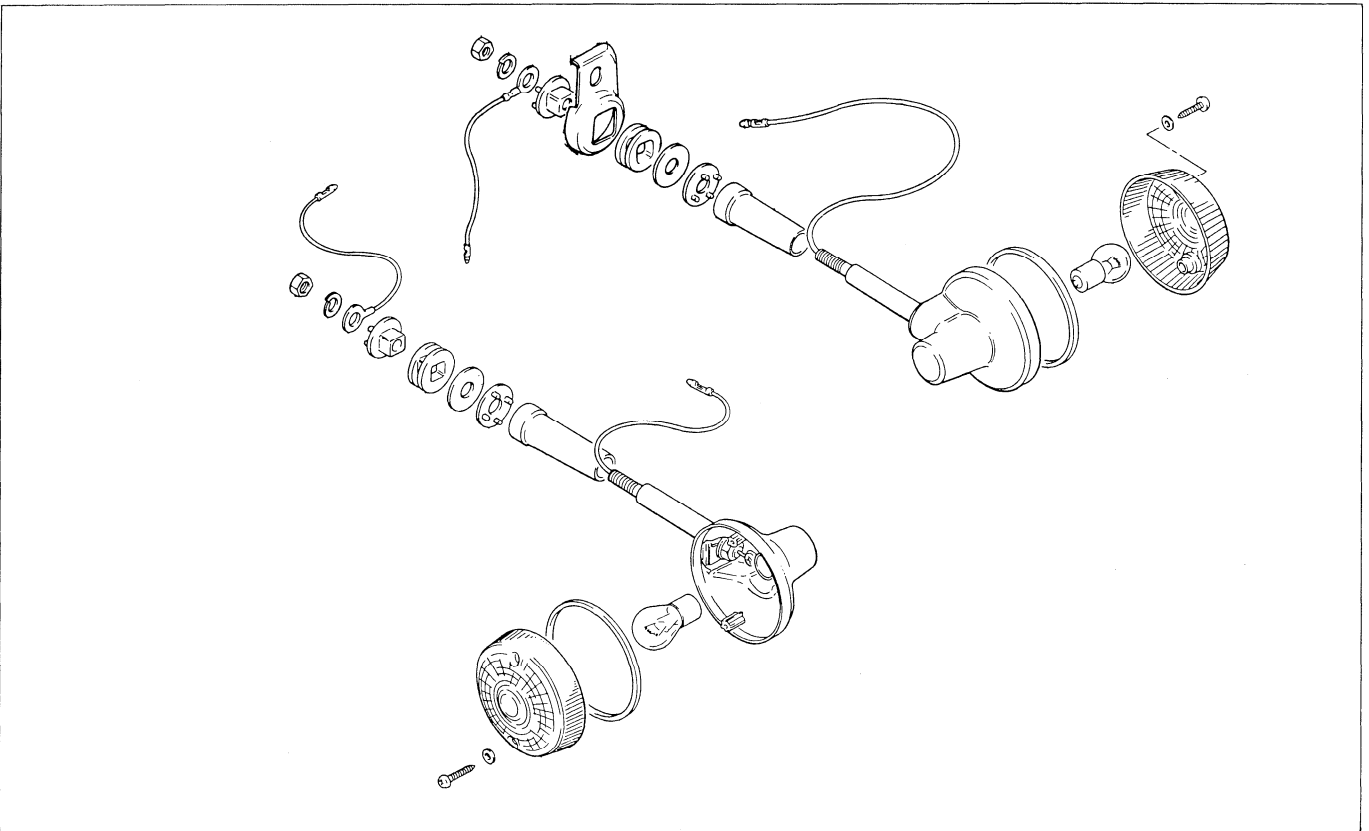
HEAD LIGHT



TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT

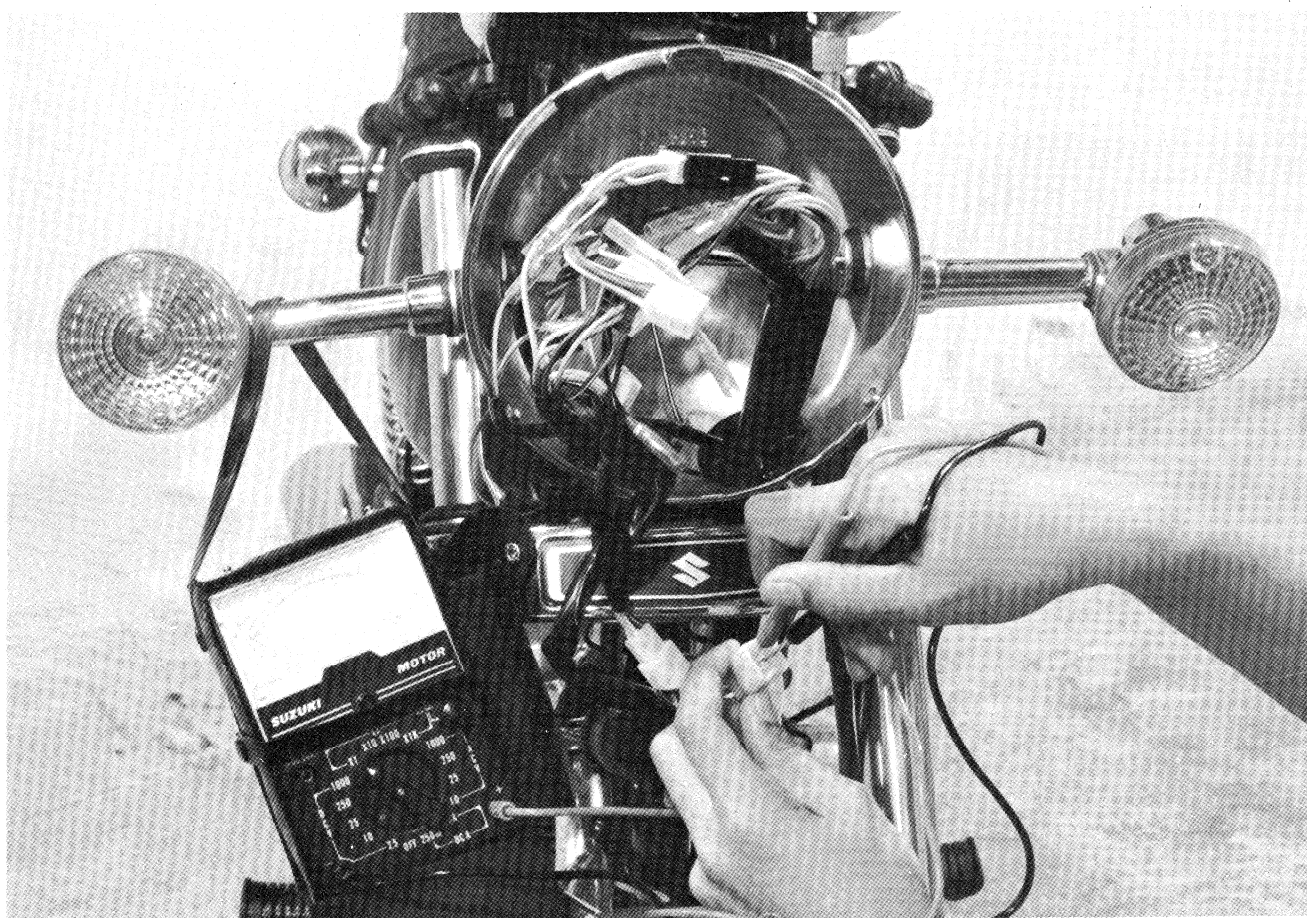


SWITCHES

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.

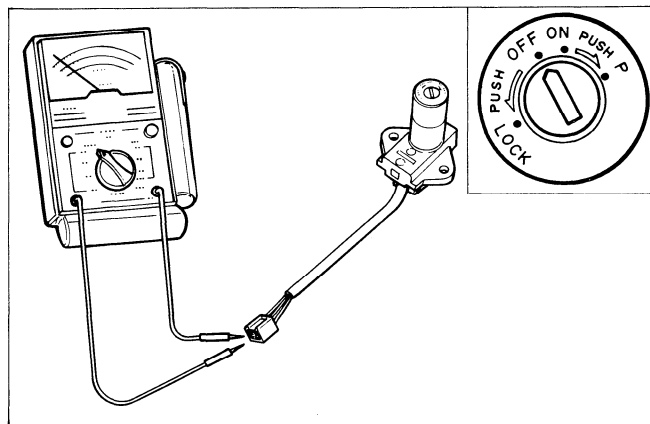
09900-25002

Pocket tester



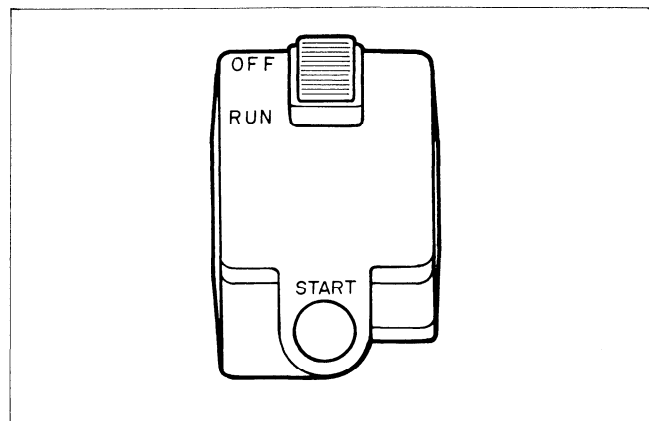
IGNITION SWITCH

	R	O	Gr	Br
OFF				
ON	○ — ○		○ — ○	
P	○ — ○			○ — ○

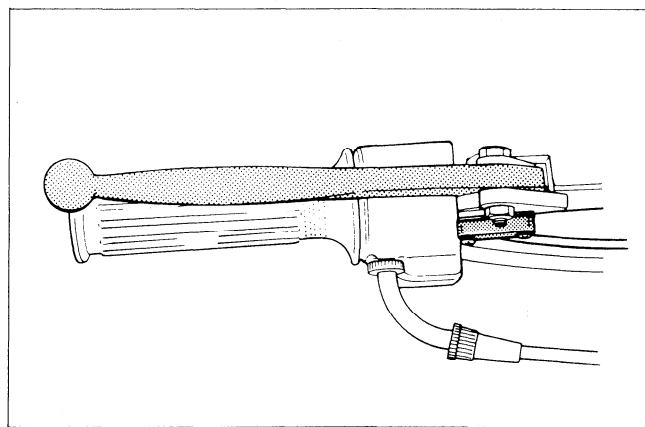


RIGHT AND LEFT SWITCH**ENGINE STOP AND START SWITCH**

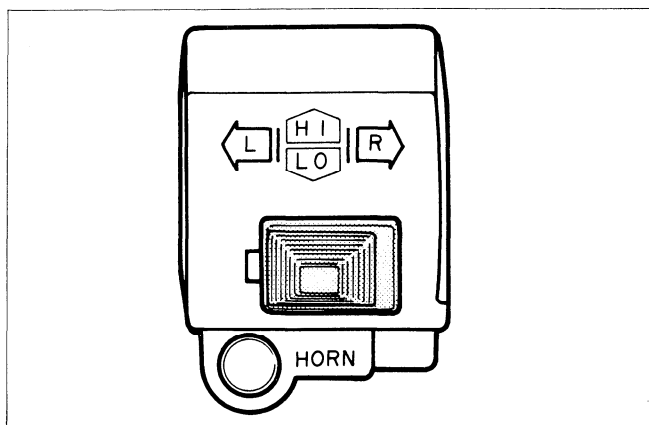
	O/W (Red coupler)	O/W	Y/G
OFF			
RUN	○ — ○		
START		○ — ○	

**FRONT BRAKE SWITCH**

	O	W (Red coupler)
OFF		
ON	○ — ○	

**DIMMER SWITCH**

	W	Y	Y/W
HI		○ — ○	
LO	○ — ○		



**TURN SIGNAL SWITCH**

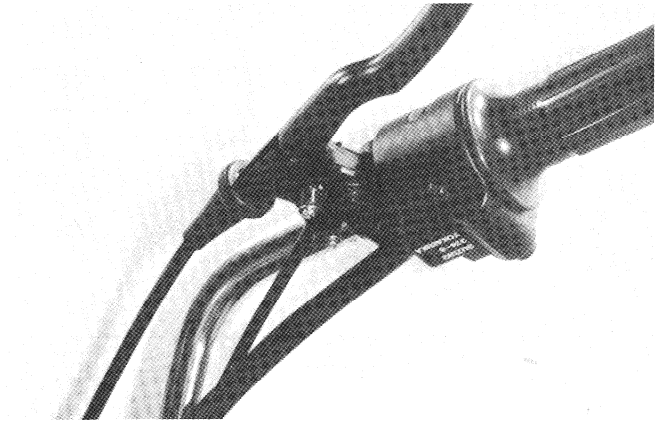
	B	Lbl	Lg
R		○ — ○	
·			
L	○ — ○		

HORN SWITCH



	G	B/W
OFF		
ON	○ — ○	

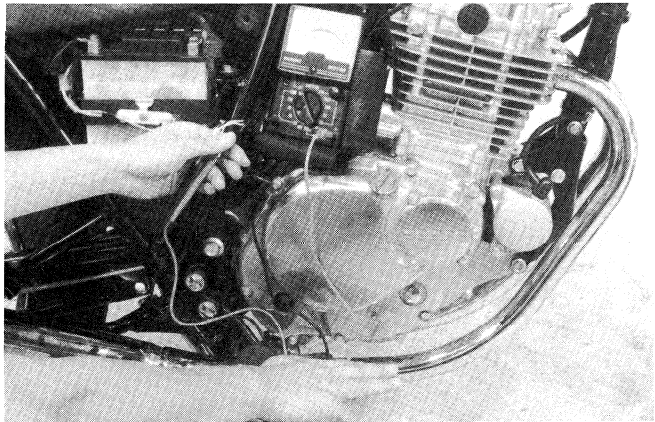
CLUTCH INTERLOCK SWITCH

	Y/G	Y/G
OFF		
ON		















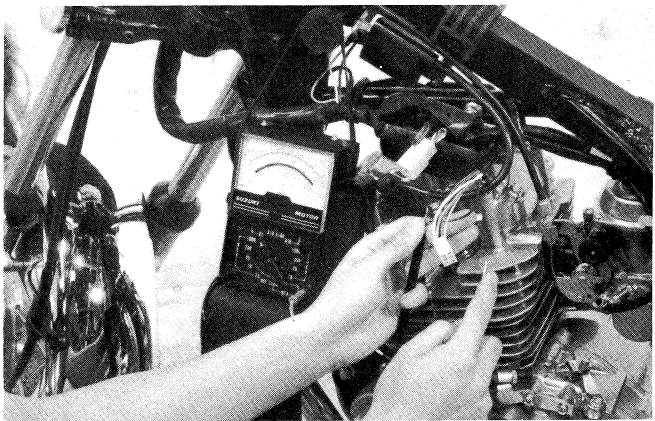
REAR BRAKE SWITCH

	O	W
OFF		
ON		



GEAR POSITION SWITCH

	BI	W/Y	R/B	G/BI	Y/BI	Br/R	Ground
1st							
Neatral							
2nd							
3rd							
4th							
Top							



BATTERY

SPECIFICATIONS

Type designation	YB10L-A2
Capacity	43.2kC(12Ah)/10HR
Standard electrolyte S.G.	1.28 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 before filling electrolyte. 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 additional electrolyte if necessary.

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

Maximum charging current	1.2A
--------------------------	------

Charging time

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

Confirmation for date of manufacture

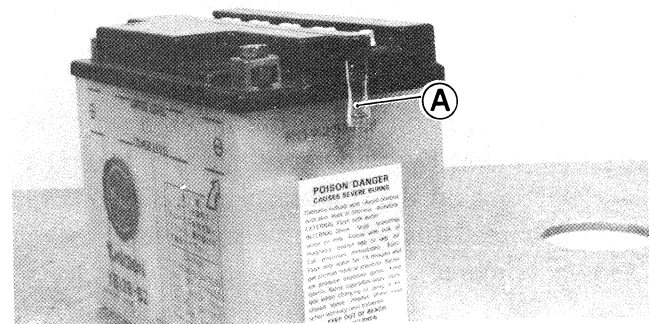
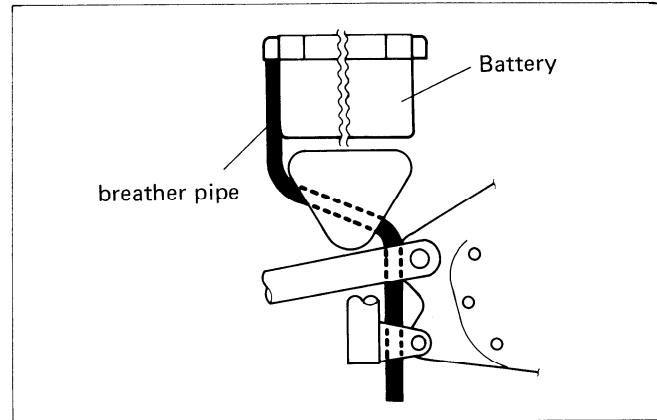
Date of manufacture is indicated by a three-part number ①, as follows, each indicating month, date and year.

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.

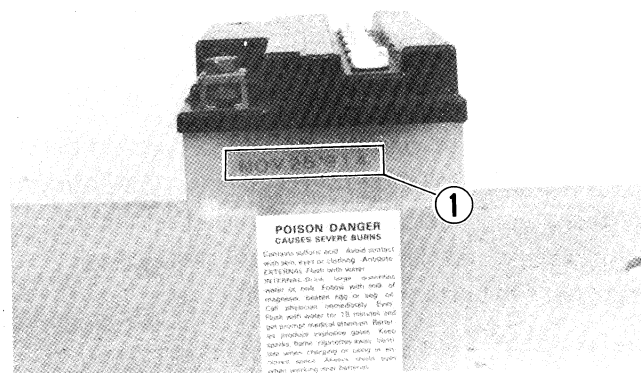
Servicing

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte 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.



Ⓐ Sealed tube



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

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 \ominus 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.

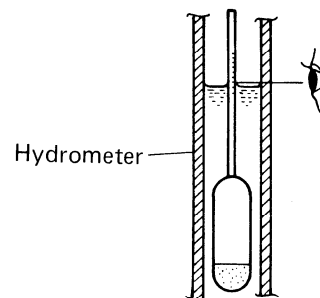
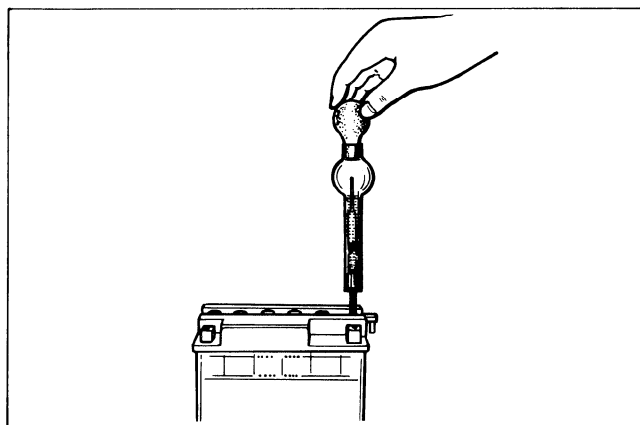
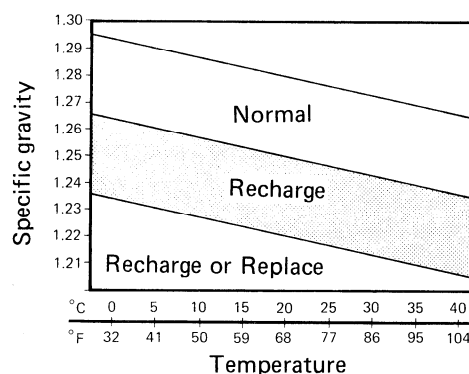
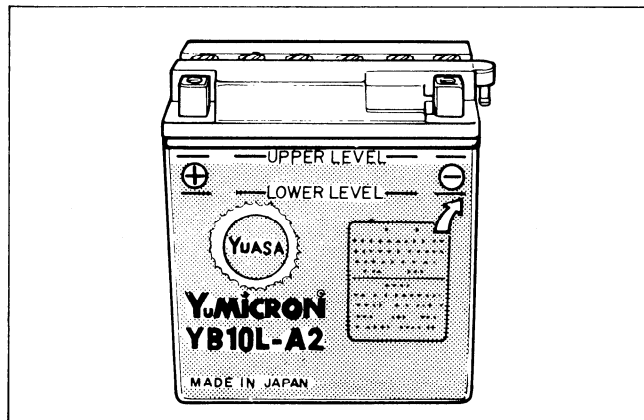
Check the reading (as corrected to 20°C) with chart to determine the recharging time in hours by constant-current charging at a charging rate of 1.2 amperes (which is a tenth of the capacity of the present battery).

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°F)
---------------------------------	---------------------

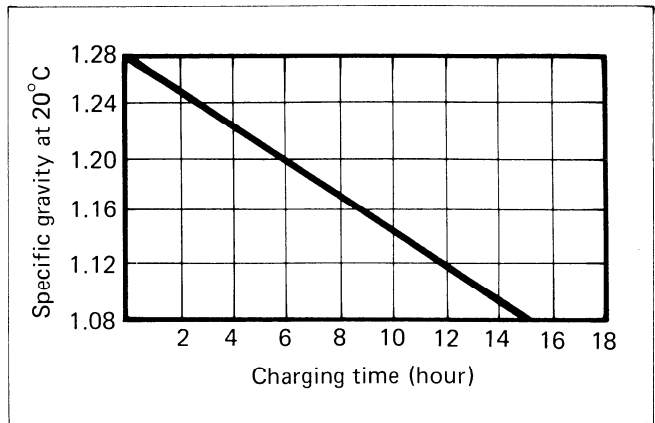
CAUTION:

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 pole plates 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 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:

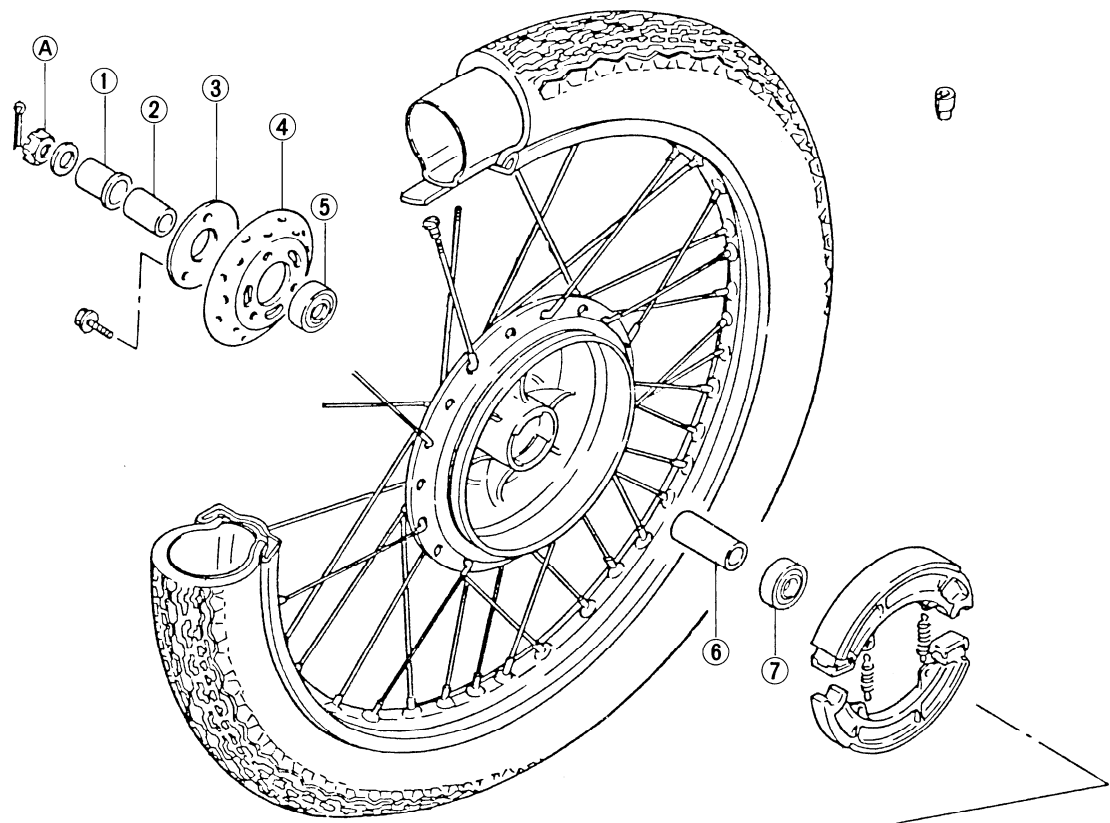
- * Before charging a battery, remove the seal cap from each cell.
- * Keep fire and sparks away from a battery being charged.
- * When removing a battery from the motorcycle, be sure to remove the (—) terminal first.

CHASSIS

CONTENTS

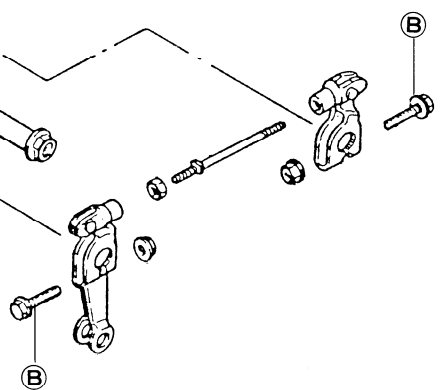
<i>FRONT WHEEL</i>	<i>7- 1</i>
<i>FRONT FORK.....</i>	<i>7- 8</i>
<i>STEERING STEM</i>	<i>7-15</i>
<i>REAR WHEEL AND REAR BRAKE.....</i>	<i>7-21</i>
<i>REAR SUSPENSION.....</i>	<i>7-30</i>

FRONT WHEEL



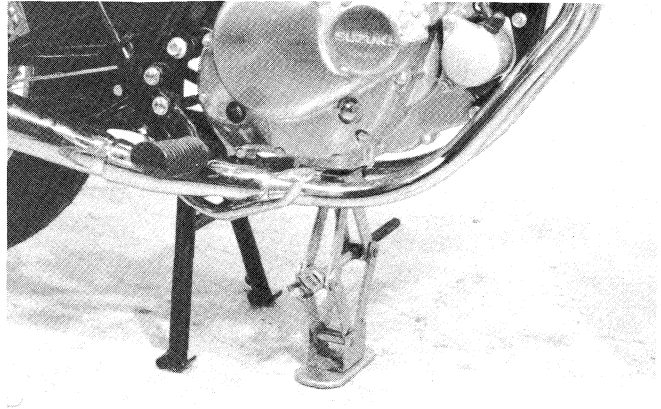
- ① Spacer
- ② Spacer
- ③ Retainer
- ④ Hub flange
- ⑤ Bearing
- ⑥ Spacer
- ⑦ Bearing
- ⑧ Circlip
- ⑨ Washer
- ⑩ Drive plate
- ⑪ Oil seal
- ⑫ Speedometer drive gear
- ⑬ Washer
- ⑭ Brake cam
- ⑮ O-ring
- ⑯ Washer
- ⑰ Axle
- ⑱ Washer
- ⑲ Spring

Tightening torque			
	kg-m	lb-ft	N·m
Ⓐ	3.6 – 5.2	26.0 – 37.5	36 – 52
Ⓑ	0.5 – 0.8	3.5 – 6.0	5 – 8

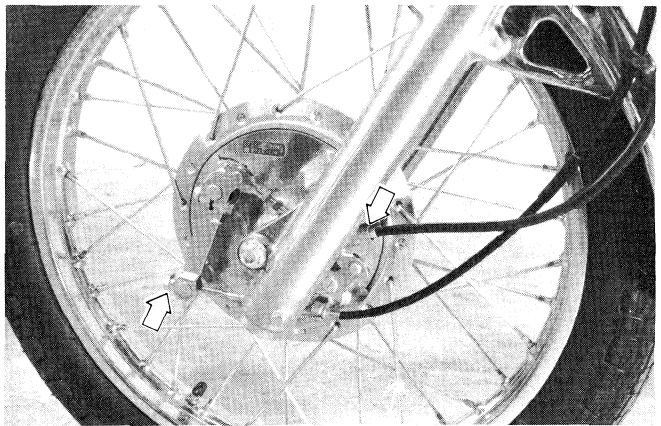


REMOVAL AND DISASSEMBLY

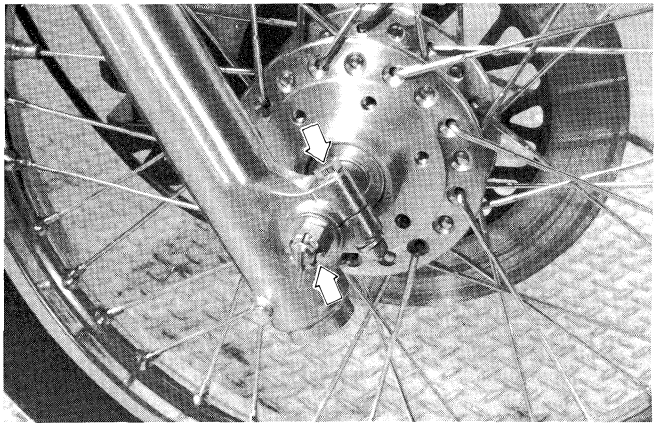
- Support the machine by jack and center stand.



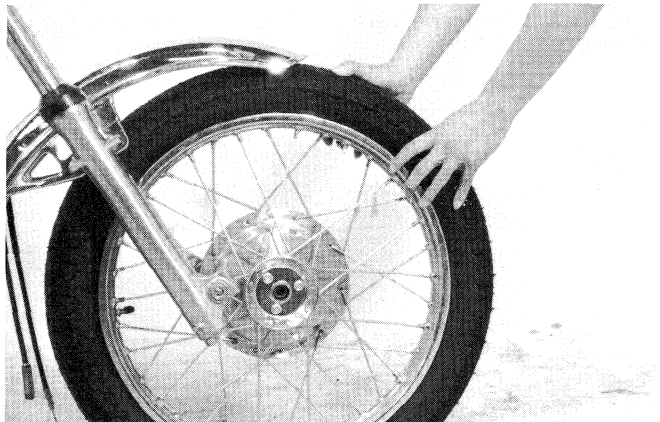
- Disconnect brake cable and speedometer cable.



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

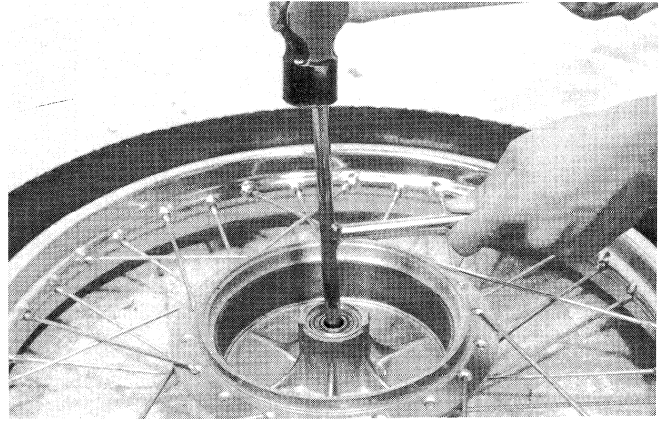


- Remove the axle shaft and take off front wheel with front brake panel.



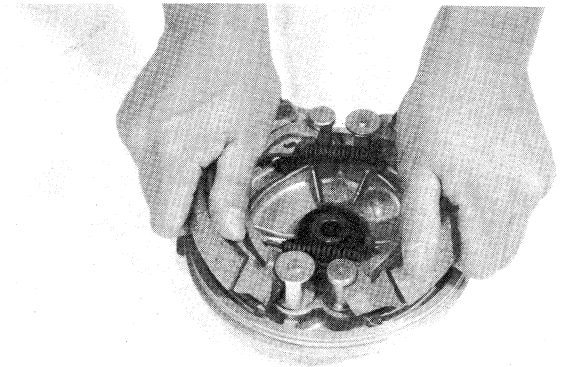
FRONT WHEEL

- Remove the wheel bearings.

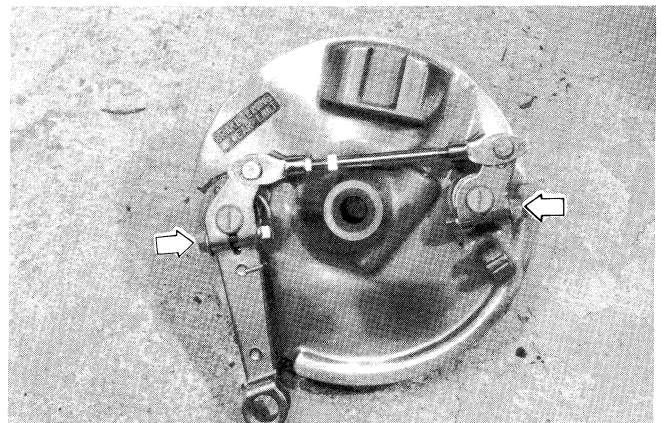


FRONT BRAKE

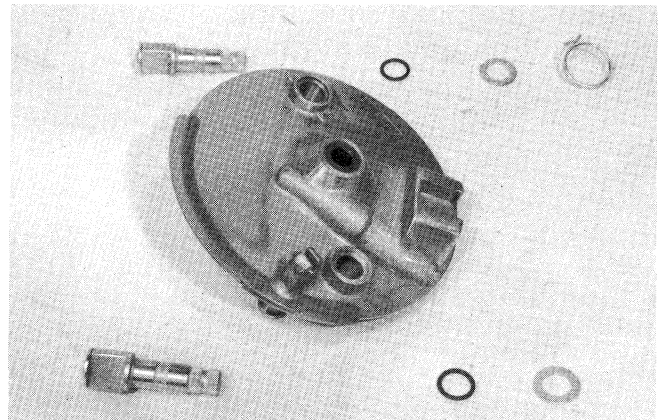
- Take off the brake shoes.



- Remove the fitting bolt and pull off cam lever.



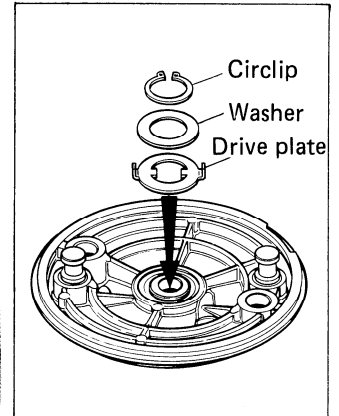
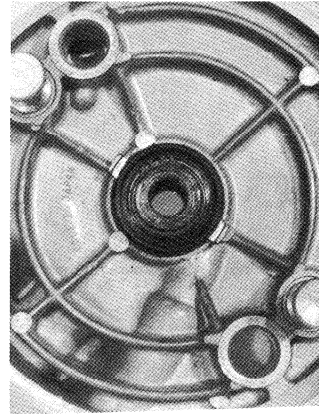
- Pull off the brake cam, O-ring, washer and spring.



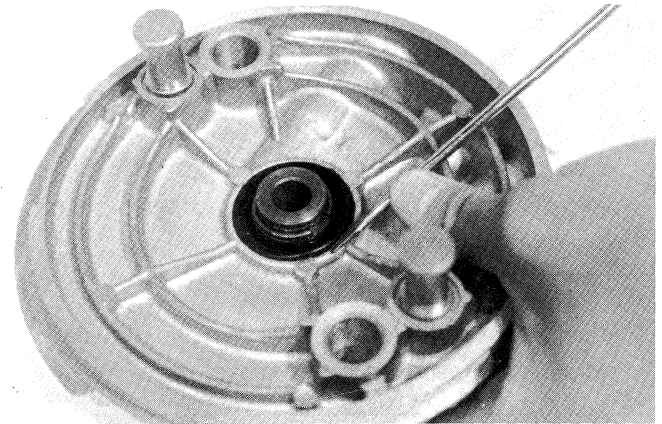
- Remove circlip and pull off washer, and drive plate.

Snap ring pliers

09900-06107



- Remove the oil seal.



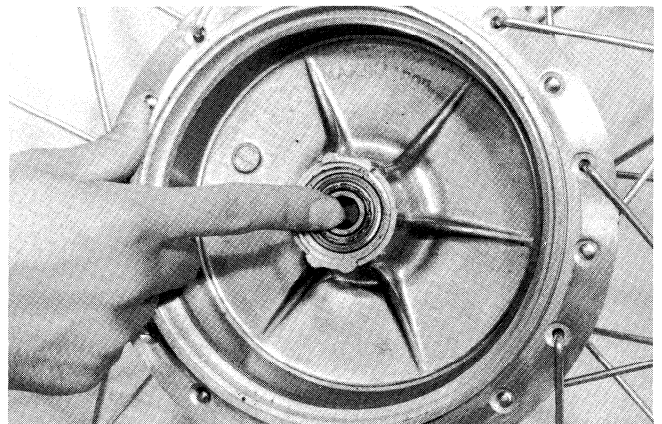
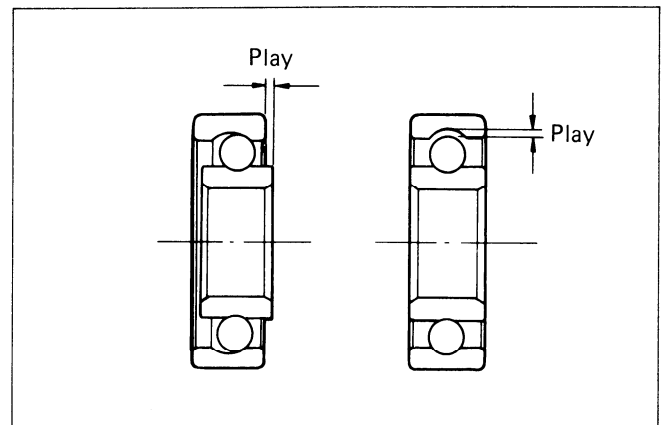
INSPECTION

WHEEL BEARING

Inspect the play of wheel bearings inner race by hands while fixing it in the wheel hub.

Rotate the inner race by hands to inspect whether abnormal noise occurs or rotating smoothly.

Replace the bearing if there is something unusual.



AXLE SHAFT

- Using a dial guage, check the axle shaft for runout and replace it if the runout exceeds the limit.

Service limit	0.25 mm (0.010 in)
---------------	-----------------------

Dial guage (1/100)	09900-20606
--------------------	-------------

TIRE

- See page 2–12.

WHEEL RIM

- Make sure that the wheel rim runout does not exceed the service limit when checked as shown. An excessive amount of runout is usually due to loose spokes or a bent wheel rim. If properly tightening the spokes will not correct the runout, replace the wheel rim.

NOTE:

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

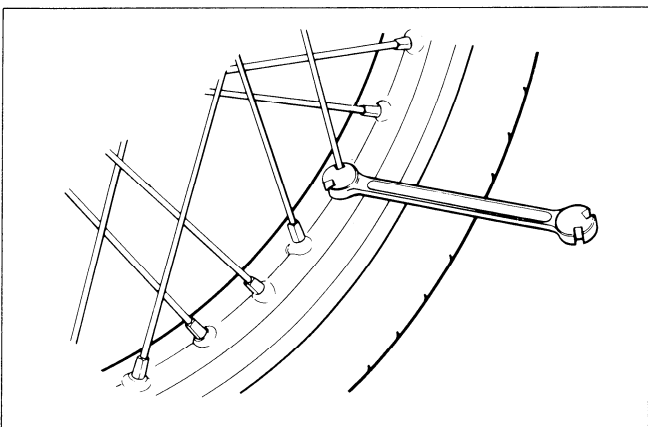
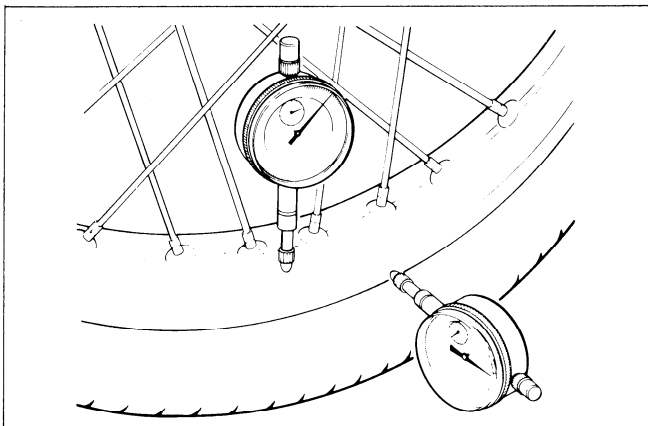
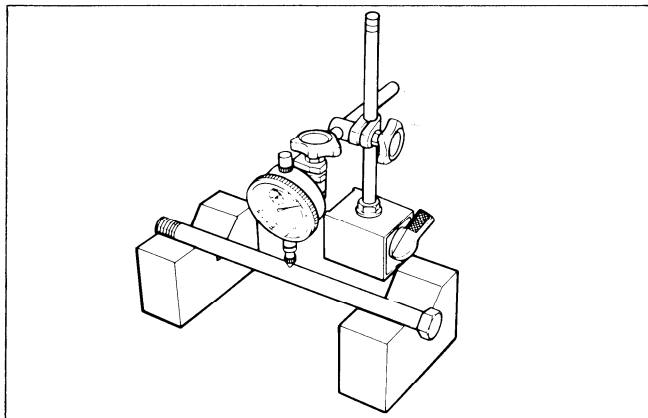
Service limit (Axial and Radial)	2.0 mm (0.08 in)
-------------------------------------	---------------------

SPOKE NIPPLE

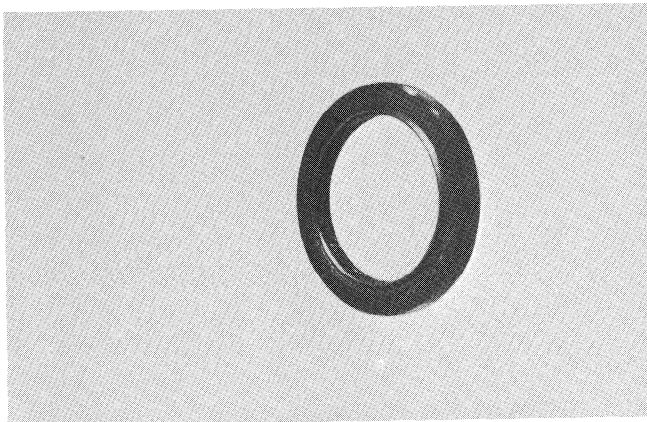
- Check to be sure that all nipples are tight, and retighten them as necessary using the special tool.

Tightening torque	0.4 – 0.5 kg-m (3.0 – 3.5 lb-ft) (4 – 5 N·m)
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Spoke nipple wrench	09940-60113
---------------------	-------------

**OIL SEAL**

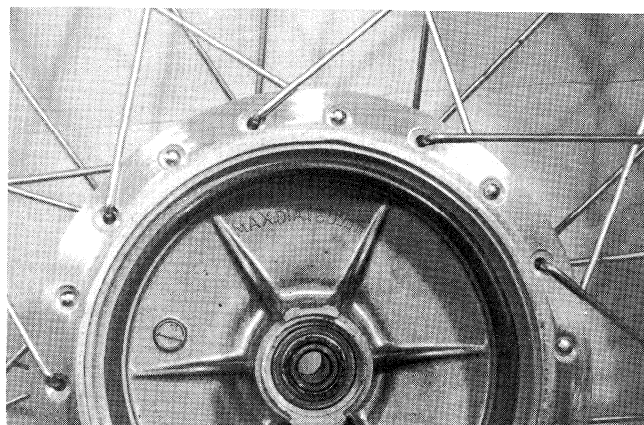
- Inspect the lip of the oil seal for damage.



BRAKE DRUM

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

Service limit	150.7 mm (5.93 in)
---------------	-----------------------

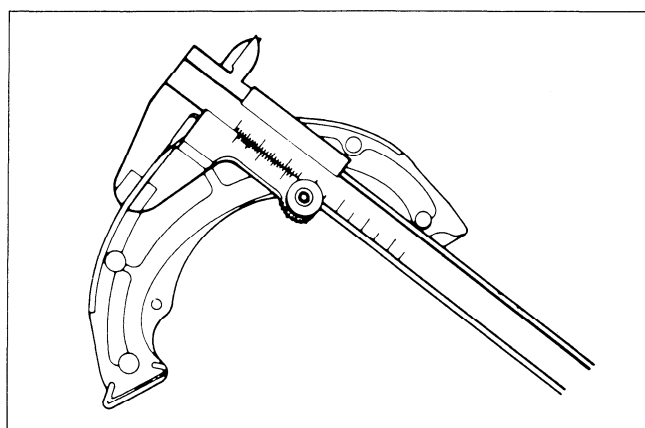
**BRAKE SHOE**

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

Service limit	1.5 mm (0.06 in)
---------------	---------------------

CAUTION:

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

**REASSEMBLY**

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

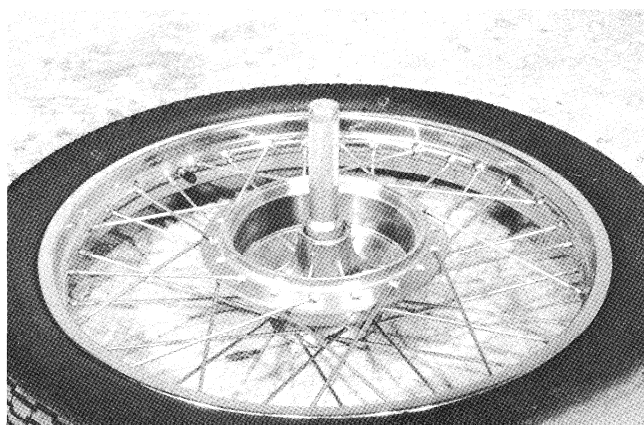
WHEEL BEARING

- Apply grease to the bearings before installing.

Suzuki super grease "A"	99000-25030
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- Install the wheel bearings by using the special tool.

Bearing installer	09913-75820
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BRAKE CAM

- Apply grease to the brake cams.

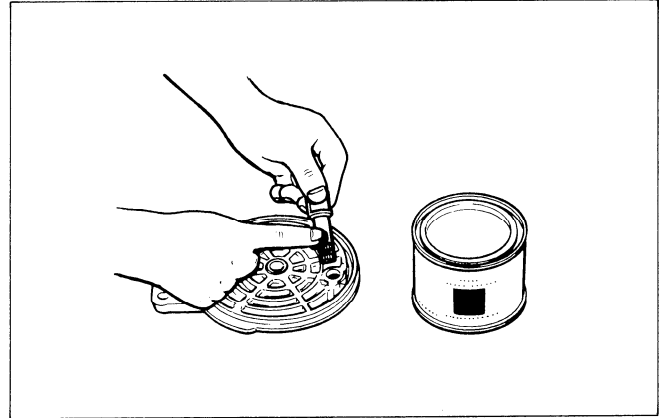
Suzuki super
grease "A"

99000-25030

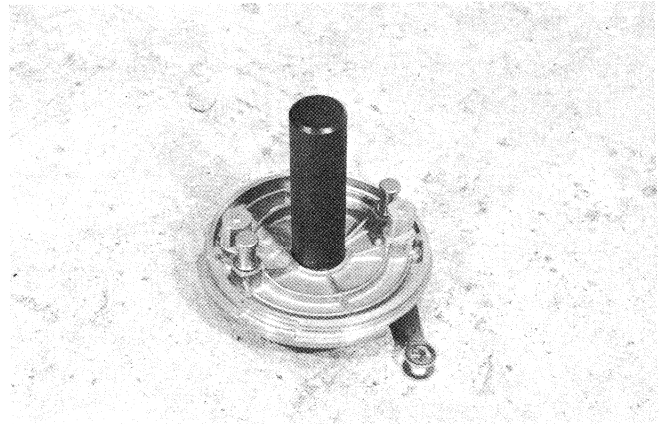
WARNING:

Be careful not to apply too much grease to the brake cam shaft.

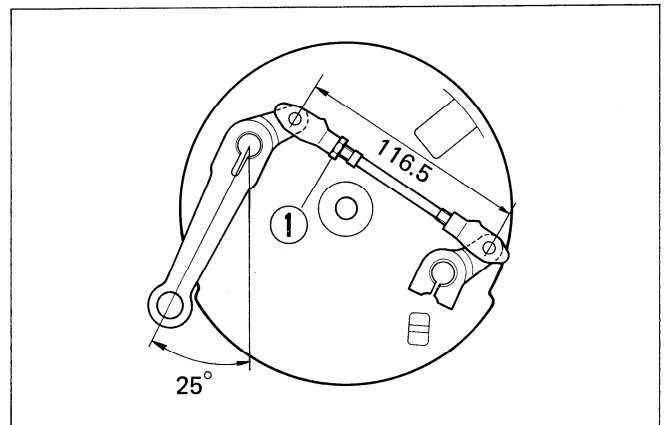
If grease gets on the lining, brake slippage will result.

**OIL SEAL**

- Install the oil seal by using the oil seal installer.

**BRAKE CAM LEVER**

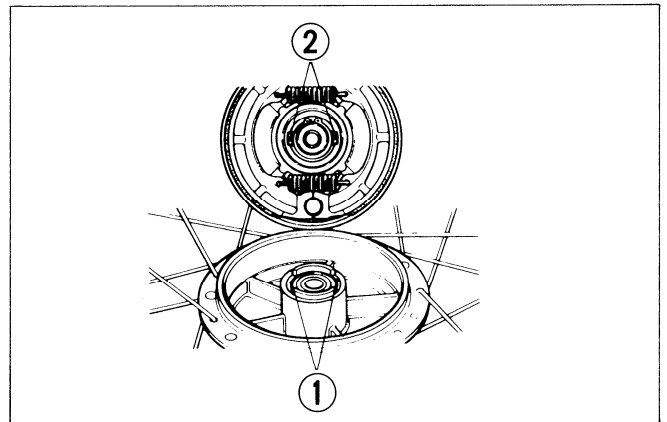
- Loosen the lock nut ① and adjust the connecting rod to the dimensions as shown in the illustration on the right.
- Tighten the lock nut ①.
- Install the brake cam lever after matching the punch mark on the cam level with the index mark on the cam.

**BRAKE PANEL**

- When installing the brake panel, align groove ① on the wheel hub and two drive pawls ② on trip meter gearbox.

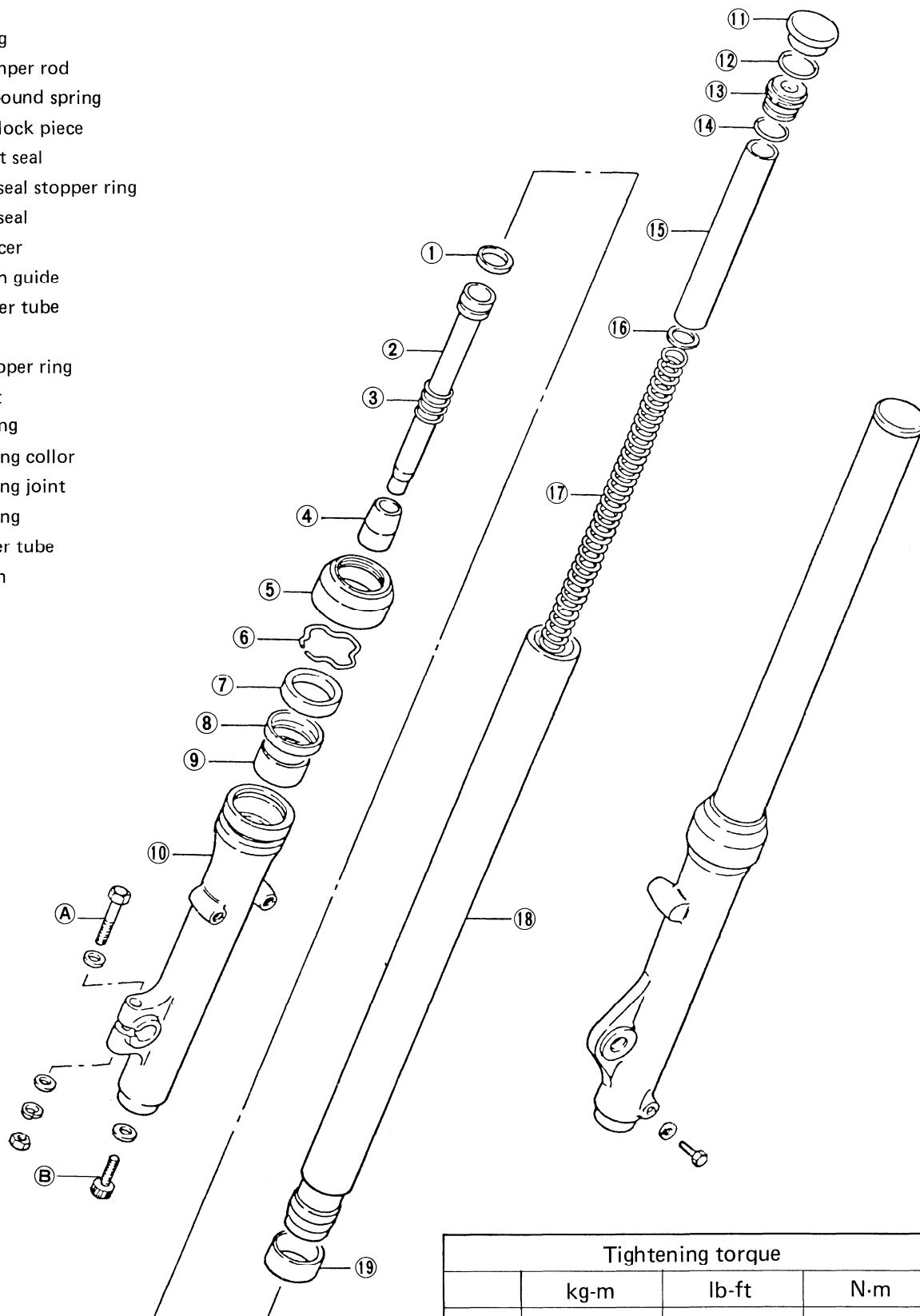
CAUTION:

Adjust the front brake lever play after installation of the front wheel. (See page 2-11).



FRONT FORK

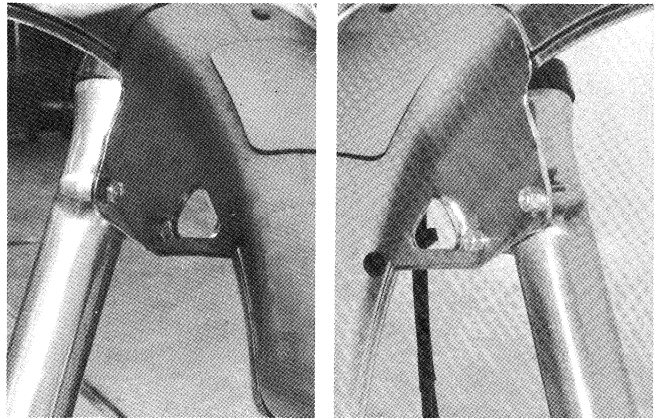
- ① Ring
- ② Damper rod
- ③ Rebound spring
- ④ Oil lock piece
- ⑤ Dust seal
- ⑥ Oil seal stopper ring
- ⑦ Oil seal
- ⑧ Spacer
- ⑨ Bush guide
- ⑩ Outer tube
- ⑪ Cap
- ⑫ Stopper ring
- ⑬ Seat
- ⑭ O-ring
- ⑮ Spring collar
- ⑯ Spring joint
- ⑰ Spring
- ⑱ Inner tube
- ⑲ Bush



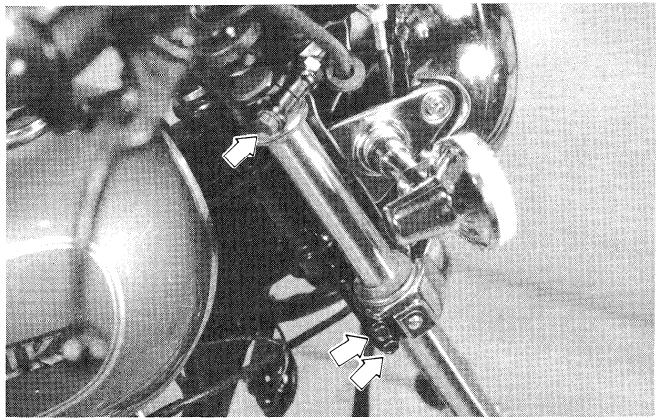
Tightening torque			
	kg-m	lb-ft	N·m
(A)	1.5 – 2.5	11.0 – 18.0	15 – 25
(B)	2.0 – 2.6	14.5 – 19.0	20 – 26

REMOVAL AND DISASSEMBLY

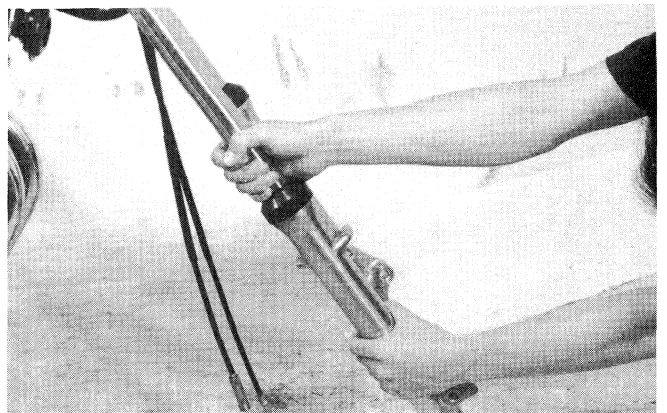
- Take off the front wheel (See page 7-1).
- Remove front fender.



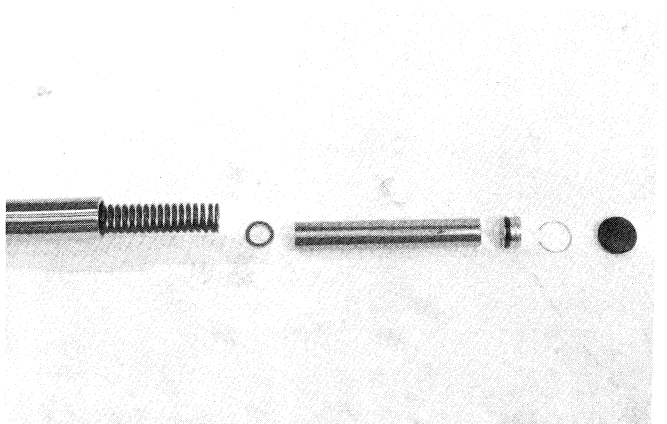
- Loosen the front fork upper and lower clamp bolts.



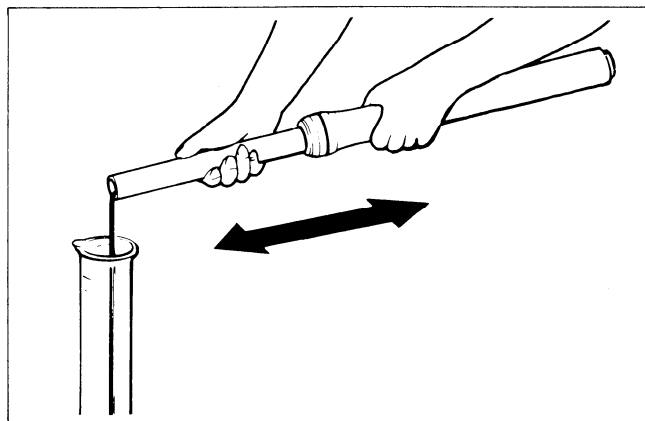
- Pull down right and left front forks.



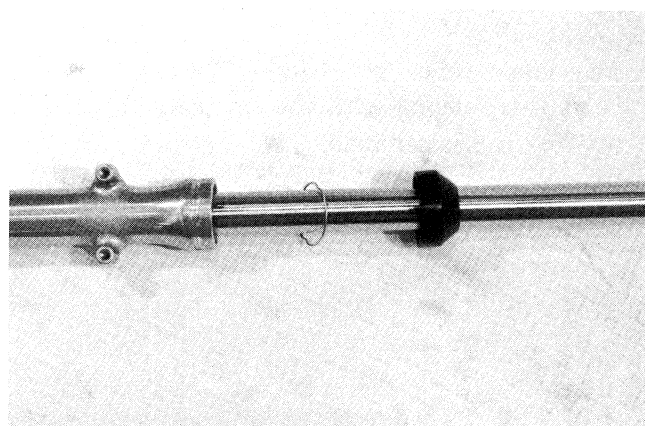
- Remove cap and snap-ring, take out the seat, o-ring, spacer, spring joint and spring.



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

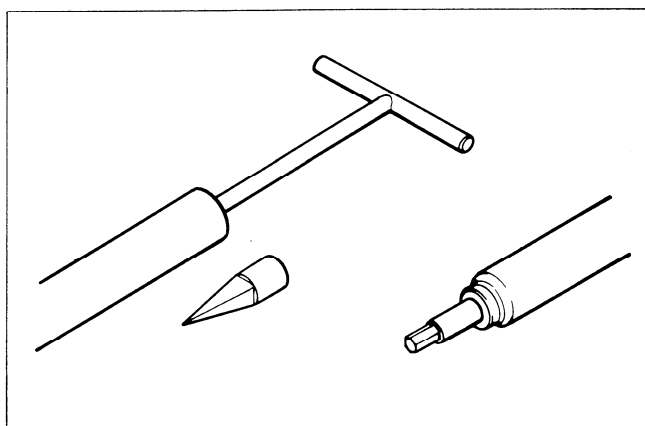


- Remove the dust seal and stopper ring.

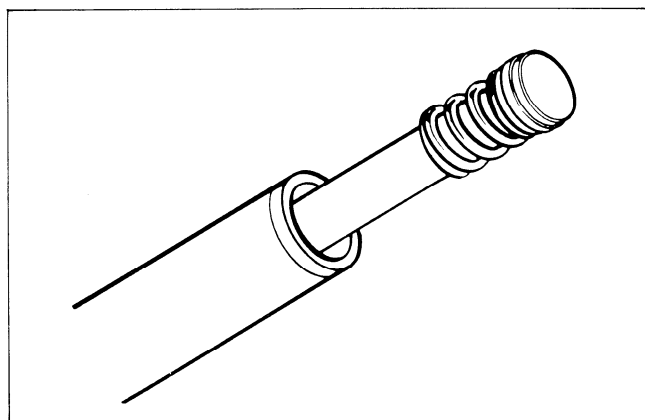


- Remove damper rod bolt by using the special tools.

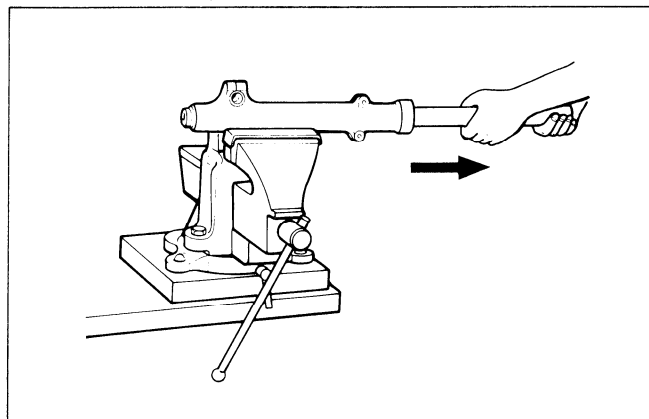
"T" handle	09940-34520
Attachment "D"	09940-34561



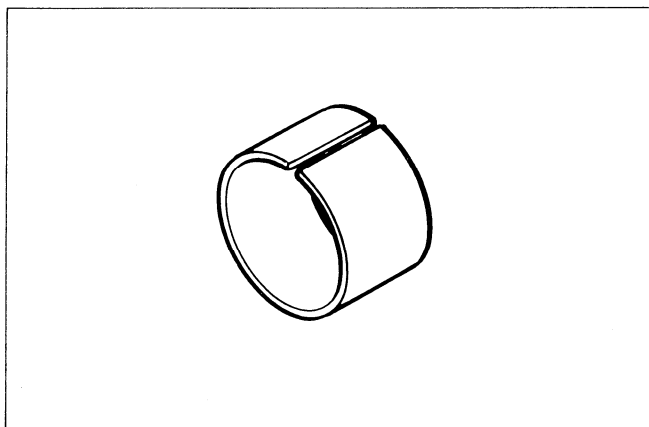
- Remove the damper rod and rebound spring.



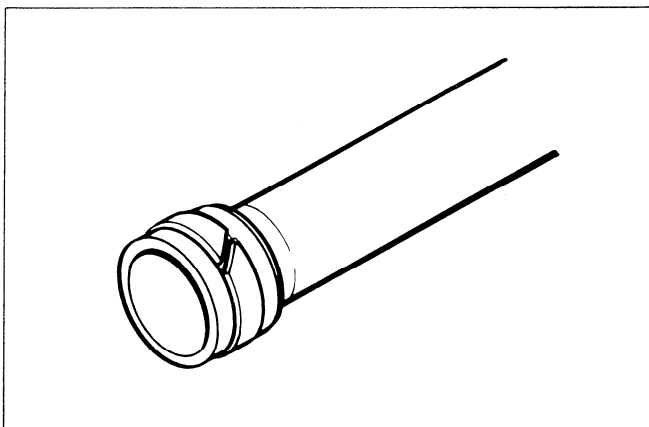
- While holding the caliper mounting portion of the outer tube by vise, separate the inner tube from the outer tube as shown.

**CAUTION:**

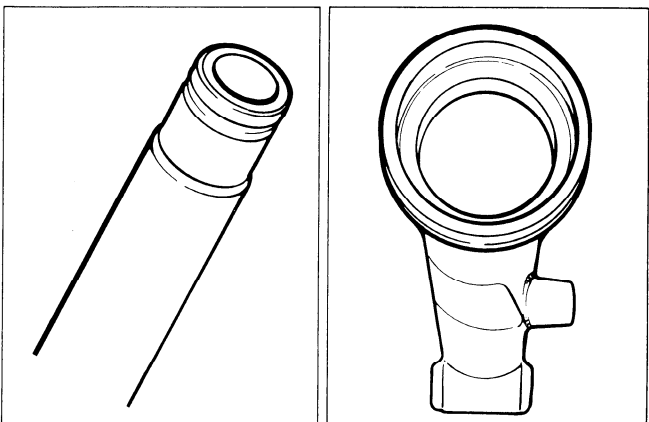
The inner tube "anti-friction" metals must be replaced along with the oil seal any time the fork is disassembled.

**INSPECTION****DAMPER ROD RING**

- Inspect damper rod ring for wear and damage.

**INNER TUBE AND OUTER TUBE**

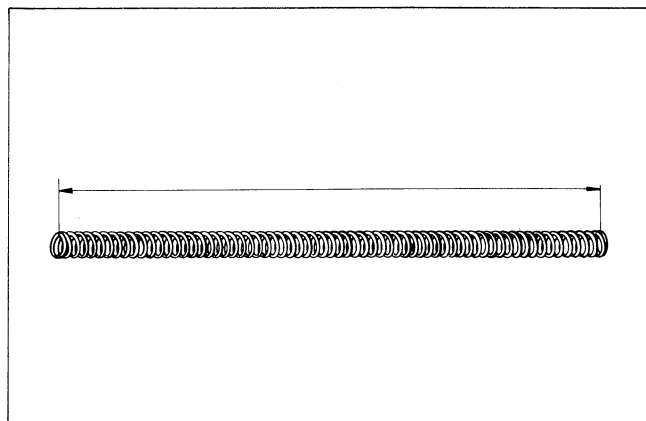
- Inspect inner tube and outer tube sliding surfaces for any scuffing or flaws.



FORK SPRING

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

Service limit	610 mm (24.0 in)
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REASSEMBLY

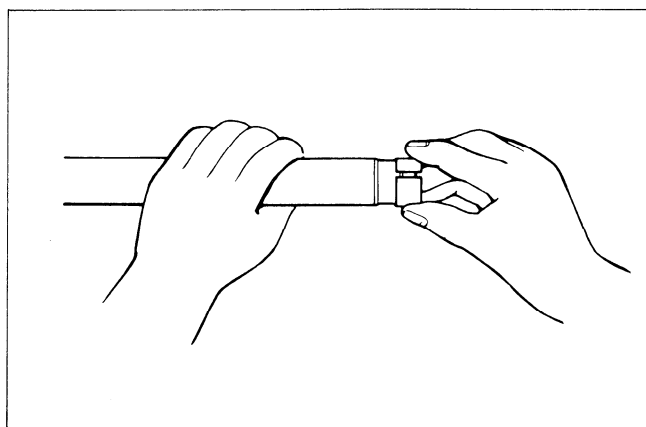
Reassemble and remount the front fork in the reverse order of disassembly and removal, and also carry out the following steps:

INNER TUBE METAL

- Install the metal by hand as shown.

CAUTION:

Take special care to prevent damage to the Teflon coated surface of the "Anti-friction" metal when mounting it.



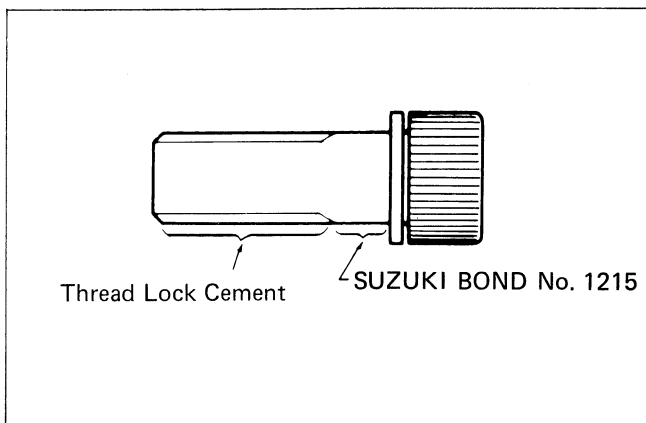
DAMPER ROD BOLT

- Apply Suzuki Bond No. 1215 and Thread Lock Cement to the damper rod bolt and tighten with specified torque.

Suzuki Bond No. 1215	99104-31110
Thread Lock Cement	99000-32040

"T" handle	09940-34520
Attachment "D"	09940-34561

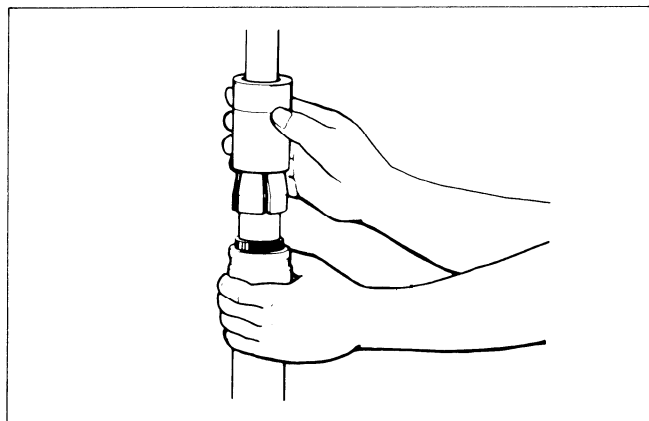
Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft) (20 – 26 N·m)
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OIL SEAL AND DUST SEAL

- Install the oil seal and dust seal with dust seal case to the outer tube by using the special tool as shown.

Fork oil seal installer	09940-50112
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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 #10
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Capacity (each leg)	216 ml (7.3 US oz)
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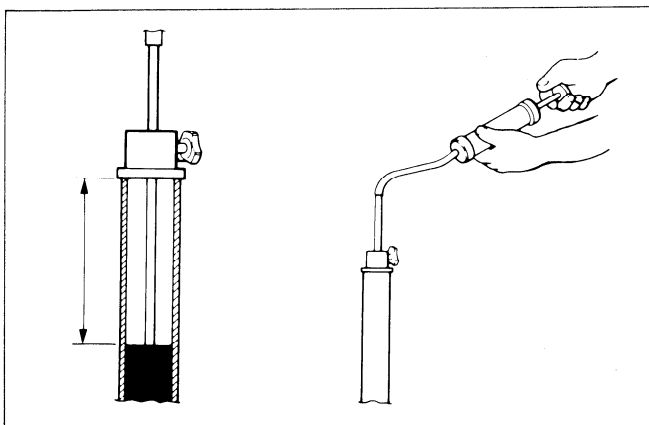
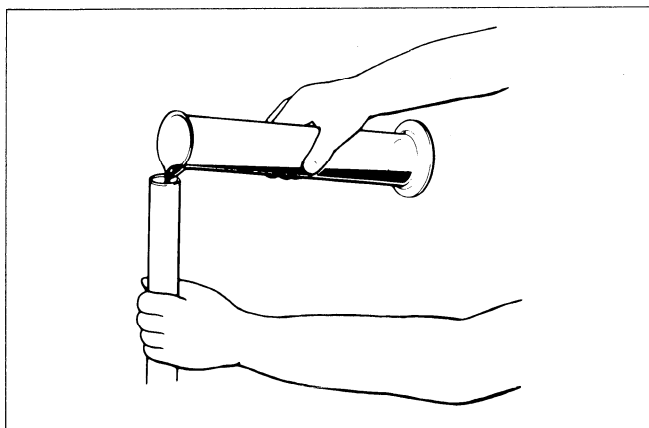
- Hold the front fork vertical and adjust the fork oil level with the special tool.

NOTE:

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

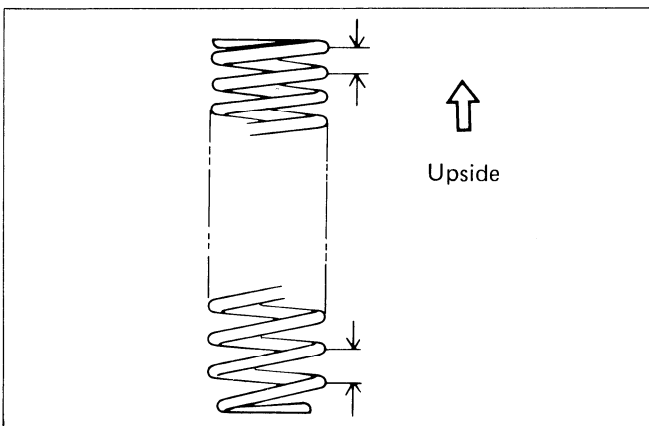
Fork oil level gauge	09943-74111
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Oil level	200 mm (7.9 in)
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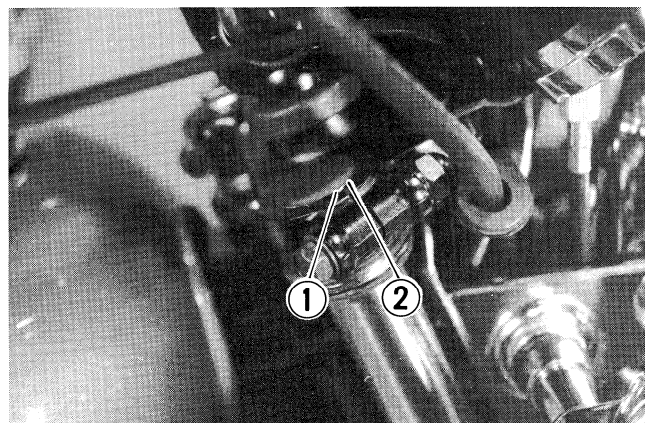
FORK SPRING

- When installing the front fork spring, the close wound end should face upward.



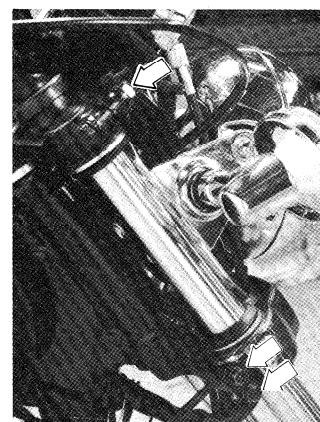
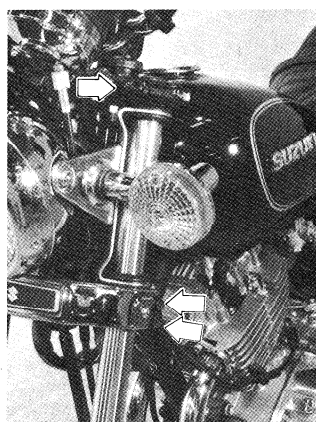
REMOUNTING

- When installing the front fork assembly, align the top ① of inner tube to the upper surface ② of the steering stem upper bracket.



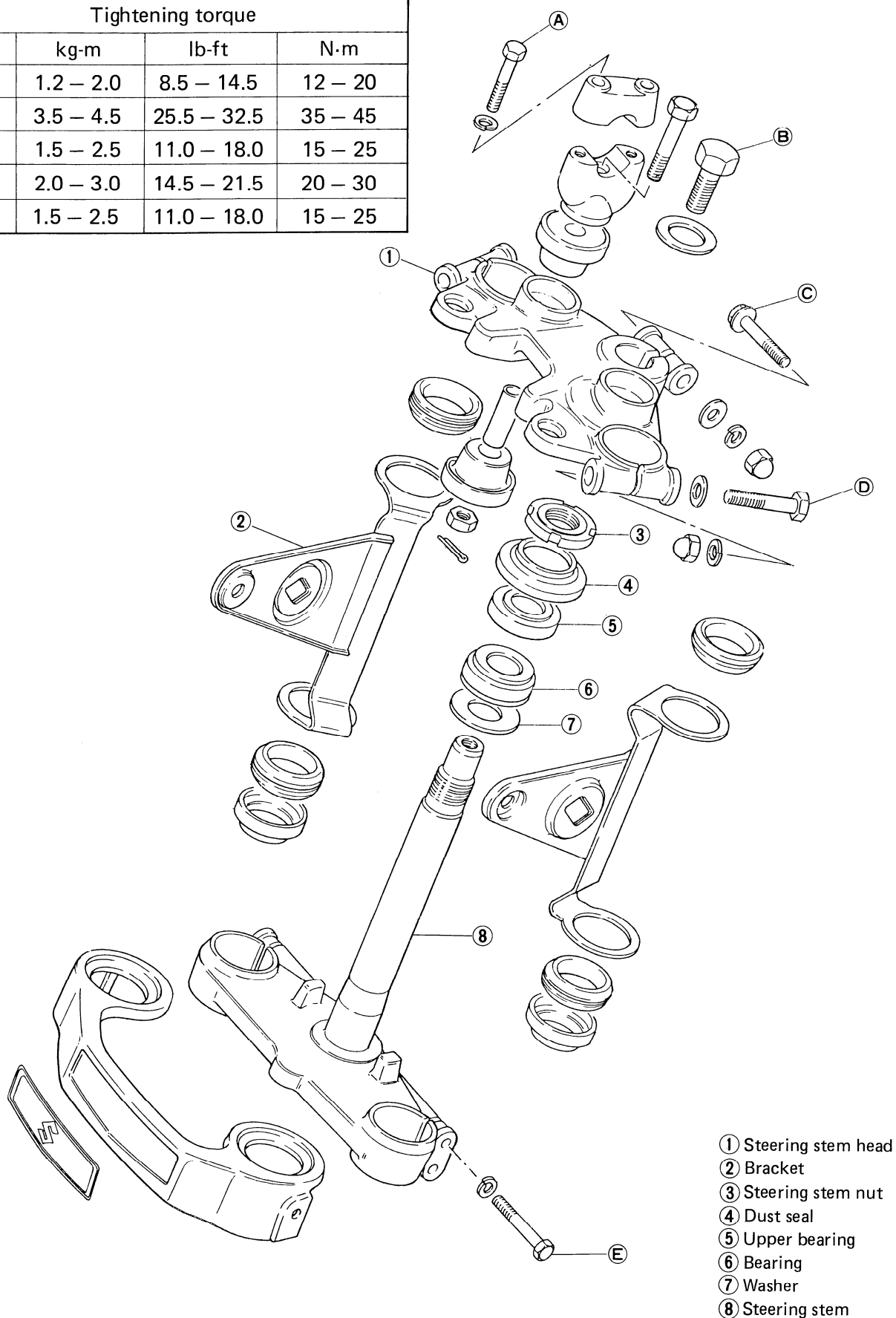
- Tighten the upper and lower clamps bolts.

Tightening torque	Upper	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft) 20 – 30 N·m
	Lower	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft) 15 – 25 N·m



STEERING STEM

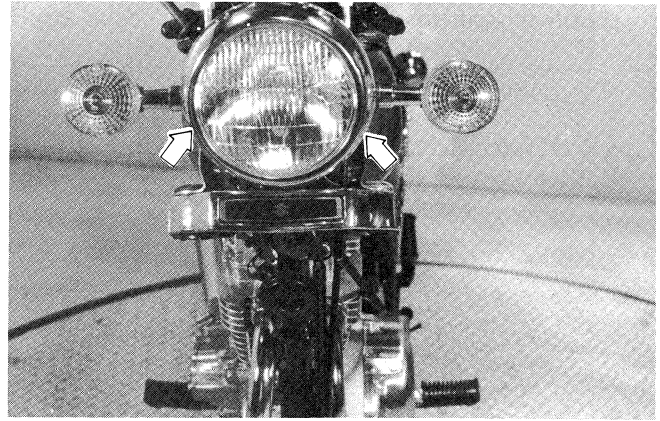
Tightening torque			
	kg-m	lb-ft	N·m
(A)	1.2 – 2.0	8.5 – 14.5	12 – 20
(B)	3.5 – 4.5	25.5 – 32.5	35 – 45
(C)	1.5 – 2.5	11.0 – 18.0	15 – 25
(D)	2.0 – 3.0	14.5 – 21.5	20 – 30
(E)	1.5 – 2.5	11.0 – 18.0	15 – 25



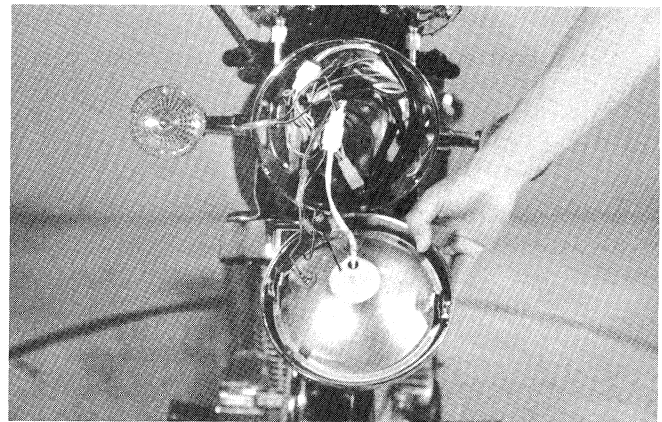
- ① Steering stem head
- ② Bracket
- ③ Steering stem nut
- ④ Dust seal
- ⑤ Upper bearing
- ⑥ Bearing
- ⑦ Washer
- ⑧ Steering stem

REMOVAL AND DISASSEMBLY

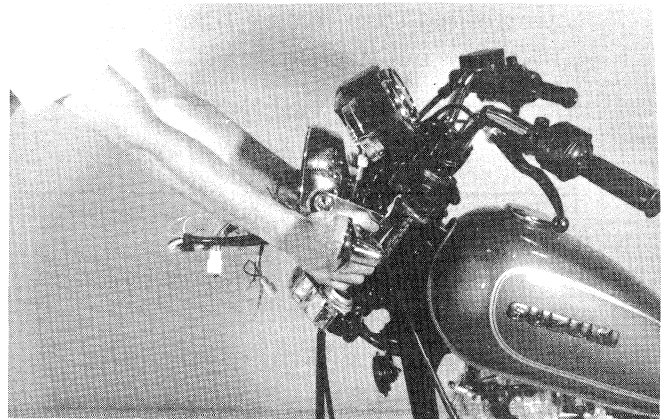
- Take off front wheel (see page 7-1)
- Take off front fork (see page 7-8)
- Remove the three screws and headlight housing.



- Disconnect lead wires in headlight housing.



- Remove the headlight housing, turn signal lights, and turn signal light brackets.

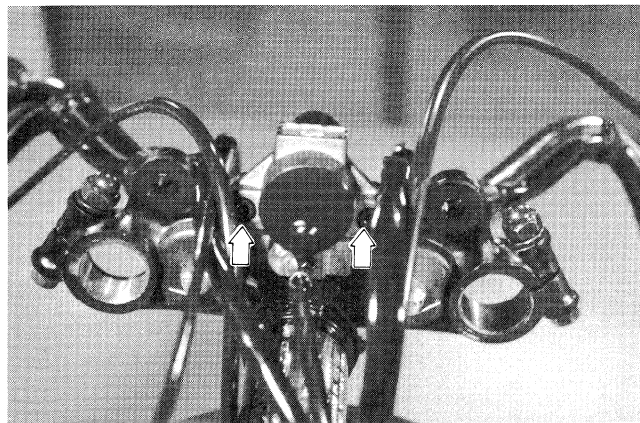


- Remove mounting nuts and take off the speed-meter.

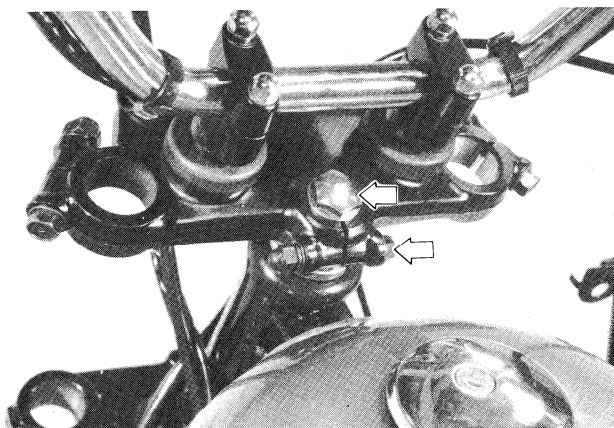


- Remove ignition switch by using special tool.

T type hexagon wrench	09911-73730
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- Remove steering stem head bolt and loosen clamp bolt and then take off steering stem head.

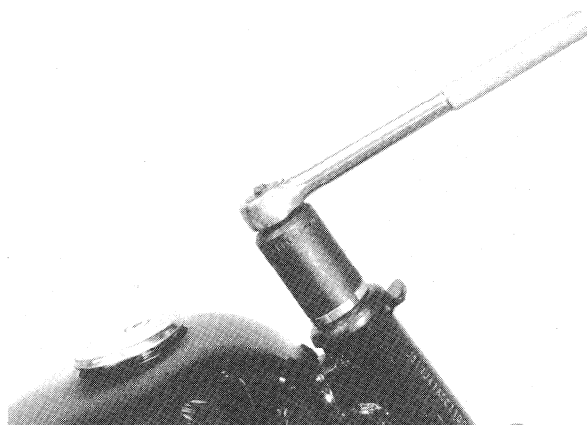


- Remove steering stem nut by using the special tool, then draw out steering stem.

Steering stem nut socket wrench	09940-14911
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NOTE:

Hold the steering stem lower bracket by hand to prevent from falling.

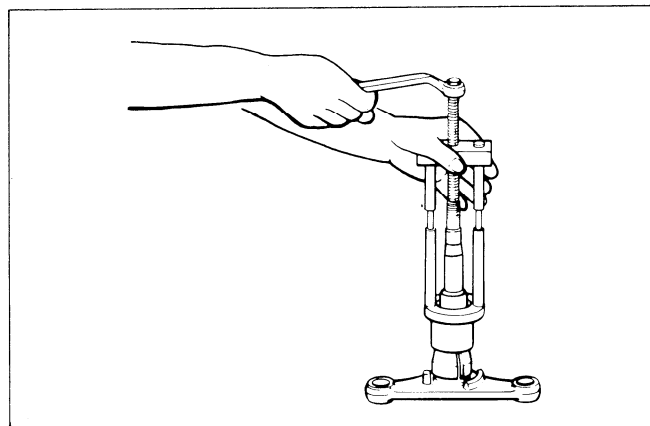


- Draw out lower steering stem bearing by using special tool.

CAUTION:

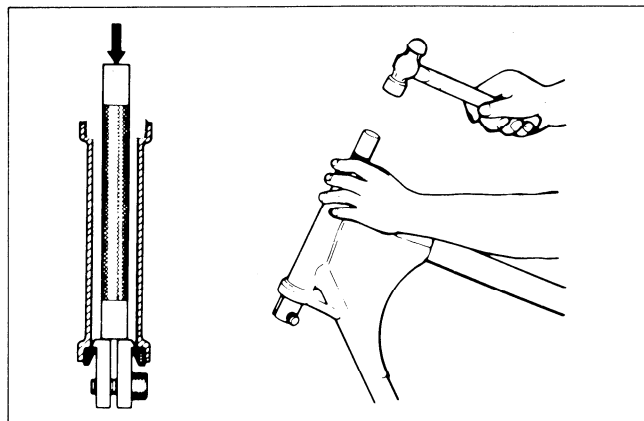
The removed bearing should be replaced.

Bearing inner race remover	09941-84510
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- Draw out steering stem bearing outer races, upper and lower, by using special tools.

Steering race remover	09941-54911
Steering bearing installer	09941-74910

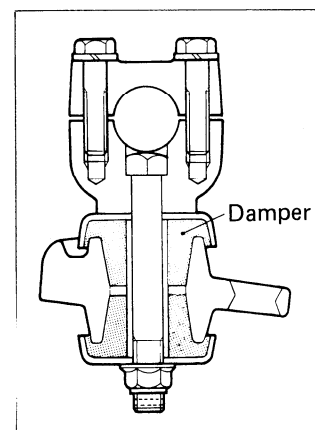
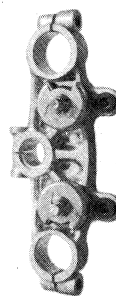


INSPECTION

Inspect and check the removed parts for the following abnormalities.

- Handlebars distortion
- Handlebars clamp wear
- Race wear and brinelling
- Worn or damaged bearing
- Distortion of steering stem

Inspect the play of dampers by hands while fixing it in the steering stem upper bracket. If the play can be found, replace the dampers.



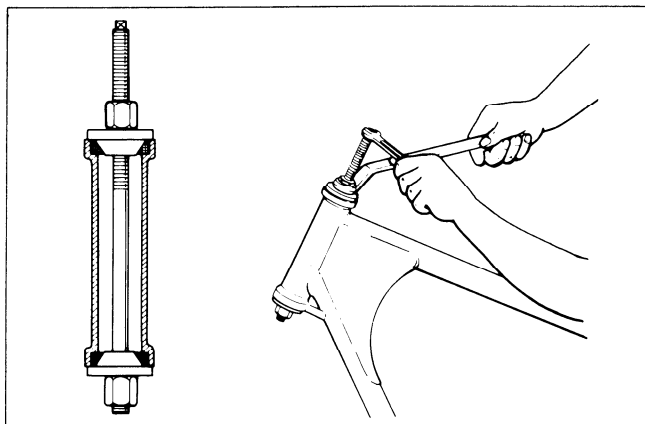
REASSEMBLY

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

OUTER RACES

- Press in the upper and lower outer races using special tool.

Steering race installer	09941-34511
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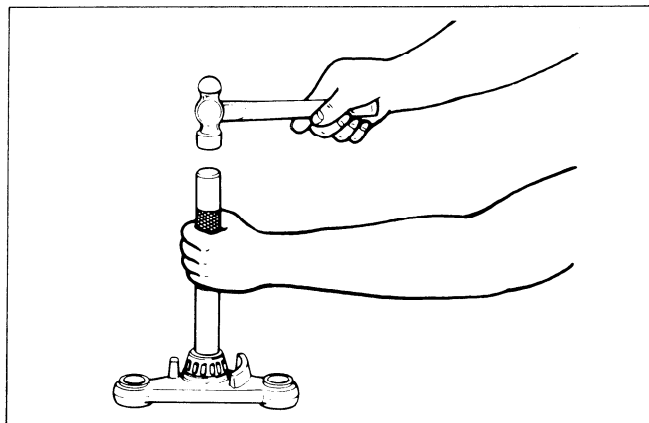


BEARING

- Press in the lower bearing by using special tool.

Steering bearing installer

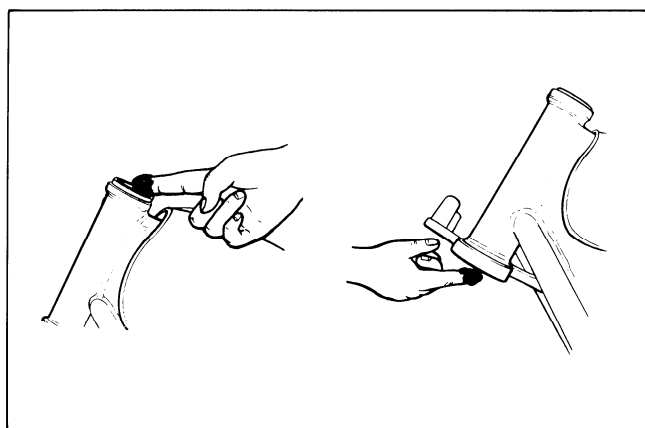
09941-74910



- Apply grease upper and lower bearing before remounting the steering stem.

Suzuki super grease "A"

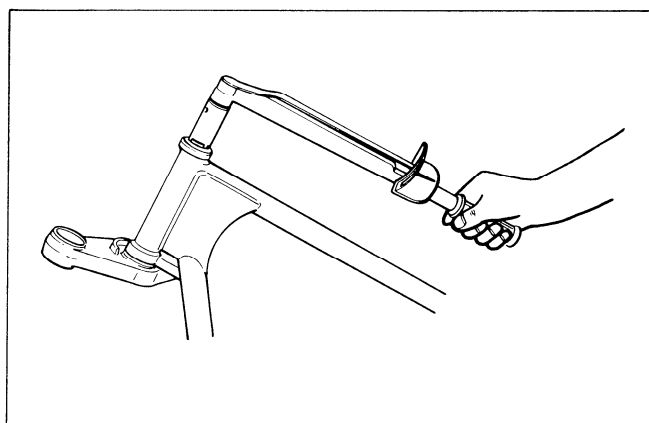
99000-25030

**STEM NUT**

- Fit the dust seal to the stem nut.
Tighten the steering stem nut to 4.0 – 5.0 kg-m
(29.0 – 36.0 lb-ft, 40 – 50 N·m)

Steering nut socket wrench

09940-14911

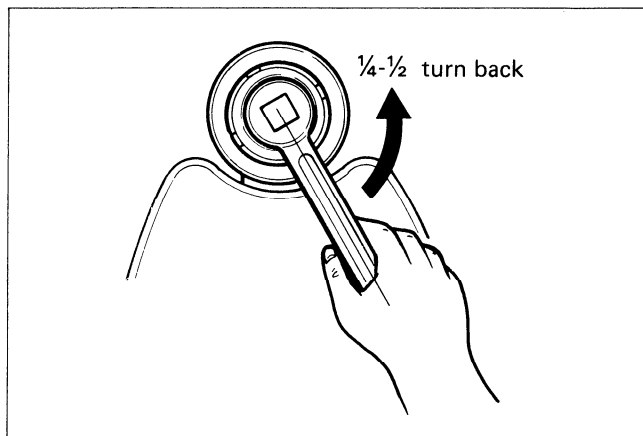


- Turn the steering stem R & L, lock to lock, five or six times to "Seat" the steering stem bearings.
- Turn back the stem nut by $\frac{1}{4}$ – $\frac{1}{2}$ turn.

NOTE:

This adjustment will vary from motorcycle to motorcycle.

- Steering stem head bolt should be tightened to the specified torque.

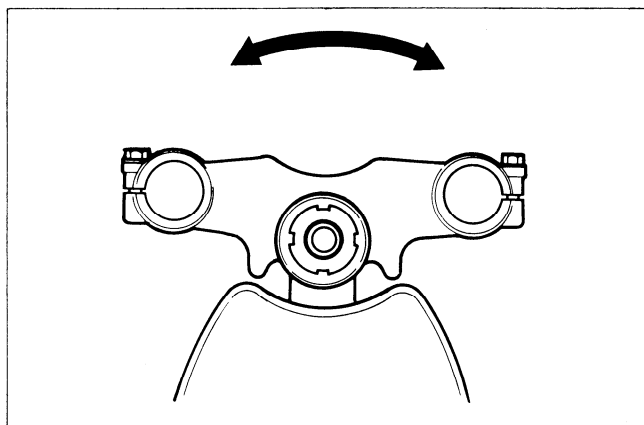


Tightening torque	$3.5 - 4.5 \text{ kg}\cdot\text{m}$ $(22.5 - 32.5 \text{ lb}\cdot\text{ft})$ $(35 - 45 \text{ N}\cdot\text{m})$
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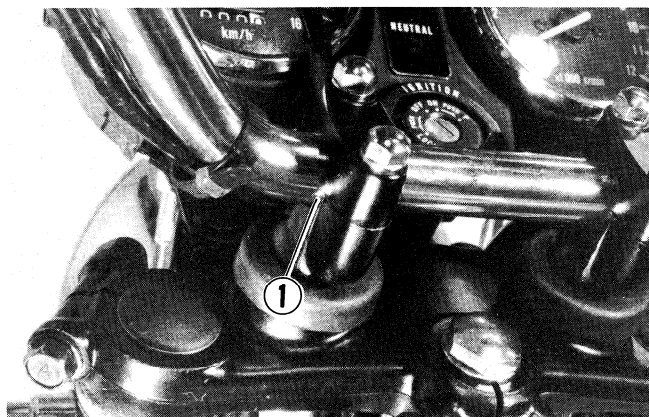
CAUTION:

After performing the adjustment and installing the steering stem upper bracket, "rock" the front wheel assembly forward 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 own weight.

If play or stiffness is noticeable, re-adjust the steering stem nut.

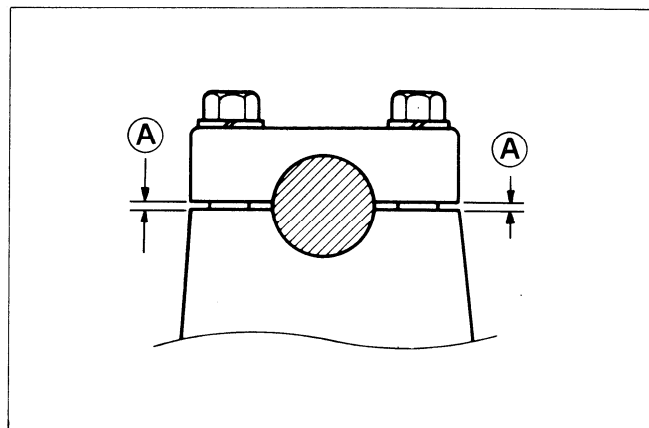
**HANDLEBARS**

- Set the handlebars to match its punched mark ① to the mating face of the holder.

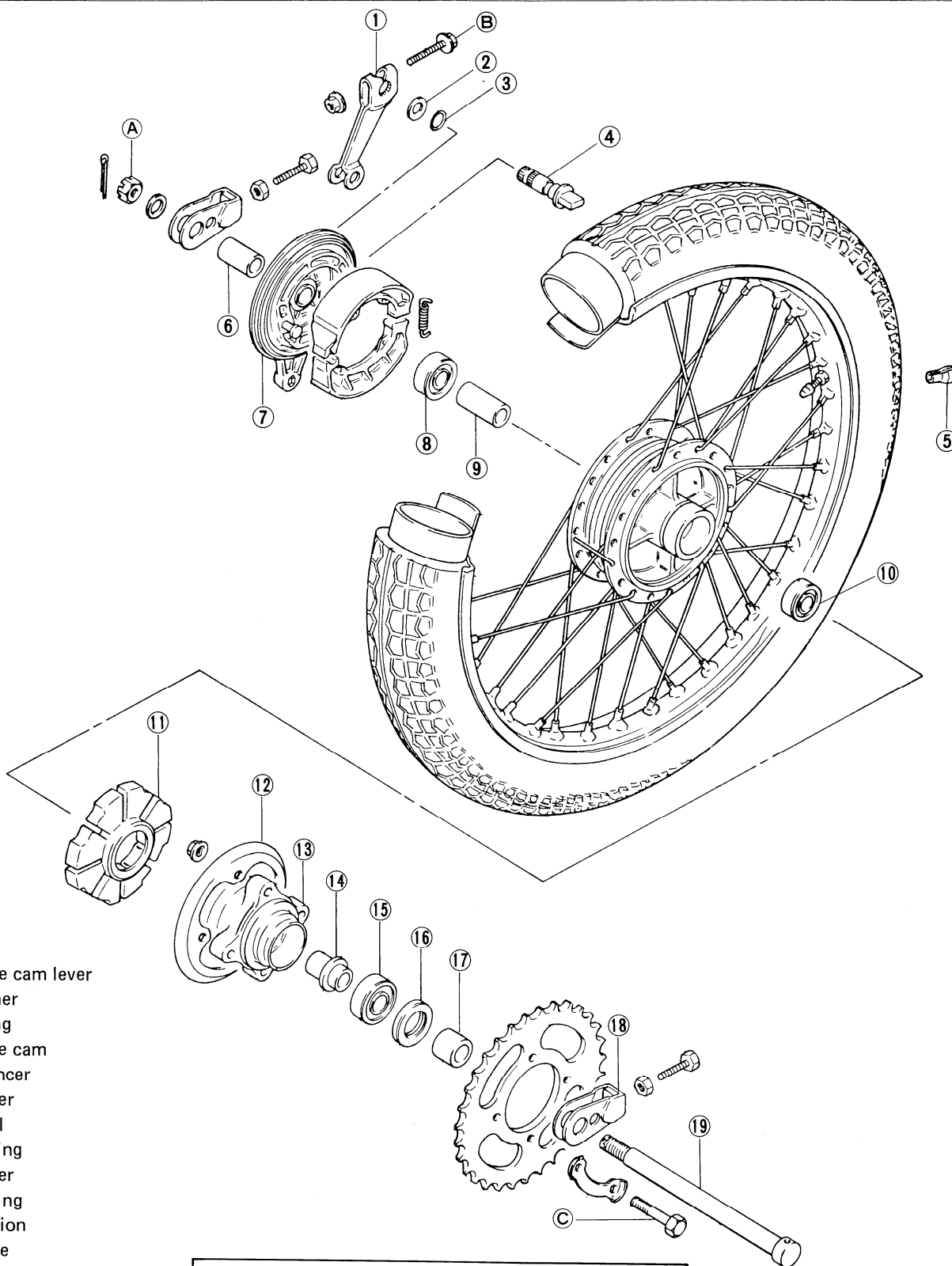


- Secure the each handlebars clamp in such a way that the clearances ① ahead of and behind the handlebars be equalized.

Tightening torque	$1.2 - 2.0 \text{ kg}\cdot\text{m}$ $(8.5 - 14.5 \text{ lb}\cdot\text{ft})$ $(12 - 20 \text{ N}\cdot\text{m})$
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REAR WHEEL AND REAR BRAKE

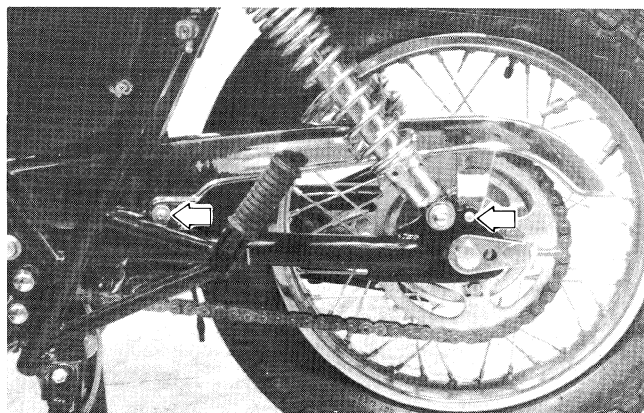


- ① Brake cam lever
- ② Washer
- ③ O-ring
- ④ Brake cam
- ⑤ Balancer
- ⑥ Spacer
- ⑦ Panel
- ⑧ Bearing
- ⑨ Spacer
- ⑩ Bearing
- ⑪ Cushion
- ⑫ Guide
- ⑬ Sprocket mounting drum
- ⑭ Mounting drum retainer
- ⑮ Mounting drum bearing
- ⑯ Oil seal
- ⑰ Spacer
- ⑱ Adjuster
- ⑲ Axle

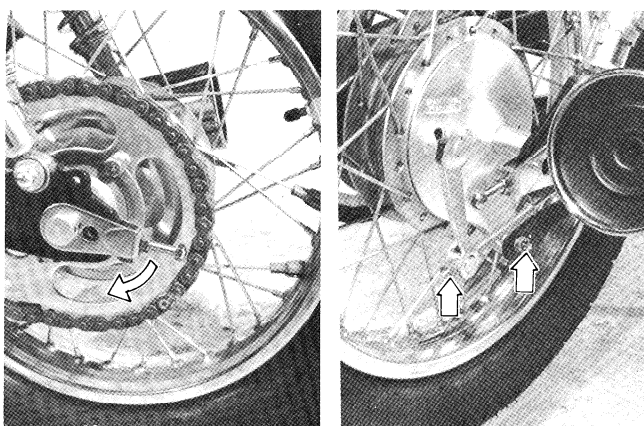
Tightening torque			
	kg-m	lb-ft	N·m
Ⓐ	5.0 – 8.0	36.0 – 58.0	50 – 80
Ⓑ	0.5 – 0.8	3.5 – 6.0	5 – 8
Ⓒ	2.5 – 4.0	18.0 – 29.0	25 – 40

REMOVAL AND DISASSEMBLY

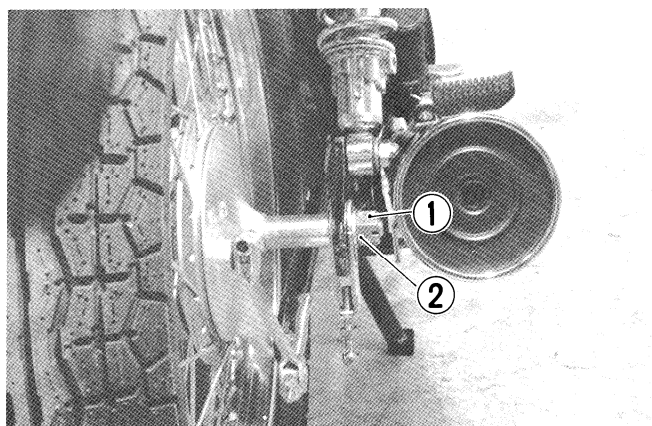
- Loosen the two fitting bolts and take off chain case.



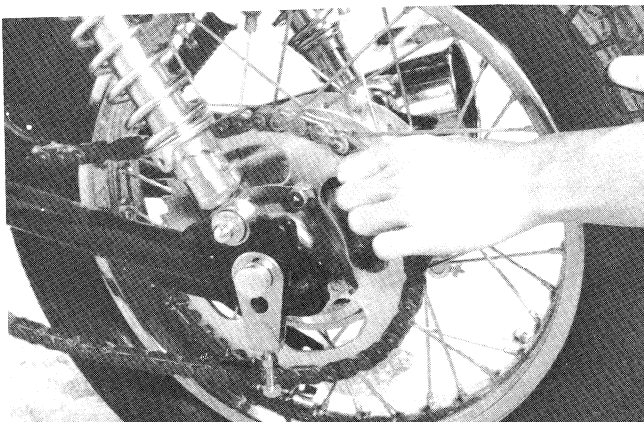
- After loosening the chain adjuster lock nut, turn the chain adjusters downward.
- Pull out the cotter pin and remove the torque link nut and bolt.
- Remove the rear brake adjuster nut.



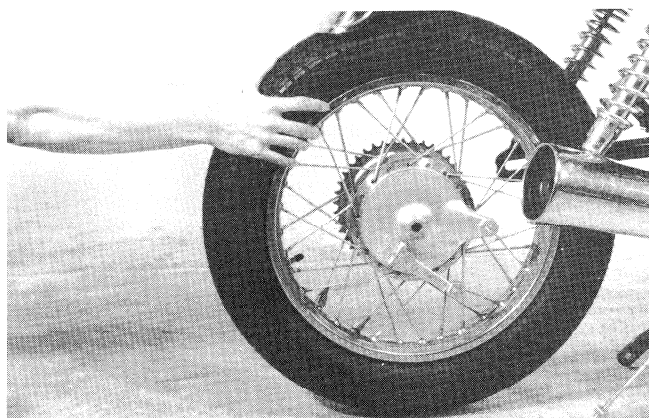
- Pull out the cotter pin ① and remove the rear axle nut ②.



- While pushing the rear wheel take the chain off the rear sprocket.

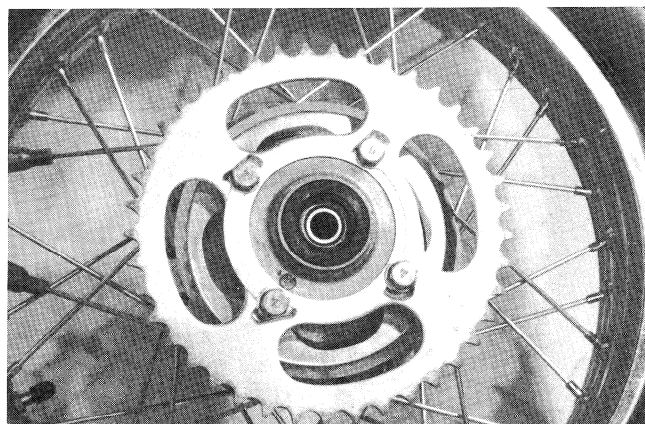


- Remove the axle shaft and take off the rear wheel.

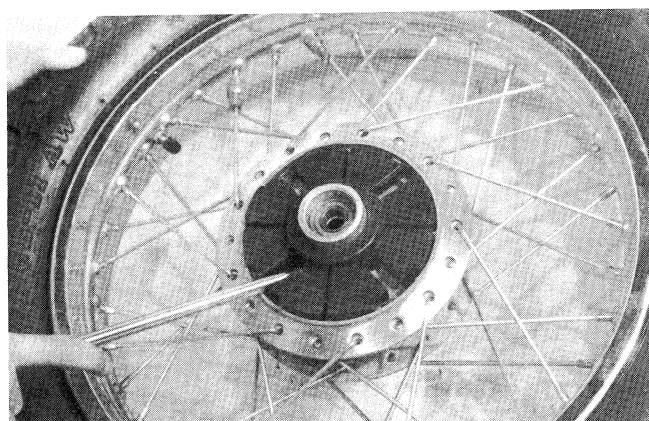


REAR WHEEL

- Draw out the rear sprocket mounting drum from the rear wheel.



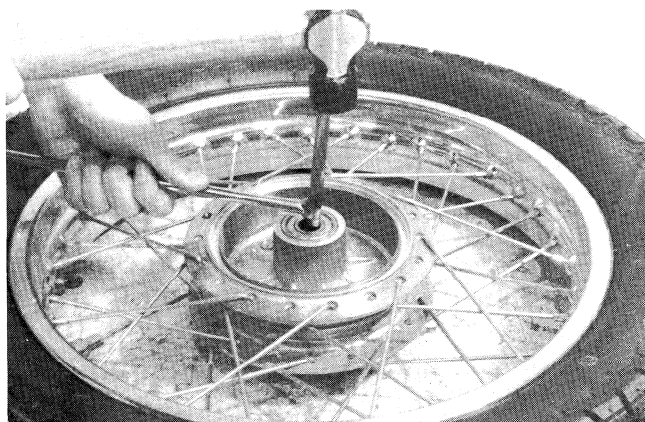
- Remove the cushion.



- Draw out wheel bearing, right and left side.

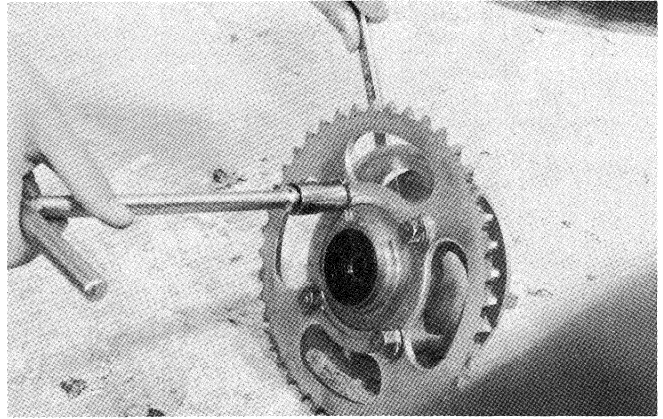
NOTE:

Remove the left side bearing first, and it makes the job easier.



SPROCKET MOUNTING DRUM

- Flatten the washers and loosen the four nuts.
- Separate the rear sprocket and sprocket mounting drum.

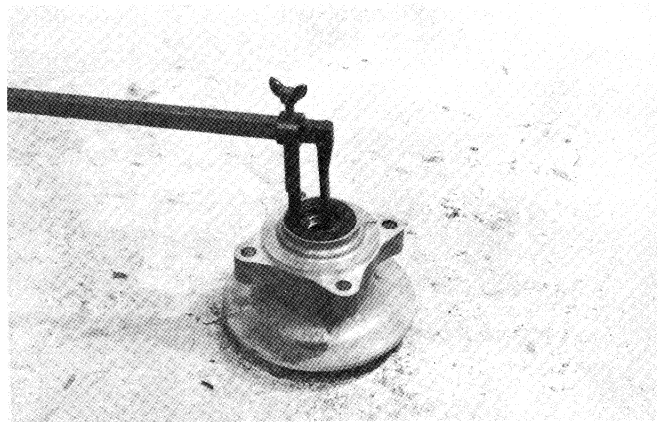


- Remove oil seal by using the special tool.

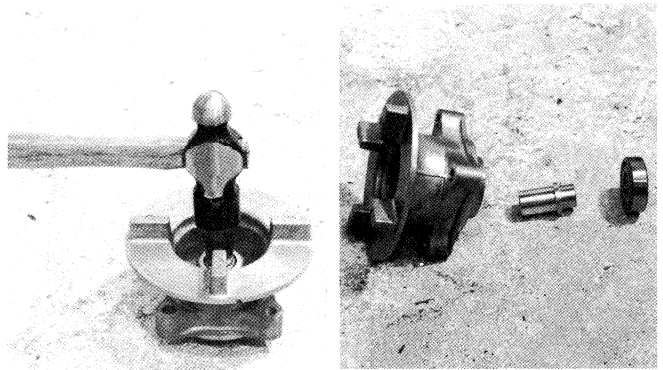
Oil seal remover	09913-50121
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CAUTION:

The oil seal removed should be replaced with a new seal.

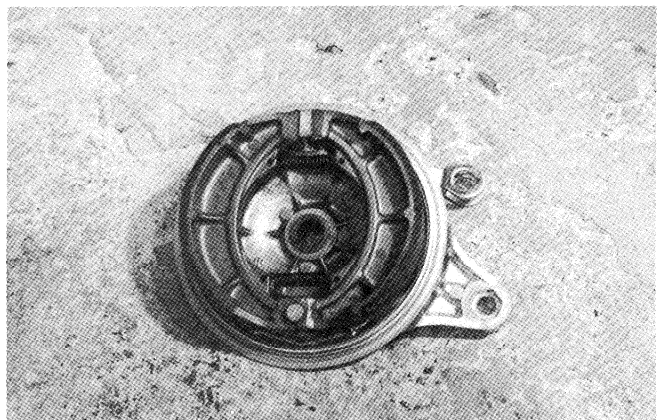


- Tap out the spacer and bearing by using a proper size bearing installer.

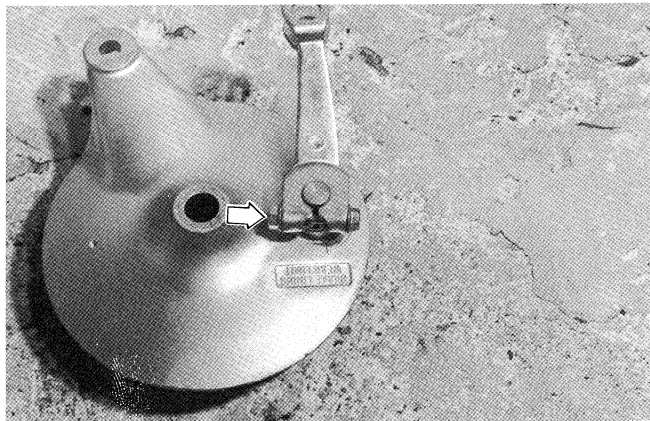


REAR BRAKE

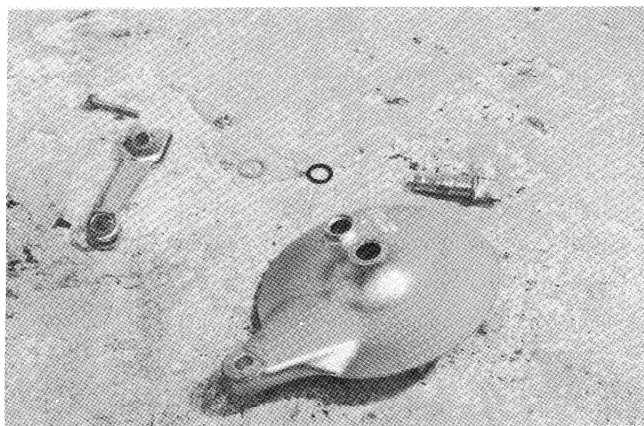
- Take off the brake shoes.



- Loosen the cam lever nut.



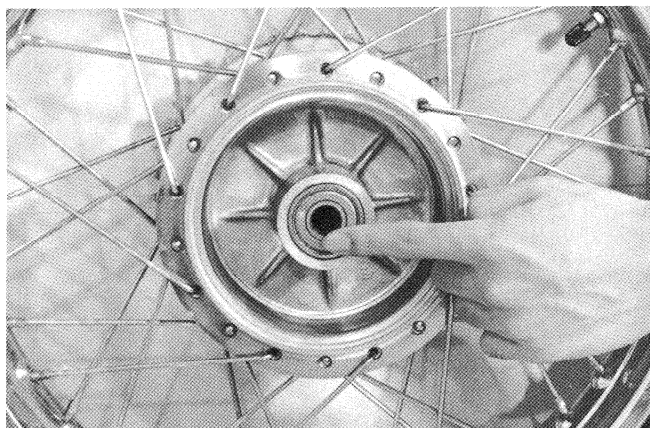
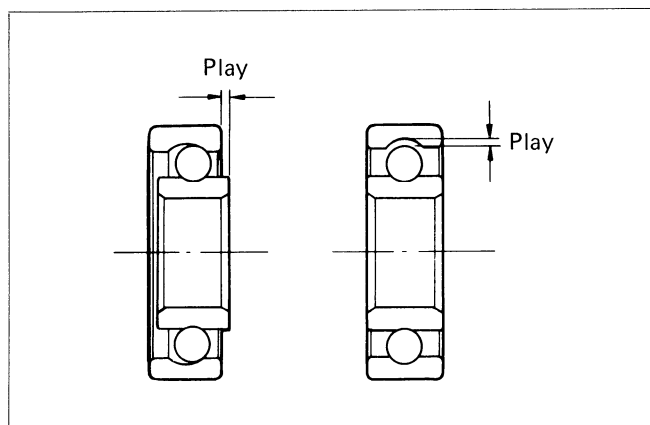
- Pull off the brake cam, washer, O-ring and cam lever.



INSPECTION

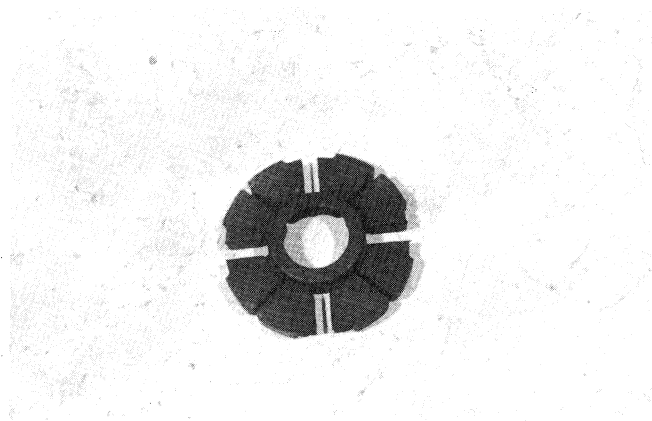
WHEEL AND MOUNTING DRUM BEARINGS

Inspect the play of wheel and mounting drum bearings inner race by hands while fixing it in the wheel hub or wheel. Rotate the inner race by hands to inspect whether abnormal noise and if it rotates smoothly. Replace the bearing if there is something unusual.



CUSHION

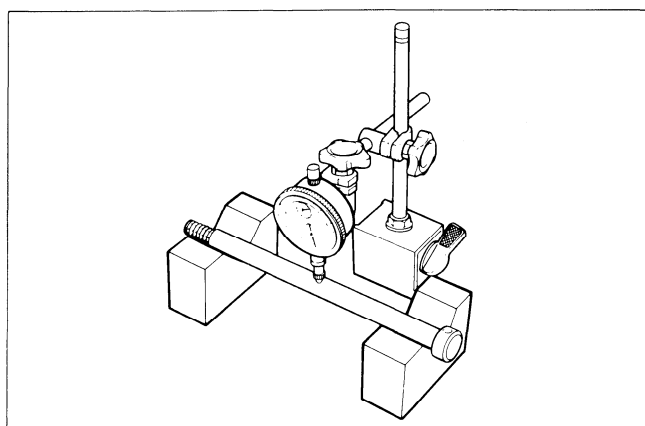
- Inspect the cushion for wear and damage.



AXLE SHAFT

- Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

Dial gauge (1/100)	09900-20606
Service limit	0.25 mm (0.010 in)



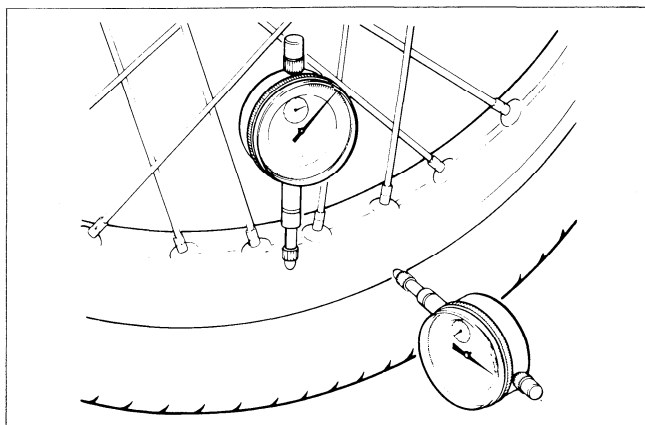
WHEEL RIM

- Make sure that the wheel rim runout does not exceed the service limit when checked as shown. An excessive amount of runout is usually due to loose spokes or a bent wheel rim. If properly tightening the spokes will not correct the runout, replace the wheel rim.

NOTE:

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

Service limit (Axial and Radial)	2.0 mm (0.08 in)
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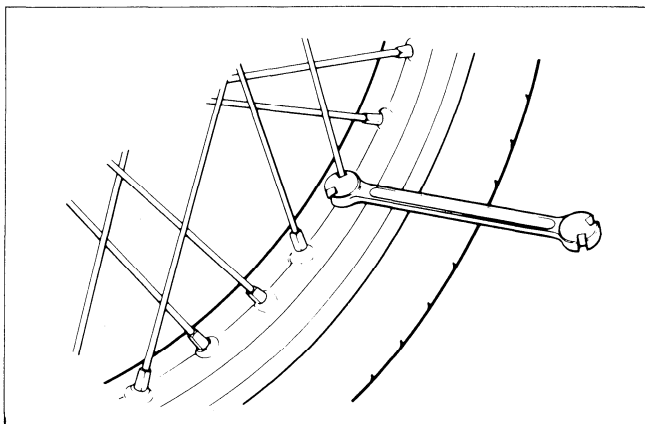


TIRE (See page 2–12)

SPOKE NIPPLE

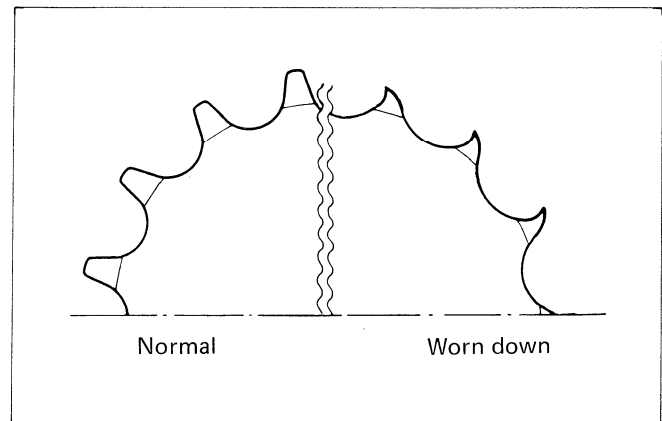
- Check to be sure that all nipples are tight, and retighten them as necessary using the special tool.

Tightening torque	0.4 – 0.5 kg-m (3.0 – 3.5 lb-ft) (4 – 5 N·m)
Spoke nipple wrench	09940-60113



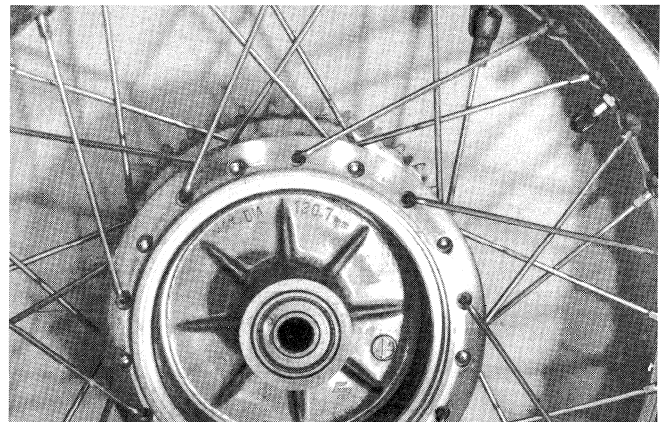
SPROCKET

- 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 exceeded by the wear noted, replace the drum. The value of this limit is indicated inside the drum.

Service limit	130.7 mm (5.15 in)
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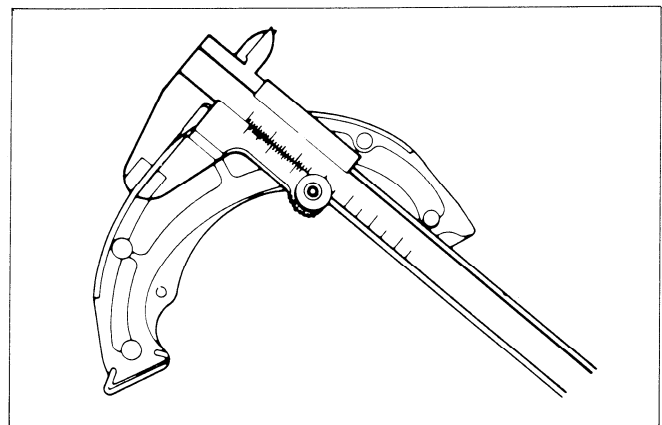
**BRAKE SHOE**

- 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 (0.06 in)
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CAUTION:

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



REASSEMBLY

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

WHEEL BEARING

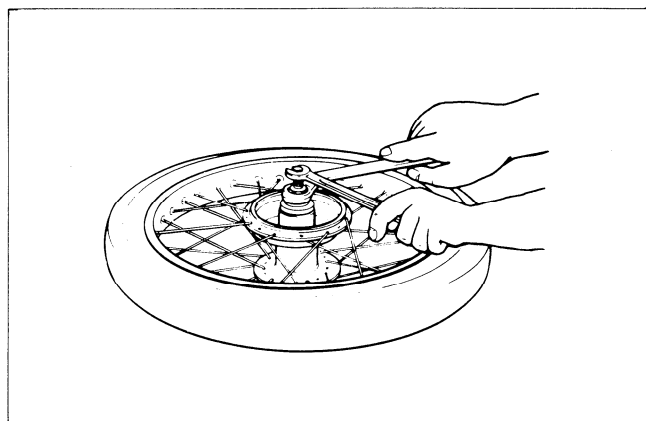
- Apply grease to the bearings before installing.

Suzuki super grease "A"	99000-25030
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- Install the wheel bearings by using a bearing installer.

NOTE:

First install the wheel bearing for right side.



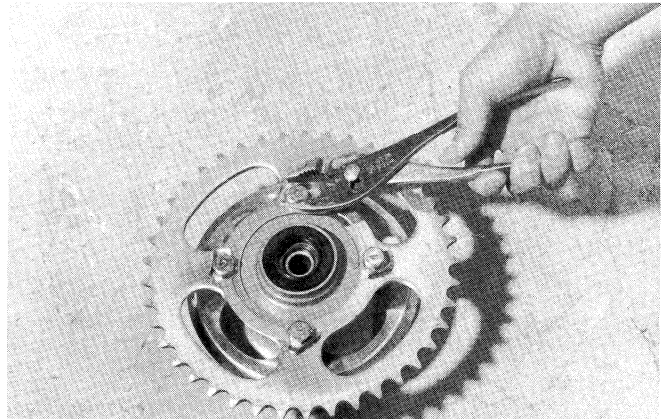
SPROCKET MOUNTING DRUM

- Insert the bearing and oil seal by using a bearing installer.



- After tightening the four nuts to specification, bend the washers.

Tightening torque	2.5 – 4.0 kg-m (18.0 – 29.0 lb-ft) 25 – 40 N·m)
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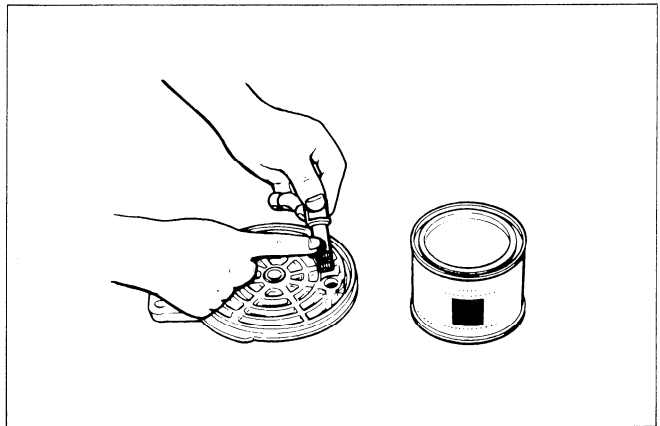
BRAKE CAM

- Apply grease to the brake cam.

Suzuki super grease "A"	99000-25030
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WARNING:

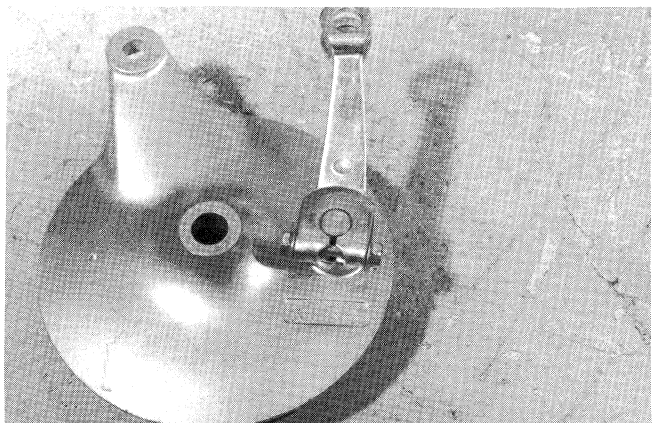
Be careful not to apply too much grease to the brake cam shaft. If grease get on the lining, brake slippage will result.



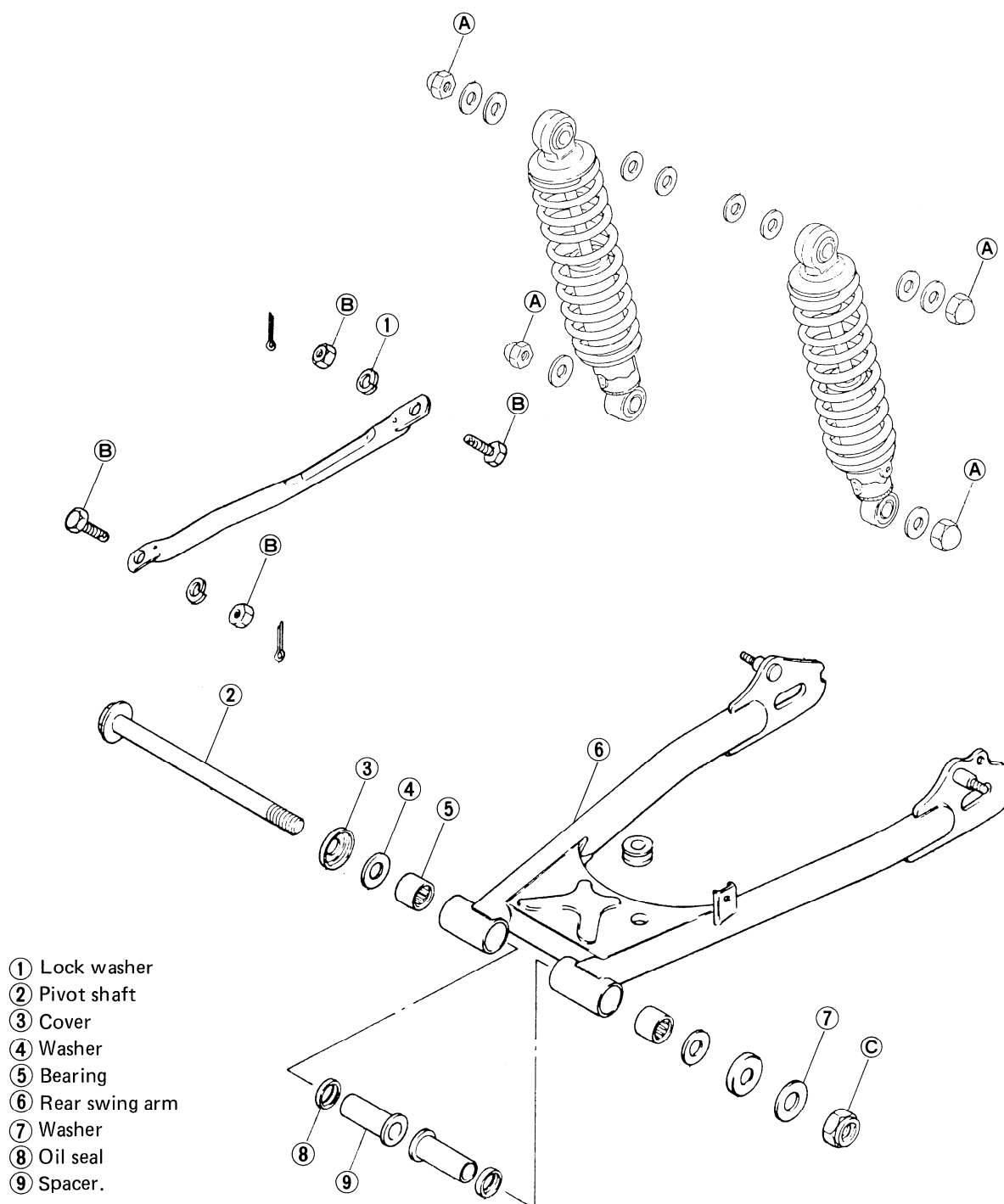
BRAKE CAM LEVER

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

Tightening torque	0.5 – 0.8 kg-m (3.5 – 6.0 lb-ft) 5 – 8 N·m)
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REAR SUSPENSION

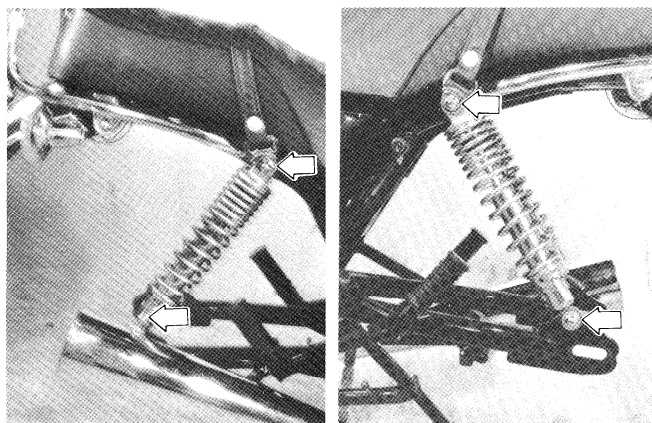


Tightening torque

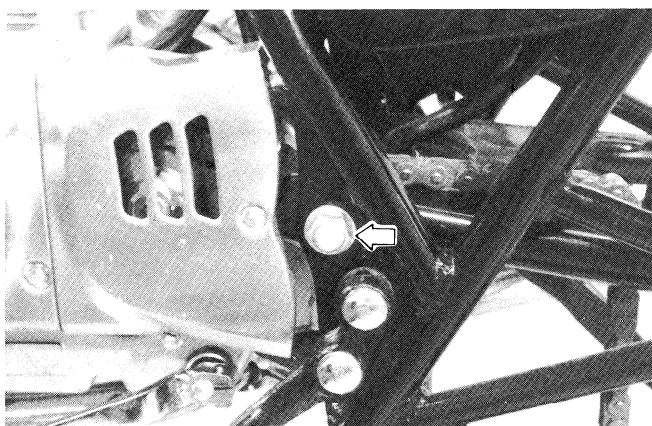
	kg-m	lb-ft	N·m
Ⓐ	2.0 – 3.0	14.5 – 21.5	20 – 30
Ⓑ	1.0 – 1.5	7.0 – 11.0	10 – 15
Ⓒ	5.0 – 8.0	36.0 – 58.0	50 – 80

REMOVAL AND DISASSEMBLY

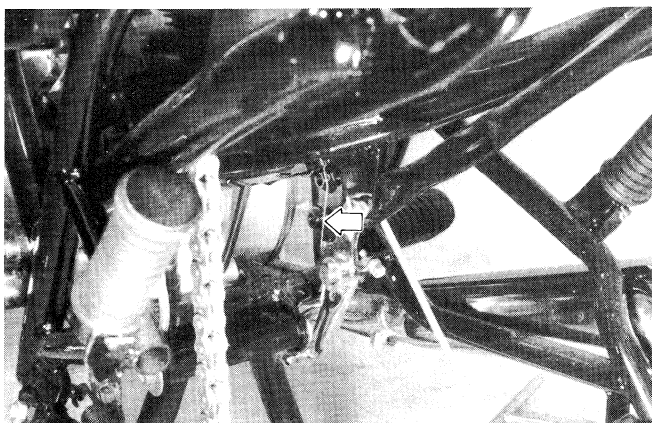
- Remove rear wheel (See page 7–21)
- Disconnect rear shock absorber right and left.



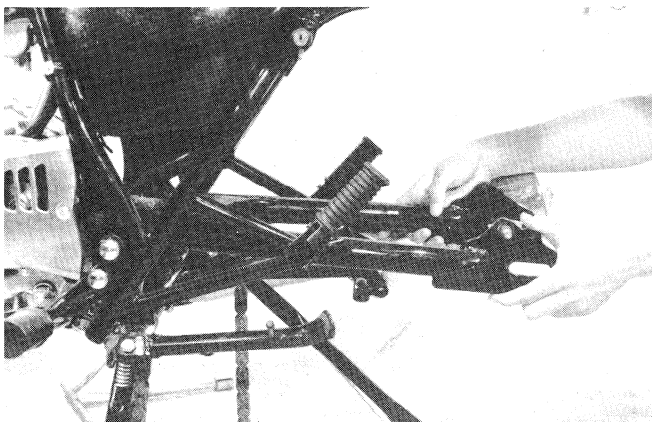
- Remove swing arm pivot nut.



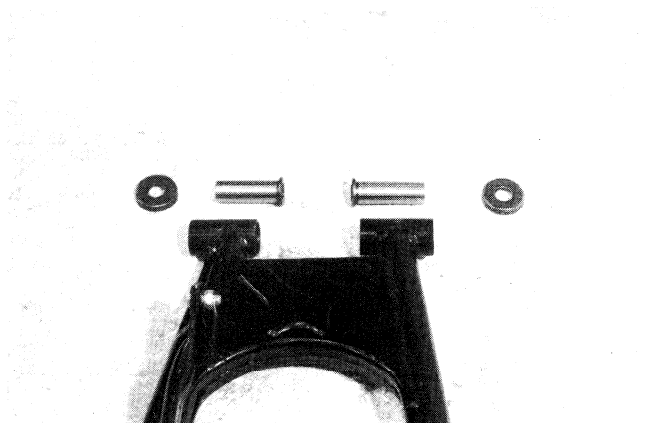
- Remove rear brake switch spring.



- Draw out pivot shaft and take off swing arm.



- Remove dust seal cover, washer and draw out spacers.

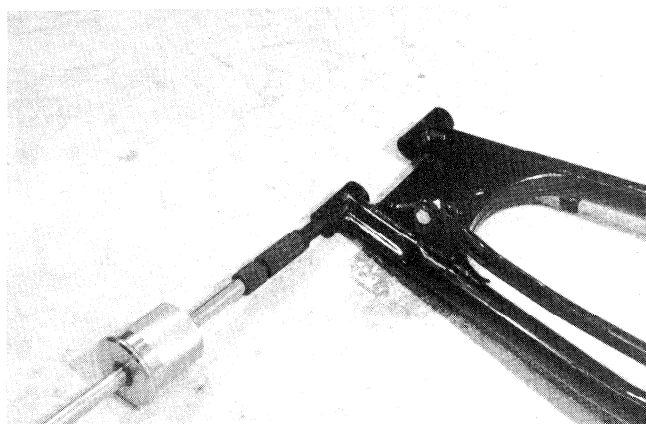


- Draw out swing arm bearings right and left by using spacial tools.

Swing arm bearing remover	09923-74510
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CAUTION:
The removed bearing should be replaced

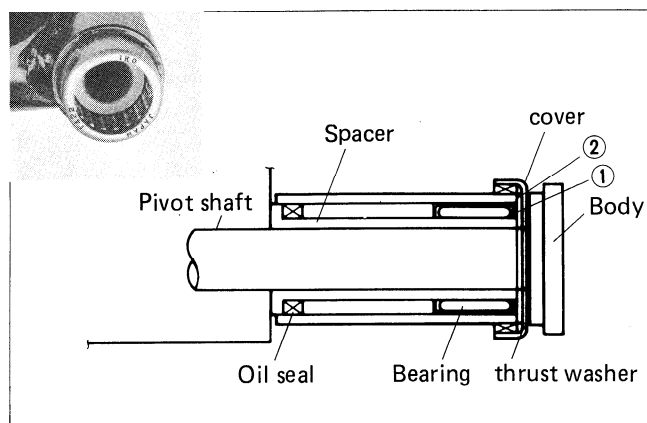
Rotor remover slide shaft	09930-30102
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INSPECTION

SWING ARM BEARINGS.

- As in the illustration, fit the Swing arm bearing, so that its stamped surface ① aligns with the Swing arm's head pipe surface ②.

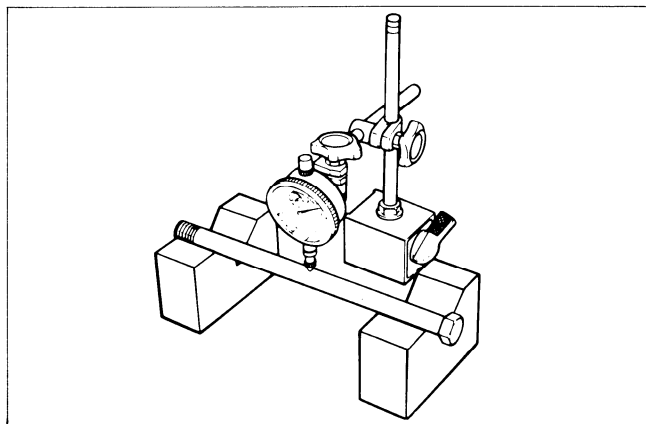


SWING ARM PIVOT SHAFT

- Using dial guage, check the pivot shaft for run-out and replace it if the runout exceeds the limit.

Dial gauge (1/100)	09900-20606
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Service limit	0.30 mm (0.012 in)
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REASSEMBLY

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

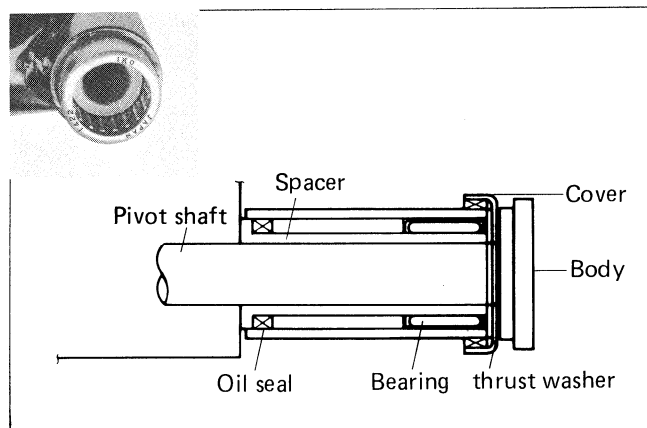
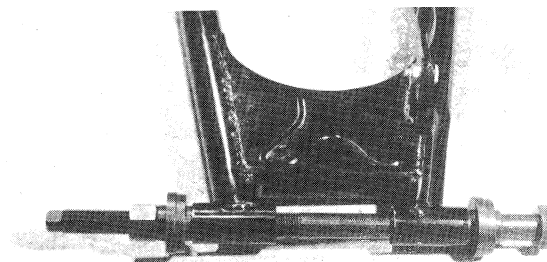
SWING ARM BEARINGS

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

Bearing installer	09941-34511
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CAUTION:

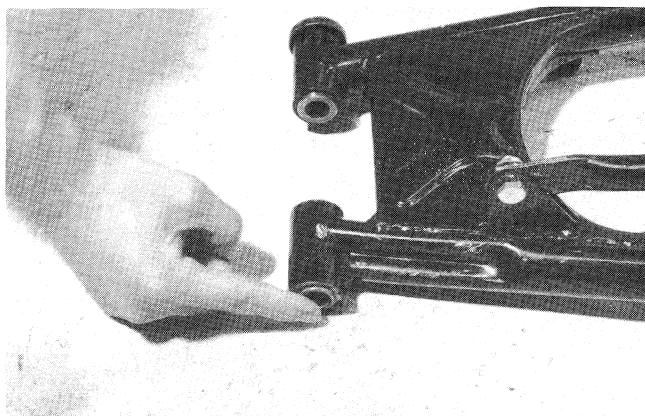
When installing a set of bearings, punch-marked side of each bearing comes on outer side.



CAUTION:

Apply grease to the bearing before installing the spacers.

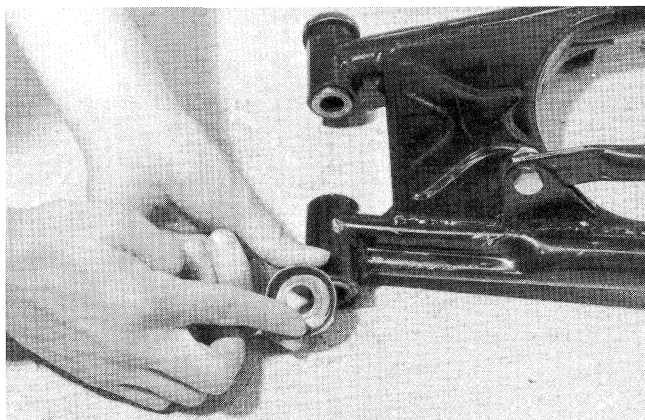
Suzuki super grease "A"	99000-25030
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DUST SEAL COVER

- Apply grease to the dust seal cover when installing.

Suzuki super grease "A"	99000-25030
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SERVICING INFORMATION

CONTENTS

TROUBLESHOOTING	8- 1
SPECIAL TOOLS.....	8- 7
TIGHTENING TORQUE.....	8-1 1
SERVICE DATA.....	8-1 3
WIRE AND CABLE ROUTING.....	8-26
WIRING DIAGRAM.....	8-29

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start.	<p>Compression too low</p> <ol style="list-style-type: none"> 1. Valve clearance out of adjustment. 2. Worn valve guides or poor seating of valves. 3. Valves mistiming. 4. Piston rings excessively worn. 5. Worn-down cylinder bore. 6. Poor seating of spark plug. 7. Starter motor cranks but too slowly <p>Plug not sparking</p> <ol style="list-style-type: none"> 1. Fouled spark plug. 2. Wet spark plug. 3. Defective pick up coil. 4. Defective ignitor unit. 5. Defective ignition coil. 6. Open or short circuit in high-tension cord. <p>No fuel reaching the carburetor</p> <ol style="list-style-type: none"> 1. Clogged hole in the fuel tank cap. 2. Clogged or defective fuel cock. 3. Defective carburetor float valve. 4. Clogged fuel pipe. 	<p>Adjust. Repair or replace. Adjust. Replace. Replace or rebore. Retighten. Consult "electrical complaints"</p> <p>Clean or replace. Clean and dry. Replace. Replace. Replace. Replace.</p> <p>Clean. Clean or replace. Replace. Clean or replace.</p>
Engine stalls easily.	<ol style="list-style-type: none"> 1. Fouled spark plug. 2. Defective pick up coil 3. Defective ignitor unit. 4. Clogged fuel pipe. 5. Clogged jets in carburetor. 6. Valve clearance out of adjustment. 	<p>Clean. Replace. Replace. Clean. Clean. Adjust.</p>
Noisy engine.	<p>Excessive valve chatter</p> <ol style="list-style-type: none"> 1. Valve clearance too large. 2. Weakened or broken valve springs. 3. Worn down rocker arm or rocker arm shaft. <p>Noise appears to come from piston</p> <ol style="list-style-type: none"> 1. Piston or cylinder worn down. 2. Combustion chamber fouled with carbon. 3. Piston pin or piston pin bore worn. 4. Piston rings or ring groove worn. <p>Noise seems to come from timing chain</p> <ol style="list-style-type: none"> 1. Stretched chain. 2. Worn sprockets. 3. Tension adjuster not working. <p>Noise seems to come from clutch</p> <ol style="list-style-type: none"> 1. Worn splines of countershaft or hub. 2. Worn teeth of clutch plates. 3. Distorted clutch plates, driven and drive. 4. Clutch dampers weakened. <p>Noise seems to come from crankshaft</p> <ol style="list-style-type: none"> 1. Worn or burnt bearings. 2. Big-end bearings worn and burnt. 3. Thrust clearance too large. 	<p>Adjust. Replace. Replace.</p> <p>Replace. Clean. Replace. Replace.</p> <p>Replace. Replace. Repair or replace.</p> <p>Replace. Replace. Replace. Replace.</p> <p>Replace. Replace. Replace.</p>

[illegible]

Complaint	Symptom and possible causes	Remedy
Engine lacks power.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	Clean. Add oil. Repair or clean. Adjust. Retighten or replace. Change.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	<ol style="list-style-type: none"> 1. Starter jet is clogged. 2. Starter pipe is clogged. 3. Air leaking from a joint between starter body and carburetor. 4. Starter plunger is not operating properly. 	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust.
Idling or low-speed trouble.	<ol style="list-style-type: none"> 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 adjust.
Medium- or high-speed trouble.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Defective ignition coil. 2. Defective spark plugs. 3. Defective pick up coil or igniter unit. 	Replace. Replace. Replace.
Spark plugs soon become fouled with carbon.	<ol style="list-style-type: none"> 1. Mixture too rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold. 	Adjust carburetors. Adjust carburetors. Change. Clean. Replace by hot type plugs.
Spark plugs become fouled too soon.	<ol style="list-style-type: none"> 1. Worn piston rings. 2. Pistons or cylinder worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal. 	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> 1. Spark plugs too hot. 2. The engine overheats. 3. Defective pick up coil or igniter unit. 4. Spark plugs loose. 5. Mixture too lean. 	Replace by cold type plugs. Tune up. Adjust. Retighten. Adjust carburetors.
Generator does not charge.	<ol style="list-style-type: none"> 1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or punctured regulator/rectifier. 	Repair or replace or retighten. Replace. Replace.
Generator charge, but charging rate is below the specification.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator/rectifier. 	Repair or replace. Replace. Replace.
Starter button is not effective.	<ol style="list-style-type: none"> 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.

BATTERY

Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	<ol style="list-style-type: none"> 1. Not enough electrolyte. 2. Battery case is cracked. 3. Battery has been left in a run-down condition for a long time. 4. Adulterated electrolyte (Foreign matter has entered the battery and become mixed with the electrolyte.) 	<p>Add distilled water, if the battery has not been damaged and "sulfation" has not advanced too far, and recharge.</p> <p>Replace the battery.</p> <p>Replace the battery.</p> <p>If "sulfation" has not advanced too far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motor-cycle and then adjusting electrolyte S.G.</p>
Battery runs down quickly.	<ol style="list-style-type: none"> 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. Adulterated electrolyte. 6. Battery is too old. 	<p>Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation.</p> <p>Replace the battery, and correct the charging system.</p> <p>Replace the battery.</p> <p>Recharge the battery fully and adjust electrolyte S.G.</p> <p>Replace the electrolyte, recharge the battery and then adjust S.G.</p> <p>Replace the battery.</p>
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"	<ol style="list-style-type: none"> 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 gravity too high or too low. 3. The battery left unused for too long in cold climate. 	<p>Replace the battery.</p> <p>Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions.</p> <p>Replace the battery, if badly sulfated.</p>
Battery discharges too rapidly	<ol style="list-style-type: none"> 1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte S.G. is too high. 	<p>Clean.</p> <p>Change the electrolyte by consulting the battery maker's directions.</p>

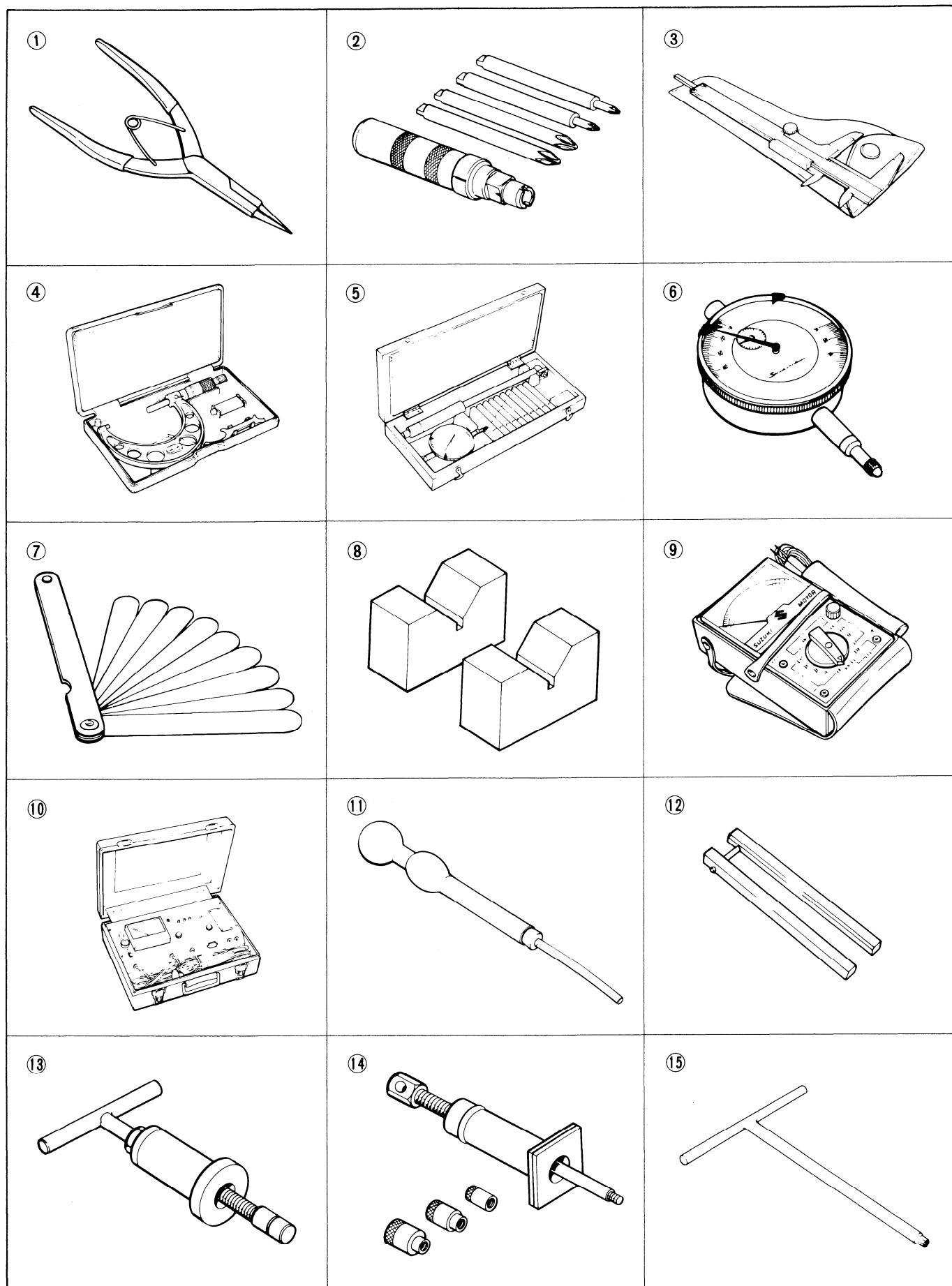
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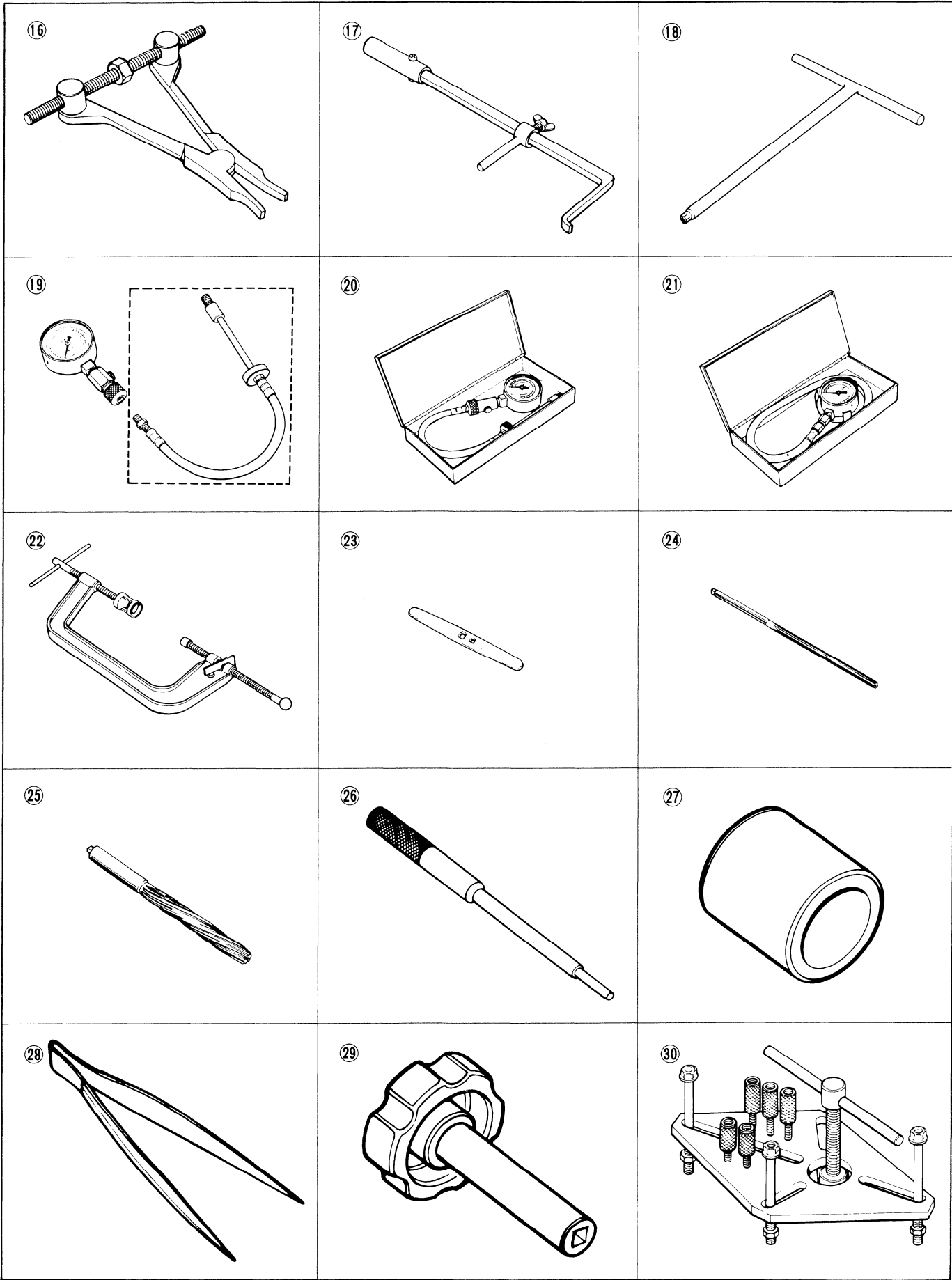
Complaint	Symptom and possible causes	Remedy
Steering feels too heavy.	<ol style="list-style-type: none"> 1. Steering stem nut overtightened. 2. Worn bearing or race in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 	Adjust. Replace. Replace. Adjust.
Steering oscillation.	<ol style="list-style-type: none"> 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.
Oscillation front wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn-down front wheel bearings. 3. Defective or incorrect tire. 4. Loose nut on axle. 	Replace. Replace. Replace. Retighten.
Front suspension too soft.	<ol style="list-style-type: none"> 1. Weakened springs. 2. Not enough fork oil. 	Replace. Refill.
Front suspension too stiff.	<ol style="list-style-type: none"> 1. Fork oil too viscous. 2. Too much fork oil. 	Replace. Remove excess oil.
Noisy front suspension.	<ol style="list-style-type: none"> 1. Not enough fork oil. 2. Loose nuts on suspension. 	Refill. Retighten.
Wobbly rear wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Defective or incorrect tire. 	Replace. Replace. Replace.
Rear suspension too soft.	<ol style="list-style-type: none"> 1. Weakened springs. 2. Rear suspension adjuster improperly set. 	Replace. Adjust.
Rear suspension too stiff.	Rear suspension adjuster improperly set	Adjust.
Noisy rear suspension	Loose nuts on suspension.	Retighten.
Poor braking. (FRONT and REAR)	<ol style="list-style-type: none"> 1. Linings worn down. 2. Too much play on brake pedal. 	Replace. Adjust.

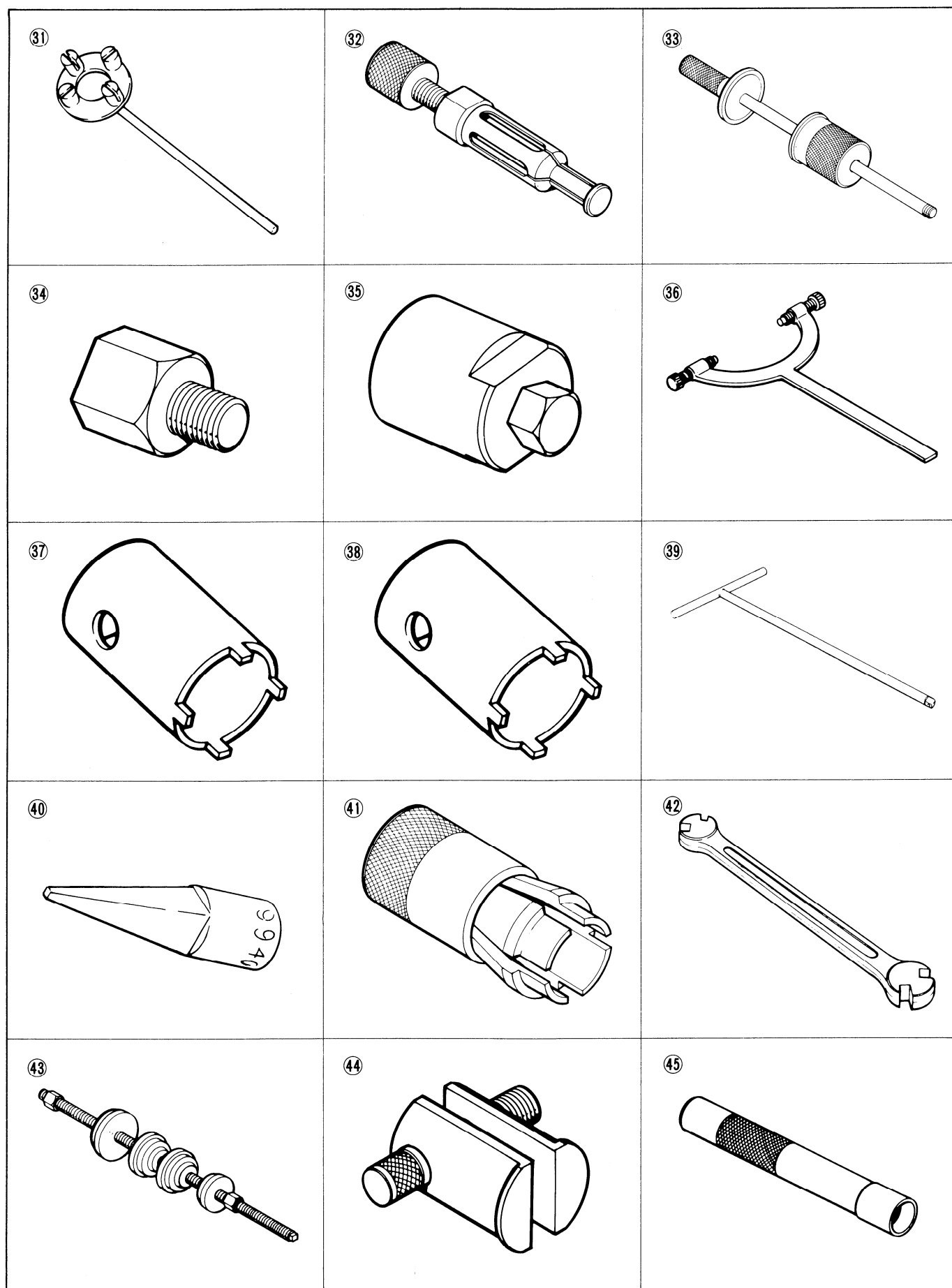
SPECIAL TOOLS

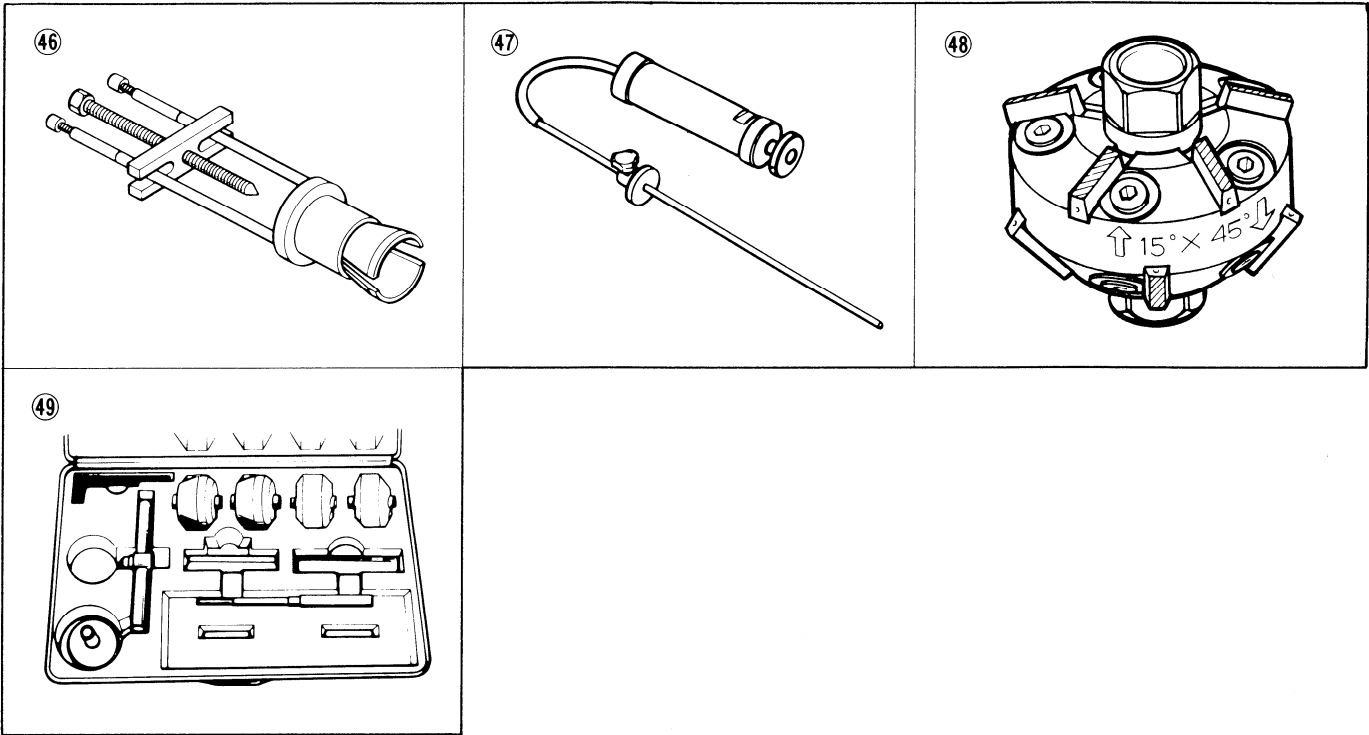
ITEM	PART NO.	PART NAME
1	09900-06107	Snap ring pliers
2	09900-09003	Impact driver set
3	09900-20101	Vernier calipers (150 mm)
4	09900-20202	Micrometer (25 – 50 mm)
	09900-20203	Micrometer (50 – 75 mm)
	09900-20205	Micrometer (0 – 25 mm)
5	09900-20508	Cylinder gauge set
6	09900-20606	Dial gauge (1/100)
7	09900-20803	Thickness gauge
8	09900-21304	V-block (100 mm)
9	09900-25002	Pocket tester
10	09900-28106	Electro tester
11	09900-28403	Hydrometer
12	09910-20116	Conrod holder
13	09910-32812	Crankshaft installer
14	09910-34510	Piston pin puller
15	09911-73730	T type hexagon wrench (5 mm)
16	09912-34510	Cylinder disassembling tool
17	09913-50121	Oil seal remover
18	09914-25811	“T” type hexagon wrench (6 mm)
19	09915-63210	Compression pressure adapter
20	09915-64510	Compression gauge
21	09915-74510	Oil pressure gauge
22	09916-14510	Valve spring compressor
23	09916-34540	Reamer handle
24	09916-34550	5.5 mm reamer
25	09916-34560	11.2 mm reamer
26	09916-44910	Valve guide installer and remover
27	09916-44920	Valve guide installer attachment
28	09916-84510	Tweezers
29	09917-14910	Tappet adjust driver
30	09920-13111	Crankcase separating tool/crankshaft remover
31	09920-53721	Clutch sleeve hub holder
32	09923-74510	Swing arm bearing remover
33	09930-30102	Rotor remover slide shaft
34	09930-33710	Attachment
35	09930-34912	Rotor remover
36	09930-44911	Rotor holder
37	09940-14911	Steering stem nut socket wrench
38	09940-14920	Steering nut socket wrench
39	09940-34520	“T” handle
40	09940-34561	Attachment “D”

ITEM	PART NO.	PART NAME
41	09940-50112	Fork oil seal installer
42	09940-60113	Spoke nipple wrench
43	09941-34511	Steering race installer
44	09941-54911	Bearing race remover
45	09941-74910	Steering bearing installer
46	09941-84510	Bearing inner race remover
47	09943-74111	Fork oil level gauge
48	99103-45012-003	15° x 45° cutter (N-116)
49	99103-45102	Valve seat cutter set









TIGHTENING TORQUE

ENGINE

ITEM		kg-m	lb-ft	N-m
Cylinder head cover bolt		0.9 – 1.0	6.5 – 7.0	9 – 10
Camshaft sprocket bolt		1.4 – 1.6	10.0 – 11.5	14 – 16
Cylinder head nut	10 mm	3.5 – 4.0	25.5 – 29.0	35 – 40
	6 mm	0.8 – 1.2	6.0 – 8.5	8 – 12
Cylinder nut		0.7 – 1.1	5.0 – 8.0	7 – 11
Magnetorotor nut		13.0 – 14.0	94.0 – 101.5	130 – 140
Balancer setting bolt		3.4 – 4.5	24.5 – 32.5	34 – 45
Primary drive gear nut		9.0 – 11.0	65.0 – 79.5	90 – 110
Clutch sleeve hub nut		4.0 – 6.0	29.0 – 43.5	40 – 60
Engine oil drain plug		1.8 – 2.0	13.5 – 14.5	18 – 20
Engine sprocket nut		8.0 – 10.0	58.0 – 72.5	80 – 100
Engine mounting bolt 8 mm Diam.		3.7 – 4.5	27.0 – 32.5	37 – 45
Exhaust pipe bolt		0.9 – 1.2	6.5 – 8.5	9 – 12
Muffler clamp bolt		2.2 – 3.5	16.0 – 25.5	22 – 35
Starter clutch damper bolt		1.5 – 2.0	11.0 – 14.5	15 – 20
Rocker arm shaft bolt		0.8 – 1.0	6.0 – 7.0	8 – 10
Cam chain tensioner adjust bolt		0.6 – 0.8	4.5 – 6.0	6 – 8

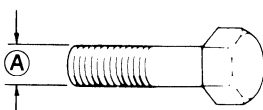
CHASSIS

ITEM	kg-m	lb-ft	N-m
Front axle nut	3.6 – 5.2	26.0 – 37.5	36 – 52
Front fork damper rod bolt	2.0 – 2.6	14.5 – 19.0	20 – 26
Front fork lower clamp bolt	1.5 – 2.5	11.0 – 18.0	15 – 25
Front fork upper clamp bolt	2.0 – 3.0	14.5 – 21.5	20 – 30
Front axle clamp nut	1.5 – 2.5	11.0 – 18.0	15 – 25
Steering stem upper clamp bolt	1.5 – 2.5	11.0 – 18.0	15 – 25
Steering stem head bolt	3.5 – 4.5	25.5 – 32.5	35 – 45
Handlebars clamp bolt	1.2 – 2.0	8.5 – 14.5	12 – 20
Front brake cam lever bolt	0.5 – 0.8	3.5 – 6.0	5 – 8
Swing arm pivot nut	5.0 – 8.0	36.0 – 58.0	50 – 80
Front footrest bolt	2.7 – 4.3	19.5 – 31.0	27 – 43
Rear torque link nut (Front and Rear)	1.0 – 1.5	7.0 – 11.0	10 – 15
Rear shock absorber fitting nut (upper and lower)	2.0 – 3.0	14.5 – 21.5	20 – 30
Rear axle nut	5.0 – 8.0	36.0 – 58.0	50 – 80
Rear sprocket nut	2.5 – 4.0	18.0 – 29.0	25 – 40
Rear brake cam lever bolt	0.5 – 0.8	3.5 – 6.0	5 – 8
Spoke nipple	0.4 – 0.5	3.0 – 3.5	4 – 5
Steering stem nut	4.0 – 5.0	29.0 – 36.0	40 – 50

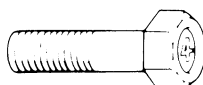
TIGHTENING TORQUE CHART

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

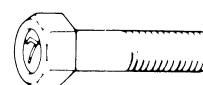
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	kg-m	lb-ft	N-m	kg-m	lb-ft	N-m
4	0.1 – 0.2	0.7 – 1.5	1.0 – 2.0	0.15 – 0.3	1.0 – 2.0	1.5 – 3.0
5	0.2 – 0.4	1.5 – 3.0	2.0 – 4.0	0.3 – 0.6	2.0 – 4.5	3.0 – 6.0
6	0.4 – 0.7	3.0 – 5.0	4.0 – 7.0	0.8 – 1.2	6.0 – 8.5	8.0 – 12.0
8	1.0 – 1.6	7.0 – 11.5	10.0 – 16.0	1.8 – 2.8	13.0 – 20.0	18.0 – 28.0
10	2.2 – 3.5	16.0 – 25.5	22.0 – 35.0	4.0 – 6.0	29.0 – 43.5	40.0 – 60.0
12	3.5 – 5.5	25.5 – 40.0	35.0 – 55.0	7.0 – 10.0	50.5 – 72.5	70.0 – 100.0
14	5.0 – 8.0	36.0 – 58.0	50.0 – 80.0	11.0 – 16.0	79.5 – 115.5	110.0 – 160.0
16	8.0 – 13.0	58.0 – 94.0	80.0 – 130.0	17.0 – 25.0	123.0 – 181.0	170.0 – 250.0
18	13.0 – 19.0	94.0 – 137.5	130.0 – 190.0	20.0 – 28.0	144.5 – 202.5	200.0 – 280.0



Conventional bolt



"4" marked bolt



"7" marked bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26 (1.02)	_____
	EX.	22 (0.86)	_____
Valve lift	IN.	6.7 (0.26)	_____
	EX.	6.7 (0.26)	_____
Valve clearance	IN.	0.03–0.08 (0.001–0.003)	_____
	EX.	0.08–0.13 (0.003–0.005)	_____
Valve guide to valve stem clearance	IN.	0.025–0.052 (0.0010–0.0020)	0.35 (0.014)
	EX.	0.040–0.067 (0.0016–0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500–5.512 (0.2165–0.2170)	_____
Valve stem O.D.	IN.	5.460–5.475 (0.2150–0.2156)	_____
	EX.	5.445–5.460 (0.2144–0.2150)	_____
Valve stem runout	IN. & EX.	_____	0.05 (0.002)
Valve head thickness	IN. & EX.	_____	0.5 (0.02)
Valve stem end length	IN. & EX.	_____	3.8 (0.15)
Valve seat width	IN. & EX.	0.9–1.1 (0.035–0.043)	_____
Valve head radial runout	IN. & EX.	_____	0.03 (0.001)
Valve spring free length (IN. & EX.)		_____	39.8 (1.57)
Valve spring tension (IN. & EX.)		16.2–19.8 kg (35.7–43.7 lbs) at length 35 mm (1.4 in)	_____

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	34.990—35.030 (1.3775—1.3791)	34.690 (1.3657)
	EX.	35.030—35.070 (1.3791—1.3807)	34.730 (1.3673)
Camshaft journal oil clearance	R. & L.	0.032—0.066 (0.0013—0.0026)	0.15 (0.006)
Camshaft journal holder I.D.	R. Side	25.012—25.025 (0.9847—0.9852)	—
	L. Side	20.012—20.025 (0.7879—0.7884)	—
Camshaft journal O.D.	R. Side	24.959—24.980 (0.9826—0.9835)	—
	L. Side	19.959—19.980 (0.7858—0.7866)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20 pitch length		—	128.90 (5.075)
Rocker arm I.D.	IN. & EX.	12.000—12.018 (0.4724—0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.966—11.984 (0.4711—0.4718)	—
Cylinder head distortion		—	0.05 (0.002)
Cylinder head cover distortion		—	0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM		STANDARD	LIMIT
Compression pressure		10—14 kg/cm ² (142—198.8 psi)	8 kg/cm ² (113.6 psi)
Piston to cylinder clearance		0.045—0.055 (0.0018—0.0022)	0.120 (0.0047)
Cylinder bore		72.000—72.015 (2.8346—2.8352)	72.085 (2.8380)
Piston diam.		71.950—71.965 (2.8327—2.8332) Measure at 15 (0.59) from the skirt end.	71.880 (2.8299)
Cylinder distortion		—	0.05 (0.002)

Unit: mm (in)

ITEM	STANDARD			LIMIT
Piston ring free end gap	1st	N	Approx. 9.5 (0.37)	7.6 (0.30)
		R	Approx. 10.5 (0.41)	8.4 (0.33)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
		R	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10–0.30 (0.004–0.012)	0.7 (0.03)
	2nd		0.10–0.30 (0.004–0.012)	0.7 (0.03)
Piston ring to groove clearance	1st		————	0.180 (0.0071)
	2nd		————	0.150 (0.0059)
Piston ring groove width	1st		1.01–1.03 (0.039–0.040)	————
	2nd		1.21–1.23 (0.047–0.048)	————
	Oil		2.51–2.53 (0.099–0.100)	————
Piston ring thickness	1st		0.975–0.990 (0.0384–0.0390)	————
	2nd		1.170–1.190 (0.0461–0.0469)	————
Piston pin bore			18.002–18.008 (0.7087–0.7089)	18.030 (0.7098)
Piston pin O.D.			17.996–18.000 (0.7085–0.7086)	17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod deflection	_____	3.0 (0.12)
Conrod big end side clearance	0.10—0.65 (0.004—0.026)	1.00 (0.039)
Conrod big end width	20.95—21.00 (0.825—0.827)	_____
Crankshaft web to web width	60.0±0.1 (2.36±0.004)	_____
Crankshaft runout	_____	0.05 (0.002)
Balancer spring free length	_____	9.9 (0.39)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.812 (68 / 21 x 33 / 38)	_____
Oil pressure (at 60°C, 140°F)	Above 0.30 kg/cm ² (4.26 psi) Below 0.70 kg/cm ² (9.94 psi) at 3000 r/min.	_____

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.16)	_____
Clutch release screw	1/4—1/2 turn back	_____
Drive plate thickness	No. 1 2.90—3.10 (0.114—0.122)	2.60 (0.102)
	No. 2 3.45—3.55 (0.136—0.140)	3.15 (0.124)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate thickness	1.6±0.05 (0.06±0.002)	_____
Driven plate distortion	_____	0.1 (0.004)
Clutch spring free length	_____	34.0 (1.34)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in)

ITEM	STANDARD		LIMIT
Primary reduction ratio	3.238 (68 / 21)		_____
Final reduction ratio	2.733 (41 / 15)		_____
Gear ratios	Low	2.636 (29 / 11)	_____
	2nd	1.687 (27 / 16)	_____
	3rd	1.263 (24 / 19)	_____
	4th	1.000 (20 / 20)	_____
	Top	0.818 (18 / 22)	_____
Shift fork to groove clearance	No.1, No.2 No.3	0.20–0.40 (0.008–0.016)	0.60 (0.023)
Shift fork groove width	No.1, No.2 No.3	4.25–4.35 (0.167–0.171)	_____
Shift fork thickness	No.1, No.2 No.3	3.95–4.05 (0.156–0.159)	_____
Drive chain	Type	D.I.D.: 520 UB TAKASAGO: RK520SU	_____
	Links	100	_____
	20 pitch length	_____	324.2 (12.76)
Drive chain slack	25–35 (1.0–1.4)		_____

CARBURETOR

Unit: mm (in)

ITEM	SPECIFICATION
	E-03
Carburetor type	MIKUNI BS34SS
Bore size	34 (1.34)
I. D. No.	38300
Idle r/min.	1250 ± 50 r/min.
Fuel level	5.0 ± 0.5 (0.20 ± 0.02)
Float height	27.4 ± 1.0 (1.08 ± 0.04)
Main jet (M. J.)	# 130
Main air jet (M. A. J.)	0.7
Jet needle (J. N.)	5DF91
Needle jet (N. J.)	O-9
Pilot jet (P. J.)	# 42.5
By pass (B. P.)	1.0, 0.7, 0.8, 0.8
Pilot outlet (P. O.)	0.7
Valve seat (V. S.)	2.0
Starter jet (G. S.)	# 40
Pilot screw (P. S.)	PRE-SET
Pilot air jet (P. A. J.)	# 150
Throttle cable play	0.5-1.0 (0.02-0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	10 ° B.T.D.C. Below 1700 ± 100 r/min and 35 ° B.T.D.C. Above 3000 ± 100 r/min.		
Spark plug	Type	NGK D8EA NIPPON DENSO X24ES-U	
	Gap	0.6–0.7 (0.02–0.03)	
Spark performance	Over 8 (0.3) at 1 atm		
Pick up coil resistance	Approx.	160–240 Ω	O–G
Ignition coil resistance	Primary	Terminal–Terminal Approx. 3–5.5 Ω	
	Secondary	Plug cap – Terminal Approx. 19–29 kΩ	
Generator no-load voltage	More than 70 V (AC) at 5000 r/min.		
Regulated voltage	13.5–16.0 V at 5000 r/min.		
Starter relay resistance	Approx.	3–4 Ω	
Battery	Type designation	YB10L-A2	
	Capacity	12V43.2kC(12Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20° C (68° F)	
Fuse size	Main	15 A	

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Front brake lever distance	20–30 (0.8–1.2)		_____
Rear brake pedal free travel	20–30 (0.8–1.2)		_____
Rear brake pedal height	10 (0.4)		_____
Brake drum I.D.	Front	_____	150.7 (5.93)
	Rear	_____	130.7 (5.15)
Brake lining thickness	_____		1.5 (0.06)
Wheel rim runout	Axial	_____	2.0 (0.08)
	Radial	_____	2.0 (0.08)
Wheel axle runout	Front	_____	0.25 (0.010)
	Rear	_____	0.25 (0.010)
Tire size	Front	3.00S18 4PR	_____
	Rear	4.60S16 4PR	_____
Tire tread depth	Front	_____	1.6 (0.06)
	Rear	_____	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140 (5.5)	_____	
Front fork spring free length	_____	610 (24.0)	
Front fork oil level	200 (7.9)	_____	
Rear wheel travel	98 (3.9)	_____	
Swing arm pivot shaft runout	_____	0.3 (0.012)	

FUEL + OIL

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 - 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	10.3 L (2.7/2.3 US/Imp gal)	
reserve	2.0 L (2.1/1.8 US/Imp qt)	
Engine oil type and grade	SAE 10W/40 SE or SF	
Engine oil capacity	Change 1300 ml (1.4/1.1 US/Imp qt)	
	Filter change 1400 ml (1.5/1.2 US/Imp qt)	
	Overhaul 1700 ml (1.8/1.5 US/Imp qt)	
Front fork oil type	Fork oil # 10	
Front fork oil capacity (each leg)	216 ml (7.3/7.6 US/Imp oz)	

TIRE PRESSURE

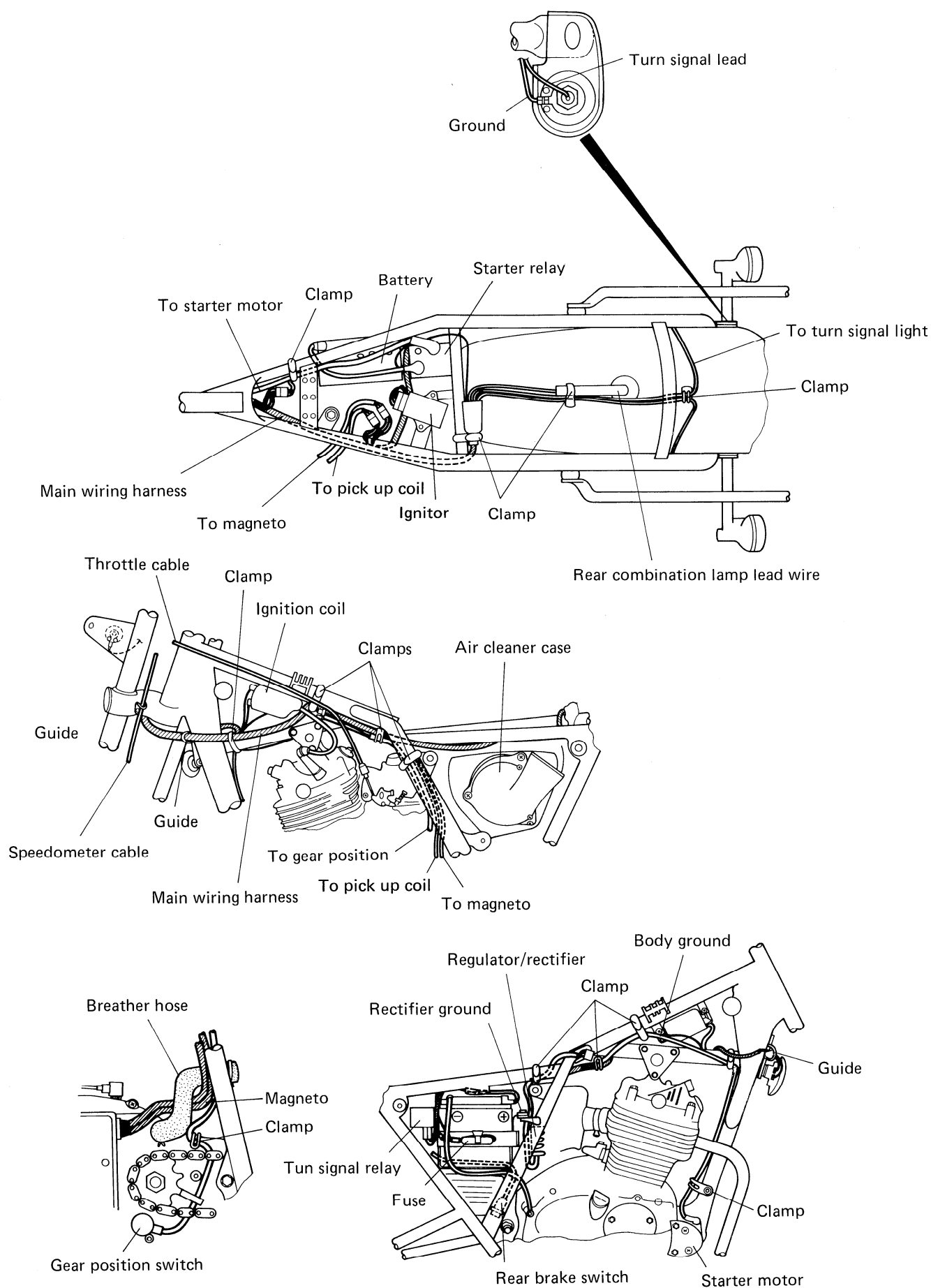
COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24	175	1.75	24	175	1.75	24	200	2.00	28
REAR	200	2.00	28	225	2.25	32	225	2.25	32	250	2.50	34

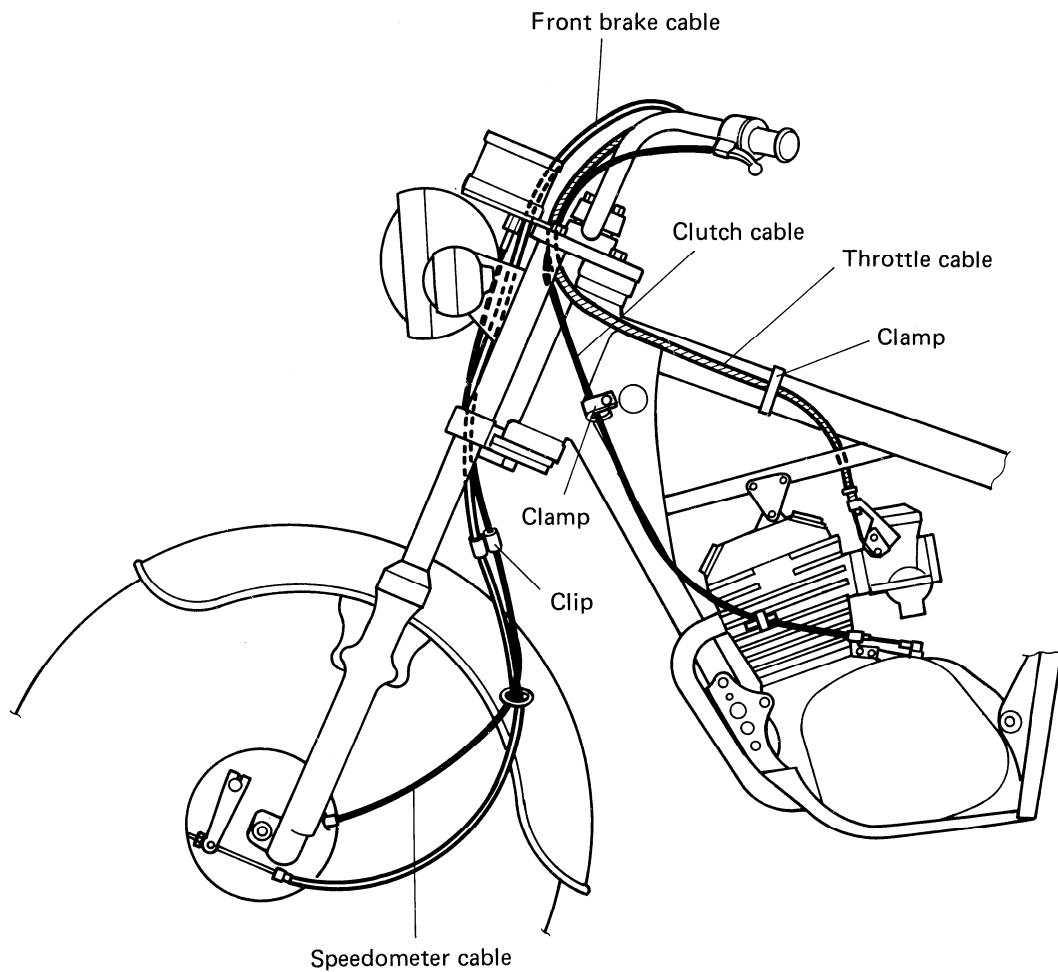
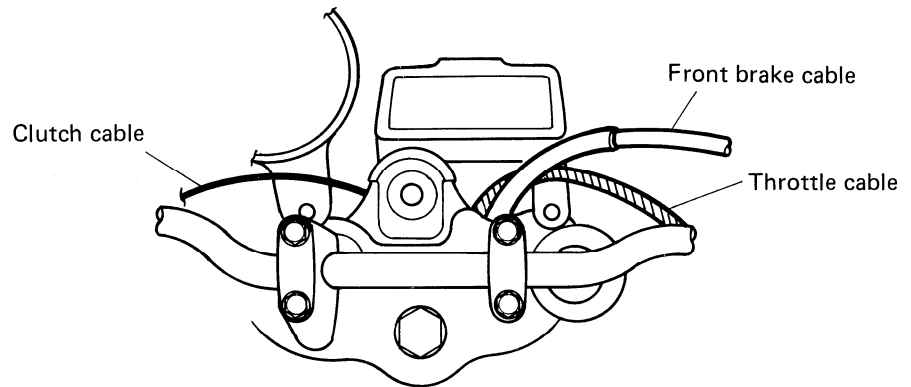
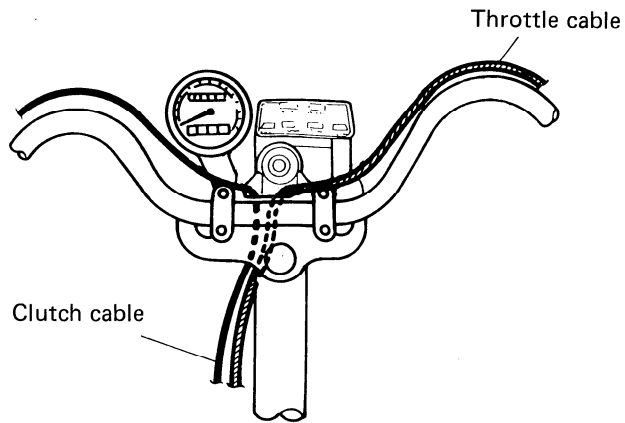
WATTAGE

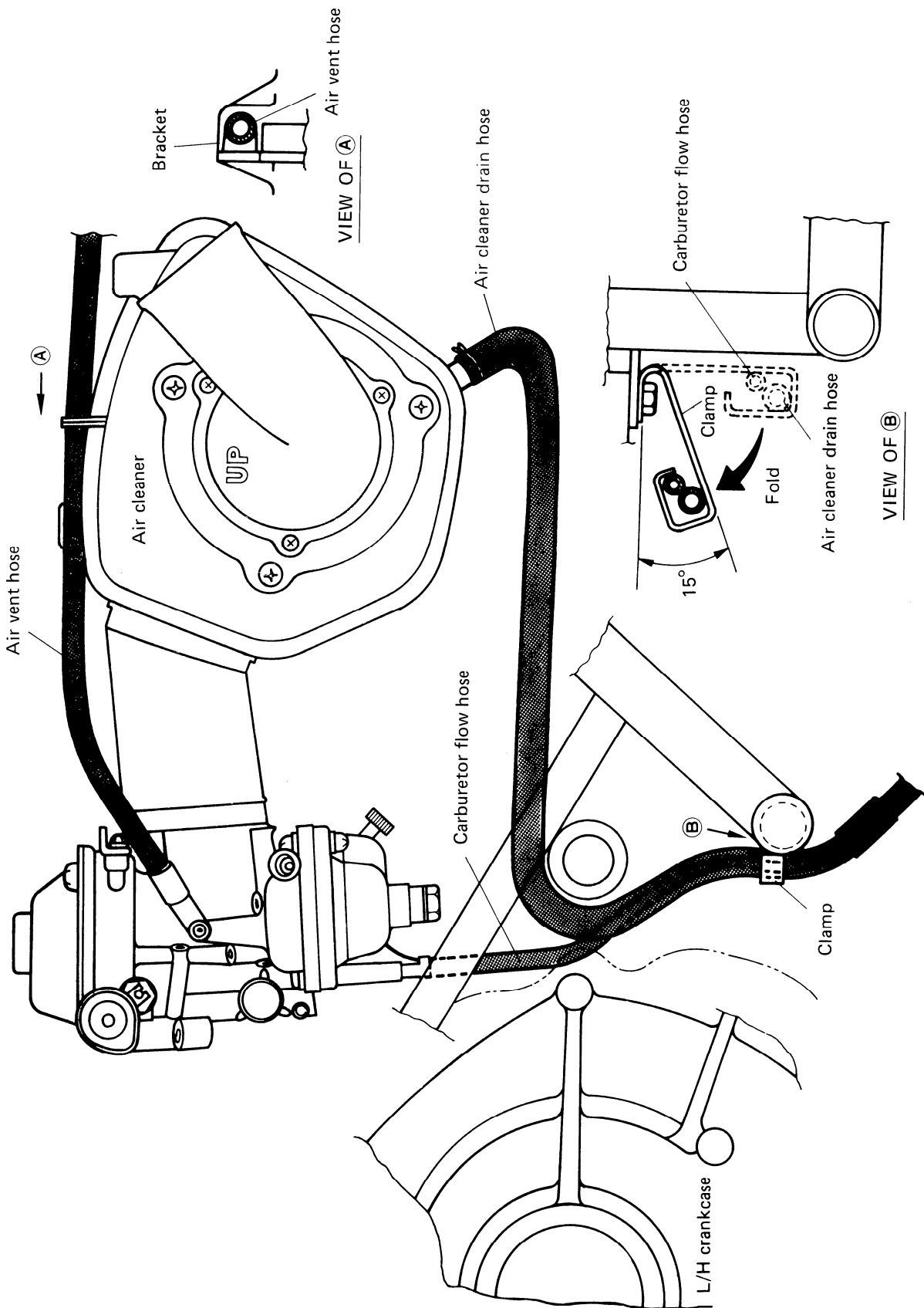
Unit: W

ITEM		SPECIFICATION
Headlight	HI	50
	LO	35
Tail/Brake light		8/23
Turn signal light		23
Speedometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4

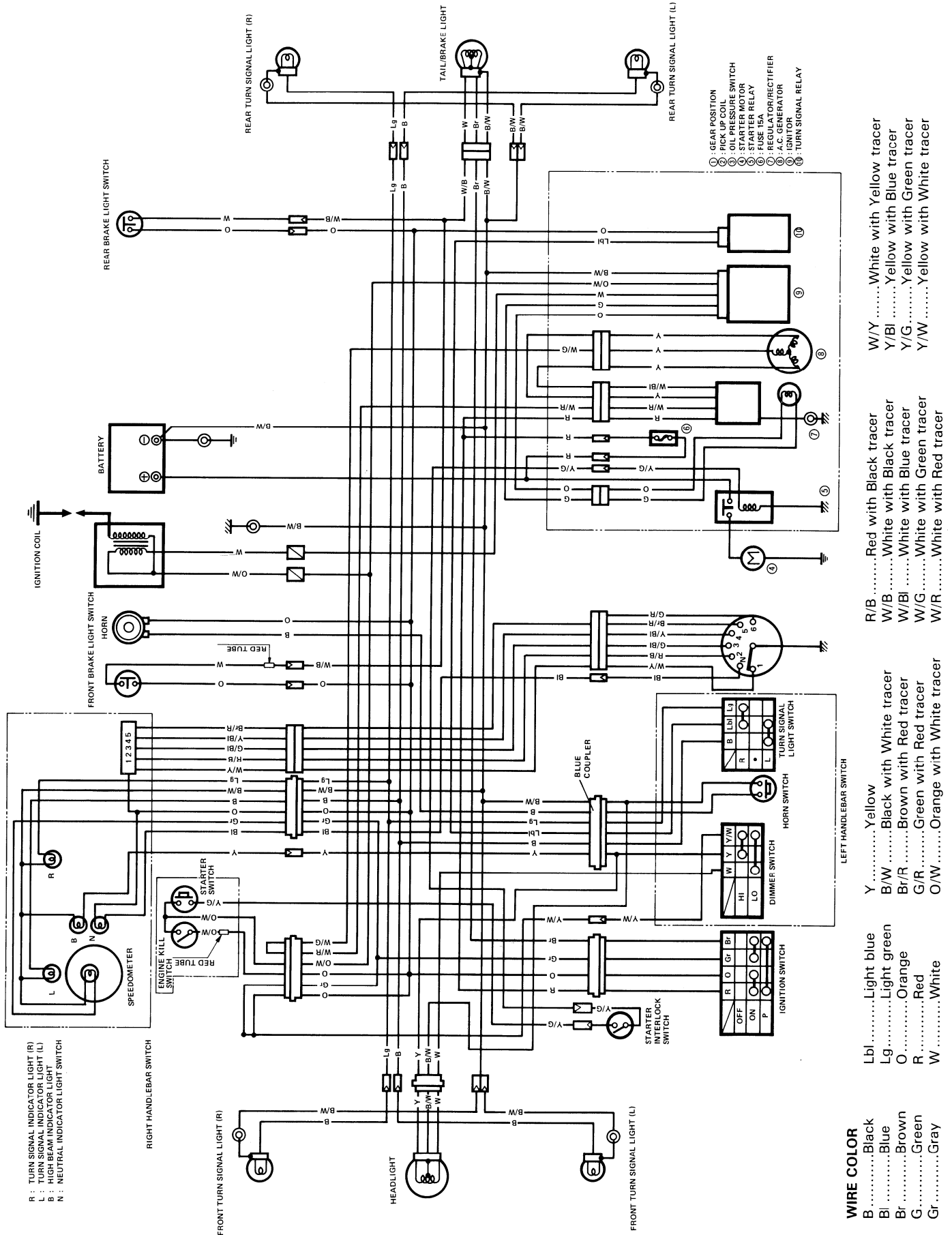
WIRE AND CABLE ROUTING







WIRING DIAGRAM



GN250D

CONTENTS

VIEW OF SUZUKI GN250D	9- 1
SPECIFICATIONS.....	9- 2
SERVICE DATA.....	9- 4
WIRE AND CABLE ROUTING.....	9-14
WIRING DIAGRAM	9-17

VIEW OF SUZUKI GN250D



RIGHT SIDE



LEFT SIDE

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 035 mm (80.1 in)
Overall width	835 mm (32.9 in)
Overall height	1 120 mm (44.1 in)
Wheelbase	1 350 mm (53.1 in)
Ground clearance	160 mm (6.3 in)
Seat height	740 mm (29.1 in)
Dry mass	129 kg (284 lbs)

ENGINE

Type	Four-stroke, air-cooled, OHC
Number of cylinders	1
Bore	72.0 mm (2.835 in)
Stroke	61.2 mm (2.409 in)
Piston displacement	249 cm ³ (15.2 cu. in)
Compression ratio	8.9 : 1
Carburetor	MIKUNI BS34SS, single
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	3.238 (68/21)
Final reduction	2.733 (41/15)
Gear ratios, Low	2.636 (29/11)
2nd	1.687 (27/16)
3rd	1.263 (24/19)
4th	1.000 (20/20)
Top	0.818 (18/22)
Drive chain	DAIDO D.I.D. 520UB or TAKASAGO RK520SU
Links	100 links

ELECTRICAL

Ignition type	Transistorized
Ignition timing	10° B.T.D.C. below 1 700 r/min and 35° B.T.D.C. above 3 000 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 43.2 kC (12 Ah)/10 HR
Fuse	15A
Headlight	12V 50/35W
Tail/Brake light	12V 8/23W
Turn signal light	12V 23W
Turn signal indicator light	12V 3.4W x 2
Neutral indicator light	12V 3.4W
Speedometer light	12V 3.4W
High beam indicator light	12V 3.4W

CHASSIS

Front suspension	Telescopic, coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, spring 5-way adjustable
Steering angle	40°
Caster	59° 45'
Trail	105 mm (4.13 in)
Turning radius	2.4 m (7.9 ft)
Front brake	Internal expanding
Rear brake	Internal expanding
Front tire size	3.00 S18 4PR
Rear tire size	4.60 S16 4PR

CAPACITIES

Fuel tank including reserve	10.3 L (2.7/2.3 US/Imp gal)
reserve	2.0 L (2.1/1.8 US/Imp qt)
Engine oil	1.3 L (1.4/1.1 US/Imp qt)
Front fork oil	*216.5 ml (7.3/7.6 US/Imp oz)

* Asterisk mark indicates new D model specifications.

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26 (1.02)	_____
	EX.	22 (0.86)	_____
Valve lift	IN.	6.7 (0.26)	_____
	EX.	6.7 (0.26)	_____
Valve clearance	IN.	0.03–0.08 (0.001–0.003)	_____
	EX.	0.08–0.13 (0.003–0.005)	_____
Valve guide to valve stem clearance	IN.	0.025–0.052 (0.0010–0.0020)	0.35 (0.014)
	EX.	0.040–0.067 (0.0016–0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500–5.512 (0.2165–0.2170)	_____
Valve stem O.D.	IN.	5.460–5.475 (0.2150–0.2156)	_____
	EX.	5.445–5.460 (0.2144–0.2150)	_____
Valve stem runout	IN. & EX.	_____	0.05 (0.002)
Valve head thickness	IN. & EX.	_____	0.5 (0.02)
Valve stem end length	IN. & EX.	_____	3.8 (0.15)
Valve seat width	IN. & EX.	0.9–1.1 (0.035–0.043)	_____
Valve head radial runout	IN. & EX.	_____	0.03 (0.001)
Valve spring free length (IN. & EX.)		_____	* 40.1 (1.58)
Valve spring tension (IN. & EX.)		* 18.4 – 21.6 kg (40.6 – 47.6 lbs) at length 35 mm (1.4 in)	_____

* Asterisk mark indicates new D model specifications.

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	34.990–35.030 (1.3775–1.3791)	34.690 (1.3657)
	EX.	35.030–35.070 (1.3791–1.3807)	34.730 (1.3673)
Camshaft journal oil clearance	R. & L.	0.032–0.066 (0.0013–0.0026)	0.15 (0.006)
Camshaft journal holder I.D.	R. Side	25.012–25.025 (0.9847–0.9852)	_____
	L. Side	20.012–20.025 (0.7879–0.7884)	_____
Camshaft journal O.D.	R. Side	24.959–24.980 (0.9826–0.9835)	_____
	L. Side	19.959–19.980 (0.7858–0.7866)	_____
Camshaft runout	IN. & EX.	_____	0.10 (0.004)
Cam chain 20 pitch length		_____	128.90 (5.075)
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	_____
Rocker arm shaft O.D.	IN. & EX.	11.966–11.984 (0.4711–0.4718)	_____
Cylinder head distortion	_____		0.05 (0.002)
Cylinder head cover distortion	_____		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD	LIMIT
Compression pressure	10–14 kg/cm ² (142–198.8 psi)	8 kg/cm ² (113.6 psi)
Piston to cylinder clearance	0.045–0.055 (0.0018–0.0022)	0.120 (0.0047)
Cylinder bore	72.000–72.015 (2.8346–2.8352)	72.085 (2.8380)
Piston diam.	71.950–71.965 (2.8327–2.8332) Measure at 15 (0.59) from the skirt end.	71.880 (2.8299)
Cylinder distortion	_____	0.05 (0.002)

Unit: mm (in)

Unit: mm (in)

ITEM	STANDARD			LIMIT
Piston ring free end gap	1st	N	Approx. 9.5 (0.37)	7.6 (0.30)
		R	Approx. 10.5 (0.41)	8.4 (0.33)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
		R	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st	0.10—0.30 (0.004—0.012)		0.7 (0.03)
	2nd	0.10—0.30 (0.004—0.012)		0.7 (0.03)
Piston ring to groove clearance	1st	————		0.180 (0.0071)
	2nd	————		0.150 (0.0059)
Piston ring groove width	1st	1.01—1.03 (0.039—0.040)		————
	2nd	1.21—1.23 (0.047—0.048)		————
	Oil	2.51—2.53 (0.099—0.100)		————
Piston ring thickness	1st	0.975—0.990 (0.0384—0.0390)		————
	2nd	1.170—1.190 (0.0461—0.0469)		————
Piston pin bore	18.002—18.008 (0.7087—0.7089)			18.030 (0.7098)
Piston pin O.D.	17.996—18.000 (0.7085—0.7086)			17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006–18.014 (0.7089–0.7092)	18.040 (0.7102)
Conrod deflection	_____	3.0 (0.12)
Conrod big end side clearance	0.10–0.65 (0.004–0.026)	1.00 (0.039)
Conrod big end width	20.95–21.00 (0.825–0.827)	_____
Crankshaft web to web width	60.0 ± 0.1 (2.36 ± 0.004)	_____
Crankshaft runout	_____	0.05 (0.002)
Balancer spring free length	_____	9.9 (0.39)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.812 (68 / 21 × 33 / 38)	_____
Oil pressure (at 60°C, 140°F)	Above 0.30 kg/cm ² (4.26 psi) Below 0.70 kg/cm ² (9.94 psi) at 3000 r/min.	_____

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.16)	_____
Clutch release screw	1/4–1/2 turn back	_____
Drive plate thickness	No. 1 2.90–3.10 (0.114–0.122)	2.60 (0.102)
	No. 2 3.45–3.55 (0.136–0.140)	3.15 (0.124)
Drive plate claw width	15.8–16.0 (0.62–0.63)	15.0 (0.59)
Driven plate thickness	1.6 ± 0.05 (0.06 ± 0.002)	_____
Driven plate distortion	_____	0.1 (0.004)
Clutch spring free length	_____	34.0 (1.34)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Primary reduction ratio	3.238 (68 / 21)		————
Final reduction ratio	2.733 (41 / 15)		————
Gear ratios	Low	2.636 (29 / 11)	————
	2nd	1.687 (27 / 16)	————
	3rd	1.263 (24 / 19)	————
	4th	1.000 (20 / 20)	————
	Top	0.818 (18 / 22)	————
Shift fork to groove clearance	No.1, No.2 No.3	0.20–0.40 (0.008–0.016)	0.60 (0.023)
Shift fork groove width	No.1, No.2 No.3	4.25–4.35 (0.167–0.171)	————
Shift fork thickness	No.1, No.2 No.3	3.95–4.05 (0.156–0.159)	————
Drive chain	Type	D.I.D.: 520 UB TAKASAGO: RK520SU	————
	Links	100 links	————
	20 pitch length	————	324.2 (12.76)
Drive chain slack	25–35 (1.0–1.4)		————

CARBURETOR

Unit: mm (in)

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS34SS
Bore size	34 (1.34)
I. D. No.	38300
Idle r/min.	1250 ± 50 r/min.
Fuel level	5.0 ± 0.5 (0.20 ± 0.02)
Float height	27.4 ± 1.0 (1.08 ± 0.04)
Main jet (M. J.)	# 130
Main air jet (M. A. J.)	0.7
Jet needle (J. N.)	5DF91
Needle jet (N. J.)	0-9
Pilot jet (P. J.)	# 42.5
By pass (B. P.)	1.0, 0.7, 0.8, 0.8
Pilot outlet (P. O.)	0.7
Valve seat (V. S.)	2.0
Starter jet (G. S.)	# 40
Pilot screw (P. S.)	PRE-SET
Pilot air jet (P. A. J.)	# 150
Throttle cable play	0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	10 ° B.T.D.C. Below 1700 ± 100 r/min and 35 ° B.T.D.C. Above 3000 ± 100 r/min.		
Spark plug	Type	NGK D8EA NIPPON DENSO X24ES-U	
	Gap	0.6–0.7	
Spark performance	Over 8 at 1 atm		
Pick up coil resistance	Approx.	160–240 Ω	O–G
Ignition coil resistance	Primary	Terminal – Terminal Approx. 3–5.5 Ω	
	Secondary	Plug cap – Terminal Approx. 19–29 kΩ	
Generator no-load voltage	More than 70 V (AC) at 5000 r/min.		
Regulated voltage	13.5–16.0 V at 5000 r/min.		
Starter relay resistance	Approx.	3–4 Ω	
Battery	Type designation	YB10L-A2	
	Capacity	12V43.2kC(12Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20° C (68° F)	
Fuse size	Main	15 A	

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Front brake lever distance	20–30 (0.8–1.2)		_____
Rear brake pedal free travel	20–30 (0.8–1.2)		_____
Rear brake pedal height	10 (0.4)		_____
Brake drum I.D.	Front	_____	150.7 (5.93)
	Rear	_____	130.7 (5.15)
Brake lining thickness	_____		1.5 (0.06)
Wheel rim runout	Axial	_____	2.0 (0.08)
	Radial	_____	2.0 (0.08)
Wheel axle runout	Front	_____	0.25 (0.010)
	Rear	_____	0.25 (0.010)
Tire size	Front	3.00S18 4PR	_____
	Rear	4.60S16 4PR	_____
Tire tread depth	Front	_____	1.6 (0.06)
	Rear	_____	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140 (5.5)	_____	
Front fork spring free length	_____	610 (24.0)	
Front fork oil level	200 (7.9)	_____	
Rear wheel travel	98 (3.9)	_____	
Swing arm pivot shaft runout	_____	0.3 (0.012)	

FUEL + OIL

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 - 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	10.3 L (2.7/2.3 US/Imp gal)	
reserve	2.0 L (2.1/1.8 US/Imp qt)	
Engine oil type and grade	SAE 10W/40 SE or SF	
Engine oil capacity	Change 1300 ml (1.4/1.1 US/Imp qt)	
	Filter change 1400 ml (1.5/1.2 US/Imp qt)	
	Overhaul 1700 ml (1.8/1.5 US/Imp qt)	
Front fork oil type	Fork oil # 10	
Front fork oil capacity (each leg)	* 216.5 ml (7.3/7.6 US/Imp oz)	

* Asterisk mark indicates new D model specifications.

TIRE PRESSURE

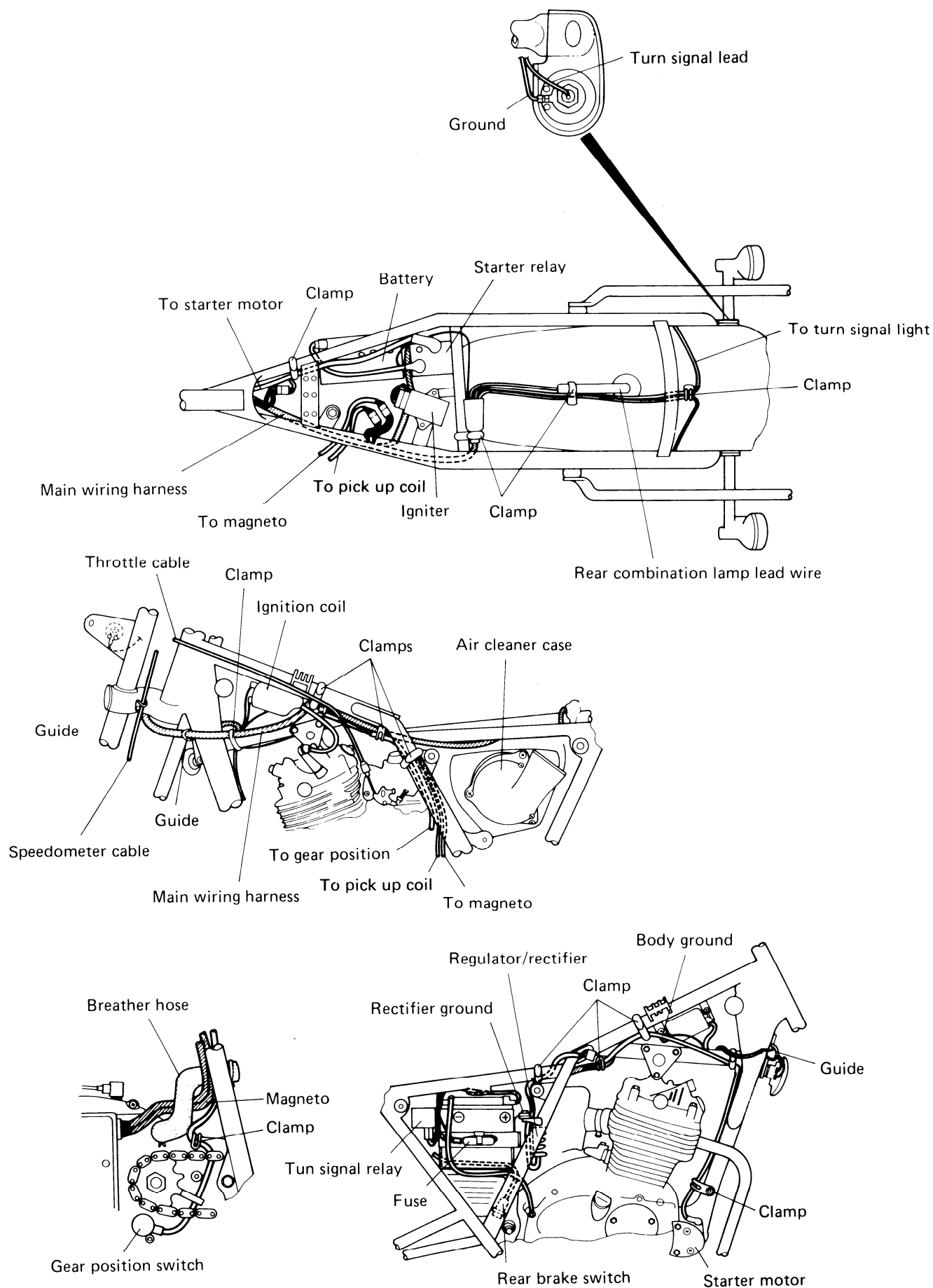
COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24	175	1.75	24	175	1.75	24	200	2.00	28
REAR	200	2.00	28	225	2.25	32	225	2.25	32	250	2.50	34

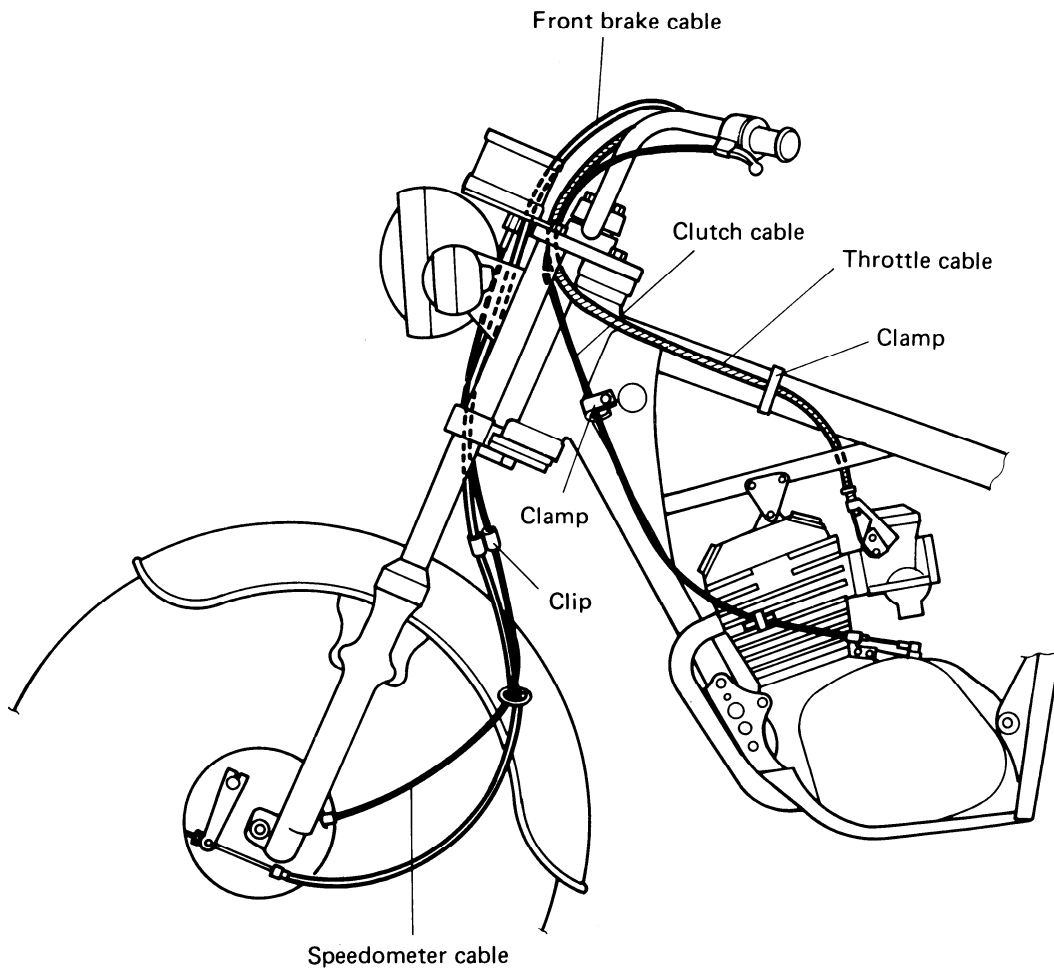
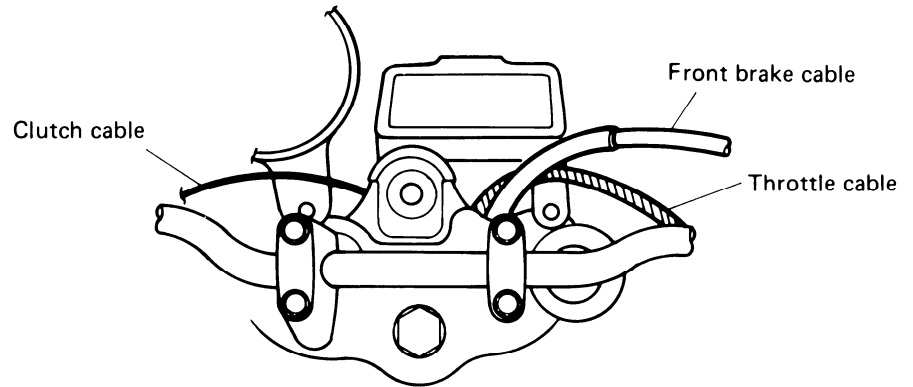
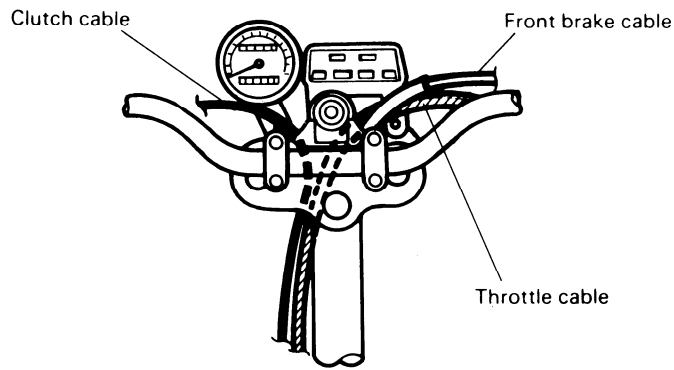
WATTAGE

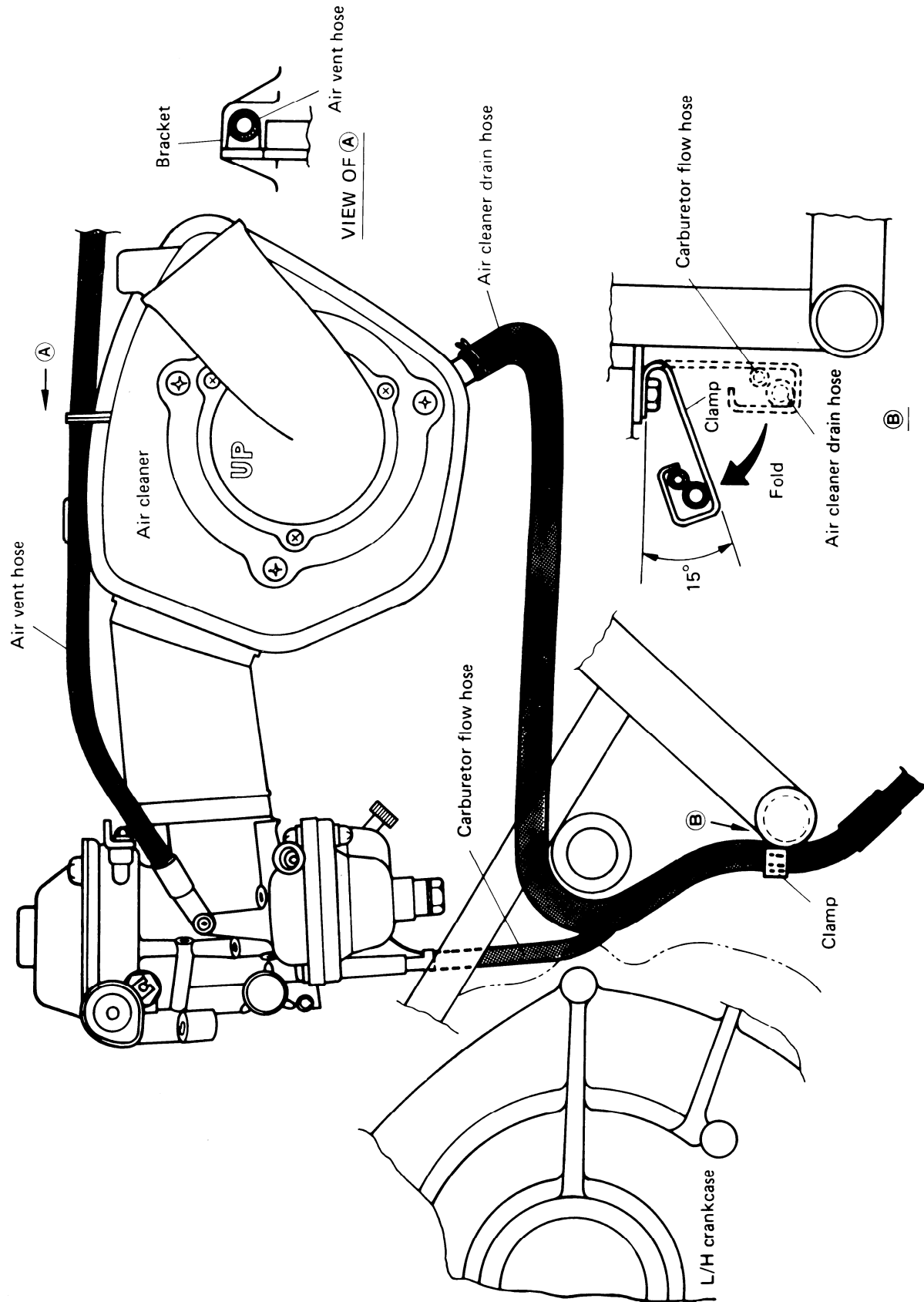
Unit: W

ITEM		SPECIFICATION
Headlight	HI	50
	LO	35
Tail/Brake light		8/23
Turn signal light		23
Speedometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4

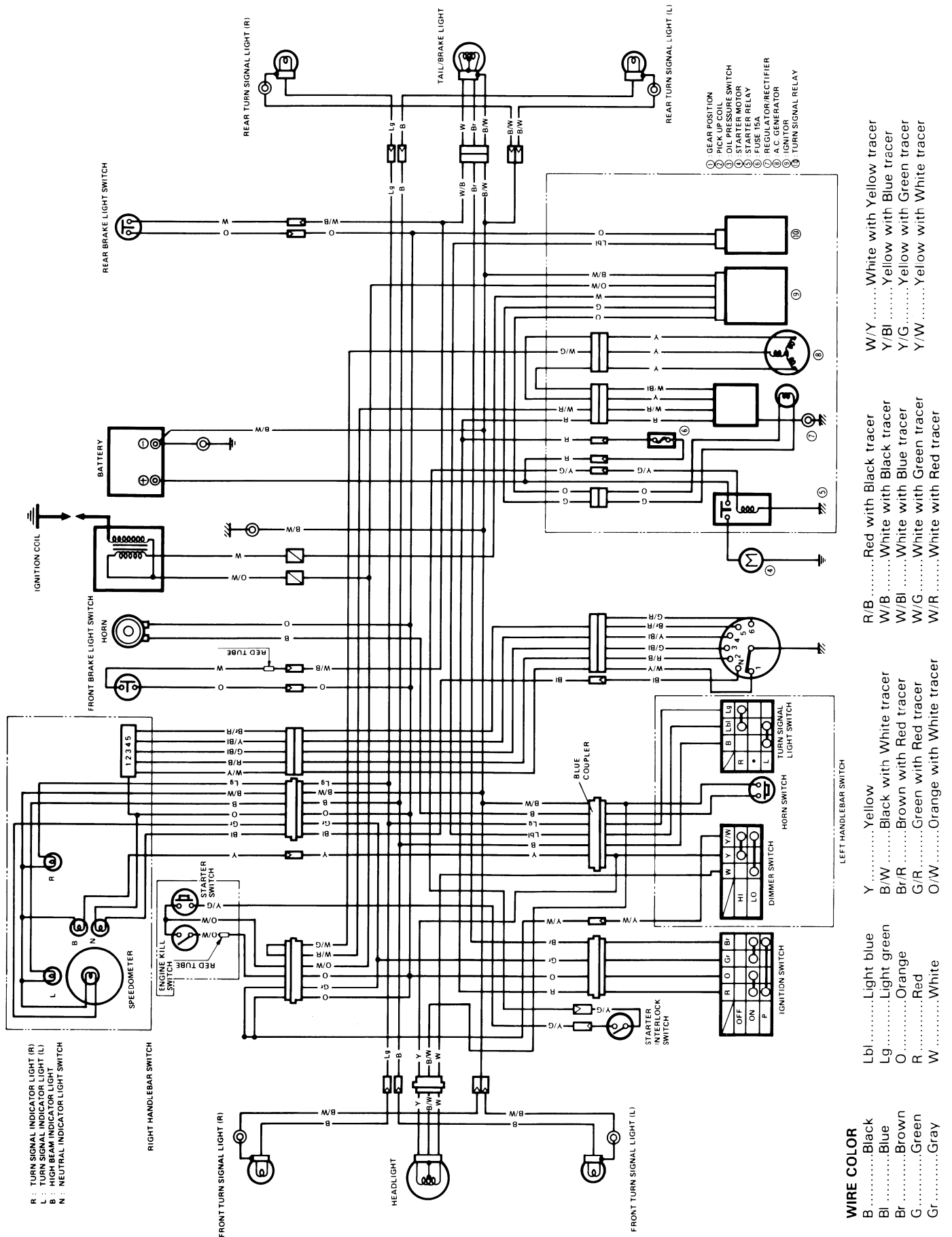
WIRE AND CABLE ROUTING







WIRING DIAGRAM



CONTENTS

SERVICE DATA.....	10- 1
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SERVICE DATA

VALVE + GUIDE

Unit: mm

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26	——
	EX.	22	——
Valve lift	IN.	6.7	——
	EX.	6.7	——
Valve clearance (when cold)	IN.	0.03—0.08	——
	EX.	0.08—0.13	——
Valve guide to valve stem clearance	IN.	0.025—0.052	0.35
	EX.	0.040—0.067	0.35
Valve guide I.D.	IN. & EX.	5.500—5.512	——
Valve stem O.D.	IN.	5.460—5.475	——
	EX.	5.445—5.460	——
Valve stem runout	IN. & EX.	——	0.05
Valve head thickness	IN. & EX.	——	0.5
Valve stem end length	IN. & EX.	——	3.7
Valve seat width	IN. & EX.	1.0	——
Valve head radial runout	IN. & EX.	——	0.03
Valve spring free length (IN. & EX.)	——		39.9
Valve spring tension (IN. & EX.)	39—49 kg at length 28.5 mm		——

CAMSHAFT + CYLINDER HEAD

Unit: mm

ITEM	STANDARD		LIMIT
Cam height	IN.	34.990—35.030	——
	EX.	35.030—35.070	
Camshaft journal oil clearance	IN. & EX.	0.032—0.066	0.150
Camshaft journal holder I.D.	R. side	25.012—25.025	——
	L. side	20.012—20.025	——
Camshaft journal O.D.	R. side	24.959—24.980	——
	L. side	19.959—19.980	——
Camshaft runout	IN. & EX.	——	0.10
Cam chain 20-pitch length	——		128.90
Rocker arm I.D.	IN. & EX.	12.000—12.018	——
Rocker arm shaft O.D.	IN. & EX.	12.966—12.984	——
Cylinder head distortion	——		0.05

CYLINDER + PISTON + PISTON RING

Unit: mm

ITEM	STANDARD	LIMIT
Compression pressure	10—14 kg/cm ²	8 kg/cm ²
Compression pressure difference	——	2 kg/cm ²
Piston to cylinder clearance	0.045—0.055	0.120
Cylinder bore	72.000—72.015	72.085
Piston diam.	71.950—71.965 Measure at 15 from the skirt end.	71.880

ITEM	STANDARD			LIMIT
Cylinder distortion	————			0.05
Piston ring free end gap	1st	N	Approx. 10.5	8.4
		R	Approx. 10.5	8.4
	2nd	N	Approx. 11.0	8.8
		R	Approx. 11.0	8.8
Piston ring end gap	1st	0.10—0.30		0.70
	2nd	0.10—0.35		0.70
Piston ring to groove clearance	1st	————		0.180
	2nd	————		0.150
Piston ring groove width	1st	1.01—1.03		————
	2nd	1.21—1.23		————
	Oil	2.51—2.53		————
Piston ring thickness	1st	0.975—0.990		————
	2nd	1.170—1.190		————
Piston pin bore	18.002—18.008			18.030
Piston pin O.D.	17.996—18.000			17.980

CONROD + CRANKSHAFT

Unit: mm

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014	18.040
Conrod deflection	—	3.0
Conrod big end side clearance	0.10—0.65	1.00
Conrod big end width	20.95—21.00	—
Crank web to web width	60.0 \pm 0.1	—
Crankshaft runout	—	0.05
Balancer spring free length	—	9.9

OIL PUMP

Unit: mm

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.812 (68/21 \times 33/38)	—
Oil pressure (at 60°C, 140°F)	Above 0.3 kg/cm ² Below 0.7 kg/cm ² at 3 000 r/min.	—

CLUTCH

Unit: mm

ITEM	STANDARD	LIMIT
Clutch cable play	4	—
Clutch release screw	$1/4$ — $1/2$ turn back	—
Drive plate thickness	No 1	2.92—3.08
	No 2	3.45—3.55
Drive plate claw width	15.8—16.0	15.0
Driven plate distortion	—	0.1
Clutch spring free length	—	38.5

TRANSMISSION + DRIVE CHAIN

Unit: mm Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.283 (68/21)	——
Final reduction ratio		2.733 (41/15)	——
Gear ratios	Low	2.636 (29/11)	——
	2nd	1.687 (27/16)	——
	3rd	1.263 (24/19)	——
	4th	1.000 (20/20)	——
	Top	0.818 (18/22)	——
Shift fork to groove clearance		0.20—0.40	0.60
Shift fork groove width		4.25—4.35	——
Shift fork thickness		3.95—4.05	——
Drive chain	Type	D.I.D.: D.I.D. 520 UBR TAKASAGO: RK520-SU	——
	Links	100 links	——
	20-pitch length	——	323.9
Drive chain slack		25—35	——

CARBURETOR

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS34SS
Bore size	34 mm
I.D. No.	38300
Idle r/min.	1 300 \pm 50 r/min.
Float height	27.4 \pm 1.0 mm
Main jet (M.J.)	#130
Main air jet (M.A.J.)	0.8 mm
Jet needle (J.N.)	5DF91
Needle jet (N.J.)	□ - 9
Throttle valve (Th.V.)	#100
Pilot jet (P.J.)	#42.5
By pass (B.P.)	1.0, 0.7, 0.8, 0.8 mm
Pilot outlet (P.O.)	0.8 mm
Valve seat (V.S.)	2.0 mm
Starter jet (G.S.)	#40
Pilot screw (P.S.)	Pre-set
Pilot air jet (P.A.J.)	#150
Throttle cable play (P.A.J.)	0.5—1.0 mm
Choke cable play	0.5—1.0 mm

ELECTRICAL

Unit: mm

ITEM	SPECIFICATION	NOTE
Ignition timing	10° B.T.D.C. Below 1 700 \pm 100 r/min. and 35° B.T.D.C. Above 3 000 \pm 100 r/min.	

ITEM	SPECIFICATION		NOTE
Spark plug	Type	N.D.: X24ES-U NGK: D8EA	
	Gap	0.6—0.7	
Spark performance	Over 8 at 1 atm.		
Signal coil resistance	Approx. 160—240 Ω		O-G
Ignition coil resistance	Primary	Terminal—Terminal 3—5.5 Ω	
	Secondary	Plug cap—Terminal 19—29 k Ω	
Generator no-load voltage	More than 70 V (AC) at 5 000 r/min.		
Generator coil resistance	3—4 Ω		
Regulated voltage	14.0—15.0 V at 5 000 r/min.		
Starter motor brush length	Limit: 9		
Commutator under-cut	Limit: 0.2		
Starter relay resistance	3—4 Ω		
Battery	Type designation	YB10L-A2	
	Capacity	12V 11Ah (39.6 kC)/10 HR	
	Standard electrolyte S.G.	1.28 at 20°C (68°F)	
Fuse size	Main	15 A	

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	50
	LO	35
Tail/Brake light		23/8
Turn signal light		23
Speedometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Gear position indicator light		1.17
Side stand warning light		3.4

BRAKE + WHEEL

Unit: mm

ITEM	STANDARD		LIMIT
Front brake lever play	3—7		——
Rear brake pedal free travel	20—30		——
Rear brake pedal height	10		——
Brake drum I.D.	Front	——	150.7
	Rear	——	130.7
Brake lining thickness	——		1.5

ITEM	STANDARD		LIMIT
Wheel rim runout	Axial	_____	2.0
	Radial	_____	2.0
Wheel axle runout	Front	_____	0.25
	Rear	_____	0.25
Tire size	Front	3.00 S18 4PR	_____
	Rear	4.60 S16	_____
Tire tread depth	Front	_____	1.6
	Rear	_____	2.0

SUSPENSION

Unit: mm

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140	_____	
Front fork spring free length	_____	457.2	
Front fork oil level	200	_____	
Rear wheel travel	98	_____	
Swing arm pivot shaft runout	_____	0.3	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kPa	kg/cm ²	kPa	kg/cm ²	kPa	kg/cm ²	kPa	kg/cm ²
FRONT	175	1.75	175	1.75	175	1.75	200	2.00
REAR	200	2.00	225	2.25	225	2.25	250	2.50

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.		
Fuel tank including reserve	10.3 L		
reserve	2.0 L		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	1 300 ml	
	Filter change	1 400 ml	
	Overhaul	1 700 ml	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	216.5 ml		

CONTENTS

SERVICE DATA	11- 1
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SERVICE DATA

VALVE + GUIDE

Unit: mm

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26	—
	EX.	22	—
Valve lift	IN.	6.7	—
	EX.	6.7	—
Valve clearance (when cold)	IN.	0.03—0.08	—
	EX.	0.08—0.13	—
Valve guide to valve stem clearance	IN.	0.025—0.052	0.35
	EX.	0.040—0.067	0.35
Valve guide I.D.	IN. & EX.	5.500—5.512	—
Valve stem O.D.	IN.	5.460—5.475	—
	EX.	5.445—5.460	—
Valve stem runout	IN. & EX.	—	0.05
Valve head thickness	IN. & EX.	—	0.5
Valve stem end length	IN. & EX.	—	3.7
Valve seat width	IN. & EX.	1.0	—
Valve head radial runout	IN. & EX.	—	0.03
Valve spring free length (IN. & EX.)	—		39.9
Valve spring tension (IN. & EX.)	39—49 kg at length 28.5 mm		—

CAMSHAFT + CYLINDER HEAD

Unit: mm

ITEM	STANDARD		LIMIT
Cam height	IN.	34.990—35.030	—
	EX.	35.030—35.070	
Camshaft journal oil clearance	IN. & EX.	0.032—0.066	0.150
Camshaft journal holder I.D.	R. side	25.012—25.025	—
	L. side	20.012—20.025	—
Camshaft journal O.D.	R. side	24.959—24.980	—
	L. side	19.959—19.980	—
Camshaft runout	IN. & EX.	—	0.10
Cam chain 20-pitch length	—		128.90
Rocker arm I.D.	IN. & EX.	12.000—12.018	—
Rocker arm shaft O.D.	IN. & EX.	12.966—12.984	—
Cylinder head distortion	—		0.05

CYLINDER + PISTON + PISTON RING

Unit: mm

ITEM	STANDARD	LIMIT
Compression pressure	10—14 kg/cm ²	8 kg/cm ²
Compression pressure difference	—	2 kg/cm ²
Piston to cylinder clearance	0.045—0.055	0.120
Cylinder bore	72.000—72.015	72.085
Piston diam.	71.950—71.965 Measure at 15 from the skirt end.	71.880

ITEM	STANDARD			LIMIT
Cylinder distortion	—			0.05
Piston ring free end gap	1st	N	Approx. 10.5	8.4
		R	Approx. 10.5	8.4
	2nd	N	Approx. 11.0	8.8
		R	Approx. 11.0	8.8
Piston ring end gap	1st	0.10—0.30		0.70
	2nd	0.10—0.35		0.70
Piston ring to groove clearance	1st	—		0.180
	2nd	—		0.150
Piston ring groove width	1st	1.01—1.03		—
	2nd	1.21—1.23		—
	Oil	2.51—2.53		—
Piston ring thickness	1st	0.975—0.990		—
	2nd	1.170—1.190		—
Piston pin bore	18.002—18.008			18.030
Piston pin O.D.	17.996—18.000			17.980

CONROD + CRANKSHAFT

Unit: mm

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014	18.040
Conrod deflection	—	3.0
Conrod big end side clearance	0.10—0.65	1.00
Conrod big end width	20.95—21.00	—
Crank web to web width	60.0 ± 0.1	—
Crankshaft runout	—	0.05
Balancer spring free length	—	9.9

OIL PUMP

Unit: mm

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.812 (68/21 × 33/38)	—
Oil pressure (at 60°C, 140°F)	Above 0.3 kg/cm ² Below 0.7 kg/cm ² at 3 000 r/min.	—

CLUTCH

Unit: mm

ITEM	STANDARD	LIMIT
Clutch cable play	4	—
Clutch release screw	1/4—1/2 turn back	—
Drive plate thickness	No 1	2.92—3.08
	No 2	3.45—3.55
Drive plate claw width	15.8—16.0	15.0
Driven plate distortion	—	0.1
Clutch spring free length	—	38.5

TRANSMISSION + DRIVE CHAIN

Unit: mm Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.283 (68/21)	——
Final reduction ratio		2.733 (41/15)	——
Gear ratios	Low	2.636 (29/11)	——
	2nd	1.687 (27/16)	——
	3rd	1.263 (24/19)	——
	4th	1.000 (20/20)	——
	Top	0.818 (18/22)	——
Shift fork to groove clearance		0.20—0.40	0.60
Shift fork groove width		4.25—4.35	——
Shift fork thickness		3.95—4.05	——
Drive chain	Type	D.I.D.: D.I.D. 520 UBR TAKASAGO: RK520-SU	——
	Links	100 links	——
	20-pitch length	——	323.9
Drive chain slack		25—35	——

CARBURETOR

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS34SS
Bore size		34 mm
I.D. No.		38300
Idle r/min.		1 300 \pm 50 r/min.
Float height		27.4 \pm 1.0 mm
Main jet	(M.J.)	#130
Main air jet	(M.A.J.)	0.8 mm
Jet needle	(J.N.)	5DF91
Needle jet	(N.J.)	□-9
Throttle valve	(Th.V.)	#100
Pilot jet	(P.J.)	#42.5
By pass	(B.P.)	1.0, 0.7, 0.8, 0.8 mm
Pilot outlet	(P.O.)	0.8 mm
Valve seat	(V.S.)	2.0 mm
Starter jet	(G.S.)	#40
Pilot screw	(P.S.)	Pre-set
Pilot air jet	(P.A.J.)	#150
Throttle cable play	(P.A.J.)	0.5—1.0 mm
Choke cable play		0.5—1.0 mm

ELECTRICAL

Unit: mm

ITEM	SPECIFICATION	NOTE
Ignition timing	10° B.T.D.C. Below 1 700 \pm 100 r/min. and 35° B.T.D.C. Above 3 000 \pm 100 r/min.	

ITEM	SPECIFICATION		NOTE
Spark plug	Type	N.D.: X24ES-U NGK: D8EA	
	Gap	0.6–0.7	
Spark performance	Over 8 at 1 atm.		
Signal coil resistance	Approx. 160–240 Ω		O-G
Ignition coil resistance	Primary	Terminal–Terminal 3–5.5 Ω	
	Secondary	Plug cap–Terminal 19–29 k Ω	
Generator no-load voltage	More than 70 V (AC) at 5 000 r/min.		
Generator coil resistance	3–4 Ω		
Regulated voltage	14.0–15.0 V at 5 000 r/min.		
Starter motor brush length	Limit: 9		
Commutator under-cut	Limit: 0.2		
Starter relay resistance	3–4 Ω		
Battery	Type designation	YB10L-A2	
	Capacity	12V 11Ah (39.6 kC)/10 HR	
	Standard electrolyte S.G.	1.28 at 20°C (68°F)	
Fuse size	Main	15 A	

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	50
	LO	35
Tail/Brake light		23/8
Turn signal light		23
Speedometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Gear position indicator light		1.17
Side stand warning light		3.4

BRAKE + WHEEL

Unit: mm

ITEM	STANDARD		LIMIT
Front brake lever play	3–7		—
Rear brake pedal free travel	20–30		—
Rear brake pedal height	10		—
Brake drum I.D.	Front	—	150.7
	Rear	—	130.7
Brake lining thickness	—		1.5

ITEM	STANDARD		LIMIT
Wheel rim runout	Axial	_____	2.0
	Radial	_____	2.0
Wheel axle runout	Front	_____	0.25
	Rear	_____	0.25
Tire size	Front	3.00 S18 4PR	_____
	Rear	4.60 S16	_____
Tire tread depth	Front	_____	1.6
	Rear	_____	2.0

SUSPENSION

Unit: mm

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140	_____	
Front fork spring free length	_____	457.2	
Front fork oil level	200	_____	
Rear wheel travel	98	_____	
Swing arm pivot shaft runout	_____	0.3	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kPa	kg/cm ²	kPa	kg/cm ²	kPa	kg/cm ²	kPa	kg/cm ²
FRONT	175	1.75	175	1.75	175	1.75	200	2.00
REAR	200	2.00	225	2.25	225	2.25	250	2.50

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.		
Fuel tank including reserve	10.3 L		
reserve	2.0 L		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	1 300 ml	
	Filter change	1 400 ml	
	Overhaul	1 700 ml	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	216.5 ml		

CONTENTS

SPECIFICATIONS	12- 1
SERVICE DATA.....	12- 3
SIDE STAND/IGNITION INTERLOCK SYSTEM	12-10
WIRE AND CABLE ROUTING.....	12-13
WIRING DIAGRAM	12-16

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length.....	2 035 mm (80.1 in)
Overall width	835 mm (32.9 in)
Overall height.....	1 120 mm (44.1 in)
Wheelbase.....	1 350 mm (53.1 in)
Ground clearance.....	160 mm (6.3 in)
Dry mass	129 kg (284 lbs)

ENGINE

Type.....	Four-stroke, air cooled, OHC
Valve lash.....	IN. 0.03—0.08 mm (0.001—0.003 in) EX. 0.08—0.13 mm (0.003—0.005 in)
Number of cylinders	1
Bore	72.0 mm (2.835 in)
Stroke.....	61.2 mm (2.409 in)
Piston displacement	249 cm ³ (15.2 cu. in)
Compression ratio.....	8.9 : 1
Carburetor	MIKUNI BS34SS, single
Air cleaner.....	Polyurethane foam element
Starter system	Electric
Lubrication system.....	Wet sump

TRANSMISSION

Clutch.....	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	3.238 (68/21)
Final reduction	2.733 (41/15)
Gear ratios, Low	2.636 (29/11)
2nd.....	1.687 (27/16)
3rd	1.263 (24/19)
4th	1.000 (20/20)
Top.....	0.818 (18/22)
Drive chain	DAIDO D.I.D.520UB or TAKASAGO RK520SU, 100 links

CHASSIS

Front suspension	Telescopic, coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, spring 5-way ad- justable
Steering angle	40° (right & left)
Caster.....	59° 45'
Trail.....	105 mm (4.13 in)
Turning radius	2.4 m (7.9 ft)
Front brake	Internal expanding
Rear brake	Internal expanding
Front tire size	3.00S18 4PR
Rear tire size	4.60S16 4PR

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26 (1.0)	——
	EX.	22 (0.9)	——
Valve lift	IN	6.7 (0.26)	——
	EX.	6.7 (0.26)	——
Valve clearance (when cold)	IN	0.03–0.08 (0.001–0.003)	——
	EX.	0.08–0.13 (0.003–0.005)	——
Valve guide to valve stem clearance	IN.	0.010–0.037 (0.0004–0.0015)	0.35 (0.014)
	EX.	0.030–0.057 (0.0012–0.0022)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500–5.512 (0.2165–0.2170)	——
Valve stem O.D.	IN.	5.460–5.475 (0.2150–0.2156)	——
	EX.	5.445–5.460 (0.2144–0.2150)	——
Valve stem runout	IN. & EX.	——	0.05 (0.002)
Valve head thickness	IN. & EX.	——	0.5 (0.02)
Valve stem end length	IN. & EX.	——	3.8 (0.15)
Valve seat width	IN. & EX.	1.0 (0.04)	——
Valve head radial runout	IN. & EX.	——	0.03 (0.001)
Valve spring free length	IN. & EX.	——	40.1 (1.58)
Valve spring tension	IN. & EX.	39–49 kg (86.0–108.0 lbs) at length 28.5 mm (1.12 in)	——

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	34.990–35.030 (1.3776–1.3791)	34.690 (1.3657)
	EX.	35.030–35.070 (1.3791–1.3807)	34.730 (1.3673)
Camshaft journal oil clearance		0.032–0.066 (0.0013–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	R. side	25.012–25.025 (0.9847–0.9852)	——
	L. side	20.012–20.025 (0.7879–0.7884)	——

ITEM	STANDARD		LIMIT
Camshaft journal O.D.	R. side	24.959–24.980 (0.9826–0.9835)	—
	L. side	19.959–19.980 (0.7858–0.7866)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		128.9 (5.07)
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.966–11.984 (0.4711–0.4718)	—
Cylinder head distortion	—		0.05 (0.002)
Cylinder head cover distortion	—		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000–1 400 kPa 10–14 kg/cm ² 142–199 psi			800 kPa 8 kg/cm ² 114 psi
Piston to cylinder clearance	0.045–0.055 (0.0017–0.0022)			0.120 (0.0047)
Cylinder bore	72.000–72.015 (2.8346–2.8352)			72.085 (2.8380)
Piston diam.	71.950–71.965 (2.8327–2.8333) Measure at 15 (0.59) from the skirt end.			71.880 (2.8300)
Cylinder distortion	—			0.05 (0.002)
Piston ring free end gap	1st	N.R.	Approx. 10.5 (0.41)	8.4 (0.33)
	2nd	N.R.	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st	0.10–0.30 (0.004–0.012)		0.70 (0.028)
	2nd	0.10–0.35 (0.004–0.014)		0.70 (0.028)
Piston ring to groove clearance	1st	—		0.180 (0.0071)
	2nd	—		0.150 (0.0059)
Piston ring groove width	1st	1.01–1.03 (0.039–0.040)		—
	2nd	1.21–1.23 (0.047–0.048)		—
	Oil	2.51–2.53 (0.099–0.100)		—

ITEM	STANDARD		LIMIT
Piston ring thickness	1st	0.975–0.990 (0.038–0.039)	———
	2nd	1.170–1.190 (0.046–0.047)	———
Piston pin bore	18.002–18.008 (0.7087–0.7090)		18.030 (0.7098)
Piston pin O.D.	17.996–18.000 (0.7085–0.7087)		17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006–18.014 (0.7089–0.7092)	18.040 (0.7102)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10–0.65 (0.004–0.026)	1.00 (0.039)
Conrod big end width	20.95–21.00 (0.825–0.827)	———
Crank web to web width	60.0 ± 0.1 (2.36 ± 0.004)	———
Crankshaft runout	———	0.05 (0.002)
Balancer spring free length	———	9.9 (0.39)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.812 (68/21 × 33/38)	———
Oil pressure (at 60°C, 140°F)	Above 30 kPa (0.3 kg/cm ² , 4.27 psi) Below 70 kPa (0.7 kg/cm ² , 9.95 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.16)	———
Clutch release screw	1/4–1/2 Turn back	———
Clutch plate thickness	No.1	2.92–3.08 (0.115–0.121)
	No.2	3.45–3.55 (0.136–0.140)
Drive plate claw width	15.8–16.0 (0.62–0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	38.5 (1.52)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.238 (68/41)	——
Final reduction ratio		2.733 (41/15)	——
Gear ratios	Low	2.636 (29/11)	——
	2nd	1.687 (27/16)	——
	3rd	1.263 (24/19)	——
	4th	1.000 (20/20)	——
	Top	0.818 (18/22)	——
Shift fork to groove clearance		0.20–0.40 (0.008–0.016)	0.60 (0.024)
Shift fork groove width		4.25–4.35 (0.167–0.171)	——
Shift fork thickness		3.95–4.05 (0.156–0.159)	——
Drive chain	Type	D.I.D.: 520UB TAKASAGO: RK520SU	——
	Links	100 links	——
	20-pitch length	——	323.9 (12.75)
Drive chain slack		25–35 (1.0–1.4)	——

CARBURETOR

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS34SS
Bore size		34 mm (1.3 in)
I.D. No.		38300
Idle r/min.		1 300 ± 50 r/min.
Float height		27.4 ± 1.0 mm (1.08 ± 0.04 in)
Main jet	(M.J.)	#130
Main air jet	(M.A.J.)	0.8 mm
Jet needle	(J.N.)	5DF91
Needle jet	(N.J.)	□-9
Throttle valve	(Th.V.)	#100
Pilot jet	(P.J.)	#42.5
By-pass	(B.P.)	1.0, 0.7, 0.8, 0.8 mm
Pilot outlet	(P.O.)	0.8 mm
Valve seat	(V.S.)	2.0 mm (0.07 in)
Starter jet	(G.S.)	#40
Pilot screw	(P.S.)	PRE-SET
Pilot air jet	(P.A.J.)	#150
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)
Choke cable play		0.5–1.0 mm (0.02–0.04 in)

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION	NOTE
Ignition timing		10° B.T.D.C. Below 1 700 \pm 100 r/min and 35° B.T.D.C. Above 3 000 \pm 100 r/min.	
Spark plug	Type	NGK: D8EA N.D.: X24ES-U	
	Gap	0.6–0.7 (0.024–0.028)	
Spark performance		Over 8 (0.3) at 1 atm.	
Ignition coil resistance	Primary	Terminal–Terminal 3–5.5 Ω	
	Secondary	Plug cap–Terminal 19–29 k Ω	
Generator no-load voltage		More than 70 V (AC) at 5 000 r/min.	
Generator coil resistance		3–4 Ω	
Regulated voltage		14–15 V at 5 000 r/min.	
Starter motor brush length		Limit: 9	
Commutator under-cut		Limit: 0.2	
Starter relay resistance		3–4 Ω	
Battery	Type designation	YB10L-A2	
	Capacity	12 V 11 Ah (39.6 kC)/10 HR	
	Standard electrolyte S.G.	1.28 at 20°C (68°F)	
Fuse size	Main	15 A	

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	50
	LO	35
Tail/Brake light		8/23
Turn signal light		23
Speedometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		1.7
Neutral indicator light		3.4
Gear position indicator light		1.12

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD	LIMIT
Master cylinder bore	14.000–14.043 (0.5512–0.5529)	—
Master cylinder piston diam.	13.957–13.984 (0.5495–0.5506)	—
Brake caliper cylinder bore	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	38.098–38.148 (1.4999–1.5019)	—

ITEM	STANDARD		LIMIT
Brake disc thickness	4.8—5.2 (0.19—0.20)		4.5 (0.18)
Brake disc runout	—		0.3 (0.01)
Rear brake pedal free travel	20—30 (0.8—1.2)		—
Rear brake pedal height	10 (0.4)		—
Brake drum I.D.	—		130.7 (5.15)
Brake lining thickness	—		1.5 (0.06)
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	3.00 S18 4PR	—
	Rear	4.60 S16 4PR	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD		LIMIT
Front fork stroke	140 (5.5)		—
Front fork spring free length	—		457.2 (18.0)
Front fork oil level	200 (7.9)		—
Rear wheel travel	98 (3.9)		—
Swingarm pivot shaft runout	—		0.3 (0.01)

TIRE PRESSURE

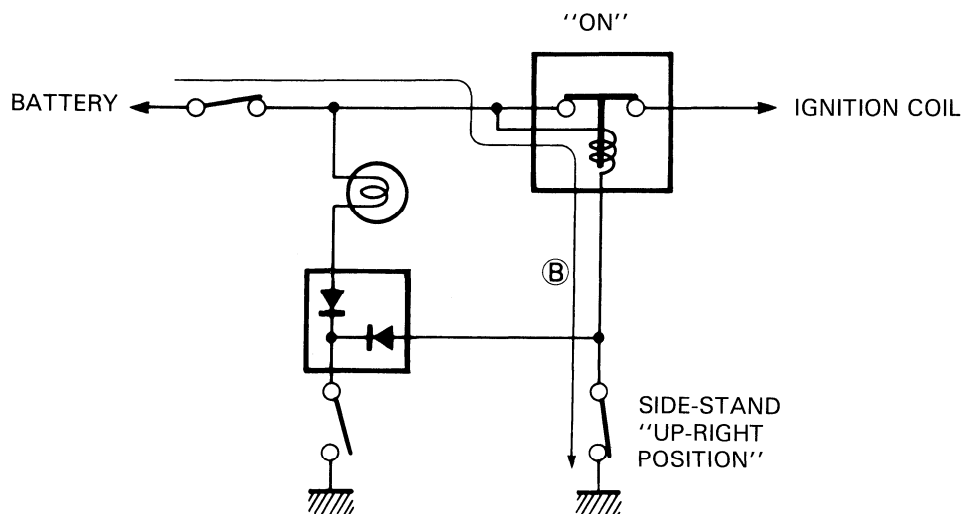
COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24.9	175	1.75	24.9	175	1.75	24.9	200	2.00	28.4
REAR	200	2.00	28.4	225	2.25	32.0	225	2.25	32.0	250	2.56	35.6

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.		
Fuel tank including reserve	10.3 L (2.7/2.3 US/Imp gal)		
reserve	2.0 L (2.1/1.8 US/Imp qt)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	1 300 ml (1.37/1.14 US/Imp qt)	
	Filter change	1 400 ml (1.48/1.23 US/Imp qt)	
	Overhaul	1 700 ml (1.80/1.50 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	216.5 ml (7.32/7.62 US/Imp oz)		
Brake fluid type	DOT3 or DOT4		

2. Side-stand: "UP-RIGHT (ON)"

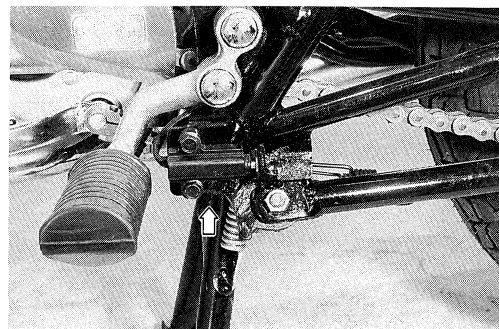
The current flow ⑧ turns "ON" the relay and the ignition coil lives. The engine can be easily started at any transmission position.



INSPECTION

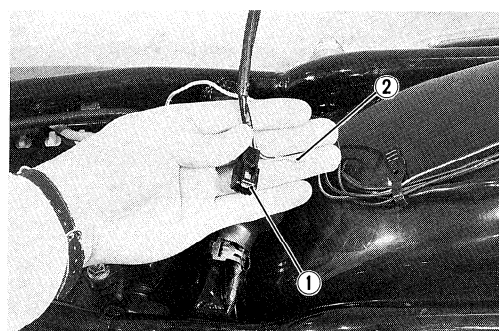
If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with new one.

09900-25002 : Pocket tester



SIDE STAND SWITCH

Disconnect the side stand switch lead wires and connect the pocket tester to terminals ① and ②. Check the side stand switch function by moving the side stand upward and downward.



	G	B/W
Fully up position	○ — ○	○ — ○
Down position		

NEUTRAL SWITCH

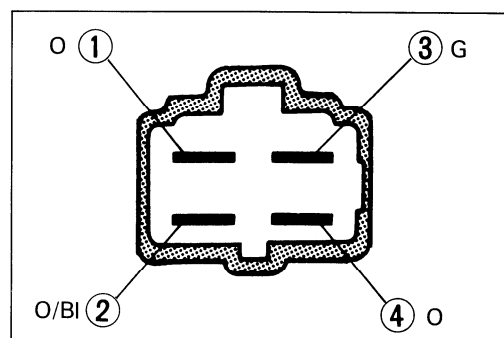
Disconnect the neutral switch lead wire and connect the pocket tester to terminal and the ground. Check the neutral switch function by shifting the transmission into neutral and out of neutral.

	Bl	Ground
Neutral	○ — ○	○ — ○
Not neutral		

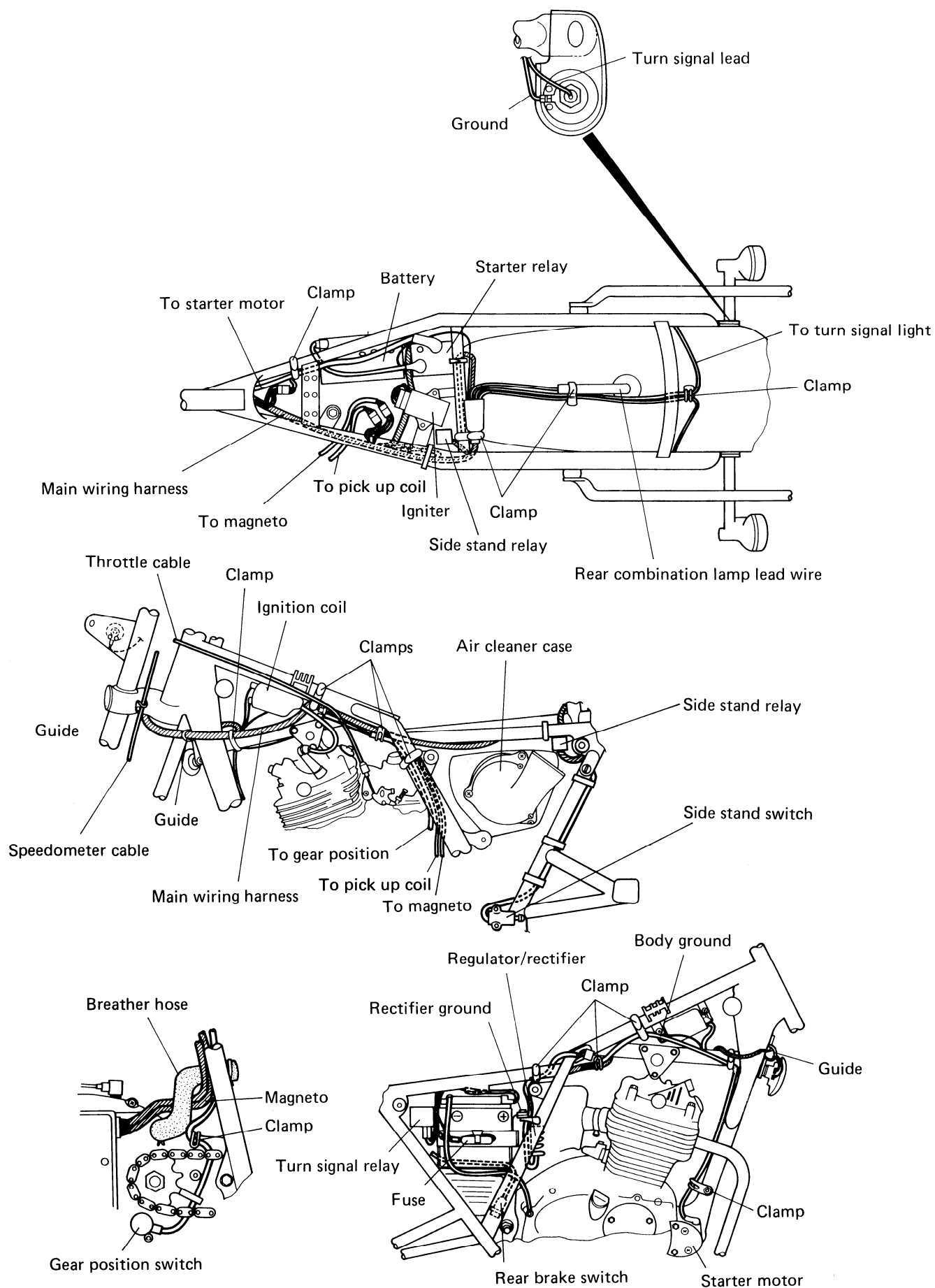
SIDE STAND/IGNITION INTERLOCK RELAY

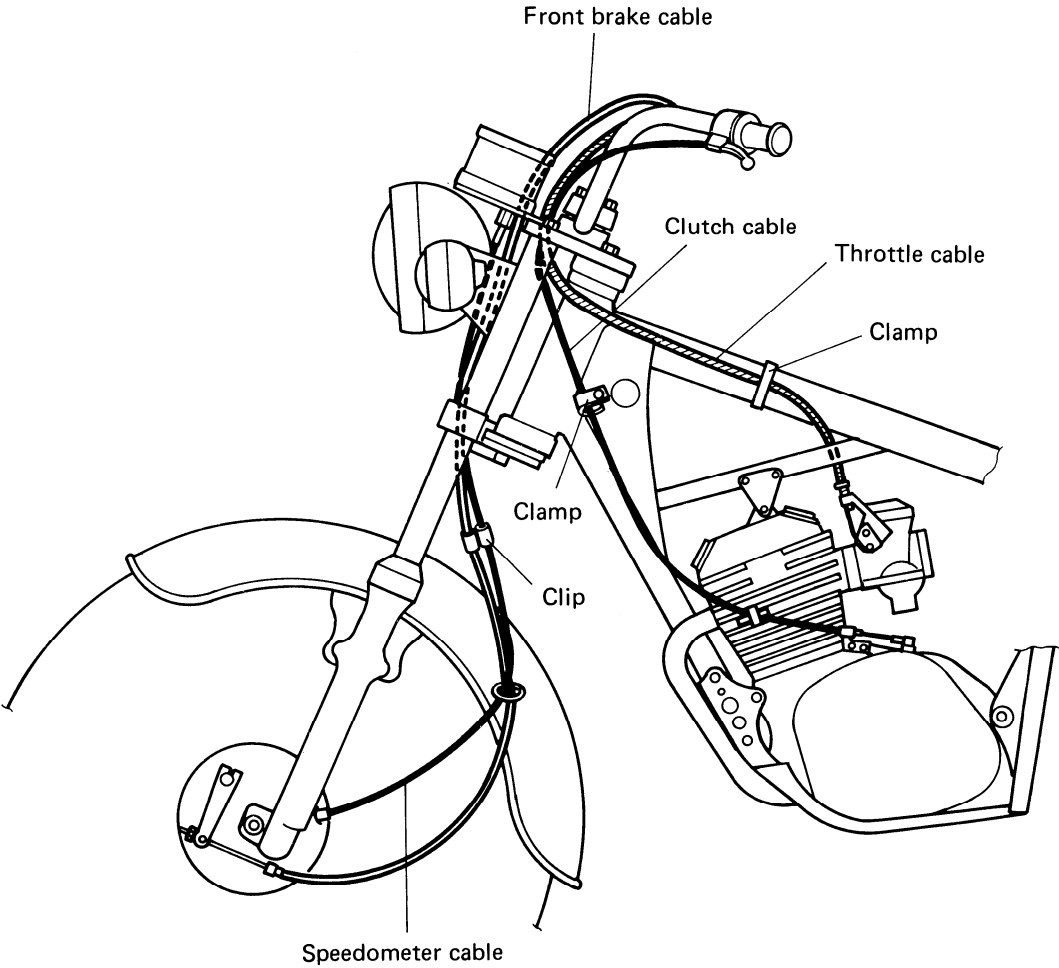
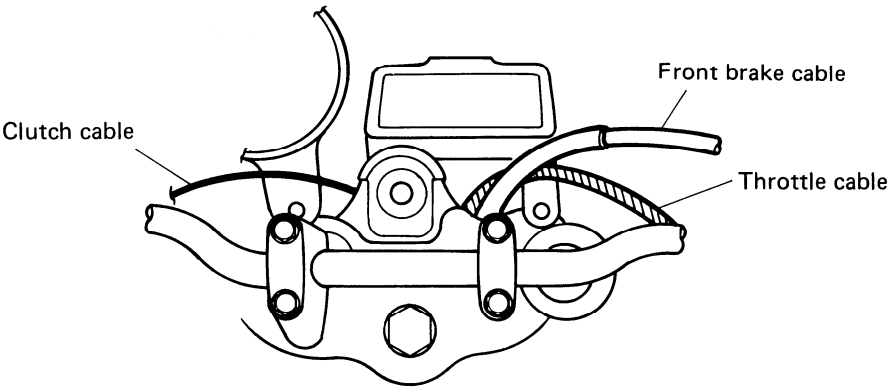
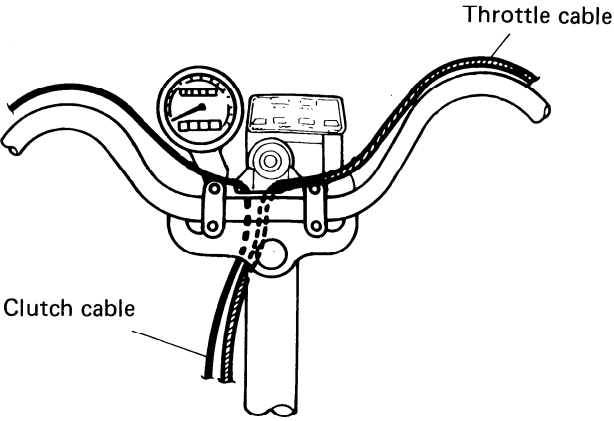
First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, \oplus to ③ and \ominus to ④, and check the continuity between ① and ②.

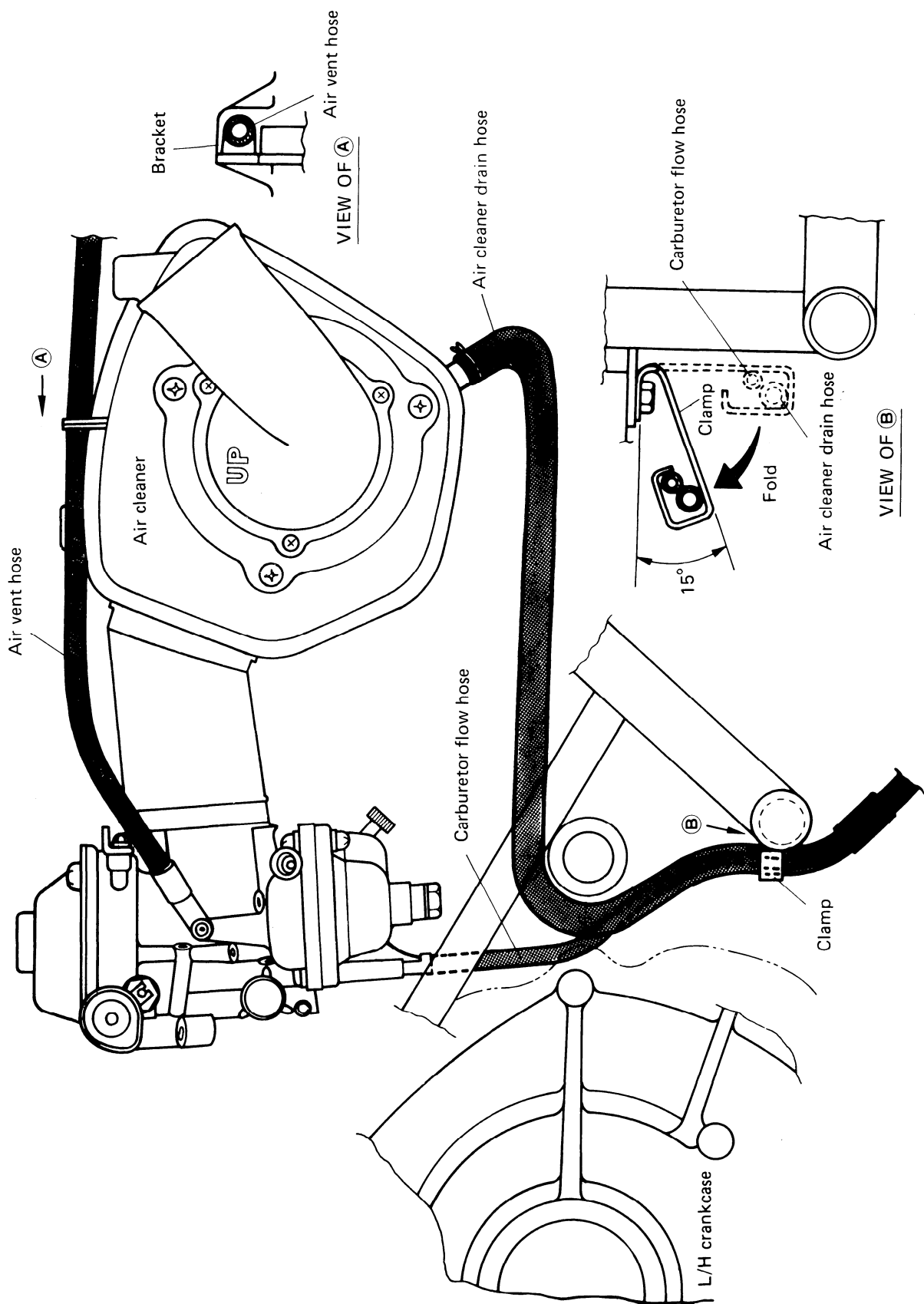
If the relay does not work properly, replace it with a new one.



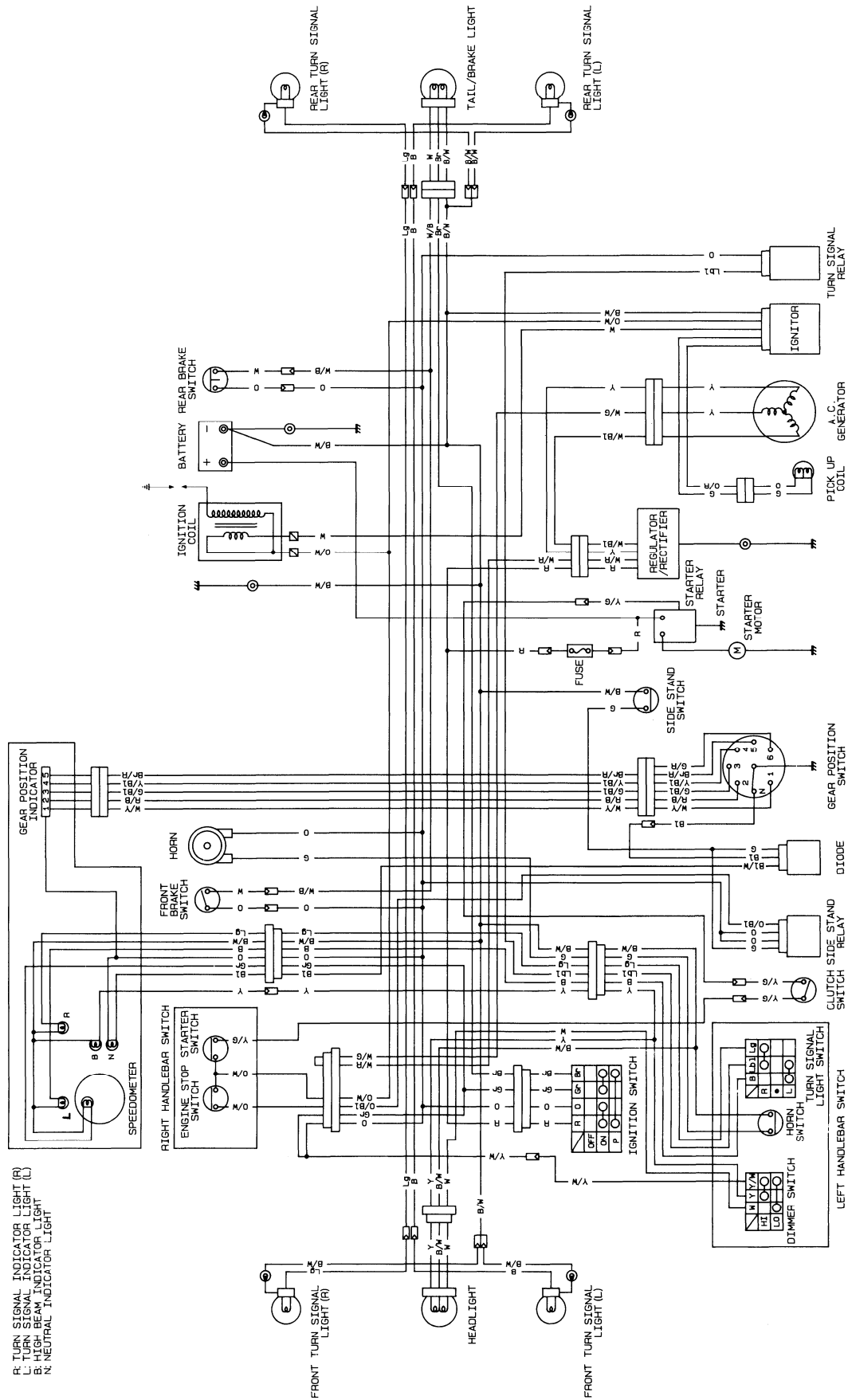
WIRE AND CABLE ROUTING







WIRING DIAGRAM



R: TURN SIGNAL INDICATOR LIGHT (R)
 L: TURN SIGNAL INDICATOR LIGHT (L)
 B: HIGH BEAM INDICATOR LIGHT
 N: NEUTRAL INDICATOR LIGHT

WIRE COLOR
 B:.....Black
 Bl:.....Blue
 Br:.....Brown
 G:.....Green
 Gr:.....Gray
 Lbl:.....Light blue

Lg:.....Light green
 O:.....Orange
 R:.....Red
 W:.....White
 Y:.....Yellow
 B/W:.....Black with White tracer

Br/R:.....Brown with Red tracer
 G/R:.....Green with Red tracer
 O/W:.....Orange with White tracer
 R/B:.....Red with Black tracer
 W/B:.....White with Blue tracer

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

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