

## FOREWORD

*The Suzuki GSX750E/ES has been developed as a companion motorcycle to the GSX models. It features highly advanced design concepts including a forged one piece crankshaft assembly. The GSX750E/ES provides excellent performance, precise control and handling plus outstanding riding comfort.*

*This service manual has been produced primarily for experienced Suzuki mechanics. Apprentice and do-it-yourself mechanics will also find this manual to be an extremely useful repair guide. This manual contains the most up-to-date information at the time of publication. The rights are reserved to update or make corrections to this manual at any time.*

**SUZUKI MOTOR CORPORATION**  
*Motorcycle Technical Service Department*

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VIEW OF SUZUKI GSX750ES



VIEW OF SUZUKI GSX750E



## **GROUP INDEX**

**GENERAL INFORMATION**

**1**

**PERIODIC MAINTENANCE AND  
TUNE-UP PROCEDURES**

**2**

**SERVICING ENGINE**

**3**

**FUEL AND LUBRICATION SYSTEM**

**4**

**ELECTRICAL SYSTEM**

**5**

**CHASSIS**

**6**

**SERVICING INFORMATION**

**7**

**GSX750EE/ESE/EFE('84-MODEL)**

**8**

**GSX750SE('84-MODEL)**

**9**

**GSX750EF/ESF/EFF('85-MODEL)**

**10**

**GSX750ESG('86-MODEL)**

**11**

**APPENDIX**

**12**

# GENERAL INFORMATION

1

## CONTENTS

|                                                   |             |
|---------------------------------------------------|-------------|
| <b>SERIAL NUMBER LOCATIONS</b> .....              | <b>1- 1</b> |
| <b>FUEL AND OIL RECOMMENDATIONS</b> .....         | <b>1- 1</b> |
| <b>BREAKING-IN PROCEDURES</b> .....               | <b>1- 2</b> |
| <b>CYLINDER IDENTIFICATION</b> .....              | <b>1- 2</b> |
| <b>SPECIAL FEATURES</b> .....                     | <b>1- 3</b> |
| <b>TSCC (TWIN SWIRL COMBUSTION CHAMBER)</b> ..... | <b>1- 3</b> |
| <b>CAM SHAFT DRIVE CHAIN TENSIONER</b> .....      | <b>1- 7</b> |
| <b>FULL TRANSISTORIZED IGNITION SYSTEM</b> .....  | <b>1- 8</b> |
| <b>ANTI-DIVE FORK</b> .....                       | <b>1- 9</b> |
| <b>FULL-FLOATING SUSPENSION SYSTEM</b> .....      | <b>1-14</b> |
| <b>PRECAUTIONS AND GENERAL INSTRUCTIONS</b> ..... | <b>1-15</b> |
| <b>SPECIAL MATERIALS</b> .....                    | <b>1-16</b> |
| <b>SPECIFICATIONS</b> .....                       | <b>1-18</b> |



## SERIAL NUMBER LOCATIONS

### FRAME NUMBER

The frame serial number ① is stamped on the steering head pipe.



### ENGINE NUMBER

The engine serial number ② is located on the right side of the crankcase.



## FUEL AND OIL RECOMMENDATIONS

### FUEL

Use gasoline with an octane number of 90 or higher (Research Method), preferably unleaded or low-lead.

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

### ENGINE OIL

Using a premium quality four stroke motor oil will increase the service life of your motorcycle. Use only oils which are rated SE or SF under the API classification system. The viscosity rating should be SAE 10W-40. If an SAE 10W-40 motor oil is not available, select an alternative according to the chart below.

|             |        |     |     |    |    |    |    |     |
|-------------|--------|-----|-----|----|----|----|----|-----|
| SAE         | 40     |     |     |    |    |    |    |     |
|             | 30     |     |     |    |    |    |    |     |
|             | 20W-50 |     |     |    |    |    |    |     |
|             | 10W-50 |     |     |    |    |    |    |     |
|             | 10W-30 |     |     |    |    |    |    |     |
|             | 20W    |     |     |    |    |    |    |     |
|             | 10W    |     |     |    |    |    |    |     |
| Temperature | °C     | -20 | -10 | 0  | 10 | 20 | 30 | 40  |
|             | °F     | -4  | 14  | 32 | 50 | 68 | 86 | 104 |

## BRAKE FLUID (for front and rear brakes)

|                                  |                         |
|----------------------------------|-------------------------|
| Specification and classification | SAE J1703, DOT3 or DOT4 |
|----------------------------------|-------------------------|

### NOTE:

- \* Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.

- \* Do not use any brake fluid taken from old or used or unsealed containers.
- \* Never re-use brake fluid left over from the previous servicing and stored for a long period.

## FRONT FORK OIL

Use fork oil  $\neq$  10.

## BREAKING-IN PROCEDURES

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:

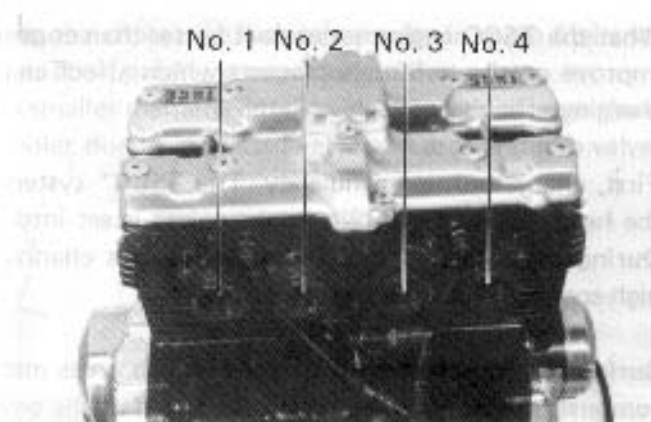
- Keep to these breaking-in engine speed limits:

|                |                     |
|----------------|---------------------|
| Initial 800 km | Below 4 000 r.p.m.  |
| Up to 1 600 km | Below 6 000 r.p.m.  |
| Over 1 600 km  | Below 10 000 r.p.m. |

- Upon reaching an odometer reading of 1 600 km, you can subject the motorcycle to full throttle operation.  
However, do not exceed 10 000 r.p.m. 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.

## CYLINDER IDENTIFICATION

The four cylinders of this engine are identified as No. 1, No. 2, No. 3 and No. 4 cylinder, as counted from left to right (as viewed by the rider on the seat).



## SPECIAL FEATURES

### TSCC (TWIN SWIRL COMBUSTION CHAMBER)

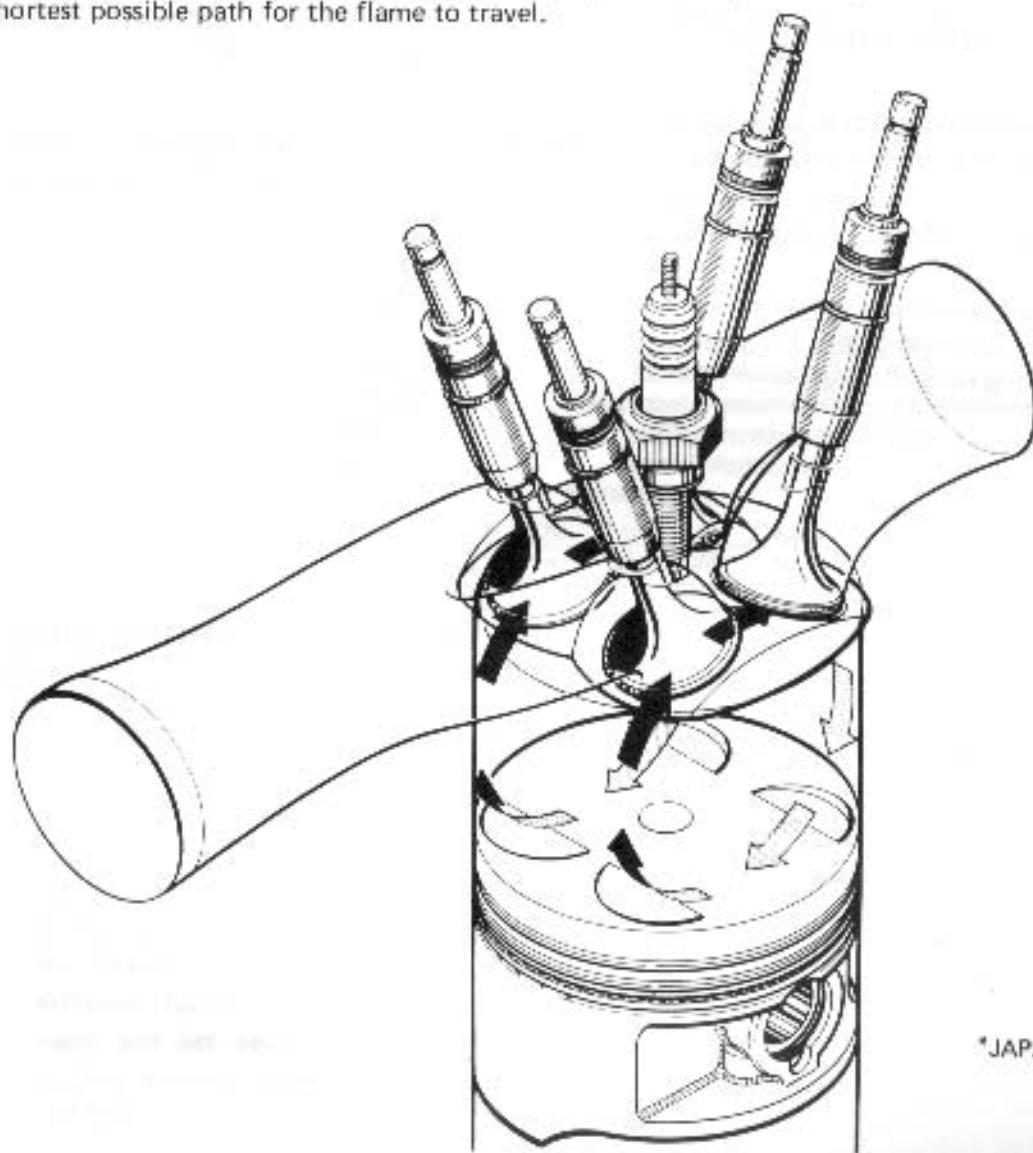
SUZUKI has introduced a new breed of 4-valves-per-cylinder high-performance 4-stroke engines--the TSCC series. TSCC describes the heart of the engine, the Twin Swirl Combustion Chamber.

What the TSCC engine series does better than conventional 4-stroke engines, either 2 valve or 4 valve, is to 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 machined 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.



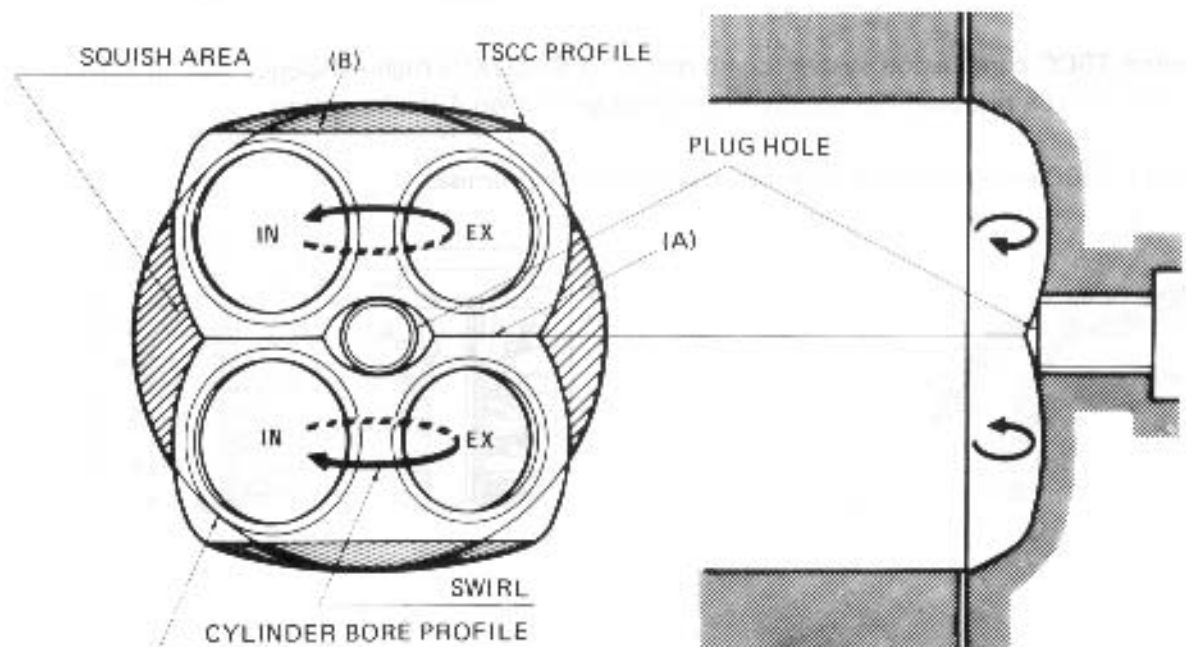
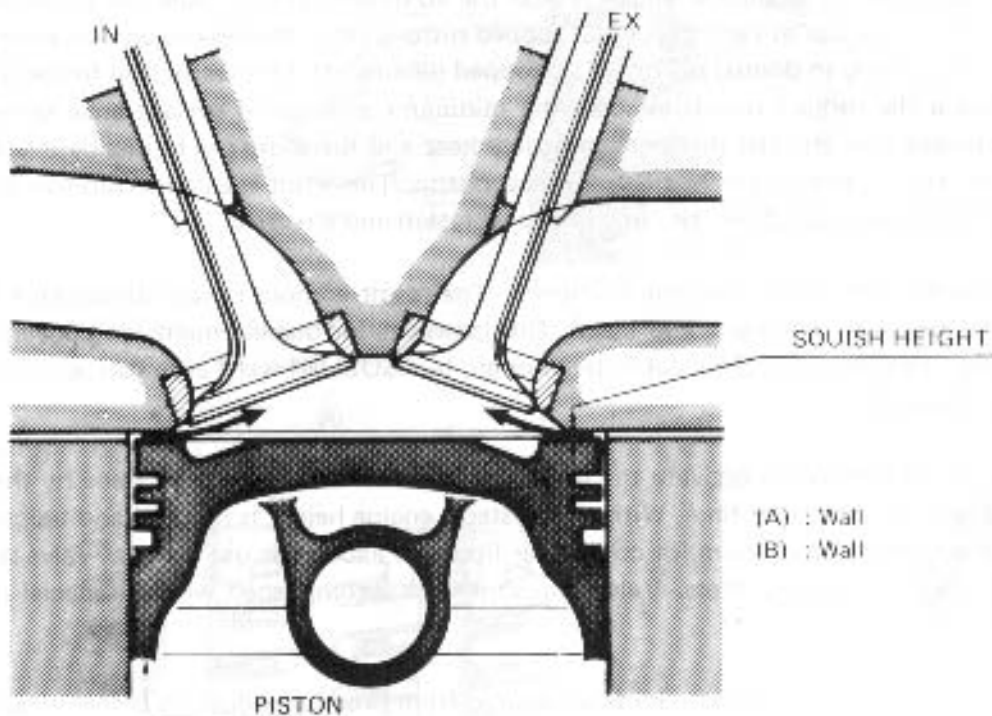
\*JAPAN PATENT NO. 771502

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 valves 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 cylinder heads. 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.

Increased 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.

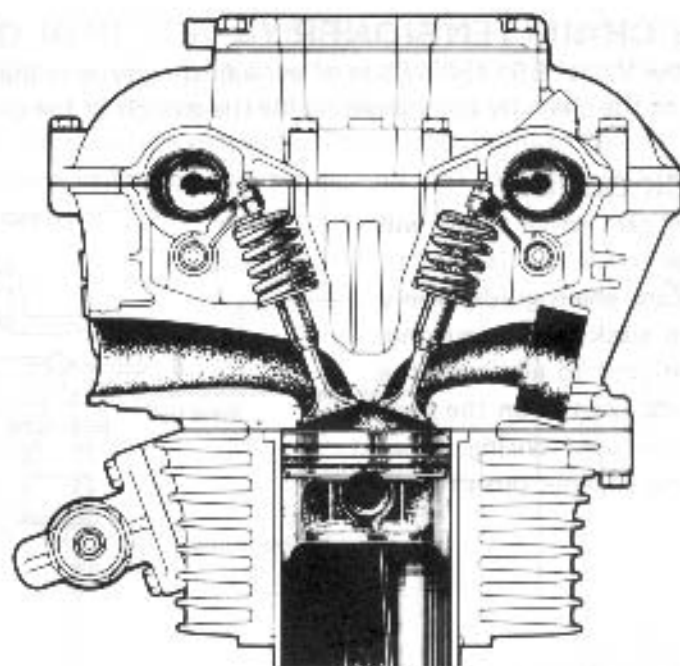
A direct acting rocker arm is utilized to activate the valves. Each rocker arm, when depressed by the cam lobe, directly activates two valves at one time. With this system, engine height is reduced and tappets are not necessary. This system allows more room for cooling air flow and allows the use of larger valve springs which increases spring life by reducing stress. Valve adjustment is accomplished without special tools—quickly and easily.

Special sintered steel valve seats are incorporated, manufactured from premium alloys to ensure even more reliability under higher heat loads.

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.

The SUZUKI TSCC engine series—performance without compromise.

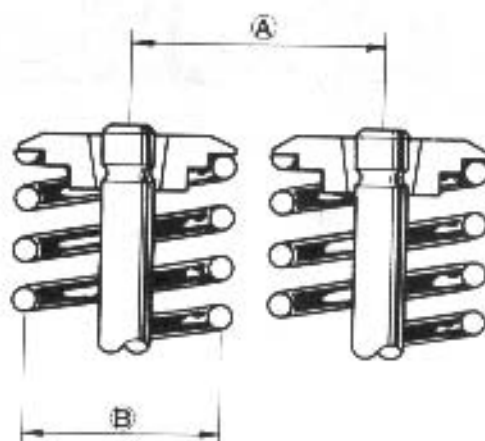




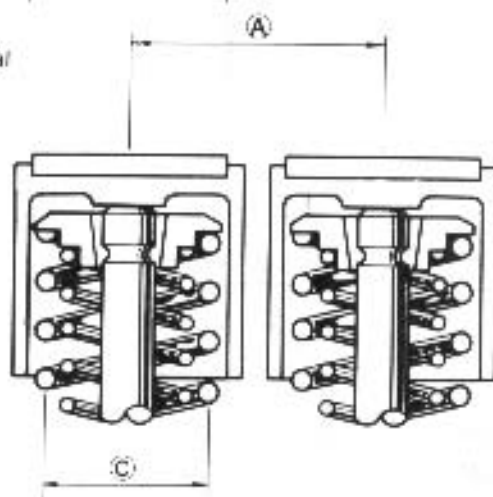
If valve pitch (A) is the same, spring diameter (B) is larger than (C).

TSCC valve angle  $\alpha$  is smaller than  $\beta$ .

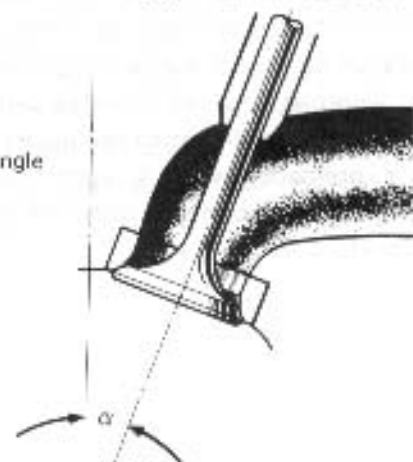
TSCC  
4-valve



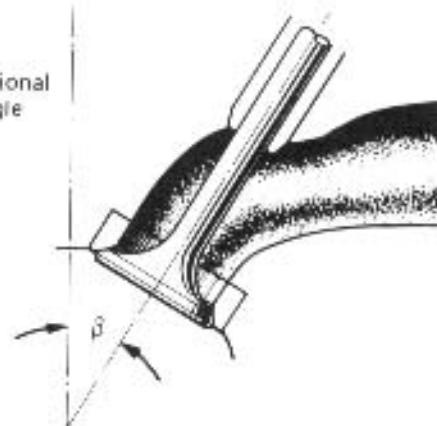
Conventional  
4-valve



TSCC  
valve angle



Conventional  
valve angle



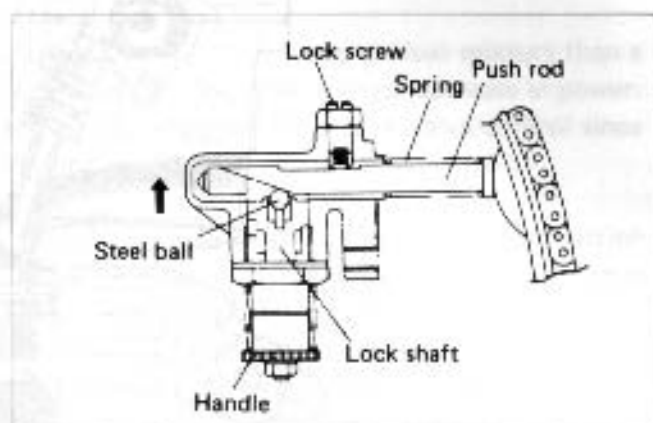


## CAMSHAFT DRIVE CHAIN TENSIONER

The chain tensioner used in the Model GSX750E/ES is of self-adjusting type in that it adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.

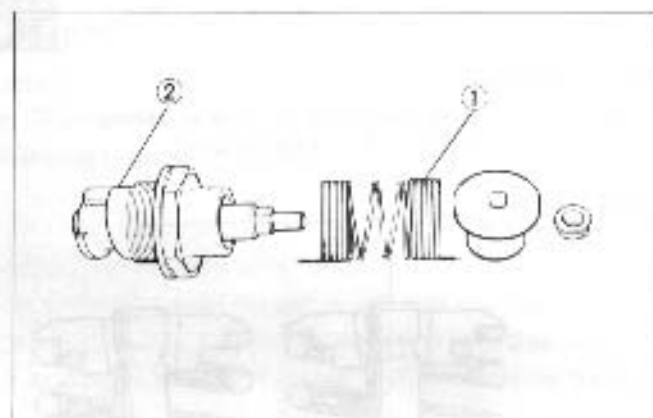
### PUSH ROD AND LOCK SCREW

During normal service the cam drive chain will stretch. A spring controlled push rod is used to constantly reposition the cam chain guide firmly against the chain to prevent slack from occurring. A lock screw and nut are utilized to eliminate the constant, high spring pressure exerted on the push rod. The lock screw is only used during either removal or installation of the adjuster push rod to ease the procedures.



### LOCK SHAFT

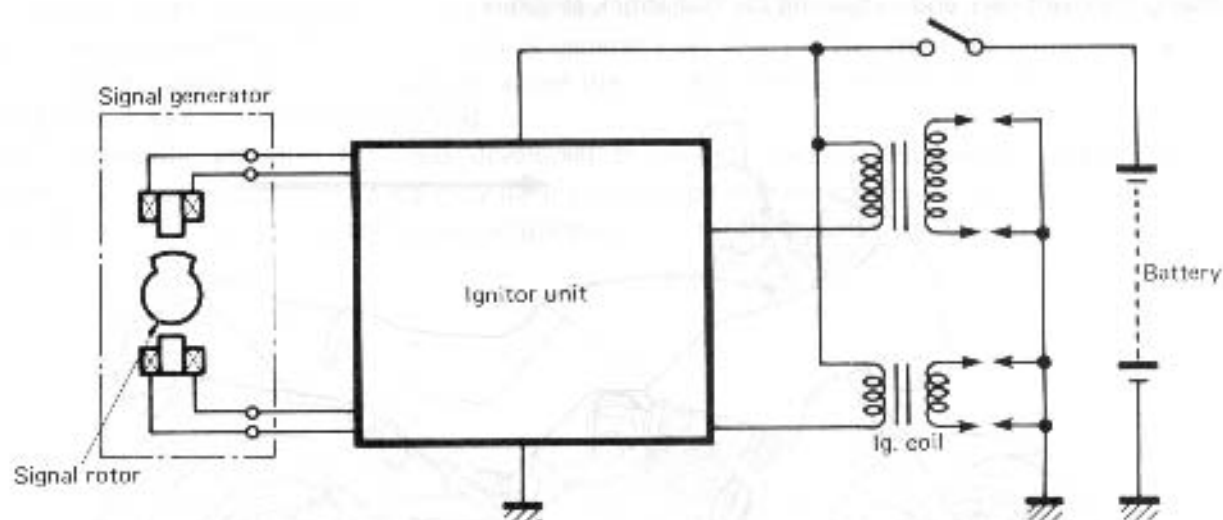
The cam drive chain tension tries to vary during engine operation. The spring controlled push rod is designed so as to only move in, towards the chain guide preventing slack from occurring if the spring pressure on the push rod were overcome. A steel ball is "jammed" against a angled surface preventing backwards movement of the push rod. The lock shaft is preloaded with a light spring ① which keeps the ball in contact with the push rod and angled surface ②.



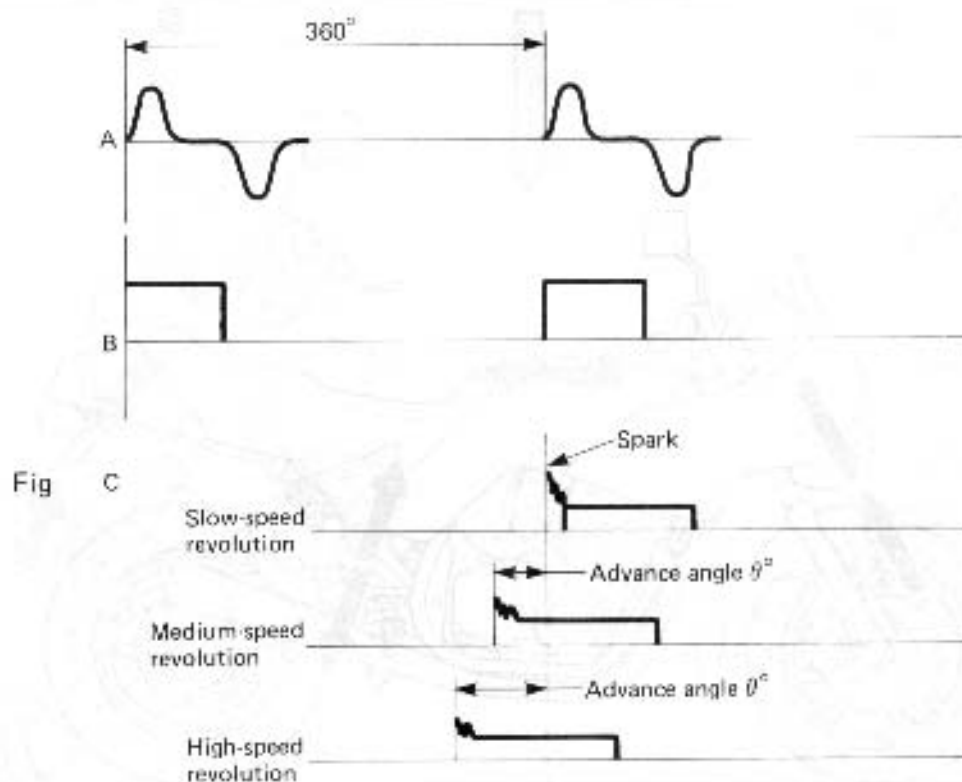


## TRANSISTORIZED IGNITION SYSTEM WITH ELECTRONIC ADVANCE

On the Model GSX750E/ES, the timing advance characteristics of the ignition timing have been changed from the previously-employed mechanical timing advance system incorporating a centrifugal advance governor to an electronic timing advance system. The introduction of this new electronic timing advance system minimizes fluctuations in the ignition timing and also has improved the timing advance performance during high-speed operations.

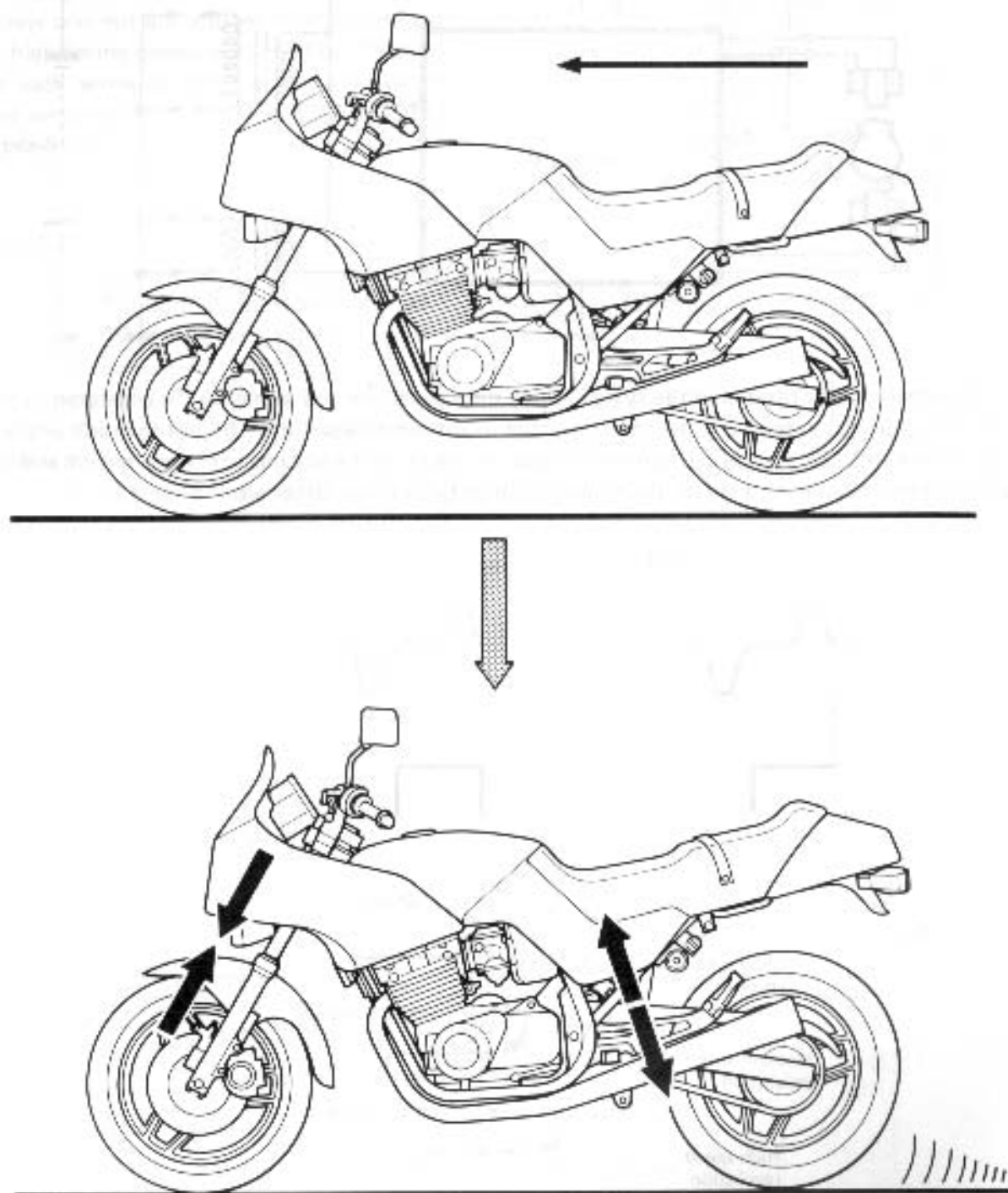


When the signal rotor is rotated in the system block diagram above, the signal "A" is generated in the pick-up coil. The thus-generated signal will be converted to the signal waveform "B" at the inside of the ignitor unit. Based on this "B" waveform, control is made by means of the advancing control circuit and the closing angle control circuit. As a result, the timing advance takes place, as shown in Fig. "C".



## ANTI-DIVE FRONT FORK

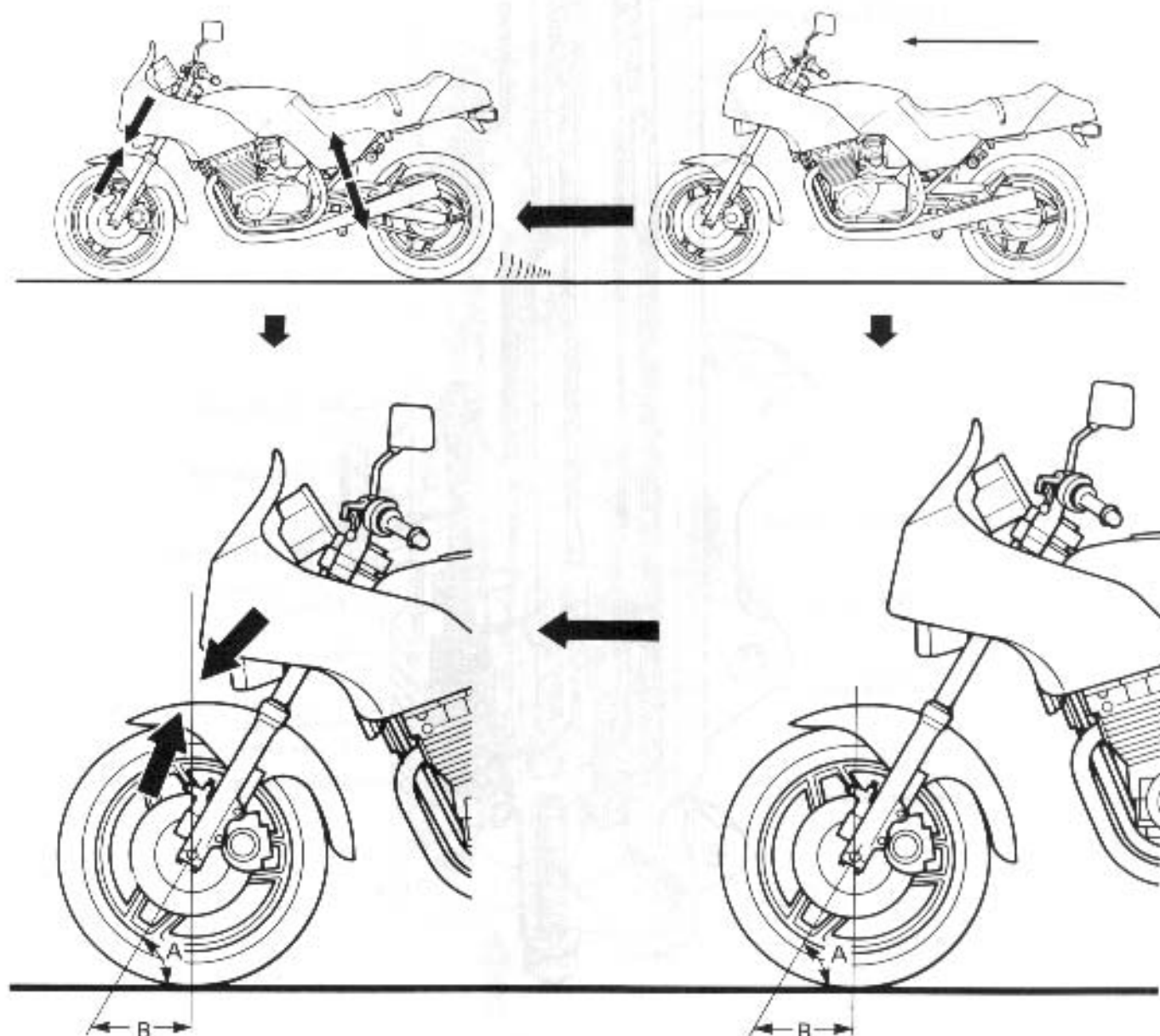
Consider the case of the motorcycle that is stopped suddenly. Excepting the rider, the machine itself cannot automatically counteract the momentum of its center of gravity moving forward to maintain its balance. At the point of "stoppage" the momentum continues its forward motion to exert its weight through the front fork on the point of contact of the front wheel. Simultaneously, the rear wheel tends to lift as the weight on it is reduced proportionately to the forward momentum. This has the effect of compressing the front fork and extending the rear shock absorber.



## ANTI-DIVE DEVICE

When a speeding motorcycle is stopped, it is impossible to prevent the front fork dive because the momentum of the machine's center of gravity continues forward. The front fork is compressed and extended, as it is braked before cornering and full throttle applied coming out of the corner, which naturally changes its cornering clearance (motorcycle-to-ground clearance) and balance. In order to minimize this change of the front fork length on a racing motorcycle, the spring of the front fork has to be stiffened, while the damping force of the rear shock absorber must be strengthened. However, the suspension system of the street motorcycle is generally set soft for absorbing the bump and shock of the road to ensure riding comfort. However, when the bike's cornering performance requires improvement, the suspension system must be reinforced.

Suzuki's hydraulic anti-dive fork was developed to provide exceptional handling performance and a smooth ride. It ensures the bike's stability during high-speed cornering by preventing the caster angle from being changed during braking and preventing loss of cornering clearance, while assuring riding comfort on the road.



**CAUTION:**

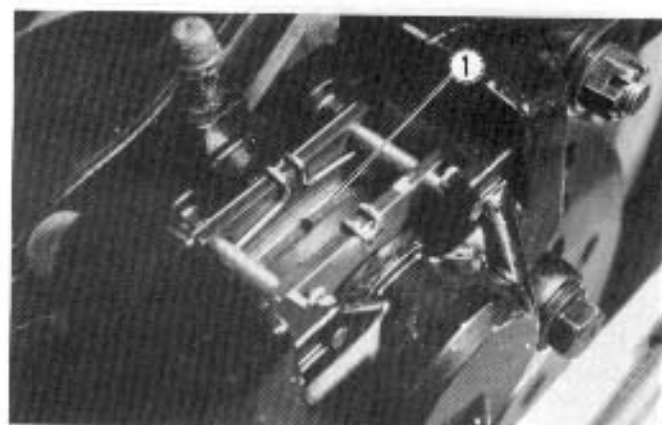
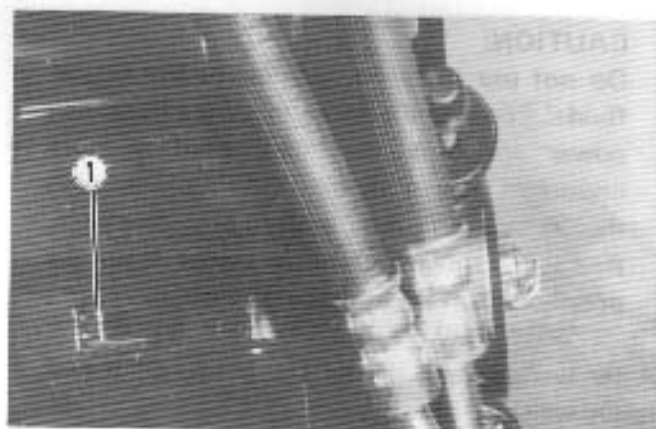
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will be caused. Do not use any brake fluid taken from old or used or unsealed containers.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

**WARNING:**

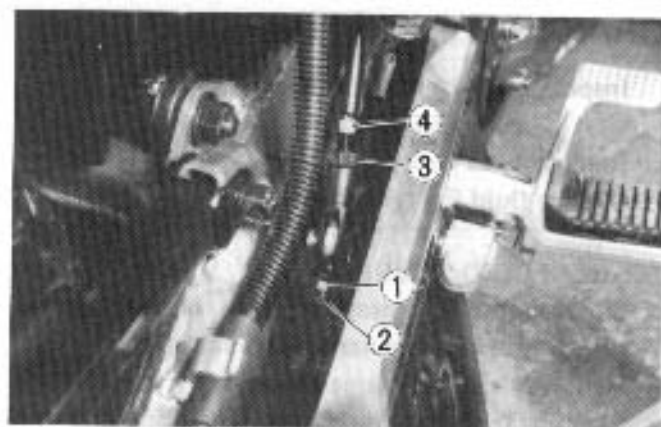
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose for cracks and hose joint for leakage before riding.

**BRAKE PADS**

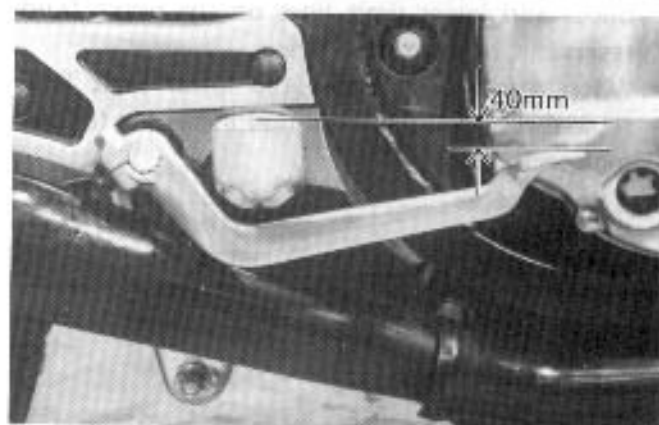
Wearing condition of brake pads can be checked by observing the red limit line ① marked on the each pad. When the wear exceeds the limit line, replace the pads with new ones. (see page 6-25)

**BRAKE PEDAL HEIGHT**

- Loosen lock nut ①, and turn stopper bolt ② away from the stopper.
- Loosen lock nut ③, and rotate push rod ④ to locate brake pedal 40 mm below the top face of the footrest.
- Turn the stopper bolt ② in so that the clearance between the stopper bolt and stopper is zero.
- Retighten both lock nuts ① and ③.



|                    |       |
|--------------------|-------|
| Brake pedal height | 40 mm |
|--------------------|-------|



### BRAKE LIGHT SWITCHES

Adjust both brake light switches, front and rear, so that brake light will come on just before a pressure is felt when the brake lever is squeezed, or the brake pedal is depressed.



### AIR BLEEDING THE BRAKE FLUID CIRCUIT

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

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



|                                    |                               |
|------------------------------------|-------------------------------|
| Bleeder valve<br>tightening torque | 0.6 – 0.9 kg-m<br>(6 – 9 N·m) |
|------------------------------------|-------------------------------|

- Bleed the air as following order. Always start with the left side.
  - ① Left anti-dive → ② Left caliper →
  - ③ Right anti-dive → ④ Right caliper
- Squeeze and release the brake lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn or so that the brake fluid runs into the receptacle; this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.





It is common for air to become "trapped" in the extra hoses or valves of the anti-dive system. Repeating the sequence of brake bleeding will remove most of this air. If the lever feel is still spongy after several bleeding sequences it may be necessary to remove the anti-dive modulator from the anti-dive assembly. This will allow the modulator to be "tipped" upwards, enabling the trapped air to be purged from the system.

**CAUTION:**

Be certain to retorque the modulator mounting screws after remounting onto the anti-dive assembly body. Thread lock "1342" (99000-32050) should be used when reinstalling the bolts. (refer to page 6-16)

**NOTE:**

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

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

**CAUTION:**

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

- Differences between front and rear are that the master cylinder is actuated by a pedal.

## CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

Tighten initial 1 000 km and every 5 000 km

### TIGHTENING TORQUE

|                       | kg-m      | N-m     |
|-----------------------|-----------|---------|
| Cylinder head nut     | 3.5 - 4.0 | 35 - 40 |
| Cylinder head bolt    | 0.8 - 1.2 | 8 - 12  |
| Exhaust pipe bolt     | 1.0 - 1.6 | 10 - 16 |
| Muttler mounting bolt | 2.2 - 3.5 | 22 - 35 |





## TIRES

Inspect Initial 1 000 km and Every 5 000 km

### TIRE TREAD CONDITION

Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace the tire when the remaining depth of tire tread reaches the following specifications.

| FRONT  | REAR   |
|--------|--------|
| 1.6 mm | 2.0 mm |

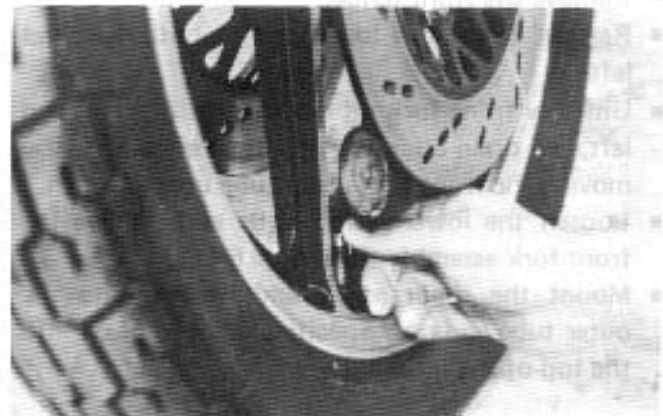
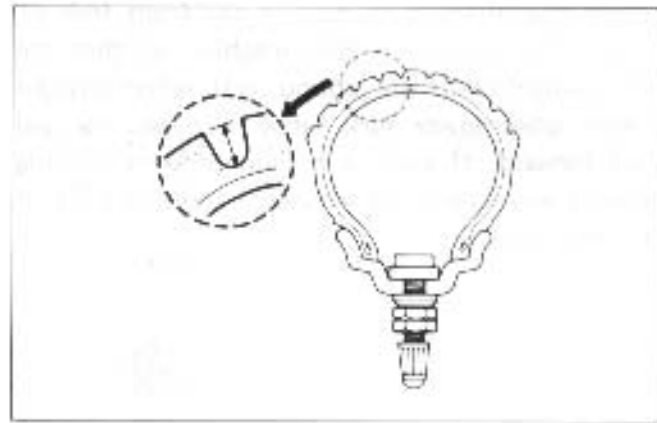
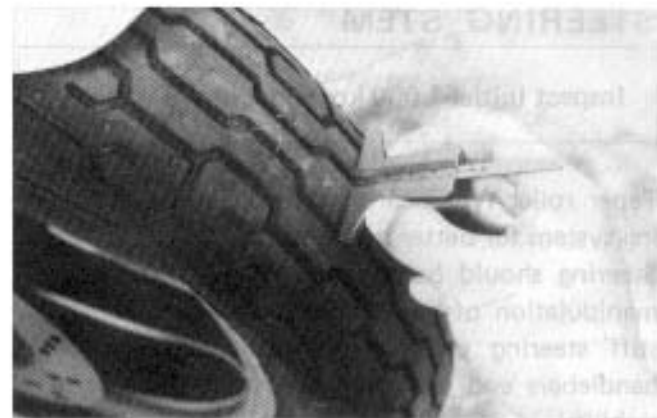
### TIRE PRESSURE

If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result. Cold inflation tire pressure is as follows.

|       | Normal riding      |     |                    |     |
|-------|--------------------|-----|--------------------|-----|
|       | Solo               |     | Dual               |     |
|       | kg/cm <sup>2</sup> | kPa | kg/cm <sup>2</sup> | kPa |
| FRONT | 2.00               | 200 | 2.25               | 225 |
| REAR  | 2.50               | 250 | 2.80               | 280 |

### CAUTION:

The standard tire fitted on this motorcycle is 100/90-16 54H for front and 120/90-17 64H for rear. The use of a tire other than the standard may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.



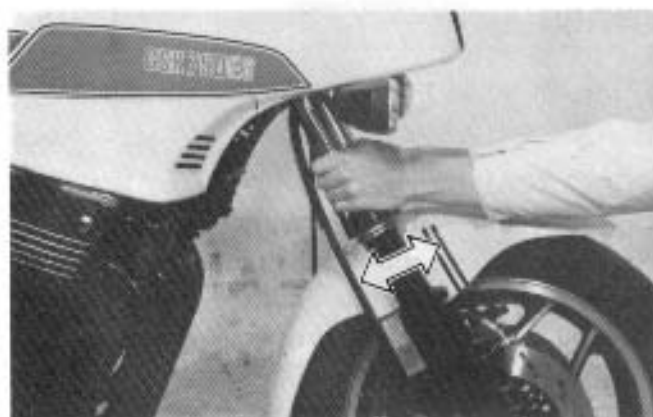
## STEERING STEM

Inspect Initial 1 000 km and Every 5 000 km

Taper roller type bearing are applied on the steering system for better handling.

Steering should be adjusted properly for smooth manipulation of handlebars and safe running. Too stiff steering prevents smooth manipulation of handlebars and too loose steering will cause poor stability.

Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with wheel straight ahead, grasp lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 6-31 of this manual.



## FRONT FORK

Change Initial 1 000 km and Every 10 000 km

### FRONT FORK OIL

- Place a jack under the engine and lift the front wheel off the floor and remove the front wheel.
- Remove the front tender.
- Remove front fork top caps ①, both right and left.
- Unscrew front fork oil drain bolts ②, right and left, and drain oil in the fork tube completely by moving the front fork outer tube up and down.
- Loosen the lower clamp bolts and remove the front fork assembly. (See page 6-8)
- Mount the drain screw and washer onto the outer tube and pour specified amount of oil into the top of the inner tube.

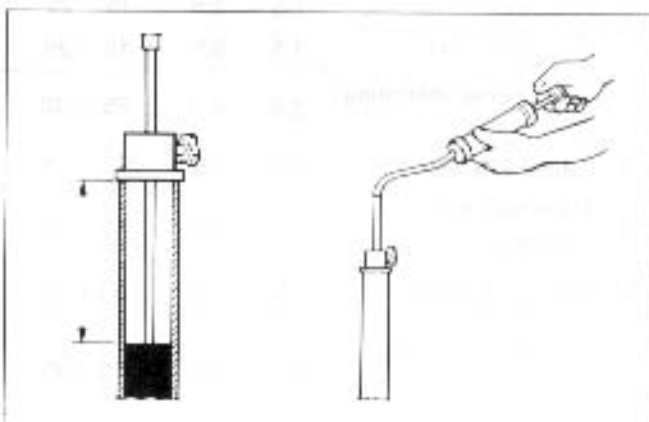
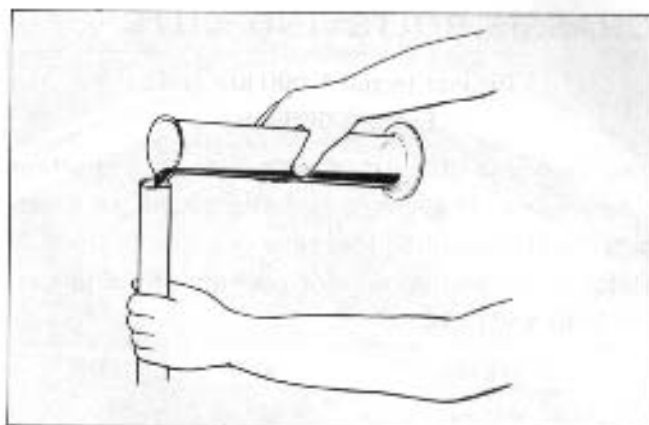


|                                |        |
|--------------------------------|--------|
| Specified amount<br>(each leg) | 293 ml |
|--------------------------------|--------|

|               |               |
|---------------|---------------|
| Specification | Fork oil # 10 |
|---------------|---------------|

### TIGHTENING TORQUE

| Item                     | kg-m      | N-m     |
|--------------------------|-----------|---------|
| Handlebar clamp bolt     | 1.5 - 2.0 | 15 - 20 |
| Handlebar mounting bolt  | 2.5 - 3.5 | 25 - 35 |
| Upper clamp bolt         | 1.5 - 2.0 | 15 - 20 |
| Fork top cap             | 2.5 - 3.0 | 25 - 30 |
| Steering stem head bolt  | 2.0 - 3.0 | 20 - 30 |
| Steering stem clamp bolt | 1.5 - 2.5 | 15 - 25 |

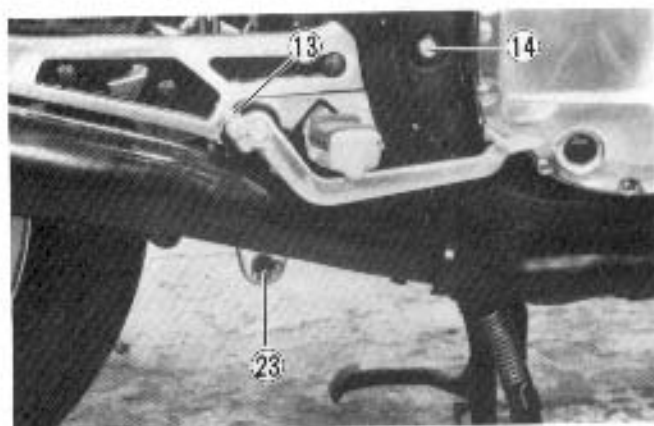
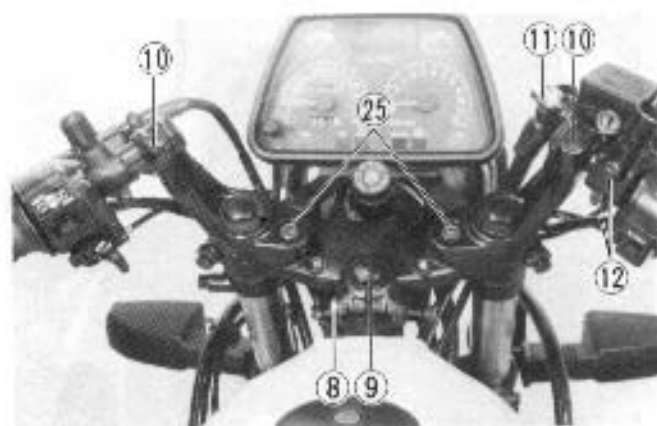
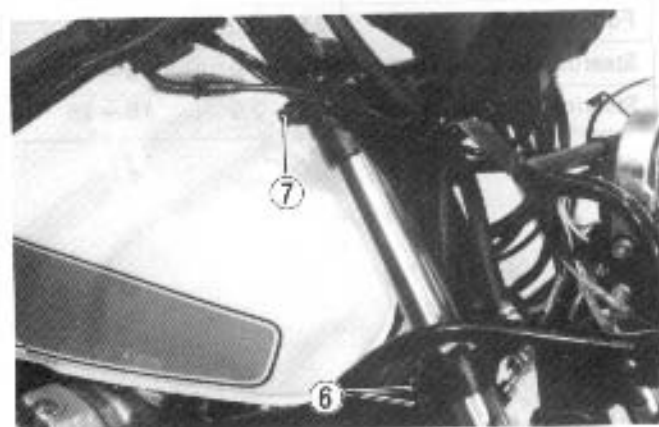
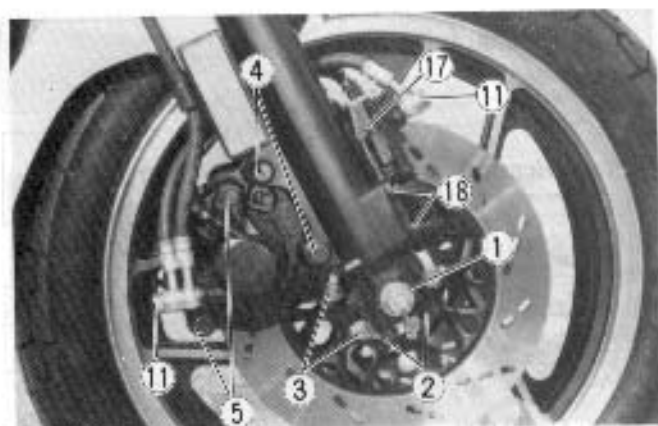


## CHASSIS BOLTS AND NUTS

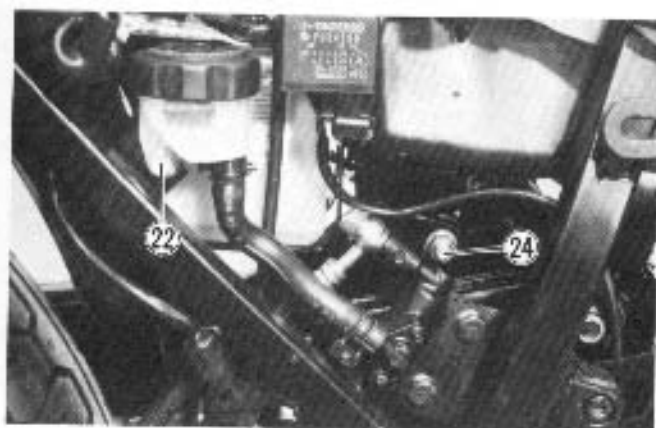
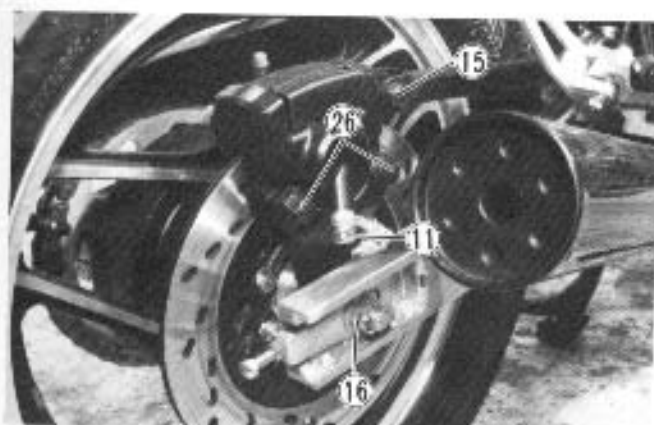
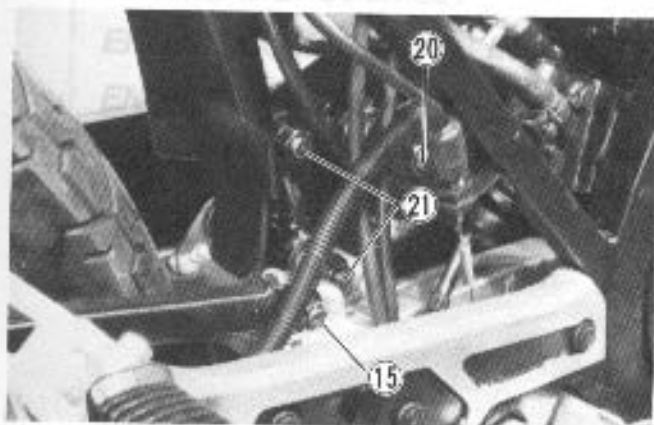
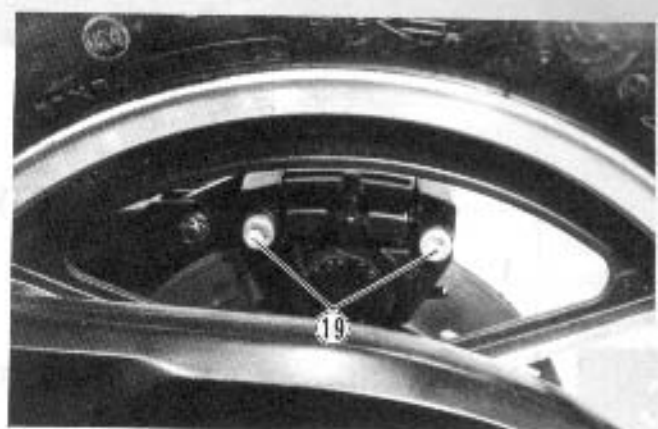
Inspect Initial 1 000 km and  
Every 5 000 km

The bolts and nuts listed hereunder are important safety parts. They must be retightened, as necessary, to the specified torque with a torque wrench. Refer to the photograph for position of the following bolts and nuts.

| ITEM |                                        | kg-m       | N-m       |
|------|----------------------------------------|------------|-----------|
| ①    | Front axle nut                         | 3.6 – 5.2  | 36 – 52   |
| ②    | Front axle holder nut                  | 1.5 – 2.5  | 15 – 25   |
| ③    | Disc plate bolt                        | 1.5 – 2.5  | 15 – 25   |
| ④    | Front caliper mounting bolt            | 2.5 – 4.0  | 25 – 40   |
| ⑤    | Caliper axle bolt                      | 2.5 – 3.5  | 25 – 35   |
| ⑥    | Front fork lower clamp bolt            | 1.5 – 2.5  | 15 – 25   |
| ⑦    | Front fork upper clamp bolt            | 2.0 – 3.0  | 20 – 30   |
| ⑧    | Steering stem clamp bolt               | 1.5 – 2.5  | 15 – 25   |
| ⑨    | Steering stem head bolt                | 2.0 – 3.0  | 20 – 30   |
| ⑩    | Handlebar clamp bolt                   | 1.2 – 2.0  | 12 – 20   |
| ⑪    | Brake hose union bolt                  | 2.0 – 2.5  | 20 – 25   |
| ⑫    | Master cylinder clamp bolt             | 0.5 – 0.8  | 5 – 8     |
| ⑬    | Brake pedal arm bolt                   | 0.6 – 0.7  | 6 – 7     |
| ⑭    | Swing arm pivot bolt lock nut          | 5.0 – 8.0  | 50 – 80   |
| ⑮    | Torque link nut                        | 2.0 – 3.0  | 20 – 30   |
| ⑯    | Rear axle nut                          | 5.0 – 8.0  | 50 – 80   |
| ⑰    | Modulator plunger bolt                 | 0.3 – 0.5  | 3 – 5     |
| ⑱    | Modulator valve bolt                   | 0.6 – 0.9  | 6 – 9     |
| ⑲    | Rear caliper bolt                      | 2.0 – 3.0  | 20 – 30   |
| ⑳    | Rear cushion lever bolt                | 7.0 – 10.0 | 70 – 100  |
| ㉑    | Rear cushion rod upper and lower bolts | 1.8 – 2.8  | 18 – 28   |
| ㉒    | Rear master cylinder mounting bolt     | 4.0 – 6.0  | 40 – 60   |
| ㉓    | Rear shock absorber unit fitting       | Lower      | 4.0 – 6.0 |
|      |                                        | Upper      | 4.8 – 7.2 |
| ㉔    | Handlebar holder mounting bolt         | 2.5 – 3.5  | 25 – 35   |
| ㉕    | Rear caliper mounting bolt             | 2.5 – 4.0  | 25 – 40   |



## SERVICING ENGINE





# SERVICING ENGINE

## CONTENTS

|                                                            |              |
|------------------------------------------------------------|--------------|
| <b>COMPRESSION CHECK .....</b>                             | <b>3- 1</b>  |
| <b>ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE...</b> | <b>3- 2</b>  |
| <b>ENGINE REMOVAL AND REINSTALLATION .....</b>             | <b>3- 3</b>  |
| <b>ENGINE DISASSEMBLY.....</b>                             | <b>3- 14</b> |
| <b>ENGINE COMPONENTS INSPECTION AND SERVICING.....</b>     | <b>3-27</b>  |
| <b>ENGINE REASSEMBLY .....</b>                             | <b>3-6 1</b> |

## COMPRESSION CHECK

### COMPRESSION

| Standard                                    | Limit                             | Difference                        |
|---------------------------------------------|-----------------------------------|-----------------------------------|
| 9 – 13 kg/cm <sup>2</sup><br>(900-1300 kPa) | 7 kg/cm <sup>2</sup><br>(700 kPa) | 2 kg/cm <sup>2</sup><br>(200 kPa) |

Low compression can indicate any of the following malconditions:

- \* Excessively worn cylinder wall
- \* Worn-down piston or piston rings
- \* Piston rings stuck in the grooves
- \* Poor sealing of valves
- \* Leaking or otherwise defective cylinder head gasket

Overhaul the engine in the following cases:

- \* Compression pressure in any one of cylinders is less than 7 kg/cm<sup>2</sup>
- \* Difference in compression pressure between the two, highest and lowest, is more than 2 kg/cm<sup>2</sup>
- \* All compression pressures are below 9 kg/cm<sup>2</sup> (standard) even when they measure more than 7 kg/cm<sup>2</sup>

### COMPRESSION TEST PROCEDURE

#### NOTE:

- \* Before testing the compression of the engine, make sure that the cylinder head nuts and bolts are torqued to the specified torque value.
- \* Warm up the engine before testing.

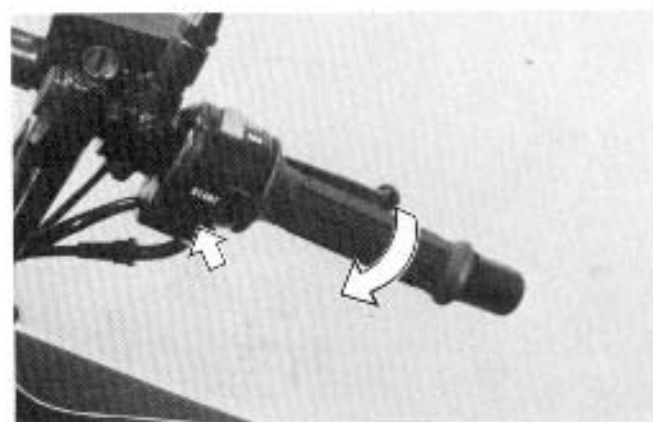
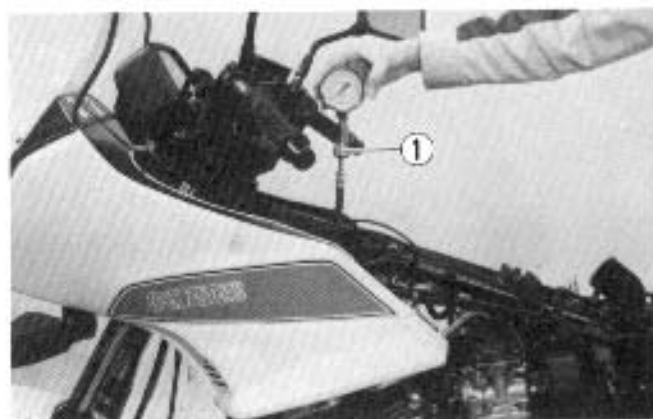
- Remove the fairing cover.
- Unscrewing the fairing retaining screws and take off the fairing.
- Loosen and remove the fairing bracket mounting bolts, and then take off the fairing bracket.
- Remove the seat and frame covers (left and right).
- Remove fuel tank.
- Remove all spark plugs. Ground all plug leads.

|             |                 |
|-------------|-----------------|
| 09930-13210 | Socket wrench   |
| 09930-14530 | Universal joint |
| 09914-24510 | T handle        |

- Fit the compression gauge ① to one of the plug holes, taking care that the connection is absolutely tight.

|             |                     |
|-------------|---------------------|
| 09915-64510 | Compression gauge   |
| 09915-63210 | Compression adapter |

- Twist the throttle grip into full-open position.
- Crank the engine a few seconds with the starter, and read the maximum gauge reading as the compression of that cylinder. Repeat this procedure with the other cylinders.



## ENGINE COMPONENTS REMOVAL WITH ENGINE IN PLACE

- Parts to be removably mounted without dismantling engine and their operations. The following sections describe operational contents from top end to carburetor, following the previous sections dealing with engine removal. Parts which can be removably mounted without dismantling the engine are described here. See reference pages with respect to their operations.

## ENGINE LEFT SIDE

|                                     |          |
|-------------------------------------|----------|
| Gear shift lever                    | See page |
| Engine sprocket cover               | 3- 9     |
| Engine sprocket and drive chain     | 3- 9     |
| Gear position indicator switch body | 3-21     |
| Generator cover                     | 3-22     |
| Generator rotor                     | 3-22     |
| Generator stator                    | 3-56     |
| Starter clutch                      | 3-22     |
| Starter clutch idle gear            | 3-22     |

## ENGINE CENTER

|                              |          |
|------------------------------|----------|
| Exhaust and muffler          | See page |
| Oil filter                   | 3- 8     |
| Oil pressure switch          | 3-17     |
| Oil pan                      | 3-18     |
| Sump filter                  | 3-23     |
| Cylinder head breather cover | 3-23     |
| Clutch cable                 | 3-14     |
| Carburetor                   | 3- 9     |
| Throttle and choke cables    | 3- 7     |
| Air cleaner                  | 3- 7     |
| Cam chain tensioner          | 3-14     |
| Cylinder head cover          | 3-14     |
| Camshaft                     | 3-14     |
| Cylinder head                | 3-16     |
| Cylinder                     | 3-16     |
| Piston                       | 3-17     |
| Starter motor                | 3-21     |
| Oil cooler                   | 3- 8     |

- Generator cover and starter motor lead wire should be removed from the starting motor relay side.

## ENGINE RIGHT SIDE

|                                          |          |
|------------------------------------------|----------|
| Signal generator                         | See page |
| Signal generator cover                   | 3-15     |
| Signal generator                         | 3-18     |
| Clutch cover                             | 3-19     |
| Clutch release bearing                   | 3-19     |
| Clutch pressure, drive and driven plates | 3-19     |
| Oil pump drive gear                      | 3-20     |
| Primary driven gear                      | 3-19     |
| Oil pump ass'y                           | 3-20     |
| Gear shifting shaft                      | 3-20     |
| Gear shifting pawl and cam drive gear    | 3-26     |

## ENGINE REMOVAL AND REINSTALLATION

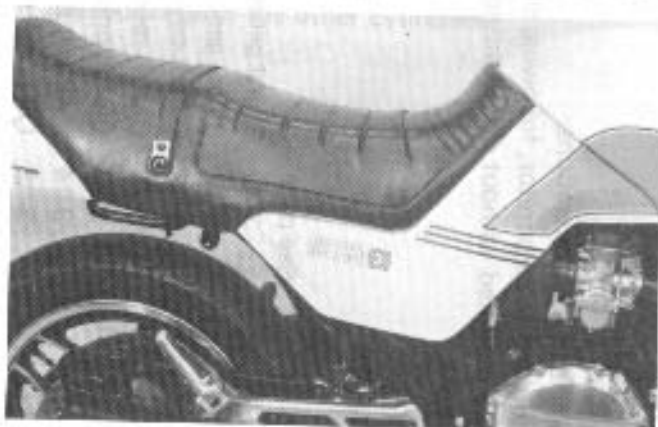
### ENGINE REMOVAL

Before taking the engine out of the frame, wash the engine with a steam cleaner and drain engine oil. The procedure of engine removal is sequentially explained in the following steps, and engine installation is effected by reversing the removal procedure.

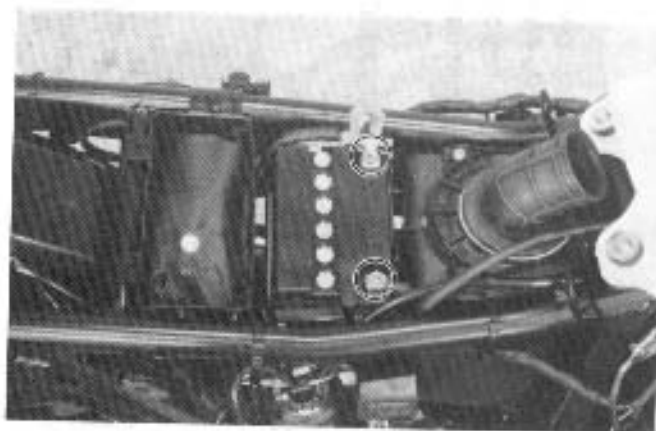


- Place an oil pan under the engine and drain oil by removing oil drain plug.

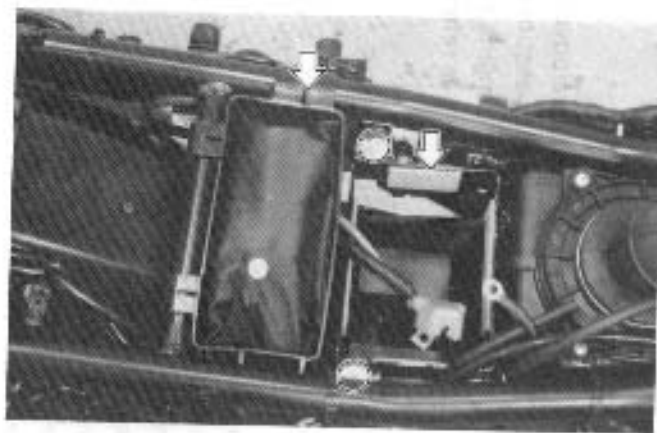
- Remove the right and left frame covers.
- Remove the seat.



- Disconnect the battery  $\oplus$  and  $\ominus$  cables.
- Remove the battery.



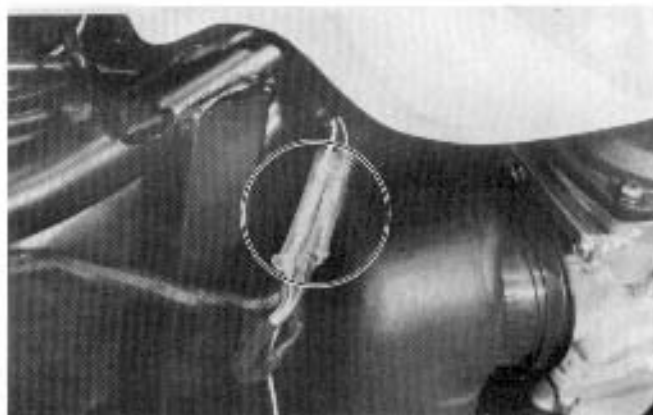
- Take off the tool case and battery holder.



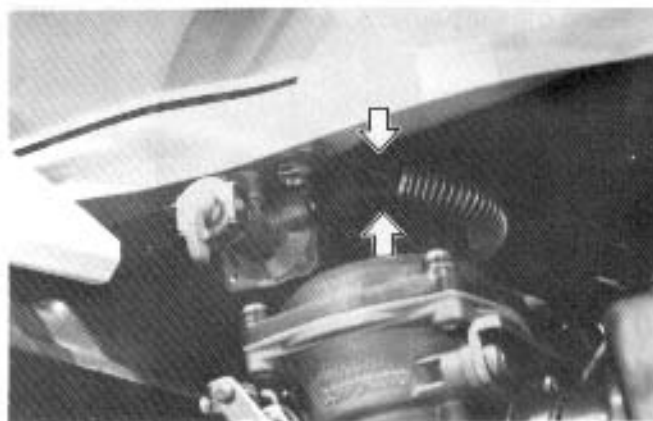
- Loosen the fuel tank mounting bolts.



- Disconnect the fuel gauge lead.



- Turn the fuel cock to "ON" or "RES" positions.
- Disconnect fuel hose and vacuum hose.
- Remove the fuel tank.



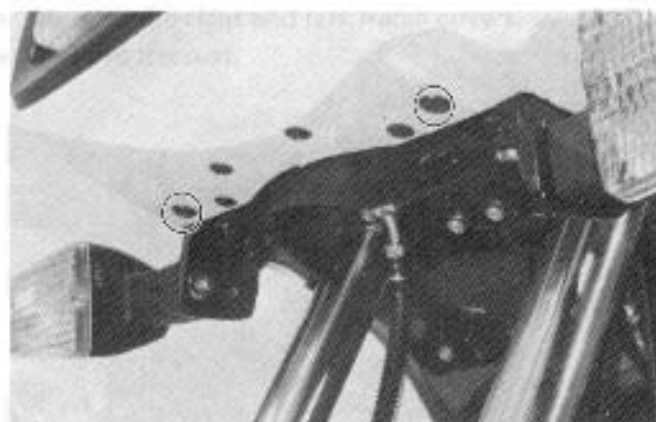
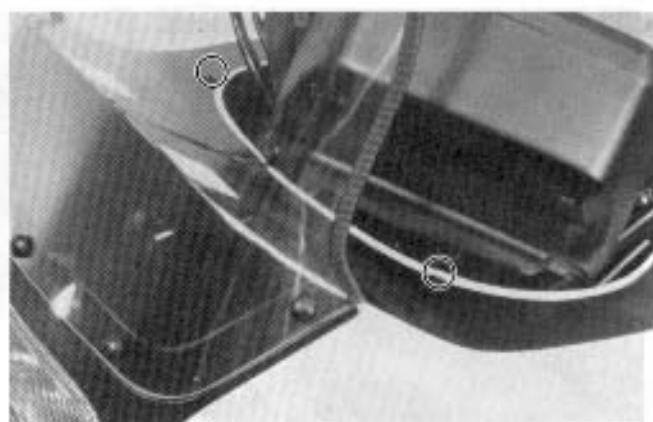
- Take off the fairing cover (right and left).



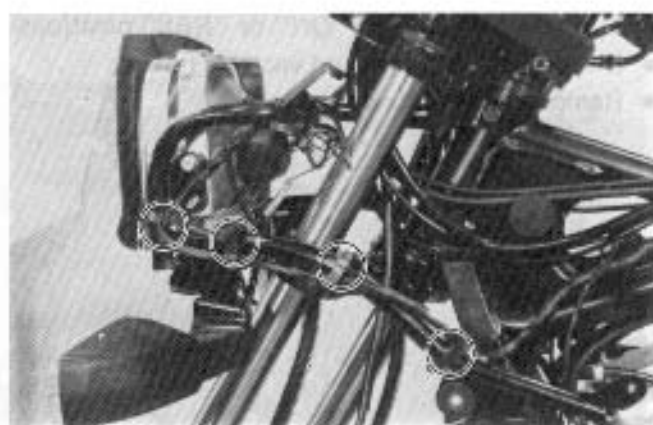


# ENGINE FAIRING REMOVAL AND REINSTALLATION

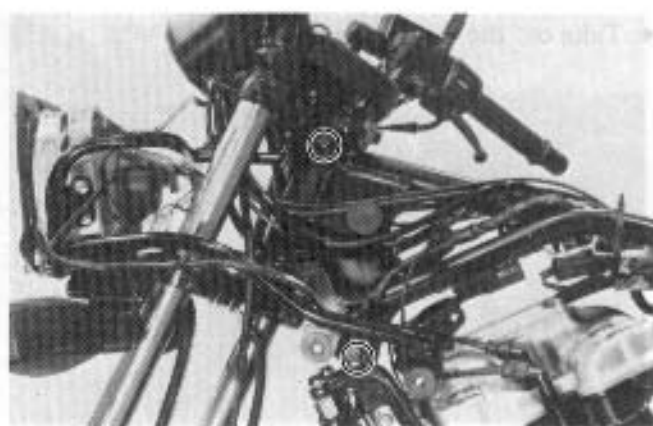
- Remove the fairing mounting screws.



- Take off the harness clamp.



- Loosen the fairing bracket mounting bolts.
- Take off the fairing bracket.



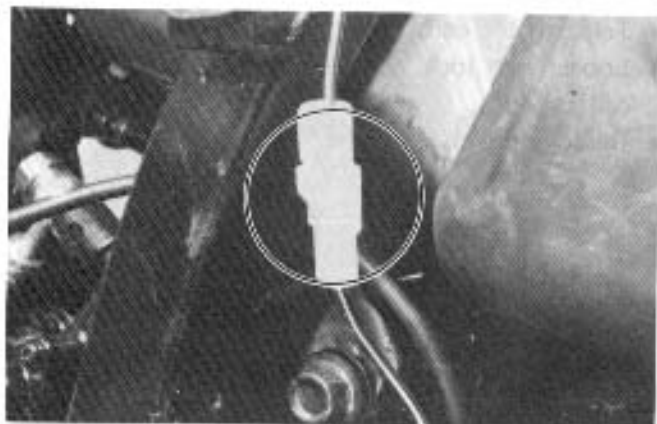
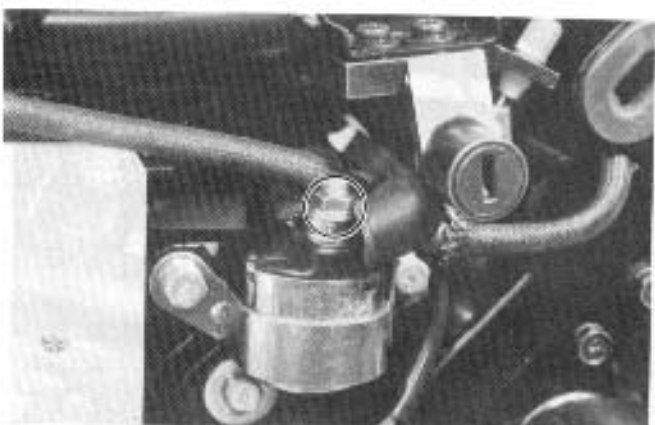
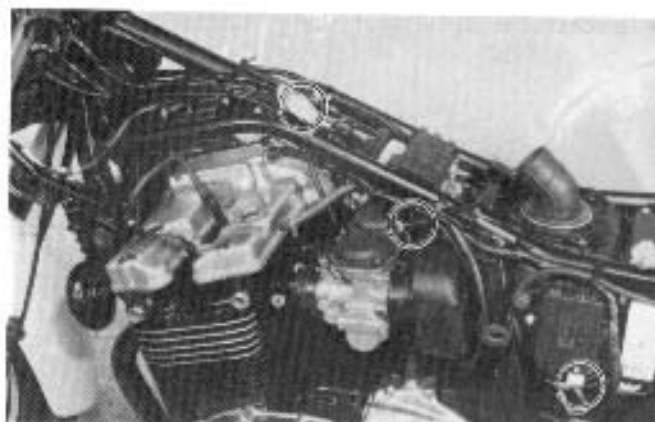
**NOTE:**

Do not forget the spacer.

- Disconnect the gear position lead wire, signal generator lead wire and generator lead wire,

- Disconnect the starter lead wire (to starter motor).

- Disconnect the  $\ominus$  lead wire.



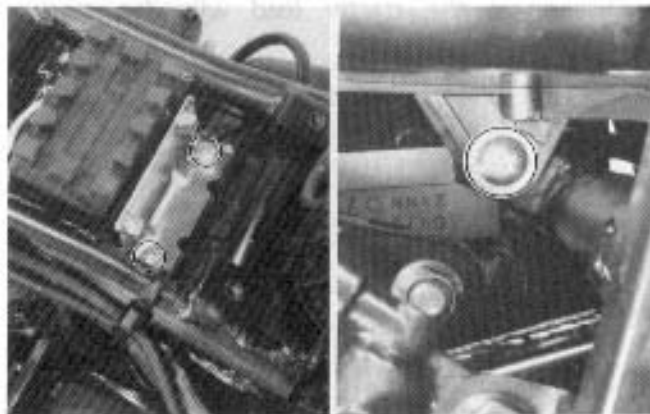
- Disconnect the breather pipe.



- Loosen the carburetor clamp screws.



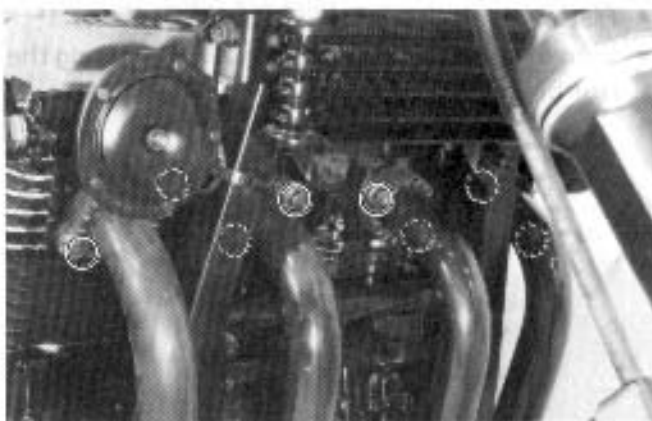
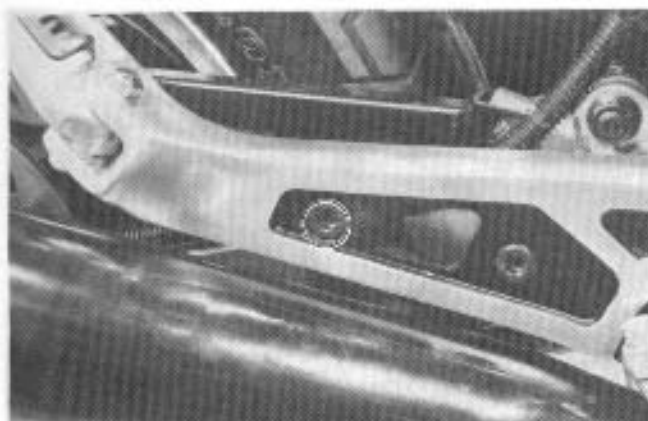
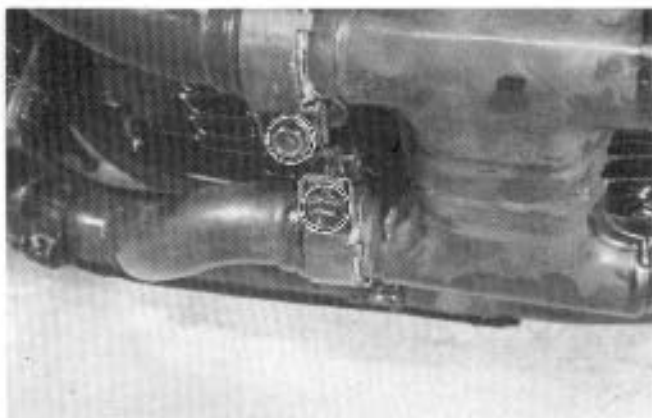
- Loosen and remove the air cleaner mounting screws.
- Remove the air cleaner mounting bracket.



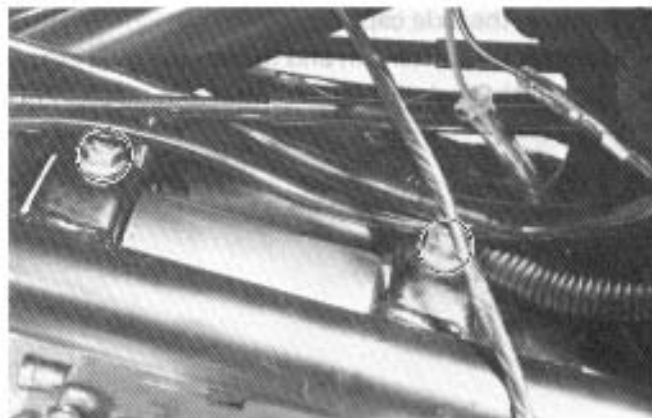
- Take off the carburetor.
- Loosen the lock nuts and take off the throttle cable.
- Remove the choke cable.



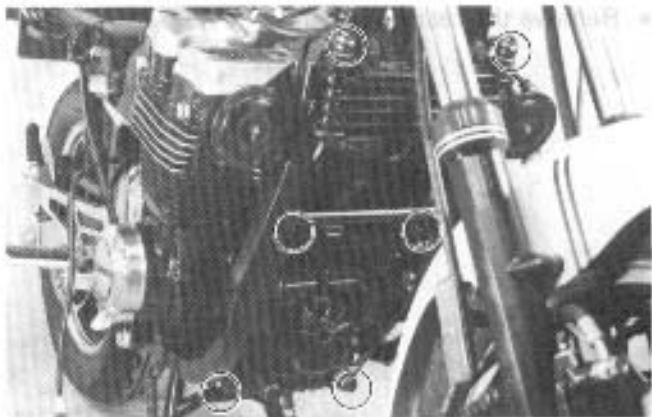
- Loosen and remove the exhaust pipe clamp bolts.



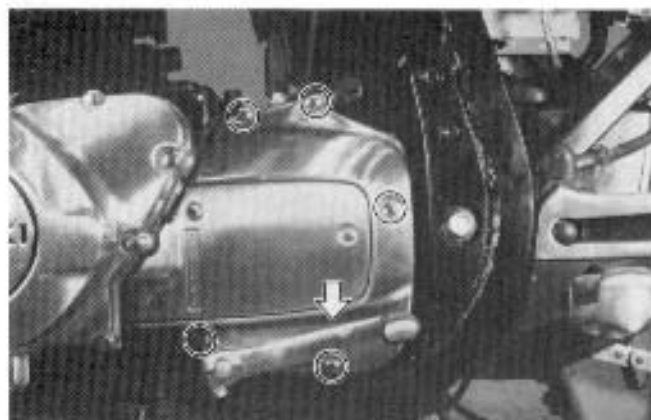
- Remove the ignition coils by loosening the nuts.



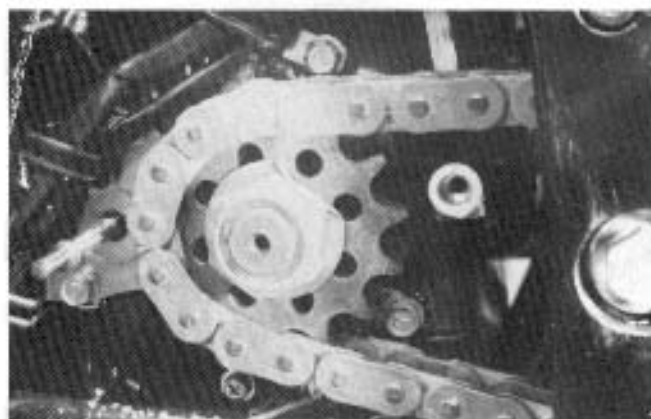
- Remove the oil cooler joint hoses.



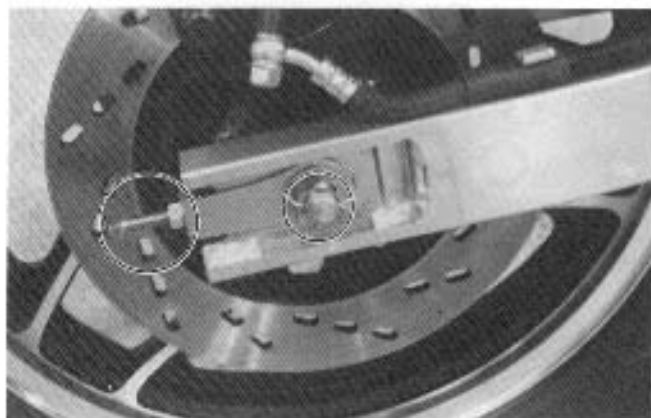
- Remove the gearshift lever and engine sprocket cover.



- Flatten the lock washer.
- Loosen the engine sprocket nut by applying the rear brake.



- Remove the axle cap.
- Remove the cotter pin and loosen the axle nut.
- Loosen the lock nut and adjuster.



- Remove the rear brake.





- Remove the engine mounting bolts.



- Gradually lift up the engine and lower the engine ass'y on the right side making sure that it does not make contact with the rear bracket.



## ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

- After inserting the engine mounting bolts, tighten engine mounting bracket bolts and engine mounting bolts. Insert all three long bolts from the left side, and insert the rear upper bolt through the spacers (Right side: 50 mm, Left side: 45 mm).

### NOTE:

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

### Tightening torque

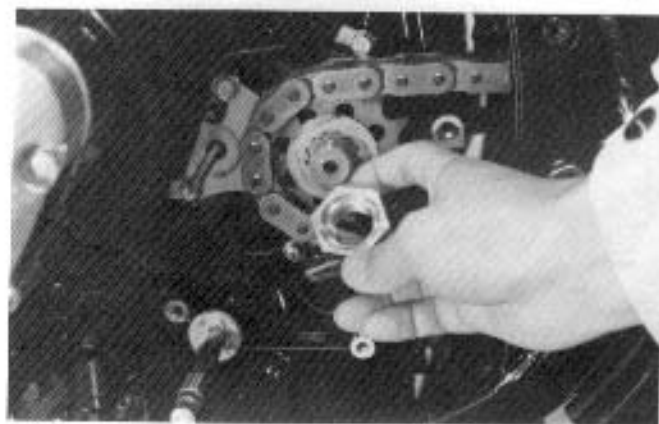
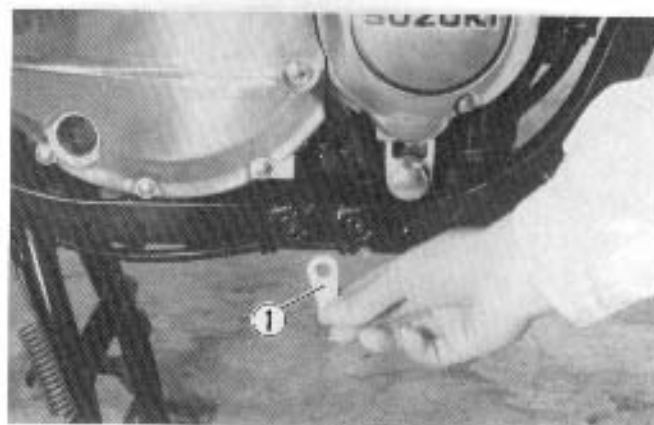
|   | Length | kg-m    | N-m   |
|---|--------|---------|-------|
| 1 | 35 mm  | 5.0-6.0 | 50-60 |
| 2 | 165 mm | 6.0-7.2 | 60-72 |
| 3 | 205 mm | 6.7-8.0 | 67-80 |
| 4 | 255 mm | 5.5-6.6 | 55-66 |

- The nut ① takes its position in the place indicated.
- The engine sprocket should be installed on the drive shaft beforehand as shown in the figure at the same time of the installation of drive chain. If it is difficult to assemble the engine sprocket, remove the rear axle cotter pin, loosen the axle nut, torque link mounting nut, and chain adjuster bolt to push the wheel forward, and give the drive chain some play. When replacing the engine sprocket nut, stepped side should be faced inside. After completing tightening of the engine mounting bolts, adjust free play of the drive chain.

(see page 2-11).

### Tightening torque

|                     | kg-m      | N-m     |
|---------------------|-----------|---------|
| Engine sprocket nut | 10.0-13.0 | 100-130 |
| Rear axle nut       | 8.5-11.5  | 85-115  |



## ENGINE DISASSEMBLY

- Install the oil cooler hose with specific torque.

|                 | kg-m    | N-m   |
|-----------------|---------|-------|
| Oil cooler side | 1.5–1.8 | 15–18 |
| Crankcase side  | 2.5–3.0 | 25–30 |

**NOTE:**

Be sure to identify that washer positions both side of hose union.

- Securely tighten bolts ① connecting exhausts and muffler of No. 2 and 3 to prevent gas leakage.

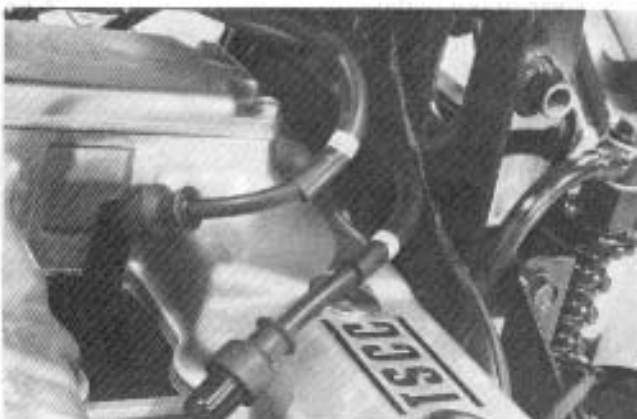
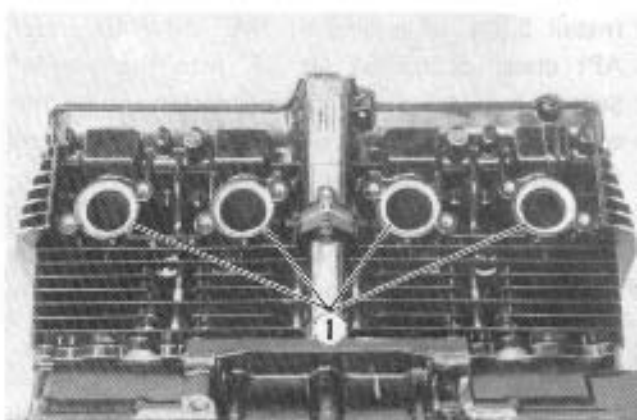
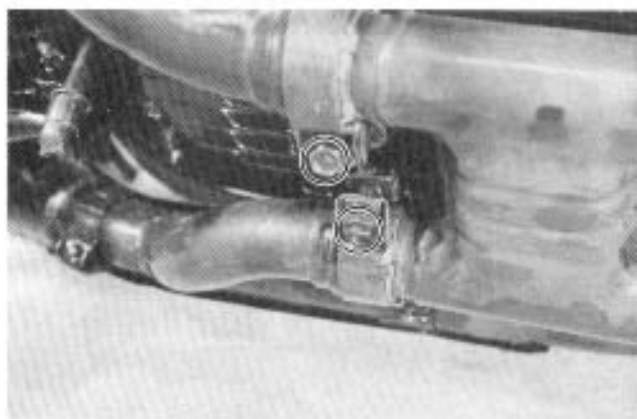
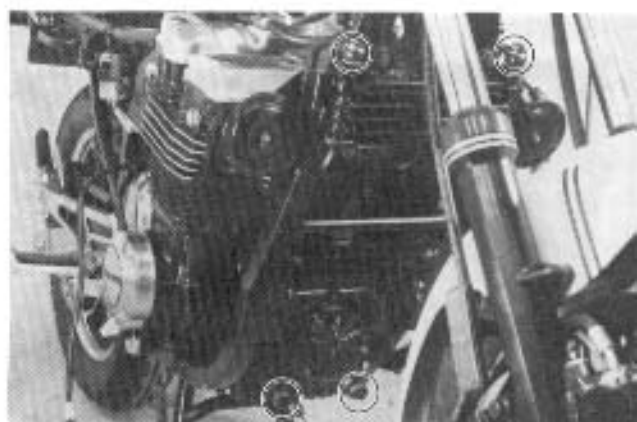
|                   |                                |
|-------------------|--------------------------------|
| Tightening torque | 0.9 – 1.4 kg-m<br>(9 – 14 N-m) |
|-------------------|--------------------------------|

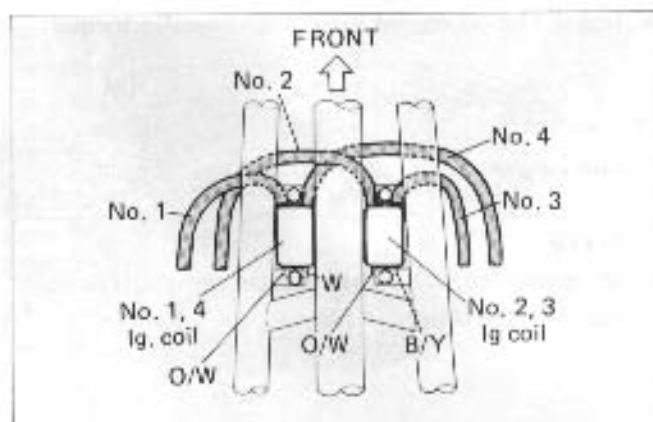
- Install exhaust pipe gasket ①, and tighten exhaust pipe bolts.
- Mount mufflers and gearshift lever, and tighten bolts with specified torque.

## Tightening torque

|                               | kg-m    | N-m   |
|-------------------------------|---------|-------|
| Muffler mounting bracket bolt | 2.2–3.5 | 22–35 |
| Exhaust pipe clamp bolts      | 1.0–1.6 | 10–16 |

- Replace the plug caps on the spark plugs so that their code markings correspond to the cylinder numbers arranged in the order of 1, 2, 3 and 4 from the left.

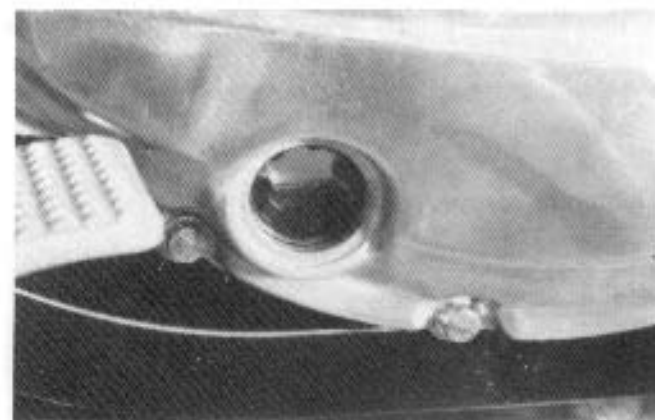




- Connect the fuel hose correctly.



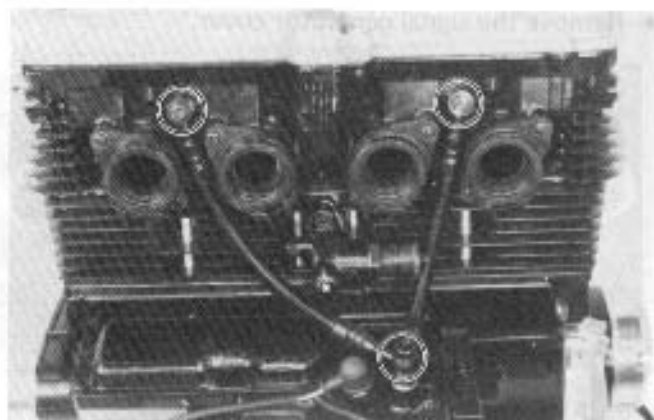
- Install 3.8 L of engine oil SAE 10W/40 under API classification SE or SF into the engine. Several minutes after starting and stopping the engine, check that the oil level remains between the marks of oil level window.
- After remounting the engine, route wiring harness and cables properly by referring to the sections, wire routing and cable routing, and adjust the following items to the specification.



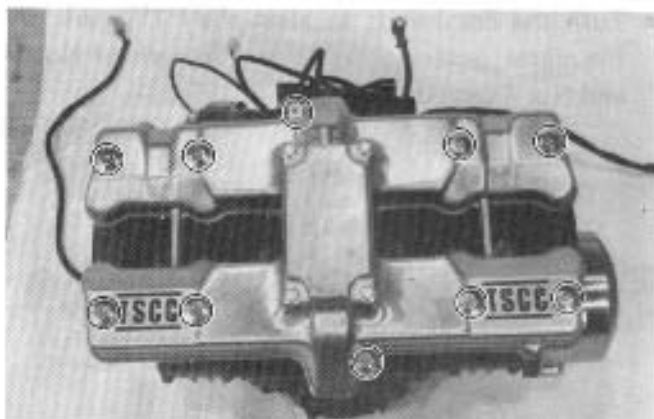
|                              | Page |
|------------------------------|------|
| * Rear brake pedal .....     | 2-13 |
| * Brake light switch .....   | 2-14 |
| * Clutch cable .....         | 2- 9 |
| * Throttle cable .....       | 2- 8 |
| * Drive chain play .....     | 2-13 |
| * Balancing carburetor ..... | 4-12 |
| * Idling adjustment .....    | 2- 8 |

## ENGINE DISASSEMBLY

- Loosen the oil hose union bolts, and remove the oil hose.



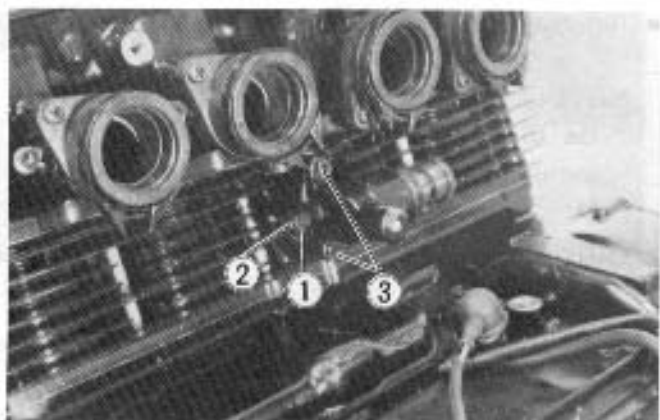
- Remove cylinder head cover.



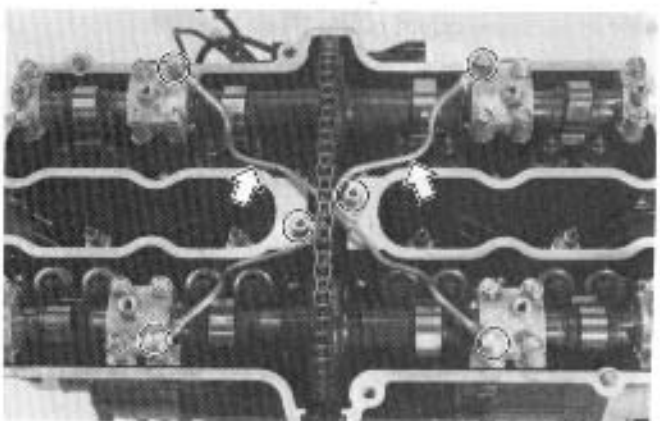
- This is accomplished by first loosening lock nut ① and tightening screw ② and then removing two mounting bolts ③ of cam chain tensioner.

**NOTE:**

Tightening screw ② prevents an inside spring from leaving out of the push rod.



- Remove the oil pipe.

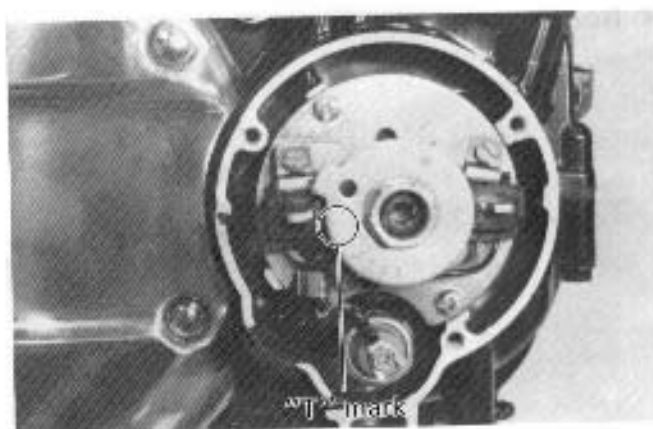




- Remove the signal generator cover.



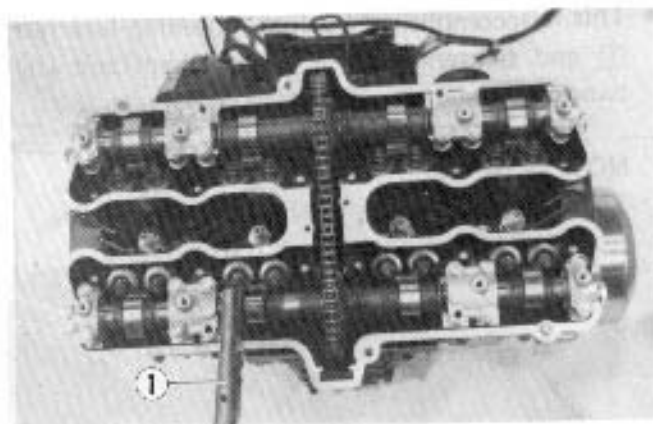
- Turn the crankshaft to align the "T" mark on the signal generator with timing mark of No. 1 and No. 4 pick up coil.



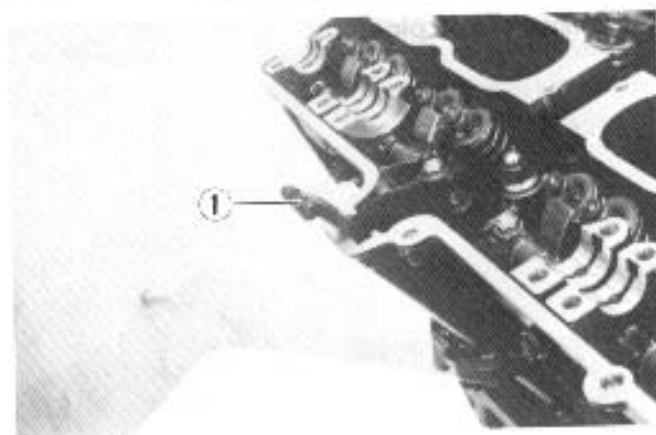
- Remove the two camshafts, intake and exhaust.

**NOTE:**

- \* Be sure to loosen camshaft holder bolts evenly by shifting the wrench diagonally.
- \* Hold down each camshaft with vice pliers ①, and remove the bolts securing the camshaft holders, four on each camshaft. Then, remove the pliers and take off the camshaft.



- Pull out cam chain guide ①.



- The cylinder head becomes free for removal when its 6-mm bolt ① and twelve 10-mm nuts are removed.

|             |                   |
|-------------|-------------------|
| 09911-74510 | Long socket 14 mm |
| 09914-24510 | T handle          |

**NOTE:**

Be sure to use the special tool ("T" wrench) designed to enter the pockets formed in the head and reach the nuts down below to loosen the 10-mm nuts, and to shift the tool sequentially in the nuts descending order of numbers in order to reduce the pressure equally and evenly.

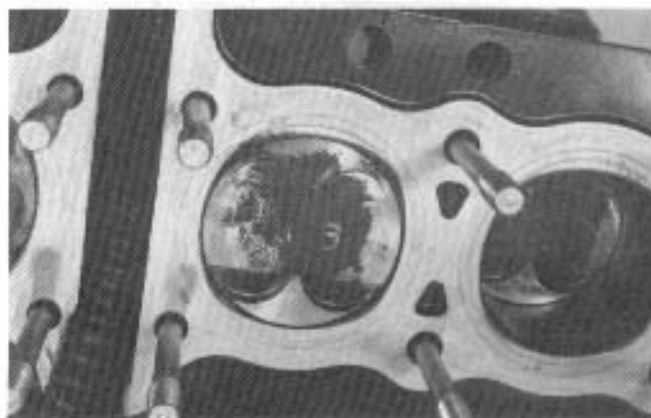
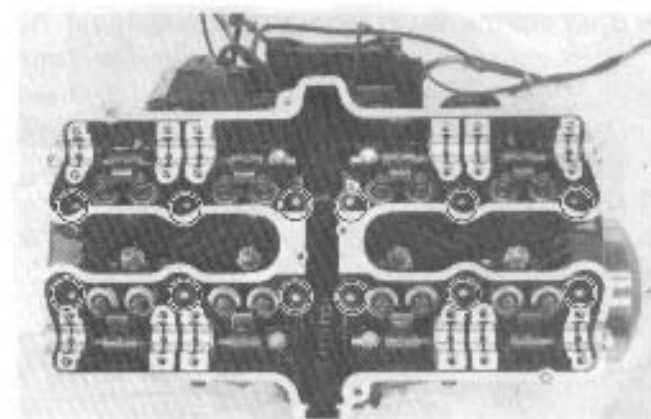
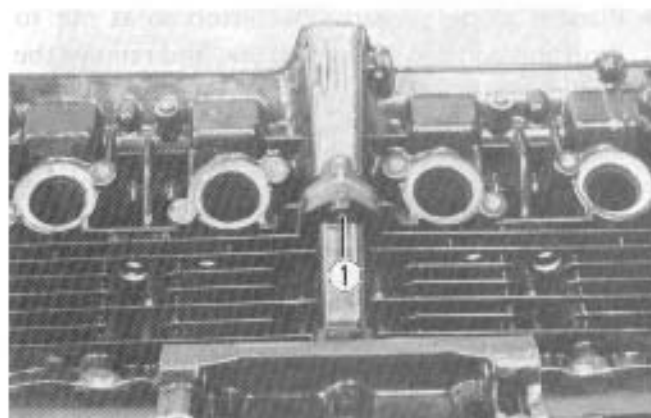
- Mark the piston number on the piston.

- Firmly grip the cylinder block at both ends, and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to shake the gasketed joint loose.

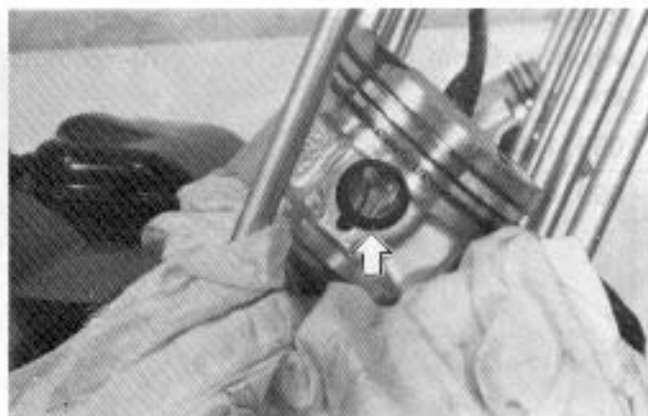
**NOTE:**

Cylinder removal from crankcase is made easier by the use of the cylinder disassembling tool. This tool can be used on the cylinder head and crankcase, too.

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



- Place a cloth beneath the piston so as not to drop the parts in the crankcase, and remove the circlip with pliers.

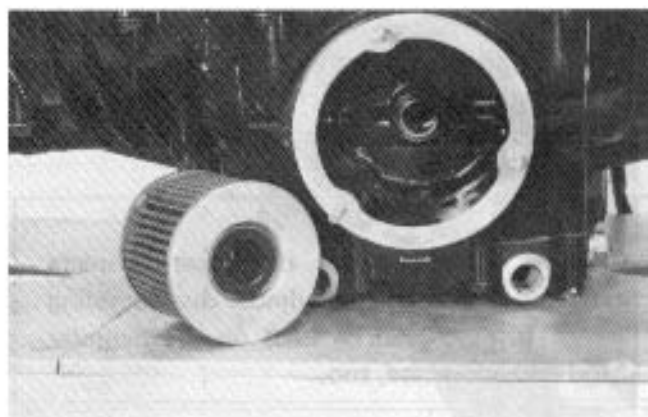
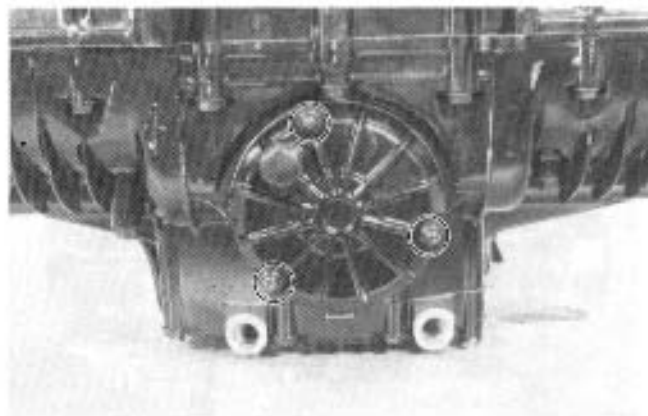


- Draw out the piston pin with the special tool (1). Place the drawn-out piston pin in the same place as that given the cylinder No. on the head of the piston.

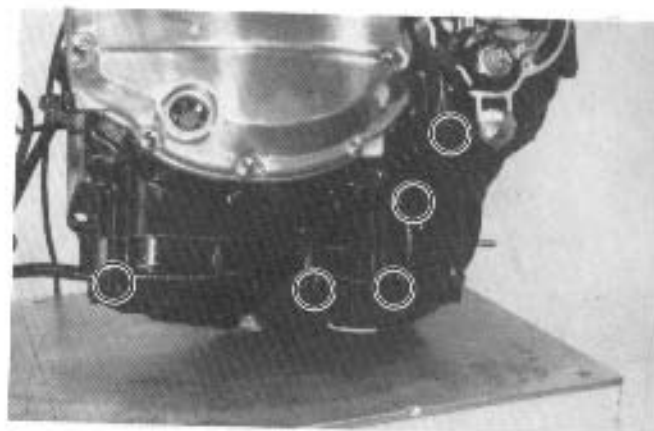
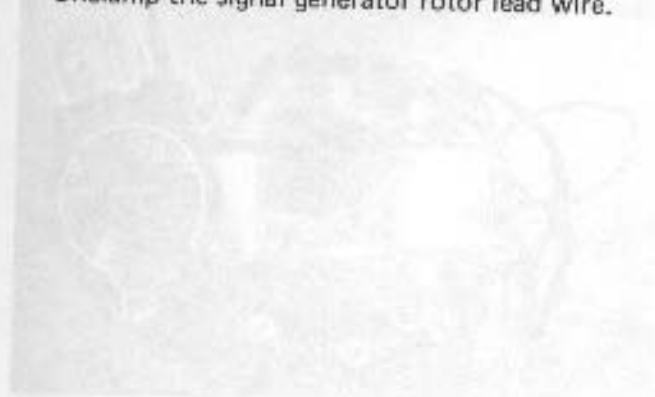


|             |                   |
|-------------|-------------------|
| 09910-34510 | Piston pin puller |
| 09910-33210 | Attachment        |

- Remove the filter cap by loosening the three nuts.
- Take off the filter.



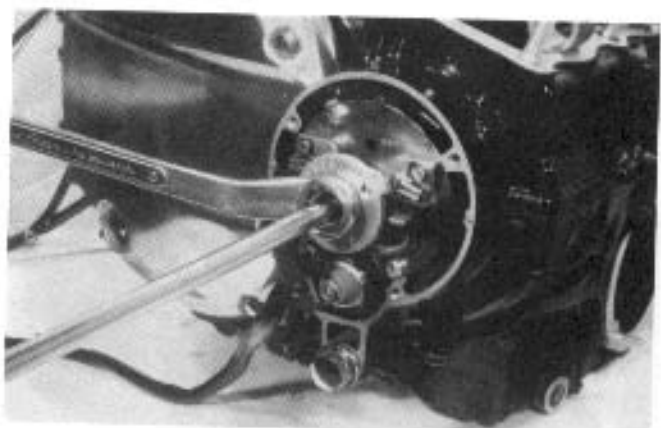
- Unclamp the signal generator rotor lead wire.



- Remove the signal generator by using 19-mm off set wrench and the special tool.

09914-25811

T-type hexagon wrench



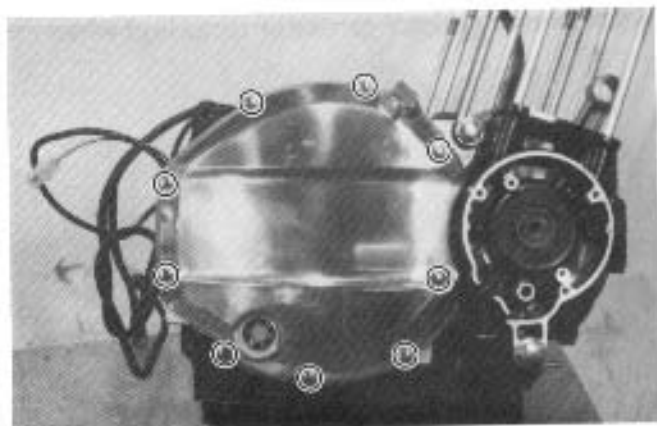
- Remove the signal generator assembly by unscrewing the screws.
- Disconnect the oil pressure lead wire.



- Remove the oil pressure switch.



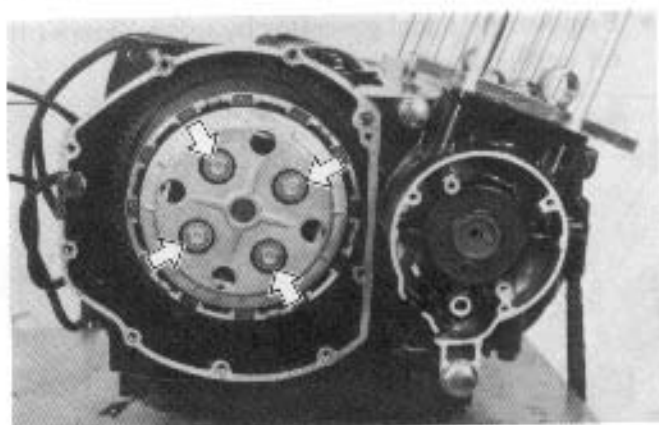
- Remove clutch cover and gasket.



- Using special tool, remove the clutch spring mounting bolts in a criss cross manner. Remove the spring, pressure plate, push piece, thrust bearing, drive plate and driven plate.

09910-20115

Conrod holder

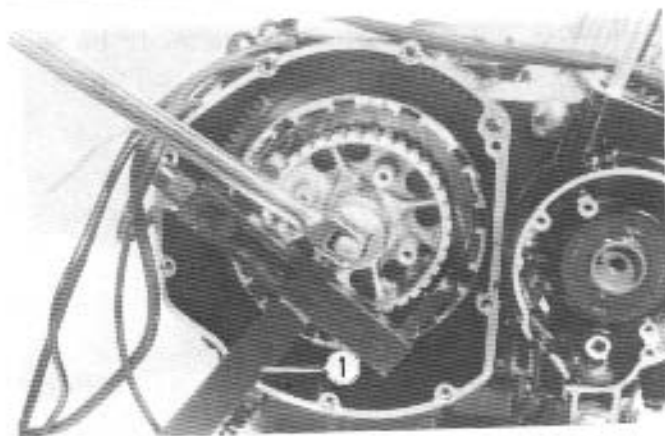


- Flatten clutch sleeve hub nut lock washer, and firmly secure clutch sleeve hub to remove mounting nut with clutch sleeve hub holder ①.

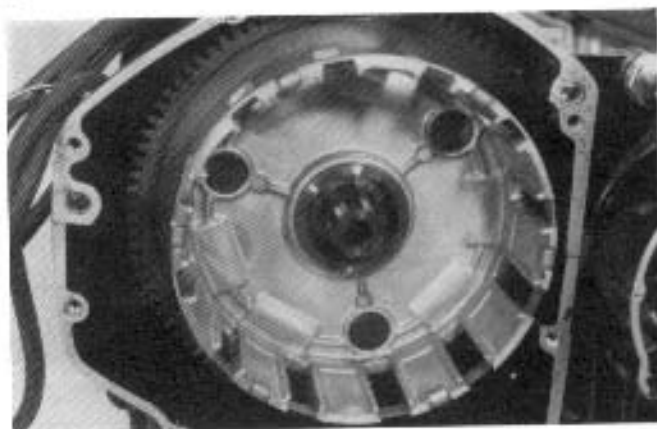
09920-53710

Clutch sleeve hub holder

- Remove clutch sleeve hub and retaining washer.



- Push the spacer and bearing backward, and then remove the clutch housing with oil pump drive gear.

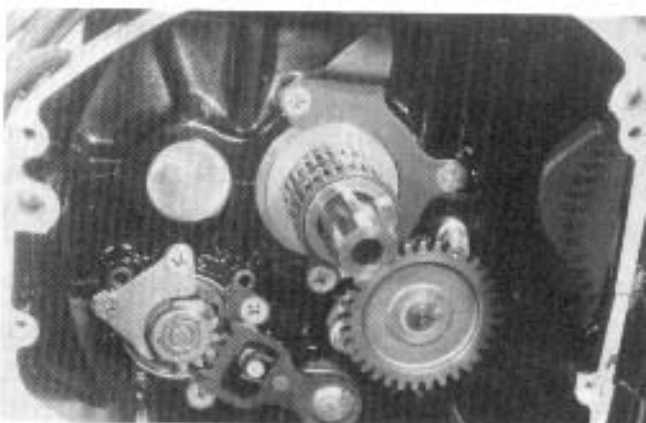




- Separate the clutch housing and oil pump drive gear.



- Remove the spacer, bearing and thrust washer.



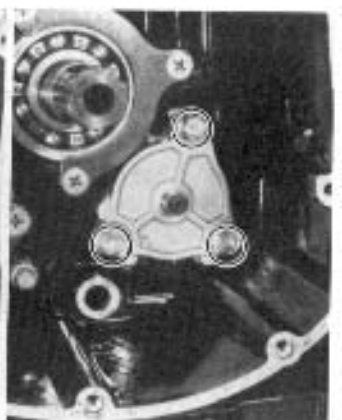
- Remove the gearshift shaft by removing the circlip and washer.



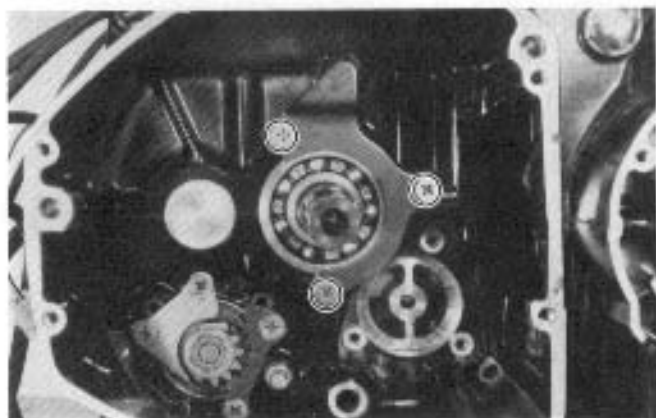
- Using the special tool, remove oil pump driven gear and its drive pin. Then remove oil pump with two O-rings.

09900-06107

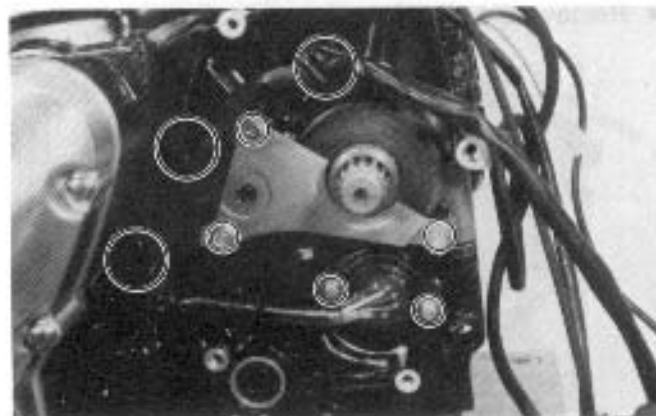
Snap ring pliers



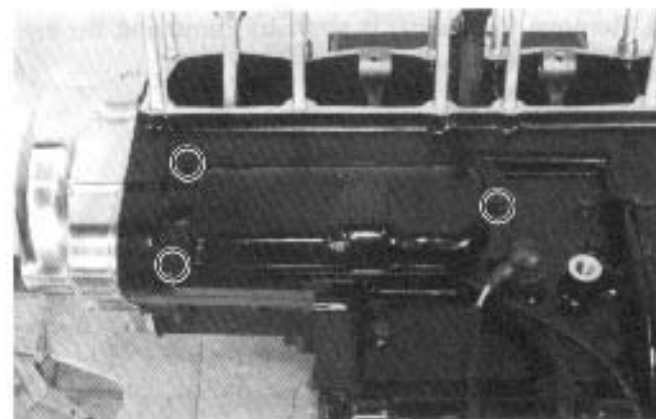
- Remove the counter shaft bearing retainer by unscrewing the retaining screws.



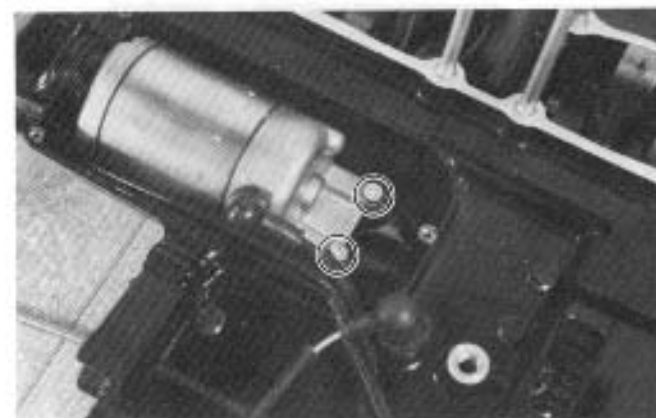
- After flatten the lock plate, loosen and remove the bolts.
- Remove the oil seal retainer plate.
- Remove the gear position switch, contact point and spring.



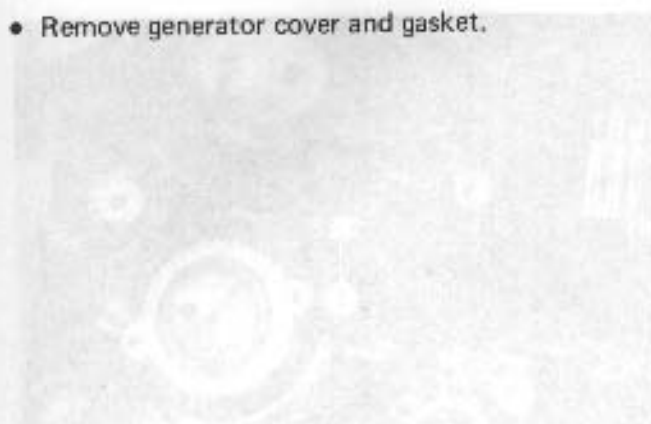
- Remove the starter motor cover.



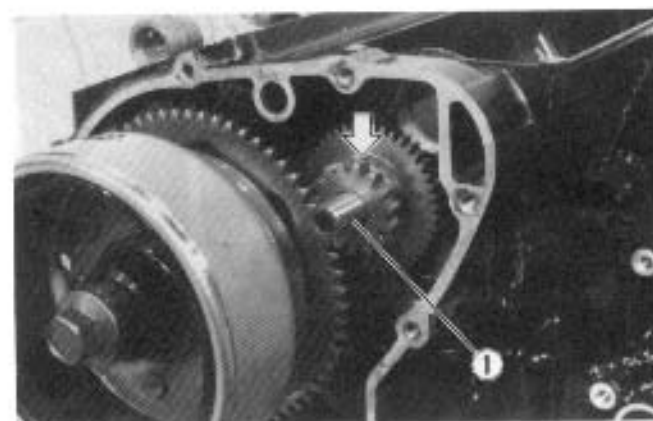
- Remove the starter motor by loosening the mounting bolts.



- Remove generator cover and gasket.



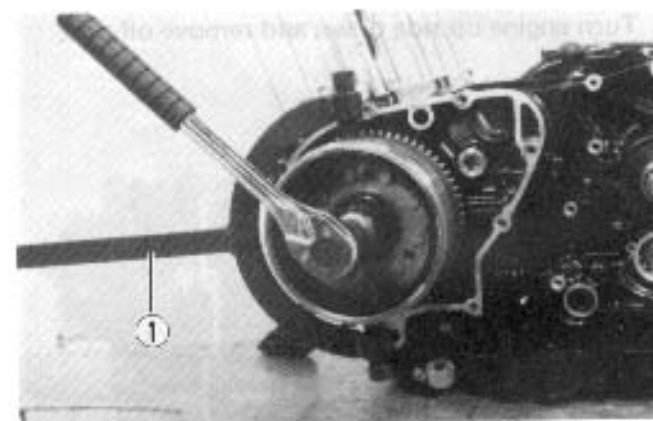
- Extract starter motor idle gear shaft ① and remove washer and idle gear.



- Using rotor holder ①, remove rotor securing bolt.

09930-44913

Rotor holder



- Install rotor remover attachment ① and sliding hammer assembly ② into the boss of rotor and remove rotor with starter clutch assembly while sliding the remover.

**NOTE:**

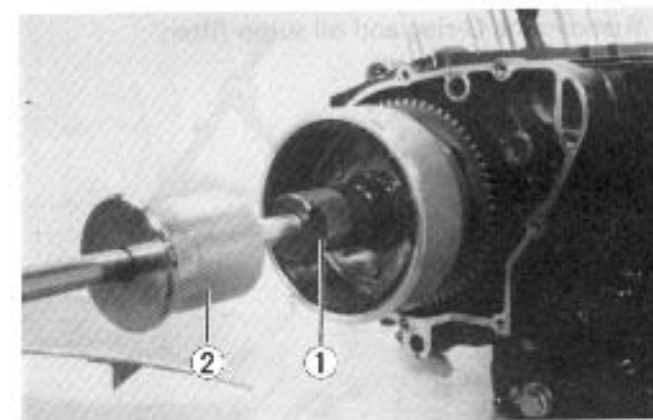
Do not hit the rotor with a hammer.

09930-30102

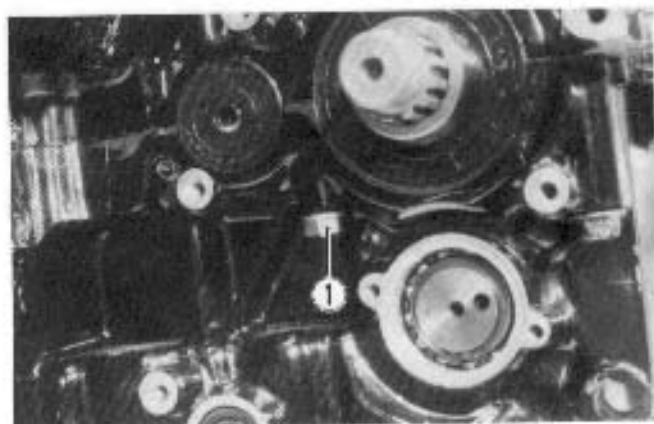
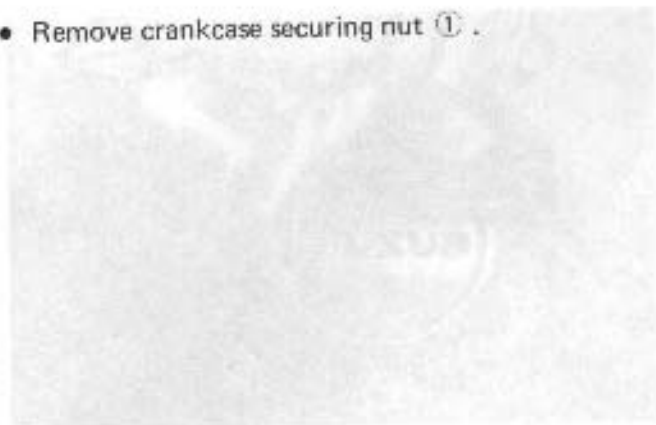
Rotor remover shaft

09930-30180

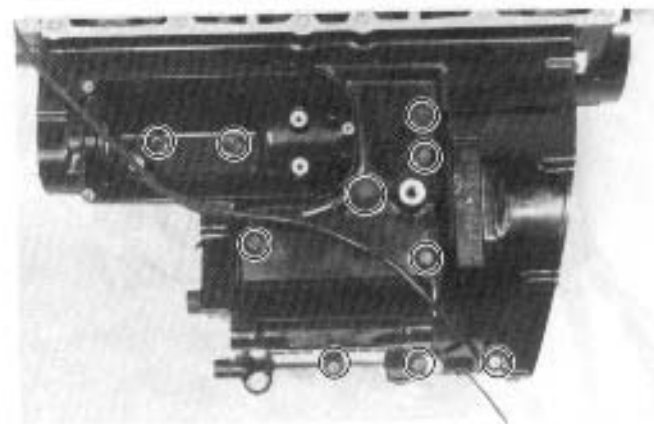
Attachment E



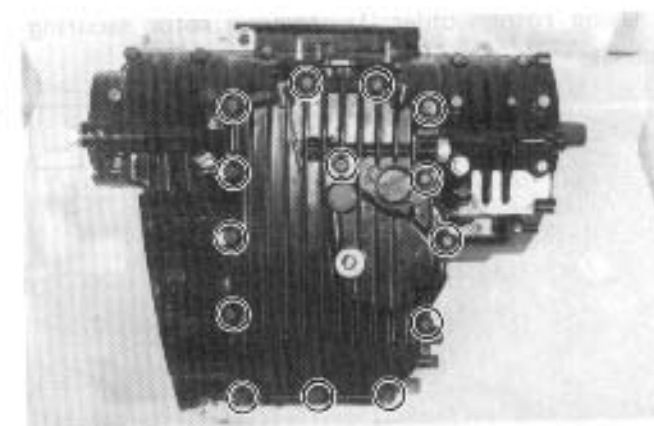
- Remove crankcase securing nut ①.



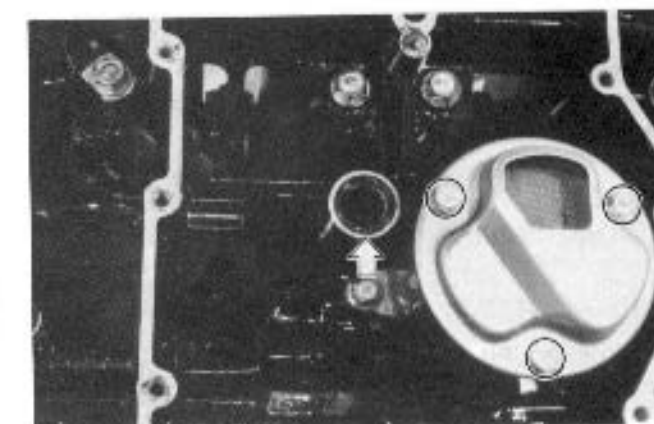
- Remove crankcase securing bolts from upper crankcase.
- Remove the oil temperature lead wire.



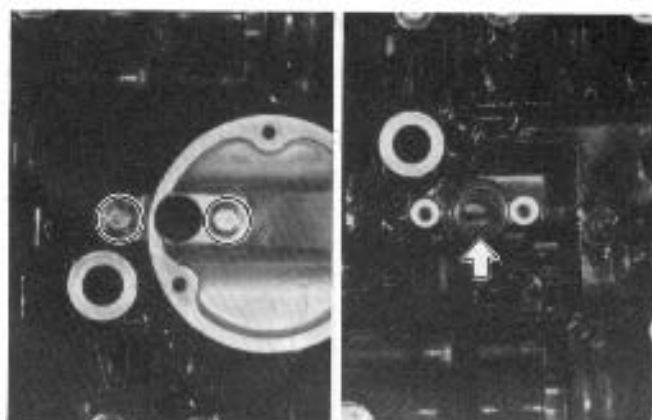
- Turn engine up side down and remove oil pan.



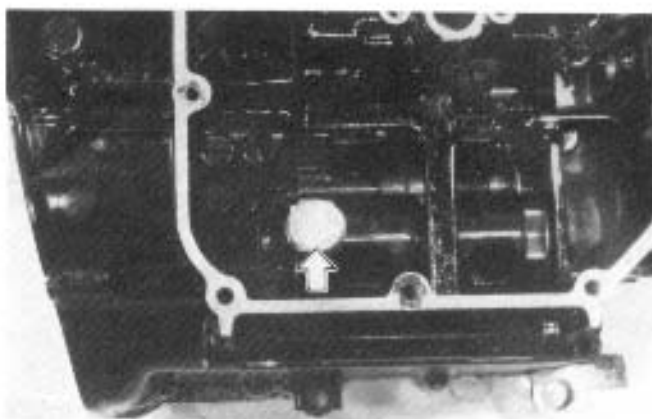
- Remove the O-ring and oil sump filter.



- Remove the oil sump protester by loosening the mounting bolts.
- Take off the O-ring.



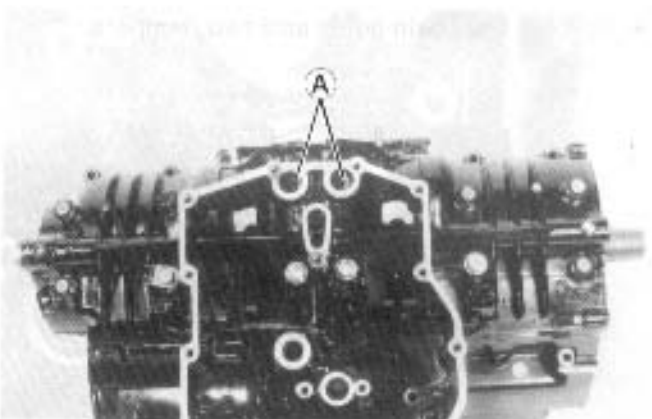
- Remove the neutral cam stopper.



- Make sure that all bolts are removed without fail. Loosen in a criss-cross manner. Hammer lightly the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.

**NOTE:**

Two allen bolts are used for securing crankcase at the portion (A).



09914-25811

"T" type hexagon wrench

09912-34510

Cylinder disassembling tool

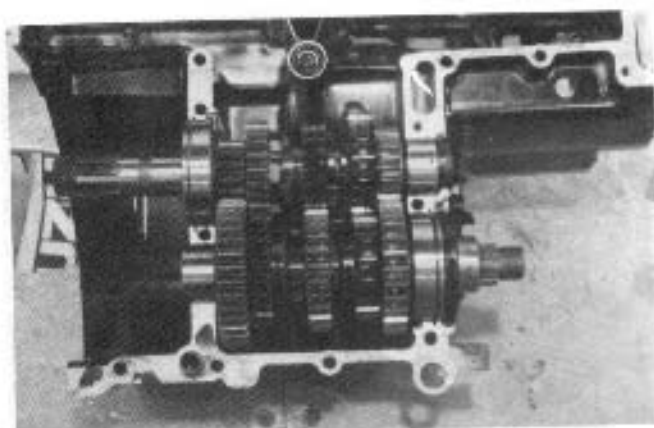




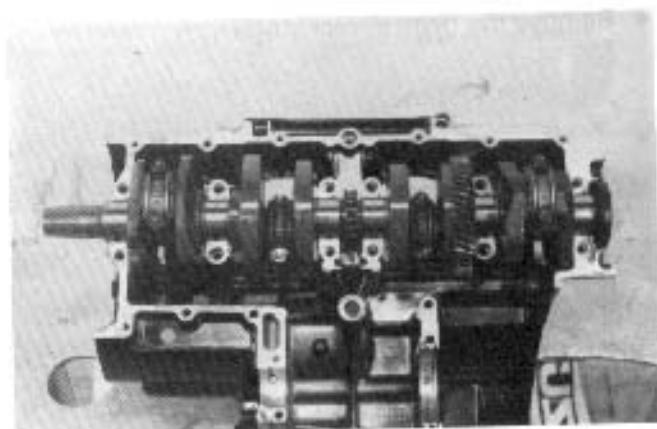
- Remove the counter shaft and drive shaft.

**NOTE:**

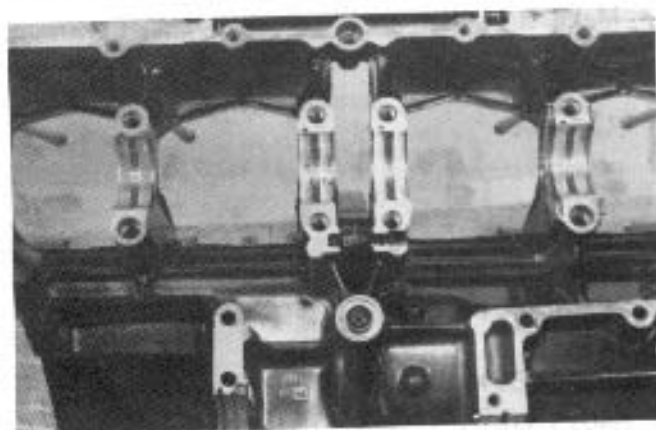
Be careful not to drop two "C" rings and the like.



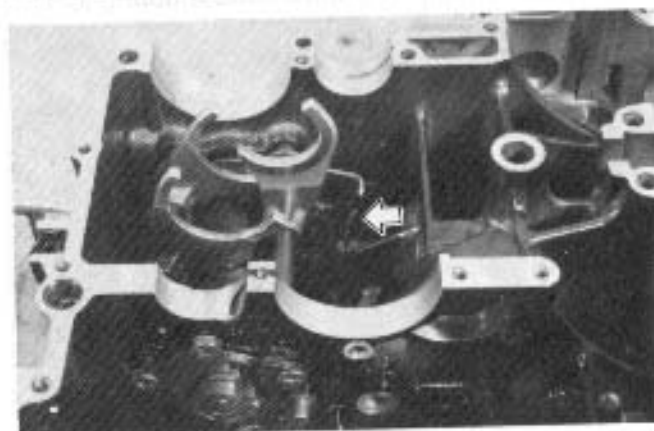
- Remove the crankshaft.



- Pull out the chain guide and two dampers.



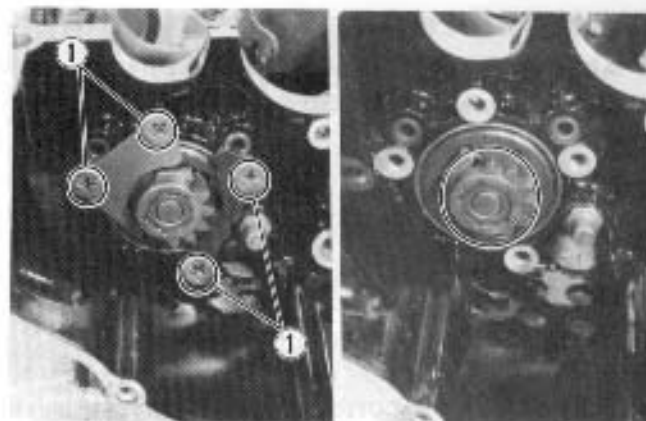
- Remove the cam stopper spring.



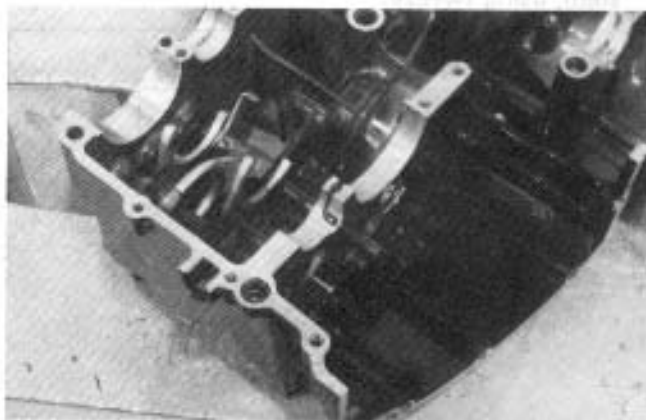
- Remove gearshift cam guide and gearshift pawl screws ①.
- Remove the cam driven gear.

**NOTE:**

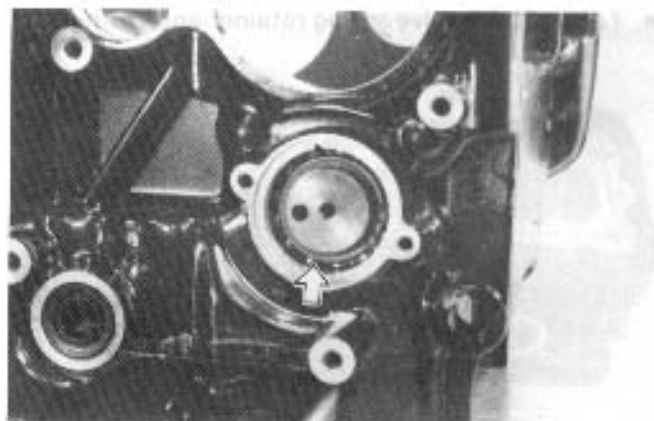
When remove the cam driven gear, do not lose gear shifting pawl, pin, and spring.



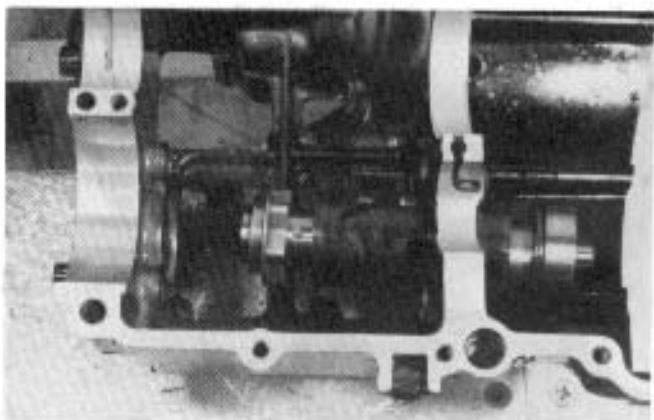
- Hold gear shifting forks by hand to extract two gear shifting fork shafts from the lower crankcase.



- Remove the gearshift cam circlip.
- Slid the gearshift cam.



- Remove the washer, spacer, cam stopper retainer and washer.
- Extract gearshift cam to the right side.



## ENGINE COMPONENTS INSPECTION AND SERVICING

### CYLINDER HEAD

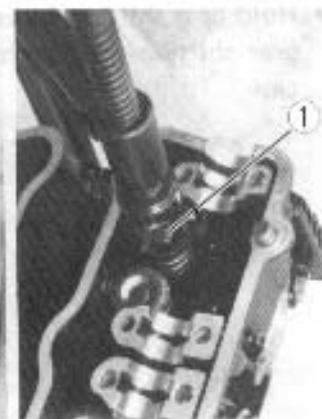
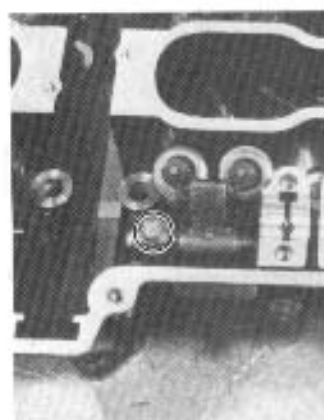
- After removing the rocker arm shaft stop bolt, pull the rocker arm shaft by using the 6mm bolt.

- Using valve lifter and its attachment, compress the valve springs.

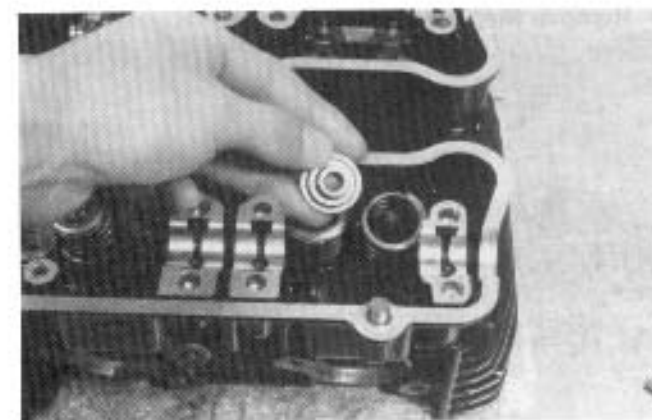
|             |                         |
|-------------|-------------------------|
| 09916-14510 | Valve lifter            |
| 09916-14910 | Valve lifter attachment |

- Take off the two cotter halves ① from the valve stem, using tweezers.

|             |         |
|-------------|---------|
| 09916-84510 | Tweezer |
|-------------|---------|



- Take out the valve spring retainer and spring.



- From the other side, pull out the valve.



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



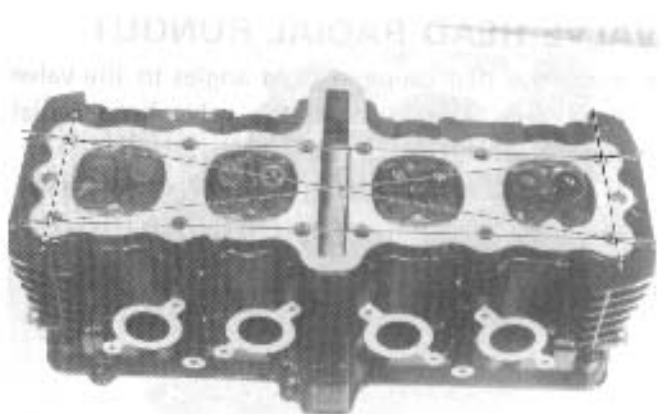
- Remove valve guide.

|             |                     |
|-------------|---------------------|
| 09916-44910 | Valve guide remover |
|-------------|---------------------|



## CYLINDER HEAD DISTORTION

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



|             |                 |
|-------------|-----------------|
| 09900-20803 | Thickness gauge |
|-------------|-----------------|

|               |        |
|---------------|--------|
| Service Limit | 0.2 mm |
|---------------|--------|

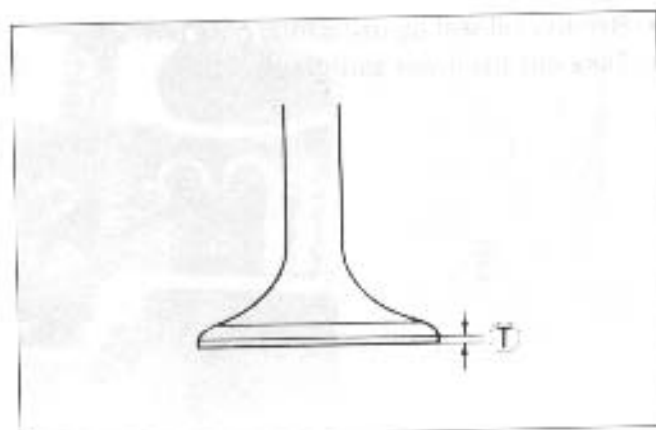


## VALVE FACE WEAR

- Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.
- The thickness  $\text{⌀}$  decreases as the wear of the face advances. Measure the thickness and, if the thickness is found to have been reduced to the limit, replace it.

Service Limit

0.5 mm

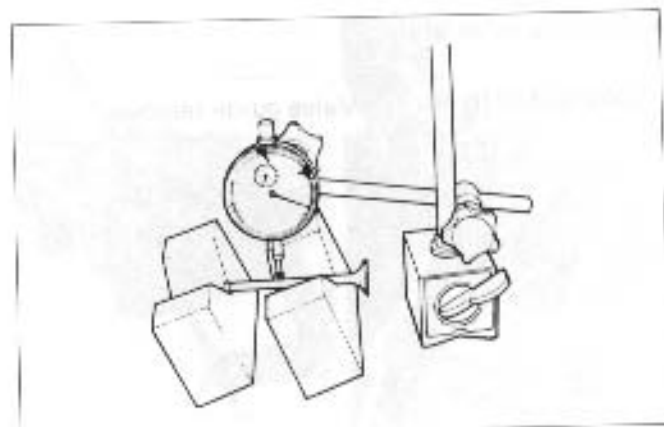


## VALVE STEM RUNOUT

- 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

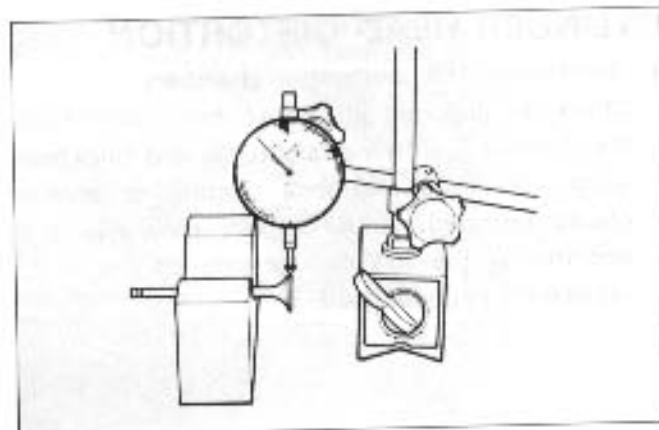


## VALVE HEAD RADIAL RUNOUT

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

Service Limit

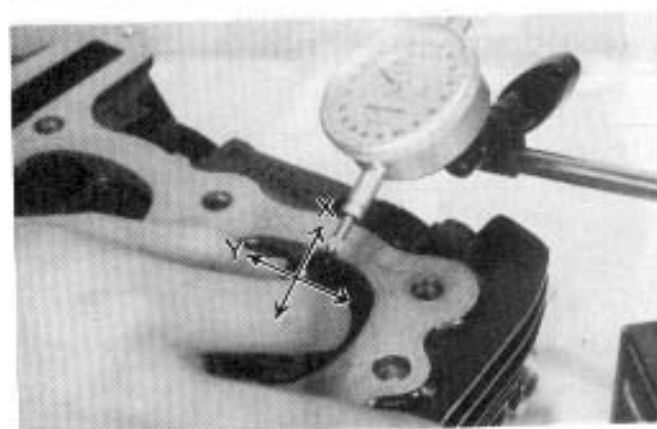
0.03 mm



## VALVE GUIDE-VALVE STEM CLEARANCE

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

| Valve          | Service Limit |
|----------------|---------------|
| Intake valves  | 0.35 mm       |
| Exhaust valves | 0.35 mm       |

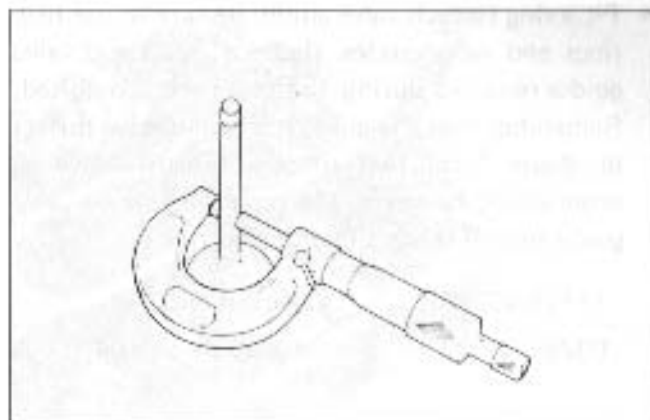




## VALVE STEM WEAR

If the valve stem is worn down to the limit, as measured with a micrometer, where the clearance is found to be in excess of the limit indicated, 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.

| 09900-20205    | Micrometer (0 – 25 mm) |
|----------------|------------------------|
| Valve          | Standard               |
| Intake valves  | 5.460 – 5.475 mm       |
| Exhaust valves | 5.445 – 5.460 mm       |



## VALVE GUIDE SERVICING

- Using valve guide remover ①, drive the valve guide out toward intake or exhaust port side.

|             |                     |
|-------------|---------------------|
| 09916-44910 | Valve guide remover |
|-------------|---------------------|

### NOTE:

- \* Discard the removed valve guide sub-assemblies.
- \* Only oversized valve guide is available.



- Re-finish the valve guide holes in cylinder head with a 11.3 mm reamer.

|             |                         |
|-------------|-------------------------|
| 09916-34561 | Valve guide hole reamer |
| 09916-34541 | Reamer handle           |



- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Reuse of rings and valve guides removed during disassembly is prohibited. Remember that the guide for intake valve differs in shape from that of the exhaust valve in production, however, the replacements of valve guide and oil seal are identical in shape.

|             |                      |
|-------------|----------------------|
| 11115-49290 | Valve guide          |
| 09289-05003 | Valve guide oil seal |

- Oil the stem hole, too, of each valve guide and drive the guide into the guide hole with the valve guide remover and attachment.

|             |                                  |
|-------------|----------------------------------|
| 09916-44910 | Valve guide remover              |
| 09916-44920 | Valve guide installer attachment |

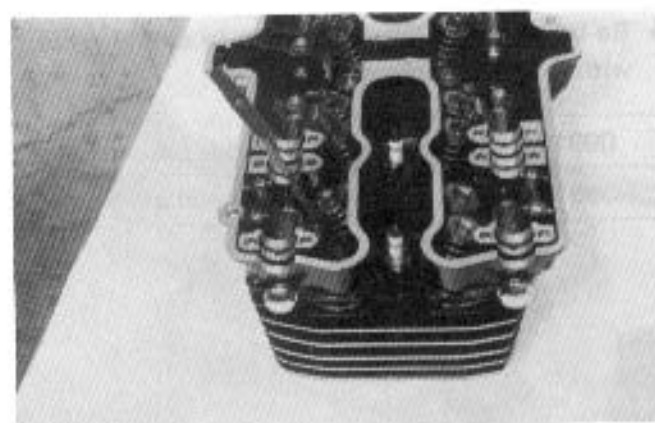
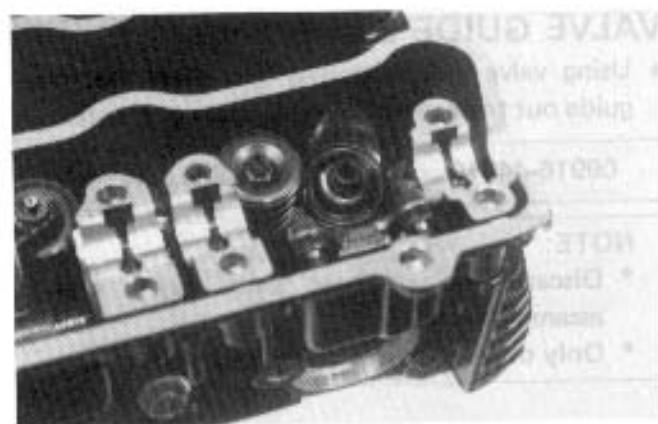
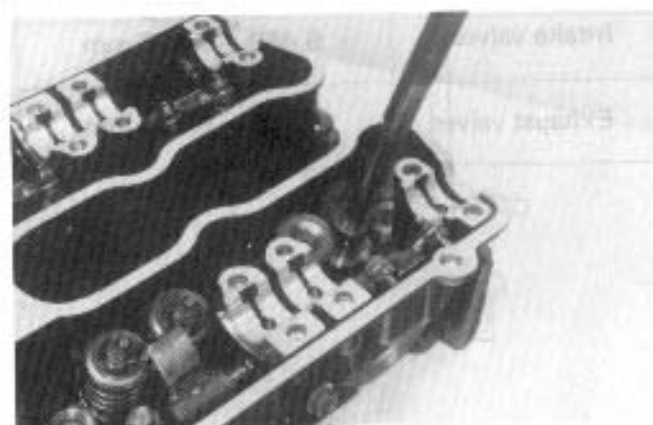
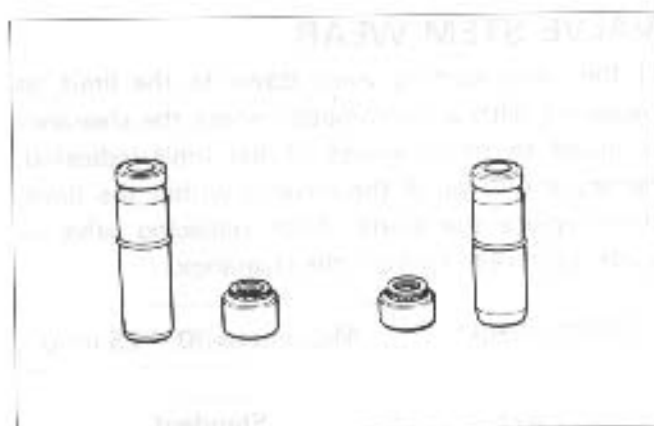
**CAUTION:**

Failure to oil the valve guide hole before driving the new guide into place may result in a damaged guide or head.

- Install the valve spring guide.

- Re-finish the valve guide inner surface with a 5.5 mm reamer.

|             |                    |
|-------------|--------------------|
| 09916-34550 | Valve guide reamer |
| 09916-34541 | Reamer handle      |



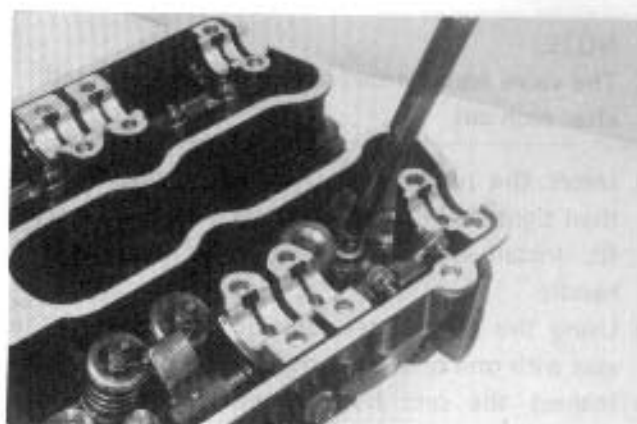
- Oil each oil seal, and drive them into position with the valve guide remover.

09916-44910

Valve guide remover

**NOTE:**

Do not use the oil seals removed once: Use new seals.

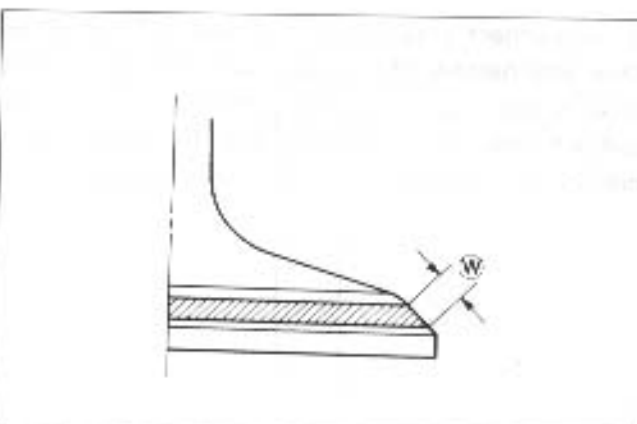
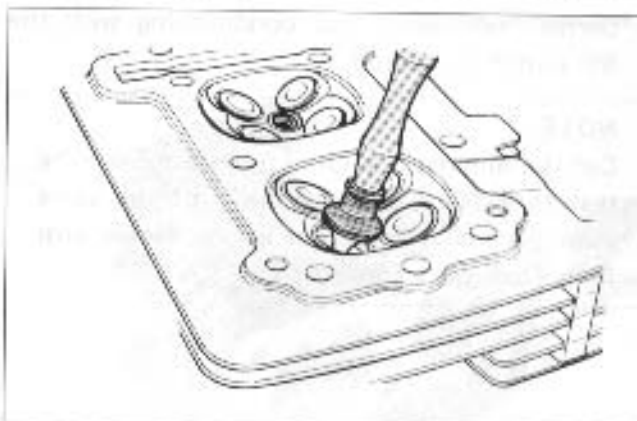
**VALVE SEAT WIDTH**

- 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—and, in addition to this requirement, the width of the dye ring, which is the visualized seat “width”, must be within the following specification:

**Valve seat width**

| Seat width | Standard     |
|------------|--------------|
| Ⓢ          | 0.9 – 1.1 mm |

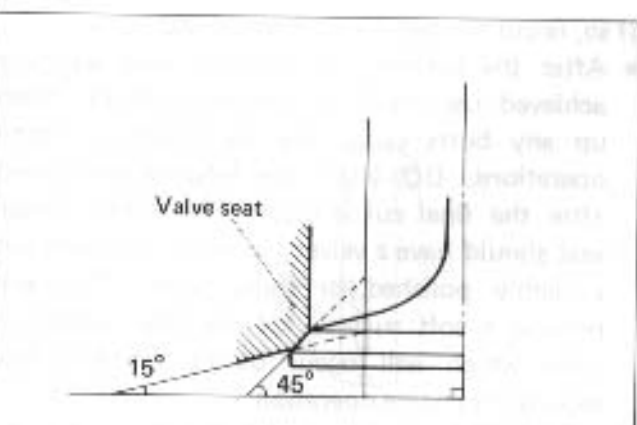
If either requirement is not met, correct the seat by servicing it as follows:

**VALVE SEAT SERVICING**

- The valve seats for both intake and exhaust valves are angled to present two bevels, 45° (seat contact surface) and 15° (top). To reface the seat, proceed as follows:

09916-21110

Valve seat cutter set



**NOTE:**

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

- Insert the pilot ① with a slight rotation, and then tighten the bottom screw that gives a snug fit. Install the 45° cutter, attachment and T handle.
- 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.

**NOTE:**

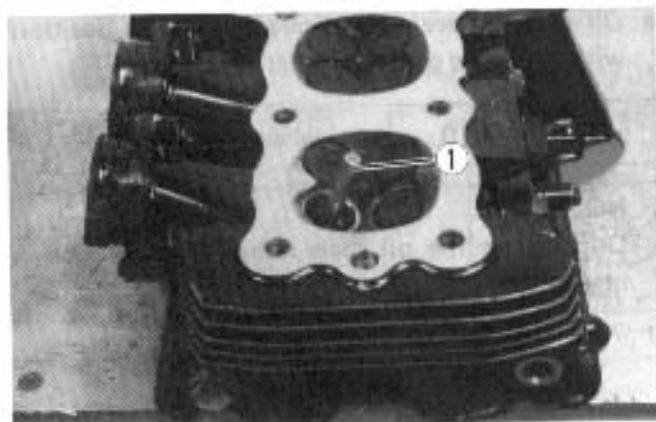
Cut the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.

If the contact area is too low, use 45° cutter to raise and narrow the contact area. If the contact area is too high, use 15° cutter to lower the contact area. After cutting the 15° angle, it is possible that the valve seat (45°) is too narrow.

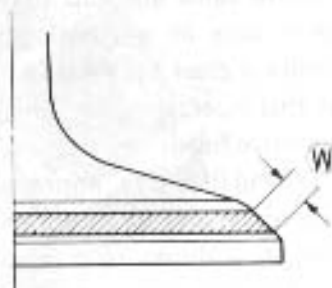


If so, re-cut the seat to the correct width.

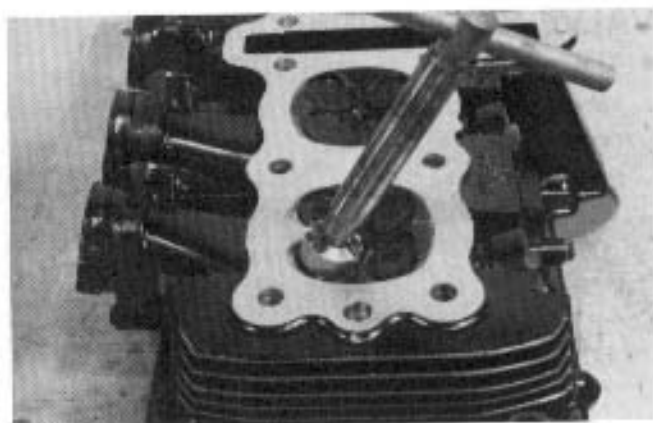
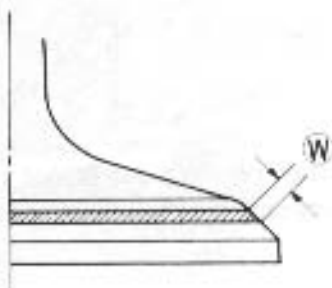
- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations. DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of valve which will occur during the first few seconds of engine operation.



Contact area too high and too wide on face of valve



Contact area too low and too narrow on face of valve



## Using part list of valve seat servicing

|                        |     | IN                      | EX                  |
|------------------------|-----|-------------------------|---------------------|
| Valve seat cutter head | 45° | N-116<br>15°x45° cutter | ←                   |
|                        | 15° | N-116<br>15°x45° cutter | N-120<br>15° cutter |
| Solid pilot            |     | N-100-10                | ←                   |
| Adapter                |     | N-503-1                 | ←                   |
| T-handle               |     | N-503                   | ←                   |

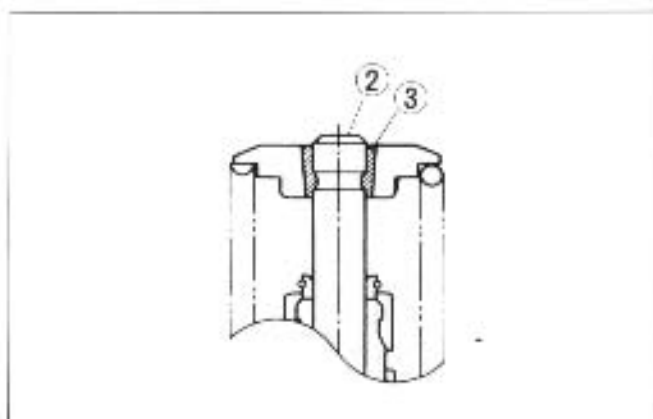
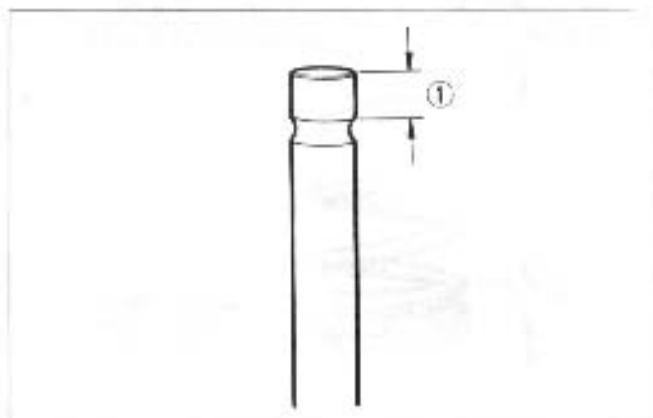
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

**NOTE:**

- \* Always use extreme caution when handling gasoline.
- \* After servicing the valve seats, be sure to adjust the valve clearance after the cylinder head has been reinstalled. (see page 2-5)

**CAUTION:**

- \* Refacing valve stem end face is permissible where the length ① will not be reduced to less than 3.6 mm. If this length becomes shorter than 3.6 mm, then the valve must be replaced.
- \* After installing the valve whose stem end has been ground off as above, check that the face ② of valve stem end is above the valve cutter ③.





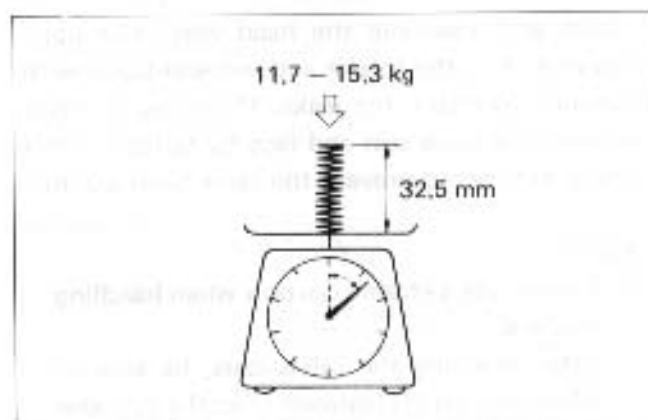
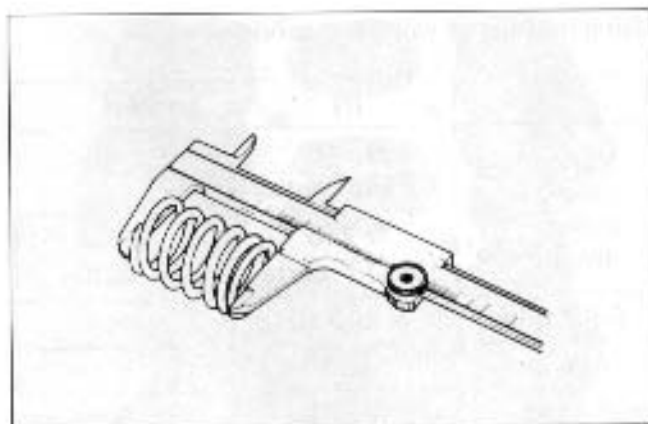
## VALVE SPRINGS

- The force of the two coil springs keeps the valve seat tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.
- Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated is exceeded by the free length reading or if the measured force does not fall within the range specified, replace with a SUZUKI spring.

### CAUTION:

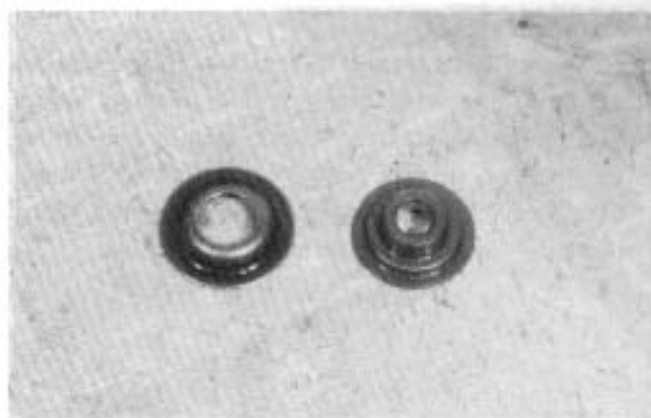
Replace all of the valve springs at a time, if any one of these is found to be beyond the limit.

|                          | Service limit                       |
|--------------------------|-------------------------------------|
| Valve spring free length | 37.95 mm                            |
|                          | Standard                            |
| Valve spring tension     | 11.7 – 15.3 kg<br>at length 32.5 mm |



## REASSEMBLY

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



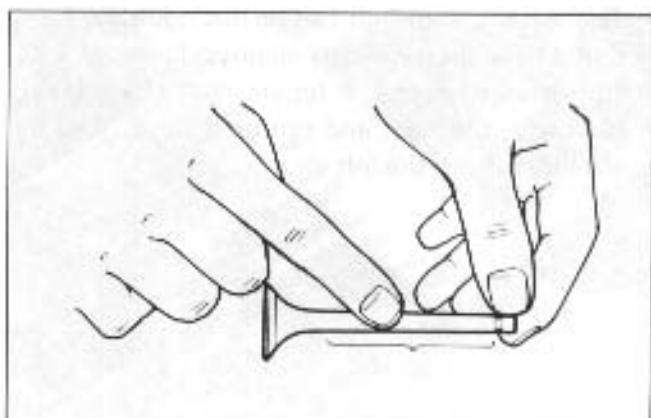
- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

### CAUTION:

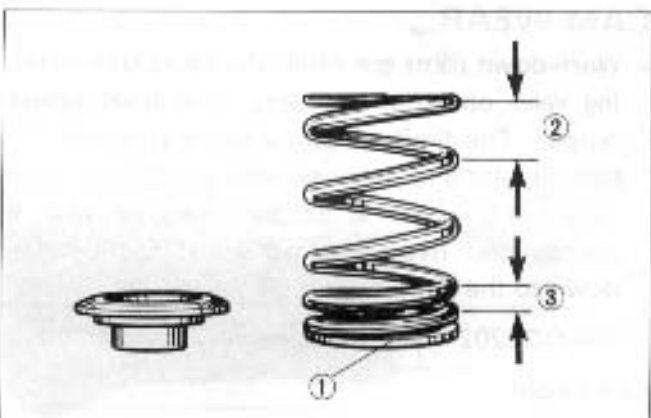
When inserting each valve, take care not to damage the lip of the stem seal.

99000-25140

SUZUKI Moly Paste



- Position valve spring in place, making them rest on lower spring seat ① by their closed-pitch end ③. Spring has varied coil pitches: the coil pitch progressively becomes shorter from one end to the other. Large-pitch portions are indicated as ②: small-pitch portions as ③.
- Put on the valve retainer and, using the valve lifter, press down the springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter ① to wedge in between retainer and stem. Be sure that the rounded lip ② of the cotter fits snugly into the groove ③ in the stem end.



09916-14510

Valve lifter

09916-14910

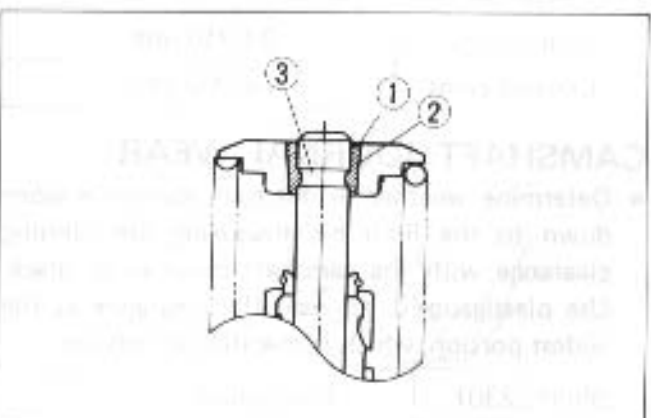
Valve lifter attachment

09916-84510

Tweezer

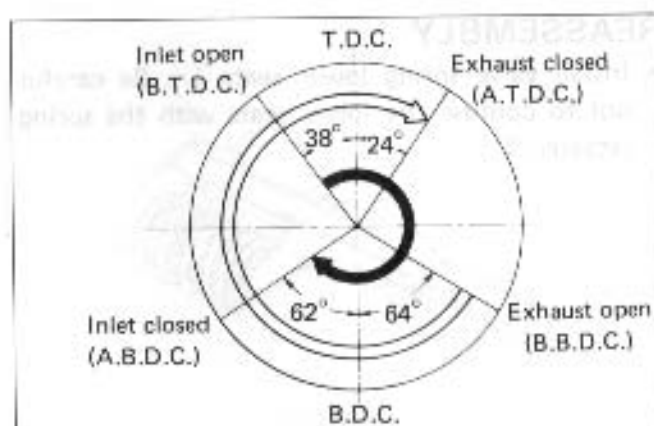
### CAUTION:

Be sure to restore each spring and valve to their original positions.

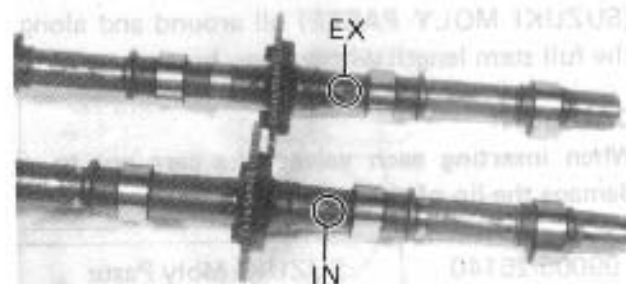


## CAMSHAFT

- Both camshafts should be checked for deflection and also for wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.



- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished by the notch from the left end.



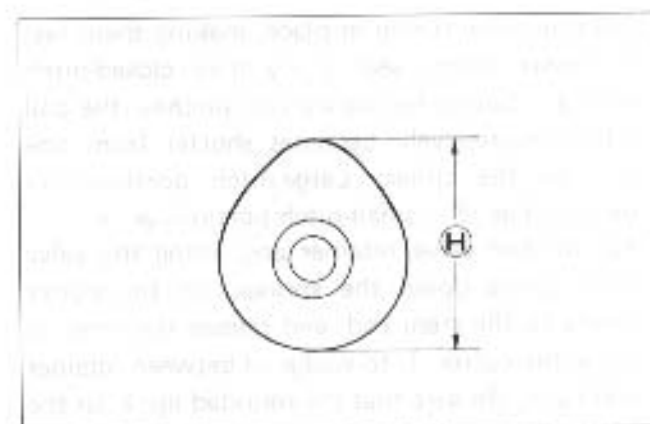
## CAM WEAR

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

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

### Cam height

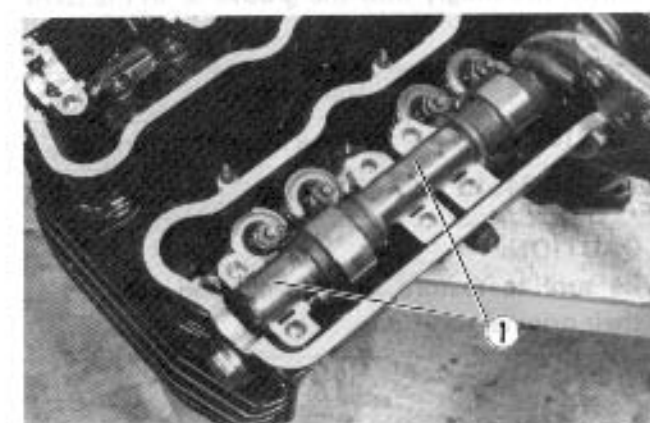
| Height $H$   | Service Limit |
|--------------|---------------|
| Intake cams  | 34.910 mm     |
| Exhaust cams | 34.060 mm     |



## CAMSHAFT JOURNAL WEAR

- Determine whether or not each journal is worn down to the limit by measuring the running clearance with the camshaft installed in place. Use plastigauge ① to read the clearance at the widest portion, which is specified as follows:

|             |             |
|-------------|-------------|
| 09900-22301 | Plastigauge |
|-------------|-------------|



**Camshaft—Journal clearance**

|               |         |
|---------------|---------|
| Service Limit | 0.15 mm |
|---------------|---------|

**NOTE:**

Install each holder to their original positions.

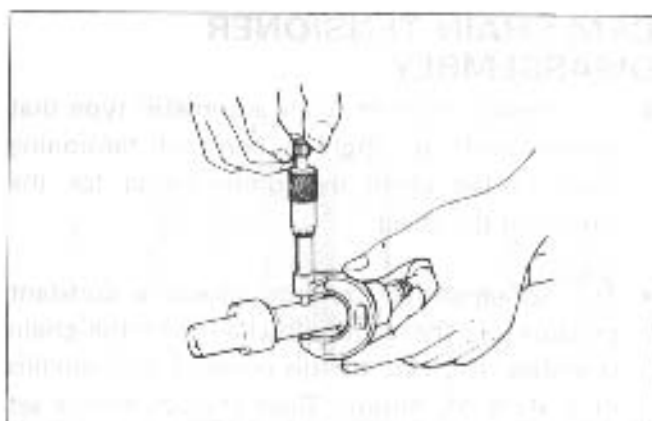
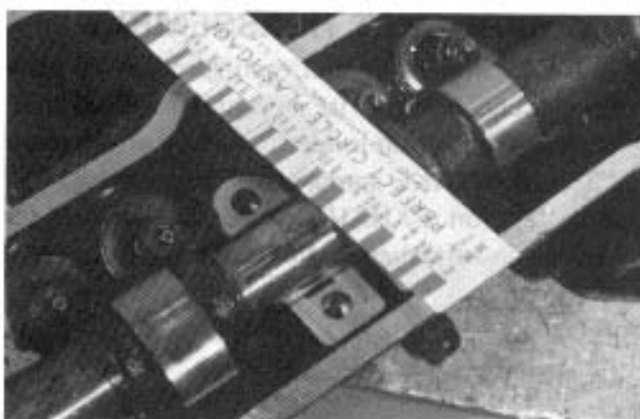
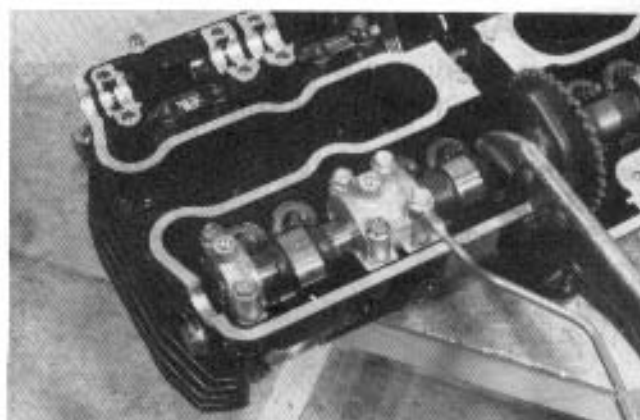
- Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

|                   |                                |
|-------------------|--------------------------------|
| Tightening torque | 0.8 – 1.2 kg-m<br>(8 – 12 N-m) |
|-------------------|--------------------------------|

- If the camshaft journal clearance measured exceed the limit, measure the inside diameter of camshaft journal holder and outside diameter of the camshaft journal, whichever the difference from specification is greater.

|             |                        |
|-------------|------------------------|
| 09900-20205 | Micrometer (0 – 25 mm) |
|-------------|------------------------|

| Standard                        |                    |
|---------------------------------|--------------------|
| Journal holder I.D. (In & Ex)   | 22.015 – 22.025 mm |
| Camshaft journal O.D. (In & Ex) | 21.959 – 21.980 mm |

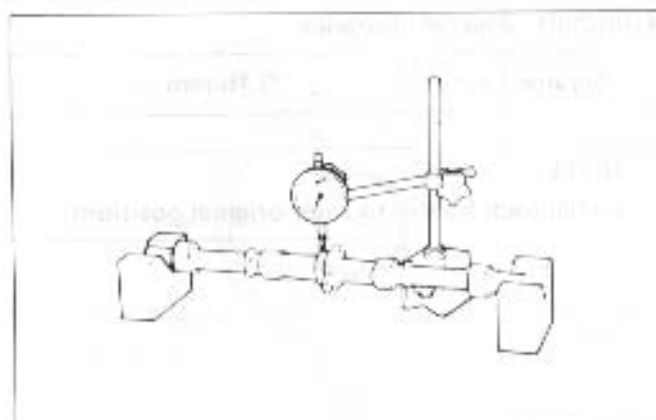


## CAMSHAFT RUNOUT

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

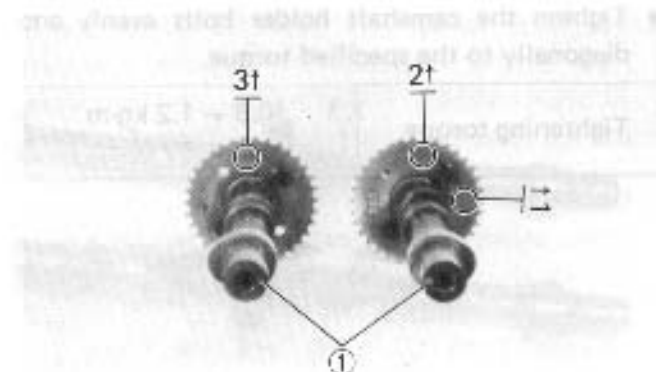
### Camshaft runout (IN & EX)

|               |        |
|---------------|--------|
| Service Limit | 0.1 mm |
|---------------|--------|



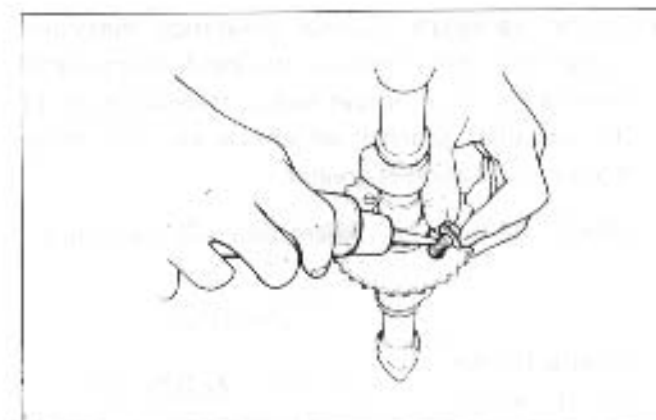
## CAM SPROCKET REASSEMBLY

- It is very important that each sprocket be positioned angularly on its camshaft as illustrated. Its correct position is determined by arrow mark "3" (on INTAKE sprocket) or arrow marks "1" and "2" (on EXHAUST sprocket) located (as shown) in reference to the notch ① in the camshaft end.



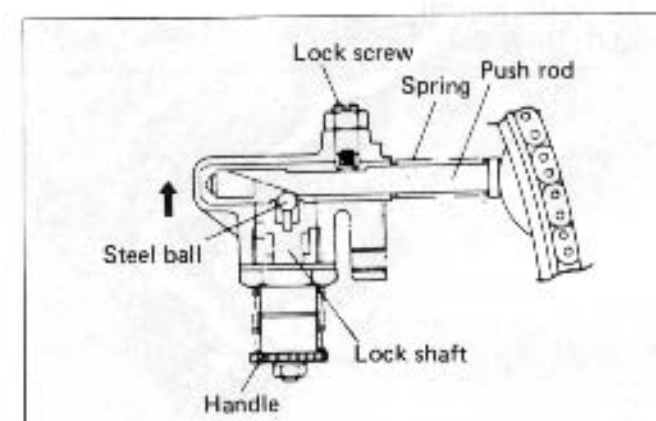
- Apply THREAD LOCK SUPER 1303B (99000-32030) to the threads of Flange bolts, and tighten them to the following torque value.

|                   |                                 |
|-------------------|---------------------------------|
| 99000-32030       | Thread lock super 1303B         |
| Tightening torque | 2.4 – 2.6 kg-m<br>(24 – 26 N·m) |



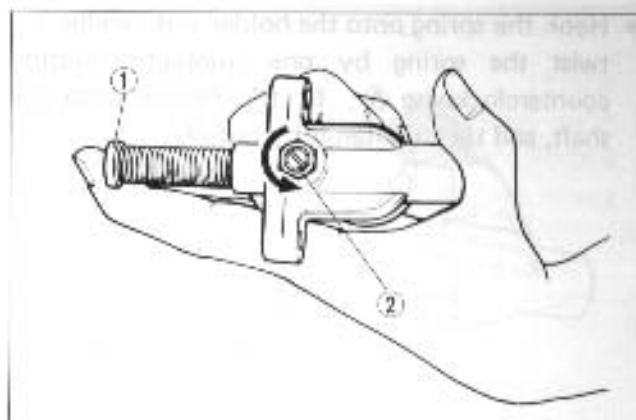
## CAM CHAIN TENSIONER DISASSEMBLY

- The tension adjuster is an automatic type that adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.
- The spring-loaded pushrod exerts a constant pressure on the camshaft chain. As the chain stretches, it yields to this pressure and remains in a state of tension. Once the adjuster is set after installation, there is no need to make any further adjustment.



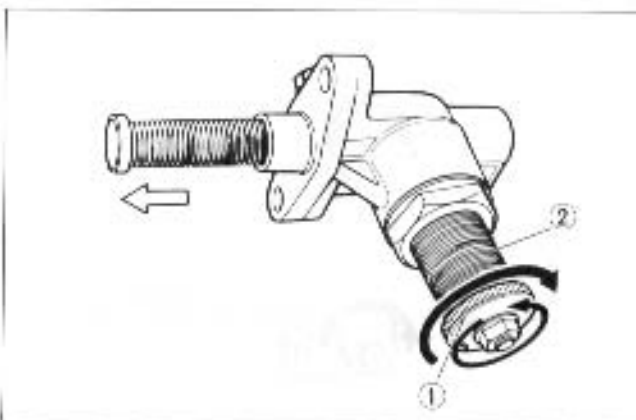
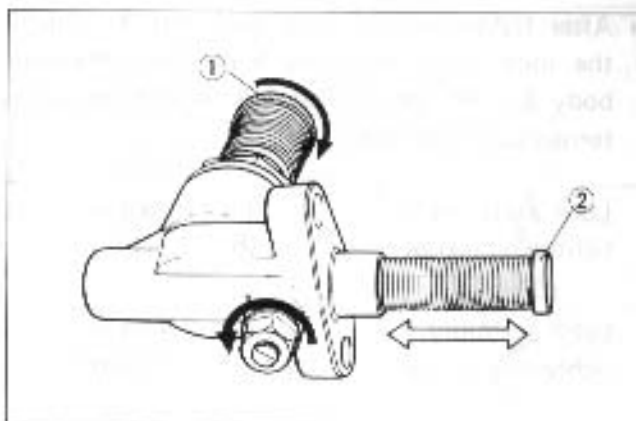


- The pushrod effectively contends with the tendency of the camshaft chain tension to vary during driving condition as it may move to one direction only.
- While pushing the push rod ①, loosen the lock screw ② and extract the push rod.



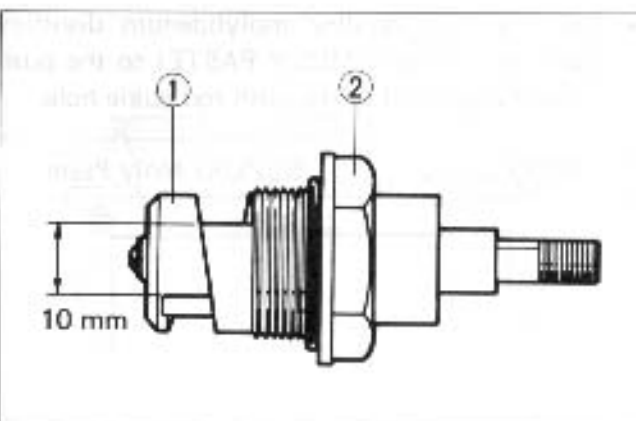
#### INSPECTION

- Turn the handle ① all the way counterclockwise after loosening the lock screw, and move the push rod ② in place to see if it slides smoothly. If any stickiness is noted, remove the rod for inspection. A bent or scratched push rod must be replaced.
- Turn handle ① all the way counterclockwise against the force of its coil spring and then turn it back as assisted by spring force to see if the handle returns to the original position ② without exhibiting any sticking on way. Repeat this process several times. If any excessive sticking is felt or if the self-adjusting action is faulty, replace the whole tensioner.

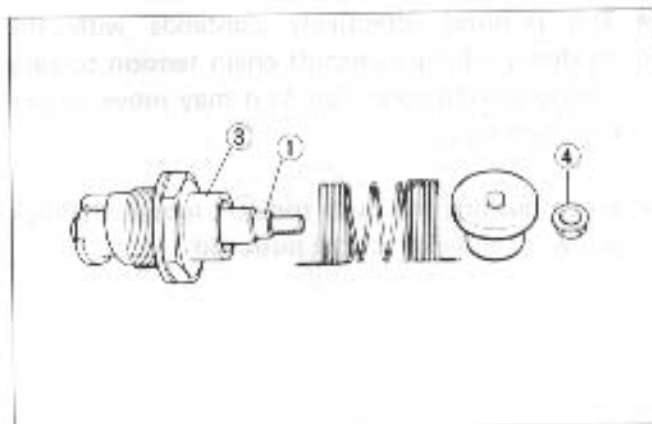


#### REASSEMBLING

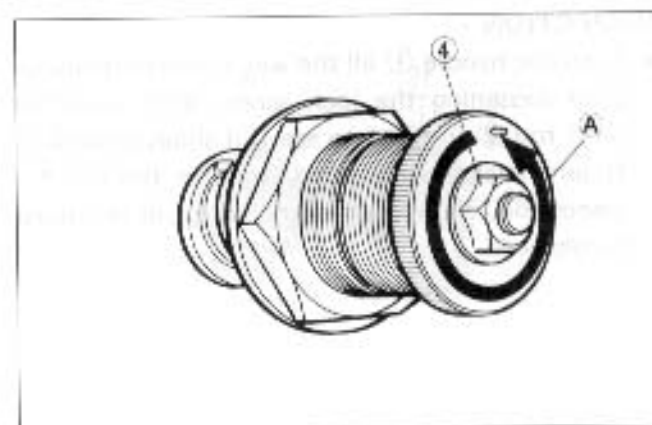
- Apply engine oil to the lock shaft ①. Insert the shaft into the holder ②, and bring the two into the relative position indicated.



- Hook the spring onto the holder and handle ③, twist the spring by one complete rotation counterclockwise (A), fit the handle onto the shaft, and then tighten it by nut ④.

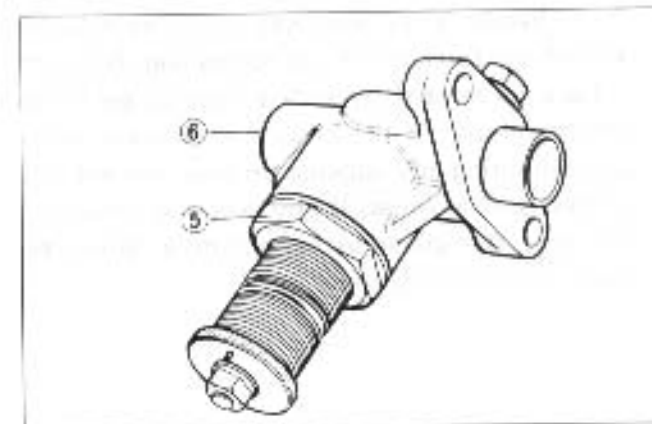


- After tightening the lock shaft nut ④, install the lock shaft assembly ⑤ on the tensioner body ⑥. Be sure to adhere to the following torque specifications:



|                                     |                              |
|-------------------------------------|------------------------------|
| Lock shaft nut<br>tightening torque | 0.8–1.0 kg-m<br>(8 – 10 N-m) |
|-------------------------------------|------------------------------|

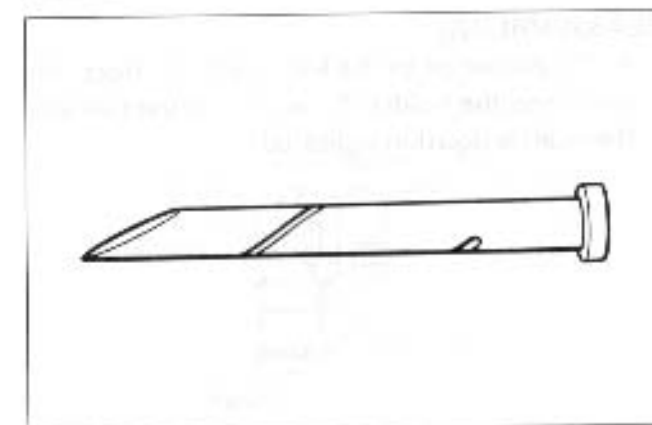
|                                     |                               |
|-------------------------------------|-------------------------------|
| Shaft assembly<br>tightening torque | 3.1–3.5 kg-m<br>(31 – 35 N-m) |
|-------------------------------------|-------------------------------|



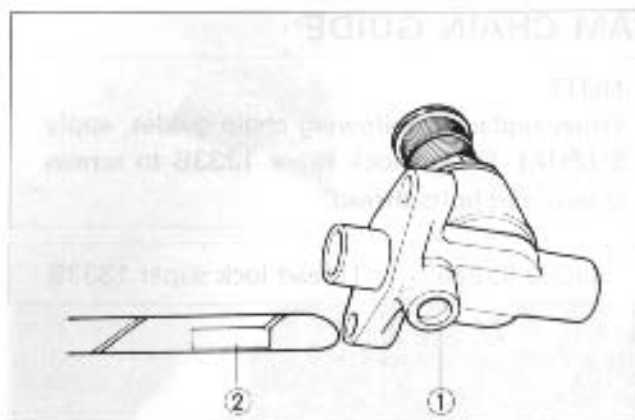
- Apply a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to the push rod and engine oil to the push rod guide hole.

99000-25140

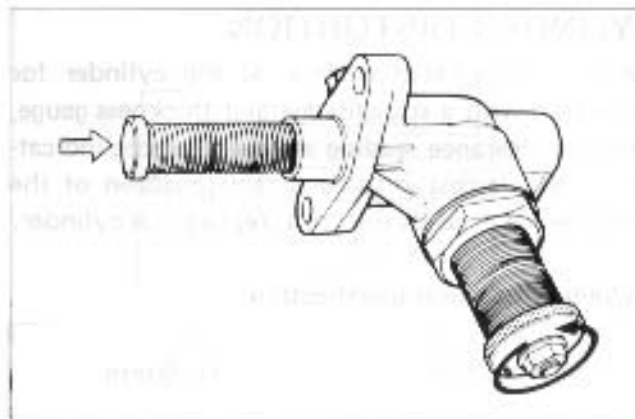
SUZUKI Moly Paste



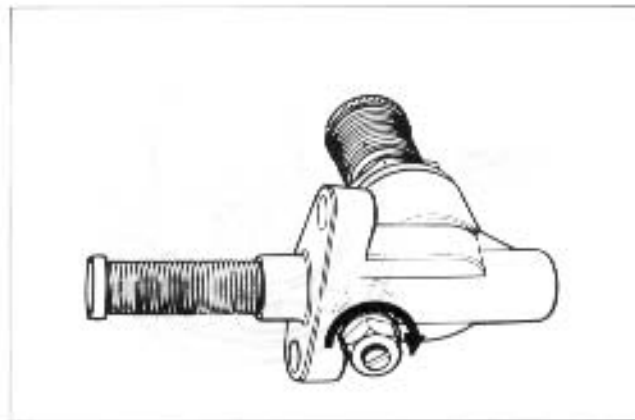
- Match the lock screw hole ① to the long groove ② in the push rod, as shown.
- Slide the push rod spring on to the pushrod.



- While turning lock shaft handle counterclockwise, push in the pushrod all the way. Keep on turning the handle until it refuses to turn further.



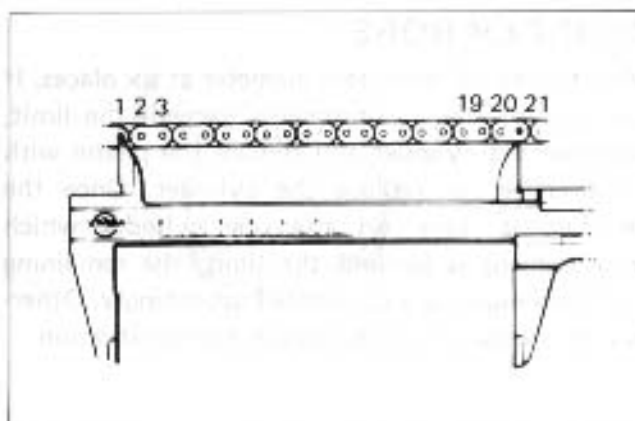
- Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.



## CAM CHAIN 20-PITCH LENGTH

Pull the chain tight to remove any slack, then using vernier calipers, measure the 20 pitch length of cam chain. If it measures more than limits, replace the cam chain.

|               |           |
|---------------|-----------|
| Service Limit | 157,80 mm |
|---------------|-----------|



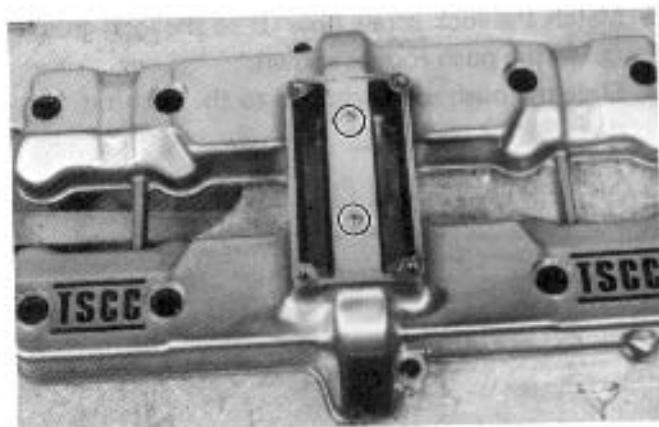
## CAM CHAIN GUIDE

### NOTE:

When replacing following chain guides, apply SUZUKI Thread lock super 1333B to screws screws and bolts thread.

99000-32020

Thread lock super 1333B



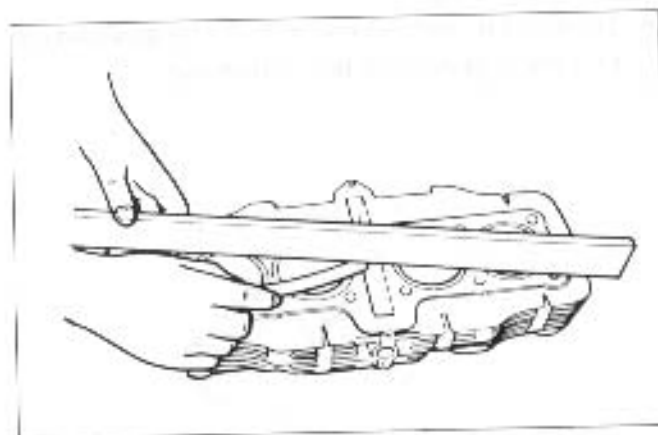
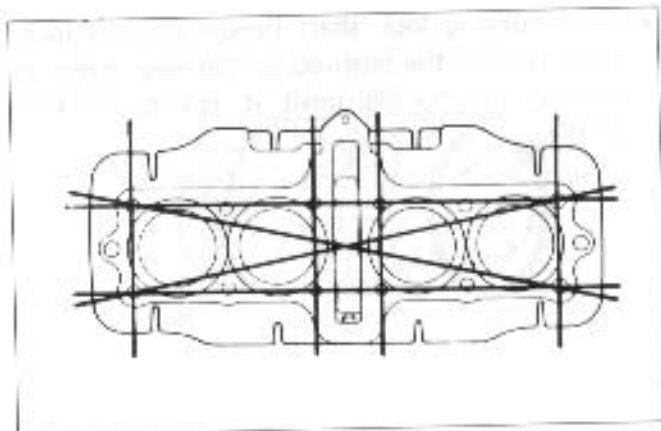
## CYLINDER DISTORTION

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

### Cylinder distortion specification

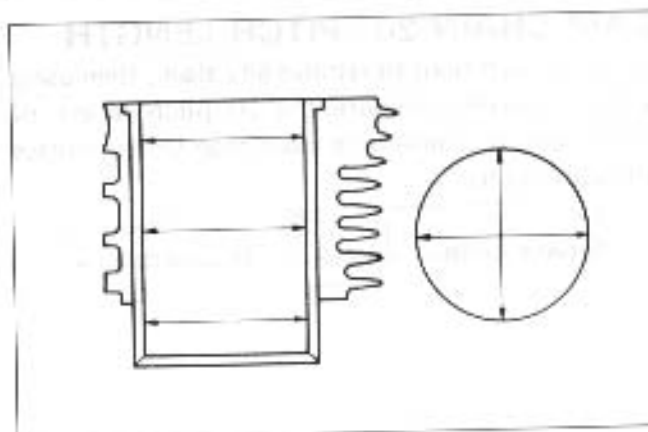
Service Limit

0.20 mm



## 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. Once the reboring is done on any one cylinder which measurement is beyond the limit, the remaining cylinders must be also rebored accordingly. Otherwise the imbalance might causes excess vibration.



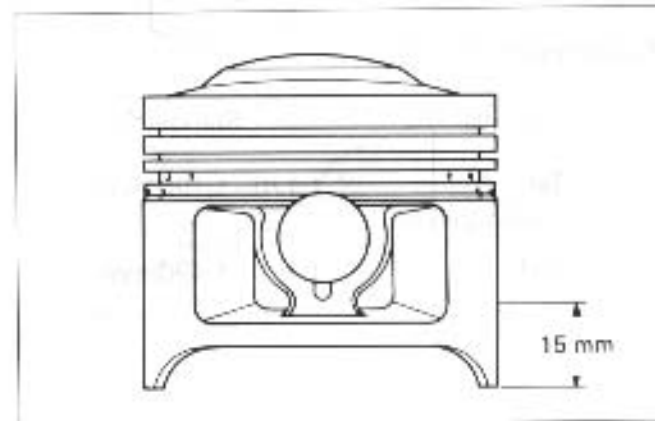
**Cylinder bore**

|               |                     |
|---------------|---------------------|
| Service Limit | 67.080 mm           |
| 09900-20508   | Cylinder gauge set. |

**PISTON DIAMETER**

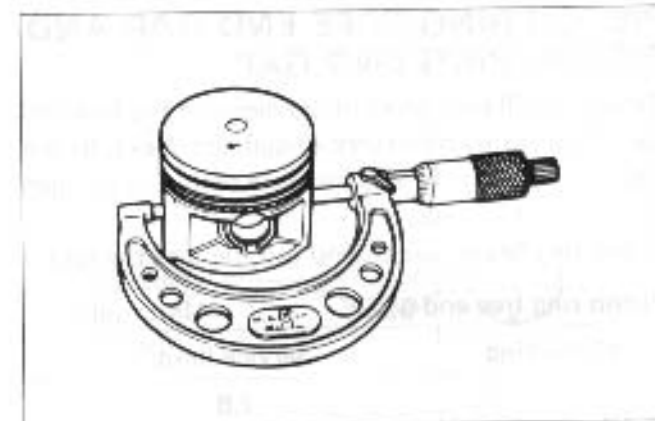
Using a micrometer, measure the piston outside diameter at the place shown in Fig. If the measurement is less than the limit, replace the piston.

|                 |                       |
|-----------------|-----------------------|
| Piston oversize | 0.5, 1.0 mm           |
| Service Limit   | 66.880 mm             |
| 09900-20203     | Micrometer (50-75 mm) |

**PISTON-CYLINDER CLEARANCE**

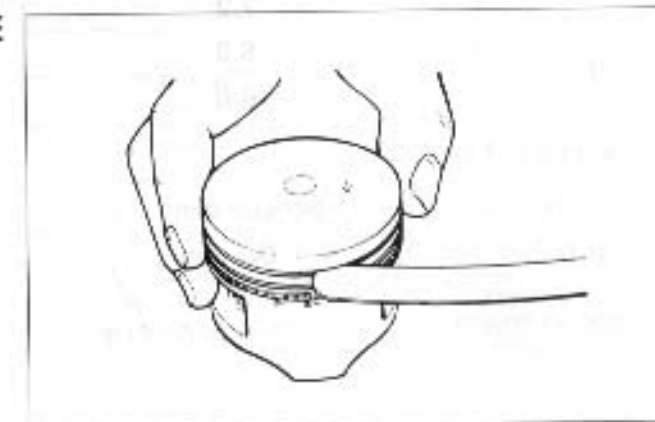
As a result of the above measurement, if the piston clearance exceeds the following limit, overhaul the cylinder and use an oversize piston, or replace both cylinder and piston.

|               |          |
|---------------|----------|
| Service Limit | 0.120 mm |
|---------------|----------|

**PISTON RING-GROOVE CLEARANCE**

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

|             |                 |
|-------------|-----------------|
| 09900-20803 | Thickness gauge |
|-------------|-----------------|





**Piston ring—groove clearance**

| Piston ring | Service Limit |
|-------------|---------------|
| 1st         | 0.180 mm      |
| 2nd         | 0.150 mm      |

**Piston ring groove width**

| Piston ring | Standard       |
|-------------|----------------|
| 1st         | 1.21 – 1.23 mm |
| 2nd         | 1.21 – 1.23 mm |
| Oil         | 2.51 – 2.53 mm |

**Piston ring thickness**

| Piston ring | Standard       |
|-------------|----------------|
| 1st         | 1.170–1.190 mm |
| 2nd         | 1.170–1.190 mm |

**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.

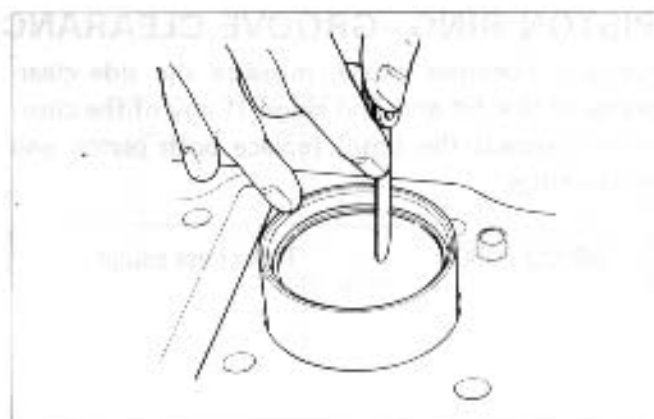
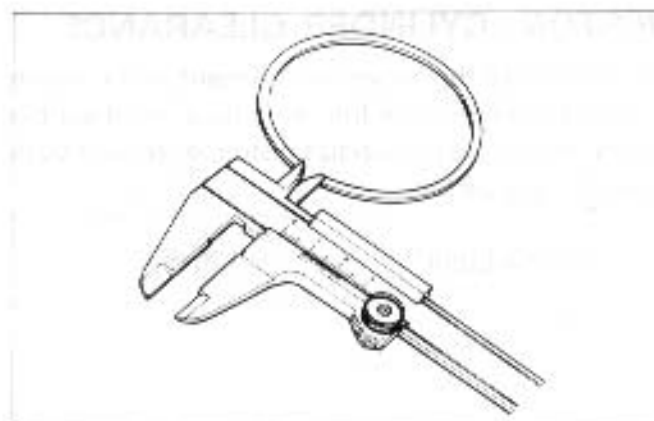
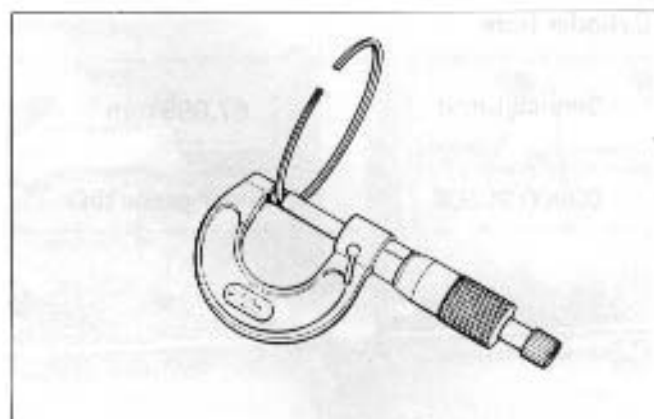
If any ring has an excess end gap, replace the ring.

**Piston ring free end gap** Unit : mm

| Piston ring |   | Service limit |
|-------------|---|---------------|
| 1st         | N | 7.6           |
|             | R | 7.2           |
| 2nd         | N | 8.0           |
|             | R | 8.0           |

**Piston ring end gap**

| Piston ring | Service Limit   |
|-------------|-----------------|
| 1st & 2nd   | 0.7 mm          |
| 09900-20803 | Thickness gauge |



- **Oversize piston rings**

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

|        | 1st | 2nd |
|--------|-----|-----|
| 0.5 mm | 50  | 50  |
| 1.0 mm | 100 | 100 |

- **Oversize oil rings**

The following two types of oversize oil rings are available as optional parts. They bear the following identification marks.

|        |                |
|--------|----------------|
| 0.5 mm | Painted red    |
| 1.0 mm | Painted yellow |

- **Oversize side rail**

Just measure out side diameter.

## PISTON PIN AND PIN BORE

Using a small bore gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the reading exceeds the following limit, replace both piston and piston pin.

### Piston pin bore I.D.

|               |           |
|---------------|-----------|
| Service Limit | 18.035 mm |
|---------------|-----------|

|             |                                  |
|-------------|----------------------------------|
| 09900-22401 | Small bore gauge<br>(10 – 18 mm) |
|-------------|----------------------------------|

Using a micrometer, measure the piston pin outside diameter at three positions.

### Piston pin O.D.

|               |           |
|---------------|-----------|
| Service Limit | 17.980 mm |
|---------------|-----------|

|             |                        |
|-------------|------------------------|
| 09900-20205 | Micrometer (0 – 25 mm) |
|-------------|------------------------|



0.5 mm O.S.

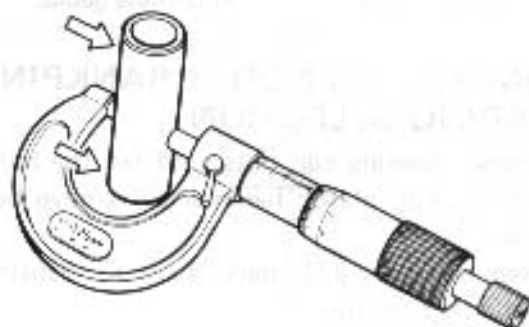
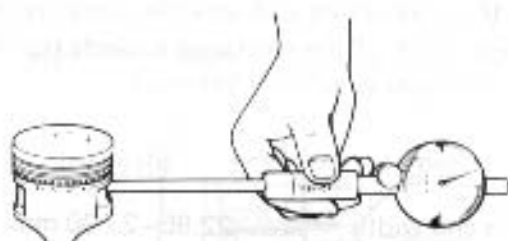


1.0 mm O.S.



Oil ring spacer

Paint



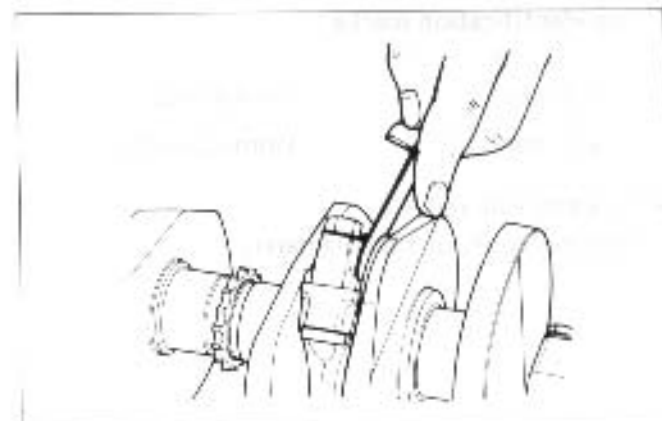
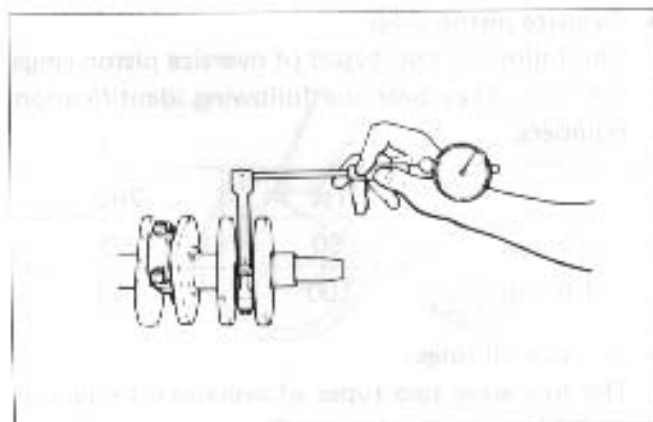
## CONNECTING ROD SMALL END BORE I.D.

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

Connecting rod small end bore I.D.

|          |                  |
|----------|------------------|
| Standard | 18.010–18.018 mm |
|----------|------------------|

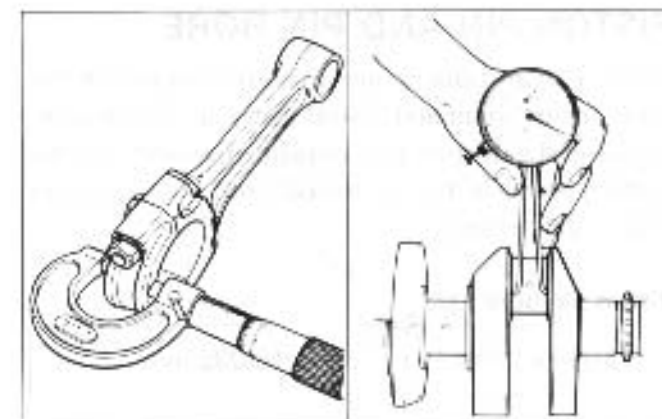
- If the connecting rod small end bore inside diameter exceeds the above-mentioned limit, replace the connecting rod.



## CONNECTING ROD BIG END THRUST CLEARANCE

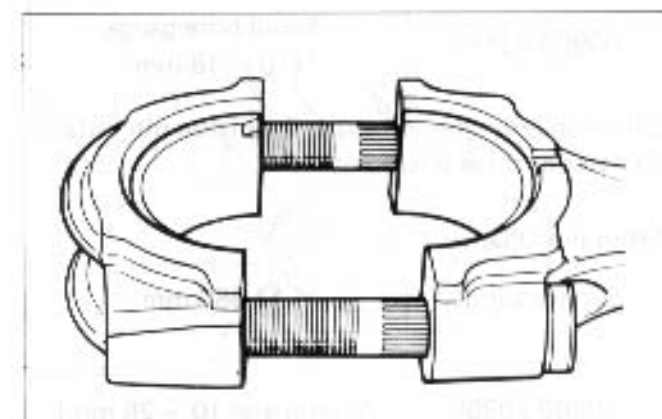
Check the connecting rod side clearance by using thickness gauge. If the clearance exceeds the limit, replace connecting rod or crankshaft.

| Item            | Standard        |
|-----------------|-----------------|
| Big end width   | 22.95–23.00 mm  |
| Crank pin width | 23.10–23.15 mm  |
| 09900-20803     | Thickness gauge |



## CONNECTING ROD–CRANKPIN BEARING SELECTION

- Loosen bearing cap nuts, and tap the bolt end lightly with plastic hammer to remove bearing cap.
- Remove rods, and mark them to identify the cylinder position.
- Inspect bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with specified set of bearings.



**NOTE:**

Never try to remove or loosen the connecting rod cap bolts due to their possible loosening. Once displaced, the bearing cap will not be fitted properly.

- Place plastigauge axially on the crank pin, avoiding oil hole and at the TDC or BDC side as shown.
- Tighten the bearing cap with two-step torque values.

**NOTE:**

When fitting bearing cap to crank pin, be sure to discriminate one end from the other, namely front and rear.

|                           |                             |
|---------------------------|-----------------------------|
| Initial tightening torque | 1.2–1.8 kg·m<br>(12–18 N·m) |
| Final tightening torque   | 3.3–3.7 kg·m<br>(33–37 N·m) |

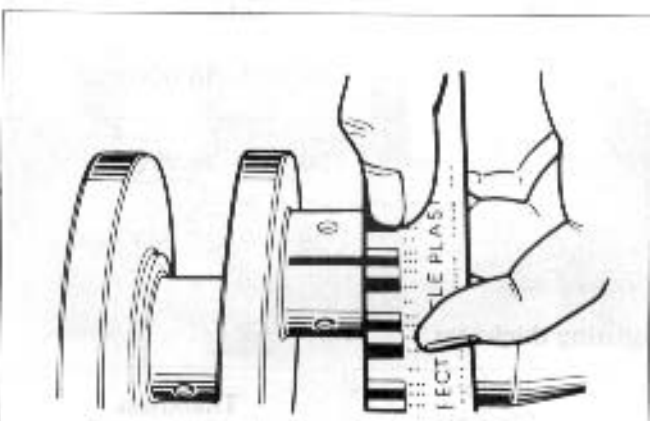
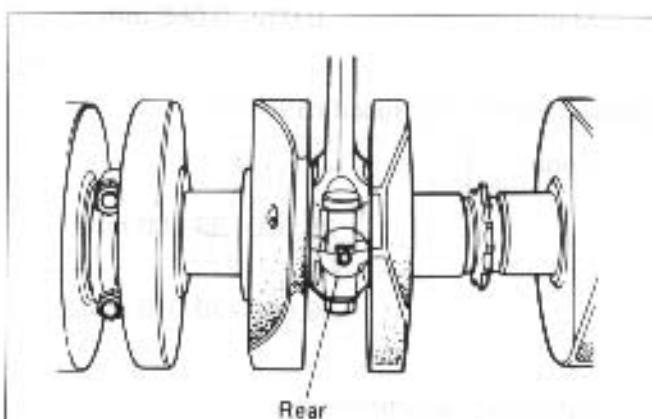
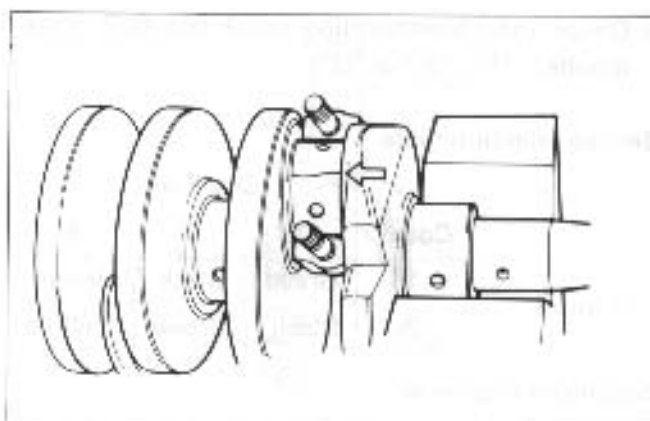
**NOTE:**

Never rotate crankshaft or connecting rod when a piece of Plastigauge is in the clearance.

- Remove the caps, and measure the width of compressed plastigauge with envelop scale. This measurement should be taken at the widest part.

|               |          |
|---------------|----------|
| Service Limit | 0.080 mm |
|---------------|----------|

- If oil clearance is exceeded service limit, select the specified bearings from the following table.
- Check the corresponding rod I.D. code number ①, "1" or "2".



- Check the corresponding crank pin O.D. code number, "1", "2" or "3".

## Bearing selection table

|        | Code | Crank pin |       |        |
|--------|------|-----------|-------|--------|
|        |      | 1         | 2     | 3      |
| Conrod | 1    | Green     | Black | Brown  |
|        | 2    | Black     | Brown | Yellow |

## Bearing oil clearance

|          |                |
|----------|----------------|
| Standard | 0.032–0.056 mm |
|----------|----------------|

## Connecting rod I.D. specification

| Code | I.D.             |
|------|------------------|
| 1    | 39.000–39.008 mm |
| 2    | 39.008–39.016 mm |

## Crank pin O.D. specification

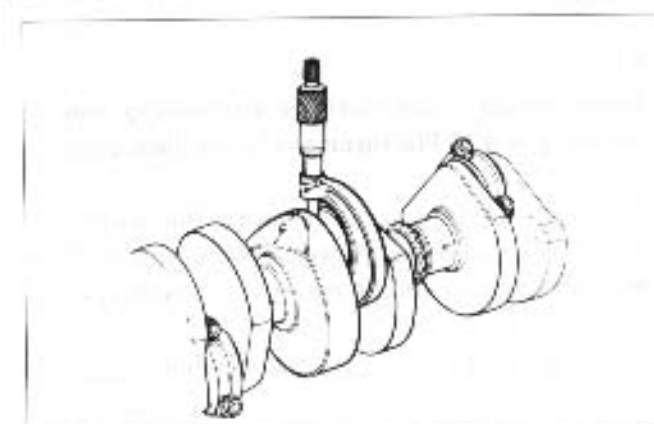
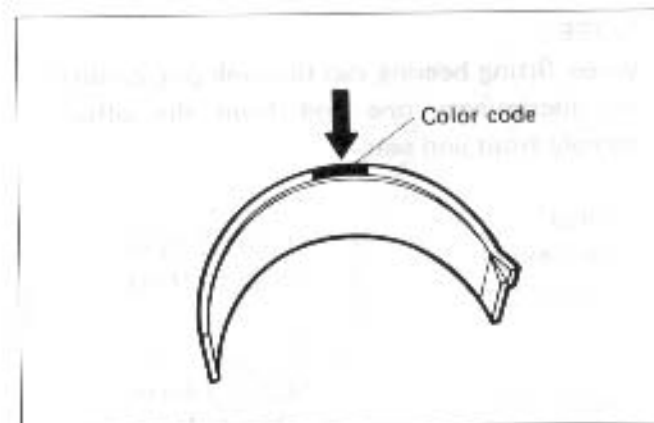
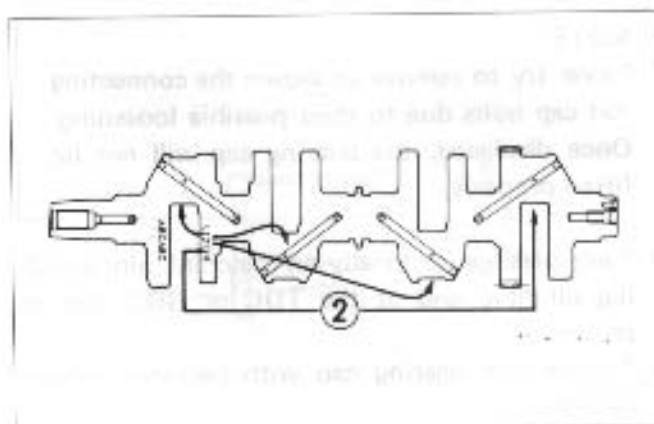
| Code | O.D.             |
|------|------------------|
| 1    | 35.992–36.000 mm |
| 2    | 35.984–35.992 mm |
| 3    | 35.976–35.984 mm |

## Bearing thickness

| Color<br>(Part No.)         | Thickness      |
|-----------------------------|----------------|
| Green<br>(12164-31310-0A0)  | 1.480–1.484 mm |
| Black<br>(12164-31310-0B0)  | 1.484–1.488 mm |
| Brown<br>(12164-31310-0C0)  | 1.488–1.492 mm |
| Yellow<br>(12164-31310-0D0) | 1.492–1.496 mm |

**CAUTION:**

Bearing should be replaced as a set.





## BEARING ASSEMBLY

- When fitting the bearings to the bearing cap and connecting rod, be sure to fix the stopper part first, and press the other end.

- Apply engine oil or SUZUKI Moly Paste to the crank pin and bearing surface.

99000-25140

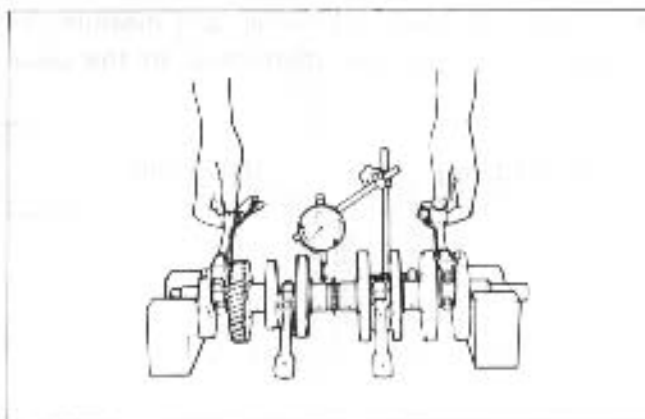
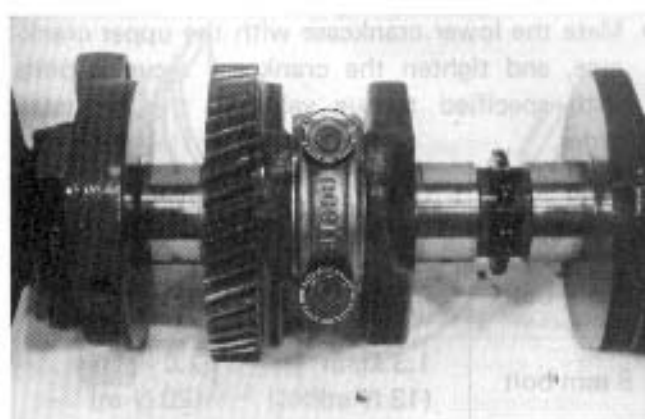
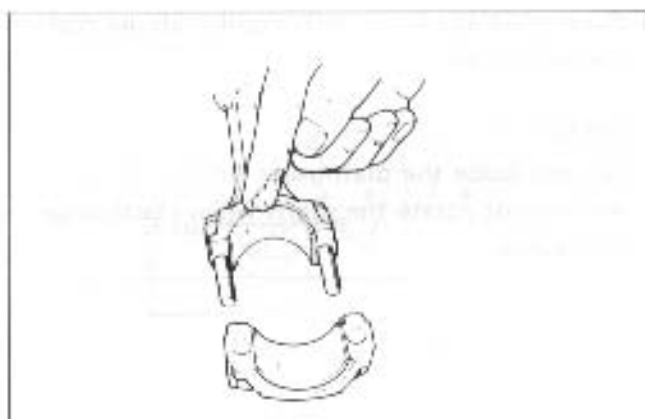
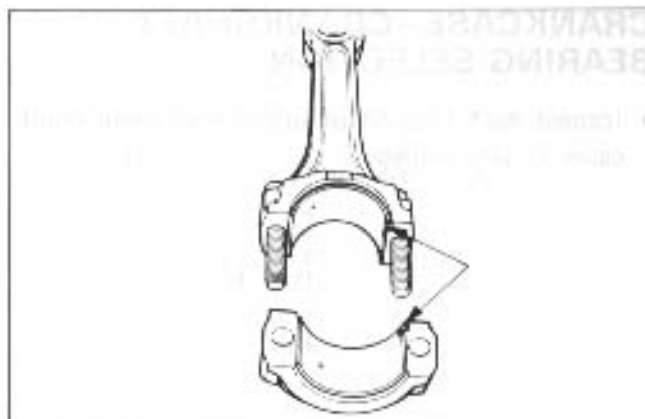
SUZUKI Moly Paste

- Tighten the connecting rod fitting nuts with specified torque.

Tightening torque

3.3–3.7 kg-m  
(33–37 N-m)

- Check the connecting rod for smooth turning.



# CRANKCASE - CRANKSHAFT BEARING SELECTION

- Inspect each bearing of upper and lower crank cases for any damage.

- Place plastigauge on each crankshaft journal in the usual manner.

## NOTE:

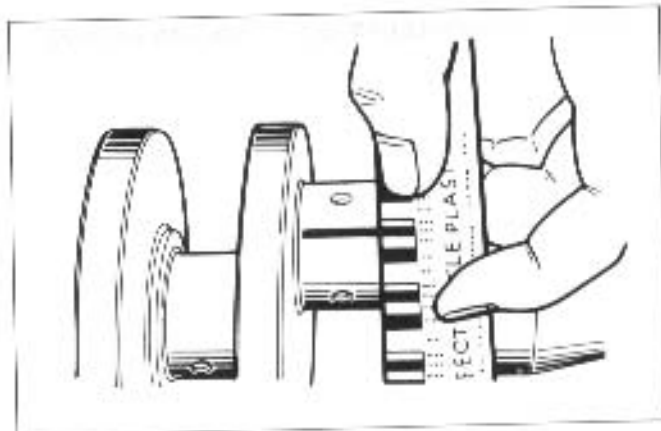
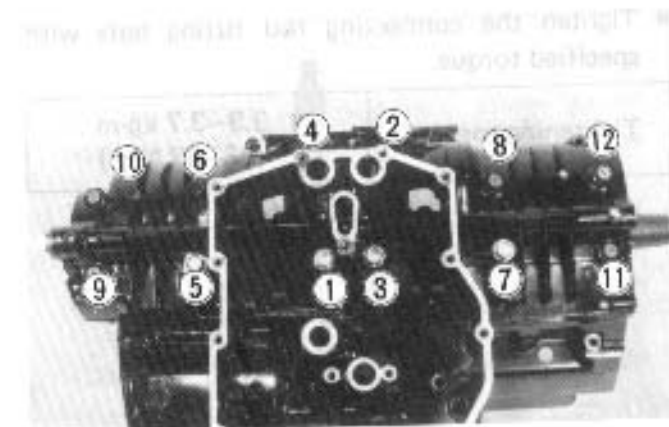
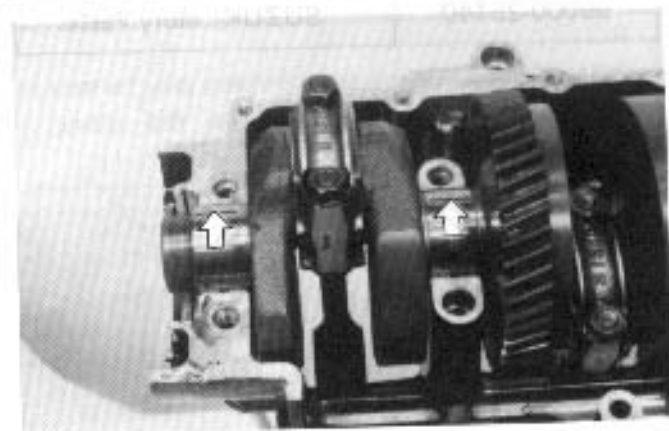
Do not place the plastigauge on the oil hole, and do not rotate the shafts when plastigauge is in place.

- Mate the lower crankcase with the upper crankcase, and tighten the crankcase securing bolts with specified torque value in the indicated order,

|           | Initial Tightening   | Final Tightening     |
|-----------|----------------------|----------------------|
| 6 mm bolt | 0.6 kg-m<br>(6 N·m)  | 1.0 kg-m<br>(10 N·m) |
| 8 mm bolt | 1.3 kg-m<br>(13 N·m) | 2.0 kg-m<br>(20 N·m) |

- Remove the lower crankcase, and measure the width of compressed plastigauge in the usual manner.

|               |          |
|---------------|----------|
| Service Limit | 0.080 mm |
|---------------|----------|



- If the width at the widest part exceeds the limit, replace the set of bearing with new ones by referring to the selection table.
- Check the corresponding crankcase journal I.D. code number ① "A" or "B" which are stamped on the rear of upper crankcase.
- Check the corresponding crankshaft journal O.D. code number ② "A", "B" or "C".

Bearing selection table

|           | Crankshaft |       |       |        |
|-----------|------------|-------|-------|--------|
|           | Code       | A     | B     | C      |
| Crankcase | A          | Green | Black | Brown  |
|           | B          | Black | Brown | Yellow |

Crankcase I.D. specification

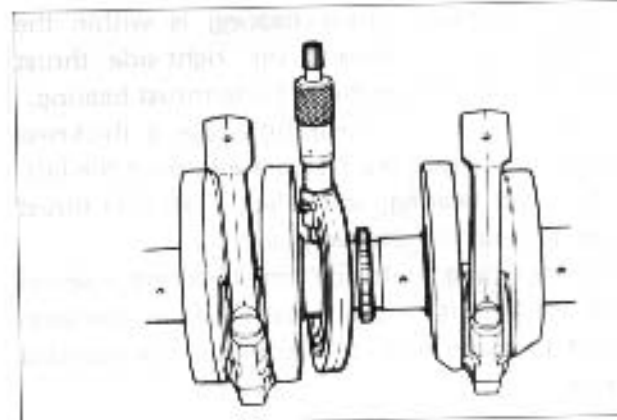
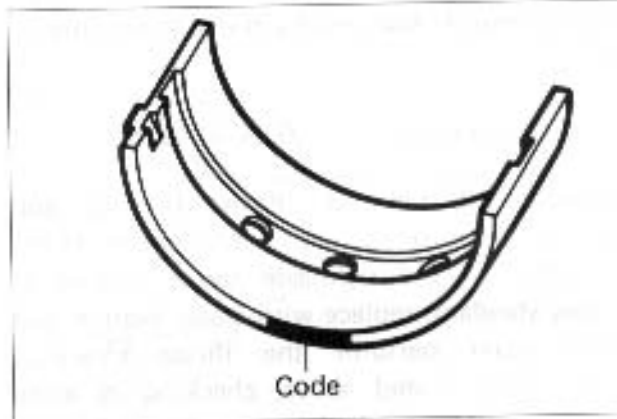
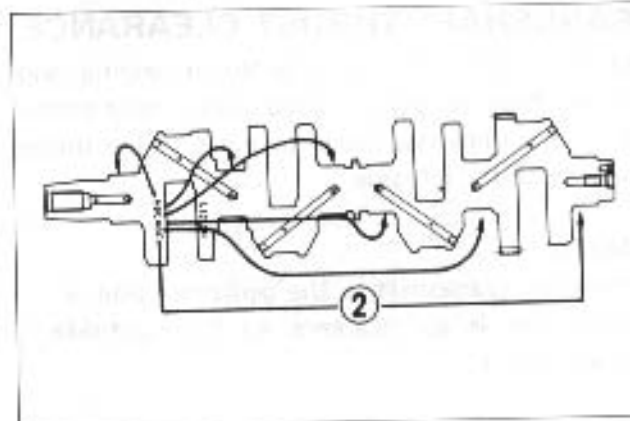
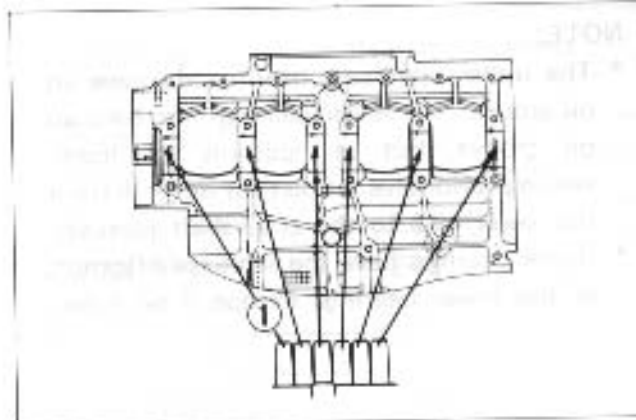
| Code | I.D.             |
|------|------------------|
| A    | 39.000–39.008 mm |
| B    | 39.008–39.016 mm |

Bearing thickness specification

| Color  | Part Number         |                     | Specification<br>Unit : mm |
|--------|---------------------|---------------------|----------------------------|
|        | Upper               | Lower               |                            |
| Green  | 12229-09311<br>-0A0 | 12229-09301<br>-0A0 | 1.486–1.490                |
| Black  | 12229-09311<br>-0B0 | 12229-09301<br>-0B0 | 1.490–1.494                |
| Brown  | 12229-09311<br>-0C0 | 12229-09301<br>-0C0 | 1.494–1.498                |
| Yellow | 12229-09311<br>-0D0 | 12229-09301<br>-0D0 | 1.498–1.502                |

Crankshaft journal O.D. specification

| Code | O.D.             |
|------|------------------|
| A    | 35.992–36.000 mm |
| B    | 35.984–35.992 mm |
| C    | 35.976–35.984 mm |



**NOTE:**

- The upper crankcase bearings do have an oil groove. The lower bearings also have an oil groove, but in addition the lower bearings also have 3 holes for oil flow from the lower case to the crankshaft journals.
- Upper bearings have the same specification as the lower bearings except 3 oil holes.

**CRANKSHAFT THRUST CLEARANCE**

With the crankshaft, right-side thrust bearing, and left-side thrust bearing inserted in the upper crankcase, use a thickness gauge to measure the thrust clearance on the left side.

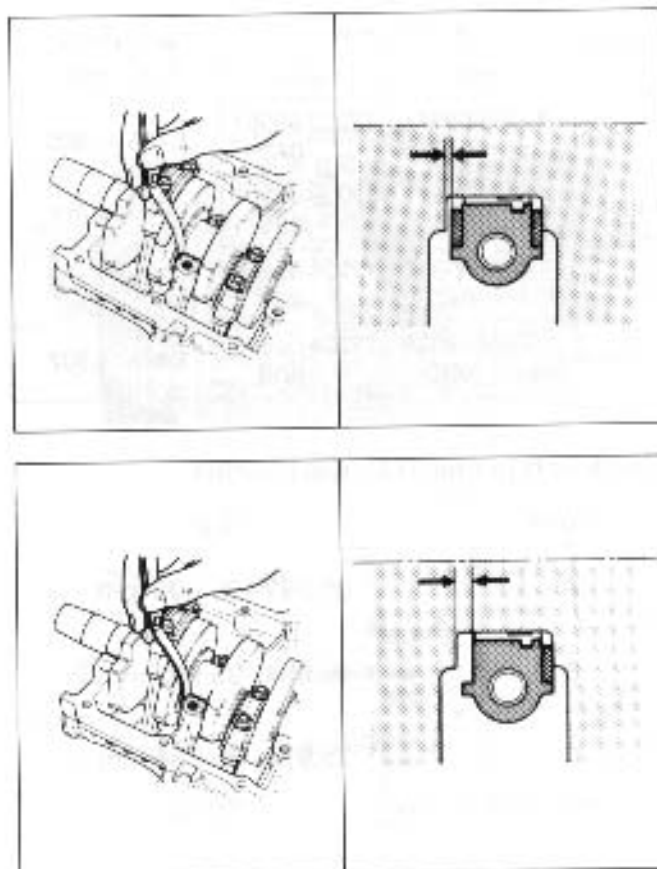
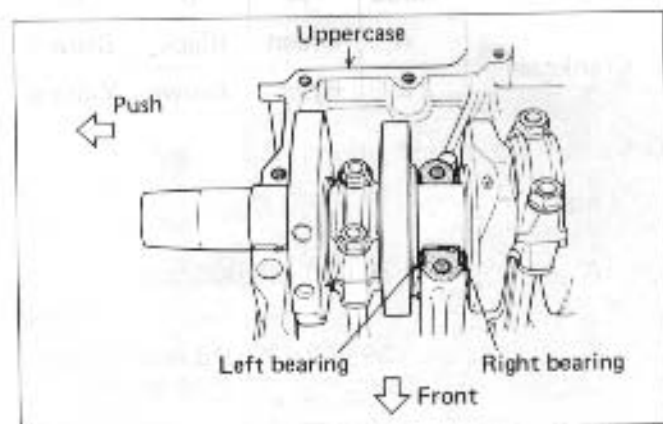
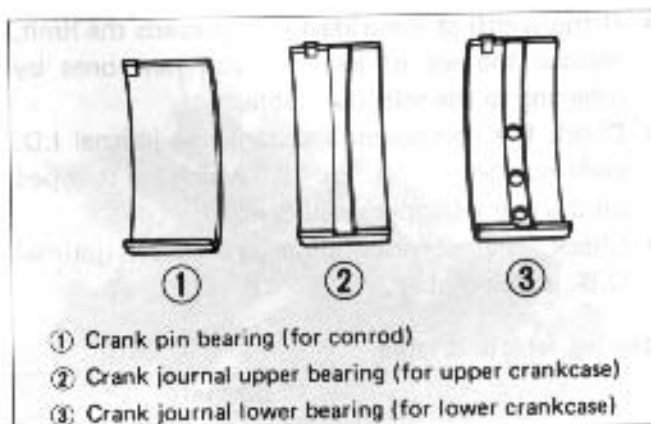
**NOTE:**

Push the crankshaft to the generator side, so that there is no clearance on the right-side thrust bearing.

If the thrust clearance exceeds the standard range, adjust the thrust clearance by the following procedures:

|                  |              |
|------------------|--------------|
| S.T.D. clearance | 0.04–0.08 mm |
|------------------|--------------|

1. Remove the right-side thrust bearing, and measure its thickness with a micrometer. If the thickness of the right-side thrust bearing is below standard, replace with a new bearing, and once again perform the thrust clearance measurement listed above, checking to make sure it is within standards.
2. If the right-side thrust bearing is within the standard range, reinsert the right-side thrust bearing, and remove the left-side thrust bearing.
3. As shown in the illustration, use a thickness gauge to measure the clearance without the left-side thrust bearing, and select a left-side thrust bearing from the selection table.
4. After selecting a left-side thrust bearing, insert it and again perform the thrust clearance measurement to make sure it falls within the standard range.



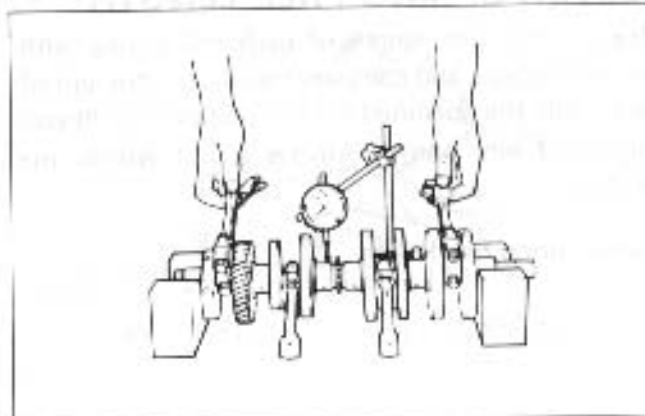
| Clearance without<br>left-side thrust bearing<br>Unit : mm | Color     |            | Bearing<br>Part No. | Bearing Thickness<br>Unit: mm |
|------------------------------------------------------------|-----------|------------|---------------------|-------------------------------|
|                                                            | Left-side | Right-side |                     |                               |
| 2.92-2.94                                                  | Red       | —          | 12228-31301         | 2.86 - 2.88                   |
| 2.94-2.96                                                  | Black     | —          | 12228-31302         | 2.88 - 2.90                   |
| 2.96-2.98                                                  | Blue      | —          | 12228-31303         | 2.90 - 2.92                   |
| 2.98-3.00                                                  | Green     | —          | 12228-31304         | 2.92 - 2.94                   |
| 3.00-3.02                                                  | Yellow    | Yellow     | 12228-31305         | 2.94 - 2.96                   |
| 3.02-3.04                                                  | White     | —          | 12228-31306         | 2.96 - 2.98                   |
| 3.04-3.06                                                  | Brown     | —          | 12228-31307         | 2.98 - 3.00                   |
| 3.06-3.07                                                  | Pink      | —          | 12228-31308         | 3.00 - 3.02                   |

## CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end journal resting on the blocks. Rig up the dial gauge, as shown, and rotate the crankshaft slowly to read the runout. Replace the crankshaft if the runout is greater than the limit.

Crankshaft runout specification

|               |         |
|---------------|---------|
| Service limit | 0.05 mm |
|---------------|---------|

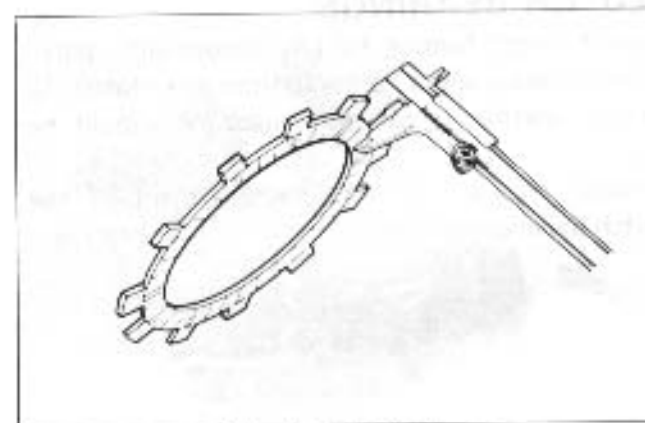


## CLUTCH DRIVE PLATES AND DRIVEN PLATES

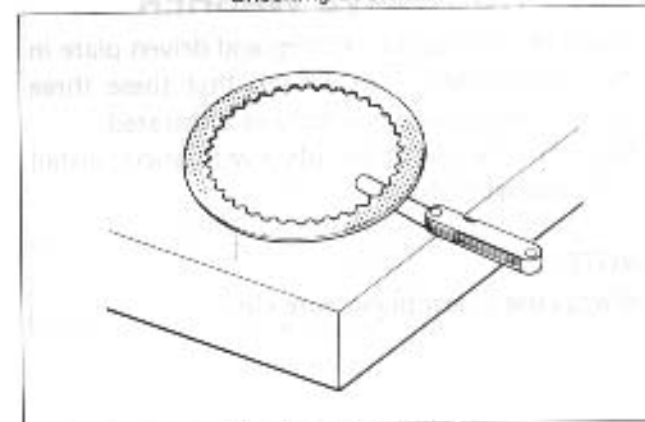
Clutch plates in service remain in oily condition as they are lubricated with oil. Because of this condition, both drive and driven plates are subject to little wearing action and therefore last much longer. Their life depends largely on the quality of oil used in the clutch and also on the way the clutch is operated.

These plates are expendable: they are meant to be replaced when found worn down or distorted to the respective limit: use a caliper to check thickness and a thickness gauge and surface plate to check distortion.

|             |                  |
|-------------|------------------|
| 09900-20102 | Vernier calipers |
| 09900-20803 | Thickness gauge  |



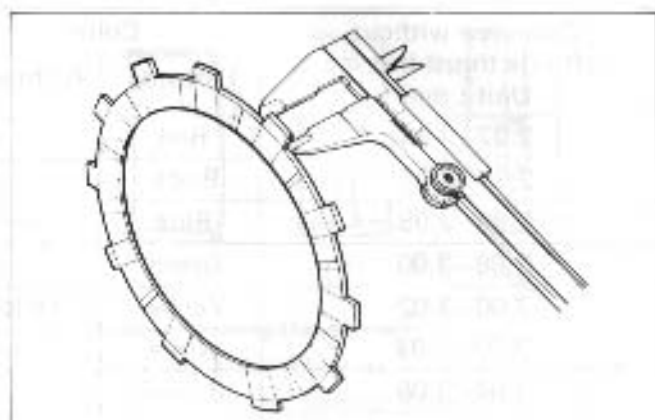
Checking thickness



Checking Claw width



| Service Limit | Unit : mm   |              |
|---------------|-------------|--------------|
|               | Drive plate | Driven plate |
| Thickness     | 2.6         | —            |
| Distortion    | —           | 0.10         |
| Claw width    | 11.2        | —            |



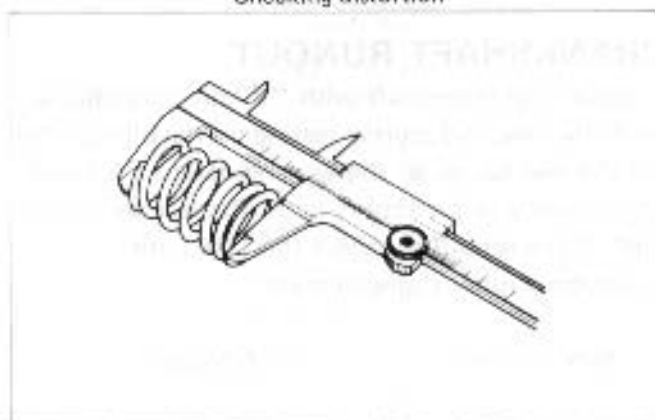
Checking distortion

## CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with vernier calipers, and compare the elastic strength of each with the specified limit. Replace the all coil springs, if any one of springs is not within the limit.

### Clutch spring free length

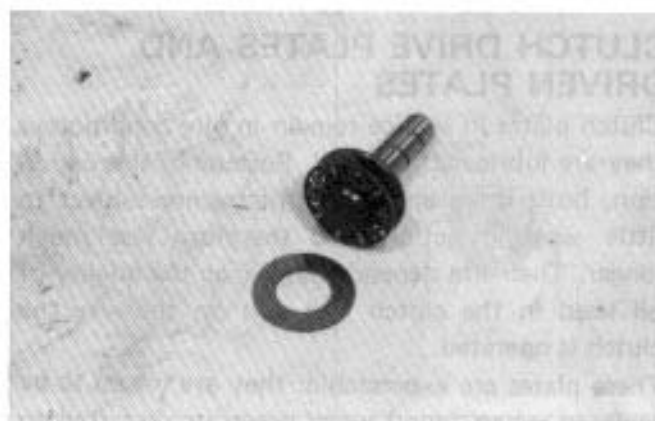
|               |          |
|---------------|----------|
| Service Limit | 33.97 mm |
|---------------|----------|



## CLUTCH BEARINGS

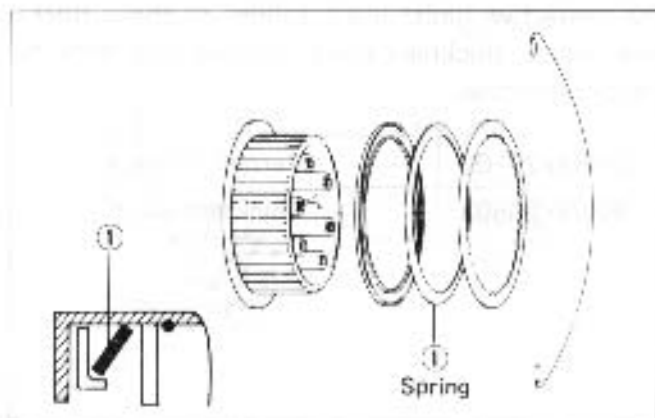
Inspect clutch bearing for any abnormality, particularly cracks, upon removal from the clutch, to decide whether it can be reused or should be replaced.

Smooth engagement and disengagement of the clutch depends much on the condition of bearing.



## SLEEVE HUB WAVE WASHER

- Install the spring seat, spring, and driven plate in the clutch sleeve hub. Check that these three parts are positioned correctly as illustrated. While holding the driven plate with pliers, install the piano wire clip.

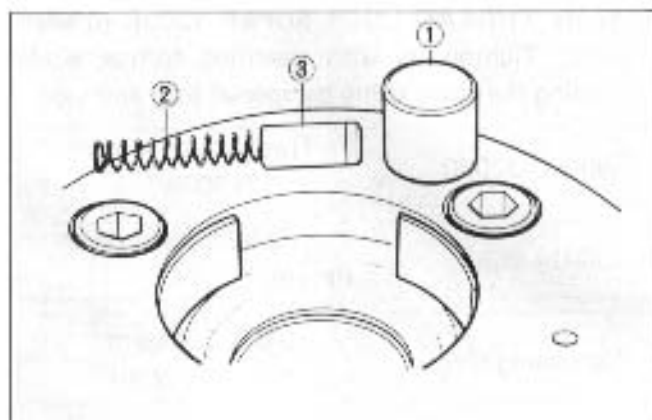


### NOTE:

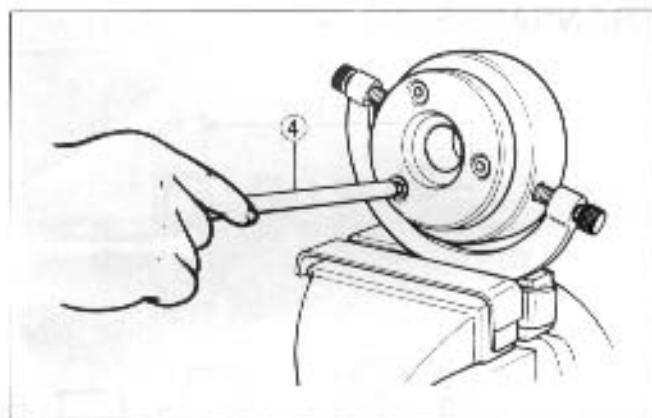
Always use a new piano wire clip.

## STARTER CLUTCH REMOVAL

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



- Clamp the rotor with the special tool and a vise taking care not to damage it and separate starter clutch from the rotor using the T type hexagon wrench ④.



09914-25811

"T" type hexagon  
wrench (6 mm)

09930-44911

Rotor holder

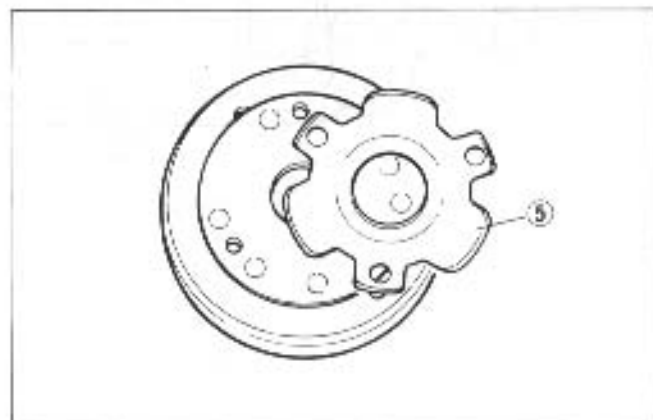
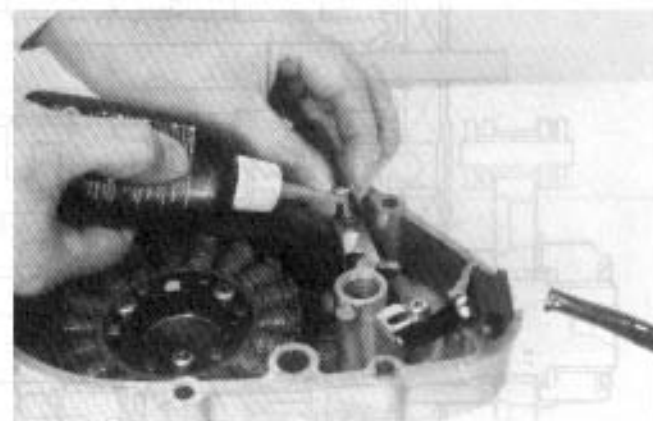
## ASSEMBLY

- Apply THREAD LOCK "1342" (99000-32050) to the stator set screws and its lead wire guide screws.

### NOTE:

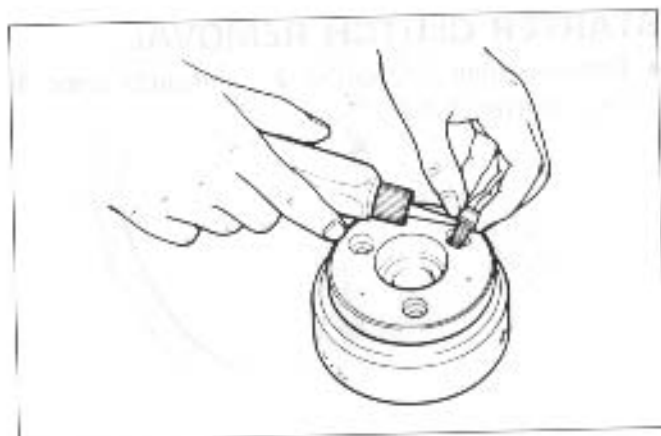
Wipe off oil and grease on screw completely, and then apply the thread lock.

- Mount the lead wire clamp as shown in the photo.
- Locate the shim ⑤ to the proper position.

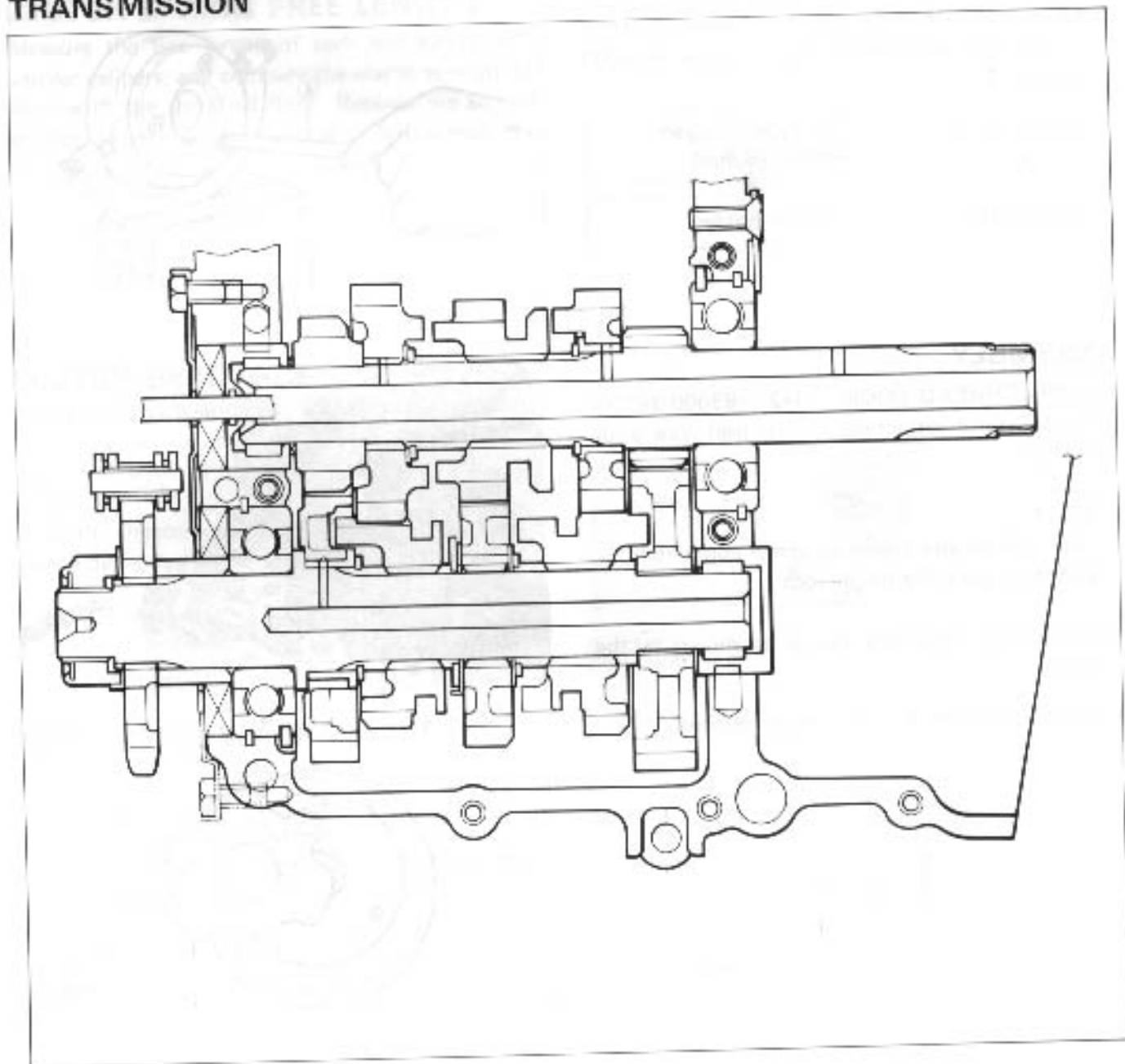


- Apply **THREAD LOCK SUPER 1303B** to allen bolts. Tighten its with specified torque while holding the rotor using by special tool and vice.

|                   |                                 |
|-------------------|---------------------------------|
| 99000-32030       | Thread lock super<br>"1303B"    |
| 09914-25811       | T-type hexagon wrench<br>(6 mm) |
| Tightening torque | 2.3 – 2.8 kg-m<br>(23 – 28 N-m) |



## TRANSMISSION



## OIL PUMP

### CAUTION:

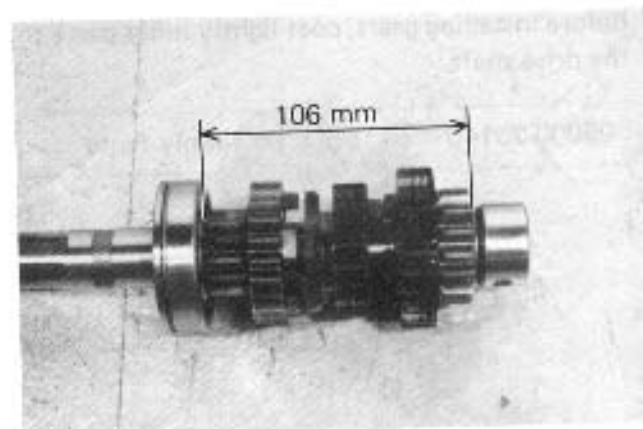
The oil pump case securing screw is applied with **SUZUKI THREAD LOCK SUPER "1303B"**. If an attempt is made to overhaul the oil pump assembly, the screw may be damaged. As a replacement, only the oil pump unit is available.

## MOUNTING 2ND DRIVE GEAR

Force-fit 2nd drive gear to a position where the distance between this drive gear and the 1st drive gear assumes the value indicated:

### NOTE:

- \* Before mounting 2nd drive gear, apply **THREAD LOCK SUPER 1303B** to its bore, taking care not to smear Top drive gear with "SUPER 1303B".
- \* After mounting the 2nd drive gear, check that Top drive gear spins smoothly by moving it with your fingers.
- \* 2nd drive gear may be replaced twice before it becomes necessary to also replace the countershaft.



## SHIFT FORK - GROOVE CLEARANCE

Using a thickness gauge, check the shifting fork clearance in the groove of its gear.

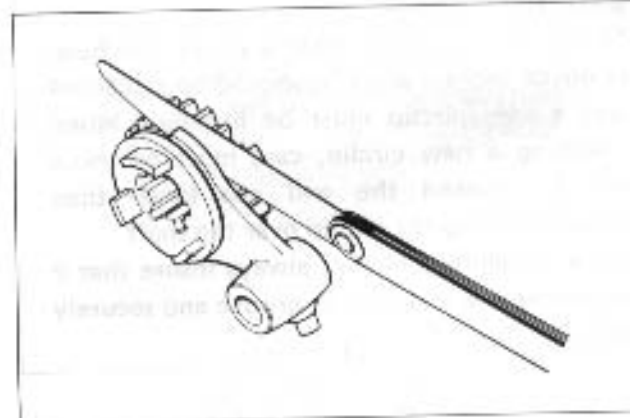
This clearance for each of the three shifting forks plays an important role in the smoothness and positiveness of shifting action.

If the clearance checked is noted to exceed the limit specified, replace the fork or its gear, or both.

|             |                 |
|-------------|-----------------|
| 09900-20803 | Thickness gauge |
|-------------|-----------------|

### Shift fork-Groove clearance

|       |                              | Service Limit |
|-------|------------------------------|---------------|
| No. 1 | for 4th and 5th driven gears | 0.50 mm       |
| No. 2 | for 3rd drive gear           |               |



### Shift fork groove width

|          |                |
|----------|----------------|
| Standard | 5.50 - 5.60 mm |
|----------|----------------|

### Shift fork thickness

|          |                |
|----------|----------------|
| Standard | 5.30 - 5.40 mm |
|----------|----------------|

## DRIVEN GEAR REASSEMBLY

- Fix O-ring ① to the drive shaft and apply thread lock cement to the inner surface of engine sprocket spacer ②.

99000-32040

Thread lock cement

- Before installing gears, coat lightly moly paste to the drive shaft.

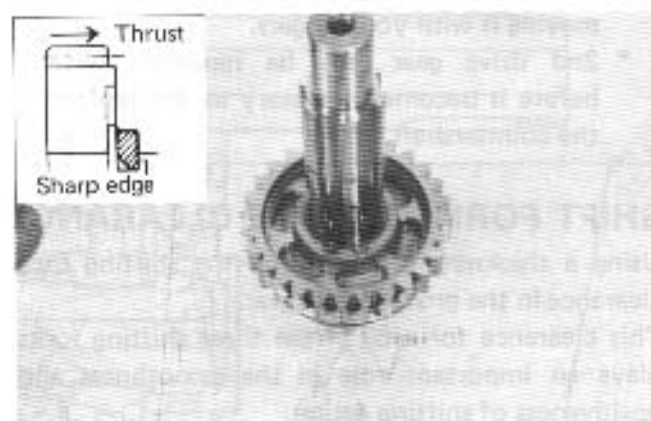
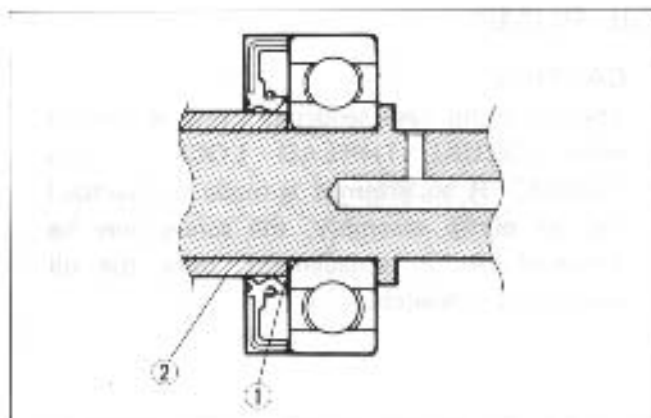
99000-25140

SUZUKI Moly Paste

- When mounting circlip, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in the figure with the rounded side against the gear surface.

### 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.

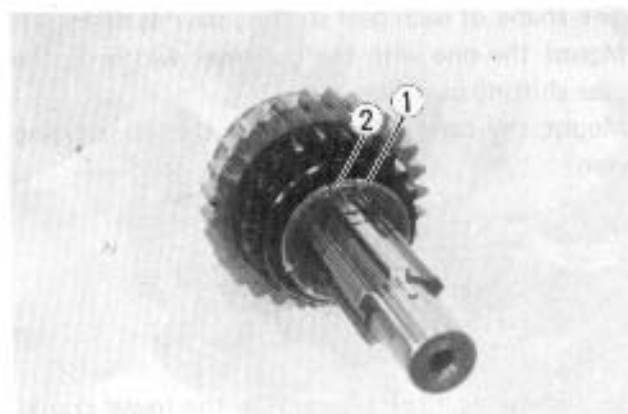
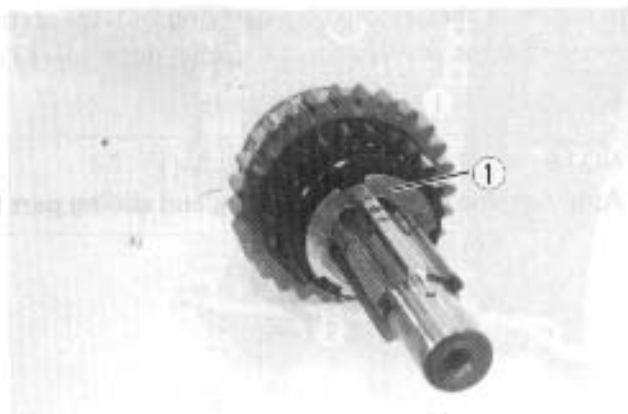




## TOP DRIVEN GEAR

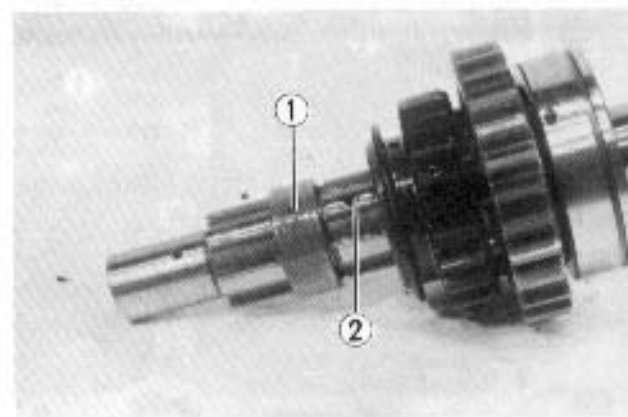
When mounting the top driven gear on the drive shaft, insert lock washer No. 2 ① into the drive shaft, and turn to fit it into the groove. Then, fit the lock washer No.1 ② in the lock washer No.2

①



## 3RD DRIVEN GEAR

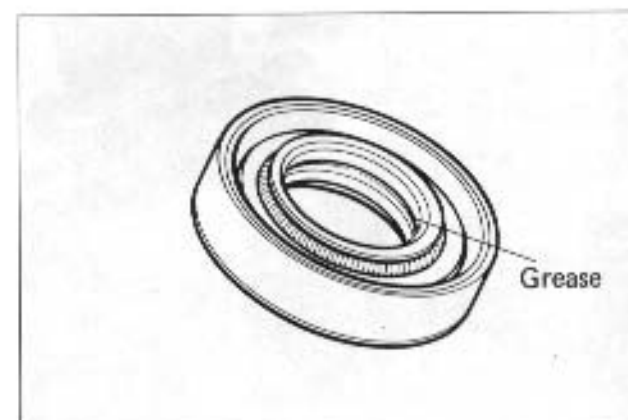
- When installing the 3rd driven gear bushing, align its oil hole ① with drive shaft oil hole ②.



- Coat SUZUKI super grease "A" to the lip of oil seal.

99000-25010

SUZUKI Super grease "A"



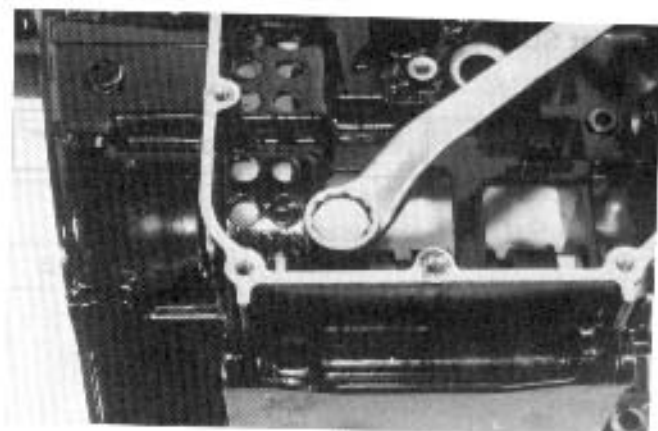
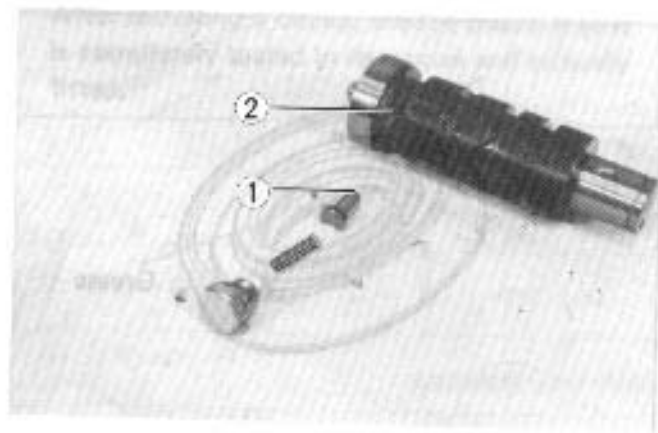
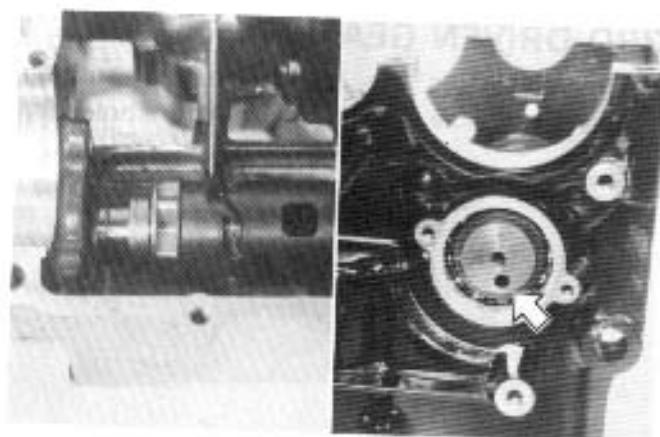
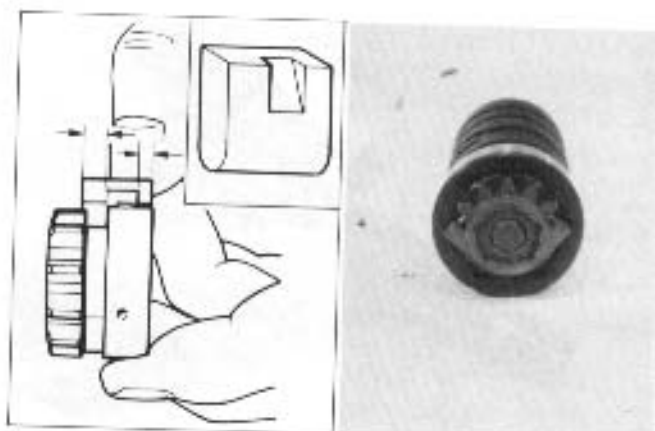
## ENGINE REASSEMBLY

The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special descriptions or precautionary measures.

### NOTE:

Apply engine oil to each running and sliding part before reinstalling.

- The shape of each gear shifting pawl is different. Mount the one with the narrower width on the gear shifting cam side.
- Mount the cam driven gear to the gearshifting cam.
- Mount the gearshifting cam on the lower crankcase. Then, install the stopper plate, spacer and thrust washer. Position the gearshifting cam using by the circlip.
- Install the gearshifting cam with the dent for the neutral stopper directed downward, and meet the neutral stopper ① with this dent ②.

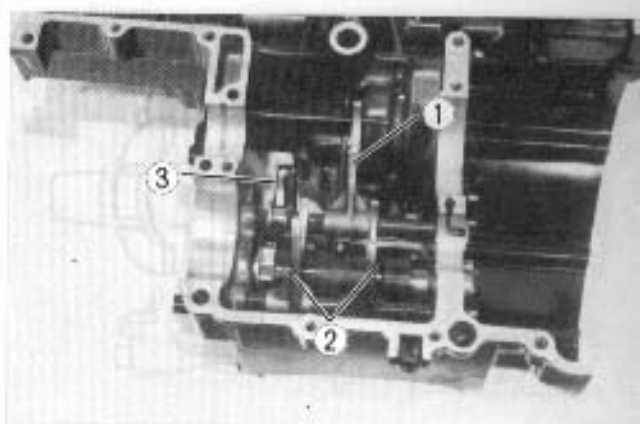


- Refer to the following figure in regard to the correct positions and orientations of the forks when installing these parts.

- ① Gear shifting fork for 3rd drive gear.
- ② Gear shifting forks for 4th and 5th driven gears.
- ③ Cam stopper.

**NOTE:**

Hitch the cam stopper spring to the correct position.

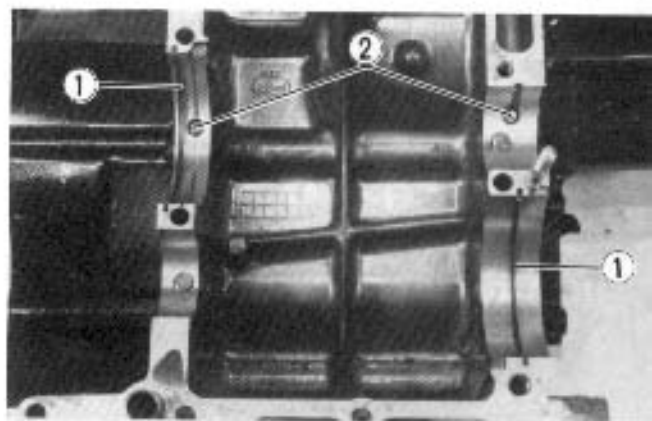


- Install both gearshift cam guide and gearshift pawl screws (overall length 12mm) with applying thread lock "1342".

99000-32050

Thread lock "1342"

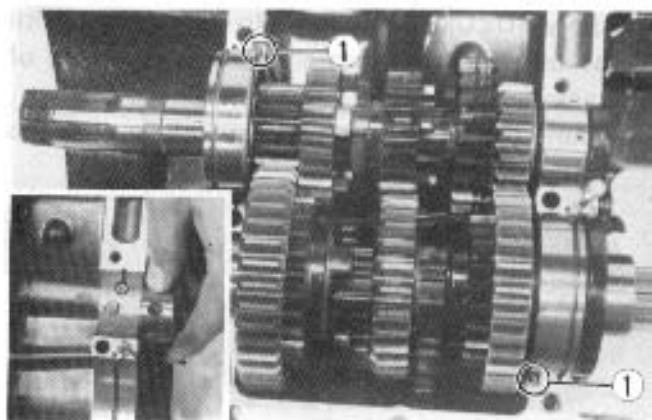
- Install two C-rings ① to the upper crankcase.
- Check the two jet ② fitted on the upper crankcase for clogging.



- Mount both counter and drive shafts on the upper crankcase.

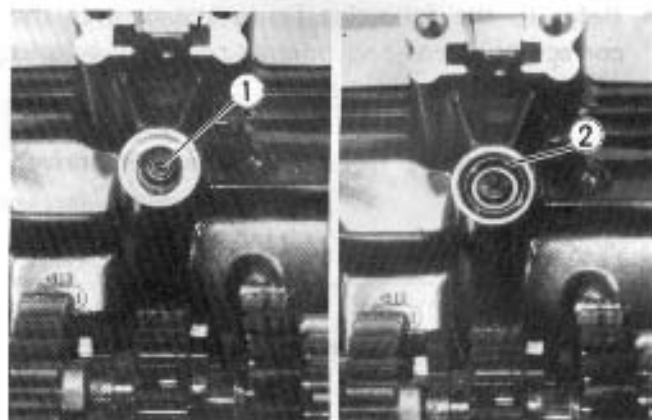
**NOTE:**

Be sure to install the bearing dowel pins ① in the respective positions.



## FINISHING UP ASSEMBLY

- Check plunger ① for clogging. Locate the O-ring ② and washer ③ to the respective position.



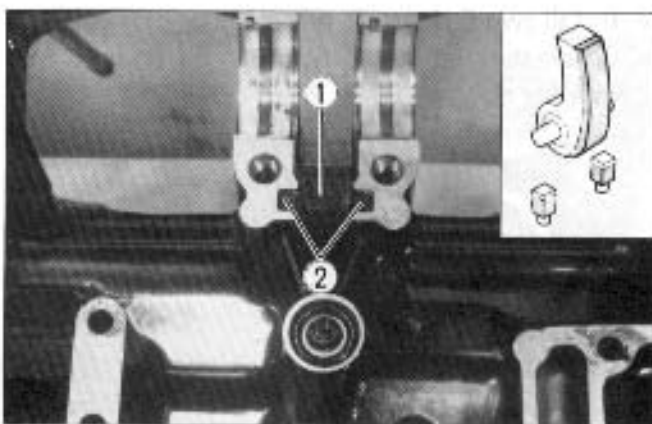
- When fitting the bearings to the crankcase, be sure to fix the stopper part ① first and press the other end.

**CAUTION:**

**Do not touch the bearing surfaces with your hands. Grasp by the edge of the bearing shell.**



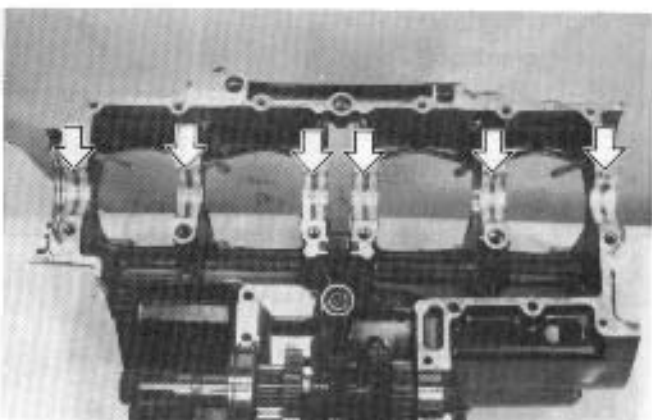
- Place cam chain guide ① properly, and fix two dampers ② so that iron side faces to the chain guide pin (inside).



- Apply SUZUKI Moly Paste to each bearing with the camel's hair brush and journal portions of crankshaft.
- Mount the crankshaft with cam drive chain to the upper crankcase.

99000-25140

SUZUKI Moly Paste



- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Apply SUZUKI BOND No. 1207B to the mating surface of the lower crankcase in the following procedure.

99000-31140

Suzuki Bond No. 1207B

**NOTE:**

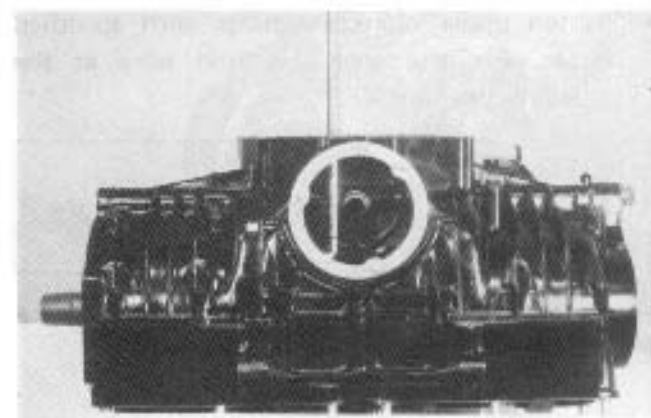
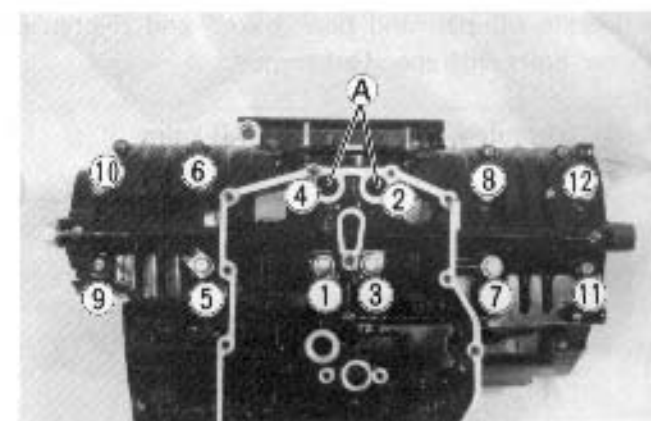
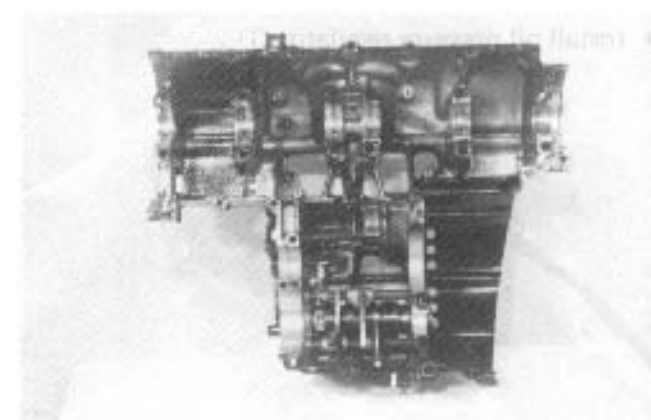
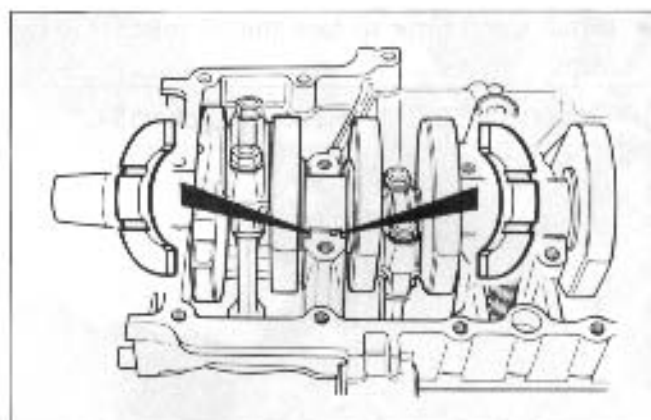
Use of SUZUKI BOND No. 1207B is as follows:

- \* Make surfaces free from moisture, oil, dust and other foreign materials.
  - \* Spread on surfaces thinly to form an even layer, and match the upper and lower cases within 5 minutes.
  - \* Take extreme care not to apply any bond No. 1207B to the bearing surfaces.
  - \* Apply to distorted surface as it forms a comparatively thick film.
- Locate the two allen bolts at position (A) and ten 8 mm bolts.
  - When securing the lower crankcase, tighten the 8-mm bolts and the 6-mm bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten all the securing bolts to the specified torque values.

09914-25811

6 mm T-type hexagon wrench

| Tightening torque | Initial tightening |     | Final tightening |     |
|-------------------|--------------------|-----|------------------|-----|
|                   | kg-m               | N-m | kg-m             | N-m |
| 6mm bolt          | 0.6                | 6   | 1.0              | 10  |
| 8mm bolt          | 1.3                | 13  | 2.0              | 20  |

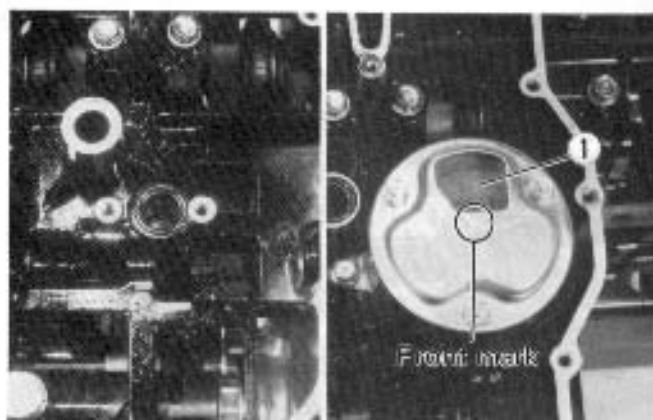




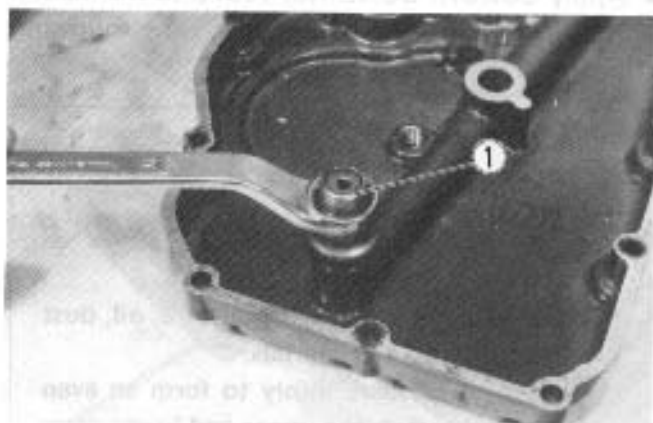
- Install sump filter to face the oil inlet ① to the front.

99000-32050

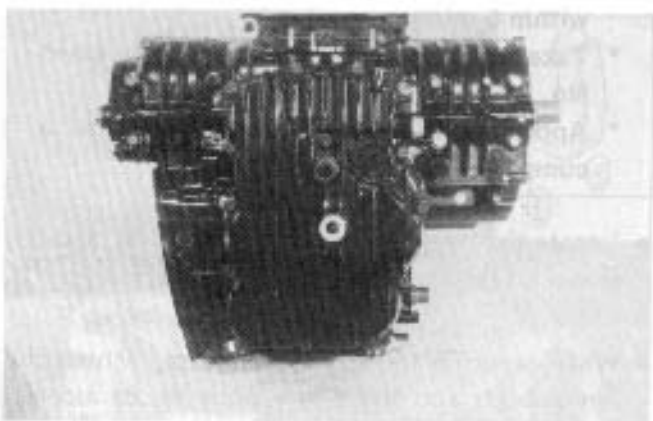
Thread Lock "1342"



- Install oil pressure regulator ①.



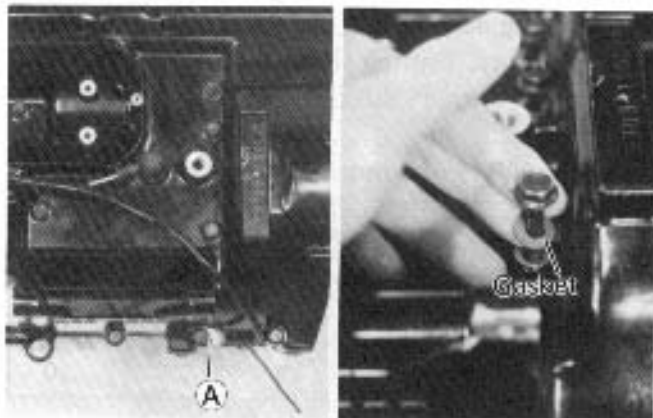
- Locate oil pan and new gasket, and tighten 6 mm bolts with specified torque.

Tightening  
torque1.0 kg-m  
(10 N-m)

- Tighten upper crankcase bolts with specified torque. Fix the engine ground wire at the respective position ①.

**NOTE:**

Do not forget the gasket as shown in the photo.



- Mount starter motor, and route the lead wire properly.

99000-32050

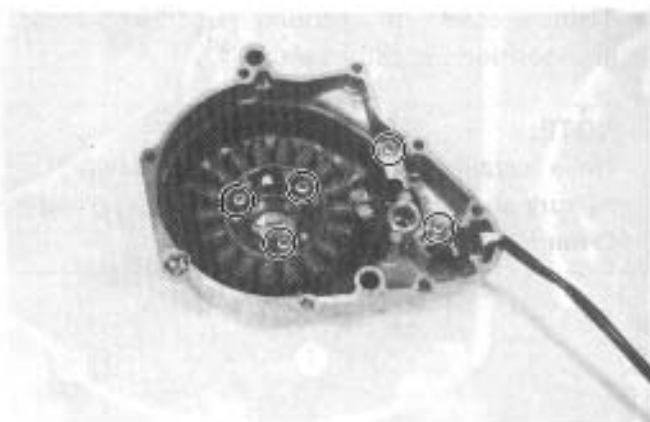
Thread lock "1342"



- Fit generator stator to generator cover, and route its lead wire correctly with 5 screws applying thread lock cement "1342".

99000-32050

Thread lock "1342"



- Degrease the tapered portion of the rotor and also the crankshaft. Use nonflammable cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.
- After mounting the rotor, secure the rotor by tightening the center bolt to the specified torque value.

Tightening torque

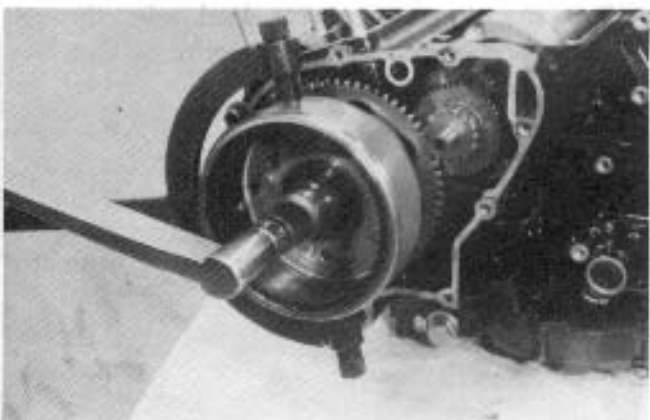
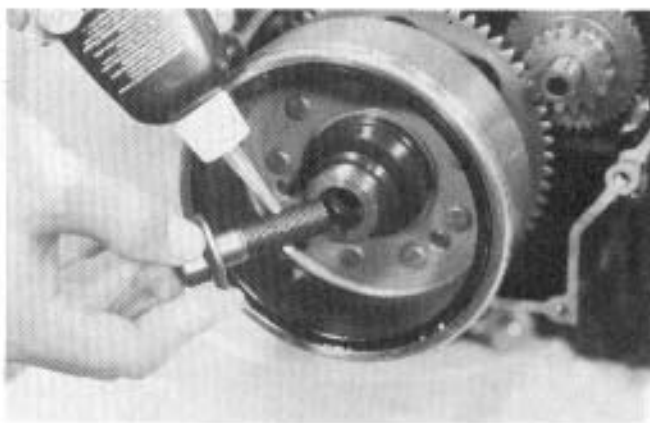
14.0–16.0 kg-m  
(140–160 N·m)

09930-44911

Rotor holder

99000-32100

Thread lock super "1305"



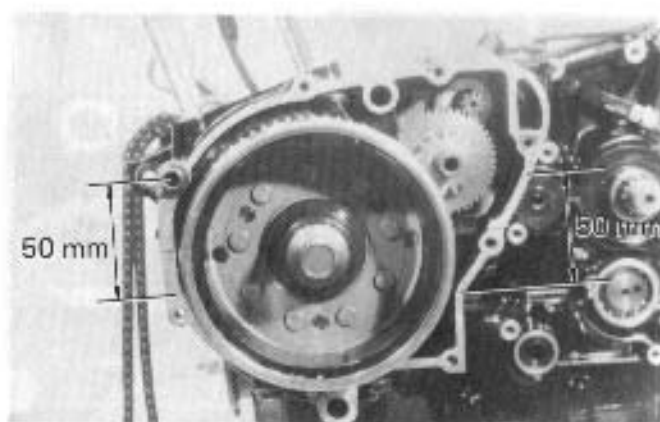
- Coat SUZUKI Bond No. 1207B lightly to the portion around mating surface between upper and lower crankcase as shown.

99000-31140

SUZUKI Bond No. 1207B

**NOTE:**

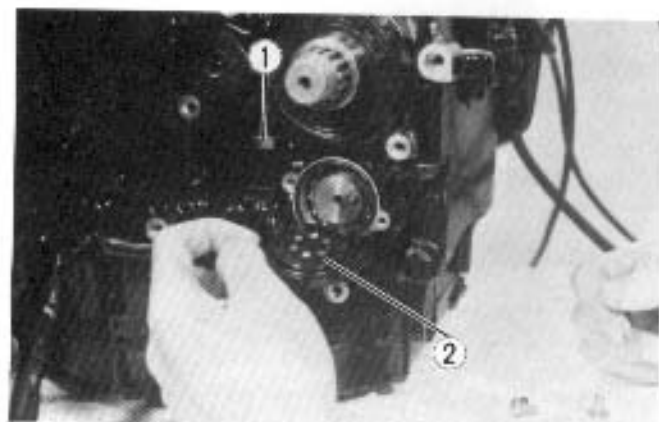
Do not forget the gasket.



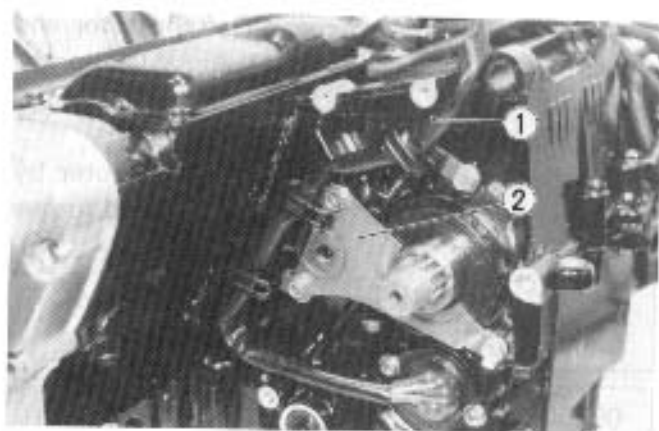
- Tighten crankcase securing nut ① and install gear position indicator switch ②.

**NOTE:**

When installing gear position indicator switch, be sure to locate spring, switch contact, and O-ring.



- Route the lead wire ①, and clamp it with countershaft oil seal retainer ②.

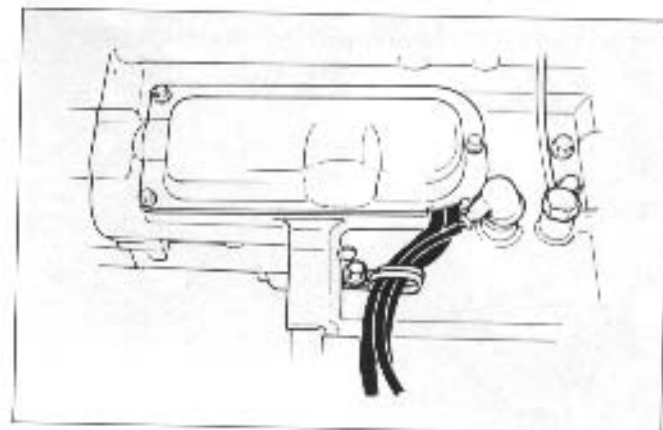


- Pass the generator stator lead wire through gasket and upper crankcase. Route its lead wire properly.

**NOTE:**

Always use new gasket, and install knock pin.

- Clamp the lead wire (starter motor generator and gear position).



- Install the following items.  
Counter shaft bearing retainer screw  
..... 3 pcs (overall length 16 mm)

99000-32050

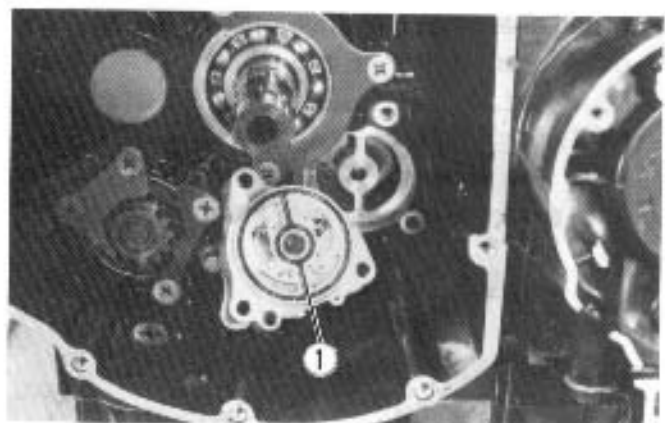
Thread lock "1342"



- Install oil pump assembly without fail to install O-ring ①.
- Apply the thread lock 1342 to bolts.

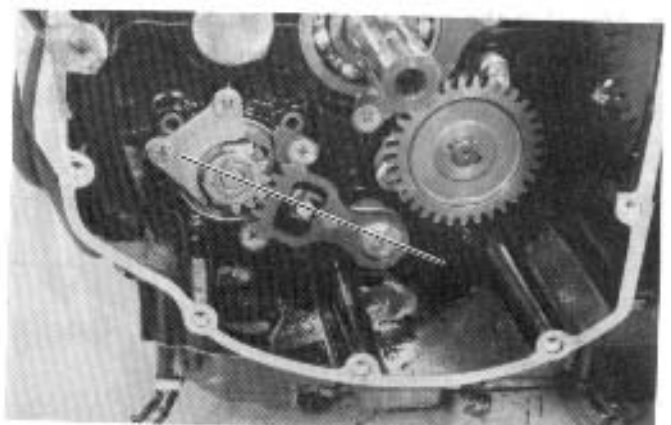
99000-32050

Thread lock "1342"

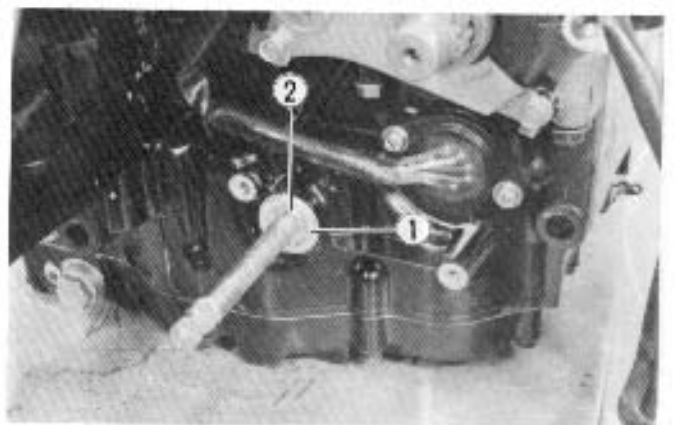


- Install the oil pump driven gear ① with positioning pin and circlip by using snap ring pliers.

- Install the gearshift shaft with the center of the gear on shaft side aligned the center of gearshift cam driven gear.



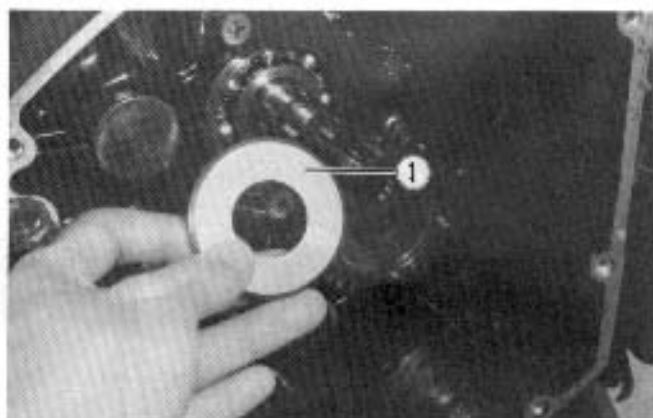
- Fix washer ① and clip ② to the gearshift shaft.



- Install the washer ①.

**NOTE:**

The chamfered end of the washer ① should be faced inward, (to the countershaft bearing side).



- Install the oil pump drive gear on the primary driven gear.

**NOTE:**

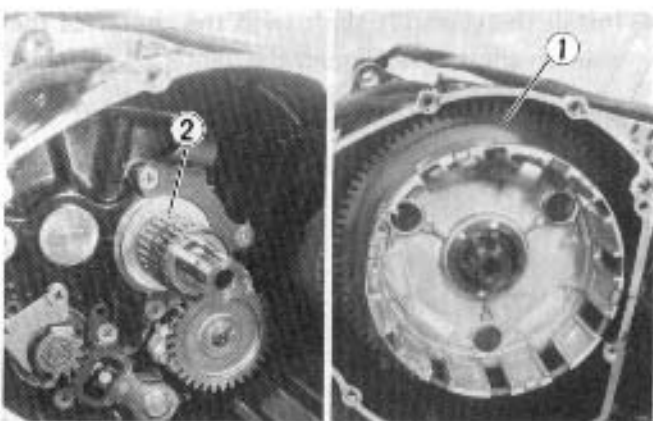
Align the knockpin of primary driven gear with groove of oil pump drive gear.



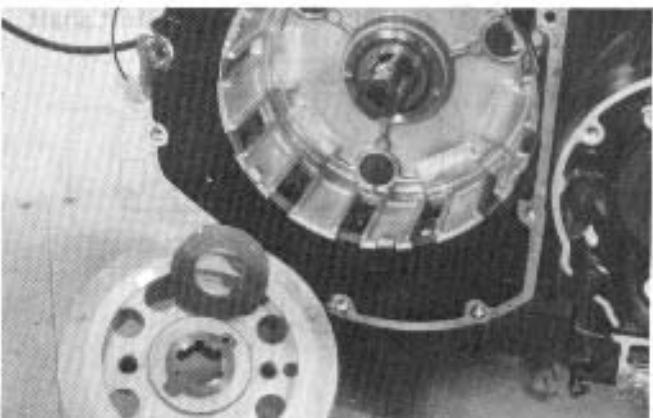
- Assemble the primary driven gear ①, and apply engine oil to the needle bearing ② and its spacer with oil groove facing inside.

**NOTE:**

Check that the rubber damper plug is in position behind the clutch hub.



- Install the thrust washer and clutch sleeve hub.

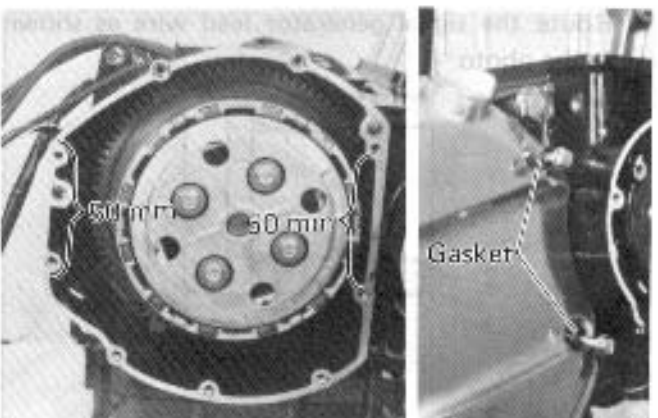
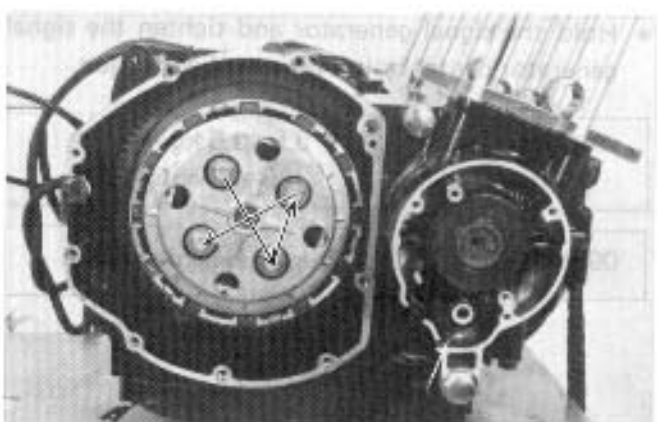
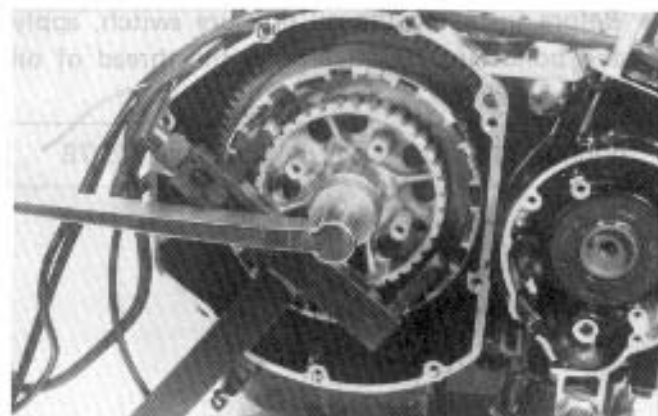




- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the washer. Tightening torque for the nut is specified.

|                                          |                             |
|------------------------------------------|-----------------------------|
| Clutch sleeve hub nut tightening torque: | 5.0–7.0 kg-m<br>(50–70 N·m) |
|------------------------------------------|-----------------------------|

|             |                      |
|-------------|----------------------|
| 09920-53710 | Clutch sleeve holder |
|-------------|----------------------|



- Insert clutch driven plate and drive plate on by one into sleeve hub in the prescribed order, cork plate first. Insert clutch release rack, bearing and thrust washer into countershaft, making sure that the thrust washer is between the bearing and the pressure plate. Then fit pressure plate into sleeve hub.

- Tighten clutch spring bolts in the order shown in the photo.

**NOTE:**

Tighten the clutch spring set bolts in the manner indicated, tightening them by degrees until they attain a uniform tightness.

|                                       |                             |
|---------------------------------------|-----------------------------|
| Clutch spring bolt tightening torque: | 1.1–1.3 kg-m<br>(11–13 N·m) |
|---------------------------------------|-----------------------------|

- Coat SUZUKI Bond No. 1207B lightly to the portion around mating surface between crank-cases as shown.

|             |                       |
|-------------|-----------------------|
| 99000-31140 | SUZUKI Bond No. 1207B |
|-------------|-----------------------|

- Replace clutch cover gasket with new one to prevent oil leakage.

**NOTE:**

Do not forget the gasket.

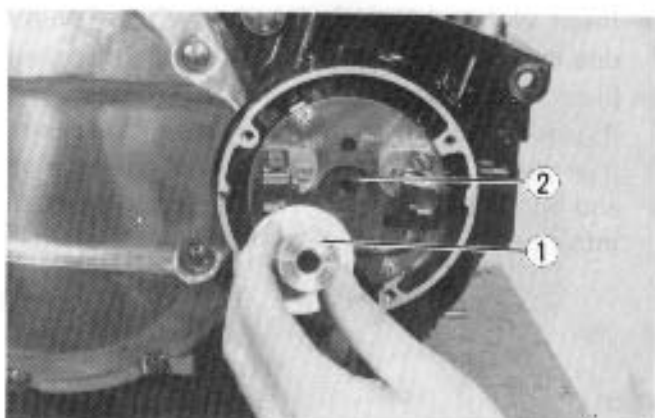
- Before installing the oil pressure switch, apply the bond No. 1207B around the thread of oil pressure switch.

99000-31140

SUZUKI bond No. 1207B



- Make sure to fit the slot ① on the back surface of signal generator over the locating pin ② at the end of crankshaft.

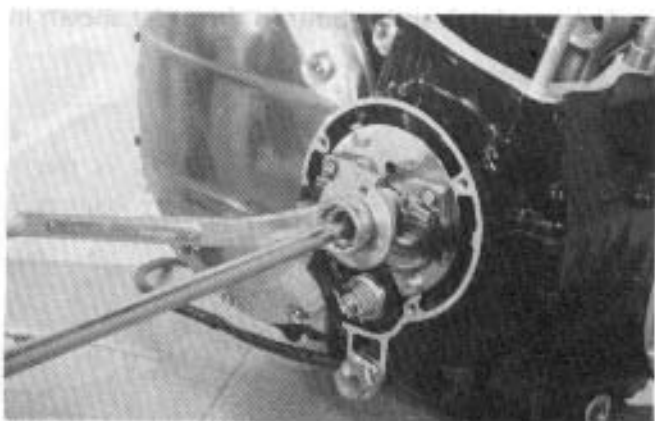


- Hold the signal generator and tighten the signal generator center bolt with specified torque.

Tightening  
torque2.5–3.5 kg-m  
(25–35 N-m)

09914-25811

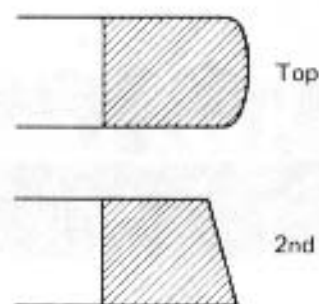
T-type hexagon wrench



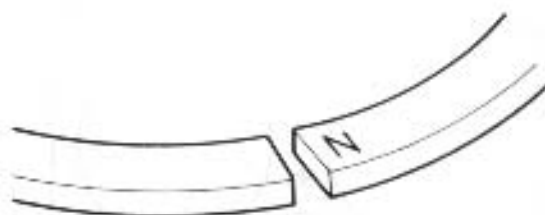
- Route the signal generator lead wire as shown in the photo.



- Mount the piston ring in the order of oil ring, 2nd ring, and top ring.
- Top ring and 2nd (middle) 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 (middle) rings have letter "N" or "R" marked on the side. Be sure to bring the marked side to top when fitting them to the piston.



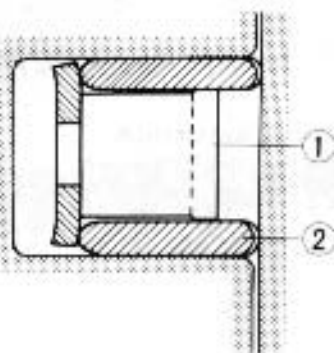
- The spacer of bottom ring (oil ring) is either of "N" type or of "R" type. Be sure that the three rings (top, 2nd, and oil) for a piston are all "N" rings or "R" rings: use of one or two "N" rings and two or one "R" rings on a piston is not permitted.



- The first member to go into the ring groove is spacer ①. After placing spacer, fit the two side rails ②. Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.

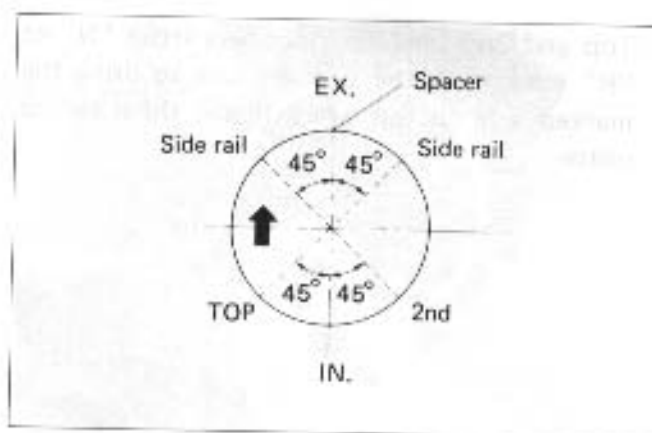
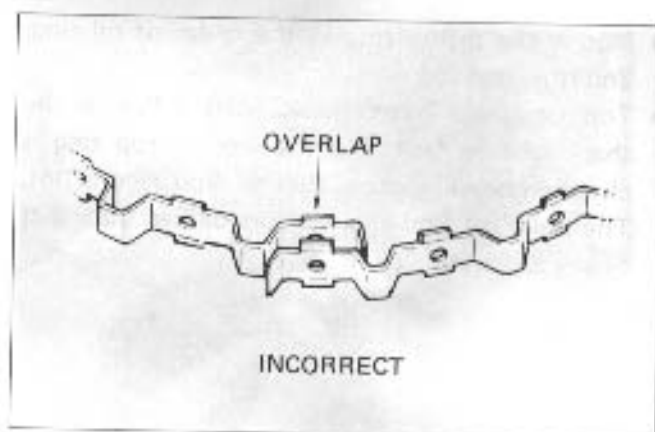
#### CAUTION:

If the spacer is of "N" type, be careful not to allow its two ends to overlap in the groove.

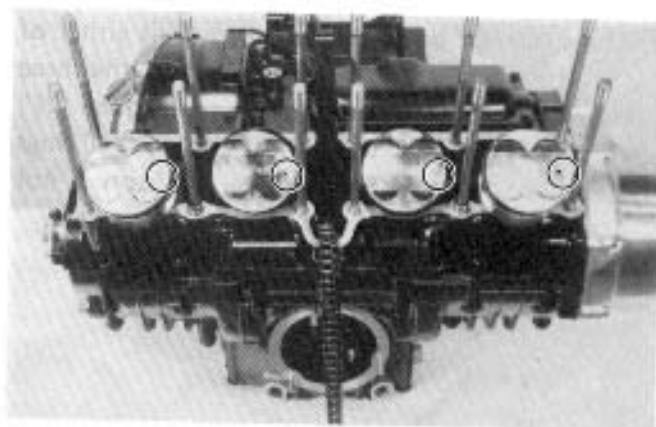




- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



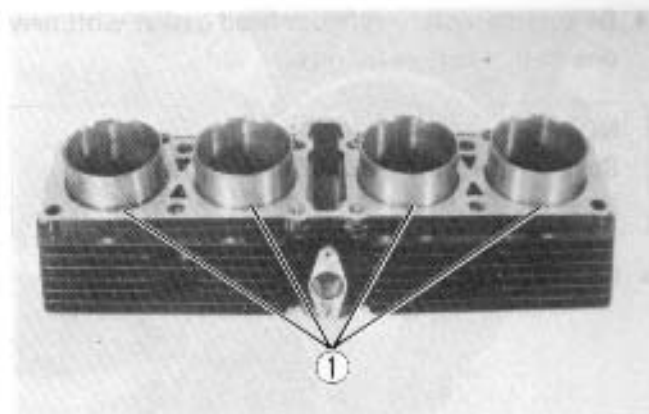
- The piston is in correct position when its arrow (on the crown) points forward.
- Be sure to install the pistons in the cylinder from which they were taken out in disassembly, refer to the letter mark, "1" through "4", scribed on the piston.



- Have each piston oiled lightly before installing it.
- Place a rag beneath the piston, and install the circlips.
- Be sure to use new circlips.



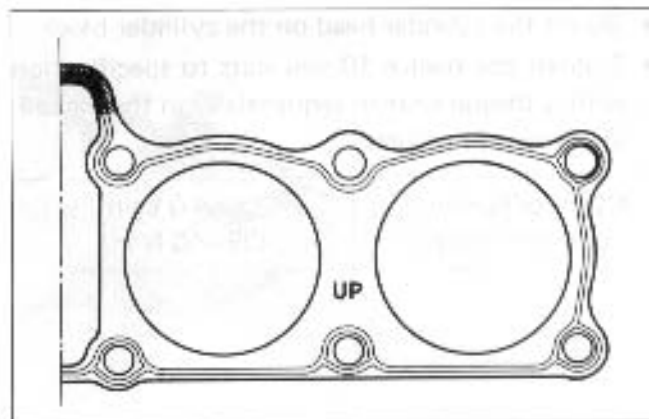
- Before putting on the cylinder block, oil the big and small ends of each connecting rod and also the sliding surface of each piston. Check to be sure that the "O" rings ① are accurately positioned in the groove.



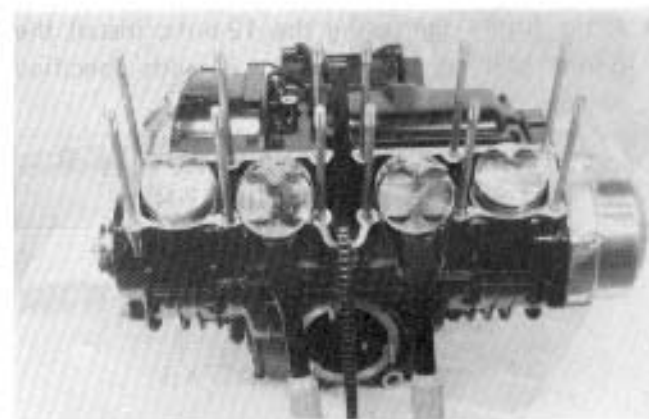
- Place the new cylinder gasket on the crankcase.

**NOTE:**

"UP" marked surface is top surface.



- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.
- With No. 2 and No. 3 pistons in place, install No. 1 and No. 4 pistons, and insert them into the cylinder.



09916-74521

Holder body

09916-74540

Band (bore 63–75 mm)

**NOTE:**

- \* Do not overtighten the special tool bands or the cylinders will resist to admit the pistons.
- \* Each band has a number punchmarked on it. The number refers to a particular range of piston sizes.



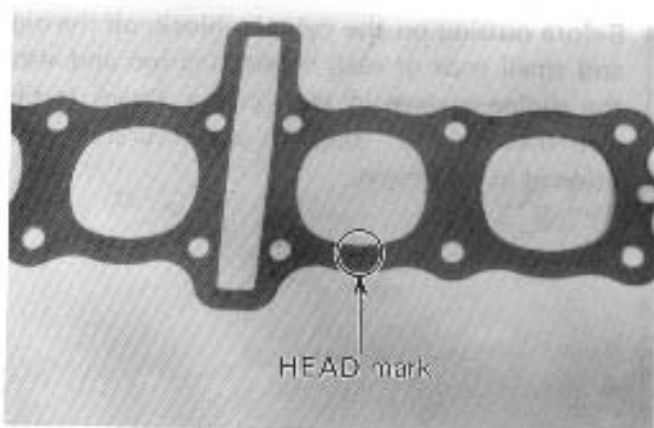


- Be sure to replace cylinder head gasket with new one to prevent gas leakage.

**NOTE:**

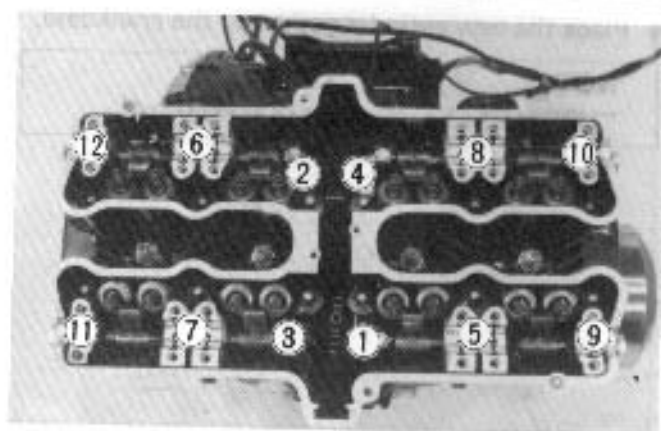
Be sure to identify that "HEAD" marked surface is top surface.

- Fix two knock pins properly.



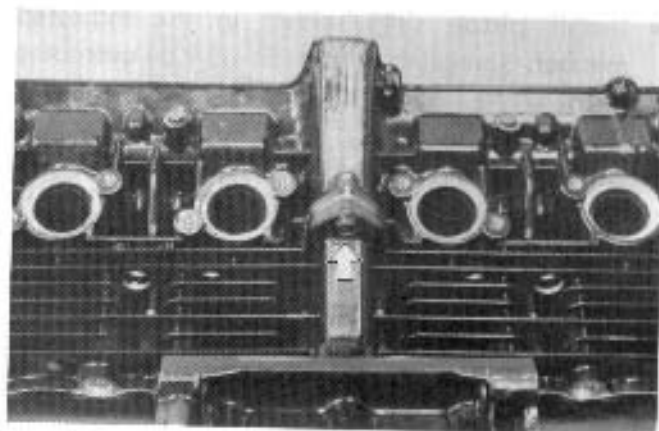
- Mount the cylinder head on the cylinder block.
- Tighten the twelve 10-mm nuts to specification with a torque wrench sequentially in the ascending order of numbers.

|                                        |                             |
|----------------------------------------|-----------------------------|
| Cylinder head nut<br>tightening torque | 3.5–4.0 kg-m<br>(35–40 N·m) |
|----------------------------------------|-----------------------------|

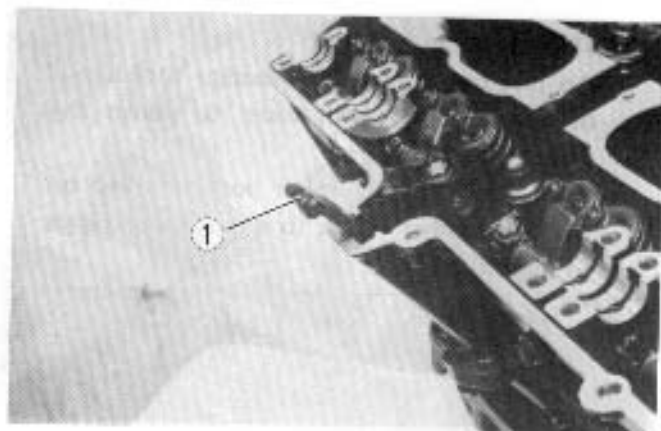


- After firmly tightening the 12-nuts, install the 6-mm bolt ① and tighten it with specified torque.

|                      |                            |
|----------------------|----------------------------|
| Tightening<br>torque | 0.8–1.2 kg-m<br>(8–12 N·m) |
|----------------------|----------------------------|



- Place chain guide ① properly.



- While holding down the timing chain, rotate the crankshaft in normal direction to bring the "T" mark (on Nos. 1 and 4 cylinder side of the signal generator) to the timing mark.

**CAUTION:**

To turn over crankshaft, torque nut with a 19 mm wrench. Never try to rotate crankshaft by putting a 6mm T-type wrench to bolt.

**NOTE:**

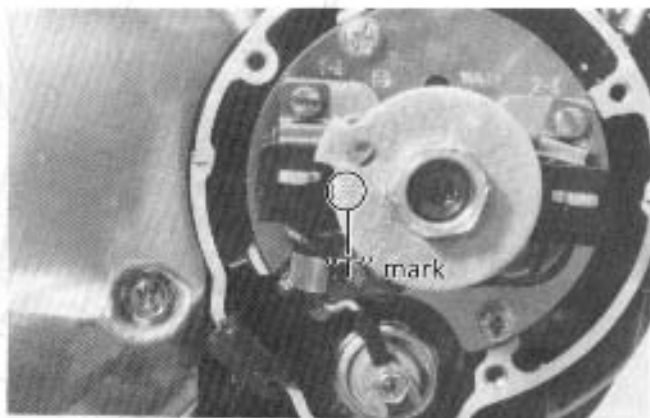
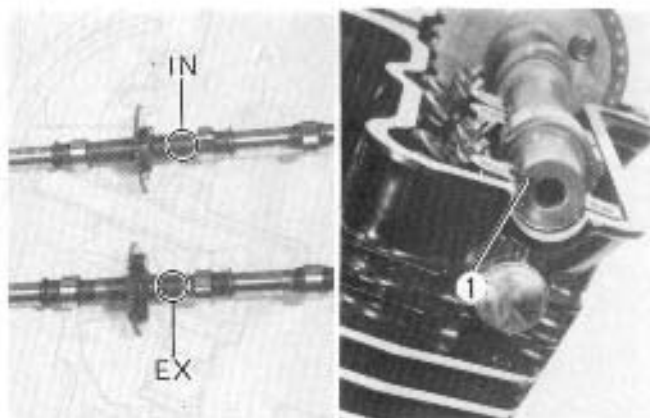
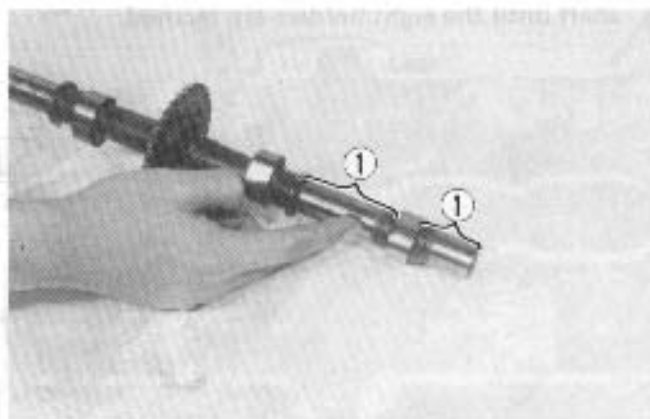
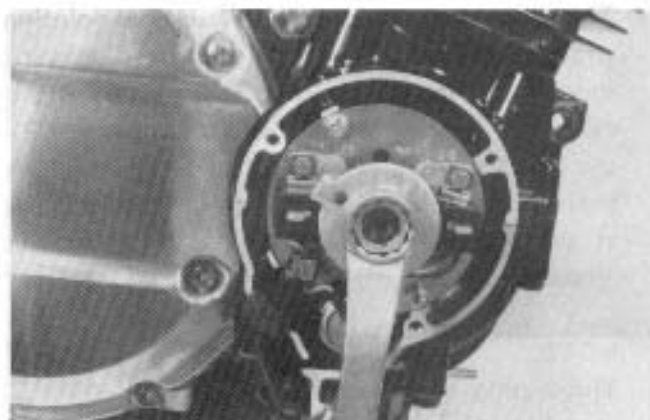
Just before placing the camshaft on the cylinder head, apply high quality molybdenum disulfide lubricant to its journals, fully coating each journal ① with the paste taking care not to leave any dry spot. Apply engine oil to the journal bearings.

99000-25140

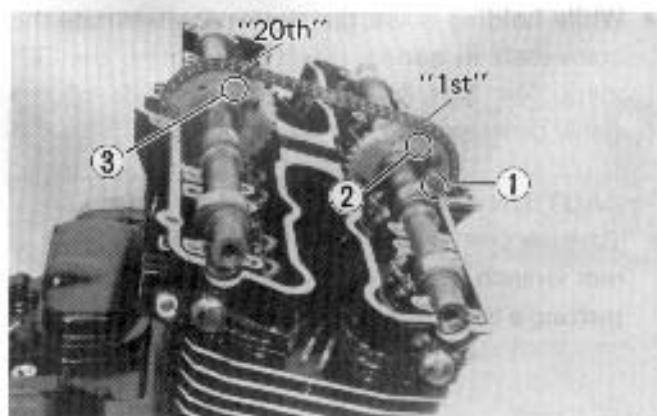
Suzuki Moly Paste

- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished by the notch ① at the right end.

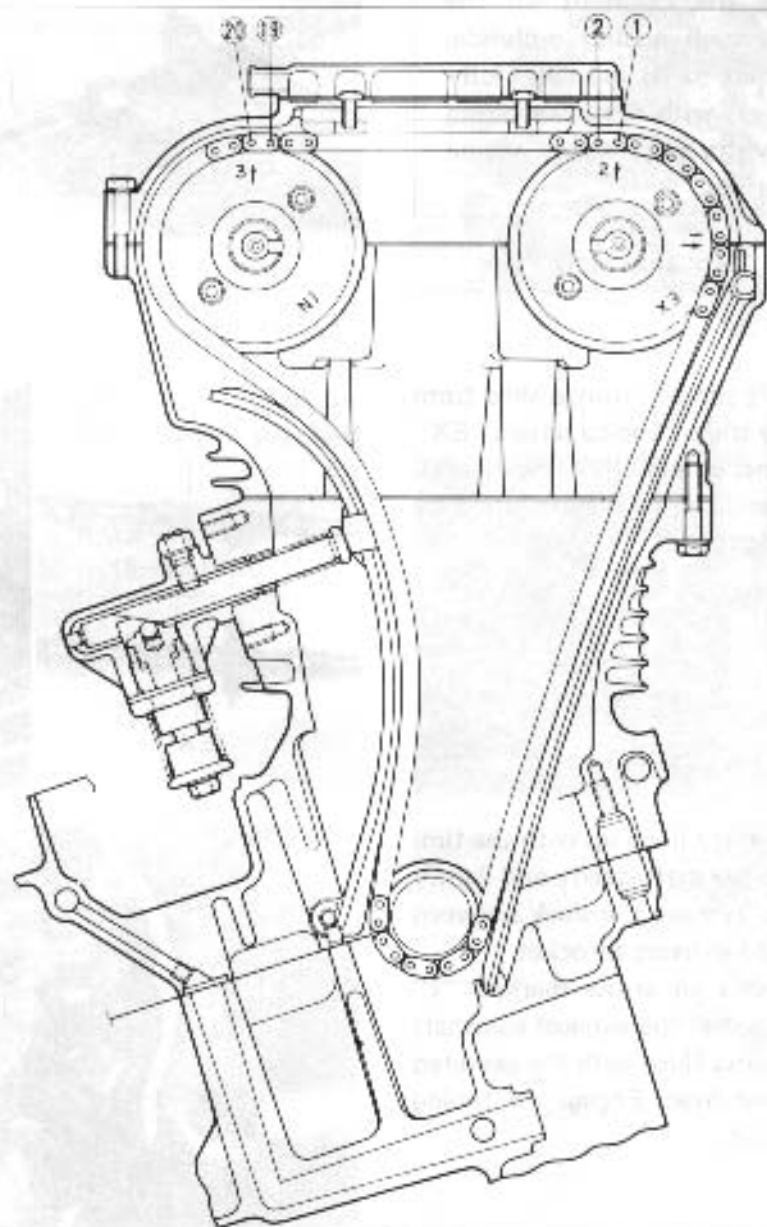
- With "T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- Exhaust sprocket bears an arrow marked "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasketed surface of the cylinder head. Engage the timing chain with this sprocket.



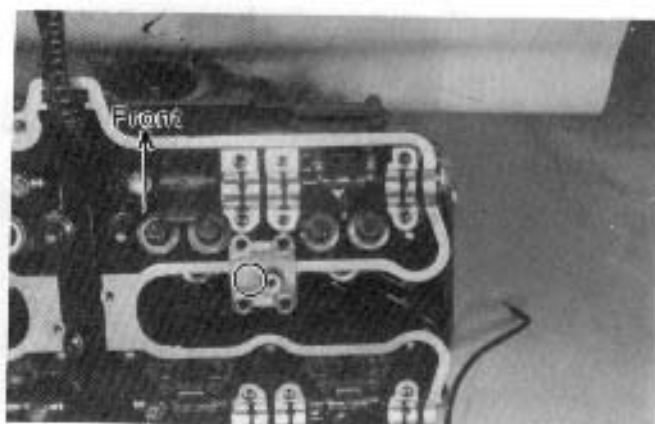
- The other arrow marked "2" ② is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 20th roller pin. Engage the chain with intake sprocket, locating the 20th pin at and above the arrow marked "3" ③ on the intake sprocket.

**NOTE:**

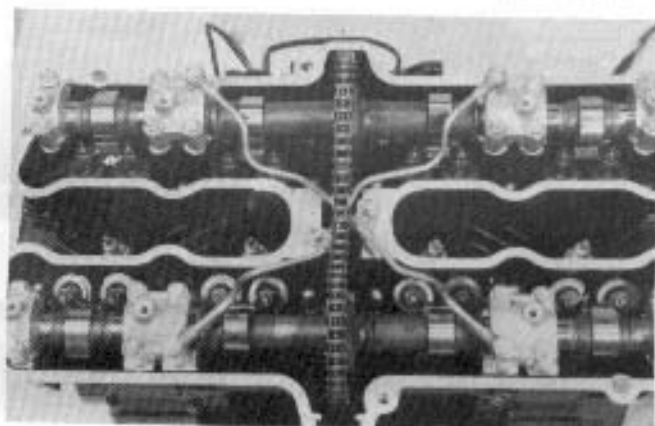
The timing chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the eight holders are secured.



- Each camshaft holder is identified with a cast-on letter with a triangle. A matching cast-on symbol appears on the head. Install each holder at its matching letter, with triangle symbols pointing forward.

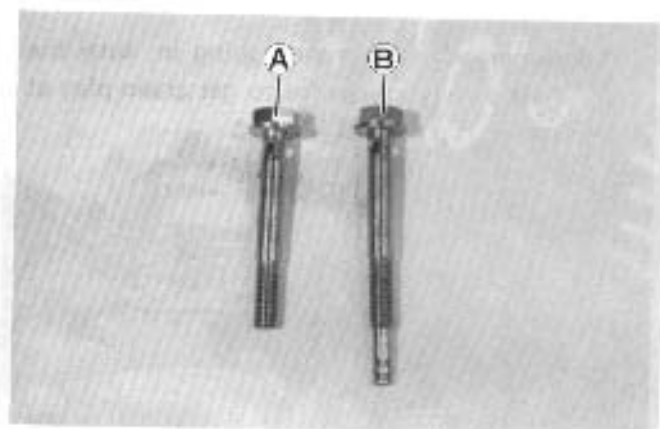


- Route the oil pipe as shown.

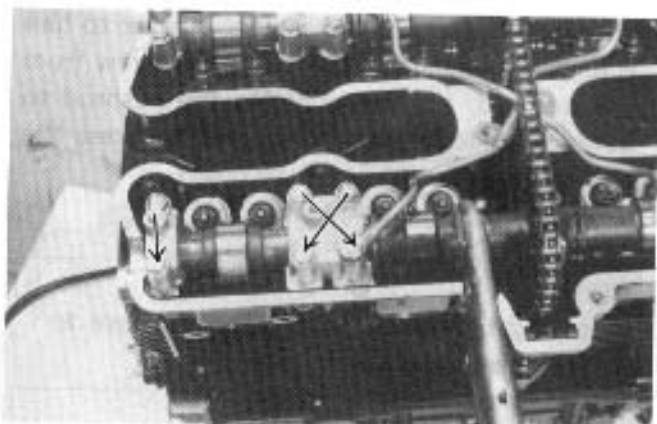


**NOTE:**

Oil pipe union bolts have two types. A bolt is exhaust side, and B bolt is intake side.



- Secure the eight camshaft bearing holders evenly by tightening the camshaft bearing holder bolts sequentially. Try to equalize the pressure by moving the wrench diagonally from one bolt to another and from one camshaft bearing holder to another, to push shafts down evenly.



**NOTE:**

Damage to head or cam bearing holder thrust surfaces may result in the situation that cam bearing holders are not drawn down evenly.



- Tighten the camshaft bearing holder bolts to the following torque value:

**CAUTION:**

The camshaft bearing holder bolts are made of a special material and much superior in strength compared with other type of high strength bolts.

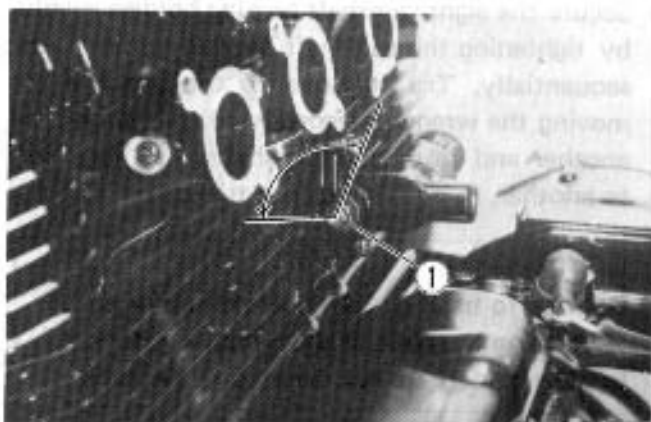
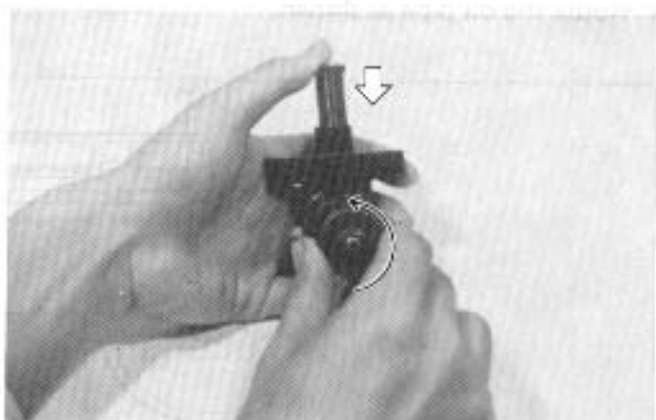
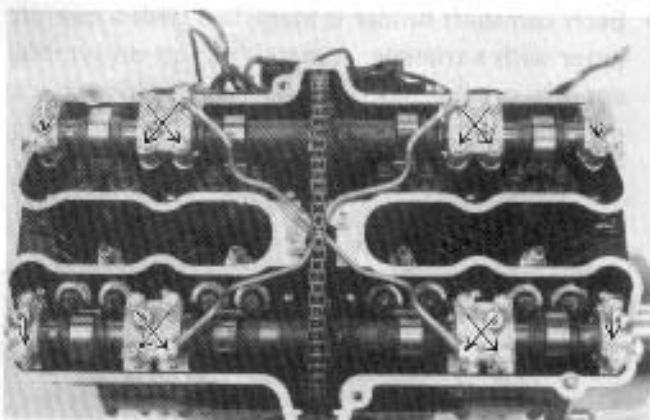
Take special care not to use other types of bolts instead of these special bolts. To identify these bolts, each of them has a figure "9" on its head.

|                                                |                            |
|------------------------------------------------|----------------------------|
| Camshaft bearing holder bolt tightening torque | 0.8–1.2 kg-m<br>(8–12 N-m) |
|------------------------------------------------|----------------------------|

- While turning lock shaft handle counterclockwise, push in the pushrod all the way. Keep on turning the handle until it refuses to turn further.
- Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.
- Secure the adjuster to the cylinder block.
- If tensioner adjuster is not going in, turn the crankshaft slowly clockwise to get chain play at inlet side.
- Withdraw the lock screw by one-quarter to half a turn: this separates the tip of the screw from the pushrod, thereby allowing the pushrod to advance under spring force and to press the tensioner against the camshaft chain.
- Tighten the lock nut ①.

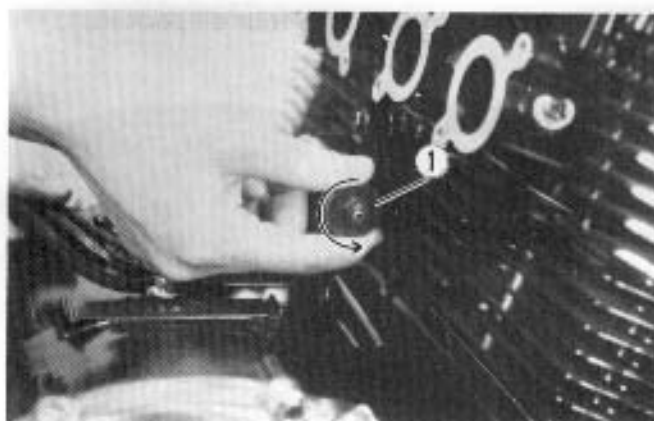
**NOTE:**

When tightening the lock nut, take care to prevent the lock screw from turning.

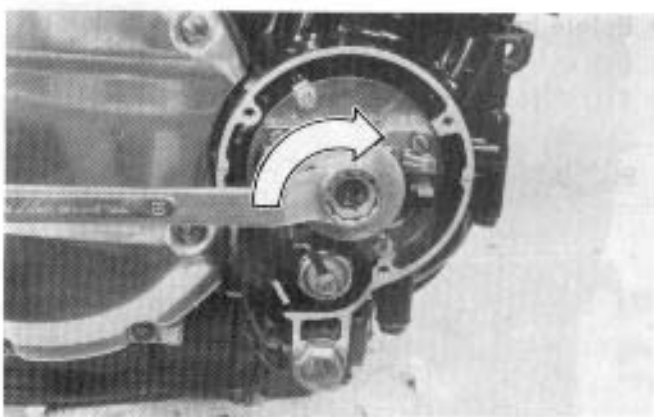




- While turning the handle ① counterclockwise, slowly rotate the crankshaft in reverse direction (thus causing the chain to push back the tensioner).



- Release the handle and slowly turn back the crankshaft in normal running direction (to slacken that portion of the chain extending along the tensioner). See if the handle rotates by itself as the chain becomes progressively slackened; if it does, then the pushrod inside is obviously moving forward under spring force as it should, thus signifying that the tensioner is in good operable condition. If the handle rotates, but sluggishly, it means that the pushrod or lock shaft is sticking and, in such a case, remove the tensioner and service the pushrod and lock shaft to make them move smoothly.

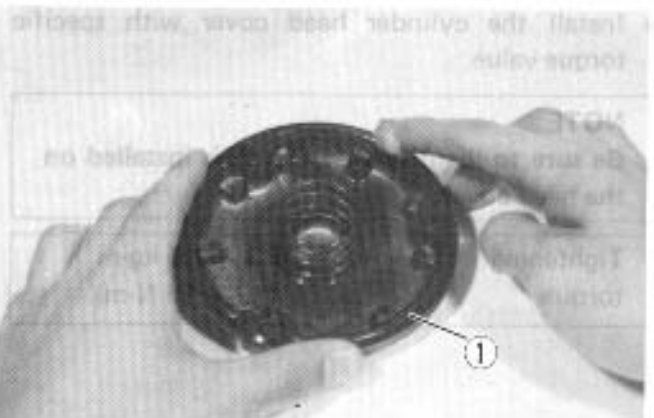


#### CAUTION:

After installing the tensioner and checking it in initially set condition for operation, do not attempt to turn the handle in either direction until the next overhaul.



- Adjust the valve clearance. (see page 2-5)
- In fitting the seal ring to the oil filter chamber cap, lightly coat grease on the seal ring groove ① to avoid any chance of dropping or mislocating the ring during the installation work.
- Tighten engine oil drain plug.



- Pour 50 ml of engine oil in four oil pockets.

- Before install the cylinder head cover gasket on the cylinder head cover, apply the bond No. 1207B to the head cover as shown.

|             |                       |
|-------------|-----------------------|
| 99000-31140 | SUZUKI bond No. 1207B |
|-------------|-----------------------|

- Apply the SUZUKI Bond No. 1207B to the cylinder head cover gasket as shown.

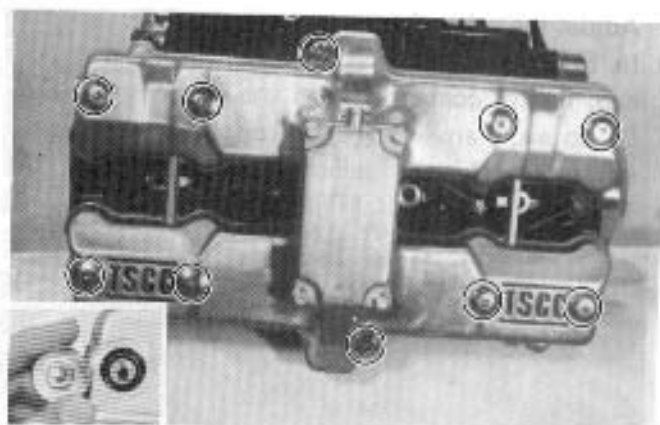
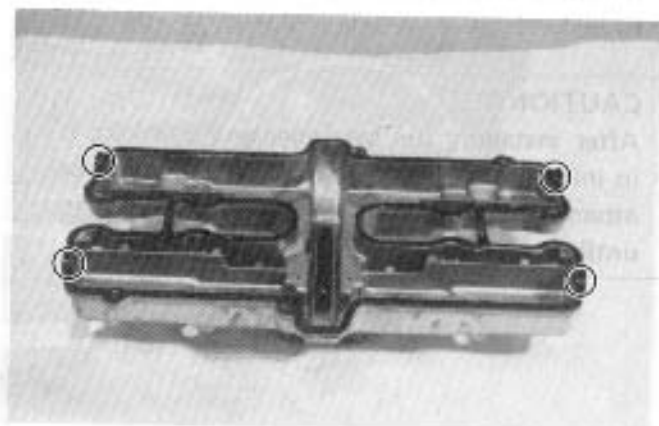
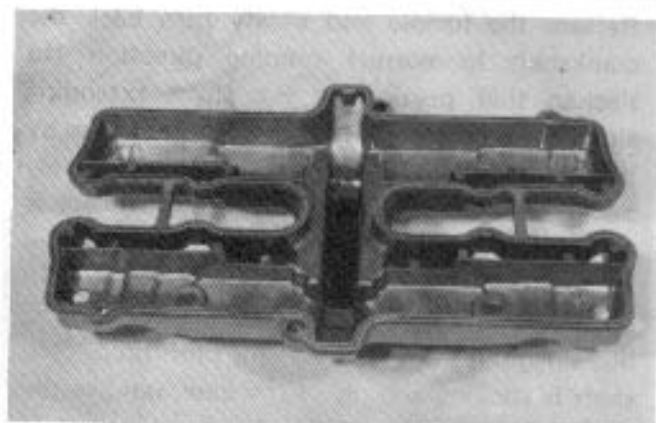
|             |                       |
|-------------|-----------------------|
| 99000-31140 | SUZUKI bond No. 1207B |
|-------------|-----------------------|

- Install the cylinder head cover with specific torque value.

**NOTE:**

Be sure to identify that O-ring is installed on the head cover.

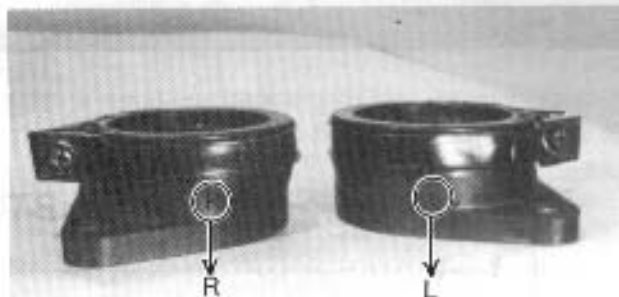
|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 1.3 – 1.5 kg-m<br>(13 – 15 N·m) |
|-------------------|---------------------------------|



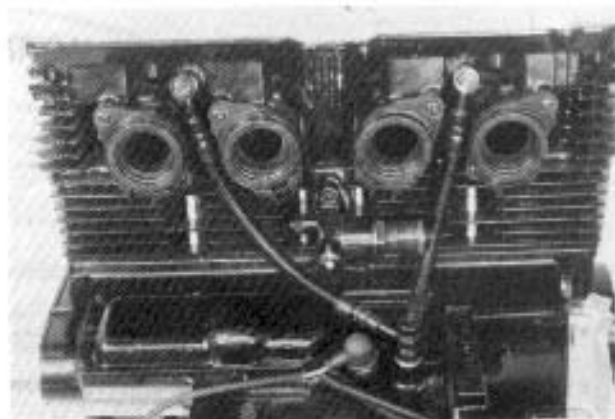
- Each cylinder head intake pipe is identified with a letter "R" or "L" on it. Fit each pipe to cylinder head properly.

**CAUTION:**

"MADE IN JAPAN" mark on the intake pipe faces to the cylinder side.



- Route and install the oil hose correctly.



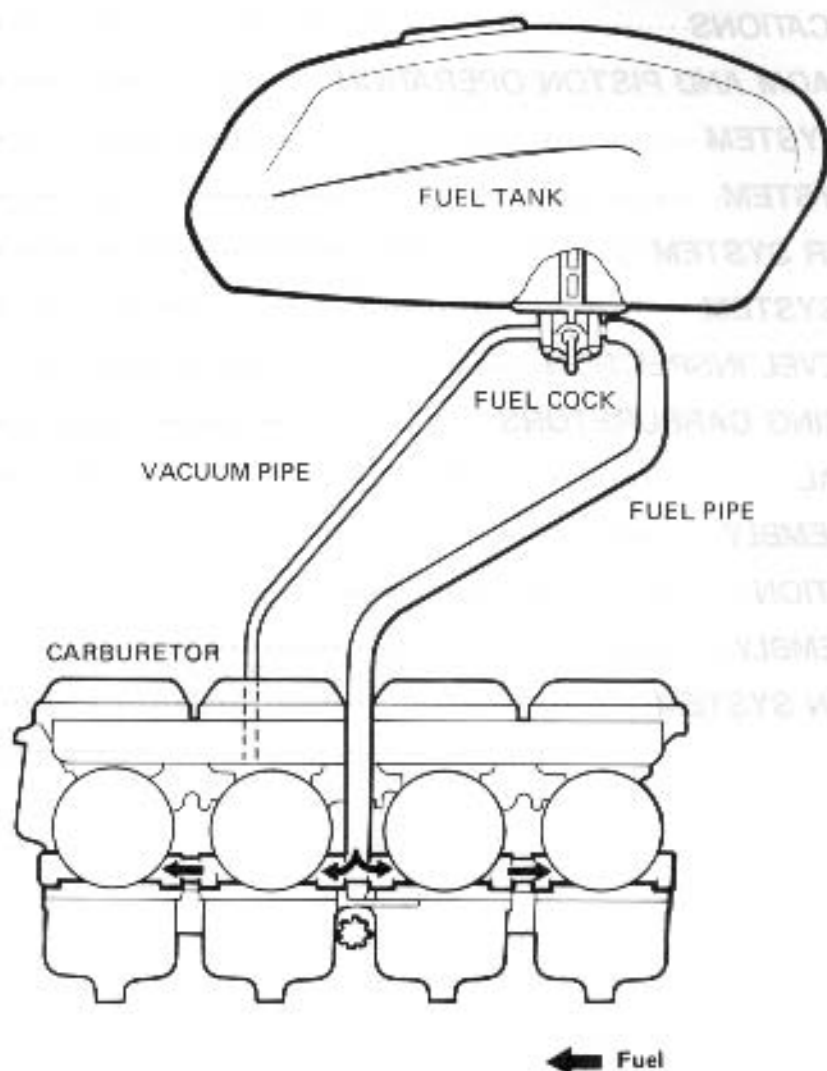
# FUEL AND LUBRICATION SYSTEM

## CONTENTS

|                                             |             |
|---------------------------------------------|-------------|
| <b>FUEL SYSTEM</b> .....                    | <b>4- 1</b> |
| <b>FUEL COCK</b> .....                      | <b>4- 2</b> |
| <b>CARBURETOR</b> .....                     | <b>4- 3</b> |
| <b>SPECIFICATIONS</b> .....                 | <b>4- 4</b> |
| <b>DIAPHRAGM AND PISTON OPERATION</b> ..... | <b>4- 5</b> |
| <b>SLOW SYSTEM</b> .....                    | <b>4- 6</b> |
| <b>MAIN SYSTEM</b> .....                    | <b>4- 7</b> |
| <b>STARTER SYSTEM</b> .....                 | <b>4- 8</b> |
| <b>FLOAT SYSTEM</b> .....                   | <b>4- 8</b> |
| <b>FUEL LEVEL INSPECTION</b> .....          | <b>4- 9</b> |
| <b>BALANCING CARBURETORS</b> .....          | <b>4- 9</b> |
| <b>REMOVAL</b> .....                        | <b>4-12</b> |
| <b>DISASSEMBLY</b> .....                    | <b>4-14</b> |
| <b>INSPECTION</b> .....                     | <b>4-17</b> |
| <b>REASSEMBLY</b> .....                     | <b>4-18</b> |
| <b>LUBRICATION SYSTEM</b> .....             | <b>4-22</b> |

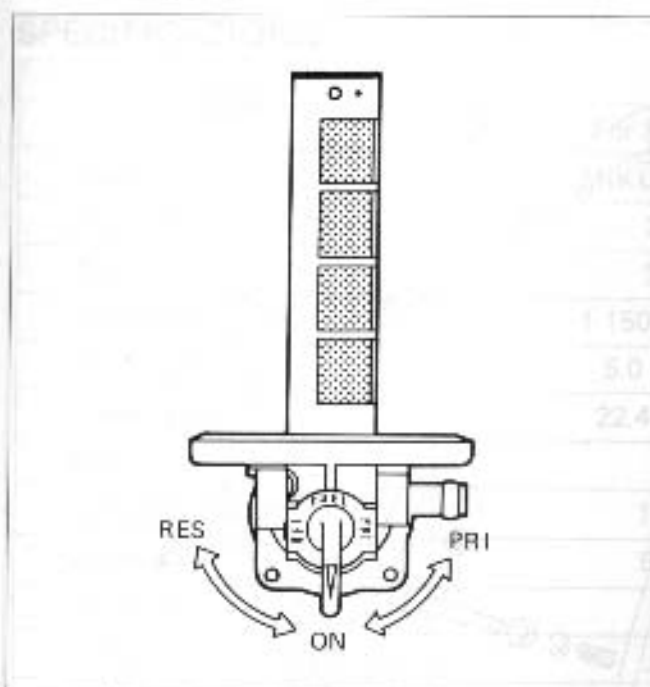
## FUEL SYSTEM

When starter motor is engaged, negative pressure is generated in the combustion chamber. This negative pressure works on the diaphragm of fuel cock through passageway provided in the carburetor main bore and vacuum pipe, and diaphragm builds up a negative pressure which is higher than the spring pressure. Fuel valve is forced to open due to diaphragm operation, and thus allows fuel to flow into carburetor float chamber.



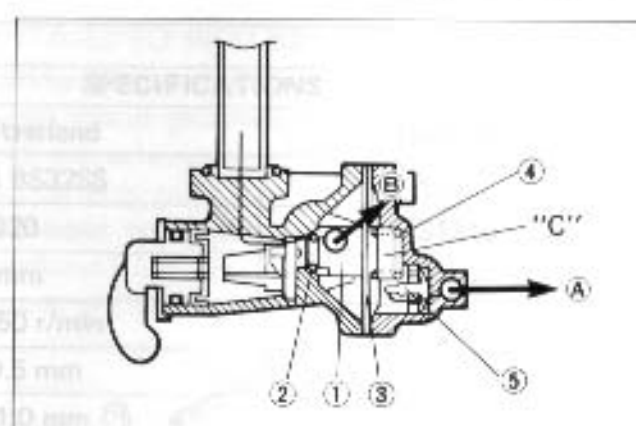


## FUEL COCK



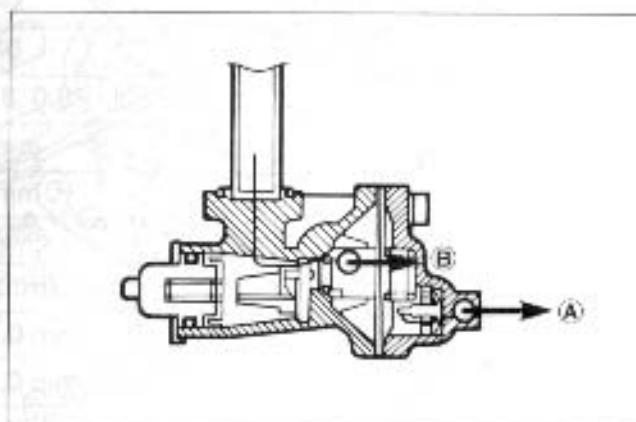
When the engine is not running and the valve is the ON or RES position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is started, a negative pressure is generated in the diaphragm chamber "C" through the vacuum (negative pressure) pipe which is connected to the No. 2 carburetor, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.

When the lever is set to PRI position, the protrusion ⑥ located on the lever end pushes back the fuel valve mechanically against the spring force and it allows fuel to flow to the carburetors directly, whether the engine is running or not, through the RES side fuel filter and fuel valve clearance.

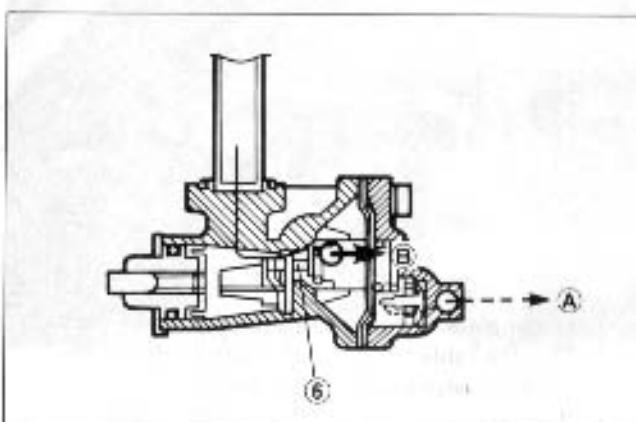


"ON"

- ① Fuel valve ② O-ring ③ Diaphragm  
④ Spring ⑤ One way valve  
(A) Vacuum (B) Fuel flow

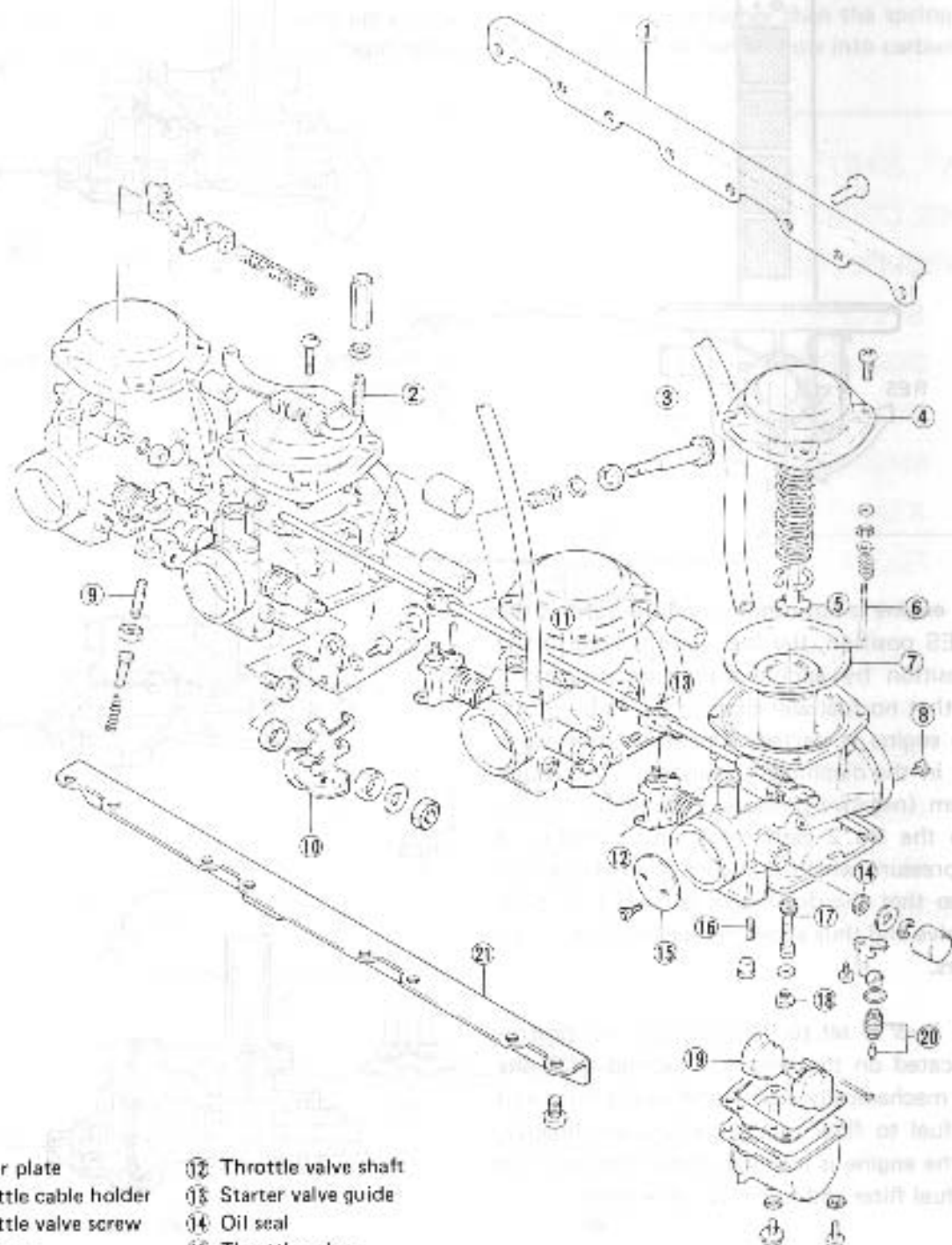


"RES"



"PRI"

## CARBURETOR



- |                         |                        |
|-------------------------|------------------------|
| ① Upper plate           | ⑫ Throttle valve shaft |
| ② Throttle cable holder | ⑬ Starter valve guide  |
| ③ Throttle valve screw  | ⑭ Oil seal             |
| ④ Top cap               | ⑮ Throttle valve       |
| ⑤ Jet needle stopper    | ⑯ Pilot jet            |
| ⑥ Jet needle            | ⑰ Needle jet           |
| ⑦ Diaphragm and piston  | ⑱ Main jet             |
| ⑧ Pilot air jet         | ⑲ Float                |
| ⑨ Synchronizer screw    | ⑳ Needle valve         |
| ⑩ Throttle lever        | ㉑ Lower plate          |
| ⑪ Starter valve shaft   |                        |

## SPECIFICATIONS

| ITEM                | SPECIFICATIONS          |            |
|---------------------|-------------------------|------------|
|                     | For Switzerland         | The others |
| Type                | MIKUNI BS32SS           | ←          |
| I.D. No.            | 31320                   | 31310      |
| Bore                | 32 mm                   | ←          |
| Idle r/min          | 1 150 ± 50 r/min        | ←          |
| Fuel level          | 5.0 ± 0.5 mm            | ←          |
| Float height        | 22.4 ± 1.0 mm           | ←          |
| Main jet            | #120                    | ←          |
| Main air jet        | 1.7 mm                  | ←          |
| Jet needle          | 5D10-3                  | ←          |
| Needle jet          | Y-7                     | ←          |
| Pilot jet           | #40                     | ←          |
| By pass             | 0.8, 0.8, 0.8           | ←          |
| Pilot outlet        | 0.7 mm                  | ←          |
| Valve seat          | 2.0 mm                  | ←          |
| Starter jet         | #45                     | ←          |
| Pilot screw         | Pre-set (2¼ turns back) | ←          |
| Throttle cable play | 0.5 – 1.0 mm            | ←          |
| Starter cable play  | 0.5 – 1.0 mm            | ←          |

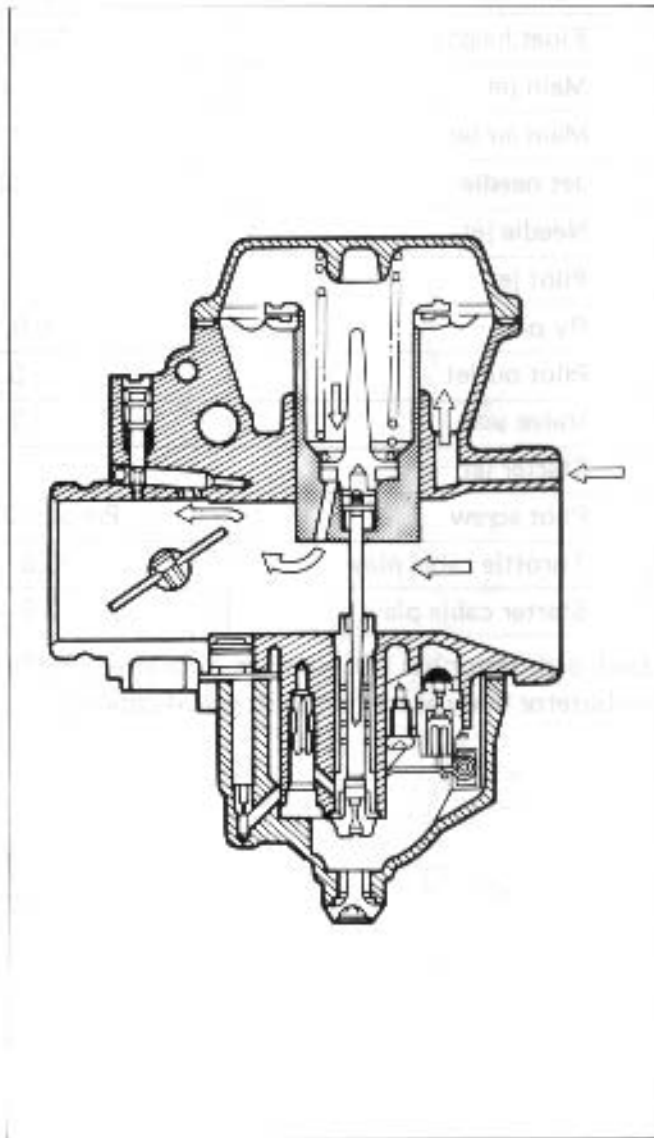
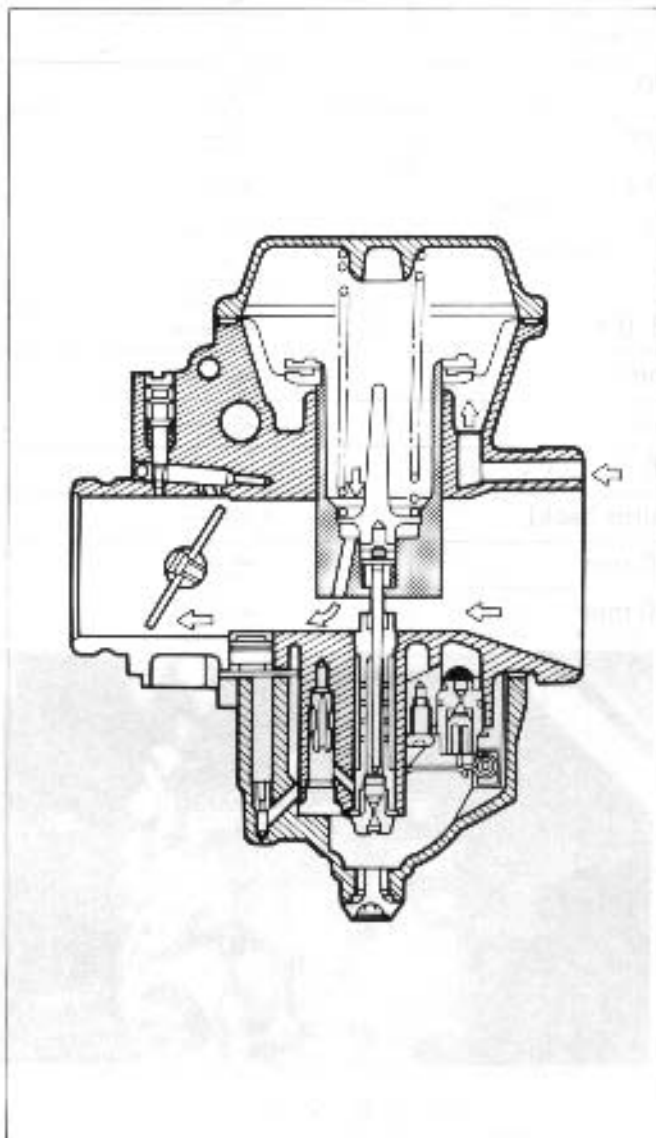
Each carburetor has I.D. Number ① printed on the carburetor body according to its specifications.



## 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 to prevent the air velocity from increasing. Therefore, 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.

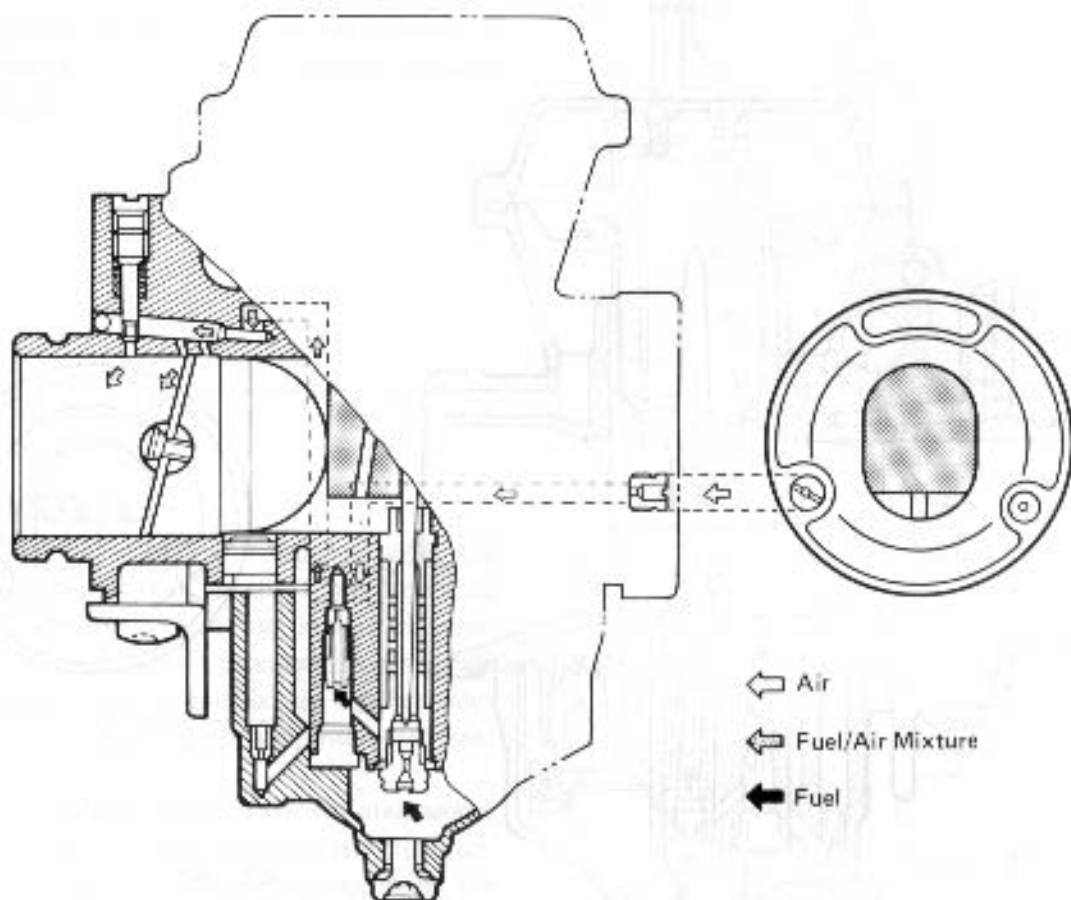


## SLOW SYSTEM

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

The fuel from float chamber is first passed through main jet and 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 bypass ports. The remainder is then metered by pilot screw and sprayed out into the main bore through pilot outlet.





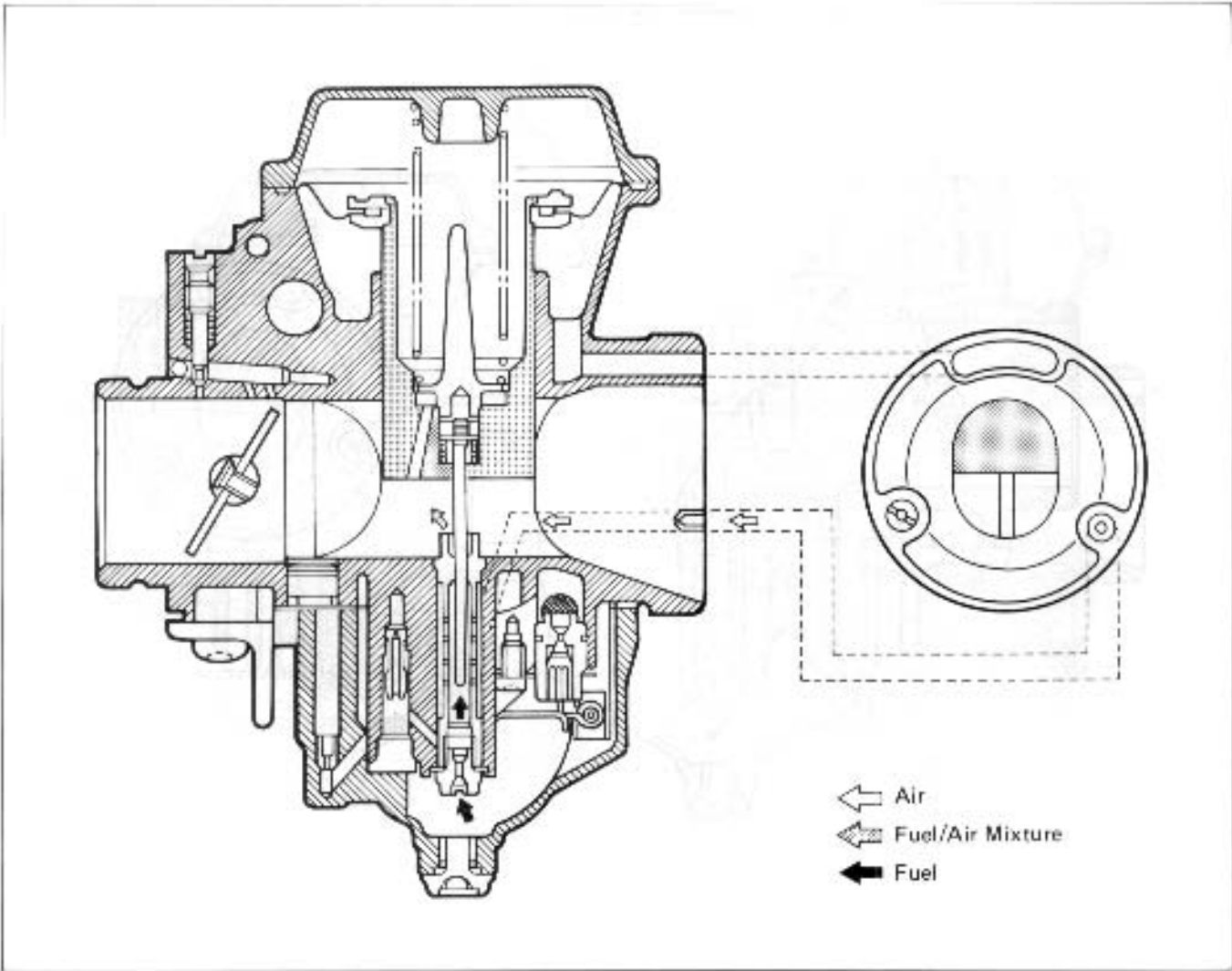
MAIN SYSTEM

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 either large or small, depending ultimately on throttle position.

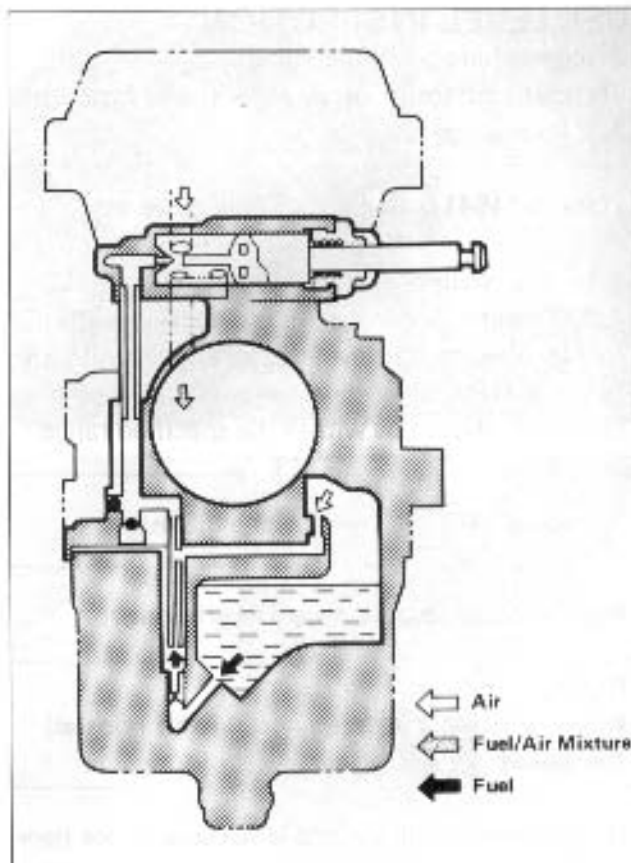


## STARTER SYSTEM

Turning the choke knob all the way left, 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 extended from behind the diaphragm.

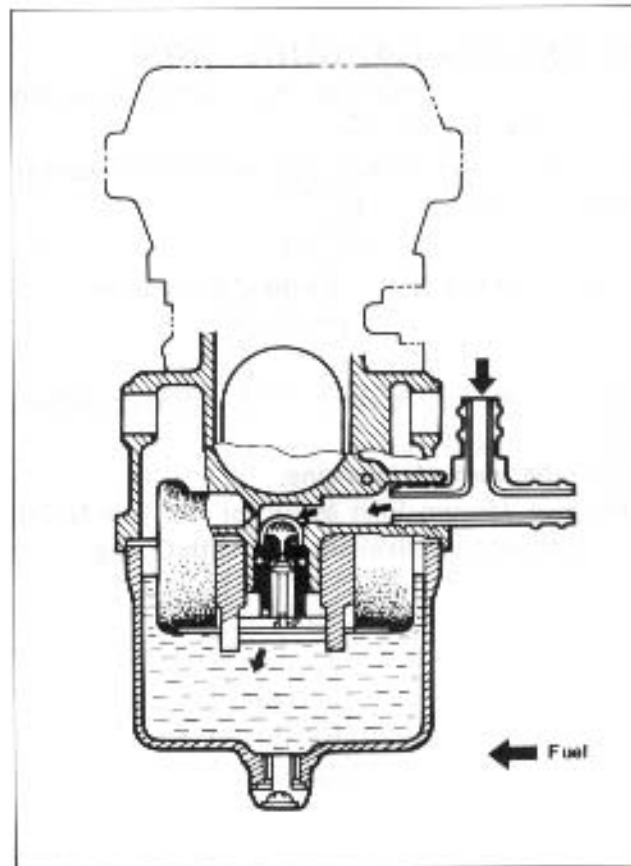
The two successive mixings of fuel with air are such that proper air/fuel mixture for starting is produced when the mixture is sprayed out through starter outlet into the main bore.



## 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 opens and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber.



## FUEL LEVEL INSPECTION

- Place machine on center stand.
- Remove carburetor drain plug ① and install the fuel level gauge ②.

09913-14541

Fuel gauge set

- Run the engine at the idling speed (1 100 – 1 200 r/min), and measure the distance with the middle line of the level gauge aligned with the lower surface of carburetor body as shown in photo. A should be within the specified range.

Distance A:

 $5.0 \pm 0.5 \text{ mm}$ 

- Repeat the procedure on each carburetor.

### NOTE:

When refitting the screw, be sure to reinstall the gasket ③.

- If fuel level readjustment is necessary, see page 4-17 for adjusting float height.

## BALANCING CARBURETORS

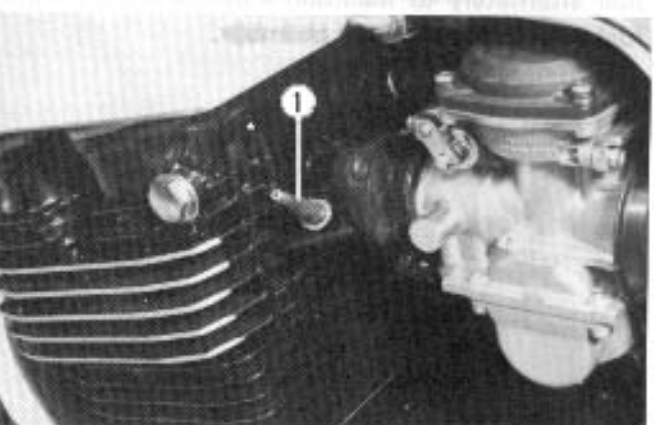
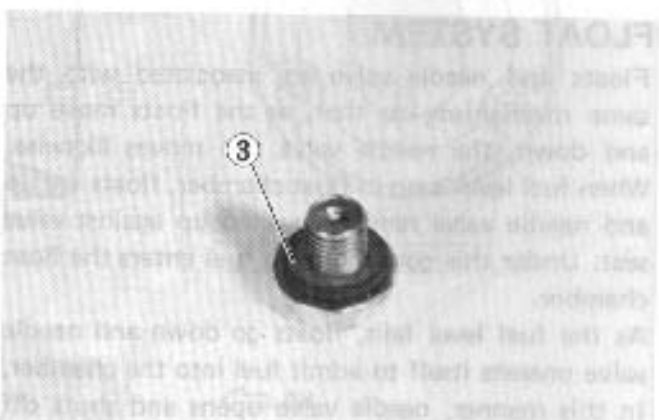
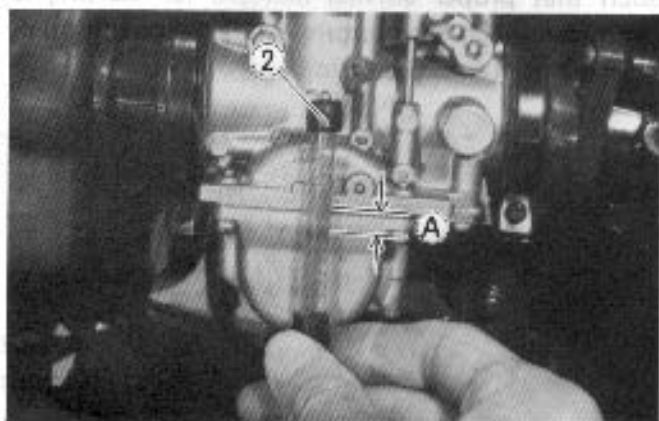
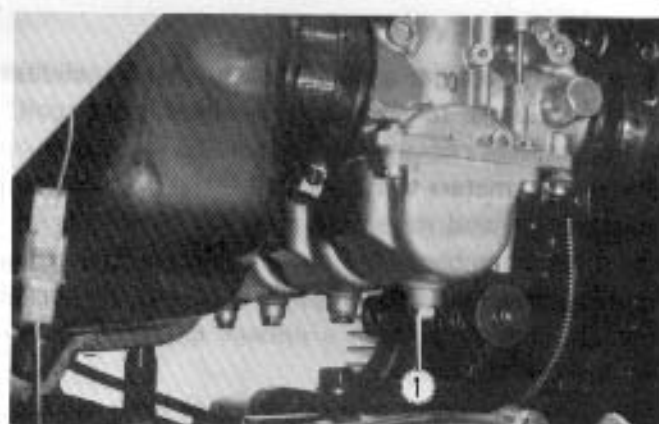
Check the four carburetors for balance according to the following procedures.

As the first step, calibrate the carburetor balancer gauge as follows:

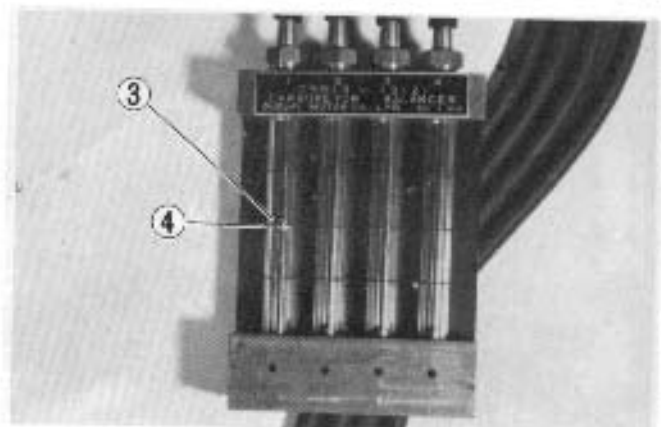
09913-13121

Carburetor balancer

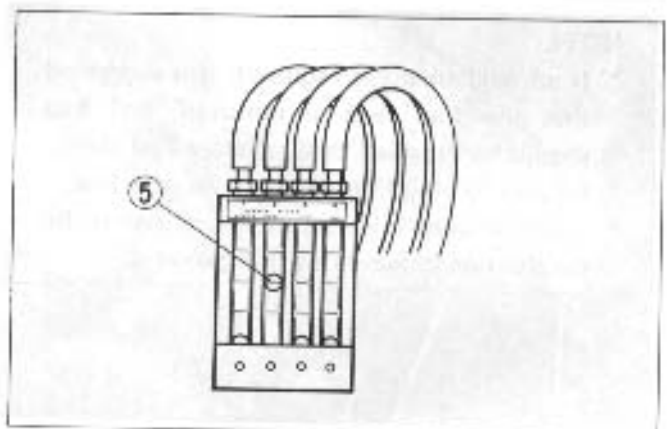
- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove vacuum inlet screw for No. 1 or No. 4 cylinder and install adapter ① with O ring.



- Connect one of the four rubber hoses of the balancer gauge to this adapter, and start up the engine, and keep it running at 1 750 r/min by turning throttle stop screw ①.
- Turn the air screw ② of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ③ in the tube to the center line ④.

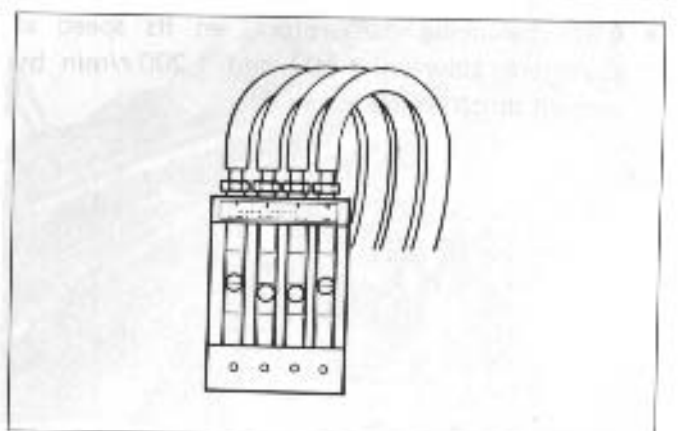


- After making sure that the steel ball stays steady at the center line, disconnect the hose from the adapter and connect the next hose to the adapter. Turn air screw to bring the other steel ball ⑤ to the center line.
- Repeat the process on the third and fourth tubes. The balancer gauge is now ready for use in balancing the carburetors.



Remove the respective vacuum inlet screws and insert the adapters in the holes. Connect the balancer gauge hoses to these adapters, and balance the four carburetors as follows:

- Start up the engine, and keep it running at 1 750 r/min.
- A correctly adjusted carburetor has the steel balls in the Nos. 1 and 4 tubes at the same level, and those in the Nos. 2 and 3 tubes also at the same level, but lower by one half of the ball diameter than the Nos. 1 and 4 tubes as shown.



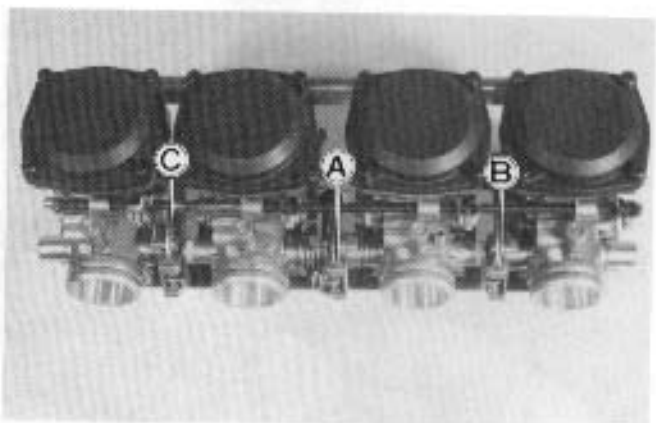
- If the steel balls are not in correct positions, remove the bracket ① and adjust the throttle valve adjusting screw correctly by using throttle valve adjust wrench.

09913-14911

Throttle valve adjust wrench

Adjusting order:

A (for No. 2 Carb) → B (for No. 1)  
 → C (for No. 4)

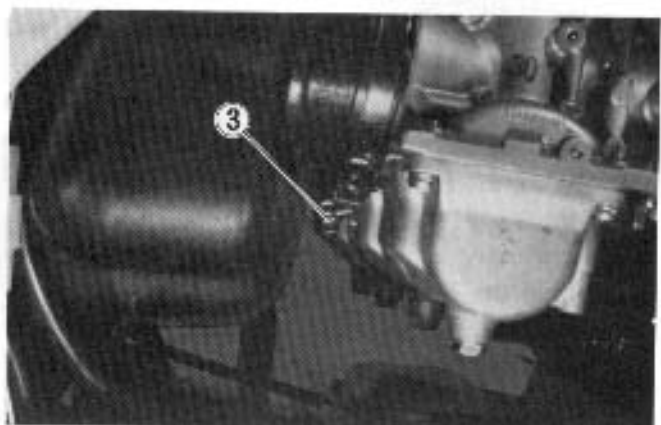


# NOTE:

- \* If an adjustment is required, it is suggested that the fuel tank is removed, and fuel should be supplied by a separate fuel tank.
- \* Be sure to plug the fuel cock vacuum line.
- \* Each vacuum inlet screw has a gasket. Be careful not to leave out this gasket ②.



- After balancing carburetors, set its speed at anywhere between 1 100 and 1 200 r/min by turning throttle stop screw ③.





## REMOVAL

- Remove the frame covers and seat.
- Take off the fuel tank.

### NOTE:

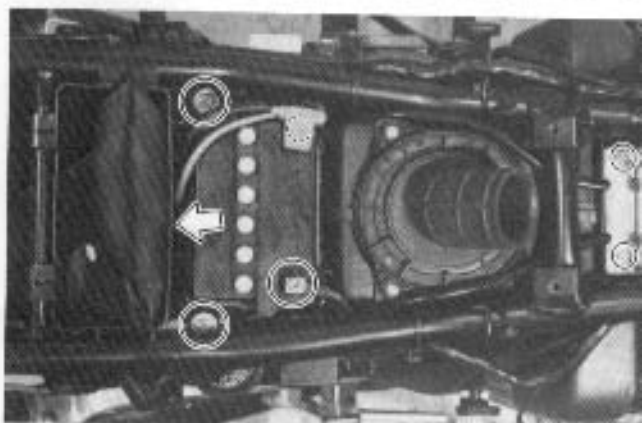
When taking off fuel tank, disconnect fuel hose and vacuum hose and turn the fuel cock lever to "ON" or "RES" position.

- Remove the tool holder.
- Remove the battery.

### NOTE:

First, remove the  lead wire.

- Remove the battery holder securing bolts.
- Remove the air cleaner assembly securing bolts and screw.

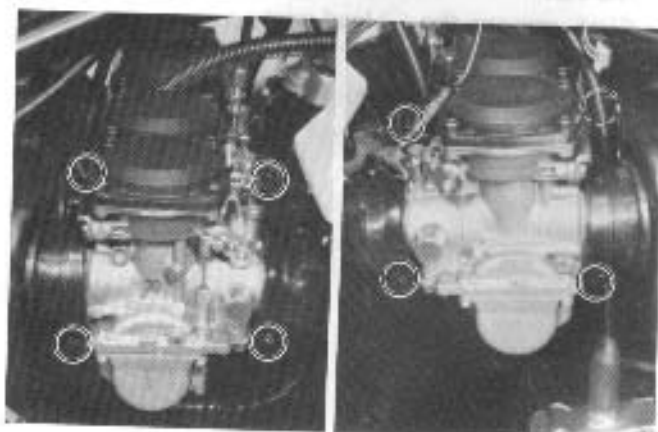


- Disconnect the breather hose from air cleaner.

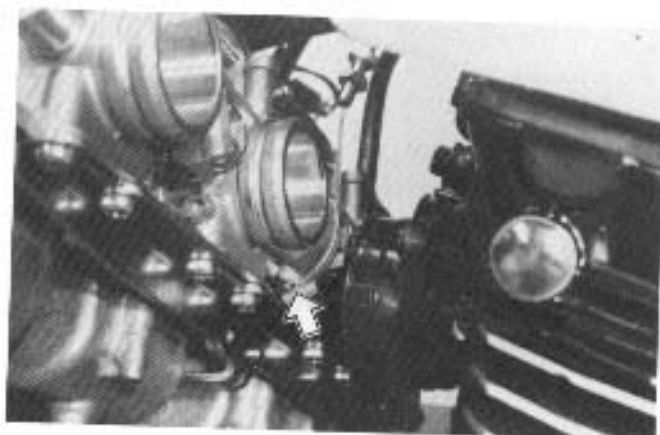
- Remove the throttle cable from bracket.
- Disconnect the choke cable from carburetor.
- Remove the bracket from carburetor.



- Loosen the respective clamps for carburetor insulator and chamber body.
- Move the air cleaner and battery holder a little rearward, and remove the carburetors.

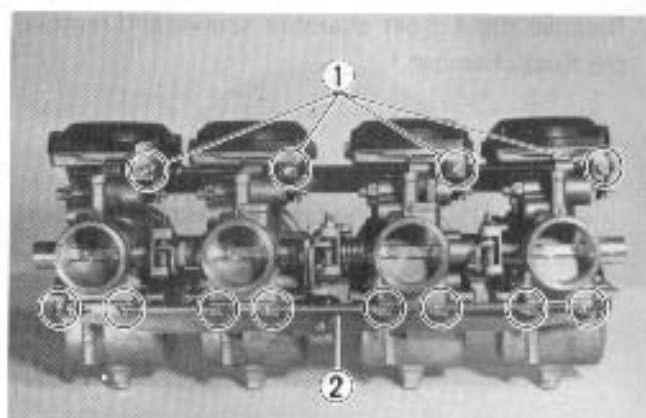


- Disconnect the throttle cable from carburetor.

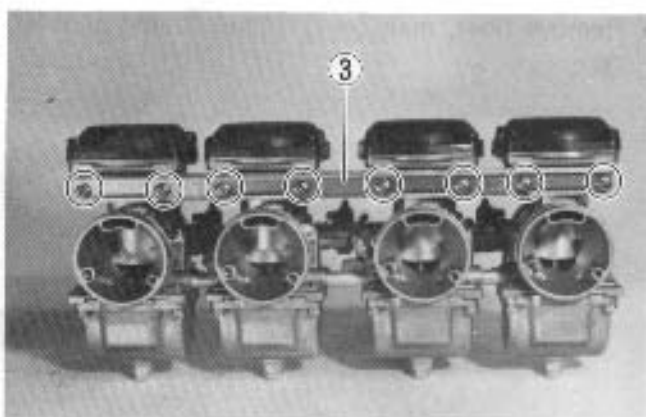


## DISASSEMBLY

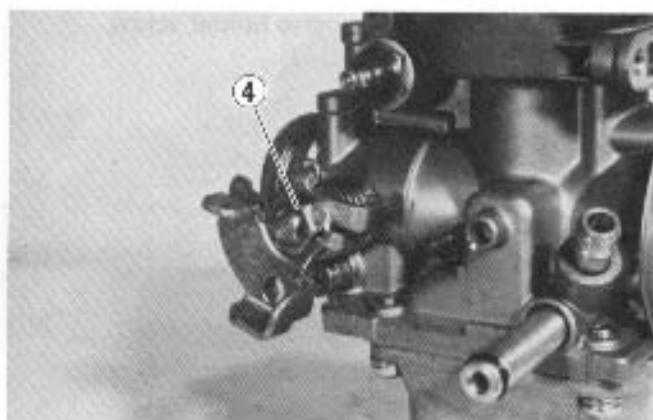
- Loosen 4 tightening screws ① of the starter shaft and pull out the starter shaft to the right.
- Remove carburetor set lower plate ② by unscrewing 8 screws.



- Remove the carburetor set upper plate ③ by unscrewing 8 screws.



- Flatten the lock washer.
- Take off the adjuster lever by removing nut ④.

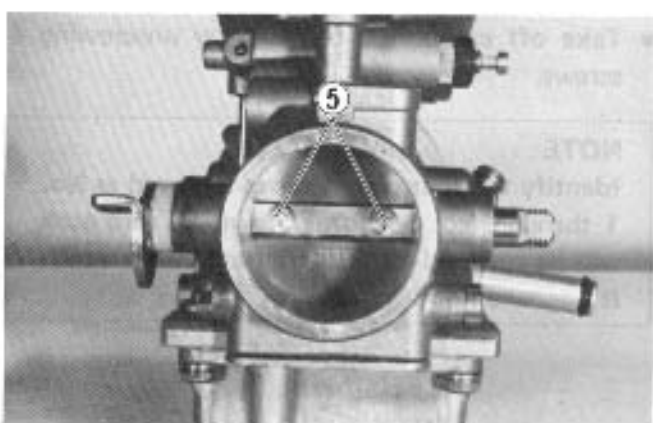


- Remove two throttle valve screws ⑤, and pull out the valve by turning throttle valve shaft.

### CAUTION:

This two screws are locked by punching its end. Once remove the screws, they will be damaged.

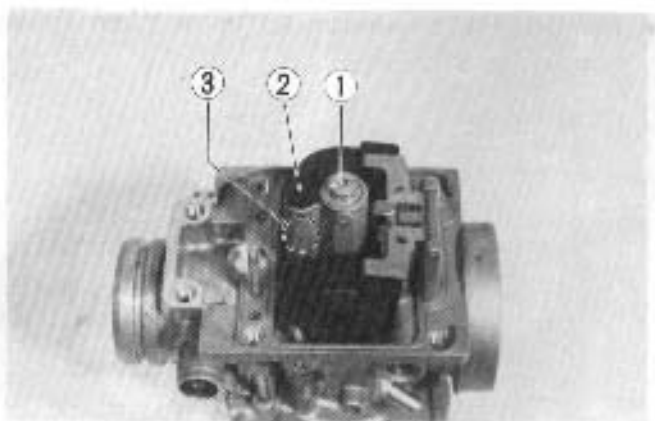
- Remove the throttle valve shaft.



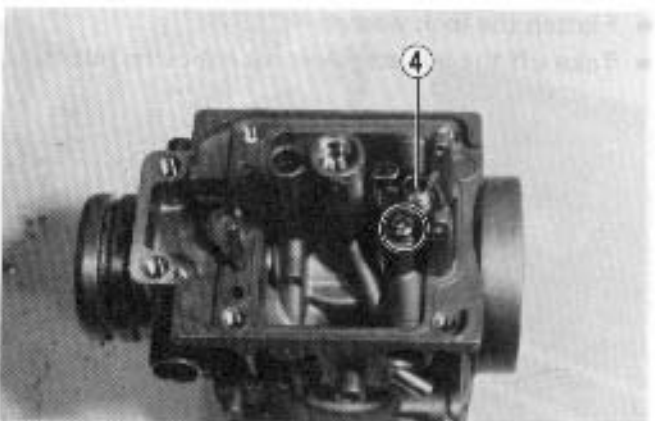
- Remove the 4 float chamber screws and remove the float chamber.



- Remove float, main jet ①, plug ② and pilot jet ③.



- Unscrewing the needle valve holder screw.
- Remove the needle valve ④.



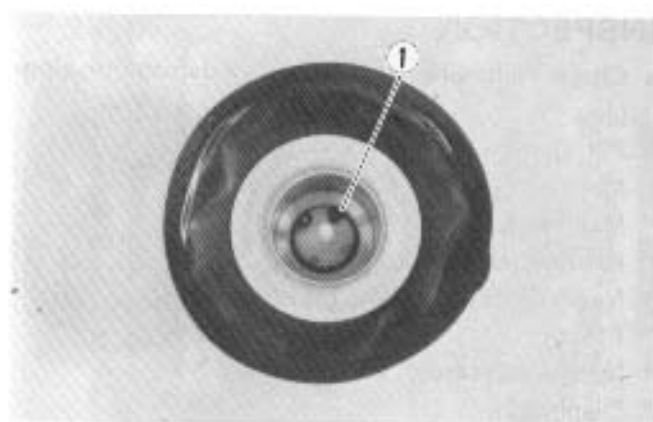
- Take off carburetor top cap by unscrewing 4 screws.

**NOTE:**

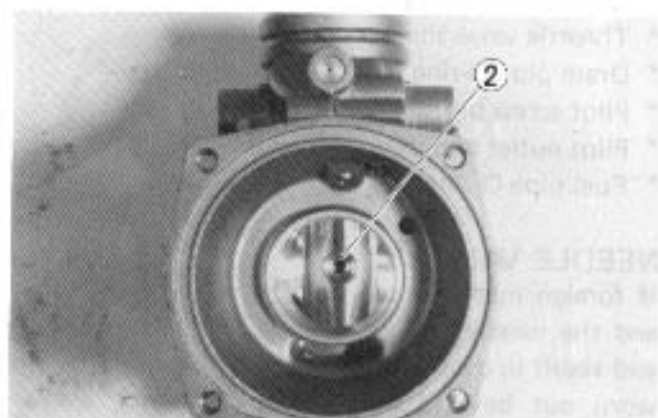
Identify the four piston valves removed as No. 1 through No. 4 in order to make sure each will be restored to the carburetor from which it was taken out.



- Remove circlip ① from piston.



- Remove needle jet ② from the top side.



- Remove starter valve housing.





## INSPECTION

- Check following items for any damage or clogging.
  - \* Pilot jet
  - \* Main jet
  - \* Main air jet
  - \* Pilot air jet
  - \* Needle jet air bleeding holes
  - \* Float
  - \* Needle valve mesh and O-ring
  - \* Diaphragm
  - \* Gasket and O-ring
  - \* Throttle valve shaft oil seals
  - \* Drain plug O-ring
  - \* Pilot screw bleeding hole and rubber cap
  - \* Pilot outlet and bypass holes
  - \* Fuel pipe O-rings

## NEEDLE VALVE

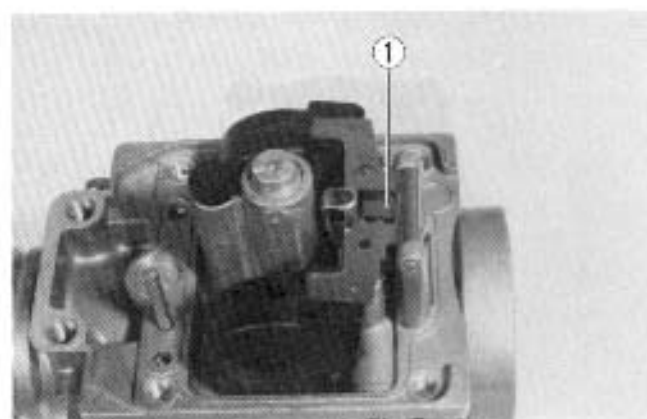
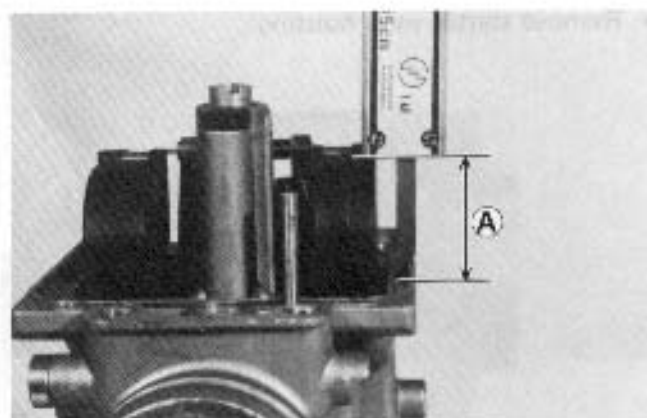
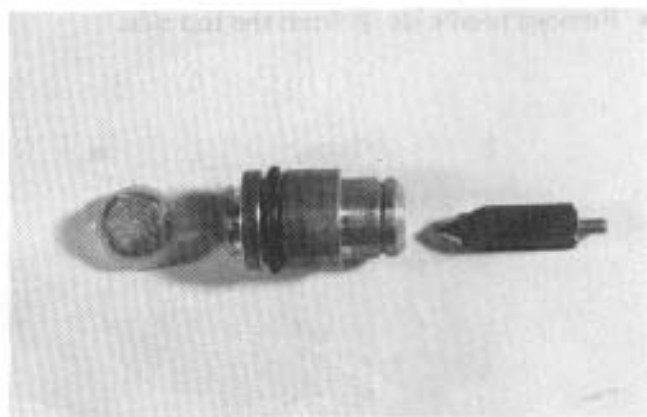
If foreign matter is caught between the valve seat and the needle, the gasoline will continue to flow and result in overflowing. If the seat and needle are worn out beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Remove the carburetor, float chamber and floats, and clean the float chamber and float parts with gasoline. If the needle is worn as shown below, 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, 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.

### NOTE:

Be sure to remove the gasket before measuring the height.



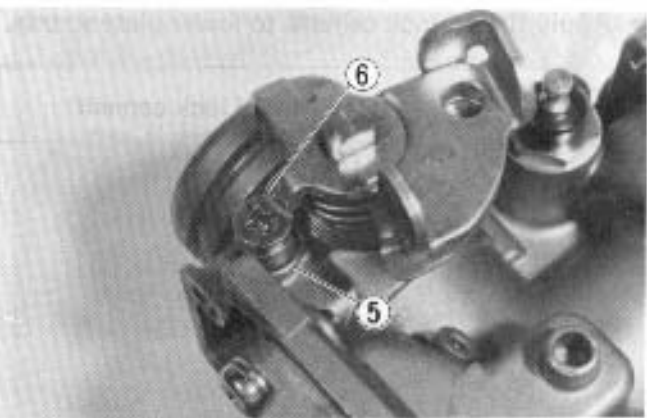
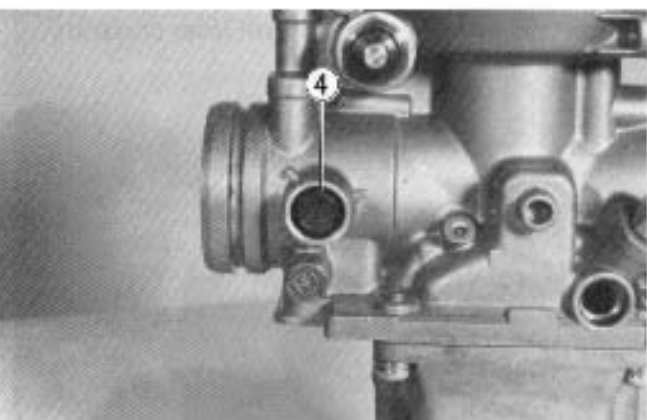
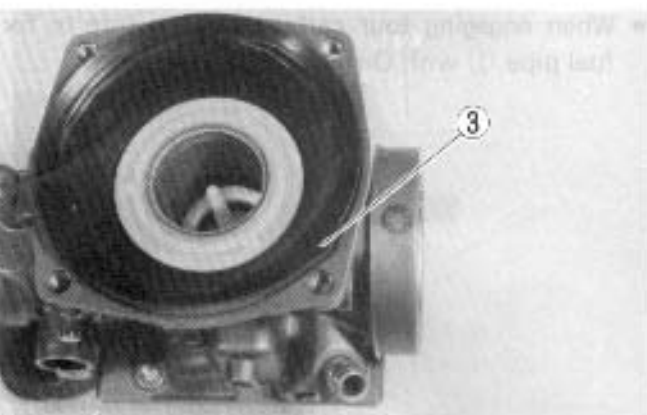
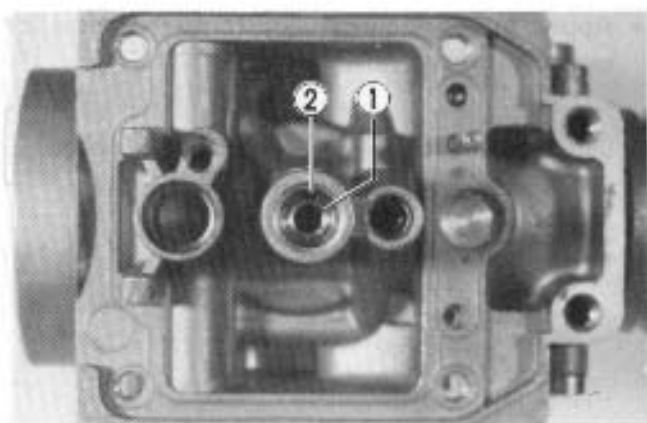
## REASSEMBLY

- Align the groove ① of the needle jet with the pin ② and replace it and install the main jet, washer, pilot jet and plug.

- Place tongue ③ of diaphragm to carburetor body properly.

- When fitting throttle valve shaft oil seals, groove should be faced outside ④.

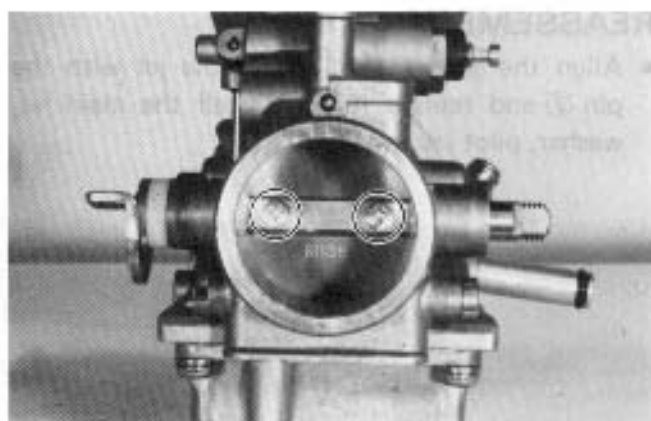
- Hook one end of spring to the boss ⑤, turn the other end ⑥ clockwise by 1/2 turn, and hook it to the cable guide properly.
- Tighten lock nut and bend up lock washer.



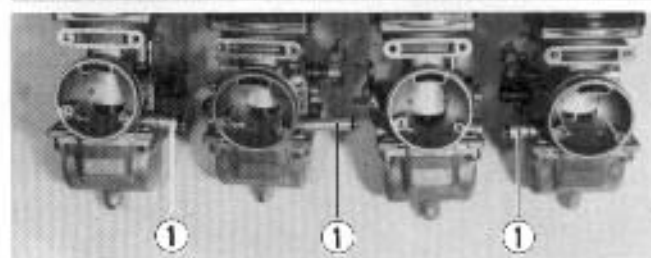
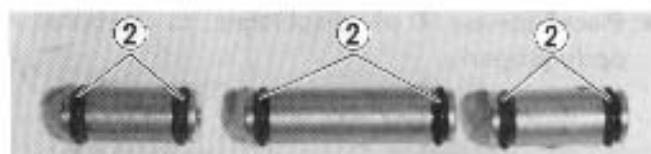
- Apply thread lock cement to two screws for securing throttle valve.

99000-32040

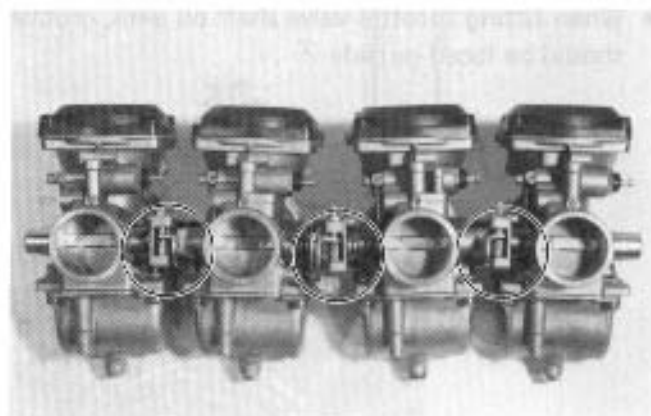
Thread Lock cement



- When engaging four carburetors, be sure to fix fuel pipe ① with O-rings ②.



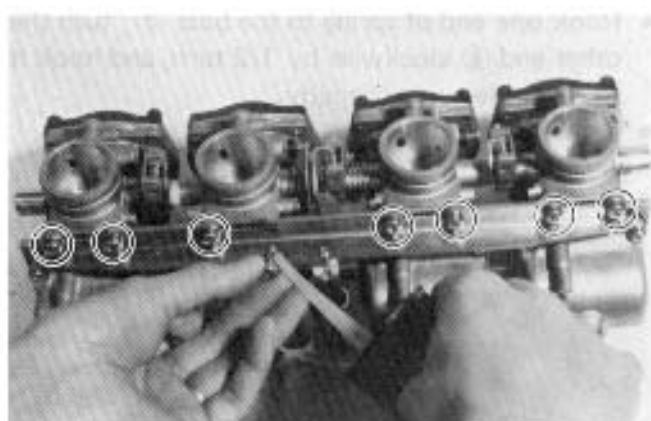
- Position throttle valve control lever correctly.



- Apply thread lock cement to lower plate screws.

99000-32040

Thread lock cement

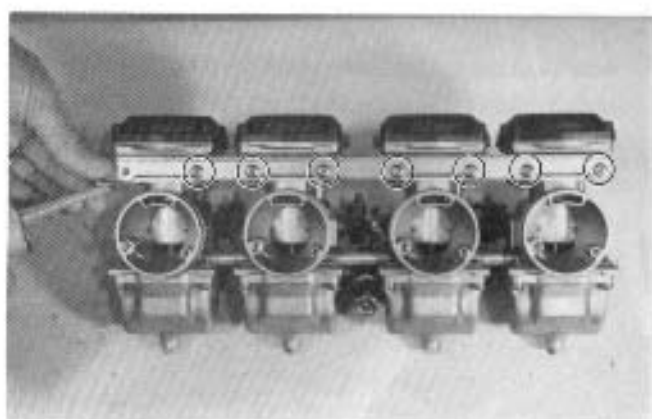


## LUBRICATION SYSTEM

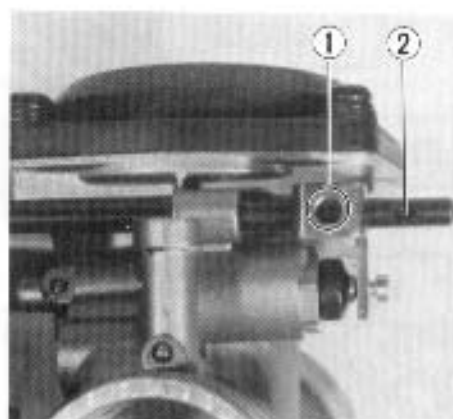
- Apply thread lock cement to the upper plate screws,

99000-32040

Thread Lock cement



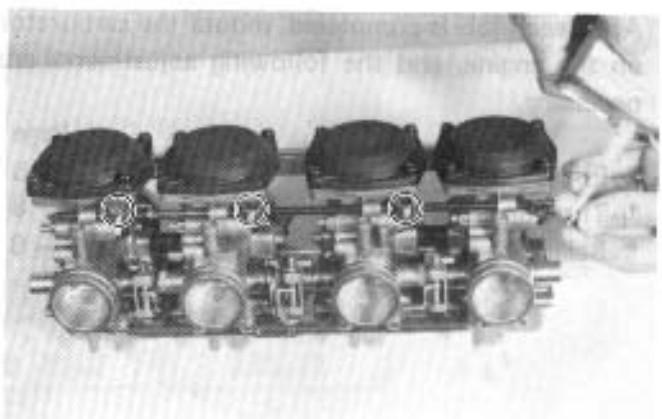
- When mounting starter shaft, align starter valve screw ① with dent mark ② on starter shaft and grease sliding portions, and align starter valve boss with the starter cable guide slit.



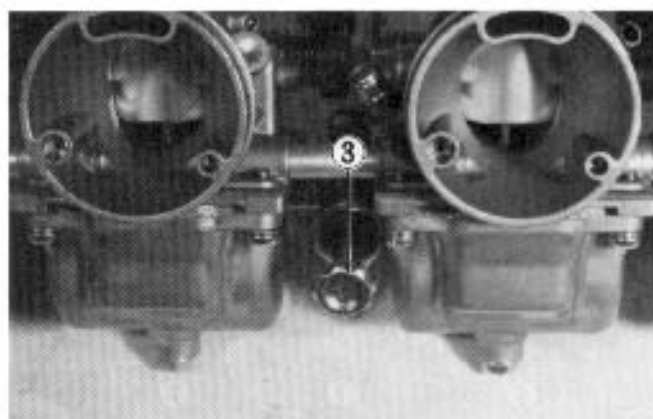
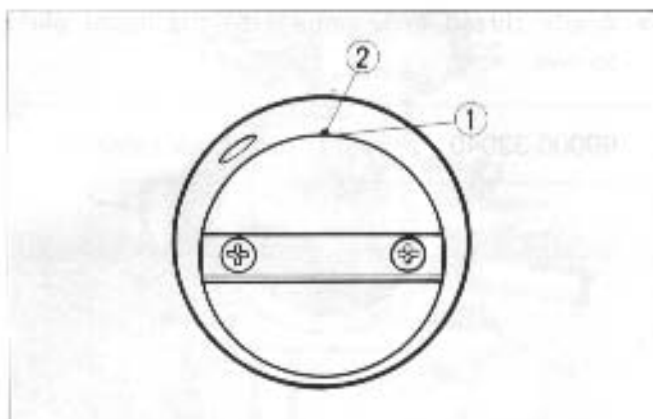
- Apply thread lock cement to starter shaft securing screws,

99000-32040

Thread lock cement



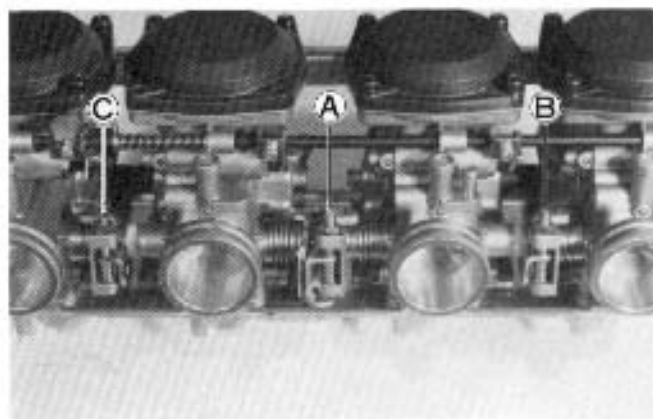
- Set each throttle valve in such a way that its top end ① meets the foremost bypass ②. This is accomplished by turning throttle valve stop screw ③ and balance screws A, B, C.



**NOTE:**

When adjusting the throttle balance screws, adjusting order is as follows:

- A (for No. 2 Carb.) → B (for No. 1)  
→ C (for No. 4)



After each job is completed, mount the carburetor on the engine, and the following adjustments are necessary.

|                              | Page  |
|------------------------------|-------|
| * Engine idle rpm .....      | 2 - 8 |
| * Throttle cable play .....  | 2 - 8 |
| * Balancing carburetor ..... | 4 - 9 |



## LUBRICATION SYSTEM

### OIL PRESSURE

Start the engine and check if the oil pump pressure indicator light is turned on. If it keeps on lighting, check the oil pump pressure indicator light circuit. If it is in good condition, check the oil pump pressure in the following manner:

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



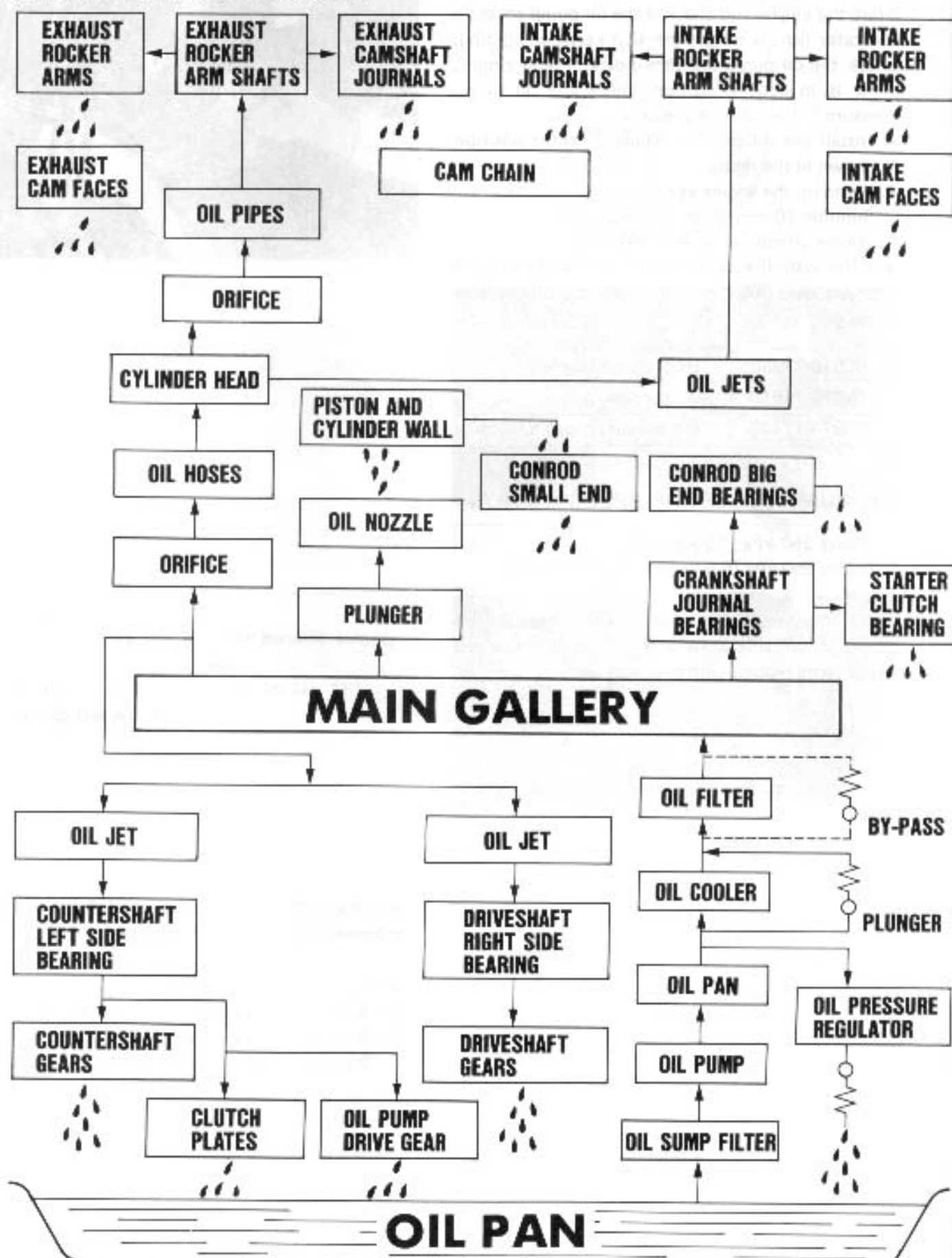
|             |                            |
|-------------|----------------------------|
| 09915-77330 | Oil pressure meter         |
| 09915-74510 | Oil pressure gauge         |
| 09915-17410 | Oil pressure gauge adaptor |

### OIL PUMP PRESSURE SPECIFICATION

Above 250 kPa (2.5 kg/cm<sup>2</sup>)  
Below 550 kPa (5.5 kg/cm<sup>2</sup>) at 3 000 r/min

If the pressure is too low, it means that the oil pump is internally worn or otherwise defective and needs to be replaced with a new one.

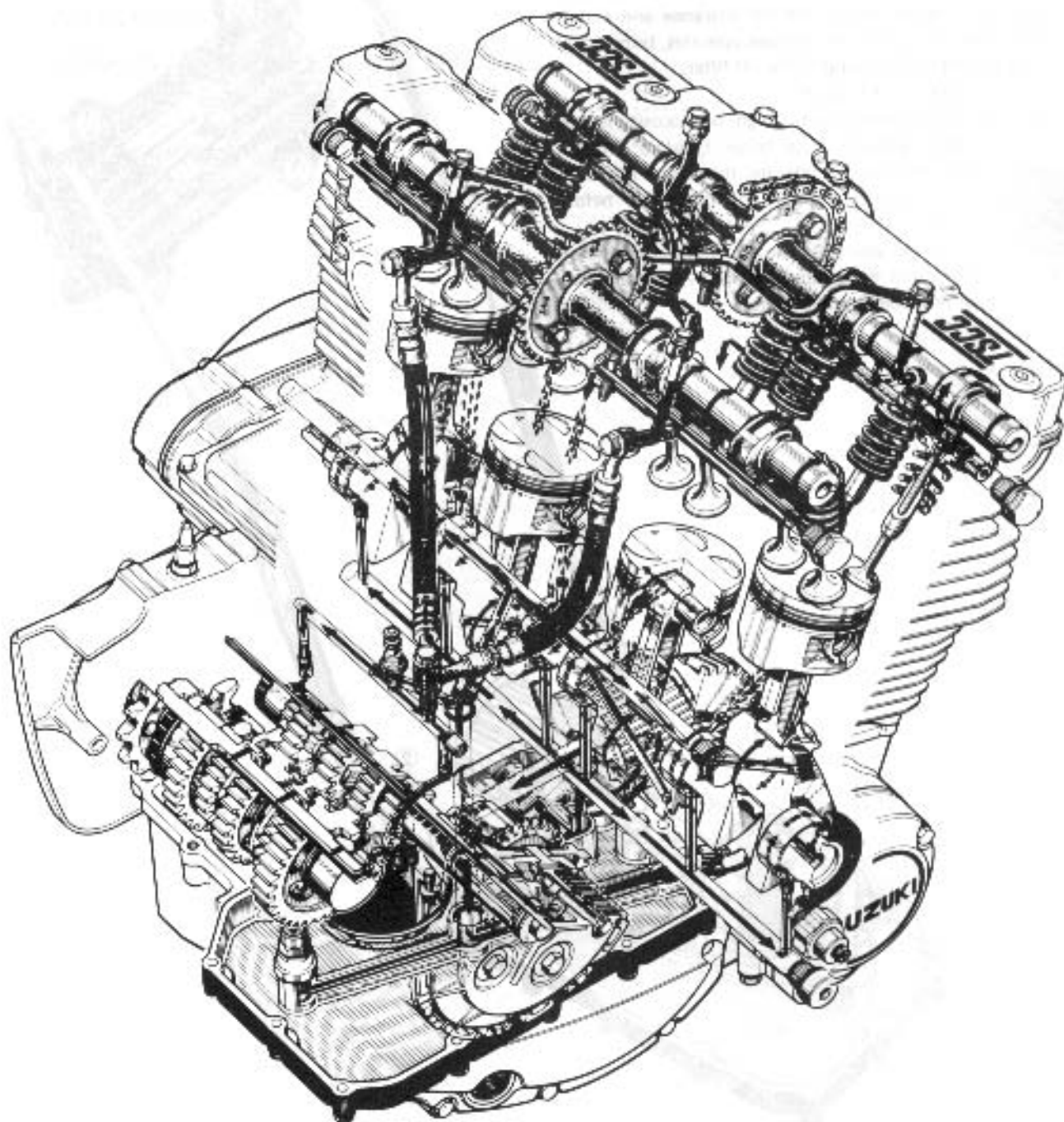
## ENGINE LUBRICATION SYSTEM



## ELECTRICAL SYSTEM

## OIL JET

- On the side surface of the crankcase journal, an oil jet is mounted to aid in piston cooling. An engine oil pressure check valve is provided in the passage from the main gallery to stop flowing low-pressurized engine oil to the jet. When engine oil pressure exceeds the operating pressure of the valve ( $1.6 \text{ kg/cm}^2$ ), the valve opens to allow oil to spray from the oil jet and thus cooling pistons and lubricating cylinder walls.
- In order to control heating up of the cylinder head by the combustion chamber and exhaust ports which are heated by the exhaust gas, oil passages are provided at the exhaust side of the cylinder head, and oil is driven into these passages to cool the cylinder head.



## OIL COOLER

- **Oil Pressure Regulator:** Oil pressure regulator is threaded into the oil passage in the oil pan. There is an O-ring used to seal the oil passage from the crankcase to the oil pan.

- **Plunger:** A plunger is mounted in the oil pan, in a parallel circuit with the oil cooler; when the relative oil pressure between the entrance and exit to the oil cooler exceeds  $1 \text{ kg/cm}^2$ , the plunger operates.

**Low Engine Oil Temperature**

When engine oil temperature is low, oil viscosity is high, and there is a great loss of pressure inside the oil cooler. When the relative pressure of the entrance and exit is greater than  $1 \text{ kg/cm}^2$ , the plunger operates, bringing oil directly from the oil pump to the oil filter.

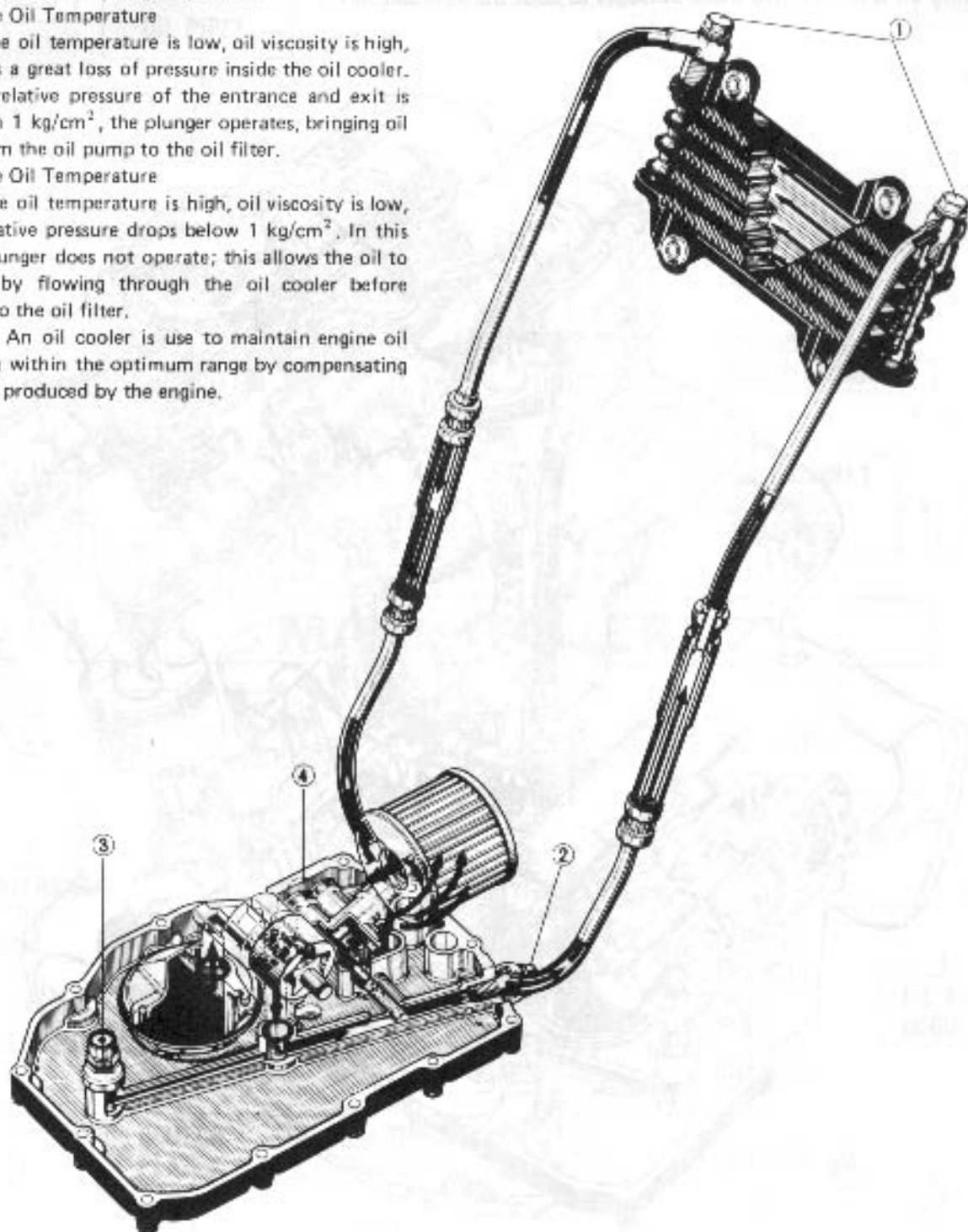
**High Engine Oil Temperature**

When engine oil temperature is high, oil viscosity is low, and the relative pressure drops below  $1 \text{ kg/cm}^2$ . In this case, the plunger does not operate; this allows the oil to be cooled by flowing through the oil cooler before passing on to the oil filter.

- **Oil Cooler:** An oil cooler is used to maintain engine oil temperature within the optimum range by compensating for the heat produced by the engine.

TIGHTENING TORQUE

| ITEM | N·m     | kg·m      |
|------|---------|-----------|
| ①    | 15 – 18 | 1.5 – 1.8 |
| ②    | 25 – 30 | 2.5 – 3.0 |
| ③    | 25 – 30 | 2.5 – 3.0 |
| ④    | 33 – 40 | 3.3 – 4.0 |



# ELECTRICAL SYSTEM

## CONTENTS

|                                           |             |
|-------------------------------------------|-------------|
| <b>CHARGING SYSTEM</b> .....              | <b>5- 1</b> |
| <b>IGNITION SYSTEM</b> .....              | <b>5- 5</b> |
| <b>BATTERY</b> .....                      | <b>5- 8</b> |
| <b>STARTER SYSTEM</b> .....               | <b>5-11</b> |
| <b>COMBINATION METER AND GAUGES</b> ..... | <b>5-15</b> |
| <b>LAMPS</b> .....                        | <b>5-20</b> |
| <b>SWITCHES</b> .....                     | <b>5-22</b> |

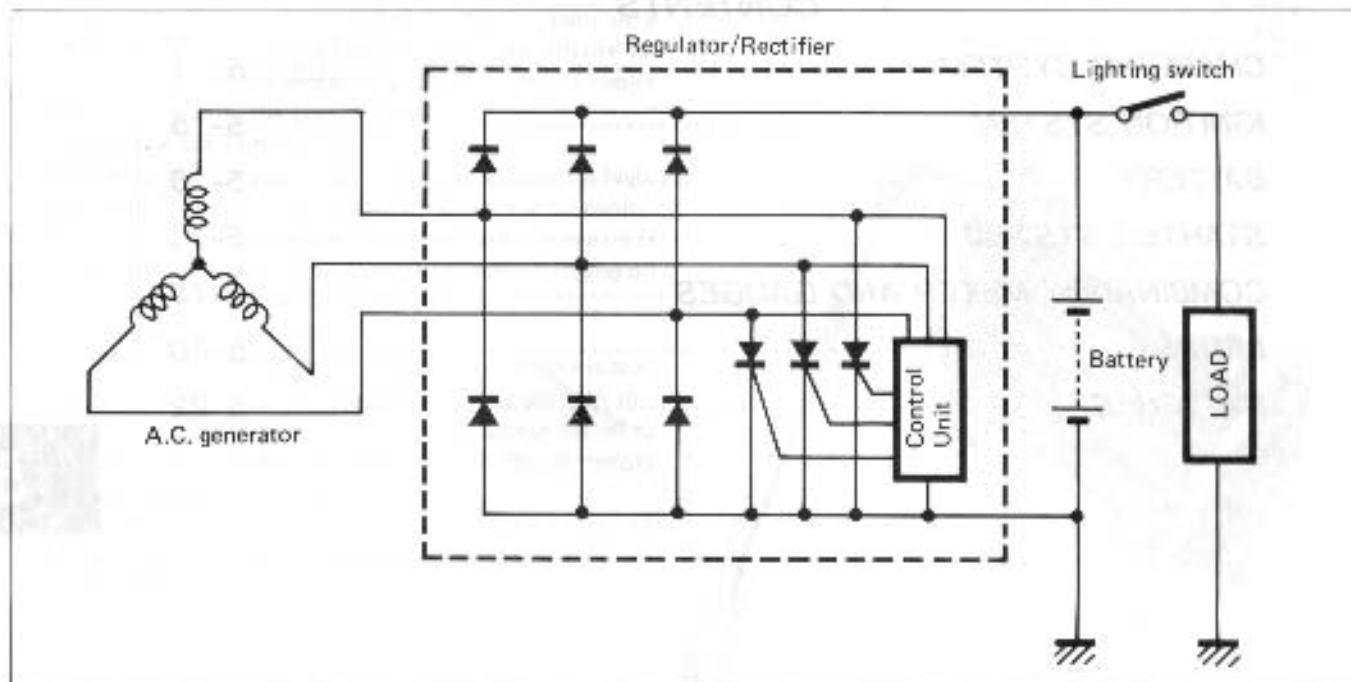


## CHARGING SYSTEM

### DISCRIPTION

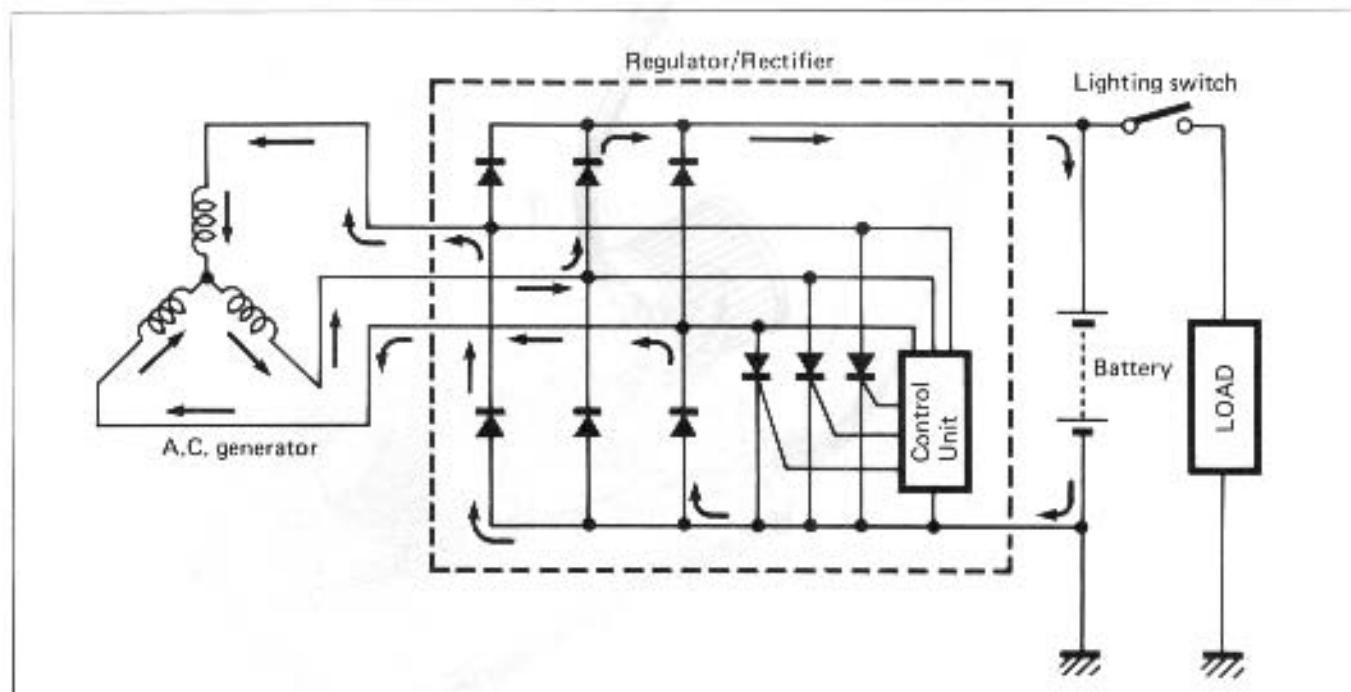
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

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

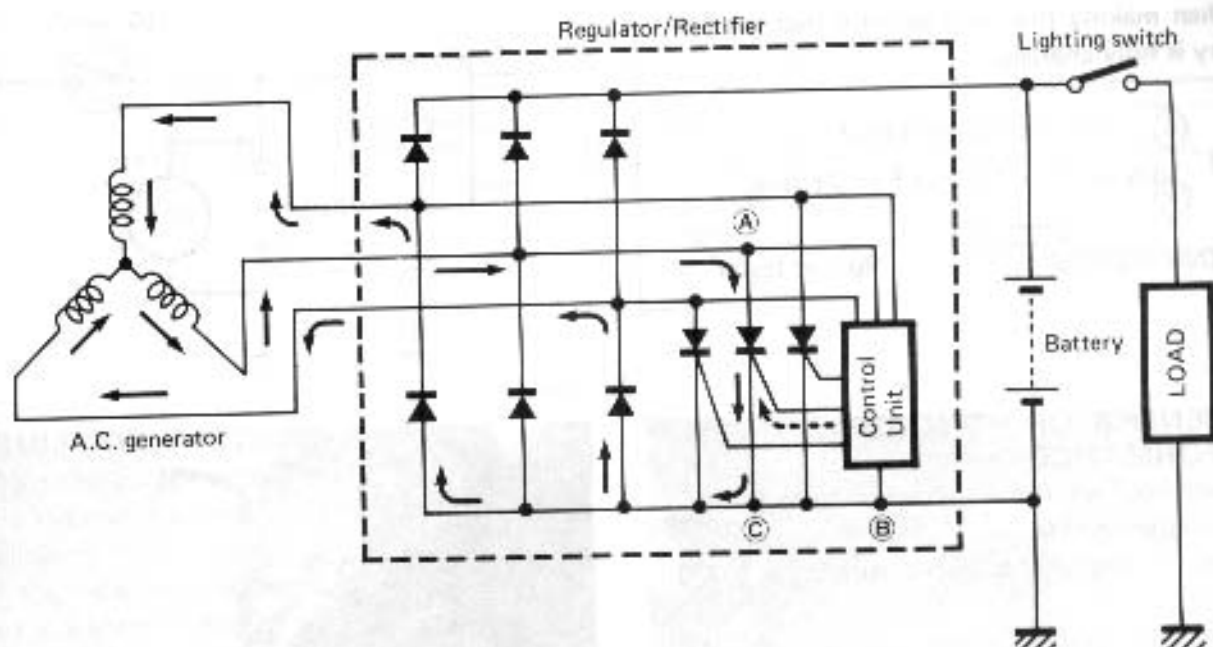


### FUNCTION OF REGULATOR

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.

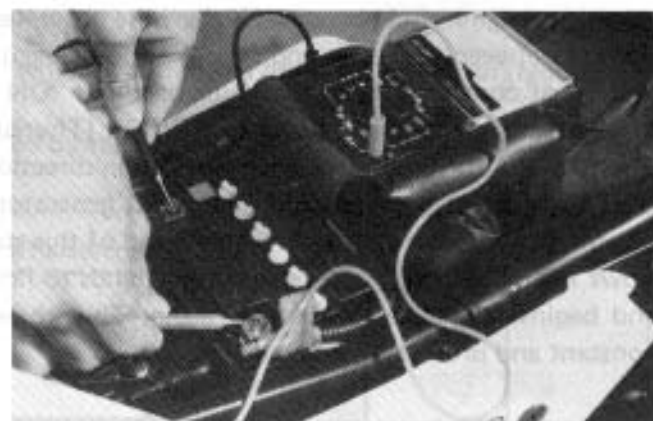


When the engine r/min becomes higher, the generated voltage of AC generator also becomes higher and the voltage between points (A) and (B) of regulator becomes high according, and when it reaches the adjusted voltage of control unit, control unit becomes "ON" condition consequently. On the "ON" condition 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 (A) to point (C). 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 (B), 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**

- Remove the seat.
- Start the engine and keep it running at 5 000 r/min with lighting switch turned to the ON position (dimmer switch in HI position).
- Using the pocket tester, measure the DC voltage between the battery terminal  $\oplus$  and  $\ominus$ .
- If the tester reads under 13.5V or over 15.5V, check the AC generator no-load performance and regulator/rectifier.

**NOTE:**

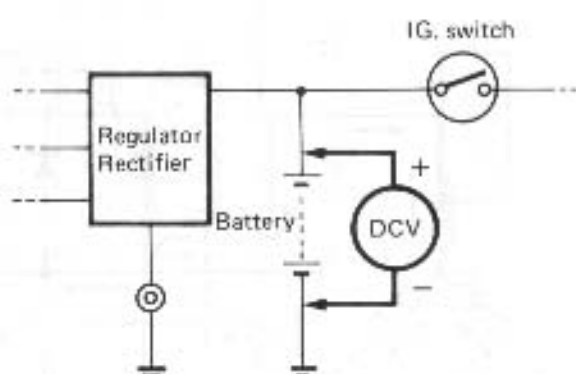
When making this test, be sure that the battery is fully-charged.

STD charging output

13.5 – 15.5V (DC) at 5 000 r/min

09900-25002

Pocket tester

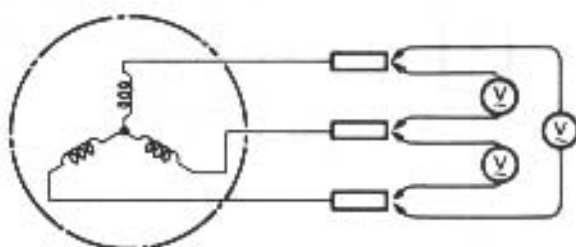
**AC GENERATOR NO-LOAD PERFORMANCE**

- 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 80V, the AC generator is faulty.



STD No-load performance

More than 80V (AC) at 5 000 r/min



**AC GENERATOR CONTINUITY CHECK**

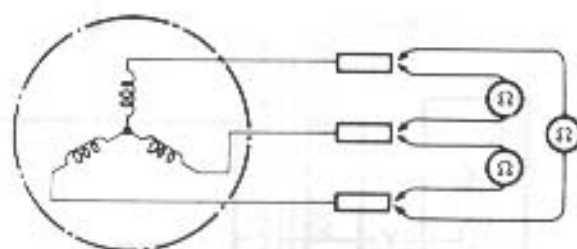
- Using the pocket tester, check the continuity between the lead wires of the stator.
- Also check that the stator core is insulated.

**NOTE:**

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

09900-25002

Pocket tester

**REGULATOR/RECTIFIER**

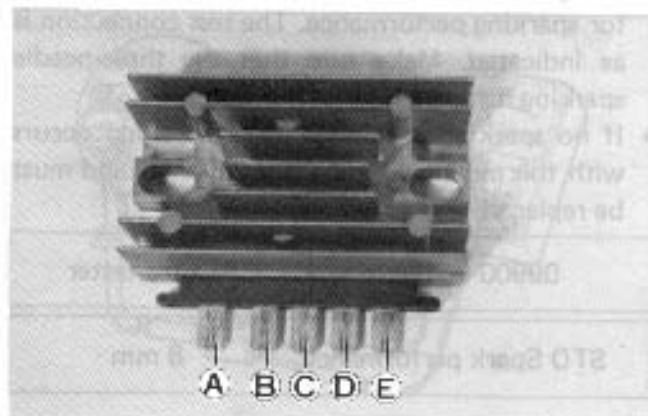
- Using the pocket tester (X1 $\Omega$  range), measure the resistance between the lead wires in the following table.
- If the resistance checked is incorrect, replace the regulator/rectifier.

09900-25002

Pocket tester



| Probe of tester | Probe of tester |         |         |         |         |
|-----------------|-----------------|---------|---------|---------|---------|
|                 | A               | B       | C       | D       | E       |
| A               |                 | 6.0-7.5 | 6.0-7.5 | 6.0-7.5 | 50-70   |
| B               | OFF             |         | OFF     | OFF     | 6.0-7.5 |
| C               | OFF             | OFF     |         | OFF     | 6.0-7.5 |
| D               | OFF             | OFF     | OFF     |         | 6.0-7.5 |
| E               | OFF             | OFF     | OFF     | OFF     |         |

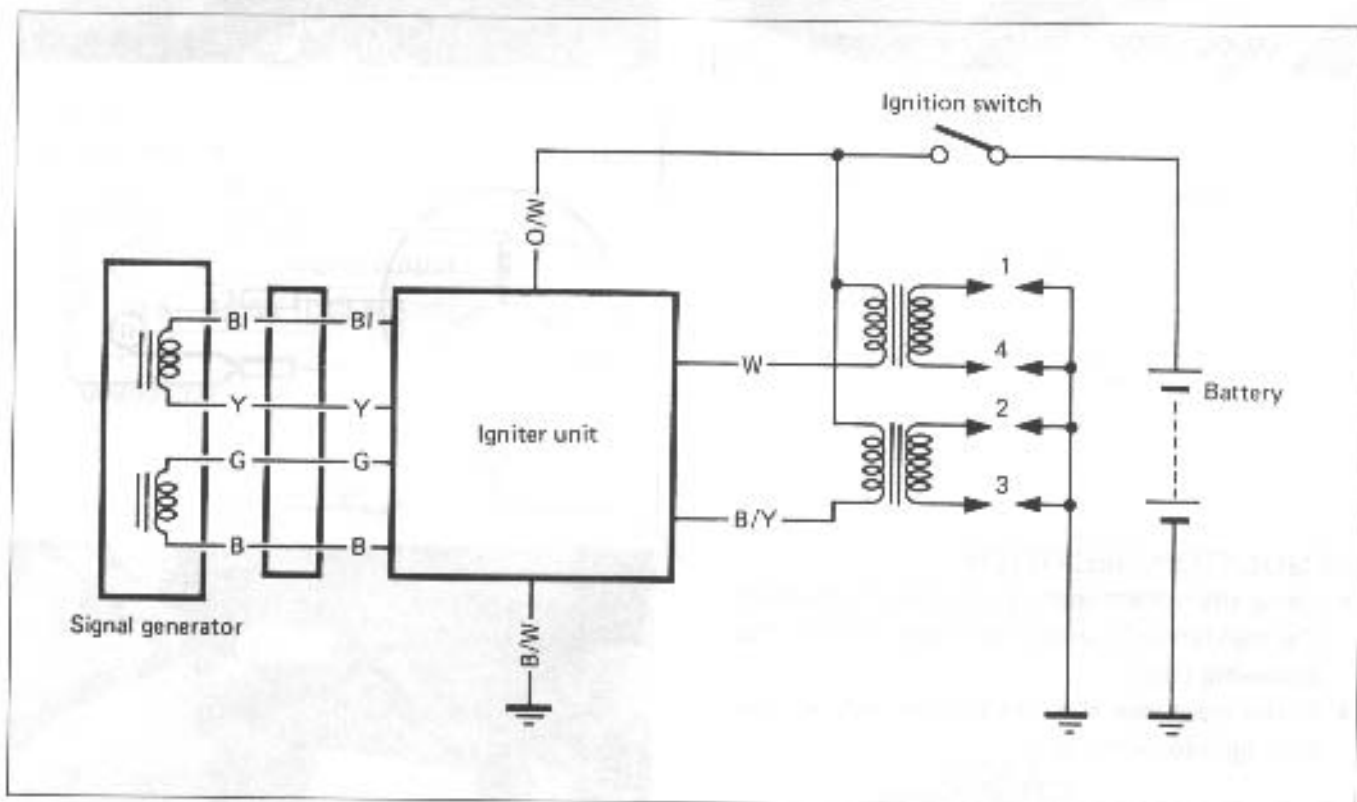


## IGNITION SYSTEM

### DESCRIPTION

The fully transistorized ignition system consists of a signal generator, igniter unit, ignition coils, and spark plugs. The signal generator comprises one rotor and two pick-up coils.

The signal generator is mounted at the right end of the crankshaft. The output of the signal generator goes to the igniter unit, where it turns ON and OFF the transistor alternately. As the transistor is turned ON and OFF, the current passing through the primary winding of the ignition coil is also turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.



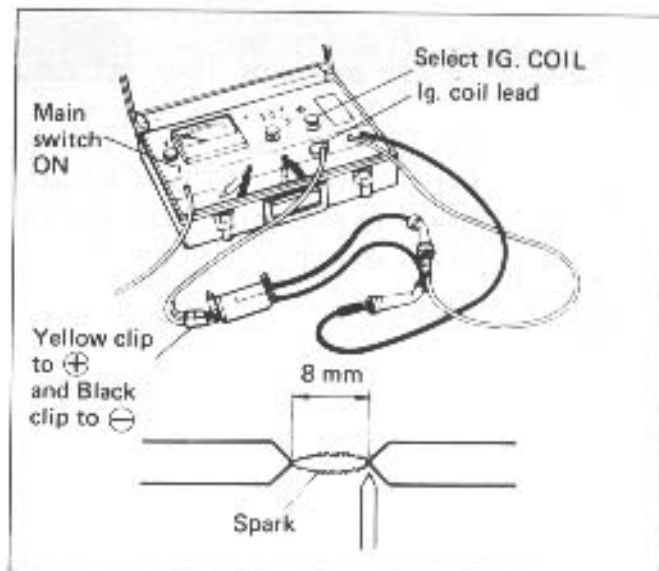
### INSPECTION

#### IGNITION COILS

##### CHECKING WITH ELECTRO TESTER

- Using the electro tester, test each ignition coil for sparking performance. The test connection is as indicated. Make sure that the three-needle sparking distance is at least 8 mm.
- If no sparking or orange color sparking occurs with this much gap, then it is defective and must be replaced.

|                       |                |
|-----------------------|----------------|
| 09900-28106           | Electro tester |
| STD Spark performance | 8 mm           |



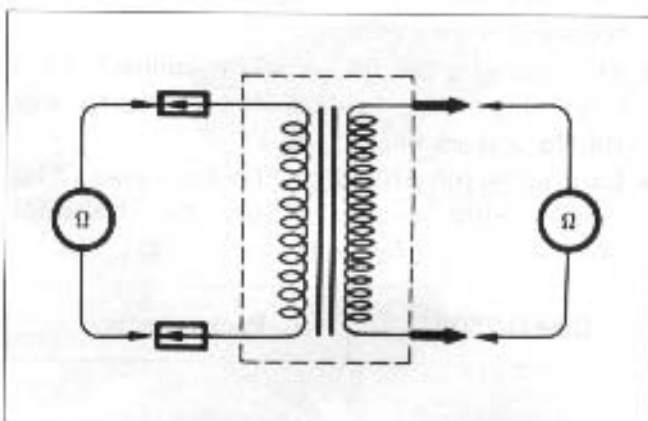
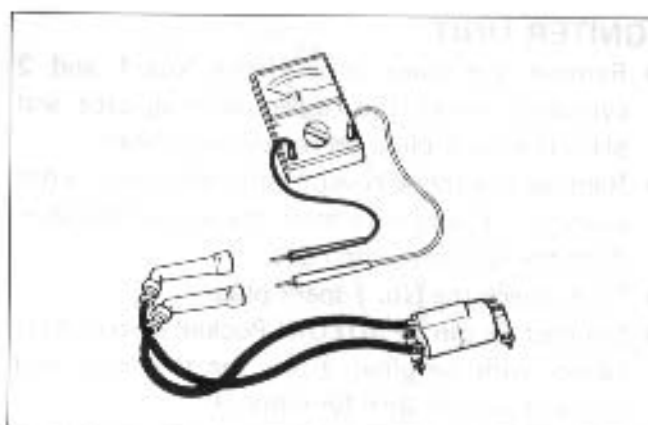


## BATTERY

## CHECKING WITH POCKET TESTER

- A SUZUKI pocket tester or an ohm meter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings. Exact ohmic readings are not necessary, but, if the windings are in sound condition, their continuity will be noted with these approximate ohmic values.

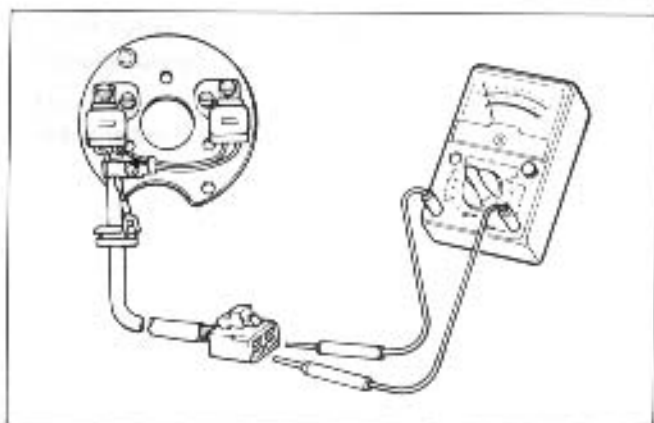
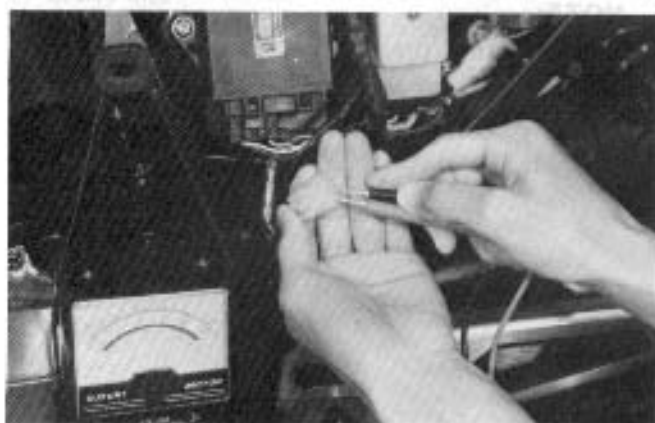
|                          |                   |
|--------------------------|-------------------|
| 09900-25002              | Pocket tester     |
| Ignition coil resistance |                   |
| Primary                  | 3 – 5 $\Omega$    |
| Secondary                | 30 – 50k $\Omega$ |



## SIGNAL GENERATOR

- Measure the resistance between lead wires.
- If the resistance is infinity or less than the specifications, the signal generator must be replaced.

|                |                    |
|----------------|--------------------|
| 09900-25002    | Pocket tester      |
| STD resistance |                    |
| Green – Black  | 130 – 200 $\Omega$ |
| Blue – Yellow  |                    |



## IGNITION

## IGNITER UNIT

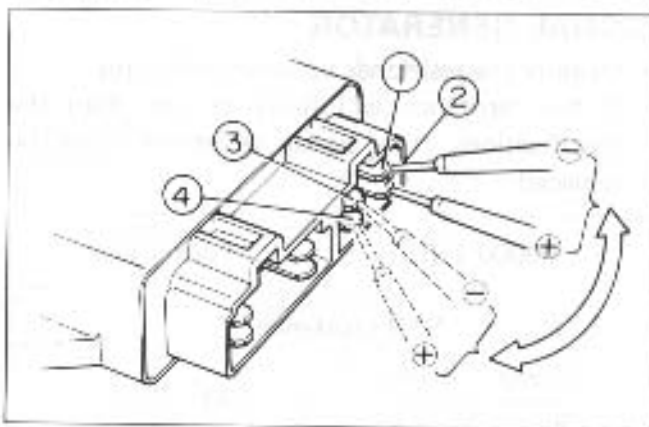
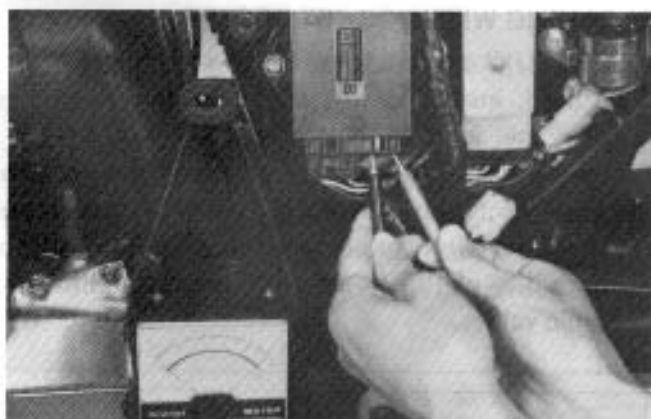
- Remove the spark plugs from Nos. 1 and 2 cylinders. Install the respective plug caps and place the spark plugs on the cylinder head.
- Remove the frame cover on the left side and disconnect the lead wire from the signal generator. Turn the ignition switch ON.
- First, check the No. 1 spark plug.
- Connect  $\oplus$  pin of SUZUKI Pocket Tester ( $\times 1\Omega$  range) with terminal ② on the transistor unit side and  $\ominus$  pin with terminal ①.
- The transistor unit is in good condition if the following is observed:
  - The moment the test pins are connected the spark plug of No. 1 cylinder sparks. Next, check the No. 2 spark plug.
- Connect  $\oplus$  pin of SUZUKI Pocket Tester ( $\times 1\Omega$  range) with terminal ④ on the transistor unit side and  $\ominus$  pin with terminal ③.

09900-25002

Pocket tester

## NOTE:

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



## BATTERY

### SPECIFICATION

|                           |                        |
|---------------------------|------------------------|
| Type designation          | YB14L-A2               |
| Capacity                  | 50.4kC (14 Ah)         |
| Standard electrolyte S.G. | 1.28 at 20°C<br>(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 | 1.4A |
|--------------------------|------|

#### 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

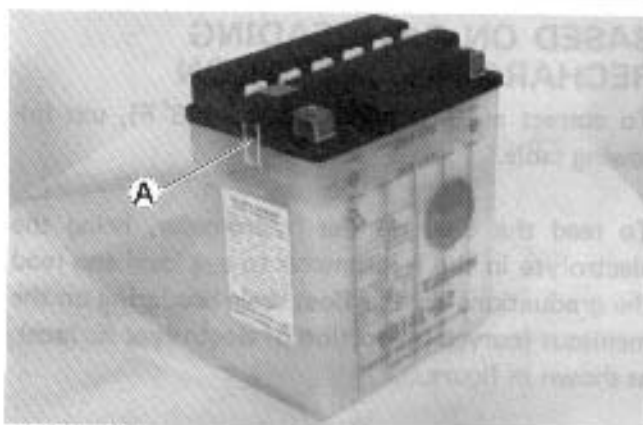
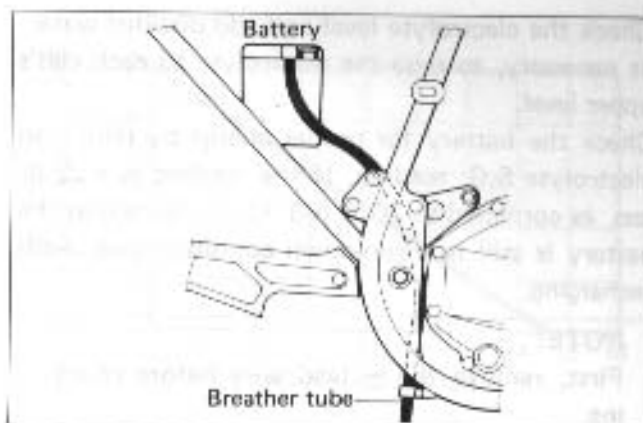
Date of manufacture is indicated by a three-part number ①, as follows, each indicating month, date and year.

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.

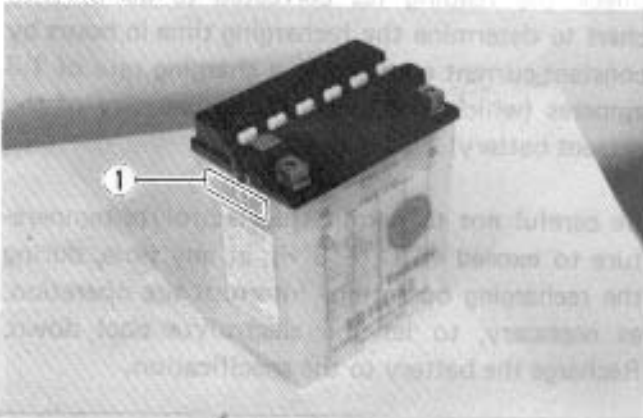
#### SERVICING

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.



A: 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 before charging.

### 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.

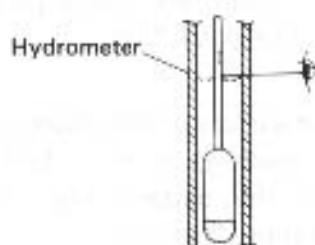
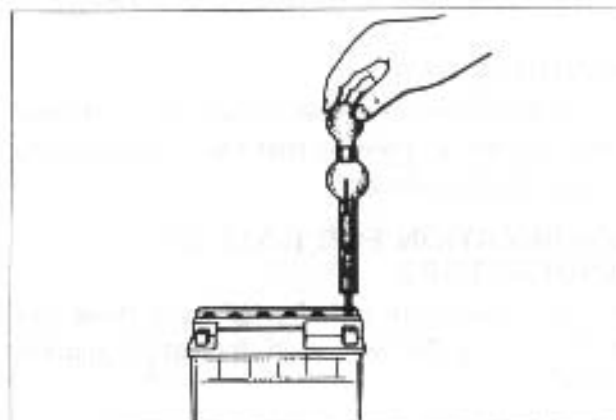
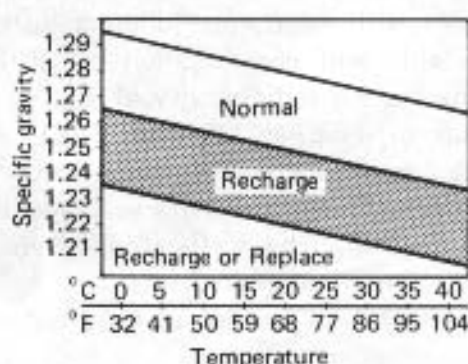
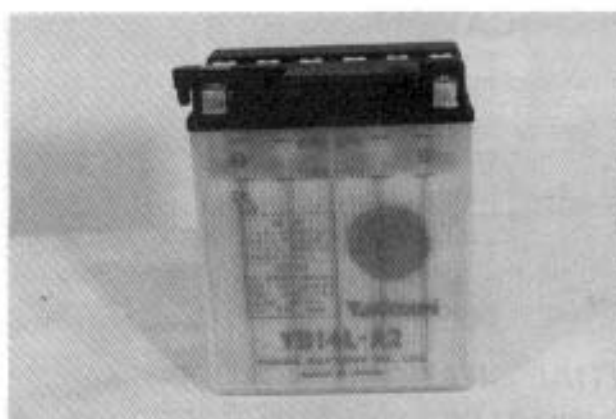
Check the reading (as corrected to 20°C) with chart to determine the recharging time in hours by constant-current charging at a charging rate of 1.4 amperes (which is a tenth of the capacity of the present battery).

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) |
|------------------------------|---------------------|

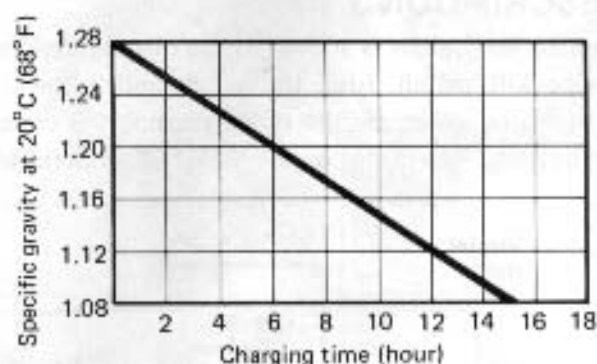
**CAUTION:**

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:

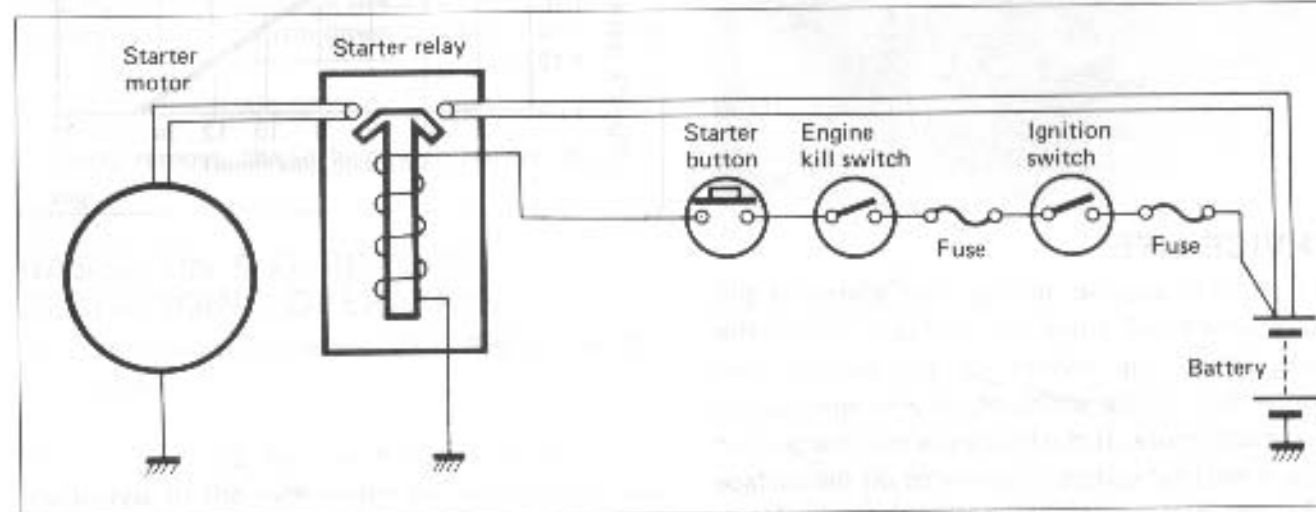
- \* Before charging a battery, remove the seal cap from each cell.
- \* Keep fire and sparks away from a battery being charged.
- \* When removing a battery from the motorcycle, be sure to remove the  $\ominus$  terminal first.



## STARTER SYSTEM

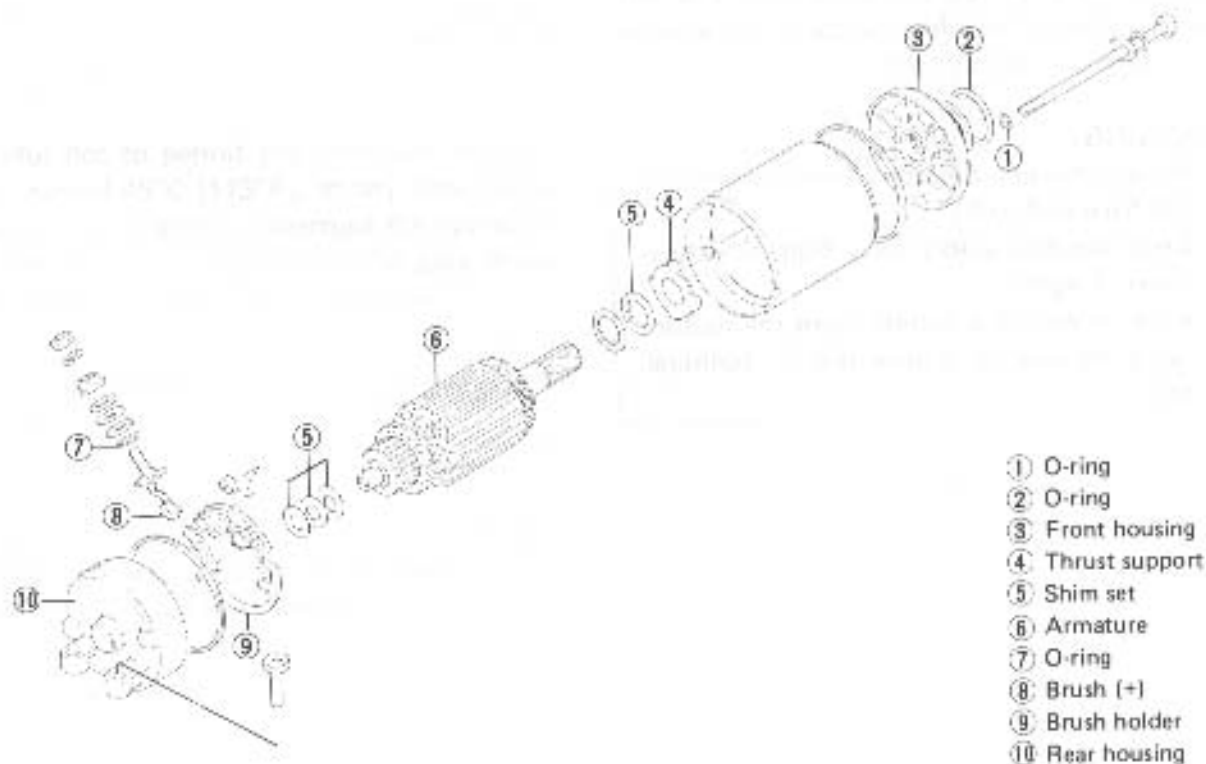
### DESCRIPTION

The starter system is shown in the diagram below: namely, the starter motor, starter relay, starter button, engine kill switch, fuse, IG switch 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 3-21).
- Disassemble the starter motor by referring to the chart.



## 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 chipped.

Service Limit

6 mm

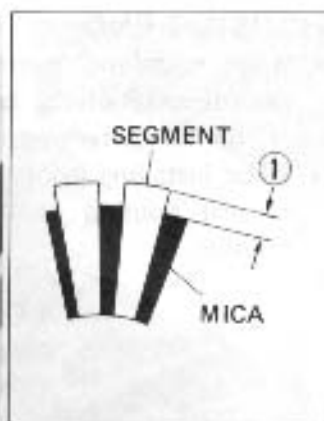


### COMMUTATOR

- 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.
- Measure the commutator under cut ①.

Service Limit

0.2 mm

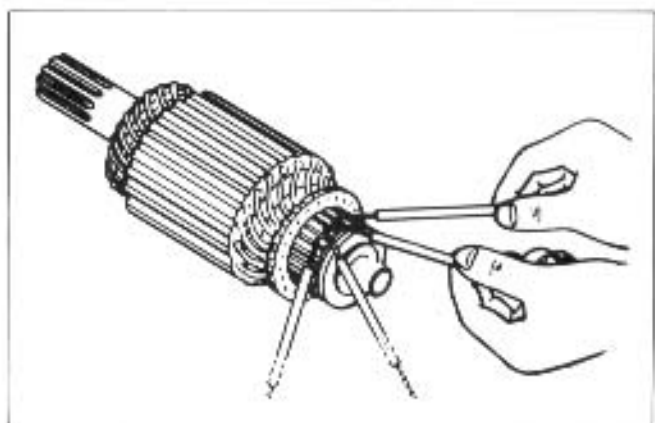


### ARMATURE COIL

- 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

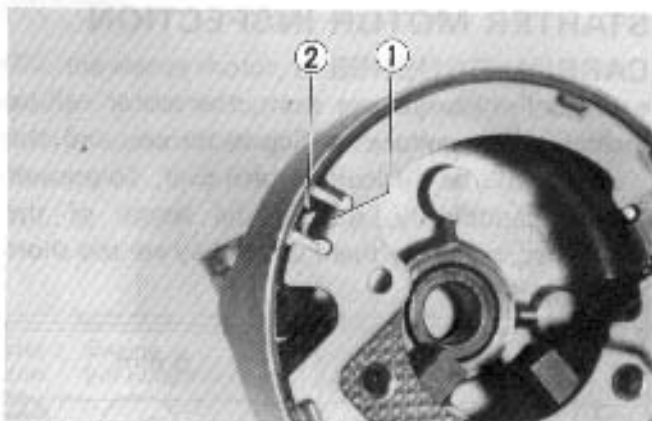


## STARTER SYSTEM

## STARTER MOTOR REASSEMBLY

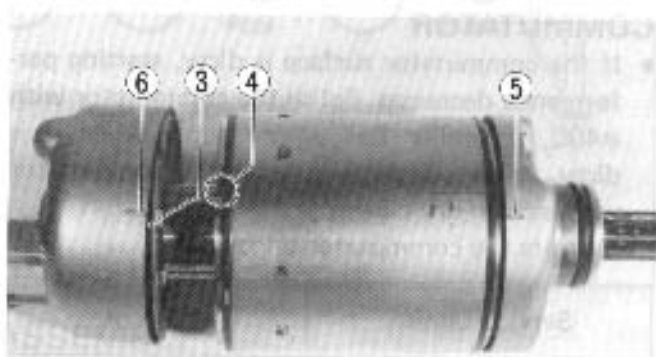
### BRUSH HOLDER

When fixing brush holder to rear housing, align the protrusion ① of the brush holder with the hole ② of the rear housing.



### HOUSING END

- When installing starter motor case, fix the protrusion ③ of the brush holder to the notch ④ on the starter motor case.
- When installing front housing, align the mark ⑤ of rear housing to the mark ⑥ on the front housing.

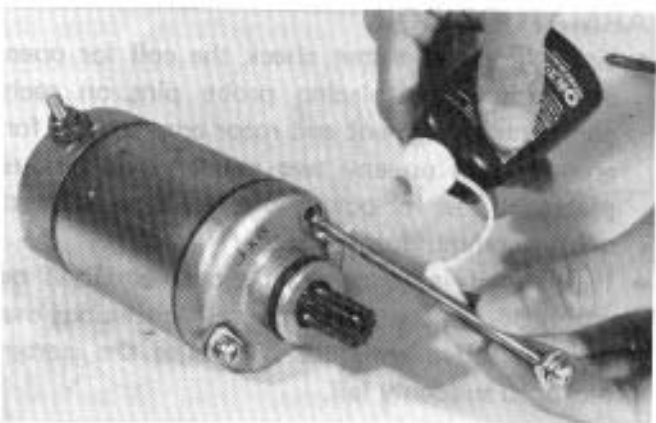


### SECURING SCREWS

Apply Thread Lock "1342" to starter motor securing screws.

99000-32050

Thread Lock "1342"



## STARTER RELAY INSPECTION

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

09900-25002

Pocket tester

- 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

3 – 4Ω



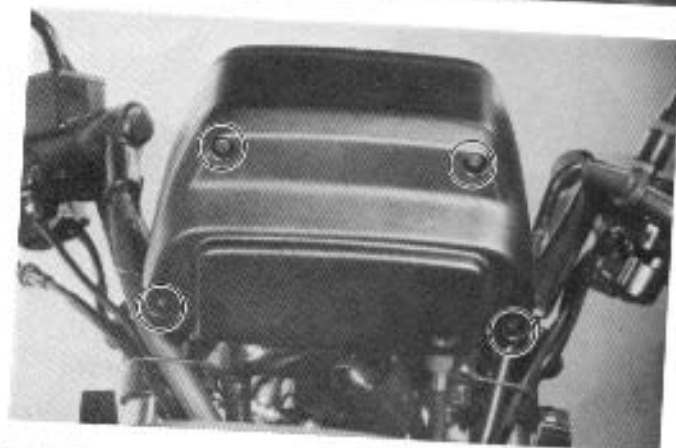
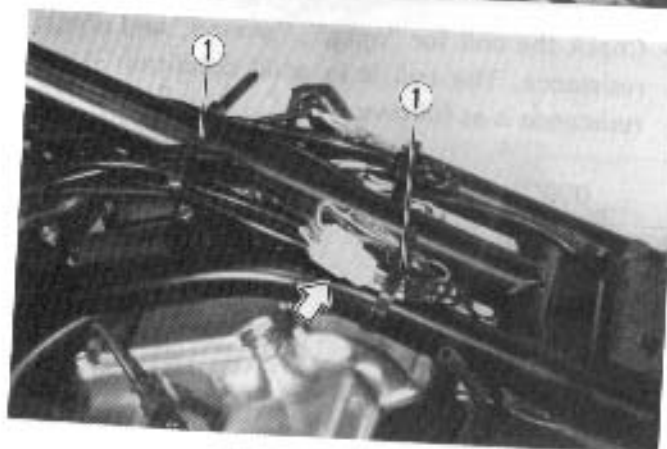
# COMBINATION METER AND GAUGES

## REMOVAL

- Remove the fairing (See page 6-1). (GSX750ES)
- Remove the right and left frame covers.
- Remove the seat.
- Take off the fuel tank.

### NOTE:

When taking off fuel tank, disconnect fuel hose, vacuum hose, and fuel gauge lead wires. Fuel cock must be in ON position.



- Disconnect the gear position indicator light lead wires and remove two clamps ①.

- Remove the combination meter cover.

- Disconnect the combination meter lead wires and the speedometer cable.



# COMBINATION METER AND GAUGES

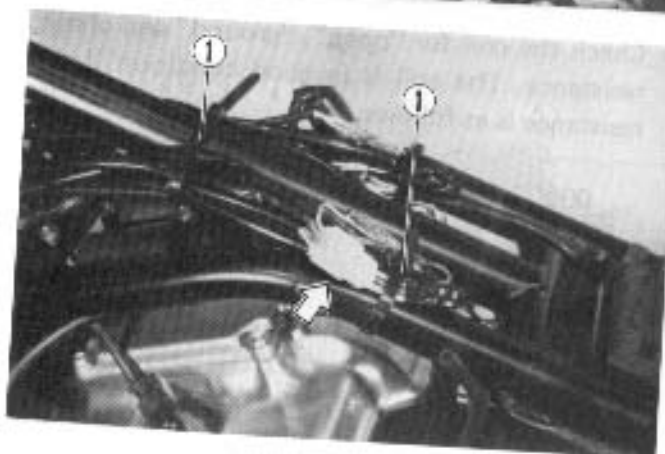
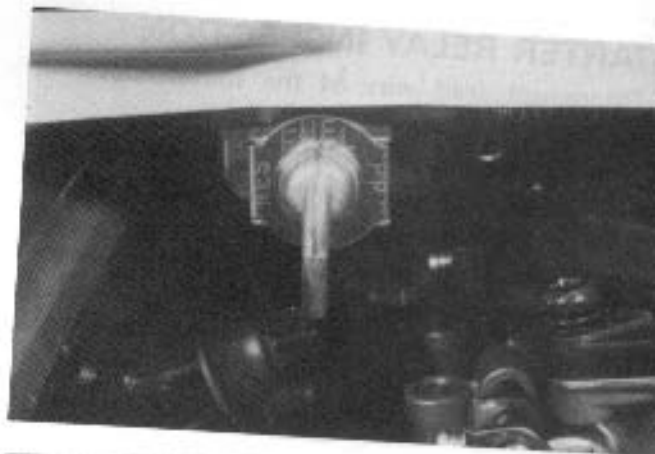
## REMOVAL

- Remove the fairing (See page 6-1). (GSX750ES)
- Remove the right and left frame covers.
- Remove the seat.
- Take off the fuel tank.

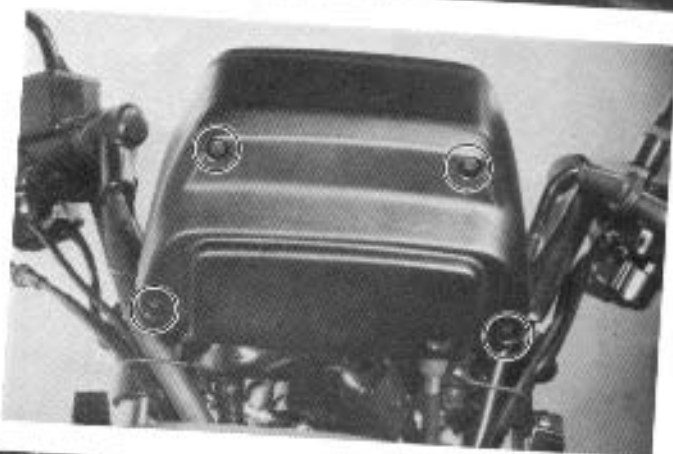
### NOTE:

When taking off fuel tank, disconnect fuel hose, vacuum hose, and fuel gauge lead wires. Fuel cock must be in ON position.

- Disconnect the gear position indicator light lead wires and remove two clamps ①.



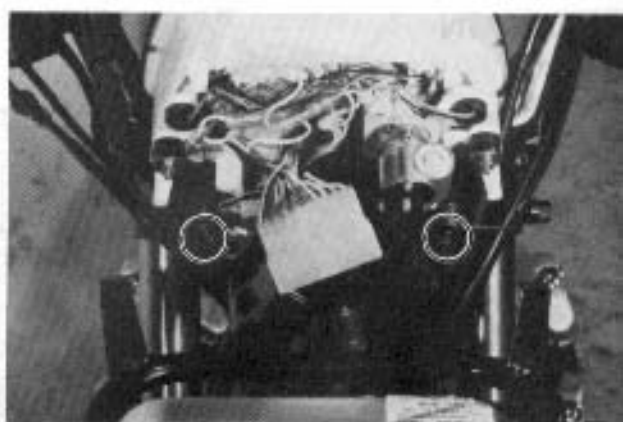
- Remove the combination meter cover.



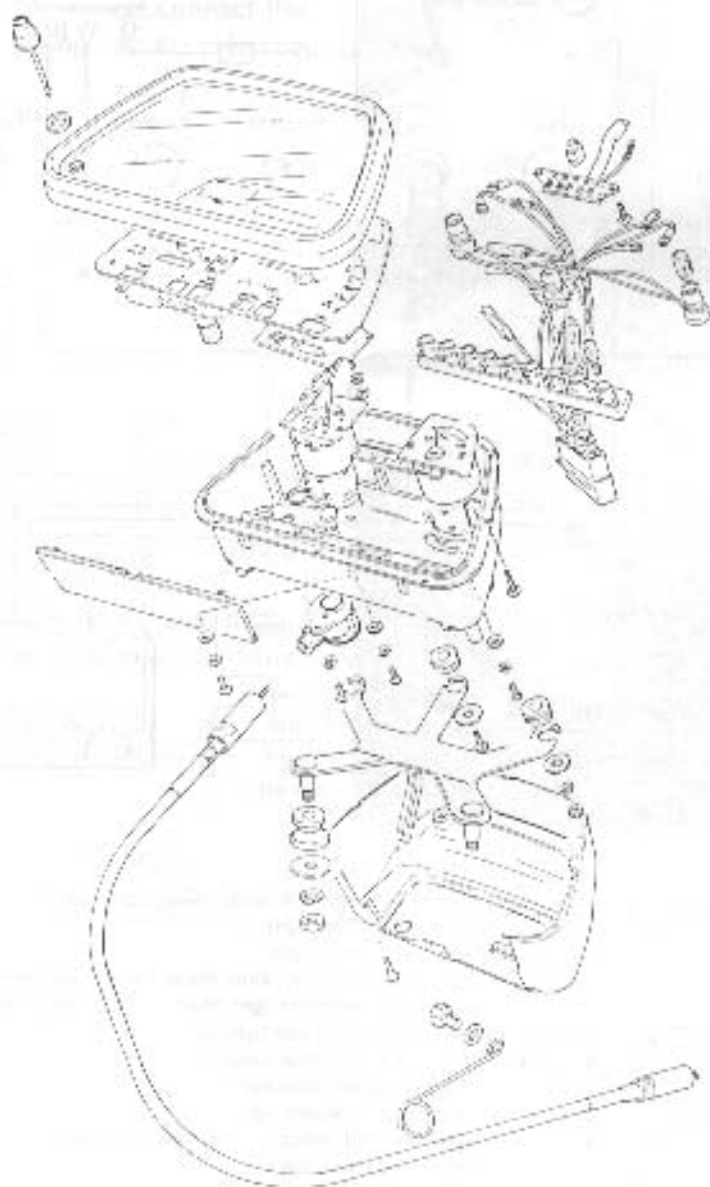
- Disconnect the combination meter lead wires and the speedometer cable.



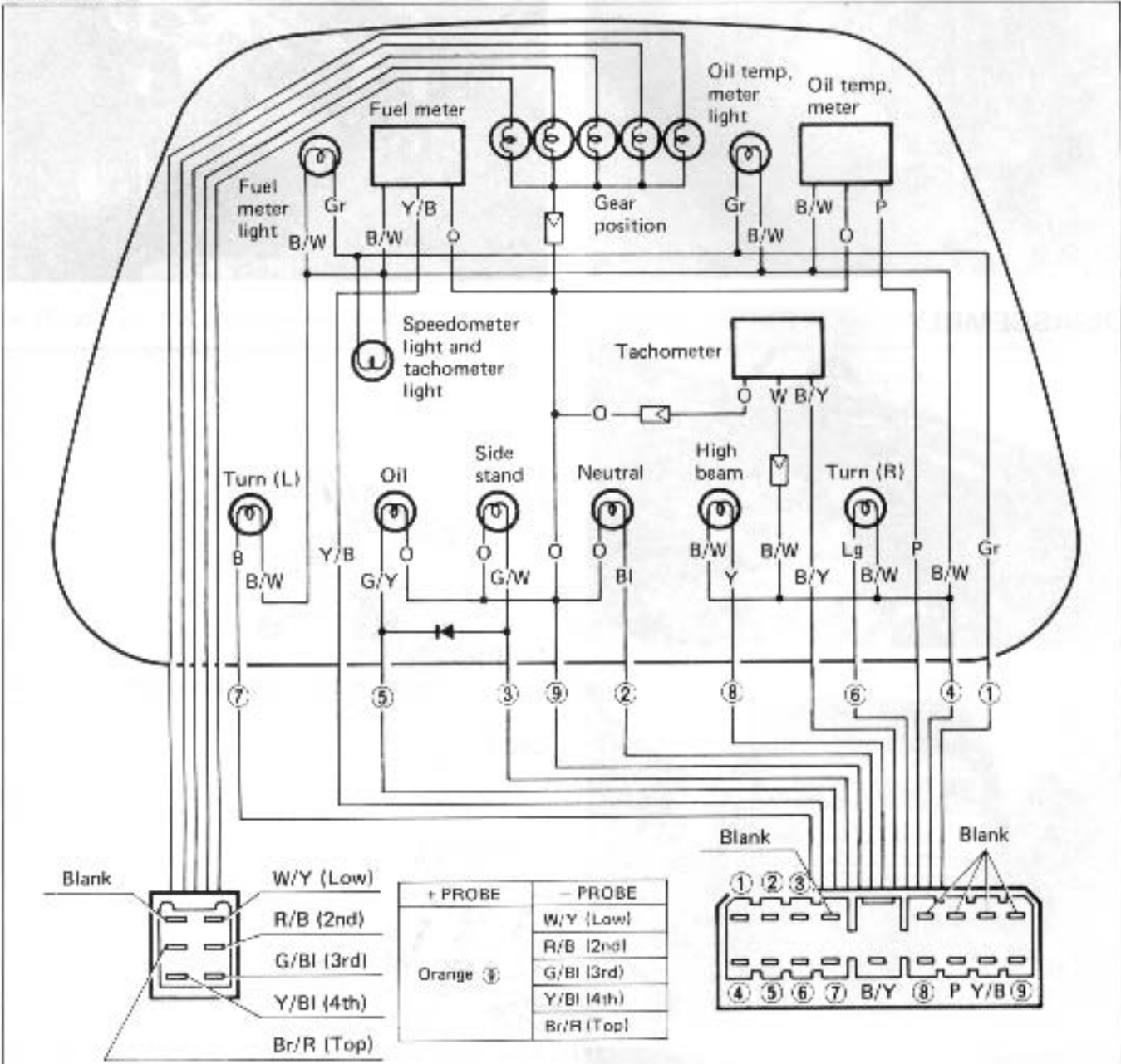
- Remove two mounting nuts and take off combination meter.



## DISASSEMBLY



INSPECTION  
DIAGRAM



| + PROBE  | - PROBE |   |
|----------|---------|---|
| ① Gr (+) | B/W (-) | ④ |
| ⑦ B (+)  | B/W (-) | ④ |
| ⑥ Lg (+) | B/W (-) | ④ |
| ③ Y (+)  | B/W (-) | ④ |
| ⑧ O (+)  | Bl (-)  | ② |
| ⑨ O (+)  | G/W (-) | ③ |
| ⑨ O (+)  | G/Y (-) | ⑤ |

- ① Gr (+) : Fuel meter light, Oil temp. meter light, Speedometer light and Tachometer light
- ② Bl (-) : Neutral indicator light
- ③ G/W (-) : Side stand check light
- ④ B/W (-) : Fuel meter light, Oil temp. meter light, Speedometer light and Tachometer light, Turn signal indicator light (Rand L), High beam indicator light
- ⑤ G/Y (-) : Oil pressure indicator light (R)
- ⑥ Lg (+) : Turn signal indicator light (L)
- ⑦ Bl (+) : Turn signal indicator light
- ⑧ Y (+) : High beam indicator light
- ⑨ O (+) : Gear position indicator light, Neutral indicator light, Oil pressure indicator light, Side stand check light

## BULBS

- Using the pocket tester, check the continuity between lead wires by referring to the diagram in page 5-17.
- If there is no continuity, replace the respective part.

09900-25002

Pocket tester



## FUEL METER

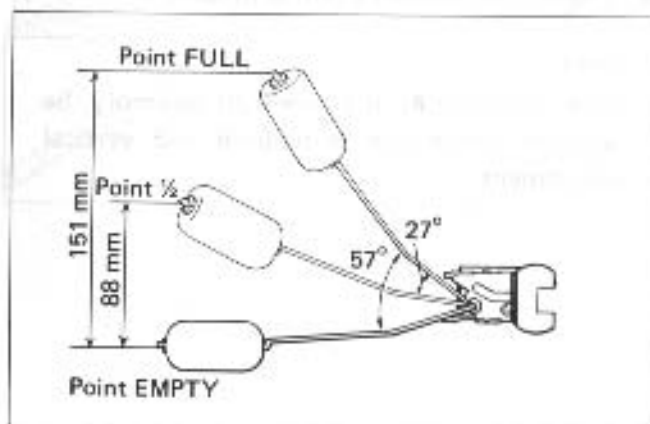
- With the ignition switch turned on, remove two lead wires going into the fuel gauge, connect the lead wires on the main wiring harness side and check the fuel meter.
- If "F" is indicated, the fuel meter is in good condition.



## FUEL GAUGE SENDING UNIT

- Remove the lead wires coming out of the fuel gauge and check resistance of each of them.
- If the resistance measured is incorrect, replace the fuel gauge assembly with new one.
- The relation between position of the fuel gauge float and resistance is shown in the following table.

| POSITION | RESISTANCE         |
|----------|--------------------|
| FULL     | 1 – 5 $\Omega$     |
| 1/2      | 25 – 40 $\Omega$   |
| EMPTY    | 100 – 120 $\Omega$ |



## OIL TEMP. GAUGE SENDING UNIT

- Warm up the engine as follows:  
Summer 10 min. or so at 2 000 r/min  
Winter 20 min. or so at 2 000 r/min
- Remove the connection of the pink lead wire, and use the pocket tester ( $\times 100\Omega$  range) to measure the resistance.

|               |                  |
|---------------|------------------|
| Pink — Ground | 30 ~ 85 $\Omega$ |
|---------------|------------------|

- The relation between oil temperature and resistance is shown in the following table.

| Oil temp.          |                    | Resistance ( $\Omega$ ) |
|--------------------|--------------------|-------------------------|
| $^{\circ}\text{C}$ | $^{\circ}\text{F}$ |                         |
| 60                 | 140                | Approx. 117             |
| 70                 | 158                | Approx. 85              |
| 80                 | 176                | Approx. 64              |
| 90                 | 194                | Approx. 48              |
| 100                | 212                | Approx. 37              |
| 110                | 230                | Approx. 30              |
| 120                | 248                | Approx. 23              |
| 130                | 266                | Approx. 19              |
| 140                | 284                | Approx. 15              |
| 150                | 302                | Approx. 13              |

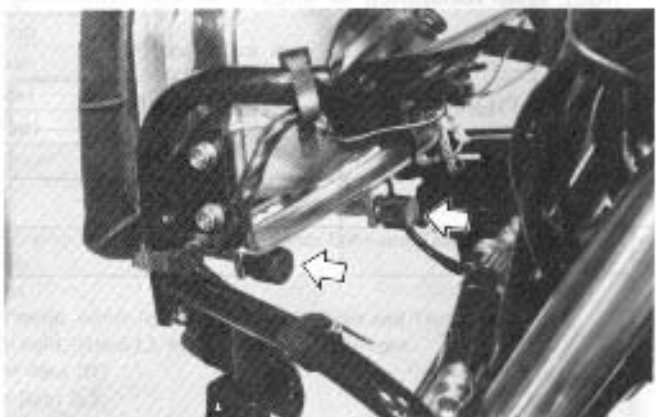
## LAMPS

### HEADLIGHT

- Remove the fairing (Refer to page 6-1). (GSX750ES)
- Remove the headlight assembly.
- Disassemble the headlight as follows.

#### NOTE:

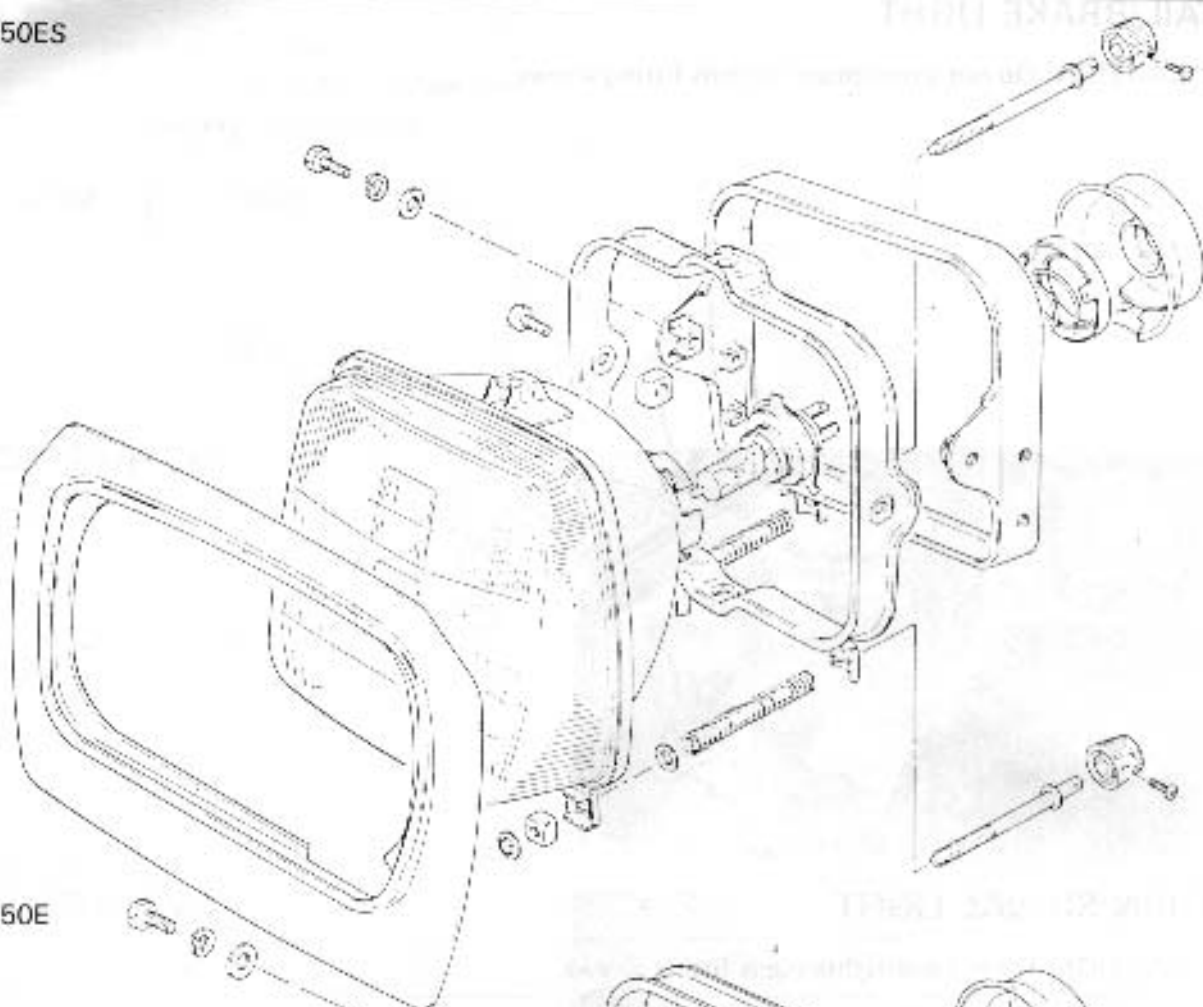
After remounting the headlight assembly, be sure to check the horizontal and vertical adjustment.



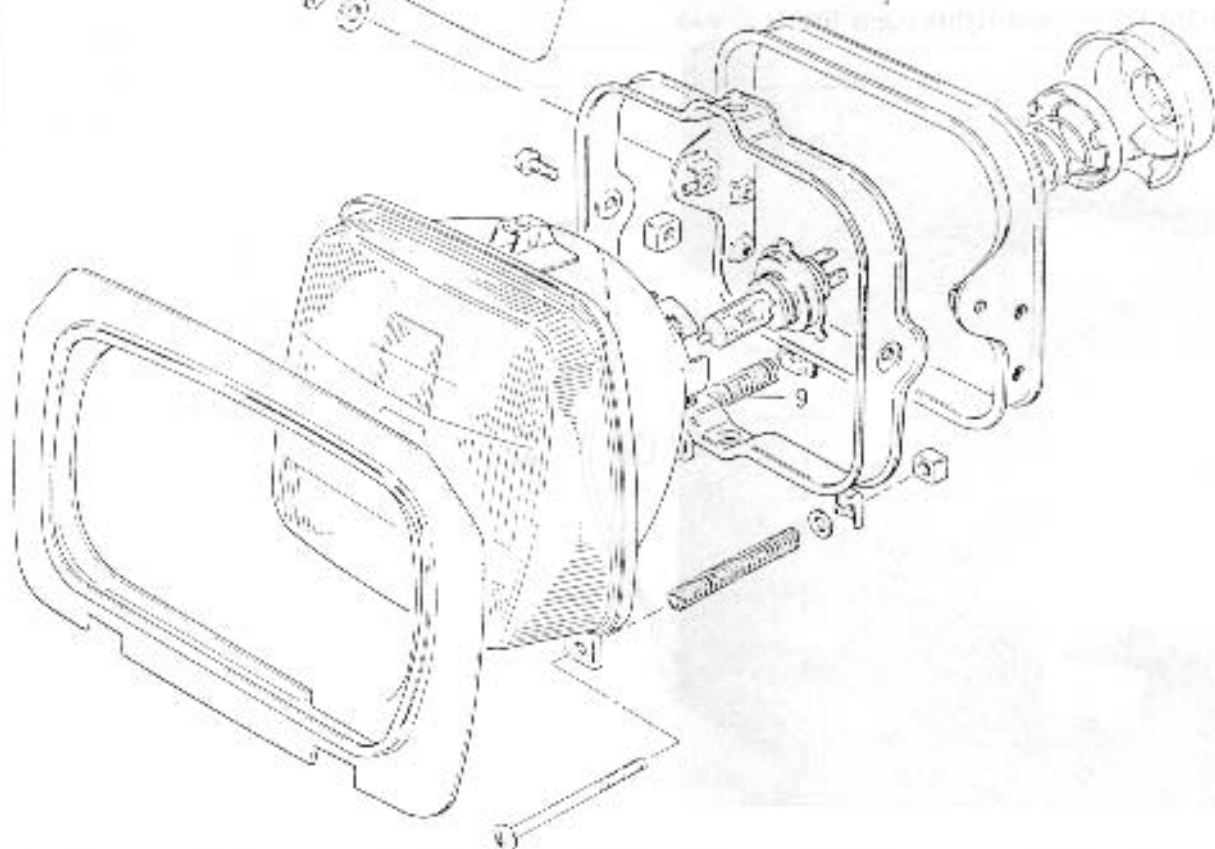


## SWITCHES

GSX750ES

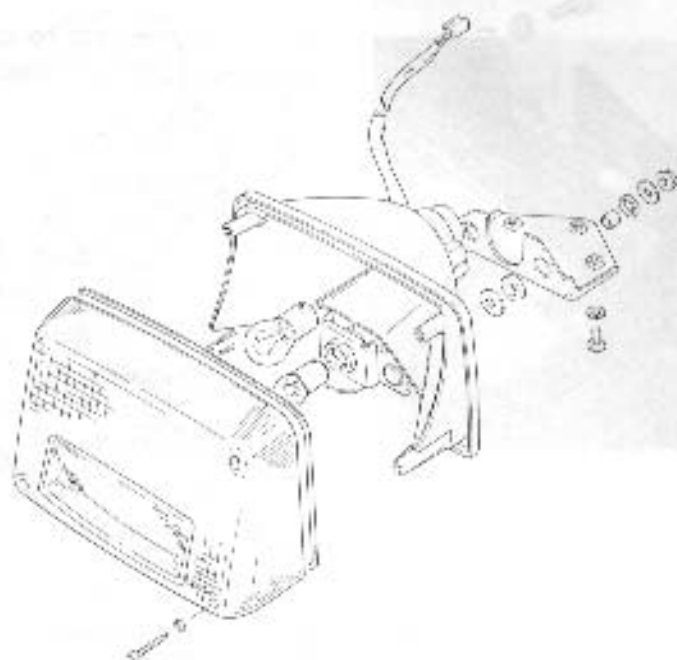


GSX750E



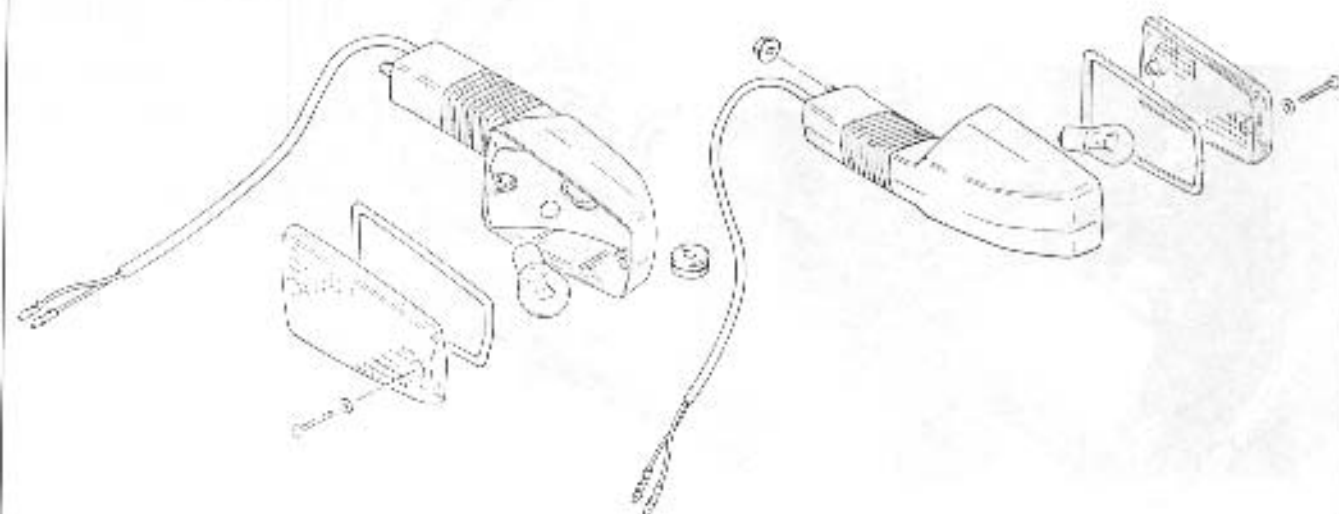
## TAIL/BRAKE LIGHT

CAUTION: Do not overtighten the lens fitting screws.



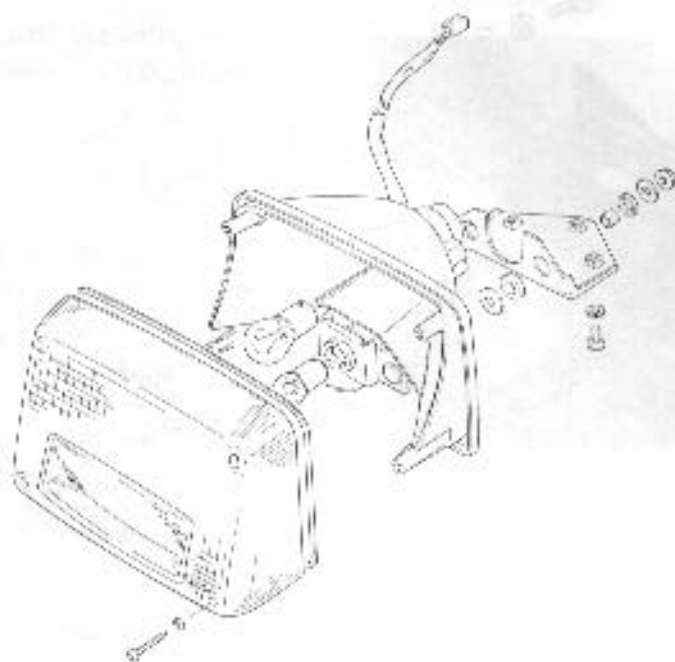
## TURN SIGNAL LIGHT

CAUTION: Do not overtighten lens fitting screws.

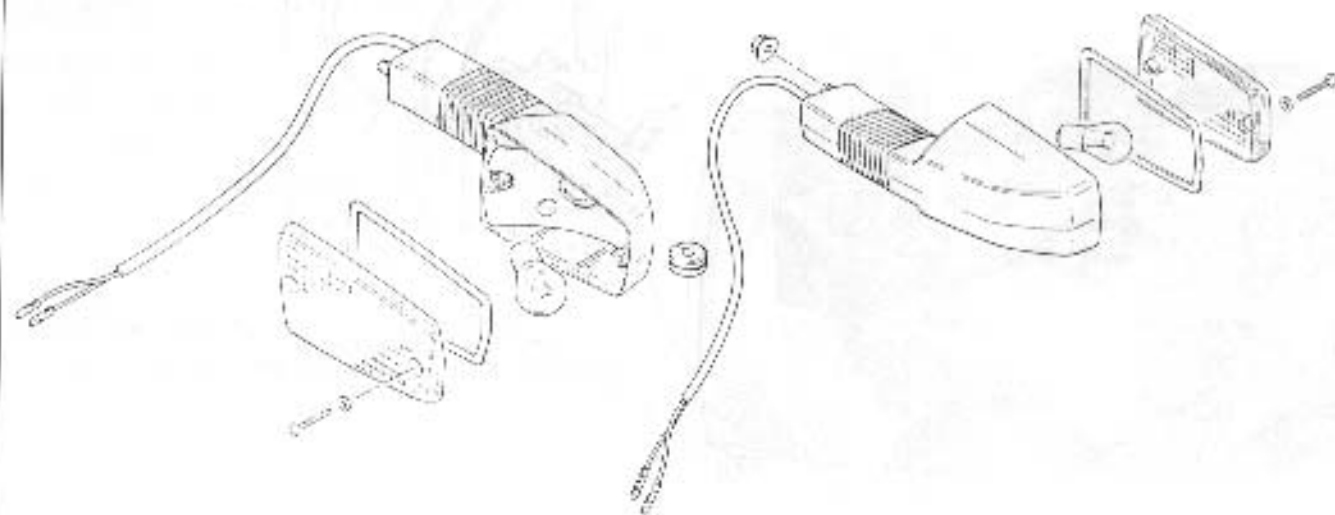


**TAIL/BRAKE LIGHT**

**CAUTION:** Do not overtighten the lens fitting screws.

**TURN SIGNAL LIGHT**

**CAUTION:** Do not overtighten lens fitting screws.



## 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

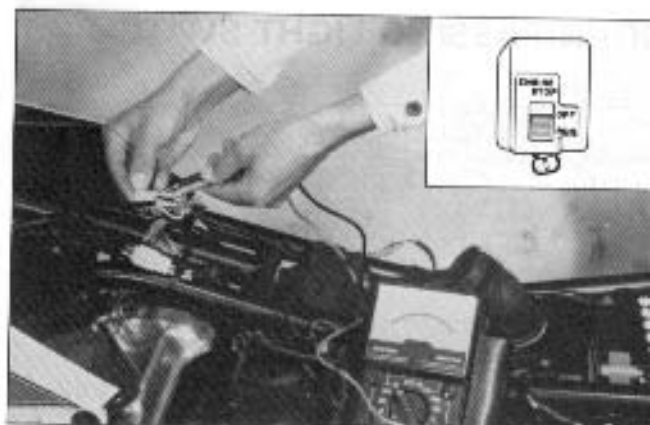
### IGNITION SWITCH

|     | R                                                                                 | O                                                                                 | Gr                                                                                | Br                                                                                |
|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| OFF |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| ON  |  |  |  |  |
| P   |  |                                                                                   |                                                                                   |  |



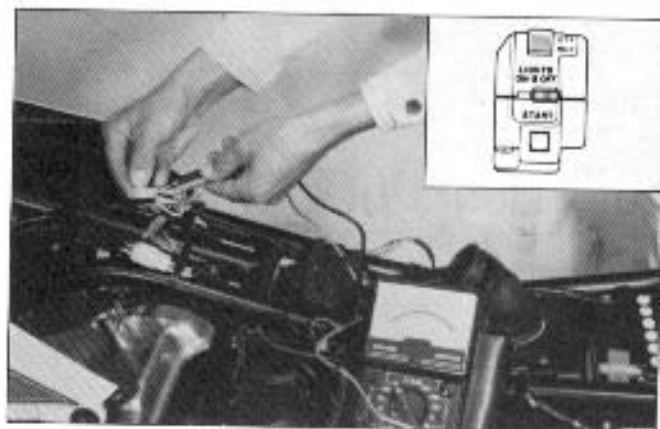
### ENGINE STOP SWITCH

|     | O                                                                                   | O/W                                                                                 |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| OFF |                                                                                     |                                                                                     |
| RUN |  |  |



### STARTER SWITCH

|           | Y/G                                                                                 | O/W                                                                                 |
|-----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| OFF       |                                                                                     |                                                                                     |
| ON (Push) |  |  |



# LIGHTING SWITCH

For Europe

|     | O/R                   | Y/W                   | Bl/W                  | W                     | O/G                   | Gr                    |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| ON  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| S   | <input type="radio"/> |                       | <input type="radio"/> |                       | <input type="radio"/> | <input type="radio"/> |
| OFF | <input type="radio"/> |                       | <input type="radio"/> |                       |                       |                       |

The Others

|     | O/R                   | Y/W                   | Bl/W                  | W                     | O/G                   | Gr                    |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| ON  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| OFF | <input type="radio"/> |                       | <input type="radio"/> |                       |                       |                       |

# DIMMER SWITCH

|    | W                     | Y                     | Y/W                   |
|----|-----------------------|-----------------------|-----------------------|
| HI |                       | <input type="radio"/> | <input type="radio"/> |
| LO | <input type="radio"/> |                       | <input type="radio"/> |

# HORN/PASSING LIGHT SWITCH

For Italy

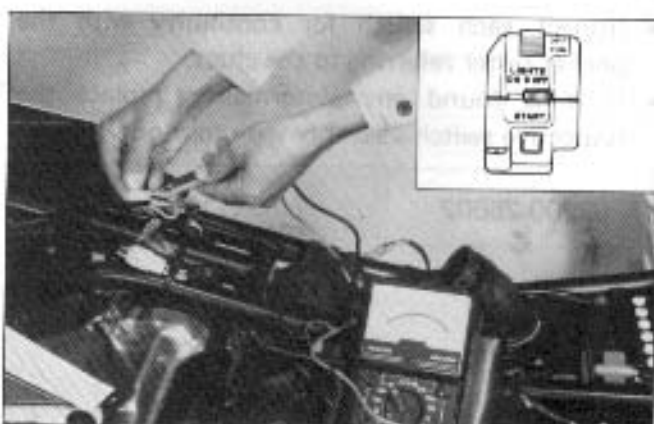
|      | G                     | B/W                   | W                     | O/R                   |
|------|-----------------------|-----------------------|-----------------------|-----------------------|
| HORN | <input type="radio"/> | <input type="radio"/> |                       |                       |
| OFF  |                       |                       |                       |                       |
| PASS |                       |                       | <input type="radio"/> | <input type="radio"/> |

The Others

|      | G                     | B/W                   | Y                     | Bl/W                  |
|------|-----------------------|-----------------------|-----------------------|-----------------------|
| HORN | <input type="radio"/> | <input type="radio"/> |                       |                       |
| OFF  |                       |                       |                       |                       |
| PASS |                       |                       | <input type="radio"/> | <input type="radio"/> |

# TURN SIGNAL LIGHT SWITCH

|   | B                     | Lbl                   | Lg                    |
|---|-----------------------|-----------------------|-----------------------|
| R |                       | <input type="radio"/> | <input type="radio"/> |
| • |                       |                       |                       |
| L | <input type="radio"/> | <input type="radio"/> |                       |





## FRONT BRAKE LIGHT SWITCH

|     | W | O/G |
|-----|---|-----|
| OFF |   |     |
| ON  |   |     |

## REAR BRAKE LIGHT SWITCH

|     | W | O/G |
|-----|---|-----|
| OFF |   |     |
| ON  |   |     |

## GEAR POSITION INDICATOR LIGHT SWITCH

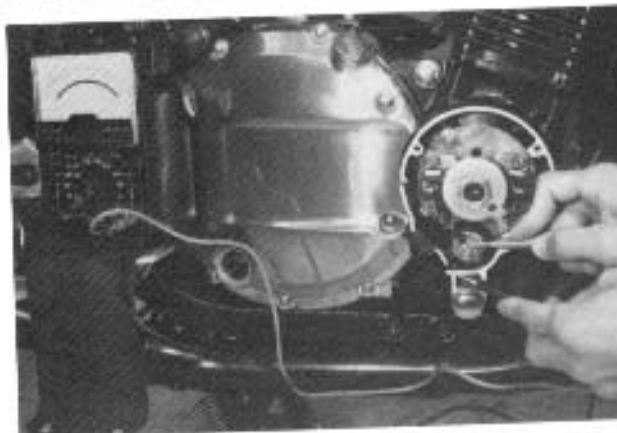
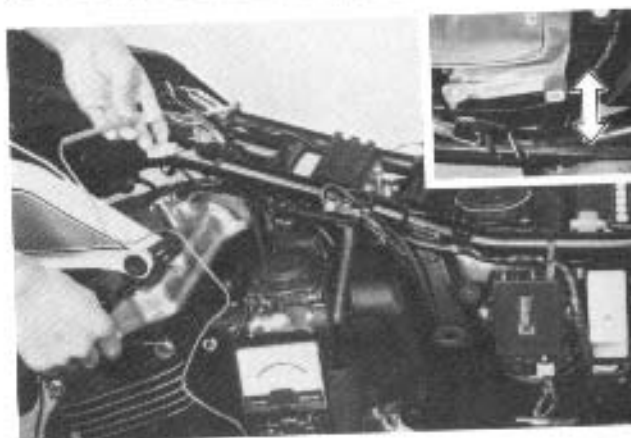
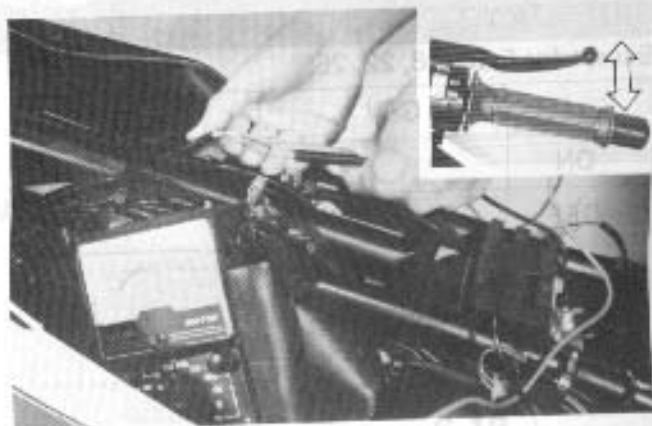
| Gear position | Wire color |        |
|---------------|------------|--------|
| 1st           | W/Y        | Ground |
| Neutral       | Bl         |        |
| 2nd           | R/B        |        |
| 3rd           | G/Bl       |        |
| 4th           | Y/Bl       |        |
| Top           | Br/R       |        |

## OIL PRESSURE SWITCH

- Continuity, when engine is stopped.
- No continuity, when engine is running.

### NOTE:

Before testing the oil pressure switch, check the engine oil level.



**SIDE STAND CHECK LIGHT SWITCH**

Except for E-16, 18, 22, 26.

|     | G/W                                                                               | B/W                                                                               |
|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| ON  |  |  |
| OFF |                                                                                   |                                                                                   |

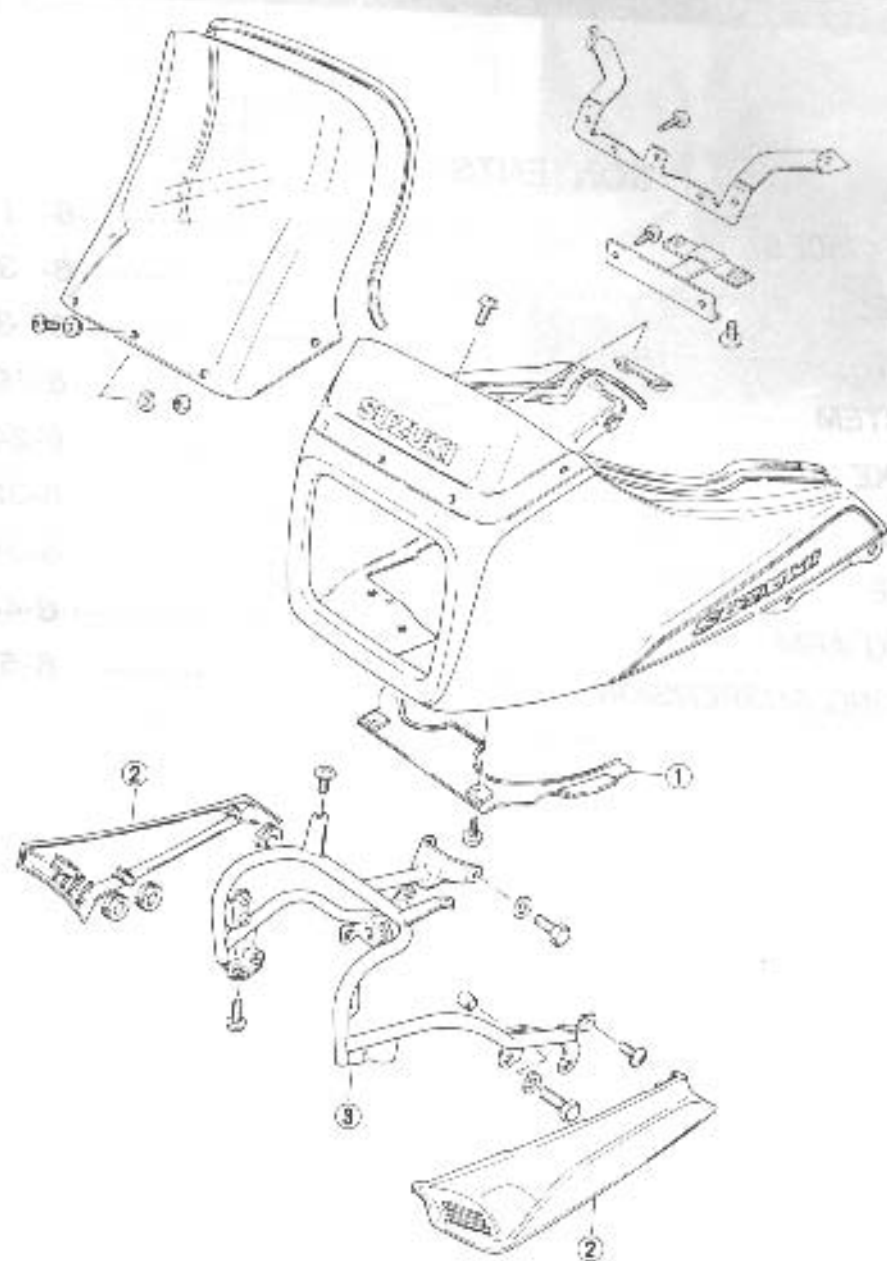


# CHASSIS

## CONTENTS

|                                |      |
|--------------------------------|------|
| FAIRING (GSX750ES).....        | 6- 1 |
| FRONT WHEEL.....               | 6- 3 |
| FRONT FORK.....                | 6- 8 |
| STEERING STEM .....            | 6-19 |
| FRONT BRAKE .....              | 6-24 |
| REAR WHEEL.....                | 6-32 |
| REAR BRAKE .....               | 6-39 |
| REAR SWING ARM .....           | 6-48 |
| FULL FLOATING SUSPENSION ..... | 6-52 |

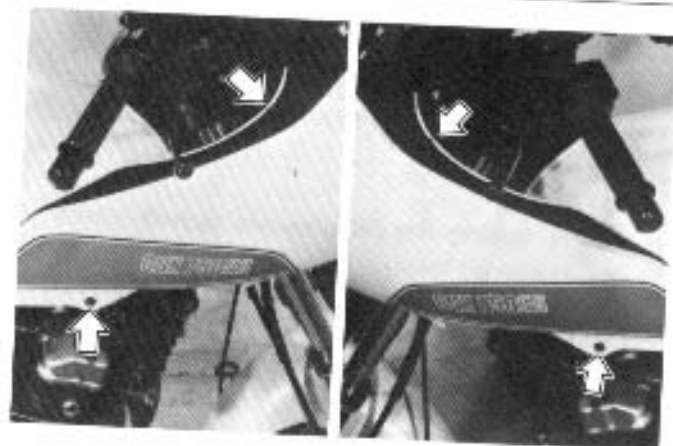
## FAIRING (GSX750ES)

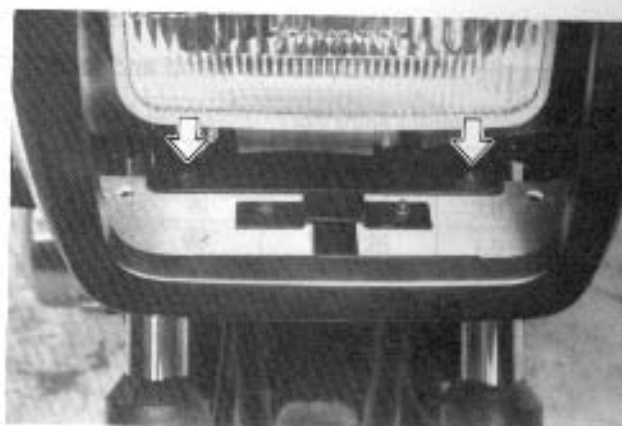
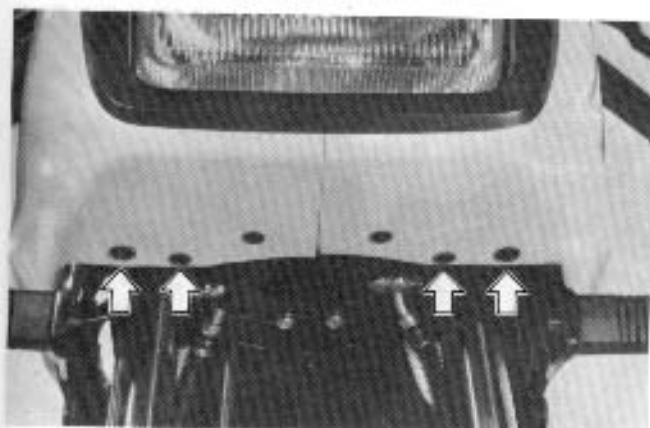


- ① Lower cover
- ② Fairing cover
- ③ Brace

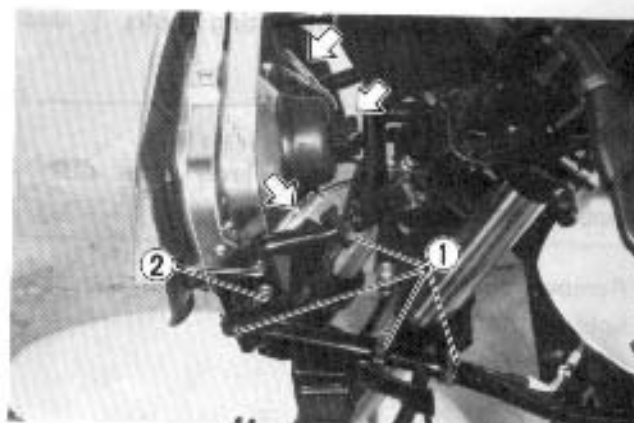
**REMOVAL**

- Remove right and left fairing covers.
- Remove the 8 screws.
- Remove the fairing from motorcycle.

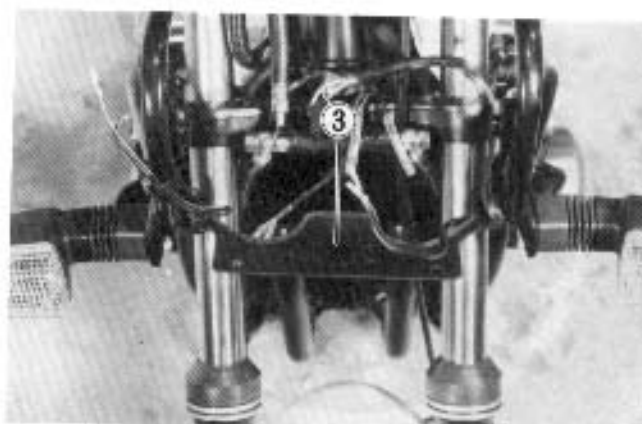




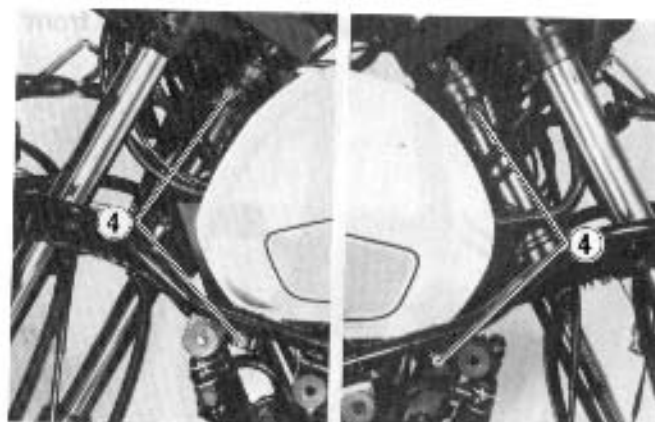
- Remove the 4 clamps ① .
- Disconnect the headlight and front turn signal lead wires.
- Remove the headlight mounting bolt ② and take off the headlight.



- Take off the lower cover ③ .



- Remove the brace mounting bolts ④ and take off the brace.





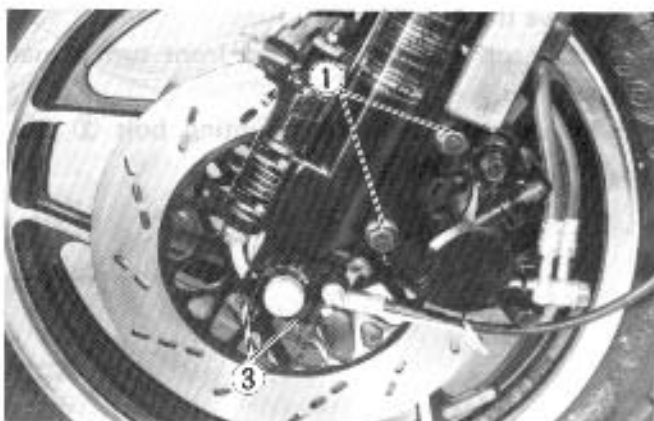
## FRONT WHEEL

### REMOVAL

- Support the machine by center stand and jack.

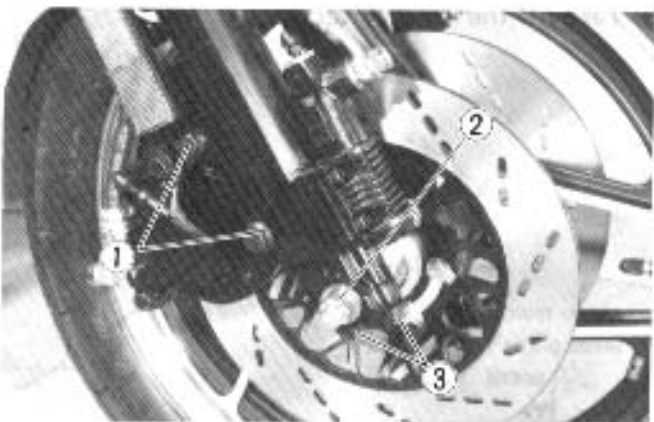


- Remove the caliper mounting bolts ① and dismount the caliper.

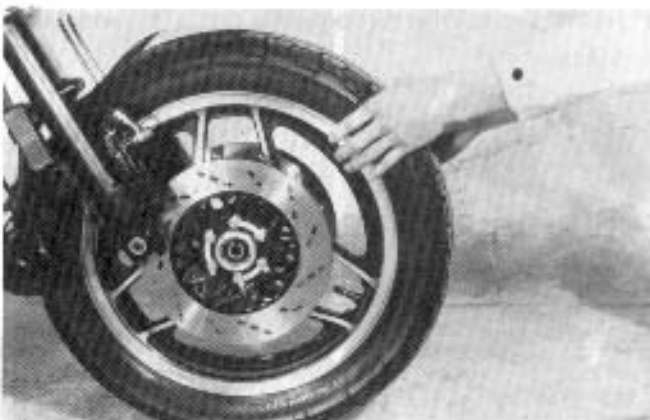
**NOTE:**

Do not operate the brake lever after dismounting the caliper.

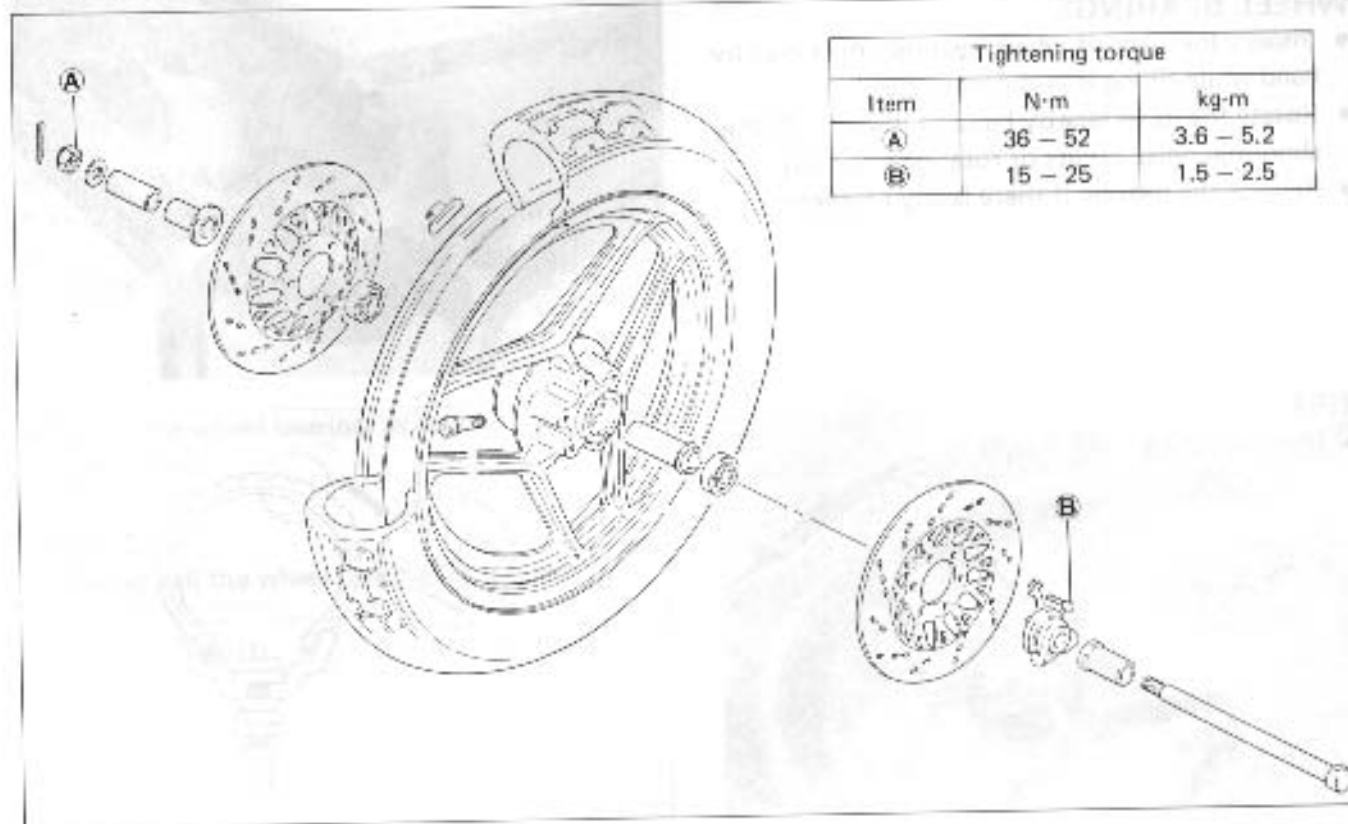
- Remove the axle nut ② and loosen the axle holder nuts ③.



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

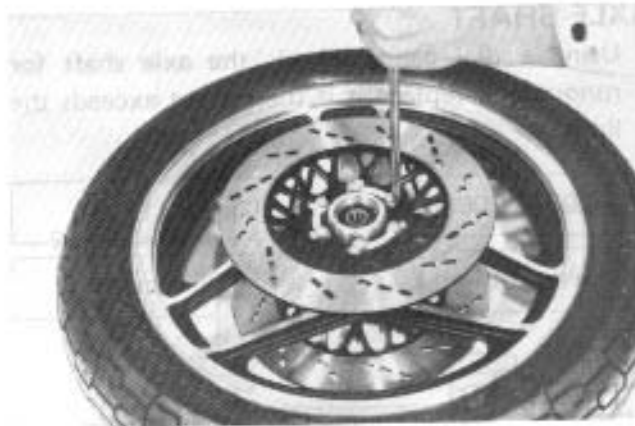


## DISASSEMBLY



- Unlock the lock washer.  
Remove the securing bolts and separate the disc from wheel (Right and Left).

**CAUTION:**  
Do not reuse the lock washer.

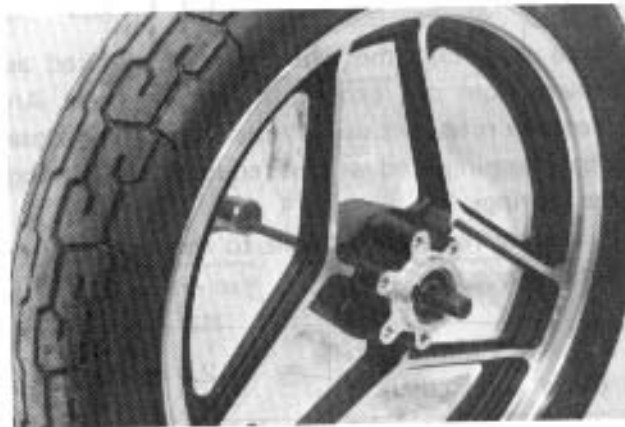


- Draw out the right and left wheel bearings by using special tool.

09941-50110

Wheel bearing remover

**CAUTION:**  
The removed bearing should be replaced.

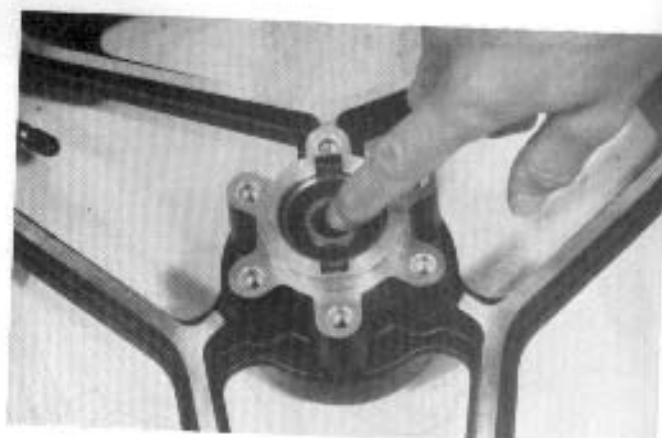


## FRONT WHEEL

## INSPECTION

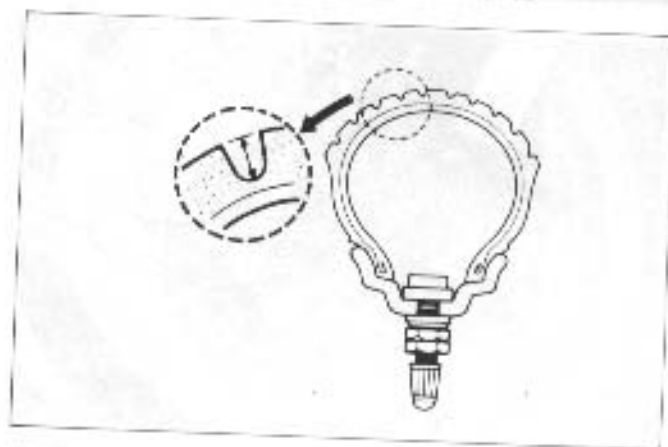
## WHEEL BEARINGS

- Inspect the play of wheel bearings inner race by hand while fixing it in the wheel.
- Rotate the inner race by hand to inspect whether abnormal noise occurs or rotating smoothly.
- Replace the bearing if there is any problem.



## TIRE

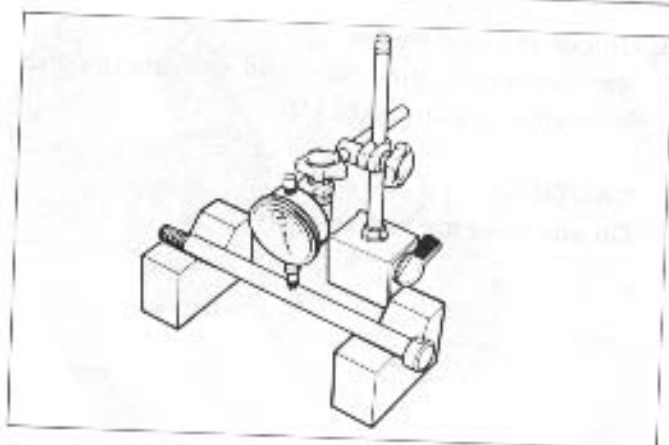
- (See page 2-16)



## AXLE SHAFT

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

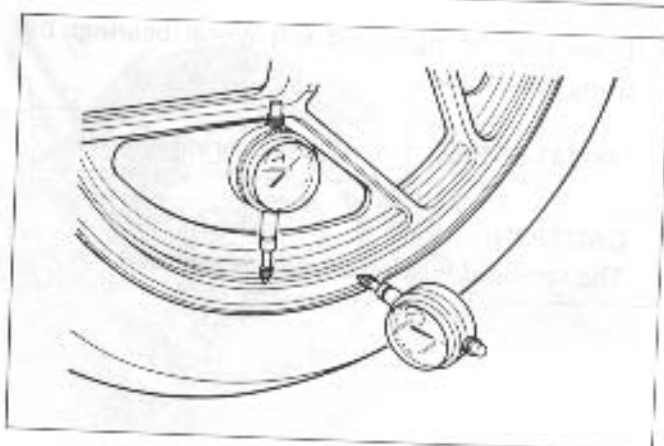
|               |                    |
|---------------|--------------------|
| 09900-20606   | Dial gauge (1/100) |
| Service Limit | 0.25 mm            |



## WHEEL

- Make sure that the wheel runout checked as shown, does not exceed the service limit. An excessive runout is usually due to worn or loose wheel bearings and will be reduced by replacing the bearings.
- If bearing replacement fails to reduce the runout, replace the wheel.

|                                     |        |
|-------------------------------------|--------|
| Service Limit<br>(Axial and Radial) | 2.0 mm |
|-------------------------------------|--------|



## REASSEMBLY

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

### WHEEL BEARING

- Apply grease before install the bearings.

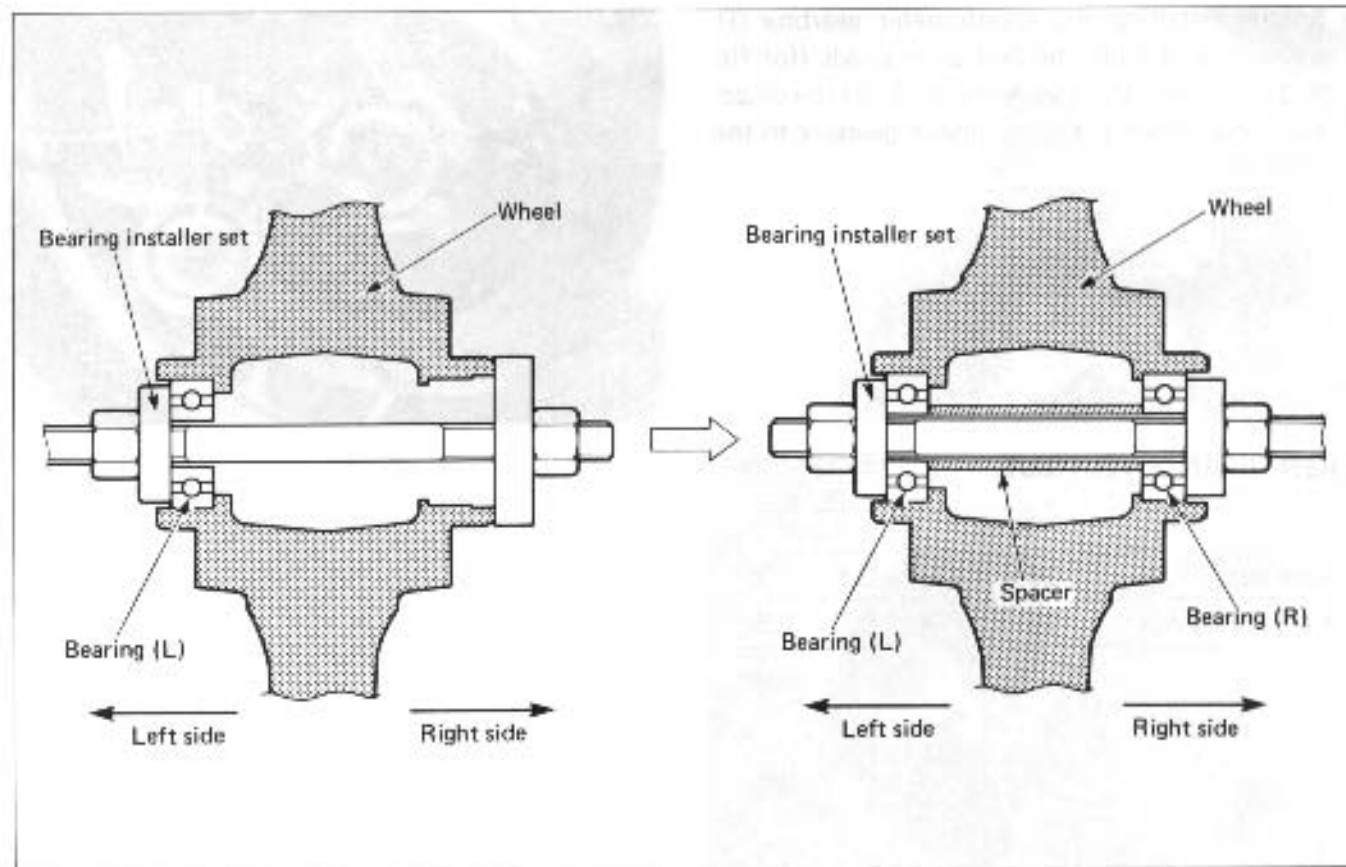
|             |                         |
|-------------|-------------------------|
| 99000-25010 | Suzuki super grease "A" |
|-------------|-------------------------|

- Install the wheel bearings as follows by using the special tool.

#### CAUTION:

First install the wheel bearing for left side.

|               |                       |
|---------------|-----------------------|
| 09924 - 84510 | Bearing installer set |
|---------------|-----------------------|



- Mount each brake disc properly according to the stamped marks, "R" or "L", on the respective disc plate.

|     |            |
|-----|------------|
| "R" | Right side |
| "L" | Left side  |

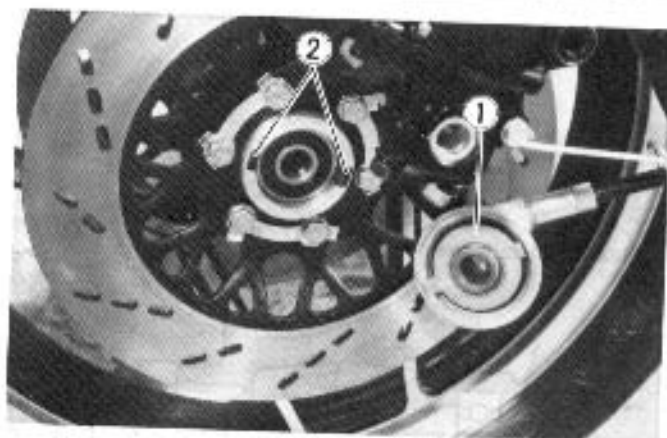
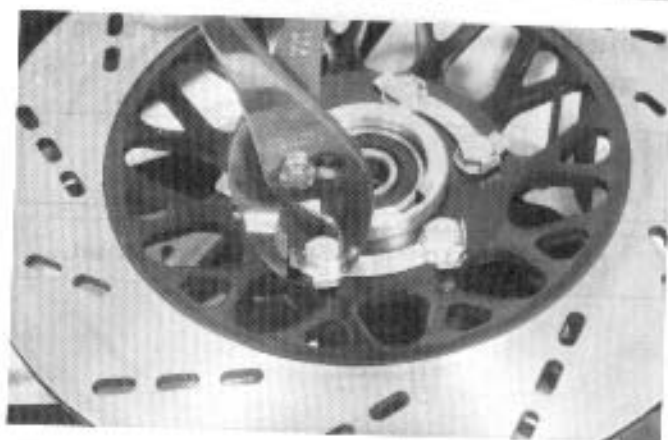
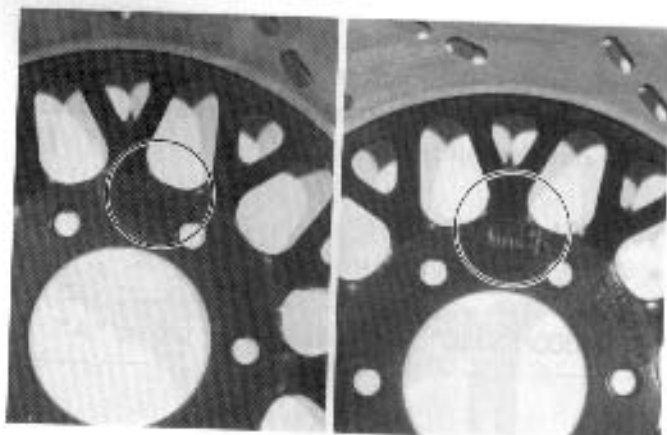
**NOTE:**

There is a dust seal on left disc plate.

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

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 15 – 25 N·m<br>(1.5 – 2.5 kg·m) |
|-------------------|---------------------------------|

- Before installing the speedometer gearbox ① grease it and align the two drive pawls (for fitting them into the two recesses ② of the wheel hub) and attach the speedometer gearbox to the wheel hub.

**TIGHTENING TORQUE**

|                 | N·m     | kg·m      |
|-----------------|---------|-----------|
| Axle nut        | 36 – 52 | 3.6 – 5.2 |
| Axle holder nut | 15 – 25 | 1.5 – 2.5 |



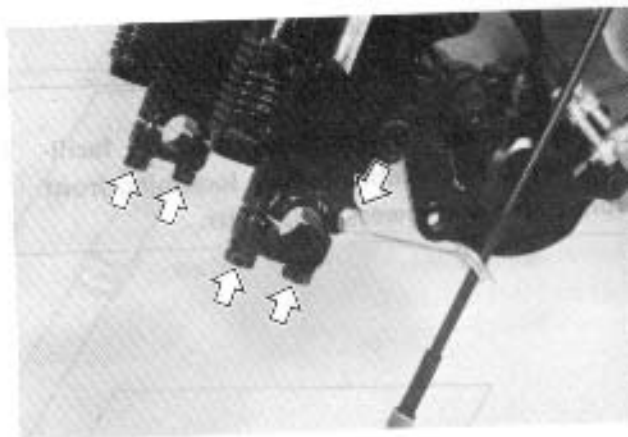
## FRONT FORK

### REMOVAL

- Remove the fairing. (See page 6-1)
  - Take off the front wheel. (See page 6-3)
  - Remove the speedometer cable guide and axle holder.
- 
- Remove the modulator plunger from the forks by using the 4 mm hexagon wrench.
- 
- Remove the fender.

#### CAUTION:

Hang the calipers from the motorcycle frame using string, etc., taking care not to bend the brake hoses.



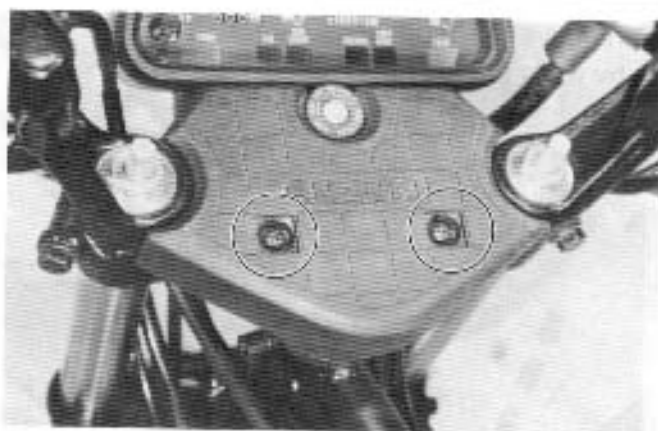
- Loosen the front fork caps.

**NOTE:**

Slightly loosen the front fork caps to facilitate later disassembly before loosening front fork upper and lower clamp bolts.



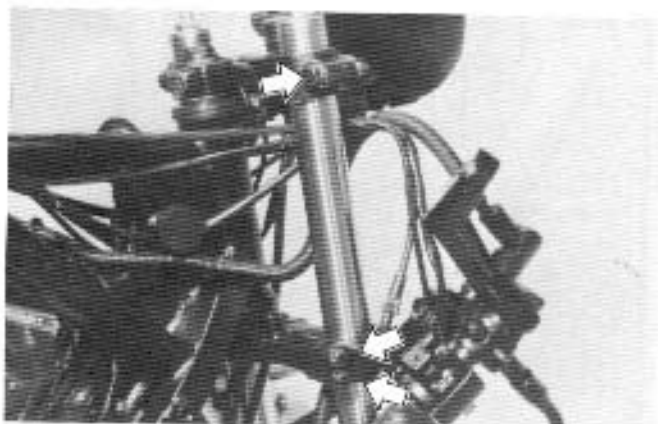
- Remove the steering stem cover.



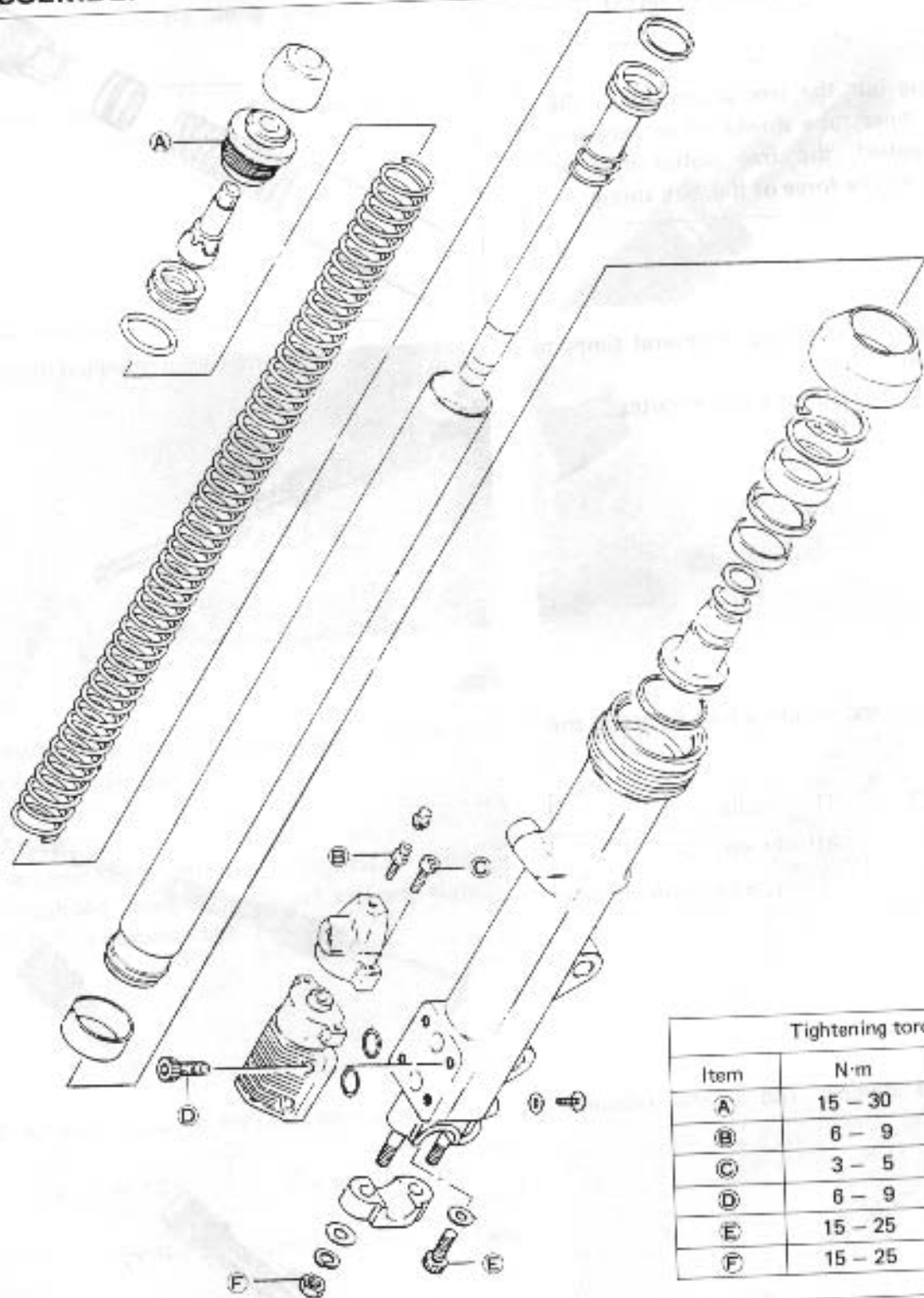
- Remove the right and left handlebars.



- Loosen the front fork upper and lower clamp bolts.
- Pull down the right and left front fork assemblies.



## DISASSEMBLY



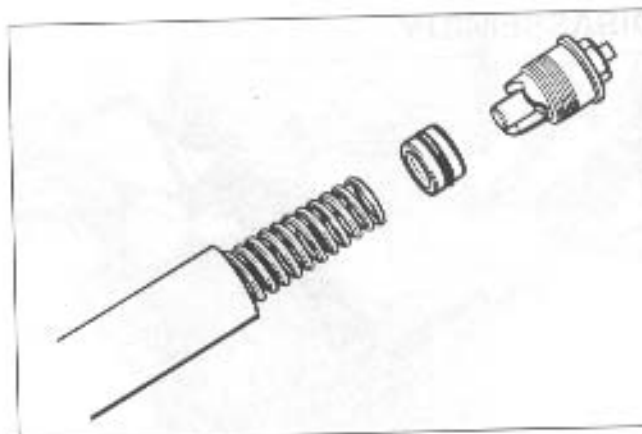
Tightening torque

| Item | N·m     | kg·m      |
|------|---------|-----------|
| A    | 15 - 30 | 1.5 - 3.0 |
| B    | 6 - 9   | 0.6 - 0.9 |
| C    | 3 - 5   | 0.3 - 0.5 |
| D    | 6 - 9   | 0.6 - 0.9 |
| E    | 15 - 25 | 1.5 - 2.5 |
| F    | 15 - 25 | 1.5 - 2.5 |

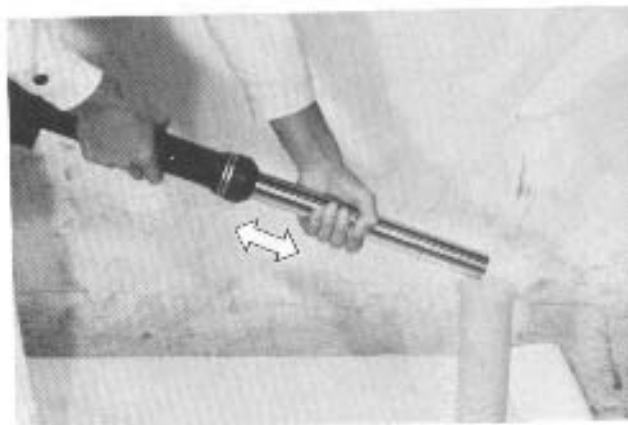
- Remove the front fork cap.
- Draw out the free piston and fork spring.

**CAUTION:**

When taking out the free piston, lower the front fork inner tube slowly. If an excessive force is applied, the free piston may be popped out by the force of the fork spring.

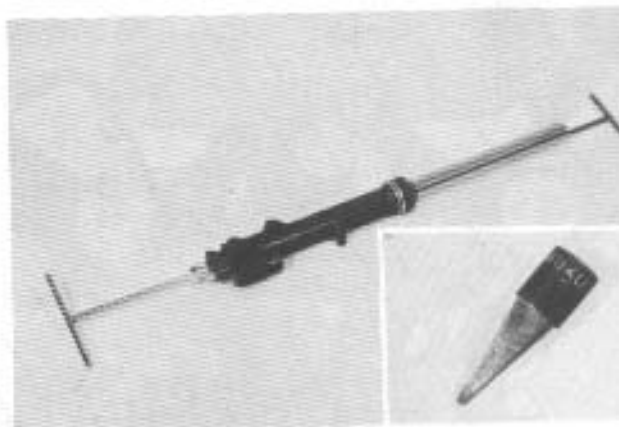


- Invert the fork and stroke it several times to remove the oil.
- Hold the fork inverted for a few minutes.

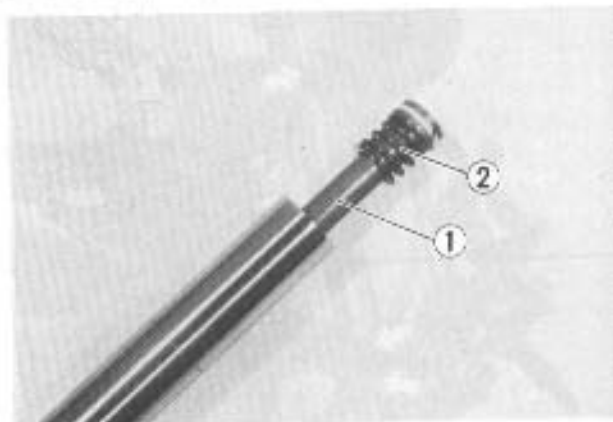


- Remove damper rod securing bolt by using the special tools.

|             |                         |
|-------------|-------------------------|
| 09940-34520 | "T" handle              |
| 09940-34561 | Attachment "D"          |
| 09914-25811 | "T" type hexagon wrench |



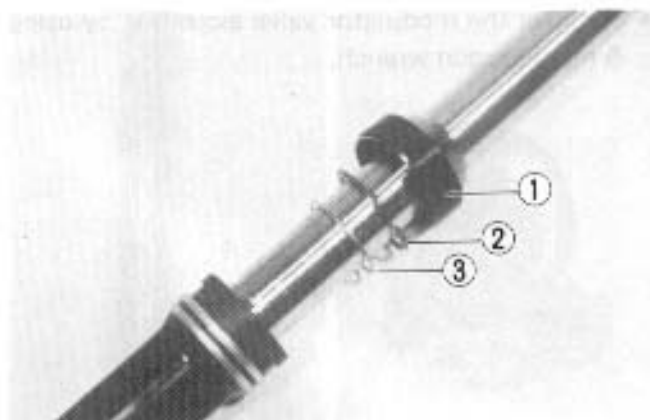
- Draw out the damper rod ① and rebound spring ②.



- Draw out dust seal ① .
- Remove circlip ② by using special tool and back up ring ③ .

09900 - 06107

Snap ring pliers



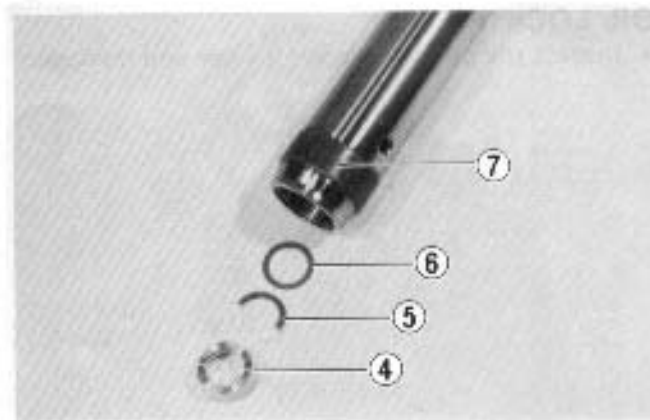
- Separate the inner tube from the outer tube.



- Draw out the valve ④ , valve spring ⑤ and oil lock piece valve ⑥ .

**CAUTION:**

The inner tube "anti-friction" metal ⑦ must be replaced along with the oil seal any time the fork is disassembled.



- Draw out oil seal ⑧ by using special tool.

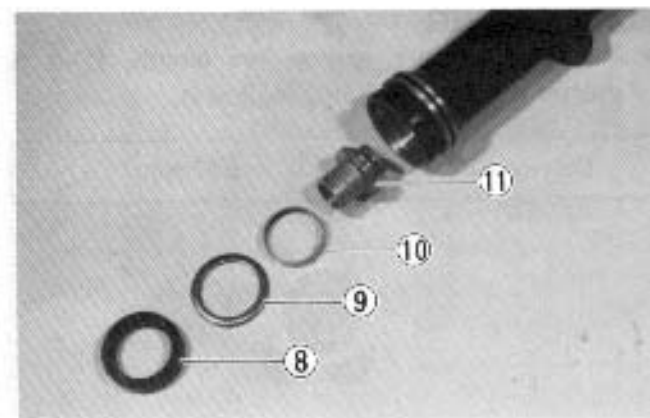
09913 - 50121

Oil seal remover

- Draw out spacer ⑨ , metal ⑩ and oil lock piece ⑪ .

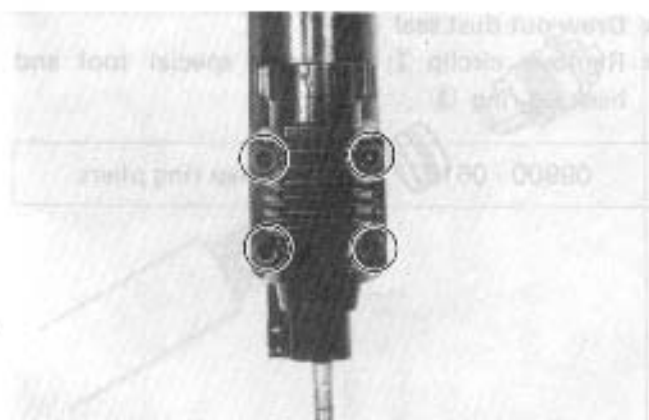
**CAUTION:**

The removed oil seal should be replaced. The "anti-friction" metal ⑩ must be replaced along with the oil seal ⑧ any time the fork is disassembled.





- Remove the modulator valve assembly, by using 5 mm hexagon wrench.



## INSPECTION

### DAMPER ROD RING

- Inspect the damper rod ring for wear and damage.



## OIL LOCK PIECE

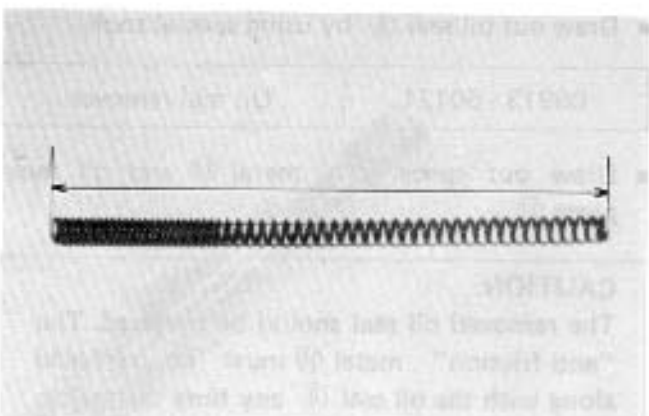
- Inspect the oil lock piece for wear and damage.



## FORK SPRING

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

|               |        |
|---------------|--------|
| Service Limit | 527 mm |
|---------------|--------|

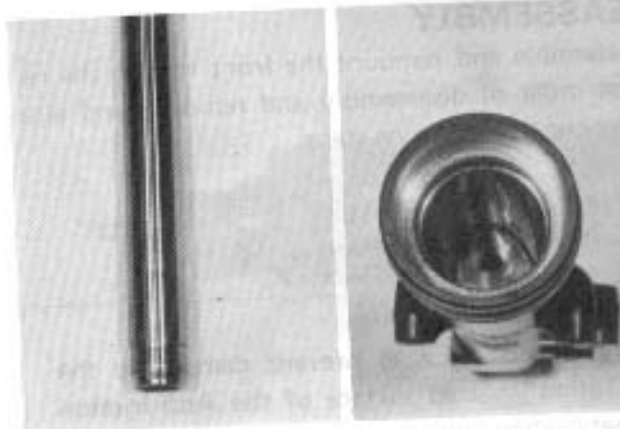


### INNER TUBE

- Inspect the inner tube outer surface for any scuffing.

### OUTER TUBE

- Inspect the outer tube inner surface for any scuffing.



### FREE PISTON

- Inspect the free piston O-ring for wear or damage.

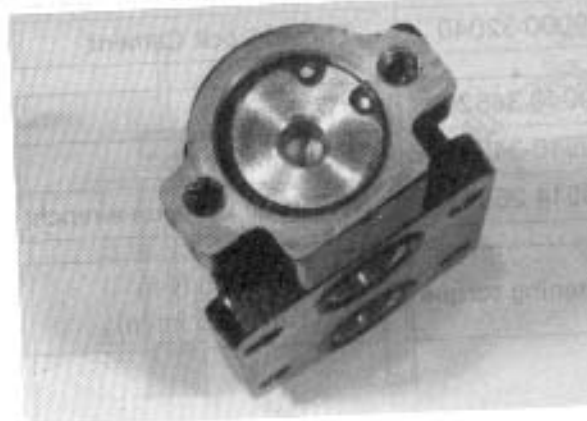


### MODULATOR PLUNGER ASSEMBLY AND VALVE ASSEMBLY

- After separating the modulator plunger from the modulator valve, inspect each sliding part for leakage of brake fluid or fork oil.
- If any defect is found, replace affected unit with new one.

#### NOTE:

Modulator plunger and valve is only available as a replacement unit.



### MODULATOR VALVE O-RINGS

- Inspect the O-rings located between modulator valve and front fork for wear or damage.



## 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:

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

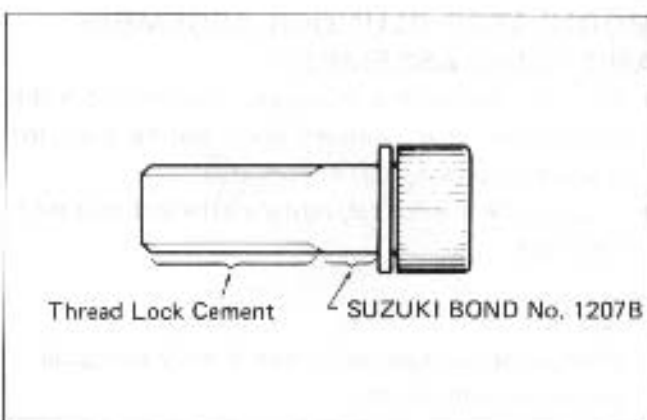
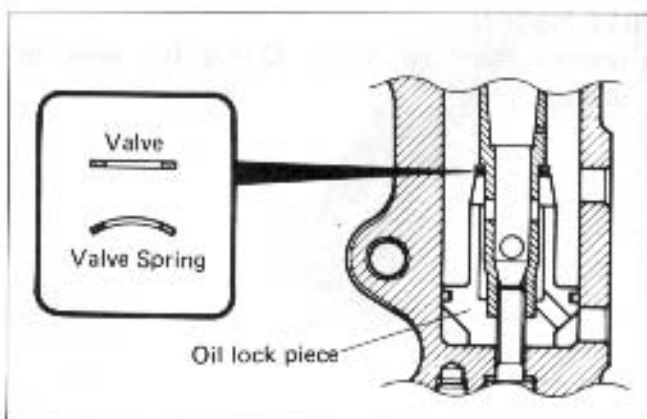
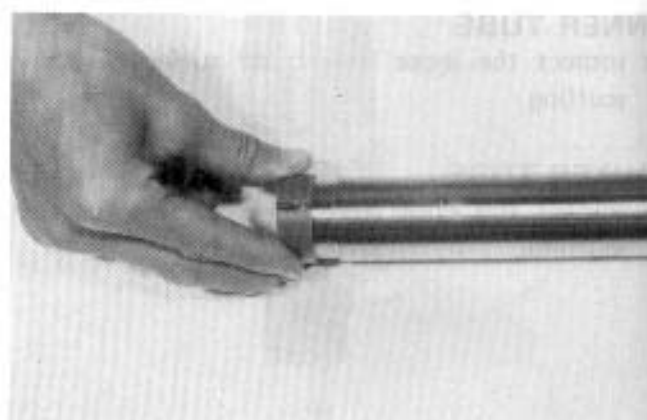
### OIL LOCK PIECE, VALVE AND VALVE SPRING

- Install the oil lock piece, valve and valve spring as shown in figure.

### DAMPER ROD BOLT

- Apply SUZUKI Bond No. 1207B and Thread Lock Cement to the damper rod bolt and tighten with specified torque.

|                   |                                 |
|-------------------|---------------------------------|
| 99000-31140       | SUZUKI Bond No. 1207B           |
| 99000-32040       | Thread Lock Cement              |
| 09940-34520       | "T" handle                      |
| 09940-34561       | Attachment "D"                  |
| 09914-25811       | "T" type hexagon wrench         |
| Tightening torque | 15 – 25 N·m<br>(1.5 – 2.5 kg-m) |



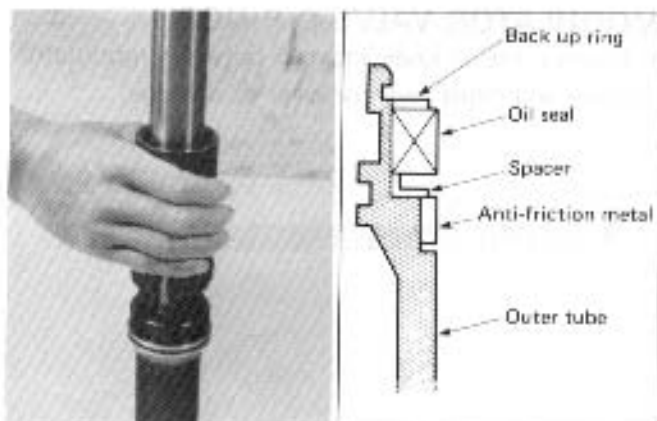
### OUTER TUBE METAL, SPACER AND OIL SEAL

- Install outer tube metal, spacer and oil seal by using special tool as shown.

#### CAUTION:

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

|             |                               |
|-------------|-------------------------------|
| 09940-50112 | Front fork oil seal installer |
|-------------|-------------------------------|



## MODULATOR VALVE

- Apply Thread Lock "1342" to the bolts and tighten to the specified torque.

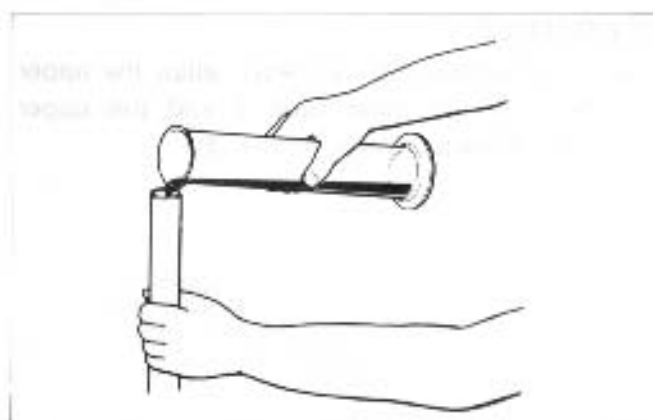
|                   |                               |
|-------------------|-------------------------------|
| 99000-32050       | Thread Lock "1342"            |
| Tightening torque | 6 – 9 N·m<br>(0.6 – 0.9 kg·m) |



## FORK OIL

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

|          |              |
|----------|--------------|
| Fork oil | Fork oil #10 |
| Capacity | 293 ml       |

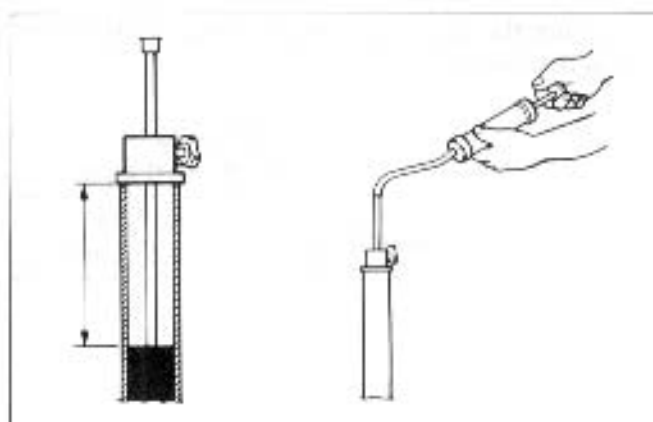


- Hold the front fork vertical and adjust the fork oil level with the special tool.

### NOTE:

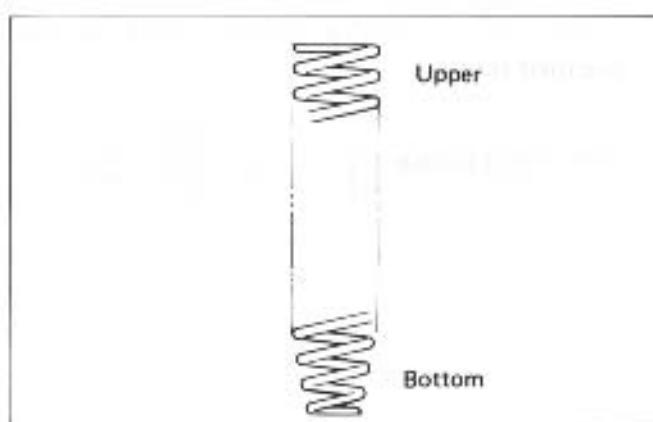
When adjusting oil level, remove the fork springs and compress the inner tube fully.

|             |                      |
|-------------|----------------------|
| 09943-74111 | Fork oil level gauge |
| Oil level   | 192 mm               |



## FORK SPRING

- Install the fork spring, as shown in figure.

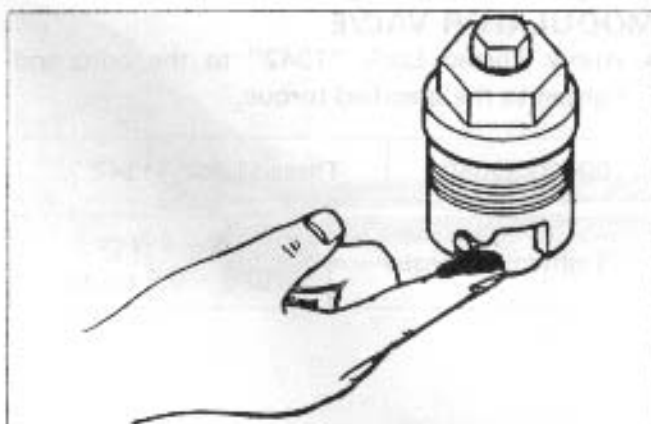


**SPRING ADJUSTER**

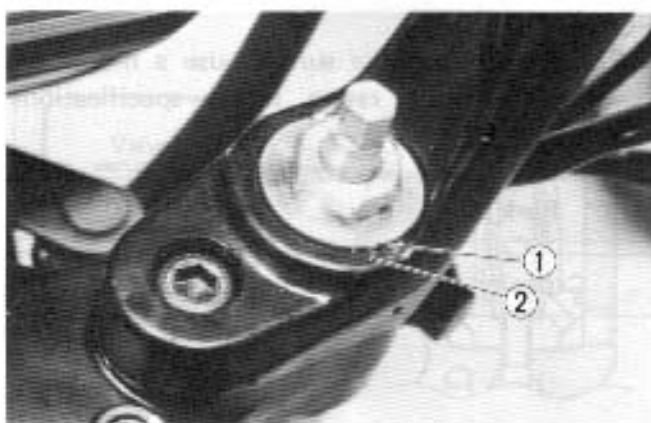
Apply the grease to the spring adjuster and tighten the cap bolt. (See page 6-18 and 6-60 for setting.)

|             |                         |
|-------------|-------------------------|
| 99000-25010 | SUZUKI super grease "A" |
|-------------|-------------------------|

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 15 – 30 N·m<br>(1.5 – 3.0 kg-m) |
|-------------------|---------------------------------|

**REMOUNT**

- When attaching the handlebar, align the upper surface of the inner tube ① and the upper surface of the handlebar holder ②.

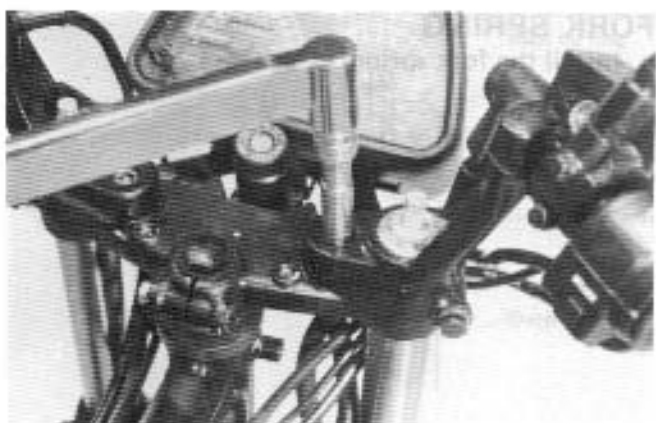


- Tighten the upper and lower clamp bolts to the specified torque.

|                   |       |                                 |
|-------------------|-------|---------------------------------|
| Tightening torque | Upper | 20 – 30 N·m<br>(2.0 – 3.0 kg-m) |
|                   | Lower | 15 – 25 N·m<br>(1.5 – 2.5 kg-m) |

- Tighten the handlebar holder bolts to the specified torque.

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 25 – 35 N·m<br>(2.5 – 3.5 kg-m) |
|-------------------|---------------------------------|





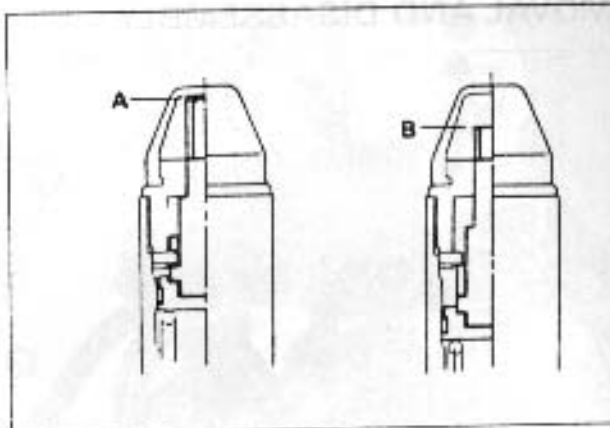
**SPRING SETTING**

- Check the spring adjuster setting position.

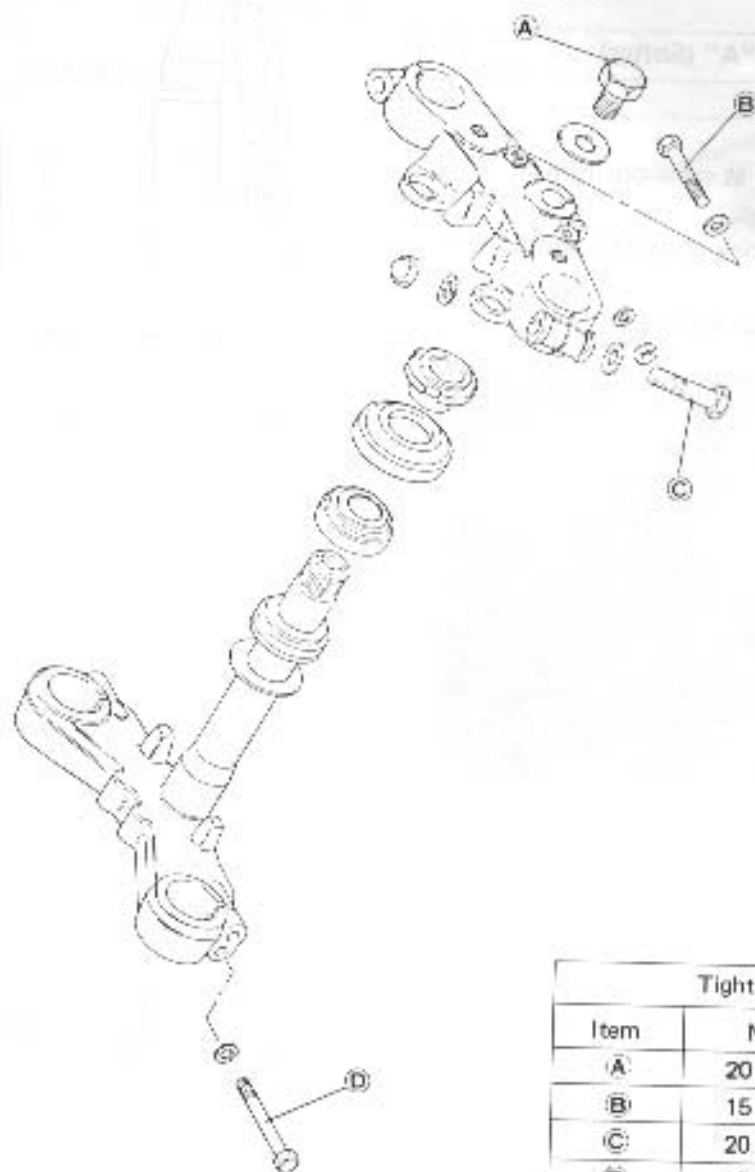
|                |              |
|----------------|--------------|
| S.T.D. setting | "A" (Softer) |
|----------------|--------------|

**WARNING:**

- \* Set the spring adjuster at same position for both right and left forks.
  - \* Both front and rear shock absorbers should be also balanced.
- See page 6-60 for proper setting.

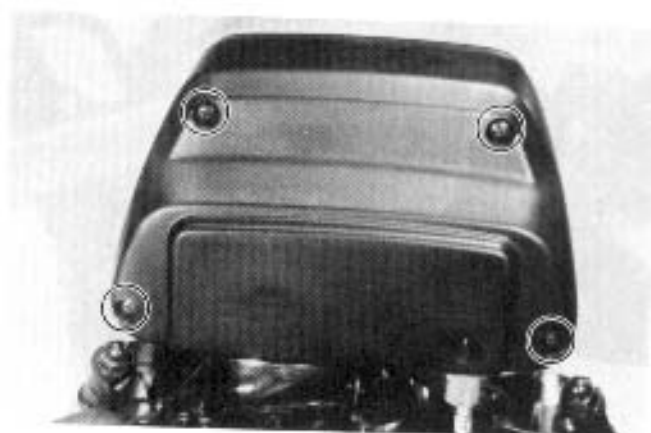


## STEERING STEM REMOVAL AND DISASSEMBLY

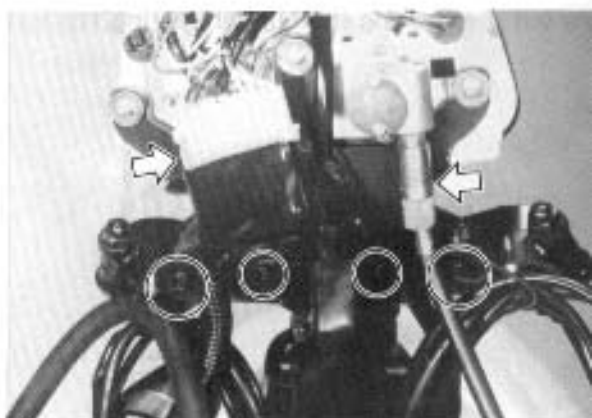


| Tightening torque |         |           |
|-------------------|---------|-----------|
| Item              | N·m     | kg·m      |
| (A)               | 20 - 30 | 2.0 - 3.0 |
| (B)               | 15 - 25 | 1.5 - 2.5 |
| (C)               | 20 - 30 | 2.0 - 3.0 |
| (D)               | 15 - 25 | 1.5 - 2.5 |

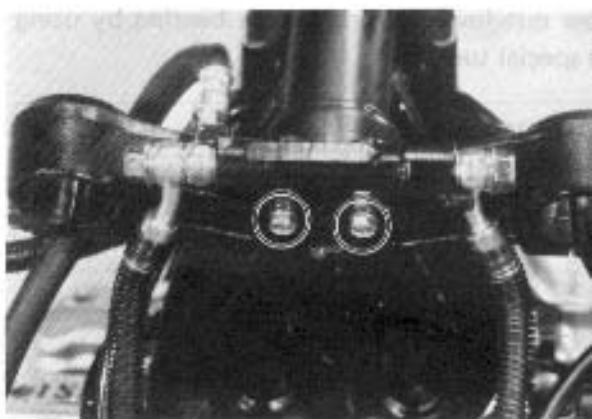
- Remove the fairing and brace (See pages 6-1 and 6-2). (GSX750ES)
- Remove the front wheel. (See page 6-3)
- Remove the front fork. (See page 6-8)
- Remove the combination meter cover.



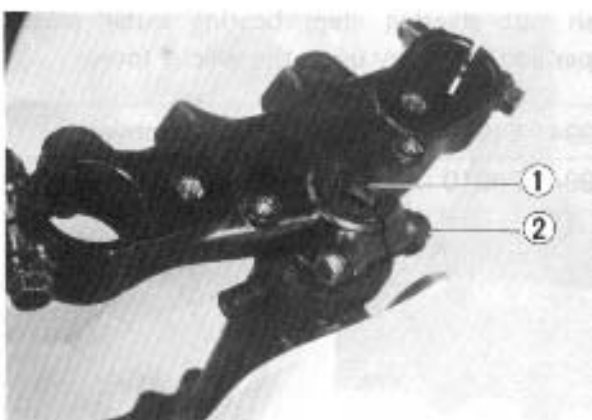
- Disconnect the combination meter coupler and speedometer cable.
- Remove the combination meter and ignition switch from steering stem upper bracket.



- Remove the brake hose joint bolts.



- Remove the steering stem head bolt ① and loosen the clamp bolt ②, then take off the steering stem upper bracket.



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

09940-14911

Steering nut socket wrench

**NOTE:**

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



- Draw out the steering stem upper bearing.



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

**CAUTION:**

The removed bearing should be replaced.

09941-84510

Bearing inner race remover



- Push out steering stem bearing outer races, upper and lower, by using the special tools.

09941-54911

Steering race remover

09941-74910

Steering bearing installer



## FRONT BRAKE

**REASSEMBLY**

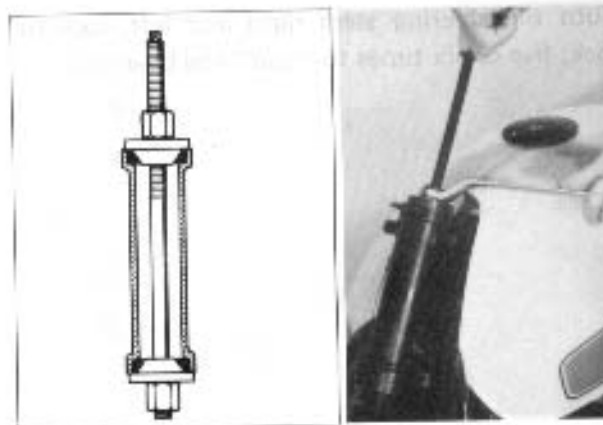
Reassemble and remount the steering stem in the reverse order of disassembly and removal, and also carry out the following steps:

**OUTER RACES**

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

09941-34511

Steering race installer

**BEARING**

- Press in the lower bearings by using the special tool.

09941-74910

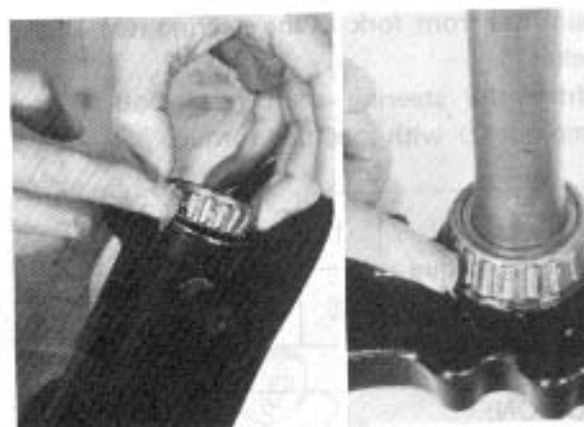
Steering bearing installer



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

99000-25010

SUZUKI Super grease "A"

**STEERING STEM NUT**

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

09940-14911

Steering nut socket wrench





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



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

**NOTE:**

This adjustment will vary from motorcycle to motorcycle.

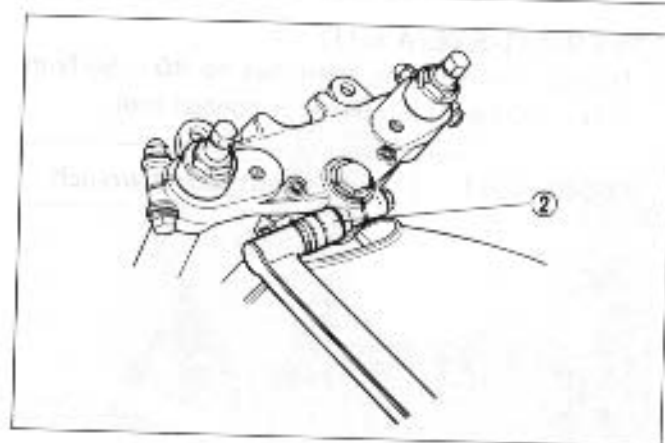
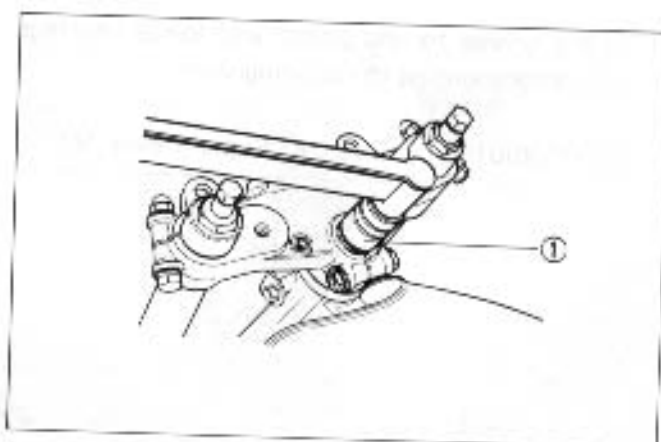


- Mount the front fork to the steering stem upper bracket.
- Tighten the steering stem head bolt ① and clamp nut ② with specified torque.

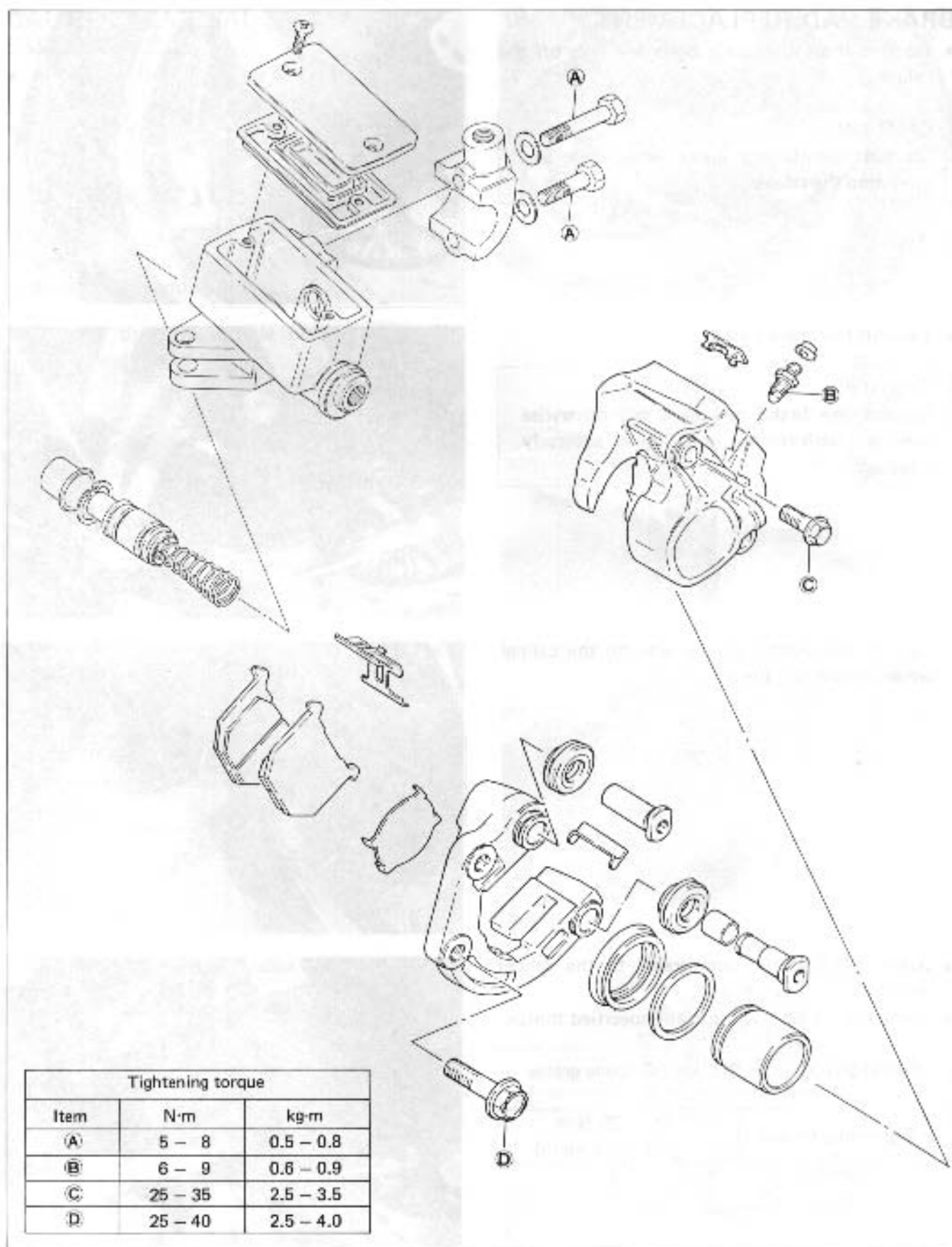
|                   |   |                                 |
|-------------------|---|---------------------------------|
| Tightening torque | ① | 20 – 30 N·m<br>(2.0 – 3.0 kg·m) |
|                   | ② | 15 – 25 N·m<br>(1.5 – 2.5 kg·m) |

**CAUTION:**

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



## FRONT BRAKE



## FRONT BRAKE BRAKE PAD REPLACEMENT

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

### CAUTION:

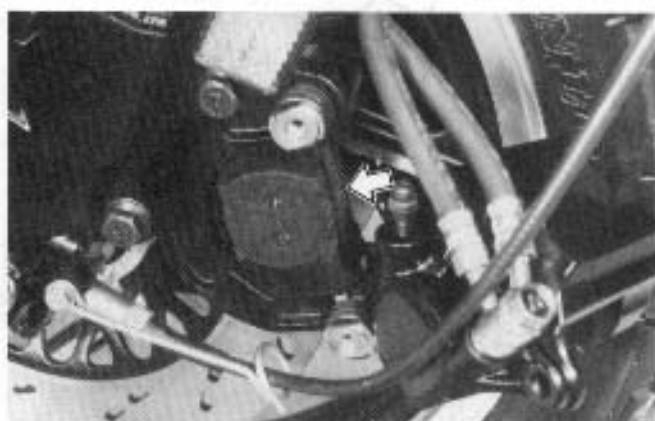
Do not operate the brake lever while dismounting the caliper.



- Take off the brake pads.

### CAUTION:

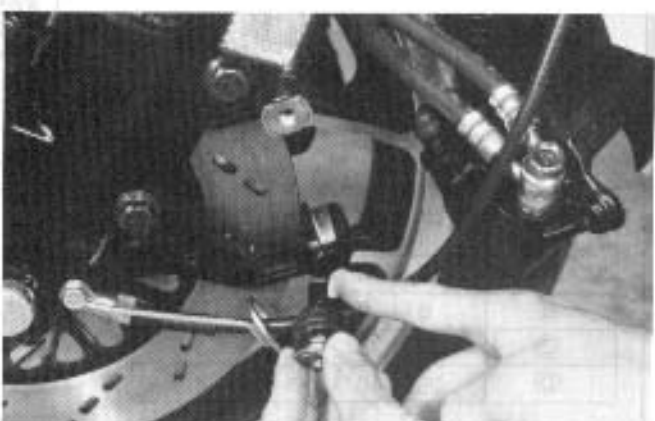
Replace the brake pad as a set, otherwise braking performance will be adversely affected.



- Push in the piston all the way to the caliper when remounting the caliper.



- Apply SUZUKI Silicone grease to the caliper axles.
- Tighten the caliper axles to the specified torque.



99000-25100

SUZUKI Silicone grease

Tightening torque

 25 – 35 N·m  
 (2.5 – 3.5 kg-m)

## CALIPER REMOVAL AND DISASSEMBLY

- Disconnect the brake hoses and catch the brake fluid in a suitable receptable.
- Remove the caliper mounting bolts and take off the caliper.

### NOTE:

Slightly loosen the caliper axle bolts to facilitate later disassembly before loosening the caliper mounting bolts.

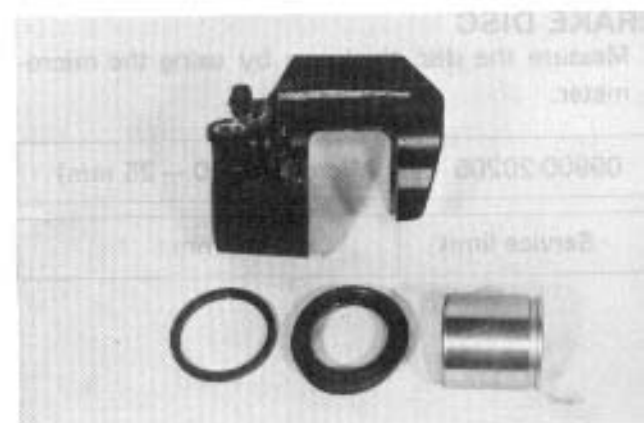
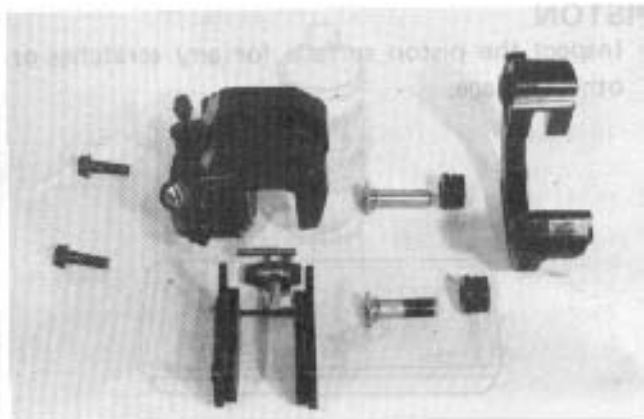
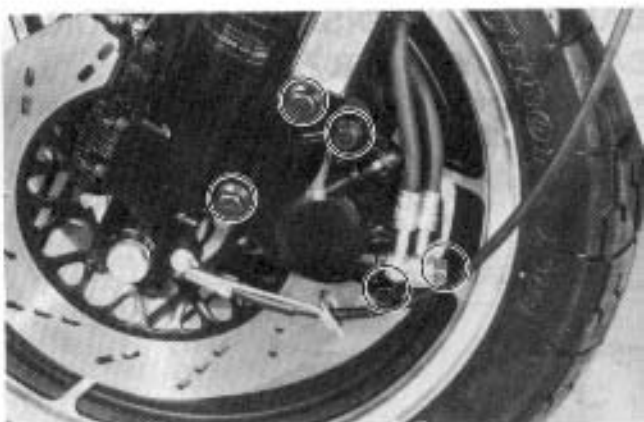
- Remove the caliper axle bolts, separate the caliper and caliper holder.

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

### CAUTION:

Do not use high pressure air to prevent piston damage.

- Remove dust boot and piston seal.



## CALIPER AND DISC INSPECTION

### CALIPER CYLINDER

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



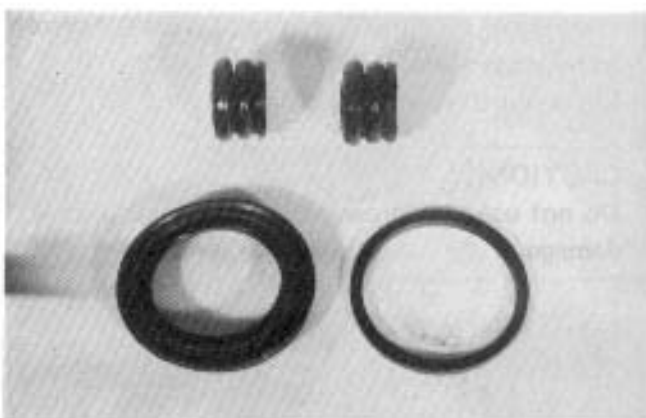
### PISTON

- Inspect the piston surface for any scratches or other damage.



### RUBBER PARTS

- Inspect each rubber part for damage and wear.



### BRAKE DISC

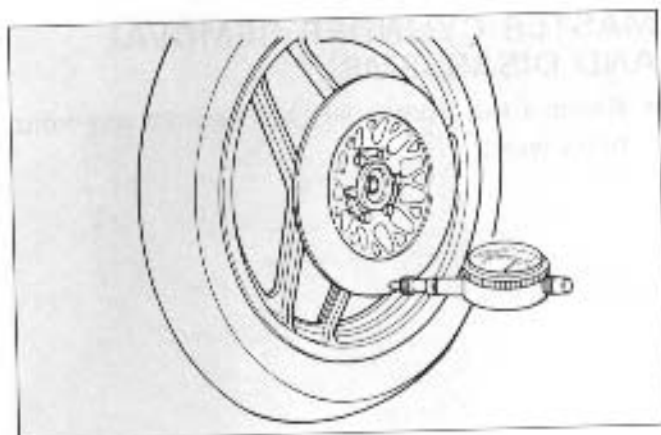
- Measure the disc thickness by using the micrometer.

|               |                        |
|---------------|------------------------|
| 09900-20205   | Micrometer (0 – 25 mm) |
| Service limit | 5.0 mm                 |





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



09900-20606

Dial gauge (1/100)

Service limit

0.3 mm

## CALIPER REASSEMBLY

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

### CAUTION:

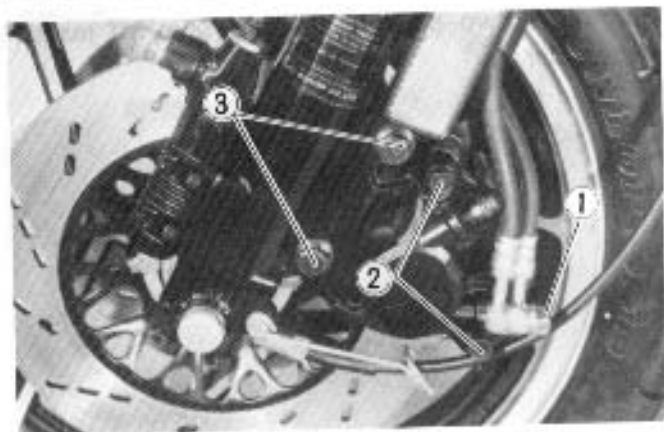
Wash the caliper components with fresh brake fluid before reassembly.

Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the caliper bore and all internal parts before inserting into the bore.



- Apply SUZUKI Silicone grease to the caliper axles.



99000-25100

SUZUKI Silicone grease

### Tightening torque

| Item                    | N·m     | kg·m      |
|-------------------------|---------|-----------|
| ① Union bolt            | 20 – 25 | 2.0 – 2.5 |
| ② Caliper axle bolt     | 25 – 35 | 2.5 – 3.5 |
| ③ Caliper mounting bolt | 25 – 40 | 2.5 – 4.0 |

### WARNING:

Bleed the air after reassembling the caliper (See page 2-14).

## MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the front brake light switch and front brake lever.



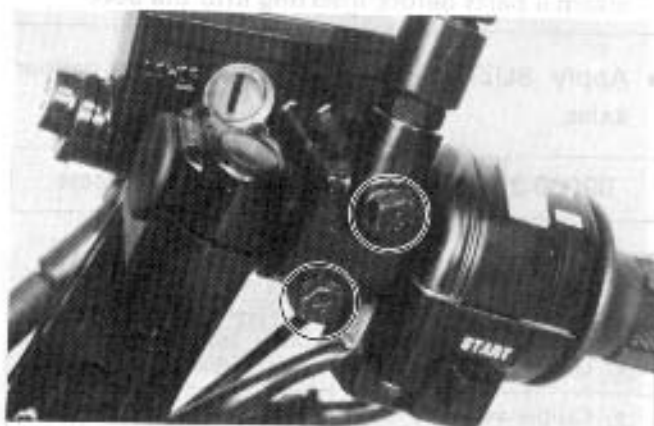
- Place a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose from the master cylinder joint.



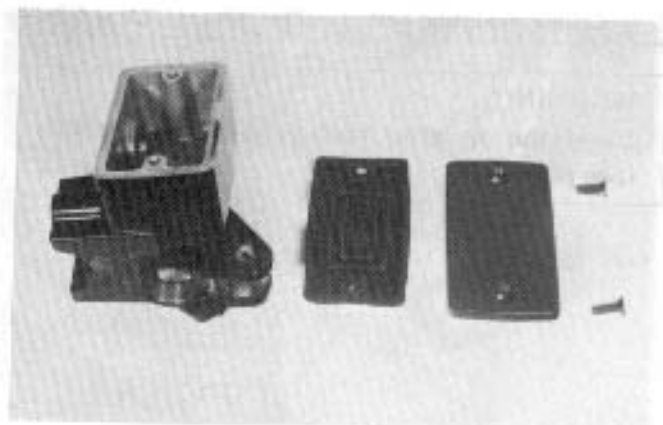
### CAUTION:

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

- Remove two clamp bolts and take off master cylinder.



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



## REAR WHEEL

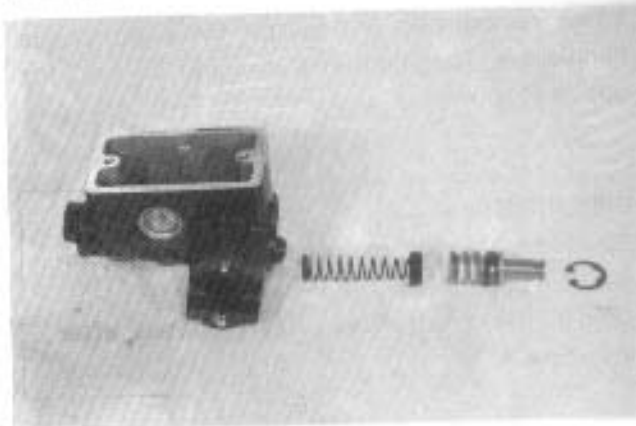
- Remove the dust seal boot.
- Remove the circlip by using the special tool.

09900-06108

Snap ring pliers



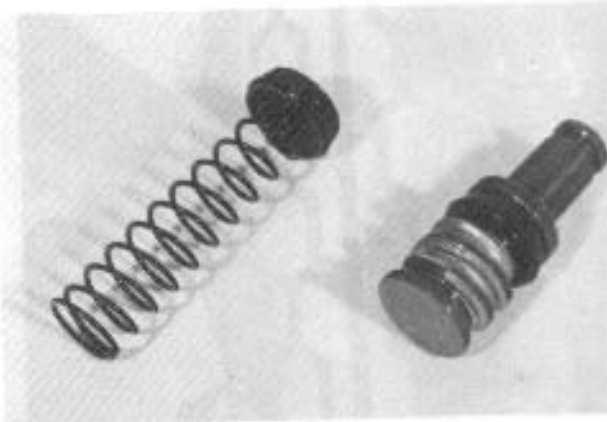
- Remove the piston, primary cup and spring.

**MASTER CYLINDER INSPECTION**

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



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



## MASTER CYLINDER REASSEMBLY

Reassemble the master cylinder in the reverse orders of disassembly and by taking the following steps.

### CAUTION:

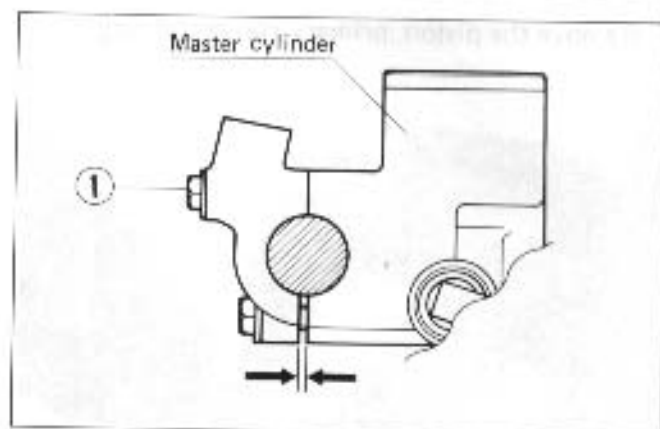
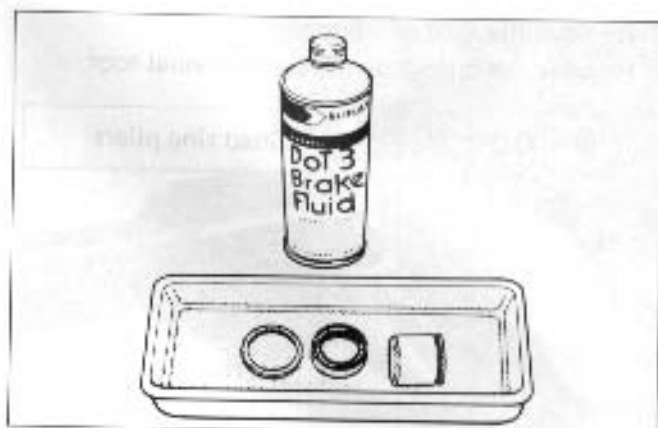
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all internal parts before inserting into the bore.

- When remounting the master cylinder on the handlebars, first tighten the clamp bolt ① for upside as shown.

### WARNING:

Bleed the air after reassembling master cylinder (See page 2-14).

Adjust the front brake light switch after installation.



## REAR WHEEL

### REMOVAL

- Support the machine by the center stand.
- Remove the pillion footrest.

- Loosen the exhaust pipe clamp bolt.

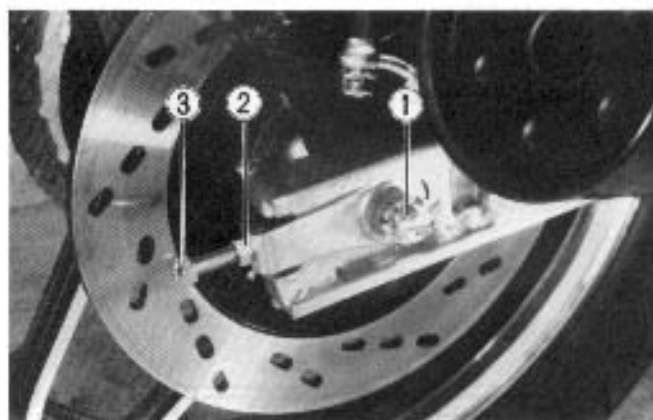
- Take off the chain case.

- Remove the rear axle cover.

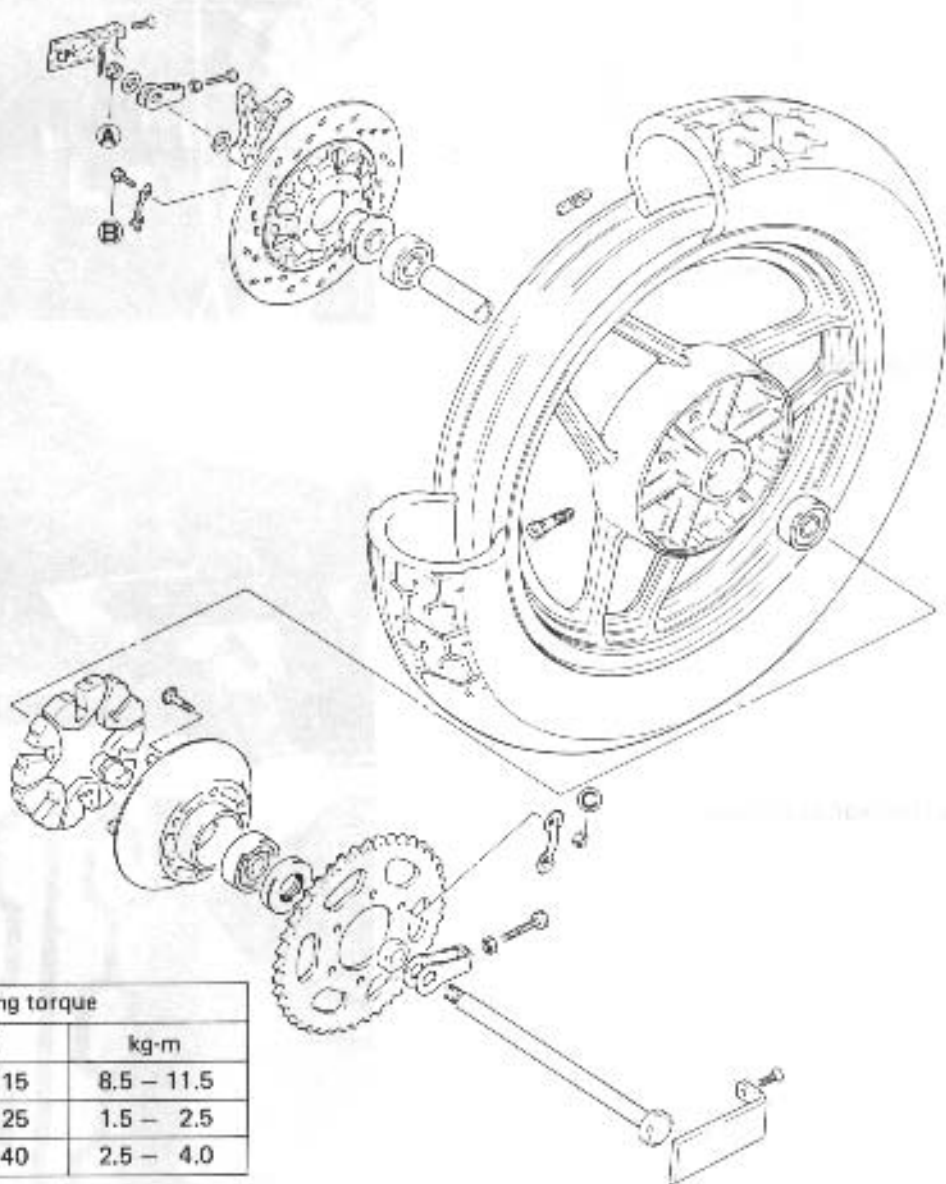




- Remove the axle nut ①
- Loosen the right and left chain adjuster lock nuts ② and adjuster bolts ③.
- Draw out the axle shaft and take off the drive chain from the rear sprocket.
- Remove the rear wheel.



## DISASSEMBLY



Tightening torque

| Item | N·m      | kg·m       |
|------|----------|------------|
| A    | 85 – 115 | 8.5 – 11.5 |
| B    | 15 – 25  | 1.5 – 2.5  |
| C    | 25 – 40  | 2.5 – 4.0  |

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



- Remove the six cushions.

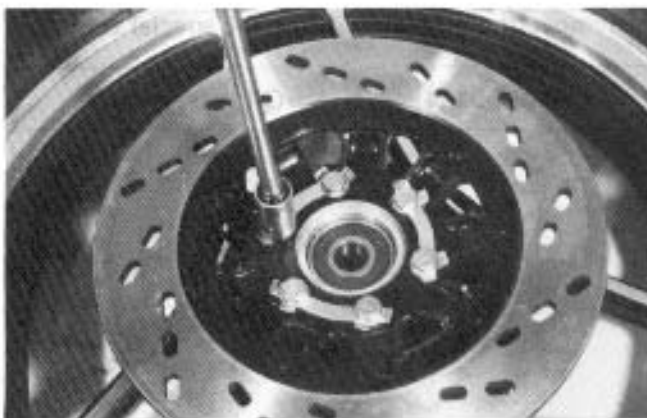


- Flatten the washers and loosen the six nuts.

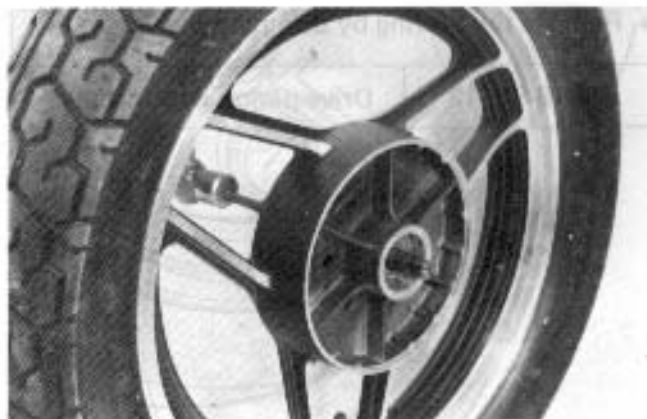
**CAUTION:**

Do not reuse the lock washers.

- Separate the disc from wheel.



- Remove the right and left side wheel bearings by using special tool.



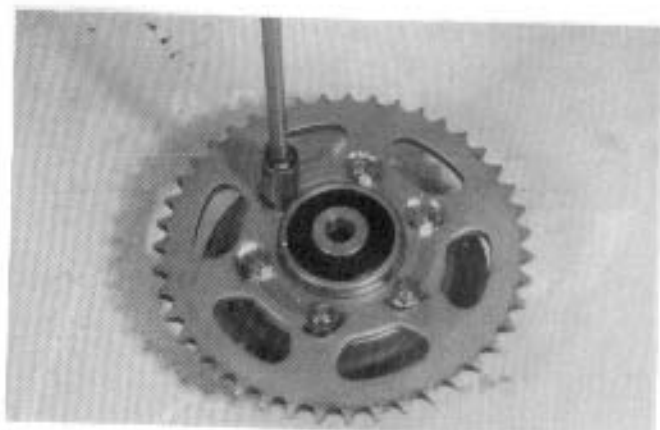
09941-50110

Wheel bearing remover

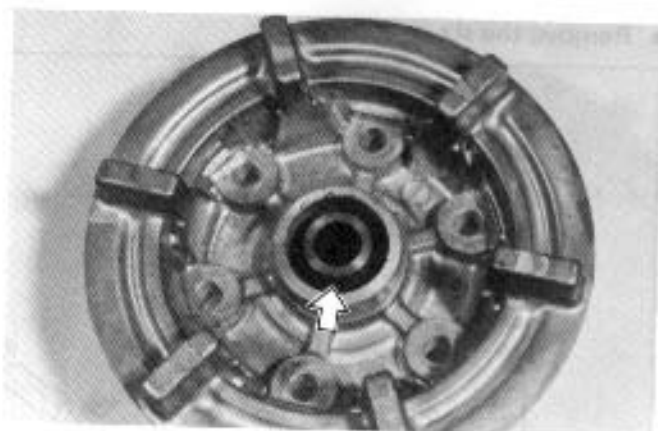
**CAUTION:**

The removed bearing should be replaced.

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



- Pull out the spacers.



- Remove the oil seal by using the special tool.

09913-50121

Oil seal remover



- Remove the bearing by using the special tool.

09913-80112

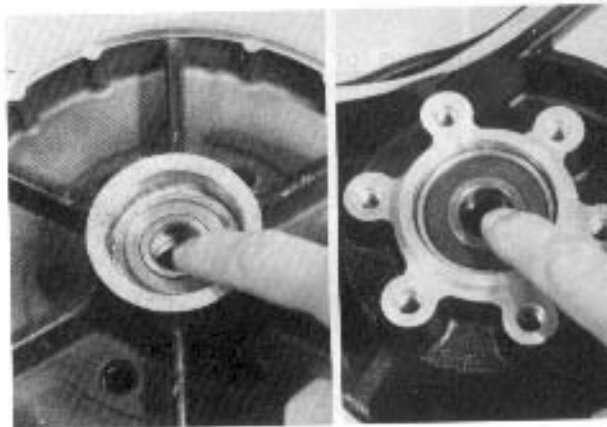
Drive pinion race installer



## INSPECTION

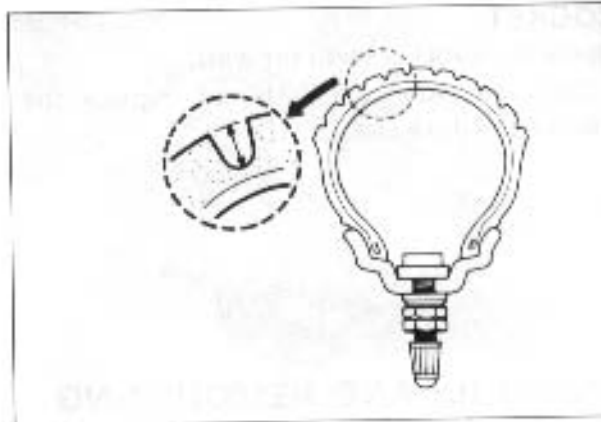
### REAR WHEEL AND MOUNTING DRUM BEARINGS

- Inspect the play of bearing inner race by hand while fixing it in the wheel and mounting drum.
- Rotate the inner race by hand to inspect whether abnormal noise occurs or rotating smoothly.
- Replace the bearing if there is something unusual.



## TIRE

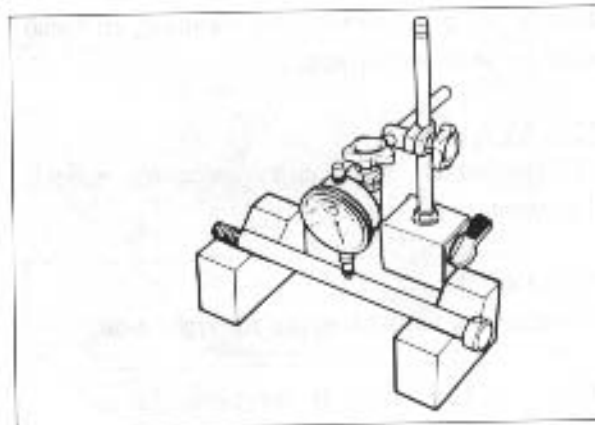
- (See page 2-16)



## AXLE SHAFT

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

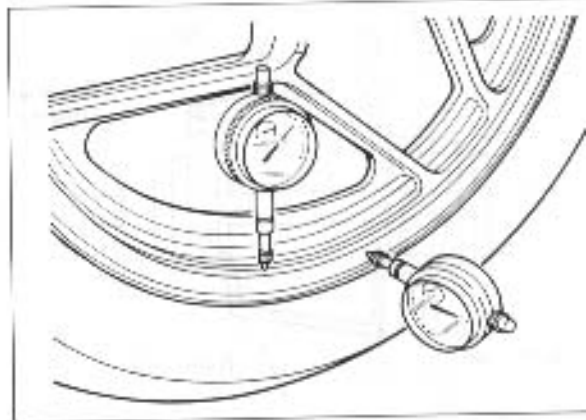
|               |                    |
|---------------|--------------------|
| 09900-20606   | Dial gauge (1/100) |
| Service Limit | 0.25 mm            |



## WHEEL

- Make sure that the wheel runout checked as shown, does not exceed the service limit. An excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings.
- If bearing replacement fails to reduce the runout, replace the wheel.

|                                     |        |
|-------------------------------------|--------|
| Service Limit<br>(Axial and Radial) | 2.0 mm |
|-------------------------------------|--------|

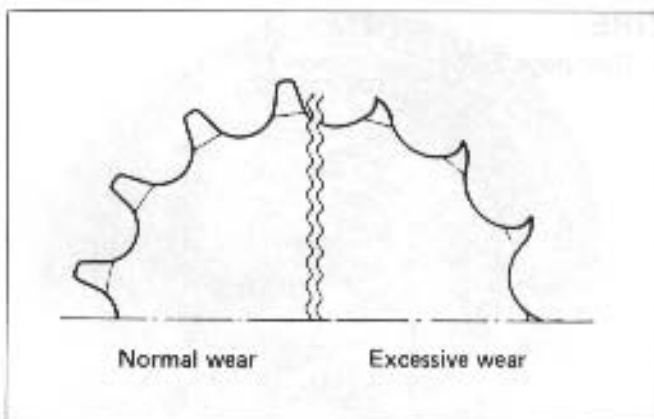


**CUSHION**

- Inspect the cushions for wear and damage.

**SPROCKET**

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

**REASSEMBLY AND REMOUNTING**

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

**WHEEL BEARINGS**

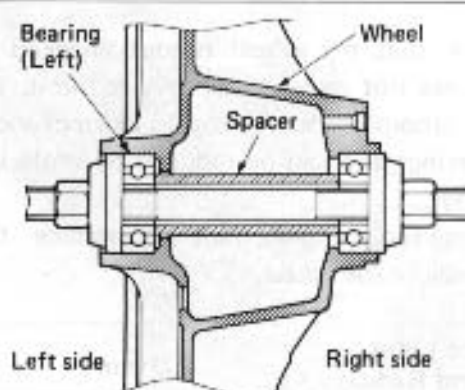
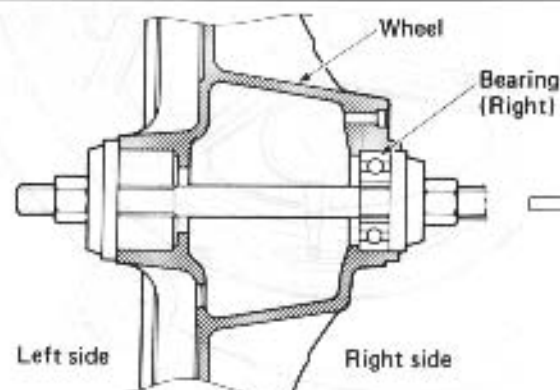
- Install the wheel bearings by using the special tool as shown.

**CAUTION:**

First install the wheel bearing for right side.

09924-84510

Bearing installer set

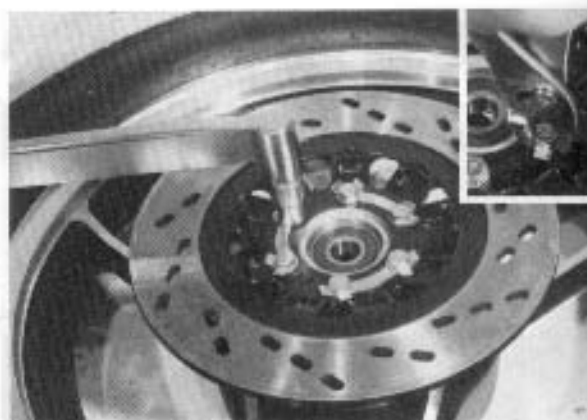




**BRAKE DISC**

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

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 15 – 25 N·m<br>(1.5 – 2.5 kg-m) |
|-------------------|---------------------------------|

**MOUNTING DRUM BEARING**

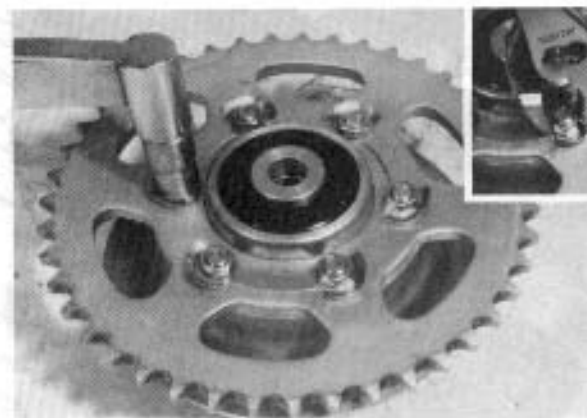
- Install the bearing by using a bearing installer.

|             |                   |
|-------------|-------------------|
| 09913-75520 | Bearing installer |
|-------------|-------------------|

**REAR SPROCKET**

- After tightening the six nuts to specification, bend the washers to lock nuts.

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 25 – 40 N·m<br>(2.5 – 4.0 kg-m) |
|-------------------|---------------------------------|

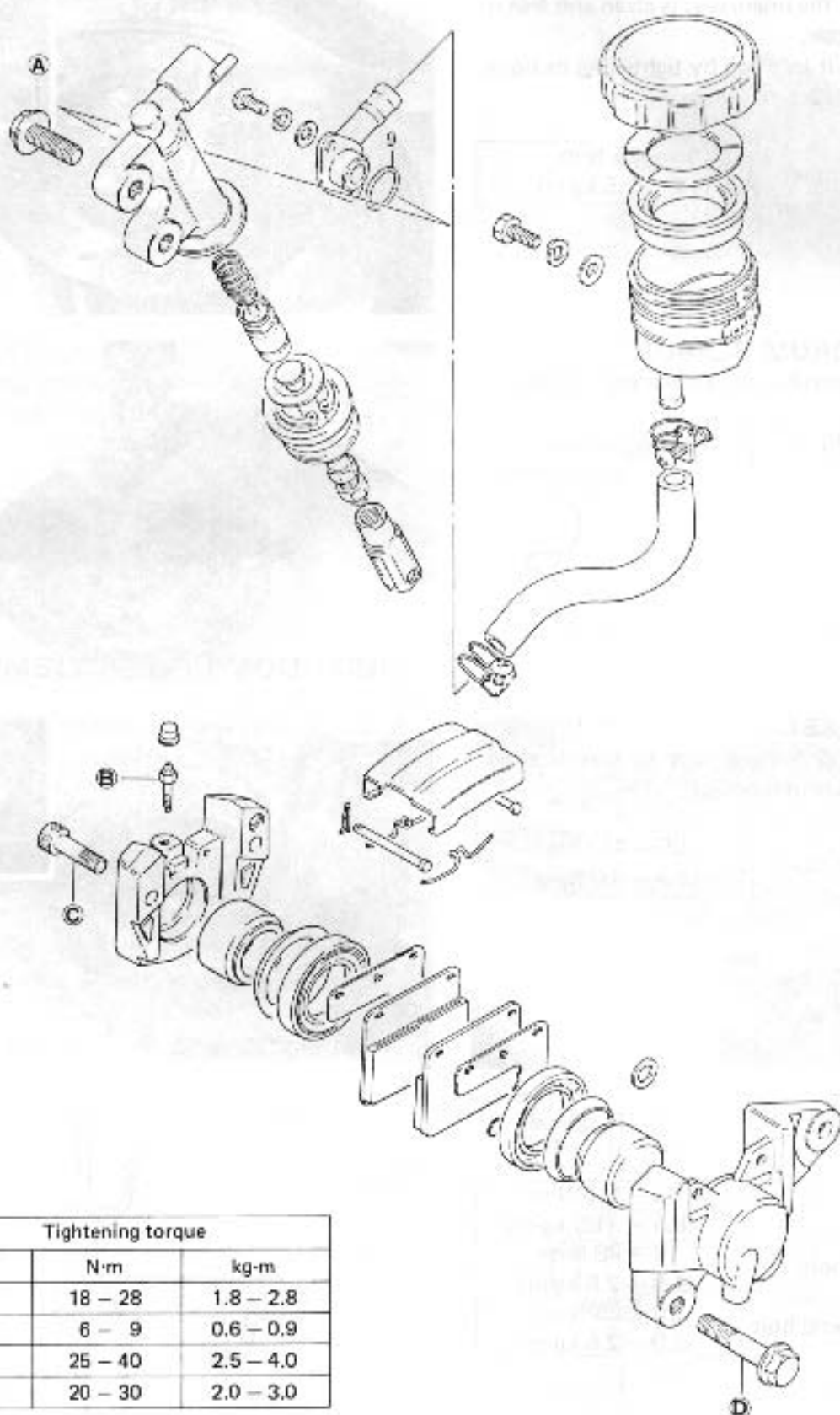
**REMountING**

Tightening torque

|                         |                                   |
|-------------------------|-----------------------------------|
| Rear axle nut           | 85 – 115 N·m<br>(8.5 – 11.5 kg-m) |
| Pillion footrest bolt   | 18 – 28 N·m<br>(1.8 – 2.8 kg-m)   |
| Exhaust pipe clamp bolt | 20 – 25 N·m<br>(2.0 – 2.5 kg-m)   |



# REAR BRAKE

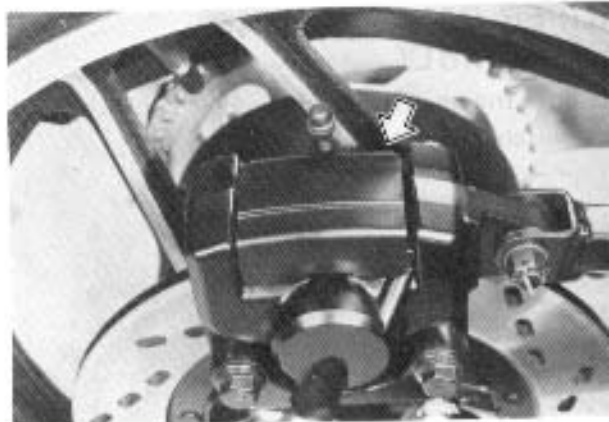


Tightening torque

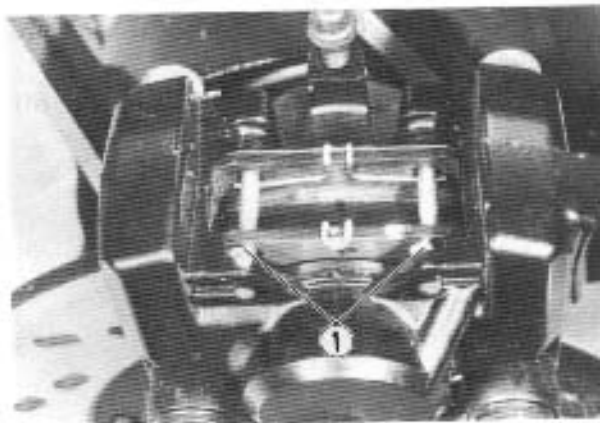
| Item | N·m     | kg·m      |
|------|---------|-----------|
| (A)  | 18 - 28 | 1.8 - 2.8 |
| (B)  | 6 - 9   | 0.6 - 0.9 |
| (C)  | 25 - 40 | 2.5 - 4.0 |
| (D)  | 20 - 30 | 2.0 - 3.0 |

## BRAKE PAD REPLACEMENT

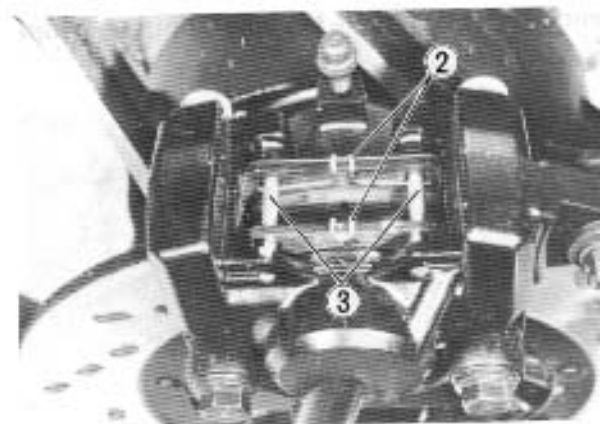
- Remove the dust cover.



- Pull off the clips ①.



- Pull off the springs ② and pins ③.
- Take off the brake pads with pad shims.



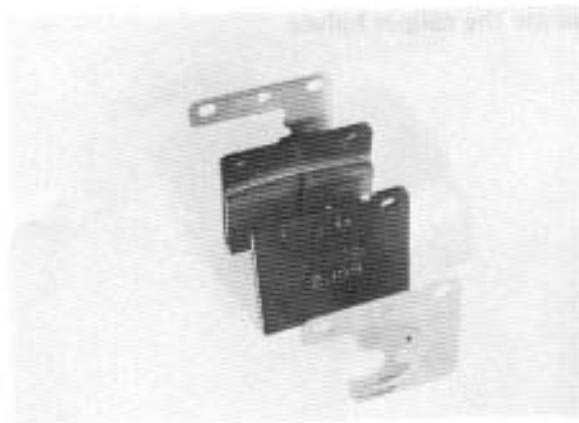
### NOTE:

Do not operate the brake pedal while taking off the brake pads.

### CAUTION:

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

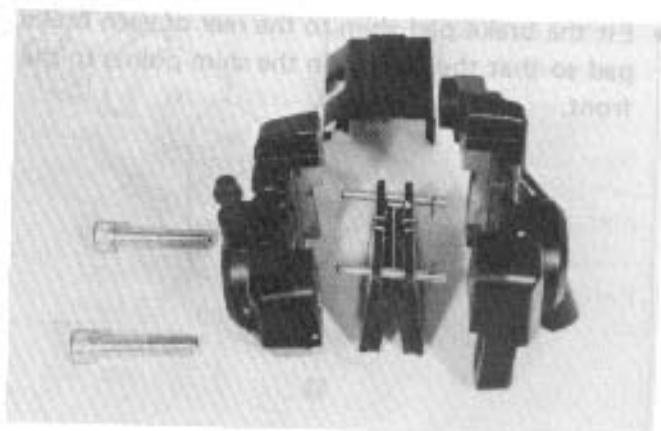
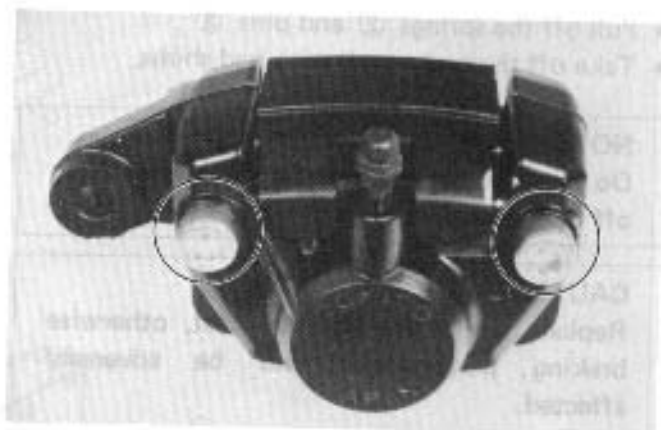
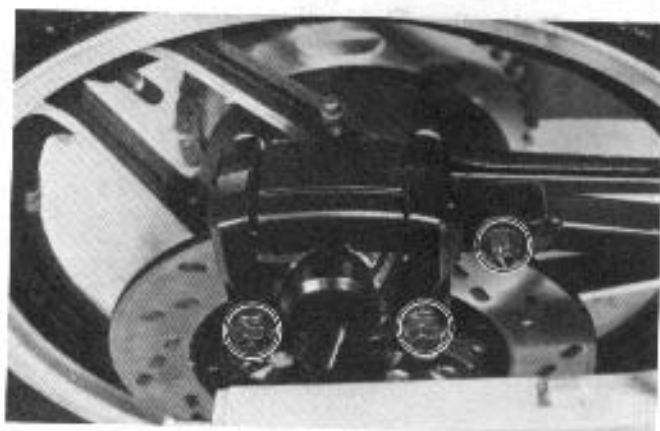
- Fit the brake pad shim to the rear of each brake pad so that the "hole" in the shim points to the front.



## REAR BRAKE

**CALIPER REMOVAL AND DISASSEMBLY**

- Remove the union bolt and catch the brake fluid in a suitable receptacle.
- Pull off the cotter pin and remove the torque link bolt and nut.
- Remove the caliper mounting bolts and take off the caliper.
- Remove the caliper axle bolts by using the 8 mm hexagon wrench.
- Separate the caliper halves.



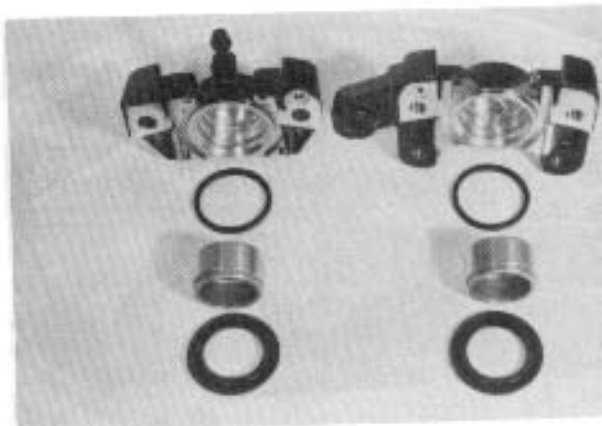
- Place a rag over the piston to prevent it from popping out.  
Push out the piston by using air gun.

**CAUTION:**

Do not use high pressure air for preventing piston damage.

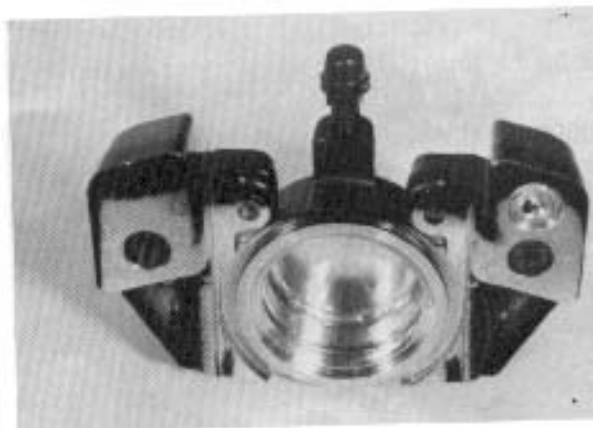


- Remove the dust boot and piston seal.

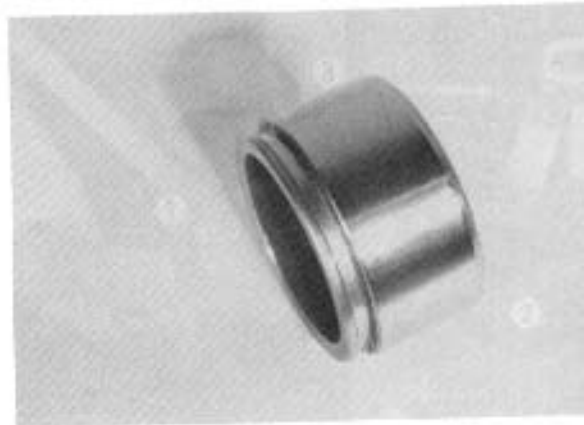


## INSPECTION CYLINDER

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

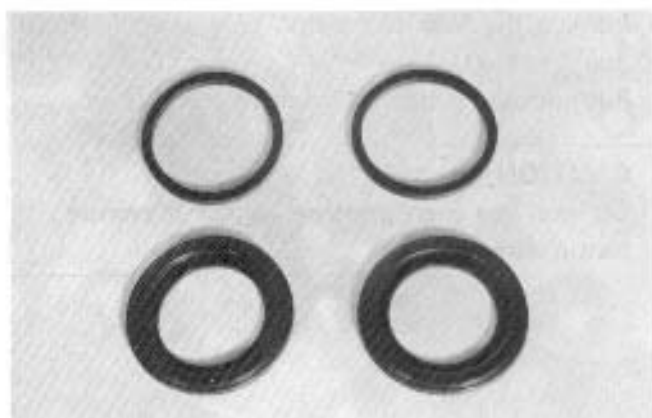
**PISTON**

- Inspect the piston surface for any flaws or other damage.



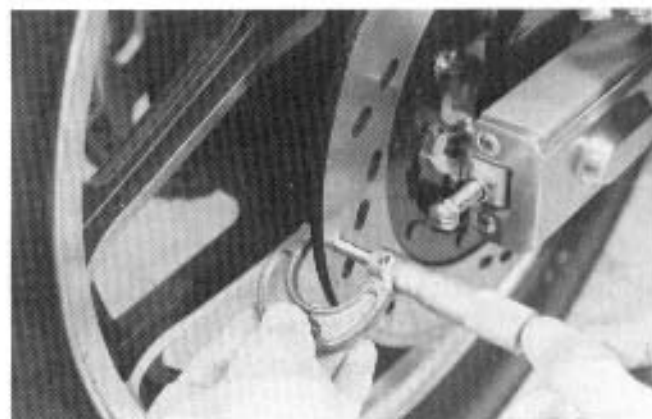
**DUST BOOT AND PISTON SEAL**

- Inspect each rubber part for damage and wear.

**DISC**

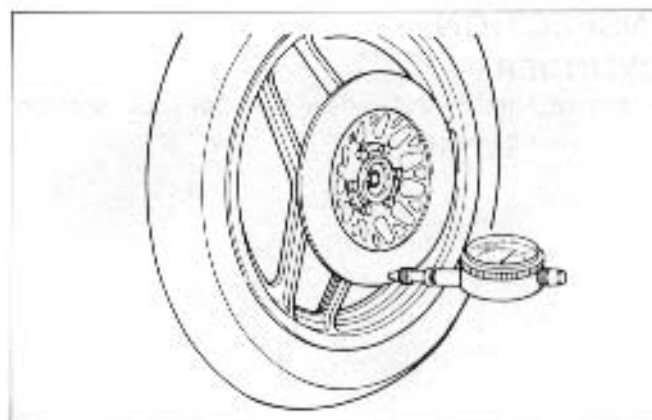
- Measure the disc thickness by using the micrometer.

|               |                        |
|---------------|------------------------|
| 09900-20205   | Micrometer (0 – 25 mm) |
| Service Limit | 6.0 mm                 |



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

|               |                    |
|---------------|--------------------|
| 09900-20606   | Dial gauge (1/100) |
| Service Limit | 0.30 mm            |



## REASSEMBLY

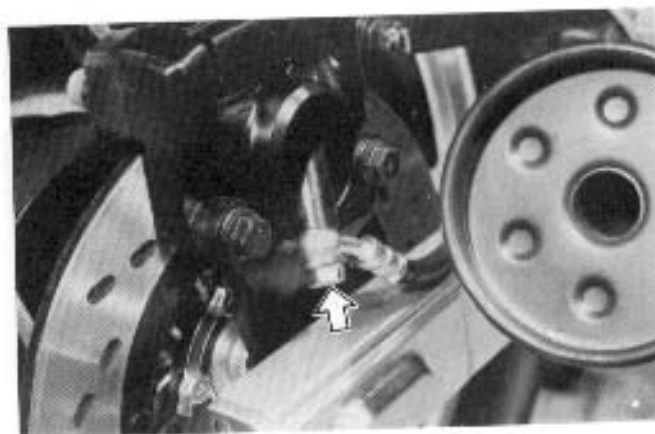
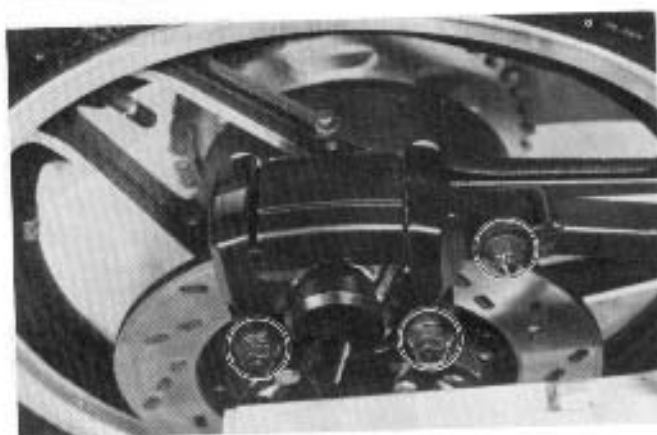
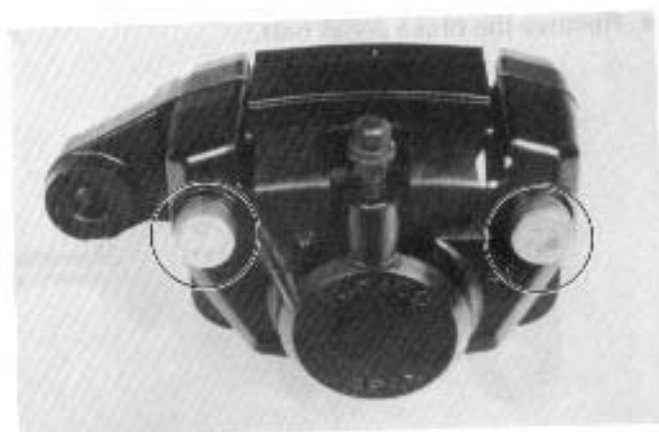
Reassemble and remount the caliper in the reverse order of disassembly and removal, and also carry out the following steps:

### CAUTION:

- \* Wash the caliper components with fresh brake fluid before reassembly.
- \* Never use cleaning solvent or gasoline to wash them.
- \* Apply brake fluid to the caliper bore and piston to be inserted into the bore.
- \* Bleed the air after reassembling the caliper (See page 2-14).

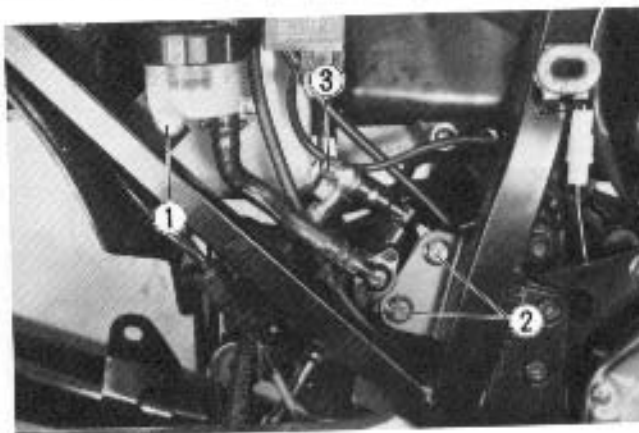
## TIGHTENING TORQUE

| Item                  | N·m     | kg·m      |
|-----------------------|---------|-----------|
| Caliper axle bolt     | 20 - 30 | 2.0 - 3.0 |
| Caliper mounting bolt | 25 - 40 | 2.5 - 4.0 |
| Union bolt            | 20 - 25 | 2.0 - 2.5 |
| Torque link nut       | 20 - 30 | 2.0 - 3.0 |



## MASTER CYLINDER REMOVAL

- Remove the rear wheel (See page 6-32).
- Remove the swing arm (See page 6-48).
- Remove the reservoir tank fitting bolt ①.
- Remove the master cylinder fitting bolts ②.
- Remove the union bolt ③.





- Remove the brake pedal bolt.



- Slide the brake pedal rod arm ① inside.



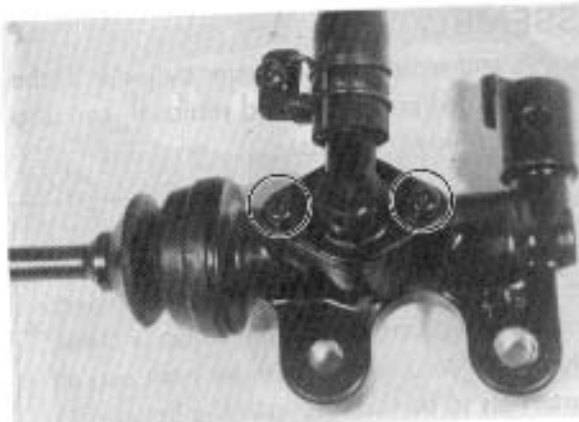
- Pull off the cotter pin and pin ②.



- Remove the master cylinder with reservoir tank.
- Remove reservoir cap and drain brake fluid.



- Loosen the two screws and remove the reservoir with brake hose.



- Remove the rod, piston, primary cup and spring by using the special tool.

09900-06105

Snap ring pliers



## INSPECTION CYLINDER

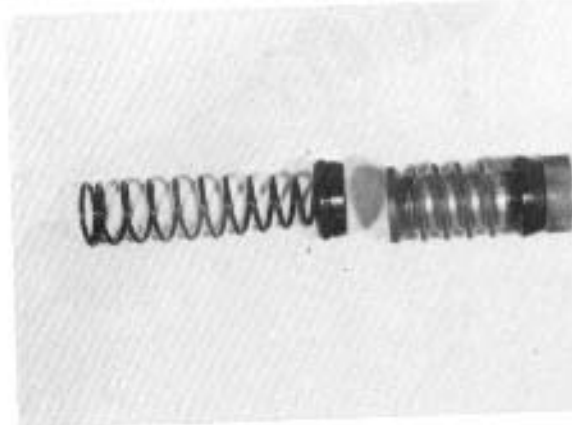
Inspect the cylinder bore wall for any scratch or other damage.



## PISTON AND CUP SET

Inspect the piston surface for scratch or other damage.

Inspect the cup set and each rubber part for damage.



## REASSEMBLY

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

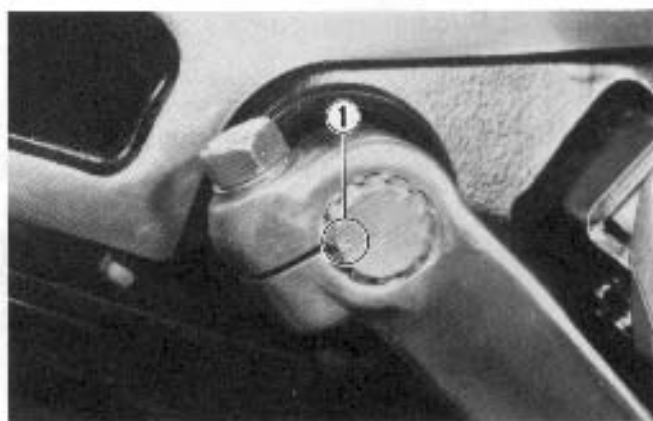
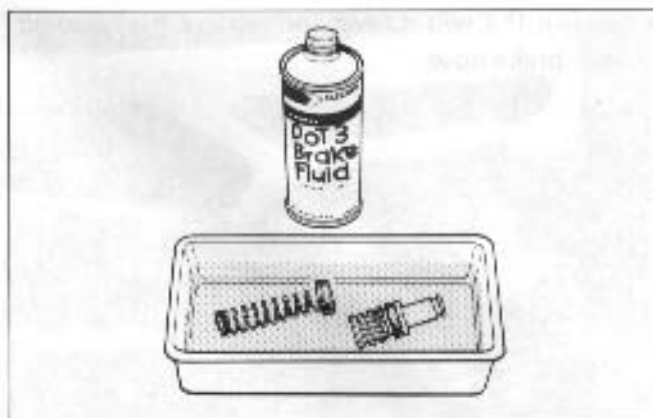
**CAUTION:**

Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

**CAUTION:**

Bleed the air after reassembling master cylinder (See page 2-14).

Adjust the rear brake light switch and brake pedal height after installation. (See page 2-13 and 2-14).



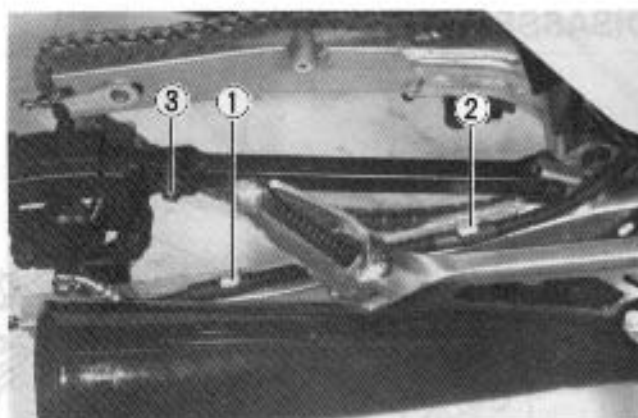
## REAR BRAKE PEDAL

When installing the rear brake pedal, align the brake pedal groove with punched mark ① provided on the end face of the brake pedal rod arm.

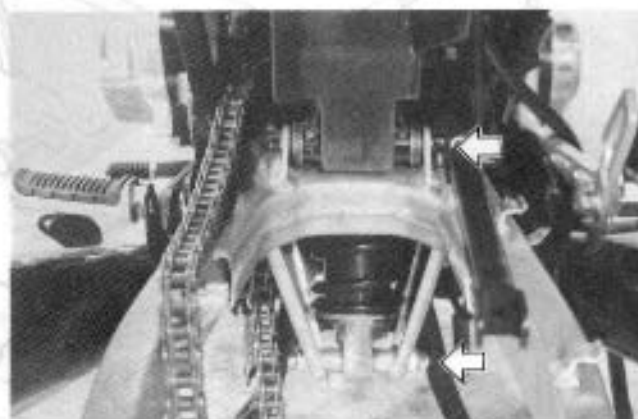
## REAR SWING ARM

### REMOVAL

- Remove the rear wheel. (See page 6-32)
- Draw out the brake hose from the clamps ① , ② .
- Pull off the cotter pin and remove the torque link bolt ③ .
- Take off the caliper.



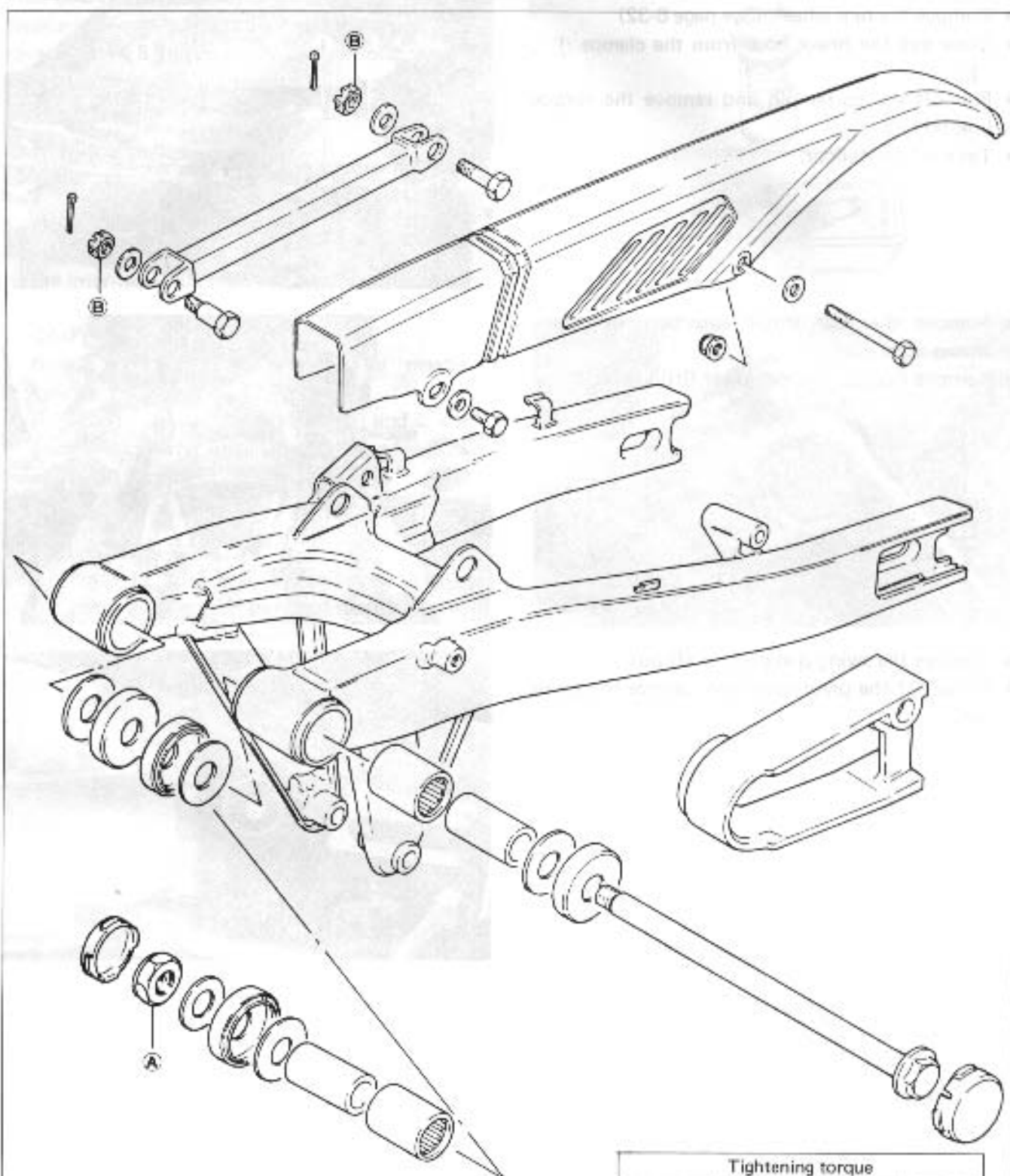
- Remove the rear shock absorber unit lower fitting bolt.
- Remove the cushion rod lower fitting bolt.



- Remove the swing arm pivot shaft nut.
- Draw out the pivot shaft and remove the swing arm.



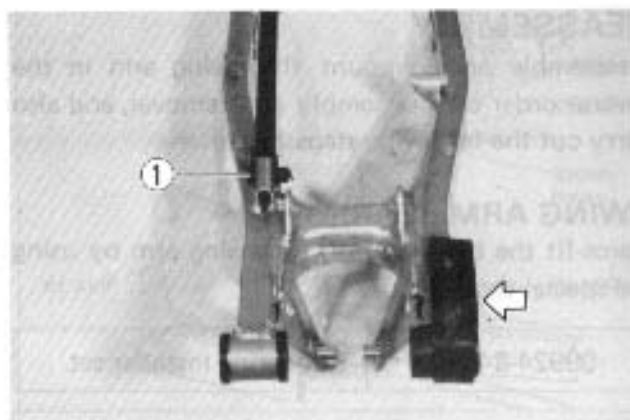
## DISASSEMBLY



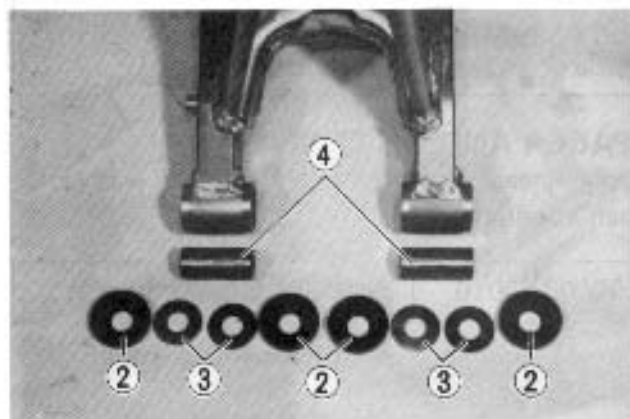
| Item | Tightening torque |           |
|------|-------------------|-----------|
|      | N·m               | kg·m      |
| Ⓐ    | 50 – 80           | 5.0 – 8.0 |
| Ⓑ    | 20 – 30           | 2.0 – 3.0 |

## FULL FLOATING REAR AXLE

- Pull off the cotter pin and remove the rear torque link bolt ①.
- Take off the rear torque link.
- Take off the chain defense buffer.



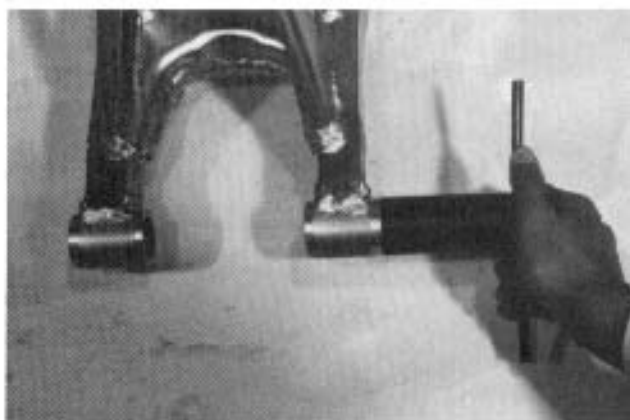
- Take off the dust seal ② and thrust washer ③.
- Draw out the spacer ④.



- Draw out the swing arm bearing by using special tool.

09941-44910

Swing arm bearing remover



## INSPECTION

## SWING ARM PIVOT SHAFT

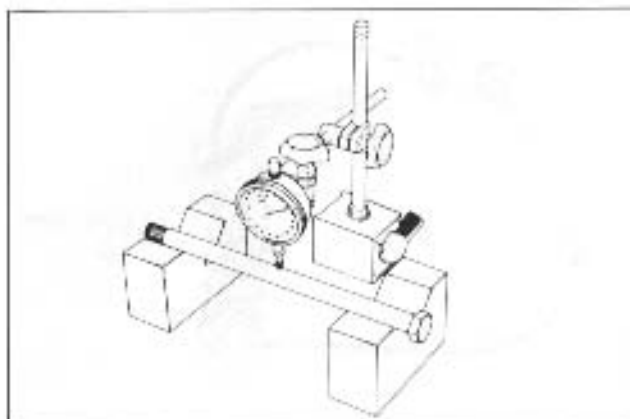
Using a dial gauge, check the pivot shaft for runout and replace it if the runout exceeds the limit.

09900-20606

Dial gauge (1/100)

Service Limit

0.3 mm





## REASSEMBLY

Reassemble and remount the swing arm 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 the special tool.

09924-84510

Bearing installer set

#### NOTE:

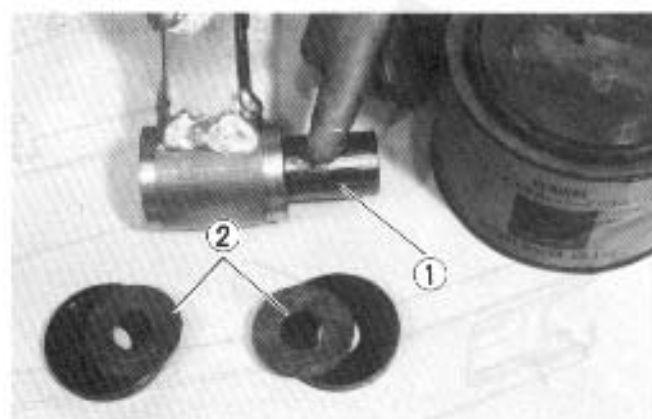
When installing two bearings, punch-marked side of bearing comes outside.

### SPACER AND DUST SEAL

Apply grease to the spacer ① and washer ② when installing them.

99000-25010

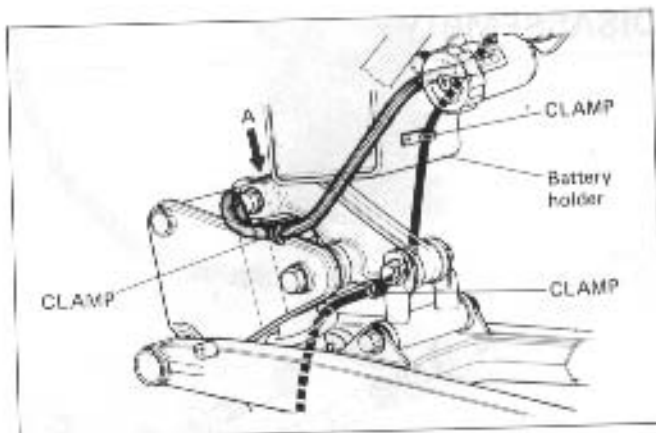
SUZUKI Super grease "A"



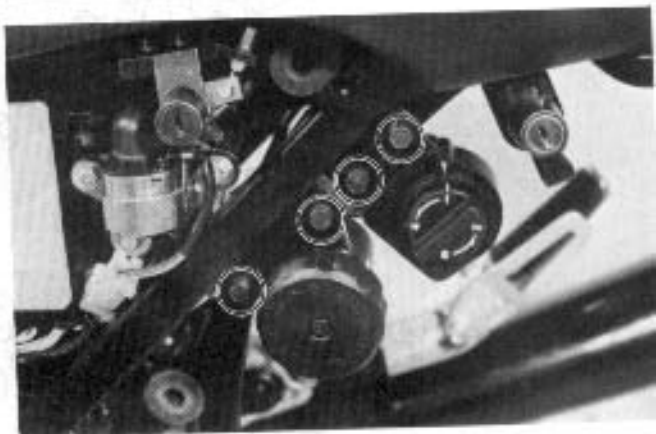
## FULL FLOATING SUSPENSION

### REMOVAL

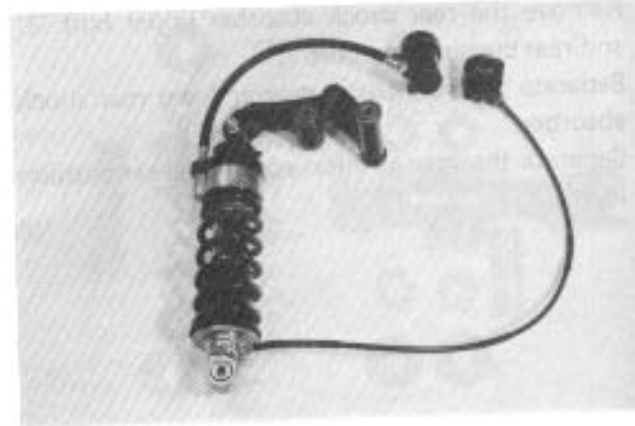
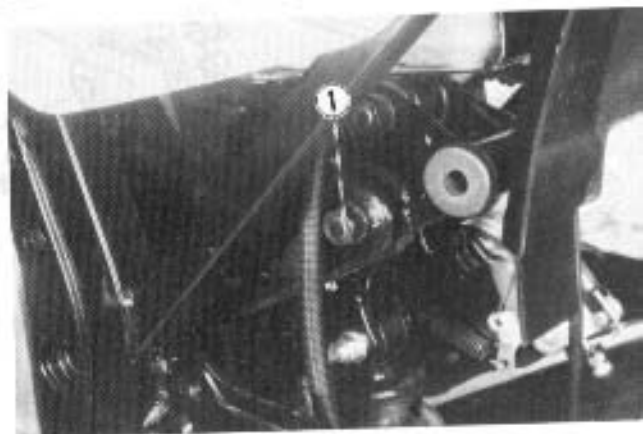
- Remove the rear wheel (See page 6-32).
- Remove the rear swing arm (See page 6-48).
- Draw out the preload adjuster hose and damping adjuster cable from the clamps.



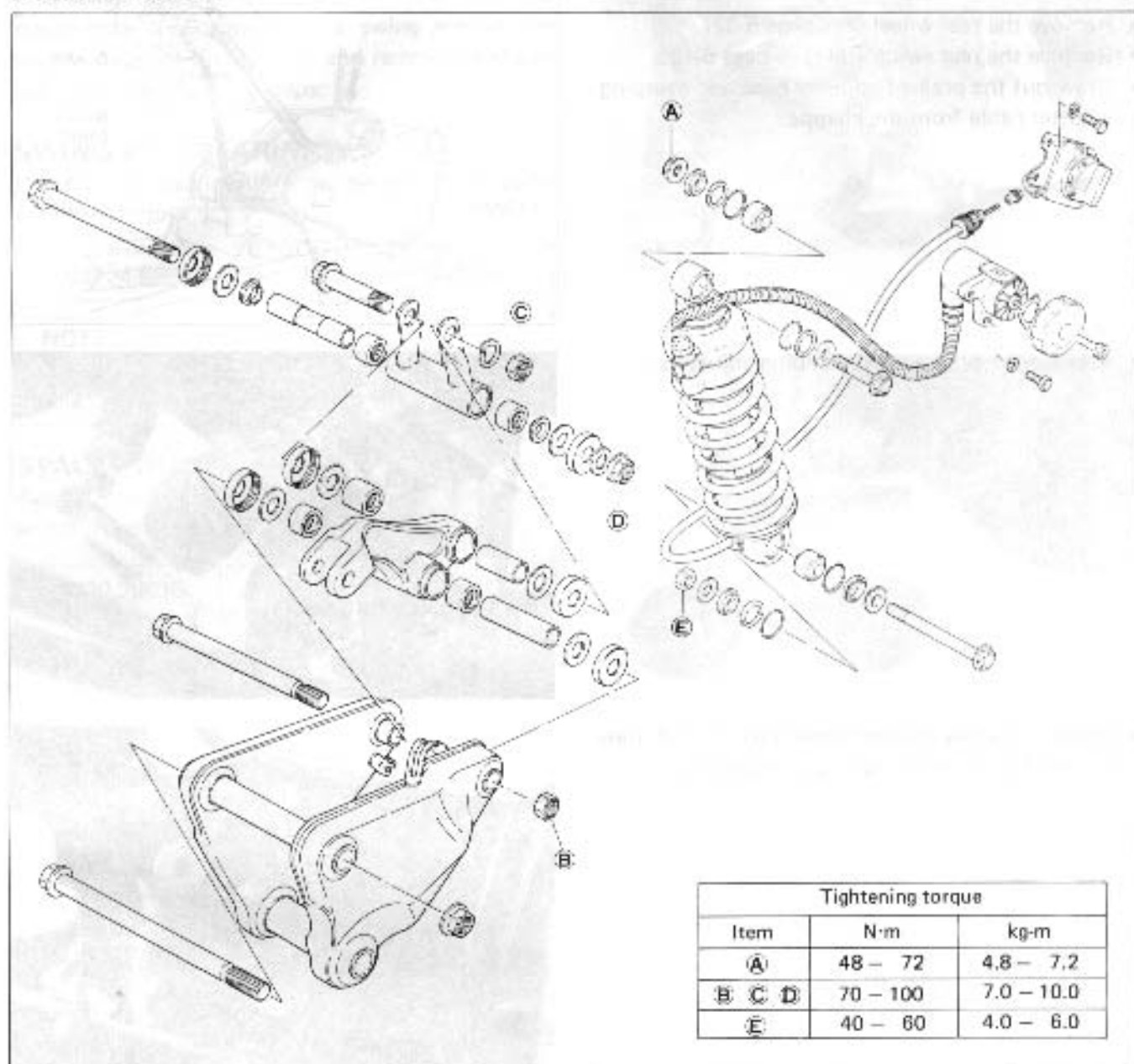
- Remove the preload and damping adjusters.



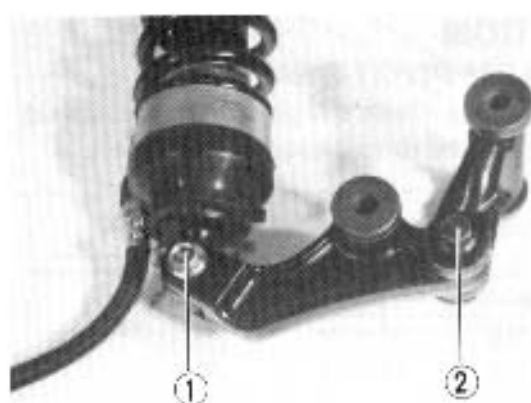
- Remove the rear cushion lever bolt ① and draw out the full floating suspension assembly.



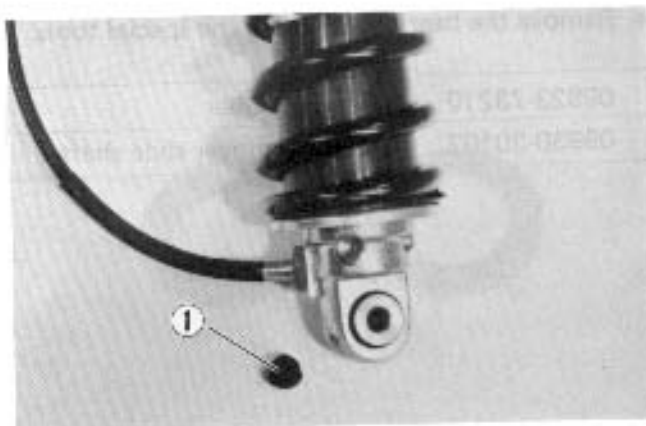
## DISASSEMBLY



- Remove the rear shock absorber upper bolt ① and rear cushion rod bolt ②.
- Separate the rear cushion lever from rear shock absorber.
- Separate the rear cushion rod from rear cushion lever.



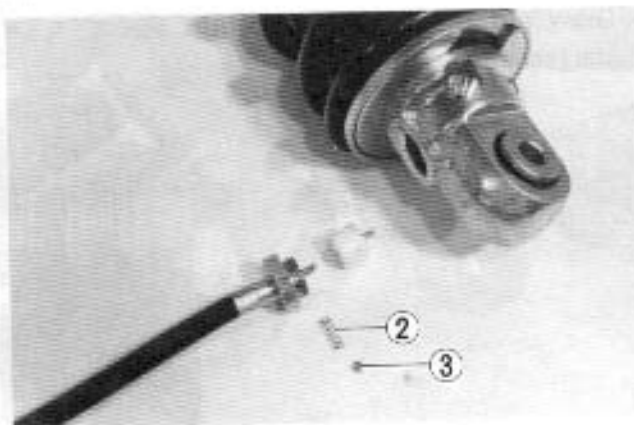
- Pull out the rubber cap ①.
- Rotate the damping adjuster to the left until the blue mark appears in the window.



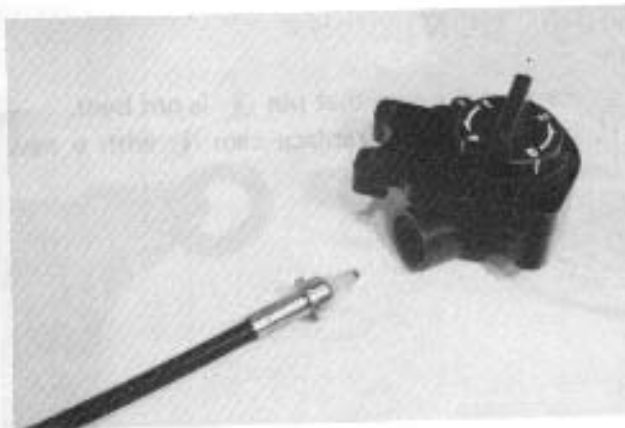
- Disconnect the damping adjuster cable from rear shock absorber.

**NOTE:**

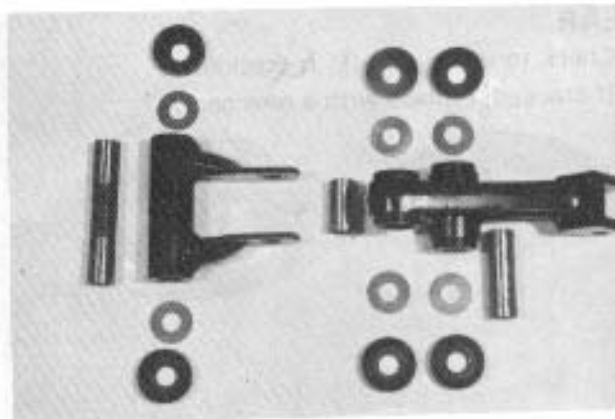
When reassembling, the spring ② and steel ball ③ are not used.



- Disconnect the damping adjuster cable from damping adjuster.

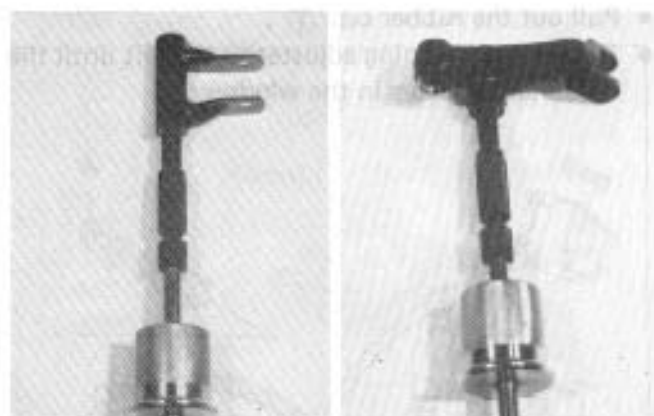


- Draw out the dust seal, washer and spacer.

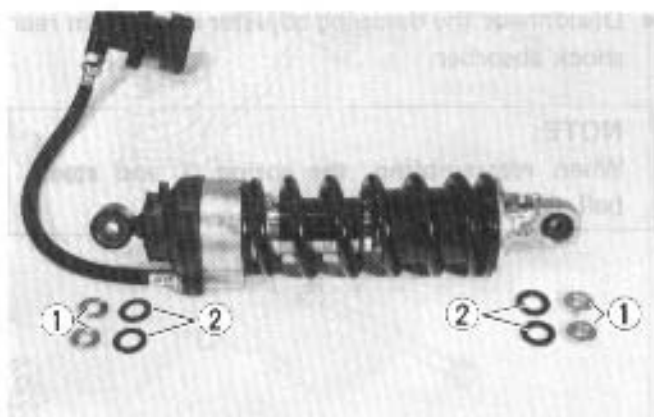


- Remove the bearings by using the special tools.

|             |                           |
|-------------|---------------------------|
| 09923-73210 | Bearing puller            |
| 09930-30102 | Rotor remover slide shaft |



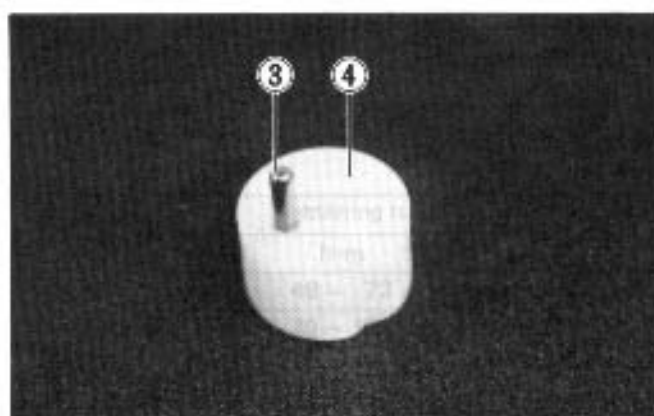
- Draw out the collar ① and dust seal ② from the rear shock absorber.



## INSPECTION

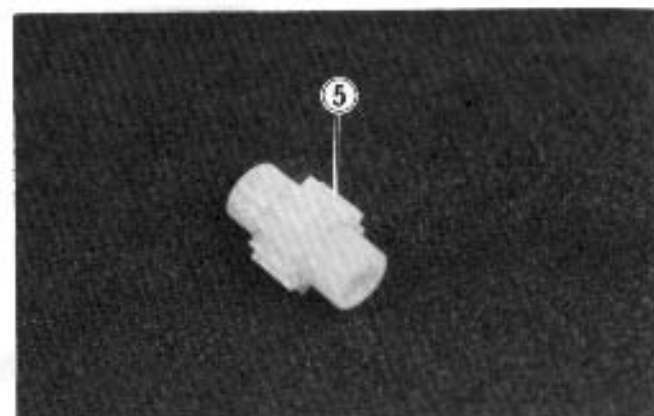
### PIN

- Check to make sure that pin ③ is not bent.
- If the pin is bent, replace cam ④ with a new one.



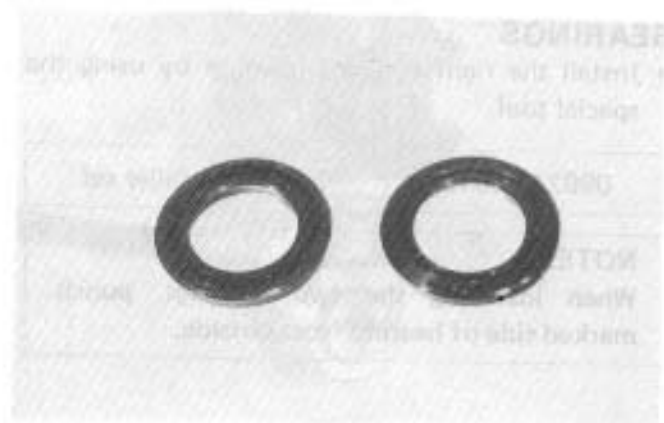
### GEAR

- Check to see if gear ⑤ is cracked.
- If cracked, replace with a new gear.



**DUST SEAL**

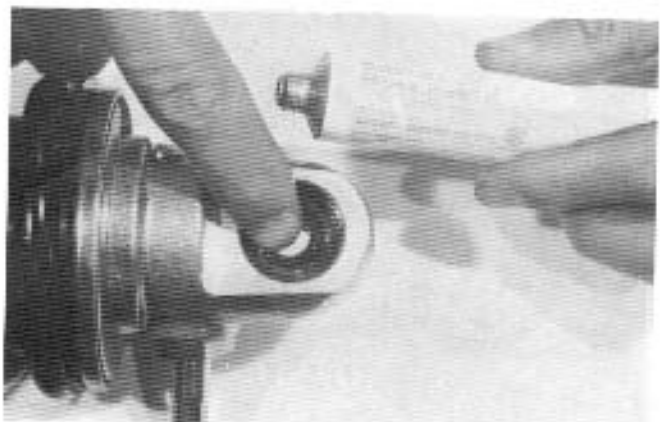
- Inspect the dust seals, if they are found to be damaged, replace them with new seals.

**REASSEMBLY**

Reassemble and remount the full floating suspension in the reverse order of disassembly and removal, and also carry out the following steps.

**REAR SHOCK ABSORBER**

- Apply SUZUKI Moly Paste to the bearings.



99000-25140

SUZUKI Moly Paste

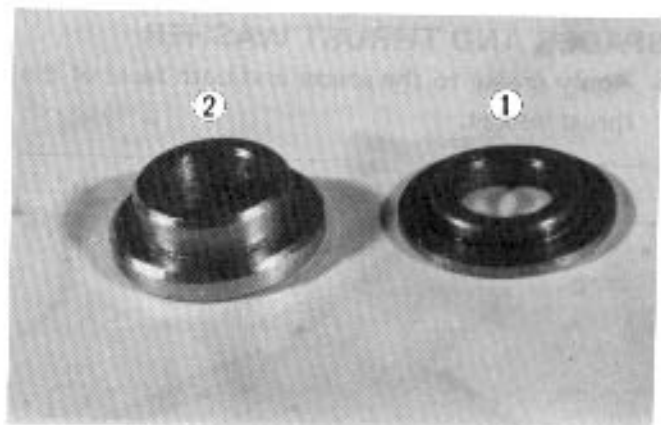
- Apply grease to the dust seal.



99000-25010

SUZUKI Super grease "A"

- When attaching the collars, be sure not to intermix the upper collar ① and the lower collar ②.





**BEARINGS**

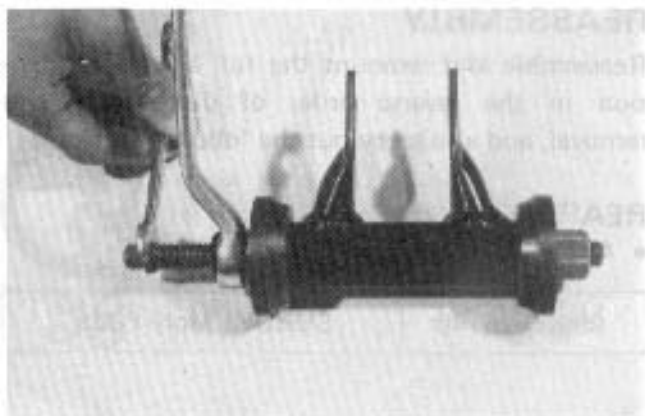
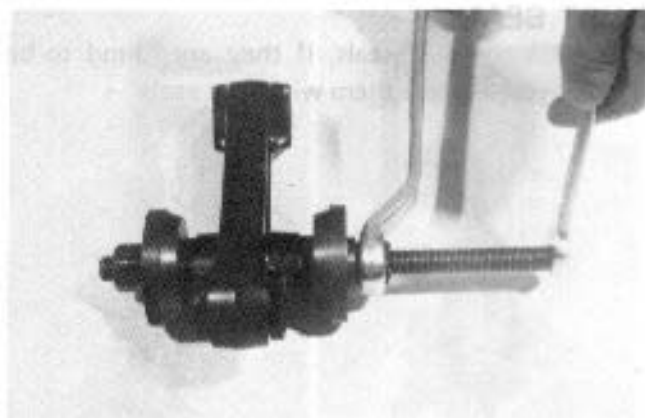
- Install the right and left bearings by using the special tool.

09924-84510

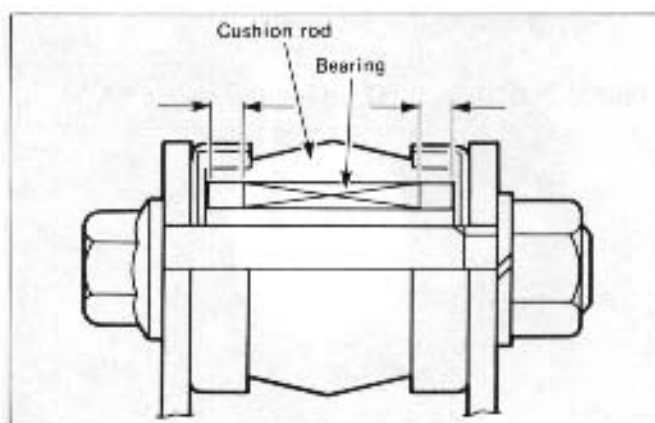
Bearing installer set

**NOTE:**

When installing the two bearings, punch marked side of bearing faces outside.

**CUSHION ROD UPPER**

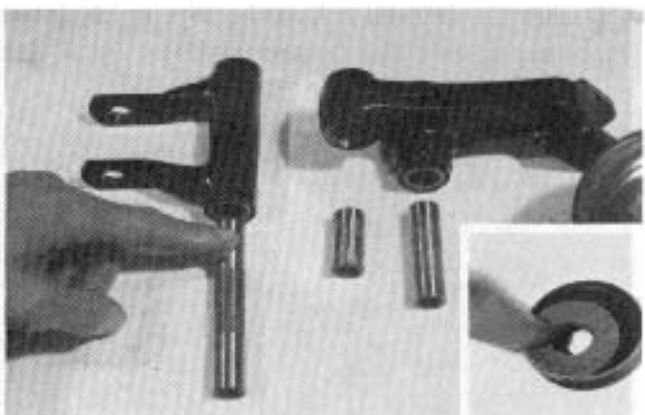
- Attach the bearing so that the distance between the face of the cushion rod and the bearing face is equal on the right and left.

**SPACER AND THRUST WASHER**

- Apply grease to the spacer and both faces of the thrust washer.

99000-25010

SUZUKI Super grease "A"



## DAMPING ADJUSTER

- (1) • Check to make sure the blue mark can be seen in the window.
- (2) • If the blue mark cannot be seen, perform steps (3) and (5).
  - Rotate the adjuster to the left so that the blue mark appears in the window, and in that position disconnect the cable from the adjuster side.
  - Perform (4), (5), (6) and (7).
  - Apply grease to the pin ①.

99000-25010

SUZUKI super grease "A"

- (3) • Insert the tip of the cable into the cam ② and insert it perpendicularly into the hole in the rear shock absorber. The pin ① may be positioned at any point.
- Tighten bolt ③ to the specified torque.

Tightening torque

 15 – 30 N·m  
 (1.5 – 3.0 kg·m)

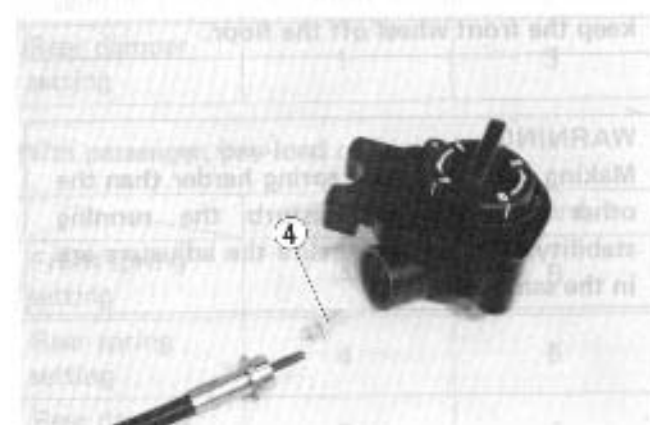
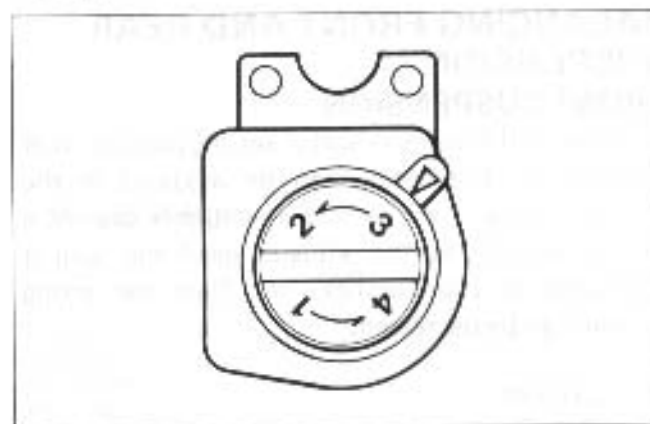
### NOTE:

The spring and steel ball which come out when the cable was removed are not necessary (See page 6-54).

- (4) • Rotate the adjuster to the left and align with the number 3 on the scale.
- (5) • Insert the gear ④ on the tip of the cable, and lightly rotate to the left by hand. In the position in which it stops, insert it in the adjuster and attach and tighten the screw by hand.

### CAUTION:

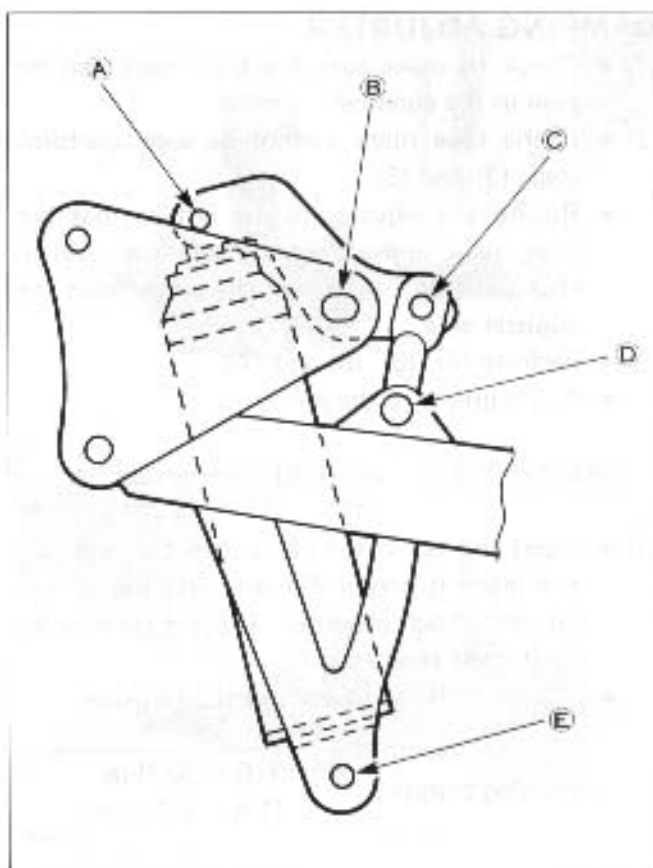
Push in gear ④ until it locks into place. If this is not done, the gear may crack.



- (6) • Turn the adjuster to the left and check to make sure it turns smoothly.
- When setting the adjuster scale at 1, check to make sure the blue mark can be seen in the window.
- (7) • Attach the rubber cap.

#### TIGHTENING TORQUE

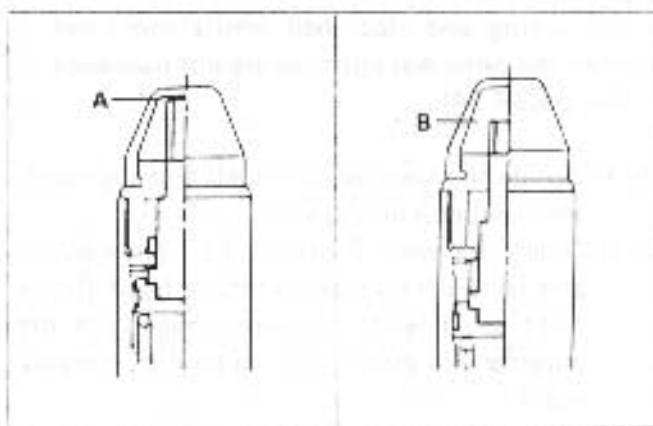
| Item | N·m      | kg·m       |
|------|----------|------------|
| A    | 48 – 72  | 4.8 – 7.2  |
| B    | 70 – 100 | 7.0 – 10.0 |
| C    | 70 – 100 | 7.0 – 10.0 |
| D    | 70 – 100 | 7.0 – 10.0 |
| E    | 40 – 60  | 4.0 – 6.0  |



## BALANCING FRONT AND REAR SUSPENSION

### FRONT SUSPENSION

The standard front fork spring setting position is at position A. The spring can be adjusted in the following way. First remove the rubber cap, fit a 10 mm wrench to the adjuster head and turn it clockwise or counterclockwise. Thus the spring tension can be decreased.



#### CAUTION:

While changing the front fork spring setting, keep the front wheel off the floor.

#### WARNING:

Making one front fork spring harder than the other will severely disturb the running stability. Always make sure the adjusters are in the same position.

## SERVICING INFORMATION

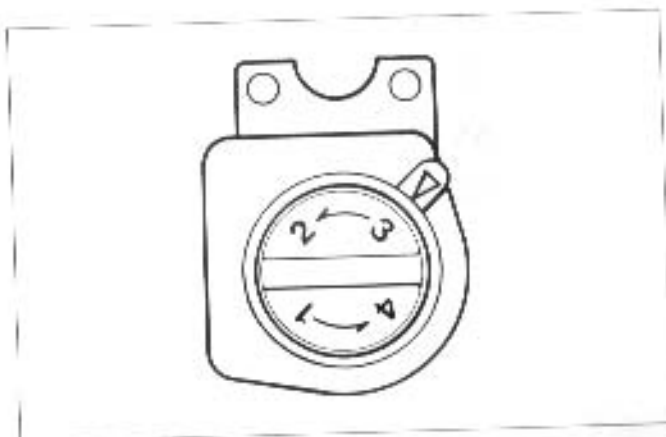
## REAR SUSPENSION

### SPRING ADJUSTMENT

The rear shock absorber spring pre-load is adjustable to compensate for rider, passenger, load, road, road conditions and motorcycle speed. To change the spring pre-load setting, place the motorcycle on the center stand. Twist the pre-load adjuster to the desired position. Position (1) provides the softest spring tension and position (5) provides the stiffest spring tension. This motorcycle is delivered from the factory with its adjuster set on the (3) position.

### DAMPING ADJUSTMENT

To increase or decrease the damping force, turn this adjusting dial as shown in the photo. Damping adjustments are indicated by the numbers 1 thru 4 engraved on the adjusting dial. As you turn the adjusting dial, you will notice a click as you reach each number position. When changing the damping, always be sure that the adjusting dial stops with the number facing the arrow, that a click is noticed and the dial feels as if it were sitting in a detent or a notch. Position 1 (softest) provides for the smallest amount of damping force, and position 4 (stiffest) for the largest amount. This motorcycle is delivered from the factory with rear damper adjusted to the number 3 position.



## CHANGING FRONT AND REAR SUSPENSION SETTING

The standard suspension setting is calculated to provide excellent suspension comfort and handling stability for the following driving conditions: solo riding, driving from low to high speed, no extra accessories attached and no payload mounted. If you feel the standard setting is too hard, change the setting to the softer setting as shown in the following table. If any load, including weight of passenger, accessories, or payload is to be increased, the suspension setting should be adjusted as guided in the following table.

#### WARNING:

Settings other than those listed in the table can cause instability. Be sure to follow the recommendations.

Suspension Setting

|                      | Soft | Standard |
|----------------------|------|----------|
| Front spring setting | A    | A        |
| Rear spring setting  | 1    | 3        |
| Rear damper setting  | 1    | 3        |

With passenger, payload or accessories

|                      | Soft | Hard |
|----------------------|------|------|
| Front spring setting | A    | B    |
| Rear spring setting  | 4    | 5    |
| Rear damper setting  | 3    | 4    |

# SERVICING INFORMATION

## CONTENTS

|                                    |              |
|------------------------------------|--------------|
| <b>TROUBLESHOOTING .....</b>       | <b>7- 1</b>  |
| <b>WIRING DIAGRAM.....</b>         | <b>7- 8</b>  |
| <b>WIRE ROUTING.....</b>           | <b>7- 12</b> |
| <b>CABLE ROUTING .....</b>         | <b>7- 15</b> |
| <b>HOSE AND PIPE ROUTING .....</b> | <b>7- 16</b> |
| <b>TIGHTENING TORQUE .....</b>     | <b>7- 19</b> |
| <b>SPECIAL TOOLS .....</b>         | <b>7-22</b>  |
| <b>SERVICE DATA .....</b>          | <b>7-29</b>  |

## TROUBLESHOOTING

## ENGINE

| Complaint                                   | Symptom and possible causes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Remedy                                                                                                                                                                                                                                    |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engine will not start, or is hard to start. | <b>Compression too low.</b><br>1. Valve clearance out of adjustment.<br>2. Worn valve guides or poor seating of valves.<br>3. Valves mistiming.<br>4. Piston rings excessively worn.<br>5. Worn-down cylinder bores.<br>6. Starter motor cranks but too slowly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Adjust.<br>Repair, or replace.<br>Adjust.<br>Replace.<br>Replace, or rebore.<br>Consult "electrical complaints".                                                                                                                          |
|                                             | <b>Plugs not sparking.</b><br>1. Fouled spark plugs.<br>2. Wet spark plugs.<br>3. Defective ignition coil.<br>4. Open or short in high-tension cords.<br>5. Defective signal generator or igniter unit.<br><b>No fuel reaching the carburetors.</b><br>1. Clogged hole in the fuel tank cap.<br>2. Clogged or defective fuel cock.<br>3. Defective carburetor needle valve.<br>4. Clogged fuel pipe or defective vacuum pipe.<br>5. Defective fuel cock diaphragm.                                                                                                                                                                                                                                                                                                                                                                                              | Clean.<br>Clean and dry.<br>Replace.<br>Replace.<br>Replace.<br><br>Clean.<br>Clean or replace.<br>Replace.<br>Clean.<br>Replace.                                                                                                         |
| Engine stalls easily.                       | 1. Fouled spark plugs.<br>2. Defective signal generator or igniter unit.<br>3. Clogged fuel pipe.<br>4. Clogged jets in carburetors.<br>5. Valve clearance out of adjustment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Clean.<br>Replace.<br>Clean.<br>Clean.<br>Adjust.                                                                                                                                                                                         |
| Noisy engine.                               | <b>Excessive valve chatter.</b><br>1. Valve clearance too large.<br>2. Weakened or broken valve springs.<br>3. Worn down rocker arm or rocker arm shaft.<br><b>Noise appears to come from pistons.</b><br>1. Pistons or cylinders worn down.<br>2. Combustion chambers fouled with carbon.<br>3. Piston pins worn.<br>4. Burnt piston or piston ring.<br><b>Noise seems to come from cam chain.</b><br>1. Stretched cam drive chain.<br>2. Worn cam chain sprockets.<br>3. Tension adjuster not working.<br><b>Noise seems to come from clutch.</b><br>1. Worn splines of countershaft or hub.<br>2. Worn teeth of clutch plates.<br>3. Distorted clutch plates, driven and drive.<br><b>Noise seems to come from crankshaft.</b><br>1. Worn or burnt bearings.<br>2. Worn or burnt crankshaft journal bearing.<br>3. Worn or burnt crankshaft thrust bearings. | Adjust.<br>Replace.<br>Replace.<br><br>Replace or rebore.<br>Clean.<br>Replace.<br>Replace.<br><br>Replace.<br>Replace.<br>Replace or replace.<br><br>Replace.<br>Replace.<br>Replace or replace.<br><br>Replace.<br>Replace.<br>Replace. |



| Complaint                               | Symptom and possible causes                                                                                                                                                                                                                                                                                                                                                                                            | Remedy                                                                                                                            |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Noisy engine.                           | Noise seems to come from transmission.<br>1. Gears worn or rubbing.<br>2. Badly worn countershaft/driveshaft splines.<br>3. Gears or shaft burnt.                                                                                                                                                                                                                                                                      | Replace.<br>Replace.<br>Replace.                                                                                                  |
| Slipping clutch.                        | 1. Clutch control out of adjustment or loss of play.<br>2. Weakened clutch springs.<br>3. Worn or distorted pressure plate.<br>4. Distorted clutch plates, drive and driven.<br>5. Wave washer weak or broken piano wire.                                                                                                                                                                                              | Adjust.<br>Replace.<br>Replace.<br>Replace.<br>Replace.                                                                           |
| Dragging clutch.                        | 1. Clutch control out of adjustment or too much play.<br>2. Some clutch springs weakened while others are not.<br>3. Distorted pressure plate or clutch plates.                                                                                                                                                                                                                                                        | Adjust.<br>Replace.<br>Replace.                                                                                                   |
| Transmission will not shift.            | 1. Broken gearshift cam.<br>2. Distorted gearshift forks.                                                                                                                                                                                                                                                                                                                                                              | Replace.<br>Replace.                                                                                                              |
| Transmission will not shift back.       | 1. Broken return spring on shift shaft.<br>2. Shift shafts are rubbing or sticky.<br>3. Distorted or worn gearshift forks.                                                                                                                                                                                                                                                                                             | Replace.<br>Repair.<br>Replace.                                                                                                   |
| Transmission jumps out of gear.         | 1. Worn shifting gears on countershaft or drive shaft.<br>2. Distorted or worn gearshift forks.<br>3. Weakened stopper spring on gearshift stopper.                                                                                                                                                                                                                                                                    | Replace.<br>Replace.<br>Replace.                                                                                                  |
| Engine idles poorly.                    | 1. Valve clearance out of adjustment.<br>2. Poor seating of valves.<br>3. Defective valve guides.<br>4. Worn rocker arm or arm shaft.<br>5. Spark plug gaps too wide.<br>6. Defective ignition coil.<br>7. Defective signal generator or igniter unit.<br>8. Float-chamber fuel level out of adjustment in carburetors.<br>9. Clogged jets or imbalance of carburetors.                                                | Adjust.<br>Replace.<br>Replace.<br>Replace.<br>Adjust or replace.<br>Replace.<br>Replace.<br>Adjust.<br>Clean or adjust.          |
| Engine runs poorly in high-speed range. | 1. Valve springs weakened.<br>2. Valve timing out of adjustment.<br>3. Worn cams or rocker arms.<br>4. Spark plug gaps too narrow.<br>5. Defective ignition coil.<br>6. Defective signal generator or igniter unit.<br>7. Float-chamber fuel level too low.<br>8. Clogged air cleaner element.<br>9. Clogged fuel pipe, resulting in inadequate fuel supply to carburetors.<br>10. Clogged or sucking air vacuum pipe. | Replace.<br>Adjust.<br>Replace.<br>Adjust.<br>Replace.<br>Replace.<br>Adjust.<br>Clean.<br>Clean, and prime.<br>Clean or replace. |
| Dirty or heavy exhaust smoke.           | 1. Too much engine oil in the engine.<br>2. Worn piston rings or cylinders.<br>3. Worn valve guides.<br>4. Cylinder walls scored or scuffed.<br>5. Worn valve stems.<br>6. Defective stem seal.                                                                                                                                                                                                                        | Check with level window.<br>Drain out excess oil.<br>Replace or rebore.<br>Replace.<br>Rebore or replace.<br>Replace.<br>Replace. |

| Complaint           | Symptom and possible causes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Remedy                                                                                                                                                                                                      |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engine lacks power. | <ol style="list-style-type: none"> <li>1. Loss of valve clearance.</li> <li>2. Weakened valve springs.</li> <li>3. Valve timing out of adjustment.</li> <li>4. Worn piston rings or cylinders.</li> <li>5. Poor seating of valves.</li> <li>6. Worn rocker arms or its shaft.</li> <li>7. Fouled spark plugs.</li> <li>8. Spark plug gaps incorrect.</li> <li>9. Clogged jets in carburetors.</li> <li>10. Float-chamber fuel level out of adjustment.</li> <li>11. Clogged air cleaner element.</li> <li>12. Carburetor balancing screw loose.</li> <li>13. Sucking air from intake pipe.</li> <li>14. Too much engine oil in the engine.</li> </ol> | Adjust.<br>Replace.<br>Adjust.<br>Replace.<br>Repair.<br>Replace.<br>Clean or replace.<br>Adjust or replace.<br>Clean.<br>Adjust.<br>Clean.<br>Retighten.<br>Retighten or replace.<br>Drain out excess oil. |
| Engine overheats.   | <ol style="list-style-type: none"> <li>1. Heavy carbon deposit on piston crowns.</li> <li>2. Not enough oil in the engine.</li> <li>3. Defective oil pump or clogged oil circuit.</li> <li>4. Fuel level too low in float chambers.</li> <li>5. Sucking air from intake pipes.</li> <li>6. Use of incorrect engine and oil.</li> </ol>                                                                                                                                                                                                                                                                                                                | Clean.<br>Add oil.<br>Replace or clean.<br>Adjust.<br>Retighten or replace.<br>Change.                                                                                                                      |

## CARBURETOR

| Complaint                             | Symptom and possible causes                                                                                                                                                                                                                                                                                               | Remedy                                                                                                                                    |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Trouble with starting.                | <ol style="list-style-type: none"> <li>1. Starter jet is clogged.</li> <li>2. Starter pipe is clogged.</li> <li>3. Air leaking from a joint between starter body and carburetor.</li> <li>4. Air leaking from carburetor's joint or vacuum gauge joint.</li> <li>5. Starter plunger is not operating properly.</li> </ol> | Clean.<br>Clean.<br>Check starter body and carburetor for tightness, adjust and replace gasket.<br>Check and adjust.<br>Check and adjust. |
| Idling or low-speed trouble.          | <ol style="list-style-type: none"> <li>1. Pilot jet, pilot air jet are clogged or loose.</li> <li>2. Air leaking from carburetor's joint, vacuum gauge joint, or starter.</li> <li>3. Pilot outlet or bypass is clogged.</li> <li>4. Starter plunger is not fully closed.</li> </ol>                                      | Check and clean.<br>Check and adjust.<br>Check and clean.<br>Check and adjust.                                                            |
| Medium- or high-speed trouble.        | <ol style="list-style-type: none"> <li>1. Main jet or main air jet is clogged.</li> <li>2. Needle jet is clogged.</li> <li>3. Throttle valve is not operating properly.</li> <li>4. Filter is clogged.</li> </ol>                                                                                                         | Check and clean.<br>Check and clean.<br>Check throttle valve for operation.<br>Check and clean.                                           |
| Overflow and fuel level fluctuations. | <ol style="list-style-type: none"> <li>1. Needle valve is worn or damaged.</li> <li>2. Spring in needle valve is broken.</li> <li>3. Float is not working properly.</li> <li>4. Foreign matter has adhered to needle valve.</li> <li>5. Fuel level is too high or low.</li> </ol>                                         | Replace.<br>Replace.<br>Check and adjust.<br>Clean.<br>Adjust float height.                                                               |

## ELECTRICAL

| Complaint                                                       | Symptom and possible causes                                                                                                                                                                                                                                                                                                                    | Remedy                                                                                                                |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| No sparking or poor sparking.                                   | <ol style="list-style-type: none"> <li>1. Defective ignition coil.</li> <li>2. Defective spark plugs.</li> <li>3. Defective signal generator or igniter unit.</li> </ol>                                                                                                                                                                       | Replace.<br>Replace.<br>Replace.                                                                                      |
| Spark plugs soon become fouled with carbon.                     | <ol style="list-style-type: none"> <li>1. Mixture too rich.</li> <li>2. Idling speed set too high.</li> <li>3. Incorrect gasoline.</li> <li>4. Dirty element in air cleaner.</li> <li>5. Spark plugs too cold.</li> </ol>                                                                                                                      | Adjust carburetors.<br>Adjust carburetors.<br>Change.<br>Clean.<br>Replace by hot type plugs.                         |
| Spark plugs become fouled too soon.                             | <ol style="list-style-type: none"> <li>1. Worn piston rings.</li> <li>2. Pistons or cylinders worn.</li> <li>3. Excessive clearance of valve stems in valve guides.</li> <li>4. Worn stem oil seal.</li> </ol>                                                                                                                                 | Replace.<br>Replace.<br>Replace.<br>Replace.                                                                          |
| Spark plug electrodes overheat or burn.                         | <ol style="list-style-type: none"> <li>1. Spark plugs too hot.</li> <li>2. The engine overheats.</li> <li>3. Defective signal generator or igniter unit.</li> <li>4. Spark plugs loose.</li> <li>5. Mixture too lean.</li> </ol>                                                                                                               | Replace by cold type plugs.<br>Tune up.<br>Adjust.<br>Retighten.<br>Adjust carburetors.                               |
| Generator does not charge.                                      | <ol style="list-style-type: none"> <li>1. Open or short in lead wires, or loose lead connections.</li> <li>2. Shorted, grounded or open generator coils.</li> <li>3. Shorted or open regulator/rectifier.</li> </ol>                                                                                                                           | Repair or replace or retighten.<br>Replace.<br>Replace.                                                               |
| Generator charge, but charging rate is below the specification. | <ol style="list-style-type: none"> <li>1. Lead wires shorted or open-circuited or loosely connected at terminals.</li> <li>2. Grounded or open-circuited stator coils of generator.</li> <li>3. Defective regulator/rectifier.</li> <li>4. Not enough electrolyte in the battery.</li> <li>5. Defective cell plates in the battery.</li> </ol> | Repair, or retighten.<br>Replace.<br>Replace.<br>Add distilled water between the level lines.<br>Replace the battery. |
| Generator overcharges.                                          | <ol style="list-style-type: none"> <li>1. Internal short-circuit in the battery.</li> <li>2. Resistor element in the regulator/rectifier damaged or defective.</li> <li>3. Regulator/rectifier poorly grounded.</li> </ol>                                                                                                                     | Replace the battery.<br>Replace.<br>Clean and tighten ground connection.                                              |
| Unstable charging.                                              | <ol style="list-style-type: none"> <li>1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting.</li> <li>2. Generator internally shorted.</li> <li>3. Defective regulator/rectifier.</li> </ol>                                                                                                                    | Repair or replace.<br>Replace.<br>Replace.                                                                            |
| Starter button is not effective.                                | <ol style="list-style-type: none"> <li>1. Battery run down.</li> <li>2. Defective switch contacts.</li> <li>3. Brushes not seating properly on commutator in starter motor.</li> <li>4. Defective starter relay.</li> </ol>                                                                                                                    | Recharge or replace.<br>Replace.<br>Repair or replace.<br>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"> <li>1. Not enough electrolyte</li> <li>2. Battery case is cracked.</li> <li>3. Battery has been left in a run-down condition for a long time.</li> <li>4. Adulterated electrolyte (Foreign matter has entered the battery and become mixed with the electrolyte.</li> </ol>                                                                                                                                      | <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 motorcycle and then adjusting electrolyte S.G.</p>               |
| Battery runs down quickly.                                                       | <ol style="list-style-type: none"> <li>1. The charging method is not correct.</li> <li>2. Cell plates have lost much of their active material as a result of over charging.</li> <li>3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte S.G.</li> <li>4. Electrolyte S.G. is too low.</li> <li>5. Adulterated electrolyte.</li> <li>6. Battery is too old.</li> </ol> | <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"> <li>1. Charging rate too low or too high. (When not in use, batteries should be recharged at least once a month to avoid sulfation.)</li> <li>2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low.</li> <li>3. The battery left unused for too long in cold climate.</li> </ol>                                                                                        | <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"> <li>1. Dirty container top and sides.</li> <li>2. Impurities in the electrolyte or electrolyte S.G. is too high.</li> </ol>                                                                                                                                                                                                                                                                                      | <p>Clean.</p> <p>Change the electrolyte by consulting the battery maker's directions.</p>                                                                                                                                                                                                                                                                                                                    |

# WIRING DIAGRAM

For 5.0L 08, 24, 27, 30

2382

## CHASSIS

| Complaint                  | Symptom and possible causes                                                                                                                                                                                                                                                     | Remedy                                                                   |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Heavy steering             | <ol style="list-style-type: none"> <li>1. Steering stem nut overtightened.</li> <li>2. Worn or broken bearing or race in steering stem.</li> <li>3. Distorted steering stem.</li> <li>4. Not enough pressure in tires.</li> </ol>                                               | Adjust.<br>Replace.<br>Replace.<br>Adjust.                               |
| Wobbly handle              | <ol style="list-style-type: none"> <li>1. Loss of balance between right and left front fork.</li> <li>2. Distorted front fork.</li> <li>3. Distorted front axle or crooked tire.</li> </ol>                                                                                     | Replace.<br>Repair or replace.<br>Replace.                               |
| Wobbly front wheel         | <ol style="list-style-type: none"> <li>1. Distorted wheel.</li> <li>2. Worn-down front wheel bearings.</li> <li>3. Defective or incorrect tire.</li> <li>4. Loose nut on axle.</li> <li>5. Loose nuts on the rear shock.</li> <li>6. Worn swing arm related bearing.</li> </ol> | Replace.<br>Replace.<br>Replace.<br>Retighten.<br>Retighten.<br>Replace. |
| Front suspension too soft  | <ol style="list-style-type: none"> <li>1. Weakened springs.</li> <li>2. Not enough fork oil.</li> <li>3. Not enough fork air.</li> </ol>                                                                                                                                        | Replace.<br>Refill.<br>Adjust to specification                           |
| Front suspension too stiff | <ol style="list-style-type: none"> <li>1. Fork oil too viscous.</li> <li>2. Too much fork oil.</li> <li>3. Fork air too high.</li> </ol>                                                                                                                                        | Replace.<br>Drain excess oil.<br>Adjust to specification                 |
| Noisy front suspension     | <ol style="list-style-type: none"> <li>1. Not enough fork oil.</li> <li>2. Loose nuts on suspension.</li> </ol>                                                                                                                                                                 | Refill.<br>Retighten.                                                    |
| Wobbly rear wheel          | <ol style="list-style-type: none"> <li>1. Distorted wheel.</li> <li>2. Worn-down rear wheel bearings.</li> <li>3. Defective or incorrect tire.</li> <li>4. Worn swing arm related bearings.</li> <li>5. Loose nuts on rear shock.</li> </ol>                                    | Replace.<br>Replace.<br>Replace.<br>Replace.<br>Retighten.               |
| Rear suspension too soft   | <ol style="list-style-type: none"> <li>1. Weakened springs.</li> <li>2. Rear suspension adjuster improperly set.</li> <li>3. Oil leakage of rear shock adjuster.</li> </ol>                                                                                                     | Replace.<br>Adjust.<br>Replace.                                          |
| Rear suspension too stiff  | <ol style="list-style-type: none"> <li>1. Rear suspension adjuster improperly set.</li> <li>2. Worn swing arm related bearing.</li> </ol>                                                                                                                                       | Adjust.<br>Replace.                                                      |
| Noisy rear suspension      | <ol style="list-style-type: none"> <li>1. Loose nuts on suspension.</li> <li>2. Worn swing arm related bearing.</li> </ol>                                                                                                                                                      | Retighten.<br>Replace.                                                   |

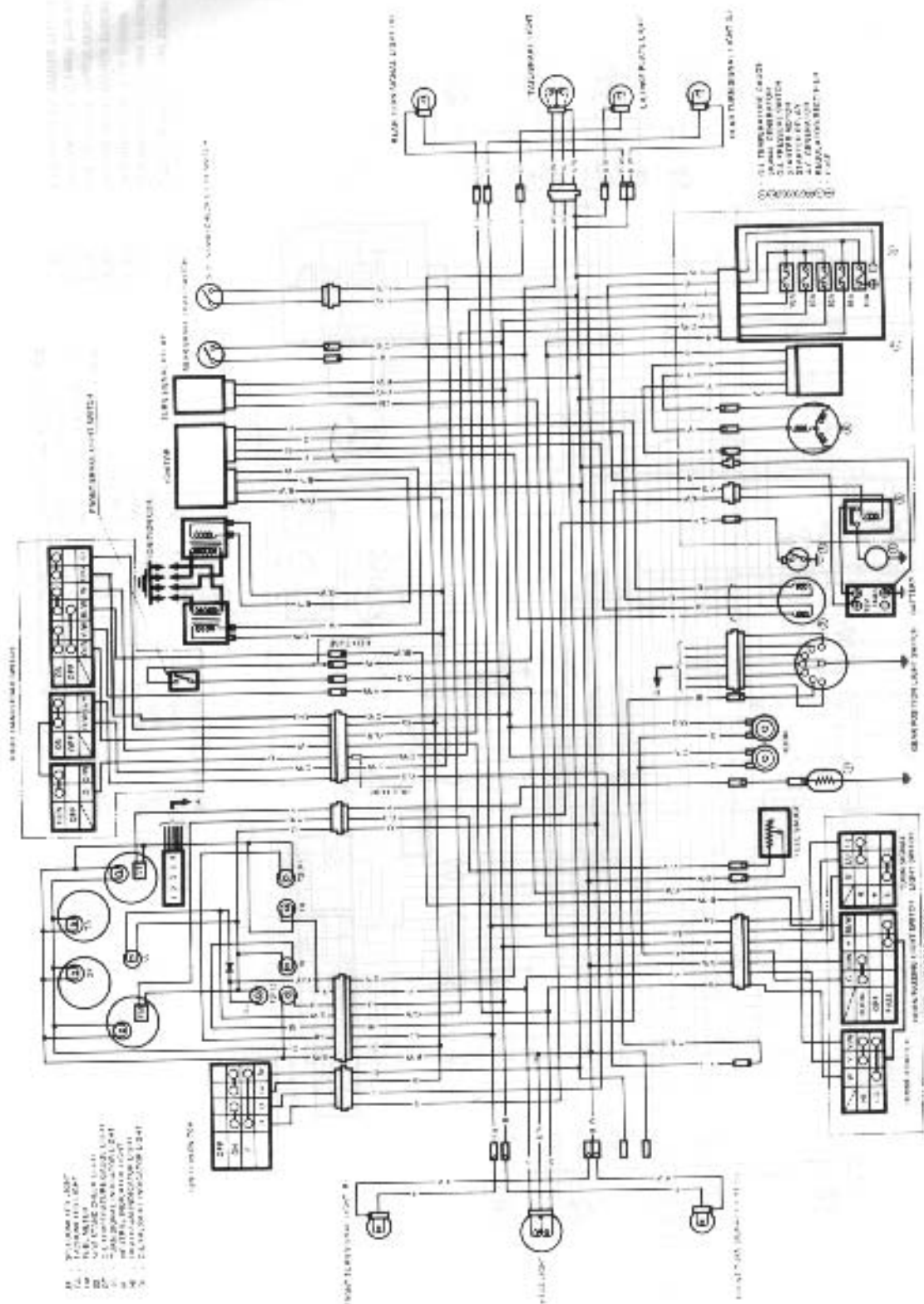
## BRAKES

| Complaint                         | Symptom and possible causes                                                                                                                                                                                                                                                                                                    | Remedy                                                                                                                                                                            |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Poor braking.<br>(FRONT and REAR) | <ol style="list-style-type: none"> <li>1. Not enough brake fluid in the reservoir.</li> <li>2. Air trapped in brake fluid circuit.</li> <li>3. Pads worn down.</li> <li>4. Too much play on brake pedal</li> </ol>                                                                                                             | Refill to level mark.<br>Bleed air out.<br>Replace.<br>Adjust.                                                                                                                    |
| Insufficient brake power.         | <ol style="list-style-type: none"> <li>1. Leakage of brake fluid from hydraulic system.</li> <li>2. Worn pads.</li> <li>3. Oil adhesion on engaging surface of pads.</li> <li>4. Worn disc.</li> <li>5. Air in hydraulic system.</li> </ol>                                                                                    | Repair or replace.<br>Replace.<br>Clean disc and pads.<br>Replace.<br>Bleed air.                                                                                                  |
| Brake squeaking.                  | <ol style="list-style-type: none"> <li>1. Carbon adhesion on pad surface.</li> <li>2. Tilted pad.</li> <li>3. Damaged wheel bearing.</li> <li>4. Loose front-wheel axle or rear-wheel axle.</li> <li>5. Worn pads.</li> <li>6. Foreign material in brake fluid.</li> <li>7. Clogged return port of master cylinder.</li> </ol> | Repair surface with emery paper.<br>Modify pad fitting.<br>Replace.<br>Tighten to specified torque.<br>Replace.<br>Replace brake fluid.<br>Disassemble and clean master cylinder. |
| Excessive brake lever stroke.     | <ol style="list-style-type: none"> <li>1. Air in hydraulic system.</li> <li>2. Worn brake lever cam.</li> <li>3. Insufficient brake fluid.</li> <li>4. Improper quality of brake fluid.</li> </ol>                                                                                                                             | Bleed air.<br>Replace brake lever.<br>Replenish fluid to specified level; bleed air.<br>Replace with correct fluid.                                                               |
| Leakage of brake fluid.           | <ol style="list-style-type: none"> <li>1. Insufficient tightening of connection joints.</li> <li>2. Cracked hose.</li> <li>3. Worn piston and/or cup.</li> </ol>                                                                                                                                                               | Tighten to specified torque.<br>Replace.<br>Replace piston and/or cup.                                                                                                            |



# WIRING DIAGRAM

For E-01,06,24,27,30



## WIRE COLOR

|     |             |
|-----|-------------|
| B   | Black       |
| Bl  | Blue        |
| Br  | Brown       |
| G   | Green       |
| Gr  | Gray        |
| Lbl | Light blue  |
| Lg  | Light green |
| O   | Orange      |

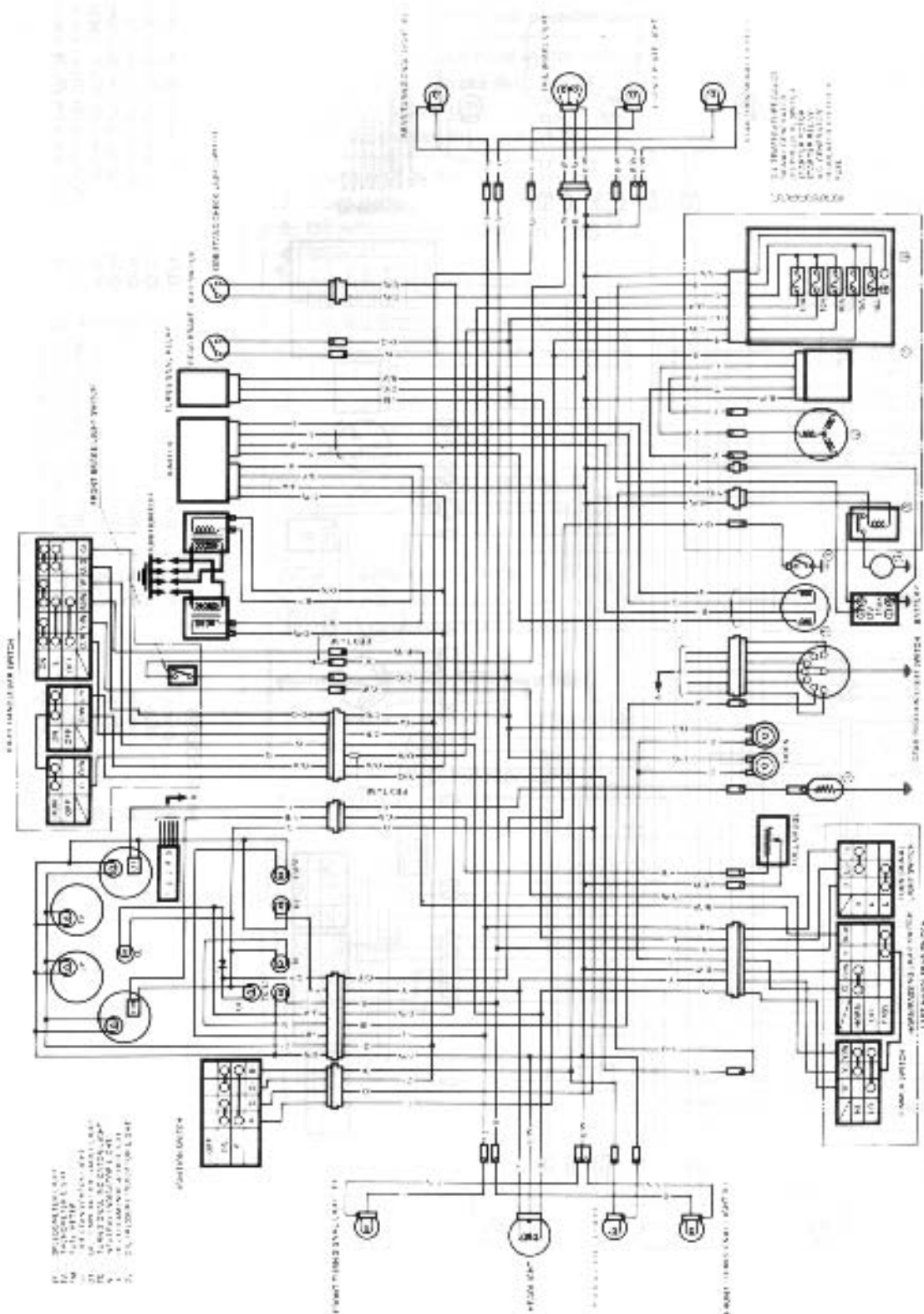
## P

|      |                          |
|------|--------------------------|
| P    | Pink                     |
| R    | Red                      |
| W    | White                    |
| Y    | Yellow                   |
| B/W  | Black with White tracer  |
| B/Y  | Black with Yellow tracer |
| Bl/W | Blue with White tracer   |
| G/W  | Green with White tracer  |

## G/Y

|     |                          |
|-----|--------------------------|
| G/Y | Green with Yellow tracer |
| O/G | Orange with Green tracer |
| O/R | Orange with Red tracer   |
| O/W | Orange with White tracer |
| Y/B | Yellow with Black tracer |
| Y/G | Yellow with Green tracer |
| Y/W | Yellow with White tracer |

## For E-02,04,15,17,21,25,39



## WIRE COLOR

|     |             |
|-----|-------------|
| B   | Black       |
| Bl  | Blue        |
| Br  | Brown       |
| G   | Green       |
| Gr  | Gray        |
| Lbl | Light blue  |
| Lg  | Light green |
| O   | Orange      |

## P

|   |      |
|---|------|
| P | Pink |
|---|------|

## H

|   |     |
|---|-----|
| H | Red |
|---|-----|

## W

|   |       |
|---|-------|
| W | White |
|---|-------|

## Y

|   |        |
|---|--------|
| Y | Yellow |
|---|--------|

## B/W

|     |                         |
|-----|-------------------------|
| B/W | Black with White tracer |
|-----|-------------------------|

## B/Y

|     |                          |
|-----|--------------------------|
| B/Y | Black with Yellow tracer |
|-----|--------------------------|

## Bl/W

|      |                        |
|------|------------------------|
| Bl/W | Blue with White tracer |
|------|------------------------|

## G/W

|     |                         |
|-----|-------------------------|
| G/W | Green with White tracer |
|-----|-------------------------|

## G/Y

|     |                          |
|-----|--------------------------|
| G/Y | Green with Yellow tracer |
|-----|--------------------------|

## O/G

|     |                          |
|-----|--------------------------|
| O/G | Orange with Green tracer |
|-----|--------------------------|

## O/R

|     |                        |
|-----|------------------------|
| O/R | Orange with Red tracer |
|-----|------------------------|

## O/W

|     |                          |
|-----|--------------------------|
| O/W | Orange with White tracer |
|-----|--------------------------|

## Y/B

|     |                          |
|-----|--------------------------|
| Y/B | Yellow with Black tracer |
|-----|--------------------------|

## Y/G

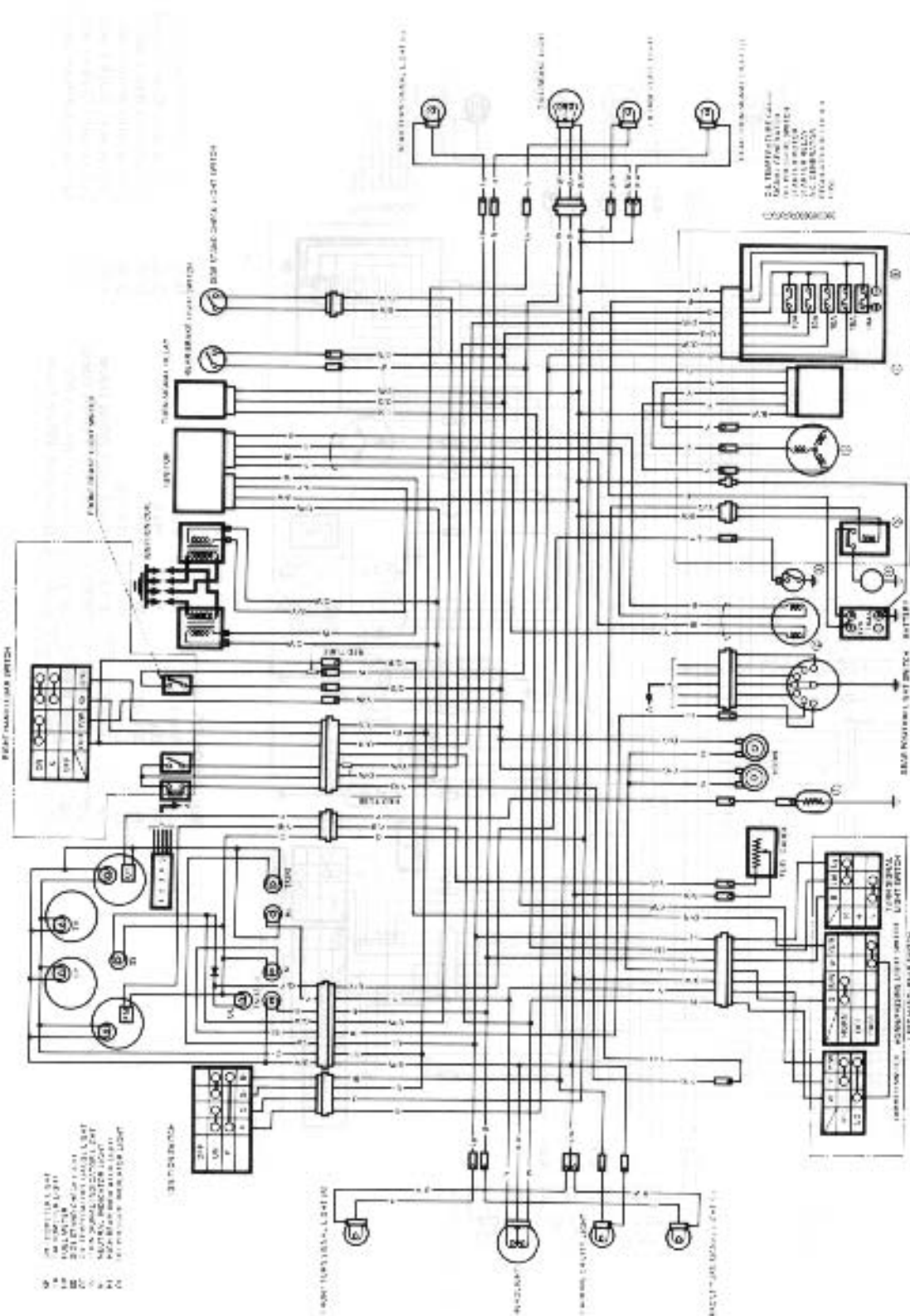
|     |                          |
|-----|--------------------------|
| Y/G | Yellow with Green tracer |
|-----|--------------------------|

## Y/W

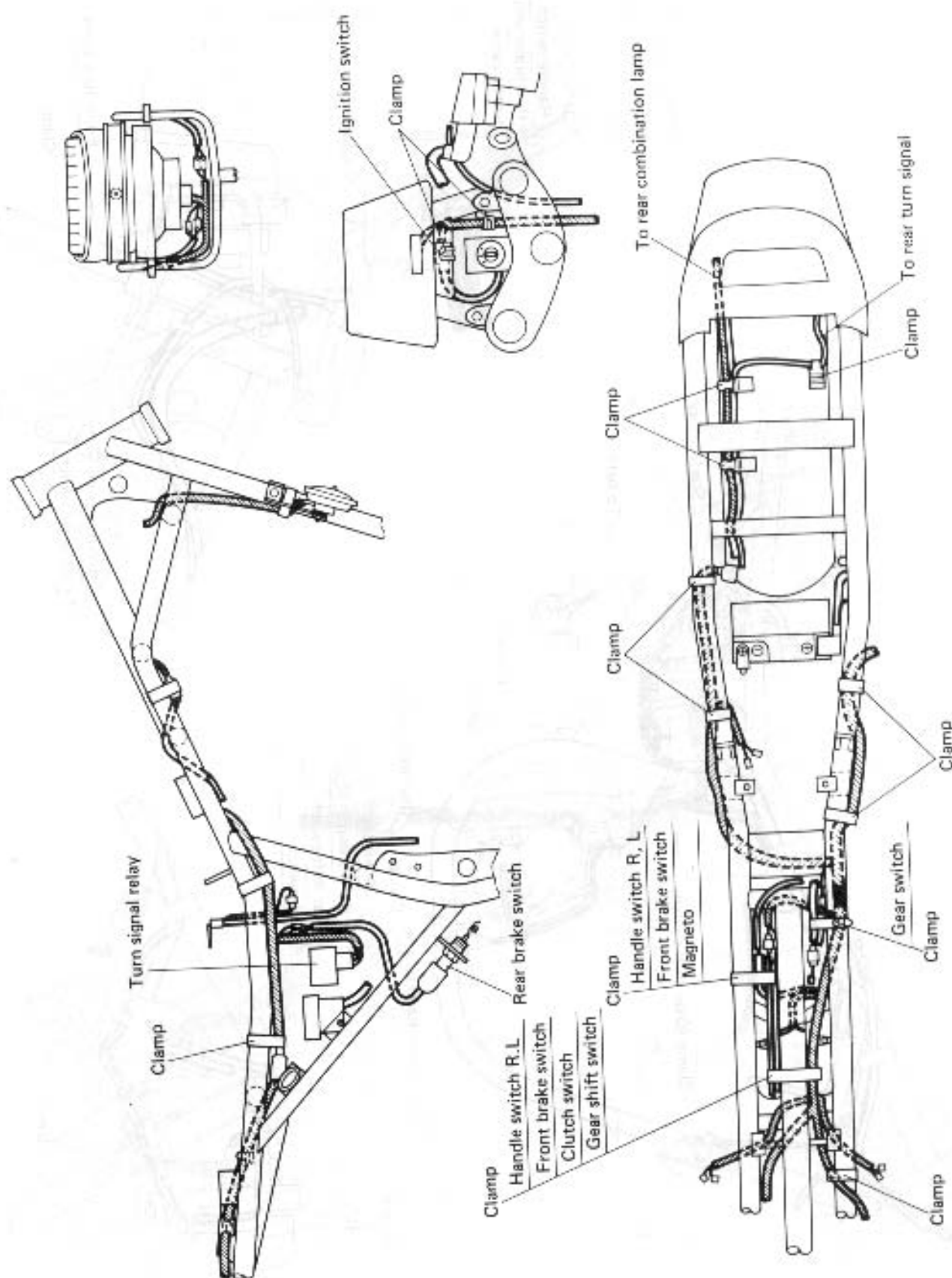
|     |                          |
|-----|--------------------------|
| Y/W | Yellow with White tracer |
|-----|--------------------------|

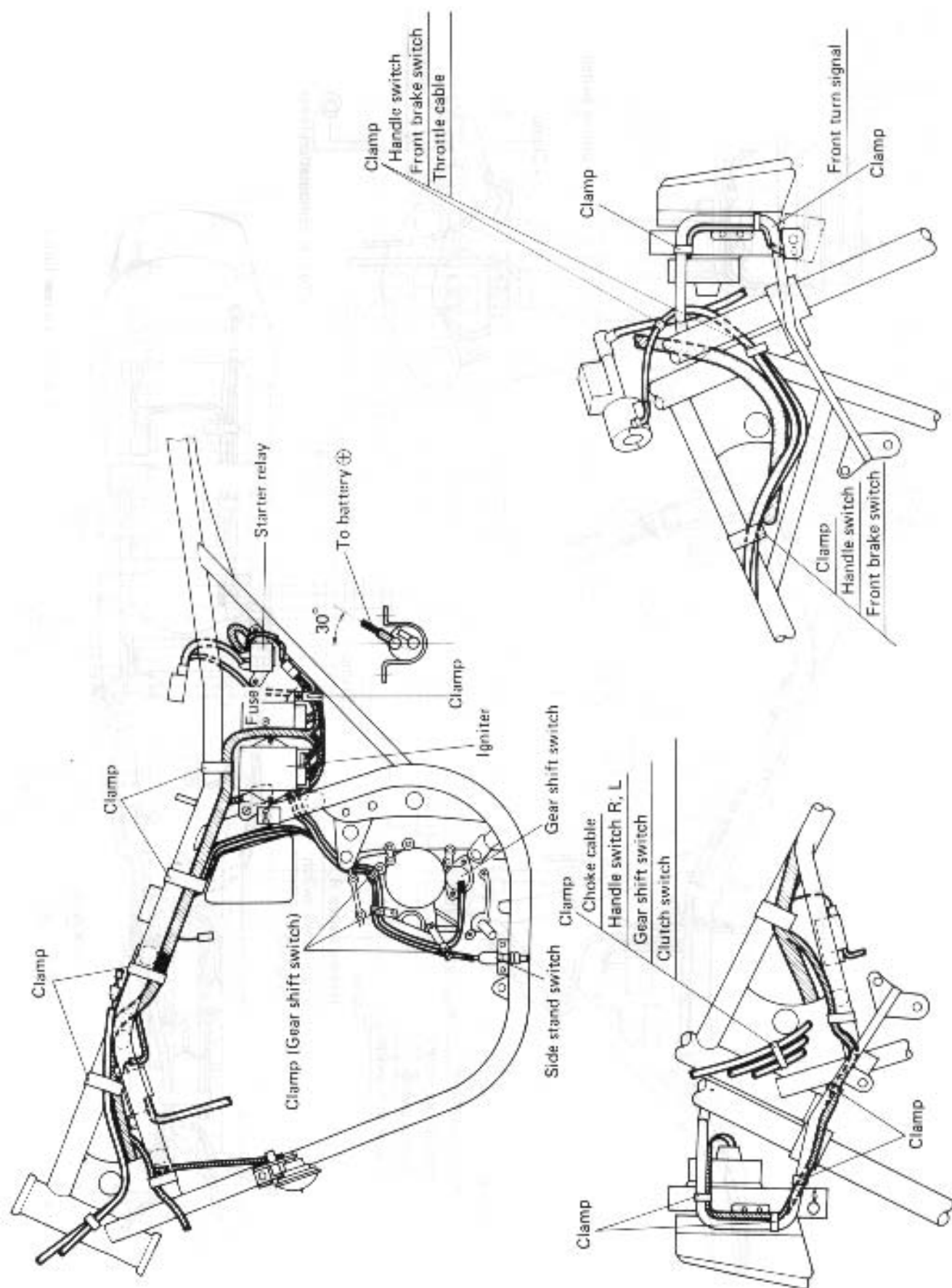


## For E-34

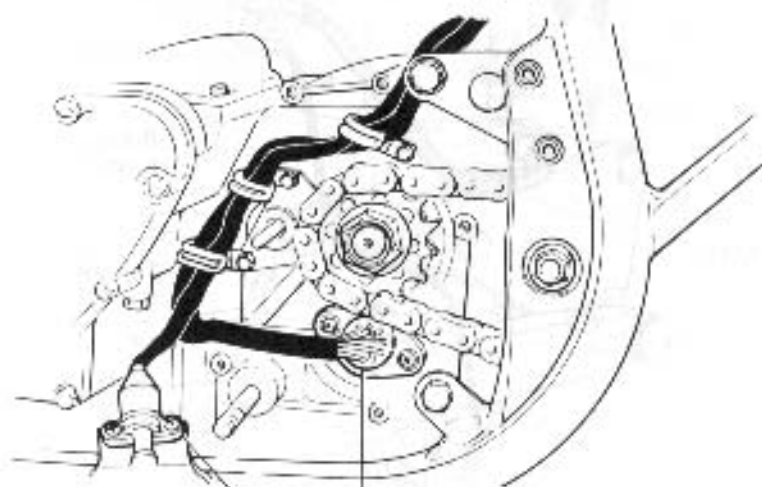
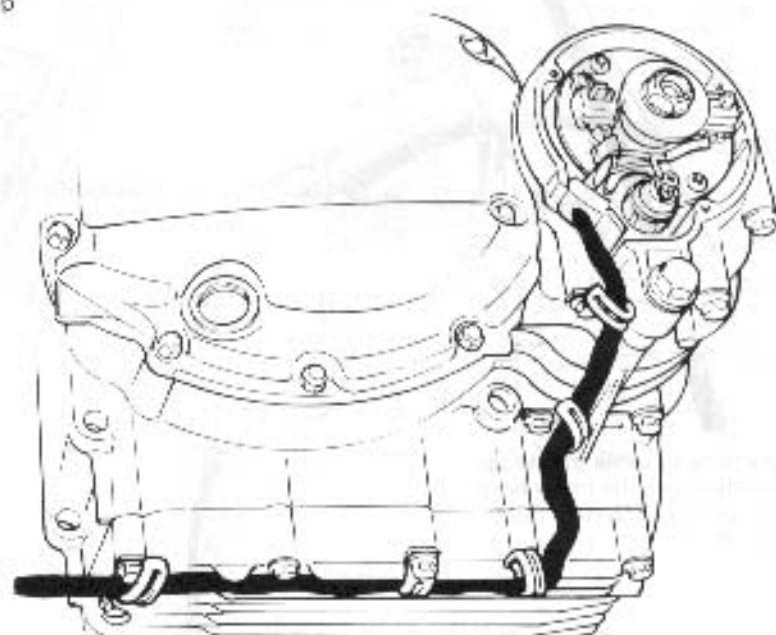
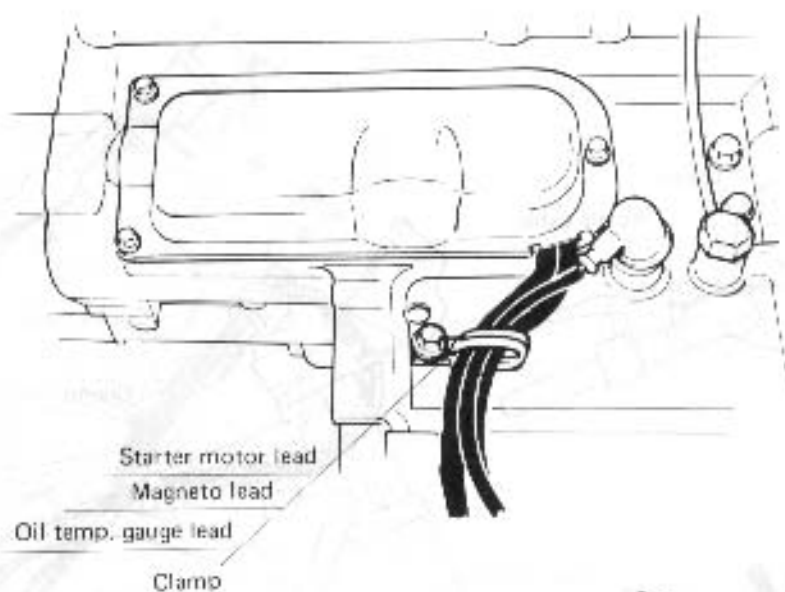


## WIRE ROUTING







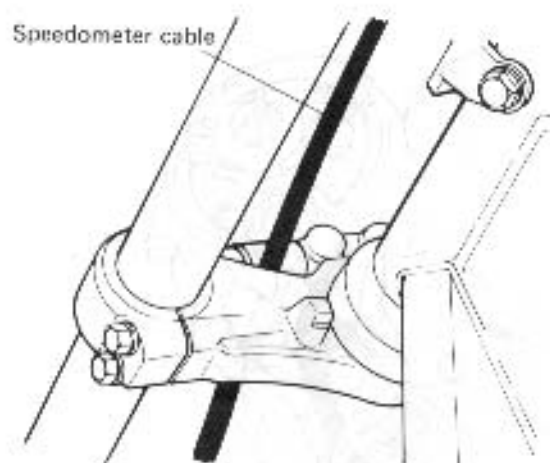
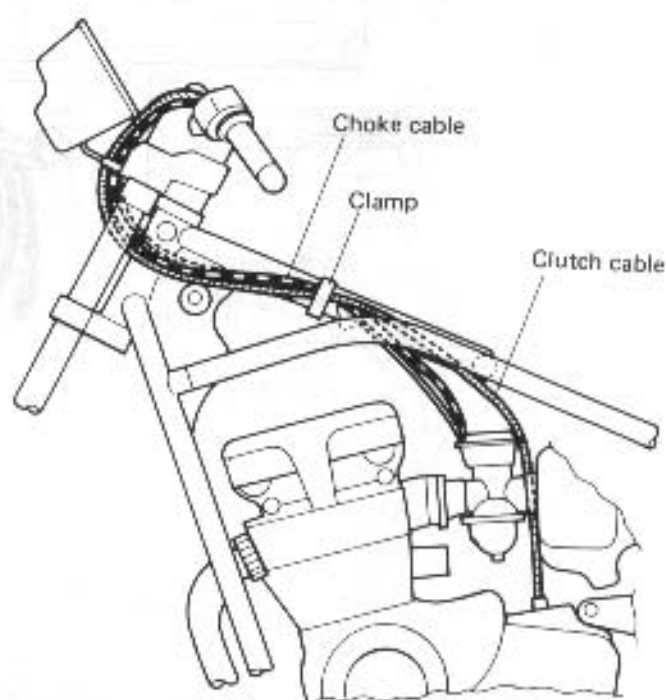
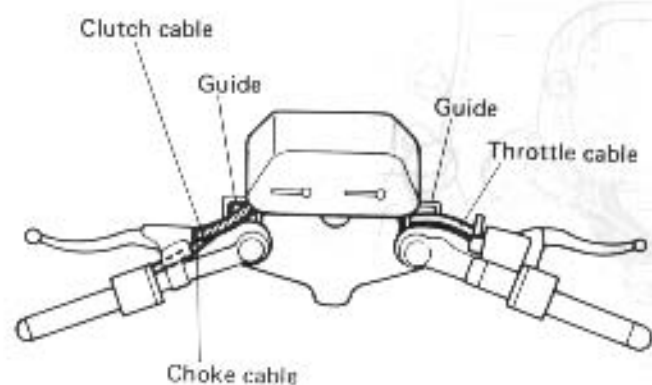


Gearshift switch  
Side stand switch

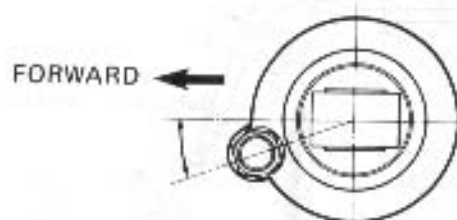


Battery  $\ominus$  lead wire

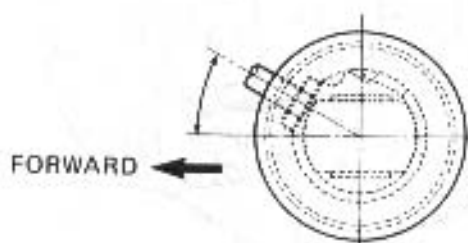
## CABLE ROUTING



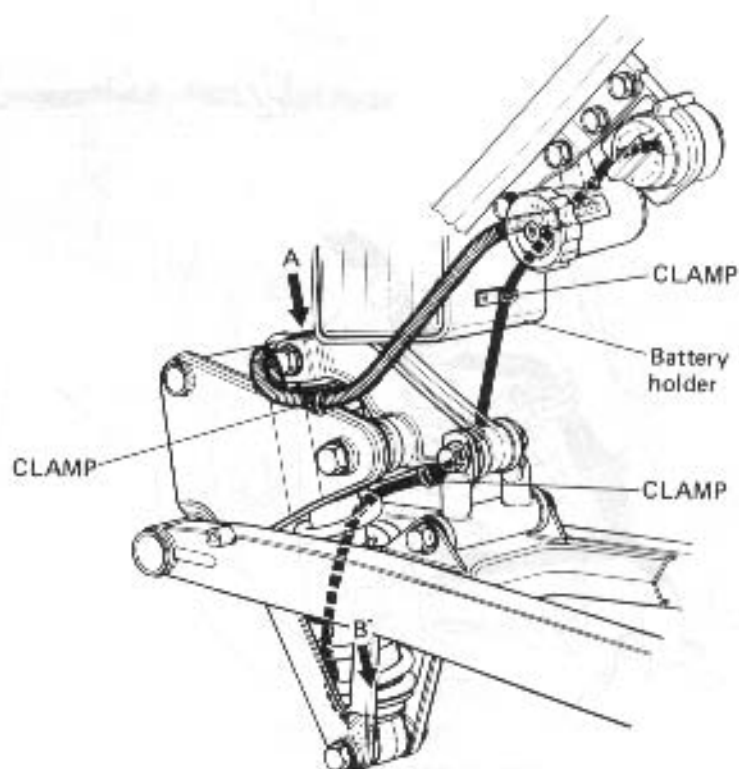
Speedometer cable should be route between the brake hose joint and steering stem lower bracket.



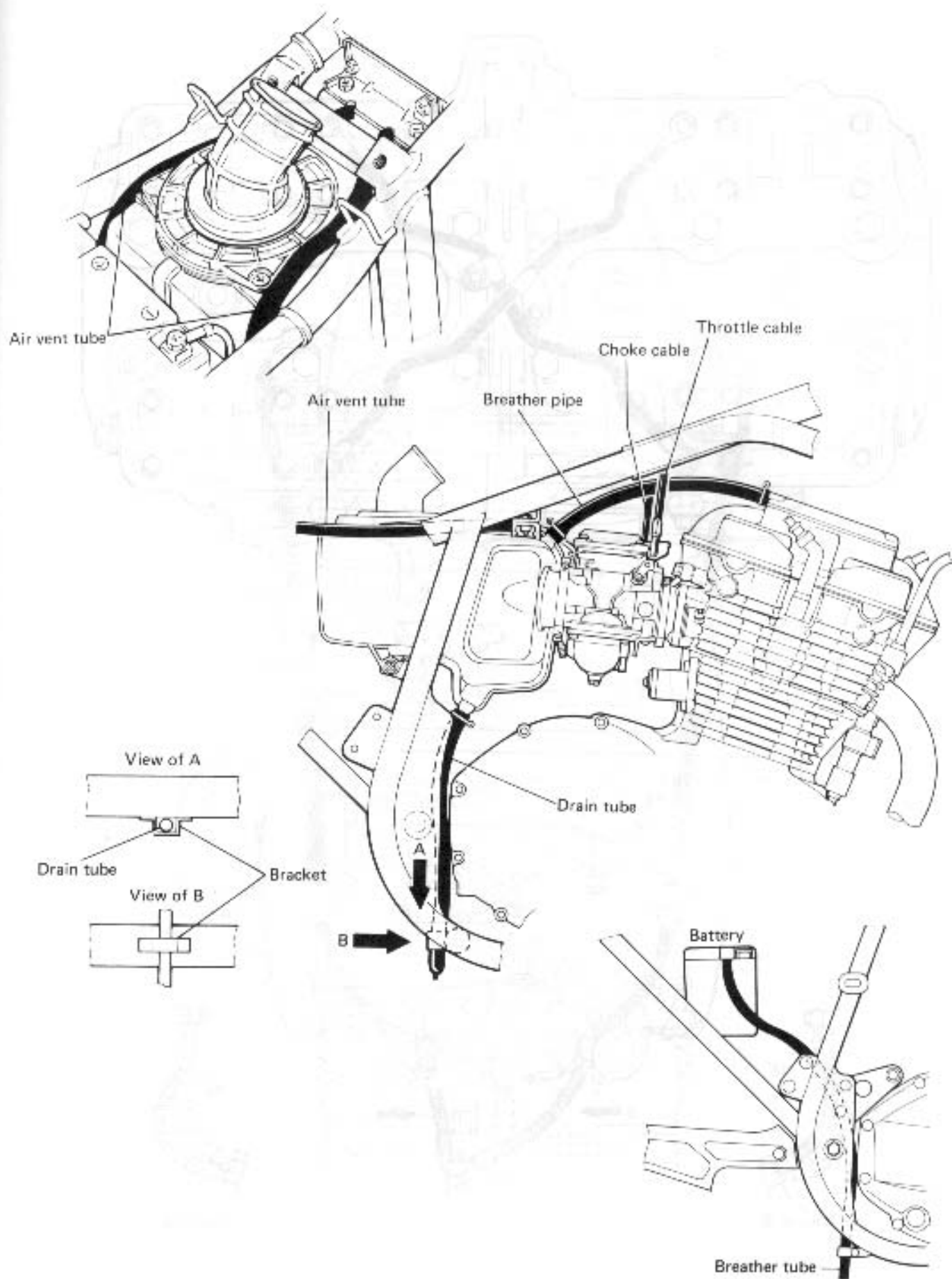
VIEW OF A

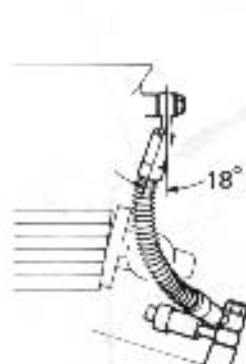
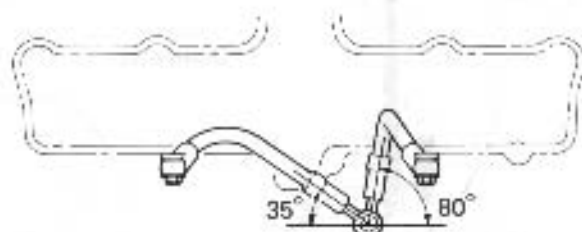
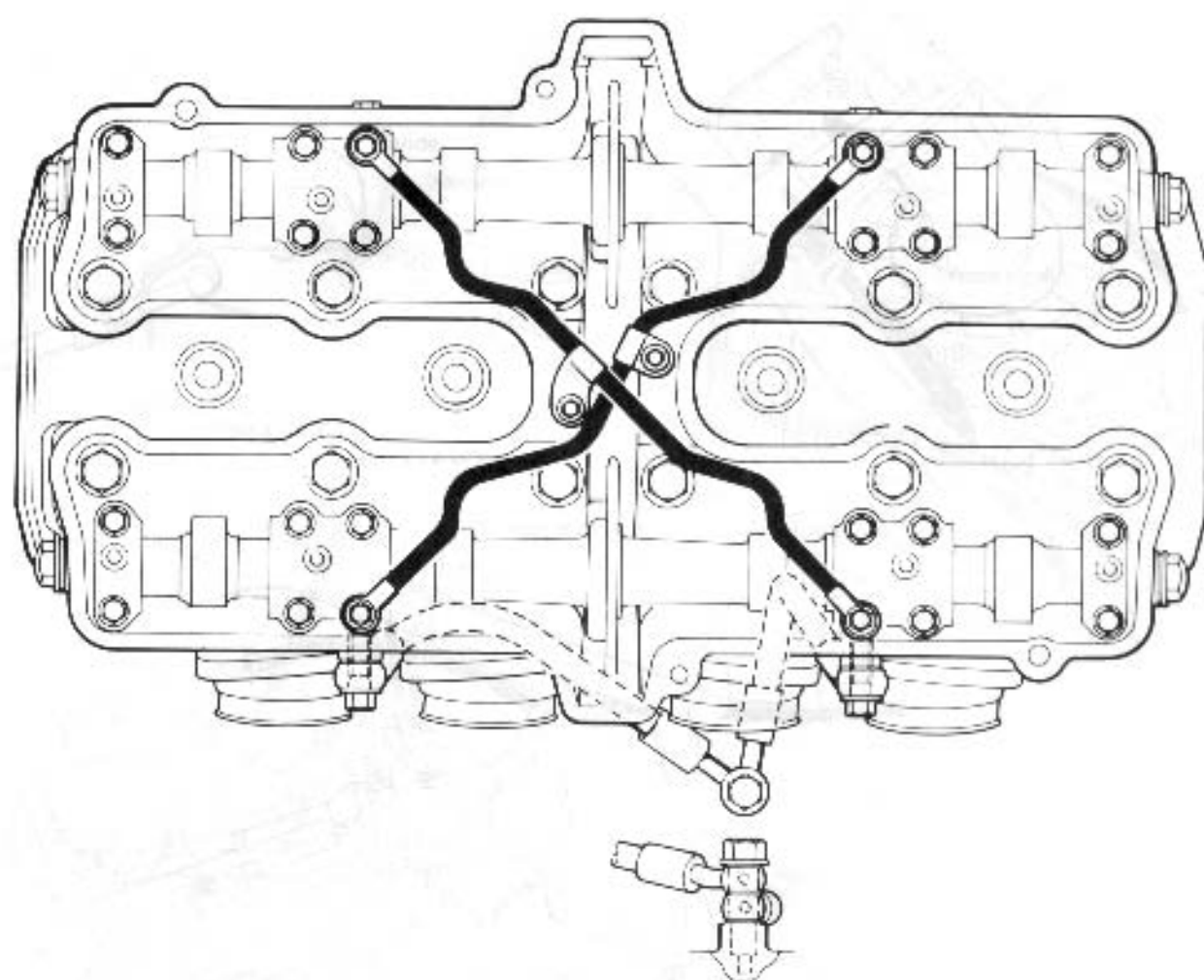


VIEW OF B

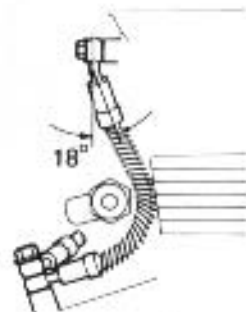
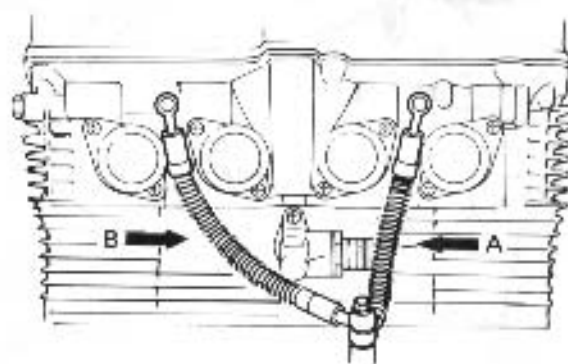


## HOSE AND PIPE ROUTING

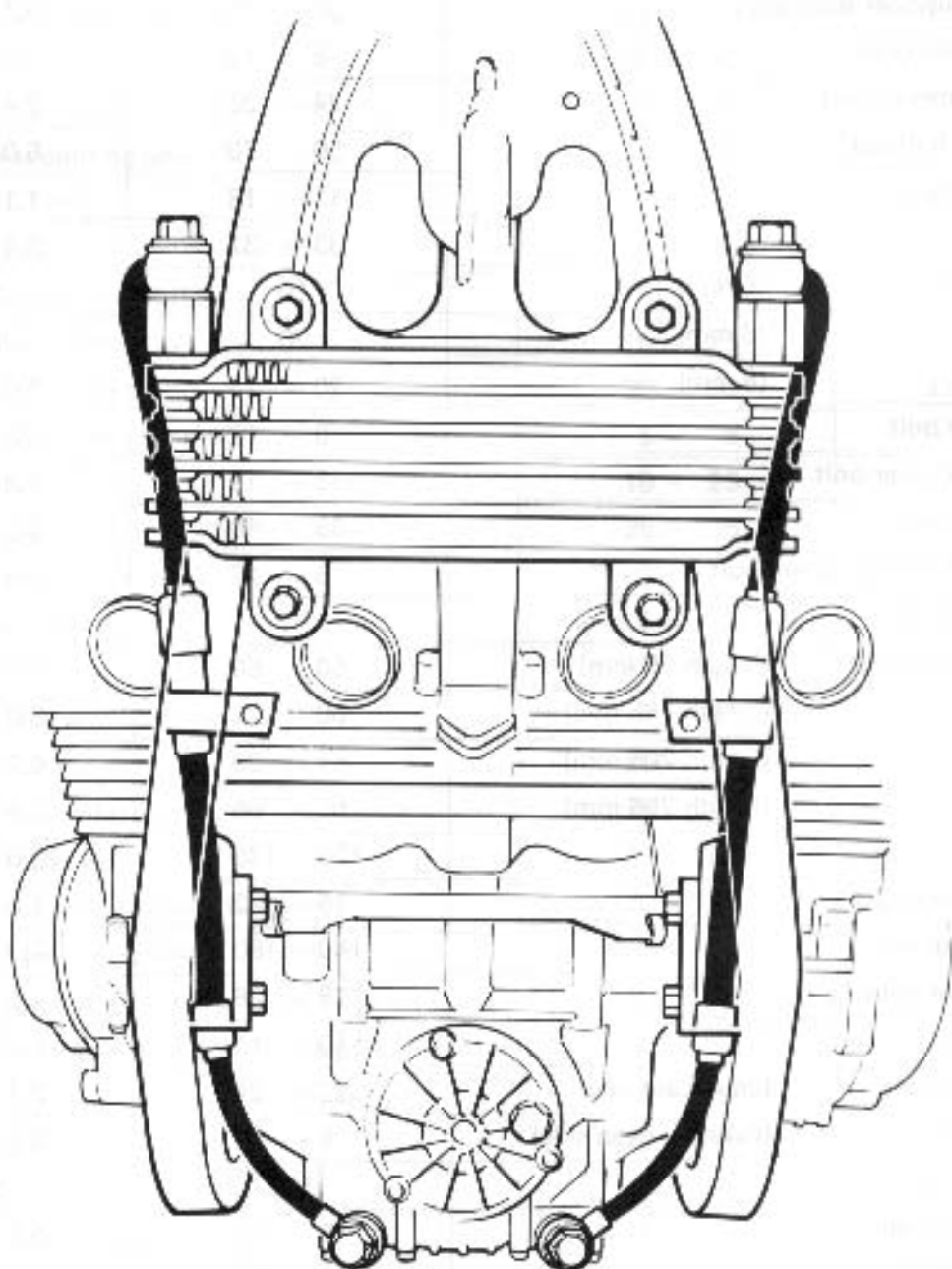




View of B



View of A



## TIGHTENING TORQUE

### ENGINE

| ITEM                                  |                      | N·m       | kg-m        |
|---------------------------------------|----------------------|-----------|-------------|
| Cam chain tensioner adjuster lock nut |                      | 9 – 14    | 0.9 – 1.4   |
| Cam chain tensioner fitting bolt      |                      | 6 – 8     | 0.6 – 0.8   |
| Cam chain tensioner lock shaft nut    |                      | 8 – 10    | 0.8 – 1.0   |
| Cam chain tensioner shaft ass'y       |                      | 31 – 35   | 3.1 – 3.5   |
| Cam shaft holder bolt                 |                      | 8 – 12    | 0.8 – 1.2   |
| Cam shaft sprocket bolt               |                      | 24 – 26   | 2.4 – 2.6   |
| Clutch sleeve hub nut                 |                      | 50 – 70   | 5.0 – 7.0   |
| Clutch spring bolt                    |                      | 11 – 13   | 1.1 – 1.3   |
| Conrod nut                            |                      | 33 – 37   | 3.3 – 3.7   |
| Crankcase bolt                        | (6 mm)               | 10        | 1.0         |
|                                       | (8 mm)               | 20        | 2.0         |
|                                       | (8 mm)               | 20 – 24   | 2.0 – 2.4   |
| Cylinder head bolt                    |                      | 8 – 12    | 0.8 – 1.2   |
| Cylinder head cover bolt              |                      | 13 – 15   | 1.3 – 1.5   |
| Cylinder head nut                     |                      | 35 – 40   | 3.5 – 4.0   |
| Cylinder head oil pipe union bolt     |                      | 8 – 12    | 0.8 – 1.2   |
| Cylinder stud bolt                    |                      | 16        | 1.6         |
| Engine mounting bolt                  | (length 35 mm)       | 50 – 60   | 5.0 – 6.0   |
|                                       | (length 165 mm)      | 60 – 72   | 6.0 – 7.2   |
|                                       | (length 205 mm)      | 67 – 80   | 6.7 – 8.0   |
|                                       | (length 255 mm)      | 55 – 66   | 5.5 – 6.6   |
| Engine sprocket nut                   |                      | 100 – 130 | 10.0 – 13.0 |
| Gearshift arm stopper                 |                      | 15 – 23   | 1.5 – 2.3   |
| Generator rotor nut                   |                      | 140 – 160 | 14.0 – 16.0 |
| Neutral stopper housing               |                      | 18 – 28   | 1.8 – 2.8   |
| Oil gallery bolt                      |                      | 10 – 14   | 1.0 – 1.4   |
| Oil hose union bolt                   | (crankcase side)     | 22 – 24   | 2.2 – 2.4   |
|                                       | (cylinder head side) | 8 – 12    | 0.8 – 1.2   |
| Oil pan bolt                          |                      | 10        | 1.0         |
| Oil pipe holder bolt                  |                      | 8 – 12    | 0.8 – 1.2   |
| Oil pressure switch                   |                      | 13 – 17   | 1.3 – 1.7   |
| Rocker arm shaft stopper bolt         |                      | 8 – 10    | 0.8 – 1.0   |
| Signal generator bolt                 |                      | 25 – 35   | 2.5 – 3.5   |
| Starter clutch allen bolt             |                      | 15 – 20   | 1.5 – 2.0   |
| Valve clearance adjuster lock nut     |                      | 9 – 11    | 0.9 – 1.1   |



## CHASSIS

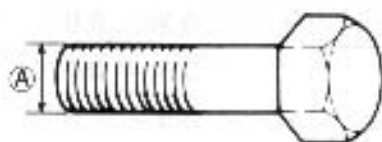
| ITEM                                     | N-m      | kg-m       |
|------------------------------------------|----------|------------|
| Brake hose union bolt                    | 20 – 25  | 2.0 – 2.5  |
| Caliper air bleeder                      | 6 – 9    | 0.6 – 0.9  |
| Disc bolt                                | 15 – 25  | 1.5 – 2.5  |
| Front axle holder nut                    | 15 – 25  | 1.5 – 2.5  |
| Front axle nut                           | 36 – 52  | 3.6 – 5.2  |
| Front caliper axle bolt                  | 25 – 35  | 2.5 – 3.5  |
| Front caliper mounting bolt              | 25 – 40  | 2.5 – 4.0  |
| Front footrest bolt                      | 27 – 43  | 2.7 – 4.3  |
| Front fork cap bolt                      | 15 – 30  | 1.5 – 3.0  |
| Front fork damper rod bolt               | 15 – 25  | 1.5 – 2.5  |
| Front fork lower clamp bolt              | 15 – 25  | 1.5 – 2.5  |
| Front fork upper clamp bolt              | 20 – 30  | 2.0 – 3.0  |
| Front master cylinder clamp bolt         | 5 – 8    | 0.5 – 0.8  |
| Handlebar clamp bolt                     | 15 – 25  | 1.5 – 2.5  |
| Handlebar holder mounting bolt           | 25 – 35  | 2.5 – 3.5  |
| Modulator plunger bolt                   | 3 – 5    | 0.3 – 0.5  |
| Modulator valve bolt                     | 6 – 9    | 0.6 – 0.9  |
| Rear axle nut                            | 85 – 115 | 8.5 – 11.5 |
| Rear brake pedal arm bolt                | 6 – 10   | 0.6 – 1.0  |
| Rear caliper bolt                        | 20 – 30  | 2.0 – 3.0  |
| Rear caliper mounting bolt               | 25 – 40  | 2.5 – 4.0  |
| Rear cushion lever bolt                  | 70 – 100 | 7.0 – 10.0 |
| Rear cushion upper and lower bolts       | 70 – 100 | 7.0 – 10.0 |
| Rear footrest mounting bolt              | 8 – 12   | 0.8 – 1.2  |
| Rear master cylinder mounting bolt       | 18 – 28  | 1.8 – 2.8  |
| Rear shock absorber fitting bolt (upper) | 48 – 72  | 4.8 – 7.2  |
| (lower)                                  | 40 – 60  | 4.0 – 6.0  |
| Rear sprocket nut                        | 25 – 40  | 2.5 – 4.0  |
| Rear torque link bolt                    | 20 – 30  | 2.0 – 3.0  |
| Steering stem clamp bolt                 | 15 – 25  | 1.5 – 2.5  |
| Steering stem head bolt                  | 20 – 30  | 2.0 – 3.0  |
| Swing arm pivot nut                      | 50 – 80  | 5.0 – 8.0  |

## TIGHTENING TORQUE CHART

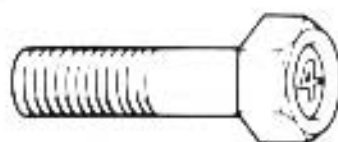
For other bolts and nuts not listed above, refer to this chart:

### Tightening torque

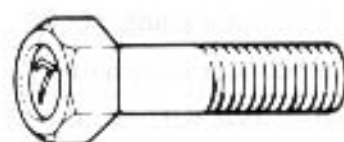
| Bolt Diameter<br>Ⓐ (mm) | Conventional or "4" marked bolt |             | "7" marked bolt |             |
|-------------------------|---------------------------------|-------------|-----------------|-------------|
|                         | N·m                             | kg·m        | N·m             | kg·m        |
| 4                       | 1 – 2                           | 0.1 – 0.2   | 1.5 – 3         | 0.15 – 0.3  |
| 5                       | 2 – 4                           | 0.2 – 0.4   | 3 – 6           | 0.3 – 0.6   |
| 6                       | 4 – 7                           | 0.4 – 0.7   | 8 – 12          | 0.8 – 1.2   |
| 8                       | 10 – 16                         | 1.0 – 1.6   | 18 – 28         | 1.8 – 2.8   |
| 10                      | 22 – 35                         | 2.2 – 3.5   | 40 – 60         | 4.0 – 6.0   |
| 12                      | 35 – 55                         | 3.5 – 5.5   | 70 – 100        | 7.0 – 10.0  |
| 14                      | 50 – 80                         | 5.0 – 8.0   | 110 – 160       | 11.0 – 16.0 |
| 16                      | 80 – 130                        | 8.0 – 13.0  | 170 – 250       | 17.0 – 25.0 |
| 18                      | 130 – 190                       | 13.0 – 19.0 | 200 – 280       | 20.0 – 28.0 |



Conventional bolt



"4" marked bolt

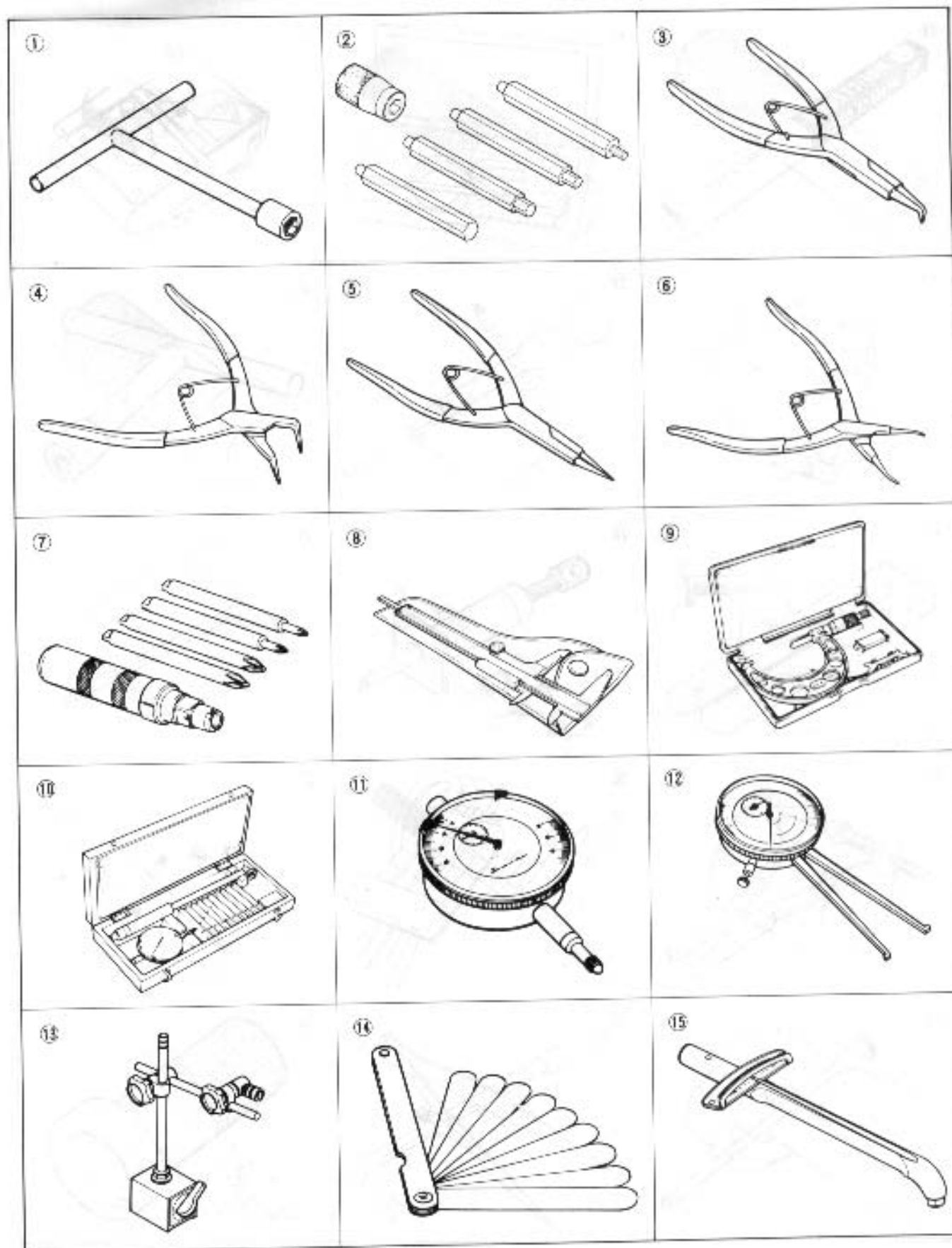


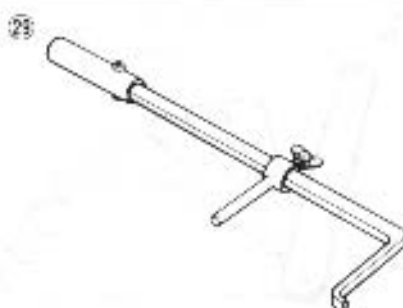
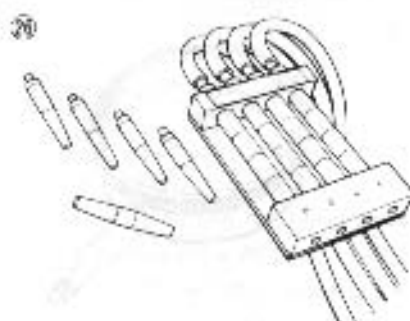
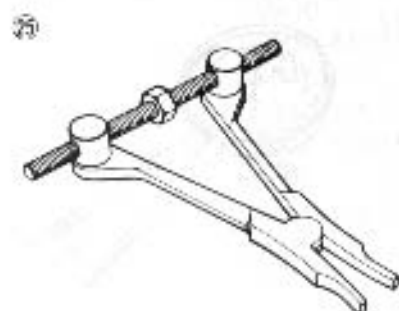
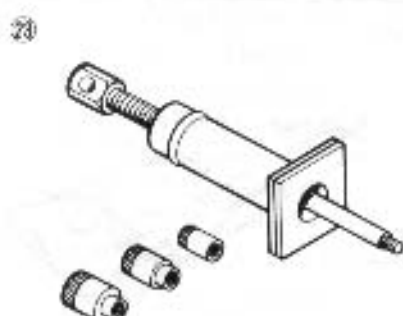
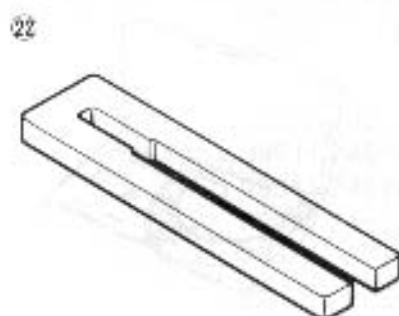
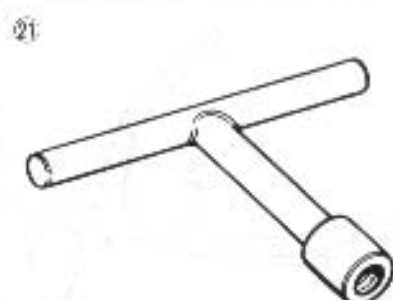
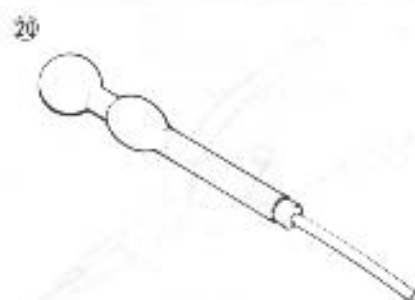
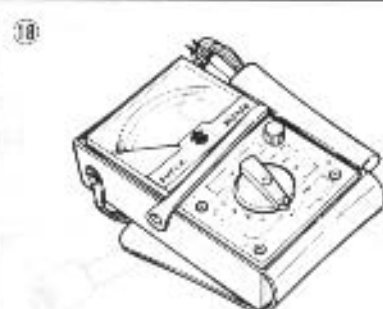
"7" marked bolt

## SPECIAL TOOLS

| Item | Part Number     | Part Name                       |
|------|-----------------|---------------------------------|
| ①    | 09900-00302-015 | "T" type box wrench (8 mm)      |
|      | 09900-06711     | "T" type box wrench (7 mm)      |
| ②    | 09900-00410     | Hexagon bit wrench set          |
|      | 09900-00411     | Socket                          |
|      | 09900-00412     | Hexagon bit (4 mm)              |
|      | 09900-00413     | Hexagon bit (5 mm)              |
|      | 09900-00414     | Hexagon bit (6 mm)              |
|      | 09900-00415     | Hexagon bit (8 mm)              |
| ③    | 09900-06104     | Snap ring pliers (opening type) |
| ④    | 09900-06105     | Snap ring pliers (closing type) |
| ⑤    | 09900-06107     | Snap ring pliers (opening type) |
| ⑥    | 09900-06108     | Snap ring pliers (closing type) |
| ⑦    | 09900-09003     | Impact driver set               |
| ⑧    | 09900-20102     | Vernier calipers (200 mm)       |
| ⑨    | 09900-20202     | Micrometer (25 – 50 mm)         |
|      | 09900-20203     | Micrometer (50 – 70 mm)         |
|      | 09900-20205     | Micrometer (0 – 25 mm)          |
| ⑩    | 09900-20508     | Cylinder gauge set              |
| ⑪    | 09900-20602     | Dial gauge (1/1000 mm)          |
|      | 09900-20606     | Dial gauge (1/100 mm)           |
| ⑫    | 09900-20605     | Dial calipers (10 – 34 mm)      |
| ⑬    | 09900-20701     | Magnetic stand                  |
| ⑭    | 09900-20803     | Thickness gauge                 |
|      | 09900-20806     | Thickness gauge                 |
| ⑮    | 09900-21101     | Torque wrench (0.5 – 4.5 kg-m)  |
|      | 09900-21102     | Torque wrench (0 – 1.2 kg-m)    |
|      | 09900-21103     | Torque wrench (1.0 – 9.0 kg-m)  |
|      | 09900-21104     | Torque wrench (5.0 – 28.0 kg-m) |
| ⑯    | 09900-22301     | Plastigauge                     |
| ⑰    | 09900-22401     | Small bore gauge (10 – 18 mm)   |
|      | 09900-22403     | Small bore gauge (18 – 35 mm)   |
| ⑱    | 09900-25002     | Pocket tester                   |
| ⑲    | 09900-28106     | Electro-tester                  |
| ⑳    | 09900-28403     | Hydrometer                      |
| ㉑    | 09910-11510     | Stud bolt installer             |
| ㉒    | 09910-20115     | Conrod stopper                  |
| ㉓    | 09910-34510     | Piston pin puller set           |
|      | 09910-33210     | Attachment                      |
| ㉔    | 09911-73730     | "T" type hexagon wrench (5 mm)  |
|      | 09914-25811     | "T" type hexagon wrench (6 mm)  |
| ㉕    | 09912-34510     | Cylinder disassembling tool     |
| ㉖    | 09913-13121     | Carburetor balancer set         |
| ㉗    | 09913-14541     | Fuel level gauge set            |
| ㉘    | 09913-14911     | Throttle valve adjust wrench    |
| ㉙    | 09913-50121     | Oil seal remover                |
| ㉚    | 09913-70122     | Bearing installer (50 mm)       |
| ㉛    | 09913-75520     | Bearing installer (60.5 mm)     |
| ㉜    | 09913-80112     | Drive pinion race installer     |

| Item | Part Number | Part Name                                     |
|------|-------------|-----------------------------------------------|
| 33   | 09913-84510 | Bearing installer (38 mm)                     |
| 34   | 09913-85210 | Bearing installer (62 mm)                     |
| 35   | 09915-63210 | Compression gauge adapter                     |
| 36   | 09915-64510 | Compression gauge                             |
| 37   | 09915-74510 | Oil pressure gauge                            |
|      | 09915-17410 | Oil pressure gauge adapter                    |
|      | 09915-77330 | Meter (0 – 10 kg/cm <sup>2</sup> )            |
| 38   | 09916-14510 | Valve lifter                                  |
|      | 09916-14910 | Attachment                                    |
| 39   | 09916-21110 | Valve seat cutter set                         |
| 40   | 09916-34541 | Handle                                        |
|      | 09916-34550 | Reamer (5.5 mm)                               |
|      | 09916-34561 | Reamer (11.3 mm)                              |
| 41   | 09916-44910 | Valve guide installer and remover             |
| 42   | 09916-44920 | Valve guide installer attachment              |
| 43   | 09916-74521 | Holder body                                   |
|      | 09916-74540 | Band (63 – 75 mm)                             |
| 44   | 09916-84510 | Tweezers                                      |
| 45   | 09917-14910 | Valve adjust driver                           |
| 46   | 09920-53710 | Clutch sleeve hub holder                      |
| 47   | 09923-73210 | Bearing puller                                |
| 48   | 09924-84510 | Bearing installer set                         |
| 49   | 09930-14511 | Cylinder head nut and spark plug wrench set   |
|      | 09911-74510 | Long socket (14 mm)                           |
|      | 09911-74520 | Long socket (12 mm)                           |
|      | 09914-24510 | "T" handle                                    |
|      | 09930-13210 | Spark plug socket wrench                      |
|      | 09930-14530 | Universal joint                               |
| 50   | 09930-30102 | Rotor remover slide shaft                     |
|      | 09930-30180 | Attachment "E"                                |
| 51   | 09930-44913 | Rotor holder                                  |
| 52   | 09940-14911 | Steering nut socket wrench                    |
| 53   | 09940-34520 | "T" handle                                    |
|      | 09940-34561 | Attachment "D"                                |
| 54   | 09940-50112 | Front fork oil seal installer                 |
| 55   | 09941-34513 | Steering race and swing arm bearing installer |
| 56   | 09941-44910 | Swing arm bearing installer                   |
| 57   | 09941-50110 | Wheel bearing remover                         |
| 58   | 09941-54911 | Bearing outer race remover                    |
| 59   | 09941-74910 | Steering bearing installer                    |
| 60   | 09941-84510 | Bearing inner race remover                    |
| 61   | 09943-74111 | Fork oil level gauge                          |



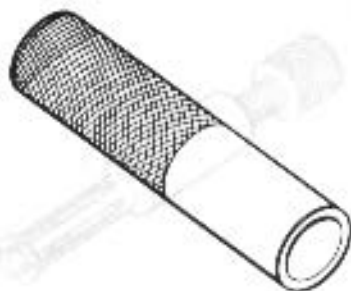




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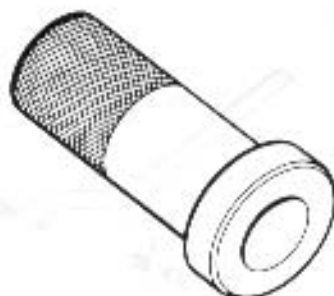
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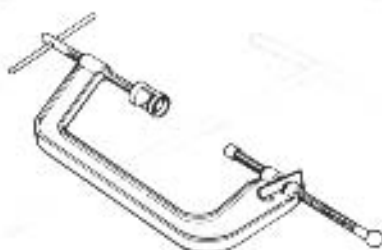
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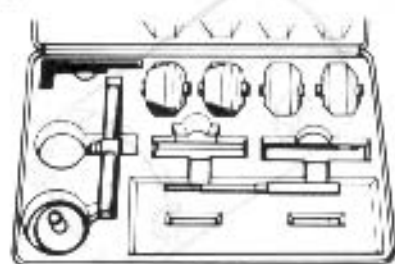
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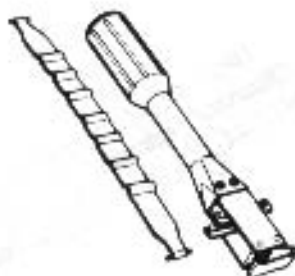
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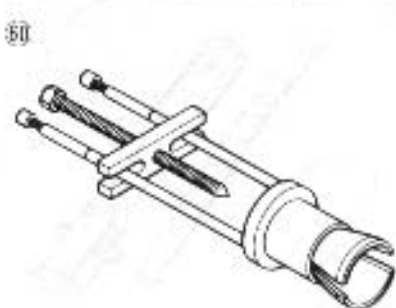
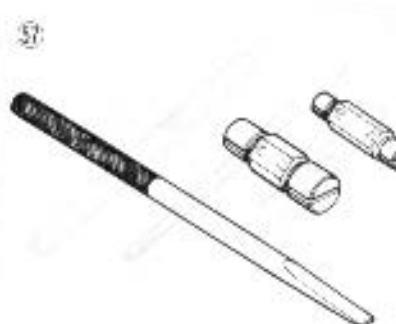
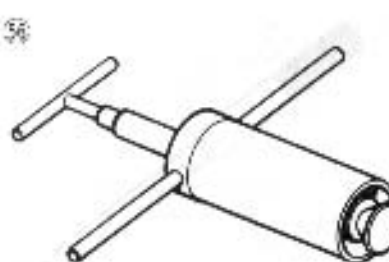
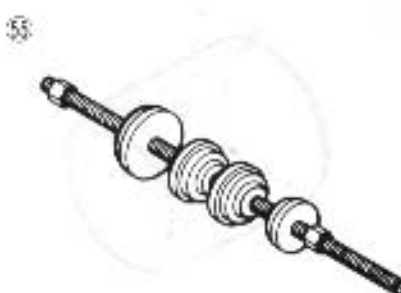
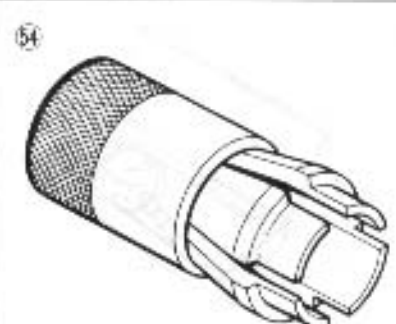
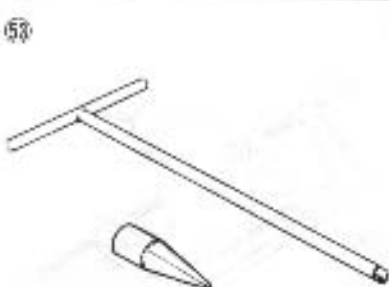
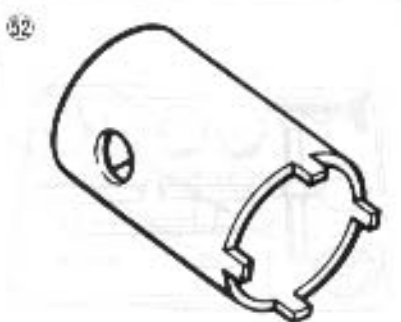
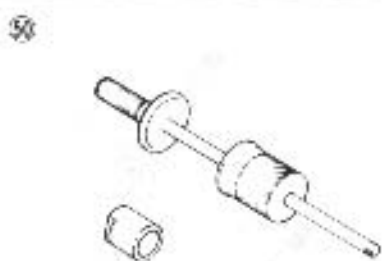
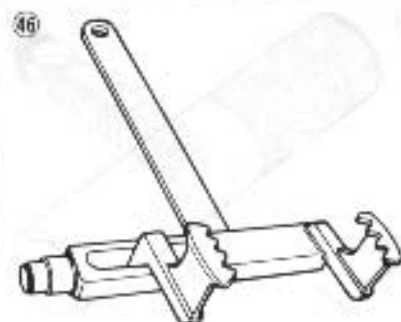


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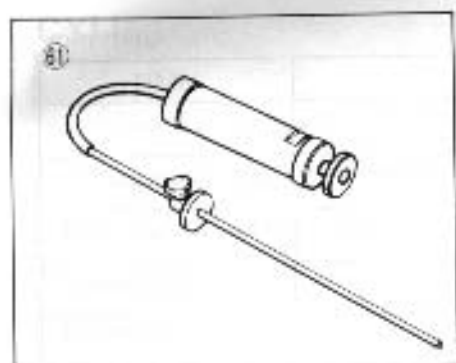


# PRICE DATA

## VE + GUIDE

ITEM

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**SERVICE DATA****VALVE + GUIDE**

Unit: mm

| ITEM                                            | STANDARD  |                               | LIMIT |
|-------------------------------------------------|-----------|-------------------------------|-------|
| Valve diam.                                     | IN.       | 25                            | —     |
|                                                 | EX.       | 21                            | —     |
| Valve lift                                      | IN.       | 7.5                           | —     |
|                                                 | EX.       | 6.5                           | —     |
| Valve clearance or tappet clearance (when cold) | IN. & EX. | 0.09–0.13                     | —     |
| 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. | —                             | 3.6   |
| Valve seat width                                | IN. & EX. | 0.9–1.1                       | —     |
| Valve head radial runout                        | IN. & EX. | —                             | 0.03  |
| Valve spring free length (IN. & EX.)            | INNER     | —                             | 38.0  |
| Valve spring tension (IN. & EX.)                | INNER     | 11.7–15.3 kg at length 32.5mm | —     |

**CAMSHAFT + CYLINDER HEAD**

Unit: mm

| ITEM                           | STANDARD  |               | LIMIT  |
|--------------------------------|-----------|---------------|--------|
| Cam height                     | IN.       | 34.940–34.980 | 34.910 |
|                                | EX.       | 34.360–34.400 | 34.060 |
| Camshaft journal oil clearance | IN. & EX. | 0.032–0.066   | 0.150  |
| Camshaft journal holder I.D.   | IN. & EX. | 22.012–22.025 | —      |
| Camshaft journal O.D.          | IN. & EX. | 21.959–21.980 | —      |
| Camshaft runout                | IN. & EX. | —             | 0.10   |
| Cam chain 20-pitch length      |           | —             | 128.9  |
| Cam chain pin (at arrow "3")   |           | 20 th pin     | —      |
| Rocker arm I.D.                | IN. & EX. | 12.000–12.018 | —      |
| Rocker arm shaft O.D.          | IN. & EX. | 11.973–11.984 | —      |
| Cylinder head distortion       |           | —             | 0.20   |

## CYLINDER + PISTON + PISTON RING

Unit: mm

| ITEM                            |     | STANDARD                                          |              | LIMIT                |
|---------------------------------|-----|---------------------------------------------------|--------------|----------------------|
| Compression pressure            |     | 9—13 kg/cm <sup>2</sup>                           |              | 7 kg/cm <sup>2</sup> |
| Compression pressure difference |     | —                                                 |              | 2 kg/cm <sup>2</sup> |
| Piston to cylinder clearance    |     | 0.04—0.05                                         |              | 0.120                |
| Cylinder bore                   |     | 67.000—67.015                                     |              | 67.080               |
| Piston diam.                    |     | 66.955—66.970<br>Measure at 15 from the skirt end |              | 66.880               |
| Cylinder distortion             |     | —                                                 |              | 0.20                 |
| Piston ring free end gap        | 1st | N                                                 | Approx. 9.5  | 7.6                  |
|                                 |     | R                                                 | Approx. 9.0  | 7.2                  |
|                                 | 2nd | N                                                 | Approx. 10.0 | 8.0                  |
|                                 |     | R                                                 | Approx. 10.0 | 8.0                  |
| Piston ring end gap             | 1st | 0.10—0.30                                         |              | 0.70                 |
|                                 | 2nd | 0.10—0.30                                         |              | 0.70                 |
| Piston ring to groove clearance | 1st | —                                                 |              | 0.180                |
|                                 | 2nd | —                                                 |              | 0.150                |
| Piston ring groove width        | 1st | 1.21—1.23                                         |              | —                    |
|                                 | 2nd | 1.21—1.23                                         |              | —                    |
|                                 | Oil | 2.51—2.53                                         |              | —                    |
| Piston ring thickness           | 1st | 1.170—1.190                                       |              | —                    |
|                                 | 2nd | 1.170—1.190                                       |              | —                    |
| Piston pin bore                 |     | 18.002—18.008                                     |              | 18.035               |
| Piston pin O.D.                 |     | 17.995—18.000                                     |              | 17.980               |

**CONROD + CRANKSHAFT**

Unit: mm

| ITEM                                | STANDARD      | LIMIT     |
|-------------------------------------|---------------|-----------|
| Conrod small end I.D.               | 18.010–18.018 | 18.040    |
| Conrod big end side clearance       | 0.10–0.20     | 0.30      |
| Conrod big end width                | 22.95–23.00   | —         |
| Crank pin width                     | 23.10–23.15   | —         |
| Conrod big end oil clearance        | 0.032–0.056   | 0.080     |
| Crank pin O.D.                      | 35.976–36.000 | —         |
| Crankshaft journal oil clearance    | 0.020–0.044   | 0.080     |
| Crankshaft journal O.D.             | 35.976–36.000 | —         |
| Crankshaft thrust bearing thickness | Right side    | 2.94–2.96 |
|                                     | Left side     | 2.86–3.02 |
| Crankshaft thrust clearance         | 0.04–0.08     | 0.28      |
| Crankshaft runout                   | —             | 0.05      |

**OIL PUMP**

| ITEM                          | STANDARD                                                                        | LIMIT |
|-------------------------------|---------------------------------------------------------------------------------|-------|
| Oil pump reduction ratio      | 1.840   91/48 x 33/34 }                                                         | —     |
| Oil pressure (at 60°C, 140°F) | Above 2.5 kg/cm <sup>2</sup><br>Below 5.5 kg/cm <sup>2</sup><br>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     | 2.7–2.9           | 2.6   |
| Drive plate claw width    | 11.8–12.0         | 11.2  |
| Driven plate thickness    | 2 ± 0.06          | —     |
| Driven plate distortion   | —                 | 0.10  |
| Clutch spring free length | —                 | 34.0  |



## TRANSMISSION + DRIVE CHAIN

Unit: mm Except ratio

| ITEM                                | STANDARD        |                                 | LIMIT |
|-------------------------------------|-----------------|---------------------------------|-------|
| Primary reduction ratio             | 1.895 ( 91/48 ) |                                 | —     |
| Final reduction ratio               | 3.071 ( 43/14 ) |                                 | —     |
| Gear ratios                         | Low             | 2.500 ( 35/14 )                 | —     |
|                                     | 2nd             | 1.750 ( 28/16 )                 | —     |
|                                     | 3rd             | 1.368 ( 26/19 )                 | —     |
|                                     | 4th             | 1.130 ( 26/23 )                 | —     |
|                                     | Top             | 0.956 ( 22/23 )                 | —     |
| Shift fork to groove clearance      | No.1,<br>No.2   | 0.10–0.30                       | 0.50  |
| Shift fork groove width             | No.1,<br>No.2   | 5.5–5.6                         | —     |
| Shift fork thickness                | No.1,<br>No.2   | 5.3–5.4                         | —     |
| Countershaft length<br>(Low to 2nd) | 106             |                                 | —     |
| Drive chain                         | Type            | D.I.D.: 50V<br>TAKASAGO: RK50GO | —     |
|                                     | Links           | 114                             | —     |
|                                     | 20 pitch length | —                               | 319   |
| Drive chain slack                   | 30–40           |                                 | —     |

## CARBURETOR

| ITEM                   | SPECIFICATION              |            |
|------------------------|----------------------------|------------|
|                        | E-18                       | The others |
| Carburetor type        | MIKUNI BS32SS              | ←          |
| Bore size              | 32 mm                      | ←          |
| I.D. No.               | 31320                      | 31310      |
| Idle r/min.            | 1 150 ± 50 r/min.          | ←          |
| Fuel level             | 5.0 ± 0.5 mm               | ←          |
| Float height           | 22.4 ± 1.0 mm              | ←          |
| Main jet (M.J.)        | # 120                      | ←          |
| Main air jet (M.A.J.)  | 1.7 mm                     | ←          |
| Jet needle (J.N.)      | 5D10-3                     | ←          |
| Needle jet (N.J.)      | Y-7                        | ←          |
| Pilot jet (P.J.)       | # 40                       | ←          |
| By pass (B.P.)         | 0.8, 0.8, 0.8 mm           | ←          |
| Pilot outlet (P.O.)    | 0.7 mm                     | ←          |
| Valve seat (V.S.)      | 2.0 mm                     | ←          |
| Starter jet (S.J.)     | # 45                       | ←          |
| Pilot screw (P.S.)     | PRE-SET (2 1/4 turns back) | ←          |
| Pilot air jet (P.A.J.) | # 155                      | ←          |
| Throttle cable play    | 0.5—1.0 mm                 | ←          |
| Choke cable play       | 0.5—1.0 mm                 | ←          |

## ELECTRICAL

Unit: mm

| ITEM                      | SPECIFICATION                                                                     |                              |            | NOTE                    |
|---------------------------|-----------------------------------------------------------------------------------|------------------------------|------------|-------------------------|
| Ignition timing           | 13° B.T.D.C. Below 1 500 ± 150 r/min and<br>35° B.T.D.C. Above 2 350 ± 150 r/min. |                              |            |                         |
| Firing order              | 1 · 2 · 4 · 3                                                                     |                              |            |                         |
| Spark plug                | Type                                                                              | NGK D8EA<br>N.D. X24ES-U     |            | E-01,24,25,27,<br>30,34 |
|                           | Gap                                                                               | 0.6—0.7                      |            |                         |
|                           | Type                                                                              | NGK DR8ES-L<br>N.D. X24ESR-U |            | The others              |
|                           | Gap                                                                               | 0.6—0.7                      |            |                         |
| Spark performance         | Over 8 at 1 atm.                                                                  |                              |            |                         |
| Signal coil resistance    | Approx.                                                                           | 130—200 Ω                    |            | BI-Y, B-G               |
| Ignition coil resistance  | Primary                                                                           | 3—5 Ω                        |            | O/W-W, O/W-B/Y          |
|                           | Secondary                                                                         | 30—50 kΩ                     |            | Plug cap—Plug cap       |
| Generator no-load voltage | More than 80 V (AC) at 5 000 r/min.                                               |                              |            |                         |
| Regulated voltage         | 13.5—15.5 V at 5 000 r/min.                                                       |                              |            |                         |
| Starter motor             | Brush length                                                                      | MITSUBA                      | Limit: 6   |                         |
|                           | Commutator under cut                                                              |                              | Limit: 0.2 |                         |
| Starter relay resistance  | Approx.                                                                           | 3—4 Ω                        |            |                         |
| Battery                   | Type designation                                                                  | YB14L-A2                     |            |                         |
|                           | Capacity                                                                          | 12V50.4kC(14Ah)/10HR         |            |                         |
|                           | Standard electrolyte S.G.                                                         | 1.280at 20°C (68°F)          |            |                         |
| Fuse size                 | Headlight                                                                         | 10 A                         |            |                         |
|                           | Turn signal                                                                       | 10 A                         |            |                         |
|                           | Ignition                                                                          | 10 A                         |            |                         |
|                           | Main                                                                              | 15 A                         |            |                         |
|                           | Power source                                                                      | 10 A                         |            |                         |

## BRAKE + WHEEL

Unit: mm

Unit: mm

| ITEM                         | STANDARD |               |               | LIMIT |
|------------------------------|----------|---------------|---------------|-------|
| Rear brake pedal height      | 40       |               |               | —     |
| Brake disc thickness         | Front    | 5.0 ± 0.2     |               | 4.5   |
|                              | Rear     | 6.7 ± 0.2     |               | 6.0   |
| Brake disc runout            | —        |               |               | 0.30  |
| Master cylinder bore         | Front    | 15.870–15.913 |               | —     |
|                              | Rear     | 14.000–14.043 |               | —     |
| Master cylinder piston diam. | Front    | 15.827–15.854 |               | —     |
|                              | Rear     | 13.957–13.984 |               | —     |
| Brake caliper cylinder bore  | Front    | 38.180–38.256 |               | —     |
|                              | Rear     | 38.180–38.256 |               | —     |
| Brake caliper piston diam.   | Front    | 38.098–38.148 |               | —     |
|                              | Rear     | 38.098–38.148 |               | —     |
| Wheel rim runout             | Axial    | —             |               | 2.0   |
|                              | Radial   | —             |               | 2.0   |
| Wheel axle runout            | Front    | —             |               | 0.25  |
|                              | Rear     | —             |               | 0.25  |
| Tire size                    | Front    | E-06, 24, 27  | 120/80V 16    | —     |
|                              |          | The others    | 100/90-16 54H | —     |
|                              | Rear     | E-06, 24, 27  | 130/80V 18    | —     |
|                              |          | The others    | 120/90-17 64H | —     |
| Tire tread depth             | Front    | —             |               | 1.6   |
|                              | Rear     | —             |               | 2.0   |

## GSX750EE/ESE/EFE(84-MODEL)

## SUSPENSION

Unit: mm

| ITEM                          | STANDARD | LIMIT | NOTE |
|-------------------------------|----------|-------|------|
| Front fork stroke             | 150      | —     |      |
| Front fork spring free length | —        | 527   |      |
| Front fork oil level          | 192      | —     |      |
| Rear wheel travel             | 107      | —     |      |
| Swing arm pivot shaft runout  | —        | 0.3   |      |

## FUEL + OIL

| ITEM                               | SPECIFICATION                                                                                                |          | NOTE |
|------------------------------------|--------------------------------------------------------------------------------------------------------------|----------|------|
| Fuel type                          | Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead gasoline type is recommended. |          |      |
| Fuel tank including reserve        | 19.5                                                                                                         | L        |      |
| reserve                            | 4.0                                                                                                          | L        |      |
| Engine oil type                    | SAE 10W/40                                                                                                   |          |      |
| Engine oil capacity                | Change                                                                                                       | 3 200 ml |      |
|                                    | Filter change                                                                                                | 3 800 ml |      |
|                                    | Overhaul                                                                                                     | 4 000 ml |      |
| Front fork oil type                | Fork oil                                                                                                     | # 10     |      |
| Front fork oil capacity (each leg) | 293 ml                                                                                                       |          |      |
| Brake fluid type                   | SAEJ1703, DOT3, or DOT4                                                                                      |          |      |

## TIRE PRESSURE

| COLD INFLATION<br>TIRE PRESSURE | NORMAL RIDING |                    |     |             |                    |     |
|---------------------------------|---------------|--------------------|-----|-------------|--------------------|-----|
|                                 | SOLO RIDING   |                    |     | DUAL RIDING |                    |     |
|                                 | kPa           | kg/cm <sup>2</sup> | psi | kPa         | kg/cm <sup>2</sup> | psi |
| FRONT                           | 200           | 2.00               | 28  | 225         | 2.25               | 32  |
| REAR                            | 250           | 2.50               | 36  | 280         | 2.80               | 40  |

## WATTAGE

Unit: W

| ITEM                                  |    | SPECIFICATION        |            |      |            |
|---------------------------------------|----|----------------------|------------|------|------------|
|                                       |    | E-01,06,24,<br>27,30 | E-16,18,26 | E-22 | The others |
| Headlight                             | HI | 60                   | ←          | ←    | ←          |
|                                       | LO | 55                   | ←          | ←    | ←          |
| Parking or city light                 |    |                      | 4          | ←    | ←          |
| Tail/Brake light                      |    | 8/23                 | 5/21       | ←    | ←          |
| Turn signal light                     |    | 23                   | 21         | ←    | ←          |
| Speedometer light<br>Tachometer light |    | 3.4                  | ←          | ←    | ←          |
| Turn signal indicator light           |    | 3.4                  | ←          | ←    | ←          |
| High beam indicator light             |    | 3.4                  | ←          | ←    | ←          |
| Neutral indicator light               |    | 3.4                  | ←          | ←    | ←          |
| Oil pressure indicator light          |    | 3.4                  | ←          | ←    | ←          |
| License light                         |    | 8                    | 5          | 10   | 5          |
| Side stand check light                |    | 3.4                  |            |      | 3.4        |
| Oil temp. meter light                 |    | 3.4                  | ←          | ←    | ←          |
| Fuel meter light                      |    | 3.4                  | ←          | ←    | ←          |
| Gear position indicator light         |    | 1.12                 | ←          | ←    | ←          |



# GSX750EE/ESE/EFE('84-MODEL)

*This section gives service data and servicing procedure which differ from those of the GSX750 ED/ESD.*

*Please also refer to the sections, 1 through 7, for all other areas of information not covered in this section.*

*This section 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 kindly requested to make query about updated information, if any.*

## NOTE:

Asterisk mark (\*) indicates New E model specification.

## CONTENTS

|                                              |             |
|----------------------------------------------|-------------|
| <b>SPECIFICATIONS</b> .....                  | <b>8- 1</b> |
| <b>SERVICE DATA</b> .....                    | <b>8- 2</b> |
| <b>FAIRING</b> .....                         | <b>8- 9</b> |
| <b>CABLE, HARNESS AND HOSE ROUTING</b> ..... | <b>8-10</b> |
| <b>WIRING DIAGRAM</b> .....                  | <b>8-16</b> |
| <b>TIGHTENING TORQUE</b> .....               | <b>8-21</b> |

## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

|                  |                                                                        |
|------------------|------------------------------------------------------------------------|
| * Overall length | 2 135 mm                                                               |
| * Overall width  | 735 mm . . . E model<br>760 mm . . . ES, EF model                      |
| * Overall height | 1 130 mm . . . E model<br>1 170 mm . . . ES, EF model                  |
| * Wheelbase      | 1 500 mm                                                               |
| Ground clearance | 140 mm                                                                 |
| * Dry mass       | 214 kg . . . E model<br>217 kg . . . ES model<br>219 kg . . . EF model |

### ENGINE

|                     |                                 |
|---------------------|---------------------------------|
| Type                | Four-stroke, Air-cooled<br>DOHC |
| Number of cylinders | 4                               |
| Bore                | 67.0 mm                         |
| Stroke              | 53.0 mm                         |
| Piston displacement | 747 cm <sup>3</sup>             |
| Compression ratio   | 9.6 : 1                         |
| Carburetor          | MIKUNI BS32SS, four             |
| 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 | 1.895 (91/48)                                                                    |
| * Final reduction | 3.214 (45/14)<br>. . . E-06, 24ES, EF model<br>3.071 (43/14)<br>. . . The others |
| Gear ratios, Low  | 2.500 (35/14)                                                                    |
| 2nd               | 1.750 (28/16)                                                                    |
| 3rd               | 1.368 (26/19)                                                                    |
| 4th               | 1.130 (26/23)                                                                    |
| Top               | 0.956 (22/23)                                                                    |
| Drive chain       | D.I.D.: 50V<br>TAKASAGO.: RK50GO<br>114 links                                    |

### CHASSIS

|                    |                                                                      |
|--------------------|----------------------------------------------------------------------|
| * Front suspension | Telescopic, oil damped,<br>spring 2-way adjustable<br>with ANTI-DIVE |
|--------------------|----------------------------------------------------------------------|

\* Asterisk mark indicates the new E ('84-year) model specifications.

|                   |                                                                                 |
|-------------------|---------------------------------------------------------------------------------|
| * Rear suspension | Full-floating suspension<br>system, damper 4-way/<br>spring pre-load adjustable |
| Steering angle    | 37° (right & left)                                                              |
| Caster            | 62° 10'                                                                         |
| Trail             | 105 mm                                                                          |
| Turning radius    | 2.8 m                                                                           |
| Front brake       | Disc brake, twin                                                                |
| Rear brake        | Disc brake                                                                      |
| Front tire size   | 120/80 V16 . . . E-06, 24<br>ES, EF model<br>100/90-16 54H<br>. . . The others  |
| Rear tire size    | 130/80 V18 . . . E-06, 24<br>ES, EF model<br>120/90-17 64H<br>. . . The others  |
| Front fork stroke | 150 mm                                                                          |
| Rear wheel travel | 107 mm                                                                          |

### ELECTRICAL

|                 |                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------|
| Ignition type   | Transistorized                                                                                                       |
| Ignition timing | 13° B.T.D.C. below<br>1 500 r/min and<br>35° B.T.D.C. above<br>2 350 r/min                                           |
| Spark plug      | N.G.K.: D8EA<br>N.D.: X24ES-U<br>. . . E-01, 24, 25, 30, 34<br>N.G.K.: DR8ES-L<br>N.D.: X24ESR-U<br>. . . The others |
| Battery         | 12V50.4kC (14Ah)/10HR                                                                                                |
| Generator       | Three-phase A.C.<br>Generator                                                                                        |
| Fuse            | 10/10/10/10/15A                                                                                                      |

### CAPACITIES

|                             |          |
|-----------------------------|----------|
| Fuel tank including reserve | 19.5 L   |
| reserve                     | 4.0 L    |
| Engine oil                  | 3 200 ml |
| * Front fork oil            | 282 ml   |

These specifications are subject to change without notice.

## SERVICE DATA VALVE + GUIDE

Unit : mm

| ITEM                                | STANDARD  |                                | LIMIT |
|-------------------------------------|-----------|--------------------------------|-------|
| Valve diam.                         | IN.       | 25                             | —     |
|                                     | EX.       | 21                             | —     |
| Valve lift                          | IN.       | 7.5                            | —     |
|                                     | EX.       | 6.5                            | —     |
| 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. | —                              | 3.6   |
| Valve seat width                    | IN. & EX. | 0.9–1.1                        | —     |
| Valve head radial runout            | IN. & EX. | —                              | 0.03  |
| Valve spring free length            | IN. & EX. | —                              | 38.0  |
| Valve spring tension                | IN. & EX. | 11.7–15.3 kg at length 32.5 mm | —     |

## CAMSHAFT + CYLINDER HEAD

Unit : mm

| ITEM                           | STANDARD  |               | LIMIT |
|--------------------------------|-----------|---------------|-------|
| Cam height                     | IN.       | 34.940–34.980 | 34.91 |
|                                | EX.       | 34.360–34.400 | 34.06 |
| Camshaft journal oil clearance | IN. & EX. | 0.032–0.066   | 0.150 |
| Camshaft journal holder I.D.   | IN. & EX. | 22.012–22.025 | —     |
| Camshaft journal O.D.          | IN. & EX. | 21.959–21.980 | —     |
| Camshaft runout                | IN. & EX. | —             | 0.10  |
| Cam chain 20-pitch length      | —         |               | 128.9 |
| Cam chain pin (at arrow "3")   | 20th pin  |               | —     |
| Rocker arm I.D.                | IN. & EX. | 12.000–12.018 | —     |
| Rocker arm shaft O.D.          | IN. & EX. | 11.973–11.984 | —     |
| Cylinder head distortion       | —         |               | 0.20  |

## CYLINDER + PISTON + PISTON RING

Unit : mm

| ITEM                            | STANDARD                                  | LIMIT                            |
|---------------------------------|-------------------------------------------|----------------------------------|
| Compression pressure            | 900–1 300 kPa,<br>9–13 kg/cm <sup>2</sup> | 700 kPa,<br>7 kg/cm <sup>2</sup> |
| Compression pressure difference | —                                         | 200 kPa,<br>2 kg/cm <sup>2</sup> |
| Piston to cylinder clearance    | 0.040–0.050                               | 0.120                            |
| Cylinder bore                   | 67.000–67.015                             | 67.080                           |
| Piston diam.                    | 66.955–66.970                             | 66.880                           |
|                                 | Measure at 15 from the skirt end.         |                                  |

Unit : mm

| ITEM                            | STANDARD      |             |              | LIMIT  |
|---------------------------------|---------------|-------------|--------------|--------|
| Cylinder distortion             |               |             |              | 0.20   |
| Piston ring free end gap        | 1st           | N           | Approx. 9.5  | 7.6    |
|                                 |               | R           | Approx. 9.0  | 7.2    |
|                                 | 2nd           | N           | Approx. 10.0 | 8.0    |
|                                 |               | R           | Approx. 10.0 | 8.0    |
| Piston ring end gap             | 1st           | 0.10–0.30   |              | 0.70   |
|                                 | 2nd           | 0.10–0.30   |              | 0.70   |
| Piston ring to groove clearance | 1st           | —           |              | 0.180  |
|                                 | 2nd           | —           |              | 0.150  |
| Piston ring groove width        | 1st           | 1.21–1.23   |              | —      |
|                                 | 2nd           | 1.21–1.23   |              | —      |
|                                 | Oil           | 2.51–2.53   |              | —      |
| Piston ring thickness           | 1st & 2nd     | 1.170–1.190 |              | —      |
| Piston pin bore                 | 18.002–18.008 |             |              | 18.035 |
| Piston pin O.D.                 | 17.995–18.000 |             |              | 17.980 |

**CONROD + CRANKSHAFT**

Unit : mm

| ITEM                                | STANDARD      |           | LIMIT  |
|-------------------------------------|---------------|-----------|--------|
| Conrod small end I.D.               | 18.010–18.018 |           | 18.040 |
| Conrod big end side clearance       | 0.10–0.20     |           | 0.30   |
| Conrod big end width                | 22.95–23.00   |           | —      |
| Crank pin width                     | 23.10–23.15   |           | —      |
| Conrod big end oil clearance        | 0.032–0.056   |           | 0.080  |
| Crank pin O.D.                      | 35.976–36.000 |           | —      |
| Crankshaft journal oil clearance    | 0.020–0.044   |           | 0.080  |
| Crankshaft journal O.D.             | 35.976–36.000 |           | —      |
| Crankshaft thrust bearing thickness | Right side    | 2.94–2.96 | —      |
|                                     | Left side     | 2.86–3.02 | —      |
| Crankshaft thrust clearance         | 0.04–0.08     |           | 0.28   |
| Crankshaft runout                   | —             |           | 0.05   |

**OIL PUMP**

| ITEM                          | STANDARD                                                                                       | LIMIT |
|-------------------------------|------------------------------------------------------------------------------------------------|-------|
| Oil pump reduction ratio      | 1.840 ( 91/48 x 33/34 )                                                                        | —     |
| Oil pressure (at 60°C, 140°F) | Above 250 kPa, 2.5 kg/cm <sup>2</sup><br>Below 550 kPa, 5.5 kg/cm <sup>2</sup> at 3 000 r/min. | —     |

**CLUTCH**

Unit : mm

| ITEM                 | STANDARD          | LIMIT |
|----------------------|-------------------|-------|
| Clutch cable play    | 4                 | —     |
| Clutch release screw | 1/4–1/2 turn back | —     |

| ITEM                      | STANDARD  | LIMIT |
|---------------------------|-----------|-------|
| Drive plate thickness     | 2.7-2.9   | 2.6   |
| Drive plate claw width    | 11.8-12.0 | 11.0  |
| Driven plate distortion   | —         | 0.10  |
| Clutch spring free length | —         | 34.0  |

## TRANSMISSION + DRIVE CHAIN

Unit : mm Except ratio

| ITEM                               | STANDARD                | LIMIT                           |
|------------------------------------|-------------------------|---------------------------------|
| Primary reduction ratio            | 1.895 ( 91/48 )         | —                               |
| * Final reduction ratio            | E-06, 24 (ES, EF model) | 3.214 ( 45/14 )                 |
|                                    | The others              | 3.071 ( 43/14 )                 |
|                                    | Low                     | 2.500 ( 35/14 )                 |
| Gear ratios                        | 2nd                     | 1.750 ( 28/16 )                 |
|                                    | 3rd                     | 1.368 ( 26/19 )                 |
|                                    | 4th                     | 1.130 ( 26/23 )                 |
|                                    | Top                     | 0.956 ( 22/23 )                 |
| Shift fork to groove clearance     | 0.10-0.30               | 0.50                            |
| Shift fork groove width            | 5.5-5.6                 | —                               |
| Shift fork thickness               | 5.3-5.4                 | —                               |
| * Countershaft length (Low to 2nd) | 105.9-106.0             | —                               |
| Drive chain                        | Type                    | D.I.D.: 50V<br>TAKASAGO: RK50GO |
|                                    | Links                   | 114                             |
|                                    | **20-pitch length       | —                               |
| Drive chain slack                  | 30-40                   | 319.4                           |

## CARBURETOR

| ITEM                  | SPECIFICATION     |            |
|-----------------------|-------------------|------------|
|                       | E-18              | The others |
| Carburetor type       | MIKUNI BS32SS     | +          |
| Bore size             | 32 mm             | +          |
| I.D. No.              | 31320             | 31310      |
| Idle r/min.           | 1 150 ± 50 r/min. | +          |
| Fuel level            | 5.0 ± 0.5 mm      | +          |
| Float height          | 22.4 ± 1.0 mm     | +          |
| Main jet (M.J.)       | #120              | +          |
| Main air jet (M.A.J.) | 1.7 mm            | 1.3 mm     |
| Jet needle (J.N.)     | 5D10-3rd          | +          |
| Needle jet (N.J.)     | Y-7               | +          |
| Pilot jet (P.J.)      | #40               | +          |
| By pass (B.P.)        | 0.8, 0.8, 0.8 mm  | +          |
| Pilot outlet (P.O.)   | 0.7 mm            | +          |

\* Asterisk mark indicates the new E ('84-year) model specifications.

| ITEM                |          | SPECIFICATION           |            |
|---------------------|----------|-------------------------|------------|
|                     |          | E-18                    | The others |
| Valve seat          | (V.S.)   | 2.0 mm                  | ←          |
| Starter jet         | (G.S.)   | #45                     | ←          |
| Pilot screw         | (P.S.)   | PRE-SET (2½ turns back) | ←          |
| Pilot air jet       | (P.A.J.) | #155                    | ←          |
| Throttle valve      | (Th.V.)  | #135                    | ←          |
| Throttle cable play |          | 0.5–1.0 mm              | ←          |
| Choke cable play    |          | 0.5–1.0 mm              | ←          |

**ELECTRICAL**

Unit : mm

| ITEM                      | SPECIFICATION                                                                     |                                   |            | NOTE                 |
|---------------------------|-----------------------------------------------------------------------------------|-----------------------------------|------------|----------------------|
| Ignition timing           | 13° B.T.D.C. Below 1 500 ± 150 r/min and<br>35° B.T.D.C. Above 2 350 ± 150 r/min. |                                   |            |                      |
| Firing order              | 1, 2, 4, 3                                                                        |                                   |            |                      |
| Spark plug                | Type                                                                              | N.G.K.: D8EA<br>N.D.: X24ES-U     |            | E-01, 24, 25, 30, 34 |
|                           | Gap                                                                               | 0.6–0.7                           |            |                      |
|                           | Type                                                                              | N.G.K.: DR8ES-L<br>N.D.: X24ESR-U |            | The others           |
|                           | Gap                                                                               | 0.6–0.7                           |            |                      |
| Spark performance         | Over 8 at 1 atm.                                                                  |                                   |            |                      |
| Signal coil resistance    | 130–200 Ω                                                                         |                                   |            | BI-Y, B-G            |
| Ignition coil resistance  | Primary                                                                           | 3–5 Ω                             |            | O/W-W, O/W-B/Y       |
|                           | Secondary                                                                         | 30–50 kΩ                          |            | Plug cap–Plug cap    |
| Generator no-load voltage | More than 80 V (AC) at 5 000 r/min.                                               |                                   |            |                      |
| Regulated voltage         | 13.5–15.5 V at 5 000 r/min.                                                       |                                   |            |                      |
| Starter motor             | Brush length                                                                      | MITSUBA                           | Limit: 6   |                      |
|                           | Commutator under cut                                                              |                                   | Limit: 0.2 |                      |
| Starter relay resistance  | 3–4 Ω                                                                             |                                   |            |                      |
| Battery                   | Type designation                                                                  | YB14L-A2                          |            |                      |
|                           | Capacity                                                                          | 12V 50.4kC (14Ah)/10HR            |            |                      |
|                           | Standard electrolyte S.G.                                                         | 1.28 at 20°C (68°F)               |            |                      |
| Fuse size                 | Headlight                                                                         | 10A                               |            |                      |
|                           | Turn signal                                                                       | 10A                               |            |                      |
|                           | Ignition                                                                          | 10A                               |            |                      |
|                           | Main                                                                              | 15A                               |            |                      |
|                           | Power source                                                                      | 10A                               |            |                      |

**WATTAGE**

Unit : W

| ITEM      |    | SPECIFICATION    |                      |            |
|-----------|----|------------------|----------------------|------------|
|           |    | E-01, 06, 24, 30 | E-15, 16, 18, 22, 26 | The others |
| Headlight | HI | 60               | ←                    | ←          |
|           | LO | 55               | ←                    | ←          |

\*Asterisk mark indicates the new E ('84-year) model specifications.



**WATTAGE**

Unit : W

| ITEM                          | SPECIFICATION    |                      |            |
|-------------------------------|------------------|----------------------|------------|
|                               | E-01, 06, 24, 30 | E-15, 16, 18, 22, 26 | The others |
| Parking or position light     |                  | 4                    | ←          |
| Tail/Brake light              | 8/23             | 5/21                 | ←          |
| Turn signal light             | 23               | 21                   | ←          |
| Meter light                   | 3                | ←                    | ←          |
| Turn signal indicator light   | 3                | ←                    | ←          |
| High beam indicator light     | 3                | ←                    | ←          |
| Neutral indicator light       | 3                | ←                    | ←          |
| Oil pressure indicator light  | 3                | ←                    | ←          |
| License light                 | 8                | 5                    | ←          |
| Side stand check light        | 3                |                      | 3          |
| Gear position indicator light | 1.12             | ←                    | ←          |

**BRAKE + WHEEL**

Unit : mm

| ITEM                         |                            | STANDARD      |               | LIMIT |
|------------------------------|----------------------------|---------------|---------------|-------|
| Rear brake pedal height      |                            | 40            |               |       |
| Brake disc thickness         | Front                      | 5.0 ± 0.2     |               | 4.5   |
|                              | Rear                       | 6.7 ± 0.2     |               | 6.0   |
| Brake disc runout            |                            | —             |               | 0.3   |
| Master cylinder bore         | Front                      | 15.870–15.913 |               | —     |
|                              | Rear                       | 14.000–14.043 |               | —     |
| Master cylinder piston diam. | Front                      | 15.827–15.854 |               | —     |
|                              | Rear                       | 13.957–13.984 |               | —     |
| Brake caliper cylinder bore  | Front                      | 38.180–38.256 |               | —     |
|                              | Rear                       | 38.180–38.256 |               | —     |
| Brake caliper piston diam.   | Front                      | 38.098–38.148 |               | —     |
|                              | Rear                       | 38.098–38.148 |               | —     |
| Wheel rim runout             | Axial                      | —             |               | 2.0   |
|                              | Radial                     | —             |               | 2.0   |
| Wheel axle runout            | Front                      | —             |               | 0.25  |
|                              | Rear                       | —             |               | 0.25  |
| * Tire size                  | E-06, 24<br>(ES, EF model) | Front         | 120/80V 16    | —     |
|                              |                            | Rear          | 130/80V 18    | —     |
|                              | The others                 | Front         | 100/90-16 54H | —     |
|                              |                            | Rear          | 120/90-17 64H | —     |
| Tire tread depth             | Front                      | —             |               | 1.6   |
|                              | Rear                       | —             |               | 2.0   |

\*Asterisk mark indicates the new E ('84-year) model specifications.

## SUSPENSION

Unit : mm.

| ITEM                            | STANDARD | LIMIT | NOTE |
|---------------------------------|----------|-------|------|
| Front fork stroke               | 150      | —     |      |
| * Front fork spring free length | —        | 527   |      |
| * Front fork oil level          | 210      | —     |      |
| Rear wheel travel               | 107      | —     |      |
| Swing arm pivot shaft runout    | —        | 0,3   |      |

## TIRE PRESSURE

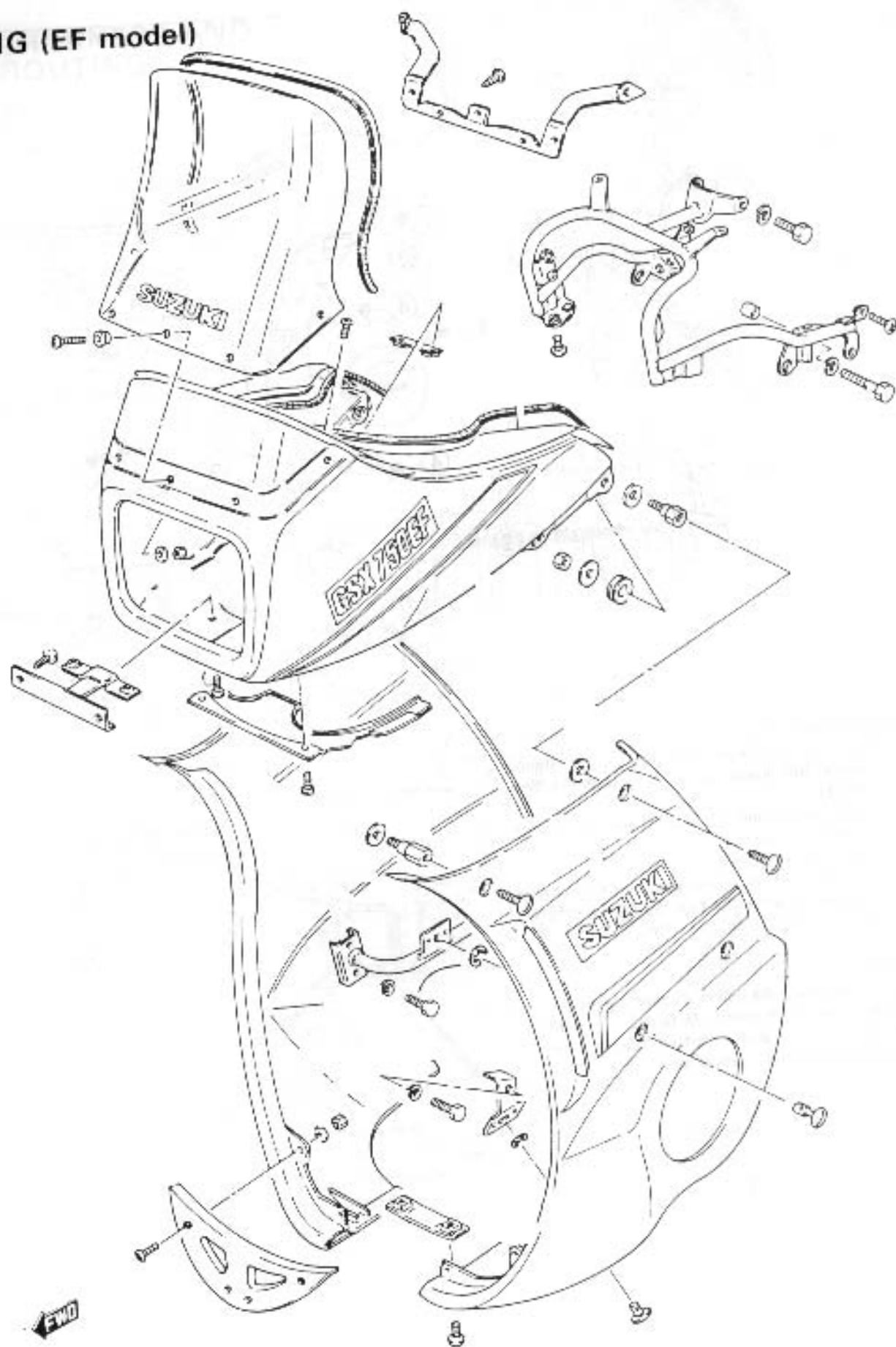
| COLD INFLATION<br>TIRE PRESSURE | SOLO RIDING |                    | DUAL RIDING |                    |
|---------------------------------|-------------|--------------------|-------------|--------------------|
|                                 | kPa         | kg/cm <sup>2</sup> | kPa         | kg/cm <sup>2</sup> |
| FRONT                           | 200         | 2.00               | 225         | 2.25               |
| REAR                            | 250         | 2.50               | 280         | 2.80               |

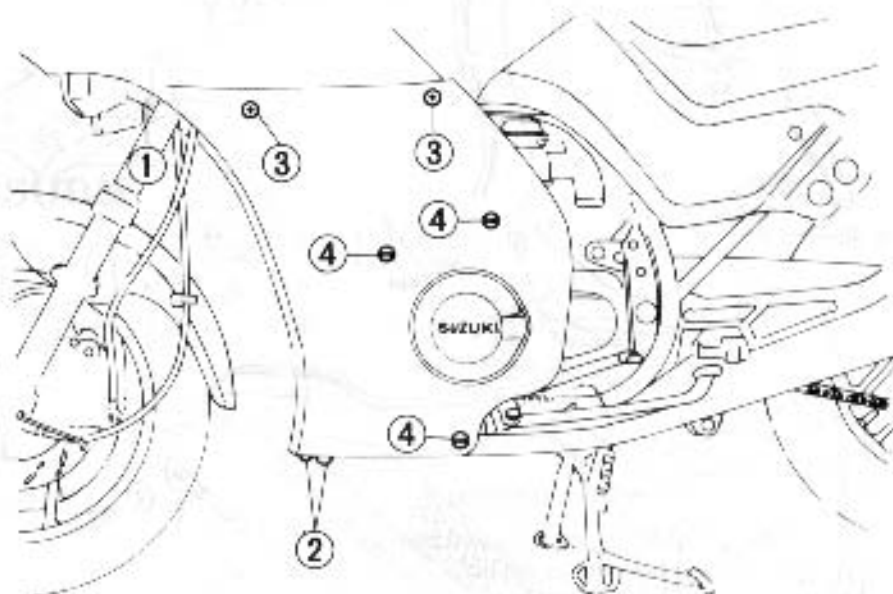
## FUEL + OIL

| ITEM                        | SPECIFICATION                                                                                                |          | NOTE |
|-----------------------------|--------------------------------------------------------------------------------------------------------------|----------|------|
| Fuel type                   | Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended. |          |      |
| Fuel tank including reserve | 19,5 L                                                                                                       |          |      |
| reserve                     | 4.0 L                                                                                                        |          |      |
| * Engine oil type           | SAE 10W/40, API SE or SF                                                                                     |          |      |
| Engine oil capacity         | Change                                                                                                       | 3 200 ml |      |
|                             | Filter change                                                                                                | 3 800 ml |      |
|                             | Overhaul                                                                                                     | 4 000 ml |      |
| Front fork oil type         | Fork oil # 10                                                                                                |          |      |
| * Front fork oil capacity   | 282 ml                                                                                                       |          |      |
| Brake fluid type            | SAE J1703, DOT3 or DOT4                                                                                      |          |      |

\* Asterisk mark indicates the new E ('84-year) model specifications.

# FAIRING (EF model)





#### FAIRING REMOVAL

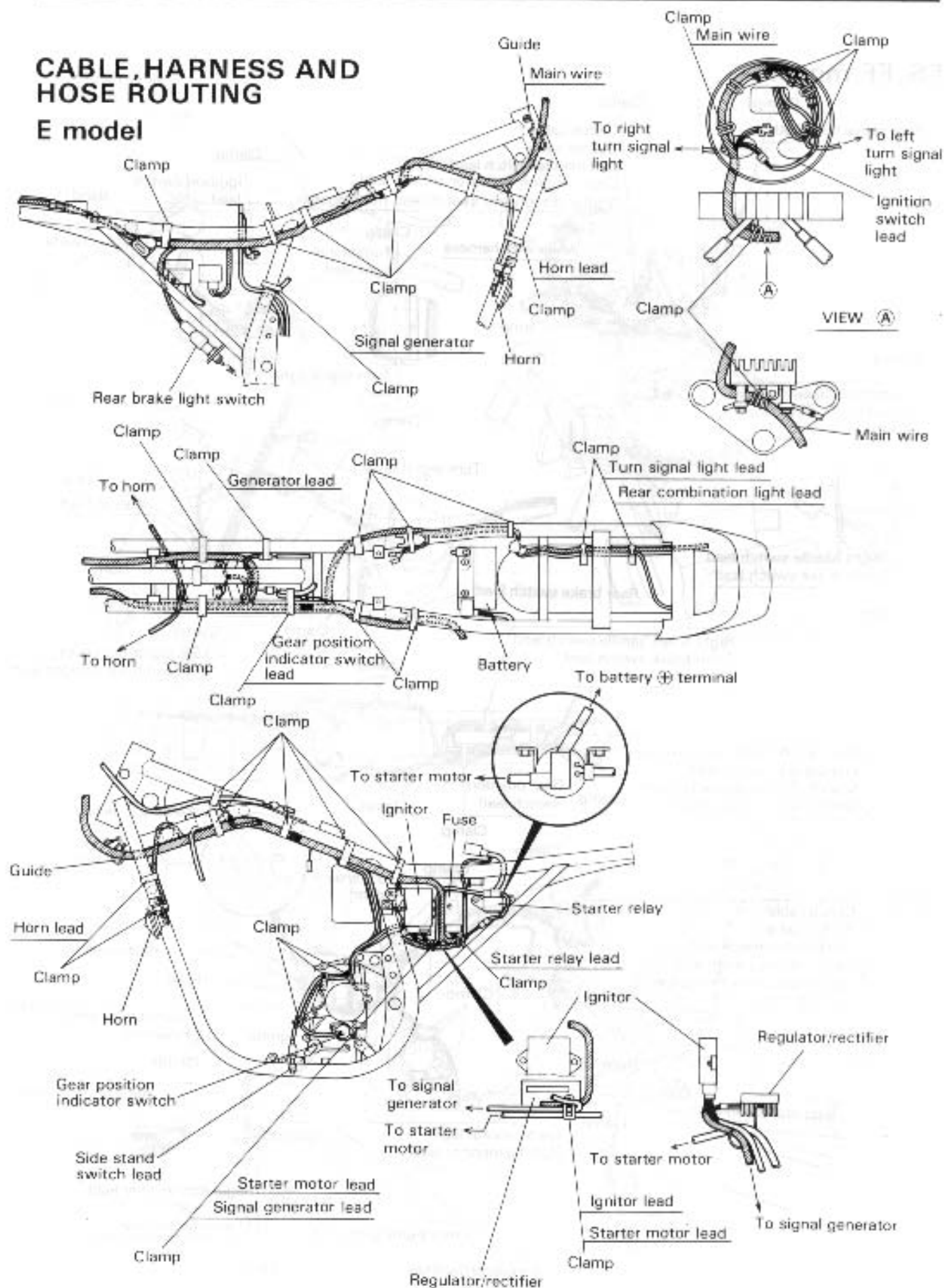
- (1) Place the motorcycle on the center stand.
- (2) Remove the lower cover by loosening two screws (1).
- (3) Loosen either one of two screws (2) on the bottom of fairing.
- (4) Loosen screws (3).
- (5) Turn fasteners (4) 90 degrees counterclockwise to loosen, separate the two fairing lower halves and detach them from the frame.

#### NOTE:

When installing the lower fairing halves on-to the frame, first tighten fasteners with screws and fitted loosely, then tighten all the screws securely.

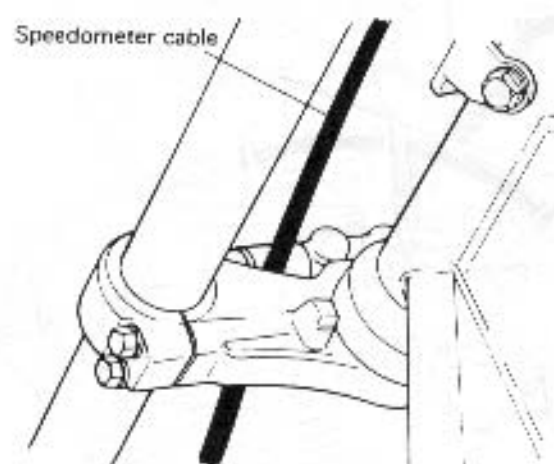
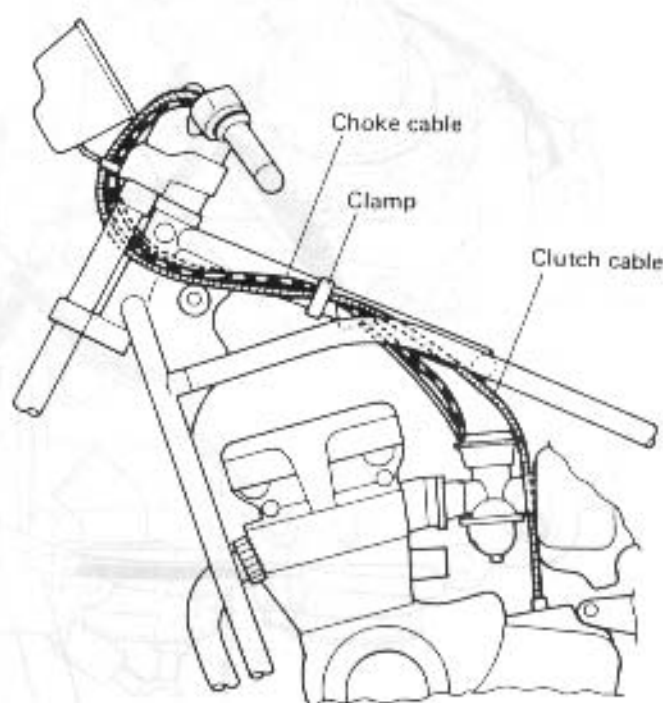
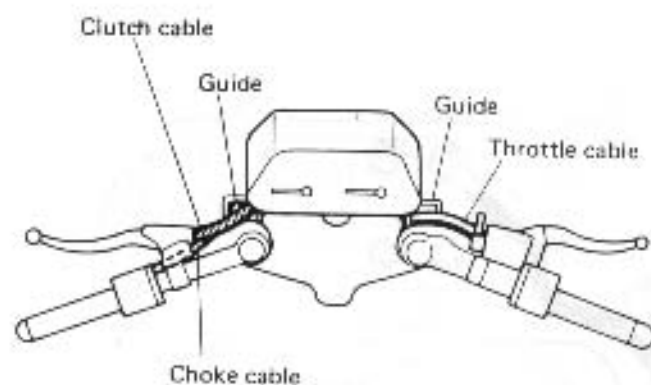
# CABLE, HARNESS AND HOSE ROUTING

## E model

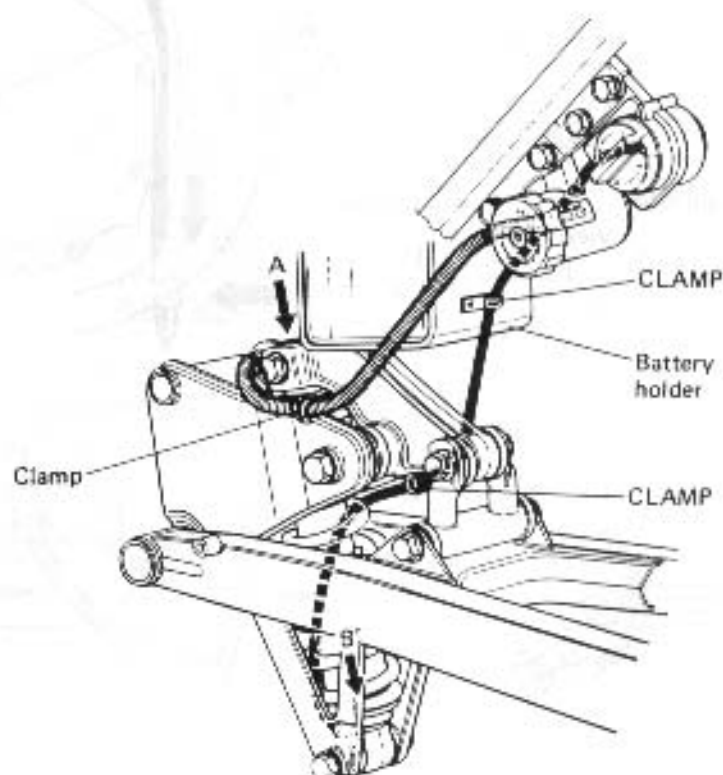
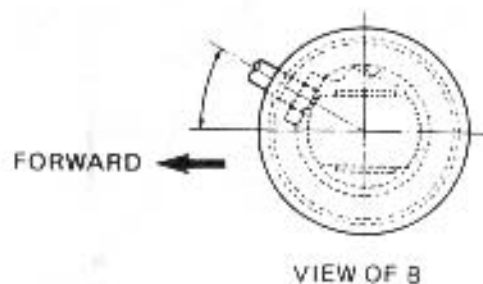
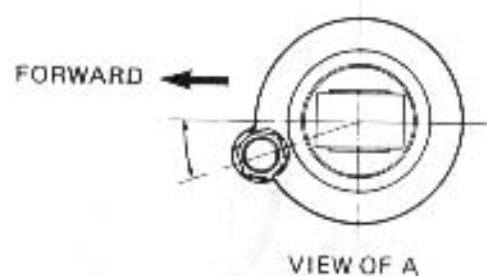


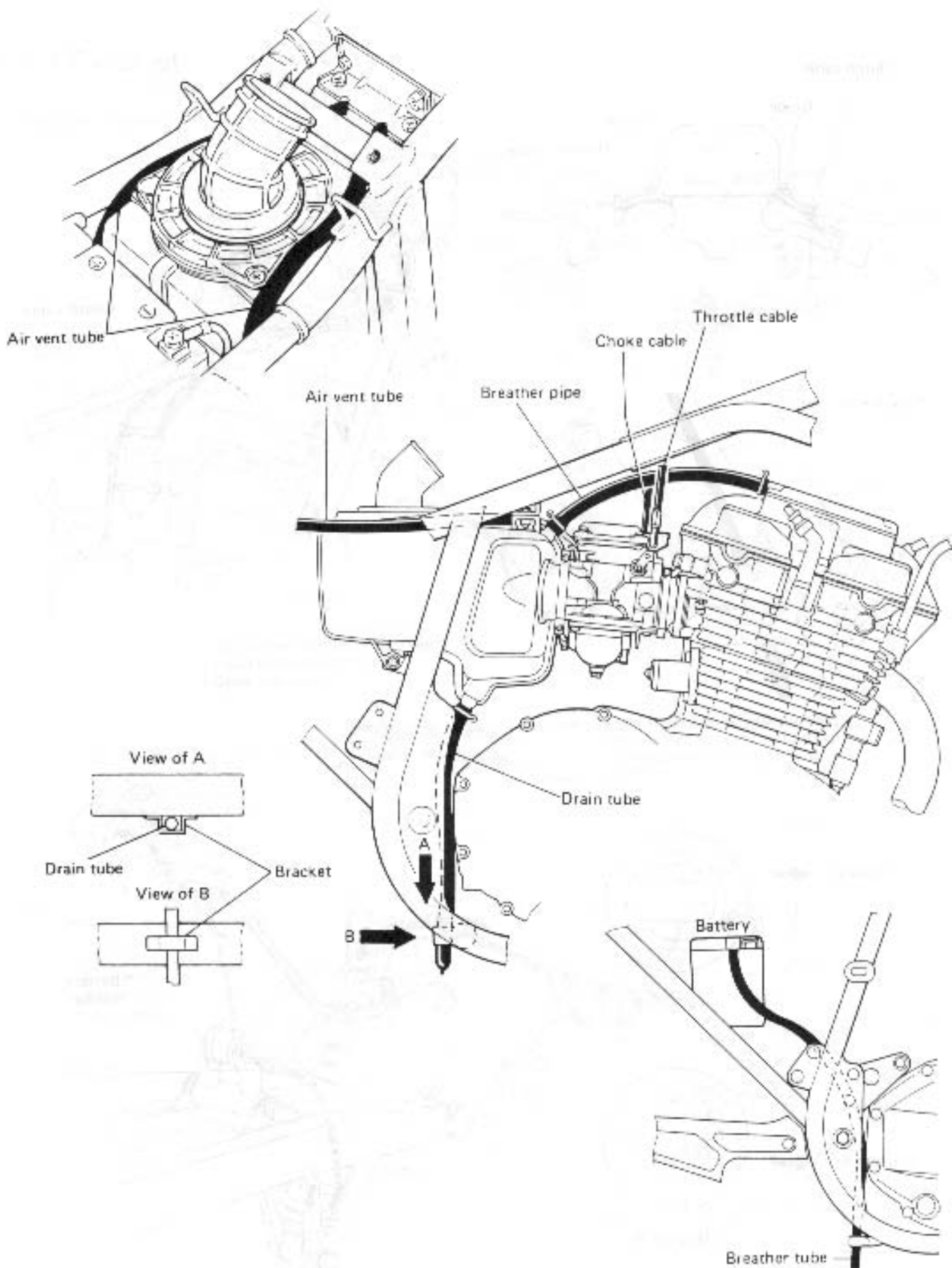
### ES, EF model



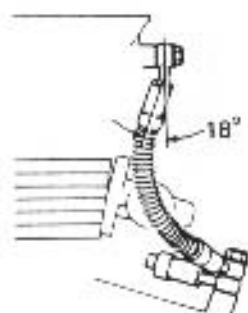
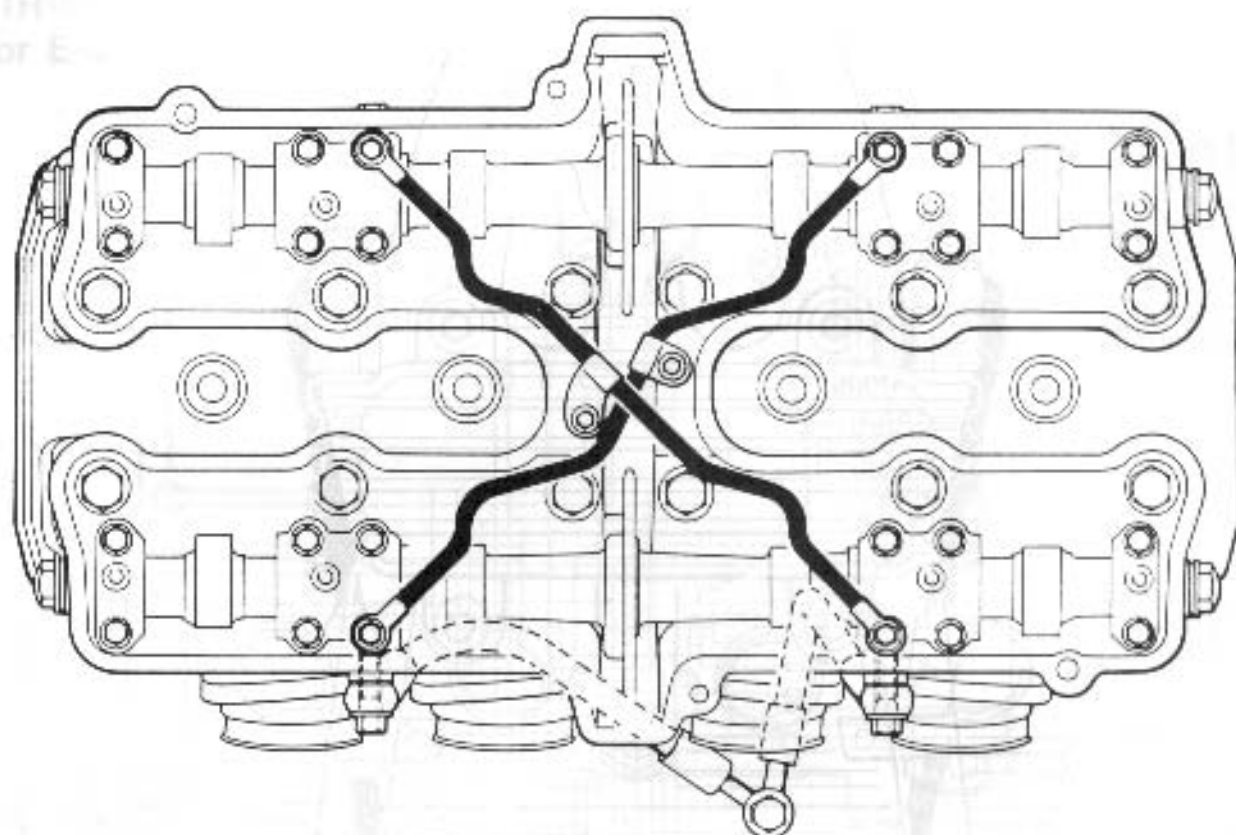


Speedometer cable should be routed between the brake hose joint and steering stem lower bracket.

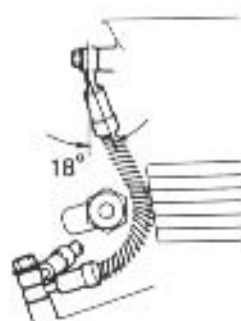
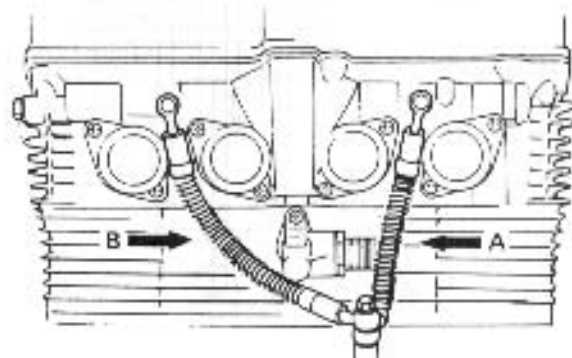




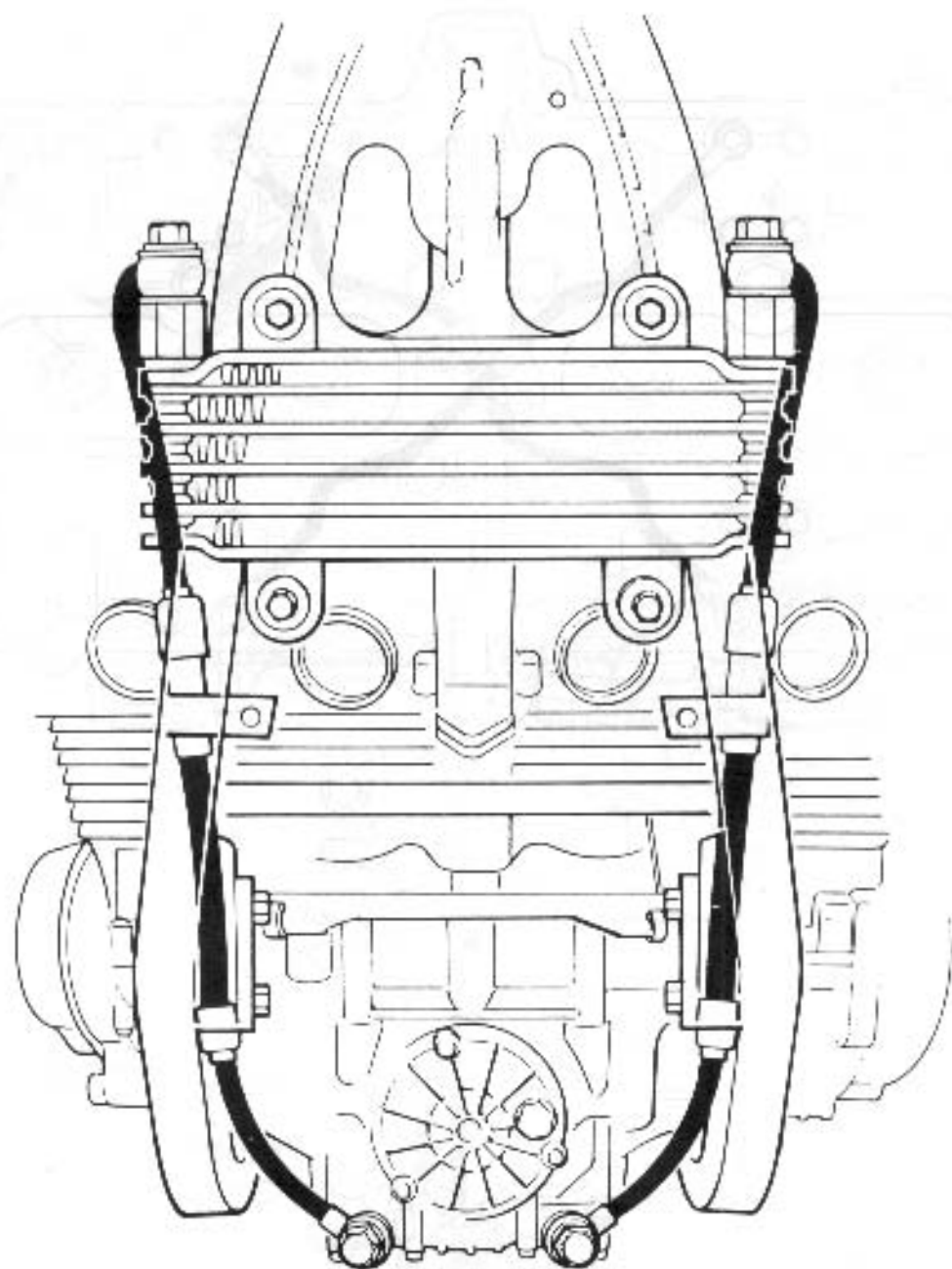
WIRING  
(For ESE)



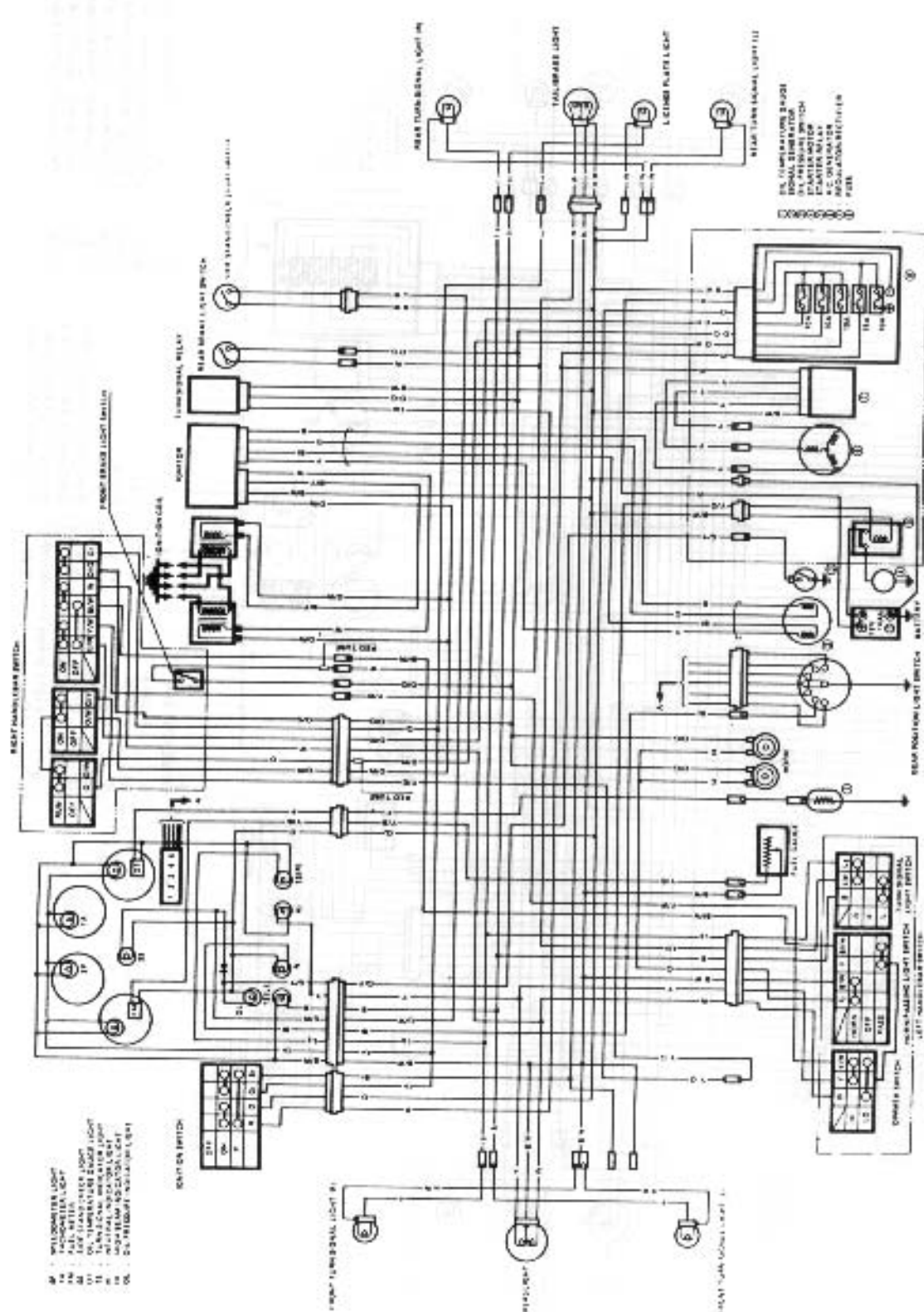
View of B



View of A



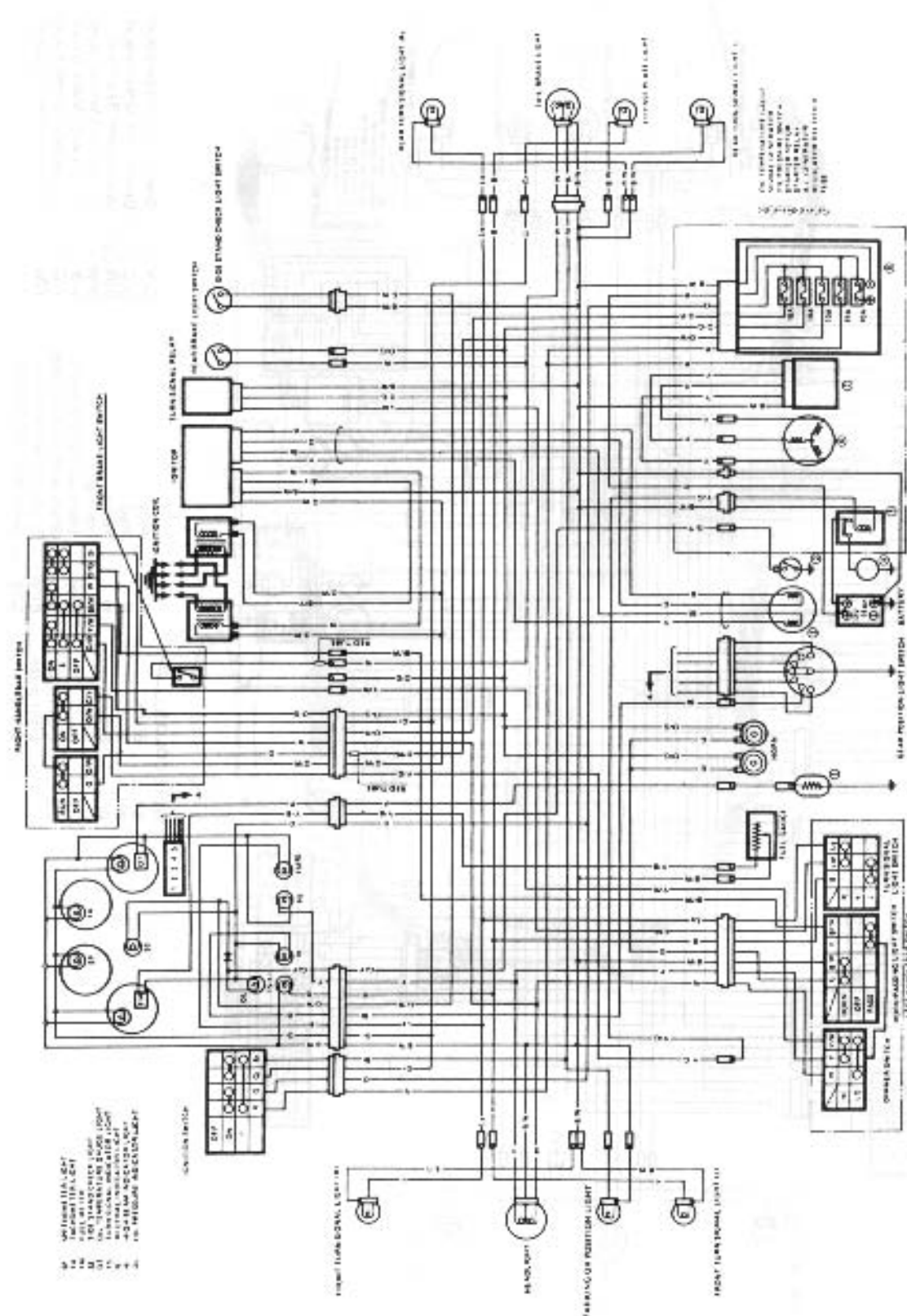
### WIRING DIAGRAM (For E-01,06,24,30)



- |     |                  |
|-----|------------------|
| 10  | WILLIAMSON, JOHN |
| 11  | WILLIAMSON, JOHN |
| 12  | WILLIAMSON, JOHN |
| 13  | WILLIAMSON, JOHN |
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| 97  | WILLIAMSON, JOHN |
| 98  | WILLIAMSON, JOHN |
| 99  | WILLIAMSON, JOHN |
| 100 | WILLIAMSON, JOHN |

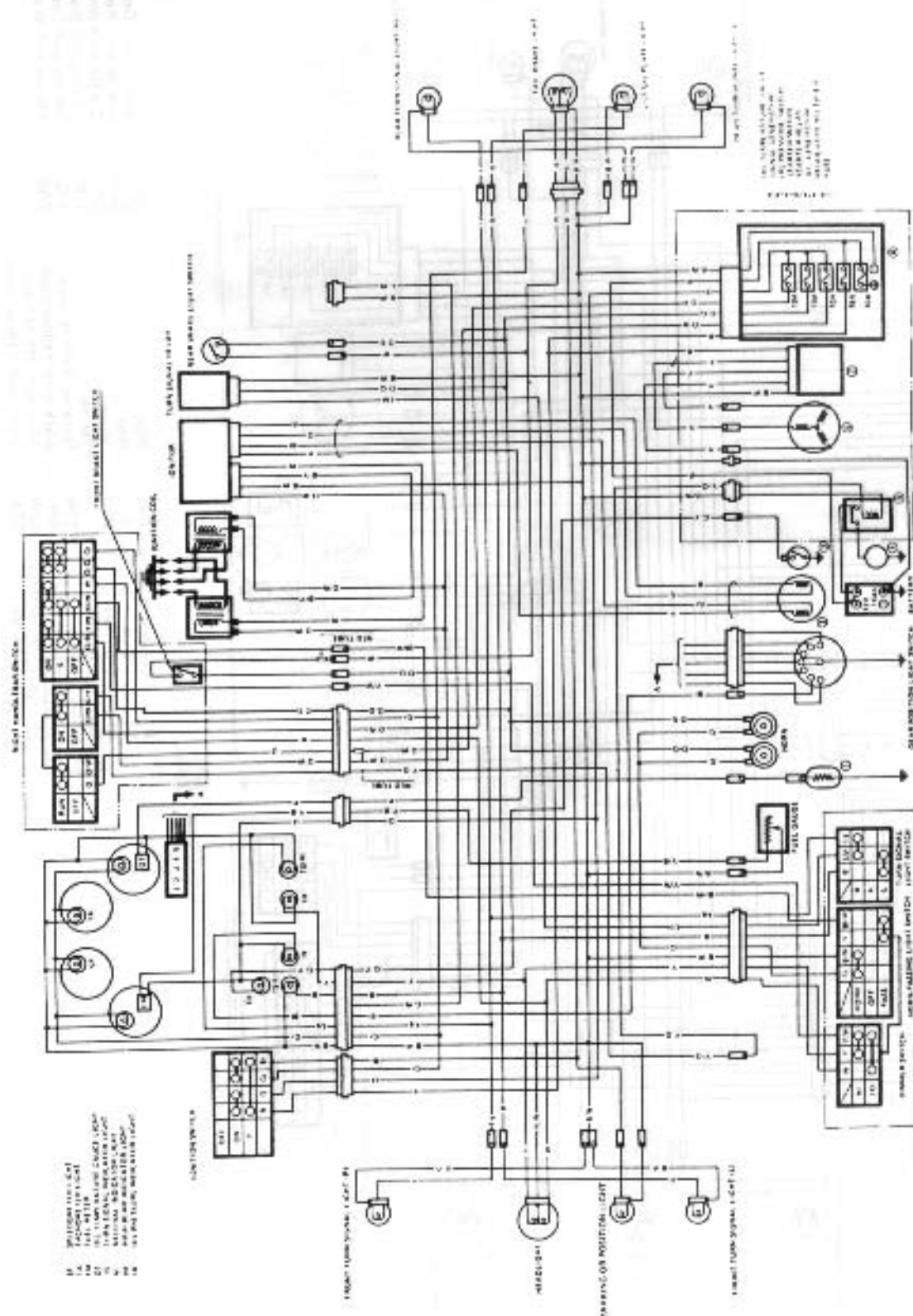
- | WIRE COLOR |                          | P                        | G/Y | Green with Yellow tracer |
|------------|--------------------------|--------------------------|-----|--------------------------|
| B          | Black                    | Black                    |     |                          |
| Bl         | Blue                     | Blue                     |     |                          |
| Br         | Brown                    | Brown                    |     |                          |
| G          | Green                    | Green                    |     |                          |
| Gr         | Gray                     | Gray                     |     |                          |
| Lbl        | Light blue               | Light blue               |     |                          |
| Lg         | Light green              | Light green              |     |                          |
| O          | Orange                   | Orange                   |     |                          |
| P          | Pink                     | Pink                     |     |                          |
| R          | Red                      | Red                      |     |                          |
| W          | White                    | White                    |     |                          |
| Y          | Yellow                   | Yellow                   |     |                          |
| B/W        | Black with White tracer  | Black with White tracer  |     |                          |
| B/Y        | Black with Yellow tracer | Black with Yellow tracer |     |                          |
| Bl/W       | Blue with White tracer   | Blue with White tracer   |     |                          |
| G/W        | Green with White tracer  | Green with White tracer  |     |                          |
| O/G        | Orange with Green tracer | Orange with Green tracer |     |                          |
| O/R        | Orange with Red tracer   | Orange with Red tracer   |     |                          |
| O/W        | Orange with White tracer | Orange with White tracer |     |                          |
| Y/B        | Yellow with Black tracer | Yellow with Black tracer |     |                          |
| Y/G        | Yellow with Green tracer | Yellow with Green tracer |     |                          |
| Y/W        | Yellow with White tracer | Yellow with White tracer |     |                          |

(For E-02,04,15,17,21,25,39)

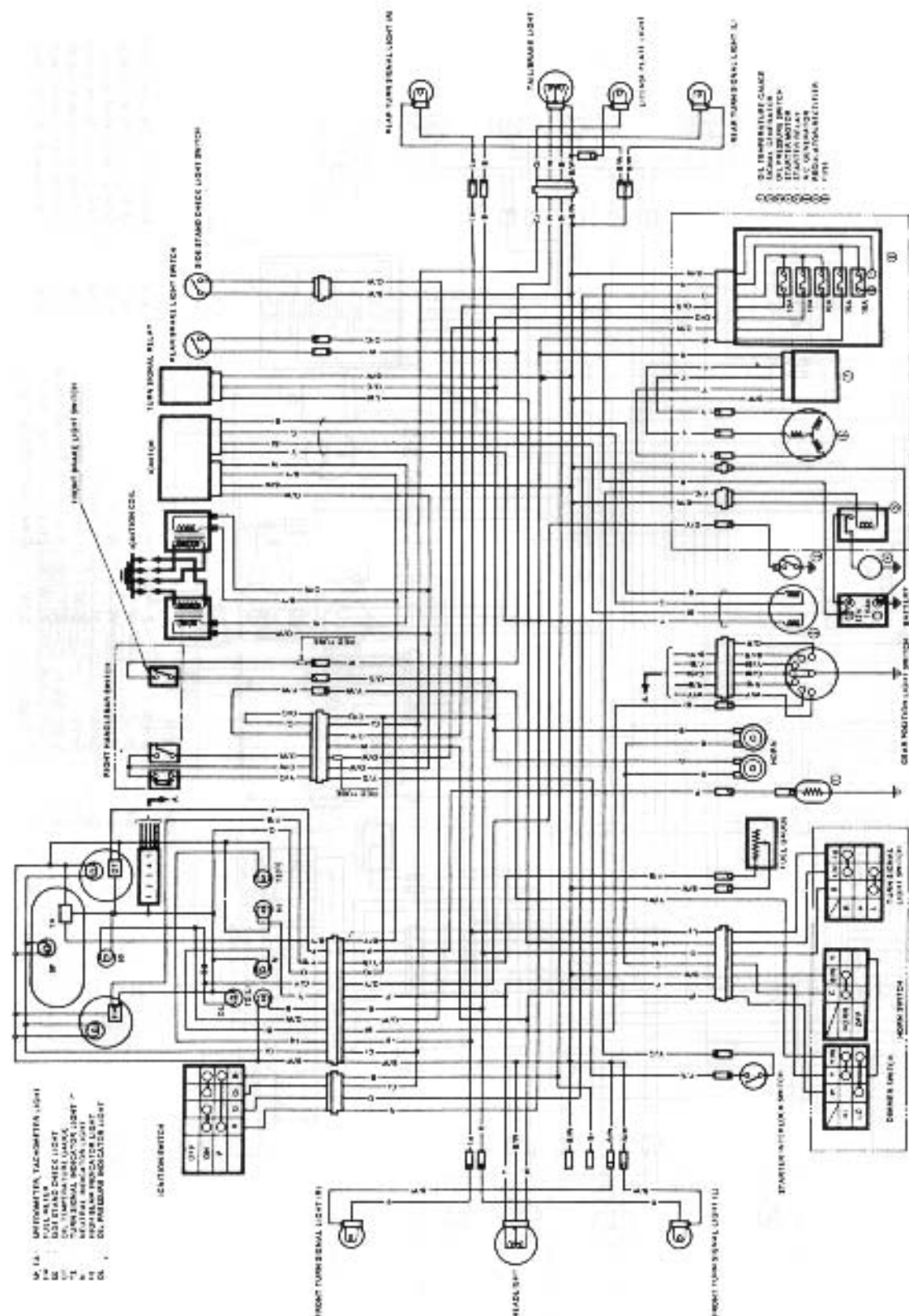




(For E-16,18,22,26)



(For E-28)

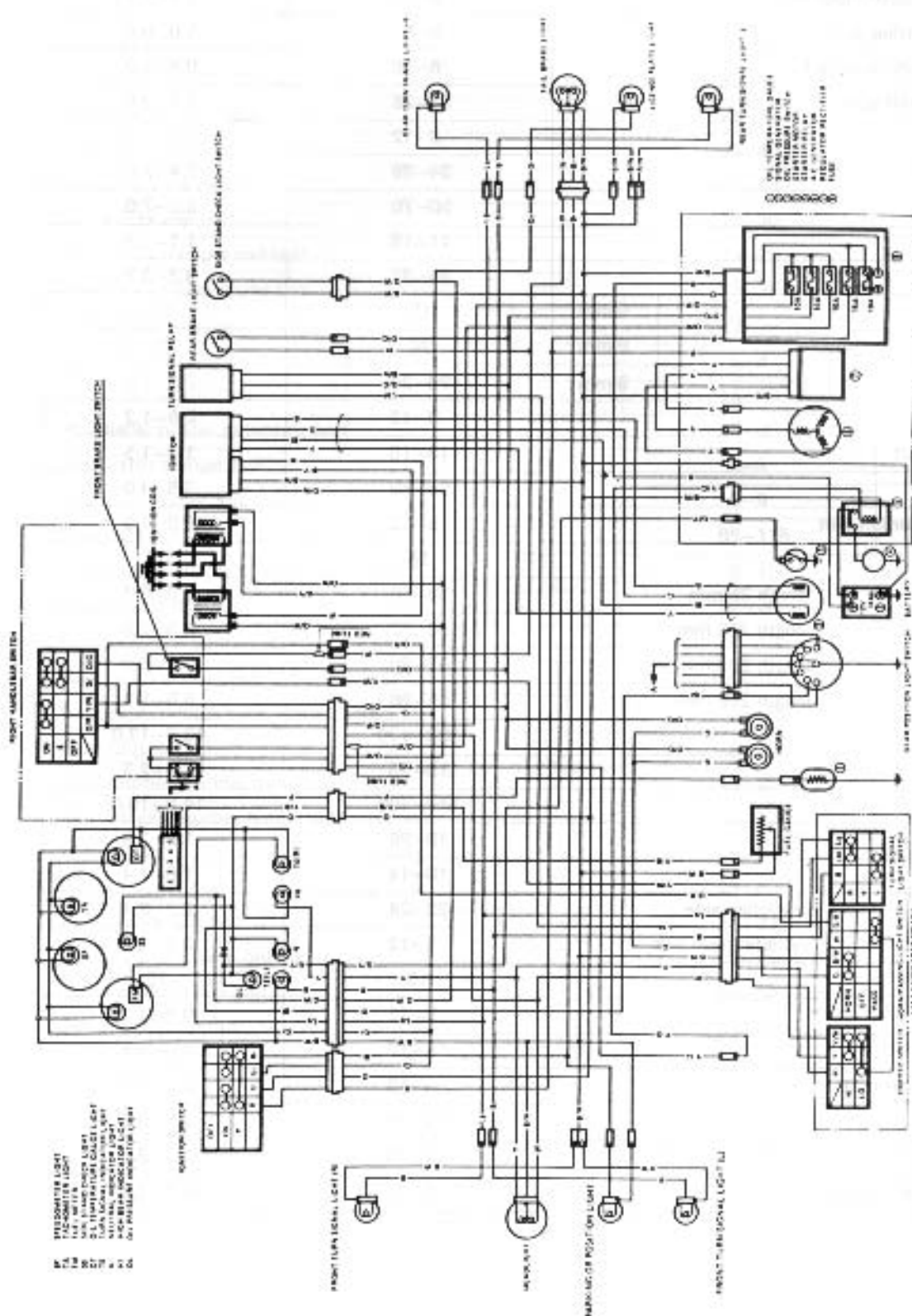


O/G ..... Orange with Green tracer  
 O/R ..... Orange with Red tracer  
 O/W ..... Orange with White tracer  
 Y/B ..... Yellow with Black tracer  
 Y/G ..... Yellow with Green tracer  
 Y/W ..... Yellow with White tracer

P ..... Pink  
 R ..... Red  
 W ..... White  
 Y ..... Yellow  
 B/W ..... Black with White tracer  
 B/Y ..... Black with Yellow tracer  
 G/W ..... Green with White tracer  
 G/Y ..... Green with Yellow tracer

B ..... Black  
 Bl ..... Blue  
 Br ..... Brown  
 G ..... Green  
 Gr ..... Gray  
 Lbl ..... Light blue  
 Lg ..... Light green  
 O ..... Orange

(For E-34)



## WIRE COLOR

|    |             |
|----|-------------|
| B  | Black       |
| Bl | Blue        |
| Br | Brown       |
| G  | Green       |
| Gr | Gray        |
| Lb | Light blue  |
| Lg | Light green |
| O  | Orange      |

|      |                          |
|------|--------------------------|
| P    | Pink                     |
| R    | Red                      |
| W    | White                    |
| Y    | Yellow                   |
| B/W  | Black with White tracer  |
| B/Y  | Black with Yellow tracer |
| Bl/W | Blue with White tracer   |
| G/W  | Green with White tracer  |

|     |                          |
|-----|--------------------------|
| G/Y | Green with Yellow tracer |
| O/G | Orange with Green tracer |
| O/R | Orange with Red tracer   |
| O/W | Orange with White tracer |
| Y/B | Yellow with Black tracer |
| Y/G | Yellow with Green tracer |
| Y/W | Yellow with White tracer |

## TIGHTENING TORQUE

### ENGINE

| ITEM                                  |                    | N-m     | kg-m      |
|---------------------------------------|--------------------|---------|-----------|
| Cam chain tensioner adjuster lock nut |                    | 9-14    | 0.9-1.4   |
| Cam chain tensioner fitting bolt      |                    | 6-8     | 0.6-0.8   |
| Cam chain tensioner lock shaft nut    |                    | 8-10    | 0.8-1.0   |
| Cam chain tensioner shaft ass'y       |                    | 31-35   | 3.1-3.5   |
| Cam shaft holder bolt                 |                    | 8-12    | 0.8-1.2   |
| Cam shaft sprocket bolt               |                    | 24-26   | 2.4-2.6   |
| Clutch sleeve hub nut                 |                    | 50-70   | 5.0-7.0   |
| Clutch spring bolt                    |                    | 11-13   | 1.1-1.3   |
| Conrod nut                            |                    | 33-37   | 3.3-3.7   |
| Crankcase bolt                        | 6 mm               | 10      | 1.0       |
|                                       | 8 mm               | 20      | 2.0       |
|                                       | 8 mm               | 20-24   | 2.0-2.4   |
| Cylinder head bolt                    |                    | 8-12    | 0.8-1.2   |
| Cylinder head cover bolt              |                    | 13-15   | 1.3-1.5   |
| Cylinder head nut                     |                    | 35-40   | 3.5-4.0   |
| Cylinder head oil pipe union bolt     |                    | 8-12    | 0.8-1.2   |
| Cylinder stud bolt                    |                    | 16      | 1.6       |
| Engine mounting bolt                  | length 35 mm       | 50-60   | 5.0-6.0   |
|                                       | length 165 mm      | 60-72   | 6.0-7.2   |
|                                       | length 205 mm      | 67-80   | 6.7-8.0   |
|                                       | length 255 mm      | 55-66   | 5.5-6.6   |
| Engine sprocket nut                   |                    | 100-130 | 10.0-13.0 |
| Gearshift arm stopper                 |                    | 15-23   | 1.5-2.3   |
| Generator rotor nut                   |                    | 140-160 | 14.0-16.0 |
| Neutral stopper housing               |                    | 18-28   | 1.8-2.8   |
| Oil gallery bolt                      |                    | 10-14   | 1.0-1.4   |
| Oil hose union bolt                   | crankcase side     | 22-24   | 2.2-2.4   |
|                                       | cylinder head side | 8-12    | 0.8-1.2   |
| Oil pan bolt                          |                    | 10      | 1.0       |
| Oil pipe holder bolt                  |                    | 8-12    | 0.8-1.2   |
| Oil pressure switch                   |                    | 13-17   | 1.3-1.7   |
| Rocker arm shaft stopper bolt         |                    | 8-10    | 0.8-1.0   |
| Signal generator bolt                 |                    | 25-35   | 2.5-3.5   |
| Starter clutch allen bolt             |                    | 23-28   | 2.3-2.8   |
| Valve clearance adjuster lock nut     |                    | 9-11    | 0.9-1.1   |

## CHASSIS

| ITEM                                     | N·m    | kg·m     |
|------------------------------------------|--------|----------|
| Brake hose union bolt                    | 20–25  | 2.0–2.5  |
| Caliper air bleeder                      | 6–9    | 0.6–0.9  |
| Disc bolt                                | 15–25  | 1.5–2.5  |
| Front axle holder nut                    | 15–25  | 1.5–2.5  |
| Front axle nut                           | 36–52  | 3.6–5.2  |
| Front caliper axle bolt                  | 25–35  | 2.5–3.5  |
| Front caliper mounting bolt              | 25–40  | 2.5–4.0  |
| Front footrest bolt                      | 27–43  | 2.7–4.3  |
| Front fork cap bolt                      | 15–30  | 1.5–3.0  |
| Front fork damper rod bolt               | 15–25  | 1.5–2.5  |
| Front fork lower clamp bolt              | 15–25  | 1.5–2.5  |
| Front fork upper clamp bolt              | 20–30  | 2.0–3.0  |
| Front master cylinder clamp bolt         | 5–8    | 0.5–0.8  |
| Handlebar clamp bolt                     | 15–25  | 1.5–2.5  |
| Handlebar holder mounting bolt           | 25–35  | 2.5–3.5  |
| Modulator plunger bolt                   | 3–5    | 0.3–0.5  |
| Modulator valve bolt                     | 6–9    | 0.6–0.9  |
| Rear axle nut                            | 85–115 | 8.5–11.5 |
| Rear brake pedal arm bolt                | 6–10   | 0.6–1.0  |
| Rear caliper bolt                        | 20–30  | 2.0–3.0  |
| Rear caliper mounting bolt               | 25–40  | 2.5–4.0  |
| Rear cushion lever bolt                  | 70–100 | 7.0–10.0 |
| Rear cushion upper and lower bolts       | 70–100 | 7.0–10.0 |
| Rear footrest mounting bolt              | 8–12   | 0.8–1.2  |
| Rear master cylinder mounting bolt       | 18–28  | 1.8–2.8  |
| Rear shock absorber fitting bolt (upper) | 48–72  | 4.8–7.2  |
| (lower)                                  | 40–60  | 4.0–6.0  |
| Rear sprocket nut                        | 25–40  | 2.5–4.0  |
| Rear torque link bolt                    | 20–30  | 2.0–3.0  |
| Steering stem clamp bolt                 | 15–25  | 1.5–2.5  |
| Steering stem head bolt                  | 20–30  | 2.0–3.0  |
| Swing arm pivot nut                      | 50–80  | 5.0–8.0  |

# GSX750SE('84-MODEL)

*This section gives service data and servicing procedure which differ from those of the GSX750S.*

*Please also refer to the sections, 1 through 7, for all other areas of information not covered in this section.*

*This section 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 kindly requested to make query about updated information, if any.*

## NOTE:

Asterisk mark (\*) indicates New E model specification.

## CONTENTS

|                                                          |       |
|----------------------------------------------------------|-------|
| <b>VIEW OF GSX750SE</b> .....                            | 9- 1  |
| <b>SPECIFICATIONS</b> .....                              | 9- 2  |
| <b>PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES</b> ..... | 9- 3  |
| <b>SERVICING ENGINE</b> .....                            | 9- 5  |
| <b>ELECTRICAL</b> .....                                  | 9- 8  |
| <b>CHASSIS</b> .....                                     | 9- 16 |
| <b>SERVICING INFORMATION</b> .....                       | 9-33  |



## VIEW OF GSX750SE



RIGHT SIDE



LEFT SIDE

## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

|                    |         |
|--------------------|---------|
| * Overall length   | 2190 mm |
| Overall width      | 760 mm  |
| * Overall height   | 1160 mm |
| * Wheelbase        | 1510 mm |
| * Ground clearance | 150 mm  |
| * Dry mass         | 212 kg  |

### ENGINE

|                     |                                     |
|---------------------|-------------------------------------|
| Type                | Four-stroke, air-cooled, DOHC, TSCC |
| Number of cylinders | 4                                   |
| Bore                | 67.0 mm                             |
| Stroke              | 53.0 mm                             |
| Piston displacement | 747 cm <sup>3</sup>                 |
| Compression ratio   | 9.6 : 1                             |
| Carburetor          | MIKUNI BS32SS                       |
| 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 | 1.895 (91/48)                                             |
| * Final reduction | 3.214 (45/14) ... E-24<br>3.071 (43/14)<br>... The others |
| Gear ratios, Low  | 2.500 (35/14)                                             |
| 2nd               | 1.750 (28/16)                                             |
| 3rd               | 1.368 (26/19)                                             |
| 4th               | 1.130 (26/23)                                             |
| Top               | 0.956 (22/23)                                             |
| * Drive chain     | D.I.D.: 50V<br>TAKASAGO: RK50GO<br>114 links              |

\*Asterisk indicates the new GSX750S specification.

### CHASSIS

|                     |                                                        |
|---------------------|--------------------------------------------------------|
| * Front suspension  | Telescopic, pneumatic/coil spring, oil dampened        |
| * Rear suspension   | Full-floating suspension system                        |
| * Steering angle    | 30° (right & left)                                     |
| * Caster            | 60° 45'                                                |
| * Trail             | 112 mm                                                 |
| * Turning radius    | 3.5 m                                                  |
| * Front brake       | Disc brake, twin                                       |
| Rear brake          | Disc brake                                             |
| Front tire size     | 120/80V 16 ... E-24<br>100/90-16 54H<br>... The others |
| * Rear tire size    | 130/80V 18 ... E-24<br>120/90-17 64H<br>... The others |
| Front fork stroke   | 150 mm                                                 |
| * Rear wheel travel | 110 mm                                                 |

### ELECTRICAL

|                   |                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------|
| Ignition type     | Transistorized                                                                                     |
| Ignition timing   | 13° B.T.D.C. below<br>1500 r/min and 35°<br>B.T.D.C. above 2350<br>r/min                           |
| * Spark plug      | N.G.K.: D9EA<br>N.D.: X27ES-U<br>... E-24, 27<br>N.G.K.: DR8ES<br>N.D.: X24ESR-U<br>... The others |
| Battery           | 12V 50.4 kC<br>(14 Ah)/10HR                                                                        |
| Generator         | Three-phase A.C.<br>Generator                                                                      |
| * Fuse            | 10/10/10/10/10A                                                                                    |
| * Circuit breaker | 30A                                                                                                |

### CAPACITIES

|                               |        |
|-------------------------------|--------|
| * Fuel tank including reserve | 21.0 L |
| reserve                       | 4.0 L  |
| Engine oil                    | 3.2 L  |
| * Front fork oil              | 259 ml |

These specifications are subject to change without notice.

## PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

Because the clutch has been changed to a hydraulic type, item of clutch hose and clutch fluid have been added to the PERIODIC MAINTENANCE CHART.

Clutch cable is eliminated. All other items remain as same as GSX750ED model.

| Interval<br>Item | Initial 1000 km       | Every 5000 km | Every 10 000 km |
|------------------|-----------------------|---------------|-----------------|
| Clutch hose      | Inspect               | —             | Inspect         |
|                  | Replace every 4 years |               |                 |
| Clutch fluid     | Change every 2 years  |               |                 |

## MAINTENANCE AND TUNE-UP PROCEDURES

For the points listed below, inspection methods and specs for GSX750SE ('84-model) are different from those for GSX750ED/ESD ('83-model).

### SPARK PLUG

Spark plug replacement guide have been changed as shown in figure.

| N.G.K.          | NIPPON<br>DENSO     | REMARKS                                                                   |
|-----------------|---------------------|---------------------------------------------------------------------------|
| D8EA<br>DR8ES-L | X24ES-U<br>X24ESR-U | If the standard plug is apt to get wet, replace with this plug, Hot type. |
| D9EA<br>DR8ES   | X27ES-U<br>X27ESR-U | Standard                                                                  |

### CLUTCH

#### CLUTCH FLUID LEVEL

- Support the motorcycle on the center stand, and place the handlebars straight.
- Check the clutch fluid level in the reservoir.
- If the level is found to be lower than the lower mark, replenish with BRAKE FLUID that meets the following specification.

|                                  |                         |
|----------------------------------|-------------------------|
| Specification and classification | SAE J1703, DOT3 or DOT4 |
| 99000-23021                      | SUZUKI Brake fluid      |

#### BLEEDING AIR FROM THE CLUTCH FLUID CIRCUIT

The clutch fluid circuit may be purged of air in the following manner:

- Fill up the master cylinder reservoir to the upper end of the inspection window. Replace the reservoir cap to prevent entry of dirt.

#### WARNING:

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



- Attach a pipe to the bleeder valve and insert the free end of the pipe into a receptacle.
- Squeeze and release the clutch lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the fluid runs into the receptacle; this will remove the tension of the clutch lever causing it to touch the handlebars grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.

**NOTE:**

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

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the upper end of the inspection window.

**BRAKES**

- Rear brake pedal height spec is as listed below.
- For the front brake system, the procedure for bleeding the air from the front brake calipers is as shown in the photograph.

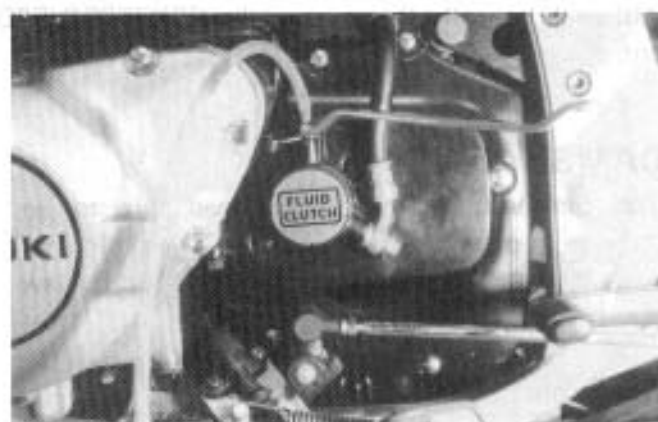
|                    |       |
|--------------------|-------|
| Brake pedal height | 50 mm |
|--------------------|-------|

**NOTE:**

When bleeding the air, always start with the left side.

**FRONT FORK**

A new design anti-dive device (Posi-damp unit) has been adopted on the each fork leg. (See page 18) New service data are indicated in the table on the right.



|                                    |                               |
|------------------------------------|-------------------------------|
| Bleeder valve<br>tightening torque | 6 – 9 N·m<br>(0.6 – 0.9 kg·m) |
|------------------------------------|-------------------------------|

**CAUTION:**

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



| Item               | Standard     | Limit  |
|--------------------|--------------|--------|
| Stroke             | 150 mm       | —      |
| Spring free length | —            | 477 mm |
| Oil level          | 213 mm       | —      |
| Oil type           | Fork oil #15 | —      |
| Oil capacity       | 259 ml       | —      |

## SERVICING ENGINE

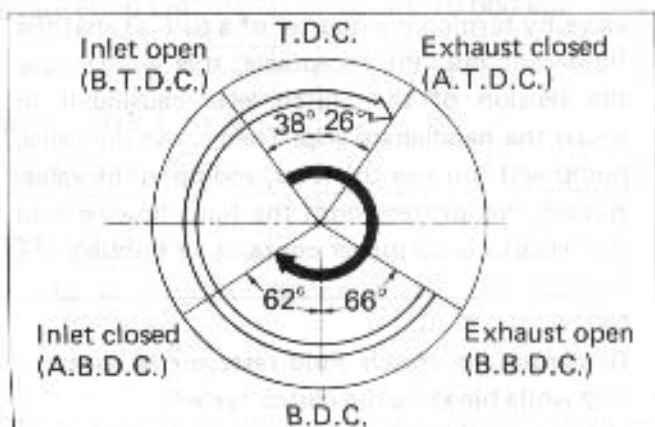
Although basically the same as the GSX750ED/ESD ('83-MODEL) engine, the items listed below are different.

### CAMSHAFT

The camshaft has been redesigned due to an increase in power output, and the valve timing has been changed to that shown on the right. New service data is shown below.

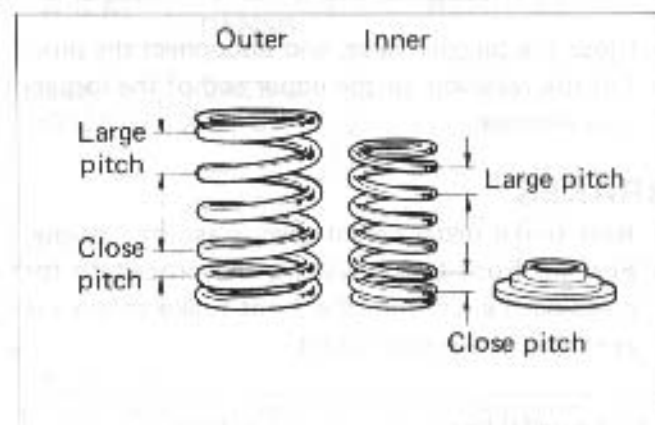
Cam height

|     | Standard         | Limit    |
|-----|------------------|----------|
| IN. | 35.323–35.363 mm | 35.03 mm |
| EX. | 34.652–34.692 mm | 34.36 mm |



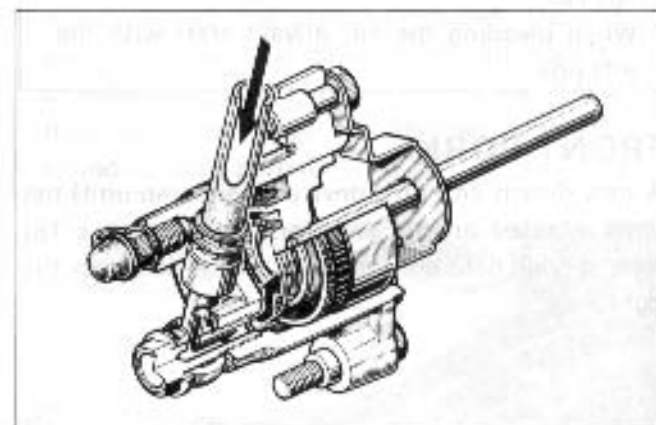
### VALVE SPRING

Two valve springs, inner and outer, are now used instead of just one. As a result, valve response at high engine speed has been improved.



### CLUTCH

The clutch has been changed to a hydraulic type. When the clutch lever is squeezed, oil flows through the clutch hose, applying pressure to the clutch piston, then the piston pushes pressure plate via push rod, disengaging the clutch. The amount of return of the clutch piston is self-adjusting so maintenance of clutch play is no longer necessary.

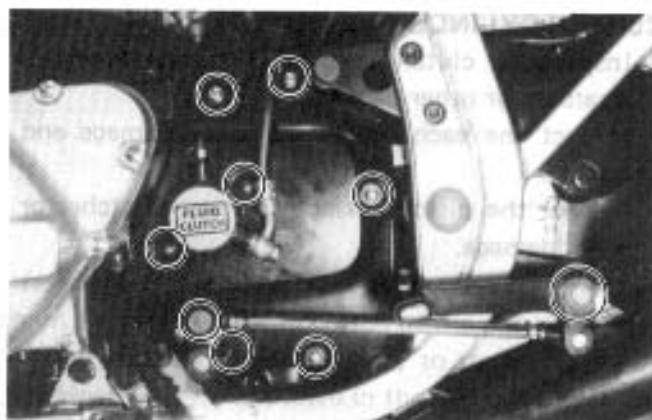




## TECHNICAL

CLUTCH CYLINDER REMOVAL AND DIS-  
ASSEMBLY

- Remove gear shift lever, engine sprocket cover and clutch cylinder bolts.



- Place a cloth underneath the union bolt on the clutch cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose from the clutch cylinder.
- Remove air bleeder valve.

**CAUTION:**

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

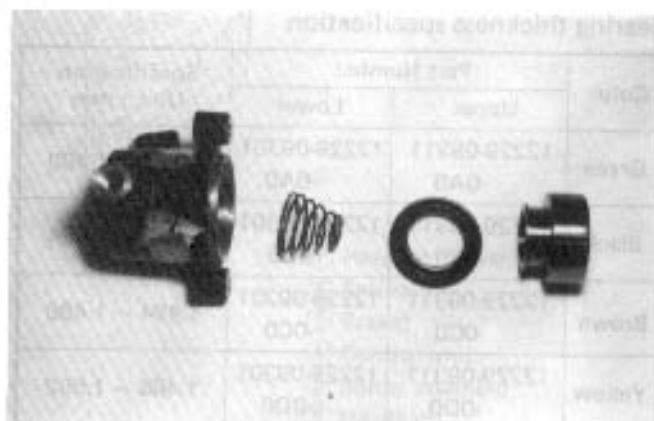
- Remove clutch cylinder.



- Place a rag over the piston to prevent it from popping out. Push out the piston by using air gun.

**CAUTION:**

Do not use high pressure air for preventing piston damage.





**CLUTCH CYLINDER INSPECTION**

- Inspect the clutch cylinder bore wall for nicks, scratches or other damage.
- Inspect the each rubber parts for damage and wear.
- Inspect the piston surface for any scratches or other damage.

**CLUTCH CYLINDER REASSEMBLY**

Reassemble the clutch cylinder in the reverse order of disassembly and by taking the following steps:

**CAUTION:**

Wash the clutch cylinder components with fresh brake fluid before reassembly.

Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the cylinder bore and piston to be inserted into the bore.

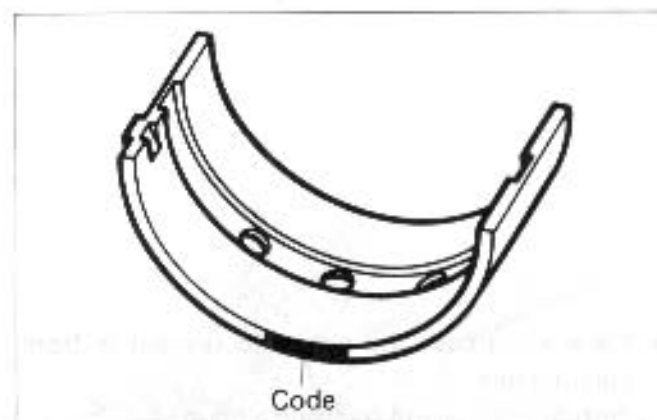
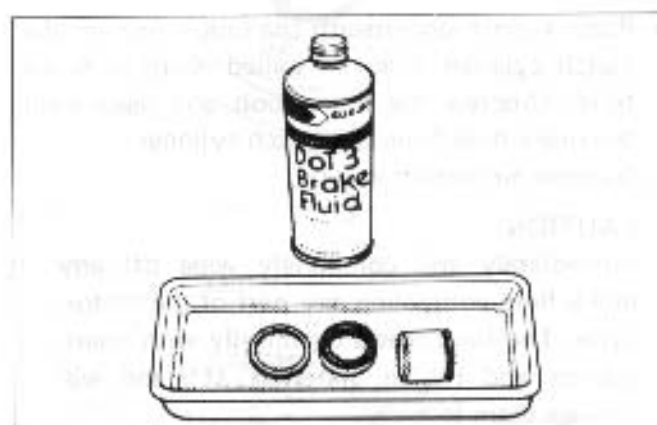
After installing the clutch cylinder to the crankcase, bleed the air from the clutch fluid circuit. (Refer to page 9-3)

**CRANKSHAFT BEARING SELECTION**

The quality of the crankshaft journal bearings has been changed and durability increased. New bearing specs are indicated below. If the oil clearance between the journal bearing and the crankshaft journal exceeds 0.08 mm, please refer to the selection table on page 3-51 of the GSX750E/ES service manual and select the proper size and type of bearings from the table below.

Bearing thickness specification

| Color  | Part Number         |                     | Specification<br>Unit : mm |
|--------|---------------------|---------------------|----------------------------|
|        | Upper               | Lower               |                            |
| Green  | 12229-09311<br>-0A0 | 12229-09301<br>-0A0 | 1.486 - 1.490              |
| Black  | 12229-09311<br>-0B0 | 12229-09301<br>0B0  | 1.490 - 1.494              |
| Brown  | 12229-09311<br>-0C0 | 12229-09301<br>-0C0 | 1.494 - 1.498              |
| Yellow | 12229-09311<br>-0D0 | 12229-09301<br>-0D0 | 1.498 - 1.502              |



## ELECTRICAL

The following items have been incorporated into the electrical system.

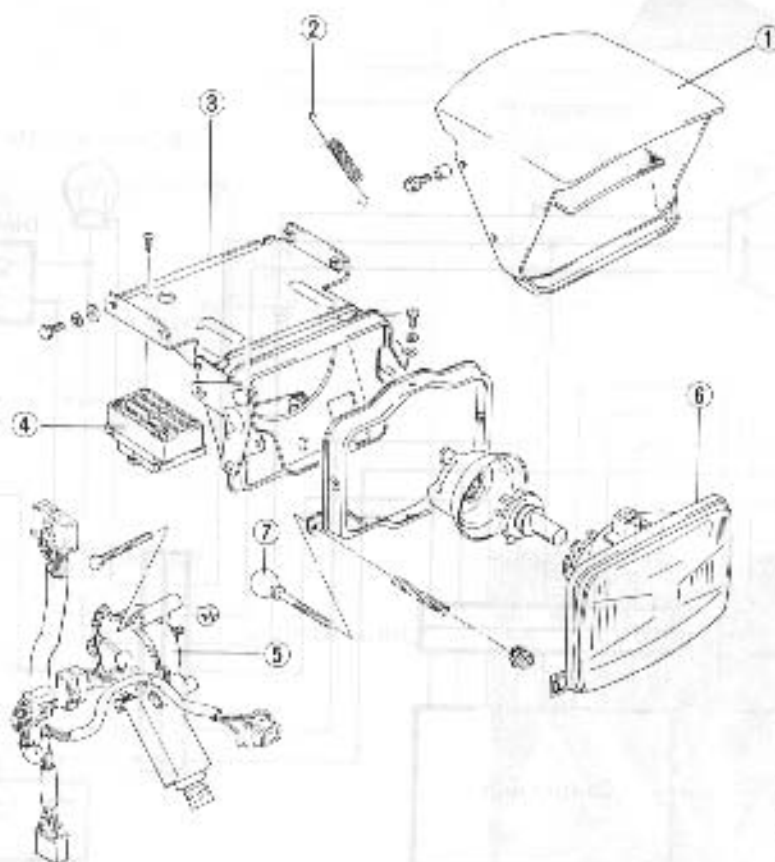
- Retractable headlight
- Newly designed meter
- Turn signal light & Tail/Brake light

### RETRACTABLE HEAD LIGHT

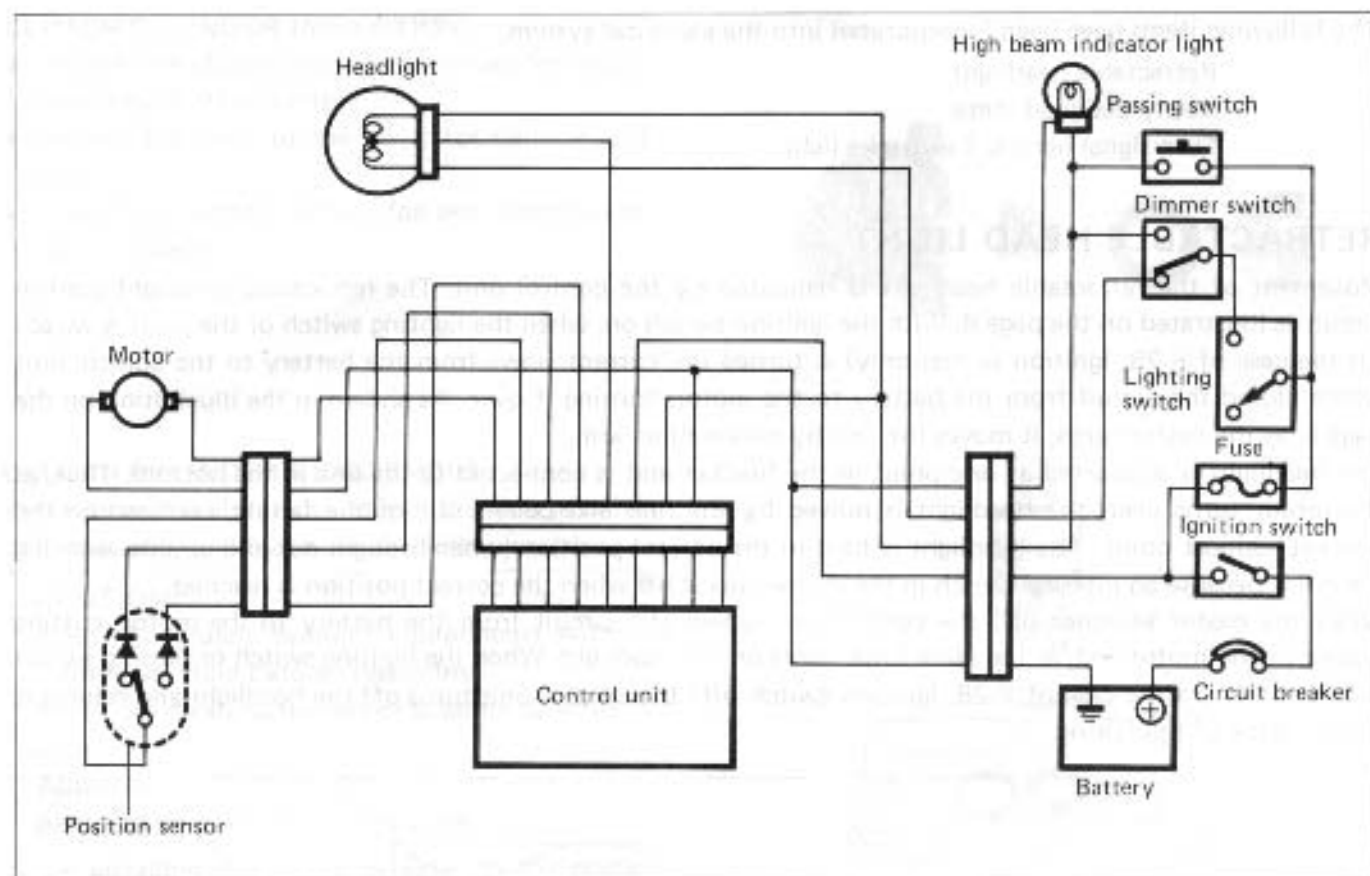
Movement of the retractable headlight is regulated by the control unit. The retractable headlight control circuit is illustrated on the page 8. With the ignition switch on, when the lighting switch or the passing switch (in the case of E-28, ignition switch only) is turned on, current flows from the battery to the control unit which closed the circuit from the battery to the motor, turning it over. As shown in the illustration on the page 9, as the motor turns, it moves the link by means of an arm.

The headlight is supported at one point in the bracket and is connected to the link at the bottom. Thus, as the motor turns over, the headlight is moved by the link and comes out of the fairing, centered on the bracket support point. The headlight is held in the correct position (when brought out and up into working position) because an internal switch in the motor cuts it off when the correct position is reached.

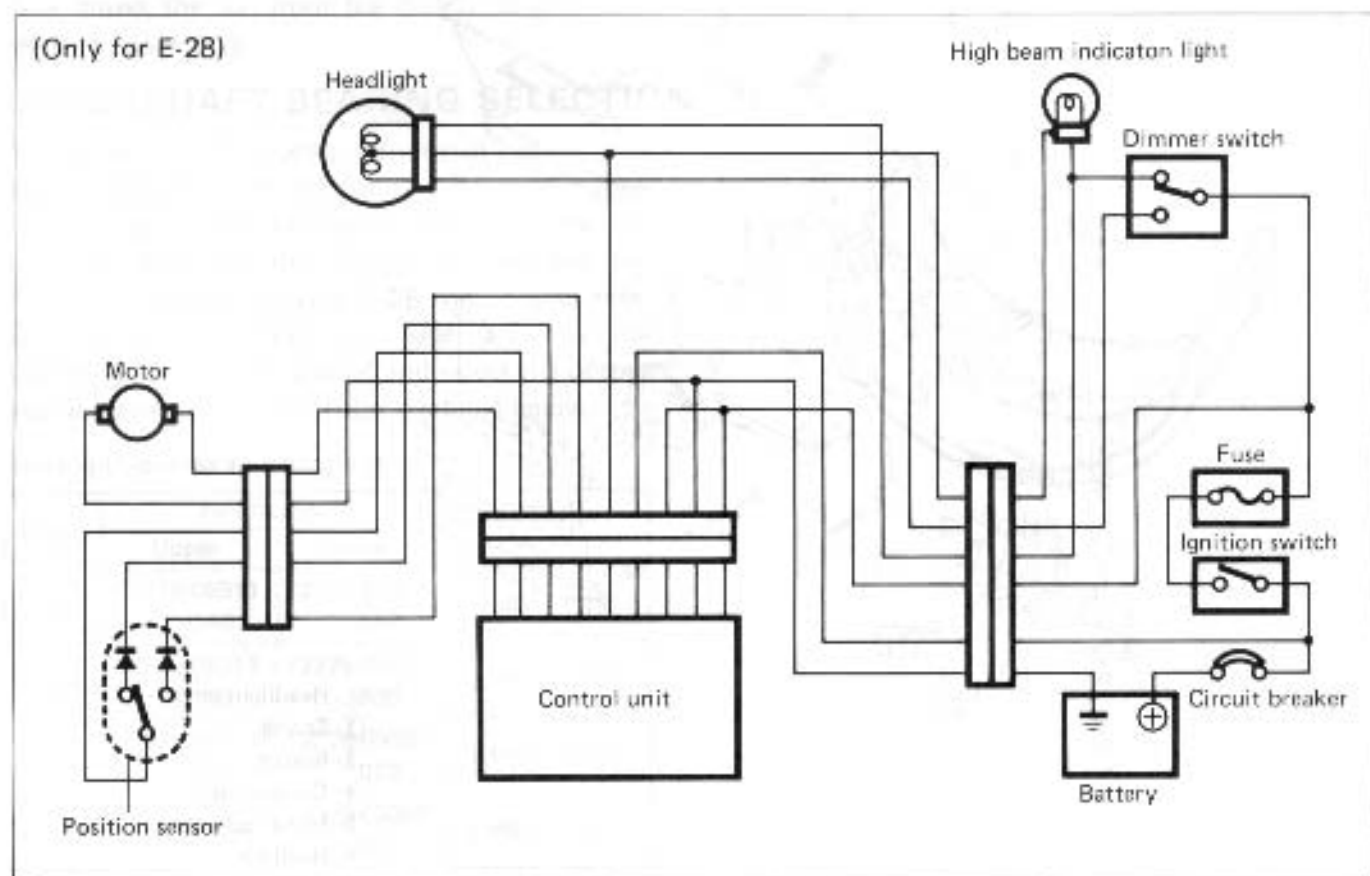
When the motor switches off, the control unit opens the circuit from the battery to the motor, cutting power to the motor and, at the same time, turns on the headlight. When the lighting switch or passing switch is turned off (in the case of E-28, ignition switch off) the control unit turns off the headlight and returns it to the inside of the fairing.

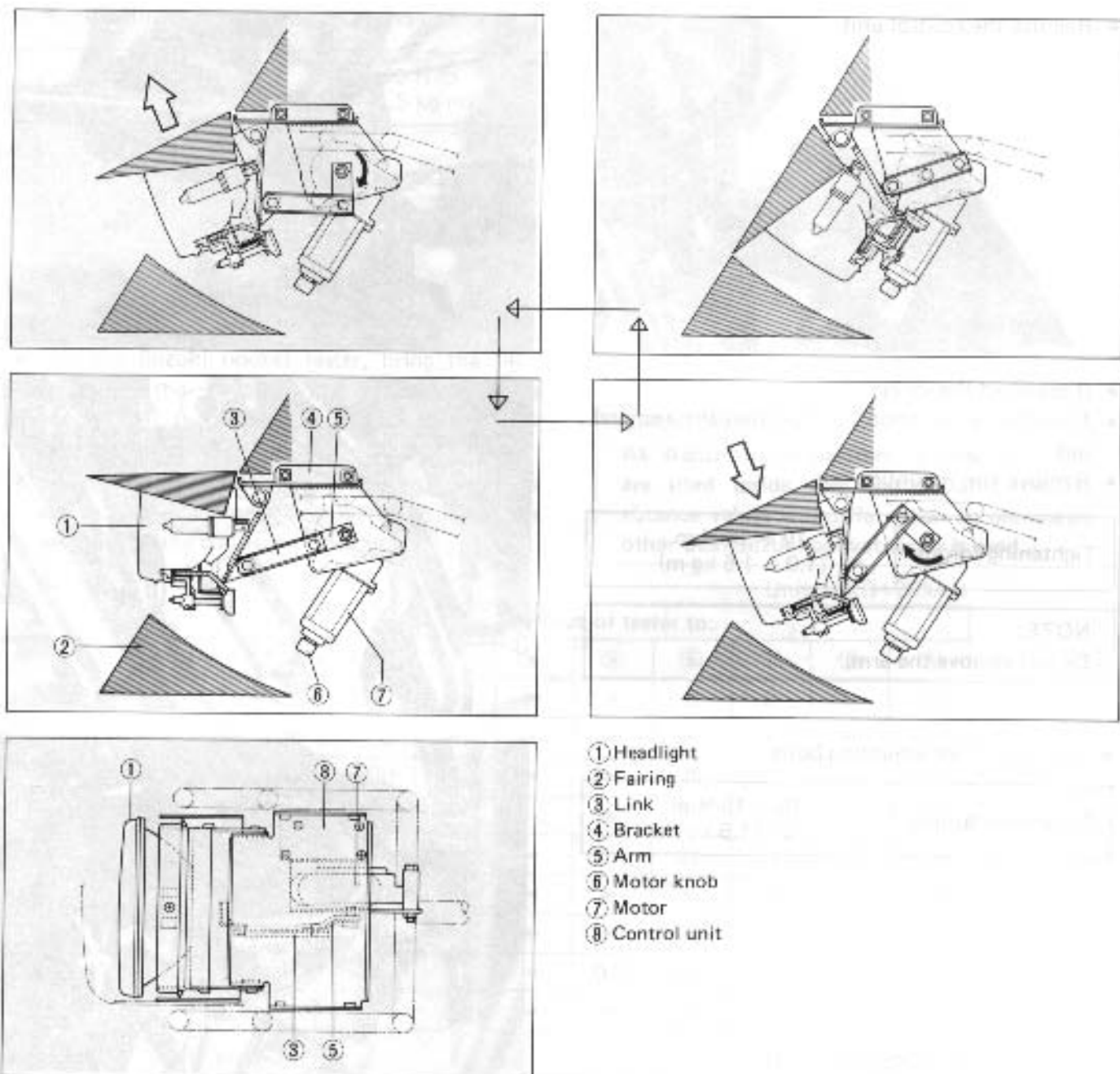


- ① Headlight cover
- ② Spring
- ③ Bracket
- ④ Control unit
- ⑤ Motor assembly
- ⑥ Headlight
- ⑦ Adjusting screw



(Only for E-28)



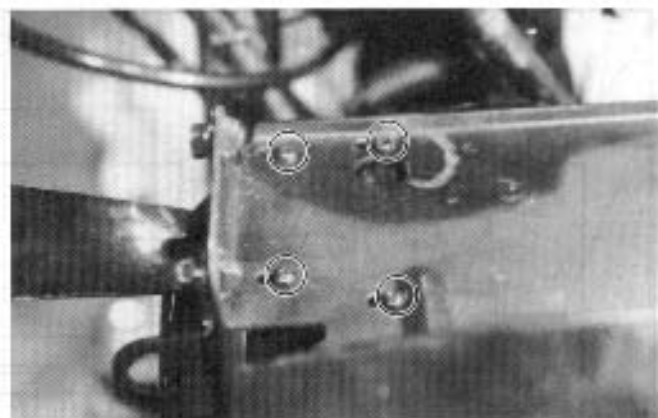


### REMOVAL AND DISASSEMBLY

- Remove fairing (See page 9-17)
- Disconnect the couplers from control unit, motor and headlight.

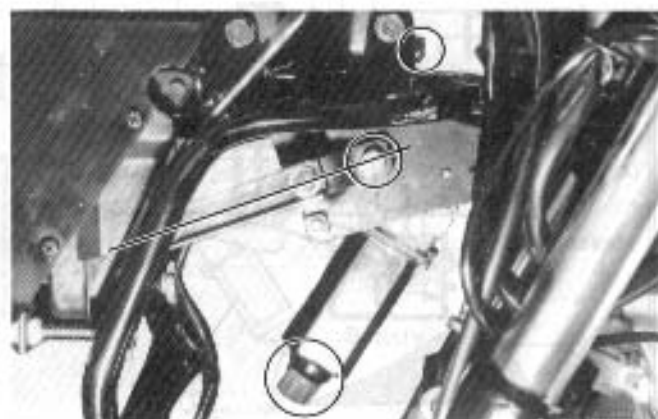


- Remove the control unit.



- Disconnect the spring.
- Turn the motor knob to straighten the arm and link.
- Remove arm mounting nut.

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 10 – 15 N·m<br>(1.0 – 1.5 kg-m) |
|-------------------|---------------------------------|



**NOTE:**  
Do not remove the arm.

- Remove motor mounting bolts.

|                   |                                 |
|-------------------|---------------------------------|
| Tightening torque | 10 – 15 N·m<br>(1.0 – 1.5 kg-m) |
|-------------------|---------------------------------|



- As shown in the photograph, remove the motor assembly by inserting a screwdriver, etc., between the link and the motor axle and prying.

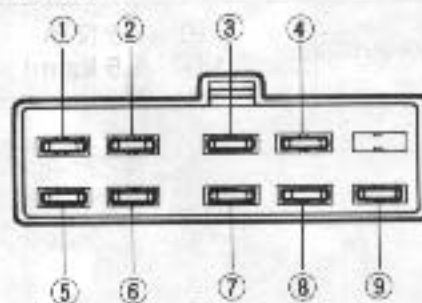
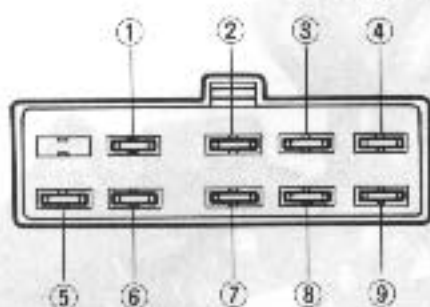








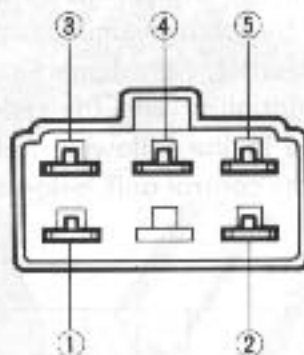
## Control unit couplers identification



(Only for E-28)

## MOTOR UNIT INSPECTION

- Using the Suzuki pocket tester, measure the resistance between ① (⊕ Probe of tester) and ② (⊖ Probe of tester). If the resistance value is not within 0–1Ω, replace unit with a new one. Then turning the motor shaft by hand, inspect the continuity between ③ (⊕ Probe) — ⑤ (⊖ Probe) and between ④ (⊕ Probe) — ⑤ (⊖ Probe). If the motor is normal, there is a open (no conductive) point in one rotation of motor shaft.



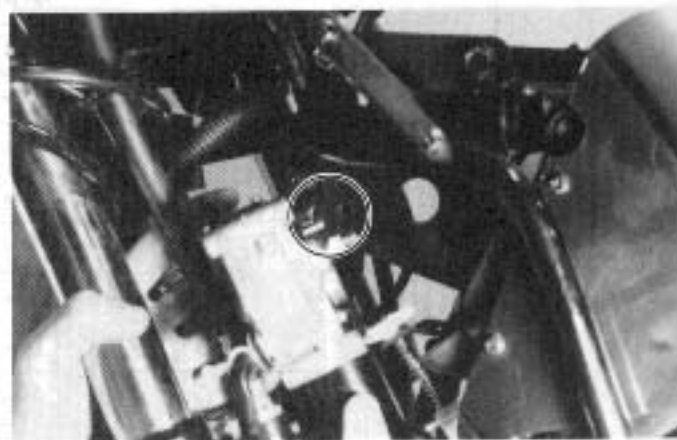
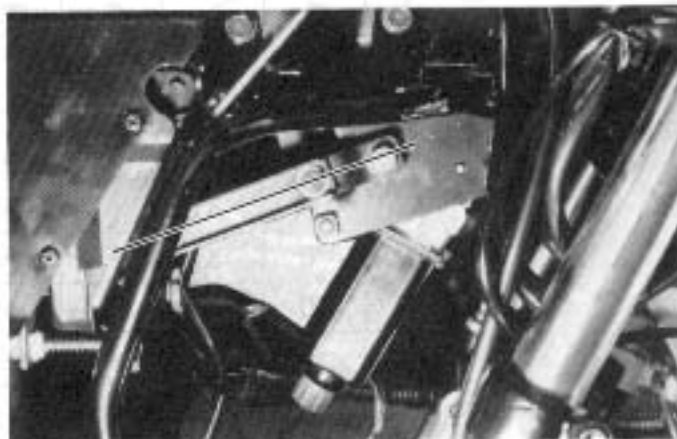
## REASSEMBLY

Reassemble the retractable headlight in the reverse order of disassembly and also carry out the following steps:

- When mounting the motor, first install the arm to motor shaft then insert the motor powl into bracket recess.

## NOTE:

When installing the arm to motor shaft, straighten arm and like correctly.



**CLUTCH**

Unit: mm

| ITEM                      | STANDARD          | LIMIT |
|---------------------------|-------------------|-------|
| Clutch cable play         | 4                 | —     |
| Clutch release screw      | 1/4-1/2 turn back | —     |
| Drive plate thickness     | 2.7–2.9           | 2.6   |
| Drive plate claw width    | 11.8–12.0         | 11.0  |
| Driven plate distortion   | —                 | 0.10  |
| Clutch spring free length | —                 | 34.0  |

**TRANSMISSION + DRIVE CHAIN**

Unit: mm Except ratio

| ITEM                             |                         | STANDARD                       | LIMIT |
|----------------------------------|-------------------------|--------------------------------|-------|
| Primary reduction ratio          |                         | 1.895 ( 91/48 )                | —     |
| Final reduction ratio            | E-06,24<br>(ES,EFmodel) | 3.214 ( 45/14 )                | —     |
|                                  | The others              | * 3.142 ( 44/14 )              | —     |
| Gear ratios                      | Low                     | 2.500 ( 35/14 )                | —     |
|                                  | 2nd                     | 1.750 ( 28/16 )                | —     |
|                                  | 3rd                     | 1.368 ( 26/19 )                | —     |
|                                  | 4th                     | 1.130 ( 26/23 )                | —     |
|                                  | Top                     | 0.956 ( 22/23 )                | —     |
| Shift fork to groove clearance   |                         | 0.10–0.30                      | 0.50  |
| Shift fork groove width          |                         | 5.5–5.6                        | —     |
| Shift fork thickness             |                         | 5.3–5.4                        | —     |
| Countershaft length (Low to 2nd) |                         | 105.9–106.0                    | —     |
| Drive chain                      | Type                    | DAIDO: 50V<br>TAKASAGO: RK50GO | —     |
|                                  | Links                   | 114                            | —     |
|                                  | 20-pitch length         | —                              | 319.4 |
| Drive chain slack                |                         | 30–40                          | —     |

**CARBURETOR**

| ITEM                  | SPECIFICATION     |            |
|-----------------------|-------------------|------------|
|                       | E-18              | The others |
| Carburetor type       | MIKUNI BS32SS     | ←          |
| Bore size             | 32 mm             | ←          |
| I.D. No.              | 31320             | * 31360    |
| Idle r/min.           | 1 150 ± 50 r/min. | ←          |
| Fuel level            | 5.0 ± 0.5 mm      | ←          |
| Float height          | 22.4 ± 1.0 mm     | ←          |
| Main jet (M.J.)       | # 120             | * #117.5   |
| Main air jet (M.A.J.) | 1.7 mm            | * ←        |
| Jet needle (J.N.)     | 5D10-3rd          | * 5C32-3rd |
| Needle jet (N.J.)     | Y-7               | ←          |
| Pilot jet (P.J.)      | # 40              | * #45      |

| ITEM                |          | SPECIFICATION              |                              |
|---------------------|----------|----------------------------|------------------------------|
|                     |          | E-18                       | The others                   |
| By-pass             | (B.P.)   | 0.8,0.8,0.8 mm             | ←                            |
| Pilot outlet        | (P.O.)   | 0.7 mm                     | ←                            |
| Valve seat          | (V.S.)   | 2.0 mm                     | ←                            |
| Starter jet         | (G.S.)   | # 45                       | ←                            |
| Pilot screw         | (P.S.)   | PRE-SET (2 1/4 turns back) | * PRE-SET (1 1/4 turns back) |
| Pilot air jet       | (P.A.J.) | # 155                      | * #190                       |
| Throttle valve      | (Th.V.)  | # 135                      | ←                            |
| Throttle cable play |          | 0.5—1.0 mm                 | ←                            |
| Choke cable play    |          | 0.5—1.0 mm                 | ←                            |

## ELECTRICAL

Unit: mm

Unit: mm

| ITEM                      |                           | SPECIFICATION                                                                     |            |  | NOTE              |
|---------------------------|---------------------------|-----------------------------------------------------------------------------------|------------|--|-------------------|
| Ignition timing           |                           | 13° B.T.D.C. Below 1 500 ± 150 r/min and<br>35° B.T.D.C. Above 2 350 ± 150 r/min, |            |  |                   |
| Firing order              |                           | 1, 2, 4, 3                                                                        |            |  |                   |
| Spark plug                | Type                      | N.G.K.: D8EA<br>N.D.: X24ES-U                                                     |            |  | E-01,24,25,34     |
|                           | Gap                       | 0.6—0.7                                                                           |            |  |                   |
|                           | Type                      | N.G.K.: DR8ES-L<br>N.D.: X24ESR-U                                                 |            |  | The others        |
|                           | Gap                       | 0.6—0.7                                                                           |            |  |                   |
| Spark performance         |                           | Over 8 at 1 atm.                                                                  |            |  |                   |
| Signal coil resistance    |                           | 130—200 Ω                                                                         |            |  | BI-Y, B-G         |
| Ignition coil resistance  | Primary                   | 3—5 Ω                                                                             |            |  | O/W-W, O/W-B/Y    |
|                           | Secondary                 | 10—20 kΩ                                                                          |            |  | Plug cap-Plug cap |
|                           |                           | 30—40 kΩ                                                                          |            |  |                   |
| Generator no-load voltage |                           | More than 80 V (AC) at 5 000 r/min.                                               |            |  |                   |
| Regulated voltage         |                           | 13.5—15.5 V at 5 000 r/min.                                                       |            |  |                   |
| Starter motor             | Brush length              | MITSUBA                                                                           | Limit: 6   |  |                   |
|                           | Commutator under-cut      |                                                                                   | Limit: 0.2 |  |                   |
| Starter relay resistance  |                           | 3—4 Ω                                                                             |            |  |                   |
| Battery                   | Type designation          | YB14L-A2                                                                          |            |  |                   |
|                           | Capacity                  | 12V50.4kC(14Ah)/10HR                                                              |            |  |                   |
|                           | Standard electrolyte S.G. | 1.28 at 20°C (68°F)                                                               |            |  |                   |
| Fuse size                 | Headlight                 | 10 A                                                                              |            |  |                   |
|                           | Turn signal               | 10 A                                                                              |            |  |                   |
|                           | Ignition                  | 10 A                                                                              |            |  |                   |
|                           | Main                      | 15 A                                                                              |            |  |                   |
|                           | Power source              | 10 A                                                                              |            |  |                   |

## \*WATTAGE

Unit: W

| ITEM                          |    | SPECIFICATION     |                      |      |      |            |
|-------------------------------|----|-------------------|----------------------|------|------|------------|
|                               |    | E-01,06,<br>24,28 | E-15,16,<br>18,22,26 | E-22 | E-25 | The others |
| Headlight                     | HI | 60                | ←                    | ←    | ←    | ←          |
|                               | LO | 55                | ←                    | ←    | ←    | ←          |
| Parking or position light     |    | ↗                 | 4                    | ←    | ←    | ←          |
| Tail/Brake light              |    | 8/23              | 5/21                 | ←    | ←    | ←          |
| Turn signal light             |    | 23                | 21                   | ←    | ←    | ←          |
| Meter light                   |    | 3                 | ←                    | ←    | ←    | ←          |
| Turn signal indicator light   |    | 3                 | ←                    | ←    | ←    | ←          |
| High beam indicator light     |    | 3                 | ←                    | ←    | ←    | ←          |
| Neutral indicator light       |    | 3                 | ←                    | ←    | ←    | ←          |
| Oil pressure indicator light  |    | 3                 | ←                    | ←    | ←    | ←          |
| License light                 |    | 8                 | 5                    | 10   | ←    | 5          |
| Side stand check light        |    | 3                 | ↗                    | ↗    | 3    | ←          |
| Gear position indicator light |    | 1.12              | ←                    | ←    | ←    | ←          |

## BRAKE + WHEEL

Unit: mm

| ITEM                         |                          | STANDARD        |               | LIMIT |
|------------------------------|--------------------------|-----------------|---------------|-------|
| Rear brake pedal height      |                          | 40              |               | —     |
| Brake disc thickness         | Front                    | 5.0 ± 0.2       |               | 4.5   |
|                              | Rear                     | 6.7 ± 0.2       |               | 6.0   |
| Brake disc runout            |                          | —               |               | 0.3   |
| Master cylinder bore         | Front                    | 15.870 – 15.913 |               | —     |
|                              | Rear                     | 14.000 – 14.043 |               | —     |
| Master cylinder piston diam. | Front                    | 15.827 – 15.854 |               | —     |
|                              | Rear                     | 13.957 – 13.984 |               | —     |
| Brake caliper cylinder bore  | Front                    | 38.180 – 38.256 |               | —     |
|                              | Rear                     | 38.180 – 38.256 |               | —     |
| Brake caliper piston diam.   | Front                    | 38.098 – 38.148 |               | —     |
|                              | Rear                     | 38.098 – 38.148 |               | —     |
| Wheel rim runout             | Axial                    | —               |               | 2.0   |
|                              | Radial                   | —               |               | 2.0   |
| Wheel axle runout            | Front                    | —               |               | 0.25  |
|                              | Rear                     | —               |               | 0.25  |
| Tire size                    | E-06, 24<br>(ES,EFmodel) | Front           | 120/80V 16    | —     |
|                              |                          | Rear            | 130/80V 18    | —     |
|                              | The others               | Front           | 100/90-16 54H | —     |
|                              |                          | Rear            | 120/90-17 64H | —     |
| Tire tread depth             | Front                    |                 | —             | 1.6   |
|                              | Rear                     |                 | —             | 2.0   |

**SUSPENSION**

Unit: mm

| ITEM                            | STANDARD               | LIMIT | NOTE       |
|---------------------------------|------------------------|-------|------------|
| Front fork stroke               | 150                    | —     |            |
| * Front fork spring free length | —                      | 465   | E-28       |
|                                 | —                      | 456   | The others |
| * Front fork oil level          | 164                    | —     | E-28       |
|                                 | 210                    | —     | The others |
| * Front fork air pressure       | 0.2 kg/cm <sup>2</sup> | —     | E-28       |
| Rear wheel travel               | 107                    | —     |            |
| Swingarm pivot shaft runout     | —                      | 0.3   |            |

**\*TIRE PRESSURE (E-06,24)**

| COLD INFLATION<br>TIRE PRESSURE | SOLO RIDING |                    | DUAL RIDING |                    |
|---------------------------------|-------------|--------------------|-------------|--------------------|
|                                 | kPa         | kg/cm <sup>2</sup> | kPa         | kg/cm <sup>2</sup> |
| FRONT                           | 200         | 2.00               | 225         | 2.25               |
| REAR                            | 225         | 2.25               | 250         | 2.50               |

**\*TIRE PRESSURE (The others)**

| COLD INFLATION<br>TIRE PRESSURE | SOLO RIDING |                    | DUAL RIDING |                    |
|---------------------------------|-------------|--------------------|-------------|--------------------|
|                                 | kPa         | kg/cm <sup>2</sup> | kPa         | kg/cm <sup>2</sup> |
| FRONT                           | 200         | 2.00               | 225         | 2.25               |
| REAR                            | 250         | 2.50               | 280         | 2.80               |

**FUEL + OIL**

| ITEM                        | SPECIFICATION                                                                                                |          | NOTE       |
|-----------------------------|--------------------------------------------------------------------------------------------------------------|----------|------------|
| Fuel type                   | Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended. |          |            |
| Fuel tank including reserve | 19.5 L                                                                                                       |          |            |
| reserve                     | 4.0 L                                                                                                        |          |            |
| Engine oil type             | SAE 10W/40, API SE or SF                                                                                     |          |            |
| Engine oil capacity         | Change                                                                                                       | 3 200 ml |            |
|                             | Filter change                                                                                                | 3 800 ml |            |
|                             | Overhaul                                                                                                     | 4 000 ml |            |
| Front fork oil type         | Fork oil # 10                                                                                                |          |            |
| * Front fork oil capacity   | 284 ml                                                                                                       |          | E-28       |
|                             | 253 ml                                                                                                       |          | The others |
| Brake fluid type            | SAE J1703, DOT3 or DOT4                                                                                      |          |            |

# GSX750ESG('86-MODEL)

*This section gives service data which differ from those of the GSX750ESG.*

*Please also refer to the sections, 1 through 10, for all other areas of information not covered in this section.*

*This section 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 kindly requested to make query about updated information, if any.*

**NOTE:**

Asterisk mark (\*) indicates New G model specification.

## CONTENTS

|                           |             |
|---------------------------|-------------|
| <b>SERVICE DATA .....</b> | <b>11-1</b> |
|---------------------------|-------------|



## SERVICE DATA

### VALVE + GUIDE

Unit: mm

| ITEM                                | STANDARD  |             | LIMIT                        |
|-------------------------------------|-----------|-------------|------------------------------|
| Valve diam.                         | IN.       | 25          | —                            |
|                                     | EX.       | 21          | —                            |
| Valve lift                          | IN.       | 7.5         | —                            |
|                                     | EX.       | 6.5         | —                            |
| Valve clearance (when cold)         | IN. & EX. | 0.09–0.13   | —                            |
| Valve guide to valve stem clearance | IN.       | 0.025–0.052 | 0.350                        |
|                                     | EX.       | 0.040–0.067 | 0.350                        |
| 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. | —           | 3.6                          |
| Valve seat width                    | IN. & EX. | 0.9–1.1     | —                            |
| Valve head radial runout            | IN. & EX. | —           | 0.03                         |
| Valve spring free length            | INNER     | IN. & EX.   | 31.9                         |
|                                     | OUTER     |             | 35.6                         |
| Valve spring tension                | INNER     | IN. & EX.   | 4.4–6.4 kg at length 28.5 mm |
|                                     | OUTER     |             | 6.5–8.9 kg at length 32 mm   |

## CAMSHAFT + CYLINDER HEAD

Unit: mm

| ITEM                           | STANDARD  |               | LIMIT |
|--------------------------------|-----------|---------------|-------|
| Cam height                     | IN.       | 35.323–35.363 | 35.03 |
|                                | EX.       | 34.652–34.692 | 34.36 |
| Camshaft journal oil clearance | IN. & EX. | 0.032–0.066   | 0.150 |
| Camshaft journal holder I.D.   | IN. & EX. | 22.012–22.025 | —     |
| Camshaft journal O.D.          | IN. & EX. | 21.959–21.980 | —     |
| Camshaft runout                | IN. & EX. | —             | 0.10  |
| Cam chain 20-pitch length      | —         |               | 129   |
| Cam chain pin lat arrow "3"1   | 20th pin  |               | —     |
| Rocker arm I.D.                | IN. & EX. | 12.000–12.018 | —     |
| Rocker arm shaft O.D.          | IN. & EX. | 11.973–11.984 | —     |
| Cylinder head distortion       | —         |               | 0.20  |

## CYLINDER + PISTON + PISTON RING

Unit: mm

| ITEM                            | STANDARD                                     | LIMIT                               |
|---------------------------------|----------------------------------------------|-------------------------------------|
| Compression pressure            | 900–1 300 kPa<br>( 9–13 kg/cm <sup>2</sup> ) | 700 kPa<br>( 7 kg/cm <sup>2</sup> ) |
| Compression pressure difference | —                                            | 200 kPa<br>( 2 kg/cm <sup>2</sup> ) |
| Piston to cylinder clearance    | 0.040–0.050                                  | 0.120                               |
| Cylinder bore                   | 67.000–67.015                                | 67.090                              |

| ITEM                            | STANDARD                                              |             |              | LIMIT  |
|---------------------------------|-------------------------------------------------------|-------------|--------------|--------|
| Piston diam.                    | 66.955—66.970<br>Measure at 15 mm from the skirt end. |             |              | 66.880 |
| Cylinder distortion             | —                                                     |             |              | 0.20   |
| Piston ring free end gap        | 1st                                                   | N           | Approx. 9.5  | 7.6    |
|                                 |                                                       | R           | Approx. 9.5  | 7.6    |
|                                 | 2nd                                                   | N           | Approx. 10.0 | 8.0    |
|                                 |                                                       | R           | Approx. 10.3 | 8.2    |
| Piston ring end gap             | 1st                                                   | 0.10—0.30   |              | 0.70   |
|                                 | 2nd                                                   | 0.10—0.30   |              | 0.70   |
| Piston ring to groove clearance | 1st                                                   | —           |              | 0.180  |
|                                 | 2nd                                                   | —           |              | 0.150  |
| Piston ring groove width        | 1st                                                   | 1.21—1.23   |              | —      |
|                                 | 2nd                                                   | 1.21—1.23   |              | —      |
|                                 | Oil                                                   | 2.51—2.53   |              | —      |
| Piston ring thickness           | 1st & 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.               | 18.010–18.018 |           | 18.040 |
| Conrod big end side clearance       | 0.10–0.20     |           | 0.30   |
| Conrod big end width                | 22.95–23.00   |           | —      |
| Crank pin width                     | 23.10–23.15   |           | —      |
| Conrod big end oil clearance        | 0.032–0.056   |           | 0.080  |
| Crank pin O.D.                      | 35.976–36.000 |           | —      |
| Crankshaft journal oil clearance    | 0.020–0.044   |           | 0.080  |
| Crankshaft journal O.D.             | 35.976–36.000 |           | —      |
| Crankshaft thrust bearing thickness | Right side    | 2.94–2.96 | —      |
|                                     | Left side     | 2.86–3.02 | —      |
| Crankshaft thrust clearance         | 0.04–0.08     |           | —      |
| Crankshaft journal holder width     | 18.04–18.12   |           | —      |
| Crankshaft journal width            | 24.00–24.05   |           | —      |
| Crankshaft runout                   | —             |           | 0.05   |

## OIL PUMP

| ITEM                          | STANDARD                                                                                          | LIMIT |
|-------------------------------|---------------------------------------------------------------------------------------------------|-------|
| Oil pump reduction ratio      | 1.840 ( 91/48 × 33/34 )                                                                           | —     |
| Oil pressure (at 60°C, 140°F) | Above 250 kPa, 2.5 kg/cm <sup>2</sup><br>Below 550 kPa, 5.5 kg/cm <sup>2</sup><br>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     | 2.7 – 2.9           | 2.4   |
| Drive plate claw width    | 11.8 – 12.0         | 11.0  |
| Driven plate distortion   | —                   | 0.10  |
| Clutch spring free length | —                   | 34.0  |

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (Except ratio)

| ITEM                             | STANDARD                            | LIMIT |
|----------------------------------|-------------------------------------|-------|
| Primary reduction ratio          | 1.895 ( 91/48 )                     | —     |
| Final reduction ratio            | E-06,24 3.214 ( 45/14 )             | —     |
|                                  | The others 3.071 ( 43/14 )          | —     |
| Gear ratios                      | Low 2.500 ( 35/14 )                 | —     |
|                                  | 2nd 1.750 ( 28/16 )                 | —     |
|                                  | 3rd 1.368 ( 26/19 )                 | —     |
|                                  | 4th 1.130 ( 26/23 )                 | —     |
|                                  | Top 0.956 ( 22/23 )                 | —     |
| Shift fork to groove clearance   | 0.10 – 0.30                         | 0.50  |
| Shift fork groove width          | 5.5 – 5.6                           | —     |
| Shift fork thickness             | 5.3 – 5.4                           | —     |
| Countershaft length (Low to 2nd) | 105.9 – 106.1                       | —     |
| Drive chain                      | Type DAIDO: 50V<br>TAKASAGO: RK50G0 | —     |
|                                  | Links 114                           | —     |
|                                  | 20-pitch length —                   | 319.4 |
| Drive chain slack                | 30 – 40                             | —     |

**CARBURETOR**

| ITEM                  | SPECIFICATION     |
|-----------------------|-------------------|
| Carburetor type       | MIKUNI BS32SS     |
| Bore size             | 32 mm             |
| I.D. No.              | 31360             |
| Idle r/min.           | 1 150 ± 50 r/min. |
| Fuel level            | 5.0 ± 0.5 mm      |
| Float height          | 22.4 ± 1.0 mm     |
| Main jet (M.J.)       | #117.5            |
| Main air jet (M.A.J.) | 1.7 mm            |
| Jet needle (J.N.)     | 5C32-3rd          |
| Needle jet (N.J.)     | Y-7               |
| Pilot jet (P.J.)      | #45               |
| By-pass (B.P.)        | 0.8, 0.8, 0.8 mm  |

| ITEM                |          | SPECIFICATION              |
|---------------------|----------|----------------------------|
| Pilot outlet        | (P.O.)   | 0.7 mm                     |
| Valve seat          | (V.S.)   | 2.0 mm                     |
| Starter jet         | (G.S.)   | #45                        |
| Pilot screw         | (P.S.)   | PRE-SET (1 1/4 turns back) |
| Pilot air jet       | (P.A.J.) | #190                       |
| Throttle valve      | (Th.V.)  | #135                       |
| Throttle cable play |          | 0.5—1.0 mm                 |
| Choke cable play    |          | 0.5—1.0 mm                 |

## ELECTRICAL

Unit: mm

| ITEM                      |                                   | SPECIFICATION                                                                      |            |               | NOTE              |
|---------------------------|-----------------------------------|------------------------------------------------------------------------------------|------------|---------------|-------------------|
| Ignition timing           |                                   | 13° B.T.D.C. Below 1 500 ± 150 r/min. and<br>35° B.T.D.C. Above 2 350 ± 150 r/min. |            |               |                   |
| Firing order              |                                   | 1, 2, 4, 3                                                                         |            |               |                   |
| Spark plug                | Type                              | NGK: D8EA<br>N.D.: X24ES-U                                                         |            | E-01,24,25,34 |                   |
|                           | Gap                               | 0.6—0.7                                                                            |            |               |                   |
|                           | Type                              | NGK: DR8ES-L<br>N.D.: X24ESR-U                                                     |            | The others    |                   |
|                           | Gap                               | 0.6—0.7                                                                            |            |               |                   |
| Spark performance         |                                   | Over 8 at 1 atm.                                                                   |            |               |                   |
| Signal coil resistance    |                                   | 130—200 Ω                                                                          |            |               | BI—Y, B—G         |
| Ignition coil resistance  |                                   | Primary                                                                            | 3—5 Ω      |               | O/W-W, O/W-B/Y    |
|                           | E-02,04,<br>15,17,21,<br>22,39,53 | Secondary                                                                          | 10—20 kΩ   |               | Plug cap-Plug cap |
|                           | The others                        | 30—40 kΩ                                                                           |            |               |                   |
| Generator no-load voltage |                                   | More than 80 V (AC) at 5 000 r/min.                                                |            |               |                   |
| Regulated voltage         |                                   | 13.5—15.5 V at 5 000 r/min.                                                        |            |               |                   |
| Starter motor             | Brush length                      | MITSUBA                                                                            | Limit: 6   |               |                   |
|                           | Commutator under-cut              |                                                                                    | Limit: 0.2 |               |                   |
| Starter relay resistance  |                                   | 3—4 Ω                                                                              |            |               |                   |
| Battery                   | Type designation                  | YB14L-A2                                                                           |            |               |                   |
|                           | Capacity                          | 12V 50.4 kC (14 Ah)/10 HR                                                          |            |               |                   |
|                           | Standard electrolyte S.G.         | 1.28 at 20°C (68°F)                                                                |            |               |                   |
| Fuse size                 | Headlight                         | 10 A                                                                               |            |               |                   |
|                           | Turn signal                       | 10 A                                                                               |            |               |                   |
|                           | Ignition                          | 10 A                                                                               |            |               |                   |
|                           | Main                              | 15 A                                                                               |            |               |                   |
|                           | Power source                      | 10 A                                                                               |            |               |                   |

**WATTAGE**

Unit: W

| ITEM                          |    | SPECIFICATION     |      |      |                   |            |
|-------------------------------|----|-------------------|------|------|-------------------|------------|
|                               |    | E-01,06,<br>24,28 | E-22 | E-25 | E-02,15,<br>16,26 | The others |
| Headlight                     | HI | 60                | ←    | ←    | ←                 | ←          |
|                               | LO | 55                | ←    | ←    | ←                 | ←          |
| Parking or position light     |    |                   |      | 4    | ←                 | ←          |
| Tail/Brake light              |    | 8/23              | 5/21 | ←    | ←                 | ←          |
| Turn signal light             |    | 23                | ←    | ←    | ←                 | ←          |
| Tachometer light              |    | 3.4               | ←    | ←    | ←                 | ←          |
| Speedometer light             |    | 3.4               | ←    | ←    | ←                 | ←          |
| Turn signal indicator light   |    | 3.4               | ←    | ←    | ←                 | ←          |
| High beam indicator light     |    | 3.4               | ←    | ←    | ←                 | ←          |
| Neutral indicator light       |    | 3.4               | ←    | ←    | ←                 | ←          |
| Oil level warning light       |    | 3.4               | ←    | ←    | ←                 | ←          |
| Side stand check light        |    | 3.4               |      | 3.4  |                   | 3.4        |
| License light                 |    | 8                 | 10   | ←    | 5                 | ←          |
| Gear position indicator light |    | 1.12              | ←    | ←    | ←                 | ←          |

**BRAKE + WHEEL**

Unit: mm

| ITEM                         |            | STANDARD        |               | LIMIT |
|------------------------------|------------|-----------------|---------------|-------|
| Rear brake pedal height      |            | 40              |               | —     |
| Brake disc thickness         | Front      | 5.0 ± 0.2       |               | 4.5   |
|                              | Rear       | 6.7 ± 0.2       |               | 6.0   |
| Brake disc runout            |            | —               |               | 0.3   |
| Master cylinder bore         | Front      | 15.870 – 15.913 |               | —     |
|                              | Rear       | 14.000 – 14.043 |               | —     |
| Master cylinder piston diam. | Front      | 15.827 – 15.854 |               | —     |
|                              | Rear       | 13.957 – 13.984 |               | —     |
| Brake caliper cylinder bore  | Front      | 38.180 – 38.256 |               | —     |
|                              | Rear       | 38.180 – 38.256 |               | —     |
| Brake caliper piston diam.   | Front      | 38.098 – 38.148 |               | —     |
|                              | Rear       | 38.098 – 38.148 |               | —     |
| Wheel rim runout             | Axial      | —               |               | 2.0   |
|                              | Radial     | —               |               | 2.0   |
| Wheel axle runout            | Front      | —               |               | 0.25  |
|                              | Rear       | —               |               | 0.25  |
| Tire size                    | E-06, 24   | Front           | 120/80V 16    | —     |
|                              |            | Rear            | 130/80V 18    | —     |
|                              | The others | Front           | 100/90-16 54H | —     |
|                              |            | Rear            | 120/90-17 64H | —     |
| Tire tread depth             | Front      | —               |               | 1.6   |
|                              | Rear       | —               |               | 2.0   |

## APPENDIX

## SUSPENSION

Unit: mm

| ITEM                          | STANDARD                         | LIMIT | NOTE       |
|-------------------------------|----------------------------------|-------|------------|
| Front fork stroke             | 150                              | —     |            |
| Front fork spring free length | —                                | 465   | E-28       |
|                               | —                                | 456   | The others |
| Front fork oil level          | 164                              | —     | E-28       |
|                               | 210                              | —     | The others |
| Front fork air pressure       | 20 kPa (0.2 kg/cm <sup>2</sup> ) | —     | E-28       |
| Rear wheel travel             | 107                              | —     |            |
| Swingarm pivot shaft runout   | —                                | 0.3   |            |

## TIRE PRESSURE (E-06, 24)

| COLD INFLATION<br>TIRE PRESSURE | SOLO RIDING |                    | DUAL RIDING |                    |
|---------------------------------|-------------|--------------------|-------------|--------------------|
|                                 | kPa         | kg/cm <sup>2</sup> | kPa         | kg/cm <sup>2</sup> |
| FRONT                           | 200         | 2.00               | 200         | 2.00               |
| REAR                            | 225         | 2.25               | 250         | 2.50               |

## TIRE PRESSURE (The others)

| COLD INFLATION<br>TIRE PRESSURE | SOLO RIDING |                    | DUAL RIDING |                    |
|---------------------------------|-------------|--------------------|-------------|--------------------|
|                                 | kPa         | kg/cm <sup>2</sup> | kPa         | kg/cm <sup>2</sup> |
| FRONT                           | 200         | 2.00               | 225         | 2.25               |
| REAR                            | 250         | 2.50               | 280         | 2.80               |

## FUEL + OIL

| ITEM                                   | SPECIFICATION                                                                                                |          | NOTE       |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------|----------|------------|
| Fuel type                              | Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended. |          |            |
| Fuel tank including reserve<br>reserve | 19.5 L                                                                                                       |          |            |
|                                        | 4.0 L                                                                                                        |          |            |
| Engine oil type                        | SAE 10W/40, API SE or SF                                                                                     |          |            |
| Engine oil capacity                    | Change                                                                                                       | 3 200 ml |            |
|                                        | Filter change                                                                                                | 3 800 ml |            |
|                                        | Overhaul                                                                                                     | 4 000 ml |            |
| Front fork oil type                    | Fork oil #10                                                                                                 |          |            |
| Front fork oil capacity (each leg)     | 284 ml                                                                                                       |          | E-28       |
|                                        | 253 ml                                                                                                       |          | The others |
| Brake fluid type                       | SAEJ1703, DOT3 or DOT4                                                                                       |          |            |



## APPENDIX

## CONTENTS

**IGNITION COIL INSPECTION METHOD.....12-1**

## IGNITION COIL INSPECTION METHOD

The sparking performance of the ignition coil can be more clearly inspected with the new method than old one.

### INSPECTION

#### NOTE:

Make sure that the three-needle sparking distance of electro tester is set at 8 mm.

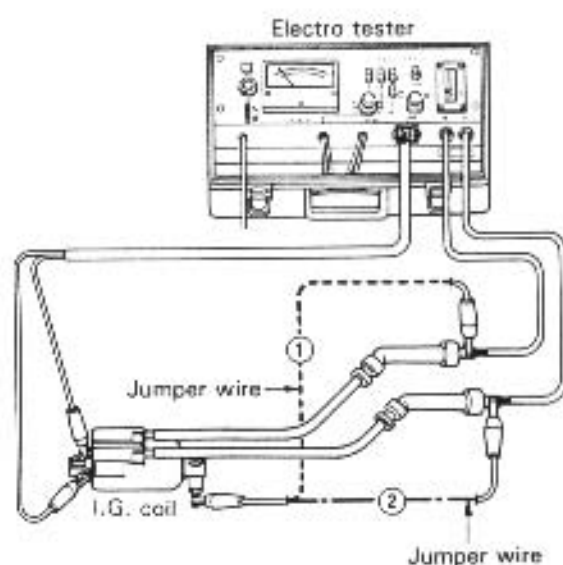
- Remove the ignition coil from the frame.
- With the tester and jumper wire, test the ignition coil for sparking performance in accordance with the following two steps.

STEP ① : Connect the jumper wire to the spark plug cap and ignition coil ground.

STEP ② : Switch over the jumper wire to the other plug cap and ground.

If no sparking or orange color sparking occurs in the above conditions, it may be caused by defective coil.

|                       |                |
|-----------------------|----------------|
| 09900-28106           | Electro tester |
| STD spark performance | 8 mm           |



Prepared by

**SUZUKI MOTOR CORPORATION**

Motorcycle Technical Service Department

6th October, 1990

1st May, 1983

Part No. 99500-37025-01E

Printed in Japan