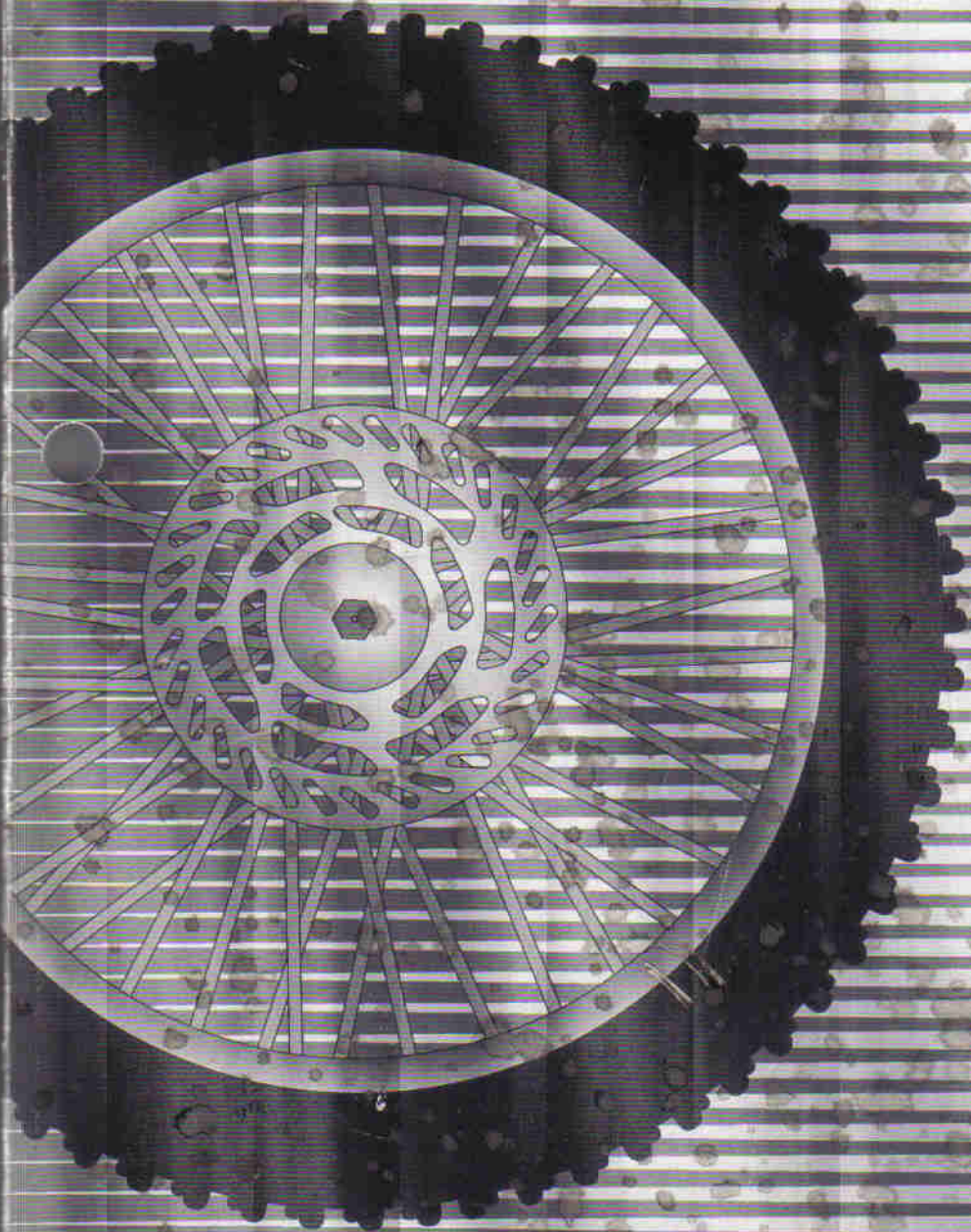


# DR650S



## Service Manual



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## FOREWORD

The SUZUKI DR650S was designed to offer superior performance through lightweight design, four stroke-power, engine counter-balancers, cooling system and full-floating suspension.

This service manual has been produced primarily for experienced mechanics whose job is to inspect, adjust, repair and service SUZUKI motorcycles. Apprentice mechanics and do-it-yourself mechanics, will also find this manual 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.

## IMPORTANT

All street-legal SUZUKI motorcycles with engine displacement of 50cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service DR650S in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

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

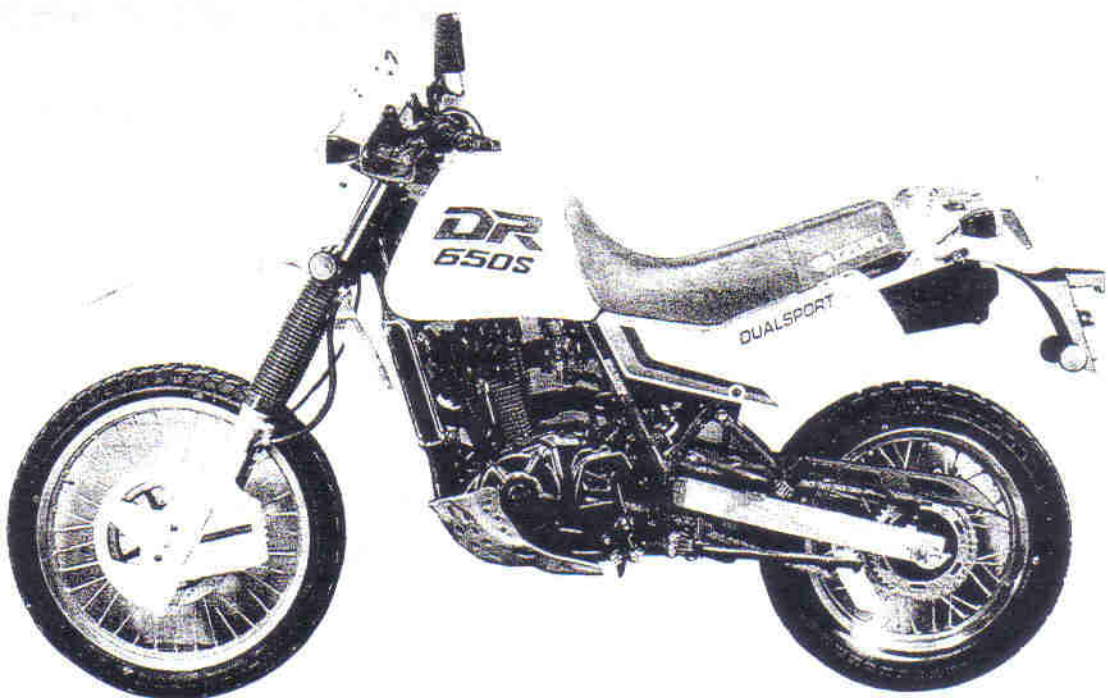
## SUZUKI MOTOR CORPORATION

Motorcycle Service Department

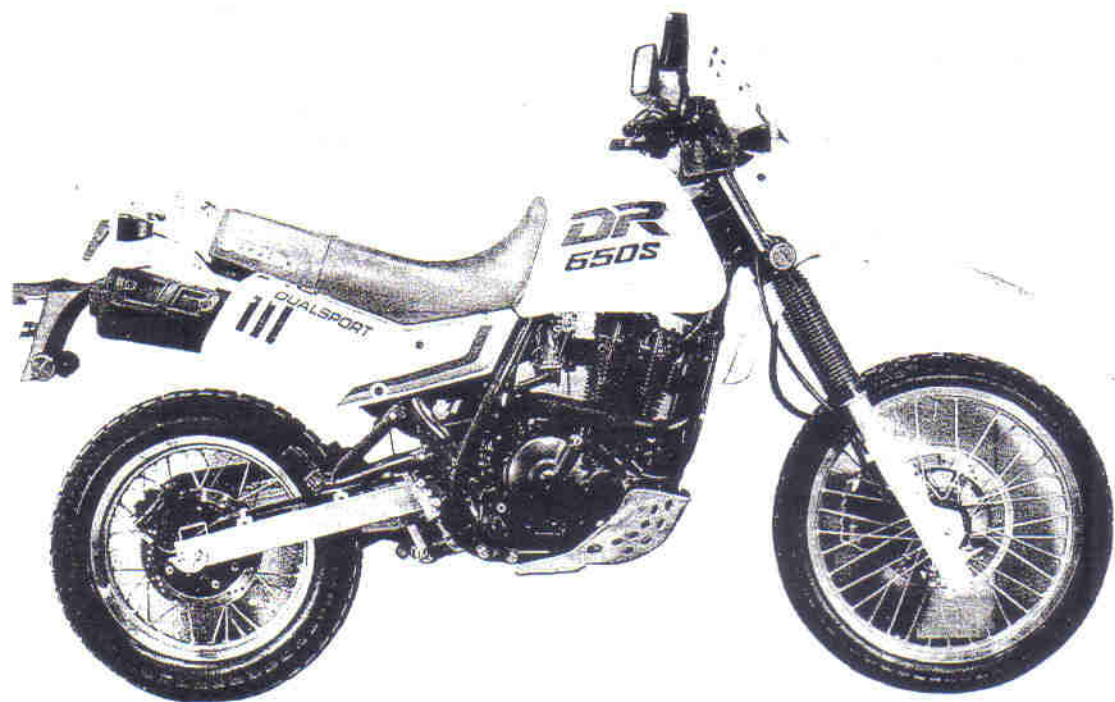
## GROUP INDEX

<b>GENERAL INFORMATION</b>	<b>1</b>
<b>PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES</b>	<b>2</b>
<b>ENGINE</b>	<b>3</b>
<b>FUEL AND LUBRICATION SYSTEM</b>	<b>4</b>
<b>ELECTRICAL SYSTEM</b>	<b>5</b>
<b>CHASSIS</b>	<b>6</b>
<b>SERVICING INFORMATION</b>	<b>7</b>
<b>EMISSION CONTROL INFORMATION</b>	<b>8</b>
<b>DR650SM ('91-MODEL)</b>	<b>9</b>

# VIEW OF DR650S



LEFT SIDE



RIGHT SIDE

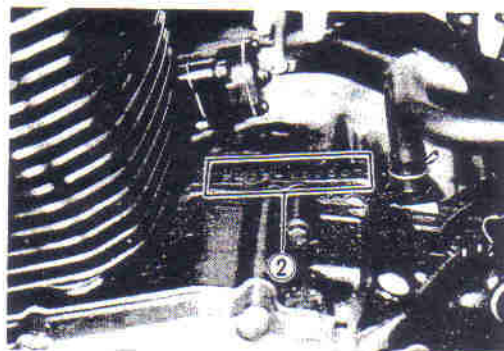
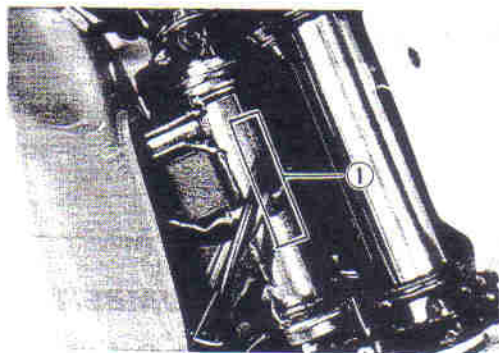
# GENERAL INFORMATION

## CONTENTS

<b>SERIAL NUMBER LOCATIONS</b> .....	<b>1- 1</b>
<b>FUEL AND OIL RECOMMENDATIONS</b> .....	<b>1- 1</b>
<b>BREAK-IN PROCEDURES</b> .....	<b>1- 2</b>
<b>SPECIAL MATERIALS</b> .....	<b>1- 3</b>
<b>PRECAUTIONS AND GENERAL INSTRUCTIONS</b> .....	<b>1- 5</b>
<b>SPECIFICATIONS</b> .....	<b>1- 7</b>

## SERIAL NUMBER LOCATIONS

The frame serial number or V.I.N. (Vehicle Identification Number) ① is stamped on the steering head pipe. The engine serial number ② is located on the crankcase. These numbers are required especially for registering the machine and ordering spare parts.



## FUEL AND OIL RECOMMENDATIONS

### FUEL

#### For U.S.A. model

1. Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) methods or 91 octane or higher rated by the research method.
2. SUZUKI recommends that customers use alcohol free, unleaded gasoline whenever possible.
3. Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.
4. Use of blended gasoline/alcohol fuel is permitted provided that it contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol free unleaded gasoline.
6. Failure to follow these guideline could possibly void applicable warranty coverage. Check with your fuel supplier to be sure that the fuel you intend to use meets the requirements listed above.

#### For CANADA model

Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) method or 91 octane or higher rated by the Research Method.

#### For other models

Gasoline used should be graded 85 – 95 octane or higher. An unleaded gasoline is recommended.

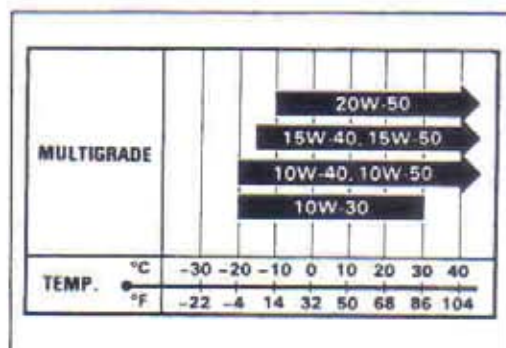
## ENGINE OIL

For U.S.A. model

SUZUKI recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or an oil which is rated SE or SF under the API (American Petroleum Institute) classification system. The viscosity rating is SAE 10W/40. If an SAE 10W/40 motor oil is not available, select an alternate according to the right chart.

For other models

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



## FRONT FORK OIL

Use fork oil # 10.

89000-99044-10G: SUZUKI Fork oil # 10

## BRAKE FLUID

Specification and classification: DOT 4

89000-23110: SUZUKI Brake fluid

### WARNING:

- \* 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.

## BREAK-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 break-in engine speed limits.

Initial 800 km (500 miles): Below 3 000 r/min

Up to 1 600 km (1 000 miles): Below 5 000 r/min





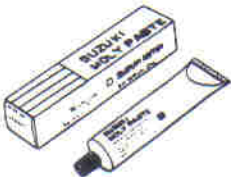
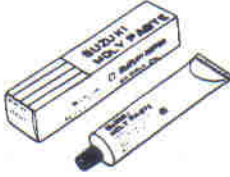




Over 1 600 km (1 000 miles): Below 7 500 r/min











- Upon reaching an odometer reading of 1 600 km (1 000 miles) you can subject the motorcycle to full throttle operation.

However, do not exceed 7 500 r/min at any time.

## SPECIAL MATERIALS

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

MATERIAL		PART	PAGE
For U.S.A. model	For other models		
 <p>SUZUKI SUPER GREASE "A" 99000-25030</p>	 <p>SUZUKI SUPER GREASE "A" 99000-25010</p>	<ul style="list-style-type: none"> <li>● Throttle grip</li> <li>● Speedometer gear box</li> <li>● Brake pedal shaft</li> <li>● Oil seals</li> <li>● O-ring</li> <li>● Front and rear wheel hub bearing</li> <li>● Steering stem bearing and steel balls</li> <li>● Shock absorber lower bearing</li> <li>● Cushion lever bearings, dust seals and spacer</li> <li>● Swingarm bearings</li> </ul>	<p>2-2 2-2 2-2 3-35 3-46, 53 2-2 6-2, 19 2-2 6-14, 17 6-28, 33 6-28, 33 6-28, 33</p>
 <p>SUZUKI SILICONE GREASE 99000-25100</p>	 <p>SUZUKI SILICONE GREASE 99000-25100</p>	<ul style="list-style-type: none"> <li>● Caliper axle</li> </ul>	<p>6-5 6-10</p>
 <p>SUZUKI MOLY PASTE 99000-25140</p>	 <p>SUZUKI MOLY PASTE 99000-25140</p>	<ul style="list-style-type: none"> <li>● Valve stems</li> <li>● Piston pin</li> <li>● Camshaft journals and cams</li> <li>● Rocker arm shafts</li> <li>● De-compression shaft</li> <li>● Countershaft and driveshaft gears</li> </ul>	<p>3-20 3-47 3-51 3-14 3-14 3-31</p>
 <p>SUZUKI BOND NO. 1207B 99104-31140</p>	 <p>SUZUKI BOND NO. 1207B 99000-31140</p>	<ul style="list-style-type: none"> <li>● Cylinder head cover</li> <li>● Magneto lead wire grommet</li> <li>● Mating surface of left and right halves of crankcase</li> <li>● Neutral lead wire grommet</li> </ul>	<p>2-4 3-51 3-42 3-39 3-37</p>
 <p>THREAD LOCK "1342" 99000-32050</p>	 <p>THREAD LOCK "1342" 99000-32050</p>	<ul style="list-style-type: none"> <li>● Crankcase bearing retainer screws</li> <li>● Gearshift cam stopper bolt</li> <li>● Gearshift cam guide/pawl lifter screws and nuts</li> <li>● Engine oil pump securing screws</li> <li>● Neutral switch lead protector screws</li> <li>● Air cleaner mounting bolts</li> <li>● Front footrest bolt</li> <li>● Front fork damper rod bolt</li> </ul>	<p>3-34 3-38 3-39 3-42 3-37 3-37 6-12</p>

MATERIAL		PART	PAGE
For U.S.A. model	For other models		
 <p>THREAD LOCK SUPER "1333B" 99000-32020</p>	 <p>THREAD LOCK SUPER "1333B" 99000-32020</p>	<ul style="list-style-type: none"> <li>● Kick starter pawl guide/stopper</li> </ul>	3-28
 <p>THREAD LOCK SUPER "1303" 99000-32030</p>	 <p>THREAD LOCK SUPER "1303" 99000-32030</p>	<ul style="list-style-type: none"> <li>● Muffler mounting bolts</li> <li>● Gearshift arm stopper</li> <li>● Cam sprocket bolts</li> <li>● Balancer chain guide screws</li> <li>● 2nd drive gear</li> <li>● Air cleaner mounting bolts</li> </ul>	3-4 3-40 3-51 3-40 3-33
 <p>THREAD LOCK SUPER "1303" 99000-32030</p>	 <p>THREAD LOCK SUPER "1305" 99000-32100</p>	<ul style="list-style-type: none"> <li>● Magneto rotor bolt</li> </ul>	3-42
 <p>THREAD LOCK SUPER "1360" 99000-32130</p>	 <p>THREAD LOCK SUPER "1360" 99000-32130</p>	<ul style="list-style-type: none"> <li>● Brake disc bolt</li> </ul>	6-1 6-19
 <p>SUZUKI BRAKE FLUID 99000-23110 (0.5L)</p>	 <p>SUZUKI BRAKE FLUID 99000-23110 (0.5L)</p>	<ul style="list-style-type: none"> <li>● Front and rear brake</li> </ul>	1-2 2-13



## PRECAUTIONS AND GENERAL INSTRUCTIONS

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

- Do not run engine indoors with little or no ventilation.
- Be sure to replace packings, gaskets, circlips, O-rings and cotter pins with new ones.

### CAUTION:

Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.

When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.

After installing a circlip, always insure that it is completely seated in its groove and securely fitted.

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

Warning, Caution and Note are included in this manual occasionally, describing the following contents.

**WARNING** . . . . . The personal safety of the rider or bystanders may be involved.  
Disregarding this information could result in personal injury.

**CAUTION** . . . . . These instructions point out special service procedures or precautions that must be followed to avoid damaging the machine.

**NOTE** . . . . . This provides special information to make maintenance easier or important instructions clearer.

## REPLACEMENT PARTS

When you replace any parts, use only genuine SUZUKI replacement parts, or their equivalent. Genuine SUZUKI parts are high quality parts which are designed and built specifically for SUZUKI vehicles.

### CAUTION:

Use of replacement parts which are not equivalent in quality to genuine SUZUKI parts can lead to performance problems and damage.



**COUNTRY OR AREA**

E-02 : U.K.  
E-03 : U.S.A.  
E-04 : France  
E-15 : Finland  
E-16 : Norway  
E-17 : Sweden  
E-18 : Switzerland  
E-21 : Belgium  
E-22 : W. Germany  
E-24 : Australia  
E-25 : Netherlands  
E-28 : Canada  
E-34 : Italy  
E-38 : Austria  
E-53 : Spain

## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length	2 250 mm (88.6 in)
Overall width	870 mm (34.3 in)
Overall height	1 315 mm (51.8 in)
Wheelbase	1 510 mm (59.4 in)
Seat height	890 mm (35.0 in)
Ground clearance	260 mm (10.2 in)
Dry mass	152 kg (335 lbs)

### ENGINE

Type	Four-stroke, air-cooled, OHC
Number of cylinders	1
Bore	95.0 mm (3.740 in)
Stroke	90.4 mm (3.559 in)
Piston displacement	640 cm <sup>3</sup> (39.0 cu. in)
Compression ratio	9.7 : 1
Carburetor	MIKUNI BST40SS, single
Air cleaner	Polyurethane foam element
Starter system	Primary kick
Lubrication system	Wet sump

### TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	2.200 (66/30)
Final reduction	2.625 (42/16)
Gear ratios, Low	2.416 (29/12)
2nd	1.625 (26/16)
3rd	1.263 (24/19)
4th	1.000 (21/21)
Top	0.826 (19/23)
Drive chain	TAKASAGO RK520SD or DAIDO D.I.D. 520VC-5, 114 links

### ELECTRICAL

Ignition type	SUZUKI "PEI" (CDI)
Ignition timing	0° B.T.D.C. Below 2 200 r/min and 28° B.T.D.C. Above 4 300 r/min
Spark plug	NGK DP9EA-9 or NIPPON DENSO X27EP-U9 (For Italy and U.S.A.) NGK DPR9EA-9 or NIPPON DENSO X27EPR- U9 (For others)
Battery	12V 18 kC (5 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	15A

### CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil damped
Rear suspension	Full floating suspension, coil spring, gas/oil damped, spring preload fully adjustable
Steering angle	45° (Right & Left)
Caster	61°
Trail	120 mm (4.7 in)
Turning radius	2.4 m (7.9 ft)
Front brake	Disc
Rear brake	Disc
Front tire size	90/90-21 54S
Rear tire size	120/90-17 64S

### CAPACITIES

Fuel tank	
including reserve	21 L (5.5/4.6 US/Imp gal)
reserve	4.5 L (1.2/1.0 US/Imp gal)
Engine oil	2.0 L (2.1/1.8 US/Imp qt)
Front fork oil	566 ml (19.1/19.9 US/ Imp oz)

These specifications are subject to change without notice.

# PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

## CONTENTS

<b>PERIODIC MAINTENANCE SCHEDULE</b> .....	2- 1
<b>PERIODIC MAINTENANCE CHART</b> .....	2- 1
<b>LUBRICATION POINTS</b> .....	2- 2
<b>MAINTENANCE AND TUNE-UP PROCEDURES</b> .....	2- 3
<b>BATTERY</b> .....	2- 3
<b>CYLINDER HEAD BOLTS AND NUTS, EXHAUST     PIPE NUTS AND MUFFLER CONNECTIONS</b> .....	2- 4
<b>AIR CLEANER ELEMENT</b> .....	2- 5
<b>VALVE CLEARANCE</b> .....	2- 6
<b>DE-COMPRESSION LEVER</b> .....	2- 7
<b>SPARK PLUGS</b> .....	2- 7
<b>FUEL LINE</b> .....	2- 8
<b>ENGINE OIL AND OIL FILTER</b> .....	2- 9
<b>CARBURETOR</b> .....	2-10
<b>BALANCER CHAIN</b> .....	2-10
<b>CLUTCH</b> .....	2-11
<b>DRIVE CHAIN</b> .....	2-12
<b>BRAKES</b> .....	2-13
<b>TIRES</b> .....	2-16
<b>STEERING</b> .....	2-17
<b>FRONT FORK</b> .....	2-17
<b>REAR SUSPENSION</b> .....	2-17
<b>CHASSIS BOLTS AND NUTS</b> .....	2-18

## PERIODIC MAINTENANCE SCHEDULE

**IMPORTANT:** The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also ensure the reliability and performance of the motorcycle.

**NOTE:**

*More frequent servicing may be performed on motorcycles that are used under severe conditions however, it is not necessary for ensuring emission level compliance.*

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Mileages are expressed in terms of kilometers, miles and time for your convenience.

### PERIODIC MAINTENANCE CHART

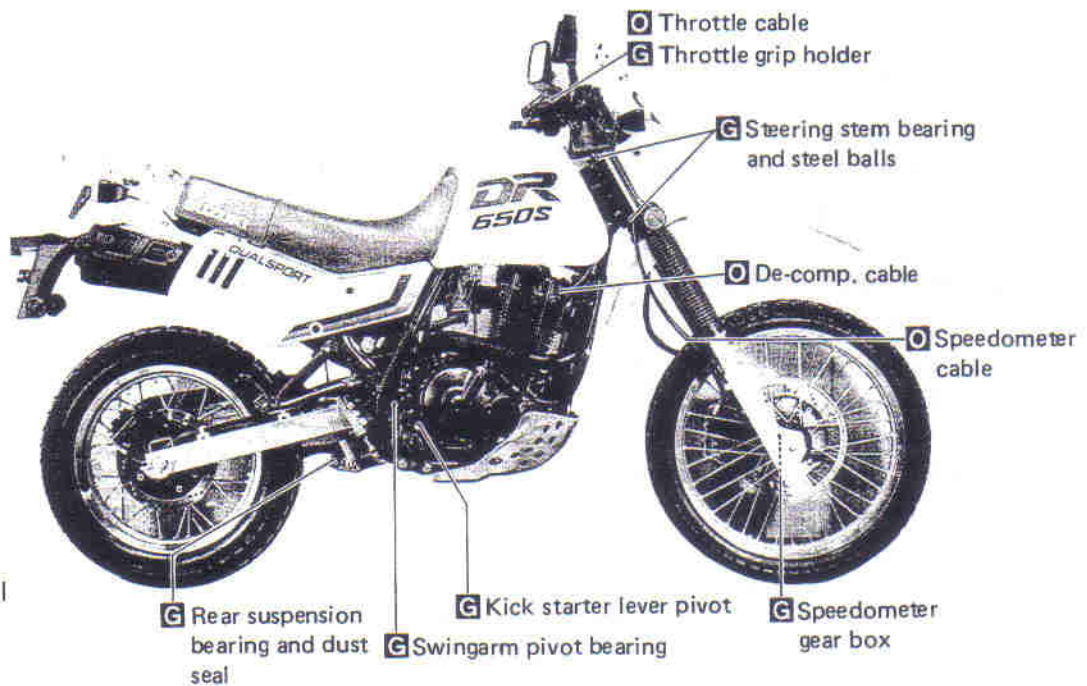
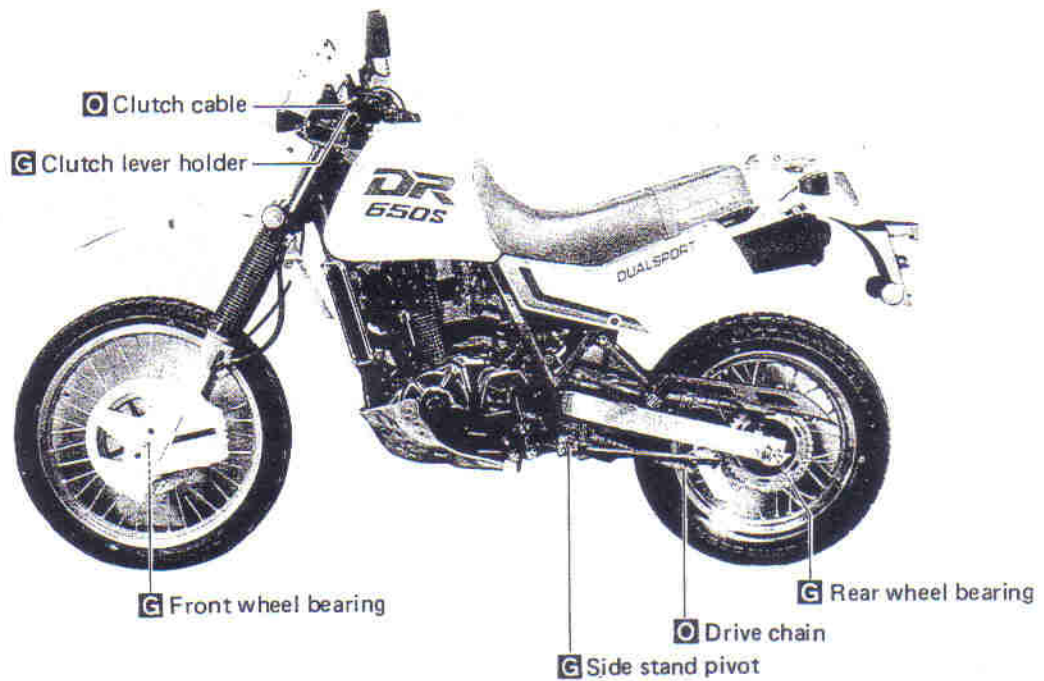
INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST	km	1 000	6 000	12 000	18 000	24 000
	miles	600	4 000	7 500	11 000	15 000
	months	2	12	24	36	48
Battery (Specific gravity of electrolyte)		—	I	I	I	I
Cylinder head bolts and nuts, exhaust pipe nuts and muffler connections		T	T	T	T	T
Air cleaner element	Clean every 3 000 km (2 000 miles).					
De-compression lever		I	I	I	I	I
Valve clearance		I	I	I	I	I
Spark plugs		—	I	R	I	R
Fuel line		I	I	I	I	I
	Replace every four years.					
Engine oil and oil filter		R	R	R	R	R
Carburetor idle rpm		I	I	I	I	I
Balancer chain		I	I	I	I	I
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
	Clean and lubricate every 1 000 km (600 miles).					
Brakes	Inspect every 3 000 km (2 000 miles).					
Brake hoses		I	I	I	I	I
	Replace every four years.					
Brake fluid	Change every two years.					
Tires		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		—	I	I	I	I
Rear suspension		—	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T

NOTE: I: Inspect and adjust, clean, lubricate or replace as necessary.

R: Replace T: Tighten

## LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part. Major oiling points are indicated below.



- ..... Motor oil
- ..... Grease

**NOTE:**

- \* Lubricate exposed parts which are subject to rust, with a rust preventative spray whenever the motorcycle has been operated under wet or rainy conditions. If the spray is unavailable, use either motor oil or grease.
- \* Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.

## MAINTENANCE AND TUNE-UP PROCEDURES

This section describes the servicing procedures for each item of the Periodic Maintenance requirements.

### BATTERY

Inspect Every 6 000 km (4 000 miles, 12 months)

- Remove the seat.
- Disconnect the battery  $\ominus$  and  $\oplus$  lead wires from the battery terminals.
- Remove the battery from its case.
- Check electrolyte for level and specific gravity. Add distilled water, as necessary to keep the surface of the electrolyte above the LOWER level line but not above the UPPER level line.
- For checking specific gravity, use a hydrometer to determine the charged condition.

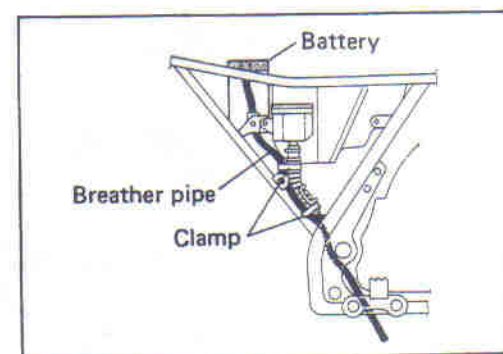
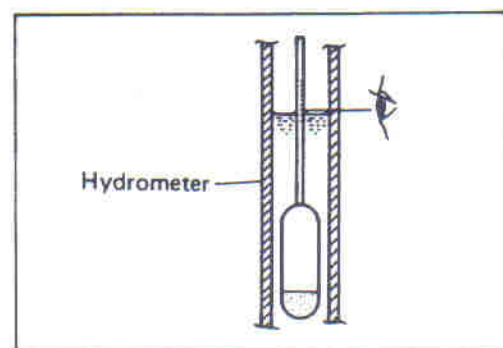
#### 09900-28403: Hydrometer

Standard specific gravity: 1.28 at 20°C (68°F)

An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging. Remove the battery from the motorcycle and charge it with a battery charger.

#### CAUTION:

- \* When removing the battery from the motorcycle, be sure to disconnect the  $\ominus$  lead wire first.
  - \* Never charge a battery while still in the motorcycle as damage may result to the battery or regulator/rectifier.
  - \* Be careful not to bend, obstruct, or change the routing of the breather pipe from the battery, make certain that the breather pipe is attached to the battery vent fitting and that the opposite end is always open.
  - \* When installing the battery lead wires, fix the  $\oplus$  lead first and  $\ominus$  lead last.
- Make sure that the breather pipe is tightly secured and undamaged, and is routed as shown in the illustration.



## CYLINDER HEAD BOLTS AND NUTS, EXHAUST PIPE NUTS AND MUFFLER CONNECTIONS

Tighten Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

### CYLINDER HEAD

- Remove the seat and fuel tank.
- Disconnect the spark plug caps.
- Disconnect the de-comp. cable.
- Remove the upper side of engine mounting bolts. (Refer to page 3-3.)
- Remove the cylinder head cover. (Refer to page 3-6.)
- First loosen and retighten the four bolts ①, and two nuts ② to the specified torque with a torque wrench sequentially in diagonally, when the engine is cold.

#### Tightening torque

① : 35 – 40 N·m (3.5 – 4.0 kg·m, 25.5 – 29.0 lb·ft)

② : 23 – 27 N·m (2.3 – 2.7 kg·m, 16.5 – 19.5 lb·ft)

- After firmly tightening the cylinder head bolts and nuts, tighten the two cylinder base nuts ③ to the specified torque.

#### Tightening torque

③ : 7 – 11 N·m (0.7 – 1.1 kg·m, 5.0 – 8.0 lb·ft)

- When installing the cylinder head cover, apply SUZUKI BOND NO. 1207B to the mating surface. (Refer to page 3-51.)

### EXHAUST PIPE AND MUFFLER

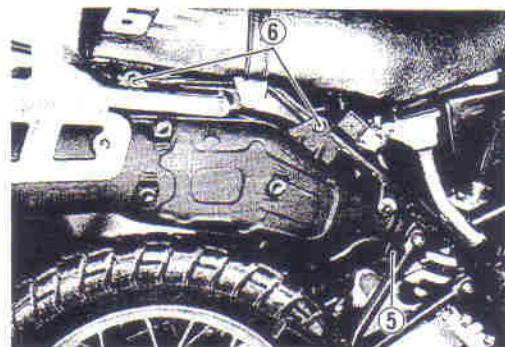
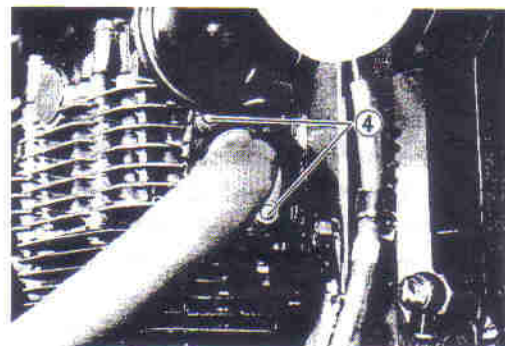
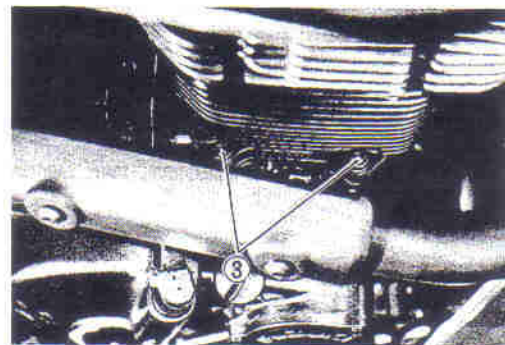
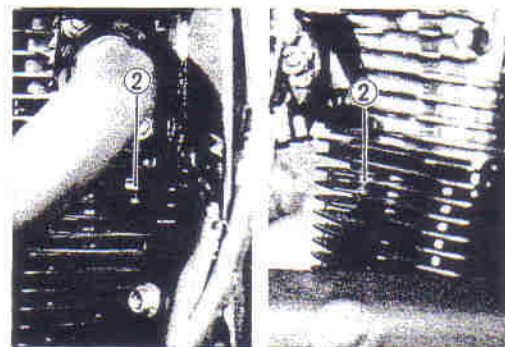
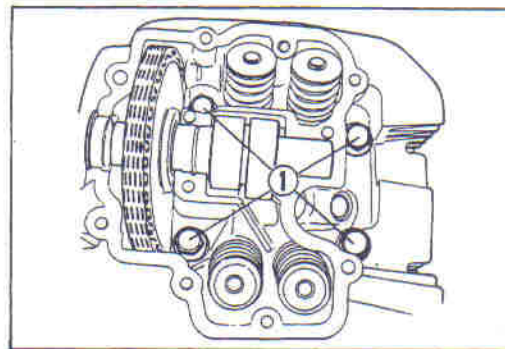
- Tighten the exhaust pipe nuts ④, muffler connection bolt ⑤ and muffler mounting bolts ⑥ to the specified torque.

#### Tightening torque

④ : 23 – 28 N·m (2.3 – 2.8 kg·m, 16.5 – 20.0 lb·ft)

⑤ : 23 – 28 N·m (2.3 – 2.8 kg·m, 16.5 – 20.0 lb·ft)

⑥ : 23 – 28 N·m (2.3 – 2.8 kg·m, 16.5 – 20.0 lb·ft)





## AIR CLEANER ELEMENT

Clean Every 3 000 km (2 000 miles)

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

Check and clean the element in the following manner.

- Remove the left frame cover.
- Remove the air cleaner case cover by removing screws ①.
- Remove the air cleaner element by removing bolt ②.
- Remove the polyurethane foam element ③ from the element frame ④.
- Fill a washing pan of a proper size with non-flammable cleaning solvent. Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands.
- Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.

### NOTE:

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

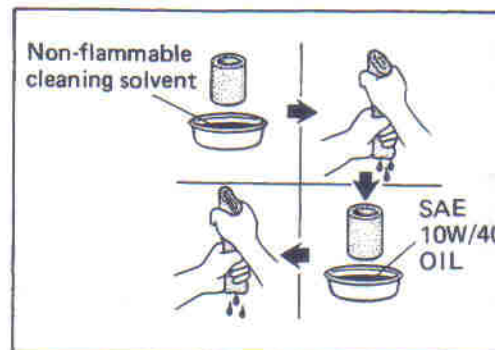
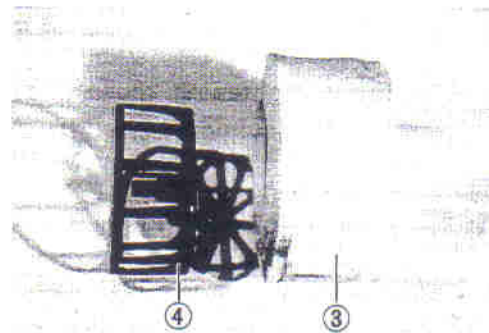
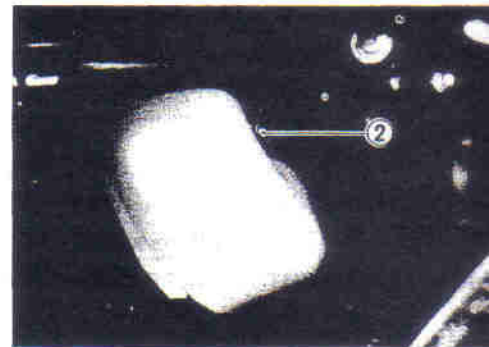
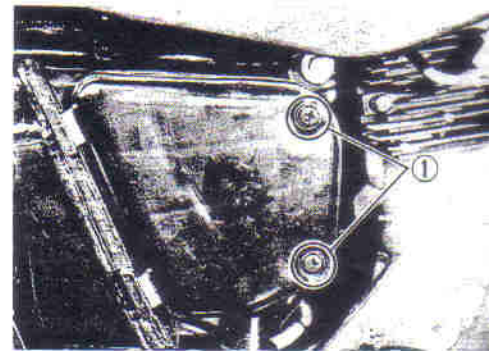
### CAUTION:

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

- Reinstall the cleaned or new cleaner element in the reverse order of removal.

### CAUTION:

If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a ruptured element. Make sure that the air cleaner is in good condition at all times. Life of the engine depends largely on this component!



## VALVE CLEARANCE

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

Excessive valve clearance results in valve noise and insufficient valve clearance results in valve damage and reduced power. At the distances indicated above, check and adjust the clearance to the specification.

Valve clearance specifications: 0.08 – 0.13 mm  
(IN. and EX.) (0.003 – 0.005 in)

The procedure for adjusting the valve clearance is as follows:

### NOTE:

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

- Remove the seat and fuel tank.
- Remove the spark plug and valve inspection caps, intake and exhaust.
- Remove the valve timing inspection plug and magneto cover cap.
- Turn the crankshaft counterclockwise with the box wrench to set the piston at T.D.C. on the compression stroke. (Turn the crankshaft until the "T" line ① on the magneto rotor is aligned with the center of hole on the magneto cover.)
- Insert the thickness gauge into the clearance between the valve stem end and the adjusting screw on the rocker arm.

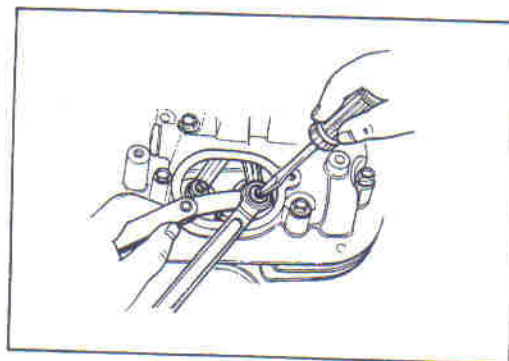
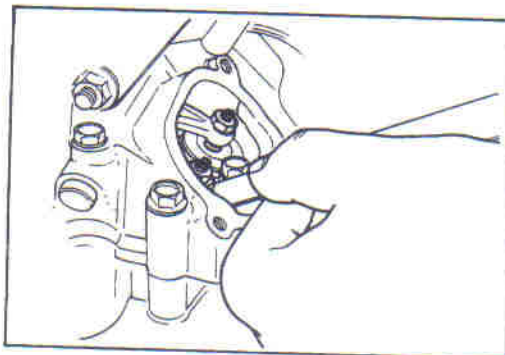
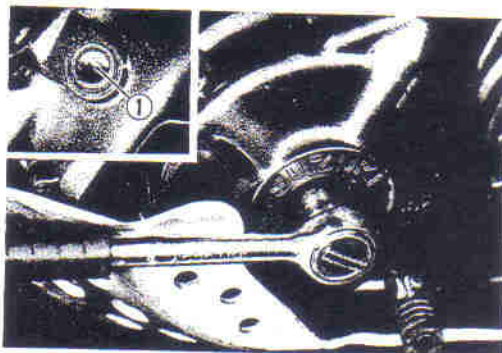
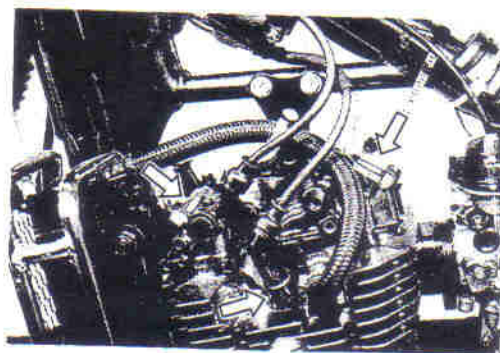
### 09900-20803: Thickness gauge

- If clearance is off the specification, bring it into the specified range with the screwdriver.
- Securely tighten the lock nut after adjustment is completed.

### CAUTION:

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

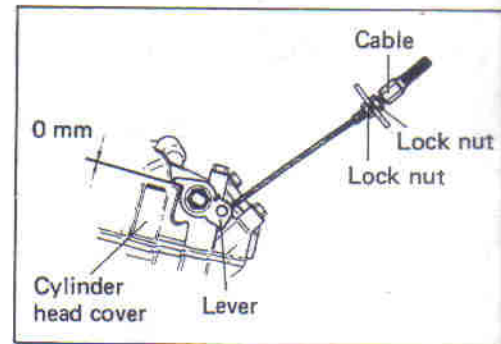
- Reinstall the spark plug, valve inspection caps, valve timing inspection plug and magneto cover cap.



## DE-COMPRESSION LEVER

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

- After adjusting the valve clearance, adjust the de-compression cable.
- With the de-compression lever squeezed, loosen and adjust the two adjuster lock nuts so that the clearance between the lever on the engine and upper cylinder head cover becomes zero as indicated in Fig. at right.
- After adjusting the cable correctly, tighten the two lock nuts.



## SPARK PLUGS

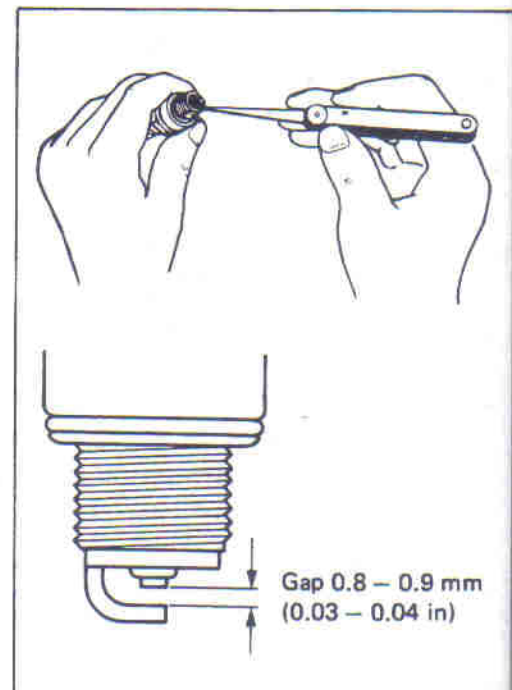
Inspect Every 6 000 km (4 000 miles, 12 months) and  
Replace Every 12 000 km (7 500 miles, 24 months)

The plug gap is adjusted to 0.8 – 0.9 mm (0.03 – 0.04 in). The gap is correctly adjusted with a thickness gauge. When carbon is deposited on the spark plug, remove the carbon with a tool with a pointed end. If the electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.

NGK DP9EA-9 or DPR9EA-9 or NIPPON DENSO X27EP-U9 or X27EPR-U9 as listed in the table should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need to be replaced, it is recommended that the standard plugs listed in the table be selected. Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are blackened by carbon, they should be replaced by a hot type NGK DP8EA-9 or DPR8EA-9 or NIPPON DENSO X24EP-U9 or X24EPR-U9.

### NOTE:

To check the spark plugs, first make sure that the fuel tank contains unleaded gasoline, and after a test ride if the plugs are either sooty with carbon or burnt white, replace them.



**NOTE:**

Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

NGK	NIPPON DENSO	REMARKS
DP8EA-9	X24EP-U9	If the standard plug is apt to get wet, replace it with this hot type plug.
DP9EA-9	X27EP-U9	Standard

**"R" type spark plug**

NGK	NIPPON DENSO	REMARKS
DPR8EA-9	X24EPR-U9	If the standard plug is apt to get wet, replace it with this hot type plug.
DPR9EA-9	X27EPR-U9	Standard

**NOTE:**

"R" type spark plug is installed for some specifications. "R" type spark plug has a resistor located at the center electrode to prevent radio noise.

**FUEL LINE**

Inspect Initial 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) Replace Every 4 years
--

## ENGINE OIL AND OIL FILTER

Replace (Change) Initial 1 000 km (600 miles, 2 months)  
Every 6 000 km (4 000 miles, 12 months)

The oil should be changed while the engine is hot. Oil filter replacement at the above intervals should be done together with engine oil change.

- Keep the motorcycle upright, supported by jack or wooden block.
- Place an oil pan below the engine and remove the engine oil drain plug ① and oil filler cap ② to drain engine oil.
- Remove the oil filter cap by removing the three bolts ③.
- Remove the oil filter ④ and install the new one.
- Replace the oil filter cap and tighten the bolts ③ securely.

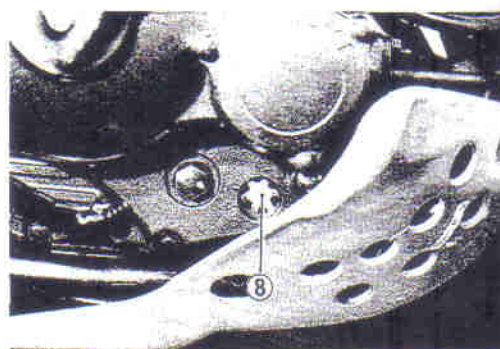
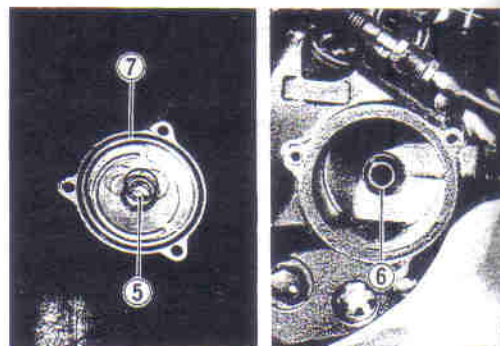
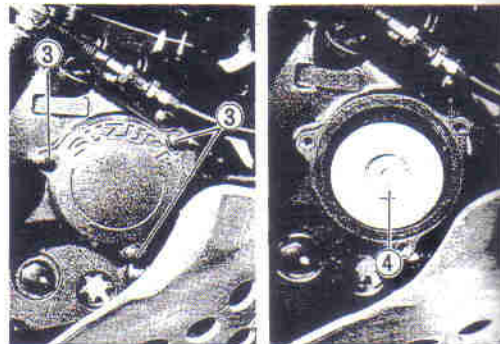
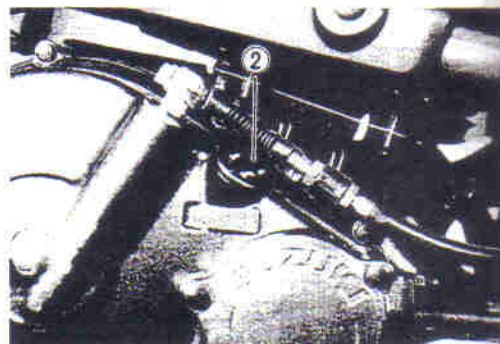
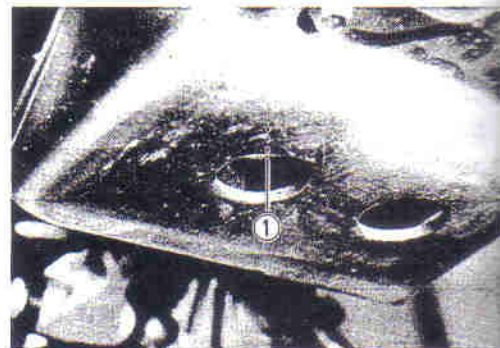
**NOTE:**

Before installing the oil filter and oil filter cap, check to be sure that the spring ⑤ and new O-rings ( ⑥ and ⑦ ) are installed correctly.

- Tighten the oil drain plug ① securely, and add fresh oil through the oil filler. The engine will hold about 2 150 ml of oil.  
Use an API classification of SE or SF oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about five minutes, then check the oil level through the inspection window ⑧. If the level is below mark "F", add oil to that level.

**NECESSARY AMOUNT OF ENGINE OIL**

Oil change : 2 000 ml (2.1/1.8 US/lmp qt)  
Filter change : 2 150 ml (2.3/1.9 US/lmp qt)  
Overhaul engine : 2 600 ml (2.7/2.3 US/lmp qt)



## CARBURETOR

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

### THROTTLE CABLE PLAY

The throttle cable should be adjusted to have a play **A** of 0.5 – 1.0 mm (0.02 – 0.04 in).

If the adjustment is necessary, adjust the play in the following way:

- Loosen the lock nut **1** and turn the adjuster **2** fully in.
- Remove the seat and fuel tank.
- Loosen the lock nut **3** and turn the adjuster **4** to acquire the specified play **A**.

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

- After adjusting the play, tighten the lock nuts (**1** and **3**).

#### NOTE:

Minor adjustment can be made by the adjuster **2** after loosening the lock nut **1**.

#### WARNING:

After the adjustment is completed, check that handlebar movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.

### IDLE R/MIN ADJUSTMENT

- Adjust the throttle cable play.

#### NOTE:

Make this adjustment when the engine is hot.

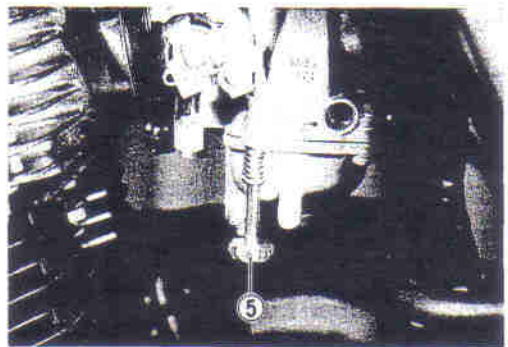
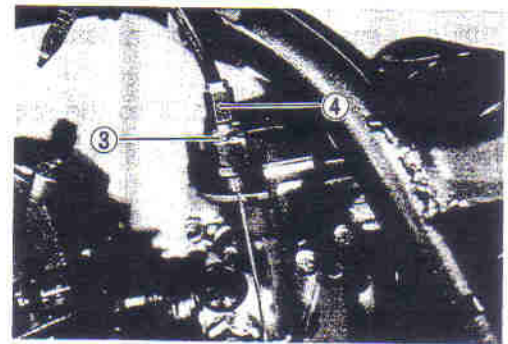
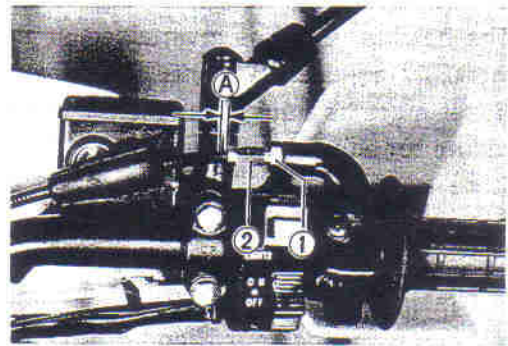
- Connect a tachometer.
- Start up the engine and set its speed at anywhere between 1 300 and 1 500 r/min by turning the throttle stop screw **5**.

### IDLE R/MIN

- 1 300 – 1 500 r/min

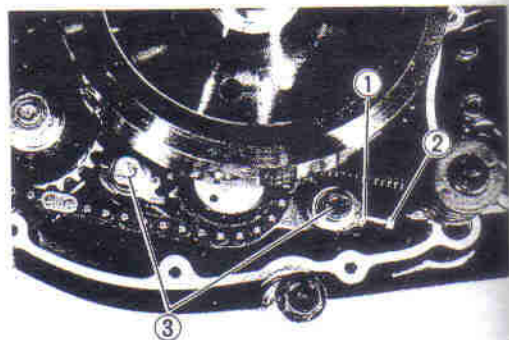
## BALANCER CHAIN

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)



The balancer chain is maintained at the proper tension by a manually adjusted tensioner. To prevent chain noise, the tensioner must be adjusted at the intervals listed above. The procedure for adjusting the balancer chain tensioner is as follows:

- Remove the engine under cover and gearshift lever.
- Drain engine oil.
- Remove the engine sprocket cover and magneto cover. (Refer to page 3-5.)
- Loosen the lock nut ① and stopper bolt ②, and then loosen on the chain tensioner allen bolts ③. This will allow a spring to pull the chain tensioner, taking up any slack that may have existed.
- Tighten the allen bolts ③ to the specified torque, and then tighten the stopper bolt ② and lock nut ①.



### Tightening torque

Bolt ③ : 15 – 20 N·m (1.5 – 2.0 kg·m, 11.0 – 14.5 lb·ft)

### NOTE:

When adjusting the balancer chain tensioner, change the oil at the same time.

### CAUTION:

To prevent oil leakage, do not use the old magneto cover gasket.

## CLUTCH

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

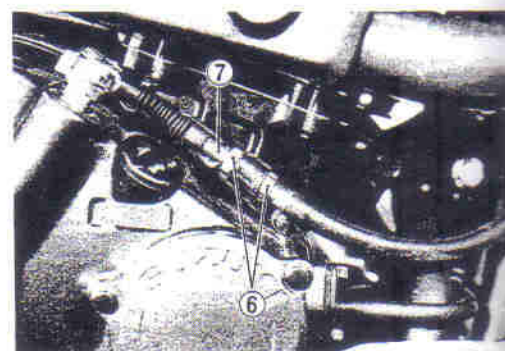
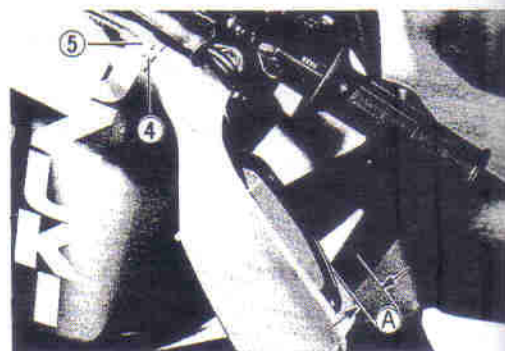
- Loosen the lock nut ④ and turn the adjuster ⑤ fully in.
- Loosen the clutch cable adjuster lock nuts ⑥ and slide the cable adjuster ⑦ to acquire the specified clutch lever play ⑧.

Clutch lever play ⑧ : 10 – 15 mm (0.4 – 0.6 in)

- Tighten the lock nuts (④ and ⑥) while holding the adjuster in position.

### NOTE:

Minor adjustment can be made by the adjuster ⑤ after loosening the lock nut ④. At the same intervals, lubricate the clutch cable with motor oil.



## DRIVE CHAIN

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)  
Clean and Lubricate Every 1 000 km (600 miles)

Visually inspect the drive chain for the listed below possible defects. (Lift the rear wheel and place a jack or block under the engine, and turn the rear wheel slowly by hand with the transmission in NEUTRAL.)

- \* Loose pins
- \* Damaged rollers
- \* Dry or rusted links
- \* Kinked or binding links
- \* Excessive wear
- \* Missing O-rings

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

### CHECKING

- \* Loosen axle nut ① after pulling out the cotter pin (For Canada and U.S.A.).
- \* Tension the drive chain fully by turning the right and left chain adjusters ②.
- \* Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds following limit, the chain must be replaced.

**Service Limit: 319.4 mm (12.57 in)**

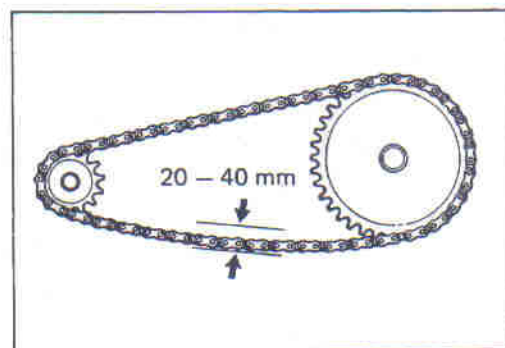
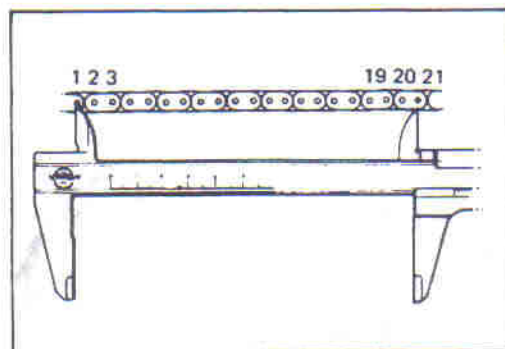
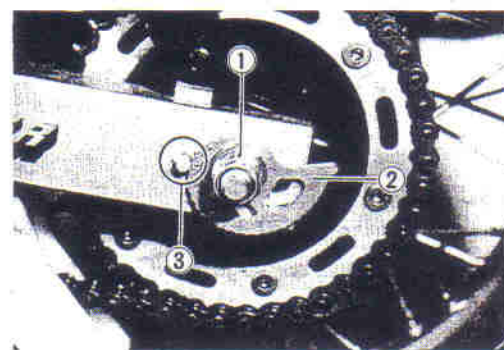
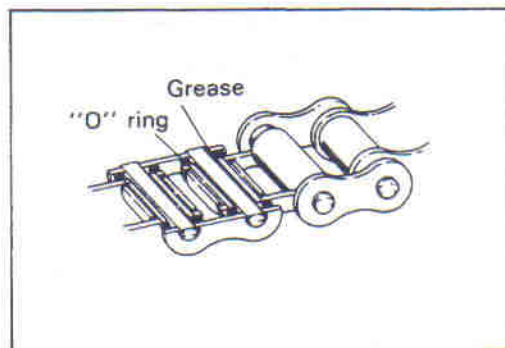
### ADJUSTING

- \* Turn both chain adjusters ② until the chain has 40 – 45 mm of slack at the middle between engine and rear sprockets. The number ③ on both chain adjusters must be at the same position to ensure that the front and rear wheels are correctly aligned.
- \* Place on side stand for accurate adjustment.

**Drive chain slack: 20 – 40 mm (0.8 – 1.6 in)**

- \* After adjusting the drive chain, tighten the axle nut ① to the specified torque. Always use a new cotter pin (For Canada and U.S.A.).

**Tightening torque: 50 – 80 N·m  
(5.0 – 8.0 kg·m, 36.0 – 58.0 lb·ft)**





### CLEANING AND LUBRICATING

- Wash the drive chain with kerosene. If the chain tends to rust faster, the intervals must be shortened.

#### CAUTION:

Do not use trichlene, gasoline or any similar fluids:

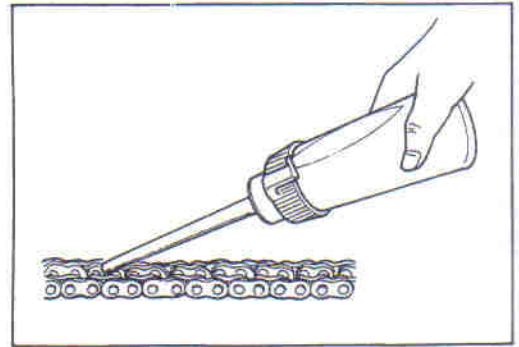
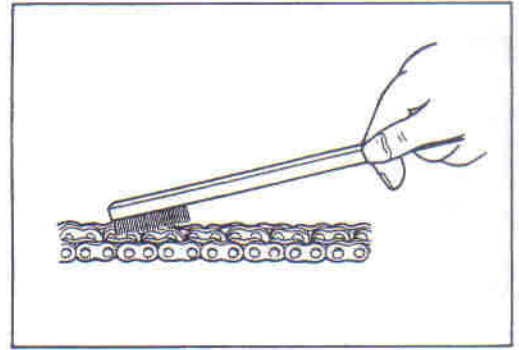
These fluids have too great a dissolving power for this chain and, what is more important, can damage the O-rings (or seals) confining the grease in the bush-to-pin clearance. Remember, high durability comes from the presence of grease in that clearance.

- After washing and drying the chain, oil it with a heavy-weight motor oil.

#### CAUTION:

Do not use any oil sold commercially as "drive chain oil". Such oil too can damage the O-rings (or seals).

The standard drive chain is DAIDO D.I.D. 520VC-5 or TAKASAGO RK520SD. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.



## BRAKES

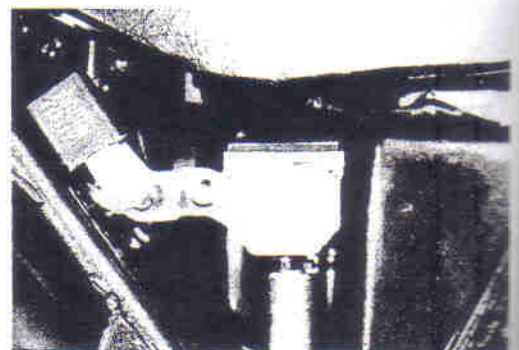
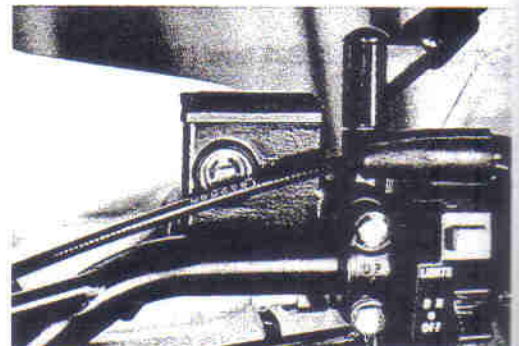
Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)  
Replace hoses Every 4 years  
Replace (change) fluid Every 2 years

### BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebar straight.
- Check the brake fluid level by observing the upper (only for rear brake) and lower (both front and rear brake) limit lines on the brake fluid reservoirs.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.

Specification and classification: DOT 4

99000-23110: SUZUKI BRAKE FLUID



**WARNING:**

The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never reuse 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 immediately discolor painted surfaces.

Check the brake hoses for cracks and hose joints for leakage before riding.

**BRAKE PADS**

Wearing condition of brake pads can be checked by observing the limit line ① (front caliper) and groove ② (rear caliper) marked on the pad. When the wear exceeds the limit mark, replace the pads with new ones. (Refer to pages 6-6 and 6-24.)

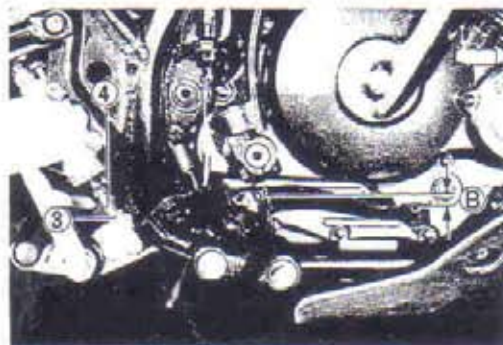
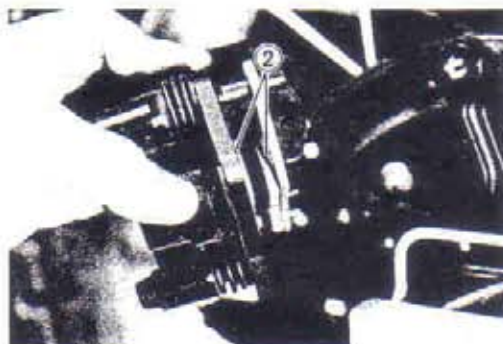
**BRAKE PEDAL HEIGHT**

- Loosen the lock nut ③, and rotate the push rod ④ to locate brake pedal 5 mm below the top face of the footrest.
- Retighten the lock nut ③ to secure the push rod ④ in the proper position.

Brake pedal height ⑤ : 5 mm (0.2 in)

**REAR BRAKE LIGHT SWITCH**

Adjust the rear brake light switch, so that brake light will come on just before a pressure is felt when the brake pedal is depressed.



**BLEEDING AIR FROM 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 brake caliper. 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 upper end of the inspection window (for front brake) and upper line (for rear brake). Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.
- Front brake: Bleed air from the bleeder valve.
- 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 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.

**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.*

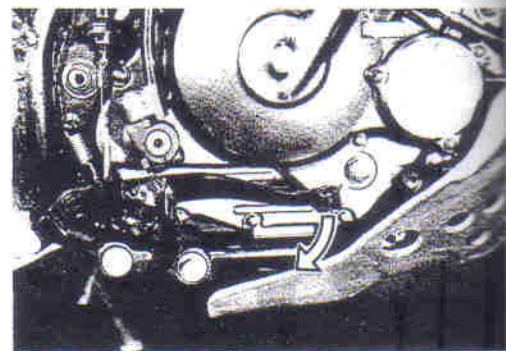
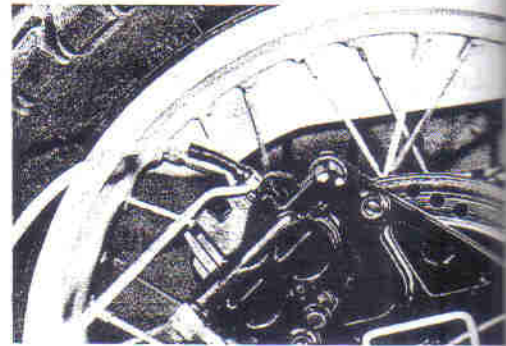
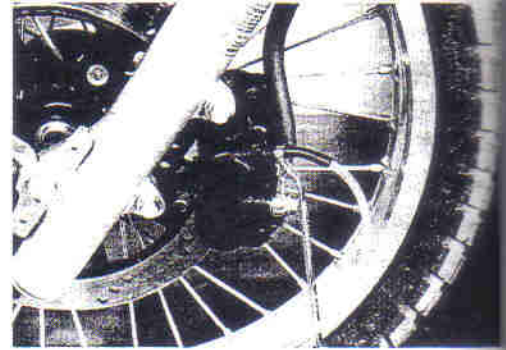
- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the upper end of the inspection window (for front brake) and upper line (for rear brake).
- Rear brake: Differences between front and rear are that the master cylinder is actuated by a pedal.

**Tightening torque**

**Bleeder valve: 6 – 9 N·m (0.6 – 0.9 kg·m, 4.5 – 6.5 lb-ft)**

**CAUTION:**

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



## TIRES

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

### 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 a tire when the remaining depth of tire tread reaches the following specification.

#### Tire tread depth limit

Front & Rear: 3.0 mm (0.12 in)

### TIRE PRESSURE

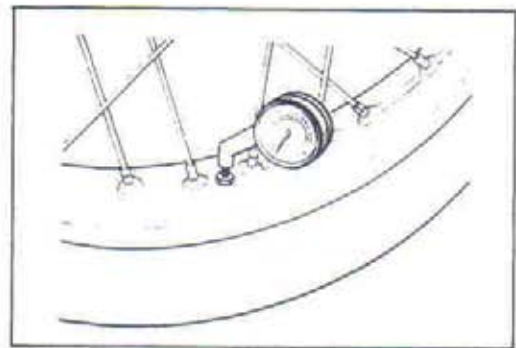
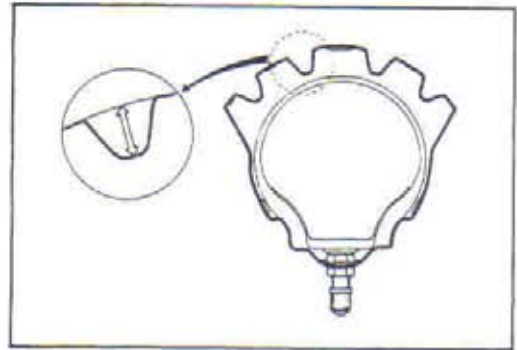
If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result.

Cold inflation tire pressure is as follows.

	FRONT			REAR		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
Solo riding	150	1.50	22	175	1.75	25
Dual riding	175	1.75	25	200	2.00	29

### CAUTION:

The standard tire fitted on this motorcycle is 90/90-21 54S for front and 120/90-17 64S for rear. The use of tires other than the those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.



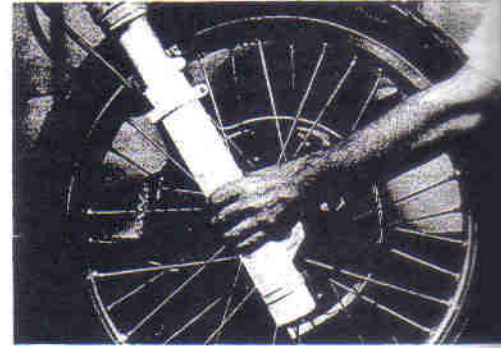
## STEERING

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

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

Steering should be adjusted properly for smooth turning of handlebar and safe running. Too stiff steering prevents smooth turning of handlebar 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. (Refer to page 6-18.)



## FRONT FORK

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

Inspect the front forks for oil leakage, scoring and scratches on the outer surface of the inner tubes.

Replace any defective parts, if necessary. (Refer to page 6-10.)

### AIR PRESSURE SERVICING

- Support the motorcycle by jack or block, and keep the front wheel off the ground.
- Remove the air valve protection caps and press the air valve to equalize the fork air pressure with atmospheric pressure. This must be done when the forks are cold.

Standard air pressure: 0 kPa (0 kg/cm<sup>2</sup>, 0 psi)

### CAUTION:

The maximum permissible air pressure is 250 kPa (2.5 kg/cm<sup>2</sup>, 35 psi) to avoid fork oil seal and valve damage.

## REAR SUSPENSION

Inspect Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

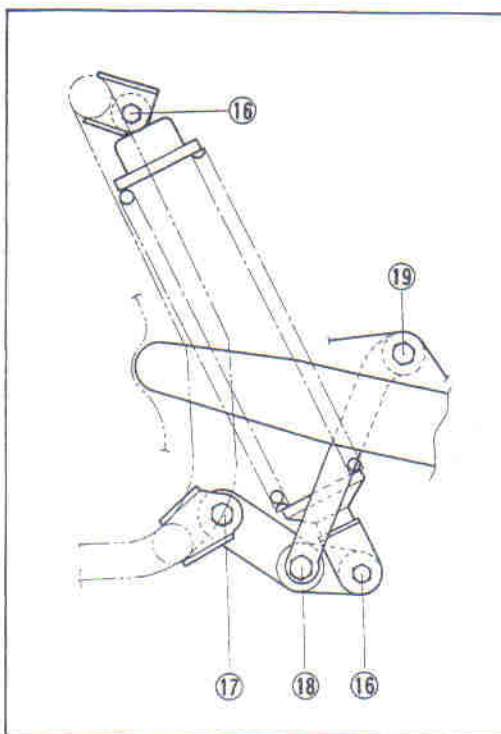
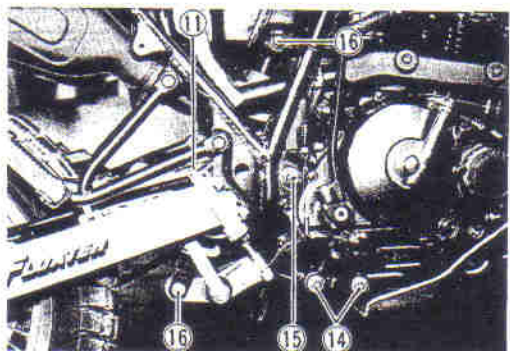
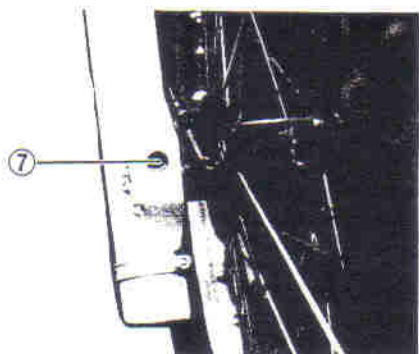
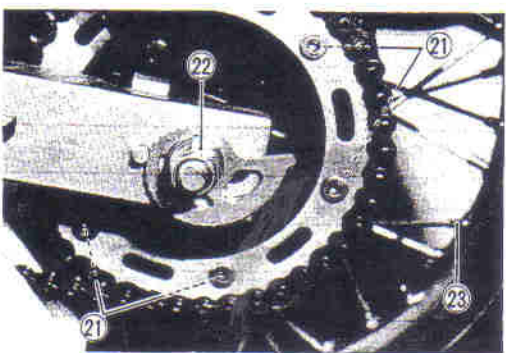
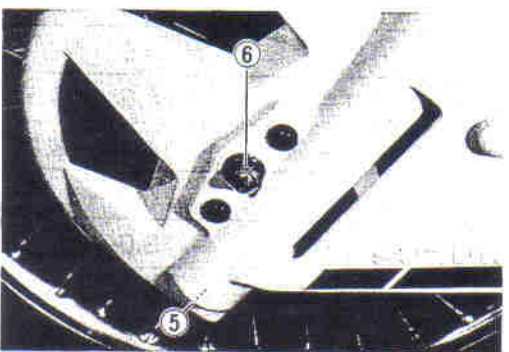
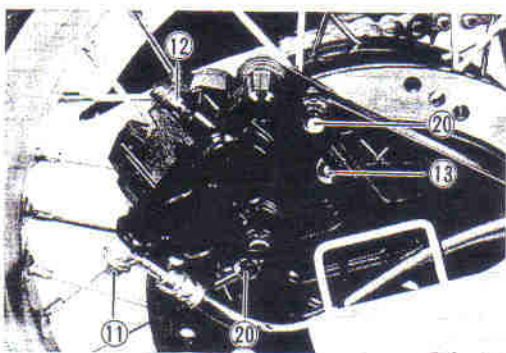
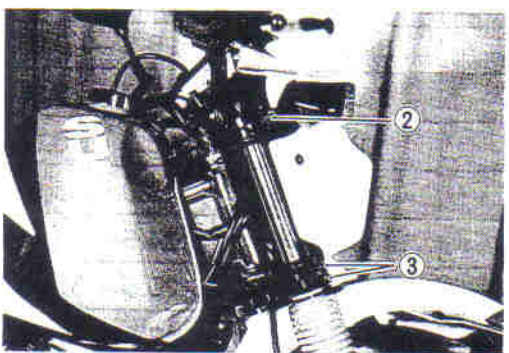
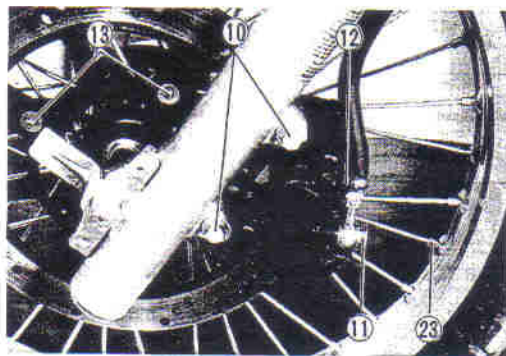
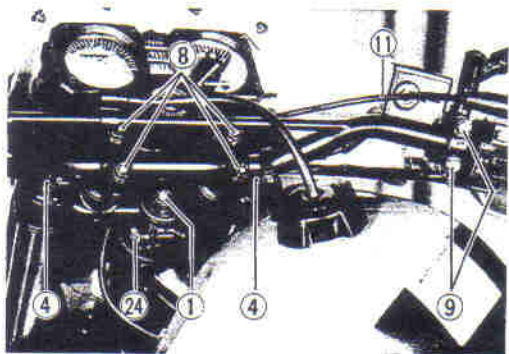
## CHASSIS BOLTS AND NUTS

Tighten Initial 1 000 km (600 miles, 2 months) and  
Every 6 000 km (4 000 miles, 12 months)

The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-19 for the locations of the following nuts and bolts on the motorcycle.)

Item	N-m	kg-m	lb-ft
① Steering stem head bolt	35 – 55	3.5 – 5.5	25.5 – 40.0
② Front fork upper clamp bolt	25 – 39	2.5 – 3.9	18.0 – 28.0
③ Front fork lower clamp bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
④ Front fork cap bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
⑤ Front fork damper rod bolt	34 – 46	3.4 – 4.6	24.5 – 33.5
⑥ Front axle nut	36 – 52	3.6 – 5.2	26.0 – 37.5
⑦ Front axle pinch bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
⑧ Handlebar clamp bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
⑨ Front brake master cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
⑩ Front brake caliper mounting bolt	20 – 31	2.0 – 3.1	14.5 – 22.5
⑪ Brake hose union bolt (Front & Rear)	20 – 25	2.0 – 2.5	14.5 – 18.0
⑫ Air bleeder valve (Front & Rear)	6 – 9	0.6 – 0.9	4.5 – 6.5
⑬ Brake disc mounting bolt (Front & Rear)	18 – 28	1.8 – 2.8	13.0 – 20.0
⑭ Front footrest bolt	27 – 43	2.7 – 4.3	19.5 – 31.0
⑮ Swingarm pivot nut	61 – 94	6.1 – 9.4	44.0 – 68.0
⑯ Shock absorber mounting nut (Upper & Lower)	48 – 72	4.8 – 7.2	34.5 – 52.0
⑰ Rear cushion lever nut (Front)	60 – 96	6.0 – 9.6	43.5 – 69.5
⑱ Rear cushion lever nut (Center)	84 – 120	8.4 – 12.0	60.5 – 87.0
⑲ Rear cushion rod bolt	84 – 120	8.4 – 12.0	60.5 – 87.0
⑳ Rear brake caliper mounting bolt	20 – 31	2.0 – 3.1	14.5 – 22.5
㉑ Rear sprocket mounting nut	22 – 32	2.2 – 3.2	16.0 – 23.0
㉒ Rear axle nut	50 – 80	5.0 – 8.0	36.0 – 58.0
㉓ Spoke nipple	4 – 5	0.4 – 0.5	3.0 – 3.5
㉔ Steering stem clamp nut	18 – 28	1.8 – 2.8	13.0 – 20.0

## 2-19 PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES



# ENGINE

## CONTENTS

<b>ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE</b> .....	3- 1
<b>ENGINE REMOVAL AND REINSTALLATION</b> .....	3- 2
<b>ENGINE DISASSEMBLY</b> .....	3- 5
<b>ENGINE COMPONENTS INSPECTION AND SERVICING</b> .....	3-12
<b>CYLINDER HEAD</b> .....	3-12
<b>ROCKER ARM</b> .....	3-13
<b>DE-COMPRESSION</b> .....	3-14
<b>VALVE</b> .....	3-15
<b>CAMSHAFT</b> .....	3-21
<b>CAM DRIVE CHAIN AND BALANCER DRIVE CHAIN</b> .....	3-22
<b>CYLINDER</b> .....	3-22
<b>PISTON</b> .....	3-23
<b>PISTON RING</b> .....	3-23
<b>CONROD</b> .....	3-25
<b>CRANKSHAFT</b> .....	3-26
<b>CLUTCH</b> .....	3-26
<b>KICK STARTER</b> .....	3-28
<b>TRANSMISSION</b> .....	3-30
<b>CRANKCASE BEARINGS</b> .....	3-34
<b>ENGINE REASSEMBLY</b> .....	3-35
<b>OIL SEALS</b> .....	3-35
<b>CRANKSHAFT</b> .....	3-36
<b>BALANCERSHAFT</b> .....	3-37
<b>TRANSMISSION</b> .....	3-38
<b>KICK STARTER</b> .....	3-38
<b>GEARSHIFT</b> .....	3-40
<b>BALANCER</b> .....	3-40
<b>MAGNETO</b> .....	3-42
<b>OIL PUMP</b> .....	3-42
<b>CLUTCH</b> .....	3-44
<b>OIL FILTER</b> .....	3-45
<b>OIL SUMP FILTER</b> .....	3-46
<b>RING AND PISTON</b> .....	3-46
<b>CYLINDER AND CYLINDER HEAD</b> .....	3-48
<b>CAMSHAFT</b> .....	3-50
<b>CYLINDER HEAD COVER</b> .....	3-51
<b>CAM DRIVE CHAIN TENSIONER</b> .....	3-52



## ENGINE COMPONENTS REMOVABLE WITH THE ENGINE IN PLACE

The parts listed below can be removed and reinstalled without removing the engine from the frame.  
Refer to the page listed in this section for removal instruction.

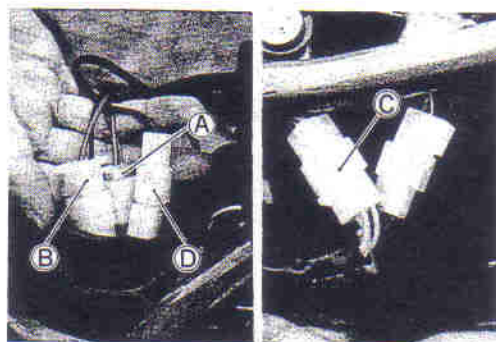
ENGINE LEFT SIDE	See page	ENGINE CENTER	See page	ENGINE RIGHT SIDE	See page
Engine sprocket .....	3-4	Cylinder head cover .....	3-6	Oil filter .....	3-45
Magneto cover .....	3-5	Camshaft .....	3-6	Clutch cover .....	3-9
Magneto rotor .....	3-7	Cylinder head .....	3-6	Clutch .....	3-9
Balancer drive chain tensioner .....	3-8	Cylinder .....	3-7	Primary driven gear .....	3-9
Balancer drive and driven sprockets ..	3-8	Piston .....	3-7	Primary drive gear and cam drive sprocket .....	3-43
Gearshifter .....	3-9	Cam drive chain tensioner .....	3-5	Oil pump driven gear .....	3-10
		Cam drive chain .....	3-10	Oil pump assembly .....	3-10
		Oil sump filter .....	3-10		

## ENGINE REMOVAL AND REINSTALLATION

### ENGINE REMOVAL

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

1. Remove the left and right frame covers.
2. Remove the seat.
3. Disconnect the battery  $\ominus$  lead wire from the battery terminal.
4. Turn the fuel cock to "OFF" position and disconnect the fuel hose from the fuel cock.
5. Remove the fuel tank.
6. Disconnect the various lead wires.
  - \* Pick-up coil (A)
  - \* Power source coil (B)
  - \* Generator coil (C)
  - \* Neutral switch (D)
7. Disconnect the de-compression cable.
8. Disconnect the throttle cable.
9. Disconnect the spark plug caps.
10. Disconnect the clutch cable.
11. Remove the oil cooler.
12. Remove the left and right footrests.
13. Unhook the rear brake pedal return spring and disconnect the cotter pin from the rear brake push rod end.
14. Loosen the muffler and exhaust pipe connection bolt.
15. Remove the exhaust pipe.
16. Remove the carburetor.
17. Disconnect the crankcase breather hose.
18. Remove the engine under cover.
19. Remove the gearshift lever.
20. Remove the engine sprocket cover and engine sprocket.



#### NOTE:

*If it is difficult to remove the engine sprocket, loosen the axle nut and chain adjusters to provide additional chain slack.*

21. Remove the engine mounting bolts, nuts, spacers and brackets.
22. Remove the engine through the right side of the frame.

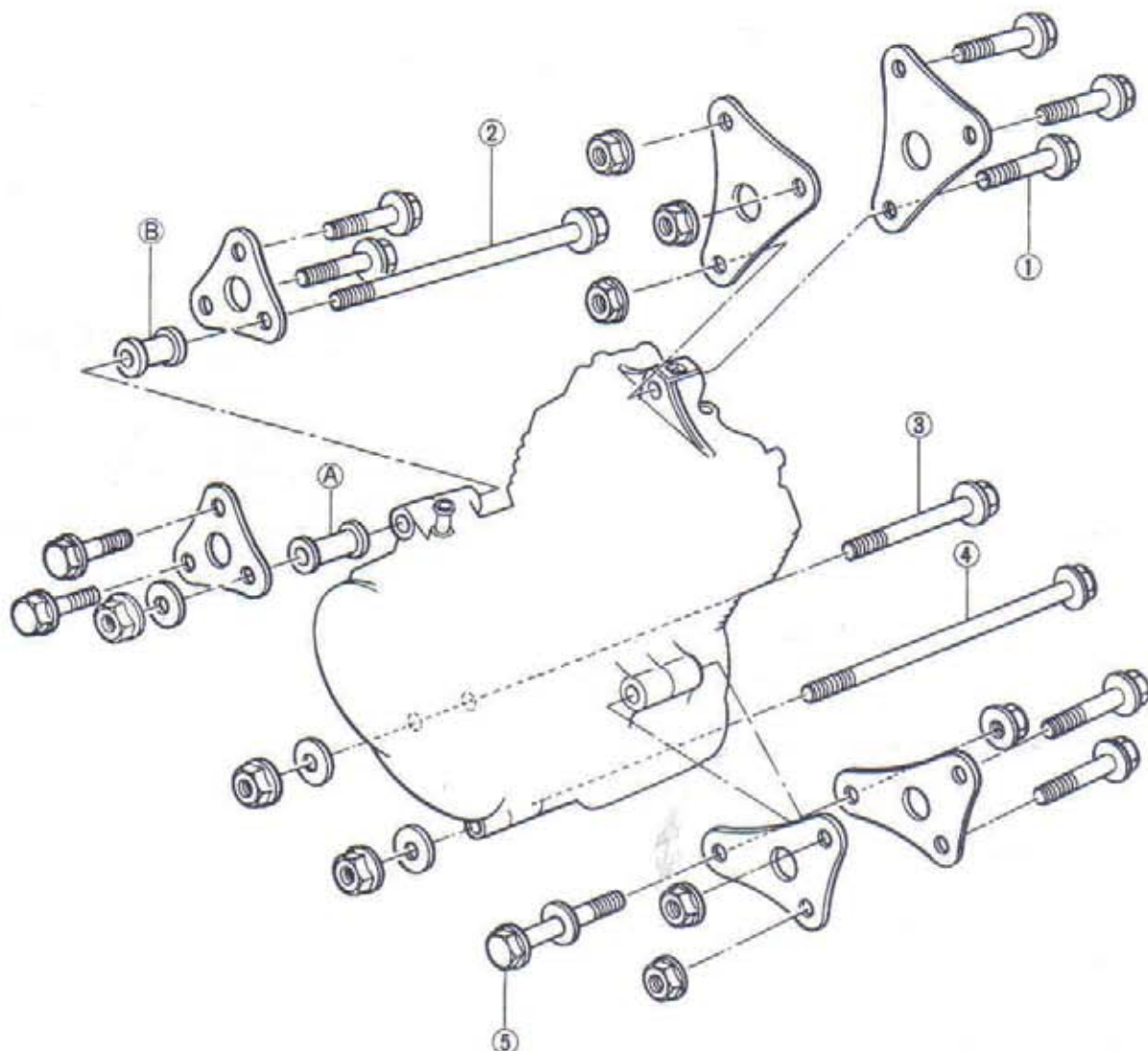
### ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

- \* Insert the two long bolts from left side. Install the brackets, spacers, bolts and nuts properly, as shown in the illustration on next page.

#### NOTE:

*The engine mounting nuts are self-locking. 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.*



- Apply THREAD LOCK SUPER "1303" to the engine mounting bolts.

99000-32030: THREAD LOCK SUPER "1303"

#### TIGHTENING TORQUE

ITEM	N·m	kg·m	lb·ft
① 8 mm Diam.	37 - 45	3.7 - 4.5	27.0 - 32.5
② ③ ④ ⑤ 10 mm Diam.	85 - 100	8.5 - 10.0	61.5 - 72.5
Other bolts	25 - 38	2.5 - 3.8	18.0 - 27.5

#### LENGTH

Bolt ①	53 mm (2.1 in)
Bolt ②	235 mm (9.3 in)
Bolt ③	130 mm (5.1 in)
Bolt ④	230 mm (9.1 in)
Bolt ⑤	80 mm (3.1 in)
Spacer A	65 mm (2.6 in)
Spacer B	55 mm (2.2 in)

- Install the oil cooler hoses, ① and ② to the clutch cover and cylinder head correctly.

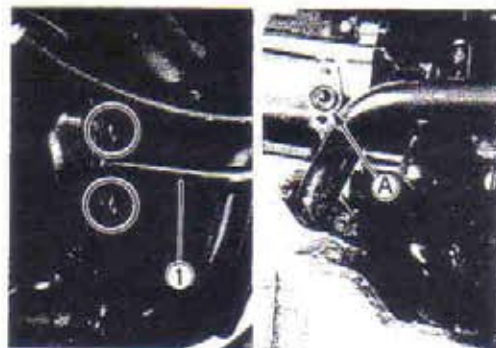
**CAUTION:**

Replace the O-ring (A) with new one to prevent oil leakage.

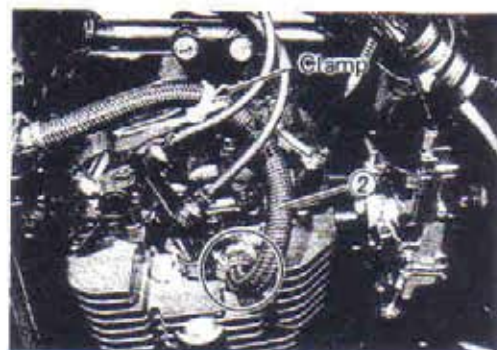
- Tighten the oil cooler hose securing bolts to the specified torque.

**Tightening torque: 8 – 12 N·m**

(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)



- Tighten the engine sprocket mounting bolts, rear axle nut, exhaust pipe nuts and muffler mounting bolts to the specified torque. (See page 7-16.)

**NOTE:**

Apply **THREAD LOCK SUPER "1303"** to the muffler mounting bolts.

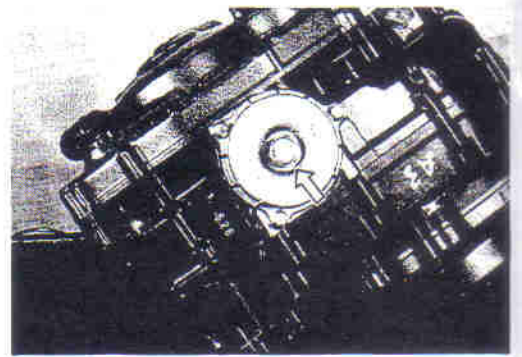
**99000-32030: THREAD LOCK SUPER "1303"**

- After remounting the engine, following adjustments are necessary.
  - \* De-comp. cable play (See page 2-7.)
  - \* Clutch cable play (See page 2-11.)
  - \* Drive chain slack (See page 2-12.)
  - \* Rear brake pedal height (See page 2-14.)
  - \* Idling speed (See page 2-10.)
  - \* Throttle cable play (See page 2-10.)
- Pour 2.6 L (2.7/2.3 US/Imp qt) of engine oil SAE 10W/40 graded SE or SF into the engine after overhauling engine.
- Start up the engine and allow it run for several minutes at idle speed. About five minutes after stopping engine, check oil level.  
If the level is below the "F" mark, add oil until the level reaches the "F" mark.

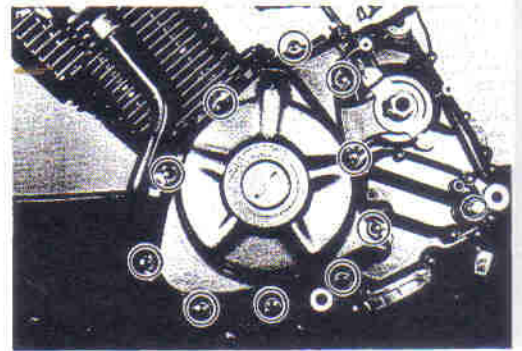
Change	2 000 ml (2.1/1.8 US/Imp qt)
Filter change	2 150 ml (2.3/1.9 US/Imp qt)
Overhaul	2 600 ml (2.7/2.3 US/Imp qt)

## ENGINE DISASSEMBLY

- Place an oil pan under the engine and remove the oil drain plug and drain out engine oil.

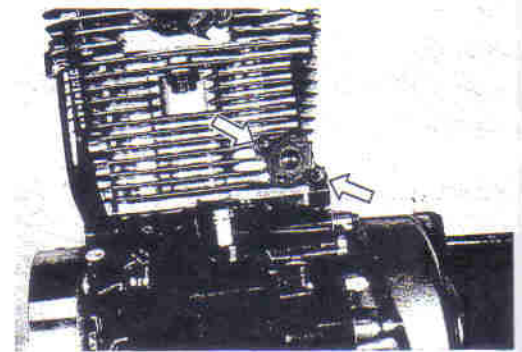


- After removing the magneto cover bolts, remove the magneto cover by tapping with a plastic hammer.

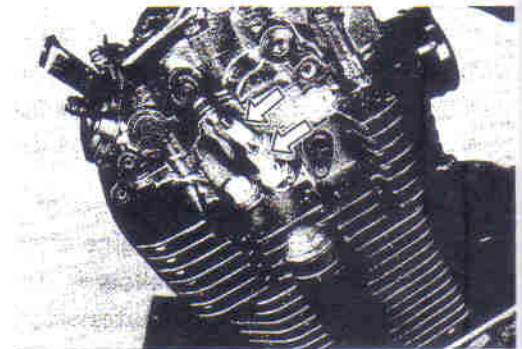


- Remove the cam drive chain tensioner by removing the bolts.

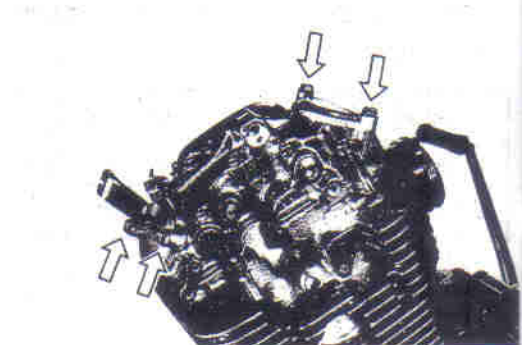
09911-73730: "T" type hexagon wrench (5 mm)



- Remove the two spark plugs.



- Remove the valve inspection caps (Intake and Exhaust) by removing the bolts.



**NOTE:**

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

Align "TOP" line on the magneto rotor with index mark on the crankcase.

- Loosen the cylinder head cover bolts in the ascending order numbers and detach the cylinder head cover.

**NOTE:**

When removing the cylinder head cover, do not remove the conically recessed top bolt (A).

- Detach the camshaft end cap (1).
- Flatten the lock washer and remove the camshaft sprocket bolts.
- Remove the camshaft and sprocket.

**NOTE:**

The cam chain tensioner bolt (B) is to be removed only when disassembling the engine.

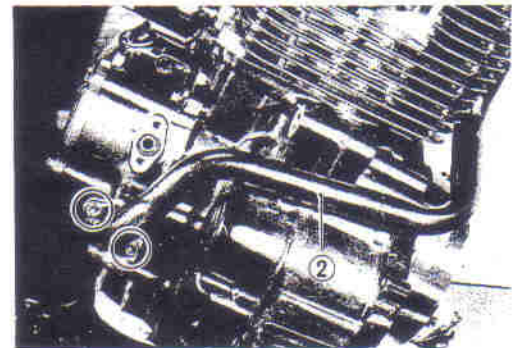
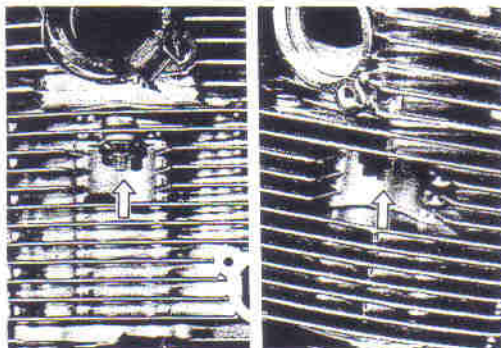
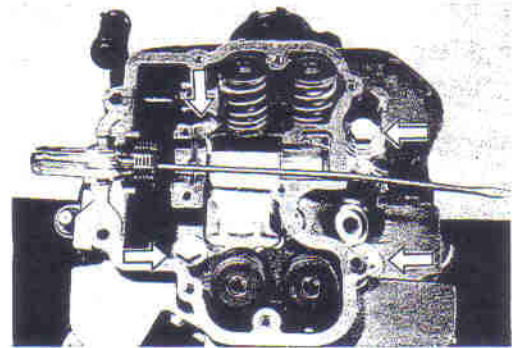
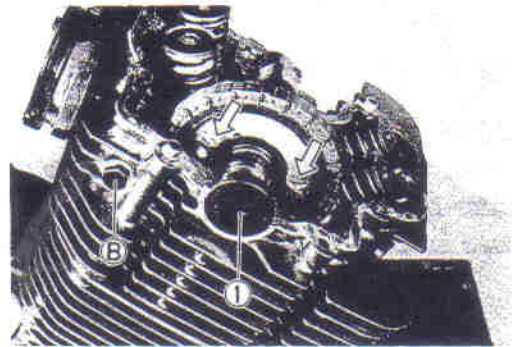
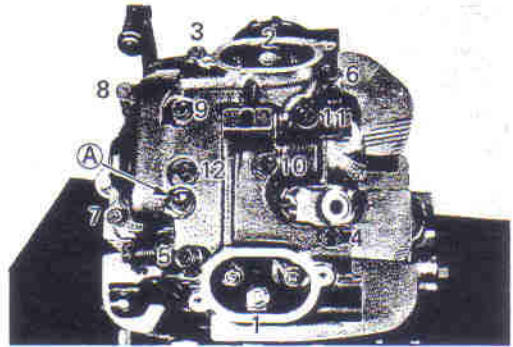
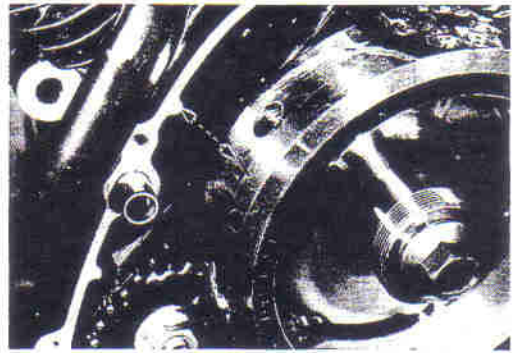
**CAUTION:**

Do not drop camshaft drive chain, pin, C-ring or sprocket into the crankcase.

- Remove the cylinder head bolts and nuts diagonally.
- Remove the oil return pipe (2).
- Remove the cylinder head.

**NOTE:**

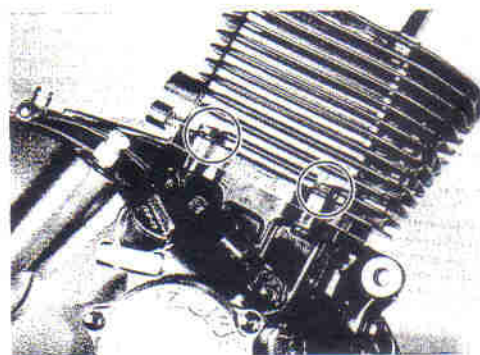
If it is difficult to remove the cylinder head, gently pry it off while tapping the finless portion of the cylinder head with a plastic hammer. Be careful not to break the fins.



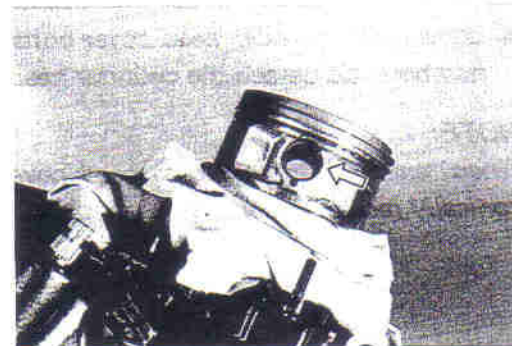
- Remove the cylinder base nuts and cylinder.

**CAUTION:**

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



- Place a clean rag over the cylinder base to prevent the piston pin circlips from dropping into crankcase. Remove the piston pin circlips with a long-nose pliers.
- Drive out the piston pin by using an appropriate drift.

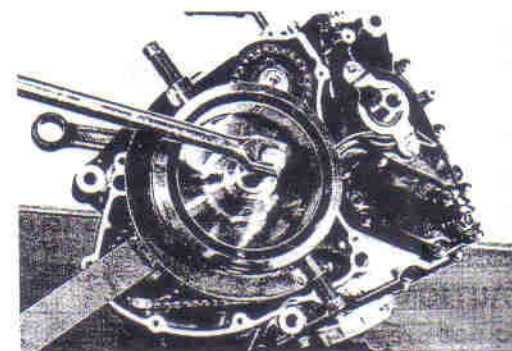


- Loosen the magneto rotor bolt by using the special tool.

**09930-44913: Rotor holder**

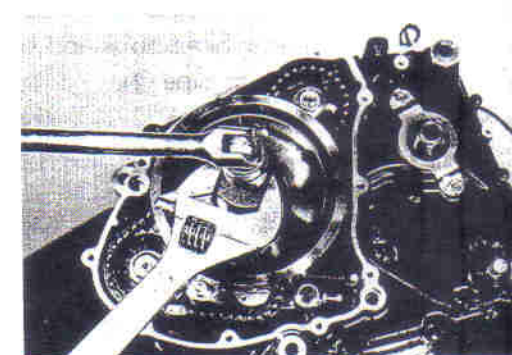
**NOTE:**

When removing the magneto rotor, do not remove the magneto rotor bolt after loosening the bolt. The magneto rotor bolt is used in conjunction with the rotor remover.



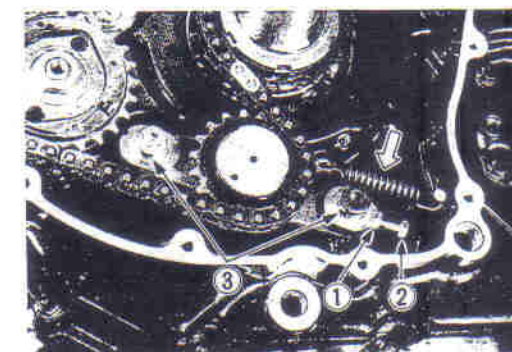
- Remove the magneto rotor by using the special tool.
- After removing the magneto rotor, remove the key from the crankshaft.

**09930-33720: Rotor remover**



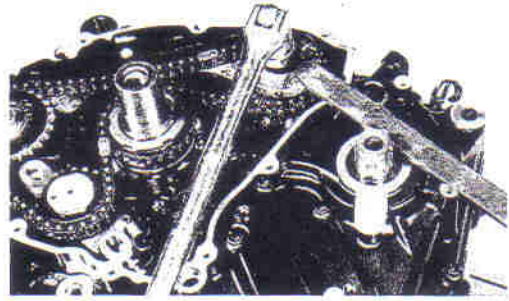
- Unhook the balancer drive chain tensioner spring.
- Loosen the lock nut ① and stopper bolt ②, then remove the bolts ③.

**09914-25811: "T" type hexagon wrench (6 mm)**

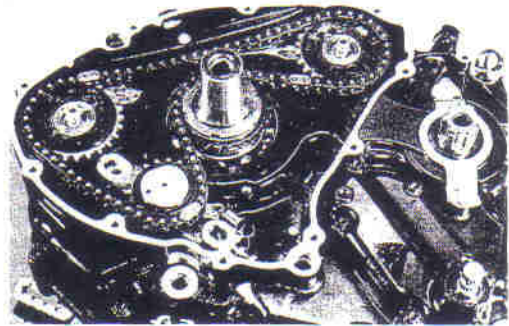


- Remove the front and rear balancer driven sprocket nuts by using the special tool.

09917-33710: Sprocket holder



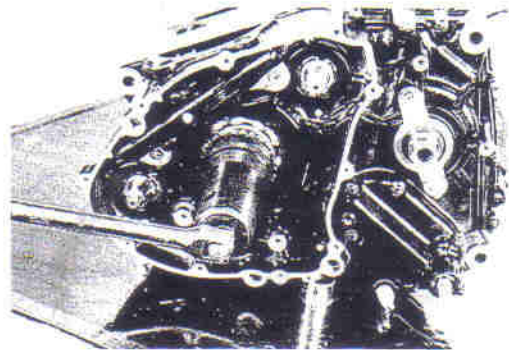
- Remove the front and rear balancer driven sprockets and balancer drive chain tensioner along with the balancer drive chain.
- Remove the keys from both balancer shafts.



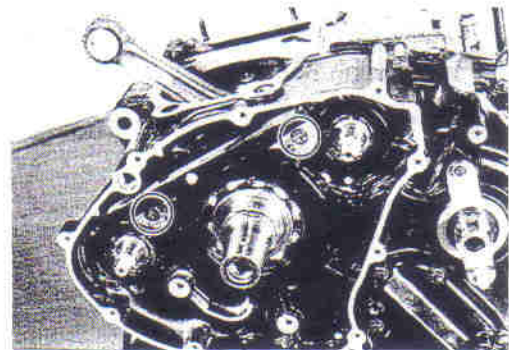
- Remove the ring nut by using the special tools, then remove the wave washer, balancer drive sprocket and key from the crankshaft.

09917-23711: Ring nut socket wrench

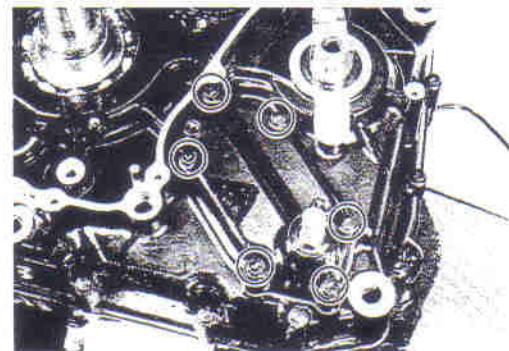
09910-20116: Conrod holder



- Remove the balancer chain guide by removing the screws.



- Remove the gearshift cover by removing the bolts.



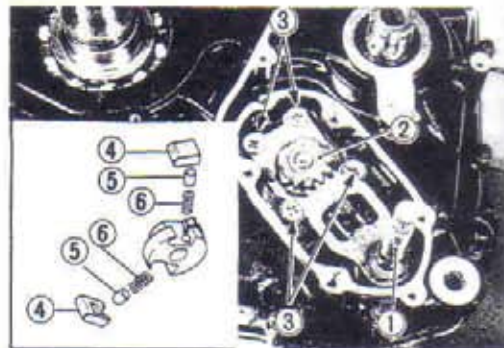


- Extract the gearshift shaft ① and remove the cam driven gear ② by removing the screws ③.

**NOTE:**

*When removing the cam driven gear, do not lose gearshift pawl ④, pin ⑤ and spring ⑥.*

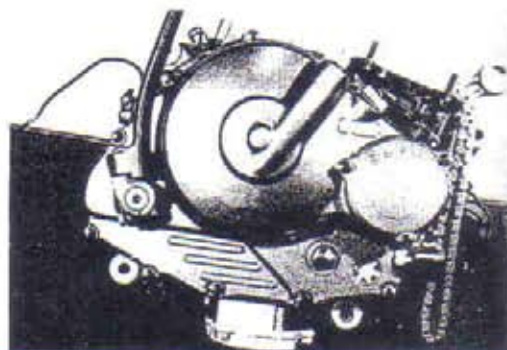
**09900-09003: Impact driver set**



- After removing the kick starter lever, remove the clutch cover bolts and detach the clutch cover by tapping with a plastic hammer.

**NOTE:**

*Do not remove the oil filter cap at this point.*



- Remove the clutch spring mounting bolts diagonally.

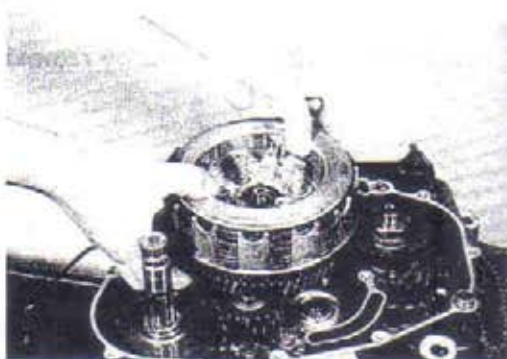


- Flatten the lock washer and remove the clutch sleeve hub nut by using the special tool.

**09920-53722: Clutch sleeve hub holder**



- Remove the clutch sleeve hub, clutch plates and pressure plate along with the primary driven gear assembly.



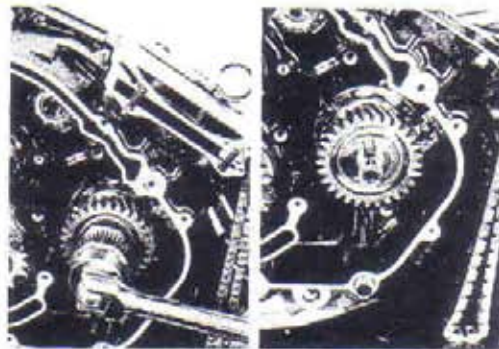
- Remove the primary drive gear nut while holding the conrod with the conrod holder.
- Remove the washer, primary drive gear and key.

99910-20116: Conrod holder

**NOTE:**

*This is a left-hand thread nut.*

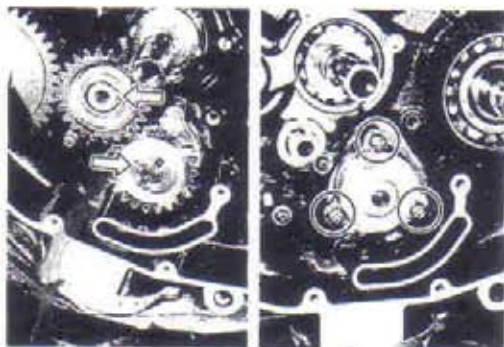
- Remove the oil nozzle with a long-nose pliers.
- Remove the cam drive chain, cam drive sprocket and key.



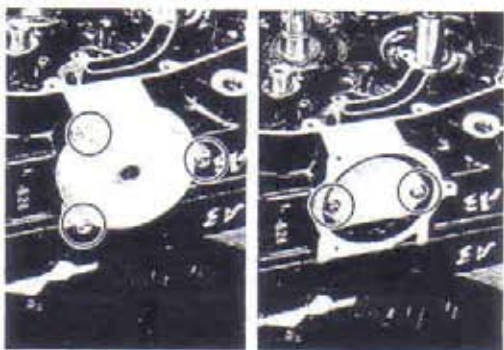
- Remove the idle gear and oil pump driven gear by removing the circlips.
- Remove the oil pump mounting screws with an impact driver.

99900-06107: Snap ring pliers

99900-09003: Impact driver set



- Remove the oil sump filter cap and oil sump filter by removing the bolts and screws.



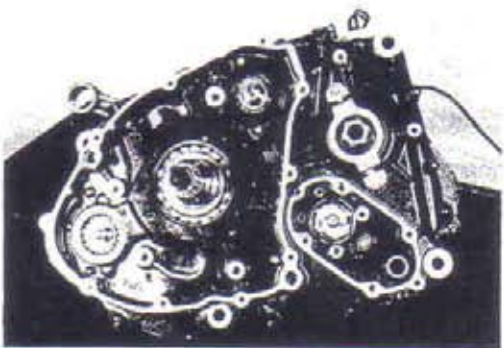
- Remove the crankcase securing bolts.
- Separate the crankcase into 2 parts, right and left with a crankcase separating tool.

99900-13120: Crankcase separating tool

**NOTE:**

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

*(Continued on next page.)*



**CAUTION:**

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

- Remove the gearshift cam stopper spring.

**NOTE:**

*Before removing the gearshift cam, remove the neutral switch. Do not lose the switch contact and its spring.*

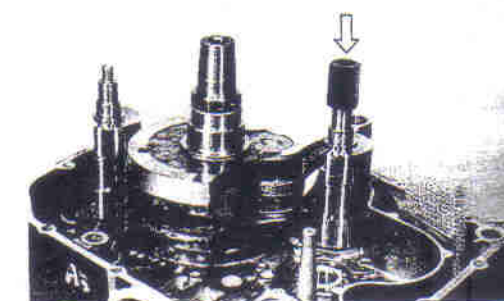
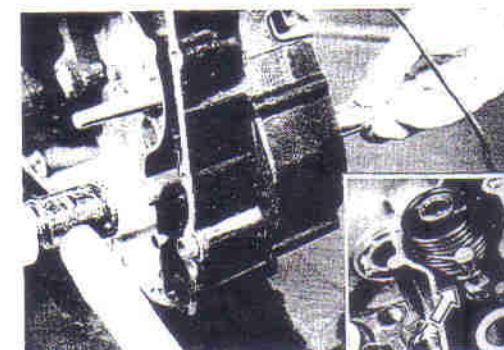
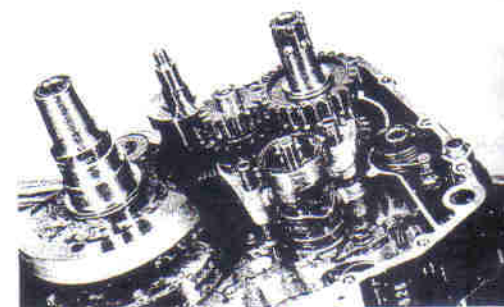
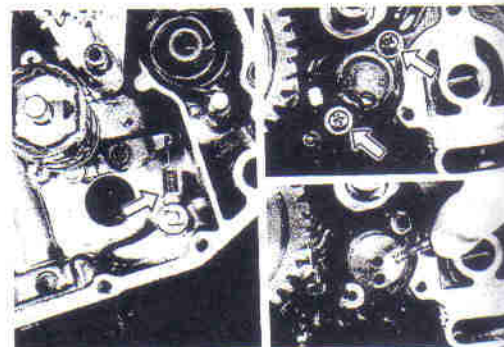
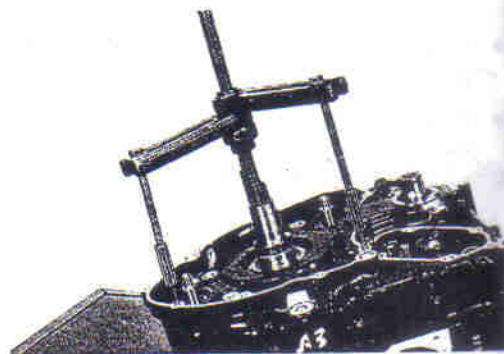
- Remove the gearshift fork shafts and gearshift forks.
- Remove the gearshift cam.
- Remove the driveshaft assembly and countershaft assembly.

- Remove the kick starter shaft return spring, then drive out the kick starter shaft with a plastic hammer.

- Remove the front and rear balancershafts by using the special tools.

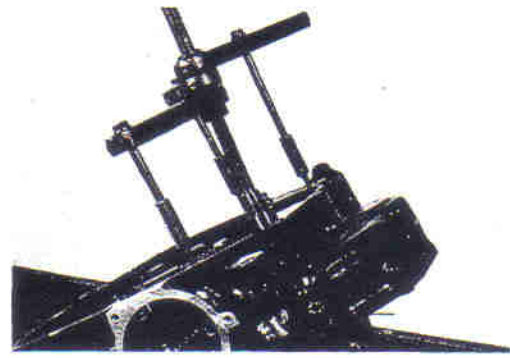
09930-30230: Balancer remover

09930-30102: Sliding shaft



- Remove the crankshaft from the crankcase by using a crankshaft remover.

09920-13120: Crankshaft remover (Crankcase separating tool)



## ENGINE COMPONENTS INSPECTION AND SERVICING

### CYLINDER HEAD COVER SERVICING

#### CAUTION:

Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "Exhaust", "Inlet", so that each will be restored to the original location during assembly.

- Pull out the de-comp. shaft.



- Remove the intake and exhaust rocker arm shaft set bolts.

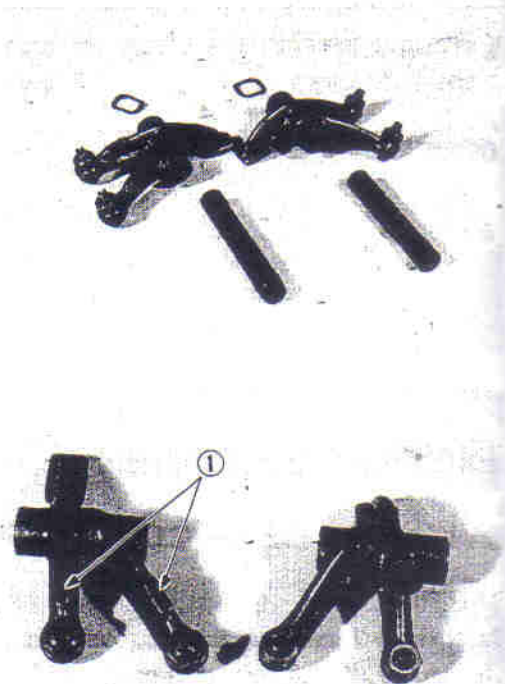


- Pull out the intake rocker arm shaft with a 6 mm bolt.
- Pull out the exhaust rocker arm shaft using pliers.



(Continued on next page.)

- The exhaust rocker arm can be distinguished from that of the intake by the de-compression shaft contacting surface ① (for exhaust).



### CYLINDER HEAD COVER DISTORTION

After removing sealant (SUZUKI BOND NO. 1207B) from the fitting surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a thickness gauge. Check points are shown in Fig.

**Service Limit: 0.05 mm (0.002 in)**

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

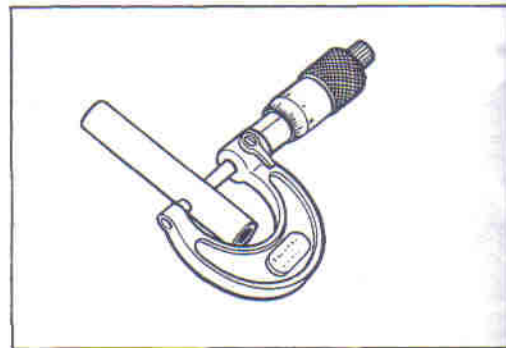


### ROCKER ARM SHAFT O.D.

Measure the diameter of rocker arm shaft with a micrometer.

**Standard: 11.966 – 11.984 mm (0.4711 – 0.4718 in)**

**09900-20205: Micrometer (0 – 25 mm)**

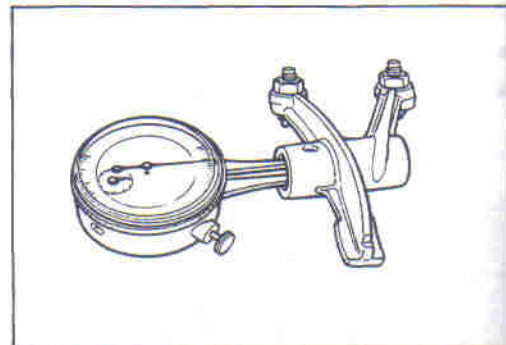


### ROCKER ARM I.D.

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

**Standard: 12.000 – 12.018 mm (0.4724 – 0.4731 in)**

**09900-20605: Dial calipers**



## ROCKER ARM AND SHAFT REASSEMBLY

- Apply SUZUKI MOLY PASTE to the rocker arm shafts.

99000-25140: SUZUKI MOLY PASTE

- Install the rocker arms and shafts.

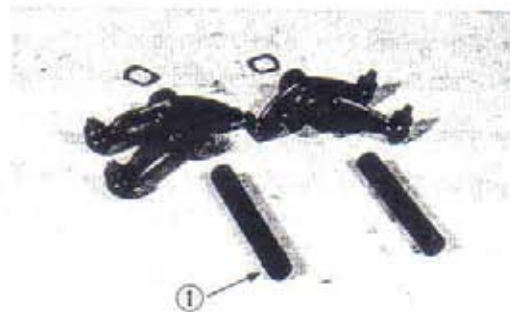
### NOTE:

- Use new O-ring ① on the exhaust rocker arm shaft.
- Use new gasket on the set bolts, ② and ③.

- Tighten the rocker arm shaft set bolts (② and ③) to the specified torque.

Set bolt ②: 8 – 10 N·m  
(0.8 – 1.0 kg·m, 6.0 – 7.0 lb-ft)

Set bolt ③: 25 – 30 N·m  
(2.5 – 3.0 kg·m, 18.0 – 21.5 lb-ft)



## DE-COMP. SHAFT REASSEMBLY

- Apply SUZUKI MOLY PASTE to the de-comp. shaft.

99000-25140: SUZUKI MOLY PASTE

### NOTE:

- Retain the de-comp. shaft with the cylinder head cover bolt.



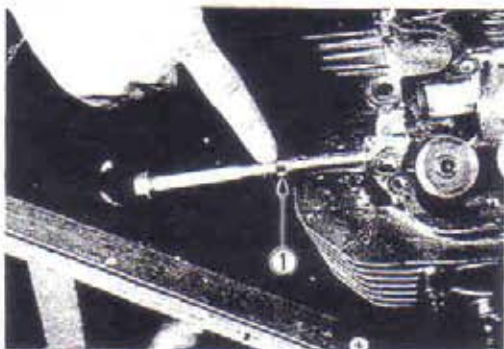
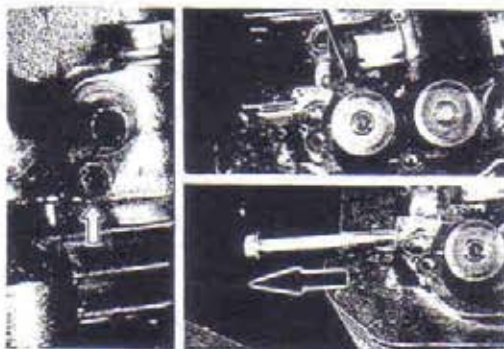
## CYLINDER HEAD SERVICING

- Remove the oil hose connector by removing the set bolt.
- Loosen the cylinder head oil pipe set screw.
- Pull out the cylinder head oil pipe with a 8 mm bolt.

### NOTE:

When inserting the cylinder head oil pipe, be sure to face the cutaway part ① to the intake side.

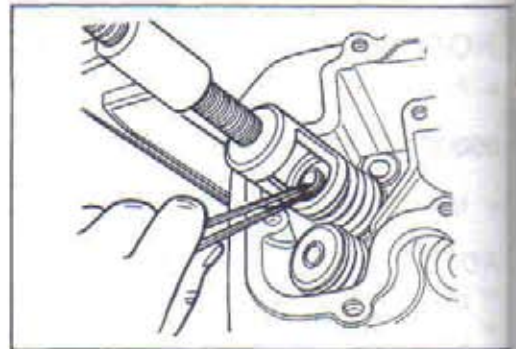
Tighten the cylinder head oil pipe set screw.



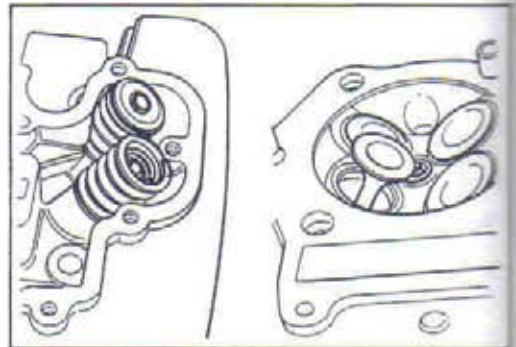
- Compress the valve springs with the valve spring compressor.
- Remove the valve cotters from the valve stem.

09916-14510: Valve spring compressor

09916-84510: Tweezers



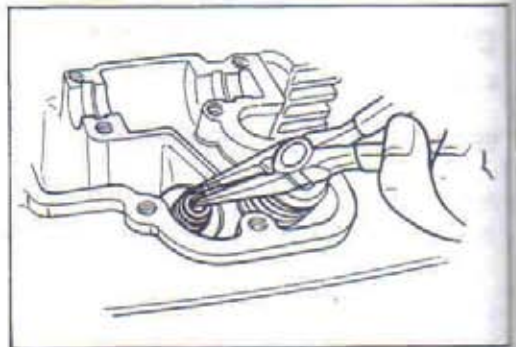
- Remove the valve spring retainer, inner spring and outer spring.
- Pull out the valve from the other side.



- Remove the oil seal by using a long-nose pliers.
- Remove the spring seat.

**NOTE:**

*Removal of the valves completes ordinary disassembling work. If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.*

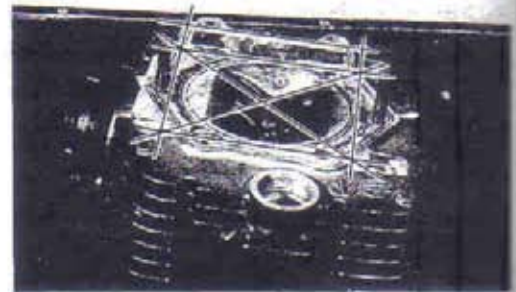


### CYLINDER HEAD DISTORTION

Decarbon combustion chamber.

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

Service Limit: 0.05 mm (0.002 in)



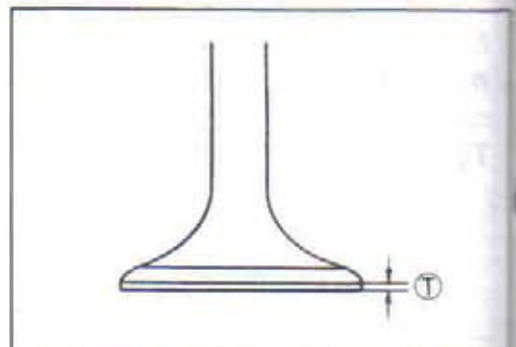
### VALVE FACE WEAR

Measure the thickness ① and, if the thickness is found to have been reduced to the limit, replace the valve.

**NOTE:**

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

Service Limit: 0.5 mm (0.02 in)



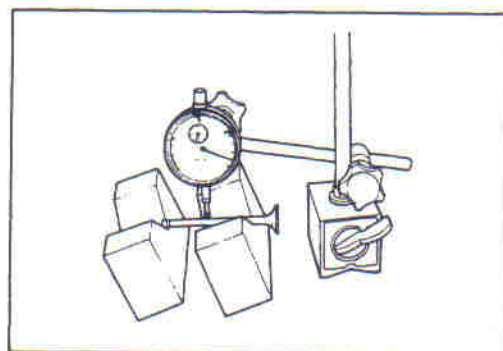
**VALVE STEM RUNOUT**

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

Service Limit: 0.05 mm (0.002 in)

8900-20701: Magnetic stand

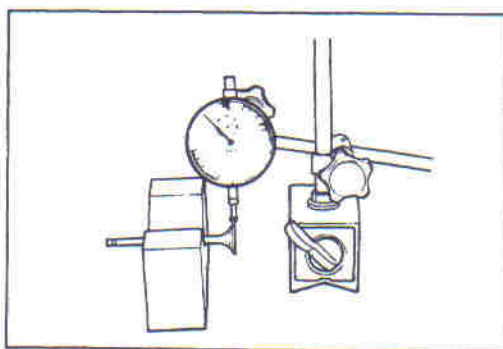
8900-20606: Dial gauge (1/100 mm)

**VALVE HEAD RADIAL RUNOUT**

Place the dial gauge at right angles to the valve head, and measure the valve head radial runout.

If it measures more than limit, replace the valve.

Service Limit: 0.03 mm (0.001 in)

**VALVE GUIDE-VALVE STEM CLEARANCE**

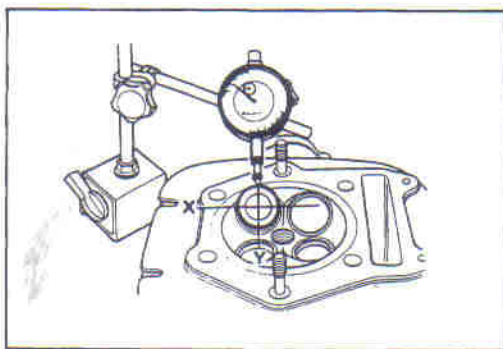
Measure the clearance in two directions, "X" and "Y" perpendicular to each other, by rigging up the dial gauge as shown. If the clearance measured exceeds the limit specified below, then determine whether the valve or the guide should be replaced to reduce the clearance to within the standard range:

Standard IN. : 0.025 – 0.055 mm (0.0010 – 0.0022 in)

EX.: 0.040 – 0.070 mm (0.0016 – 0.0028 in)

Service Limit IN. : 0.35 mm (0.014 in)

EX. : 0.35 mm (0.014 in)

**VALVE STEM WEAR**

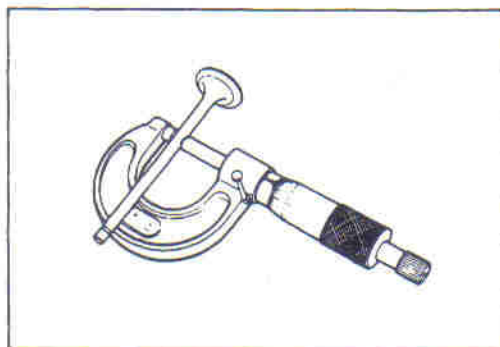
If the valve stem is worn down to the limit, when measured with a micrometer, and the clearance is found to be in excess of the limit indicated previously, replace the valve, if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to re-check the clearance.

8900-20205: Micrometer (0 – 25 mm)

Valve stem O.D.

Standard IN. : 6.960 – 6.975 mm (0.2740 – 0.2746 in)

EX.: 6.945 – 6.960 mm (0.2734 – 0.2740 in)

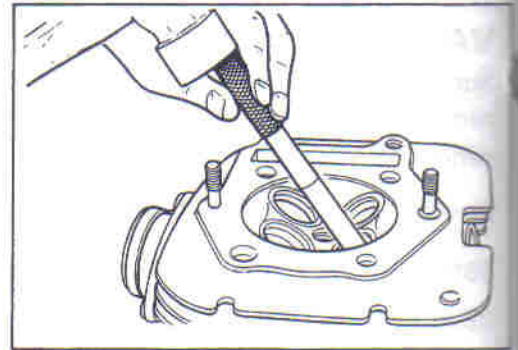




## VALVE GUIDE SERVICING

- Remove the valve guide with the valve guide remover.

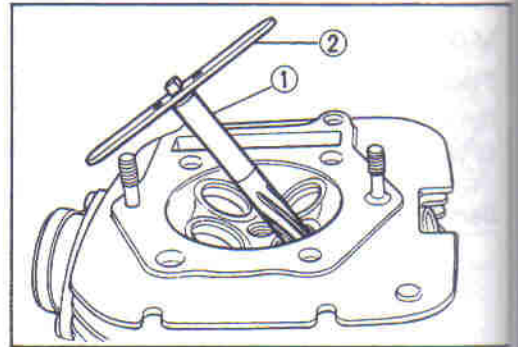
**09916-44511: Valve guide remover**



- Re-finish the valve guide holes in cylinder head with a 12.3 mm reamer ① and handle ②.

**09916-34531: 12.3 mm reamer**

**09916-34541: Handle**

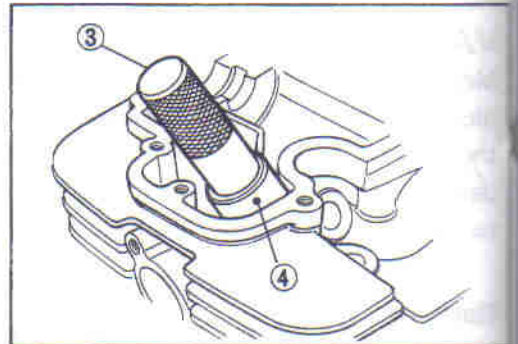


- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Rings and valve guides removed in disassembly must be discarded.

- Lubricate each valve guide with oil, and drive the guide into the guide hole using the valve guide installer handle ③ and valve guide installer attachment ④. (See page 3-55.)

**09916-57321: Valve guide installer handle**

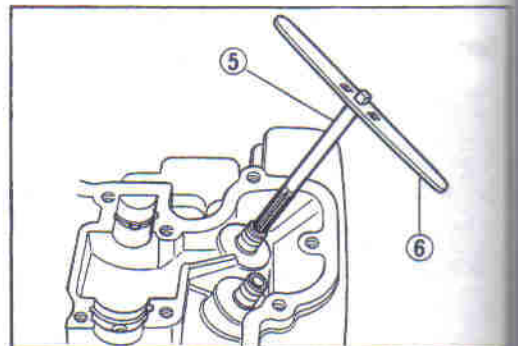
**09916-57311: Attachment**



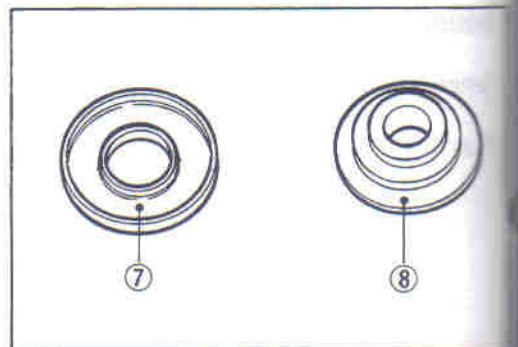
- After fitting the valve guides, re-finish their guiding bores with the 7 mm reamer ⑤ and handle ⑥. Be sure to clean and oil the guides after reaming.

**09916-34520: 7 mm reamer**

**09916-34541: Handle**



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



- Lubricate each seal with oil, and drive them into position with the valve guide installer handle (9) and stem seal installer attachment (10). (See page 3-55.)

**CAUTION:**

Do not reuse the oil seals.

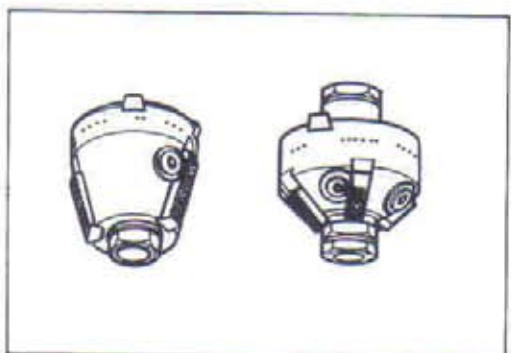
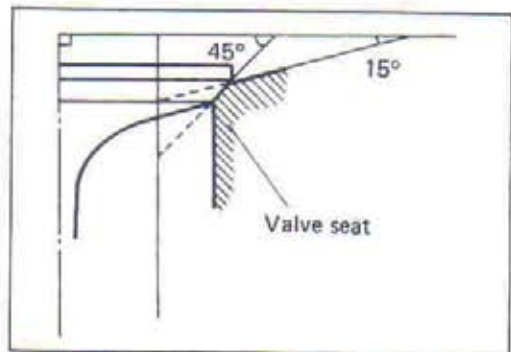
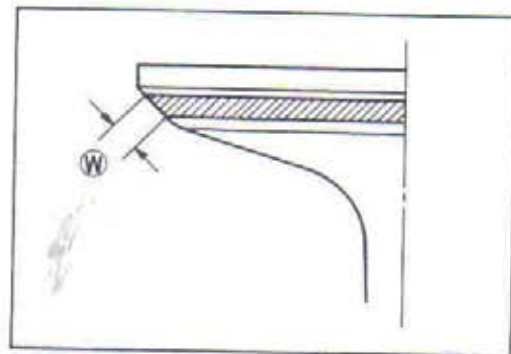
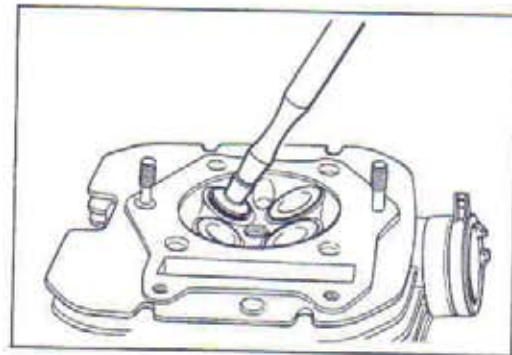
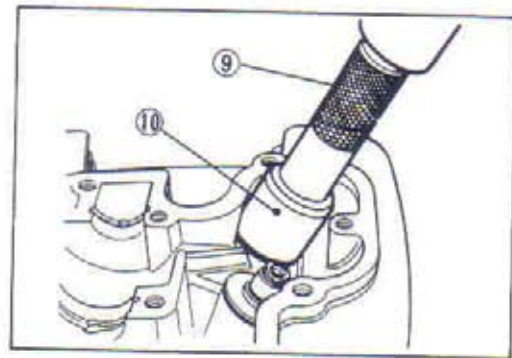
09916-57321: Valve guide installer handle

09911-93710: Attachment

## VALVE AND SEAT CONDITION

### VALVE SEAT WIDTH

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



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

**Valve seat width**

STD.  $\varnothing$  : 1.0 – 1.2 mm (0.039 – 0.047 in)

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

**VALVE SEAT SERVICING**

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

	Intake side	Exhaust side
45°	N-608	N-608
15°	N-212	N-212

(For U.S.A. model)

Valve seat cutter (N-608)
Valve seat cutter (N-212)
Solid pilot (N-140-7.0)

(For the Other models)

09916-24900: Valve seat cutter set

09916-24910: Valve seat cutter (N-212)

09916-24935: Valve seat cutter (N-608)

(N-140-7.0) : Solid pilot

**NOTE:**

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

1. Insert the solid pilot with a slight rotation, the solid pilot that gives a snug fit.
2. Using the 45° cutter, descale and clean up the seat with one or two turns.
3. Inspect the seat by the previous seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

**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.

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

**WARNING:**

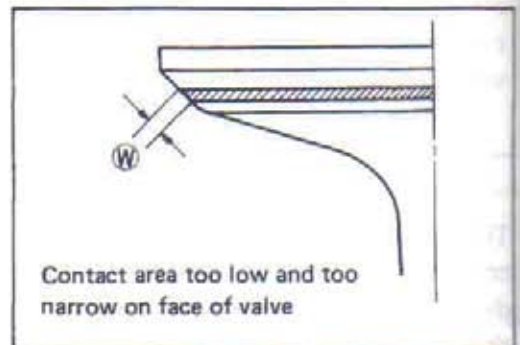
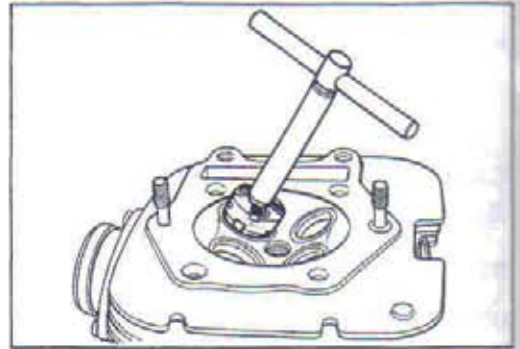
Always use extreme caution when handling gasoline.

**NOTE:**

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

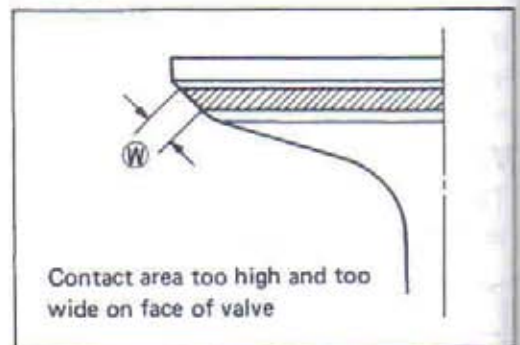
**VALVE STEM END CONDITION**

Inspect the valve stem end face for pitting and wear. If pitting or wear of the stem end face are present, the valve stem end may be resurfaced, providing that the length ① will not be reduced to less than 4.3 mm (0.17 in). If this length becomes less than 4.3 mm (0.17 in), the valve must be replaced. After installing a valve whose stem end has been ground off as above, check to ensure that the face ② of the valve stem end is above the cotters ③.



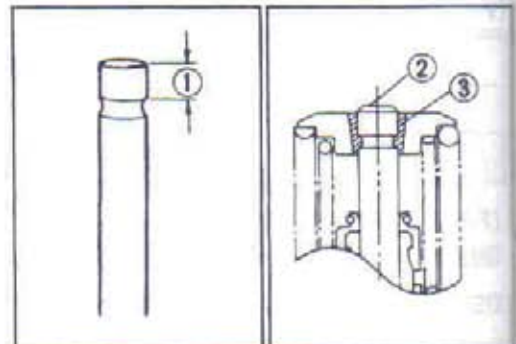
Contact area too low and too narrow on face of valve

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



Contact area too high and too wide on face of valve

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



## VALVE SPRINGS

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

### Valve spring free length

#### Service Limit

INNER : 35.5 mm (1.40 in)

OUTER: 40.3 mm (1.59 in)

### Valve spring tension

#### Standard

INNER : 7.0 – 8.5 kg/31 mm (15.4 – 18.7 lbs/1.2 in)

OUTER: 16.4 – 18.8 kg/33 mm (36.2 – 41.4 lbs/1.3 in)

## VALVE AND VALVE SPRING REASSEMBLY

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

Similarly oil the lip of the stem seal.

99000-25140: SUZUKI MOLY PASTE

### CAUTION:

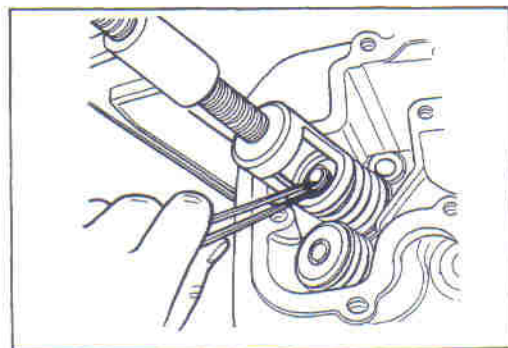
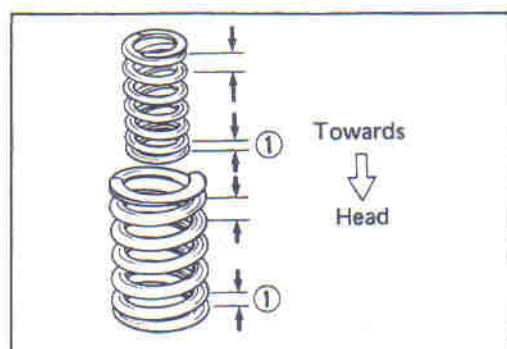
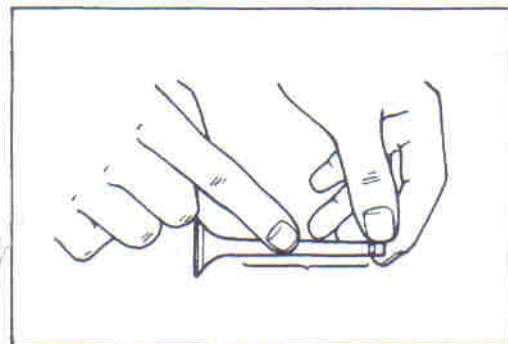
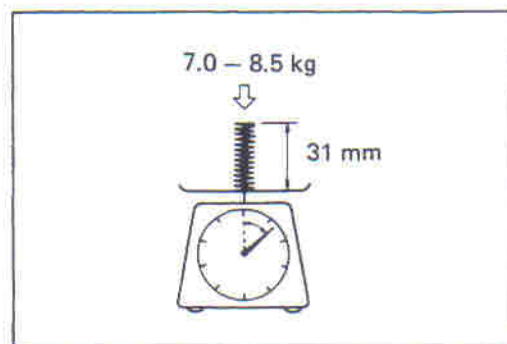
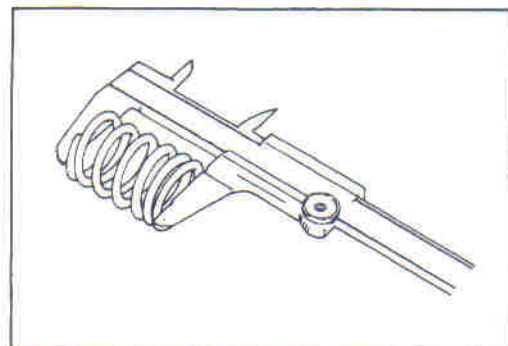
When inserting each valve, take care not to damage the lip of the stem seal.

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

- Fit a valve spring retainer, compress the springs with a valve spring compressor and fit the cotter halves to the stem end.

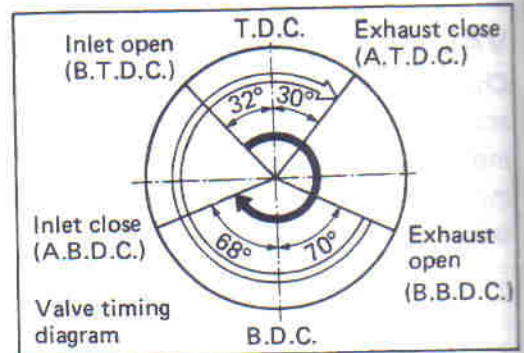
09916-14510: Valve spring compressor

09916-84510: Tweezers



## CAMSHAFT

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



## CAMSHAFT CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced output power.

The limit of cam wear is specified for both intake and exhaust cams in terms of cam height  $\text{H}$ , which is to be measured with a micrometer.

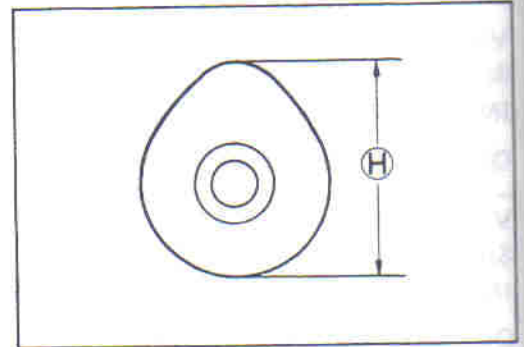
Replace the camshaft if found it worn down to the limit.

09900-20202: Micrometer (25 – 50 mm)

Cam height  $\text{H}$

Service Limit Intake cam : 36.230 mm (1.4264 in)

Exhaust cam: 36.460 mm (1.4354 in)



## CAMSHAFT JOURNAL WEAR

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

Camshaft journal oil clearance

Service Limit: 0.150 mm (0.0059 in)

- Tighten the cylinder head cover bolts evenly and diagonally to the specified torque.

Cylinder head cover

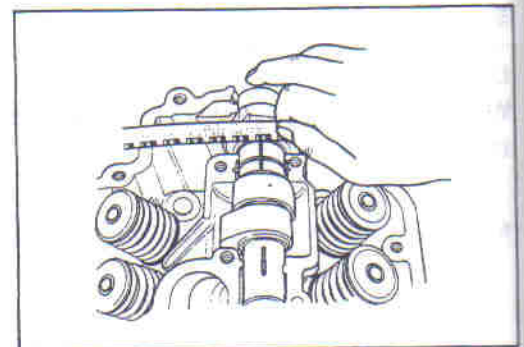
Tightening torque: 9 – 11 N·m

(0.9 – 1.1 kg·m, 6.5 – 8.0 lb·ft)

09900-22301: Plastigauge

### NOTE:

To properly measure the oil clearance with plasti-gauge, all gasket material must be removed from fitting surfaces of cylinder head and cover. Do not apply SUZUKI BOND No. 1207B until after the oil clearance has been determined.



If the camshaft journal oil clearance measured exceeds the limit, measure the outside diameter of camshaft.  
Replace either the cylinder head set or the camshaft if the clearance is incorrect.

09900-20205: Micrometer (0 – 25 mm)

Camshaft journal O.D. 24.959 – 24.980 mm

(Right & Center): (0.9826 – 0.9835 in)

Camshaft journal O.D. 19.959 – 19.980 mm

(Left): (0.7858 – 0.7866 in)

### CAMSHAFT RUNOUT

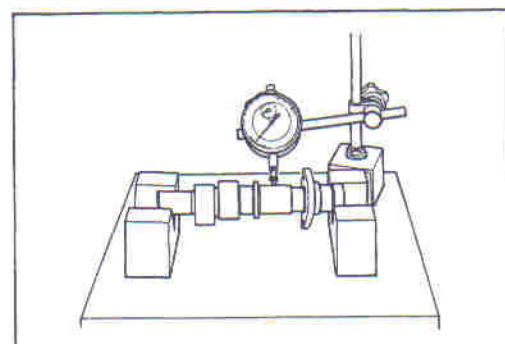
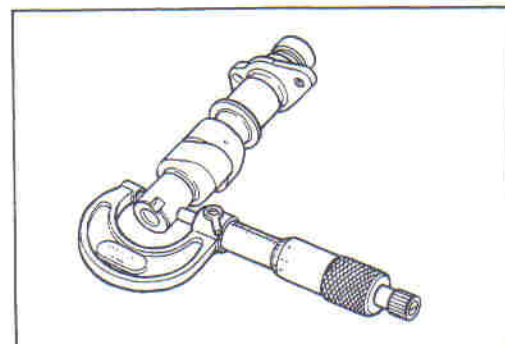
Measure the runout with a dial gauge. Replace the camshaft if the runout exceeds the limit.

Service Limit: 0.10 mm (0.004 in)

09900-20701: Magnetic stand

09900-20606: Dial gauge (1/100 mm)

09900-21304: V-block



### CAM DRIVE CHAIN AND BALANCER DRIVE CHAIN 20-PITCH LENGTH

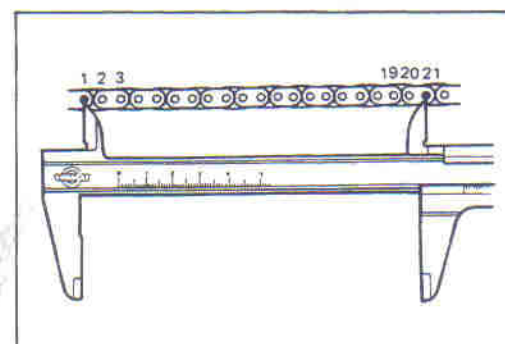
Pull the chain tight to remove any slack, then using vernier calipers, measure the 20-pitch (21 pins) length of chain. If it measures more than the limits, replace the chain.

Cam drive chain

Service Limit: 129.0 mm (5.08 in)

Balancer drive chain

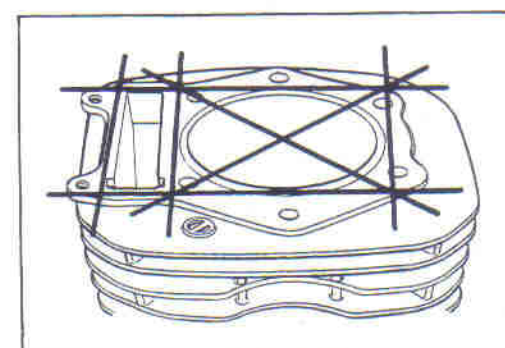
Service Limit: 158.0 mm (6.22 in)



### CYLINDER DISTORTION

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

Service Limit: 0.05 mm (0.002 in)



### CYLINDER BORE

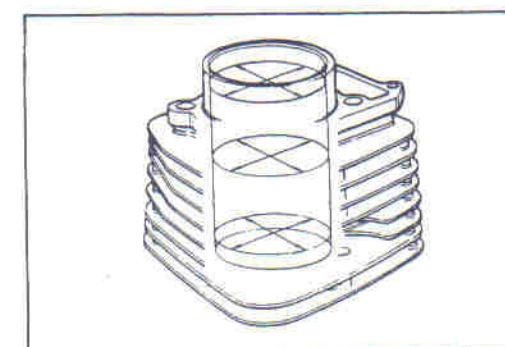
Measure the cylinder bore diameter at six places.

If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder.

Service Limit: 95.065 mm (3.7427 in)

09900-20508: Cylinder bore gauge set

09900-20513: Gauge rod



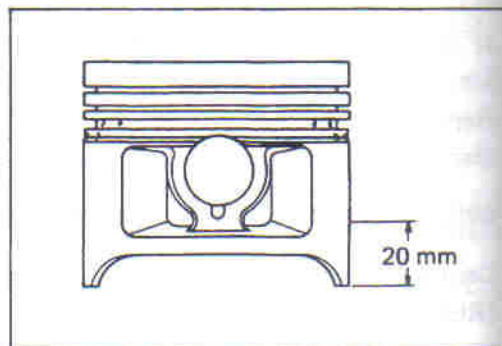
## PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place 20 mm (0.79 in) from the skirt end as shown in Fig. If the measurement is less than the limit, replace the piston.

09900-20204: Micrometer (75 – 100 mm)

Service Limit: 94.880 mm (3.7354 in)

Piston oversize: 0.5, 1.0 mm



## PISTON-CYLINDER CLEARANCE

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

Service Limit: 0.120 mm (0.0047 in)

## PISTON RING-GROOVE CLEARANCE

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

09900-20803: Thickness gauge

09900-20205: Micrometer (0 – 25 mm)

Piston ring-groove clearance

Service Limit

1st : 0.180 mm (0.0071 in)

2nd: 0.150 mm (0.0059 in)

Piston ring groove width

Standard

1st : 1.21 – 1.24 mm (0.047 – 0.049 in)

2nd: 1.21 – 1.23 mm (0.047 – 0.048 in)

Oil : 2.81 – 2.83 mm (0.110 – 0.111 in)

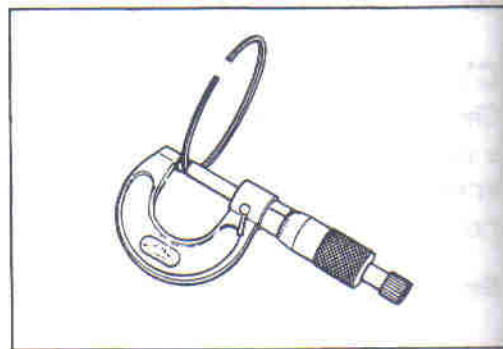
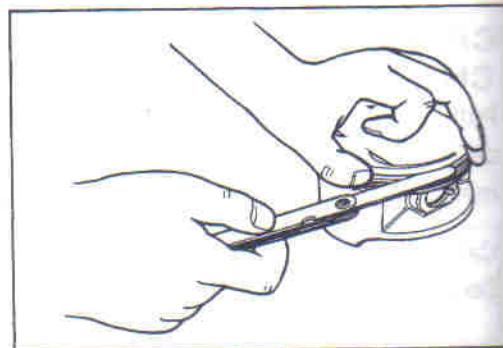
Piston ring thickness

Standard

1st and 2nd: 1.170 – 1.185 mm (0.0461 – 0.0467 in)

### NOTE:

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



## 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

#### Service Limit

1st : 9.6 mm (0.38 in)

2nd: 9.6 mm (0.38 in)

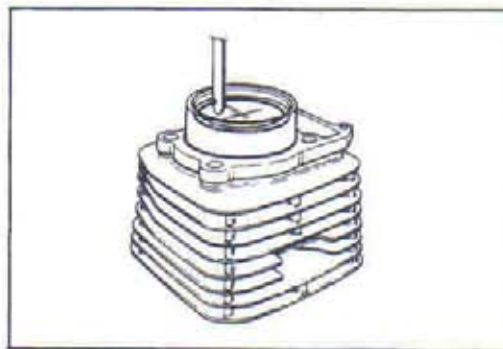
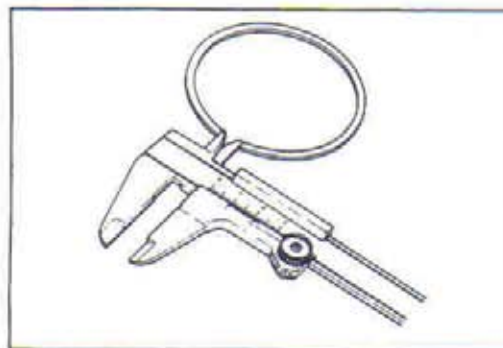
09900-20102: Vernier calipers

### Piston ring end gap

#### Service Limit

1st and 2nd: 0.70 mm (0.028 in)

09900-20803: Thickness gauge



## OVERSIZE RINGS

### • Oversize piston ring

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

#### Piston ring 1st and 2nd

0.5 mm: 50

1.0 mm: 100

### • Oversize oil ring

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

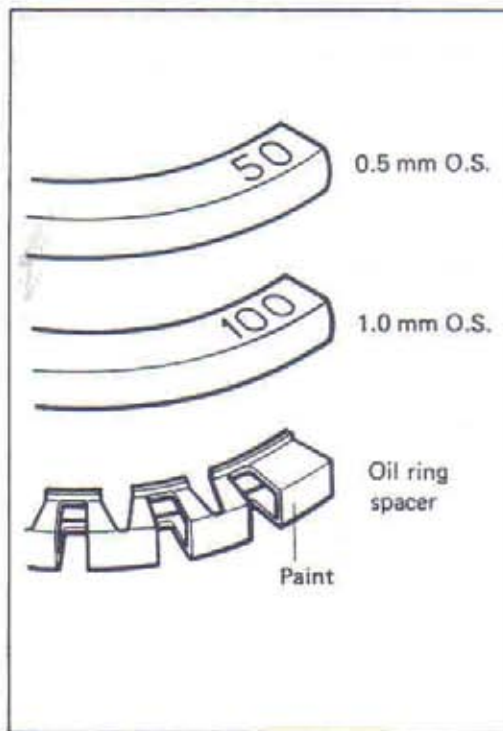
#### Oil ring

0.5 mm: Painted blue

1.0 mm: Painted yellow

### • Oversize side rail

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

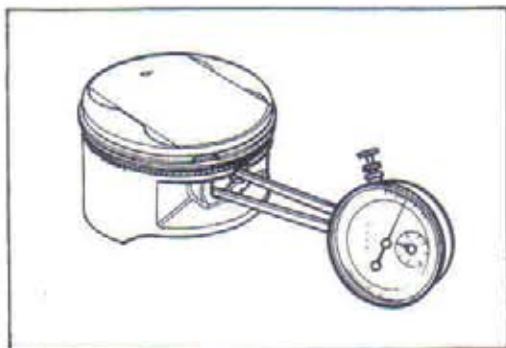


## PISTON PIN AND PIN BORE

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

09900-20605: Dial calipers

09900-20205: Micrometer (0 – 25 mm)



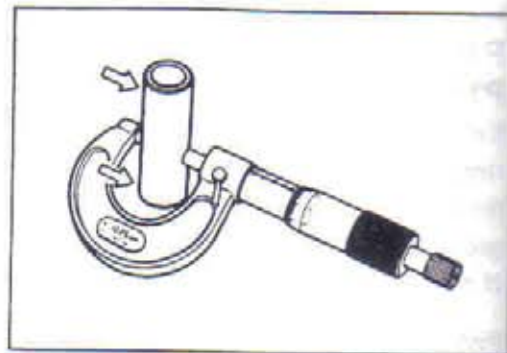


Piston pin bore

Service Limit: 23.030 mm (0.9067 in)

Piston pin O.D.

Service Limit: 22.980 mm (0.9047 in)



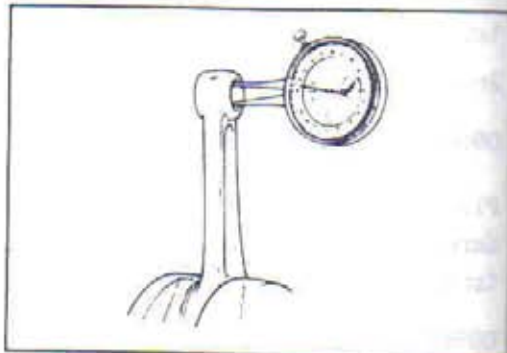
### CONROD SMALL END I.D.

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

09900-20605: Dial calipers

Service Limit: 23.040 mm (0.9071 in)

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



### CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

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

Service Limit: 3.0 mm (0.12 in)

09900-20701: Magnetic stand

09900-20606: Dial gauge (1/100 mm)

09900-21304: V-block

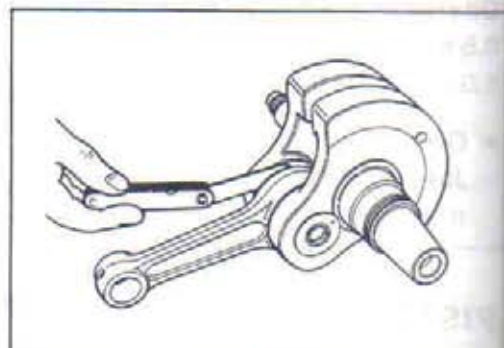
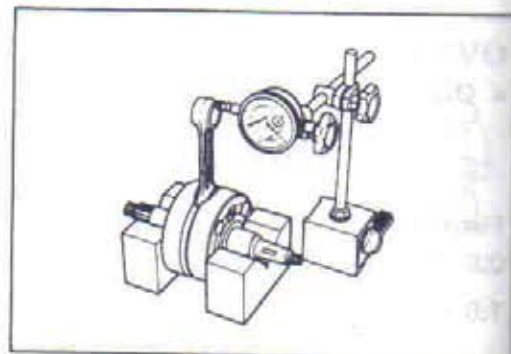
Push the big end of the conrod to one side and measure the side clearance with a thickness gauge.

09900-20803: Thickness gauge

Standard: 0.15 – 0.60 mm (0.006 – 0.024 in)

Service Limit: 1.00 mm (0.039 in)

Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance to within the limit by replacing the worn parts – conrod, big end bearing and crank pin etc.



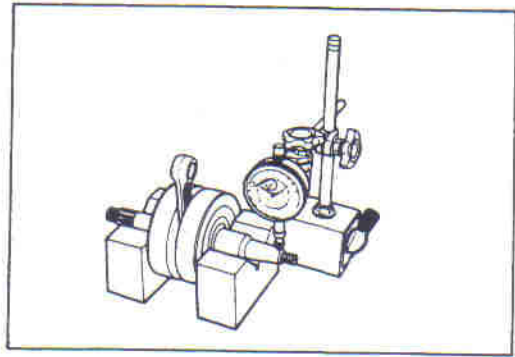
## CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end journals resting on the blocks.

Position the dial gauge, as shown, and rotate the crankshaft slowly to read the runout.

Correct or replace the crankshaft if the runout is greater than the limit.

**Service Limit:** 0.05 mm (0.002 in)



## CLUTCH DRIVE PLATE

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

**SS900-20102:** Vernier calipers

### Standard

**Thickness** No. 1: 2.72 – 2.88 mm (0.107 – 0.113 in)

No. 2: 3.45 – 3.55 mm (0.136 – 0.140 in)

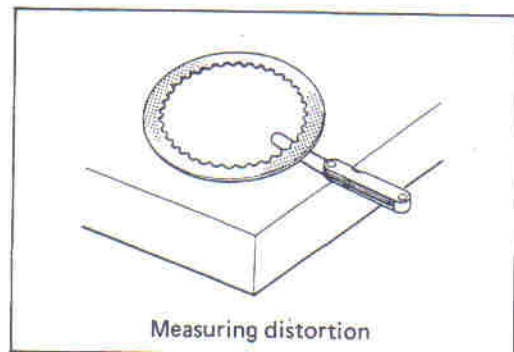
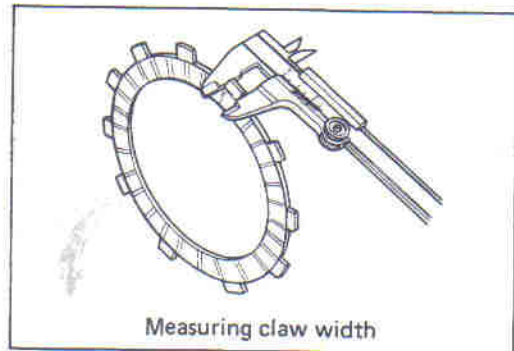
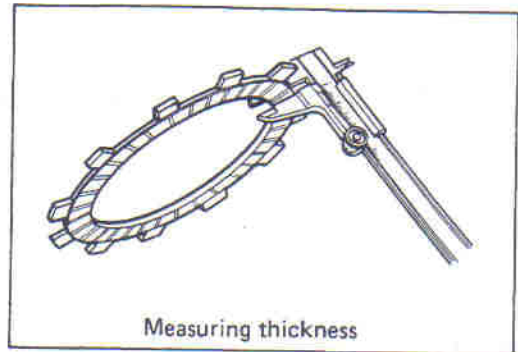
**Claw width :** 15.8 – 16.0 mm (0.62 – 0.63 in)

### Service Limit

**Thickness** No. 1: 2.42 mm (0.095 in)

No. 2: 3.15 mm (0.124 in)

**Claw width :** 15.0 mm (0.59 in)



## CLUTCH DRIVEN PLATE

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

**SS900-20803:** Thickness gauge

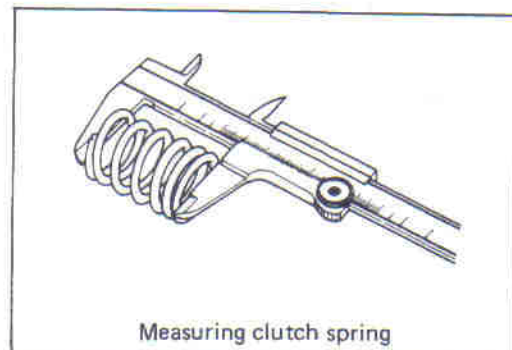
**Service Limit:** 0.1 mm (0.004 in)

## CLUTCH SPRING FREE LENGTH

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

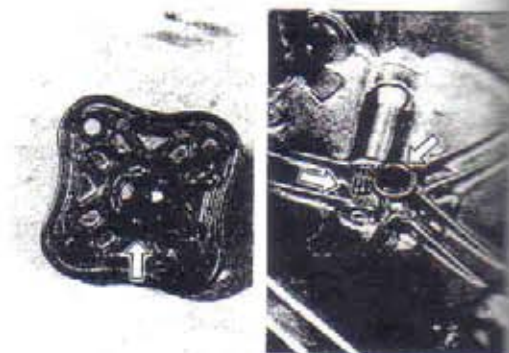
**SS900-20102:** Vernier calipers

**Service Limit:** 34.0 mm (1.34 in)



## CLUTCH RELEASE BEARING

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



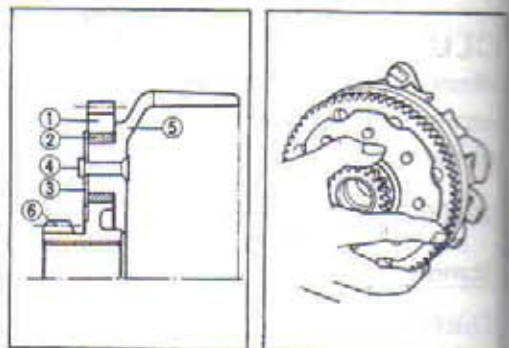
## CLUTCH RELEASE PINION AND RACK

Rotate the clutch release pinion by hand to inspect for a smooth rotation. If a large resistance is felt to rotation, inspect the pinion and rack for damage or wear. If the defect is found, replace them as a set.

## PRIMARY DRIVEN GEAR ASS'Y

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

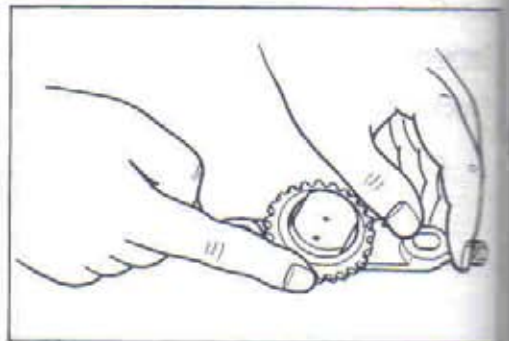
- |                       |                       |
|-----------------------|-----------------------|
| ① Primary driven gear | ④ Rivet               |
| ② Damper              | ⑤ Clutch housing      |
| ③ Plate               | ⑥ Oil pump drive gear |



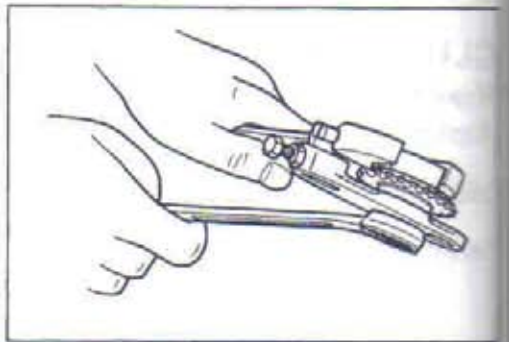
## BALANCER DRIVE CHAIN TENSIONER

Rotate the sprocket by hand to inspect the bearing for an abnormal noise and a smooth rotation.

Replace the bearing if there is anything unusual.

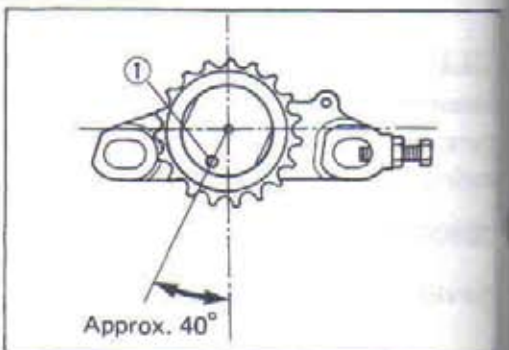


- Remove the nut by holding the shaft.

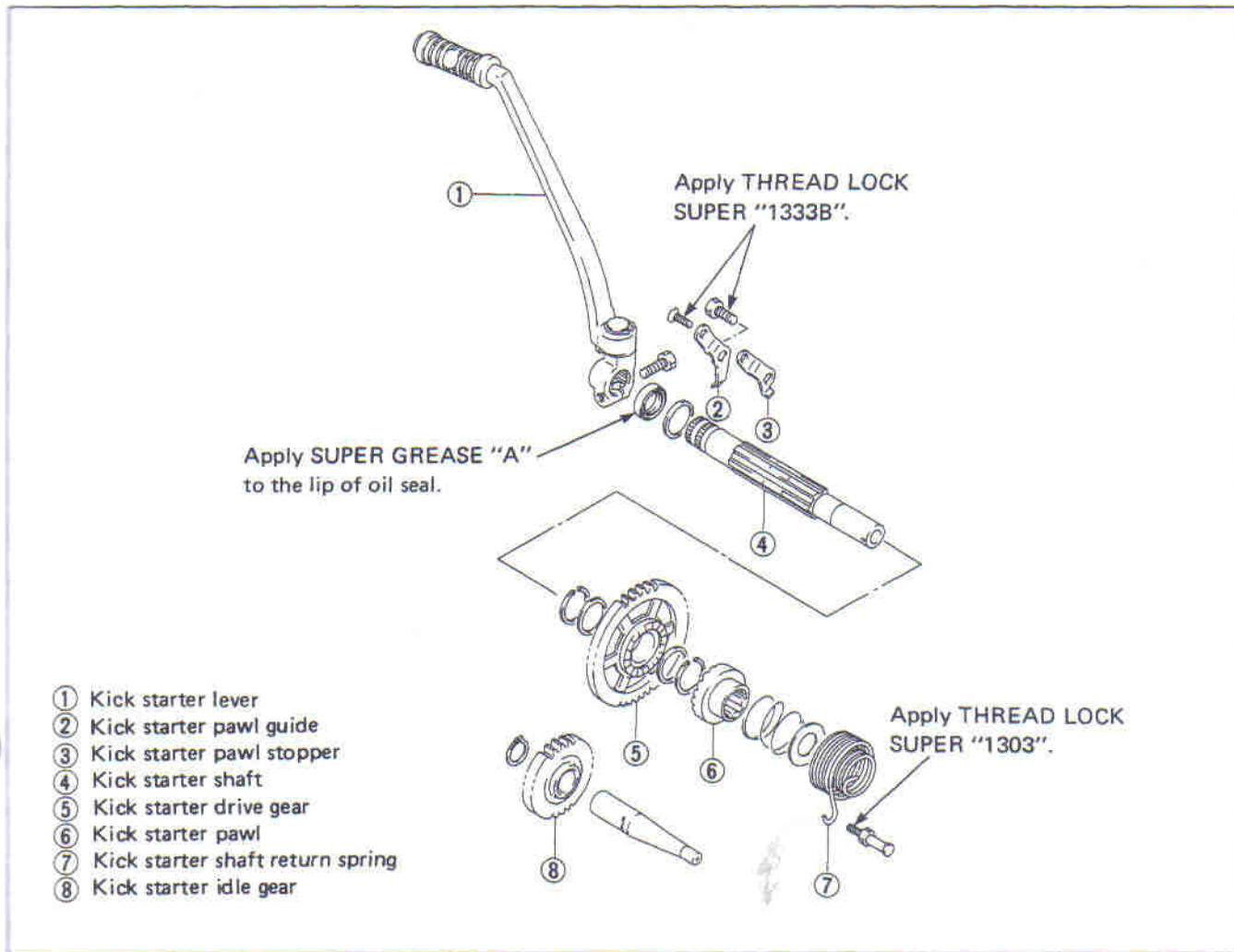


- Be sure to set the hole ① on the shaft with the specified angle, as shown in the illustration.

Tightening torque: 45 – 70 N·m  
(4.5 – 7.0 kg·m, 32.5 – 50.5 lb·ft)

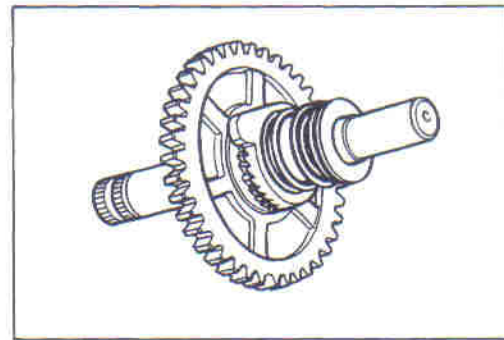


## KICK STARTER



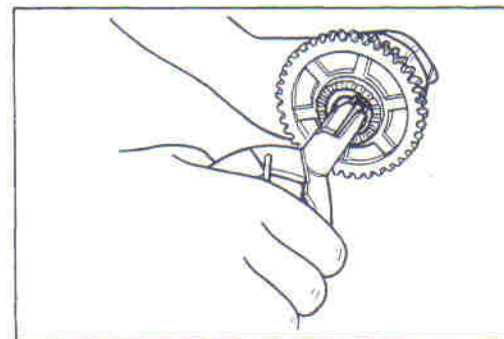
## DISASSEMBLY

- Remove the thrust washer, spring and kick starter pawl from the kick starter shaft.



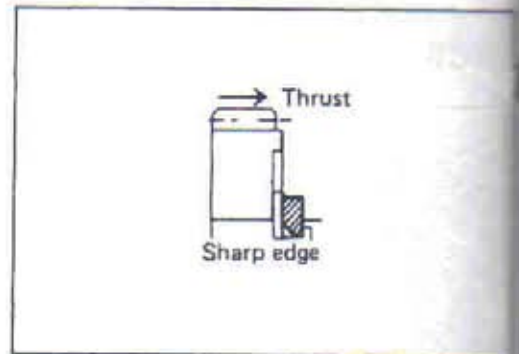
- Remove the kick starter drive gear by removing the circlip.

©9900-06107: Snap ring pliers

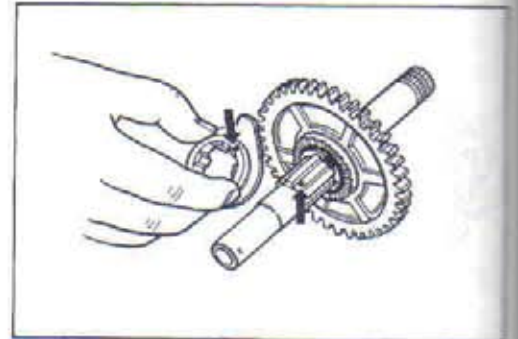


**REASSEMBLY**

- When installing a 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.

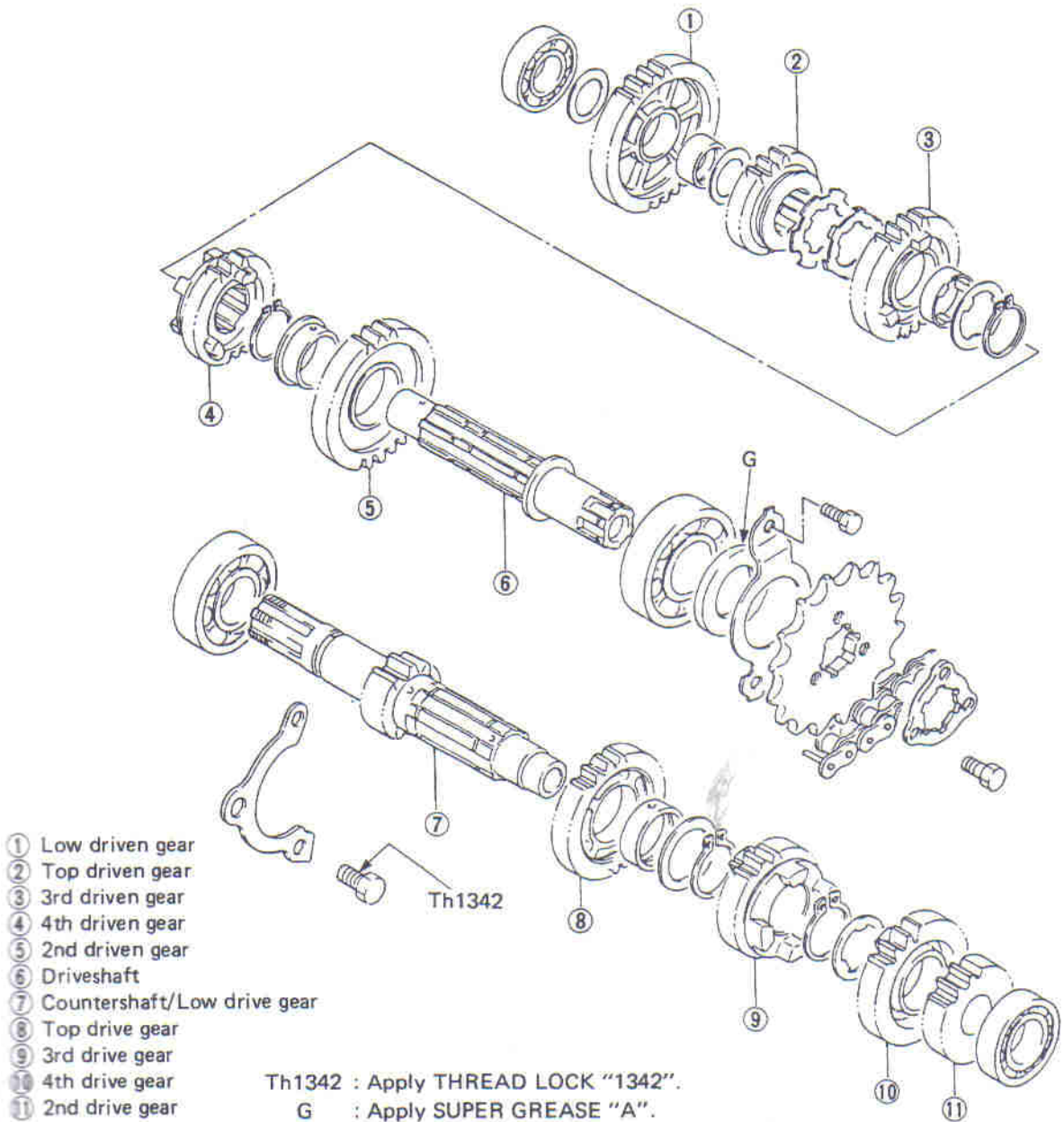


- When fitting the kick starter pawl onto the kick starter shaft, be sure to align the punched marks.



## TRANSMISSION

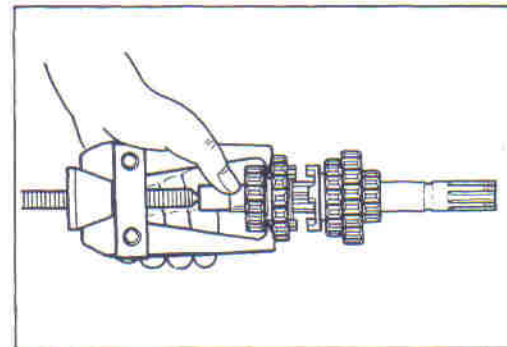
- Disassemble the transmission gears as shown in the illustration.



### 2ND DRIVE GEAR DISASSEMBLY

- Remove the 2nd drive gear by using the gear puller and appropriate attachment.

89913-60910: Gear puller



## COUNTERSHAFT AND DRIVESHAFT REASSEMBLY

Assemble the countershaft and driveshaft, in the reverse order of disassembly. Pay attention to following points:

**NOTE:**

*Always use new circlips.*

**NOTE:**

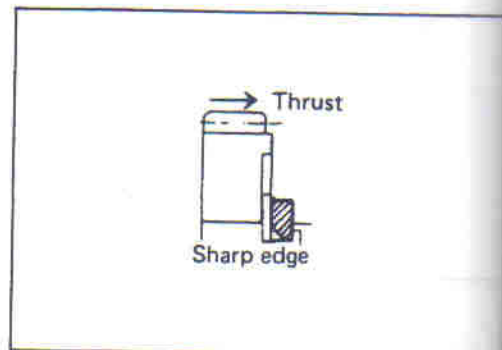
*Before installing the gears, coat lightly moly paste or engine oil to the driveshaft and countershaft.*

### 99000-25140: SUZUKI MOLY PASTE

- When installing a new circlip, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in figure.

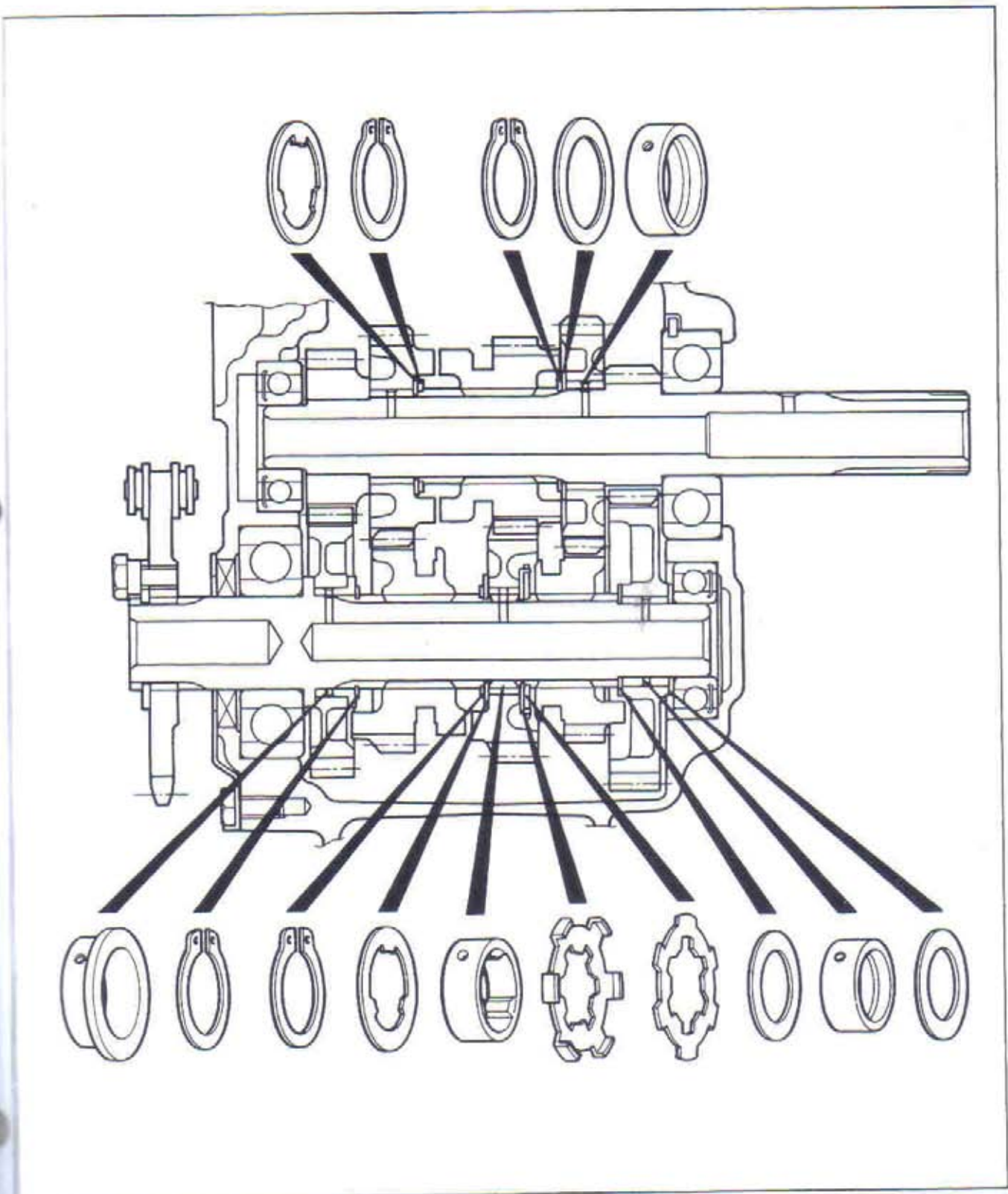
**CAUTION:**

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



**NOTE:**

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





**2ND DRIVE GEAR**

- Press-fit 2nd drive gear ① onto the countershaft.

**NOTE:**

Before reassembling, coat the internal face of the 2nd drive gear with **THREAD LOCK SUPER "1303"**.

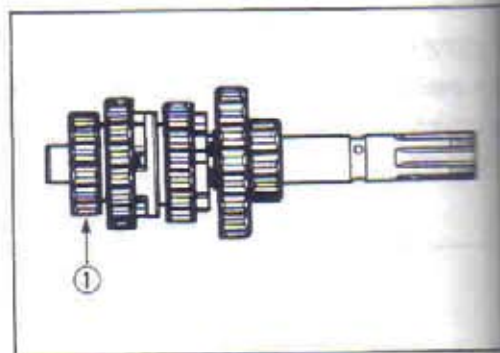
99000-32030: **THREAD LOCK SUPER "1303"**

**NOTE:**

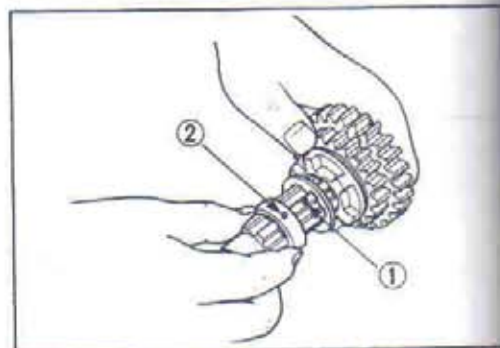
Take care not to smear 4th drive gear with **THREAD LOCK SUPER "1303"**.

**NOTE:**

- \* After mounting the 2nd drive gear, check that 4th drive gear spins smoothly by moving it with your fingers.
- \* This procedure may be performed only twice before shaft replacement is required.

**3RD DRIVEN GEAR BUSHING**

- When installing the 3rd driven gear bushing onto the driveshaft, align the oil hole ① of the driveshaft with the bushing oil hole ②.

**SHIFT FORK-GROOVE CLEARANCE**

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

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

**Shift fork-Groove clearance**

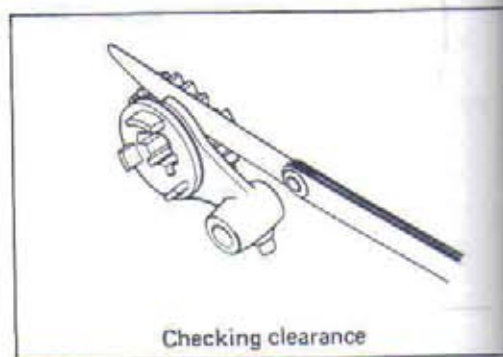
Standard : 0.10 – 0.30 mm (0.004 – 0.012 in)

Service Limit: 0.50 mm (0.020 in)

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

09900-20803: Thickness gauge

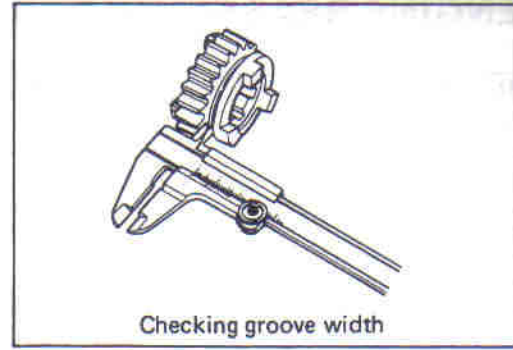
09900-20102: Vernier calipers



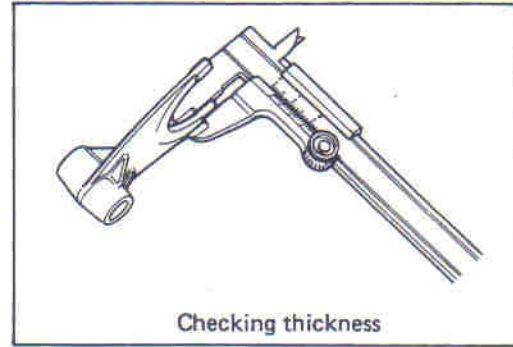
Checking clearance

**Shift fork groove width**

Standard: 5.00 – 5.10 mm (0.197 – 0.201 in)

**Shift fork thickness**

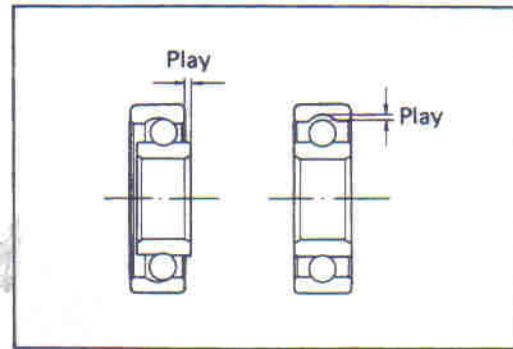
Standard: 4.80 – 4.90 mm (0.189 – 0.193 in)

**CRANKCASE BEARINGS**

Inspect the play of the crankcase bearings by hand while they are in the left and right crankcases. Rotate each crankcase bearing inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.

**NOTE:**

*When reassembling the bearing retainer, apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws and bolts.*



## ENGINE REASSEMBLY

Reassembly is generally performed in the reverse order to disassembly, but there are a number of reassembling steps that demand or deserve detailed explanation or emphasis. These steps will be taken up for respective parts and components.

**NOTE:**

*Apply engine oil to each running and sliding part before reassembling.*

### OIL SEALS

- Fit the respective oil seals to the cylinder head cover, crankcase, clutch cover and gearshifter cover.
- Coat SUPER GREASE "A" to the lip of oil seals.

(For U.S.A. model)

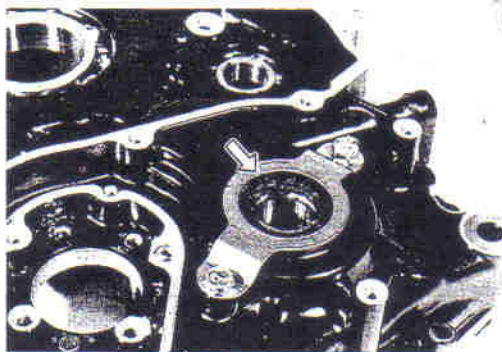
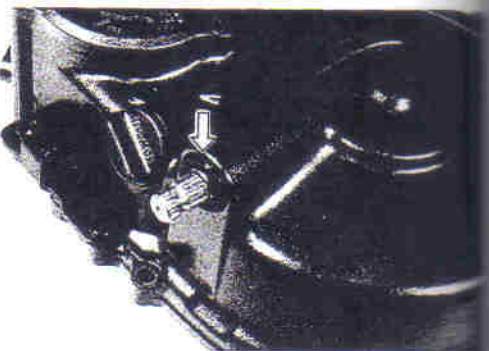
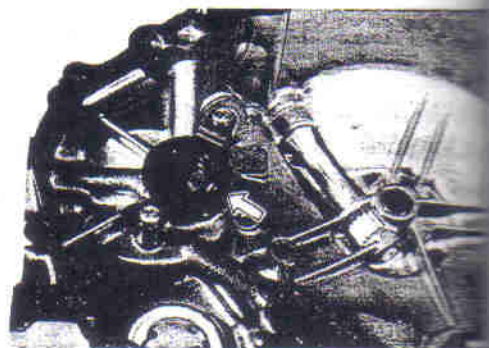
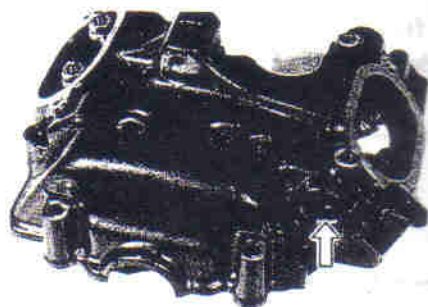
99000-32030: SUZUKI SUPER GREASE "A"

(For the other models)

99000-25010: SUZUKI SUPER GREASE "A"

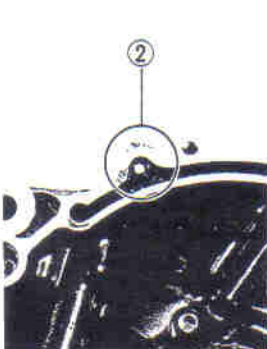
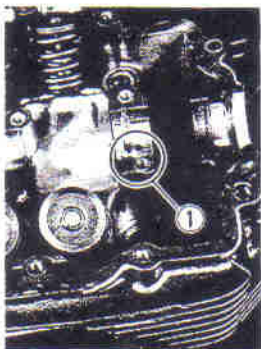
**CAUTION:**

Replace the oil seals with new ones every disassembly to prevent oil leakage.



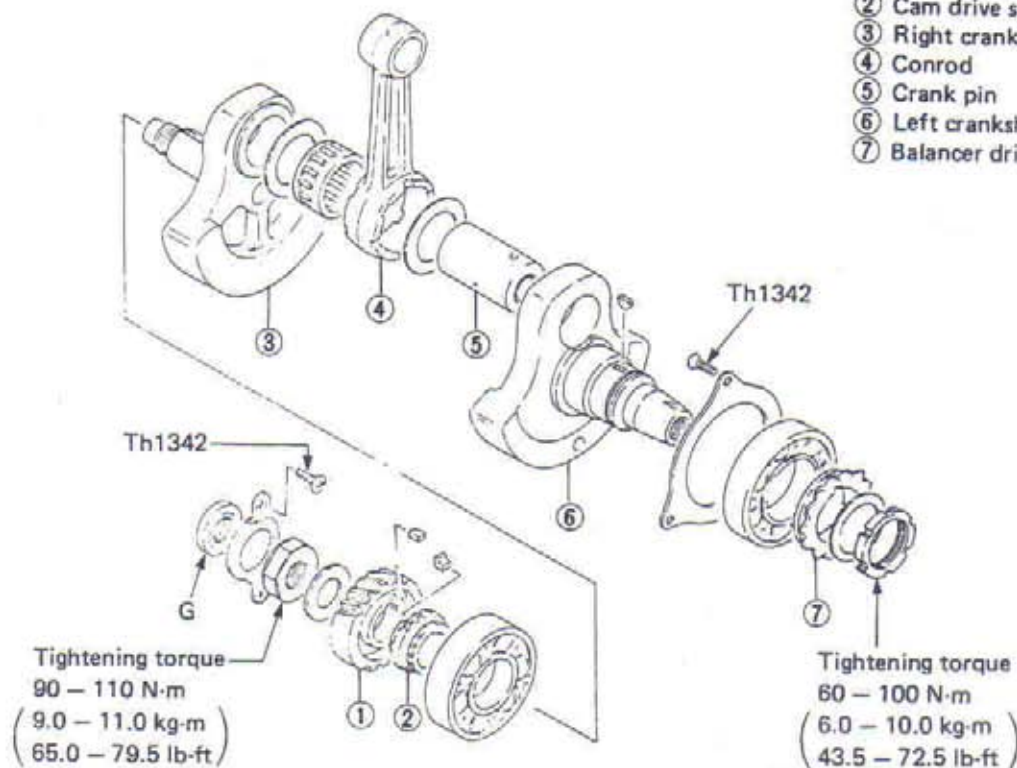
**NOTE:**

*Check the oil jets (① and ②) and oil nozzle (③) for clogging.*



## CRANKSHAFT

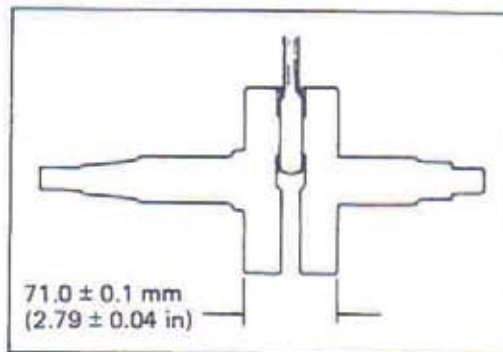
- ① Primary drive gear
- ② Cam drive sprocket
- ③ Right crankshaft
- ④ Conrod
- ⑤ Crank pin
- ⑥ Left crankshaft
- ⑦ Balancer drive sprocket



Th1342 : Apply THREAD LOCK "1342".  
G : Apply SUPER GREASE "A".

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

STD width between webs:  $71.0 \pm 0.1$  mm ( $2.79 \pm 0.004$  in)



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

09910-32812: Crankshaft installer

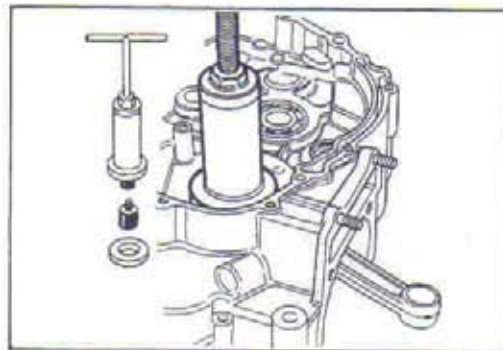
09910-32830: Attachment

09910-32820: Spacer

**CAUTION:**

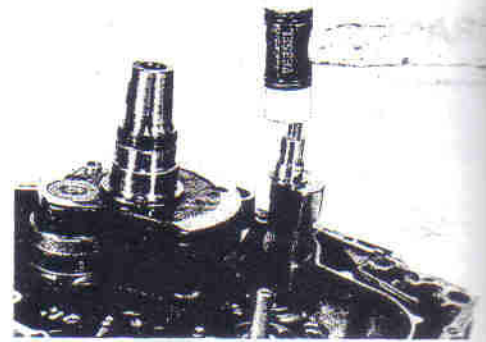
Never fit the crankshaft into the crankcase by striking it with a plastic hammer.

Always use the special tool, otherwise crankshaft alignment accuracy will be affected.



## BALANCERSHAFT

- Install the front and rear balancershafts into the right crankcase by striking them with a plastic hammer.



## GEARSHIFT MECHANISM

Tightening torque  
 15 – 23 N·m  
 (1.5 – 2.3 kg·m  
 11.0 – 16.5 lb·ft)

Th1303

G

B1207B

Th1342

Th1342

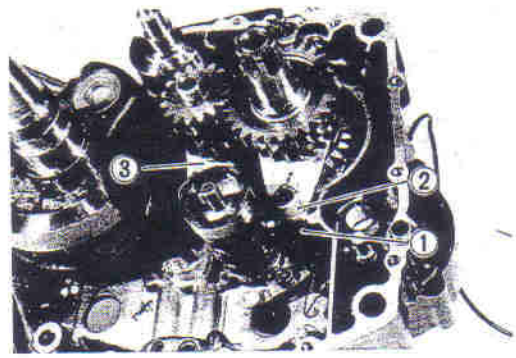
Th1342

Th1342

① Gearshift arm stopper  
 ② Gearshift shaft  
 ③ Gearshift lever  
 ④ Cam stopper plate  
 ⑤ Cam stopper  
 ⑥ Cam stopper bolt  
 ⑦ Gearshift cam  
 ⑧ Gearshift fork No. 1  
 ⑨ Gearshift fork No. 2  
 ⑩ Gearshift fork No. 3  
 ⑪ Pawl lifter  
 ⑫ Cam guide  
 ⑬ Cam driven gear

Th1342 : Apply THREAD LOCK "1342".  
 Th1303 : Apply THREAD LOCK SUPER "1303".  
 G : Apply SUPER GREASE "A".  
 B1207B : Apply BOND No. 1207B.  
 Align the pin groove (A) with the pin (B) as shown in Fig.

- After installing the countershaft assembly and driveshaft assembly into the right crankcase, fit the gearshift forks ①, ② and ③ into the gearshift fork grooves.

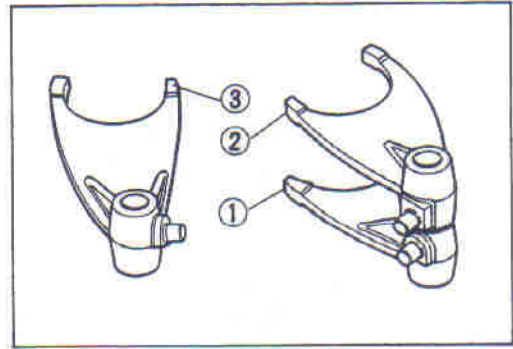


- ① For Top driven gear (No. 1)
- ② For 4th driven gear (No. 2)
- ③ For 3rd drive gear (No. 3)

**NOTE:**

Three kinds of gearshift forks, ①, ② and ③ are used. They resemble each other very closely in external appearance and configuration.

Carefully examine the illustration for correct installing positions and directions.



- Position the gearshift cam as shown in Fig. so that the gearshift fork shafts can be installed easily.

**NOTE:**

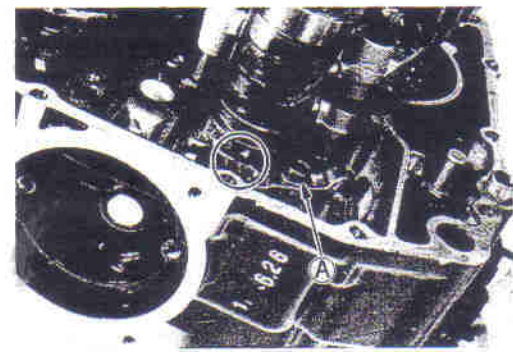
When replacing the gearshift cam stopper bolt (A), apply a small quantity of THREAD LOCK "1342" to the threaded part of the bolt.

99000-32050: THREAD LOCK "1342"

- After installing the gearshift fork shafts, hook the gearshift cam stopper spring.

**NOTE:**

After installing the gearshift cam stopper spring, install the neutral switch. (See page 3-11.)



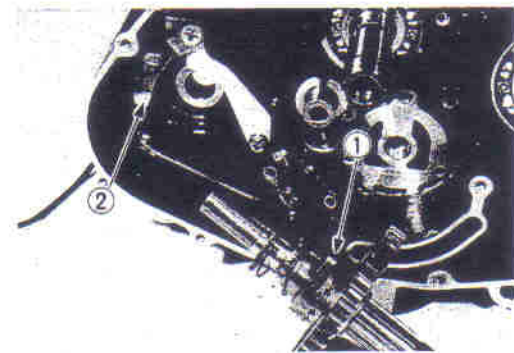
## KICK STARTER

- When inserting the kick starter shaft into the crankcase, engage the pawl ① of the kick starter with the starter pawl guide ②.

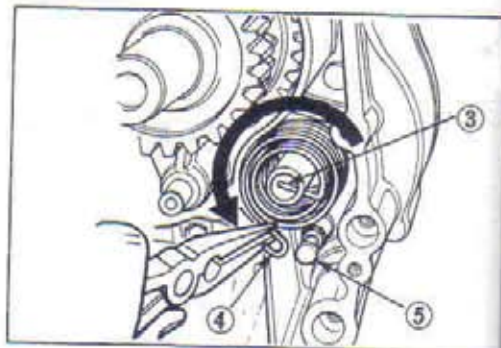
**NOTE:**

When replacing the kick starter pawl guide/stopper, apply a small quantity of THREAD LOCK SUPER "1303" to the bolt and screw.

99000-32030: THREAD LOCK SUPER "1303"



- When fitting the kick starter shaft return spring, fit the part ③ of return spring into the hole of kick starter shaft and turn it counterclockwise with pliers and hook the hooked part ④ of return spring onto the bolt ⑤.



## CRANKCASE

When reassembling the crankcase pay attention to the following points:

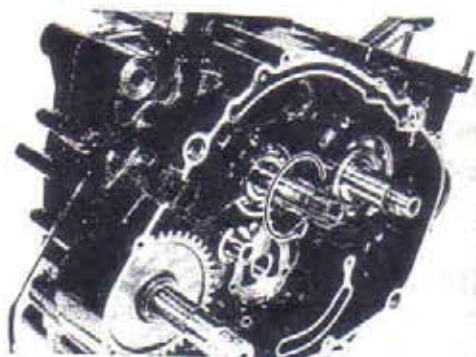
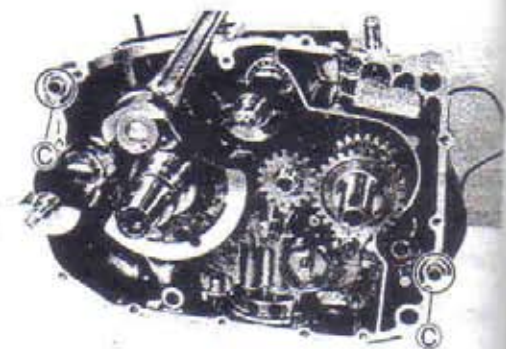
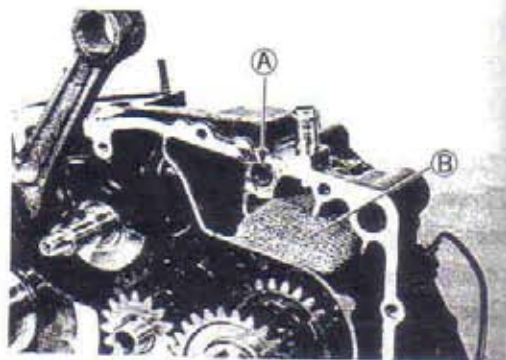
- Remove sealant material on the mating surfaces of right and left halves of crankcase and thoroughly remove oil stains.
- Fit the O-ring (A), oil separator (B) and dowel pins (C) on the right half as shown in Fig.
- Apply engine oil to the conrod big end of the crankshaft and all parts of the transmission gears.
- Apply SUZUKI BOND NO. 1207B uniformly to the mating surface of the right half of the crankcase, and assemble the cases within few minutes.

(For U.S.A. model)

99104-31140: SUZUKI BOND NO. 1207B

(For the other models)

99000-31140: SUZUKI BOND NO. 1207B

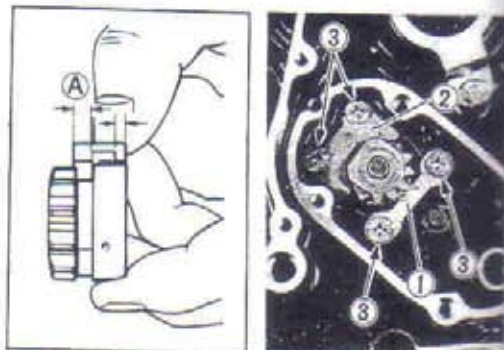


- After the crankcase bolts have been tightened, check if driveshaft and countershaft rotate smoothly.
- If a large resistance is felt to rotation, try to free the shafts by tapping the driveshaft or countershaft with a plastic hammer.

## CAM DRIVEN GEAR

- Install the gearshift pawls into the cam driven gear. The large shoulder (A) must face to the outside as shown in the illustration.
- When installing the cam guide (1) and pawl lifter (2), apply a small quantity of THREAD LOCK "1342" to the securing screws (3).

09900-32050: THREAD LOCK "1342"



## GEARSHIFT SHAFT

- Fit a spring to the gearshift shaft correctly.
- Install the gearshift shaft. Match the center teeth of the gear on the gearshift shaft with the center teeth on the cam driven gear as shown.

### NOTE:

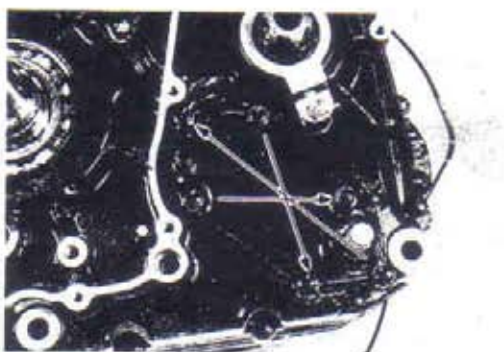
When replacing the gearshift arm stopper **(B)**, apply a small quantity of **THREAD LOCK SUPER "1303"** to its threaded part and tighten it to the specified torque. (See page 7-18.)

99000-32030: **THREAD LOCK SUPER "1303"**

- Fit the gearshift cover and tighten the bolts diagonally.

### NOTE:

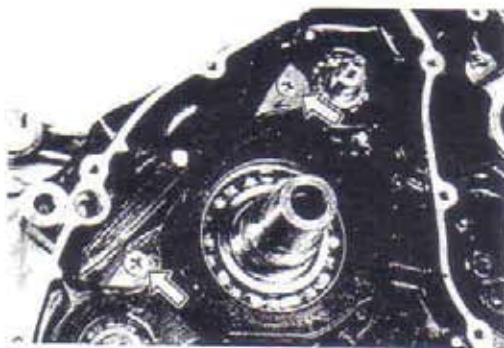
After the gearshift cover and gearshift lever have been fitted, confirm that gear change is normal while turning the countershaft and driveshaft. If gear change is not obtained, it means that assembly of gears or installation of gearshift fork is incorrect. If this is the case, disassemble and trace the mistake.



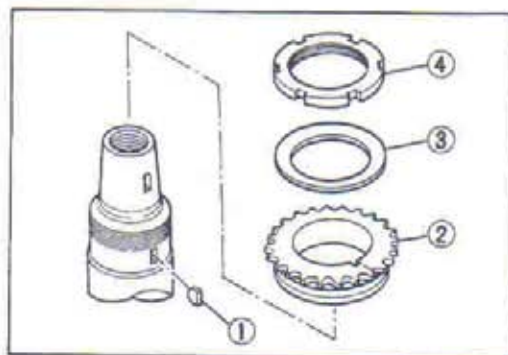
## BALANCER

- Apply a small quantity of **THREAD LOCK SUPER "1303"** to the balancer chain guide securing screws.

99000-32030: **THREAD LOCK SUPER "1303"**



- Fit the key **(1)** in the key slot on the crankshaft, then install the balancer drive sprocket **(2)**, wave washer **(3)** and ring nut **(4)**.
- Tighten the ring nut to the specified torque by using the special tools and torque wrench.

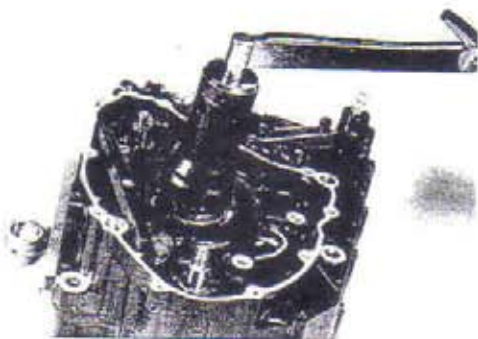


09917-23711: Ring nut socket wrench

09910-20116: Conrod holder

Tightening torque: 60 – 100 N·m

(6.0 – 10.0 kg·m, 43.5 – 72.5 lb-ft)



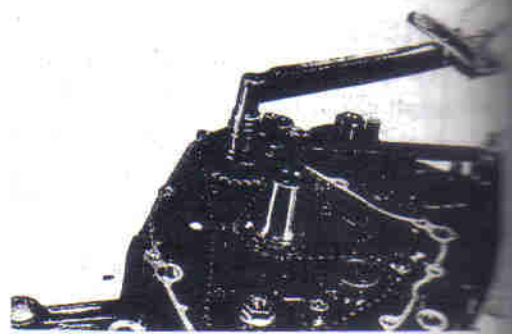


- Fit the keys in each key slot on the front and rear balancer shafts.
- Install the front and rear balancer driven sprockets and balancer chain tensioner along with the balancer chain.

**NOTE:**

Front and rear balancer driven sprockets are identified with the letters of "F" or "R".

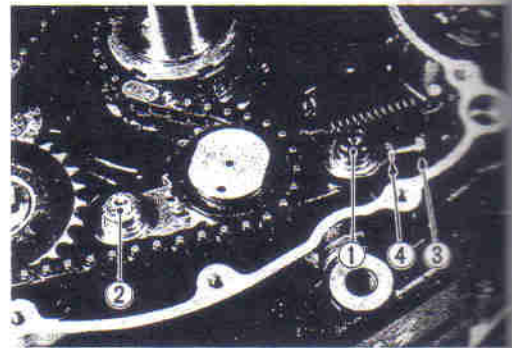
- Tighten each nut to the specified torque by using the special tool and torque wrench.



**09917-33710: Sprocket holder**

**Tightening torque: 25 – 40 N·m**  
(2.5 – 4.0 kg·m, 18.0 – 29.0 lb-ft)

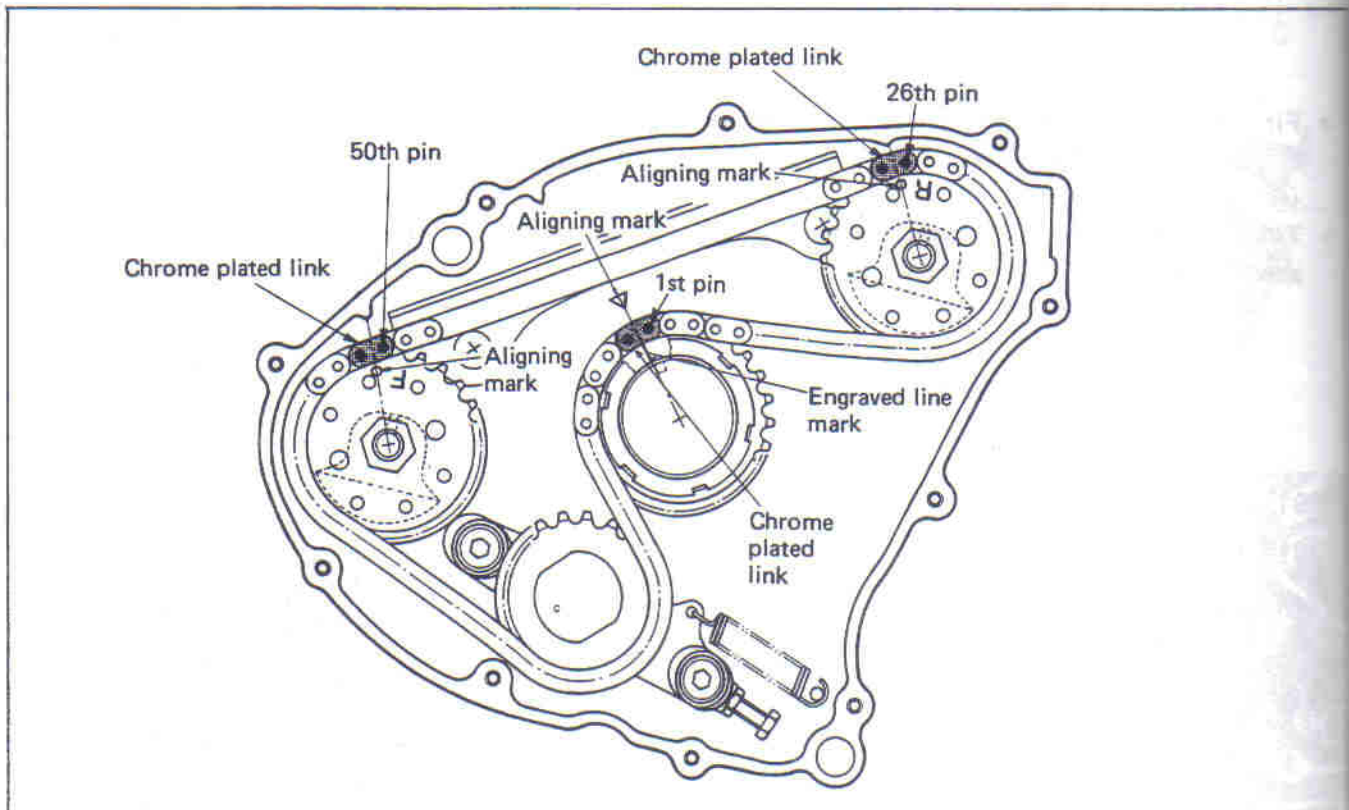
- Be sure to align the aligning marks on the crankcase with the aligning marks on the drive and driven sprockets as shown in the illustration.
- Hook the balancer chain tensioner spring onto the hooked part of crankcase.
- Tighten the two bolts (① and ②) to the specified torque, then tighten the stopper bolt ③ and lock nut ④.



**Tightening torque: 15 – 20 N·m**  
(① and ②) (1.5 – 2.0 kg·m, 11.0 – 14.5 lb-ft)

**NOTE:**

The bolt ① is longer than the bolt ②.



## MAGNETO

- Degrease the tapered portion of the magneto rotor and also the crankshaft.
- Fit the key in the key slot on the crankshaft, then install the magneto rotor.
- Apply a small quantity of THREAD LOCK SUPER "1303"/"1305" to the threaded part of rotor bolt.
- Tighten the magneto rotor bolt to the specified torque by using the special tool and torque wrench.

(For U.S.A. model)

99000-32030: THREAD LOCK SUPER "1303"

(For the other models)

99000-32100: THREAD LOCK SUPER "1305"

09930-44913: Rotor holder

Tightening torque: 150 – 170 N·m  
(15.0 – 17.0 kg·m, 108.5 – 123.0 lb-ft)

- BOND NO. 1207B should be applied to the groove of magneto lead wire grommet.

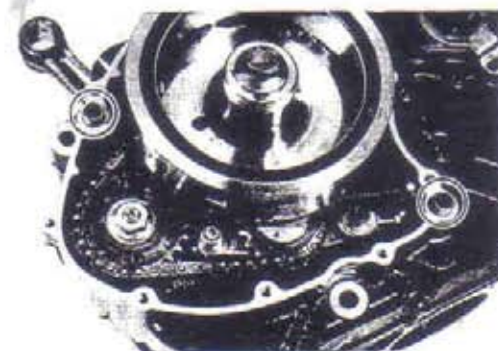
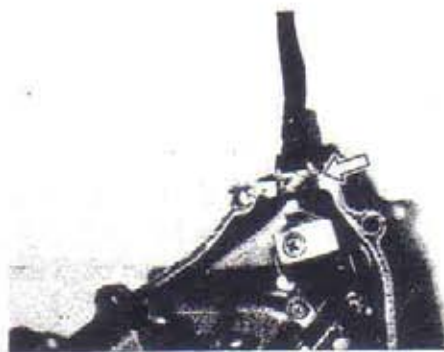
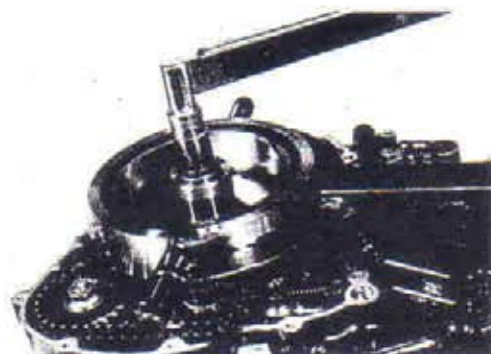
(For U.S.A. model)

99104-31140: SUZUKI BOND NO. 1207B

(For the other models)

99000-31140: SUZUKI BOND NO. 1207B

- Fit the two dowel pins and attach new gasket.
- Install the magneto cover.

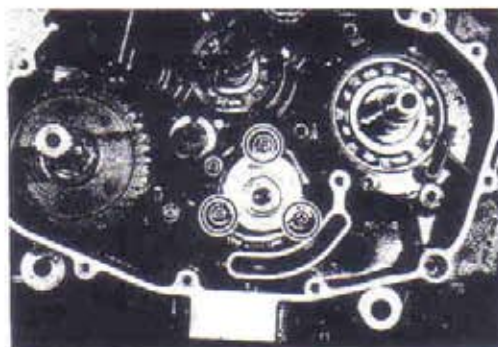


## OIL PUMP

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

99000-32050: THREAD LOCK "1342"

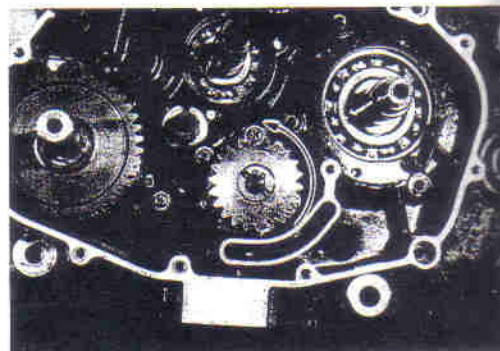
- Tighten the oil pump mounting screws.



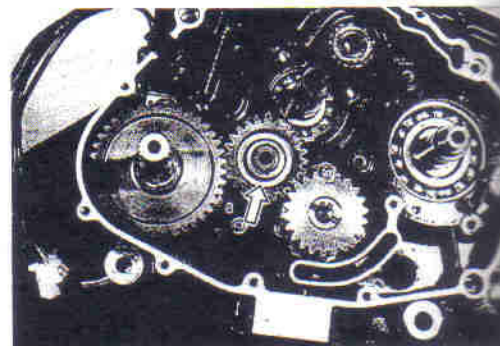
- Fix the oil pump driven gear with the circlip.

**NOTE:**

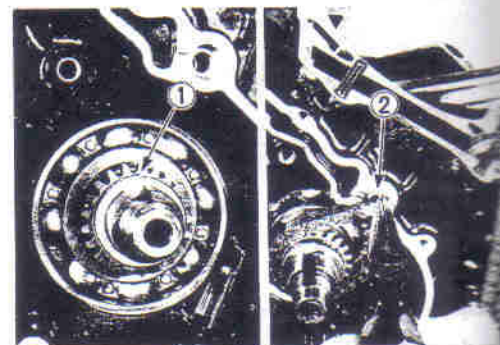
*After installing the oil pump driven gear, rotate the pump gear by hand to see if it turns smoothly.*



- Fix the idle gear with the circlip.

**CAM DRIVE SPROCKET**

- Install the cam drive sprocket onto the crankshaft, then fit the key ① in the key slot on the crankshaft.
- Engage the cam drive chain onto the cam drive sprocket.
- Install the oil nozzle ②.

**PRIMARY DRIVE GEAR**

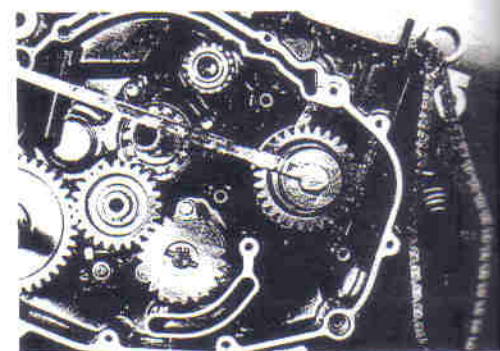
- Fit the key in the key slot on the crankshaft, then install the primary drive gear, washer and nut.
- Tighten the primary drive gear nut to the specified torque by using the special tool and torque wrench.

09910-20116: Conrod holder

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

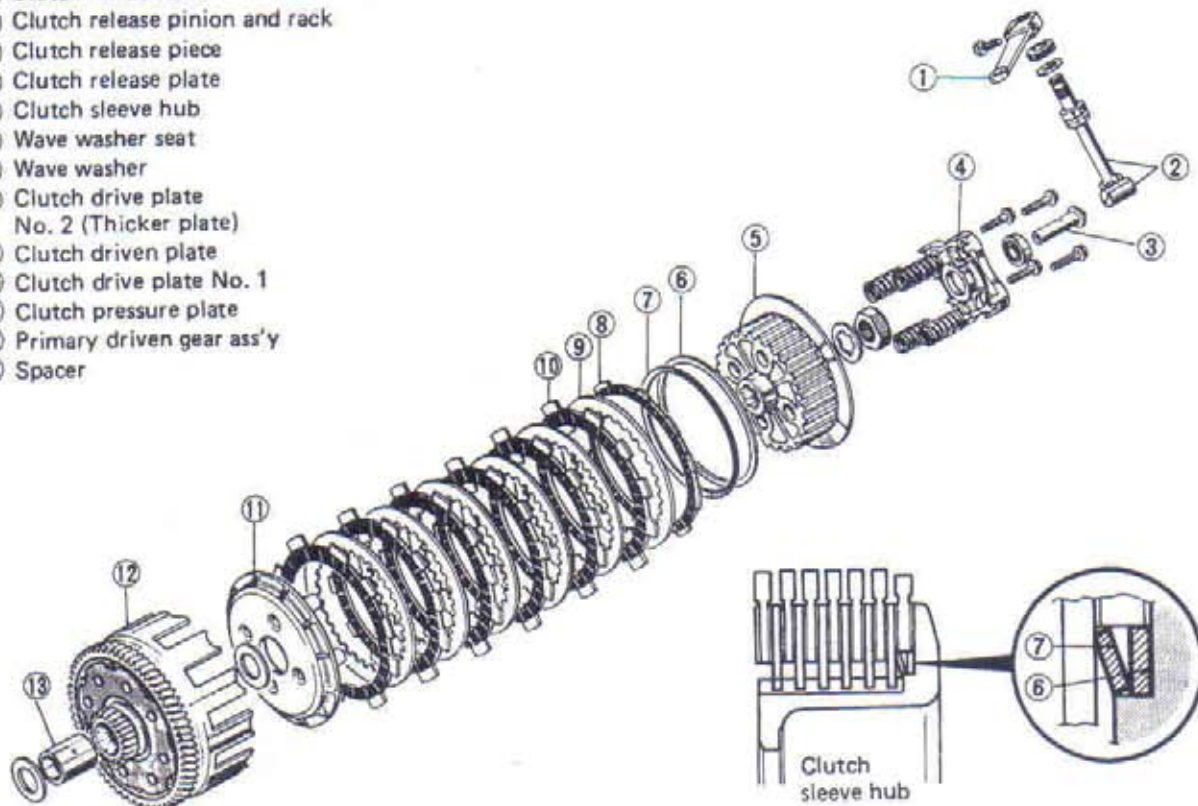
**NOTE:**

*The primary drive gear nut is a left-hand thread nut.*



## CLUTCH

- ① Clutch release arm
- ② Clutch release pinion and rack
- ③ Clutch release piece
- ④ Clutch release plate
- ⑤ Clutch sleeve hub
- ⑥ Wave washer seat
- ⑦ Wave washer
- ⑧ Clutch drive plate No. 2 (Thicker plate)
- ⑨ Clutch driven plate
- ⑩ Clutch drive plate No. 1
- ⑪ Clutch pressure plate
- ⑫ Primary driven gear ass'y
- ⑬ Spacer

**NOTE:**

Check to be sure that the wave washer seat ⑥ and wave washer ⑦ are properly installed.

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

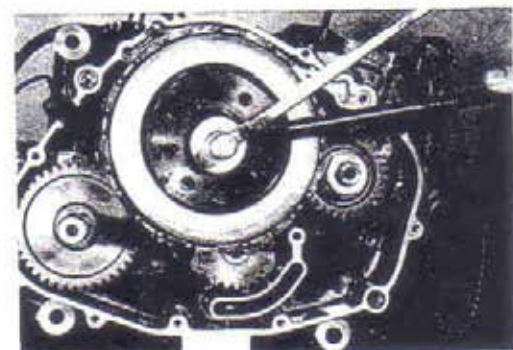
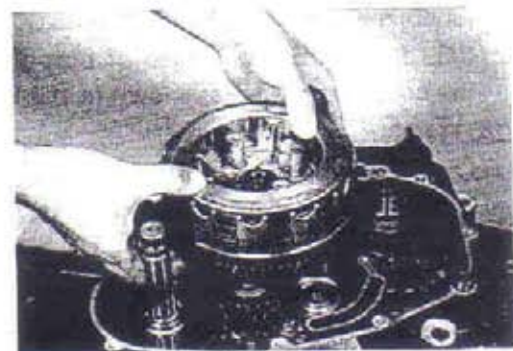
**NOTE:**

When inserting the spacer into the primary driven gear, apply a small quantity of engine oil to both inside and outside of the spacer.

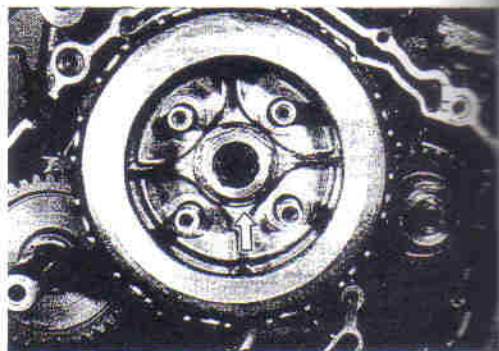
- Install the clutch sleeve hub, clutch plates and pressure plate to the primary driven gear and install them onto the counter-shaft, tighten the clutch sleeve hub nut to the specified torque by using the special tool and torque wrench.

09920-53722: Clutch sleeve hub holder

Tightening torque: 40 – 60 N·m  
(4.0 – 6.0 kg·m, 29.0 – 43.0 lb-ft)



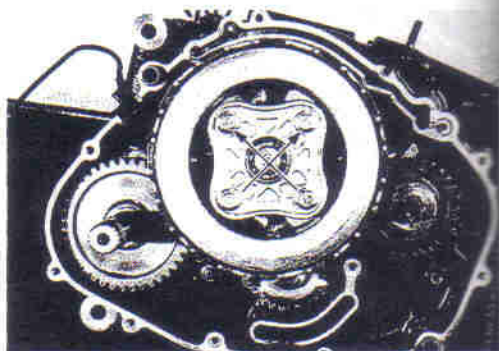
- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the lock washer.



- Tighten the clutch spring mounting bolts diagonally to the specified torque by using the special tool and torque wrench.

Tightening torque: 11 – 13 N·m

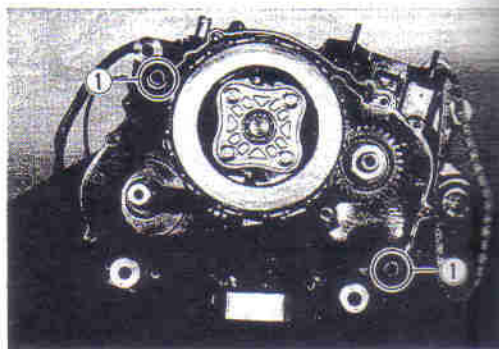
(1.1 – 1.3 kg·m, 8.0 – 9.5 lb-ft)



- Fit the two dowel pins ① to the crankcase and attach a new gasket.

#### CAUTION:

Use a new gasket to prevent oil leakage.



- When reassembling the clutch cover, apply SUZUKI BOND NO. 1207B to the thread of bolt ② and fit the gaskets to the correct position as shown in the Fig.

#### CAUTION:

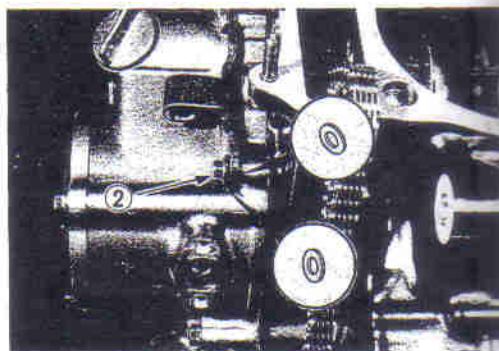
Use a new gasket to prevent oil leakage.

(For U.S.A. model)

99104-31140: SUZUKI BOND NO. 1207B

(For the other models)

99000-31140: SUZUKI BOND NO. 1270B

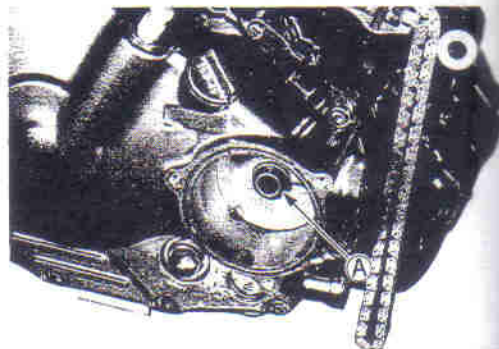


### OIL FILTER

- Before installing the oil filter, check to be sure that the O-rings, ① and ② and spring ③ are installed correctly.

#### CAUTION:

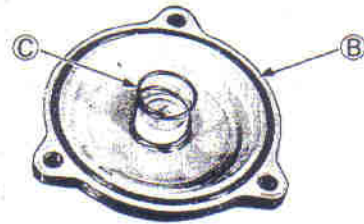
Replace the O-rings with new ones to prevent oil leakage.



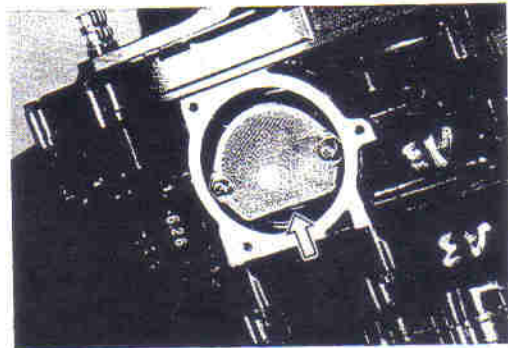
(Continued on next page.)

**NOTE:**

Coat the O-ring ⑥ of oil filter cap with grease.

**OIL SUMP FILTER**

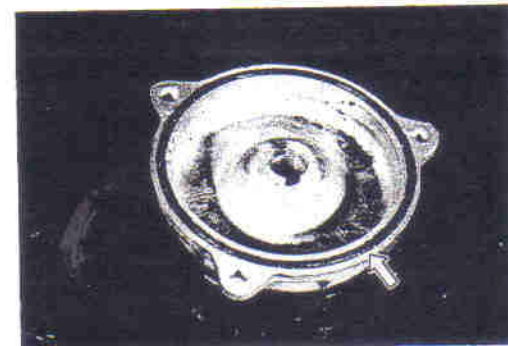
- Before installing the sump filter, wash it with cleaning solvent, and then blow compressed air through it to dry off solvent.



- Fit the O-ring to the O-ring groove as shown in Fig.

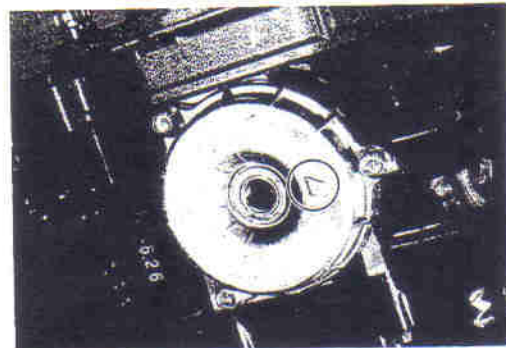
**CAUTION:**

Use new O-ring to prevent oil leakage.

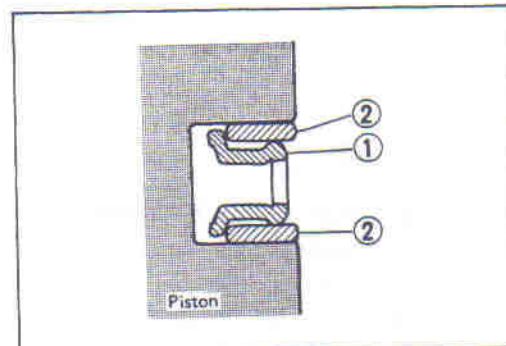
**NOTE:**

Coat the O-ring of sump filter cap with grease.

- Be sure to face the arrow mark on the oil sump filter cap to the front.

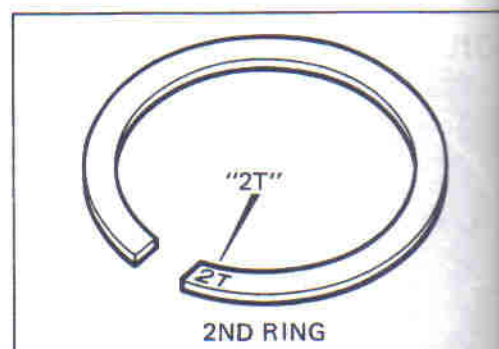
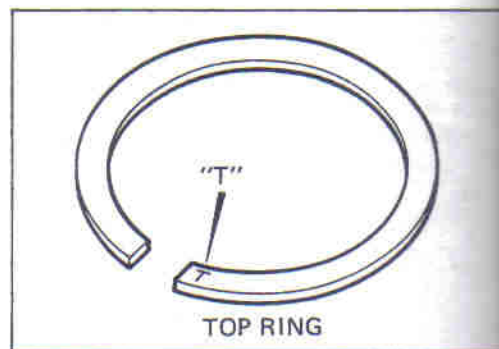
**OIL RING**

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

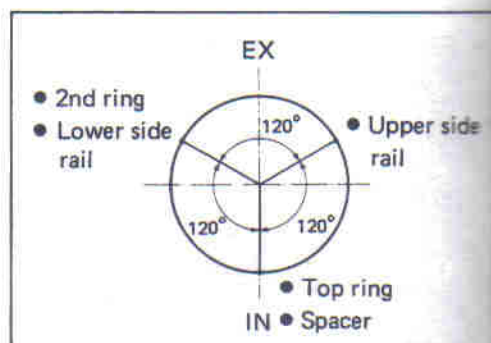


## TOP RING AND 2ND RING

The top ring and 2nd ring differ in the letter of the top mark. The 2nd ring letter size is larger than the top one. Be sure to bring the marked side to top when fitting them to the piston.



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



## PISTON

The following are reminders for piston installation:

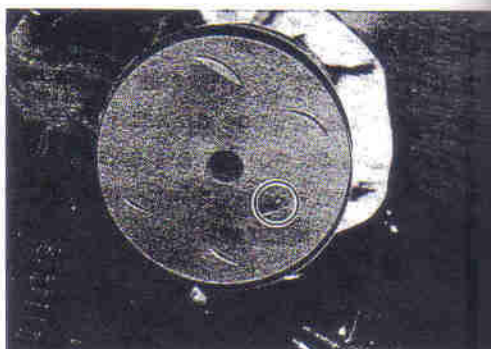
- Rub a small quantity of SUZUKI MOLY PASTE onto the piston pin.

### 99000-25140: SUZUKI MOLY PASTE

- Place a clean rag over the cylinder base to prevent the piston pin circlips from dropping into the crankcase.
- When fitting the piston, turn arrow mark on the piston head to exhaust side.
- Fit the piston pin circlips with long-nose pliers.

### CAUTION:

Use new piston pin circlip to prevent circlip failure which will occur with a bent one.



## CYLINDER

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

- Fit the dowel pins ① to the crankcase and attach a new gasket.

### CAUTION:

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

- Hold each piston ring with properly position, and insert the piston into the cylinder.

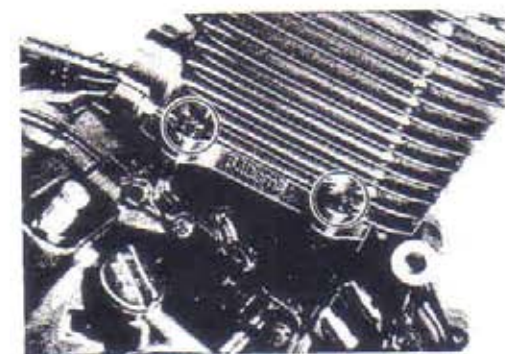
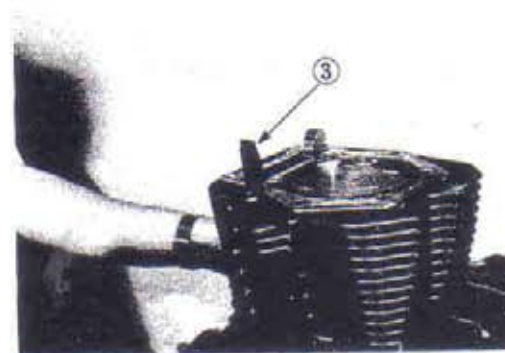
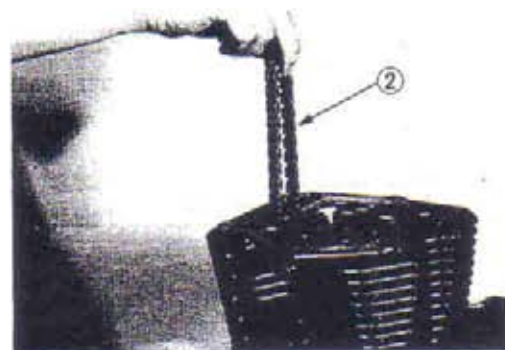
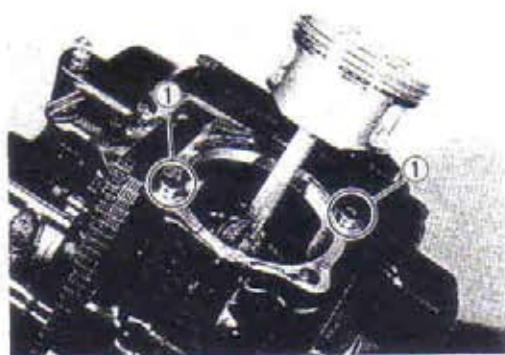
### NOTE:

When mounting the cylinder, keep the camshaft drive chain ② out. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.

### NOTE:

There is a holder for the bottom end of the cam chain guide out in the crankcase. Be sure that the cam chain guide ③ is mounted properly.

- Temporarily tighten the cylinder base nuts.



## CYLINDER HEAD

- Fit the dowel pins ① to the cylinder and attach a new gasket.

### CAUTION:

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

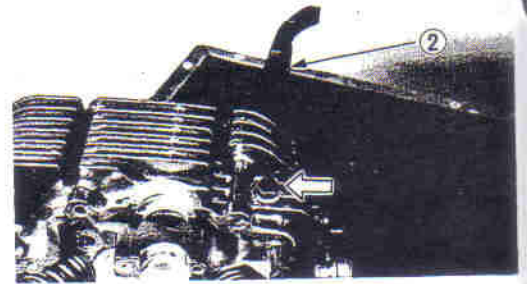




- Install the cam chain tensioner ② to the cylinder head.

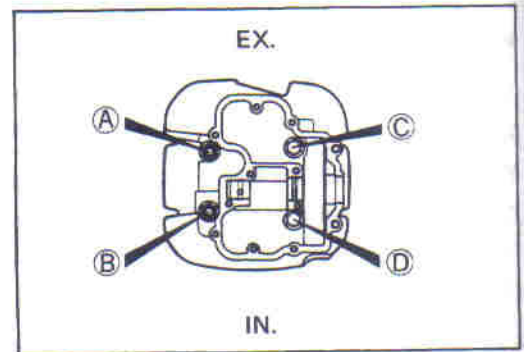
Tightening torque: 16 – 24 N·m

(1.6 – 2.4 kg-m, 11.5 – 17.5 lb-ft)



- Place the cylinder head on the cylinder.
- Cylinder head bolts and copper washers must be fitted in the correct position, as shown in the illustration.

- Ⓐ : Copper washer with 190 mm bolt
- Ⓑ : Copper washer with 215 mm bolt
- Ⓒ : 190 mm bolt
- Ⓓ : 215 mm bolt



- Fasten the cylinder head by tightening the bolts and nuts diagonally. Tighten each bolt and nut to the torque value specified below.

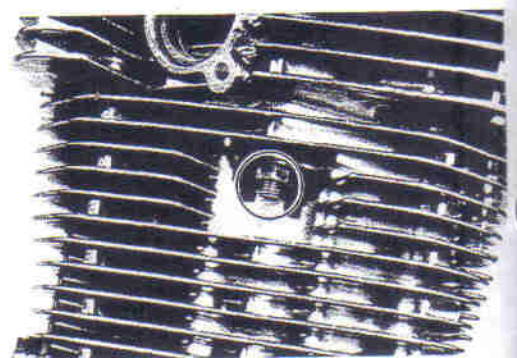
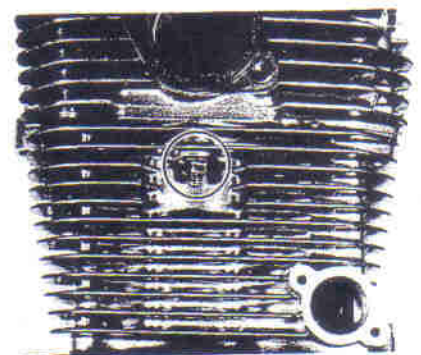
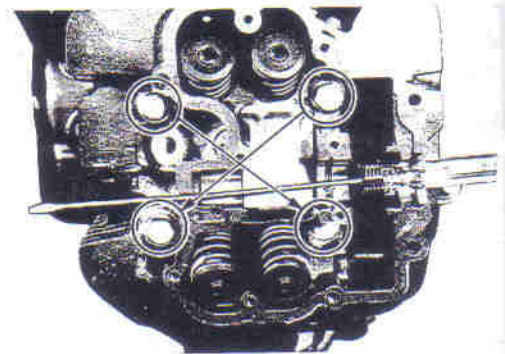
Cylinder head bolts and nuts tightening torque

Bolt: 35 – 40 N·m

(3.5 – 4.0 kg-m, 25.5 – 29.0 lb-ft)

Nut : 23 – 27 N·m

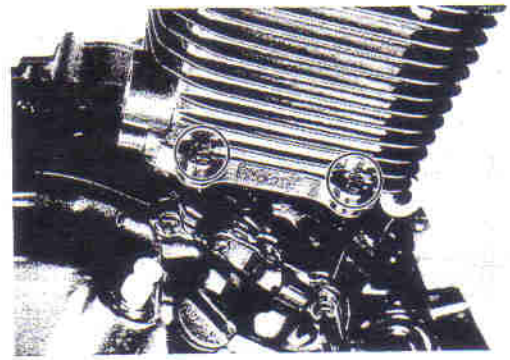
(2.3 – 2.7 kg-m, 16.5 – 19.5 lb-ft)



- After tightening the cylinder head bolts and nuts to the specified torque, tighten the cylinder base nuts.

#### Cylinder base nuts

Tightening torque: 7 – 11 N·m  
(0.7 – 1.1 kg·m, 5.0 – 8.0 lb·ft)

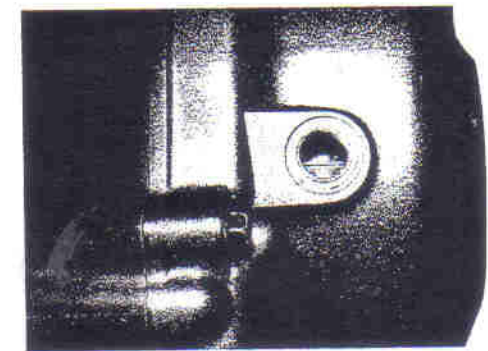
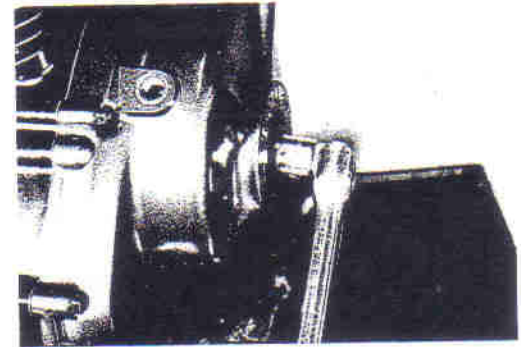


## CAMSHAFT

- Turn the crankshaft counterclockwise with the box wrench and align "T" line on the magneto rotor with the center of hole on the magneto cover keeping the camshaft drive chain pulled upward.

#### CAUTION:

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



#### NOTE:

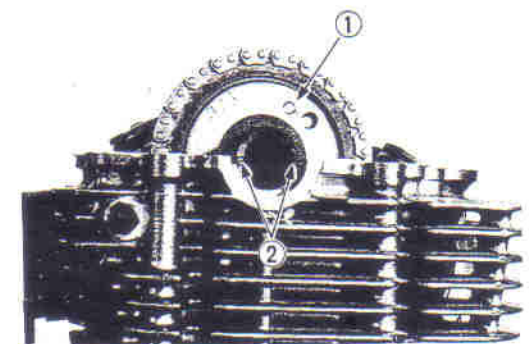
Apply grease on the cam sprocket locating pin and install the pin into the camshaft.

- Engage the chain on the cam sprocket with the locating pin hole ① at one o'clock position.

#### NOTE:

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

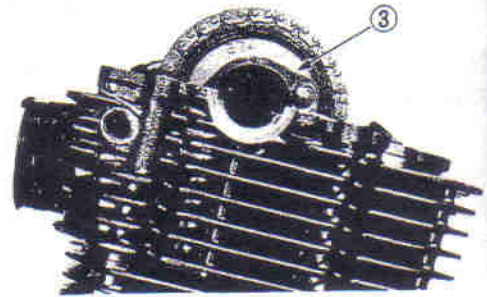
- Align the engraved line mark ② on the camshaft so it is parallel with the surface of the cylinder head.
- Install the C-ring into the ring groove of the cylinder head.



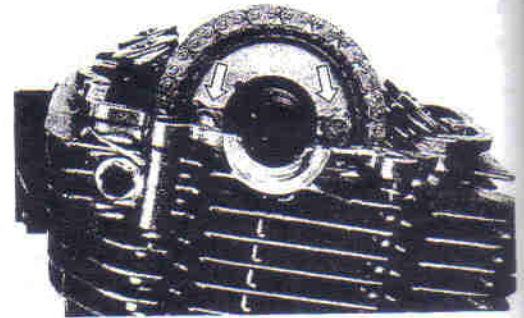
- Fit the lock washer ③ so that it is covering the locating pin.
- Apply THREAD LOCK SUPER "1303" to the cam sprocket bolts and tighten them.

Tightening torque: 14 – 16 N·m  
(1.4 – 1.6 kg-m, 10.0 – 11.5 lb-ft)

99000-32030: THREAD LOCK SUPER "1303"



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



- Apply SUZUKI MOLY PASTE to the camshaft journals and cam faces.

99000-25140: SUZUKI MOLY PASTE

### CYLINDER HEAD COVER (See page 3-54.)

- Thoroughly wipe off oil from the fitting surfaces of cylinder head and cover.
- Fit the two dowel pins ① to the cylinder head side.
- Uniformly apply SUZUKI BOND NO. 1207B to the cylinder head surface.

(For the U.S.A. model)

99104-31140: SUZUKI BOND NO. 1207B

(For the other models)

99000-31140: SUZUKI BOND NO. 1207B

#### NOTE:

Do not apply SUZUKI BOND NO. 1207B to the camshaft end cap ②.

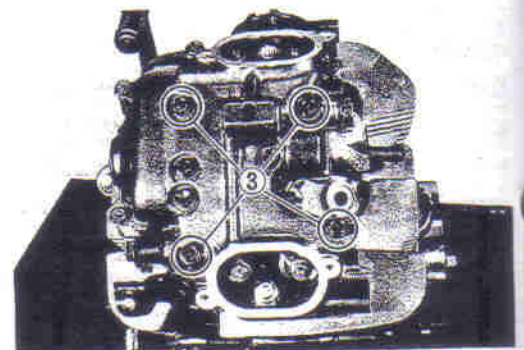
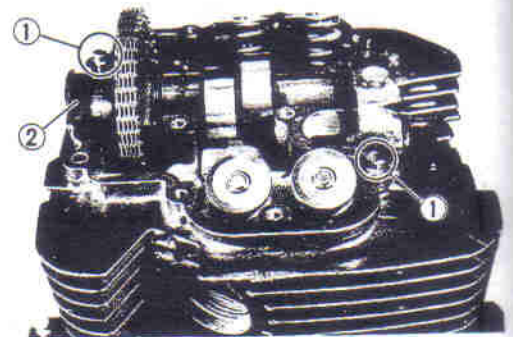
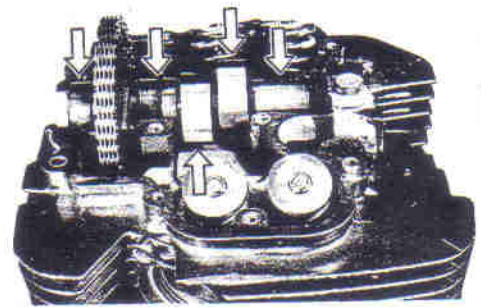
- Fit the four gaskets ③ to the head cover bolts correctly as shown in Fig.

#### CAUTION:

Use a new gasket to prevent oil leakage.

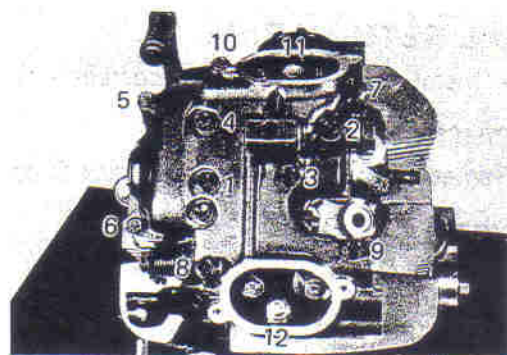
#### NOTE:

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



- Lightly tighten the cylinder head cover bolts sequentially in the ascending order of numbers, and then if everything is satisfactory, tighten securely with a torque wrench to the specified torque.

Tightening torque: 9 – 11 N·m  
(0.9 – 1.1 kg-m, 6.5 – 8.0 lb-ft)



## CAM DRIVE CHAIN TENSIONER

Install the cam drive chain tensioner following the procedure below.

- Remove the cap ① and turn the slotted end of the chain tensioner to lock it with a screwdriver in the clockwise direction.
- Install the chain tensioner on the cylinder.

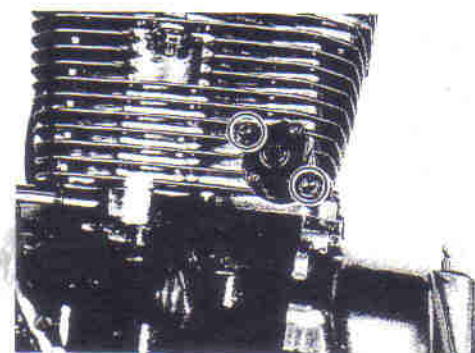
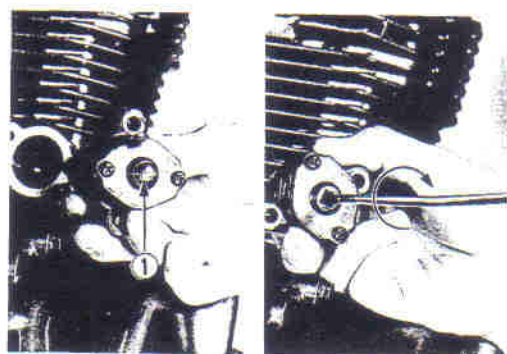
Tightening torque: 6 – 8 N·m  
(0.6 – 0.8 kg-m, 4.5 – 6.0 lb-ft)

09911-73730: "T" type hexagon wrench (5 mm)

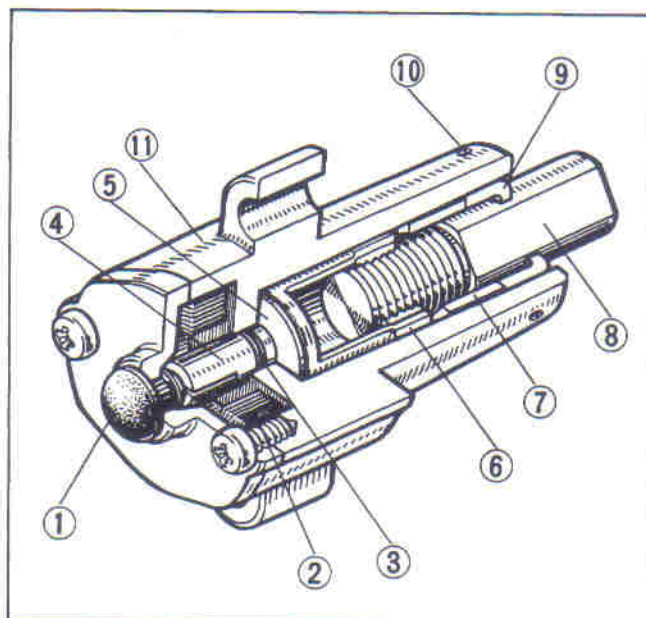
- Turn back and pull out the screwdriver from the chain tensioner. As the cylinder turns, the tensioner rod is advanced under spring force and pushes the tensioner against the cam drive chain.

### NOTE:

*The cam drive chain tensioner is maintained at the proper tension by an automatically adjusted tensioner. Before installing the cam drive chain tensioner, inspect the smooth movement.*



- ① Cap
- ② Spring
- ③ O-ring
- ④ Cylinder shaft
- ⑤ Thrust washer
- ⑥ Cylinder
- ⑦ Spacer
- ⑧ Tensioner rod
- ⑨ Rod guide
- ⑩ Guide locating pin
- ⑪ Case



### OIL RETURN PIPE

- Install the oil return pipe correctly as shown in Fig.

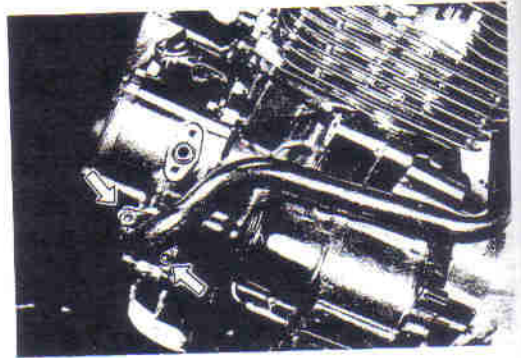
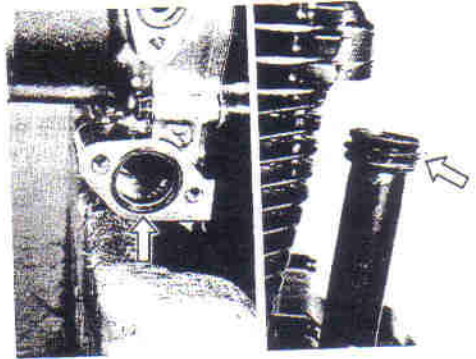
**CAUTION:**

Replace the O-rings with new ones to prevent oil leakage.

**NOTE:**

Coat the O-ring with grease.

Tightening torque: 8 – 12 N·m  
(0.8 – 1.2 kg·m, 6.0 – 8.5 lb·ft)

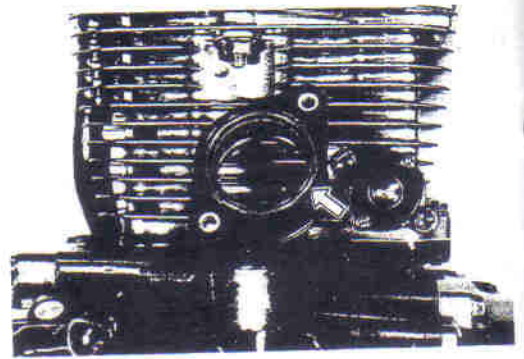


### INTAKE PIPE

**CAUTION:**

When replacing the intake pipe, use a new O-ring to prevent sucking air from the joint.

- Coat the O-ring with grease.

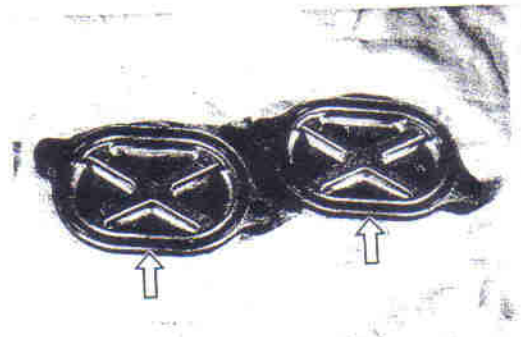


### VALVE INSPECTION CAP AND CAM TIMING INSPECTION CAP

- Before installing the valve inspection caps and cam timing inspection cap, coat the respective O-rings with grease.

**CAUTION:**

Replace the respective O-rings with new ones.



### VALVE CLEARANCE

- Check and adjust the valve clearance. (Refer to page 2-6 for procedures.)



## CYLINDER HEAD COVER BOLT

Unit: mm (in)

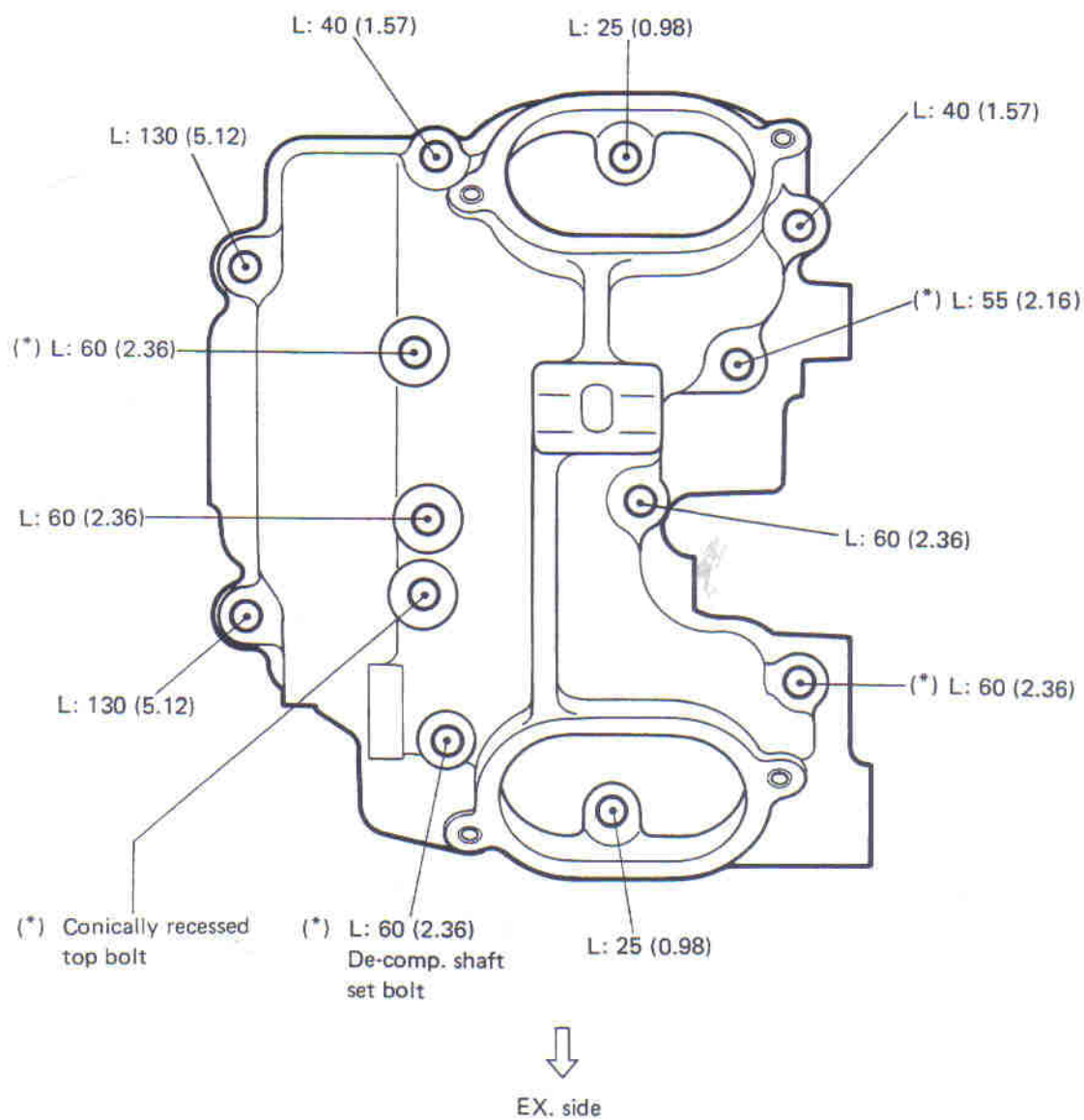
L : Bolt length

(\*) : Gasket position

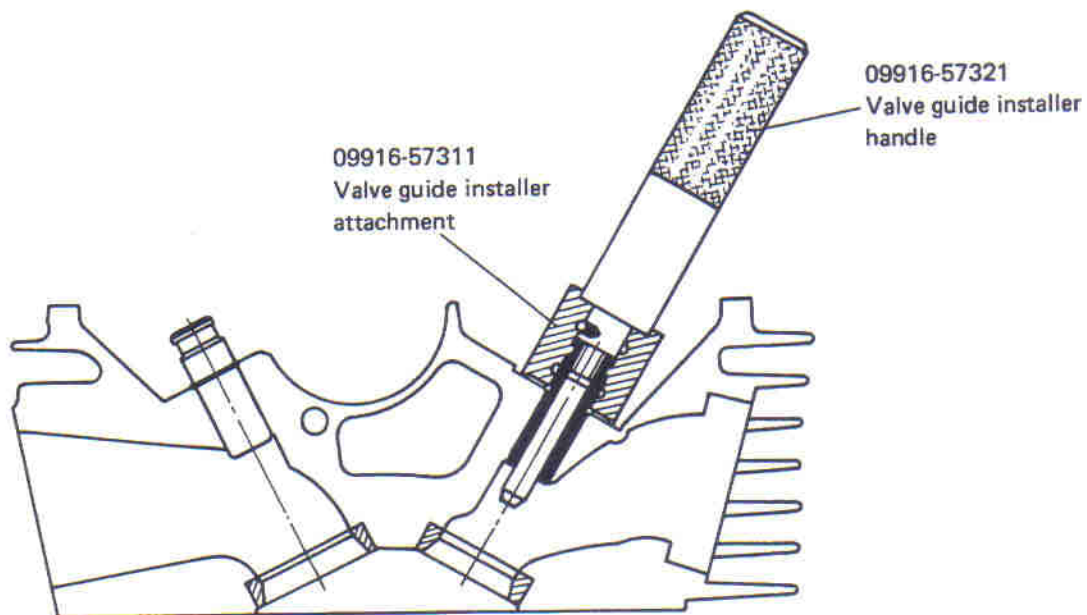
## TIGHTENING TORQUE

9 – 11 N·m

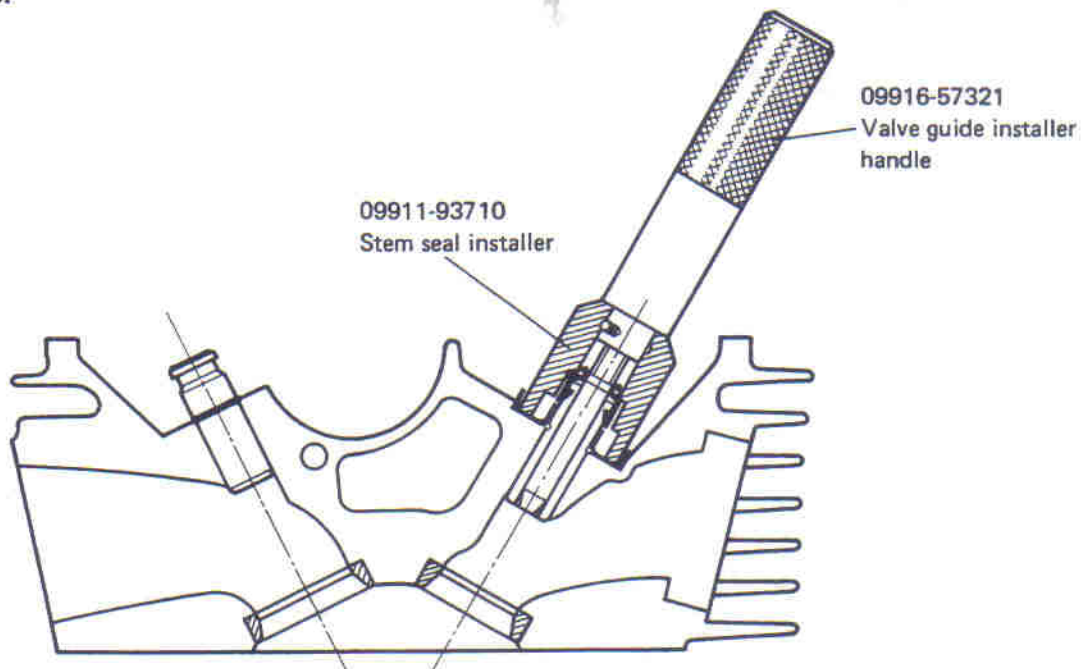
(0.9 – 1.1 kg-m, 6.5 – 8.0 lb-ft)



See page 3-17.



See page 3-18.



# FUEL AND LUBRICATION SYSTEM

## CONTENTS

<b>FUEL TANK AND FUEL COCK</b> .....	4- 1
<b>FUEL TANK REMOVAL</b> .....	4- 1
<b>FUEL COCK REMOVAL</b> .....	4- 1
<b>INSPECTION AND CLEANING</b> .....	4- 1
<b>FUEL LINE INSPECTION</b> .....	4- 1
<b>CARBURETOR</b> .....	4- 2
<b>CONSTRUCTION</b> .....	4- 2
<b>SPECIFICATIONS</b> .....	4- 3
<b>I. D. NO. LOCATION</b> .....	4- 4
<b>REMOVAL</b> .....	4- 5
<b>DISASSEMBLY</b> .....	4- 5
<b>INSPECTION AND ADJUSTMENT</b> .....	4- 5
<b>NEEDLE VALVE INSPECTION</b> .....	4- 5
<b>FLOAT HEIGHT ADJUSTMENT</b> .....	4- 5
<b>REASSEMBLY AND REMOUNTING</b> .....	4- 5
<b>LUBRICATION SYSTEM AND COOLING SYSTEM</b> .....	4- 6
<b>OIL PRESSURE</b> .....	4- 6
<b>OIL SUMP FILTER</b> .....	4- 6
<b>OIL FILTER</b> .....	4- 7
<b>OIL COOLER</b> .....	4- 7
<b>ENGINE LUBRICATION / CYLINDER</b>	
<b>HEAD COOLING SYSTEM CHART</b> .....	4- 8



## FUEL TANK AND FUEL COCK

### FUEL TANK REMOVAL

See page 3-4.

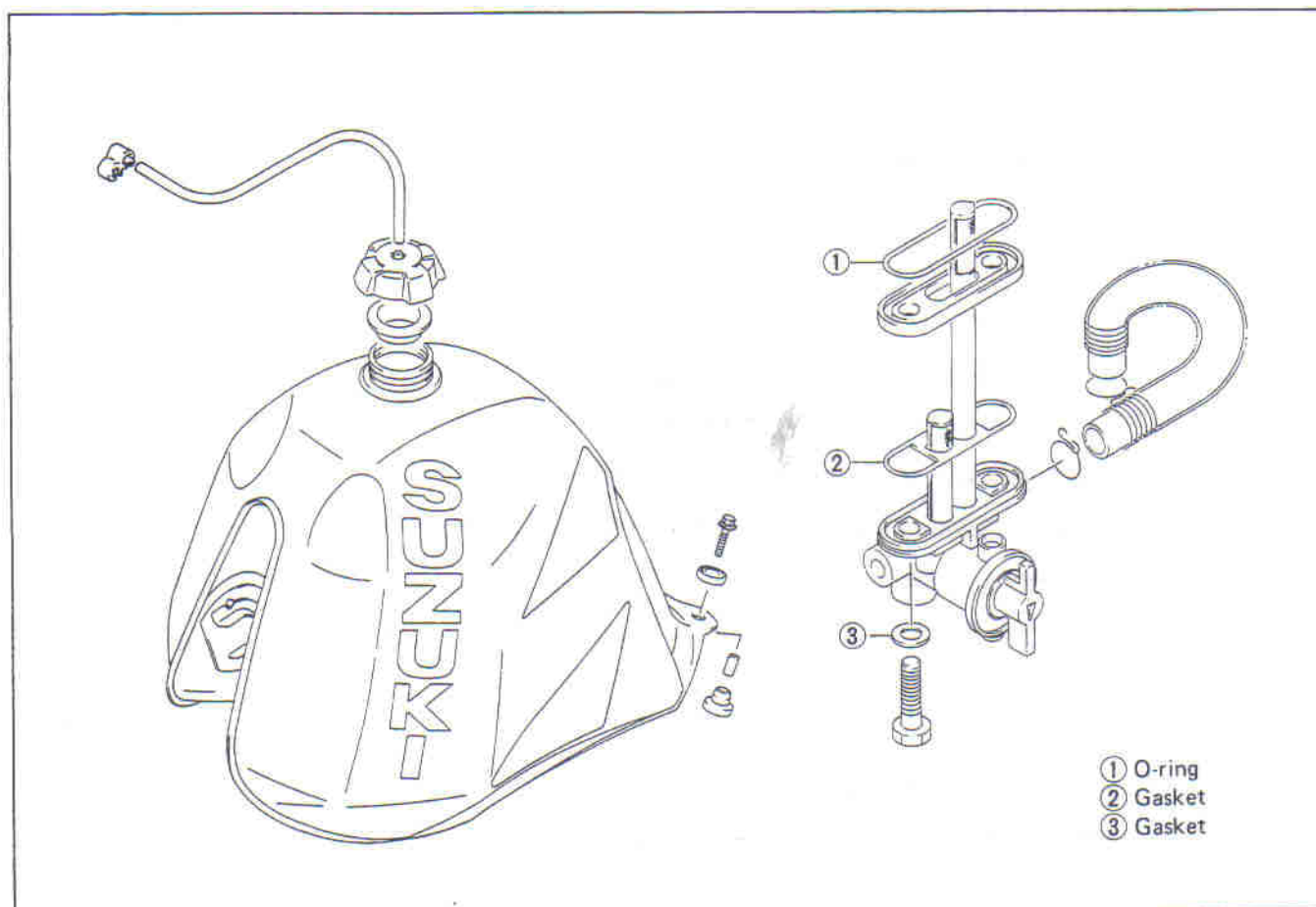
### FUEL COCK REMOVAL

- Turn the fuel cock to OFF position.
- Shift the fuel hose clip sideways and disconnect the fuel hose from the fuel cock.
- Turn the fuel cock to ON position and drain the fuel.
- Remove the fuel cock assembly by removing the two bolts.

#### WARNING:

Gasoline is very explosive. Extreme care must be taken.

Gaskets and O-ring must be replaced with new ones to prevent fuel leakage.

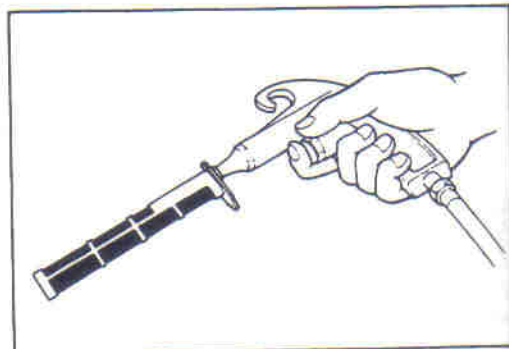


### INSPECTION AND CLEANING

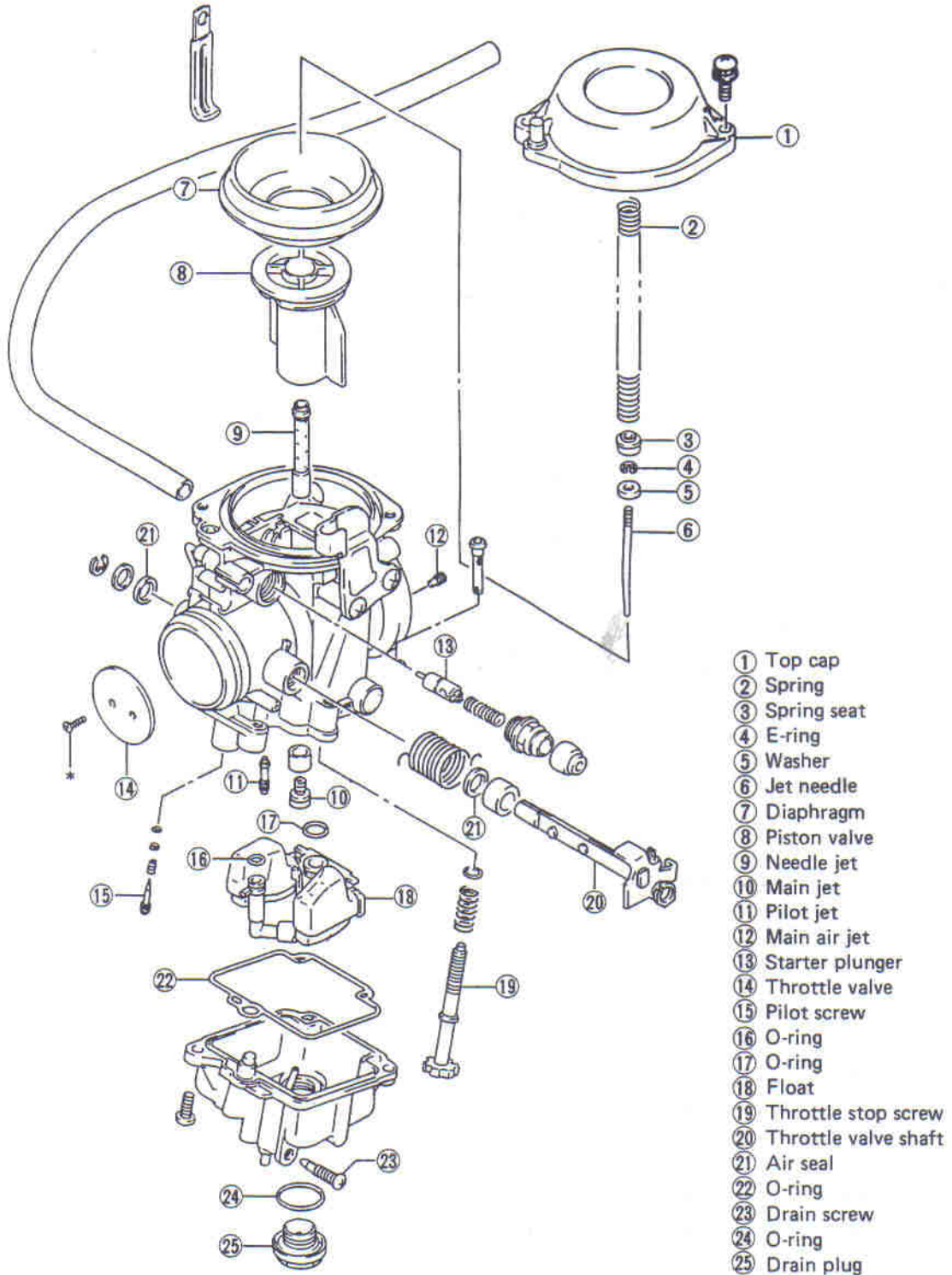
If the fuel strainer is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel strainer with compressed air.

### FUEL LINE INSPECTION

Visually inspect the fuel lines for damage and fuel leakage. If they are found to be damaged, replace them with new ones.



# CARBURETOR CONSTRUCTION



•: Apply THREAD LOCK "1342".

## SPECIFICATIONS

ITEM	SPECIFICATION					
	E-02,04, 15,21,25, 34,53,	E-16, 17,28	E-22	E-24,39	U-type of E-22	E-18
Carburetor type	MIKUNI BST40SS	←	←	←	←	←
Bore size	40 mm	←	←	←	←	←
I.D. No	15A7	15A3	15A4	14A9	15A5	15A6
Idle r/min.	1400 ± 100 r/min	←	←	←	←	1400 ± 50 r/min
Float height	14.7 ± 1.0 mm (0.58 ± 0.04 in)	←	←	←	←	←
Main jet (M.J.)	# 142.5	←	←	←	←	# 147.5
Main air jet (M.A.J.)	0.7 mm	←	←	←	←	←
Jet needle (J.N.)	6H12-3rd	←	←	←	6J8-3rd	6F87-3rd
Needle jet (N.J.)	X-9	←	←	←	←	←
Throttle valve (Th.V.)	# 110	←	←	←	←	←
Pilot jet (P.J.)	# 50	←	←	←	# 47.5	←
By-pass (B.P.)	0.8 mm	←	←	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←	←	←
Valve seat (V.S.)	2.3 mm	←	←	←	←	←
Starter jet (G.S.)	# 35	←	←	←	←	←
Pilot screw (P.S.)	PRE-SET (1¼ turns back)	←	PRE-SET (1½ turns back)	←	PRE-SET (1¼ turns back)	PRE-SET (1¾ turns back)
Pilot air jet (P.A.J.)	1.4 mm	←	←	←	←	←
Throttle cable play	0.5— 1.0 mm (0.02— 0.04 in)	←	←	←	←	←
Choke cable play	0.5— 1.0 mm (0.02— 0.04 in)	←	←	←	←	←

## COUNTRY or AREA

E-02 : U.K.

E-03 : U.S.A.

E-04 : France

E-15 : Finland

E-16 : Norway

E-17 : Sweden

E-18 : Switzerland

E-21 : Belgium

E-22 : W. Germany

E-24 : Australia

E-25 : Netherlands

E-28 : Canada

E-33 : California (U.S.A.)

E-34 : Italy

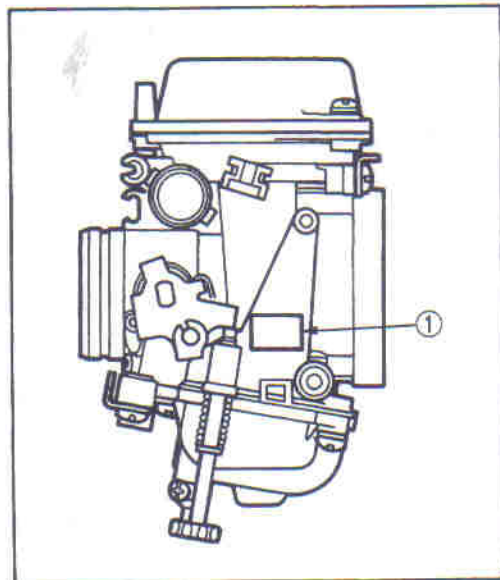
E-39 : Austria

E-53 : Spain

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST40SS	←
Bore size	40 mm	←
I.D. No.	14A7	14A8
Idle r/min.	1400 ± 100 r/min	←
Float height	14.7 ± 1.0 mm (0.58 ± 0.04 in)	←
Main jet (M.J.)	#147.5	←
Main air jet (M.A.J.)	0.7 mm	←
Jet needle (J.N.)	6G6-3rd	←
Needle jet (N.J.)	X-9	←
Throttle valve (Th.V.)	#110	←
Pilot jet (P.J.)	#47.5	←
By-pass (B.P.)	0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	←
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	#35	←
Pilot screw (P.S.)	PRE-SET	←
Pilot air jet (P.A.J.)	1.3 mm	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←
Choke cable play	0.5–1.0 mm (0.02–0.04 in)	←

**I.D. NO. LOCATION**

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



## REMOVAL

See page 3-5.

## DISASSEMBLY

Disassemble the carburetor as shown in the illustration on page 4-2.

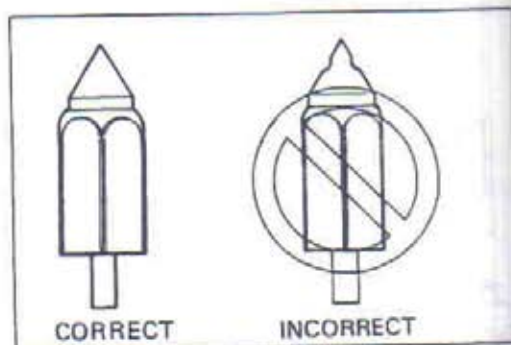
## INSPECTION AND ADJUSTMENT

Check following items for any damage or clogging.

- \* Pilot jet
- \* Main jet
- \* Main air jet
- \* Pilot air jet
- \* Needle jet air bleeding hole
- \* Float
- \* Needle valve
- \* Starter jet
- \* Gasket and O-ring
- \* Throttle shaft oil seal
- \* Diaphragm
- \* Pilot outlet and by-pass holes

## NEEDLE VALVE INSPECTION

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

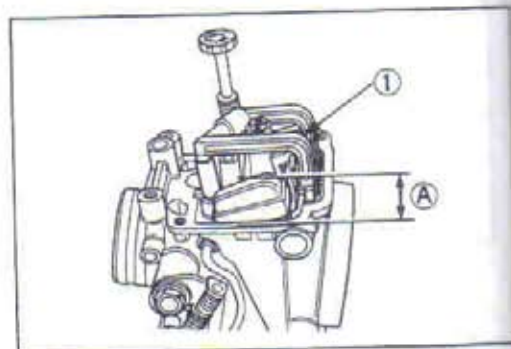


## FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body, with the float arm kept free, measure the height (A) while float arm is just in contact with needle valve by using calipers. Bend the tongue (1) as necessary to bring the height (A) to this value.

Float height (A) : 14.7 ± 1.0 mm (0.58 ± 0.04 in)

09900-20102: Vernier calipers



## REASSEMBLY AND REMOUNTING

Reassemble and remount the carburetor assembly in the reverse order of disassembly and removal.

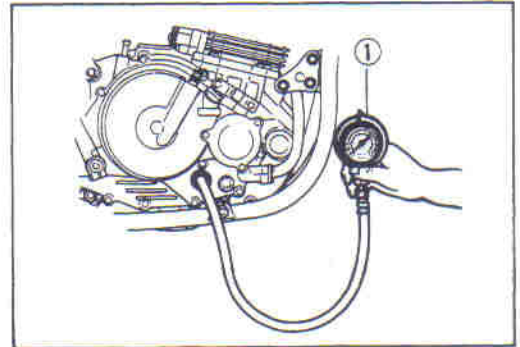
- After remounting the carburetor, the following adjustments are necessary.
  - \* Engine idle r/min ..... Page 2-10
  - \* Throttle cable play ..... Page 2-10

## LUBRICATION SYSTEM AND COOLING SYSTEM

### OIL PRESSURE

Check the oil pressure in the following manner:

- Check the oil level with the oil level inspection window.
- Remove the oil pressure inspection plug.
- Install the oil pressure gauge ① in the position shown in the Fig.
- Connect an electric tachometer to the engine.
- Warm up the engine as follows.  
Summer approx. 10 min. at 2 000 r/min.  
Winter approx. 20 min. at 2 000 r/min.
- After the warming up operation, increase the engine speed to 3 000 r/min, and read the oil pressure gauge.



#### NOTE:

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

09915-74510: Oil pressure gauge

#### Oil pressure specification

Above 30 kPa, 0.3 kg/cm<sup>2</sup> (4.3 psi),  
Below 70 kPa, 0.7 kg/cm<sup>2</sup> (10 psi)  
at 3 000 r/min. Oil temp. at 60° C (140° F)

If the oil pressure is lower or higher than the specifications, several causes may be considered.

- \* Low oil pressure is usually the result of a clogged oil filter, oil leakage from the oil passageway, damaged oil seal, a defective oil pump or a combination of these items.
- \* High oil pressure is usually caused by a engine oil which is too heavy a weight, a clogged oil passage, improper installation of the oil filter or a combination of these items.

### OIL SUMP FILTER

Clean the oil sump filter in the following manner:

- Remove the engine under cover.
- Drain engine oil by removing the drain plug and filler cap. (Refer to page 2-9.)
- Remove the oil sump filter cap by removing the bolts. (Refer to page 3-10.)
- Remove the oil sump filter by removing the screws. (Refer to page 3-10.)
- Wash the oil sump filter with cleaning solvent, and then blow compressed air through it to dry off solvent.

**REASSEMBLY**

(Refer to page 3-46.)

- Fit the O-ring to the O-ring groove.
- Coat the O-ring with grease.

**CAUTION:**

Use a new O-ring to prevent oil leakage.

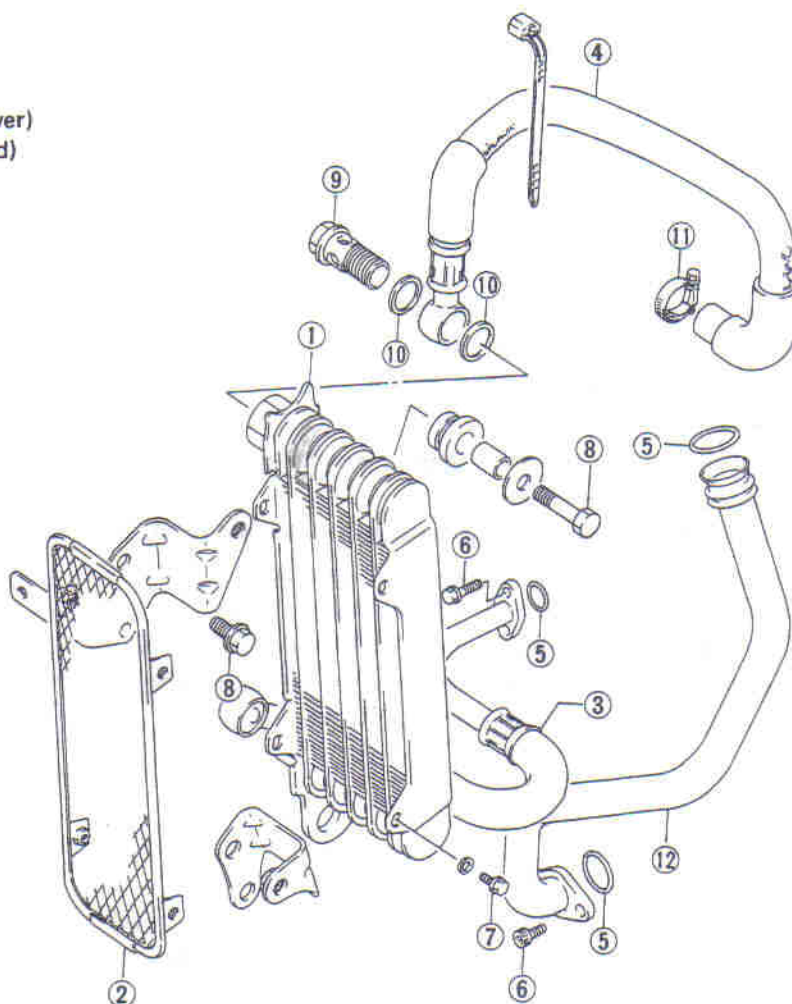
- Fit the drain plug securely, and add fresh oil through the filler. (Refer to page 2-9.)

**OIL FILTER**

(Refer to page 2-9.)

**OIL COOLER**

- ① Oil cooler
- ② Oil cooler stone guard
- ③ Oil cooler hose (From clutch cover)
- ④ Oil cooler hose (To cylinder head)
- ⑤ O-ring
- ⑥ Oil cooler hose bolt
- ⑦ Oil cooler stone guard bolt
- ⑧ Oil cooler mounting bolt
- ⑨ Oil cooler union bolt
- ⑩ Gasket
- ⑪ Oil cooler hose band
- ⑫ Oil return pipe



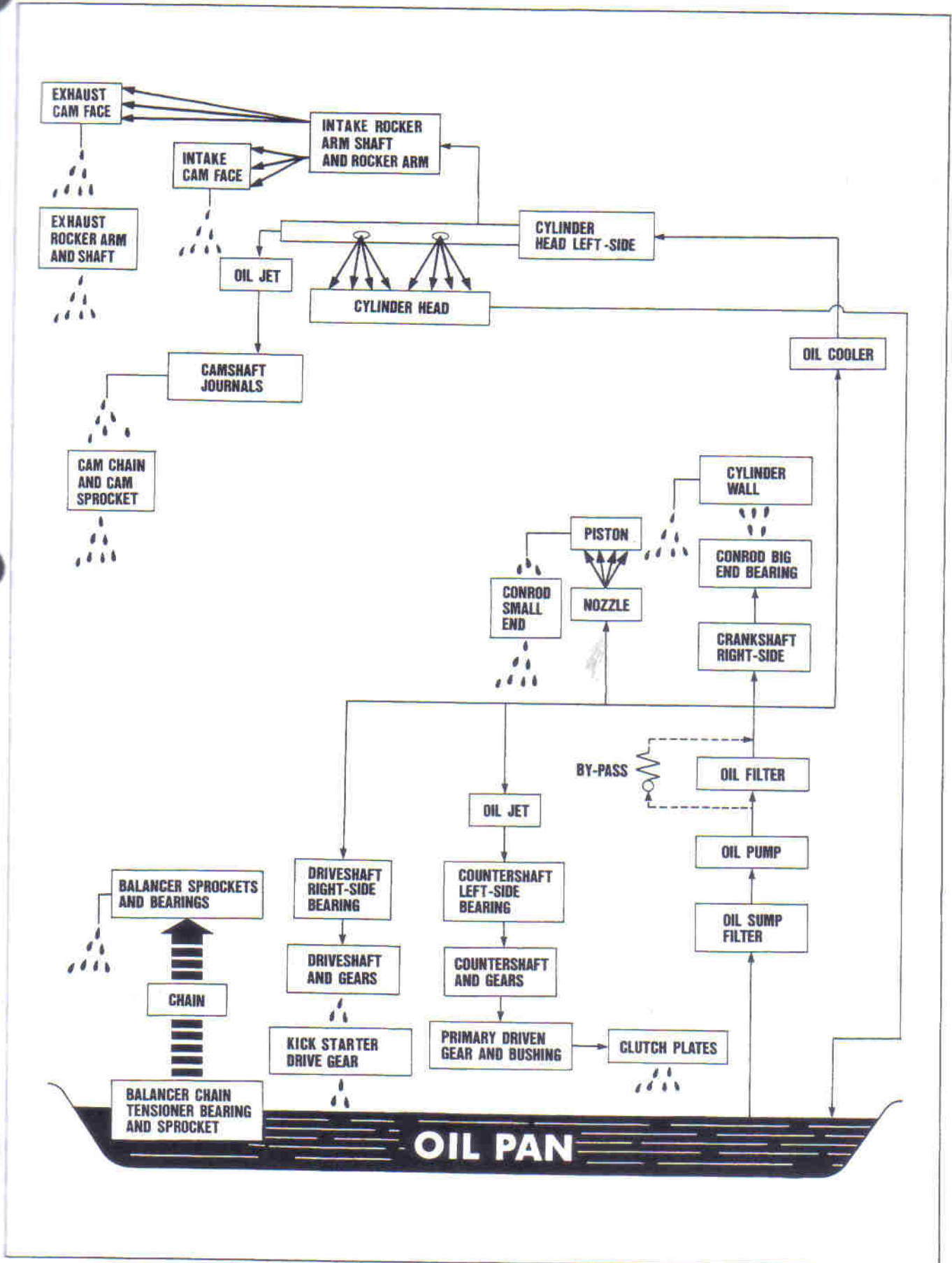
**Tightening torque**

Item	N-m	kg-m	lb-ft
⑥	8 - 12	0.8 - 1.2	6.0 - 8.5
⑦	3 - 6	0.3 - 0.6	2.0 - 4.5
⑧	18 - 28	1.8 - 2.8	13.5 - 20.0
⑨	20 - 25	2.0 - 2.5	14.5 - 18.0

**CAUTION:**

When tightening the union bolt ⑨, hold the oil cooler union with open-end wrench.

ENGINE LUBRICATION/CYLINDER HEAD COOLING SYSTEM CHART





# ELECTRICAL SYSTEM

## CONTENTS

<b>IGNITION SYSTEM</b> .....	<b>5 -1</b>
<b>DESCRIPTION</b> .....	<b>5- 1</b>
<b>INSPECTION</b> .....	<b>5- 1</b>
<b>CHARGING SYSTEM</b> .....	<b>5- 3</b>
<b>DESCRIPTION</b> .....	<b>5- 3</b>
<b>INSPECTION</b> .....	<b>5- 4</b>
<b>LAMPS</b> .....	<b>5- 6</b>
<b>COMBINATION METER</b> .....	<b>5- 8</b>
<b>SWITCHES</b> .....	<b>5- 9</b>
<b>BATTERY</b> .....	<b>5-10</b>
<b>SPECIFICATIONS</b> .....	<b>5-10</b>
<b>INITIAL CHARGING</b> .....	<b>5-10</b>
<b>SERVICING</b> .....	<b>5-11</b>
<b>RECHARGING OPERATION</b> .....	<b>5-12</b>
<b>SERVICE LIFE</b> .....	<b>5-12</b>

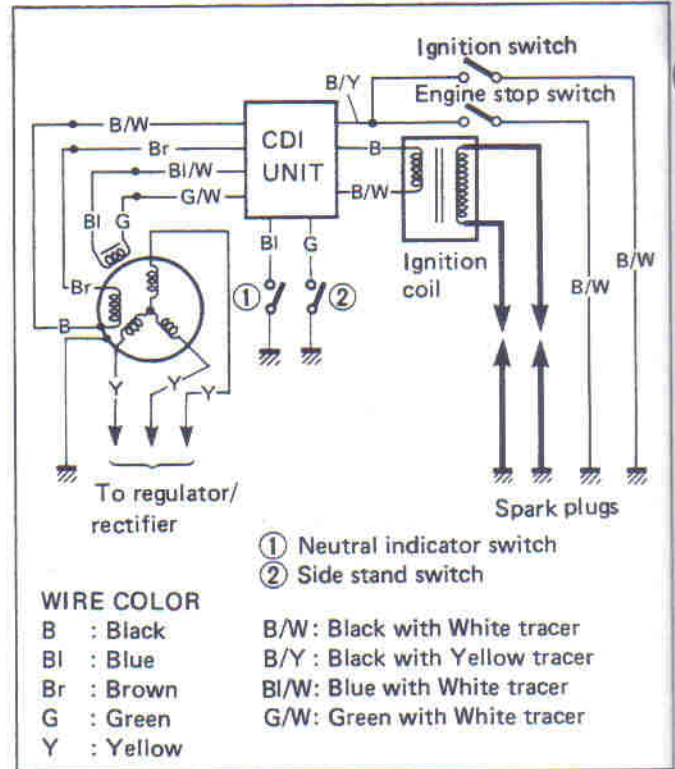
## IGNITION SYSTEM

### DESCRIPTION

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

This motorcycle is equipped with interlock switches for ignition circuit. The engine can only be started if:

- Transmission is in neutral or
- The transmission is in gear, the side stand is fully up.



### INSPECTION

#### MAGNETO COIL

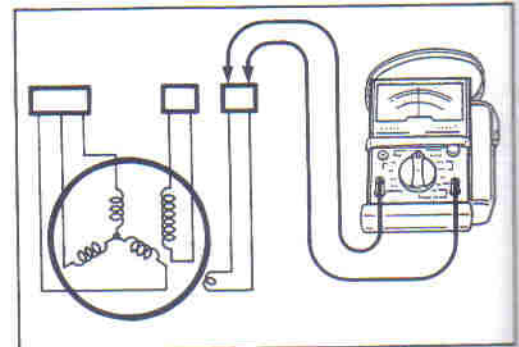
- Remove the seat and fuel tank.
- Disconnect the magneto lead wires.

Measure the resistance between the lead wires in the following table with a pocket tester.

09900-25002: Pocket tester

#### Magneto coil resistance

Pick-up coil	G – Bl 160 – 240 Ω (x 100 Ω range)
Power source coil	Br – B 240 – 360 Ω (x 100 Ω range)
Charging coil	Y – Y 0.1 – 1.5 Ω (x 1 Ω range)

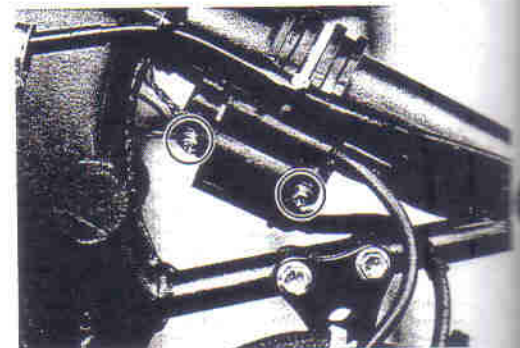


#### WIRE COLOR

- B : Black
- Bl : Blue
- Br : Brown
- G : Green
- Y : Yellow

#### IGNITION COIL

- Remove the seat and fuel tank.
- Remove the ignition coil.



**Checking with electro tester**

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.

Spark performance (STD): 8 mm (0.3 in)

09900-28106: Electro tester

**NOTE:**

Make sure that the three-needle sparking distance of electro tester is set at 8 mm.

**Checking with pocket tester****Ignition coil resistance**

Primary (B – B/W): 0.1 – 1.0  $\Omega$

Secondary (Plug cap – Plug cap): 23 – 35 k $\Omega$

09900-25002: Pocket tester

**CDI UNIT**

- Remove the seat.
- Remove the CDI unit.

Measure the resistance between the lead wires in the following table with the pocket tester.

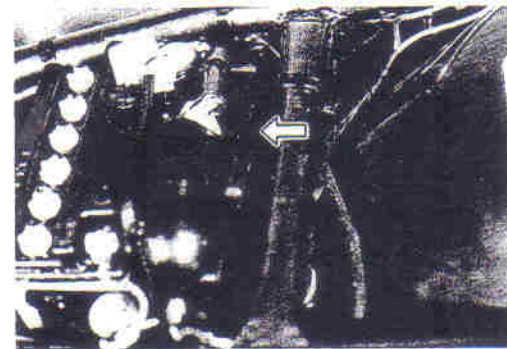
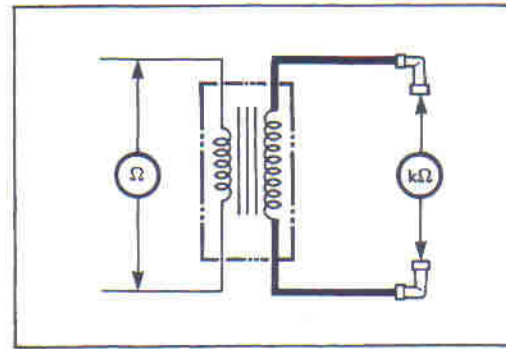
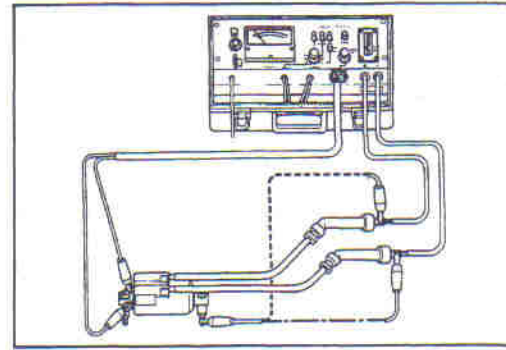
09900-25002: Pocket tester

Unit: Approx. k $\Omega$

		⊕ Probe of tester to:									
		G	Bl	Bl/B	B/W	Br	G/W	Bl/W	B/Y	B	
⊖ Probe of tester to:	G	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
	Bl	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
	Bl/B	∞	3	∞	∞	∞	∞	∞	∞	∞	∞
	B/W	400	400	∞	40	10	0	9	∞	∞	∞
	Br	1000	1000	∞	30	50	30	70	∞	∞	∞
	G/W	500	500	∞	10	55	10	30	∞	∞	∞
	Bl/W	400	400	∞	0	40	10	9	∞	∞	∞
	B/Y	500	500	∞	110	300	140	110	∞	∞	∞
	B	1000	1000	∞	3	70	17	3	30	∞	∞

**CAUTION:**

As capacitors, zener diodes, etc. are used inside this unit, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.

**WIRE COLOR**

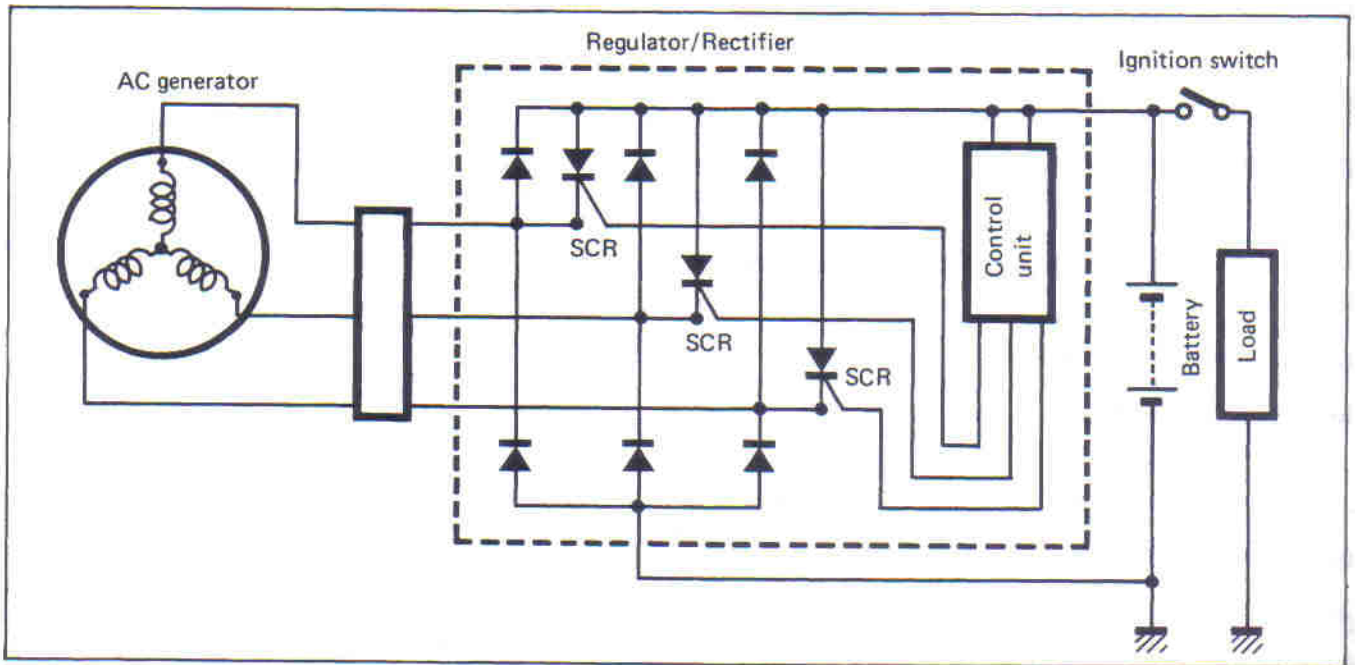
- B : Black
- Bl : Blue
- Br : Brown
- G : Green
- B/W : Black with White tracer
- B/Y : Black with Yellow tracer
- Bl/B : Blue with Black tracer
- Bl/W : Blue with White tracer
- G/W : Green with White tracer

## CHARGING SYSTEM

### DESCRIPTION

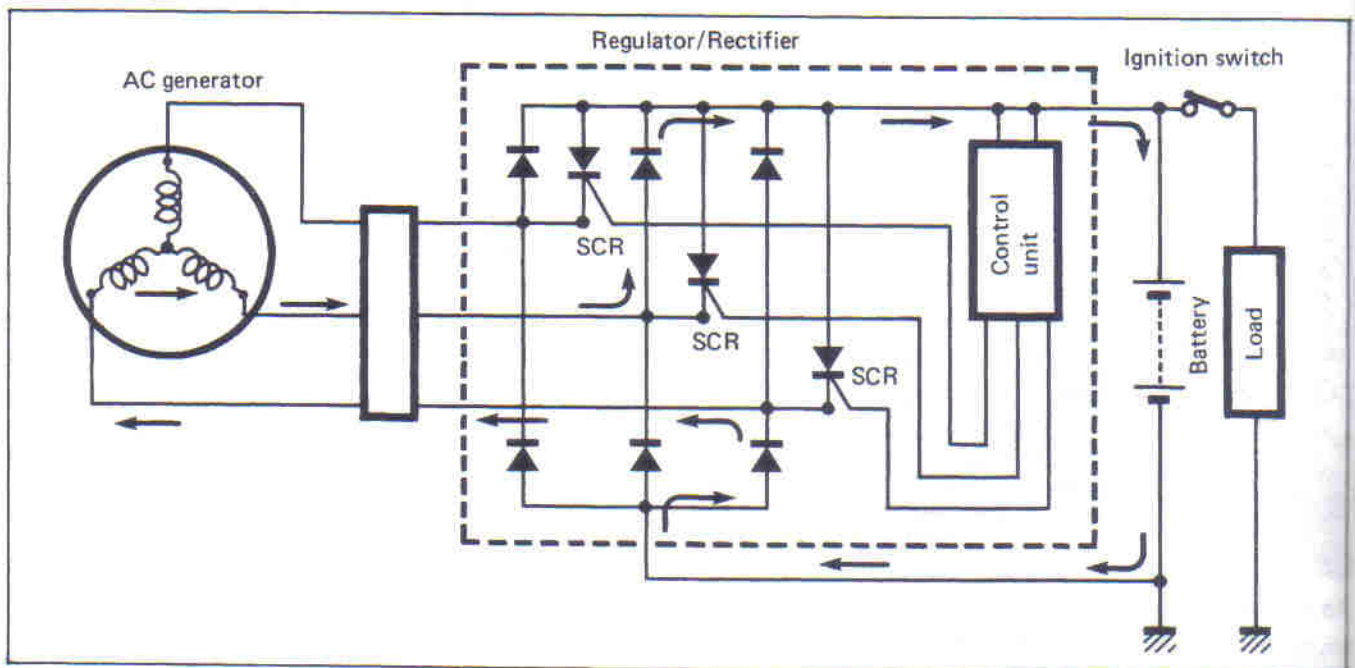
The circuit of the charging system is indicated in the figure, which is composed of an AC generator, regulator/rectifier unit and battery.

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



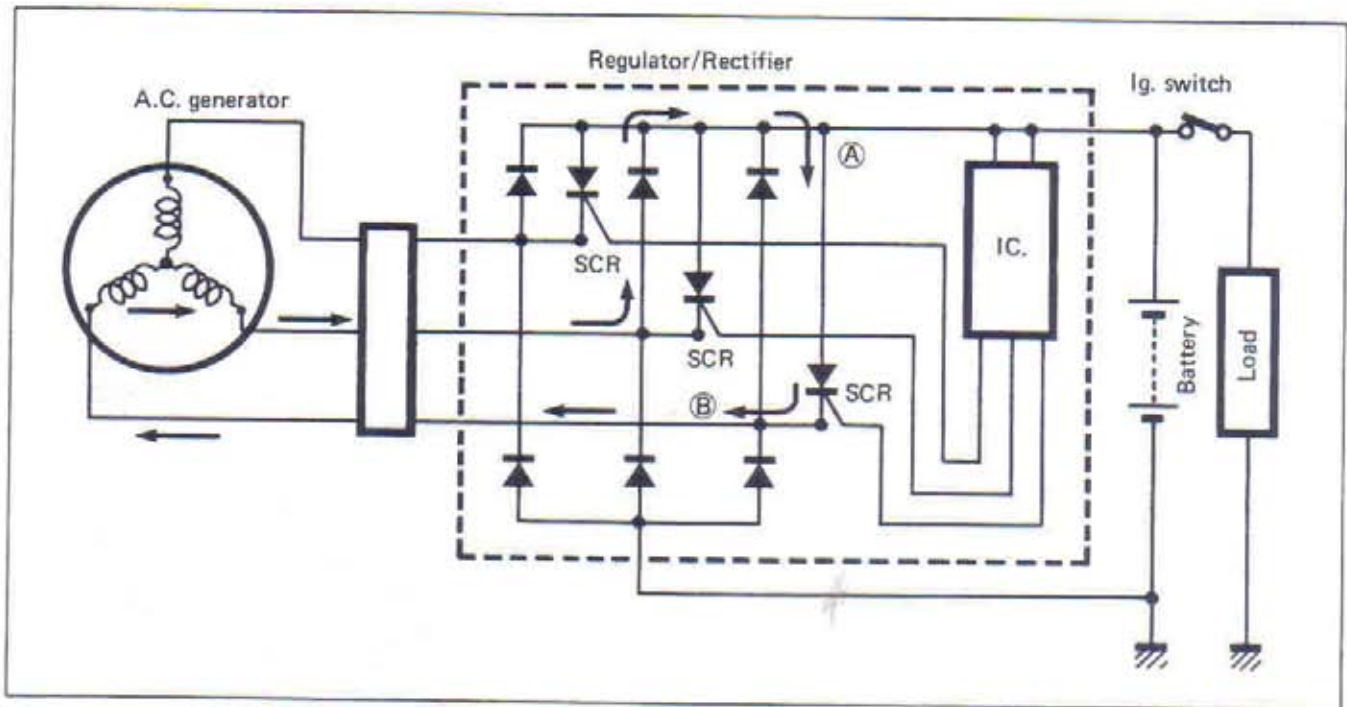
### FUNCTION OF REGULATOR

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



When the engine r/min becomes higher, the generated voltage of the AC generator also becomes higher and the voltage between the battery terminals becomes high accordingly. When it reaches the adjusted voltage of the I.C., (Integrated Circuit) and it is turned "ON", a signal will be sent to the SCR (Thyristor) gate probe and the SCR will be turned "ON".

Then, the SCR becomes conductive in the direction from point (A) to point (B). At this time, the current generated from the AC generator gets through the 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 to point (B), the reverse current tends to flow to SCR. Then, the circuit of SCR turns to the OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage and current 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 ON and dimmer switch turned HI position.

Using the pocket tester, measure the DC voltage between the battery terminals, ⊕ and ⊖.

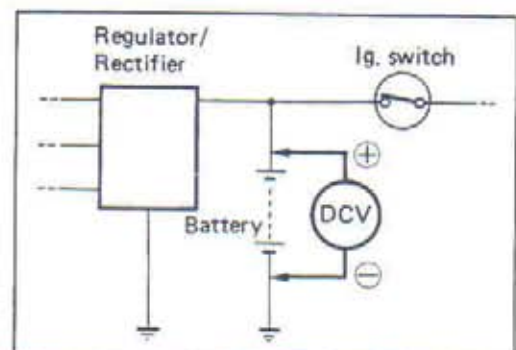
If the tester reads under 13.5V or over 15.5V, check the AC generator no-load performance or replace the regulator/rectifier.

#### NOTE:

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

STD charging output: 13.5 – 15.5V (DC) at 5 000 r/min

09900-25002: Pocket tester



**AC GENERATOR NO-LOAD PERFORMANCE**

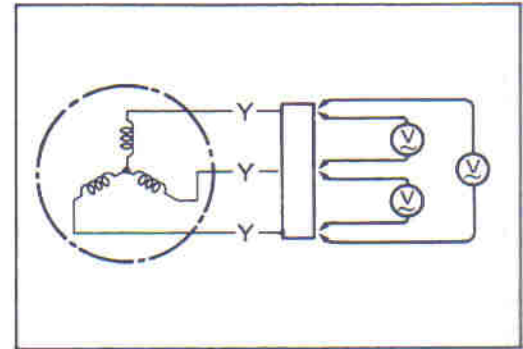
- Remove the seat.
- Disconnect the AC generator lead wire connector from the regulator/rectifier.
- Start the engine and keep it running at 5 000 r/min.

Using the pocket tester, measure the AC voltage between the three yellow lead wires.

If the tester reads under 65V, the AC generator (stator or rotor) is faulty.

**STD No-load performance: More than 65V (AC) at 5 000 r/min (when engine is cold)**

• 09900-25002: Pocket tester



**AC GENERATOR CONTINUITY CHECK**

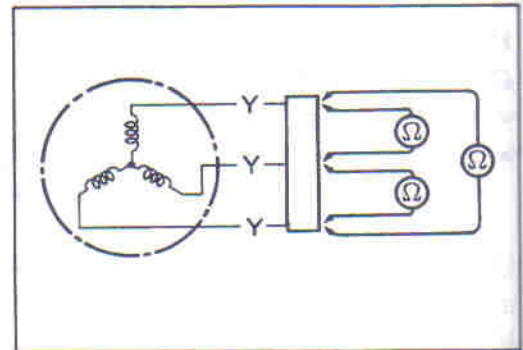
Using the pocket tester, check the continuity between the three yellow lead wires.

Also check that the stator core is insulated.

Check that there is no continuity between the yellow leads and ground.

**NOTE:**

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



**REGULATOR/RECTIFIER**

- Remove the seat.
- Disconnect the lead wires.

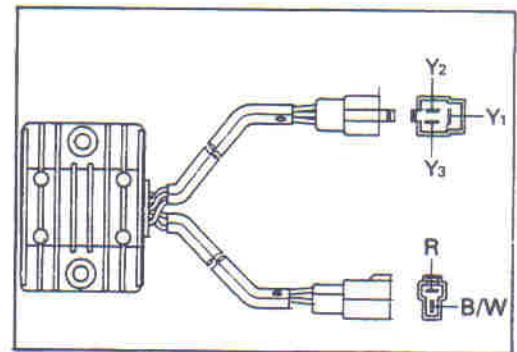


Using the pocket tester (x 1 k $\Omega$  range); measure the resistance between the lead wires in the following table. If the reading is incorrect, replace the regulator/rectifier.

09900-25002: Pocket tester

Unit: Approx. k $\Omega$

⊖ Probe of tester to:	⊕ Probe of tester to:				
	Y <sub>1</sub>	Y <sub>2</sub>	Y <sub>3</sub>	R	B/W
Y <sub>1</sub>	/	$\infty$	$\infty$	3.5	$\infty$
Y <sub>2</sub>	$\infty$	/	$\infty$	3.5	$\infty$
Y <sub>3</sub>	$\infty$	$\infty$	/	3.5	$\infty$
R	$\infty$	$\infty$	$\infty$	/	$\infty$
B/W	3.5	3.5	3.5	6	/



#### WIRE COLOR

Y : Yellow

R : Red

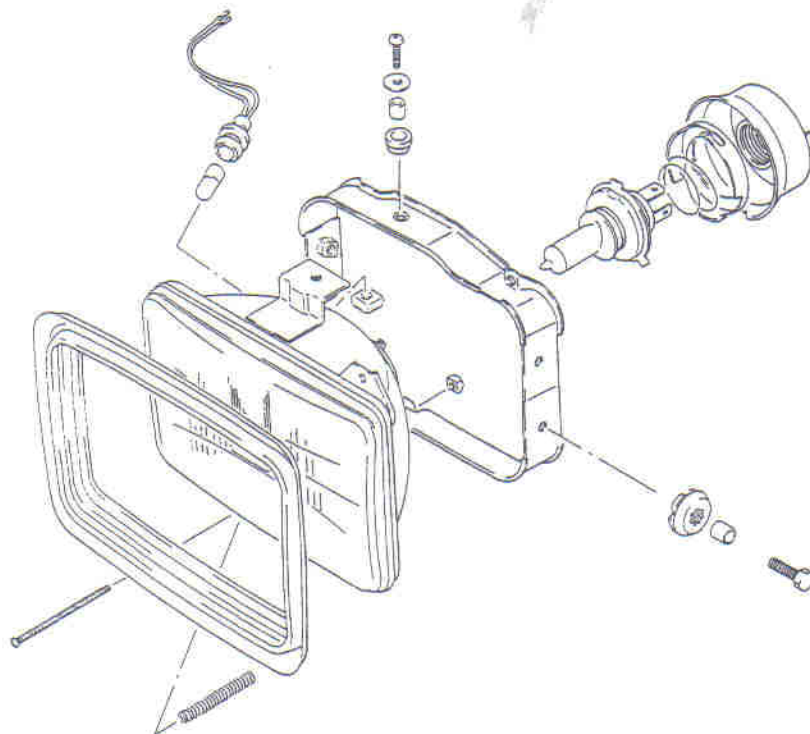
B/W: Black with White tracer

#### CAUTION:

As SCR and diodes are used inside this regulator/rectifier unit, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.

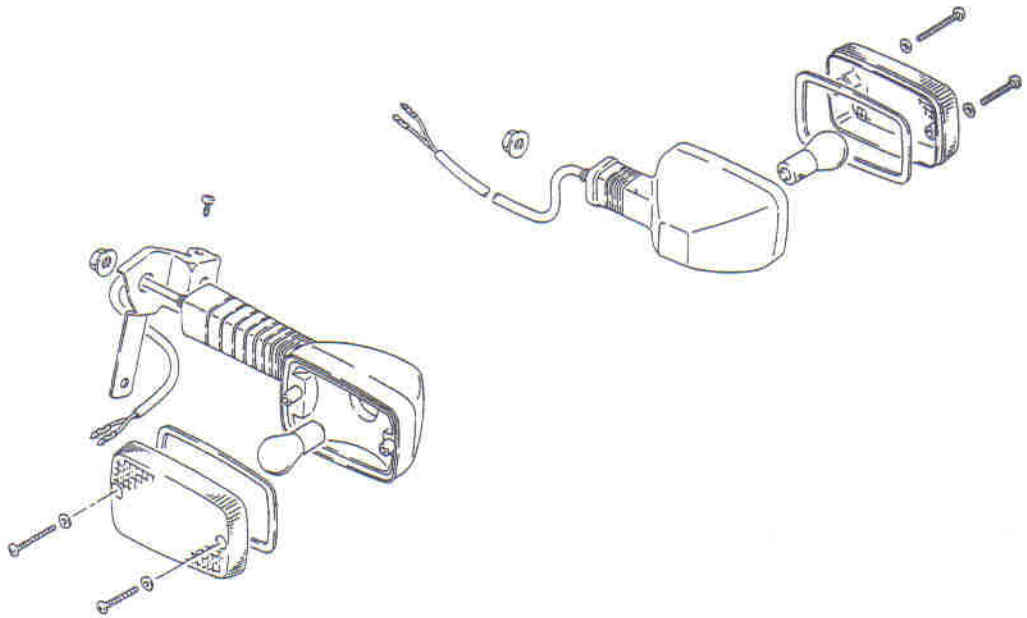
## LAMPS

### HEADLIGHT

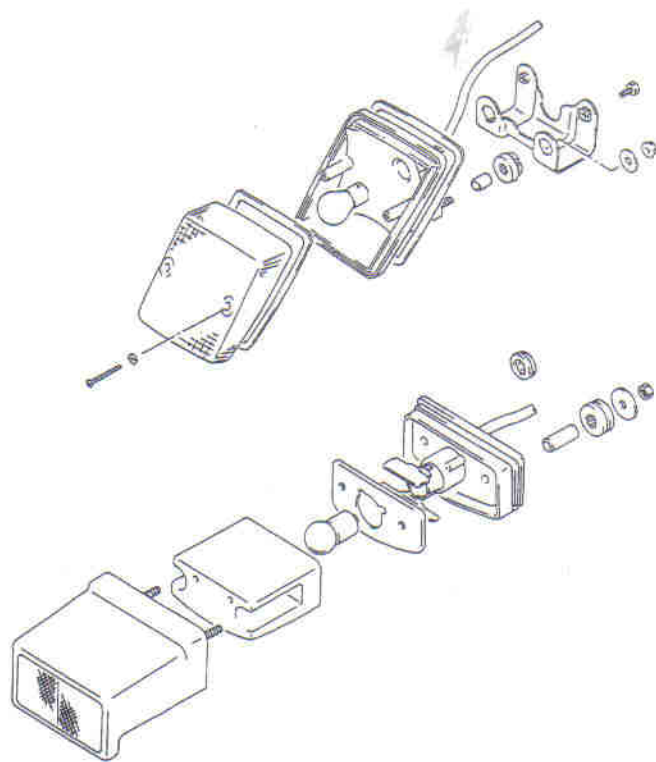


**NOTE:** Adjust the headlight, both vertical and horizontal, after reassembling.

TURN SIGNAL LIGHT



TAIL/BRAKE LIGHT AND LICENSE LIGHT

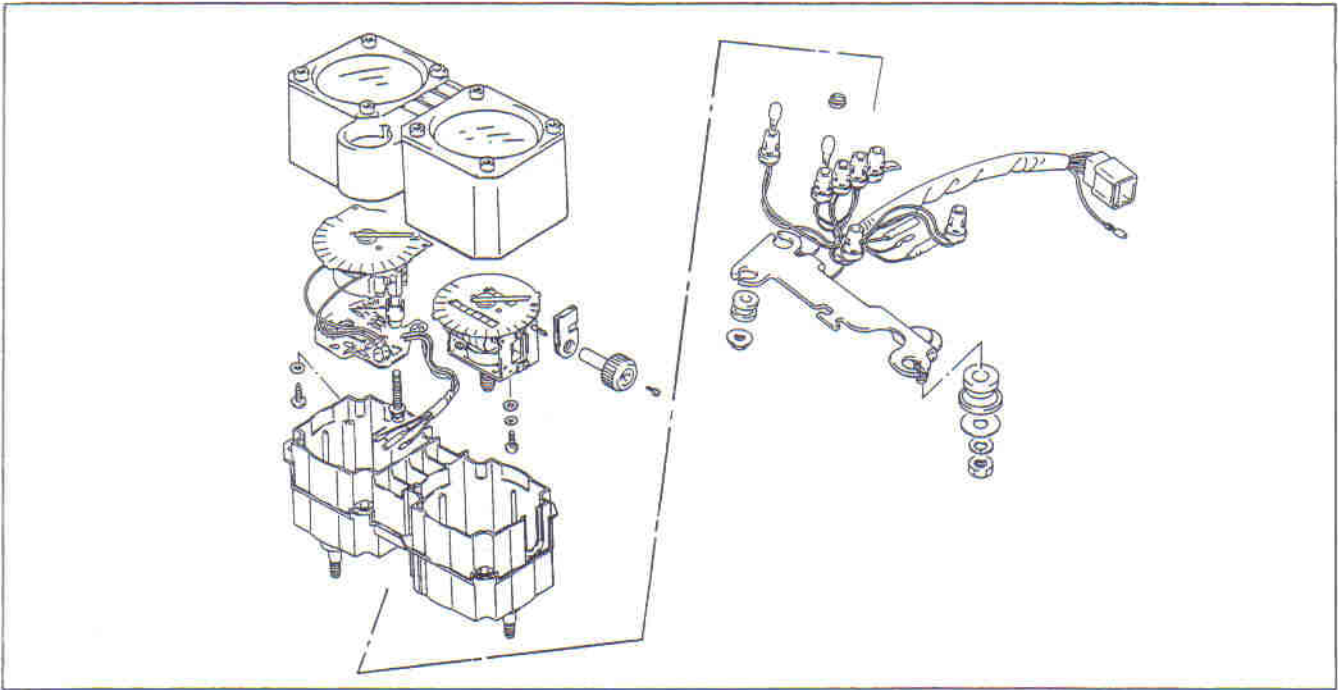


**CAUTION:** Do not overtighten the lens fitting screws.



## COMBINATION METER

- Disassemble the combination meter as shown in the following illustration.



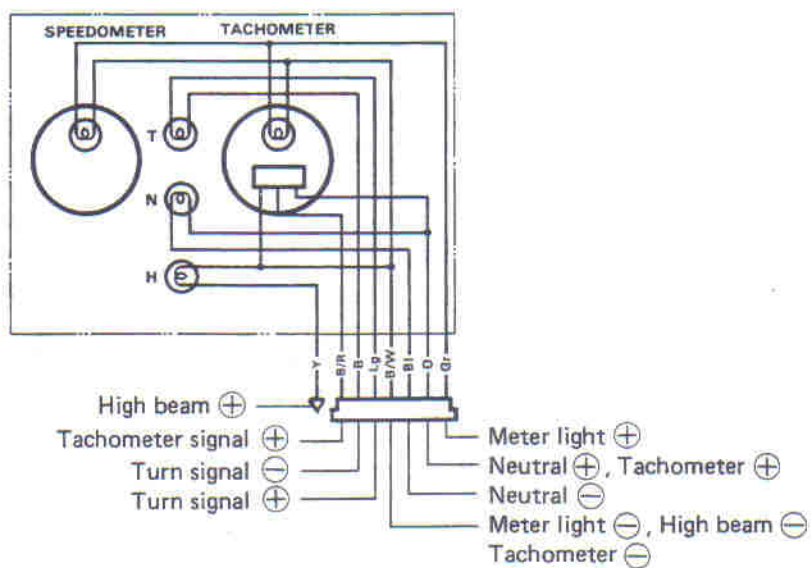
## INSPECTION

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

09900-25002: Pocket tester

### NOTE:

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



H : High beam indicator light  
 T : Turn signal indicator light  
 N : Neutral indicator light

## SWITCHES

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

09900-25002: Pocket tester

### IGNITION SWITCH

POSITION \ COLOR	B/Y	B/W	R	O	Gr	Br
OFF	○—○					
ON			○—○		○—○	
P	○—○		○—○			○—○

### LIGHTING SWITCH

(For Canada and U.S.A. models)

POSITION \ COLOR	O	Gr	Y/W
ON	○—○	○—○	○—○

(For the other models)

POSITION \ COLOR	O	Gr	Y/W
OFF			
•	○—○	○—○	
ON	○—○	○—○	○—○

### DIMMER SWITCH

POSITION \ COLOR	W	Y	Y/W
HI		○—○	○—○
LO	○—○		○—○

### PASSING LIGHT SWITCH

(Except for Canada and U.S.A. models)

POSITION \ COLOR	O	Y
ON (Push)	○—○	○—○
OFF		

### TURN SIGNAL SWITCH

POSITION \ COLOR	B	Lbl	Lg
R		○—○	○—○
•			
L	○—○	○—○	

### HORN SWITCH

POSITION \ COLOR	B/Bl	B/W
ON (Push)	○—○	○—○
OFF		

### SIDE STAND SWITCH

POSITION \ COLOR	G	B/W
ON (Upright position)	○—○	○—○
OFF (Down position)		

#### NOTE:

When inspecting the side stand switch, connect the  $\oplus$  probe of pocket tester to B/W lead wire and  $\ominus$  probe to G lead wire.

### ENGINE STOP SWITCH

POSITION \ COLOR	B/Y	B/W
OFF	○—○	○—○
RUN		

### NEUTRAL INDICATOR SWITCH

POSITION \ COLOR	Bl	Ground
ON (Neutral position)	○—○	○—○
OFF		

**FRONT BRAKE SWITCH**

POSITION \ COLOR	Terminal	Terminal
ON (Squeeze lever)		
OFF		

**REAR BRAKE SWITCH**

POSITION \ COLOR	O	W
ON (Depress pedal)		
OFF		

**WIRE COLOR**

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

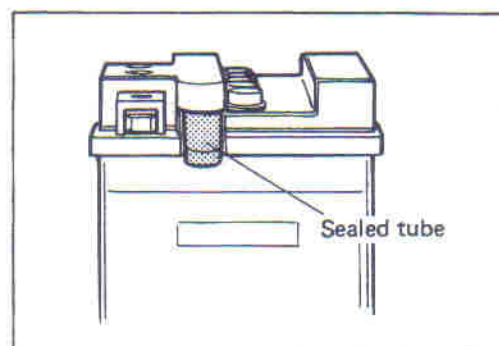
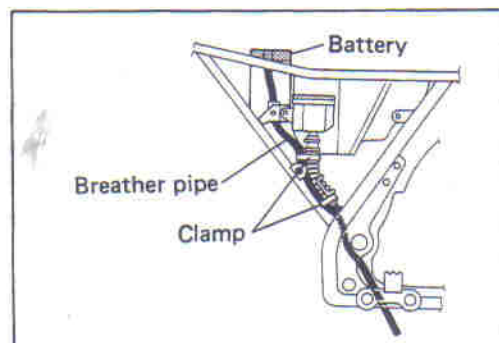
**BATTERY****SPECIFICATIONS**

Type designation : 12N5-3B  
 Capacity : 12V, 18 kC (5 Ah)/10HR  
 Standard electrolyte S.G.: 1.28 at 20°C (68°F)

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

**INITIAL CHARGING****Filling electrolyte**

Remove the short sealed tube before filling electrolyte. Fill the 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. 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: 0.5A**

### 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 shown in the illustration, each indicating month, date and year.

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

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.

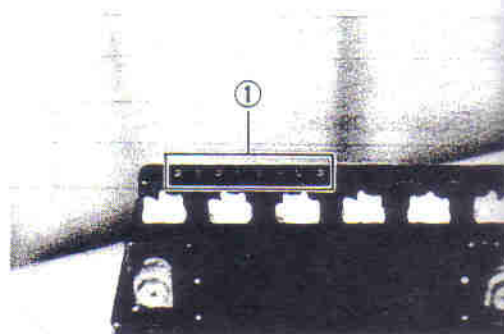
## SERVICING

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.

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.



## RECHARGING OPERATION BASED ON S.G. READING

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 hour by constant-current charging at a charging rate of 0.5 amperes (which is 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

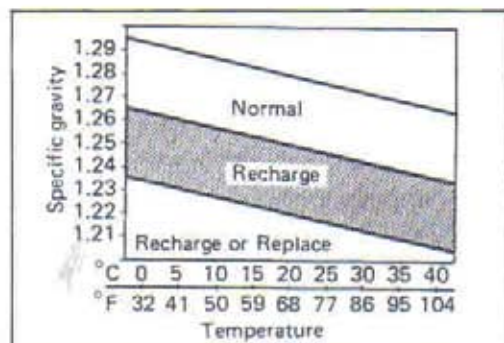
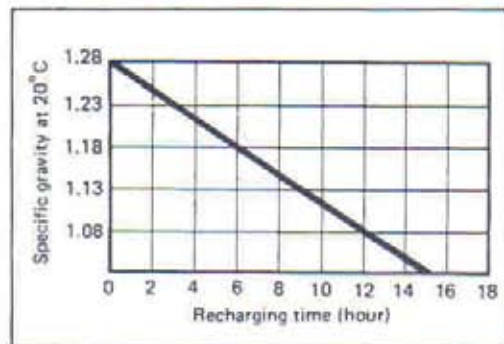
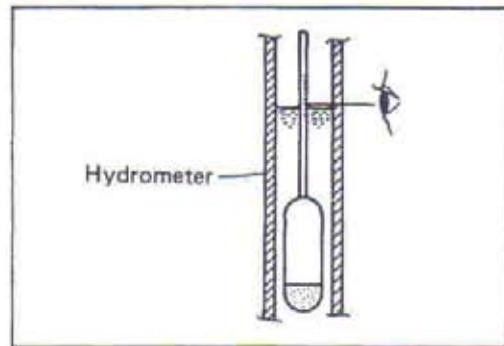
### WARNING:

- \* 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.

## 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.



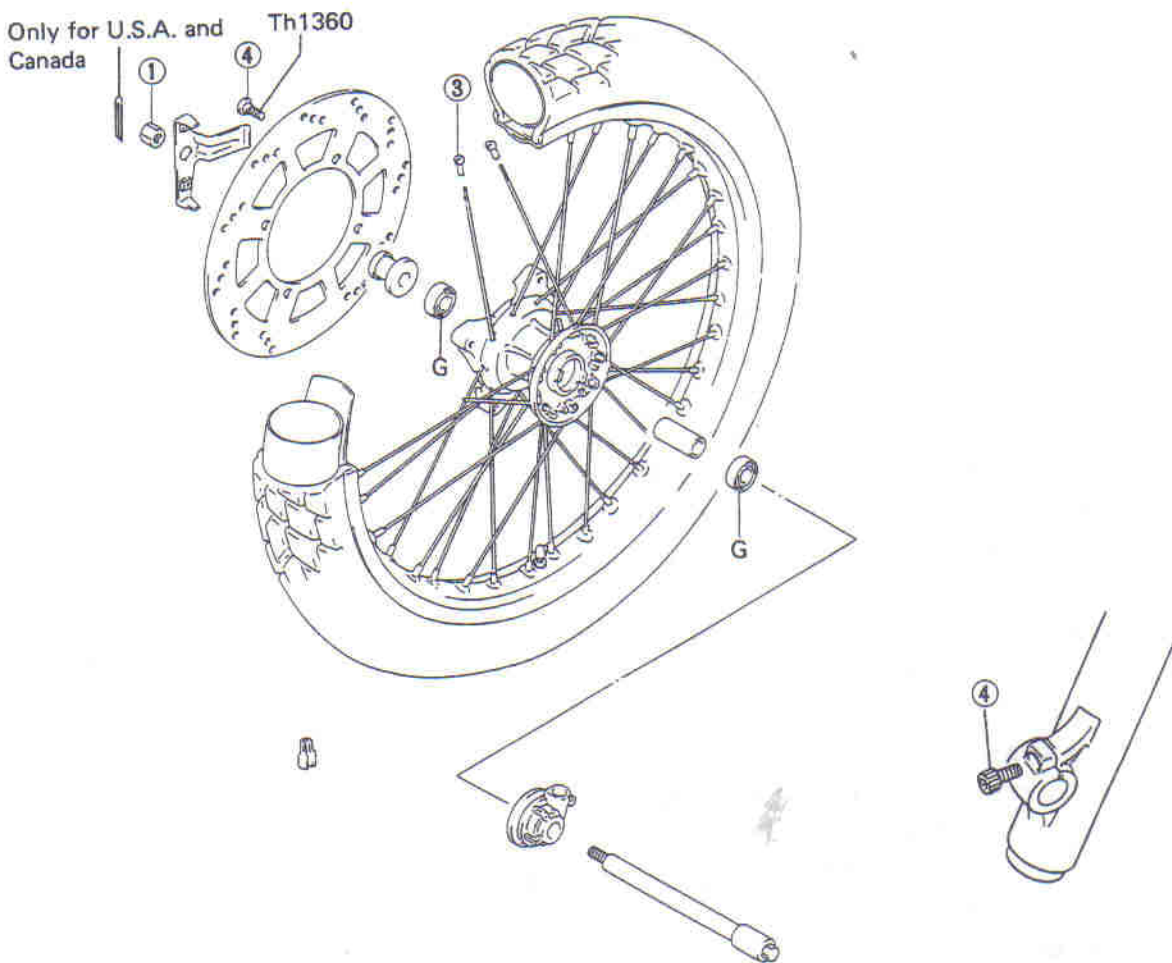
# CHASSIS

## CONTENTS

<b>FRONT WHEEL</b> .....	6- 1
<b>REMOVAL</b> .....	6- 1
<b>INSPECTION AND DISASSEMBLY</b> .....	6- 2
<b>REASSEMBLY AND REMOUNTING</b> .....	6- 3
<b>FRONT BRAKE</b> .....	6- 5
<b>BRAKE PAD REPLACEMENT</b> .....	6- 6
<b>CALIPER REMOVAL AND DISASSEMBLY</b> .....	6- 6
<b>CALIPER AND DISC INSPECTION</b> .....	6- 7
<b>CALIPER REASSEMBLY</b> .....	6- 8
<b>MASTER CYLINDER REMOVAL AND DISASSEMBLY</b> .....	6- 8
<b>MASTER CYLINDER INSPECTION</b> .....	6- 9
<b>MASTER CYLINDER REASSEMBLY     AND REMOUNTING</b> .....	6- 9
<b>FRONT FORK</b> .....	6-10
<b>REMOVAL AND DISASSEMBLY</b> .....	6-10
<b>INSPECTION</b> .....	6-12
<b>REASSEMBLY AND REMOUNTING</b> .....	6-12
<b>STEERING</b> .....	6-14
<b>REMOVAL AND DISASSEMBLY</b> .....	6-14
<b>INSPECTION</b> .....	6-17
<b>REASSEMBLY AND REMOUNTING</b> .....	6-17
<b>REAR WHEEL</b> .....	6-19
<b>REMOVAL</b> .....	6-19
<b>INSPECTION AND DISASSEMBLY</b> .....	6-20
<b>REASSEMBLY AND REMOUNTING</b> .....	6-21
<b>REAR BRAKE</b> .....	6-23
<b>BRAKE PAD REPLACEMENT</b> .....	6-24
<b>CALIPER REMOVAL AND DISASSEMBLY</b> .....	6-24
<b>CALIPER AND DISC INSPECTION</b> .....	6-25
<b>CALIPER REASSEMBLY AND REMOUNTING</b> .....	6-26
<b>MASTER CYLINDER REMOVAL AND DISASSEMBLY</b> .....	6-26
<b>MASTER CYLINDER INSPECTION</b> .....	6-27
<b>MASTER CYLINDER REASSEMBLY     AND REMOUNTING</b> .....	6-27
<b>REAR SWINGARM AND SUSPENSION</b> .....	6-28
<b>REMOVAL</b> .....	6-29
<b>INSPECTION AND REMOVAL</b> .....	6-31
<b>REASSEMBLY AND REMOUNTING</b> .....	6-32
<b>REASSEMBLING INFORMATION</b> .....	6-33

## FRONT WHEEL

Only for U.S.A. and  
Canada



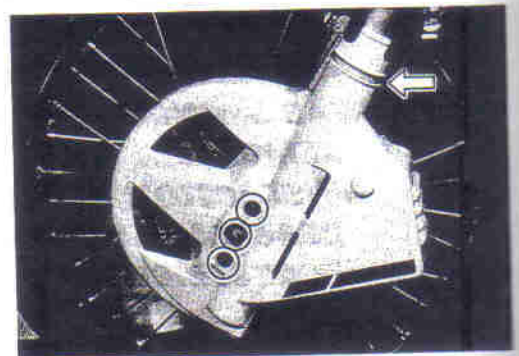
G : Apply SUZUKI SUPER GREASE "A"  
(99000-25030 . . . U.S.A.)  
(99000-25010 . . . Others)

Th1360 : Apply THREAD LOCK SUPER "1360"  
(99000-32130)

Tightening torque			
Item	N·m	kg·m	lb·ft
①	36 - 52	3.6 - 5.2	26.0 - 37.5
②	18 - 28	1.8 - 2.8	13.0 - 20.0
③	4 - 5	0.4 - 0.5	3.0 - 3.5
④	18 - 28	1.8 - 2.8	13.0 - 20.0

## REMOVAL

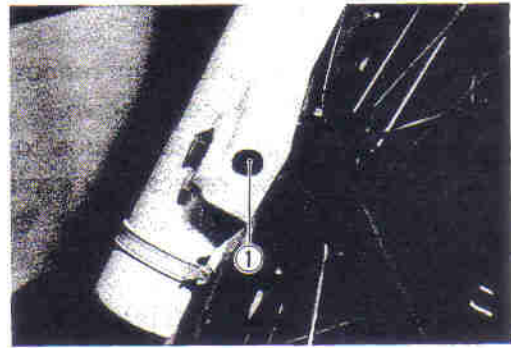
- Remove the front fork/disc brake cover.
- Support the motorcycle with the jack or wooden block.
- Remove the cotter pin. (For Canada model and U.S.A.)
- Remove the axle nut.



- Remove the axle shaft by loosening the axle shaft holder bolt ①.
- Remove the front wheel.

**NOTE:**

*Do not operate the brake lever while dismantling the front wheel.*

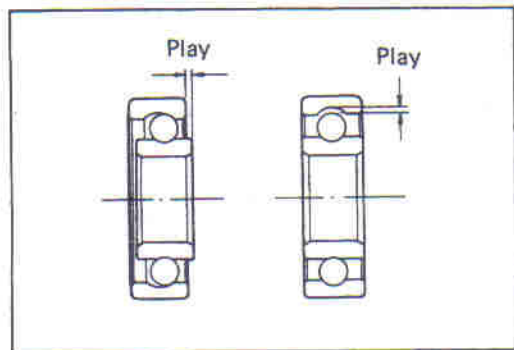


## INSPECTION AND DISASSEMBLY WHEEL BEARING

Inspect the play of bearing inner ring by hand while mounted in the wheel.

Rotate the inner ring by hand to inspect if any abnormal noise occurs or rotating smoothly.

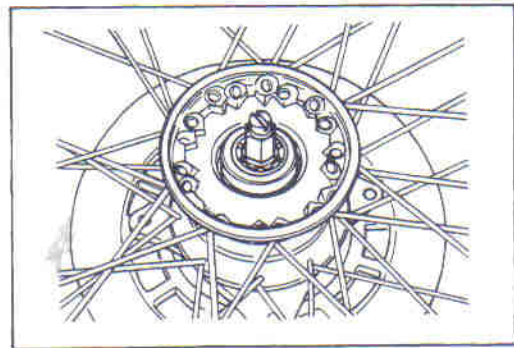
Replace the bearing if there is anything unusual.



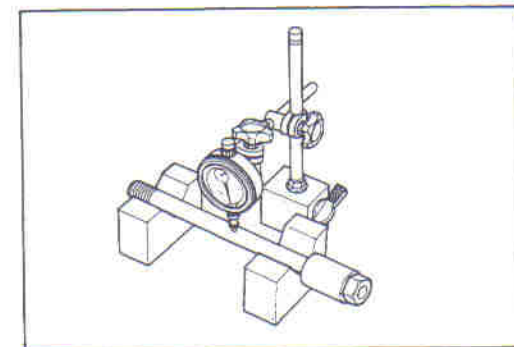
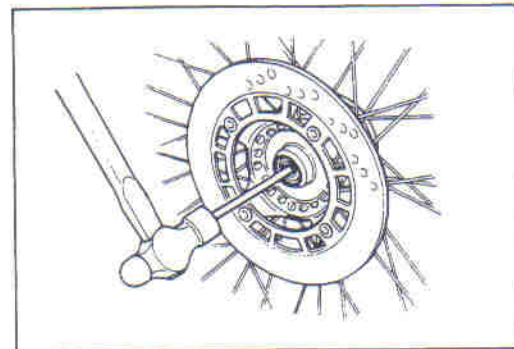
- Drive out the both bearing with the special tool in the following procedures.

### 09941-50110: Bearing remover

- Insert the adapter into the bearing.
- After inserting the wedge bar from the opposite side, lock the wedge bar in the slit of the adapter.
- Drive out the bearing by knocking the wedge bar.

**CAUTION:**

The removed bearing should be replaced with new ones.



## AXLE SHAFT

Check the axle shaft runout with a dial gauge and replace it if the runout exceeds the limit.

Service Limit: 0.25 mm (0.010 in)

09900-20606: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

09900-21304: "V" block set



**WHEEL RIM**

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

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: 2.0 mm (0.08 in)**  
(Axial and Radial)

**SPOKE NIPPLE**

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

**Tightening torque: 4 – 5 N·m**  
(0.4 – 0.5 kg-m, 3.0 – 3.5 lb-ft)

**TIRE** (Refer to page 2-16.)

**REASSEMBLY AND REMOUNTING**

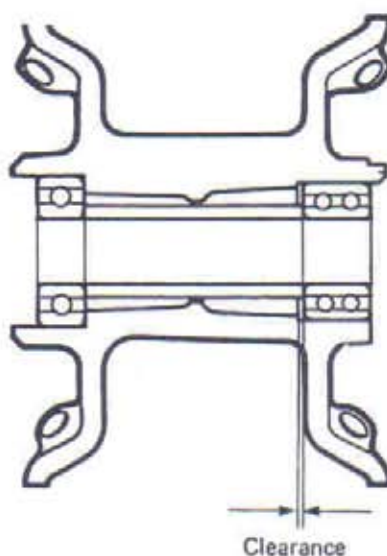
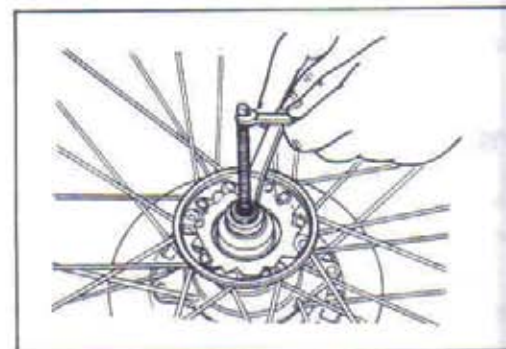
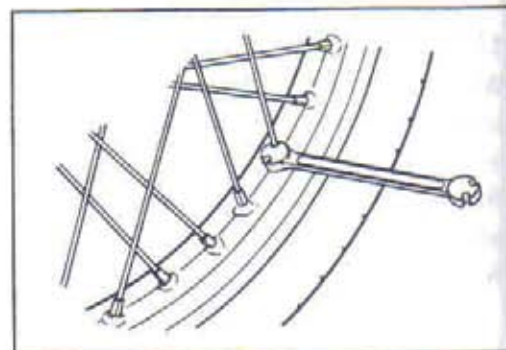
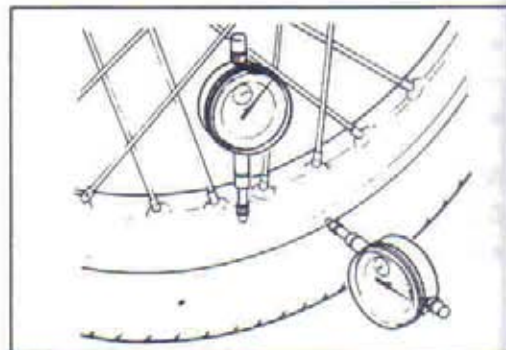
Reassemble and remount the front wheel in the reverse order of removal and disassembly, and also carry out the following steps:

- Install the wheel bearing with the special tools.

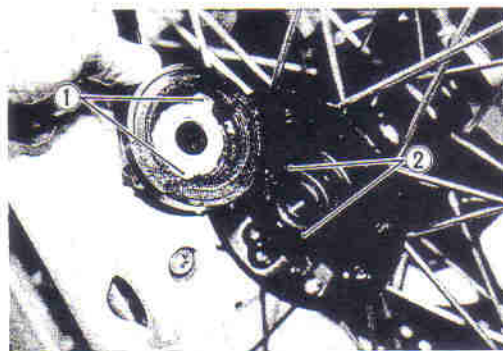
**09924-84520: Bearing installer**

**NOTE:**

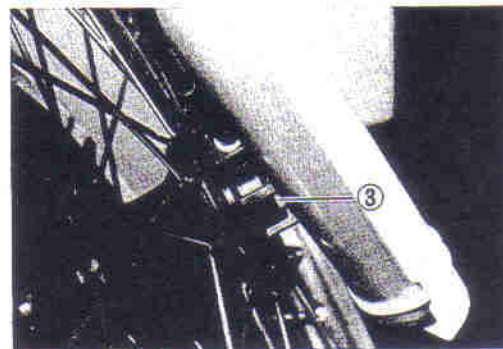
*First install the wheel bearing for left side.*



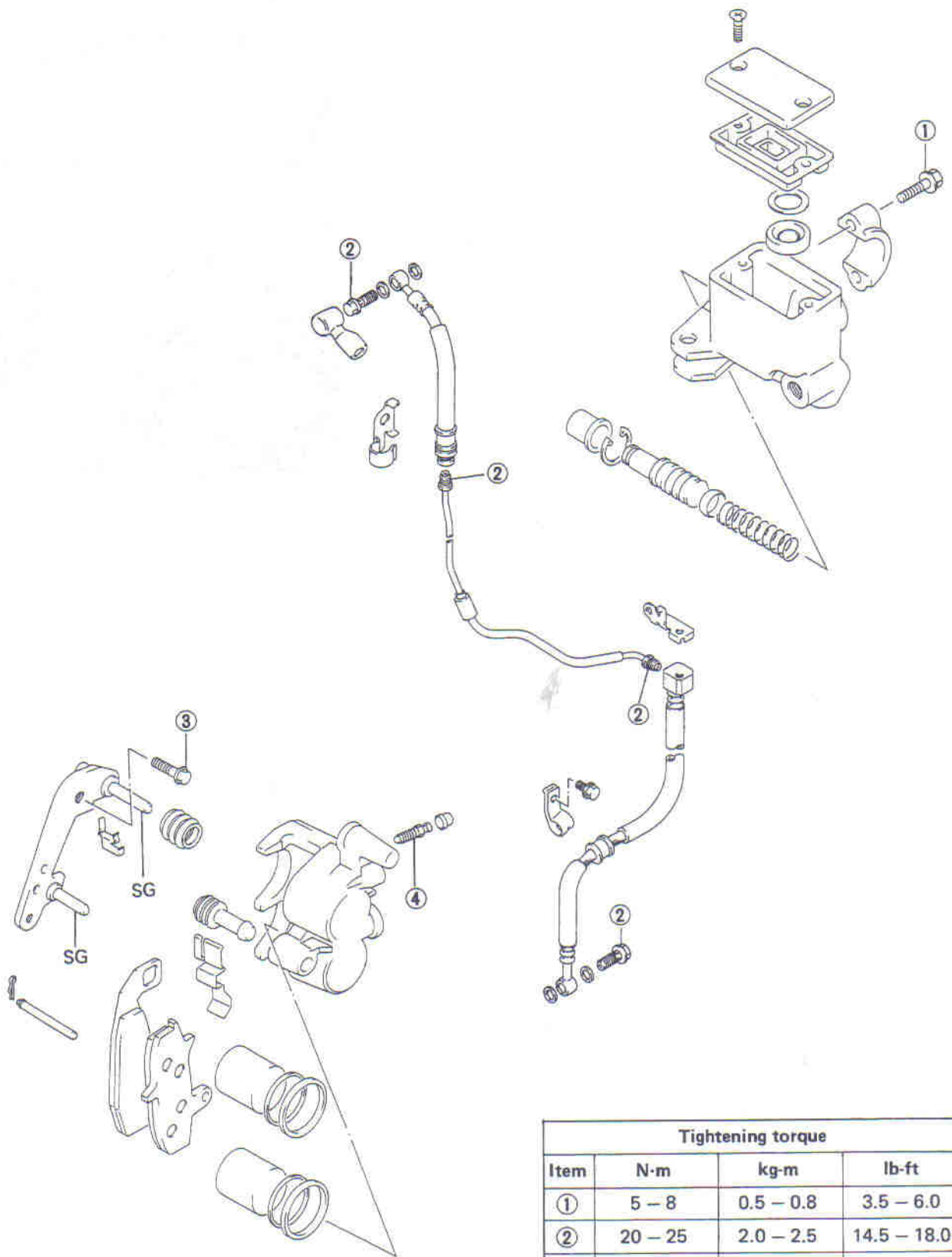
- Align the drive lugs ① to the recesses ② of the wheel hub.



- Before tightening the axle nut, touch the stopper ③ of speedometer gear box to the stopper.



## FRONT BRAKE



SG: Apply SUZUKI SILICONE GREASE (99000-25100)

Tightening torque			
Item	N·m	kg·m	lb·ft
①	5 - 8	0.5 - 0.8	3.5 - 6.0
②	20 - 25	2.0 - 2.5	14.5 - 18.0
③	20 - 31	2.0 - 3.1	14.5 - 22.5
④	6 - 9	0.6 - 0.9	4.5 - 6.5

## BRAKE PAD REPLACEMENT

- Remove the front fork/disc brake cover.
- Remove the brake caliper by removing the mounting bolts.

### TIGHTENING TORQUE

Brake caliper

mounting bolt: 20 – 31 N·m

(2.0 – 3.1 kg·m, 14.5 – 22.5 lb-ft)

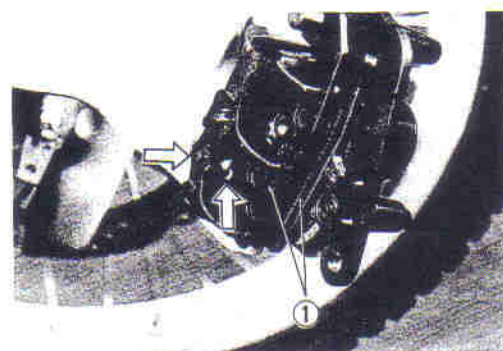
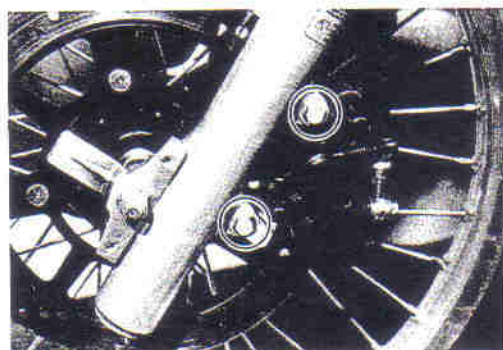
- Remove the brake pads ① by removing the clip and pin.

### CAUTION:

- \* Do not operate the brake lever while dismantling the pads.
- \* Replace the brake pad as a set, otherwise braking performance will be adversely affected.

### NOTE:

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



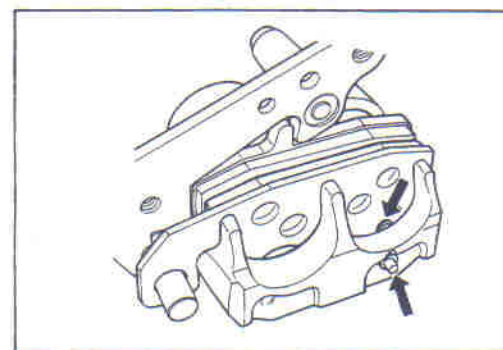
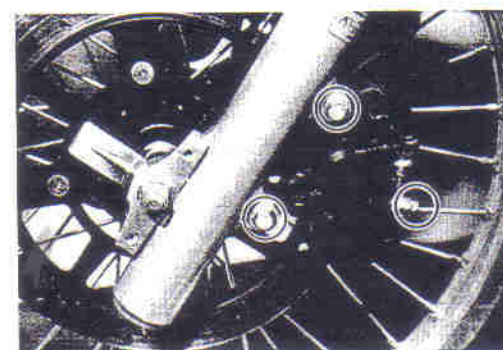
## CALIPER REMOVAL AND DISASSEMBLY

- Remove the front fork/disc brake cover.
- Remove the brake caliper by removing the union bolt and mounting bolts.

### CAUTION:

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

- Remove the pads by removing the cotter pin and shaft.
- Remove the caliper holder.

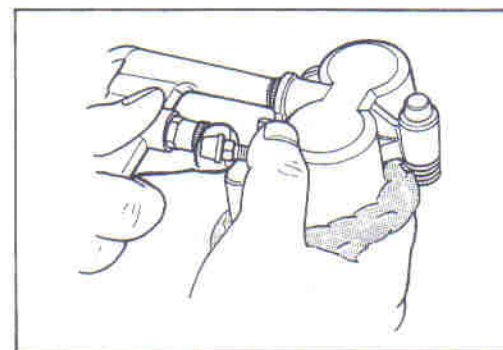


- Place a rag over the piston to prevent popping up. Force out the pistons with an air gun.

### CAUTION:

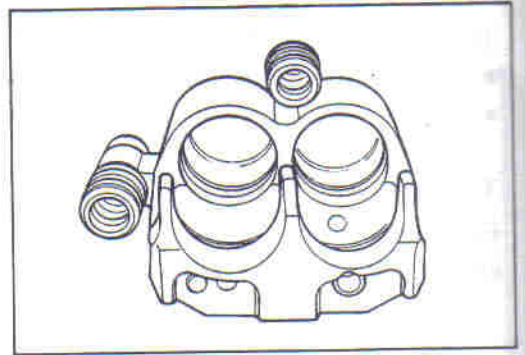
Do not use high pressure air to prevent piston damage.

- Remove the dust seals and piston seals.

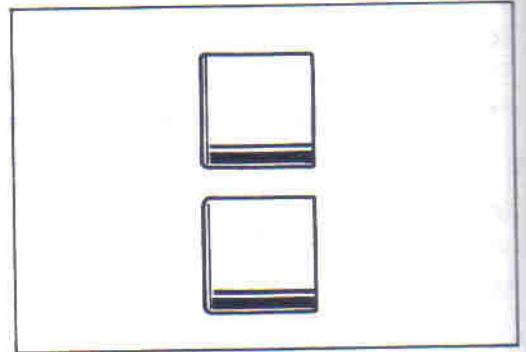


## CALIPER AND DISC INSPECTION

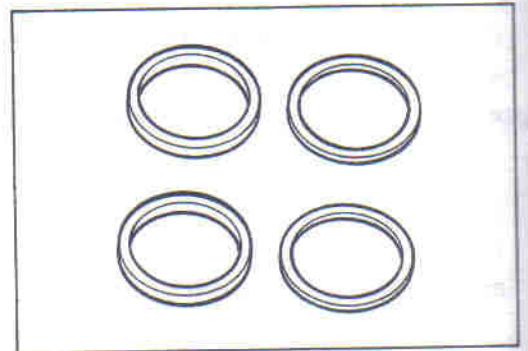
Inspect the caliper cylinder bore wall for nicks, scratches or other damage.



Inspect each piston for damage and wear.



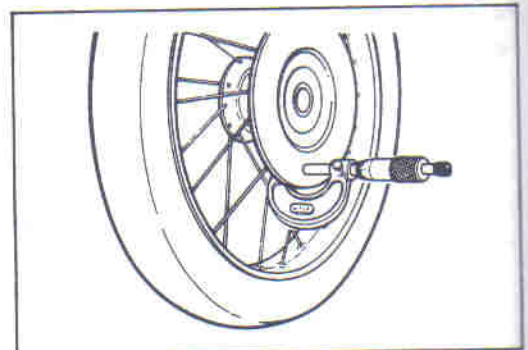
Inspect each rubber part for damage and wear.



Check the disc for wear with a micrometer. Its thickness can be checked with disc and wheel in place. Replace the disc if the thickness exceeds the service limit.

**Service Limit: 4.0 mm (0.16 in)**

**09900-20205: Micrometer (0 – 25 mm)**



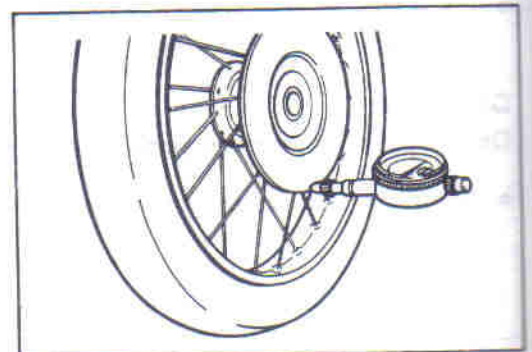
With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

Replace the disc if the runout exceeds the service limit.

**Service Limit: 0.30 mm (0.012 in)**

**09900-20606: Dial gauge (1/100 mm)**

**09900-20701: Magnetic stand**



## CALIPER REASSEMBLY

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

### CAUTION:

Wash the caliper components with fresh brake fluid before reassembly.

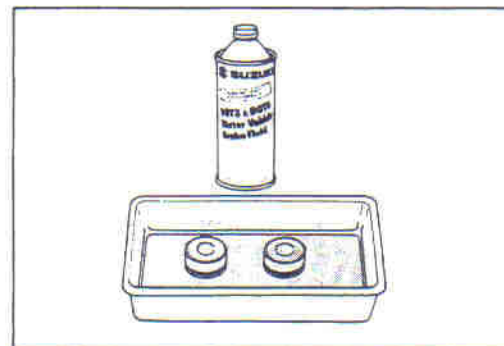
Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the caliper bore and piston to be inserted into the bore.

- Reassemble and remount the caliper. (Refer to page 6-5.)

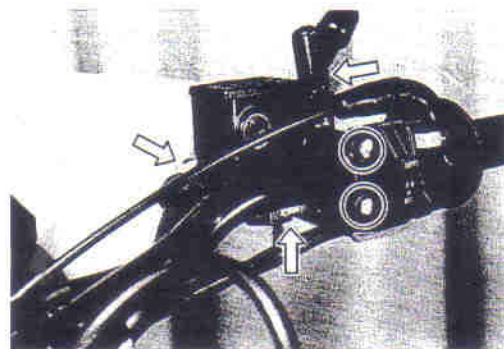
### WARNING:

Bleed air after reassembling the caliper. (Refer to page 2-15.)



## MASTER CYLINDER REMOVAL AND DISASSEMBLY

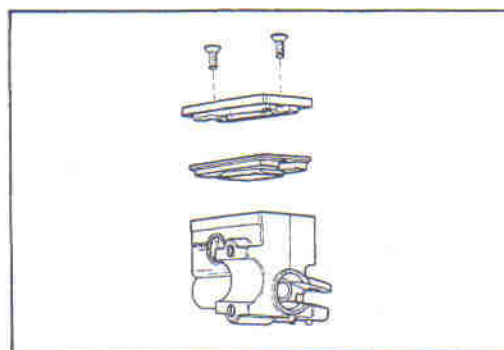
- Remove the rear view mirror.
- Remove the brake lever cover by removing the mounting screw and nut.
- Remove the brake lever.
- Disconnect the front brake switch lead wires.
- Place a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.



### CAUTION:

Completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials, etc.

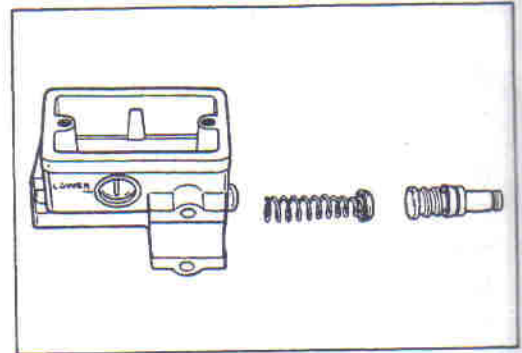
- Remove the master cylinder.
- Remove the reservoir cap and diaphragm.
- Drain brake fluid.



- Remove the dust boot.
- Remove the circlip with the special tool.

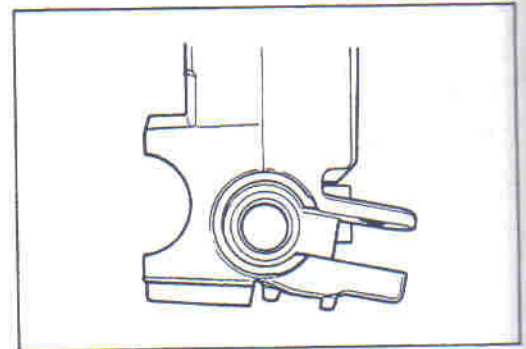
09900-06108: Snap ring pliers

- Remove the piston, primary cup and spring.

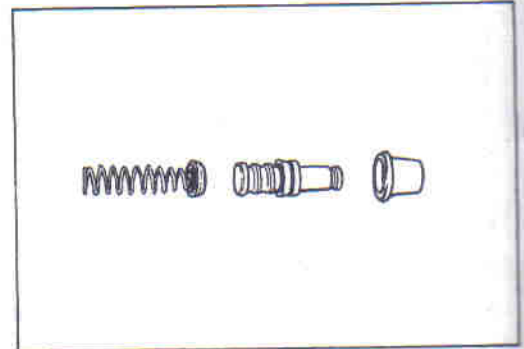


### MASTER CYLINDER INSPECTION

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



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



### MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

**CAUTION:**

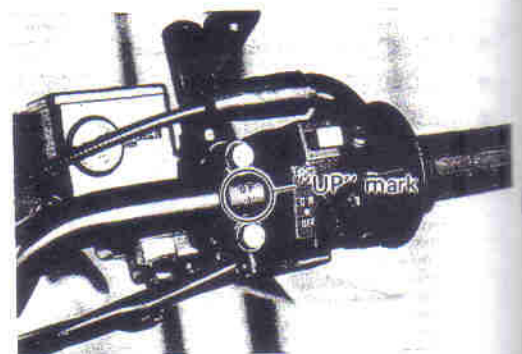
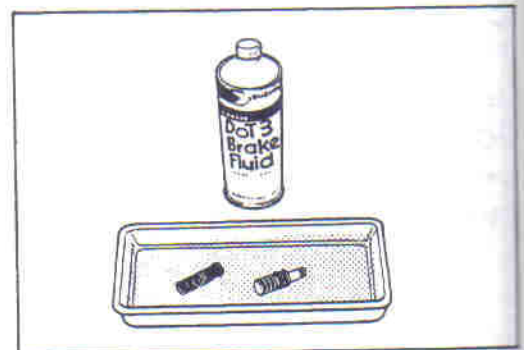
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

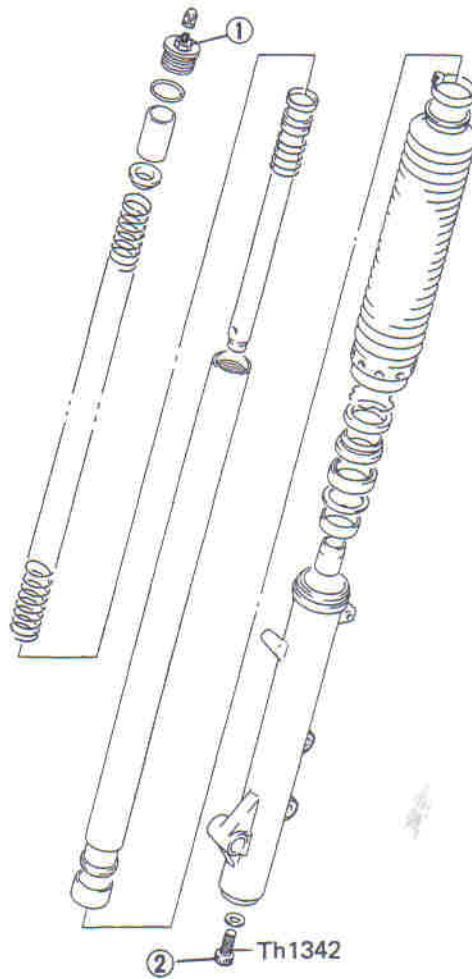
- Reassemble and remount the master cylinder. (Refer to page 6-5.)
- When remounting the master cylinder on the handlebar, first tighten the clamp bolt for upside.

**CAUTION:**

Bleed air after reassembling the master cylinder. (Refer to page 2-15.)



## FRONT FORK

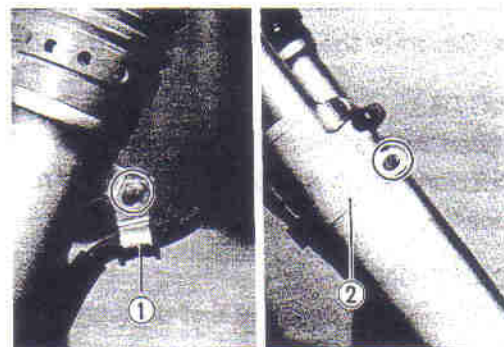


Tightening torque			
Item	N-m	kg-m	lb-ft
①	25 – 35	2.5 – 3.5	18.0 – 25.5
②	34 – 46	3.4 – 4.6	24.5 – 33.5

Th1342: Apply THREAD LOCK "1342" (99000-32050)

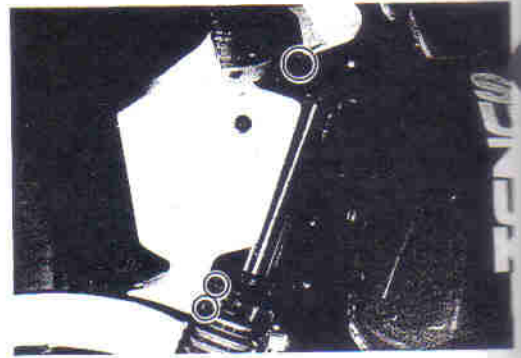
## REMOVAL AND DISASSEMBLY

- Remove the front wheel. (Refer to page 6-1.)
- Remove the front brake caliper. (Refer to page 6-6.)
- Remove the brake hose clamp ①.
- Remove the speedometer cable clamp ②.

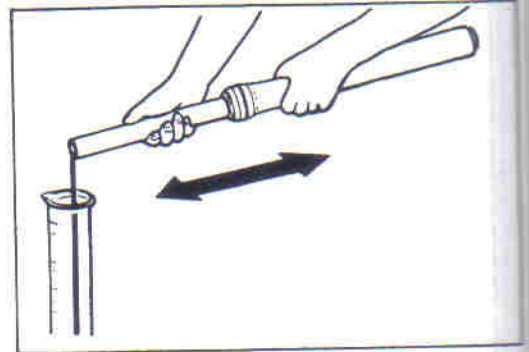




- Slightly loosen the front fork cap bolt to facilitate later disassembly.
- Loosen the front fork upper and lower clamp bolts and pull down the front fork assembly.
- Push the air valve.
- Remove the front fork cap bolt, spacer, spring guide and spring.



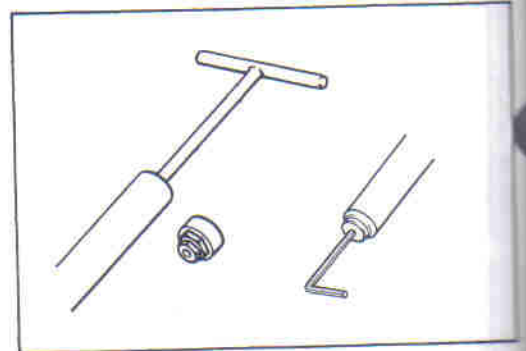
- Invert the fork and stroke it several times to drain oil.
- Hold the fork inverted for a few minutes to drain oil.



- Remove the damper rod securing bolt with a 10 mm hexagon wrench and special tools.

09940-34520: "T" handle

09940-34581: Attachment "F"

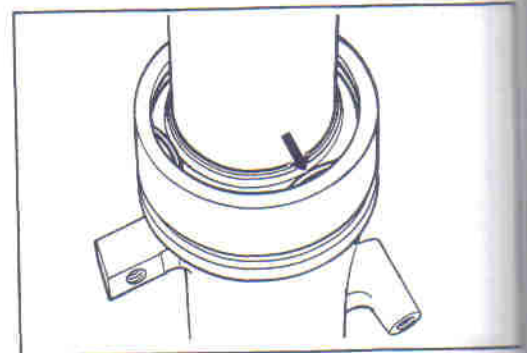


- Remove the boot.

**CAUTION:**

The removed boot clamp should be replaced with a new one.

- Remove the dust seal stopper ring.



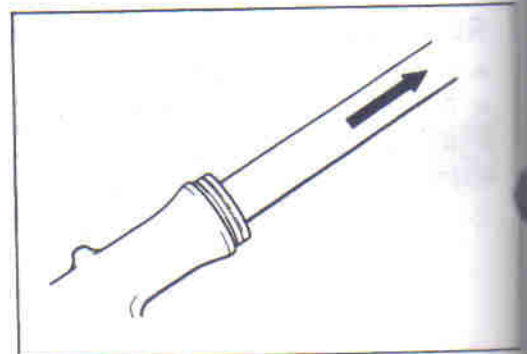
- Separate the inner tube from the outer tube.

**NOTE:**

When separating the inner tube from the outer tube, both anti-friction metals may be damaged and must be replaced with new ones.

**CAUTION:**

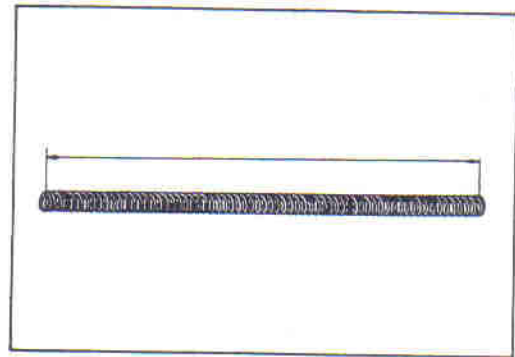
The removed dust seal and oil seal should be replaced.



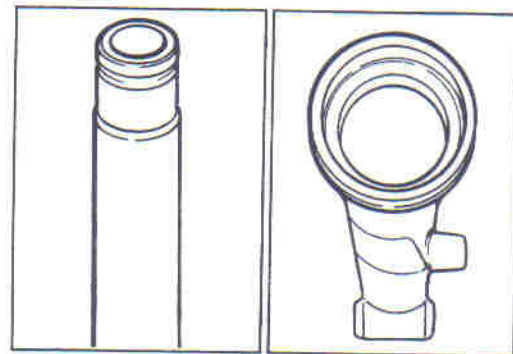
**INSPECTION****FORK SPRING**

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

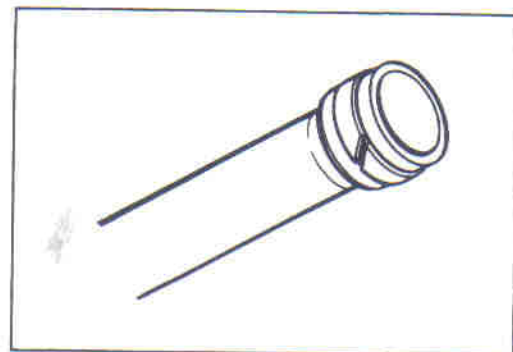
Service Limit: 468 mm (18.4 in)

**INNER TUBE AND OUTER TUBE**

Inspect the inner tube sliding surface for any scuffing and check for bend. Inspect the outer tube sliding surface for any scuffing.

**DAMPER ROD RING**

Inspect the damper rod ring for wear and damage.

**REASSEMBLY AND REMOUNTING**

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

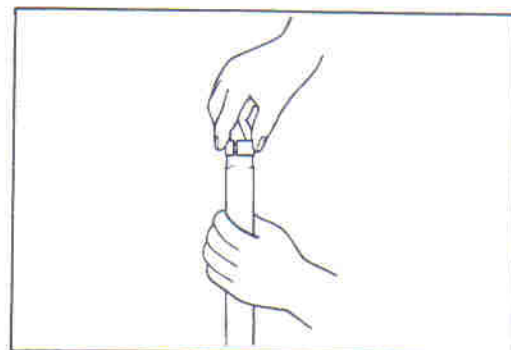
- Install the front fork. (Refer to page 6-10.)

**INNER TUBE METAL**

- Install the metal by hand as shown in the illustration.

**CAUTION:**

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

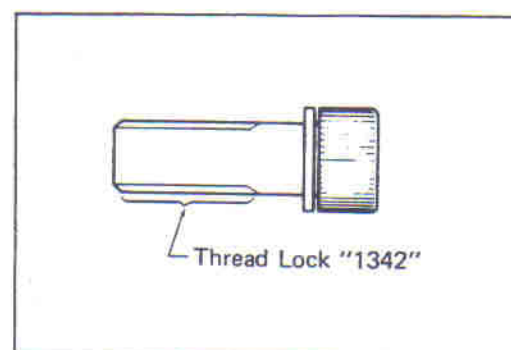
**DAMPER ROD BOLT**

- Apply THREAD LOCK "1342" to the damper rod bolt and tighten it to the specified torque with the special tools and 10 mm hexagon wrench. (Refer to page 6-10.)

09940-34520: "T" handle

09940-34581: Attachment "F"

99000-32050: THREAD LOCK "1342"



**OUTER TUBE METAL, OIL SEAL AND DUST SEAL**

- Clean the metal groove of outer tube and metal outer surface.
- Install the outer tube metal ①, oil seal retainer ②, oil seal ③ and dust seal ④.

09940-50112: Front fork oil seal installer

**CAUTION:**

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

**CAUTION:**

Install dust seal stopper ring ⑤ securely.

**FORK OIL**

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

Fork oil type: Fork oil # 10

Fork oil capacity: 566 ml (19.1/19.9 US/Imp oz)

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

**NOTE:**

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

STD oil level: 142 mm (5.6 in)

09943-74111: Fork oil level gauge

**FRONT FORK REMOUNTING**

- Align the top surface ⑥ of the inner tube to the top surface ⑦ of the steering stem upper bracket.

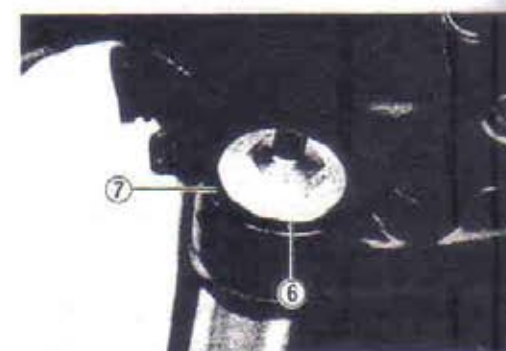
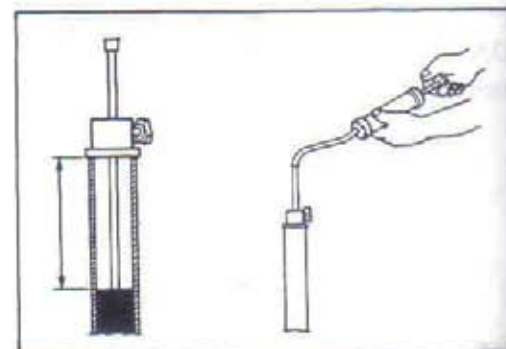
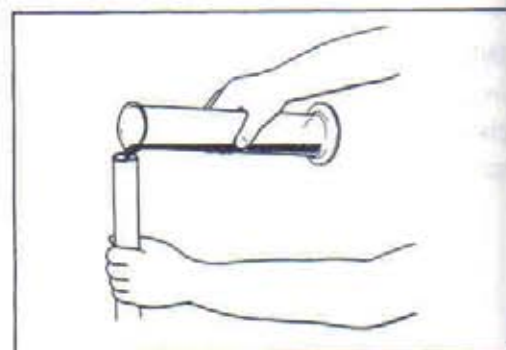
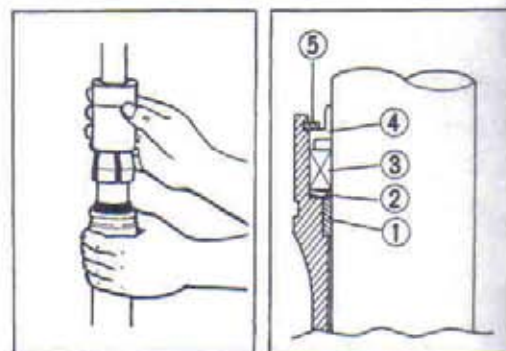
**AIR PRESSURE SERVICING**

- Refer to page 2-17.

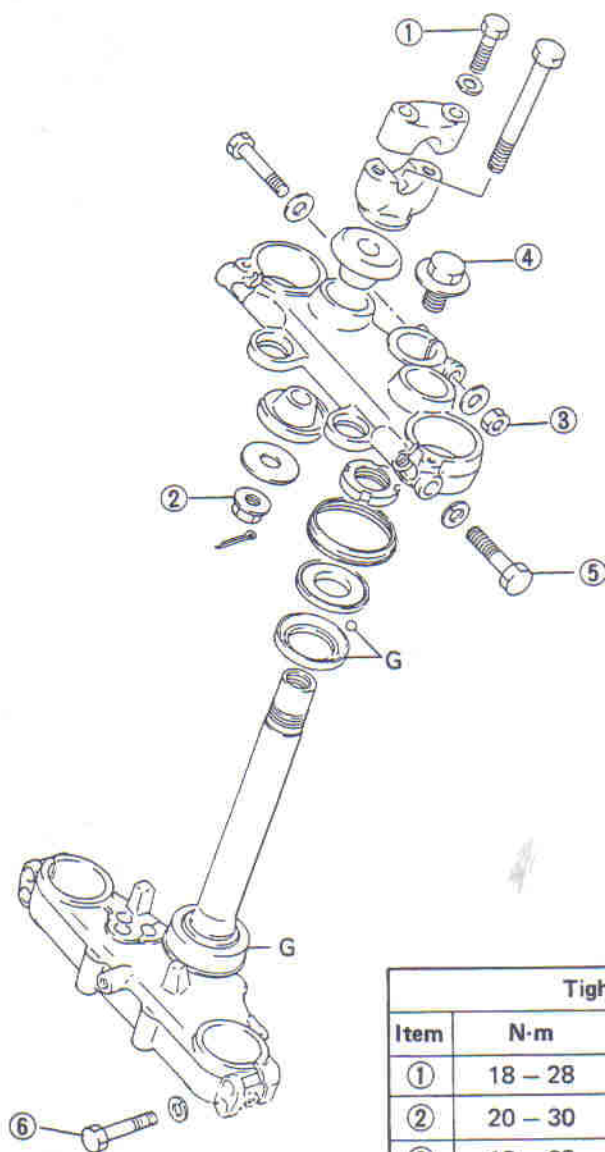
Standard air pressure: 0 kPa (0 kg/cm<sup>2</sup>, 0 psi)

**CAUTION:**

The maximum permissible air pressure is 250 kPa, 2.5 kg/cm<sup>2</sup> (35 psi) to avoid fork oil seal and valve damage.



## STEERING

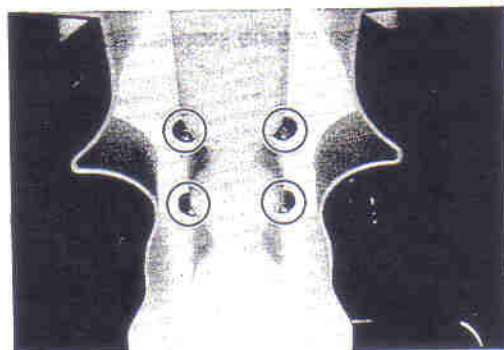


G: Apply SUZUKI SUPER GREASE "A"  
 (99000-25030 . . . U.S.A.)  
 (99000-25010 . . . Others)

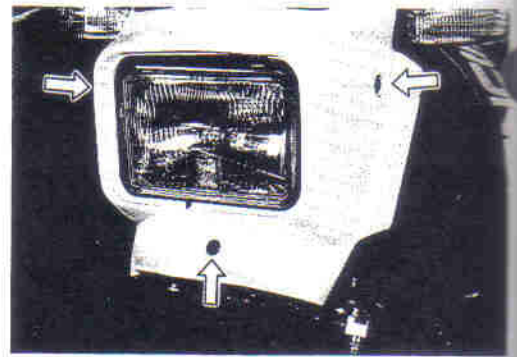
Tightening torque			
Item	N·m	kg·m	lb·ft
①	18 - 28	1.8 - 2.8	13.0 - 20.0
②	20 - 30	2.0 - 3.0	14.5 - 21.5
③	18 - 28	1.8 - 2.8	13.0 - 20.0
④	35 - 55	3.5 - 5.5	25.5 - 40.0
⑤	25 - 39	2.5 - 3.9	18.0 - 28.0
⑥	18 - 28	1.8 - 2.8	13.0 - 20.0

## REMOVAL AND DISASSEMBLY

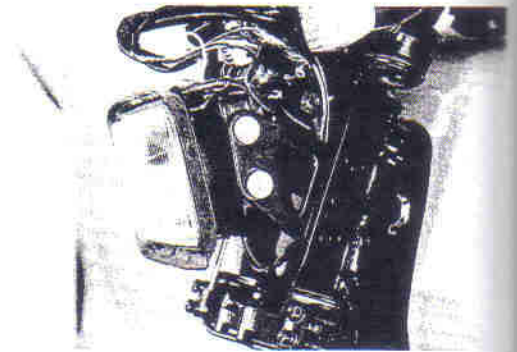
- Remove the front wheel. (Refer to page 6-1.)
- Remove the front fork. (Refer to page 6-10.)
- Remove the front fender.



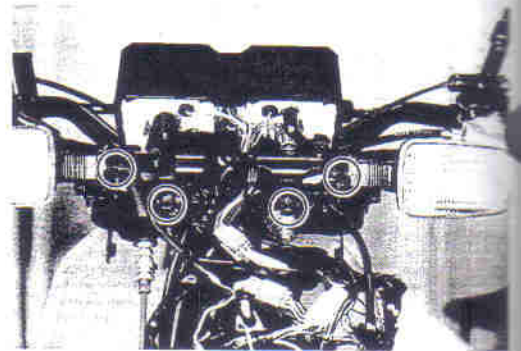
- Remove the headlight cover by removing the three screws.



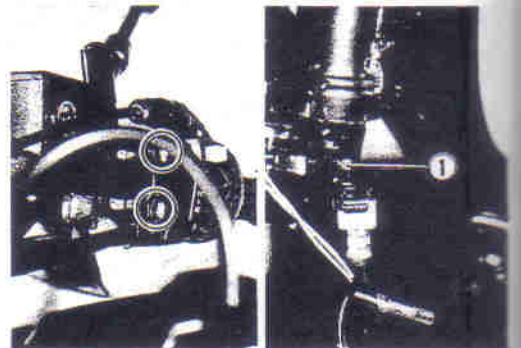
- Disconnect the headlight lead wires.
- Remove the headlight with headlight bracket.
- Remove the speedometer cable.



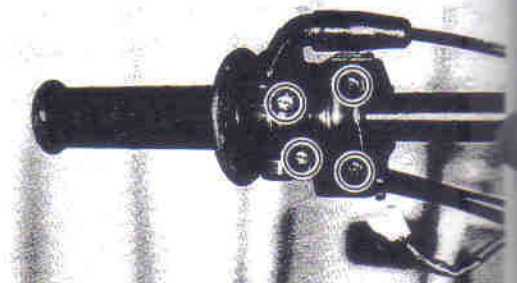
- Disconnect the speedometer/tachometer bracket, front turn signal light lead wires.
- Remove the meters and turn signal lights.



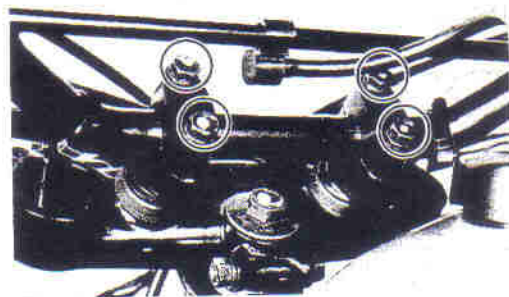
- Remove the front brake master cylinder with brake lever.
- Remove the brake hose bracket mounting bolt ①.



- Remove the engine stop switch and throttle case.



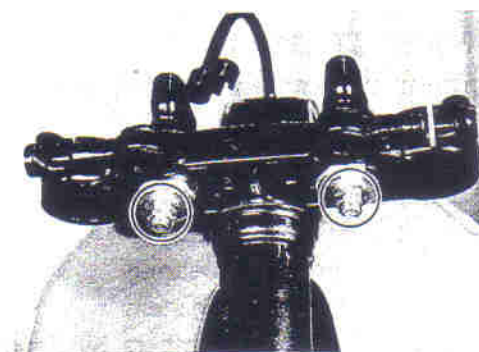
- Remove the handlebar by removing the four mounting bolts.



- Remove the handlebar clamp by removing the cotter pins and mounting nuts.

**CAUTION:**

The removed cotter pins should be replaced with new ones.



- Remove the steering stem upper bracket by removing the stem head bolt and loosening the clamp nut.



- Loosen the steering stem nut with the special tool.

09940-14920: Steering nut socket wrench

- Remove the steering stem lower bracket.

**NOTE:**

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



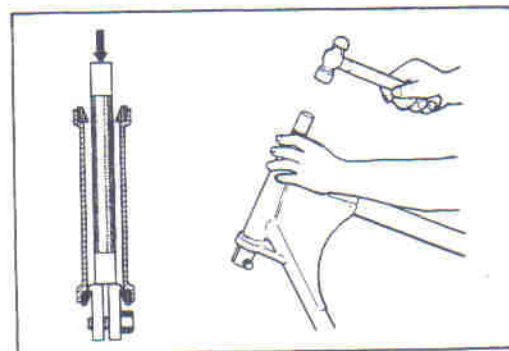
- Remove the upper steering stem steel balls.

Number of balls: 18 pcs

- Remove the steering stem bearing races, upper and lower with the special tools.

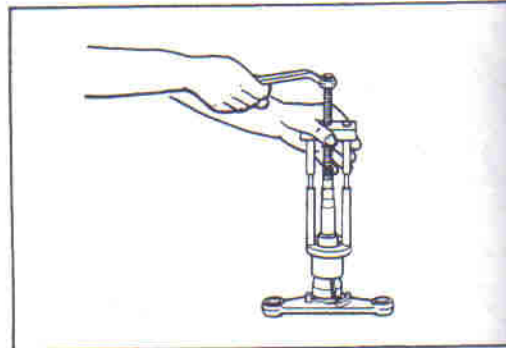
09941-54911: Steering race remover

09941-74910: Steering bearing remover and installer



- Remove the steering stem lower bearing with the special tool.

09941-84510: Bearing inner race remover

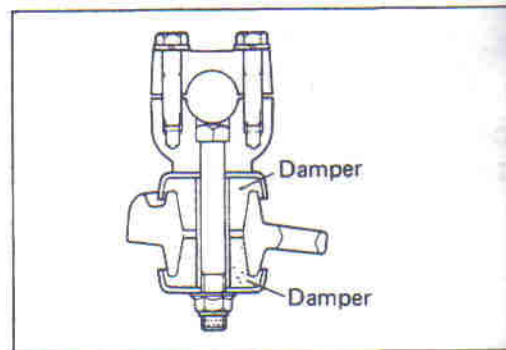


### INSPECTION

Inspect the removed parts for the following abnormalities.

- \* Handlebar distortion
- \* Handlebar clamp wear
- \* Race wear and brinelling
- \* Steel balls wear or damage
- \* Abnormal noise of bearing
- \* Distortion of steering stem

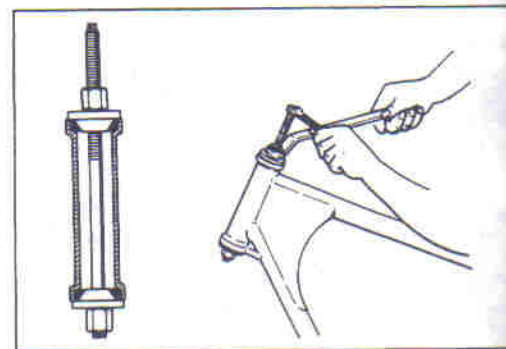
Inspect the play of dampers by hands while fixing it in the steering stem upper bracket. If the play can be found, replace the dampers.



### REASSEMBLY AND REMOUNTING

Reassemble and remount the steering stem in the reverse order of disassembly and removal. Pay attention to the following points:

- Remount the steering stem. (Refer to page 6-14.)



### BEARING RACES

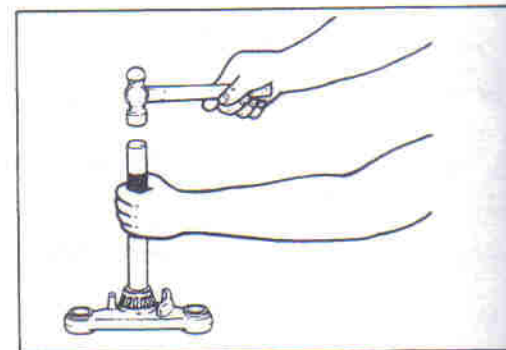
- Press in the upper and lower bearing races with the special tool.

09941-34513: Steering outer race installer

### BEARING

- Press in the lower bearing with the special tool.

09941-74910: Steering bearing installer



- Apply grease to the upper race and lower bearing.

99000-25030: SUZUKI SUPER GREASE "A" (U.S.A.)

99000-25010: SUZUKI SUPER GREASE "A" (The others)

- Install the steel balls to the upper race.

Number of balls: 18 pcs



**STEM NUT**

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

09940-14920: Steering stem nut wrench

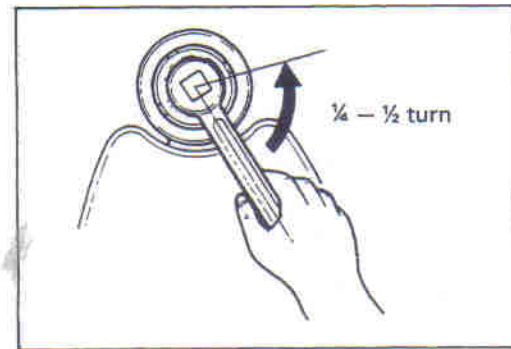
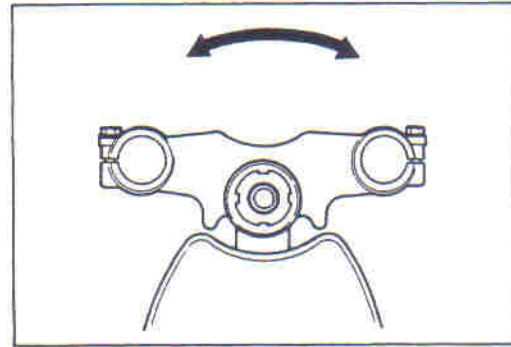
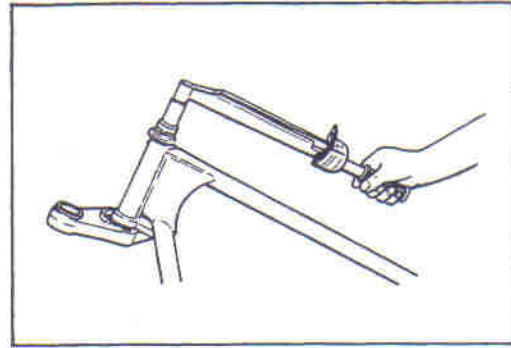
- Turn the steering stem bracket about five or six times to the left and right until it locks in position so that the taper roller bearing will be seated properly.
- Turn back the stem nut by 1/4 – 1/2 turn.

**NOTE:**

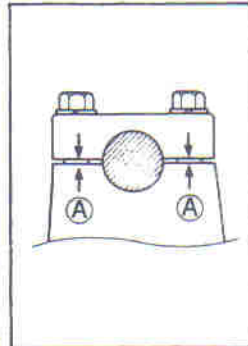
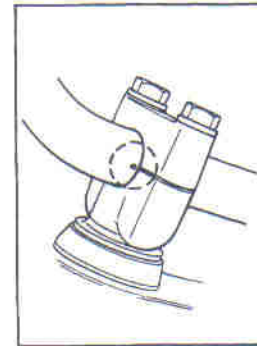
*This adjustment will vary from motorcycle to motorcycle.*

**CAUTION:**

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

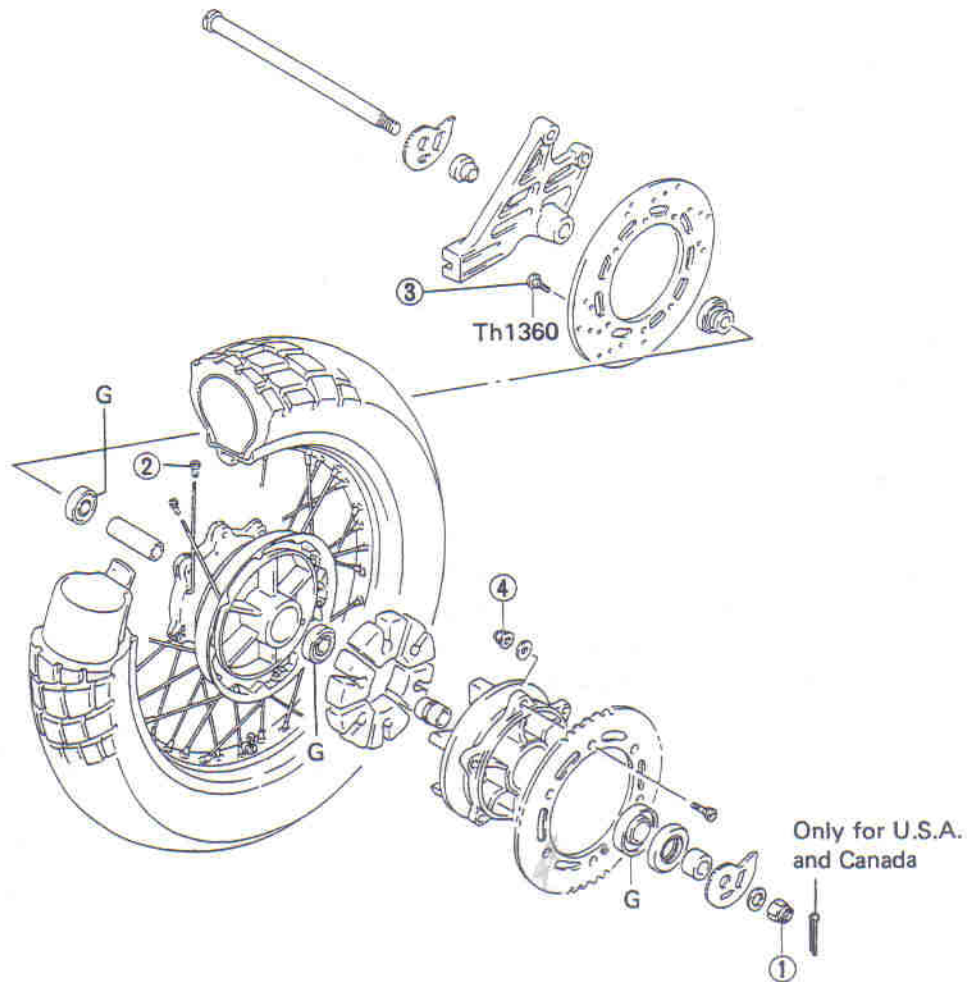
**HANDLEBAR**

- Set the handlebar to match its punched mark to the mating face of the holder.
- Secure the each handlebar clamp in such a way that the clearances (A) ahead of and behind the handlebar are equalized.





## REAR WHEEL



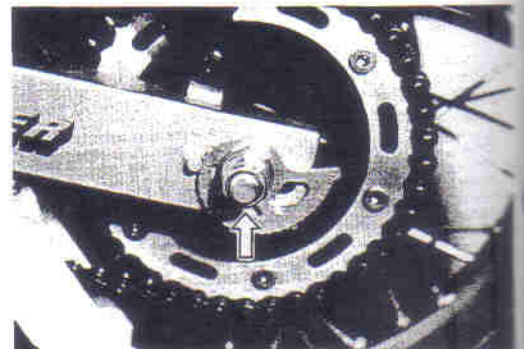
G : Apply SUZUKI SUPER GREASE "A"  
(99000-25030 . . . U.S.A.)  
(99000-25010 . . . Others)

Th1360 : Apply THREAD LOCK SUPER "1360"  
(99000-32130)

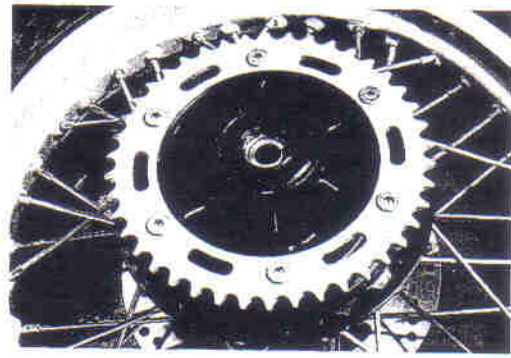
Tightening torque			
Item	N-m	kg-m	lb-ft
①	50 - 80	5.0 - 8.0	36.0 - 58.0
②	4 - 5	0.4 - 0.5	3.0 - 3.5
③	18 - 28	1.8 - 2.8	13.0 - 20.0
④	22 - 32	2.2 - 3.2	16.0 - 23.0

## REMOVAL

- Remove the rear brake caliper. (Refer to page 6-24.)
- Support the motorcycle with jack or wooden block.
- Remove the drive chain guide.
- Remove the cotter pin. (For Canada and U.S.A.)
- Remove the axle shaft by removing the axle nut.
- Remove the rear wheel.



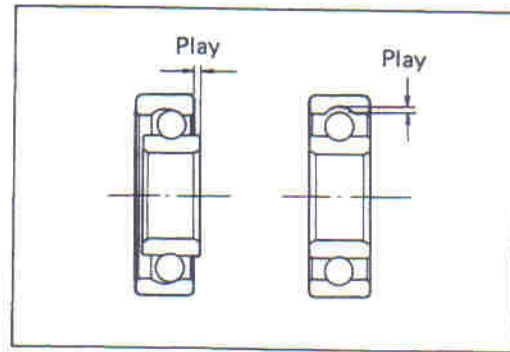
- Remove the rear sprocket with sprocket drum.
- Remove the rear brake disc.



## INSPECTION AND DISASSEMBLY

### WHEEL BEARING AND SPROCKET DRUM BEARING

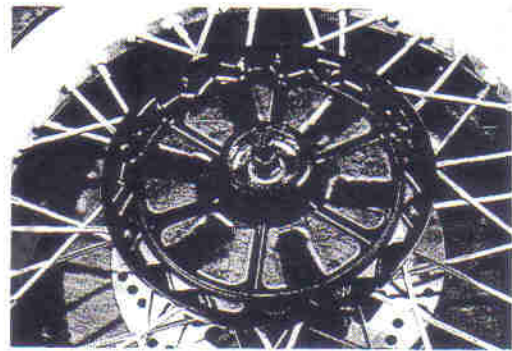
Inspect the play of bearing inner ring by hand while mounted in the wheel or sprocket drum. Rotate the inner ring by hand to inspect any abnormal noise occurs or rotating smoothly. Replace the bearing if there is anything unusual.



Remove the both bearing with the special tool in the following procedures.

- Insert the adapter into the bearing.

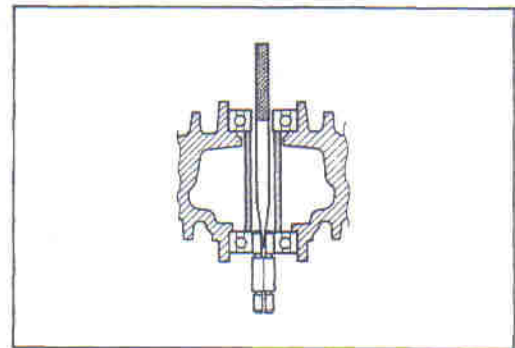
09941-50110: Bearing remover



- After inserting the wedge bar from the opposite side, lock the wedge bar in the slit of the adapter.
- Drive out the bearing by knocking the wedge bar.

#### CAUTION:

The removed bearing should be replaced with new ones.

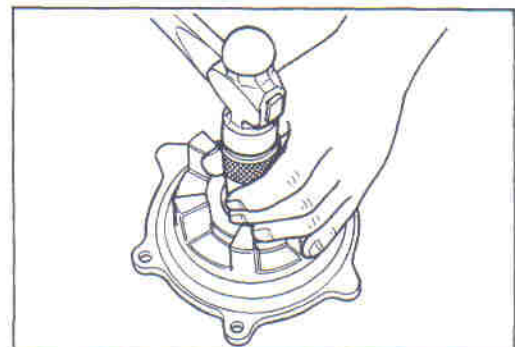


- Remove the sprocket drum bearing with the special tool.

09913-75830: Bearing remover

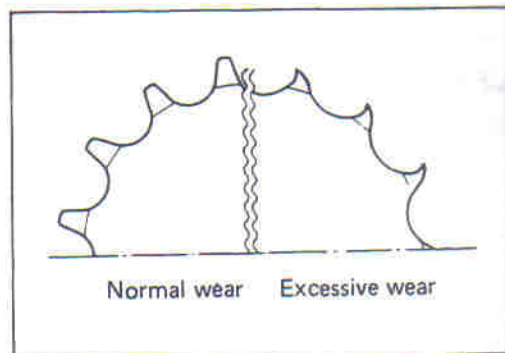
#### CAUTION:

The removed bearing should be replaced with a new one.



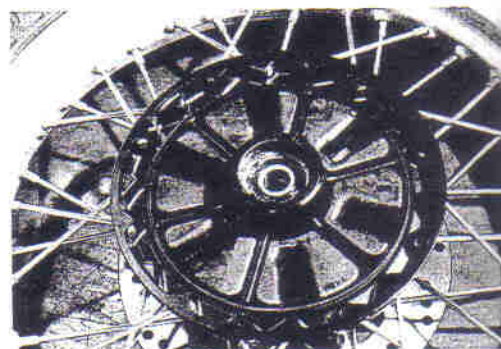
**REAR SPROCKET**

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



**REAR SPROCKET DAMPER**

Inspect the dampers for wear and damage. If any defects are found, replace the dampers as a set.



- AXLE SHAFT ..... Refer to page 6-2.
- WHEEL RIM ..... Refer to page 6-3.
- REAR TIRE ..... Refer to page 2-16.
- Service Limit: 3.0 mm (0.12 in)
- SPOKE NIPPLE ..... Refer to page 6-3.

**REASSEMBLY AND REMOUNTING**

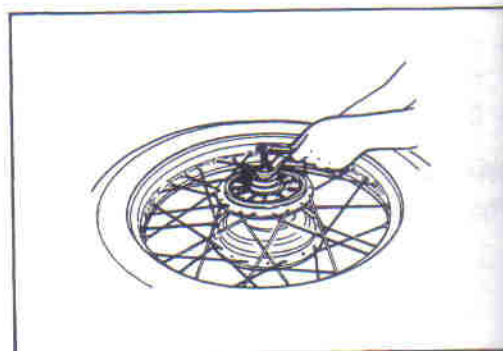
Reassemble and remount the rear wheel in the reverse order of removal and disassembly and also carry out the following steps:

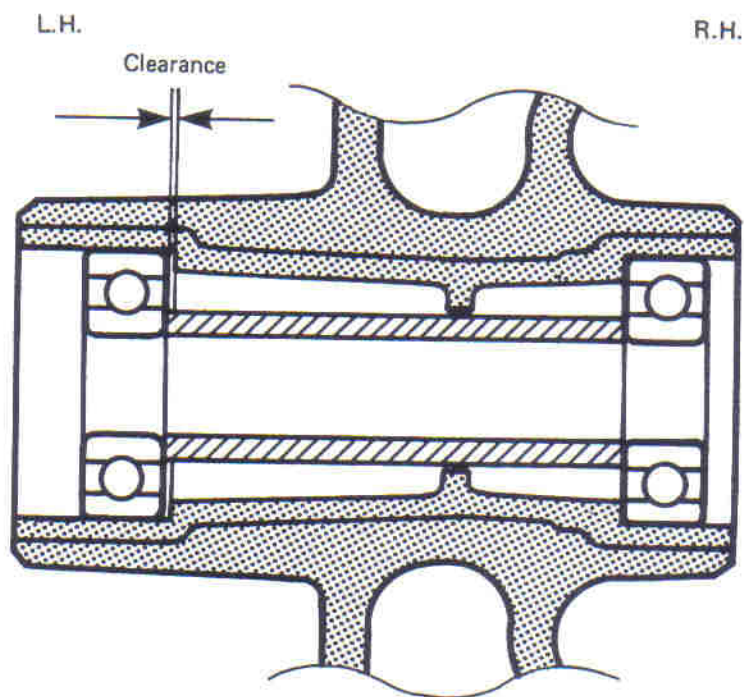
- Reassemble and remount the rear wheel. (Refer to page 6-19.)
- Install the wheel hub bearing with the special tool.

09941-34513: Bearing installer

**NOTE:**

*First install the bearing for right side. Seal side of bearing goes toward outside.*



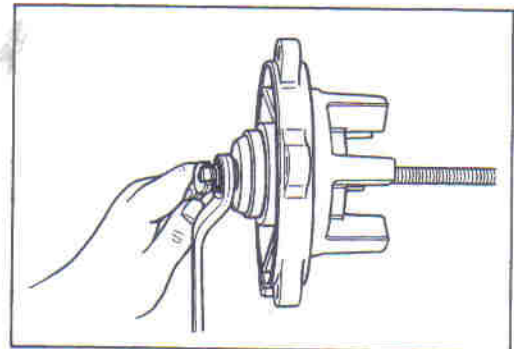


- Install the rear sprocket drum bearing by using a bearing installer.

**09941-34513: Bearing installer**

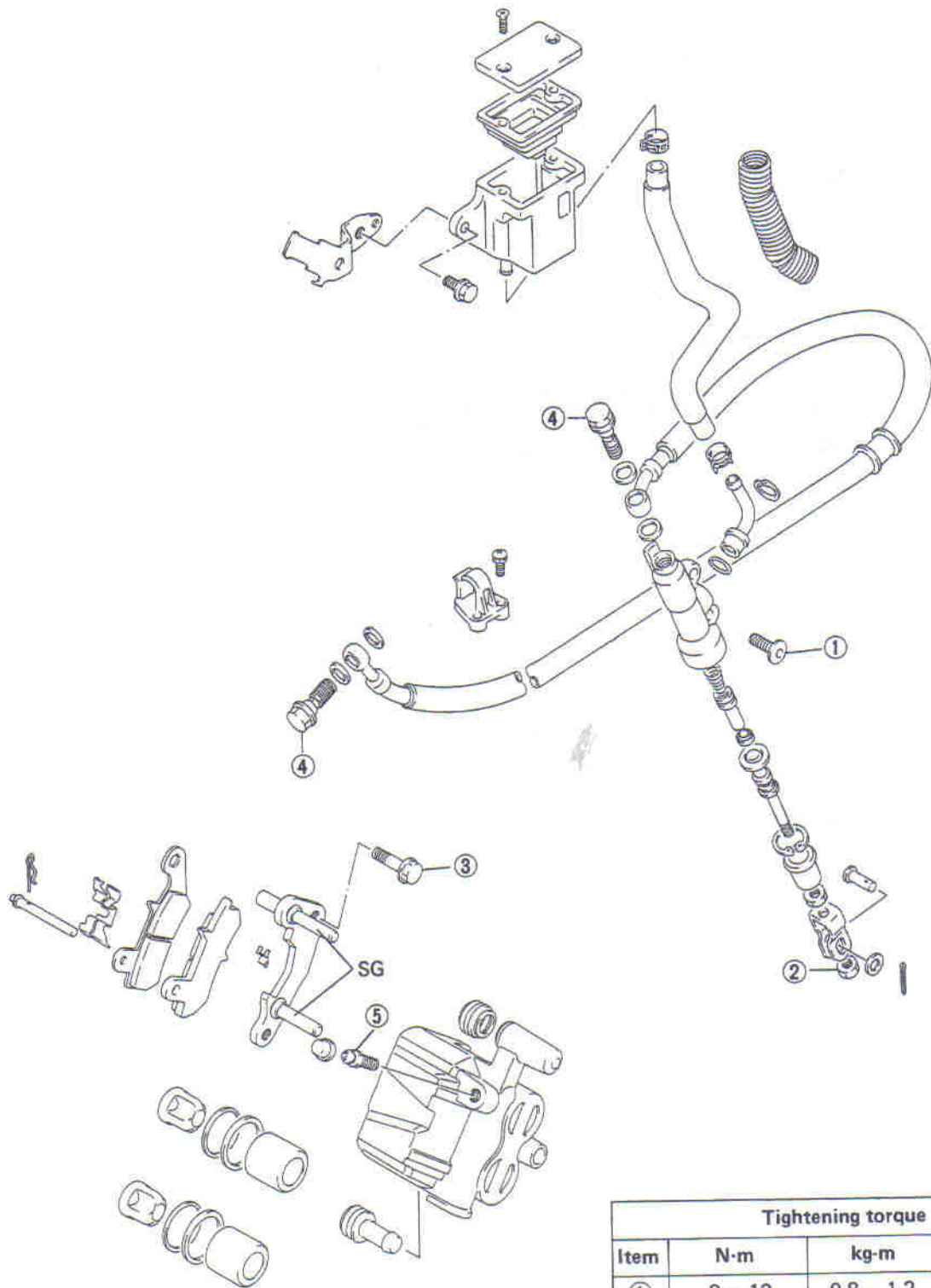
**NOTE:**

*Seal side of bearing goes toward outside.*



- After remounting the rear wheel, adjust the drive chain slack. (Refer to page 2-12.)

## REAR BRAKE



SG: Apply SUZUKI SILICONE GREASE (99000-25100)

Tightening torque			
Item	N-m	kg-m	lb-ft
①	8 - 12	0.8 - 1.2	6.0 - 8.5
②	15 - 20	1.5 - 2.0	11.0 - 14.5
③	20 - 31	2.0 - 3.1	14.5 - 22.5
④	20 - 25	2.0 - 2.5	14.5 - 18.0
⑤	6 - 9	0.6 - 0.9	4.5 - 6.5

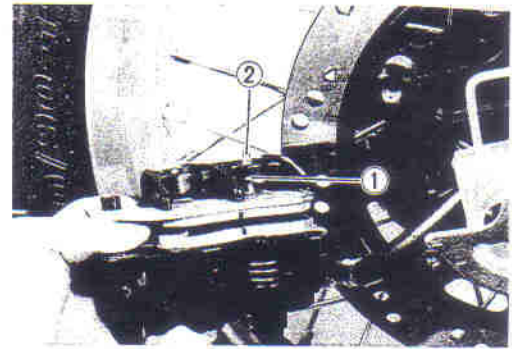
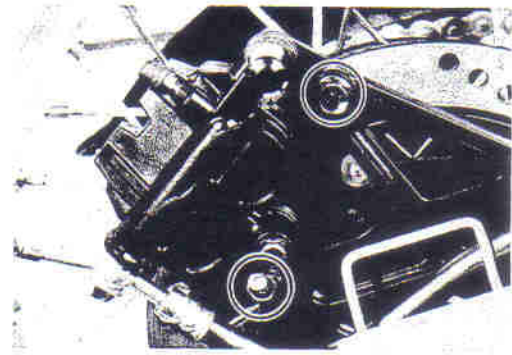
## BRAKE PAD REPLACEMENT

- Remove the caliper mounting bolts.
- Remove the brake pads by removing the clip ① and pad mounting shaft ②.

### CAUTION:

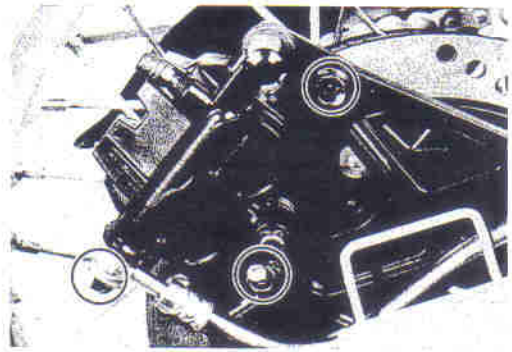
Replace the brake pad as a set, otherwise braking performance will be adversely affected.

- Reassemble and remount the caliper. (Refer to page 6-23.)

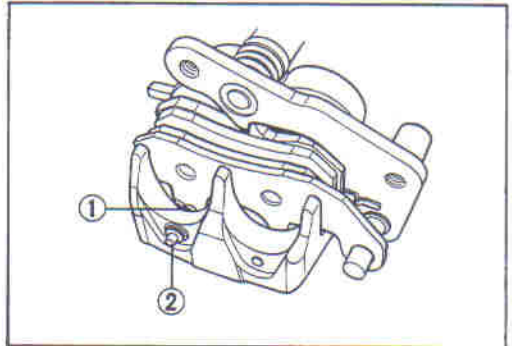


## CALIPER REMOVAL AND DISASSEMBLY

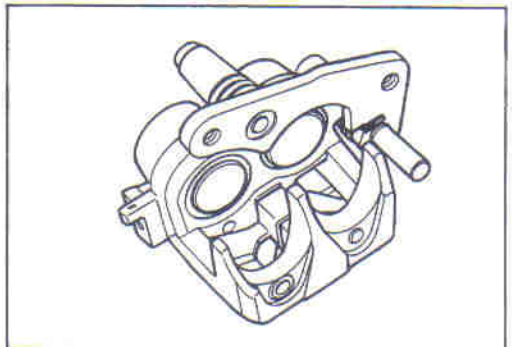
- Disconnect the brake hose and catch the brake fluid in a suitable receptacle.
- Remove the caliper.



- Remove the brake pads by removing the clip ① and pad mounting shaft ②.



- Remove the caliper holder, spring and piston insulator.

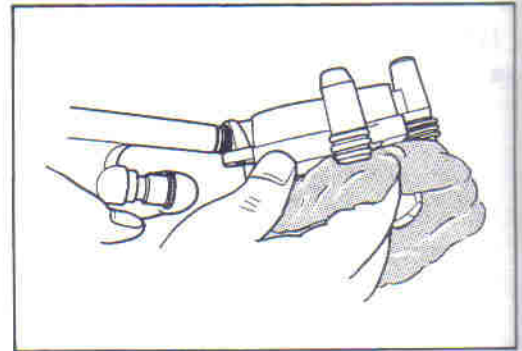


- Place a rag over the piston to prevent popping up. Force out the piston with an air gun.

**CAUTION:**

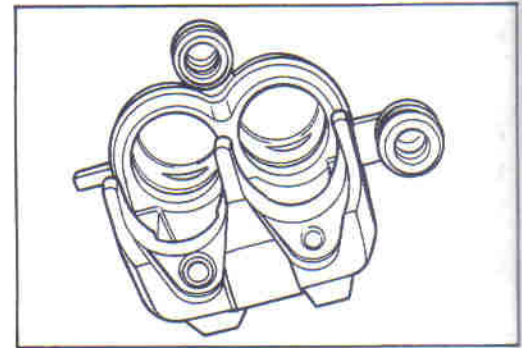
Do not use high pressure air to prevent piston damage.

- Remove the dust seal and piston seal.

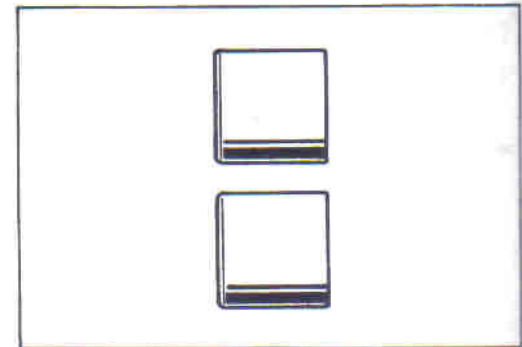


**CALIPER AND DISC INSPECTION**

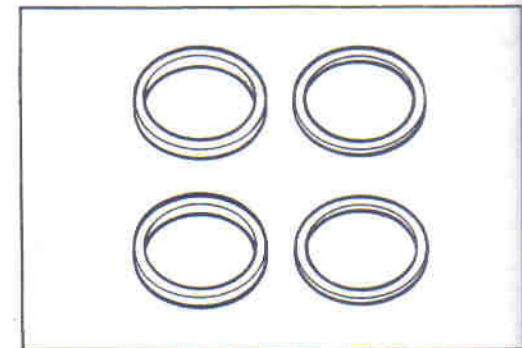
Inspect the caliper cylinder bore wall for nicks, scratches or other damage.



Inspect the pistons for damage and wear.



Inspect each rubber part for damage and wear.



**DISC THICKNESS** ..... Refer to page 6-7.

Service Limit: 3.5 mm (0.14 in)

**DISC RUNOUT** ..... Refer to page 6-7.

Service Limit: 0.3 mm (0.012 in)

## CALIPER REASSEMBLY AND REMOUNTING

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

- Reassemble and remount the caliper. (Refer to page 6-23.)

### CAUTION:

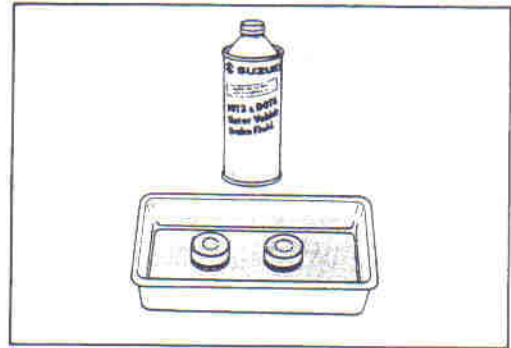
Wash the caliper components with fresh brake fluid before reassembly.

Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the caliper bore and piston to be inserted into the bore.

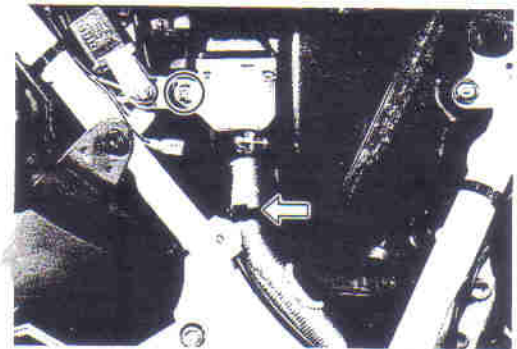
### WARNING:

Bleed air after reassembling the caliper. (Refer to page 2-15.)

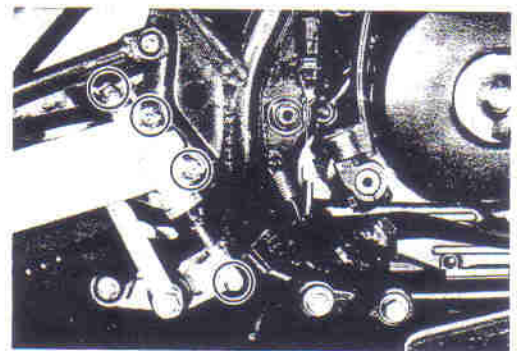


## MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the right frame cover.
- Remove the reservoir tank mounting bolt and brake hose clamp.



- Remove the cotter pin and pin.
- 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/master cylinder joint.



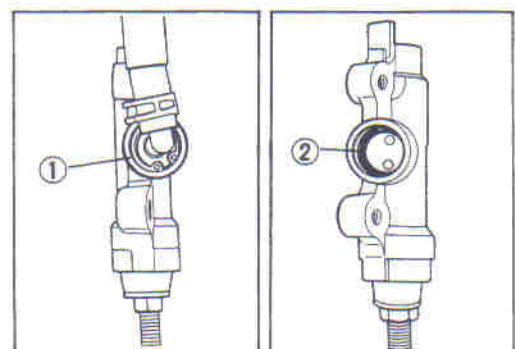
### CAUTION:

Completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials, etc.

- Remove the connector by removing the circlip ① with the special tool.

09900-06108: Snap ring pliers

- Remove the O-ring ②.

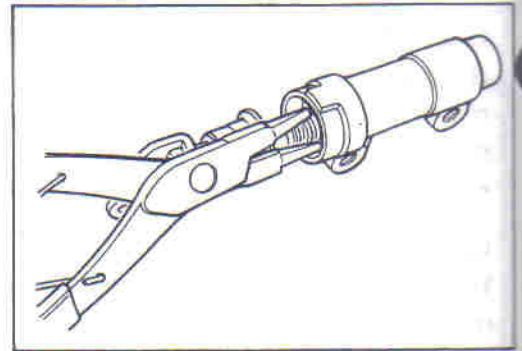




- Remove the dust boot.
- Remove the circlip with the special tool.

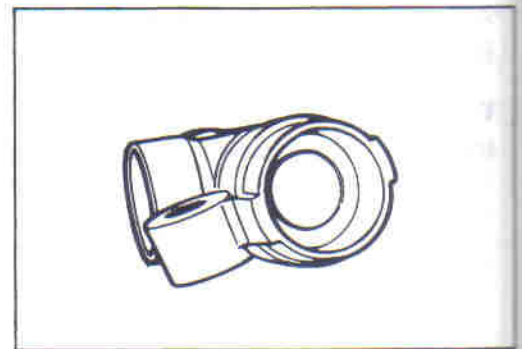
09900-06108: Snap ring pliers

- Remove the rod, piston, primary cup and spring.

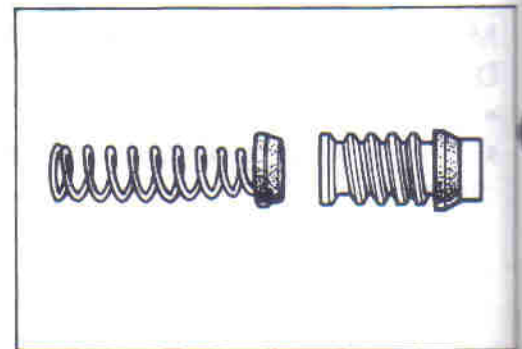


### MASTER CYLINDER INSPECTION

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



Inspect the piston surface for scratches or other damage.  
Inspect the primary cup for damage.



### MASTER CYLINDER REASSEMBLY AND REMOUNTING

Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

#### CAUTION:

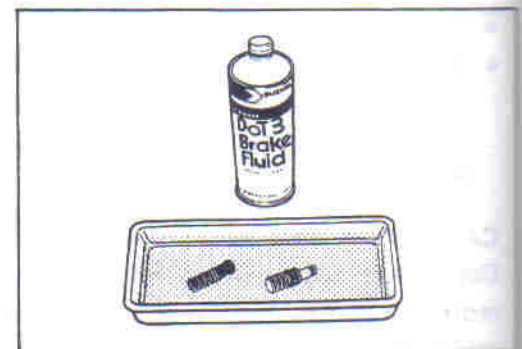
- \* Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
  - \* Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.
- Reassemble and remount the master cylinder. (Refer to page 6-23.)

#### WARNING:

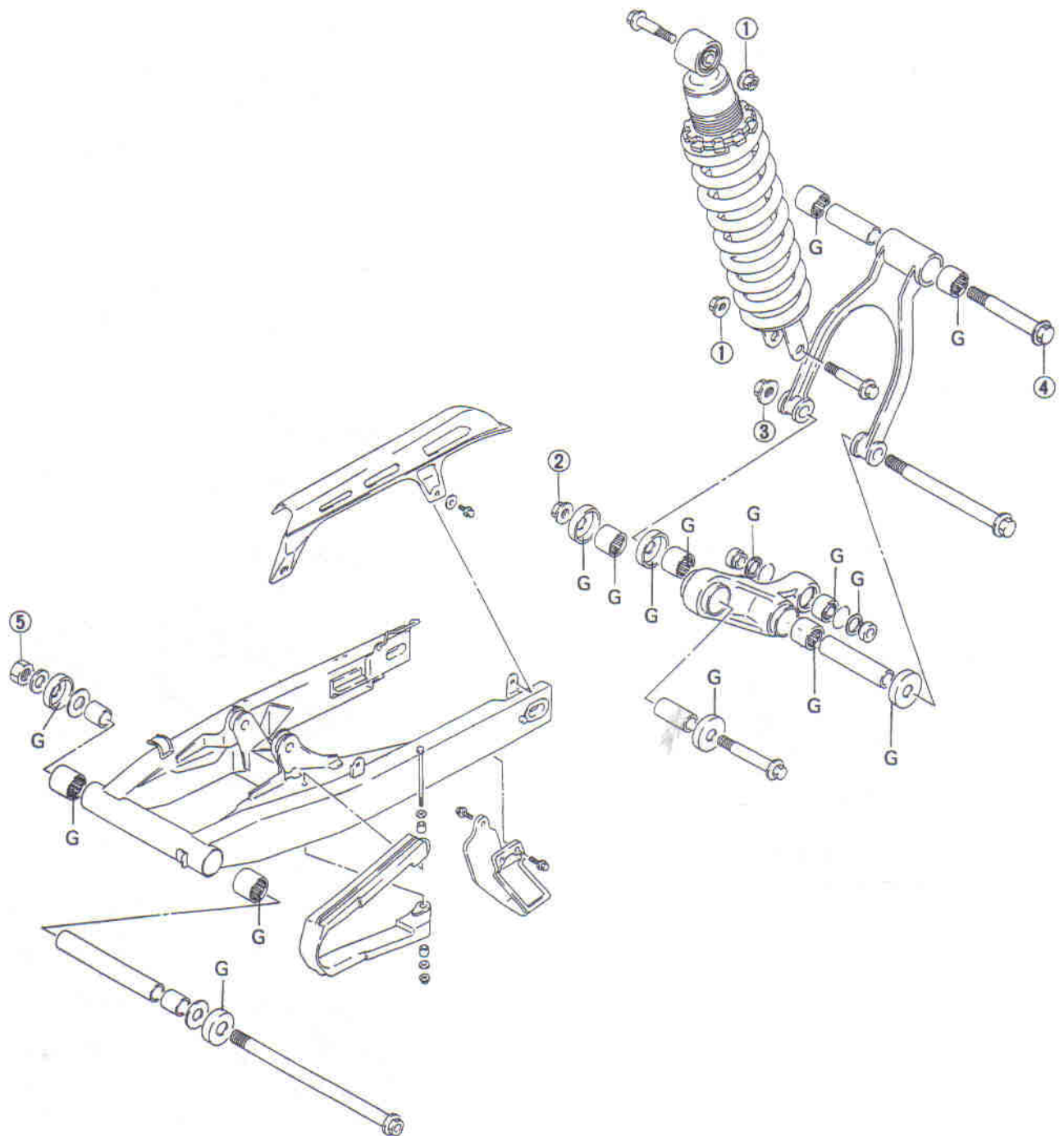
Bleed air after reassembling the master cylinder. (Refer to page 2-15.)

#### CAUTION:

Adjust the brake pedal height. (Refer to page 2-14.)



# REAR SWINGARM AND SUSPENSION



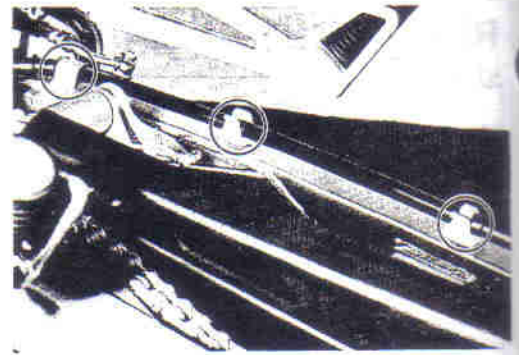
Tightening torque

Item	N-m	kg-m	lb-ft
①	48 - 72	4.8 - 7.2	34.5 - 52.0
②	84 - 120	8.4 - 12.0	60.5 - 87.0
③	60 - 96	6.0 - 9.6	43.5 - 69.5
④	84 - 120	8.4 - 12.0	60.5 - 87.0
⑤	61 - 94	6.1 - 9.4	44.0 - 68.0

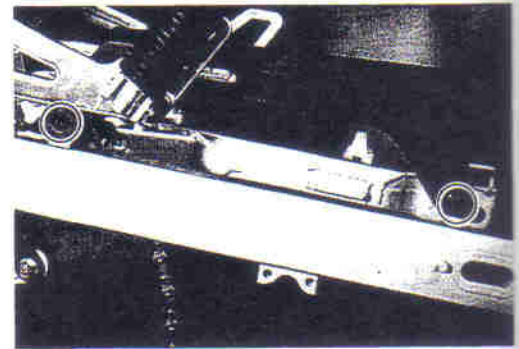
G: Apply SUZUKI SUPER GREASE "A"  
 (99000-25030 . . . U.S.A.)  
 (99000-25010 . . . Others)

## REMOVAL

- Remove the rear wheel. (Refer to page 6-22.)
- Remove the seat and frame covers.
- Disconnect the brake hose from the hose guides.



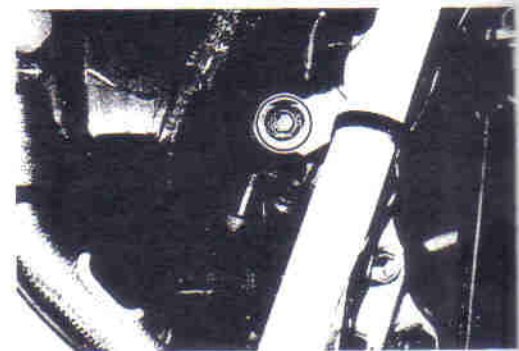
- Remove the chain cover.



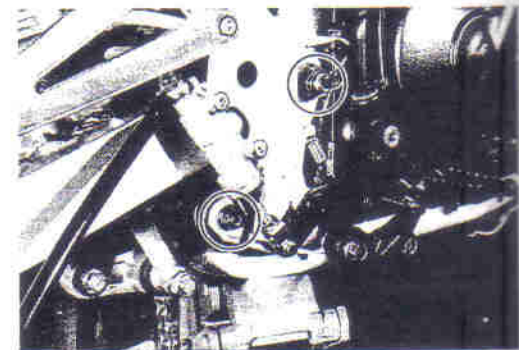
- Remove the rear shock absorber upper mounting bolt.

### NOTE:

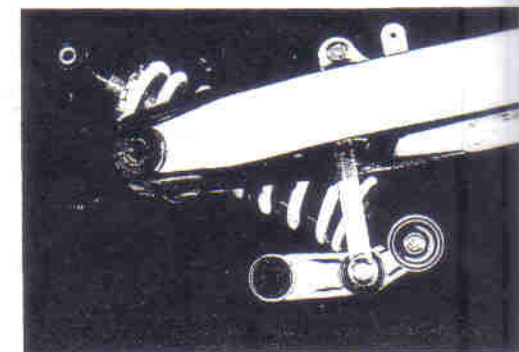
*When removing the shock absorber upper mounting bolt, loosen the air cleaner three mounting bolts.*



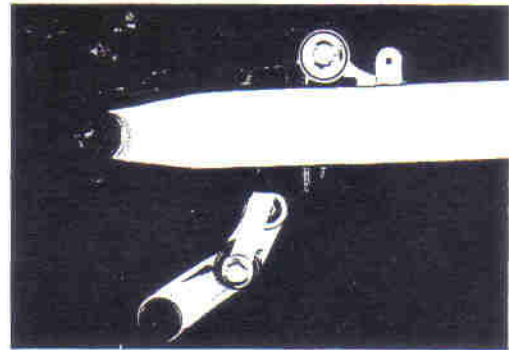
- Remove the rear swingarm with suspension by removing the cushion rod bolt and swingarm pivot shaft.



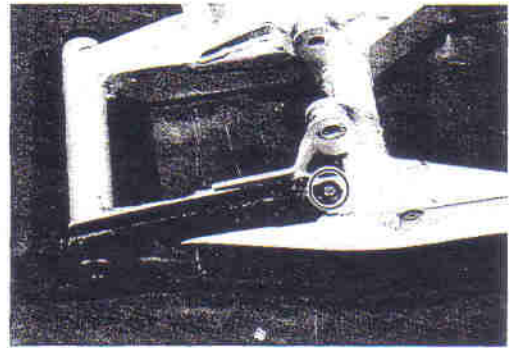
- Remove the shock absorber.



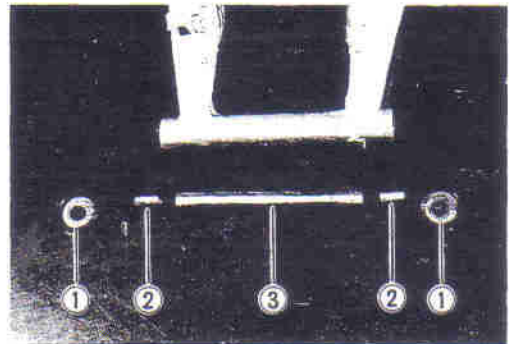
- Remove the cushion rod mounting bolt.



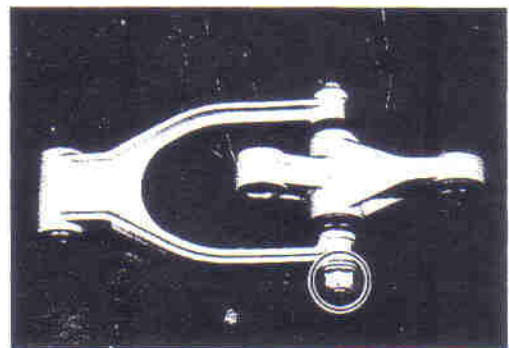
- Remove the chain buffer by removing the bolt and nut.



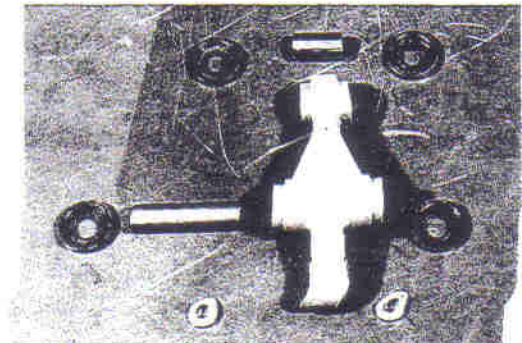
- Remove the dust seal covers ①, spacer ② and spacer ③.



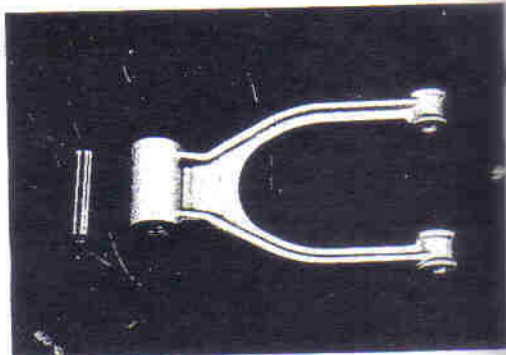
- Remove the cushion lever.



- Remove the dust seal covers and spacers.



- Remove the spacer.



### INSPECTION AND REMOVAL BEARING

Inspect the rotates of the swingarm bearing, shock absorber bearing and cushion rod bearing by hand while fixing it in the swingarm and cushion rod.

Rotate the needle roller bearing by hand to inspect whether abnormal noise occurs or it rotates smoothly.

Replace the bearing if there is anything unusual.

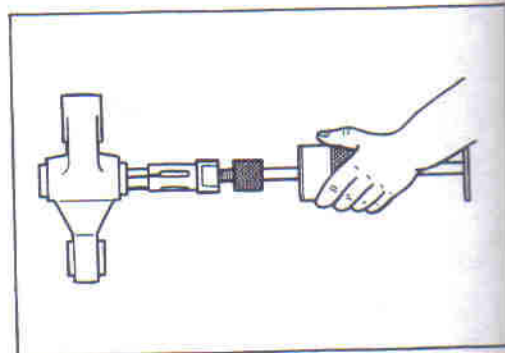
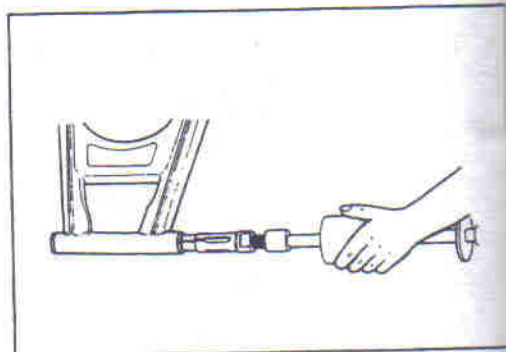
- Remove the bearings from the swingarm, cushion lever and cushion rod with the special tools.

09923-73210: Bearing remover

09930-30102: Sliding shaft

**CAUTION:**

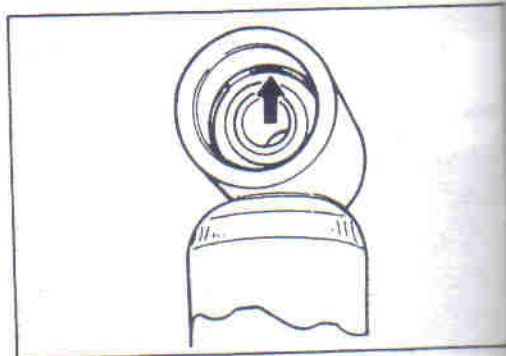
The removed bearings should be replaced with new ones.



- Remove the stopper ring and bearing.

**CAUTION:**

The removed bearing should be replaced with new one.



**SWINGARM PIVOT SHAFT**

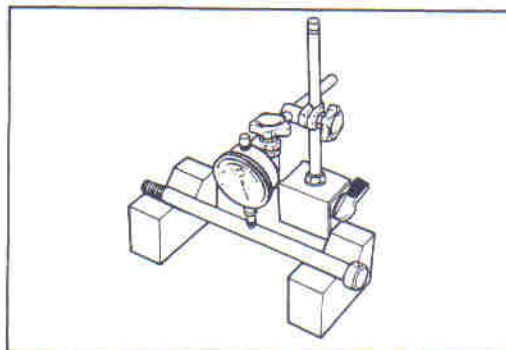
Check the pivot shaft for runout with the special tools.

Service Limit: 0.3 mm (0.01 in)

09900-20606: Dial guage

09900-20701: Magnetic stand

09900-21304: V-block

**SHOCK ABSORBER**

Inspect the shock absorber for oil leakage or other damage.

**REASSEMBLY AND REMOUNTING**

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

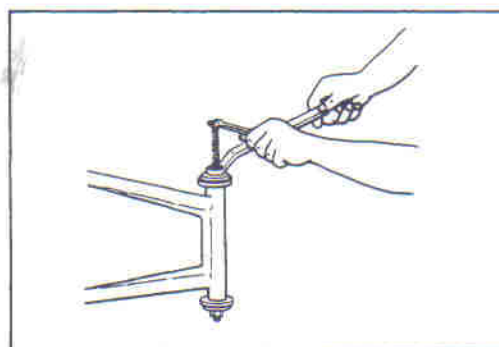
**SWINGARM BEARING**

- Install the new bearing with the suitable socket and special tool.

09924-84511: Bearing installer

**NOTE:**

- \* When installing the bearing, punch-marked side of bearing faces outside.
- \* The bearing fixed position is as shown in the illustration.

**CUSHION LEVER AND CUSHION ROD BEARING**

- Install the new bearing with the special tool.

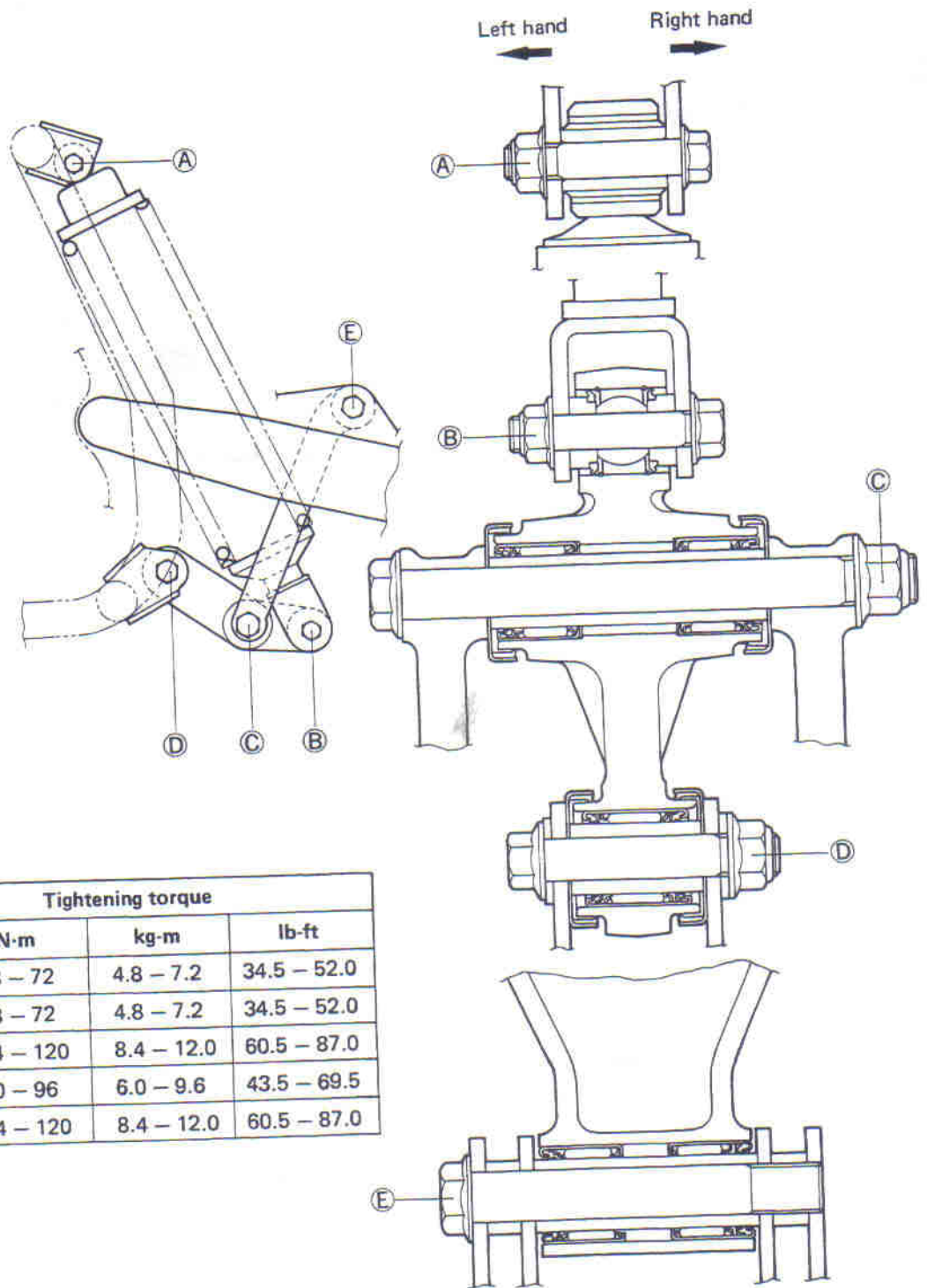
09924-84510: Bearing installer

**NOTE:**

When installing the bearing, punch-mark side of bearing faces outside.

- Remount the rear swingarm and suspension. (Refer to pages 6-28 and 6-33.)

REASSEMBLING INFORMATION



Tightening torque			
Item	N-m	kg-m	lb-ft
(A)	48 - 72	4.8 - 7.2	34.5 - 52.0
(B)	48 - 72	4.8 - 7.2	34.5 - 52.0
(C)	84 - 120	8.4 - 12.0	60.5 - 87.0
(D)	60 - 96	6.0 - 9.6	43.5 - 69.5
(E)	84 - 120	8.4 - 12.0	60.5 - 87.0

# SERVICE INFORMATION

## CONTENTS

<b>TROUBLESHOOTING</b> .....	<b>7- 1</b>
<b>WIRING DIAGRAM</b> .....	<b>7- 8</b>
<b>WIRE, CABLE AND HOSE ROUTING</b> .....	<b>7-10</b>
<b>SPECIAL TOOLS</b> .....	<b>7-14</b>
<b>TIGHTENING TOTQUE</b> .....	<b>7-16</b>
<b>SERVICE DATA</b> .....	<b>7-19</b>



## TROUBLESHOOTING

## ENGINE

Complaint	Symptom and possible causes	Remedy
<p><b>Engine will not start, or is hard to start.</b></p>	<p><b>Compression too low</b></p> <ol style="list-style-type: none"> <li>1. Valve clearance out of adjustment.</li> <li>2. Worn valve guides or poor seating of valves.</li> <li>3. Valves mistiming.</li> <li>4. Piston rings excessively worn.</li> <li>5. Worn-down cylinder bore.</li> <li>6. Improperly adjusted de-compression cable.</li> </ol> <p><b>Plugs not sparking</b></p> <ol style="list-style-type: none"> <li>1. Fouled spark plugs.</li> <li>2. Wet spark plug.</li> <li>3. Defective ignition coil.</li> <li>4. Open or short in high-tension cord.</li> <li>5. Defective pick-up coil or CDI unit.</li> <li>6. Defective side stand switch.</li> </ol> <p><b>No fuel reaching the carburetors</b></p> <ol style="list-style-type: none"> <li>1. Clogged hole in the fuel tank cap.</li> <li>2. Clogged or defective fuel cock.</li> <li>3. Defective carburetor float valve.</li> <li>4. Clogged fuel hose or vacuum hose.</li> <li>5. Clogged fuel filter.</li> </ol>	<p>Adjust. Repair, or replace. Adjust. Replace. Replace, or rebore. Replace.</p> <p>Clean. Clean and dry. Replace. Replace. Replace. Adjust or replace.</p> <p>Clean. Clean or replace. Replace. Clean. Replace.</p>
<p><b>Engine stalls easily.</b></p>	<ol style="list-style-type: none"> <li>1. Fouled spark plugs.</li> <li>2. Defective pick-up coil or CDI unit.</li> <li>3. Clogged fuel hose.</li> <li>4. Clogged jets in carburetor.</li> <li>5. Valve clearance out of adjustment.</li> <li>6. Defective ignition coil.</li> </ol>	<p>Clean. Replace. Replace. Clean. Adjust. Replace.</p>
<p><b>Noisy engine.</b></p>	<p><b>Excessive valve chatter</b></p> <ol style="list-style-type: none"> <li>1. Valve clearance too large.</li> <li>2. Weakened or broken valve springs.</li> <li>3. Camshaft journal worn and burnt.</li> <li>4. De-compression cable play is maladjusted.</li> </ol> <p><b>Noise appears to come from piston</b></p> <ol style="list-style-type: none"> <li>1. Piston or cylinder worn down.</li> <li>2. Combustion chamber fouled with carbon.</li> <li>3. Piston pin or piston pin bore worn.</li> <li>4. Piston rings or ring groove worn.</li> </ol> <p><b>Noise seems to come from timing chain</b></p> <ol style="list-style-type: none"> <li>1. Stretched chain.</li> <li>2. Worn sprocket.</li> <li>3. Tension adjuster not working.</li> </ol>	<p>Adjust. Replace. Replace. Adjust.</p> <p>Replace. Clean. Replace. Replace.</p> <p>Replace. Replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
<b>Noisy engine.</b>	<p><b>Noise seems to come from clutch</b></p> <ol style="list-style-type: none"> <li>1. Worn splines of countershaft or hub.</li> <li>2. Worn teeth of clutch plates.</li> <li>3. Distorted clutch plates, driven and drive.</li> <li>4. Worn/Damaged clutch release bearing.</li> <li>5. Clutch dampers weakened.</li> </ol> <p><b>Noise seems to come from crankshaft</b></p> <ol style="list-style-type: none"> <li>1. Rattling thrust washer due to wear.</li> <li>2. Big-end bearings worn and burnt.</li> <li>3. Journal bearing worn and burnt.</li> <li>4. Thrust clearance too large.</li> </ol> <p><b>Noise seems to come from transmission</b></p> <ol style="list-style-type: none"> <li>1. Gears worn or rubbing.</li> <li>2. Badly worn splines.</li> <li>3. Primary gears worn or rubbing.</li> <li>4. Badly worn bearings.</li> </ol>	<p>Replace. Replace. Replace. Replace. Replace the primary driven gear.</p> <p>Replace. Replace. Replace. Replace the thrust washers or con-rod.</p> <p>Replace. Replace. Replace. Replace.</p>
<b>Slipping clutch.</b>	<ol style="list-style-type: none"> <li>1. Clutch control out of adjustment or loss of play.</li> <li>2. Weakened clutch springs.</li> <li>3. Worn or distorted pressure plate.</li> <li>4. Distorted clutch plates, driven and drive.</li> </ol>	<p>Adjust. Replace. Replace. Replace.</p>
<b>Dragging clutch.</b>	<ol style="list-style-type: none"> <li>1. Clutch control out of adjustment or too much play.</li> <li>2. Some clutch springs weakened while others are not.</li> <li>3. Distorted pressure plate or clutch plates.</li> </ol>	<p>Adjust. Replace. Replace.</p>
<b>Transmission will not shift.</b>	<ol style="list-style-type: none"> <li>1. Broken gearshift cam.</li> <li>2. Distorted gearshift forks.</li> <li>3. Worn gearshift pawl.</li> </ol>	<p>Replace. Replace. Replace.</p>
<b>Transmission will not shift back.</b>	<ol style="list-style-type: none"> <li>1. Broken return spring on shift shaft.</li> <li>2. Gearshift fork shafts are rubbing or sticky.</li> <li>3. Distorted or worn gearshift forks.</li> </ol>	<p>Replace. Repair. Replace.</p>
<b>Transmission jumps out of gear.</b>	<ol style="list-style-type: none"> <li>1. Worn shifting gears on driveshaft or countershaft.</li> <li>2. Distorted or worn gearshift forks.</li> <li>3. Weakened cam stopper spring of gearshift cam.</li> <li>4. Worn gearshift pawl.</li> </ol>	<p>Replace. Replace. Replace. Replace.</p>
<b>Engine idles poorly.</b>	<ol style="list-style-type: none"> <li>1. Valve clearance out of adjustment.</li> <li>2. Poor seating of valves.</li> <li>3. Defective valve guides.</li> <li>4. Spark plug gaps too wide.</li> <li>5. Defective ignition coil.</li> <li>6. Defective pick-up coil or CDI unit.</li> <li>7. Float-chamber fuel level out of adjustment in carburetor.</li> <li>8. Clogged jets in carburetor.</li> </ol>	<p>Adjust. Repair or replace. Replace. Adjust or replace. Replace. Replace. Adjust. Clean or adjust.</p>

Complaint	Symptom and possible causes	Remedy
Engine runs poorly in high-speed range.	<ol style="list-style-type: none"> <li>1. Valve springs weakened.</li> <li>2. Valve timing out of adjustment.</li> <li>3. Spark plug gaps too narrow.</li> <li>4. Clogged jets in carburetor.</li> <li>5. Defective ignition coil.</li> <li>6. Defective pick-up coil or CDI unit.</li> <li>7. Float-chamber fuel level too low.</li> <li>8. Clogged air cleaner element.</li> <li>9. Clogged fuel hose, resulting in inadequate fuel supply to carburetor.</li> </ol>	Replace. Adjust. Adjust or replace. Clean or adjust. Replace. Replace. Adjust. Clean or replace. Clean and prime.
Dirty or heavy exhaust smoke.	<ol style="list-style-type: none"> <li>1. Too much engine oil in the engine.</li> <li>2. Worn piston rings or cylinder.</li> <li>3. Worn valve guides.</li> <li>4. Cylinder walls scored or scuffed.</li> <li>5. Worn valve stems.</li> <li>6. Defective stem seal.</li> <li>7. Worn oil ring or side rail.</li> </ol>	Check with level inspection window, drain out excess oil. Replace. Replace. Rebore or replace. Replace. Replace. Replace.
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 cylinder.</li> <li>5. Poor seating of valves.</li> <li>6. Spark plug gaps incorrect.</li> <li>7. Clogged jets in carburetor.</li> <li>8. Float-chamber fuel level out of adjustment.</li> <li>9. Clogged air cleaner element.</li> <li>10. Sucking air from intake pipe.</li> <li>11. Too much engine oil in the engine.</li> <li>12. Defective pick-up coil/CDI unit/ignition coil.</li> </ol>	Adjust. Replace. Adjust. Replace. Repair. Adjust or replace. Clean. Adjust. Clean. Retighten or replace O-ring. Drain out excess oil. Replace.
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 chamber.</li> <li>5. Suck air from intake pipes.</li> <li>6. Use incorrect engine oil.</li> </ol>	Clean. Add oil. Replace or clean. Adjust. Retighten or replace. 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.</li> <li>5. Starter plunger is not operating properly.</li> </ol>	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust. Check and adjust.

Complaint	Symptom and possible causes	Remedy
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 or starter body.</li> <li>3. Pilot outlet or by-pass is clogged.</li> <li>4. Starter plunger is not fully closed.</li> </ol>	<p>Check and clean. Check and adjust. Check and clean. Check and adjust.</p>
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>	<p>Check and clean. Check and clean. Check throttle valve for operation. Check and clean.</p>
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> <li>6. Clogged carburetor air vent hose.</li> </ol>	<p>Replace. Replace. Check and adjust. Clean. Adjust float height. Clean.</p>

## 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 plug.</li> <li>3. Defective magneto rotor.</li> <li>4. Defective CDI unit.</li> <li>5. Defective pick-up coil or power source coil.</li> </ol>	<p>Replace. Replace. Replace. Replace. Replace.</p>
Spark plug soon becomes 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 plug too cold.</li> </ol>	<p>Adjust carburetor. Adjust carburetor. Change. Clean. Replace by hot type plug.</p>
Spark plug becomes fouled with oil.	<ol style="list-style-type: none"> <li>1. Worn piston rings.</li> <li>2. Piston or cylinder worn.</li> <li>3. Excessive clearance of valve stems in valve guides.</li> <li>4. Worn stem oil seals.</li> </ol>	<p>Replace. Replace. Replace. Replace.</p>
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> <li>1. Spark plug too hot.</li> <li>2. The engine overheats.</li> <li>3. Spark plug loose.</li> <li>4. Mixture too lean.</li> </ol>	<p>Replace by cold type plug. Tune up. Retighten. Adjust carburetor.</p>
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 punctured regulator/rectifier.</li> </ol>	<p>Repair, replace or retighten. Replace. Replace.</p>
Generator does charge, but charging rate is below the specification.	<ol style="list-style-type: none"> <li>1. Lead wires tend to get 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>	<p>Repair or retighten. Replace. Replace. Add distilled water to the upper level. Replace the battery.</p>

Complaint	Symptom and possible causes	Remedy
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>	<p>Replace the battery. Replace.</p> <p>Clean and tighten ground connection.</p>
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>	<p>Repair or replace.</p> <p>Replace. Replace.</p>

## 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. Contaminated 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. 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. Contaminated 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. Replace the battery.</p> <p>Recharge the battery fully and adjust electrolyte S.G. Replace the electrolyte, recharge the battery and then adjust S.G. 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. Replace the battery, if badly sulfated.</p>

Complaint	Symptom and possible causes	Remedy
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>

## CHASSIS

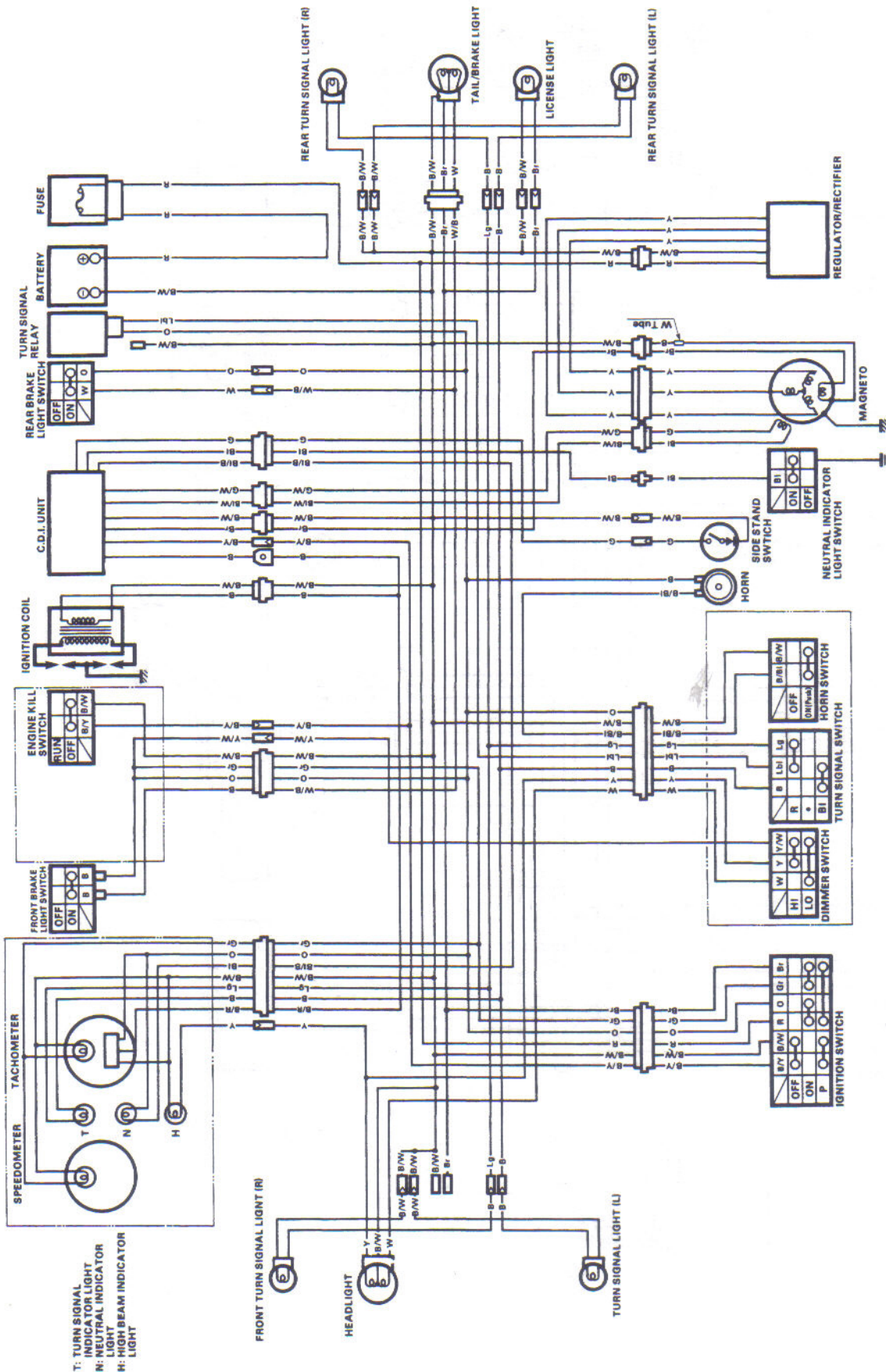
Complaint	Symptom and possible causes	Remedy
Heavy steering.	<ol style="list-style-type: none"> <li>1. Steering stem nut overtightened.</li> <li>2. Broken bearing in steering stem.</li> <li>3. Distorted steering stem.</li> <li>4. Not enough pressure in tires.</li> </ol>	<p>Adjust.</p> <p>Replace.</p> <p>Replace.</p> <p>Adjust.</p>
Wobbly handle.	<ol style="list-style-type: none"> <li>1. Loss of balance between right and left front forks.</li> <li>2. Distorted front fork.</li> <li>3. Distorted front axle or crooked tire.</li> <li>4. Incorrect front fork air pressure.</li> </ol>	<p>Replace.</p> <p>Repair or replace.</p> <p>Replace.</p> <p>Adjust.</p>
Wobbly front wheel.	<ol style="list-style-type: none"> <li>1. Distorted wheel rim.</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. Incorrect front fork oil or air pressure.</li> </ol>	<p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Retighten.</p> <p>Adjust.</p>
Front suspension too soft.	<ol style="list-style-type: none"> <li>1. Weakened spring.</li> <li>2. Not enough fork oil.</li> </ol>	<p>Replace.</p> <p>Refill.</p>
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. Incorrect air pressure in front fork.</li> </ol>	<p>Replace.</p> <p>Drain excess oil.</p> <p>Adjust.</p>
Noisy front suspension.	<ol style="list-style-type: none"> <li>1. Not enough fork oil.</li> <li>2. Loose nuts on suspension.</li> </ol>	<p>Refill.</p> <p>Retighten.</p>
Wobbly rear wheel.	<ol style="list-style-type: none"> <li>1. Distorted wheel rim.</li> <li>2. Worn-down rear wheel bearings or swingarm bearings.</li> <li>3. Defective or incorrect tire.</li> <li>4. Worn swingarm and rear cushion related bearings.</li> <li>5. Loose nuts or bolts on rear suspension.</li> <li>6. Loose nut on axle.</li> </ol>	<p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Retighten.</p> <p>Retighten.</p>
Rear suspension too soft.	<ol style="list-style-type: none"> <li>1. Weakened shock absorber spring.</li> <li>2. Rear suspension adjuster improperly set.</li> <li>3. Oil leakage of shock absorber.</li> </ol>	<p>Replace.</p> <p>Adjust.</p> <p>Replace.</p>
Rear suspension too stiff.	<ol style="list-style-type: none"> <li>1. Rear suspension adjuster improperly set.</li> <li>2. Shock absorber shaft bent.</li> <li>3. Swingarm bent.</li> <li>4. Worn swingarm and rear cushion related bearings.</li> </ol>	<p>Adjust.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p>
Noisy rear suspension.	<ol style="list-style-type: none"> <li>1. Loose nuts or bolts on rear suspension.</li> <li>2. Worn swingarm and rear cushion related bearings.</li> </ol>	<p>Retighten.</p> <p>Replace.</p>

**BRAKES**

Complaint	Symptom and possible causes	Remedy
Poor braking.	<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> </ol>	Refill to level mark. Bleed air out. Replace.
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 entered into hydraulic system.</li> </ol>	Repair or replace. Replace. Clean disc and pads. Replace. 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 bearings.</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> <li>8. Wrongly fixed pad retainer.</li> <li>9. Caliper binding on caliper axles.</li> </ol>	Repair surface with sandpaper. Modify pad fitting. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder. Set correctly. Clean and lubricate.
Excessive brake lever stroke.	<ol style="list-style-type: none"> <li>1. Air entered into hydraulic system.</li> <li>2. Insufficient brake fluid.</li> <li>3. Improper quality of brake fluid.</li> </ol>	Bleed air. Replenish fluid to specified level; bleed air. 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. Replace. Replace piston and/or cup.

# WIRING DIAGRAM

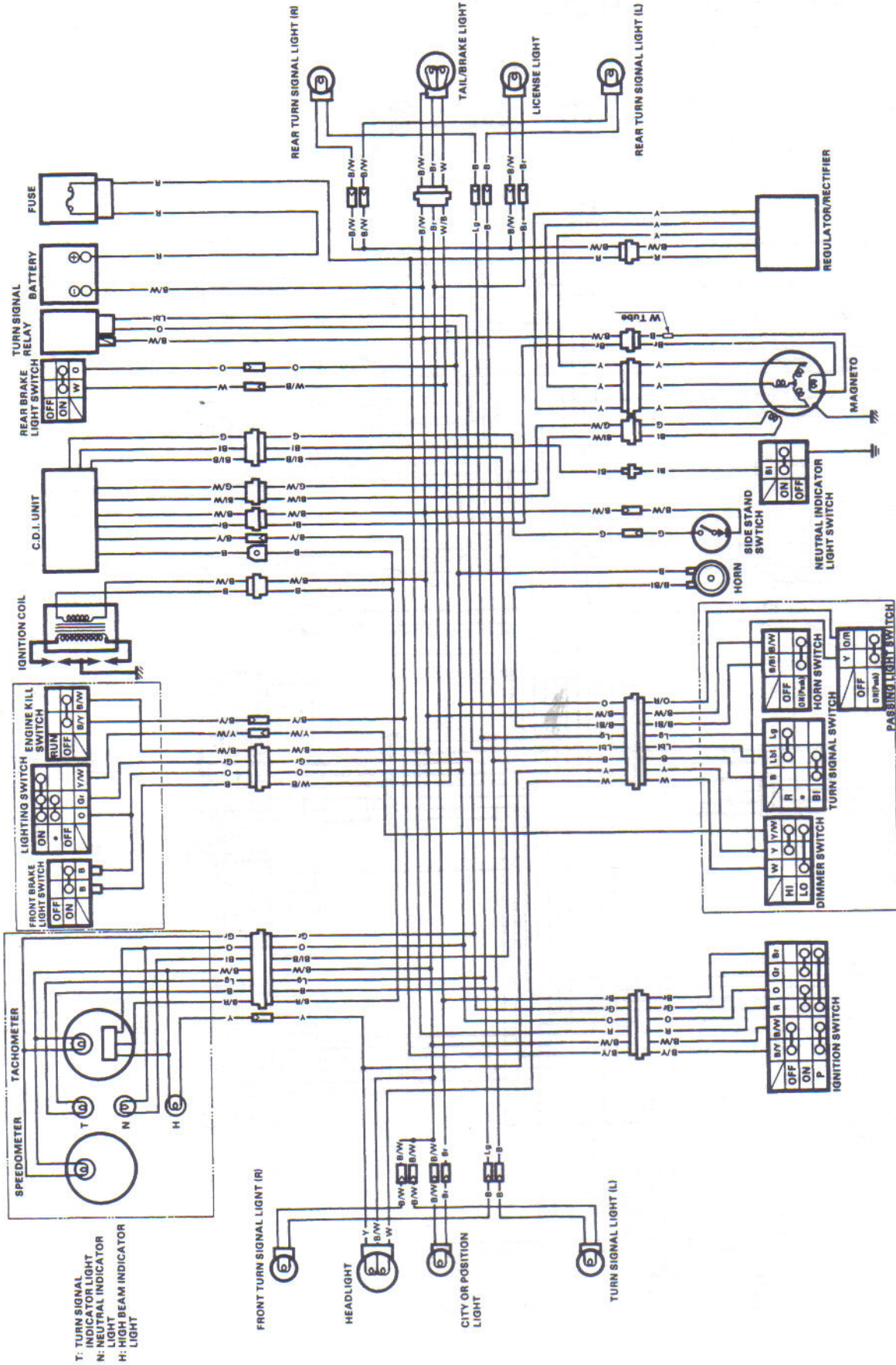
## DR650S (FOR U.S.A. AND CANADA)



- WIRE COLOR**
- B . . . . . Black
  - Bl . . . . . Blue
  - Br . . . . . Brown
  - G . . . . . Green
  - Gr . . . . . Gray
  - Lbl . . . . . Light blue
  - Lg . . . . . Light green
  - O . . . . . Orange
  - R . . . . . Red
  - W . . . . . White
  - Y . . . . . Yellow
  - B/Bl . . . . . Black with Blue tracer
  - B/R . . . . . Black with Red tracer
  - B/W . . . . . Black with White tracer
  - B/Y . . . . . Black with Yellow tracer
  - Bl/B . . . . . Blue with Black tracer
  - Bl/W . . . . . Blue with White tracer
  - G/W . . . . . Green with White tracer
  - O/R . . . . . Orange with Red tracer
  - W/B . . . . . White with Black tracer
  - Y/W . . . . . Yellow with White tracer



DR650R (EXCEPT FOR U.S.A. AND CANADA)

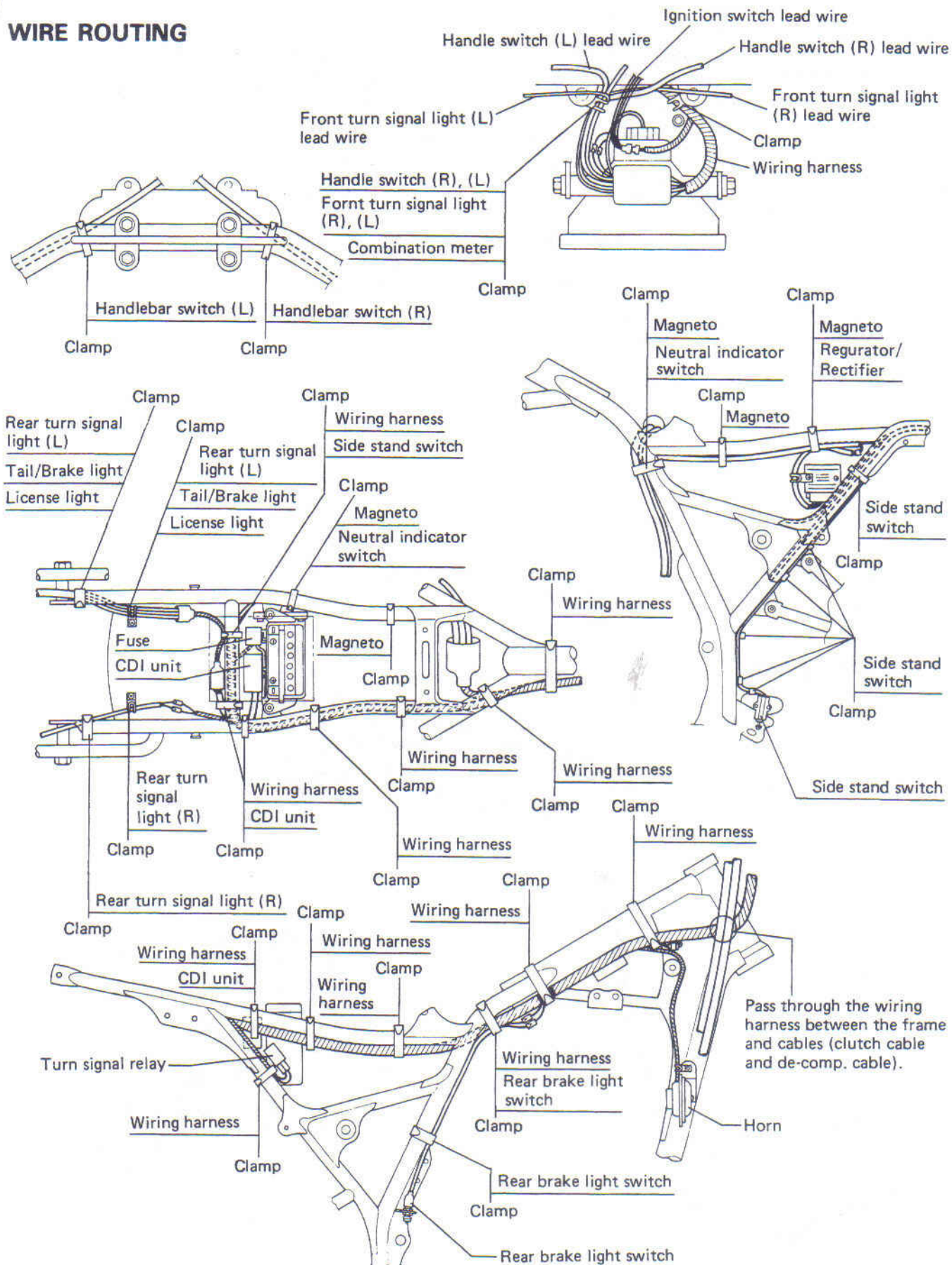


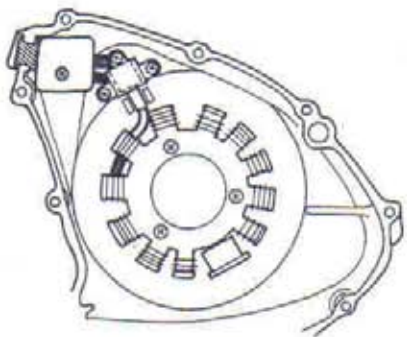
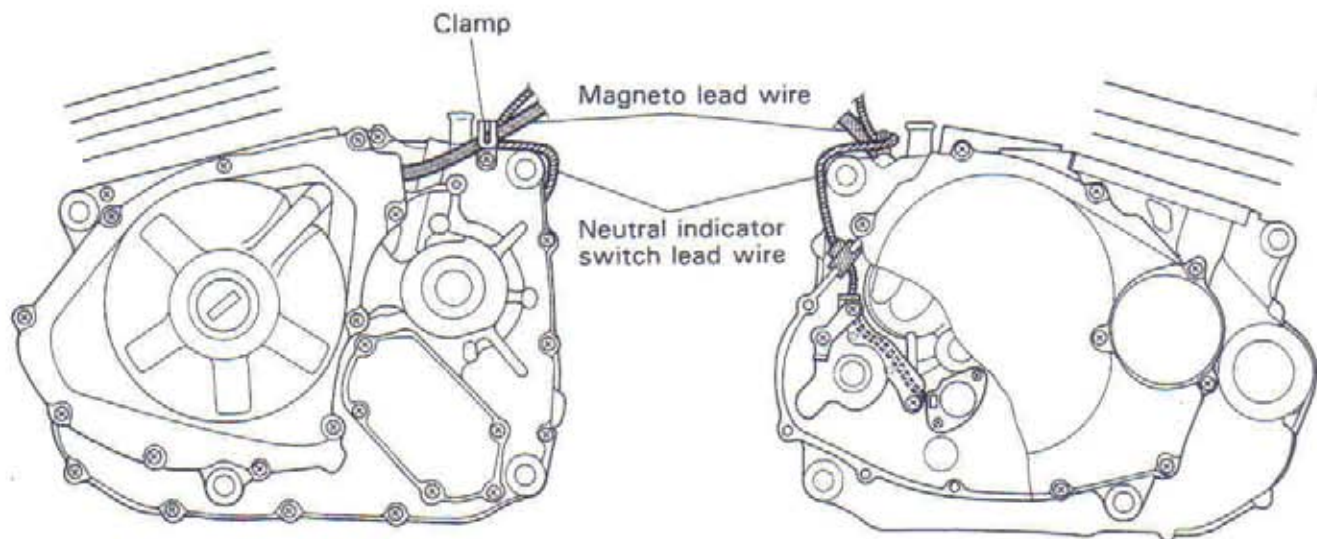
T: TURN SIGNAL INDICATOR LIGHT  
 N: NEUTRAL INDICATOR LIGHT  
 H: HIGH BEAM INDICATOR LIGHT

- WIRE COLOR**
- B . . . . . Black
  - Bl . . . . . Blue
  - Br . . . . . Brown
  - G . . . . . Green
  - Gr . . . . . Gray
  - Lbl . . . . . Light blue
  - Lg . . . . . Light green
  - O . . . . . Orange
  - R . . . . . Red
  - W . . . . . White
  - Y . . . . . Yellow
  - B/Bl . . . . . Black with Blue tracer
  - B/R . . . . . Black with Red tracer
  - B/W . . . . . Black with White tracer
  - B/Y . . . . . Black with Yellow tracer
  - Bl/B . . . . . Blue with Black tracer
  - Bl/W . . . . . Blue with White tracer
  - G/W . . . . . Green with White tracer
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  - W/B . . . . . White with Black tracer
  - Y/W . . . . . Yellow with White tracer

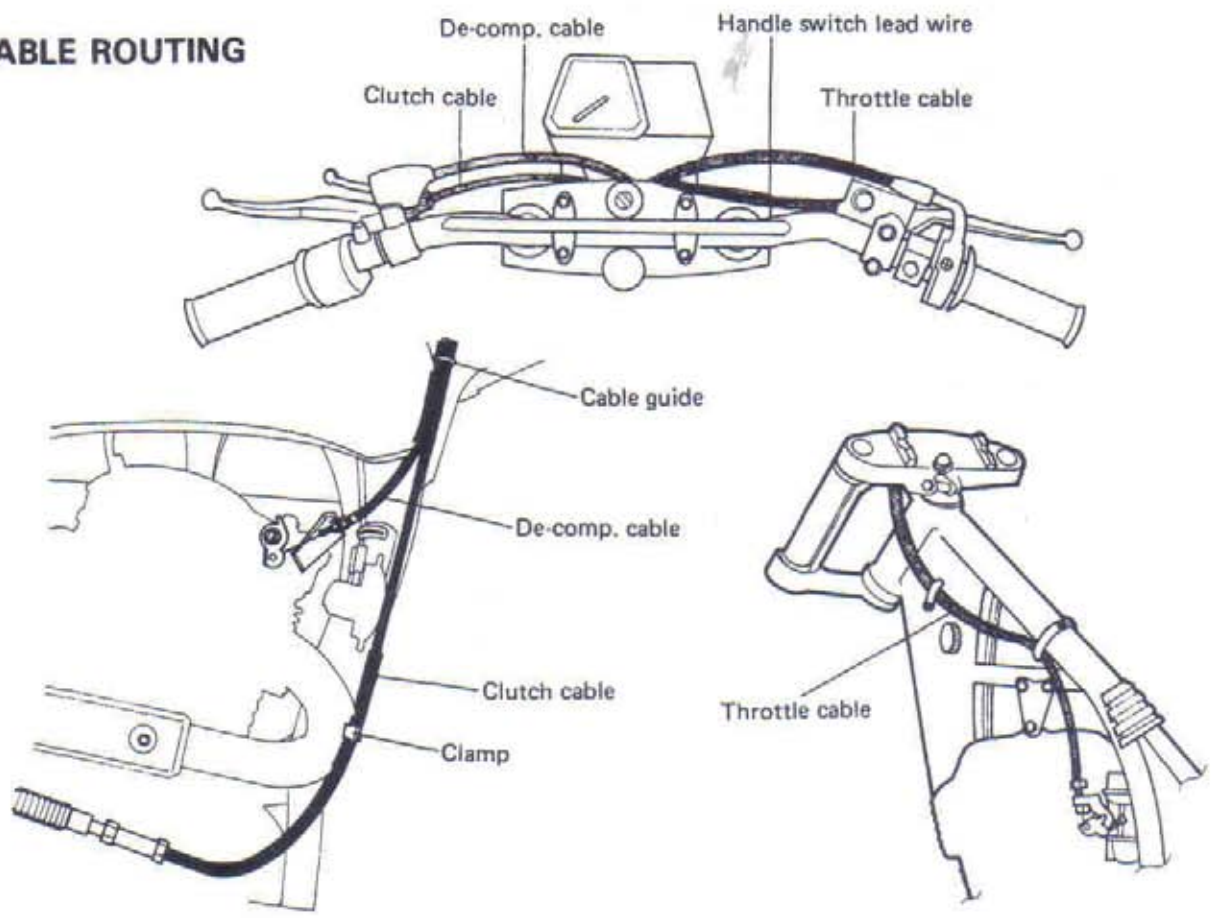
# WIRE, CABLE AND HOSE ROUTING

## WIRE ROUTING

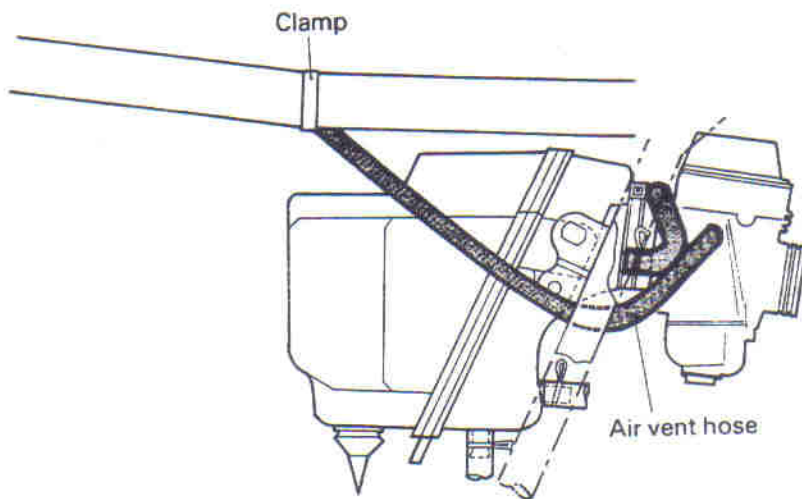
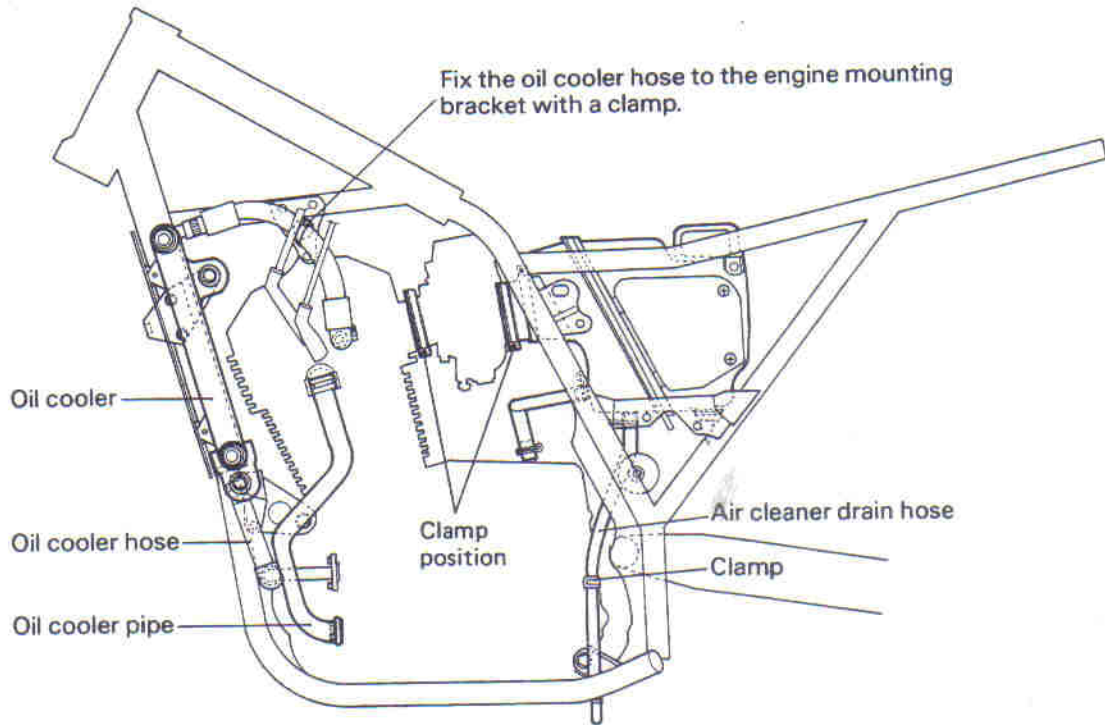
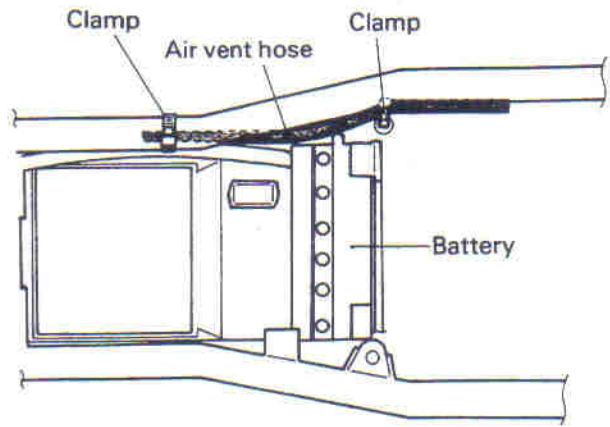


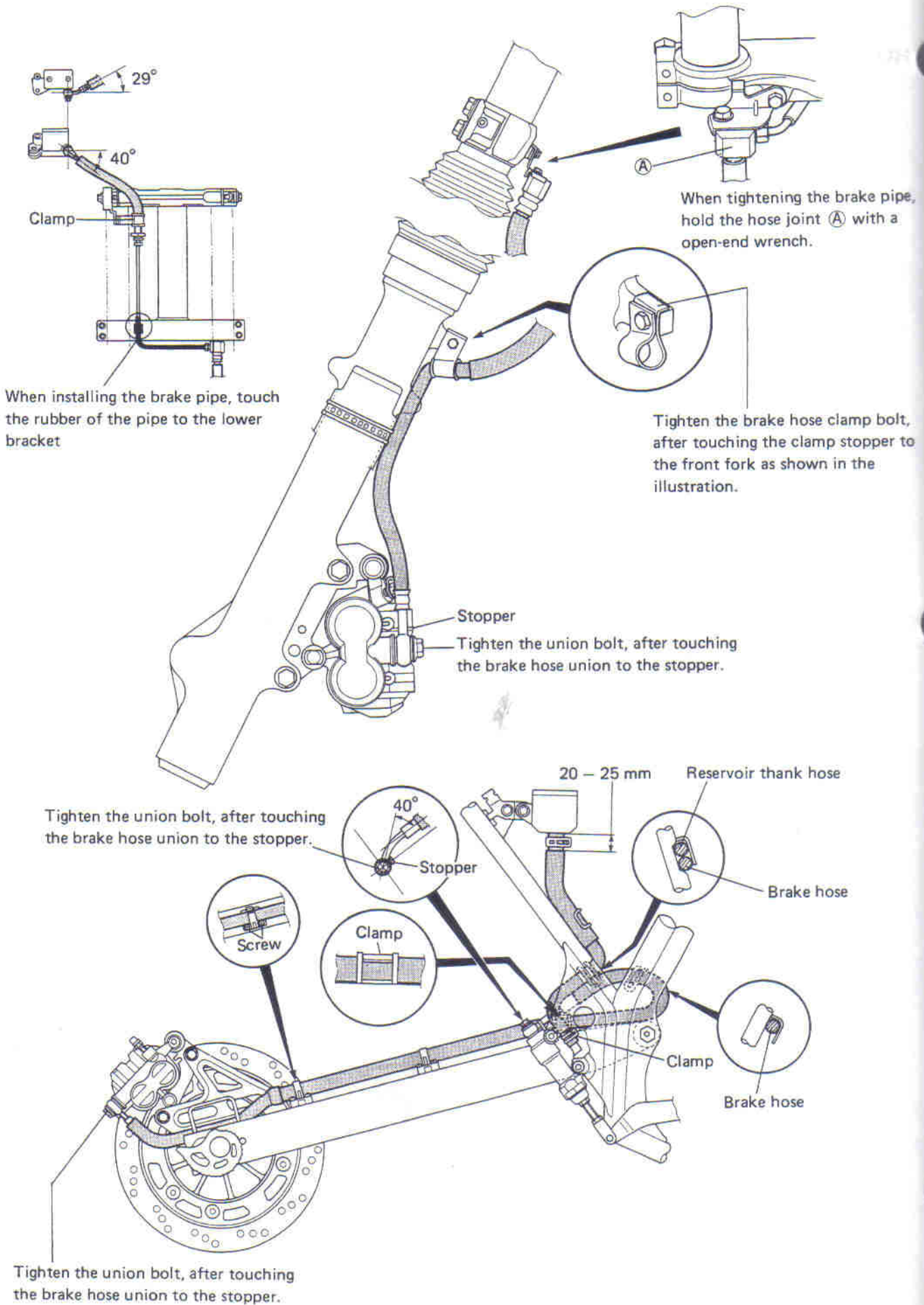


**CABLE ROUTING**

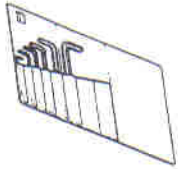

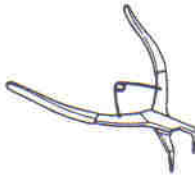

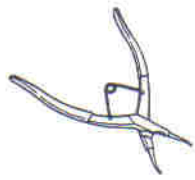











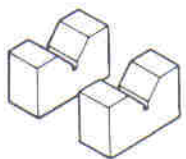











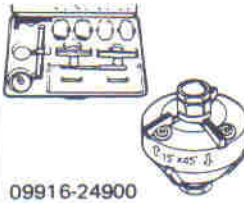



# HOSE ROUTING




















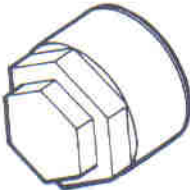








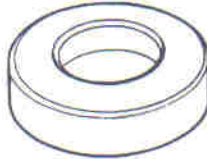





# SPECIAL TOOLS

 <p>09900-00401 "L" type hexagon wrench set</p>	 <p>09900-00410 Hexagon bit wrench set</p>	 <p>09900-06105 Snap ring pliers</p>	 <p>09900-06107 Snap ring pliers</p>	 <p>09900-06108 Snap ring pliers</p>
 <p>09900-09003 Impact driver set</p>	 <p>09900-20102 Vernier calipers</p>	 <p>09900-20202 Micrometer (25 - 50 mm)</p>	 <p>09900-20204 Micrometer (75 - 100 mm)</p>	 <p>09900-20205 Micrometer (0 - 25 mm)</p>
 <p>09900-20508 Cylinder bore gauge set 09900-20513 Gauge rod 94 mm</p>	 <p>09900-20605 Dial calipers</p>	 <p>09900-20606 Dial gauge (1/100)</p>	 <p>09900-20701 Magnetic stand</p>	 <p>09900-20803 Thickness gauge</p>
 <p>09900-20805 Tire depth gauge</p>	 <p>09900-21304 V-block (100 mm)</p>	 <p>09900-22301 Plastigauge</p>	 <p>09900-25002 Pocket tester</p>	 <p>09900-28106 Electro tester</p>
 <p>09900-28403 Hydrometer</p>	 <p>09910-20116 Conrod holder</p>	 <p>09911-93710 Stem seal installer attachment</p>	 <p>09913-50121 Oil seal remover</p>	 <p>09913-75830 Bearing remover</p>
 <p>09915-74510 Oil pressure gauge</p>	 <p>09916-14510 Valve spring compressor</p>	 <p>Solid pilot (N-140-7.0)</p>	 <p>09916-24900 Valve seat cutter set Valve seat cutter head N-608, N-212 *See page 3-18</p>	 <p>09916-34541 Reamer handle</p>

**7-15 SERVICING INFORMATION**

 <p>09916-34520 Valve guide reamer (7.0 mm)</p>	 <p>09916-34531 Valve guide reamer (12.3 mm)</p>	 <p>09916-44511 Valve guide remover/ installer</p>	 <p>09916-57311 Valve guide installer attachment</p>	 <p>09916-57321 Valve guide installer handle</p>
 <p>09916-84510 Tweezers</p>	 <p>09917-23711 Ring nut socket wrench</p>	 <p>09920-13120 Crankcase separating tool</p>	 <p>09920-53722 Clutch sleeve hub holder</p>	 <p>09923-73210 Bearing puller</p>
 <p>09924-84511 Bearing installer</p>	 <p>09924-84520 Bearing installer</p>	 <p>09930-30102 Sliding shaft</p>	 <p>09930-30230 Balancer shaft remover</p>	 <p>09930-33720 Rotor remover</p>
 <p>09930-40113 Rotor holder</p>	 <p>09930-44913 Rotor holder</p>	 <p>09940-14920 Steering stem nut wrench</p>	 <p>09940-34520 "T" handle</p>	 <p>09940-34581 Attachment "F" (Front fork disassembling tool)</p>
 <p>09940-50112 Front fork oil seal installer</p>	 <p>09941-34513 Steering race installer</p>	 <p>09941-50110 Bearing remover</p>	 <p>09941-54911 Steering race remover</p>	 <p>09941-74910 Steering bearing installer</p>
 <p>09941-84510 Bearing remover</p>	 <p>09943-74111 Fork oil level gauge</p>	 <p>09910-32812 Crankshaft installer</p>	 <p>09910-32820 Spacer</p>	 <p>09910-32830 Attachment</p>

## TIGHTENING TORQUE

## ENGINE

ITEM	N·m	kg·m	lb·ft
Cylinder head cover bolt	9 – 11	0.9 – 1.1	6.5 – 8.0
Camshaft sprocket bolt	14 – 16	1.4 – 1.6	10.0 – 11.5
Cylinder head bolt 10 mm Diam.	35 – 40	3.5 – 4.0	25.5 – 29.0
Cylinder head nut 8 mm Diam.	23 – 27	2.3 – 2.7	16.5 – 19.5
Cylinder base nut	7 – 11	0.7 – 1.1	5.0 – 8.0
Cam drive chain tensioner fitting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Magneto rotor bolt	150 – 170	15.0 – 17.0	108.5 – 123.0
Balancer drive sprocket ring nut	60 – 100	6.0 – 10.0	43.5 – 72.5
Balancer driven sprocket nut (Front and Rear)	25 – 40	2.5 – 4.0	18.0 – 29.0
Balancer drive chain tensioner sprocket nut	45 – 70	4.5 – 7.0	32.5 – 50.5
Balancer drive chain tensioner allen bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Primary drive gear nut	90 – 110	9.0 – 11.0	65.0 – 79.5
Clutch spring mounting bolt	11 – 13	1.1 – 1.3	8.0 – 9.5
Clutch sleeve hub nut	40 – 60	4.0 – 6.0	29.0 – 43.0
Gearshift arm stopper	15 – 23	1.5 – 2.3	11.0 – 16.5
Engine oil drain plug	20 – 25	2.0 – 2.5	14.5 – 18.0
Oil filter cap nut and oil sump filter cap bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Engine sprocket bolt	4 – 7	0.4 – 0.7	3.0 – 5.0
Engine mounting bolt 8 mm Diam.	37 – 45	3.7 – 4.5	27.0 – 32.5
Engine mounting bolt 10 mm Diam.	85 – 100	8.5 – 10.0	61.5 – 72.5
Exhaust pipe nut	23 – 28	2.3 – 2.8	16.5 – 20.0
Muffler mounting bolt	23 – 28	2.3 – 2.8	16.5 – 20.0



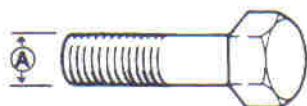
## CHASSIS

ITEM	N-m	kg-m	lb-ft
Front axle nut	36 – 52	3.6 – 5.2	26.0 – 37.5
Front axle pinch bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Front fork damper rod bolt	34 – 46	3.4 – 4.6	24.5 – 33.5
Front fork lower clamp bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Front fork upper clamp bolt	25 – 39	2.5 – 3.9	18.0 – 28.0
Front fork cap bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Steering stem head clamp nut	18 – 28	1.8 – 2.8	13.0 – 20.0
Steering stem head bolt	35 – 55	3.5 – 5.5	25.5 – 40.0
Handlebar clamp bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Handlebar holder nut	20 – 30	2.0 – 3.0	14.5 – 21.5
Front brake master cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Front brake caliper mounting bolt	20 – 31	2.0 – 3.1	14.5 – 22.5
Front brake caliper axle bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Brake hose union bolt (Front & Rear)	20 – 25	2.0 – 2.5	14.5 – 18.0
Brake air bleeder valve (Front & Rear)	6 – 9	0.6 – 0.9	4.5 – 6.5
Front brake disc mounting bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Swingarm pivot nut	61 – 94	6.1 – 9.4	44.0 – 68.0
Front footrest bolt	27 – 43	2.7 – 4.3	19.5 – 31.0
Rear brake disc mounting bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Rear brake caliper mounting bolt	20 – 31	2.0 – 3.1	14.5 – 22.5
Rear brake master cylinder mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Rear brake rod lock nut	15 – 20	1.5 – 2.0	11.0 – 14.5
Rear shock absorber nut (Upper & Lower)	48 – 72	4.8 – 7.2	34.5 – 52.0
Rear cushion lever nut (Front)	60 – 96	6.0 – 9.6	43.5 – 69.5
Rear cushion lever nut (Center)	84 – 120	8.4 – 12.0	60.5 – 87.0
Rear cushion rod bolt	84 – 120	8.4 – 12.0	60.5 – 87.0
Rear axle nut	50 – 80	5.0 – 8.0	36.0 – 58.0
Rear sprocket mounting nut	22 – 32	2.2 – 3.2	16.0 – 23.0
Spoke nipple (Front & Rear)	4 – 5	0.4 – 0.5	3.0 – 3.5

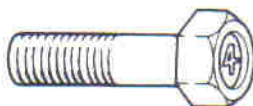
## TIGHTENING TORQUE CHART

For other bolts and nuts not listed prescribed, refer to this chart:

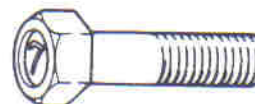
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg·m	lb·ft	N·m	kg·m	lb·ft
4	1.0 – 2.0	0.1 – 0.2	0.7 – 1.5	1.5 – 3.0	0.15 – 0.3	1.0 – 2.0
5	2.0 – 4.0	0.2 – 0.4	1.5 – 3.0	3.0 – 6.0	0.3 – 0.6	2.0 – 4.5
6	4.0 – 7.0	0.4 – 0.7	3.0 – 5.0	8.0 – 12.0	0.8 – 1.2	6.0 – 8.5
8	10.0 –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



Conventional bolt



"4" marked bolt



"7" marked bolt

## SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	32.4 (1.3)	—
	EX.	28 (1.1)	—
Valve lift	IN.	9 (0.4)	—
	EX.	9 (0.4)	—
Valve clearance (when engine is cold)	IN. & EX.	0.08—0.13 (0.003—0.005)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	0.35 (0.014)
	EX.	0.040—0.070 (0.0016—0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	4.3 (0.17)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.5 (1.40)
	OUTER	—	40.3 (1.59)
Valve spring tension (IN. & EX.)	INNER	7.0—8.5 kg (15.4—18.7 lbs) at length 31 (1.2)	—
	OUTER	16.4—18.8 kg (36.2—41.4 lbs) at length 33 (1.3)	—

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.529–36.569 (1.4381–1.4397)	36.230 (1.4264)
	EX.	36.755–36.795 (1.4470–1.4486)	36.460 (1.4354)
Camshaft journal oil clearance	0.032–0.066 (0.0013–0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	Right & Center	25.012–25.025 (0.9847–0.9852)	—
	Left	20.012–20.025 (0.7879–0.7884)	—
Camshaft journal O.D.	Right & Center	24.959–24.980 (0.9826–0.9835)	—
	Left	19.959–19.980 (0.7858–0.7866)	—
Camshaft runout	—		0.10 (0.004)
Cam chain 20-pitch length	—		129 (5.1)
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.966–11.984 (0.4711–0.4718)	—
Cylinder head distortion	—		0.05 (0.002)
Cylinder head cover distortion	—		0.05 (0.002)
De-compression lever play	0		—

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Piston to cylinder clearance	0.055–0.082 (0.0024–0.0030)		0.120 (0.0047)
Cylinder bore	95.000–95.015 (3.7402–3.7407)		95.065 (3.7427)
Piston diam.	94.925–94.945 (3.7372–3.7380) Measure at 20 (0.8) from the skirt end.		94.880 (3.7354)
Cylinder distortion	—		0.05 (0.002)
Piston ring free end gap	1st	T	Approx. 12.0 (0.47)
	2nd	T	Approx. 12.0 (0.47)
Piston ring end gap	1st	0.30–0.45 (0.012–0.018)	
	2nd	0.25–0.40 (0.010–0.016)	

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width	1st	1.210–1.240 (0.0476–0.0488)	—
	2nd	1.210–1.230 (0.0476–0.0484)	—
	Oil	2.81–2.83 (0.1106–0.1114)	—
Piston ring thickness	1st	1.170–1.185 (0.0461–0.0467)	—
	2nd	1.170–1.185 (0.0461–0.0467)	—
Piston pin bore	23.000–23.006 (0.9055–0.9057)		23.030 (0.9067)
Piston pin O.D.	22.996–23.006 (0.9054–0.9057)		22.980 (0.9047)

**CONROD + CRANKSHAFT + BALANCER**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	23.006–23.014 (0.9057–0.9061)	23.040 (0.9071)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.15–0.60 (0.006–0.024)	1.00 (0.039)
Conrod big end width	24.95–25.00 (0.982–0.984)	—
Crankshaft runout	—	0.05 (0.002)
Crank web to web width	71.0 ± 0.1 (2.795 ± 0.004)	—
Balancer chain 20-pitch length	—	158 (6.2)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.688 (66/30 x 24/18 x 22/24)	—
Oil pressure (at 60°C, 140°F)	Above 30 kPa (0.3 kg/cm <sup>2</sup> , 4.3 psi) Below 70 kPa (0.7 kg/cm <sup>2</sup> , 10.0 psi) at 3 000 r/min.	—

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2–3 (0.08–0.12)	—

ITEM	STANDARD		LIMIT
	Drive plate thickness	No.1	
No.2		3.45-3.55 (0.136-0.140)	3.15 (0.124)
Drive plate claw width	15.8-16.0 (0.62-0.63)		15.0 (0.59)
Driven plate distortion	—		0.10 (0.004)
Clutch spring free length	—		34.0 (1.34)

Unit: mm (in) Except ratio

**TRANSMISSION + DRIVE CHAIN**

ITEM		STANDARD	LIMIT
Primary reduction ratio		2.200 (66/30)	—
Final reduction ratio		2.625 (42/16)	—
Gear ratios	Low	2.416 (29/12)	—
	2nd	1.625 (26/16)	—
	3rd	1.263 (24/19)	—
	4th	1.000 (21/21)	—
	Top	0.826 (19/23)	—
Shift fork to groove clearance		0.10-0.30 (0.004-0.012)	0.50 (0.020)
Shift fork groove width		5.0-5.1 (0.197-0.200)	—
Shift fork thickness		4.8-4.9 (0.189-0.193)	—
Drive chain	Type	TAKASAGO: RK520SD DAIDO: DID520VC-5	—
	Links	114	—
	20-pitch length	—	319.4 (12.57)
Drive chain slack		20-40 (0.8-1.6)	—

**CARBURETOR**

ITEM	SPECIFICATION					
	E-02,04, 15,21,25, 34,53,	E-16, 17,28	E-22	E-24,39	U-type of E-22	E-18
Carburetor type	MIKUNI BST40SS	←	←	←	←	←
Bore size	40 mm	←	←	←	←	←
I.D. No	15A7	15A3	15A4	14A9	15A5	15A6
Idle r/min.	1400 ± 100 r/min	←	←	←	←	1400 ± 50 r/min
Float height	14.7 ± 1.0 mm (0.58 ± 0.04 in)	←	←	←	←	←

ITEM		SPECIFICATION					
Main jet	(M.J.)	# 142.5	←	←	←	←	# 147.5
Main air jet	(M.A.J.)	0.7 mm	←	←	←	←	←
Jet needle	(J.N.)	6H12-3rd	←	←	←	6J8-3rd	6F87-3rd
Needle jet	(N.J.)	X-9	←	←	←	←	←
Throttle valve	(Th.V.)	# 110	←	←	←	←	←
Pilot jet	(P.J.)	# 50	←	←	←	# 47.5	←
By-pass	(B.P.)	0.8 mm	←	←	←	←	←
Pilot outlet	(P.O.)	0.8 mm	←	←	←	←	←
Valve seat	(V.S.)	2.3 mm	←	←	←	←	←
Starter jet	(G.S.)	# 35	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (1¼ turns back)	←	PRE-SET (1½ turns back)	←	PRE-SET (1¼ turns back)	PRE-SET (1¾ turns back)
Pilot air jet	(P.A.J.)	1.4 mm	←	←	←	←	←
Throttle cable play		0.5– 1.0 mm (0.02– 0.04 in)	←	←	←	←	←
Choke cable play		0.5– 1.0 mm (0.02– 0.04 in)	←	←	←	←	←

## CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST40SS	←
Bore size	40 mm	←
I.D. No.	14A7	14A8
Idle r/min.	1400 ± 100 r/min	←
Float height	14.7 ± 1.0 mm (0.58 ± 0.04 in)	←
Main jet	(M.J.) # 147.5	←
Main air jet	(M.A.J.) 0.7 mm	←
Jet needle	(J.N.) 6G6-3rd	←
Needle jet	(N.J.) X-9	←
Throttle valve	(Th.V.) # 110	←
Pilot jet	(P.J.) # 47.5	←
By-pass	(B.P.) 0.8 mm	←
Pilot outlet	(P.O.) 0.8 mm	←
Valve seat	(V.S.) 2.3 mm	←
Starter jet	(G.S.) # 35	←
Pilot screw	(P.S.) PRE-SET	←
Pilot air jet	(P.A.J.) 1.3 mm	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←
Choke cable play	0.5–1.0 mm (0.02–0.04 in)	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		0° B.T.D.C. Below 2 200 r/min. and 28° B.T.D.C. Above 4 300 r/min.		
Spark plug	Type	ND.: X27EP-U9 N.G.K.: DP9EA-9		E-03,33,34
		ND.: X27EPR-U9 N.G.K.: DPR9EA-9		The others
	Gap	0.8–0.9 (0.03–0.04)		
Spark performance		Over 8 (0.3) at 1 atm.		
Ignition coil resistance	Primary	0.1–1.0 Ω		B–B/W
	Secondary	23–35 kΩ		Plug cap– Plug cap
Magneto coil resistance	Charging	0.1–1.5 Ω		Y–Y
	Power source	240–360 Ω		Br–B
	Pick-up	160–240 Ω		Bl–G
Generator no-load voltage		More than 65 V(AC) at 5 000 r/min.		
Regulated voltage		13.5–15.5 V at 5 000 r/min.		
Battery	Type designation	12N5-3B		
	Capacity	12V 18 kC (5Ah)/10 HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		15 A		

**WATTAGE**

Unit:W

ITEM		SPECIFICATION		
		E-03,24,28,33	E-02	The others
Headlight	HI	60	←	←
	LO	55	←	←
Parking or position light			3.4	4
Tail/Brake light		8/23	5/21	←
Turn signal light		23	21	←
Tachometer light		3	←	←
Speedometer light		3.4	←	←
Turn signal indicator light		3	←	←
Hight beam indicator light		1.7	←	←
Neutral indicator light		3	←	←
License light		5	←	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Brake lever play	0–0.3 (0–0.01)	—
Rear brake pedal height	5 (0.2)	—



ITEM	STANDARD		LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	14.000–14.043 (0.5512–0.5529)	—
	Rear	14.000–14.043 (0.5512–0.5529)	—
Master cylinder piston diam.	Front	13.957–13.984 (0.5495–0.5506)	—
	Rear	13.957–13.984 (0.5495–0.5506)	—
Brake caliper cylinder bore	Front	32.030–32.106 (1.2610–1.2640)	—
	Rear	27.000–27.076 (1.0630–1.0660)	—
Brake caliper piston diam.	Front	31.950–32.000 (1.2578–1.2598)	—
	Rear	26.920–26.970 (1.0598–1.0618)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	90/90-21 54S	—
	Rear	120/90-17 64S	—
Tire tread depth	Front	—	3.0 (0.12)
	Rear	—	3.0 (0.12)

## SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	240 (9.4)	—	
Front fork spring free length	—	468 (18.4)	
Front fork oil level (compress inner tube without spring)	142 (5.6)	—	
Front fork air pressure	0 kPa (0 kg/cm <sup>2</sup> )	—	
Rear shock absorber spring pre-set length	240.5 (9.5)	—	

ITEM	STANDARD	LIMIT	NOTE
Rear wheel travel	220 (8.7)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

**TIRE PRESSURE**

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	150	1.50	22	175	1.75	25
REAR	175	1.75	25	200	2.00	29

**FUEL + OIL**

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03
	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.	E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.	The others
Fuel tank including reserve	21.0 L (5.5/4.6 US/lmp gal)	
reserve	4.5 L (1.2/1.0 US/lmp gal)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change	2 000 ml (2.1/1.8 US/lmp qt)
	Filter change	2 150 ml (2.3/1.9 US/lmp qt)
	Overhaul	2 600 ml (2.7/2.3 US/lmp qt)
Front fork oil type	Fork oil # 10	
Front fork oil capacity (each leg)	566 ml (19.1/19.9 US/lmp oz)	
Brake fluid type	DOT 4	

# **EMISSION CONTROL INFORMATION**

## **CONTENTS**

<b>EMISSION CONTROL CARBURETOR COMPONENTS.....</b>	<b>8- 1</b>
<b>EVAPORATIVE EMISSION CONTROL SYSTEM.....</b>	<b>8- 2</b>
<b>CANISTER HOSE ROUTING.....</b>	<b>8- 3</b>

## EMISSION CONTROL CARBURETOR COMPONENTS

DR650S motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

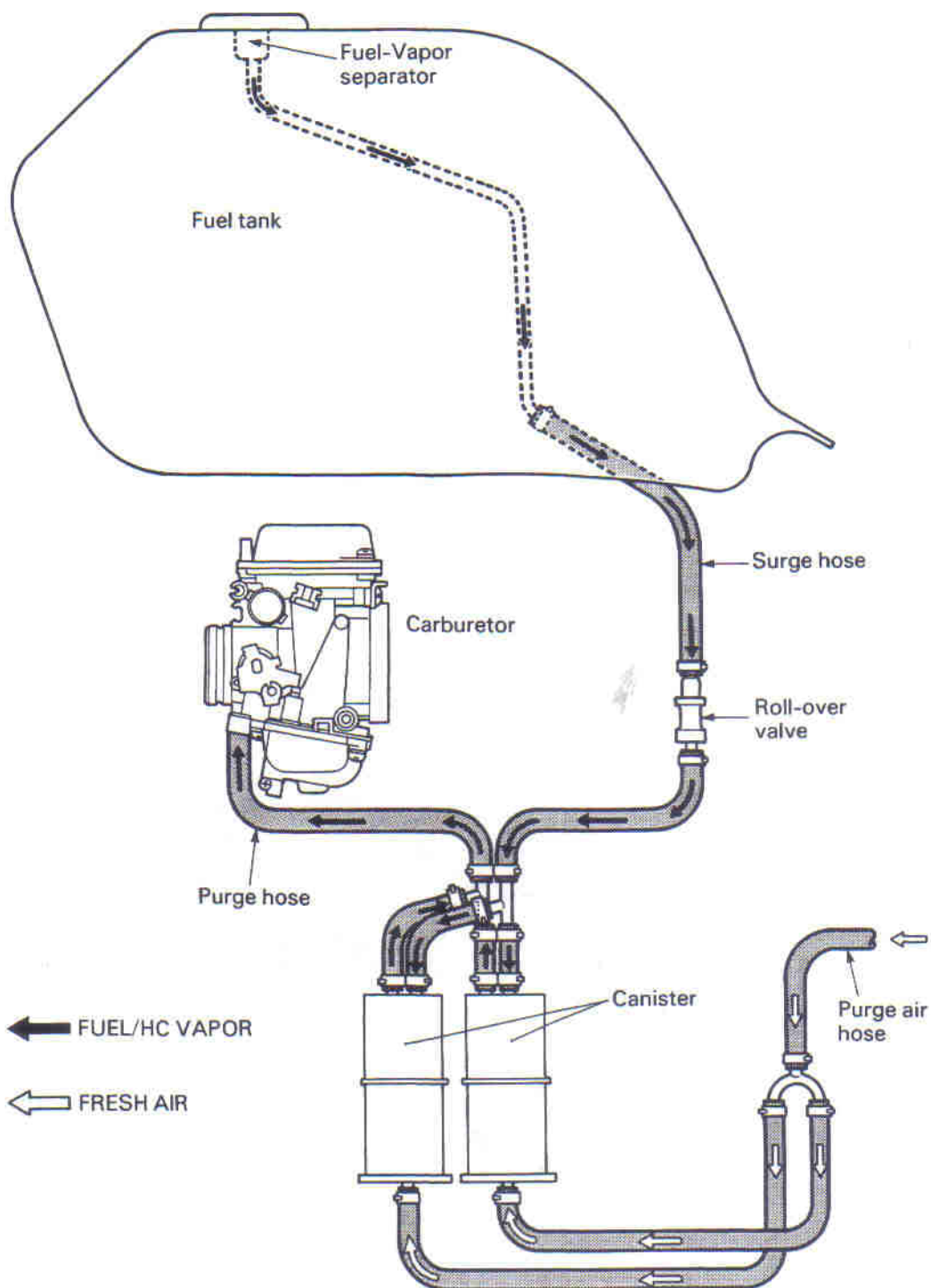
Conventional Figures Used on Standard Tolerance Jet Components	1	2	3	4	5	6	7	8	9	0
Emission Type Figures Used On Close Tolerance jet Components	1	2	3	4	5	6	7	8	9	0

The carburetor specification for the emission-controlled DR650S are as follows.

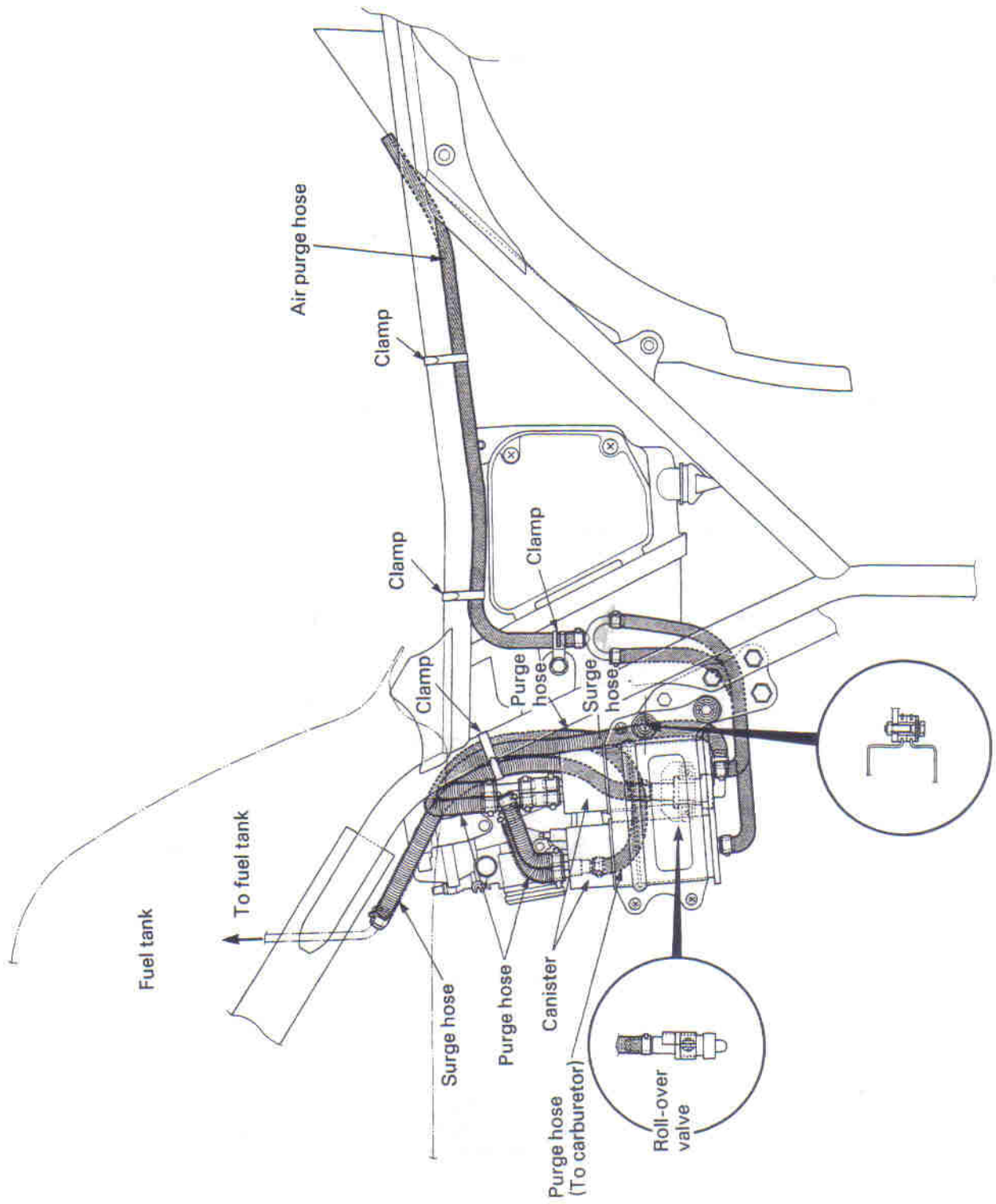
Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
14A8 (California model)	# 147.5	X-9	6G6-3rd	#47.5	PRE-SET DO NOT ADJUST
14A7 (Other state models)					

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

# EVAPORATIVE EMISSION CONTROL SYSTEM (Only for California model)



# CANISTER HOSE ROUTING (Only for California model)



# **DR650SM ('91-MODEL)**

## **CONTENTS**

<b>SPECIFICATIONS</b> .....	<b>9- 1</b>
<b>SERVICE DATA</b> .....	<b>9- 2</b>
<b>HOSE AND CORD ROUTING</b> .....	<b>9-10</b>

## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length	2 285 mm (90.0 in)
	E15,16,17,18,22
	2 240 mm (88.2 in)...Others
Overall width	870 mm (34.3 in)
Overall height	1 315 mm (51.8 in)
Wheelbase	1 510 mm (59.4 in)
Seat height	890 mm (35.0 in)
Ground clearance	260 mm (10.2 in)
Dry mass	152 kg (335 lbs)

### ENGINE

Type	Four-stroke, air-cooled, OHC
Number of cylinders	1
Bore	95.0 mm (3.740 in)
Stroke	90.4 mm (3.559 in)
Piston displacement	640 cm <sup>3</sup> (39.0 cu. in)
Compression ratio	9.7 : 1
Carburetor	MIKUNI BST40, single
Air cleaner	Polyurethane foam element
Starter system	Primary kick
Lubrication system	Wet sump

### TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	2.200 (66/30)
Final reduction	2.625 (42/16)
Gear ratios, Low	2.416 (29/12)
2nd	1.625 (26/16)
3rd	1.263 (24/19)
4th	1.000 (21/21)
Top	0.826 (19/23)
Drive chain	TAKASAGO RK520SO or DAIDO D.I.D. 520VC-5, 114 links

### ELECTRICAL

Ignition type	SUZUKI "PEI" (CDI)
Ignition timing	0° B.T.D.C. Below 2 200 r/min and 28° B.T.D.C. Above 4 300 r/min
Spark plug	NGK DP9EA-9 or NIPPON DENSO X27EP-U9 (For Italy and U.S.A.) NGK DPR9EA-9 or NIPPON DENSO X27EPR- U9 (For others)
Battery	12V 18 kC (5 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	15A

### CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil damped
Rear suspension	Full floating suspension, coil spring, gas/oil damped, spring preload fully adjustable
Steering angle	45° (Right & Left)
Caster	61°
Trail	120 mm (4.7 in)
Turning radius	2.4 m (7.9 ft)
Front brake	Disc
Rear brake	Disc
Front tire size	90/90-21 54S
Rear tire size	120/90-17 64S

### CAPACITIES

Fuel tank	
including reserve	21 L (5.5/4.6 US/Imp gal)
reserve	4.5 L (1.2/1.0 US/Imp gal)
Engine oil	2.0 L (2.1/1.8 US/Imp qt)
Front fork oil	566 ml (19.1/19.9 US/ Imp oz)

These specifications are subject to change without notice.



# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	32.4 (1.3)	—
	EX.	28 (1.1)	—
Valve lift	IN.	9 (0.4)	—
	EX.	9 (0.4)	—
Valve clearance (when engine is cold)	IN. & EX.	0.08–0.13 (0.003–0.005)	—
Valve guide to valve stem clearance	IN.	0.025–0.055 (0.0010–0.0022)	0.35 (0.014)
	EX.	0.040–0.070 (0.0016–0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000–7.015 (0.2756–0.2762)	—
Valve stem O.D.	IN.	6.960–6.975 (0.2740–0.2746)	—
	EX.	6.945–6.960 (0.2734–0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	4.3 (0.17)
Valve seat width	IN. & EX.	1.0–1.2 (0.04–0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.5 (1.40)
	OUTER	—	40.3 (1.59)
Valve spring tension (IN. & EX.)	INNER	7.0–8.5 kg (15.4–18.7 lbs) at length 31 (1.2)	—
	OUTER	16.4–18.8 kg (36.2–41.4 lbs) at length 33 (1.3)	—

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.529–36.569 (1.4381–1.4397)	36.230 (1.4264)
	EX.	36.755–36.795 (1.4470–1.4486)	36.460 (1.4354)
Camshaft journal oil clearance	0.032–0.066 (0.0013–0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	Right & Center	25.012–25.025 (0.9847–0.9852)	—
	Left	20.012–20.025 (0.7879–0.7884)	—
Camshaft journal O.D.	Right & Center	24.959–24.980 (0.9826–0.9835)	—
	Left	19.959–19.980 (0.7858–0.7866)	—
Camshaft runout	—		0.10 (0.004)
Cam chain 20-pitch length	—		129 (5.1)
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.966–11.984 (0.4711–0.4718)	—
Cylinder head distortion	—		0.05 (0.002)
Cylinder head cover distortion	—		0.05 (0.002)
De-compression lever play	0		—

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT
Piston to cylinder clearance	0.055–0.082 (0.0024–0.0030)		0.120 (0.0047)
Cylinder bore	95.000–95.015 (3.7402–3.7407)		95.065 (3.7427)
Piston diam.	94.925–94.945 (3.7372–3.7380) Measure at 20 (0.8) from the skirt end.		94.880 (3.7354)
Cylinder distortion	—		0.05 (0.002)
Piston ring free end gap	1st	T	Approx. 12.0 (0.47)
	2nd	T	Approx. 12.0 (0.47)
Piston ring end gap	1st	0.30–0.45 (0.012–0.018)	
	2nd	0.25–0.40 (0.010–0.016)	

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width	1st	1.210–1.240 (0.0476–0.0488)	—
	2nd	1.210–1.230 (0.0476–0.0484)	—
	Oil	2.81–2.83 (0.1106–0.1114)	—
Piston ring thickness	1st	1.170–1.185 (0.0461–0.0467)	—
	2nd	1.170–1.185 (0.0461–0.0467)	—
Piston pin bore	23.000–23.006 (0.9055–0.9057)		23.030 (0.9067)
Piston pin O.D.	22.996–23.006 (0.9054–0.9057)		22.980 (0.9047)

**CONROD + CRANKSHAFT + BALANCER**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	23.006–23.014 (0.9057–0.9061)	23.040 (0.9071)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.15–0.60 (0.006–0.024)	1.00 (0.039)
Conrod big end width	24.95–25.00 (0.982–0.984)	—
Crankshaft runout	—	0.05 (0.002)
Crank web to web width	71.0 ± 0.1 (2.795 ± 0.004)	—
Balancer chain 20-pitch length	—	158 (6.2)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.688 (66/30 x 24/18 x 22/24)	—
Oil pressure (at 60°C, 140°F)	Above 30 kPa (0.3 kg/cm <sup>2</sup> , 4.3 psi) Below 70 kPa (0.7 kg/cm <sup>2</sup> , 10.0 psi) at 3 000 r/min.	—

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2–3 (0.08–0.12)	—

ITEM	STANDARD		LIMIT
Drive plate thickness	No.1	2.72–2.88 (0.107–0.113)	2.42 (0.095)
	No.2	3.45–3.55 (0.136–0.140)	3.15 (0.124)
Drive plate claw width	15.8–16.0 (0.62–0.63)		15.0 (0.59)
Driven plate distortion	—		0.10 (0.004)
Clutch spring free length	—		34.0 (1.34)

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Primary reduction ratio	2.200 (66/30)		—
Final reduction ratio	2.625 (42/16)		—
Gear ratios	Low	2.416 (29/12)	—
	2nd	1.625 (26/16)	—
	3rd	1.263 (24/19)	—
	4th	1.000 (21/21)	—
	Top	0.826 (19/23)	—
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)		0.50 (0.020)
Shift fork groove width	5.0–5.1 (0.197–0.200)		—
Shift fork thickness	4.8–4.9 (0.189–0.193)		—
Drive chain	Type	TAKASAGO: RK520SD DAIDO: DID520VC-5	—
	Links	114	—
	20-pitch length	—	319.4 (12.57)
Drive chain slack	20–40 (0.8–1.6)		—

**CARBURETOR**

ITEM	SPECIFICATION					
	E-02,04, 15,21,25, 34,53,	E-16, 17,28	E-22	E-24,39	U-type of E-22	E-18
Carburetor type	MIKUNI BST40SS	←	←	←	←	←
Bore size	40 mm	←	←	←	←	←
I.D. No	15A7	15A3	15A4	14A9	15A5	15A8
Idle r/min.	1400 ± 100 r/min	←	←	←	←	1400 ± 50 r/min
Float height	14.7 ± 1.0 mm (0.58 ± 0.04 in)	←	←	←	←	←

ITEM	SPECIFICATION						
Main jet (M.J.)	# 142.5	←	←	←	←	←	# 147.5
Main air jet (M.A.J.)	0.7 mm	←	←	←	←	←	←
Jet needle (J.N.)	6H12-3rd	←	←	←	6J8-3rd	6F87-3rd	
Needle jet (N.J.)	X-9	←	←	←	←	←	Y-1
Throttle valve (Th.V.)	# 110	←	←	←	←	←	←
Pilot jet (P.J.)	# 50	←	# 47.5	←	←	←	45
By-pass (B.P.)	0.8 mm	←	←	←	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←	←	←	←
Valve seat (V.S.)	2.3 mm	←	←	←	←	←	←
Starter jet (G.S.)	# 35	←	←	←	←	←	←
Pilot screw (P.S.)	PRE-SET (1¼ turns back)	←	PRE-SET (1½ turns back)	←	PRE-SET (1¼ turns back)	PRE-SET (1½ turns back)	
Pilot air jet (P.A.J.)	1.4 mm	←	←	←	←	←	1.35
Throttle cable play	0.5– 1.0 mm (0.02– 0.04 in)	←	←	←	←	←	←
Choke cable play	0.5– 1.0 mm (0.02– 0.04 in)	←	←	←	←	←	←

## CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST40SS	←
Bore size	40 mm	←
I.D. No.	14A7	14A8
Idle r/min.	1400 ± 100 r/min	←
Float height	14.7 ± 1.0 mm (0.58 ± 0.04 in)	←
Main jet (M.J.)	# 147.5	←
Main air jet (M.A.J.)	0.7 mm	←
Jet needle (J.N.)	6G7-1st	←
Needle jet (N.J.)	Y-3	←
Throttle valve (Th.V.)	# 110	←
Pilot jet (P.J.)	# 47.5	←
By-pass (B.P.)	0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	←
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	# 35	←
Pilot screw (P.S.)	PRE-SET (2 turns back)	PRE-SET (1½ turns back)
Pilot air jet (P.A.J.)	1.3 mm	1.2 mm
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←
Choke cable play	0.5–1.0 mm (0.02–0.04 in)	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		0° B.T.D.C. Below 2 200 r/min. and 28° B.T.D.C. Above 4 300 r/min.		
Spark plug	Type	ND.: X27EP-U9 N.G.K.: DP9EA-9	E-03,33,34	
		ND.: X27EPR-U9 N.G.K.: DPR9EA-9	The others	
	Gap	0.8–0.9 (0.03–0.04)		
Spark performance		Over 8 (0.3) at 1 atm.		
Ignition coil resistance	Primary	0.1–1.0 Ω	B–B/W	
	Secondary	23–35 kΩ	Plug cap– Plug cap	
Magneto coil resistance	Charging	0.1–1.5 Ω	Y–Y	
	Power source	240–360 Ω	Br–B	
	Pick-up	160–240 Ω	Bl–G	
Generator no-load voltage		More than 65 V(AC) at 5 000 r/min.		
Regulated voltage		13.5–15.5 V at 5 000 r/min.		
Battery	Type designation	12N5-3B		
	Capacity	12V 18 kC (5Ah)/10 HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		15 A		

**WATTAGE**

Unit:W

ITEM		SPECIFICATION		
		E-03,24,28,33	E-02	The others
Headlight	HI	60	←	←
	LO	55	←	←
Parking or position light			3.4	4
Tail/Brake light		8/23	5/21	←
Turn signal light		23	21	←
Tachometer light		3	←	←
Speedometer light		3.4	←	←
Turn signal indicator light		3	←	←
Hight beam indicator light		1.7	←	←
Neutral indicator light		3	←	←
License light		5	←	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Brake lever play	0–0.3 (0–0.01)	—
Rear brake pedal height	5 (0.2)	—

ITEM	STANDARD		LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	14.000–14.043 (0.5512–0.5529)	—
	Rear	14.000–14.043 (0.5512–0.5529)	—
Master cylinder piston diam.	Front	13.957–13.984 (0.5495–0.5506)	—
	Rear	13.957–13.984 (0.5495–0.5506)	—
Brake caliper cylinder bore	Front	32.030–32.106 (1.2610–1.2640)	—
	Rear	27.000–27.076 (1.0630–1.0660)	—
Brake caliper piston diam.	Front	31.950–32.000 (1.2578–1.2598)	—
	Rear	26.920–26.970 (1.0598–1.0618)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	90/90-21 54S	—
	Rear	120/90-17 64S	—
Tire tread depth	Front	—	3.0 (0.12)
	Rear	—	3.0 (0.12)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	240 (9.4)	—	
Front fork spring free length	—	468 (18.4)	
Front fork oil level (compress inner tube without spring)	142 (5.6)	—	
Front fork air pressure	0 kPa (0 kg/cm <sup>2</sup> )	—	
Rear shock absorber spring pre-set length	240.5 (9.5)	—	

ITEM	STANDARD	LIMIT	NOTE
Rear wheel travel	220 (8.7)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

**TIRE PRESSURE**

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	150	1.50	22	175	1.75	25
REAR	175	1.75	25	200	2.00	29

**FUEL + OIL**

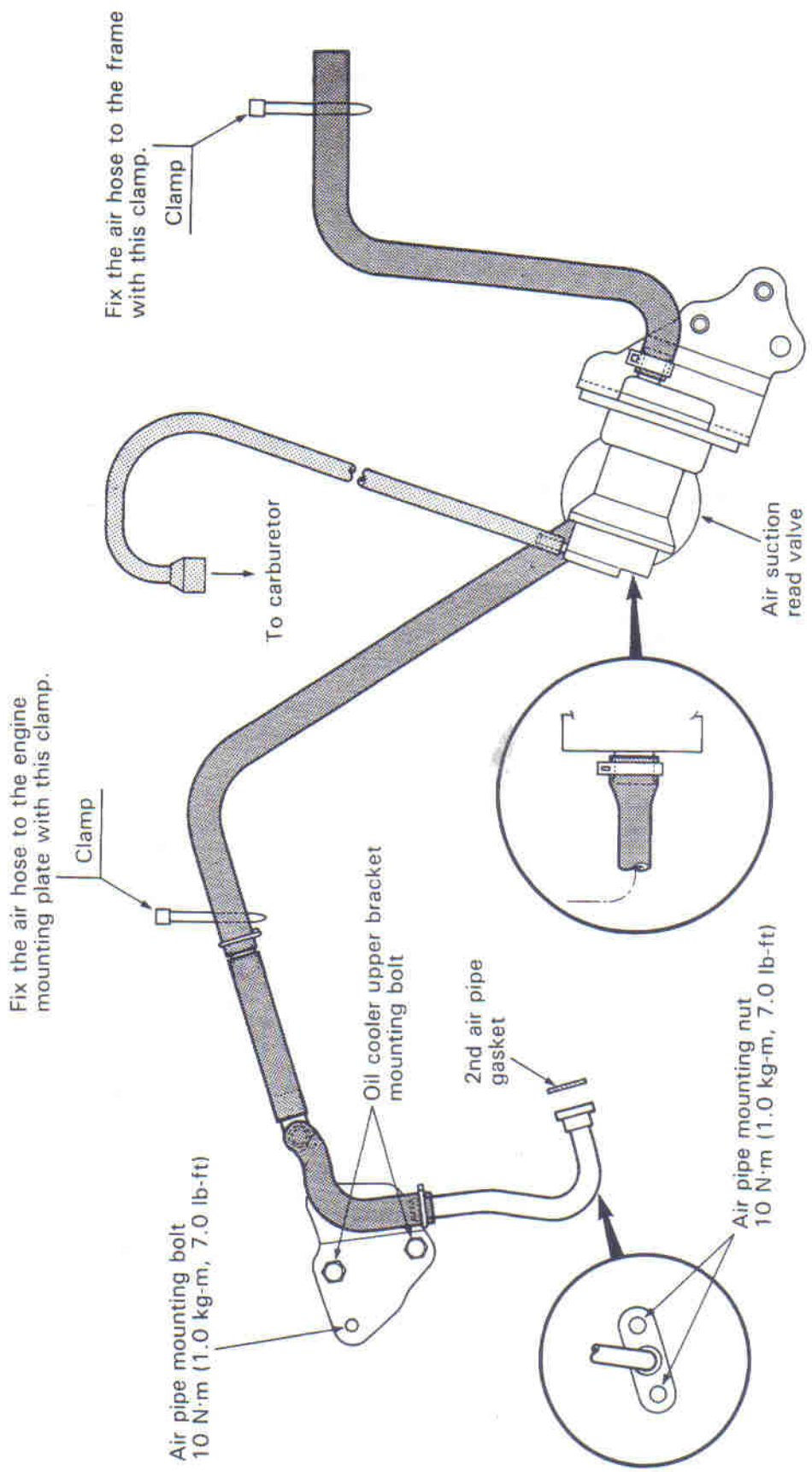
ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03
	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.	E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.	The others
Fuel tank including reserve	21.0 L (5.5/4.6 US/Imp gal)	
reserve	4.5 L (1.2/1.0 US/Imp gal)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change	2 000 ml (2.1/1.8 US/Imp qt)
	Filter change	2 150 ml (2.3/1.9 US/Imp qt)
	Overhaul	2 600 ml (2.7/2.3 US/Imp qt)
Front fork oil type	Fork oil # 10	
Front fork oil capacity (each leg)	566 ml (19.1/19.9 US/Imp oz)	
Brake fluid type	DOT 4	





# SECONDARY-AIR SUPPLY SYSTEM (AIR SUCTION SYSTEM)

SWITZERLAND MODEL ONLY



NOTE: Refer to this illustration for the clip setting direction.

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